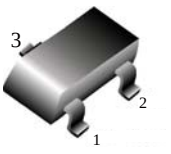
General Purpose Transistor

NPN Silicon

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



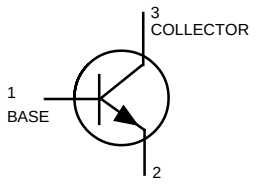
SOT– 323 / SC-70

ORDERING INFORMATION (Pb– Free)

Device	Package	Shipping
BC846/847/848U	SC-70	3000/Tape&Reel

MAXIMUM RATINGS

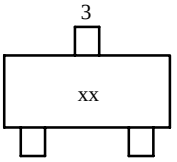
Rating	Symbol	BC846U	BC847U	BC848U	Unit
Collector–Emitter Voltage	V_{CEO}	65	45	30	V
Collector–Base Voltage	V_{CBO}	80	50	30	V
Emitter–Base Voltage	V_{EBO}	6.0	6.0	5.0	V
Collector Current — Continuous	I_C	100	100	100	mAdc



THERMAL CHARACTERISTICS

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

MARKING DIAGRAM



xx= Device Marking
(See Table Below)

DEVICE MARKING

BC846UA = 1A; BC846UB = 1B; BC847UA = 1E; BC847UB = 1F;
BC847UC = 1G; BC848UA = 1J; BC848UB = 1K; BC848UC= 1L;

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage (I_C = 10 mA)	BC846 Series	$V_{(BR)CEO}$	65	—	—	v
	BC847 Series		45	—	—	
	BC848 Series		30	—	—	
Collector–Emitter Breakdown Voltage (I_C = 10 µA, V_{EB} = 0)	BC846 Series	$V_{(BR)CES}$	80	—	—	v
	BC847 Series		50	—	—	
	BC848 Series		30	—	—	
Collector–Base Breakdown Voltage (I_C = 10 µA)	BC846 Series	$V_{(BR)CBO}$	80	—	—	v
	BC847 Series		50	—	—	
	BC848 Series		30	—	—	
Emitter–Base Breakdown Voltage (I_E = 1.0 µA)	BC846 Series	$V_{(BR)EBO}$	6.0	—	—	v
	BC847 Series		6.0	—	—	
	BC848 Series		5.0	—	—	
Collector Cutoff Current (V_{CB} = 30 V)		I_{CBO}	—	—	15	nA
(V_{CB} = 30 V, T_A = 150°C)			—	—	5.0	µA

1.FR–5=1.0 x 0.75 x 0.062in

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

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS						
DC Current Gain	BC846UA, BC847UA, BC848UA	h_{FE}	—	90	—	—
(I_C = 10 µA, V_{CE} = 5.0 V)	BC846UB, BC847UB, BC848UB		—	150	—	
	BC84U7C, BC848UC		—	270	—	
(I_C = 2.0 mA, V_{CE} = 5 0 V)	BC846UA, BC847UA, BC848UA		110	180	220	
	BC846UB, BC847UB, BC848UB		200	290	450	
	BC847UC, BC848UC		420	520	800	
Collector–Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA)		$V_{CE(sat)}$	—	—	0.25	V
(I_C = 100 mA, I_B = 5.0 mA)			—	—	0.6	
Base–Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA)		$V_{BE(sat)}$	—	0.7	—	V
(I_C = 100 mA, I_B = 5.0 mA)			—	0.9	—	
Base–Emitter Voltage (I_C = 2.0 mA, V_{CE} = 5.0 V)		$V_{BE(on)}$	580	660	700	mV
(I_C = 10 mA, V_{CE} = 5.0 V)			—	—	770	
SMALL–SIGNAL CHARACTERISTICS						
Current–Gain — Bandwidth Product (I_C = 10 mA, V_{CE} = 5.0 Vdc, f = 100 MHz)		f_T	100	—	—	MHz
Output Capacitance (V_{CB} = 10 V, f = 1.0 MHz)		C_{obo}	—	—	4.5	pF
Noise Figure (I_C = 0.2 mA,	BC846UA, BC847UA, BC848UA	NF				dB
V_{CE} = 5.0 V_{dc}, R_S = 2.0 kΩ,	BC846UB, BC847UB, BC848UB		—	—	10	
f = 1.0 kHz, BW = 200 Hz)	BC847UC, BC848UC		—	—	4.0	

