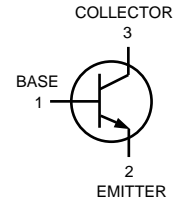
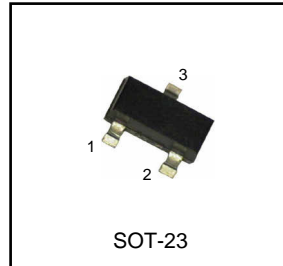


# General Purpose Transistor

## NPN Silicon

### BC847A,B,C



### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	45	V <sub>d</sub> c
Collector-Base Voltage	V <sub>CBO</sub>	50	V <sub>d</sub> c
Emitter-Base Voltage	V <sub>EBO</sub>	6.0	V <sub>d</sub> c
Collector Current-Continuous	I <sub>C</sub>	100	mA <sub>d</sub> c

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max.	Unit
Total Device Dissipation FR-5 Board <sup>(1)</sup> T <sub>A</sub> =25°C Derate above 25°C	P <sub>D</sub>	225 1.8	mW mW / °C
Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	556	°C / W
Total Device Dissipation Alumina Substrate, <sup>(2)</sup> T <sub>A</sub> =25°C Derate above 25°C	P <sub>D</sub>	300 2.4	mW mW / °C
Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	417	°C / W
Junction and Storage Temperature	T <sub>J</sub> ,T <sub>STG</sub>	-55 to +150	°C

### DEVICE MARKING

**BC847A=1E; BC847B=1F; BC847C=1G**

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Breakdowe Voltage ( I <sub>C</sub> =10mA )	V <sub>(BR)CEO</sub>	45	-	-	V <sub>d</sub> c
Collector-Emitter Breakdowe Voltage ( I <sub>C</sub> =10 uA, V <sub>EB</sub> =0 )	V <sub>(BR)CES</sub>	50	-	-	V <sub>d</sub> c
Collector-Base Breakdowe Voltage ( I <sub>C</sub> =10 uA )	V <sub>(BR)CBO</sub>	50	-	-	V <sub>d</sub> c
Emitter-Base Breakdowe Voltage ( I <sub>E</sub> =1.0 uA )	V <sub>(BR)EBO</sub>	6.0	-	-	V <sub>d</sub> c
Collector Cutoff Current ( V <sub>CB</sub> =30 V ) ( V <sub>CB</sub> =30 V, T <sub>A</sub> = 150°C )	I <sub>CBO</sub>	- -	- -	15 5.0	nA <sub>d</sub> c uA <sub>d</sub> c

(1) FR-5=1.0 x 0.75 x 0.062in.

(2) Alumina=0.4 x 0.3 x 0.024in. 99.5% alumina.

**ELECTRICAL CHARACTERISTICS** (TA=25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
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**ON CHARACTERISTICS**

DC Current Gain ( IC= 10 $\mu$ A, VCE= 5.0 V )  ( IC= 2.0 mA, VCE= 5.0 V )	BC847A	-	90	-	-
	BC847B	-	150	-	
	BC847C	-	270	-	
	HFE			220	
	BC847A	110	180		
	BC847B	200	290	450	
BC847C	420	520	800		
Collector-Emitter Saturation Voltage ( IC= 10 mA, IB= 0.5 mA ) ( IC= 100 mA, IB= 5.0 mA )	VCE(sat)	-	-	0.25 0.60	V
Base-Emitter Saturation Voltage ( IC= 10 mA, IB= 0.5 mA ) ( IC= 100 mA, IB= 5.0 mA )	VBE(sat)	-	0.7 0.9	-	V
Base-Emitter Voltage ( IC= 2.0 mA, VCE= 5.0V ) ( IC= 10 mA, VCE= 5.0V )	VBE(on)	580 -	660 -	700 770	mV

**SMALL-SIGNAL CHARACTERISTIC**

Current-Gain-Bandwidth Product ( IC= 10 mA, VCE= 5.0 V, f=100 MHz )	f <sub>T</sub>	100	-	-	MHz
Output Capacitance ( VCB= 10 V, f=1.0 MHz )	C <sub>obo</sub>	-	-	4.5	pF
Noise Figure ( VCE= 5.0 Vdc, IC= 0.2 mA, RS= 2.0k ohms, f=1.0 kHz, BW = 200Hz)	NF	-	-	10	dB

