

# Plastic Medium-Power Silicon NPN Transistors

## BD435G, BD437G, BD439G, BD441G

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	$^\circ\text{C}$

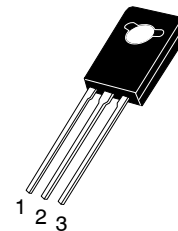
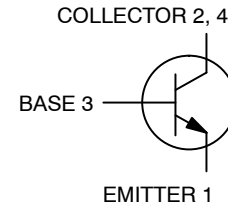
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### 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 **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## 4.0 AMPERES POWER TRANSISTORS NPN SILICON



TO-225  
CASE 77-09  
STYLE 1

### 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

# BD435G, BD437G, BD439G, BD441G

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = 100 mA, I <sub>B</sub> = 0) BD435G BD437G BD439G BD441G	V <sub>(BR)CEO</sub>	32 45 60 80	– – – –	– – – –	Vdc
Collector–Base Breakdown Voltage (I <sub>C</sub> = 100 μA, I <sub>B</sub> = 0) BD435G BD437G BD439G BD441G	V <sub>(BR)CBO</sub>	32 45 60 80	– – – –	– – – –	Vdc
Emitter–Base Breakdown Voltage (I <sub>E</sub> = 100 μA, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	5.0	–	–	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 32 V, I <sub>E</sub> = 0) BD435G (V <sub>CB</sub> = 45 V, I <sub>E</sub> = 0) BD437G (V <sub>CB</sub> = 60 V, I <sub>E</sub> = 0) BD439G (V <sub>CB</sub> = 80 V, I <sub>E</sub> = 0) BD441G	I <sub>CBO</sub>	– – – –	– – – –	0.1 0.1 0.1 0.1	mAdc
Emitter Cutoff Current (V <sub>EB</sub> = 5.0 V)	I <sub>EBO</sub>	–	–	1.0	mAdc
DC Current Gain (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 V) BD435G BD437G BD439G BD441G	h <sub>FE</sub>	40 30 20 15	– – – –	– – – –	–
DC Current Gain (I <sub>C</sub> = 500 mA, V <sub>CE</sub> = 1.0 V) BD435G BD437G BD439G, BD441G	h <sub>FE</sub>	85 85 40	– – –	475 375 475	–
DC Current Gain (I <sub>C</sub> = 2.0 A, V <sub>CE</sub> = 1.0 V) BD435G BD437G BD439G BD441G	h <sub>FE</sub>	50 40 25 15	– – – –	– – – –	–
Collector Saturation Voltage (I <sub>C</sub> = 2.0 A, I <sub>B</sub> = 0.2 V) BD435G (I <sub>C</sub> = 3.0 A, I <sub>B</sub> = 0.3 A) BD437G, BD439G, BD441G	V <sub>CE(sat)</sub>	– –	– –	0.5 0.8	Vdc
Base–Emitter On Voltage (I <sub>C</sub> = 2.0 A, V <sub>CE</sub> = 1.0 V)	V <sub>BE(on)</sub>	–	–	1.1	Vdc
Current–Gain – Bandwidth Product (V <sub>CE</sub> = 1.0 V, I <sub>C</sub> = 250 mA, f = 1.0 MHz)	f <sub>T</sub>	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.

