

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 ($T_A = 25^\circ\text{C}$)

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

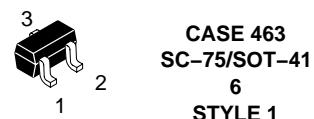
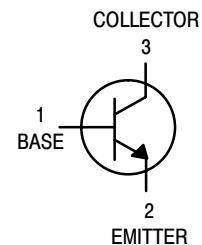
1. FR-4 @ min pad.
2. FR-4 @ 1.0×1.0 in pad.

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

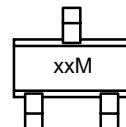


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MARKING DIAGRAM



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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage ($I_C = 10 \text{ mA}$)	$V_{(\text{BR})\text{CEO}}$	45	–	–	V
Collector–Emitter Breakdown Voltage ($I_C = 10 \mu\text{A}$, $V_{\text{EB}} = 0$)	$V_{(\text{BR})\text{CES}}$	50	–	–	V
Collector–Base Breakdown Voltage ($I_C = 10 \mu\text{A}$)	$V_{(\text{BR})\text{CBO}}$	50	–	–	V
Emitter–Base Breakdown Voltage ($I_E = 1.0 \mu\text{A}$)	$V_{(\text{BR})\text{EBO}}$	6.0	–	–	V
Collector Cutoff Current ($V_{\text{CB}} = 30 \text{ V}$) ($V_{\text{CB}} = 30 \text{ V}$, $T_A = 150^\circ\text{C}$)	I_{CBO}	–	–	15 5.0	nA μA
ON CHARACTERISTICS					
DC Current Gain ($I_C = 10 \mu\text{A}$, $V_{\text{CE}} = 5.0 \text{ V}$)	h_{FE}	–	90 150 270	–	–
		BC847A BC847B BC847C			
($I_C = 2.0 \text{ mA}$, $V_{\text{CE}} = 5.0 \text{ V}$)		BC847A BC847B BC847C	110 200 420	180 290 520	220 450 800
Collector–Emitter Saturation Voltage ($I_C = 10 \text{ mA}$, $I_B = 0.5 \text{ mA}$) ($I_C = 100 \text{ mA}$, $I_B = 5.0 \text{ mA}$)	$V_{\text{CE}(\text{sat})}$	–	–	0.25 0.6	V
Base–Emitter Saturation Voltage ($I_C = 10 \text{ mA}$, $I_B = 0.5 \text{ mA}$) ($I_C = 100 \text{ mA}$, $I_B = 5.0 \text{ mA}$)	$V_{\text{BE}(\text{sat})}$	–	0.7 0.9	–	V
Base–Emitter Voltage ($I_C = 2.0 \text{ mA}$, $V_{\text{CE}} = 5.0 \text{ V}$) ($I_C = 10 \text{ mA}$, $V_{\text{CE}} = 5.0 \text{ V}$)	$V_{\text{BE}(\text{on})}$	580	660	700 770	mV
SMALL-SIGNAL CHARACTERISTICS					
Current–Gain – Bandwidth Product ($I_C = 10 \text{ mA}$, $V_{\text{CE}} = 5.0 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	100	–	–	MHz
Output Capacitance ($V_{\text{CB}} = 10 \text{ V}$, $f = 1.0 \text{ MHz}$)	C_{obo}	–	–	4.5	pF
Noise Figure ($I_C = 0.2 \text{ mA}$, $V_{\text{CE}} = 5.0 \text{ Vdc}$, $R_S = 2.0 \text{ k}\Omega$, $f = 1.0 \text{ kHz}$, $\text{BW} = 200 \text{ Hz}$)	NF	–	–	10	dB

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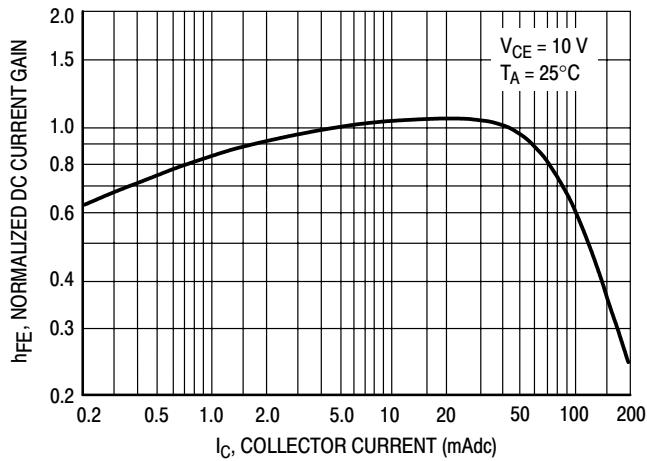


