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Design and Assembly Process Implementation for Ball Grid Arrays (BGAs)

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

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Table of Contents

1	SCOPE	1	4	COMPONENT CONSIDERATIONS	15
1.1	Purpose	1	4.1	Semiconductor Packaging Comparisons and Drivers	15
1.1.1	Intent	1	4.1.1	Package Feature Comparisons	15
1.1.2	Interpretation of “Shall”	1	4.1.2	BGA Package Influencers	16
1.1.3	Presentation	1	4.1.3	Cost Concerns	16
1.1.4	Use of “Lead”	1	4.1.4	Component Handling	16
1.1.5	Abbreviations and Acronyms	1	4.1.5	Thermal Performance	18
2	APPLICABLE DOCUMENTS	1	4.1.6	Spatial Constraint	18
2.1	IPC	1	4.1.7	Electrical Performance	18
2.2	Joint Standards	2	4.1.8	Mechanical Performance	18
2.3	JEDEC	2	4.2	Die Mounting in the BGA Package	19
2.4	EIA	3	4.2.1	Wire Bonding	19
3	SELECTION CRITERIA AND MANAGING BGA IMPLEMENTATION	3	4.2.2	Flip Chip	20
3.1	Terms and Definitions	3	4.2.3	Changing BGA Termination Materials	20
3.1.1	Solder-Mask-Defined (SMD) BGA Pad	3	4.2.4	Options for Nonreballled BGAs	21
3.1.2	Non-Solder-Mask Defined (NSMD) BGA Pad	3	4.3	Standardization	22
3.1.3	Nonwet Open (NWO)	3	4.3.1	Industry Standards for BGAs	22
3.1.4	Head-on-Pillow (HoP)	3	4.3.2	BGA Package Pitch	24
3.2	Overview	3	4.3.3	BGA Package Outline	25
3.3	Description of Assembly Infrastructure	4	4.3.4	Ball Size Relationships	25
3.3.1	Land Patterns and Printed Board Considerations	4	4.3.5	Package-on-Package (PoP) BGA	26
3.3.2	Technology Comparison	5	4.3.6	Coplanarity	26
3.3.3	Assembly Equipment Impact	8	4.4	Component Packaging Style Considerations	26
3.3.4	Stencil Requirements	8	4.4.1	Solder Ball Alloys	27
3.3.5	Inspection Requirements	8	4.4.2	Ball Attach Process	30
3.3.6	Test	8	4.4.3	Ceramic Ball Grid Array (CBGA)	30
3.4	Time-to-Market Readiness	8	4.4.4	Ceramic Column Grid Arrays (CCGAs)	31
3.5	Methodology	9	4.4.5	Tape-Based Ball Grid Arrays (TBGAs)	35
3.6	Process Step Analysis	9	4.4.6	Multiple-Die Packaging	35
3.7	BGA Limitations and Issues	9	4.4.7	System-in-Package (SiP)	36
3.7.1	Visual Inspection	9	4.4.8	Three-Dimensional (3D) Folded Package Technology	36
3.7.2	Moisture Sensitivity	10	4.4.9	Ball Stack	36
3.7.3	BGA and Board Coplanarity and Warpage	10	4.4.10	Folded and Stacked Packaging Combination	37
3.7.4	Rework	11	4.4.11	Package-on-Package (PoP)	37
3.7.5	Cost	11	4.4.12	Benefits of Multiple-Die Packaging	37
3.7.6	Voids in BGAs	11	4.5	BGA Connectors and Sockets	38
3.7.7	Pad Cratering	11	4.5.1	Material Considerations for BGA Connectors	38
3.7.8	Head-on-Pillow (Hop) Defect	13	4.5.2	Attachment Considerations for BGA Connectors	38
3.7.9	Nonwet Open (NWO) Defect	14	4.5.3	BGA Materials and Socket Types	39
3.7.10	Reliability Concerns	14	4.5.4	Attachment Considerations for BGA Sockets	39

