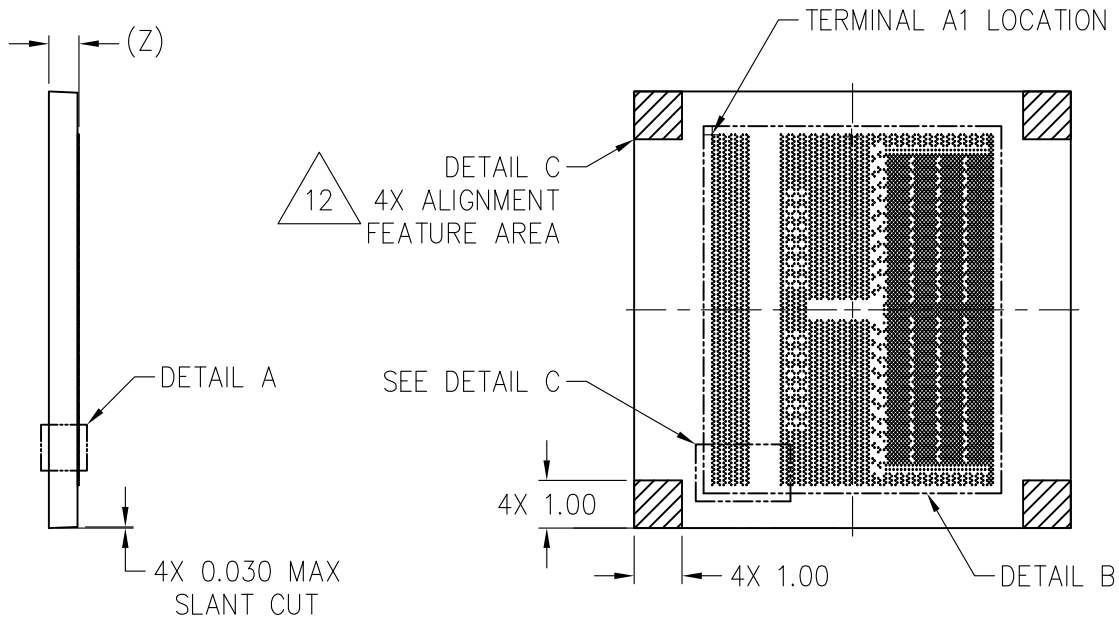


TOP VIEW



SIDE VIEW

BOTTOM VIEW

JEDEC SOLID STATE  
PRODUCT OUTLINE  
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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 SILICON BOTTOM GRID  
ARRAY COLUMN, 0.048MM X 0.055MM  
PITCH SQUARE PACKAGE

