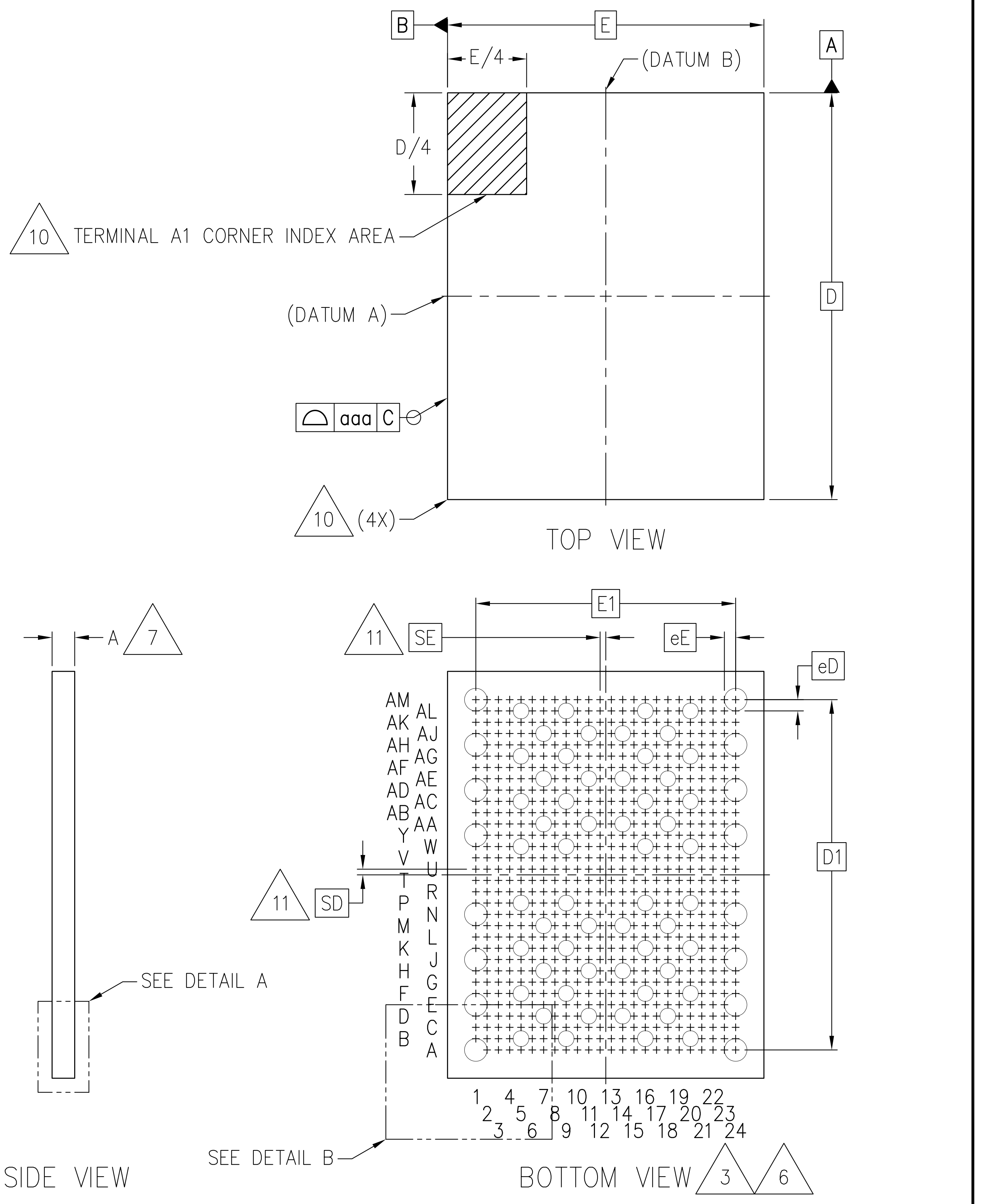
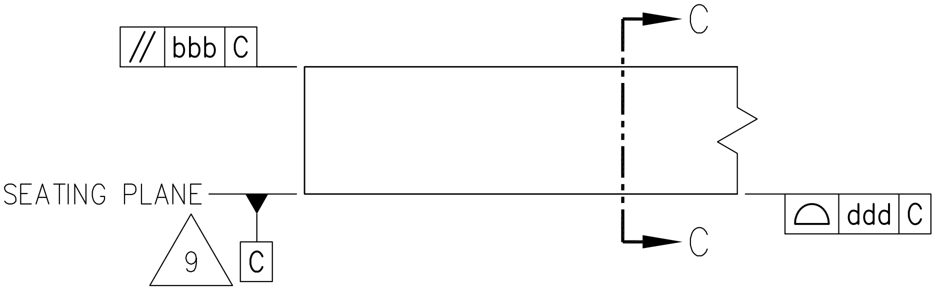


