

FIGURE 1

ALL DIMENSIONS IN MILLIMETERS

JEDEC
SOLID STATE PRODUCT
OUTLINES

THIS **STANDARD OUTLINE** HAS BEEN PREPARED BY THE JEDEC JC-11 COMMITTEE AND APPROVED BY THE JEDEC COUNCIL AND REFLECTS A PRODUCT WITH WIDE ACCEPTANCE IN THE ELECTRONICS INDUSTRY; CHANGES ARE NOT LIKELY TO OCCUR.

TITLE
LOW/THIN PROFILE
PLASTIC QUAD FLAT PACKAGE,
2.00 mm FOOTPRINT,
OPTIONAL HEAT SLUG

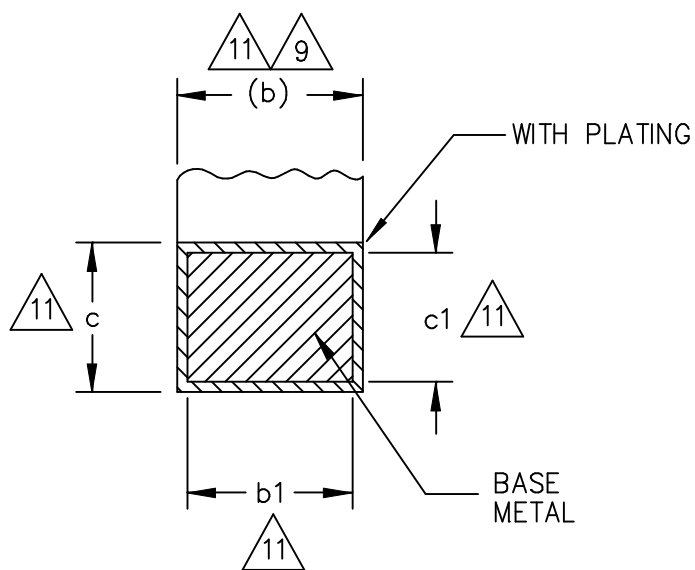
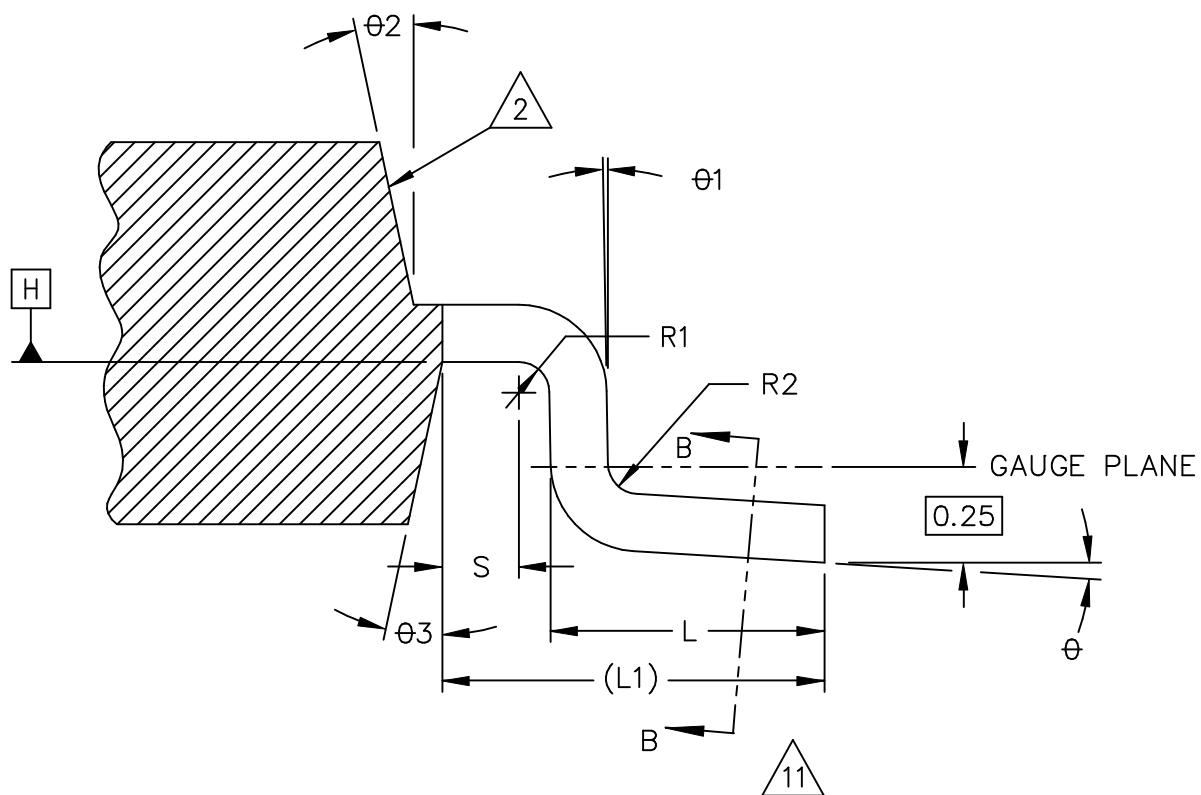
JESD-30 DESIGNATOR
(H)L-PQFP-G &
(H)T-PQFP-G

