

# BD237G (NPN), BD234G, BD238G (PNP)

## 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

- High DC Current Gain
- Epoxy Meets UL 94 V0 @ 0.125 in
- These Devices are Pb-Free and are RoHS Compliant\*

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BD234G DB237G, BD238G	$V_{CEO}$	45 80	Vdc
Collector-Base Voltage BD234G DB237G, BD238G	$V_{CBO}$	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	$^\circ\text{C}$
ESD - Human Body Model	HBM	3B	V
ESD - Machine Model	MM	C	V

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS

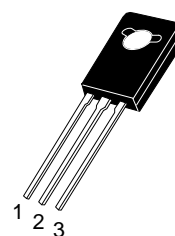
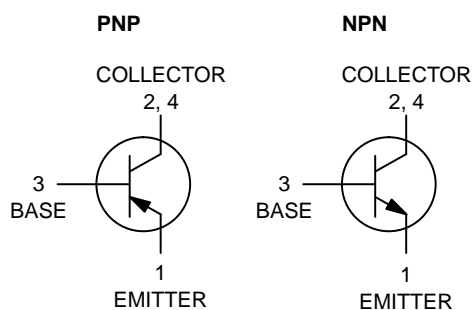
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	5.0	$^\circ\text{C/W}$



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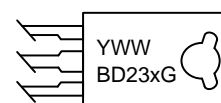
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## 2.0 AMPERES POWER TRANSISTORS 25 WATTS



TO-225  
CASE 77-09  
STYLE 1

### MARKING DIAGRAM



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

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

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

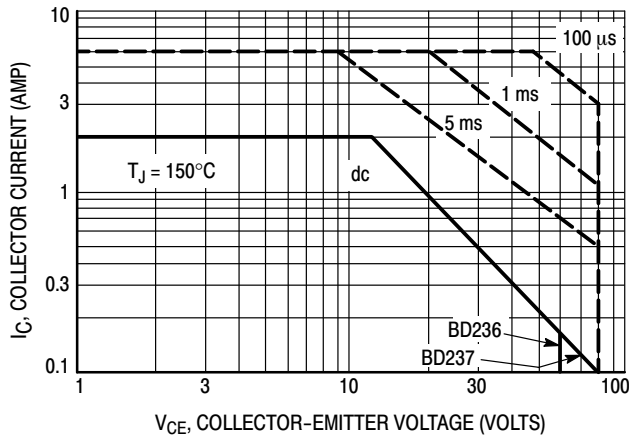
## BD237G (NPN), BD234G, BD238G (PNP)

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

Characteristic	Symbol	Min	Max	Unit
Collector-Emitter Sustaining Voltage (Note 1) ( $I_C = 0.1\text{ Adc}$ , $I_B = 0$ ) BD237G, BD238G BD234G	$V_{(BR)CEO}$	80 45	- -	Vdc
Collector Cutoff Current ( $V_{CB} = 100\text{ Vdc}$ , $I_E = 0$ ) BD237G, BD238G ( $V_{CB} = 60\text{ Vdc}$ , $I_E = 0$ ) BD234G	$I_{CBO}$	- -	0.1 0.1	mAdc
Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	-	1.0	mAdc
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) ( $I_C = 1.0\text{ Adc}$ , $I_B = 0.1\text{ Adc}$ )	$V_{CE(sat)}$	-	0.6	Vdc
Base-Emitter On Voltage (Note 1) ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 2.0\text{ Vdc}$ )	$V_{BE(on)}$	-	1.3	Vdc
Current-Gain - Bandwidth Product ( $I_C = 250\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ MHz}$ )	$f_T$	3.0	-	MHz

