

# 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<sub>A</sub> = 25°C)

Rating	Symbol	Max	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	45	V
Collector-Base Voltage	V <sub>CBO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	6.0	V
Collector Current - Continuous	I <sub>C</sub>	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

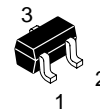
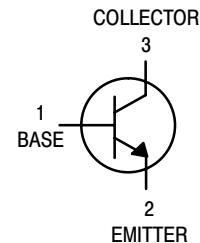
Characteristic	Symbol	Max	Unit
Total Device Dissipation, FR-4 Board (Note 1) T <sub>A</sub> = 25°C Derated above 25°C	P <sub>D</sub>	200	mW
Thermal Resistance, Junction-to-Ambient (Note 1)	R <sub>θJA</sub>	600	°C/W
Total Device Dissipation, FR-4 Board (Note 2) T <sub>A</sub> = 25°C Derated above 25°C	P <sub>D</sub>	300	mW
Thermal Resistance, Junction-to-Ambient (Note 2)	R <sub>θJA</sub>	400	°C/W
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

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



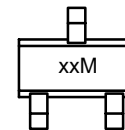
ON Semiconductor®

<http://onsemi.com>



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.

\*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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## 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 ( $I_C = 10\text{ mA}$ )	BC847 Series $V_{(BR)CEO}$	45	–	–	V
Collector–Emitter Breakdown Voltage ( $I_C = 10\ \mu\text{A}$ , $V_{EB} = 0$ )	BC847 Series $V_{(BR)CES}$	50	–	–	V
Collector–Base Breakdown Voltage ( $I_C = 10\ \mu\text{A}$ )	BC847 Series $V_{(BR)CBO}$	50	–	–	V
Emitter–Base Breakdown Voltage ( $I_E = 1.0\ \mu\text{A}$ )	BC847 Series $V_{(BR)EBO}$	6.0	–	–	V
Collector Cutoff Current ( $V_{CB} = 30\text{ V}$ ) ( $V_{CB} = 30\text{ V}$ , $T_A = 150^\circ\text{C}$ )	$I_{CBO}$	–	–	15 5.0	nA $\mu\text{A}$
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = 10\ \mu\text{A}$ , $V_{CE} = 5.0\text{ V}$ )	BC847A BC847B BC847C	$h_{FE}$	–	90 150 270	–
( $I_C = 2.0\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ )	BC847A BC847B BC847C		110 200 420	180 290 520	220 450 800
Collector–Emitter Saturation Voltage ( $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ ) ( $I_C = 100\text{ mA}$ , $I_B = 5.0\text{ mA}$ )	$V_{CE(sat)}$	–	–	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
<b>SMALL–SIGNAL CHARACTERISTICS</b>					
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

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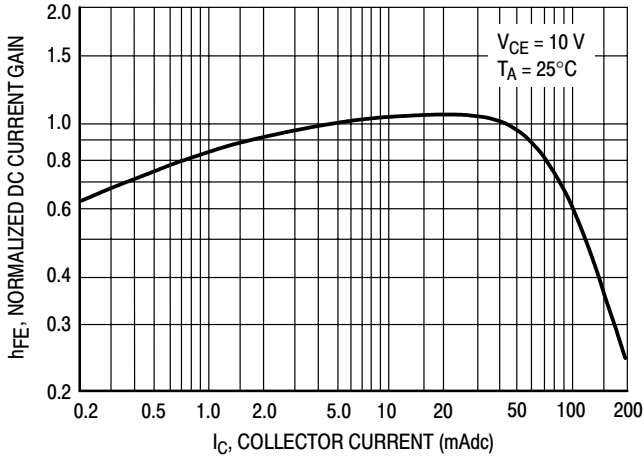


