



DATA SHEET

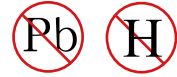
SEMICONDUCTOR

BC856-7-8-A-B-CW

General Purpose Transistors

PNP Silicon

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



Features

Pb- Free Package May be Available. The G.Suffix Denotes a

Pb- Free Lead Finish

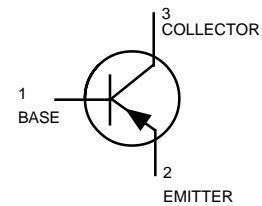
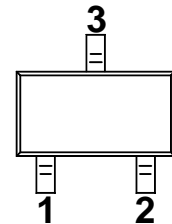
MAXIMUM RATINGS

Rating	Symbol	BC856	BC857	BC858	Unit
Collector-Emmitter 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, (1) $T_A = 25^\circ\text{C}$	P_D	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

SOT-323



DEVICE MARKING

BC856AW = 3A; BC856BW = 3B; BC857AW = 3E; BC857BW = 3F
BC858AW = 3J; BC858BW = 3K; BC858CW = 3L ;BC857CW=3G

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emmitter Breakdown Voltage ($I_C = -10\text{ mA}$)	BC856 Series	-65	—	—	v	
	BC857 Series	$V_{(BR)CEO}$	-45	—		
	BC858 Series	-30	—	—		
Collector-Emmitter Breakdown Voltage ($I_C = -10\ \mu\text{A}, V_{EB} = 0$)	BC856 Series	-80	—	—	v	
	BC857 Series	$V_{(BR)CES}$	-50	—		
	BC858 Series	-30	—	—		
Collector-Base Breakdown Voltage ($I_C = -10\ \mu\text{A}$)	BC856 Series	-80	—	—	v	
	BC857 Series	$V_{(BR)CBO}$	-50	—		
	BC858 Series	-30	—	—		
Emitter-Base Breakdown Voltage ($I_E = -1.0\ \mu\text{A}$)	BC856 Series	-5.0	—	—	v	
	BC857 Series	$V_{(BR)EBO}$	-5.0	—		
	BC858 Series	-5.0	—	—		
Collector Cutoff Current ($V_{CB} = -30\text{ V}$) ($V_{CB} = -30\text{ V}, T_A = 150^\circ\text{C}$)		I_{CBO}	—	—	-15	nA
					-4.0	μA

1.FR-5=1.0 x 0.75 x 0.062in

<http://www.yeashin.com>

ELECTRICAL CHARACTERISTICS

BC856-7-8-A-B-CW

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = -10\ \mu\text{A}$, $V_{CE} = -5.0\ \text{V}$)	BC856A, BC857A, BC858A BC856B, BC857B, BC858B	h_{FE}	—	90 150	—
($I_C = -2.0\ \text{mA}$, $V_{CE} = -5.0\ \text{V}$)	BC856A, BC857A, BC858A BC856B, BC857B, BC858B BC857C, BC858C,		125 220 420	180 290 520	250 475 800
Collector–Emitter Saturation Voltage ($I_C = -10\ \text{mA}$, $I_B = -0.5\ \text{mA}$) ($I_C = -100\ \text{mA}$, $I_B = -5.0\ \text{mA}$)	$V_{CE(sat)}$	—	—	-0.3 -0.65	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 ($I_C = -2.0\ \text{mA}$, $V_{CE} = -5.0\ \text{V}$) ($I_C = -10\ \text{mA}$, $V_{CE} = -5.0\ \text{V}$)	$V_{BE(on)}$	-0.6	—	-0.75 -0.82	V

