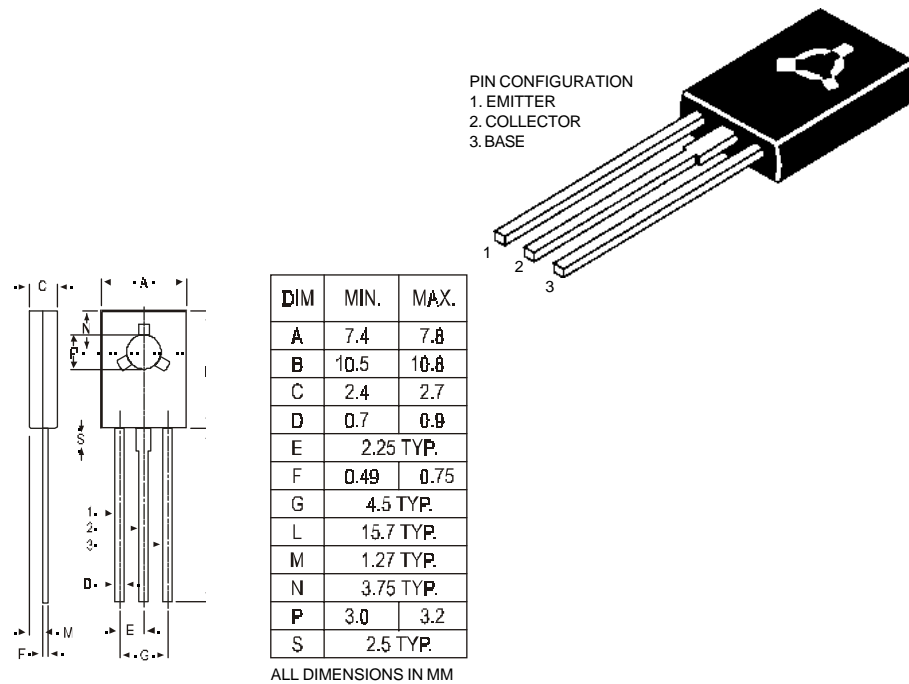


**TO-126 (SOT-32) Plastic Package**

**BD135, BD137, BD139**

**BD135, 137, 139 NPN PLASTIC POWER TRANSISTORS**  
 Complementary BD136, 138, 140  
 Medium Power Linear and Switching Applications



**ABSOLUTE MAXIMUM RATINGS**

		<b>135</b>	<b>137</b>	<b>139</b>	
Collector-base voltage (open emitter)	$V_{CBO}$ max.	45	60	100	V
Collector-emitter voltage (open base)	$V_{CEO}$ max.	45	60	80	V
Collector current	$I_C$ max.		1.5		A
Total power dissipation up to $T_C = 25^\circ\text{C}$	$P_{tot}$ max.		12.5		W
Junction temperature	$T_j$ max.		150		$^\circ\text{C}$
Collector-emitter saturation voltage $I_C = 0.5\text{ A}; I_B = 0.05\text{ A}$	$V_{CEsat}$ max.		0.5		V
D.C. current gain $I_C = 0.15\text{ A}; V_{CE} = 2\text{ V}$	$h_{FE}$ min.		40		
	$h_{FE}$ max.		250		

**RATINGS** (at  $T_A=25^\circ\text{C}$  unless otherwise specified)

Limiting values		<b>135</b>	<b>137</b>	<b>139</b>	
Collector-base voltage (open emitter)	$V_{CBO}$ max.	45	60	100	V
Collector-emitter voltage (open base)	$V_{CEO}$ max.	45	60	80	V
Emitter-base voltage (open collector)	$V_{EBO}$ max.		5.0		V

## BD135, BD137, BD139

Collector current	$I_C$	max.	1.5	A
Base current	$I_B$	max.	0.5	A
Total power dissipation up to $T_A = 25^\circ\text{C}$	$P_{tot}$	max.	1.25	W
Derate above $25^\circ\text{C}$		max	10	mW/°C
Total power dissipation up to $T_C = 25^\circ\text{C}$	$P_{tot}$	max.	12.5	W
Derate above $25^\circ\text{C}$		max	100	mW/°C
Junction temperature	$T_j$	max.	150	°C
Storage temperature	$T_{stg}$		-65 to +150	°C

### THERMAL RESISTANCE

From junction to case	$R_{thj-c}$		10	°C/W
From junction to ambient	$R_{thj-a}$		100	°C/W

### CHARACTERISTICS

$T_{amb} = 25^\circ\text{C}$  unless otherwise specified

			<b>135</b>	<b>137</b>	<b>139</b>	
<b>Collector cutoff current</b>						
$I_E = 0; V_{CB} = 30\text{ V}$	$I_{CBO}$	max.	0.1			$\mu\text{A}$
$I_E = 0; V_{CB} = 30\text{ V}; T_C = 125^\circ\text{C}$	$I_{CBO}$	max.	10			$\mu\text{A}$
<b>Emitter cut-off current</b>						
$I_C = 0; V_{EB} = 5\text{ V}$	$I_{EBO}$	max.	10			$\mu\text{A}$
<b>Breakdown voltages</b>						
$I_C = 0.03\text{ A}; I_B = 0$	$V_{CEO(sus)}^*$	min.	45	60	80	V
$I_C = 1\text{ mA}; I_E = 0$	$V_{CBO}$	min.	45	60	100	V
$I_E = 1\text{ mA}; I_C = 0$	$V_{EBO}$	min.	5.0			V
<b>Saturation voltage</b>						
$I_C = 0.5\text{ A}; I_B = 0.05\text{ A}$	$V_{CEsat}^*$	max.	0.5			V
<b>Base-emitter on voltage</b>						
$I_C = 0.5\text{ A}; V_{CE} = 2\text{ V}$	$V_{BE(on)}^*$	max.	1.0			V
<b>D.C. current gain</b>						
$I_C = 0.005\text{ A}; V_{CE} = 2\text{ V}^*$	$h_{FE}^*$	min.	25			
$I_C = 0.15\text{ A}; V_{CE} = 2\text{ V}^{**}$	$h_{FE}^*$	min.	40			
		max.	250			
$I_C = 0.5\text{ A}; V_{CE} = 2\text{ V}^*$	$h_{FE}^*$	min.	25			
<b>** <math>h_{FE}</math> classification:</b>						
	<b>-6</b>	min.	40			
		max.	100			
	<b>-10</b>	min.	63			
		max.	160			
	<b>-16</b>	min.	100			
		max.	250			
	<b>-25</b>	min.	160			
		max.	400			

\* Pulse test: pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

## Notes

### Disclaimer

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