4.6	BGA Construction Materials	40	6.1.4	Alignment Legends (Silkscreened Ink, Cu Features, Pin 1 Identifier)	59
4.6.1	Types of BGA Substrate Materials	40	6.2	Attachment Sites (Land Patterns and Vias)	60
4.6.2	BGA Substrate Materials Properties	41	6.2.1	Land Diameter Size and Its Impact on Routing	60
4.7	BGA Package Design Considerations	42	6.2.2	Solder-Mask-Defined (SMD) Land and Metal-Defined Land Designs	61
4.7.1	Power and Ground Planes	42	6.2.3	Conductor Width	62
4.7.2	Signal Integrity	43	6.2.4	Via Size and Location	62
4.7.3	Heat Spreader Incorporation Inside the Package	43	6.2.5	Parameters Affecting Solder Mask on BGAs ...	64
4.8	BGA Package Acceptance Criteria and Shipping Format	43	6.2.6	Multiple-Grid BGA Land Pattern Array Designs	64
4.8.1	Missing Balls	43	6.3	Escape and Conductor Routing Strategies	65
4.8.2	Voids in Solder Balls	44	6.3.1	Escape Strategies	68
4.8.3	Solder Ball Attach Integrity	44	6.3.2	Surface Conductor and Space Width	68
4.8.4	Package and Ball Coplanarity	44	6.3.3	Land-to-Via (Dog Bone) Routing Patterns	69
4.8.5	Moisture Sensitivity (Baking, Storage, Handling and Rebaking)	45	6.3.4	Design for Mechanical Strain Mitigation	70
4.8.6	Shipping Medium (Tape and Reel, Trays, Tubes)	46	6.3.5	Uncapped Via-in-Pad and Its Impacts on Reliability	71
5	PRINTED BOARDS AND OTHER MOUNTING STRUCTURES	46	6.3.6	Fine-Pitch BGA (FBGA) Microvia-in-Land Strategies	72
5.1	Substrates	46	6.3.7	Power and Ground Connectivity	72
5.1.1	Organic Substrates	46	6.4	Impact of Wave Solder on Top-Side BGAs	73
5.1.2	Inorganic Substrates	46	6.4.1	Top-Side Reflow	73
5.1.3	High-Density Interconnect (HDI) Build-Up Layers	46	6.4.2	Impact of Top-Side Reflow	73
5.2	Base Materials Considerations	48	6.4.3	Methods for Avoiding Top-Side Reflow	75
5.2.1	Resin Systems	48	6.4.4	Top-Side Reflow for Pb-Free Boards	75
5.2.2	Laminate Material Properties	48	6.5	Testability and Test Point Access	75
5.3	Printed Board Surface Finishes	49	6.5.1	Component Testing	75
5.3.1	Hot-Air Solder Leveling (HASL)	50	6.5.2	Solder Ball Damage During Test and Burn-In	76
5.3.2	Organic Solderability Preservative (OSP) Coatings	51	6.5.3	Printed Board Testing	77
5.3.3	Noble Platings/Coatings	51	6.5.4	Printed Board Assembly Testing	78
5.4	Solder Mask	55	6.6	Other Design for Manufacturability (DfM) Issues	79
5.4.1	Wet- and Dry-Film Solder Masks	55	6.6.1	Panel/Pallet Design	80
5.4.2	Jettable Solder Mask	55	6.6.2	In-Process/End-Product Test Coupons	80
5.4.3	Registration of Board-to-Panel Image for Solder Mask	56	6.7	Thermal Management	82
5.5	Via Protection	56	6.7.1	Conduction	82
5.5.1	Encroached Vias	56	6.7.2	Radiation	82
5.5.2	Via Tenting, Plugging and Filling	56	6.7.3	Convection	83
6	PRINTED CIRCUIT ASSEMBLY DESIGN CONSIDERATIONS	58	6.7.4	Thermal Interface Materials	83
6.1	Component Placement and Clearances	58	6.7.5	Heat Sink Attachment Methods for BGAs	84
6.1.1	Pick-and-Place Assembly	58	7	BGA ASSEMBLY	86
6.1.2	Repair/Rework Requirements	58	7.1	Surface Mount Assembly Processes	86
6.1.3	Global Placement	59	7.1.1	Solder Paste and Its Application	86
			7.1.2	Component Placement Impact	92

7.1.3	Vision Systems for BGA Placement	92	7.8.6	Nonwet Open (NWO) / Hanging Ball	139
7.1.4	Reflow Soldering and Profiling	94	7.8.7	Component Defects	139
7.1.5	Effects of Materials on Flux Activation, Component Damage and Solderability	102	7.9	Repair Processes	140
7.1.6	Clean vs. No-Clean	102	7.9.1	Rework and Repair Philosophy	140
7.1.7	Package Stand-Off	103	7.9.2	Removal of BGAs	140
7.2	Processes After Assembly	104	7.9.3	Replacement	141
7.2.1	Conformal Coatings	104	8	RELIABILITY	143
7.2.2	Use of Underfills and Adhesives	105	8.1	Reliability Factors for BGA Assemblies	144
7.2.3	Depaneling of Printed Boards and Modules ...	111	8.1.1	Cyclic Strain	144
7.3	Inspection Techniques	111	8.1.2	Fatigue	144
7.3.1	X-Ray Inspection	111	8.1.3	Creep	145
7.3.2	X-Ray Image Acquisition	112	8.1.4	Creep and Fatigue Interaction	146
7.3.3	Definition and Discussion of X-Ray System Terminology	113	8.1.5	Reliability Under Mechanical Loads	146
7.3.4	X-Ray Image Analysis	117	8.2	Damage Mechanisms and Failure of Solder Attachments	147
7.3.5	Scanning Acoustic Microscopy (SAM)	119	8.2.1	Comparison of Thermal Fatigue Crack Growth Mechanism in SnAgCu (SAC) vs. SnPb BGA Solder Joints	148
7.3.6	BGA Stand-Off Measurement	121	8.2.2	Mixed-Alloy Soldering	149
7.3.7	Optical Inspection (Endoscopy)	121	8.3	Solder Joints and Attachment Types	150
7.3.8	Destructive Analysis Methods	122	8.3.1	Global Expansion Mismatch	151
7.4	Testing and Product Verification	125	8.3.2	Local Expansion Mismatch	151
7.4.1	Electrical Testing	125	8.3.3	Internal Expansion Mismatch	151
7.4.2	Functional Test (FT) Coverage	125	8.4	Solder Attachment Failure	151
7.4.3	Burn-In Testing	125	8.4.1	Solder Attachment Failure Classification	151
7.4.4	Product Screening Tests	125	8.5	Critical Factors Impacting Reliability	156
7.5	Void Identification	125	8.5.1	Package Technology	156
7.5.1	Sources of Voids	126	8.5.2	Stand-Off Height	157
7.5.2	Void Classification	127	8.5.3	Printed Board Design Considerations	158
7.5.3	Voids in BGA Solder Joints	127	8.5.4	Reliability of Solder Attachments of Ceramic Grid Arrays (CGAs)	158
7.6	Void Measurement	128	8.5.5	Pb-Free Soldering of BGAs	159
7.6.1	X-Ray Detection and Measurement Cautions	128	8.6	Design for Reliability (DfR) Process	165
7.6.2	Impacts of Voids	128	8.7	Validation and Qualification Tests	165
7.6.3	Void Protocol Development	129	8.8	Screening Procedures	166
7.6.4	Sampling Plans for Void Evaluation	130	8.8.1	Solder Joint Defects	166
7.7	Process Control for Void Reduction	131	8.8.2	Screening Recommendations	166
7.7.1	Process Parameter Impact on Void Formation	131	8.9	Accelerated Reliability Testing	166
7.7.2	Process Control Criteria for Voids in Solder Balls	134	9	PROCESS TROUBLESHOOTING	166
7.7.3	Process Control Criteria	135	9.1	Solder Mask-Defined (SMD) BGA Conditions	166
7.8	Solder Defects	136	9.1.1	Solder-Mask-Defined (SMD) and Non- Solder-Mask-Defined (NSMD) Lands	167
7.8.1	Solder Bridging	136	9.1.2	Solder-Mask-Defined (SMD) Land on Product Printed Board	167
7.8.2	Cold Solder	136	9.1.3	Solder-Mask-Defined (SMD) BGA Failures	168
7.8.3	Opens	136			
7.8.4	Insufficient/Uneven Heating	136			
7.8.5	Head-on-Pillow (HoP)	137			

