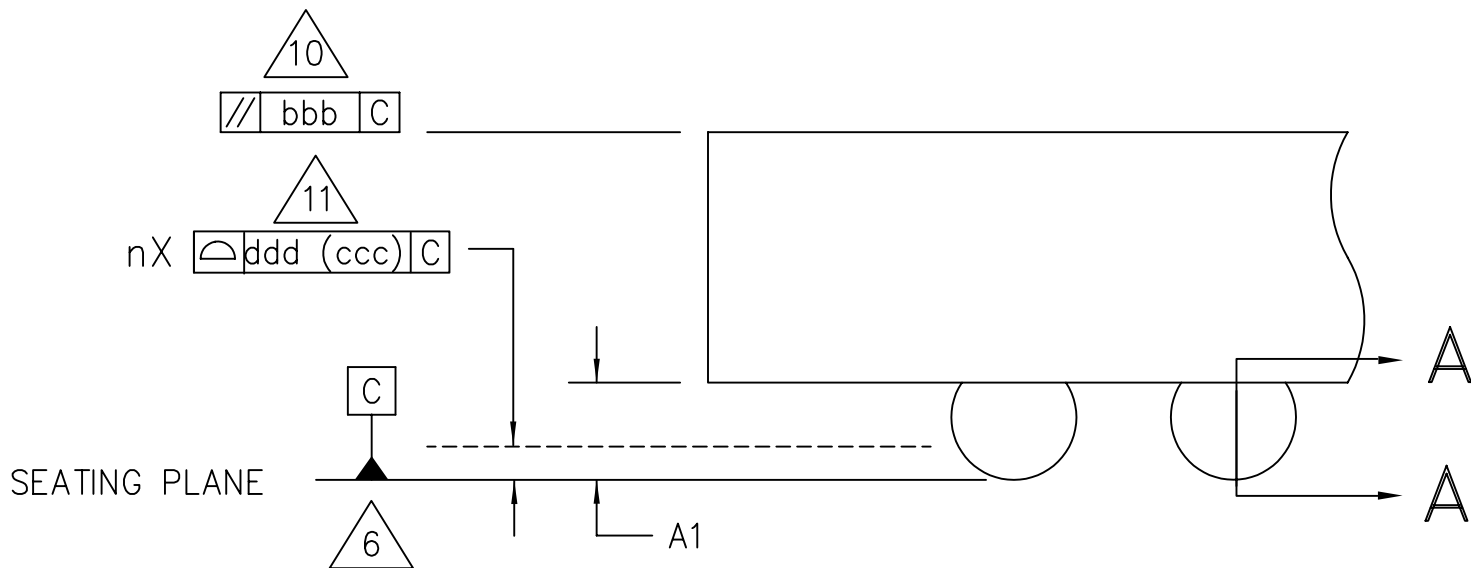


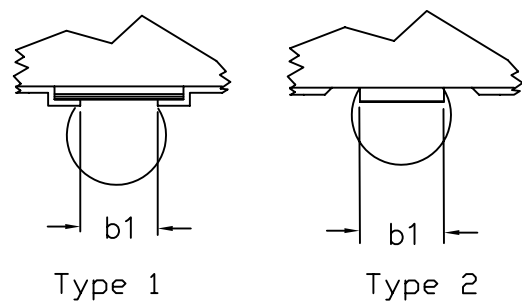
JEDEC
SOLID STATE
PRODUCT OUTLINE

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	PACKAGE DESIGNATOR	ISSUE	DATE		SHEET
LOW PROFILE, FINE PITCH BALL GRID ARRAY FAMILY, 0.80 MM PITCH (SQ. & RECT.)	LF-XBGA LFR-XBGA	G	Jan 07	MO-219	1 OF 13

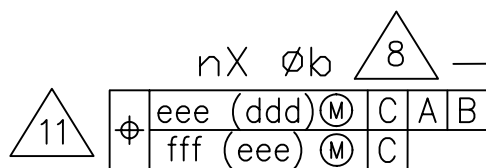


DETAIL A



SECTION A-A 13

Proposed



DETAIL B

JEDEC
SOLID STATE
PRODUCT OUTLINE

TITLE
LOW PROFILE, FINE PITCH,
BALL GRID ARRAY FAMILY,
0.80 MM PITCH (SQ. & RECT.)

