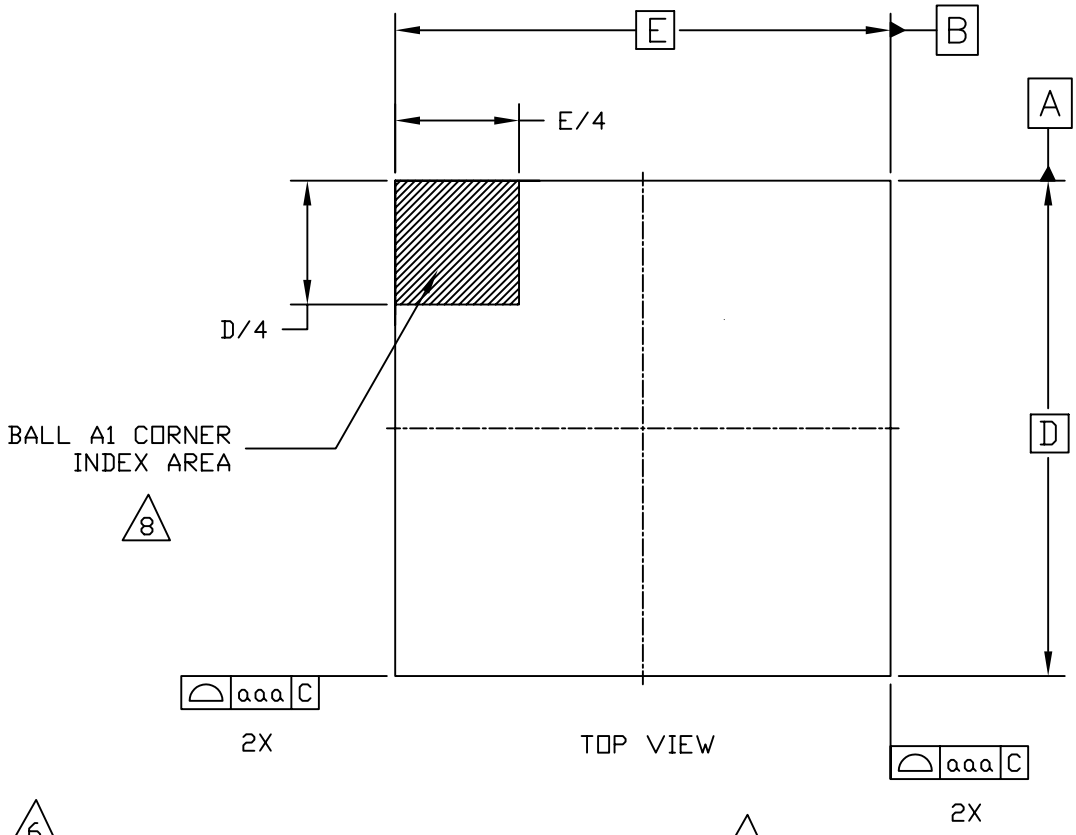
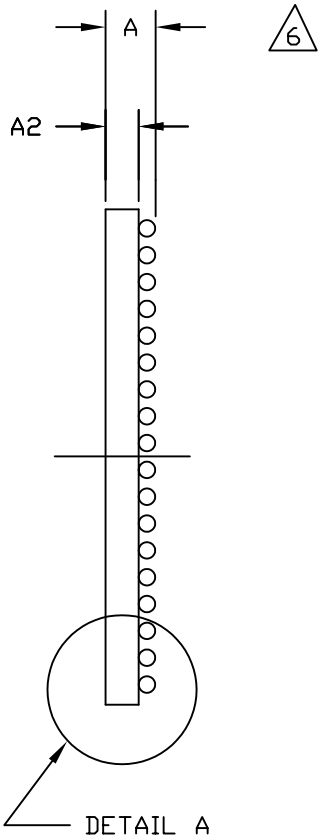