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

# BD237G (NPN), BD234G, BD238G (PNP)

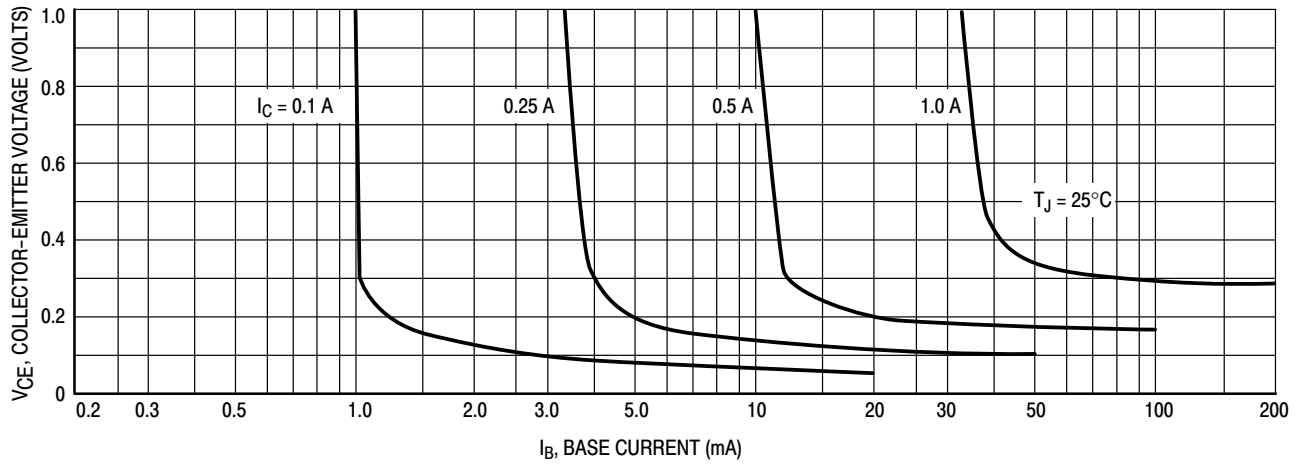


Figure 2. Collector Saturation Region

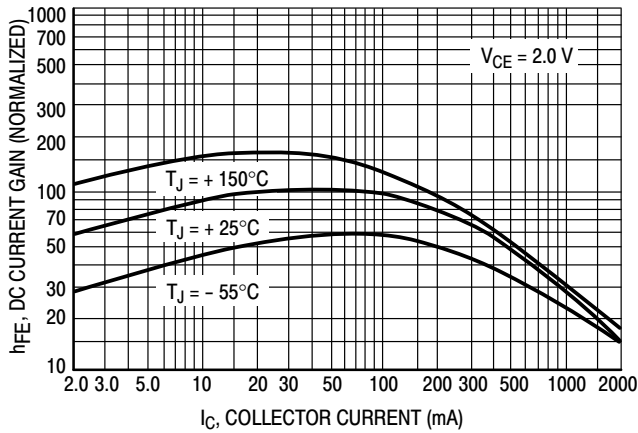


Figure 3. Current Gain

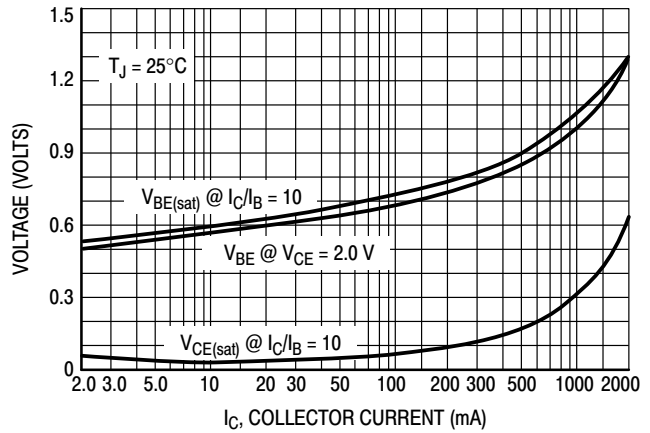


Figure 4. "On" Voltages

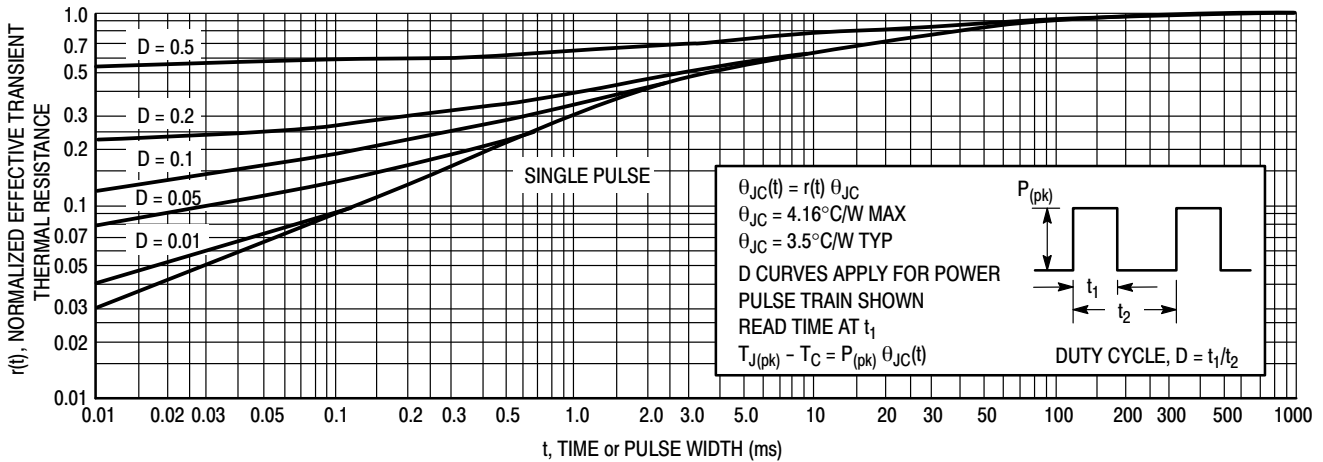


Figure 5. Thermal Response

## BD237G (NPN), BD234G, BD238G (PNP)

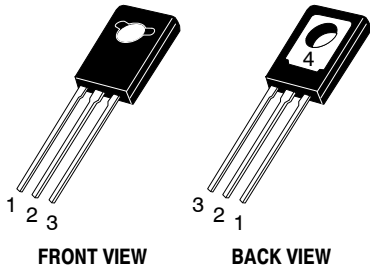
### ORDERING INFORMATION

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

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

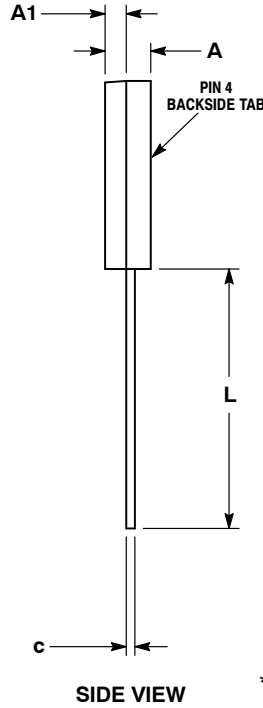
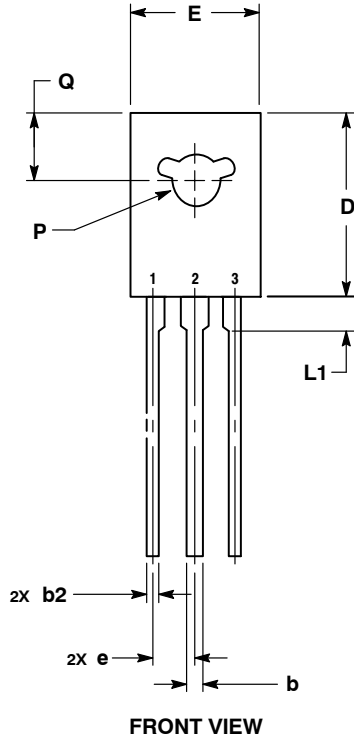
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CASE 77-09  
ISSUE AD

DATE 25 MAR 2015

SCALE 1:1

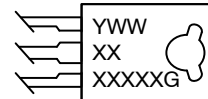


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. NUMBER AND SHAPE OF LUGS OPTIONAL.

DIM	MILLIMETERS	
	MIN	MAX
A	2.40	3.00
A1	1.00	1.50
b	0.60	0.90
b2	0.51	0.88
c	0.39	0.63
D	10.60	11.10
E	7.40	7.80
e	2.04	2.54
L	14.50	16.63
