

# MJE3439G

## NPN Silicon High-Voltage Power Transistor

This device is designed for use in line-operated equipment requiring high  $f_T$ .

### Features

- High DC Current Gain
- High Current-Gain – Bandwidth Product
- Low Output Capacitance
- These Devices are Pb-Free and are RoHS Compliant\*

### 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 $25^\circ\text{C}$	$P_D$	15 0.12	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS

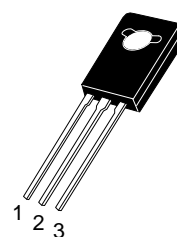
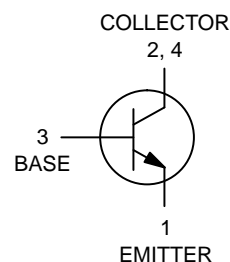
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$\theta_{JC}$	8.33	$^\circ\text{C/W}$



**ON Semiconductor**<sup>®</sup>

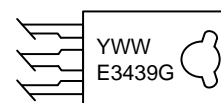
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**0.3 AMPERE  
POWER TRANSISTOR  
NPN SILICON  
350 VOLTS, 15 WATTS**



**TO-225  
CASE 77-09  
STYLE 1**

### MARKING DIAGRAM



Y = Year  
WW = Work Week  
E3439 = Device Code  
G = Pb-Free Package

### ORDERING INFORMATION

Device	Package	Shipping
MJE3439G	TO-225 (Pb-Free)	500 Units/Box

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MJE3439G

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Sustaining Voltage (I <sub>C</sub> = 5.0 mA <sub>dc</sub> , I <sub>B</sub> = 0)	V <sub>CEO(sus)</sub>	350	–	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CE</sub> = 300 V <sub>dc</sub> , I <sub>B</sub> = 0)	I <sub>CEO</sub>	–	20	μA <sub>dc</sub>
Collector Cutoff Current (V <sub>CE</sub> = 450 V <sub>dc</sub> , V <sub>EB(off)</sub> = 1.5 V <sub>dc</sub> )	I <sub>CEX</sub>	–	500	μA <sub>dc</sub>
Collector Cutoff Current (V <sub>CB</sub> = 350 V <sub>dc</sub> , I <sub>E</sub> = 0)	I <sub>CBO</sub>	–	20	μA <sub>dc</sub>
Emitter Cutoff Current (V <sub>BE</sub> = 5.0 V <sub>dc</sub> , I <sub>C</sub> = 0)	I <sub>EBO</sub>	–	20	μA <sub>dc</sub>
<b>ON CHARACTERISTICS</b>				
DC Current Gain (I <sub>C</sub> = 2.0 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> ) (I <sub>C</sub> = 20 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )	h <sub>FE</sub>	30 15	– 200	–
Collector–Emitter Saturation Voltage (I <sub>C</sub> = 50 mA <sub>dc</sub> , I <sub>B</sub> = 4.0 mA <sub>dc</sub> )	V <sub>CE(sat)</sub>	–	0.5	V <sub>dc</sub>
Base–Emitter Saturation Voltage (I <sub>C</sub> = 50 mA <sub>dc</sub> , I <sub>B</sub> = 4.0 mA <sub>dc</sub> )	V <sub>BE(sat)</sub>	–	1.3	V <sub>dc</sub>
Base–Emitter On Voltage (I <sub>C</sub> = 50 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )	V <sub>BE(on)</sub>	–	0.8	V <sub>dc</sub>
<b>DYNAMIC CHARACTERISTICS</b>				
Current–Gain – Bandwidth Product (I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> , f = 5.0 MHz)	f <sub>T</sub>	15	–	MHz
Output Capacitance (V <sub>CB</sub> = 10 V <sub>dc</sub> , I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>ob</sub>	–	10	pF
Small–Signal Current Gain (I <sub>C</sub> = 5.0 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> , f = 1.0 kHz)	h <sub>fe</sub>	25	–	–

