

BD436, BD438, BD440, BD442

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

- Pb-Free Packages are Available*

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|---|----------------------|--------------------------|
| Collector-Emitter Voltage | BD436 BD438 BD440 BD442 V_{CEO} | 32 45 60 80 | Vdc |
| Collector-Base Voltage | BD436 BD438 BD440 BD442 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 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--------------------------------------|---------------|-----|---------------------------|
| Thermal Resistance, Junction-to-Case | θ_{JC} | 3.5 | $^\circ\text{C}/\text{W}$ |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

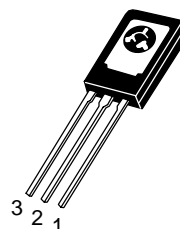
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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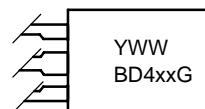
<http://onsemi.com>

4.0 AMP POWER TRANSISTORS PNP SILICON



TO-225AA
CASE 77
STYLE 1

MARKING DIAGRAM



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

ORDERING INFORMATION

| Device | Package | Shipping |
|---------|-----------------------|---------------|
| BD436 | TO-225AA | 500 Units/Box |
| BD436G | TO-225AA (Pb-Free) | 500 Units/Box |
| BD436T | TO-225AA | 50 Units/Rail |
| BD436TG | TO-225AA (Pb-Free) | 50 Units/Rail |
| BD438 | TO-225AA | 500 Units/Box |
| BD438G | TO-225AA (Pb-Free) | 500 Units/Box |
| BD440 | TO-225AA | 500 Units/Box |
| BD440G | TO-225AA (Pb-Free) | 500 Units/Box |
| BD442 | TO-225AA | 500 Units/Box |
| BD442G | TO-225AA (Pb-Free) | 500 Units/Box |

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

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|--|----------------------------------|---------------|----------------------|------------------|--------------------------|------|
| Collector–Emitter Breakdown Voltage ($I_C = 100\text{ mA}$, $I_B = 0$) | BD436 BD438 BD440 BD442 | $V_{(BR)CEO}$ | 32 45 60 80 | – – – – | – – – – | Vdc |
| Collector–Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{A}$, $I_B = 0$) | BD436 BD438 BD440 BD442 | $V_{(BR)CBO}$ | 32 45 60 80 | – – – – | – – – – | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = 100\text{ }\mu\text{A}$, $I_C = 0$) | | $V_{(BR)EBO}$ | 5.0 | – | – | Vdc |
| Collector Cutoff Current ($V_{CB} = 32\text{ V}$, $I_E = 0$) ($V_{CB} = 45\text{ V}$, $I_E = 0$) ($V_{CB} = 60\text{ V}$, $I_E = 0$) ($V_{CB} = 80\text{ V}$, $I_E = 0$) | BD436 BD438 BD440 BD442 | I_{CBO} | – – – – | – – – – | 0.1 0.1 0.1 0.1 | mAdc |
| Emitter Cutoff Current ($V_{EB} = 5.0\text{ V}$) | | I_{EBO} | – | – | 1.0 | mAdc |
| DC Current Gain ($I_C = 10\text{ mA}$, $V_{CE} = 5.0\text{ V}$) | BD436 BD438 BD440 BD442 | h_{FE} | 40 30 20 15 | – – – – | – – – – | |
| DC Current Gain ($I_C = 500\text{ mA}$, $V_{CE} = 1.0\text{ V}$) | BD436 BD438 BD440 BD442 | h_{FE} | 85 85 40 40 | – – – – | 475 475 475 475 | |
| DC Current Gain ($I_C = 2.0\text{ A}$, $V_{CE} = 1.0\text{ V}$) | BD436 BD438 BD440 BD442 | h_{FE} | 50 40 25 15 | – – – – | – – – – | |
| Collector Saturation Voltage ($I_C = 2.0\text{ A}$, $I_B = 0.2\text{ A}$) ($I_C = 3.0\text{ A}$, $I_B = 0.3\text{ A}$) | BD436 BD438 BD440 BD442 | $V_{CE(sat)}$ | – – – – | – – – – | 0.5 0.7 0.8 0.8 | Vdc |
| Base–Emitter On Voltage ($I_C = 2.0\text{ A}$, $V_{CE} = 1.0\text{ V}$) | BD436/BD438 BD440/BD442 | $V_{BE(ON)}$ | – – | – – | 1.1 1.5 | Vdc |
| Current–Gain – Bandwidth Product ($V_{CE} = 1.0\text{ V}$, $I_C = 250\text{ mA}$, $f = 1.0\text{ MHz}$) | | f_T | 3.0 | – | – | MHz |