9.2	Over-Collapse BGA Solder Ball Conditions	168	Figure 3-9	Corner View (Left) and Cross-Section View (right) of a Head-on-Pillow (HoP) Solder Joint Defect	13
9.2.1	BGA Ball Shape Without Heat Slug 500- μ m Stand-Off Height	168	Figure 3-10	Cross-Section View of a Head-on-Pillow (HoP) Open Defect	13
9.2.2	BGA Ball Shape with Heat Slug 375- μ m Stand-Off Height	169	Figure 3-11	Examples of Nonwet Open (NWO) Defects in Side View and Cross-Section View	14
9.2.3	BGA Ball Shape with Heat Slug 300- μ m Stand-Off Height	169	Figure 4-1	Termination Types for Area Array Packages ..	17
9.2.4	Critical Solder Paste Conditions	169	Figure 4-2	Board-on-Chip (BOC) BGA Construction	19
9.2.5	Void Determination Through X-Ray and Cross-Section	169	Figure 4-3	Top of Molded Board-on-Chip (BOC) BGA	20
9.2.6	Voids and Uneven Solder Balls	170	Figure 4-4	Flip Chip (Bumped Die) on a BGA Substrate	20
9.2.7	Eggshell Void	170	Figure 4-5	BGA Solder Joints Using SnPb – (A) and Mixed-Metallurgy (B) (Pb-Free Alloy in a SnPb Process) With Partially Mixed SnPb in a SAC Ball	22
9.3	BGA Warpage	170	Figure 4-6	JEDEC Standard Format for Package-on-Package Components	26
9.3.1	BGA Warpage	171	Figure 4-7	Dynamic Warpage Plot with Temperature for a Flip Chip BGA Package	28
9.3.2	Solder Joint Opens Due to Interposer Warpage	171	Figure 4-8	Low-Temperature Alloys with Liquidus Temperatures Between 100 °C and 200 °C and Which Do Not Contain Pb, Cd or Au	28
9.4	Solder Joint Conditions	172	Figure 4-9	SnBi Phase Diagram	29
9.4.1	Target Solder Condition	172	Figure 4-10	Typical Microstructure of SnBi Solder Alloy ...	29
9.4.2	Solder Balls with Excessive Oxide	172	Figure 4-11	Plastic Ball Grid Array (PBGA) Package	30
9.4.3	Dewetting	173	Figure 4-12	Cross-Section of a Thermally Enhanced Ceramic Ball Grid Array (CBGA) Package	30
9.4.4	Nonwetting	173	Figure 4-13	Ceramic Ball Grid Array (CBGA) Package with Molded Polymer Encapsulation	31
9.4.5	Incomplete Joining Due to Land Contamination	174	Figure 4-14	Typical Ceramic Column Grid Array (CCGA) With Cu Ribbon Wrap	31
9.4.6	Deformed Solder Ball	174	Figure 4-15	Plastic BGA (PBGA) with Variety of Columns	32
9.4.7	Deformed Solder Ball – Dynamic Warping ...	175	Figure 4-16	Typical Solder Column with Cu Ribbon Wrap	32
9.4.8	Insufficient Solder and Flux for Proper Joint Formation	175	Figure 4-17	Section View of PbSn10 Solder Column with Electroplated Cu Covered with SnPb40 Outer Layer	32
9.4.9	Reduced Termination Contact Area	176	Figure 4-18	SnPb-Plated Microcoil (Left) and Au-Plated Microcoil (Right)	33
9.4.10	Solder Bridging	176	Figure 4-19	Au-Plated Microcoil Spring on Column Grid Array (CGA1152) Ceramic IC Package	33
9.4.11	Incomplete Solder Reflow	177	Figure 4-20	Microcoil Spring with SAC305 Fillet on Column Grid Array (CGA) Package	33
9.4.12	Missing Solder	177	Figure 4-21	Microcoil Spring (Electroplated SnPb40) Column Grid Array (CGA1152) With SnPb37 Fillet	33
9.4.13	Nonwet Open (NWO)	178	Figure 4-22	Polyimide Film-Based Lead-Bond μ BGA Package Substrate	35
9.4.14	Head-on-Pillow (HoP) Solder Joint	178	Figure 4-23	Comparison of In-Package Circuit Routing of Single- and Two-Metal Layer Tape Substrates	35
APPENDIX A	Process Control Characterization to Reduce the Occurrence of Voids	179	Figure 4-24	Single-Package Die-Stack BGA	36
APPENDIX B	Glossary of Acronyms and Abbreviations	185	Figure 4-25	Custom Eight Die (Flip Chip and Wire Bond) SiP Assembly	36
Figures					
Figure 3-1	BGA Package Manufacturing Process	4	Figure 4-26	Folded Multiple-Die BGA Package	36
Figure 3-2	Multichip Module (MCM) Type 2S-L-WB	5			
Figure 3-3	Conductor Width-to-Pitch Relationship	7			
Figure 3-4	Wire-Bonded Ball Grid Array (BGA)	7			
Figure 3-5	Flip Chip Bonded Ball Grid Array (BGA)	8			
Figure 3-6	BGA Warpage	10			
Figure 3-7	Examples of Pad Cratering	12			
Figure 3-8	Various Possible Failure Modes for a BGA Solder Joint	12			

