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Design and Assembly Process Implementation for Bottom Termination SMT Components

Developed by the IPC Bottom Termination Components (BTC) Task Group (5-21h) of the Assembly & Joining Processes Committee (5-20) of IPC

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

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# Table of Contents

## 1 SCOPE
- Purpose .......................................................... 1
- Intent ..................................................................... 1

## 2 APPLICABLE DOCUMENTS
- IPC ........................................................................ 1
- JEDEC .................................................................... 2

## 3 SELECTION CRITERIA AND MANAGING BTC IMPLEMENTATION
- Terms and Definitions ............................................. 2
- Bottom Termination Components (BTC) .................... 2
- Component Mounting Site ..................................... 2
- Conductive Pattern* .............................................. 2
- Land Pattern* .......................................................... 2
- Mixed Component-Mounting Technology* ............... 2
- Printed Board Assembly ......................................... 2
- Surface Mount Technology (SMT)* ......................... 2
- BTC Executive Summary ....................................... 2
- Description of Different Component Structures .......... 3
- Total Cost of Ownership ....................................... 6
- Design and Assembly Process Considerations for QFN Type BTC Packages ..................................... 6
- Future Needs and Expectations ............................. 8

## 4 COMPONENT CONSIDERATIONS
- General Description of Different BTC Packages .......... 8
- Detailed Description and Standards for BTCs .......... 8
- Single Row Molded Lead-Frame Based Packaging .......... 9
- Multiple Row Molded Lead-Frame Based Packaging .......... 9
- JEDEC Publication 95 Design Guide 4.8 .................. 10
- JEDEC Publication 95 Design Guide 4.23 .................. 12
- JEDEC Publication 95 Design Guide 4.19 .................. 15
- Detailed Description of QFN and SON (DFN) Packages ............................................. 17
- Manufacturing Methods ......................................... 17
- Types of Defects ..................................................... 21
- Marking Alternatives .............................................. 21
- Materials Used ....................................................... 21
- Solderability Testing ............................................... 21
- Custom QFN and SON (DFN) .................................. 21
- Detailed Description of LGA, QFN and SON (DFN) Substrate-Based Packages ......................... 23
- Manufacturing Methods for Substrate-Based Packages ..................................................... 23
- Types of Defects ..................................................... 24

## 5 MOUNTING STRUCTURES
- Types of Mounting Structures ................................ 31
- Organic Resin Systems .......................................... 31
- Inorganic Structures ............................................. 31
- Layering (Multilayer, Sequential or Build-Up and HDI) .................................................. 31
- Properties of Mounting Structures ......................... 31
- Resin Systems ...................................................... 32
- Reinforcements .................................................... 32
- Reliability Concerns with High Temperature Lead-Free Soldering ........................................ 32
- Thermal Expansion ............................................. 33
- Moisture Absorption .......................................... 33
- Flatness (Bow and Twist) ....................................... 34
- Surface Finishes .................................................. 34
- Hot Air Solder Leveling (HASL) .............................. 35
- Organic Surface Protection (Organic Solder-ability Preservative) Coatings .................... 36
- Noble Metal Platings/Coatings ................................ 36
- Solder Mask .......................................................... 38
- Wet and Dry Film Solder Masks ............................ 38
- Photoimageable Solder Masks ......................... 40
- Registration .......................................................... 41
- Via Protection .......................................................... 41
- Thermal Spreader Structure Incorporation (e.g., Metal Core Boards) ............... 44
- Lamination Sequences ......................................... 44
- Heat Transfer Pathway ......................................... 44
- Thermal Pad Attachment ........................................ 44
- Thermal Vias .......................................................... 45
- Solderless Interconnections Systems ..................... 45

## 6 PRINTED CIRCUIT ASSEMBLY DESIGN CONSIDERATIONS
- BTC Part Description ........................................... 46
- BTC Package Variations ......................................... 46
- Termination Formats ............................................... 48
- Mounting Conditions ............................................. 48
- Package Tolerances ............................................... 54
- Attachment Techniques ......................................... 57
7 ASSEMBLY OF BTCs ON PRINTED BOARDS