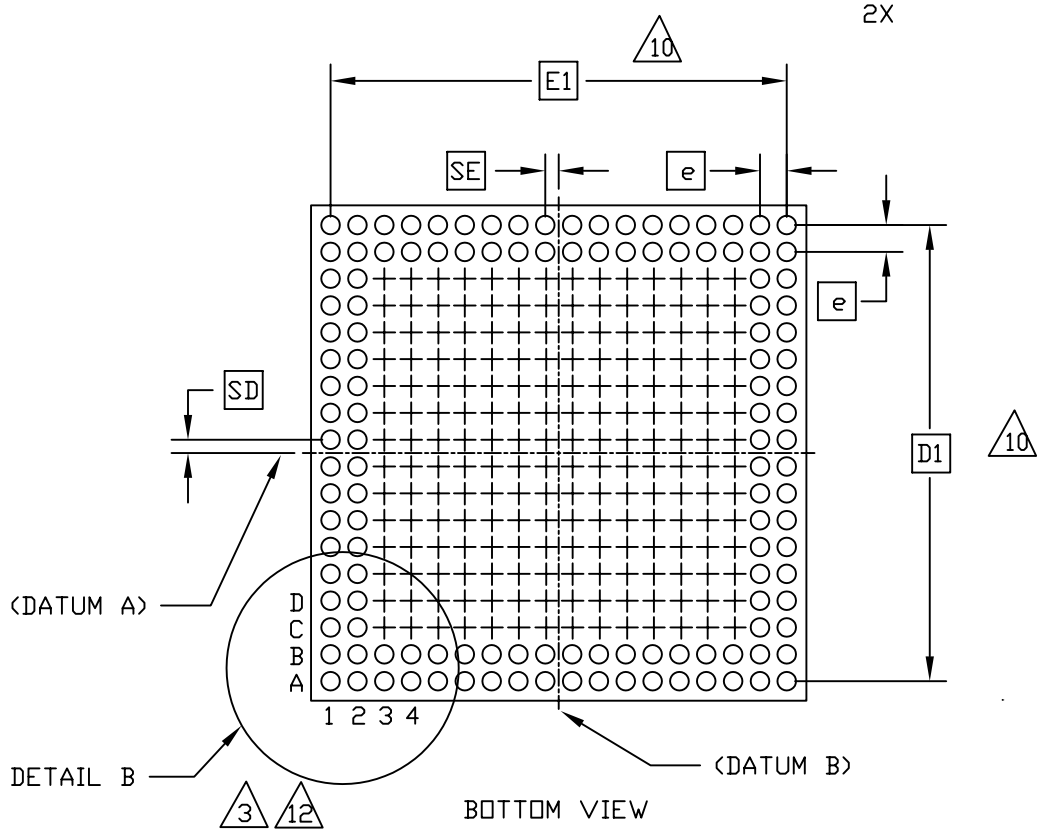
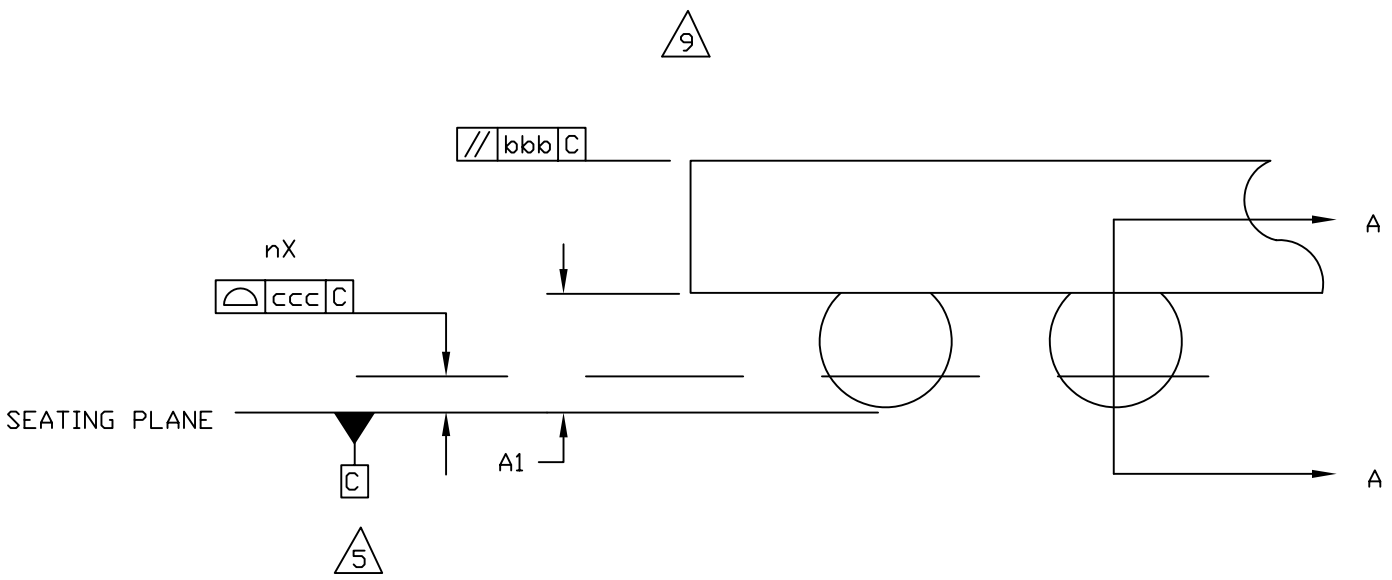


