Vector-LP Radio Beacon Transmitter

Schematics

VR125
VR250

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Vector-LP Radio Beacon Transmitter
TECHNICAL INSTRUCTION MANUAL

Section 9 ELECTRICAL SCHEMATICS

9.1 INTRODUCTION
This section contains electrical schematics/ logic diagrams for the subject equipment. Block diagrams, simplified electrical schematics, and/or logic diagrams may be included. Refer to Table 9-1 for an itemized listing.

9.2 COMPONENT VALUES
Unless otherwise specified on the logic/ schematic diagram, the following applies:

- Resistor values are shown in ohms. (K = 1000 and M = 1 000 000).
- Resistor power ratings are not shown when less than 0.5 W.
- Capacitor values are shown in microfarads (μF).
- Unidentified diodes are part number 1N4938.

9.3 GRAPHIC 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.

9.4 LOGIC SYMBOLS
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.

9.5 REFERENCE DESIGNATIONS
Reference 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, this basic identifier must be prefixed with the reference designation assigned to all higher assemblies.

9.6 UNIQUE SYMBOLOGY
Nautel utilizes unique symbology on electrical schematics to describe two-state (logic) inputs/outputs that differ from those inputs/ outputs having only one distinct state or multiple states (analog).

9.6.1 Type of Inputs/Outputs
On electrical schematics, names used to describe two-state (logic) inputs/outputs are prefixed by a '#'. Those inputs/outputs representing a one-state or analog signal will have no prefix.

9.6.2 Logic Level/Convention
The '#' prefix identifies an input/output that has two distinct states - 'high' and 'low'. A suffix, '+' or '-', identifies the active (true) state of the input/output. The 'high' (+) is the more positive of the two levels used to represent the logic states. The 'low' (-) is the less positive of the two levels used to represent the logic states. 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 state and 'high' represents the inactive state.

9.7 TROUBLESHOOTING AIDS
Waveforms and/or voltage levels are provided on some electrical schematics to aid in troubleshooting. Where applicable, accompanying text is included to establish conditional operating parameters that apply to the corresponding waveforms or voltages.

9.8 IDENTIFICATION OF SCHEMATIC DIAGRAMS

A number that is both the figure number and the page number identifies each illustration in this section. The numbers are assigned sequentially and are prefixed by the letters 'SD-'. The electrical schematics/logic diagrams included in this section are listed in Table 9-1.

9.9 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. Inputs normally originate on the left-hand side and outputs will 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/assembly was not necessarily a factor when a schematic was drawn. The full reference designation assigned to a part/assembly, in conjunction with the family tree in Figure 7-1 and the assembly detail drawings in section 10 will identify its location.

Figure SD-1 identifies each major stage and its detailed interconnection. Each stage contains cross-references that identify which block is the signal source for inputs or the destination for outputs.

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

9.10 LOCATING THE SCHEMATIC DIAGRAM(S) FOR A FUNCTIONAL BLOCK

The text inside a functional block provides the key to locating its schematic diagram(s). When a functional block is assigned a reference designation, refer to Table 9-1 with the Nautel nomenclature number and/or the description to identify the appropriate figure number(s), if applicable.

9.11 LOCATING A PART/ ASSEMBLY IDENTIFIED ON A SCHEMATIC

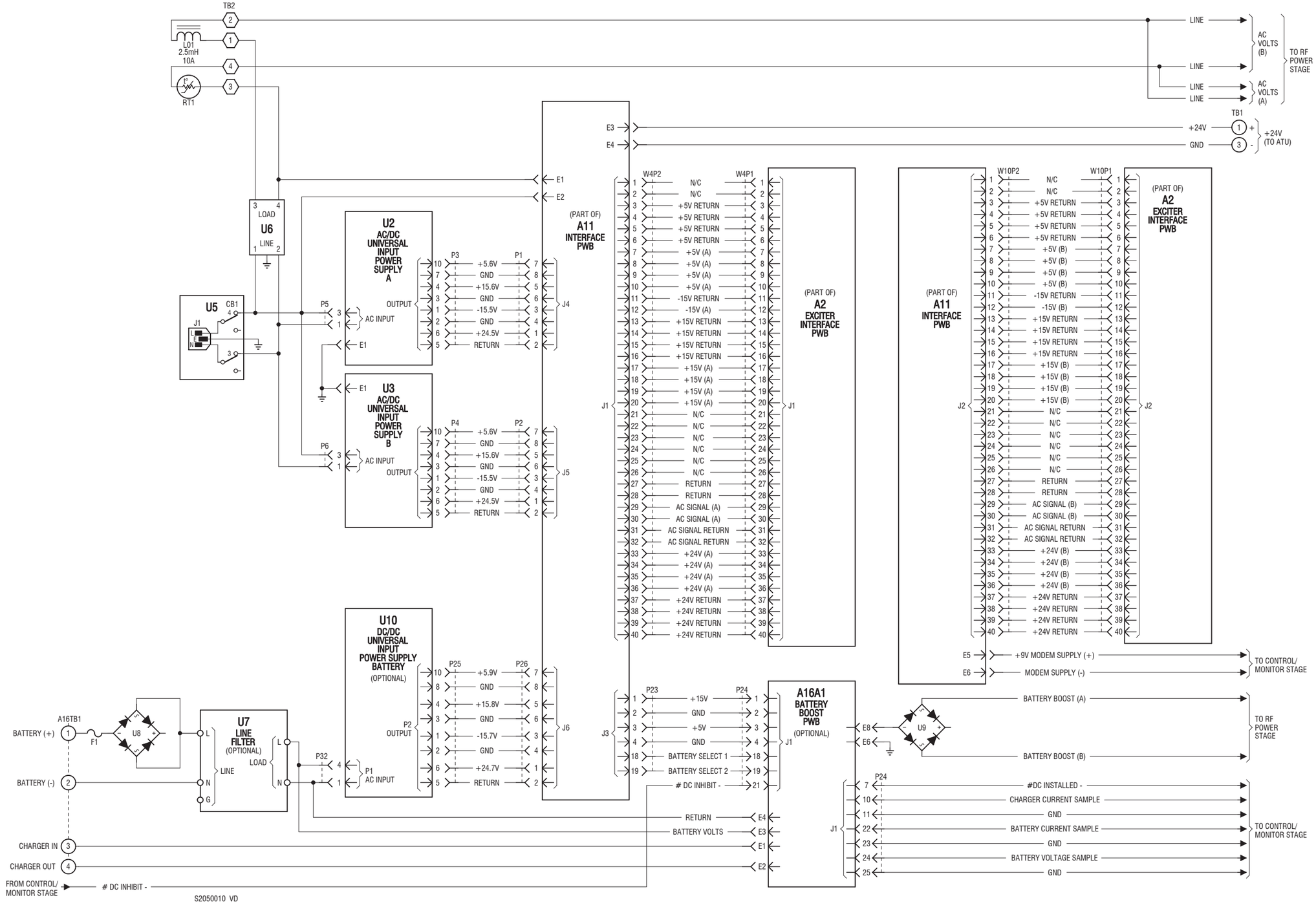
The full reference designation assigned to a part/assembly is the key to physically locating that part/assembly.

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.

Table 9-1: Electrical Schematics

Figure #	Description
SD-1	Electrical Schematic – Vector-LP Transmitter: Ac/Dc Power Stage
SD-2	Electrical Schematic – Vector-LP Transmitter: Exciter Stage
SD-3	Electrical Schematic – Vector-LP Transmitter: Control/Monitor Stage
SD-4	Electrical Schematic – Vector-LP Transmitter: RF Power Stage
SD-5	Electrical Schematic – Control/Display PWB (NAPC147D) (Sheet 1 of 4)
SD-6	Electrical Schematic – Control/Display PWB (NAPC147D) (Sheet 2 of 4)
SD-7	Electrical Schematic – Control/Display PWB (NAPC147D) (Sheet 3 of 4)
SD-8	Electrical Schematic – Control/Display PWB (NAPC147D) (Sheet 4 of 4)
SD-9	Electrical Schematic – Exciter Interface PWB (NAPI76A/02) (Sheet 1 of 2)
SD-10	Electrical Schematic – Exciter Interface PWB (NAPI76A/02) (Sheet 2 of 2)
SD-11	Electrical Schematic – Remote Interface PWB (NAPI78D/02) (Sheet 1 of 3)
SD-12	Electrical Schematic – Remote Interface PWB (NAPI78D/02) (Sheet 2 of 3)
SD-13	Electrical Schematic – Remote Interface PWB (NAPI78D/02) (Sheet 3 of 3)
SD-14	Electrical Schematic – Site Interface PWB (NAPI80, Optional) (Sheet 1 of 2)
SD-15	Electrical Schematic – Site Interface PWB (NAPI80, Optional) (Sheet 1 of 2)
SD-16	Electrical Schematic – RF Synthesizer PWB (NAPE70C/01) (Sheet 1 of 2)
SD-17	Electrical Schematic – RF Synthesizer PWB (NAPE70C/01) (Sheet 2 of 2)
SD-18	Electrical Schematic – Interphase PDM Driver PWB (NAPM11)
SD-19	Electrical Schematic – Exciter Monitor/Generator PWB (NAPE76A/03) (Sheet 1 of 2)
SD-20	Electrical Schematic – Exciter Monitor/Generator PWB (NAPE76A/03) (Sheet 2 of 2)
SD-21	Electrical Schematic – Interface PWB (NAPI94A)
SD-22	Electrical Schematic – RF Power Module (NAP35A & NAP35A/01)
SD-23	Electrical Schematic – Power Module Control/Interface PWB (NAPC151A)
SD-24	Electrical Schematic – Switch Mode Power Supply PWB (NAPS31B/02 & /03)
SD-25	Electrical Schematic – Battery Boost PWB (NAPS35, Optional)
SD-26	Electrical Schematic – Vector-LP in Deluxe Cabinet (205-8075, Optional)
SD-27	Electrical Schematic – Vector-LP in IP66 Cabinet (205-8080, Optional)
SD-28	Electrical Schematic – Vector-LP in Short Cabinet [205-8120 (with battery) & 205-8120-01 (no battery), Optional]
SD-29	Electrical Schematic – Vector-LP in Tall Cabinet (205-8200, Optional)



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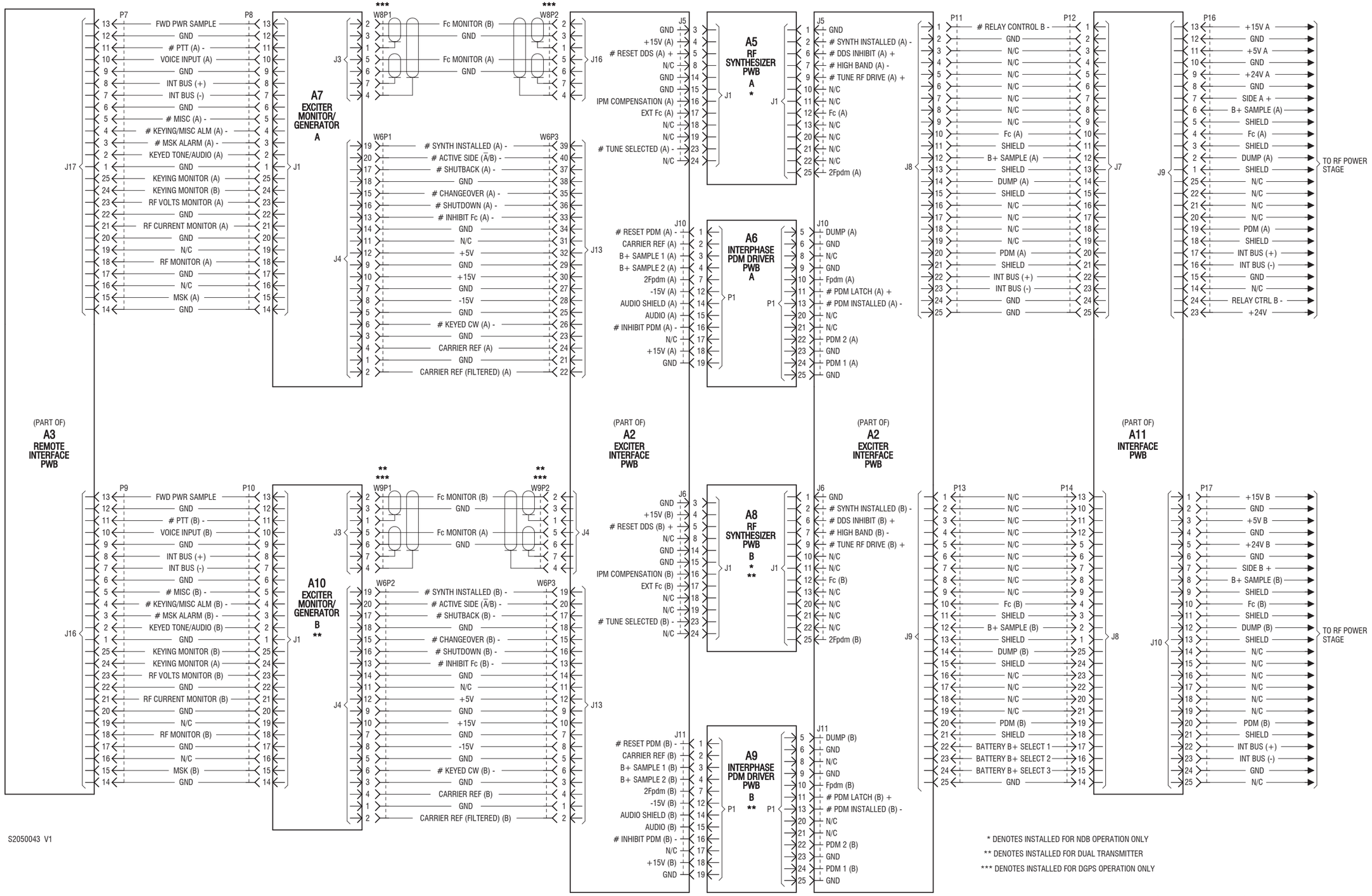
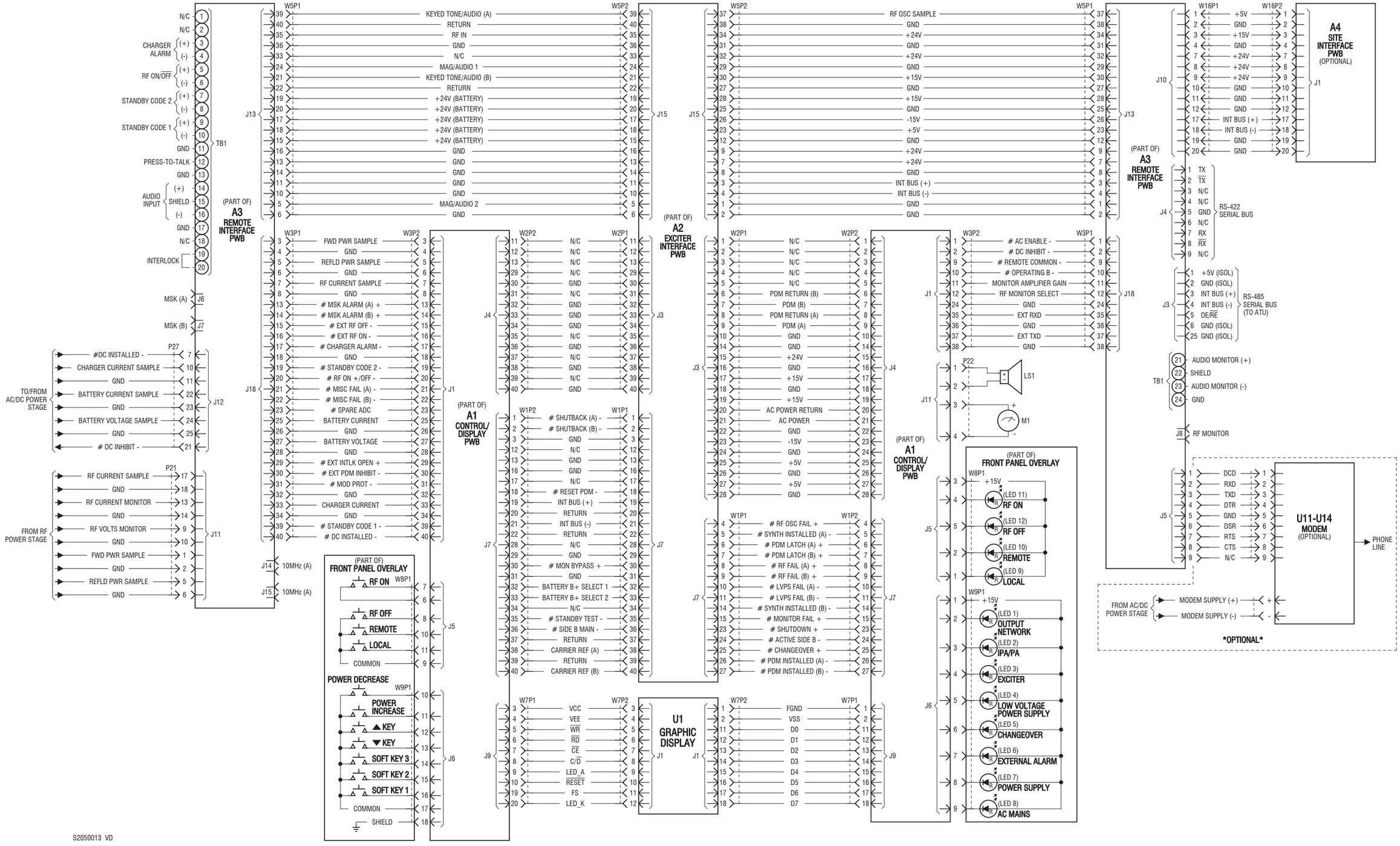
Dimensions = mm (inches)

