

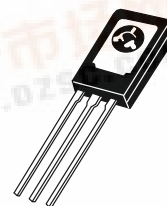
# Plastic Medium Power Silicon NPN Transistor

**BD135**  
**BD137**  
**BD139**

... designed for use as audio amplifiers and drivers utilizing complementary or quasi complementary circuits.

- DC Current Gain —  $h_{FE} = 40$  (Min) @  $I_C = 0.15$  Adc
- BD 135, 137, 139 are complementary with BD 136, 138, 140

**1.5 AMPERE**  
**POWER TRANSISTORS**  
**NPN SILICON**  
**45, 60, 80 VOLTS**  
**10 WATTS**



**CASE 77-08**  
**TO-225AA TYPE**

## MAXIMUM RATINGS

Rating	Symbol	Type	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	BD 135 BD 137 BD 139	45 60 80	Vdc
Collector-Base Voltage	$V_{CBO}$	BD 135 BD 137 BD 139	45 60 100	Vdc
Emitter-Base Voltage	$V_{EBO}$		5	Vdc
Collector Current	$I_C$		1.5	Adc
Base Current	$I_B$		0.5	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$		1.25 10	Watts mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$		12.5 100	Watt mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$		-55 to +150	$^\circ\text{C}$

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	10	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient	$\theta_{JA}$	100	$^\circ\text{C}/\text{W}$

# BD135 BD137 BD139

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

Characteristic	Symbol	Type	Min	Max	Unit
Collector–Emitter Sustaining Voltage* (I <sub>C</sub> = 0.03 Adc, I <sub>B</sub> = 0)	BV <sub>CEO</sub> *	BD 135 BD 137 BD 139	45 60 80	— — —	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 30 Vdc, I <sub>E</sub> = 0) (V <sub>CB</sub> = 30 Vdc, I <sub>E</sub> = 0, T <sub>C</sub> = 125°C)	I <sub>CBO</sub>		— —	0.1 10	μAdc
Emitter Cutoff Current (V <sub>BE</sub> = 5.0 Vdc, I <sub>C</sub> = 0)	I <sub>EBO</sub>		—	10	μAdc
DC Current Gain (I <sub>C</sub> = 0.005 A, V <sub>CE</sub> = 2 V) (I <sub>C</sub> = 0.15 A, V <sub>CE</sub> = 2 V) (I <sub>C</sub> = 0.5 A V <sub>CE</sub> = 2 V)	h <sub>FE</sub> *		25 40 25	— 250 —	—
Collector–Emitter Saturation Voltage* (I <sub>C</sub> = 0.5 Adc, I <sub>B</sub> = 0.05 Adc)	V <sub>CE(sat)</sub> *		—	0.5	Vdc
Base–Emitter On Voltage* (I <sub>C</sub> = 0.5 Adc, V <sub>CE</sub> = 2.0 Vdc)	V <sub>BE(on)</sub> *		—	1	Vdc

\* Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

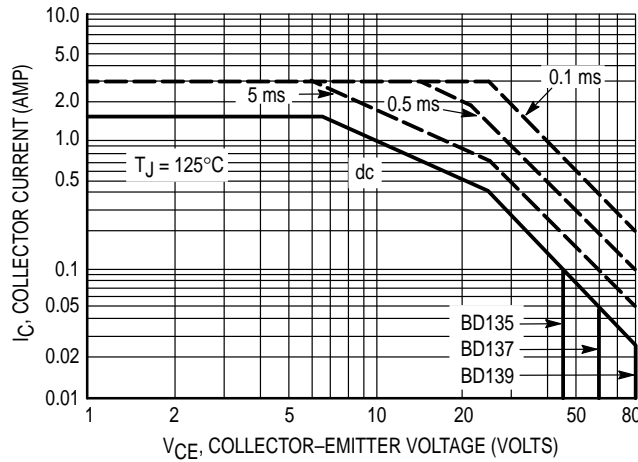
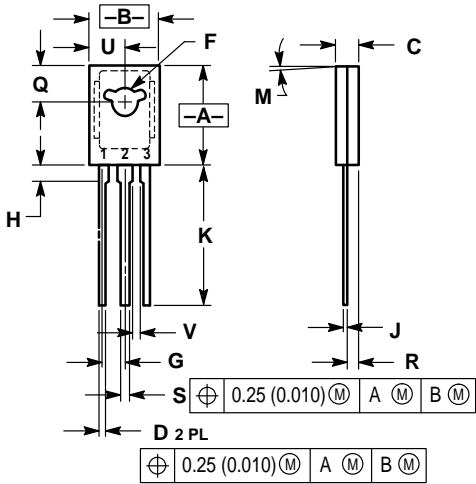


Figure 1. Active-Region Safe Operating Area

**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:  
 PIN 1. EMITTER  
 2. COLLECTOR  
 3. BASE

**CASE 77-08  
 TO-225AA TYPE  
 ISSUE V**

## BD135 BD137 BD139

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