

# BD237 (NPN), BD234 (PNP), BD238 (PNP)

Preferred Devices

## Plastic Medium Power Bipolar Transistors

Designed for use in 5.0 to 10 W audio amplifiers and drivers utilizing complementary or quasi complementary circuits.

### Features

- DC Current Gain –  
 $h_{FE} = 40 \text{ (Min) @ } I_C = 0.15 \text{ A}$
- Epoxy Meets UL 94 V0 @ 0.125 in
- ESD Ratings: Human Body Model, 3B; >8000 V  
Machine Model, C; >400 V
- Pb-Free Packages are Available\*

### MAXIMUM RATINGS

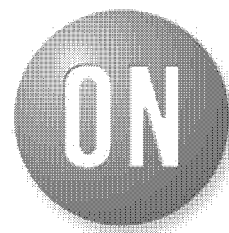
Rating	Symbol	BD234	BD237 BD238	Unit
Collector-Emitter Voltage	$V_{CEO}$	45	80	Vdc
Collector-Base Voltage	$V_{CBO}$	60	100	Vdc
Emitter-Base Voltage	$V_{EBO}$	5.0		Vdc
Collector Current	$I_C$	2.0		Adc
Base Current	$I_B$	1.0		Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$	$P_D$	25		W
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150		$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	5.0	$^\circ\text{C/W}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

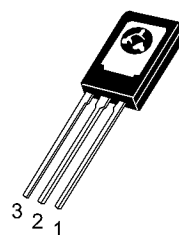
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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## 2.0 AMPERES POWER TRANSISTORS 25 WATTS



TO-225  
CASE 77  
STYLE 1

### MARKING DIAGRAM



BD23x = Device Code  
x = 4, 7 or 8  
Y = Year  
WW = Work Week  
G = Pb-Free Package

### ORDERING INFORMATION

Device	Package	Shipping
BD234	TO-225	500 Units / Box
BD234G	TO-225 (Pb-Free)	500 Units / Box
BD237	TO-225	500 Units / Box
BD237G	TO-225 (Pb-Free)	500 Units / Box
BD238	TO-225	500 Units / Box
BD238G	TO-225 (Pb-Free)	500 Units / Box

Preferred devices are recommended choices for future use and best overall value.

## BD237 (NPN), BD234 (PNP), BD238 (PNP)

### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Type	Min	Max	Unit
Collector-Emitter Sustaining Voltage (Note 1) ( $I_C = 0.1\text{ A}$ , $I_B = 0$ )	$V_{(BR)CEO}$	BD237, BD238 BD234	80 45	– –	Vdc
Collector Cutoff Current ( $V_{CB} = 100\text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 60\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	BD237, BD238 BD234	– –	0.1 0.1	mA
Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	–	–	1.0	mA
DC Current Gain ( $I_C = 0.15\text{ A}$ , $V_{CE} = 2.0\text{ V}$ ) ( $I_C = 1.0\text{ A}$ , $V_{CE} = 2.0\text{ V}$ )	$h_{FE1}$ $h_{FE2}$	– –	40 25	– –	–
Collector-Emitter Saturation Voltage (Note 1) ( $I_C = 1.0\text{ A}$ , $I_B = 0.1\text{ A}$ )	$V_{CE(sat)}$	–	–	0.6	Vdc
Base-Emitter On Voltage (Note 1) ( $I_C = 1.0\text{ A}$ , $V_{CE} = 2.0\text{ Vdc}$ )	$V_{BE(on)}$	–	–	1.3	Vdc
Current-Gain – Bandwidth Product ( $I_C = 250\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ MHz}$ )	$f_T$	–	3.0	–	MHz

1. Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

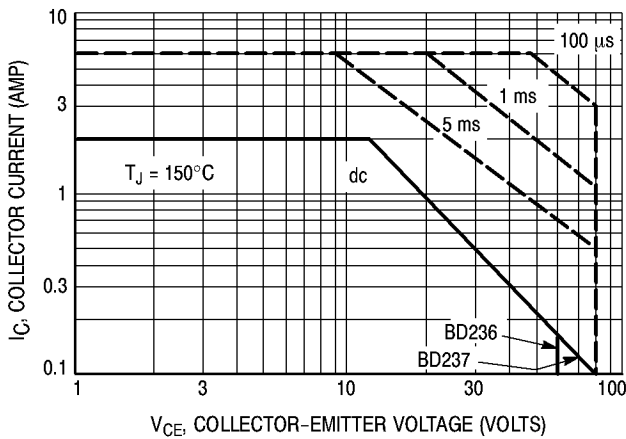


Figure 1. Active Region Safe Operating Area

The Safe Operating Area Curves indicate  $I_C$ – $V_{CE}$  limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum  $T_J$ , power-temperature derating must be observed for both steady state and pulse power conditions.

