

General Purpose Transistors

PNP Silicon

BC856B, BC857B, BC858A

These transistors are designed for general purpose amplifier applications. They are housed in the SC-70/SOT-323 which is designed for low power surface mount applications.

Features

- S and NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC856 BC857 BC858	V _{CEO}	-65 -45 -30	V
Collector-Base Voltage BC856 BC857 BC858	V _{CBO}	-80 -50 -30	V
Emitter-Base Voltage	V _{EBO}	-5.0	V
Collector Current - Continuous	I _C	-100	mAdc
Collector Current - Peak (1 ms pulse)	I _{CM}	-130	mA

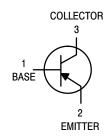
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, (Note 1) T _A = 25°C	P _D	150	mW
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	883	°C/W
Junction and Storage Temperature	T _J , T _{stg}	-55 to +150	°C

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.

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1. $FR-5 = 1.0 \times 0.75 \times 0.062$ in.





SC-70/SOT-323 CASE 419 STYLE 3

MARKING DIAGRAM



XX = Specific 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

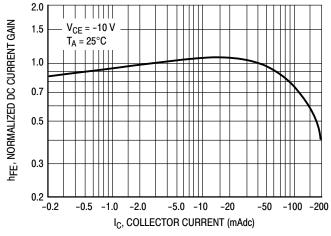
See detailed ordering and shipping information on page 5 of this data sheet.

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

Characteristic	Symbol	Min	Тур	Max	Unit		
OFF CHARACTERISTICS							
Collector – Emitter Breakdown Voltage ($I_C = -10 \text{ mA}$)	BC856 BC857 BC858	V _{(BR)CEO}	-65 -45 -30	- - -	- - -	V	
Collector – Emitter Breakdown Voltage ($I_C = -10 \mu A$, $V_{EB} = 0$)	BC856 BC857 BC858	V _{(BR)CES}	-80 -50 -30	- - -	- - -	V	
Collector – Base Breakdown Voltage ($I_C = -10 \mu A$)	BC856 BC857 BC858	V _(BR) CBO	-80 -50 -30	- - -	- - -	V	
Emitter – Base Breakdown Voltage ($I_E = -1.0 \mu A$)	BC856 BC857 BC858	V _{(BR)EBO}	-5.0 -5.0 -5.0	- - -	- - -	V	
Collector Cutoff Current ($V_{CB} = -30 \text{ V}$) ($V_{CB} = -30 \text{ V}$, $T_A = 150^{\circ}\text{C}$)	I _{CBO}	- -	_ _	–15 –4.0	nA μA	
ON CHARACTERISTICS							
DC Current Gain ($I_C = -10 \mu A$, $V_{CE} = -5.0 V$)	BC856A, BC585A BC856B, BC857B, BC858B BC857C	h _{FE}	- - -	90 150 270	- - -	-	
$(I_C = -2.0 \text{ mA}, V_{CE} = -5.0 \text{ V})$	BC856A, BC858A BC856B, BC857B, BC858B BC857C		125 220 420	180 290 520	250 475 800		
Collector – Emitter Saturation Voltage (I_C = -10 mA, I_B = -0.5 mA) (I_C = -100 mA, I_B = -5.0 mA)		V _{CE(sat)}	- -	- -	-0.3 -0.65	V	
Base – Emitter Saturation Voltage (I_C = -10 mA, I_B = -0.5 mA) (I_C = -100 mA, I_B = -5.0 mA)		V _{BE(sat)}	- -	-0.7 -0.9	- -	V	
Base – Emitter On Voltage (I_C = -2.0 mA, V_{CE} = -5.0 V) (I_C = -10 mA, V_{CE} = -5.0 V)		V _{BE(on)}	-0.6 -	- -	-0.75 -0.82	>	
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 _{ob}	-	_	4.5	pF	
Noise Figure (I _C = -0.2 mA, V _{CE} = -5.0 Vdc, R _S = 2.0 k Ω , 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.