Electrical Schematic – Vector-LP Transmitter: Ac/Dc Power Stage			
Issue 1.8	Not to Scale	Figure SD-1	Sheet 1 of 1



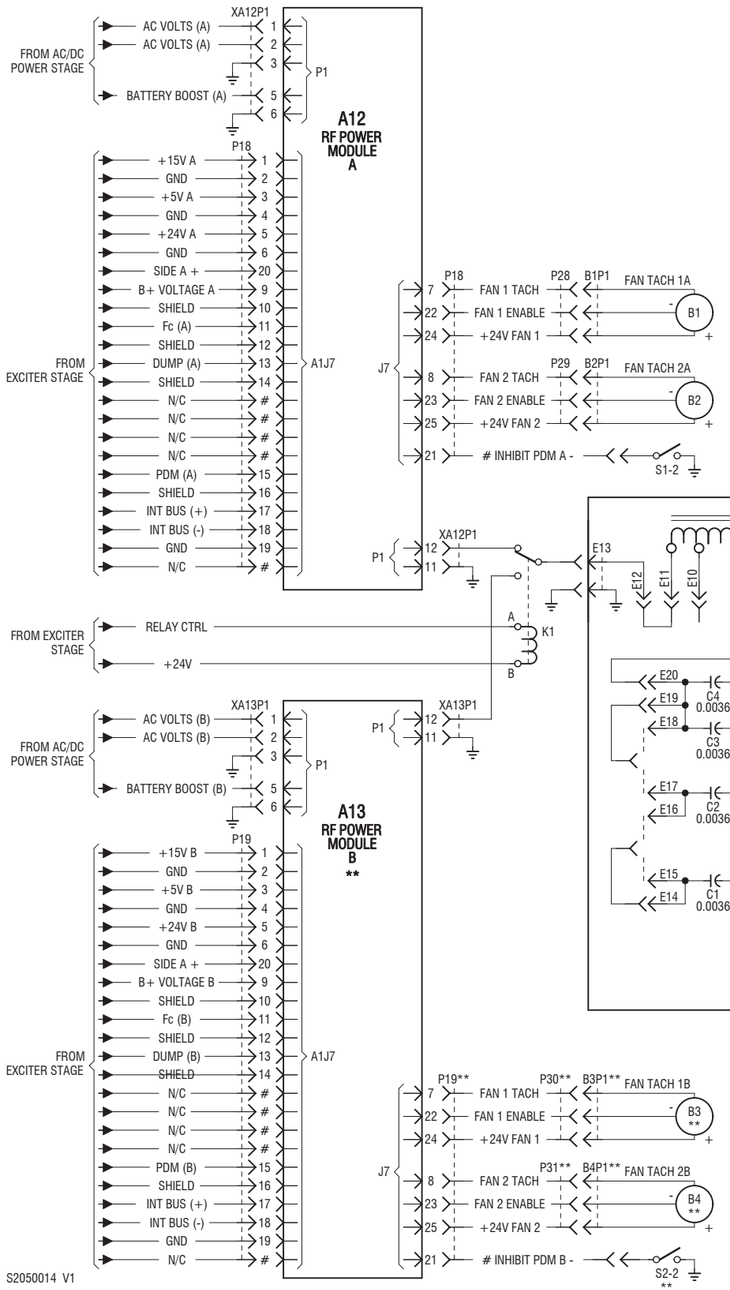
Dimensions = mm (inches)

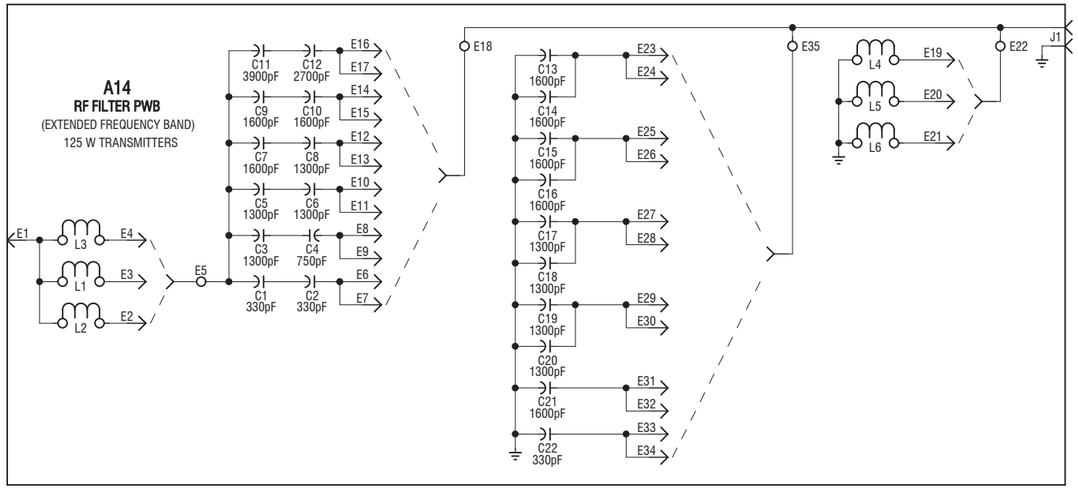
Electrical Schematic – Vector-LP Transmitter: Exciter Stage			
Issue 1.8	Not to Scale	Figure SD-2	Sheet 1 of 1

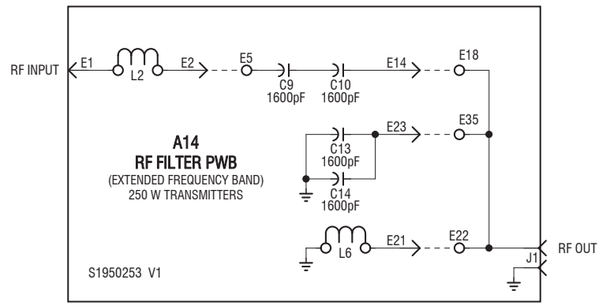


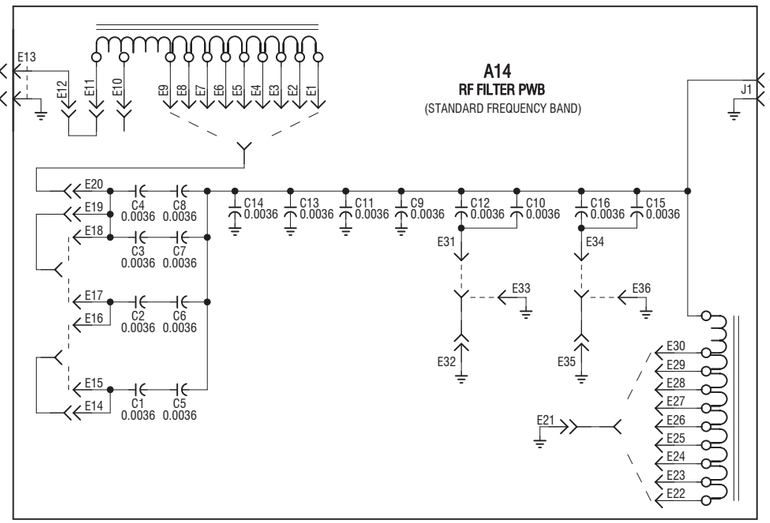
Dimensions = mm (inches)

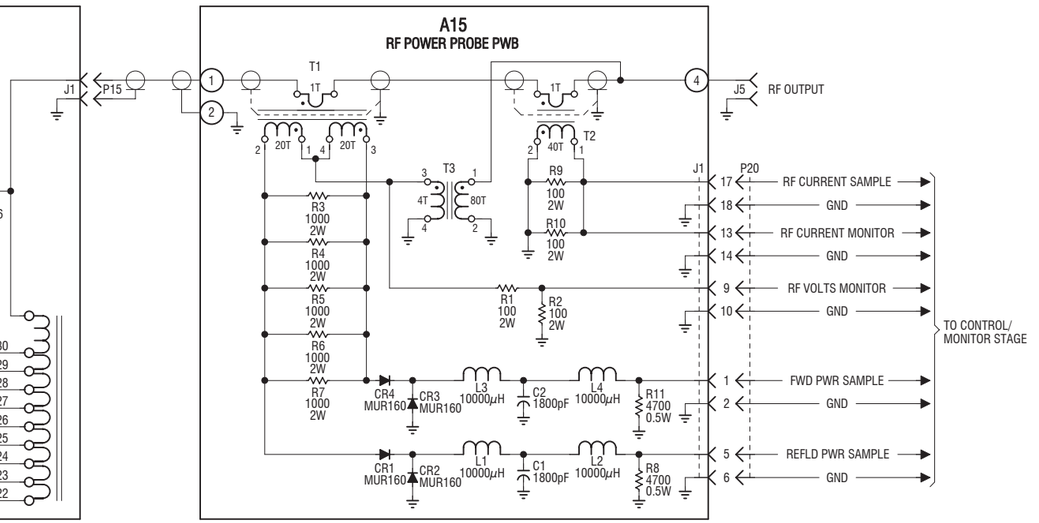
Electrical Schematic – Vector-LP Transmitter: Control/Monitor Stage			
Issue 1.8	Not to Scale	Figure SD-3	Sheet 1 of 1







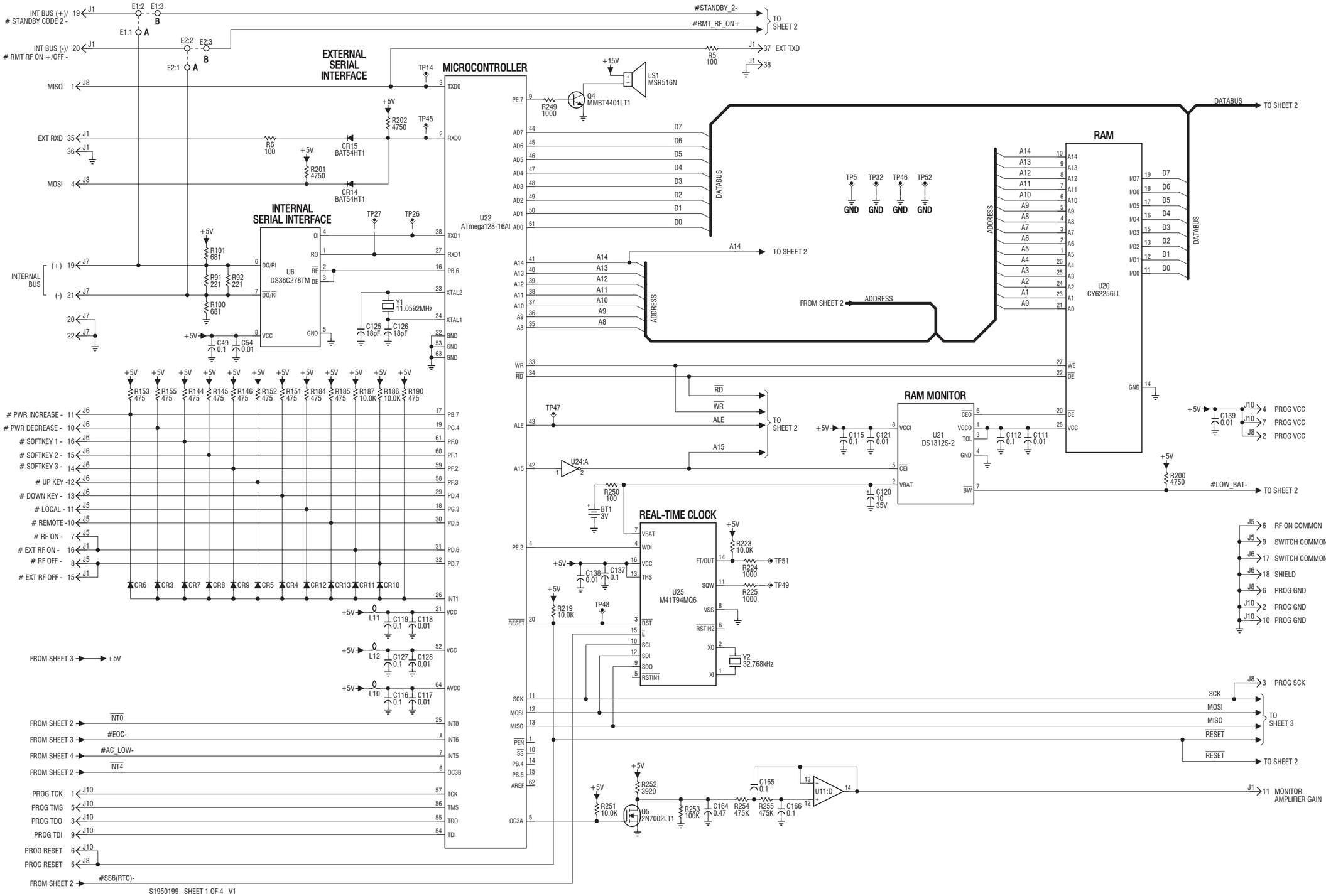




** DENOTES INSTALLED FOR DUAL TRANSMITTER

Dimensions = mm (inches)

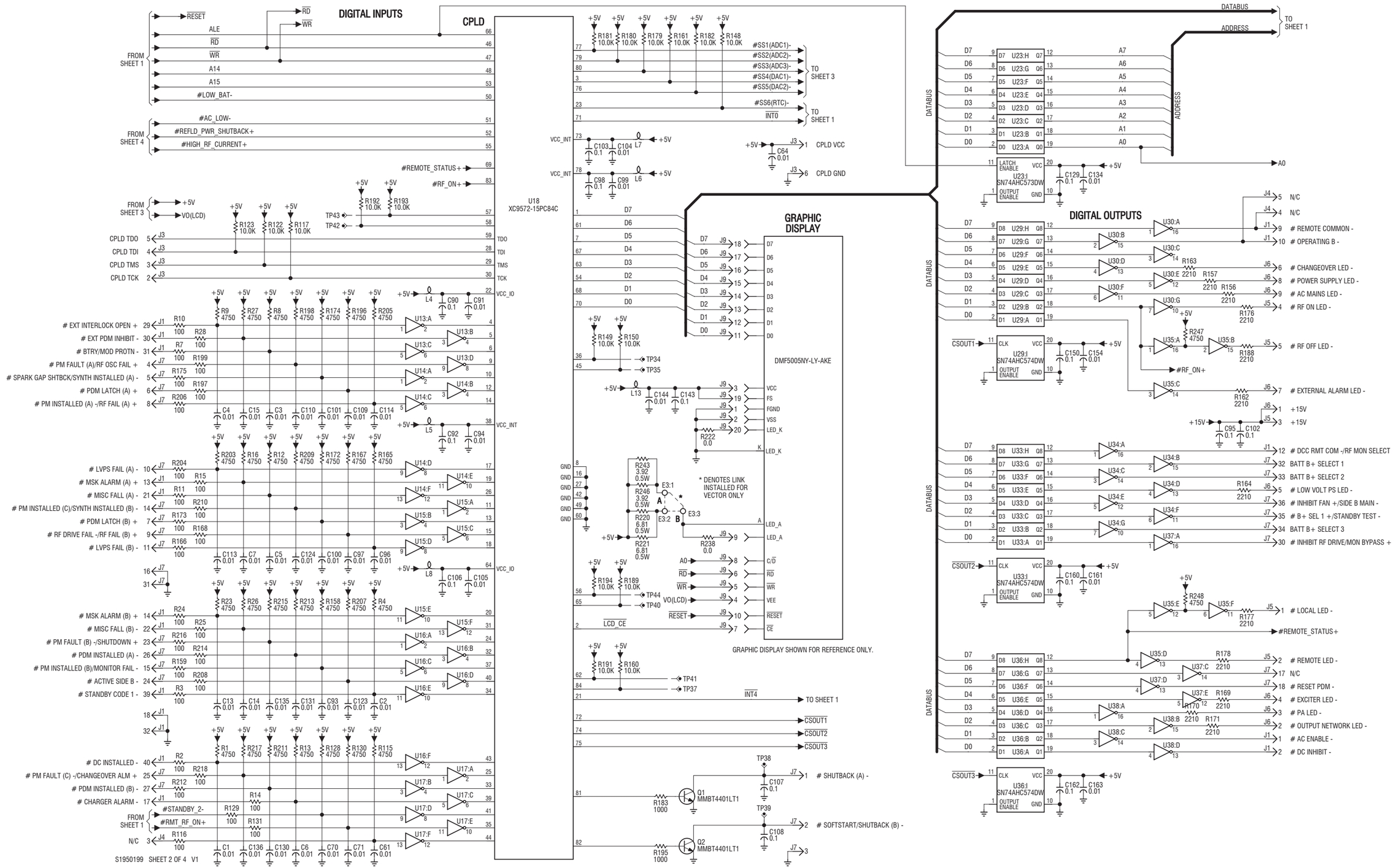
Electrical Schematic – Vector-LP Transmitter: RF Power Stage			
Issue 1.8	Not to Scale	Figure SD-4	Sheet 1 of 1