ISSUE
G

DATE
Jan
07

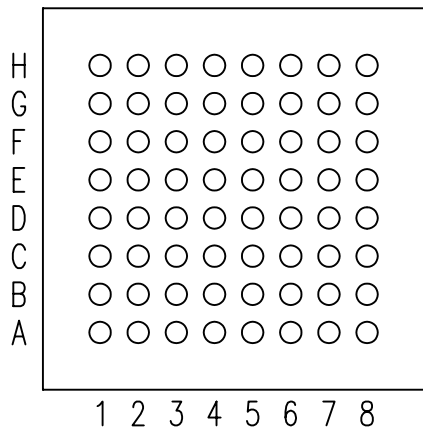
MO-219

SHEET
2 OF 13

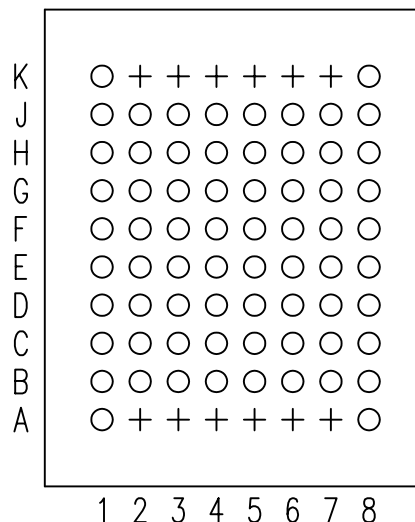
BALL PATTERNS



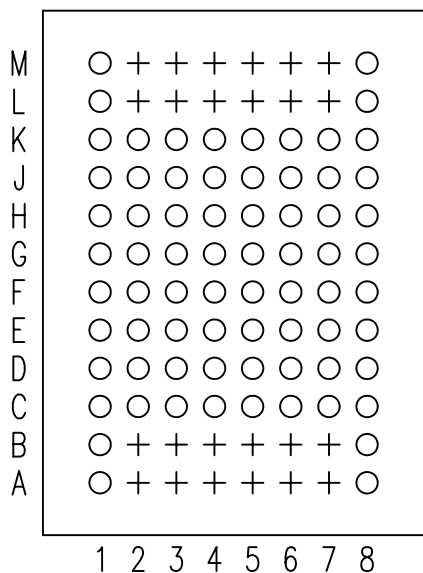
+ = DEPOPULATED BALL POSITION



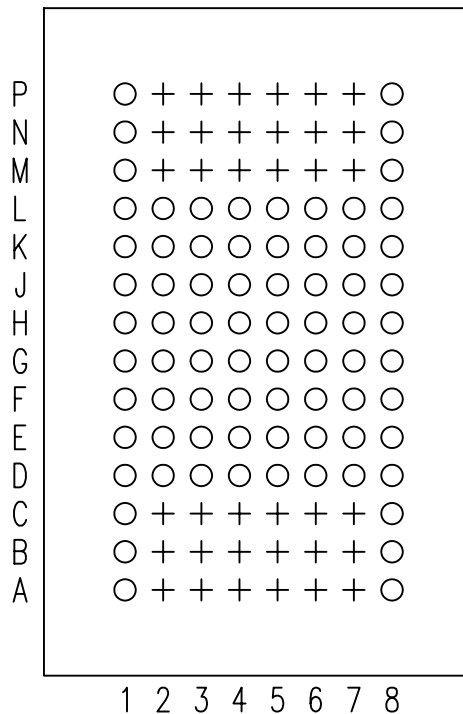
VARIATION AA



VARIATION BA



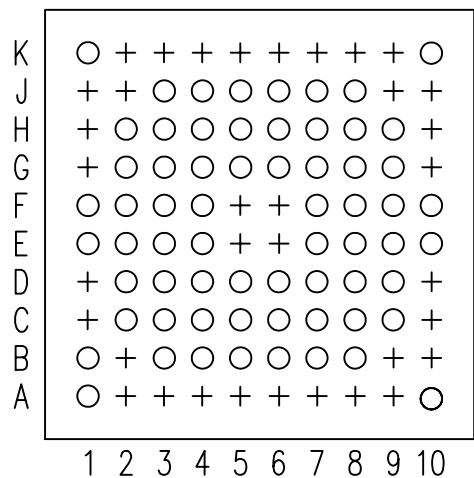
VARIATION BB-BC



