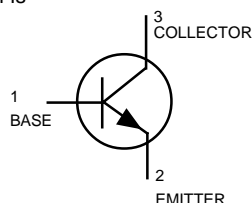


# General Purpose Transistors

## NPN Silicon

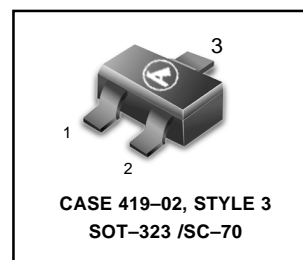
These transistors are designed for general purpose amplifier applications. They are housed in the SOT-323/SC-70 which is designed for low power surface mount applications.



**BC846AWT1,BWT1  
BC847AWT1,BWT1  
CWT1  
BC848AWT1,BWT1  
CWT1**

### 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	$V_{(BR)CEO}$	45	—	
	BC848 Series	30	—	—	
Collector-Emitter Breakdown Voltage ( $I_C = 10\ \mu\text{A}, V_{EB} = 0$ )	BC846 Series	80	—	—	v
	BC847 Series	$V_{(BR)CES}$	50	—	
	BC848 Series	30	—	—	
Collector-Base Breakdown Voltage ( $I_C = 10\ \mu\text{A}$ )	BC846 Series	80	—	—	v
	BC847 Series	$V_{(BR)CBO}$	50	—	
	BC848 Series	30	—	—	
Emitter-Base Breakdown Voltage ( $I_E = 1.0\ \mu\text{A}$ )	BC846 Series	6.0	—	—	v
	BC847 Series,	$V_{(BR)EBO}$	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

**BC846AWT1,BWT1 BC847AWT1,BWT1 CWT1 BC848AWT1,BWT1,CWT1**

**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	—	—
( $I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V}$ )		—	150	—	—
		—	270	—	—
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	V
		—	—	0.6	
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	—	V
		—	0.9	—	
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	mV
		—	—	770	

