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

- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- 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

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

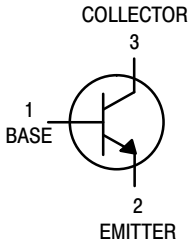
THERMAL CHARACTERISTICS

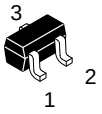
Characteristic	Symbol	Max	Unit
Total Device Dissipation, FR−4 Board (Note 1) T_A = 25°C Derated above 25°C	P_D	200 1.6	mW mW/°C
Thermal Resistance, Junction−to−Ambient (Note 1)	$R_{\theta JA}$	600	°C/W
Total Device Dissipation, FR−4 Board (Note 2) T_A = 25°C Derated above 25°C	P_D	300 2.4	mW mW/°C
Thermal 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.

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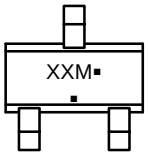
http://onsemi.com





CASE 463
SC−75/SOT−416
STYLE 1

MARKING DIAGRAM



XX = Device Code
M = Date Code
▪ = Pb−Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering, marking 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

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

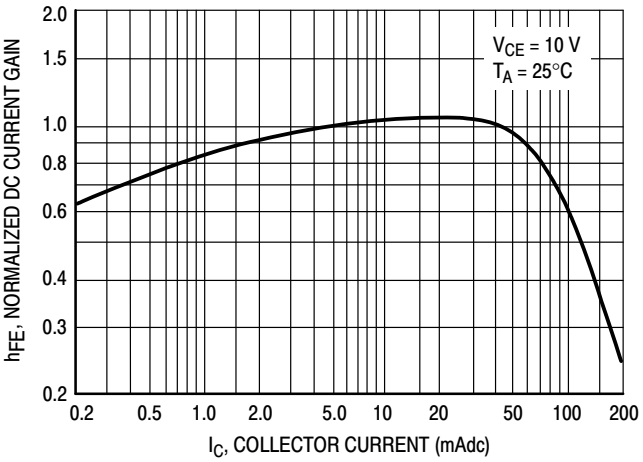


Figure 1. Normalized DC Current Gain

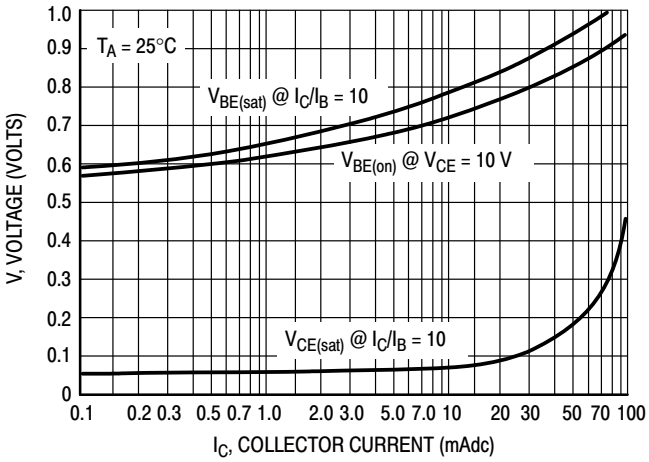


Figure 2. “Saturation” and “On” Voltages

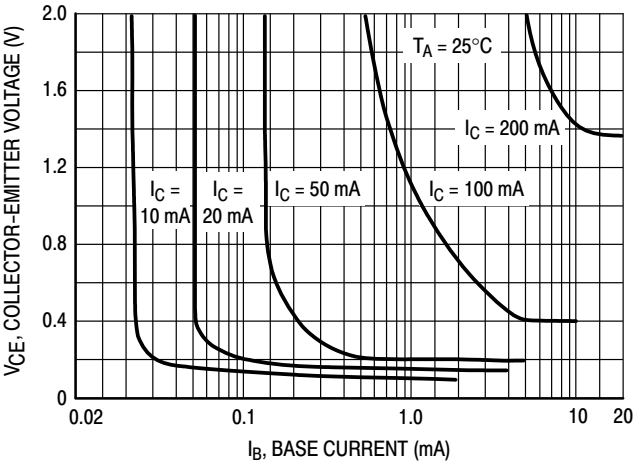


Figure 3. Collector Saturation Region

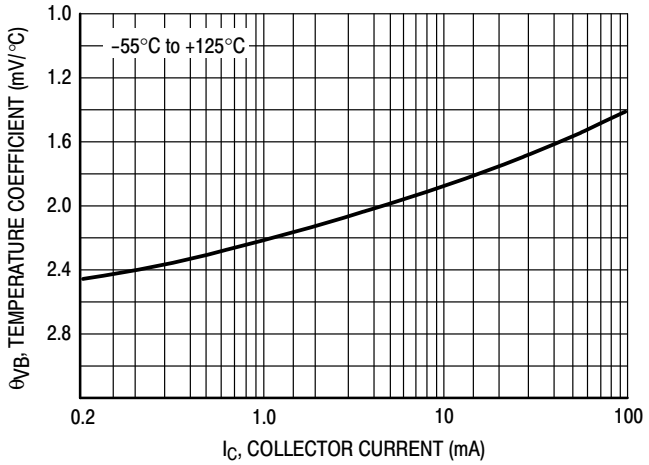


Figure 4. Base−Emitter Temperature Coefficient

BC847

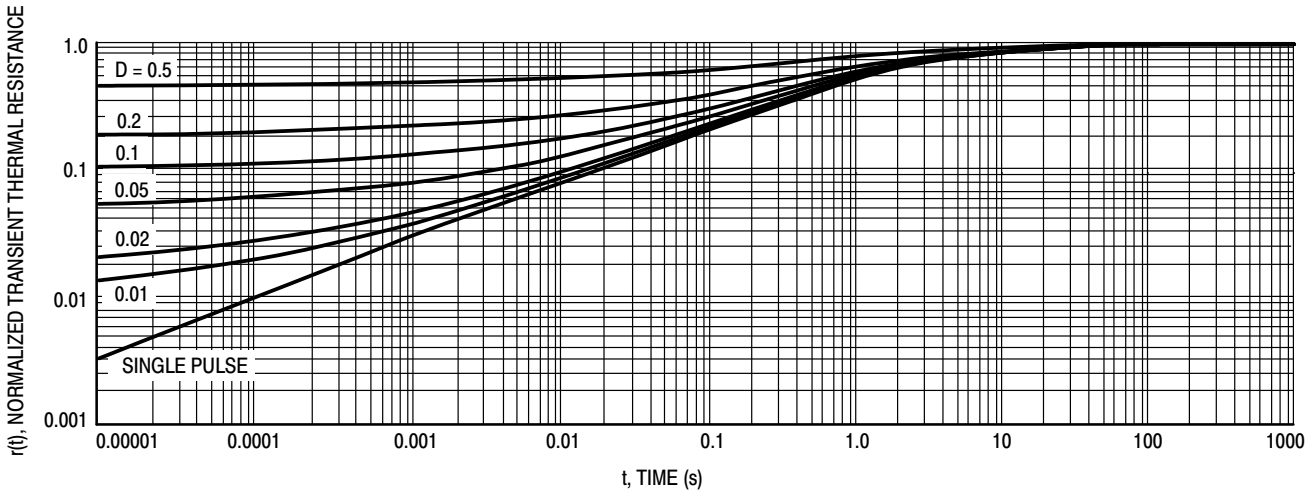


Figure 5. Normalized Thermal Response

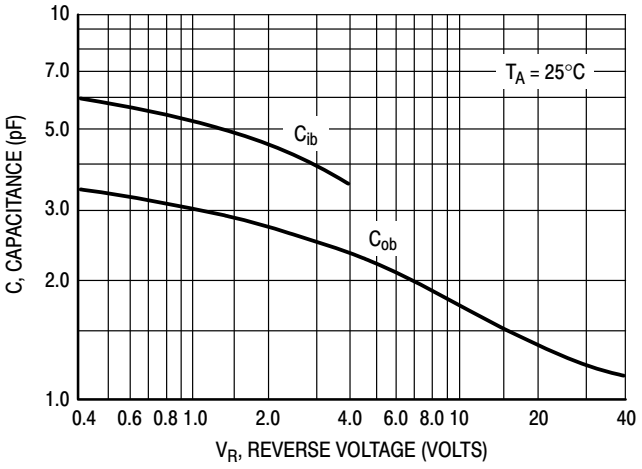


Figure 6. Capacitances

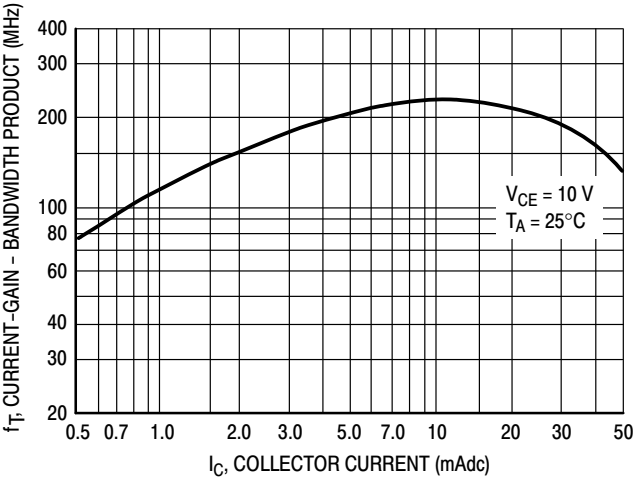


Figure 7. Current−Gain − Bandwidth Product

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)	
NSVBC847BTT1G*	1F	SC−75/SOT−416 (Pb−Free)	3,000 / Tape & Reel
BC847CTT1G	1G	SC−75/SOT−416 (Pb−Free)	3,000 / Tape & Reel

†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.

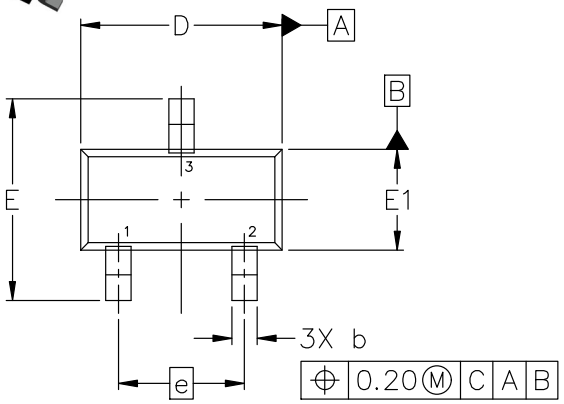
*NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable.

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

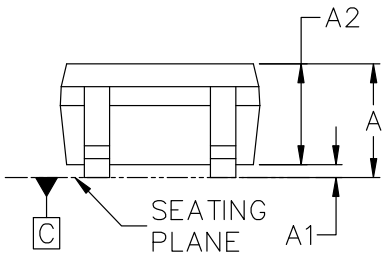
SC75−3 1.60x0.80x0.80, 1.00P
CASE 463
ISSUE H

DATE 01 FEB 2024

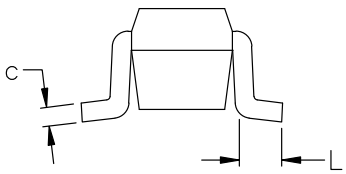




