

## BD136/138/140

### Medium Power Linear and Switching Applications

- Complement to BD135, BD137 and BD139 respectively



### PNP Epitaxial Silicon Transistor

#### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage : BD136	- 45	V
	: BD138	- 60	V
	: BD140	- 80	V
$V_{CEO}$	Collector-Emitter Voltage : BD136	- 45	V
	: BD138	- 60	V
	: BD140	- 80	V
$V_{EBO}$	Emitter-Base Voltage	- 5	V
$I_C$	Collector Current (DC)	- 1.5	A
$I_{CP}$	Collector Current (Pulse)	- 3.0	A
$I_B$	Base Current	- 0.5	A
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	12.5	W
$P_C$	Collector Dissipation ( $T_a=25^\circ\text{C}$ )	1.25	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 55 ~ 150	$^\circ\text{C}$

#### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{CEO(sus)}$	* Collector-Emitter Sustaining Voltage : BD136 : BD138 : BD140	$I_C = - 30\text{mA}, I_B = 0$	- 45			V
			- 60			V
			- 80			V
$I_{CBO}$	Collector Cut-off Current	$V_{CB} = - 30\text{V}, I_E = 0$			- 0.1	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = - 5\text{V}, I_C = 0$			- 10	$\mu\text{A}$
$h_{FE1}$ $h_{FE2}$ $h_{FE3}$	* DC Current Gain	$V_{CE} = - 2\text{V}, I_C = - 5\text{mA}$	25			
$V_{CE} = - 2\text{V}, I_C = - 0.5\text{A}$		25				
$V_{CE} = - 2\text{V}, I_C = - 150\text{mA}$		40		250		
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage	$I_C = - 500\text{mA}, I_B = - 50\text{mA}$			- 0.5	V
$V_{BE(on)}$	* Base-Emitter ON Voltage	$V_{CE} = - 2\text{V}, I_C = - 0.5\text{A}$			- 1	V

