

PBA Qualification Guideline

EDM-Q-001

Rigid Printed Circuit Board Qualification

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The Electronics Design and Manufacturing Guidelines principles

The Electronics Design and Manufacturing Guidelines are designed to provide all electronic supply chain actors involved in the design, qualification, industrialization and production of electronics practical guidelines to master the multi-disciplinary hardware aspects of electronic module realization and operation in a cost-effective way. The Qualification Guidelines are intended to support the qualification of materials, substrate, components, assemblies to achieve reliable, cost-competitive electronics.

Some of the characteristics of the Qualification Guidelines are:

- The guidelines refer to the relevant industry standards that are predominantly used in the international electronics industry such as those published by organizations as IPC and JEDEC. The guidelines do not replace industrial standards but define or recommend what options in the standards to use and will fill-in gaps if necessary. They provide the basis on which a company/product/product-line or application specific approach for qualification can be defined.
- Scientific argumentation and physical models form the basis of a large part of the guidelines and of the associated tools. This allows the use of the guidelines beyond the boundary of the users' experience domain. Therefore, it provides a powerful product and process innovation aid.
- The Qualification Guidelines will not specify, recommend or exclude specific brands of materials, components, suppliers or products. They define the qualification best practice.
- The Qualification Guidelines are based on verifiable physical models, standards and empirical data.

Qualification Guideline Scope

This guideline provides the methodology to qualify the quality and reliability of Printed Circuit Boards delivered by a specific PCB supplier.

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1. Applicable Documents

This PBA Qualification Guideline refers to the most recent version of the following documents and standards:

EDM-D-001	Printed Circuit Board Specification
IPC-6011	Generic Performance Specification for Printed Boards
IPC-6012	Qualification and Performance Specification for Rigid Printed Boards
IPC-6012DA	Automotive Applications Addendum to IPC-6012D Qualification and Performance Specification for Rigid Printed Boards
IPC-A-600	Acceptability of Printed Boards
IPC-D-279	Design Guidelines for reliable Surface Mount Technology Printed Board Assemblies
IPC-SM-840	Qualification and Performance Specification of Permanent Solder Mask and Flexible Cover Materials
IPC-1601	Printed Board Handling and Storage Guideline
IPC-4101	Specification for Base Materials for Rigid and Multilayer Printed Boards
IPC-4552	Specification for Electroless Nickel/Immersion Gold (ENIG) Plating for Printed Circuit Boards
IPC-4553	Specification for Immersion Silver Plating for Printed Boards
IPC-4554	Specification for Immersion Tin Plating for Printed Circuit Boards
IPC-4556	Specification for Electroless Nickel/Electroless Palladium/Immersion Gold (ENEPIG) Plating for Printed Circuit Boards
IPC-9701	Performance Test Methods and Qualification Requirements for Surface Mount Solder Attachments
IPC-TM-650	2.6.27. Thermal Stress, Convection Reflow Assembly Simulation
IPC-WP-023	IPC Technology Solutions White Paper on Performance-Based Printed Board OEM Acceptance. Via Chain Continuity Reflow Test: The hidden Reliability Threat – Weak Microvia Interface.
J-STD-609	Marking and Labeling of Components, PCBs and PCBAs to identify Lead (Pb), Pb-Free and Other Attributes
J-STD-020	Moisture/Reflow Sensitivity Classification for Non-Hermetic Solid State Surface Mount Devices
UL-796	Standard for Printed-Wiring Boards

2. Applicability of the Qualification Guideline EDM-Q-001

This guideline is applicable to the qualification of rigid Printed Circuit Boards. It complements the Design Guideline EDM-D-001 on PCB specification. It covers the verification of the specifications set by EDM-D-001 and specifies qualification tests and acceptance criteria related to robustness and reliability.