BD435, BD437, BD439, BD441

Plastic Medium Power Silicon NPN Transistor

This series of plastic, medium−power silicon NPN transistors can be used for amplifier and switching applications. Complementary types are BD438 and BD442.

Features

- Pb−Free Package is Available*

ON Semiconductor®

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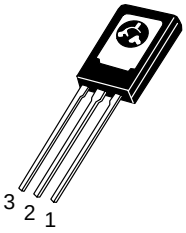
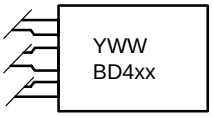
4.0 AMPERES POWER TRANSISTORS NPN SILICON



TO−225AA
CASE 77
STYLE 1

MARKING DIAGRAM



xx = 35, 37, 39, 41
Y = Year
WW = Work Week

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Collector−Emitter Voltage	BD435 BD437 BD439 BD441	V_{CEO}	32 45 60 80	Vdc
Collector−Base Voltage	BD435 BD437 BD439 BD441	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	Watts W/°C
Operating and Storage Junction Temperature Range		T_J, T_{stg}	−55 to +150	°C

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.

THERMAL CHARACTERISTICS

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

ORDERING INFORMATION

Device	Package	Shipping†
BD435	TO−225AA	500 Units/Box
BD437	TO−225AA	500 Units/Box
BD437G	TO−225AA (Pb−Free)	500 Units/Box
BD437T	TO−225AA	500 Units/Rail
BD439	TO−225AA	500 Units/Box
BD441	TO−225AA	500 Units/Box

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

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)	BD435 BD437 BD439 BD441	$V_{(BR)CEO}$	32 45 60 80	− − − −	− − − −	Vdc
Collector−Base Breakdown Voltage (I_C = 100 μA, I_B = 0)	BD435 BD437 BD439 BD441	$V_{(BR)CBO}$	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		I_{CBO}				mAdc
(V_{CB} = 32 V, I_E = 0)	BD435		−	−	0.1	
(V_{CB} = 45 V, I_E = 0)	BD437		−	−	0.1	
(V_{CB} = 60 V, I_E = 0)	BD439		−	−	0.1	
(V_{CB} = 80 V, I_E = 0)	BD441		−	−	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)	BD435 BD437 BD439 BD441	h_{FE}	40 30 20 15	− − − −	− − − −	
DC Current Gain (I_C = 500 mA, V_{CE} = 1.0 V)	BD435 BD437 BD439, BD441	h_{FE}	85 85 40	− − −	475 375 475	
DC Current Gain (I_C = 2.0 A, V_{CE} = 1.0 V)	BD435 BD437 BD439 BD441	h_{FE}	50 40 25 15	− − − −	− − − −	
Collector Saturation Voltage		$V_{CE(sat)}$				Vdc
(I_C = 2.0 A, I_B = 0.2 V)	BD435		−	−	0.5	
(I_C = 3.0 A, I_B = 0.3 A)	BD437, BD439, BD441		−	−	0.8	
Base−Emitter On Voltage (I_C = 2.0 A, V_{CE} = 1.0 V)		$V_{BE(on)}$	−	−	1.1	Vdc
Current−Gain − Bandwidth Product (V_{CE} = 1.0 V, I_C = 250 mA, f = 1.0 MHz)		f_T	3.0	−	−	MHz

