

## General Purpose Transistor

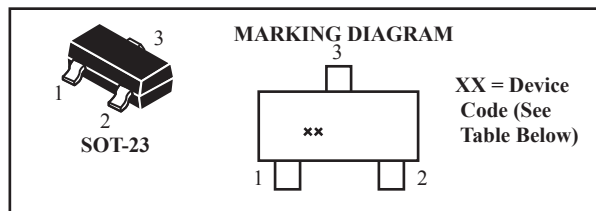
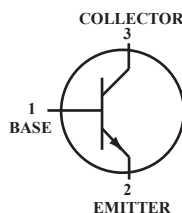
### NPN Silicon

 **Lead(Pb)-Free**

\*Moisture Sensitivity Level: 1

\*ESD Rating - Human Body Model:>4000V

-Machine Model:>400V



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

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC846	V <sub>CEO</sub>	65	V <sub>dc</sub>
BC847, BC850		45	
BC848, BC849		30	
Collector-Base Voltage BC846	V <sub>CBO</sub>	80	V <sub>dc</sub>
BC847, BC850		50	
BC848, BC849		30	
Emitter-Base Voltage BC846	V <sub>EBO</sub>	6.0	V <sub>dc</sub>
BC847, BC850		6.0	
BC848, BC849		5.0	
Collector Current-Continuous	I <sub>C</sub>	100	mA <sub>dc</sub>

### Thermal Characteristics

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

### Device Marking

BC846A=1A; BC846B=1B; BC847A=1E; BC847B=1F; BC847C=1G; BC848A=1J;  
BC848B;=1K; BC848C=1L; BC849B=2B; BC849C=2C; BC850B=2F; BC850C=2G

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 (TA=25°C Unless Otherwise noted)

Characteristics	Symbol	Min	Typ	Max	Unit
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### Off Characteristics

Collector-Emitter Breakdown Voltage (IC= 10mA)	BC846A,B BC847A,B,C BC850B.C BC848A,B,C BC849B,C	V(BR)CEO	65 45 30	- - -	- - -	V
Collector-Emitter Breakdown Voltage (IC=10 μA, VEB=0)	BC846A,B BC847A,B,C BC850B.C BC848A,B,C BC849B,C	V(BR)CES	80 50 30	- - -	- - -	V
Collector-Base Breakdown Voltage (IC=10 μA)	BC846A,B BC847A,B,C BC850B.C BC848A,B,C BC849B,C	V(BR)CBO	80 50 30	- - -	- - -	V
Emitter-Base Breakdown Voltage (IE=1.0 μA)	BC846A,B BC847A,B,C BC850B.C BC848A,B,C BC849B,C	V(BR)EBO	6.0 6.0 5.0	- - -	- - -	V
Collector Cutoff Current (VCB=30V) (VCB=30V, TA=150°C)		ICBO	- -	- -	15 5.0	nA mA

### On Characteristics

DC Current Gain (IC= 10μA, VCE=5.0V)	BC846A, BC847A, BC848A BC846B, BC847B, BC848B BC847C, BC848C	hFE	. . . . .	90 150 270	. . . . .	-
(IC= 2.0mA, VCE=5.0V)	BC846A, BC847A, BC848A BC846B, BC847B, BC848B BC849B, BC850B, BC847C, BC848C, BC849C, BC850C		110 200 420	180 290 520	220 450 800	
Collector-Emitter Saturation Voltage (IC= 10mA, IB=0.5mA) (IC= 100mA, IB=5.0mA)		VCE(sat)	- -	- -	0.25 0.6	V
Base-Emitter Saturation Voltage (IC= 10mA, IB=0.5mA) (IC= 100mA, IB=5.0mA)		VBE(sat)	- -	-0.7 -0.9	. .	V
Base-Emitter On Voltage (IC= 2.0mA, VCE=5.0V) (IC= 10mA, VCE=5.0V)		VBE(on)	580 .	660 .	700 770	V

### 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=2.0 kw, f=1.0 kHz, BW=200Hz)	BC846A,B, BC847A,B,C, BC848A,B,C, BC849B,C, BC850B,C	NF	- -	- -	10 4.0	dB

