

SUMMARY TABLE FOR LQFP

ITEM	PACKAGE	LEADCOUNT	BODYSIZE	PITCH	BODY THICKNESS	FOOT PRINT	STANDOFF	JEDEC #	VARIATION
1	LQFP	32LD	7 x 7	0.80	1.4	2.0	0.1	MS-026	BBA
2	LQFP	48LD	7 x 7	0.50	1.4	2.0	0.1	MS-026	BBC
3	LQFP	64LD	7 x 7	0.40	1.4	2.0	0.1	MS-026	BBD
4	LQFP	44LD	10 x 10	0.80	1.4	2.0	0.1	MS-026	BCB
5	LQFP	64LD	10 x 10	0.50	1.4	2.0	0.1	MS-026	BCD
6	LQFP	64LD	14 x 14	0.80	1.4	2.0	0.1	MS-026	BEB
7	LQFP	80LD	14 x 14	0.65	1.4	2.0	0.1	MS-026	BEC
8	LQFP	100LD	14 x 14	0.50	1.4	2.0	0.1	MS-026	BED
9	LQFP	144LD	20 x 20	0.50	1.4	2.0	0.1	MS-026	BFB
10	LQFP	176LD	24 x 24	0.50	1.4	2.0	0.1	MS-026	BGA
11	LQFP	128LD	14 x 14	0.40	1.4	2.0	0.1	NJR	ZZ9
12	LQFP	120LD	14 x 14	0.40	1.4	2.0	0.1	MS-026	BEE