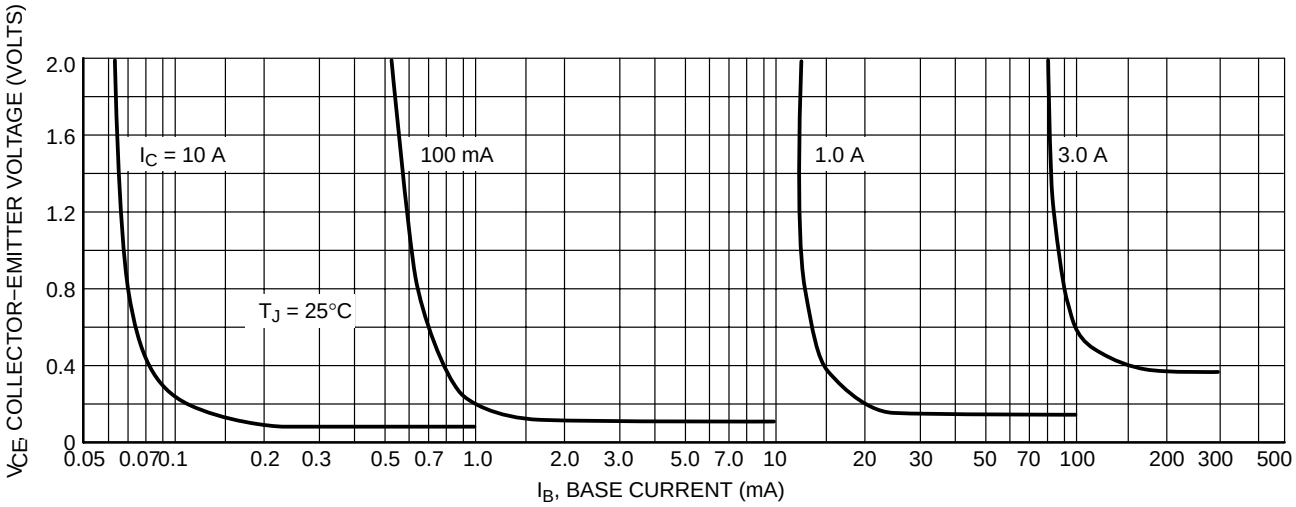


Figure 1. Collector Saturation Region

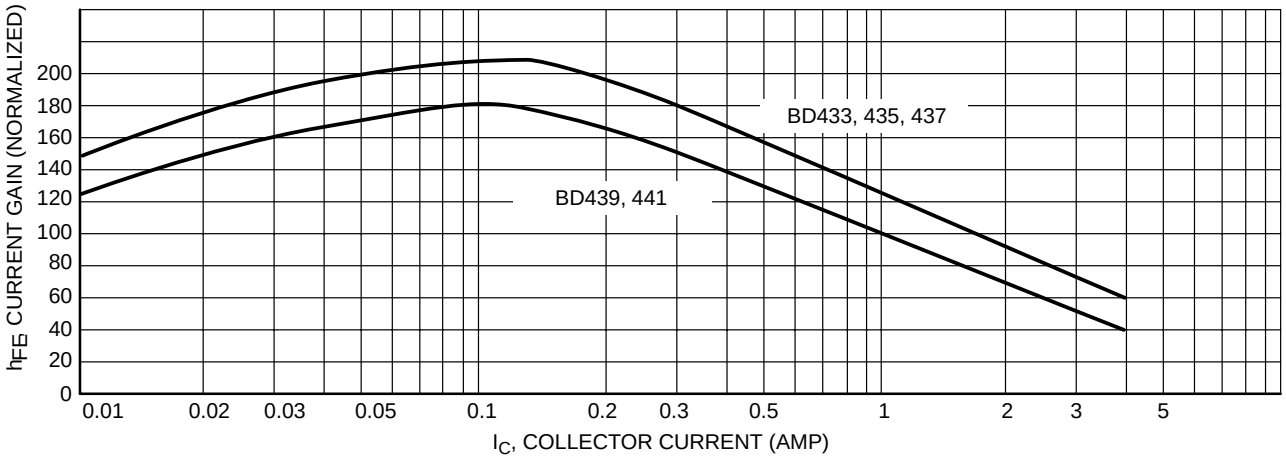


Figure 2. Current Gain

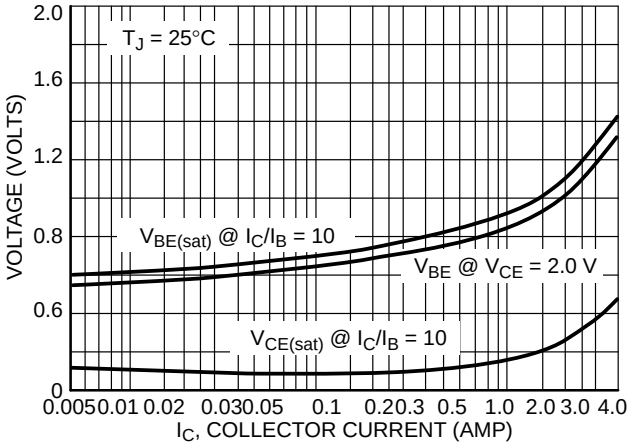


Figure 3. “On” Voltage

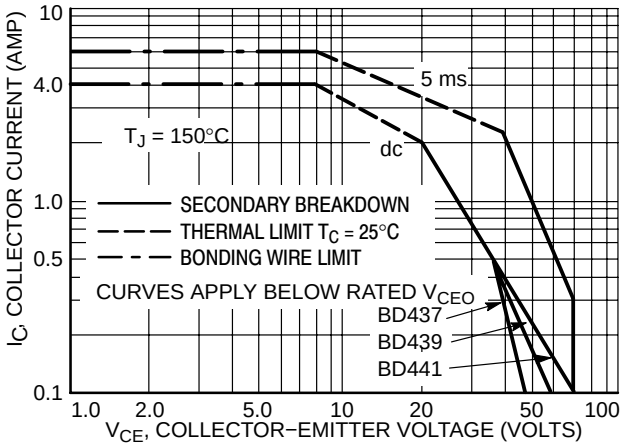
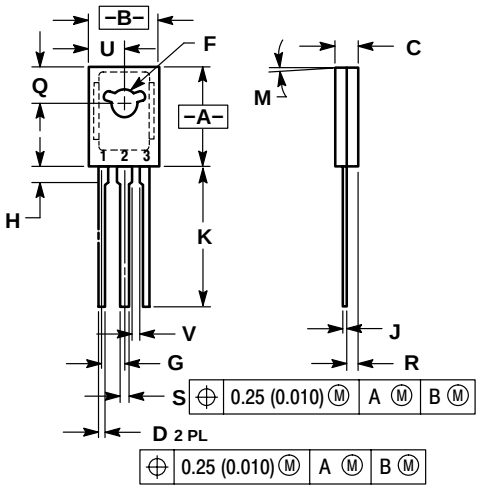


Figure 4. Active Region Safe Operating Area

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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