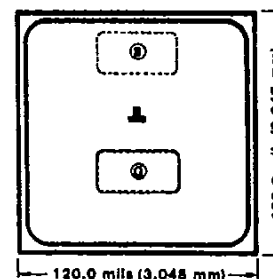


# N-Channel Enhancement-Mode Power Field-Effect Transistor Chip

10 A, 120 V, 0.3  $\Omega$

## Features:

- **Contact metallization:**  
Gate and source-aluminum  
Drain-tri-metal (Al-Ti-Ni)
- **Assembly recommendations:**  
Gate and source-10-mil aluminum wire  
Drain-mounted with 95/5 lead-tin solder
- **Die Number-09530**
- **Device types that are derived from PCF10N12L-**  
RFM10N12L RFP10N12L  
RFM10N15L RFP10N15L



ATTACH AREAS: 02C8-38990  
 ② Source } 0.020" x 0.040" (0.508 mm x 1.016 mm)  
 ① Gate }  
 Back Side - Drain  
 DIE THICKNESS - 14 ± 1 mils (0.356 ± 0.025 mm)

## CHIP LAYOUT

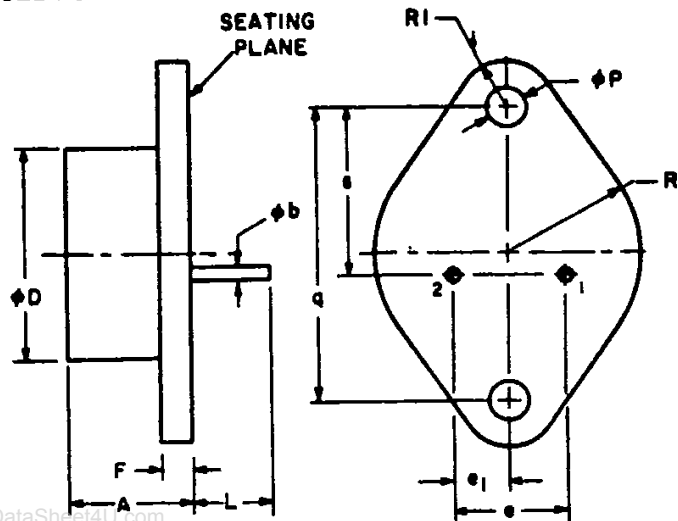
## Electrical Characteristics at 25°C

The chip is 100% probed to the actual conditions and limits specified.

Characteristic	Test Conditions	Limits		Units
		PCF10N12L		
		Min.	Max.	
$BV_{DSS}$	$I_D=1\text{ mA}$ $V_{GS}=0$	120	—	V
$V_{GS(TH)}$	$V_{GS}=V_{DS}$ $I_D=1\text{ mA}$	1	2	V
$I_{OSS}$	$V_{DS}=100\text{ V}$	—	1	$\mu\text{A}$
$I_{GSS}$	$V_{GS}=\pm 10\text{ V}$ $V_{DS}=0$	—	100	nA
$V_{DS(ON)}^a$	$I_D=5\text{ A}$ $V_{GS}=5\text{ V}$	—	1.5	V
$g_{fs}^a$	$V_{DS}=10\text{ V}$ $I_D=5\text{ A}$	2	—	mho

<sup>a</sup>Pulsed; pulse duration=300  $\mu\text{s}$  max., duty factor=2%.

