

# BD435G, BD437G, BD439G, BD441G

## Plastic Medium-Power Silicon NPN Transistors

This series of plastic, medium-power silicon NPN transistors can be used for amplifier and switching applications.

### Features

- Complementary Types are BD438 and BD442
- These Devices are Pb-Free and are RoHS Compliant\*

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BD435G BD437G BD439G BD441G	$V_{CEO}$	32 45 60 80	Vdc
Collector-Base Voltage BD435G BD437G BD439G BD441G	$V_{CBO}$	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 $25^\circ\text{C}$	$P_D$	36 288	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS

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

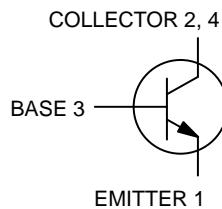
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



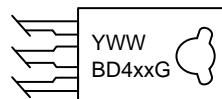
ON Semiconductor®

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## 4.0 AMPERES POWER TRANSISTORS NPN SILICON



### MARKING DIAGRAM



Y = Year  
WW = Work Week  
BD4xx = Device Code  
xx = 35, 37, 37T, 39, 41  
G = Pb-Free Package

### ORDERING INFORMATION

Device	Package	Shipping
BD435G	TO-225 (Pb-Free)	500 Units/Box
BD437G	TO-225 (Pb-Free)	500 Units/Box
BD437TG	TO-225 (Pb-Free)	50 Units/Rail
BD439G	TO-225 (Pb-Free)	500 Units/Box
BD441G	TO-225 (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 ( $I_C = 100 \text{ mA}$ , $I_B = 0$ ) BD435G BD437G BD439G BD441G	$V_{(\text{BR})\text{CEO}}$	32 45 60 80	— — — —	— — — —	Vdc
Collector-Base Breakdown Voltage ( $I_C = 100 \mu\text{A}$ , $I_B = 0$ ) BD435G BD437G BD439G BD441G	$V_{(\text{BR})\text{CBO}}$	32 45 60 80	— — — —	— — — —	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 100 \mu\text{A}$ , $I_C = 0$ )	$V_{(\text{BR})\text{EBO}}$	5.0	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 32 \text{ V}$ , $I_E = 0$ ) BD435G ( $V_{CB} = 45 \text{ V}$ , $I_E = 0$ ) BD437G ( $V_{CB} = 60 \text{ V}$ , $I_E = 0$ ) BD439G ( $V_{CB} = 80 \text{ V}$ , $I_E = 0$ ) BD441G	$I_{\text{CBO}}$	— — — — —	— — — —	0.1 0.1 0.1 0.1	mA
Emitter Cutoff Current ( $V_{EB} = 5.0 \text{ V}$ )	$I_{\text{EBO}}$	—	—	1.0	mA
DC Current Gain ( $I_C = 10 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ ) BD435G BD437G BD439G BD441G	$h_{\text{FE}}$	40 30 20 15	— — — —	— — — —	—
DC Current Gain ( $I_C = 500 \text{ mA}$ , $V_{CE} = 1.0 \text{ V}$ ) BD435G BD437G BD439G, BD441G	$h_{\text{FE}}$	85 85 40	— — —	475 375 475	—
DC Current Gain ( $I_C = 2.0 \text{ A}$ , $V_{CE} = 1.0 \text{ V}$ ) BD435G BD437G BD439G BD441G	$h_{\text{FE}}$	50 40 25 15	— — — —	— — — —	—
Collector Saturation Voltage ( $I_C = 2.0 \text{ A}$ , $I_B = 0.2 \text{ V}$ ) BD435G ( $I_C = 3.0 \text{ A}$ , $I_B = 0.3 \text{ A}$ ) BD437G, BD439G, BD441G	$V_{CE(\text{sat})}$	— —	— —	0.5 0.8	Vdc
Base-Emitter On Voltage ( $I_C = 2.0 \text{ A}$ , $V_{CE} = 1.0 \text{ V}$ )	$V_{BE(\text{on})}$	—	—	1.1	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

