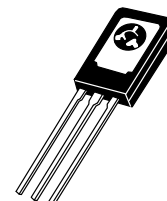


MJE3439

0.3 AMPERE
POWER TRANSISTOR
NPN SILICON
350 VOLTS
15 WATTS



CASE 77-08
TO-225AA TYPE

NPN Silicon High-Voltage Power Transistors

... designed for use in line-operated equipment requiring high f_T .

- High DC Current Gain
 $h_{FE} = 40-160$ @ $I_C = 20$ mAdc
- Current Gain Bandwidth Product —
 $f_T = 15$ MHz (Min) @ $I_C = 10$ mAdc
- Low Output Capacitance
 $C_{ob} = 10$ pF (Max) @ $f = 1.0$ MHz

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	350	Vdc
Collector-Base Voltage	V_{CB}	450	Vdc
Emitter-Base Voltage	V_{EB}	5.0	Vdc
Collector Current — Continuous	I_C	0.3	Adc
Base Current	I_B	150	mAdc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	15 0.12	Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	8.33	$^\circ\text{C/W}$

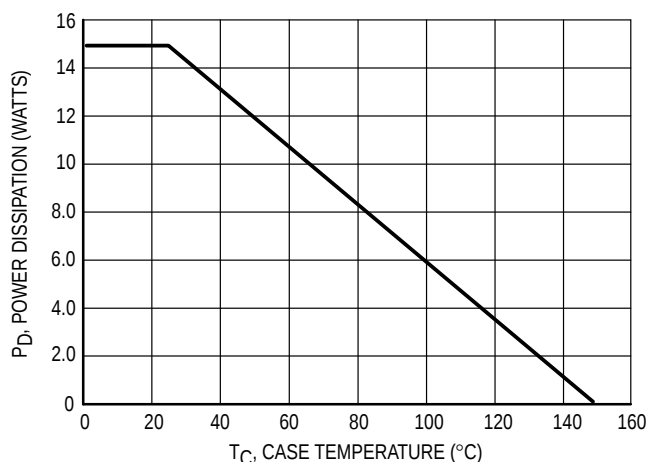


Figure 1. Power-Temperature Derating Curve

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage ($I_C = 5.0\text{ mAdc}$, $I_B = 0$)	$V_{CEO(sus)}$	350	—	Vdc
Collector Cutoff Current ($V_{CE} = 300\text{ Vdc}$, $I_B = 0$)	I_{CEO}	—	20	μAdc
Collector Cutoff Current ($V_{CE} = 450\text{ Vdc}$, $V_{EB(off)} = 1.5\text{ Vdc}$)	I_{CEX}	—	500	μAdc
Collector Cutoff Current ($V_{CB} = 350\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	20	μAdc
Emitter Cutoff Current ($V_{BE} = 5.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	20	μAdc
ON CHARACTERISTICS				
DC Current Gain ($I_C = 2.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 20\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)	h_{FE}	30 15	— 200	—
Collector–Emitter Saturation Voltage ($I_C = 50\text{ mAdc}$, $I_B = 4.0\text{ mAdc}$)	$V_{CE(sat)}$	—	0.5	Vdc
Base–Emitter Saturation Voltage ($I_C = 50\text{ mAdc}$, $I_B = 4.0\text{ mAdc}$)	$V_{BE(sat)}$	—	1.3	Vdc
Base–Emitter On Voltage ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)	$V_{BE(on)}$	—	0.8	Vdc
DYNAMIC CHARACTERISTICS				
Current–Gain — Bandwidth Product ($I_C = 10\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 5.0\text{ MHz}$)	f_T	15	—	MHz
Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	10	pF
Small–Signal Current Gain ($I_C = 5.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1.0\text{ kHz}$)	h_{fe}	25	—	—

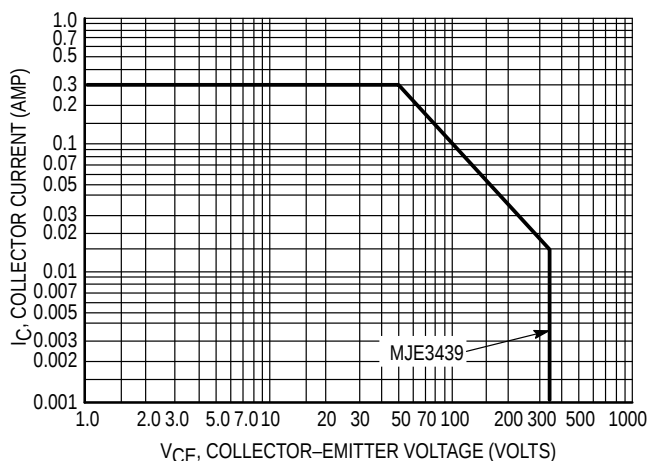
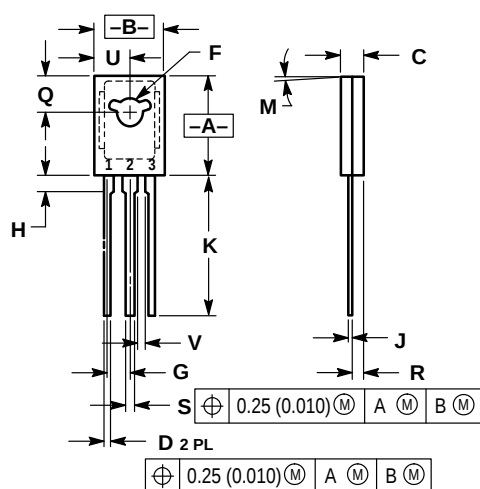


Figure 2. Active–Region Safe Operating Area

The Safe Operating Area Curves indicate $I_C - V_{CE}$ limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum T_J , power–temperature derating must be observed for both steady state and pulse power conditions.

PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.425	0.435	10.80	11.04
B	0.295	0.305	7.50	7.74
C	0.095	0.105	2.42	2.66
D	0.020	0.026	0.51	0.66
F	0.115	0.130	2.93	3.30
G	0.094 BSC		2.39 BSC	
H	0.050	0.095	1.27	2.41
J	0.015	0.025	0.39	0.63
K	0.575	0.655	14.61	16.63
M	5° TYP		5° TYP	
Q	0.148	0.158	3.76	4.01
R	0.045	0.055	1.15	1.39
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	—	1.02	—

STYLE 1:

1. EMITTER
2. COLLECTOR
3. BASE

CASE 77-08
TO-225AA TYPE
ISSUE V

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How to reach us:

USA / EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE (602) 244-6609
INTERNET: <http://Design-NET.com>

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

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