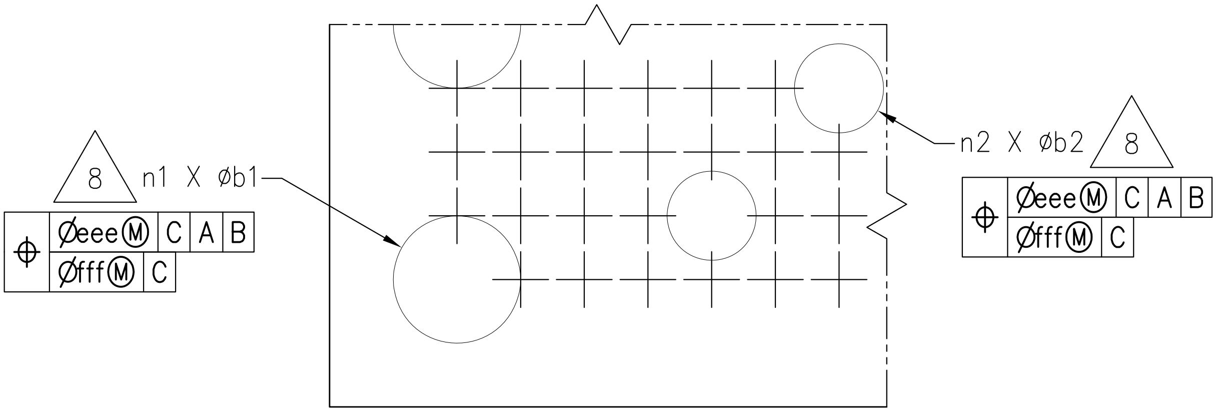
JEDEC SOLID STATE PRODUCT OUTLINE

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
LAND GRID ARRAY FAMILY, RECTANGULAR, 0.50 mm PITCH	(U, W, V, T, L) FR-PLGA	B	03/12	MO-303	1 OF 7



DETAIL A
(ROTATED 90° CW)



DETAIL B

TYPE 1 – SMD
(SOLDER MASK DEFINED)

TYPE 2 – NSMD
(NON SOLDER MASK DEFINED)

SECTION C–C

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TABLE 1

COMMON DIMENSIONS									
SYMBOL	U: ULTRA THIN PROFILE			W: VERY VERY THIN PROFILE			V: VERY THIN PROFILE		
	MIN	NOM	MAX	MIN	NOM	MAX	MIN	NOM	MAX
A	–	–	0.65	–	–	0.80	–	–	1.00
A1	0.01	–	0.04	0.01	–	0.04	0.01	–	0.04
b1	0.95	1.00	1.05	0.95	1.00	1.05	0.95	1.00	1.05
b2	0.65	0.70	0.75	0.65	0.70	0.75	0.65	0.70	0.75
NOTES	1, 2			1, 2			1, 2		
REF	11–817			11–857			11–817		
ISSUE	A			B			A		

TABLE 1

COMMON DIMENSIONS						
SYMBOL	T: THIN PROFILE			L: LOW PROFILE		
	MIN	NOM	MAX	MIN	NOM	MAX
A	–	–	1.20	–	–	1.70
A1	0.01	–	0.04	0.01	–	0.04
b1	0.95	1.00	1.05	0.95	1.00	1.05
b2	0.65	0.70	0.75	0.65	0.70	0.75
NOTES	1, 2			1, 2		
REF	11–857			11–817		
ISSUE	B			A		

TABLE 2:

TOLERANCE OF FORM AND POSITION	
SYMBOL	VALUE
aaa	0.10
bbb	0.10
ddd	0.10
eee	0.15
fff	0.08
NOTES	1, 2
REF	11-817
ISSUE	A

