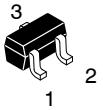
General Purpose Transistor

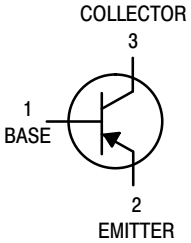
PNP Silicon

BC857BTT1G



SOT−416
CASE 463
STYLE 1

These transistors are designed for general purpose amplifier applications. They are housed in the SOT−416/SC−75 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
- This is a Pb−Free Device

MAXIMUM RATINGS (T_A = 25°C)

Symbol	Rating	Max	Unit
V_{CEO}	Collector−Emitter Voltage	−45	V
V_{CBO}	Collector−Base Voltage	−50	V
V_{EBO}	Emitter−Base Voltage	−5.0	V
I_C	Collector Current − Continuous	−100	mAdc
I_C	Collector Current − Peak	−200	mAdc

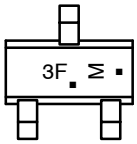
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

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

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

MARKING DIAGRAM



3F = Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*Date Code orientation may vary depending upon manufacturing location.

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

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

Symbol	Characteristic	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector−Emitter Breakdown Voltage (I_C = −10 mA)	−45	–	–	V
$V_{(BR)CES}$	Collector−Emitter Breakdown Voltage (I_C = −10 μA, V_{EB} = 0)	−50	–	–	V
$V_{(BR)CBO}$	Collector−Base Breakdown Voltage (I_C = −10 μA)	−50	–	–	V
$V_{(BR)EBO}$	Emitter−Base Breakdown Voltage (I_E = −1.0 μA)	−5.0	–	–	V
I_{CBO}	Collector Cutoff Current (V_{CB} = −30 V) (V_{CB} = −30 V, T_A = 150°C)	– –	– –	−15 −4.0	nA μA
ON CHARACTERISTICS					
h_{FE}	DC Current Gain (I_C = −10 μA, V_{CE} = −5.0 V) (I_C = −2.0 mA, V_{CE} = −5.0 V)	– 220	150 290	– 475	–
$V_{CE(sat)}$	Collector−Emitter Saturation Voltage (I_C = −10 mA, I_B = −0.5 mA) (I_C = −100 mA, I_B = −5.0 mA)	– –	– –	−0.3 −0.65	V
$V_{BE(sat)}$	Base−Emitter Saturation Voltage (I_C = −10 mA, I_B = −0.5 mA) (I_C = −100 mA, I_B = −5.0 mA)	– –	−0.7 −0.9	– –	V
$V_{BE(on)}$	Base−Emitter On Voltage (I_C = −2.0 mA, V_{CE} = −5.0 V) (I_C = −10 mA, V_{CE} = −5.0 V)	−0.6 –	– –	−0.75 −0.82	V
SMALL−SIGNAL CHARACTERISTICS					
f_T	Current−Gain − Bandwidth Product (I_C = −10 mA, V_{CE} = −5.0 Vdc, f = 100 MHz)	100	–	–	MHz
C_{ob}	Output Capacitance (V_{CB} = −10 V, f = 1.0 MHz)	–	–	4.5	pF
NF	Noise Figure (I_C = −0.2 mA, V_{CE} = −5.0 Vdc, R_S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)	–	–	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.

