

**TO-126 Plastic-Encapsulate Transistors****BD439/441** TRANSISTOR (NPN)**FEATURES**

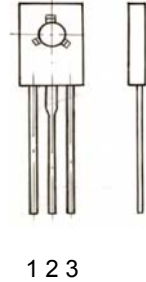
Amplifier and switching applications

MAXIMUM RATINGS($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	BD439 60	V
		BD441 80	
V_{CEO}	Collector-Emitter Voltage	BD439 60	V
		BD441 80	
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current –Continuous	4	A
P_C	Collector Power Dissipation	1.25	W
T_J	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55-150	$^{\circ}\text{C}$

TO-126

1. EMITTER
2. COLLECTOR
3. BASE

**ELECTRICAL CHARACTERISTICS** ($T_{amb}=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu\text{A}, I_E=0$ BD439 60 BD441 80	60 80			V
Collector-emitter breakdown voltage	$V_{CEO(SUS)}^{(1)}$	$I_C=100\text{mA}, I_B=0$ BD439 60 BD441 80	60 80			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu\text{A}, I_C=0$	5			V
Collector cut-off current	I_{CBO}	$V_{CB}=60\text{V}, I_E=0$ BD439 $V_{CB}=80\text{V}, I_E=0$ BD441			100	μA
Emitter cut-off current	I_{EBO}	$V_{EB}=5\text{V}, I_E=0$			1	mA
DC current gain	$h_{FE(1)}^{(1)}$	$V_{CE}=1\text{V}, I_C=500\text{mA}$	40		475	
	$h_{FE(2)}^{(1)}$	$V_{CE}=5\text{V}, I_C=10\text{mA}$ BD439 20 BD441 15	20 15			
	$h_{FE(3)}^{(1)}$	$V_{CE}=1\text{V}, I_C=2\text{A}$ BD439 25 BD441 15	25 15			
Collector-emitter saturation voltage	$V_{CE(sat)}^{(1)}$	$I_C=3\text{A}, I_B=0.3\text{A}$			0.8	V
Base-emitter voltage	$V_{BE}^{(1)}$	$V_{CE}=1\text{V}, I_C=2\text{A}$			1.1	V
Transition frequency	f_T	$V_{CE}=1\text{V}, I_C=250\text{mA}$	3			MHz

