

## BD135/137/139

### Medium Power Linear and Switching Applications

- Complement to BD136, BD138 and BD140 respectively



### NPN Epitaxial Silicon Transistor

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

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage : BD135	45	V
	: BD137	60	V
	: BD139	80	V
$V_{CEO}$	Collector-Emitter Voltage : BD135	45	V
	: BD137	60	V
	: BD139	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 : BD135	$I_C = 30\text{mA}, I_B = 0$	45			V	
	: BD137		60			V	
	: BD139		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	$\mu\text{A}$	
$h_{FE1}$	DC Current Gain : ALL DEVICE	$V_{CE} = 2\text{V}, I_C = 5\text{mA}$	25				
$h_{FE2}$		$V_{CE} = 2\text{V}, I_C = 0.5\text{A}$	25				
$h_{FE3}$		: BD135	$V_{CE} = 2\text{V}, I_C = 150\text{mA}$	40		250	
		: BD137, BD139		40		160	
$V_{CE(sat)}$	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	

### $h_{FE}$ Classification

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

# Typical Characteristics



Figure 1. DC current Gain

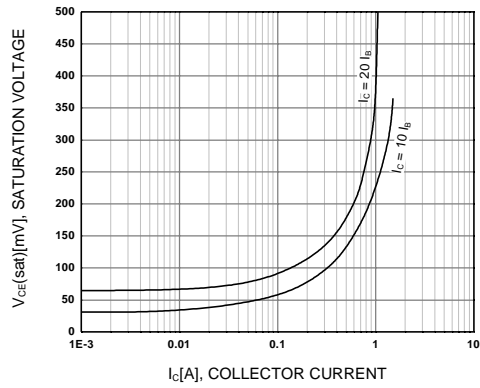


Figure 2. Collector-Emitter Saturation Voltage



Figure 3. Base-Emitter Voltage

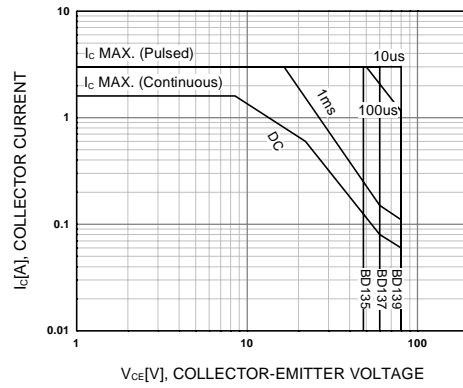


Figure 4. Safe Operating Area



Figure 5. Power Derating

# Package Dimensions

## TO-126

BD135/137/139



Dimensions in Millimeters

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NPN Epitaxial Silicon Transistor

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Product	Product status	Pricing*	Package type	Leads	Packing method
BD13716STU	Full Production	\$0.159	<a href="#">TO-126</a>	3	RAIL
BD13710STU	Full Production	\$0.159	<a href="#">TO-126</a>	3	RAIL
BD1376STU	Full Production	\$0.159	<a href="#">TO-126</a>	3	RAIL
BD13716S	Full Production	\$0.159	<a href="#">TO-126</a>	3	BULK
BD1376S	Full Production	\$0.159	<a href="#">TO-126</a>	3	BULK
BD13710S	Full Production	\$0.159	<a href="#">TO-126</a>	3	BULK

\* 1,000 piece Budgetary Pricing

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BD1396S	Full Production	\$0.163	<a href="#">TO-126</a>	3	BULK
BD13910STU	Full Production	\$0.191	<a href="#">TO-126</a>	3	RAIL
BD13916S	Full Production	\$0.191	<a href="#">TO-126</a>	3	BULK
BD1396STU	Full Production	\$0.163	<a href="#">TO-126</a>	3	RAIL
BD13916STU	Full Production	\$0.191	<a href="#">TO-126</a>	3	RAIL

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BD1356S	Full Production	\$0.19	<a href="#">TO-126</a>	3	BULK
BD1356STU	Full Production	\$0.19	<a href="#">TO-126</a>	3	RAIL
BD13510STU	Full Production	\$0.19	<a href="#">TO-126</a>	3	RAIL
BD13516STU	Full Production	\$0.19	<a href="#">TO-126</a>	3	RAIL
BD13516S	Full Production	\$0.19	<a href="#">TO-126</a>	3	BULK

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