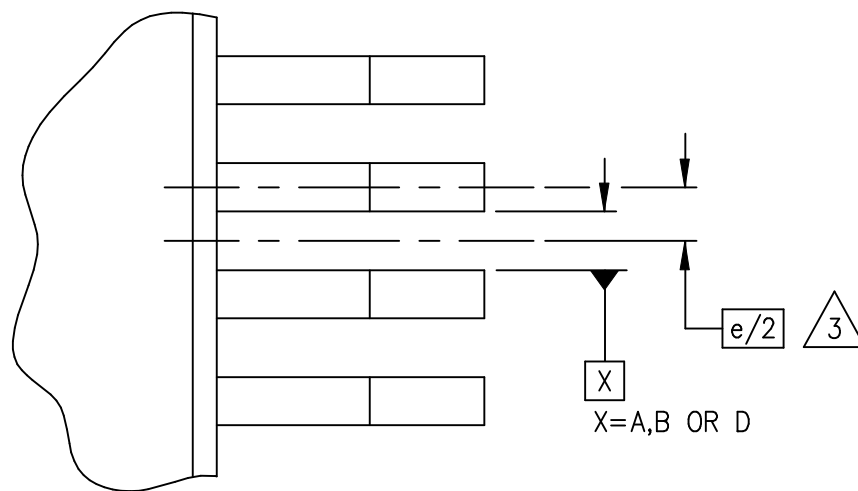
ISSUE
D

DATE
1/01

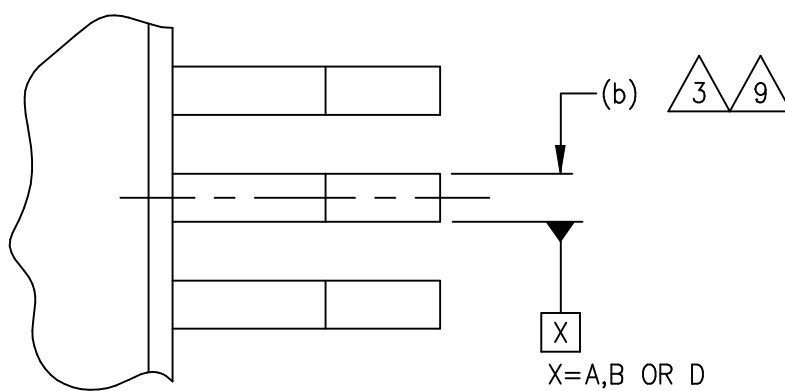
MS-026

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

EVEN LEAD SIDES
TOP VIEW



ODD LEAD SIDES
TOP VIEW

FIGURE 4

SYMBOL	COMMON DIMENSIONS			NOTE
	MIN.	NOM.	MAX.	
θ	0°	3.5°	7°	
$\theta 1$	0°	—	—	
$\theta 2$	11°	12°	13°	
$\theta 3$	11°	12°	13°	
C	0.09	—	0.20	11
C1	0.09	—	0.16	11
D2	2.00	—	—	13
E2	2.00	—	—	13
L	0.45	0.60	0.75	
L1	1.00 REF			
R1	0.08	—	—	
R2	0.08	—	0.20	
S	0.20	—	—	
TOLERANCES OF FORM AND POSITION				
aaa	0.20			
bbb	0.20			
NOTE	1,8			
REF	11-411, 11-521S			
ISSUE	A, C			