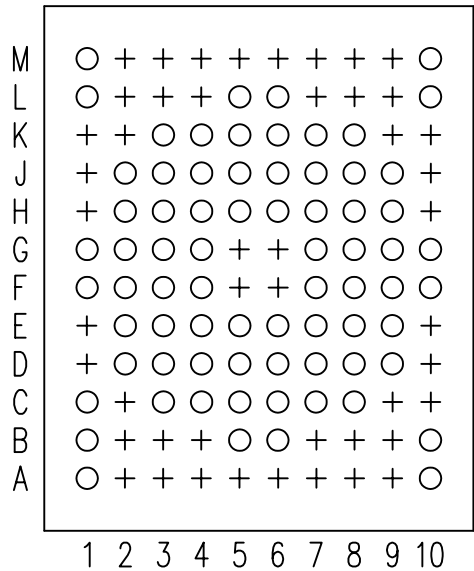
VARIATION BD

JEDEC SOLID STATE PRODUCT OUTLINE	TITLE LOW PROFILE, FINE PITCH, BALL GRID ARRAY FAMILY, 0.80 MM PITCH (SQ. & RECT.)	ISSUE G	DATE Jan 07	M□-219	SHEET 3 OF 13
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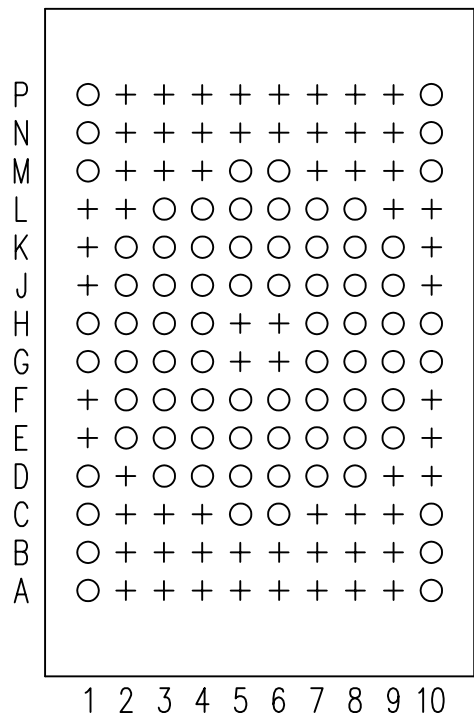
+ = DEPOPULATED BALL POSITION



