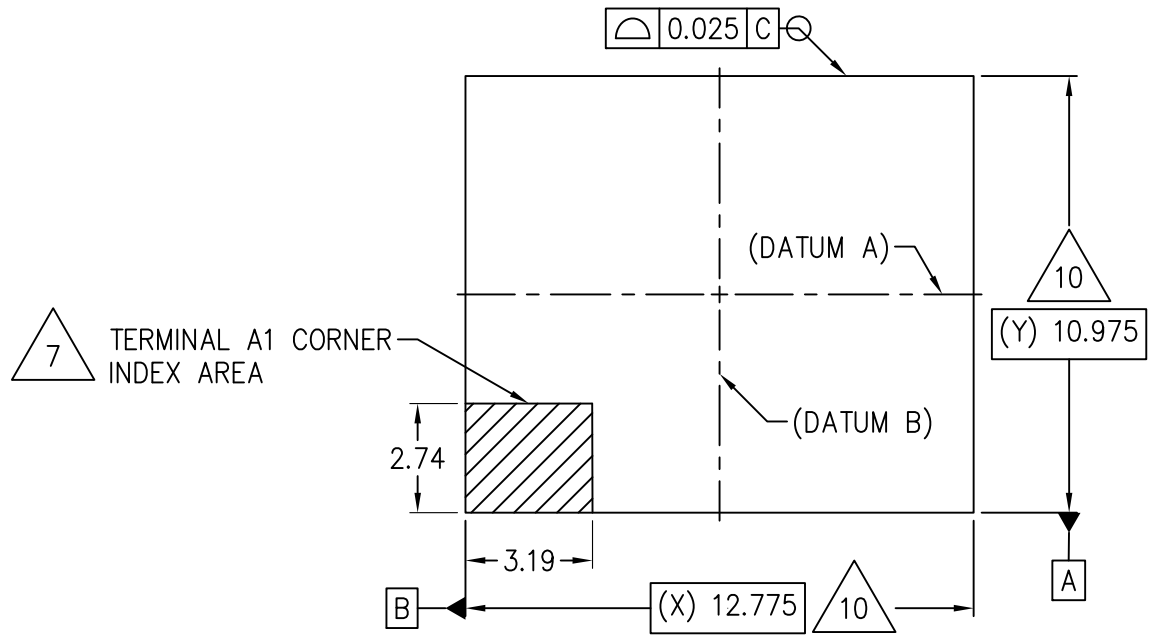
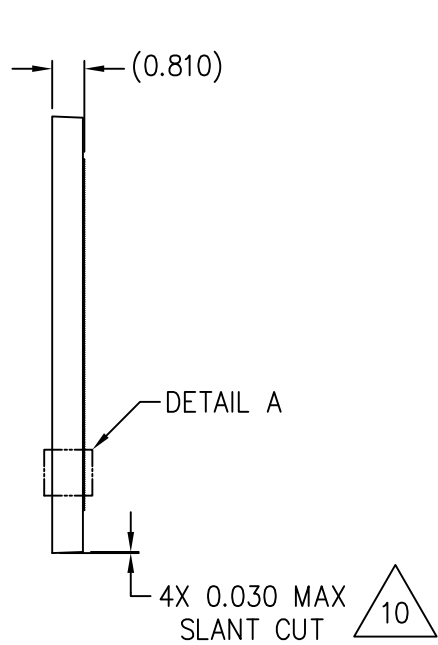


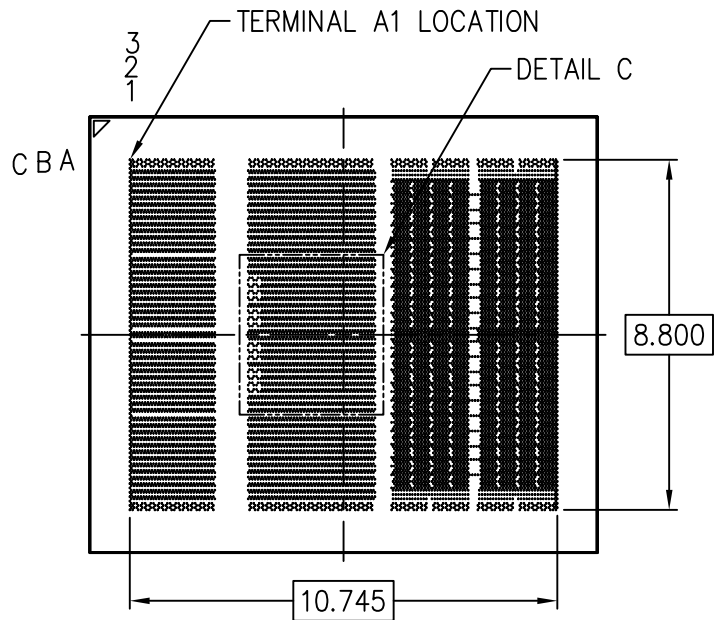
HBM4



TOP VIEW



SIDE VIEW



BOTTOM VIEW

JEDEC SOLID STATE PRODUCT OUTLINE

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THIS **REGISTERED OUTLINE** WAS PREPARED BY THE JEDEC JC-11 COMMITTEE AND REFLECTS A PRODUCT FOR ANTICIPATED USE IN THE ELECTRONICS INDUSTRY. CHANGES ARE LIKELY TO OCCUR. USERS ASSUME ALL RISK AND LIABILITY RESULTING FROM THE USE OF THIS OUTLINE.