TABLE 3

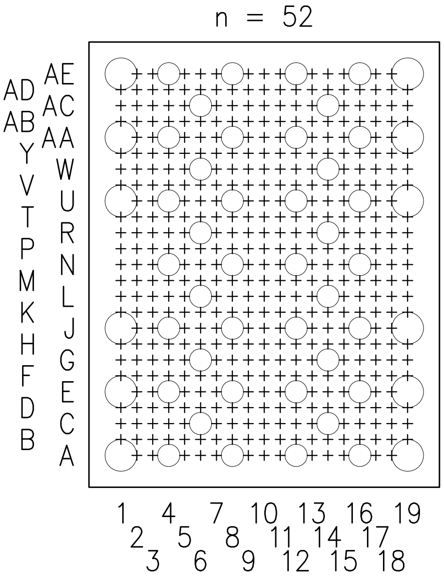
VARIATION DESIGNATORS						
1ST CHARACTER SYMBOL		2ND CHARACTER SYMBOL		3RD CHARACTER SYMBOL		4TH CHARACTER SYMBOL
PROFILE HEIGHT, A(MAX)		BODY SIZE, D		BODY SIZE, E		FOOTPRINT
0.65	U	14.00	A	10.00	A	
0.80	W	15.00	B	11.00	B	
1.00	V	16.00	C	12.00	C	
1.20	T	17.00	D	13.00	D	
1.70	L	18.00	E	14.00	E	
NOTES	1, 2					
REF	11-857					
ISSUE	B					

TABLE 4

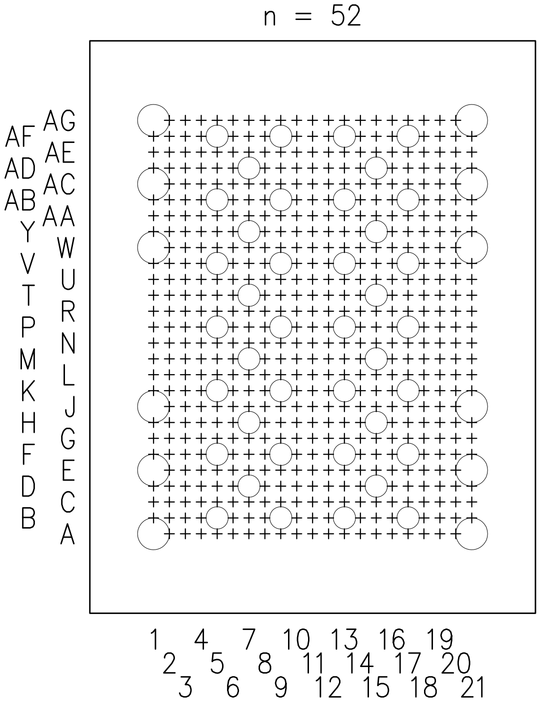
$\boxed{eD}$ & $\boxed{eE}$ = 0.50				
VARIATIONS SYMBOLS	UABA	UDCB	UEEB	UDCC
	WABA	WDCB	WEEB	WDCC
	VABA	VDCB	VEEB	VDCC
	TABA	TDCB	TEEB	TDCC
	LABA	LDCB	LEEB	LDCC
D	14.00	17.00	18.00	17.00
D1	12.00	13.00	13.00	13.00
E	11.00	12.00	14.00	12.00
E1	9.00	10.00	10.00	10.00
MD	25	27	27	27
ME	19	21	21	21
SD	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00
n1	12	12	12	14
n2	40	40	40	46
n	52	52	52	60
FOOTPRINT	A	B	B	C
NOTES	1, 2			
REF	11-857	11-857	11-857	11-857
ISSUE	B	B	B	B

NOTE: VARIATIONS (U,V,L)DCB WERE VARIATIONS (U,V,L)AA IN MO-303A
NOTE: VARIATIONS (U,V,L)EEB WERE VARIATIONS (U,V,L)BB IN MO-303A

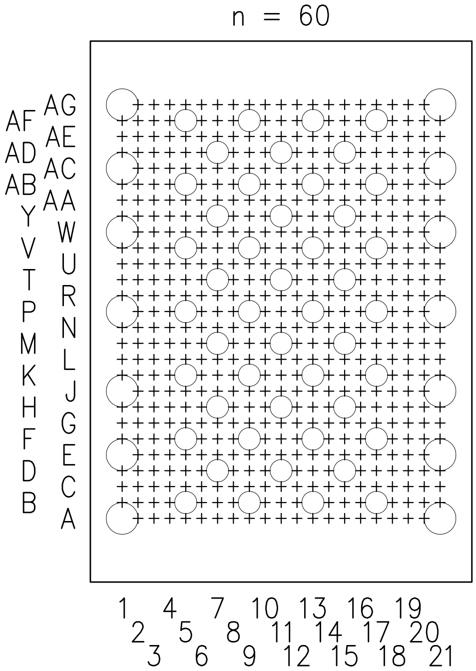
JEDEC SOLID STATE PRODUCT OUTLINE Copyright © 2012 JEDEC	TITLE LAND GRID ARRAY FAMILY, RECTANGULAR, 0.50 MM PITCH	ISSUE B	DATE 03/12	MO-303	SHEET 5 OF 7