TYPICAL CHARACTERISTICS

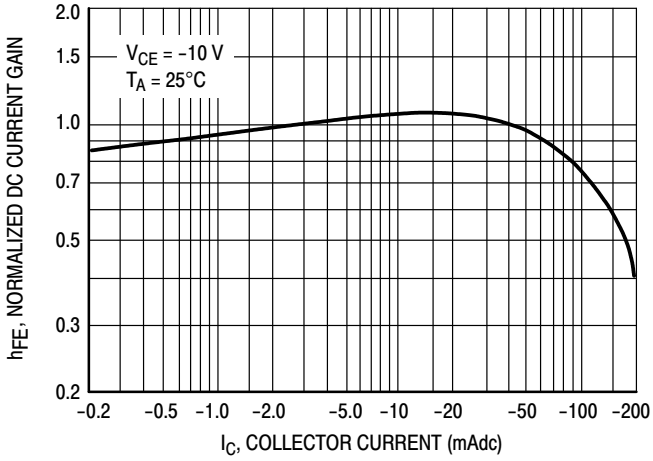


Figure 1. Normalized DC Current Gain

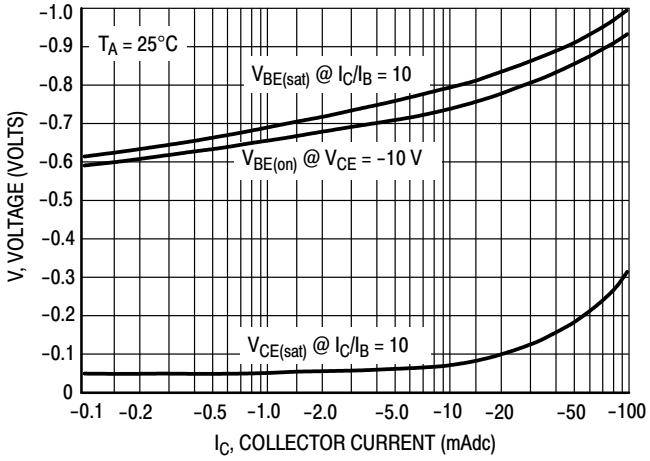


Figure 2. “Saturation” and “On” Voltages

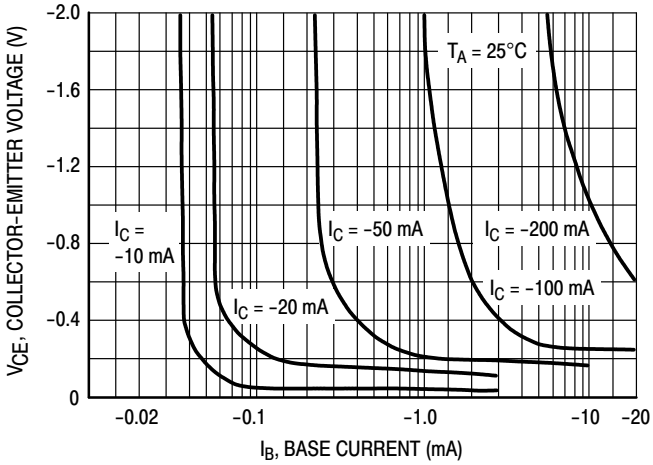


Figure 3. Collector Saturation Region

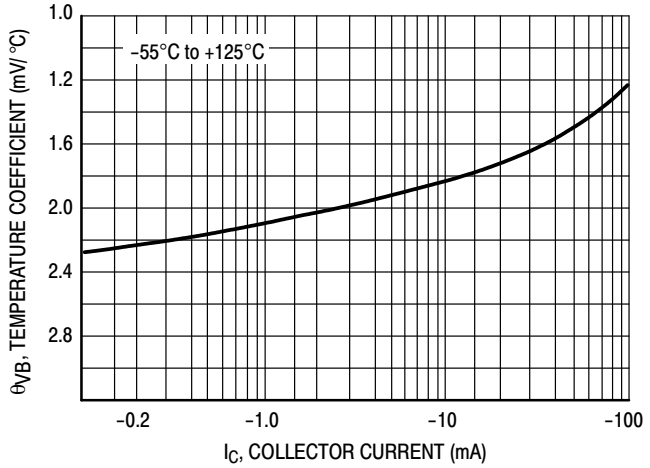


Figure 4. Base−Emitter Temperature Coefficient

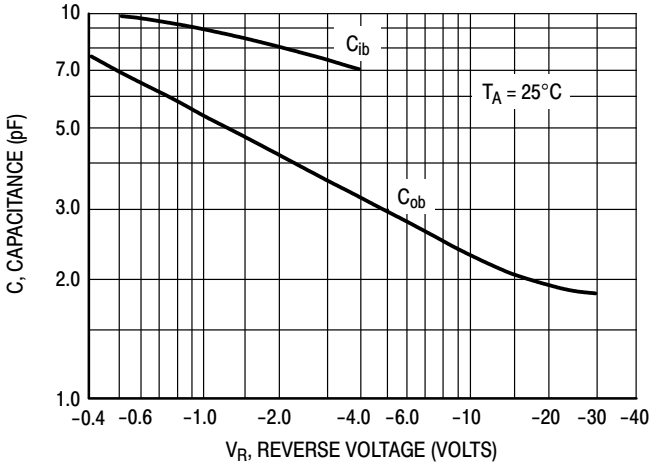


Figure 5. Capacitances

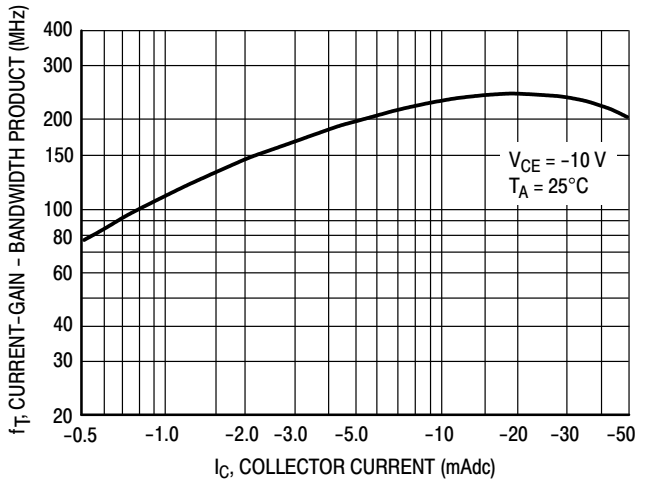


Figure 6. Current−Gain − Bandwidth Product

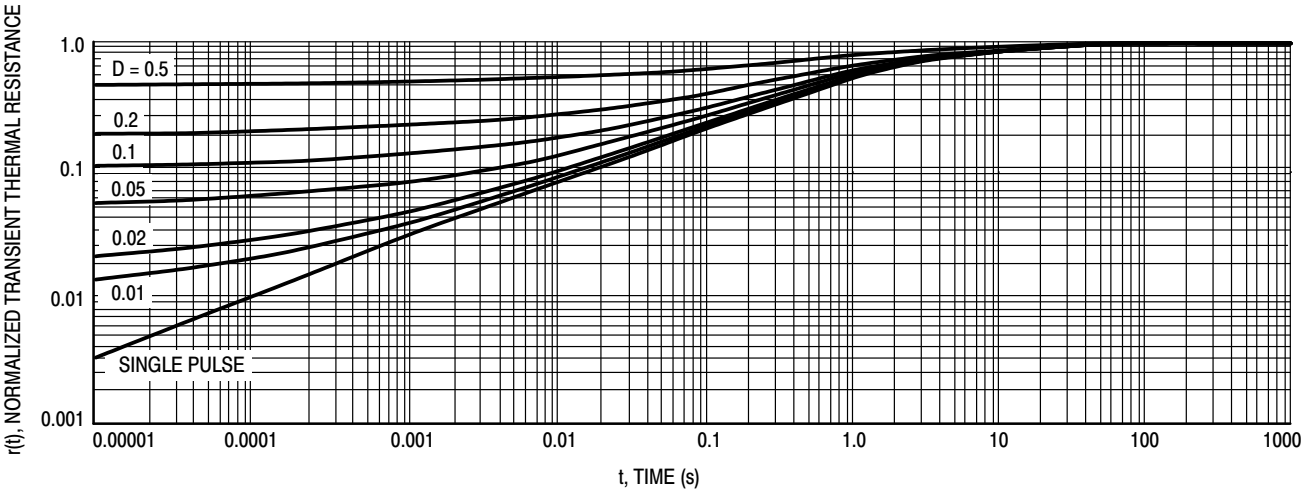


Figure 7. Thermal Response

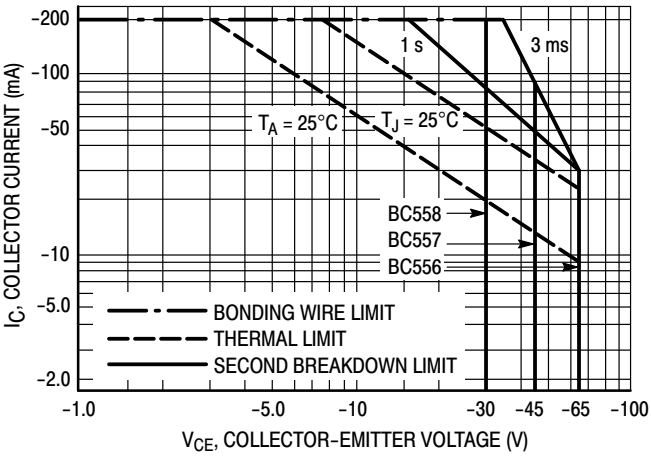


Figure 8. Active Region Safe Operating Area

