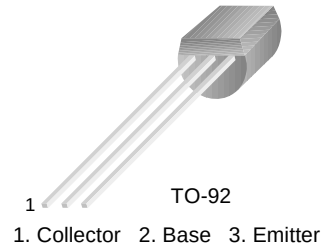


BC237/238/239

Switching and Amplifier Applications

- Low Noise: BC239



NPN Epitaxial Silicon Transistor

Absolute Maximum Ratings $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage : BC237 : BC238/239	50	V
		30	V
V_{CEO}	Collector-Emitter Voltage : BC237 : BC238/239	45	V
		25	V
V_{EBO}	Emitter-Base Voltage : BC237 : BC238/239	6	V
		5	V
I_C	Collector Current (DC)	100	mA
P_C	Collector Dissipation	500	mW
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature	-55 ~ 150	$^\circ\text{C}$

Electrical Characteristics $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
BV_{CEO}	Collector-Emitter Breakdown Voltage : BC237 : BC238/239	$I_C=2\text{mA}$, $I_B=0$	45			V
			25			V
BV_{EBO}	Emitter Base Breakdown Voltage : BC237 : BC238/239	$I_E=1\mu\text{A}$, $I_C=0$	6			V
			5			V
I_{CES}	Collector Cut-off Current : BC237 : BC238/239	$V_{CE}=50\text{V}$, $V_{BE}=0$ $V_{CE}=30\text{V}$, $V_{BE}=0$		0.2	15	nA
				0.2	15	nA
h_{FE}	DC Current Gain	$V_{CE}=5\text{V}$, $I_C=2\text{mA}$	120		800	
$V_{CE}(\text{sat})$	Collector-Emitter Saturation Voltage	$I_C=10\text{mA}$, $I_B=0.5\text{mA}$		0.07	0.2	V
		$I_C=100\text{mA}$, $I_B=5\text{mA}$		0.2	0.6	V
$V_{BE}(\text{sat})$	Collector-Base Saturation Voltage	$I_C=10\text{mA}$, $I_B=0.5\text{mA}$		0.73	0.83	V
		$I_C=100\text{mA}$, $I_B=5\text{mA}$		0.87	1.05	V
$V_{BE}(\text{on})$	Base-Emitter On Voltage	$V_{CE}=5\text{V}$, $I_C=2\text{mA}$	0.55	0.62	0.7	V
f_T	Current Gain Bandwidth Product	$V_{CE}=3\text{V}$, $I_C=0.5\text{mA}$, $f=100\text{MHz}$		85		MHz
		$V_{CE}=5\text{V}$, $I_C=10\text{mA}$, $f=100\text{MHz}$	150	250		MHz
C_{ob}	Output Capacitance	$V_{CB}=10\text{V}$, $I_E=0$, $f=1\text{MHz}$		3.5	6	pF
C_{ib}	Input Base Capacitance	$V_{EB}=0.5\text{V}$, $I_C=0$, $f=1\text{MHz}$		8		pF
NF	Noise Figure : BC237/238 : BC239 : BC239	$V_{CE}=5\text{V}$, $I_C=0.2\text{mA}$, $f=1\text{KHz}$ $R_G=2\text{K}\Omega$ $V_{CE}=5\text{V}$, $I_C=0.2\text{mA}$ $R_G=2\text{K}\Omega$, $f=30\sim 15\text{KHz}$		2	10	dB
					4	dB
					4	dB
					4	dB

