



4: TROUBLESHOOTING MANUAL

NX10

AM TRANSMITTER

Document ID:

NHB-NX10-TRB

Version:

2.0

Issue Date:

2016-05-06

Status:

Standard



Contact Information

Nautel Limited

10089 Peggy's Cove Road
Hackett's Cove, NS Canada B3Z 3J4

Toll Free: +1.877.6NAUTEL (662.8835)

(Canada & USA only) or

Phone: +1.902.823.3900 or

Fax: +1.902.823.3183

Nautel Inc.

201 Target Industrial Circle
Bangor, Maine USA 04401

Phone: +1.207.947.8200

Fax: +1.207.947.3693

Customer Service (24-hour support)

+1.877.628.8353 (Canada & USA only)

+1.902.823.5100 (International)

Email: support@nautel.com

Web: www.nautel.com

The comparisons and other information provided in this document have been prepared in good faith based on publicly available information. For verification of materials, the reader is encouraged to consult the respective manufacturer's most recent publication on the official website or through contact with Customer Service.

© Copyright 2016 NAUTEL. All rights reserved.

CONTENTS

Contact Information	4.iii
RELEASE CONTROL RECORD	4.vii
RESPONDING TO ALARMS	4.1.1
Corrective Maintenance	4.1.1
Electrostatic Protection	4.1.3
Identifying an Alarm	4.1.4
Troubleshooting an Alarm	4.1.6
Accessing the Inside of the Transmitter	4.1.44
Troubleshooting Tips	4.1.46
Removing and Reinstalling RF Power Modules	4.1.52
Troubleshooting RF Power Modules	4.1.57
Control/Interface PWB Removal/Replacement	4.1.65
SCR Rectifier Inspection/Replacement	4.1.67
Digital AM Exciter PWB Replacement	4.1.69
Exgine PWB Replacement	4.1.74
GPS Sync PWB Replacement	4.1.74
Rack Interface PWB Replacement	4.1.75
Power Module Interface PWB Replacement	4.1.77
Gas Discharge PWB and Relay Replacement	4.1.79
Fan Tray Replacement	4.1.81
Fan Tray Cooling Fan Replacement	4.1.82
RF Voltage and Current Sample PWB Replacement	4.1.83
Directional Coupler Replacement	4.1.87
Arc Detector UV Sensor Replacement	4.1.89
+15 V or +48 V Power Supply Replacement	4.1.92
Graphic User Interface Display and UI Interface PWB Replacement	4.1.94

PARTS LISTS	4.2.1
Family Tree	4.2.1
How to Locate Information About a Specific Part	4.2.1
Column Content	4.2.2
OEM Code to Manufacturers Cross-Reference	4.2.3
Common Abbreviations/Acronyms	4.2.4

WIRING/CONNECTOR LISTS	4.3.1
Wiring Lists Provided	4.3.1
Wiring Lists Not Provided	4.3.1
Connector Mating Information	4.3.1
Wire Colours	4.3.1
Printed Wiring Board Patterns	4.3.1

READING ELECTRICAL SCHEMATICS	4.4.1
Component Values	4.4.1
Graphic and Logic Symbols	4.4.1
Reference Designations	4.4.1
Unique Symbols	4.4.2
Identifying Schematic Diagrams	4.4.2
Structure of Schematics	4.4.3
Locating Schematic Diagram(s) for a Functional Block	4.4.3
Locating a Part or Assembly on a Schematic	4.4.4

MECHANICAL DRAWINGS	4.5.1
Identifying Mechanical Drawings	4.5.1
Content of Mechanical Drawings	4.5.1
Locating a Part or Assembly on a Mechanical Drawing	4.5.1

LIST OF TERMS	4.6.1
----------------------	--------------

Release Control Record

ISSUE	DATE	REASON
2.0	2016-05-06	Release 2 of NX10. Supports hardware NARA65A. Supports NX SW version 4.7 and higher.

SECTION 4.1: RESPONDING TO ALARMS

This section provides instructions you need when performing troubleshooting on the NX10 transmitter, including the following topics:

- [Corrective Maintenance](#)
- [Electrostatic Protection - see page 4.1.3](#)
- [Identifying an Alarm - see page 4.1.4](#)
- [Troubleshooting an Alarm - see page 4.1.6](#)
- [Accessing the Inside of the Transmitter - see page 4.1.44](#)
- [Troubleshooting Tips - see page 4.1.46](#)
- [Troubleshooting RF Power Modules - see page 4.1.57](#)
- [Other Module Replacement Procedures - see page 4.1.43](#)

If none of the procedures and alarms described in this section address your problem, contact Nautel for assistance.

Corrective Maintenance

Corrective maintenance procedures consist of identifying and correcting defects or deficiencies that arise during transmitter operation. Local and/or remote alarm signals are generated when a malfunction occurs. If an alarm condition is caused by a malfunction in the RF power stage, the transmitter may maintain operation at a reduced RF output level. The nature of the fault – and station policy – will dictate whether an immediate maintenance response is necessary. Fault analysis and rectification may be conducted from three different levels, with a different technical competence level required for each: on-air troubleshooting, remote or local, and off-air troubleshooting.

CAUTION! The transmitter contains many solid state devices that may be damaged if subjected to excessive heat or high voltage transients. Take every effort to ensure that circuits are not overdriven or disconnected from their loads while turned on.

On-Air Troubleshooting

On-air troubleshooting can be performed from a remote location, or locally at the transmitter site.

Remote Troubleshooting

Remote on-air troubleshooting consists of monitoring the transmitter's radiated signal using an on-air monitor or via a LAN connection, and observing the status of each remote fault alarm indicator. Information obtained from these sources should enable an operator to decide whether an alarm response may be deferred to a more convenient time, an immediate corrective action must be taken, or if a standby transmitter must be enabled (if one is available). It is recommended that the significance of remote indications, and the appropriate responses, be incorporated into a station's standard operating procedures. Refer to ["Identifying an Alarm" on page 4.1.4](#) to determine the remedial action required for a given fault.

Local Troubleshooting

Local on-air troubleshooting consists of monitoring the transmitter's integral meters and fault alarm indicators. Analysis of this data will normally identify the type of fault, and in most cases will determine what corrective action must be taken. Refer to ["Identifying an Alarm" on page 4.1.4](#) to determine the remedial action required for a given fault.

The power amplifier stage contains an integral modular reserve (IMR) feature. This feature permits the transmitter to operate at a reduced RF output level when a malfunction occurs in one of its power modules. Station operating procedures will dictate whether a reduced RF output level is acceptable. When a reduced RF output level can be tolerated, replacement of the defective RF power module may be deferred to a convenient time. A defective RF power module may be removed from the transmitter for servicing, while the transmitter is operating, provided that the conditions in the removal instructions detailed in ["Removing an RF Power Module" on page 4.1.52](#) are met.

WARNING! FAILURE TO FOLLOW THE RF POWER MODULE REMOVAL INSTRUCTIONS MAY RESULT IN INJURY TO THE OPERATOR AND SERIOUS PHYSICAL DAMAGE TO THE RF POWER MODULE AND TRANSMITTER.

Off-Air Troubleshooting

Off-air troubleshooting must be performed when the replacement of a defective RF power amplifier module, or routine on-air calibration adjustments, will not restore operation.

It is recommended that the transmitter's output be connected to a precision 50 Ω resistive dummy load (rated for at least 1.5 times the rated transmitter carrier power) before starting off-air troubleshooting procedures. If an appropriate dummy load is not available, troubleshooting for a majority of faults can be performed with RF power stage turned off. The transmitter may remain connected to its antenna system for these procedures.

NOTE: Reduce the RF output level to a minimal value when troubleshooting faults in the power amplifier stage while the transmitter's RF output is connected to the antenna system.

Electrostatic Protection

The transmitter's assemblies contain semiconductor devices that are susceptible to damage from electrostatic discharge. The following precautions must be observed when handling an assembly which contains these devices.

CAUTION! Electrostatic energy is produced when two insulating materials are rubbed together. A person wearing rubber-soled shoes, walking across a nylon carpet or a waxed floor, can generate an extremely large electrostatic charge. This effect is magnified during periods of low humidity. Semiconductor devices such as integrated circuits, field-effect transistors, thyristors and Schottky diodes may be damaged by this high voltage unless adequate precautions are taken.

Electrical Discharging of Personnel

Personnel should be electrically discharged by a suitable grounding system (e.g., anti-static mats, grounding straps) when removing an assembly from the transmitter, and while handling the assembly for maintenance procedures.

Handling/Storage

An assembly should be placed in an anti-static bag when it is not installed in a transmitter, or when it is not undergoing maintenance. Electronic components should be stored in anti-static materials.

Tools/Test Equipment

Testing and maintenance equipment – including soldering and unsoldering tools – should be suitable for contact with static sensitive semiconductor devices.

Stress Current Protection

Every precaution should be taken to ensure the static sensitive semiconductor devices are protected from unnecessary stress current. This is achieved by ensuring that current is not flowing when an electrical connection is broken, and that voltages are not present on external control/monitoring circuits when they are connected.

Identifying an Alarm

You can identify an alarm locally by viewing the front panel (see [“Front Panel UI Alarm Checks”](#)) or remotely by viewing the remote AUI’s Transmitter Status page (see [“Remote AUI Alarm Checks”](#) on page 4.1.5). After successfully identifying an alarm, attempt to determine the cause of the alarm and correct it (see [“Troubleshooting an Alarm”](#) on page 4.1.6).

Front Panel UI Alarm Checks

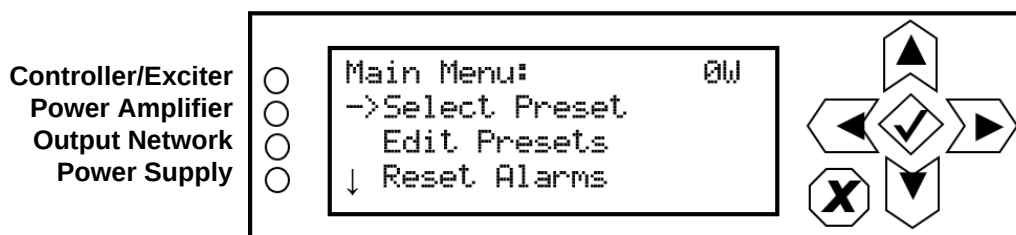
There are two ways to check for alarms on the front panel:

- [Alarm/Status LEDs](#)
- [View Alarms Screen](#) - see page 4.1.5

Alarm/Status LEDs

There are four LEDs on the left-hand side of the LCD display that provide information about the operational status of various sections of the transmitter - Controller/Exciter, Power Amplifier, Output Network and Power Supply (see [Figure 4.1.1](#)). The LEDs can glow green, amber or red. Typically, green indicates normal operation, amber indicates a warning, and red indicates a fault or error.

Figure 4.1.1: Alarm/Status LEDs



When an LED is:

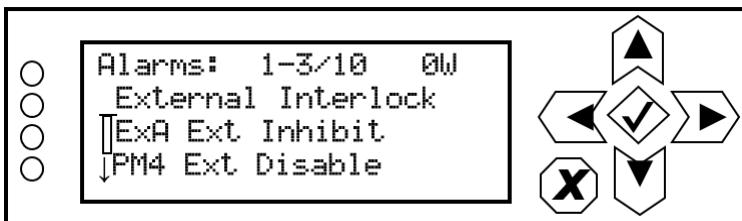
- ❖ Green - transmitter is on, with no known faults that would affect the normal operation of the transmitter.
- ❖ Amber - a fault is present that affects the normal operation of the transmitter and may cause a reduction in RF power, but the transmitter is still producing RF power.
- ❖ Red - a fault is present and the transmitter is not producing RF power.

When a fault is present, the transmitter may still produce an RF output. In this case, or if the transmitter has shut down, you should schedule and commence more in-depth fault diagnosis. See [“View Alarms Screen”](#) on page 4.1.5.

View Alarms Screen

If an alarm exists and is currently being recognized by the transmitter system, it is displayed in the View Alarms screen (Main Menu -> View Status -> View Alarms) of the front panel Display (see [Figure 4.1.2](#)). Scroll through the View Alarms screen to view the active faults.

Figure 4.1.2: View Alarms Screen



Alarm prefix indicates origin:

Exc: Exciter (single exciter systems)

ExA: Exciter A (dual exciter systems)

ExB: Exciter B (dual exciter systems)

PM#: Power Module #

Rk: Rack Interface

Exg: Exgine

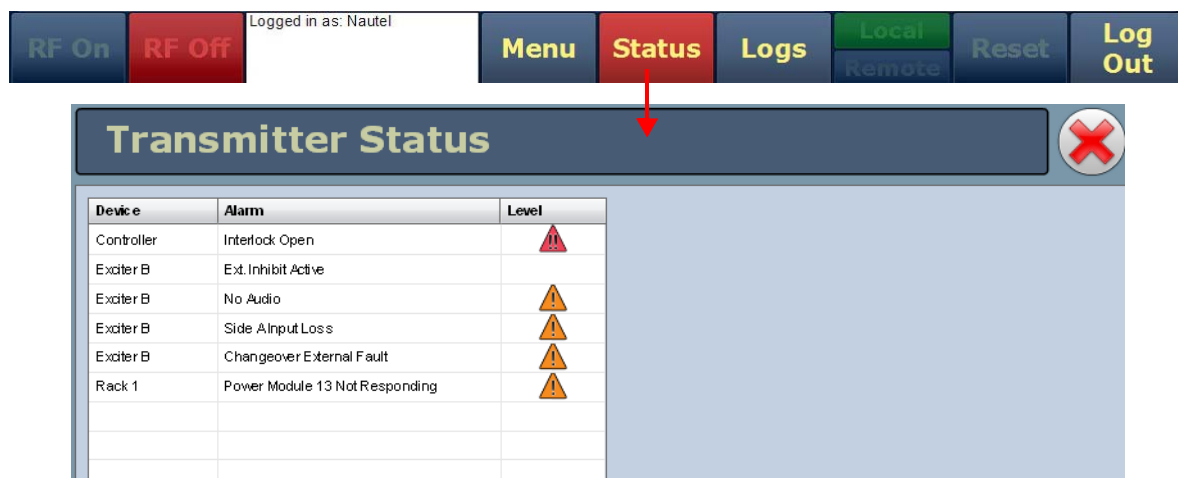
No prefix: Controller

Remote AUI Alarm Checks

The colour of the Status button (see [Figure 4.1.3 on page 4.1.5](#)) at the bottom of the remote AUI indicates the severity of the highest offending alarm. The button can display green, amber or red. When the Status button is:

- ❖ Green - transmitter is on, with no known faults that would affect the normal operation of the transmitter.
- ❖ Amber - a fault is present that affects the normal operation of the transmitter and may cause a reduction in RF power, but the transmitter is still producing RF power.
- ❖ Red - a fault is present and the transmitter is not producing RF power.

Figure 4.1.3: Transmitter Status Page



Click the Status button to view the Transmitter Status page (see [Figure 4.1.3 on page 4.1.5](#)), which displays a list of active alarms. Alarms are listed by their origin (Device column), then by name (Alarm column), and then by severity (Level column).

- The Device column displays the sub-system origin of the alarm. The sub-systems that can be displayed are:
 - ❖ Controller: All alarms in this sub-system apply to the controller.
 - ❖ Exciter A or B: All alarms in this sub-system apply to an exciter (A or B).
 - ❖ Rack #: All alarms in this sub-system apply to a rack (cabinet) (only Rack 1 for NX10).
 - ❖ Module #: All alarms in this sub-system apply to a specific RF power module (1 through 4).
 - ❖ Engine: For systems with Engine installed, all alarms in this sub-system apply to the Engine.
- The Alarm column displays the alarm name. Use this name as a cross-reference during troubleshooting (see [“Troubleshooting an Alarm” on page 4.1.6](#)).
- The Level column displays a symbol indicates the severity of the alarm, as follows:
 - ❖ One Yellow ! - low severity, normal operation of transmitter not affected
 - ❖ One Orange ! - medium severity, normal operation of transmitter affected, RF output may be reduced
 - ❖ Two Red !! - high severity, RF output is inhibited

Troubleshooting an Alarm

Troubleshoot an alarm as follows:

NOTE: Before undertaking any troubleshooting, record all meter readings and note if any other alarms are displayed on the front panel UI's View Alarms page or the remote AUI's Transmitter Status page. Record all alarms.

1. Attempt to clear any latching alarms:
 - ❖ locally, using the front panel UI, by pressing the checkmark button in the Main Menu -> View Status -> Reset Alarms screen.
 - ❖ remotely, using the remote AUI, by pressing the Reset button on the bottom banner of the AUI page.

If the alarm persists, it will not clear from the display.

2. Locate the alarm name in the appropriate table (see below) to determine the cause of the alarm and perform any recommended procedures in the Description and Troubleshooting Action column. This may also lead to replacing a suspect PWB, power supply or fan, as detailed in [Table on page 4.1.37](#).

- ❖ See [Table 4.1.1 on page 4.1.8](#) for Controller alarms
- ❖ See [Table 4.1.2 on page 4.1.19](#) for Exciter A/B alarms
- ❖ See [Table 4.1.3 on page 4.1.28](#) for Engine alarms
- ❖ See [Table 4.1.4 on page 4.1.29](#) for RF Power Module alarms
- ❖ See [Table 4.1.5 on page 4.1.34](#) for Rack alarms

NOTE: [Table 4.1.1](#) through [Table 4.1.5](#) list all **Alarms** that can occur, sorted alphanumerically for each sub-system (e.g., Controller, Exciter A/B, Module, etc.), including both the names displayed on the AUI and, if different, the front panel UI (in parentheses). The **Severity** column shows the low, medium or high severity of the alarm (see [page 4.1.6](#)). The **Description and Troubleshooting Action** column provides a brief description of the alarm, troubleshooting tips and a cross-reference to more detailed troubleshooting, as applicable.

- ❖ See [Table 4.1.6 on page 4.1.38](#) for Summary alarms

NOTE: [Table 4.1.6](#) lists the Summary alarms that can be configured for remote monitoring through the front panel UI or remote AUI's Remote I/O -> Remote Outputs menu (see the "Operating the Transmitter" section of the Operations & Maintenance Manual for configuration details). Each Summary alarm can be triggered by any one alarm in a specific sub-set, as shown in [Table 4.1.6](#). The **Description and Trigger Alarms** column of [Table 4.1.6](#) provides a brief description of the summary alarm and a list of the triggering alarms. To determine the root cause(s) of a Summary Alarm, check the front panel UI or remote AUI for an offending trigger alarm and refer to its troubleshooting information for more details.

3. If troubleshooting and subsequent replacement of a suspect PWB or module causes the alarm to disappear, the alarm has been successfully cleared. If the fault condition does not clear contact Nautel Customer Service for assistance.

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
+1.2V Fail	Low	This alarm occurs if the +1.2 V rail is outside its acceptable range of 1.08 V to 1.32 V. The transmitter takes no action on this alarm. Replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
+3.3V Fail	Low	This alarm occurs if the +3.3 V rail is outside its acceptable range of 2.97 V to 3.63 V. The transmitter takes no action on this alarm. Replace the control/interface PWB(see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
-15V Fail	Low	This alarm occurs if the -15 V rail is outside its acceptable range of -16.5 V to -13.5 V. The transmitter takes no action on this alarm. Replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Arc Shutback	High	This alarm indicates the transmitter has entered a shutback (see Shutback on page 3.1.10 of the Operations & Maintenance Manual for a description of the shutback routine) due to one of the rack controller's arc detectors being activated. When this fault occurs, the transmitter immediately inhibits PDM and the transmitter's output power drops to 0 W. Once the fault clears the transmitter will automatically recover, either to the power setpoint, or to a reduced power as determined by the cutback routine (see Cutback on page 3.1.11 of the Operations & Maintenance Manual for a description of the cutback routine). Visually inspect the inside of the transmitter to locate the fault causing the arc detector to trigger.
Audio Loss Shutdown	High	This alarm occurs if the modulation level is below the preset threshold for the designated period of time set in the Audio Loss settings of the current preset, and the desired action was set to RF Inhibit. This will cause the transmitter to shut down its RF output until the exciter determines that the modulation source has returned. If this alarm is unexpected, check the audio inputs specified in the preset and verify there is signal present.
Brownout Reset	Medium	This alarm is only visible in the transmitter logs, and indicates the controller was reset because its +5 V power supply voltage was less than +4.3 V, but remained above +1.4 V, and then subsequently recovered. This alarm should occur concurrently with other alarms. Follow the troubleshooting information for the associated alarms. If the alarm persists without the presence of other alarms, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
Combiner Interlock Open (Combiner Interlock)	High	This alarm will only occur if the transmitter is connected in a combined system. The alarm indicates that the interlock signal from the combiner is open. When this alarm occurs, the transmitter immediately inhibits the PDM and the transmitter's output power drops to 0 W. If this condition persists for more than 10 seconds, the transmitter will inhibit the RF power modules, fans and B+ power supply. The transmitter will automatically recover when the condition is cleared. Check the combiner for a condition that may cause it to open the interlock to the transmitter. If so, troubleshoot the cause of that condition. If not, inspect the wiring between the combiner and the transmitter and verify there is no damage. If the alarm persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Controller Reset	Medium	This alarm is only visible in the transmitter logs, and indicates the controller was reset because its +5 V power supply voltage was less than 1.4 V, which normally happens due to a loss of ac power. If the controller is rebooting without losing ac power to the transmitter, check for the presence of other alarms at the time of the controller reset and follow the troubleshooting information for those alarms. Otherwise, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
EEPROM Failure: Config (EEP Fail Config)	Medium	This alarm occurs when the transmitter is unable to read the following settings from EEPROM upon boot-up. The transmitter will revert to its initial default settings, which may be different from the values set before the transmitter was shipped. The alarm will remain asserted until at least one of the settings are changed. Affected settings are: – Main Exciter (Defaults to A) – Standby Exciter Installed (Defaults to Yes) – Exciter Sync (Defaults to None) – Active Max Power Lockout (Defaults to 1) – RF Monitor Select (Defaults to forward power) – Host Watchdog Enable (Defaults to OFF, should be turned ON) – UI Backlight Brightness (Defaults to 100%) – UI Inactivity Timeout (Defaults to 10 minutes) – Network Configuration Configure the affected settings as desired. Cycle (turn off, then on) ac power to the transmitter. If the alarm persists, replace the battery on the control/interface PWB and retry the above steps. If the alarm persists, replace the control/interface PWB (see “Control/Interface PWB Removal/Replacement” on page 4.1.65)..
EEPROM Failure: Potentiometers (EEP Fail Pots)	Medium	This alarm occurs when the transmitter is unable to read its RF Symmetry Adjustment calibration from EEPROM upon boot-up. The alarm will remain asserted until the RF Symmetry has been re-calibrated. When this alarm occurs, the transmitter will load a default level of exactly mid-scale for the symmetry adjustment potentiometers. Set the RF Symmetry Adjust per the factory configuration. Cycle (turn off, then on) ac power to the transmitter. If the alarm persists, replace the battery on the control/interface PWB and retry the above steps. If the alarm persists, replace the control/interface PWB (see “Control/Interface PWB Removal/Replacement” on page 4.1.65).

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
EEPROM Failure: Remotes (EEP Fail Remotes)	Medium	This alarm occurs when the transmitter is unable to read its remote I/O configuration from EEPROM upon boot-up. The transmitter will revert to the initial default remote I/O settings and the alarm will remain asserted until a new remote input/output is configured. Reconfigure the remote I/O settings as desired. Cycle (turn off, then on) ac power to the transmitter. If the alarm persists, replace the battery on the control/interface PWB and retry the above steps. If the alarm persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
EEPROM Failure: Schedule (EEP Fail Schedule)	Medium	This alarm occurs when the transmitter is unable to read its schedule configuration from EEPROM upon boot-up. The transmitter will establish a new, completely blank schedule. The alarm will remain asserted until at least one new scheduled event is created. Recreate the desired schedule settings. Cycle (turn off, then on) ac power to the transmitter. If the alarm persists, replace the battery on the control/interface PWB and retry the above steps. If it still persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
EEPROM Failure: Thresholds (EEP Fail Thresholds)	Medium	This alarm occurs when the transmitter is unable to read the setting for the Fast SWR Shutback threshold voltage from EEPROM upon boot-up. The transmitter will revert to its initial default settings, which may be different from the values set before the transmitter was shipped. The alarm will remain asserted until the setting is changed. Contact Nautel to obtain to correct value for the Fast SWR Shutback Voltage threshold and configure the setting accordingly. Cycle (turn off, then on) ac power to the transmitter. If the alarm persists, replace the battery on the control/interface PWB and retry the above steps. If the alarm persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
Exciter A or B Not Responding (Exciter A or B Offline)	Medium	This alarm occurs when the controller is configured to expect exciter A (or B) is installed, and it has failed to receive any serial response from that exciter. The alarm is cleared if the controller is configured to expect that same exciter is not installed, or if it receives a serial response from the exciter. When this alarm occurs on the standby exciter, automatic changeover will be inhibited. When this alarm occurs on the main exciter, if automatic changeovers are enabled and the main exciter is active and the standby exciter is responding to serial communication, an automatic changeover will occur. If there are two exciters in the transmitter, swap exciter positions. If the alarm follows the exciter, or there is only one exciter in the system, replace the digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69). If the alarm persists, or the alarm remains with the position, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Exciter Changeover (Auto Changeover)	Medium	This alarm indicates that an automatic exciter changeover has occurred. This alarm will occur as a result of another alarm triggering the automatic exciter changeover. Follow the troubleshooting information for the associated alarm.
Exgine Not Responding (Exgine Offline)	Low	This alarm indicates the transmitter is configured for an IBOC mode of operation and the controller has not received any communication from the Exgine over a set period of time. The alarm will clear if the transmitter is configured for a non-IBOC mode of operation, or the controller receives a response from the Exgine. If the Exgine is operating normally, ignore this alarm. If the Exgine is not operating normally, cycle ac power to the transmitter. If the alarm persists, inspect the cabling between the Exgine and the transmitter controller. If the cabling is acceptable and the alarm persists, replace the Exgine PWB see "Exgine PWB Replacement" on page 4.1.74). If the alarm persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
External PDM Inhibit (External Inhibit)	High	This alarm occurs if the external PDM inhibit circuit, wired to the control/interface PWB, is closed. When this alarm occurs, the transmitter immediately inhibits the PDM and the transmitter's output power drops to 0 W. The transmitter will automatically recover when the condition is cleared. Ensure the transmitter is set to RF Off and disconnect the PDM inhibit circuit from the transmitter. Measure the impedance of the interlock circuit. If the impedance measures short circuit (low impedance) the PDM inhibit is closed, and it will be necessary to locate the external device that is causing this condition. If the impedance does not measure short circuit, verify the PDM inhibit circuitry has been properly configured. If the PDM inhibit circuitry is properly configured and the alarm persists, replace the control PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65). See also "Controller: External PDM Inhibit" on page 4.1.46 .
External Reset	Medium	This alarm is only visible in the transmitter logs, and indicates the controller was reset by triggering the controller's reset pin. If this alarm continues to occur unexpectedly, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Fast SWR Shutback	High	This alarm indicates the peak reflected power measured by the directional coupler at the output of the transmitter has exceeded the factory-set threshold. When this alarm occurs, the transmitter immediately inhibits the PDM and RF drive (see Shutback on page 3.1.10 of the Operations & Maintenance Manual for a description of the shutback routine). Once the fault clears, the transmitter will automatically recover, either to the power setpoint, or to a reduced power as determined by the cutback routine (see Cutback on page 3.1.11 of the Operations & Maintenance Manual for a description of the cutback routine). If this alarm occurs in conjunction with the Exciter's SWR Shutback alarm, it generally indicates a fault in the transmitter's external RF output network (e.g., rigid-line, antenna, etc.). If this alarm is occurring while the Exciter's SWR Shutback alarm is not, verify the wiring between the directional coupler and the control/interface PWB is not damaged. If not, verify the Fast SWR Shutback threshold is set properly (contact Nautel to obtain the correct setting for your transmitter). If this threshold is set correctly and the alarm persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65). If the alarm continues to persist, replace the directional coupler assembly (see "Directional Coupler Replacement" on page 4.1.87).

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
GPS Not Responding (GPS Offline)	Medium	This alarm indicates the transmitter is configured to use a GPS sync PWB as a frequency and phase reference, but the controller is not receiving communication from the GPS sync PWB. The alarm will clear when the transmitter is configured to not use the GPS sync PWB as the frequency and phase reference, or the controller receives communication from the GPS sync PWB. Inspect the wiring between the GPS sync PWB and the control/interface PWB, if applicable. If the wiring is acceptable, replace the GPS sync PWB (see "GPS Sync PWB Replacement" on page 4.1.74).
GPS PLL Unlocked	Medium	This alarm indicates the timing phase-lock-loop between the 1 PPS signal from the GPS and the 10 MHz reference is not locked. This can occur due to a power failure, or because the GPS receiver is not locked to the GPS satellites. Verify the GPS antenna is installed and is located in a spot where it is possible to obtain a GPS satellite lock. If the alarm persists, replace the GPS sync PWB (see "GPS Sync PWB Replacement" on page 4.1.74).
GPS Receiver Not Responding (GPS Rcvr Offline)	Medium	This alarm occurs when the GPS receiver is not responding to serial commands on the GPS sync PWB. When this occurs, the GPS sync PWB's phase-lock-loop will not be locked, and the timing signals will be free-running. Cycle (turn off, then on) the ac power to the transmitter. If the alarm persists, replace the GPS sync PWB (see "GPS Sync PWB Replacement" on page 4.1.74).
GPS Sync No 1-PPS (GPS No 1-PPS)	Medium	The alarm occurs when the 1 PPS output from the GPS receiver is not present. This occurs when the GPS receiver is not locked to the GPS satellites. When the 1 PPS input is not present, the phase-lock-loop cannot lock properly to discipline the 10 MHz reference. Verify the GPS antenna is installed and is located in a spot where it is possible to obtain a GPS satellite lock. If the alarm persists, replace the GPS sync PWB (see "GPS Sync PWB Replacement" on page 4.1.74).
GPS Unlocked	Medium	This alarm occurs when the GPS module on the GPS sync PWB does not have a valid satellite lock. When this alarm occurs, the phase-lock-loop is no longer running to discipline the 10 MHz oscillator, and it is allowed to free-run at the last valid setting. Verify the GPS antenna is installed and is located in a spot where it is possible to obtain a GPS satellite lock. If the alarm persists, replace the GPS sync PWB (see "GPS Sync PWB Replacement" on page 4.1.74).

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
High RF Drive	Low	This alarm indicates the controller's RF Drive Duty Cycle meter has risen above 60% for longer than 10 seconds. This alarm will cause an exciter changeover, if automatic changeover is enabled and the transmitter is operating on the main exciter. If there are two exciters in the transmitter, swap exciter positions. If the alarm follows the exciter, or there is only one exciter in the system, replace the digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69). If the alarm persists or the alarm remains with the position, replace the control/interface PWB. (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Host Network Down	Low	This alarm indicates the transmitter is configured to have networking enabled, but the host is indicating there is no network connectivity. If the transmitter is not connected to a network, the alarm can be inhibited by changing the network settings to static IP and setting the IP address to 0.0.0.0. If the transmitter is connected to a network, verify the network settings are configured properly, and the network cable is connected to the correct port on the transmitter.
Host Not Booted	Medium	This alarm indicates that the controller has not received any communication from the host since the last time the controller booted (i.e., was powered up). The occurrence of this alarm is normal for approximately one to five minutes while the host is booting, immediately after ac power has been applied to the transmitter. If this alarm continues to occur more than 30 minutes after ac power has been applied to the transmitter, cycle (turn off, then on) the ac power. If the alarm persists after 30 minutes, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Host Not Responding	Medium	This alarm indicates that the controller has not received any communication from the host in a set period of time. The occurrence of this alarm is normal for approximately one to five minutes while the host is booting, immediately after ac power has been applied to the transmitter. If this alarm continues to occur more than 30 minutes after ac power has been applied to the transmitter, cycle (turn off, then on) the ac power. If the alarm persists after 30 minutes, replace the control/interface PWB. (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Internal Watchdog Reset	Medium	This alarm will only be seen in transmitter logs, and indicates that the controller was reset by its internal watchdog. If this alarm persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
Interlock Open	High	This alarm indicates that the external interlock input wired to the control/interface PWB is open. An alarm will be triggered by user-set conditions (e.g., the state of the door to the ATU). When this alarm occurs, the transmitter immediately inhibits the PDM and the transmitter's output power drops to 0 W. If this condition persists for more than 10 seconds, the transmitter will inhibit the RF power modules, fans and B+ power supply. The transmitter will automatically recover when the condition is cleared. With the transmitter set to RF Off, disconnect the interlock circuit from the transmitter. Measure the impedance of the interlock circuit. If the impedance measures open circuit (high impedance) the interlock is open, and it will be necessary to locate the external device that is causing this condition. If the impedance does not measure open circuit, verify the interlock circuitry has been properly configured. If the interlock circuitry is properly configured, make a temporary jumper and use it to short out the interlock circuit. If the alarm disappears, the transmitter is operating as expected and it will be necessary to locate the external device that is causing this condition. If the alarm persists, replace the control PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65). See also "Controller: Interlock Open" on page 4.1.46 .
Jumped to Bootloader Code (Jump to Bootloader)	Medium	This alarm is only visible in the transmitter logs, and indicates the controller was reset due to performing a firmware upgrade. If this alarm is occurring when a firmware upgrade is not being performed, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Local UI Failure (UI Failure)	Low	This alarm indicates that the transmitter controller is not receiving any communication from the local user interface. The alarm will clear when the controller begins to receive communications from the local user interface. Inspect the wiring between the local user interface and the control/interface PWB. If the alarm persists, replace the local user interface (see "Graphic User Interface Display and UI Interface PWB Replacement" on page 4.1.94).
Low Battery	Medium	This alarm occurs if the voltage of the backup battery has fallen below an acceptable level. Replace the battery (BT1) on the control/interface PWB while ac power is on. If the alarm persists after replacing the battery, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
Low RF Drive	Low	This alarm indicates the controller's RF Drive Duty Cycle meter has fallen below 40% for longer than 10 seconds. This alarm will cause an exciter changeover, if automatic changeover is enabled and the transmitter is operating on the main exciter. If there are two exciters in the transmitter, swap exciter positions. If the alarm follows the exciter, or there is only one exciter in the system, replace the digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69). If the alarm persists, or the alarm remains with the position, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Out of Memory Reset	Medium	This alarm is only visible in the transmitter logs, and indicates the controller automatically reset because it ran out of the memory required to continue normal operation. If the alarm persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Power Loss	Medium	This alarm indicates that the controller lost power at the time the event was logged. The alarm should occur concurrently with other alarms. Follow the troubleshooting action for the associated alarm(s). Otherwise, if the alarm persists without the presence of other alarms, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Rack 1 Not Responding	Medium	This alarm indicates that the controller is no longer receiving serial communication from Rack 1. No action is taken. Check the wiring and connections between the control/interface PWB and the rack interface PWB and verify there is no damage. If the wiring is OK, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65). If the alarm persists, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75).
Rack Shutback	High	This alarm indicates that the rack interface has requested a shutback, but there is no information on the specific cause for the request. This alarm causes the transmitter to shut back (see Shutback on page 3.1.10 of the Operations & Maintenance Manual for a description of the shutback routine). Check the wiring and connections between the control/interface PWB and the rack interface PWB, specifically the Rack Shutback signal and the serial communication bus, and verify there is no damage. If the wiring is OK, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65) or the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75).

Table 4.1.1: Troubleshooting Controller Alarms

Controller Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
Unknown Reset Cause	Medium	This alarm is only visible in the transmitter logs, and indicates the controller was reset, but it was unable to determine the cause of the reset. if the controller is rebooting unexpectedly, check for the presence of other alarms at the time of this alarm and follow the troubleshooting action for the associated alarm(s). Otherwise, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).

Table 4.1.2: Troubleshooting Exciter A/B Alarms

Exciter A/B Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
AES 1 (or 2) Unlocked	Medium	This alarm indicates there is no AES data detected on the applicable AES (1 or 2) input and that same input is selected as the active input in either Analog or Digital settings for the active preset. Verify there is valid AES data being applied to the corresponding input on the control/interface PWB. If there is data being applied to the correct input and the alarm persists, replace the digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69) or the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
AM Input Loss	Medium	This alarm occurs if the input signal being used to generate the analog AM modulation is low or not present. This alarm will be triggered immediately if the AES input is unlocked, or after 2 minutes if the incoming modulation level is below 10%. The presence of this alarm will trigger an exciter changeover if automatic changeover is enabled and the transmitter is operating on the main exciter. Verify that the active preset is calling up the correct audio input and is set for the correct input level. Verify that there is a valid audio signal on the audio input being used. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
Audio Loss	Medium	This alarm occurs as a result of the modulation being below the specified threshold for the designated period of time set in the remote AUI's Audio Loss tab for the current preset. This will cause the action specified in the preset to be taken. Check the audio inputs specified in the preset and verify there is signal present.
Audio Overmod Protection (Audio Overmod)	Medium	This alarm indicates that the exciter has reduced the output signal due to overmodulation on the audio input. This alarm is typically caused by low frequency or excessive modulation, although it can also occur if the DRM AES input sensitivity is incorrectly configured, resulting in too much signal level. The alarm will clear and allow the gain to return to 100% once the excessive modulation condition disappears. Check the input signal being applied to the exciter and reduce the level as necessary.

Table 4.1.2: Troubleshooting Exciter A/B Alarms

Exciter A/B Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
B+ Sample Uncalibrated (B+ Uncalibrated)	Medium	This alarm indicates that the associated exciter's B+ sample has never been calibrated. This alarm should only occur when replacing an exciter, and indicates the configuration file was not properly uploaded (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
Carrier Sync Unlocked (Sync Unlock)	Medium	This alarm occurs when the transmitter's Sync Source is set to GPS Sync Card or Combiner and the exciter cannot lock to the 1 kHz signal used for phase synchronization. If the Sync Source is set to Combiner, this alarm will cause the transmitter to be inhibited, otherwise this alarm is displayed for information only. If the transmitter's Sync Source is set to GPS Sync Card, check the connection between the GPS sync PWB and the control/interface PWB. If the connection looks OK, replace the GPS sync PWB (see "GPS Sync PWB Replacement" on page 4.1.74). If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69) or the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65). If the transmitter's Sync Source is set to Combiner, check the connection between the combiner and the control/interface PWB. If the connection looks OK, troubleshoot the combiner's synchronization signal source.
Cutback	Medium	The forward power has been reduced due to multiple shutbacks. See "Cutback:" on page 3.1.11 of the Operations & Maintenance Manual for a description of the cutback routine. Check for associated alarms and refer to their troubleshooting information to determine the specific cause of the cutback.
Digital Input Loss (Dig Input Loss)	Medium	This alarm indicates the input signal being used to generate the digital modulation is too low or no longer present. This alarm will be triggered immediately if the AES input (DRM) is unlocked or the Exgine stream (IBOC) is missing, or if the DSP is receiving zeroes on the AES (DRM) or Exgine (IBOC) input for more than 100 ms. The presence of this alarm will trigger an exciter changeover, if automatic changeover is enabled and the transmitter is operating on the main exciter. Verify that the active preset is calling up the correct input and is set for the correct input level. Verify that there is a valid signal on the input being used. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).

Table 4.1.2: Troubleshooting Exciter A/B Alarms

Exciter A/B Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
Entered Firmware Upgrade (FW Upgrade)	Low	This alarm indicates that the exciter firmware is being upgraded, and it has inhibited the RF output until complete. The alarm will clear when the upgrade is complete and the exciter reboots. If a firmware upgrade has not been initialized intentionally, try resetting the exciter. If the alarm continues to persist, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
External Inhibit Active (Ext Inhibit)	Low	This alarm indicates that the transmitter controller has inhibited the exciters. Transmitter output power is reduced to 0 W. It is normal to see this alarm when the transmitter is in an RF OFF state. If this alarm occurs while RF is turned on, there should be a corresponding alarm indicated by the transmitter controller. Follow the troubleshooting information for that alarm.
FPGA Test Failed (FPGA Test Fail)	Medium	This alarm indicates there is a programming failure with the FPGA. Cycle the power (off, then on) to the transmitter. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
High B+ Voltage (High B+)	Medium	This alarm indicates that the B+ voltage measured by the exciter exceeded the B+ setpoint by more than 20 V for at least ten (10) seconds. If the rack interface's High B+ voltage alarm is present, see the troubleshooting action for that alarm. If the rack interface's alarm is not present, compare the exciter's B+ voltage meter with the rack's B+ voltage meter. If they are different, calibrate the exciter's B+ voltage sample using a multimeter to measure the B+ voltage. If after calibrating the exciter's B+ voltage sample the meters continue to read the incorrect voltage, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
High DC Current Foldback (IDC Foldback)	Medium	This alarm indicates that the transmitter's forward power is being reduced because the total dc current being drawn from the B+ power supply, as measured by the transmitter controller's Total B+ Current meter, exceeded 49 A. The alarm will clear once the transmitter's forward power is no longer being reduced. This alarm indicates the transmitter's efficiency is much lower than expected, most likely due to a poor load being presented to the RF power modules. Ensure the load impedance being presented to the transmitter by the antenna network is within specification.

Table 4.1.2: Troubleshooting Exciter A/B Alarms

Exciter A/B Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
High Forward Foldback (Fwd Foldback)	Medium	This alarm occurs when the transmitter's forward power has been reduced because the average forward power increased above 150% of the transmitter's rated carrier power. The alarm will clear when the forward power is no longer being reduced. The alarm will generally occur due to excessive modulation. Reduce the level of modulation applied to the transmitter.
High Power Lockout (Power Lockout)	Medium	This alarm occurs when the exciter has reduced the power set point due to the currently active high power lockout limit being lower than the active preset's power set point.
High Temperature Foldback (Temp Foldback)	Medium	This alarm indicates either the average temperature of the RF power modules has exceeded 80 degrees Celsius, or the rectifier heatsink temperature has exceeded 80 degrees Celsius, and the transmitter's forward power is being reduced to maintain temperatures that are below the above temperature thresholds. Once the high temperature condition has cleared, it may take up to an hour for the transmitter to return to its power setpoint, and the alarm will clear when the power is no longer being reduced. Otherwise, pressing the reset button will cause the alarm to clear. Check the transmitter's output network and verify that the air filter in the back of the cabinet is clean. Verify the temperature of the transmitter building is within specifications.
Low B+ Voltage (Low B+)	Medium	This alarm occurs when the B+ voltage measured by the exciter drops below 75% of the B+ setpoint for more than 10 seconds. When this alarm is present the exciter will not allow the PDM duty cycle to be increased to compensate for fluctuations in B+. This alarm will clear when the B+ voltage measurement exceeds 81.25% of the B+ setpoint. Generally this alarm indicates that the B+ voltage cannot be increased because the ac voltage is too low. Check the ac mains voltage connected to the transmitter and verify the power transformer is tapped correctly.
Low Forward Power Threshold 1 (or 2) (Low Forward 1 or 2)	Medium	This alarm occurs when the output power of the transmitter is below the corresponding user-defined Low Forward Power Threshold (1 or 2). This alarm should occur with other alarms indicating why the transmitter's output power has dropped. See the troubleshooting information with associated alarms.

Table 4.1.2: Troubleshooting Exciter A/B Alarms

Exciter A/B Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
No B+ Sample	Medium	This alarm indicates the exciter's B+ voltage sample is below 40 V for more than 10 seconds. If there is an associated Low B+ voltage alarm, follow the troubleshooting information for that alarm. If there are no additional alarms and there is a second exciter installed, switch exciters and check if the alarm is present on the other exciter. If the alarm is present on the second exciter, check the cabling between the B+ sampling point and the control/interface PWB. If the connection is OK, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65). If the alarm is not present on the second exciter, or there is no second exciter in the transmitter, replace the digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
No Carrier Sync Signal Present (No Carrier Sync)	Medium	This alarm will occur when the transmitter's Sync Source is set to GPS Sync Card or Combiner and the 10 MHz or 1 kHz synchronization signal is either not present or out of specification. If the Sync Source is set to Combiner, this alarm will cause the transmitter to be inhibited, otherwise this alarm is displayed for information only. If the transmitter's Sync Source is set to GPS Sync Card, check the connection between the GPS sync PWB and the control/interface PWB. If the connection is OK, replace the GPS sync PWB (see "GPS Sync PWB Replacement" on page 4.1.74). If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69) or the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65). If the transmitter's Sync Source is set to Combiner, check the connection between the combiner and the control/interface PWB. If the connection looks OK, troubleshoot the combiner's synchronization signal source.
No External 10 MHz (No Ext 10MHz)	Medium	This alarm indicates the transmitter is set to run on an external 10 MHz source, but the exciter has determined the frequency of the external source to be outside of the range 9.9 MHz to 10.1 MHz. This will cause the exciter to revert to using its internal 10 MHz reference until it determines the external 10 MHz is in range. This may also cause an exciter changeover if a backup exciter is installed and automatic changeover is enabled. Check the integrity and signal level of the external 10 MHz source. If the external source is acceptable and the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).

Table 4.1.2: Troubleshooting Exciter A/B Alarms

Exciter A/B Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
No Host Audio	Medium	This alarm indicates there is no audio modulation being provided by the audio player when the transmitter configured to run using the audio player as the audio source. This alarm will trigger the AM Input Loss alarm. Verify the transmitter is intentionally running with the audio player as the analog audio source. Verify the audio player is configured to play audio files, those files are present on a USB flash drive connected to the transmitter, and the audio player is playing. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69) or the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
No IBOC Data	Medium	This alarm indicates there is no modulation data being provided by the embedded Engine when the transmitter is running in an IBOC mode of operation. This alarm will trigger the Digital Input Loss alarm. Verify the transmitter is operating in the intended mode. Verify the embedded Engine is connected to the control/interface PWB and the wiring connections are intact. Verify the Exporter is connected to the Engine and the Engine is receiving data from the Exporter. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69) or the Engine PWB (see "Engine PWB Replacement" on page 4.1.74).
Over-Current Shutback (RF I Shutback)	High	This alarm indicates the peak RF current at the output of the transmitter has exceeded the Peak RF Current Limit. This alarm causes the transmitter to immediately shut down its RF output and then recover. If this alarm occurs in conjunction with the Controller's Fast SWR Shutback alarm, there may be a fault in the transmitter's external RF output network (i.e., rigid-line, antenna, etc.). If this alarm is occurring without the presence of the Controller's Fast SWR Shutback alarm, verify the RF current sample, RF voltage sample and the wiring between the sample point and the control/interface PWB is not damaged. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).

Table 4.1.2: Troubleshooting Exciter A/B Alarms

Exciter A/B Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
PLL Unlocked	High	This alarm indicates the exciter's phase lock loop, which locks the transmitter's carrier frequency to a 10 MHz reference, is no longer locked to the reference. If an external 10 MHz source is being used, the exciter will fall back to using its internal 10 MHz clock. Otherwise, the exciter will inhibit its output. If an external 10 MHz source is being used, check the integrity and signal level of the source. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
Power Below Setpoint (Pwr Below Set)	Medium	This alarm indicates that the transmitter cannot achieve the desired output power. For the alarm to occur, the power must be at least 10% below the setpoint for more than four (4) seconds, and the exciter is not able to increase the output power because it has reached maximum gain, or the output is being limited by a foldback condition. The alarm is typically accompanied by other alarms. See the troubleshooting action for the associated alarms
Pre correction Inhibited (Correction Off)	Medium	This alarm indicates that the exciter has disabled its pre-correction compensation. This alarm will occur because the transmitter's B+ voltage is too low. See the troubleshooting action for the associated low B+ voltage alarm.
Protection Mechanisms Disabled (Protection Off)	Medium	This alarm indicates that the exciter's protection (shutback, foldback, cutback) has been turned off by the user. The state should only be required when calibrating the transmitter after a frequency change. If this state is not intentional, press the reset button on the associated digital AM exciter PWB. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
Reboot for Settings Needed (Reboot Needed)	Medium	This alarm indicates that the exciter needs to reboot itself to reconfigure its settings. The exciter should automatically reboot itself, however if the alarm persists, press the reset button on the associated digital AM exciter PWB. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69)..
RF Probes Uncalibrated (RF Uncalibrated)	High	This alarm indicates that the associated exciter has not been calibrated for the transmitter's current operating frequency. If the operating frequency has been changed inadvertently, change the frequency back to its original setting. If a frequency change has been performed, recalibrate the exciter per the Nautel provided frequency change procedure.

Table 4.1.2: Troubleshooting Exciter A/B Alarms

Exciter A/B Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
SWR Foldback	Medium	This alarm indicates the average reflected power has exceeded the acceptable limit, and the transmitter's RF output is being reduced to maintain the maximum acceptable reflected power. This alarm normally occurs due to a poor impedance being presented to the transmitter. Inspect the antenna network and check the tuning to ensure the impedance being presented to the transmitter is within specification.
SWR Shutback	High	This alarm indicates the transmitter's peak reflected power has exceeded the factory set peak reflected limit. This alarm causes the transmitter to immediately shut down its RF output, then recover. If this alarm occurs in conjunction with the Controller's Fast SWR Shutback alarm, it generally indicates a fault in the transmitter's external RF output network (e.g., rigid-line, antenna, etc.). If this alarm occurs without the presence of the Controller's Fast SWR Shutback alarm, verify the RF current sample, RF voltage sample and the wiring between the sample point and the control/interface PWB is not damaged. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
Transmitter Gain Too Low (TX Gain Low)	High	This alarm occurs when the power gain of the transmitter falls below 63%. This alarm is latching and requires pressing the reset button to clear the alarm. This alarm normally occurs because there is a significant number (greater than 37%) of disabled power modules. Try resetting transmitter alarms to clear power module faults. If the alarm persists, repair or replace RF power modules to clear this alarm (see "Troubleshooting RF Power Modules" on page 4.1.57).
Transmitter Type Not Set (TX Type Not Set)	High	This alarm indicates that the associated exciter has not been informed of the type of transmitter it has been installed in. If the affected exciter is a replacement, follow the digital AM exciter PWB replacement procedure to clear the alarm (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
Unsigned DSP Image (Unsigned DSP)	High	This alarm indicates that the software installed on the exciter is invalid or corrupt and it is inhibiting its output. Try pressing the reset button on the digital AM exciter PWB. If the alarm persists, perform a software upgrade on the transmitter. If the alarm persists, replace the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).

Table 4.1.2: Troubleshooting Exciter A/B Alarms

Exciter A/B Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
Unsigned FPGA Image (Unsigned FPGA)	High	This alarm indicates that the software installed on the exciter is invalid or corrupt. Press the reset button on the digital AM exciter PWB. If the alarm persists, perform a software upgrade on the transmitter. If the alarm persists, replace the associated digital AM exciter PWB (see “Digital AM Exciter PWB Replacement” on page 4.1.69).

Table 4.1.3: Troubleshooting Engine Alarms

Engine Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
AM/FM Mode Mismatched (Mode Mismatch)	Medium	This alarm indicates the Exporter mode does not match the Engine mode. Reconfigure the Exporter or Engine to the correct mode.
DPLL Unlocked	Medium	This alarm occurs when the Engine phase-locked loop can no longer follow the reference input within 1 ppm of its calibrated value. When using Ethernet sync, this can be triggered by excessive jitter on the Ethernet link or a sudden change in throughput delay of the E2X signal path (e.g., switched IP circuits). This alarm can be temporary, in this case, once the delay has been compensated for and a new equilibrium has been found. This alarm can also be caused by Engine crystal aging, which can be resolved by recalibrating the Engine crystal. Ensure the alarm is not temporary and persists for at least one (1) hour. Verify the disciplining input (Exporter clock) is correct. If Engine crystal aging is suspected, widen the VCXOPPM limits to 5 ppm. Restart the system, operate for 24 hours and ensure the alarm clears. Configure the calibrated VCXO value with the new DAC value as reported from the Engine status screen. Set the limits back to 0.95 ppm. Restart the system and ensure the alarm is cleared.
Lost External 10MHz (Lost Ext 10MHz)	Medium	This alarm is occurs when the Engine's external 10 MHz signal disappears during an active E2X connection. When this alarm is present, the Engine will run on the internal oscillator. This can eventually lead to diversity delay drifts and FIFO Overflow or Underflow conditions. If an external 10 MHz signal is being intentionally applied to the Engine, verify a valid 10 MHz signal is being applied to the Engine. If an external 10 MHz signal is not being applied to the Engine, cycle (turn off, then on) ac power to the transmitter. If the alarm persists in either condition, replace the Engine PWB (see "Engine PWB Replacement" on page 4.1.74).
Network Down	Medium	This alarm indicates the Engine has no network connectivity. Verify the Engine's network settings are configured properly, and the network cable is connected to the correct port on the Engine PWB.
Network Misconfigured	Medium	This alarm indicates that invalid Engine network parameters have been configured. Review and correct all engine network settings including the IP address, netmask and gateway.
System Error	Medium	This alarm acts as a summary alarm for a number of unexpected Engine system conditions, such as failed memory checks or internal configuration errors. Contact Nautel Customer Service to troubleshoot this issue.

Table 4.1.4: Troubleshooting RF Power Module Alarms

Module Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
+15V Fail	Medium	This alarm indicates the RF power module's +15 V power supply is below +13.5 V or above +16.5 V. This alarm will cause the RF power module to be immediately disabled. If other alarms are present at the same time this alarm is active, see the troubleshooting action for the associated alarms. Otherwise, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52).
EEPROM Failure (EEPROM Fail)	Medium	This alarm indicates the RF power module was not able to load valid data from its EEPROM. Try removing and re-inserting the RF power module. If the alarm persists, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52).
External Disable Active (Ext. Disable)	Medium	This alarm indicates the PDM cable has been disconnected from the front of the RF power module, which causes the power module to be immediately disabled. If this alarm occurs, reconnect the PDM drive cable associated with that RF power module. If the problem persists, swap the affected RF power module with an operational RF power module's position. If the fault follows the RF power module, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52). If the fault remains with the position, try replacing the PDM drive cable. If the alarm persists, replace the source of the PDM signal (see "Digital AM Exciter PWB Replacement" on page 4.1.69 or "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Front Panel Inhibit (User Inhibit)	Medium	This alarm indicates that the RF power module has been disabled through the front panel user interface. If this alarm is present, attempt to enable the RF power module through the front panel user interface.
High B+ Voltage (High B+)	Medium	This alarm indicates the RF power module's B+ meter has exceeded 450 V. If high B+ voltage alarms are present for other system components, see the troubleshooting action for those alarms. If the alarm persists, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52).

Table 4.1.4: Troubleshooting RF Power Module Alarms

Module Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
High DC Current (High DC I)	Medium	This alarm indicates that the RF power module's DC Current meter has exceeded 22 A, or the RF power module's peak DC current has exceeded the threshold applied to the microcontroller's comparator. This alarm will immediately disable the RF power module, and latch it off. If this alarm occurred in conjunction with an Overmodulation alarm, follow the troubleshooting action for that alarm. Otherwise, try resetting the alarms using the front panel UI or the remote AUI. If the alarm persists, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52). If the alarm clears, troubleshoot the suspect RF power module for RF FET failures (see "Troubleshooting RF Power Modules" on page 4.1.57) or the associated gas discharge tube has activated. If the alarm persists, suspect that the associated RF relay is not opening (see "Gas Discharge PWB and Relay Replacement" on page 4.1.79).
High PA Voltage (High PAV)	Medium	This alarm occurs because of one of two conditions: (1) the PA voltage is at least 10% above the product of the B+ level and the PDM duty cycle; or (2) the PA voltage has exceeded 95% of the B+ value for more than 50 ms. The alarm is latching and will cause the associated RF power module to disable itself. This alarm generally indicates that a modulator FET has failed. See "Troubleshooting RF Power Modules" on page 4.1.57 to determine whether to replace the affected RF power module or to repair damaged parts.
High RF Drive (High RF Drv)	Medium	This alarm indicates the RF drive duty cycle as measured by the RF power module is above 65%. The affected RF power module is immediately disabled. Try swapping the affected RF power module with an operational RF power module in another position. If the fault follows the RF power module, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52). If the fault remains with that position, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75) or associated RF power module interface PWB (see "Power Module Interface PWB Replacement" on page 4.1.77). If the alarm is present on all RF power modules, try replacing the RF drive cable. If the alarm persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65) or the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).

Table 4.1.4: Troubleshooting RF Power Module Alarms

Module Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
High Temperature (High Temp)	Medium	This alarm indicates the power module's measured heatsink temperature has exceeded 90 degrees Celsius. The affected RF power module is immediately disabled. If this alarm occurs with another alarm, troubleshoot that alarm first. Otherwise, see "Troubleshooting RF Power Modules" on page 4.1.57 to determine whether to replace the affected RF power module or to repair damaged parts.
Invalid Thermistor Sample (Therm. Fault)	Medium	This alarm indicates there is a problem with the associated RF power module's temperature sample. When this alarm occurs, the associated RF power module will disable itself until the condition is cleared. Inspect R1 on the RF power module, which is soldered to pads G and H of A1, and repair or replace as necessary. Otherwise replace the entire RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52).
Low B+ Voltage (Low B+)	Medium	This alarm indicates the B+ level of the associated RF power module is below 75% of its nominal value. If the Rack Interface's Low B+ Voltage alarm is present, follow the troubleshooting action for that alarm. Try swapping the affected RF power module with an operational RF power module in another position. If the fault follows the RF power module, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52). If the fault remains with that position, check the B+ fuse associated with the RF power module and replace as necessary (see "RF Module #: Low B+ Voltage" on page 4.1.50).
Low Fan 1 (or 2) Speed (Fan 1 or 2 Fault)	Medium	This alarm occurs if the RF power module is expected to produce RF power and the fan (1 or 2) tachometer drops below 1650 RPM. The affected RF power module is immediately disabled. Try swapping the affected RF power module with an operational RF power module in another position. If the fault follows the RF power module, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52). If the fault remains with that position, replace the associated fan tray assembly (see "Fan Tray Replacement" on page 4.1.81). If the alarm persists, replace the associated power module interface PWB (see "Power Module Interface PWB Replacement" on page 4.1.77).

Table 4.1.4: Troubleshooting RF Power Module Alarms

Module Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
Low PA Voltage (Low PAV)	Medium	This alarm indicates the RF power module's PA Voltage meter has dropped 10% below the expected value - determined by multiplying the power module's B+ Voltage meter by the PDM Duty Cycle meter - for more than 500 ms. This alarm can only be triggered if the RF power module PDM Duty Cycle meter is above 10%, causing the affected RF power module to be immediately disabled, and latched. Try resetting the alarm using the front panel UI or remote AUI. If the alarm persists, replace the affected RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52).
Low RF Drive	Medium	This alarm indicates the RF drive duty cycle of the affected RF power module is below 35%. The affected RF power module is immediately disabled. Try swapping the affected RF power module with an operational RF power module in another position. If the fault follows the RF power module, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52). If the fault remains with that position, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75) or associated RF power module interface PWB (see "Power Module Interface PWB Replacement" on page 4.1.77). If the alarm is present on all RF power modules, try replacing the RF drive cable. If the alarm persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65) or the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).
No Controller Communications (No Comms)	Medium	This alarm indicates the RF power module has not received any communication from the rack interface for 10 seconds. Try swapping the affected RF power module with an operational RF power module in another position. If the alarm follows the RF power module, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52). If the alarm remains with the position, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75) or the power module interface PWB (see "Power Module Interface PWB Replacement" on page 4.1.77).

Table 4.1.4: Troubleshooting RF Power Module Alarms

Module Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
Overmodulation (Overmod)	Medium	This alarm indicates the RF power module's PDM Duty Cycle meter is above 95%. Verify the modulation being applied to the transmitter is not too high. Try swapping the RF power module with an RF power module that is not showing this alarm. If the alarm follows the RF power module, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52). If the alarm remains with the original position, try replacing the digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69) or the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65).
Residual PA Voltage Present (Residual PAV)	Medium	This alarm indicates the PA voltage of the RF power module is higher than expected with either the modulator or the RF amplifier disabled. See "Troubleshooting RF Power Modules" on page 4.1.57 to determine whether to replace the affected RF power module or to repair damaged parts, suspecting a failure of one of the FETs.
RF Drive Fault (RF Drv Fault)	Medium	This alarm indicates that the duty cycle of the RF drive or the dead time between RF drive signals on the associated RF power module is not as expected. This alarm causes the RF power module to be immediately disabled and latched off. Try resetting the alarm using the front panel UI or the remote AUI. Try swapping the affected RF power module with an operational RF power module in another position. If the fault follows the RF power module, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52). If the fault remains with that position, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75) or associated RF power module interface PWB (see "Power Module Interface PWB Replacement" on page 4.1.77). If the alarm is present on all RF power modules, try replacing the RF drive cable. If the alarm persists, replace the control/interface PWB (see "Control/Interface PWB Removal/Replacement" on page 4.1.65) or the associated digital AM exciter PWB (see "Digital AM Exciter PWB Replacement" on page 4.1.69).

Table 4.1.5: Troubleshooting Rack Alarms

Rack Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
+15 V Fail	Medium	This alarm occurs if the +15 V rail is outside the acceptable range (13.5 V to 16.5 V). Measure the output voltage of the +15 V power supply. If it is outside the acceptable range, replace the +15 V power supply (see "+15 V or +48 V Power Supply Replacement" on page 4.1.92). Otherwise check the continuity of the cabling between the power supply and the rack interface PWB and repair as necessary. If the cabling is OK, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75).
+30 V Fail	Medium	This alarm occurs if the +30 V rail is outside the acceptable range (27 V to 33 V). Replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75).
+48 V Fail	Medium	This alarm occurs if the +48 V rail is outside the acceptable range (44 V to 52 V). Measure the output voltage of the +48 V power supply. If it is outside the acceptable range, replace the +48 V power supply (see "Graphic User Interface Display and UI Interface PWB Replacement" on page 4.1.94). Otherwise check the continuity of the cabling between the power supply and the rack interface PWB and repair as necessary. If the cabling is OK, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75).
-15 V Fail	Medium	This alarm occurs if the -15 V rail is outside the acceptable range (-13.5 V to -16.5 V). Suspect a faulty dc-dc converter (U5) on the rack interface PWB. Remove the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75) and replace the defective dc-dc converter or the entire rack interface PWB.
AC Phase Loss	Medium	This alarm occurs when the SCR rectifier assembly detects a significant imbalance in the ac phase voltages. The rectifier will shut down when this condition exists and prevent the transmitter from generating RF. In a safe manner, measure the voltage of each phase of the ac mains. If a phase is missing, check the ac mains fuses. If the ac mains phases are normal and the alarm persists, check the Phase Loss LED on the rectifier. If it is on, replace the SCR rectifier (see "SCR Rectifier Inspection/Replacement" on page 4.1.67). If the Phase Loss LED is off, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75).
Arc Detector 1	High	This alarm indicates that the transmitter's arc detector has detected an arc and caused the transmitter to shut back. Due to the sensitivity of the arc detector, it is possible for an external UV source to cause this alarm. Check and remove all external UV sources. If the alarm persists, perform a visual inspection inside the rear of the transmitter for signs of corona or arcing.

Table 4.1.5: Troubleshooting Rack Alarms

Rack Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
EEPROM Failure (EEPROM Fail)	Medium	This alarm indicates that the rack controller has failed to load its configuration from EEPROM. Remove and reapply the ac power to the transmitter. If the alarm persists, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75).
High AC Voltage (High AC)	Medium	This alarm indicates the rack interface's Ac Sample meter is above 384 V. The alarm clears when the sample falls below this voltage. It can be caused by an improperly tapped power transformer or a transient on the ac mains. Verify the mains transformer is tapped correctly (see Step 11 of "Connecting Ac Power" in the Installation Manual). If so, monitor the ac mains for transient conditions when this alarm occurs.
High B+ Shutback (Hi B+ Shutback)	High	This alarm occurs when the B+ voltage measured by the rack interface exceeds the set threshold (normally 430 V). This causes the transmitter to disable the B+ power supply until the B+ voltage has decreased an additional 15 volts below the threshold. This alarm normally occurs with extreme changes in transmitter power (i.e., preset changes, interlock open, etc.). If the alarm is occurring continuously, or when unexpected, monitor the B+ with an oscilloscope and determine if the B+ is exceeding the shutback limit. If it is not exceeding the limit, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75). If it is exceeding the limit, verify the ac mains transformer is tapped correctly (see Step 11 of "Connecting Ac Power" in the Installation Manual).
High B+ Voltage (High B+)	Medium	If the B+ voltage is more than 10 V above the B+ voltage set point, the rack interface will attempt to decrease the rectifier's output. If the rack interface reaches the bottom of its adjustment range and the B+ voltage remains 10 V or more above the B+ voltage setpoint for more than 15 seconds, this alarm will occur. The alarm will clear when the B+ voltage changes to within 10 V of the B+ voltage setpoint, or the B+ power supply is inhibited (by turning RF Off, for example). If the alarm persists while the transmitter is producing RF power, check the ac mains voltages and verify they are within $\pm 10\%$ of the nominal voltage for which the transformer is tapped. Verify the mains transformer is tapped correctly (see Step 11 of "Connecting Ac Power" in the Installation Manual). If the alarm persists, replace the rectifier assembly (see "SCR Rectifier Inspection/Replacement" on page 4.1.67) or the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75).

Table 4.1.5: Troubleshooting Rack Alarms

Rack Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
High Rectifier Temperature (Rectifier Temp)	Medium	This alarm indicates that the rectifier heatsink temperature has exceeded 100 degrees Celsius. The exciter should reduce the transmitter's output power before this alarm occurs (see High Temperature Foldback alarm in Table 4.1.2). The alarm will clear once the rectifier heatsink temperature drops below 99.5 degrees Celsius. The alarm indicates that there is excessive dissipation in the rectifier, likely due to high current draw. This may be due to the secondary voltage of the power transformer being lower than specified. Verify the mains transformer is tapped correctly (see Step 11 of "Connecting Ac Power" in the Installation Manual). If the alarm persists, replace the rectifier assembly (see "SCR Rectifier Inspection/Replacement" on page 4.1.67).
Low AC Voltage (Low AC)	Medium	This alarm indicates the rack interface's Ac Sample meter is below 256 V. The alarm clears when the sample rises above this voltage. It is caused by an improperly tapped transformer, or a transient on the ac mains. Verify the mains transformer is tapped correctly (see Step 11 of "Connecting Ac Power" in the Installation Manual). If so, monitor the ac mains for transient conditions when this alarm occurs.
Low B+ Shutdown	High	This alarm indicates that the B+ decreases more than 126 V below the B+ setpoint. While this alarm is active, the rectifier and exciter PDM outputs will be inhibited. This alarm will clear if the measured ac voltage on the transformer secondary increases above 263 Vac line-to-line after a minimum one (1) second delay or if the transmitter is turned RF Off. If the alarm persists, check the ac mains voltage and verify they are within the nominal voltage the transmitter is tapped for $\pm 10\%$. Verify the mains transformer is tapped correctly (see Step 11 of "Connecting Ac Power" in the Installation Manual). With RF On at low power, verify the B+ voltage is 400 V (or per the B+ setpoint if adjusted). If not, replace the rectifier (see "SCR Rectifier Inspection/Replacement" on page 4.1.67). Otherwise suspect the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75).

Table 4.1.5: Troubleshooting Rack Alarms

Rack Alarm Name (AUI/UI)	Severity	Description and Troubleshooting Action
Low B+ Voltage (Low B+)	Medium	If the B+ voltage falls to more than 15% below the B+ voltage set point, the rack interface will attempt to turn up the rectifier output voltage. If the rack interface reaches the top of its adjustment range and the B+ voltage remains 25% or more below the B+ voltage setpoint for more than two (2) seconds, this alarm will occur. The alarm will clear when the B+ voltage changes to within 25% of the B+ voltage setpoint, or the B+ power supply is inhibited (by turning RF Off, for example). If the alarm persists while the transmitter is producing RF power, check the main B+ fuse and replace as necessary. If the fuse is OK or the alarm persists, check the ac mains voltages and verify they are within $\pm 10\%$ of the nominal voltage for which the transformer is tapped. Verify the mains transformer is tapped correctly (see Step 11 of "Connecting Ac Power" in the Installation Manual). If the alarm persists, replace the rectifier assembly (see "SCR Rectifier Inspection/Replacement" on page 4.1.67) or the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75).
Power Module 1 (or 2,3,4) Not Responding (PM 1 or 2,3,4 Offline)	Medium	This alarm indicates that the rack interface PWB is not receiving a response from the associated RF power module. Try swapping the affected RF power module with an RF power module in another location. If the alarm follows the RF power module, replace the RF power module (see "Removing and Reinstalling RF Power Modules" on page 4.1.52). If the alarm remains with the location, replace the rack interface PWB (see "Rack Interface PWB Replacement" on page 4.1.75). If the alarm persists, replace the associated power module interface PWB (see "Power Module Interface PWB Replacement" on page 4.1.77).