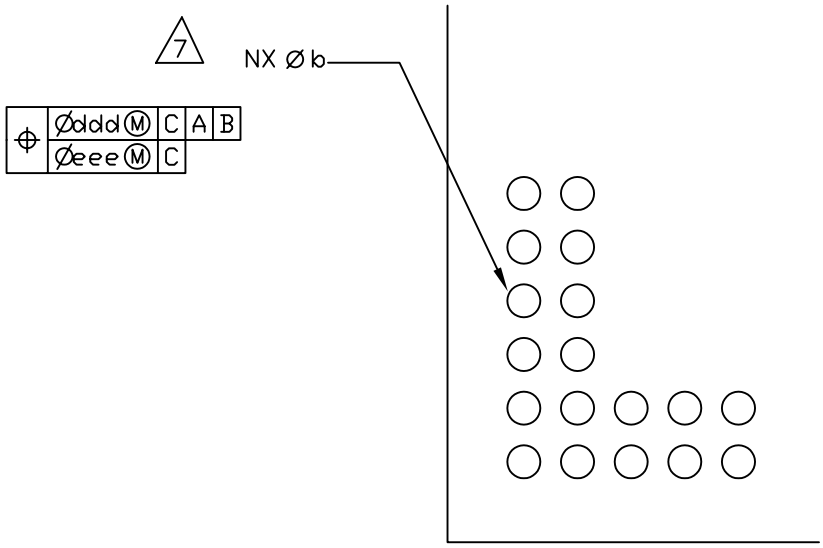




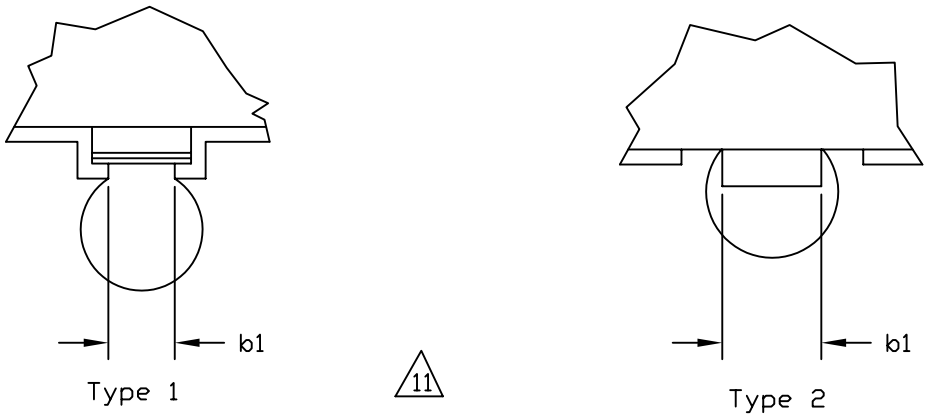
JEDEC SOLID STATE PRODUCT OUTLINES	THIS REGISTERED OUTLINE HAS BEEN PREPARED BY THE JEDEC JC-11 COMMITTEE AND REFLECTS A PRODUCT WITH ANTICIPATED USAGE IN THE ELECTRONICS INDUSTRY; CHANGES ARE LIKELY TO OCCUR					
TITLE: UPPER POP PACKAGE, SQUARE, FINE PITCH, BALL GRID ARRAY (0.65 AND 0.50 MM PITCH)		PACKAGE DESIGNATOR: POP-XFBGA	ISSUE: A	DATE: June06	MO-273	SHEET: 1 OF 8



