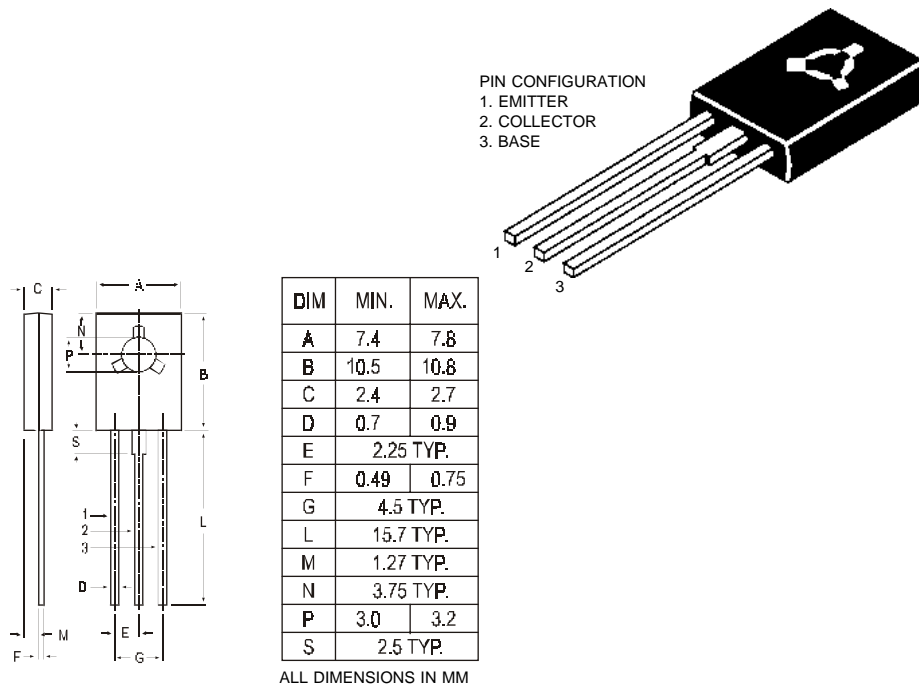


**TO-126 (SOT-32) Plastic Package**

**BD136, BD138, BD140**

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



**ABSOLUTE MAXIMUM RATINGS**

		<b>136</b>	<b>138</b>	<b>140</b>	
Collector-base voltage (open emitter)	$V_{CBO}$ max.	45	60	100	V
Collector-base 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		
			250		

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

Limiting values		<b>136</b>	<b>138</b>	<b>140</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

## BD136, BD138, BD140

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	$R_{th\ jc}$		10	°CW
From junction to ambient	$R_{th\ ja}$		100	°CW

### CHARACTERISTICS

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

			<b>136</b>	<b>138</b>	<b>140</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

The product information and the selection guides facilitate selection of the CDIL's Discrete Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished on the CDIL Web Site/CD is believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Discrete Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



CDIL is a registered Trademark of  
**Continental Device India Limited**

C-120 Naraina Industrial Area, New Delhi 110 028, India.  
Telephone + 91-11-579 6150 Fax + 91-11-579 9569, 579 5290  
e-mail sales@cdil.com www.cdil.com