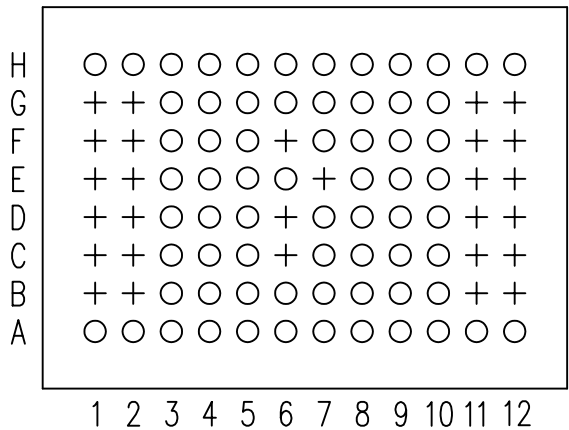
VARIATION AB



VARIATION BE–BG

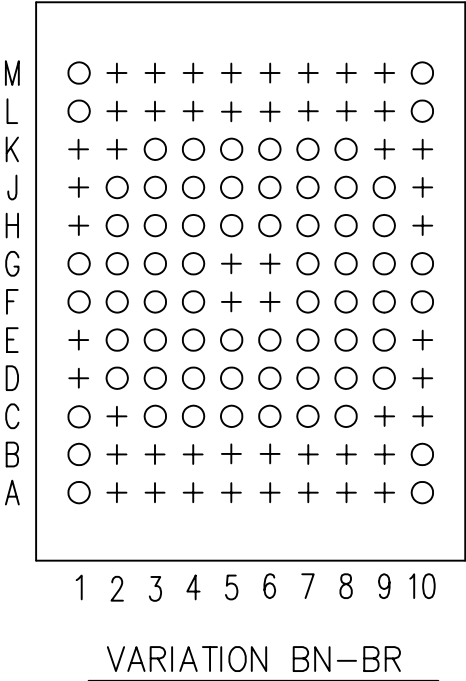
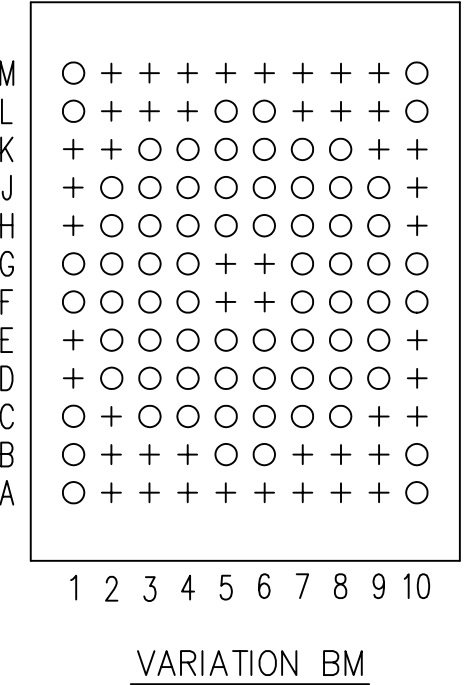
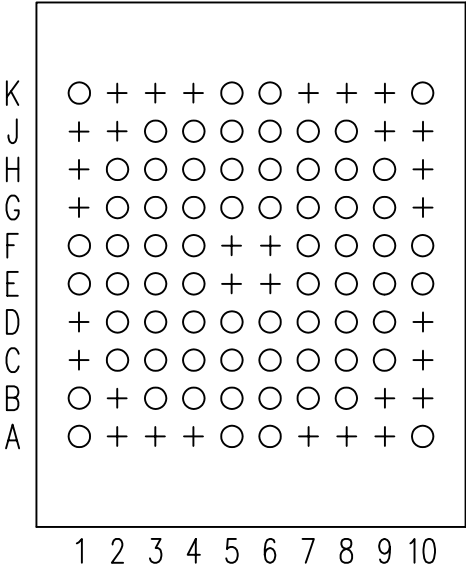
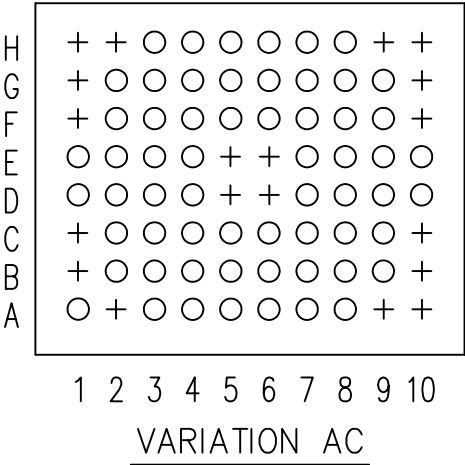


