

THAT ANY
T ARE ADDED
D BE ADDED
ONDING LOWER

Diagram illustrating the TOP VIEW of a rectangular feature. The overall width is labeled E and the overall height is labeled D . A corner feature is defined by a square with side length $E/4$ and $D/4$, indicated by dashed lines. This corner is shaded with diagonal lines and labeled "11" (INDEX AREA). A feature is located at the top center, consisting of a semi-circular shape (radius $E/4$) followed by a rectangular section labeled "aaa" and "C". This feature is associated with datum "A" (indicated by a circle with a dot) and datum "B" (indicated by a circle with a dot). The feature is also labeled "E" and "B". The feature is also labeled "D" and "A". The feature is also labeled "D" and "A".

11

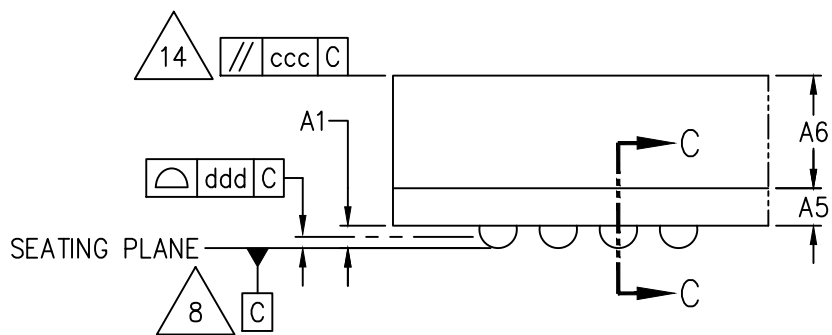
11 (4X)

TOP VIEW

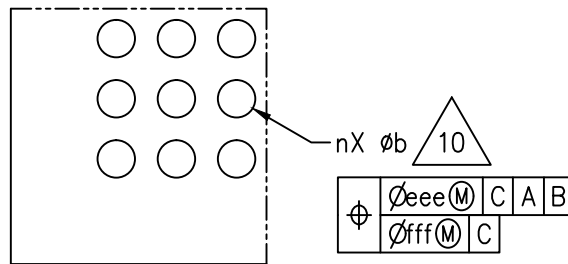


THIS *REGISTERED OUTLINE* HAS BEEN PREPARED BY THE JEDEC JC-11 COMMITTEE AND REFLECTS A PRODUCT WITH ANTICIPATED USAGE IN THE ELECTRONICS INDUSTRY; CHANGES ARE LIKELY TO OCCUR.

SHEET
1 OF 8

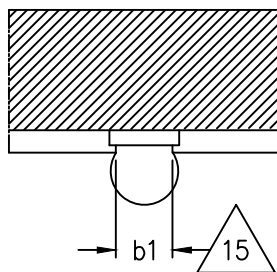


DETAIL A
(ROTATED 90° CW)

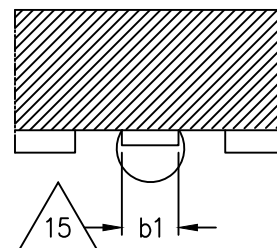


DETAIL B

TYPE 1 – SMD
(SOLDER MASK DEFINED)



TYPE 2 – NSMD
(NON SOLDER MASK DEFINED)



SECTION C-C

TABLE 1

COMMON DIMENSIONS									
VARIATION	P = PACKAGE PROFILE HEIGHT								
	60			70			80		
SYMBOL	MIN	NOM	MAX	MIN	NOM	MAX	MIN	NOM	MAX
A	> 0.50	----	0.60	> 0.60	----	0.70	> 0.70	----	0.80
A2	—	—	0.48	—	—	0.58	—	—	0.68
A5	OPTIONAL – DESIGN SPECIFIC								
A6	OPTIONAL – DESIGN SPECIFIC								
e	0.40 BASIC								
NOTES	1, 2, 9			1, 2, 9			1, 2, 9		
REF	11-929, 11-941E			11-929, 11-941E			11-929, 11-941E		
ISSUE	A.01			A.01			A.01		

