

JEDEC SOLID STATE
PRODUCT OUTLINES
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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 THICK THERMALLY ENHANCED FINE
PITCH SQUARE BALL GRID ARRAY
FAMILY

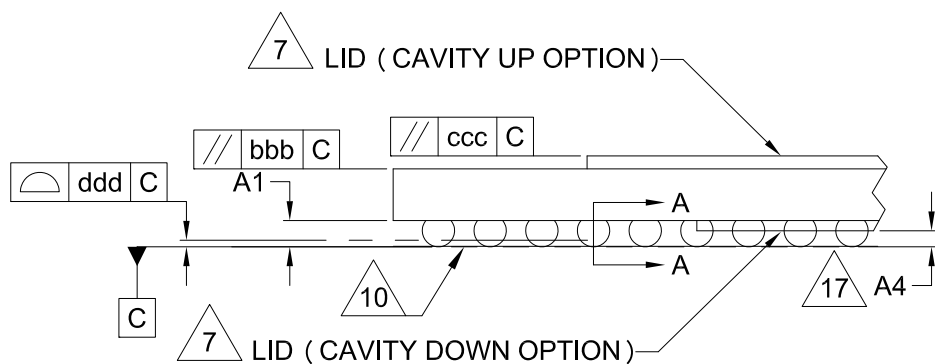
PACKAGE DESIGNATOR
BF-XBGA

ISSUE
A

DATE
APRIL
2012

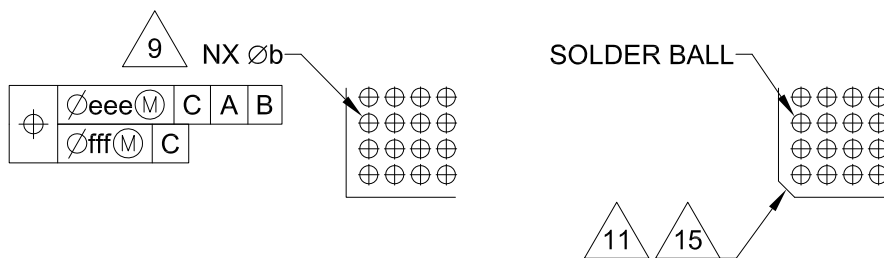
MO-308

SHEET
1 OF 6



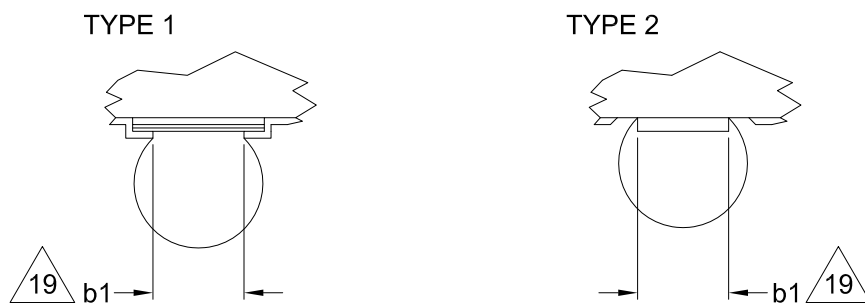
DETAIL "B"

ROTATED 90 DEGREES CLOCKWISE



DETAIL "A"

CORNER A1
OPTIONAL CONFIGURATION



SECTION A - A

TABLE1: COMMON DIMENSIONS

DIMENSION	$e = 0.80$		
	MIN	NOM	MAX
A	-	-	5.50
A1	0.27	-	-
A2	0.25	-	3.00
A3	-	-	3.40
A4	0.10	-	-
b	0.45	0.50	0.55
b1 TYPE 1	0.35	-	-
b1 TYPE 2	0.35	-	-
NOTES:	1, 2, 4, 7, 8, 9, 10		
REF	11-853		
ISSUE	A		

TABLE 2: TOLERANCES OF FORM AND POSITION

DIMENSION	$e = 0.80$
aaa	0.20
bbb	0.25
ccc	0.35
ddd	0.20
eee	0.20
fff	0.08
NOTES:	1, 2, 4, 7, 9, 10
REF	11-853
ISSUE	A

TABLE 3: VARIATIONS - 0.80 PITCH

D / E	[e] = 0.80											
	M1	N1	S1	VARIATION	REF	ISSUE	M2	N2	S2	VARIATION	REF	ISSUE
15.00	18	324	0.40	AAE-1	11-853	A	17	289	0.00	AAE-2	11-853	A
17.00	20	400	0.40	AAF-1	11-853	A	19	361	0.00	AAF-2	11-853	A
19.00	23	529	0.00	AAG-1	11-853	A	22	484	0.40	AAG-2	11-853	A
21.00	25	625	0.00	AAH-1	11-853	A	24	576	0.40	AAH-2	11-853	A
23.00	28	784	0.40	AAJ-1	11-853	A	27	729	0.00	AAJ-2	11-853	A
25.00	30	900	0.40	AAK-1	11-853	A	29	841	0.00	AAK-2	11-853	A
27.00	33	1089	0.00	AAL-1	11-853	A	32	1024	0.40	AAL-2	11-853	A
29.00	35	1225	0.00	AAM-1	11-853	A	34	1156	0.40	AAM-2	11-853	A
31.00	38	1444	0.40	AAN-1	11-853	A	37	1369	0.00	AAN-2	11-853	A
33.00	40	1600	0.40	AAP-1	11-853	A	39	1521	0.00	AAP-2	11-853	A
35.00	43	1849	0.00	AAR-1	11-853	A	42	1764	0.40	AAR-2	11-853	A
37.50	46	2116	0.40	AAT-1	11-853	A	45	2025	0.00	AAT-2	11-853	A
40.00	49	2401	0.00	AAU-1	11-853	A	48	2304	0.40	AAU-2	11-853	A
42.50	52	2704	0.40	AAV-1	11-853	A	51	2601	0.00	AAV-2	11-853	A
45.00	55	3025	0.00	AAW-1	11-853	A	54	2916	0.40	AAW-2	11-853	A
47.50	58	3364	0.40	AAY-1	11-853	A	57	3249	0.00	AAY-2	11-853	A
50.00	61	3721	0.00	ABA-1	11-853	A	60	3600	0.40	ABA-2	11-853	A
52.50	65	4225	0.00	ABF-1	11-853	A	64	4096	0.40	ABF-2	11-853	A
55.00	68	4624	0.40	ABG-1	11-853	A	67	4489	0.00	ABG-2	11-853	A
NOTES:	3	5,13	12				3	5,13	12			
	1, 2, 4						1, 2, 4					