Figure 1. Normalized DC Current Gain

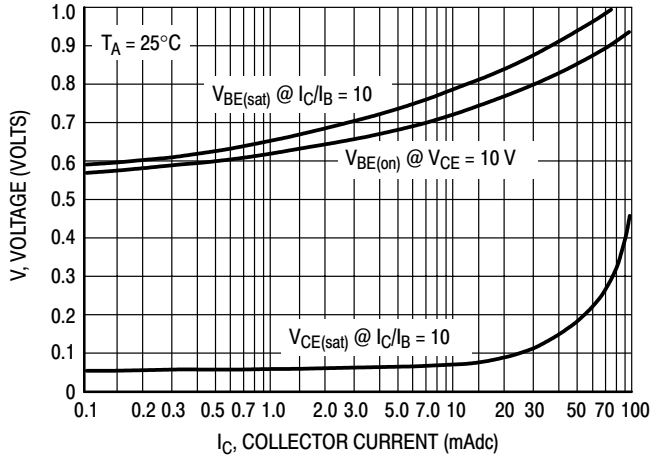


Figure 2. "Saturation" and "On" Voltages

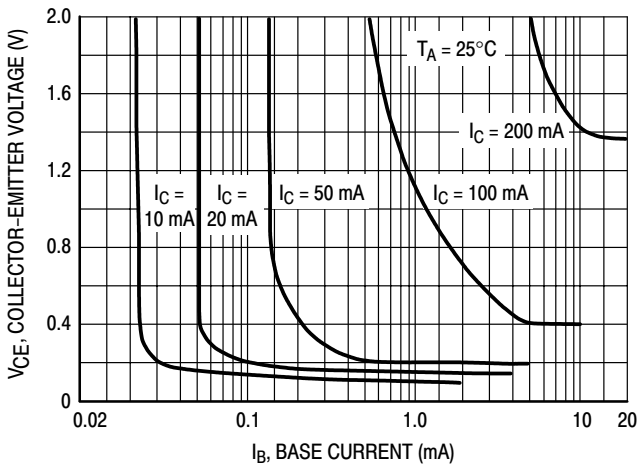


Figure 3. Collector Saturation Region

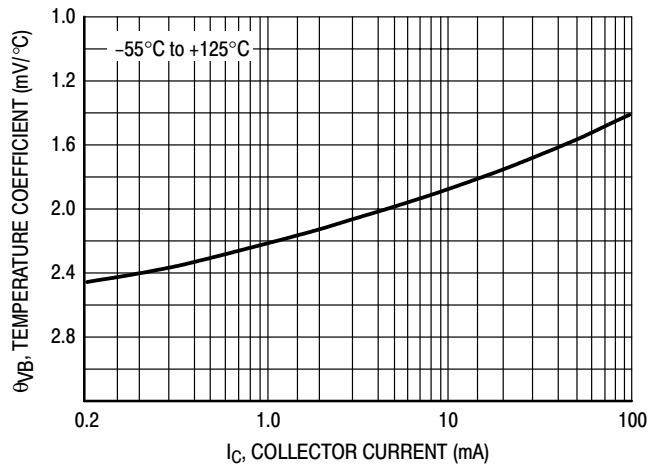


Figure 4. Base-Emitter Temperature Coefficient

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## BC847

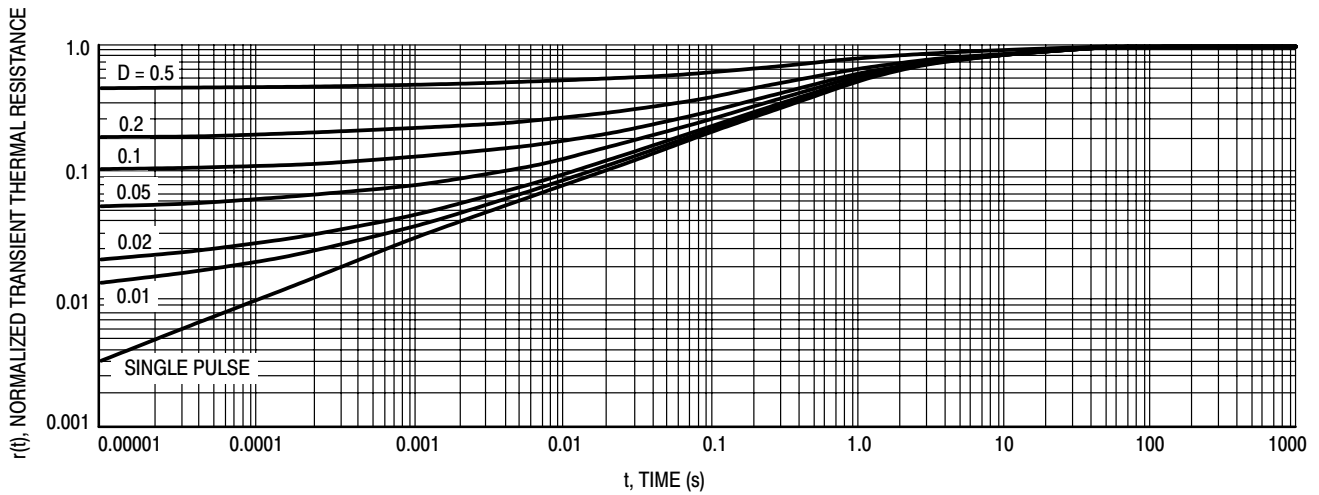


Figure 5. Normalized Thermal Response

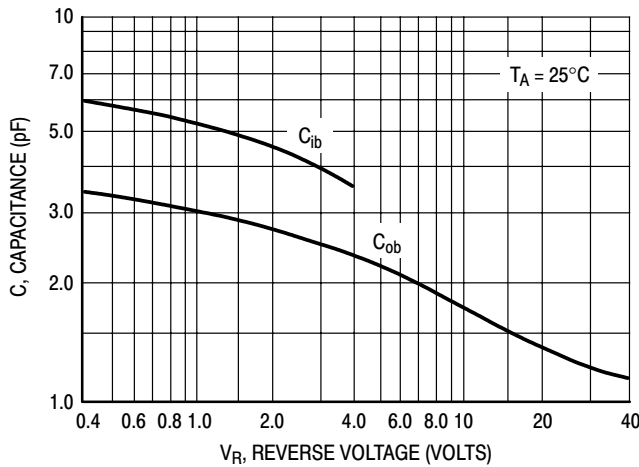


Figure 6. Capacitances

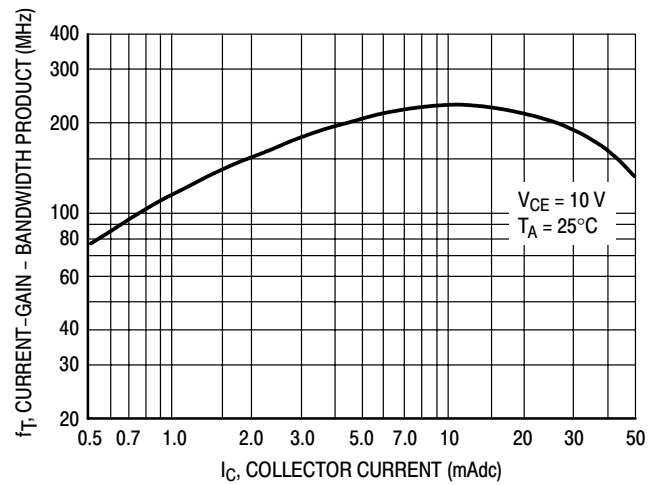