TABLE 1 CONTINUED

COMMON DIMENSIONS									
VARIATION	P = PACKAGE PROFILE HEIGHT								
	90			100			----		
SYMBOL	MIN	NOM	MAX	MIN	NOM	MAX	MIN	NOM	MAX
A	> 0.80	----	0.90	> 0.90	----	1.00	----	----	----
A2	—	—	0.78	—	—	0.88	----	----	----
A5	OPTIONAL – DESIGN SPECIFIC								
A6	OPTIONAL – DESIGN SPECIFIC								
e	0.40 BASIC								
NOTES	1, 2, 9			1, 2, 9			—		
REF	11-929, 11-941E			11-929, 11-941E			11-929, 11-941E		
ISSUE	A.01			A.01			A.01		


TABLE 2

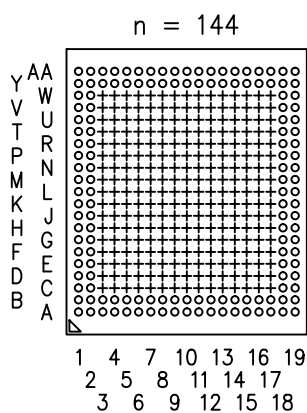
COMMON DIMENSIONS			
SYMBOL		(b) SOLDER BALL DIAMETER	
		MIN	MAX
A1		0.12	---
b		0.20	0.30
b1	TYPE 1	0.20	---
	TYPE 2	0.20	---
NOTES		1, 2	
REF		11-929	
ISSUE		A	

TABLE 3

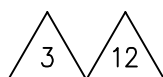
TOLERANCE OF FORM AND POSITION		
SYMBOL	VALUE	
	b NOM = 0.25	
aaa	0.10	
ccc	0.20	
ddd	D OR E	
	≤10.00	0.08
	>10.00, <14.00	0.10
	≥14.00	0.12
eee	0.15	
fff	0.05	
NOTES	1, 2	
REF	11–929	
ISSUE	A	

TABLE 4

NEW VARIATION		OLD VARIATION	D BASIC	E BASIC	D1 BASIC	E1 BASIC	MD	ME	SD BASIC	SE BASIC	n	N	FOOT PRINT	REF	ISSUE
P9.5X8.0-LN-144A		---	9.50	8.00	8.00	7.20	21	19	0.00	0.00	144	399	A	11-929	A
		NOTES	2	2	2	2	5	5	2, 12	2, 12	6, 13	6	13		



FOOTPRINT A



+ = DEPOPULATED BALL POSITIONS

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5–2009.
THIS OUTLINE CONFORMS TO JEP95, SECTION 4.22.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
- 3 SOLDER BALL POSITION DESIGNATIONS PER JEP95, SECTION 3, SPP–010.
4. "e" REPRESENT THE SOLDER BALL GRID PITCH.
5. MD AND ME REPRESENT THE MAXIMUM MATRIX SIZE CORRESPONDING TO THE D AND E DIRECTIONS, RESPECTIVELY.
6. n REPRESENTS THE ACTUAL NUMBER OF SOLDER BALLS AFTER DEPOPLUATION.
N REPRESENTS THE MAXIMUM NUMBER OF SOLDER BALLS FOR A FULL MATRIX, MD X ME.

7 A DEPOPULATED 36 X 40 MATRIX SIZE IS SHOWN FOR ILLUSTRATION ONLY.

8 PRIMARY DATUM C (SEATING PLANE) IS DEFINED BY THE PLANE ESTABLISHED BY THE CONTACT POINTS OF THREE OR MORE SOLDER BALLS THAT SUPPORT THE DEVICE WHEN IT IS PLACED ON TOP OF A PLANAR SURFACE.

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

10 DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER PARALLEL TO PRIMARY DATUM C.

11 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.