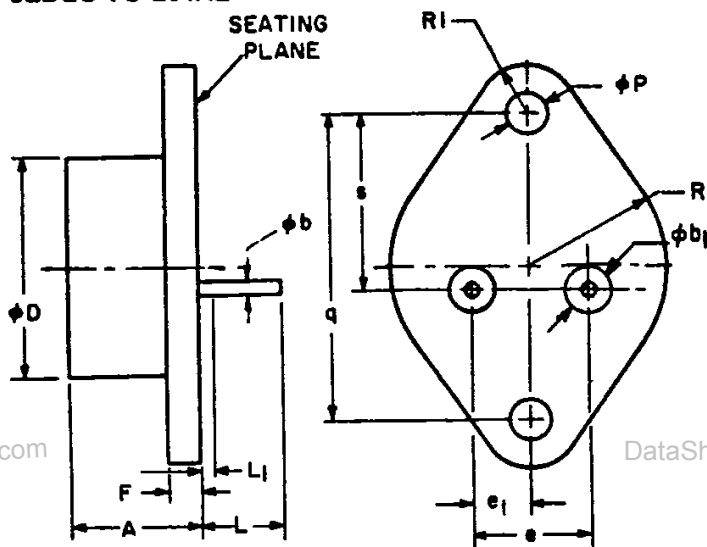
**JEDEC TO-204AA**



SYMBOL	INCHES		MILLIMETERS		NOTE
	MIN.	MAX.	MIN.	MAX.	
A	0.250	0.450	6.4	11.4	
$\phi b$	0.038	0.043	0.968	1.092	
$\phi D$	—	0.875	—	22.22	
e	0.420	0.440	10.67	11.17	
e <sub>1</sub>	0.205	0.225	5.21	5.71	
F	—	0.135	—	3.42	
L	0.312	—	7.93	—	
$\phi P$	0.151	0.161	3.84	4.08	
q	1.187 BSC		30.15 BSC		
R	—	0.525	—	13.33	
R <sub>1</sub>	—	0.188	—	4.77	
s	0.655	0.675	16.64	17.14	

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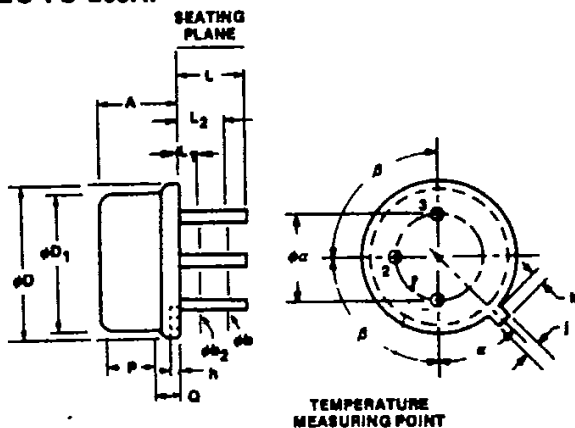
**JEDEC TO-204AE**



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	0.250	0.450	6.4	11.4	
$\phi b$	0.057	0.063	1.45	1.60	
$\phi b_1$	0.141 NOM		3.58 NOM		
$\phi D_2$	—	0.875	—	22.22	
e	0.420	0.440	10.67	11.17	
e <sub>1</sub>	0.205	0.225	5.21	5.71	
F	0.060	0.135	1.53	3.42	
L	0.440	0.480	11.18	12.19	
$\phi P$	0.151	0.161	3.84	4.08	
q	1.187 BSC		30.15 BSC		
R	0.495	0.525	12.58	13.33	
R <sub>1</sub>	0.131	0.188	3.33	4.77	
s	0.655	0.675	16.64	17.14	

