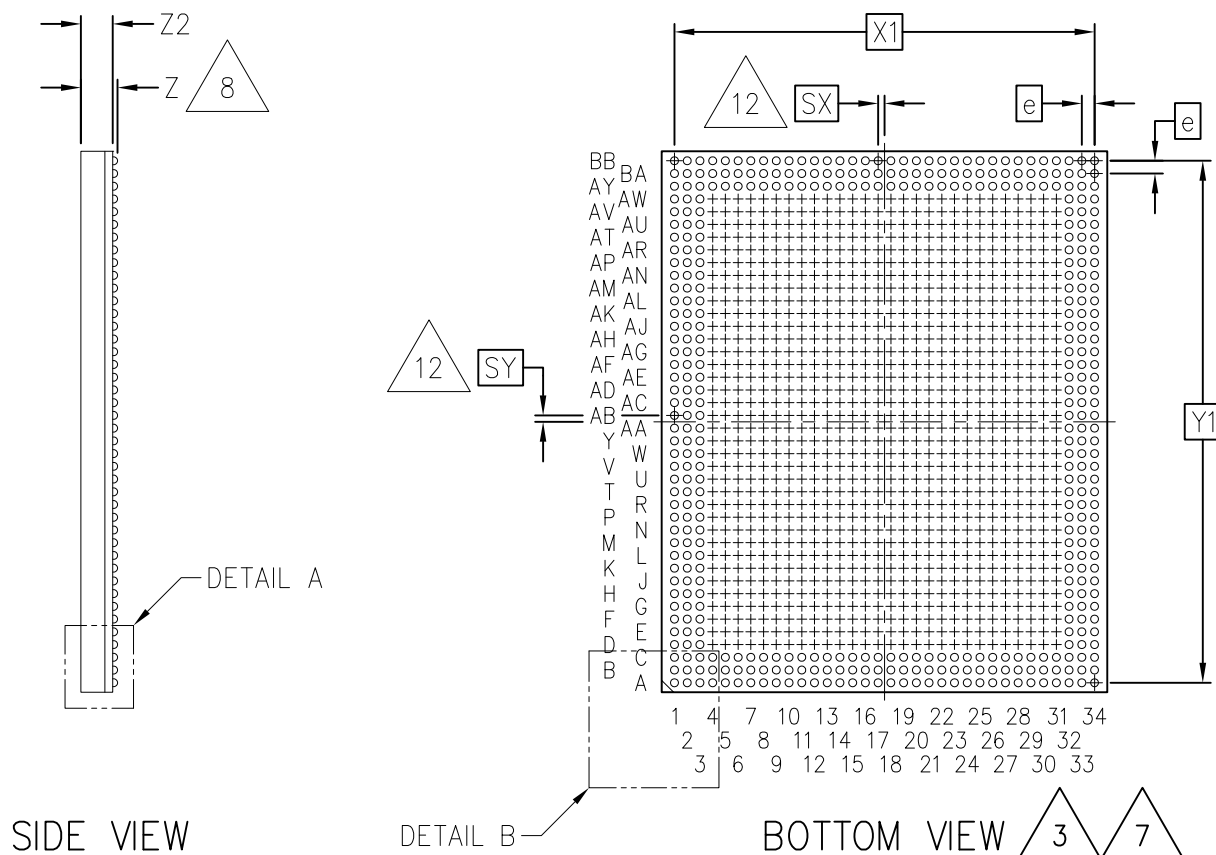
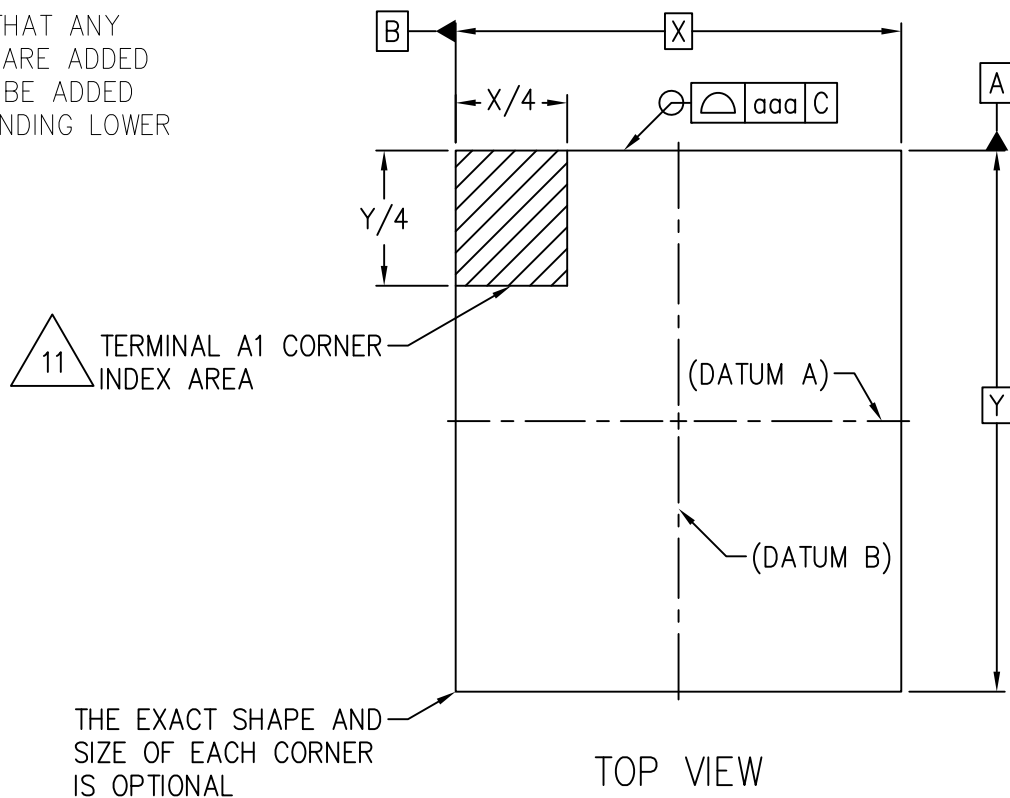