7.1 PCB Surface Finish Requirements .............................................. 60
7.2 PCB Design ................................................................. 61
7.2.1 Consideration for Soldering Process ........................................ 61
7.2.2 Component Preconditioning Bake ............................................. 62
7.2.3 Component Preparation for Assembly ......................................... 62
7.2.4 Solder Paste and its Application .............................................. 62
7.2.5 Component Placement Impact .................................................. 65
7.2.6 Reflow Soldering and Profiling ............................................. 66
7.2.7 Reflow Process Impact on Material .......................................... 68
7.2.8 Vapor Phase .................................................................. 69
7.2.9 Cleaning vs. No-Clean ....................................................... 70
7.2.10 Package Standoff ............................................................ 70
7.3 Post-SMT Processes ............................................................ 71
7.3.1 Conformal Coatings ........................................................ 71
7.3.2 Use of Underfills and Adhesives ............................................. 71
7.3.3 Depaneling of Boards and Modules ......................................... 71
7.4 Inspection Techniques .......................................................... 71
7.4.1 X-Ray Usage .................................................................. 72
7.4.2 Scanning Acoustic Microscopy ............................................... 72
7.4.3 BTC Standoff Measurement ................................................... 72
7.4.4 Optical Inspection ............................................................. 73
7.4.5 Destructive Analysis Methods ............................................... 73
7.5 Testing and Product Verification ................................................ 74
7.5.1 Electrical Testing .............................................................. 74
7.5.2 Test Coverage ................................................................ 75
7.5.3 Burn-In Testing ................................................................. 75
7.5.4 Product Screening Tests ....................................................... 75
7.6 Assembly Process Control Criteria for Plastic BTCs ................. 75
7.6.1 Voids in BTC Solder Joints ..................................................... 75
7.6.2 Solder Bridging ................................................................. 76
7.6.3 Opens ........................................................................... 77
7.6.4 Cold Solder ................................................................ 78
7.6.5 Defect Correlation/Process Improvement ................................. 78
7.6.6 Effect of Insufficient and/or Uneven Heating ......................... 78
7.6.7 BTC Component Solderability Testing ..................................... 78
7.6.8 Solder Ball Defects ............................................................ 78
7.7 Repair Processes ................................................................. 78
7.7.1 Rework/Repair Philosophy ................................................... 78
7.7.2 Removal of BTC ............................................................... 79
7.7.3 BTC Assembly Defect Repair ............................................... 79

8 RELIABILITY ................................................................. 83
8.1 Accelerated Reliability Testing .................................................. 83
8.2 Damage Mechanisms and Failure of Solder Attachments ............ 83
8.2.1 Differences in Accelerated Testing of SAC vs. Tin/Lead ............ 84
8.2.2 Mixed Alloy Soldering ......................................................... 85
8.2.3 Mold Compound Material ...................................................... 85
8.2.4 Die Size ........................................................................ 85
8.2.5 Full vs. Half Etched Leadframe ............................................ 85
8.2.6 Gold/Silver/Palladium Embrittlement ..................................... 85
8.2.7 Stand-Off Height ............................................................... 85
8.3 PCB Design Considerations ...................................................... 85
8.3.1 Land Size .................................................................... 85
8.3.2 Fillet Formation ............................................................... 86
8.3.3 Board Thickness .............................................................. 87
8.4 Voids in Thermal Pad ............................................................. 87
8.5 Design for Reliability (DfR) Process .......................................... 87
8.5.1 Wear-Out Mechanisms ....................................................... 88
8.5.2 Creep-Fatigue Interaction ..................................................... 88
8.5.3 Solder Thickness Mechanical Reliability ................................ 89
8.6 Wear-Out Mechanisms Review ............................................... 90
8.6.1 Reliability Factors ............................................................ 90
8.6.2 Benefits of Reinforcement .................................................... 90
8.6.3 Event Related Failures ....................................................... 91
8.7 Design for Reliability Issues and Concerns ............................. 91
8.7.1 Damage Mechanisms and Failure of Solder Attachments ......... 91
8.7.2 Solder Joints and Attachment Types ....................................... 91
8.7.3 Solder Interface Grain Structure Effects ................................. 92
8.7.4 Global Expansion Mismatch ............................................... 92
8.7.5 Local Expansion Mismatch ................................................... 92
8.7.6 Internal Expansion Mismatch ............................................... 93
8.8 Solder Attachment Failure ..................................................... 93
8.9 Validation and Qualification Tests ............................................. 93
8.10 Screening Procedures .......................................................... 93
8.10.1 Solder Joint Defects .......................................................... 93
8.10.2 Screening Recommendations .............................................. 93

