

# Plastic Medium Power Bipolar Transistors

## BD237G (NPN), BD234G (PNP)

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

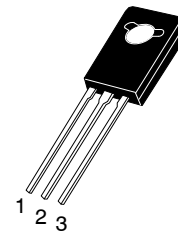
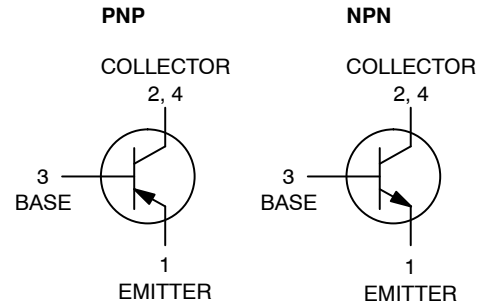
| Rating                                                 | Symbol         | Value       | Unit             |
|--------------------------------------------------------|----------------|-------------|------------------|
| Collector-Emitter Voltage<br>BD234G<br>DB237G, BD238G  | $V_{CEO}$      | 45<br>80    | Vdc              |
| Collector-Base Voltage<br>BD234G<br>DB237G, BD238G     | $V_{CBO}$      | 60<br>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<br>@ $T_C = 25^\circ\text{C}$ | $P_D$          | 25          | W                |
| Operating and Storage Junction<br>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 | $^\circ\text{C/W}$ |

## 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.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 4.

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

## BD237G (NPN), BD234G (PNP)

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

| Characteristic                                                                                                                                | Symbol                 | Min      | Max        | Unit |
|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------|------------|------|
| Collector-Emitter Sustaining Voltage (Note 1)<br>( $I_C = 0.1\text{ A}$ , $I_B = 0$ )<br>BD237G, BD238G<br>BD234G                             | $V_{(BR)CEO}$          | 80<br>45 | –<br>–     | Vdc  |
| Collector Cutoff Current<br>( $V_{CB} = 100\text{ Vdc}$ , $I_E = 0$ )<br>BD237G, BD238G<br>( $V_{CB} = 60\text{ Vdc}$ , $I_E = 0$ )<br>BD234G | $I_{CBO}$              | –<br>–   | 0.1<br>0.1 | mAdc |
| Emitter Cutoff Current<br>( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )                                                                           | $I_{EBO}$              | –        | 1.0        | mAdc |
| DC Current Gain<br>( $I_C = 0.15\text{ A}$ , $V_{CE} = 2.0\text{ V}$ )<br>( $I_C = 1.0\text{ A}$ , $V_{CE} = 2.0\text{ V}$ )                  | $h_{FE1}$<br>$h_{FE2}$ | 40<br>25 | –<br>–     | –    |
| Collector-Emitter Saturation Voltage (Note 1)<br>( $I_C = 1.0\text{ A}$ , $I_B = 0.1\text{ A}$ )                                              | $V_{CE(sat)}$          | –        | 0.6        | Vdc  |
| Base-Emitter On Voltage (Note 1)<br>( $I_C = 1.0\text{ A}$ , $V_{CE} = 2.0\text{ Vdc}$ )                                                      | $V_{BE(on)}$           | –        | 1.3        | Vdc  |
| Current-Gain – Bandwidth Product<br>( $I_C = 250\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ MHz}$ )                             | $f_T$                  | 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  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

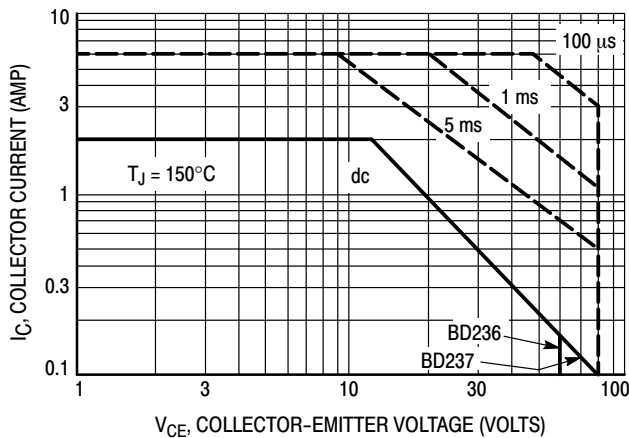


Figure 1. Active Region Safe Operating Area

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.