⁽¹⁾Pulse test

Typical Characteristics

BD439, 441

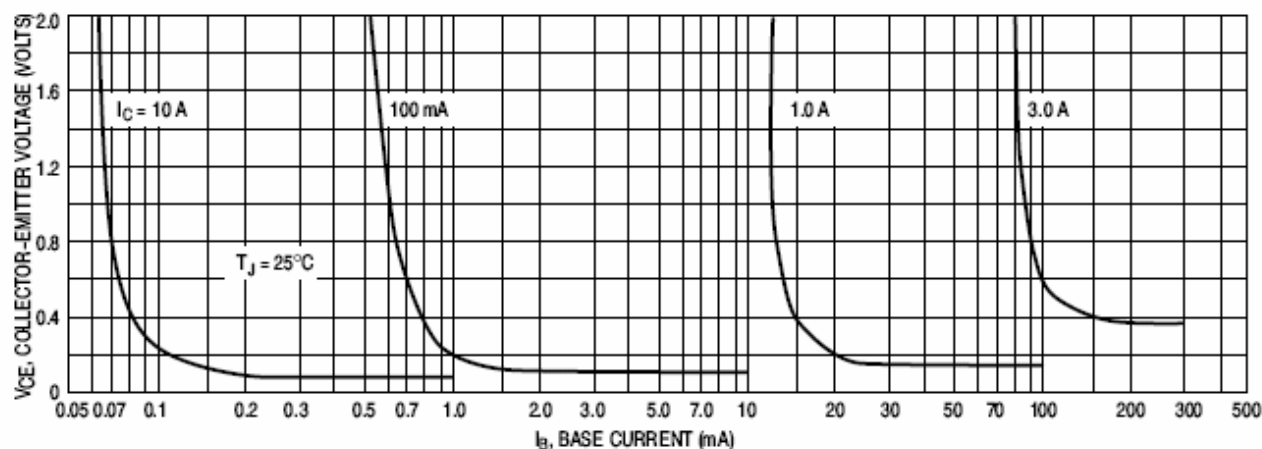


Figure 1. Collector Saturation Region

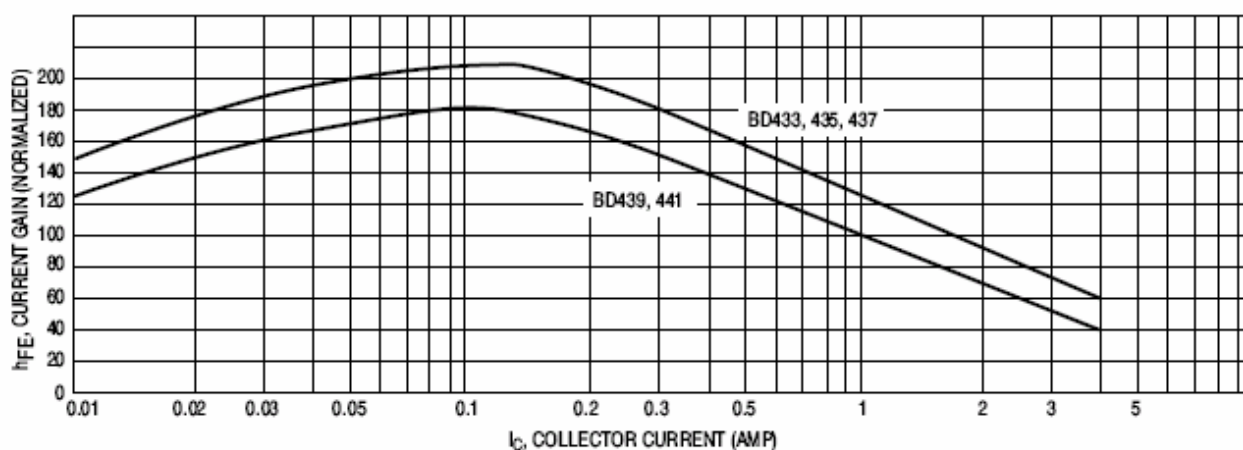


Figure 2. Current Gain

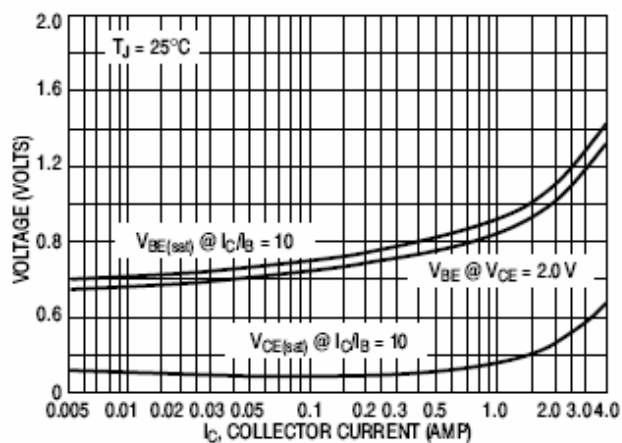


Figure 3. "On" Voltage

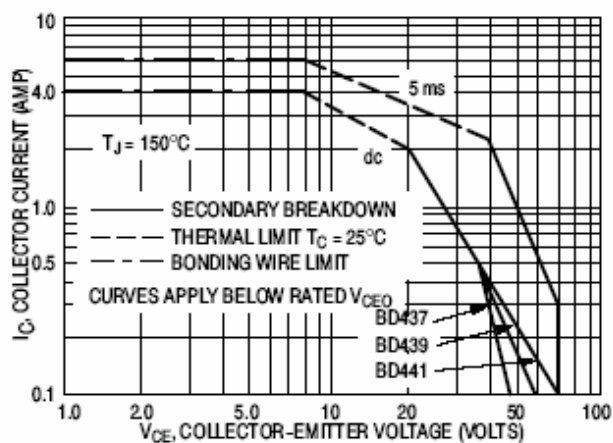


Figure 4. Active Region Safe Operating Area