9 DEFECT AND FAILURE ANALYSIS CASE STUDIES .................................................. 94
9.1 Solder Attachment Failures ....................................................... 94
9.1.1 Solder Attachment Failure Conditions ..................................... 94
9.1.2 Insufficient Solder Failures .................................................... 94
9.1.3 Land, Nonsolderable .......................................................... 95
9.1.4 Termination, Nonsolderable ................................................... 95
9.2 Package Failures ................................................................. 95
9.2.1 Package Warpage .............................................................. 95
9.3 Dewetting Failures ............................................................... 96
9.3.1 Dewetting on QFN ........................................................... 96
9.4 Cracked Solder Joint Failure .................................................... 96
9.4.1 Cracks in Solder Joints ........................................................ 96
9.5 Component Failures ............................................................. 97
9.5.1 Tilted Component ............................................................. 97
9.5.2 Lead Configuration Conditions ............................................ 97
9.5.3 Joint Configuration Condition .............................................. 98
9.5.4 Solder Joint Volume .......................................................... 98
9.6 Voids .............................................................. 99
9.6.1 Voids in Solder Joint Through Xray .............. 99
9.6.2 Voids in Solder Joints Microsection and X-Ray ........................................ 99
9.6.3 Voids in Thermal Pad ...................................... 100

