

# Plastic Medium-Power Silicon PNP Transistor

## BD180G

This device is designed for use in 5.0 to 10 Watt audio amplifiers and drivers utilizing complementary or quasi complementary circuits.

### Features

- High DC Current Gain
- BD180 is complementary with BD179
- These Devices are Pb-Free and are RoHS Compliant\*

### MAXIMUM RATINGS

| Rating                                                                                   | Symbol         | Value       | Unit                      |
|------------------------------------------------------------------------------------------|----------------|-------------|---------------------------|
| Collector-Emitter Voltage                                                                | $V_{CEO}$      | 80          | Vdc                       |
| Collector-Base Voltage                                                                   | $V_{CBO}$      | 80          | Vdc                       |
| Emitter-Base Voltage                                                                     | $V_{EBO}$      | 5.0         | Vdc                       |
| Collector Current                                                                        | $I_C$          | 1.0         | Adc                       |
| Base Current                                                                             | $I_B$          | 2.0         | Adc                       |
| Total Power Dissipation<br>@ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 30<br>240   | W<br>mW/ $^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                      | $T_J, T_{stg}$ | -65 to +150 | $^\circ\text{C}$          |

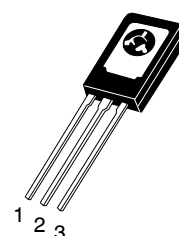
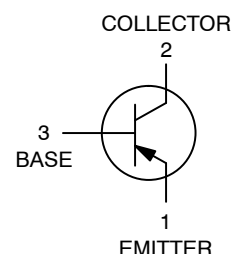
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS

| Characteristic                       | Symbol          | Max  | Unit               |
|--------------------------------------|-----------------|------|--------------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 4.16 | $^\circ\text{C/W}$ |

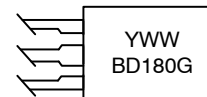
\*For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## 3.0 AMPERES POWER TRANSISTORS PNP SILICON 80 VOLTS, 30 WATTS



TO-225  
CASE 77  
STYLE 1

### MARKING DIAGRAM



Y = Year  
WW = Work Week  
BD180 = Device Code  
G = Pb-Free Package

### ORDERING INFORMATION

| Device | Package             | Shipping      |
|--------|---------------------|---------------|
| BD180G | TO-225<br>(Pb-Free) | 500 Units/Box |

# BD180G

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

| Characteristic                                                                                                               | Symbol        | Min      | Max      | Unit |
|------------------------------------------------------------------------------------------------------------------------------|---------------|----------|----------|------|
| Collector-Emitter Sustaining Voltage (Note 1)<br>( $I_C = 0.1\text{ A}$ , $I_B = 0$ )                                        | $V_{(BR)CEO}$ | 80       | –        | Vdc  |
| Collector Cutoff Current<br>( $V_{CB} = 80\text{ Vdc}$ , $I_E = 0$ )                                                         | $I_{CBO}$     | –        | 1.0      | 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>( $I_C = 1.0\text{ A}$ , $V_{CE} = 2.0\text{ V}$ ) | $h_{FE}$      | 40<br>15 | 250<br>– | –    |
| Collector-Emitter Saturation Voltage (Note 1)<br>( $I_C = 1.0\text{ Adc}$ , $I_B = 0.1\text{ Adc}$ )                         | $V_{CE(sat)}$ | –        | 0.8      | Vdc  |
| Base-Emitter On Voltage (Note 1)<br>( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 2.0\text{ Vdc}$ )                                   | $V_{BE(on)}$  | –        | 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  |

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

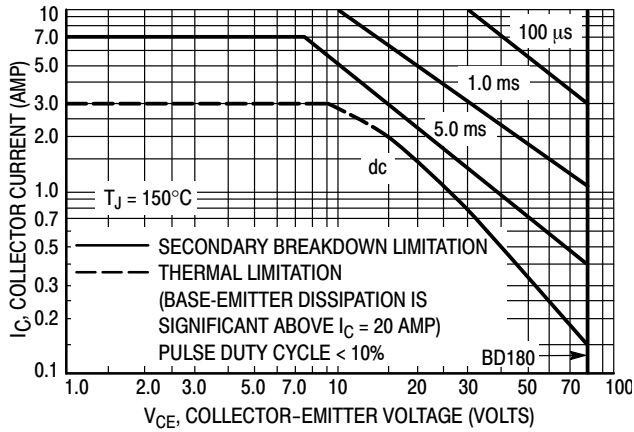


Figure 1. Active Region Safe Operating Area

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.

