



ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES

IPC-6015

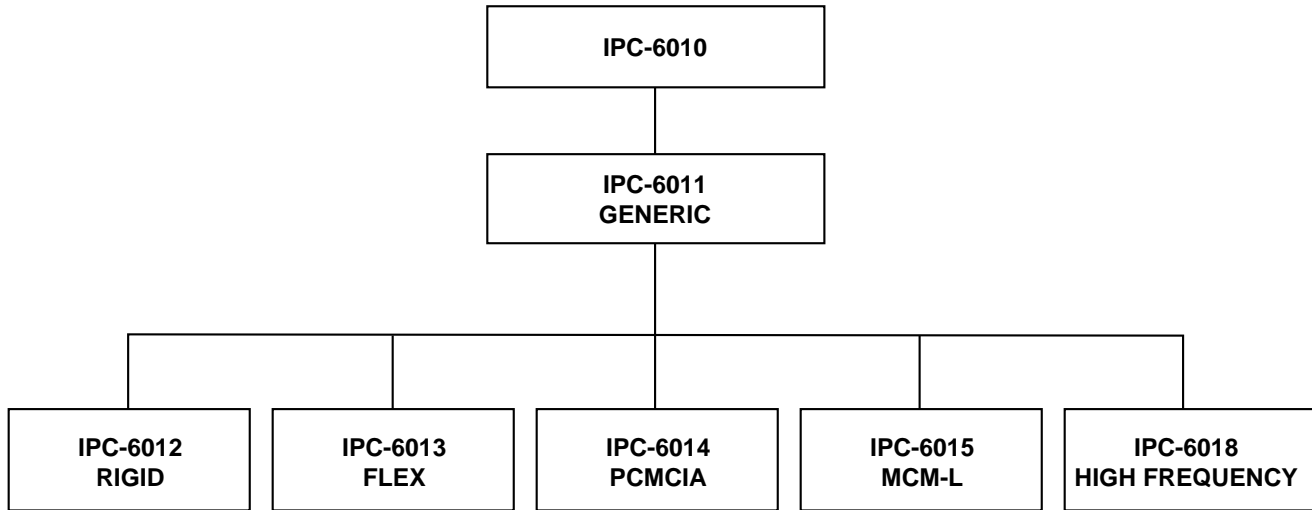
Qualification and Performance Specification for Organic Multichip Module (MCM-L) Mounting and Interconnecting Structures

IPC-6015

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A standard developed by IPC

**HIERARCHY OF IPC QUALIFICATION AND
PERFORMANCE SPECIFICATIONS
(6010 SERIES)**



FOREWORD

This specification is intended to provide information on the detailed performance criteria of organic multichip modules. The information contained herein is also intended to supplement the generic requirements identified in IPC-6011. When used together, these documents should lead both manufacturer and customer to consistent terms of acceptability.

IPC's documentation strategy is to provide distinct documents that focus on specific aspects of electronic packaging issues. In this regard, document sets are used to provide the total information related to a particular electronic packaging topic. A document set is identified by a four digit number that ends in zero (0) (i.e., IPC-6010).

Included in the set is the generic information which is contained in the first document of the set. The generic specification is supplemented by one or multiple performance documents, each of which provide specific focus on one aspect of the topic or the technology selected.

Failure to have all information available prior to building a board may result in a conflict in terms of acceptability.

As technology changes, a performance specification will be updated, or new focus specifications will be added to the document set. The IPC invites input on the effectiveness of the documentation and encourages user response through completion of "Suggestions for Improvement" forms located at the end of each document.

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Qualification and Performance Specification for Organic Multichip Module (MCM-L) Mounting and Interconnecting Structures

1.0 SCOPE

1.1 Scope This specification establishes the specific requirements for the organic mounting structure used to interconnect chip components, which in combination form the completed functional Organic Single-chip Module (SCM-L) or Organic Multichip Module (MCM-L) assembly, and the quality and reliability assurance requirements that must be met for their acquisition.

1.2 Purpose The requirements contained herein are intended to reflect the electrical, mechanical, and environmental properties of the MCM-L mounting structure.

1.3 Performance Classification This specification recognizes that MCM-L mounting structures will be subject to variations in performance requirements based on end use. The MCM-L mounting structures are classified by a Performance Class of 1, 2, or 3. Performance Classes are defined in IPC-6011, Generic Performance Specification for Printed Boards.

1.4 Documentation Hierarchy This document, combined with IPC-6011, Generic Performance Specification for Printed Boards, constitutes a qualification and performance specification for MCM-L mounting structures.

2.0 APPLICABLE DOCUMENTS

2.1 Mandatory Documents The following documents form a mandatory part of this standard and all requirements stated therein apply, unless modified in the section where they are invoked:

IPC-2221 Generic Standard on Printed Board Design

IPC-2225 Sectional Design Standard for Organic Multichip Modules (MCM-L) and MCM-L Assemblies

IPC-6011 Generic Performance Specification for Printed Boards

2.2 Supplemental Documents The following documents of the issue in effect on the date of issuance of this specification, form a part of this specification to the extent specified herein. Subsequent issues of, or amendments to, these documents may become a part of this specification.

