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# BD135 / 137 / 139

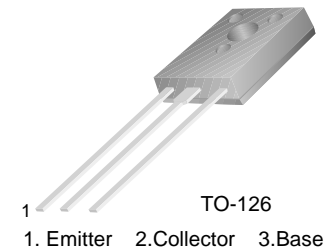
## NPN Epitaxial Silicon Transistor

### Features

- Complement to BD136, BD138 and BD140 respectively

### Applications

- Medium Power Linear and Switching



### Ordering Information

Part Number	Marking	Package	Packing Method
BD13516S	BD135-16	TO-126 3L	Bulk
BD1356STU	BD135-6		Rail
BD13510STU	BD135-10		Rail
BD13516STU	BD135-16		Bulk
BD13716STU	BD137-16		Rail
BD13710STU	BD137-10		Bulk
BD13716S	BD137-16		Rail
BD13916STU	BD139-16		Bulk
BD13910S	BD139-10		Rail
BD13916S	BD139-16		Bulk
BD1396STU	BD139-6		Rail
BD13910STU	BD139-10		Rail

BD135 / 137 / 139 — NPN Epitaxial Silicon Transistor

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_C = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	BD135	45
		BD137	60
		BD139	80
$V_{CEO}$	Collector-Emitter Voltage	BD135	45
		BD137	60
		BD139	80
$V_{EBO}$	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
$P_C$	Device Dissipation	$T_C = 25^\circ\text{C}$	12.5
		$T_A = 25^\circ\text{C}$	1.25
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 55 to +150	$^\circ\text{C}$

## Electrical Characteristics

Values are at  $T_C = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = 30\text{ mA}, I_B = 0$	BD135	45		
			BD137	60		
			BD139	80		
$I_{CBO}$	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	$V_{CE} = 2\text{ V}, I_C = 5\text{ mA}$	25			
$h_{FE2}$		$V_{CE} = 2\text{ V}, I_C = 0.5\text{ A}$	25			
$h_{FE3}$		$V_{CE} = 2\text{ V}, I_C = 150\text{ mA}$	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