12 DIMENSIONS SD AND SE ARE MEASURED WITH RESPECT TO DATUM A AND DATUM B AND DEFINE THE POSITION OF THE CENTER SOLDER BALL IN THE OUTER ROW.
WHEN THERE IS AN ODD NUMBER OF SOLDER BALLS IN THE OUTER ROW SD OR SE = 0
WHEN THERE IS AN EVEN NUMBER OF SOLDER BALLS IN THE OUTER ROW,
SD = $eD/2$ AND SE = $eE/2$.

13 SOLDER BALL DEPOPULATION IS ALLOWED. DEPOPULATION IS THE OMISSION OF SOLDER BALLS FROM A FULL MATRIX (MD, ME).

14 PARALLELISM (ccc) APPLIES ONLY TO THE SURFACE DIRECTLY ABOVE THE DIE AREA FOR GLOB TOP, OVER MOLDED AND / OR FLIP CHIP CONFIGURATIONS. THE PARALLELISM SPECIFICATION WILL NOT APPLY TO ANY FILLET OR SLOPED REGION OF THE ENCAPSULANT.

15 THE SOLDERABLE SURFACE MAY BE DEFINED BY AN OPENING IN THE SOLDER RESIST LAYER. IT MAY BE ELLIPTICAL, PROVIDED THE RATIO OF MAJOR TO MINOR AXIS IS NO GREATER THAN 2/1, AND THE SURFACE AREA IS NO LESS THAN THE MINIMUM FOR A CIRCULAR PAD.



EXPLANATION OF VARIATION SCHEME.

PDD.DxEE.E–eb–nF

P = PACKAGE PROFILE HEIGHT CODE (DIMENSION A).

CONTINUES AS PER SPP–025

140 = $1.30 < A \leq 1.40$

130 = $1.20 < A \leq 1.30$

120 = $1.10 < A \leq 1.20$

110 = $1.00 < A \leq 1.10$

100 = $0.90 < A \leq 1.00$

090 = $0.80 < A \leq 0.90$

080 = $0.70 < A \leq 0.80$

070 = $0.60 < A \leq 0.70$

CONTINUES AS PER SPP–025

DD.D = PACKAGE BODY SIZE IN THE D DIMENSION (Y AXIS) TO 1 DECIMAL PLACE.

EE.E = PACKAGE BODY SIZE IN THE E DIMENSION (X AXIS) TO 1 DECIMAL PLACE.

EXAMPLE: D = 55.00 mm TO BE LISTED AS 55.0

D = 5.50 mm TO BE LISTED AS 5.5.

e = BALL PITCH PER THE FOLLOWING CODES.

A = FUTURE NEW BALL PITCH.

B = FUTURE NEW BALL PITCH.

C = 1.50 mm

D = 1.27 mm

E = 1.00 mm

F = 0.80 mm

G = 0.75 mm

H = 0.65 mm

J = FUTURE NEW PITCH

K = 0.50 mm

L = 0.40 mm

b = NOMINAL BALL DIAMETER.

A = FUTURE NEW BALL DIAMETER.

B = FUTURE NEW BALL DIAMETER.

C = 0.75 mm

D = 0.70 mm

E = 0.65 mm

F = 0.60 mm

G = 0.55 mm

H = 0.50 mm

J = 0.45 mm

K = 0.40 mm

L = 0.35 mm

M = 0.30 mm

N = 0.25 mm

P = 0.20 mm

R = 0.17 mm

n = ACTUAL SOLDER BALL COUNT.

F = FOOTPRINT LETTER.

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: AUGUST 2016	ITEM NUMBER: 11-929
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CHANGE RECORD HISTORY:

ISSUE: A.01	DATE: MARCH 2017	ITEM NUMBER: 11-941E
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LOCATION:	CHANGED FROM:	CHANGED TO:
SHEET 1, BOTTOM VIEW	FULLY POPULATED	DEPOPULATED
SHEETS 2 AND 3		ADDED DIMENSIONS A5 AND A6
SHEET 7, NOTE 7	...FULLY POPULATED...	...DEPOPULATED...