L1	1.27	2.54
P	2.90	3.30
Q	3.80	4.20

GENERIC MARKING DIAGRAM\*



- Y = Year
- WW = Work Week
- XXXXX = Device Code
- G = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present.

- |   |   |   |   |   |
|---|---|---|---|---|
| <p>STYLE 1:<br/>PIN 1. EMITTER<br/>2., 4. COLLECTOR<br/>3. BASE</p> | <p>STYLE 2:<br/>PIN 1. CATHODE<br/>2., 4. ANODE<br/>3. GATE</p> | <p>STYLE 3:<br/>PIN 1. BASE<br/>2., 4. COLLECTOR<br/>3. EMITTER</p> | <p>STYLE 4:<br/>PIN 1. ANODE 1<br/>2., 4. ANODE 2<br/>3. GATE</p> | <p>STYLE 5:<br/>PIN 1. MT 1<br/>2., 4. MT 2<br/>3. GATE</p>     |
| <p>STYLE 6:<br/>PIN 1. CATHODE<br/>2., 4. GATE<br/>3. ANODE</p>     | <p>STYLE 7:<br/>PIN 1. MT 1<br/>2., 4. GATE<br/>3. MT 2</p>     | <p>STYLE 8:<br/>PIN 1. SOURCE<br/>2., 4. GATE<br/>3. DRAIN</p>      | <p>STYLE 9:<br/>PIN 1. GATE<br/>2., 4. DRAIN<br/>3. SOURCE</p>    | <p>STYLE 10:<br/>PIN 1. SOURCE<br/>2., 4. DRAIN<br/>3. GATE</p> |

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DESCRIPTION:	TO-225	PAGE 1 OF 1

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