

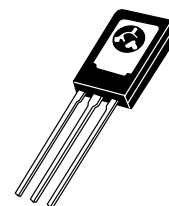
# Plastic Medium Power Silicon PNP Transistor

...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 136, 138, 140 are complementary with BD 135, 137, 139

**BD136**  
**BD138**  
**BD140**  
**BD140-10**

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



**CASE 77-09**  
**TO-225AA TYPE**

## MAXIMUM RATINGS

Rating	Symbol	Type	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	BD 136 BD 138 BD 140	45 60 80	Vdc
Collector-Base Voltage	$V_{CBO}$	BD 136 BD 138 BD 140	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	$^\circ\text{C}$

# BD136 BD138 BD140 BD140–10

## THERMAL CHARACTERISTICS

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

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

Characteristic	Symbol	Type	Min	Max	Unit
Collector–Emitter Sustaining Voltage* ( $I_C = 0.03\text{ A dc}$ , $I_B = 0$ )	$BV_{CEO}$	BD 136 BD 138 BD 140	45 60 80	— — —	Vdc
Collector Cutoff Current ( $V_{CB} = 30\text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 30\text{ Vdc}$ , $I_E = 0$ , $T_C = 125^\circ\text{C}$ )	$I_{CBO}$		— —	0.1 10	$\mu\text{A dc}$
Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$		—	10	$\mu\text{A dc}$
DC Current Gain ( $I_C = 0.005\text{ A}$ , $V_{CE} = 2\text{ V}$ )  ( $I_C = 0.15\text{ A}$ , $V_{CE} = 2\text{ V}$ )  ( $I_C = 0.5\text{ A}$ , $V_{CE} = 2\text{ V}$ )	$h_{FE}^*$	ALL  ALL BD140–10	25 40  63 25	— 250  160 —	—
Collector–Emitter Saturation Voltage* ( $I_C = 0.5\text{ A dc}$ , $I_B = 0.05\text{ A dc}$ )	$V_{CE(sat)}^*$		—	0.5	Vdc
Base–Emitter On Voltage* ( $I_C = 0.5\text{ A dc}$ , $V_{CE} = 2.0\text{ Vdc}$ )	$V_{BE(on)}^*$		—	1	Vdc

\*Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

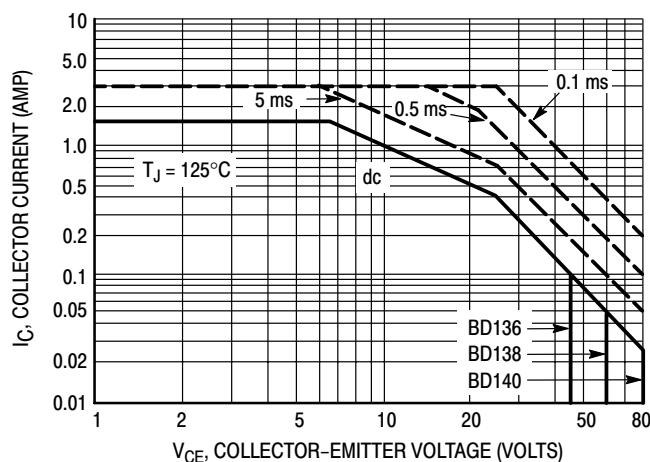
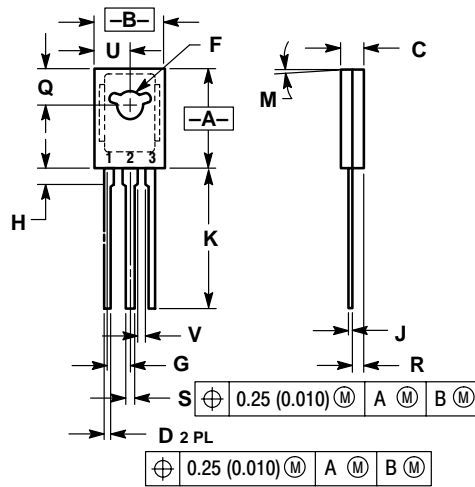


Figure 1. Active-Region Safe Operating Area

# BD136 BD138 BD140 BD140-10


## PACKAGE DIMENSIONS

TO-225AA  
CASE 77-09  
ISSUE W



- 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	0.065	1.15	1.65
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	---	1.02	---

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