S1950199 SHEET 1 OF 4 V1

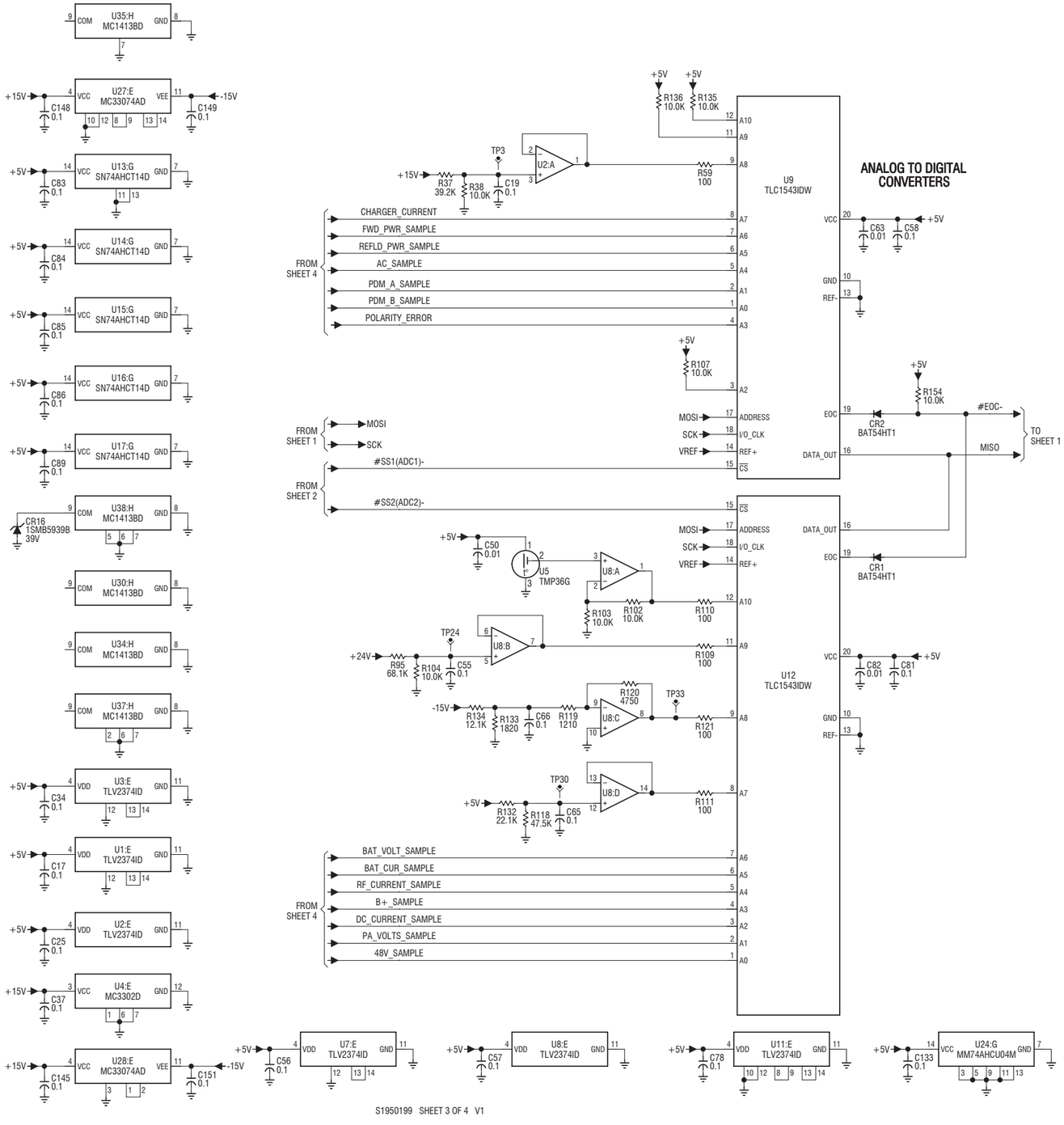
Dimensions = mm (inches)

Electrical Schematic – Control/Display PWB (NAPC147D)			
Issue 1.8	Not to Scale	Figure SD-5	Sheet 1 of 4



Dimensions = mm (inches)

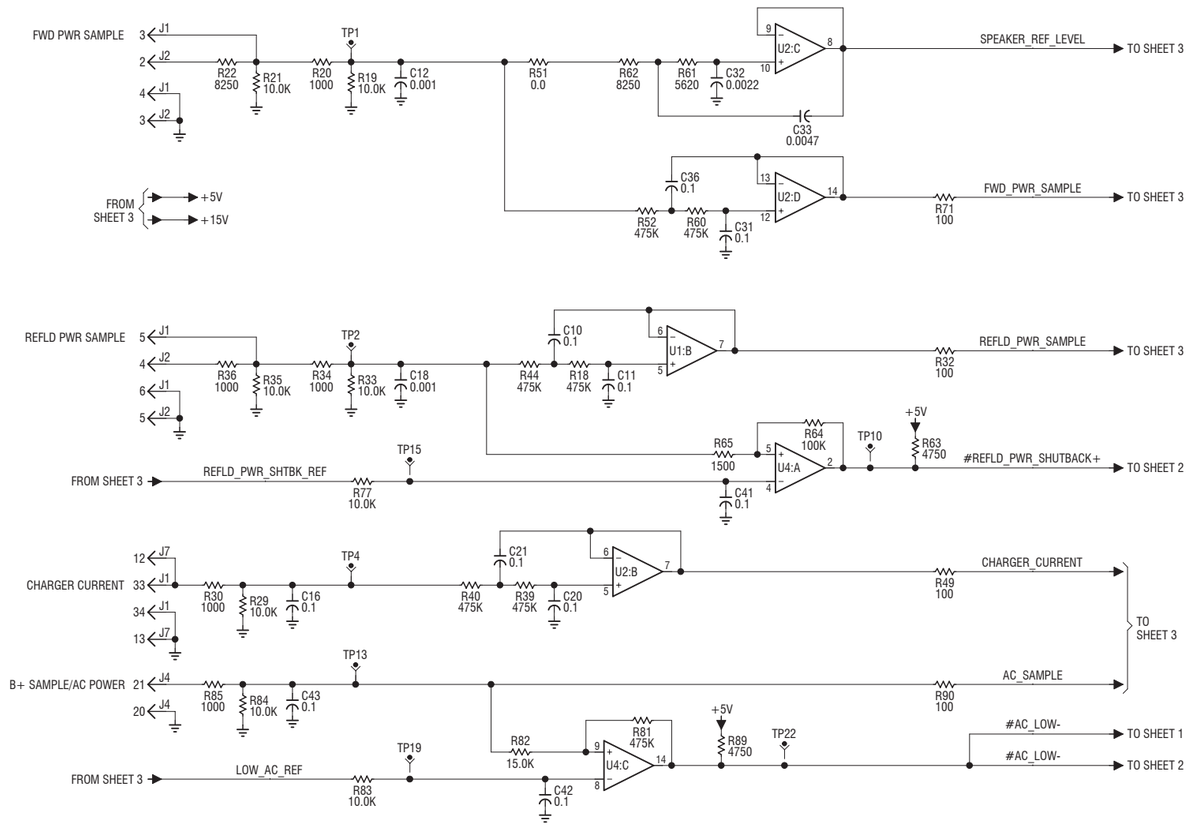
Electrical Schematic – Control/Display PWB (NAPC147D)			
Issue 1.8	Not to Scale	Figure SD-6	Sheet 2 of 4



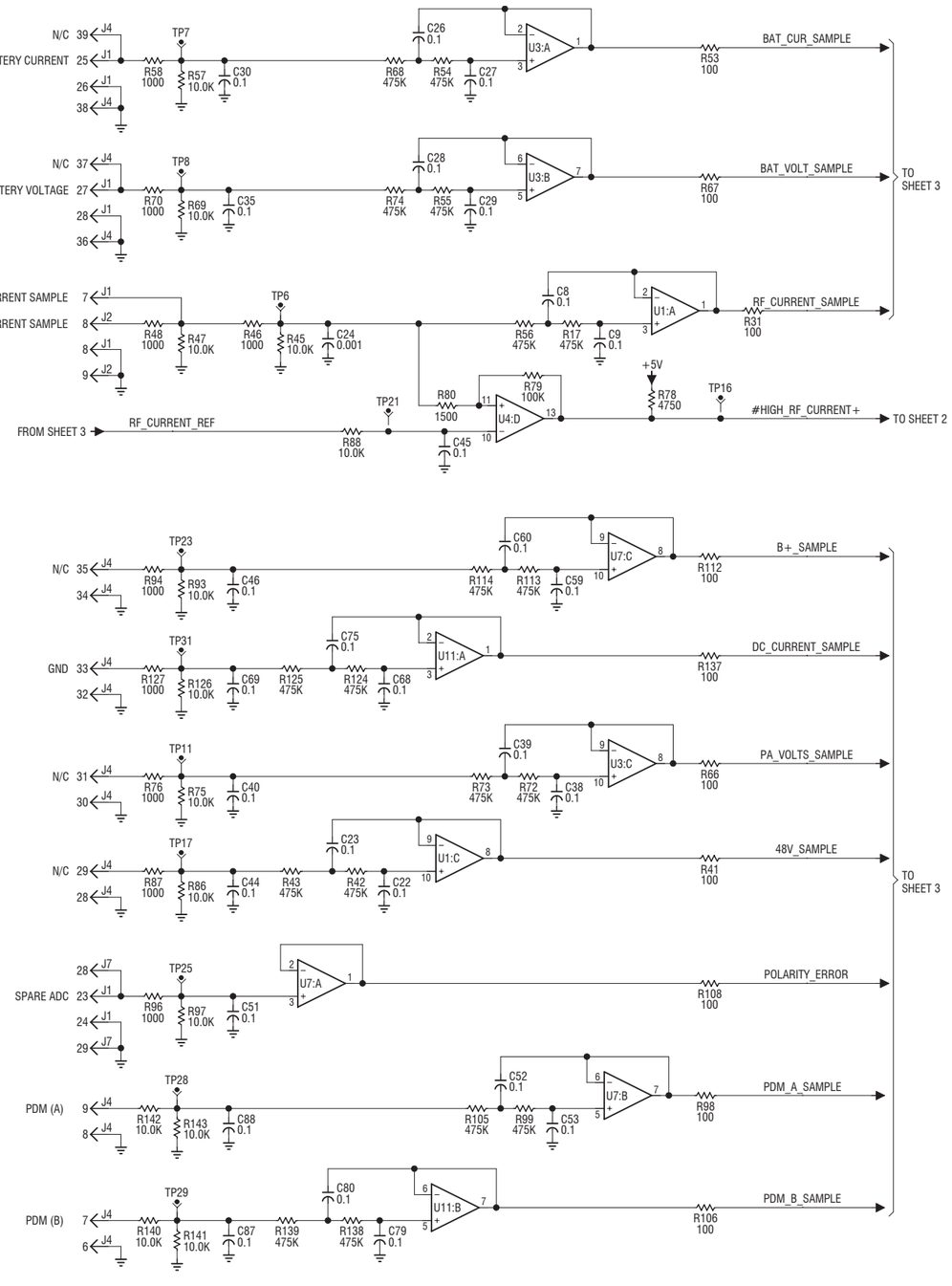
S1950199 SHEET 3 OF 4 V1

Dimensions = mm (inches)

Electrical Schematic – Control/Display PWB (NAPC147D)			
Issue 1.8	Not to Scale	Figure SD-7	Sheet 3 of 4