**BC847/BC848/BC849/BC850 Series**

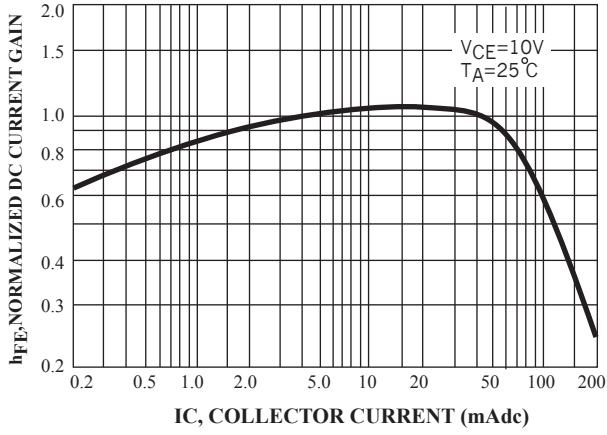


Figure 1. Normalized DC Current Gain

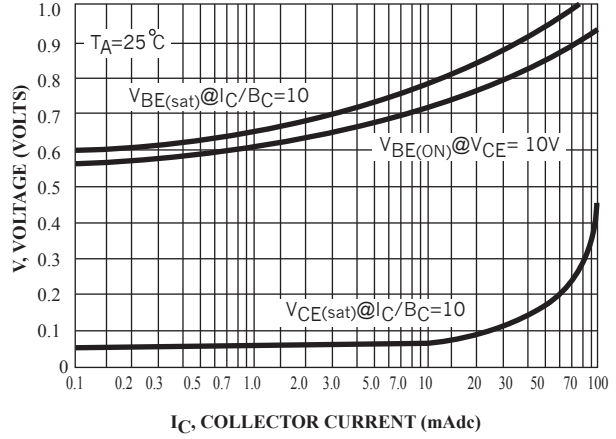


Figure 2. "Saturation" And "On" Voltage

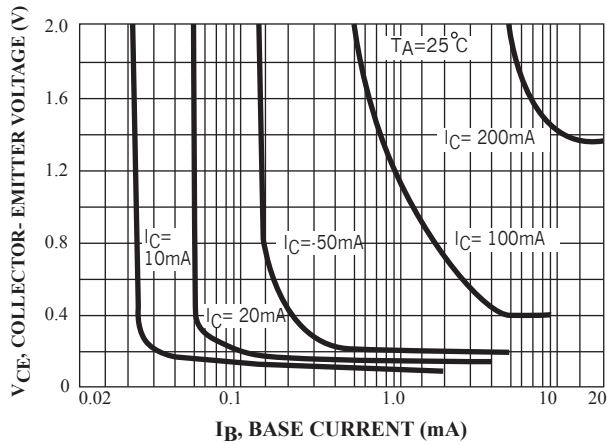


Figure 3. Collector Saturation Region