The safe operating area curves indicate I_C–V_{CE} limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 8 is based upon $T_{J(pk)}$ = 150°C; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq$ 150°C. $T_{J(pk)}$ may be calculated from the data in Figure 7. At high case or ambient temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary breakdown.

ORDERING INFORMATION

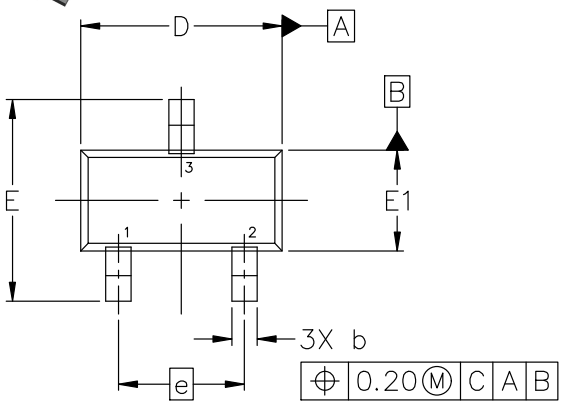
Device	Package	Shipping†
BC857BTT1G	SOT–416 (PB–Free)	3,000 / Tape & Reel
NSVBC857BTT1G*		

†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.

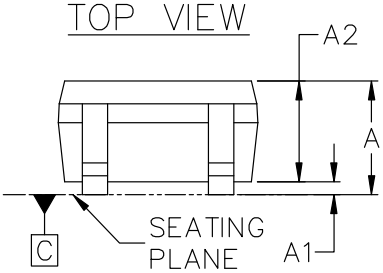
*NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC–Q101 Qualified and PPAP Capable.

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

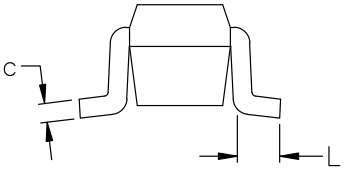
DATE 01 FEB 2024



TOP VIEW



SIDE VIEW



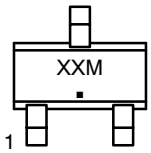
END VIEW

NOTES:

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

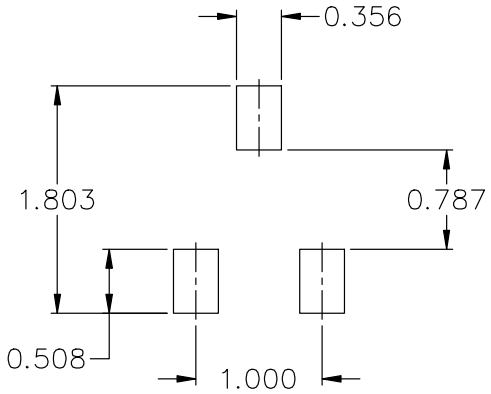
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.70	0.80	0.90
A1	0.00	0.05	0.10
A2	0.80 REF.		
b	0.15	0.20	0.30
c	0.10	0.15	0.25
D	1.55	1.60	1.65
E	1.50	1.60	1.70
E1	0.70	0.80	0.90
e	1.00 BSC		
L	0.10	0.15	0.20

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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