# BD237G (NPN), BD234G (PNP)

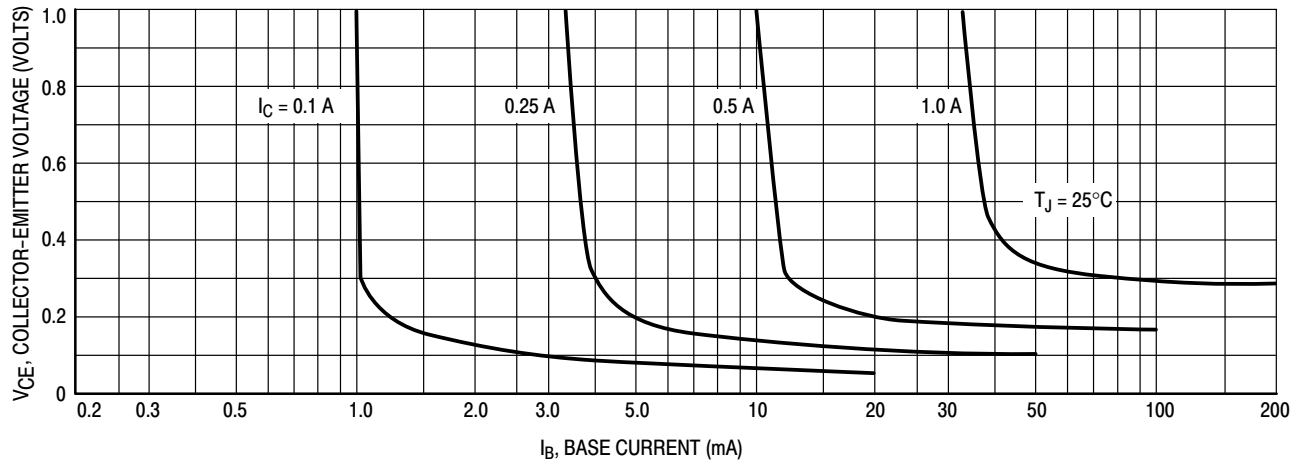


Figure 2. Collector Saturation Region

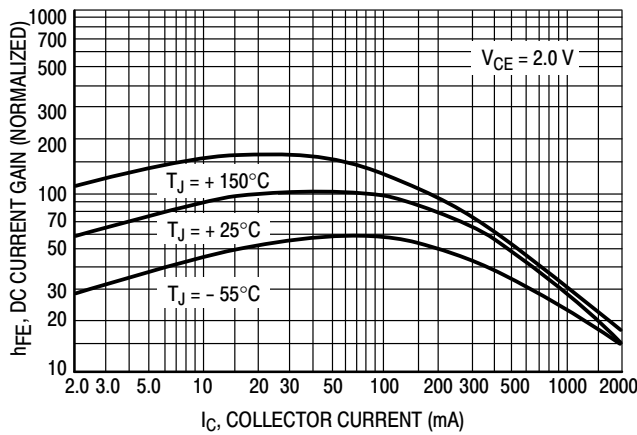


Figure 3. Current Gain

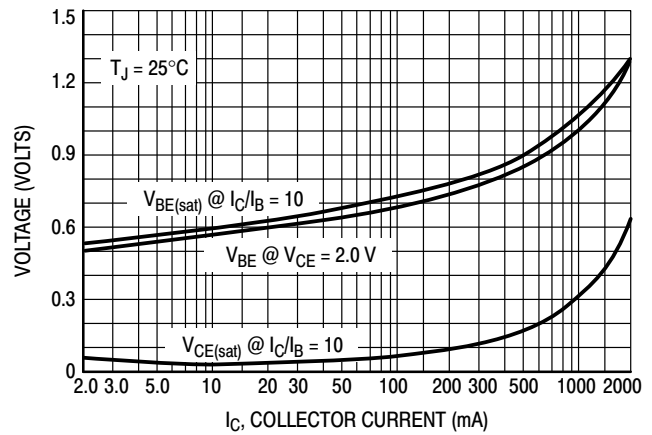


Figure 4. "On" Voltages

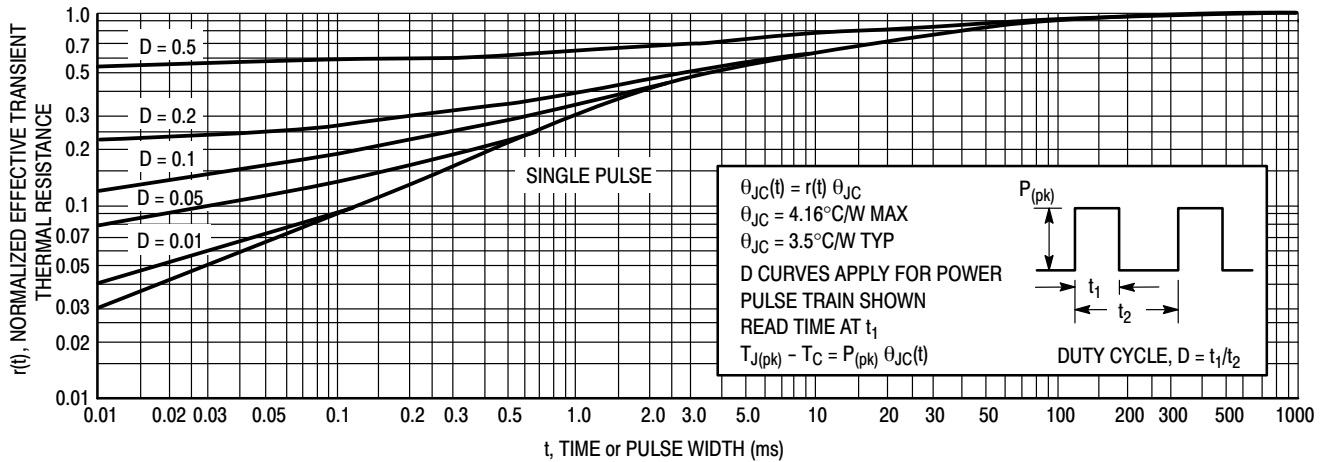


Figure 5. Thermal Response

## BD237G (NPN), BD234G (PNP)

### ORDERING INFORMATION

| Device | Package             | Shipping        |
|--------|---------------------|-----------------|
| BD237G | TO-225<br>(Pb-Free) | 500 Units / Box |

### DISCONTINUED (Note 2)

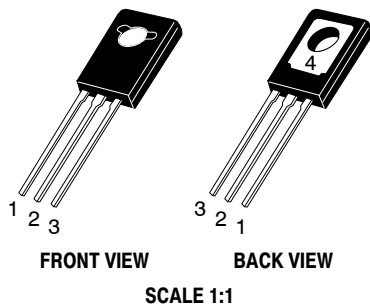
|        |                     |                 |
|--------|---------------------|-----------------|
| BD234G | TO-225<br>(Pb-Free) | 500 Units / Box |
|--------|---------------------|-----------------|

2. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on [www.onsemi.com](http://www.onsemi.com).

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

