

1.0 SCOPE

This document defines the requirements for a printed wire assembly.

2.0 DOCUMENT CITATIONS

IPC-A-600 Acceptability of Printed Circuit Boards

IPC-D-300 Printed Board Dimensions and Tolerances

IPC-6012 Qualification and Performance Specification for Rigid Printed Boards

IPC-D-949 Design Standards for Rigid Multilayer Printed Boards

IPC-SM-840 Qualification and Performance of Permanent Polymer Coating (Solder mask) for Printed Boards

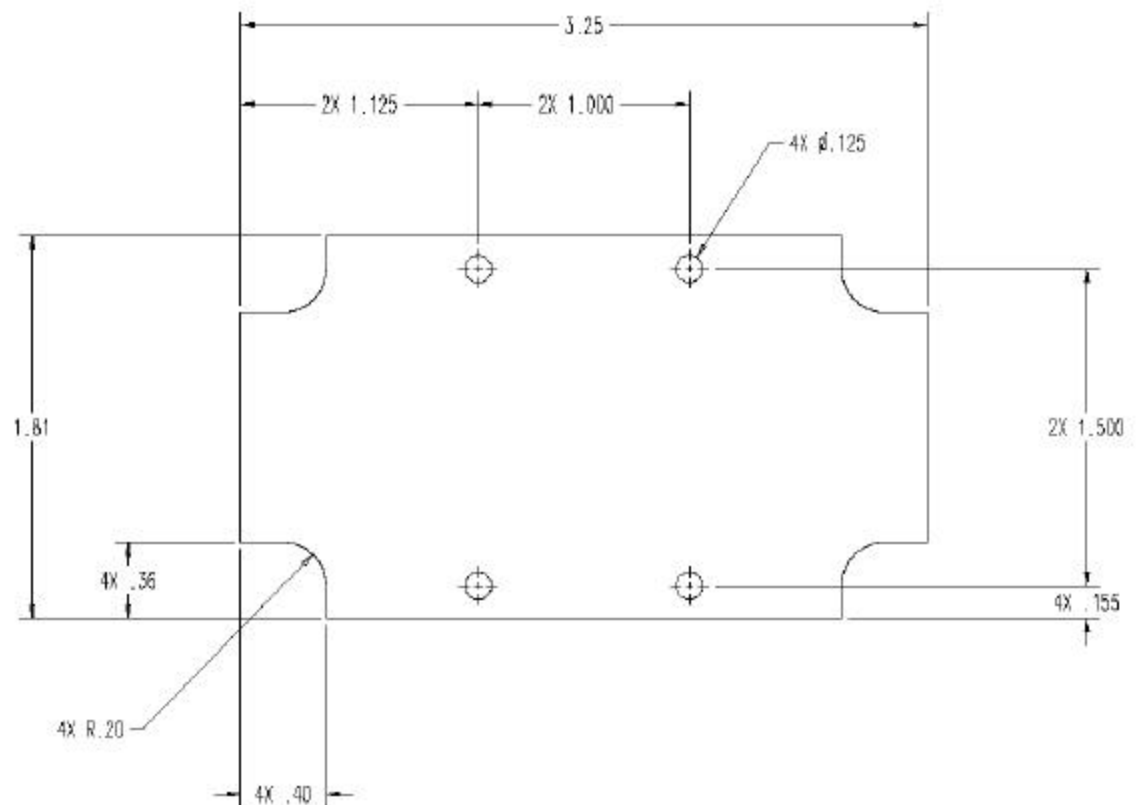
IPC-S-815 General Requirements for Soldering Electronic Interconnections

IPC-A-610 Acceptability of Electronic Assemblies

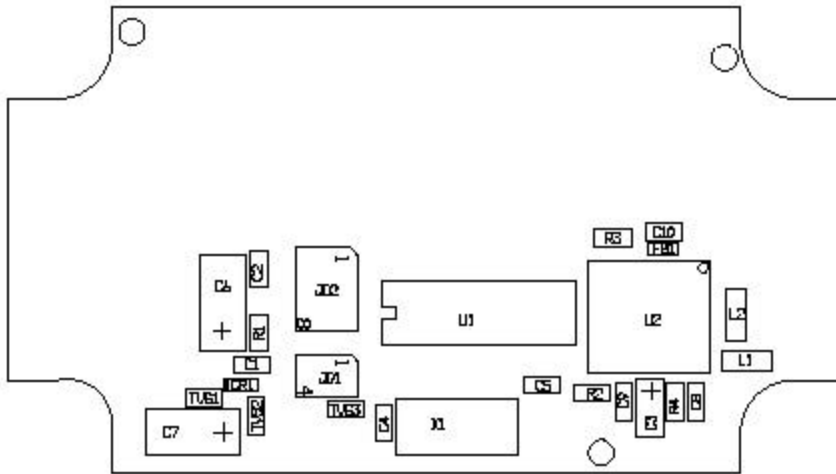
SDI PQ-044 Electrostatic Sensitive Material: Definitions, Handling, and Protection

