

# General Purpose Transistors

## NPN Silicon

We declare that the material of product compliance with RoHS requirements. RoHS product for packing code suffix "G" Halogen free product for packing code suffix "H"

Moisture Sensitivity Level 1

### ORDERING INFORMATION

Device	Package	Shipping
BC84xWT1	SOT-323	3000/Tape&Reel

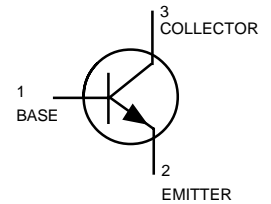


### MAXIMUM RATINGS

Rating	Symbol	BC846	BC847	BC848	Unit
Collector–Emitter Voltage	$V_{CEO}$	65	45	30	V
Collector–Base Voltage	$V_{CBO}$	80	50	30	V
Emitter–Base Voltage	$V_{EBO}$	6.0	6.0	5.0	V
Collector Current — Continuous	$I_C$	100	100	100	mAdc

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR–5 Board, (1) $T_A = 25^\circ\text{C}$	$P_D$	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	$^\circ\text{C}/\text{W}$
Total Device Dissipation	$P_D$	2.4	mW/ $^\circ\text{C}$
Junction and Storage Temperature	$T_J, T_{stg}$	–55 to +150	$^\circ\text{C}$



### DEVICE MARKING

**BC846AWT1= 1A; BC846BWT1 = 1B; BC847AWT1= 1E; BC847BWT1= 1F**  
**BC847CWT1= 1G; BC848AWT1 = 1J; BC848BWT1 = 1K; BC848CWT1 = 1L**

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage ( $I_C = 10\text{ mA}$ )	BC846 Series	65	—	—	v
	BC847 Series	45	—	—	
	BC848 Series	30	—	—	
Collector–Emitter Breakdown Voltage ( $I_C = 10\ \mu\text{A}, V_{EB} = 0$ )	BC846 Series	80	—	—	v
	BC847 Series	50	—	—	
	BC848 Series	30	—	—	
Collector–Base Breakdown Voltage ( $I_C = 10\ \mu\text{A}$ )	BC846 Series	80	—	—	v
	BC847 Series	50	—	—	
	BC848 Series	30	—	—	
Emitter–Base Breakdown Voltage ( $I_E = 1.0\ \mu\text{A}$ )	BC846 Series	6.0	—	—	v
	BC847 Series	6.0	—	—	
	BC848 Series	5.0	—	—	
Collector Cutoff Current ( $V_{CB} = 30\text{ V}$ ) ( $V_{CB} = 30\text{ V}, T_A = 150^\circ\text{C}$ )	$I_{CBO}$	—	—	15	nA
		—	—	5.0	$\mu\text{A}$

1.FR–5=1.0 x 0.75 x 0.062in

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ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = 10\ \mu\text{A}$ , $V_{CE} = 5.0\ \text{V}$ )	$h_{FE}$	—	90	—	—
BC846A, BC847A, BC848A		—	150	—	—
BC846B, BC847B, BC848B BC847C, BC848C		—	270	—	—
( $I_C = 2.0\ \text{mA}$ , $V_{CE} = 5.0\ \text{V}$ )	$h_{FE}$	110	180	220	—
BC846A, BC847A, BC848A		200	290	450	—
BC846B, BC847B, BC848B BC847C, BC848C		420	520	800	—
Collector–Emitter Saturation Voltage ( $I_C = 10\ \text{mA}$ , $I_B = 0.5\ \text{mA}$ ) ( $I_C = 100\ \text{mA}$ , $I_B = 5.0\ \text{mA}$ )	$V_{CE(sat)}$	—	—	0.25 0.6	V
Base–Emitter Saturation Voltage ( $I_C = 10\ \text{mA}$ , $I_B = 0.5\ \text{mA}$ ) ( $I_C = 100\ \text{mA}$ , $I_B = 5.0\ \text{mA}$ )	$V_{BE(sat)}$	—	0.7 0.9	—	V
Base–Emitter Voltage ( $I_C = 2.0\ \text{mA}$ , $V_{CE} = 5.0\ \text{V}$ ) ( $I_C = 10\ \text{mA}$ , $V_{CE} = 5.0\ \text{V}$ )	$V_{BE(on)}$	580	660	700 770	mV