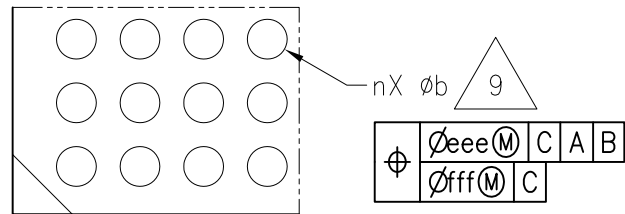
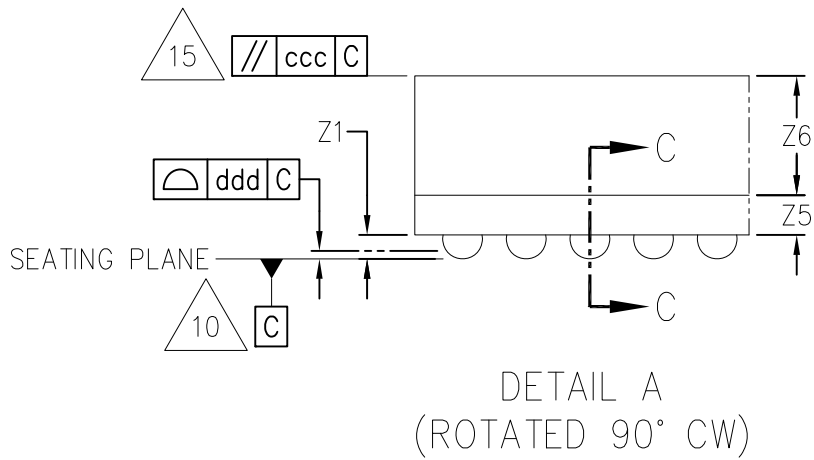


