General Purpose Transistors

PNP Silicon

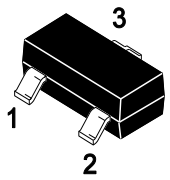
These transistors are designed for general purpose amplifier applications. They are housed in the SOT–323 which is designed for low power surface mount applications.

Features

We declare that the material of product compliance with RoHS requirements.
S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

BC856AW, BW
BC857AW, BW,CW
BC858AW, BW,CW

S-BC856AW, BW
S-BC857AW, BW,CW
S-BC858AW, BW,CW



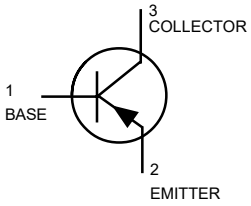
SOT-323

MAXIMUM RATINGS

Rating	Symbol	BC856	BC857	BC858	Unit
Collector–Emitter Voltage	V_{CEO}	–65	–45	–30	V
Collector–Base Voltage	V_{CBO}	–80	–50	–30	V
Emitter–Base Voltage	V_{EBO}	–5.0	–5.0	–5.0	V
Collector Current — Continuous	I_C	–100	–100	–100	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR– 5 Board, T_A = 25°C	P_D	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	°C/W
Junction and Storage Temperature	T_J , T_{stg}	–55 to +150	°C



DEVICE MARKING

(S-)BC856AW= 3A; (S-)BC856BW= 3B; (S-)BC857AW= 3E; (S-)BC857CW= 3F;
(S-)BC857CW= 3G; (S-)BC858AW= 3J; (S-)BC858BW= 3K; (S-)BC858CW= 3L

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)	BC856 Series	$V_{(BR)CEO}$	– 65	—	—	v
	BC857 Series		– 45	—	—	
	BC858 Series		– 30	—	—	
Collector–Emitter Breakdown Voltage (I_C = –10 µA, V_{EB} = 0)	BC856 Series	$V_{(BR)CES}$	– 80	—	—	v
	BC857B Only		– 50	—	—	
	BC858 Series		– 30	—	—	
Collector–Base Breakdown Voltage (I_C = – 10 µA)	BC856 Series	$V_{(BR)CBO}$	– 80	—	—	v
	BC857 Series		– 50	—	—	
	BC858 Series		– 30	—	—	
Emitter–Base Breakdown Voltage (I_E = – 1.0 µA)	BC856 Series	$V_{(BR)EBO}$	– 5.0	—	—	v
	BC857 Series		– 5.0	—	—	
	BC858 Series		– 5.0	—	—	
Collector Cutoff Current (V_{CB} = – 30 V)		I_{CBO}	—	—	– 15	nA
(V_{CB} = – 30 V, T_A = 150°C)			—	—	– 4.0	µA
Emitter Cutoff Current (V_{BE} = – 5 V)		I_{EBO}	—	—	–100	nA

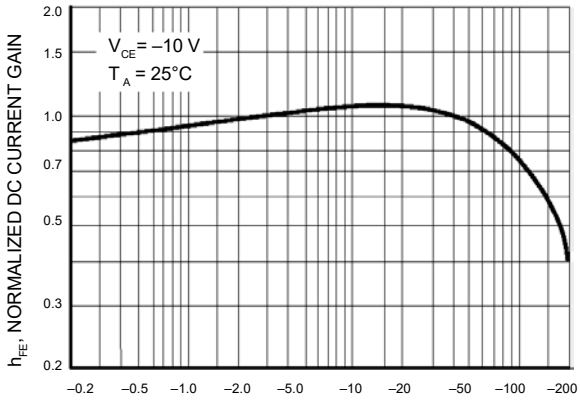
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				—
(I_C = –2.0 mA, V_{CE} = –5.0 V)	BC856A, BC857A, BC858A		125	180	250	
	BC856B,BC857B, BC858B		220	290	475	
	BC857C, BC858C		420	520	800	
Collector–Emitter Saturation Voltage (I_C = –10 mA, I_B = – 0.5 mA)		$V_{CE(sat)}$	—	—	– 0.3	V
(I_C = –100 mA, I_B = – 5.0 mA)			—	—	– 0.65	
Base–Emitter Saturation Voltage (I_C = –10 mA, I_B = –0.5 mA)		$V_{BE(sat)}$	—	– 0.7	– 1	V
(I_C = –100 mA, I_B = –5.0 mA)			—	– 0.9	– 1.2	
Base–Emitter Voltage (I_C = –2.0 mA, V_{CE} = –5.0 V)		$V_{BE(on)}$	– 0.6	—	– 0.75	V
(I_C = –10 mA, V_{CE} = –5.0 V)			—	—	– 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 V_{dc}, R_S= 2.0 kΩ, f =1.0 kHz, BW= 200 Hz)		NF	—	—	10	dB