Table 4.1.6: Troubleshooting Summary Alarms

Summary Alarm Name, AUI (front panel UI)	Description and Triggering Alarms		
Audio Loss Summary (Audio Loss Summary)	This summary alarm is triggered if any of the following audio loss related alarms occur: <u>Exciter A/B alarms:</u> AES1/2 Unlocked Audio Loss No Host Audio AM Input Loss Digital Input Loss No IBOC Data		
Controller Fault Summary (Controller Summary)	This summary alarm is triggered if any of the following Controller related alarms occur: <u>Controller alarms:</u> EEPROM Failure: Config Host Not Booted +1.2V Fail EEPROM Failure: Potentiometers Host Not Responding +3.3V Fail EEPROM Failure: Remotes Local UI Failure -5V Fail EEPROM Failure: Schedule Low Battery -15V Fail		
Exciter Fault Summary (Exciter Summary)	This summary alarm is triggered if any of the following Exciter related alarms occur: <u>Controller alarms:</u> Audio Loss Shutdown High RF Drive Exciter Changeover Low RF Drive Exciter A or B Not Responding <u>Exciter A/B alarms:</u> AES 1/ 2 Unlocked Low Forward Power 1/2 Power Below Setpoint AM Input Loss No B+ Sample Precorrection Inhibited Audio Loss No Carrier Sync Signal RF Probes Uncalibrated B+ Sample Uncalibrated No External 10 MHz Transmitter Gain Too Low Carrier Sync Unlocked No Host Audio Transmitter Type Not Set Digital Input Loss No IBOC Data Unsigned DSP Image External Inhibit Active PLL Unlocked Unsigned FPGA Image FPGA Test Failed		

Table 4.1.6: Troubleshooting Summary Alarms

Summary Alarm Name, AUI (front panel UI)	Description and Triggering Alarms
Exgine Fault Summary (Exgine Summary)	This summary alarm is triggered if any of the following Exgine related alarms occur: <u>Controller alarms:</u> Exgine Not Responding <u>Exgine alarms:</u> AM/FM Mode Mismatched FIFO Underflow Network Misconfigured DPLL Unlocked Lost External 10 MHz System Error FIFO Overflow Network Down
External Fault Summary (External Summary)	This summary alarm is triggered if any of the following external alarms occur: <u>Controller alarms:</u> Combiner Interlock Open External PDM Inhibit Interlock Open <u>Exciter alarms:</u> Audio Overmod Protection
GPS Sync Fault Summary (GPS Sync Summary)	This summary alarm is triggered if any of the following GPS related alarms occur: <u>Controller alarms:</u> GPS Not Responding GPS Receiver Not Responding GPS Unlocked GPS PLL Unlocked GPS Sync No 1-PPS
High Reflected Power Summary (Refl Power Summary)	This summary alarm is triggered if any of the following high reflected power related alarms occur: <u>Controller alarms:</u> Fast SWR Shutback <u>Exciter alarms:</u> SWR Foldback SWR Shutback
High Temperature Summary (High Temp Summary)	This summary alarm is triggered if any of the following temperature related alarms occur: <u>Exciter alarms:</u> High Temperature Foldback <u>Rack alarms:</u> High Rectifier Temperature

Table 4.1.6: Troubleshooting Summary Alarms

Summary Alarm Name, AUI (front panel UI)	Description and Triggering Alarms		
Maintenance Fault Summary (Maintenance Summary)	This summary alarm is triggered if any of the following maintenance related alarms occur: <u>Controller alarms:</u> EEPROM Failure: Config GPS Not Responding Local UI Failure EEPROM Failure: Potentiometers GPS PLL Unlocked Low Battery EEPROM Failure: Remotes GPS Receiver Not Responding Low RF Drive EEPROM Failure: Schedule GPS Sync No 1-PPS Rack 1 Not Responding EEPROM Failure: Thresholds GPS Unlocked +1.2V Fail Exciter Changeover High RF Drive +3.3V Fail Exciter A or B Not Responding Host Not Booted -5V Fail Exigine Not Responding Host Not Responding -15V Fail <u>Exciter alarms:</u> B+ Sample Uncalibrated High B+ Voltage No Carrier Sync Signal Carrier Sync Unlocked Low B+ Voltage No External 10MHz External Inhibit Active No B+ Sample Precorrection Inhibited <u>Exigine alarms:</u> AM/FM Mode Mismatched FIFO Underflow Network Down DPLL Unlocked Lost External 10MHz Network Misconfigured FIFO Overflow <u>Module alarms:</u> External Disable Active High Temperature No Controller Comms Front Panel Inhibit Invalid Thermistor Sample Overmodulation High B+ Voltage Low B+ Voltage Residual PA Voltage High DC Current Low Fan 1/2 Speed RF Drive Fault High PA Voltage Low PA Voltage +15V Fail High RF Drive Low RF Drive <u>Rack alarms:</u> AC Phase Loss High Rectifier Temp +5V Fail EEPROM Failure Low AC Voltage +30V Fail High Ac Voltage Low B+ Voltage +48V Fail High B+ Voltage PM 1-4 Not Responding -5V Fail		

Table 4.1.6: Troubleshooting Summary Alarms

Summary Alarm Name, AUI (front panel UI)	Description and Triggering Alarms																					
Off Air Summary (Off Air Summary)	This summary alarm is triggered if any of the following off-air related alarms occur: <u>Controller alarms:</u> <table><tr><td>Arc Shutback</td><td>Combiner Interlock Open</td><td>Fast SWR Shutback</td></tr><tr><td>Audio Loss Shutdown</td><td>External PDM Inhibit</td><td>Interlock Open</td></tr></table> <u>Exciter alarms:</u> <table><tr><td>FPGA Test Failed</td><td>RF Probes Uncalibrated</td><td>Transmitter Type Not Set</td></tr><tr><td>Over-Current Shutback</td><td>SWR Shutback</td><td>Unsigned DSP Image</td></tr><tr><td>PLL Unlocked</td><td>Transmitter Gain Too Low</td><td>Unsigned FPGA Image</td></tr></table> <u>Rack alarms:</u> <table><tr><td>Arc Detector 1</td><td>High B+ Shutback</td><td>Low B+ Shutdown</td></tr></table>	Arc Shutback	Combiner Interlock Open	Fast SWR Shutback	Audio Loss Shutdown	External PDM Inhibit	Interlock Open	FPGA Test Failed	RF Probes Uncalibrated	Transmitter Type Not Set	Over-Current Shutback	SWR Shutback	Unsigned DSP Image	PLL Unlocked	Transmitter Gain Too Low	Unsigned FPGA Image	Arc Detector 1	High B+ Shutback	Low B+ Shutdown			
Arc Shutback	Combiner Interlock Open	Fast SWR Shutback																				
Audio Loss Shutdown	External PDM Inhibit	Interlock Open																				
FPGA Test Failed	RF Probes Uncalibrated	Transmitter Type Not Set																				
Over-Current Shutback	SWR Shutback	Unsigned DSP Image																				
PLL Unlocked	Transmitter Gain Too Low	Unsigned FPGA Image																				
Arc Detector 1	High B+ Shutback	Low B+ Shutdown																				
Output Network Fault Summary (O/P Network Summary)	This summary alarm is triggered if any of the following output network related alarms occur: <u>Controller alarms:</u> <table><tr><td>Arc Shutback</td><td>Fast SWR Shutback</td></tr></table> <u>Exciter alarms:</u> <table><tr><td>Cutback</td><td>Over-Current Shutback</td><td>SWR Shutback</td></tr><tr><td>High Forward Foldback</td><td>SWR Foldback</td><td></td></tr></table> <u>Rack alarms:</u> <table><tr><td>Arc Detector 1</td><td></td><td></td></tr></table>	Arc Shutback	Fast SWR Shutback	Cutback	Over-Current Shutback	SWR Shutback	High Forward Foldback	SWR Foldback		Arc Detector 1												
Arc Shutback	Fast SWR Shutback																					
Cutback	Over-Current Shutback	SWR Shutback																				
High Forward Foldback	SWR Foldback																					
Arc Detector 1																						
Power Module Fault Summary (PM Summary)	This summary alarm is triggered if any of the following power module related alarms occur: <u>Module alarms:</u> <table><tr><td>EEPROM Failure</td><td>High RF Drive</td><td>Low RF Drive</td></tr><tr><td>External Disable Active</td><td>High Temperature</td><td>No Controller Comms</td></tr><tr><td>Front Panel Inhibit</td><td>Invalid Thermistor Sample</td><td>Overmodulation</td></tr><tr><td>High B+ Voltage</td><td>Low B+ Voltage</td><td>Residual PA Voltage Present</td></tr><tr><td>High DC Current</td><td>Low Fan 1/2 Speed</td><td>RF Drive Fault</td></tr><tr><td>High PA Voltage</td><td>Low PA Voltage</td><td>+15V Fail</td></tr></table> <u>Rack alarms:</u> <table><tr><td>PM 1-4 Not Responding</td><td></td><td></td></tr></table>	EEPROM Failure	High RF Drive	Low RF Drive	External Disable Active	High Temperature	No Controller Comms	Front Panel Inhibit	Invalid Thermistor Sample	Overmodulation	High B+ Voltage	Low B+ Voltage	Residual PA Voltage Present	High DC Current	Low Fan 1/2 Speed	RF Drive Fault	High PA Voltage	Low PA Voltage	+15V Fail	PM 1-4 Not Responding		
EEPROM Failure	High RF Drive	Low RF Drive																				
External Disable Active	High Temperature	No Controller Comms																				
Front Panel Inhibit	Invalid Thermistor Sample	Overmodulation																				
High B+ Voltage	Low B+ Voltage	Residual PA Voltage Present																				
High DC Current	Low Fan 1/2 Speed	RF Drive Fault																				
High PA Voltage	Low PA Voltage	+15V Fail																				
PM 1-4 Not Responding																						

Table 4.1.6: Troubleshooting Summary Alarms

Summary Alarm Name, AUI (front panel UI)	Description and Triggering Alarms
Power Supply Fault Summary (PS Summary)	This summary alarm is triggered if any of the following power supply related alarms occur: <u>Exciter alarms:</u> High B+ Voltage High DC Curr Foldback Low B+ Voltage <u>Rack alarms:</u> AC Phase Loss High Rectifier Temp +15V Fail High AC Voltage Low AC Voltage +30V Fail High B+ Shutback Low B+ Shutdown +48V Fail High B+ Voltage +5V Fail -15V Fail High DC Curr Foldback
Rack Fault Summary (Rack Summary)	This summary alarm is triggered if any of the following rack related alarms occur: <u>Controller alarms:</u> Rack 1 Not Responding <u>Rack alarms:</u> EEPROM Failure
Reduced Power Summary (Power Low Summary)	This summary alarm is triggered if any of the following reduced power related alarms occur: <u>Exciter alarms:</u> Audio Overmod Protection High Forward Foldback Power Below Setpoint Cutback High Temp Foldback SWR Foldback High DC Current Foldback Low Forward Power 1/2

Table 4.1.7: Module Replacement Procedures

Module	Replacement Procedure
RF Power Module	See page 4.1.52
Power Amplifier MOSFET	See page 4.1.61
Modulator MOSFET	See page 4.1.63
Control/Interface PWB	See page 4.1.65
SCR Rectifier Assembly	See page 4.1.67
Digital AM Exciter PWB	See page 4.1.69
Exgine PWB	See page 4.1.74
GPS Sync PWB	See page 4.1.74
Rack Interface PWB	See page 4.1.75
Power Module Interface PWB	See page 4.1.77
Gas Discharge PWB and Relays	See page 4.1.79
Fan Tray	See page 4.1.81
Fan Tray Cooling Fan	See page 4.1.82
RF Voltage and Current Sample PWB	See page 4.1.83
Directional Coupler	See page 4.1.87
Arc Detector UV Sensor	See page 4.1.89
+15 V or +48 V Power Supply	See page 4.1.92
Graphic User Interface (GUI) and UI Interface PWB	See page 4.1.94

Accessing the Inside of the Transmitter

See [Figure 4.1.4 on page 4.1.45](#).

Front Access

The front of the NX10 has a hinged door that provides access to the control/exciter panel, which contains the control/interface PWB (A4), digital AM exciter PWBs (A5 and optional A6), Exgine PWB (A7, optional) and GPS sync PWB (A8, optional). You can also access RF power modules 1 through 4 (A12 through A15) and fan tray assemblies (A16 through A19).

Removing the 16 M5 screws that secure the hinged control/exciter panel allows access to the directional coupler assembly (A23).

Removing the 16 M5 screws that secure the lower, front panel allows access to the power transformer (T1). It should not be necessary to access the power transformer, but when it is necessary, use extreme caution as high voltage is present behind the panel when ac power is being applied.

WARNING! WHEN AC POWER IS ENABLED (ON), DANGEROUS VOLTAGES THAT CAN CAUSE INJURY OR DEATH ARE PRESENT BEHIND THE LOWER, FRONT PANEL. NAUTEL RECOMMENDS THAT ONLY TRAINED PERSONNEL BE ALLOWED ACCESS TO THIS AREA.

DISCONNECT AND LOCK OUT AC POWER BEFORE WORKING IN AREAS WHERE DANGEROUS VOLTAGES MAY BE PRESENT TO ENSURE THE SAFETY OF PERSONNEL.

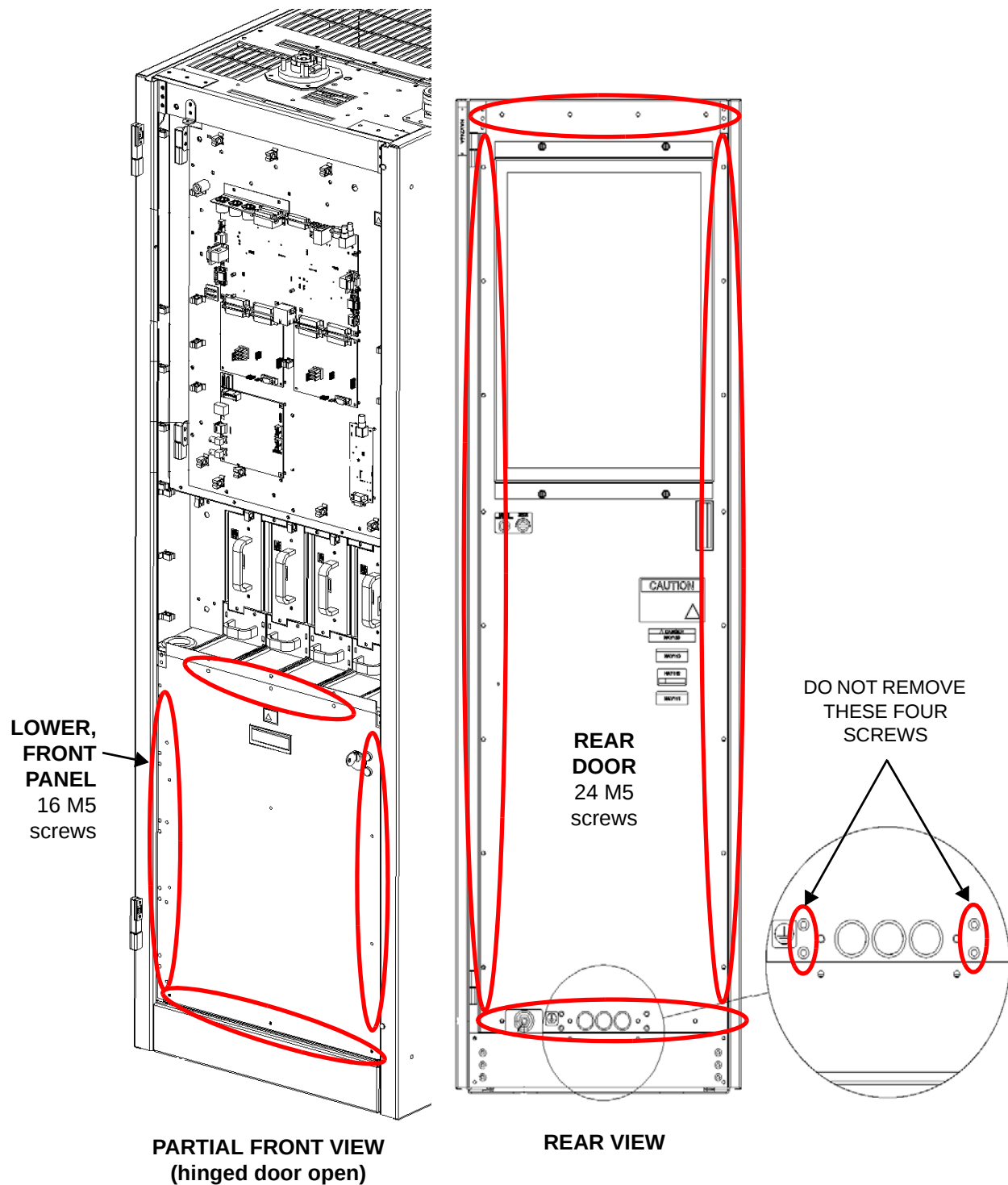
Rear Access

The rear of the NX10 has a hinged door that - for safety purposes - is also secured with 24 screws. Removing these screws and opening the door provides access to the rectifier assembly (A1), rack interface PWB (A9), power module interface PWBs (A10 and A11), RF voltage and current sample PWB (A20), arc detector assembly (A24), +15 V power supply (U1) and +48 V power supply (U2).

WARNING! WHEN AC POWER IS ENABLED (ON), DANGEROUS VOLTAGES THAT CAN CAUSE INJURY OR DEATH ARE PRESENT BEHIND THE REAR PANEL. NAUTEL RECOMMENDS THAT ONLY TRAINED PERSONNEL BE ALLOWED ACCESS TO THIS AREA.

DISCONNECT AND LOCK OUT AC POWER BEFORE WORKING IN AREAS WHERE DANGEROUS VOLTAGES MAY BE PRESENT TO ENSURE THE SAFETY OF PERSONNEL.

Figure 4.1.4: Front and Rear Access



Troubleshooting Tips

Controller: External PDM Inhibit

A Controller: External PDM Inhibit alarm indicates that an external PDM inhibit command is present. The alarm could be caused by a short circuit in the external wiring path to the control/interface PWB or a fault in the switching circuitry on the control/interface PWB. Troubleshoot as follows:

The external PDM inhibit is wired to the control/interface PWB.

1. Gain access to the control/interface PWB (A4) (see [Figure 4.1.12 on page 4.1.66](#)) by opening the transmitter's front door. The door is not latched and just swings open to the left.
2. Connect a digital multimeter (set to measure dc) between J6A-12 of the control/interface PWB and ground.
 - ❖ If 15 V is present on J6A-12, there is no external PDM inhibit command. Suspect the control/interface PWB and if necessary, replace it (see ["Control/Interface PWB Removal/Replacement" on page 4.1.65](#)).
 - ❖ If 0 V is present on J6A-12, there is a valid external PDM inhibit command. Check the external PDM inhibit circuitry to determine the cause.

Controller: Interlock Open

A Controller: Interlock Open alarm indicates an external interlock is open. The transmitter's RF output will be inhibited.

The external interlock input is wired to the control/interface PWB by the end user and triggered by the conditions that they set (e.g., the state of the door to the transmitter room).

1. Gain access to the control/interface PWB (A4) (see [Figure 4.1.12 on page 4.1.66](#)) by opening the transmitter's front door. The door is not latched and just swings open to the left.
2. Connect a digital multimeter (set to measure dc) between J6A-20 of the control/interface PWB and ground.
 - ❖ If 0 V is present on J6A-20, the external interlock circuit is intact and the probable cause of the alarm is a defective monitoring circuit. Suspect the control/interface PWB and if necessary, replace it (see ["Control/Interface PWB Removal/Replacement" on page 4.1.65](#)).
 - ❖ If 15 V is present, the external interlock circuit is open (normally caused by an open interlock switch). Check the external system interlock circuitry to determine the cause.

RF Module Faults

There are many alarms on the front panel UI or remote AUI, prefixed by the text PM, that indicate faults related to one or more of the four RF power modules in the transmitter. The number that appears after Module (1-4) identifies the position of the affected module. Numbers correspond to modules in a left to right sequence, as viewed from the front of the transmitter.

1. Check the forward power reading on the front panel UI or remote AUI. If it is less than the preset level, one or more RF power modules are defective. Proceed to [“RF Power Module Fault Validation” on page 4.1.49](#).
2. If the forward power reading in [Step 1](#) is normal, go to the front panel UI's Alarms screen or click the remote AUI's Status button to check for other alarms that may have triggered the RF power module alarm.
3. From the remote AUI's Meter List View page (see [Figure 4.1.5](#)), click the **i** (information) button next to the Modules - Rack 1 folder in the Transmitter Layout section to view the status screen for all RF power modules (see [Figure 4.1.6 on page 4.1.48](#)) or click the left-hand drop-arrow to expand the Modules folder to allow clicking on the **i** button for an individual Module (PM) (see [Figure 4.1.7 on page 4.1.48](#)). You can also use the front panel UI's View Status -> View Meters -> Module screen to view meters sorted by meter name, by pressing the checkmark button, or by RF power module (PM), by pressing the right-hand arrow button. These screens display critical parameters for RF power modules. As an aid in troubleshooting, compare parameters to isolate possible module faults.

Figure 4.1.5: AUI - Meter List View page

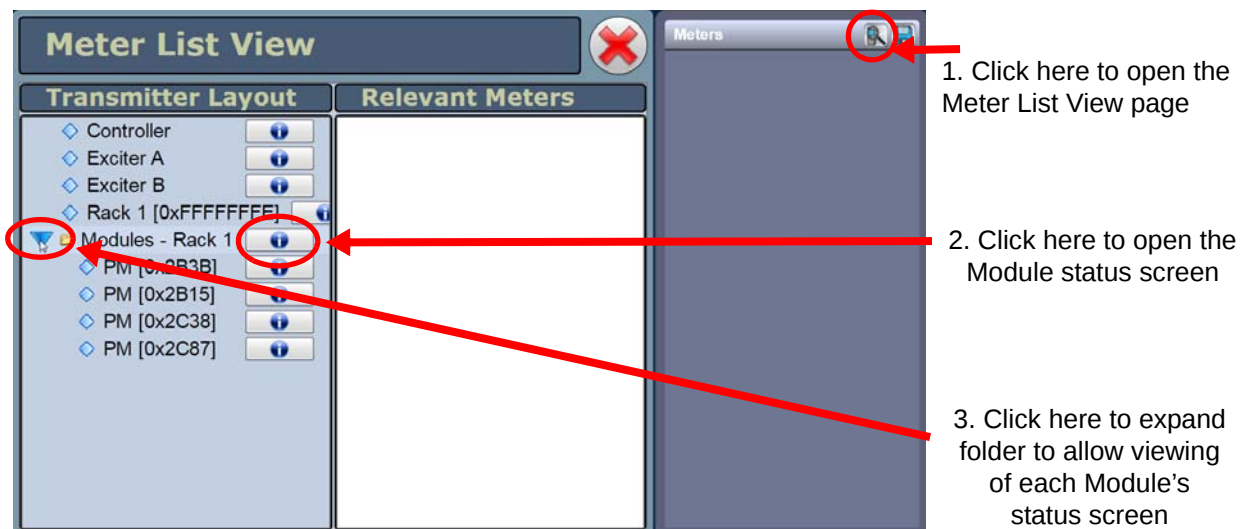
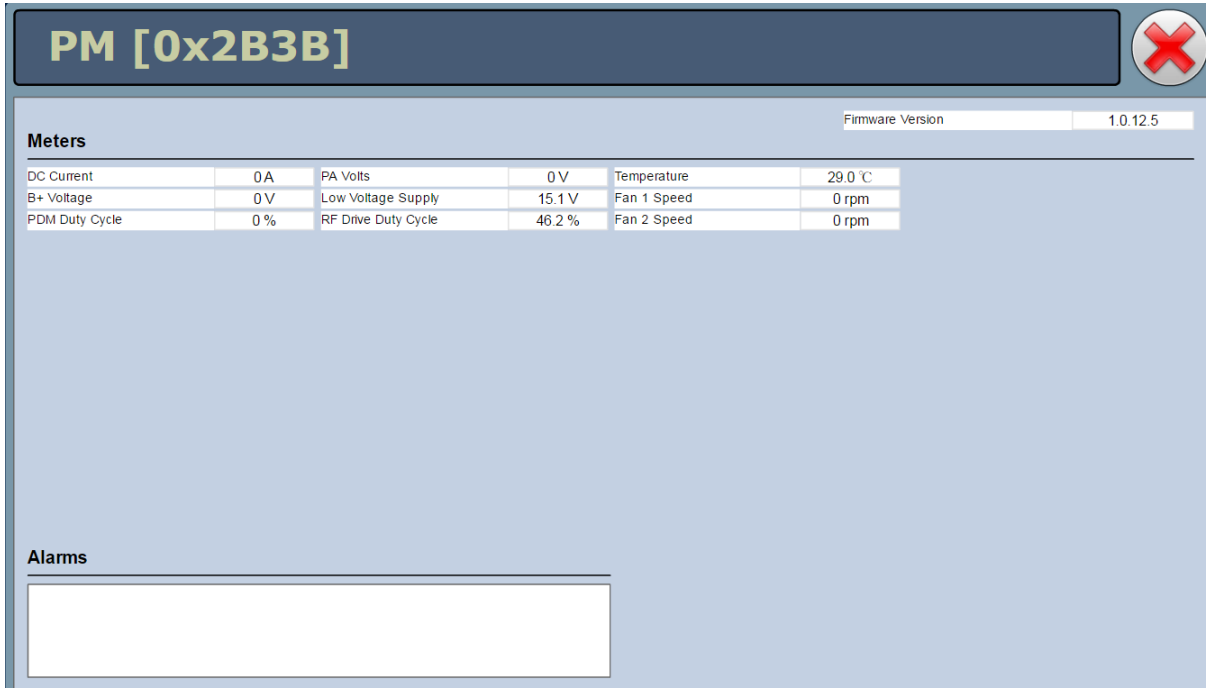


Figure 4.1.6: RF Module Status Screen (all modules)



Figure 4.1.7: RF Module Status Screen (individual module)



RF Power Module Fault Validation

Each RF power module has a multi-colour LED on its front panel, which can help in identifying a fault and allowing you to determine whether remedial action is required now or later.

Identify and isolate a defective RF power module, and verify the nature of the defect by checking the LEDs on the RF power modules' front panels. Note which RF power module is not operating normally and producing RF power (i.e., LED is not solid green). Record which RF power module(s) is/are displaying an alarm and the state of its/their LED (see below).

- ❖ solid green: module is producing RF with no alarms
- ❖ flashing amber and off: module is RF off
- ❖ solid red: module has a non-latching alarm, and is not producing RF
- ❖ flashing red, then green: module is producing RF, but has an alarm
- ❖ long red, short amber: module has a latching alarm, and is not producing RF
- ❖ long red, short off: module has no valid serial number
- ❖ short red, long off: module has no valid serial address on the internal bus
- ❖ long amber, short green: module is producing RF, but is receiving no serial communication from the rack interface
- ❖ long amber, short red: module is not producing RF and is receiving no serial communication from the rack interface

Except in the case of a High PA Volts or Residual PA Volts alarm, attempt to reset an RF power module by disconnecting and reconnecting the RJ45 plug in the front of the module. If you cannot reset the front panel LED alarm, see [“RF Power Module Troubleshooting”](#).

RF Power Module Troubleshooting

Refer to [“Removing and Reinstalling RF Power Modules”](#) on page 4.1.52 for removal and installation instructions and then refer to [“Troubleshooting RF Power Modules”](#) on page 4.1.57 for detailed troubleshooting information.

NOTE: A defective RF power module can be removed for repair without turning off the transmitter, as described in [“Removing an RF Power Module”](#) on page 4.1.52. The transmitter can be operated at a reduced output power level with an RF power module removed.

WARNING! FAILURE TO FOLLOW THE RF POWER MODULE REMOVAL INSTRUCTIONS MAY RESULT IN INJURY TO THE OPERATOR AND SERIOUS PHYSICAL DAMAGE TO THE RF POWER MODULE AND TRANSMITTER.

RF Module #: Low B+ Voltage

A Module # Low B+ Voltage alarm is triggered when the B+ voltage is less than 75% of its nominal level.

1. If all RF power modules are reporting this alarm, it is very likely there is also a Rack #: Low B+ Voltage alarm. If so, the fault is not likely associated with an RF power module; proceed to ["Rack #: Low B+ Voltage Alarm"](#) for further troubleshooting information. If not, proceed to [Step 2](#).
2. Check and, if necessary, replace the fuse on the power module interface PWB for the affected RF power module. Each power module interface PWB serves two RF power modules and therefore has two B+ fuses (F1 and F2). Refer to Figure MD-2 in the Mechanical Drawings section of this manual to locate the associated power module interface PWB and then refer to Figure MD-9 to locate fuse F1 or F2. If the alarm persists, continue to [Step 3](#).
3. Check and, if necessary, replace the affected RF power module. See ["Troubleshooting RF Power Modules"](#) on page 4.1.57.

Rack #: Low B+ Voltage Alarm

A Rack #: Low B+ Voltage alarm is triggered when the B+ voltage is at least 25% below its expected level. Recovery from this alarm is automatic when the B+ voltage rises to an acceptable level.

NOTE: An NX10 transmitter has only one rack (or cabinet) and will only display Rack 1.

If the transmitter does not automatically recover from this alarm, the low B+ voltage is normally caused by low ac input voltage, improper primary tap settings on the power transformer, or a faulty rectifier assembly. Troubleshoot a Rack #: Low B+ alarm as follows.

WARNING! LETHAL VOLTAGES EXIST IN THE POWER SUPPLY COMPARTMENT OF THE TRANSMITTER. USE EXTREME CAUTION IN THIS AREA.

1. Check the B+ voltage on the transmitter's AUI. If it is less than 75% of desired, the ac power source voltage or power transformer tap selection is suspect.
2. Check the ac sample voltage. If less than 302 V, continue to [Step 3](#). If not, go to [Step 4](#).
3. Measure the ac input voltage and verify the power transformer is tapped as shown in Section 2.4 of the NX10 Installation Manual. If necessary, turn off the transmitter, lock out the ac input voltage and retap the power transformer for the next lower voltage.
4. If the transformer taps are correct, the rectifier assembly may be defective or there may be a fault with the monitoring circuit. Contact Nautel for troubleshooting information.

Rack #: Low AC

A Rack #: Low AC alarm is triggered when the ac input voltage is less than 256 V. Recovery from this alarm is automatic when the ac voltage rises to an acceptable level.

NOTE: An NX10 transmitter has only one rack (or cabinet) and will only display Rack 1.

If the transmitter does not automatically recover from this alarm, the low ac voltage is normally caused by low ac mains voltage or improper primary tap settings on the power transformer. Troubleshoot a Rack #: Low AC alarm as follows.

WARNING! LETHAL VOLTAGES EXIST IN THE POWER SUPPLY COMPARTMENT OF THE TRANSMITTER. USE EXTREME CAUTION IN THIS AREA.

1. Measure the ac input voltage and verify the power transformer is tapped as shown in Section 2.4 of the NX10 Installation Manual. If necessary, turn off the transmitter, lock out the ac input voltage and retap the power transformer for the next lower voltage.
2. If the transformer taps are correct, the monitoring circuit may be defective. Contact Nautel for troubleshooting information.

Removing and Reinstalling RF Power Modules

Removing an RF Power Module

1. Confirm the location of the RF power module that is being removed. Note the alarm text includes a Module serial address that is also identified on the front panel of each RF power module. See [Figure 4.1.8 on page 4.1.53](#) to determine the location for a given RF power module [1 (A12) through 4 (A15)].
2. If possible, turn off the transmitter before removing an RF power module. If you need to remove a module while "on air", disable the RF power module to be removed using the front panel UI or the remote AUI.
 - ❖ Front Panel UI: From the Main Menu, go to the System Settings -> PM Inhibit screen (see [Figure 4.1.9 on page 4.1.54](#)). Use the up and down buttons to move the cursor to the desired RF power module (1 through 4) and then press the right button to enable editing. Use the up and down buttons to select Enable or Disable. Press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.
 - ❖ Remote AUI: From the Meters page, click on the Modules - Rack 1 information (i) button. The Power Module status screen (see [Figure 4.1.9 on page 4.1.54](#)) should appear. Click on the associated RF power module's Front Panel Inhibit icon. The icon colour should change from green to red, indicating the RF power module is disabled.
3. After the RF power module is disabled, you should hear a relay in the back of the cabinet drop out (de-energize). If you do not hear the relay de-energize (click), **DO NOT CONTINUE** to [Step 4](#). Try re-enabling and disabling a few times while trying to hear the relay de-energize. If you do not hear the sound, **DO NOT** remove the RF power module while the transmitter is on-air. Turn RF Off, remove the RF power module and replace the relay before turning RF On (see ["Gas Discharge PWB and Relay Replacement" on page 4.1.79](#)).
4. Disconnect the RJ45 cable from the front of the RF power module.

WARNING! FAILURE TO FOLLOW THE RF POWER MODULE REMOVAL INSTRUCTIONS MAY RESULT IN INJURY TO THE OPERATOR AND SERIOUS PHYSICAL DAMAGE TO THE RF POWER MODULE AND TRANSMITTER.

5. Remove both mounting screws from the RF power module's front panel.
6. Grasp the handle on the front of the RF power module and carefully pull the RF power module out of the transmitter.

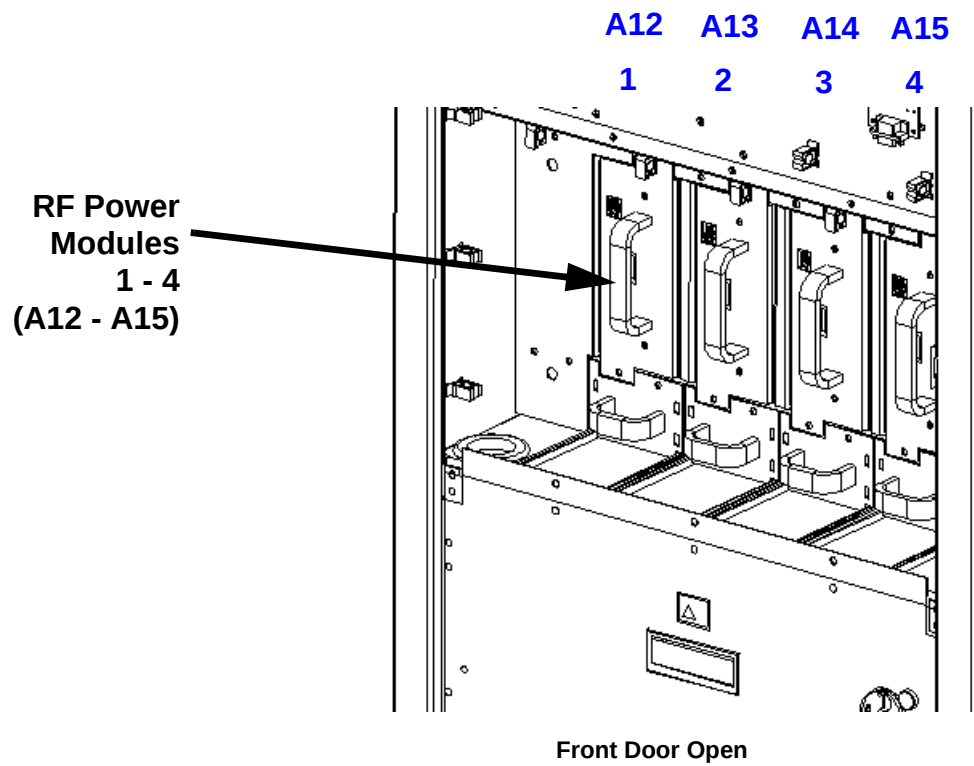
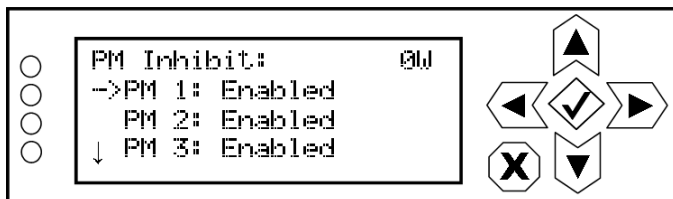
Figure 4.1.8: RF Power Module Locations

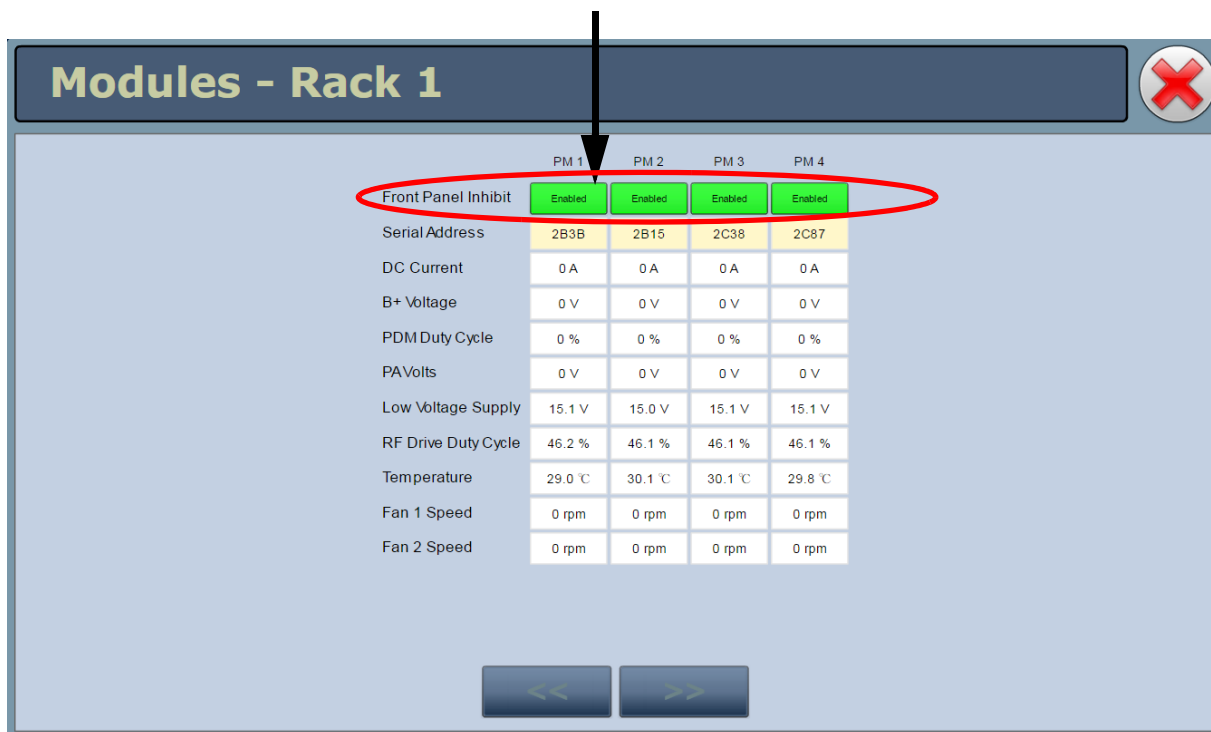
Figure 4.1.9: Disabling/Enabling an RF Power Module

Front Panel UI: Main Menu -> System Settings -> PM Inhibit



Remote AUI: Meters Page -> Rack information (i) button

Green indicates enabled. Click to disable (will turn red);
click again to re-enable (will turn green)



Installing an RF Power Module

NOTE: To ensure the transmitter recognizes RF power modules being installed, modules must be programmed with software version equivalent to NX SW 4.4 or newer.

1. If possible, turn off the transmitter before installing an RF power module. Grasp the handle on the front of the RF power module and insert it into the transmitter.
2. Carefully push the RF power module into place so that its card-edge connector mates with the transmitter. Verify the RF power module is fully inserted by ensuring the faceplate of the RF power module is touching the transmitter chassis that it mates with.
3. Install both mounting screws in the RF power module's front panel.
4. Connect the RJ45 cable to the front of the RF power module.
5. If the RF power module was disabled through a user interface, enable it as follows:
 - ❖ Front Panel UI: From the Main Menu, go to the System Settings -> PM Inhibit screen (see [Figure 4.1.9 on page 4.1.54](#)). Use the up and down buttons to move the cursor to the desired RF power module (1 through 4) and then press the right button to enable editing. Use the up and down buttons to select Enable. Press the accept (checkmark) button to save the change. Press cancel (X) to discard changes and return to the previous menu.
 - ❖ Remote AUI: From the Meters page, click on the Modules - Rack 1 information (i) button. The Power Module status screen (see [Figure 4.1.9 on page 4.1.54](#)) should appear. Click on the associated RF power module's Front Panel Inhibit icon. The icon colour should change from red to green, indicating the RF power module is enabled.

You should hear a relay in the back of the transmitter pick up (energize).

6. Upgrade the RF power module's software using the front panel UI's Updating Firmware screen or the remote AUI's Upgrade Software page under the appropriate System Settings menu, by running an upgrade using the existing .tgz file already installed on the transmitter. See the NX10 Operations and Maintenance Manual for detailed instructions.

Optimizing RF Power Module Performance

When swapping damaged RF power modules with new RF power modules, it is possible that spurs of the fundamental PDM frequency ($f_c \pm 155$ kHz) may appear at the output of the transmitter. If these spurs violate the emissions limits of the region of installation, the problem may be corrected by initiating the PDM minimization routine, as follows:

CAUTION! Running the PDM minimization routine will disable the exciter's SWR protection. For this reason, you should only run this routine when the transmitter is connected to a suitable rated 50 ohm test load.

1. Turn off (RF Off) the transmitter and connect its RF output to a suitably rated 50-ohm test load.
2. Using the front panel UI or the remote AUI, set the following items as instructed:
 - ❖ Overall Mode = Analog AM
 - ❖ Output Power = rated power
 - ❖ AM Source = Unused
3. Set the transmitter to its RF On state.
4. Using the front panel UI or the remote AUI, navigate to the PDM minimization routine:
 - ❖ Front Panel UI: From the Main Menu, go to the Factory Settings -> PDM Settings - > PDM Minimization screen. Press the accept (checkmark) button to start the routine.
 - ❖ Remote AUI: From the Factory Settings -> PDM Settings page, click on the Start button next to Minimization Routine.

The PDM minimization routine requires approximately 30 minutes to complete.

Troubleshooting RF Power Modules

Maintenance Philosophy

Recommended troubleshooting procedures for RF power modules are limited to “go” or “no-go” resistance or diode measurements on the module’s power semi-conductors and replacement procedures for these devices.

Special Tools and Test Equipment

The following test equipment and cables are required to troubleshoot an RF power module.

- A digital multimeter with resistance and diode settings.
- A torque screwdriver with a torque range of 0 to 2.3 N-m (0 - 20 in-lbs). Required for installing MOSFET attaching hardware.
- A soldering iron and desoldering tool.
- An NX10 spares kit (contains replacement semi-conductors).

Electrostatic Precautions

The RF power module contains semiconductor devices that are susceptible to damage from electrostatic discharge. Follow the electrostatic precautions in [“Electrostatic Protection” on page 4.1.3](#) at all times.

Preparation for Troubleshooting

1. Follow the procedure in [“Removing an RF Power Module” on page 4.1.52](#) to remove the RF power module from the transmitter.
2. Place the RF power module on a suitable work surface.
3. Perform the resistance measurements on the modulator and power amplifier MOSFETs as described in [“Resistance Measurements” on page 4.1.58](#).
4. Perform the diode checks on the protection and free-wheel diodes as described in [“Protection Diode Checks” on page 4.1.58](#) and [“Protection Diode Checks” on page 4.1.58](#).
5. If the measurements in [Step 3](#) and [Step 4](#) are satisfactory, but the RF power module continues to display alarms when installed in the transmitter, replace the RF power module.

Resistance Measurements

Complete the following resistance measurements for each suspect RF power module. See [Figure 4.1.10 on page 4.1.60](#) to identify the power MOSFETs on the RF power module.

1. Remove fuse F1 from its holder and measure its resistance using a digital multimeter. A blown fuse will measure an open circuit. If the fuse is OK, return it to its holder.
2. For each power amplifier MOSFET (Q7 through Q10) and each modulator MOSFET (Q11, Q12 and Q13), use a digital multimeter to make the following resistance measurements. Note that Q7 through Q10 have screw-head terminals and Q11 through Q13 have solder pads (see [Figure 4.1.10 on page 4.1.60](#)):
 - ❖ Check for 1,000 Ω between the gate and source.
 - ❖ Check for an open circuit between the gate and drain.
3. If either measurement in [Step 2](#) is not satisfactory, replace the affected power amplifier MOSFET (see “[Power Amplifier FET Replacement](#)” on [page 4.1.61](#)) or modulator MOSFET (see “[Modulator FET or Free-Wheel Diode Replacement](#)” on [page 4.1.63](#)), as applicable, or replace the RF power module.

Protection Diode Checks

Complete the following protection diode checks for each suspect RF power module. See [Figure 4.1.10 on page 4.1.60](#) to identify the protection diode on the RF power module.

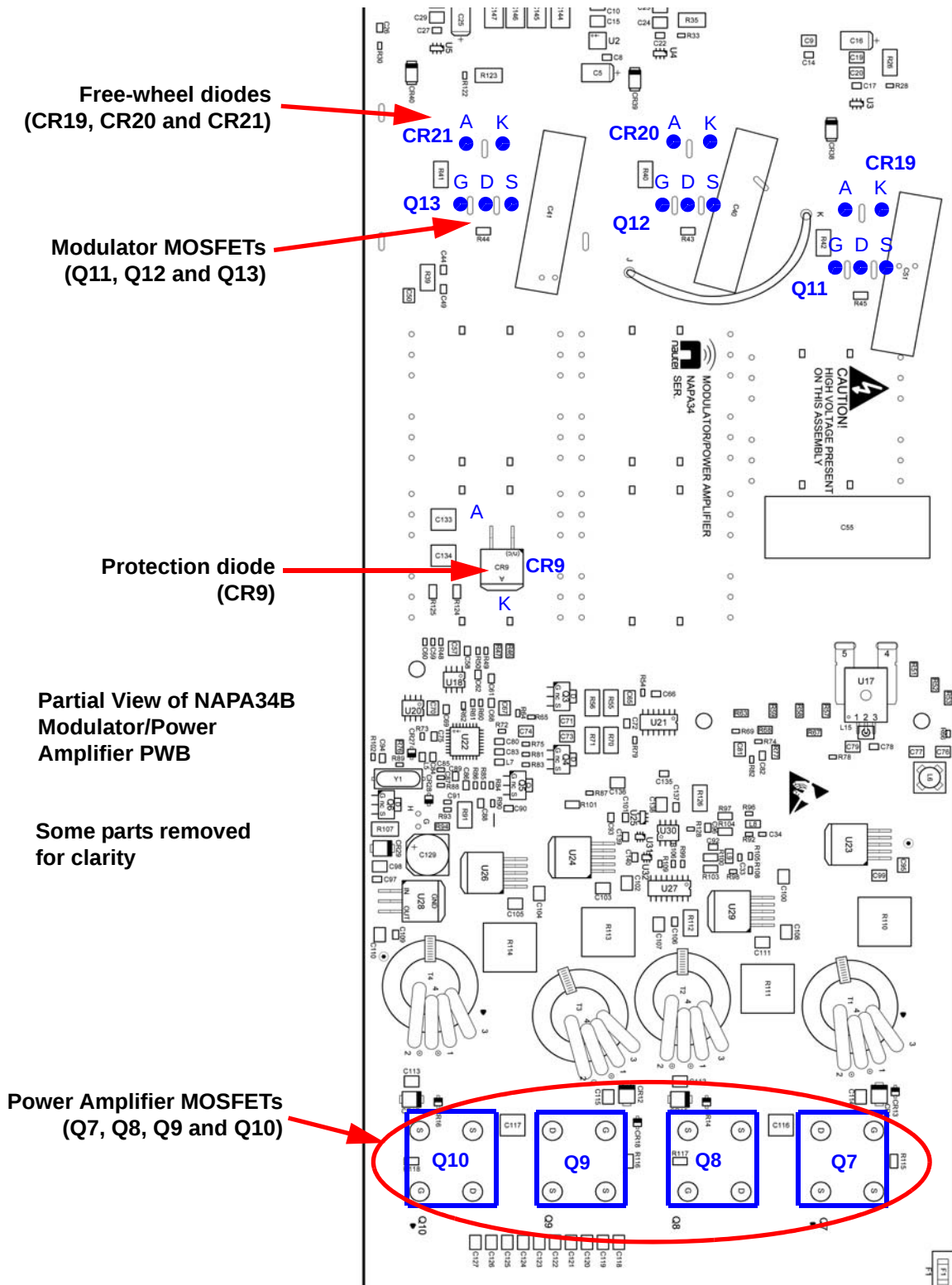
1. Use a digital multimeter (on its diode setting) to check protection diode CR9, noting the anode (A) and cathode (K) markings (see [Figure 4.1.10 on page 4.1.60](#)):
 - ❖ Check for a voltage of between 0.5 and 0.8 V with multimeter test leads in the forward bias orientation (+ on anode, - on cathode).
 - ❖ Check for an open circuit with multimeter test leads in the reverse bias orientation (- on anode, + on cathode).
2. If the diode is not satisfactory, replace it by desoldering its surface-mount leads and case from the PWB. Locate a replacement diode (Nautel Part # QM72) in the spares kit, if purchased, and solder it to the PWB, noting correct orientation.

Free-Wheel Diode Checks

Complete the following free-wheel diode checks for each suspect RF power module. See [Figure 4.1.10 on page 4.1.60](#) to identify the free-wheel diodes on the RF power module.

1. Use a digital multimeter (on its diode setting) to check free-wheel diodes CR19 through CR21, noting the anode (A) and cathode (K) markings (see [Figure 4.1.10 on page 4.1.60](#)):
 - ❖ Check for a voltage of between 0.4 and 0.8 V with multimeter test leads in the forward bias orientation (+ on anode, - on cathode).
 - ❖ Check for an open circuit with multimeter test leads in the reverse bias orientation (- on anode, + on cathode).
2. If a diode is not satisfactory, replace it as detailed in [“Modulator FET or Free-Wheel Diode Replacement” on page 4.1.63](#).

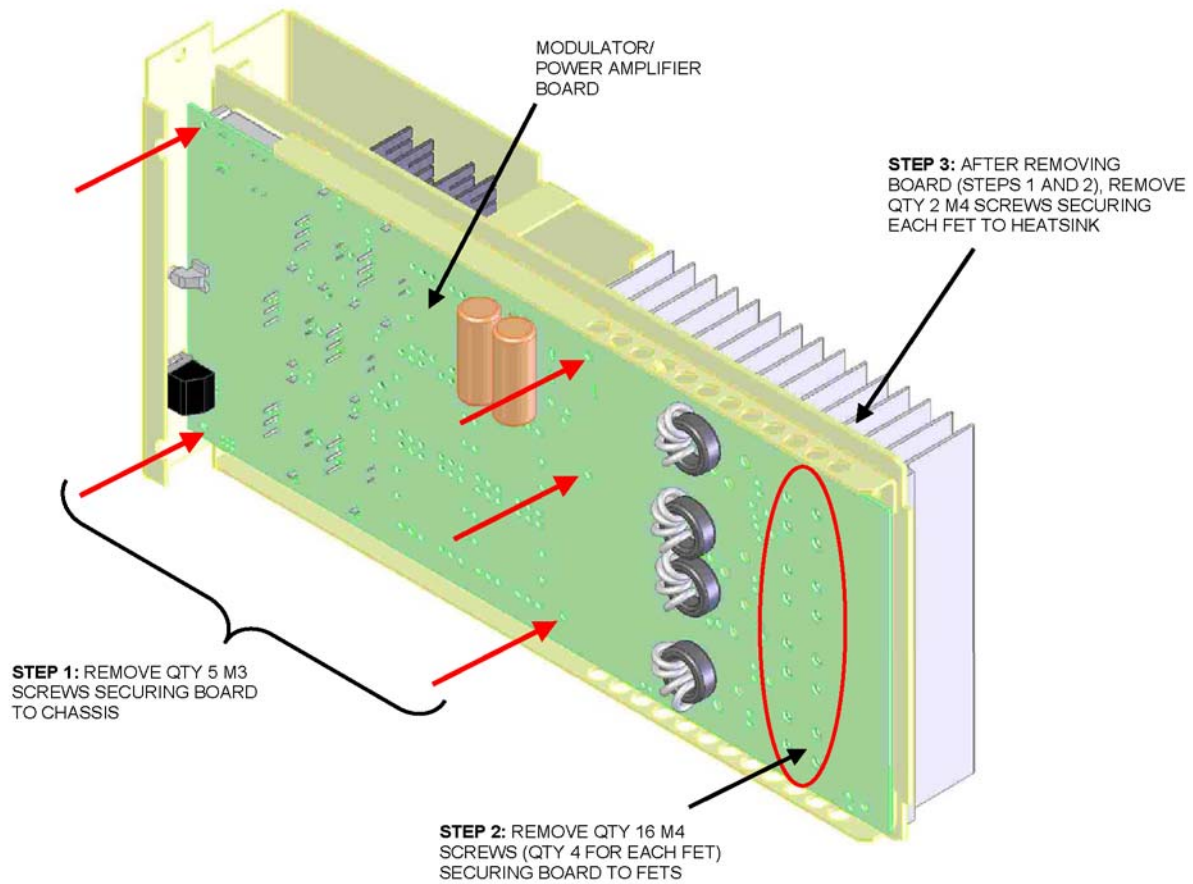
Figure 4.1.10: RF Power Module MOSFET and Diode Locations



Power Amplifier FET Replacement

See [Figure 4.1.11 on page 4.1.62](#).

1. Remove five M3 screws that secure the modulator/power amplifier PWB to the chassis.
2. Remove 16 M4 screws (four for each MOSFET) that secure the PWB to the MOSFETs.
3. Swing the PWB away from the chassis and remove two M4 screws that secure the defective MOSFET to the chassis. If necessary, remove the screw securing the thermistor wire to the heatsink.
4. Discard the defective MOSFET and its associated thermal pad (between MOSFET and heatsink).
5. Ensure the surface of the heatsink is clean and free of debris.
6. Obtain a replacement MOSFET (Nautel Part # QR68) and a new thermal pad (Nautel Part # HAK55) from the spares kit, if purchased, and install them on the RF power module chassis using the two M4 screws removed in step 3. Torque hardware to 12 in-lbs (1.3 N-m).
7. Replace any other defective MOSFETs and then re-install the PWB to the chassis by reversing the instructions in steps 1 through 3. Torque the 16 MOSFET screws (four for each MOSFET) to 10 in-lbs (1.1 N-m).
8. Return the power module to service (see ["Installing an RF Power Module" on page 4.1.55](#)).

Figure 4.1.11: Power Amplifier FET Replacement

Modulator FET or Free-Wheel Diode Replacement

1. Remove five M3 screws that secure the modulator/power amplifier PWB to the chassis.
2. Remove 16 M4 screws (four for each device) that secure the PWB to the devices.
3. Swing the PWB away from the chassis. If necessary, remove the screw securing the thermistor wire to the heatsink.
4. Desolder the connections that secure the defective device (modulator FET or free-wheel diode) to the PWB (see [Figure 4.1.10 on page 4.1.60](#)):
 - ❖ For modulator FETs (Q11, Q12, Q13), desolder the gate (G), drain (D) and source (S) connections.
 - ❖ For free-wheel diodes (CR19, CR20, CR21), desolder the anode (A) and cathode (K) connections.

Also desolder the two connections that secure the defective device's heatsink to the PWB. Remove the heat sink and the device from the PWB.

5. Remove the heatsink clip that holds the device on its heat sink. Remove and discard the defective device.

CAUTION! The heat sinks of modulator devices are coated with a film of thermal compound. Use care to ensure the film does not become contaminated with foreign particles.

When installing a replacement device, visually inspect the mating surfaces of the device and its heat sink. Ensure the heat sink surface is coated with a thin film of thermal compound. Ensure foreign particles that may affect thermal transfer are not embedded in the compound.

6. Clean the surface of the heat sink and make sure it is free of debris.
7. Obtain a replacement device (modulator FETs are Nautel Part # QR75; free-wheel diodes are Nautel part # QK50) from the spares kit. Apply a thin film of thermal compound (Nautel Part # HAG39, from the ancillary kit) to the device.
8. Install the device on the heat sink using the punched hole in the heat sink as an alignment aid. Apply downward pressure on the device and wiggle it slightly left and right and up and down to release trapped air and excess thermal compound. Reinstall the heat sink clip removed in [Step 5](#).

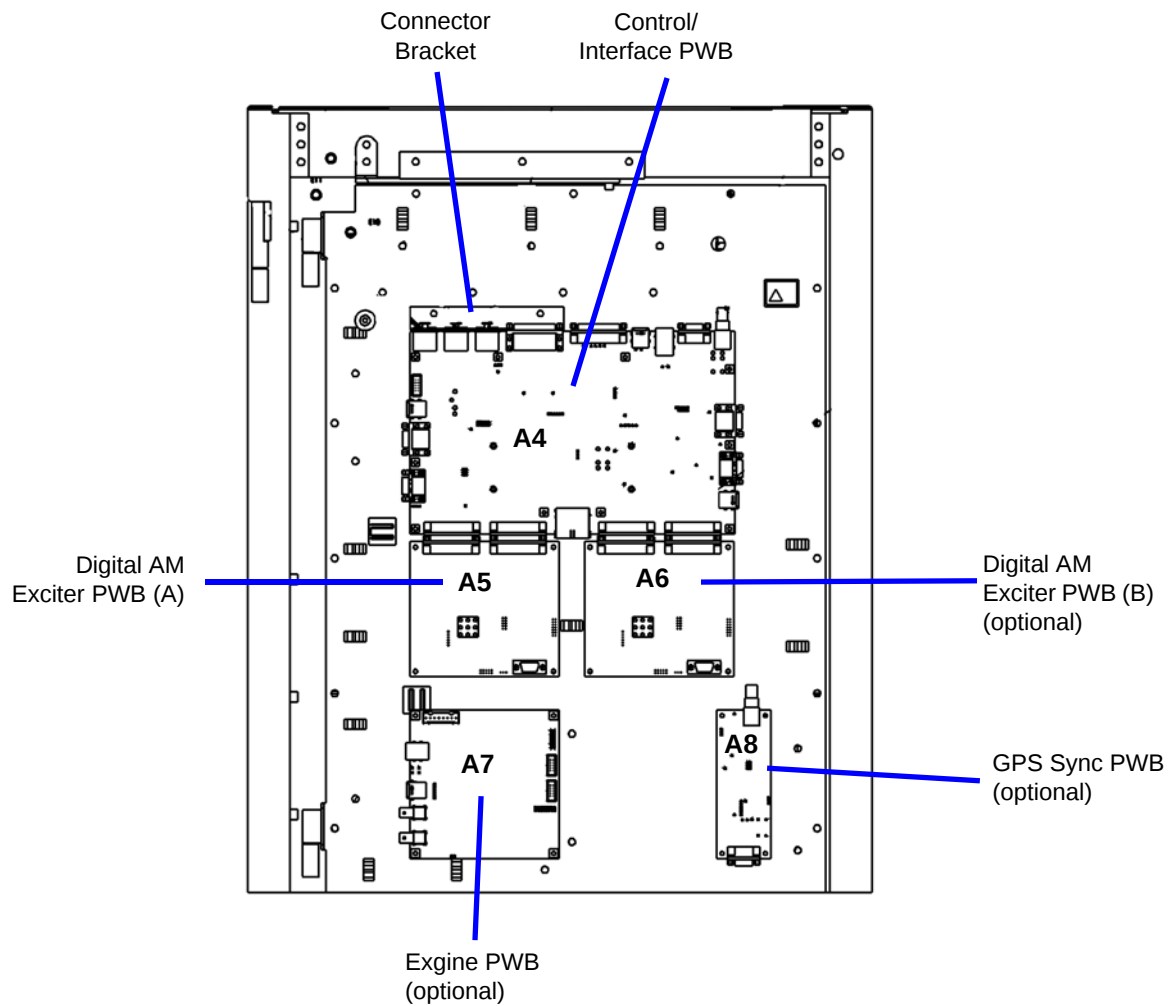
NOTE: The thermal joint between a modulator FET or free-wheel diode and its heatsink is critical for the reliability of the device. Incorrectly installed thermal compound could result in significantly reduced lifetime for the device, or even immediate failure of the device. See Microsemi Application Note 1810 for a more detailed procedure on properly applying thermal compound for electronic devices.

See http://www.microsemi.com/index.php?option=com_docman&task=doc_download&gid=14750

9. Re-install the heatsink on the PWB, first by soldering the two heatsink connections and then by soldering the device's leads:
 - ❖ For modulator FETs (Q11, Q12, Q13), solder the gate (G), drain (D) and source (S) connections.
 - ❖ For free-wheel diodes (CR19, CR20, CR21), solder the anode (A) and cathode (K) connections.
10. Replace any other defective devices and then reinstall the PWB to the chassis by reversing the instructions in steps 1, 2 and 3. Torque the 16 power amplifier MOSFET screws (four for each MOSFET) to a maximum of 10 in-lbs (1.1 N-m).
11. Return the power module to service (see ["Installing an RF Power Module" on page 4.1.55](#)).

Control/Interface PWB Removal/Replacement

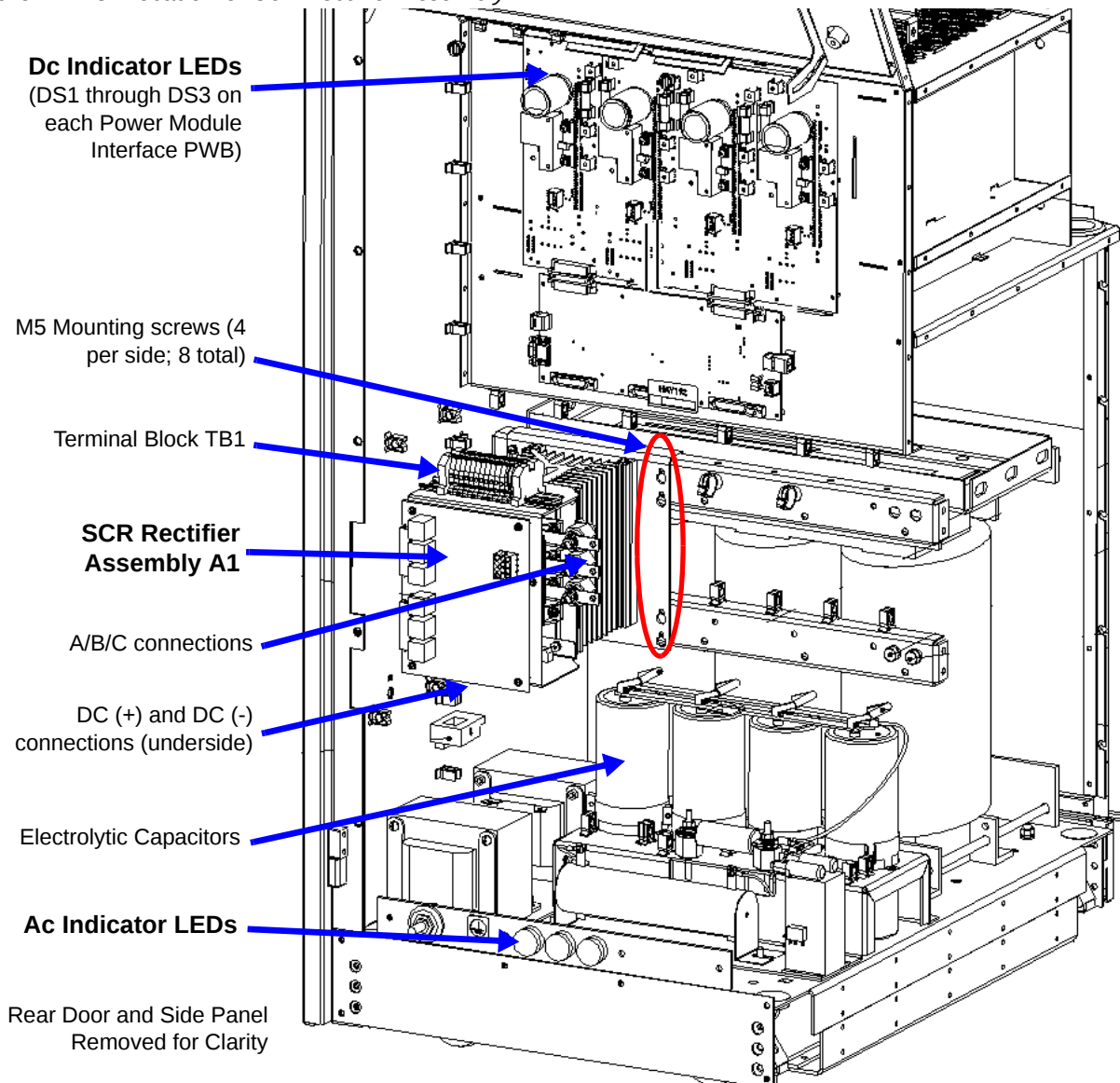
1. Record the following minimum information from the front panel UI and remote AUI, as applicable:
 - ❖ Scheduler page: record Rules and Daily Events information.
 - ❖ Factory Settings page: record all information in the RF Symmetry, SWR Thresholds, Transmitter Type, Transmitter Frequency and PDM Settings menus.
 - ❖ System Settings page: record all information in the Exciter Clock Calibration, RF Monitor Level, Power Lockout and Power Thresholds menus.
 - ❖ Remote I/O page: record all information for the user-defined remote Inputs and Outputs, including Channel and Control settings.
2. Set the transmitter to its RF Off state. Turn off (disable or lock out) the ac power at the source. Open the front door to gain access to the exciter panel (see [Figure 4.1.12 on page 4.1.66](#)).
3. Disconnect all cables attached to the control/interface PWB (A4), taking note of the connector labels on the cables and the PWB.
4. Remove and retain the two screws securing the connector bracket in the upper, left portion of the control/interface PWB.
5. Remove and retain 10 sets of mounting hardware from the control/interface PWB.
6. Gently remove the control/interface PWB away from the digital AM exciter PWB(s) and out of the transmitter.
7. Obtain a replacement control/interface PWB (Nautel Part # NAPC168A).
8. Set jumper E1 on the replacement PWB to the same position as E1 on the defective PWB.
9. Install the new control/interface PWB by reversing [Step 3](#) through [Step 6](#). For connector mating assistance, refer to the connector mating tables in [Section 4.3, "Wiring/Connector lists" on page 4.3.1](#).
10. Turn on (enable) the ac power source. Set the transmitter to its RF On state.
11. Upgrade the subsystem's software using the front panel UI's Updating Firmware screen or the remote AUI's Upgrade Software page under the appropriate System Settings menu, by running an upgrade using the existing .tgz file already installed on the transmitter. See the NX10 Operations and Maintenance Manual for detailed instructions.
12. Use the remote AUI's Meter List View page to verify that the meters for all installed Modules are populated. See the NX10 Operations and Maintenance Manual for detailed instructions.
13. Re-enter all the front panel UI and remote AUI information recorded in [Step 1](#).

Figure 4.1.12: NX10 Control/Exciter Panel

SCR Rectifier Inspection/Replacement

WARNING! LETHAL VOLTAGES EXIST INSIDE THE TRANSMITTER WHEN THE POWER IS TURNED ON. TURN OFF AND LOCK OUT THE POWER AT THE SOURCE AND WAIT UNTIL THE THREE AMBER LEDs IN THE BACK OF THE TRANSMITTER ARE OFF BEFORE REMOVING CONNECTIONS OR ASSEMBLIES.

Figure 4.1.13: Location of SCR Rectifier Assembly A1



See [Figure 4.1.13 on page 4.1.67](#).

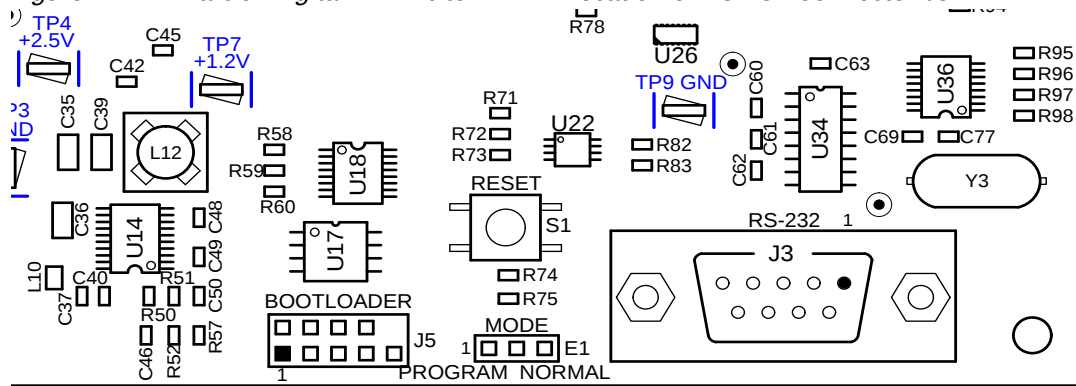
1. Turn off (disable and lock out) the ac power at the source. When the three ac indicator LEDs are off (amber when on), open the rear door. Verify the three dc indicator LEDs on each power module interface PWB are off (amber when on). For additional safety, measure the dc voltage across the + and - terminals of any of the four, electrolytic capacitors. Open the lower, front panel to access the power transformer's terminals and measure all line-to-line and line-to-neutral ac voltages. There should be little or no ac or dc voltage. **DO NOT PROCEED** if the dc voltage is greater than 5 V.
2. Disconnect all wiring attached to the SCR rectifier assembly's A (Line 1), B (Line 2), C (Line 3), DC (+), DC (-) and TB1 terminals, taking note of the wiring labels.
3. Loosen, but do not remove, the eight (8) sets of M5 mounting hardware that support the SCR rectifier assembly.
4. Carefully lift and remove the SCR rectifier assembly from the transmitter.
5. Obtain a replacement SCR rectifier assembly (Nautel Part # 212-7055).
6. Reverse [Step 2](#) through [Step 4](#) to reinstall the new or repaired SCR rectifier assembly. Ensure all connections are tight, noting that connections to the A, B, C, DC (+) and DC (-) terminals have special torque requirements. Torque these wires to 60 in-lbs (6.7 N-m). Torque TB1 connections to 4 in-lbs (0.45 N-m).
7. Re-install the lower, front panel over the power transformer. Close and secure the rear door. Turn on (enable) the ac power source and resume transmitter operation.

Digital AM Exciter PWB Replacement

NOTE: To ensure the transmitter recognizes exciter PWBs being installed, exciter PWBs must be programmed with software version equivalent to NX SW 4.4 or newer.

1. Set the transmitter to its RF Off state. Open the front door to gain access to the exciter panel (see Figure 4.1.12 on page 4.1.66).
2. Connect a straight-through serial (DB9) cable between the defective digital AM exciter PWB's RS-232 connector (9-pin D-sub J3, see Figure 4.1.14) and the serial port on a PC. See Figure 4.1.12 on page 4.1.66 to locate the digital AM exciter PWB(s) (A5 and A6, if purchased).

Figure 4.1.14: Part of Digital AM Exciter PWB - Location of RS-232 Connector J3



3. On MODE program header E1 (see Figure 4.1.14), install the shorting jumper in the PROGRAM position (shorting pins 1 and 2). Press RESET switch S1, located directly above E1.
4. Obtain the NCode Uploader application from Nautel's FTP site:
<ftp://www3.nautel.com/Utilities/NCodeUploader/>
5. From the PC, run the NCode Uploader application (see Figure 4.1.15 on page 4.1.70). Click Settings and ensure the COM port reflects the port that the serial cable is connected to on your PC.

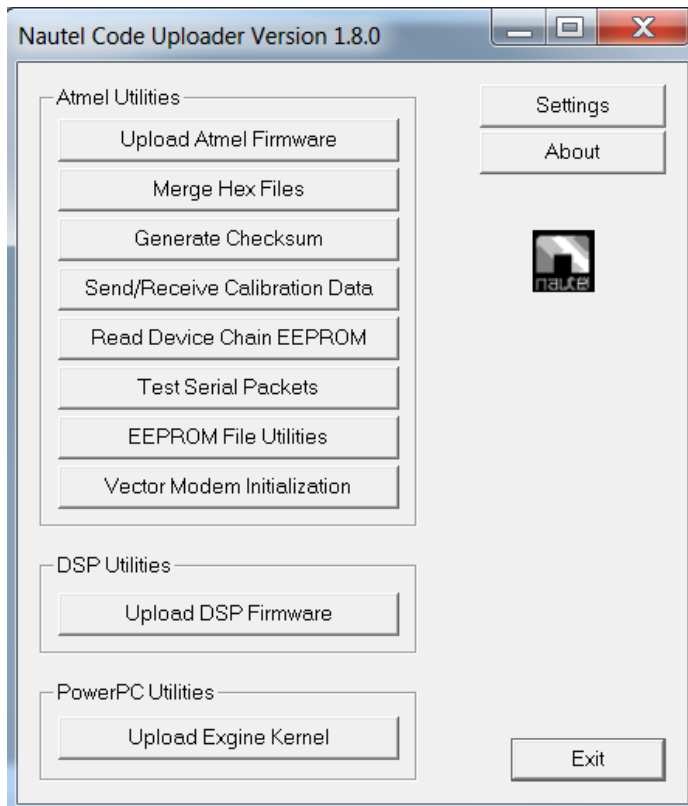
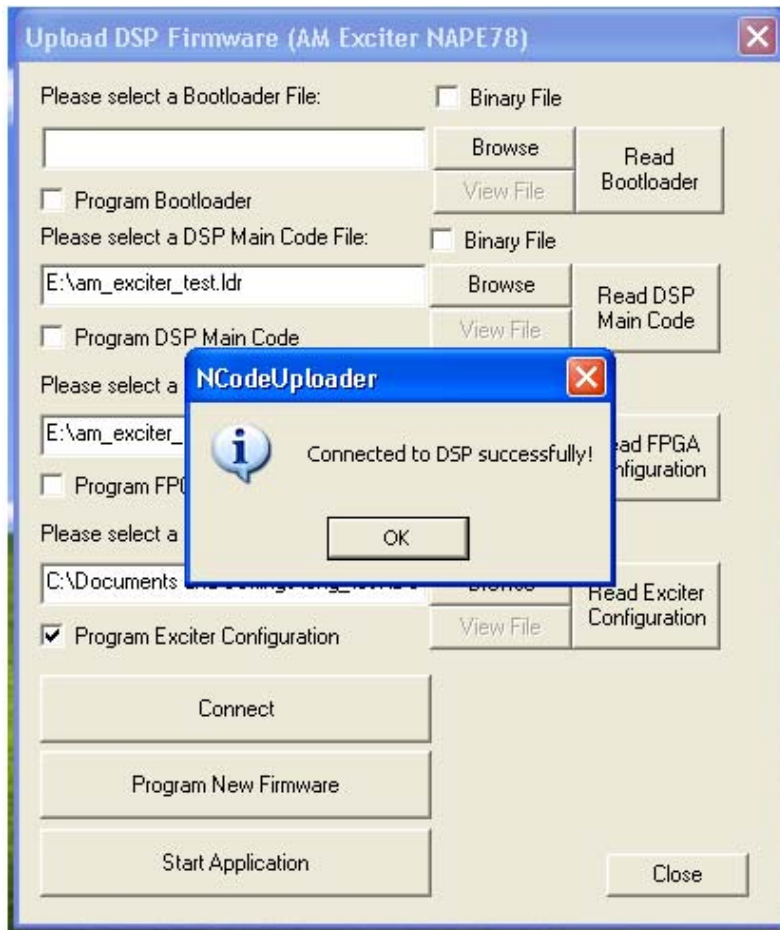
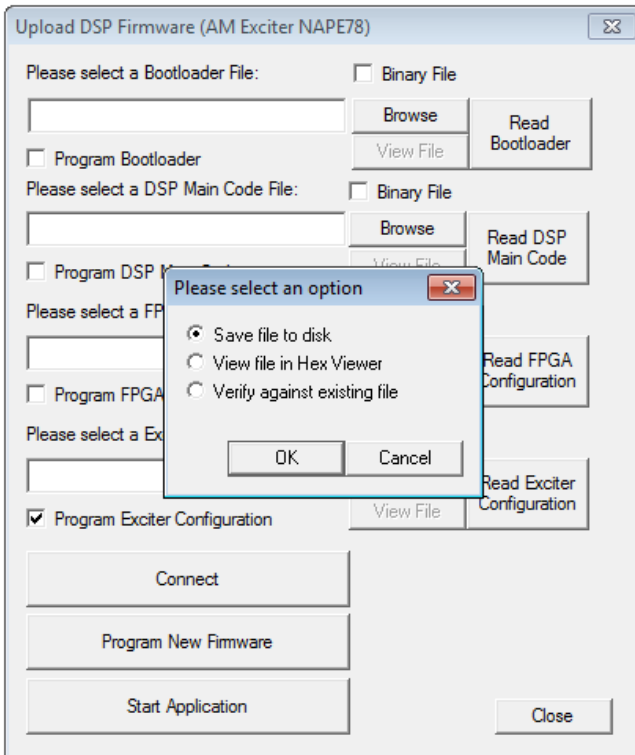
Figure 4.1.15: NCode Uploader Menu

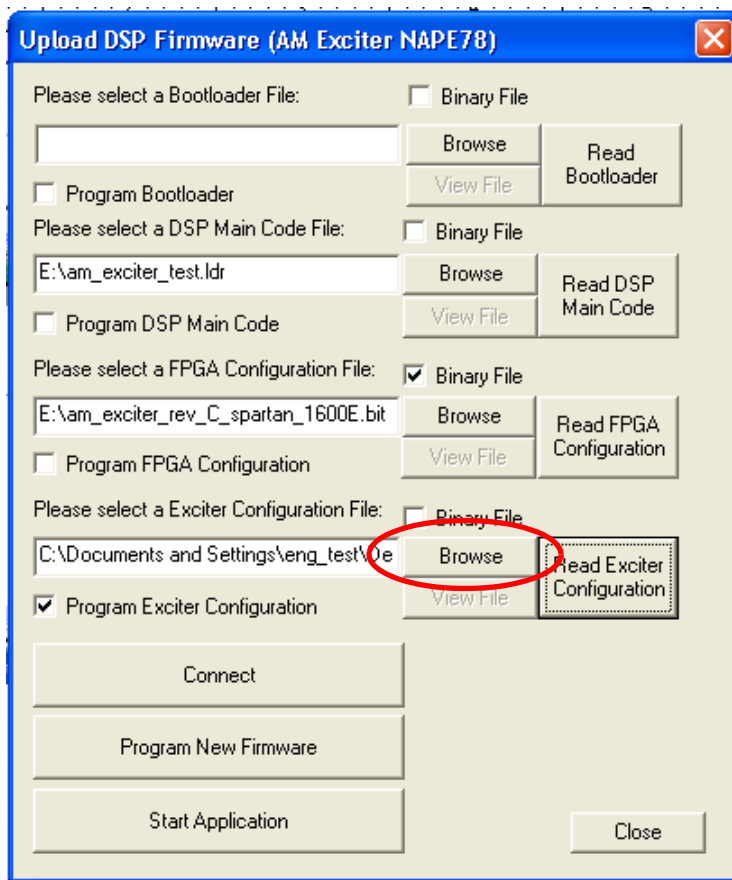
Figure 4.1.16: Upload DSP Firmware Menu

6. Click the Upload DSP Firmware button (see [Figure 4.1.15 on page 4.1.70](#)). The menu shown in [Figure 4.1.16](#) should appear, along with the Connected to DSP successfully! prompt. Click OK.
7. Once connected, click the Read Exciter Configuration button. Select Save file to disk and click OK (see [Figure 4.1.17 on page 4.1.72](#)) to save the current calibration data. Browse to a desired location to save the file.
8. If the defective exciter does not allow the previous steps to be performed, try using the operational exciter to save the required calibration data. In this case, repeat [Step 2](#) through [Step 7](#) for the operational exciter's digital AM exciter PWB. If there is no operational exciter, contact Nautel for the required calibration data.

