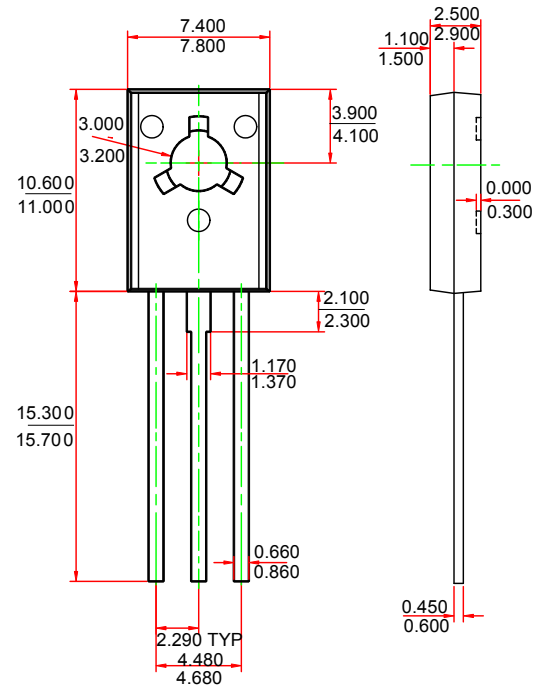


# BD438/440/442(PNP)

TO-126 Transistor

## TO-126

1. EMITTER
2. COLLECOTR
3. BASE



Dimensions in inches and (millimeters)

## 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	BD438 -45 BD440 -60 BD442 -80	V	
	$V_{CEO}$	Collector-Emitter Voltage	BD438 -45 BD440 -60 BD442 -80	V
		$V_{EBO}$	Emitter-Base Voltage	-5
$I_C$		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	$^\circ\text{C}$	

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

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-100\mu\text{A}, I_E=0$ BD438	-45			V
		BD440	-60			
		BD442	-80			
Collector-emitter breakdown voltage	$V_{CEO(SUS)}^{(1)}$	$I_C=-100\text{mA}, I_B=0$ BD438	-45			V
		BD440	-60			
		BD442	-80			
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-100\mu\text{A}, I_C=0$	-5			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=-45\text{V}, I_E=0$ BD438			-0.1	$\mu\text{A}$
		$V_{CB}=-60\text{V}, I_E=0$ BD440				
		$V_{CB}=-80\text{V}, I_E=0$ BD442				
Emitter cut-off current	$I_{EBO}$	$V_{EB}=-5\text{V}, I_C=0$			-1	$\mu\text{A}$
DC current gain	$h_{FE(1)}^{(1)}$	$V_{CE}=-5\text{V}, I_C=-10\text{mA}$ BD438	30			
		BD440	20			
		BD442	15			
	$h_{FE(2)}^{(1)}$	$V_{CE}=-1\text{V}, I_C=-500\text{mA}$ BD438	85		375	
		BD440/BD442	40		475	
	$h_{FE(3)}^{(1)}$	$V_{CE}=-1\text{V}, I_C=-2\text{A}$ BD438	40			
		BD440	25			
		BD442	15			
Collector-emitter saturation voltage	$V_{CE(sat)}^{(1)}$	$I_C=-3\text{A}, I_B=-300\text{mA}$ BD438			-0.7	V
		BD440/BD442			-0.8	
Base-emitter voltage	$V_{BE}^{(1)}$	$V_{CE}=-1\text{V}, I_C=-2\text{A}$ BD438			-1.1	V
		BD440/BD442			-1.5	
Transition frequency	$f_T$	$V_{CE}=-1\text{V}, I_C=-250\text{mA}, f=1\text{MHz}$	3			MHz

<sup>(1)</sup>Pulse test.

