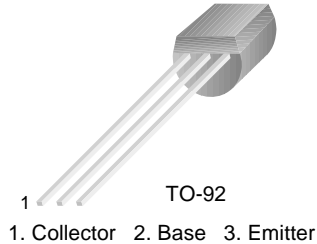


BC237/238/239

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

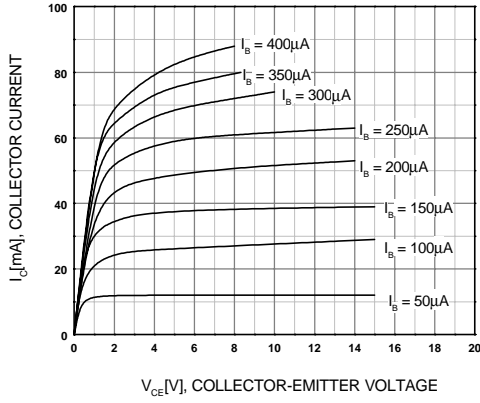


Figure 1. Static Characteristic

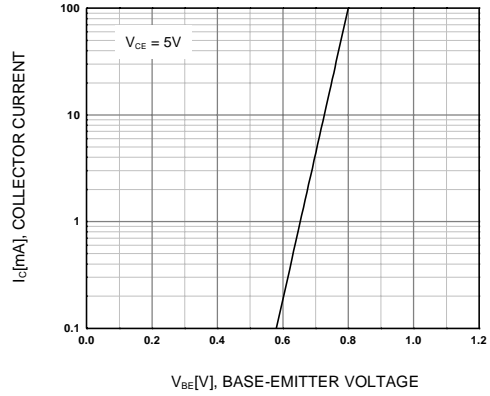


Figure 2. Transfer Characteristic

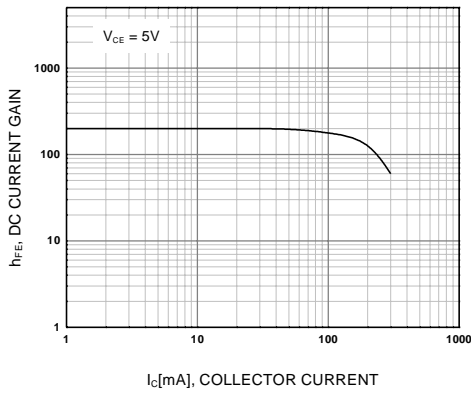


Figure 3. DC current Gain

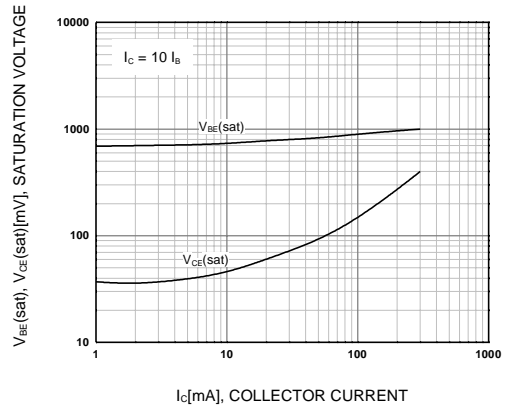


Figure 4. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

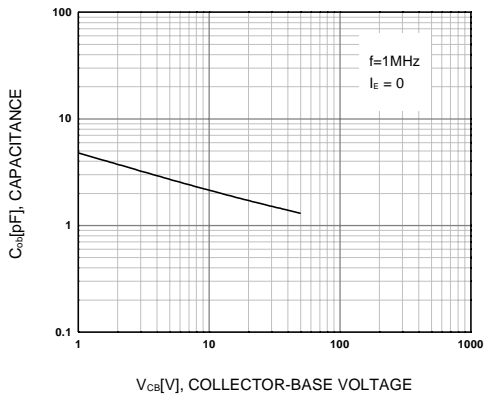


Figure 5. Output Capacitance

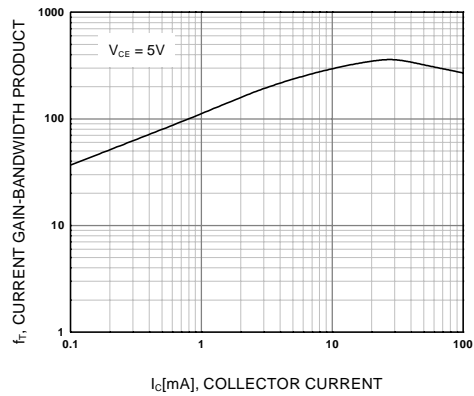
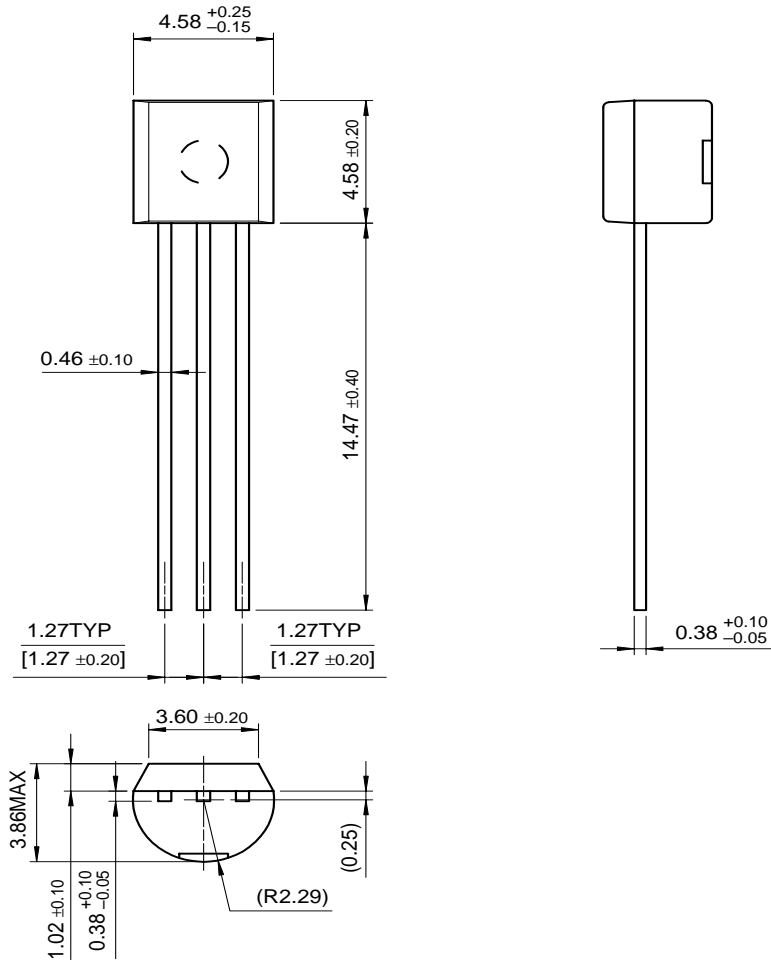


Figure 6. Current Gain Bandwidth Product

Package Dimensions

BC237/238/239

TO-92



Dimensions in Millimeters

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BC238

NPN Epitaxial Silicon Transistor

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Product	Product status	Pb-free Status	Pricing*	Package type	Leads	Packing method	Package Marking Convention**
BC238	Full Production	Full Production	\$0.0473	TO-92	3	BULK	Line 1: \$Y (Fairchild logo) &Z (Asm. Plant Code) &3 (3-Digit Date Code) Line 2: BC238
BC238A	Full Production	Full Production	\$0.0473	TO-92	3	BULK	Line 1: \$Y (Fairchild logo) &Z (Asm. Plant Code) &3 (3-Digit Date Code) Line 2: BC Line 3: 238A