TOP VIEW



SIDE VIEW



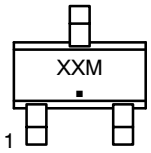
END VIEW

NOTES:

1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5−2018.
2. ALL DIMENSION ARE IN MILLIMETERS.

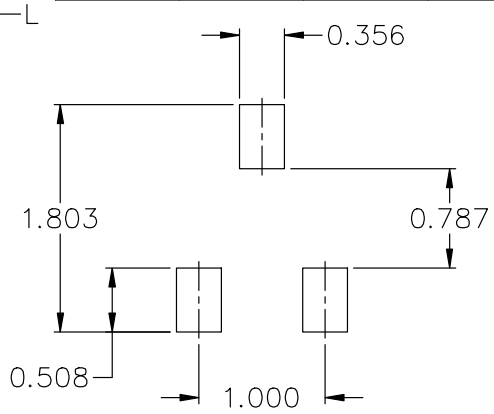
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.70	0.80	0.90
A1	0.00	0.05	0.10
A2		0.80 REF.	
b	0.15	0.20	0.30
c	0.10	0.15	0.25
D	1.55	1.60	1.65
E	1.50	1.60	1.70
E1	0.70	0.80	0.90
e		1.00 BSC	
L	0.10	0.15	0.20

GENERIC
MARKING DIAGRAM*



XX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.



RECOMMENDED MOUNTING FOOTPRINT*

* FOR ADDITIONAL INFORMATION ON OUR Pb−FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

STYLE 1:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

STYLE 2:
PIN 1. ANODE
2. N/C
3. CATHODE

STYLE 3:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 4:
PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 5:
PIN 1. GATE
2. SOURCE
3. DRAIN

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DESCRIPTION:	SC75−3 1.60x0.80x0.80, 1.00P	PAGE 1 OF 1

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