SUMMARY TABLE						
BODY SIZE	PITCH	LEAD COUNT	1.00 mm THK BODY T-PQFP-G	ENHANCED 1.00 mm THK BODY HT-PQFP-G 	1.40 mm THK BODY L-PQFP-G	ENHANCED 1.40 mm THK BODY HL-PQFP-G 
4 X 4	0.65	20	AKA	AKA-HU / AKA-HD	BKA	BKA-HU / BKA-HD
4 X 4	0.50	24	AKB	AKB-HU / AKB-HD	BKB	BKB-HU / BKB-HD
4 X 4	0.40	32	AKC	AKC-HU / AKC-HD	BKC	BKC-HU / BKC-HD
5 X 5	0.50	32	AAA	AAA-HU / AAA-HD	BAA	BAA-HU / BAA-HD
5 X 5	0.40	40	AAB	AAB-HU / AAB-HD	BAB	BAB-HU / BAB-HD
7 X 7	0.80	32	ABA	ABA-HU / ABA-HD	BBA	BBA-HU / BBA-HD
7 X 7	0.65	40	ABB	ABB-HU / ABB-HD	BBB	BBB-HU / BBB-HD
7 X 7	0.50	48	ABC	ABC-HU / ABC-HD	BBC	BBC-HU / BBC-HD
7 X 7	0.40	64	ABD	ABD-HU / ABD-HD	BBD	BBD-HU / BBD-HD
10 X 10	1.00	36	ACA	ACA-HU / ACA-HD	BCA	BCA-HU / BCA-HD
10 X 10	0.80	44	ACB	ACB-HU / ACB-HD	BCB	BCB-HU / BCB-HD
10 X 10	0.65	52	ACC	ACC-HU / ACC-HD	BCC	BCC-HU / BCC-HD
10 X 10	0.50	64	ACD	ACD-HU /ACD-HD	BCD	BCD-HU / BCD-HD
10 X 10	0.40	80	ACE	ACE-HU / ACE-HD	BCE	BCE-HU / BCE-HD
12 X 12	1.00	44	ADA	ADA-HU / ADA-HD	BDA	BDA-HU / BDA-HD
12 X 12	0.80	52	ADB	ADB-HU / ADB-HS	BDB	BDB-HU / BDB-HD
12 X 12	0.65	64	ADC	ADC-HU / ADC-HD	BDC	BDC-HU / BDC-HD
12 X 12	0.50	80	ADD	ADD-HU / ADD-HD	BDD	BDD-HU / BDD-HD
12 X 12	0.40	100	ADE	ADE-HU / ADE-HD	BDE	BDE-HU / BDE-HD
14 X 14	1.00	52	AEA	AEA-HU / AEA-HD	BEA	BEA-HU / BEA-HD
14 X 14	0.80	64	AEB	AEB-HU / AEB-HD	BEB	BEB-HU / BEB-HD
14 X 14	0.65	80	AEC	AEC-HU / AEC-HD	BEC	BEC-HU / BEC-HD
14 X 14	0.50	100	AED	AED-HU / AED-HD	BED	BED-HU / BED-HD
14 X 14	0.40	120	AEE	AEE-HU / AEE-HD	BEE	BEE-HU / BEE-HD
20 X 20	0.65	112	AFA	AFA-HU / AFA-HD	BFA	BFA-HU / BFA-HD
20 X 20	0.50	144	AFB	AFB-HU / AFB-HD	BFB	BFB-HU / BFB-HD
20 X 20	0.40	176	AFC	AFC-HU / AFC-HD	BFC	BFC-HU / BFC-HD
24 X 24	0.50	176	AGA	AGA-HU / AGA-HD	BGA	BGA-HU / BGA-HD
24 X 24	0.40	216	AGB	AGB-HU /AGB-HD	BGB	BGB-HU / BGB-HD
14 X 20	0.65	100	AHA	AHA-HU / AHA-HD	BHA	BHA-HU / BHA-HD
14 X 20	0.50	128	AHB	AHB-HU / AHB-HD	BHB	BHB-HU / BHB-HD
28 X 28	0.65	160	—	—	BJA	BJA-HU / BJA-HD
28 X 28	0.50	208	—	—	BJB	BJB-HU / BJB-HD
28 X 28	0.40	256	—	—	BJC	BJC-HU / BJC-HD