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	APP'D			LQFP PACKAGE OUTLINE
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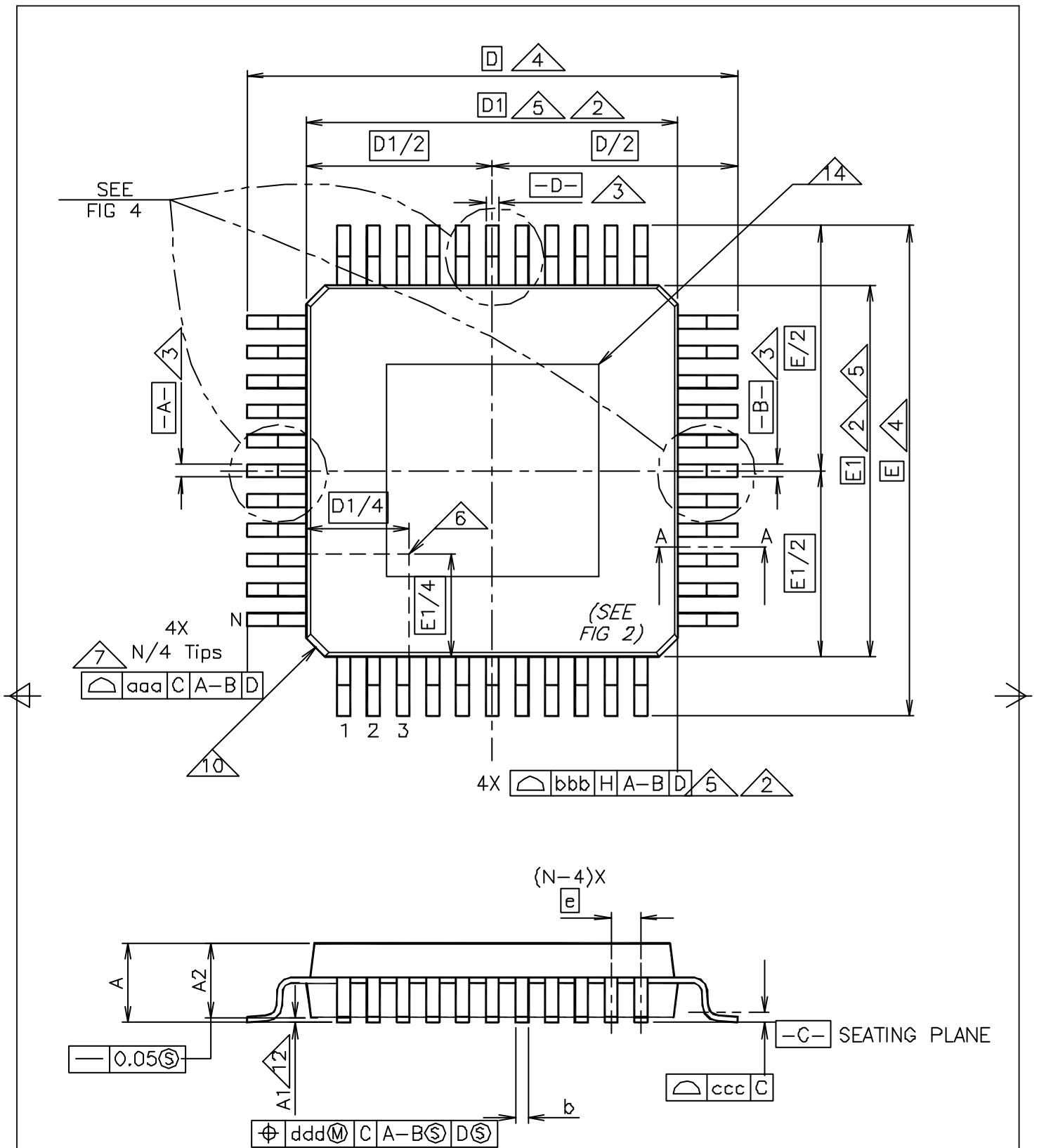
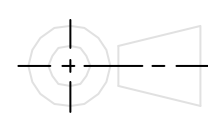
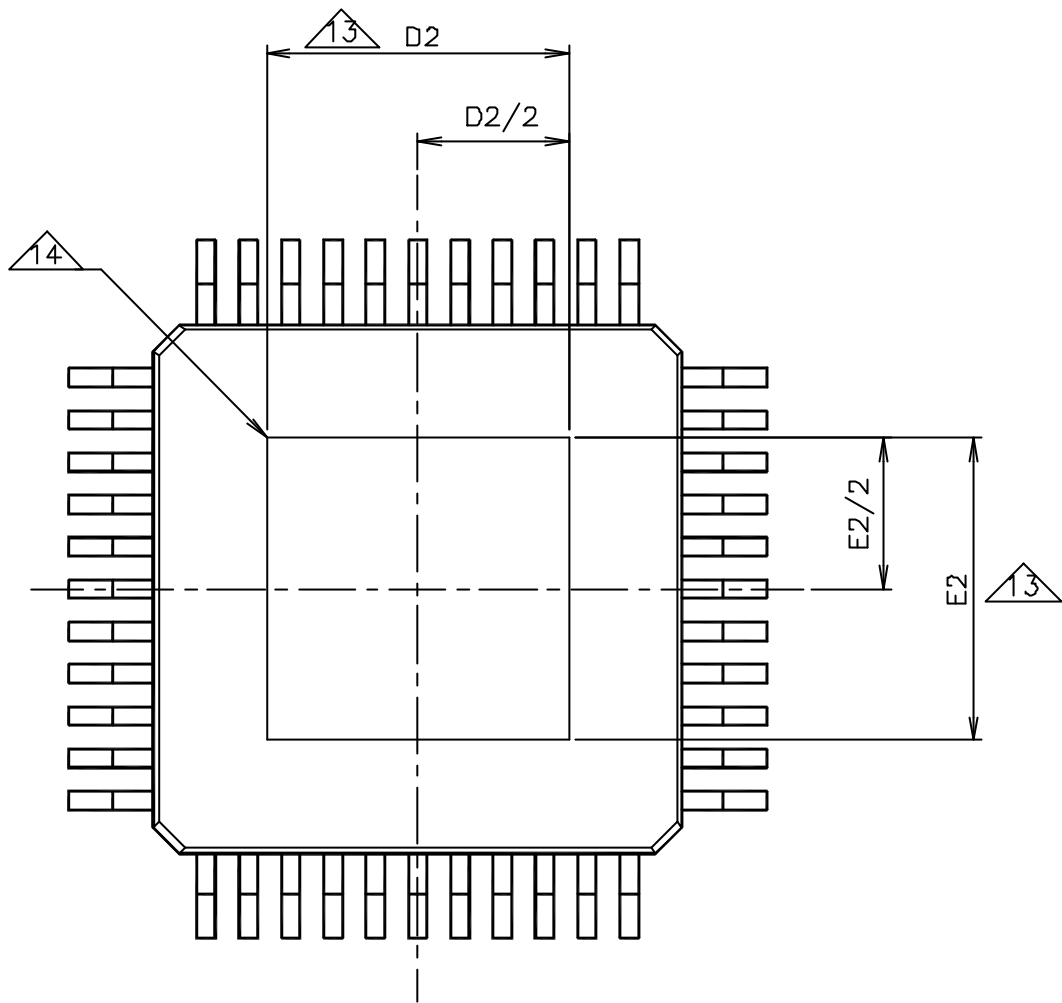