3.0 PHYSICAL REQUIREMENTS

3.1. Dimensional



3.2. Assembly



1. Identify Assembly with Revision in space provided.
2. J02 not loaded

3.3. BOM

REFDES	QTY	PART	PACKAGE	VALUE	TOL	MFGR
C1	1	08051C392KATMA	0805	3900PF	10%	AVX
C2	1	08055C104KATMA	0805	0.1UF	10%	AVX
C3	1	T491B106K006AS	3528	10UF		KMT
C4,C5	2	08051A220JATMA	0805	22PF	10%	AVX
C6,C7	2	T491X337K006AS	7343H	330UF		KMT
C8,C9,C10	3	08051A101KATMA	0805	100PF	10%	AVX
CR1	1	MA729-(TX)	MA729			PAN
FB1	1	2506033017YO	0603		10%	FAIR-RITE
J01	1	95615-104	CONN4			BERG
J02	0	95615-008	CONN8			BERG
L1	1	1206CS-820XJBC	1206	82NH		COILCRAFT
L2	1	1206CS-181XJBC	1206	180NH		COILCRAFT
R1	1	MCR10F5111	0805	5.11K	1%	ROHM
R2,R4	2	MCR10EZHMJW1000	0805	100	5%	ROHM
R3	1	MCR10EZHMJW4022	0805	40.2K	5%	ROHM
TVS1,TVS2,TVS3	3	VC08LC18A500	0805	0.1J	5%	AVX
U1	1	PIC16LC63-04/SO	SOIC28			MICROCHIP
U2	1	TX5002	SM-20L			RFM

X1	1	ECS-35-17-18-TR	CSM-12	3M579545		ECS
SOFTWARE	1	97-0328—1B				
PCB	1	71-0323				

3.4. Markings

6.3.1 In-Circuit Test Mark

See In-Circuit Test section.

6.3.2 Identification

Each PWA Assembly shall have an identification sticker containing, at a minimum, a number. This number shall represent the serial number of the PWA. The number shall have the format XXXXXX representing a numerical string representing the individual board serial number.

6.3.3 Part Number Identification

The bare PCB shall include the assigned PCB part number and current revision in copper. The printed wire assembly shall be marked with the assigned assembly part number in the form of an ink stamp, label, or in the silkscreen. A stamp of the current printed wire assembly Bill of Material revision level (i.e. A, B, C...) shall follow the part number marking.

3.5. Cleanliness

The material shall not exhibit observable embedded foreign material and loose particles or fibers. Visual inspection shall be by the unaided eye (having original or restored 20/20 vision) at approximately 18 inches.

3.6. Workmanship

PWAs shall meet the applicable sections of the IPC publications ANSI/IPC-S-815B and IPC-A-610B, for Class 3 devices.

4.0 ENVIRONMENTAL

4.1. Operating Environment

- Temperature: 2°C (35.6°F) to 40°C (104°F)
- Humidity: 90% relative humidity maximum, non-condensing.
- Atmospheric Pressure: 70 kPa (10.2 PSI or 10,000 feet above sea level) to 106 kPa (15.4 PSI).

4.2. Storage Environment

- Temperature: -20°C (-4°F) to 60°C (140°F)
- Humidity: 90% relative humidity maximum, non-condensing
- Atmospheric Pressure: 70 kPa (10.2 PSI or 10,000 feet above sea level) to 106 kPa (15.4 PSI).

5.0 TEST REQUIREMENTS

5.1. In-Circuit Test

This section defines the requirements for an in-circuit test.

5.1.1 Sampling

100% of production shall have been tested and documented as passed the in-circuit test requirements of this specification.

5.1.2 Marking/Reporting

All PWA assemblies which are tested per these requirements and pass shall be marked with a permanent ink or paint mark indicating test acceptance.

5.1.3 Applied Voltage

Unless otherwise indicated, all tests in this specification shall be performed at the voltages specified in this specification.

5.2. Baseline Tests

Baseline tests shall be performed which encompass the following requirements:

5.2.1. Shorts/Opens

All nodal connections shall be learned and tested for shorts and opens.

5.2.2. Capacitors

Test all capacitors for value within their specification.

NOTE: Some circuit nodes may include more than one component in parallel. In this situation, the node will be tested for a value equal to the sum of all the parallel component values.

5.2.3. Resistors

Test all resistors for value within their specification.

NOTE: Some circuit nodes may include more than one component in parallel. In this situation, the node will be tested for a value equal to the sum of all the parallel component values.

5.2.4. Diodes

Standard in-circuit test shall be used on these devices.

