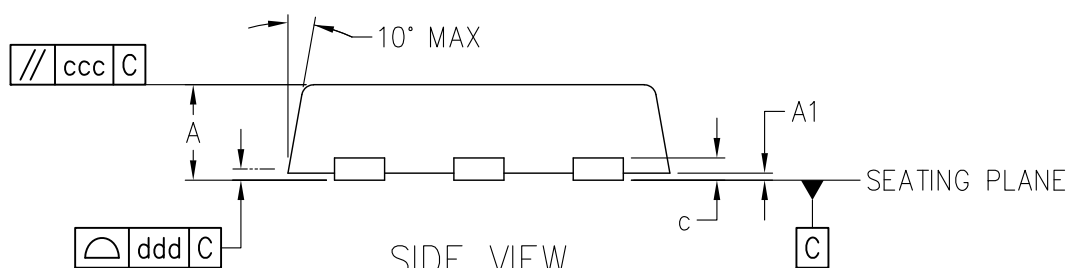
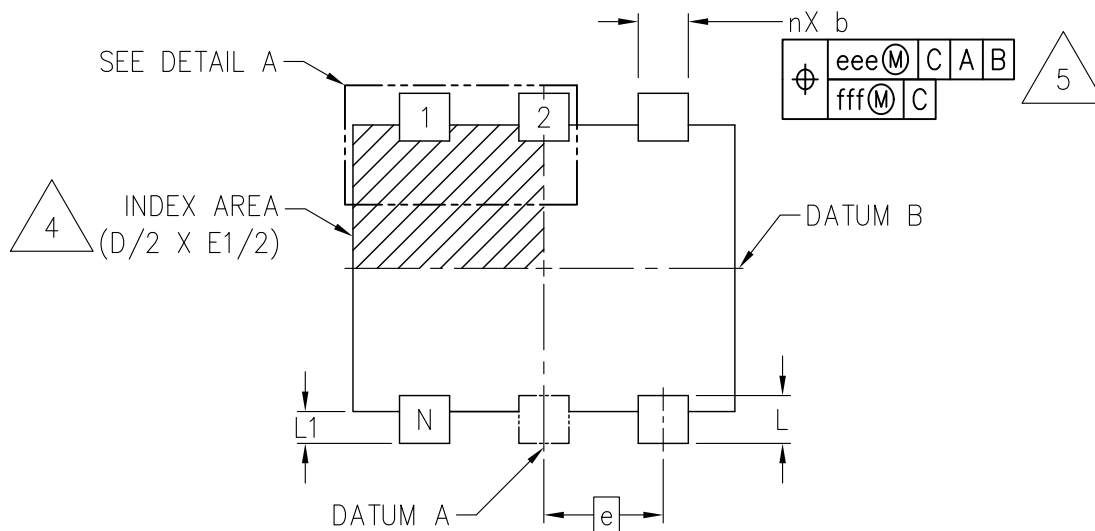


TOP VIEW



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 PLASTIC, ULTRA, EXTRA AND  
SUPER THIN, FINE PITCH, DUAL SMALL  
OUTLINE, FLAT, LEADED PACKAGE

