

JEDEC
SOLID STATE PRODUCT
OUTLINES

THIS *REGISTERED OUTLINE* HAS BEEN PREPARED BY THE JEDEC JC-11 COMMITTEE AND REFLECTS A PRODUCT WITH ANTICIPATED USAGE IN THE ELECTRONICS INDUSTRY; CHANGES ARE LIKELY TO OCCUR.

TITLE
RECTANGULAR CERAMIC BALL
GRID ARRAY FAMILY
1.00, 1.27, AND 1.50 MM PITCH

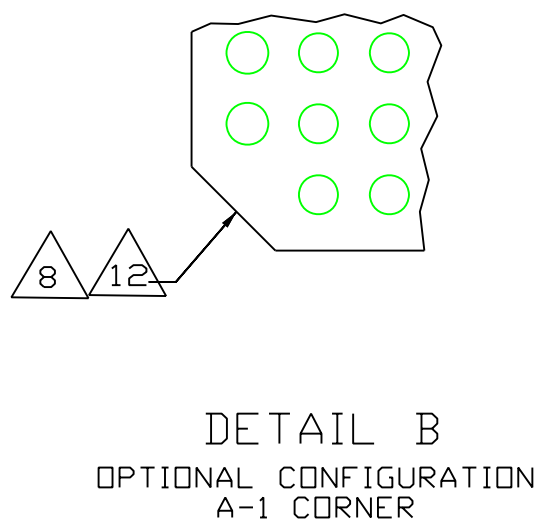
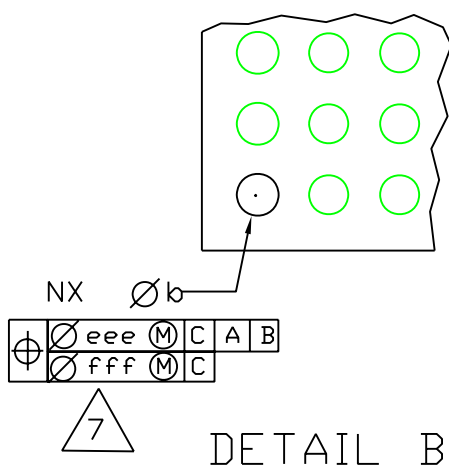
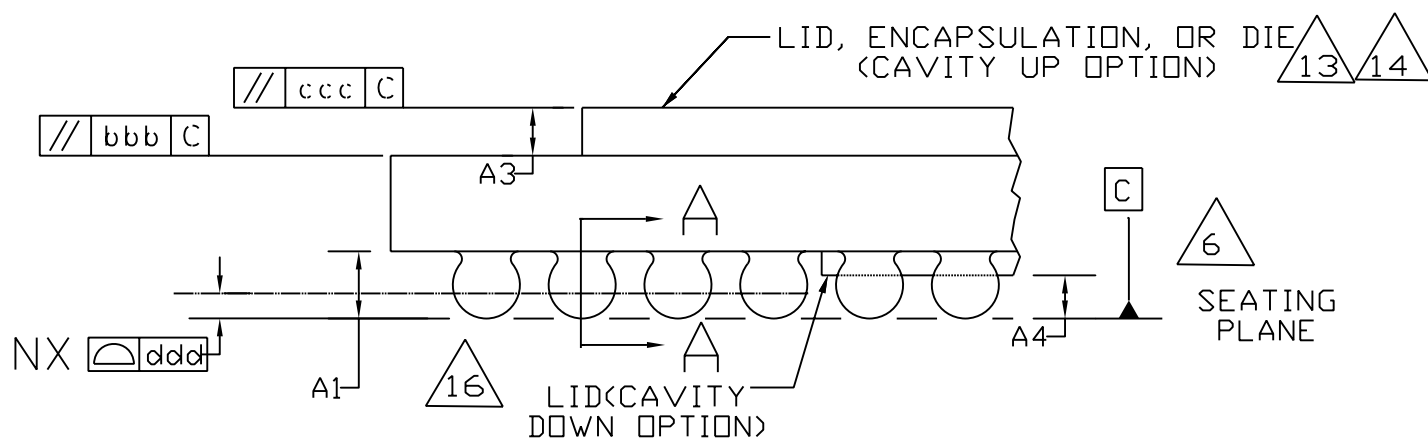
JESD-30 DESIGNATOR
CBGA