5.2.5. ICs – U1

Program this device with the program specified on the PWA BOM. Programming can be before assembly, or after assembly - through the programming port on the PWA.

Standard in-circuit test.

6.0 PRINTED CIRCUIT BOARD

Requirements outlined in this specification supersede those outlined in published reference documents.

6.1. Physical Requirements

6.1.1. Classification

The classification of the following categories for the PCB shall be in accordance with the indicated IPC standards:

Design	Class C IPC-D-949
Performance	Class 2 IPC-6012
Dimensioning	Class B IPC-D-300 Type 1

6.1.1.1. Dimensions and Tolerances

Parts shall meet the dimensional requirements of the applicable SDI document and IPC-D-300 as detailed herein, with the SDI document superseding.

If required, maximum radius on all inside corners to be .062.

Master artwork patterns are used to fabricate boards as specified. Gerber files must be used by board vendor.

6.1.1.2. PCB lay-Out

1 oz. copper weight all layers

6.1.1.3. PCB Construction

Two layers as detailed in drawings per IPC ML-950C.

6.1.1.4. Soldermask

"LPI" (Liquid Photo Imagable) soldermask per IPC-SM-84, type B, class 3, both sides green transparent with max misregistration to be .003, over bare copper. All exposed copper areas, both sides, to be tin lead coated using hot air leveling process to yield .0003 minimum. Vendor must modify soldermask artwork to remove any slivers that are .004 or less between fine pitched lands.

6.1.1.5. Silkscreen

Both sides as required using white epoxy ink. Vendor must modify silkscreen artwork to remove white epoxy ink from exposed metal..

6.1.1.6. Annular Ring

Minimum annular ring around plated through holes to be .002".

6.1.1.7. Copper Plating

Minimum copper plate in all holes to be .001".

6.1.1.8. Conductive Pattern Finish

63/37 tin lead with a thickness of .0001"-.0008" on plated through holes and non-solder masked areas. Tin can deviate 50 to 70%.

6.1.1.9. Materials

Materials used in the manufacture of the PCB shall comply with the requirements of IPC-D-949. Base material shall be glass epoxy FR4 UL94V-0 or equivalent, 0.062 ±.007.

6.1.1.10. Marking

Marking inks used shall meet the requirements of IPC-D-949.

Manufacturer to mark board with copper or white epoxy ink with UL Identification code as required by UL796 and UL94. Manufacturer to mark board with copper or white epoxy ink, with date code indicating year and week of fabrication, 4 digit format, (YYWW). Additional copper shall not be placed in or near the antenna.

6.1.2. Chemical Requirements

PCBs must be able to withstand fluxes, cleaning solvents, soldering and coatings used in the manufacture thereof or later manufacturing processes as specified in IPC-D-949.

6.1.3. Cleanliness Requirements

Parts shall meet the requirements for ionic and organic contamination as specified in IPC-ML-950.

6.1.4. Performance

The PCBs shall meet the requirements as specified in IPC-ML-950 and IPC-SM-840.

6.1.5. Workmanship

The PCBs shall meet the workmanship, visual, and dimensional requirements as specified in IPC-D-300, IPC-A-600 and IPC-ML-950.

6.1.6. Bow and Twist

The PCBs shall meet the requirements of IPC-D-300 and IPC-A-600.

7.0 SHIPMENT PACKAGING AND CONFIGURATION

7.1 Packaging Configuration

10.1.1 Packaging shall be adequate to provide protection from damage and contamination from expected handling, transit, and storage.

7.2 Shipment Identification

7.2.1 Each shipping carton shall have adequate identification to positively identify the parts to the respective purchase order.

8.0 QUALITY ASSURANCE REQUIREMENTS

8.1 Acceptance Criteria

SIMS Deltec, Inc. (SDI) may, at its discretion, perform any inspection, tests, or audits to assure the manufacturer's compliance with the documents specified by the Bill of Materials for this part(s).

8.2 Traceability

The manufacturer shall record and retain lot numbers of all items supplied and lot numbers traceability of the raw material used to manufacture them. This information shall be available on request by SIMS Deltec until SIMS Deltec notifies the manufacturer otherwise.

8.3 Notification/Approval of Change

Prior to producing or shipping product, the supplier is required to notify a Purchasing Agent of SDI to obtain written approval for material, process or tooling changes that are discrepant to the documentation specified by the Bill of Materials.

8.4 Certification

The supplier shall provide a certification with each lot shipped which specifies that the articles shipped meet the requirements of this specification and accompanying documentation. The certification shall be printed on suppliers company letterhead. As a minimum, the certification shall contain the following information:

- Date
- Purchase Order Number
- SIMS Deltec Part Number
- Quantity Shipped
- Signature and Title of Appropriate QA Personnel

8.4.1 Supplier may contact a Purchasing Agent of SDI to obtain information for preparing an appropriate certification.