2.2.1 IPC¹

IPC-T-50 Terms and Definitions for Interconnecting and Packaging Electronic Circuits

IPC-PC-90 General Requirements for Implementation of Statistical Process Control

IPC-DD-135 Qualification for Deposited Organic Interlayer Dielectric Materials for Multichip Modules

IPC-CF-148 Resin Coated Metal for Printed Boards

IPC-MF-150 Metal Foil for Printed Wiring Applications

IPC-CF-152 Composite Material Specifications for Printed Wiring Boards

IPC-FC-231 Flexible Base Dielectrics for Use in Flexible Printed Wiring

IPC-FC-232 Adhesive Coated Dielectric Films for Use in Flexible Printed Wiring and Flexible Bonding Films

IPC-FC-241 Flexible Metal Clad Dielectrics for Use in Fabrication of Flexible Printed Wiring

IPC-D-325 Documentation Requirements for Printed Boards

IPC-A-600 Acceptability of Printed Boards

IPC-AI-642 User's Guidelines for Automated Inspection of Artwork, Innerlayers, and Unpopulated PWBs

IPC-TM-650 Test Methods Manual

2.1.1 Microsectioning

2.3.25 Resistivity of Solvent Extract

2.3.38 Surface Organic Contaminant Detection Test (In-house Method)

2.3.39 Surface Organic Contaminant Identification Test (Infrared Analytical Method)

2.4.1 Adhesion, Plating

2.4.21.1 Bond Strength, Surface Mount Land (Perpendicular Pull Method)

2.4.22 Bow and Twist

2.4.28.1 Adhesion, Solder Mask (Over Melting Metals)

1. The Institute for Interconnecting and Packaging Electronic Circuits, 2215 Sanders Road, Northbrook, IL 60062-6135.

- 2.4.41.2 Coefficient of Thermal Expansion, Strain Gage Method
- 2.4.42.2 Die Shear Strength
- 2.4.42.3 Wire Bond Pull Strength
- 2.5.7 Dielectric Withstanding Voltage, Printed Wiring Material
- 2.6.1 Fungus Resistance, Printed Wiring Materials
- 2.6.3 Moisture and Insulation Resistance, Rigid, Rigid/Flex and Flex Printed Wiring Boards
- 2.6.4 Outgassing, Multilayer Printed Wiring Boards
- 2.6.5 Physical (mechanical) Shock, Multilayer Printed Wiring
- 2.6.7.2 Thermal Shock-Rigid Printed Boards
- 2.6.9 Vibration, Rigid Printed Wiring
- 2.6.20 Assessment of Plastic Surface Mount Components for Susceptibility to Moisture Induced Damage

IPC-ET-652 Guidelines and Requirements for Electrical Testing of Unpopulated Printed Boards

IPC-SM-786 Procedures for Characterizing and Handling of Moisture/Reflow Sensitive ICs

IPC-CC-830 Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies

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

IPC-2141 Controlled Impedance Circuit Boards and High Speed Logic Design

IPC-4101 Specification for Base materials for Rigid and Multilayer Printed Boards

IPC-7711 Rework of Electronic Assemblies

IPC-7721 Repair and Modification of Printed Boards and Electronic Assemblies

2.2.2 Joint Industry Standards¹

J-STD-003 Solderability Tests for Printed Boards

J-STD-005 Requirements for Soldering Pastes

J-STD-006 Requirements for Electronic Grade Solder Alloys and Fluxed and Non-Fluxed Solid Solders for Electronic Soldering Applications

J-STD-020 Moisture/Reflow Sensitivity Classification of Plastic Surface Mount Devices

2.2.3 Military² Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

MIL-G-45204 Gold Plating, Electrodeposited

2.2.4 EIA/JEDEC³

JESD22-A102 Accelerated Moisture Resistance - Unbiased Autoclave

JEDEC Publication 95 Registered and Standard Outlines for Solid State and Related Products

2.2.5 Federal Specifications²

QQ-A-250 Aluminum Alloy, Plate and Sheet

QQ-N-290 Nickel Plating

QQ-S-635 Steel

2.2.6 Other Publications

2.2.6.1 ASTM⁴

ASTM-B-152 Copper Sheet, Strip and Rolled Bar

ASTM-B-579 Standard Specification for Electrodeposited Coating of Tin-Lead Alloy (Solder Paste)

2.2.6.2 NEMA⁵

NEMA LI1 Industrial Laminate Thermosetting Product

2.2.6.3 American Society for Quality Control⁶ Zero Acceptance Number C=0 Sampling Plan

3.0 REQUIREMENTS

3.1 General MCM-L mounting structures furnished under this specification **shall** meet or exceed all of the requirements of the specific performance class as required by the procurement documentation. These mounting structures must meet specific requirements because of the chip component assembly processes used for MCM-Ls.

2. Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

3. EIA, 2500 Wilson Boulevard, Arlington, VA 22201-3834.

4. ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

5. NEMA, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.

6. ASQC, 230 West Wells Street, Milwaukee, WI 53203.