DETAIL A (ROTATED 90 DEGREES)



DETAIL B



SECTION A-A

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE UPPER POP PACKAGE, SQUARE, FINE PITCH, BALL GRID ARRAY (0.65 AND 0.50 MM PITCH)	ISSUE A	DATE June06	MO-273	SHEET 2 OF 8

TABLE 1

VARIATION DESIGNATORS											
FIRST DIGIT CODE		SECOND DIGIT CODE		THIRD DIGIT CODE		FOURTH DIGIT CODE		FIFTH DIGIT CODE		SIXTH DIGIT CODE	
OVERALL HEIGHT		*BODY LENGTH*		*BODY WIDTH*		*TERMINAL PITCH*		*BALL SIZE*		*PERIPHERAL ROWS*	
A	LETTER CODE	D	LETTER CODE	E	LETTER CODE	e	LETTER CODE	b	LETTER CODE		LETTER CODE
1.70 MAX	L	10.00	A	10.00	A	0.65	A	0.500	A	1	A
1.20 MAX	T	11.00	B	11.00	B	0.50	B	0.450	B	2	B
1.00 MAX	V	12.00	C	12.00	C	–	–	0.350	C	3	C
–	–	13.00	D	13.00	D	–	–	–	–	–	–
–	–	14.00	E	14.00	E	–	–	–	–	–	–
–	–	15.00	F	15.00	F	–	–	–	–	–	–
–	–	16.00	G	16.00	G	–	–	–	–	–	–
–	–	17.00	H	17.00	H	–	–	–	–	–	–

TABLE 2

VARIATION xxxAAx COMMON DIMENSIONS									
	L: LOW PROFILE			T: THIN PROFILE			V: VERY THIN PROFILE		
SYMBOL	*MIN*	*NOM*	*MAX*	*MIN*	*NOM*	*MAX*	*MIN*	*NOM*	*MAX*
A	–	–	1.70	–	–	1.20	–	–	1.00
A1	0.40	–	–	0.40	–	–	0.40	–	–
A2	–	–	1.20	–	–	0.80	–	–	0.50
b	0.48	0.50	0.52	0.48	0.50	0.52	0.48	0.50	0.52
b1	0.27	–	–	0.27	–	–	0.27	–	–
e	0.65 BSC								
NOTES	1,2,6,7,11								
REF									
ISSUE									

TABLE 3

VARIATION xxxABx COMMON DIMENSIONS									
	L: LOW PROFILE			T: THIN PROFILE			V: VERY THIN PROFILE		
SYMBOL	*MIN*	*NOM*	*MAX*	*MIN*	*NOM*	*MAX*	*MIN*	*NOM*	*MAX*
A	–	–	1.70	–	–	1.20	–	–	1.00
A1	0.35	–	–	0.35	–	–	0.35	–	–
A2	–	–	1.25	–	–	0.85	–	–	0.55
b	0.40	0.45	0.50	0.40	0.45	0.50	0.40	0.45	0.50
b1	0.27	–	–	0.27	–	–	0.27	–	–
e	0.65 BSC								
NOTES	1,2,6,7,11								
REF									
ISSUE									

