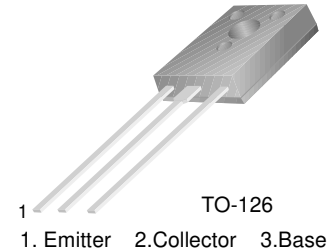


## BD176/178/180

### Medium Power Linear and Switching Applications

- Complement to BD 175/177/179 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 : BD176	- 45	V
	: BD178	- 60	V
	: BD180	- 80	V
$V_{CEO}$	Collector-Emitter Voltage : BD176	- 45	V
	: BD178	- 60	V
	: BD180	- 80	V
$V_{EBO}$	Emitter-Base Voltage	- 5	V
$I_C$	Collector Current (DC)	- 3	A
$I_C$	*Collector Current (Pulse)	- 7	A
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	30	W
$R_{\theta ja}$	Junction to Ambient	70	$^\circ\text{C/W}$
$R_{\theta jc}$	Junction to Case	8.5	$^\circ\text{C/W}$
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 65 ~ 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 : BD176	$I_C = - 100\text{mA}, I_B = 0$	- 45			V		
	: BD178						- 60	V
	: BD180						- 80	V
$I_{CBO}$	Collector Cut-off Current : BD176	$V_{CB} = - 45\text{V}, I_E = 0$			- 100	$\mu\text{A}$		
	: BD178	$V_{CB} = - 60\text{V}, I_E = 0$			- 100	$\mu\text{A}$		
	: BD180	$V_{CB} = - 80\text{V}, I_E = 0$			- 100	$\mu\text{A}$		
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = - 5\text{V}, I_C = 0$			- 1	mA		
$h_{FE1}$ $h_{FE2}$	* DC Current Gain	$V_{CE} = - 2\text{V}, I_C = - 150\text{mA}$	40		250			
		$V_{CE} = - 2\text{V}, I_C = - 1\text{A}$	15					
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage	$I_C = - 1\text{A}, I_B = - 0.1\text{A}$			- 0.8	V		
$V_{BE(on)}$	* Base-Emitter On Voltage	$V_{CE} = - 2\text{V}, I_C = - 1\text{A}$			- 1.3	V		
$f_T$	Current Gain Bandwidth Product	$V_{CE} = - 10\text{V}, I_C = - 250\text{mA}$	3			MHz		