JEDEC SOLID STATE PRODUCT OUTLINES		TITLE LOW/THIN PROFILE PLASTIC QUAD FLAT PACKAGE, 2.00 mm FOOTPRINT, OPTIONAL HEAT SLUG	ISSUE D	DATE 1/01	MS-026	PAGE 5 OF 18
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VARIATIONS												
SYMBOL	AAA			NOTE	AAB			NOTE	ABA			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.20	14	—	—	1.20	14	—	—	1.20	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	0.95	1.00	1.05	14	0.95	1.00	1.05	14	0.95	1.00	1.05	14
b	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11	0.30	0.37	0.45	9,11
b1	0.17	0.20	0.23	11	0.13	0.16	0.19	11	0.30	0.35	0.40	11
D	7.00 BSC			4	7.00 BSC			4	9.00 BSC			4
D1	5.00 BSC			5,2	5.00 BSC			5,2	7.00 BSC			5,2
e	0.50 BSC				0.40 BSC				0.80 BSC			
E	7.00 BSC			4	7.00 BSC			4	9.00 BSC			4
E1	5.00 BSC			5,2	5.00 BSC			5,2	7.00 BSC			5,2
N	32				40				32			
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.08				0.10			
ddd	0.08				0.07				0.20			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	ABB			NOTE	ABC			NOTE	ABD			NOTE
					SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.20	14	—	—	1.20	14	—	—	1.20	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	0.95	1.00	1.05	14	0.95	1.00	1.05	14	0.95	1.00	1.05	14
b	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11
b1	0.22	0.30	0.33	11	0.17	0.20	0.23	11	0.13	0.16	0.19	11
D	9.00 BSC			4	9.00 BSC			4	9.00 BSC			4
D1	7.00 BSC			5,2	7.00 BSC			5,2	7.00 BSC			5,2
e	0.65 BSC				0.50 BSC				0.40 BSC			
E	9.00 BSC				9.00 BSC			4	9.00 BSC			4
E1	7.00 BSC			5,2	7.00 BSC			5,2	7.00 BSC			5,2
N	40				48				64			
ccc	0.10				0.08				0.08			
ddd	0.13				0.08				0.07			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	ACA			NOTE	ACB			NOTE	ACC			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.20	14	—	—	1.20	14	—	—	1.20	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	0.95	1.00	1.05	14	0.95	1.00	1.05	14	0.95	1.00	1.05	14
b	0.35	0.42	0.50	9,11	0.30	0.37	0.45	9,11	0.22	0.32	0.38	9,11
b1	0.35	0.40	0.45	11	0.30	0.35	0.40	11	0.22	0.30	0.33	11
D	12.00 BSC			4	12.00 BSC			4	12.00 BSC			4
D1	10.00 BSC			5,2	10.00 BSC			5,2	10.00 BSC			5,2
e	1.00 BSC				0.80 BSC				0.65 BSC			
E	12.00 BSC			4	12.00 BSC			4	12.00 BSC			4
E1	10.00 BSC			5,2	10.00 BSC			5,2	10.00 BSC			5,2
N	36				44				52			
TOLERANCES OF FORM AND POSITION												
ccc	0.10				0.10				0.10			
ddd	0.20				0.20				0.13			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	ACD			NOTE	ACE			NOTE	ADA			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.20	14	—	—	1.20	14	—	—	1.20	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	0.95	1.00	1.05	14	0.95	1.00	1.05	14	0.95	1.00	1.05	14
b	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11	0.35	0.42	0.50	9,11
b1	0.17	0.20	0.23	11	0.13	0.16	0.19	11	0.35	0.40	0.45	11
D	12.00 BSC			4	12.00 BSC			4	14.00 BSC			4
D1	10.00 BSC			5,2	10.00 BSC			5,2	12.00 BSC			5,2
e	0.50 BSC				0.40 BSC				1.00 BSC			
E	12.00 BSC			4	12.00 BSC			4	14.00 BSC			4
E1	10.00 BSC			5,2	10.00 BSC			5,2	12.00 BSC			5,2
N	64				80				44			
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.08				0.10			
ddd	0.08				0.07				0.20			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	ADB			NOTE	ADC			NOTE	ADD			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.20	14	—	—	1.20	14	—	—	1.20	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	0.95	1.00	1.05	14	0.95	1.00	1.05	14	0.95	1.00	1.05	14
b	0.30	0.37	0.45	9,11	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11
b1	0.30	0.35	0.40	11	0.22	0.30	0.33	11	0.17	0.20	0.23	11
D	14.00 BSC			4	14.00 BSC			4	14.00 BSC			4
D1	12.00 BSC			5,2	12.00 BSC			5,2	12.00 BSC			5,2
e	0.80 BSC				0.65 BSC				0.50 BSC			
E	14.00 BSC			4	14.00 BSC			4	14.00 BSC			4
E1	12.00 BSC			5,2	12.00 BSC			5,2	12.00 BSC			5,2
N	52				64				80			
TOLERANCES OF FORM AND POSITION												
ccc	0.10				0.10				0.08			
