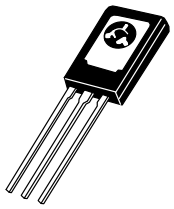
BD438 BD440 BD442

Plastic Medium Power Silicon PNP Transistor

. . . for amplifier and switching applications. Complementary types are BD437 and BD441.

4.0 AMPERES POWER TRANSISTORS PNP SILICON



CASE 77–08 TO–225AA TYPE

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Collector–Emitter Voltage	BD438 BD440 BD442	V_{CEO}	45 60 80	Vdc
Collector–Base Voltage	BD438 BD440 BD442	V_{CBO}	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	Watts 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

REV 7

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

Characteristic		Symbol	Min	Typ	Max	Unit
Collector–Emitter Breakdown Voltage		$V_{(BR)CEO}$				Vdc
(I_C = 100 mA, I_B = 0)	BD438		45	—	—	
	BD440		60	—	—	
	BD442		80	—	—	
Collector–Base Breakdown Voltage		$V_{(BR)CBO}$				Vdc
(I_C = 100 μA, I_B = 0)	BD438		45	—	—	
	BD440		60	—	—	
	BD442		80	—	—	
Emitter–Base Breakdown Voltage		$V_{(BR)EBO}$	5.0	—	—	Vdc
(I_E = 100 μA, I_C = 0)						
Collector Cutoff Current		I_{CBO}				mAdc
(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		I_{EBO}	—	—	1.0	mAdc
(V_{EB} = 5.0 V)						
DC Current Gain		h_{FE}				
(I_C = 10 mA, V_{CE} = 5.0 V)	BD438		30	—	—	
	BD440		20	—	—	
	BD442		15	—	—	
DC Current Gain		h_{FE}				
(I_C = 500 mA, V_{CE} = 1.0 V)	BD438		85	—	375	
	BD440		40	—	475	
	BD442		40	—	475	
DC Current Gain		h_{FE}				
(I_C = 2.0 A, V_{CE} = 1.0 V)	BD438		40	—	—	
	BD440		25	—	—	
	BD442		15	—	—	
Collector Saturation Voltage		$V_{CE(sat)}$				Vdc
(I_C = 3.0 A, I_B = 0.3 A)	BD438		—	—	0.7	
	BD440		—	—	0.8	
	BD442		—	—	0.8	
Base–Emitter On Voltage	BD438	$V_{BE(ON)}$	—	—	1.1	Vdc
(I_C = 2.0 A, V_{CE} = 1.0 V)	BD440/442		—	—	1.5	
Current–Gain — Bandwidth Product		f_T	3.0	—	—	MHz
(V_{CE} = 1.0 V, I_C = 250 mA, f = 1.0 MHz)						

