

BD436G, BD438G, BD440G, BD442G

Plastic Medium Power Silicon PNP Transistor

This series of plastic, medium-power silicon PNP transistors can be used for amplifier and switching applications. Complementary types are BD437 and BD441.

Features

- These Devices are Pb-Free and are RoHS Compliant*

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|----------------|----------------------|--------------------------|
| Collector-Emitter Voltage BD436G BD438G BD440G BD442G | V_{CEO} | 32 45 60 80 | Vdc |
| Collector-Base Voltage BD436G BD438G BD440G BD442G | V_{CBO} | 32 45 60 80 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 5.0 | Vdc |
| Collector Current | I_C | 4.0 | Adc |
| Base Current | I_B | 1.0 | Adc |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 36 288 | W W/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -55 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 | $R_{\theta JC}$ | 3.5 | $^\circ\text{C}/\text{W}$ |

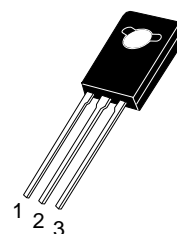
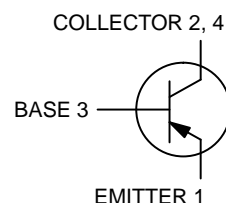
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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4.0 AMP POWER TRANSISTORS PNP SILICON



TO-225
CASE 77-09
STYLE 1

MARKING DIAGRAM



Y = Year
WW = Work Week
BD4xx = Device Code
xx = 36, 36T, 38, 38T, 40, 42
G = Pb-Free Package

ORDERING INFORMATION

| Device | Package | Shipping |
|---------|---------------------|---------------|
| BD436G | TO-225 (Pb-Free) | 500 Units/Box |
| BD436TG | TO-225 (Pb-Free) | 50 Units/Rail |
| BD438G | TO-225 (Pb-Free) | 500 Units/Box |
| BD438TG | TO-225 (Pb-Free) | 50 Units/Rail |
| BD440G | TO-225 (Pb-Free) | 500 Units/Box |
| BD442G | TO-225 (Pb-Free) | 500 Units/Box |

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|----------------------|----------------------|------------------|--------------------------|------|
| Collector–Emitter Breakdown Voltage (I _C = 100 mA, I _B = 0) BD436G BD438G BD440G BD442G | V _{(BR)CEO} | 32 45 60 80 | – – – – | – – – – | Vdc |
| Collector–Base Breakdown Voltage (I _C = 100 μA, I _B = 0) BD436G BD438G BD440G BD442G | V _{(BR)CBO} | 32 45 60 80 | – – – – | – – – – | Vdc |
| Emitter–Base Breakdown Voltage (I _E = 100 μA, I _C = 0) | V _{(BR)EBO} | 5.0 | – | – | Vdc |
| Collector Cutoff Current (V _{CB} = 32 V, I _E = 0) BD436G (V _{CB} = 45 V, I _E = 0) BD438G (V _{CB} = 60 V, I _E = 0) BD440G (V _{CB} = 80 V, I _E = 0) BD442G | I _{CBO} | – – – – | – – – – | 0.1 0.1 0.1 0.1 | mAdc |
| Emitter Cutoff Current (V _{EB} = 5.0 V) | I _{EBO} | – | – | 1.0 | mAdc |
| DC Current Gain (I _C = 10 mA, V _{CE} = 5.0 V) BD436G BD438G BD440G BD442G | h _{FE} | 40 30 20 15 | – – – – | – – – – | – |
| DC Current Gain (I _C = 500 mA, V _{CE} = 1.0 V) BD436G BD438G BD440G BD442G | h _{FE} | 85 85 40 40 | – – – – | 475 475 475 475 | – |
| DC Current Gain (I _C = 2.0 A, V _{CE} = 1.0 V) BD436G BD438G BD440G BD442G | h _{FE} | 50 40 25 15 | – – – – | – – – – | – |
| Collector Saturation Voltage (I _C = 2.0 A, I _B = 0.2 A) BD436G (I _C = 3.0 A, I _B = 0.3 A) BD438G BD440G BD442G | V _{CE(sat)} | – – – – | – – – – | 0.5 0.7 0.8 0.8 | Vdc |
| Base–Emitter On Voltage (I _C = 2.0 A, V _{CE} = 1.0 V) BD436G/BD438G BD440G/BD442G | V _{BE(ON)} | – – | – – | 1.1 1.5 | Vdc |
| Current–Gain – Bandwidth Product (V _{CE} = 1.0 V, I _C = 250 mA, f = 1.0 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.