ORDERING INFORMATION (Pb– Free)

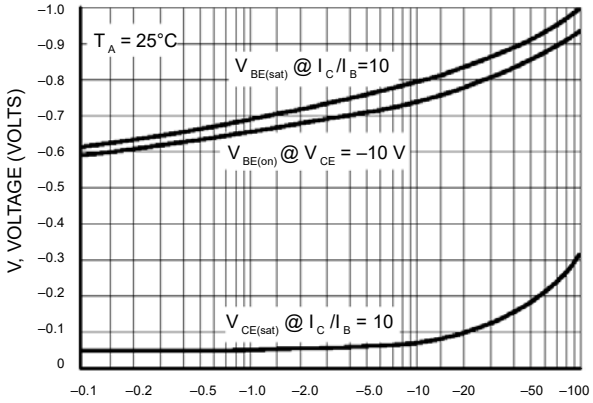
Device	Package	Shipping
BC856-858AW Series	SOT-323	3000/Tape & Reel

BC857/BC858



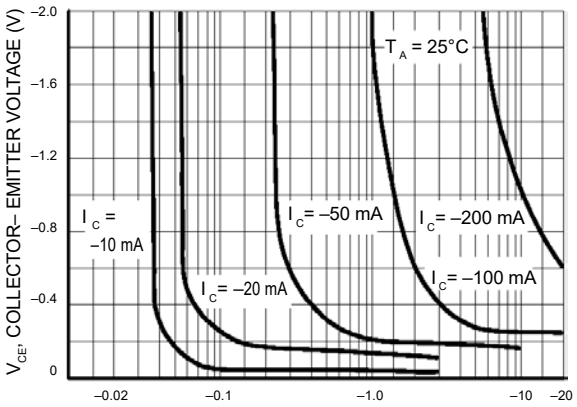
I_C, COLLECTOR CURRENT (mAdc)

Figure 1. Normalized DC Current Gain



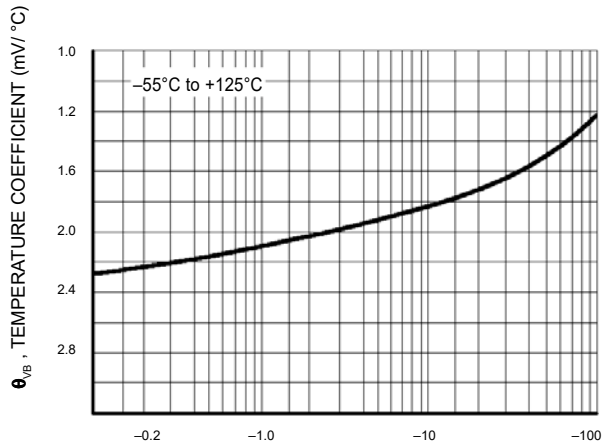
I_C, COLLECTOR CURRENT (mAdc)

Figure 2. "Saturation" and "On" Voltages



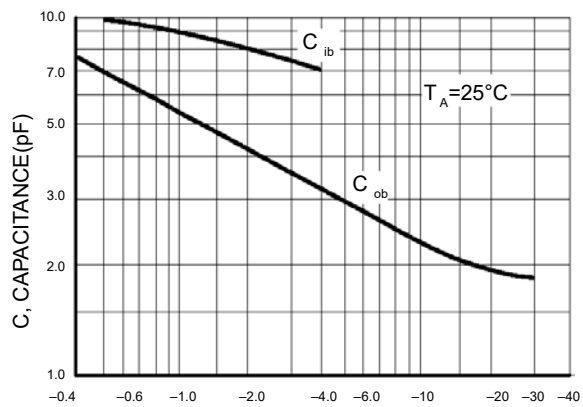
I_B, BASE CURRENT (mA)