TITLE SILICON BOTTOM GRID
ARRAY, COLUMN, 0.035 MM X 0.055 MM
PITCH RECT PACKAGE (HBM4)

PACKAGE DESIGNATOR
SBGA-M#[#]
_D0p065...

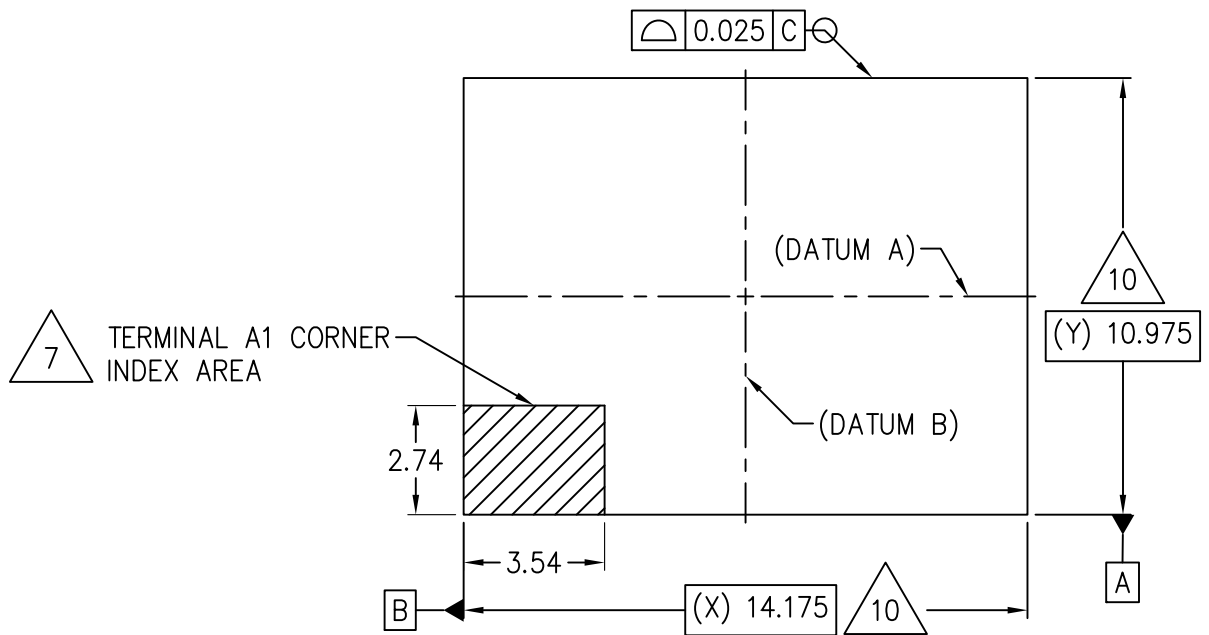
NUMBER
MO-362

ISSUE
B

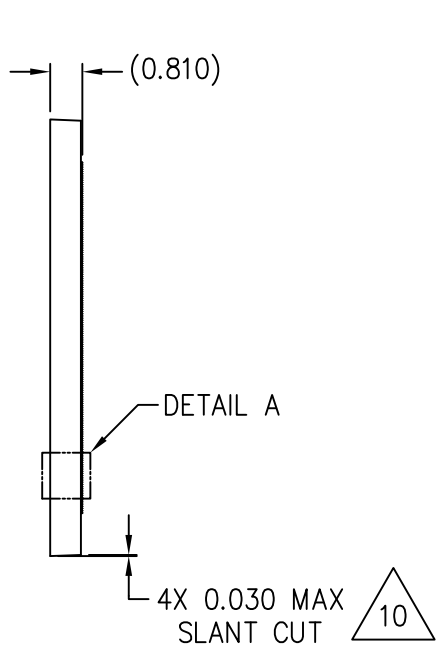
DATE
APR 2025

SHEET
1 OF 9

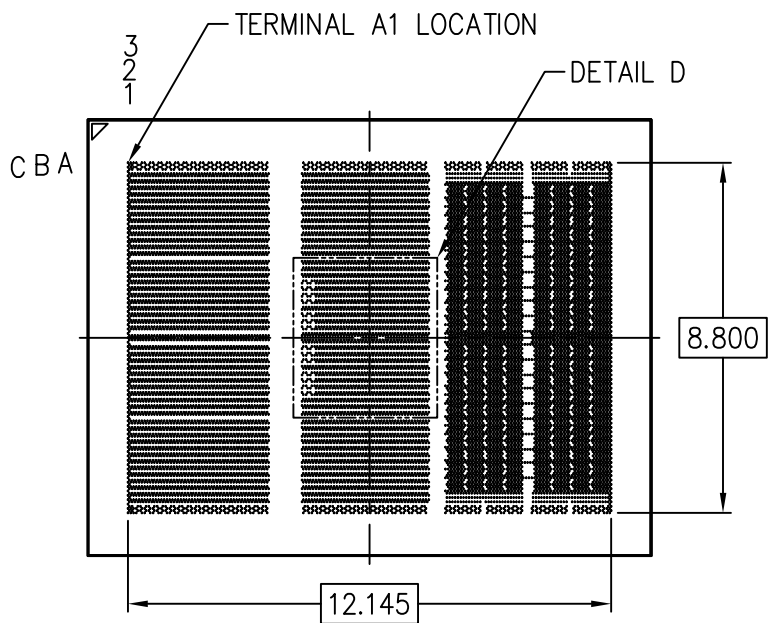