NOTES:

1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5-2009.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
- 3 BALL DESIGNATION IS PER JEP95, SECTION 3, SPP-010.
4. e REPRESENTS THE SOLDER BALL GRID PITCH.
5. N1 AND N2 REPRESENT THE MAXIMUM NUMBER OF SOLDER BALLS FOR MATRIX SIZE M1 AND M2.
- 6 18 X 18 MATRIX PATTERN IS SHOWN FOR ILLUSTRATION ONLY.
- 7 LID MAY EXTEND TO PERIPHERY OF PACKAGE AND MAY CONSIST OF MOLDING COMPOUND, METAL, CERAMIC OR OTHER MATERIAL. LID MAY EXTEND ABOVE/BELOW PACKAGE BODY SURFACE OR MAY BE INCORPORATED WITHIN PACKAGE BODY, e.g., COMPLETE OVER BODY MOLD.
- 8 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.
- 9 DIMENSION b IS MEASURED AT THE MAXIMUM DIAMETER OF THE TERMINAL (BALL) IN A PLANE PARALLEL TO PRIMARY DATUM C.
- 10 PRIMARY DATUM C (SEATING PLANE) IS DEFINED BY THE PLANE ESTABLISHED BY THE CONTACT POINTS OF THREE OR MORE SOLDER BALLS THAT SUPPORT THE DEVICE WHEN IT IS PLACED ON TOP OF A PLANAR SURFACE.
- 11 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, LID OR INTEGRAL HEAT SLUG, ON THE TOP SURFACE OF THE PACKAGE. A DISTINGUISHING FEATURE IS ALLOWABLE ON THE BOTTOM SURFACE OF THE PACKAGE TO IDENTIFY THE TERMINAL A1 CORNER.
- 12 BASIC DIMENSION S_x IS DEFINED WITH RESPECT TO DATUMS A AND B, AND DEFINES THE POSITION OF THE CENTER BALL(S) IN THE OUTER ROW OR COLUMN OF A FULLY POPULATED MATRIX. WHEN THERE IS AN ODD NUMBER OF BALLS IN THE OUTER ROW, $S_x = 0.00 \text{ mm}$; WHEN THERE IS AN EVEN NUMBER OF BALLS IN THE OUTER ROW, $S_x = e/2$.
- 13 THE ARRAY OF BALLS MAY BE DEPOPULATED IN ANY MANNER. DEPOPULATION IS THE OMISSION OF BALLS FROM A FULL MATRIX (M1 OR M2).
- 14 THE BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.
- 15 THE EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.
- 16 Q IS THE MINIMUM CLEARANCE BETWEEN THE LID EDGE AND THE INNER ROW OF SOLDER BALLS ON CAVITY DOWN CONFIGURATIONS.
- 17 FOR CAVITY DOWN CONFIGURATIONS A MINIMUM DISTANCE (AFTER COMPONENT MOUNTING) FROM THE LID SURFACE TO CIRCUIT BOARD SURFACE IS RECOMMENDED FOR CIRCUIT BOARD CLEANING.

APPLICATION NOTES:

18. THE USER SHOULD ENSURE THAT THE BALL GEOMETRY AND METALLURGY ARE APPROPRIATE FOR THE INTENDED USE.

19. THE SOLDERABLE SURFACE MAY BE DEFINED BY AN OPENING IN THE SOLDER RESIST LAYER (Type 1) OR BY THE SIZE OF A METALLIZED PAD (Type 2). IT MAY BE ELLIPTICAL PROVIDED THE RATIO OF MAJOR TO MINOR AXES IS NO GREATER THAT 2/1, AND THE SURFACE AREA IS NO LESS THAN THE MINIMUM FOR A CIRCULAR PAD. FOR TYPE 2 DESIGNS, EXPOSED COPPER TRACES ARE PERMITTED OUTSIDE THE b1 PAD AREA.

Change Record

If the change involves any words added or deleted (excluding deletion of accidentally repeated words), the change is to be included below. Punctuation changes may or may not be included.

Initial Issue: A	Date: APRIL 2012	Item: 11.11-853
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Revision History:

Location	Change from:	Change to:
ENTIRE DOCUMENT	N/A	NEW MO SPECIFICATION