

**Switching and Amplifier Applications**

.Low Noise:BC239



**NPN Epitaxial Silicon Transistor**

**Absolute Maximum Ratings Ta=25°C unless otherwise noted**

Symbol	Parameter	Value	Units
V <sub>CES</sub>	Collector-Emitter Voltage	:BC237	50
		:BC238/239	30
V <sub>CEO</sub>	Collector-Emitter Voltage	:BC237	45
		:BC238/239	25
V <sub>EBO</sub>	Emitter-Base Voltage	:BC237	6
		:BC238/239	5
I <sub>C</sub>	Collector Current(DC)	100	mA
P <sub>C</sub>	Collector Power Dissipation	500	mW
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>STG</sub>	Storage Temperature	-55~150	°C

**Electrical Characteristics Ta=25°C unless otherwise noted**

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
BV <sub>CEO</sub>	Collector-Emitter Breakdown :BC237 :BC238/239	I <sub>C</sub> =2mA, I <sub>B</sub> =0	45			V
			25			V
BV <sub>EBO</sub>	Emitter Base Breakdown Voltage :BC237 :BC238/239	I <sub>E</sub> =1μA, I <sub>C</sub> =0	6			V
			5			V
I <sub>CES</sub>	Collector Cut-off Current :BC237 :BC238/239	V <sub>CE</sub> =50V, V <sub>BE</sub> =0		0.2	15	nA
		V <sub>CE</sub> =30V, V <sub>BE</sub> =0		0.2	15	nA
h <sub>FE</sub>	DC Current Gain	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA	120		800	
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> =10mA, I <sub>B</sub> =0.5mA		0.07	0.2	V
		I <sub>C</sub> =100mA, I <sub>B</sub> =5mA		0.2	0.6	V
V <sub>BE(sat)</sub>	Collector-Base Saturation Voltage	I <sub>C</sub> =10mA, I <sub>B</sub> =0.5mA		0.73	0.83	V
		I <sub>C</sub> =100mA, I <sub>B</sub> =5mA		0.87	1.05	V
V <sub>BE(on)</sub>	Base-Emitter On Voltage	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA	0.55	0.62	0.7	V
f <sub>T</sub>	Current Gain Bandwidth Product	V <sub>CE</sub> =3V, I <sub>C</sub> =0.5mA, f=100MHz		85		MHz
		V <sub>CE</sub> =5V, I <sub>C</sub> =10mA, f=100MHz	150	250		MHz
C <sub>ob</sub>	Output Capacitance	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz		3.5	6	pF
C <sub>ib</sub>	Input Base Capacitance	V <sub>EB</sub> =0.5V, I <sub>C</sub> =0, f=1MHz		8		pF
NF	Noise Figure :BC237/238 :BC239 :BC239	V <sub>CE</sub> =5V, I <sub>C</sub> =0.2mA, F=1KHz, R <sub>G</sub> =2kΩ		2	10	dB
		V <sub>CE</sub> =5V, I <sub>C</sub> =0.2mA			4	dB
		R <sub>G</sub> =2k Ω, f=30-15kHz			4	dB