HBM4E



TOP VIEW

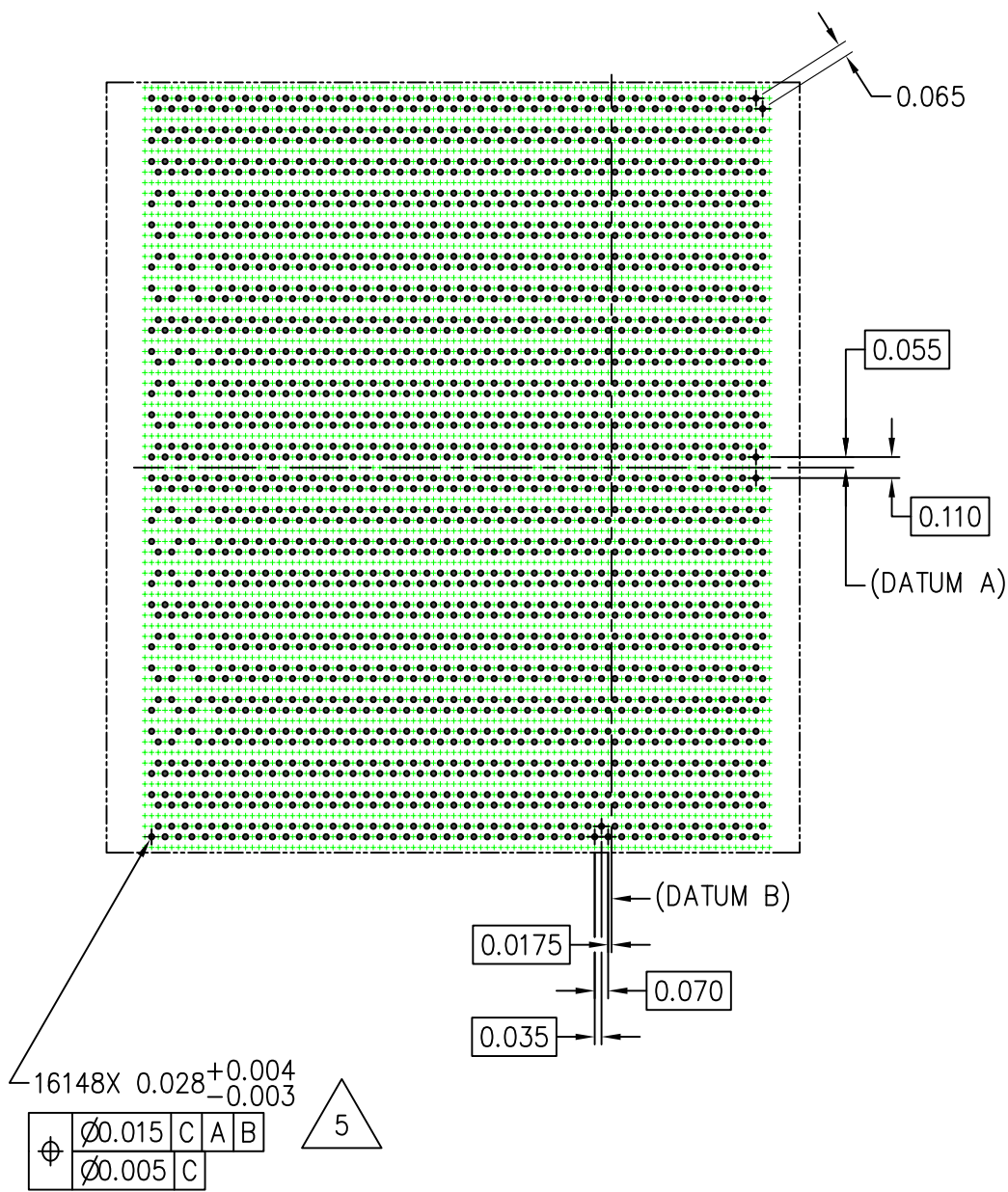


SIDE VIEW



BOTTOM VIEW

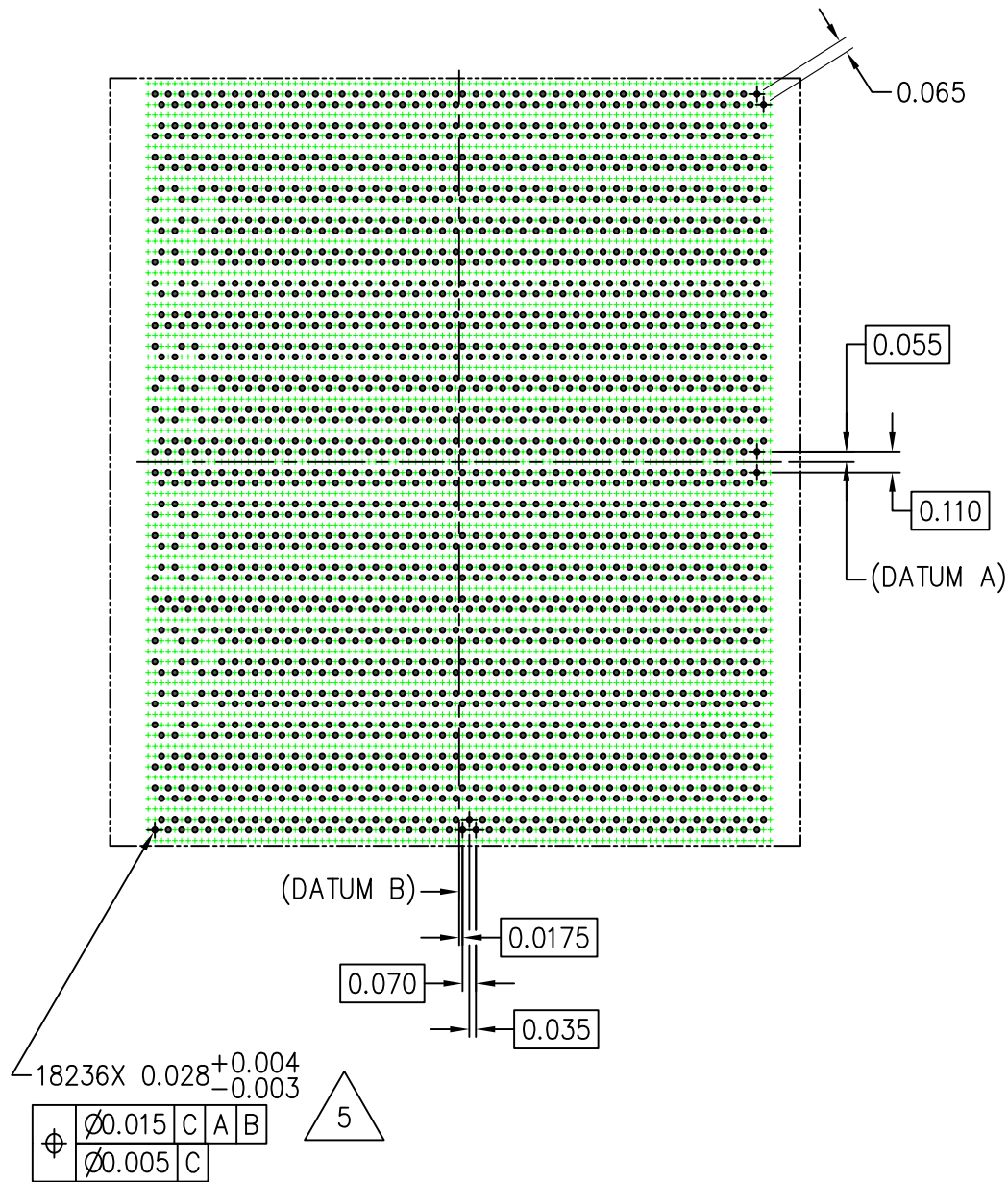
