



DATA SHEET

SEMICONDUCTOR

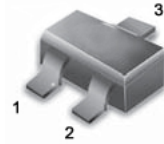
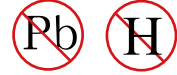
BC846-7-8-A-B-CW

General Purpose Transistors NPN Silicon

We declare that the material of product compliance with RoHS requirements.

ORDERING INFORMATION (Pb-Free)

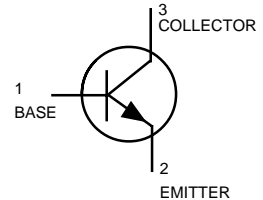
Device	Package	Shipping
BC846,847,848 AW,BW,CW	SOT-323	3000/Tape&Reel



SOT-323 /SC-70

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

BC846AW = 1A; BC846BW = 1B; BC847AW = 1E; BC847BW = 1F;
BC847CW = 1G; BC848AW = 1J; BC848BW = 1K; BC848CW = 1L;

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 10\text{ mA}$)	BC846 Series	$V_{(BR)CEO}$	65	—	—	v
	BC847 Series		45	—	—	
	BC848 Series		30	—	—	
Collector-Emitter Breakdown Voltage ($I_C = 10\ \mu\text{A}, V_{EB} = 0$)	BC846 Series	$V_{(BR)CES}$	80	—	—	v
	BC847 Series		50	—	—	
	BC848 Series		30	—	—	
Collector-Base Breakdown Voltage ($I_C = 10\ \mu\text{A}$)	BC846 Series	$V_{(BR)CBO}$	80	—	—	v
	BC847 Series		50	—	—	
	BC848 Series		30	—	—	
Emitter-Base Breakdown Voltage ($I_E = 1.0\ \mu\text{A}$)	BC846 Series	$V_{(BR)EBO}$	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	μA

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

DEVICE CHARACTERISTICS

BC846-7-8-A-B-CW

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = 10\ \mu\text{A}$, $V_{CE} = 5.0\ \text{V}$)	h_{FE}	—	90	—	—
		—	150	—	—
		—	270	—	—
($I_C = 2.0\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$)		110	180	220	
		200	290	450	
		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

