



ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES

IPC-SM-840C

Qualification and Performance of Permanent Solder Mask

Amendment 1

IPC-SM-840C

A standard developed by IPC

Amendment 1
June 2000

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In May 1995 the IPC's Technical Activities Executive Committee adopted Principles of Standardization as a guiding principle of IPC's standardization efforts.

Standards Should:

- Show relationship to Design for Manufacturability (DFM) and Design for the Environment (DFE)
- Minimize time to market
- Contain simple (simplified) language
- Just include spec information
- Focus on end product performance
- Include a feedback system on use and problems for future improvement

Standards Should Not:

- Inhibit innovation
- Increase time-to-market
- Keep people out
- Increase cycle time
- Tell you how to make something
- Contain anything that cannot be defended with data

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Adopted October 6, 1998

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Qualification and Performance of Permanent Solder Mask

1.2 Purpose

Paragraph 1:

Replace:

IPC-RB-276

With:

IPC-6011 and IPC-6012

Add the following paragraph at the end of section:

Telcordia Technologies (formerly Bellcore) acceptance of IPC-SM-840C is stated in “Physical Design and Manufacture of Telecommunications Products - Qualification Test Procedures” - GR-78-CORE - Issue 1, September 1997 on page 13-10, paragraph 13.2.1.

13.2.1 General “R13-11 [813] In lieu of the requirements in this section for solder mask, testing to IPC-SM-840C, January 1996, Class “T” requirements shall be acceptable. The requirements contained in the IPC document are similar or equivalent to the ones contained herein.”

1.3 Classes

Add the following paragraph at the end of section:

Note: Solder mask types were previously described as Type A for screen imaged (liquid) or coverlay for flex

2.1 IPC¹

(dry), and Type B for all types of photo defined solder mask (liquid or dry film).

3.4.1 Formulation Change

4th bullet point

Replace:

- Changes in type of dye or pigment.

With:

- Changes in type of dye or pigment, excluding coloring dye or pigment within a defined, tested range of lowest (none) and highest (supplied) loading levels of the specific coloring materials.

6th bullet point

Replace:

- Addition, deletion or change in composition of “inert” materials in the formulation such as matting agent(s).

With

- Addition, deletion or change in composition of “inert” materials in the formulation such as matting agent(s), excluding a change in quantity of a single “inert” material already present in the formula within a defined, tested range of lowest (none) and highest (supplied) loading levels of that specific “inert” material. Change to more than one material is considered a formulation change.

Replace the following:	With the following:
IPC-RB-276 Qualification and Performance of Rigid Printed Boards	IPC-6011 Generic Performance Specification for Printed Boards IPC-6012 Qualification and Performance specification for Rigid Printed Boards
TM 2.3.25 Detection of Ionizable Surface Contamination (Static Method)	TM 2.3.25 Detection and Measurement of Ionizable Surface Contaminants
TM 2.3.26 Detection of Ionizable Surface Contamination (Dynamic Method) TM 2.3.26.1 Ionizable Detection of Surface Contamination (Static Method)	TM 2.3.25.1 Ionic Cleanliness Testing of Bare Printed Wiring Boards
TM 2.3.38 Inspection Test for Organic Contaminates on Printed Wiring Board and Assembly Surfaces	TM 2.3.38 Surface Organic Contaminant Detection Test
TM 2.3.39 Identification of Residual Organic Non-Ionic Contaminates on Printed Wiring Boards and Assembly Surfaces	TM 2.3.39 Surface Organic Contaminant Identification Test (Infrared Analytical Method)
TM 2.4.28.1 Adhesion, Solder Mask (Over Melting and Non-Melting Metals)	TM 2.4.28.1 Adhesion, Solder Resist (Mask), Tape Test Method
TM 2.6.3.1 Moisture and Insulation Resistance Polymeric Solder Masks and Conformal Coating	TM 2.6.3.1 Moisture and Insulation Resistance – Solder Masks
TM 2.6.7.1 Thermal Shock – Polymer Solder Mask Coatings	TM 2.6.7.3 Thermal Shock – Solder Mask
TM 2.6.11 Hydrolytic Stability – Solder Masks and Conformal Coating	TM 2.6.11 Hydrolytic Stability – Solder Mask

1. Current and revised IPC Test Methods are available through IPC-TM-650 subscription and on the IPC Web site (www.ipc.org/html/testmethods.htm).

3.4.5 Cure**Add sentence at the end of Note:**

Contact manufacturer of solder mask to determine method to test cure.

3.4.10 Dimensional Requirements**Replace:**

If a specific thickness or breakdown voltage is required it shall be specified by the end user on the procurement document.

With:

If a specific thickness or breakdown voltage is required or allowed it shall be specified by the end user on the procurement document.

Table 1 Thermal Shock IPC Test Method**Replace:**

2.6.7.1

With:

2.6.7.3

Table 4**Delete and replace with:****Table 4 Moisture and Insulation Resistance**

Class	Test Temperature	Test Humidity	Bias Voltage (VDC)	Test Voltage (VDC)	Duration	Test Pattern IPC-B-25A Board	Requirements (megohm)
T	65° ± 2°C [149° ± 3.6°F]	90 ± 3 %	0	100	24 hours	E and F, C	500
H	25° to 65° ± 2° C [77° to 149° ± 3.6 F]	90, -5, + 3%	50	100	6 2/3 days	D, C	500

Table 5**Delete and replace with:****Table 5 Electrochemical Migration**

Class	Test Temperature	Test Humidity	Bias Voltage (VDC)	Test Voltage (VDC)	Duration	Test Pattern IPC-B-25A Board	Requirements
T	85° ± 2°C [185° ± 3.6°F]	85% minimum	10	45 - 100	500 hours	D, C	< 1 decade drop in resistance
H	85° ± 2°C [185° ± 3.6°F]	90%	10	10	168 hours	D, C	Resistance ≥ 2 megohms

3.9.3 Thermal Shock**Replace:****TM 2.6.7.1****With:****TM 2.6.7.3****Table 7****Replace row:**

Requirement	Paragraph	Test Method	D* or N	Class T	Class H
Moisture and Insulation Resistance (comb pattern)	3.9.1	2.6.3.1	D	≥500 megohms (B-25A or B-25)	≥100 megohms (B-25A) ≥ 500 megohms (B-25)

With:

Moisture and Insulation Resistance (comb pattern)	3.9.1	2.6.3.1	D	≥500 megohms (IPC-B-25A Board, Pattern E and F)	≥500 megohms (IPC-B-25A Board, Pattern D)
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Thermal Shock Test Method**Replace:**

2.6.7.1

With:

2.6.7.3

4.6.1 Inspection of Product for Delivery**Replace:**

IPC-RB-276

With:

IPC-6011 and IPC-6012

4.7.1 Preparation Prior to Coating**Replace:**

TM 2.3.26, TM 2.3.26.1

With:

TM 2.3.25.1



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