Figure 4-27	Eight-Layer Ball Stack Package	36	Figure 6-10	Balls Anywhere Land Pattern Design for a Balls Anywhere BGA Component	65
Figure 4-28	Single-Sided Small Outline Dual In-Line Memory Module (SO-DIMM) Memory Card Assembly	37	Figure 6-11	Uniform-Grid BGA Land Pattern	65
Figure 4-29	Folded and Stacked Multiple-Die BGA	37	Figure 6-12	Quadrant BGA Pattern	66
Figure 4-30	Package-on-Package (PoP) Assembly	37	Figure 6-13	Square Array	66
Figure 4-31	BGA Connector	38	Figure 6-14	Rectangular Array	66
Figure 4-32	BGA Connector with Vacuum Cap	38	Figure 6-15	Depopulated Array	66
Figure 4-33	Pin Grid Array (PGA) Socket Pins	39	Figure 6-16	Square Array with Missing Balls	67
Figure 4-34	Pin Grid Array (PGA) Socket with and Without Pick-and-Place Cover	39	Figure 6-17	Interspersed Array	67
Figure 4-35	Land Grid Array (LGA) Contact Pin	39	Figure 6-18	Conductor Routing Strategy	68
Figure 4-36	Land Grid Array (LGA) Socket with and Without Pick-and-Place Cover	39	Figure 6-19	Conductor and Space Widths for Different Array Pitches	69
Figure 4-37	Example of Missing Balls on a BGA	43	Figure 6-20	One- and Two-Track Conductor Routing	69
Figure 4-38	Example of Voids in Eutectic Solder Balls at Incoming Inspection	44	Figure 6-21	Typical Land-to-Via (Dog Bone) Layout	69
Figure 4-39	Examples of Solder Ball and Land Surface Conditions	44	Figure 6-22	Land-to-Via (Dog Bone) Routing Options	69
Figure 4-40	Establishing BGA Coplanarity Requirement ...	45	Figure 6-23	BGA Land-to-Via (Dog Bone) Land Pattern Preferred Direction for Conductor Routing	70
Figure 4-41	Ball Contact Positional Tolerance	45	Figure 6-24	Preferred Screw and Support Placement	70
Figure 5-1	Possible HDI Build-Ups Using Laser-Via Generation	47	Figure 6-25	Connector Screw Support Placement	70
Figure 5-2	Possible HDI Build-Ups Using Etching and Mechanical Processes	47	Figure 6-26	Cross-Section of 0.75-mm Ball with Via-in-Pad Structure	71
Figure 5-3	Expansion Rate Above T_g	48	Figure 6-27	Cross-Section Illustration of Via-in-Pad Design Showing Via Cap and Solder Ball	71
Figure 5-4	Hot Air Solder Level (HASL) Surface Topology Comparison	51	Figure 6-28	Via-in-Pad Process Descriptions (BGAs on Top)	72
Figure 5-5	Illustration of Electroless Ni/Immersion Au (ENIG) Structure	52	Figure 6-29	Microvia Example (Cross-Section)	72
Figure 5-6	Black Pad Fracture Showing a Crack Between Ni and Ni-Sn Intermetallic Layer	52	Figure 6-30	Void in Microvia	72
Figure 5-7	Typical Mud Crack Appearance of Black Pad Surface	52	Figure 6-31	Ground or Power BGA Connection	73
Figure 5-8	Large Region of Severe Black Pad with Corrosion Spikes Protruding into Ni-Rich Layer Through P-Rich Layer Underneath Immersion Au Surface	53	Figure 6-32	Example of Ball Deformation and Dewetting of Top-Side Reflow Joints	73
Figure 5-9	Au Embrittlement	53	Figure 6-33	Top-Side Mixed-Component Board Assembly Wave Soldering Temperature Profile	74
Figure 5-10	Illustration of Electroless Ni/Electroless Pd/ Immersion Au (ENEPIG) Structure	53	Figure 6-34	Heat Pathways to BGA Solder Joint During Wave Soldering	74
Figure 5-11	Graphic Depiction of Directed Immersion Au (DIG)	54	Figure 6-35	Methods of Avoiding Top-Side BGA Solder Joint Reflow During Wave Soldering	75
Figure 5-12	Examples of Microvoids	55	Figure 6-36	Example of a Side Contact Made with Tweezers-Type Contact	76
Figure 5-13	Via Plugging Methods	57	Figure 6-37	Pogo-Pin-Type Electrical Contact Impressions on the Bottom of a Solder Ball	76
Figure 6-1	BGA Alignment Marks	59	Figure 6-38	Area Array Land Pattern Testing	77
Figure 6-2	Solder Lands for BGA Components	61	Figure 6-39	Board Panelization	81
Figure 6-3	Metal-Defined Land Attachment Profile	62	Figure 6-40	Comb Pattern Examples	81
Figure 6-4	Solder Mask Stress Concentration	62	Figure 6-41	Heat Sink Attached to a BGA Using Adhesive	84
Figure 6-5	Solder Joint Geometry Contrast	62	Figure 6-42	Heat Sink Attached to a BGA Using a Clip	85
Figure 6-6	Good and Bad Solder Mask Designs	63	Figure 6-43	Heat Sink Attached to a BGA Using a Clip That Hooks into Printed Board Holes	85
Figure 6-7	Examples of Metal-Defined Lands	63	Figure 6-44	Heat Sink Attached to a BGA Using a Clip That Hooks onto a Stake Soldered to the Printed Board	85
Figure 6-8	Bad Solder Mask Registration	64			
Figure 6-9	Good Solder Mask Registration	64			