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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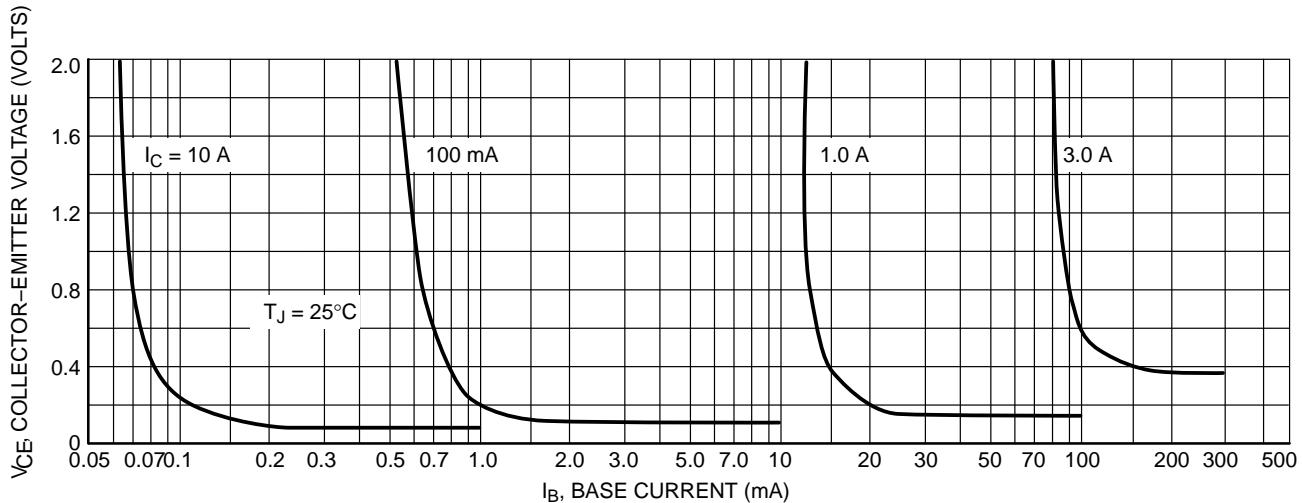


