

# BD180G

## Plastic Medium-Power Silicon PNP Transistor

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 @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	30 240	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### THERMAL CHARACTERISTICS

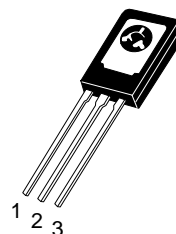
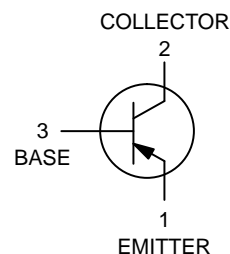
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.16	$^\circ\text{C/W}$



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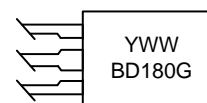
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**3.0 AMPERES  
POWER TRANSISTORS  
PNP SILICON  
80 VOLTS, 30 WATTS**



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 (Pb-Free)	500 Units/Box

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

# BD180G

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

Characteristic	Symbol	Min	Max	Unit
Collector–Emitter Sustaining Voltage (Note 1) ( $I_C = 0.1\text{ Adc}$ , $I_B = 0$ )	$V_{(BR)CEO}$	80	–	Vdc
Collector Cutoff Current ( $V_{CB} = 80\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	–	1.0	mAdc
Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	–	1.0	mAdc
DC Current Gain ( $I_C = 0.15\text{ A}$ , $V_{CE} = 2.0\text{ V}$ ) ( $I_C = 1.0\text{ A}$ , $V_{CE} = 2.0\text{ V}$ )	$h_{FE}$	40 15	250 –	–
Collector–Emitter Saturation Voltage (Note 1) ( $I_C = 1.0\text{ Adc}$ , $I_B = 0.1\text{ Adc}$ )	$V_{CE(sat)}$	–	0.8	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

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

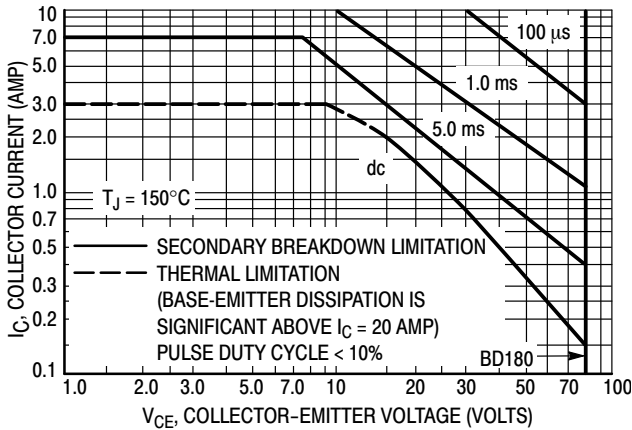


Figure 1. Active Region Safe Operating Area

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.