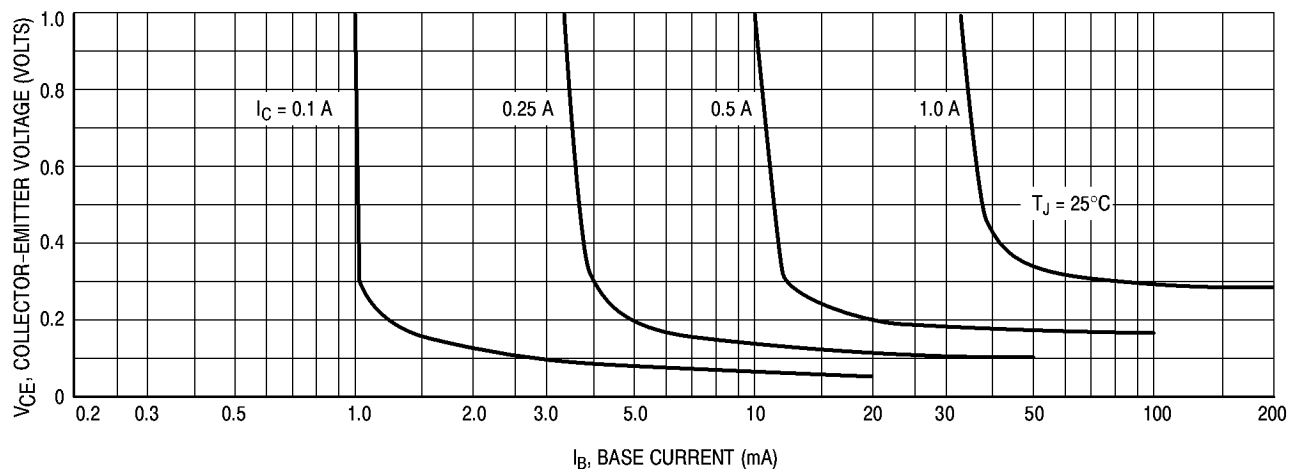


Figure 2. Collector Saturation Region

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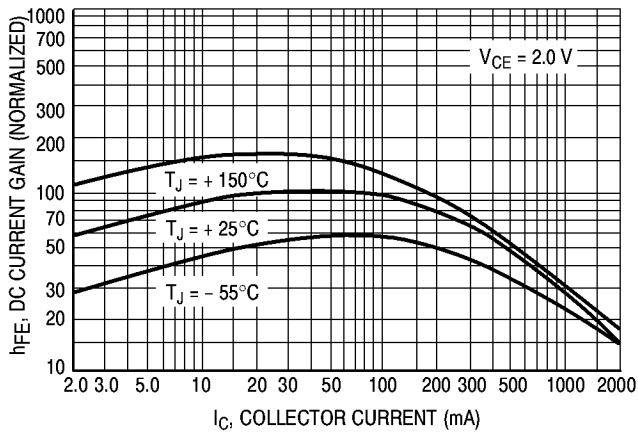