VARIATION BH

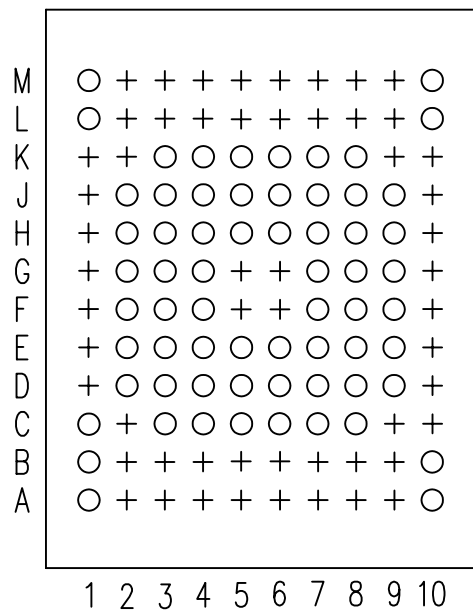


12. VARIATION BJ–BK

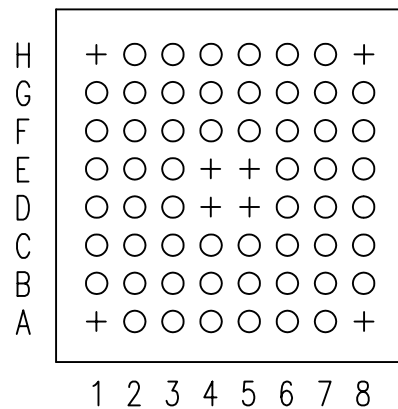
+ = DEPOPULATED BALL POSITION



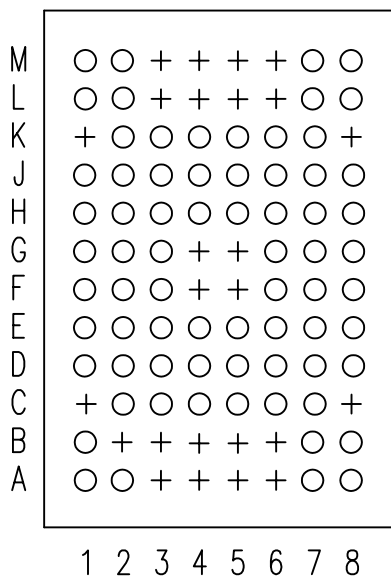
+ = DEPOPULATED BALL POSITION



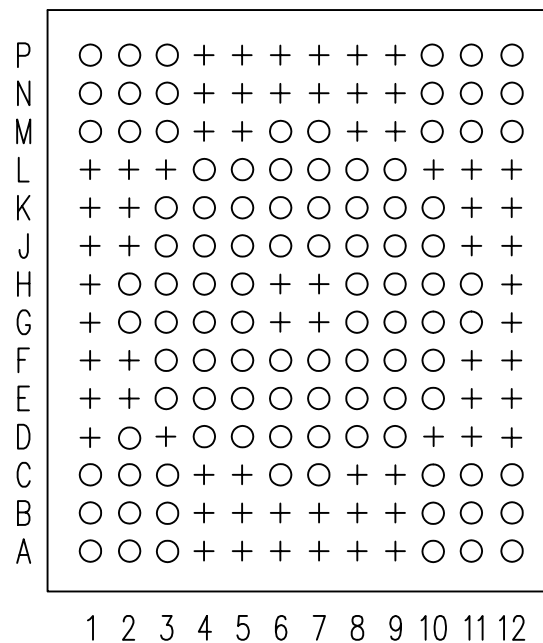
VARIATION BT



VARIATION BU

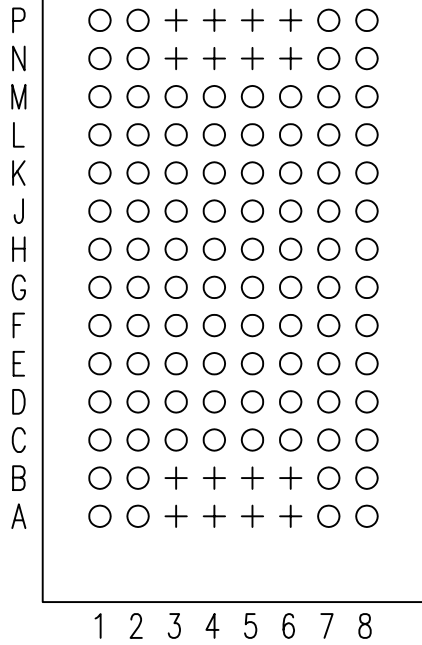


VARIATION BV/BW

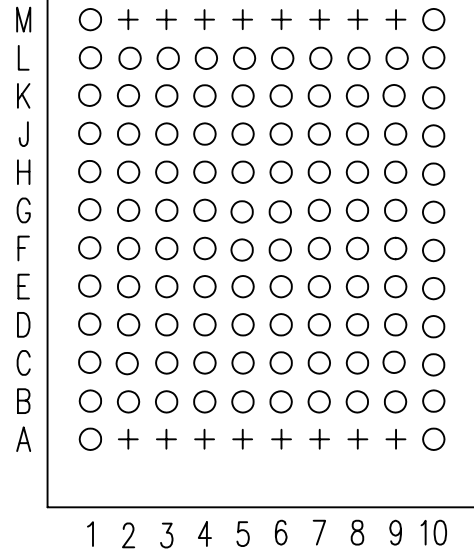


VARIATION BY

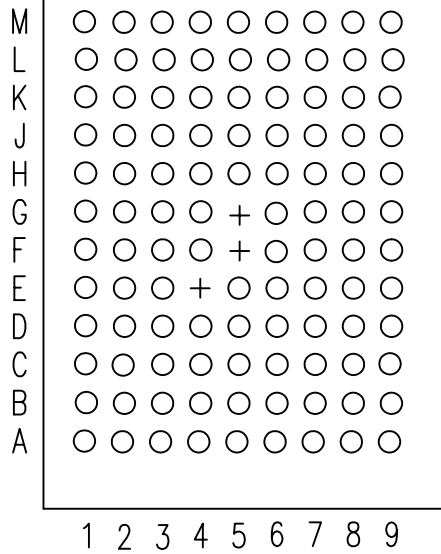
+ = DEPOPULATED BALL POSITION



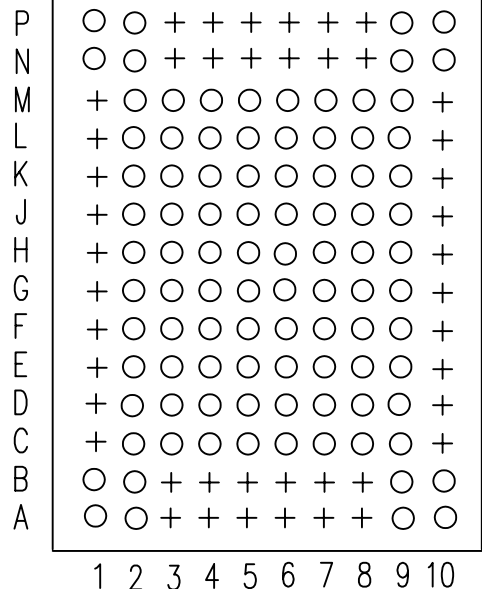
VARIATION BAA



VARIATION BAB

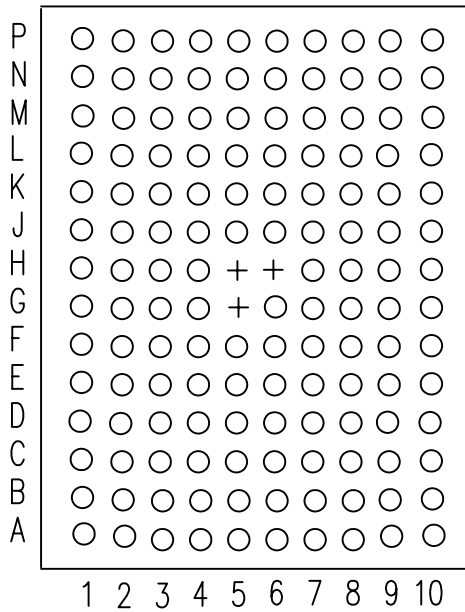


VARIATION BAC

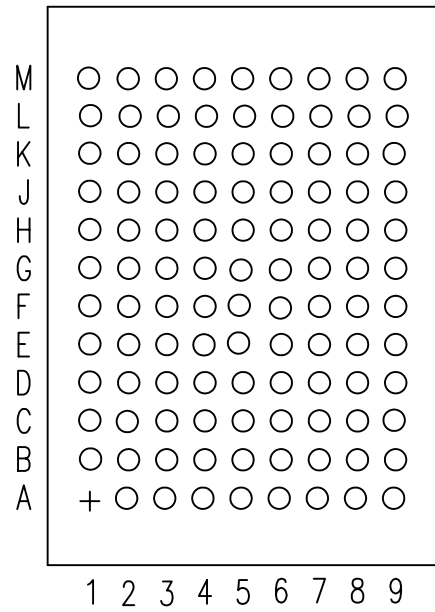


VARIATION BAD

+ = DEPOPULATED BALL POSITION



VARIATION BAE



VARIATION BAF

Table 1

SYMBOL	COMMON DIMENSIONS			NOTES	SYMBOL	TOLERANCES OF FORM AND POSITION	NOTES
	MINIMUM	NOMINAL	MAXIMUM				
A	—	—	1.70	7	aaa	0.15	
A1	0.25	—	—	7	bbb	0.20	10
A2	0.80	—	—		ddd (ccc)	0.12	11
b	0.40	0.45	0.50	8	eee (ddd)	0.15	11
b1	0.30	—	—		fff (eee)	0.08	11
eD	0.80 BSC						
eE	0.80 BSC						
NOTES	1,2						
REF	11-587/671						
ISSUE	E						

Table 2

SQUARE VARIATIONS							
VARIATIONS	D/E BSC	D1/E1 BSC	MD/ME	n	SD/SE BSC	REF.	ISSUE
AA	8.00	5.60	8	64	0.40	11-540	A
AB	9.00	7.20	10	65	0.40	11-540	A
AC	9.00	5.60/7.20	8/10	61	0.40	11-579	C
NOTES			4	5			
NOTES	1,2						