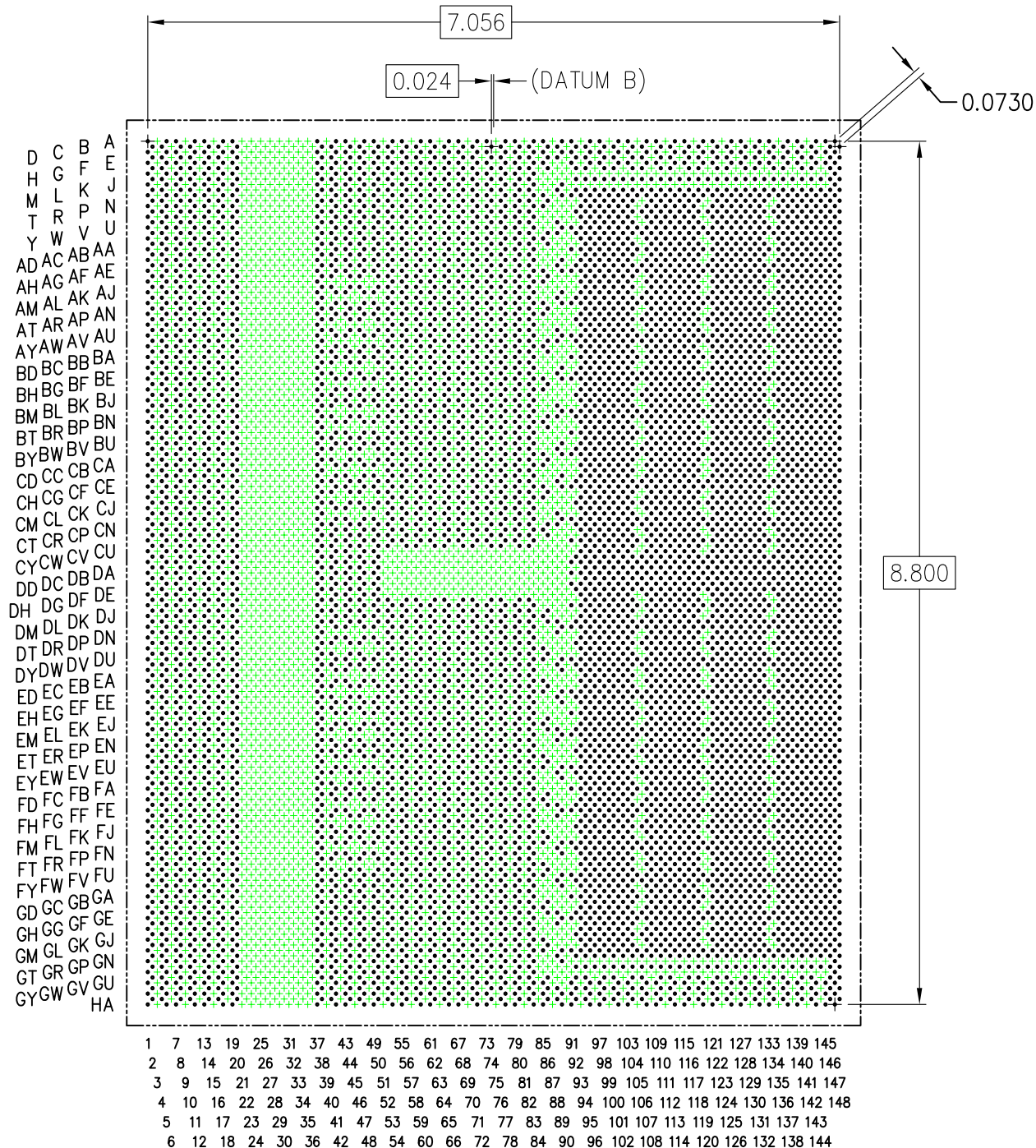
PACKAGE DESIGNATOR  
SBGA-M7775[23828]  
\_D0p073...