10 GLOSSARY AND ACRONYMS ........................................ 101

11 BIBLIOGRAPHY AND REFERENCES ............................. 101

APPENDIX A ......................................................... 102

APPENDIX B ........................................................ 105

Figures
Figure 3-1 Discrete General Types of Bottom-Only Terminations ............................. 3
Figure 3-2 Quad Flat No Lead Type Bottom-Only Terminations ......................... 4
Figure 3-3 Small Outline No Lead Type Bottom-Only Terminations .................. 4
Figure 3-4 Land Grid Array Type Bottom-Only Terminations ................................. 4
Figure 3-5 Typical QFN Cross-Section ......................................................... 5
Figure 3-6 Saw Singulated (a, b) BTC Package ............................................. 6
Figure 3-7 MLF Package Thickness When Compared to Other Types of Packages ........ 6
Figure 3-8 Solder Mask Clearance Guideline for BTCs ..................................... 7
Figure 3-9 Example of Segmented Stencil Pattern Design on Thermal Land ......... 7
Figure 3-10 Recommended Stencil Design to Provide 50–60% Paste Coverage to Ground Lands (but 100% on I/O lands) ....................... 8
Figure 4-1 Various Forms of BTC Parts ......................................................... 9
Figure 4-2 Singulated LGA Showing Bottom of Part .................................. 10
Figure 4-3 Basic Single Row Lead-Frame Based SON-QFN Package Assembly Model ......................................................... 10
Figure 4-4 Basic Multiple Row QFN Package Assembly Model ..................... 10
Figure 4-5 Terminal Configuration for Single Row SON and QFN Packaging .......... 10
Figure 4-6 JEDEC Defined Package Outlines for Single Row SON and QFN Packaging ......................................................... 11
Figure 4-7 Terminal Design Variations for Single Row SON and QFN Packaging ........................ ......................... 12
Figure 4-8 Odd and Even Terminal Contact Layout ................................. 12
Figure 4-9 Depopulation Schemes for Single Row QFN Packaging ................. 13
Figure 4-10 Corner Terminals and Exposed Heat Spreader .......................... 13
Figure 4-11 Fine-Pitch Two Row QFN (No lead) Packaging ................. 13
Figure 4-12 QFN Dual Row Package (top and side views) .......................... 14
Figure 4-13 Outer and Inner Terminal Layout Variations .......................... 15
Figure 4-14 Two Row Terminal Layout .................................................... 15
Figure 4-15 The Notch Feature on the Exposed Die Attach Pad Confirms Package Orientation with Reference to the A1 and B1 Terminals ....... 15
Figure 4-16 Two and Three Row QFN Package Examples .................. 16
Figure 4-17 Basic Two Row Terminal Layout Variations .......................... 16
Figure 4-18 Basic Three Row Terminal Layout Variations ........................ 17
Figure 4-19 Contact Geometry Variations ................................................. 17
Figure 4-20 Basic QFN Package Outline Drawing .................................. 17
Figure 4-21 Pin 1 Location Option ......................................................... 18
Figure 4-22 BTC Multiple Package Configurations .................................... 18
Figure 4-23 Typical Die Attach Side Leadframe with Ni-PdAu Finish for QFNs .................. 18
Figure 4-24 Typical Solder Pad Side of QFN Panel for with Tape over the Leadframe ......................................................... 18
Figure 4-25 QFN Fabrication with Saw Singulation .................................... 19
Figure 4-26 Overmolded Leadframe Configuration ................................... 19
Figure 4-27 QFN Fabrication with Punch Singulation .................................... 20
Figure 4-28 Comparing Punch-Press and Saw-Cut Singulation and Illustrating Wire Bond Options ......................................................... 20
Figure 4-29 Example of Half Etch Pullback Contact and Full Etch No-Pullback Perimeter Contact Configurations ......................................................... 21
Figure 4-30 Plating Layer Construction Comparison .................................. 23
Figure 4-31 Detailed View of a Custom Site for a QFN ................................. 23
Figure 4-32 Bottom View of Land Grid Array Printed Board ...................... 24
Figure 4-33 Top View of Land Grid Array Printed Board ............................ 24
Figure 4-34 BTC Fabrication on a Substrate with Saw Singulation ............... 25
Figure 4-35 Amkor’s 28 I/O MicroLeadFrame® Package ............................ 27
Figure 4-36 Fairchild’s MLP is a Thermally Enhanced SON Developed for Power Switch Technology ......................................................... 27
Figure 4-37 Intersil’s Quad No-lead Micro Leadframe Plastic Package (MLFP) .................. 27
Figure 4-38 JEDEC MO-220 Package Outline ........................................... 28
Figure 4-39 QFN Contact Design .......................................................... 28
Figure 4-40 Analog Devices LFCSP™ (Leadframe Chip-Scale Package) ........ 29
Figure 4-41 National Semiconductor LLPTS™ (Leadless Package) .................. 29
Figure 4-42 Typical LLC and LFCSP Outline Detail .................................... 30
Figure 4-43 JEDEC Tray Carrier Format .................................................... 30
Figure 5-1 Typical Build-Up HDI Platform, 2[4]2 Layer Configuration ................. 31
Figure 5-2 Material Thermal Expansion Comparison ................................... 34
Figure 5-3 SSD Application Basic Fabrication Steps ................................ 39
Figure 5-4 SSD Process Steps ............................................................ 40
Figure 5-5 Comparing Solder Mask off Via Land with a Solder Mask Encroached Via Land ......................................................... 41
Figure 5-6 Planarized and Capped Via Protection Example .................................. 42
Figure 5-7 Via Protection Methods ........................................................ 43
Figure 5-8 Metal Core Board Construction Examples ............................. 44
Figure 5-9 Examples of Type VII Filled and Capped Vias .......................... 45
Figure 7-8 Assessing Maximum Pre-Reflow Off-Land Acceptance