\* Pulse Test: PW=350 $\mu\text{s}$ , duty Cycle=2% Pulsed

#### $h_{FE}$ Classification

Classification	6	10	16
$h_{FE3}$	40 ~ 100	63 ~ 160	100 ~ 250

# Typical Characteristics

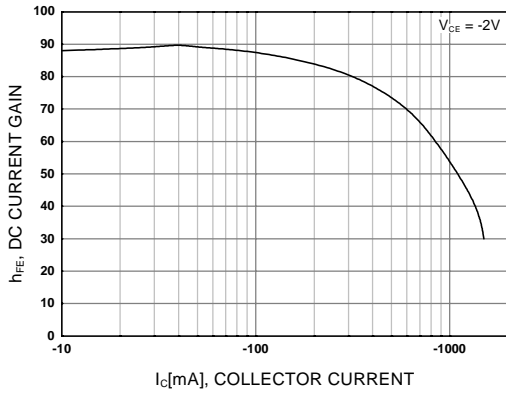


Figure 1. DC current Gain

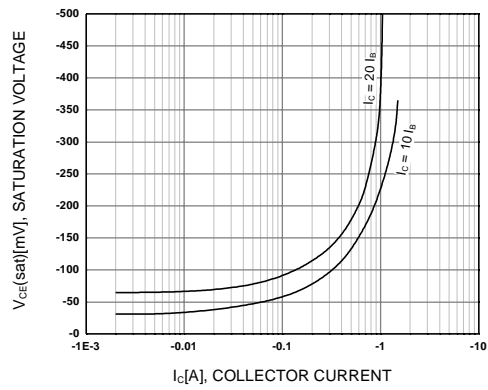


Figure 2. Collector-Emitter Saturation Voltage

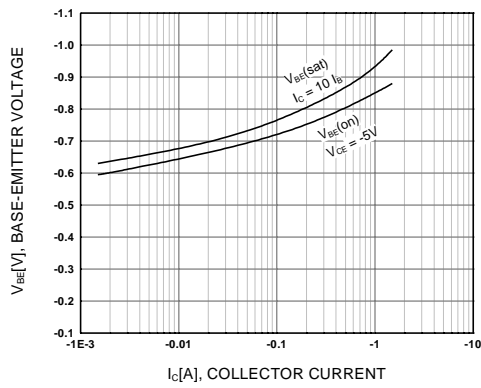


Figure 3. Base-Emitter Voltage

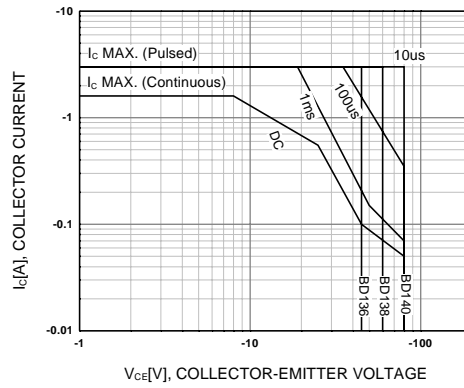


Figure 4. Safe Operating Area

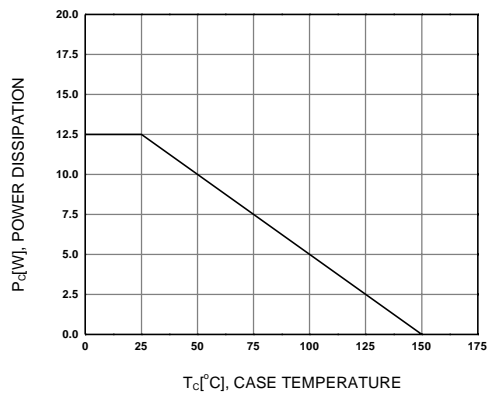
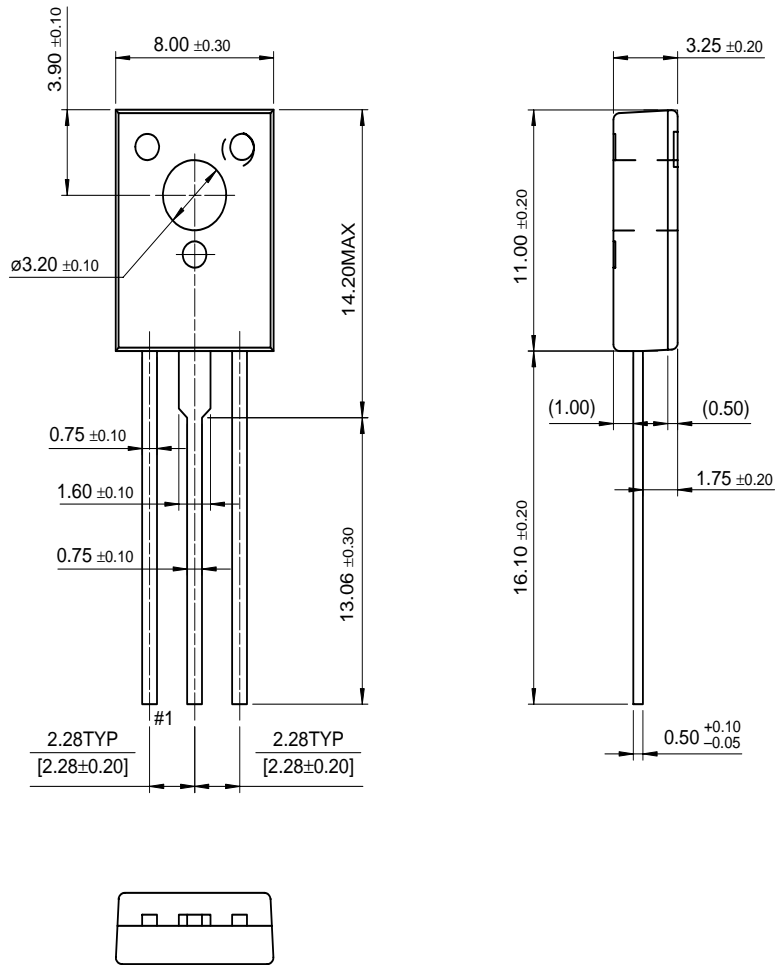


Figure 5. Power Derating

# Package Dimensions

BD136/138/140

## TO-126



Dimensions in Millimeters

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