# 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<br>BD234G<br>DB237G, BD238G | $V_{CEO}$ | <br>45<br>80 | Vdc |
| Collector−Base Voltage<br>BD234G<br>DB237G, BD238G | $V_{CBO}$ | <br>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°C | $P_D$ | <br>25 | W |
| Operating and Storage Junction Temperature Range | $T_J$, $T_{stg}$ | −55 to +150 | °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

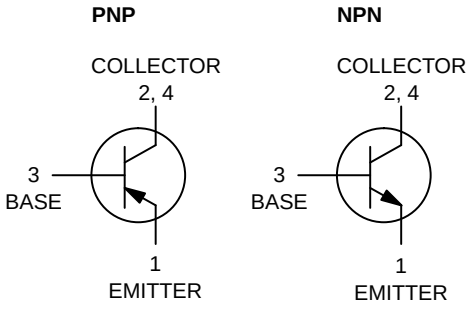
| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance, Junction−to−Case | $R_{\theta JC}$ | 5.0 | °C/W |

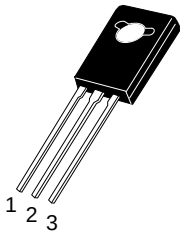
*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**ON Semiconductor®**

**http://onsemi.com**

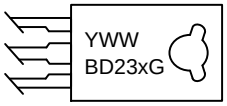
## 2.0 AMPERES POWER TRANSISTORS 25 WATTS




**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.

**ELECTRICAL CHARACTERISTICS** ($T_C$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Collector−Emitter Sustaining Voltage (Note 1)<br>($I_C$ = 0.1 Adc, $I_B$ = 0)<br>BD237G, BD238G<br>BD234G | $V_{(BR)CEO}$ | <br><br>80<br>45 | <br><br>−<br>− | Vdc |
| Collector Cutoff Current<br>($V_{CB}$ = 100 Vdc, $I_E$ = 0)<br>BD237G, BD238G<br>($V_{CB}$ = 60 Vdc, $I_E$ = 0)<br>BD234G | $I_{CBO}$ | <br><br>−<br><br>− | <br><br>0.1<br><br>0.1 | mAdc |
| Emitter Cutoff Current<br>($V_{BE}$ = 5.0 Vdc, $I_C$ = 0) | $I_{EBO}$ | <br>− | <br>1.0 | mAdc |
| DC Current Gain<br>($I_C$ = 0.15 A, $V_{CE}$ = 2.0 V)<br>($I_C$ = 1.0 A, $V_{CE}$ = 2.0 V) | <br>$h_{FE1}$<br>$h_{FE2}$ | <br>40<br>25 | <br>−<br>− | − |
| Collector−Emitter Saturation Voltage (Note 1)<br>($I_C$ = 1.0 Adc, $I_B$ = 0.1 Adc) | $V_{CE(sat)}$ | <br>− | <br>0.6 | Vdc |
| Base−Emitter On Voltage (Note 1)<br>($I_C$ = 1.0 Adc, $V_{CE}$ = 2.0 Vdc) | $V_{BE(on)}$ | <br>− | <br>1.3 | Vdc |
| Current−Gain − Bandwidth Product<br>($I_C$ = 250 mAdc, $V_{CE}$ = 10 Vdc, f = 1.0 MHz) | $f_T$ | <br>3.0 | <br>− | 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 ≤ 300 μs, Duty Cycle ≤ 2.0%.

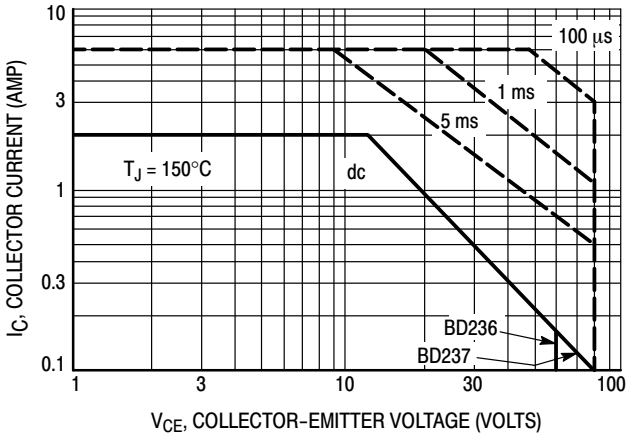



**Figure 1. Active Region Safe Operating Area**

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.