NUMBER  
MO-349

ISSUE  
A.01

DATE  
AUG 2022

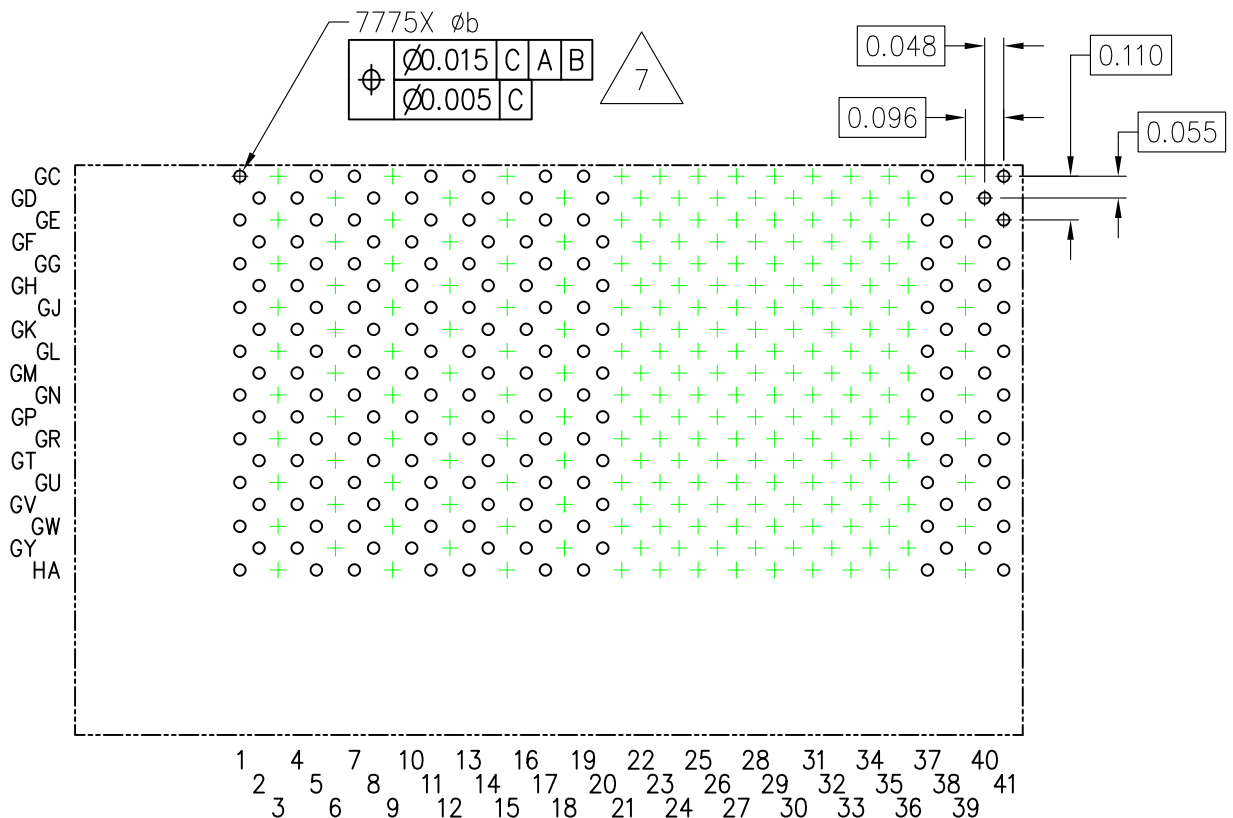
SHEET  
1 OF 9



DETAIL B



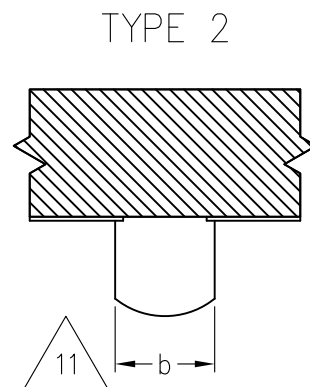
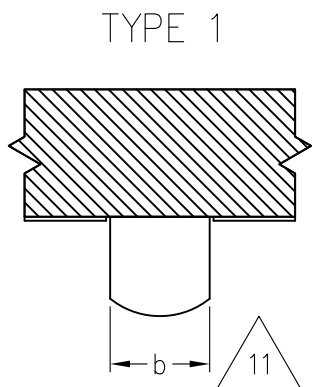
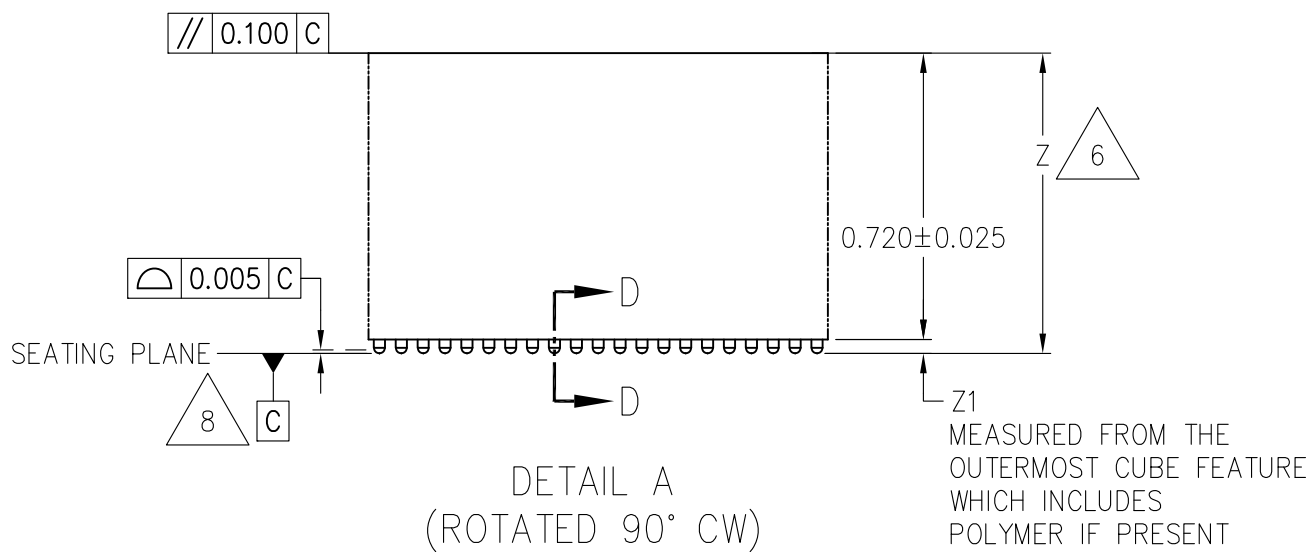
+ = DEPOPULATED TERMINAL POSITIONS