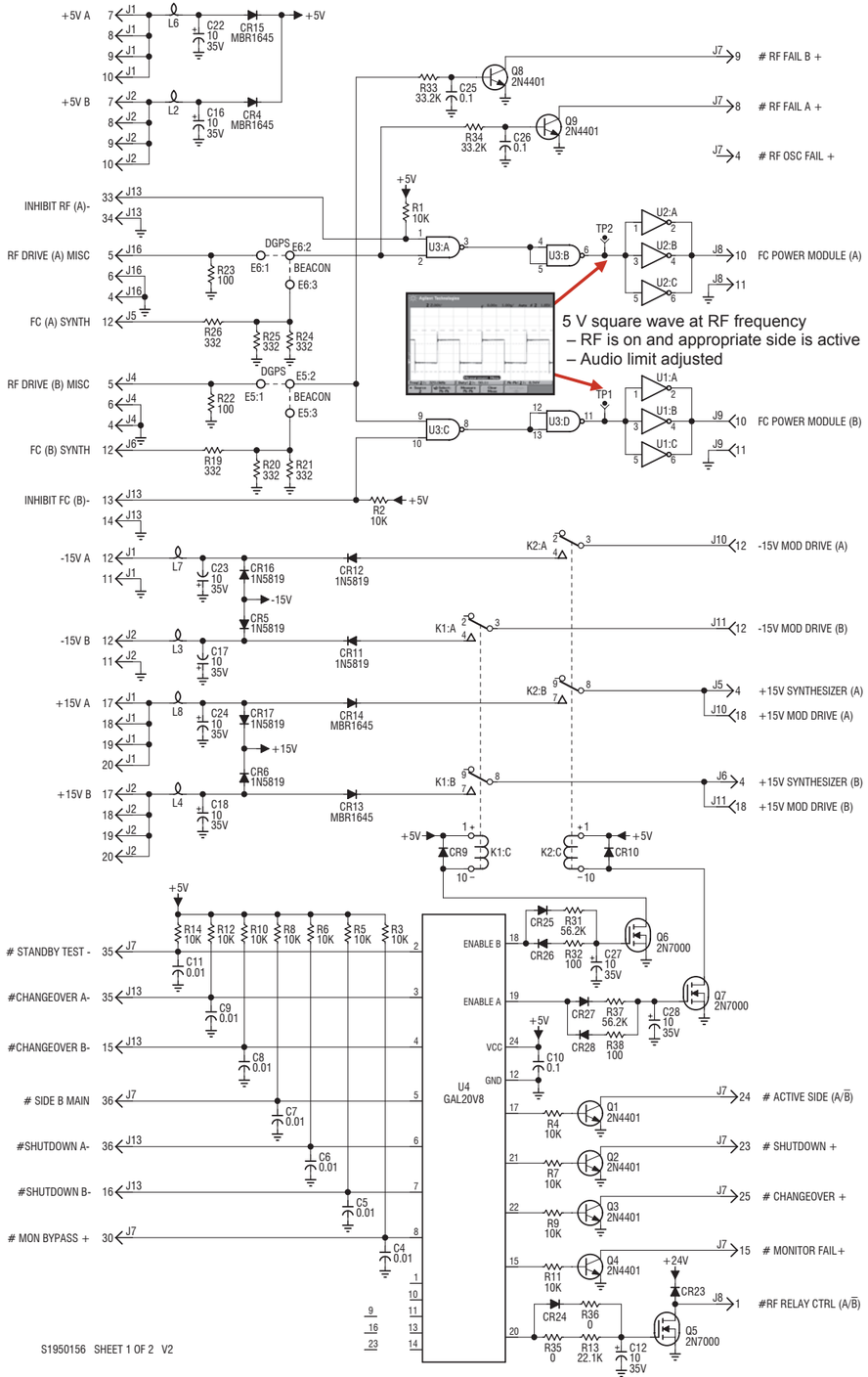


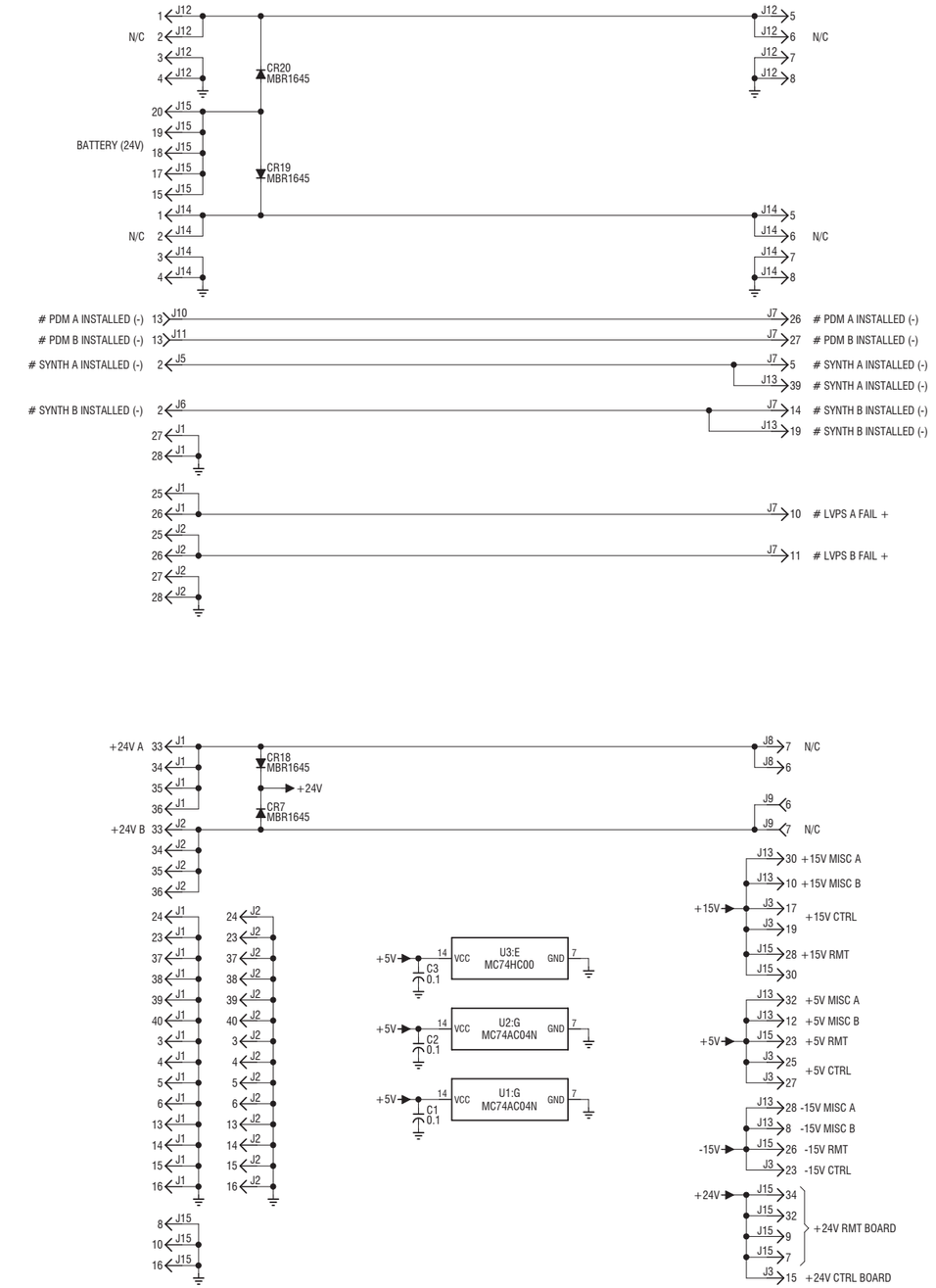
S1950199 SHEET 4 OF 4 V1



Dimensions = mm (inches)

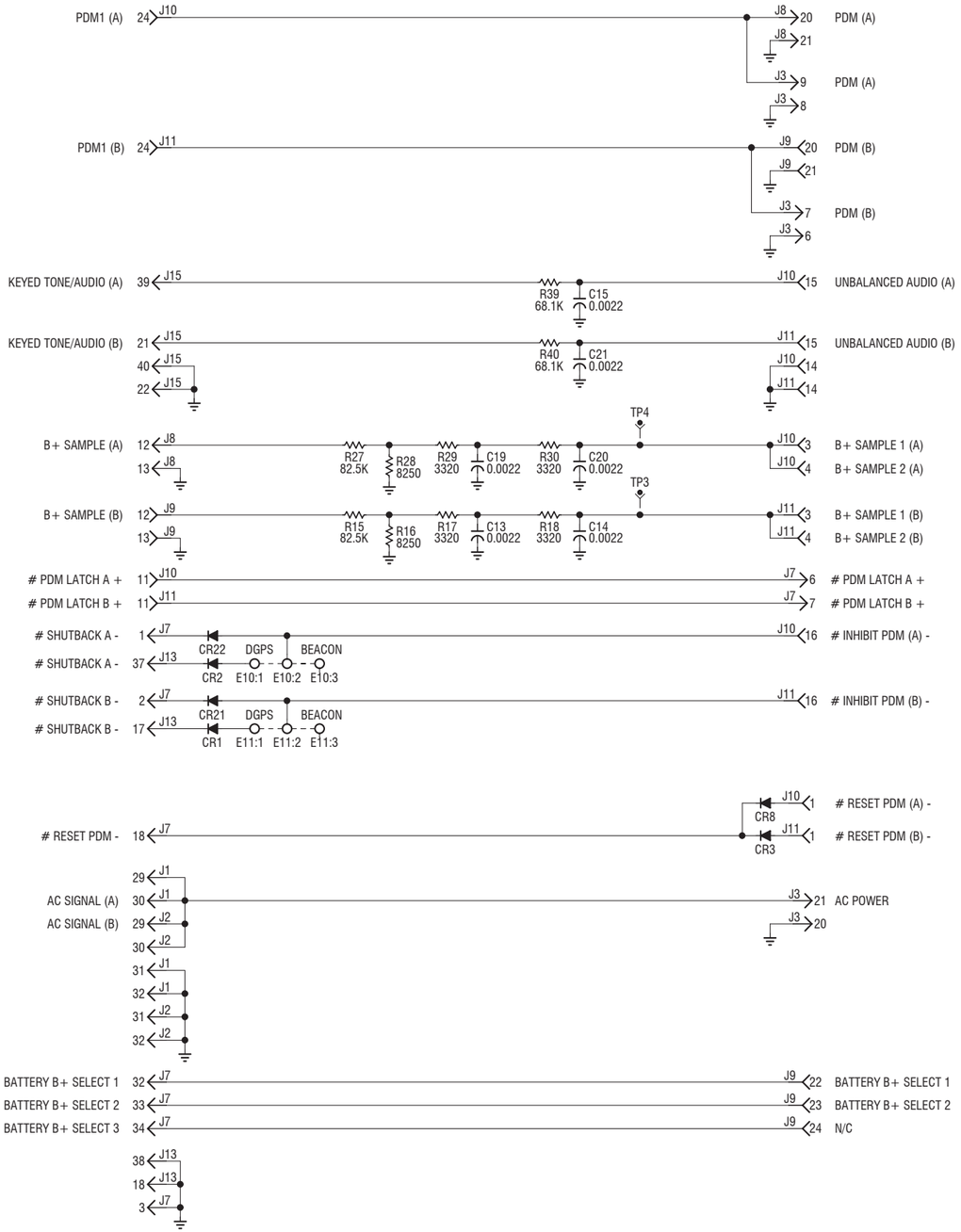
Electrical Schematic – Control/Display PWB (NAPC147D)			
Issue 1.8	Not to Scale	Figure SD-8	Sheet 4 of 4

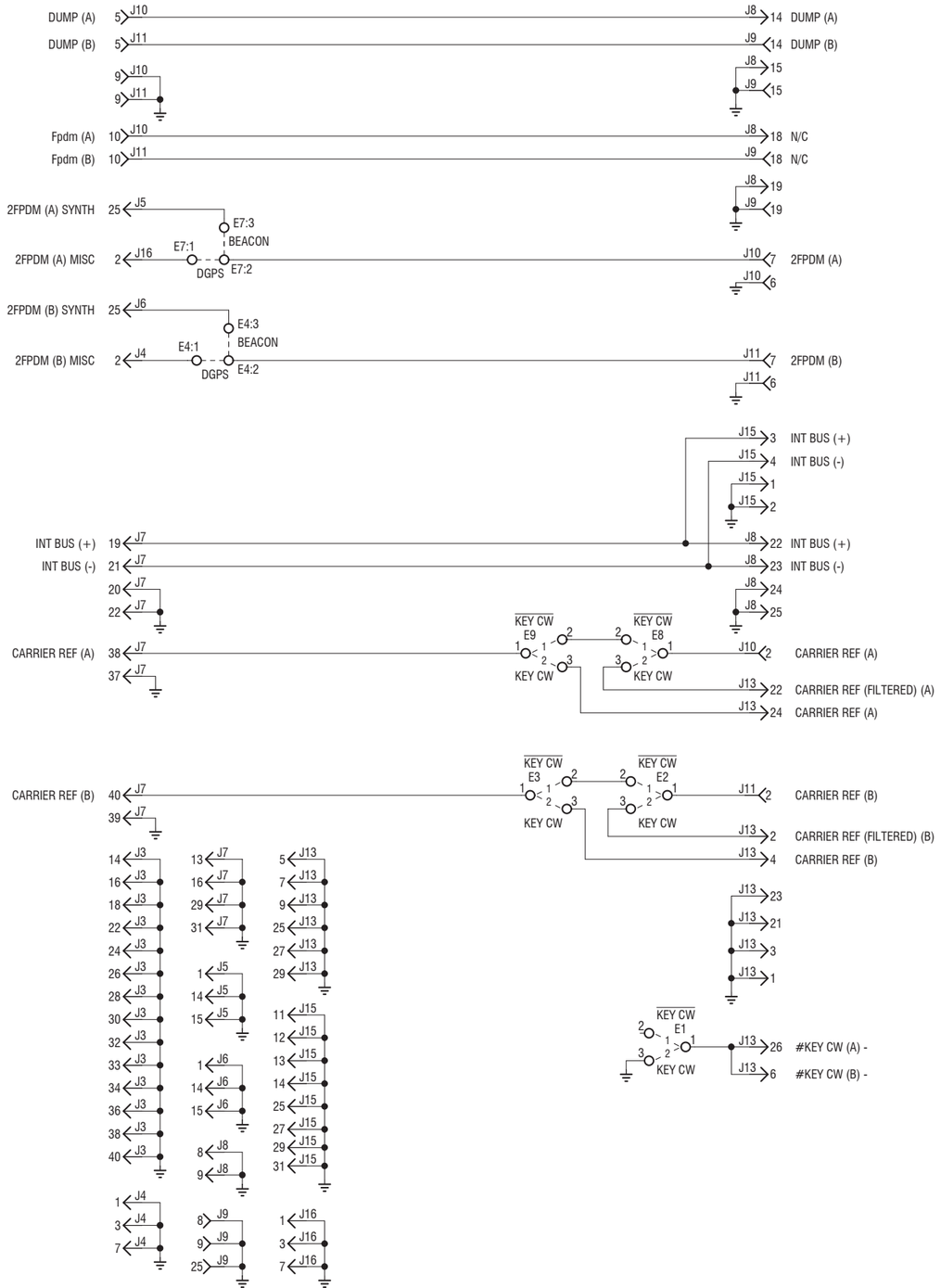




Dimensions = mm (inches)

Electrical Schematic – Exciter Interface PWB (NAPI76A/02)			
Issue 1.8	Not to Scale	Figure SD-9	Sheet 1 of 2