ddd	0.20				0.13				0.08			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	ADE			NOTE	AEA			NOTE	AEB			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.20	14	—	—	1.20	14	—	—	1.20	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	0.95	1.00	1.05	14	0.95	1.00	1.05	14	0.95	1.00	1.05	14
b	0.13	0.18	0.23	9,11	0.35	0.42	0.50	9,11	0.30	0.37	0.45	9,11
b1	0.13	0.16	0.19	11	0.35	0.40	0.45	11	0.30	0.35	0.40	11
D	14.00 BSC			4	16.00 BSC			4	16.00 BSC			4
D1	12.00 BSC			5,2	14.00 BSC			5,2	14.00 BSC			5,2
e	0.40 BSC				1.00 BSC				0.80			
E	14.00 BSC			4	16.00 BSC			4	16.00 BSC			4
E1	12.00 BSC			5,2	14.00 BSC			5,2	14.00 BSC			5,2
N	100				52				64			
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.10				0.10			
ddd	0.07				0.20				0.20			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	AEC			NOTE	AED			NOTE	AEE			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.20	14	—	—	1.20	14	—	—	1.20	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	0.95	1.00	1.05	14	0.95	1.00	1.05	14	0.95	1.00	1.05	14
b	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11
b1	0.22	0.30	0.33	11	0.17	0.20	0.23	11	0.13	0.16	0.19	11
D	16.00 BSC			4	16.00 BSC			4	16.00 BSC			4
D1	14.00 BSC			5,2	14.00 BSC			5,2	14.00 BSC			5,2
e	0.65 BSC				0.50 BSC				0.40 BSC			
E	16.00 BSC			4	16.00 BSC			4	16.00 BSC			4
E1	14.00 BSC			5,2	14.00 BSC			5,2	14.00 BSC			5,2
N	80				100				120			
TOLERANCES OF FORM AND POSITION												
ccc	0.10				0.08				0.08			
ddd	0.13				0.08				0.07			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	AFA			NOTE	AFB			NOTE	AFC			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.20	14	—	—	1.20	14	—	—	1.20	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	0.95	1.00	1.05	14	0.95	1.00	1.05	14	0.95	1.00	1.05	14
b	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11
b1	0.22	0.30	0.33	11	0.17	0.20	0.23	11	0.13	0.16	0.19	11
D	22.00 BSC			4	22.00 BSC			4	22.00 BSC			4
D1	20.00 BSC			5,2	20.00 BSC			5,2	20.00 BSC			5,2
e	0.65 BSC				0.50 BSC				0.40 BSC			
E	22.00 BSC			4	22.00 BSC			4	22.00 BSC			4
E1	20.00 BSC			5,2	20.00 BSC			5,2	20.00 BSC			5,2
N	112				144				176			
TOLERANCES OF FORM AND POSITION												
ccc	0.10				0.08				0.08			
ddd	0.13				0.08				0.07			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	AGA			NOTE	AGB			NOTE	AHA			NOTE
	SQUARE				SQUARE				RECTANGULAR			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.20	14	—	—	1.20	14	—	—	1.20	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	0.95	1.00	1.05	14	0.95	1.00	1.05	14	0.95	1.00	1.05	14
b	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11	0.22	0.32	0.38	9,11
b1	0.17	0.20	0.23	11	0.13	0.16	0.19	11	0.22	0.30	0.33	11
D	26.00 BSC			4	26.00 BSC			4	22.00 BSC			4
D1	24.00 BSC			5,2	24.00 BSC			5,2	20.00 BSC			5,2
e	0.50 BSC				0.40 BSC				0.65 BSC			
E	26.00 BSC			4	26.00 BSC			4	16.00 BSC			4
E1	24.00 BSC			5,2	24.00 BSC			5,2	14.00 BSC			5,2
N	176				216				100			7
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.08				0.10			
ddd	0.08				0.07				0.13			
NOTE	1,8,15				1,8,15				1,7,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	AHB			NOTE	AKA			NOTE	AKB			NOTE
	RECTANGULAR				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.20	14	—	—	1.20	14	—	—	1.20	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	0.95	1.00	1.05	14	0.95	1.00	1.05	14	0.95	1.00	1.05	14
b	0.17	0.22	0.27	9,11	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11
b1	0.17	0.20	0.23	11	0.22	0.30	0.33	11	0.17	0.20	0.23	11
D	22.00 BSC			4	6.00 BSC			4	6.00 BSC			4
D1	20.00 BSC			5,2	4.00 BSC			5,2	4.00 BSC			5,2
e	0.50 BSC				0.65 BSC				0.50 BSC			
E	16.00 BSC			4	6.00 BSC			4	6.00 BSC			4
E1	14.00 BSC			5,2	4.00 BSC			5,2	4.00 BSC			5,2
N	128			7	20				24			
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.10				0.08			
ddd	0.08				0.13				0.08			
NOTE	1,7,8,15				1,8,15				1,8,15			
REF	11–411				11–483S				11–483S			
ISSUE	A				B				B			