h_{FE} Classification

Classification	A	B	C
h_{FE}	120 ~ 220	180 ~ 460	380 ~ 800

Typical Characteristics

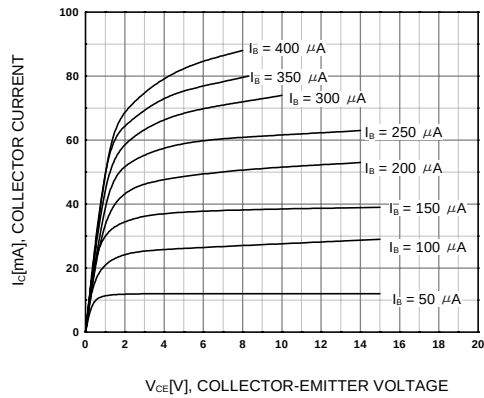


Figure 1. Static Characteristic

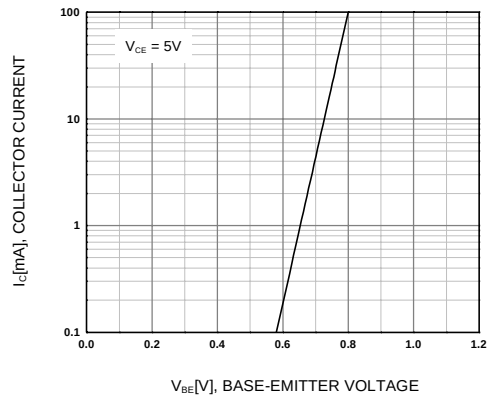


Figure 2. Transfer Characteristic

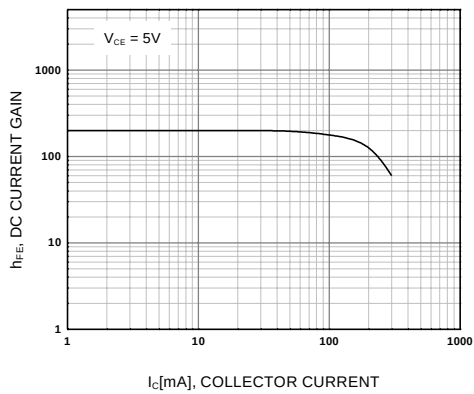


Figure 3. DC current Gain

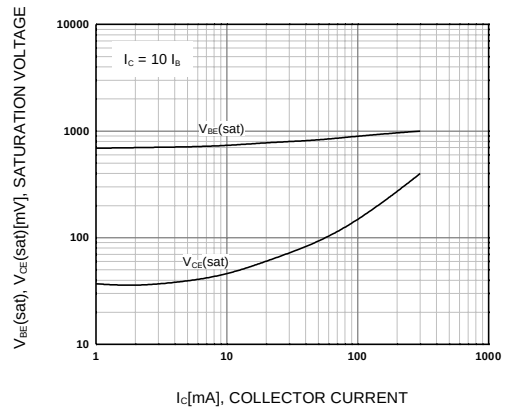


Figure 4. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

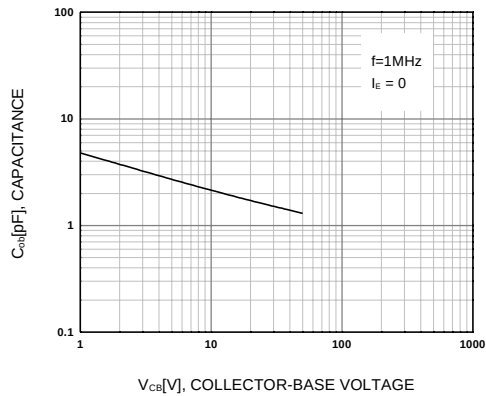


Figure 5. Output Capacitance

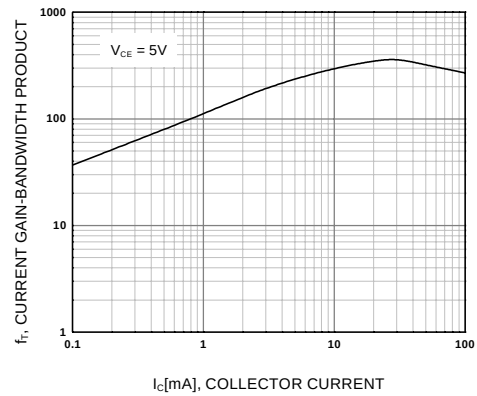
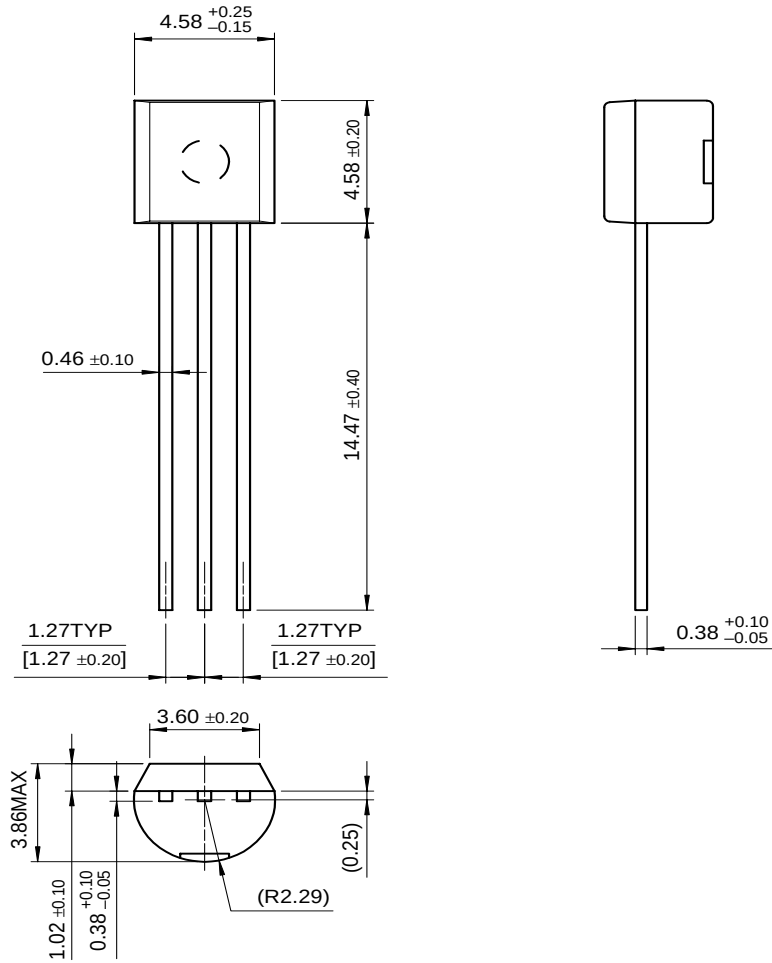


Figure 6. Current Gain Bandwidth Product

Package Dimensions

TO-92



Dimensions in Millimeters

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