Figure 4.1.17: Upload DSP Firmware Menu - Select an Option



9. Turn off (disable) the ac power for the transmitter at the source. Remove and retain four sets of mounting hardware from the digital AM exciter PWB being replaced (A5 or A6).
10. Pull the digital AM exciter PWB away from the control/interface PWB (A4). It may be helpful to gently pry the connectors loose with a screwdriver.
11. Obtain a replacement digital AM exciter PWB (Nautel Part # NAPE78A/01).
12. Install the new digital AM exciter PWB by reversing [Step 9](#) and [Step 10](#).
13. Turn on (enable) the ac power source.
14. Connect a straight-through serial (DB9) cable between the replacement digital AM exciter PWB's RS-232 connector (9-pin D-sub J3, see [Figure 4.1.14 on page 4.1.69](#)) and the serial port on a PC.
15. On the digital AM exciter PWB's MODE program header E1 (see [Figure 4.1.14 on page 4.1.69](#)), install the shorting jumper in the PROGRAM position (shorting pins 1 and 2). Press RESET switch S1, located directly above E1.
16. Once connected, use the PC to browse to the configuration file saved in [Step 7](#) by clicking the Browse button next to the "Please Select a Exciter Configuration file:" field (see [Figure 4.1.18 on page 4.1.73](#)).

Figure 4.1.18: Upload DSP Firmware Menu - Browse for configuration file

17. Click the Program Exciter Configuration checkbox (see [Figure 4.1.18](#)) so that the box contains a checkmark. Ensure the Program Bootloader, Program DSP Main Code and Program FPGA Configuration checkboxes are not checked. Click the Program New Firmware button.
18. On the digital AM exciter PWB's MODE program header E1 (see [Figure 4.1.14](#) on page 4.1.69), return the shorting jumper to the NORMAL position (shorting pins 2 and 3). Press RESET switch S1, located directly above E1.
19. Using the front panel UI or remote AUI, reset any active alarms.
20. Upgrade the subsystem's software using the front panel UI's Updating Firmware screen or the remote AUI's Upgrade Software page under the appropriate System Settings menu, by running an upgrade using the existing .tgz file already installed on the transmitter. See the NX10 Operations and Maintenance Manual for detailed instructions.
21. Set the transmitter to its RF On state. Ensure any previously present alarms have cleared.

Exgine PWB Replacement

1. Set the transmitter to its RF Off state. Turn off (disable) the ac power at the source. Open the front door to gain access to the exciter panel (see [Figure 4.1.12 on page 4.1.66](#)).
2. Disconnect all cables attached to the Exgine PWB (A7), taking note of the connector labels on the cables and the PWB.
3. Carefully remove and retain the four (4) sets of mounting hardware and remove the Exgine PWB from the exciter panel.
4. Obtain a replacement Exgine PWB (Nautel Part # NAPE74C/01).
5. Install the new Exgine PWB by reversing [Step 2](#) and [Step 3](#). Ensure all connections are tight. For connector mating assistance, refer to the connector mating tables in [Section 4.3, "Wiring/Connector lists" on page 4.3.1](#).
6. Turn on (enable) the ac power source. Set the transmitter to its RF On state. Ensure any previously present alarms have cleared.

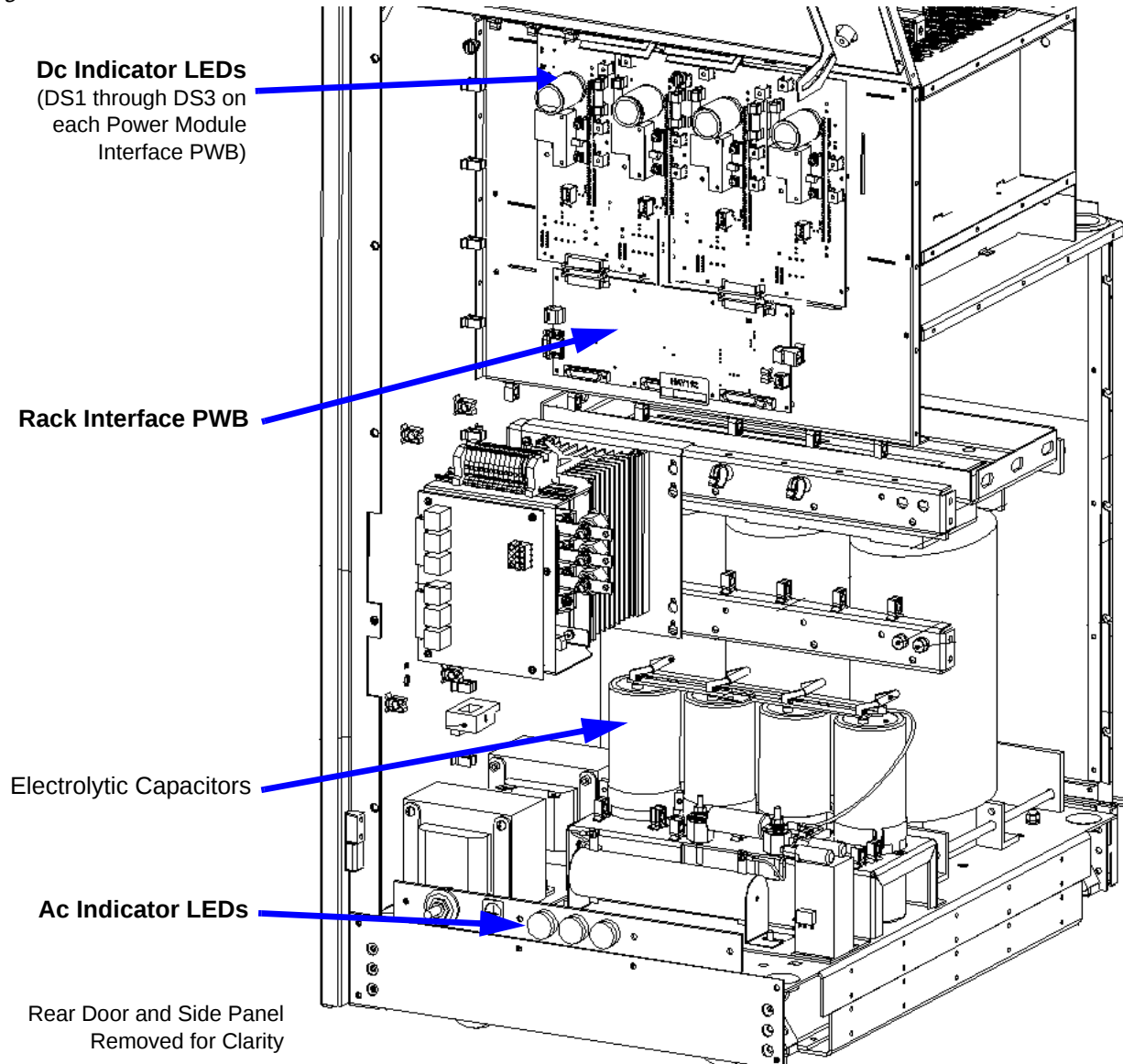
GPS Sync PWB Replacement

1. Set the transmitter to its RF Off state. Turn off (disable) the ac power at the source. Open the front door to gain access to the exciter panel (see [Figure 4.1.12 on page 4.1.66](#)).
2. Disconnect all cables attached to the GPS sync PWB (A8), taking note of the connector labels on the cables and the PWB.
3. Carefully remove and retain the four (4) sets of mounting hardware and remove the GPS sync PWB from the exciter panel.
4. Obtain a replacement GPS sync PWB (Nautel Part # NAPX46). Remove the jack screws from 9-pin D-sub connector J1 on the new GPS sync PWB before installing it.
5. Set the jumpers on the replacement PWB to the same positions as the defective PWB.
6. Install the new GPS sync PWB by reversing [Step 2](#) and [Step 3](#). Ensure all connections are tight. For connector mating assistance, refer to the connector mating tables in [Section 4.3, "Wiring/Connector lists" on page 4.3.1](#).
7. Turn on (enable) the ac power source. Set the transmitter to its RF On state. Ensure any previously present alarms have cleared.

Rack Interface PWB Replacement

WARNING! LETHAL VOLTAGES EXIST INSIDE THE TRANSMITTER WHEN THE POWER IS TURNED ON. TURN OFF AND LOCK OUT THE POWER AT THE SOURCE AND WAIT UNTIL THE THREE AMBER LEDS IN THE BACK OF THE TRANSMITTER ARE OFF BEFORE REMOVING CONNECTIONS OR ASSEMBLIES.

Figure 4.1.19: Location of Rack Interface PWB



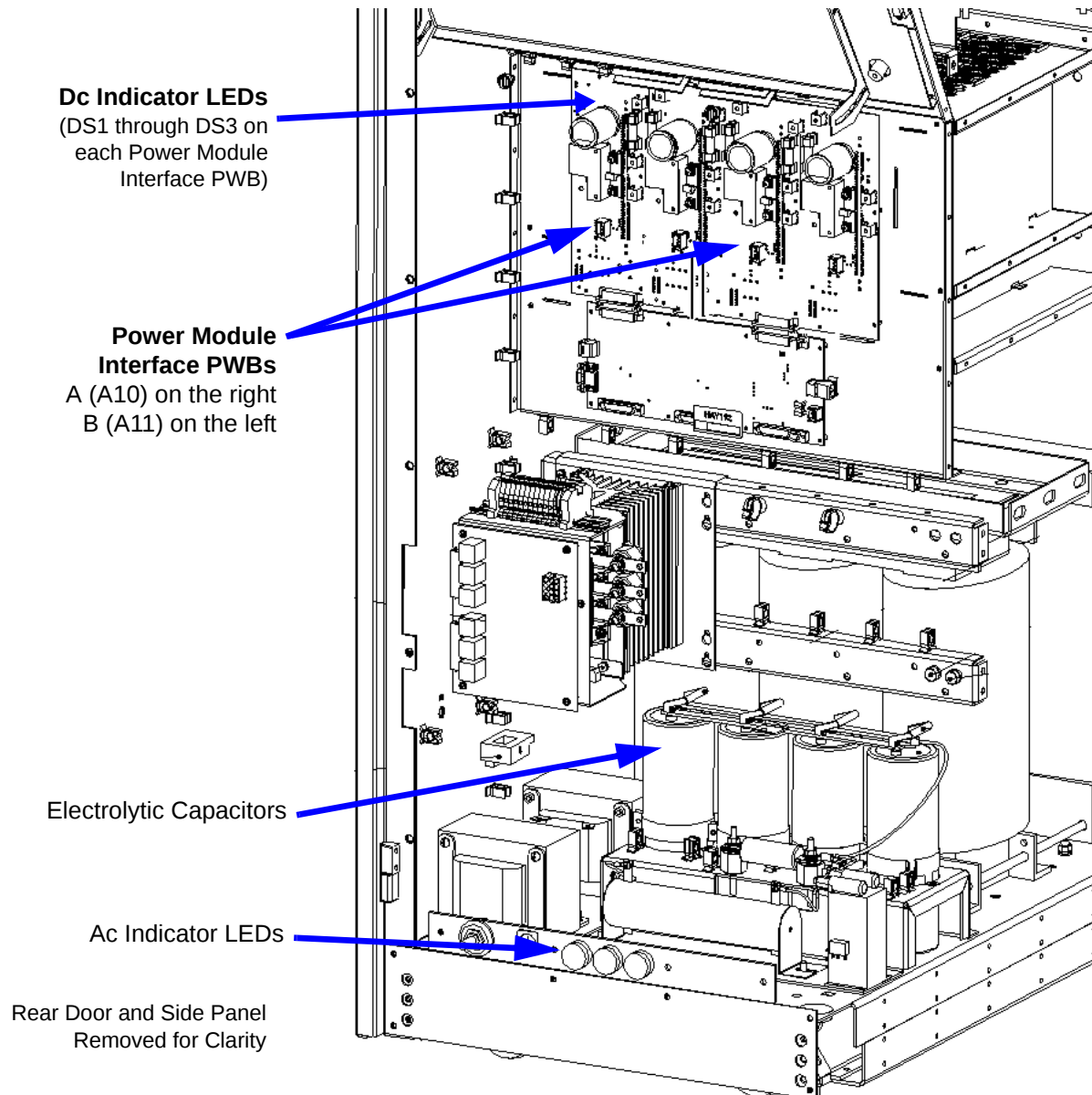
See [Figure 4.1.19 on page 4.1.75](#).

1. Turn off (disable and lock out) the ac power at the source. When the three ac indicator LEDs are off (amber when on), open the rear door. Verify the three dc indicator LEDs on each power module interface PWB are off (amber when on). For additional safety, measure the dc voltage across the + and - terminals of any of the four, electrolytic capacitors. Open the lower, front panel to access the power transformer's terminals and measure all line-to-line and line-to-neutral ac voltages. There should be little or no ac or dc voltage. **DO NOT PROCEED** if the dc voltage is greater than 5 V.
2. Disconnect all cables attached to the rack interface PWB (A9), taking note of the connector labels on the cables and the PWB.
3. Carefully remove and retain the eight (8) sets of mounting hardware and remove the rack interface PWB from the transmitter.
4. Obtain a replacement rack interface PWB (Nautel Part # NAPI173A).
5. Reverse [Step 2](#) through [Step 3](#) to install the replacement PWB. Ensure all connections are tight. For connector mating assistance, refer to the connector mating tables in [Section 4.3, "Wiring/Connector lists" on page 4.3.1](#).
6. Before restoring ac power, remove the four RF power modules from the transmitter (see ["Removing and Reinstalling RF Power Modules" on page 4.1.52](#)).
7. Re-install the lower, front panel over the power transformer. Close and secure the rear door. Turn on (enable) the ac power source.
8. One at a time, reinstall each RF power module. The LED sequence on the front panel of each module should change to solid red. Reconnect each RF power module's PDM cable; the LED sequence should change to flashing amber.
9. Load the subsystem software (existing .tgz file) using the front panel UI's Updating Firmware screen or the remote AUI's Upgrade Software page under the appropriate System Settings menu. See the NX10 Operations and Maintenance Manual for detailed instructions.
10. Set the transmitter to its RF On state. Ensure any previously present alarms have cleared.

Power Module Interface PWB Replacement

WARNING! LETHAL VOLTAGES EXIST INSIDE THE TRANSMITTER WHEN THE POWER IS TURNED ON. TURN OFF AND LOCK OUT THE POWER AT THE SOURCE AND WAIT UNTIL THE THREE AMBER LEDS IN THE BACK OF THE TRANSMITTER ARE OFF BEFORE REMOVING CONNECTIONS OR ASSEMBLIES.

Figure 4.1.20: Location of Power Module Interface PWBs



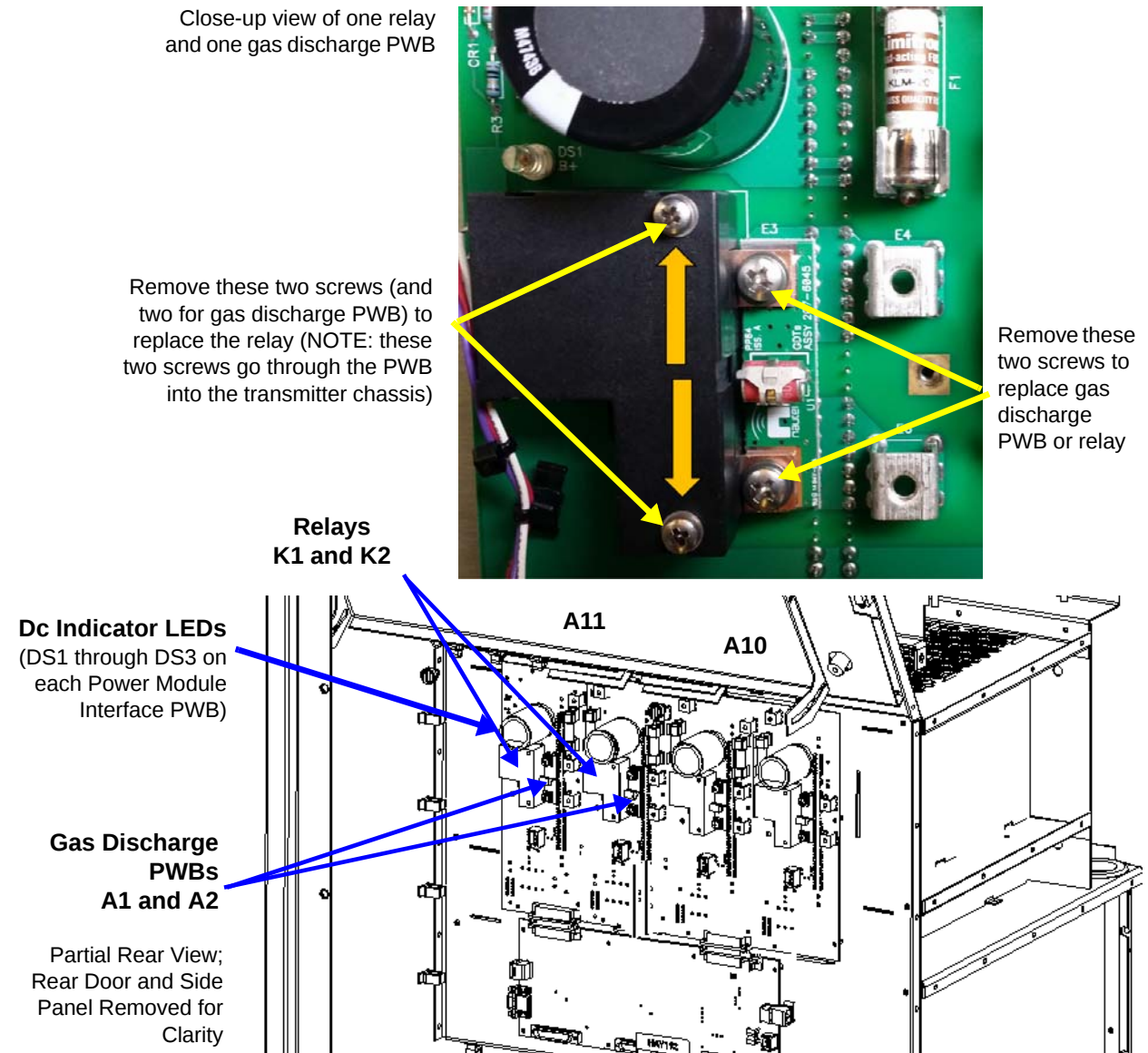
See [Figure 4.1.20 on page 4.1.77](#).

1. Turn off (disable and lock out) the ac power at the source. When the three ac indicator LEDs are off (amber when on), open the rear door. Verify the three dc indicator LEDs on each power module interface PWB are off (amber when on). For additional safety, measure the dc voltage across the + and - terminals of any of the four, electrolytic capacitors. Open the lower, front panel to access the power transformer's terminals and measure all line-to-line and line-to-neutral ac voltages. There should be little or no ac or dc voltage. **DO NOT PROCEED** if the dc voltage is greater than 5 V.
2. Disconnect all wiring and cables attached to the suspect power module interface PWB (A10 or A11), taking note of the connector labels on the cables and the PWB. Pay particular attention to the difference in shrink-wrap colour on the wires connected to E4/E8 and E6/E10.
3. From the front of the transmitter, remove the two RF power modules and two fan trays associated with the suspect power module interface PWB.
4. Remove the two gas discharge PWBs and two relays from the suspect power module interface PWB as detailed in ["Gas Discharge PWB and Relay Replacement" on page 4.1.79](#).
5. Carefully remove and retain the 16 sets of mounting hardware from the suspect power module interface PWB (A10 or A11) and remove the power module interface PWB from the transmitter.
NOTE: There are more than 16 screws in each power module interface PWB. The mounting hardware is located on the square pads of the PWB.
6. Obtain a replacement power module interface PWB (Nautel Part # NAPI174).
7. Install the new PWB by reversing [Step 2](#) through [Step 5](#), including the re-installation of the two gas discharge PWBs and relays. Ensure all connections are tight, noting that connections to terminals E1, E2, E4, E6, E8 and E10 have special torque requirements. Torque these wires to 20 in-lbs (2.2 N-m).
8. Re-install the lower, front panel over the power transformer. Close and secure the rear door. Turn on (enable) the ac power source and resume transmitter operation. Ensure any previously present alarms have cleared.

Gas Discharge PWB and Relay Replacement

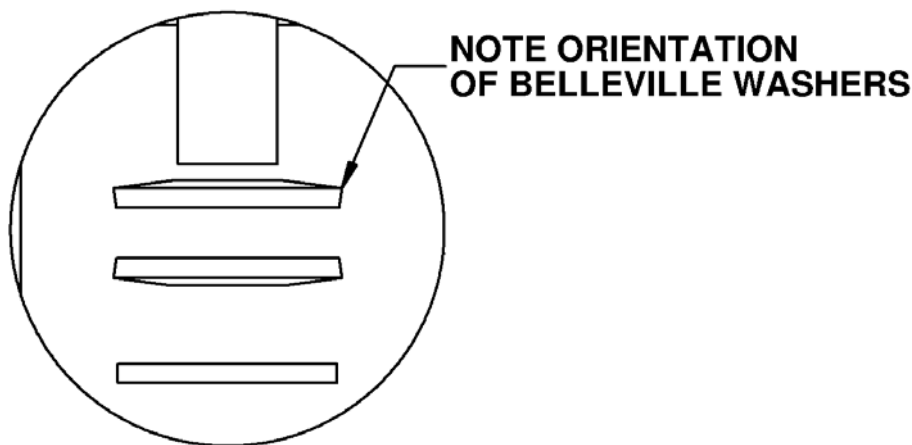
WARNING! LETHAL VOLTAGES EXIST INSIDE THE TRANSMITTER WHEN THE POWER IS TURNED ON. TURN OFF AND LOCK OUT THE POWER AT THE SOURCE AND WAIT UNTIL THE THREE AMBER LEDS IN THE BACK OF THE TRANSMITTER ARE OFF BEFORE REMOVING CONNECTIONS OR ASSEMBLIES.

Figure 4.1.21: Location of Gas Discharge PWB and Relays



1. Turn off (disable and lock out) the ac power at the source. When the three ac indicator LEDs are off (amber when on), open the rear door. Verify the three dc indicator LEDs on each power module interface PWB are off (amber when on). For additional safety, measure the dc voltage across the + and - terminals of any of the four, electrolytic capacitors. Open the lower, front panel to access the power transformer's terminals and measure all line-to-line and line-to-neutral ac voltages. There should be little or no ac or dc voltage. **DO NOT PROCEED** if the dc voltage is greater than 5 V.
2. Remove and retain the two sets of mounting hardware from the suspect gas discharge PWB (A10A1, A10A2, A11A1 or A11A2) or four sets of mounting hardware from the suspect relay (A10K1, A10K2, A11K1 or A11K2). See [Figure 4.1.21 on page 4.1.79](#) and Figure MD-9 in the Mechanical Drawings section of this manual. Note the orientation of the Belleville washers that secure the relay and gas discharge PWB to the power module interface PWB terminals (see [Figure 4.1.22 on page 4.1.80](#)).
3. Remove the defective PWB(s) or relay(s).

Figure 4.1.22: Orientation of Belleville Washers

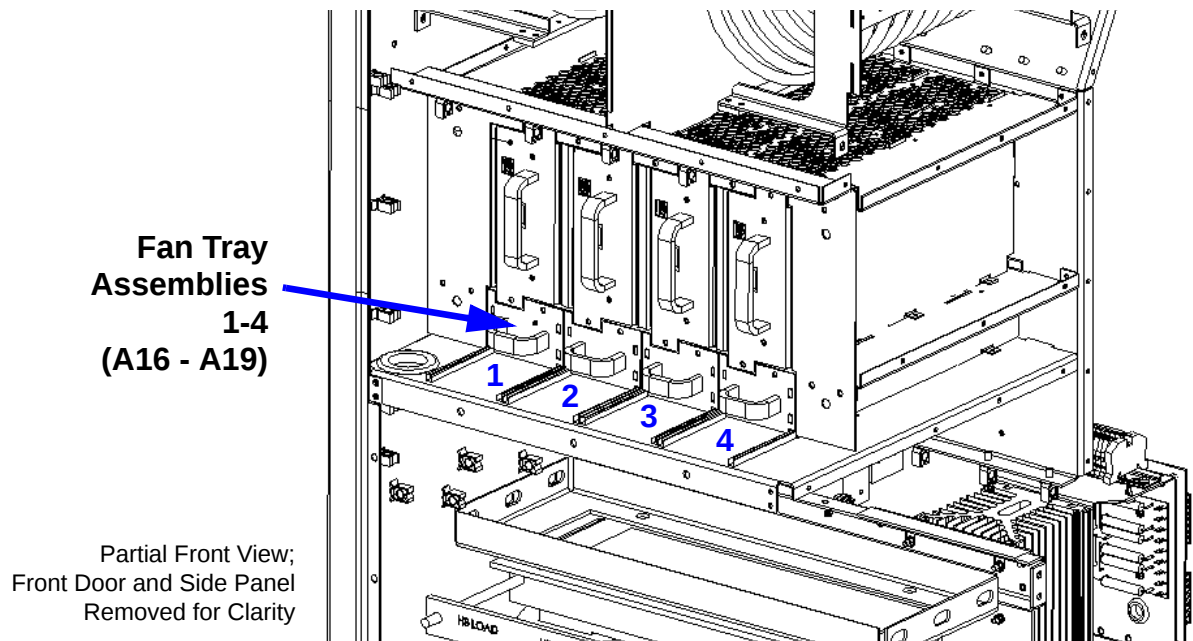


4. Install the new PWB or relay by reversing [Step 2](#) and [Step 3](#). Use new Belleville washers (Nautel Part # HM49) and torque to 12 in-lbs to secure the relays.
5. Re-install the lower, front panel over the power transformer. Close and secure the rear door. Turn on (enable) the ac power source and resume transmitter operation. Ensure the offending alarm has cleared.

Fan Tray Replacement

NOTE: Fan tray replacement can be performed with the transmitter 'on-air' (RF On).

Figure 4.1.23: Location of Fan Tray Assemblies



1. Open the front door.
2. Locate the suspect fan tray assembly [1 (A16) through 4 (A19)] associated with the RF Power Module 1-4 alarm(s) (see [Figure 4.1.23](#)).
3. Remove and retain the two sets of mounting hardware.

CAUTION! If one of the fans in the tray is still operational, its blades may still be rotating. Be careful to keep fingers away from fan blades.

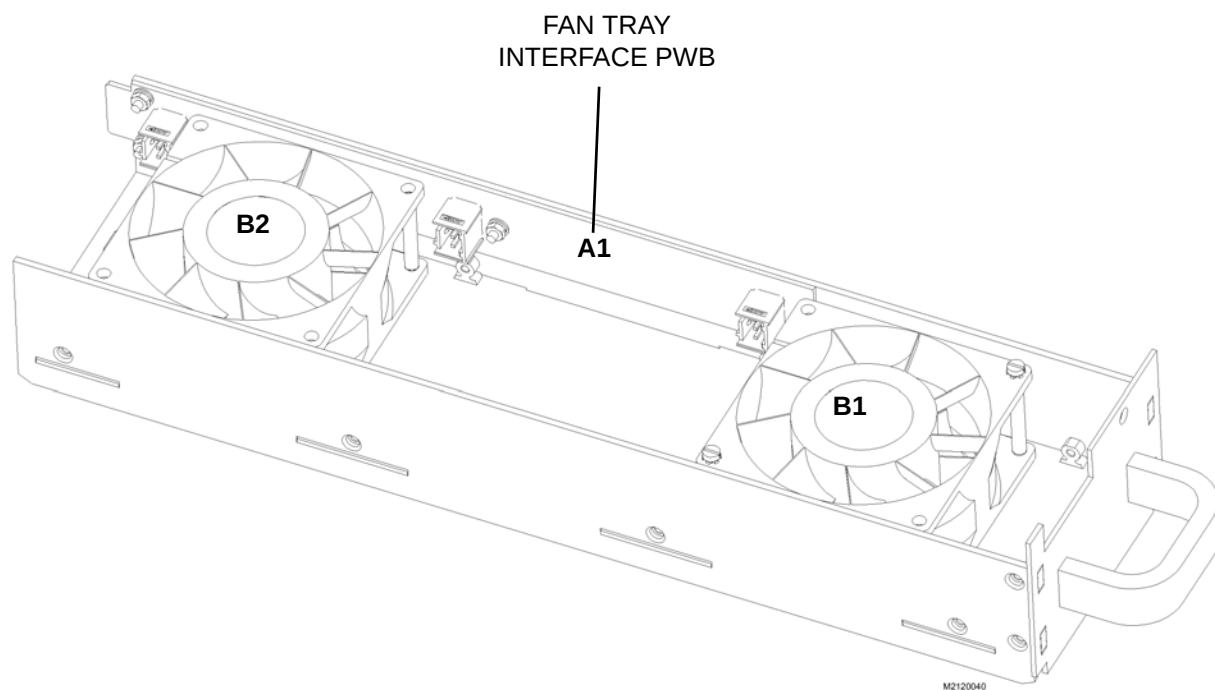
4. Pull the fan tray assembly out of the transmitter.
5. Obtain a replacement fan tray (Nautel Part # NAX274).
6. Install the new fan tray in the transmitter and secure using retained screws. Ensure the offending alarm has cleared.

NOTE: You can also replace an individual fan of a fan tray assembly. See "[Fan Tray Cooling Fan Replacement](#)" on page 4.1.82.

Fan Tray Cooling Fan Replacement

1. Remove the fan tray assembly [1 (A16) through 4 (A19)] that contains the suspect fan as detailed in ["Fan Tray Replacement" on page 4.1.81](#).
2. Disconnect the suspect fan's mating plug (B1P1 or B2P1) (see [Figure 4.1.24](#)).
3. Remove and retain the cooling fan's two M3 screws that secure the fan to the fan tray, along with the spacer sleeves that are installed between the two ears of the fan.
4. Obtain a replacement fan (Nautel Part # ZAP50) from the site spares kit, if purchased (vendor part # is Minebea Motor Mfg. Corp. 3115RL-07W-B79-E51).
5. Install the replacement fan using retained screws and spacers, ensuring correct orientation for proper air flow. Check the position of the other fan as a reference.
6. Reinstall the fan tray in the transmitter and secure using retained screws. Ensure the offending alarm has cleared.

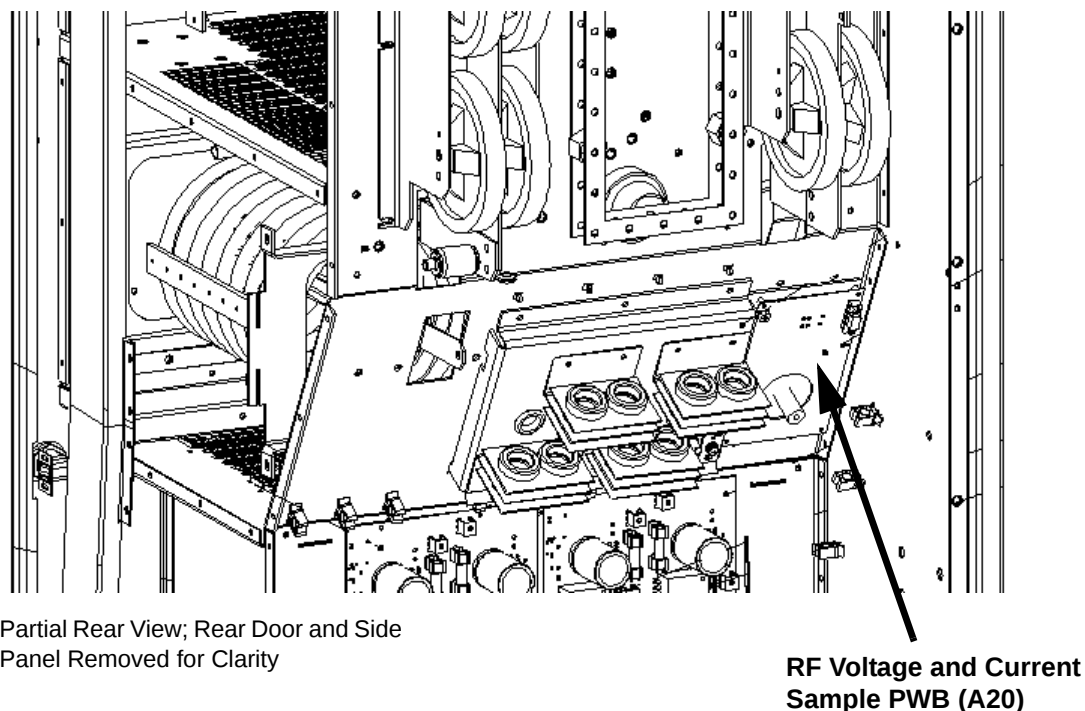
Figure 4.1.24: Fan Tray Assembly Cooling Fans (B1 and B2)



RF Voltage and Current Sample PWB Replacement

WARNING! LETHAL VOLTAGES EXIST INSIDE THE TRANSMITTER WHEN THE POWER IS TURNED ON. TURN OFF AND LOCK OUT THE POWER AT THE SOURCE AND WAIT UNTIL THE THREE AMBER LEDS IN THE BACK OF THE TRANSMITTER ARE OFF BEFORE REMOVING CONNECTIONS OR ASSEMBLIES.

Figure 4.1.25: Location of RF Voltage and Current Sample PWB



1. Turn off (disable and lock out) the ac power at the source. When the three ac indicator LEDs are off (amber when on), open the rear door. Verify the three dc indicator LEDs on each power module interface PWB are off (amber when on). For additional safety, measure the dc voltage across the + and - terminals of any of the four, electrolytic capacitors. Open the lower, front panel to access the power transformer's terminals and measure all line-to-line and line-to-neutral ac voltages. There should be little or no ac or dc voltage. **DO NOT PROCEED** if the dc voltage is greater than 5 V.
2. Disconnect all cables attached to the RF voltage and current sample PWB (A20) (see [Figure 4.1.25](#)), taking note of the connector labels on the cables and the PWB.
3. Remove the four (4) sets of hardware that secure the cover plate for the RF voltage and current sample PWB.

4. Carefully remove and retain the four (4) sets of mounting hardware from the RF voltage and current sample PWB and remove the PWB from the transmitter.
5. Obtain a replacement RF voltage and current sample PWB (Nautel Part # NAPP11/02A).
6. Install the new PWB by reversing [Step 2](#) through [Step 4](#). Ensure all connections are tight, noting that the connection to terminal E1 has a special torque requirement. Torque this wire to 10 in-lbs (1.1 N-m).
7. Re-install the lower, front panel over the power transformer. Close and secure the rear door. Turn on (enable) the ac power source and resume transmitter operation.
8. Perform a re-calibration of the transmitter (see ["Re-Calibrating the Transmitter"](#)).

Re-Calibrating the Transmitter

You will need the following test equipment to perform the re-calibration:

- ❖ Calibration values from Nautel Customer Service: 1st Inductor Value, Filter Lag and Ideal PA Impedance
 - ❖ 50-ohm test load, rated for full power including modulation
 - ❖ Impedance measuring device capable of measuring impedance (both resistive and reactive)
 - ❖ RF current probe with RMS meter
1. Disable and lock out the ac power source for the transmitter. Terminate the transmitter's RF output into the test load.
 2. Measure and record the test load impedance at the transmitter's RF output (include the hardline between the transmitter and test load in the measurement), at the transmitter's carrier frequency.

NOTE: If the current probe is not in line at the output of the transmitter, measure the test load impedance seen at both the output of the transmitter ($Z_{\text{Transmitter_Output}}$) and the position of the current probe ($Z_{\text{Position of Current Probe}}$).

3. Calculate the rated RF current as follows:

$$I_{\text{Rated}} = \sqrt{\frac{P_{\text{Rated}}}{R_{\text{Position of RF Current Probe}}}}$$

Figure 4.1.26: Forward/Reflected Power Screen on Remote AUI

4. Enable the ac power source for the transmitter.
5. Set the RF output power to 5% of rated power. In the remote AUI's Menu -> Factory Settings -> Forward/Reflected Power screen (see [Figure 4.1.26 on page 4.1.85](#)), set SWR Protection to Off. Press RF On. Measure the RF current on the RF current probe.
6. Calculate the transmitter output current as follows:

$$I_{\text{Transmitter Output}} = \sqrt{\frac{I_{\text{Measured}} \times R_{\text{Position of RF Current Probe}}}{R_{\text{Transmitter Output}}}}$$

NOTE: I_{measured} is the RF current probe measurement

7. In the remote AUI's Menu -> Factory Settings -> Forward/Reflected Power screen (see [Figure 4.1.26](#)), enter the test load impedance measurement from [Step 2](#) in the Output Impedance field. Enter the transmitter output current calculated in [Step 4](#) in the RF Current field. Press Calibrate to begin calibrating.

NOTE: On the Forward/Reflected Power screen, the 1st Inductor Value, Filter Lag and Ideal PA Impedance fields should already contain values. Contact Nautel Customer Service to ensure the values are correct.

8. When the calibration routine is complete (indicated at the bottom of the Forward/Reflected Power screen), set SWR Protection to On.
9. Verify the RF current probe reads $22.5\% \pm 5\%$ of the rated RF current calculated in [Step 3](#).

10. Ensure the RMS Envelope Magnitude meter in the upper, right corner of the remote AUI reads within $\pm 1\%$ of the ideal value, noting the ideal value is calculated as follows:

$$\text{Ideal Value} = \frac{163 \text{ V} \times \% \text{ Volts}}{\sqrt{\frac{50}{\text{Exciter Carrier Impedance}}}} / \text{Exciter B+ Sample} \times 100\%$$

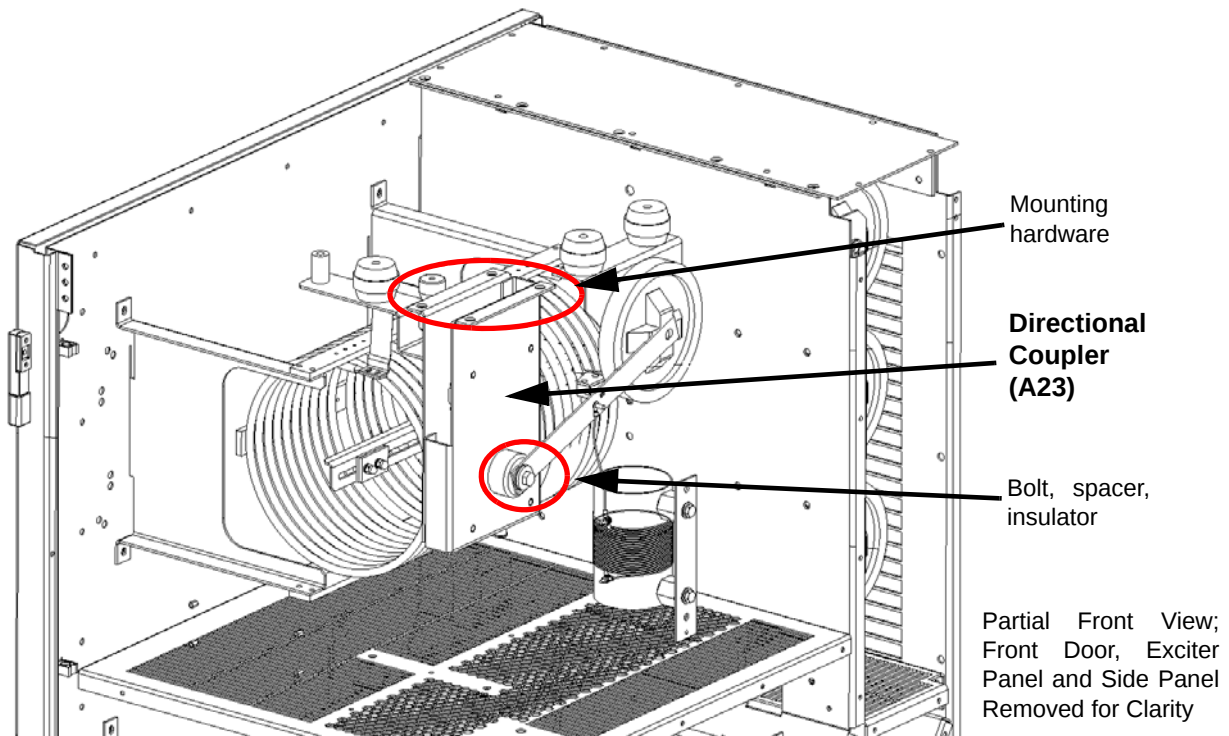
NOTE:

- ❖ % Volts = 22.5%/100
 - ❖ Exciter Carrier Impedance (see meters) displays in rectangular form; convert to polar form and use only the magnitude
 - ❖ Exciter B+ Sample (see meters)
11. Increase the RF output power to 10% of rated power. Measure the RF current on the RF current probe. The RF current should be $31.5\% \pm 5\%$ of the rated RF current in [Step 3](#). Use the formula from [Step 10](#) ($\% \text{ Volts} = 31.5\%/100$) to ensure the RMS Envelope Magnitude meter is within $\pm 1\%$ of the ideal value. If not, enter the test load impedance measurement from [Step 2](#) in the Output Impedance field. Use the RF current measurement in this step to calculate the transmitter output current (see [Step 4](#)) and enter the calculated result in the RF Current field. Press Calibrate. When the calibration routine is complete (indicated at the bottom of the Forward/Reflected Power screen), verify the new RF Current and RMS Envelope Magnitude values are correct.
 12. Increase the RF output power to 50% of rated power. Measure the RF current on the RF current probe. The RF current should be $71\% \pm 5\%$ of the rated RF current in [Step 3](#). Use the formula from [Step 10](#) ($\% \text{ Volts} = 71\%/100$) to ensure the RMS Envelope Magnitude meter is within $\pm 1\%$ of the ideal value. If not, enter the test load impedance measurement from [Step 2](#) in the Output Impedance field. Use the RF current measurement in this step to calculate the transmitter output current (see [Step 4](#)) and enter the calculated result in the RF Current field. Press Calibrate. When the calibration routine is complete (indicated at the bottom of the Forward/Reflected Power screen), verify the new RF Current and RMS Envelope Magnitude values are correct.
 13. Increase the RF output power to 100% of rated power. Measure the RF current on the RF current probe. The RF current should be $100\% \pm 5\%$ of the rated RF current in [Step 3](#). Use the formula from [Step 10](#) ($\% \text{ Volts} = 100\%/100$) to ensure the RMS Envelope Magnitude meter is within $\pm 1\%$ of the ideal value. If not, enter the test load impedance measurement from [Step 2](#) in the Output Impedance field. Use the RF current measurement in this step to calculate the transmitter output current (see [Step 4](#)) and enter the calculated result in the RF Current field. Press Calibrate. When the calibration routine is complete (indicated at the bottom of the Forward/Reflected Power screen), verify the new RF Current and RMS Envelope Magnitude values are correct.
 14. Verify VSWR Protection is enabled (set to On).
 15. Select exciter B, if applicable, and repeat [Step 5](#) through [Step 14](#).
 16. Return the transmitter to normal operation.

Directional Coupler Replacement

WARNING! LETHAL VOLTAGES EXIST INSIDE THE TRANSMITTER WHEN THE POWER IS TURNED ON. TURN OFF AND LOCK OUT THE POWER AT THE SOURCE AND WAIT UNTIL THE THREE AMBER LEDS IN THE BACK OF THE TRANSMITTER ARE OFF BEFORE REMOVING CONNECTIONS OR ASSEMBLIES.

Figure 4.1.27: Location of Directional Coupler Assembly



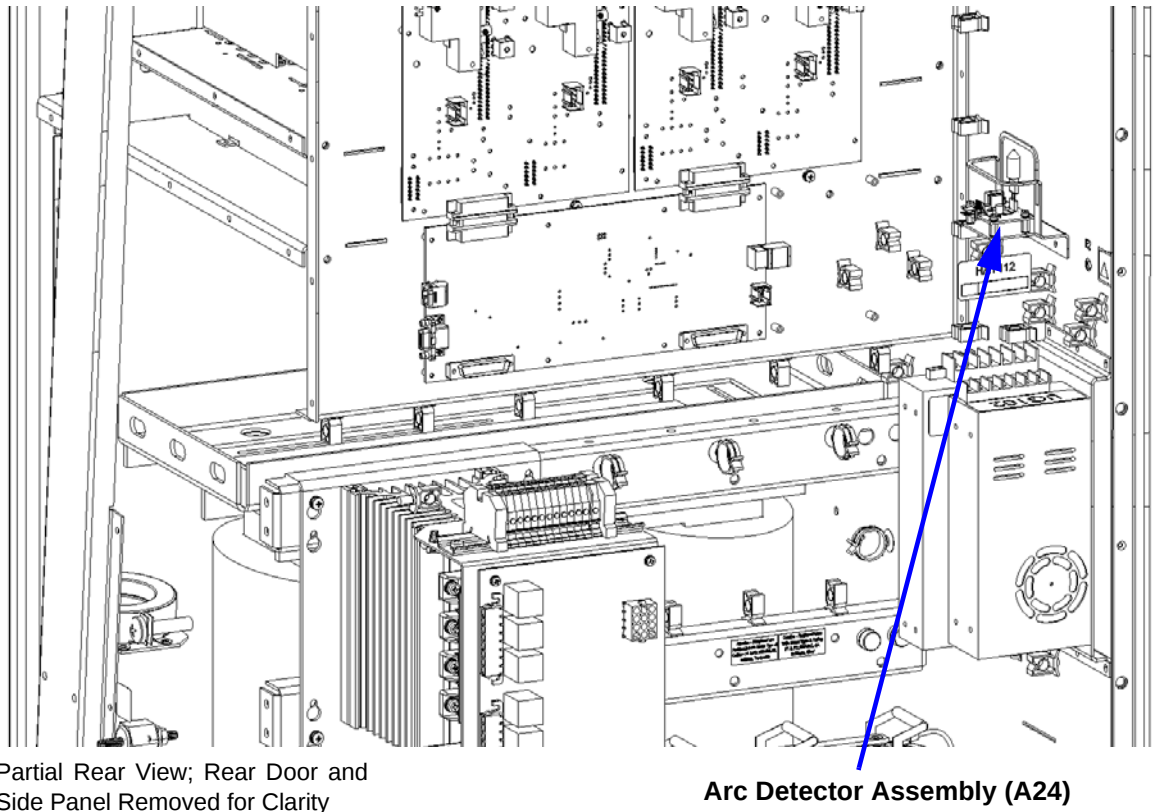
1. Set the transmitter to its RF Off state. Turn off (disable and lock out) the ac power at the source. Open the front door to gain access to the exciter panel. Remove 16 screws that secure the exciter panel and open the exciter panel to gain access to the directional coupler (A23) (see [Figure 4.1.27](#)).
2. Disconnect all cables attached to the directional coupler, taking note of the connector labels on the cables and the assembly.
3. Remove the bolt, spacer and associated hardware from inside the insulator on the directional coupler.
4. Carefully remove and retain the four (4) sets of mounting hardware at the top of the cabinet and remove the directional coupler from the transmitter.

-
5. Obtain a replacement directional coupler (Nautel Part # NAFP112).
 6. Install the new directional coupler by reversing [Step 2](#) through [Step 4](#), noting that a new bolt, sleeve and associated hardware are supplied with the directional coupler. Torque the center conductor bolt to 292 in-lbs (32.7 N-m). For wiring and connector mating assistance, refer to [Section 4.3, "Wiring/Connector lists" on page 4.3.1](#).
 7. Close and secure the exciter panel. Turn on (enable) the ac power source.
 8. Using the front panel UI, go to the User Settings -> RF Monitor -> RF Mon Select menu and select Reflected Power. Use a digital multimeter to measure the RMS voltage on the control/interface PWB's RF MONITOR BNC connector (J1).
 - ❖ If the measurement is less than 156 mV RMS, no further adjustment is required. Proceed to [Step 10](#).
 - ❖ If the measurement is greater than 156 mV RMS, you will need to null the directional coupler as detailed in [Step 9](#).
 9. If necessary, null the directional coupler as follows:
 - ❖ Turn off (disable) the ac power source. Disconnect the transmitter from the antenna system and connect the transmitter's RF output to a suitably rated 50-ohm test load.
 - ❖ Remove the 0.5-inch diameter black hole-plug from the exciter panel, noting it is located above the upper, right-hand corner of the control/interface PWB (A4). **NOTE:** This allows access to the directional coupler's variable resistor.
 - ❖ Turn on (enable) the ac power source. Set the forward power to 1.6 kW and press RF On.
 - ❖ Connect an oscilloscope to the reflected power sample test point (TP24) on the control/interface PWB (A4). Use a tuning tool or insulated screwdriver (available for purchase from Nautel, Part # HAS48) to adjust the directional coupler's variable resistor, through the hole in the exciter panel, to achieve the lowest possible rms voltage on the oscilloscope. If you cannot achieve 156 mV or less, contact Nautel.
 - ❖ Re-install the hole plug in the exciter panel. Close the front door.
 - ❖ Press RF Off and turn off (disable) the ac power source.
 - ❖ Reconnect the transmitter's RF output to the antenna system.
 10. Turn on (enable) the ac power source and press RF On. Ensure the offending alarm has cleared.

Arc Detector UV Sensor Replacement

WARNING! LETHAL VOLTAGES EXIST INSIDE THE TRANSMITTER WHEN THE POWER IS TURNED ON. TURN OFF AND LOCK OUT THE POWER AT THE SOURCE AND WAIT UNTIL THE THREE AMBER LEDS IN THE BACK OF THE TRANSMITTER ARE OFF BEFORE REMOVING CONNECTIONS OR ASSEMBLIES.

Figure 4.1.28: Location of Arc Detector Assembly

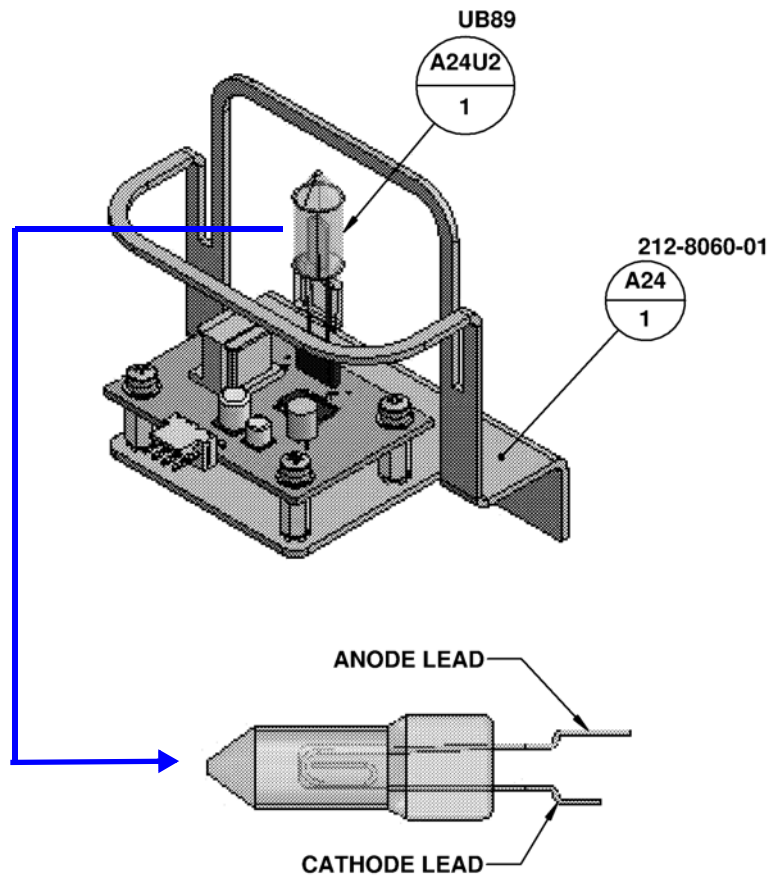
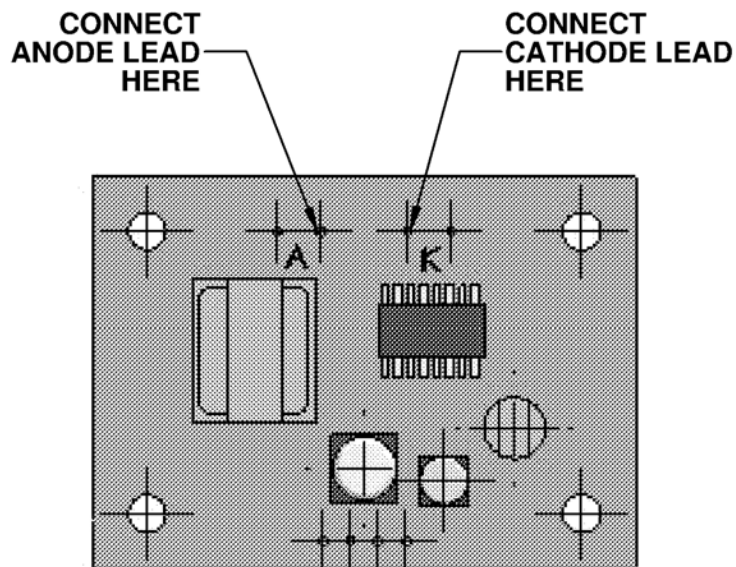


1. Turn off (disable and lock out) the ac power at the source. When the three ac indicator LEDs are off (amber when on), open the rear door. Verify the three dc indicator LEDs on each power module interface PWB are off (amber when on). For additional safety, measure the dc voltage across the + and - terminals of any of the four, electrolytic capacitors. Open the lower, front panel to access the power transformer's terminals and measure all line-to-line and line-to-neutral ac voltages. There should be little or no ac or dc voltage. **DO NOT PROCEED** if the dc voltage is greater than 5 V.
2. Disconnect the cable attached to the arc detector assembly (see [Figure 4.1.28](#)), taking note of the connector label on the cable and the assembly.

3. Carefully remove and retain the two (2) sets of mounting hardware and remove the arc detector assembly from the transmitter. Remove the UV sensor (U2) from the arc detector assembly's driver PWB (U1) (see [Figure 4.1.29 on page 4.1.91](#)).
4. Obtain a replacement UV sensor (Nautel Part # UB89).

WARNING! TAKE SPECIAL CARE WHEN HANDLING THE UV SENSOR AFTER REMOVING IT FROM THE PACKAGING SO IT DOES NOT RECEIVE IMPACT SHOCK. DO NOT ALLOW SKIN CONTACT WITH THE GLASS FACE. WEAR CLEAN GLOVES TO ENSURE NO OILS FROM YOUR SKIN CONTACT THE SURFACE OF THE GLASS.

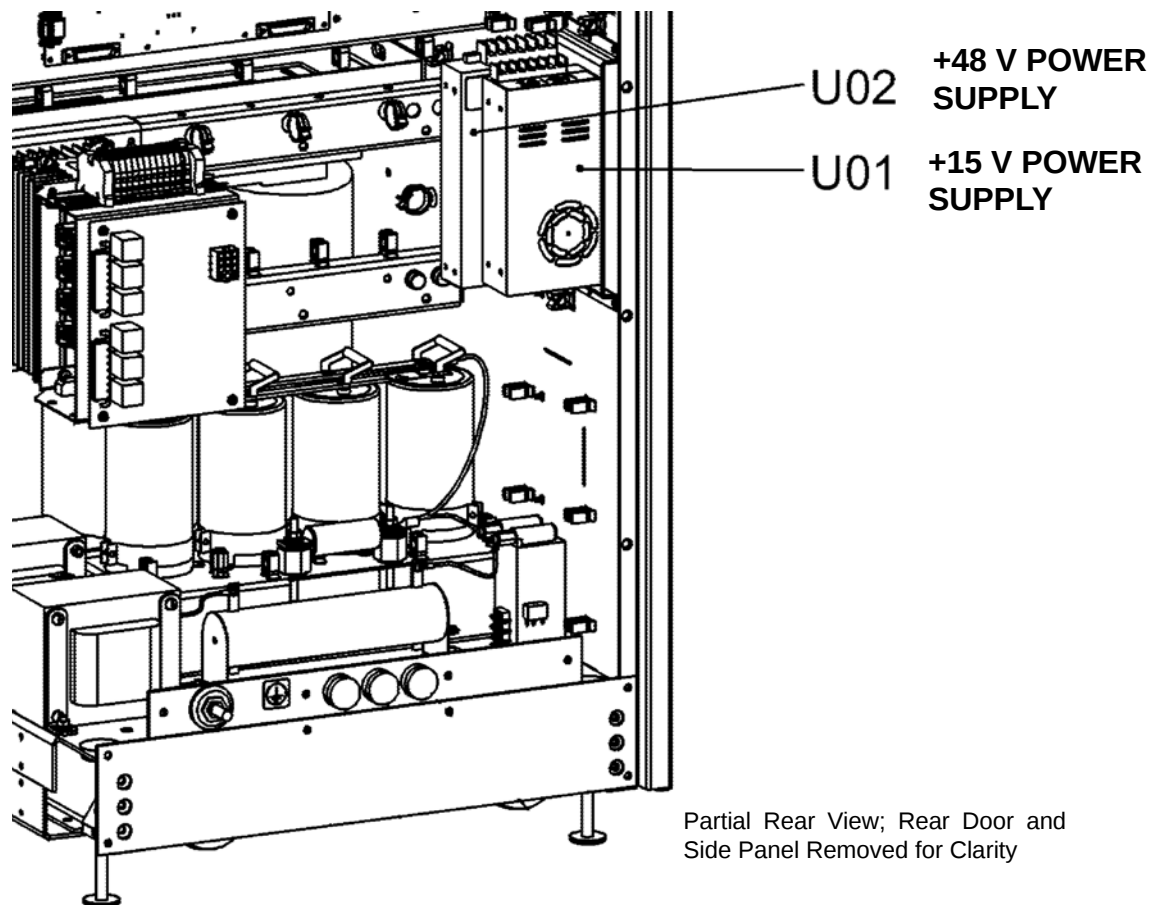
5. Cut the anode lead of the UV sensor to the same length as the cathode, noting the anode/cathode orientation and taking care not to bend the leads. Install the UV sensor on the arc detector assembly's driver PWB (U1), ensuring proper orientation (see [Figure 4.1.29 on page 4.1.91](#) and [Figure 4.1.30 on page 4.1.91](#)).
6. Complete the replacement procedure by reversing [Step 2](#) and [Step 3](#).
7. Re-install the lower, front panel over the power transformer. Close and secure the rear door. Turn on (enable) the ac power source and resume transmitter operation. Ensure the offending alarm has cleared.

Figure 4.1.29: Arc Detector Assembly UV Photo Tube Sensor (UB89)*Figure 4.1.30: UB89 Orientation on Driver PWB U1*

+15 V or +48 V Power Supply Replacement

WARNING! LETHAL VOLTAGES EXIST INSIDE THE TRANSMITTER WHEN THE POWER IS TURNED ON. TURN OFF AND LOCK OUT THE POWER AT THE SOURCE AND WAIT UNTIL THE THREE AMBER LEDS IN THE BACK OF THE TRANSMITTER ARE OFF BEFORE REMOVING CONNECTIONS OR ASSEMBLIES.

Figure 4.1.31: Location of +15 V and +48 V Low Voltage Power Supplies



NOTE: Both the +15 V (U1) and +48 V (U2) power supply modules must be removed to allow the replacement of either module.

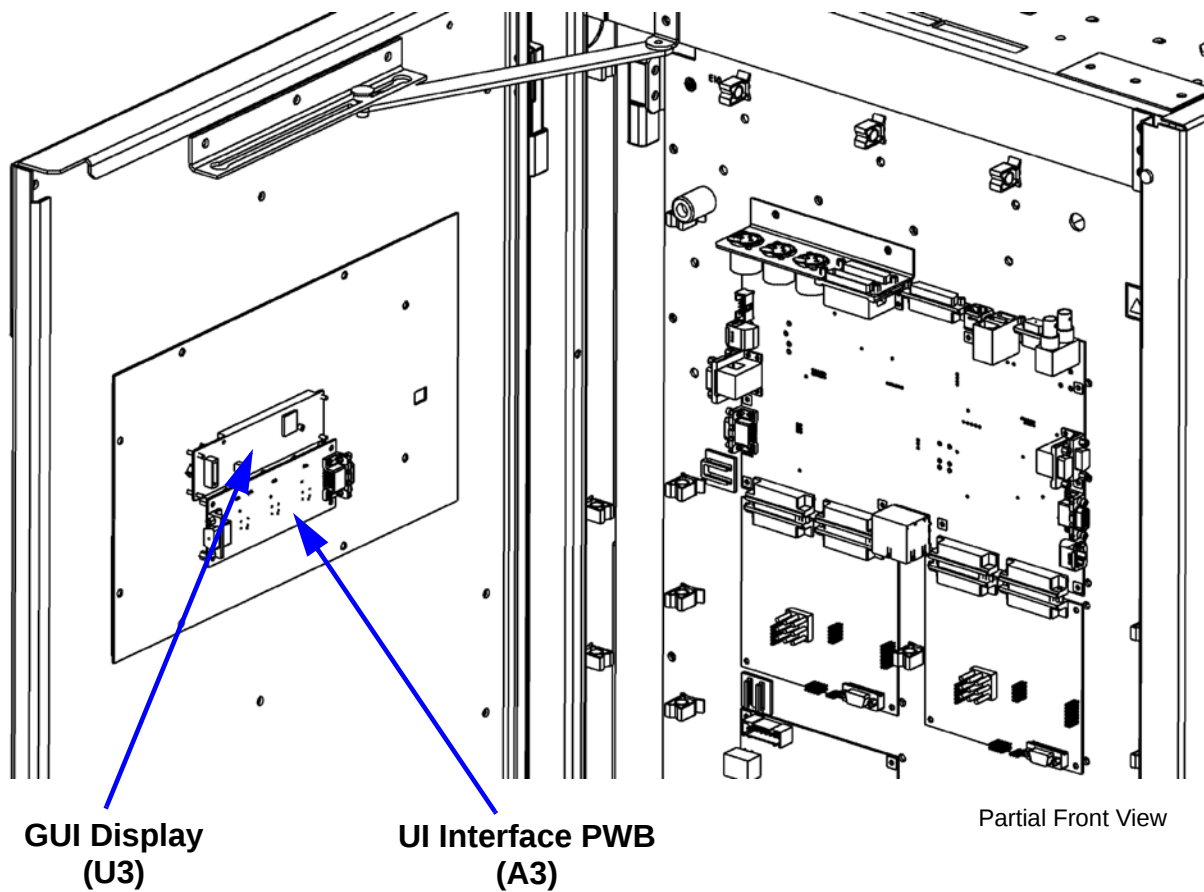
-
1. Turn off (disable and lock out) the ac power at the source. When the three ac indicator LEDs are off (amber when on), open the rear door. Verify the three dc indicator LEDs on each power module interface PWB are off (amber when on). For additional safety, measure the dc voltage across the + and - terminals of any of the four, electrolytic capacitors. Open the lower, front panel to access the power transformer's terminals and measure all line-to-line and line-to-neutral ac voltages. There should be little or no ac or dc voltage. **DO NOT PROCEED** if the dc voltage is greater than 5 V.
 2. Disconnect all wiring attached to the +15 V power supply module (U1) and +48 V power supply module (U2) (see [Figure 4.1.31 on page 4.1.92](#)), taking note of the wiring labels.
 3. Carefully remove and retain the six (6) sets of mounting hardware that secure the power supply mounting bracket to the transmitter. Remove the screws that secure the suspect power supply to the mounting bracket.
 4. Obtain a replacement power supply module, noting:
 - ❖ the +15 V power supply module is Nautel Part # UG102
 - ❖ the +48 V power supply module is Nautel Part # UG103
 5. Install the new power supply module by reversing [Step 2](#) and [Step 3](#). Ensure all connections are tight, noting there are special torque requirements for the L, N, G, V+ and V- terminals for each supply.
 - ❖ For the +15 V power supply module, torque the wiring connections to 9.7 in-lbs (1.1 N-m).
 - ❖ For the +48 V power supply module, torque the L, N and G wiring connections to 15 in-lbs (1.7 N-m) and torque the V+ and V- connections to 16 in-lbs (1.8 N-m)..
 6. Re-install the lower, front panel over the power transformer. Close and secure the rear door. Turn on (enable) the ac power source and resume transmitter operation. Ensure the offending alarm has cleared.

Graphic User Interface Display and UI Interface PWB Replacement

Graphic User Interface (GUI) Display Replacement

See [Figure 4.1.32](#).

1. Turn off (disable) the ac power source for the transmitter.
2. Open the front door to access the GUI display (U3) on the back of the door.
3. Disconnect the cable attached to the GUI display, noting its orientation.
4. Carefully remove the four (4) sets of mounting hardware that secure the GUI display and remove the GUI display from the transmitter.
5. Obtain a replacement GUI display (Nautel Part # UW146).
6. Reverse [Step 3](#) through [Step 4](#) to reinstall the GUI display. Reconnect all wiring.
7. Turn on (enable) the ac power source for the transmitter.

Figure 4.1.32: Graphic User Interface and UI Interface PWB Location

UI Interface PWB Replacement

See [Figure 4.1.32](#).

1. Turn off (disable) the ac power at the source.
2. Open the front door to access the UI interface PWB (A3) on the back of the door.
3. Disconnect the cables attached to the UI interface PWB, noting their orientation.
4. Remove and retain the four (4) M4 mounting screws that secure the PWB and remove the PWB from the transmitter.
5. Obtain a replacement UI interface PWB (Nautel Part # NAPI142A).
6. Reverse [Step 3](#) and [Step 4](#) to reinstall the GUI display. Reconnect all wiring.
7. Turn on (enable) the ac power source and resume transmitter operation.

SECTION 4.2: PARTS LISTS

This section contains reference designation lists that provide descriptive and provisioning information for all electrical and mechanical parts that have an assigned reference designation and form a part of the subject equipment.

Topics in this section include

- [Family Tree](#)
- [How to Locate Information About a Specific Part](#)
- [Column Content on page 4.2.2](#)
- [OEM Code to Manufacturers Cross-Reference on page 4.2.3](#)
- [Common Abbreviations/Acronyms on page 4.2.4](#)

Family Tree

[Figure 4.2.1 on page 4.2.7](#) depicts the family tree for the subject equipment. It is based on the descending order of the reference designation hierarchy and identifies all assemblies that have an assigned Nautel configuration control number.

How to Locate Information About a Specific Part

To locate the information for a specific part, the assigned reference designation for the part must be known. In addition, the Nautel nomenclature (e.g., NAP39B) assigned to the assembly containing the part or the full reference designation, including the reference designation of all higher assemblies, must be known.

When the Nautel Nomenclature is Known:

- Refer to the family tree ([Figure 4.2.1 on page 4.2.7](#)) and identify the block(s) associated with the Nautel nomenclature. Locate the part's reference designation in the identified reference designation list in this section, noting they are sorted alphanumerically.

When the Reference Designation is Known:

- Refer to the family tree depicted in [Figure 4.2.1 on page 4.2.7](#) with the full reference designation.
- Follow the family tree branches to the block that represents the lowest level assembly assigned a Nautel configuration control number. Then locate the part number index table for that Nautel configuration control number.
- Locate the part's reference designation in the specified table.

Reference Designation Lists

Individual reference designation lists are provided for:

- assemblies that are assigned an alpha-prefixed Nautel nomenclature (e.g., NAP39B)
- cable harnesses that are assigned a numbered Nautel part (e.g., 212-8003)
- optional kits that are assigned a numbered Nautel part

To obtain the full reference designation for a specific part the Nautel configuration control number must be located in the family tree ([Figure 4.2.1 on page 4.2.7](#)) to include the reference designation of all higher level assemblies. The reference designation lists, which are titled and presented in alphanumeric order, are divided into columns to aid in locating specific information.

Column Content

The following paragraphs provide an explanation of the purpose and contents of each column in the part number indexes.

Ref Des Column

The 'ref des' column contains the reference designation for a specific part. These designations are assigned in accordance with the requirements of American National Standard Specification ANSI Y32.16.

Description Column

This column contains the name and descriptive information for each part. The key word is presented first, followed by the adjective identifiers. When the description is 'See Family Tree for Assembly Nomenclature', the associated part is subject to its own part index table or is contained in an optional kit's list. Look up the reference designation list title (nomenclature) and the reference designation of the associated part in the family tree ([Figure 4.2.1 on page 4.2.7](#)) to determine where to locate its part information.

