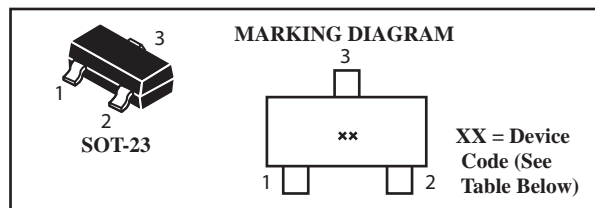
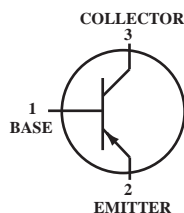


## General Purpose Transistor

### PNP Silicon

 Lead(Pb)-Free



### Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	BC856	-65
		BC857	-45
		BC858,BC859	-30
Collector-Base Voltage	V <sub>CBO</sub>	BC856	-80
		BC857	-50
		BC858,BC859	-30
Emitter-Base Voltage	V <sub>EBO</sub>	-5.0	V
Collector Current-Continuous	I <sub>C</sub>	-100	mAdc

### Thermal Characteristics

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board <sup>(1)</sup> (Note 1.) $T_A=25^\circ\text{C}$ Derate above $25^\circ\text{C}$	P <sub>D</sub>	225	mW
		1.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	R $\theta$ JA	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (Note 2.) $T_A=25^\circ\text{C}$ Derate above $25^\circ\text{C}$	P <sub>D</sub>	300	mW
		2.4	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	R $\theta$ JA	417	$^\circ\text{C}/\text{W}$
Junction and Storage, Temperature	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	$^\circ\text{C}$

1. FR-5=1.0 x 0.75 x 0.062 in. 2. Alumina=0.4 x 0.3 x 0.024 in. 99.5% alumina.

### Electrical Characteristics ( $T_A=25^\circ\text{C}$ Unless Otherwise noted)

Characteristics	Symbol	Min	Typ	Max	Unit
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### Off Characteristics

Collector-Emitter Breakdown Voltage (I <sub>C</sub> = -10mA)	BC856 Series BC857 Series BC858, BC859 Series	V <sub>(BR)CEO</sub>	-65 -45 -30	- - -	- - -	V
Collector-Emitter Breakdown Voltage (I <sub>C</sub> =-10 $\mu\text{A}$ , V <sub>EB</sub> =0)	BC856 Series BC857 Series BC858, BC859 Series	V <sub>(BR)CES</sub>	-80 -50 -30	- - -	- - -	V
Collector-Base Breakdown Voltage (I <sub>C</sub> =-10 $\mu\text{A}$ )	BC856 Series BC857 Series BC858, BC859 Series	V <sub>(BR)CBO</sub>	-80 -50 -30	- - -	- - -	V
Emitter-Base Breakdown Voltage (I <sub>E</sub> =-1.0 $\mu\text{A}$ )	BC856 Series BC857 Series BC858, BC859 Series	V <sub>(BR)EBO</sub>	-5.0 -5.0 -5.0	- - -	- - -	V
Collector Cutoff Current (V <sub>CB</sub> =-30V) (V <sub>CB</sub> =-30V, T <sub>A</sub> =150 $^\circ\text{C}$ )		I <sub>CBO</sub>	- -	- -	-15 -4.0	nA mA

**Electrical Characteristics** (TA=25°C Unless Otherwise noted)

Characteristics	Symbol	Min	Typ	Max	Unit
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**On Characteristics**

DC Current Gain (IC= -10uA, VCE=-5.0V)	BC856A, BC857A, BC858A BC856B, BC857B, BC858B BC858C	hFE	-	90	-	-
(IC= -2.0mA, VCE=-5.0V)	BC856A, BC857A, BC858A BC856B, BC857B, BC858B, BC859B BC857C, BC858C, BC859C		125	180	250	
			220	290	475	
			420	520	800	
Collector-Emitter Saturation Voltage (IC= -10mA, IB=-0.5mA)		VCE(sat)	-	-	-0.3	V
(IC= -100mA, IB=-5.0mA)			-	-	-0.65	
Base-Emitter Saturation Voltage (IC= -10mA, IB=-0.5mA)		VBE(sat)	-	-0.7	-	V
(IC= -100mA, IB=-5.0mA)			-	-0.9	-	
Base-Emitter On Voltage (IC= -10mA, IB=-0.5mA)		VBE(on)	-0.6	-	-0.75	V
(IC= -100mA, IB=-5.0mA)			-	-	-0.82	