Figure 6-45	Heat Sink Attached to a BGA by Wave Soldering Its Pins in Through-Holes	86	Figure 7-25	Flow of Underfill Between Two Parallel Surfaces	107
Figure 7-1	Stencil Aperture Labels for Aspect Ratio, Area Ratio Calculations (Solder Stencil Feature Dimensions)	88	Figure 7-26	Examples of Air Bubbles in Underfill	108
Figure 7-2	BGA Balls After Paste Dipping	90	Figure 7-27	Example of Partial Underfill	108
Figure 7-3	Cavity Board and 3D Stencil	90	Figure 7-28	Microsection of BGA With Corner-Applied Adhesive	109
Figure 7-4	3D Stencil with Two Cavity Pockets	90	Figure 7-29	Top View of BGA With Corner-Applied Adhesive	109
Figure 7-5	Slit-Metal Squeegee	91	Figure 7-30	Critical Dimension for Application of Corner-Applied Adhesive Prior to Reflow	109
Figure 7-6	Cavity Keep-Out Zone	91	Figure 7-31	Typical Corner-Applied Adhesive Failure Mode	109
Figure 7-7	High-Pb and Eutectic Solder Ball and Joint Comparison	91	Figure 7-32	Examples of Four Strategies for Polymeric Reinforcement of BGA Solder Joints	110
Figure 7-8	Balls Anywhere Image Captures for Offline Teaching	93	Figure 7-33	Solder Joint Encapsulation Material (SJEM)	110
Figure 7-9	Examples of Peak Reflow Temperatures at Various Locations at or Near a BGA	94	Figure 7-34	Fundamentals of X-Ray Technology	112
Figure 7-10	Schematic of Reflow Profile for SnPb Assemblies	96	Figure 7-35	X-Ray Example of Head-on-Pillow (HoP) Solder Joints	112
Figure 7-11	Schematic of Reflow Profile for Pb-Free Assemblies	96	Figure 7-36	Three X-Ray Examples of Voiding in Solder Ball Contacts	112
Figure 7-12	Locations of Thermocouples on a Printed Board Assembly with Large and Small Components	97	Figure 7-37	Two Examples of Manual X-Ray System Image Quality	113
Figure 7-13	Recommended Locations of Thermocouples on a BGA	97	Figure 7-38	Example of X-Ray Pin Cushion Distortion and Voltage Blooming	113
Figure 7-14	Proper Thermocouple Location on a BGA Connector	97	Figure 7-39	Transmission Image (2D)	114
Figure 7-15	Comparison of Assembly Processes for a SAC BGA Component Using SAC Solder Paste (Top), BiSn Baseline or Ductile Metallurgy Solder Paste (Middle) and Resin-Containing Joint-Reinforcement Paste (JRP) (Bottom)	98	Figure 7-40	Tomosynthesis Image (3D)	114
Figure 7-16	Comparison of the Reflow Temperature Profiles for SAC, BiSnAg and Low-Temperature JRP Solder Pastes	99	Figure 7-41	Laminography 3D Automated X-Ray Inspection (AXI) Section Image	114
Figure 7-17	Mixed-Alloy BGA Solder Joint Formed with SAC Ball Soldered with Ductile Metallurgy BiSn Solder Paste	100	Figure 7-42	High-Quality 2D Transmission X-Ray Image Example	115
Figure 7-18	Mixed-Alloy BGA Solder Joint Formed with SAC Ball Soldered with BiSn Joint-Reinforcement Paste (JRP)	100	Figure 7-43	Oblique Viewing Printed Board Tilt	115
Figure 7-19	Effect of Paste Volume on the Area of Bi-Mixed Regions with Mixed-Alloy SAC-BiSn BGA Solder Joints	101	Figure 7-44	Oblique Viewing Detector Tilt	115
Figure 7-20	Solder Joint Shapes and Microstructures for Three Combinations of Solder Balls and Solder Pastes for a Paddle-Contact BGA Socket	101	Figure 7-45	Top-Down View of FBGA Solder Joints	116
Figure 7-21	Effect of Solder Mask Relief Around BGA Lands of a Printed Board	104	Figure 7-46	Oblique View of FBGA Solder Joints	116
Figure 7-22	Impact of Improper Usage of Conformal Coating	105	Figure 7-47	Large Board Computed Tomography (CT) / Partial CT Principle	116
Figure 7-23	Map of Underfill Adhesive Usage for BGAs and Other Packages	106	Figure 7-48	Large-Board Computed Tomography (CT) Scan (Left) and 3D Rendering (Right) Showing Head-on-Pillow (HoP)	117
Figure 7-24	BGA Package with Incomplete Underfill Coverage	107	Figure 7-49	Large-Board Computed Tomography (CT) ...	117
			Figure 7-50	Tomosynthesis	117
			Figure 7-51	Scanned Beam X-Ray Laminography	118
			Figure 7-52	Voiding Creation Dynamics Within a QFN Device Observed Using Heated Stage	119
			Figure 7-53	Typical Acoustic Microscopy Configuration ..	120
			Figure 7-54	C-Scan Image (left) and T-Scan Image (right) of the Same BGA	120
			Figure 7-55	Endoscope Example 1	121
			Figure 7-56	Endoscope Example 2	121
			Figure 7-57	Endoscope Example 3	121
			Figure 7-58	Engineering Crack Evaluation Technique	122
			Figure 7-59	Solder Balls Cross-Sectioned Through Voids in the Solder Balls	122