BC238ABU	Full Production	Full Production	\$0.0238	TO-92	3	BULK	Line 1: BC238 Line 2: A Line 3: -&3
BC238ATA	Full Production		\$0.0238	TO-92	3	AMMO	Line 1: BC238 Line 2: A Line 3: -&3

		 Full Production					
BC238ATF	Full Production	 Full Production	\$0.0238	TO-92	3	TAPE REEL	Line 1: BC238 Line 2: A Line 3: -&3
BC238ATFR	Full Production	 Full Production	\$0.0238	TO-92	3	TAPE REEL	N/A
BC238BBU	Full Production	 Full Production	\$0.0238	TO-92	3	BULK	Line 1: BC238 Line 2: B Line 3: -&3
BC238BTA	Full Production	 Full Production	\$0.0238	TO-92	3	AMMO	Line 1: BC238 Line 2: B Line 3: -&3
BC238BU	Full Production	 Full Production	\$0.0238	TO-92	3	BULK	Line 1: BC238 Line 2: B Line 3: -&3
BC238CBU	Full Production	 Full Production	\$0.0238	TO-92	3	BULK	Line 1: BC238 Line 2: C Line 3: -&3
BC238CTA	Full Production	 Full Production	\$0.0238	TO-92	3	AMMO	Line 1: BC238 Line 2: C Line 3: -&3
BC238TAR	Full Production	 Full Production	\$0.0238	TO-92	3	AMMO	N/A
BC238TF	Full Production	 Full Production	\$0.0238	TO-92	3	TAPE REEL	Line 1: BC238 Line 3: -&3
BC238TFR	Full Production	 Full Production	\$0.0238	TO-92	3	TAPE REEL	Line 1: BC238 Line 3: -&3

* Fairchild 1,000 piece Budgetary Pricing

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Product
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