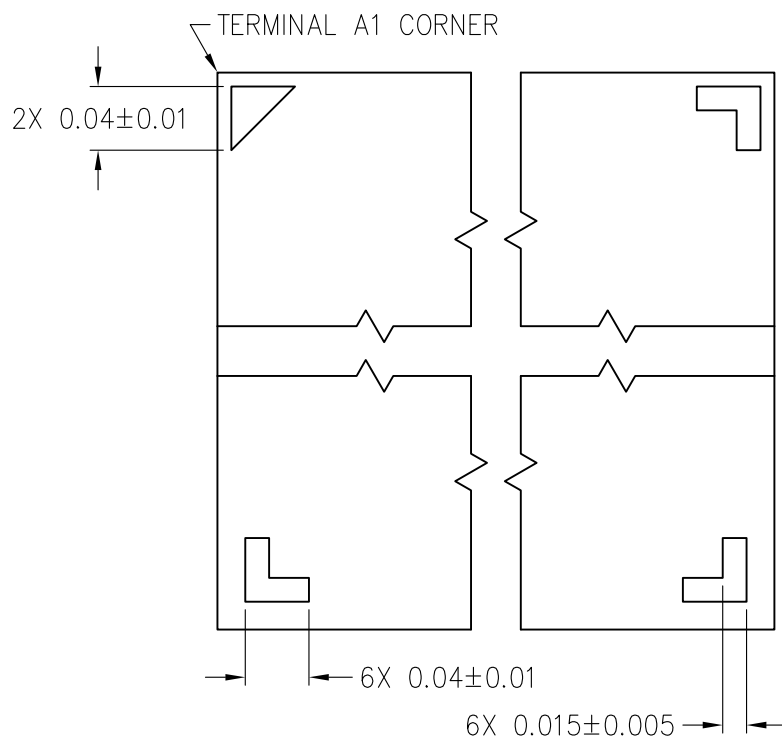
DETAIL C



+ = DEPOPULATED TERMINAL POSITIONS



SECTION D-D




DETAIL C 

TABLE 1

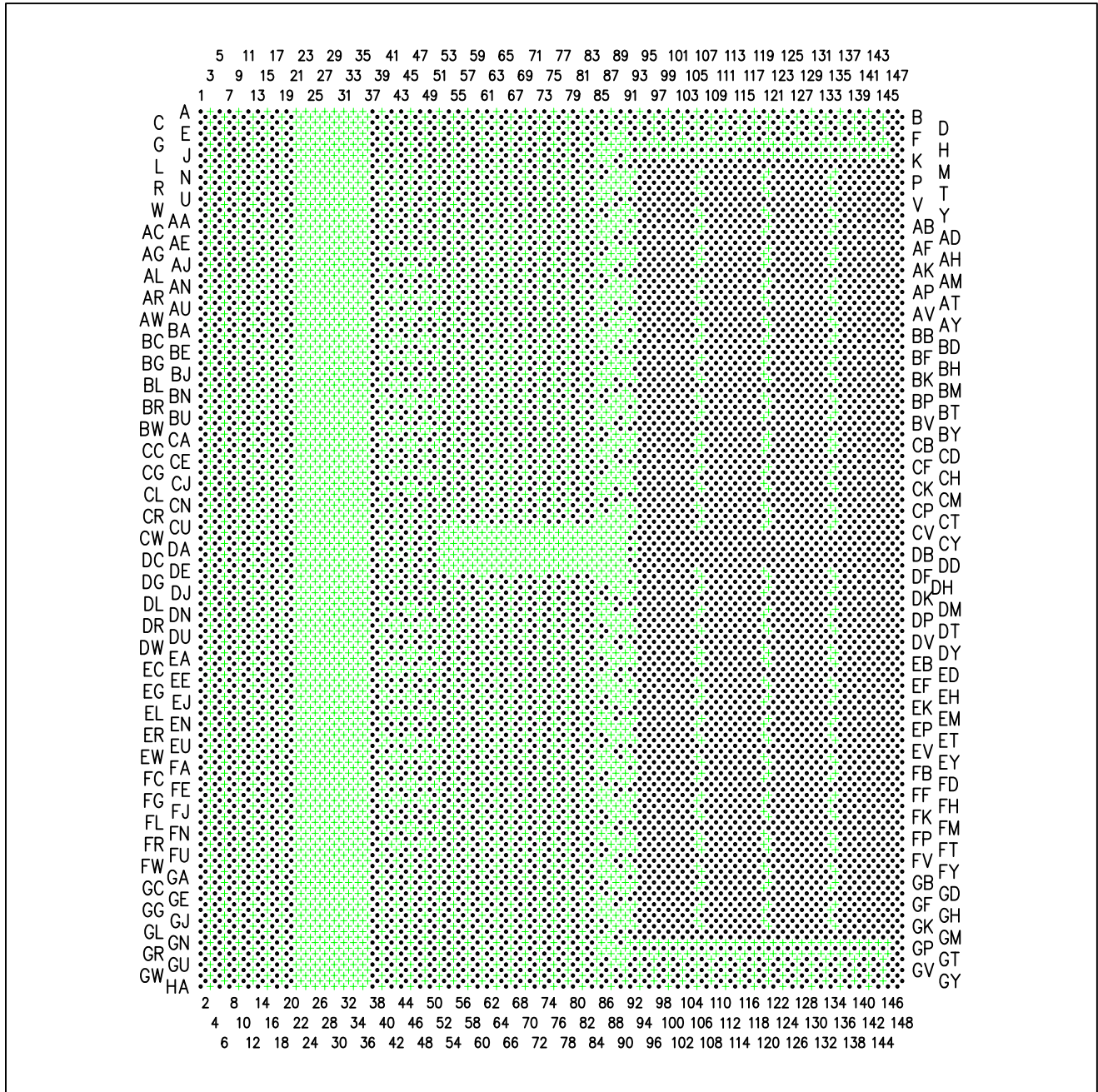
COMMON DIMENSIONS										
SYMBOL		(b) PILLAR DIAMETER								
		MIN	NOM	MAX	MIN	NOM	MAX	MIN	NOM	MAX
Z		0.730	0.755	0.780	----	----	----	----	----	----
Z1		0.030	0.035	0.040	----	----	----	----	----	----
b		0.025	0.028	0.032	----	----	----	----	----	----
b1	TYPE1	0.031	----	----	----	----	----	----	----	----
	TYPE2	0.031	----	----	----	----	----	----	----	----
NOTES		2, 9			—			—		
REF		4—996			—			—		
ISSUE		A			—			—		

TABLE 2

$\phi b = 0.028$ NOMINAL									
NEW VARIATION 	X BASIC	Y BASIC	MX	MY	n	N	TERMINAL PATTERN	REF	ISSUE
SBGA-M7775[23828]_D0p073- R10p975x10p975Z7p8-C0p032Z0p03	10.975	10.975	148	161	7775	23828	A	4-996	A
NOTES	2	2	5	5	6, 13	6	13		

