BC847ATT1, BC847BTT1, BC847CTT1

General Purpose Transistors

NPN Silicon

These transistors are designed for general purpose amplifier applications. They are housed in the SC−75/SOT−416 package which is designed for low power surface mount applications.

Features

- Pb−Free Packages are Available*

MAXIMUM RATINGS (T_A = 25°C)

Rating	Symbol	Max	Unit
Collector−Emitter Voltage	V_{CEO}	45	V
Collector−Base Voltage	V_{CBO}	50	V
Emitter−Base Voltage	V_{EBO}	6.0	V
Collector Current − Continuous	I_C	100	mAdc

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation, FR−4 Board (Note 1) T_A = 25°C Derated above 25°C	P_D	200 1.6	mW mW/°C
Thermal Resistance, Junction−to−Ambient (Note 1)	$R_{\theta JA}$	600	°C/W
Total Device Dissipation, FR−4 Board (Note 2) T_A = 25°C Derated above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance, Junction−to−Ambient (Note 2)	$R_{\theta JA}$	400	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

1. FR−4 @ min pad.
2. FR−4 @ 1.0 × 1.0 in pad.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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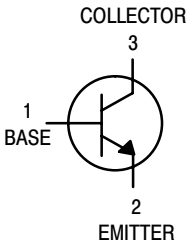
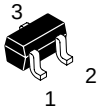
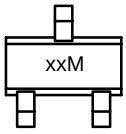




CASE 463
SC−75/SOT−41
6
STYLE 1

MARKING DIAGRAM



xx = Device Code
M = Date Code

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

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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)	BC847 Series	$V_{(BR)CEO}$	45	−	−	V
Collector−Emitter Breakdown Voltage (I_C = 10 μA, V_{EB} = 0)	BC847 Series	$V_{(BR)CES}$	50	−	−	V
Collector−Base Breakdown Voltage (I_C = 10 μA)	BC847 Series	$V_{(BR)CBO}$	50	−	−	V
Emitter−Base Breakdown Voltage (I_E = 1.0 μA)	BC847 Series	$V_{(BR)EBO}$	6.0	−	−	V
Collector Cutoff Current (V_{CB} = 30 V)		I_{CBO}	−	−	15	nA
	(V_{CB} = 30 V, T_A = 150°C)		−	−	5.0	μA
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				−
(I_C = 10 μA, V_{CE} = 5.0 V)	BC847A		−	90	−	
	BC847B		−	150	−	
	BC847C		−	270	−	
(I_C = 2.0 mA, V_{CE} = 5.0 V)	BC847A		110	180	220	
	BC847B		200	290	450	
	BC847C		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, V_{CE} = 5.0 Vdc, R_S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)		NF	−	−	10	dB