IT IS REQUESTED THAT ANY FOOTPRINTS THAT ARE ADDED TO THIS MO ALSO BE ADDED TO THE CORRESPONDING LOWER POP PACKAGE.

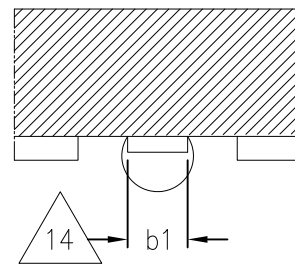
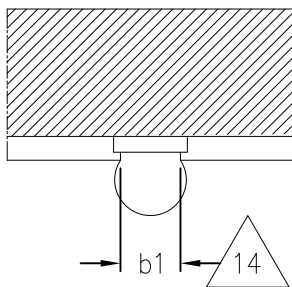




DETAIL B

TYPE 1 – SMD  
(SOLDER MASK DEFINED)

TYPE 2 – NSMD  
(NON SOLDER MASK DEFINED)



SECTION C-C

TABLE 1

COMMON DIMENSIONS		
SYMBOL		
Z		PACKAGE SPECIFIC
Z2	$b(\text{NOM}) = 0.250$	$Z2(\text{MAX}) = Z(\text{MAX}) - Z1$
Z5		OPTIONAL – PACKAGE SPECIFIC
Z6		OPTIONAL – PACKAGE SPECIFIC
e		0.40 BASIC
NOTES		2, 8
REF		11–976, 11–1035
ISSUE		B

TABLE 2


COMMON DIMENSIONS				
SYMBOL		(b) SOLDER BALL DIAMETER		
		MIN	NOM	MAX
Z1		PACKAGE SPECIFIC	---	---
b		0.175	0.250	0.325
	TYPE 1	0.16	---	---
	TYPE 2	0.16	---	---
NOTES		1, 2, 17		
REF		11-976, 11-1035		
ISSUE		B		

