by Global Electronics Association

IPC-6921

Requirements and Acceptance for Organic IC Substrates

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Developed by the IPC–6921 IC Substrate Task Group (3–14A) of the Printed Board Base Materials Committee (3–10) of Global Electronics Association.

Users of this publication are encouraged to participate in the development of future revisions.

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1 SCOPE

This specification establishes and defines the qualification, performance requirements and acceptance requirements for organic IC substrates including wire bonding and flip chip IC substrates products.

1.1 Purpose

The purpose of this specification is to provide requirements for qualification and performance of rigid organic substrates based on the following constructions and/or technologies. These requirements apply to the finished products unless otherwise specified:

- Double-sided organic IC substrates with or without plated-through holes (PTHs).
- Multilayer organic IC substrates with or without PTHs or buried/blind vias/microvias.
- Passive embedded circuitry organic IC substrates with capacitive planes or resistive planes.

1.2 Performance Classification and Type

1.2.1 Classification

Three general end product classes have been established to reflect differences in manufacturability, complexity, functional performance requirements and verification (inspection/test) frequency. Use of this standard requires agreement on the class to which the product belongs. The user has the responsibility for identifying the class to which the assembly is produced. If the user does not establish and document the acceptance class, the manufacturer may do so.

Class 1 General Electronic Products Includes products suitable for applications where the major requirement is the function of the completed product.

Class 2 Dedicated Service Electronic Products Includes products where continued performance and extended life is required, and for which uninterrupted service is desired but not critical. Typically, the end-use environment would not cause failures.

Class 3 High Performance/Harsh Environment Electronic Products Includes products where continued high performance or performance-on-demand is critical, product downtime cannot be tolerated, end-use environment may be uncommonly harsh, and the product must function when required, such as life support or other critical systems.

Acceptability criteria in this document have been separated so that organic IC substrates products may be evaluated to any one of the three performance classes. The use of one class for a specific characteristic does not mean that all other characteristics **shall** meet the same Class. Selection should be based on minimum requirement. The user has the ultimate responsibility for identifying the class to which the product is evaluated. Thus, accept and/or reject decisions **shall** be based on applicable documentation such as contracts, procurement documentation, specifications, standards, and reference documents.

1.2.2 Selection for Procurement

Performance class **shall** be specified in the procurement documentation. The procurement documentation **shall** provide sufficient information to fabricate the organic IC substrates and ensure that the user receives the desired product.

1.2.3 Material, Plating Process and Surface Finish

1.2.3.1 Laminate Material

Laminate material is identified by numbers and/or letters, classes and types as specified by the appropriate specification listed in the procurement documentation.

1.2.3.2 Plating Process

The copper plating process, which is used to provide conductivity in the holes, is identified by a single number as follows:

1) Acid copper electroplating only
2) Pyrophosphate copper electroplating only
3) Acid and/or pyrophosphate copper electroplating
4) Additive/electroless copper
5) Electrodeposited Nickel underplate with acid and/or pyrophosphate copper electroplating