ISSUE
C

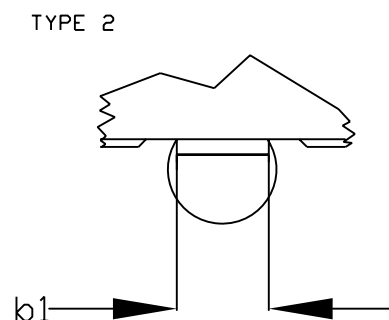
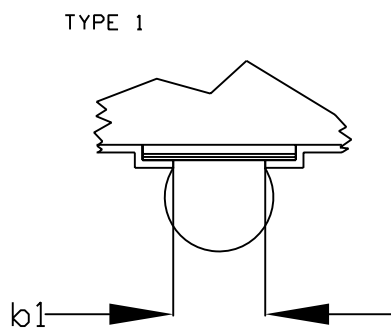
DATE
April
2005

M0-157

SHEET
1 OF 6



SECTION A-A



SUMMARY TABLE							
D	E	e =1.50 mm		e =1.27 mm		e =1.00 mm	
		MD X ME	N	MD X ME	N	MD X ME	N
21.00	18.50	14 X 12	168	16 X 14	224	20 X 17	340
25.00	21.00	16 X 14	224	19 X 16	304	24 X 20	480
32.50	25.00	21 X 16	336	25 X 19	475	31 X 24	744
NOTES		15	15	15	15	15	15
		1,2					

COMMON DIMENSION TABLE										
SYMBOL	e =1.50 mm			e =1.27 mm			e =1.00 mm			NOTE
	MIN	NOM	MAX	MIN	NOM	MAX	MIN	NOM	MAX	
A	--	--	6.00	--	--	6.00	--	--	5.80	5
A2	0.30	--	5.00	0.30	--	5.00	0.30	--	5.00	

TOLERANCES OF FORM AND POSITION				
aaa	0.20	0.20	0.20	11
bbb	0.25	0.25	0.25	
ccc	0.35	0.35	0.35	
ddd	0.15	0.15	0.15	
eee	0.30	0.30	0.25	
fff	0.15	0.15	0.10	
NOTES	1,2			
ISSUE	B			
REF.	10-396			

SOLDER BALL DIMENSION TABLE										
VARIATION AXX (for bga balls that do not collapse)										
SYMBOL	e =1.50 mm			e =1.27 mm			e =1.00 mm			NOTE
	MIN	NOM	MAX	MIN	NOM	MAX	MIN	NOM	MAX	
A1	0.80	0.90	1.00	0.80	0.90	1.00	0.70	0.80	0.90	
b	0.82	0.89	0.93	0.82	0.89	0.93	0.70	0.80	0.85	7
b1	0.81	0.86	0.91	0.81	0.86	0.91	0.75	0.80	0.85	
NOTES	1,2									
ISSUE	C									
REF.	10-433									

VARIATION BXX (for BGA balls that do collapse)										
SYMBOL	e =1.50 mm			e =1.27 mm			e =1.00 mm			NOTE
	MIN	NOM	MAX	MIN	NOM	MAX	MIN	NOM	MAX	
A1	0.50	0.60	0.70	0.50	0.60	0.70	0.40	0.50	0.60	
b	0.60	0.75	0.90	0.60	0.75	0.90	0.50	0.60	0.70	7
b1							0.65	0.70	0.75	
NOTES	1,2									
ISSUE	C									
REF.	10-433									

VARIATIONS TABLE										
D	E	e =1.50 mm								
		MD	ME	N	D1	E1	VARIATION		REF.	ISSUE
21.00	18.50	14	12	168	19.50	16.50	AAA	BAA	10-337	A
25.00	21.00	16	14	224	22.50	19.50	AAB	BAB	10-337	A
32.50	25.00	21	16	336	30.00	22.50	AAC	BAC	10-337	A
NOTES		15	15	10,15			REFER TO SOLDER BALL DIMENSION TABLE			
		1, 2								

VARIATIONS TABLE										
D	E	e =1.27 mm								
		MD	ME	N	D1	E1	VARIATION		REF.	ISSUE
21.00	18.50	16	14	224	19.05	16.51	ABA	BBA	10-337	A
25.00	21.00	19	16	304	22.86	19.05	ABB	BBB	10-337	A
32.50	25.00	25	19	475	30.48	22.86	ABC	BBC	10-337	A
NOTES		15	15	10,15			REFER TO SOLDER BALL DIMENSION TABLE			
		1, 2								