Nautel # Column

This column contains the Nautel number assigned to each part. This number is Nautel's drawing number for Nautel manufactured parts, Nautel's configuration control number for assemblies that are under configuration control management, or Nautel's inventory management number for purchased parts. When a Nautel configuration control number (e.g. NAPC*) is referenced in this column, the associated ref des item is subject to its own part index table.

Vendor # Column

This column contains an original equipment manufacturer's part number for a part. A single part number is listed for each part, even though there may be more than one known manufacturer. The listed number is Nautel's usual or preferred choice. The use of this number does not restrict Nautel from selecting and using commercial equivalents during manufacture, where their use will not degrade circuit operation or reliability.

OEM Code Column

This column typically contains a five digit coded group as the original equipment manufacturer's (OEM) identifier. The code was extracted from Cataloging Handbook H4/H8 Commercial and Government Entity (Cage) Code. Manufacturers that were not listed in the catalog when this listing was compiled have been assigned a unique five-letter code. This code is assigned arbitrarily and has no other significance. The manufacturers identified for parts that have JAN or MIL part numbers are Nautel's normal supply source for that part.

NOTE: OEM code 37338 is listed for parts manufactured by Nautel or to a Nautel control drawing. United States of America customers should refer all replacement part orders to Nautel Maine Incorporated (OEM code 57655).

OEM Code to Manufacturers Cross-Reference

The OEM (CAGE) codes listed in the reference designation lists are representative of the original equipment manufacturers of those parts. To determine a specific part's manufacturer contact information, enter the five-character OEM (CAGE) code for that part in the following website:

<https://www.logisticsinformationservice.dla.mil/BINCS/>

After entering the OEM (CAGE) code number, manufacturer pertinent information (address, telephone number, fax number, etc.) will be displayed. Please contact Nautel if a part cannot be obtained (see also "On-Line Part Quotes" in the Warranty section of this manual).

Manufacturers Index

For customers without web access, [Table 4.2.1 on page 4.2.5](#) provides a cross-reference from the original equipment manufacturer's (OEM) codes to the manufacturer's name. The listing is sorted alphanumerically by the OEM code.

Common Abbreviations/Acronyms

The following abbreviations/acronyms may appear in the Description of Part column:

- SMT
Denotes item is designed to be installed using Surface Mount Technology.
- MTA
Denotes item is a Mass Termination Assembly connector.
- SIP
Single In-line Package
- DIP
Dual In-line Package
- IDC
Denotes item is an Insulation Displacement connector for ribbon cable.

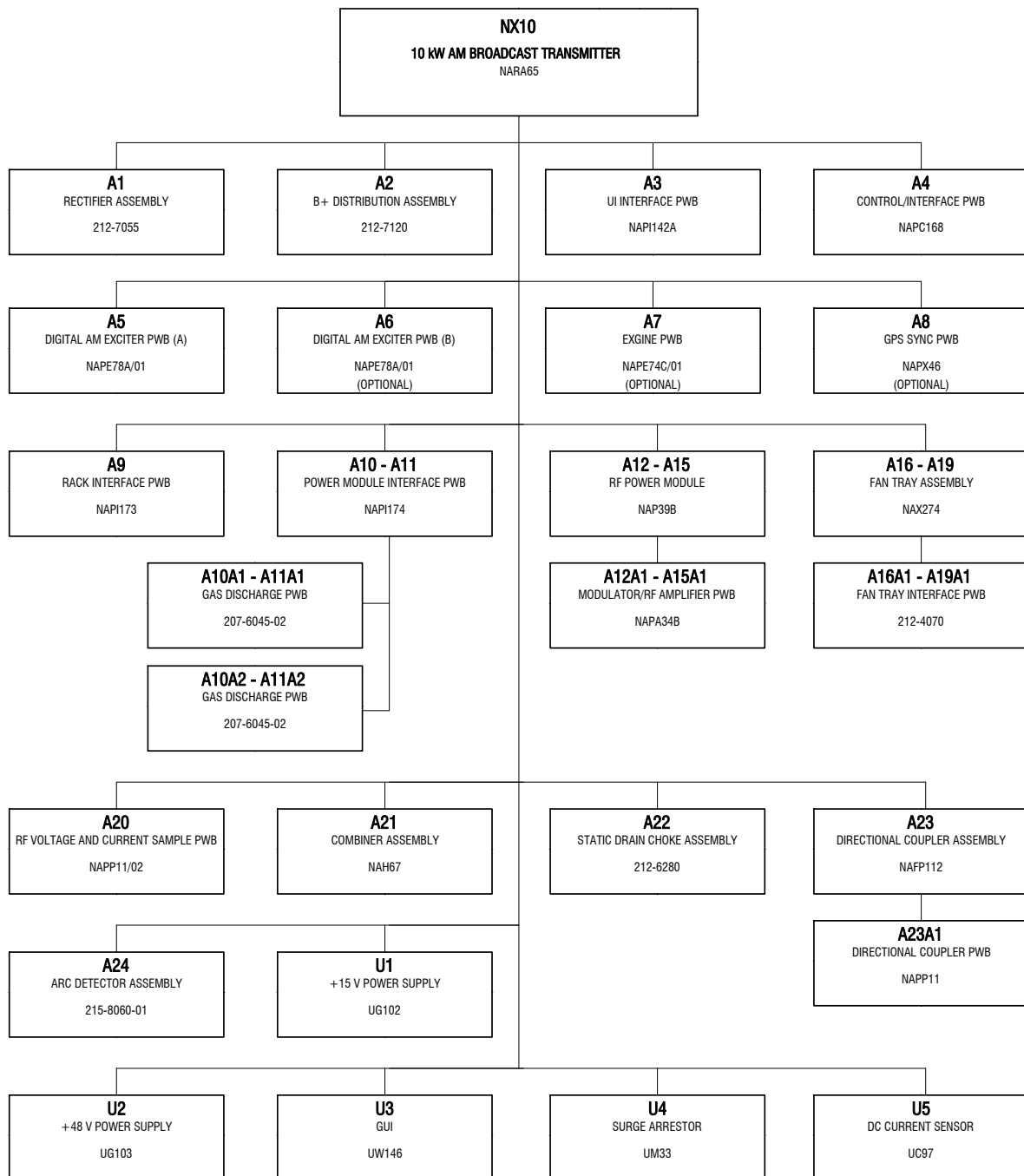
Table 4.2.1: OEM Codes/ Manufacturers

OEM CODE	MANUFACTURER	OEM CODE	MANUFACTURER
00779	CTS Company Incorporated	0DY74	Microsemi Corp-Power Products Grp
01295	Texas Instruments Incorporated	0FMA6	Neutrik USA Inc
01961	Pulse Engineering Inc.	0G343	Huffman Manufacturing Co.
02660	Amphenol Corp., Spectra-Strip/ITD	0GP12	Radiall Inc.
03LB0	Sandisk Corporation	0P2J5	Kingston Technology Company Inc.
04713	Motorola Incorporated	12060	Diodes Inc.
06090	Raychem Corporation	13919	Burr-Brown Corp.
07263	Fairchild Semiconductor Corp	14655	Cornell Dubilier Electronics
07933	Fairchild Semiconductor Corp	15542	Scientific Components Corp.
07EN1	Advanced Monolithic Ceramics	1AA44	Collmer Semiconductor Inc
08779	Signal Transformer Co. Inc.	1E4C5	SEI Electronics Inc.
09482	Amp of Canada Limited	1FN41	Atmel Corporation
09581	3M Canada Incorporated	1JRT7	Epson Electronics American Inc.
0A5K5	IXYS Corporation	1KK13	ITT Industries Incorporated
0AG18	Hirose Electric / USA / Inc.	1MQ07	ZRG Incorporated
0B0A9	Dallas Semiconductor Corporation	1N3T0	Semikron Inc.
0CVK3	Allegro Microsystems Inc.	1W344	United Chemi-Con Mfg Inc.
22421	Thomas and Betts Limited	79942	Intel Corp Sales Office
23598	Ross Engineering Corp.	7D893	Fairchild Semiconductor Corporation
23875	M-Tron Industries Incorporated	80294	Bourns Instrument Incorporated
24355	Analog Devices Incorporated	83330	Dialight Corporation, DBA Dialight
27014	National Semiconductor Corporation	90201	Hammond Mfg. Co. Ltd.
27264	Molex Incorporated	91833	Keystone Electronics Corporation
2D829	Cornell Dubilier Electronics Corp.	91929	Honeywell Incorporated
31433	Kemet Electronics Corporation	95146	Alco Electronic Products Inc.
31781	Edac Incorporated	96095	AVX Ceramics, Div of AVX Corp
33062	Ferronics Incorporated	AMP/TYCO	Tyco Electronics Corporation
35005	Dale Electronics	ANALOG D	Analog Devices
37338	Nautel Limited	ASTEC	Astec Power
3CYG3	Sanyo Denki America Inc.	AVAGO	Avago Technologies
3DX59	Citizen America Corporation	AVX CORP	AVX Corporation
3EH09	Murata Electronics North America Inc	C3057	Conec Elektronische Bauelemente
3USB5	Startech.com USA LLP	C4751	Epcos AG
3WCG0	Ferraz Shawmut Incorporated	C & D	C & D Technologies
45496	Digital Systems	COMET	
48862	GC Electronics	Comp Corp	Components Corporation

Table 4.2.1: OEM Codes/ Manufacturers

OEM CODE	MANUFACTURER	OEM CODE	MANUFACTURER
49588	S B E Incorporated	CORNELL	See 2D829
4G927	Raychem Corporation	CREE INC	Cree Inc.
4TKQ5	UPE Inc.	ER737	Texas Instruments
54473	Matsushita Electric Corp of America	HYPERTR	Hypertronics Corporation
54583	TDK Electronics Corp.	IDT	Integrated Device Technology, Inc.
56289	Sprague Electric Company	ITT INDUS	See 1KK13
56699	BC Components	KEYSTONE	See 91833
56845	Vishay Dale Electronics Inc.	KYCON	Kycon Cable & Connector Inc.
59124	KOA Speer Electronics Inc.	LINEAR	See 64155
59993	International Rectifier Corp.	LITEON	Vishay-Liteon Power Semiconductor
5Y407	Phoenix Contact Inc.	L3845	Circuit-Test Electronics Ltd.
63590	Premier Industrial Corp.	MARKTEC	Marktech Optoelectronics
64155	Linear Technology Corporation	MICRON	Micron Technology, Inc.
65786	Cypress Semiconductor Corp.	MINI-CIRC	Mini-Circuits
71400	Cooper Bussman Inc.	MOLEX	Molex Inc.
71468	ITT Corporation	NATIONAL	See 27014
75042	TRW Incorporated	NXP SEMI	NXP Semiconductors
75915	Littelfuse World Headquarters	ON-SEMI	ON Semiconductor
PANAS	Panasonic	SL575	Meanwell Sales Information
PHOENIX	See 5Y407	TDK	See 54583
SARONIX	Saronix	TEXAS	See ER737
SAW84	IEI Technology Corp.	U3040	ST Microelectronics
SB ELE	SB Electronics Incorporated	VENKEL	Venkel Ltd
SCT30	Fairchild	WANJIA	Wanjia

Figure 4.2.1: NX10 Family Tree



F2120021 V2

207-6045-01**Gas Discharge PWB Assy**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
U01	Gas Discharge Tube, 600V, Fail Short	UM98	SL1024A600RF(RoHS)	75915

212-1036-01**RF Relay Mod, NX5 & NX10**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
P01	MTA, Standard Dust Cover, 4 pin	JU02	640551-4	09482
P01	MTA, Keyed Closed End Housing, 4 pin, 22AWG	JU27	3-644463-4(ROHS) AMP	00779

212-4070**Fan Interface PWB Assy, NX5 & NX10**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
J01	MTA, Keyed Square Post Header Assy, 3 pin	JU60	647123-3	
J02	Not Used	-	NOT USED	37338
J03	MTA, Keyed Square Post Header Assy, 3 pin	JU60	647123-3	

212-7055**Rectifier Assy, NX5 & NX10**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C01	Capacitor, Non-Polarized, 10uf, +/-20%, 35V	CS68	NNR100M35V5X11	NICCOMP
C02	Capacitor, Ceramic, 0.1uF 10%100V	CCG07	CKR06BX104KRV	56289
U01	Rectifier, (BeO), SCR, 3-PH, 400VDC, 55A, Full CTRL	UR110	30655346	1N3T0



212-7120**B+ Distribution Assy, NX10**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C01	Capacitor,Elect.,10,000uf,450Vdc	CT54	3186GN103T450MPA1	14655
C02	Capacitor,Elect.,10,000uf,450Vdc	CT54	3186GN103T450MPA1	14655
C03	Capacitor,Elect.,10,000uf,450Vdc	CT54	3186GN103T450MPA1	14655
C04	Capacitor,Elect.,10,000uf,450Vdc	CT54	3186GN103T450MPA1	14655
F01	Fuse, 70A, 600V, Class J, OpenIndicator	FD24	AJT70	3WCG0
K01	Discharge Relay Mod NX5 & NX10	212-8611	212-8611	37338
R01	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338
R02	Resistor,Cap Discharge,27Komhs5%,13W	RC44	UP10SR-27K-J	4TKQ5
R03	Resistor,Cap Discharge,27Komhs5%,13W	RC44	UP10SR-27K-J	4TKQ5
R04	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338
R05	Resistor, Wirewound, HL, 50 ohms/350W/5% c/w mt fixture	RX53	DQR-F 350W 50 ohms	



REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
P01	Connector, Quick-Dis, F,1/4 Tab 14-16	HAM13	3-350820-2	09482
P02	Connector,Quick-dis,F,1/4Tab,10-12	HAM67	DNF10-250FIB-D	OXJ45
P03	Connector, Quick-Dis, F,1/4 Tab 14-16	HAM13	3-350820-2	09482
P04	Connector,Quick-dis,F,1/4Tab,10-12	HAM67	DNF10-250FIB-D	OXJ45
P05	Connector, Quick-Dis, F,1/4 Tab	HAM05	2-520184-2	09482
P06	Connector, Quick-Dis, M,1/4 Tab	HAM06	2-520103-2	09482
P07	Contact, Pin, 22-30AWG (Crimp)	JQ48	08-56-0110	
P07	Connector, MTA-5051, 4-Pin,Term Housing, Accepts JQ48	JT182	22-01-1042(RoHS)	
P08	Conn, HRS, DF11, 2mm, DualSocket 8, Crimp	JU57	DF11-8DS-2C	0AG18
P08	Conn, Contact for Socket DF11, 22AWG	JU58	DF11-22SC	0AG18
P09	Conn, Contact, Pin, HDP-20Strip	JQ17	66506-4	09482
P09	Conn, Plug, D-Sub, 9 pin	JR28	205204-1	09482
P09	Conn, Shell, D-Sub, 9 pin	JS33	DE115339-20	71468
P09	Conn, Lock Screw, D-Sub, Male	JT16	205980-1	09482
P10	Conn, 16 Pin, Dual Row Crimp	JN61	DF11-16DS-2C(RoHS)	0AG18
P10	Conn, Contact for Socket DF11, 22AWG	JU58	DF11-22SC	0AG18
P11	Conn, Contact, Pin, HDP-20Strip	JQ17	66506-4	09482
P11	Conn, Plug, D-Sub, 9 pin	JR28	205204-1	09482
P11	Conn, Lock Screw, D-Sub, Male	JT16	205980-1	09482
P12	Conn, Contact, Socket, HDP-20Strip	JQ18	66504-4	09482
P12	Conn, Socket, D-Sub, 9 pin	JR27	205203-1	09482
P12	Conn, Lock Screw, D-Sub, Male	JT16	205980-1	09482
P13	Conn, Contact, Pin, HDP-20Strip	JQ17	66506-4	09482
P13	Conn, Plug, D-Sub, 25 pin, HDP-20	JR39	205208-1	09482
P13	Conn, Shell, D-Sub, 25 pin	JS35	DB115339-22	71468
P13	Conn, Lock Screw, D-Sub, Male	JT16	205980-1	09482
P14	Conn, Contact, Socket, HDP-20Strip	JQ18	66504-4	09482
P14	Conn, Socket, D-Sub, HDP-20, 25 pin	JR38	205207-1	09482
P14	Conn, Shell, D-Sub, 25 pin	JS35	DB115339-22	71468
P14	Conn, Lock Screw, D-Sub, Male	JT16	205980-1	09482
P15	Conn, ferrule, 10mm, non insul for 10AWG	JQ88	F82-10-M	
P15	Connector,Plug, 2 pos, Socket,20A, 600V, 7.62mm, 12AWG max	JT149	1804904	
P16	Contact, MTA, SL-156 LID	JQ87	647409-1	
P16	MTA, Housing, SL-156 LID,3-pin, Locking	JU81	647402-3(RoHS)	
P17	Conn, Contact, Pin, HDP-20Strip	JQ17	66506-4	09482
P17	Conn, Plug, D-Sub, 9 pin	JR28	205204-1	09482
P17	Conn, Shell, D-Sub, 9 pin	JS33	DE115339-20	71468
P17	Conn, Lock Screw, D-Sub, Male	JT16	205980-1	09482



212-8004-01 Cableset, NX10, RLS 2

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
P18	Conn, Contact, Pin, HDP-20Strip	JQ17	66506-4	09482
P18	Conn, Plug, D-Sub, 9 pin	JR28	205204-1	09482
P18	Conn, Lock Screw, D-Sub, Male	JT16	205980-1	09482
P19	Connector, MTA-100, 4-Pin, 22 AWG	JT55	640440-4	09482
P19	Cover, Dust, 4-Pin Used with JT55	JT56	640550-4	09482
W01	Cable 2.5ft, D-Sub 15 HD, M/M	UA258	CHD15MM-2.5(RoHS)	43321
W02	Cable, Ethernet, 36", Shld, Black, 28AWG, 80degC, with guard	UA204	PCF-S36I- UA204G(RoHS)	
W03	Cable, Ethernet, 36", Shld, Black, 28AWG, 80degC, with guard	UA204	PCF-S36I- UA204G(RoHS)	
W04	Cable, Ethernet, 40", Shld, Black, 28AWG, 80degC, with guard	UA200	PCF-S40I- UA200G(RoHS)	
W05	Cable, Ethernet, 45", Shld, Black, 28AWG, 80degC, with guard	UA229	PCF-S45I- UA229G(RoHS)	
W06	Cable 10ft, D-Sub 15 HD, M/M	UA272	CHD15MM-10	
W07	Cable, Ethernet, 96", Shld, Black, 28AWG, 80degC, with guard	UA273	PCF-S96I- UA273G(RoHS)	

212-8611 Discharge Relay Mod NX5 & NX10

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
K01	Relay, 12KV, NC, 180V, AUX SW, Ext Range	KC76	E12-NC-12-1T-181- NAU	
P01	Connector, Quick-Dis, M, 1/4 Tab	HAM06	2-520103-2	09482
P02	Connector, Quick-Dis, F, 1/4 Tab	HAM05	2-520184-2	09482

215-8060-01 Arc Detector Assy

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
U01	Board, UV TRON DRVR Pwb, PS 12-24Vdc, Out OC 10ms	UB88	C10423-04(STATIC)	OJXJ4
U01CX	Capacitor, Tantalum, Epoxy, 1uF 10% 35V	CCF06	T351A105K035AT(RoHS) KEMET	56289
U01J1	Header, 4-pin, Square, Pol, 0.1", Rt Angle, PCB mount	JT157	22053041	13150
U02	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338

NAFP112 Directional Coupler Assy, NX10

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
A01	RF Sample PWB Assy - Directional Coupler, NX10	NAPP11	212-6290	37338
C01	Capacitor, Ceramic, 25pF, +/-10%, 5000V	CCG54	HT53T250KA(RoHS)	



NAH67**Combiner Assy, NX10**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
J01	Conn, Coax, BNC, Recept, 50ohm	JDP26	UG1094/U	02660

NAP39B**RF Power Module Assy,NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
A01	Modulator/RF Amplifier PWB Assy, NX Series	NAPA34B	207-1150-02	37338
Q07	Transistor, FET, N Channel, 500V, 0.05ohm fast	QR68	APT50m50JFLL(Static)	
Q08	Transistor, FET, N Channel, 500V, 0.05ohm fast	QR68	APT50m50JFLL(Static)	
Q09	Transistor, FET, N Channel, 500V, 0.05ohm fast	QR68	APT50m50JFLL(Static)	
Q10	Transistor, FET, N Channel, 500V, 0.05ohm fast	QR68	APT50m50JFLL(Static)	
R01	Thermistor,-30/105°C,10Kohms@25°C,Neg,Bvalue 3435K	RX49	EC2F103A2-07U002	

NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C001	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C002	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C003	Not Used	-	NOT USED	37338
C004	Not Used	-	NOT USED	37338
C005	Cap,SMT,Tantalum,10uF,10%,35V,2917	CTFS03	T494D106K035AS	31433
C006	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C007	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C008	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C009	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C010	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C011	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C012	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C013	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C014	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C015	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C016	Cap,SMT,Tantalum,10uF,10%,35V,2917	CTFS03	T494D106K035AS	31433
C017	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C018	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C019	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C020	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C021	Cap,SMT,Tantalum,10uF,10%,35V,2917	CTFS03	T494D106K035AS	31433
C022	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C023	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C024	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C025	Cap,SMT,Tantalum,10uF,10%,35V,2917	CTFS03	T494D106K035AS	31433
C026	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C027	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C028	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C029	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C030	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C031	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C032	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C033	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C034	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433



NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C035	Not Used	-	NOT USED	37338
C036	Not Used	-	NOT USED	37338
C037	Not Used	-	NOT USED	37338
C038	Not Used	-	NOT USED	37338
C039	Not Used	-	NOT USED	37338
C040	Capacitor, Polyprop, 0.15uF, 5%, 600V	CP31	715P15456MA3	49588
C041	Capacitor, Polyprop, 0.15uF, 5%, 600V	CP31	715P15456MA3	49588
C042	Not Used	-	NOT USED	37338
C043	Not Used	-	NOT USED	37338
C044	Cap, SMT, Ceramic, 0.1uF, 10%, 50V, X7R, 0805	CCFS07	C0805C104K5RAC	31433
C045	Not Used	-	NOT USED	37338
C046	Not Used	-	NOT USED	37338
C047	Not Used	-	NOT USED	37338
C048	Not Used	-	NOT USED	37338
C049	Cap, SMT, Ceramic, 0.1uF, 10%, 50V, X7R, 0805	CCFS07	C0805C104K5RAC	31433
C050	Cap, SMT, Ceramic, 1uF, 10%, 100V, X7R, 1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C051	Capacitor, Polyprop, 0.15uF, 5%, 600V	CP31	715P15456MA3	49588
C052	Not Used	-	NOT USED	37338
C053	Not Used	-	NOT USED	37338
C054	Not Used	-	NOT USED	37338
C055	Capacitor, Polyprop, 0.15uF, 5%, 600V	CP31	715P15456MA3	49588
C056	Not Used	-	NOT USED	37338
C057	Cap, SMT, Ceramic, 1uF, 10%, 100V, X7R, 1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C058	Cap, SMT, Ceramic, 0.1uF, 10%, 50V, X7R, 0805	CCFS07	C0805C104K5RAC	31433
C059	Cap, SMT, Ceramic, 0.001uF, 10%, 50V, X7R, 0603	CCFS01	C0603C102K5RAC	31433
C060	Cap, SMT, Ceramic, 0.001uF, 10%, 50V, X7R, 0603	CCFS01	C0603C102K5RAC	31433
C061	Cap, SMT, Ceramic, 0.1uF, 10%, 50V, X7R, 0805	CCFS07	C0805C104K5RAC	31433
C062	Cap, SMT, Ceramic, 0.1uF, 10%, 50V, X7R, 0805	CCFS07	C0805C104K5RAC	31433
C063	Not Used	-	NOT USED	37338
C064	Not Used	-	NOT USED	37338
C065	Cap, SMT, Ceramic, 1uF, 10%, 100V, X7R, 1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C066	Cap, SMT, Ceramic, 0.1uF, 10%, 50V, X7R, 0805	CCFS07	C0805C104K5RAC	31433
C067	Cap, SMT, Ceramic, 1uF, 10%, 100V, X7R, 1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C068	Cap, SMT, Ceramic, 0.1uF, 10%, 50V, X7R, 0805	CCFS07	C0805C104K5RAC	31433
C069	Cap, SMT, Ceramic, 0.1uF, 10%, 50V, X7R, 0805	CCFS07	C0805C104K5RAC	31433
C070	Cap, SMT, Ceramic, 1uF, 10%, 100V, X7R, 1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP



NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C071	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C072	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C073	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C074	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C075	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C076	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C077	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C078	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C079	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C080	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C081	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C082	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C083	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C084	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C085	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C086	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C087	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C088	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C089	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C090	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C091	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C092	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C093	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C094	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C095	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C096	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C097	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C098	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C099	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C100	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C101	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C102	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C103	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP



NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C104	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C105	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C106	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C107	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C108	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C109	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C110	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C111	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C112	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C113	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C114	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C115	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C116	Capacitor, SMT, 0.054u, NPO,5%, J-lead, 4x2225, 1000V	CT88	HMC49JN543J102TH02	SCM35
C117	Capacitor, SMT, 0.054u, NPO,5%, J-lead, 4x2225, 1000V	CT88	HMC49JN543J102TH02	SCM35
C118	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C119	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C120	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C121	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C122	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C123	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C124	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C125	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C126	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C127	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C128	Not Used	-	NOT USED	37338
C129	Capacitor, SMT, Al Electrolytic 330uF, 25VDC, ESR 0.8ohm	CT57	AVS337M25G24T	2D829
C130	Not Used	-	NOT USED	37338
C131	Not Used	-	NOT USED	37338



NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C132	Not Used	-	NOT USED	37338
C133	Capacitor, SMT, 0.47u, 630V,X7R, 20%, j-lead, MLCC	CT58	CKG57NX7R2J474M(RoHS)	
C134	Capacitor, SMT, 0.47u, 630V,X7R, 20%, j-lead, MLCC	CT58	CKG57NX7R2J474M(RoHS)	
C135	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C136	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(ROHS)	AVX CORP
C137	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C138	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(ROHS)	AVX CORP
C139	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C140	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C141	Not Used	-	NOT USED	37338
C142	Not Used	-	NOT USED	37338
C143	Not Used	-	NOT USED	37338
C144	Cap,SMT,Tantalum,10uF,10%,35V,2917	CTFS03	T494D106K035AS	31433
C145	Cap,SMT,Tantalum,10uF,10%,35V,2917	CTFS03	T494D106K035AS	31433
C146	Cap,SMT,Tantalum,10uF,10%,35V,2917	CTFS03	T494D106K035AS	31433
C147	Cap,SMT,Tantalum,10uF,10%,35V,2917	CTFS03	T494D106K035AS	31433
CR01	Not Used	-	NOT USED	37338
CR02	Not Used	-	NOT USED	37338
CR03	Not Used	-	NOT USED	37338
CR04	Not Used	-	NOT USED	37338
CR05	Not Used	-	NOT USED	37338
CR06	Not Used	-	NOT USED	37338
CR07	Not Used	-	NOT USED	37338
CR08	Not Used	-	NOT USED	37338
CR09	Diode, SMT, Ultra Fast, 1200V,15A, D2PAK	QM64	STTH1512G(STATIC)(RoHS) ST Microelectronics	4QN91
CR10	Not Used	-	NOT USED	37338
CR11	Diode,SMT,Zener,5.1V,5%,3W,SMB	QDZS01	1SMB5918BT3	04713
CR12	Diode,SMT,Zener,5.1V,5%,3W,SMB	QDZS01	1SMB5918BT3	04713
CR13	Diode,SMT,Fast Switching,80V,0.5A SOD-323	QM55	1N4448HWS-7-F(STATIC)(ROHS)	12060
CR14	Diode,SMT,Fast Switching,80V,0.5A SOD-323	QM55	1N4448HWS-7-F(STATIC)(ROHS)	12060
CR15	Diode,SMT,Zener,5.1V,5%,3W,SMB	QDZS01	1SMB5918BT3	04713
CR16	Diode,SMT,Fast Switching,80V,0.5A SOD-323	QM55	1N4448HWS-7-F(STATIC)(ROHS)	12060
CR17	Diode,SMT,Zener,5.1V,5%,3W,SMB	QDZS01	1SMB5918BT3	04713
CR18	Diode,SMT,Fast Switching,80V,0.5A SOD-323	QM55	1N4448HWS-7-F(STATIC)(ROHS)	12060



NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
CR19	Diode,Schottky,600V,10A,SIC	QK50	CSD10060A(STATIC)	CREE INC
CR20	Diode,Schottky,600V,10A,SIC	QK50	CSD10060A(STATIC)	CREE INC
CR21	Diode,Schottky,600V,10A,SIC	QK50	CSD10060A(STATIC)	CREE INC
CR22	Not Used	-	NOT USED	37338
CR23	Not Used	-	NOT USED	37338
CR24	Not Used	-	NOT USED	37338
CR25	Not Used	-	NOT USED	37338
CR26	Not Used	-	NOT USED	37338
CR27	Diode,SMT,Fast Switching,80V,0.5A SOD-323	QM55	1N4448HWS-7-F(STATIC)(ROHS)	12060
CR28	Diode,SMT,Fast Switching,80V,0.5A SOD-323	QM55	1N4448HWS-7-F(STATIC)(ROHS)	12060
CR29	Diode,SMT,Ultrafast,200V,1A,SMB	QM47	MURS120T3	04713
CR30	Not Used	-	NOT USED	37338
CR31	Not Used	-	NOT USED	37338
CR32	Not Used	-	NOT USED	37338
CR33	Not Used	-	NOT USED	37338
CR34	Not Used	-	NOT USED	37338
CR35	Not Used	-	NOT USED	37338
CR36	Not Used	-	NOT USED	37338
CR37	Not Used	-	NOT USED	37338
CR38	Diode, SMT Ultrafast, 600V, 1ASMA	QM71	MURA160T3G(RoHS)	04713
CR39	Diode, SMT Ultrafast, 600V, 1ASMA	QM71	MURA160T3G(RoHS)	04713
CR40	Diode, SMT Ultrafast, 600V, 1ASMA	QM71	MURA160T3G(RoHS)	04713
DS01	Diode,SMT,LED,Bicolor,Red/Green,1210	QDLS04	597-7701-507(STATIC)	83330
F01	Fuse,SMT,Fuse Block,3A VeryFast Acting,Installed	FA46	154 003(ROHS)	75915
J01	Conn, Modular Jack, RJ45, Shld, Side, PWB, 50u	JM44	556591-1	09482
J02	Conn, Header,Square Post,Gold,Dual,40-pin	JF47	4-102973-0	09482
L01	Choke,SMT,Common Mode,2200 ohm,200mA,1206	LS22	DLW31SN222SQ2L(R OHS)	3EH09
L02	Choke,SMT,Common Mode,2200 ohm,200mA,1206	LS22	DLW31SN222SQ2L(R OHS)	3EH09
L03	Choke,SMT,Common Mode,2200 ohm,200mA,1206	LS22	DLW31SN222SQ2L(R OHS)	3EH09
L04	Choke,SMT,Common Mode,2200 ohm,200mA,1206	LS22	DLW31SN222SQ2L(R OHS)	3EH09
L05	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L06	Inductor,SMT,Pwr,Shielded DrumCore,P1167series, 2A, 10.0uH	LS16	P1167.103	01961
L07	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L08	Choke,SMT,Common Mode,2200 ohm,200mA,1206	LS22	DLW31SN222SQ2L(R OHS)	3EH09



NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
L09	Choke,SMT,Common Mode,2200 ohm,200mA,1206	LS22	DLW31SN222SQ2L(R OHS)	3EH09
L10	Inductor Assy,	207-1053-03	207-1053-03	37338
L11	Inductor Assy,	207-1053-03	207-1053-03	37338
L12	Inductor Assy	207-1053-01	207-1053-01	37338
L13	Inductor Assy	207-1053-01	207-1053-01	37338
L14	Inductor Assy	207-1053-01	207-1053-01	37338
L15	Bead, Ferrite, 3.5mm, B Mtl	LXP20	21-030-B	33062
Q01	Transistor,SMT,MOSFET,N-Channel,100V,1.5A,SOT-223	QS25	IRLL110PbF(STATIC)(ROHS)	59993
Q02	Transistor,SMT,MOSFET,N-Channel,100V,1.5A,SOT-223	QS25	IRLL110PbF(STATIC)(ROHS)	59993
Q03	Transistor,SMT,MOSFET,N-Channel,100V,1.5A,SOT-223	QS25	IRLL110PbF(STATIC)(ROHS)	59993
Q04	Transistor,SMT,MOSFET,N-Channel,100V,1.5A,SOT-223	QS25	IRLL110PbF(STATIC)(ROHS)	59993
Q05	Transistor,SMT,MOSFET,N-Channel,100V,1.5A,SOT-223	QS25	IRLL110PbF(STATIC)(ROHS)	59993
Q06	Transistor,SMT,MOSFET,N-Channel,100V,1.5A,SOT-223	QS25	IRLL110PbF(STATIC)(ROHS)	59993
Q07	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338
Q08	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338
Q09	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338
Q10	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338
Q11	Transistor, FET, N, 500V, 30A,0.165 Ohm	QR75	IXFH30N50P(STATIC)	
Q12	Transistor, FET, N, 500V, 30A,0.165 Ohm	QR75	IXFH30N50P(STATIC)	
Q13	Transistor, FET, N, 500V, 30A,0.165 Ohm	QR75	IXFH30N50P(STATIC)	
R001	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R002	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R003	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R004	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R005	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R006	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R007	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R008	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R009	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R010	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R011	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R012	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R013	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R014	Resistor, SMT, MF, 221 Ohms,1% 1/4W	RAD17	RK73H2BL2210F	59124

NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R015	Resistor, SMT, MF, 221 Ohms,1% 1/4W	RAD17	RK73H2BL2210F	59124
R016	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R017	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R018	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R019	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R020	Resistor,SMT,MF,33.2Kohms,1%,1/10W,0603	RFFS56	RK73H1JLTD3322F	59124
R021	Resistor,SMT,MF,33.2Kohms,1%,1/10W,0603	RFFS56	RK73H1JLTD3322F	59124
R022	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R023	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R024	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R025	Resistor,SMT,MF,33.2Kohms,1%,1/10W,0603	RFFS56	RK73H1JLTD3322F	59124
R026	Resistor, SMT, 0 Ohms, 1%, 1W2512	RAD85Z	CR2512-1W-000T-SP(RoHS)	
R027	Not Used	-	NOT USED	37338
R028	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R029	Not Used	-	NOT USED	37338
R030	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R031	Not Used	-	NOT USED	37338
R032	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R033	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R034	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R035	Resistor, SMT, 0 Ohms, 1%, 1W2512	RAD85Z	CR2512-1W-000T-SP(RoHS)	
R036	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R037	Not Used	-	NOT USED	37338
R038	Not Used	-	NOT USED	37338
R039	Resistor,SMT,MF,10ohms,1%,2W	RAD49Z	CR2512-2W-10R0F-SP	VENKEL
R040	Resistor,SMT,MF,20ohms,1%,2W	RAD50Z	CR2512-2W-20R0F-SP	VENKEL
R041	Resistor,SMT,MF,20ohms,1%,2W	RAD50Z	CR2512-2W-20R0F-SP	VENKEL
R042	Resistor,SMT,MF,20ohms,1%,2W	RAD50Z	CR2512-2W-20R0F-SP	VENKEL
R043	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R044	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R045	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R046	Resistor, SMT, MF, 121 Ohms,1% 1/4W	RAD14	RK73H2BL1210F	59124
R047	Resistor, SMT, MF, 121 Ohms,1% 1/4W	RAD14	RK73H2BL1210F	59124
R048	Resistor,SMT,MF,3320ohms,1%,1/10W,0603	RFFS44	RK73H1JLTD3321F	59124
R049	Resistor,SMT,MF,3320ohms,1%,1/10W,0603	RFFS44	RK73H1JLTD3321F	59124
R050	Resistor,SMT,MF,3320ohms,1%,1/10W,0603	RFFS44	RK73H1JLTD3321F	59124

NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R051	Resistor, SMT, MF, 1.0M Ohms,1% 1/4W	RAE13	RK73H2BL1004F	59124
R052	Resistor, SMT, MF, 1.0M Ohms,1% 1/4W	RAE13	RK73H2BL1004F	59124
R053	Resistor, SMT, MF, 1.0M Ohms,1% 1/4W	RAE13	RK73H2BL1004F	59124
R054	Resistor,SMT,MF,100Kohms,1%,1/10W,0603	RFFS62	RK73H1JLTD1003F	59124
R055	Resistor,SMT,MF,20ohms,1%,2W	RAD50Z	CR2512-2W-20R0F-SP	VENKEL
R056	Resistor,SMT,MF,20ohms,1%,2W	RAD50Z	CR2512-2W-20R0F-SP	VENKEL
R057	Resistor, SMT, MF, 1.0M Ohms,1% 1/4W	RAE13	RK73H2BL1004F	59124
R058	Resistor, SMT, MF, 1.0M Ohms,1% 1/4W	RAE13	RK73H2BL1004F	59124
R059	Resistor, SMT, MF, 1.0M Ohms,1% 1/4W	RAE13	RK73H2BL1004F	59124
R060	Resistor,SMT,MF,3320ohms,1%,1/10W,0603	RFFS44	RK73H1JLTD3321F	59124
R061	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R062	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R063	Resistor, SMT, MF, 1.0M Ohms,1% 1/4W	RAE13	RK73H2BL1004F	59124
R064	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R065	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R066	Resistor,SMT,MF,28.7 KOhms,1%,1/10W,0603	RFFS83	RK73H1JT2872F	59124
R067	Resistor, SMT, MF, 1.0M Ohms,1% 1/4W	RAE13	RK73H2BL1004F	59124
R068	Resistor, SMT, MF, 1.0M Ohms,1% 1/4W	RAE13	RK73H2BL1004F	59124
R069	Resistor,SMT,MF,28.7 KOhms,1%,1/10W,0603	RFFS83	RK73H1JT2872F	59124
R070	Resistor,SMT,MF,20ohms,1%,2W	RAD50Z	CR2512-2W-20R0F-SP	VENKEL
R071	Resistor,SMT,MF,20ohms,1%,2W	RAD50Z	CR2512-2W-20R0F-SP	VENKEL
R072	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R073	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R074	Resistor,SMT,MF,100Kohms,1%,1/10W,0603	RFFS62	RK73H1JLTD1003F	59124
R075	Resistor,SMT,MF,100Kohms,1%,1/10W,0603	RFFS62	RK73H1JLTD1003F	59124
R076	Resistor, SMT, MF, 121 Ohms,1% 1/4W	RAD14	RK73H2BL1210F	59124
R077	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R078	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R079	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R080	Not Used	-	NOT USED	37338
R081	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R082	Resistor,SMT,MF,8250ohms,1%,1/10W,0603	RFFS49	RK73H1JLTD8251F	59124
R083	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R084	Resistor,SMT,MF,1500ohms,1%,1/10W,0603	RFFS40	RK73H1JLTD1501F	59124
R085	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R086	Resistor,SMT,MF,3320ohms,1%,1/10W,0603	RFFS44	RK73H1JLTD3321F	59124
R087	Resistor,SMT,MF,1500ohms,1%,1/10W,0603	RFFS40	RK73H1JLTD1501F	59124

NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R088	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R089	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R090	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R091	Resistor, SMT, MF, 270 Ohms,1%, 1W 2512	RAD79	ERJ-1TYF271U(RoHS)	
R092	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R093	Resistor,SMT,MF,27.4Kohms,1%,1/10W,0603	RFFS55	RK73H1JLTD2742F	59124
R094	Resistor, SMT, MF, 121 Ohms,1% 1/4W	RAD14	RK73H2BL1210F	59124
R095	Not Used	-	NOT USED	37338
R096	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R097	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R098	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R099	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R100	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R101	Resistor, SMT, MF, 2210 Ohms,1% 1/4W	RAD29	RK73H2BL2211F	59124
R102	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R103	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R104	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R105	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R106	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R107	Resistor,SMT,MF,20ohms,1%,2W	RAD50Z	CR2512-2W-20R0F-SP	VENKEL
R108	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R109	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R110	Resistor, SMT, Power, 5 ohms,1%, 5W	RAD81	HPC 12 5.0 1% R(RoHS)	1E4C5
R111	Resistor, SMT, Power, 5 ohms,1%, 5W	RAD81	HPC 12 5.0 1% R(RoHS)	1E4C5
R112	Resistor,SMT,MF,10ohms,1%,2W	RAD49Z	CR2512-2W-10R0F-SP	VENKEL
R113	Resistor, SMT, Power, 5 ohms,1%, 5W	RAD81	HPC 12 5.0 1% R(RoHS)	1E4C5
R114	Resistor, SMT, Power, 5 ohms,1%, 5W	RAD81	HPC 12 5.0 1% R(RoHS)	1E4C5
R115	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R116	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R117	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R118	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R119	Not Used	-	NOT USED	37338
R120	Not Used	-	NOT USED	37338
R121	Not Used	-	NOT USED	37338
R122	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124

NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R123	Resistor, SMT, 0 Ohms, 1%, 1W2512	RAD85Z	CR2512-1W-000T-SP(RoHS)	
R124	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R125	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R126	Resistor,SMT,MF,10ohms,1%,2W	RAD49Z	CR2512-2W-10R0F-SP	VENKEL
R127	Not Used	-	NOT USED	37338
R128	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R129	Not Used	-	NOT USED	37338
R130	Not Used	-	NOT USED	37338
R131	Not Used	-	NOT USED	37338
R132	Not Used	-	NOT USED	37338
R133	Not Used	-	NOT USED	37338
R134	Not Used	-	NOT USED	37338
T01	Toroid, Ferrite, Uncoated,22.1mmOD	LA39	B64290-A719-X49	C4751
T02	Toroid, Ferrite, Uncoated,22.1mmOD	LA39	B64290-A719-X49	C4751
T03	Toroid, Ferrite, Uncoated,22.1mmOD	LA39	B64290-A719-X49	C4751
T04	Toroid, Ferrite, Uncoated,22.1mmOD	LA39	B64290-A719-X49	C4751
U01	IC,SMT,Quad RS-422 Receiver,16-SOIC	UT91	DS26C32ATM(STATIC)	NATIONAL
U02	IC, SMT, Quad FET Driver, 2A, Non-inverting	UT137	EL7457CLZ(RoSH)	
U03	IC, MOSFET, Gate Driver, 9A,20Vpk IN	UD93	ZXGD3002E6(STATIC)(RoHS)	
U04	IC, MOSFET, Gate Driver, 9A,20Vpk IN	UD93	ZXGD3002E6(STATIC)(RoHS)	
U05	IC, MOSFET, Gate Driver, 9A,20Vpk IN	UD93	ZXGD3002E6(STATIC)(RoHS)	
U06	Not Used	-	NOT USED	37338
U07	Not Used	-	NOT USED	37338
U08	Not Used	-	NOT USED	37338
U09	Not Used	-	NOT USED	37338
U10	Not Used	-	NOT USED	37338
U11	Not Used	-	NOT USED	37338
U12	Not Used	-	NOT USED	37338
U13	Not Used	-	NOT USED	37338
U14	Not Used	-	NOT USED	37338
U15	Not Used	-	NOT USED	37338
U16	Not Used	-	NOT USED	37338
U17	Current Sensor, Hall, 50A,AC/DC, Bi Direc	UP103	ACS756KCA-050B-PFF-T(Static)(RoHS)	
U18	IC, SMT, High Speed Comparator, SOIC-8	UT70	TL3016ID(STATIC)	01295
U19	Not Used	-	NOT USED	37338



NAPA34B**Modulator/RF Amplifier PWB Assy, NX Series**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
U20	IC,SMT,RS-485 Transceiver,Sgl,SOIC-8	UDTS03	DS36C278TM(STATIC)	27014
U21	IC,SMT,Opamp,Quad,Rail-To-Rail,SOIC-14	ULAS02	TLV2374ID(STATIC)	01295
U22	IC,SMT,Micro, ADC,PWM,TQFP-32,16k Flash	UX95	ATMEGA 168-20AI(STATIC)	1FN41
U23	IC, SMT, FET Driver, 14A, Non-inverting, TO-263	UT136	IXDD614YI(STATIC)(RoHS)	0A5K5
U24	IC, SMT, FET Driver, 14A, Non-inverting, TO-263	UT136	IXDD614YI(STATIC)(RoHS)	0A5K5
U25	IC,SMT,Single,2 InputExclusive OR,SOT23-5L	UD64	74V1G86STR(STATIC) (RoHS)	SCE76
U26	IC, SMT, FET Driver, 14A, Non-inverting, TO-263	UT136	IXDD614YI(STATIC)(RoHS)	0A5K5
U27	IC,SMT,Quad RS-422 Receiver,16-SOIC	UT91	DS26C32ATM(STATIC)	NATIONAL
U28	IC,SMT,Voltage Regulator,5V,1A, D2PAK	UT93	L7805ABD2T-TR(STATIC)(RoHS)	ST MICRO
U29	IC, SMT, FET Driver, 14A, Non-inverting, TO-263	UT136	IXDD614YI(STATIC)(RoHS)	0A5K5
U30	IC, SMT, Delay Line, 5 Taps,20-100nS, SOIC8 (150mil)	UD81	DS1100Z-100+(Static)(RoHS) Dallas	0B0A9
U31	IC, SMT, 2-Input Logic, UHSUniv Config SC70-6	UD82	NC7SZ57P6X(Static)(RoHS)	07933
U32	IC, SMT, 2-Input Logic, UHSUniv Config SC70-6	UD82	NC7SZ57P6X(Static)(RoHS)	07933
Y01	Crystal, SMT, Fund, 11.0592MHz	XFPS11	HCM49-11.0592MABJ-UT(RoHS)	3DX59



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
BT1	Battery, Lithium, 3V,20mm Coin Cell	BBLT01	CR2032	PANAS
C001	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C002	Cap,SMT,Ceramic,220pF,2%,50V,C0G,0603	CCFS34	C0603C221G5GAC	31433
C003	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C004	Cap,SMT,Ceramic,220pF,2%,50V,C0G,0603	CCFS34	C0603C221G5GAC	31433
C005	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C006	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C007	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C008	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C009	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C010	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C011	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C012	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C013	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C014	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C015	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C016	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C017	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C018	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C019	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C020	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C021	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C022	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C023	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C024	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C025	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C026	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C027	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C028	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C029	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C030	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C031	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C032	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C033	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C034	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C035	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C036	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C037	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C038	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433

NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C039	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C040	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C041	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C042	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C043	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C044	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C045	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C046	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C047	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C048	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C049	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C050	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C051	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C052	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C053	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C054	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C055	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C056	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C057	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C058	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C059	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C060	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C061	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C062	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C063	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C064	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C065	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C066	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C067	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C068	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C069	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C070	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C071	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C072	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C073	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C074	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C075	Cap, SMT, Ceramic,47uF,20%,6.3V, 1210	CCFS53	C3225X5R0J476M(Ro HS)	56289
C076	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C077	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C078	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C079	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C080	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C081	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C082	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C083	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C084	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C085	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C086	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C087	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C088	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C089	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C090	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C091	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C092	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C093	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C094	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C095	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C096	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C097	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C098	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C099	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C100	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C101	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C102	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C103	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C104	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C105	Cap, SMT, Ceramic,47uF,20%,6.3V, 1210	CCFS53	C3225X5R0J476M(Ro HS)	56289
C106	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C107	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C108	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C109	Capacitor, SMT, Ceramic, 25V,47uF, 20%	CT90	CKG57NX5R1E476M(RoHS)	
C110	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C111	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C112	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C113	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C114	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C115	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C116	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C117	Cap,SMT,Ceramic,0.0022uF,10%,50V,X7R,0603	CCFS02	C0603C222K5RAC	31433
C118	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C119	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C120	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C121	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C122	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C123	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C124	Cap,SMT,Ceramic,4.7uF,10%,10V,X5R, 1206	CX38	C1206C475K8PACTU	
C125	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C126	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C127	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C128	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C129	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C130	Capacitor, SMT, Ceramic, 25V,47uF, 20%	CT90	CKG57NX5R1E476M(RoHS)	
C131	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C132	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C133	Capacitor, SMT, Ceramic, 25V,47uF, 20%	CT90	CKG57NX5R1E476M(RoHS)	
C134	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C135	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C136	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C137	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C138	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C139	Cap,SMT,Ceramic,100pF,2%,50V,C0G,0603	CCFS32	C0603C101G5GAC	31433
C140	Cap, SMT, Ceramic, 1uF, 10%,16V, X5R, 0603	CCFS73	C0603C105K4PAC(RoHS)	31433
C141	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C142	Cap, SMT, Ceramic,47uF,20%,6.3V, 1210	CCFS53	C3225X5R0J476M(RoHS)	56289
C143	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C144	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C145	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C146	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C147	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C148	Capacitor, SMT, Ceramic, 50V,22uF, 20%	CT91	CKG57NX5R1H226M(RoHS)	
C149	Cap,SMT,Ceramic,5.6±0.5pF,50V,C0G,0603	CCFS18	C0603C569D5GAC	31433
C150	Cap, SMT, Ceramic, 1uF, 10%,16V, X5R, 0603	CCFS73	C0603C105K4PAC(RoHS)	31433
C151	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C152	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C153	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C154	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C155	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C156	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C157	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C158	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C159	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C160	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C161	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C162	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C163	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C164	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C165	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C166	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C167	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C168	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C169	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C170	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C171	Cap,SMT,Ceramic,0.001uF,10%,50V,X7R,0603	CCFS01	C0603C102K5RAC	31433
C172	Cap,SMT,Ceramic,0.0047uF,10%,50V,X7R,0603	CCFS03	C0603C472K5RAC	31433
C173	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C174	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C175	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C176	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C177	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C178	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C179	Cap, SMT, Ceramic,47uF,20%,6.3V, 1210	CCFS53	C3225X5R0J476M(Ro HS)	56289
C180	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C181	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C182	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C183	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C184	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C185	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C186	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C187	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C188	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C189	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C190	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C191	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C192	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C193	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C194	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C195	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C196	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C197	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C198	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C199	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C200	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C201	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C202	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C203	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C204	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C205	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C206	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C207	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C208	Cap,SMT,Ceramic,3900pF,2%,50V,C0G,1206	CCFS47	C1206C392G5GAC	31433
C209	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C210	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C211	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C212	Cap,SMT,Ceramic,150pF,1%,50V,C0G,0603	CCFS33	06035A151FAT2A	56289
C213	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C214	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C215	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C216	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C217	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C218	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C219	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C220	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C221	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C222	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C223	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C224	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C225	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C226	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C227	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C228	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C229	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C230	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C231	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C232	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C233	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C234	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C235	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C236	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C237	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C238	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C239	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C240	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C241	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C242	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C243	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C244	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C245	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C246	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C247	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C248	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C249	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C250	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C251	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C252	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C253	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C254	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C255	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C256	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C257	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C258	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C259	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C260	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C261	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C262	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C263	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C264	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C265	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C266	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C267	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C268	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C269	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C270	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C271	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C272	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C273	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C274	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C275	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C276	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C277	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C278	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C279	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C280	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C281	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C282	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C283	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C284	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C285	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C286	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C287	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C288	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C289	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C290	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C291	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C292	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C293	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C294	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C295	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C296	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C297	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C298	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C299	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C300	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C301	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C302	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
CR01	Diode,SMT,Transient Suppr,10V,SMB	QM48	1SMB10CAT3	04713
CR02	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR03	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR04	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR05	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
CR06	Diode,SMT,Transient Suppr,10V,SMB	QM48	1SMB10CAT3	04713
CR07	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR08	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR09	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR10	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR11	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR12	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR13	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR14	Diode,SMT,Schottky,30V,0.2A,SOD-323	QDSS01	BAT54HT1(STATIC)	04713
CR15	Diode,SMT,Schottky,30V,0.2A,SOD-323	QDSS01	BAT54HT1(STATIC)	04713
CR16	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR17	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR18	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR19	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR20	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA- TR1(RoHS)	71400
CR21	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR22	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA- TR1(RoHS)	71400
CR23	Diode, SMT, Shottky, 70V, 15mA, SOD-123	QK53	1N5711W-7- F(STATIC)(RoHS)	12060
CR24	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA- TR1(RoHS)	71400
CR25	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR26	Diode, SMT, Shottky, 70V, 15mA, SOD-123	QK53	1N5711W-7- F(STATIC)(RoHS)	12060
CR27	Diode, SMT, Shottky, 70V, 15mA, SOD-123	QK53	1N5711W-7- F(STATIC)(RoHS)	12060
CR28	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA- TR1(RoHS)	71400
CR29	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR30	Diode, SMT, Shottky, 70V, 15mA, SOD-123	QK53	1N5711W-7- F(STATIC)(RoHS)	12060
CR31	Diode, SMT, Shottky, 70V, 15mA, SOD-123	QK53	1N5711W-7- F(STATIC)(RoHS)	12060
CR32	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA- TR1(RoHS)	71400
CR33	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA- TR1(RoHS)	71400
CR34	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR35	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA- TR1(RoHS)	71400
CR36	Diode,SMT,Switching,250V,0.2A,SOD-323	QDRS01	BAS21HT1(STATIC)	04713
CR37	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA- TR1(RoHS)	71400

NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
CR38	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR39	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR40	Diode, SMT, Schottky, 40V, 1A, SMA	QDDS02	STPS140A(RoHS)	
CR41	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR42	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR43	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR44	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR45	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR46	Diode,SMT,Schottky,30V,0.2A,SOD-323	QDSS01	BAT54HT1(STATIC)	04713
DS1	Diode, SMT, LED, Amber,(592nm), 0603	QDLS07	598-8040-107F(STATIC)(RoHS)	83330
DS2	Diode, SMT, LED, Green,(560nm), 0603	QDLS01	597-5312-402F(STATIC)(RoHS)	83330
E1	Conn, Post Shunt, 2 Pos, .10 Centreline	JQ15	390088-2	09482
J01	Conn, Dual, BNC, PWB, Rt Angle	JT100	364A2595	9T253
J02	Conn, Socket, D-Sub, 9 pin, PWB Mt	JQ34	K22-E9S-NJ	KYCON
J03	Conn, Socket, 1xMag RJ45 + 2xUSB-A	JM49	08C2-1X1T-03(RoHS)	
J04	Conn, Modular Jack, RJ45, Shld, Side, PWB, 50u	JM44	556591-1	09482
J05	Conn, Socket, D-Sub, 25 pin, PWB Mt	JS13	K22-B25S-NJ	22421
J06	Connector,Dual,D-Sub,M/F,25-pin,Rt Agl,PWB	JT78	663-025-264-036(RoHS)	EDAC
J07	Conn,3-pin,PWB Mount, Fem, XLR	JT87	NC3FAH-2	NEUTRIK A
J08	Conn,3-pin,PWB Mount, Fem, XLR	JT87	NC3FAH-2	NEUTRIK A
J09	Conn,3-pin,PWB Mount, Fem, XLR	JT87	NC3FAH-2	NEUTRIK A
J10	Conn, Socket, D-Sub, 25 pin, PWB Mt	JS13	K22-B25S-NJ	22421
J11	Conn, Plug, D-Sub, 25 pin, PWB Mt	JS12	K22X-B25P-NJ	63590
J12	Connector, Modular, 2x2, RJ45,Jack	JT179	5569260-1(RoHS)	
J13	Conn, Socket, D-Sub, 25 pin, PWB Mt	JS13	K22-B25S-NJ	22421
J14	Conn, Plug, D-Sub, 25 pin, PWB Mt	JS12	K22X-B25P-NJ	63590
J15	Conn, Header, Ribbon Cbl, 10-Pin	JQ54	103308-1	00779
J16	Conn, Modular Jack, RJ45, Shld, Side, PWB, 50u	JM44	556591-1	09482
J17	Conn, Dual, D-Sub, F/M, 9 pin, Rt. Angle, PWB	JT121	178-009-313R571(RoHS)	1L3S8
J18	Conn, Socket, D-Sub, HD15pin,90deg, PWB	JS129	ICD15S13E6GV00LF(RoHS) FCI	
J19	Conn, Dual, D-Sub, F/M, 9 pin, Rt. Angle, PWB	JT121	178-009-313R571(RoHS)	1L3S8
J20	Conn, Socket, D-Sub, HD15pin,90deg, PWB	JS129	ICD15S13E6GV00LF(RoHS) FCI	

NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
J21	Conn, Modular Jack, RJ45, Shld, Side, PWB, 50u	JM44	556591-1	09482
J22	Conn, Header,Square Post,Gold,Dual,40-pin	JF47	4-102973-0	09482
J23	Conn, Header,Square Post,Gold,Dual,40-pin	JF47	4-102973-0	09482
J24	Conn, Header, SIP,12 Pin Breakaway,.10 Ctr	JQ16	1-103185-2	09482
J25	Not Used	-	NOT USED	37338
J26	Conn, Header,Square Post,Gold,Dual,40-pin	JF47	4-102973-0	09482
L01	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L02	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L03	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L04	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L05	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L06	Inductor, SMT, Shielded, 33uH, 3.3A RMS	LS45	DR125-330-R(RoHS)	005K5
L07	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L08	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L09	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L10	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L11	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L12	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L13	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L14	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L15	Inductor, SMT, 10uH, 2.4A, RMS	LS24	DRQ74-100-R(RoHS)	005K5
L16	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L17	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L18	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L19	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L20	Inductor, SMT, 3.3uH, 5.6A,RMS	LS56	SRN8040-3R3Y(RoHS)	
L21	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L22	Inductor, SMT, Shielded, 33uH, 3.3A RMS	LS45	DR125-330-R(RoHS)	005K5
L23	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L24	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L25	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L26	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L27	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L28	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
L29	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L30	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L31	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L32	Inductor, Choke, 2.5 Turns, JMTl	LA16	82-152-J	33062
L33	Inductor, Choke, 2.5 Turns, JMTl	LA16	82-152-J	33062
R001	Resistor,SMT,MF,681ohms,1%,1/10W,0603	RFFS36	RK73H1JLTD6810F	59124
R002	Resistor,SMT,MF,681ohms,1%,1/10W,0603	RFFS36	RK73H1JLTD6810F	59124
R003	Resistor,SMT,MF,562ohms,1%,1/10W,0603	RFFS35	RK73H1JLTD5620F	59124
R004	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R005	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	RFFS42	RK73H1JLTD2211F	59124
R006	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R007	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R008	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R009	Resistor,SMT,MF,681ohms,1%,1/10W,0603	RFFS36	RK73H1JLTD6810F	59124
R010	Resistor,SMT,MF,562ohms,1%,1/10W,0603	RFFS35	RK73H1JLTD5620F	59124
R011	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R012	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	RFFS42	RK73H1JLTD2211F	59124
R013	Resistor,SMT,MF,121ohms,1%,1/10W,0603	RFFS27	RK73H1JLTD1210F	59124
R014	Resistor,SMT,MF,82.5ohms,1%,1/10W,0603	RFFS25	RK73H1JLTD82R5F	59124
R015	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R016	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R017	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R018	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R019	Resistor,SMT,MF,681ohms,1%,1/10W,0603	RFFS36	RK73H1JLTD6810F	59124
R020	Resistor, SMT, MF, 221 Ohms,1% 1/4W	RAD17	RK73H2BL2210F	59124
R021	Resistor, SMT, MF, 221 Ohms,1% 1/4W	RAD17	RK73H2BL2210F	59124
R022	Resistor,SMT,MF,681ohms,1%,1/10W,0603	RFFS36	RK73H1JLTD6810F	59124
R023	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R024	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R025	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R026	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R027	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R028	Resistor,SMT,MF,681ohms,1%,1/10W,0603	RFFS36	RK73H1JLTD6810F	59124
R029	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R030	Resistor,SMT,MF,825ohms,1%,1/10W,0603	RFFS37	RK73H1JLTD8250F	59124
R031	Resistor,SMT,MF,121ohms,1%,1/10W,0603	RFFS27	RK73H1JLTD1210F	59124
R032	Resistor,SMT,MF,1210ohms,1%,1/10W,0603	RFFS39	RK73H1JLTD1211F	59124
R033	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R034	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R035	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R036	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R037	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R038	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R039	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R040	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R041	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R042	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R043	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R044	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R045	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R046	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R047	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R048	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R049	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R050	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R051	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R052	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R053	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R054	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R055	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R056	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R057	Resistor,SMT,MF,1210ohms,1%,1/10W,0603	RFFS27	RK73H1JLTD1210F	59124
R058	Resistor,SMT,MF,1210ohms,1%,1/10W,0603	RFFS39	RK73H1JLTD1211F	59124
R059	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R060	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R061	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R062	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R063	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R064	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R065	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R066	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R067	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R068	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R069	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R070	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R071	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R072	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R073	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R074	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R075	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R076	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R077	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R078	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R079	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R080	Resistor,SMT,MF,12.1Kohms,1%,1/10W,0603	RFFS51	RK73H1JLTD1212F	59124
R081	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R082	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R083	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R084	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R085	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R086	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R087	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R088	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R089	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R090	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R091	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R092	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R093	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R094	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R095	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R096	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R097	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R098	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R099	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R100	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R101	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R102	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R103	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R104	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R105	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R106	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R107	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R108	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R109	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R110	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R111	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R112	Not Used	-	NOT USED	37338
R113	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R114	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R115	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R116	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R117	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R118	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R119	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R120	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R121	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R122	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R123	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R124	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R125	Resistor,SMT,MF,1.00Mohms,1%,1/10W,0603	RFFS74	RK73H1JLTD1004F	59124
R126	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R127	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R128	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R129	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R130	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R131	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R132	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R133	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R134	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R135	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R136	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R137	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R138	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R139	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R140	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R141	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R142	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R143	Resistor,SMT,MF,27.4Kohms,1%,1/10W,0603	RFFS55	RK73H1JLTD2742F	59124
R144	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R145	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R146	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R147	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R148	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R149	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R150	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R151	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R152	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R153	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R154	Resistor,SMT,MF,12.1ohms,1%,1/10W,0603	RFFS15	RK73H1JLTD12R1F	59124
R155	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R156	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R157	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R158	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R159	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R160	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R161	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R162	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R163	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R164	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R165	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R166	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R167	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R168	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R169	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R170	Resistor,SMT,49.9 Ohms, 1%	RT20	RK73H2ET49R9F	59124
R171	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R172	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R173	Resistor,SMT,49.9 Ohms, 1%	RT20	RK73H2ET49R9F	59124
R174	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R175	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R176	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R177	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R178	Resistor,SMT,MF,825ohms,1%,1/10W,0603	RFFS37	RK73H1JLTD8250F	59124
R179	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R180	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R181	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R182	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R183	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R184	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R185	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R186	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R187	Resistor,SMT,49.9 Ohms, 1%	RT20	RK73H2ET49R9F	59124
R188	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R189	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R190	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R191	Resistor,SMT,49.9 Ohms, 1%	RT20	RK73H2ET49R9F	59124
R192	Resistor,2512 SMT,100 ohms,1%,1W,	RAD52	ERJ-1TYF101U	PANAS
R193	Resistor,SMT,49.9 Ohms, 1%	RT20	RK73H2ET49R9F	59124
R194	Resistor, SMT, MF, 4750 Ohms,1%, 1/4W	RAD33	RK73H2BL4751F	59124
R195	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R196	Resistor,2512 SMT,100 ohms,1%,1W,	RAD52	ERJ-1TYF101U	PANAS
R197	Resistor,SMT,49.9 Ohms, 1%	RT20	RK73H2ET49R9F	59124
R198	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R199	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R200	Resistor,SMT,49.9 Ohms, 1%	RT20	RK73H2ET49R9F	59124
R201	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	RFFS42	RK73H1JLTD2211F	59124
R202	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R203	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R204	Resistor,SMT,MF,56.2Kohms,1%,1/10W,0603	RFFS59	RK73H1JLTD5622F	59124
R205	Resistor,SMT,49.9 Ohms, 1%	RT20	RK73H2ET49R9F	59124
R206	Resistor,SMT,MF,15.0Kohms,1%,1/10W,0603	RFFS52	RK73H1JLTD1502F	59124
R207	Resistor,SMT,MF,15.0Kohms,1%,1/10W,0603	RFFS52	RK73H1JLTD1502F	59124
R208	Resistor,SMT,MF,27.4ohms,1%,1/10W,0603	RFFS19	RK73H1JLTD27R4F	59124
R209	Resistor,SMT,MF,27.4ohms,1%,1/10W,0603	RFFS19	RK73H1JLTD27R4F	59124
R210	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R211	Resistor,SMT,MF,182Kohms,1%,1/10W,0603	RFFS65	RK73H1JLTD1823F	59124
R212	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R213	Resistor,SMT,MF,825ohms,1%,1/10W,0603	RFFS37	RK73H1JLTD8250F	59124
R214	Resistor,SMT,MF,15.0Kohms,1%,1/10W,0603	RFFS52	RK73H1JLTD1502F	59124
R215	Resistor,SMT,MF,22.1Kohms,1%,1/10W,0603	RFFS54	RK73H1JLTD2212F	59124
R216	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R217	Resistor,SMT,MF,15.0Kohms,1%,1/10W,0603	RFFS52	RK73H1JLTD1502F	59124
R218	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R219	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R220	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R221	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R222	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R223	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R224	Resistor,SMT,MF,1500ohms,1%,1/10W,0603	RFFS40	RK73H1JLTD1501F	59124
R225	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R226	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R227	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R228	Resistor,SMT,MF,15.0Kohms,1%,1/10W,0603	RFFS52	RK73H1JLTD1502F	59124



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R229	Resistor,SMT,MF,15.0Kohms,1%,1/10W,0603	RFFS52	RK73H1JLTD1502F	59124
R230	Resistor,SMT,MF,15.0Kohms,1%,1/10W,0603	RFFS52	RK73H1JLTD1502F	59124
R231	Resistor,SMT,MF,15.0Kohms,1%,1/10W,0603	RFFS52	RK73H1JLTD1502F	59124
R232	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R233	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R234	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R235	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R236	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R237	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R238	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R239	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R240	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R241	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R242	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R243	Not Used	-	NOT USED	37338
R244	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R245	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R246	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R247	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R248	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R249	Resistor,SMT,MF,22.1Kohms,1%,1/10W,0603	RFFS54	RK73H1JLTD2212F	59124
R250	Resistor,SMT,MF,1210ohms,1%,1/10W,0603	RFFS39	RK73H1JLTD1211F	59124
R251	Resistor,SMT,MF,121Kohms,1%,1/10W,0603	RFFS63	RK73H1JLTD1213F	59124
R252	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R253	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R254	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R255	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R256	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R257	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R258	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R259	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R260	Resistor, SMT, MF, 121K Ohms,1% 1/4W	RAE02	RK73H2BL1213F	59124
R261	Resistor, SMT, MF, 121K Ohms,1% 1/4W	RAE02	RK73H2BL1213F	59124
R262	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R263	Resistor,SMT,MF,47.5ohms,1%,1/10W,0603	RFFS22	RK73H1JLTD47R5F	59124
R264	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R265	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R266	Not Used	-	NOT USED	37338
R267	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R268	Resistor, SMT, MF, 121K Ohms,1% 1/4W	RAE02	RK73H2BL1213F	59124
R269	Resistor, SMT, MF, 121K Ohms,1% 1/4W	RAE02	RK73H2BL1213F	59124
R270	Resistor,SMT,49.9 Ohms, 1%	RT20	RK73H2ET49R9F	59124
R271	Resistor,SMT,MF,274ohms,1%,1/10W,0603	RFFS31	RK73H1JLTD2740F	59124
R272	Resistor,SMT,MF,3320ohms,1%,1/10W,0603	RFFS44	RK73H1JLTD3321F	59124
R273	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R274	Resistor,SMT,MF,10ohms,1%,2W	RAD49Z	CR2512-2W-10R0F-SP	VENKEL
R275	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R276	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R277	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R278	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R279	Resistor,SMT,MF,6810ohms,1%,1/10W,0603	RFFS48	RK73H1JLTD6811F	59124
R280	Resistor,SMT,MF,3320ohms,1%,1/10W,0603	RFFS44	RK73H1JLTD3321F	59124
R281	Resistor,SMT,MF,20ohms,1%,2W	RAD50Z	CR2512-2W-20R0F-SP	VENKEL
R282	Resistor,SMT,MF,68.1Kohms,1%,1/10W,0603	RFFS60	RK73H1JLTD6812F	59124
R283	Resistor,SMT,MF,20ohms,1%,2W	RAD50Z	CR2512-2W-20R0F-SP	VENKEL
R284	Resistor,SMT,150 Ohms,,1%,2W	RAD55Z	CR2512-2W-1500F-SP	3EQW4
R285	Resistor, SMT, 590 Ohms, 1%, 1W, 2512	RAD69	ERJ-1TNF5900U	
R286	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R287	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R288	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R289	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R290	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R291	Not Used	-	NOT USED	37338
R292	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R293	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R294	Resistor,SMT,MF,6.49K,1%,1/10W,0603	RAE31	RK73H1JT6491F	59124
R295	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R296	Resistor,SMT,MF,121Kohms,1%,1/10W,0603	RFFS63	RK73H1JLTD1213F	59124
R297	Resistor,SMT,MF,27.4ohms,1%,1/10W,0603	RFFS19	RK73H1JLTD27R4F	59124
R298	Resistor,SMT,MF,27.4ohms,1%,1/10W,0603	RFFS19	RK73H1JLTD27R4F	59124
R299	Resistor,SMT,MF,39.2ohms,1%,1/10W,0603	RFFS21	RK73H1JLTD39R2F	59124
R300	Resistor,SMT,MF,27.4ohms,1%,1/10W,0603	RFFS19	RK73H1JLTD27R4F	59124
R301	Resistor,SMT,MF,39.2ohms,1%,1/10W,0603	RFFS21	RK73H1JLTD39R2F	59124
R302	Resistor,SMT,MF,27.4ohms,1%,1/10W,0603	RFFS19	RK73H1JLTD27R4F	59124
R303	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R304	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R305	Resistor, SMT, MF, 1000 Ohms,1%, 1/4W	RAD25	RK73H2BL1001F	59124
R306	Resistor, SMT, MF, 1000 Ohms,1%, 1/4W	RAD25	RK73H2BL1001F	59124
R307	Resistor, SMT, 590 Ohms, 1%, 1W, 2512	RAD69	ERJ-1TNF5900U	
R308	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R309	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R310	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R311	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R312	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R313	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R314	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R315	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R316	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R317	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R318	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R319	Resistor,SMT,MF,182Kohms,1%,1/10W,0603	RFFS65	RK73H1JLTD1823F	59124
R320	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R321	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R322	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R323	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
RT01	Thermistor, PTC, SMT, 2920,500mA Hold	RX64	2920L050(RoHS)	75915
RT02	Thermistor, PTC, SMT, 29202A Hold, 24V	RX66	2920L200/24(RoHS)	
RT03	Thermistor, PTC, SMT, 29202A Hold, 24V	RX66	2920L200/24(RoHS)	
RT04	Thermistor, PTC, SMT, 2920,500mA Hold	RX64	2920L050(RoHS)	75915
RT05	Thermistor, PTC, SMT, 2920,500mA Hold	RX64	2920L050(RoHS)	75915
RT06	Thermistor, PTC, SMT, 2920,500mA Hold	RX64	2920L050(RoHS)	75915
RT07	Thermistor, PTC, SMT, 2920,500mA Hold	RX64	2920L050(RoHS)	75915
RT08	Thermister, PTC, SMT, 2920,750mA Hold, 60V	RX65	2920L075/60(RoHS)	75915
RT09	Thermistor, PTC, SMT, 29202A Hold, 24V	RX66	2920L200/24(RoHS)	
RT10	Thermistor, PTC, SMT, 2920,500mA Hold	RX64	2920L050(RoHS)	75915
T01	Transmformer RF, 4:1, 0.03 to75 MHz, Gull Wing	TE22	T16-6T-KK81+(RoHS)	15542
T02	Transformer,SMT,50 ohms,0.03to 125MHz	TZ88	ADT1-6T+(ROHS)	MINI-CIRC
T03	Transformer,SMT,50 ohms,0.03to 125MHz	TZ88	ADT1-6T+(ROHS)	MINI-CIRC
T04	Transformer, Gate Drive, HighFreq	TZ74	P0584	01961
T05	Transmformer RF, 4:1, 0.03 to75 MHz, Gull Wing	TE22	T16-6T-KK81+(RoHS)	15542
T06	Transformer, Gate Drive, HighFreq	TZ74	P0584	01961
TP01	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP02	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
TP06	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP07	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP09	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP11	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP12	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP13	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP14	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP15	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP16	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP20	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP21	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP22	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP23	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP24	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP33	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP38	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP39	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP41	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
TP42	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP43	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP44	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP46	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP47	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
U01	IC,SMT,Op Amp,Audio,Dual,SO-8	UP93	OP275GS(STATIC)	45496
U02	IC,SMT,Quad LVDS Rxcrv,3.3V,SOIC-16	UX76	DS90LV048ATM(STAT IC)	27014
U03	IC,SMT,RS-485 Transceiver,Sgl,SOIC-8	UDTS03	DS36C278TM(STATIC)	27014
U04	IC, SMT, Full Duplex RS485RxDx, SOIC-8	UDTS07	SN65HVD31D(STATIC (RoHS)	01295
U05	IC, SMT, CMOS, Quad And Gate, SOIC-14	US30	74VHCT08AM(STATIC)	07263
U06	IC,SMT,SPI UART,3.3V	UW91	SC16IS740IPW(STATI C)(ROHS)	NXP
U07	IC, SMT, High Speed Comparator, SOIC-8	UT70	TL3016ID(STATIC)	01295
U08	IC,SMT,Quad 2 TO 1 DATA Sel/Mux 3 States Output,3.3V	UW90	74LVC257APW(STATI C)(ROHS) NXP SEMICONDUCTOR	NXP SEMI
U09	IC, SMT, Quad 422, Diff LineReceiver, 16 SOIC, 3.3V IN	UT149	DS26LV32ATM/NOPB(STATIC)(RoHS)	
U10	IC,SMT,Dual Optocoupler,SOIC-8	UDOS01	MOCD223-M(STATIC)	7D893
U11	IC,SMT,Micro,256K Flash,5V,TQFP-100	UX100	ATmega2560- 16AUR(STATIC)(ROH S) ATMEL	1FN41
U12	IC, SMT, real Time Clock, 12C, SOIC-8	UD89	ISL12022IBZ(STATIC)(RoHS)	
U13	IC,SMT,Dual Optocoupler,SOIC-8	UDOS01	MOCD223-M(STATIC)	7D893
U14	IC, CMOS, EEPROM, 128kx8,1.7V-5V, 8 SOIC	UW172	AT25M01-SSHM- T(STATIC)(RoHS)	
U15	IC,SMT,Opamp,Quad,Single Supply,SOIC-14	ULAS01	MC33074AD(STATIC)	04713
U16	IC,SMT,DAC,8-Bit,4-ch,SPI,SOIC-14	UMDS01	TLV5620ID(STATIC)	64155
U17	IC, SMT, CMOS, Octal Latch,SOIC-20	UDLS02	SN74AHC573DW(STA TIC)	01295
U18	IC, SMT, SRAM 128kx8, SOIC-32	UDMS18	CY62128ELL- 45SXI(STATIC)(RoHS) Cypress	
U19	IC, SMT, Backup Battery Supervisor, 10-MSOP	UP117	TPS3613- 01DGS(STATIC)(RoH S) Texas	01295