Figure 7. Current-Gain - Bandwidth Product

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### ORDERING INFORMATION

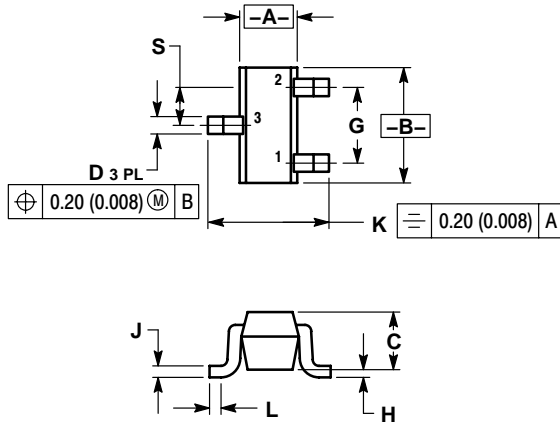
Device	Marking	Package	Shipping†
BC847ATT1	1E	SC-75/SOT-416	3,000 / Tape & Reel
BC847BTT1	1F	SC-75/SOT-416	3,000 / Tape & Reel
BC847BTT1G	1F	SC-75/SOT-416 (Pb-Free)	
BC847CTT1	1G	SC-75/SOT-416	3,000 / Tape & Reel
BC847CTT1G	1G	SC-75/SOT-416 (Pb-Free)	

†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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