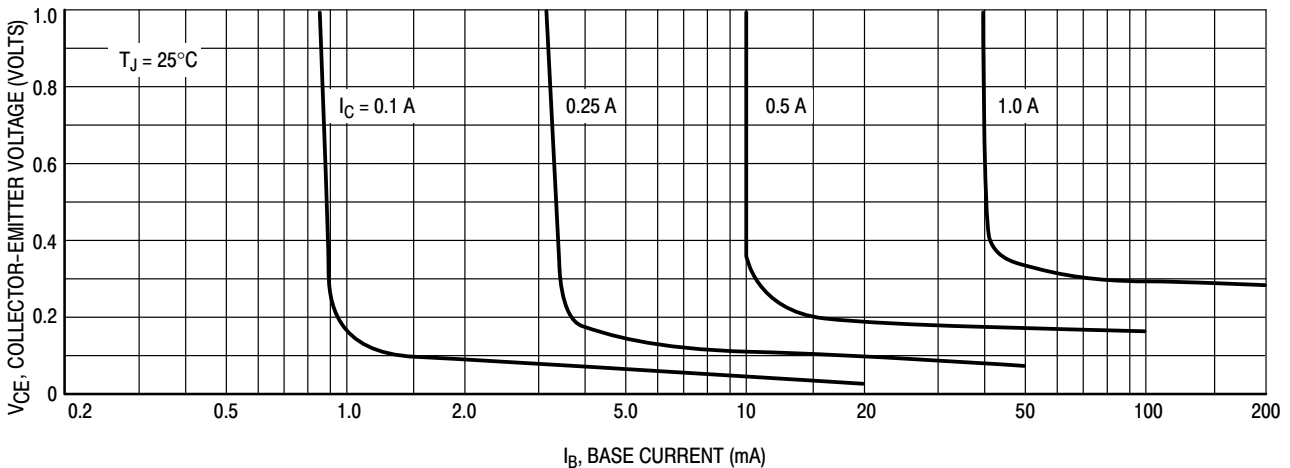


Figure 2. Collector Saturation Region

# BD180G

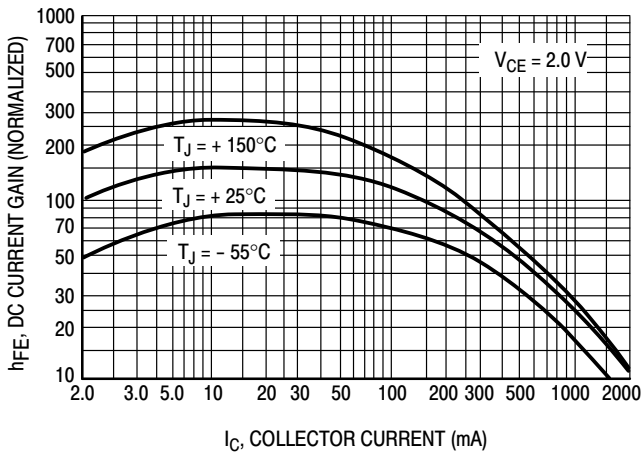


Figure 3. Current Gain

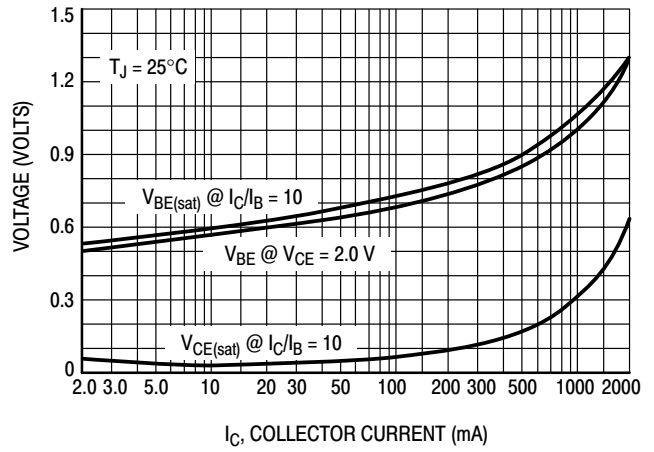


Figure 4. "On" Voltages

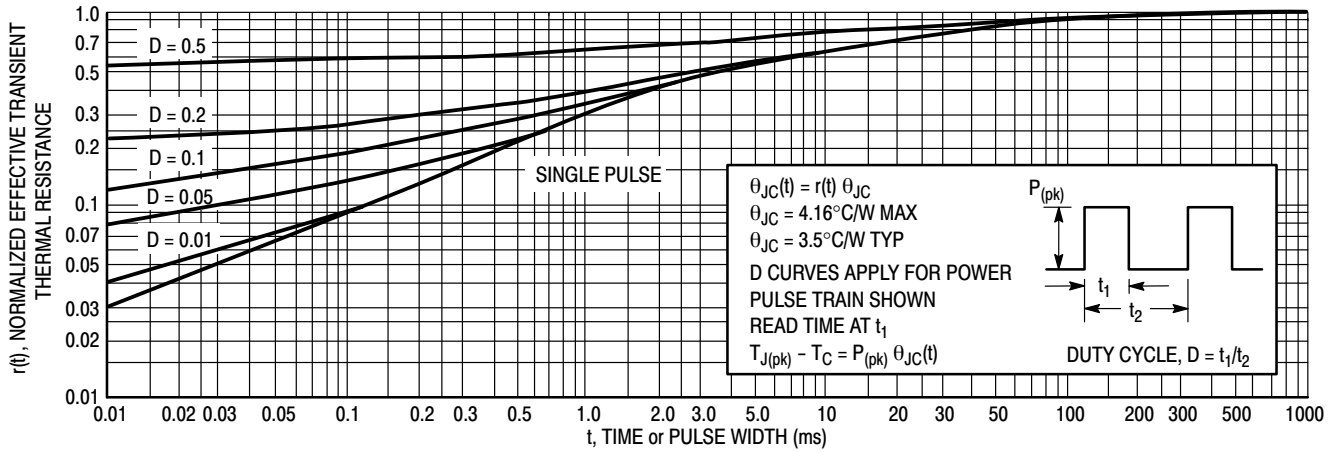
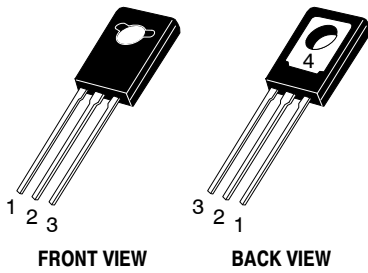


Figure 5. Thermal Response

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

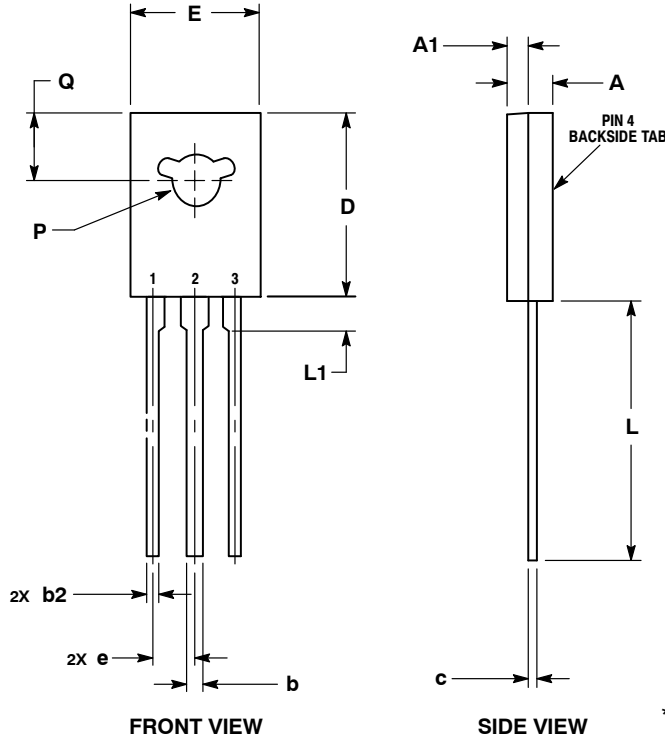
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**TO-225**  
CASE 77-09  
ISSUE AD

DATE 25 MAR 2015

SCALE 1:1

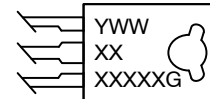


**NOTES:**

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 "µ", 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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