



Micro Commercial Components



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**BD233  
BD235  
BD237**

## Features

- Power Dissipation:  $P_{CM}=1.25W$ ,  $T_a=25^{\circ}C$
- Collector Current :  $I_C=2A$
- Complement to BD234/236/238 respectively
- Lead Free Finish/RoHS Compliant (Note1) ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking: Type Number

## Maximum Ratings\*

Symbol	Rating	Rating	Unit
$V_{CEO}$	Collector-Emitter Voltage	BD233	45
		BD235	60
		BD237	80
$V_{CBO}$	Collector-Base Voltage	BD233	45
		BD235	60
		BD237	100
$V_{CER}$	Collector-Emitter Voltage	BD233	45
		BD235	60
		BD237	100
$V_{EBO}$	Emitter-Base Voltage		5
$I_C$	Collector Current (DC)		2
$I_{CP}$	Collector Current (Pulse)		6
$P_C$	Collector Dissipation ( $T_C=25^{\circ}C$ )		25
$T_J$	Operating Junction Temperature		150
$T_{STG}$	Storage Temperature		-65 to +150

## Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
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### OFF CHARACTERISTICS

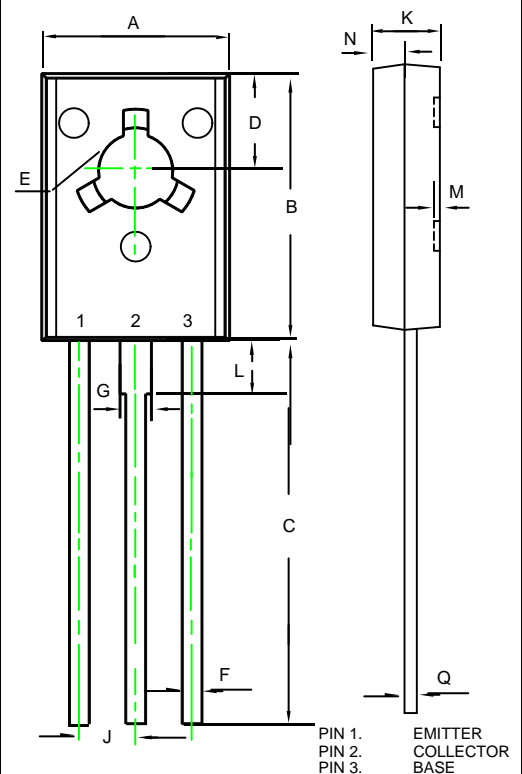
$V_{CEO(sus)}$	Collector-Emitter Breakdown Voltage			
	BD233 ( $I_C=0.1A_{dc}$ , $I_B=0$ )	45	---	V
	BD235 ( $I_C=0.1A_{dc}$ , $I_B=0$ )	60	---	V
$I_{CBO}$	Collector Cutoff Current			
	BD233 ( $V_{CB}=45V_{dc}$ , $I_E=0$ )	---	100	$\mu A$
	BD235 ( $V_{CB}=60V_{dc}$ , $I_E=0$ )	---	100	$\mu A$
$I_{EBO}$	Emitter Cutoff Current			
	( $V_{BE}=5.0V_{dc}$ , $I_C=0$ )	---	1.0	mA
$h_{FE}$	DC Current Gain			
	( $V_{CE}=2V$ , $I_C=150mA$ ) ( $V_{CE}=2V$ , $I_C=1A$ )	40 25	---	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage			
	( $I_C=1A$ , $I_B=0.1A$ )	---	0.6	V
$V_{BE(on)}$	Base-Emitter ON Voltage			
	( $V_{CE}=2V$ , $I_C=1A$ )	---	1.3	V
$f_T$	Current Gain Bandwidth Product			
	( $V_{CE}=10V$ , $I_C=0.25A$ )	3	---	MHz

\*Pulse Test:  $PW=300\mu s$ , Duty Cycle=1.5% Pulsed

Notes: 1. High Temperature Solder Exemption Applied, see EU Directive Annex Notes 7.

## NPN Plastic-Encapsulate Transistors

TO-18



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.291	0.307	7.40	7.80	
B	0.417	0.433	10.60	11.00	
C	0.602	0.618	15.30	15.70	
D	0.154	0.161	3.90	4.10	
E	0.118	0.126	3.00	3.20	
F	0.026	0.034	0.66	0.86	
G	0.046	0.054	1.17	1.37	
J	0.090TYP		2.290TYP		
K	0.098	0.114	2.50	2.90	
L	0.083	0.091	2.10	2.30	
M	0.000	0.012	0.00	0.30	
N	0.043	0.059	1.10	1.50	
Q	0.018	0.024	0.45	0.60	

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# BD233/235/237



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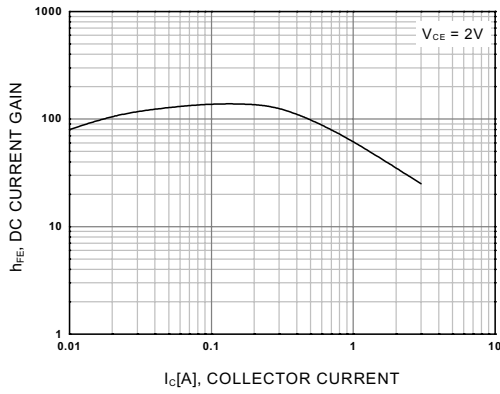


Figure 1. DC current Gain

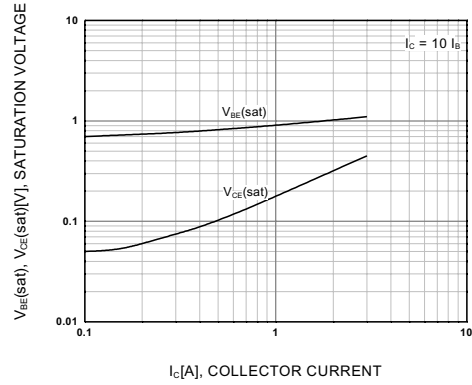


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

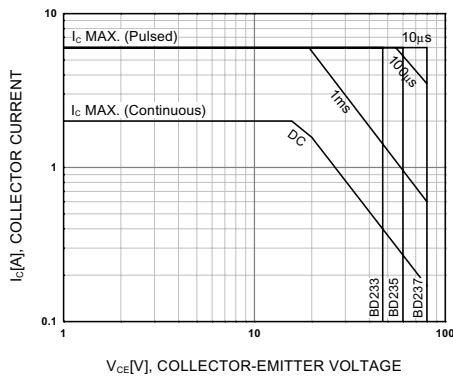


Figure 3. Safe Operating Area

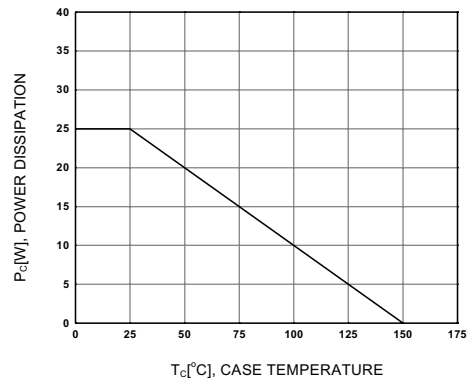


Figure 4. Power Derating



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### Ordering Information :

Device	Packing
Part Number-BP	Bulk; 1Kpcs/Box

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