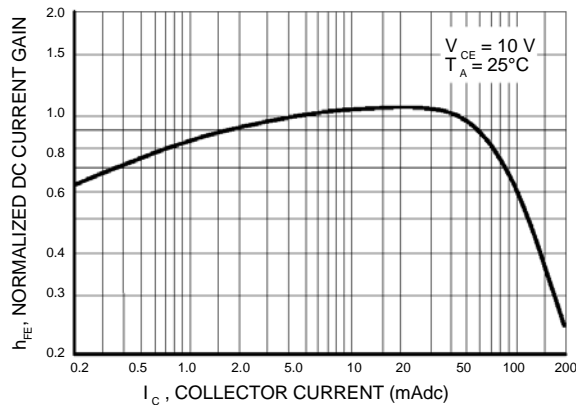


Figure 1. Normalized DC Current Gain

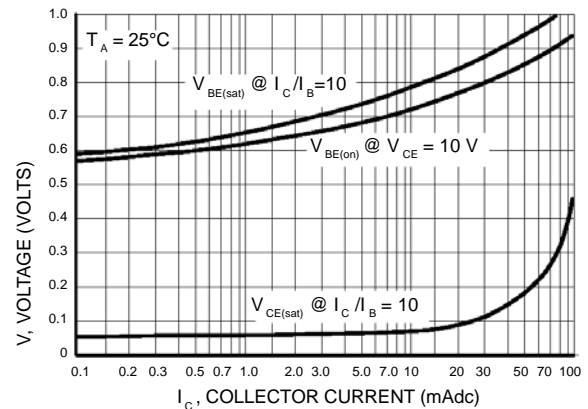


Figure 2. "Saturation" and "On" Voltages

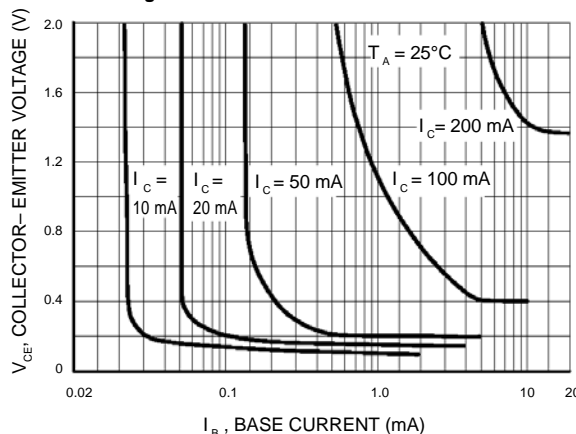


Figure 3. Collector Saturation Region

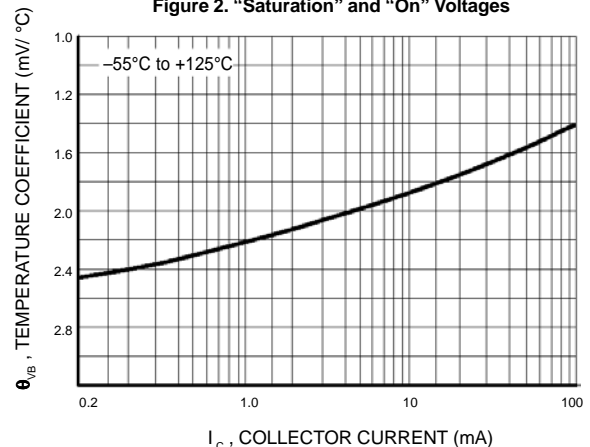


Figure 4. Base–Emitter Temperature Coefficient

DEVICE CHARACTERISTICS

BC846-7-8-A-B-CW

BC846

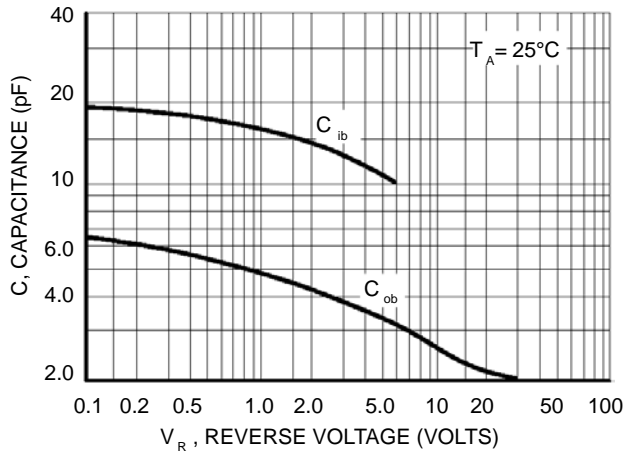


Figure 11. Capacitance

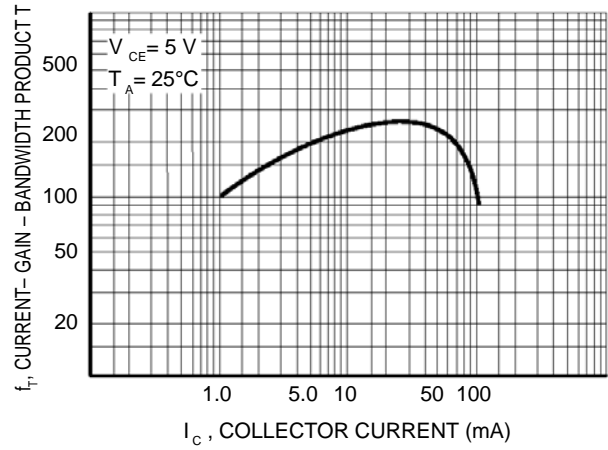