Figure 3. Collector Saturation Region



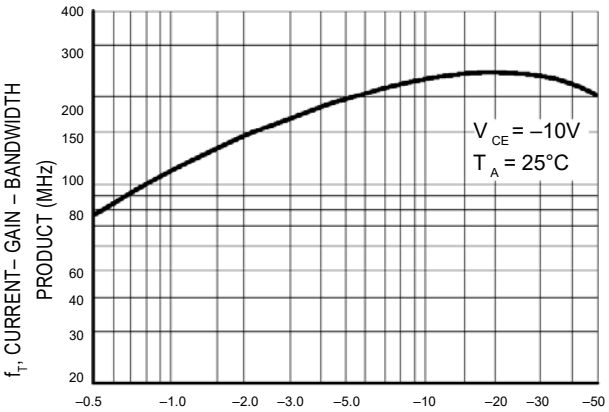
I_C, COLLECTOR CURRENT (mA)

Figure 4. Base–Emitter Temperature Coefficient



V_R, REVERSE VOLTAGE (VOLTS)

Figure 5. Capacitances



I_C, COLLECTOR CURRENT (mAdc)

Figure 6. Current–Gain – Bandwidth Product

BC856

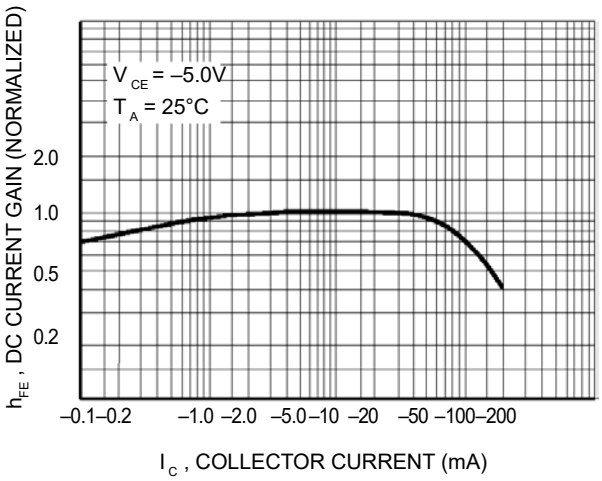


Figure 7. DC Current Gain

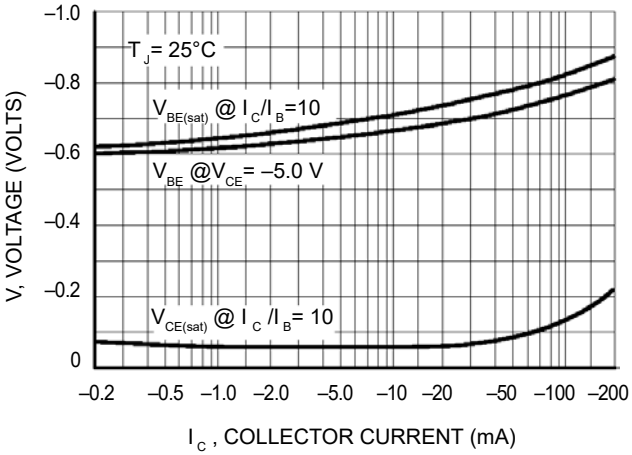


Figure 8. “On” Voltage

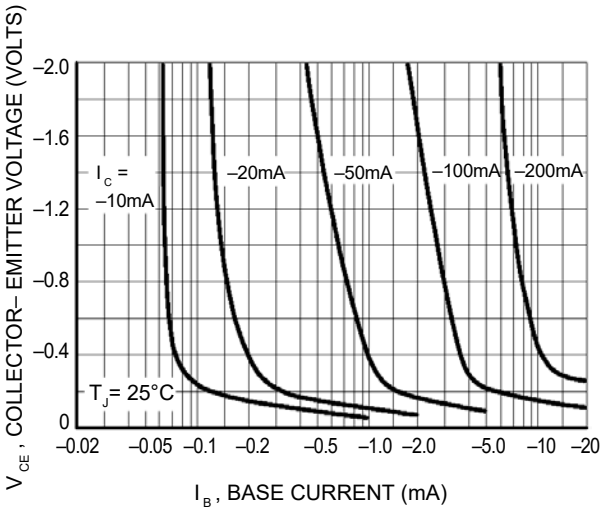


Figure 9. Collector Saturation Region

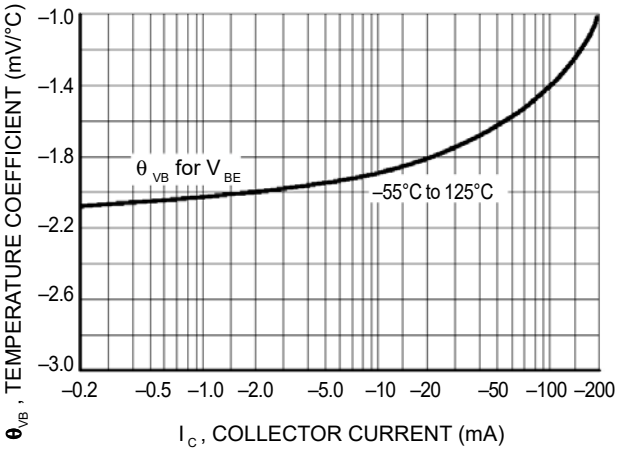