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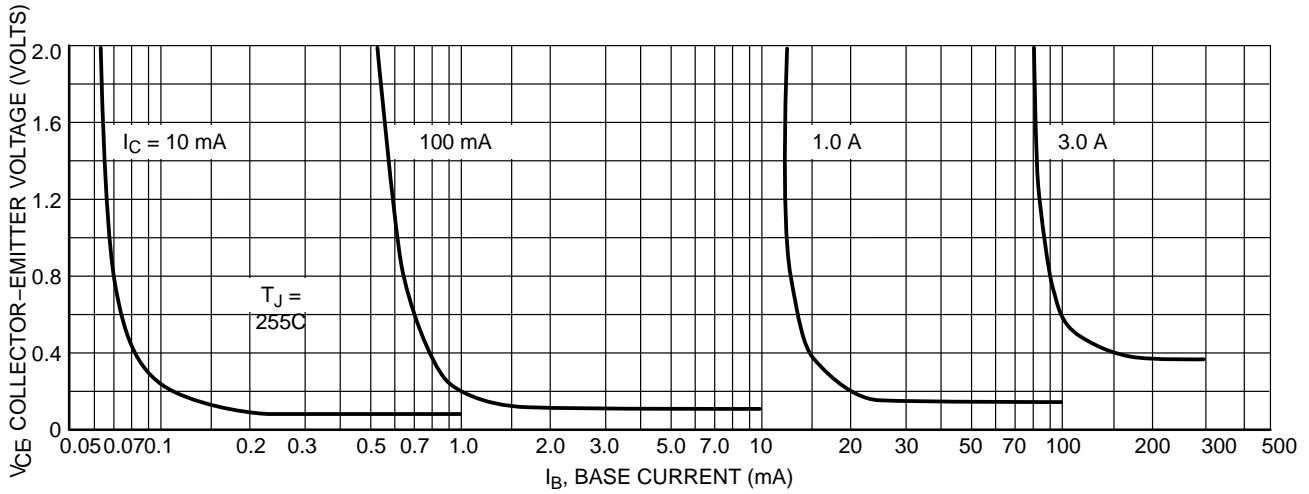