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
U20	IC, SMT, Power Shift Register,SOIC-16	US23	STPIC6C595MTR(STA TIC)(RoHS)	01295
U21	IC,SMT,2.5V Reference,0.1%,SOT-23-6	UX83	LT1790BIS6- 2.5(STATIC)	64155
U22	IC,SMT,Digital Pot,Quad,20K,TSSOP-24	UX87	AD5263BRU20(STATI C)	45496
U23	IC, SMT, Inverter, UHS, Dual,UnBFR, 6p SC70 1.2mm wide	UD80	NC7WZU04P6X(RoHS)	SCT30
U24	IC,SMT,Opamp,Quad,Single Supply,SOIC-14	ULAS01	MC33074AD(STATIC)	04713
U25	IC,SMT,DAC,8-Bit,4-ch,SPI,SOIC-14	UMDS01	TLV5620ID(STATIC)	64155
U26	IC,SMT,Quad RS-422 DIFF LineDriver	UD66	DS26C31T/DS26C31M (STATIC)	NATIONAL
U27	IC,SMT,Ultrafast Single Supply Comparator,TSSOP	UT83	AD8561ARUZ(STATIC)	45496
U28	IC, SMT, CPLD, 1.8V, 128 Macrocell, 1.5-3.3V IO, VQFP-100	UX170	XC2C128- 7VQG100C(STATIC)(R oHS)	
U29	IC, SMT, Power Shift Register,SOIC-16	US23	STPIC6C595MTR(STA TIC)(RoHS)	01295
U30	IC,SMT,Quad RS-422 DIFF LineDriver	UD66	DS26C31T/DS26C31M (STATIC)	NATIONAL
U31	IC,SMT,Dual Optocoupler,SOIC-8	UDOS01	MOCD223-M(STATIC)	7D893
U32	IC,SMT,Dual Optocoupler,SOIC-8	UDOS01	MOCD223-M(STATIC)	7D893
U33	IC,SMT,CMOS,Quad Tri-State Buffer, SOIC-14	UDLS06	MC74HC125AD(STATI C)	04713
U34	IC, SMT, CMOS, Quad And Gate, SOIC-14	US30	74VHCT08AM(STATIC)	07263
U35	IC,SMT,Dual Optocoupler,SOIC-8	UDOS01	MOCD223-M(STATIC)	7D893
U36	IC,SMT,Quad RS-422 DIFF LineDriver	UD66	DS26C31T/DS26C31M (STATIC)	NATIONAL
U37	IC,SMT,CMOS,8-Bit Shft Reg,Par I/P, SOIC-16	UDLS04	MC74HC165AD(STATI C)	04713
U38	IC,SMT,RS-485 Transceiver,Sgl,SOIC-8	UDTS03	DS36C278TM(STATIC)	27014
U39	IC,SMT,Dual Optocoupler,SOIC-8	UDOS01	MOCD223-M(STATIC)	7D893
U40	IC, SMT, High Speed Comparator, SOIC-8	UT70	TL3016ID(STATIC)	01295
U41	IC,SMT,Quad RS-422 DIFF LineDriver	UD66	DS26C31T/DS26C31M (STATIC)	NATIONAL
U42	IC, SMT, Quad 422, Diff LineReceiver, 16 SOIC, 3.3V IN	UT149	DS26LV32ATM/NOPB(STATIC)(RoHS)	
U43	IC,SMT,Dual Optocoupler,SOIC-8	UDOS01	MOCD223-M(STATIC)	7D893
U44	IC, Voltage Regulator, 1.5A,ADJ, Low Drop	UT110	LP38500TS- ADJ(STATIC)	27014 National
U45	IC. SMT, NAND Flash 4Gb, x8,1b ECC, TSOP-48	UDMS11	S34ML04G100TFI00(S TSTIC)(RoHS) SPANSION INC	08RJ3
U46	IC, SMT, DC-DC Converter,Boost/Inverting MSOP8	UP105	LT3580IMS8E#PBF(R oHS)(STATIC)	64155



NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
U47	IC, SMT, 4-port USB Hub, LQFP-32	UX123	TUSB2046BVF(STATI C)(RoHS) Texas Instruments	01295
U48	IC,SMT,RS-232 Transceiver,3.3V,SO-16	UDTS05	ADM3202ARN(STATIC)	45496
U49	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U50	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U51	IC, SMT, Voltage Regulator,-5V, DPAK	UP70	MC79M05BDT(STATIC)	ON SEMI
U52	Res, SMT Network, 0402x8, 4.7K, 5%	UW110	EXB- 2HV472JV(RoHS)	
U53	IC, SMT, High Speed Comparator, SOIC-8	UT70	TL3016ID(STATIC)	01295
U54	IC, SMT, Quad USB Power Controller, SOIC-16	UP108	TPS2044BD(STATIC)(RoHS) Texas Instruments	01295
U55	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U56	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U57	IC, SMT, 2-Input Logic, UHSUniv Config SC70-6	UD82	NC7SZ57P6X(Static)(RoHS)	07933
U58	IC, SMT, USB-OTG Transceiver,QFN-24	UDTS06	STOTG04ESQTR(STA TIC)(RoHS)	U3040
U59	Res, SMT Network, 0402x8, 4.7K, 5%	UW110	EXB- 2HV472JV(RoHS)	
U60	IC, SMT, ARM Processor, 266MHz TFBGA296	UT115	LPC3240FET296(STA TIC)(RoHS)	
U61	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U62	IC,SMT,Opamp,Quad,Rail-To-Rail,SOIC-14	ULAS02	TLV2374ID(STATIC)	01295
U63	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U64	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U65	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U66	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U67	IC,SMT,Ethernet Phy,3.3V,LQFP48	UX93	KSZ8721BL(STATIC)	60496
U68	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U69	Res, SMT Network, 0402x8, 4.7K, 5%	UW110	EXB- 2HV472JV(RoHS)	
U70	Res, SMT Network, 0402x8, 4.7K, 5%	UW110	EXB- 2HV472JV(RoHS)	
U71	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U72	IC,SMT,Quad RS-422 Receiver,16-SOIC	UT91	DS26C32ATM(STATIC)	NATIONAL
U73	IC,SMT,Quad 2 TO 1 DATA Sel/Mux 3 States Output,3.3V	UW90	74LVC257APW(STATI C)(ROHS) NXP SEMICONDUCTOR	NXP SEMI
U74	IC, SMT, SPI Flash, 16Mbit,SOIC8W	UW109	M25P16- VMW6G(STATIC)(RoH S)	
U75	IC, Voltage Regulator, 1.5A,ADJ, Low Drop	UT110	LP38500TS- ADJ(STATIC) National	27014

NAPC168A**Control/Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
U76	IC, SMT, 5A Buck Converter,8-SO, w/ pwr pad	UX162	TPS54527DDAR(STAT IC)(RoHS) TexasInstruments	
U77	IC,SMT,RS-232, Isolated Transceiver, 5V	UDTS08	ADM3251EARWZ(STA TIC)(RoHS) Analog Devices	
U78	IC,Variable Gain Amp,SMT,90MHz,SOIC-8	UT79	AD603AR(STATIC)	45496
U79	IC,SMT,Quad 2 TO 1 DATA Sel/Mux 3 States Output,3.3V	UW90	74LVC257APW(STATI C)(ROHS) NXP SEMICONDUCTOR	NXP SEMI
U80	IC, SMT, CMOS, Switch, SPDT ,Latch-up proof, 40V, MSOP-8	UDMS17	ADG5419BRMZ(STATI C)(RoHS)	45496
U81	IC,SMT,Quad RS-422 DIFF LineDriver	UD66	DS26C31T/DS26C31M (STATIC)	NATIONAL
U82	IC,SMT,Amp,35MHz,CurrentFeedback 1.1A,TO263-7	UT90	LT1210CR(STATIC)	64155
U83	IC,SMT,OP-AMP,Dual,CurrentFeedback,SO-8	UD71	OPA2691ID(STATIC)	TEXAS
U84	IC,SMT,OP-AMP,Dual,CurrentFeedback,SO-8	UD71	OPA2691ID(STATIC)	TEXAS
U85	IC, SMT, SDRAM, 16Mx16, 3.3V,TSOP-54	US13	MT48LC16M16A2TG- 6A(STATIC)	
U86	IC, SMT, SDRAM, 16Mx16, 3.3V,TSOP-54	US13	MT48LC16M16A2TG- 6A(STATIC)	
U87	Load switch, Adjustable current limit, IC, SMT, 8-SOIC	UW181	FPF2700MX(STATIC)(RoHS)	
U88	IC, SMT, Level Translator, 16-bit, 5V/3.3V, 48-TSSOP	UW182	SN74ALVC164245DG GR(STATIC)(RoHS)	
U89	IC,SMT,LDO,Voltage Regulator,+1.8V,SO-8	UW82	TPS76618D(STATIC)(ROHS)	TEXAS
XBT1	Holder, 20mm Coin Cell, PWB Mt	BBHT01	1065	91833
XE1	Conn, Header, SIP,12 Pin Breakaway, .10 Ctr	JQ16	1-103185-2	09482
Y1	Crystal, SMT, Fund, 11.0592MHz	XFPS11	HCM49-11.0592MABJ- UT(RoHS)	3DX59
Y2	Crystal,SMT,Fund,ParRes,32.768kHz, 20ppm, 12.5pF, - 40-85C	XFPS10	ABS07-32.768KHZ- T(STATIC)(RoHS) Abracon Corp	
Y3	Crystal, SMT, Fund, 12MHz	XFPS07	ABLS-12.000MHZ-B2- T(RoHS)	
Y4	Oscillator,SMT,25MHz,3.3V	UT100	S1613B- 25.0000(STATIC)(ROH S)	SARONIX
Y5	Crystal,SMT,Fund,ParRes,32.768kHz, 20ppm, 12.5pF, - 40-85C	XFPS10	ABS07-32.768KHZ- T(STATIC)(RoHS) Abracon Corp	



NAPE78A/01**Digital AM Exciter PWB Assy**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C001	Cap,SMT,Ceramic,22pF,2%,50V,C0G,0603	CCFS24	C0603C220G5GAC	31433
C002	Cap,SMT,Ceramic,100pF,2%,50V,C0G,0603	CCFS32	C0603C101G5GAC	31433
C003	Cap,SMT,Ceramic,100pF,2%,50V,C0G,0603	CCFS32	C0603C101G5GAC	31433
C004	Cap,SMT,Ceramic,22pF,2%,50V,C0G,0603	CCFS24	C0603C220G5GAC	31433
C005	Not Used	-	NOT USED	37338
C006	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C007	Cap,SMT,Ceramic,0.001uF,10%,50V,X7R,0603	CCFS01	C0603C102K5RAC	31433
C008	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C009	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C010	Not Used	-	NOT USED	37338
C011	Not Used	-	NOT USED	37338
C012	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C013	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C014	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C015	Cap,SMT,Ceramic,4700pF,2%,50V,C0G,1206	CCFS48	C1206C472G5GAC	31433
C016	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C017	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C018	Cap,SMT,Ceramic,100pF,2%,50V,C0G,0603	CCFS32	C0603C101G5GAC	31433
C019	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C020	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C021	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C022	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C023	Not Used	-	NOT USED	37338
C024	Not Used	-	NOT USED	37338
C025	Not Used	-	NOT USED	37338
C026	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C027	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C028	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C029	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C030	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C031	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C032	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C033	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C034	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C035	Cap, SMT, Ceramic,47uF,20%,6.3V, 1210	CCFS53	C3225X5R0J476M(Ro HS)	56289
C036	Cap, SMT, Ceramic,47uF,20%,6.3V, 1210	CCFS53	C3225X5R0J476M(Ro HS)	56289
C037	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C038	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433



NAPE78A/01 Digital AM Exciter PWB Assy

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C039	Cap, SMT, Ceramic, 47uF, 20%, 6.3V, 1210	CCFS53	C3225X5R0J476M(Ro HS)	56289
C040	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C041	Cap, SMT, Ceramic, 0.01uF, 10%, 50V, X7R, 0603	CCFS04	C0603C103K5RAC	31433
C042	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C043	Cap, SMT, Ceramic, 0.01uF, 10%, 50V, X7R, 0603	CCFS04	C0603C103K5RAC	31433
C044	Cap, SMT, Ceramic, 0.01uF, 10%, 50V, X7R, 0603	CCFS04	C0603C103K5RAC	31433
C045	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C046	Cap, SMT, Ceramic, 0.0047uF, 10%, 50V, X7R, 0603	CCFS03	C0603C472K5RAC	31433
C047	Not Used	-	NOT USED	37338
C048	Cap, SMT, Ceramic, 0.047uF, 10%, 50V, X7R, 0603	CCFS06	C0603C473K5RAC	31433
C049	Cap, SMT, Ceramic, 220pF, 2%, 50V, C0G, 0603	CCFS34	C0603C221G5GAC	31433
C050	Cap, SMT, Ceramic, 0.0047uF, 10%, 50V, X7R, 0603	CCFS03	C0603C472K5RAC	31433
C051	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C052	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C053	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C054	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C055	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C056	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C057	Cap, SMT, Ceramic, 100pF, 2%, 50V, C0G, 0603	CCFS32	C0603C101G5GAC	31433
C058	Cap, SMT, Ceramic, 100pF, 2%, 50V, C0G, 0603	CCFS32	C0603C101G5GAC	31433
C059	Cap, SMT, Ceramic, 1000pF, 2%, 50V, C0G, 0805	CCFS42	C0805C102G5GAC	31433
C060	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C061	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C062	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C063	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C064	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C065	Cap, SMT, Ceramic, 1000pF, 2%, 50V, C0G, 0805	CCFS42	C0805C102G5GAC	31433
C066	Cap, SMT, Ceramic, 1000pF, 2%, 50V, C0G, 0805	CCFS42	C0805C102G5GAC	31433
C067	Cap, SMT, Ceramic, 1000pF, 2%, 50V, C0G, 0805	CCFS42	C0805C102G5GAC	31433
C068	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C069	Cap, SMT, Ceramic, 18pF, 2%, 50V, C0G, 0603	CCFS23	C0603C180G5GAC	31433
C070	Cap, SMT, Ceramic, 1uF, 10%, 25V, X7R, 1206	CCFS10	C1206C105K3RAC	31433
C071	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C072	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C073	Cap, SMT, Ceramic, 1000pF, 2%, 50V, C0G, 0805	CCFS42	C0805C102G5GAC	31433
C074	Cap, SMT, Ceramic, 1uF, 10%, 25V, X7R, 1206	CCFS10	C1206C105K3RAC	31433
C075	Cap, SMT, Ceramic, 100pF, 2%, 50V, C0G, 0603	CCFS32	C0603C101G5GAC	31433
C076	Cap, SMT, Ceramic, 100pF, 2%, 50V, C0G, 0603	CCFS32	C0603C101G5GAC	31433
C077	Cap, SMT, Ceramic, 18pF, 2%, 50V, C0G, 0603	CCFS23	C0603C180G5GAC	31433



NAPE78A/01**Digital AM Exciter PWB Assy**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C078	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C079	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C080	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C081	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C082	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C083	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C084	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C085	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C086	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C087	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C088	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C089	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C090	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C091	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C092	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C093	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C094	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C095	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C096	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C097	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C098	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C099	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C100	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C101	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C102	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C103	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C104	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C105	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C106	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C107	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C108	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C109	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C110	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C111	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C112	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C113	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C114	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C115	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C116	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433



NAPE78A/01**Digital AM Exciter PWB Assy**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C117	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C118	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C119	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C120	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C121	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C122	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C123	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C124	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C125	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C126	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C127	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C128	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C129	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C130	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C131	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C132	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C133	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C134	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C135	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C136	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C137	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C138	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C139	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C140	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C141	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C142	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C143	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C144	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C145	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C146	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C147	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C148	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C149	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C150	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C151	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C152	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C153	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C154	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C155	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433



NAPE78A/01**Digital AM Exciter PWB Assy**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C156	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C157	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C158	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C159	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C160	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C161	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C162	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C163	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C164	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C165	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C166	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C167	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C168	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C169	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C170	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C171	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C172	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C173	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C174	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C175	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C176	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C177	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C178	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C179	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C180	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C181	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C182	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C183	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C184	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C185	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C186	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C187	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C188	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C189	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C190	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C191	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C192	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C193	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C194	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583



NAPE78A/01 Digital AM Exciter PWB Assy

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C195	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C196	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C197	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C198	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C199	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C200	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C201	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C202	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C203	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C204	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C205	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C206	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C207	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C208	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C209	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C210	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C211	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C212	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C213	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C214	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C215	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C216	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C217	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C218	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C219	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C220	Cap,SMT,Ceramic,0.001uF,10%,50V,X7R,0603	CCFS01	C0603C102K5RAC	31433
DS01	Diode, SMT, LED, Green,(560nm), 0603	QDLS01	597-5312-402F(STATIC)(RoHS)	83330
DS02	Diode, SMT, LED, Green,(560nm), 0603	QDLS01	597-5312-402F(STATIC)(RoHS)	83330
DS03	Diode, SMT, LED, Green,(560nm), 0603	QDLS01	597-5312-402F(STATIC)(RoHS)	83330
DS04	Diode, SMT, LED, Green,(560nm), 0603	QDLS01	597-5312-402F(STATIC)(RoHS)	83330
E01	Conn, Post Shunt, 2 Pos, .10 Centreline	JQ15	390088-2	09482
J01	Conn, Plug, D-Sub, 25 pin, PWB Mt	JS12	K22X-B25P-NJ	63590
J02	Conn, Socket, D-Sub, 25 pin, PWB Mt	JS13	K22-B25S-NJ	22421
J03	Conn, Socket, D-Sub, 9-Pin,Vertical PWB	JS50	164A16669X	C3057
J04	Conn, Header, SIP,12 Pin Breakaway,.10 Ctr	JQ16	1-103185-2	09482
J05	Conn, Header,Square Post,Gold,Dual,40-pin	JF47	4-102973-0	09482
J06	Conn, Header,Square Post,Gold,Dual,40-pin	JF47	4-102973-0	09482

NAPE78A/01 Digital AM Exciter PWB Assy

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
J07	Conn, Header,Square Post,Gold,Dual,40-pin	JF47	4-102973-0	09482
L01	Inductor,SMT,390nH,375mA,2520	LS21	NLV25T-R39J-PF(ROHS)	TDK
L02	Inductor,SMT,560nH,325mA,2520	LS20	NLV25T-R56J-PF(ROHS)	TDK
L03	Inductor,SMT,390nH,375mA,2520	LS21	NLV25T-R39J-PF(ROHS)	TDK
L04	Inductor,SMT,390nH,375mA,2520	LS21	NLV25T-R39J-PF(ROHS)	TDK
L05	Inductor,SMT,560nH,325mA,2520	LS20	NLV25T-R56J-PF(ROHS)	TDK
L06	Inductor,SMT,390nH,375mA,2520	LS21	NLV25T-R39J-PF(ROHS)	TDK
L07	Not Used	-	NOT USED	37338
L08	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L09	Not Used	-	NOT USED	37338
L10	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L11	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L12	Inductor,SMT,Pwr,Shielded,P116 7 Series,3.5A,3.6uH	LS17	P1167.362	01961
L13	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L14	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L15	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L16	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
R01	Resistor, SMT, 200ohm, 1%,1/10W, 0603	RFFS87	RK73H1JLTD2000F	59124
R02	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R03	Not Used	-	NOT USED	37338
R04	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R05	Resistor, SMT, 200ohm, 1%,1/10W, 0603	RFFS87	RK73H1JLTD2000F	59124
R06	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R07	Not Used	-	NOT USED	37338
R08	Resistor,SMT,MF,274ohms,1%,1/10W,0603	RFFS31	RK73H1JLTD2740F	59124
R09	Not Used	-	NOT USED	37338
R10	Resistor,SMT,MF,150Kohms,1%,1/10W,0603	RFFS64	RK73H1JLTD1503F	59124
R11	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	RFFS42	RK73H1JLTD2211F	59124
R12	Resistor,SMT,MF,56.2Kohms,1%,1/10W,0603	RFFS59	RK73H1JLTD5622F	59124
R13	Resistor,SMT,MF,150ohms,1%,1/10W,0603	RFFS28	RK73H1JLTD1500F	59124
R14	Resistor,SMT,MF,150ohms,1%,1/10W,0603	RFFS28	RK73H1JLTD1500F	59124
R15	Resistor,SMT,MF,150ohms,1%,1/10W,0603	RFFS28	RK73H1JLTD1500F	59124
R16	Resistor,SMT,MF,150ohms,1%,1/10W,0603	RFFS28	RK73H1JLTD1500F	59124
R17	Resistor,SMT,MF,1.00ohms,1%,1/10W,0603	RFFS02	RK73H1JLTD1R00F	59124
R18	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R19	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124



NAPE78A/01**Digital AM Exciter PWB Assy**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R20	Resistor,SMT,MF,1.00ohms,1%,1/10W,0603	RFFS02	RK73H1JLTD1R00F	59124
R21	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R22	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R23	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R24	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R25	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R26	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R27	Not Used	-	NOT USED	37338
R28	Not Used	-	NOT USED	37338
R29	Not Used	-	NOT USED	37338
R30	Resistor,SMT,MF,121ohms,1%,1/10W,0603	RFFS27	RK73H1JLTD1210F	59124
R31	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R32	Resistor,SMT,MF,392ohms,1%,1/10W,0603	RFFS33	RK73H1JLTD3920F	59124
R33	Resistor,SMT,MF,56.2Kohms,1%,1/10W,0603	RFFS59	RK73H1JLTD5622F	59124
R34	Resistor,SMT,MF,1.00ohms,1%,1/10W,0603	RFFS02	RK73H1JLTD1R00F	59124
R35	Resistor,SMT,MF,1.00ohms,1%,1/10W,0603	RFFS02	RK73H1JLTD1R00F	59124
R36	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R37	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R38	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R39	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R40	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R41	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R42	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R43	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R44	Not Used	-	NOT USED	37338
R45	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R46	Not Used	-	NOT USED	37338
R47	Not Used	-	NOT USED	37338
R48	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R49	Resistor,SMT,MF,274ohms,1%,1/10W,0603	RFFS31	RK73H1JLTD2740F	59124
R50	Resistor,SMT,MF,28.7 KOhms,1%,1/10W,0603	RFFS83	RK73H1JT2872F	59124
R51	Resistor,SMT,MF,221ohms,1%,1/10W,0603	RFFS30	RK73H1JLTD2210F	59124
R52	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R53	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R54	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R55	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R56	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R57	Resistor,SMT,MF,3920ohms,1%,1/10W,0603	RFFS45	RK73H1JLTD3921F	59124
R58	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124



NAPE78A/01**Digital AM Exciter PWB Assy**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R59	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R60	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R61	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R62	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R63	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R64	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R65	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R66	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R67	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R68	Resistor,SMT,MF,274ohms,1%,1/10W,0603	RFFS31	RK73H1JLTD2740F	59124
R69	Resistor,SMT,MF,562ohms,1%,1/10W,0603	RFFS35	RK73H1JLTD5620F	59124
R70	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R71	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R72	Resistor,SMT,MF,1210ohms,1%,1/10W,0603	RFFS39	RK73H1JLTD1211F	59124
R73	Resistor,SMT,MF,1500ohms,1%,1/10W,0603	RFFS40	RK73H1JLTD1501F	59124
R74	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R75	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R76	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R77	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R78	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R79	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R80	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R81	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R82	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R83	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R84	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R85	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R86	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124
R87	Resistor,SMT,MF,3920ohms,1%,1/10W,0603	RFFS45	RK73H1JLTD3921F	59124
R88	Resistor,SMT,MF,3920ohms,1%,1/10W,0603	RFFS45	RK73H1JLTD3921F	59124
R89	Resistor,SMT,MF,12.1Kohms,1%,1/10W,0603	RFFS51	RK73H1JLTD1212F	59124
R90	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R91	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R92	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R93	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R94	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R95	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R96	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R97	Resistor,SMT,MF,22.1ohms,1%,1/10W,0603	RFFS18	RK73H1JLTD22R1F	59124



NAPE78A/01**Digital AM Exciter PWB Assy**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R98	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
S01	Switch,SMT,Mom.,1PSTNO	SA60	KSC321G	ITT INDUS
T01	Transformer, SMT,4:1,0.03 to 125MHz	TZ93	ADT4-6T	
T02	Transformer,SMT,50 ohms,0.03to 125MHz	TZ88	ADT1-6T+(ROHS)	MINI-CIRC
T03	Transformer,SMT,50 ohms,0.03to 125MHz	TZ88	ADT1-6T+(ROHS)	MINI-CIRC
TP01	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP03	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP04	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP05	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP06	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP07	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP08	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP09	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP11	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP12	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP13	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP14	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
TP15	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS)	
			COMPONENTS CORP	
U01	IC,SMT,DAC,400MSPS,14 bitTQFP-48	UW86	DAC5674IPHPR(STAT	TEXAS
			IC)(ROHS)	TEXAS
U02	Oscillator,SMT,TCVCXO,10MHz,3.3V,2ppm	UT98	TC75-10M000-BV020A(STATIC)(ROHS)	4TIMING
U03	IC,SMT,DAC,16 Bit Serial,MSOP-8	UW64	DAC8531E(STATIC)	13919
U04	IC, SMT, Inverter, UHS, Dual,UnBFR, 6p SC70 1.2mm wide	UD80	NC7WZU04P6X(RoHS)	SCT30



NAPE78A/01**Digital AM Exciter PWB Assy**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
U05	IC,SMT,Linear Regulator,3A Adj,Q-5 DD	UX67	LT1764AEQ(STATIC)	64155
U06	IC,SMT,CMOS,Phase Locked Loop,SO-16	UDLS08	ADF4116BRUZ(static)	27014
U07	IC,SMT,Quad 2 TO 1 DATA Sel/Mux 3 States Output,3.3V	UW90	74LVC257APW(STATI C)(ROHS) NXP SEMICONDUCTOR	NXP SEMI
U08	IC,SMT,ADC,RF,14 bit,TQFP-64	UW94	ADS5542IPAP(STATIC) (ROHS)	TEXAS
U09	IC,SMT,3.3V Voltage Reference,SOT23-3	UX97	REF3033AIDBZT(STA TIC)	13919
U10	IC,SMT,Linear Regulator,150mAAdj.,MSOP-8	UX66	LT1762EMS8(STATIC)	64155
U11	IC,SMT,ECL Clock Divider /2,SO-8	UX82	MC100EP32D(STATIC)	1MQ07
U12	IC,SMT,ADC,RF,14 bit,TQFP-64	UW94	ADS5542IPAP(STATIC) (ROHS)	TEXAS
U13	IC, SMT, Spartan3-1600 FPGA,FG320	UW115	XC3S1600E- 5FG320C(STATIC)	68994
U14	IC,SMT,3A Sync Buck Converter,SO-20 w/pwr pad	UX65	TPS54310PWP(STATI C)	01295
U15	IC,SMT,ADC,Serial, 12 bit	UW89	ADC121S051CIMF(ST ATIC)(ROHS)	NATIONAL
U16	IC,SMT,Linear Regulator,3A Adj,Q-5 DD	UX67	LT1764AEQ(STATIC)	64155
U17	IC, SMT, SPI Flash, 16Mbit,SOIC8W	UW109	M25P16- VMW6G(STATIC)(RoH S)	
U18	IC,SMT,Quad 2 TO 1 DATA Sel/Mux 3 States Output,3.3V	UW90	74LVC257APW(STATI C)(ROHS) NXP SEMICONDUCTOR	NXP SEMI
U19	IC,SMT,RS-485 Transceiver,3.3V,SO-8	UDTS04	LTC1480IS8(STATIC)	64155
U20	IC,SMT,SRC,Async,2-ch,TQFP-48	UW80	SRC4382IPFBR(STATI C)(ROHS)	TEXAS
U21	IC,SMT,Linear Regulator,3A Adj,Q-5 DD	UX67	LT1764AEQ(STATIC)	64155
U22	IC,SMT,Power Supervisor,Dual/P,33/1.5V,MSOP	UX64	TPS3306- 15DGK(STATIC)	01295
U23	IC,SMT,SRC,Async,2-ch,TQFP-48	UW80	SRC4382IPFBR(STATI C)(ROHS)	TEXAS
U24	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U25	IC,SMT,Blackfin DSP,500 MHzmBGA160	UW88	ADSP-BF533SBBC- 5V(STATIC)	ANALOG
U26	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U27	IC, SDRAM, 128Mbit, x16, TSOP-II, Ext Temp	UX121	MT48LC8M16A2TG- 7E IT:G(STATIC) Micron	
U28	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U29	IC,SMT,Differential LineReceivr, 100dB CMR	UD65	SSM2141S(STATIC)	LINEAR
U30	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U31	IC,SMT,Op Amp,Audio,Dual,SO-8	UP93	OP275GS(STATIC)	45496
U32	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473
U33	Res,SMT Network,0402x8,39R	UW63	EXB2HV390J	54473



NAPE78A/01 Digital AM Exciter PWB Assy

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
U34	IC,SMT,RS-232 Transceiver,3.3V,SO-16	UDTS05	ADM3202ARN(STATIC)	45496
U35	IC,SMT,Stereo ADC,24bit,96kHz,TSSOP-28	UP95	AD1871YRS(STATIC)	45496
U36	IC,SMT,SPI UART,3.3V	UW91	SC16IS740IPW(STATI C)(ROHS)	NXP
U37	IC,SMT,Voltage Regulator,5V,1A, D2PAK	UT93	L7805ABD2T-TR(STATIC)(ROHS)	ST MICRO
XE01	Conn, Header, SIP,12 Pin Breakaway,.10 Ctr	JQ16	1-103185-2	09482
Y01	Oscilitor, SMT, VCXO,158.76MHz LVPECL, 3.3V, 9x14mmx4	UT124	VCFRPE-158M760-BBA3Y(STATIC)(RoHS) 4TIMING	
Y02	Oscillator,SMT,25MHz,3.3V	UT100	S1613B-25.0000(STATIC)(ROH S)	SARONIX
Y03	Crystal,SMT,Fund,Par Res,3.6864MHz,Comm	XFPS03	ATSM49-3.6864MHz	23875



NAPI142A**UI Interface PWB Assy (NVLT)**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C01	Cap,SMT,Ceramic,22pF,2%,50V,C0G,0603	CCFS24	C0603C220G5GAC	31433
C02	Cap,SMT,Ceramic,100pF,2%,50V,C0G,0603	CCFS32	C0603C101G5GAC	31433
C03	Cap,SMT,Ceramic,22pF,2%,50V,C0G,0603	CCFS24	C0603C220G5GAC	31433
C04	Cap,SMT,Ceramic,22pF,2%,50V,C0G,0603	CCFS24	C0603C220G5GAC	31433
C05	Cap,SMT,Ceramic,22pF,2%,50V,C0G,0603	CCFS24	C0603C220G5GAC	31433
C06	Cap,SMT,Ceramic,22pF,2%,50V,C0G,0603	CCFS24	C0603C220G5GAC	31433
C07	Cap,SMT,Ceramic,470pF,2%,50V,C0G,0603	CCFS38	C0603C471G5GAC	31433
C08	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C09	Cap,SMT,Ceramic,470pF,2%,50V,C0G,0603	CCFS38	C0603C471G5GAC	31433
C10	Cap,SMT,Ceramic,470pF,2%,50V,C0G,0603	CCFS38	C0603C471G5GAC	31433
C11	Cap,SMT,Ceramic,470pF,2%,50V,C0G,0603	CCFS38	C0603C471G5GAC	31433
C12	Cap,SMT,Ceramic,470pF,2%,50V,C0G,0603	CCFS38	C0603C471G5GAC	31433
C13	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C14	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C15	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C16	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C17	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C18	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C19	Cap,SMT,Ceramic,0.47uF,10%,25V,X7R,0805	CCFS09	C0805C474K3RAC	31433
C20	Cap,SMT,Ceramic,0.47uF,10%,25V,X7R,0805	CCFS09	C0805C474K3RAC	31433
C21	Cap,SMT,Ceramic,100pF,2%,50V,C0G,0603	CCFS32	C0603C101G5GAC	31433
C22	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C23	Cap,SMT,Ceramic,470pF,2%,50V,C0G,0603	CCFS38	C0603C471G5GAC	31433
C24	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C25	Cap,SMT,Ceramic,22pF,2%,50V,C0G,0603	CCFS24	C0603C220G5GAC	31433
CR01	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR02	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR03	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR04	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR05	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR06	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR07	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR08	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR09	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400

NAPI142A**UI Interface PWB Assy (NVLT)**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
DS01	Diode, LED, Amber	QK14	HLMP-3451	50434
DS02	Diode, LED, Amber	QK14	HLMP-3451	50434
DS03	Diode, LED, Amber	QK14	HLMP-3451	50434
DS04	Diode, LED, Amber	QK14	HLMP-3451	50434
J01	Conn, Socket, D-Sub, HD15pin,90deg, PWB	JS129	ICD15S13E6GV00LF(RoHS) FCI	
J02	Conn, Socket, D-Sub, 9 pin, PWB Mt	JQ34	K22-E9S-NJ	KYCON
L01	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L02	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L03	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L04	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L05	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L06	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L07	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L08	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L09	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L10	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L11	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L12	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L13	Choke,SMT,Common Mode,2200 ohm,200mA,1206	LS22	DLW31SN222SQ2L(ROHS)	3EH09
L14	Choke,SMT,Common Mode,2200 ohm,200mA,1206	LS22	DLW31SN222SQ2L(ROHS)	3EH09
L15	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
L16	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L17	Inductor, SMT, Choke, 600ohms,2A, 0805	LCFS01	ILHB0805RK601V	56845
L18	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	LCFS02	ILBB0805ER202V(RoHS)	56845
R01	Resistor, SMT, MF, 475 Ohms,1% 1/4W	RAD21	RK73H2BL4750F	59124
R02	Resistor, SMT, MF, 475 Ohms,1% 1/4W	RAD21	RK73H2BL4750F	59124
R03	Resistor, SMT, MF, 475 Ohms,1% 1/4W	RAD21	RK73H2BL4750F	59124
R04	Resistor, SMT, MF, 475 Ohms,1% 1/4W	RAD21	RK73H2BL4750F	59124
R05	Resistor, SMT, MF, 475 Ohms,1% 1/4W	RAD21	RK73H2BL4750F	59124
R06	Resistor, SMT, 2 Ohms, 5%, 1/4W, 1206	RAD75	ERJ-8GEYJ2R0V(STATIC)(RoHS)	
R07	Resistor, SMT, MF, 332 Ohms,1% 1/4W	RAD19	RK73H2BL3320F	59124



NAPI142A**UI Interface PWB Assy (NVLT)**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R08	Resistor, SMT, MF, 332 Ohms,1% 1/4W	RAD19	RK73H2BL3320F	59124
R09	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R10	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R11	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R12	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R13	Resistor, SMT, MF, 332 Ohms,1% 1/4W	RAD19	RK73H2BL3320F	59124
R14	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R15	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R16	Resistor,SMT,MF,49.9R,1%,1/10W0603	RAE34	RK73H1JT49R9F	59124
R17	Resistor, SMT, MF, 475 Ohms,1% 1/4W	RAD21	RK73H2BL4750F	59124
R18	Resistor, SMT, MF, 475 Ohms,1% 1/4W	RAD21	RK73H2BL4750F	59124
R19	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R20	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R21	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R22	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R23	Resistor, SMT, MF, 332 Ohms,1% 1/4W	RAD19	RK73H2BL3320F	59124
R24	Resistor, SMT, MF, 475 Ohms,1% 1/4W	RAD21	RK73H2BL4750F	59124
R25	Resistor, SMT, 2 Ohms, 5%, 1/4W, 1206	RAD75	ERJ-8GEYJ2R0V(STATIC)(RoHS)	
S01	Switch, MOM, SPDT, PB, Black,No LED	SA70	5501M1BLKX	OUA4U
S02	Switch, MOM, SPDT, PB, REDNo LED	SA71	5501MREDX	OUA4U
S03	Switch, MOM, SPDT, PB, Black,No LED	SA70	5501M1BLKX	OUA4U
TP01	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
U01	IC,SMT,RS-485 Transceiver,Sgl,SOIC-8	UDTS03	DS36C278TM(STATIC)	27014
U02	IC,SMT,RS-485 Transceiver,Sgl,SOIC-8	UDTS03	DS36C278TM(STATIC)	27014
U03	IC,CMOS,Hex Schmitt,Trigger Inverter,SOIC-14	UG35	MM74HC14M(STATIC)	07263
U04	IC, SMT, Voltage Regulator,5V,1.5A, 150C, D2PAK	UT130	L4940D2T5-TR(STATIC)(RoHS)	

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C001	Cap,SMT,Ceramic,0.022uF,10%,50V,X7R,0603	CCFS05	C0603C223K5RAC	31433
C002	Cap,SMT,Ceramic,0.047uF,10%,50V,X7R,0603	CCFS06	C0603C473K5RAC	31433
C003	Cap,SMT,Ceramic,0.022uF,10%,50V,X7R,0603	CCFS05	C0603C223K5RAC	31433
C004	Cap,SMT,Ceramic,0.047uF,10%,50V,X7R,0603	CCFS06	C0603C473K5RAC	31433
C005	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C006	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C007	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C008	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C009	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C010	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C011	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C012	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C013	Cap,SMT,Ceramic,0.047uF,10%,50V,X7R,0603	CCFS06	C0603C473K5RAC	31433
C014	Cap, SMT, Ceramic,47uF,20%,6.3V, 1210	CCFS53	C3225X5R0J476M(Ro HS)	56289
C015	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C016	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C017	Cap,SMT,Ceramic,0.047uF,10%,50V,X7R,0603	CCFS06	C0603C473K5RAC	31433
C018	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C019	Cap,SMT,Ceramic,0.022uF,10%,50V,X7R,0603	CCFS05	C0603C223K5RAC	31433
C020	Cap, SMT, Ceramic, 10uF, 10%,50V, 2220	CCFS72	22205C106KAT2A(Ro HS)	27604
C021	Cap,SMT,Ceramic,0.047uF,10%,50V,X7R,0603	CCFS06	C0603C473K5RAC	31433
C022	Cap,SMT,Ceramic,0.022uF,10%,50V,X7R,0603	CCFS05	C0603C223K5RAC	31433
C023	Cap, SMT, Ceramic, 10uF, 10%,50V, 2220	CCFS72	22205C106KAT2A(Ro HS)	27604
C024	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C025	Cap, SMT, Ceramic, 10uF, 10%,50V, 2220	CCFS72	22205C106KAT2A(Ro HS)	27604
C026	Capacitor, SMT, Ceramic, 25V,47uF, 20%	CT90	CKG57NX5R1E476M(RoHS)	
C027	Cap,SMT,Ceramic,0.0022uF,10%,50V,X7R,0603	CCFS02	C0603C222K5RAC	31433
C028	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C029	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C030	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C031	Cap,SMT,Ceramic,0.001uF,10%,50V,X7R,0603	CCFS01	C0603C102K5RAC	31433
C032	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C033	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C034	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C035	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433

NAPI173A**Rack Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C036	Cap,SMT,Ceramic,0.001uF,10%,50V,X7R,0603	CCFS01	C0603C102K5RAC	31433
C037	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C038	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C039	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C040	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C041	Cap,SMT,Ceramic,100pF,2%,50V,C0G,0603	CCFS32	C0603C101G5GAC	31433
C042	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C043	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C044	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C045	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C046	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C047	Cap,SMT,Ceramic,100pF,2%,50V,C0G,0603	CCFS32	C0603C101G5GAC	31433
C048	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C049	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C050	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C051	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C052	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C053	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C054	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C055	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C056	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C057	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C058	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C059	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C060	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C061	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C062	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C063	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C064	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C065	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C066	Capacitor, SMT, Ceramic, 0.039uF, 50V, 10%	CT63	ATC200B393KT50X	29990
C067	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C068	Cap, SMT, Ceramic, 10uF, 10%,50V, 2220	CCFS72	22205C106KAT2A(Ro HS)	27604
C069	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C070	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C071	Cap,SMT,Ceramic,0.47uF,10%,25V,X7R,0805	CCFS09	C0805C474K3RAC	31433



NAPI173A**Rack Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C072	Cap,SMT,Ceramic,33pF,2%,50V,C0G,0603	CCFS26	C0603C330G5GAC	31433
C073	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C074	Cap,SMT,Ceramic,0.022uF,10%,50V,X7R,0603	CCFS05	C0603C223K5RAC	31433
C075	Cap,SMT,Ceramic,0.022uF,10%,50V,X7R,0603	CCFS05	C0603C223K5RAC	31433
C076	Cap,SMT,Ceramic,0.022uF,10%,50V,X7R,0603	CCFS05	C0603C223K5RAC	31433
C077	Cap, SMT, Ceramic, 10uF, 10%,50V, 2220	CCFS72	22205C106KAT2A(Ro HS)	27604
C078	Capacitor, SMT, Ceramic, 25V,47uF, 20%	CT90	CKG57NX5R1E476M(RoHS)	
C079	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C080	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C081	Cap,SMT,Ceramic,0.022uF,10%,50V,X7R,0603	CCFS05	C0603C223K5RAC	31433
C082	Cap,SMT,Ceramic,18pF,2%,50V,C0G,0603	CCFS23	C0603C180G5GAC	31433
C083	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C084	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C085	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C086	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C087	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C088	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C089	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C090	Cap,SMT,Ceramic,0.47uF,10%,25V,X7R,0805	CCFS09	C0805C474K3RAC	31433
C091	Cap,SMT,Ceramic,0.47uF,10%,25V,X7R,0805	CCFS09	C0805C474K3RAC	31433
C092	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C093	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C094	Cap,SMT,Ceramic,0.001uF,10%,50V,X7R,0603	CCFS01	C0603C102K5RAC	31433
C095	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C096	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	CCFS04	C0603C103K5RAC	31433
C097	Cap,SMT,Ceramic,10uF,20%,6.3V,X5R,0805	CCFS57	C2012X5R0J106M	54583
C099	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C100	Cap, SMT, Ceramic, 10uF, 10%,25V	CCFS62	C3225X5R1E106K	
C101	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C102	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(RO HS)	AVX CORP
C103	Cap,SMT,Ceramic,0.047uF,10%,50V,X7R,0603	CCFS06	C0603C473K5RAC	31433
C104	Cap, SMT, Electrolytic, 1000uF, 20%, 50V	CT72	EEEFK1H102AM(RoH S)	
C105	Capacitor, SMT, Ceramic, 2.2uF 10%, 100V, X7R, 1812	CT64	GRM43ER72A225KA0 1L	72982
C106	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C107	Cap,SMT,Ceramic,0.047uF,10%,50V,X7R,0603	CCFS06	C0603C473K5RAC	31433



NAPI173A**Rack Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C108	Cap, SMT, Electrolytic, 1000uF, 20%, 50V	CT72	EEEFK1H102AM(RoHS)	
C109	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C110	Cap,SMT,Ceramic,1uF,10%,100V,X7R,1210	CCFS60	12101C105KAT2A(ROHS)	AVX CORP
C111	Cap,SMT,Ceramic,0.047uF,10%,50V,X7R,0603	CCFS06	C0603C473K5RAC	31433
C112	Cap, SMT, Ceramic, 1uF, 10%,16V, X5R, 0603	CCFS73	C0603C105K4PAC(RoHS)	31433
C113	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C114	Cap, SMT, Ceramic,47uF,20%,6.3V, 1210	CCFS53	C3225X5R0J476M(RoHS)	56289
C115	Cap, SMT, Ceramic,47uF,20%,6.3V, 1210	CCFS53	C3225X5R0J476M(RoHS)	56289
C116	Cap,SMT,Ceramic,0.022uF,10%,50V,X7R,0603	CCFS05	C0603C223K5RAC	31433
C117	Cap,SMT,Ceramic,0.047uF,10%,50V,X7R,0603	CCFS06	C0603C473K5RAC	31433
C118	Cap,SMT,Ceramic,0.022uF,10%,50V,X7R,0603	CCFS05	C0603C223K5RAC	31433
CR1	Diode,SMT,Schottky,30V,0.2A,SOD-323	QDSS01	BAT54HT1(STATIC)	04713
CR2	Diode, SMT, Schottky, 40V, 1A, SMA	QDDS02	STPS140A(RoHS)	
CR3	Diode, SMT, Shottky, 40V, 3A,SMA	QDSS03	MBRA340T3G(STATIC)(RoHS)	
CR4	Diode,SMT,Zener,39V,5%,3W,SMB	QDZS04	1SMB5939BT3	04713
CR5	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR6	Not Used	-	NOT USED	37338
CR7	Diode, SMT Ultrafast, 600V, 1ASMA	QM71	MURA160T3G(RoHS)	04713
CR8	Diode, SMT Ultrafast, 600V, 1ASMA	QM71	MURA160T3G(RoHS)	04713
DS1	Diode, SMT, LED, Amber,(592nm), 0603	QDLS07	598-8040-107F(STATIC)(RoHS)	83330
DS2	Diode, SMT, LED, Green,(560nm), 0603	QDLS01	597-5312-402F(STATIC)(RoHS)	83330
J1	Conn, Socket, D-Sub, 25 pin, PWB Mt	JS13	K22-B25S-NJ	22421
J2	Conn, Socket, D-Sub, 25 pin, PWB Mt	JS13	K22-B25S-NJ	22421
J3	Conn, Modular Jack, RJ45, Shld, Side, PWB, 50u	JM44	556591-1	09482
J4	Conn, Socket, D-Sub, HD15pin,90deg, PWB	JS129	ICD15S13E6GV00LF(RoHS) FCI	
J5	Conn,Socket,D-Sub,25 pin,VertPWB	JS53	628-025-220-017	31781
J6	Conn, Plug, D-Sub, 25 pin, Vert PWB	JS43	627 025 220 017	31781
J7	Connector, Header, 2 pos, 90deg, PWB,20A, 600V, 7.62mm	JT148	1804797	
J8	MTA, Square Post Header Assy,3-pin, Locking	JU80	640445-3(RoHS)	
J9	Conn, Header,Square Post,Gold,Dual,40-pin	JF47	4-102973-0	09482
L01	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L02	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L03	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L04	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	

NAPI173A**Rack Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
L05	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L06	Inductor, SMT, Shielded, 33uH, 3.3A RMS	LS45	DR125-330-R(RoHS)	005K5
L07	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L08	Inductor, SMT, Shielded, DRSeries, 15uH, 4A RMS	LS35	DR125-150-R(RoHS)	005K5
L09	Inductor, SMT, 10uH, 2.4A, RMS	LS24	DRQ74-100-R(RoHS)	005K5
L10	Bead, Ferrite SMT, 200 ohms @1MHz, 100mA, 1206	LCFS04	LF1206A302R-10(RoHS)	
L11	Inductor, SMT, Shielded, DRSeries, 15uH, 4A RMS	LS35	DR125-150-R(RoHS)	005K5
L12	Inductor, SMT, Shielded, 33uH, 3.3A RMS	LS45	DR125-330-R(RoHS)	005K5
L13	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
L14	Choke, SMT, Common Mode, 10kohm @ 1MHz, 200mA	LS50	CM2824B103R-10	
Q01	Transistor,SMT,MOSFET,N-Channel,60V,115mA,SOT-23	QN53	2N7002LT1G(STATIC)(ROHS)	1MQ07
R001	Resistor,SMT,MF,221ohms,1%,1/10W,0603	RFFS30	RK73H1JLTD2210F	59124
R002	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R003	Resistor, SMT, 2 Ohms, 5%, 1/4W, 1206	RAD75	ERJ-8GEYJ2R0V(STATIC)(RoHS)	
R004	Resistor,SMT,MF,221ohms,1%,1/10W,0603	RFFS30	RK73H1JLTD2210F	59124
R005	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R006	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R007	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R008	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R009	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R010	Resistor, SMT, MF, 221 Ohms,1% 1/4W	RAD17	RK73H2BL2210F	59124
R011	Resistor, SMT, 2 Ohms, 5%, 1/4W, 1206	RAD75	ERJ-8GEYJ2R0V(STATIC)(RoHS)	
R012	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R013	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R014	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R015	Resistor, SMT, MF, 82.5 Ohms,1% 1/4W	RAD12	RK73H2BL82R5F	59124
R016	Resistor,SMT,MF,681ohms,1%,1/10W,0603	RFFS36	RK73H1JLTD6810F	59124
R017	Resistor, SMT, MF, 221 Ohms,1% 1/4W	RAD17	RK73H2BL2210F	59124
R018	Resistor,SMT,MF,681ohms,1%,1/10W,0603	RFFS36	RK73H1JLTD6810F	59124
R019	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R020	Resistor, SMT, MF, 1000 Ohms,1% 1/4W	RAD25	RK73H2BL1001F	59124
R021	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R022	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R023	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R024	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124



NAPI173A**Rack Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R025	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R026	Resistor, SMT, 2 Ohms, 5%, 1/4W, 1206	RAD75	ERJ-8GEYJ2R0V(STATIC)(RoHS)	
R027	Resistor, SMT, 2 Ohms, 5%, 1/4W, 1206	RAD75	ERJ-8GEYJ2R0V(STATIC)(RoHS)	
R028	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R029	Resistor,SMT,MF,221ohms,1%,1/10W,0603	RFFS30	RK73H1JLTD2210F	59124
R030	Resistor,SMT,MF,3320ohms,1%,1/10W,0603	RFFS44	RK73H1JLTD3321F	59124
R031	Resistor, SMT, MF, 47.5K Ohms, 1% 1/4W	RAD45	RK73H2BL4752F	59124
R032	Resistor, SMT, 590 Ohms, 1%, 1W, 2512	RAD69	ERJ-1TNF5900U	
R033	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R034	Resistor,SMT,MF,221ohms,1%,1/10W,0603	RFFS30	RK73H1JLTD2210F	59124
R035	Resistor, SMT, 590 Ohms, 1%, 1W, 2512	RAD69	ERJ-1TNF5900U	
R036	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R037	Resistor,SMT,MF,182Kohms,1%,1/10W,0603	RFFS65	RK73H1JLTD1823F	59124
R038	Resistor,SMT,MF,22.1Kohms,1%,1/10W,0603	RFFS54	RK73H1JLTD2212F	59124
R039	Resistor,SMT,MF,56.2Kohms,1%,1/10W,0603	RFFS59	RK73H1JLTD5622F	59124
R040	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R041	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R042	Resistor,SMT,MF,100Kohms,1%,1/10W,0603	RFFS62	RK73H1JLTD1003F	59124
R043	Resistor,SMT,MF,1500ohms,1%,1/10W,0603	RFFS40	RK73H1JLTD1501F	59124
R044	Resistor,SMT,MF,5620ohms,1%,1/10W,0603	RFFS47	RK73H1JLTD5621F	59124
R045	Resistor,SMT,MF,22.1Kohms,1%,1/10W,0603	RFFS54	RK73H1JLTD2212F	59124
R046	Resistor,SMT,MF,8250ohms,1%,1/10W,0603	RFFS49	RK73H1JLTD8251F	59124
R047	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R048	Resistor,SMT,MF,15.0Kohms,1%,1/10W,0603	RFFS52	RK73H1JLTD1502F	59124
R049	Resistor,SMT,MF,3920ohms,1%,1/10W,0603	RFFS45	RK73H1JLTD3921F	59124
R050	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R051	Resistor,SMT,MF,1210ohms,1%,1/10W,0603	RFFS39	RK73H1JLTD1211F	59124
R052	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R053	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R054	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R055	Resistor,SMT,MF,475Kohms,1%,1/10W,0603	RFFS70	RK73H1JLTD4753F	59124
R056	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R057	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R058	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R059	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R060	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R061	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124



NAPI173A**Rack Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R062	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R063	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R064	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R065	Resistor,SMT,MF,6810ohms,1%,1/10W,0603	RFFS48	RK73H1JLTD6811F	59124
R066	Resistor,SMT,MF,12.1Kohms,1%,1/10W,0603	RFFS51	RK73H1JLTD1212F	59124
R067	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R068	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R069	Resistor,SMT,MF,475Kohms,1%,1/10W,0603	RFFS70	RK73H1JLTD4753F	59124
R070	Resistor,SMT,MF,475Kohms,1%,1/10W,0603	RFFS70	RK73H1JLTD4753F	59124
R071	Resistor,SMT,MF,15.0Kohms,1%,1/10W,0603	RFFS52	RK73H1JLTD1502F	59124
R072	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	RFFS42	RK73H1JLTD2211F	59124
R073	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R074	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R075	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R076	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R077	Resistor,SMT,MF,274ohms,1%,1/10W,0603	RFFS31	RK73H1JLTD2740F	59124
R078	Resistor,SMT,MF,274ohms,1%,1/10W,0603	RFFS31	RK73H1JLTD2740F	59124
R079	Resistor,SMT,MF,274ohms,1%,1/10W,0603	RFFS31	RK73H1JLTD2740F	59124
R080	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R081	Resistor, SMT, MF, 100 Ohms,1% 1/4W	RAD13	RK73H2BL1000F	59124
R082	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R083	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R084	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R085	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R086	Resistor,SMT,MF,3320ohms,1%,1/10W,0603	RFFS44	RK73H1JLTD3321F	59124
R087	Resistor,SMT,MF,221Kohms,1%,1/10W,0603	RFFS66	RK73H1JLTD2213F	59124
R088	Resistor, SMT, MF, 121K Ohms,1% 1/4W	RAE02	RK73H2BL1213F	59124
R089	Resistor,SMT,MF,221ohms,1%,1/10W,0603	RFFS30	RK73H1JLTD2210F	59124
R090	Resistor,SMT,MF,221ohms,1%,1/10W,0603	RFFS30	RK73H1JLTD2210F	59124
R091	Resistor,SMT,MF,221ohms,1%,1/10W,0603	RFFS30	RK73H1JLTD2210F	59124
R092	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R093	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R094	Resistor,SMT,MF,1500ohms,1%,1/10W,0603	RFFS40	RK73H1JLTD1501F	59124
R095	Resistor, SMT, MF, 100 Ohms,1% 1/4W	RAD13	RK73H2BL1000F	59124
R096	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R097	Resistor, SMT, MF, 100 Ohms,1% 1/4W	RAD13	RK73H2BL1000F	59124
R098	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R099	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R100	Resistor, SMT, MF, 100 Ohms,1% 1/4W	RAD13	RK73H2BL1000F	59124



NAPI173A**Rack Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R101	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R102	Resistor,SMT,MF,1500ohms,1%,1/10W,0603	RFFS40	RK73H1JLTD1501F	59124
R103	Resistor,SMT,MF,1500ohms,1%,1/10W,0603	RFFS40	RK73H1JLTD1501F	59124
R104	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R105	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R106	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R107	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R108	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R109	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R110	Resistor,SMT,MF,4750ohms,1%,1/10W,0603	RFFS46	RK73H1JLTD4751F	59124
R111	Resistor,SMT,MF,10.0ohms,1%,1/10W,0603	RFFS14	RK73H1JLTD10R0F	59124
R112	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R113	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R114	Resistor,SMT,MF,10ohms,1%,2W	RAD49Z	CR2512-2W-10R0F-SP	VENKEL
R115	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R116	Resistor,SMT,MF,10ohms,1%,2W	RAD49Z	CR2512-2W-10R0F-SP	VENKEL
R117	Resistor, SMT, MF, 100 Ohms,1% 1/4W	RAD13	RK73H2BL1000F	59124
R118	Resistor, SMT, 2 Ohms, 5%, 1/4W, 1206	RAD75	ERJ-8GEYJ2R0V(STATIC)(RoHS)	
R119	Resistor, SMT, MF, 100 Ohms,1% 1/4W	RAD13	RK73H2BL1000F	59124
R120	Resistor, SMT, 2 Ohms, 5%, 1/4W, 1206	RAD75	ERJ-8GEYJ2R0V(STATIC)(RoHS)	
R121	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R122	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R123	Resistor, SMT, MF, 100 Ohms,1% 1/4W	RAD13	RK73H2BL1000F	59124
R124	Resistor, SMT, 2 Ohms, 5%, 1/4W, 1206	RAD75	ERJ-8GEYJ2R0V(STATIC)(RoHS)	
R125	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R126	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R127	Resistor, SMT, MF, 150K Ohms,1% 1/4W	RAE03	RK73H2BL1503F	59124
R128	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R129	Resistor,SMT,MF,221ohms,1%,1/10W,0603	RFFS30	RK73H1JLTD2210F	59124
R130	Resistor, SMT, MF, 100 Ohms,1% 1/4W	RAD13	RK73H2BL1000F	59124
R131	Resistor, SMT, 2 Ohms, 5%, 1/4W, 1206	RAD75	ERJ-8GEYJ2R0V(STATIC)(RoHS)	
R132	Resistor, SMT, MF, 150K Ohms,1% 1/4W	RAE03	RK73H2BL1503F	59124
R133	Resistor, SMT, MF, 150K Ohms,1% 1/4W	RAE03	RK73H2BL1503F	59124
R134	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124



NAPI173A**Rack Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
R135	Resistor,SMT,MF,221ohms,1%,1/10W,0603	RFFS30	RK73H1JLTD2210F	59124
R136	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R137	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R138	Resistor, SMT, MF, 0.0 Ohms,Jumper, 1206	RAD72	RK73Z2BTDD	
RT01	Thermistor, PTC, SMT, 29202A Hold, 24V	RX66	2920L200/24(RoHS)	
RT02	Thermistor, PTC, SMT, 29202A Hold, 24V	RX66	2920L200/24(RoHS)	
RT03	Thermistor, PTC, SMT, 2920,500mA Hold	RX64	2920L050(RoHS)	75915
RT05	Thermistor, PTC, SMT, 29202A Hold, 24V	RX66	2920L200/24(RoHS)	
TP01	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP03	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP11	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP12	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP15	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
TP40	Terminal, SMT, Test Point, PWB	HAJ66	TP-107-02-1-T(RoHS) COMPONENTS CORP	
U01	IC,SMT,Quad RS-422 DIFF LineDriver	UD66	DS26C31T/DS26C31M (STATIC)	NATIONAL
U02	IC,SMT,Quad RS-422 Receiver,16-SOIC	UT91	DS26C32ATM(STATIC)	NATIONAL
U03	IC,SMT,RS-485 Transceiver,Sgl,SOIC-8	UDTS03	DS36C278TM(STATIC)	27014
U04	IC,SMT,Quad RS-422 DIFF LineDriver	UD66	DS26C31T/DS26C31M (STATIC)	NATIONAL
U05	IC, SMT, DC-DC Converter,Boost/Inverting MSOP8	UP105	LT3580IMS8E#PBF(RoHS)(STATIC)	64155
U06	IC,SMT,Comparator,Quad,SOIC-14	ULCS01	MC3302D(STATIC)	04713
U07	IC,SMT,2.5V Reference,0.1%,SOT-23-6	UX83	LT1790BIS6-2.5(STATIC)	64155
U08	IC,SMT,ADC,10-Bit,11-ch,SPI,SOIC-20	UMAS01	TLC1543IDW(STATIC)	01295
U09	IC,SMT,Opamp,Quad,Rail-To-Rail,SOIC-14	ULAS02	TLV2374ID(STATIC)	01295
U10	IC,SMT,Opamp,Quad,Single Supply,SOIC-14	ULAS01	MC33074AD(STATIC)	04713
U11	IC,SMT,DAC,8-Bit,4-ch,SPI,SOIC-14	UMDS01	TLV5620ID(STATIC)	64155
U12	IC,SMT,Quad 2 TO 1 DATA Sel/Mux 3 States Output,3.3V	UW90	74LVC257APW(STATIC)(ROHS) NXP SEMICONDUCTOR	NXP SEMI
U13	IC, SMT, Micro, ADC, PWM,Flash, TQFP-64	UDMS02	ATMEGA128-16AI(STATIC)	1FN41



NAPI173A**Rack Interface PWB Assy,Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
U14	IC,SMT,RS-485 Transceiver,Sgl,SOIC-8	UDTS03	DS36C278TM(STATIC)	27014
U15	IC, SMT, 5A, Boost Converter,HTSSOP-14, w/ PowerPAD	UX163	TPS55340PWP(STATI C)(RoHS) TEXAS INSTRUMENTS	
U16	IC,SMT,CMOS,Hex Schm,Trig,Inv,SOIC-14	UDLS03	SN74AHCT14D(STATI C)	01295
U17	IC,SMT,RS-485 Transceiver,Sgl,SOIC-8	UDTS03	DS36C278TM(STATIC)	27014
U18	IC,SMT,Quad 2-input AND gate,SO-14	UD70	MC74ACT08D(STATIC)	ON SEMI
U19	IC, SMT, SRAM, 32Kx8, SOIC-28(Wide)	UDMS01	CY62256NLL-55SNXI(STATIC)(RoH S)	65786
U20	IC, SMT, CMOS, Octal Latch,SOIC-20	UDLS02	SN74AHC573DW(STA TIC)	01295
U21	IC,SMT,Trans Array, 7 Darl.,SOIC-16	UDAS01	MC1413BD(STATIC)	04713
U22	IC, SMT, Voltage Reg, 9V, 1.5A, D2PAK	UT113	L7809CD2T(STATIC)(RoHS) STMicroelectronics	
U23	IC,SMT,RS-485 Transceiver,Sgl,SOIC-8	UDTS03	DS36C278TM(STATIC)	27014
U24	IC,SMT,Dual Optocoupler,SOIC-8	UDOS01	MOCD223-M(STATIC)	7D893
U25	IC, SMT, DC-DC Converter,5V-5VIsolated, 2W, 1kVrms isolation	UT145	DCR010505U(STATIC) (RoHS) Texas Instruments	
U26	Amplifier, Isolation, SMT, 1kVUnity Gain	UT144	ACPL-C87B-000E(RoHS)(STATIC)	
U27	IC,SMT,RS-485 Transceiver,Sgl,SOIC-8	UDTS03	DS36C278TM(STATIC)	27014
U28	IC,SMT,Voltage Regulator,5V,1A, D2PAK	UT93	L7805ABD2T-TR(STATIC)(ROHS)	ST MICRO
Y01	Crystal, SMT, Fund, 11.0592MHz	XFPS11	HCM49-11.0592MABJ-UT(RoHS)	3DX59



REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
A01	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338
A02	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338
C1	Capacitor, Electrolytic, 470uF450V	CBP15	381LR471M450A052 CORNELL	14655
C2	Capacitor, Ceramic, 0.1uF 10%100V	CCG07	CKR06BX104KRV	56289
C3	Cao, Electrolytic, 1000uF, +/-20%, 63V Radial Lead	CAP81	EEUFC1J102(RoHS)	
C4	Cao, Electrolytic, 1000uF, +/-20%, 63V Radial Lead	CAP81	EEUFC1J102(RoHS)	
C5	Capacitor, Electrolytic, 470uF450V	CBP15	381LR471M450A052 CORNELL	14655
C6	Capacitor, Ceramic, 0.1uF 10%100V	CCG07	CKR06BX104KRV	56289
CR1	Diode, Zener, 30V, 500mW, 5%,	QK54	1N5256B(RoHS)	
CR2	Diode, General Purpose, 400V,1A	QE28	1N4004	04713
CR3	Diode, General Purpose, 400V,1A	QE28	1N4004	04713
CR4	Diode, Power Rectifier, 4A, Ultra Fast	QI10	MUR415	04713
CR5	Diode, General Purpose, 400V,1A	QE28	1N4004	04713
CR6	Diode, General Purpose, 400V,1A	QE28	1N4004	04713
DS1	Diode, LED, Ultrabright, Amber, 5mm	QM75	C503B-ACS- CY0Z0252- 030(STATIC)(RoHS) CREE	
DS2	Diode, LED, Ultrabright, Amber, 5mm	QM75	C503B-ACS- CY0Z0252- 030(STATIC)(RoHS) CREE	
DS3	Diode, LED, Ultrabright, Amber, 5mm	QM75	C503B-ACS- CY0Z0252- 030(STATIC)(RoHS) CREE	
E01	Terminal,PC Screw 10-32,30 Amp	HAC55	7787	KEYSTONE
E02	Terminal,PC Screw 10-32,30 Amp	HAC55	7787	KEYSTONE
E03	Terminal, PC Screw M4, 30 Amp	HAC121	7798	
E04	Terminal,PC Screw 10-32,30 Amp	HAC55	7787	KEYSTONE
E05	Terminal, PC Screw M4, 30 Amp	HAC121	7798	
E06	Terminal,PC Screw 10-32,30 Amp	HAC55	7787	KEYSTONE
E07	Terminal, PC Screw M4, 30 Amp	HAC121	7798	
E08	Terminal,PC Screw 10-32,30 Amp	HAC55	7787	KEYSTONE
E09	Terminal, PC Screw M4, 30 Amp	HAC121	7798	
E10	Terminal,PC Screw 10-32,30 Amp	HAC55	7787	KEYSTONE
F1	Fuse, 20A, 500Vdc, Non Time Delay, KLM	FA34	KLM-20	71400
F2	Fuse, 20A, 500Vdc, Non Time Delay, KLM	FA34	KLM-20	71400
J1	MTA, Keyed Square Post HeaderAssy, 4 pin	JU25	647123-4	00779
J2	MTA, Keyed Square Post HeaderAssy, 4 pin	JU25	647123-4	00779
J3	Conn, Plug, D-Sub, 25 pin, PWB Mt	JS12	K22X-B25P-NJ	63590

NAPI174**Power Module Interface PWB Assy, Low Power NX**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
J4	Conn,Edge Card,88 Contacts,Dual Row,30u Gold, M3	JN59	346-088-620-207	31781
J5	Conn,Edge Card,88 Contacts,Dual Row,30u Gold, M3	JN59	346-088-620-207	31781
J6	Conn, Edge Card, 3A, 12 Contacts, Dual Row, 30u Gold M3	JN69	346-012-620-207(RoHS)	31781
J7	Conn, Edge Card, 3A, 12 Contacts, Dual Row, 30u Gold M3	JN69	346-012-620-207(RoHS)	31781
K1	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338
K2	Installed at Next Higher Assy	+	INSTALLED AT NEXT HIGHER ASSY	37338
R01	Resistor, Film, 120K Ohms, 2PC1/2W	RD20	RL20S124G	35005
R02	Resistor, MF, 33.2K Ohms, 1PC1/4W	RAB43	MF1/4DL3322F	59124
R03	Resistor, MF, 10.0 Ohms, 1PC 1/4W	RAB01	MF1/4DL10R0F	59124
R04	Resistor, Film, 120K Ohms, 2PC1/2W	RD20	RL20S124G	35005
R05	Resistor, MF, 10.0 Ohms, 1PC 1/4W	RAB01	MF1/4DL10R0F	59124
R06	Resistor, Film, 100K Ohms, 5%, 2W	RBP25	GS-3, 100K OHMS	75042
R07	Not Used	-	NOT USED	37338
R08	Not Used	-	NOT USED	37338
R09	Not Used	-	NOT USED	37338
R10	Resistor, Film, 100K Ohms, 5%, 2W	RBP25	GS-3, 100K OHMS	75042
R11	Resistor, MF, 56.2 Ohms, 1PC 1/4W	RAB10	MF1/4DL56R2F	59124
R12	Resistor, MF, 56.2 Ohms, 1PC 1/4W	RAB10	MF1/4DL56R2F	59124
R13	Not Used	-	NOT USED	37338
R14	Not Used	-	NOT USED	37338
R15	Not Used	-	NOT USED	37338
R16	Resistor, MF, 56.2 Ohms, 1PC 1/4W	RAB10	MF1/4DL56R2F	59124
R17	Resistor, MF, 56.2 Ohms, 1PC 1/4W	RAB10	MF1/4DL56R2F	59124
R18	Resistor, Film, 100K Ohms, 5%, 2W	RBP25	GS-3, 100K OHMS	75042
R19	Resistor, Film, 100K Ohms, 5%, 2W	RBP25	GS-3, 100K OHMS	75042
RT1	Thermistor, PTC, .12-.19 Ohms, 1.35A Hold	RX09	RXE135	4G927
RT2	Thermistor, PTC, .12-.19 Ohms, 1.35A Hold	RX09	RXE135	4G927
XF1	Fuse Clip, 13/32 Dia Fuse, PWB Mt	FC27	1A3400-09	71400
XF2	Fuse Clip, 13/32 Dia Fuse, PWB Mt	FC27	1A3400-09	71400



REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C01	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C02	Cap,SMT,Ceramic,1000pF,2%,50V,C0G,0805	CCFS42	C0805C102G5GAC	31433
C03	Cap,SMT,Ceramic,1000pF,2%,50V,C0G,0805	CCFS42	C0805C102G5GAC	31433
C04	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C05	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C06	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C07	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C08	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C09	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C10	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C11	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C12	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C13	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C14	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C15	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C16	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C17	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C18	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C19	Cap, SMT, Ceramic, 10uF, 10%,50V, 2220	CCFS72	22205C106KAT2A(Ro HS)	27604
C20	Cap,SMT,Ceramic,10000pF,5%,50V,COG, 1206	CCFS82	C3216C0G1H103J060 AA(RoHS)	
C21	Not Used	-	NOT USED	37338
C22	Not Used	-	NOT USED	37338
C23	Cap,SMT,Ceramic,220pF,2%,50V,C0G,0603	CCFS34	C0603C221G5GAC	31433
C24	Cap,SMT,Ceramic,100pF,2%,50V,C0G,0603	CCFS32	C0603C101G5GAC	31433
C25	Cap,SMT,Ceramic,10000pF,5%,50V,COG, 1206	CCFS82	C3216C0G1H103J060 AA(RoHS)	
C26	Not Used	-	NOT USED	37338
C27	Not Used	-	NOT USED	37338
C28	Not Used	-	NOT USED	37338
C29	Cap, SMT, Ceramic, 10uF, 10%,50V, 2220	CCFS72	22205C106KAT2A(Ro HS)	27604
CR01	Diode,SMT,Schottky,30V,0.2A,SOD-323	QDSS01	BAT54HT1(STATIC)	04713
CR02	Diode,SMT,Schottky,30V,0.2A,SOD-323	QDSS01	BAT54HT1(STATIC)	04713
CR03	Diode,SMT,Schottky,30V,0.2A,SOD-323	QDSS01	BAT54HT1(STATIC)	04713
CR04	Diode,SMT,Schottky,30V,0.2A,SOD-323	QDSS01	BAT54HT1(STATIC)	04713
CR05	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR06	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
E01	Terminal, PWB, 6-32, Vert	HR08	8191	91833