## Typical Characteristics

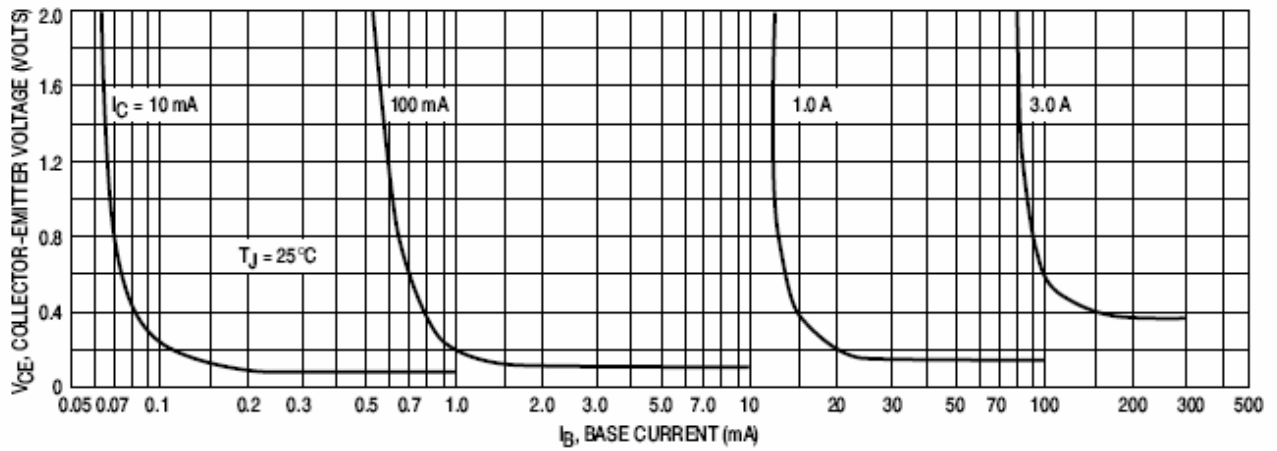


Figure 1. Collector Saturation Region

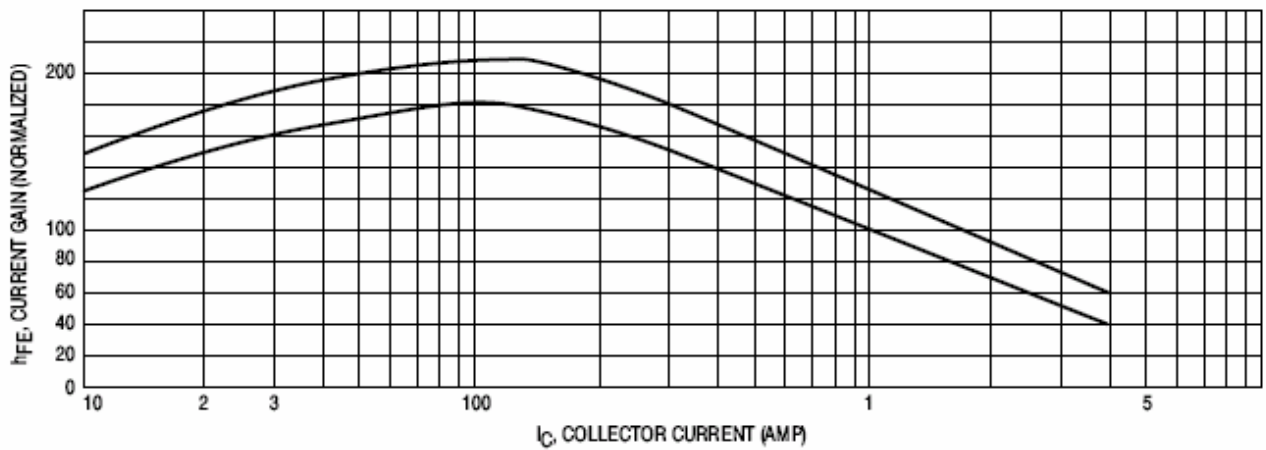


Figure 2. Current Gain

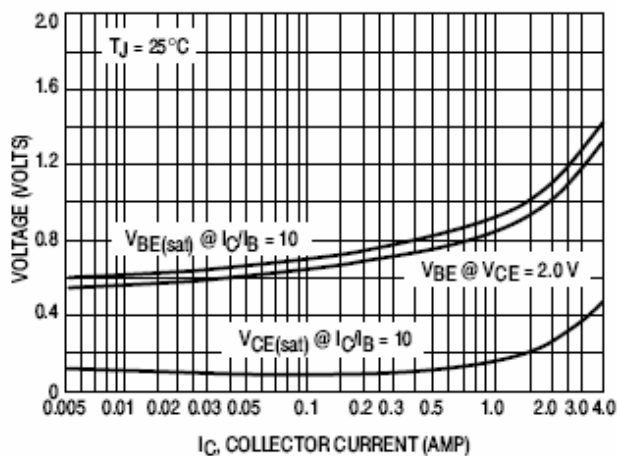


Figure 3. "On" Voltage

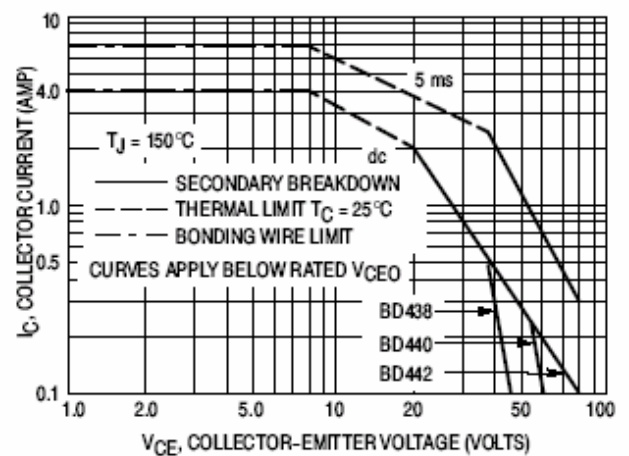


Figure 4. Active Region Safe Operating Area