JEDEC SOLID STATE PRODUCT OUTLINE	TITLE LOW PROFILE, FINE PITCH, BALL GRID ARRAY FAMILY, 0.80 MM PITCH (SQ. & RECT.)	ISSUE G	DATE Jan 07	M0-219	SHEET 9 OF 13
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Table 3

RECTANGULAR VARIATIONS											
VARIATIONS	D BSC	E BSC	D1 BSC	E1 BSC	MD	ME	SD BSC	SE BSC	n	REF.	ISSUE
BA	10.00	8.00	7.20	5.60	10	8	0.40	0.40	68	11-540	A
BB	11.00	8.00	8.80	5.60	12	8	0.40	0.40	72	11-540	A
BC	12.00	9.00	8.80	5.60	12	8	0.40	0.40	72	11-540	A
BD	14.00	9.00	10.40	5.60	14	8	0.40	0.40	76	11-540	A
BE	11.00	8.00	8.80	7.20	12	10	0.40	0.40	73	11-540	A
BF	11.00	9.00	8.80	7.20	12	10	0.40	0.40	73	11-540	A
BG	12.00	9.00	8.80	7.20	12	10	0.40	0.40	73	11-540	A
BH	14.00	9.00	10.80	7.20	14	10	0.40	0.40	77	11-540	A
BJ	10.00	8.00	8.80	5.60	12	8	0.40	0.40	68	11-554	B
BK	12.00	8.00	8.80	5.60	12	8	0.40	0.40	68	11-554	B
BL	11.00	8.00	7.20	7.20	10	10	0.40	0.40	69	11-579	C
BM	11.00	8.00	8.80	7.20	12	10	0.40	0.40	73	11-579	C
BN	11.00	8.00	8.80	7.20	12	10	0.40	0.40	69	11-579	C
BP	11.00	9.00	8.80	7.20	12	10	0.40	0.40	69	11-579	C
BR	12.00	9.00	8.80	7.20	12	10	0.40	0.40	69	11-579	C
BT	12.00	9.00	8.80	7.20	12	10	0.40	0.40	65	11-579	C
BU	7.20	7.00	5.60	5.60	8	8	0.40	0.40	56	11-579	C
BV	11.00	7.00	8.80	5.60	12	8	0.40	0.40	71	11-579	C
BW	12.00	7.00	8.80	5.60	12	8	0.40	0.40	71	11-579	C
BY	12.00	11.00	10.40	8.80	14	12	0.40	0.40	101	11-579	C
BAA	14.00	8.00	10.40	5.60	14	8	0.40	0.40	96	11-587	D
BAB	12.00	9.00	8.80	7.20	12	10	0.40	0.40	104	11-671	E
BAC	11.00	9.00	8.80	6.40	12	9	0.40	0.00	105	11-708	F
BAD	12.00	9.00	10.40	7.20	14	10	0.40	0.40	96	11-708	F
BAE	12.00	9.00	10.40	7.20	14	10	0.40	0.40	137	11-708	F
BAF	11.00	9.00	8.80	6.40	12	9	0.40	0.00	107	11-763	G
NOTES	1,2				4	4			5		
JEDEC SOLID STATE PRODUCT OUTLINE		TITLE LOW PROFILE, FINE PITCH, BALL GRID ARRAY FAMILY, 0.80 MM PITCH (SQ. & RECT.)					ISSUE G	DATE Jan 07	M0-219	SHEET 10 OF 13	

NOTES :

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.

2. DIMENSIONS ARE IN MILLIMETERS.

3. CONTACT BALL DESIGNATION PER JEDEC PUBLICATION 95, SPP010 (SQ) and SPP020 (REC)

4. 'MD' AND 'ME' ARE THE MAXIMUM BALL MATRIX SIZES FOR THE 'D' AND 'E' DIMENSIONS RESPECTIVELY.

5. 'n' REPRESENTS THE NUMBER OF POPULATED BALLS FOR EACH VARIATION.