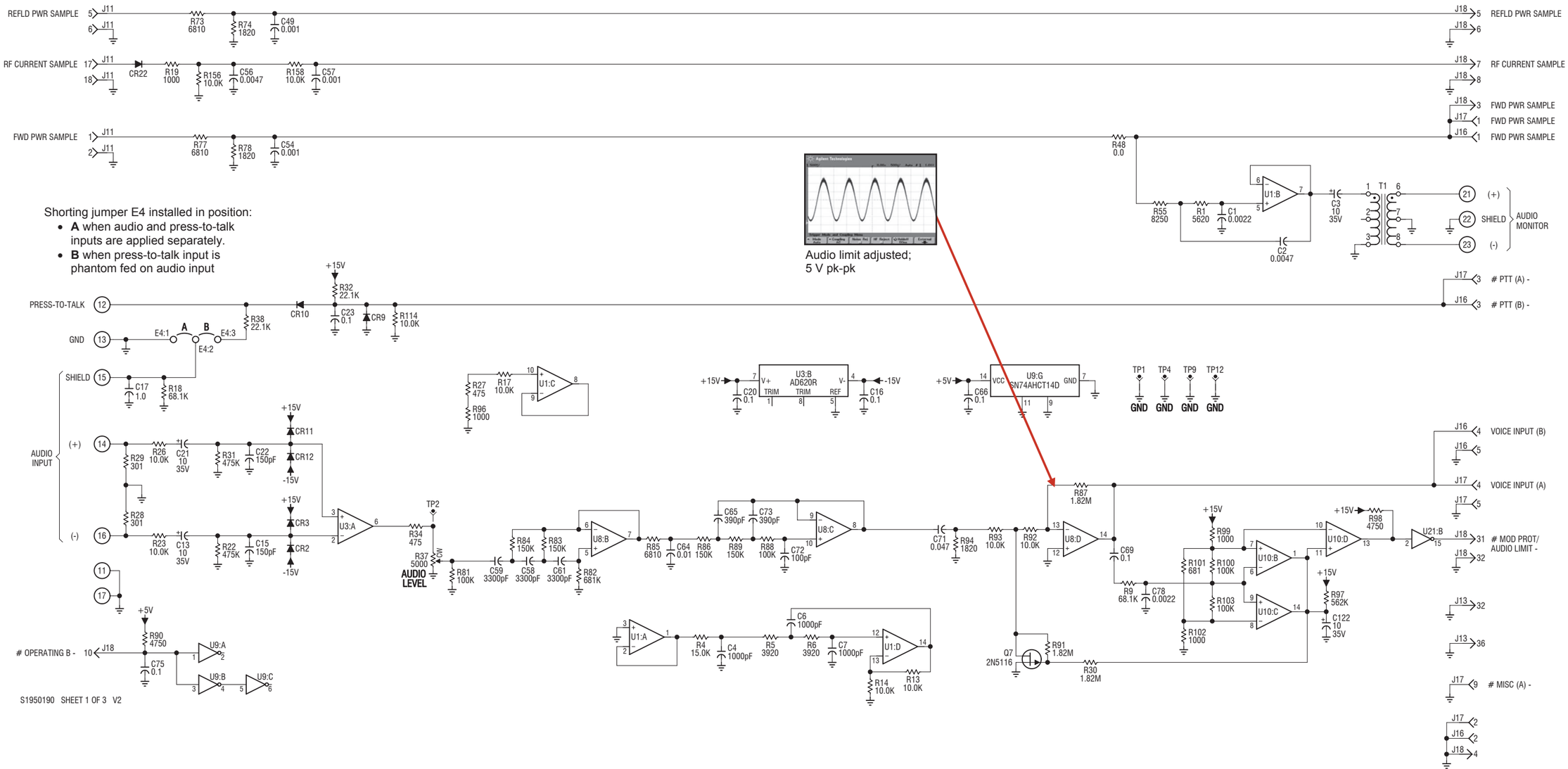




S1950156 SHEET 2 OF 2 V2

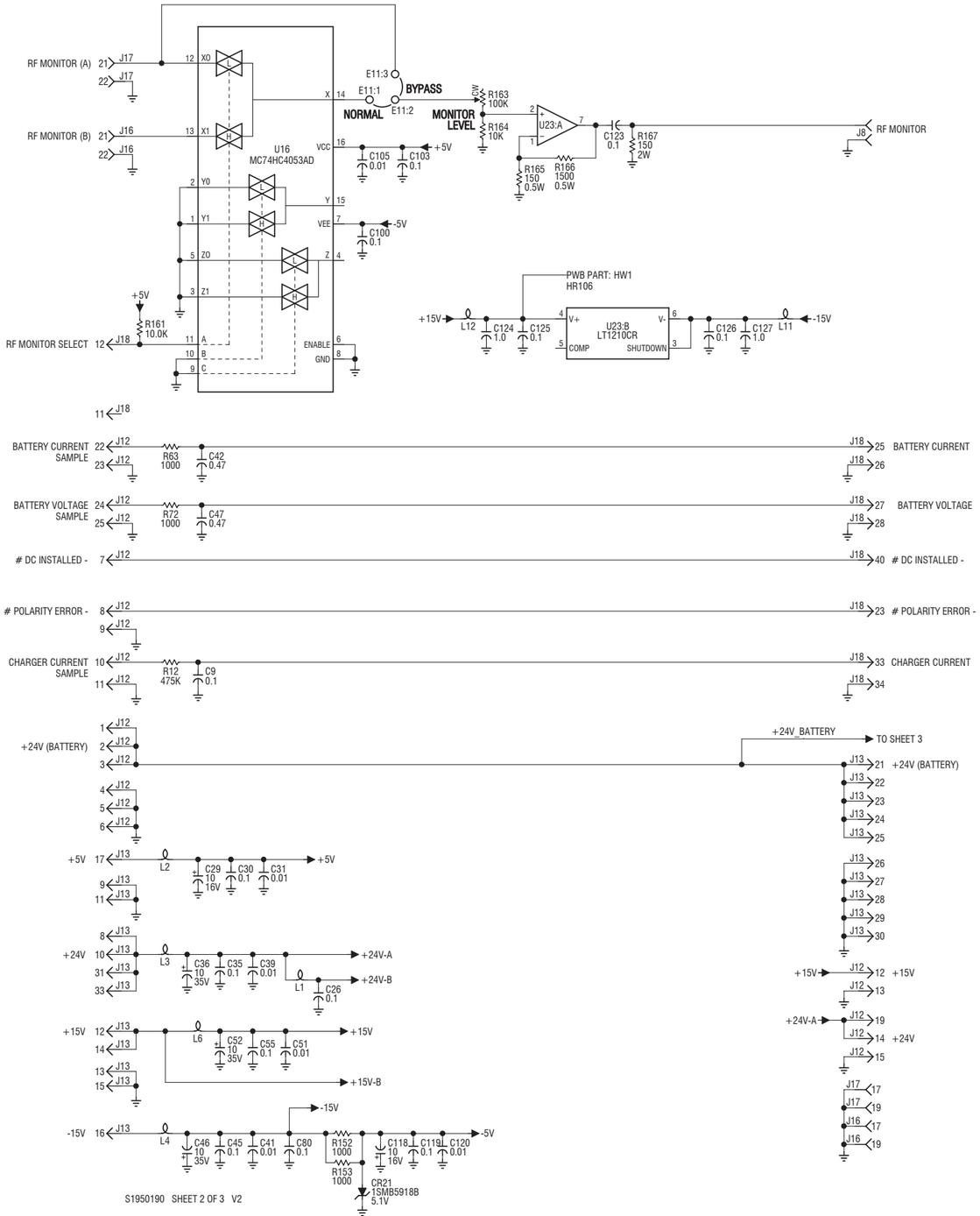
Dimensions = mm (inches)

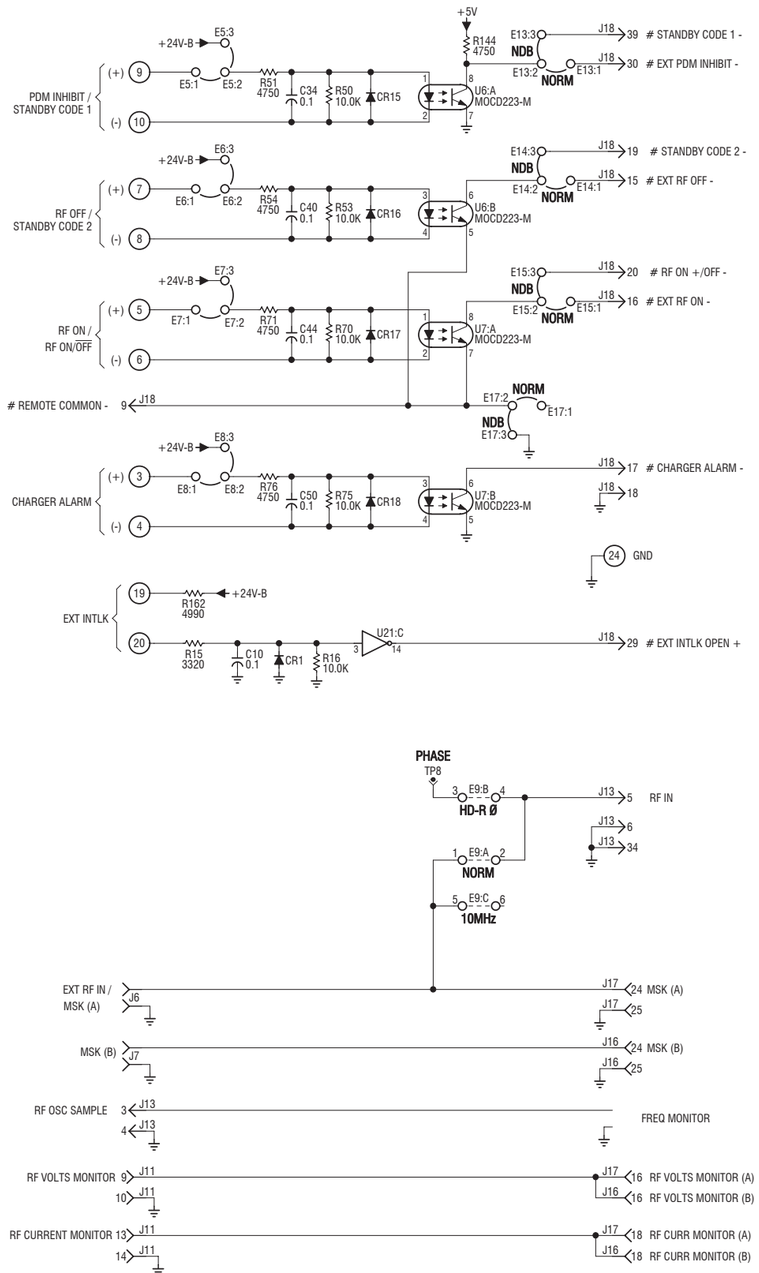
Electrical Schematic – Exciter Interface PWB (NAPI76A/02)			
Issue 1.8	Not to Scale	Figure SD-10	Sheet 2 of 2



Dimensions = mm (inches)

Electrical Schematic - Remote Interface PWB (NAPI78D/02)			
Issue 1.8	Not to Scale	Figure SD-11	Sheet 1 of 3

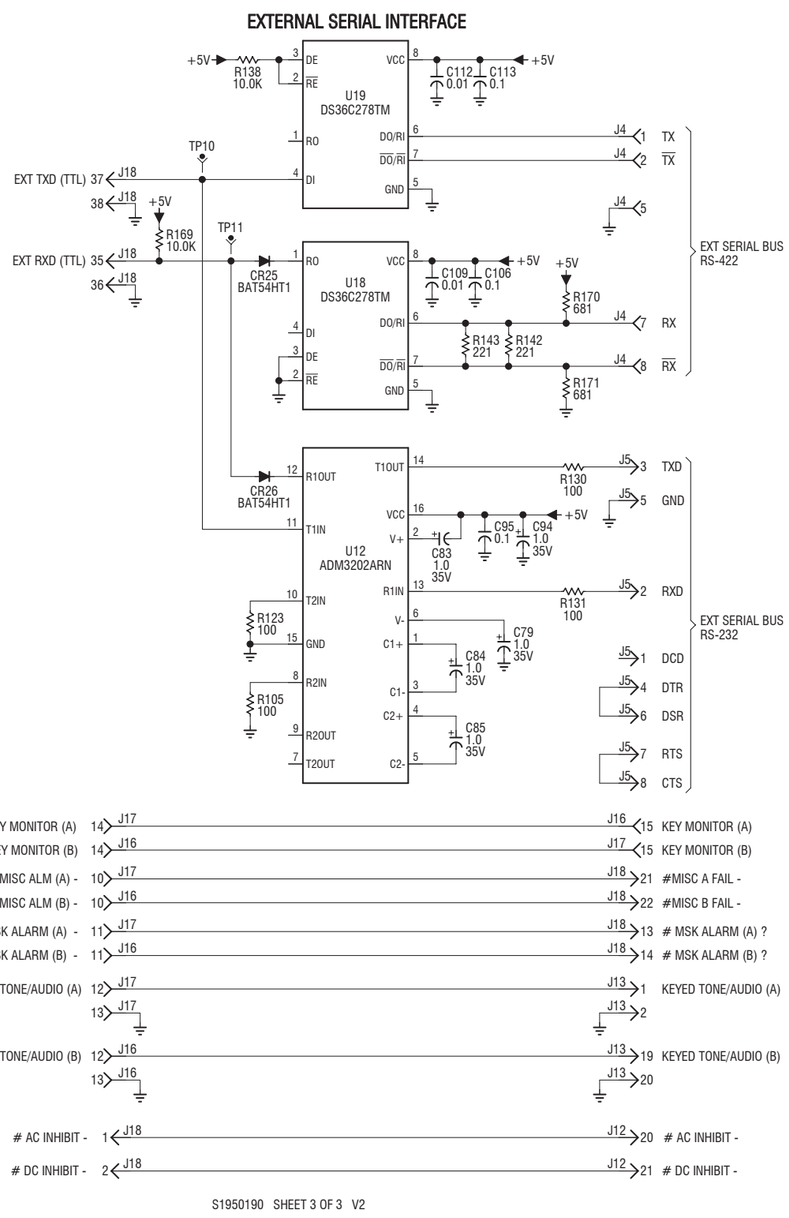




Dimensions = mm (inches)

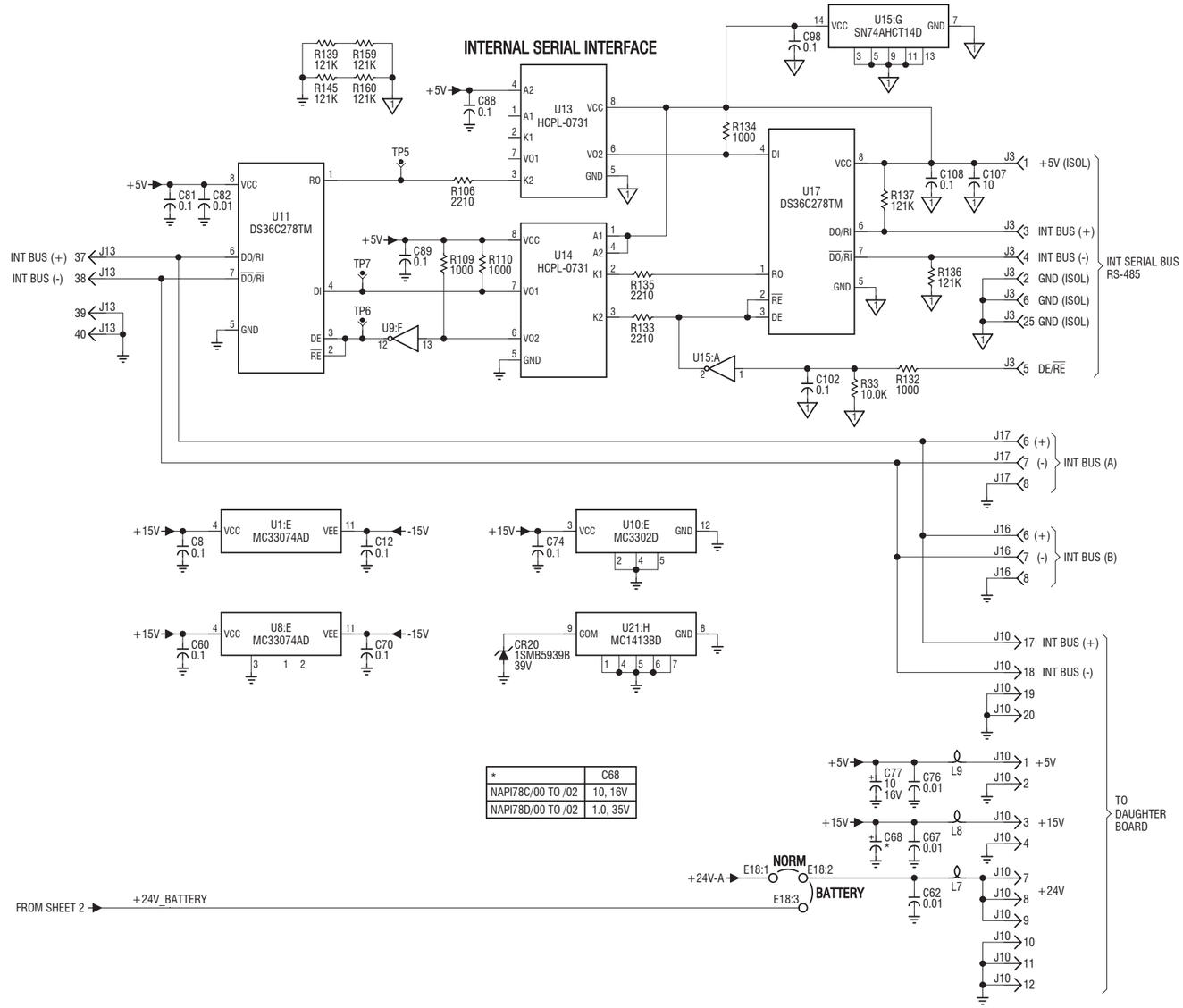
Electrical Schematic - Remote Interface PWB (NAPI78D/02)			
Issue 1.8	Not to Scale	Figure SD-12	Sheet 2 of 3