**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	dB
		—	—	4.0	

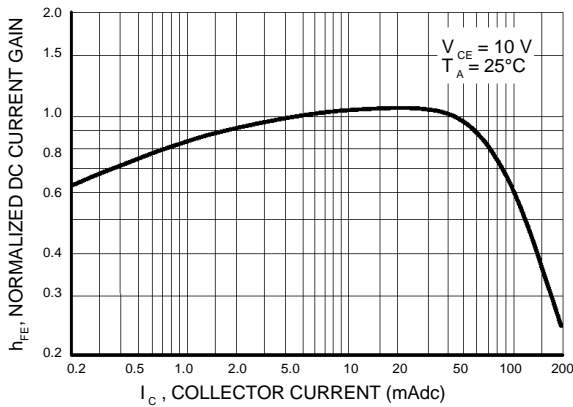


Figure 1. Normalized DC Current Gain

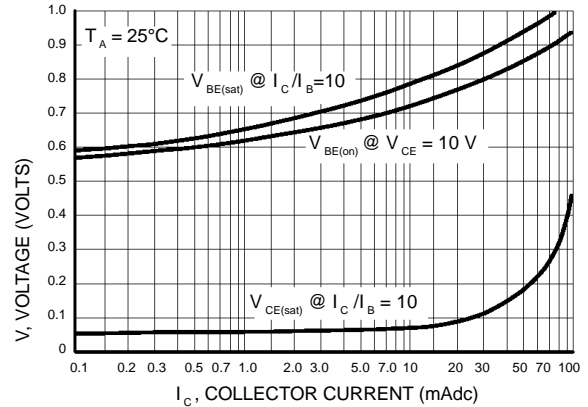


Figure 2. “Saturation” and “On” Voltages

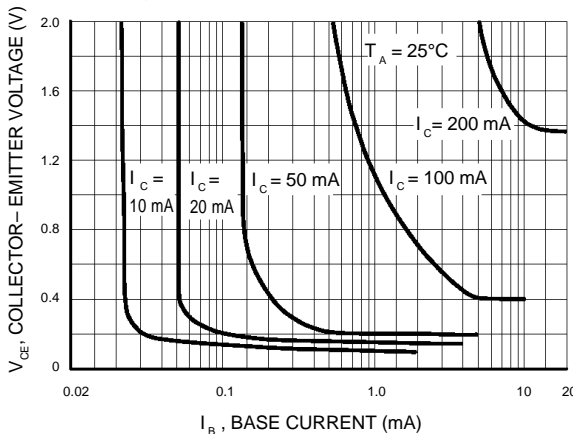


Figure 3. Collector Saturation Region

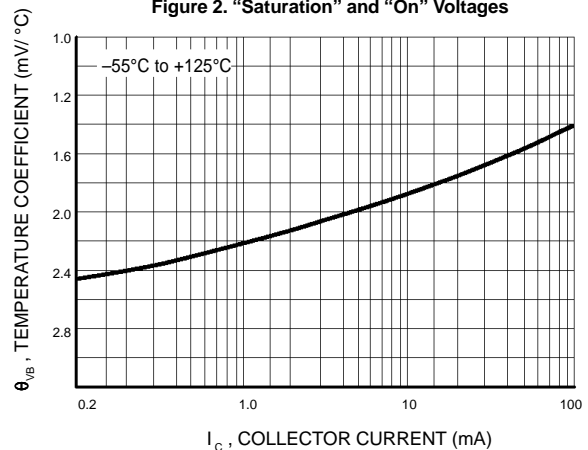


Figure 4. Base–Emitter Temperature Coefficient

BC846AWT1, BWT1 BC847AWT1, BWT1, CWT1 BC848AWT1, BWT1, CWT1

BC847/BC848

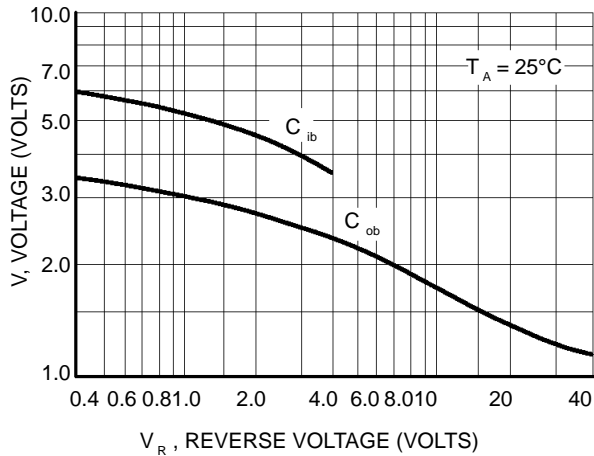


Figure 5. Capacitances

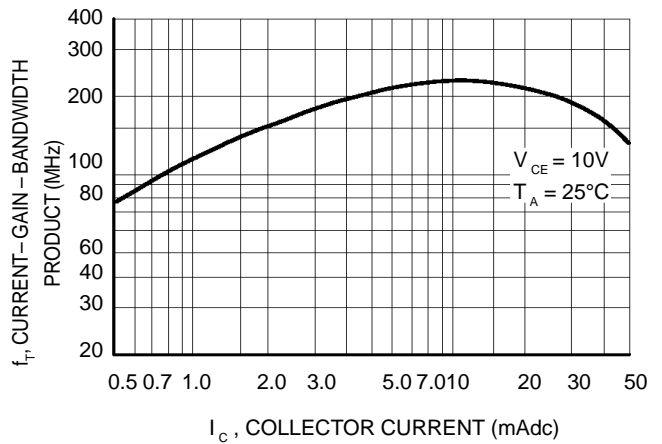


Figure 6. Current-Gain - Bandwidth Product

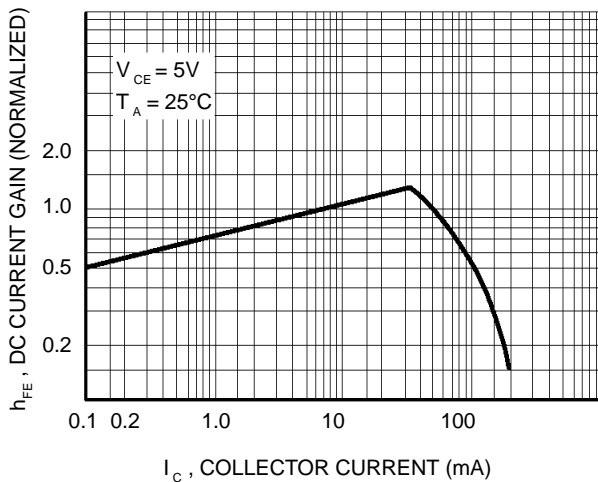


Figure 7. DC Current Gain

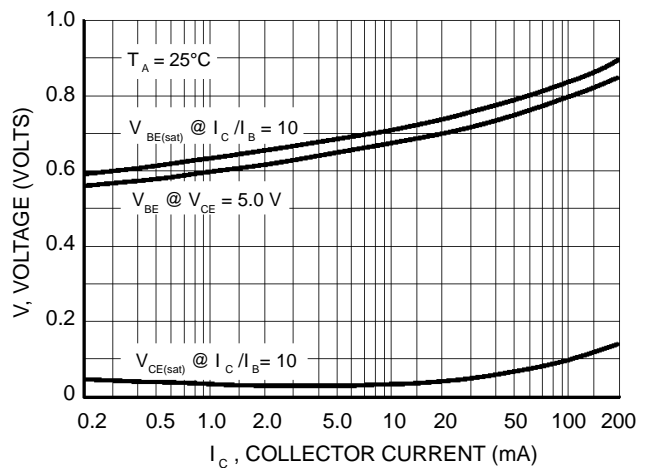


Figure 8. "On" Voltage

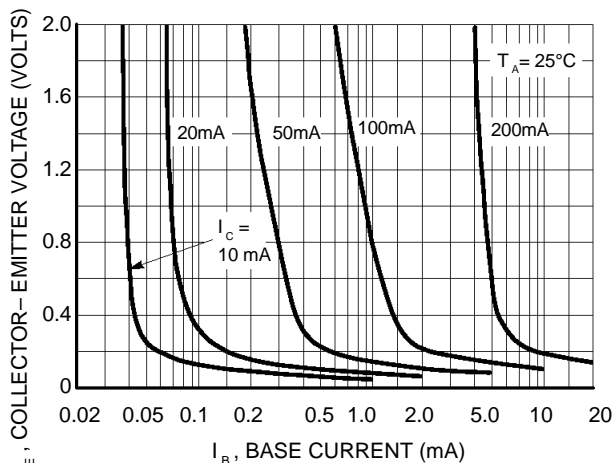


Figure 9. Collector Saturation Region

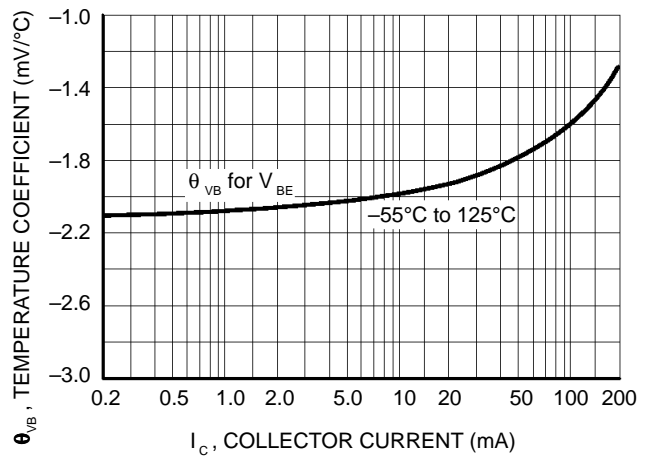


Figure 10. Base-Emitter Temperature Coefficient

BC846AWT1, BWT1 BC847AWT1, BWT1, CWT1 BC848AWT1, BWT1, CWT1

BC846

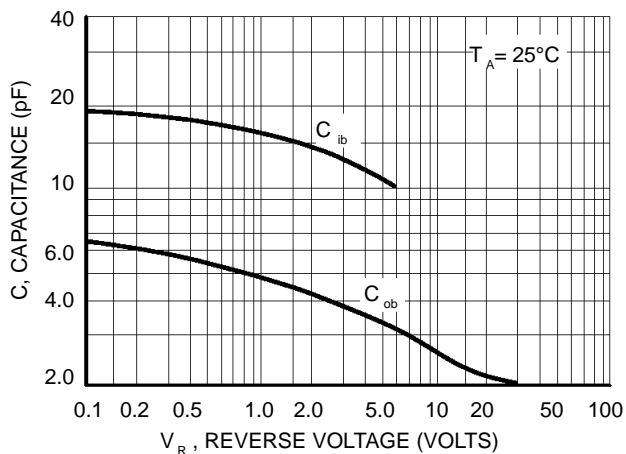


Figure 11. Capacitance

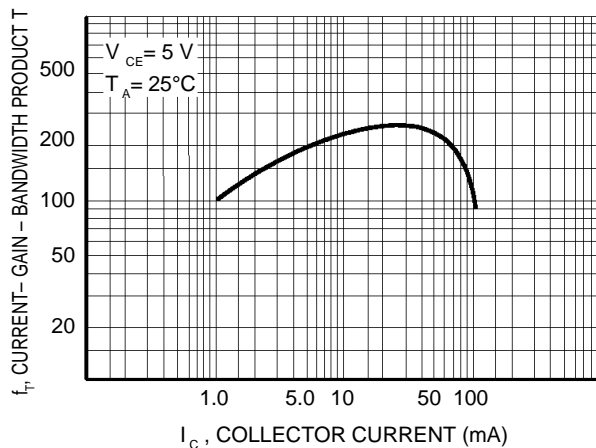


Figure 12. Current-Gain - Bandwidth Product