SMALL–SIGNAL CHARACTERISTICS

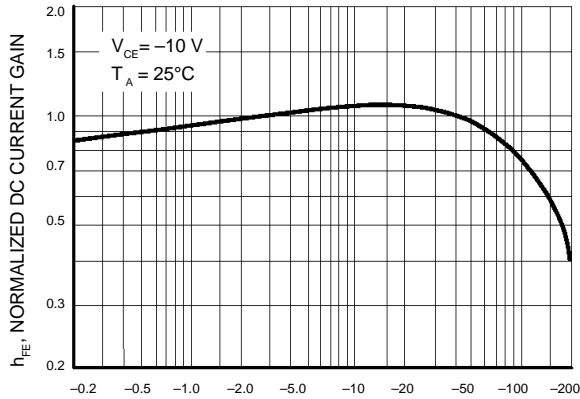
Current–Gain — Bandwidth Product ($I_C = -10\ \text{mA}$, $V_{CE} = -5.0\ \text{Vdc}$, $f = 100\ \text{MHz}$)	f_T	100	—	—	MHz
Output Capacitance ($V_{CB} = -10\ \text{V}$, $f = 1.0\ \text{MHz}$)	C_{ob}	—	—	4.5	pF
Noise Figure ($I_C = -0.2\ \text{mA}$, $V_{CE} = -5.0\ \text{Vdc}$, $R_S = 2.0\ \text{k}\Omega$, $f = 1.0\ \text{kHz}$, $BW = 200\ \text{Hz}$)	NF	—	—	10	dB

ORDERING INFORMATION (Pb–Free)

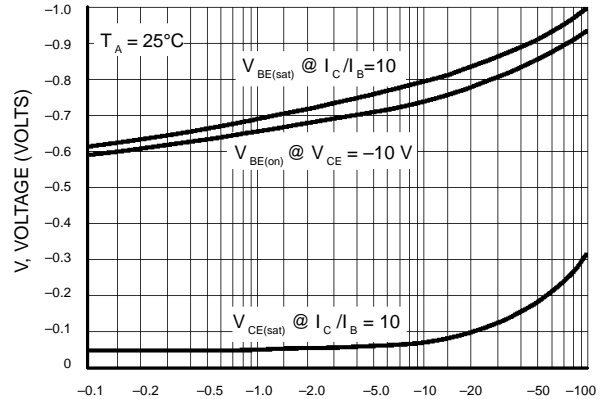
Device	Package	Shipping
BC856AW, BW	SOT-323	3000/Tape & Reel
BC857AW, BW, CW	SOT-323	3000/Tape & Reel
BC858AW, BW, CW	SOT-323	3000/Tape & Reel

DEVICE CHARACTERISTICS

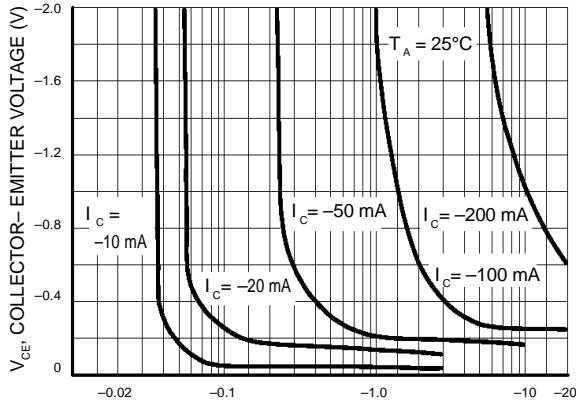
BC856-7-8-A-B-CW



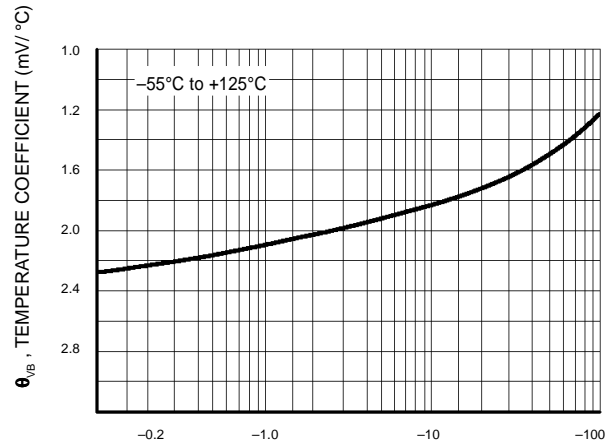
I_C , COLLECTOR CURRENT (mAdc)
Figure 1. Normalized DC Current Gain