NAPP11**RF Sample PWB Assy - Directional Coupler, NX10**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
J01	Conn, Socket, D-Sub, 9 pin, PWB Mt	JQ34	K22-E9S-NJ	KYCON
L01	Inductor,SMT,2.2uH,600ma,1210	LS18	LQH32CN2R2M23	72982
L02	Inductor,SMT,2.2uH,600ma,1210	LS18	LQH32CN2R2M23	72982
R01	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R02	Not Used	-	NOT USED	37338
R03	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R04	Not Used	-	NOT USED	37338
R05	Resistor, SMT, 1000 Ohms, 5%,1W, 2512	RAD76	ERJ-1TYJ102U(STATIC)(R oHS)	
R06	Resistor,SMT,MF,825ohms,1%,1/10W,0603	RFFS37	RK73H1JLTD8250F	59124
R07	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R08	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R09	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R10	Resistor,Variable,Film,10kohm,1/2W, 25 turn	RW45	3299X-1-103LF(RoHS)	
R11	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R12	Not Used	-	NOT USED	37338
R13	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R14	Resistor,SMT,MF,182ohms,1%,1/10W,0603	RFFS29	RK73H1JLTD1820F	59124
R15	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R16	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R17	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R18	Resistor,SMT,MF,332ohms,1%,1/10W,0603	RFFS32	RK73H1JLTD3320F	59124
R19	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R20	Resistor,SMT,MF,0.0ohms,Jumper,0603	RFFS01	RK73Z1JLTD	59124
R21	Not Used	-	NOT USED	37338
R22	Not Used	-	NOT USED	37338
R23	Not Used	-	NOT USED	37338
R24	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	RFFS50	RK73H1JLTD1002F	59124
R25	Resistor,SMT,MF,1000ohms,1%,1/10W,0603	RFFS38	RK73H1JLTD1001F	59124
R26	Resistor,SMT,MF,475ohms,1%,1/10W,0603	RFFS34	RK73H1JLTD4750F	59124
R27	Resistor,2512 SMT,100 ohms,1%,1W,	RAD52	ERJ-1TYF101U	PANAS
R28	Resistor,SMT,MF,100ohms,1%,1/10W,0603	RFFS26	RK73H1JLTD1000F	59124
R29	Not Used	-	NOT USED	37338
R30	Not Used	-	NOT USED	37338
T01	Transformer, Gate Drive, HighFreq	TZ74	P0584	01961
U01	IC,SMT,Amp,35MHz,CurrentFeedback 1.1A,TO263-7	UT90	LT1210CR(STATIC)	64155
U02	IC,SMT,Amp,35MHz,CurrentFeedback 1.1A,TO263-7	UT90	LT1210CR(STATIC)	64155
U03	IC,SMT,Amp,35MHz,CurrentFeedback 1.1A,TO263-7	UT90	LT1210CR(STATIC)	64155



REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C01	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C02	Cap,SMT,Ceramic,1000pF,2%,50V,C0G,0805	CCFS42	C0805C102G5GAC	31433
C03	Cap,SMT,Ceramic,1000pF,2%,50V,C0G,0805	CCFS42	C0805C102G5GAC	31433
C04	Not Used	-	NOT USED	37338
C05	Not Used	-	NOT USED	37338
C06	Not Used	-	NOT USED	37338
C07	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C08	Not Used	-	NOT USED	37338
C09	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C10	Cap, SMT, Ceramic, 0.1uF, 10%25V X7R, 0603	CCFS52	C0603C104K3RAC	31433
C11	Cap,SMT,Ceramic,1uF,10%,25V,,X7R,1206	CCFS10	C1206C105K3RAC	31433
C12	Not Used	-	NOT USED	37338
C13	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	CCFS07	C0805C104K5RAC	31433
C14	Not Used	-	NOT USED	37338
C15	Not Used	-	NOT USED	37338
C16	Not Used	-	NOT USED	37338
C17	Not Used	-	NOT USED	37338
C18	Not Used	-	NOT USED	37338
C19	Cap, SMT, Ceramic, 10uF, 10%,50V, 2220	CCFS72	22205C106KAT2A(Ro HS)	27604
C20	Cap, SMT, Ceramic, 4700pF, 5%,50V,COG, 1206	CFS02	C3216C0G1H472J060 AA(RoHS)	
C21	Cap, SMT, Ceramic, 4700pF, 5%,50V,COG, 1206	CFS02	C3216C0G1H472J060 AA(RoHS)	
C22	Not Used	-	NOT USED	37338
C23	Not Used	-	NOT USED	37338
C24	Not Used	-	NOT USED	37338
C25	Not Used	-	NOT USED	37338
C26	Not Used	-	NOT USED	37338
C27	Not Used	-	NOT USED	37338
C28	Not Used	-	NOT USED	37338
C29	Cap, SMT, Ceramic, 10uF, 10%,50V, 2220	CCFS72	22205C106KAT2A(Ro HS)	27604
CR01	Not Used	-	NOT USED	37338
CR02	Not Used	-	NOT USED	37338
CR03	Not Used	-	NOT USED	37338
CR04	Not Used	-	NOT USED	37338
CR05	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
CR06	Suppressor, Transient Voltage,SMT 60V Clamp	QR70	0603ESDA-TR1(RoHS)	71400
E01	Terminal, PWB, 6-32, Vert	HR08	8191	91833

NAPP11/02A**RF Sample PWB Assy, RF Volt and Current Sample, NX10**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
J01	Conn, Socket, D-Sub, 9-Pin, Vertical PWB	JS50	164A16669X	C3057
L01	Inductor, SMT, 2.2uH, 600ma, 1210	LS18	LQH32CN2R2M23	72982
L02	Inductor, SMT, 2.2uH, 600ma, 1210	LS18	LQH32CN2R2M23	72982
R01	Not Used	-	NOT USED	37338
R02	Resistor, SMT, MF, 0.0ohms, Jumper, 0603	RFFS01	RK73Z1JLTD	59124
R03	Not Used	-	NOT USED	37338
R04	Resistor, SMT, MF, 0.0ohms, Jumper, 0603	RFFS01	RK73Z1JLTD	59124
R05	Resistor, SMT, 1000 Ohms, 5%, 1W, 2512	RAD76	ERJ-1TYJ102U(STATIC)(R0HS)	
R06	Not Used	-	NOT USED	37338
R07	Not Used	-	NOT USED	37338
R08	Resistor, SMT, MF, 10.0Kohms, 1%, 1/10W, 0603	RFFS50	RK73H1JLTD1002F	59124
R09	Not Used	-	NOT USED	37338
R10	Not Used	-	NOT USED	37338
R11	Resistor, SMT, MF, 0.0ohms, Jumper, 0603	RFFS01	RK73Z1JLTD	59124
R12	Resistor, SMT, MF, 221ohms, 1%, 1/10W, 0603	RFFS30	RK73H1JLTD2210F	59124
R13	Not Used	-	NOT USED	37338
R14	Not Used	-	NOT USED	37338
R15	Resistor, SMT, MF, 1000ohms, 1%, 1/10W, 0603	RFFS38	RK73H1JLTD1001F	59124
R16	Not Used	-	NOT USED	37338
R17	Not Used	-	NOT USED	37338
R18	Not Used	-	NOT USED	37338
R19	Resistor, SMT, MF, 10.0Kohms, 1%, 1/10W, 0603	RFFS50	RK73H1JLTD1002F	59124
R20	Not Used	-	NOT USED	37338
R21	Not Used	-	NOT USED	37338
R22	Resistor, SMT, MF, 0.0ohms, Jumper, 0603	RFFS01	RK73Z1JLTD	59124
R23	Resistor, SMT, MF, 0.0ohms, Jumper, 0603	RFFS01	RK73Z1JLTD	59124
R24	Not Used	-	NOT USED	37338
R25	Not Used	-	NOT USED	37338
R26	Not Used	-	NOT USED	37338
R27	Not Used	-	NOT USED	37338
R28	Resistor, SMT, MF, 0.0ohms, Jumper, 0603	RFFS01	RK73Z1JLTD	59124
R29	Not Used	-	NOT USED	37338
R30	Resistor, SMT, MF, 0.0ohms, Jumper, 0603	RFFS01	RK73Z1JLTD	59124
T01	Not Used	-	NOT USED	37338
U01	Not Used	-	NOT USED	37338
U02	IC, SMT, Amp, 35MHz, Current Feedback 1.1A, TO263-7	UT90	LT1210CR(STATIC)	64155
U03	Not Used	-	NOT USED	37338



NARA65A**Final Assy, NX10, RLS 2**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
A01	Rectifier Assy, NX5 & NX10	212-7055	212-7055	37338
A02	B+ Distribution Assy, NX10	212-7120	212-7120	37338
A02R1	Resistor,Cap Discharge,27Komhs5%,13W	RC44	UP10SR-27K-J	4TKQ5
A02R4	Resistor,Cap Discharge,27Komhs5%,13W	RC44	UP10SR-27K-J	4TKQ5
A03	UI Interface PWB Assy (NVLT)	NAPI142A	219-4070-01	37338
A04	Control/Interface PWB Assy,Low Power NX	NAPC168A	212-2030-01	37338
A05	Digital AM Exciter PWB Assy	NAPE78A/01	207-3050-03	37338
A06	See Sales Order - Exciter PWB	NAPE%	NAPE%	37338
A07	See Sales Order	%	% SEE SALES ORDER	37338
A08	See Sales Order	%	% SEE SALES ORDER	37338
A09	Rack Interface PWB Assy,Low Power NX	NAPI173A	212-4064-01	37338
A10	Power Module Interface PWB Assy, Low Power NX	NAPI174	212-4020	37338
A10A1	Gas Discharge PWB Assy	207-6045-01	207-6045-01	37338
A10A2	Gas Discharge PWB Assy	207-6045-01	207-6045-01	37338
A10K1	RF Relay Mod, NX5 & NX10	212-1036-01	212-1036-01	37338
A10K2	RF Relay Mod, NX5 & NX10	212-1036-01	212-1036-01	37338
A11	Power Module Interface PWB Assy, Low Power NX	NAPI174	212-4020	37338
A11A1	Gas Discharge PWB Assy	207-6045-01	207-6045-01	37338
A11A2	Gas Discharge PWB Assy	207-6045-01	207-6045-01	37338
A11K1	RF Relay Mod, NX5 & NX10	212-1036-01	212-1036-01	37338
A11K2	RF Relay Mod, NX5 & NX10	212-1036-01	212-1036-01	37338
A12	RF Power Module Assy,NX Series	NAP39B	207-1100-02	37338
A13	RF Power Module Assy,NX Series	NAP39B	207-1100-02	37338
A14	RF Power Module Assy,NX Series	NAP39B	207-1100-02	37338
A15	RF Power Module Assy,NX Series	NAP39B	207-1100-02	37338
A16	Fan Tray Assy, NX5 & NX10	NAX274	212-8050	37338
A17	Fan Tray Assy, NX5 & NX10	NAX274	212-8050	37338
A18	Fan Tray Assy, NX5 & NX10	NAX274	212-8050	37338
A19	Fan Tray Assy, NX5 & NX10	NAX274	212-8050	37338
A20	RF Sample PWB Assy, RF Volt and Current Sample, NX10	NAPP11/02A	212-6290-05	37338
A21	Combiner Assy, NX10	NAH67	212-6010	37338
A22	Static Drain Choke Assy, NX5 & NX10	212-6280	212-6280	37338
A23	Directional Coupler Assy, NX10	NAFP112	212-6250	37338
A24	Arc Detector Assy	215-8060-01	215-8060-01	37338
A24U2	Sensor, Flame UV photo tube,for UB88	UB89	R9454	OJXJ4
C01	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
C02	See Master Work Order	*	* SEE MASTER WORK ORDER	37338



NARA65A**Final Assy, NX10, RLS 2**

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
C03	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
C04	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
C05	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
C06	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
C07	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
C08	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
C09	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
C10	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
C11	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
C12	Capacitor, Ceramic, 25pF,+/-10%, 5000V	CCG54	HT53T250KA(RoHS)	
DS1	LED, Pilot Light, Amber, 230Vac	BAP44	LEDTECA220AC	
DS2	LED, Pilot Light, Amber, 230Vac	BAP44	LEDTECA220AC	
DS3	LED, Pilot Light, Amber, 230Vac	BAP44	LEDTECA220AC	
F01	Fuse, 5A, 250V, Slow, 5 x 20mm	FB44	0215005.	
F02	Fuse, 5A, 250V, Slow, 5 x 20mm	FB44	0215005.	
L01	Inductor, Choke, 10Mh, 30 ADC	TF45	214007	
L02	Inductor, Choke, 10Mh, 30 ADC	TF45	214007	
L03	L3 Coil Detail Assy NX5 & NX10	212-8036	212-8036	37338
L04	L4 Coil Detail Assy NX5 & NX10	212-8040	212-8040	37338
L05	L5 Top Strap, NX5 & NX10	212-8035	212-8035	37338
L05	L5 Bottom Strap, NX5 & NX10	212-8035-01	212-8035-01	37338
L06	L6 Coil Detail Assy NX5 & NX10	212-8042	212-8042	37338
T01	See Master Work Order	*	* SEE MASTER WORK ORDER	37338
U01	Power Supply, 15V, 240W, Univ.Input	UG102	SP-240-15	
U02	Power Supply, 48V, 336W, Univ.Input, PFC, Rem ON/OFF	UG103	HRPG-300-48	
U03	Display, 20x4 LCD, 3.3 - 5V,-20/+70	UW146	CFA735-TFK-KR(STATIC)(RoHS)	1E566
U04	Surge Arrester, 4000Vdc 10PC	UM33	GXH40	1C532
U05	Current Sensor, Hall effect,50A	UC97	HC-TF050V4B15	1AA44
XF01	Fuseholder, Panel, 10A, 250V, Type 5 x 20mm	BAP48	3455LF8	
XF02	Fuseholder, Panel, 10A, 250V, Type 5 x 20mm	BAP48	3455LF8	



NAX274

Fan Tray Assy, NX5 & NX10

REFDES	DESCRIPTION	NAUTEL #	VENDOR #	OEM CODE
A01	Fan Interface PWB Assy, NX5 &NX10	212-4070	212-4070	37338
B01	Fan, 80mm, Brushless, 48Vdc,EMI Caps, Tach w/conn	ZAP50	3115RL-07W-B79-E51(RoHS)	
B02	Fan, 80mm, Brushless, 48Vdc,EMI Caps, Tach w/conn	ZAP50	3115RL-07W-B79-E51(RoHS)	

SECTION 4.3: WIRING/CONNECTOR LISTS

This section contains the wiring information for the hard-wired assemblies of the transmitter, and applicable connector mating information.

Wiring Lists Provided

Wiring lists are provided in tabular format. [Table 4.3.1 on page 4.3.2](#) lists the tables containing wiring information. These tables provide non-printed wiring pattern, point-to-point (source and destination) interconnection information.

Wiring Lists Not Provided

Separate wiring lists are not provided for some assemblies, including:

- Assemblies that have a separate maintenance manual. Refer to the appropriate maintenance manual for detailed wiring information for these assemblies, if provided.
- Assemblies that have their wiring information shown in tables on their assembly detail drawing(s). Refer to the Mechanical Drawings section of this manual for detailed wiring information for these assemblies.

Connector Mating Information

Where applicable, a connector mating table is provided after the corresponding wiring list. [Table 4.3.2 on page 4.3.2](#) identifies all provided connector information.

Wire Colours

Every effort is made to manufacture assemblies using the wire colour shown in the **Color** column of the wiring list tables. Sometimes, a white wire will be substituted for the listed colour. In such cases, wires must be identified by their assigned numbers.

Printed Wiring Board Patterns

Printed wiring pattern information for printed wiring boards (PWBs) is beyond the scope of this manual, and therefore not provided.

Table 4.3.1: Wiring Lists Provided

TABLE #	Description
Table 4.3.3	Wiring List - NX10 Transmitter (page 4.3.2)
Table 4.3.5	Wiring List - B+ Distribution Assembly (Nautel Part # 211-7120) (page 4.3.7)

Table 4.3.2: Connector Mating Tables Provided

TABLE #	Description
Table 4.3.4	Connector Mating Information - NX10 Transmitter (page 4.3.6)
Table 4.3.6	Connector Mating Information - NAX274 Fan Tray Assembly (page 4.3.7)

Table 4.3.3: Wiring List - NX10 Transmitter

Source	Destination	Wire #	Color	Size	Remarks
T1 Load 0	P3	1	Grey	14	torque source 137 in-lb
T1 Load 1	A1U1-A	2	Grey	6	torque source 137 in-lb torque destination 60 in-lb
T1 Load 2	A1U1-B	3	Grey	6	torque source 137 in-lb torque destination 60 in-lb
T1 Load 3	A1U1-C	4	Grey	6	torque source 292 in-lb torque destination 60 in-lb
T1 Ground	E13	5	Grn/Yel	6	torque source 67 in-lb torque destination 60 in-lb
P1	A1U1-A	6	Grey	14	torque destination 60 in-lb
P2	A2K1-TB1-1	7	Grey	18	torque destination 6 in-lb
P2	U1-Line	8	Grey	18	torque destination 60 in-lb
T1 Load 0	DS1-X2	9	Grey	14	torque source 292 in-lb torque destination 7 in-lb
P4	A2K1-TB1-2	10	Grey	18	torque destination 6 in-lb
P4	U1-Neutral	11	Grey	18	torque destination 9.7 in-lb
DS1-X1	A1U1-A	12	Grey	14	torque source 7 in-lb torque destination 60 in-lb
DS1-X2	DS2-X2	13	Grey	14	torque source 7 in-lb torque destination 7 in-lb
DS2-X1	A1U1-B	14	Grey	14	torque source 7 in-lb torque destination 60 in-lb
DS2-X2	DS3-X2	15	Grey	14	torque source 7 in-lb torque destination 7 in-lb
DS3-X1	A1U1-C	16	Grey	14	torque source 7 in-lb torque destination 60 in-lb

Table 4.3.3: Wiring List - NX10 Transmitter

Source	Destination	Wire #	Color	Size	Remarks
A1U1-DC+	L1-E2	17	White	10	torque source 60 in-lb torque destination 19 in-lb
A1U1-DC+	L2-E1	18	White	10	torque source 60 in-lb torque destination 19 in-lb
A1U1-DC-	A2(C4-)	19	Black	6	torque source 60 in-lb torque destination 25 in-lb
A1U1-DC-	E1	20	Black	6	torque source 60 in-lb torque destination 137 in-lb
A1U1TB1-3	P13-23	21	White	20	
A1U1TB1-4	P6	22	White	22	
A1U1TB1-5	P13-19	23	White	22	
A1U1TB1-6	P14-12	24	White	22	
A1U1TB1-10	P13-3	25	Centre	22	1-Conductor
A1U1TB1-8	P13-11	25	Shield	-	Shielded
A1U1TB1-11	P13-15	26	Black	20	
A1U1TB1-13	P13-22	27	Centre	22	1-Conductor
A1U1TB1-14	P13-10	27	Shield	-	Shielded
A2F1E1	L1-E1	28	White	10	torque source 67 in-lb torque destination 19 in-lb
A2F1E1	L2-E2	29	White	10	torque source 67 in-lb torque destination 19 in-lb
A2(C1+)	A10E1	30	White	10	torque source 25 in-lb torque destination 20 in-lb
A2(C1-)	A10E2	31	Black	10	torque source 25 in-lb torque destination 20 in-lb
A2(C1+)	A11E1	32	White	10	torque source 25 in-lb torque destination 20 in-lb
A2(C1-)	A11E2	33	Black	10	torque source 25 in-lb torque destination 20 in-lb
P5	P14-11	34	White	22	
P7-1	P13-4	35	White	22	
P7-2	P13-16	36	White	22	
P7-3	P13-18	37	White	22	
P7-4	P13-6	38	Black	22	
U1-Line	U2-Line	39	Gray	18	torque source 9.7 in-lb torque destination 15 in-lb
U1-Neutral	U2-Neutral	40	Grey	18	torque source 9.7 in-lb torque destination 15 in-lb
U1-Gnd	E2	41	Grn/Yel	14	torque source 9.7 in-lb torque destination 19 in-lb

Table 4.3.3: Wiring List - NX10 Transmitter

Source	Destination	Wire #	Color	Size	Remarks
U1-V+	P15-1	42	White	10	torque source 9.7 in-lb
U1-V-	P15-2	43	Black	10	torque source 9.7 in-lb
U2-Line	P16-1	44	Grey	18	torque source 15 in-lb
U2-Neutral	P16-3	45	Grey	18	torque source 15 in-lb
U2-Gnd	E2	46	Grn/Yel	14	torque source 15 in-lb torque destination 19 in-lb
U2-V+	P14-3	47	White	20	torque source 16 in-lb
U2-V+	P14-16	48	White	20	torque source 16 in-lb
U2-V-	P14-1	49	Black	20	torque source 16 in-lb
U2-V-	P14-2	50	Black	20	torque source 16 in-lb
P8-6	P14-9	52	White	22	
P8-4	P14-5	53	White	22	
P9-1	P10-1	54	White	22	
P9-2	P10-2	55	White	22	
P9-3	P10-11	56	White	22	
P9-4	P10-12	57	White	22	
P9-5	P10-16	58	White	22	
P9-6	P10-15	59	Black	22	
P9-7	P10-10	60	White	22	
P9-8	P10-9	61	White	22	
P9-9	P10-13	62	White	22	
P11-1	P18-4	63	Centre	24	Coaxial Cable
P11-6	P18-1	63	Shield	-	
P11-2	P18-2	64	White	22	
P11-3	P18-7	65	Black	22	
P11-5	P18-6	66	White	22	
P11-7	P18-5	67	Centre	24	Coaxial Cable
P11-8	P18-8	67	Shield	-	
P12-5	P17-4	68	Centre	24	Coaxial Cable
P12-9	P17-1	68	Shield	-	
P12-4	P17-2	69	White	22	
P12-3	P17-7	70	Black	22	
P12-1	P17-6	71	White	22	
P12-8	P17-5	72	Centre	24	Coaxial Cable
P12-7	P17-8	72	Shield	-	
P14-18	P19-3	73	Centre	22	1-Conductor
P14-20	P19-1	73	Shield	-	Shielded

Table 4.3.3: Wiring List - NX10 Transmitter

Source	Destination	Wire #	Color	Size	Remarks
P14-21	P19-2	74	Centre	22	1-Conductor
P14-22	P19-1	74	Shield	-	Shielded
A20E1	C12E2	75	White	22	torque source 10 in-lb torque destination 2.5 in-lb
A22E1	E3	76	Yellow	14	torque source 5 in-lb torque destination 19 in-lb
A22E2	E4	77	Yellow	14	torque source 5 in-lb torque destination 19 in-lb
A23C1E1	E14	78	White	22	torque source 2.5 in-lb torque destination 19 in-lb
U4E2	E5	79	Yellow	18	torque destination 19 in-lb
E6	E7	80	Grn/Yel	2	torque source 170 in-lb torque destination 292 in-lb
E6	E12	81	Grn/Yel	2	torque source 170 in-lb torque destination 60 in-lb
E8	E9	82	Grn/Yel	14	torque source 19 in-lb torque destination 19 in-lb
E10	E11	83	Grn/Yel	14	torque source 19 in-lb torque destination 19 in-lb
E17	E16	84	Grn/Yel	14	torque source 19 in-lb torque destination 19 in-lb

Table 4.3.4: Connector Mating Information - NX10 Transmitter

Connector	Mate
P1	XF1-Line
P2	XF1-Load
P3	XF2-Line
P4	XF2-Load
P5	A2K1P1
P6	A2K1P2
P7	U5J1
P8	U2CN100
P9	A3J2
P10	U3H1
P11	A4J19A
P12	A4J19B
P13	A9J5
P14	A9J6
P15	A9J7
P16	A9J8
P17	A20J1
P18	A23A1J1
P19	A24U1J1
W1P1	A3J1
W1P2	A4J18
W2P1	A4J12A
W2P2	A12A1J1
W3P1	A4J12B
W3P2	A13A1J1
W4P1	A4J12C
W4P2	A14A1J1
W5P1	A4J12D
W5P2	A15A1J1
W6P1	A4J20
W6P2	A9J4
W7P1	A4J21
W7P2	A9J3

Table 4.3.5: Wiring List - B+ Distribution Assembly (Nautel Part # 212-7120)

Source	Destination	Wire #	Color	Size	Remarks
F1E2	C4+	-	White	10	torque source 67 in-lb torque destination 25 in-lb
F1E2	C4+	-	White	10	torque source 67 in-lb torque destination 25 in-lb
F1E2	K1-1	-	Yellow	14	torque source 67 in-lb torque destination 44 in-lb
K1-2	R5E1	-	Yellow	14	torque source 44 in-lb torque destination 20 in-lb
R5E2	A2E1	-	Yellow	14	torque source 20 in-lb torque destination 35 in-lb

Table 4.3.6: Connector Mating Information - NAX274 Fan Tray Assembly

Connector	Mate
B1P1	A1J1
B2P1	A1J3

SECTION 4.4: READING ELECTRICAL SCHEMATICS

This section contains electrical schematics and logic diagrams for the transmitter. Block diagrams, simplified electrical schematics, and logic diagrams may be included. Refer to [Table 4.4.1 on page 4.4.5](#) for an itemized listing.

Component Values

Unless otherwise specified on the logic or schematic diagram, the following defaults apply:

-  5 Capacitor values are shown in microfarads (uF) (e.g. 5 uF)
-  10 Resistor values are shown in ohms (e.g. 10 ohms; K = 1,000 and M = 1,000,000)
Resistor power ratings are not shown when less than 0.5 W
-  Unidentified diodes are part number BAS21HT1 (Nautel Part # QDRS01)
-  24V Unidentified transient suppressors are part number 0603E SDA-TR1 (Nautel Part # QR70)

Graphic and Logic Symbols

The graphic symbols used on electrical schematics are in accordance with American National Standard ANSI Y32.2-1975 - Graphic Symbols for Electrical and Electronic Diagrams.

The logic symbols used on electrical schematics and logic diagrams are in accordance with American National Standard ANSI Y32.14-1975 - Graphic Symbols for Logic Diagrams.

Reference Designations

Referenced designations were assigned in accordance with *American National Standard ANSI Y32.16-1975 - Reference Designations for Electrical and Electronic Parts and Equipment*.

Each electrical symbol is identified with its basic reference designation. To obtain the full reference designation for a specific part, prefix this basic identifier with the reference designation assigned to all higher assemblies. For example, the complete designation for a resistor (R1) on a printed wiring board (A1), that is part of a larger board (A2), would be A2A1R1.

Unique Symbols

Nautel uses unique symbols on electrical schematics to describe logic (two-state) signals. These signals differ from single-state signals or analog signals that may have multiple values.

Type of Inputs and Outputs

On electrical schematics, names used to describe logic (two-state) input and output signals are prefixed with a # symbol.

Logic Level Convention

The # prefix identifies an input or output signal that has two distinct states: high and low.

The suffix on an input or output signal name identifies the active (true) state of the signal. The high suffix (+) indicates the more positive of the two levels used to represent the logic states. The low suffix (-) indicates the less positive of the two levels.

Two types of logic, positive and negative, may be represented on a particular schematic. In positive logic, high represents the active (true) state, and low represents the inactive (false) state. In negative logic, low represents the active (true) state, and high represents the inactive (false) state.

Identifying Schematic Diagrams

Each electrical schematic in this section is identified by a number that is both the figure number and the page number. The numbers are assigned sequentially and are prefixed by the letters SD. The electrical schematics and logic diagrams included in this section are listed in [Table 4.4.1 on page 4.4.5](#).

Structure of Schematics

The electrical schematics are structured in a hierarchical format that is based on function and signal flow. Wherever practical, the signal flow is from left to right. Normally, inputs originate on the left-hand side and outputs extend to the right-hand side. Exceptions are shown by an arrow indicating the direction of signal flow.

NOTE: The physical location of a part or assembly was not necessarily a factor during creation of the schematic. The full reference designation assigned to a part or assembly, in conjunction with the family tree (see [Section 4.2, "Parts Lists" on page 4.2.1](#)) and the assembly detail drawings (see [Section 4.5, "Mechanical Drawings" on page 4.5.1](#)), will identify its location.

Figures SD-1 through SD-5 identify each major stage and its detailed interconnection. Each stage contains cross-references that identify which blocks are the signal sources for inputs, or the destinations for outputs.

When a sub-function is treated as a block in figures SD-1 through SD-5, its detailed circuit information is included in its own schematic drawing(s), which is also included in this section.

Locating Schematic Diagram(s) for a Functional Block

The text inside a functional block provides the key to locating its schematic diagram(s).

1. When a functional block is assigned a reference designation (e.g., A2A1), refer to the family trees in [Section 4.2, "Parts Lists" on page 4.2.1](#). Follow the family tree branches to the block that contains the desired reference designation, and associated Nautel nomenclature (e.g., NAPA34B Modulator/Power Amplifier PWB). Note the reference designations and Nautel nomenclatures of all higher assemblies in the path.
Example: A12 NAP39B RF Power Module > A12A1 NAPA34B Modulator/Power Amplifier PWB.
2. Refer to [Table 4.4.1 on page 4.4.5](#) and use the reference designation and Nautel nomenclature to identify the appropriate schematic diagram(s).
Example: NAPA34B Modulator/Power Amplifier PWB shown on schematics SD-21 and SD-22.
3. If necessary, refer to the referenced figure (e.g., SD-21 or SD-22) in the schematics at the end of this section and locate the next, lower-level assembly. Then, repeat this procedure until the desired schematic diagram is found.

Locating a Part or Assembly on a Schematic

The full reference designation assigned to a part or assembly is the key to physically locating that part or assembly.

NOTE: Full reference designations contain the assembly hierarchical coding. When the end item is divided into units (cabinets), the first coding is a unit number (1, 2, 3, etc.). When the end item is divided into assemblies, the first coding is an assembly number (A1, A2, A3, etc.). If a unit or an assembly is divided into sub-assemblies, assembly coding that identifies assembly relationship (1A1, A2A1, A2A1A1, etc.) is added.

1. Refer to the family trees in [Section 4.2, "Parts Lists" on page 4.2.1](#).
2. Follow the family tree branches to the block that contains the desired reference designation, while noting the Nautel nomenclatures and names of all higher assemblies in the path. Example: A12 NAP39B RF Power Module > A12A1 NAPA34B Modulator/Power Amplifier PWB.

NOTE: The drawings in the Mechanical Drawings section depict the assembly detail of the transmitter and its modules and assemblies

3. Refer to [Table 6.1 in Section 6, "Mechanical Drawings" on page 1.6.1](#). Use the Nautel nomenclature and name of each family tree block in the path, starting at the highest assembly – this is normally Figure MD-1 – to determine the figure number(s) for that assembly. Example: The NAPA34B Modulator/Power Amplifier PWB is shown on MD-11 and MD-12.
4. Refer to the referenced figure (e.g., MD-11 or MD-12) in [Section 6.1, "List of Mechanical Drawings" on page 1.6.2](#) to locate the desired part or assembly.

Table 4.4.1: List of Electrical Schematics

Figure #	Title
SD-1	NX10 Transmitter - Ac-Dc Power Stage
SD-2	NX10 Transmitter - Exciter Stage
SD-3	NX10 Transmitter - Control/Monitor Stage
SD-4	NX10 Transmitter - RF Power Stage (Sheet 1 of 2)
SD-5	NX10 Transmitter - RF Power Stage, RF Output Filter (Sheet 2 of 2)
SD-6	NAPI142A UI Interface PWB
SD-7	NAPC168 Control/Interface PWB (Sheet 1 of 9)
SD-8	NAPC168 Control/Interface PWB (Sheet 2 of 9)
SD-9	NAPC168 Control/Interface PWB (Sheet 3 of 9)
SD-10	NAPC168 Control/Interface PWB (Sheet 4 of 9)
SD-11	NAPC168 Control/Interface PWB (Sheet 5 of 9)
SD-12	NAPC168 Control/Interface PWB (Sheet 6 of 9)
SD-13	NAPC168 Control/Interface PWB (Sheet 7 of 9)
SD-14	NAPC168 Control/Interface PWB (Sheet 8 of 9)
SD-15	NAPC168 Control/Interface PWB (Sheet 9 of 9)
SD-16	NAPX46 GPS Sync PWB (Optional)
SD-17	NAPI173 Rack Interface PWB (Sheet 1 of 3)
SD-18	NAPI173 Rack Interface PWB (Sheet 2 of 3)
SD-19	NAPI173 Rack Interface PWB (Sheet 3 of 3)
SD-20	NAPI174 Power Module Interface PWB
SD-21	NAP39B RF Power Module and NAPA34B Modulator/Power Amplifier PWB (Sheet 1 of 2)
SD-22	NAP39B RF Power Module and NAPA34B Modulator/Power Amplifier PWB (Sheet 2 of 2)
SD-23	NAPP11/02 RF Voltage and Current Sample PWB
SD-24	NAPP11 Directional Coupler PWB

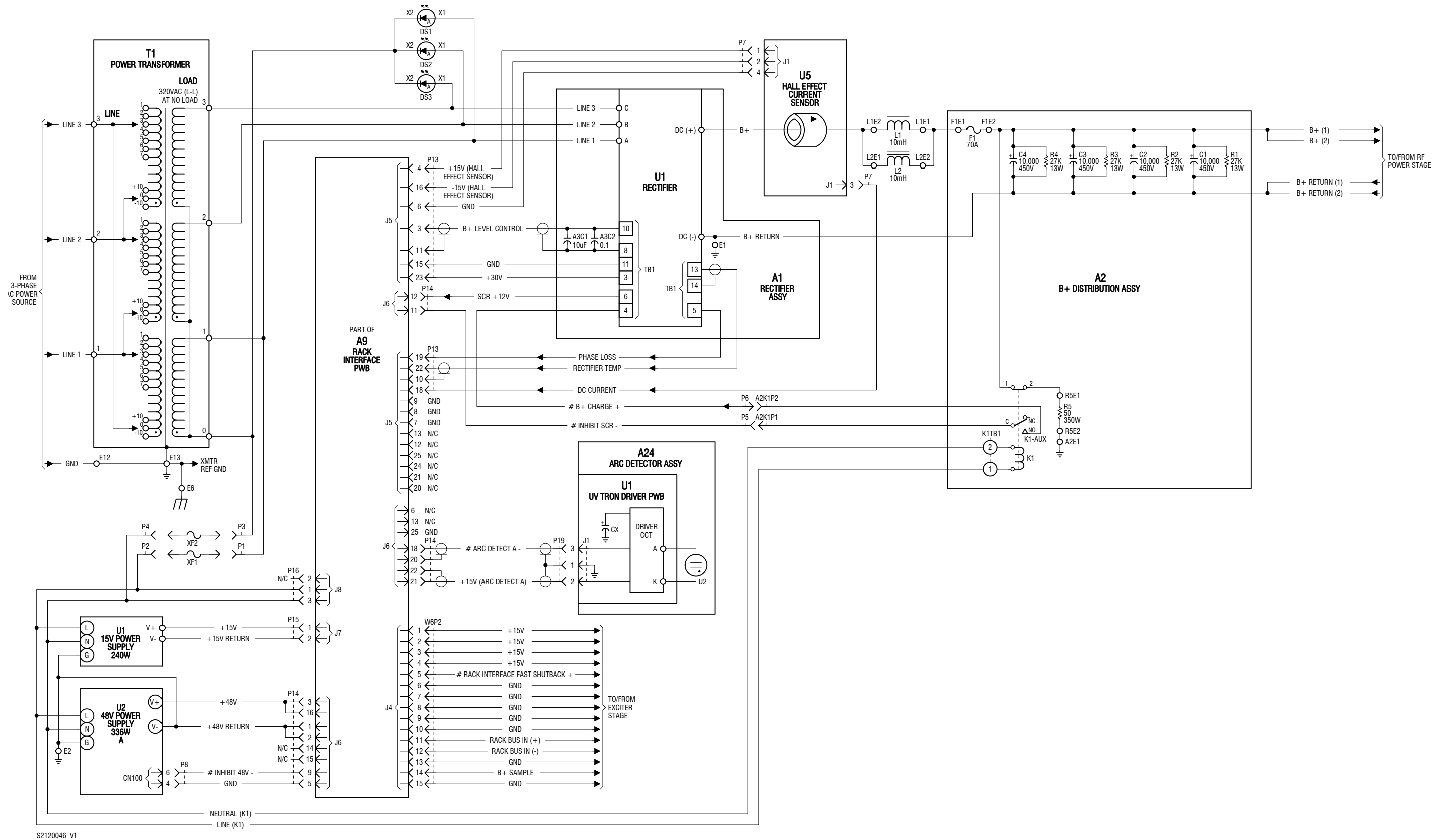
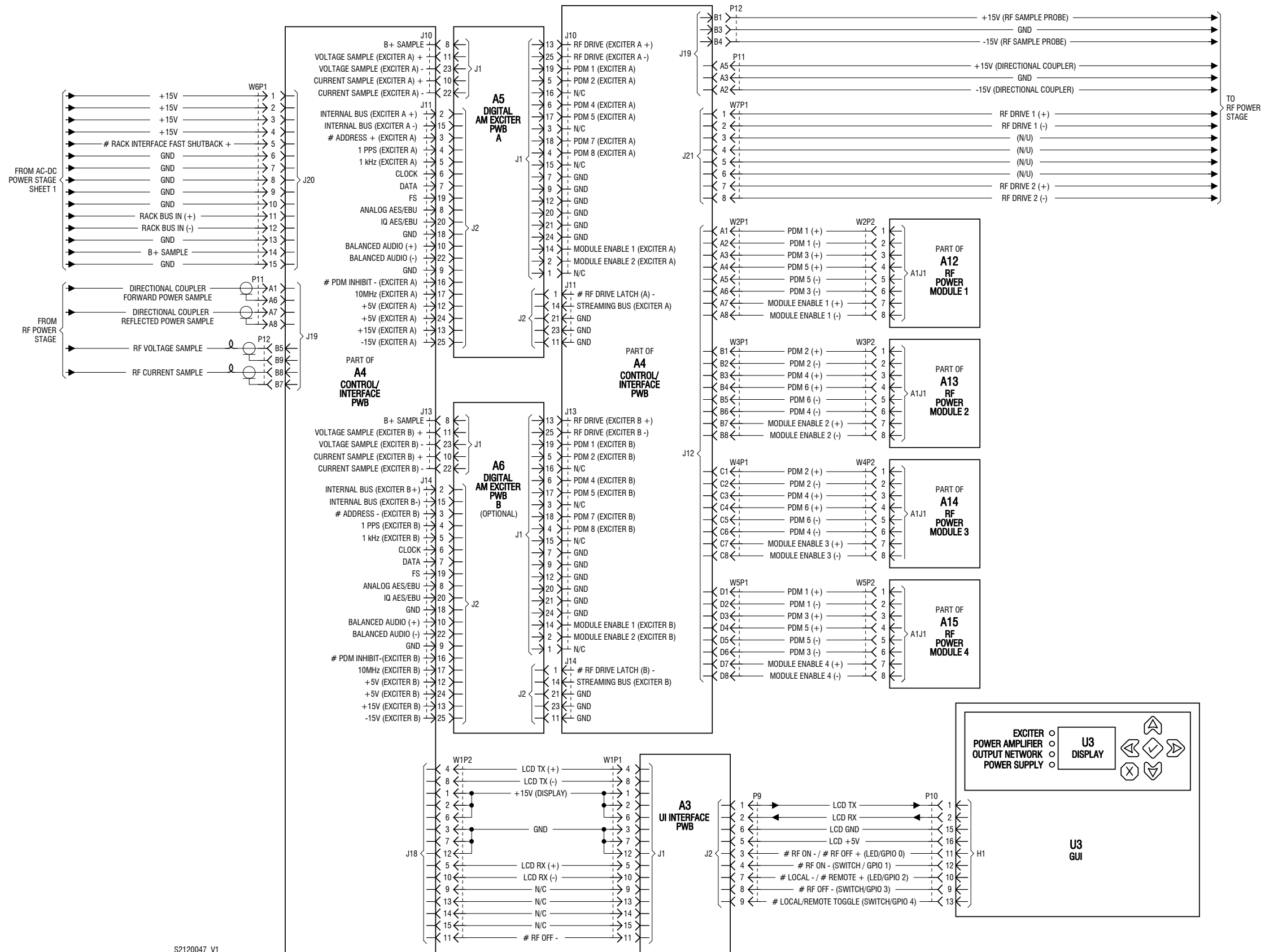


Figure SD-1: NX10 Transmitter - Ac-Dc Power Stage



S2120047 V1

Figure SD-2: NX10 Transmitter - Exciter Stage

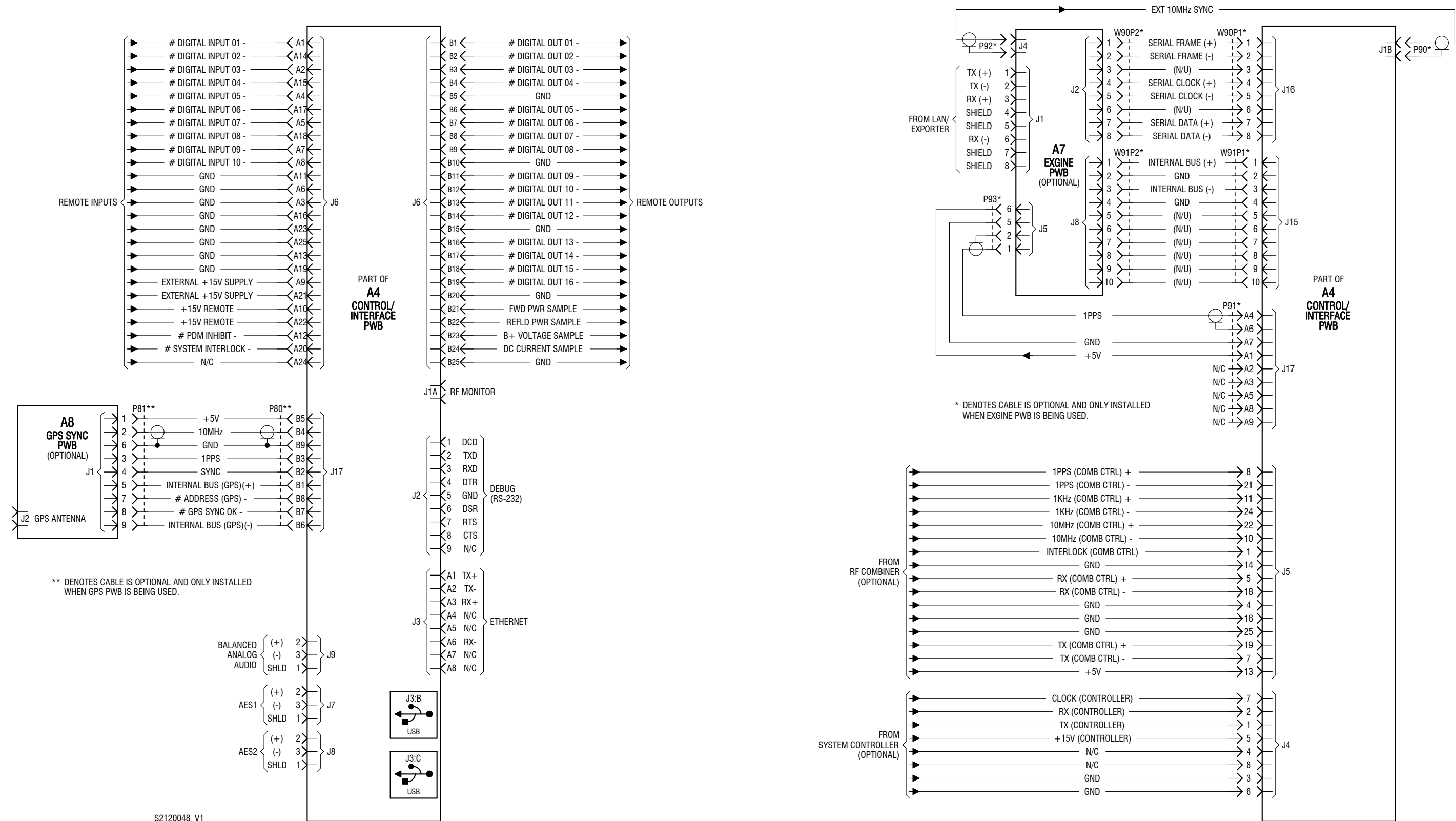


Figure SD-3: NX10 Transmitter - Control/Monitor Stage

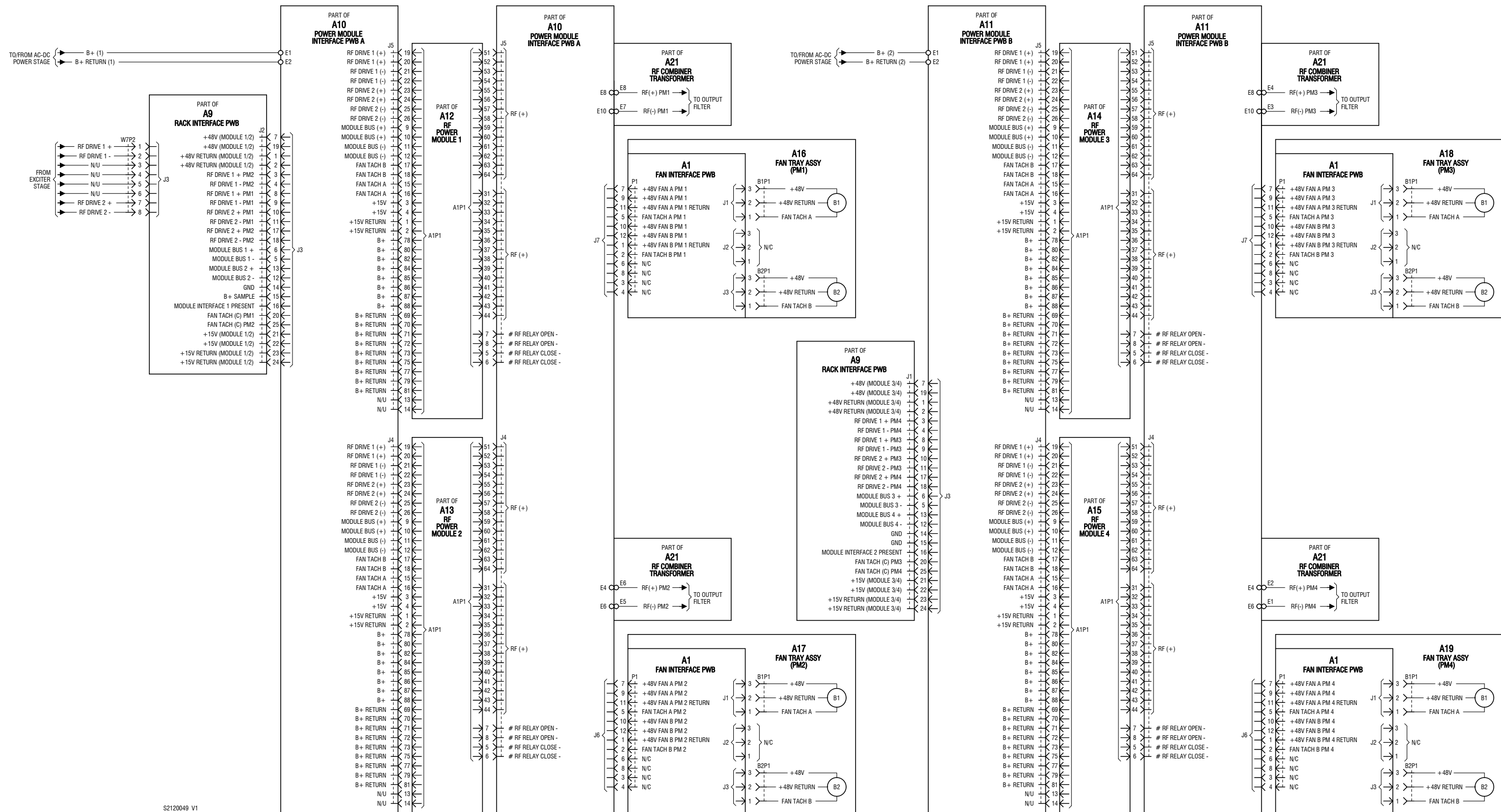


Figure SD-4: RF Power Stage, RF Power Block (Sheet 1 of 2)

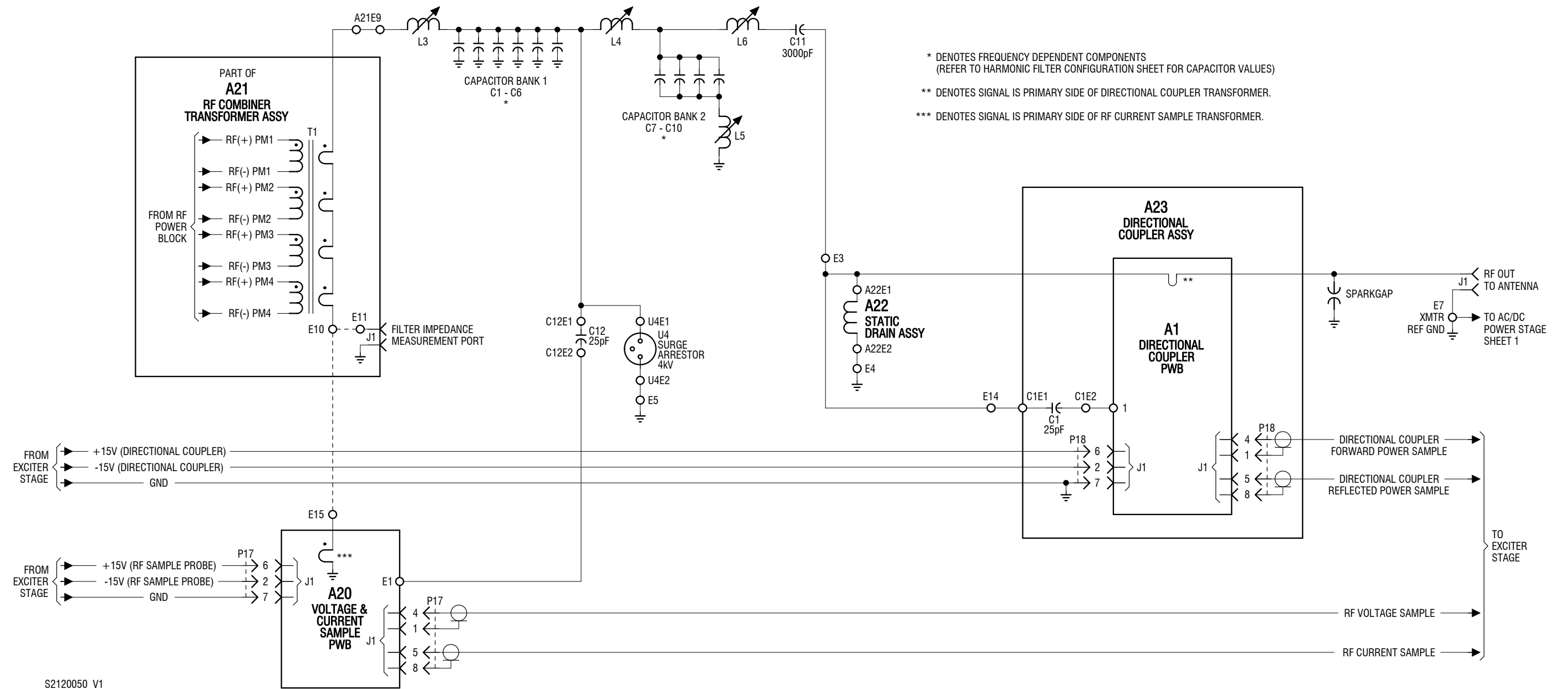


Figure SD-5: RF Power Stage, RF Output Filter (Sheet 2 of 2)

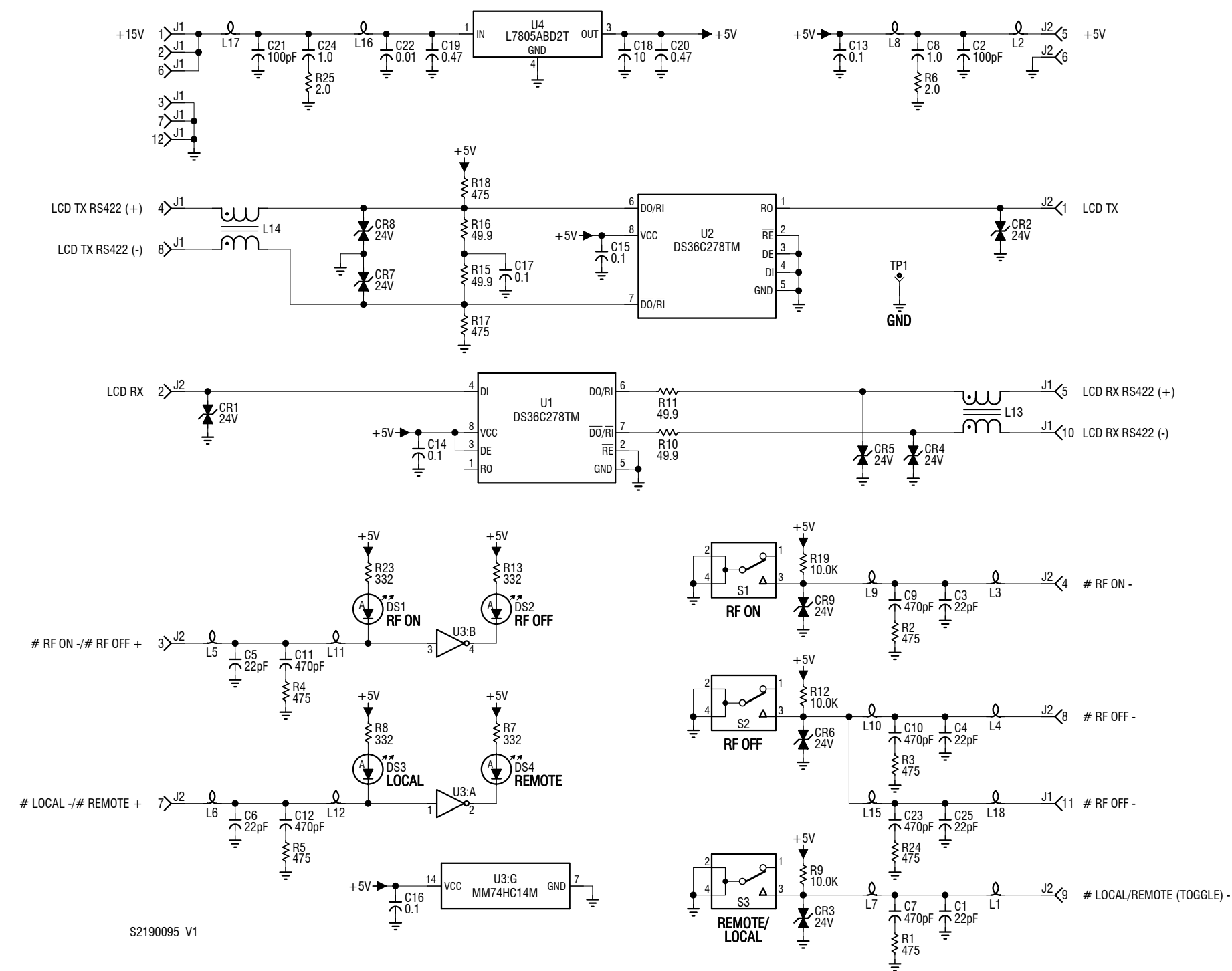


Figure SD-6: NAPI142A UI Interface PWB

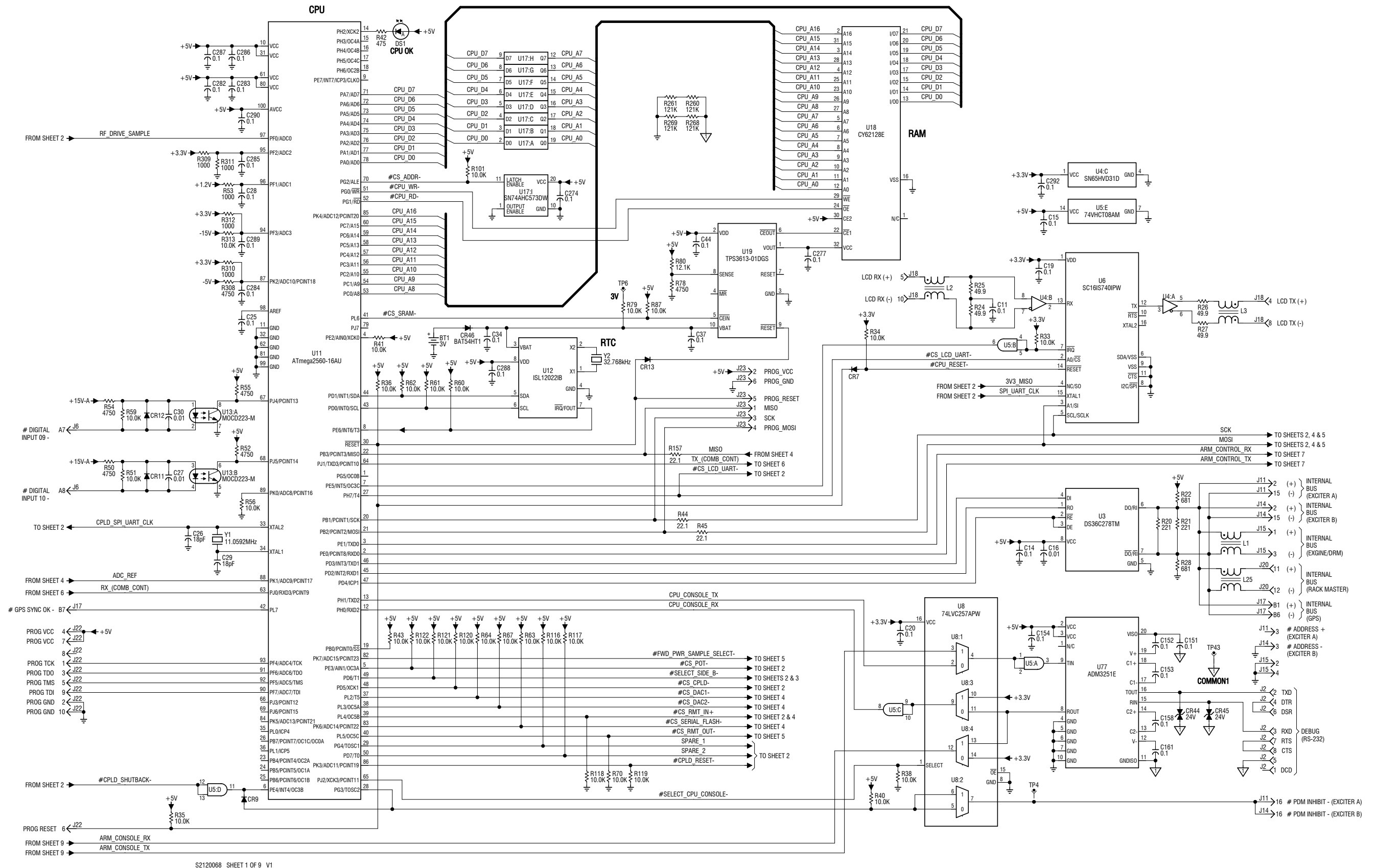


Figure SD-7: NAPC168A Control/Interface PWB (Sheet 1 of 9)

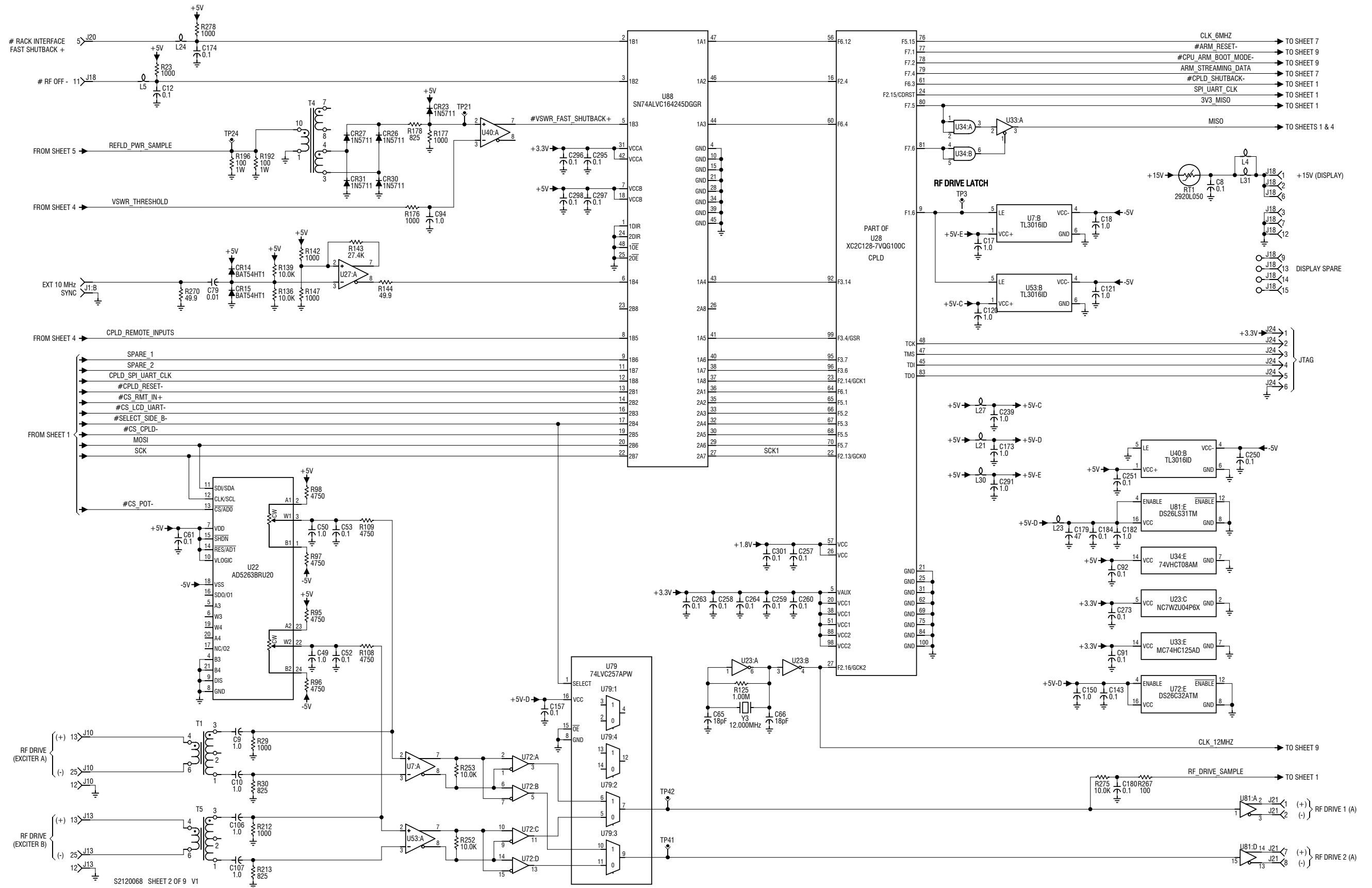


Figure SD-8: NAPC168A Control/Interface PWB (Sheet 2 of 9)

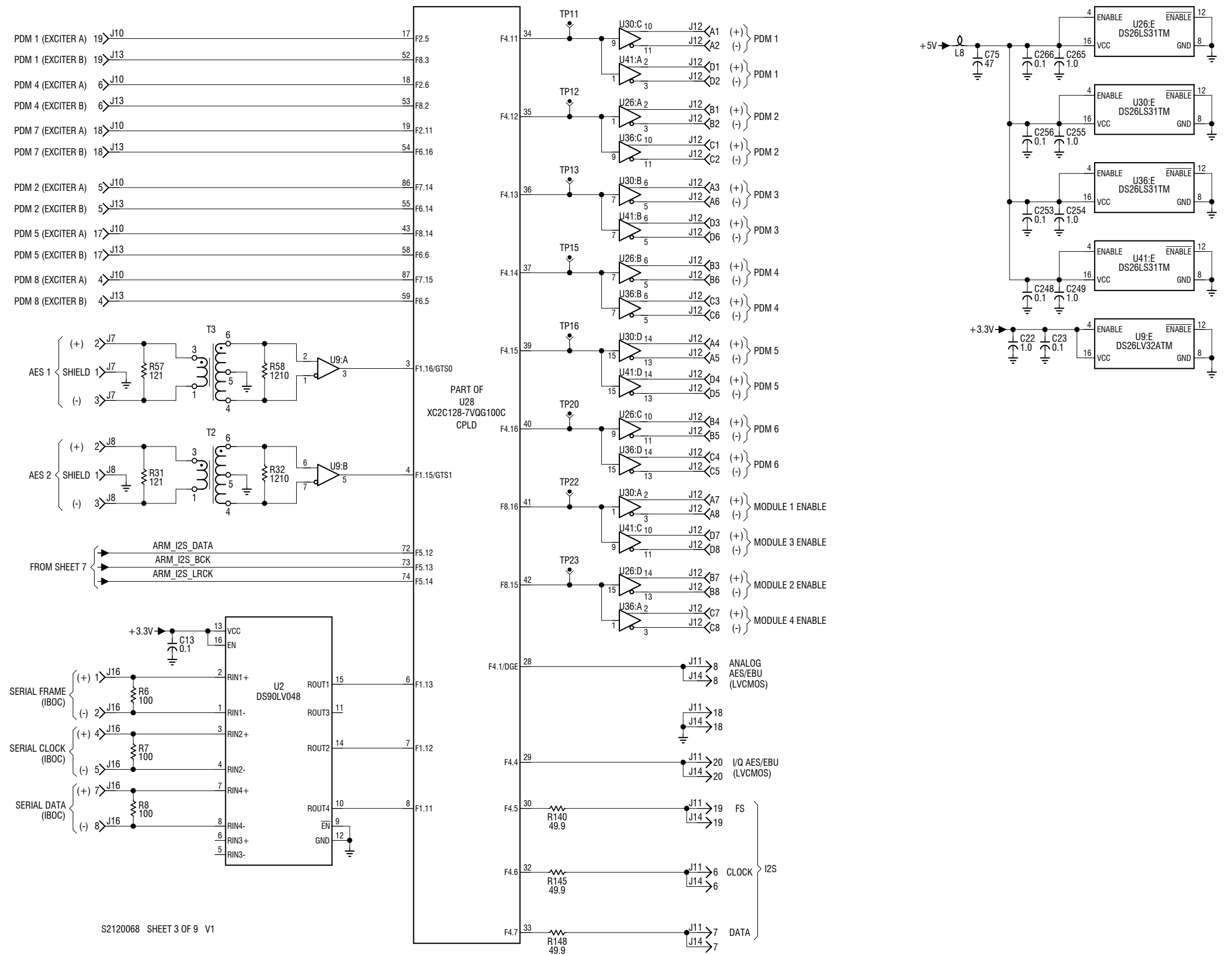
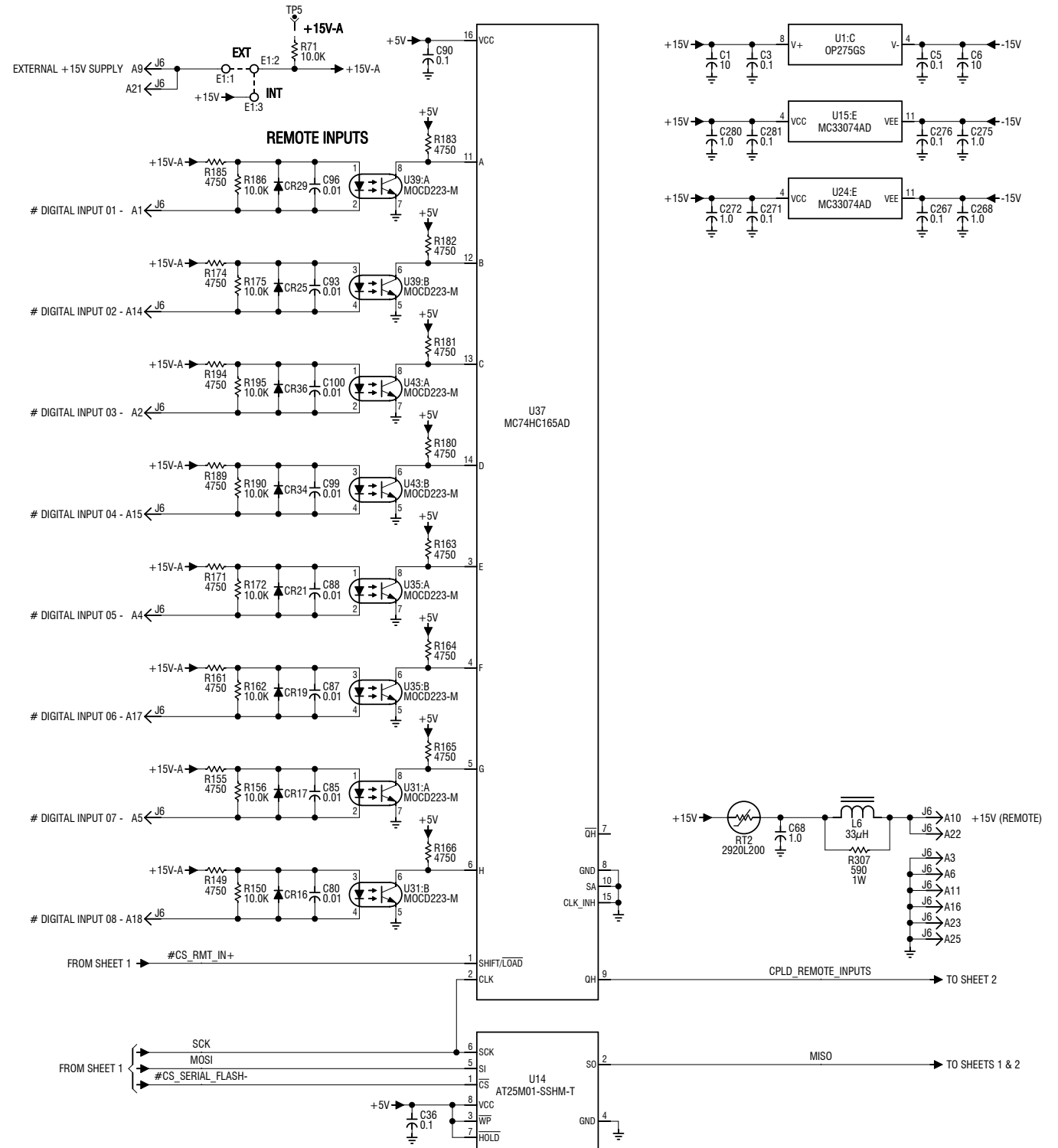
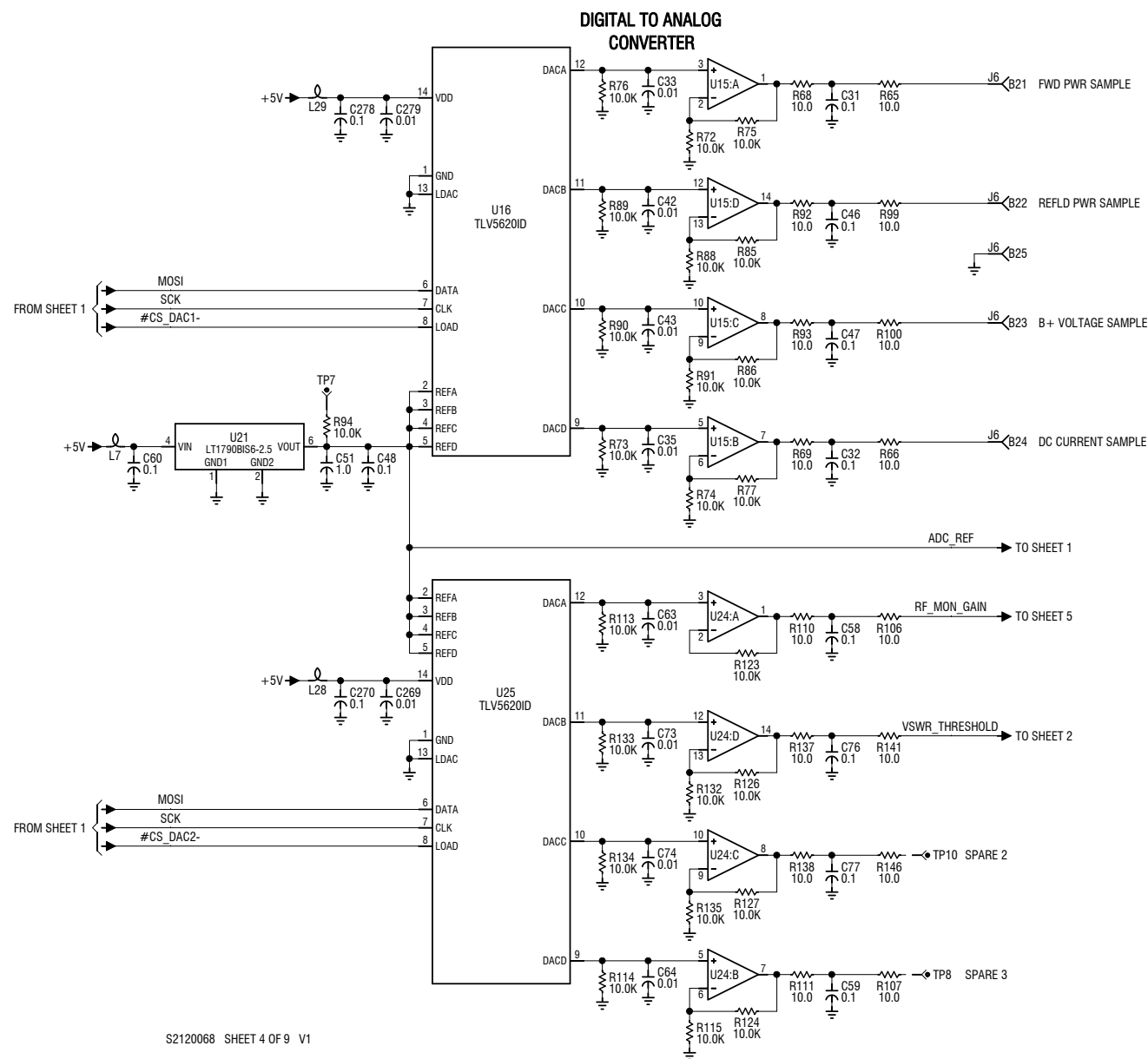
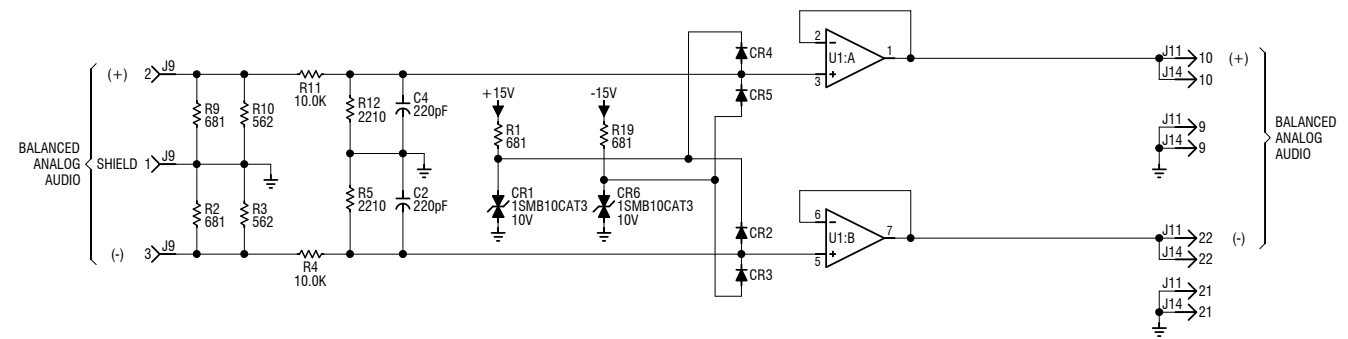