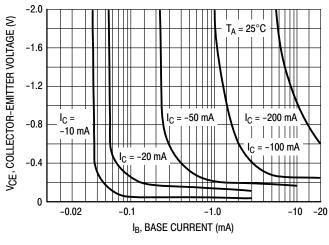
BC857/BC858



-1.0 T_A = 25°C -0.9 $V_{BE(sat)} @ I_C/I_B = 10$ -0.8 -0.7 V, VOLTAGE (VOLTS) $\overline{V}_{BE(on)} @ V_{CE} = -10 V$ -0.6 -0.5 -0.4 -0.3-0.2 $V_{CE(sat)} @ I_C/I_B = 10$ -0.1 -0.1 -0.2 -1.0 -2.0 -5.0 -50 -100 IC, COLLECTOR CURRENT (mAdc)

Figure 1. Normalized DC Current Gain

Figure 2. "Saturation" and "On" Voltages



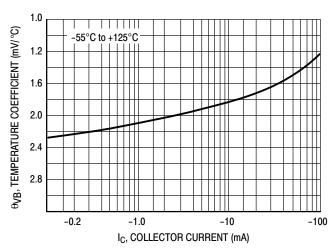
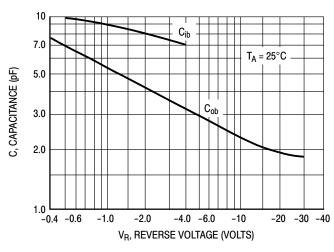


