

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
VERY THIN PROFILE, FINE PITCH,
SQ BUMP GRID ARRAY FAMILY

PACKAGE DESIGNATOR
VF-XBGA

ISSUE
A

DATE
NOV
08

MO-294

SHEET
1 OF 8

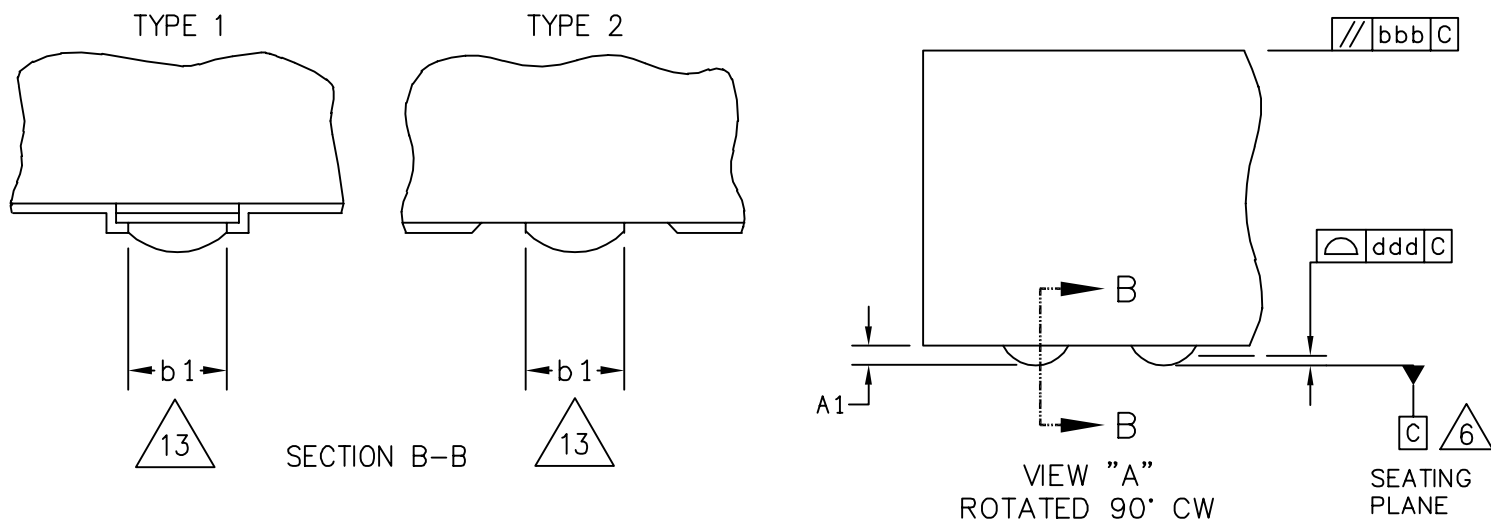


TABLE 1

VARIATION DESIGNATORS							
FIRST & SECOND CHARACTER CODES		THIRD CHARACTER CODE		FOURTH CHARACTER CODE		FIFTH CHARACTER CODE	
BODY SIZE		BUMP PITCH		BUMP SIZE		COLUMN / ROW	
D/E	LETTER CODE	e	LETTER CODE	b	LETTER CODE	MD/ME	NUMBER CODE
3.50	A	0.65	A	0.33	A	MD/ME	1
4.00	B	0.50	B	0.28	B	MD-1/ME-1	2
5.00	C	0.40	C	0.26	C	----	----
6.00	D	----	----	----	----	----	----
7.00	E	----	----	----	----	----	----
8.00	F	----	----	----	----	----	----
9.00	G	----	----	----	----	----	----
10.00	H	----	----	----	----	----	----
11.00	J	----	----	----	----	----	----
12.00	K	----	----	----	----	----	----
13.00	L	----	----	----	----	----	----
14.00	M	----	----	----	----	----	----
15.00	N	----	----	----	----	----	----
16.00	P	----	----	----	----	----	----
17.00	R	----	----	----	----	----	----