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**JEDEC TO-205AF**



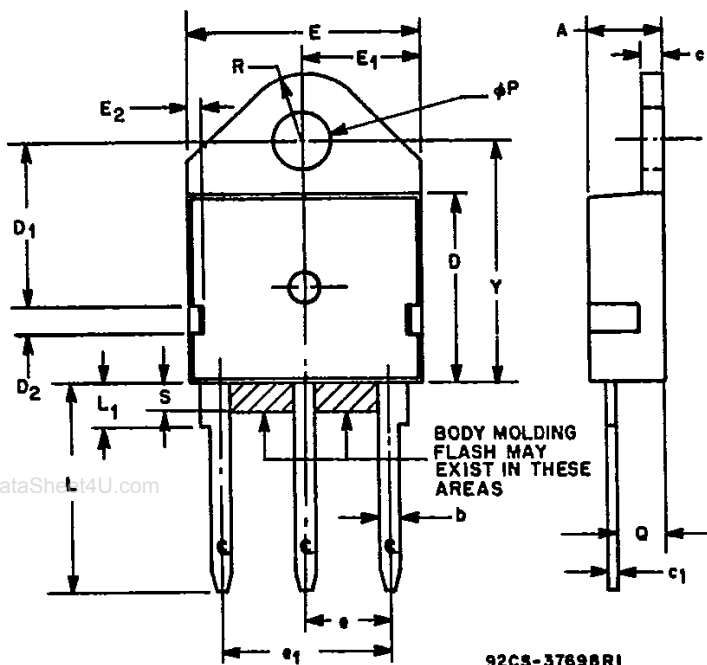
**Notes:**

1. Dimension k measured from  $\phi D$  maximum.
2.  $\phi D_1$  shall not vary more than 0.010 in Zone P. This zone controlled for automatic handling.
3. Details of outline in this zone optional.
4. Leads at gauge plane 0.054-0.055 below seating plane shall be within 0.007 radius of positional tolerance at MMC relative to tab at MMC. Device may be measured by direct methods or by gauge and gauging procedure described on JEDEC gauge drawing GS-1.
5.  $\phi b_2$  applies between L<sub>1</sub> and L<sub>2</sub>.  $\phi b$  applies between L<sub>2</sub> and L minimum. Diameter is uncontrolled in L<sub>1</sub> and beyond L minimum.

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
$\phi a$	0.200 BSC		5.08 BSC		4
A	0.160	0.180	4.07	4.57	
$\phi b$	0.016	0.021	0.41	0.53	5
$\phi b_2$	0.016	0.019	0.41	0.48	5
$\phi D$	0.340	0.370	8.64	9.39	
$\phi D_1$	0.315	0.355	8.01	9.01	2
h	0.009	0.041	0.23	1.04	
j	0.028	0.034	0.72	0.86	
k	0.029	0.045	0.74	1.14	1
L	0.500	0.750	12.70	19.05	5
L <sub>1</sub>	—	0.050	—	1.27	5
L <sub>2</sub>	0.250	—	6.35	—	5
P	0.070	—	1.78	—	2
Q	—	0.050	—	1.27	3
$\alpha$	45° NOMINAL				
$\beta$	90° NOMINAL				

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JEDEC TO-218AC



92CS-37698R1

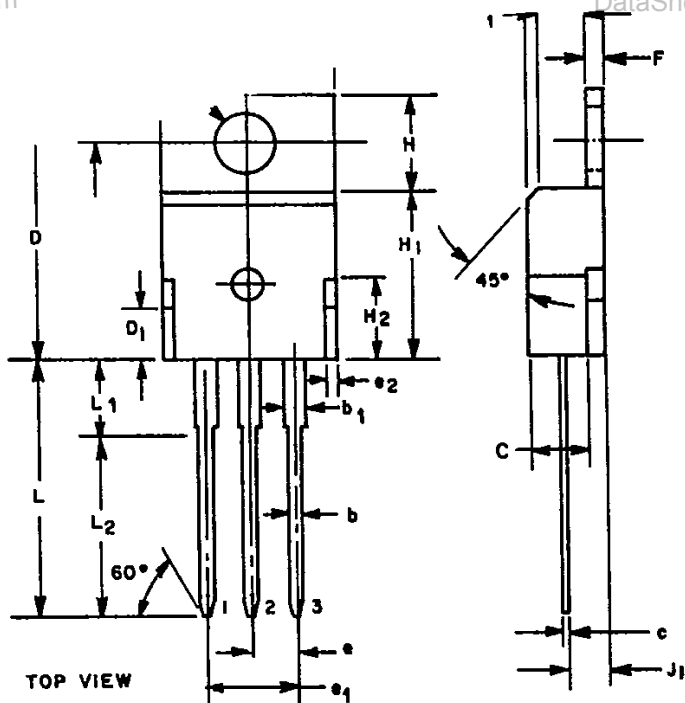
Notes:

- 1: Tab outline optional within boundaries of dimensions E and R.
- 2: Lead dimensions uncontrolled in L<sub>1</sub>.
- 3: Controlling dimensions: inch.