EXTERNAL SERIAL INTERFACE



S1950190 SHEET 3 OF 3 V2

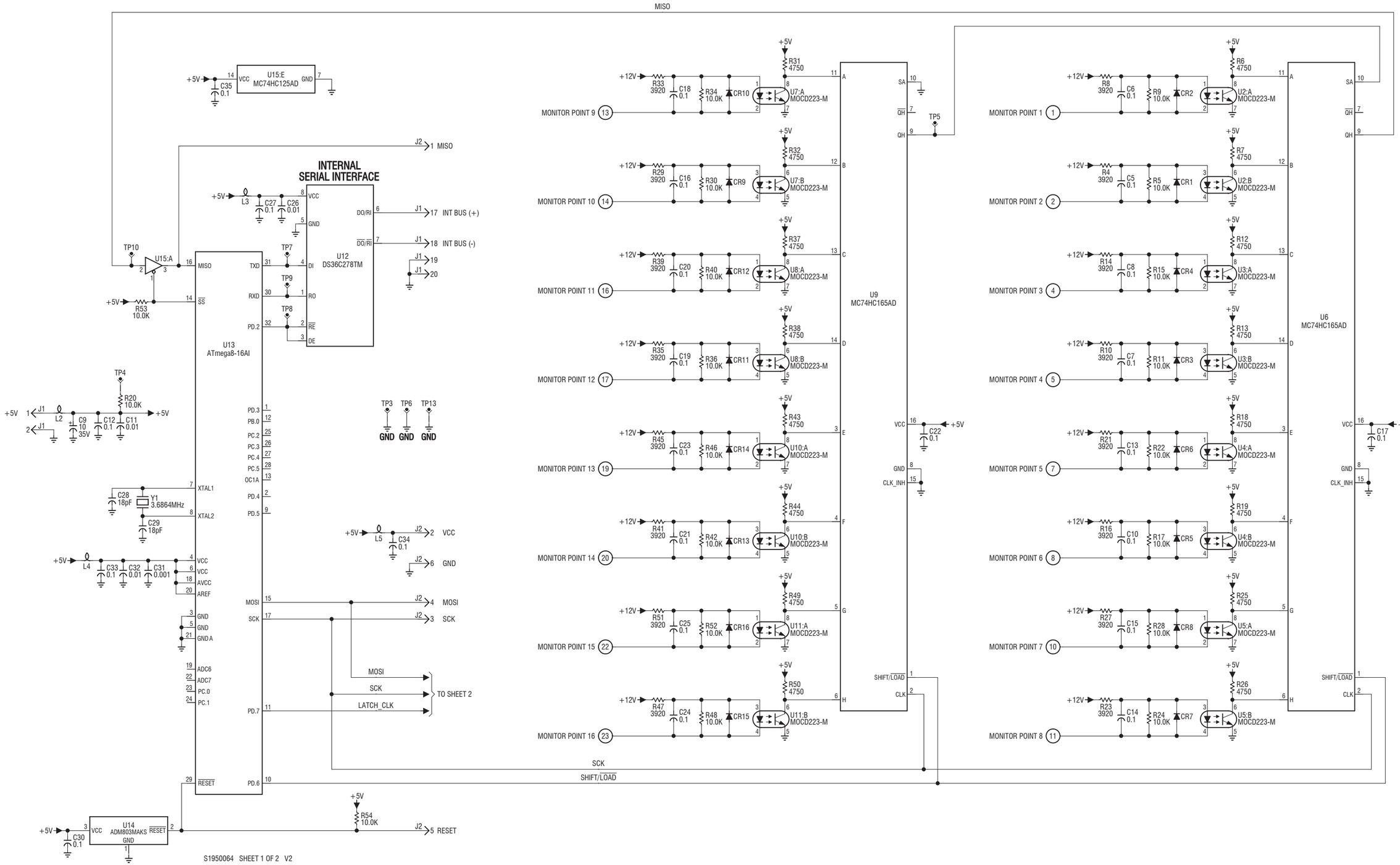
INTERNAL SERIAL INTERFACE



*	C68
NAPI78C/00 TO /02	10, 16V
NAPI78D/00 TO /02	1.0, 35V

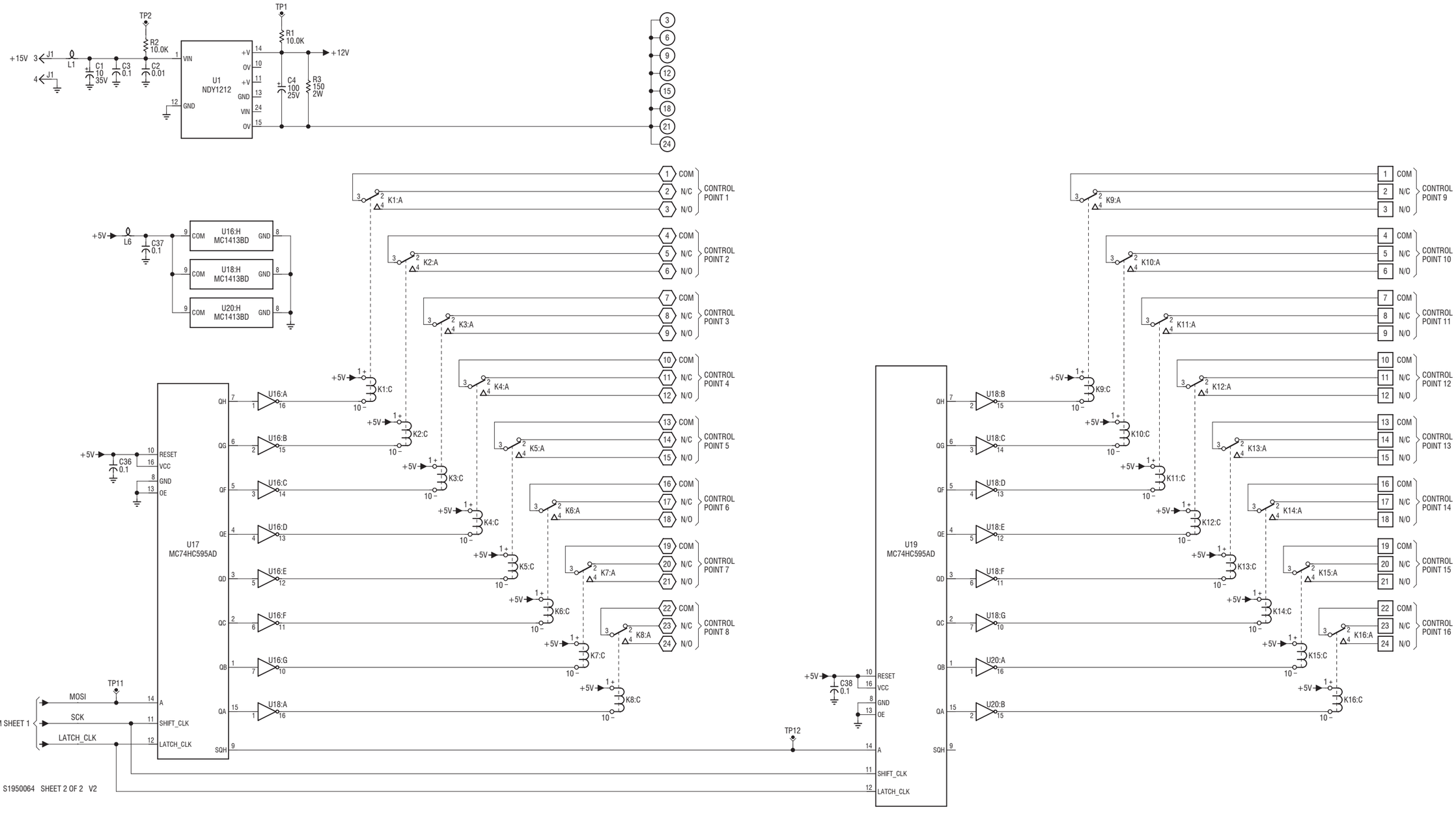
Dimensions = mm (inches)

Electrical Schematic – Remote Interface PWB (NAPI78D/02)			
Issue 1.8	Not to Scale	Figure SD-13	Sheet 3 of 3



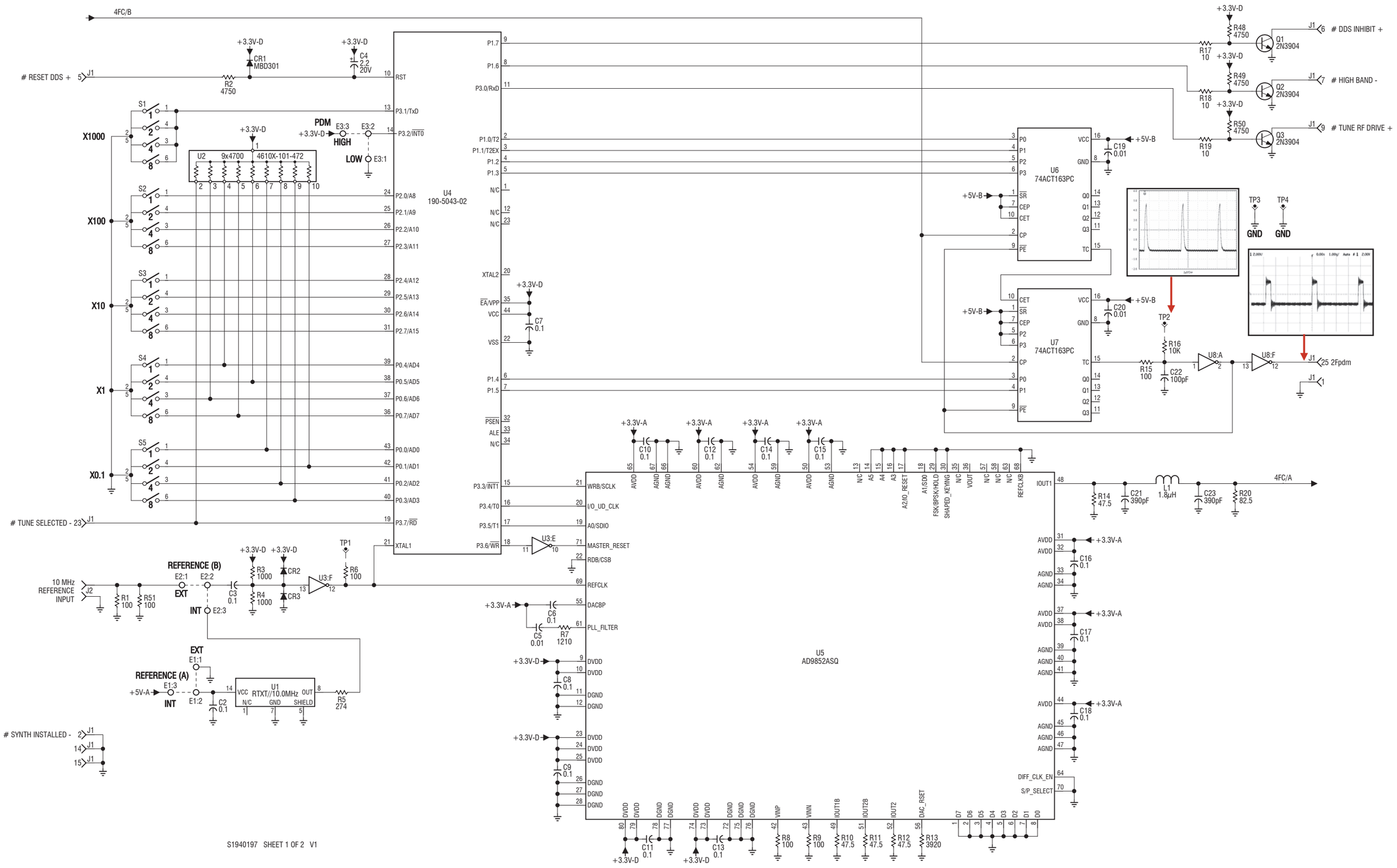
Dimensions = mm (inches)

Electrical Schematic – Site Interface PWB (NAPI80), Optional			
Issue 1.8	Not to Scale	Figure SD-14	Sheet 1 of 2



Dimensions = mm (inches)

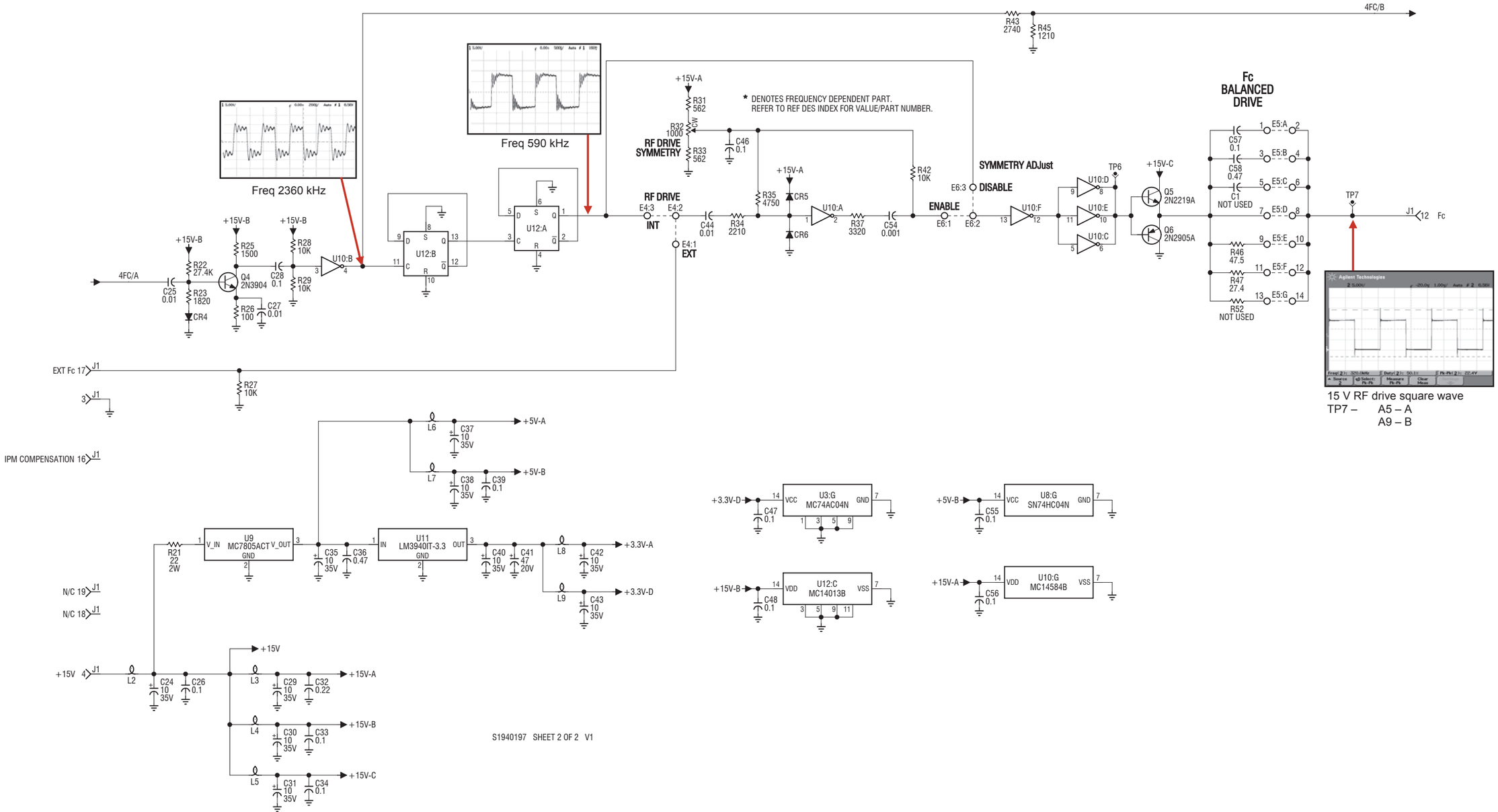
Electrical Schematic – Site Interface PWB (NAPI80), Optional			
Issue 1.8	Not to Scale	Figure SD-15	Sheet 2 of 2



S1940197 SHEET 1 OF 2 V1

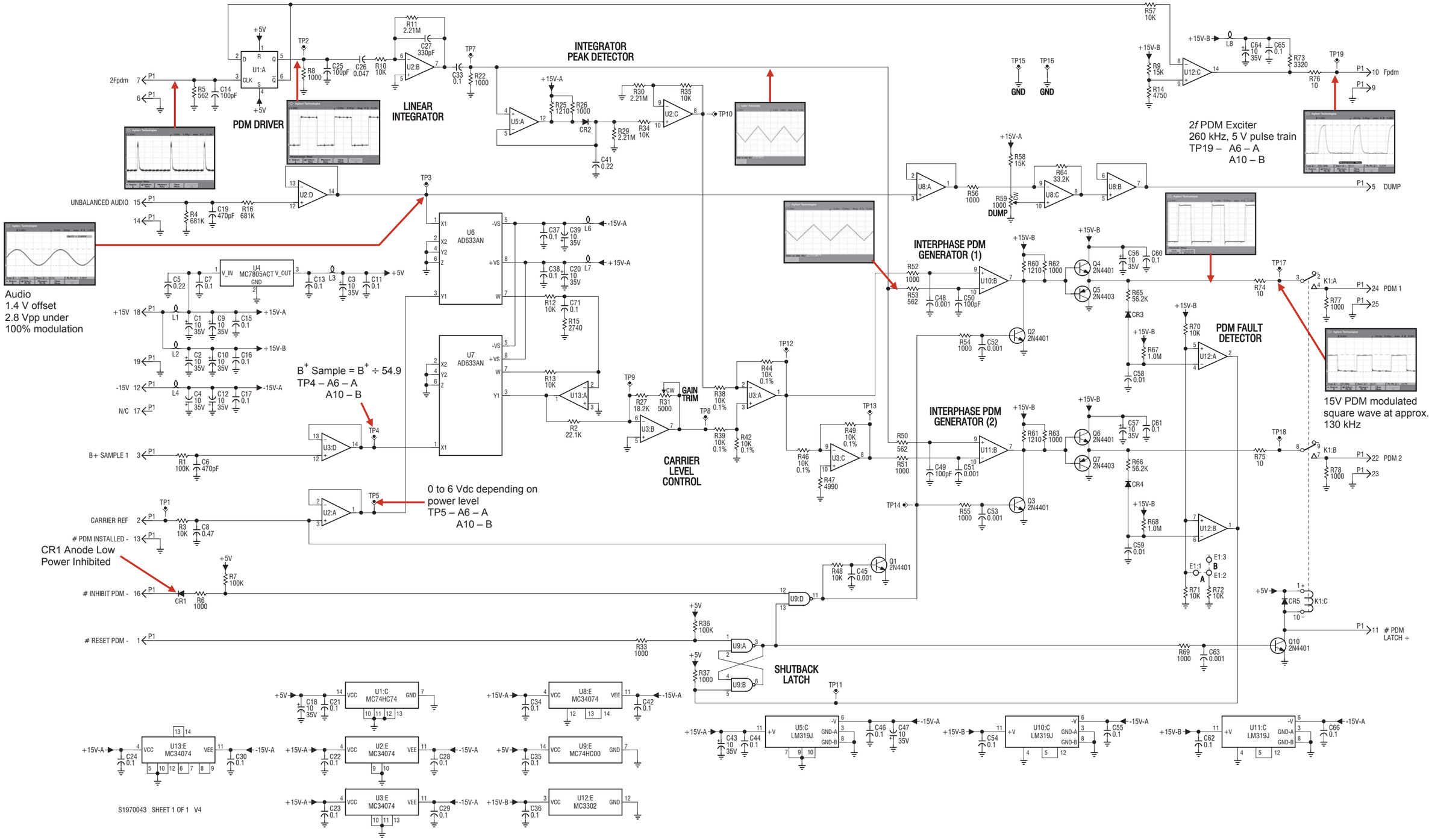
Dimensions = mm (inches)