TABLE 2

SUMMARY TABLE			
BODY SIZE	BUMP PITCH	N	NOMINAL BUMP SIZE DIAMETER 0.33
3.50 X 3.50	0.65	16	AAAA-1

JEDEC SOLID STATE PRODUCT OUTLINE	TITLE VERY THIN PROFILE, FINE PITCH, SQ BUMP GRID ARRAY FAMILY	ISSUE A	DATE NOV 08	MO-294	SHEET 2 OF 8
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TABLE 2A

SUMMARY TABLE								
BODY SIZE	BUMP PITCH	N	NOMINAL BUMP SIZE DIAMETER 0.28		BODY SIZE	BUMP PITCH	N	NOMINAL BUMP SIZE DIAMETER 0.28
4.00 X 4.00	0.50	49	BBBB-1		11.00 X 11.00	0.50	441	JJBB-1
		36	BBBB-2				400	JJBB-2
5.00 X 5.00	0.50	81	CCBB-1		12.00 X 12.00	0.50	529	KKBB-1
		64	CCBB-2				484	KKBB-2
6.00 X 6.00	0.50	121	DDBB-1		13.00 X 13.00	0.50	625	LLBB-1
		100	DDBB-2				576	LLBB-2
7.00 X 7.00	0.50	169	EEBB-1		14.00 X 14.00	0.50	729	MMBB-1
		144	EEBB-2				676	MMBB-2
8.00 X 8.00	0.50	225	FFBB-1		15.00 X 15.00	0.50	841	NNBB-1
		196	FFBB-2				784	NNBB-2
9.00 X 9.00	0.50	289	GGBB-1		16.00 X 16.00	0.50	961	PPBB-1
		256	GGBB-2				900	PPBB-2
10.00 X 10.00	0.50	361	HHBB-1		17.00 X 17.00	0.50	1089	RRBB-1
		324	HHBB-2				1024	RRBB-2

TABLE 2B

SUMMARY TABLE								
BODY SIZE	BUMP PITCH	N	NOMINAL BUMP SIZE DIAMETER 0.26		BODY SIZE	BUMP PITCH	N	NOMINAL BUMP SIZE DIAMETER 0.26
4.00 X 4.00	0.40	64	BBCC-1		11.00 X 11.00	0.40	676	JJCC-1
		49	BBCC-2				625	JJCC-2
5.00 X 5.00	0.40	121	CCCC-1		12.00 X 12.00	0.40	784	KKCC-1
		100	CCCC-2				729	KKCC-2
6.00 X 6.00	0.40	169	DDCC-1		13.00 X 13.00	0.40	961	LLCC-1
		144	DDCC-2				900	LLCC-2
7.00 X 7.00	0.40	256	EECC-1		14.00 X 14.00	0.40	1089	MMCC-1
		225	EECC-2				1024	MMCC-2
8.00 X 8.00	0.40	324	FFCC-1		15.00 X 15.00	0.40	1296	NNCC-1
		289	FFCC-2				1225	NNCC-2
9.00 X 9.00	0.40	441	GGCC-1		16.00 X 16.00	0.40	1444	PPCC-1
		400	GGCC-2				1369	PPCC-2
10.00 X 10.00	0.40	529	HHCC-1		17.00 X 17.00	0.40	1681	RRCC-1
		484	HHCC-2				1600	RRCC-2

TABLE 3

TOLERANCES OF FORM AND POSITION				
PITCH [e] SYMBOL	[e] = 0.65	[e] = 0.50	[e] = 0.40	NOTES
aaa	0.10	0.10	0.10	
bbb	0.10	0.10	0.10	12
ddd	0.08	0.08	0.08	
eee	0.15	0.15	0.15	
fff	0.08	0.05	0.05	
NOTES	1, 2, 11			
REF	11-804			
ISSUE	A			