VARIATIONS												
SYMBOL	AKC			NOTE				NOTE				NOTE
	SQUARE											
	MIN.	NOM.	MAX.									
A	—	—	1.20	14								
A1	0.05	—	0.15	12								
A2	0.95	1.00	1.05	14								
b	0.13	0.18	0.23	9,11								
b1	0.13	0.16	0.19	11								
D	6.00 BSC			4								
D1	4.00 BSC			5,2								
e	0.40 BSC											
E	6.00 BSC			4								
E1	4.00 BSC			5,2								
N	32											
TOLERANCES OF FORM AND POSITION												
ccc	0.08											
ddd	0.07											
NOTE	1,8,15											
REF	11–483S											
ISSUE	B											

VARIATIONS												
SYMBOL	BAA			NOTE	BAB			NOTE	BBA			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14	—	—	1.60	14	—	—	1.60	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11	0.30	0.37	0.45	9,11
b1	0.17	0.20	0.23	11	0.13	0.16	0.19	11	0.30	0.35	0.40	11
D	7.00 BSC			4	7.00 BSC			4	9.00 BSC			4
D1	5.00 BSC			5,2	5.00 BSC			5,2	7.00 BSC			5,2
e	0.50 BSC				0.40 BSC				0.80 BSC			
E	7.00 BSC			4	7.00 BSC			4	9.00 BSC			4
E1	5.00 BSC			5,2	5.00 BSC			5,2	7.00 BSC			5,2
N	32				40				32			
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.08				0.10			
ddd	0.08				0.07				0.20			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	BBB			NOTE	BBC			NOTE	BBD			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14	—	—	1.60	14	—	—	1.60	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11
b1	0.22	0.30	0.33	11	0.17	0.20	0.23	11	0.13	0.16	0.19	11
D	9.00 BSC			4	9.00 BSC			4	9.00 BSC			4
D1	7.00 BSC			5,2	7.00 BSC			5,2	7.00 BSC			5,2
e	0.65 BSC				0.50 BSC				0.40 BSC			
E	9.00 BSC			4	9.00 BSC			4	9.00 BSC			4
E1	7.00 BSC			5,2	7.00 BSC			5,2	7.00 BSC			5,2
N	40				48				64			
TOLERANCES OF FORM AND POSITION												
ccc	0.10				0.08				0.08			
ddd	0.13				0.08				0.07			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	BCA			NOTE	BCB			NOTE	BCC			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14	—	—	1.60	14	—	—	1.60	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.35	0.42	0.50	9,11	0.30	0.37	0.45	9,11	0.22	0.32	0.38	9,11
b1	0.35	0.40	0.45	11	0.30	0.35	0.40	11	0.22	0.30	0.33	11
D	12.00 BSC			4	12.00 BSC			4	12.00 BSC			4
D1	10.00 BSC			5,2	10.00 BSC			5,2	10.00 BSC			5,2
e	1.00 BSC				0.80 BSC				0.65 BSC			
E	12.00 BSC			4	12.00 BSC			4	12.00 BSC			4
E1	10.00 BSC			5,2	10.00 BSC			5,2	10.00 BSC			5,2
N	36				44				52			
TOLERANCES OF FORM AND POSITION												
ccc	0.10				0.10				0.10			
ddd	0.20				0.20				0.13			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	BCD			NOTE	BCE			NOTE	BDA			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14	—	—	1.60	14	—	—	1.60	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11	0.35	0.42	0.50	9,11
b1	0.17	0.20	0.23	11	0.13	0.16	0.19	11	0.35	0.40	0.45	11
D	12.00 BSC			4	12.00 BSC			4	14.00 BSC			4
D1	10.00 BSC			5,2	10.00 BSC			5,2	12.00 BSC			5,2
e	0.50 BSC				0.40 BSC				1.00 BSC			
E	12.00 BSC			4	12.00 BSC			4	14.00 BSC			4
E1	10.00 BSC			5,2	10.00 BSC			5,2	12.00 BSC			5,2
N	64				80				44			
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.08				0.10			
ddd	0.08				0.07				0.20			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	BDB			NOTE	BDC			NOTE	BDD			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14	—	—	1.60	14	—	—	1.60	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.30	0.37	0.45	9,11	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11
b1	0.30	0.35	0.40	11	0.22	0.30	0.33	11	0.17	0.20	0.23	11
D	14.00 BSC			4	14.00 BSC			4	14.00 BSC			4
D1	12.00 BSC			5,2	12.00 BSC			5,2	12.00 BSC			5,2
e	0.80 BSC				0.65 BSC				0.50 BSC			
E	14.00 BSC			4	14.00 BSC			4	14.00 BSC			4
E1	12.00 BSC			5,2	12.00 BSC			5,2	12.00 BSC			5,2
N	52				64				80			
TOLERANCES OF FORM AND POSITION												
ccc	0.10				0.10				0.08			
ddd	0.20				0.13				0.08			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	BDE			NOTE	BEA			NOTE	BEB			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14	—	—	1.60	14	—	—	1.60	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.13	0.18	0.23	9,11	0.35	0.42	0.50	9,11	0.30	0.37	0.45	9,11
b1	0.13	0.16	0.19	11	0.35	0.40	0.45	11	0.30	0.35	0.40	11
D	14.00 BSC			4	16.00 BSC			4	16.00 BSC			4
D1	12.00 BSC			5,2	14.00 BSC			5,2	14.00 BSC			5,2
e	0.40 BSC				1.00 BSC				0.80 BSC			
E	14.00 BSC			4	16.00 BSC			4	16.00 BSC			4
E1	12.00 BSC			5,2	14.00 BSC			5,2	14.00 BSC			5,2
N	100				52				64			
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.10				0.10			
ddd	0.07				0.20				0.20			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	BEC			NOTE	BED			NOTE	BEE			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14	—	—	1.60	14	—	—	1.60	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11
b1	0.22	0.30	0.33	11	0.17	0.20	0.23	11	0.13	0.16	0.19	11
D	16.00 BSC			4	16.00 BSC			4	16.00 BSC			4
D1	14.00 BSC			5,2	14.00 BSC			5,2	14.00 BSC			5,2
e	0.65 BSC				0.50 BSC				0.40 BSC			
E	16.00 BSC			4	16.00 BSC			4	16.00 BSC			4
E1	14.00 BSC			5,2	14.00 BSC			5,2	14.00 BSC			5,2
N	80				100				120			
TOLERANCES OF FORM AND POSITION												
ccc	0.10				0.08				0.08			
ddd	0.13				0.08				0.07			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	BFA			NOTE	BFB			NOTE	BFC			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14	—	—	1.60	14	—	—	1.60	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11
b1	0.22	0.30	0.33	11	0.17	0.20	0.23	11	0.13	0.16	0.19	11
D	22.00 BSC			4	22.00 BSC			4	22.00 BSC			4
D1	20.00 BSC			5,2	20.00 BSC			5,2	20.00 BSC			5,2
e	0.65 BSC				0.50 BSC				0.40 BSC			
E	22.00 BSC			4	22.00 BSC			4	22.00 BSC			4
E1	20.00 BSC			5,2	20.00 BSC			5,2	20.00 BSC			5,2
N	112				144				176			
TOLERANCES OF FORM AND POSITION												
ccc	0.10				0.08				0.08			
ddd	0.13				0.08				0.07			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	BGA			NOTE	BGB			NOTE	BHA			NOTE
	SQUARE				SQUARE				RECTANGULAR			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14	—	—	1.60	14	—	—	1.60	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.17	0.22	0.27	9,11	0.13	0.18	0.23	9,11	0.22	0.32	0.38	9,11
b1	0.17	0.20	0.23	11	0.13	0.16	0.19	11	0.22	0.30	0.33	11
D	26.00 BSC			4	26.00 BSC			4	22.00 BSC			4
D1	24.00 BSC			5,2	24.00 BSC			5,2	20.00 BSC			5,2
e	0.50 BSC				0.40 BSC				0.65 BSC			
E	26.00 BSC			4	26.00 BSC			4	16.00 BSC			4
E1	24.00 BSC			5,2	24.00 BSC			5,2	14.00 BSC			5,2
N	176				216				100			7
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.08				0.10			
ddd	0.08				0.07				0.13			
NOTE	1,8,15				1,8,15				1,7,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	BHB			NOTE	BJA			NOTE	BJB			NOTE
	RECTANGULAR				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14	—	—	1.60	14	—	—	1.60	14
A1	0.05	—	0.15	12	0.05	—	0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.17	0.22	0.27	9,11	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11
b1	0.17	0.20	0.23	11	0.22	0.30	0.33	11	0.17	0.20	0.23	11
D	22.00 BSC			4	30.00 BSC			4	30.00 BSC			4
D1	20.00 BSC			5,2	28.00 BSC			5,2	28.00 BSC			5,2
e	0.50 BSC				0.65 BSC				0.50 BSC			
E	16.00 BSC			4	30.00 BSC			4	30.00 BSC			4
E1	14.00 BSC			5,2	28.00 BSC			5,2	28.00 BSC			5,2
N	128			7	160				208			
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.10				0.08			
ddd	0.08				0.13				0.08			
NOTE	1,7,8,15				1,8,15				1,8,15			
REF	11–411				11–411				11–411			
ISSUE	A				A				A			