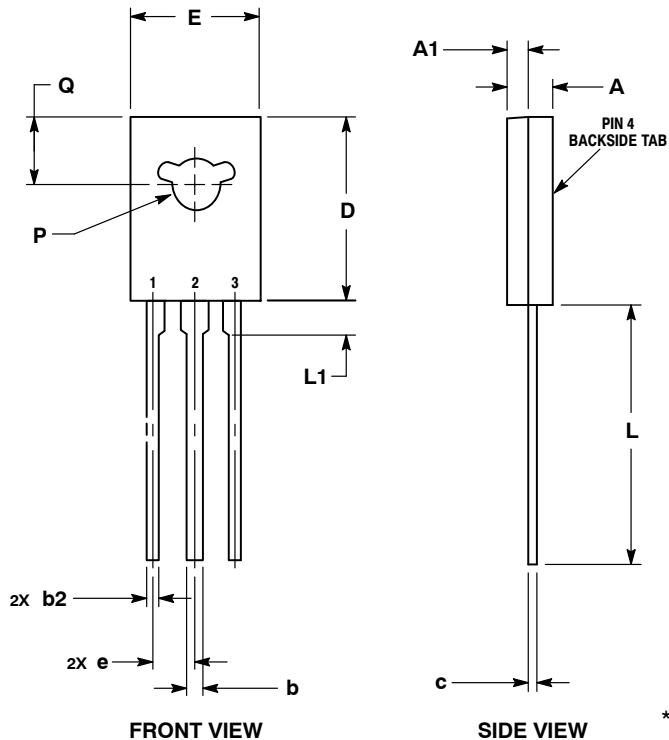
ON Semiconductor®

ON



TO-225  
CASE 77-09  
ISSUE AD

DATE 25 MAR 2015

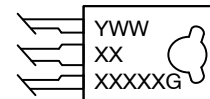


## NOTES:

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

| MILLIMETERS |       |       |
|-------------|-------|-------|
| DIM         | 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.

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

|                  |             |                                                                                                                                                                                     |
|------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| DESCRIPTION:     | TO-225      | PAGE 1 OF 1                                                                                                                                                                         |

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