Figure 7-7 QFN Component and Land Pattern

Figure 7-6 Recommended Land Pattern for JEDEC 6 I/O SON Package

Figure 7-5 Recommended Aperture Dimensions for Composite

Figure 7-4 Undersized PCB Pads Resulting in Potential Areas Where Pure Tin Finish Has Not Mixed with SnPb Solder Paste

Figure 7-3 Comparison of Solder Dipped and a Non-Solder-Dipped BTC and Resultant No Solder Condition

Figure 7-2 Solder Stencil Aperture Wall Area

Figure 7-1 Example of Good Land Patterns for Bottom Termination Components

Figure 6-21 Solder Protrusion from the Bottom Side of PCB for Encroached Vias

Figure 6-20 X-Ray Example Showing Voids in the Thermal Pad

Figure 6-19 Effect of Voids on Thermal Performance

Figure 6-18 Comparison of the 80% Rule with Standard Grid Systems for Routing Improvement

Figure 6-17 PCB Thermal Pad and Via Array for 7x7 mm, 48 lead and 10x10 mm, 68 Lead Packages

Figure 6-16 Effect of Number of Thermal Via on Package Thermal Performance

Figure 6-15 Representative BTC Outline Detail

Figure 6-14 Solder Mask for (A) Perimeter Lands for 0.5 mm and Higher Pitch Parts, and (B) for 0.4 mm Pitch Parts

Figure 6-13 Comparing Optional Solder Mask Variations

Figure 6-12 The Affect of θJA vs. Number, Distribution and Diameter of Thermal Vias and Die Sizes for a 36 I/O QFN with a 9 x 9 mm Body and 7x7 mm Thermal Land

Figure 6-11 DAP to PCB Interface Example

Figure 6-10 SON 0.5 mm Pitch, 6 Pin with Thermal Tab

Figure 6-9 Comparing Pull Back to no-Pull Back Package Outline and Land Pattern Thermal Land Layout

Figure 6-8 Definition of Toe, Heel and Side Fillets

Figure 6-7 QFN Component and Land Pattern

Figure 6-6 Recommended Land Pattern for JEDEC 6 I/O SON Package

Figure 6-5 Basic Outline Drawing for the 6 I/O SON

Figure 6-4 Land Pattern and DAP Land Layout Guide

Figure 6-3 Comparing Pullback and No-Pullback Configurations

Figure 6-2 Example of Poor Land Patterns for Bottom

Figure 6-1 Example of Good Land Patterns for Bottom

Figure 5-10 Example of Circuit Development of Solderless Connection Technology

Figure 5-9 Metal Defined Land Solder Joint

Figure 5-8 Solder Crack Due to CTE Mismatch after 1000 Cycles

Figure 5-7 Weibull Plot Showing Thinner Board Results in Higher Fatigue Life

Figure 5-6 The Crack Formation is the Result of the CTE Mismatch

Figure 5-5 Depiction of the Effects of Accumulating Fatigue Damage in the Solder Joint Structure

Figure 5-4 Undersized PCB Pads Resulting in Potential Areas Where Pure Tin Finish Has Not Mixed with SnPb Solder Paste

Figure 5-3 Comparison of Solder Dipped and a Non-Solder-Dipped BTC and Resultant No Solder Condition

Figure 5-2 Solder Stencil Aperture Wall Area

Figure 5-1 Example of Good Land Patterns for Bottom Termination Components

Figure 4-10 E acceptability

Figure 4-9 Wire-bond X-Ray to Leadframe Illustration

Figure 4-8 Typical X-Ray After Process

Figure 4-7 Depiction of the Effects of Accumulating Temperature Shock

Figure 4-6 The Crack Formation is the Result of the CTE Mismatch

Figure 4-5 Weibull Plot Showing Thinner Board Results in Higher Fatigue Life

Figure 4-4 Undersized PCB Pads Resulting in Potential Areas Where Pure Tin Finish Has Not Mixed with SnPb Solder Paste