VARIATIONS												
SYMBOL	BJC			NOTE	BKA			NOTE	BKB			NOTE
	SQUARE				SQUARE				SQUARE			
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A			1.60	14			1.60	14	—	—	1.60	14
A1	0.05		0.15	12	0.05		0.15	12	0.05	—	0.15	12
A2	1.35	1.40	1.45	14	1.35	1.40	1.45	14	1.35	1.40	1.45	14
b	0.13	0.18	0.23	9,11	0.22	0.32	0.38	9,11	0.17	0.22	0.27	9,11
b1	0.13	0.16	0.19	11	0.22	0.30	0.33	11	0.17	0.20	0.23	11
D	30.00 BSC			4	6.00 BSC			4	6.00 BSC			4
D1	28.00 BSC			5,2	4.00 BSC			5,2	4.00 BSC			5,2
e	0.40 BSC				0.65 BSC				0.50 BSC			
E	30.00 BSC			4	6.00 BSC			4	6.00 BSC			4
E1	28.00 BSC			5,2	4.00 BSC			5,2	4.00 BSC			5,2
N	256				20				24			
TOLERANCES OF FORM AND POSITION												
ccc	0.08				0.10				0.08			
ddd	0.07				0.13				0.08			
NOTE	1,8,15				1,8,15				1,8,15			
REF	11—411				11—483S				11—483S			
ISSUE	A				B				B			