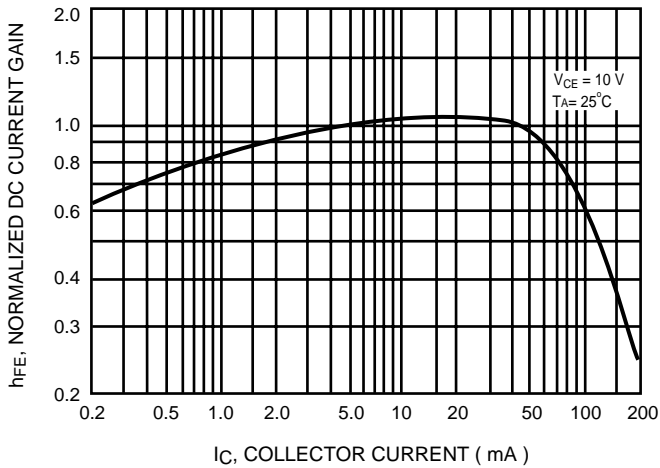


Figure 1. Normalized DC Current Gain

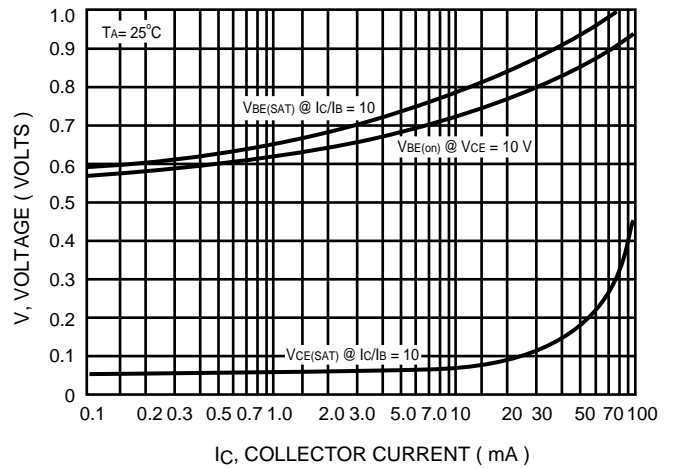


Figure 2. "Saturation" and "On" Voltage

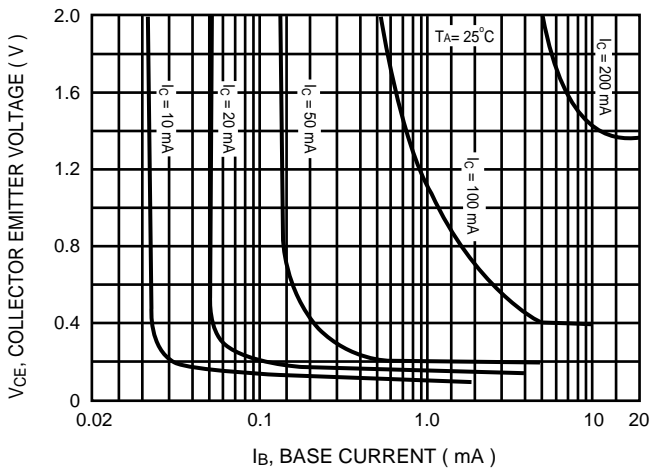


Figure 3. Collector Saturation Region

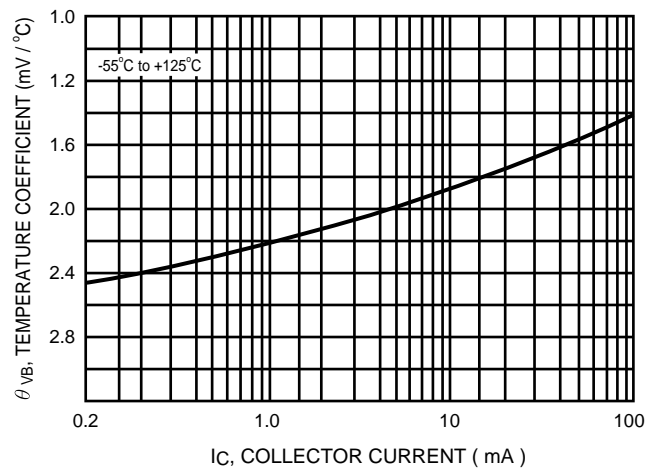


Figure 4. Base-Emitter Temperature Coefficient

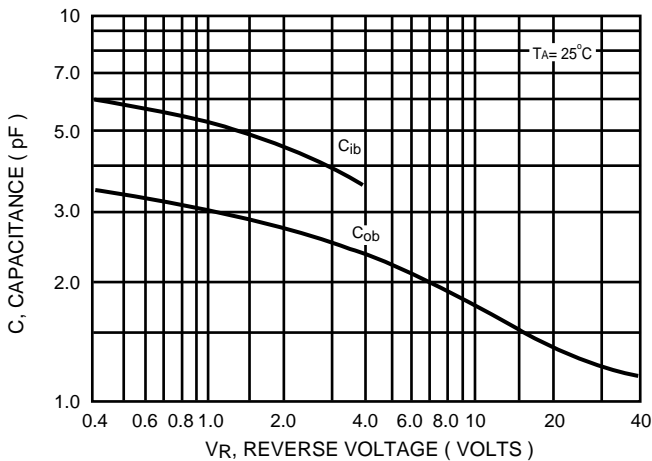


Figure 5. Capacitances

