BD436, BD438, BD440, BD442

Plastic Medium Power Silicon PNP Transistor

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

Features

- Pb−Free Packages are Available*

ON Semiconductor®

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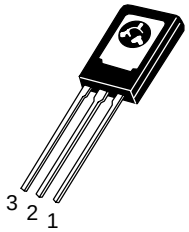
4.0 AMP POWER TRANSISTORS PNP SILICON



TO−225AA
CASE 77
STYLE 1

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°C Derate above 25°C		P_D	36 288	W W/°C
Operating and Storage Junction Temperature Range		T_J, T_{stg}	−55 to +150	°C

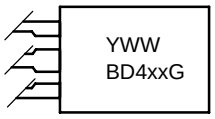
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	θ_{JC}	3.5	°C/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.

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

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

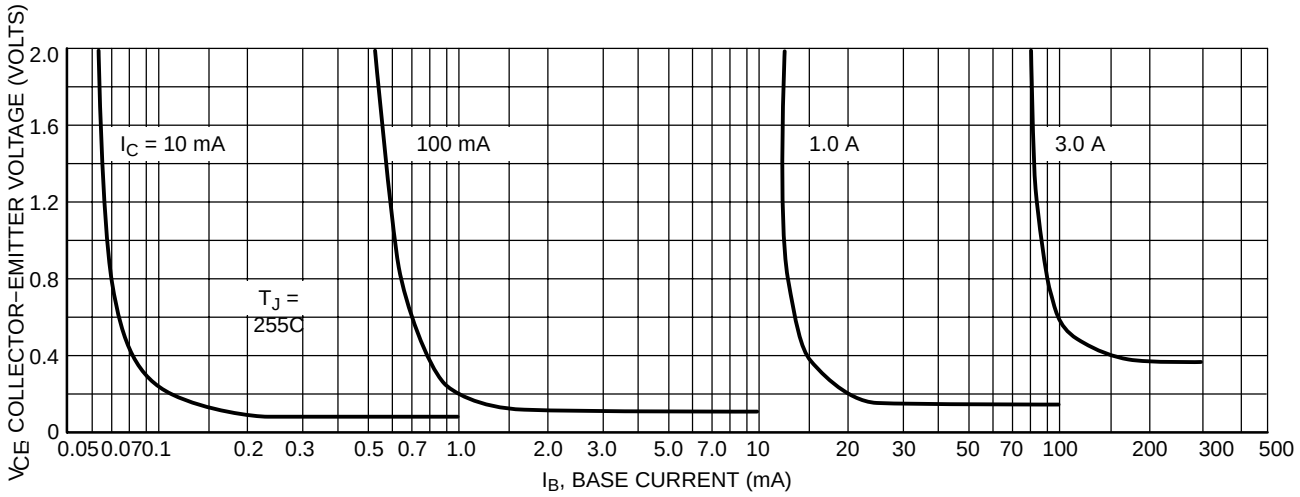


Figure 1. Collector Saturation Region

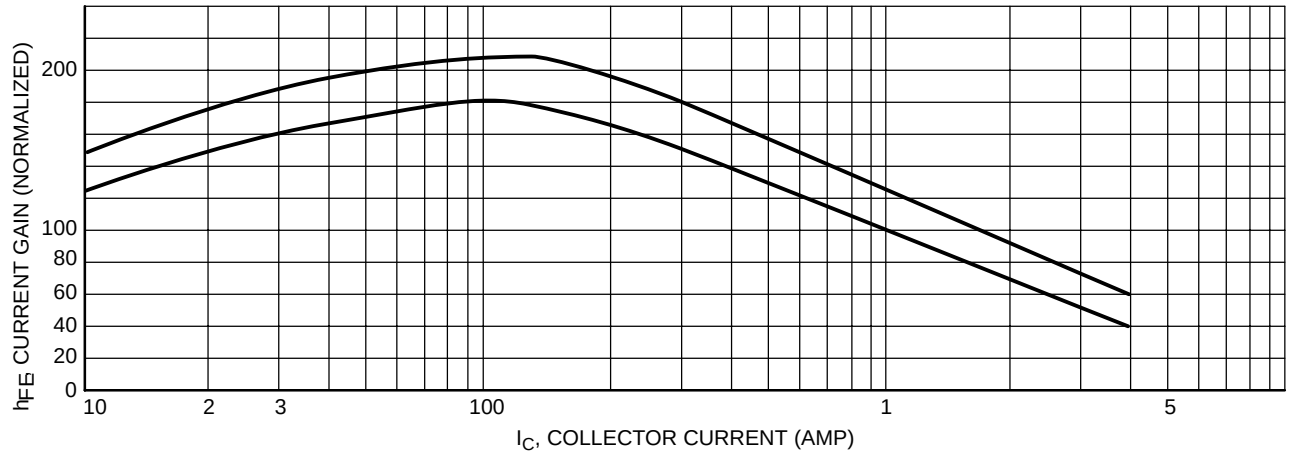


Figure 2. Current Gain

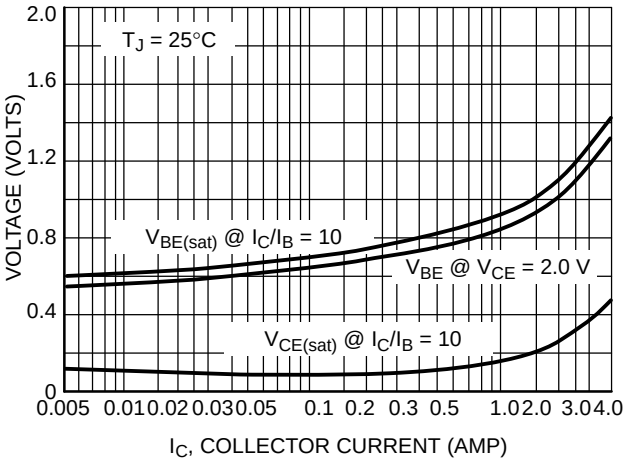


Figure 3. “On” Voltage

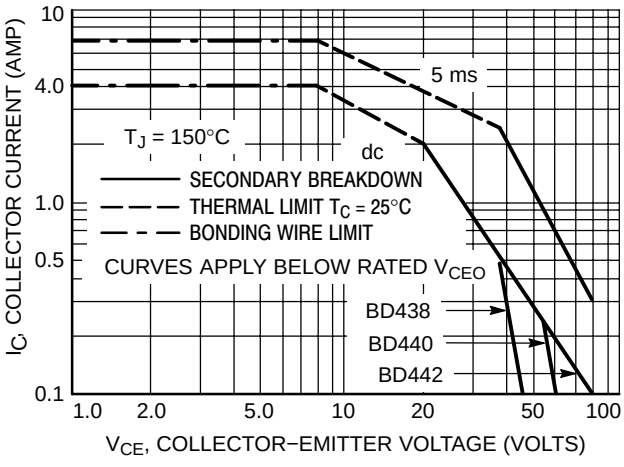
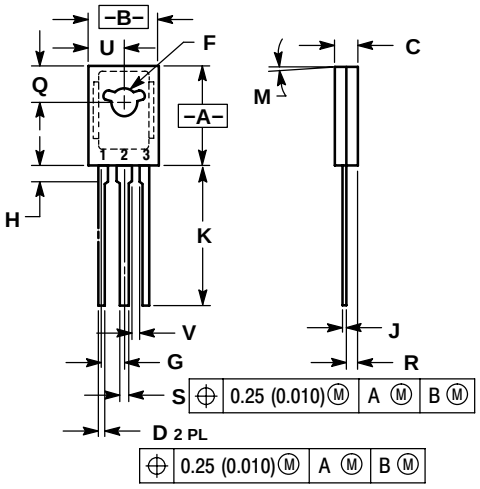


Figure 4. Active Region Safe Operating Area

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.

	INCHES		MILLIMETERS	
DIM	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

PUBLICATION ORDERING INFORMATION

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