FIGURE 1  
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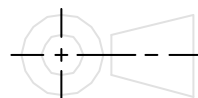
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FIG 2 SECTION A-A

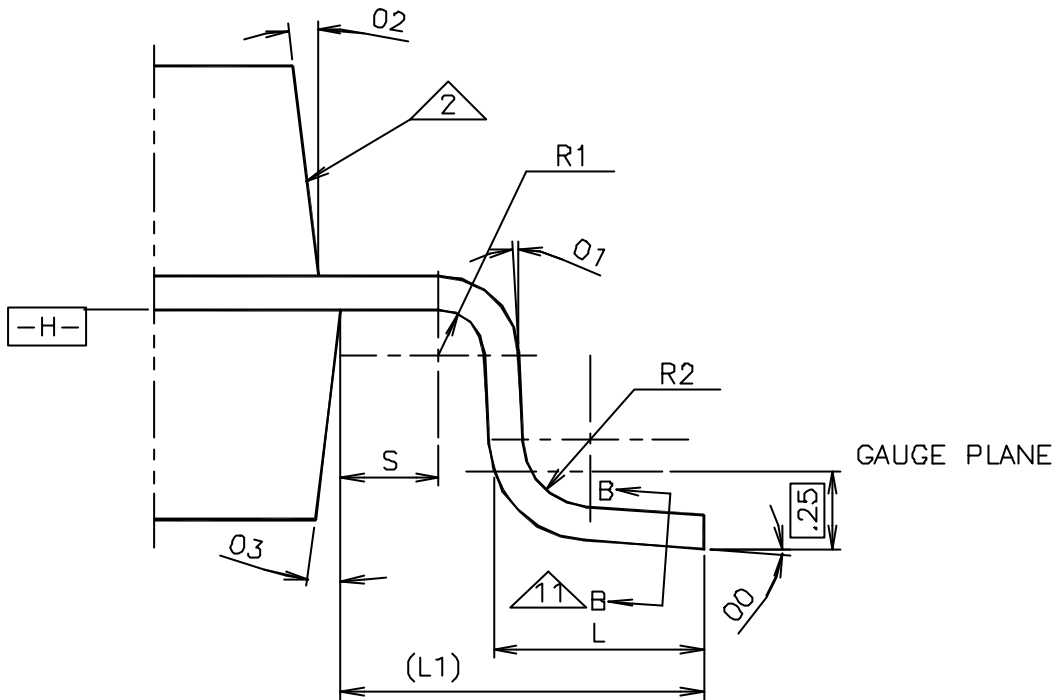
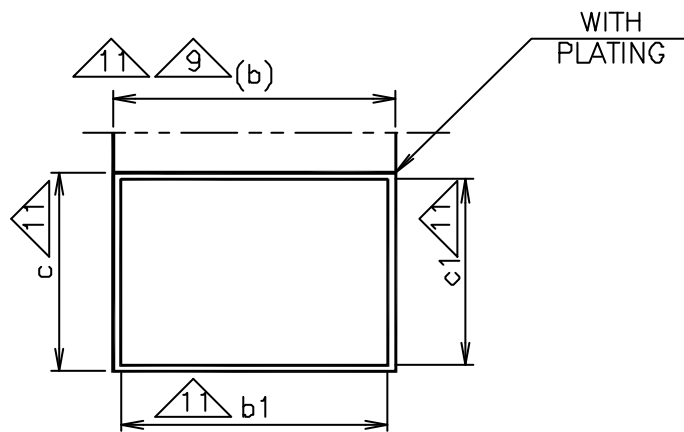



