

RoHS Compliant Product

A suffix of "-C" specifies halogen & lead-free

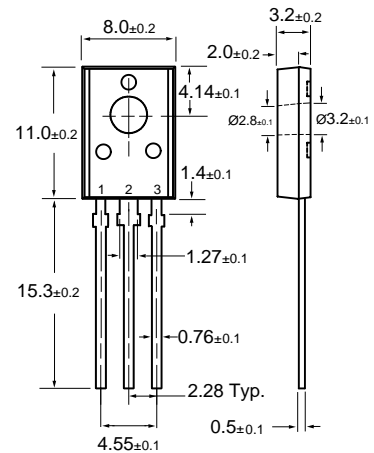
Features

* Amplifier and switching applications

TO-18

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
	Collector-Emitter Voltage	BD438 -45 BD440 -60 BD442 -80	V
	Emitter-Base Voltage	-5	V
I_C	Collector Current –Continuous	-4	A
P_C	Collector Dissipation	1.25	W
T_J	Junction Temperature	150	
T_{stg}	Storage Temperature	-55-150	



1: Emitter
2: Collector
3: Base

Dimensions in Millimeters

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	$V_{(BR)CEO}$	$I_C=-100\text{mA}, I_B=0$ 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				μA
		$V_{CB}=-60\text{V}, I_E=0$ BD440			-0.1	
		$V_{CB}=-80\text{V}, I_E=0$ BD442				
Emitter cut-off current	I_{EBO}	$V_{EB}=-5\text{V}, I_C=0$			-1	μA
DC current gain	$h_{FE(1)}$	$V_{CE}=-5\text{V}, I_C=-10\text{mA}$ BD438	30			
		BD440	20			
		BD442	15			
	$h_{FE(2)}$	$V_{CE}=-1\text{V}, I_C=-500\text{mA}$ BD438	85		375	
		BD440/BD442	40		475	
	$h_{FE(3)}$	$V_{CE}=-1\text{V}, I_C=-2\text{A}$ BD438	40			
		BD440	25			
		BD442	15			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=-3\text{A}, I_B=-300\text{mA}$ BD438			-0.7	V
		BD440/BD442			-0.8	
Base-emitter voltage	V_{BE}	$V_{CE}=-1\text{V}, I_C=-2\text{A}$ 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