## $h_{FE}$ Classification

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

## Typical Performance Characteristics

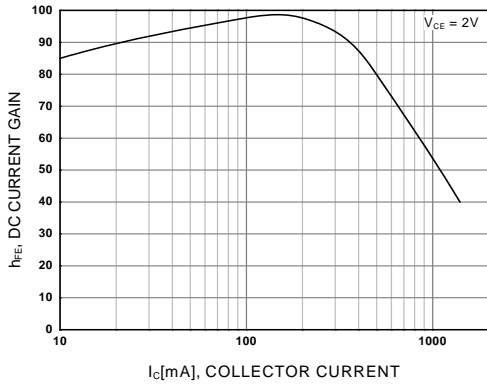


Figure 1. DC current Gain

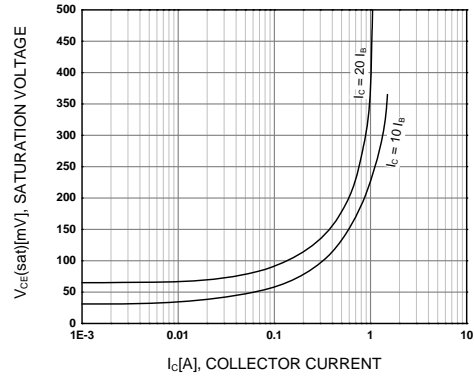


Figure 2. Collector-Emitter Saturation Voltage

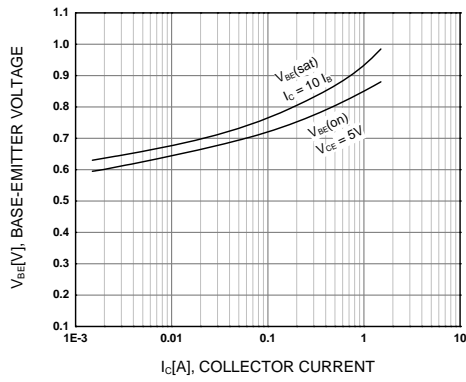


Figure 3. Base-Emitter Voltage

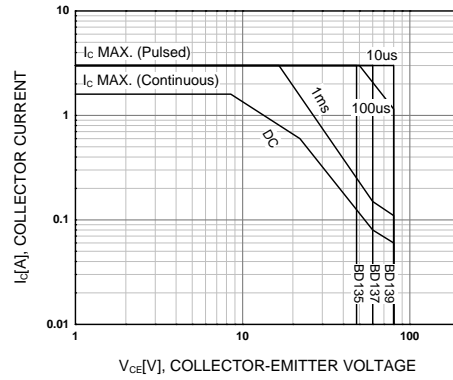


Figure 4. Safe Operating Area

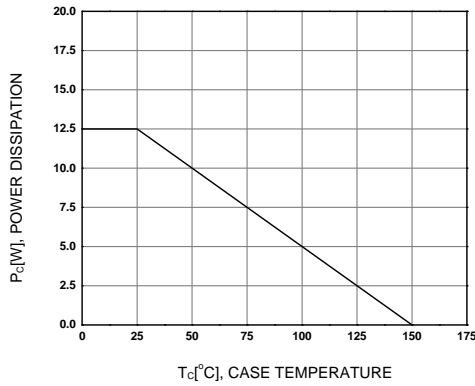
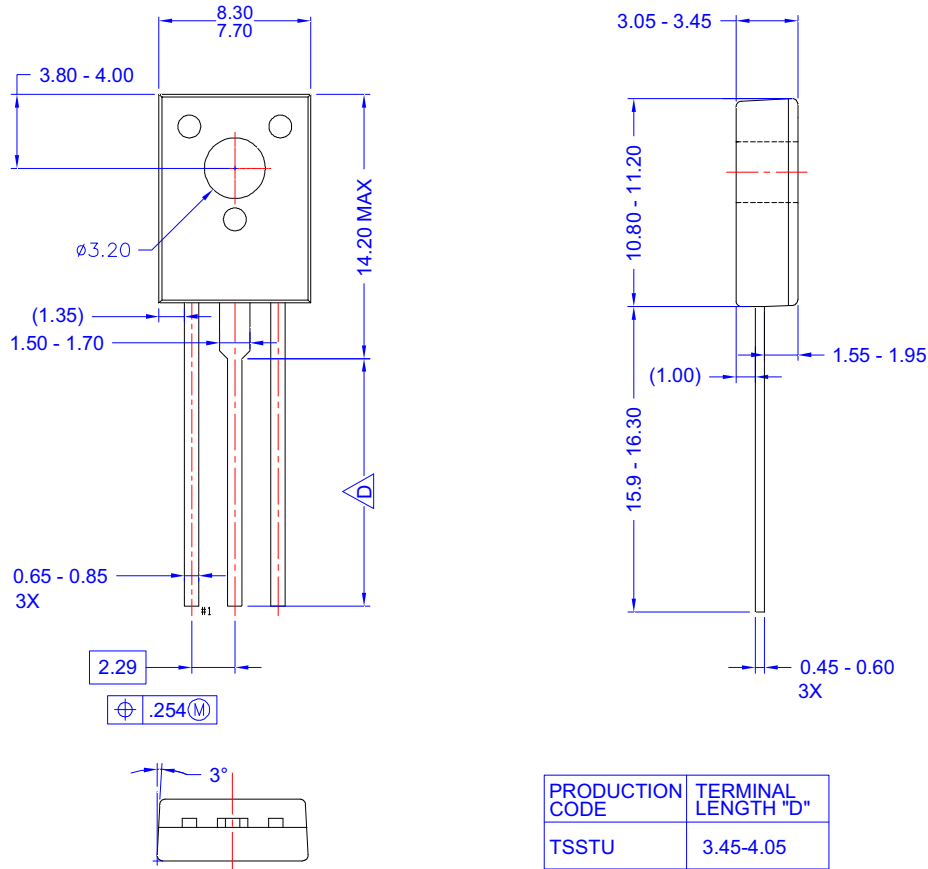


Figure 5. Power Derating

Physical Dimensions

TO-126 3L



- NOTES:
- A) THIS PACKAGE DOES NOT COMPLY TO ANY CURRENT PACKAGING STANDARD.
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
  - D) FOR TERMINAL LENGTH SEE TABLE
  - E) DRAWING FILE NAME AND REVISION : MKT-TO126AArev1

Figure 6. TO-126 (SOT-32) UNIFIED DRAWING (TSTU, TSSTU, STANDARD)

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