Figure 12. Current-Gain - Bandwidth Product

DEVICE CHARACTERISTICS

BC846-7-8-A-B-CW

BC847/BC848

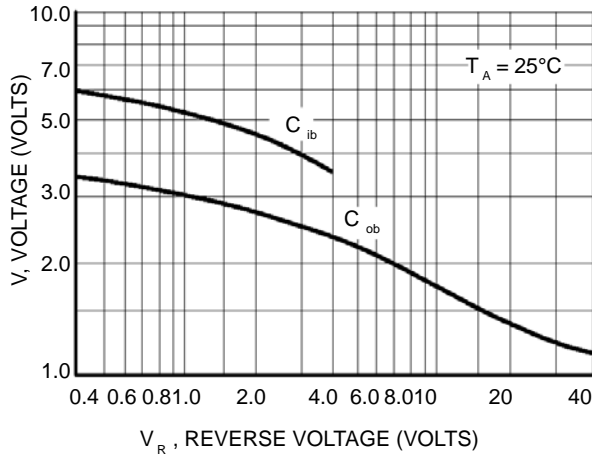


Figure 5. Capacitances

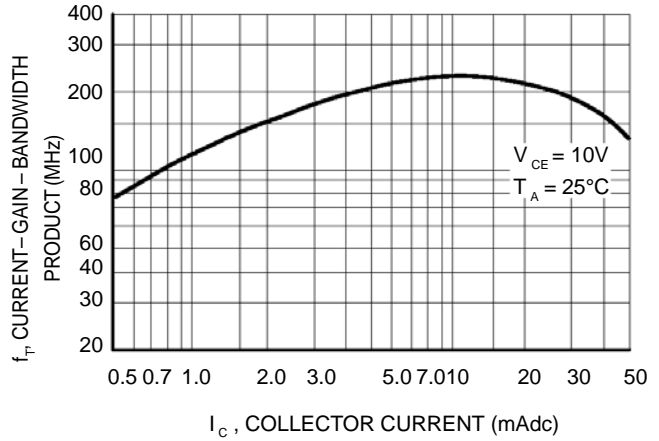


Figure 6. Current-Gain - Bandwidth Product

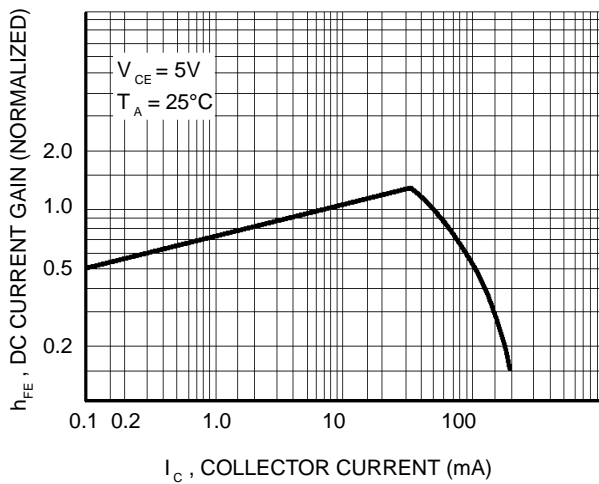


Figure 7. DC Current Gain

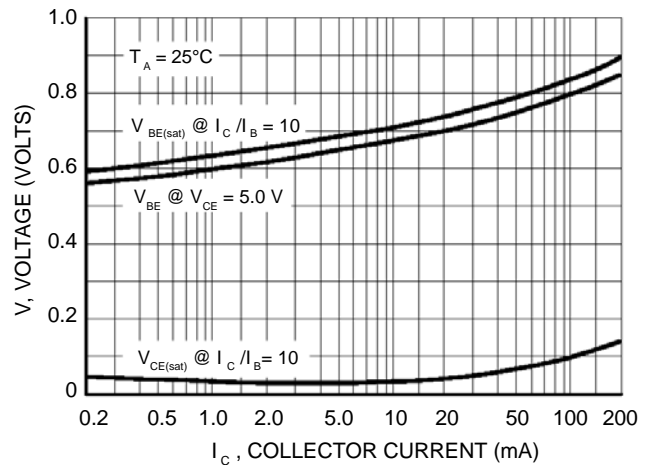


Figure 8. "On" Voltage

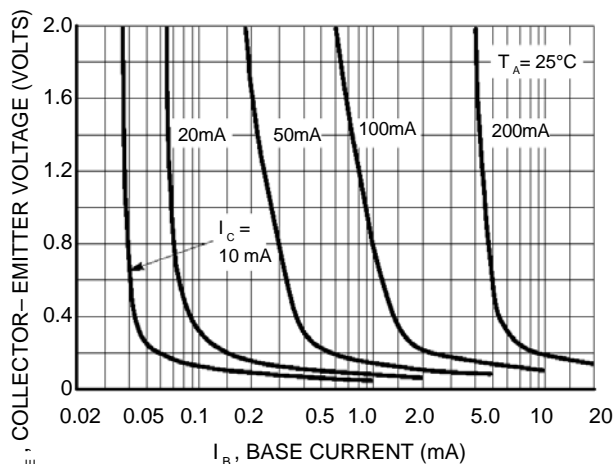


Figure 9. Collector Saturation Region

