

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

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

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	$^\circ\text{C}/\text{W}$

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.

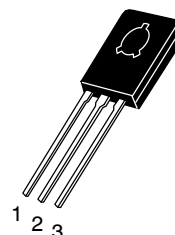
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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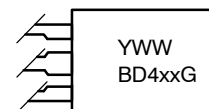
<http://onsemi.com>

4.0 AMP POWER TRANSISTORS PNP SILICON



TO-225
CASE 77-09
STYLE 1

MARKING DIAGRAM



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

ORDERING INFORMATION

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

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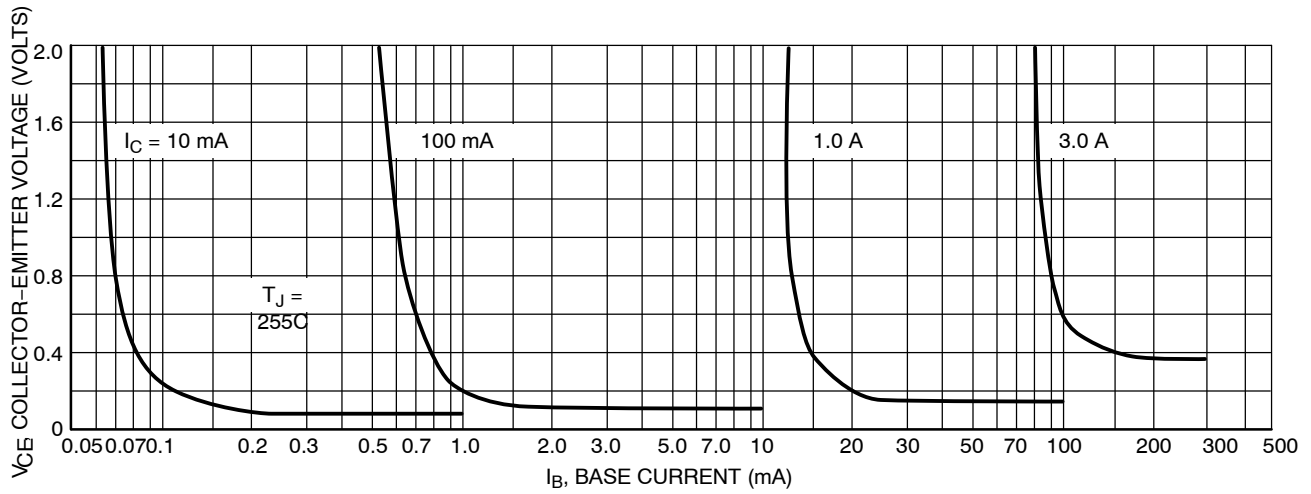