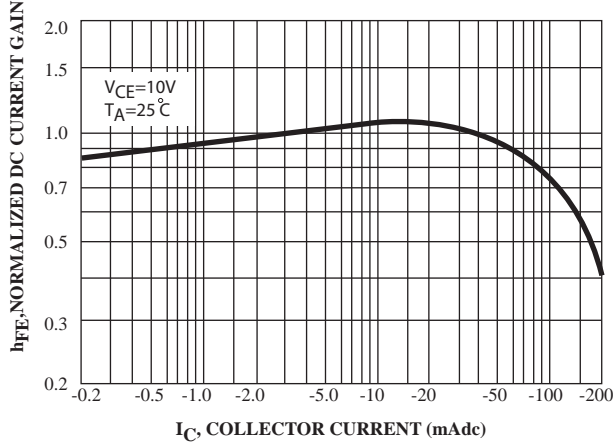
**Small-signal Characteristics**

Current-Gain-Bandwidth Product (IC= -10mA, VCE= -5.0VDC, f=100MHz)	fT	100	-	-	MHz
Output Capacitance (VCB= -10V, f=1.0MHz)	Cobo	-	-	4.5	pF
Noise Figure (IC= -0.2mA, VCE= -5.0Vdc, Rs=2.0kΩ, f=1.0kHz, BW=200Hz)	NF	-	-	10	dB
BC856, BC857, BC858 Series		-	-	4.0	
BC859, Series		-	-		

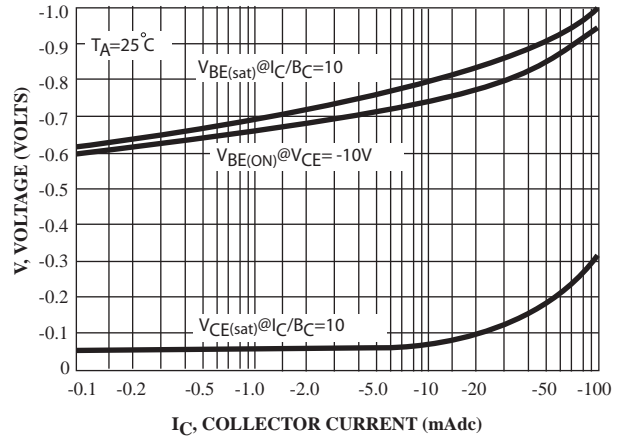
**Device Marking**

BC856A=3A; BC856B=3B; BC857A=3E; BC857B=3F; BC857C=3G BC858A=3J; BC858B=3K; BC858C=3L; BC859B=4B; BC859C=4C
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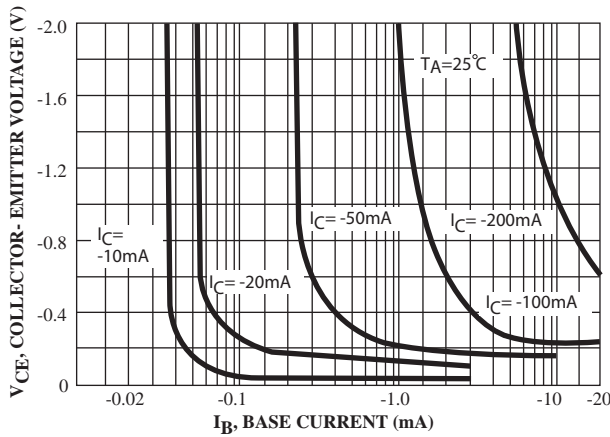
**BC857/BC858/BC859 Series**