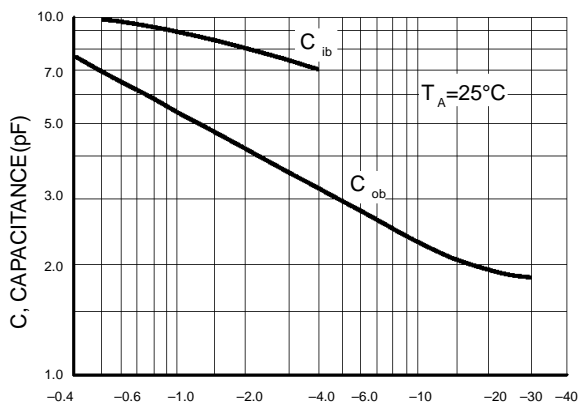
I_C , COLLECTOR CURRENT (mAdc)
Figure 2. "Saturation" and "On" Voltages



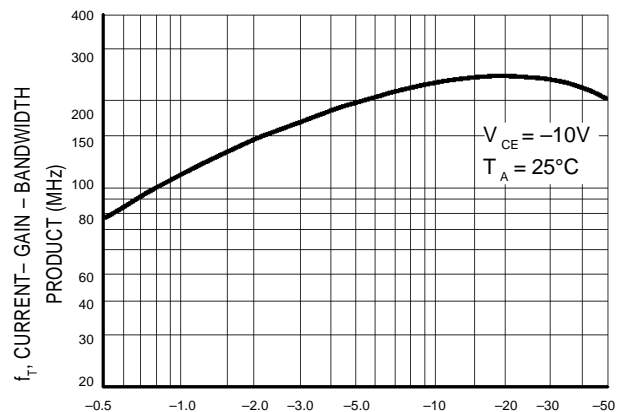
I_B , BASE CURRENT (mA)
Figure 3. Collector Saturation Region