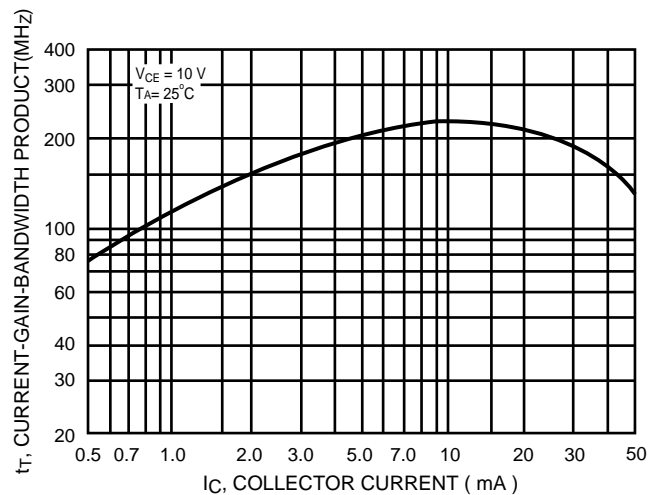


Figure 6. Current-Gain-Bandwidth Product

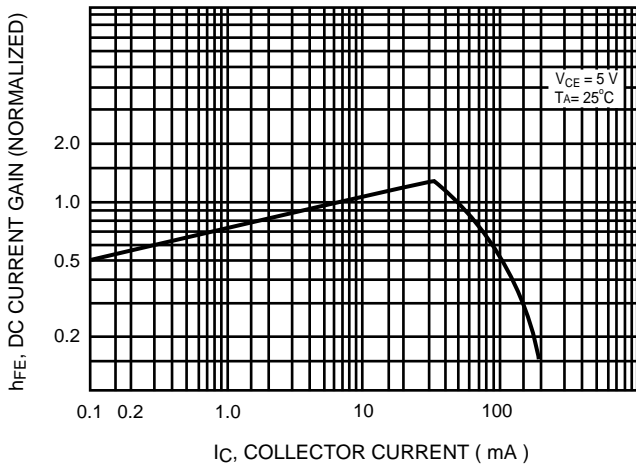


Figure 7. DC Current Gain

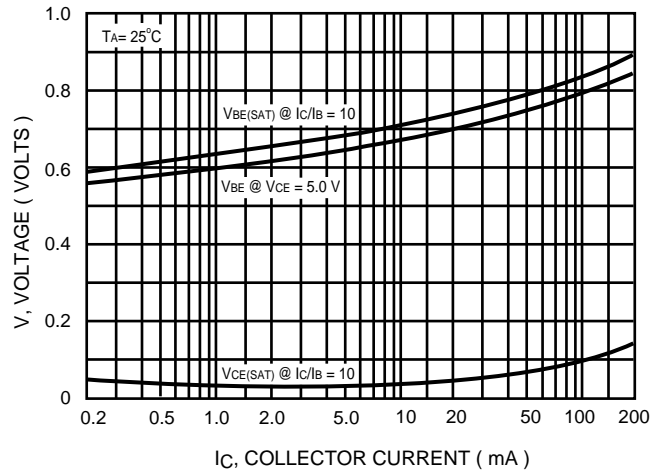


Figure 8. "On" Voltage

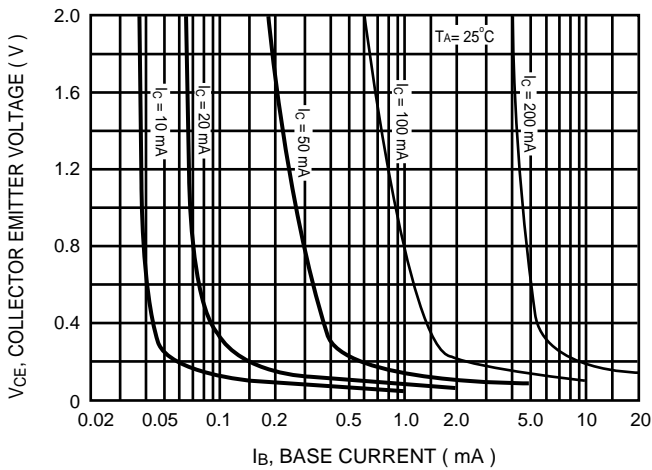


Figure 9. Collector Saturation Region

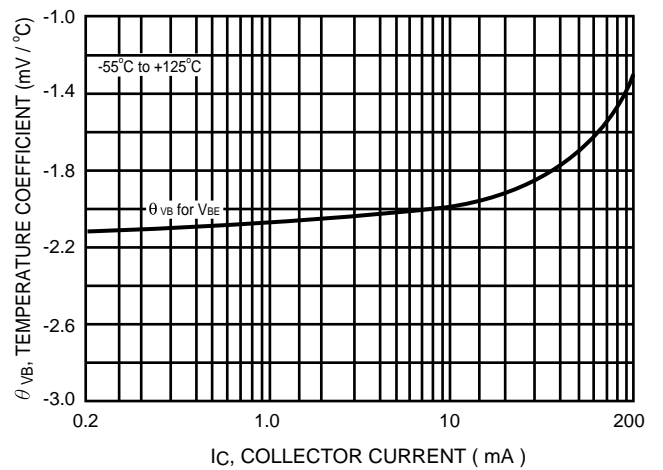


Figure 10. Base-Emitter Temperature Coefficient