Figure 7-60	Cross-Section of a Crack Initiation Near the Ball/Pad Interface	123	Figure 8-5	Incomplete Solder Joint Formation for 1 % Ag Ball Alloy Assembled at Low End of Typical Process Window	150
Figure 7-61	Dye and Pull (Pry) Showing No Dye Indications on the BGA Pad or Printed Board Surfaces	123	Figure 8-6	Solder Joint Failure Due to Silicon and Printed Board Coefficient of Thermal Expansion (CTE) Mismatch	151
Figure 7-62	Dye and Pull (Pry) Showing Dye Indications on Both the Printed Board and BGA Pads	124	Figure 8-7	Cold Solder Joint with Grainy Appearance ..	152
Figure 7-63	Dye and Pull (Pry) Showing Laminate Fractures (Pad Cratering) With Dye Indications on BGA Side and Printed Board Side	124	Figure 8-8	Land Contamination (Solder Mask Residue)	152
Figure 7-64	Small Voids Clustered in Mass at the Ball-to-Land Interface	126	Figure 8-9	Solder Ball Drop	152
Figure 7-65	Typical Size and Location of Various Types of Voids in a BGA Solder Joint	127	Figure 8-10	Missing Solder Ball	153
Figure 7-66	X-Ray Image of Solder Balls with Voids	128	Figure 8-11	Dynamic Warpage of Flip Chip BGAs and Printed Boards	153
Figure 7-67	Comparison Between Standard Reflow Soldering (Top) and Vacuum-Assisted Reflow Soldering (Bottom) for BGA Solder Joints	133	Figure 8-12	Solder Joint Defects Caused by Severely Warped BGA and Printed Board After Reflow	154
Figure 7-68	Vacuum-Assisted Convection Reflow Oven	133	Figure 8-13	Examples of Acceptable Convex Solder Joints	154
Figure 7-69	Vacuum-Assisted Vapor Phase Reflow Oven	134	Figure 8-14	Example of an Acceptable Columnar Solder Joint	155
Figure 7-70	Time vs. Pressure Plot Showing the Difference Between Vacuum-Assisted and High-Pressure Soldering Processes	134	Figure 8-15	Two Examples of Pad Cratering (Located at Corner of BGA)	155
Figure 7-71	Example of Voided Area at Land and Printed Board Interface	135	Figure 8-16	Pad Crater Under 1-mm-Pitch Pb-Free Solder Ball	155
Figure 7-72	X-Ray Image Showing Uneven Heating	136	Figure 8-17	Cross-Sections Illustrating Insufficient Melting of Solder Joints During Reflow	156
Figure 7-73	X-Ray Image at 45° Showing Insufficient Heating in One Corner of the BGA	136	Figure 8-18	Solder Mask Influence	158
Figure 7-74	Example of Head-on-Pillow (HoP) Showing Ball and Solder Paste That Have Not Coalesced	137	Figure 8-19	Reliability Test Failure Due to Very Large Void	158
Figure 7-75	Head-on-Pillow (HoP) Occurrence Process Sequence	137	Figure 8-20	Endoscope Photo of SnAgCu (SAC) BGA Solder Ball	161
Figure 7-76	Head-on-Pillow (HoP) Due to High Package Warpage	138	Figure 8-21	Comparison of Reflow Soldering Profiles for SnPb, Backward-Compatibility and Pb-Free Printed Board Assemblies	162
Figure 7-77	Example of Liquidus Time Delay (LTD)	138	Figure 8-22	Micrographs of a Cross-Section of a BGA SAC Solder Ball Assembled onto a Printed Board with SnPb Solder Paste Using Standard SnPb Reflow Soldering Profile	162
Figure 7-78	Solder Particles on a Printed Board Noncoalesced After Reflow	138	Figure 8-23	Micrograph of a Cross-Section of a BGA SAC Solder Ball Assembled onto a Printed Board with SnPb Solder Paste Using Backward-Compatibility Reflow Soldering Profile	163
Figure 7-79	Examples of Hanging Ball Defects	139	Figure 8-24	Mixed-Metallurgy (SAC/SnPb) BGA Solder Joint Alternatives	164
Figure 7-80	X-Ray Image of Popcorning	139	Figure 9-1	Cracks Caused by Solder-Mask-Defined (SMD) Land	167
Figure 7-81	X-Ray Image Showing Warpage in a BGA ..	140	Figure 9-2	Solder Mask Encroaching Too Far on Land	167
Figure 7-82	BGA/Assembly Shielding Examples	141	Figure 9-3	Solder Mask-Defined (SMD) BGA Solder Joint Failure	168
Figure 8-1	Example of Solder Joint Crack Due to Thermomechanical Fatigue	148	Figure 9-4	BGA Ball Shape Without Heat Slug 500- μ m Stand-Off Height	168
Figure 8-2	BGAs Following Thermal Cycling Showing Coarsening with a Fatigue Crack (A) and Coarsening (B)	148	Figure 9-5	BGA Ball Shape with Heat Slug 375- μ m Stand-Off Height	169
Figure 8-3	Thermal Fatigue Crack Propagation in Eutectic SnPb Solder Joints in a Ceramic Ball Grid Array (CBGA) Module	149	Figure 9-6	BGA Ball Shape with Heat Slug 300- μ m Stand-Off Height	169
Figure 8-4	Thermal Fatigue Crack Propagation in SnAg3.8Cu0.7 Joints in a Ceramic Ball Grid Array (CBGA) Module	149			