Figure 1. Collector Saturation Region

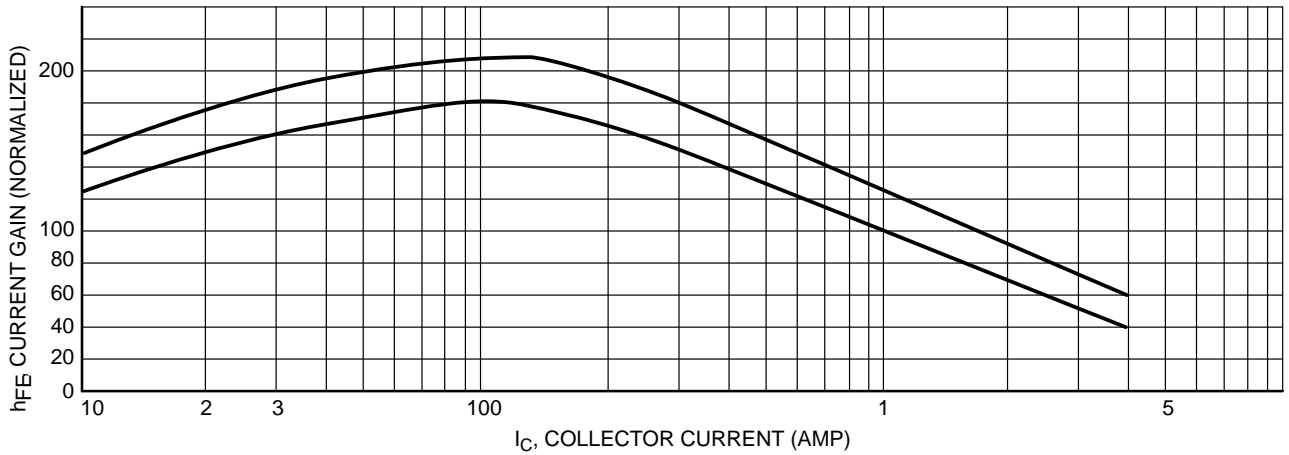


Figure 2. Current Gain

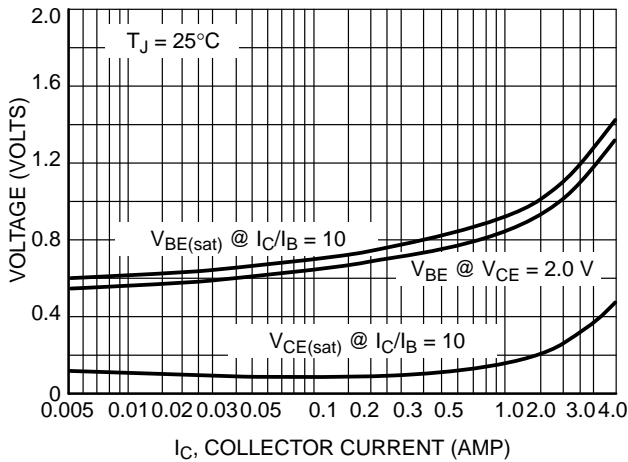


Figure 3. "On" Voltage

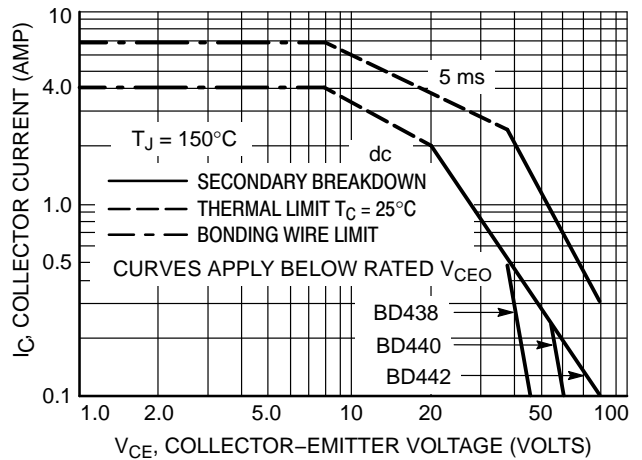
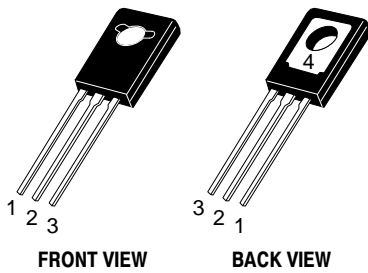


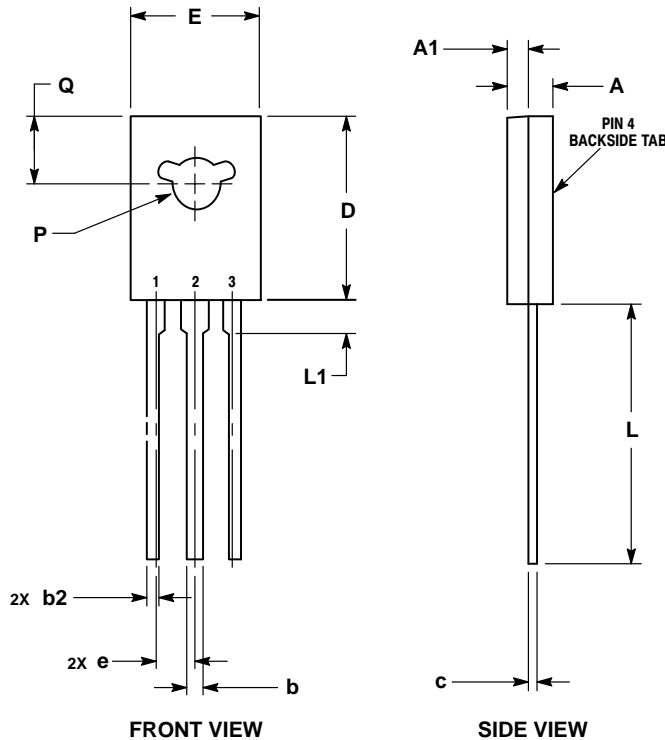
Figure 4. Active Region Safe Operating Area

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PACKAGE DIMENSIONS



TO-225
CASE 77-09
ISSUE AC



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 |

STYLE 1:

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

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