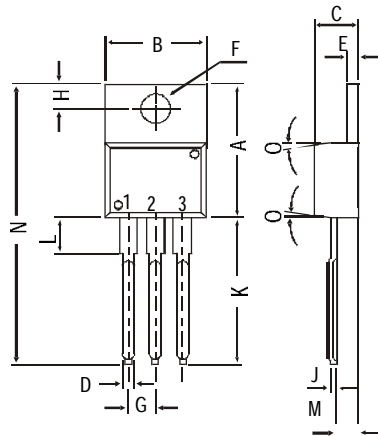
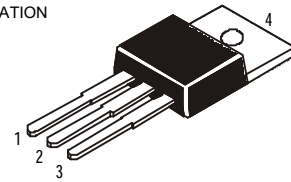


TO-220 Plastic Package

BD202, BD204, BDX78

**BD202, BD204, BDX78 PNP PLASTIC POWER TRANSISTORS**  
Complementary BD201, BD203 and BDX77  
Medium Power Switching and Amplifier Applications

PIN CONFIGURATION  
1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR



All dimensions in mm.

DIM	MIN.	MAX.
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D		0.90
E	1.15	1.40
F	3.75	3.88
G	2.29	2.79
H	2.54	3.43
J		0.56
K	12.70	14.73
L	2.80	4.07
M	2.03	2.92
N		31.24
O		DEG 7

**ABSOLUTE MAXIMUM RATINGS**

		202	204	BDX78	
Collector-base voltage (open emitter)	$V_{CBO}$ max.	60	60	100	V
Collector-emitter voltage (open base)	$V_{CEO}$ max.	45	60	80	V
Collector current (DC)	$I_C$ max.		8.0		A
Total power dissipation up to $T_{mb} = 25^\circ\text{C}$	$P_{tot}$ max.		60		W
Junction temperature	$T_j$ max.		150		$^\circ\text{C}$
Collector-emitter saturation voltage $I_C = 3\text{ A}; I_B = 0.3\text{ A}$	$V_{CEsat}$ max.		1.0		V
D.C. current gain $I_C = 1\text{ A}; V_{CE} = 2\text{ V}$	$h_{FE}$ min.	-	-	30	
$I_C = 2\text{ A}; V_{CE} = 2\text{ V}$	$h_{FE}$ min.	-	30	-	
$I_C = 3\text{ A}; V_{CE} = 2\text{ V}$	$h_{FE}$ min.	30	-	-	

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

		202	204	BDX78	
Limiting values					
Collector-base voltage (open emitter)	$V_{CBO}$ max.	60	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
Collector current (DC)	$I_C$ max.		8.0		A

## BD202, BD204, BDX78

Collector current (peak $t_p = 10$ ms)	$I_{CM}$	max.	12	A
Collector current (non-repetitive peak $t_p = 2$ ms)	$I_{CSM}$	max.	25	A
Base current	$I_B$	max.	3.0	A
Total power dissipation up to $T_{mb} = 25^\circ\text{C}$	$P_{tot}$	max.	60	W
Junction temperature	$T_j$	max.	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-65 to +150	$^\circ\text{C}$

### THERMAL RESISTANCE

From junction to ambient	$R_{th\ j-a}$		70	K/W
--------------------------	---------------	--	----	-----

### CHARACTERISTICS

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

			202 204 BDX78			
<b>Collector cutoff current</b>						
$I_B = 0$ ; $V_{CE} = 30$ V	$I_{CEO}$	max.	0.2			mA
$I_B = 0$ ; $V_{CB} = 40$ V; $T_j = 150^\circ\text{C}$	$I_{CBO}$	max.	1.0			mA
<b>Emitter cut-off current</b>						
$I_C = 0$ ; $V_{EB} = 5$ V	$I_{EBO}$	max.	0.5			mA
<b>Breakdown voltages</b>						
$I_C = 0.2$ A; $I_B = 0$	$V_{CEO}$	min.	45	60	80	V
$I_C = 1$ mA; $I_E = 0$	$V_{CBO}$	min.	60	60	100	V
$I_E = 1$ mA; $I_C = 0$	$V_{EBO}$	min.	5.0			V
<b>Saturation voltages</b>						
$I_C = 3$ A; $I_B = 0.3$ A	$V_{CEsat}^*$	max.	1.0			V
$I_C = 6$ A; $I_B = 0.6$ A	$V_{CEsat}^*$	max.	1.5			V
	$V_{BEsat}^*$	max.	2.0			V
<b>Base-emitter on voltage</b>						
$I_C = 3$ A; $V_{CE} = 2$ V	$V_{BE(on)}^*$	max.	1.5			V
<b>D.C. current gain</b>						
$I_C = 1$ A; $V_{CE} = 2$ V	$h_{FE}^*$	min.	-	-	30	
$I_C = 2$ A; $V_{CE} = 2$ V	$h_{FE}^*$	min.	-	30	-	
$I_C = 3$ A; $V_{CE} = 2$ V	$h_{FE}^*$	min.	30	-	-	
<b>Common emitter small</b>						
$I_C = 0.3$ A; $V_{CE} = 3$ V	$f_{hfe}$	min.	25			KHz
<b>Transition frequency</b>						
$I_C = 0.3$ A; $V_{CE} = 3$ V; $f = 1$ MHz	$f_T$	min.	7.0			MHz
<b>Second breakdown collector current with base forward biased (non-repetitive)</b>						
$V_{CE} = 40$ V; $t_p = 0.1$ s	$I_{S/b}$	min.	1.5			A

### Switching time

$I_{Con} = 2$  A;  $I_{Bon} = I_{Boff} = 0.2$  A

Turn on time	$t_{on}$	max.	1	$\mu\text{s}$
Turn off time	$t_{off}$	max.	2	$\mu\text{s}$

\* Pulse test:  $t_p \leq 300$   $\mu\text{s}$ ; 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](mailto:sales@cdil.com) [www.cdil.com](http://www.cdil.com)