Figure 9-7	Uneven and Missing Solder Balls	170	Table 4-11	Typical Properties of Common Dielectric Materials for BGA Package Substrates	42
Figure 9-8	Eggshell Void	170	Table 4-12	Controlled Coplanarity Per Ball Size	45
Figure 9-9	Convex (Frowning) BGA With Bridging at Corners	171	Table 4-13	Moisture Classification Level and Floor Life	46
Figure 9-10	Solder Joint Opens Due to Interposer Warpage	171	Table 5-1	Key Attributes for Various Printed Board Surface Finishes	50
Figure 9-11	Target Solder Condition	172	Table 5-2	Evaluation Via Filling/Encroachment Based on Surface Finish Process	56
Figure 9-12	Solder Balls with Excessive Oxide	172	Table 5-3	Via Fill Options	58
Figure 9-13	Dewetting of Solder at Interface	173	Table 6-1	Number of Conductors Between Solder Lands – 1.27-mm-Pitch BGA (0.75-mm Ball Diameter)	60
Figure 9-14	Nonwetting	173	Table 6-2	Number of Conductors Between Solder Lands – 1-mm-Pitch BGA (0.60-mm Ball Diameter)	60
Figure 9-15	Incomplete Joining Due to Land Contamination	174	Table 6-3	Number of Conductors Between Solder Lands – 0.80-mm-Pitch BGA (0.50-mm Ball Diameter)	60
Figure 9-16	Solder Ball Deformation	174	Table 6-4	Number of Conductors Between Solder Lands – 0.65-mm-Pitch BGA (0.40-mm Ball Diameter)	60
Figure 9-17	Column-Shaped Ball Deformation	175	Table 6-5	Number of Conductors Between Solder Lands – 0.50-mm-Pitch BGA (0.30-mm Ball Diameter)	61
Figure 9-18	Suspended Solder Ball	175	Table 6-6	Maximum Solder Land to Pitch Relationship (mm)	61
Figure 9-19	Extended and Proper Solder Connections on the Same BGA	176	Table 6-7	Escape Strategies for Full Arrays	68
Figure 9-20	Solder Bridging	176	Table 6-8	Conductor and Space Width for Different Array Pitches	68
Figure 9-21	Incomplete Solder Reflow	177	Table 6-9	Effects of Material Type on Conduction	82
Figure 9-22	Missing Solder Paste Deposit	177	Table 6-10	Emissivity Ratings for Certain Materials	83
Figure 9-23	Nonwet Open (NWO)	178	Table 7-1	Solder Ball Size Distribution by Type and Mesh	87
Figure 9-24	Head-on-Pillow (HoP)	178	Table 7-2	Recommendations for Solder Powder Type for Different Pitches to Achieve Good Solder Paste Release (S/P Ratio > 4.2)	87
Figure A-1	Typical Flow Diagram for Void Assessment	179	Table 7-3	Stencil Thicknesses Per BGA Pitch	87
Figure A-2	Voids in BGAs With Crack Started at Corner Lead	183	Table 7-4	Pros and Cons of Common Stencil Technologies and Options	89
Figure A-3	Void Diameter Related to Land Size	184	Table 7-5	Fine-Pitch BGA (FBGA) Printing Options	90
Tables			Table 7-6	Example of Solder Paste Volume Requirements for Ceramic Array Packages	92
Table 3-1	Multichip Module (MCM) Definitions	5	Table 7-7	Profile Comparison Between SnPb and SAC Alloys	95
Table 3-2	Number of Conductors vs. Array Size on Two Layers of Circuitry	6	Table 7-8	Inspection Usage Application Recommendations	111
Table 3-3	List of IPC Standards Related to Pad Cratering	13	Table 7-9	Field of View for Inspection	118
Table 4-1	JEDEC Standard JEP95-1/5 Allowable Ball Diameter Variations for FBGA	23	Table 7-10	Void Classification	127
Table 4-2	Ball Diameter Sizes for Plastic BGAs (PBGAs)	24	Table 7-11	Examples of Suggested Void Protocols	129
Table 4-3	Ball Diameter Sizes for Die-Size BGAs (DSBGAs)	24	Table 7-12	Ball-to-Void Size Image – Comparisons for Various Ball Diameters	130
Table 4-4	Land Pattern Design	24	Table 7-13	Repair Process Temperature Profiles for SnPb Assembly	143
Table 4-5	Land-to-Ball Calculations for BGA Packages (mm)	25	Table 7-14	Repair Process Temperature Profiles for Pb-Free Assemblies	143
Table 4-6	Examples of JEDEC-Registered BGA Outlines	26			
Table 4-7	Pb-Free Alloy Variations	27			
Table 4-8	Column Grid Array (CGA) Land Size Approximation	34			
Table 4-9	Column Grid Array (CGA) Alloy and Construction Styles	34			
Table 4-10	IPC-4101 FR-4 Property Summaries – Illustrations of Specification Sheets of Materials Projected to Better Withstand Pb-free Assembly	41			