Figure 1. Normalized DC Current Gain

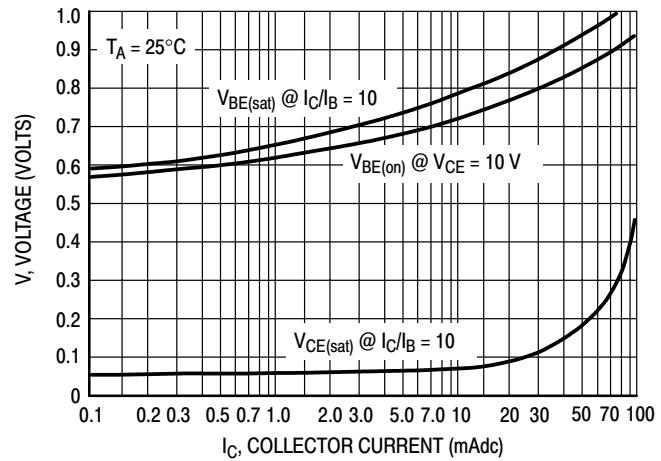


Figure 2. "Saturation" and "On" Voltages

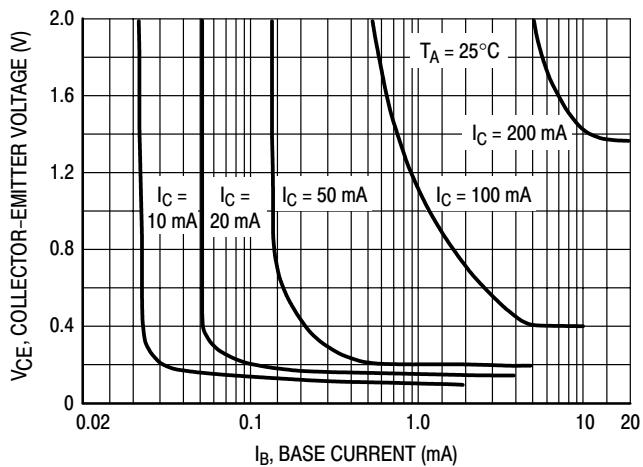


Figure 3. Collector Saturation Region

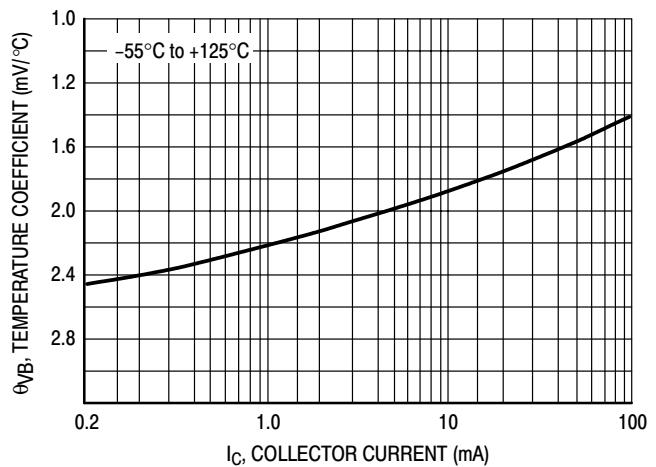


Figure 4. Base-Emitter Temperature Coefficient

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BC847

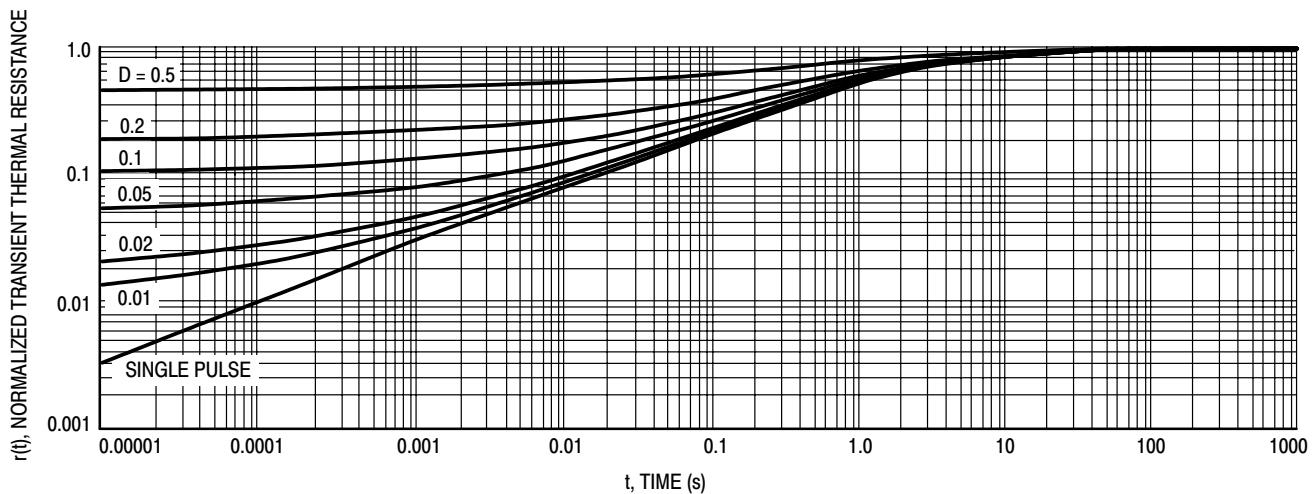


Figure 5. Normalized Thermal Response

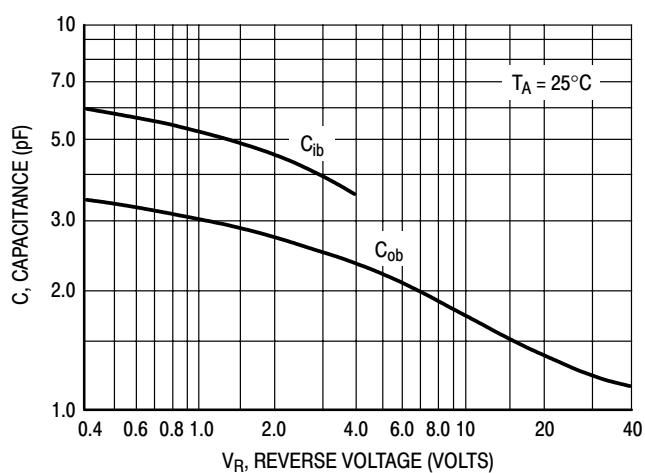


Figure 6. Capacitances

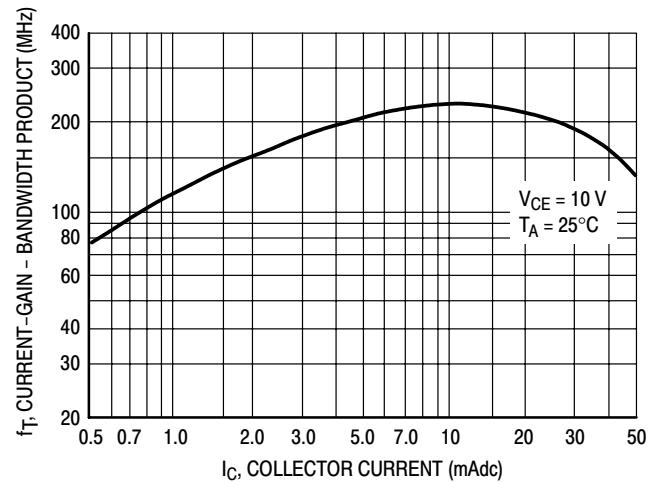


Figure 7. Current-Gain – Bandwidth Product

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ORDERING INFORMATION