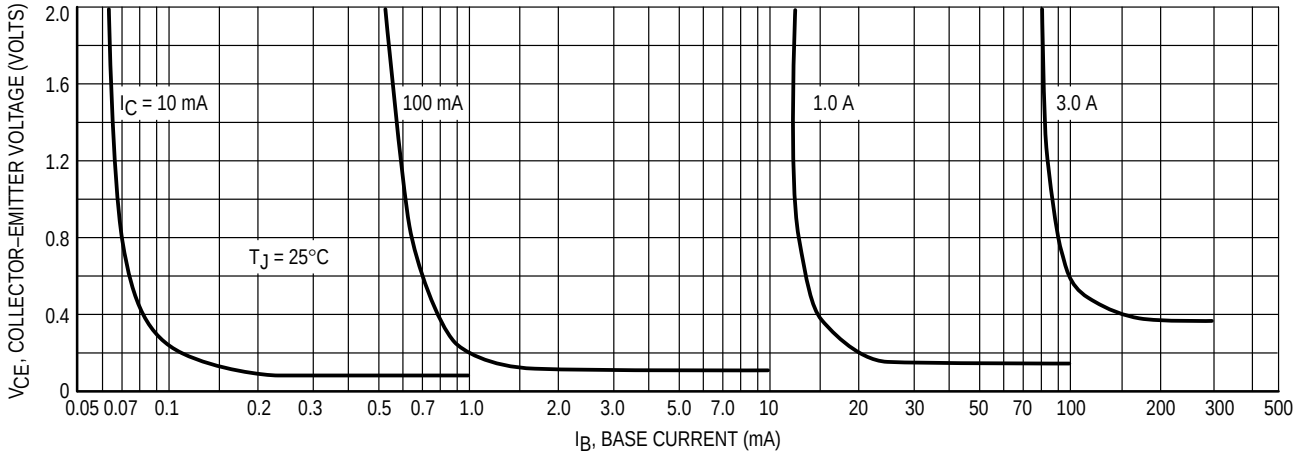


Figure 1. Collector Saturation Region

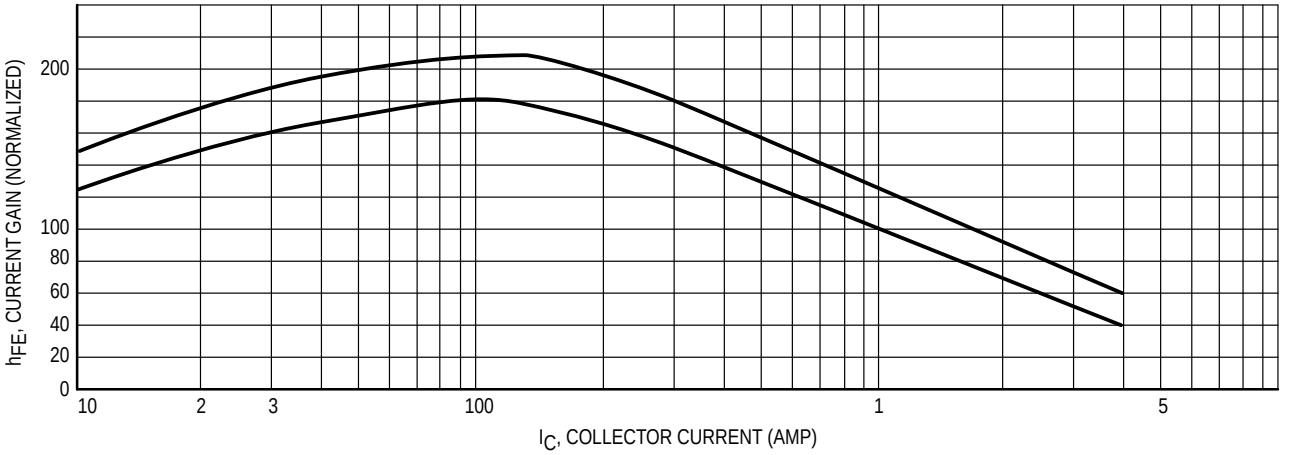


Figure 2. Current Gain

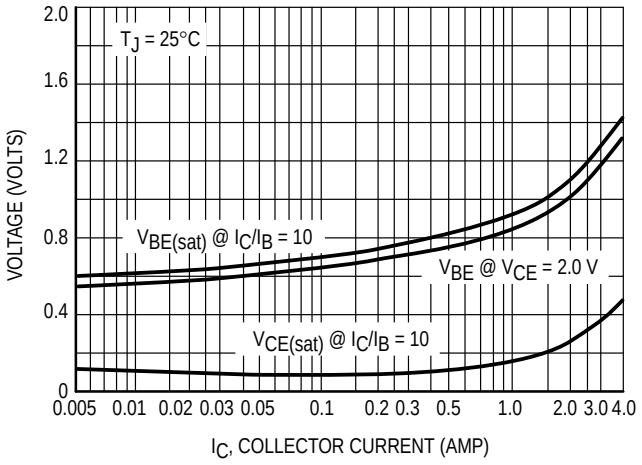


Figure 3. “On” Voltage

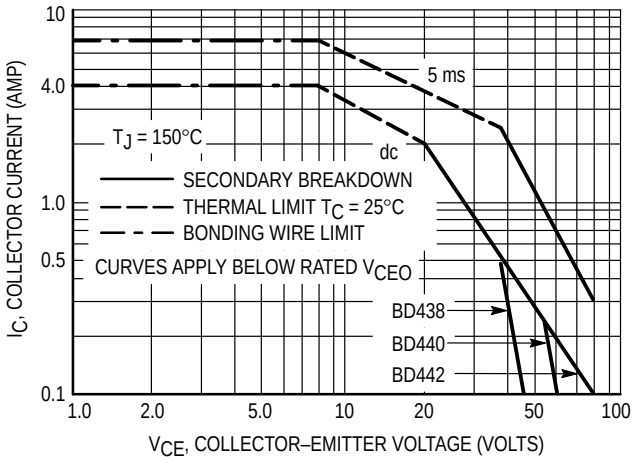
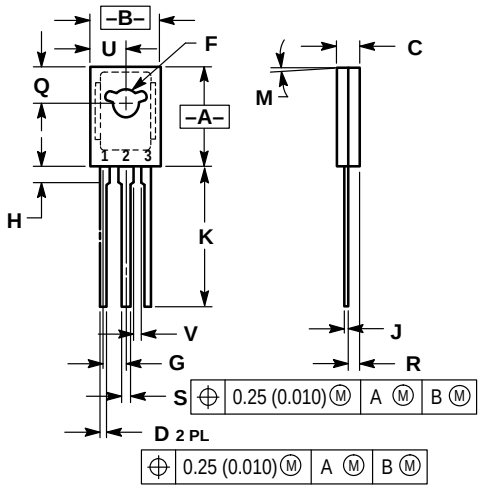


Figure 4. Active Region Safe Operating Area

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	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	0.055	1.15	1.39
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

CASE 77–08
TO–225AA TYPE
ISSUE V

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