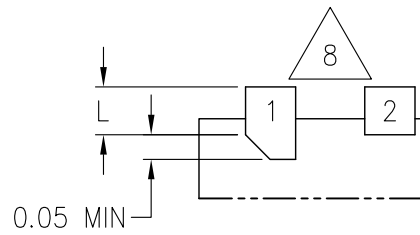
PACKAGE DESIGNATOR  
(U,X1,X2)F-PSOF,HX2-PSOF

NUMBER  
**MO-293**

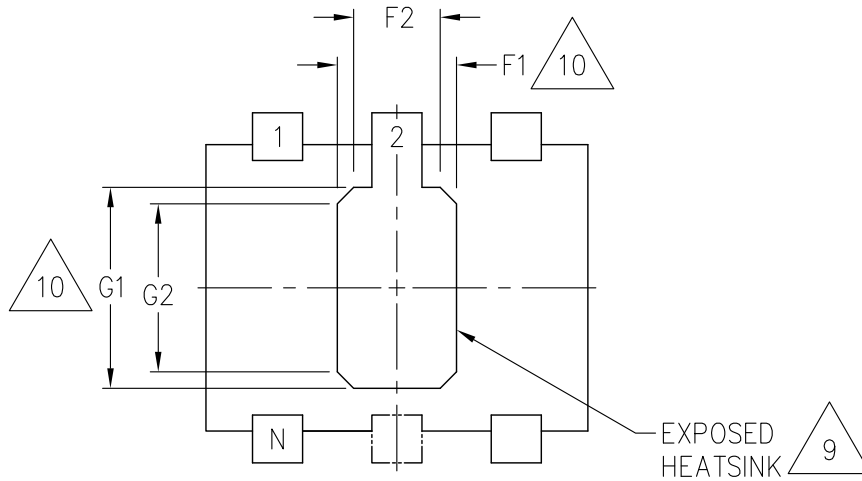
ISSUE  
**B**

DATE  
SEP 2021

SHEET  
1 OF 7



ELONGATION AND CHAMFER  
OPTIONAL PIN 1 IDENTIFIERS  
DETAIL A



OPTIONAL EXPOSED HEATSINK  
APPLICABLE ONLY TO  
VARIATION X2CDF & X2CDF-1

TABLE 1

VARIATION DESIGNATORS							
FIRST DIGIT CODE		SECOND DIGIT CODE		THIRD DIGIT CODE		FOURTH DIGIT CODE	
OVERALL HEIGHT		PACKAGE LENGTH		PACKAGE WIDTH		TERMINAL PITCH	
A	LETTER CODE	D	LETTER CODE	E	LETTER CODE	e	LETTER CODE
0.60 MAX	U	1.60	A	1.60	A	0.50	D
0.50 MAX	X1	1.00	B	1.00	B	0.35	E
0.40 MAX	X2	2.00	C	2.35	D	0.65	F
		2.10	D				
NOTES		1,2		1,2		1,2	
REF		10–445, 10–459		10–445		10–445	
ISSUE		B		A		A	

TABLE 2

COMMON DIMENSIONS									
	U: ULTRA THIN			X1: EXTRA THIN			X2: SUPER THIN		
SYMBOL	MIN	NOM	MAX	MIN	NOM	MAX	MIN	NOM	MAX
A	>0.50	–	0.60	>0.40	–	0.50	>0.30	–	0.40
A1	0	0.02	0.05	0	0.02	0.05	0	–	0.05
c	0.08	–	0.20	0.08	–	0.20	0.08	–	0.20
NOTES	1,2			1,2			1,2		
REF	10–445			10–445			10–445		
ISSUE	A			A			A		

TABLE 3

LEAD WIDTH			
b			
PITCH	MIN	NOM	MAX
0.65	0.15	0.23	0.30
0.50	0.15	0.22	0.31
0.35	0.10	0.15	0.20
NOTES	1,2,5		
REF	10–445		
ISSUE	A		

TABLE 4

TOLERANCE OF FORM & POSITION			
SYMBOL	PITCH		
	0.65	0.50	0.35
aaa	0.20	0.20	0.10
ccc	0.05	0.05	0.05
ddd	0.05	0.05	0.05
eee	0.10	0.10	0.07
fff	0.05	0.05	0.05
NOTES	1,2		
REF	10–445, 10–459		
ISSUE	B		

TABLE 5

OPTIONAL EXPOSED HEATSINK			
SYMBOL	MIN	NOM	MAX
F1	0.80	0.90	1.00
F2	0.40	0.55	0.65
G1	1.15	1.25	1.35
G2	0.55	0.70	0.80
NOTES	10		
REF	10–445		
ISSUE	A		

TABLE 6

VARIATION SUMMARY TABLE					
PACKAGE SIZE (D X E)	LEAD PITCH (e)	LEAD COUNT (n)	ULTRA THIN (U)	EXTRA THIN (X1)	SUPER THIN (X2)
1.00 X 1.00	0.35	6	—	X1BBE	—
1.00 X 1.00	0.35	5	—	X1BBE-1	—
1.60 X 1.60	0.50	6	UAAD	—	—
1.60 X 1.60	0.50	5	UAAD-1	—	—
2.10 x 1.60	0.50	8	UDAD	—	—
2.00 X 2.35	0.65	6	—	—	X2CDF
2.00 X 2.35	0.65	5	—	—	X2CDF-1
NOTES	1,2				
REF	10-445, 10-459				
ISSUE	B				

