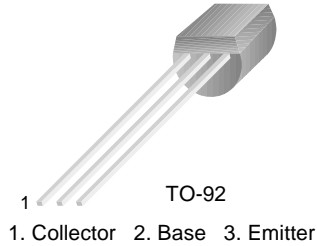


# BC237/238/239

## 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	50	V
		: BC238/239	30	V
$V_{CEO}$	Collector-Emitter Voltage	: BC237	45	V
		: BC238/239	25	V
$V_{EBO}$	Emitter-Base Voltage	: BC237	6	V
		: BC238/239	5	V
$I_C$	Collector Current (DC)	100	mA	
$P_C$	Collector Power 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	$I_C=2\text{mA}, I_B=0$	: BC237	45		V
			: BC238/239	25		V
$BV_{EBO}$	Emitter Base Breakdown Voltage	$I_E=1\mu\text{A}, I_C=0$	: BC237	6		V
			: BC238/239	5		V
$I_{CES}$	Collector Cut-off Current	$V_{CE}=50\text{V}, V_{BE}=0$ $V_{CE}=30\text{V}, V_{BE}=0$	: BC237	0.2	15	nA
			: BC238/239	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	$I_C=10\text{mA}, I_B=0.5\text{mA}$ $I_C=100\text{mA}, I_B=5\text{mA}$		0.07	0.2	V
				0.2	0.6	V
$V_{BE}(\text{sat})$	Collector-Base Saturation Voltage	$I_C=10\text{mA}, I_B=0.5\text{mA}$ $I_C=100\text{mA}, I_B=5\text{mA}$		0.73	0.83	V
				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	$V_{CE}=3\text{V}, I_C=0.5\text{mA}, f=100\text{MHz}$ $V_{CE}=5\text{V}, I_C=10\text{mA}, f=100\text{MHz}$		85		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	$V_{CE}=5\text{V}, I_C=0.2\text{mA},$ $f=1\text{KHz}, R_G=2\text{K}\Omega$ $V_{CE}=5\text{V}, I_C=0.2\text{mA}$ $R_G=2\text{K}\Omega, f=30\sim 15\text{KHz}$	: BC237/238	2	10	dB
			: BC239		4	dB
			: BC239		4	dB

### $h_{FE}$ Classification

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

# Typical Characteristics

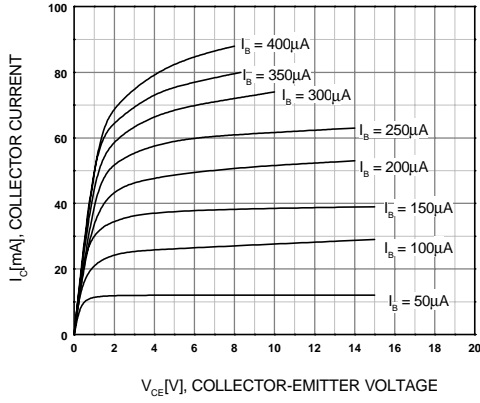


Figure 1. Static Characteristic

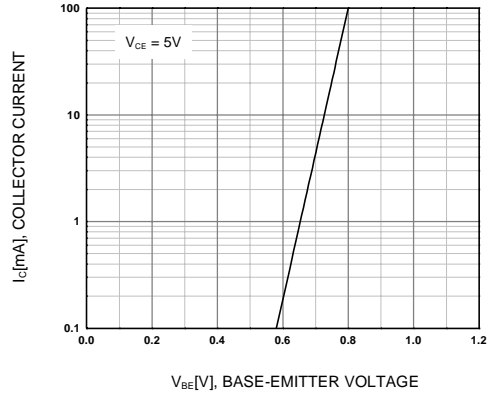


Figure 2. Transfer Characteristic

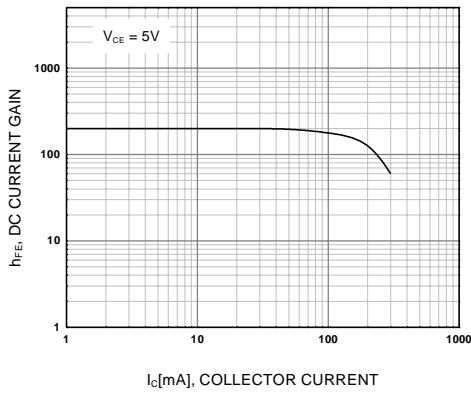


Figure 3. DC current Gain

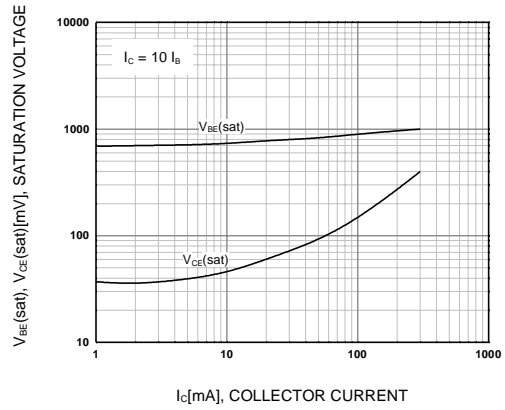


Figure 4. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

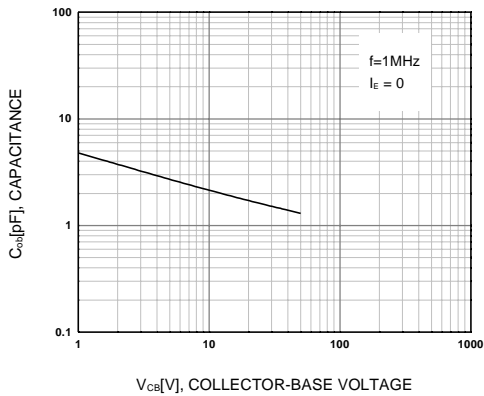


Figure 5. Output Capacitance

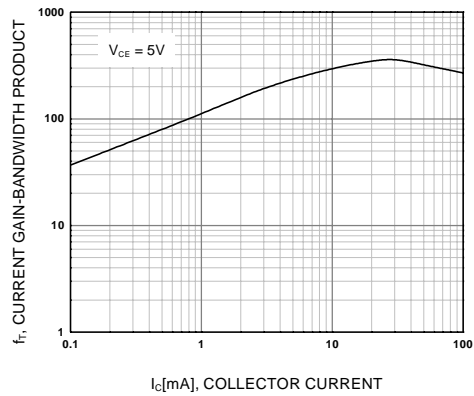


Figure 6. Current Gain Bandwidth Product

# Package Dimensions

BC237/238/239

## TO-92



Dimensions in Millimeters

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