FIG 3 SECTION B-B

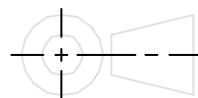


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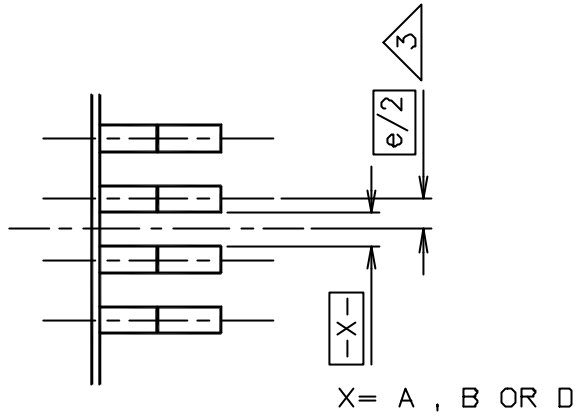
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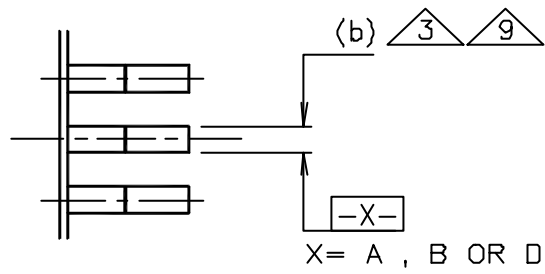
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LQFP  
PACKAGE OUTLINE

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EVEN LEAD SIDES  
TOP VIEW

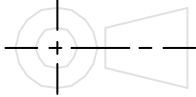


ODD LEAD SIDES  
TOP VIEW

FIGURE 4

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- 1 ALL DIMENSIONING AND TOLERANCING CONFORMS TO ANSI Y14.5M-1982.
- 2 THE TOP PACKAGE BODY SIZE MAY BE SMALLER THAN THE BOTTOM PACKAGE BODY SIZE BY AS MUCH AS 0.15mm.
- 3 DATUMS  $\boxed{A - B}$  AND  $\boxed{- D -}$  TO BE DETERMINED AT DATUM PLANE  $\boxed{- H -}$
- 4 TO BE DETERMINED AT SEATING PLANE  $\boxed{- C -}$
- 5 DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS 0.25mm PER SIDE. D1 AND E1 ARE MAXIMUM PLASTIC BODY SIZE DIMENSIONS INCLUDING MOLD MISMATCH.
- 6 DETAILS OF PIN 1 IDENTIFIER ARE OPTIONAL BUT MUST BE LOCATED WITHIN THE ZONE INDICATED.
- 7 RECTANGULAR VARIATIONS AHA AND BHA HAVE 38 AND 26 LEADS ON SIDES D AND E RESPECTIVELY. RECTANGULAR VARIATIONS AHB AND BHB HAVE 30 AND 20 LEADS ON SIDES D AND E RESPECTIVELY.
- 8 ALL DIMENSIONS ARE IN MILLIMETRE.
- 9 DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL NOT CAUSE THE LEAD WIDTH TO EXCEED THE MAXIMUM b DIMENSION BY MORE THAN 0.08mm. DAMBAR CAN NOT BE LOCATED ON THE LOWER RADIUS OR THE FOOT. MINIMUM SPACE BETWEEN PROTRUSION AND AN ADJACENT LEAD IS 0.07 mm FOR 0.4 mm AND 0.5 mm PITCH PACKAGES.
- 10 EXACT SHAPE OF EACH CORNER IS OPTIONAL.
- 11 THESE DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.10mm AND 0.25mm FROM THE LEAD TIP.
- 12 A1 IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT OF THE PACKAGE BODY.
- 13 DIMENSION D2 AND E2 SHOW THE MINIMUM ALLOWED FOR THE OPTIONAL EXPOSED HEAT SLUG. THE MINIMUM ALLOWED IS EQUAL TO THE PACKAGE BODY SIZE (D1 & E1). HOWEVER, THE SIZE OF THE EXPOSED HEAT SLUG IS VARIABLE DEPENDING ON DEVICE FUNCTION (DIE SIZE). END USERS SHOULD VERIFY THE ACTUAL SIZE OF EITHER TOP OR BOTTOM EXPOSED THERMAL PAD FOR SPECIFIC DEVICE APPLICATION.
- 14 THE OPTIONAL EXPOSED HEAT SLUG IS COINCIDENT WITH THE TOP OR BOTTOM SIDE OF THE PACKAGE AND NOT ALLOWED TO PROTRUDE BEYOND THAT SURFACE.
- 15 THERMALLY ENHANCED VARIATIONS HAVE "HU" OR "HD" AFTER THE VARIATION DESIGNATOR
  - HU = HEAT SLUG UP
  - \*HD = HEAT SLUG DOWN

