

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	μA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = - 5\text{V}, I_C = 0$			- 10	μA
h_{FE1} h_{FE2} h_{FE3}	* DC Current Gain	$V_{CE} = - 2\text{V}, I_C = - 5\text{mA}$ $V_{CE} = - 2\text{V}, I_C = - 0.5\text{A}$ $V_{CE} = - 2\text{V}, I_C = - 150\text{mA}$	25 25 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 μs , 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

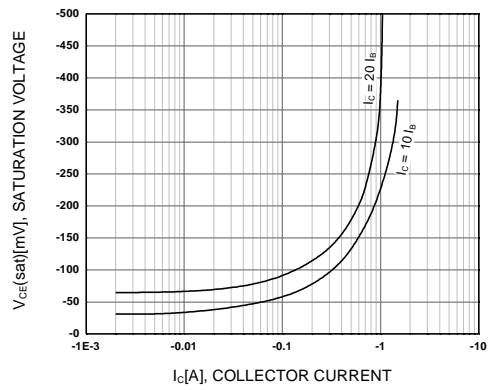


Figure 2. Collector-Emitter Saturation Voltage

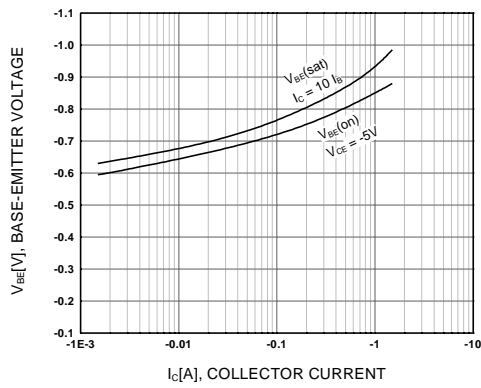


Figure 3. Base-Emitter Voltage

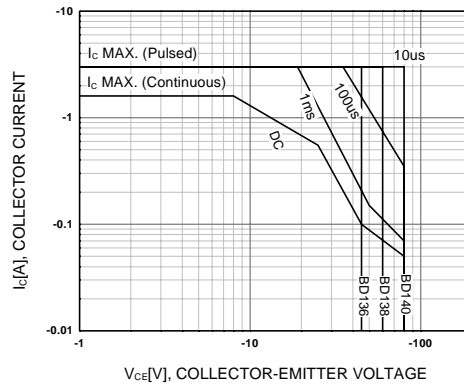


Figure 4. Safe Operating Area

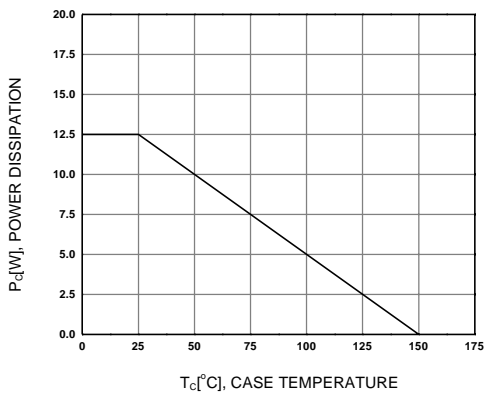


Figure 5. Power Derating

Package Dimensions

BD136/138/140

TO-126



Dimensions in Millimeters

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Datasheet Identification	Product Status	Definition
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BD138

PNP Epitaxial Silicon Transistor

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- Complement to BD135, BD137 and BD139 respectively

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Product	Product status	Pricing*	Package type	Leads	Packing method
BD13810S	Full Production	\$0.163	TO-126	3	BULK
BD1386S	Full Production	\$0.163	TO-126	3	BULK
BD13816S	Full Production	\$0.163	TO-126	3	BULK
BD13810STU	Full Production	\$0.163	TO-126	3	RAIL
BD1386STU	Full Production	\$0.163	TO-126	3	RAIL
BD13816STU	Full Production	\$0.163	TO-126	3	RAIL

* 1,000 piece Budgetary Pricing

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Product status/pricing/packaging

Product	Product status	Pricing*	Package type	Leads	Packing method
BD14016S	Full Production	\$0.193	TO-126	3	BULK
BD14010S	Full Production	\$0.193	TO-126	3	BULK
BD14010STU	Full Production	\$0.193	TO-126	3	RAIL
BD1406S	Full Production	\$0.193	TO-126	3	BULK
BD14016STU	Full Production	\$0.193	TO-126	3	RAIL
BD1406STU	Full Production	\$0.193	TO-126	3	RAIL

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BD136

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BD13610STU	Full Production	\$0.19	TO-126	3	RAIL
BD1366S	Full Production	\$0.19	TO-126	3	BULK
BD13616S	Full Production	\$0.192	TO-126	3	BULK
BD1366STU	Full Production	\$0.19	TO-126	3	RAIL
BD13616STU	Full Production	\$0.192	TO-126	3	RAIL

* 1,000 piece Budgetary Pricing

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