IPC-MC-324

Performance Specification for Metal Core Boards
Performace Specification for Rigid Metal Core Boards

1.0 SCOPE

1.1 Scope This specification establishes the qualification and performance requirements for a metal core packaging interconnection (P/I) structure, hereafter referred to as a metal core board. Metal core boards consist of at least one conductive pattern on each side of an insulated metal substrate. Interconnection between conductive patterns shall be made using plated-through holes. The metal substrate shall be an integral part of the metal core board prior to interconnecting the conductive pattern.

1.2 Purpose The purpose of this specification is to provide classes of requirements for performance/acceptance of metal core boards for industry and government use.

1.3 Classifications This specification recognizes that the metal core boards will be subject to classifications by intended end item use and to the methods of applying the coating to the bare metallic substrates. Toward this end three general classes with three specific types and four processes of applying the coating have been established to reflect progressive increases in sophistication, functional performance requirement and testing inspection frequency. It should also be recognized that there may be an overlap of equipment between classes, types and/or process application. The user has the responsibility to determine the class, type and or process application into which this product belongs. The classes, types and process application are defined below:

Class 1—Consumer Products
Includes TV sets, toys, entertainment electronics and non-critical consumer or industrial control devices. Boards in this class are suitable for applications where cosmetic imperfections are not of importance and the major requirement is function of the completed circuit.

Class 2—General Industry
Includes computers, communication equipment, sophisticated business machines, instruments and certain non-critical military applications. Boards in this class are suitable for high performance commercial and industrial products in which extended life is required but for which uninterrupted service is not critical. Certain cosmetic imperfections are allowed.

Class 3—High Reliability
Includes those equipments where continued performance is critical, equipment downtime cannot be tolerated or the equipment is a life support item. Boards of this class are suitable for applications where high levels of assurance are required and uninterrupted service is essential.

Requirements in this specification have been separated so that the performance of the metal core board products may be tested to any of the three classes. The use of one class for a specific attribute does not mean that all other attributes must meet that same class. Selection should be based on minimum need, however, cross-over between classes requires complete definition of test requirements in the procurement document.

Note: Unless otherwise specified, military electronic equipment shall be Class 3. Metal core boards furnished under this specification for military usage shall be fabricated by a supplier who has been certified by inspection in accordance with paragraph 4.5 and 4.6.

1.3.1 Metal Core Board Types
Type 1—Single conductive layer on both sides of the metal core substrate. Conductive material to be copper foil and electrodeposited copper. (See Figure 1.)

Type 2—More than one conductive layer on one or both sides of the metal core substrate. Conductive material to be copper foil and electrodeposited copper. (See Figure 2.)

Type 3—Single conductive layer on both sides of the metal core substrate. Conductive material to be electroless copper. (See Figure 3.)

1.3.2 Metal Core Insulating Processes
Process A—Spray Coating Process—Oversized holes are drilled into the bare metal core substrate. The metal is then treated to roughen the surface. An insulating film (coating) is then applied over the entire substrate by a spray method. The coating is then sensitized so that it has an affinity for copper and a copper flash is then applied over all surfaces.