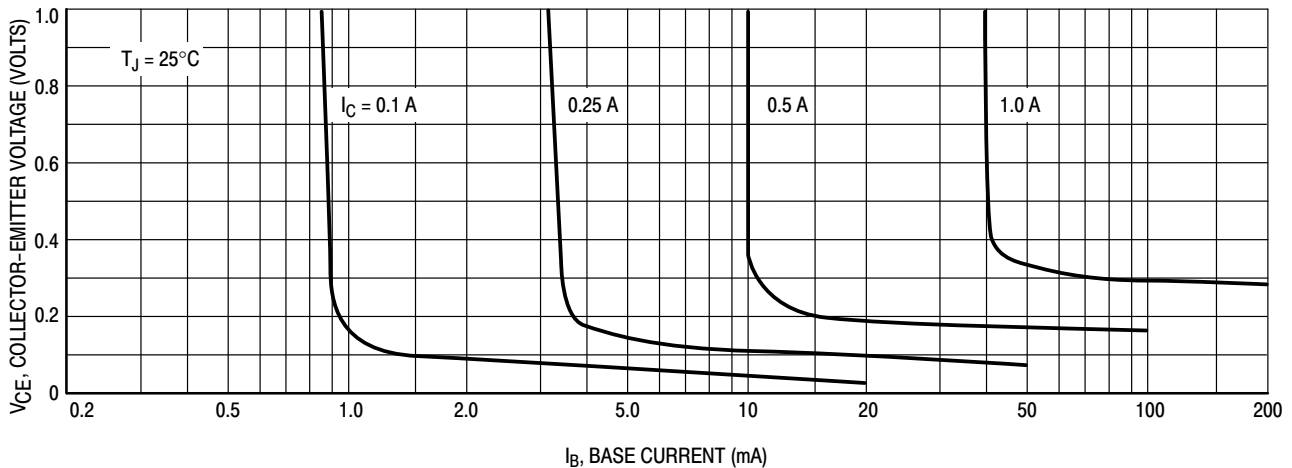
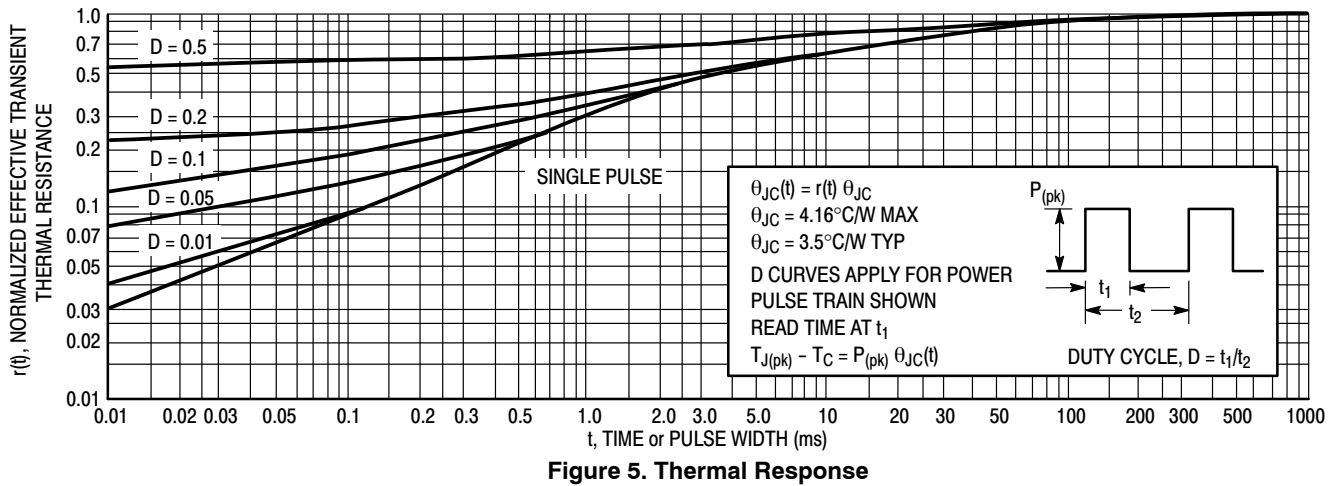
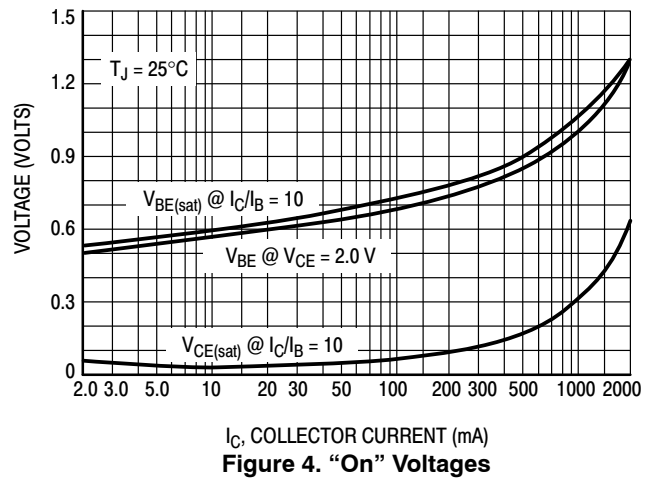
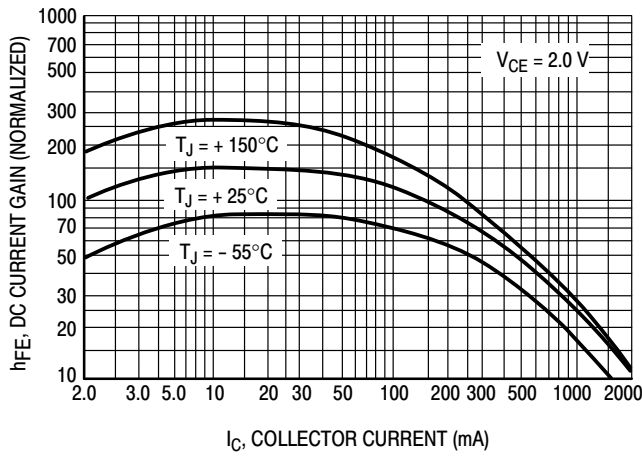
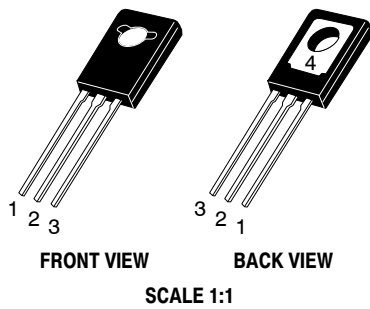