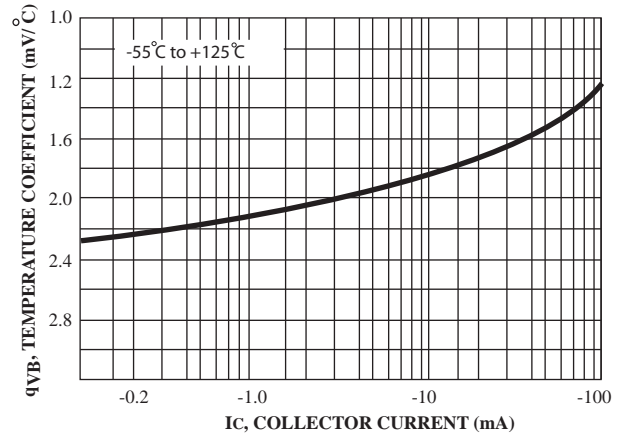
**Figure 1. Normalized DC Current Gain**



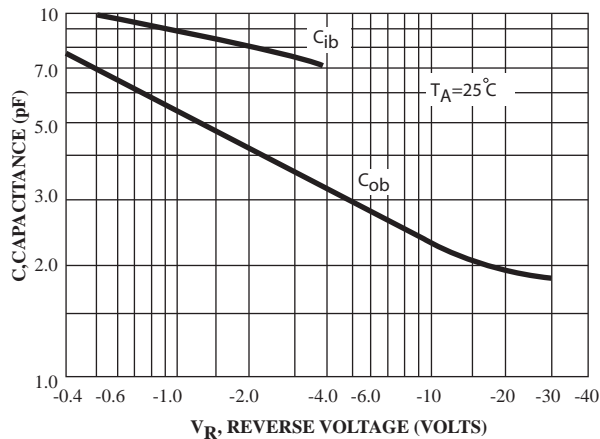
**Figure 2. "Saturation" and "On" Voltage**



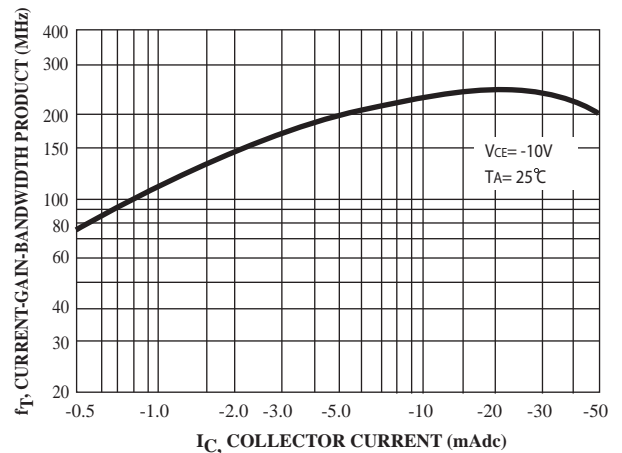
**Figure 3. Collector Saturation Region**