Figure SD-9: NAPC168A Control/Interface PWB (Sheet 3 of 9)



S2120068 SHEET 4 OF 9 V1

Figure SD-10: NAPC168A Control/Interface PWB (Sheet 4 of 9)

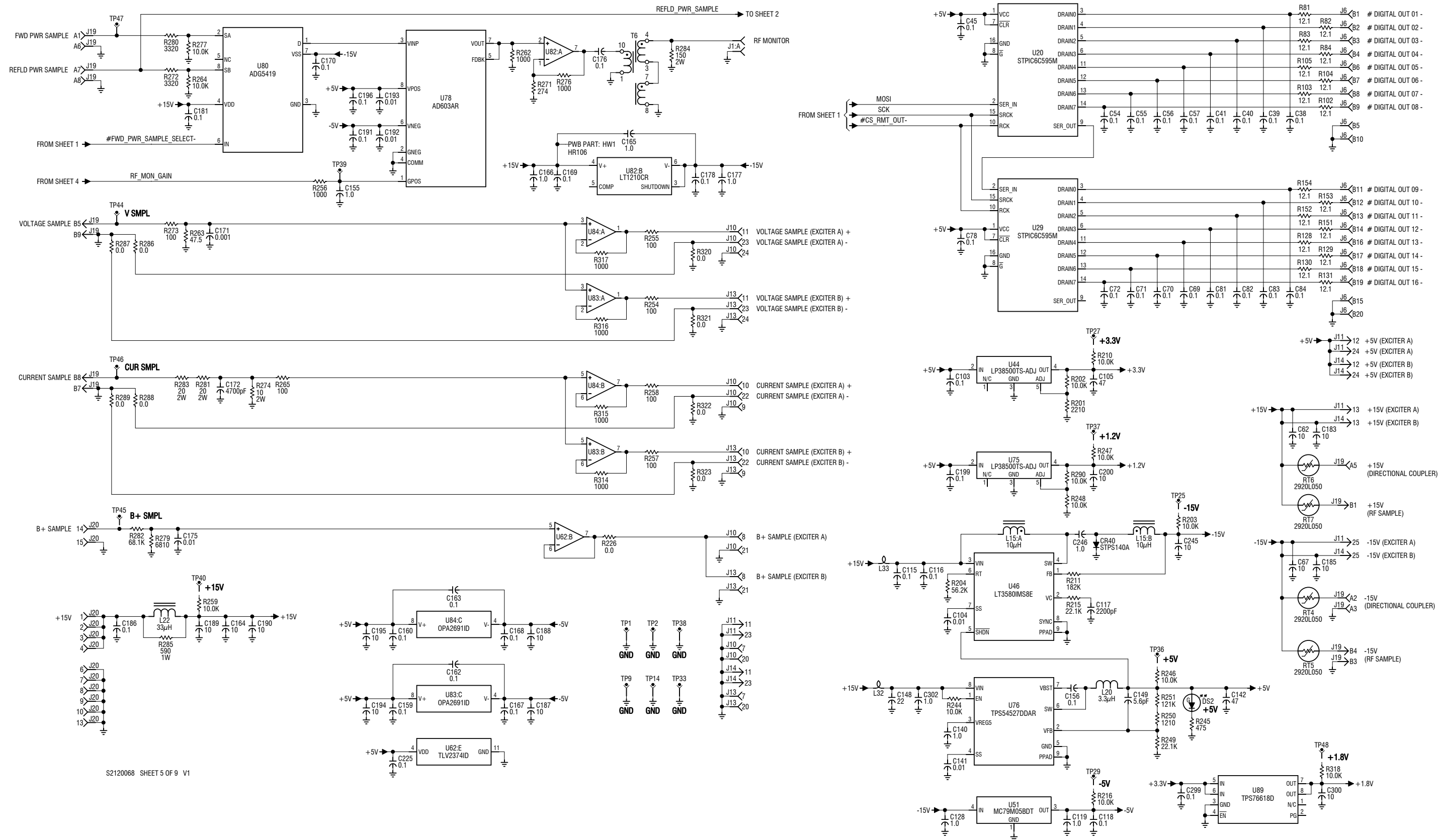


Figure SD-11: NAPC168A Control/Interface PWB (Sheet 5 of 9)

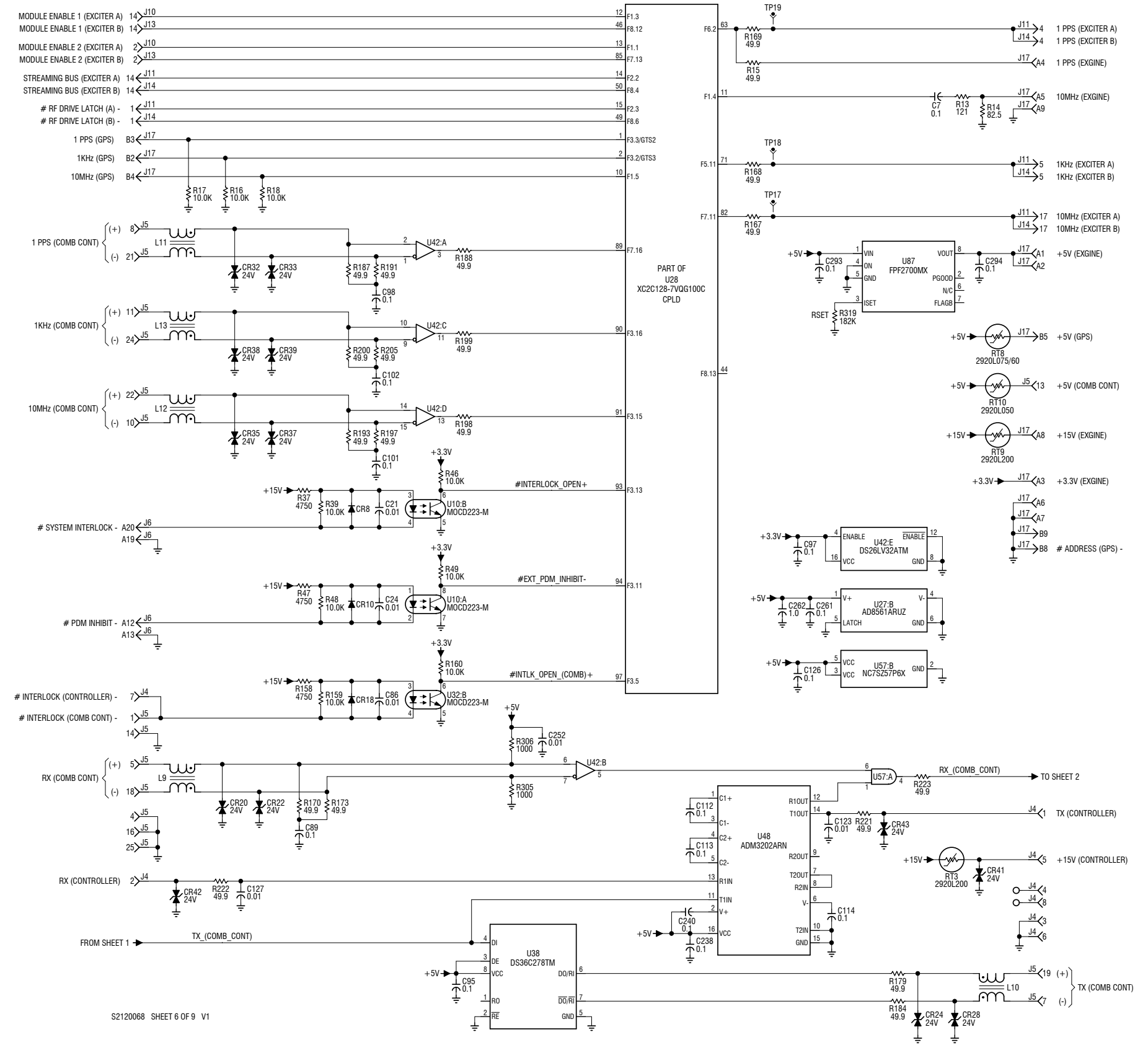
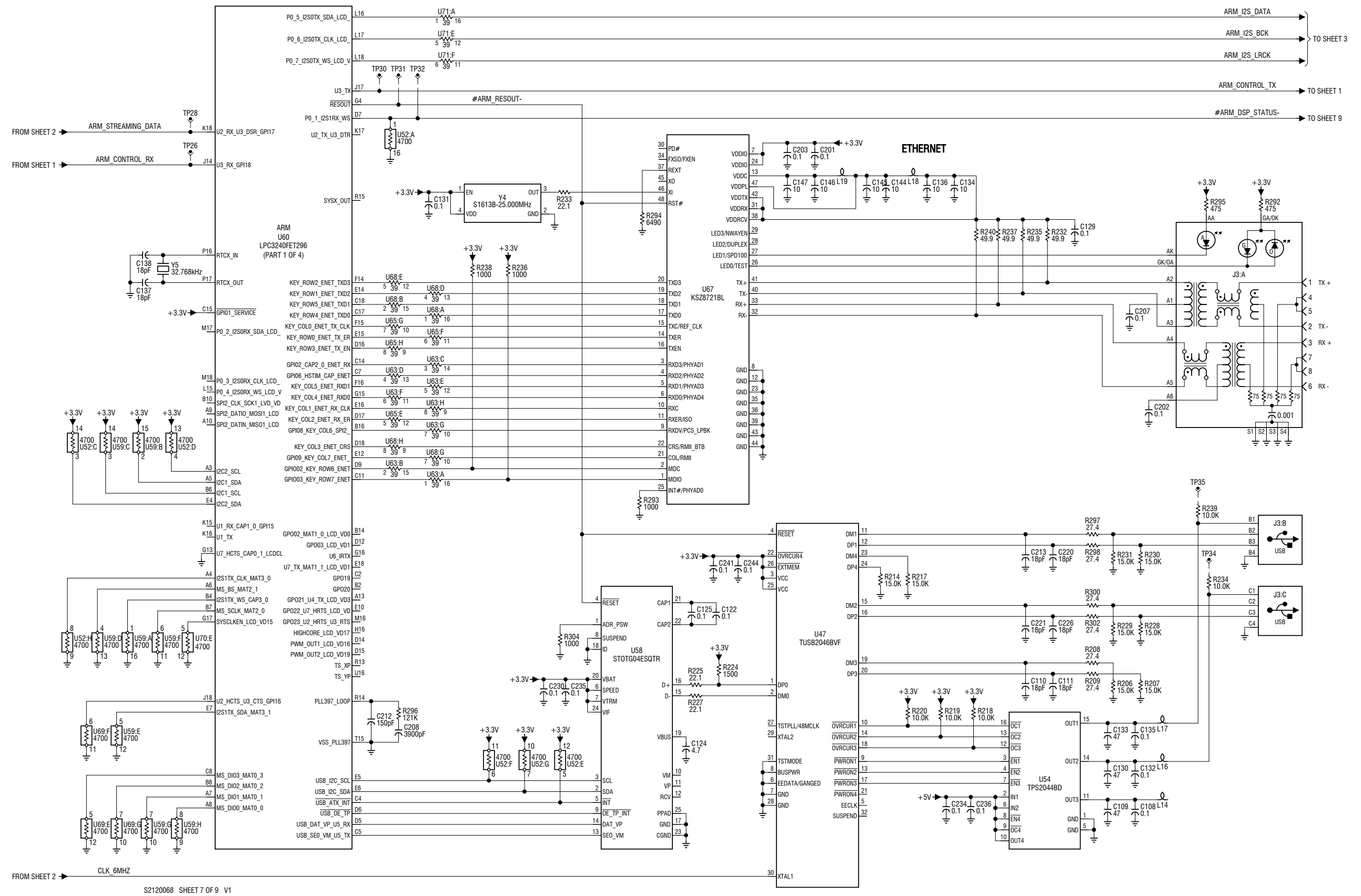
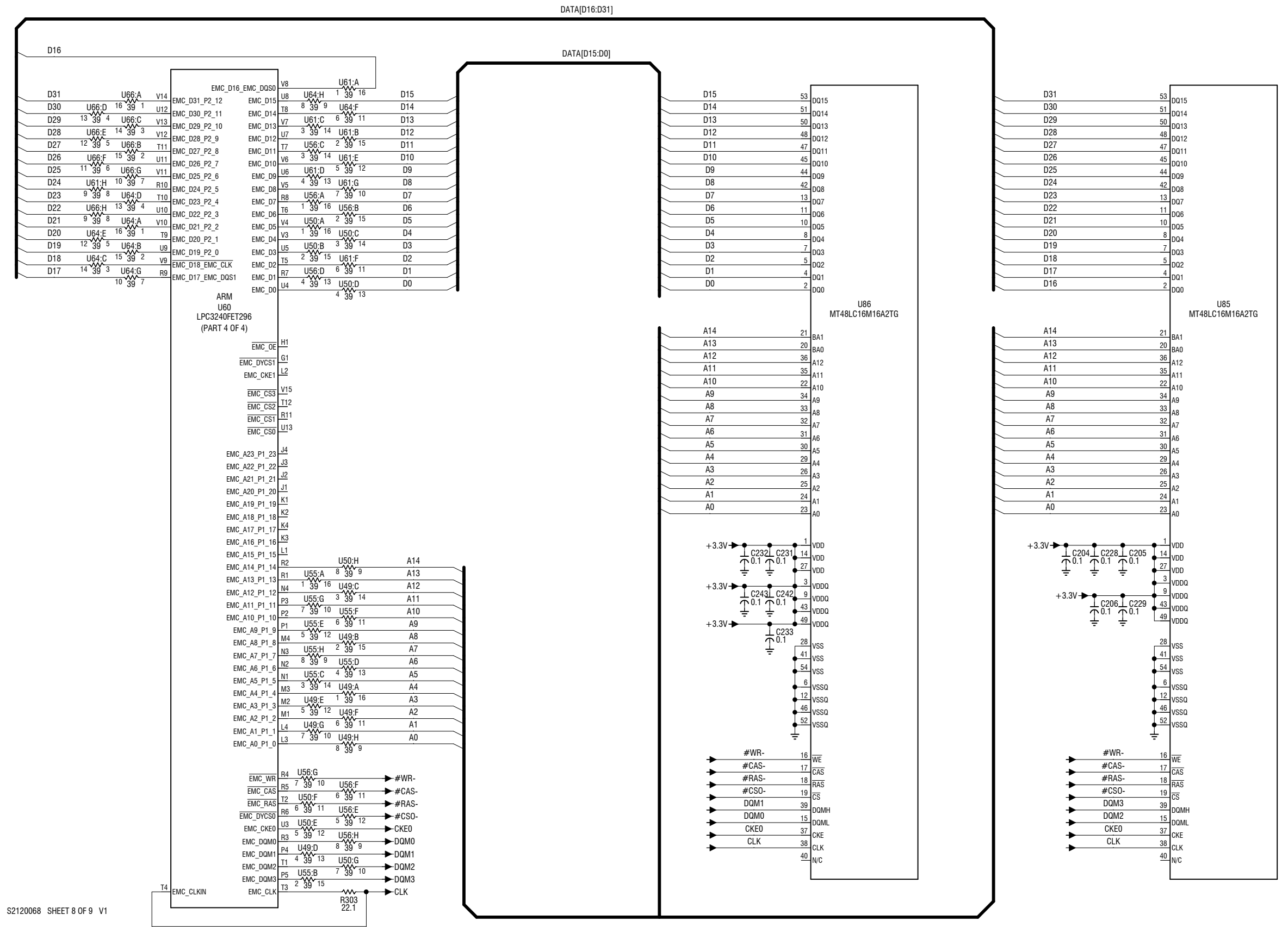


Figure SD-12: NAPC168A Control/Interface PWB (Sheet 6 of 9)





S2120068 SHEET 8 OF 9 V1

Figure SD-14: NAPC168A Control/Interface PWB (Sheet 8 of 9)

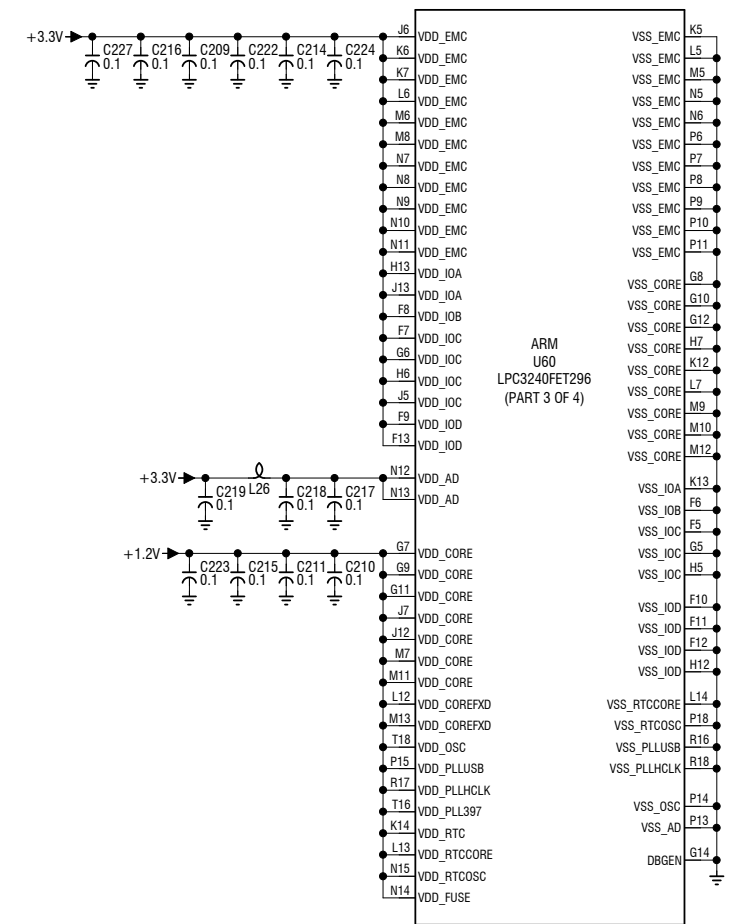
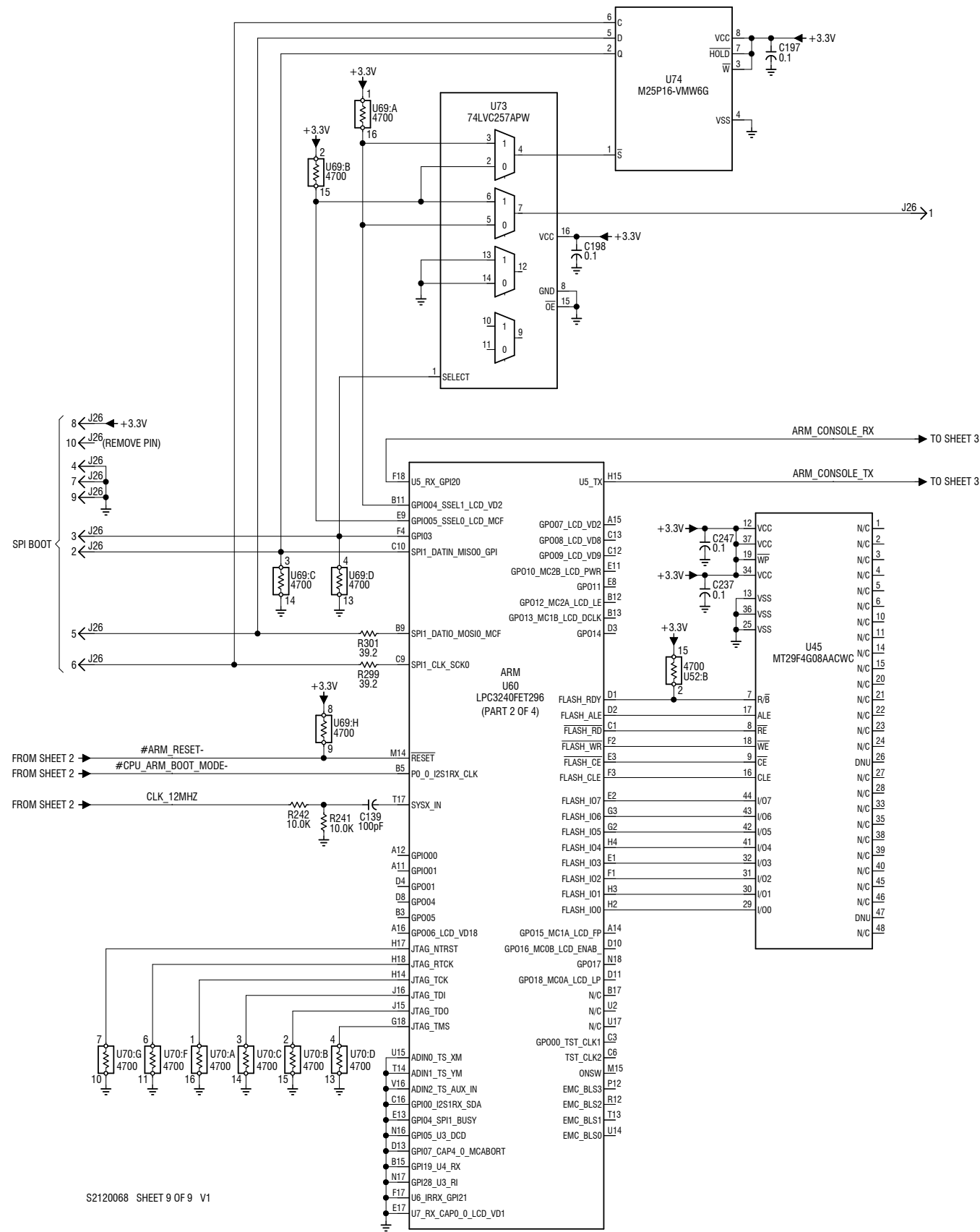


Figure SD-15: NAPC168A Control/Interface PWB (Sheet 9 of 9)

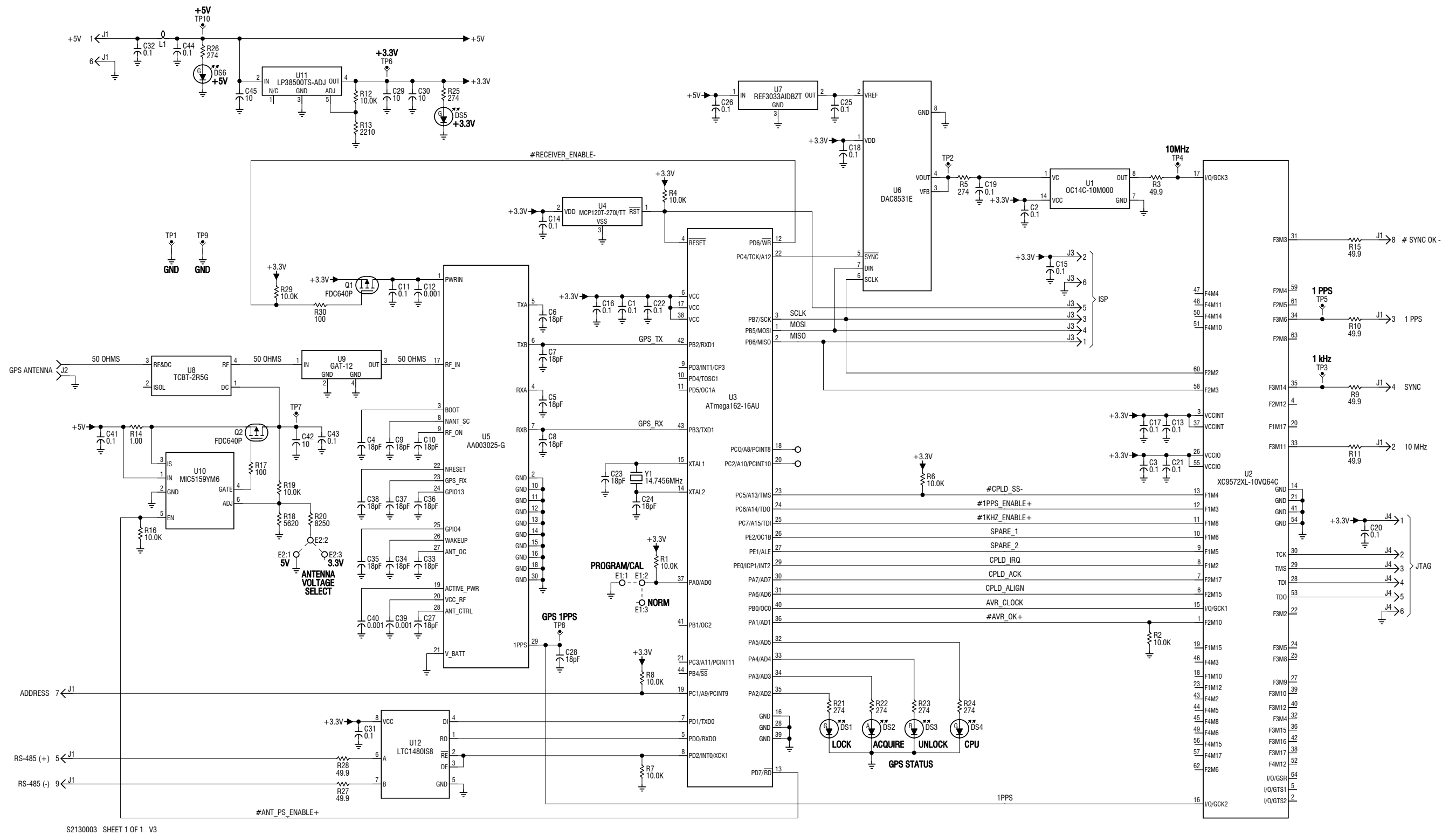


Figure SD-16: NAPX46 GPS Sync PWB (Optional)

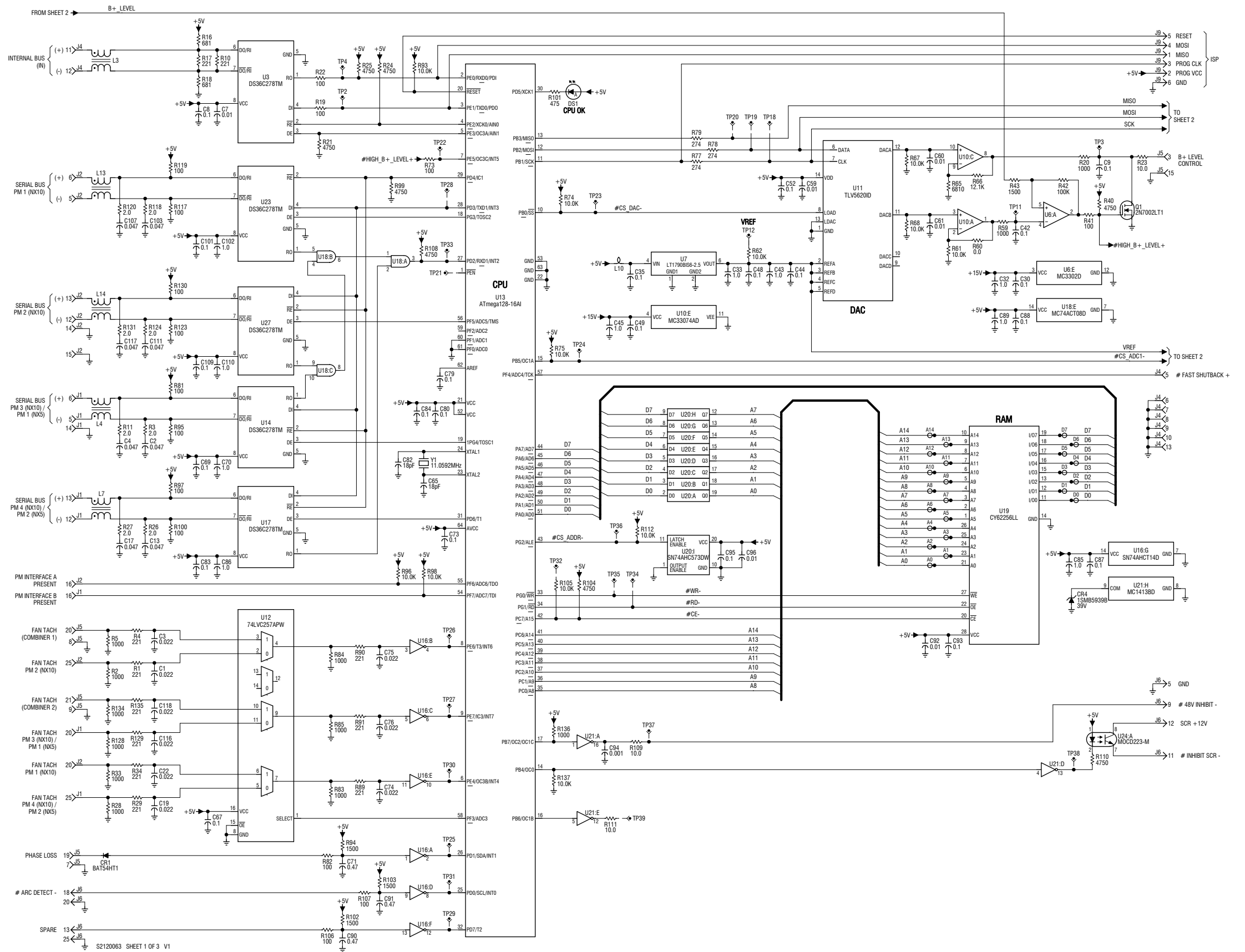


Figure SD-17: NAPI173A Rack Interface PWB (Sheet 1 of 3)

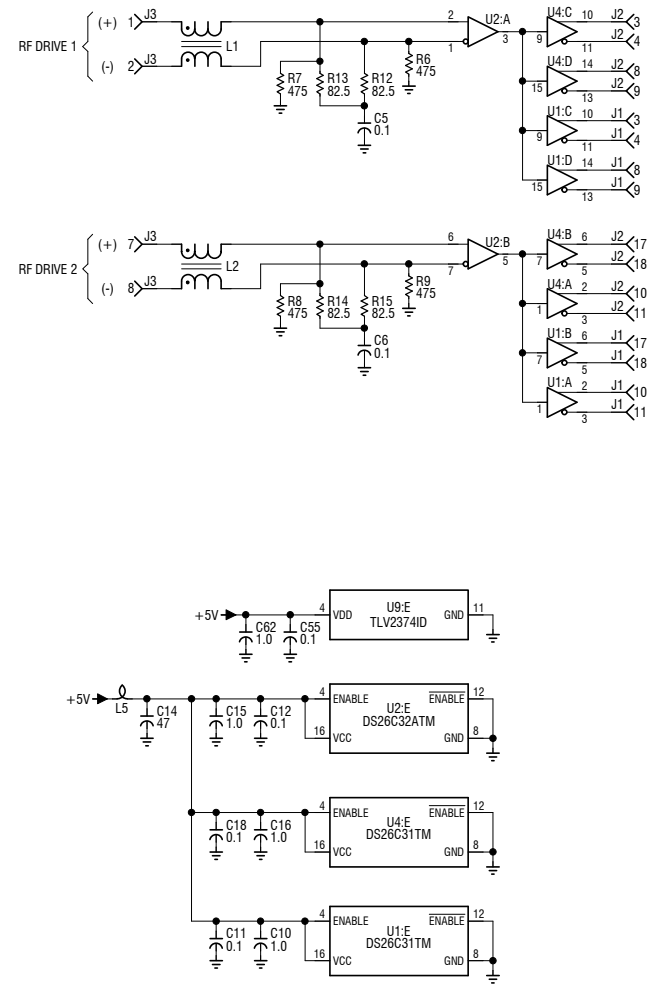
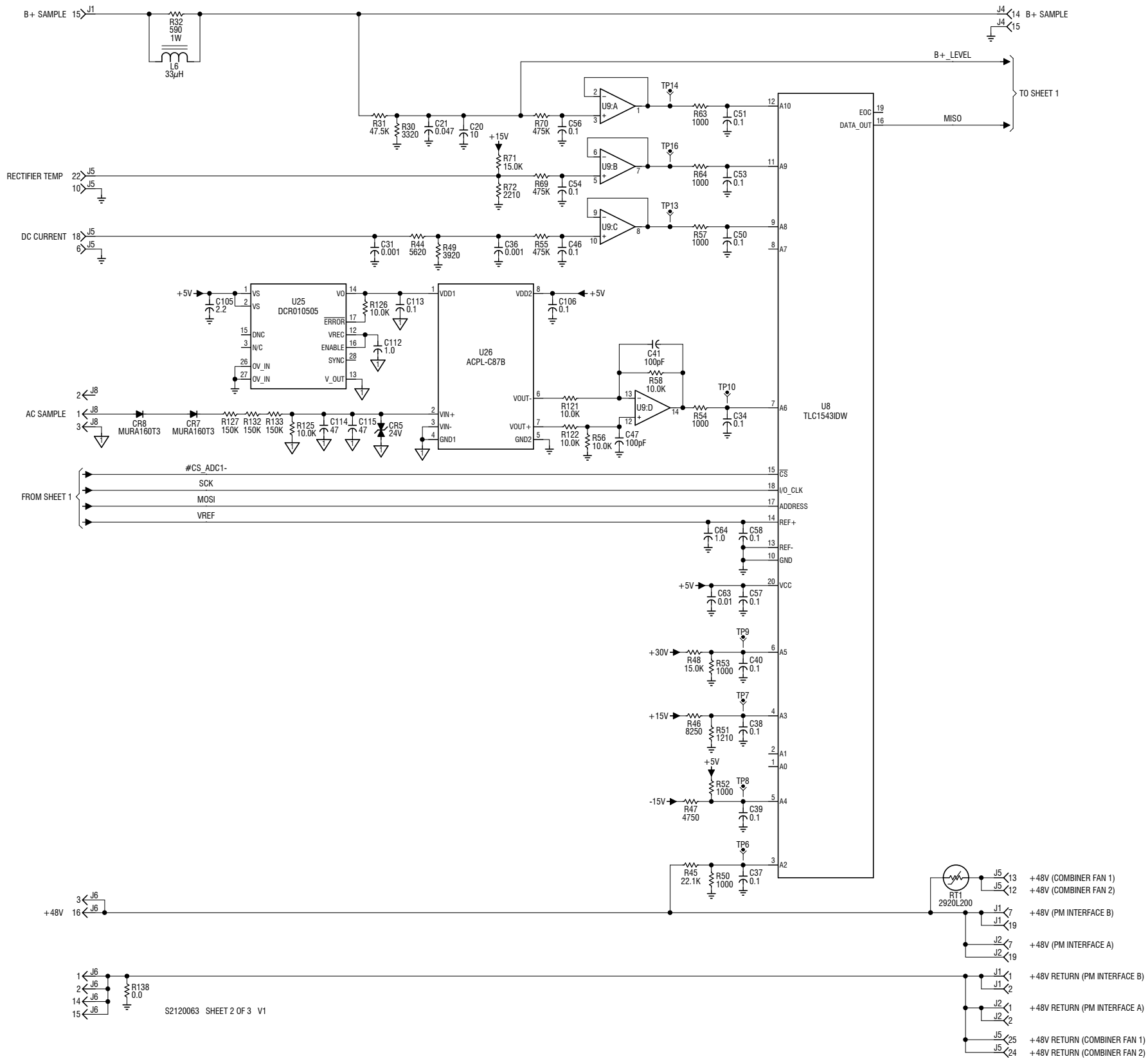
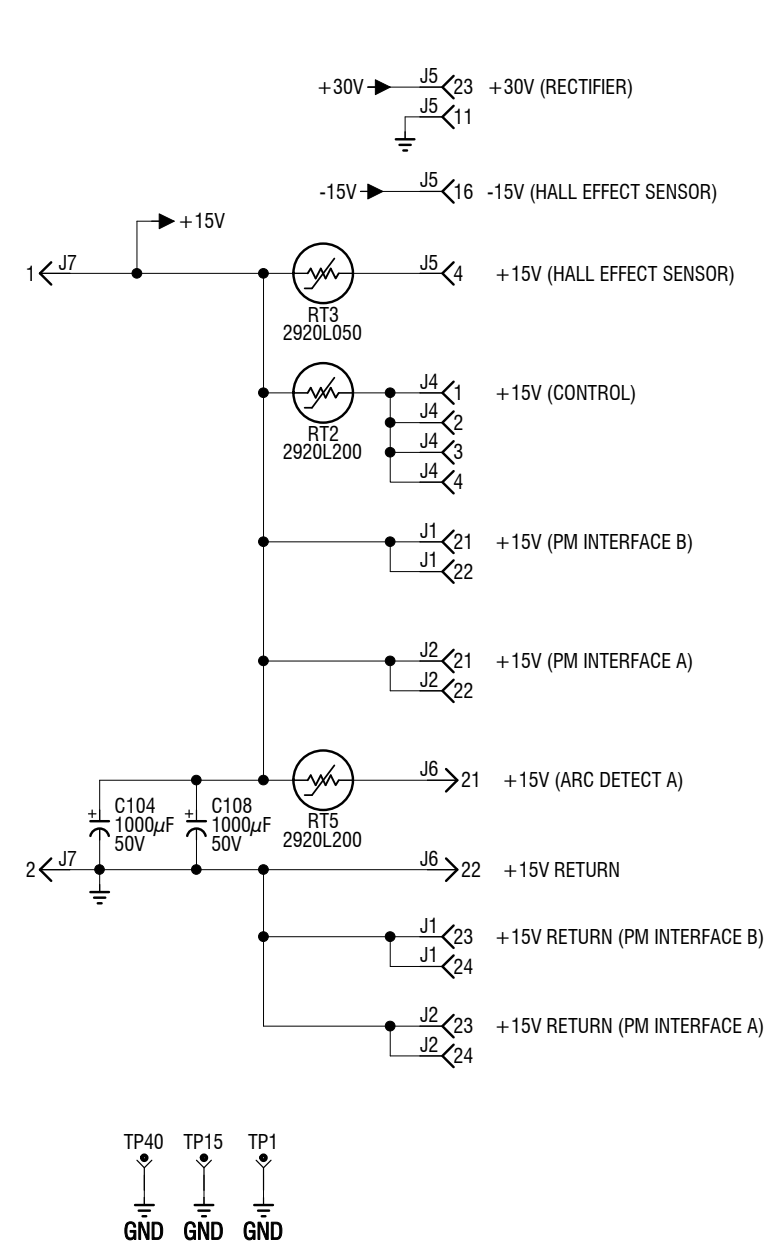


Figure SD-18: NAPI173A Rack Interface PWB (Sheet 2 of 3)



S2120063 SHEET 3 OF 3 V1

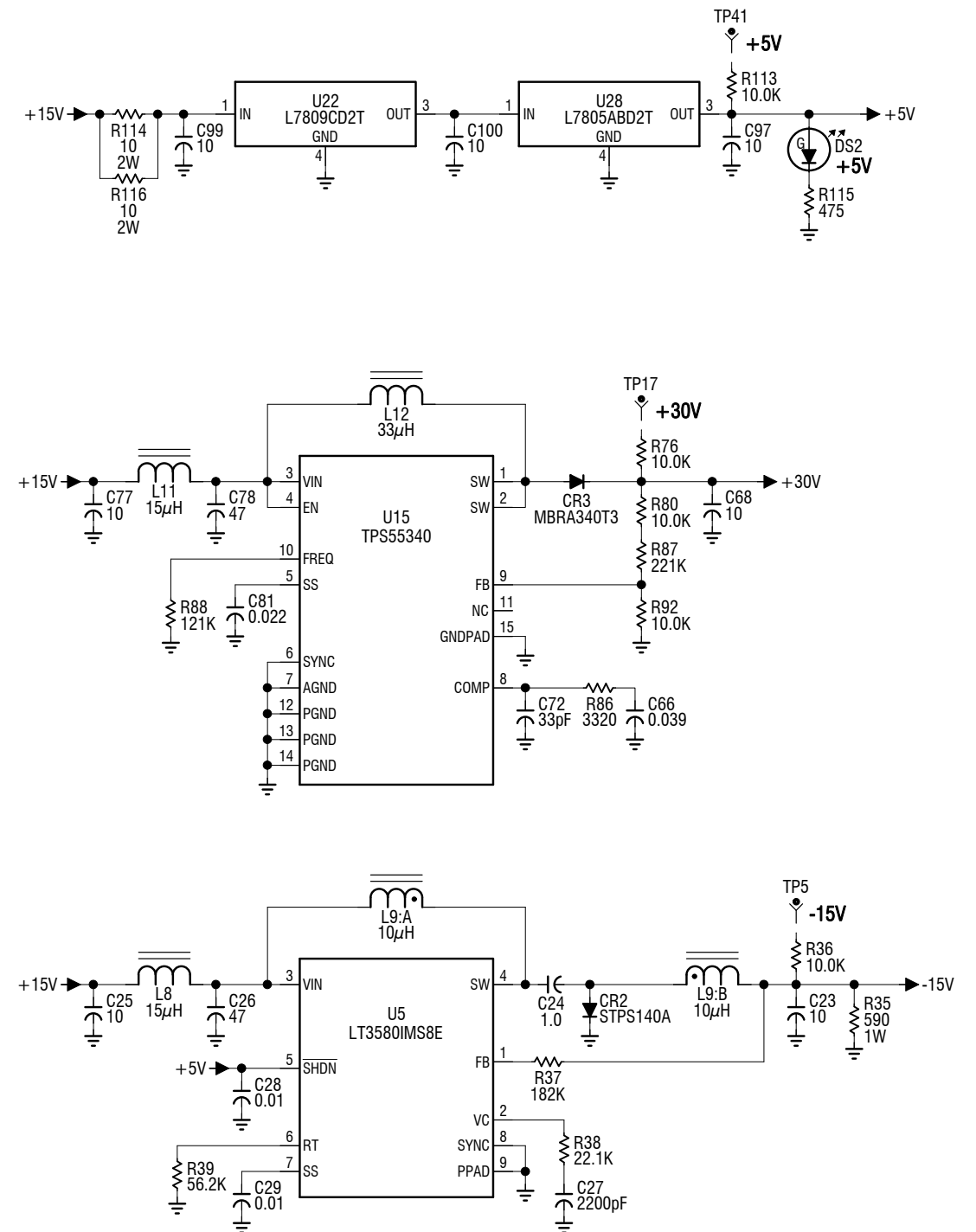
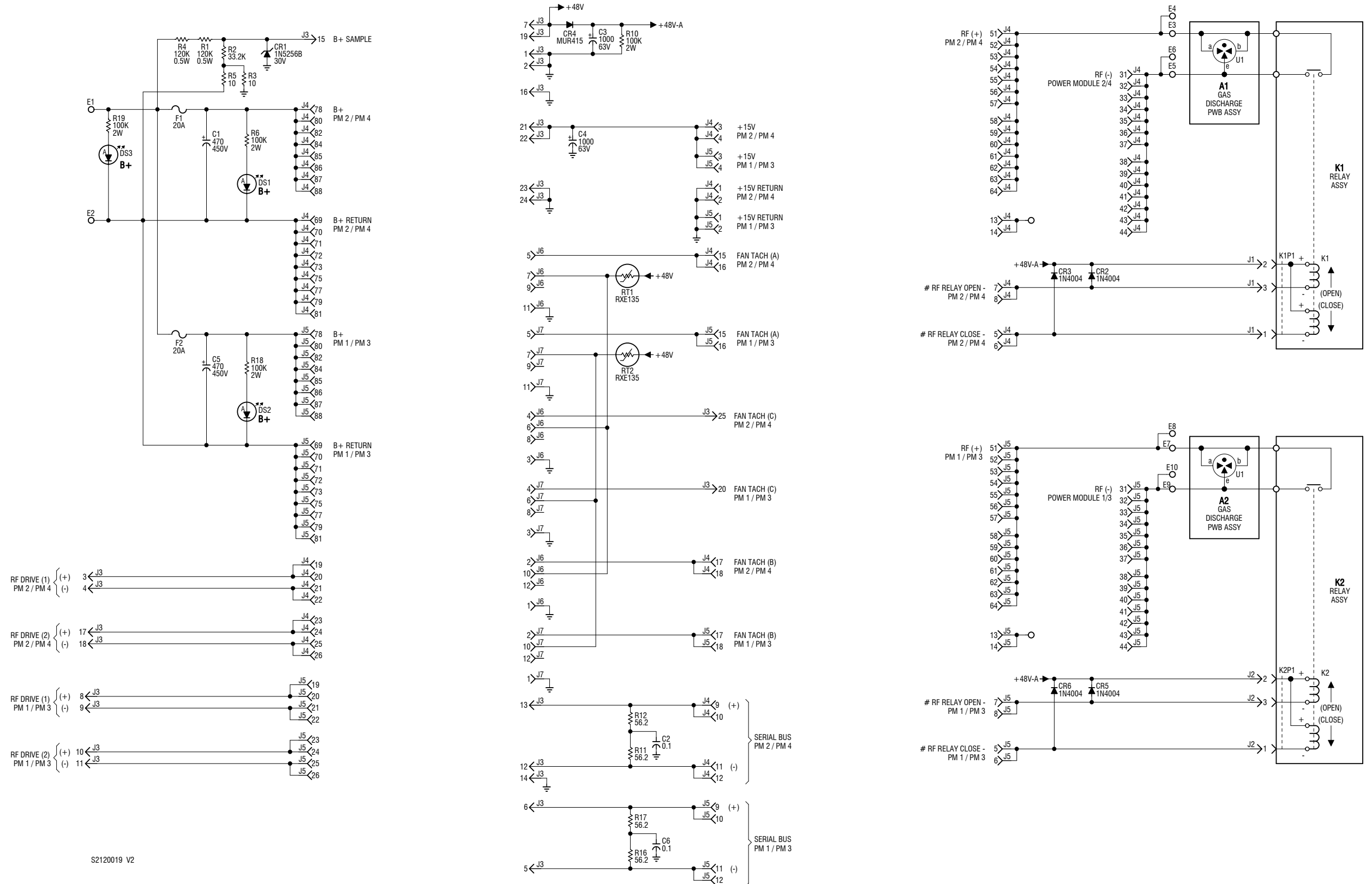


Figure SD-19: NAPI173A Rack Interface PWB (Sheet 3 of 3)



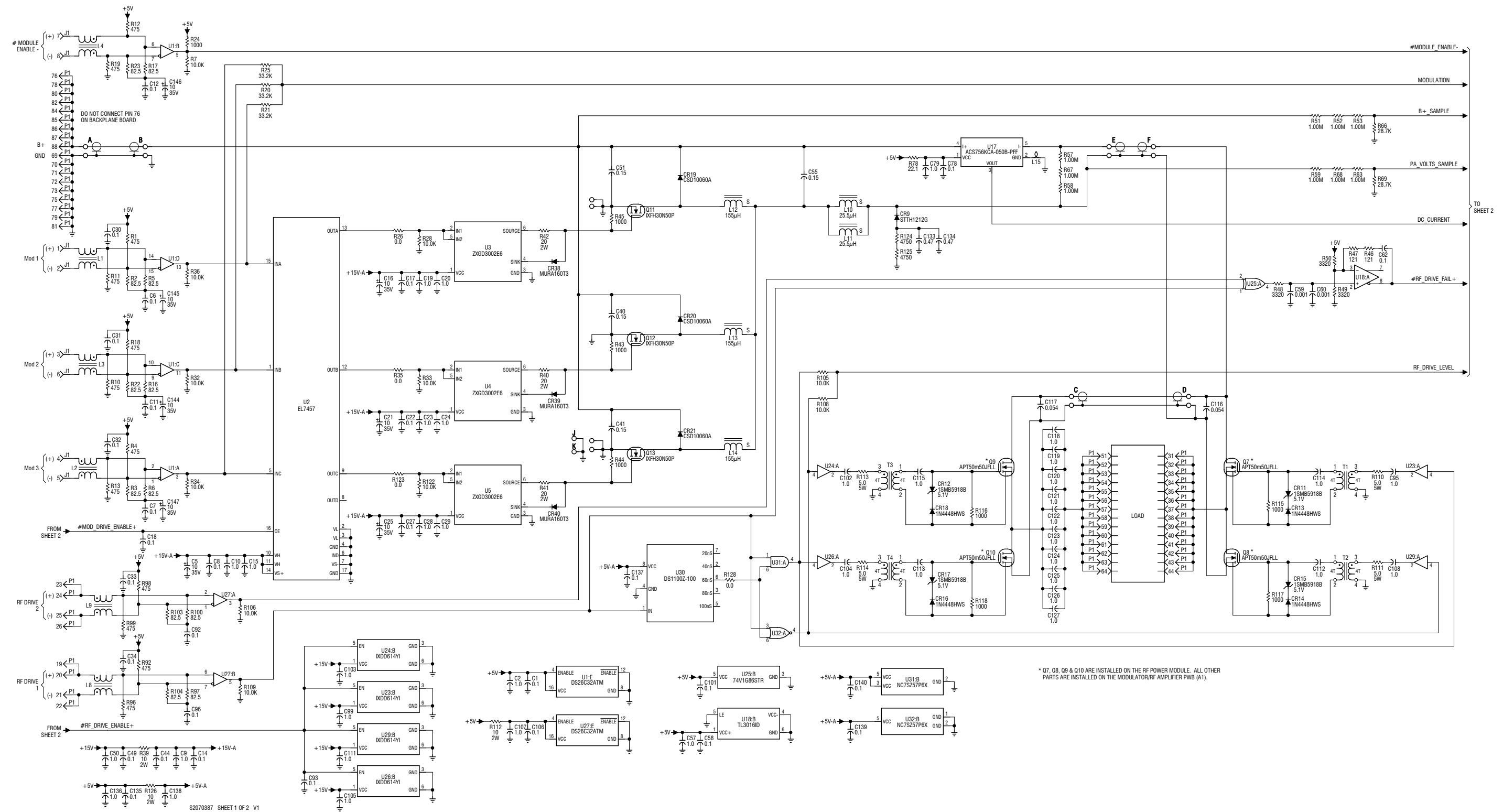


Figure SD-21: NAP39B RF Power Module and NAPA34B Modulator/Power Amplifier PWB (Sheet 1 of 2)

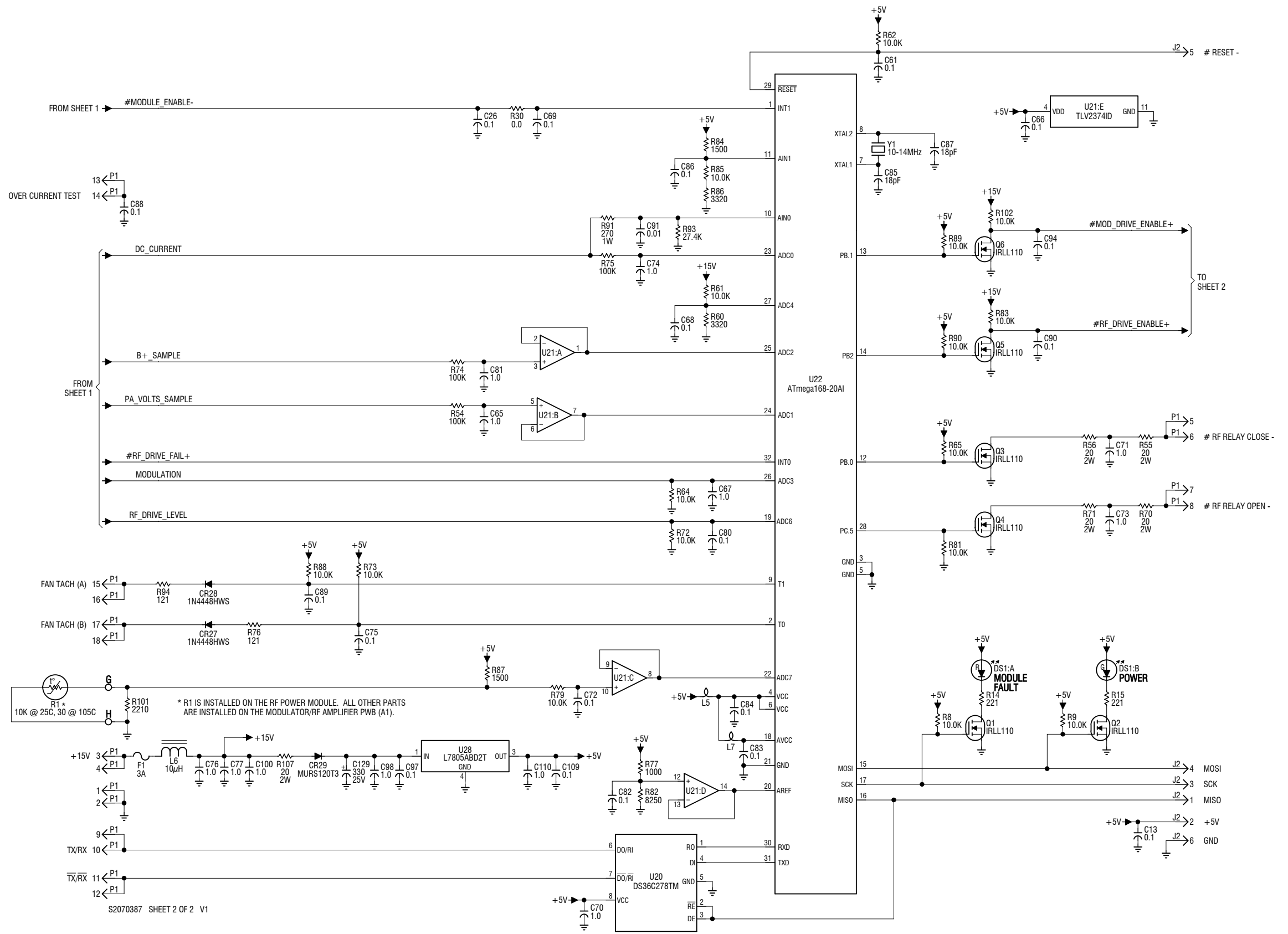


Figure SD-22: NAP39B RF Power Module and NAPA34B Modulator/Power Amplifier PWB (Sheet 2 of 2)

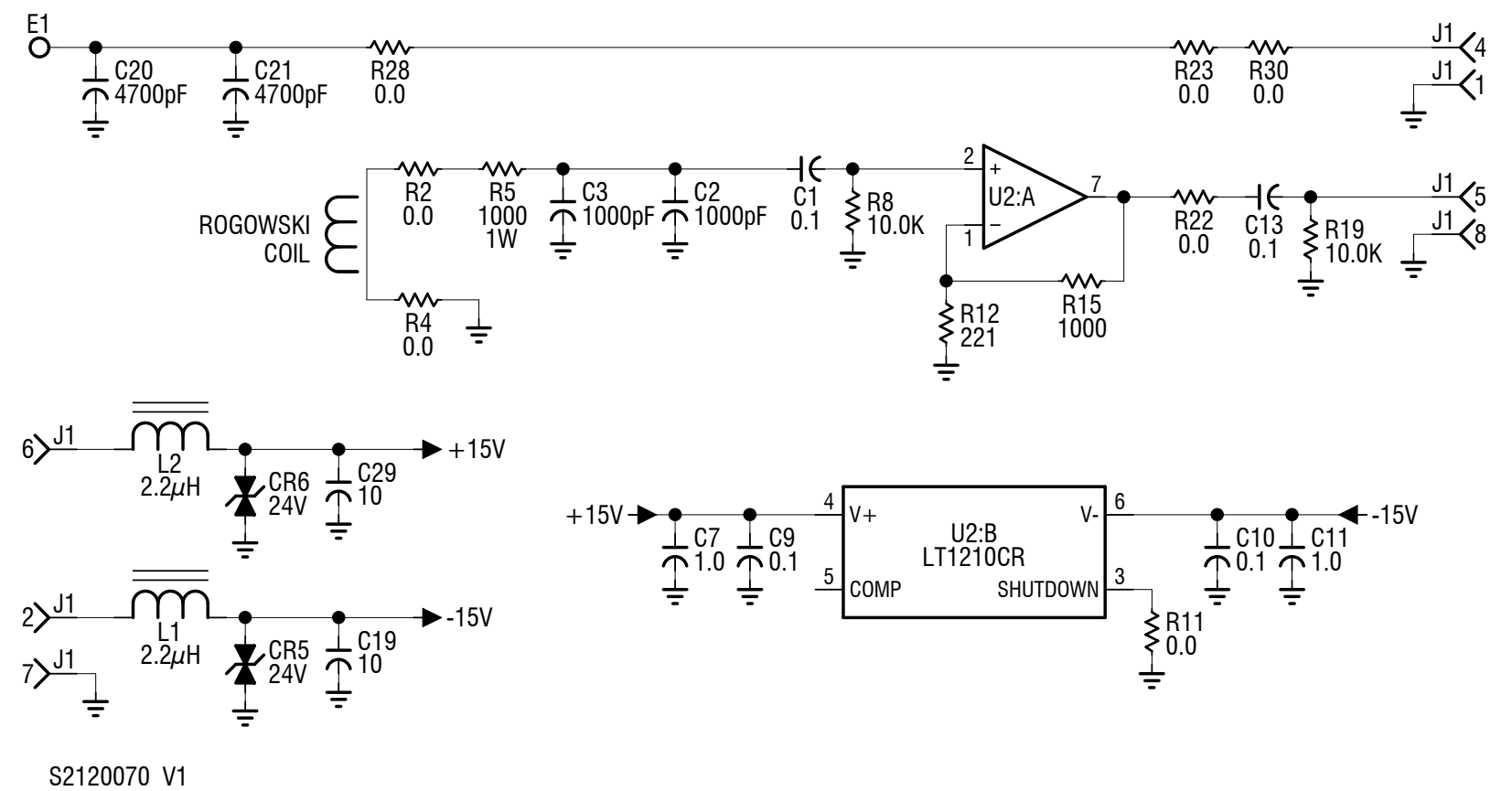


Figure SD-23: NAPP11/02A RF Voltage and Current Sample PWB

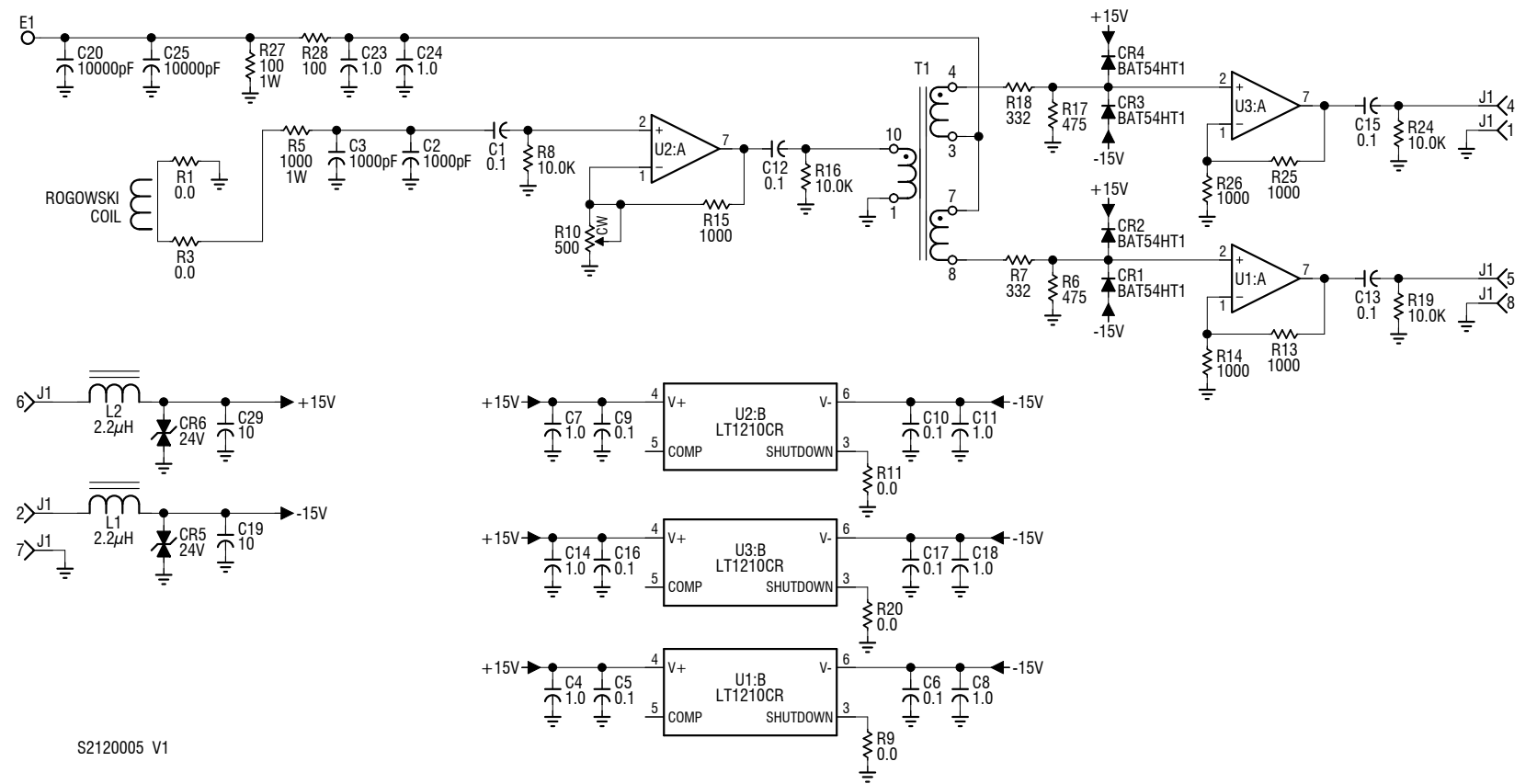


Figure SD-24: NAPP11 Directional Coupler PWB

SECTION 4.5: MECHANICAL DRAWINGS

This section contains mechanical drawings for assemblies of the transmitter. Dimensional drawings may be included. Refer to [Table 4.5.1 on page 4.5.2](#) for an itemized list.

Assembly detail drawings for assemblies and modules that have separate manuals are not included. Refer to the appropriate maintenance manual for the assembly detail of these assemblies.

Identifying Mechanical Drawings

Each mechanical drawing in this section is identified by a number that is both the figure number and the page number. The numbers are assigned sequentially and are prefixed by the letters MD. Drawings in this section are listed in [Table 4.5.1 on page 4.5.2](#).

Content of Mechanical Drawings

Mechanical drawings are illustrations that depict the location of electrical components and show assembly outline detail. Dimensional information is included, where appropriate.

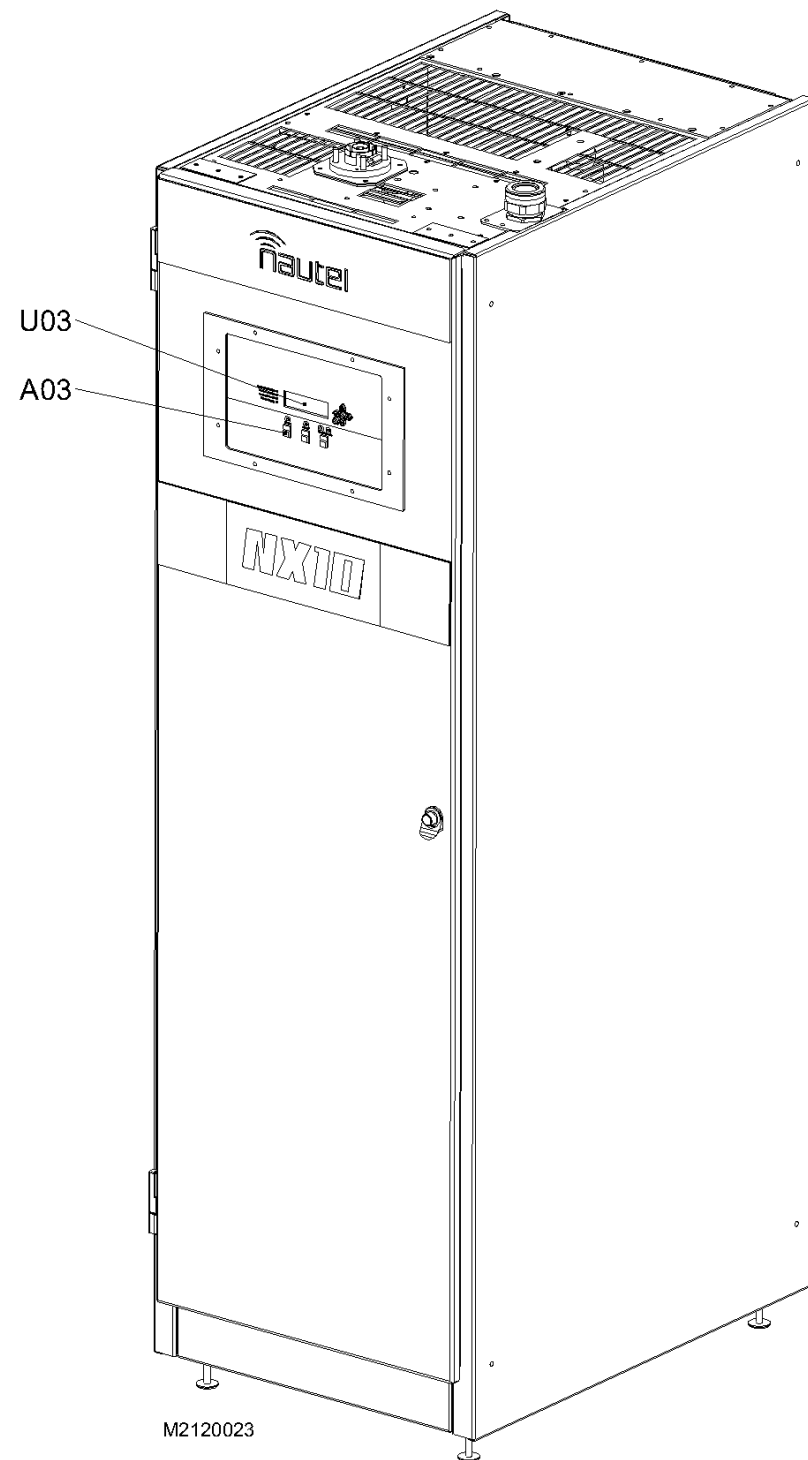
When a module or assembly is the subject of its own assembly detail drawing, and it is also shown in a higher level assembly, the detail depicted in the higher level assembly may have minor differences from the module or assembly actually installed. In this case, always refer to the assembly detail drawing of the module or assembly for detailed information.