HBM4



DETAIL C

3 8 + = DEPOPULATED TERMINAL POSITIONS

HBM4E

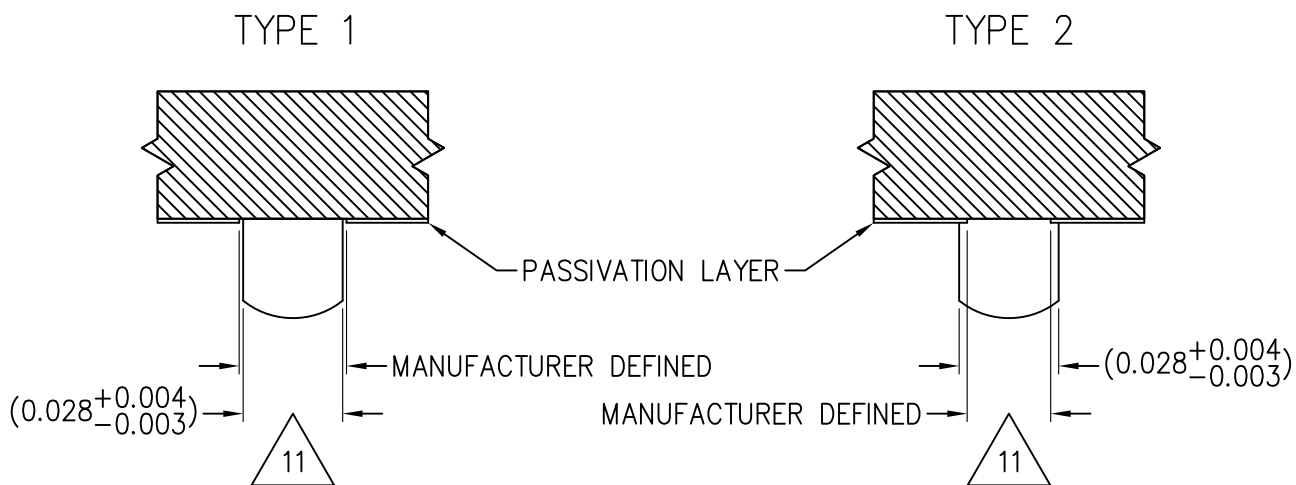
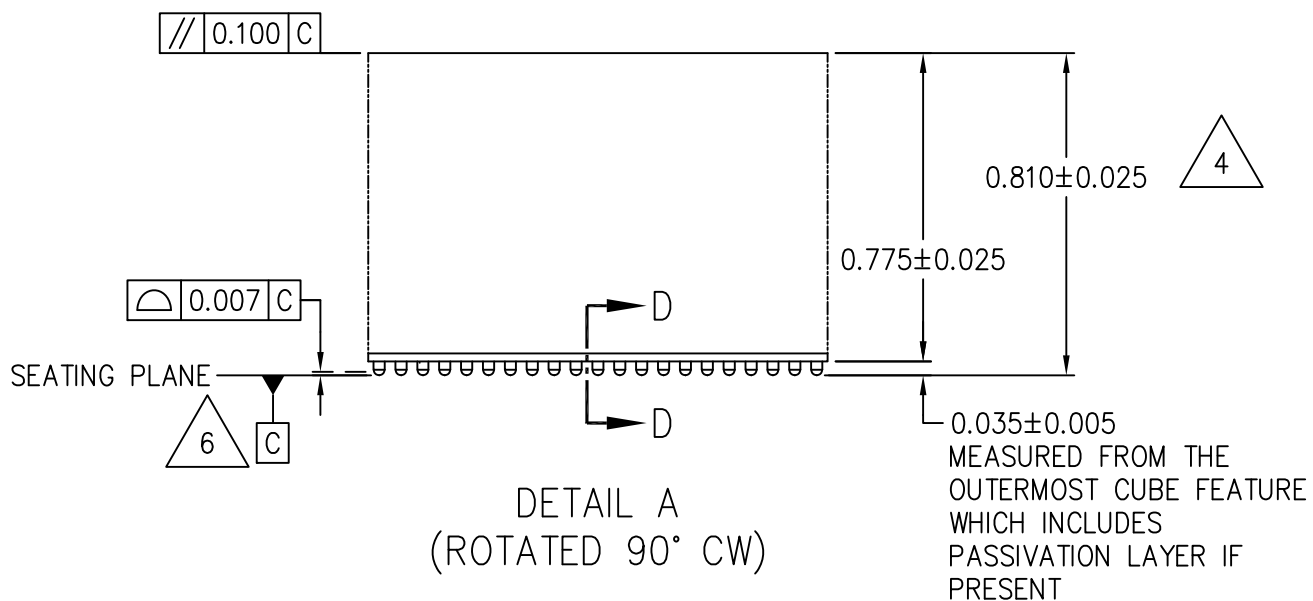


DETAIL D

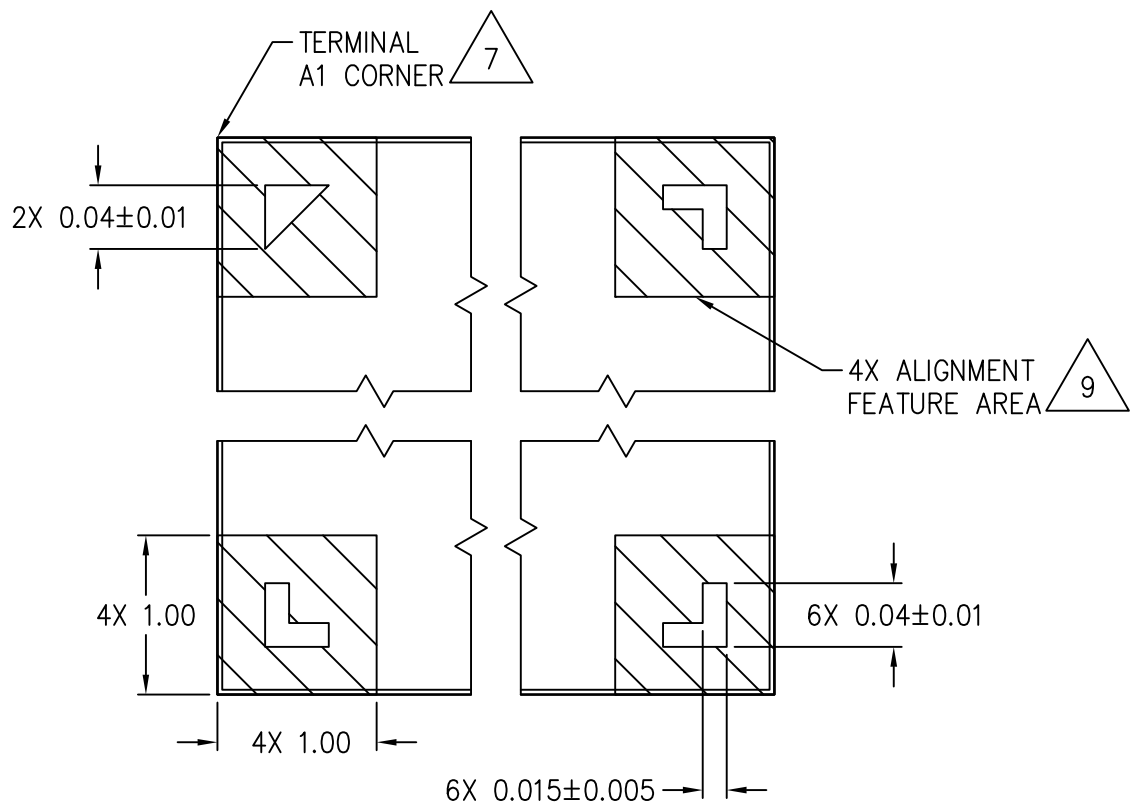


+ = DEPOPULATED TERMINAL POSITIONS

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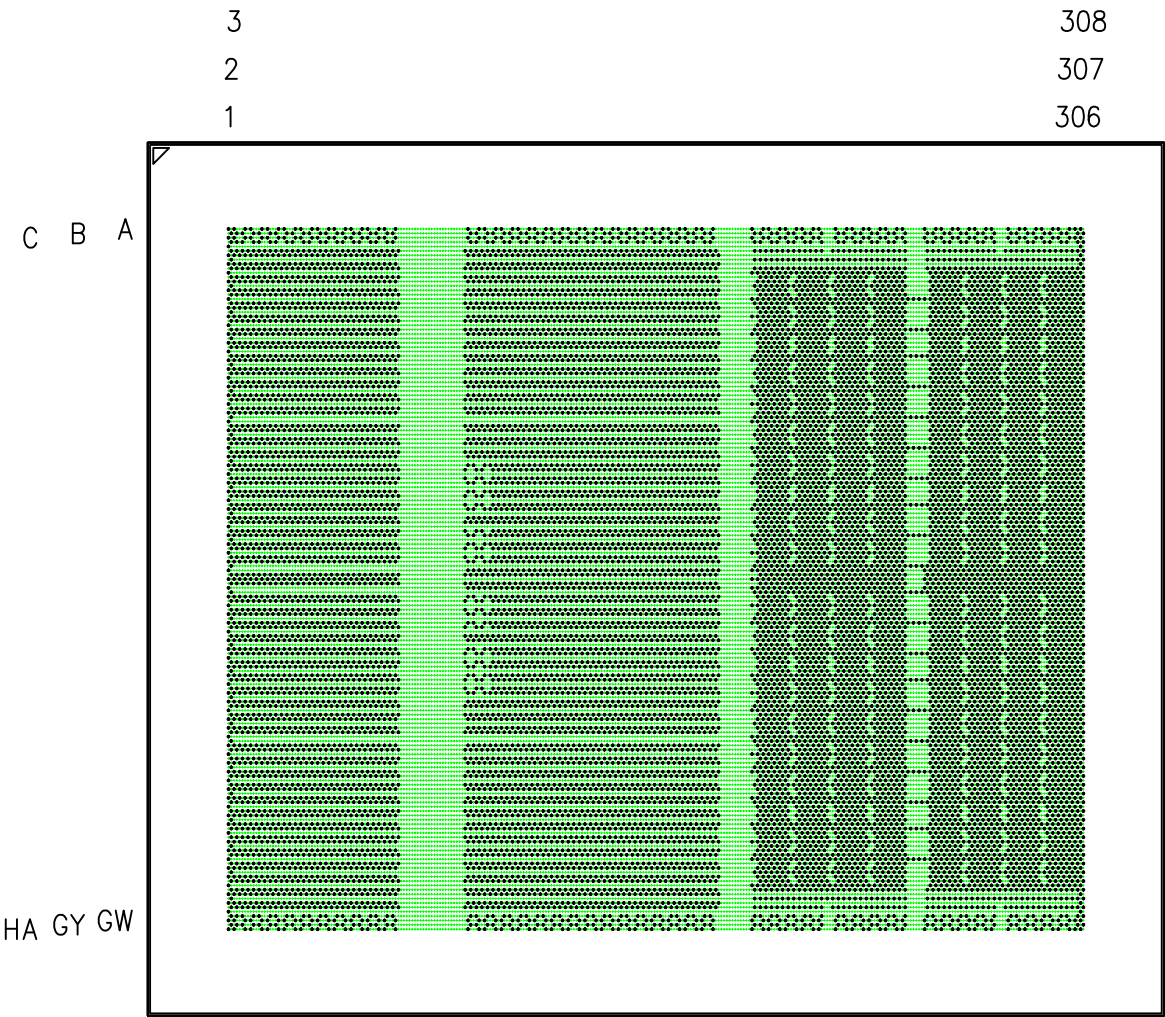
SECTION D-D



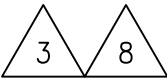
BOTTOM VIEW

ALIGNMENT FEATURE AREA 

SEE JESD270-4 FOR X,Y LOCATIONS
HIGH BANDWIDTH MEMORY (HBM4)

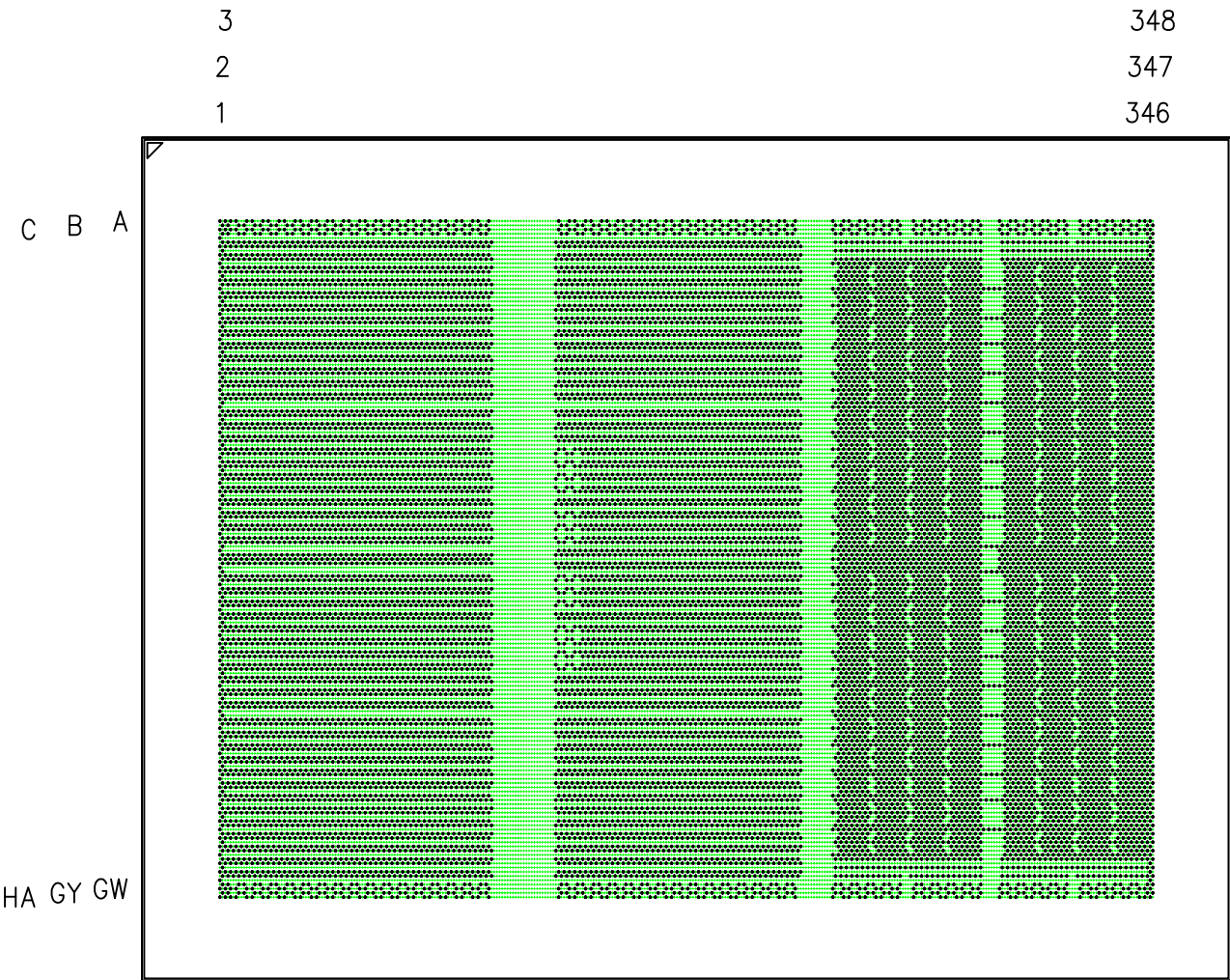


16148 TERMINAL PATTERN



+ = DEPOPULATED TERMINAL POSITIONS

SEE JESD270-4 FOR X,Y LOCATIONS
HIGH BANDWIDTH MEMORY (HBM4E)



18236 TERMINAL PATTERN



+ = DEPOPULATED TERMINAL POSITIONS

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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. PACKAGE HEIGHT (0.810 ± 0.025) INCLUDES COLUMN HEIGHT (0.035 ± 0.005) AND PACKAGE BODY THICKNESS (0.775 ± 0.025) BUT DOES NOT INCLUDE ATTACHED FEATURES, e.g., EXTERNAL HEATSINK. AN INTEGRAL HEATSLUG IS NOT CONSIDERED AN ATTACHED FEATURE.



5. TERMINAL DIMENSION ($0.028 + 0.004 / -0.003$) IS MEASURED AT THE MAXIMUM TERMINAL DIAMETER PARALLEL TO PRIMARY DATUM C.



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



7. 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.



8. TERMINAL DEPOPULATION IS ALLOWED. DEPOPULATION IS THE OMISSION OF TERMINALS FROM A FULL MATRIX.



9. PACKAGE ALIGNMENT AREAS FOR SUBSEQUENT PROCESSING MUST BE LOCATED WITHIN THE DESIGNATED AREAS. ALL ALIGNMENT MARKS SHALL BE EQUIDISTANT FROM THE CENTER OF THE TERMINAL ARRAY.

A METAL-FREE CLEARANCE ZONE AROUND THE ALIGNMENT MARKS SHOULD BE A MINIMUM OF $1/2$ OF THE FEATURE SIZE (0.04 ± 0.01).



10. X AND Y DIMENSIONS ARE MEASURED ON THE SLANT CUT SIDE. DUE TO DIFFERENT VENDOR MANUFACTURING PROCESSES THE SLANT COULD BE ON THE TOP OR BOTTOM. SEE SUPPLIER FOR DETAILS.



11. THE TERMINAL COLUMN MAY EXIST IN TWO FORMS.
TYPE 1 CONTAINS COLUMNS THAT ARE CONTAINED WITHIN THE PASSIVATION LAYER OPENING.
TYPE 2 CONTAINS COLUMNS THAT OVERLAP THE PASSIVATION LAYER OPENING.
THE COLUMN HEIGHT (0.035 ± 0.005) IS DEFINED BY THE DISTANCE BETWEEN THE SEATING PLANE AND SURFACE OF THE PASSIVATION LAYER FOR BOTH TYPES.

STP (3D) FILE RECORD

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

STP FILE NAME	DATE	ITEM NUMBER
MO-362A_SBGA-M16148[49588]_I0p065-R12p775x10p975Z0p81-C0p028Z0p035	NOV 2024	4-1056
MO-362B_SBGA-M18236[56028]_I0p065-R14p175x10p975Z0p81-C0p028Z0p035	APR 2025	4-1079

TASK GROUP CONTRIBUTORS

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 AP MEMORY TECHNOLOGY CORPORATION
 ARM LTD.
 ADVANCED MICRO DEVICES INC.
 ADVANTEST CORPORATION
 AKROSTAR TECHNOLOGY CO., LTD.
 ALIBABA GROUP (U.S.) INC.
 ALPHAWAVE SEMI.
 AMPERE COMPUTING
 ANALOG DEVICES INC.
 ANNAPURNA LABS (U.S.), INC.
 APPLE INC.
 AVANT TECHNOLOGY INC.
 BEIJING XIAOMI MOBILE SOFTWARE CO., LTD.
 BLUE CHEETAH ANALOG DESIGN INC.
 BROADCOM INC.
 CADENCE DESIGN SYSTEMS
 CAMBRICON TECHNOLOGIES CORPORATION LIMITED
 CANON INC.
 CHANGXIN MEMORY TECHNOLOGIES INC. (CXMT)
 CHENGDU HAIGUANG INTEGRATED CIRCUIT DESIGN CO. LTD.
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 ETRON TECHNOLOGY INC.
 FOXCONN INTERCONNECT TECHNOLOGY LTD TAIWAN BRANCH
 FUJITSU SEMICONDUCTOR MEMORY SOLUTION LIMITED
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 KAIMAI TECH LTD.
 KEYSIGHT TECHNOLOGIES INC.
 KINGSTON TECHNOLOGY COMPANY INC.
 KIOXIA CORPORATION
 LG ELECTRONICS INC.
 LX SEMICON
 LENOVO
 MARVELL SEMICONDUCTOR
 MEDIATEK INC.
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TASK GROUP CONTRIBUTORS

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TRANSCEND INFORMATION INC.
TSAVORITE SCALABLE INTELLIGENCE
VIVO MOBILE COMMUNICATION CO. LTD.
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WISTRON CORPORATION
WOLLEY INC.
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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 2024	ITEM NUMBER: 4-1056
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CHANGE RECORD HISTORY:

ISSUE: B	DATE: APRIL 2025	ITEM NUMBER: 4-1079
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LOCATION	CHANGED FROM:	CHANGED TO:
ALL SHEETS		ADDED (HBM4) TO TITLE TO:
SHEET 1	12.775 AND 10.975:	(X) 12.775 AND (Y) 10.975
	PROFILE TOLERANCE: 0.050	PROFILE TOLERANCE: 0.025
		ADDED BUMP CENTER TO BUMP CENTER: X=10.745 AND Y=8.00
		ADDED NOTE 10 TO SLANT CUT
		ADDED HBM4 TO SHEET TOP
		ADDED A1 TERMINAL INDICATOR
		REMOVED DETAIL B
		REMOVED 4X ALIGNMENT FEATURE AREA
SHEET 2		ADDED HBM4E
SHEET 3		ADDED HBM4 TO SHEET TOP
		REMOVED TERMINAL NUMBERING
SHEET 4		ADDED DETAIL FOR HBM4E
SHEET 5	0.035±0.005...	0.035±0.005... WHICH INCLUDES PASSIVATION LAYER IF PRESENT
		ADDED TYPE 1 COLUMN
SHEET 6		ADDED 4X ALIGNMENT FEATURE AREA REMOVED FROM SHEET 1
SHEETS 7 & 8		ADDED STANDARD TERMINAL PATTERN FOR HBM4 & HBM4E
SHEET 9	X (12.775) AND Y (10.975) DIMENSIONS ARE MEASURED ON THE PILLAR SIDE.	X AND Y DIMENSIONS ARE MEASURED ON THE SLANT CUT SIDE. DUE TO DIFFERENT...
		ADDED NOTE 11

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