Electrical Schematic – RF Synthesizer PWB (NAPE70C/01)			
Issue 1.8	Not to Scale	Figure SD-16	Sheet 1 of 2



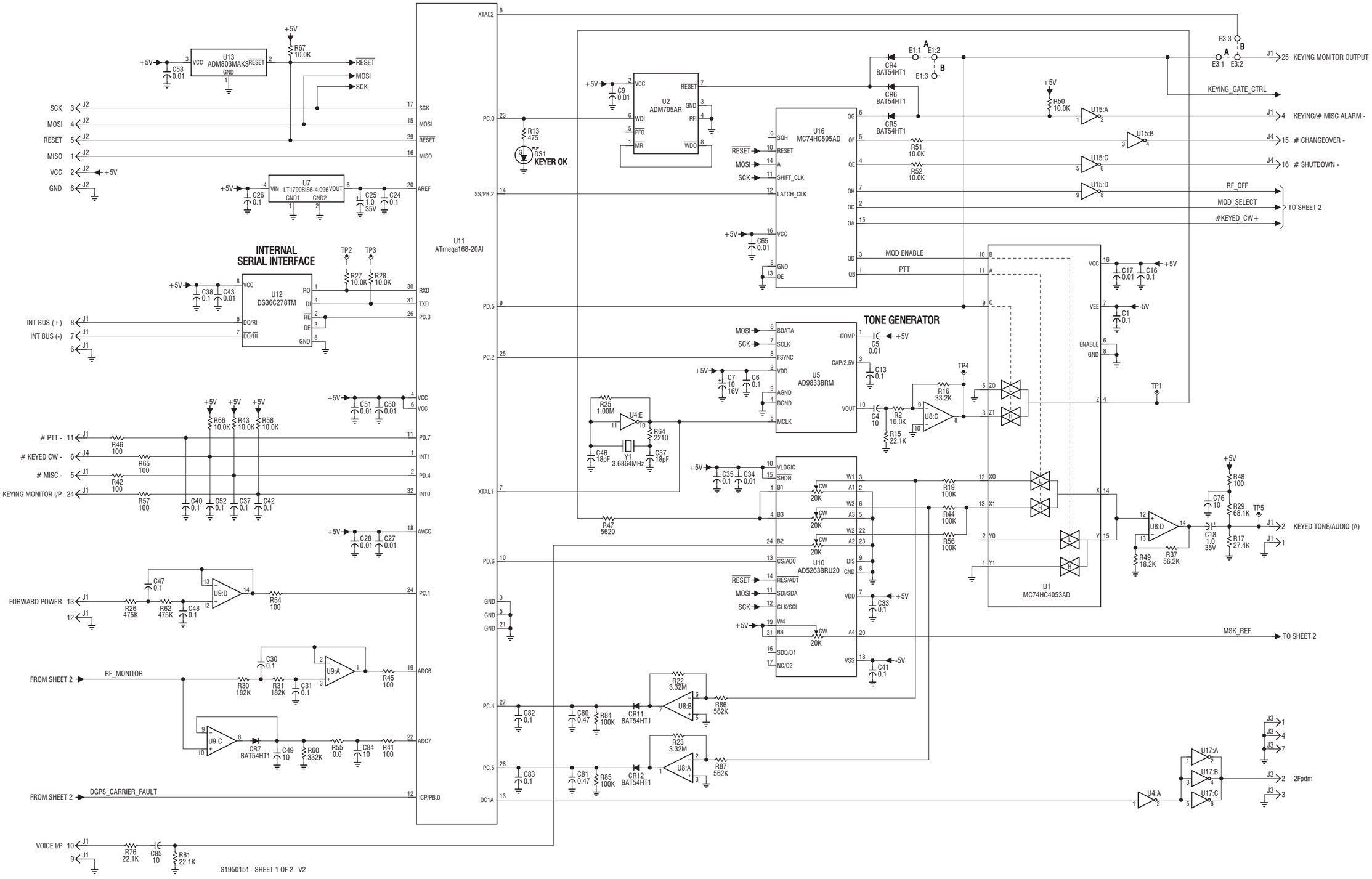
Dimensions = mm (inches)

Electrical Schematic – RF Synthesizer PWB (NAPE70C/01)			
Issue 1.8	Not to Scale	Figure SD-17	Sheet 2 of 2



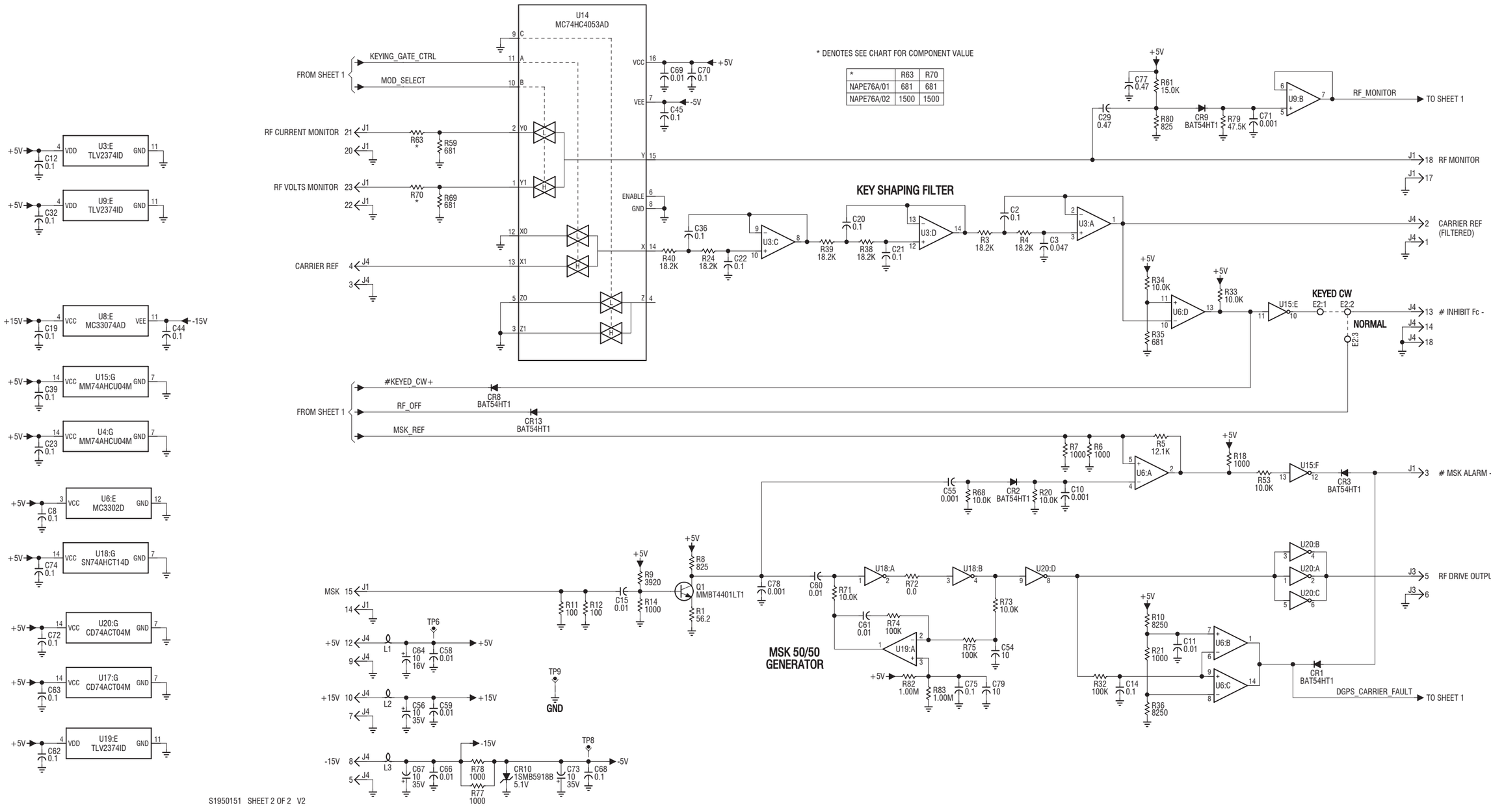
Dimensions = mm (inches)

Electrical Schematic – Interphase PDM Driver PWB (NAPM11)			
Issue 1.8	Not to Scale	Figure SD-18	Sheet 1 of 1



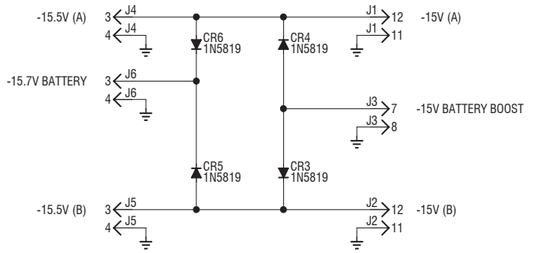
Dimensions = mm (inches)

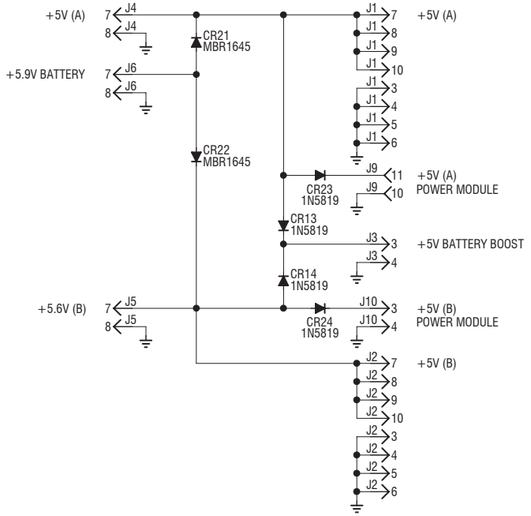
Electrical Schematic – Exciter Monitor/Generator PWB (NAPE76A/03)			
Issue 1.8	Not to Scale	Figure SD-19	Sheet 1 of 2

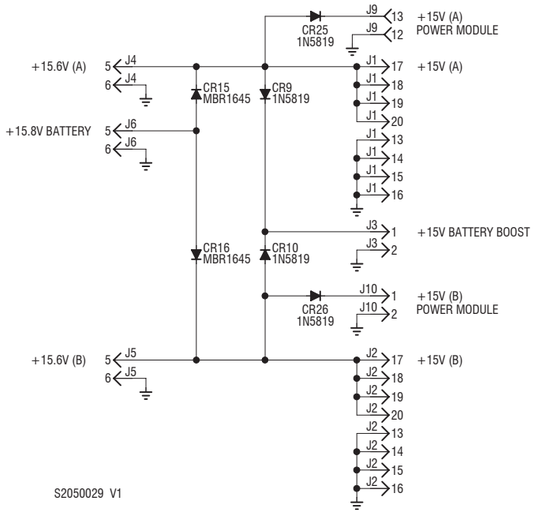


Dimensions = mm (inches)

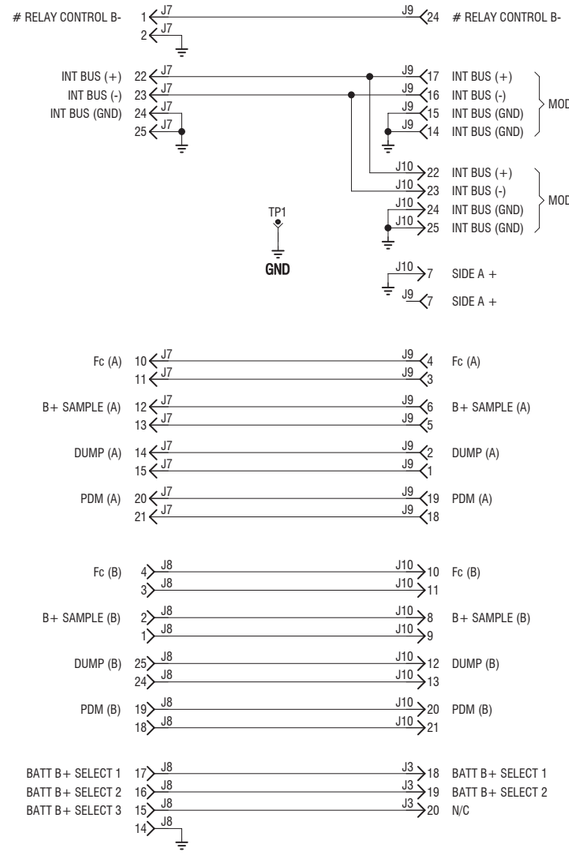
Electrical Schematic – Exciter Monitor/Generator PWB (NAPE76A/03)			
Issue 1.8	Not to Scale	Figure SD-20	Sheet 2 of 2