Figure 4-3 Comparing Pullback and No-Pullback Configurations

Figure 4-2 Example of Poor Land Patterns for Bottom
Figure 9–1 Optical image of acceptable QFN edge terminations. Solder fillets should exist if the design incorporates pads that extend beyond the package width. .................................94

Figure 9–2 Optical image of acceptable QFN edge terminations. Solder fillets should be visible to a minimum of 75% of the width of the termination. .................................................94

Figure 9–3 Cross section of BTC open joint due to insufficient solder paste volume during printing. ..........................................................94

Figure 9–4 Cross section of BTC reliability failure after 1000 cycles due to insufficient solder paste volume during printing. .........................................................94

Figure 9–5 Nonsolderable land on LGA package. .................95

Figure 9–6 3-D X-ray shows non-wet joints on a QFN. .....95

Figure 9–7 Optical image of unacceptable QFN edge terminations. The solder rise is limited and an open joint can be seen. The package is also 'floating' above the surface of the pads. ....95

Figure 9–8 Cross section image of QFN with an open joint caused by nonwetting of the solder to the bottom land of the QFN. .................................95

Figure 9–9 Cross section of LGA with a corner joint failure. The paste wicked to the package .........95

Figure 9–10 Concave warpage on 15x15 mm BTC............95

Figure 9–11 Good wetting on QFN thermal pad after printing and reflow. ........................................96

Figure 9–12 Dewetting on QFN thermal pad after printing and reflow. ........................................96

Figure 9–13 Defect Condition of QFN edge joints showing insufficient solder in a joint. .................................96

Figure 9–14 Cracks in QFN solder joints after temperature shock. ........................................96

Figure 9–15 Tilted BTC causing high joint height open on the left. .....................................................97

Figure 9–16 Tilted BTC causing good height on the right. ...97

Figure 9–17 Full lead option on BTS component. ............97

Figure 9–18 Half etched option on BTS component. ........97

Figure 9–19 Small fillet due to nonwetting of the side copper. .............................................................98

Figure 9–20 Side fillet on bottom termination component good wetting to copper lead. .........................98

Figure 9–21 Large fillet due to increase of solder volume. ...98

Figure 9–22 No side fillet on bottom termination component .............................................................98

Figure 9–23 Target Condition of QFN edge joints where showing a moderate level of voiding within joints is acceptable. All joints have reflowed. ...99

Figure 9–24 Acceptable Condition of QFN edge joints showing an increased level of voiding within the joints but well within any action level. .........99

Figure 9–25 BTC component with a large edge joint. The joint did not have any cracking after shock test. .............................................................99

Figure 9–26 16-pin QFN with voids in the joint and the thermal pad but well within action level. .................99

Figure 9–27 QFN component with increase level of voiding to above 30%. Could be a reliability concern. ..........................................................100

Figure 9–28 Acceptable Condition of QFN edge joints showing an increased level of voiding within the joints but well within any action level. ....100

Figure B1-1 BTC Component (left) and PCB (right) after Part Removal .................................................106

Tables

Table 3-1 Total Cost of Ownership of Bottom Terminated Components (BTC) .........................7

Table 4-1 QFN and DFN Configurations .................................................9

Table 4-2 Terminal width variations for SON and QFN ... 13

Table 4-3 Body Outline and Maximum Terminal Count 14

Table 4-4 Leadframe Package Defects and Failure Modes ..........................................................22

Table 4-5 Plating Systems Used on Metal Leadframes 23

Table 4-6 Substrate Based Package Defects and Failure Modes .................................................26

Table 4-7 Typical Package Outline and I/O for QFN 29

Table 4-8 Contact Pitch and Width Variations 30

Table 4-9 Basic Material Elements for the LLC and LF CSP Devices .........................................30

Table 5-1 Environmental Properties of Common Dielectric Materials ........................................33