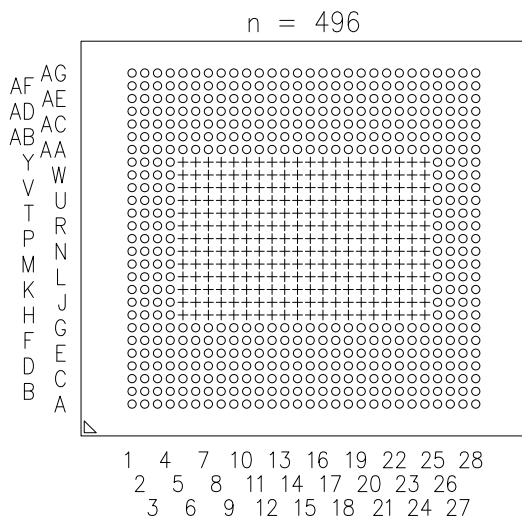
TABLE 3

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	11–976	
ISSUE	A	

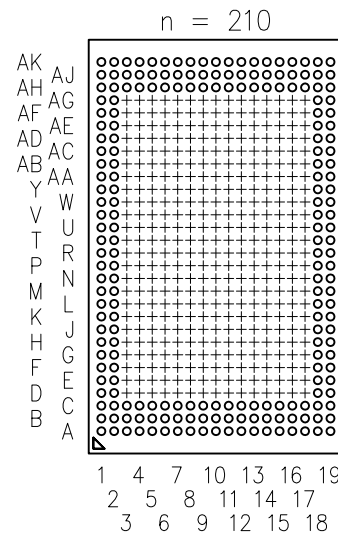
$$b1 = b(\text{NOM}) * 0.667$$

TABLE 4

øb = 0.25MM NOMINAL													
VARIATION 	X BASIC	Y BASIC	X1 BASIC	Y1 BASIC	MX	MY	SX BASIC	SY BASIC	n	N	TERMINAL PATTERN	REF	ISSUE
PBGA–B496[756]_I0p40– R14p0x12p4Z#–C0p25Z0p12	14.00	12.40	10.80	10.40	28	27	0.20	0.00	496	756	A	11–976	A
PBGA–B210[570]_I0p40– R8p0x13p0Z#–C0p25Z#	8.00	13.00	7.20	11.60	19	30	0.00	0.20	210	570	B	11–1035	B
	2	2	2	2	5	5	2, 12	2, 12	6, 13	6	13		



TERMINAL PATTERN A



TERMINAL PATTERN B

TERMINAL PATTERN A IS NON STANDARD  
AND SHOULD NOT BE USED FOR  
ADDITIONAL PACKAGE SIZES



+ = 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 DESIGNATION PER JEP95 SECTION 3, SPP–010.
4.  $e$  REPRESENT THE SOLDER BALL GRID PITCH.
5. MX AND MY REPRESENT THE MAXIMUM MATRIX SIZE CORRESPONDING TO THE X AND Y 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, MX X MY.

7 A DEPOPULATED 34 X 42 MATRIX SIZE IS SHOWN FOR ILLUSTRATION ONLY.

8 DIMENSION Z INCLUDES STANDOFF HEIGHT Z1, PACKAGE BODY THICKNESS HEIGHT, BUT DOES NOT INCLUDE ATTACHED FEATURES, e.g. EXTERNAL HEAT SINK. AN INTEGRAL HEAT SLUG IS NOT CONSIDERED AN ATTACHED FEATURE.

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

10 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.

11 THE TERMINAL 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 SX AND SY ARE MEASURED WITH RESPECT TO DATUM A AND DATUM B AND DEFINE THE POSITION OF THE CENTER SOLDER BALL. WHEN THERE IS AN ODD NUMBER OF SOLDER BALLS IN THE OUTER ROW SX OR SY = 0.00. WHEN THERE IS AN EVEN NUMBER OF SOLDER BALLS, SX AND SY =  $e/2$ .

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

14 THE 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 AXIS 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  $b_1$  AREA.



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



SEE JESD30 FOR EXPLANATION OF VARIATION SCHEME.

17. THE Z1 HEIGHT NEEDS TO BE ACCEPTABLE TO MANUFACTURING STANDARDS.



STP (3D) FILE RECORD  
3D FILE NAMES MAY EXCEED LENGTH REQUIREMENTS FOR SOME SOFTWARE TOOLS.

STP FILE NAME	DATE	ITEM NUMBER
MO-344A_PBGA-B496[756]_I0p40-R14p0x12p4Z#-C0p25Z0p12	AUG 2020	11-976
MO-344B_PBGA-B210[570]_I0p40-R8p0x13p0Z#-C0p25Z#	AUG 2023	11-1035

## TASK GROUP CONTRIBUTORS

SAMSUNG

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 2020	ITEM NUMBER: 11-976
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CHANGE RECORD HISTORY:
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ISSUE: B	DATE: AUGUST 2023	ITEM NUMBER: 11-1035
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LOCATION:	CHANGED FROM:	CHANGED TO:
SHEET 3	$Z2(\text{MAX}) = Z(\text{MAX}) - Z1(0.10)$	$Z2(\text{MAX}) = Z(\text{MAX}) - Z1$
SHEET 4, TABLE 2	$Z1 = 0.10$	$Z1 = \text{PACKAGE SPECIFIC}$
		ADDED NOTE 17
		MOVED b1 = $b(\text{NOM}) * 0.667$ TO BOTTOM OF PAGE
SHEET 5		ADDED VARIATION PBGA-B210[570]_I0p40- R8p0x13p0Z#-C0p25Z#
SHEET 6		ADDED TERMINAL PATTERN B
SHEET 8		ADDED NOTE 17