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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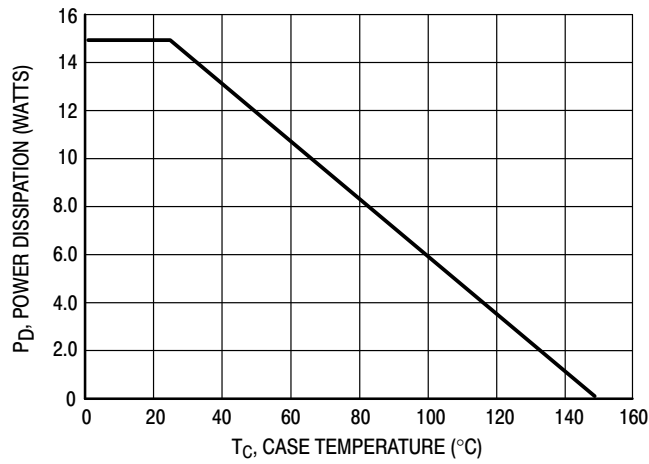


Figure 1. Power-Temperature Derating Curve

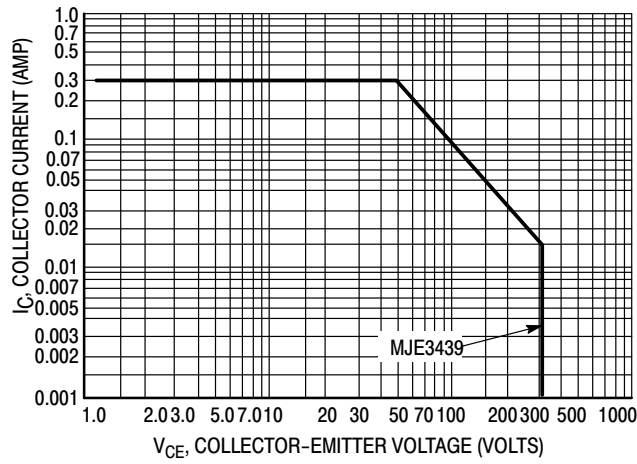


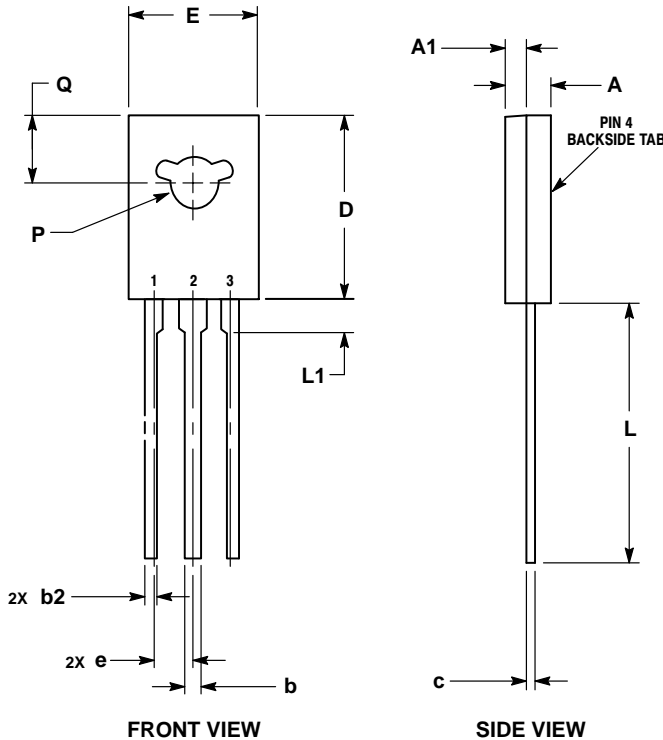
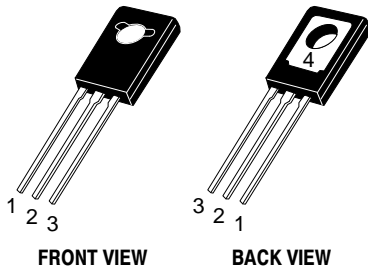
Figure 2. Active-Region Safe Operating Area

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.

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## PACKAGE DIMENSIONS


TO-225  
CASE 77-09  
ISSUE AC



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
  2. CONTROLLING DIMENSION: MILLIMETERS.
  3. NUMBER AND SHAPE OF LUGS OPTIONAL.

DIM	MILLIMETERS	
	MIN	MAX
A	2.40	3.00
A1	1.00	1.50
b	0.60	0.90
b2	0.51	0.88
c	0.39	0.63
D	10.60	11.10
E	7.40	7.80
e	2.04	2.54
L	14.50	16.63
L1	1.27	2.54
P	2.90	3.30
Q	3.80	4.20

- STYLE 1:  
PIN 1. EMITTER  
2., 4. COLLECTOR  
3. BASE

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