**h<sub>FE</sub> Classification**

Classification	A	B	C
h <sub>FE</sub>	120~220	180~460	380~800

**Typical Characteristics**

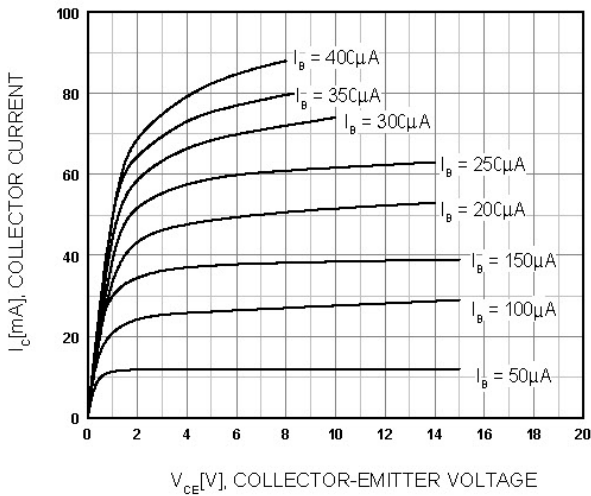


Figure 1. Static Characteristic

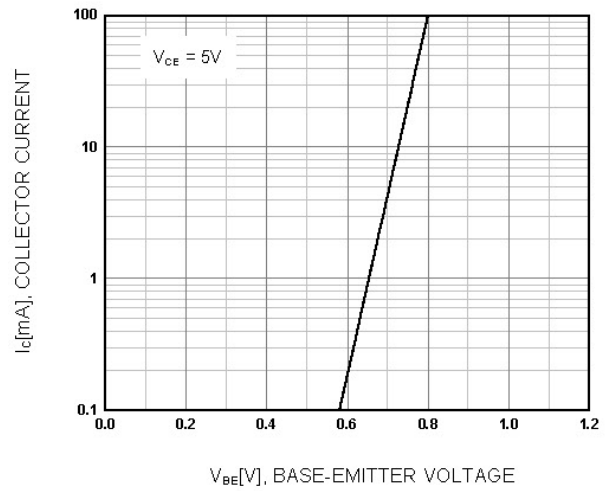


Figure 2. Transfer Characteristic

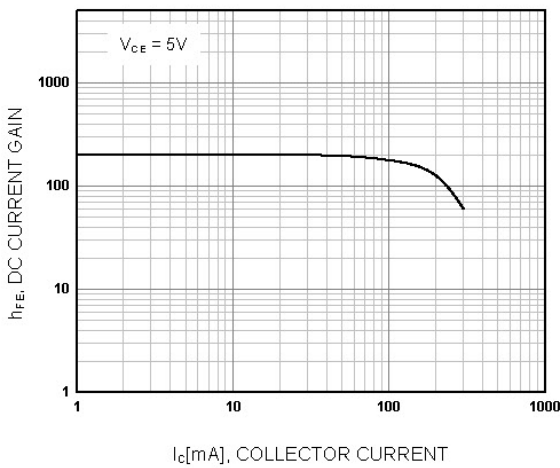


Figure 3. DC current Gain

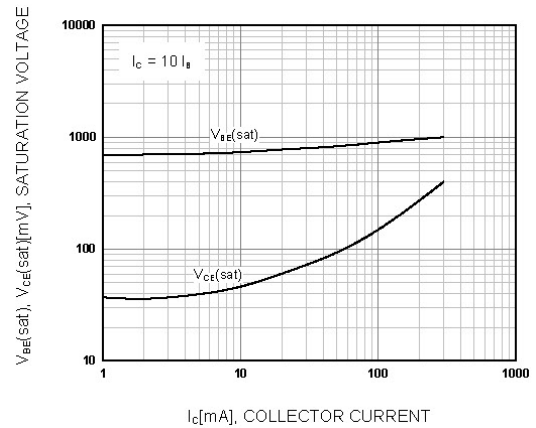


Figure 4. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

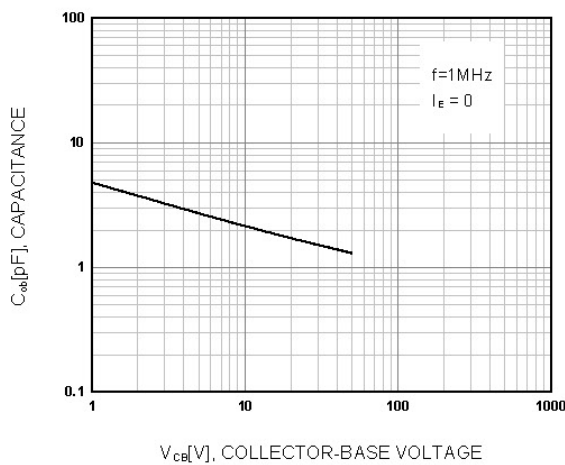


Figure 5. Output Capacitance

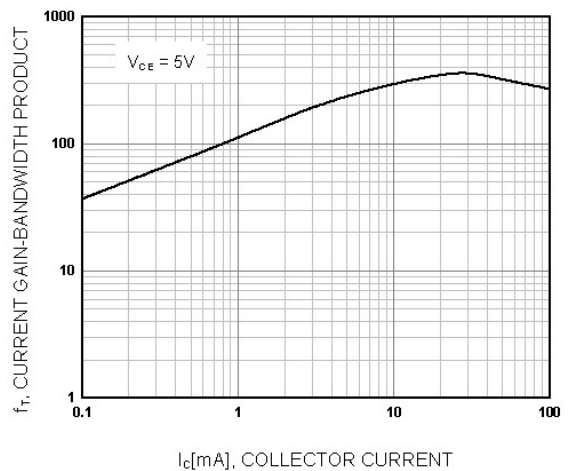


Figure 6. Current Gain Bandwidth Product

Package Dimensions

TO-92