Figure 1. Collector Saturation Region

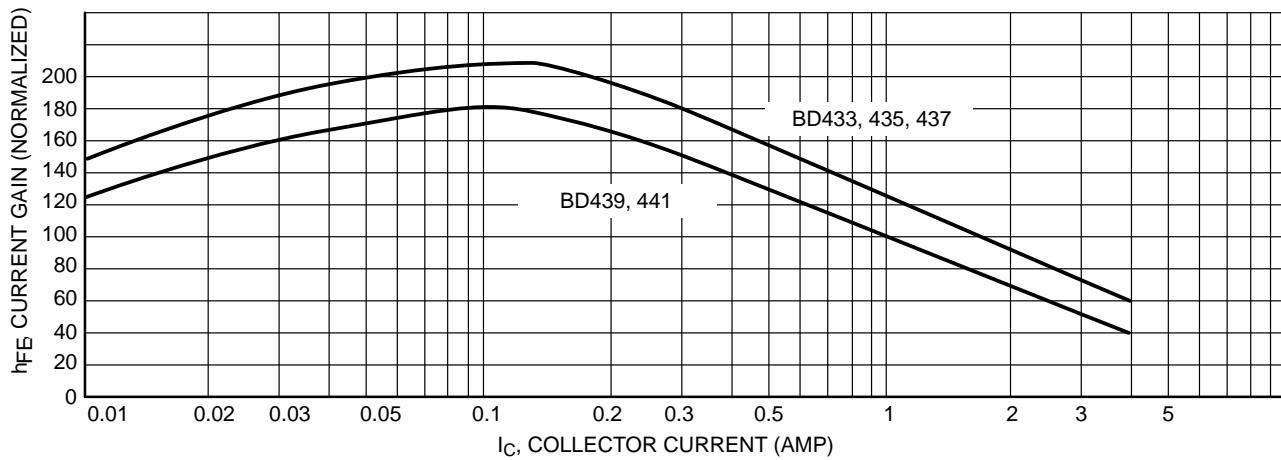


Figure 2. Current Gain

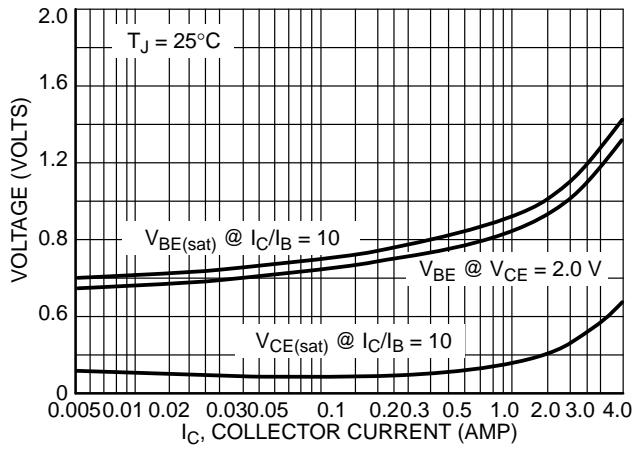


Figure 3. "On" Voltage

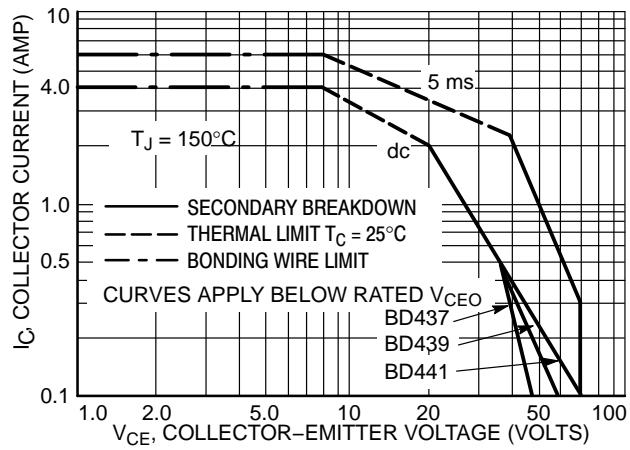
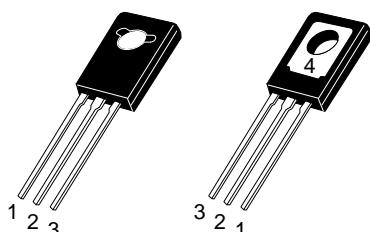


Figure 4. Active Region Safe Operating Area

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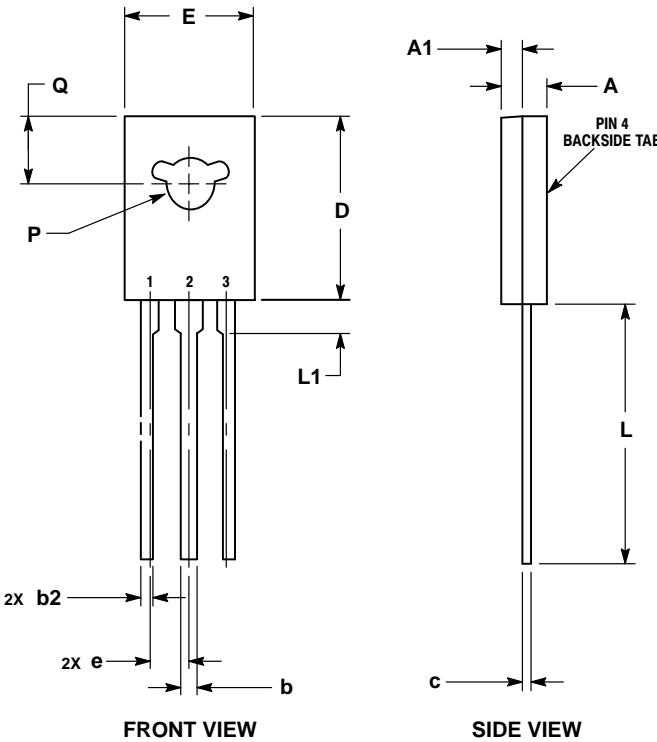
## PACKAGE DIMENSIONS



FRONT VIEW

BACK VIEW

TO-225  
CASE 77-09  
ISSUE AC



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. NUMBER AND SHAPE OF LUGS OPTIONAL.

DIM	MILLIMETERS	
	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  
2., 4. Collector  
3. Base

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