Table 8-1	Typical Stand-Off Heights for BGAs	157
Table 8-2	Melting Points, Advantages and Disadvantages of Common Solder Alloys	159
Table 8-3	Types of Pb-free Assemblies	161
Table A-1	Corrective Action Indicator for Lands Used With 1-mm, 1.27-mm and 1.5-mm Pitch	181
Table A-2	Corrective Action Indicator for Lands Used With 0.5-mm, 0.65-mm or 0.8-mm Pitch	182
Table A-3	Corrective Action Indicator for Microvia-in-Pad Lands Used With 0.3-mm, 0.4-mm or 0.5-mm Pitch	183

Design and Assembly Process Implementation for Ball Grid Arrays (BGAs)

1 SCOPE

This standard describes design and assembly implementation for ball grid array (BGA) and fine-pitch BGA (FBGA) technology, focusing on inspection, repair and reliability issues associated with design and assembly of printed boards using these packages.

1.1 Purpose The purpose of this standard is to provide useful and practical information to those who use or are considering using BGAs. The target audiences for this document are managers, designers and process engineers who are responsible for design, assembly, inspection and repair processes of printed boards and printed board assemblies.

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

1.1.2 Interpretation of “Shall” The imperative form of the verb “**shall**” is used throughout this standard whenever a requirement is intended to express a provision that is mandatory. Deviation from a “**shall**” requirement may be considered if sufficient data are supplied to justify the exception. To assist the reader, the word “**shall**” is presented in bold characters.

The words “should” and “may” are used whenever it is necessary to express nonmandatory provisions. “Will” is used to express a declaration of purpose.

1.1.3 Presentation All dimensions and tolerances in this specification are expressed in hard SI (metric) units and bracketed soft imperial [inch] units. Users of this specification are expected to use metric dimensions. All dimensions ≥ 1 mm [0.0394 in] will be expressed in millimeters and inches. All dimensions < 1 mm [0.0394 in] will be expressed in micrometers and microinches.

1.1.4 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).

1.1.5 Abbreviations and Acronyms Periodic table elements are abbreviated in this standard. See Appendix B for full spellings of abbreviations (including elements) and acronyms used in this standard.

2 APPLICABLE DOCUMENTS

2.1 IPC¹

IPC-T-50 Terms and Definitions for Printed Boards and Printed Board Assemblies

IPC-D-279 Design Guidelines for Reliable Surface Mount Technology Printed Board Assemblies

IPC-A-610 Acceptability of Electronic Assemblies

IPC-TM-650 Test Methods Manual²

2.4.42 Torsional Strength of Chip Adhesives

IPC-SM-785 Guidelines for Accelerated Reliability Testing of Surface Mount Attachments

IPC-SM-817 General Requirements for Dielectric Surface Mounting Adhesives

IPC-CC-830 Qualification and Performance of Electrical Insulating Compound for Printed Wiring Assemblies

IPC-HDBK-830 Guidelines for Design, Selection and Application of Conformal Coatings

IPC-1401 Corporate Social Responsibility and Sustainability Protocols for Electronic Manufacturing Industry

IPC-1601 Printed Board Handling and Storage Guidelines

IPC-1751 Generic Requirements for Declaration Process Management

1. www.ipc.org

2. Current and revised IPC Test Methods are available on the IPC Web site (www.ipc.org/test-methods.aspx)