TABLE 4

COMMON DIMENSIONS										
PITCH [e] SYMBOL	[e] = 0.65			[e] = 0.50			[e] = 0.40			NOTES
	MIN	NOM	MAX	MIN	NOM	MAX	MIN	NOM	MAX	
A	—	—	1.00	—	—	1.00	—	—	1.00	7
A1	—	—	0.10	—	—	0.105	—	—	0.105	7
A2	0.65	—	—	0.65	—	—	0.65	—	—	
b	0.28	0.33	0.38	0.23	0.28	0.33	0.22	0.26	0.30	8
b1	0.25	—	—	0.20	—	—	0.20	—	—	13
NOTES	1, 2, 11									
REF	11-804									
ISSUE	A									

TABLE 5

VARIATIONS xxAA-1 [e] = 0.65						
D/E BSC	D1/E1 BSC	MD/ME	N	SD/SE BSC	REF	ISSUE
3.50	1.95	4	16	0.325	11-804	A
NOTES		4	5	10		

TABLE 6

VARIATIONS xxBB-1 $\bar{e} = 0.50$						
D/E BSC	D1/E1 BSC	MD/ME	N	SD/SE BSC	REF	ISSUE
4.00	3.00	7	49	0	11-804	A
5.00	4.00	9	81	0	11-804	A
6.00	5.00	11	121	0	11-804	A
7.00	6.00	13	169	0	11-804	A
8.00	7.00	15	225	0	11-804	A
9.00	8.00	17	289	0	11-804	A
10.00	9.00	19	361	0	11-804	A
11.00	10.00	21	441	0	11-804	A
12.00	11.00	23	529	0	11-804	A
13.00	12.00	25	625	0	11-804	A
14.00	13.00	27	729	0	11-804	A
15.00	14.00	29	841	0	11-804	A
16.00	15.00	31	961	0	11-804	A
17.00	16.00	33	1089	0	11-804	A
NOTES		4	5	10		

TABLE 6A

VARIATIONS xxBB-2 $\bar{e} = 0.50$						
D/E BSC	D1/E1 BSC	MD-1/ME-1	N	SD/SE BSC	REF	ISSUE
4.00	2.50	6	36	0.25	11-804	A
5.00	3.50	8	64	0.25	11-804	A
6.00	4.50	10	100	0.25	11-804	A
7.00	5.50	12	144	0.25	11-804	A
8.00	6.50	14	196	0.25	11-804	A
9.00	7.50	16	256	0.25	11-804	A
10.00	8.50	18	324	0.25	11-804	A
11.00	9.50	20	400	0.25	11-804	A
12.00	10.50	22	484	0.25	11-804	A
13.00	11.50	24	576	0.25	11-804	A
14.00	12.50	26	676	0.25	11-804	A
15.00	13.50	28	784	0.25	11-804	A
16.00	14.50	30	900	0.25	11-804	A
17.00	15.50	32	1024	0.25	11-804	A
NOTES		4	5	10		

TABLE 7

VARIATIONS xxCC-1 $\bar{e} = 0.40$						
D/E BSC	D1/E1 BSC	MD/ME	N	SD/SE BSC	REF	ISSUE
4.00	2.80	8	64	0.20	11-804	A
5.00	4.00	11	121	0	11-804	A
6.00	4.80	13	169	0	11-804	A
7.00	6.00	16	256	0.20	11-804	A
8.00	6.80	18	324	0.20	11-804	A
9.00	8.00	21	441	0	11-804	A
10.00	8.80	23	529	0	11-804	A
11.00	10.00	26	676	0.20	11-804	A
12.00	10.80	28	784	0.20	11-804	A
13.00	12.00	31	961	0	11-804	A
14.00	12.80	33	1089	0	11-804	A
15.00	14.00	36	1296	0.20	11-804	A
16.00	14.80	38	1444	0.20	11-804	A
17.00	16.00	41	1681	0	11-804	A
NOTES		4	5	10		