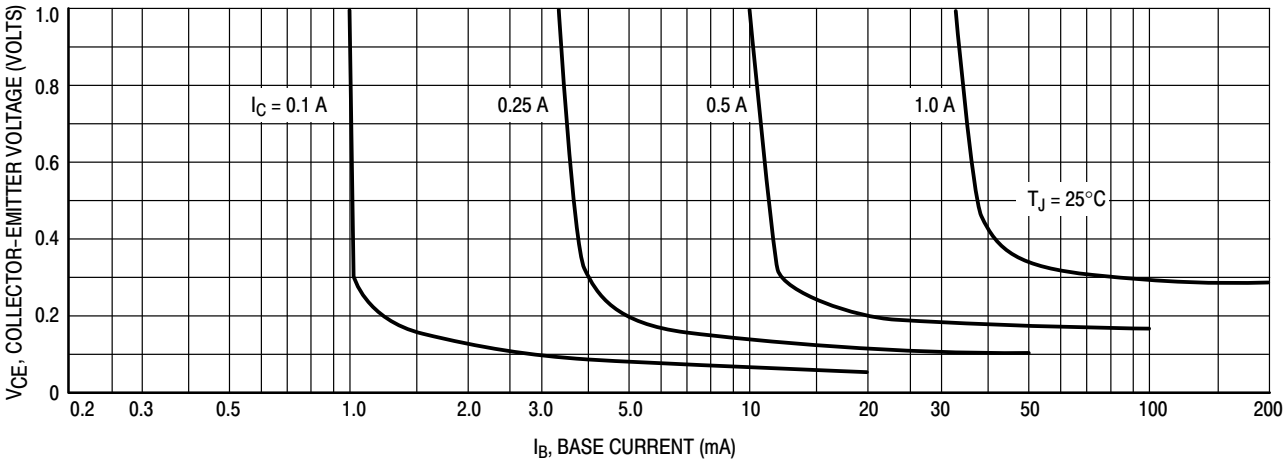



**Figure 2. Collector Saturation Region**

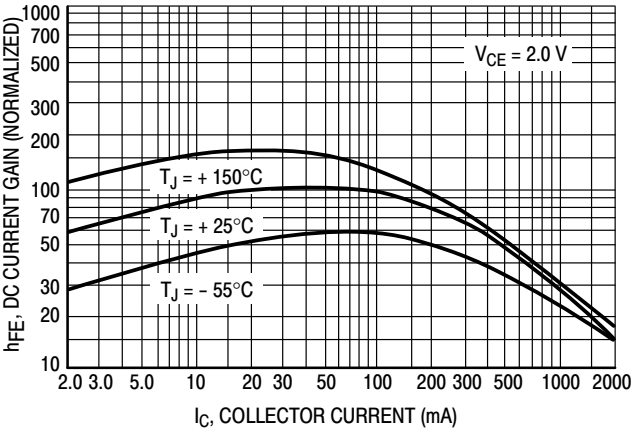



**Figure 3. Current Gain**

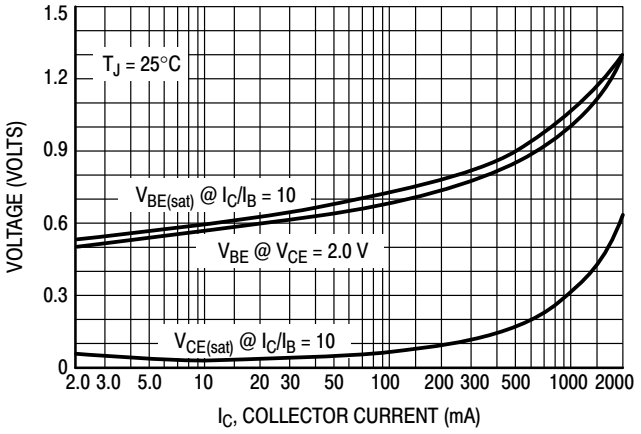



**Figure 4. “On” Voltages**

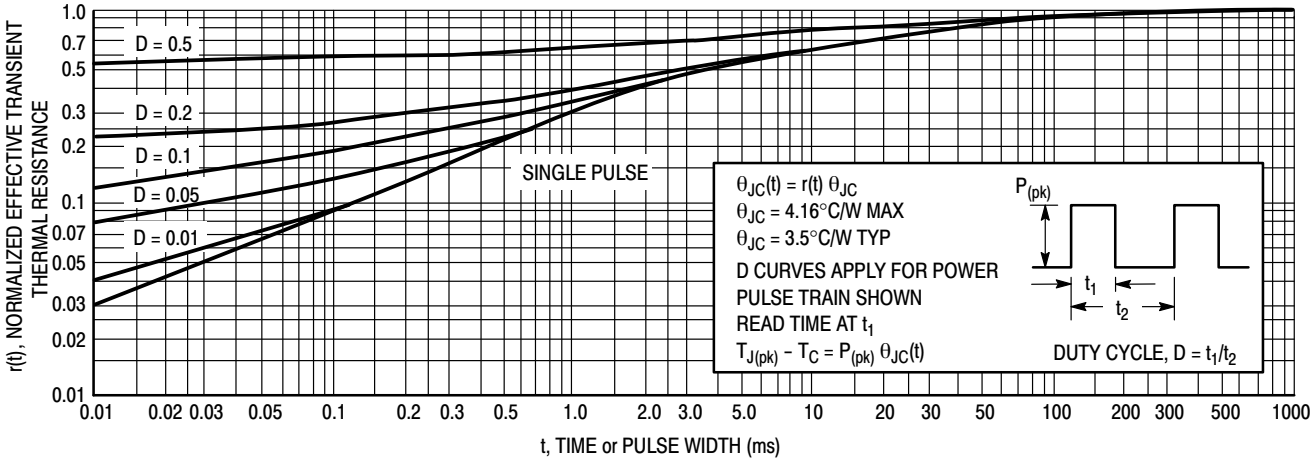



**Figure 5. Thermal Response**

**ORDERING INFORMATION**

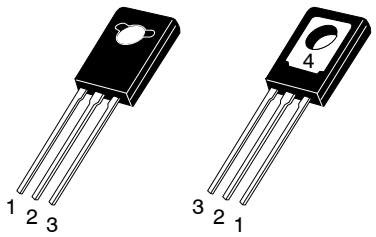
| Device | Package | Shipping |
|---|---|---|
| BD234G | TO−225<br>(Pb−Free) | 500 Units / Box |
| BD237G | TO−225<br>(Pb−Free) | 500 Units / Box |
| BD238G | TO−225<br>(Pb−Free) | 500 Units / Box |

# MECHANICAL CASE OUTLINE
## PACKAGE DIMENSIONS

ON Semiconductor®

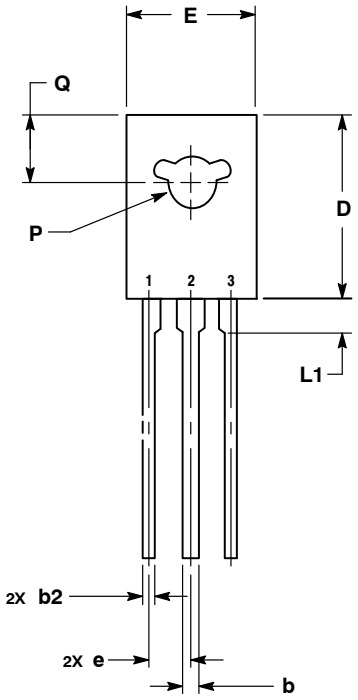
**TO−225**
CASE 77−09
ISSUE AD

DATE 25 MAR 2015

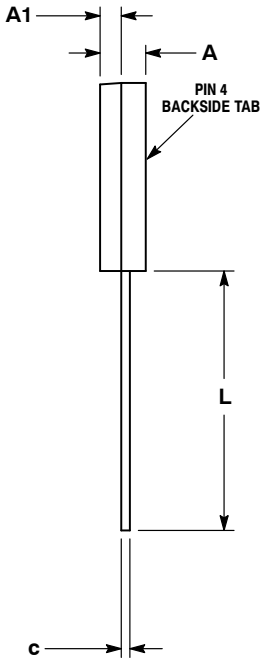



**FRONT VIEW** **BACK VIEW**

**SCALE 1:1**




**FRONT VIEW**

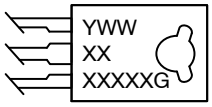



**SIDE VIEW**

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:
PIN 1. EMITTER
2., 4. COLLECTOR
3. BASE

STYLE 2:
PIN 1. CATHODE
2., 4. ANODE
3. GATE

STYLE 3:
PIN 1. BASE
2., 4. COLLECTOR
3. EMITTER

STYLE 4:
PIN 1. ANODE 1
2., 4. ANODE 2
3. GATE

STYLE 5:
PIN 1. MT 1
2., 4. MT 2
3. GATE

STYLE 6:
PIN 1. CATHODE
2., 4. GATE
3. ANODE

STYLE 7:
PIN 1. MT 1
2., 4. GATE
3. MT 2

STYLE 8:
PIN 1. SOURCE
2., 4. GATE
3. DRAIN

STYLE 9:
PIN 1. GATE
2., 4. DRAIN
3. SOURCE

STYLE 10:
PIN 1. SOURCE
2., 4. DRAIN
3. GATE

| | | |
|---|---|---|
| **DOCUMENT NUMBER:** | **98ASB42049B** | Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red. |
| **DESCRIPTION:** | **TO−225** | **PAGE 1 OF 1** |

## PUBLICATION ORDERING INFORMATION

**LITERATURE FULFILLMENT**:
**Email Requests to:** orderlit@onsemi.com

**onsemi Website:** www.onsemi.com

**TECHNICAL SUPPORT**
**North American Technical Support:**
Voice Mail: 1 800−282−9855 Toll Free USA/Canada
Phone: 011 421 33 790 2910

**Europe, Middle East and Africa Technical Support:**
Phone: 00421 33 790 2910
For additional information, please contact your local Sales Representative

◊