Figure 10. Base–Emitter Temperature Coefficient

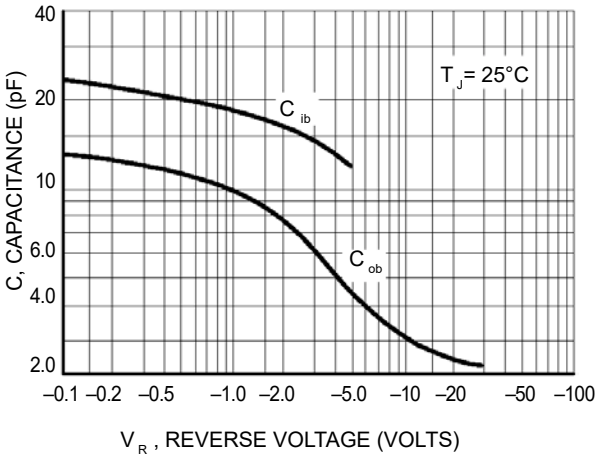


Figure 11. Capacitance

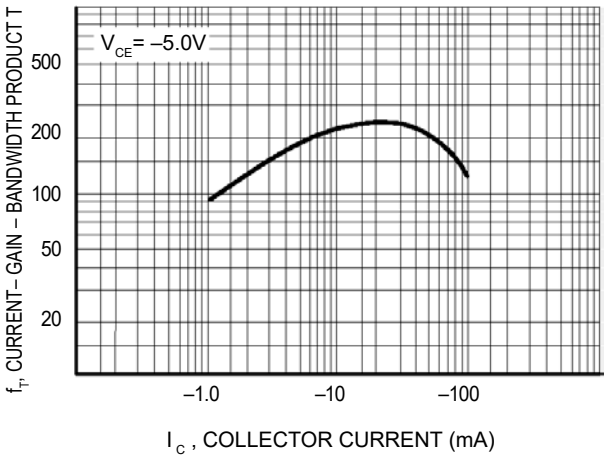


Figure 12. Current–Gain – Bandwidth Product

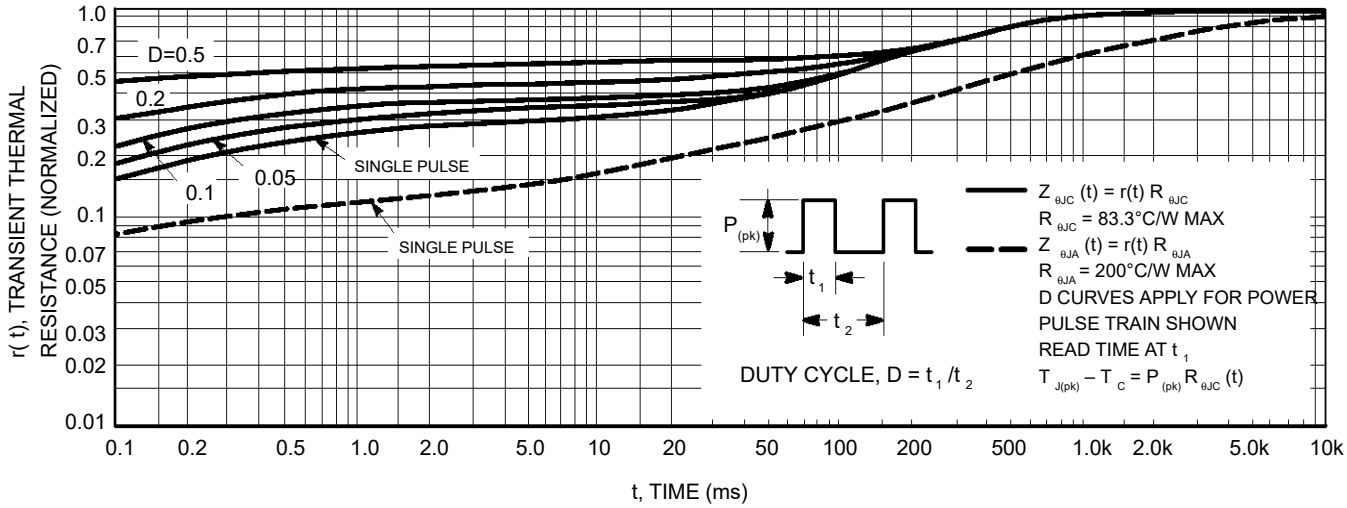


Figure 13. Thermal Response

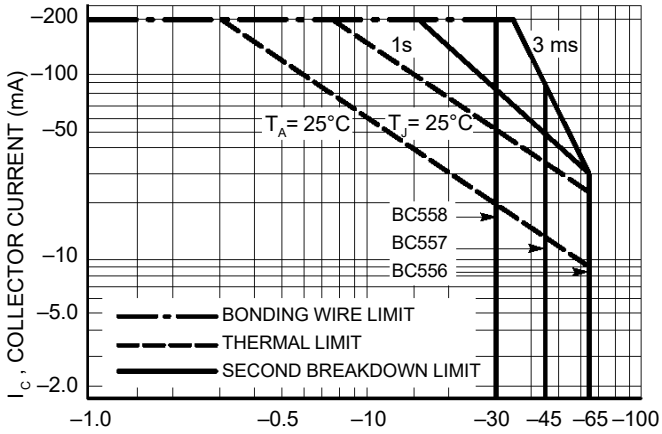
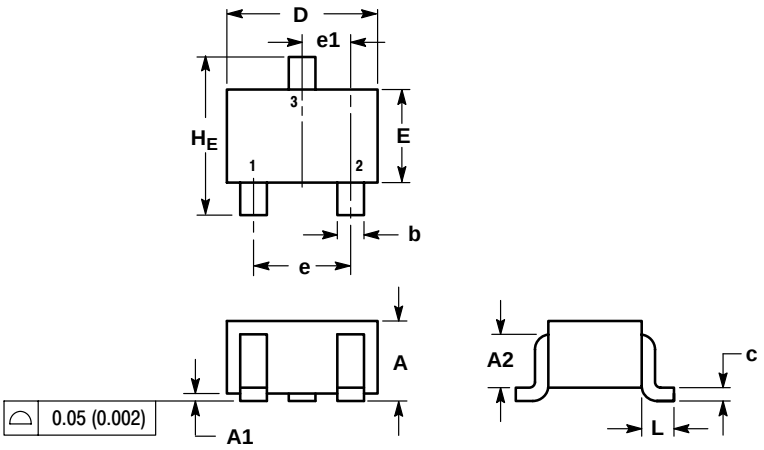


Figure 14. Active Region Safe Operating Area

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°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 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.

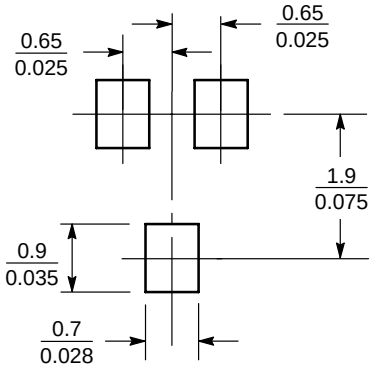
SOT−323



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

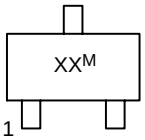
	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2		0.7 REF			0.028 REF	
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.10	2.20	0.071	0.083	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	1.30	1.40	0.047	0.051	0.055
e1		0.65 BSC			0.026 BSC	
L		0.425 REF			0.017 REF	
H_E	2.00	2.10	2.40	0.079	0.083	0.095

SOLDERING FOOTPRINT*



SCALE 10:1 (mm / inches)

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.