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

DEVICE CHARACTERISTICS

BC856-7-8-A-B-CW

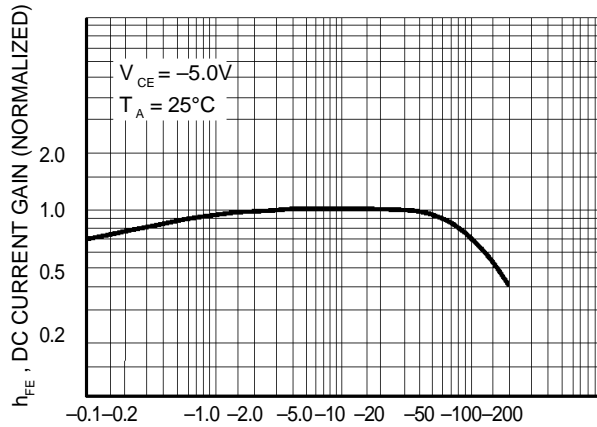


Figure 7. DC Current Gain

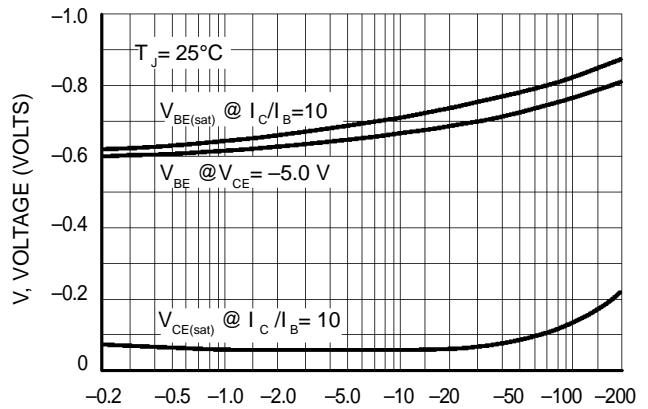


Figure 8. "On" Voltage

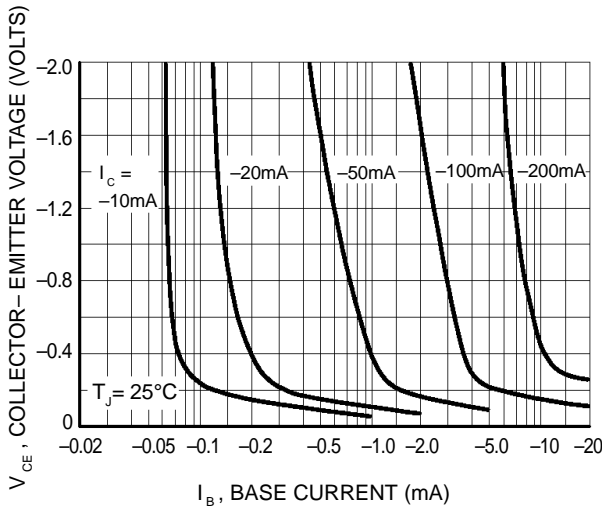


Figure 9. Collector Saturation Region

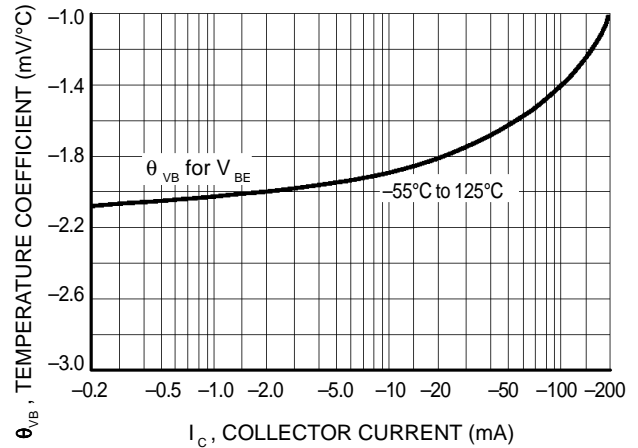


Figure 10. Base-Emitter Temperature Coefficient

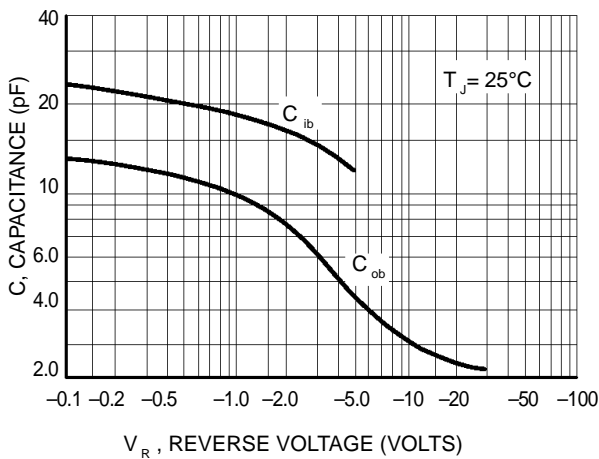


Figure 11. Capacitance

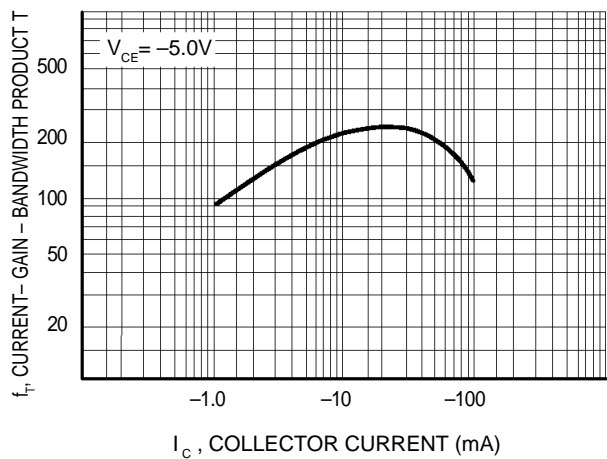


Figure 12. Current-Gain - Bandwidth Product

DEVICE CHARACTERISTICS

BC856-7-8-A-B-CW

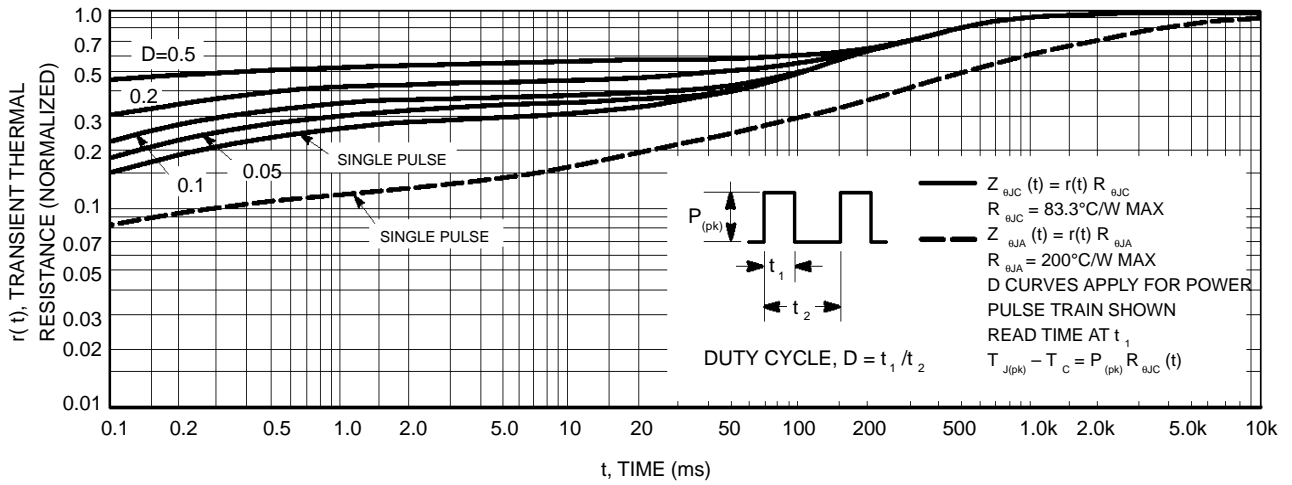