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.165	.200	4.191	5.080	
b	.040	.063	1.016	1.600	
c	.053	.065	1.346	1.651	
c <sub>1</sub>	.018	.030	.457	.762	
D	.485	.505	12.319	12.827	
D <sub>1</sub>	.395	.415	10.033	10.541	
D <sub>2</sub>	.070	.090	1.778	2.286	
E	.610	.640	15.494	16.256	1
E <sub>1</sub>	.305	.320	7.747	8.128	
E <sub>2</sub>	.040	.060	1.016	1.524	
e	.205	.225	5.207	5.715	
e <sub>1</sub>	.420	.440	10.688	11.176	
L	.500	.610	12.700	15.494	
L <sub>1</sub>	—	.125	—	3.175	2
phi P	.157	.167	3.988	4.241	
Q	.094	.126	2.388	3.200	
R	.170	.190	4.318	4.828	
S	—	0.60	—	1.524	
Y	.626	.670	15.900	17.018	

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JEDEC TO-220AB



92CS-34697R1

NOTES:

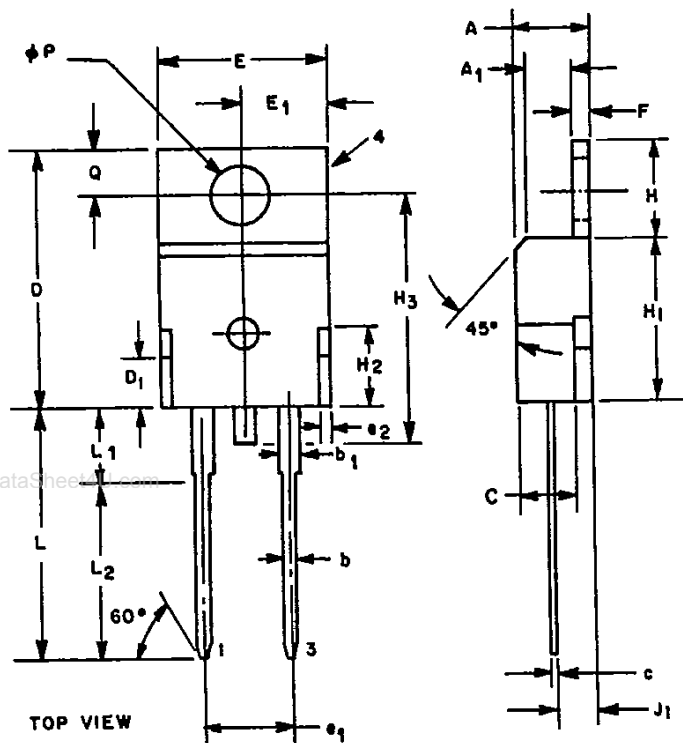
- 1. Position of lead to be measured 0.250-0.255 in. (6.350-6.477 mm) from case.

SYMBOL	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.140	0.190	3.56	4.82
A <sub>1</sub>	0.080	0.085	2.03	2.16
b	0.020	0.045	0.51	1.14
b <sub>1</sub>	0.045	0.070	1.14	1.77
C	—	0.125	—	3.18
c	0.015	0.025	0.38	0.63
D	0.560	0.625	14.23	15.87
D <sub>1</sub>	—	0.100	—	2.54
E	0.380	0.420	9.66	10.66
e	0.090	0.110	2.29	2.79
e <sub>1</sub>	0.190	0.210	4.83	5.33
e <sub>2</sub>	—	0.030	—	0.76
F	0.045	0.055	1.14	1.39
H	0.230	0.270	5.85	6.85
H <sub>1</sub>	0.355	0.370	9.02	9.40
H <sub>2</sub>	—	0.160	—	4.06
J <sub>1</sub>	0.080	0.115	2.04	2.92
L	0.500	0.562	12.70	14.27
L <sub>1</sub>	—	0.250	—	6.35
L <sub>2</sub>	0.400	0.410	10.16	10.41
phi P	0.139	0.161	3.531	4.089
Q	0.100	0.120	2.54	3.04