\*THE MINIMUM A1 VALUE FOR THE HEAT SLUG DOWN (HD) VARIATIONS MAY BE 0.00mm TO ACCOMODATE REFLOW PROCESSES AND GLUING OF THE HEAT SLUG DIRECTLY TO THE PRINTED CIRCUIT BOARD (PCB). THE MAXIMUM VALUES FOR A1 REMAINS THE SAME FOR EITHER HD OR HU VARIATIONS.
- 16 \* LEAD WIDTH DEVIATES FROM JEDEC

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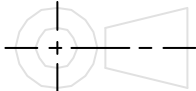
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SYM	COMMON DIMENSION			NOTE
	MIN	NOM	MAX	
R2	0.08	----	0.20	
R1	0.08	----	----	
00	0°	3.5°	7°	
01	0°	----	----	
02	11°	12°	13°	
03	11°	12°	13°	
S	0.20	----	----	
c	0.09	----	0.20	11
c1	0.09	----	0.16	11
L	0.45	0.60	0.75	
L1	1.00 REF			
D2	2.00	----	----	13
E2	2.00	----	----	13
<i>TOL OF FORM AND POSITION</i>				
aaa	0.20			
bbb	0.20			

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VARIATIONS												
SYMBOL	MS-026			NOTE	MS-026			NOTE	MS-026			NOTE
	BBA				BBC				BCB			
	SQUARE				SQUARE				SQUARE			
	MIN	NOM	MAX		MIN	NOM	MAX		MIN	NOM	MAX	
A	1.40	1.50	1.60		1.40	1.50	1.60		1.40	1.50	1.60	
A1	0.05	0.10	0.15		0.05	0.10	0.15		0.05	0.10	0.15	
A2	1.35	1.40	1.45		1.35	1.40	1.45		1.35	1.40	1.45	
D	9.00 BSC			4	9.00 BSC			4	12.00 BSC			4
D1	7.00 BSC			5,2	7.00 BSC			5,2	10.00 BSC			5,2
E	9.00 BSC			4	9.00 BSC			4	12.00 BSC			4
E1	7.00 BSC			5,2	7.00 BSC			5,2	10.00 BSC			5,2
N	32				48				44			
e	0.80 BSC				0.50 BSC				0.80 BSC			
b	0.30	0.37	0.45	9	0.17	0.22	0.27	9	0.30	0.37	0.45	9
b1	0.275*	0.300*	0.325	16	0.17	0.20	0.23		0.275*	0.30*	0.325	16

**TOLERANCE OF FORM AND POSITION**

ccc	0.10				0.08				0.10			
ddd	0.20				0.08				0.20			
NOTE	1 , 8				1 , 8				1 , 8			
REF	11-411				11-411				11-411			
ISSUE	A				A				A			

**VARIATIONS**

SYMBOL	MS-026			NOTE	MS-026			NOTE	MS-026			NOTE
	BCD				BEB				BEC			
	SQUARE				SQUARE				SQUARE			
	MIN	NOM	MAX		MIN	NOM	MAX		MIN	NOM	MAX	
A	1.40	1.50	1.60		1.40	1.50	1.60		1.40	1.50	1.60	
A1	0.05	0.10	0.15		0.05	0.10	0.15		0.05	0.10	0.15	
A2	1.35	1.40	1.45		1.35	1.40	1.45		1.35	1.40	1.45	
D	12.00 BSC			4	16.00 BSC			4	16.00 BSC			4
D1	10.00 BSC			5,2	14.00 BSC			5,2	14.00 BSC			5,2
E	12.00 BSC			4	16.00 BSC			4	16.00 BSC			4
E1	10.00 BSC			5,2	14.00 BSC			5,2	14.00 BSC			5,2
N	64				64				80			
e	0.50 BSC				0.80 BSC				0.65 BSC			
b	0.17	0.22	0.27	9	0.30	0.37	0.45	9	0.22	0.32	0.38	9
b1	0.17	0.20	0.23		0.30	0.35	0.40		0.22	0.30	0.33	

**TOLERANCE OF FORM AND POSITION**

ccc	0.08				0.10				0.10			
ddd	0.08				0.20				0.13			
NOTE	1 , 8				1 , 8				1 , 8			
REF	11-411				11-411				11-411			
ISSUE	A				A				A			