TABLE 4

VARIATION xxxBCx COMMON DIMENSIONS									
	L: LOW PROFILE			T: THIN PROFILE			V: VERY THIN PROFILE		
SYMBOL	*MIN*	*NOM*	*MAX*	*MIN*	*NOM*	*MAX*	*MIN*	*NOM*	*MAX*
A	–	–	1.70	–	–	1.20	–	–	1.00
A1	0.25	–	–	0.25	–	–	0.25	–	–
A2	–	–	1.35	–	–	0.95	–	–	0.65
b	0.30	0.35	0.40	0.30	0.35	0.40	0.30	0.35	0.40
b1	0.22	–	–	0.22	–	–	0.22	–	–
e	0.50 BSC								
NOTES	1,2,6,7,11								
REF									
ISSUE									

TABLE 5

TOLERANCES OF FORM and POSITION			
VARIATION / SYMBOL	xxxAAx	xxxABx	xxxBCx
	VALUE	*VALUE*	*VALUE*
aaa	0.10	0.10	0.10
bbb	0.10	0.10	0.10
ccc	0.12	0.12	0.10
ddd	0.15	0.15	0.15
eee	0.08	0.08	0.05
e	0.65 BSC	0.65 BSC	0.50 BSC
NOTES	1,2,5		
REF			
ISSUE			

TABLE 6

SUMMARY TABLE					
BODY SIZE	LEAD PITCH	LEAD COUNT	LOW PROFILE LFBGA	THIN PROFILE TFBGA	V. THIN PROFILE VFBGA
10.00 x 10.00	0.65	104	LAAAAB/LAAABB	TAAAAB/TAAABB	VAAAAB/VAAABB
	0.50	136	LAABCB	TAABCB	VAABCB
11.00 X 11.00	0.65	112	LBBAAB/LBBABB	TBBAAB/TBBABB	VBBAAB/VBBABB
	0.50	152	LBBBCB	TBBBCB	VBBBCB
12.00 X 12.00	0.65	128	LCCAAB/LCCABB	TCCAAB/TCCABB	VCCAAB/VCCABB
	0.50	168	LCCBCB	TCCBCB	VCCBCB
13.00 X 13.00	0.65	136	LDDAAB/LDDABB	TDDAAB/TDDABB	VDDAAB/VDDABB
	0.50	184	LDDBCB	TDDBCB	VDDBCB
14.00 X 14.00	0.65	152	LEEAAB/LEEABB	TEEAAB/TEEABB	VEEAAB/VEEABB
	0.50	200	LEEBCB	TEEBCB	VEEBCB
15.00 X 15.00	0.65	160	LFFAAB/LFFABB	TFFAAB/TFFABB	VFFAAB/VFFABB
	0.50	216	LFFBCB	TFFBCB	VFFBCB
16.00 X 16.00	0.65	176	LGGAAB/LGGABB	TGGAAB/TGGABB	VGGAAB/VGGABB
	0.50	232	LGGBCB	TGGBCB	VGGBCB
17.00 X 17.00	0.65	188	LHHAAB/LHHABB	THHAAB/THHABB	VHHAAB/VHHABB
	0.50	248	LHHBCB	THHBCB	VHHBCB

TABLE 7A

e=0.65 PITCH									
VARIATION / SYMBOL	LAAAAB/LAAABB TLAAAAB/TAAABB VAAAAB/VAAABB	LBBAAB/LBBABB TBBAAB/TBBABB VBBAAB/VBBABB	LCCAAB/LCCABB TCCAAB/TCCABB VCCAAB/VCCABB	LDDAAB/LDDABB TDDAAB/TDDABB VDDAAB/VDDABB	LEEAAB/LEEABB TEEAAB/TEEABB VEEAAB/VEEABB	LFFAAB/LFFABB TFFAAB/TFFABB VFFAAB/VFFABB	LGGAAB/LGGABB TGGAAB/TGGABB VGGAAB/VGGABB	LHHAAB/LHHABB THHAAB/THHABB VHHAAB/VHHABB	NOTE
D BSC	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	
E BSC	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	
D1 BSC	9.10	9.75	11.05	11.70	13.00	13.65	14.95	15.60	10
E1 BSC	9.10	9.75	11.05	11.70	13.00	13.65	14.95	15.60	10
SD BSC	0.325	0.000	0.000	0.325	0.325	0.000	0.000	0.325	
SE BSC	0.325	0.000	0.000	0.325	0.325	0.000	0.000	0.325	
N	104	112	128	136	152	160	176	188	4
NOTES	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
REF									
ISSUE									