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# Dimensional Outlines

JEDEC TO-220AC



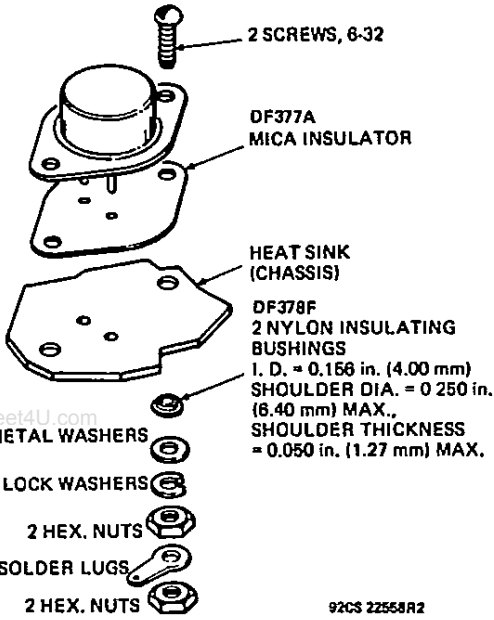
SYMBOL	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.140	0.190	3.56	4.82
A <sub>1</sub>	0.080	0.085	2.03	2.16
b	0.020	0.045	0.51	1.14
b <sub>1</sub>	0.045	0.070	1.14	1.77
C	—	0.125	—	3.18
c	0.015	0.025	0.38	0.63
D	0.560	0.825	14.23	15.87
D <sub>1</sub>	—	0.100	—	2.54
E	0.380	0.420	9.66	10.66
e <sub>1</sub>	0.190	0.210	4.83	5.33
e <sub>2</sub>	—	0.030	—	0.76
F	0.045	0.055	1.14	1.39
H	0.230	0.270	5.85	6.85
H <sub>1</sub>	0.355	0.370	9.02	9.40
H <sub>2</sub>	—	0.160	—	4.08
H <sub>3</sub>	—	0.600	—	15.24
J <sub>1</sub>	0.080	0.115	2.04	2.92
L	0.500	0.562	12.70	14.27
L <sub>1</sub>	—	0.250	—	6.35
L <sub>2</sub>	0.400	0.410	10.16	10.41
φP	0.139	0.161	3.531	4.089
Q	0.100	0.120	2.54	3.04

**NOTES:**

1. Position of lead to be measured 0.250-0.255 in. (6.350-6.477 mm) from case.

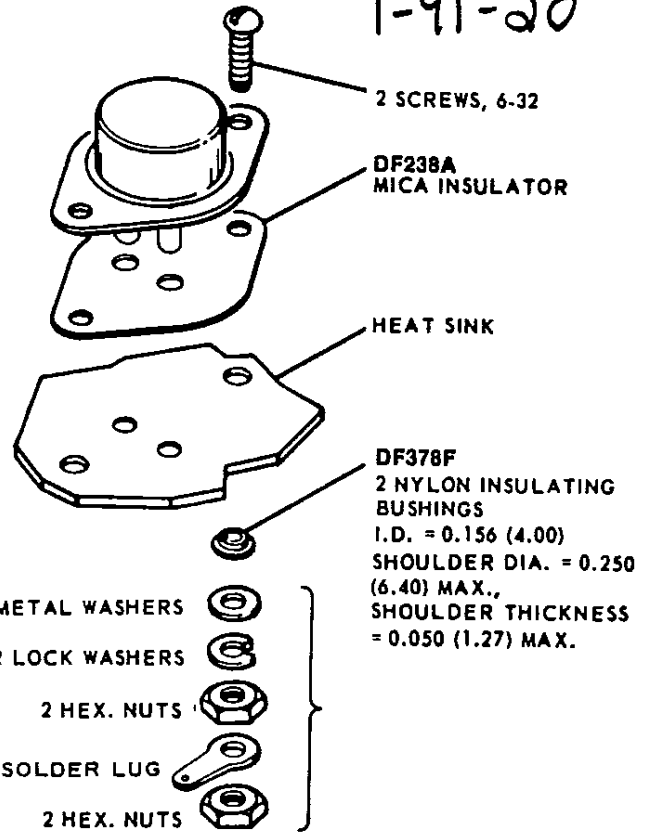
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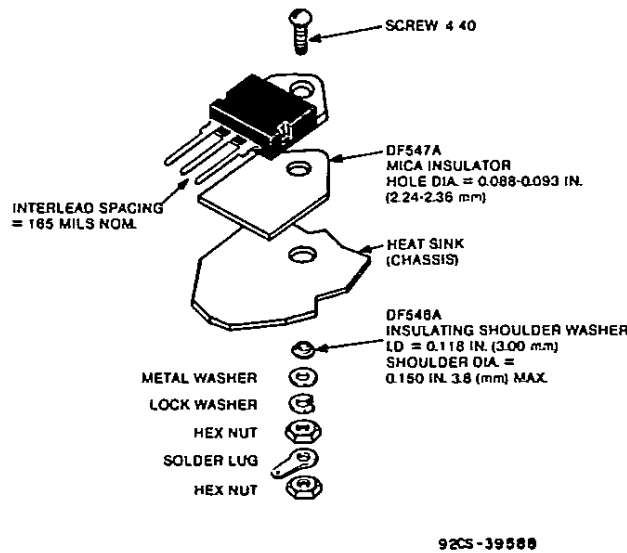


