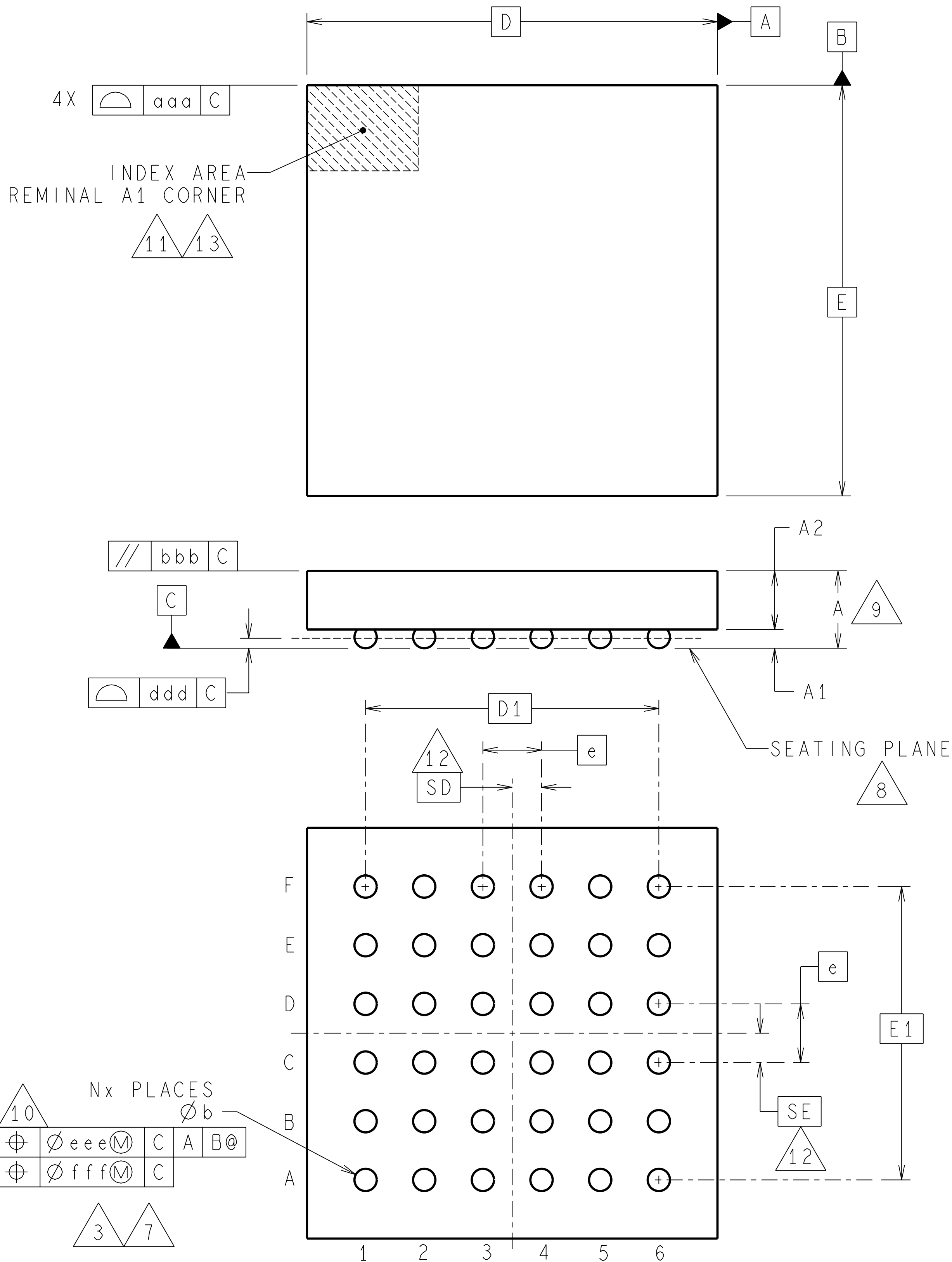

JEDEC SOLID STATE PRODUCT OUTLINE	*THIS REGISTERED OUTLINE HAS BEEN PREPARED BY THE JEDEC JC-11 COMMITEE AND REFLECTS A PRODUCT WITH ANTICIPATED USAGE IN THE ELECTRONICS INDUSTRY; CHANGES ARE LIKELY TO OCCUR*