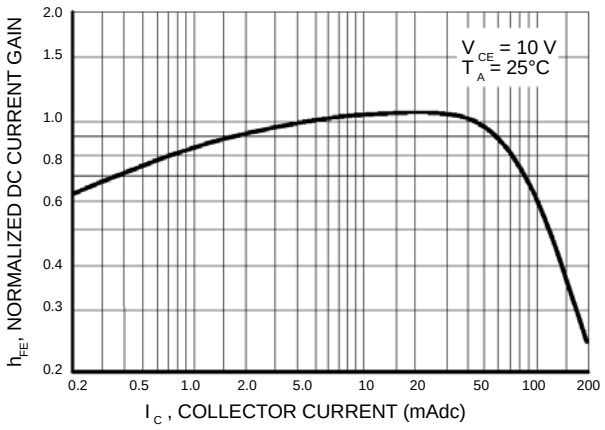


Figure 1. Normalized DC Current Gain

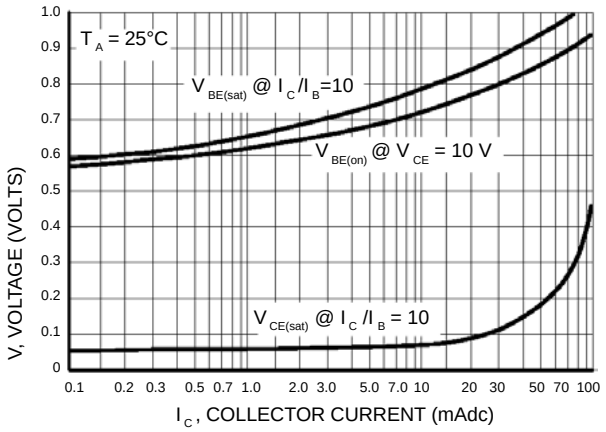


Figure 2. "Saturation" and "On" Voltages

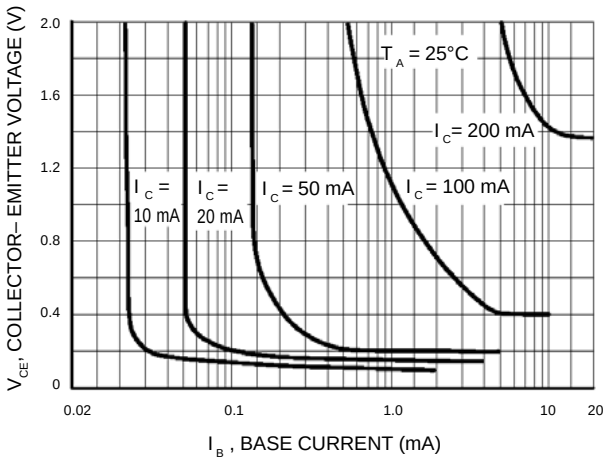


Figure 3. Collector Saturation Region

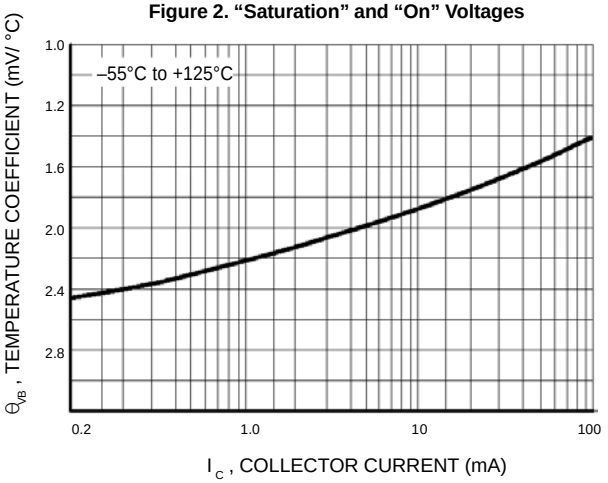


Figure 4. Base–Emitter Temperature Coefficient