Locating a Part or Assembly on a Mechanical Drawing

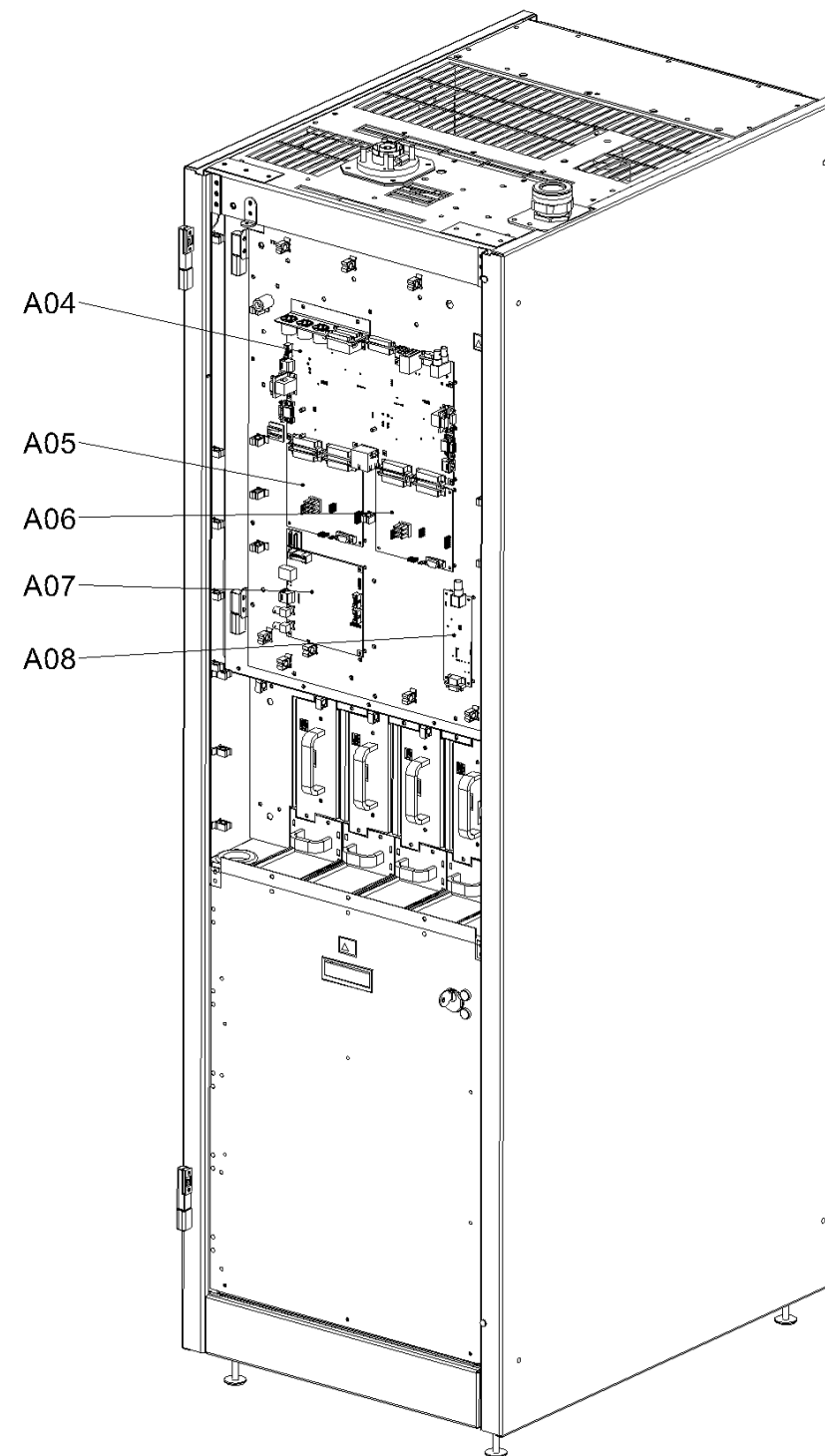
1. When a part or assembly is assigned a reference designation (e.g., A2A1 or A2A1R1), refer to the family trees in [Section 4.2, "Parts Lists" on page 4.2.1](#). Follow the family tree branches to the block that contains the desired reference designation and Nautel nomenclature (e.g., NAPA34B Modulator/Power Amplifier PWB). Note the reference designations and Nautel nomenclatures of all higher assemblies in the path.
Example: A12 NAP39B RF Power Module > A12A1 NAPA34B Modulator/Power Amplifier PWB.
2. Refer to [Table 4.5.1 on page 4.5.2](#). Use the reference designation and Nautel nomenclature to identify the appropriate mechanical drawing.
Example: The NAPA34B Modulator/Power Amplifier PWB is shown on MD-11 and MD-12.
3. If necessary, refer to the referenced figure (e.g., MD-11 and MD-12) in this section and locate the next, lower-level assembly. Repeat this procedure until the desired part or assembly is found.

Table 4.5.1: List of Mechanical Drawings

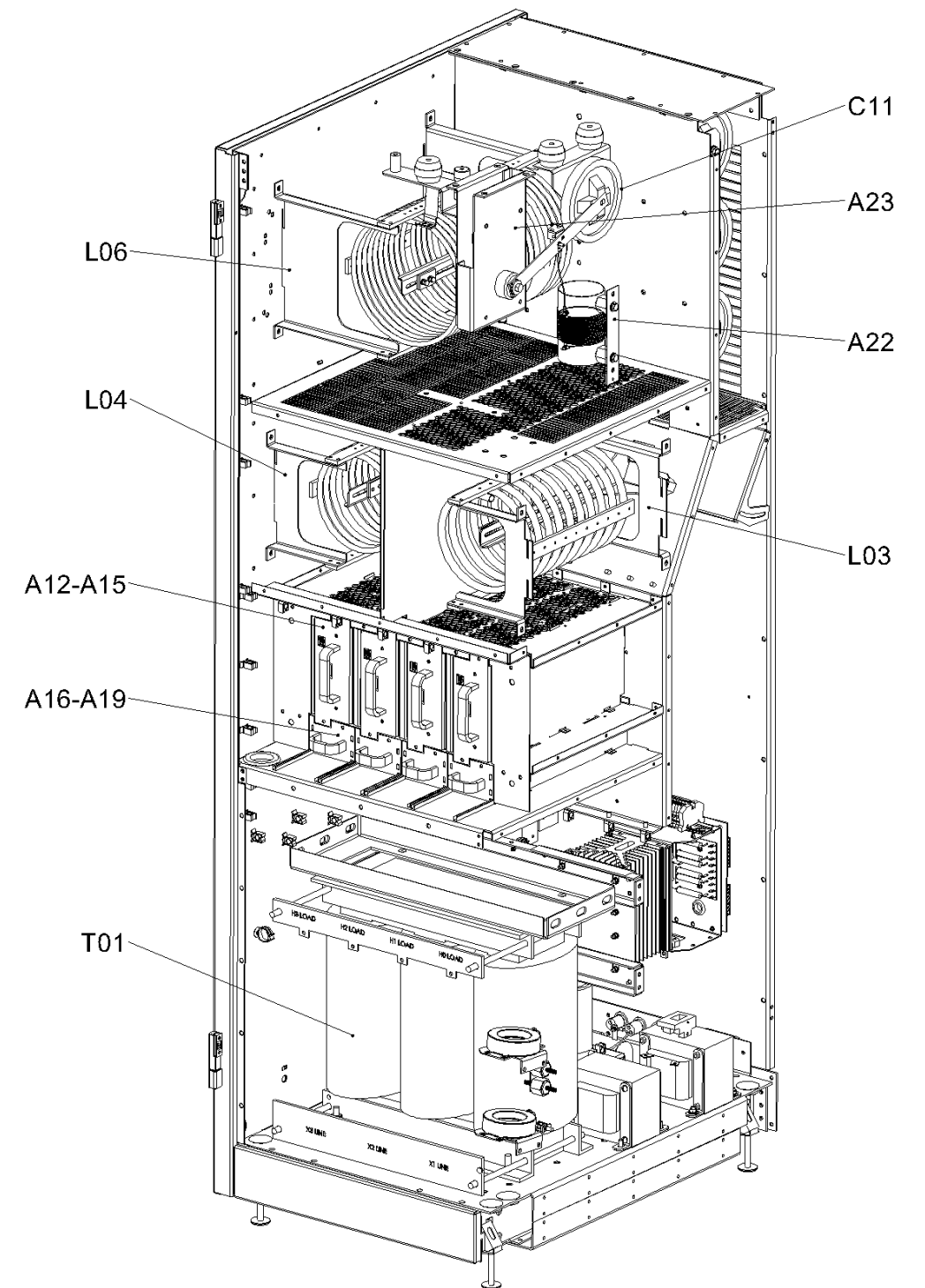
Figure #	Title
MD-1	NX10 Transmitter (Front Views)
MD-2	NX10 Transmitter (Rear Views)
MD-3	B+ Distribution Assembly (212-7120)
MD-4	NAPI142A UI Interface PWB
MD-5	NAPC168 Control/Interface PWB
MD-6	NAPE78A/01 Digital AM Exciter PWB
MD-7	NAPX46 GPS Sync PWB (Optional)
MD-8	NAPI173 Rack Interface PWB
MD-9	NAPI174 Power Module Interface PWB
MD-10	NAP39B RF Power Module
MD-11	NAPA34B Modulator/Power Amplifier PWB (Front View)
MD-12	NAPA34B Modulator/Power Amplifier PWB (Rear View)
MD-13	NAX274 Fan Tray Assembly
MD-14	NAPP11/02 RF Voltage and Current Sample PWB
MD-15	NAFP112 Directional Coupler Assembly (NAPP11 Directional Coupler PWB)



A3 - UI INTERFACE PWB
U3 - FRONT PANEL UI



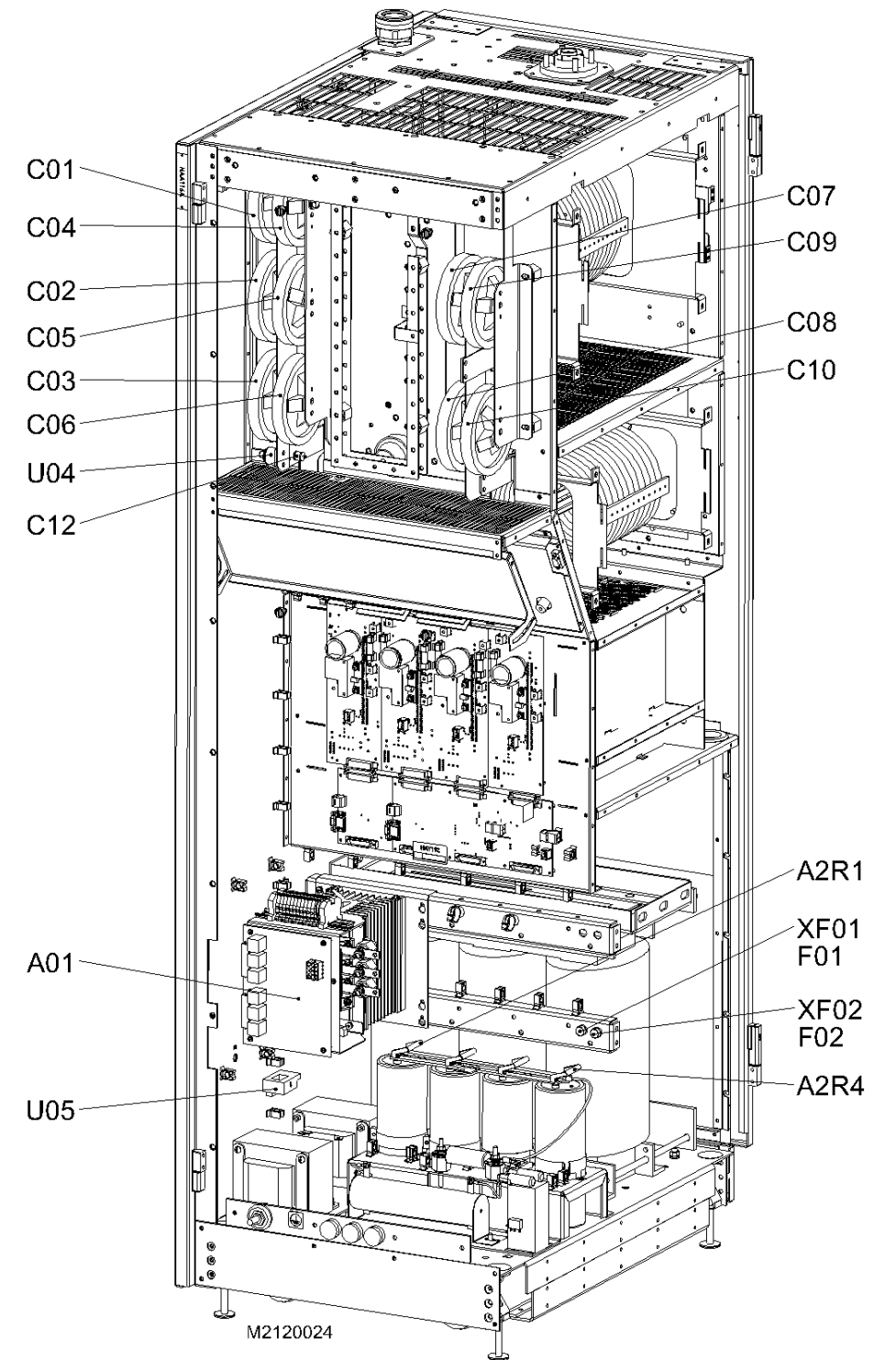
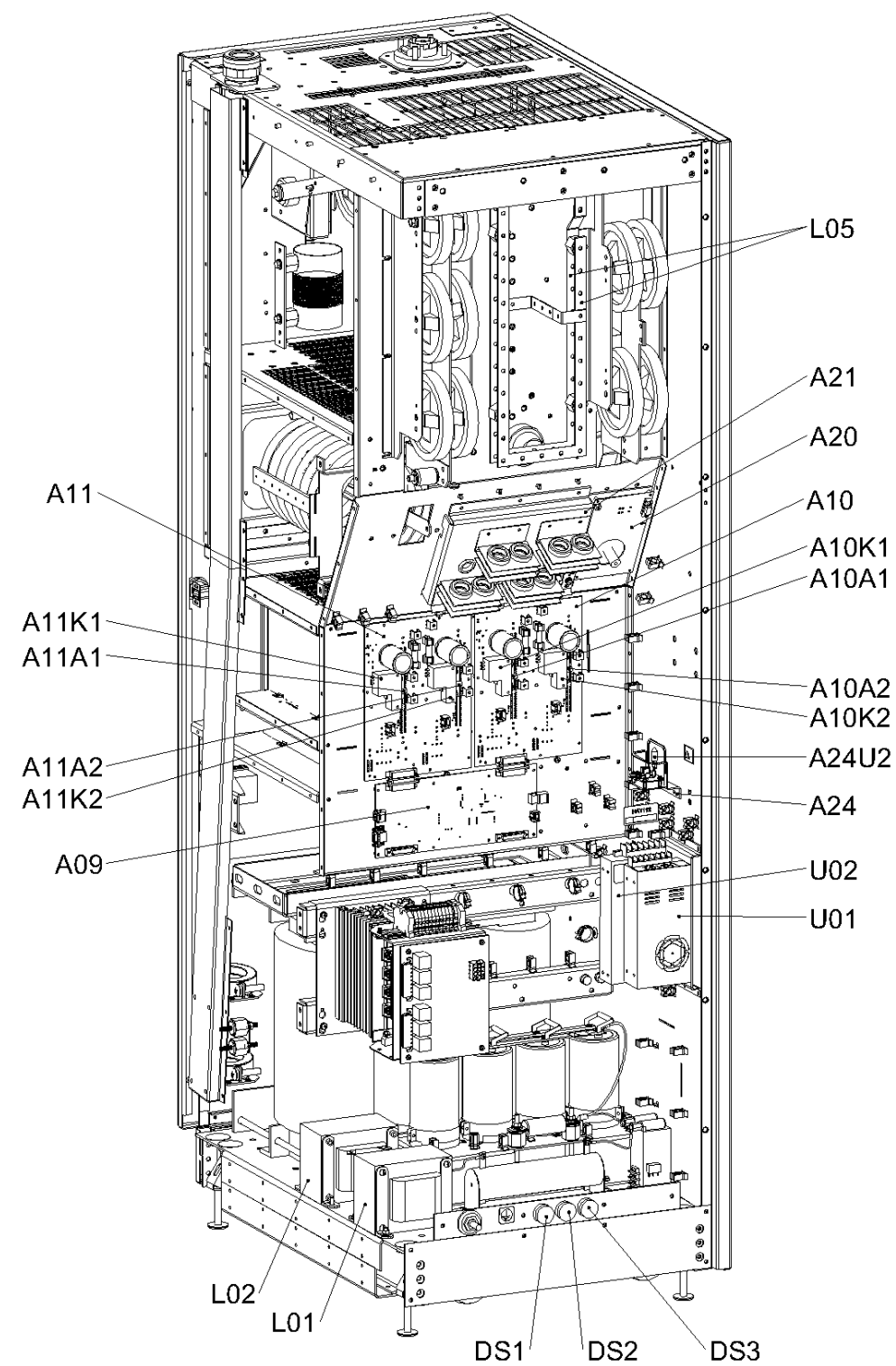
A4 - CONTROL/INTERFACE PWB
A5 - DIGITAL AM EXCITER PWB (A)
A6 - DIGITAL AM EXCITER PWB (B) (OPTIONAL)
A7 - EXGINE PWB (OPTIONAL)
A8 - GPS SYNC PWB (OPTIONAL)



A12, A13, A14, A15 - RF POWER MODULES 1, 2, 3, 4
A16, A17, A18, A19 - FAN TRAY ASSEMBLIES 1, 2, 3, 4
A22 - STATIC DRAIN CHOKE ASSEMBLY
A23 - DIRECTIONAL COUPLER ASSEMBLY
T1 - POWER TRANSFORMER

Figure MD-1: NX10 Transmitter (Front Views)

A9 - RACK INTERFACE PWB
 A10 - POWER MODULE INTERFACE PWB (A)
 A11 - POWER MODULE INTERFACE PWB (B)
 A20 - RF VOLTAGE AND CURRENT SAMPLE PWB
 A21 - COMBINER ASSEMBLY
 A24 - ARC DETECTOR ASSEMBLY
 DS1, DS2, DS3 - 3-PHASE AC INDICATORS
 U1 - +15V POWER SUPPLY
 U2 - +48V POWER SUPPLY



A1 - RECTIFIER ASSEMBLY
 A2 - B+ DISTRIBUTION ASSEMBLY
 U4 - SURGE ARRESTOR
 U5 - DC CURRENT SENSOR

Figure MD-2: NX10 Transmitter (Rear Views)

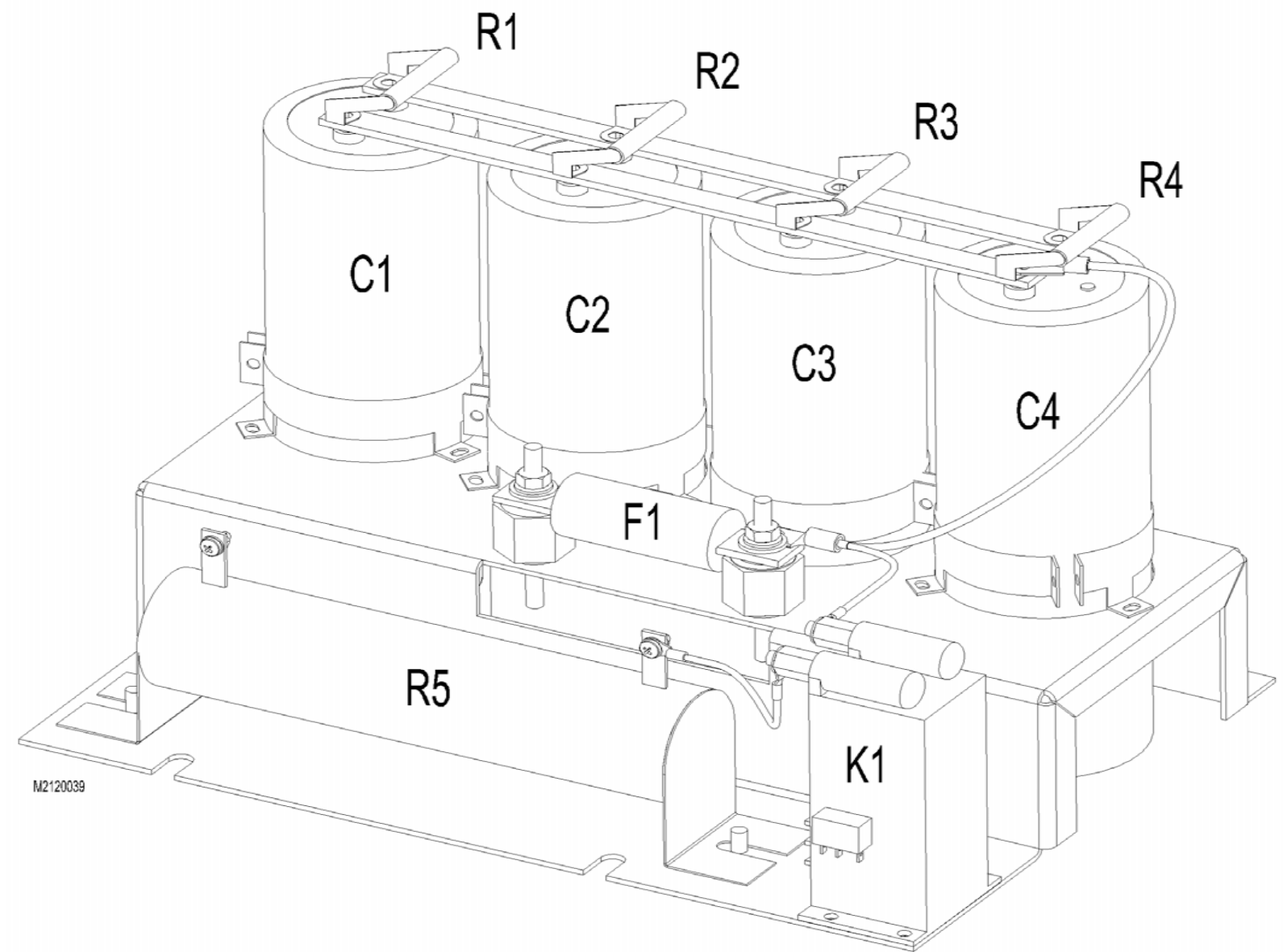


Figure MD-3: B+ Distribution Assembly (212-7120)

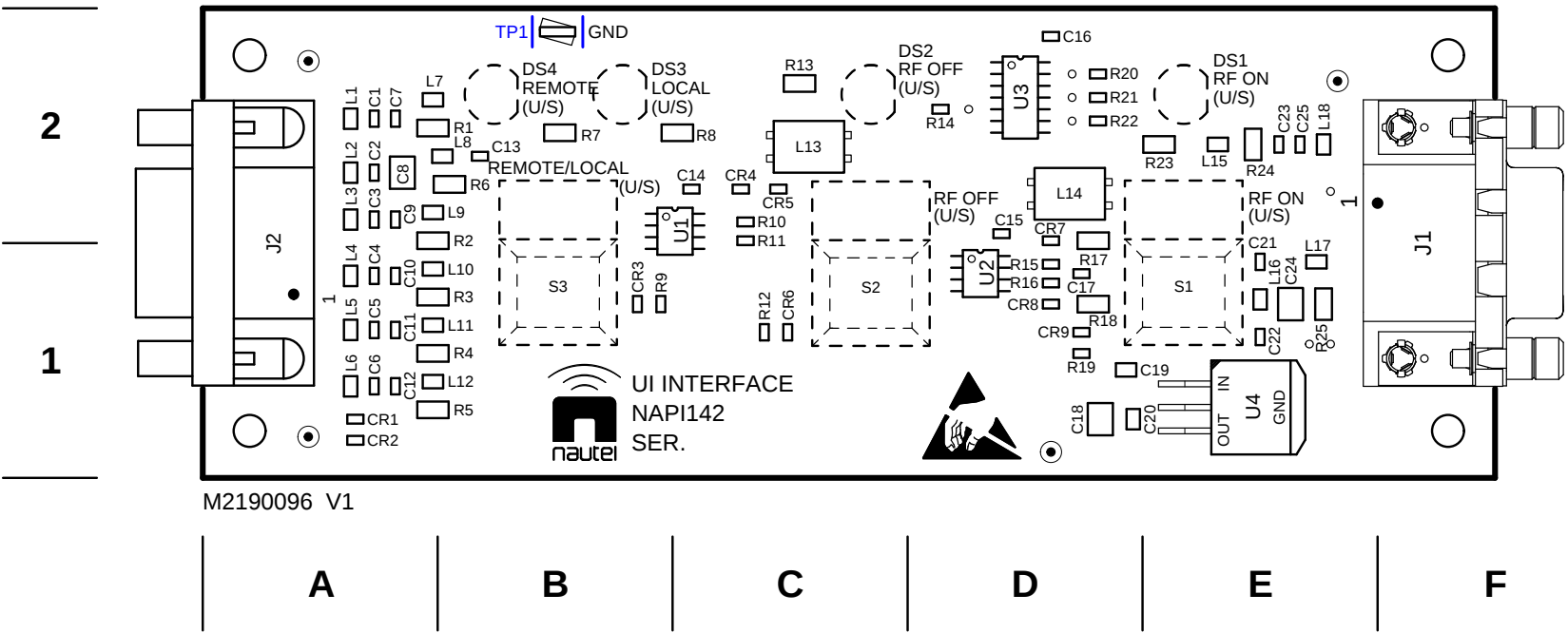


Figure MD-4: NAPI142A UI Interface PWB

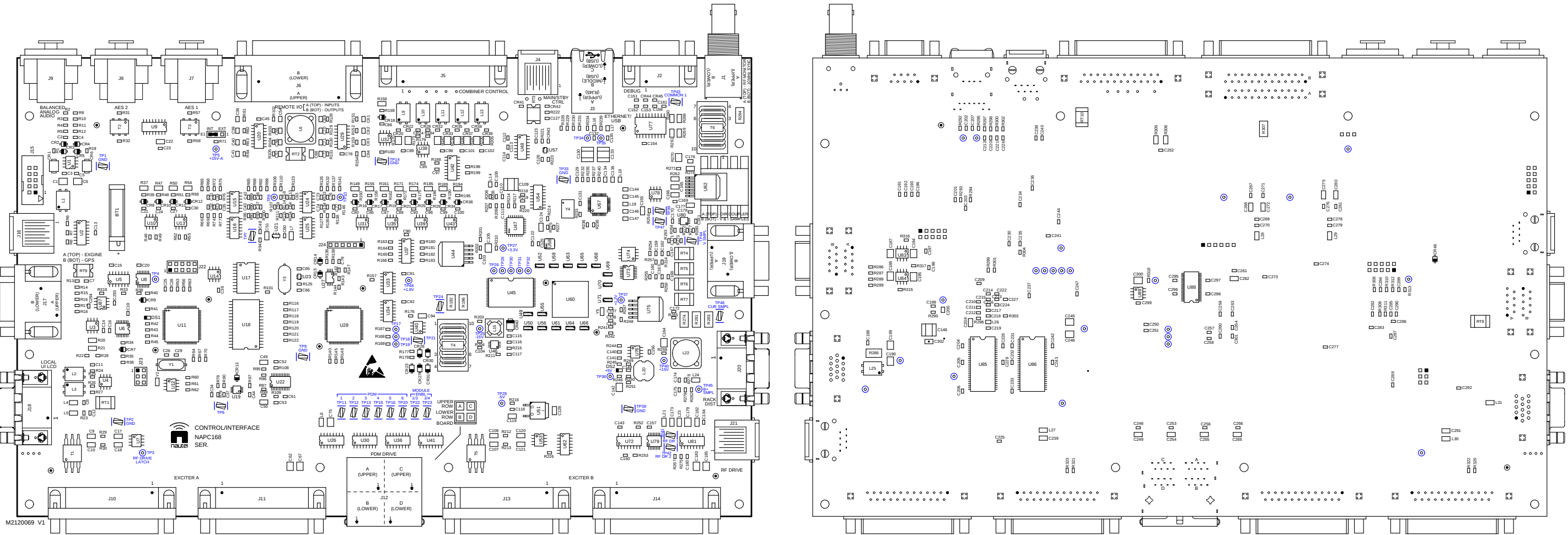


Figure MD-5: NAPC168A Control/Interface PWB

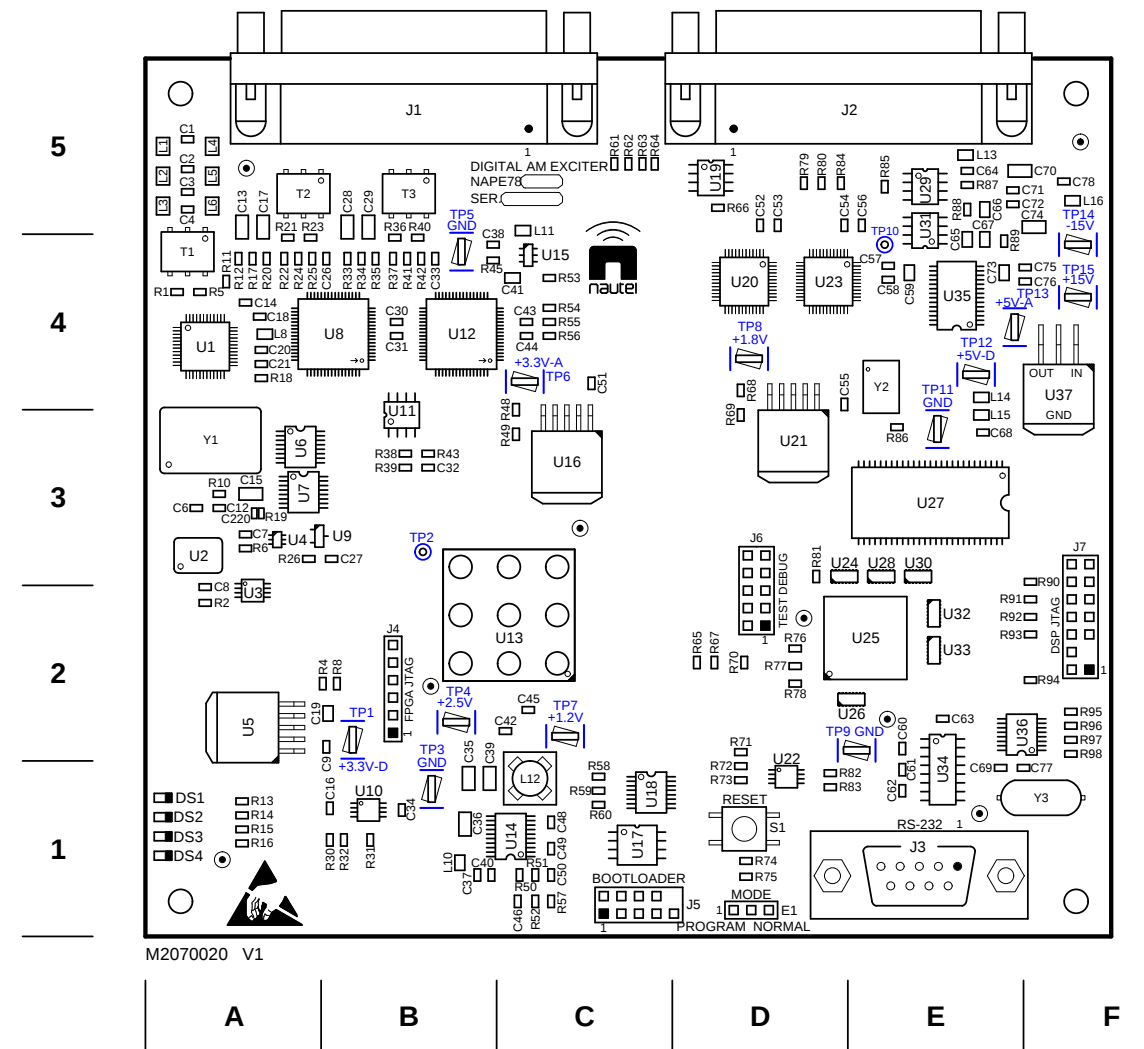
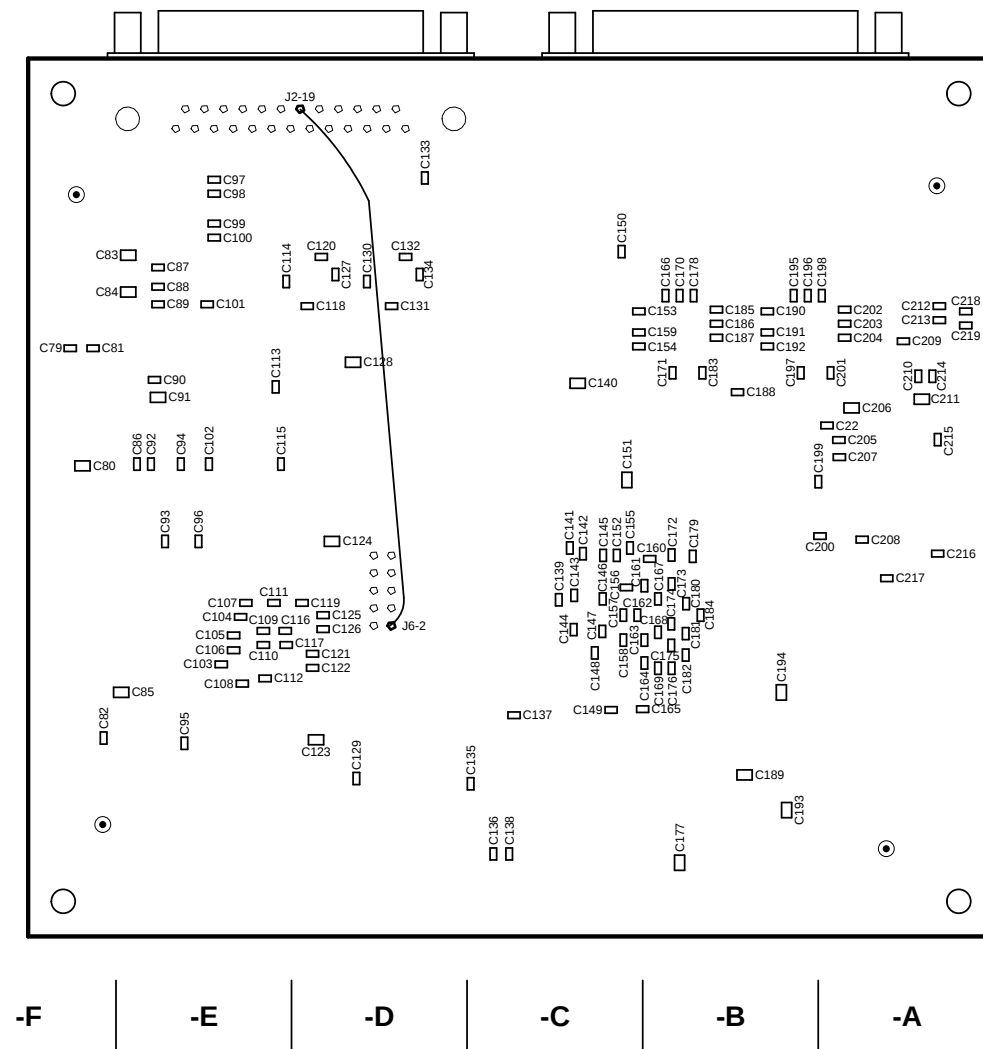


Figure MD-6: NAPE78A/01 Digital AM Exciter PWB

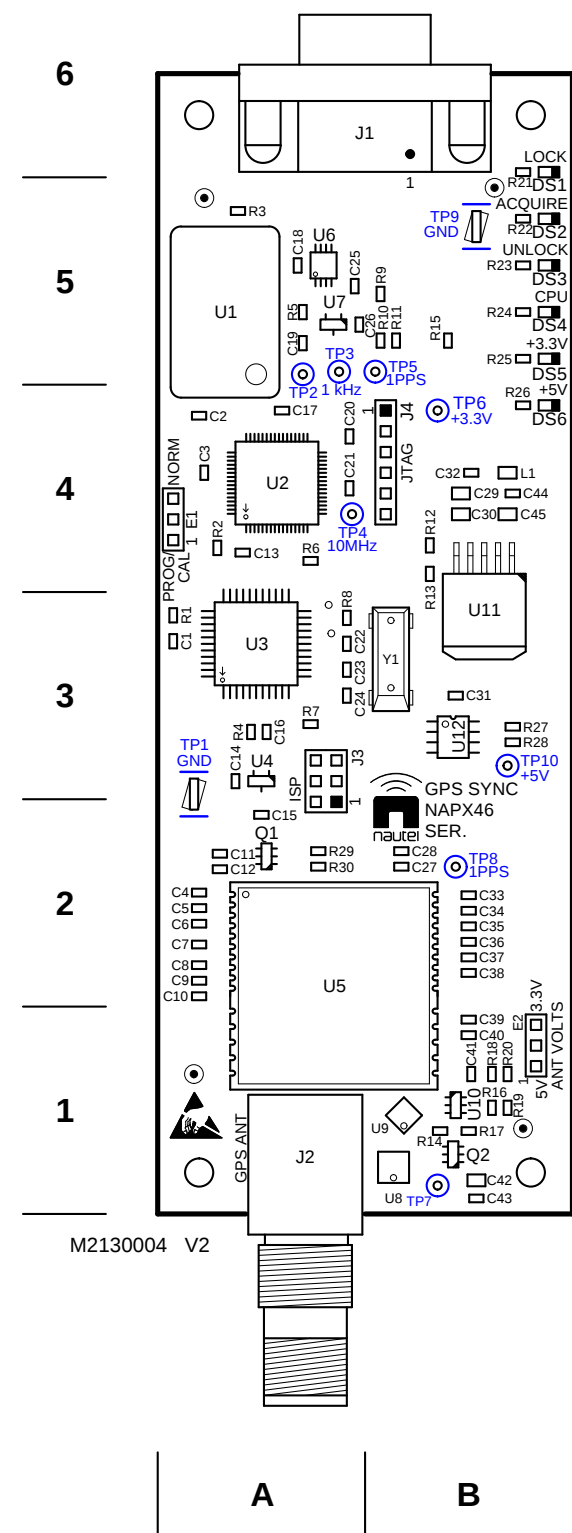


Figure MD-7: NAPX46 GPS Sync PWB (Optional)

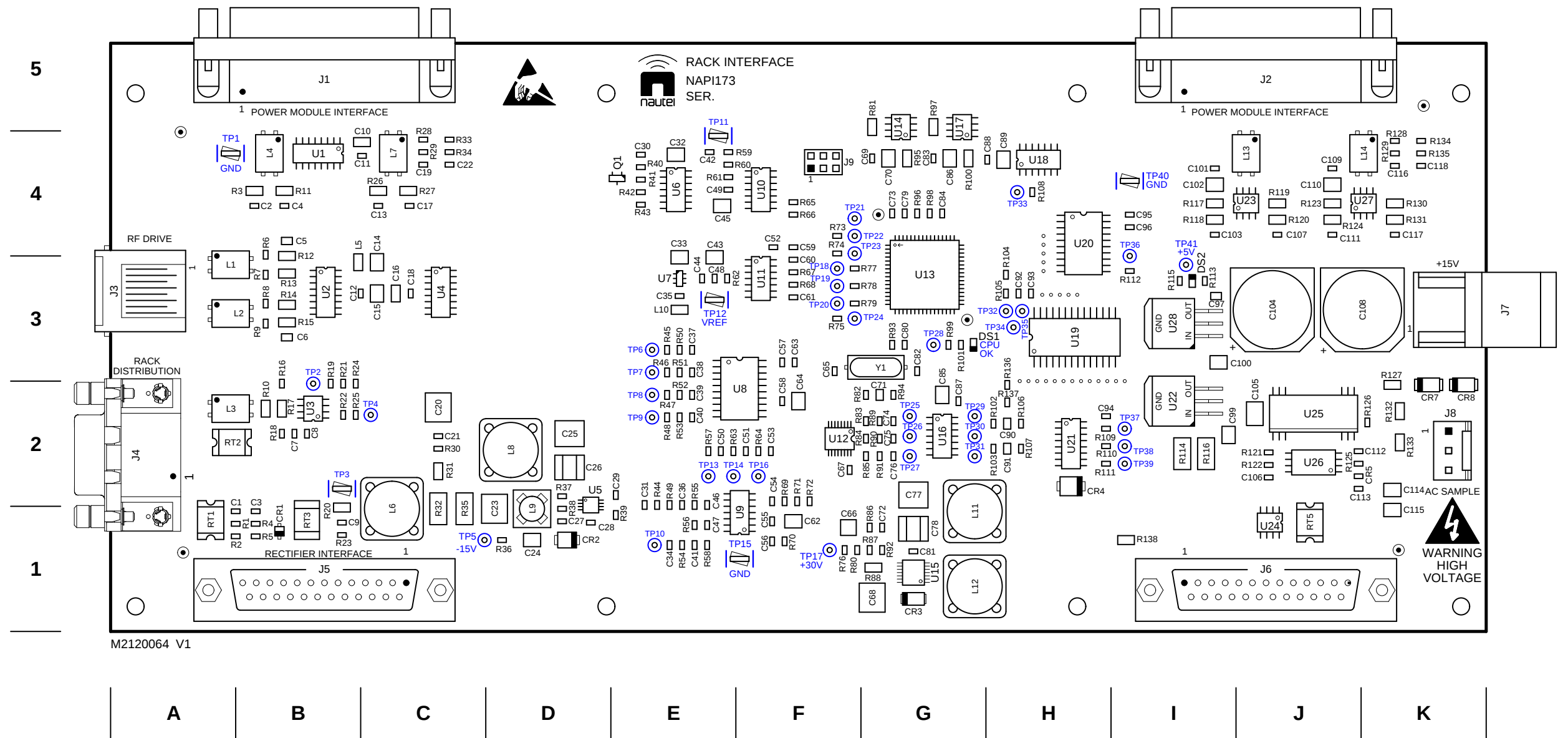


Figure MD-8: NAPI173A Rack Interface PWB

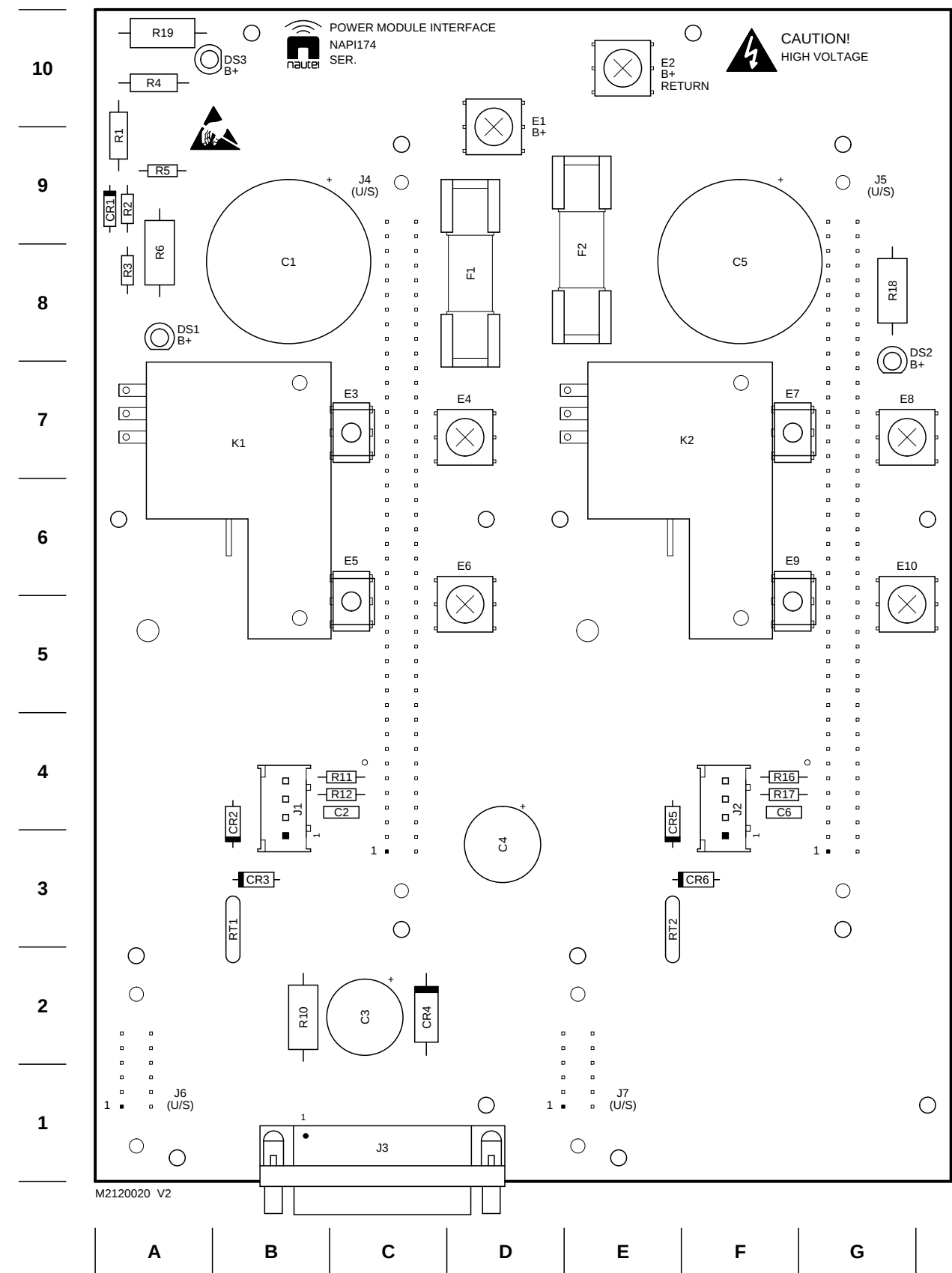


Figure MD-9: NAPI174 Power Module Interface PWB

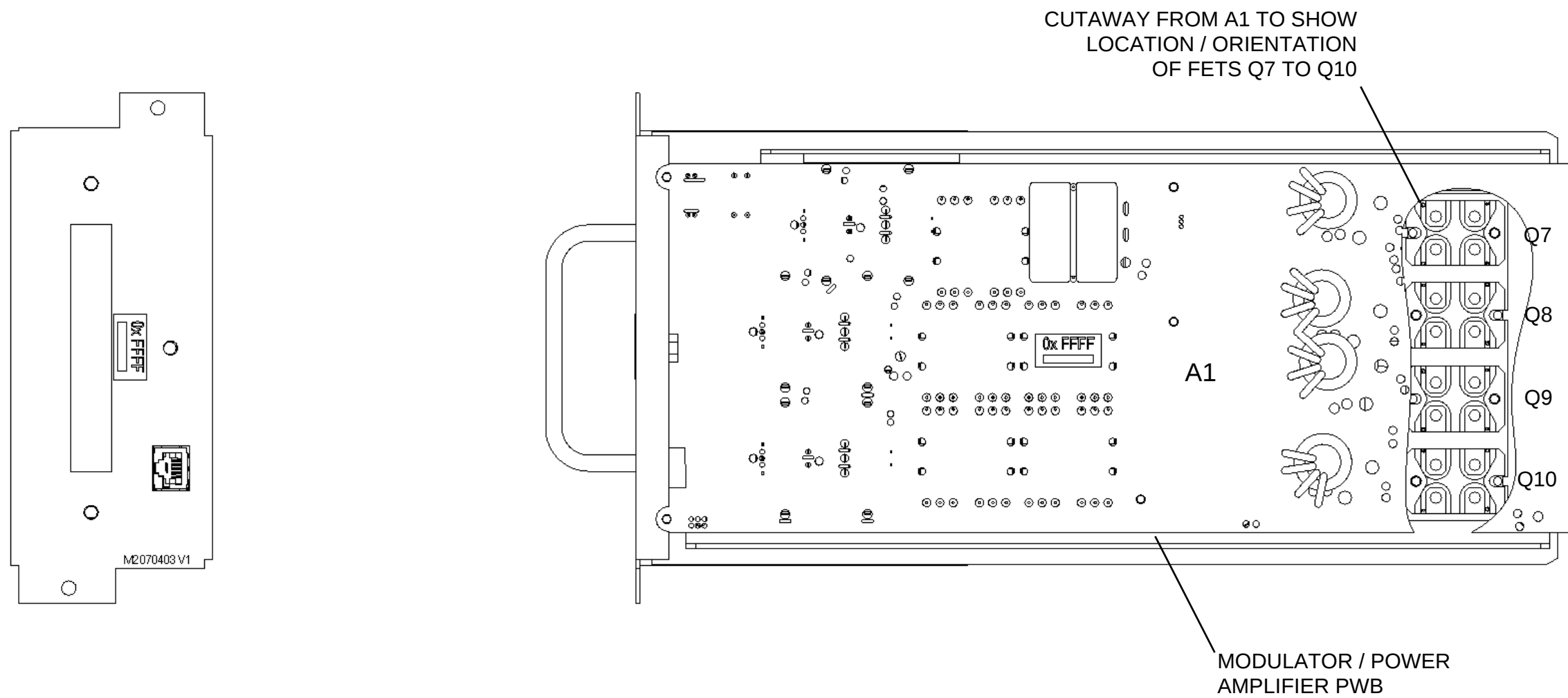
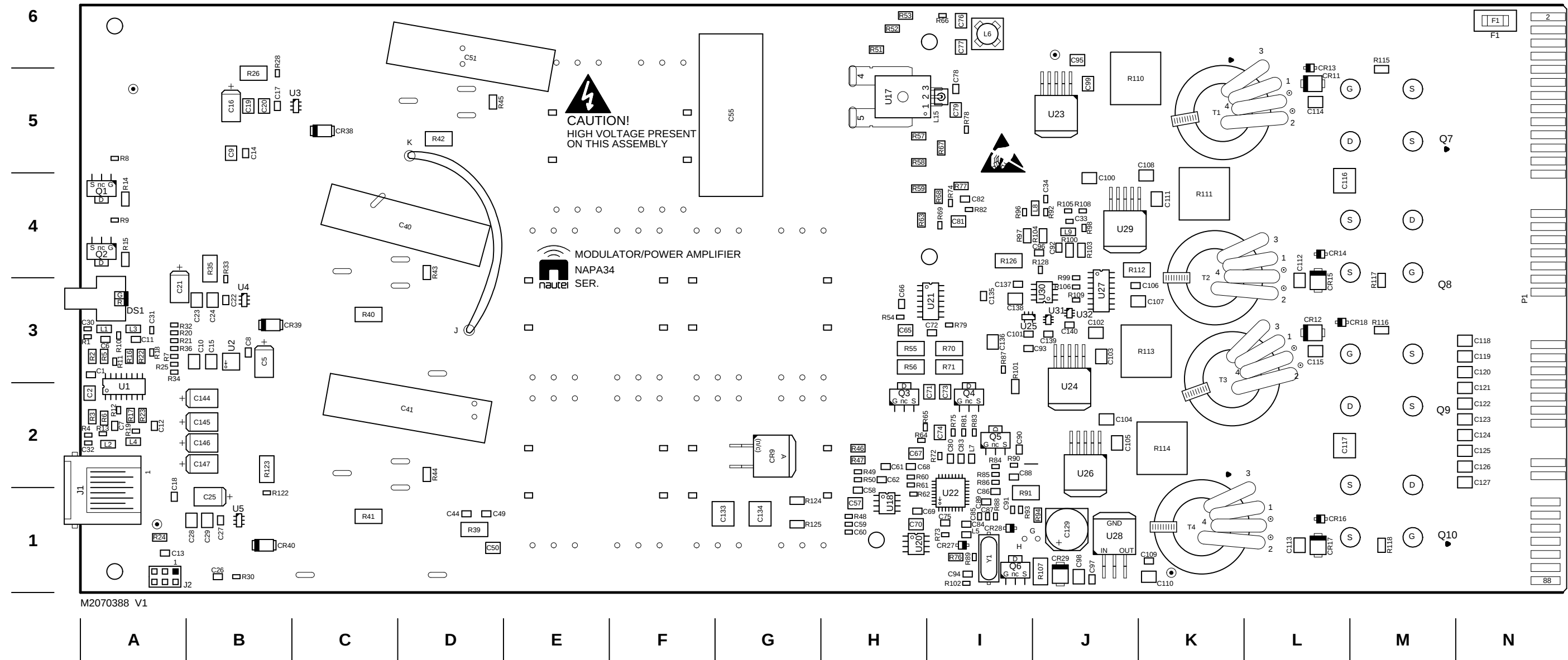
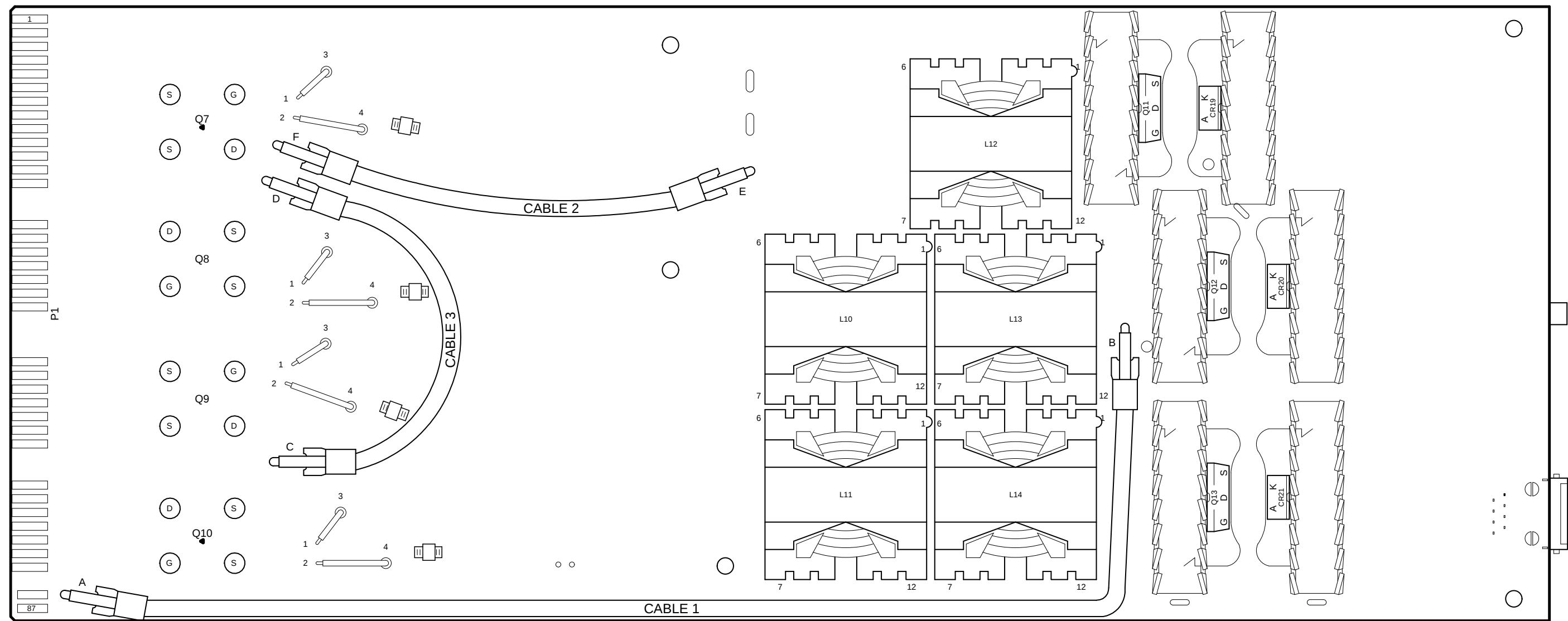


Figure MD-10: NAP39B RF Power Module



FRONT

Figure MD-11: NAPA34B Modulator/Power Amplifier PWB (Front View)



REAR

Figure MD-12: NAPA34B Modulator/Power Amplifier PWB (Rear View)

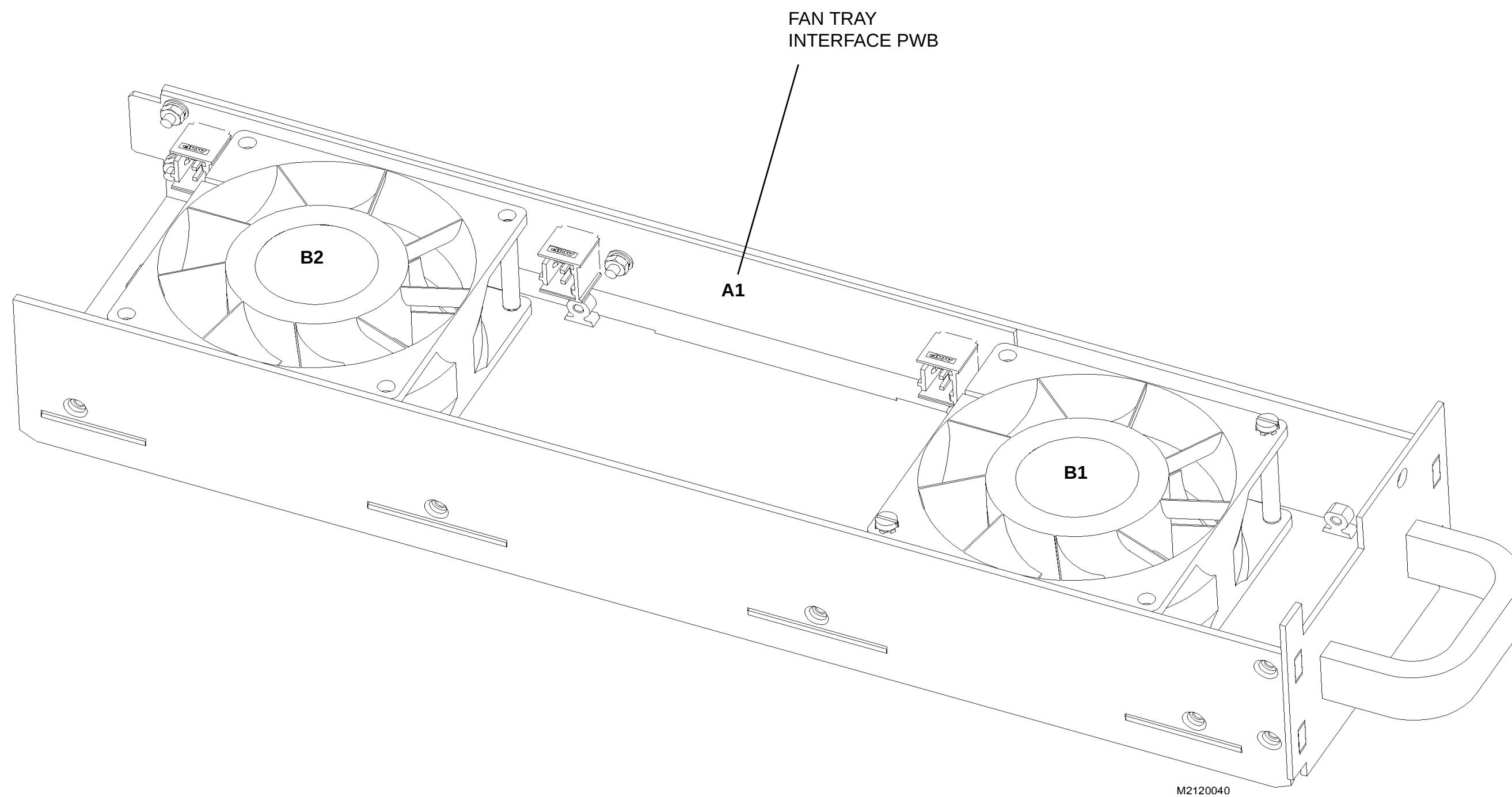


Figure MD-13: NAX274 Fan Tray Assembly

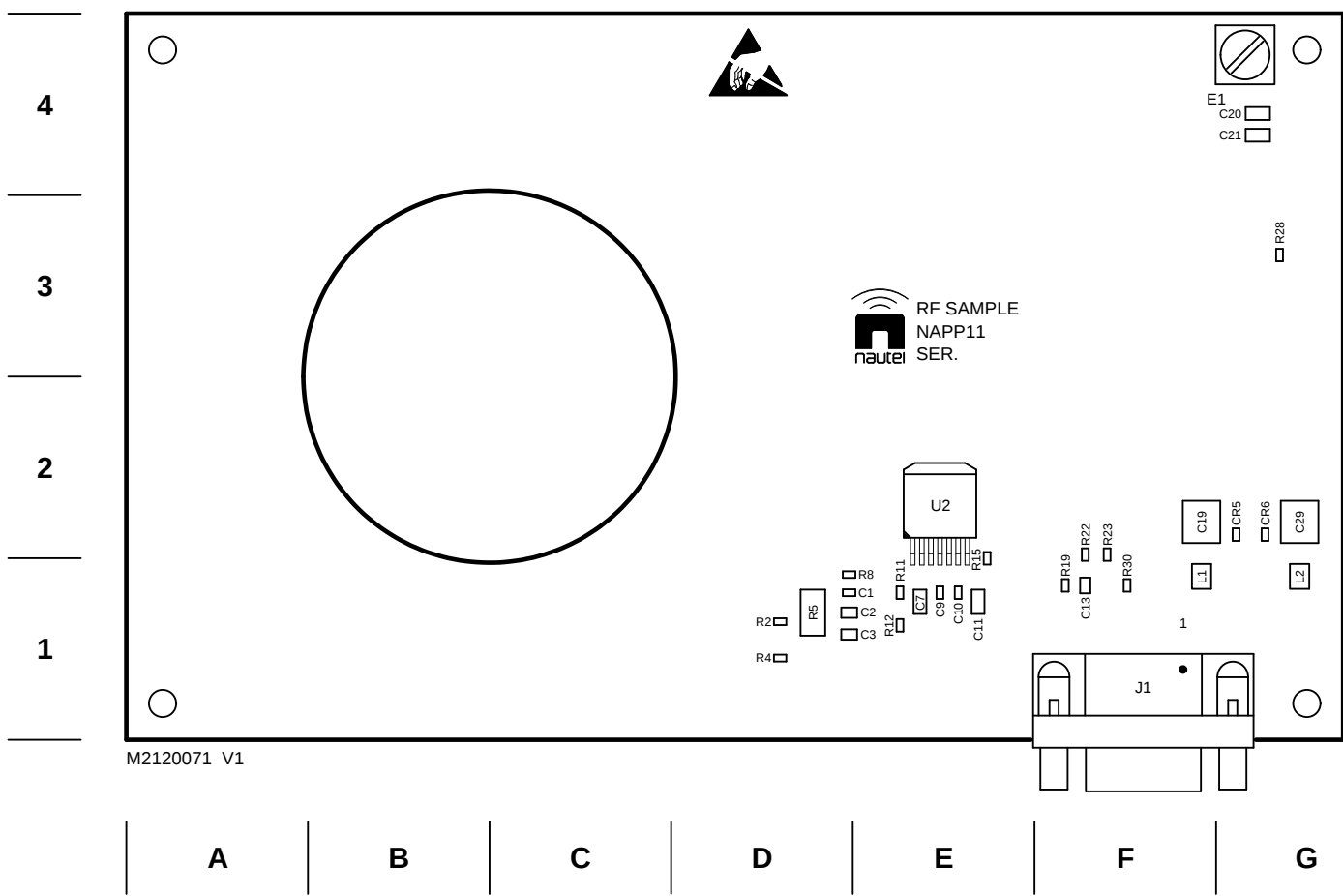
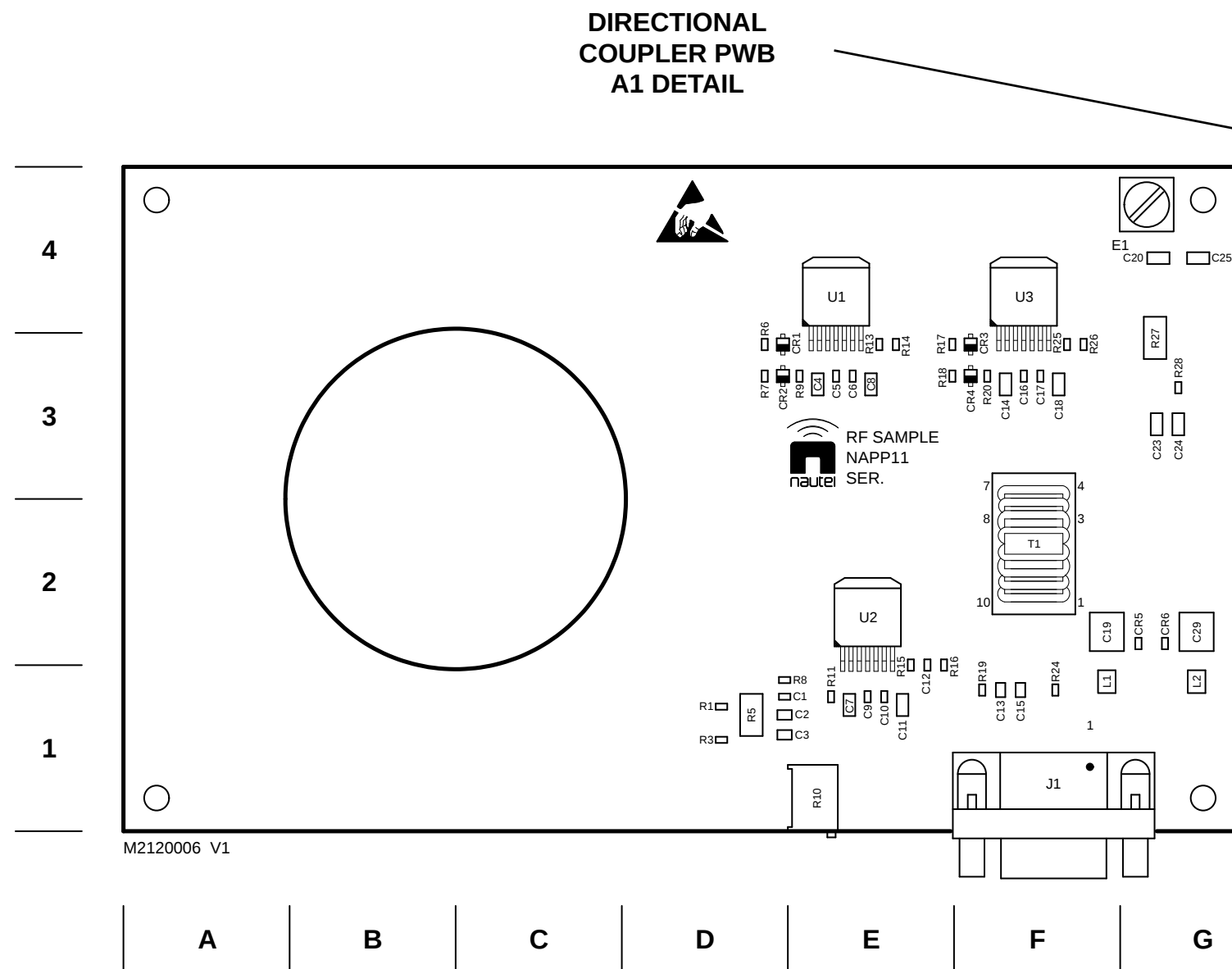


Figure MD-14: NAPP11/02A RF Voltage and Current Sample Probe



Cover partially
removed for clarity

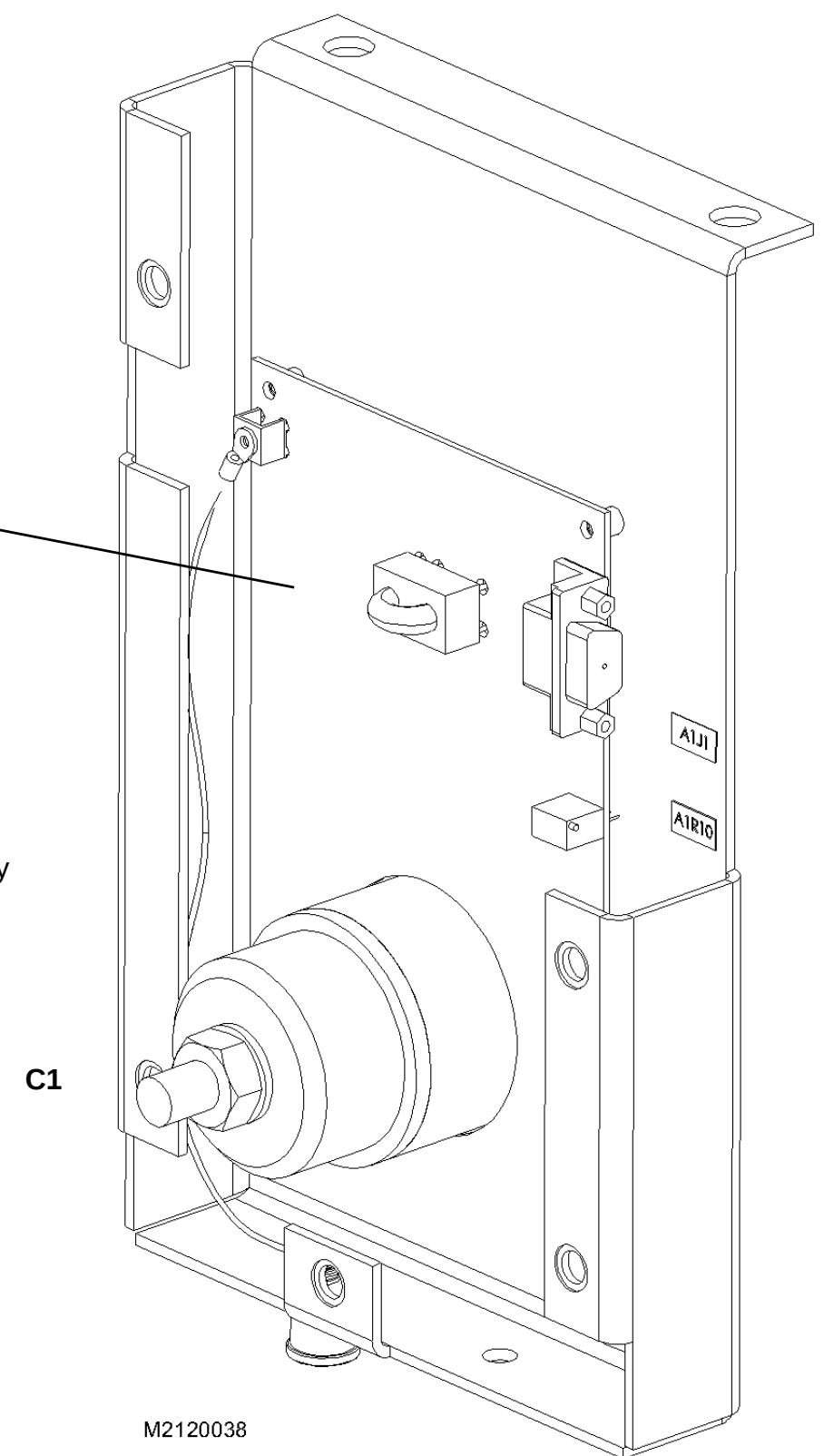


Figure MD-15: NAFP112 Directional Coupler Assembly (NAPP11 Directional Coupler PWB)

SECTION 4.6: LIST OF TERMS

This section defines some of the terms that are used in Nautel documentation.

ADC. Analog to Digital Converter.

AES-EBU. Audio Engineering Society/European Broadcasting Union (AES/EBU) is the name of a digital audio transfer standard. The AES/EBU digital interface is usually implemented using 3-pin XLR connectors (the same type connector used in professional microphones). One cable carries both left and right-channel audio data to the receiving device.

B+. The high voltage dc generated by the transmitter's ac power supply for use within the transmitter. The B+ voltage is used to supply the transmitter's modulators and other transmitter circuitry.

CUTBACK. A reduction in RF output power, caused by a total power limit fault or the occurrence of three shutbacks within a five second period.

DAC. Digital to Analog Converter.

DAM. Dynamic Amplitude Modulation.

DCC. Dynamic Carrier Control.

DRM. Digital Radio Mondiale. A set of digital audio broadcasting technologies designed to work existing AM radio channels.

DSP. Digital Signal Processing.

FPGA. Field Programmable Gate Array.

HD RADIO. HD Radio is another term for In Band On Channel (IBOC) technology. HD Radio is a trademark of iBiquity Digital Corporation.

IBOC. Nautel In-Band-On-Channel technology provides high quality digital audio over existing AM radio channels.

IPM. Incidental Phase Modulation

LATCHING ALARM. An alarm that, while active, keeps the transmitter in an 'RF inhibited' state. This type of alarm (e.g., High SWR Shutdown) require a reset - locally or remotely - to attempt to restore transmitter operation.

NE IBOC. Nautel's In-Band-On-Channel signal generator. See IBOC. Required for NX series IBOC installations.

PDM. Pulse Duration Modulation.

PRESET. A setting that controls power level, active exciter, and power scheduler status on a time-of-day and date basis. Exciters can be configured on a preset for a specific operating mode (for example, Exciter A - conventional AM, and Exciter B - IBOC). The NX10 allows you to pre-program multiple presets.

SHUTBACK. A complete loss of RF output power, caused by any one of a variety of faults, including high VSWR, low B+ voltage, high RF current, RF drive failure, external interlock or spark gap.

SURGE PROTECTION BOARD. An electrical panel that protects equipment from electrical surges in the ac power supply, antenna or site ground caused by lightning strikes.

VSWR. Voltage standing wave ratio. This is an expression of the ratio of forward voltage to reverse voltage on the feedline and antenna system. An ideal VSWR of 1:1 provides maximum transmitter-antenna efficiency.

NX10 TROUBLESHOOTING MANUAL

Document: NHB-NX10-TRB

Issue: 2016-05-06

Nautel Limited

10089 Peggy's Cove Road
Hackett's Cove, NS Canada B3Z 3J4

Toll Free: +1.877.6NAUTEL (662.8835)
(Canada & USA only) or

Phone: +1.902.823.3900 or

Fax: +1.902.823.3183

Nautel Inc.

201 Target Industrial Circle
Bangor, Maine USA 04401

Phone: +1.207.947.8200

Fax: +1.207.947.3693

Customer Service (24-hour support)

+1.877.628.8353 (Canada & USA only)

+1.902.823.5100 (International)

Email: support@nautel.com

Web: www.nautel.com

© Copyright 2016 NAUTEL. All rights reserved.