6. PRIMARY DATUM C (SEATING PLANE) IS DEFINED BY THE SPHERICAL CROWNS OF THE CONTACT BALLS.

7. DIMENSION 'A' INCLUDES STANDOFF HEIGHT 'A1', PACKAGE BODY THICKNESS, AND LID HEIGHT, BUT DOES NOT INCLUDE ATTACHED FEATURES, e.g. EXTERNAL HEAT SINK OR CHIP CAPACITORS. AN INTEGRAL HEAT SLUG IS NOT CONSIDERED AN ATTACHED FEATURE.

8. DIMENSION 'b' IS MEASURED AT THE MAXIMUM BALL DIAMETER IN A PLANE PARALLEL TO PRIMARY DATUM C.

9. THE A1 CORNER MUST BE IDENTIFIED ON THE TOP SURFACE OF THE PACKAGE BY USING A CORNER CHAMFER, INK OR METALIZED MARKINGS, INDENTATION, OR OTHER FEATURE OF PACKAGE BODY, LID, OR INTEGRAL HEAT SLUG. IF THE OPTIONAL CHAMFERED CORNER IS USED, THE MAXIMUM NUMBER OF SOLDER BALLS MAY BE REDUCED. EXACT SHAPE OF EACH CORNER IS OPTIONAL, BUT PIN 1 CORNER MUST BE UNIQUE. SOME ORIENTATION FEATURE ON THE BALL ATTACH SIDE IS RECOMMENDED.

10. FOR GLOB TOP CONFIGURATIONS, PARALLELISM (bbb) IS APPLICABLE ON THE TOP SURFACE IN A CENTERED MINIMUM AREA OF 2.50 X 2.50 mm. THE PARALLELISM SPECIFICATION WILL NOT APPLY TO THE FILLET OR SLOPED REGION OF THE ENCAPSULANT.

11. SYMBOLS SHOWN IN PARENTHESES ARE FOR FRBGA VARIATIONS ONLY. REFER TO JEDEC PUBLICATION 95, SECTION 4.5, "FINE-PITCH SQUARE BALL GRID ARRAY DESIGN GUIDE", AND SECTION 4.6 "FINE-PITCH, RECTANGULAR BALL GRID ARRAY DESIGN GUIDE", FOR DETAILED DEFINITION OF SYMBOLS FOR SQUARE AND RECTANGULAR VARIATIONS, RESPECTIVELY.

JEDEC SOLID STATE PRODUCT OUTLINE	TITLE LOW PROFILE, FINE PITCH, BALL GRID ARRAY FAMILY, 0.80 MM PITCH (SQ. & RECT.)	ISSUE G	DATE Jan 07	M0-219	SHEET 11 OF 13
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APPLICATION NOTES :

12. VARIATIONS BJ-BK WERE DESIGNED AND IN PRODUCTION PRIOR TO RELEASE OF JEDEC PUBLICATION 95, SECTION 4.6, "FINE-PITCH RECTANGULAR BALL GRID ARRAY PACKAGE DESIGN GUIDE". PIN 1 CORNER LOCATION DOES NOT MEET FBGA DESIGN GUIDE RECOMMENDATION.

13. 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). THE SURFACE MAY BE ELLIPTICAL PROVIDED THE RATIO OF THE MAJOR TO MINOR AXES IS NO GREATER THAN 2/1, AND THE AREA IS NO LESS THAN THE MINIMUM FOR A CIRCULAR PAD. FOR TYPE 2 DESIGNS EXPOSED COPPER TRACES OUTSIDE THE b1 PAD AREA ARE PERMITTED.

JEDEC SOLID STATE PRODUCT OUTLINE	TITLE LOW PROFILE, FINE PITCH, BALL GRID ARRAY FAMILY, 0.80 MM PITCH (SQ. & RECT.)	ISSUE G	DATE Jan 07	M0-219	SHEET 12 OF 13
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Change Record

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

Initial Issue: A	Date: Nov. 1999	Item: M0-219
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Revision History:

Issue: F	Date: Jan 07	Item: 11-763
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Location	Change from:	Change to:
Pages 8 and 10		Add Variation BAF

Issue:	Date:	Item:
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Location	Change from:	Change to:

Issue:	Date:	Item:
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Location	Change from:	Change to:

JEDEC SOLID STATE PRODUCT OUTLINE	TITLE LOW PROFILE, FINE PITCH, BALL GRID ARRAY FAMILY, 0.80 MM PITCH (SQ. & RECT.)	ISSUE G	DATE Jan 07	M0-219	SHEET 13 OF 13
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