

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
 - Class Q Military
 - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)
 - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

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 Packages are Available*

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Collector-Emitter Voltage	BD435	V_{CEO}	32	Vdc
	BD437		45	
	BD439		60	
	BD441		80	
Collector-Base Voltage	BD435	V_{CBO}	32	Vdc
	BD437		45	
	BD439		60	
	BD441		80	
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°C		P_D	36 288	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range		T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

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

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.

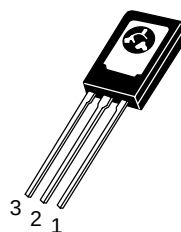
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

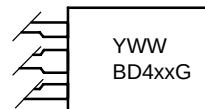
<http://onsemi.com>

4.0 AMPERES POWER TRANSISTORS NPN SILICON



TO-225AA
CASE 77
STYLE 1

MARKING DIAGRAM



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

ORDERING INFORMATION

Device	Package	Shipping
BD435	TO-225AA	500 Units/Box
BD435G	TO-225AA (Pb-Free)	500 Units/Box
BD437	TO-225AA	500 Units/Box
BD437G	TO-225AA (Pb-Free)	500 Units/Box
BD437T	TO-225AA	50 Units/Rail
BD437TG	TO-225AA (Pb-Free)	50 Units/Rail
BD439	TO-225AA	500 Units/Box
BD439G	TO-225AA (Pb-Free)	500 Units/Box
BD441	TO-225AA	500 Units/Box
BD441G	TO-225AA (Pb-Free)	500 Units/Box

BD435, BD437, BD439, BD441

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
Collector–Emitter Breakdown Voltage ($I_C = 100\text{ mA}$, $I_B = 0$)	BD435 BD437 BD439 BD441	$V_{(BR)CEO}$	32 45 60 80	– – – –	– – – –	Vdc
Collector–Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{A}$, $I_B = 0$)	BD435 BD437 BD439 BD441	$V_{(BR)CBO}$	32 45 60 80	– – – –	– – – –	Vdc
Emitter–Base Breakdown Voltage ($I_E = 100\text{ }\mu\text{A}$, $I_C = 0$)		$V_{(BR)EBO}$	5.0	–	–	Vdc
Collector Cutoff Current ($V_{CB} = 32\text{ V}$, $I_E = 0$) ($V_{CB} = 45\text{ V}$, $I_E = 0$) ($V_{CB} = 60\text{ V}$, $I_E = 0$) ($V_{CB} = 80\text{ V}$, $I_E = 0$)	BD435 BD437 BD439 BD441	I_{CBO}	– – – –	– – – –	0.1 0.1 0.1 0.1	mAdc
Emitter Cutoff Current ($V_{EB} = 5.0\text{ V}$)		I_{EBO}	–	–	1.0	mAdc
DC Current Gain ($I_C = 10\text{ mA}$, $V_{CE} = 5.0\text{ V}$)	BD435 BD437 BD439 BD441	h_{FE}	40 30 20 15	– – – –	– – – –	–
DC Current Gain ($I_C = 500\text{ mA}$, $V_{CE} = 1.0\text{ V}$)	BD435 BD437 BD439, BD441	h_{FE}	85 85 40	– – –	475 375 475	–
DC Current Gain ($I_C = 2.0\text{ A}$, $V_{CE} = 1.0\text{ V}$)	BD435 BD437 BD439 BD441	h_{FE}	50 40 25 15	– – – –	– – – –	–
Collector Saturation Voltage ($I_C = 2.0\text{ A}$, $I_B = 0.2\text{ V}$) ($I_C = 3.0\text{ A}$, $I_B = 0.3\text{ A}$)	BD435 BD437, BD439, BD441	$V_{CE(sat)}$	– –	– –	0.5 0.8	Vdc
Base–Emitter On Voltage ($I_C = 2.0\text{ A}$, $V_{CE} = 1.0\text{ V}$)		$V_{BE(on)}$	–	–	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

