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by Global Electronics Association

IPC-7093B

Design and Assembly Process Guidance for Bottom Termination Components (BTCs)

If a conflict occurs between the English language and translated versions of this document, the English version will take precedence.

Developed by the Bottom Termination Components (BTC) Task Group (5-21h) of the Assembly & Joining Committee (5-20) of Global Electronics Association.

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

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Design and Assembly Process Guidance for Bottom Termination Components (BTCs)

1 SCOPE

This document describes design and assembly guidance for implementing bottom termination components (BTCs). The focus of the information contained herein is on critical design, materials, assembly, inspection, repair, quality and reliability issues associated with BTCs.

This document applies only to BTCs, which are components with planar terminations under the body with or without wettable side terminations or flanks. Examples of BTCs include small-outline no-lead (SON), dual-flat no-lead (DFN), quad-flat no-lead (QFN), land grid array (LGA), etc. (see Section 4).

1.1 Purpose The purpose of this document is to provide useful and practical information to those who use or are considering using BTCs. The target audiences for this document are physical designers, process engineers, reliability engineers and managers who are responsible for design, assembly, inspection and repair processes of printed boards and printed board assemblies. Information described in this document enables high quality and highly reliable BTC assembled devices operating within an electronic system.

This document also describes how to successfully implement robust design and assembly processes for printed board assemblies using BTCs as well as ways to troubleshoot some common anomalies which can occur during BTC assembly. For accept/reject criteria and requirements for BTC assemblies, see J-STD-001 and IPC-A-610.

Figure 1-1 provides an example of various forms of BTCs.

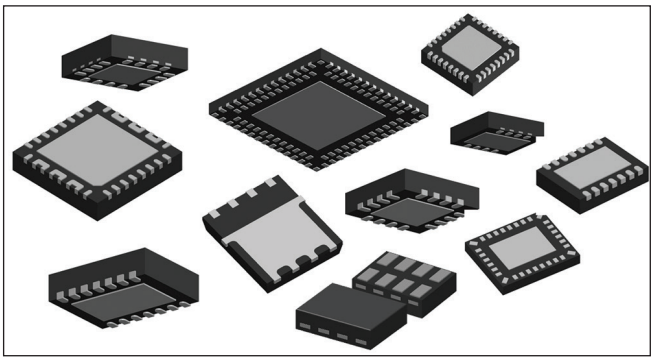

Figure 1-1 Various Forms of BTCs

1.2 Classification

CLASS 1 General Electronic Products

Includes products suitable for applications where the major requirement is function of the completed assembly.

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, equipment downtime cannot be tolerated, end-use environment may be uncommonly harsh, and the equipment must function when required, such as life support or other critical systems.

1.3 Measurement Units This document uses International System of Units (SI units) per IEEE/ASTM SI 10, Section 3. The SI units used in this document are millimeters (mm) for dimensions and dimensional tolerances, Celsius (°C) for temperature and temperature tolerances, grams (g) for weight, and lux (lx) for illuminance.

Note: This document uses other SI prefixes (ASTM SI10, Section 3.2) to eliminate leading zeroes (for example, 0.0012 mm becomes 1.2 µm) or as an alternative to powers-of-ten (3.6 x 103 mm becomes 3.6 m).

1.4 Use of "Lead" For readability and translation, this document uses the word lead only to describe leads of a component (sometimes referred to as terminations).

1.5 Abbreviations and Acronyms Periodic table elements are written in their abbreviated form only in this document. See Appendix A for full spellings of these and other abbreviations and all acronyms used in this document.

1.6 Terms and Definitions Other than those terms listed below, the definitions of terms used in this document are in accordance with IPC-T-50.

1.6.1 Wettable Side Flank A BTC peripheral termination that is partially plated to improve solderability.