\* Pulse Test: PW=300 $\mu\text{s}$ , duty Cycle=1.5% Pulsed

#### $h_{FE}$ Classification

Classification	6	10	16
$h_{FE1}$	40 ~ 100	63 ~ 160	100 ~ 250

\* Classification 16: Only BD 176

# Typical Characteristics

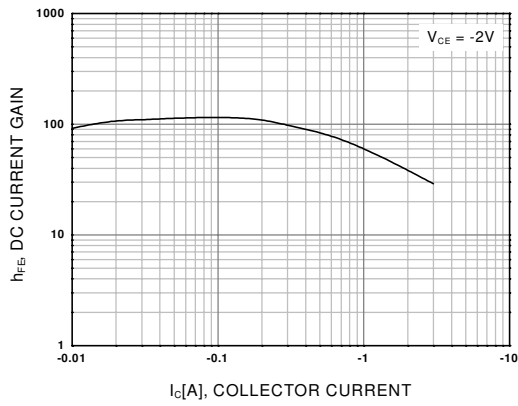


Figure 1. DC current Gain

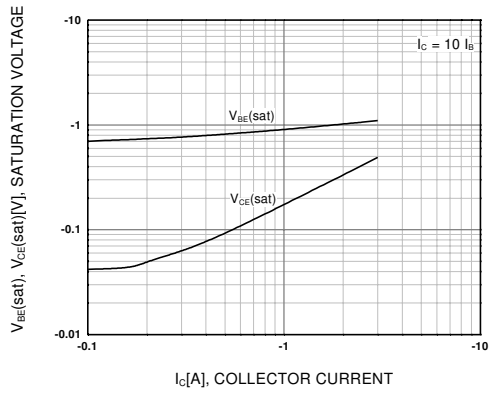


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

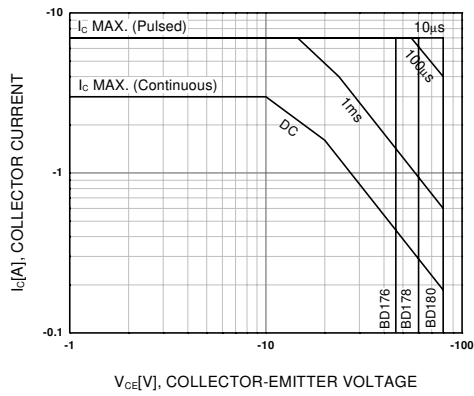


Figure 3. Safe Operating Area

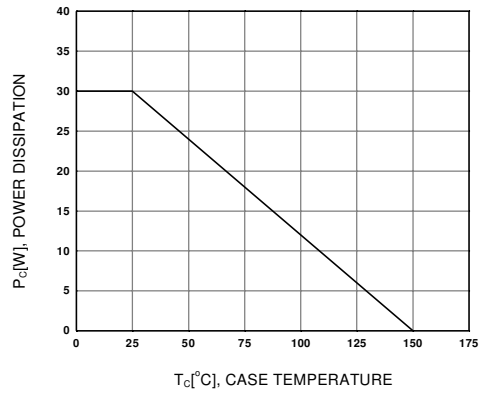
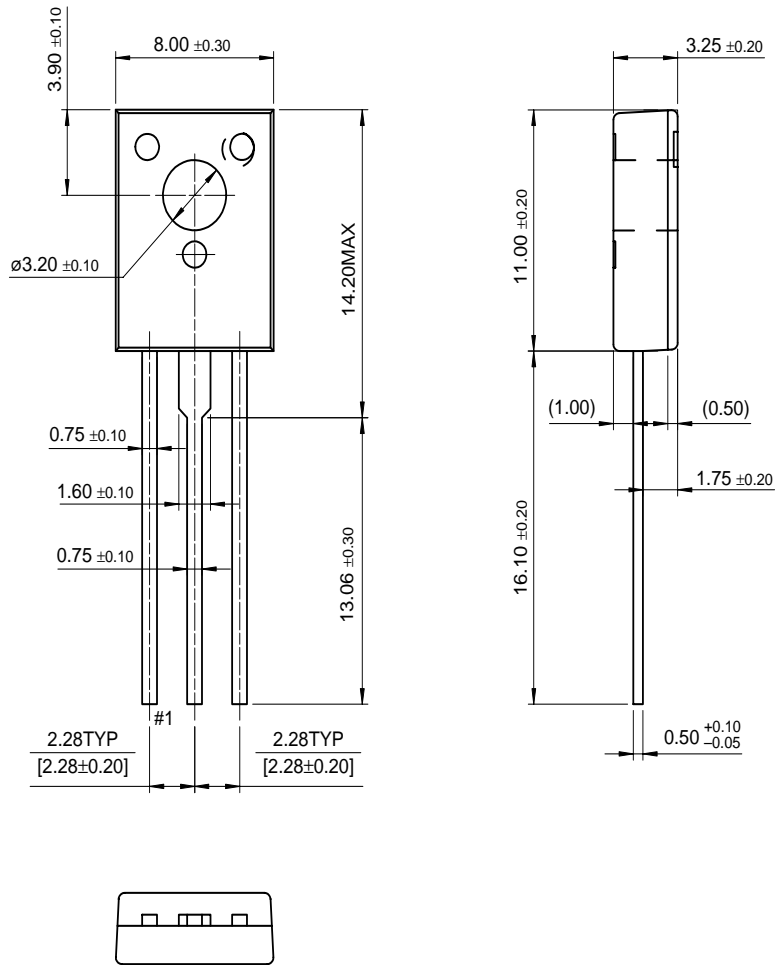


Figure 4. Power Derating

# Package Dimensions

## TO-126

BD176/178/180



Dimensions in Millimeters

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