

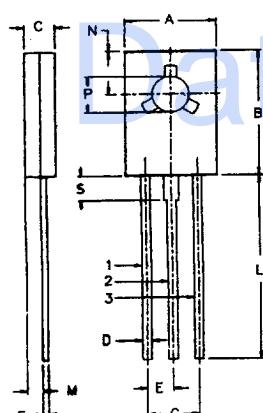
BD233, 235, 237

NPN PLASTIC POWER TRANSISTORS

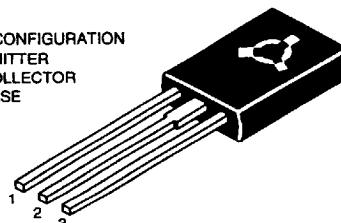
BD234, 236, 238

PNP PLASTIC POWER TRANSISTORS

Medium Power Liner and Switching Applications



PIN CONFIGURATION  
 1. Emitter  
 2. Collector  
 3. Base



DIM	MIN.	MAX.
A	7.4	7.8
B	10.5	10.8
C	2.4	2.7
D	0.7	0.9
E	2.25 TYP.	
F	0.49	0.75
G	4.5 TYP.	
L	15.7 TYP.	
M	1.27 TYP.	
N	3.75 TYP.	
P	3.0	3.2
S	2.5 TYP.	

ALL DIMENSIONS IN MM

## ABSOLUTE MAXIMUM RATINGS

		233	235	237		
		234	236	238		
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.		2.0		A
Total power dissipation up to $T_C = 25^\circ\text{C}$	$P_{tot}$	max.		25		W
Junction temperature	$T_j$	max.		150		$^\circ\text{C}$
Collector-emitter saturation voltage $I_C = 1 \text{ A}; I_B = 0.1 \text{ A}$	$V_{CEsat}$	max.		0.6		V
D.C. current gain $I_C = 150 \text{ mA}; V_{CE} = 2 \text{ V}$	$h_{FE}$	min.		40		

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

Limiting values		233	235	237		
		234	236	238		
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-emitter voltage ( $R_{BE} = 1\text{K}\Omega$ )	$V_{CER}$	max.	45	60	100	V
Emitter-base voltage (open collector)	$V_{EBO}$	max.		5.0		V
Collector current	$I_C$	max.		2.0		A
Collector current (peak value)	$I_{CM}$	max.		6.0		A
Total power dissipation up to $T_C = 25^\circ\text{C}$	$P_{tot}$	max.		25		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 case	$R_{th j-c}$		5.0		$^\circ\text{C/W}$
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## CHARACTERISTICS

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

		233	235	237		
		234	236	238		
Collector cutoff current						
$I_E = 0; V_{CB} = 45\text{ V}$	$I_{CBO}$	max.	100	-	-	$\mu\text{A}$
$I_E = 0; V_{CB} = 60\text{ V}$	$I_{CBO}$	max.	-	100	-	$\mu\text{A}$
$I_E = 0; V_{CB} = 100\text{ V}$	$I_{CBO}$	max.	-	-	100	$\mu\text{A}$
$I_E = 0; V_{CB} = 45\text{ V}; T_C = 150^\circ\text{C}$	$I_{CBO}$	max.	2.0	-	-	mA
$I_E = 0; V_{CB} = 60\text{ V}; T_C = 150^\circ\text{C}$	$I_{CBO}$	max.	-	2.0	-	mA
$I_E = 0; V_{CB} = 100\text{ V}; T_C = 150^\circ\text{C}$	$I_{CBO}$	max.	-	-	2.0	mA
Emitter cut-off current						
$I_C = 0; V_{EB} = 5\text{ V}$	$I_{EBO}$	max.		1.0		mA
Breakdown voltages						
$I_C = 0.1\text{ A}; I_B = 0$	$V_{CEO(sus)}^*$	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
Saturation voltage						
$I_C = 1\text{ A}; I_B = 0.1\text{ A}$	$V_{CEsat}^*$	max.		0.6		V
Base-emitter on voltage						
$I_C = 1\text{ A}; V_{CE} = 2\text{ V}$	$V_{BE(on)}^*$	max.		1.3		V
D.C. current gain						
$I_C = 150\text{ mA}; V_{CE} = 2\text{ V}$	$h_{FE}^*$	min.		40		
$I_C = 1\text{ A}; V_{CE} = 2\text{ V}$	$h_{FE}^*$	min.		25		
Transition frequency						
$I_C = 250\text{ mA}; V_{CE} = 10\text{V}$	$f_T$	min.		3.0		MHz

\* Pulse test: pulse duration = 300  $\mu\text{s}$ ; duty cycle  $\leq 1.5\%$ .