SYMBOL	BKC			NOTE				NOTE				NOTE
	SQUARE											
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.		MIN.	NOM.	MAX.	
A	—	—	1.60	14								
A1	0.05	—	0.15	12								
A2	1.35	1.40	1.45	14								
b	0.13	0.18	0.23	9,11								
b1	0.13	0.16	0.19	11								
D	6.00 BSC			4								
D1	4.00 BSC			5,2								
e	0.40 BSC											
E	6.00 BSC			4								
E1	4.00 BSC			5,2								
N	32											
TOLERANCES OF FORM AND POSITION												
ccc	0.08											
ddd	0.07											
NOTE	1,8,15											
REF	11–483S											
ISSUE	B											

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.

2 THE TOP PACKAGE BODY SIZE MAY BE SMALLER THAN THE BOTTOM PACKAGE SIZE BY AS MUCH AS 0.15 mm.

3 DATUMS A-B AND D TO BE DETERMINED AT DATUM PLANE H.

4 TO BE DETERMINED AT SEATING DATUM PLANE C.

5 DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD PROTRUSIONS. ALLOWABLE PROTRUSION IS 0.25 mm 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 AND HEAT SLUG VARIATIONS HAVE 30 AND 20 LEADS ON SIDES D AND E RESPECTIVELY. RECTANGULAR VARIATIONS AHB AND BHB AND HEAT SLUG VARIATIONS HAVE 38 AND 26 LEADS ON SIDES D AND E RESPECTIVELY.

8. ALL DIMENSIONS ARE IN MILLIMETERS.

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 0.08 mm. DAMBAR CANNOT 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 0.10 mm AND 0.25 mm FROM THE LEAD TIP.

12 A1 IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.

13 DIMENSION D2 AND E2 SHOW THE MINIMUM ALLOWED FOR THE OPTIONAL EXPOSED HEAT SLUG. THE MAXIMUM 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 HEATSLUG 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 0.00 mm TO ACCOMMODATE 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.

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE LOW/THIN PROFILE PLASTIC QUAD FLAT PACKAGE, 2.00 mm FOOTPRINT, OPTIONAL HEAT SLUG	ISSUE D	DATE 1/01	MS-026	PAGE 18 OF 18
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