TABLE 7

VARIATIONS				
e = 0.35 PITCH				
SYMBOL		X1BBE	X1BBE-1	NOTES
D BSC		1.00	1.00	
E BSC		1.00	1.00	
E1 BSC		0.80	0.80	
L	MIN	0.12	0.12	
	NOM	0.15	0.15	
	MAX	0.17	0.17	
L1	MIN	0.05	0.05	
	NOM	0.10	0.10	
	MAX	0.15	0.15	
n		6	5	3
NOTES		1,2		
REF		10-445		
ISSUE		A		

TABLE 8

VARIATIONS					
e = 0.50 PITCH					
SYMBOL		UAAD	UAAD-1	UDAD	NOTES
D BSC		1.60	1.60	2.10	
E BSC		1.60	1.60	1.60	
E1 BSC		1.20	1.20	1.20	
L	MIN	0.20	0.20	0.20	
	NOM	0.30	0.30	0.30	
	MAX	0.46	0.46	0.46	
L1	MIN	0.14	0.14	0.10	
	NOM	0.20	0.20	0.20	
	MAX	0.27	0.27	0.30	
n		6	5	8	3
NOTES		1,2			
REF		10-445, 10-459			
ISSUE		B			

TABLE 9

VARIATIONS				
e = 0.65 PITCH				
SYMBOL		X2CCF	X2CCF-1	NOTES
D BSC		2.00	2.00	
E BSC		2.35	2.35	
E1 BSC		1.80	1.80	
L	MIN	0.30	0.30	
	NOM	0.40	0.40	
	MAX	0.50	0.50	
L1	MIN	0.25	0.25	
	NOM	0.30	0.30	
	MAX	0.35	0.35	
n		6	5	3
NOTES		1,2		
REF		10-445		
ISSUE		A		

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. n IS THE TOTAL NUMBER OF TERMINALS.



4. TERMINAL #1 IDENTIFIER AND TERMINAL NUMBERING CONVENTION SHALL CONFORM TO JEP95, SECTION 3, SPP-012. TERMINAL #1 IDENTIFIER MUST BE LOCATED WITHIN THE ZONE INDICATED. TOPSIDE TERMINAL #1 IDENTIFIER MAY BE MOLDED OR MARKED FEATURE. OPTIONAL IDENTIFIER ON BOTTOM SURFACE MAY BE MOLDED, MARKED, OR METALLIZED FEATURE.



5. DIMENSION b APPLIES TO THE METALLIZED TERMINAL AND IS MEASURED MIDPOINT ALONG THE TERMINAL LENGTH L



6. DEPOPULATION IS POSSIBLE BY REMOVAL OF ONLY THE CENTER TERMINAL ON THE SIDE OPPOSITE TERMINAL 1



7. OPTIONAL TERMINAL 1 IDENTIFIER LEAD ELONGATION IS OUTSIDE OF THE TERMINAL DIMENSION L BY A MINIMUM OF 0.05 MM.



8. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTURSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.10 MAX PER END OR SIDE. MOLD FLASH BETWEEN LEADS (E1) IS ALLOWED TO THE FULL LENGTH OF THE LEADS.



9. APPLICATION NOTE: EXPOSED HEATSINK IS SOLDERED SIMULTANEOUSLY WITH THAT OF THE LEADS FOR EFFECTIVE HEAT DISSIPATION.



10. THE MAXIMUM VALUE OF F1 AND G1 ESTABLISHED THE MINIMUM MOUNTING SURFACE WHEN DESIGNING THE PCB PAD.

## TASK GROUP CONTRIBUTORS

TEXAS INSTRUMENTS



# 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: DECEMBER 2008	ITEM NUMBER: 10-445
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CHANGE RECORD HISTORY:
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ISSUE: B	DATE: SEPTEMBER 2021	ITEM NUMBER: 10-459
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LOCATION:	CHANGED FROM:	CHANGED TO:
SHEET 3, TABLE 1		ADDED SECOND DIGIT CODE "D" FOR 2.10MM PACKAGE LENGTH
SHEET 3, TABLE 4	aaa: 0.65/0.50 PITCH – 0.10 aaa: 0.35 PITCH – 0.08	aaa: 0.65/0.50 PITCH – 0.20 aaa: 0.35 PITCH – 0.10
SHEETS 5 TABLE 7	WAS TABLE 8	
SHEETS 5 TABLE 6	NONE	ADDED UDAD VARIATION
SHEET 6 TABLE 8	WAS TABLE 7	
SHEET 6 TABLE 8	NONE	ADDED UDAD VARIATION