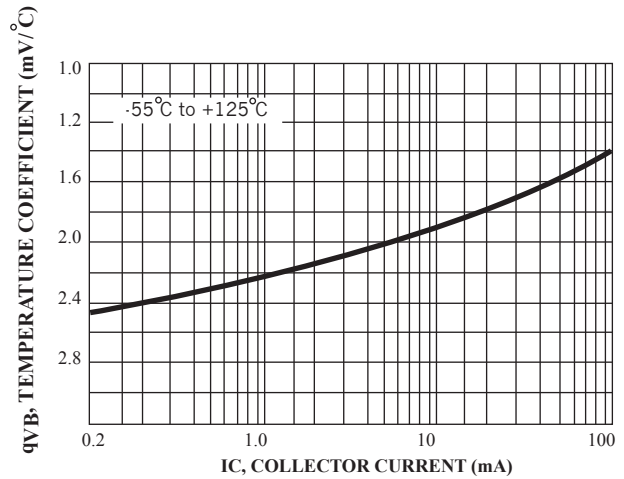


Figure 4. Base-Emitter Temperature Coefficient

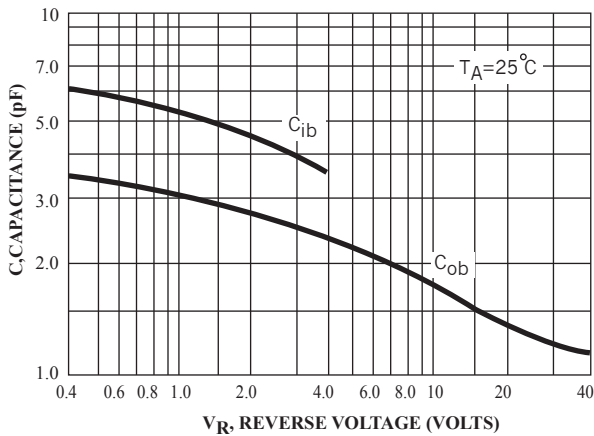


Figure 5. Capacitances

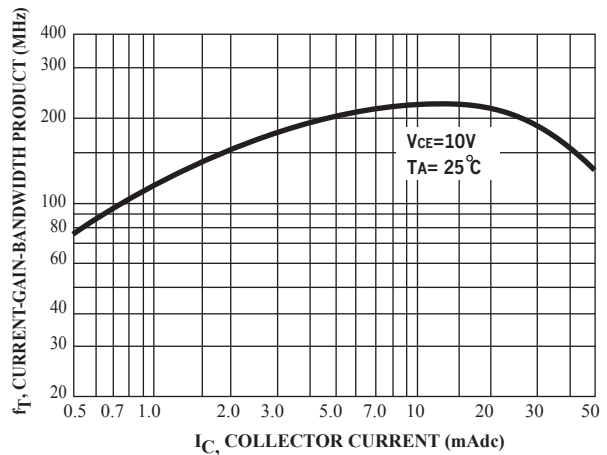
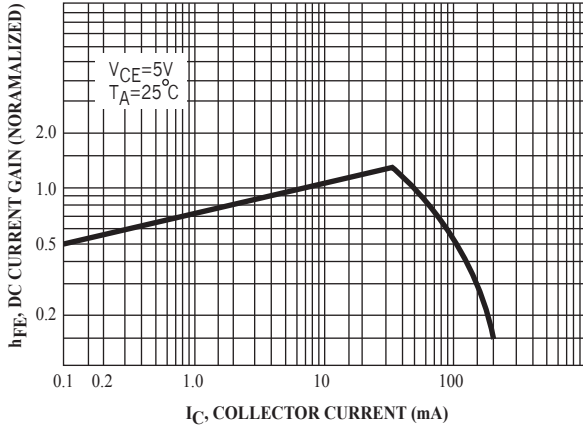
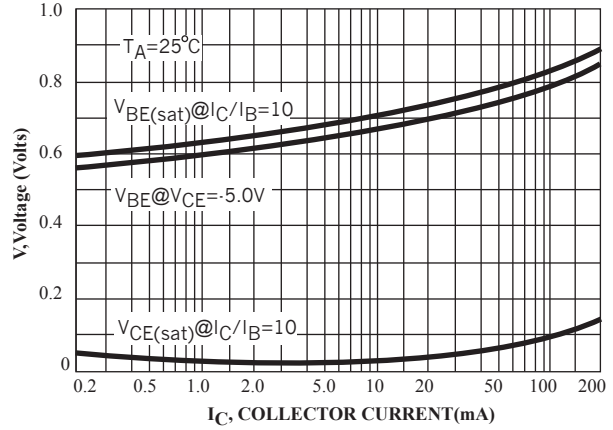