Figure 13. Thermal Response

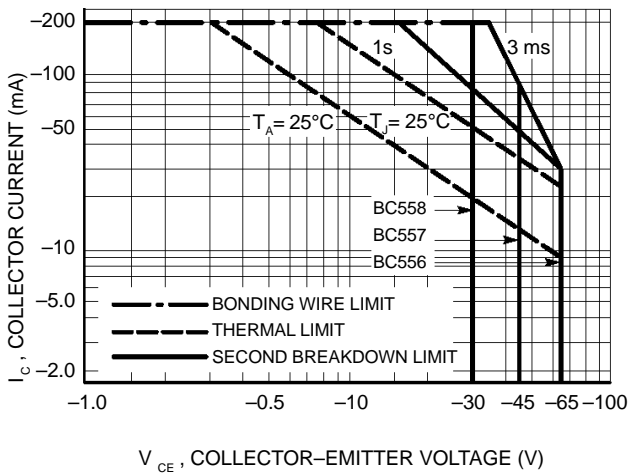


Figure 14. Active Region Safe Operating Area

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.

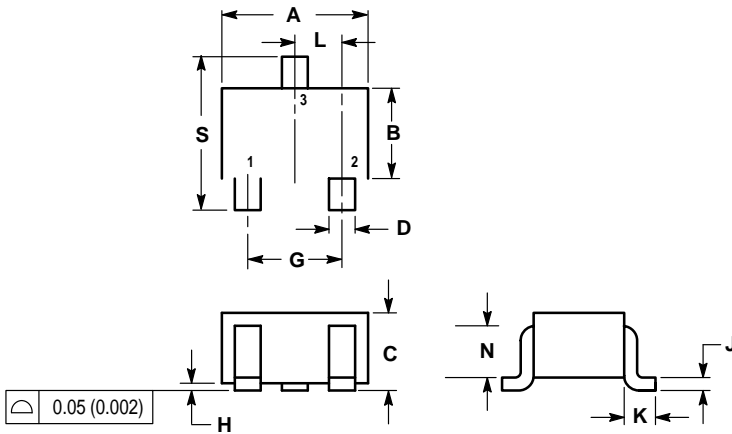
PACKAGE OUTLINE & DIMENSIONS

BC856-7-8-A-B-CW

SC-70 / SOT-323

NOTES:

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



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.032	0.040	0.80	1.00
D	0.012	0.016	0.30	0.40
G	0.047	0.055	1.20	1.40
H	0.000	0.004	0.00	0.10
J	0.004	0.010	0.10	0.25
K	0.017 REF		0.425 REF	
L	0.026 BSC		0.650 BSC	
N	0.028 REF		0.700 REF	
S	0.079	0.095	2.00	2.40

- PIN 1. BASE
 PIN 2. EMITTER
 PIN 3. COLLECTOR