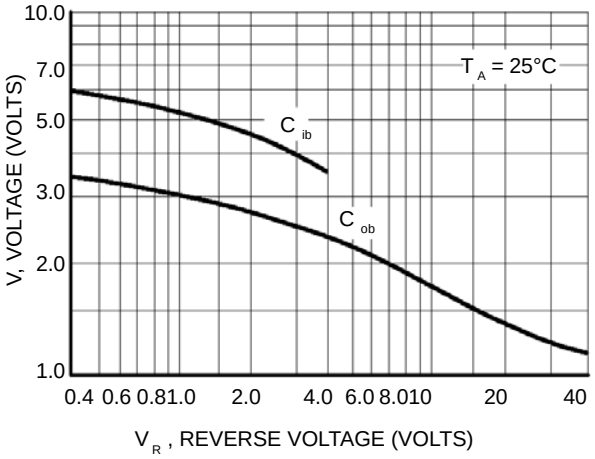


Figure 5. Capacitances

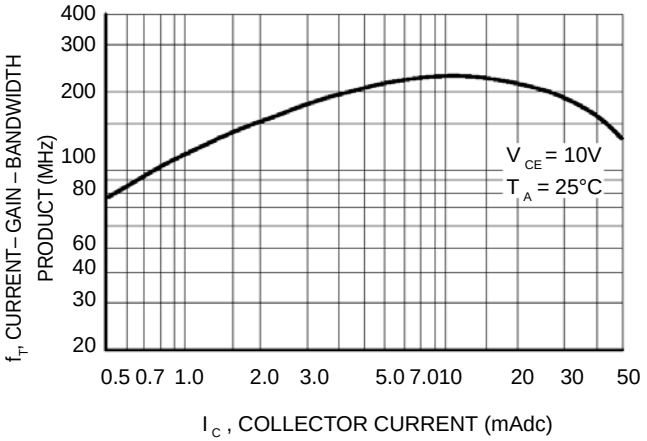


Figure 6. Current–Gain – Bandwidth Product

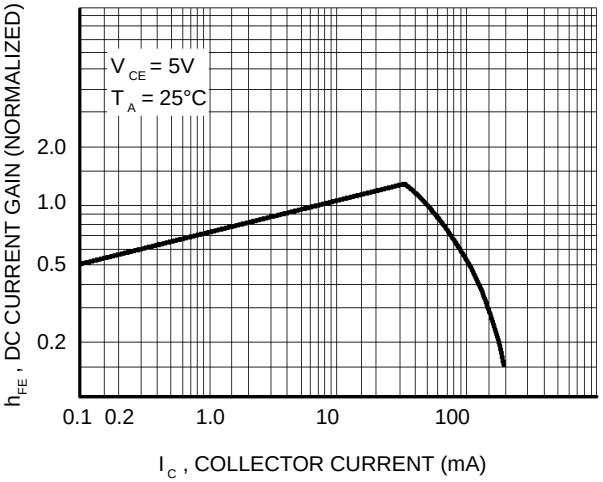


Figure 7. DC Current Gain

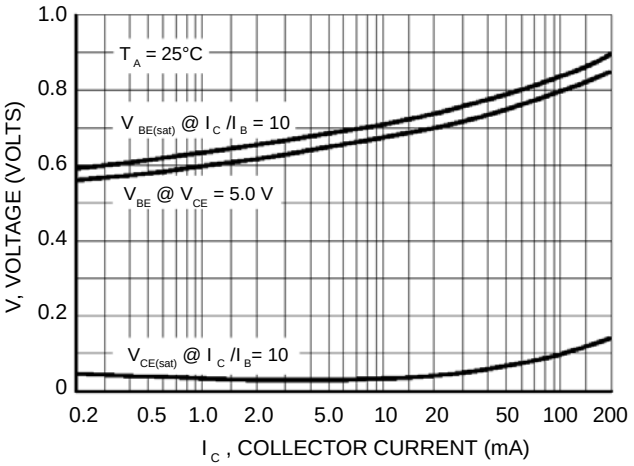


Figure 8. “On” Voltage

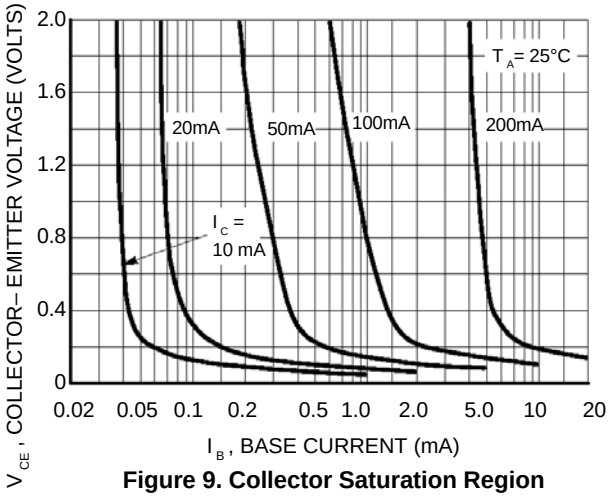


Figure 9. Collector Saturation Region