Figure 6. Current-Gain- Bandwidth Product

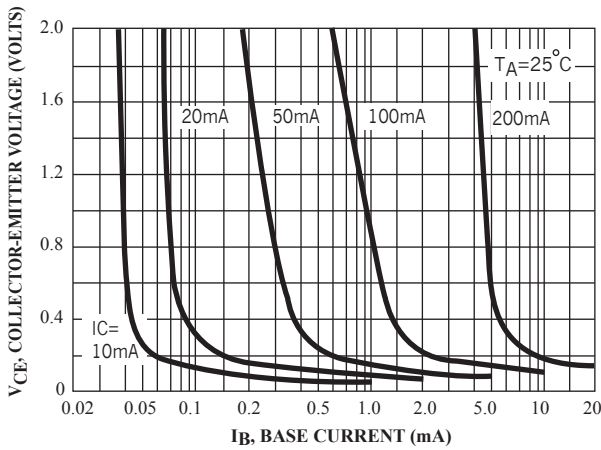
**BC846 Series**



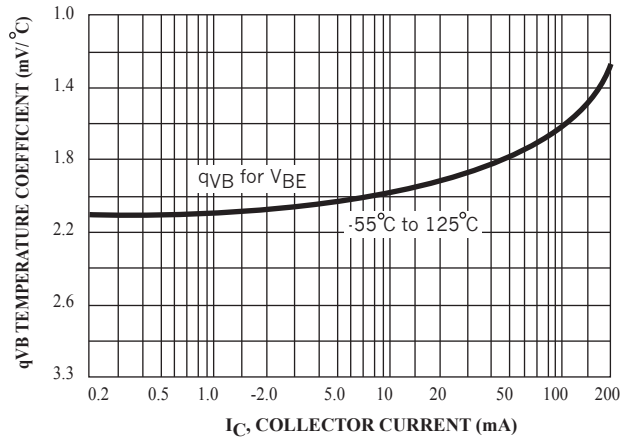
**Figure 7. DC Current Gain**



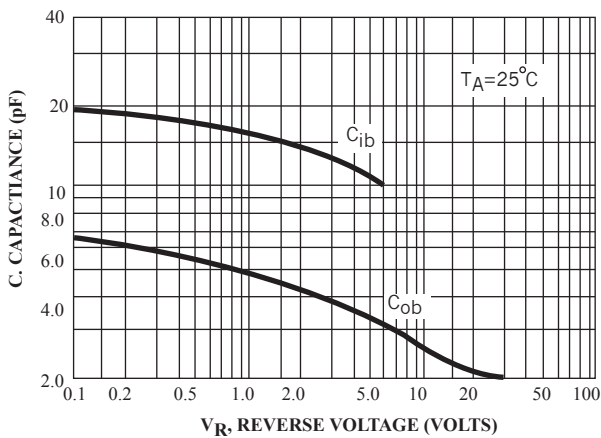
**Figure 8. "ON" Voltage**



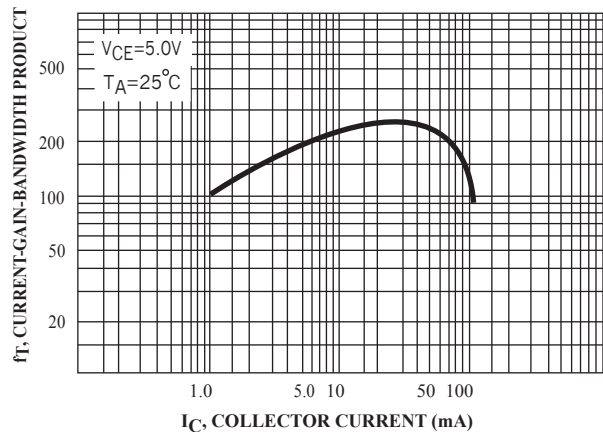
**Figure 9. Collector Saturation Region**



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



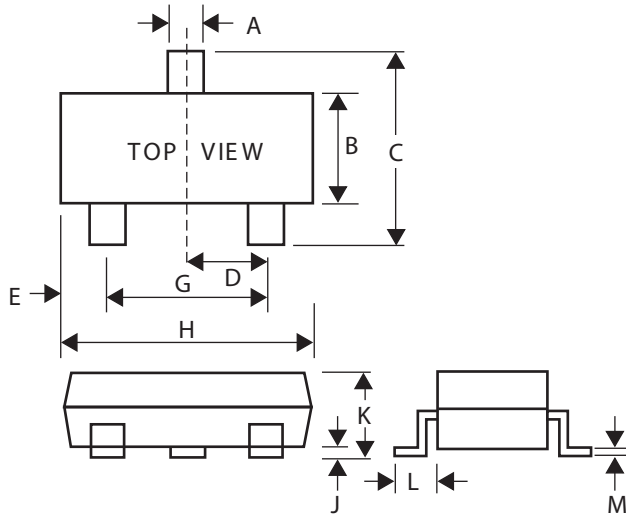
**Figure 11. Capacitance**



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

## SOT-23 Package Outline Dimensions

Unit:mm



Dim	Min	Max
A	0.35	0.51
B	1.19	1.40
C	2.10	3.00
D	0.85	1.05
E	0.46	1.00
G	1.70	2.10
H	2.70	3.10
J	0.01	0.13
K	0.89	1.10
L	0.30	0.61
M	0.076	0.25