TABLE 7A

VARIATIONS xxCC-2 $\bar{e} = 0.40$						
D/E BSC	D1/E1 BSC	MD-1/ME-1	N	SD/SE BSC	REF	ISSUE
4.00	2.40	7	49	0	11-804	A
5.00	3.60	10	100	0.20	11-804	A
6.00	4.40	12	144	0.20	11-804	A
7.00	5.60	15	225	0	11-804	A
8.00	6.40	17	289	0	11-804	A
9.00	7.60	20	400	0.20	11-804	A
10.00	8.40	22	484	0.20	11-804	A
11.00	9.60	25	625	0	11-804	A
12.00	10.40	27	729	0	11-804	A
13.00	11.60	30	900	0.20	11-804	A
14.00	12.40	32	1024	0.20	11-804	A
15.00	13.60	35	1225	0	11-804	A
16.00	14.40	37	1369	0	11-804	A
17.00	15.60	40	1600	0.20	11-804	A
NOTES		4	5	10		

NOTES:

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

2. DIMENSIONS ARE IN MILLIMETERS, ANGLES IN DEGREES.

3 BUMP DESIGNATION PER JEP95, SECTION 3, SPP-010.

4. 'MD' AND 'ME' ARE THE MAXIMUM BUMPS MATRIX SIZE FOR THE 'D' AND 'E' DIMENSIONS RESPECTIVELY.

5. 'N' IS THE MAXIMUM NUMBER OF BUMPS FOR A SPECIFIED MATRIX SIZE.

6 PRIMARY DATUM C (SEATING PLANE) IS DEFINED BY THE DOMED CROWNS OF THE BUMPS.

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 BUMP DIAMETER, 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 BUMPS 'N' MAY BE REDUCED. EXACT SHAPE OF EACH CORNER IS OPTIONAL, BUT THE A1 CORNER MUST BE UNIQUE. SOME ORIENTATION FEATURE ON THE BUMP ATTACH SIDE IS RECOMMENDED.

10 DIMENSIONS 'SD' AND 'SE' ARE MEASURED WITH RESPECT TO DATUMS A AND B AND DEFINES THE POSITION OF THE CENTER BUMP IN THE OUTER ROW. WHEN THERE IS AN ODD NUMBER OF BUMPS IN THE OUTER ROW PARALLEL TO DIMENSION 'D' OR 'E' RESPECTIVELY, 'SD' OR 'SE' = 0 WHEN THERE IS AN EVEN NUMBER OF BUMPS IN THE OUTER ROW, 'SD' OR 'SE' = $e/2$ BASIC.

11 BUMP ARRAY MAY BE DEPOPULATED IN ANY PATTERN. DEPOPULATION IS THE OMISSION OF BUMPS FROM A FULL MATRIX.

12 PARALLELISM (bbb) ON THE TOP SURFACE APPLIES ONLY TO THE 2.50 X 2.50 mm MINIMUM FLAT AREA SHOWN ON THE TOP VIEW (SHEET 1). THIS AREA MAY BE USED FOR MARKING OR VACUUM PICKUP.

APPLICATION NOTES:

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). IT MAY BE ELLIPTICAL PROVIDED THE RATIO OF MAJOR TO MINOR AXES IS NO GREATER THAN 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.

JEDEC SOLID STATE PRODUCT OUTLINE	TITLE VERY THIN PROFILE, FINE PITCH, SQ BUMP GRID ARRAY FAMILY	ISSUE A	DATE NOV 08	MO-294	SHEET 7 OF 8
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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 A	Date: November 2008	Item: 11-804
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Revision History:

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

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 VERY THIN PROFILE, FINE PITCH, SQ BUMP GRID ARRAY FAMILY	ISSUE A	DATE NOV 08	MO-294	SHEET 8 OF 8
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