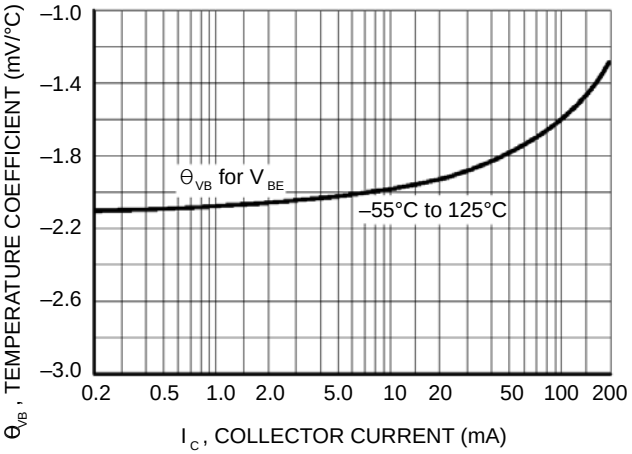


Figure 10. Base–Emitter Temperature Coefficient

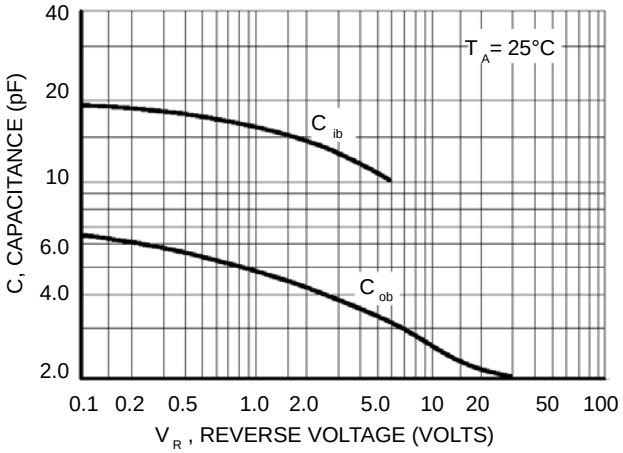


Figure 11. Capacitance

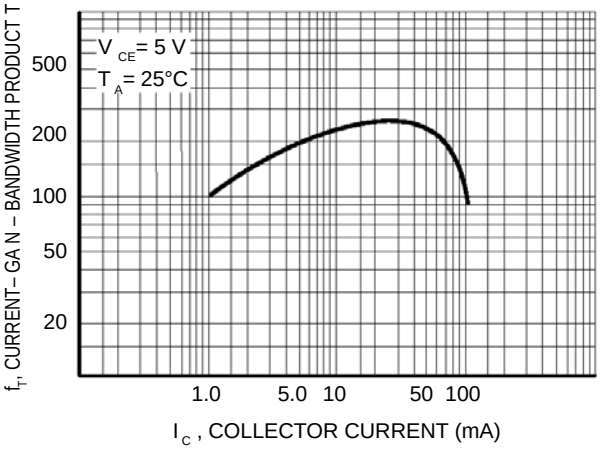
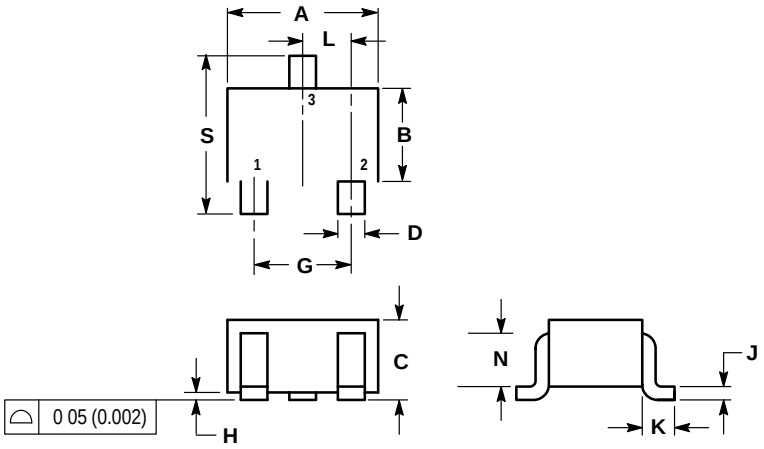


Figure 12. Current–Gain – Bandwidth Product

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
2. EMITTER
3. COLLECTOR