TABLE 7B

e=0.50 PITCH									
VARIATION / SYMBOL	LAABCB TAABCB VAABCB	LBBBCB TBBBCB VBBBCB	LCCBCB TCCBCB VCCBCB	LDDBCB TDDBCB VDDBCB	LEEBCB TEEBCB VEEBCB	LFFBCB TFFBCB VFFBCB	LGGBCB TGGBCB VGGBCB	LHHBCB TLHHBCB VHHBCB	NOTE
D BSC	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	
E BSC	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	
D1 BSC	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	10
E1 BSC	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	10
SD BSC	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	
SE BSC	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	
N	136	152	168	184	200	216	232	248	4
NOTES	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
REF									
ISSUE									

NOTES:

1. ALL DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5M-1994.

2. ALL DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).

3. SOLDER BALL POSITION DESIGNATION PER JEP95, SECTION 3.0, SPP-010. Variation A depopulation is shown on the bottom view of page 1 and the + indicators on the drawing show the depopulated ball areas.

4. N IS THE NUMBER OF BALLS PRESENT.

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

6. DIMENSION A INCLUDES THE STANDOFF HEIGHT A1 AND PACKAGE BODY THICKNESS A2.

7. DIMENSION b IS MEASURED AT THE MAXIMUM BALL DIAMETER, PARALLEL TO DATUM C.

8. THE TERMINAL A1 CORNER MUST BE IDENTIFIED ON THE TOP SURFACE OF THE PACKAGE BY USING INK OR METALLIZED MARKINGS, INDENTATIONS, OR OTHER FEATURES. THE EXACT SHAPE OF EACH CORNER IS OPTIONAL.

9. FOR GLOB TOP AND FLIP CHIP CONFIGURATIONS, PARALLELISM (bbb) MUST BE ENSURED. ONLY ON THE SURFACE DIRECTLY ABOVE THE DIE AREA. THE PARALLELISM SPECIFICATION WILL NOT APPLY TO ANY FILLET OR SLOPED REGION OF THE ENCAPSULANT.

10. E1 AND D1 SHALL ONLY BE A MULTIPLE OF THE PITCH e.

11. 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, COPPER TRACES ARE PERMITTED OUTSIDE THE b1 PAD AREA.

12. 12 X 12MM, 0.65MM PITCH, (VARIATION xCCAxB) IS SHOWN FOR ILLUSTRATION ONLY.

APPLICATION NOTES:

1. UPPER POP PACKAGE REFLOW TO TOP OF CORRESPONDING BOTTOM POP PACKAGE BASED ON THE PACKAGE SIZE, TOP LAND PITCH, AND MOLD CAP THICKNESS OF THE BOTTOM POP PACKAGE. VARIATIONS OF UPPER POP PACKAGE WITH LARGER BALL DIAMETER ARE (SUCH AS VARIATION xxxAAB) ARE RECOMMENDED TO REFLOW ON TOP OF BOTTOM POP PACKAGE THICKER MOLD CAPS. REFER TO POP PACKAGE DESIGN GUIDE FOR SQUARE FBGA PACKAGES AND BOTTOM POP PACKAGE MO.

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: June06	Item: MO-273A

Revision History:

Issue:	Date:	Item:

Location	Change from:	Change to:

Issue:	Date:	Item:

Location	Change from:	Change to:

Issue:	Date:	Item:

Location	Change from:	Change to: