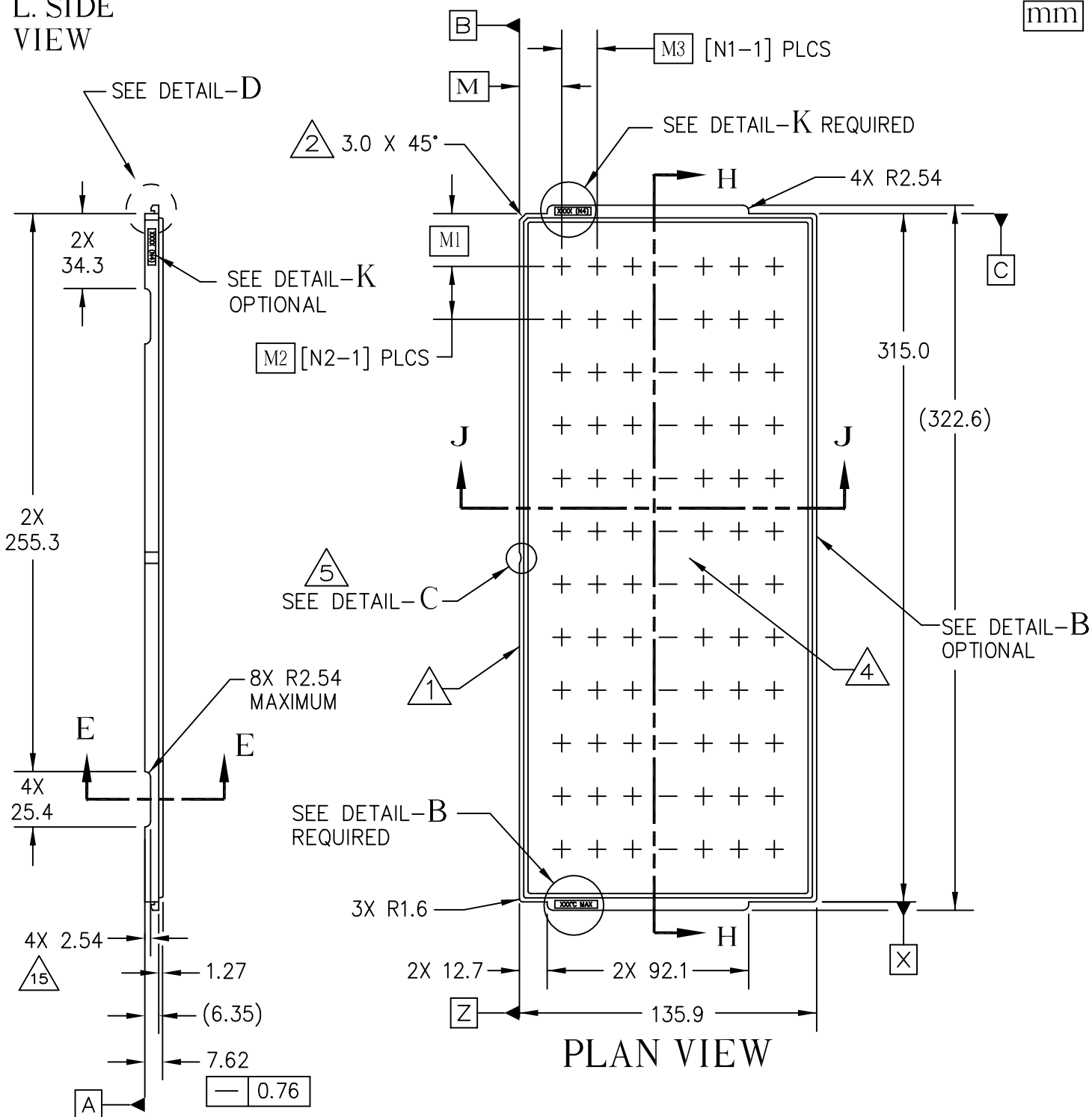


# L. SIDE VIEW

mm



## PLAN VIEW

## FRONT VIEW

JEDEC  
SOLID STATE PRODUCT  
OUTLINE

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

TITLE: THIN MATRIX TRAY FOR  
SHIPPING AND HANDLING  
OF BALL GRID PACKAGES

ISSUE  
H

DATE  
9/02

CO-029

SHEET  
1 OF 13

mm

XXXX (N4)

13

TRAY DESIGNATOR

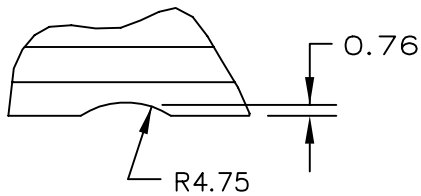
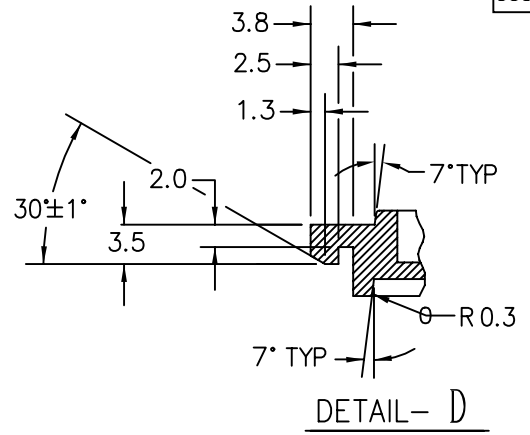
DETAIL-K

XXX°C MAX

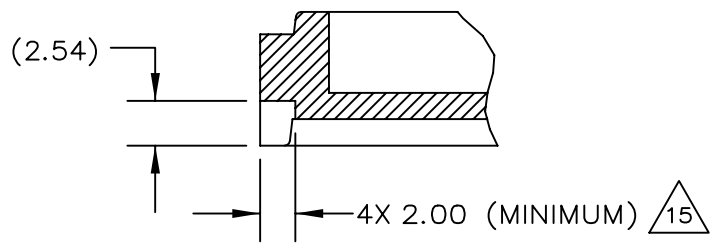
12

TEMP. RATING

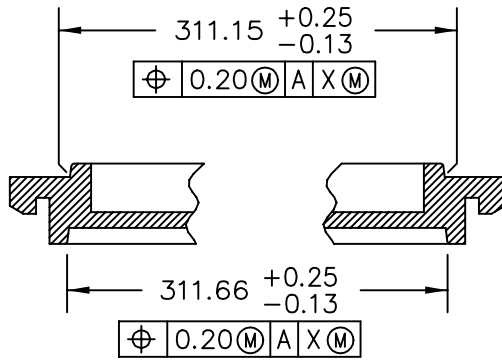
DETAIL-B



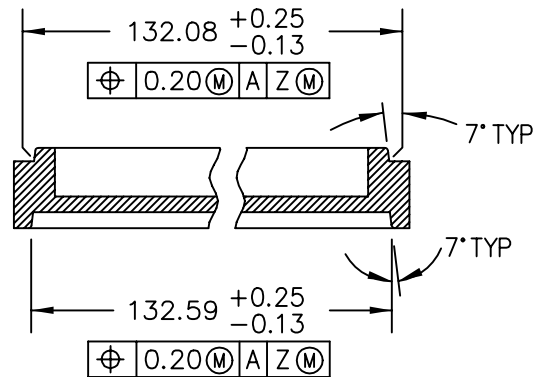
NOTE: SCALLOP IS CENTERED  
ON SIDE OF TRAY



ROTATED 90° CCW



ROTATED 90° CCW



## TRAY STACKING DETAIL

JEDEC  
SOLID STATE  
PRODUCT OUTLINE

TITLE: THIN MATRIX TRAY FOR  
SHIPPING AND HANDLING  
OF BALL GRID PACKAGES

ISSUE  
H

DATE  
9/02

CO-029

SHEET  
2 OF 13

VARIATION DIMENSIONS ARE IN MILLIMETERS

VARIATION		PACKAGE BODY SIZE	TRAY MATRIX			
AA		7MM X 7MM	13 X 32			
AB		9MM X 9MM	10 X 26			
AC		11MM X 11MM	8 X 22			
AD		13MM X 13MM	8 X 20			
AE		15MM X 15MM	7 X 18			
AF		17MM X 17MM	6 X 15			
AG	19MM X 19MM, 18.5MM X 18.5MM, 18MM X 18MM		6 X 14			
AH	21MM X 21MM, 20MM X 20MM		5 X 12			
AJ	23MM X 23MM, 22MM X 22MM		5 X 12			
AK	25MM X 25MM		4 X 11			
AL		27MM X 27MM	4 X 10			
AM		29MM X 29MM	4 X 9			
AN		31MM X 31MM	3 X 9			
AP	33MM X 33MM, 32.5MM X 32.5MM		3 X 8			
AR		35MM X 35MM	3 X 8			
AS		37.5MM X 37.5MM	3 X 7			
AT		40MM X 40MM	3 X 7			
AU		42.5MM X 42.5MM	2 X 6			
AV		45MM X 45MM	2 X 6			
AW		47.5MM X 47.5MM	2 X 6			
AX		50MM X 50MM	2 X 5			
AY		10MM X 10MM	10 X 24			
AZ		12MM X 12MM	9 X 21			
AAA		5MM X 5MM	16 X 36			
AAB		8MM X 8MM	12 X 29			
AAC		14MM X 14MM	8 X 19			
BA		22MM X 14MM	7 X 12			
BB		21MM X 18.5MM	6 X 13			
BC		25MM X 21MM	5 X 11			
BD		32.5MM X 25MM	4 X 8			
BE		22MM X 14MM	8 X 12			
BF		16MM X 8MM	11 X 15			
BG		13MM X 11MM	9 X 20			
BH		15MM X 11MM	9 X 18			
JEDEC SOLID STATE PRODUCT OUTLINE		TITLE: THIN MATRIX TRAY FOR SHIPPING AND HANDLING OF BALL GRID PACKAGES	ISSUE H	DATE 9/02	CO-029	SHEET 3 OF 13

# VARIATIONS

SYMBOL	AA			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	11.55 BSC			14
M1	11.80 BSC			14
M2	9.40 BSC			14
M3	9.40 BSC			14
N	16–25–36			6
N1	13 COLUMNS			
N2	32 ROWS			
N3	416			7
N4	7 MM X 7 MM			13
N5	ROW/COLUMN [4/7], [29/7]			4
N6	[15/6,7,8], [16/6,7,8], [17/6,7,8], [18/6,7,8]			3
NOTES	9, 10, 11, 14			
REF.	5–375			
ISSUE	A			

SYMBOL	AB			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	16.65 BSC			14
M1	15.00 BSC			14
M2	11.40 BSC			14
M3	11.40 BSC			14
N	36–49–64			6
N1	10 COLUMNS			
N2	26 ROWS			
N3	260			7
N4	9 MM X 9 MM			13
N5	ROW/COLUMN [3/5], [24/6]			4
N6	[12/4,5,6,7] [13/4,5,6,7] [14/4,5,6,7] [15/4,5,6,7]			3
NOTES	9, 10, 11, 14			
REF.	5–375			
ISSUE	A			

SYMBOL	AC			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	17.20 BSC			14
M1	16.80 BSC			14
M2	13.40 BSC			14
M3	14.50 BSC			14
N	49–64–100			6
N1	8 COLUMNS			
N2	22 ROWS			
N3	176			7
N4	11 MM X 11 MM			13
N5	ROW/COLUMN [3/4], [20/5]			4
N6	ROW/COLUMN [11/4,5] [12/4,5]			3
NOTES	9, 10, 11, 14			
REF.	5—375			
ISSUE	A			

SYMBOL	AD			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	15.45 BSC			14
M1	15.00 BSC			14
M2	15.00 BSC			14
M3	15.00 BSC			14
N	64–100–144			6
N1	8 COLUMNS			
N2	20 ROWS			
N3	160			7
N4	13 MM X 13 MM			13
N5	ROW/COLUMN [3/4], [18/5]			4
N6	ROW/COLUMN [10/4,5] [11/4,5]			3
NOTES	9, 10, 11, 14			
REF.	5—375			
ISSUE	A			

# VARIATIONS

SYMBOL	AE			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	16.35 BSC			14
M1	11.30 BSC			14
M2	17.20 BSC			14
M3	17.20 BSC			14
N	100-121-196			6
N1	7 COLUMNS			
N2	18 ROWS			
N3	126			7
N4	15 MM X 15 MM			13
N5	ROW/COLUMN [2/4], [17/4]			4
N6	ROW/COLUMN [9/3,4,5],[10/3,4,5]			3
NOTES	9, 10, 11, 14			
REF.	5-375			
ISSUE	A			

SYMBOL	AF			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	19.20 BSC			14
M1	21.00 BSC			14
M2	19.50 BSC			14
M3	19.50 BSC			14
N	121-169-256			6
N1	6 COLUMNS			
N2	15 ROWS			
N3	90			7
N4	17 MM X 17 MM			13
N5	ROW/COLUMN [2/3], [14/4]			4
N6	ROW/COLUMN [7/3,4], [8/3,4], [9/3,4]			3
NOTES	9, 10, 11, 14			
REF.	5-375			
ISSUE	A			

SYMBOL	AG			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	14.60 BSC			14
M1	18.79 BSC			14
M2	21.34 BSC			14
M3	21.34 BSC			14
N	144-196-225-289-324			6
N1	6 COLUMNS			
N2	14 ROWS			
N3	84			7
N4	19 MM X 19 MM, 18.5 MM X 18.5 MM, 18 MM X 18 MM			13
N5	ROW/COLUMN [2/3], [13/4]			4
N6	ROW/COLUMN [7/3,4], [8/3,4]			3
NOTES	9, 10, 11, 14			
REF.	5-544			
ISSUE	F			

SYMBOL	AH			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	20.15 BSC			14
M1	26.05 BSC			14
M2	23.90 BSC			14
M3	23.90 BSC			14
N	196–256–400			6
N1	5 COLUMNS			
N2	12 ROWS			
N3	60			7
N4	21 MM X 21 MM, 20 MM X 20 MM			13
N5	ROW/COLUMN [2/2], [11/4]			4
N6	ROW/COLUMN [6/2,3,4], [7/2,3,4]			3
NOTES	9, 10, 11, 14			
REF.	5–544			
ISSUE	F			

# VARIATIONS

SYMBOL	AJ			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	16.95 BSC			14
M1	17.25 BSC			14
M2	25.50 BSC			14
M3	25.50 BSC			14
N	225–324–484			6
N1	5 COLUMNS			
N2	12 ROWS			
N3	60			7
N4	23 MM X 23 MM, 22 MM X 22 MM			13
N5	ROW/COLUMN [2/2], [11/4]			4
N6	ROW/COLUMN [6/3], [7/3]			3
NOTES	9, 10, 11, 14			
REF.	5–544			
ISSUE	F			

SYMBOL	AK			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	26.70 BSC			14
M1	20.00 BSC			14
M2	27.50 BSC			14
M3	27.50 BSC			14
N	256–361–576			6
N1	4 COLUMNS			
N2	11 ROWS			
N3	44			7
N4	25 MM X 25 MM			13
N5	ROW/COLUMN [2/2], [10/3]			4
N6	ROW/COLUMN [6/2,3]			3
NOTES	9, 10, 11, 14			
REF.	5—375			
ISSUE	A			

SYMBOL	AL			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	24.15 BSC			14
M1	26.10 BSC			14
M2	29.20 BSC			14
M3	29.20 BSC			14
N	324–441–676			6
N1	4 COLUMNS			
N2	10 ROWS			
N3	40			7
N4	27 MM X 27 MM			13
N5	ROW/COLUMN [2/2], [9/3]			4
N6	ROW/COLUMN [5/3] [6/2]			3
NOTES	9, 10, 11, 14			
REF.	5–375			
ISSUE	A			

SYMBOL	AM			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	20.85 BSC			14
M1	31.10 BSC			14
M2	31.60 BSC			14
M3	31.40 BSC			14
N	361—484—784			6
N1	4 COLUMNS			
N2	9 ROWS			
N3	36			7
N4	29 MM X 29 MM			13
N5	ROW/COLUMN [2/2], [8/3]			4
N6	ROW/COLUMN [5/2,3]			3
NOTES	9, 10, 11, 14			
REF.	5—375			
ISSUE	A			

# VARIATIONS

SYMBOL	AN			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	25.05 BSC			14
M1	21.90 BSC			14
M2	33.90 BSC			14
M3	42.90 BSC			14
N	400–576–900			6
N1	3 COLUMNS			
N2	9 ROWS			
N3	27			7
N4	31 MM X 31 MM			13
N5	ROW/COLUMN [2/2], [8/2]			4
N6	ROW/COLUMN [5/2]			3
NOTES	9, 10, 11, 14			
REF.	5—375			
ISSUE	A			

SYMBOL	AP			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	32.45 BSC			14
M1	33.25 BSC			14
M2	35.50 BSC			14
M3	35.50 BSC			14
N	441–484–625–676–1024			6
N1	3 COLUMNS			
N2	8 ROWS			
N3	24			7
N4	33 MM X 33 MM, 32.5 X 32.5 MM			13
N5	ROW/COLUMN [2/2], [7/2]			4
N6	ROW/COLUMN [4/2], [5/2]			3
NOTES	9, 10, 11, 14			
REF.	5–375			
ISSUE	A			

SYMBOL	AR			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	29.95 BSC			14
M1	24.50 BSC			14
M2	38.00 BSC			14
M3	38.00 BSC			14
N	529–729–1156			6
N1	3 COLUMNS			
N2	8 ROWS			
N3	24			7
N4	35 MM X 35 MM			13
N5	ROW/COLUMN [2/2], [7/2]			4
N6	ROW/COLUMN [4/2] [5/2]			3
NOTES	9, 10, 11, 14			
REF.	5—375			
ISSUE	A			

SYMBOL	AS			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	27.95 BSC			14
M1	37.50 BSC			14
M2	40.00 BSC			14
M3	40.00 BSC			14
N	625–841–1369			6
N1	3 COLUMNS			
N2	7 ROWS			
N3	21			7
N4	37.5 MM X 37.5 MM			13
N5	ROW/COLUMN [2/2], [6/2]			4
N6	ROW/COLUMN [4/2]			3
NOTES	9, 10, 11, 14			
REF.	5—375			
ISSUE	A			

# VARIATIONS

SYMBOL	AT			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	25.65 BSC			14
M1	30.60 BSC			14
M2	42.30 BSC			14
M3	42.30 BSC			14
N	676-961-1521			6
N1	3 COLUMNS			
N2	7 ROWS			
N3	≥ 1			7
N4	40 MM X 40 MM			13
N5	ROW/COLUMN [2/2], [6/2]			4
N6	ROW/COLUMN [4/2]			3
NOTES	9, 10, 11, 14			
REF.	5-375			
ISSUE	A			

SYMBOL	AU			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	26.70 BSC			14
M1	43.75 BSC			14
M2	45.50 BSC			14
M3	82.50 BSC			14
N	784-1089-1764			6
N1	2 COLUMNS			
N2	6 ROWS			
N3	1 2			7
N4	42.5 MM X 42.5 MM			13
N5	N/A			4
N6	N/A			3
NOTES	9, 10, 11, 14, 19			
REF.	5-375			
ISSUE	A			

SYMBOL	AV			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	30.00 BSC			14
M1	30.00 BSC			14
M2	51.00 BSC			14
M3	75.90 BSC			14
N	900-1225-1936			6
N1	2 COLUMNS			
N2	6 ROWS			
N3	1 2			7
N4	45 MM X 45 MM			13
N5	ROW/COLUMN [1/1], [6/2]			4
N6	ROW/COLUMN [3/2] [4/1]			3
NOTES	9, 10, 11, 14			
REF.	5-375			
ISSUE	A			

SYMBOL	AW			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	30.00 BSC			14
M1	31.25 BSC			14
M2	50.50 BSC			14
M3	75.90 BSC			14
N	961-1369-2209			6
N1	2 COLUMNS			
N2	6 ROWS			
N3	1 2			7
N4	47.5 MM X 47.5 MM			13
N5	ROW/COLUMN [1/1], [6/2]			4
N6	ROW/COLUMN [3/2], [4/1]			3
NOTES	9, 10, 11, 14			
REF.	5—375			
ISSUE	A			



# VARIATIONS

SYMBOL	AX			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	41.45 BSC			14
M1	51.50 BSC			14
M2	53.00 BSC			14
M3	53.00 BSC			14
N	1089-1521-2401			6
N1	2 COLUMNS			
N2	5 ROWS			
N3	1 O			7
N4	50 MM X 50 MM			13
N5	ROW/COLUMN [1/1], [5/2]			4
N6	ROW/COLUMN [3/1], [3/2]			3
NOTES	9, 10, 11, 14			
REF.	5-375			
ISSUE	A			

SYMBOL	AY			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	9.00 BSC			14
M1	9.15 BSC			14
M2	12.90 BSC			14
M3	13.10 BSC			14
N	25–36–49–64–81			6
N1	10 COLUMNS			
N2	24 ROWS			
N3	240			7
N4	10 MM X 10 MM			13
N5	ROW/COLUMN [2/5], [23/6]			4
N6	ROW/COLUMN [11/4,5,6], [12/4,5,6], [13,4,5,6], [14/4,5,6]			3
NOTES	9, 10, 11, 14			
REF.	5–526			
ISSUE	D			

SYMBOL	AZ			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	9.55 BSC			14
M1	10.00 BSC			14
M2	14.75 BSC			14
M3	14.60 BSC			14
N	49–64–81–100–121			6
N1	9 COLUMNS			
N2	21 ROWS			
N3	189			7
N4	12 MM X 12 MM			13
N5	ROW/COLUMN [2/5], [20/5]			4
N6	ROW/COLUMN [10/4,5,6], [11/4,5,6], [12/4,5,6]			3
NOTES	9, 10, 11, 14			
REF.	5–526			
ISSUE	D			

SYMBOL	AAA			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	8.70 BSC			14
M1	8.75 BSC			14
M2	8.50 BSC			14
M3	7.90 BSC			14
N	32			6
N1	16 COLUMNS			
N2	36 ROWS			
N3	576			7
N4	5 MM X 5 MM			13
N5	ROW/COLUMN [2/8], [35/9]			4
N6	ROW/COLUMN [17/7,8,9,10], [18/7,8,9,10], [19/7,8,9,10], [20/7,8,9,10]			3
NOTES	9, 10, 11, 14			
REF.	5—537			
ISSUE	E			

# VARIATIONS

SYMBOL	AAB			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	10.75 BSC			14
M1	11.90 BSC			14
M2	10.40 BSC			14
M3	10.40 BSC			14
N	9-16-25-36-49-64-81			6
N1	12 COLUMNS			
N2	29 ROWS			
N3	348			7
N4	8 MM X 8 MM			13
N5	ROW/COLUMN [3/6], [27/7]			4
N6	ROW/COLUMN [14/5,6,7,8], [15/5,6,7,8], [16/5,6,7,8]			3
NOTES	9, 10, 11, 14			
REF.	5-537			
ISSUE	E			

SYMBOL	AAC			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	10.55 BSC			14
M1	10.80 BSC			14
M2	16.30 BSC			14
M3	16.40 BSC			14
N	64-81-100-144-169			6
N1	8 COLUMNS			
N2	19 ROWS			
N3	152			7
N4	14 MM X 14 MM			13
N5	ROW/COLUMN [2/4], [18/5]			4
N6	ROW/COLUMN [9/4,5], [10/4,5], [11/4,5]			3
NOTES	9, 10, 11, 14			
REF.	5-544			
ISSUE	F			

S Y M B O L				N O T E
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M				14
M1				14
M2				14
M3				14
N				6
N1				
N2				
N3				7
N4				13
N5				4
N6				3
NOTES				
REF.				
ISSUE				

S Y M B O L				N O T E
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M				14
M1				14
M2				14
M3				14
N				6
N1				
N2				
N3				7
N4				13
N5				4
N6				3
NOTES				
REF.				
ISSUE				

# VARIATIONS

SYMBOL	BA			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	12.75 BSC			14
M1	23.30 BSC			14
M2	24.40 BSC			14
M3	18.40 BSC			14
N	119—153			6
N1	7 COLUMNS			
N2	12 ROWS			
N3	84			7
N4	22 MM X 14 MM			13
N5	ROW/COLUMN [2/4], [11/4]			4
N6	ROW/COLUMN [6/3,4,5], [7/3,4,5]			3
NOTES	9, 10, 11, 14			
REF.	5—375			
ISSUE	E			

SYMBOL	BB			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	14.60 BSC			14
M1	16.50 BSC			14
M2	23.50 BSC			14
M3	21.34 BSC			14
N	168–224–340			6
N1	6 COLUMNS			
N2	13 ROWS			
N3	78			7
N4	21 MM X 18.5 MM			13
N5	ROW/COLUMN [2/3], [12/4]			4
N6	ROW/COLUMN [7/3,4]			3
NOTES	9, 10, 11, 14			
REF.	5–375			
ISSUE	F			

SYMBOL	BC			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	20.95 BSC			14
M1	20.00 BSC			14
M2	27.50 BSC			14
M3	23.50 BSC			14
N	224–304–480			6
N1	5 COLUMNS			
N2	11 ROWS			
N3	55			7
N4	25 MM X 21 MM			13
N5	ROW/COLUMN [2/2], [10/4]			4
N6	ROW/COLUMN [6/2,3,4]			3
NOTES	9, 10, 11, 14			
REF.	5–375			
ISSUE	A			

SYMBOL	BD			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	26.70 BSC			14
M1	33.25 BSC			14
M2	35.50 BSC			14
M3	27.50 BSC			14
N	336–475–744			6
N1	4 COLUMNS			
N2	8 ROWS			
N3	32			7
N4	32.5 MM X 25 MM			13
N5	ROW/COLUMN [2/2], [7/3]			4
N6	ROW/COLUMN [4/2,3], [5/2,3]			3
NOTES	9, 10, 11, 14			
REF.	5–375			
ISSUE	A			

# VARIATIONS

SYMBOL	BE			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	11.60 BSC			14
M1	24.95 BSC			14
M2	24.10 BSC			14
M3	16.10 BSC			14
N	119—153			6
N1	8 COLUMNS			
N2	12 ROWS			
N3	96			7
N4	22 MM X 14 MM			13
N5	ROW/COLUMN [2/4], [11/5]			4
N6	ROW/COLUMN [6/4,5], [7/4,5]			3
NOTES	9, 10, 11, 14			
REF.	5—470			
ISSUE	B			

SYMBOL	BF			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	8.20 BSC			14
M1	12.60 BSC			14
M2	20.70 BSC			14
M3	11.95 BSC			14
N	60			6
N1	11 COLUMNS			
N2	15 ROWS			
N3	165			7
N4	16 MM X 8 MM			13
N5	ROW/COLUMN [6/2], [6/14]			4
N6	ROW/COLUMN [5/7,8,9], [6/7,8,9], [7/7,8,9]			3
NOTES	9, 10, 11, 14			
REF.	5—526			
ISSUE	D			

SYMBOL	BG			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	9.55 BSC			14
M1	10.25 BSC			14
M2	15.50 BSC			14
M3	14.60 BSC			14
N	64			6
N1	9 COLUMNS			
N2	20 ROWS			
N3	180			7
N4	13 MM X 11 MM			13
N5	ROW/COLUMN [2/5], [19/5]			4
N6	ROW/COLUMN [10/4,5,6], [11/4,5,6]			3
NOTES	9, 10, 11, 14			
REF.	5—537			
ISSUE	E			

SYMBOL	BH			NOTE
	DIMENSIONS ARE IN MILLIMETERS			
	MIN	NOM	MAX	
M	9.55 BSC			14
M1	11.30 BSC			14
M2	17.20 BSC			14
M3	14.60 BSC			14
N	64/84			6
N1	9 COLUMNS			
N2	18 ROWS			
N3	162			7
N4	15 MM X 11 MM			13
N5	ROW/COLUMN [2/5], [17/5]			4
N6	ROW/COLUMN [9/4,5,6], [10/4,5,6]			3
NOTES	9, 10, 11, 14			
REF.	5—584			
ISSUE	G			

NOTES:

- 1 THESE SURFACES TO BE FREE OF SEAMS.
- 2 CHAMFER DENOTES PACKAGE PIN 1 ORIENTATION.
3. TRAY VACUUM PICKUP METHOD ALLOWS TWO SEPARATE PICKUP AREAS, RESULTING IN TWO CLOSED CELLS PER TRAY. OPTIONAL VACUUM PICKUP CELL LOCATIONS ARE N5.
- 4 TRAY VACUUM PICKUP METHOD REQUIRES A 28 mm SQUARE (MINIMUM) WALLED PICKUP AREA, LOCATED AS CLOSE TO THE CENTER OF THE TRAY AS IS PRACTICAL. CENTER VACUUM PICKUP CELL LOCATIONS ARE N6.
- 5 THE SCALLOP ALLOWS THE USE OF A PIN TO MECHANICALLY BIAS THE TRAY ORIENTATION.
6. N REFERS TO THE PACKAGE LEADCOUNTS SUPPORTED, FULLY POPULATED ARRAY.
7. TOTAL USABLE CELLS  $N3 = N1 \times N2$ .
8. PACKAGE INTERFACE CONTROLLED BY PACKAGE DESIGN AND LEAD FORM.
9. NONTABULATED DIMENSIONS HAVE A TOLERANCE OF  $.X = \pm 0.25$ ,  
 $.XX = \pm 0.13$ , ANGLES  $\pm 0.5^\circ$ .
10. ALL DIMENSIONS ARE IN MILLIMETERS.
11. INTERPRET DIMENSIONS AND TOLERANCES IN ACCORDANCE WITH ASME Y14.5M-1994
- 12 XXX IS THE MAXIMUM OPERATING TEMPERATURE THE EMPTY TRAY CAN BE SUBJECTED TO FOR 48 CONTINUOUS HOURS WITHOUT VIOLATING THE DIMENSIONAL TOLERANCE OF THE TRAY.
- 13 N4 INDICATES THE PACKAGE TYPE ACCOMODATED.
14. DIMENSIONS M, M1, M2, AND M3 DEFINE THE CENTER LINES FOR THE CELL SITES.
- 15 BOTTOM SIDEWALL NOTCHES REQUIRE A 2.00 mm (MINIMUM) DEPTH TO FACILITATE AUTO HANDLING EQUIPMENT.
16. ALL EXTERNAL TRAY SURFACES THAT MAY COME IN CONTACT WITH THE DRY PACK BAGS SHALL BE FREE OF SHARP EDGES.
17. ALL TRAY MEASUREMENTS ARE TO BE MADE WITH THE TRAY UN-RESTRICTED.
18. RECOMMENDED FOR PACKAGES WITH OVERALL THICKNESS OF 4.75 mm OR LESS
19. VACUUM CELL LOCATIONS ARE IN THE FREE AREAS DOWN THE CENTER OF THE TRAY, NOT IN THE POCKET AREAS.

JEDEC SOLID STATE PRODUCT OUTLINE	TITLE: THIN MATRIX TRAY FOR SHIPPING AND HANDLING OF BALL GRID PACKAGES	ISSUE H	DATE 9/02	CO-029	SHEET 13 OF 13
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