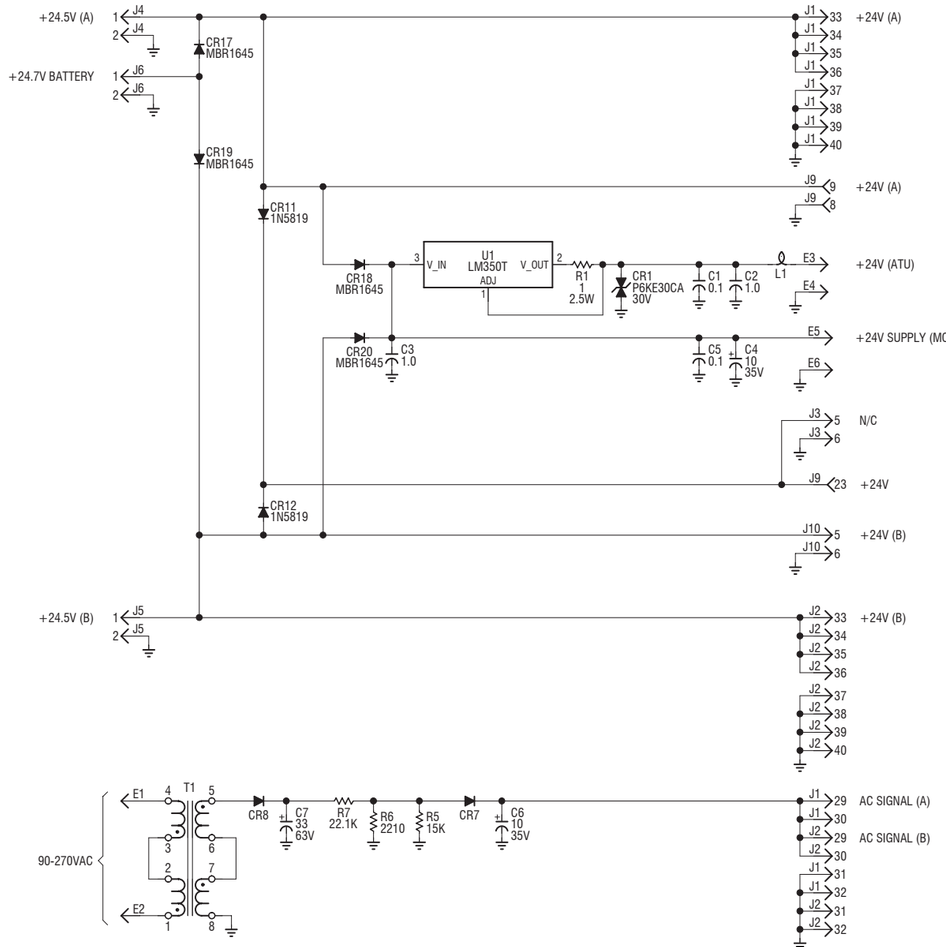






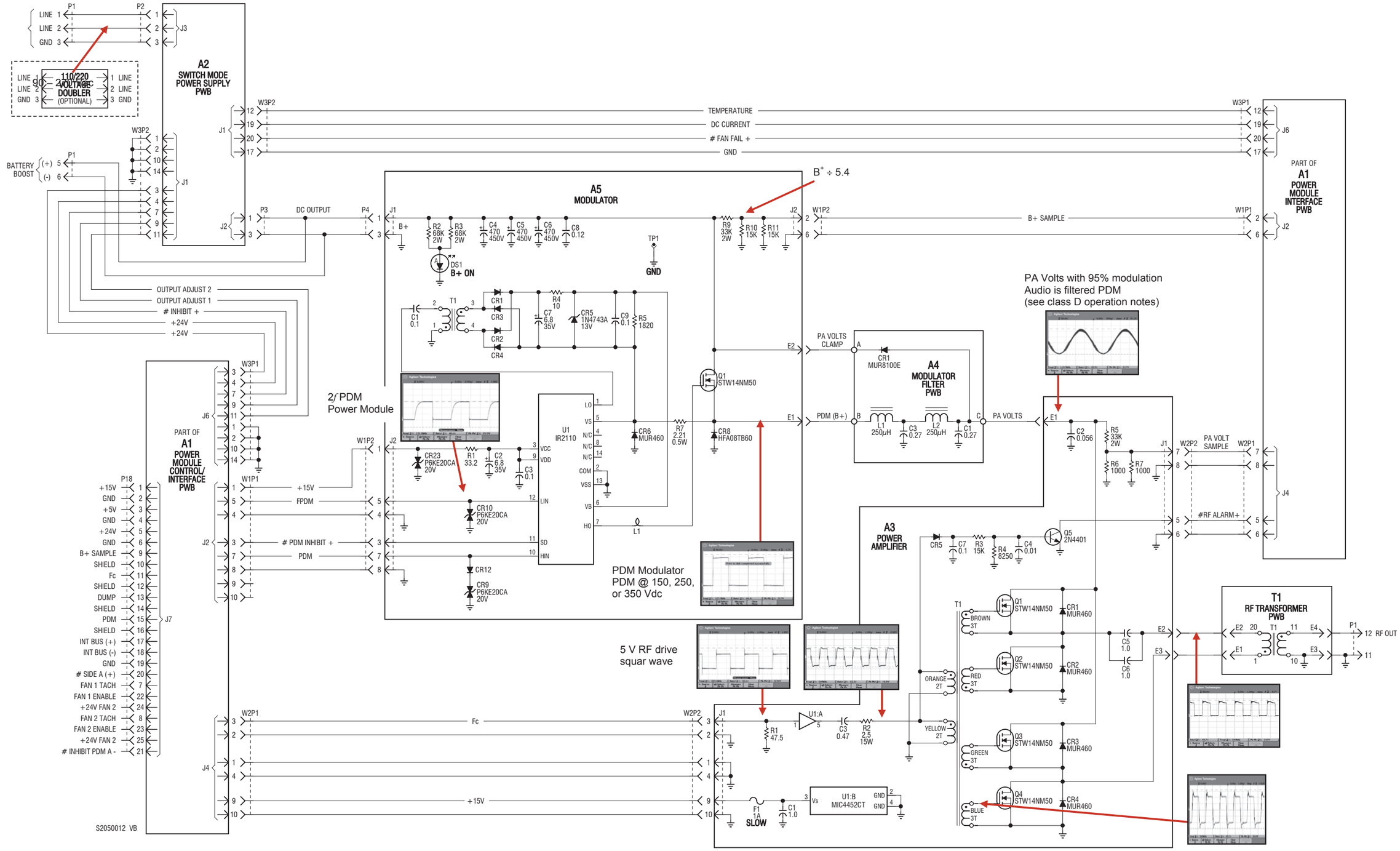
S2050029 V1





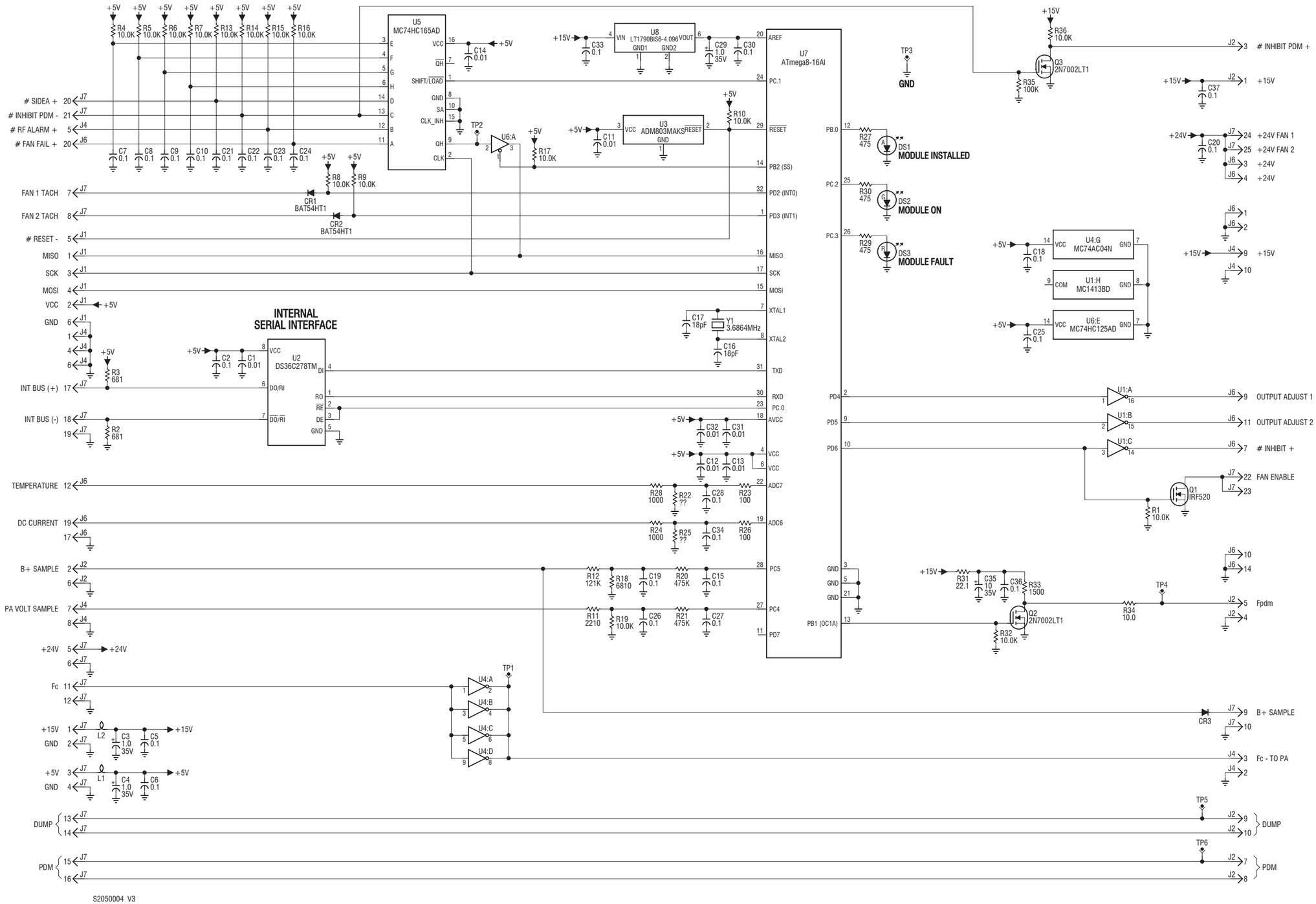
Dimensions = mm (inches)

Electrical Schematic – Interface PWB (NAPI94A)			
Issue 1.8	Not to Scale	Figure SD-21	Sheet 1 of 1



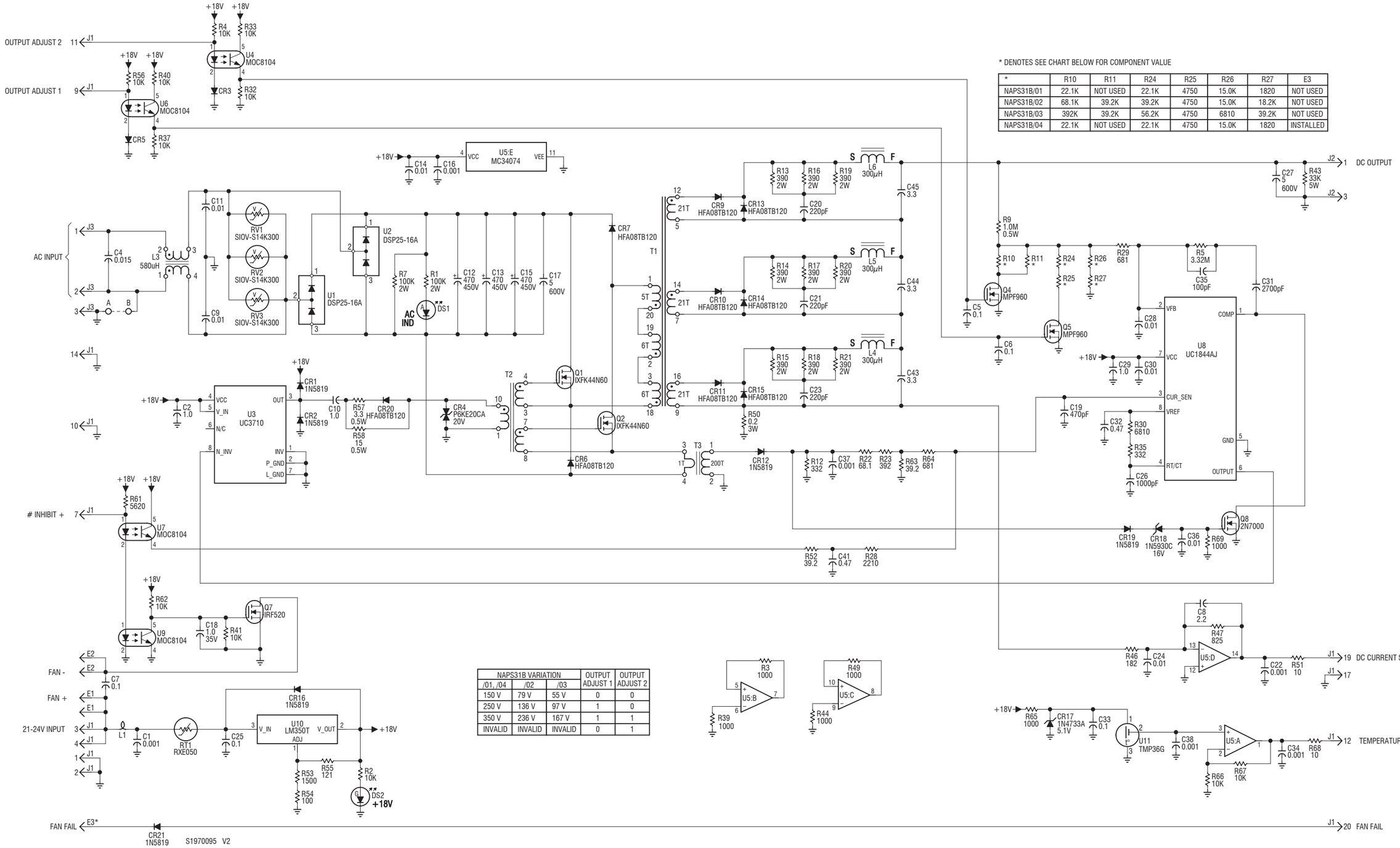
Dimensions = mm (inches)

Electrical Schematic – RF Power Module (NAP35A & NAP35A/01)			
Issue 1.8	Not to Scale	Figure SD-22	Sheet 1 of 1



Dimensions = mm (inches)

Electrical Schematic – Power Module Control/Interface (NAPC151A)			
Issue 1.8	Not to Scale	Figure SD-23	Sheet 1 of 1



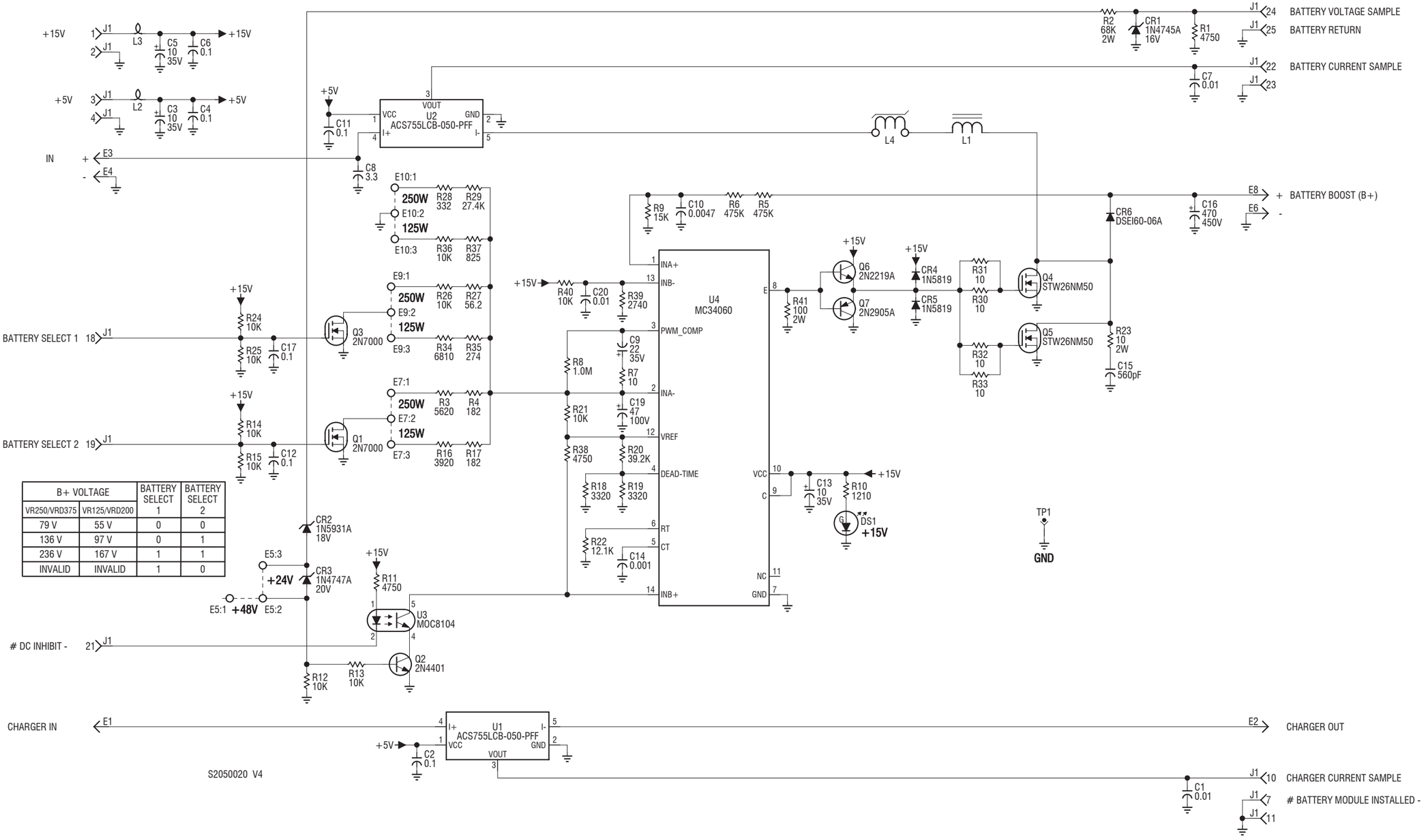
* DENOTES SEE CHART BELOW FOR COMPONENT VALUE

*	R10	R11	R24	R25	R26	R27	E3
NAPS31B/01	22.1K	NOT USED	22.1K	4750	15.0K	1820	NOT USED
NAPS31B/02	68.1K	39.2K	39.2K	4750	15.0K	18.2K	NOT USED
NAPS31B/03	392K	39.2K	56.2K	4750	6810	39.2K	NOT USED
NAPS31B/04	22.1K	NOT USED	22.1K	4750	15.0K	1820	INSTALLED

NAPS31B VARIATION			OUTPUT ADJUST 1	OUTPUT ADJUST 2
/01, /04	/02	/03		
150 V	79 V	55 V	0	0
250 V	136 V	97 V	1	0
350 V	236 V	167 V	1	1
INVALID	INVALID	INVALID	0	1

Dimensions = mm (inches)

Electrical Schematic – Switch Mode Power Supply PWB (NAPS31B/02 & /03)			
Issue 1.8	Not to Scale	Figure SD-24	Sheet 1 of 1



Dimensions = mm (inches)

Electrical Schematic – Battery Boost PWB (NAPS35)			
Issue 1.8	Not to Scale	Figure SD-25	Sheet 1 of 1