Figure 1. Collector Saturation Region

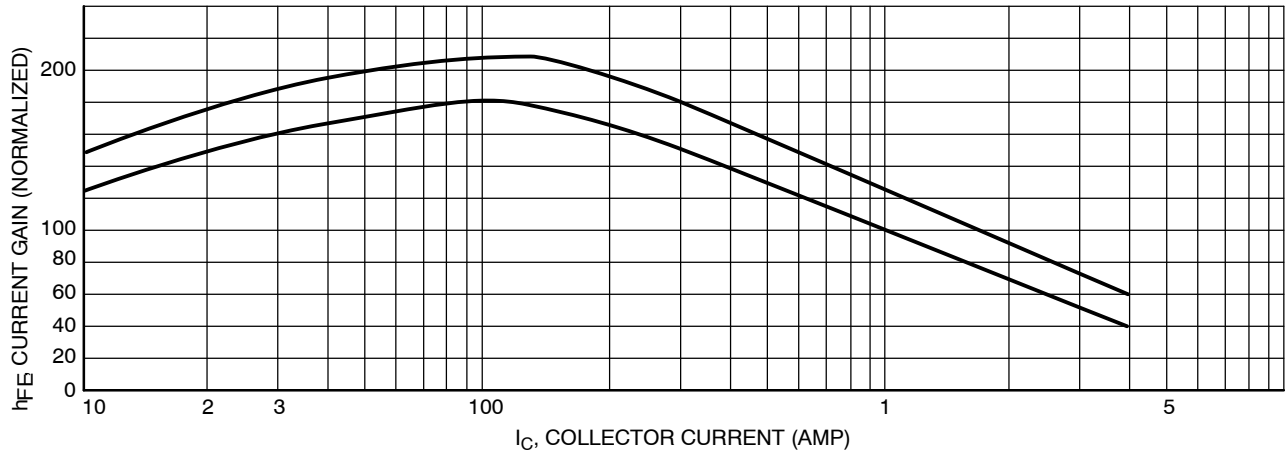


Figure 2. Current Gain

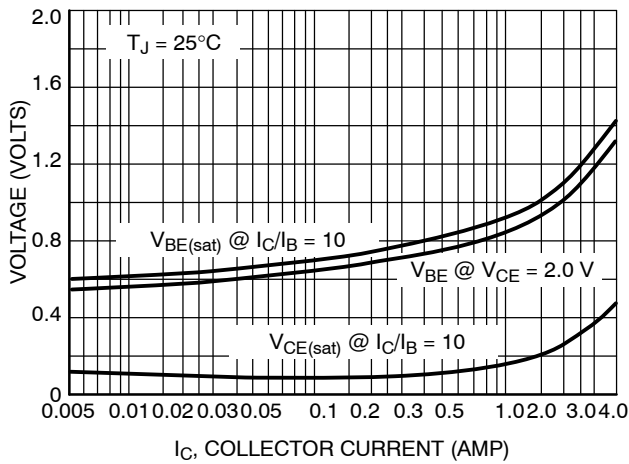


Figure 3. "On" Voltage

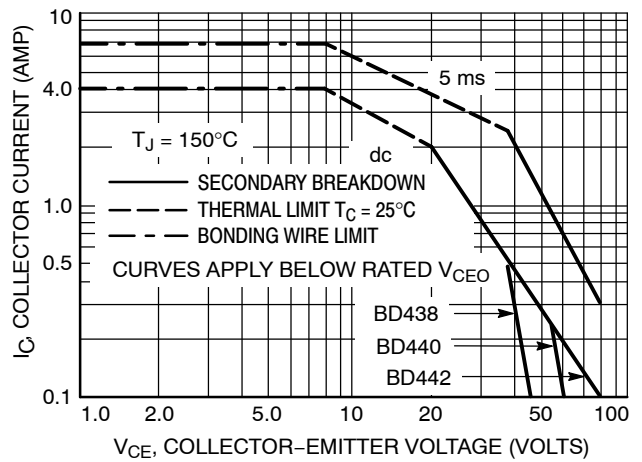
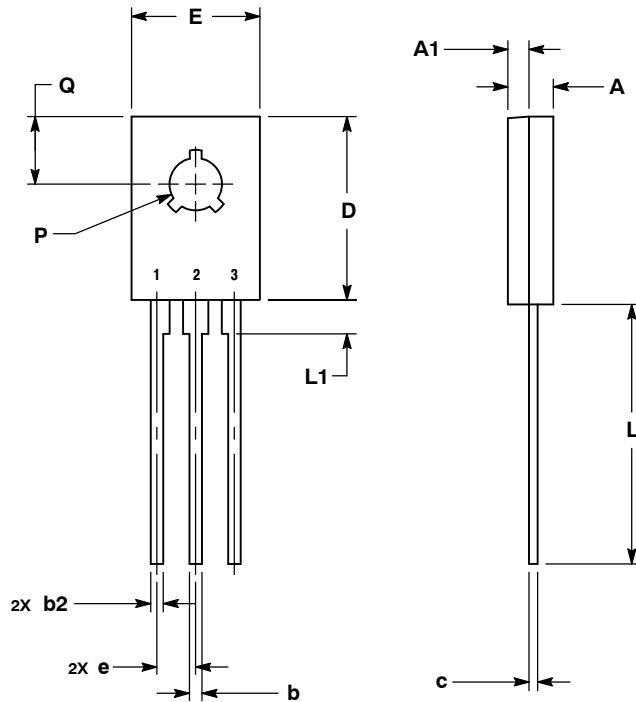


Figure 4. Active Region Safe Operating Area

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PACKAGE DIMENSIONS

TO-225
CASE 77-09
ISSUE AA



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

STYLE 1:

- PIN 1. EMITTER
- COLLECTOR
- BASE

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