Figure 2. Collector Saturation Region

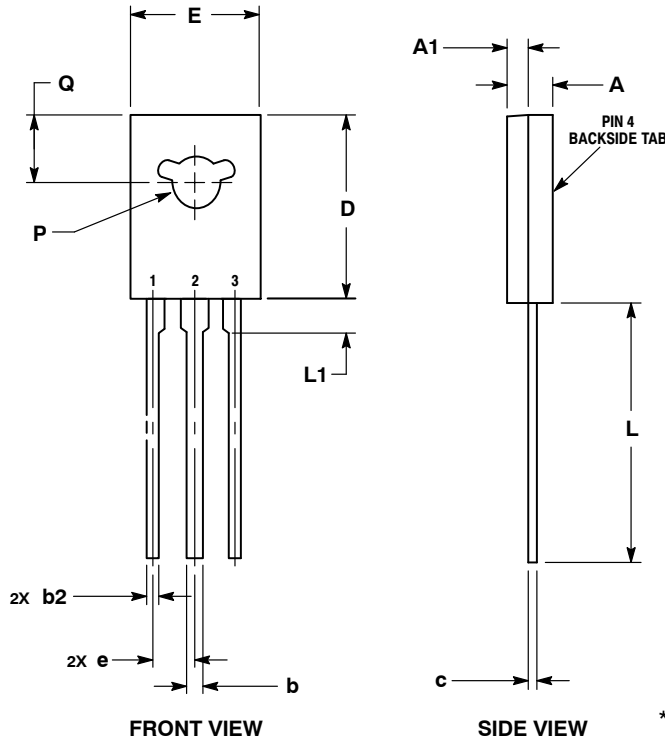
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CASE 77-09  
ISSUE AD

DATE 25 MAR 2015

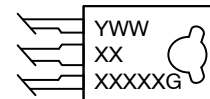


NOTES:

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. Some products may not follow the Generic Marking.

|                                                           |                                                       |                                                           |                                                         |                                                       |
|-----------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|
| 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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