FOOTPRINT A 3



FOOTPRINT B 3



FOOTPRINT C 3

12 + = DEPOPULATED LAND POSITIONS

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5–2009.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. LAND POSITION DESIGNATOR PER JEP95, SECTION 3, SPP–020.
4. MD AND ME REPRESENT THE MATRIX SIZE CORRESPONDING TO THE D AND E DIRECTIONS RESPECTIVELY.
5. n REPRESENTS THE NUMBER OF LANDS FOR EACH VARIATION.
6. A DEPOPULATED 24 X 32 MATRIX SIZE IS SHOWN FOR ILLUSTRATION ONLY.
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 ”b1” AND ”b2” ARE MEASURED AT THE MAXIMUM LAND DIAMETER PARALLEL TO PRIMARY DATUM C.
9. PRIMARY DATUM C (SEATING PLANE) IS DEFINED BY THE PLANE ESTABLISHED BY THE CONTACT POINTS OF THREE OR MORE SOLDER LANDS THAT SUPPORT THE DEVICE WHEN IT IS PLACED ON TOP OF A PLANAR SURFACE.
10. THE CORNER A1 MUST BE IDENTIFIED ON BOTH THE BOTTOM AND TOP SIDES OF THE PACKAGE, THE IDENTIFICATION FEATURE CAN BE MADE USING INK OR METALIZED MARKINGS, INDENTATIONS, OR OTHER FEATURES. THE EXACT SHAPE OF EACH CORNER IS OPTIONAL.
11. DIMENSIONS ‘SD’ AND ’SE’ ARE MEASURED WITH RESPECT TO DATUM A AND DATUM B AND DEFINE THE POSITION OF THE CENTER LAND IN THE OUTER ROW.
WHEN THERE IS AN ODD NUMBER OF LANDS IN THE OUTER ROW ‘SD’ OR ‘SE’ = 0
WHEN THERE IS AN EVEN NUMBER OF LANDS IN THE OUTER ROW,
‘SD’ = eD/2 AND ‘SE’ = eE/2.
12. LAND DEPOPULATION IS ALLOWED. DEPOPULATION IS THE OMISSION OF SOLDER LANDS FROM A FULL MATRIX (MD, ME).
13. SOLDERABLE SURFACE MAY BE DEFINED BY AN OPENING IN THE SOLDER RESIST LAYER (TYPE 1) OR BY THE SIZE OF A METALIZED 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/b2 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: OCT 2011	ITEM NUMBER: 11-817

CHANGE RECORD HISTORY:

ISSUE: B	DATE: FEB 2012	ITEM NUMBER: 11-857

LOCATION	CHANGED FROM:	CHANGED TO:
SHEET 1	TOP & FRONT VIEW	UPDATED TO JEDEC STANDARD COMBINED SHEET 1 & 2
SHEET 2	BOTTOM VIEW ONLY	BOTTOM VIEW TO PAGE 1 DETAIL A & B SECTION G -G
SHEET 3	SECTION G-G	TABLE 1, COMMON DIM SYMBOLS W & T
SHEET 4	TABLE 1, VAR DESIGNATORS TABLE 2, COMMON DIM TABLE 3, RECTANGULAR VAR	TABLE 2, FORM & POSITION TABLE 3, VAR DESIGNATORS ADDED W & T PROFILE HT
SHEET 5	TABLE 4, FORM & POSITION	TABLE 4, VAR SYMBOLS
SHEET 6	NOTES	ADDED FOOTPRINTS A, B, & C
SHEET 7	REVISION HISTORY	NOTES, UPDATED TO STANDARD JEDEC NOTES
SHEET i		REVISION HISTORY

ISSUE:	DATE:	ITEM NUMBER:

LOCATION	CHANGED FROM:	CHANGED TO:

JEDEC SOLID STATE PRODUCT OUTLINE	TITLE	ISSUE	DATE		SHEET
	LAND GRID ARRAY FAMILY, RECTANGULAR, 0.50 MM PITCH	B	03/12	MO-303	i