# SEE JESD238 HIGH BANDWIDTH MEMORY (HBM3)

7775 TERMINALS



TERMINAL PATTERN A



+ = DEPOPULATED TERMINAL POSITIONS



## NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5–2009.  
THIS OUTLINE CONFORMS TO JEP95, SECTION 4.26.

2. ALL DIMENSIONS ARE IN MILLIMETERS.



3. TERMINAL POSITION DESIGNATION PER JEP95 SECTION 3, SPP–010.

4. MX AND MY REPRESENT THE MAXIMUM MATRIX SIZE CORRESPONDING TO THE X AND Y DIRECTIONS RESPECTIVELY.

5. n REPRESENTS THE ACTUAL NUMBER OF TERMINAL COLUMNS AFTER DEPOPLUATION.  
N REPRESENTS THE MAX. NUMBER OF TERMINAL COLUMNS FOR A FULL MATRIX, MX X MY.



6. DIMENSION Z INCLUDES STAND–OFF HEIGHT Z1 AND PACKAGE BODY THICKNESS  $0.720 \pm 0.025$ , BUT DOES NOT INCLUDE ATTACHED FEATURES, e.g., EXTERNAL HEATSINK. AN INTEGRAL HEATSLUG IS NOT CONSIDERED AN ATTACHED FEATURE.



7. DIMENSION "b" IS MEASURED AT THE MAXIMUM TERMINAL COLUMN DIAMETER PARALLEL TO PRIMARY DATUM C.



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



9. THE TERMINAL A1 CORNER SHOULD BE IDENTIFIED ON BOTH THE BOTTOM AND TOP SIDES OF THE PACKAGE, THE IDENTIFICATION FEATURE CAN BE MADE USING INK, METALIZED MARKINGS, OR OTHER FEATURES. DUE TO PACKAGE PROCESSING, THE TOP FEATURE MAY NOT BE PRESENT.



10. TERMINAL COLUMN DEPOPULATION IS ALLOWED. DEPOPULATION IS THE OMISSION OF COLUMNS FROM A FULL MATRIX (MX X MY).



11. THE TERMINAL COLUMN MAY EXIST IN TWO FORMS.  
TYPE 1 CONTAINS COLUMNS THAT ARE CONTAINED WITHIN THE REPASSIVATION OPENING.  
TYPE 2 CONTAINS COLUMNS THAT OVERLAP THE REPASSIVATION OPENING.  
THE COLUMN HEIGHT A1 IS DEFINED BY THE DISTANCE BETWEEN THE SEATING PLANE AND SURFACE OF THE REPASSIVATION LAYER FOR BOTH TYPES.



12. PACKAGE ALIGNMENT AREAS FOR SUBSEQUENT PROCESSING MUST BE LOCATED WITHIN THE DESIGNATED AREAS. ALL ALIGNMENT MARKS SHALL BE EQUIDISTANT FROM THE CENTER OF THE COLUMN ARRAY.  
A METAL–FREE CLEARANCE ZONE AROUND THE ALIGNMENT MARKS SHOULD BE A MINIMUM OF  $1/2$  OF THE FEATURE SIZE ( $0.04 \pm 0.01$ ).



13. SEE JESD30 FOR EXPLANATION OF VARIATION SCHEME.  
PACKAGE HEIGHT IS THE MAXIMUM PACKAGE THICKNESS.

## STP (3D) FILE RECORD

3D FILE NAMES MAY EXCEED LENGTH REQUIREMENTS FOR SOME SOFTWARE TOOLS.

STP FILE NAME	DATE	ITEM NUMBER
MO-349A_SBGA-M7775[23828]_I0p073-R10p975x10p975Z7p8-C0p032Z0p03	NOV 2021	4-996

## TASK GROUP CONTRIBUTORS

SK HYNIX  
MICRON TECHNOLOGY INC.  
SAMSUNG SEMICONDUCTOR

# 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: NOVEMBER 2021	ITEM NUMBER: 4-996
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CHANGE RECORD HISTORY:
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ISSUE: A.01	DATE: AUGUST 2022	ITEM NUMBER: 4-966E
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LOCATION	CHANGED FROM:	CHANGED TO:
SHEET 8		ADDED SEE JESD238 HIGH BANDWIDTH MEMORY (HBM3)