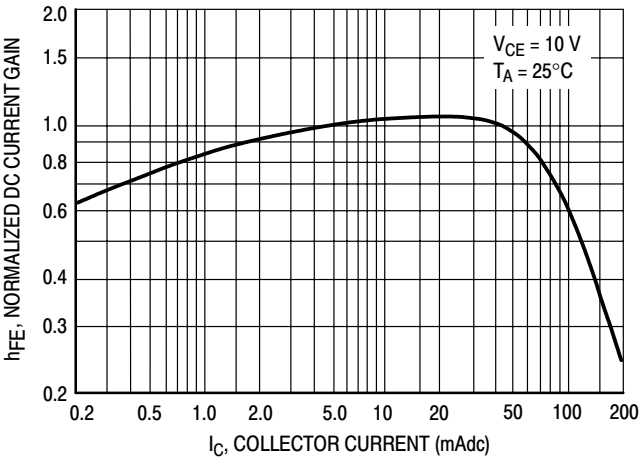


Figure 1. Normalized DC Current Gain

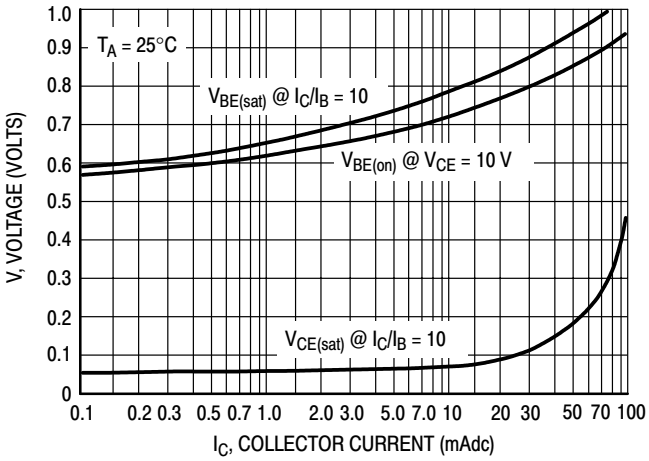


Figure 2. “Saturation” and “On” Voltages

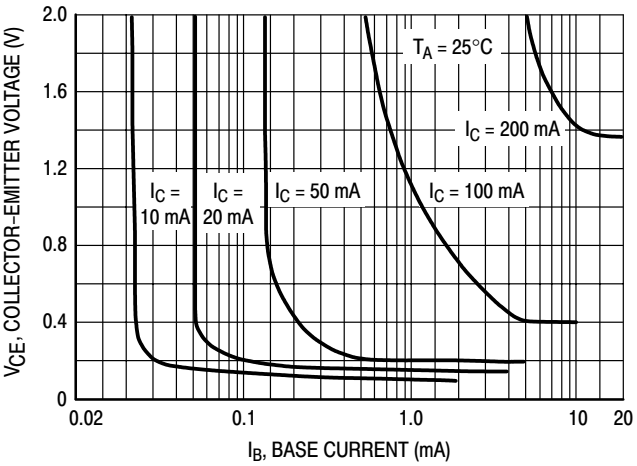


Figure 3. Collector Saturation Region

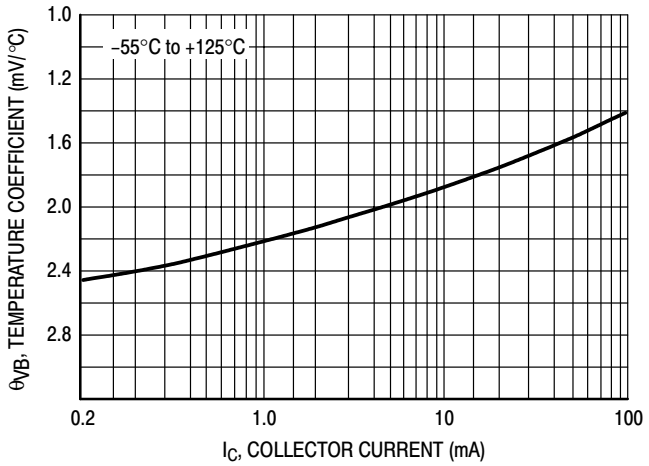


Figure 4. Base−Emitter Temperature Coefficient

BC847

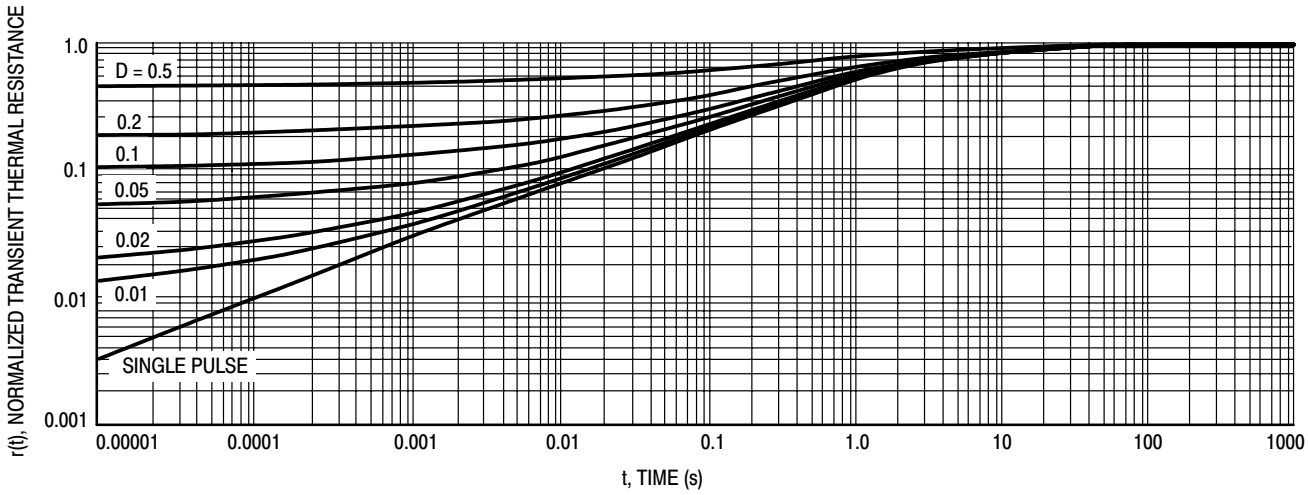


Figure 5. Normalized Thermal Response

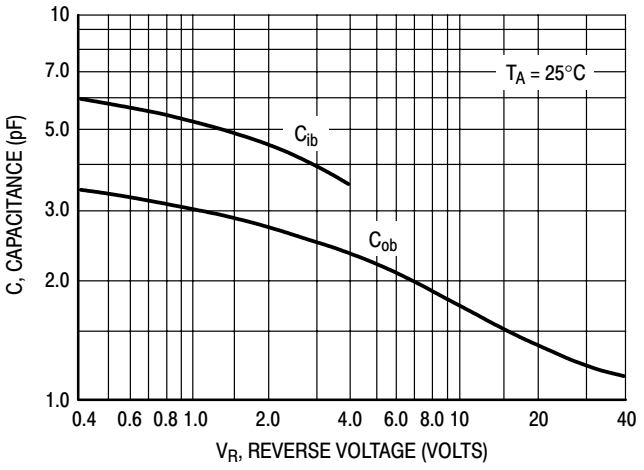


Figure 6. Capacitances

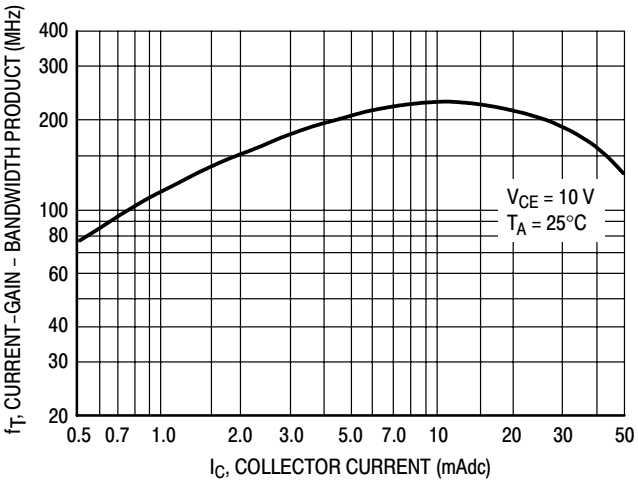


Figure 7. Current−Gain − Bandwidth Product

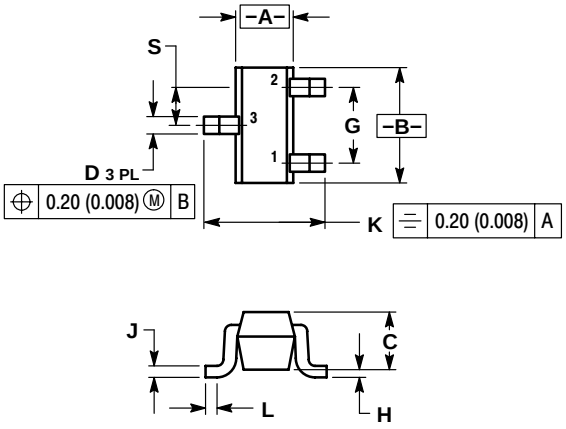
ORDERING INFORMATION

Device	Marking	Package	Shipping†
BC847ATT1	1E	SC−75/SOT−416	3,000 / Tape & Reel
BC847BTT1	1F	SC−75/SOT−416	3,000 / Tape & Reel
BC847BTT1G	1F	SC−75/SOT−416 (Pb−Free)	
BC847CTT1	1G	SC−75/SOT−416	3,000 / Tape & Reel
BC847CTT1G	1G	SC−75/SOT−416 (Pb−Free)	

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

PACKAGE DIMENSIONS

SC−75/SOT−416
CASE 463−01
ISSUE C



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

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	0.70	0.90	0.028	0.035
B	1.40	1.80	0.055	0.071
C	0.60	0.90	0.024	0.035
D	0.15	0.30	0.006	0.012
G	1.00 BSC		0.039 BSC	
H	−−−	0.10	−−−	0.004
J	0.10	0.25	0.004	0.010
K	1.45	1.75	0.057	0.069
L	0.10	0.20	0.004	0.008
S	0.50 BSC		0.020 BSC	

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