BD435, BD437, BD439, BD441

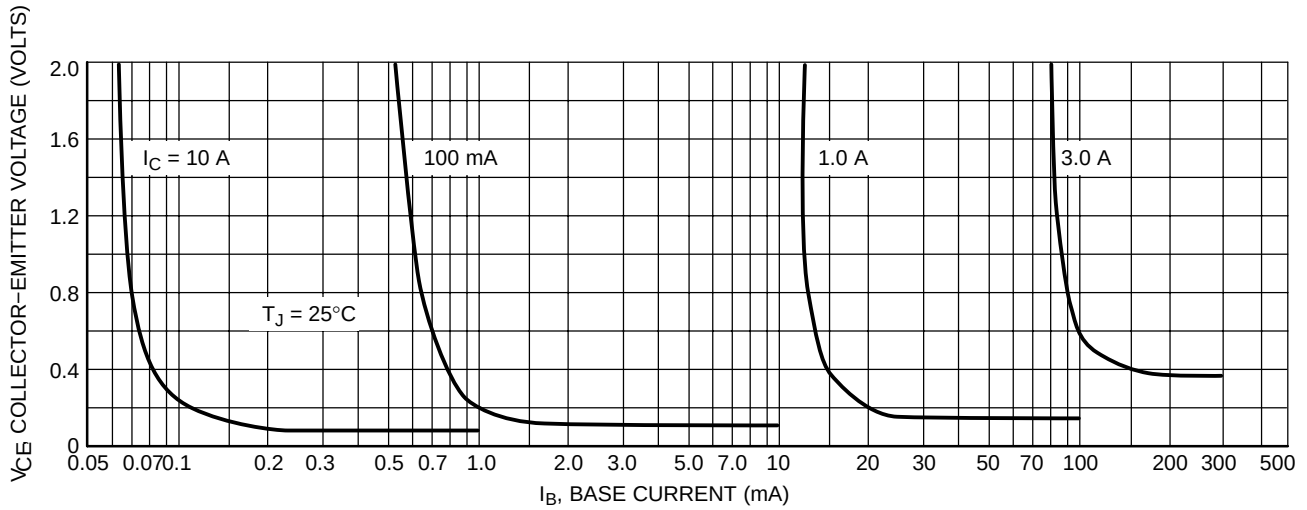


Figure 1. Collector Saturation Region

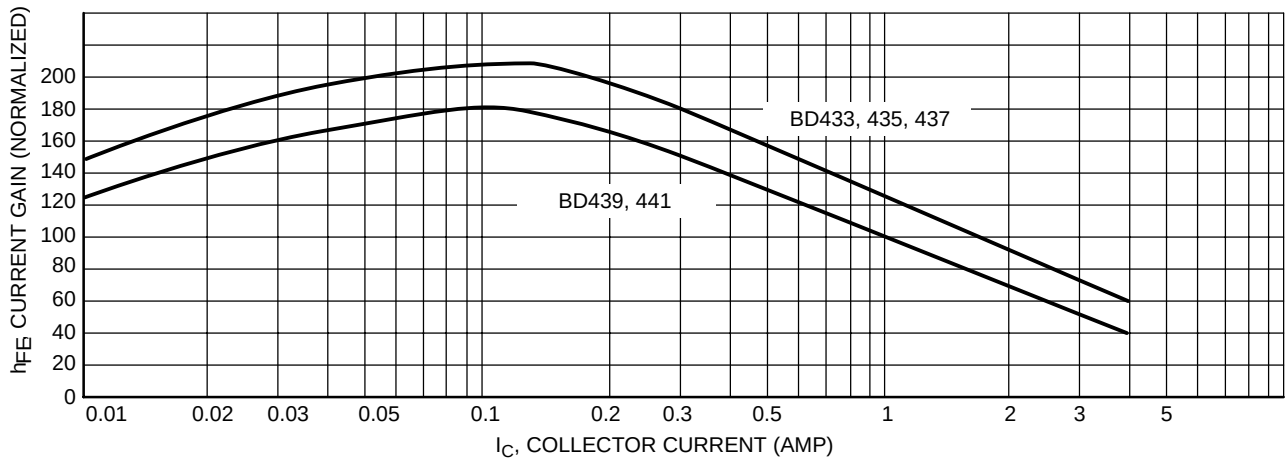


Figure 2. Current Gain

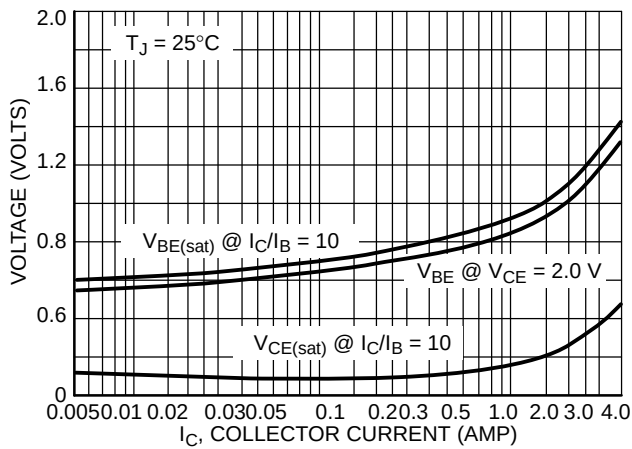


Figure 3. "On" Voltage

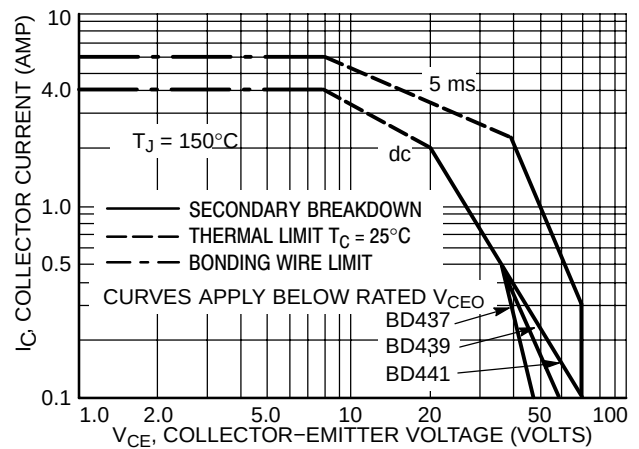
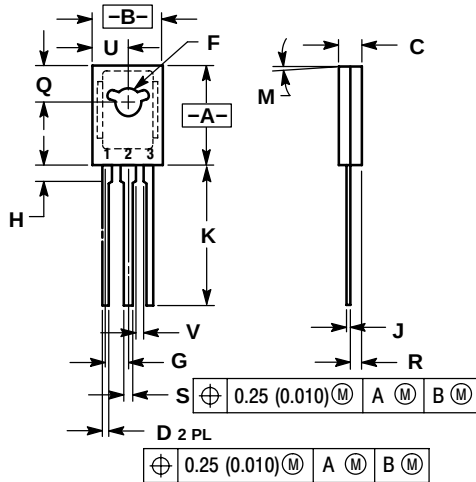


Figure 4. Active Region Safe Operating Area

BD435, BD437, BD439, BD441

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.

DIM	INCHES		MILLIMETERS	
	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:

1. EMITTER
2. COLLECTOR
3. BASE

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