## SMALL-SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product ( $I_C = 10\ \text{mA}$ , $V_{CE} = 5.0\ \text{Vdc}$ , $f = 100\ \text{MHz}$ )	$f_T$	100	—	—	MHz
Output Capacitance ( $V_{CB} = 10\ \text{V}$ , $f = 1.0\ \text{MHz}$ )	$C_{obo}$	—	—	4.5	pF
Noise Figure ( $I_C = 0.2\ \text{mA}$ , $V_{CE} = 5.0\ \text{Vdc}$ , $R_S = 2.0\ \text{k}\Omega$ , $f = 1.0\ \text{kHz}$ , $BW = 200\ \text{Hz}$ )	NF	—	—	10 4.0	dB

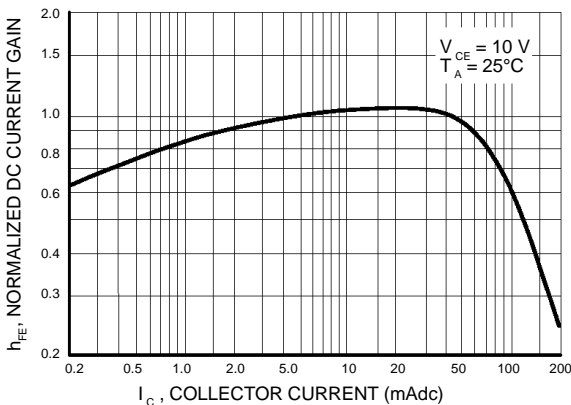


Figure 1. Normalized DC Current Gain

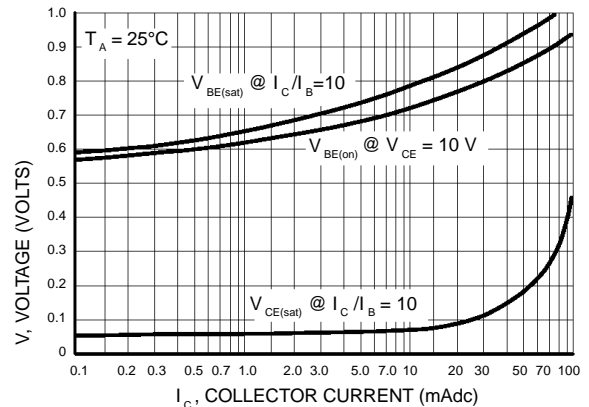


Figure 2. "Saturation" and "On" Voltages

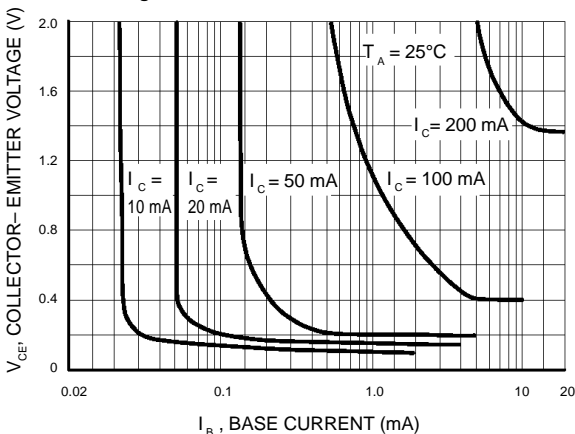


Figure 3. Collector Saturation Region

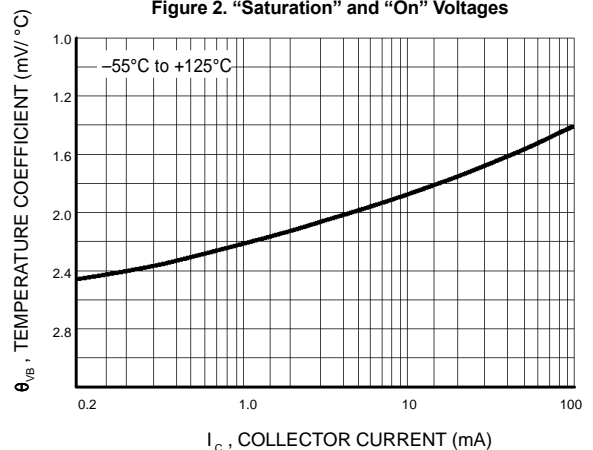


Figure 4. Base–Emitter Temperature Coefficient

# General Purpose Transistors

## BC847 / BC848

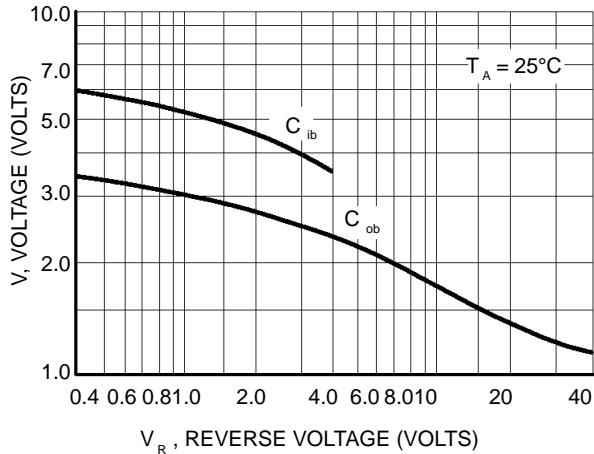


Figure 5. Capacitances

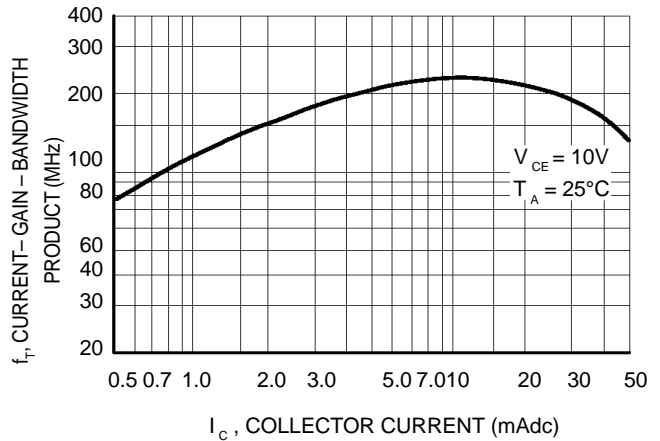


Figure 6. Current-Gain - Bandwidth Product

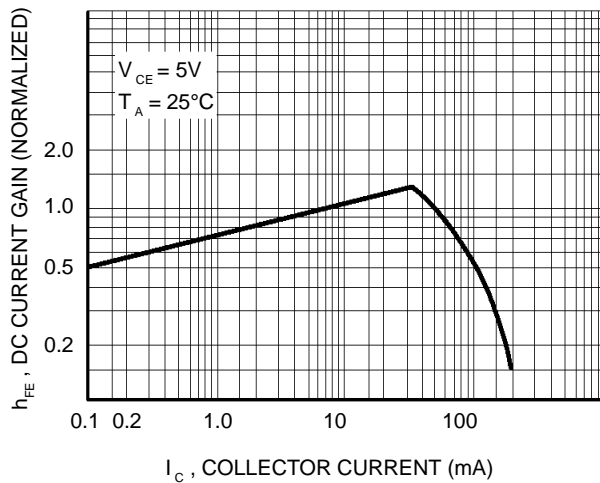


Figure 7. DC Current Gain

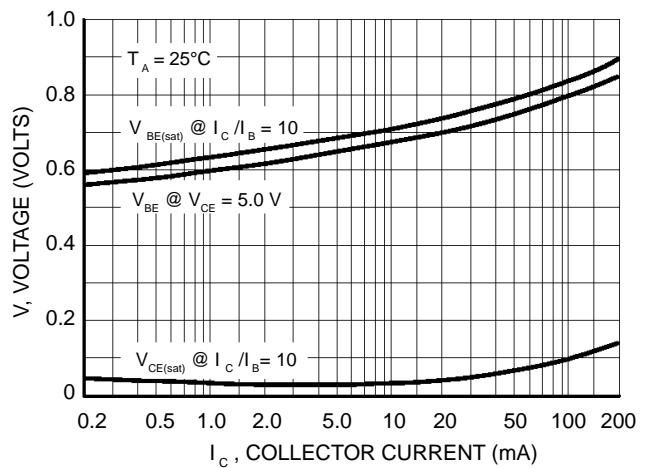


Figure 8. "On" Voltage

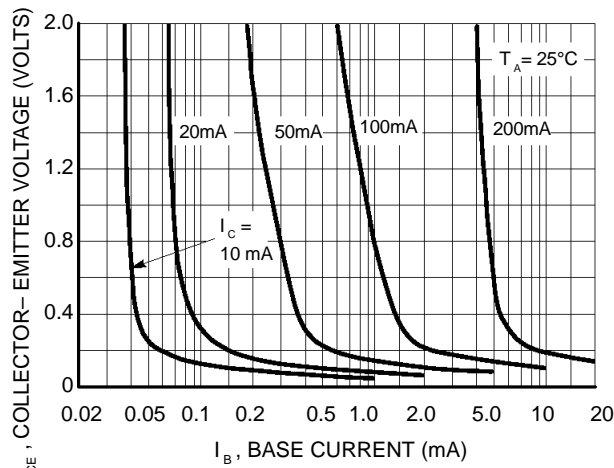


Figure 9. Collector Saturation Region

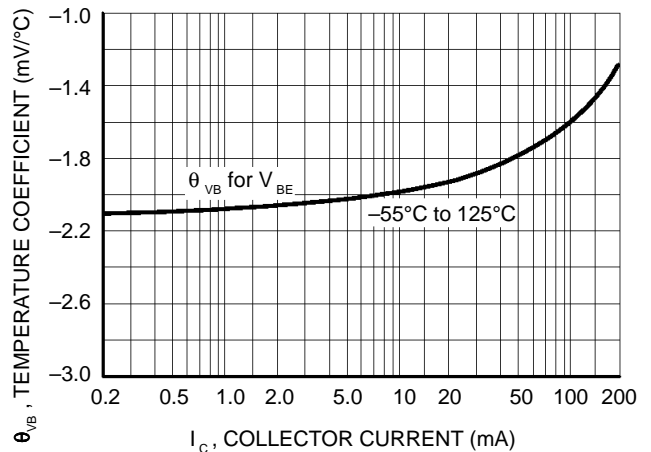
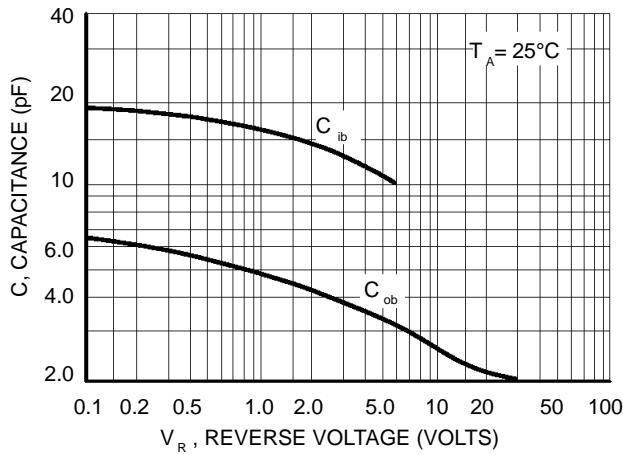


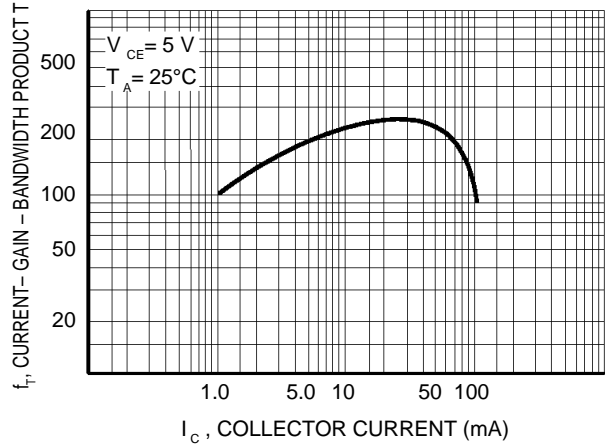
Figure 10. Base-Emitter Temperature Coefficient

**General Purpose Transistors**

**BC846**



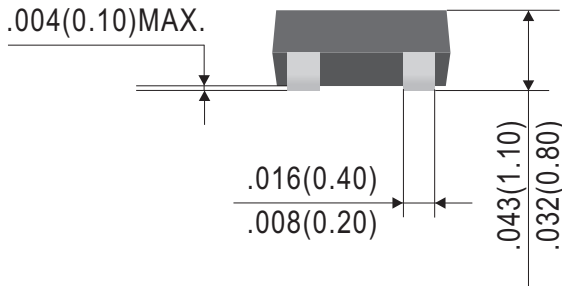
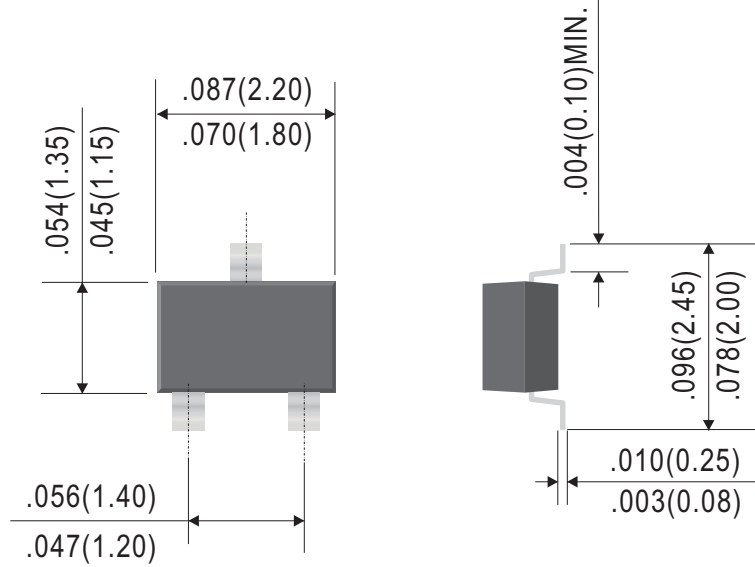
**Figure 11. Capacitance**



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

**General Purpose Transistors**

**SOT-323**



Dimensions in inches and (millimeters)

## General Purpose Transistors

**BC846A/BWT1**  
**BC847A/B/CWT1**  
**BC848A/B/CWT1**

### Ordering Information:

Device PN	Packing
Part Number G <sup>(1)</sup> -WS	Tape&Reel: 3 Kpcs/Reel

Note: (1) RoHS product for packing code suffix "G" ; Halogen free product for packing code suffix "H"

### **\*\*\*Disclaimer\*\*\***

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