Figure 3. Current Gain

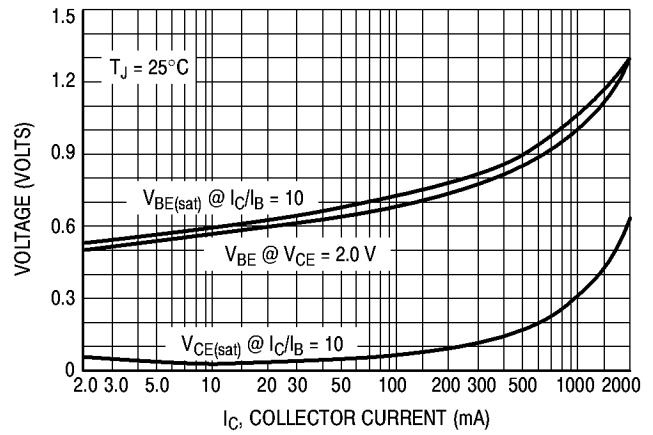


Figure 4. "On" Voltages

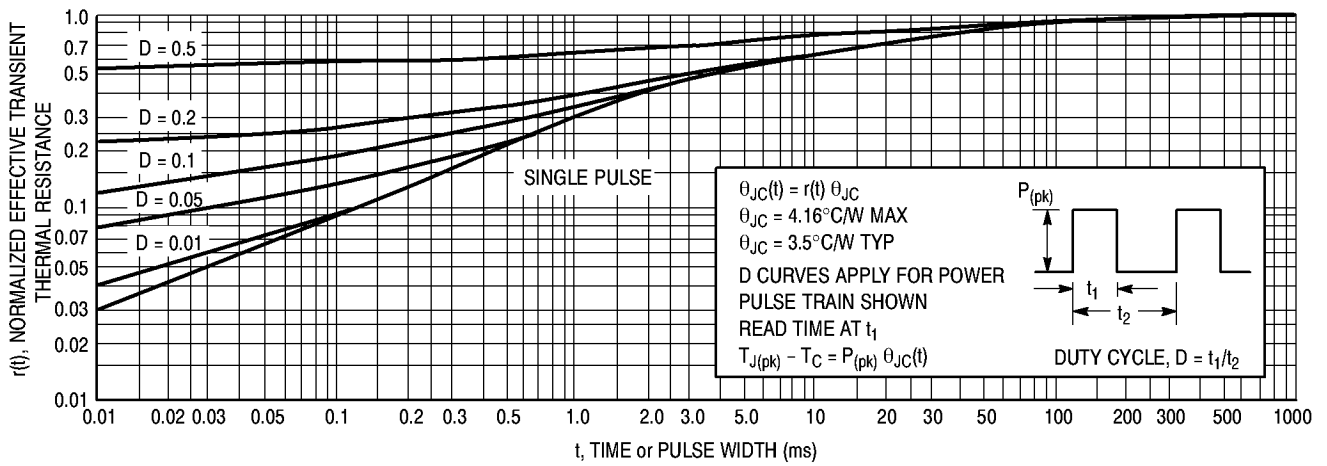
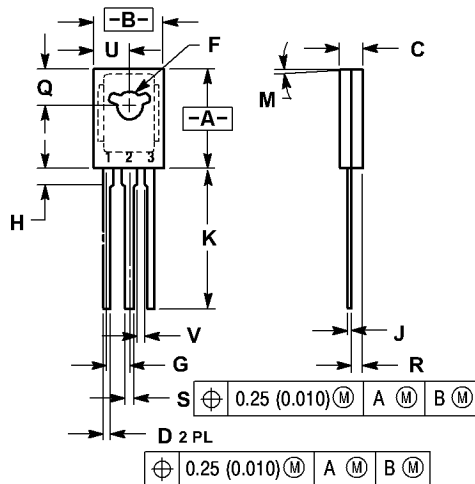


Figure 5. Thermal Response

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## PACKAGE DIMENSIONS

TO-225  
CASE 77-09  
ISSUE Z




### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 077-01 THRU -08 OBSOLETE, NEW STANDARD 077-09.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.425	0.435	10.80	11.04
B	0.295	0.305	7.50	7.74
C	0.095	0.105	2.42	2.66
D	0.020	0.026	0.51	0.66
F	0.115	0.130	2.93	3.30
G	0.094 BSC		2.39 BSC	
H	0.050	0.095	1.27	2.41
J	0.015	0.025	0.39	0.63
K	0.575	0.655	14.61	16.63
M	5° TYP		5° TYP	
Q	0.148	0.158	3.76	4.01
R	0.045	0.065	1.15	1.65
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	---	1.02	---

### STYLE 1:

- PIN 1. EMITTER  
2. COLLECTOR  
3. BASE

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