BD436, BD438, BD440, BD442

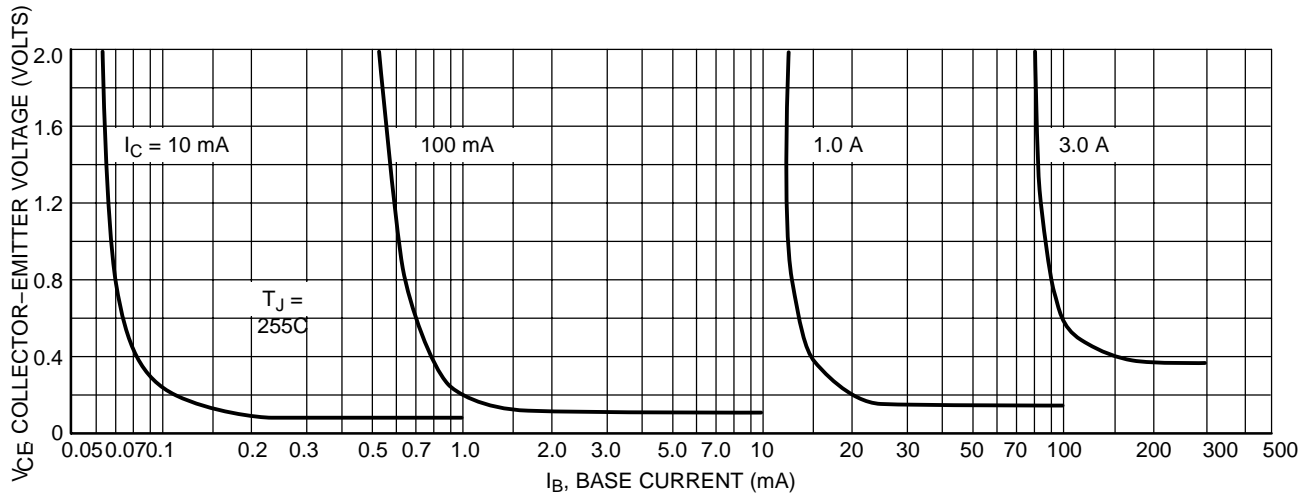


Figure 1. Collector Saturation Region

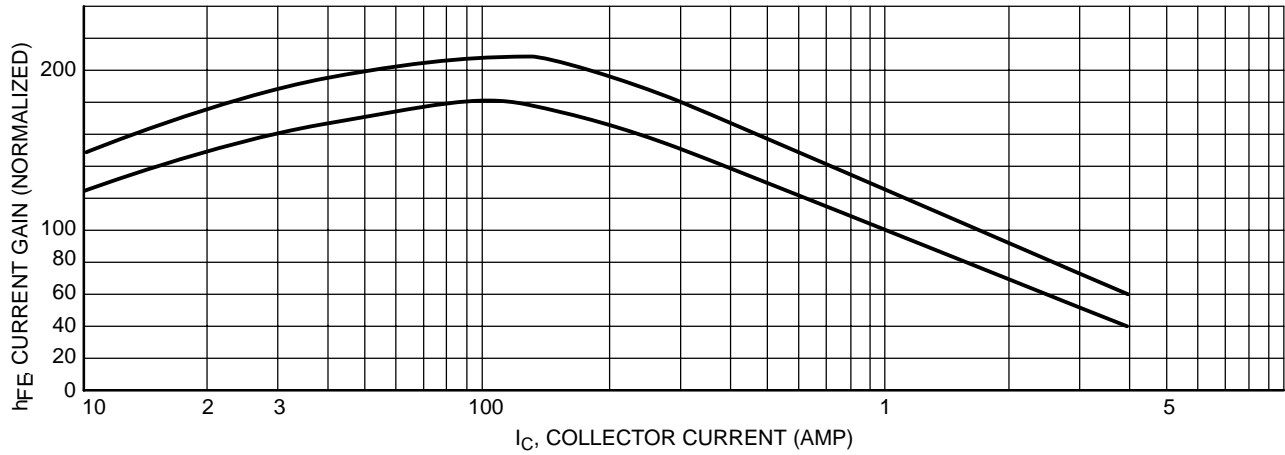


Figure 2. Current Gain

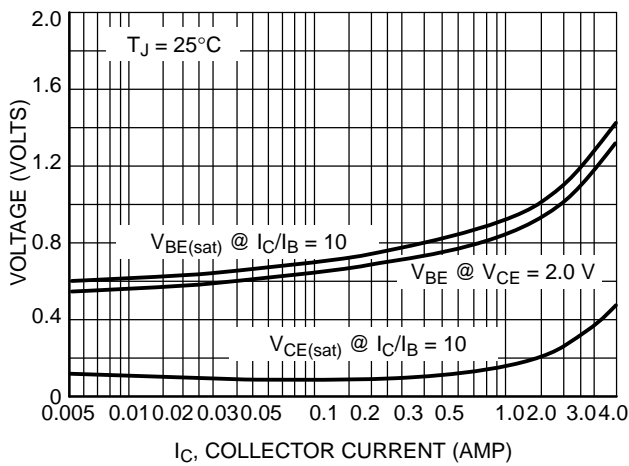


Figure 3. "On" Voltage

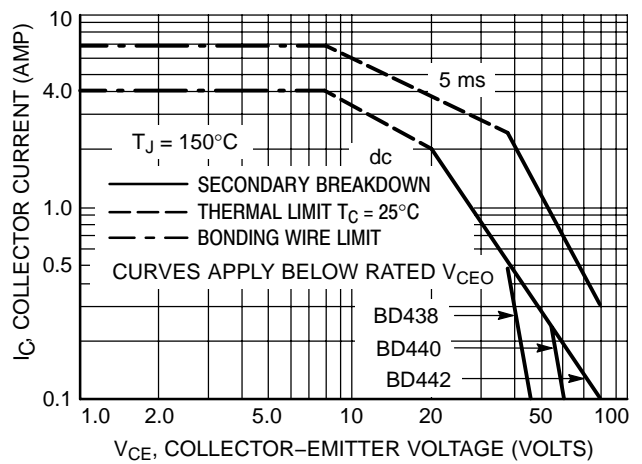
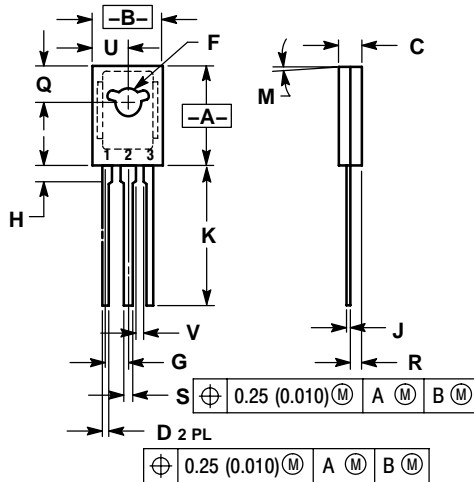


Figure 4. Active Region Safe Operating Area

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PACKAGE DIMENSIONS

TO-225AA
CASE 77-09
ISSUE Z




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 077-01 THRU -08 OBSOLETE, NEW STANDARD 077-09.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.425 | 0.435 | 10.80 | 11.04 |
| B | 0.295 | 0.305 | 7.50 | 7.74 |
| C | 0.095 | 0.105 | 2.42 | 2.66 |
| D | 0.020 | 0.026 | 0.51 | 0.66 |
| F | 0.115 | 0.130 | 2.93 | 3.30 |
| G | 0.094 BSC | | 2.39 BSC | |
| H | 0.050 | 0.095 | 1.27 | 2.41 |
| J | 0.015 | 0.025 | 0.39 | 0.63 |
| K | 0.575 | 0.655 | 14.61 | 16.63 |
| M | 5° TYP | | 5° TYP | |
| Q | 0.148 | 0.158 | 3.76 | 4.01 |
| R | 0.045 | 0.065 | 1.15 | 1.65 |
| S | 0.025 | 0.035 | 0.64 | 0.88 |
| U | 0.145 | 0.155 | 3.69 | 3.93 |
| V | 0.040 | --- | 1.02 | --- |

STYLE 1:

- PIN 1. EMITTER
2. COLLECTOR
3. BASE

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