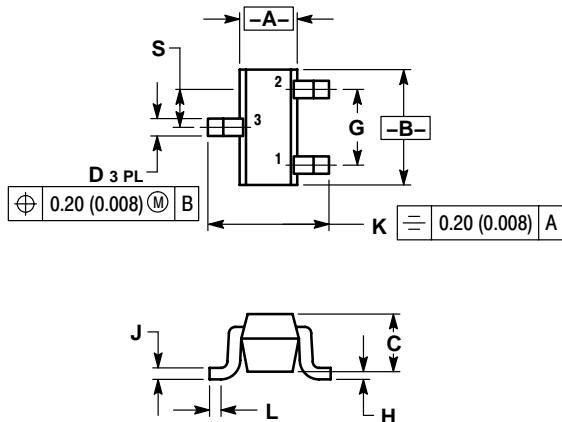
Device	Marking	Package	Shipping [†]
BC847ATT1	1E	SC-75/SOT-416	3,000 / Tape & Reel
BC847BTT1	1F	SC-75/SOT-416	3,000 / Tape & Reel
BC847BTT1G	1F	SC-75/SOT-416 (Pb-Free)	
BC847CTT1	1G	SC-75/SOT-416	3,000 / Tape & Reel
BC847CTT1G	1G	SC-75/SOT-416 (Pb-Free)	

[†]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.

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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.

DIM	MILLIMETERS		INCHES	
	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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