DIE SIZE BALL GRID ARRAY	JESD-30 DESIGNATOR F-XBGA	ISSUE A	DATE AUG 1998	**MO-211**	SHEET 1 OF 4

COMMON DIMENSIONS

SYMBOL	VARIATION					
	Ax			Bx		
	MIN	*NOM*	*MAX*	*MIN*	*NOM*	*MAX*
A	-	-	1.20	-	-	1.20
A1	0.10	-	0.15	0.10	-	0.15
A2	-	-	1.00	-	-	1.00
b	0.15	0.17	0.19	0.15	0.17	0.19
e	0.40 BASIC			0.50 BASIC		
NOTES	1,2,4			1,2,4		
REF						

GEOMETRIC TOLERANCES

SYMBOL	VARIATION	
	Ax	Bx
aaa	0.25	0.35
bbb	0.10	0.10
ddd	0.05	0.05
eee	0.05	0.05
fff	0.05	0.05
NOTES	1,2	1,2
REF		

VARIATIONS

e = 0.40 PITCH

D	D1	E	E1	MD	ME	N	SD	SE	VARIATION CODE
0.95	0.40	0.95	0.40	2	2	4	0.20	0.20	AA
1.35	0.80	0.95	0.40	3	2	6	0.00	0.20	AB
1.35	0.80	1.35	0.80	3	3	9	0.00	0.00	AC
1.75	1.20	1.75	1.20	4	4	16	0.20	0.20	AD
2.15	1.60	1.75	1.20	5	4	20	0.00	0.20	AE
2.15	1.60	2.15	1.60	5	5	25	0.00	0.00	AF
2.55	2.00	2.55	2.00	6	6	36	0.20	0.20	AG
NOTES				5	5	6,13	12	12	
REF									

VARIATIONS

e = 0.50 PITCH

D	D1	E	E1	MD	ME	N	SD	SE	VARIATION CODE
1.15	0.50	1.15	0.50	2	2	4	0.25	0.25	BA
1.65	1.00	1.15	0.50	3	2	6	0.00	0.25	BB
1.65	1.00	1.65	1.00	3	3	9	0.00	0.00	BC
2.15	1.50	2.15	1.50	4	4	16	0.25	0.25	BD
2.65	2.00	2.15	1.50	5	4	20	0.00	0.25	BE
2.65	2.00	2.65	2.00	5	5	25	0.00	0.00	BF
3.15	2.50	3.15	2.50	6	6	36	0.25	0.25	BG
NOTES				5	5	6	12	12	
REF									

NOTES

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
2. DIMENSIONS ARE IN MILLIMETERS.
3. (△) CONTACT BALL DESIGNATION PER JESD 95-1, SPP-010.
4. SYMBOL "e" REPRESENTS THE SOLDER BALL GRID PITCH.
5. SYMBOL "MD" IS THE BALL MATRIX SIZE IN THE "D" DIRECTION.
   SYMBOL "ME" IS THE BALL MATRIX SIZE IN THE "E" DIRECTION.
6. SYMBOL "N" REPRESENTS THE MAXIMUM ALLOWABLE NUMBER OF CONTACT BALLS FOR MATRIX SIZE.
7. (△) 6 X 6 MATRIX PATTERN IS SHOWN FOR ILLUSTRATION ONLY.
8. (△) PRIMARY DATUM C AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE CONTACT BALLS.
9. (△) DIMENSION "A" INCLUDES STANDOFF HEIGHT "A1", PACKAGE BODY THICKNESS, BUT DOES NOT INCLUDE ATTACHED FEATURES, E.G., EXTERNAL HEAT SINK OR CHIP CAPACITOR. AN INTEGRAL HEATSLUG IS NOT CONSIDERED AN ATTACHED FEATURE.
10. (△) DIMENSION "b" IS MEASURED AT THE MAXIMUM BALL DIAMETER, PARALLEL TO PRIMARY DATUM C.
11. (△) BALL A1 CORNER MUST BE IDENTIFIED ON THE TOP SURFACE BY CHAMFER, INK MARK, METALLIZED MARKING, INDENTATION, OR OTHER MEANS ON THE PACKAGE BODY, LID OR INTEGRAL HEATSLUG.
12. (△) DIMENSIONS "SD" AND "SE" ARE MEASURED WITH RESPECT TO DATUMS A AND B AND DEFINE THE POSITION OF THE CENTER CONTACT BALL IN THE OUTER ROW. WHEN THERE IS AN ODD NUMBER OF CONTACT BALLS IN THE OUTER ROW PARALLEL TO THE D OR E DIMENSION, RESPECTIVELY, SD OR SE = 0.00. WHEN THERE IS AN EVEN NUMBER OF SOLDER BALLS IN THE OUTER ROW, SD OR SE = e/2.
13. (△) SOLDER BALL ARRAY MAY BE DEPOPULATED IN ANY PATTERN. DEPOPULATING IS THE OMISSION OF BALLS FROM A FULL MATRIX.