**Figure 4. Base-Emitter Temperature Coefficient**

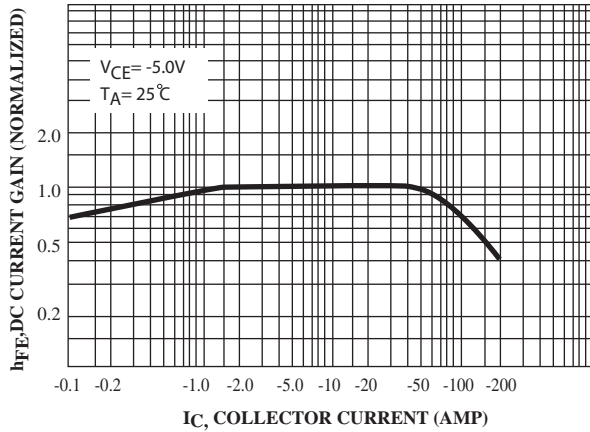


**Figure 5. Capacitances**

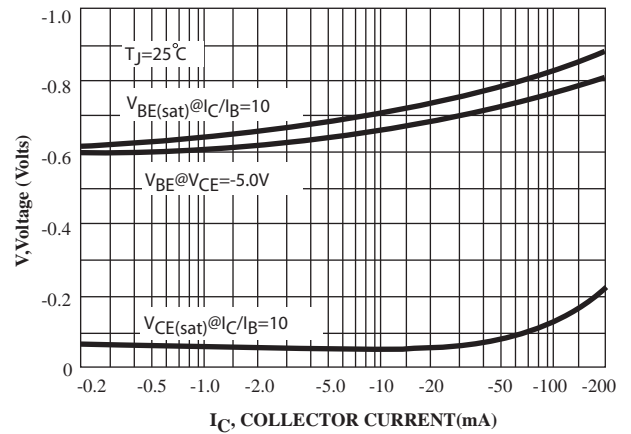


**Figure 6. Current-Gain- Bandwidth Product**

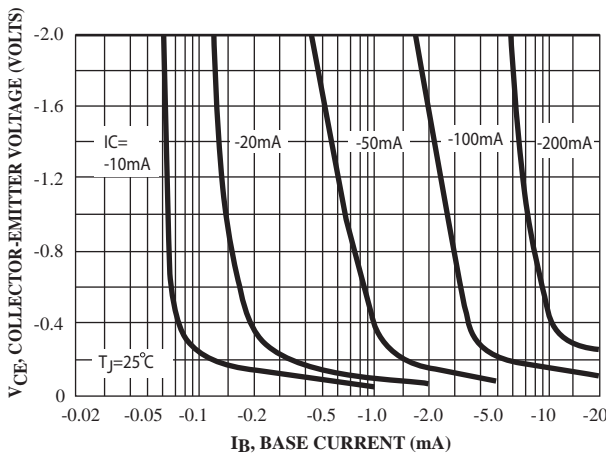
**BC856 Series**



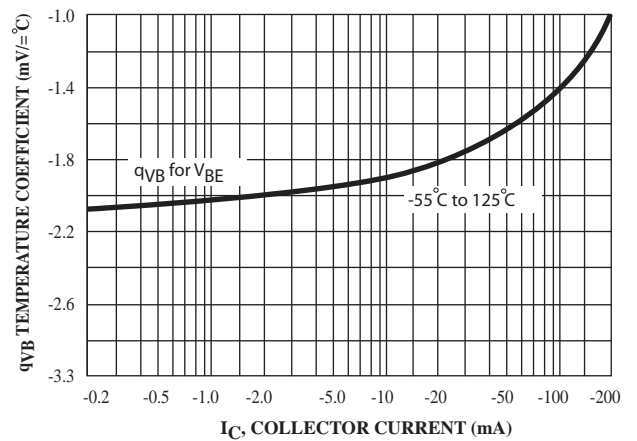
**Figure 7. DC Current Gain**



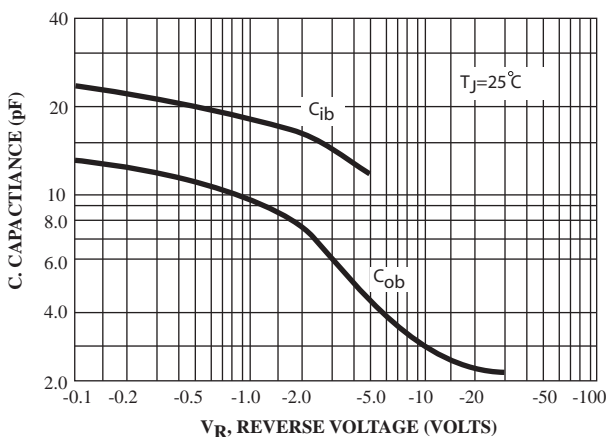
**Figure 8. "ON" Voltage**



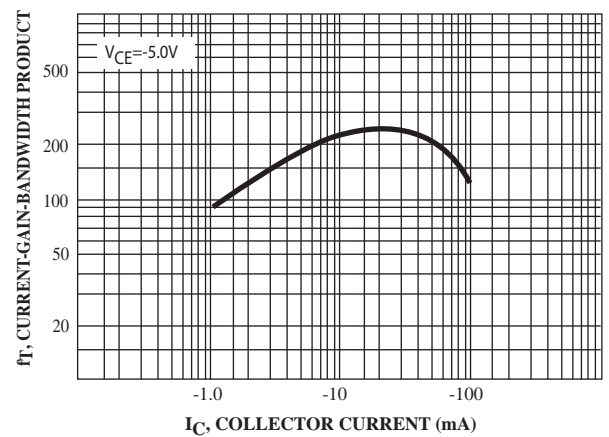
**Figure 9. Collector Saturation Region**



**Figure 10. Base-Emitter Temperature Coefficient**



**Figure 11. Capacitance**



**Figure 12. Current-Gain-Bandwidth Product**