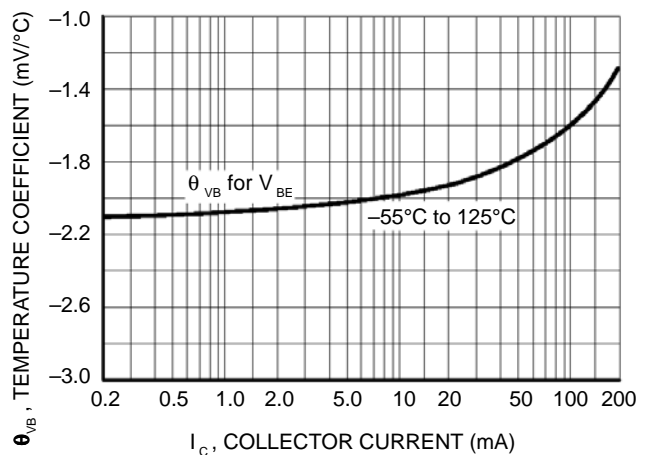


Figure 10. Base-Emitter Temperature Coefficient

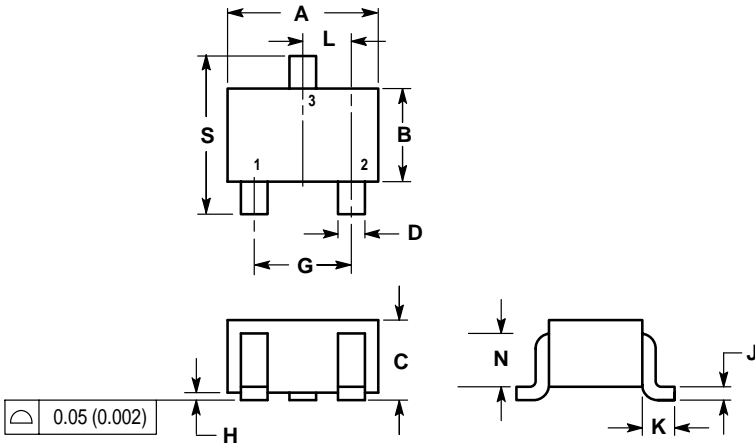
PACKAGE OUTLINE & DIMENSIONS

BC846-7-8-A-B-CW

SC-70 / SOT-323

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.032	0.040	0.80	1.00
D	0.012	0.016	0.30	0.40
G	0.047	0.055	1.20	1.40
H	0.000	0.004	0.00	0.10
J	0.004	0.010	0.10	0.25
K	0.017 REF		0.425 REF	
L	0.026 BSC		0.650 BSC	
N	0.028 REF		0.700 REF	
S	0.079	0.095	2.00	2.40

- PIN 1. BASE
 PIN 2. EMITTER
 PIN 3. COLLECTOR