Table 5-2 Key Attributes for Various Board Surface Finishes .........................................................35

Table 5-3 Via filling/encroachment to surface finish process evaluation ...........................................42

Table 6-1 Quad Flat No Lead Tolerance Goals for Solder Joint Formation ......................................51

Table 6-2 Package and Land Pattern (Pullback and No-Pullback) Dimensions ................................52

Table 6-3 Legend for Basic Mechanical Attributes ........................44

Table 6-4 Contact Pitch and Width Variations ........................56

Table 7-1 Particle Size Comparisons .................................................63

Table 7-2 Typical Reflow Profile for Eutectic (63Sn/37Pb) Solder Paste ........................................67

Table 7-3 Profile Comparison Between SnPb and SAC Alloys .........................................................67

Table 7-4 Typical Reflow Profile for Lead-Free (SAC305 or SAC405) Solder Paste .......................69

Table 7-5 Guidelines for Void Criteria in Thermal/ Ground Planes of BTCs ................................76

Table 8-1 Accelerated Testing for End Use Environments ............................................................84

Table 8-2 Coefficients of Thermal Expansion for Typical Materials .................................................89

Table 8-3 Typical Heights (Joined) .................................................89

Table A1-1 Etchants used to highlight Intermetallic compounds ..............................................104
Design and Assembly Process Implementation for Bottom Termination Components

1 SCOPE

This document describes the design and assembly challenges for implementing Bottom Termination surface mount Components (BTCs) whose external connections consist of metallized terminations that are an integral part of the component body. Throughout this document the word “BTC” can mean all types and forms of bottom only termination components intended for surface-mounting. This includes such industry descriptive nomenclature as QFN, DFN, SON, LGA, MLP, and MLF, which utilize surface to surface interconnections. The focus of the information contained herein is on critical design, assembly, inspection, repair, and reliability issues associated with BTCs.

1.1 Purpose The target audiences for this document are managers, design and process engineers, and operators and technicians who deal with the electronic design, assembly, inspection, and repair processes. The intent is to provide useful and practical information to those companies who are using or considering tin/lead, lead-free, adhesives or other forms of interconnection processes for assembly of BTC type components.

1.2 Intent This document, although not a complete recipe, identifies many of the characteristics that influence the successful implementation of robust and reliable assembly processes and provides guidance information to component suppliers regarding the issues being faced in the assembly process. The exchange of information between the component supplier, product designer, and assembly personnel about those parameters that influence good assembly practices are more critical with BTC implementation than with many other surface mount parts.

2 APPLICABLE DOCUMENTS

2.1 IPC

IPC-T-50   Terms and Definitions for Interconnecting and Packaging Electronic Circuits
IPC-CH-65   Guidelines for Cleaning of Printed Boards and Assemblies
IPC-D-279   Design Guidelines for Reliable Surface Mount Technology Printed Board Assemblies

IPCA-610   Acceptability of Electronic Assemblies
IPC-SM-785   Guidelines for Accelerated Reliability Testing of Surface Mount Solder Attachments
IPC-1756   Manufacturing Process Data Management
IPC-2226   Sectional Design Standard for High Density Interconnect (HDI) Printed Boards
IPC-4101   Specification for Base Materials for Rigid and Multilayer Printed Boards
IPC-4761   Design Guide for Protection of Printed Board Via Structures
IPC-6012   Qualification and Performance Specification for Rigid Printed Boards
IPC-7351   Generic Requirements for Surface Mount Design and Land Pattern Standard
IPC-7525   Stencil Design Guidelines
IPC-7526   Stencil and Misprinted Board Cleaning Handbook
IPC-9201   Surface Insulation Resistance Handbook
IPC-9701   Performance Test Methods and Qualification Requirements for Surface Mount Solder Attachments
J-STD-001   Requirements for Soldered Electrical and Electronic Assemblies
J-STD-002   Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires
J-STD-005   Requirements for Soldering Pastes
J-STD-033   Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices

1. www.ipc.org