VARIATIONS TABLE										
D	E	e =1.00 mm								
		MD	ME	N	D1	E1	VARIATION		REF.	ISSUE
21.00	18.50	20	17	340	19.00	16.00	ACA	BCA	10-337	A
25.00	21.00	24	20	480	23.00	19.00	ACB	BCB	10-337	A
32.50	25.00	31	24	744	30.00	23.00	ACC	BCC	10-337	A
NOTES		15	15	10,15			REFER TO SOLDER BALL DIMENSION TABLE			
		1, 2								

NOTES

1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5M-1994.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. TERMINAL POSITION (BALL) DESIGNATION PER JEP95 Sec 4.3, SPP-010.
4. 16 X 14 PERIPHERAL MATRIX IS SHOWN FOR ILLUSTRATION ONLY.
5. TOTAL PROFILE HEIGHT INCLUDES STANDOFF HEIGHT A1, PACKAGE BODY THICKNESS AND LID OR ENCAPSULATION HEIGHT, BUT DOES NOT INCLUDE ATTACHED FEATURES, E.G., EXTERNAL HEATSINK OR CHIP CAPACITORS. AN INTERNAL HEATSLUG IS NOT CONSIDERED AN ATTACHED FEATURE.
6. PRIMARY DATUM C AND SEATING PLANE ARE DEFINED BY THE CROWNS OF THE SOLDER BALLS.
7. DIMENSION b IS MEASURED AT THE MAXIMUM DIAMETER OF THE TERMINAL (BALL), IN A PLANE PARALLEL TO PRIMARY DATUM C.
8. THE TERMINAL A1 CORNER MUST BE IDENTIFIED ON THE TOP SURFACE OF THE PACKAGE BY USING A CORNER CHAMFER, INK OR METALLIZED MARKINGS, INDENTATION, OR OTHER FEATURE OF PACKAGE BODY, OR INTEGRAL HEATSLUG. A DISTINGUISHING FEATURE IS ALLOWABLE ON THE BOTTOM SURFACE OF THE PACKAGE TO IDENTIFY THE TERMINAL A1 CORNER.
9. S IS MEASURED WITH RESPECT TO DATUMS A AND B AND DEFINES THE POSITION OF THE CENTER TERMINAL (BALL) IN THE OUTER ROW OR COLUMN WHEN THERE IS AN ODD NUMBER OF TERMINALS IN THE OUTER ROW, $S = 0.00 \text{ mm}$. WHEN THERE IS AN EVEN NUMBER OF TERMINALS IN THE OUTER ROW, $S = e/2$.
10. THE TERMINAL (BALL) ARRAY MAY BE DEPOPULATED BY ANY METHOD, PROVIDED THERE IS NO PATTERN SHIFTING FROM ITS ORIGINAL CENTER. DEPOPULATION IS THE OMISSION OF TERMINALS (BALLS) FROM A FULL MATRIX.
11. BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.
12. EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.
13. FOR GLOB-TOP CONFIGURATIONS, THE PARALLELISM SPECIFICATION WILL NOT APPLY TO THE FILLET OR SLOPED REGION OF THE ENCAPSULANT.
14. LID MAY EXTEND TO PERIPHERY OF PACKAGE AND MAY CONSIST OF MOLDING COMPOUND, CERAMIC, METAL OR OTHER MATERIAL. LID MAY EXTEND ABOVE/BELOW PACKAGE BODY, E.G., COMPLETE OVERBODY MOLD.

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE RECTANGULAR CERAMIC BALL GRID ARRAY FAMILY 1.00, 1.27, AND 1.50 mm PITCH	ISSUE C	DATE April 2005	M0-157	SHEET 5 OF 6
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NOTES (CONTINUED)

- 15 "MD" REPRESENTS THE MAXIMUM NUMBER OF SOLDER BALL COLUMNS PERPENDICULAR TO THE D DIMENSION. "ME" REPRESENTS THE MAXIMUM NUMBER OF SOLDER BALL ROWS PERPENDICULAR TO THE E DIMENSION. "N" REPRESENTS THE MAXIMUM BALL POPULATION FOR A VARIATION.

APPLICATION NOTES

- 16 FOR CAVITY DOWN CONFIGURATIONS, A MINIMUM DISTANCE (AFTER COMPONENT MOUNTING) OF 0.1 mm FROM THE LID SURFACE TO CIRCUIT BOARD SURFACE IS RECOMMENDED FOR CIRCUIT BOARD CLEANING.
- 17 THE COMPONENT MANUFACTURER SHOULD INSURE BALL GEOMETRIES AND METALLURGY ARE COORDINATED FOR PROPER INTERCONNECT COMPLIANCY.

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