# BD435G, BD437G, BD439G, BD441G

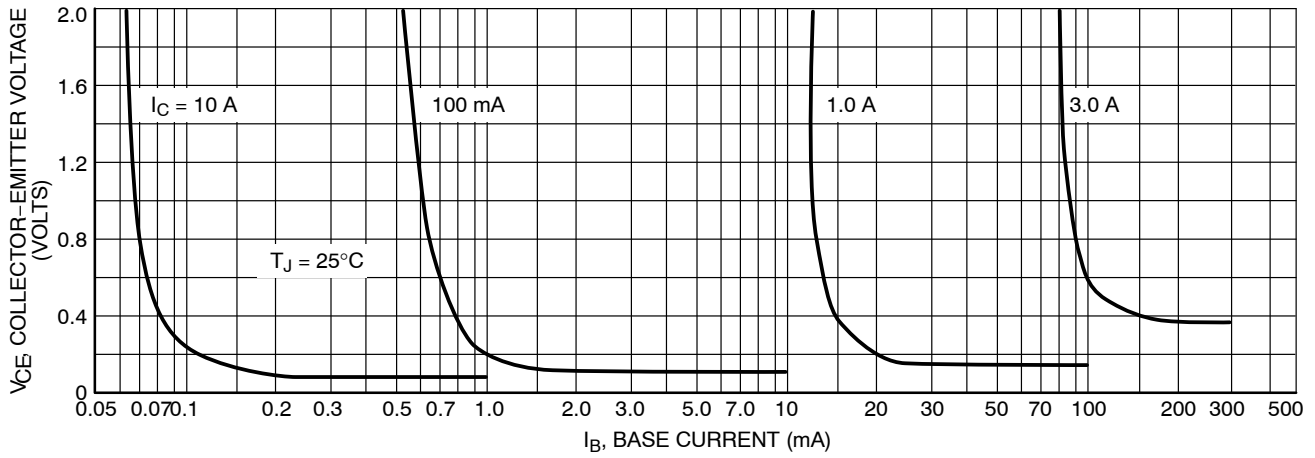


Figure 1. Collector Saturation Region

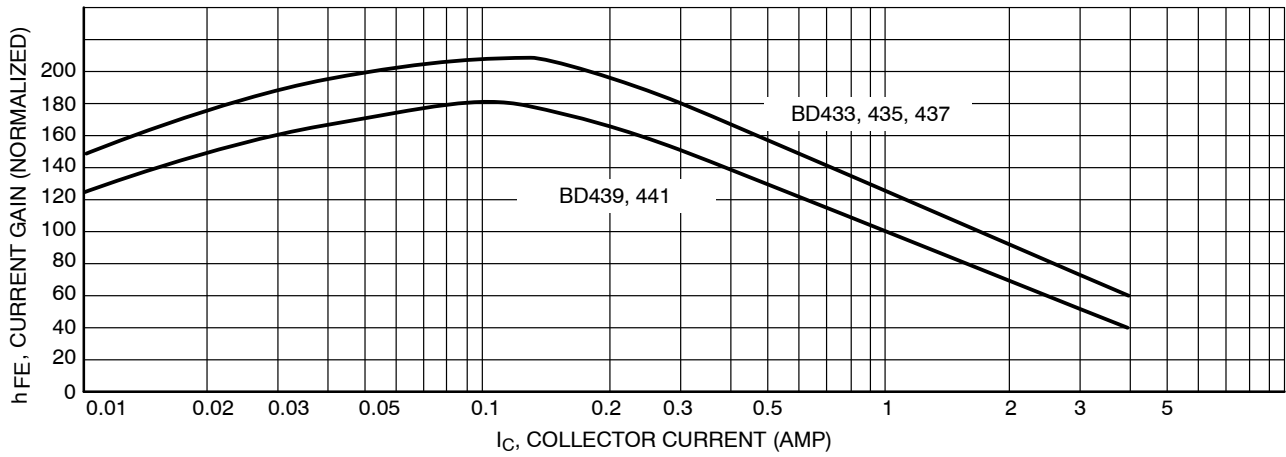


Figure 2. Current Gain

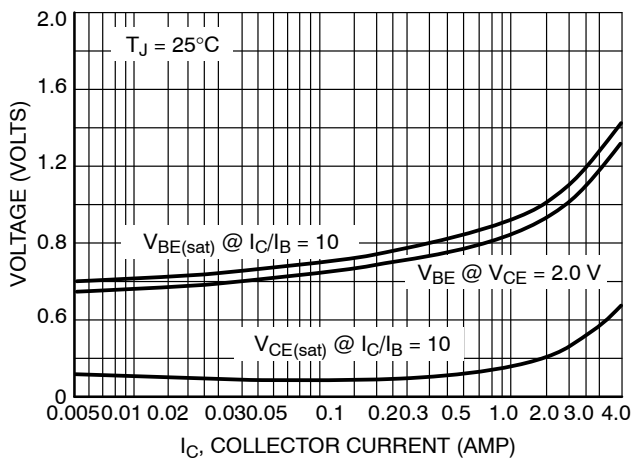


Figure 3. "On" Voltage

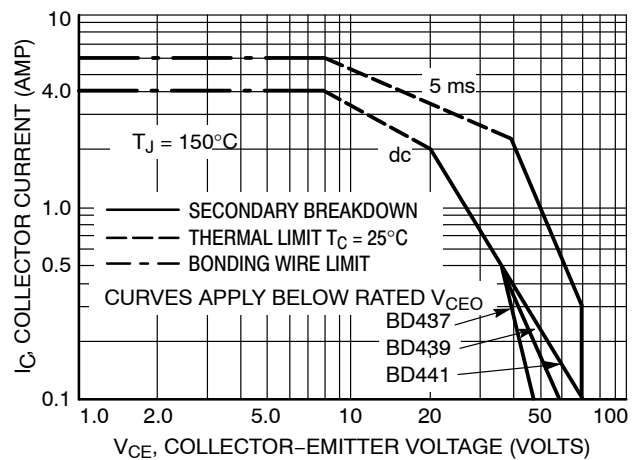
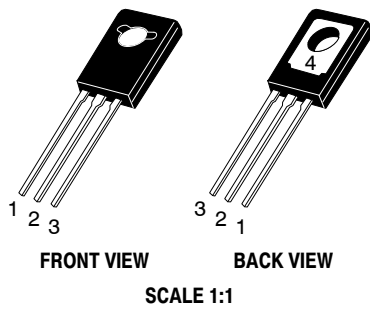
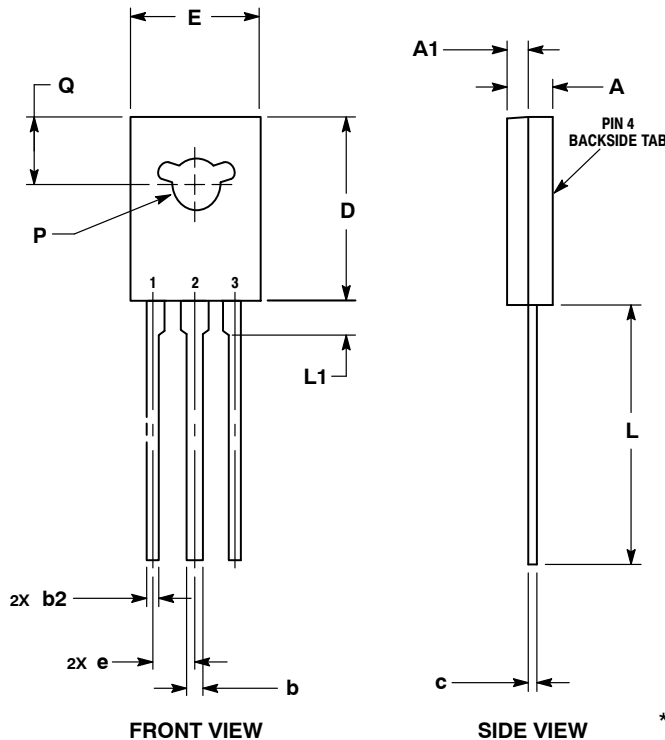


Figure 4. Active Region Safe Operating Area



TO-225  
CASE 77-09  
ISSUE AD

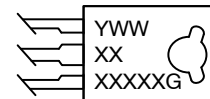
DATE 25 MAR 2015



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

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

GENERIC  
MARKING DIAGRAM\*



Y = Year  
WW = Work Week  
XXXXX = Device Code  
G = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

STYLE 1: PIN 1. EMITTER 2., 4. COLLECTOR 3. BASE	STYLE 2: PIN 1. CATHODE 2., 4. ANODE 3. GATE	STYLE 3: PIN 1. BASE 2., 4. COLLECTOR 3. EMITTER	STYLE 4: PIN 1. ANODE 1 2., 4. ANODE 2 3. GATE	STYLE 5: PIN 1. MT 1 2., 4. MT 2 3. GATE
STYLE 6: PIN 1. CATHODE 2., 4. GATE 3. ANODE	STYLE 7: PIN 1. MT 1 2., 4. GATE 3. MT 2	STYLE 8: PIN 1. SOURCE 2., 4. GATE 3. DRAIN	STYLE 9: PIN 1. GATE 2., 4. DRAIN 3. SOURCE	STYLE 10: PIN 1. SOURCE 2., 4. DRAIN 3. GATE

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