NOTE MAXIMUM TORQUE APPLIED TO MOUNTING  
FLANGE IS 12 in.-lbs. (0.14 kgf m)

**Suggested mounting hardware for JEDEC TO-204AA  
(formerly JEDEC TO-3)**

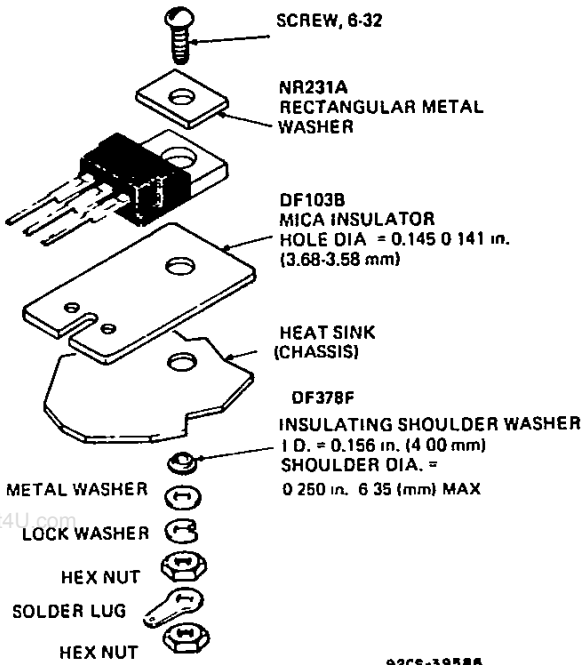


**Suggested mounting hardware for JEDEC TO-204AE  
(formerly JEDEC TO-3)**



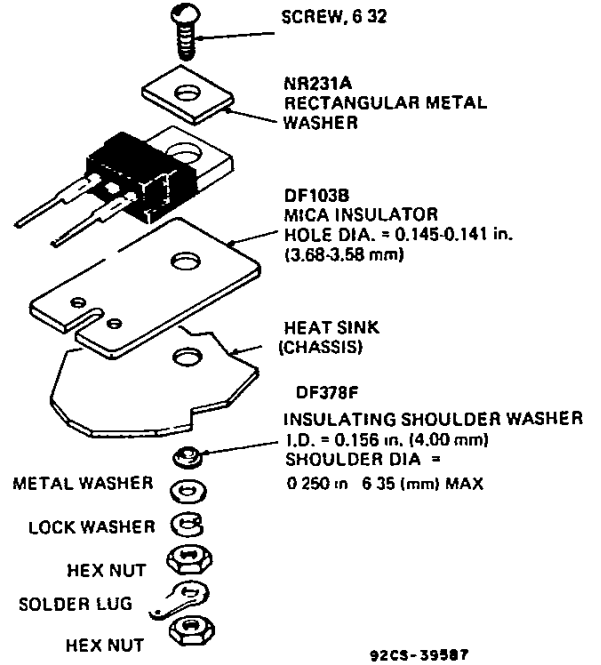
**Suggested mounting hardware for JEDEC TO-218AC**

# Mounting Hardware



NOTE: MAXIMUM TORQUE APPLIED TO MOUNTING  
FLANGE IS 8 in. lb. (0.09 kgf m)

**Suggested mounting hardware for JEDEC TO-220AB**



NOTE: MAXIMUM TORQUE APPLIED TO MOUNTING  
FLANGE IS 8 in. lb. (0.09 kgf m)

**Suggested mounting hardware for JEDEC TO-220AC**