Typical Characteristics

BD438,440,442

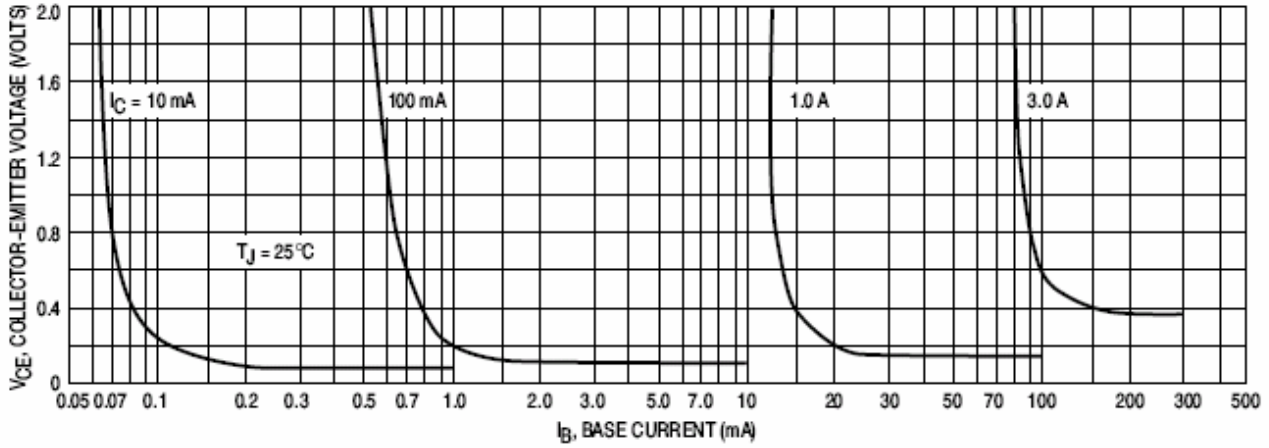


Figure 1. Collector Saturation Region

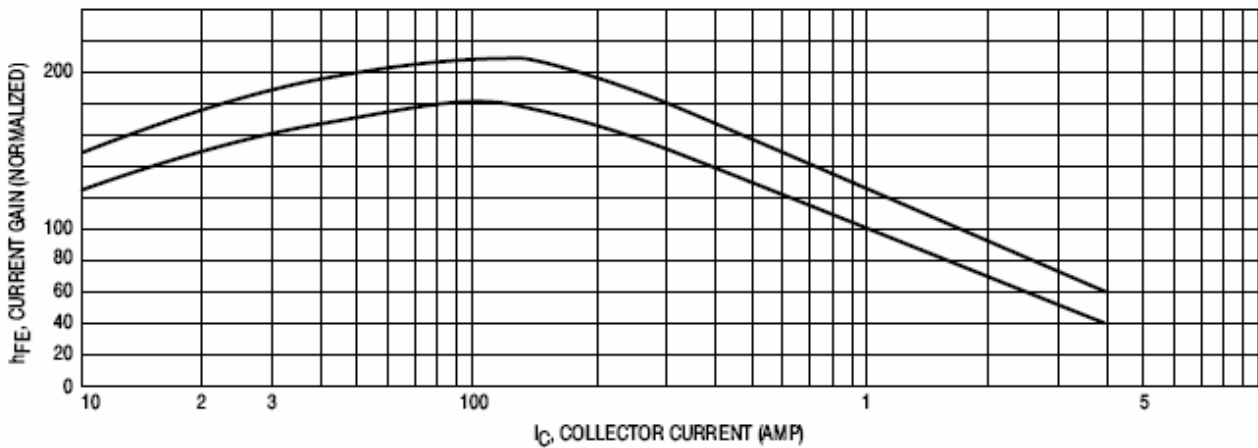


Figure 2. Current Gain

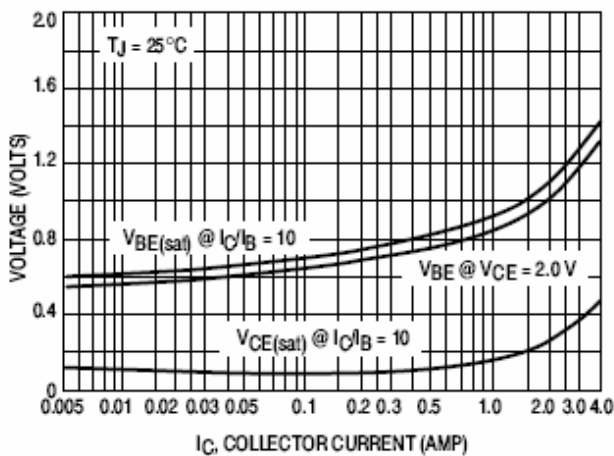


Figure 3. "On" Voltage

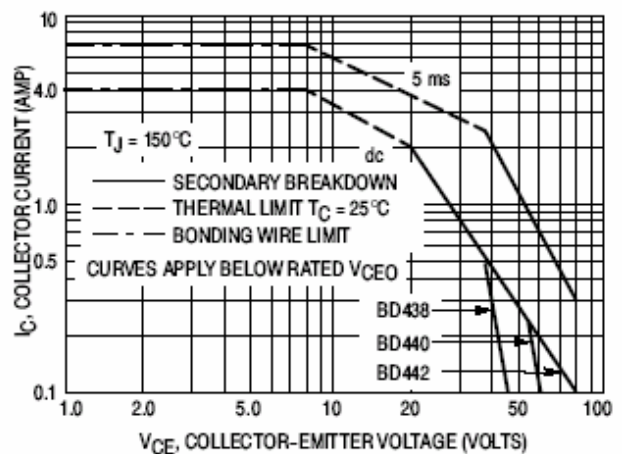


Figure 4. Active Region Safe Operating Area