Figure 3. Collector Saturation Region

Figure 4. Base-Emitter Temperature Coefficient



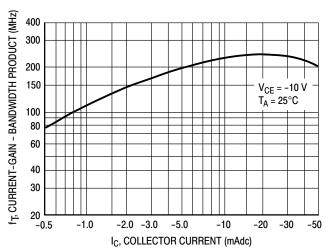


Figure 5. Capacitances

Figure 6. Current-Gain - Bandwidth Product

BC856

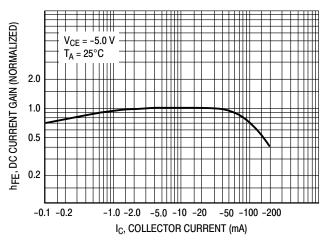


Figure 7. DC Current Gain

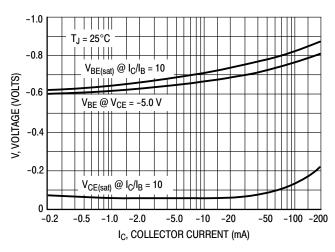


Figure 8. "On" Voltage

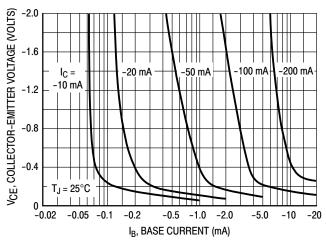


Figure 9. Collector Saturation Region

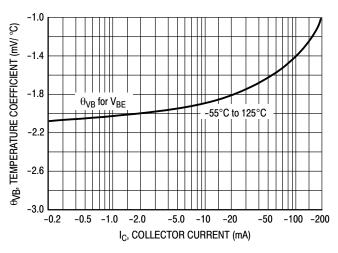


Figure 10. Base-Emitter Temperature Coefficient

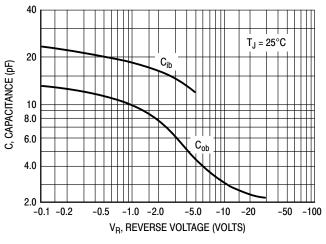


Figure 11. Capacitance

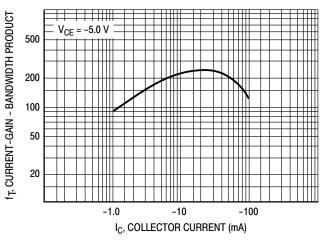


Figure 12. Current-Gain - Bandwidth Product

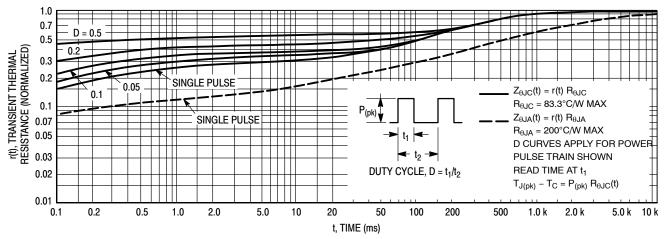


Figure 13. Thermal Response

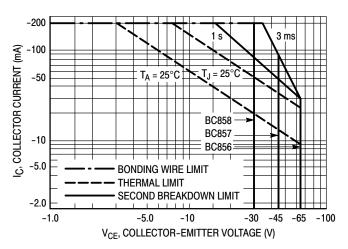


Figure 14. Active Region Safe Operating Area

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 14 is based upon $T_{J(pk)} = 150^{\circ}\text{C}$; T_{C} or T_{A} is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^{\circ}\text{C}$. $T_{J(pk)}$ may be calculated from the data in Figure 13. 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	Marking	Package	Shipping [†]	
BC856BWT1G	3B	SC-70/SOT-323	3,000 / Tape & Reel	
SBC856BWT1G*	36	(Pb-Free)		
BC857BWT1G	3F	SC-70/SOT-323	3,000 / Tape & Reel	
SBC857BWT1G*	35	(Pb-Free)		
BC857CWT1G	3G	SC-70/SOT-323	3,000 / Tape & Reel	
NSVBC857CWT1G*	30	(Pb-Free)	3,000 / Tape & neer	
BC858AWT1G	3J	SC-70/SOT-323 (Pb-Free) 3,000 / Tape & Re		
BC858BWT1G	3K	SC-70/SOT-323 (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.

^{*}S and NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.







SC-70 (SOT-323) CASE 419 ISSUE R

DATE 11 OCT 2022

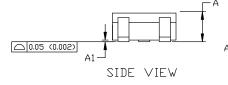
NOTES:

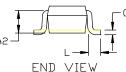
- 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1982.
- 2. CONTROLLING DIMENSION: INCH

	MILLIMETERS				INCHES	
DIM	MIN.	N□M.	MAX.	MIN.	N□M.	MAX.
Α	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.70 REF			0.028 BSC		
b	0.30	0.35	0.40	0.012	0.014	0.016
С	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.00	2.20	0.071	0.080	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
е	1.20	1.30	1.40	0.047	0.051	0.055
e1	0.65 BSC				0.026 BS	C
L	0.20	0.38	0.56	0.008	0.015	0.022
HE	2.00	2.10	2.40	0.079	0.083	0.095

SCALE 4:1

TOP VIEW





GENERIC MARKING DIAGRAM

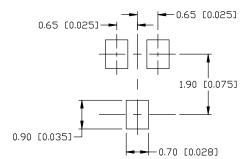


XX = Specific Device Code

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.



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

SOLDERING FOOTPRINT

STYLE 1: CANCELLED	STYLE 2: PIN 1. ANODE 2. N.C. 3. CATHODE	STYLE 3: PIN 1. BASE 2. EMITTER 3. COLLECTOR	STYLE 4: PIN 1. CATHODE 2. CATHODE 3. ANODE	STYLE 5: PIN 1. ANODE 2. ANODE 3. CATHODE	
STYLE 6:	STYLE 7:	STYLE 8:	STYLE 9:	STYLE 10:	STYLE 11:
PIN 1. EMITTER	PIN 1. BASE	PIN 1. GATE	PIN 1. ANODE	PIN 1. CATHODE	PIN 1. CATHODE
2. BASE	2. EMITTER	2. SOURCE	2. CATHODE	2. ANODE	2. CATHODE
3. COLLECTOR	3. COLLECTOR	3. DRAIN	3. CATHODE-ANODE	3. ANODE-CATHODE	3. CATHODE

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