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VARIATIONS												
SYMBOL	MS-026			NOTE	MS-026			NOTE	MS-026			NOTE
	BED				BFB				BGA			
	SQUARE				SQUARE				SQUARE			
	MIN	NOM	MAX		MIN	NOM	MAX		MIN	NOM	MAX	
A	1.40	1.50	1.60		1.40	1.50	1.60		1.40	1.50	1.60	
A1	0.05	0.10	0.15		0.05	0.10	0.15		0.05	0.10	0.15	
A2	1.35	1.40	1.45		1.35	1.40	1.45		1.35	1.40	1.45	
D	16.00 BSC			4	22.00 BSC			4	26.00 BSC			4
D1	14.00 BSC			5,2	20.00 BSC			5,2	24.00 BSC			5,2
E	16.00 BSC			4	22.00 BSC			4	26.00 BSC			4
E1	14.00 BSC			5,2	20.00 BSC			5,2	24.00 BSC			5,2
N	100				144				176			
e	0.50 BSC				0.50 BSC				0.50 BSC			
b	0.17	0.22	0.27	9	0.17	0.22	0.27	9	0.17	0.22	0.27	9
b1	0.17	0.20	0.23		0.17	0.20	0.23		0.17	0.20	0.23	

**TOLERANCE OF FORM AND POSITION**

ccc	0.08				0.08				0.08			
ddd	0.08				0.08				0.08			
NOTE	1, 8				1, 8				1, 8			
REF	11-411				11-411				11-411			
ISSUE	A				A				A			

**VARIATIONS**

SYMBOL	N.J.R			NOTE	MS-026			NOTE	MS-026			NOTE
	ZZ9				BBD				BEE			
	SQUARE				SQUARE				SQUARE			
	MIN	NOM	MAX		MIN	NOM	MAX		MIN	NOM	MAX	
A	1.40	1.50	1.60		1.40	1.50	1.60		1.40	1.50	1.60	
A1	0.05	0.10	0.15		0.05	0.10	0.15		0.05	0.10	0.15	
A2	1.35	1.40	1.45		1.35	1.40	1.45		1.35	1.40	1.45	
D	16.00 BSC				9.00 BSC			4	16.00 BSC			4
D1	14.00 BSC				7.00 BSC			5,2	14.00 BSC			5,2
E	16.00 BSC				9.00 BSC			4	16.00 BSC			4
E1	14.00 BSC				7.00 BSC			5,2	14.00 BSC			5,2
N	128				64				120			
e	0.40 BSC				0.40 BSC				0.40 BSC			
b	0.13	0.18	0.23		0.13	0.18	0.23	9	0.13	0.18	0.23	9
b1	0.1298*	0.1450*	0.19	16	0.13	0.16	0.19		0.13	0.16	0.19	

**TOLERANCE OF FORM AND POSITION**

ccc	0.08				0.08				0.08			
ddd	0.08				0.07				0.07			
NOTE	N/A				1,8				1,8			
REF	N/A				11-411				11-411			
ISSUE	N/A				A				A			

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VARIATIONS												
SYMBOL	MS-026			NOTE	MS-026			NOTE	MS-026			NOTE
	BAA				ACC				SQUARE			
	SQUARE				SQUARE				SQUARE			
	MIN	NOM	MAX		MIN	NOM	MAX		MIN	NOM	MAX	
A	1.40	1.50	1.60		1.40	1.50	1.60					
A1	0.05	0.10	0.15		0.05	0.10	0.15					
A2	1.35	1.40	1.45		1.35	1.40	1.45					
D	7.00 BSC			4	12.00 BSC							
D1	5.00 BSC			5,2	10.00 BSC							
E	7.00 BSC			4	12.00 BSC							
E1	5.00 BSC			5,2	10.00 BSC							
N	32				52							
e	0.50 BSC				0.65 BSC							
b	0.17	0.22	0.27	9	0.22	---	0.38					
b1	0.195	0.22	0.245*	16	0.22	0.30	0.33					

TOLERANCE OF FORM AND POSITION											
ccc	0.08				0.08						
ddd	0.08				0.08						
NOTE	1 , 8				1 , 8						
REF	11-411										
ISSUE	A										

VARIATIONS												
SYMBOL	MS-026			NOTE	MS-026			NOTE	MS-026			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN	NOM	MAX		MIN	NOM	MAX		MIN	NOM	MAX	
	A											
A1												
A2												
D												
D1												
E												
E1												
N												
e												
b												
b1												

TOLERANCE OF FORM AND POSITION											
ccc											
ddd											
REF											
ISSUE											

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