

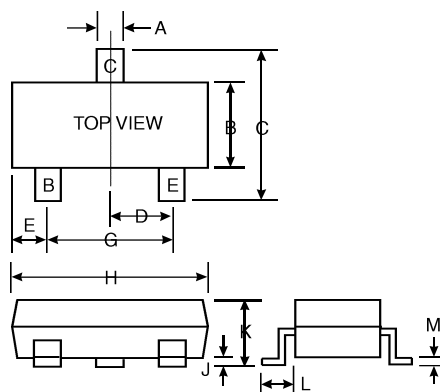
Features

Epitaxial Die Construction
Ideally Suited for Automatic Insertion
310 mW Power Dissipation
Complementary NPN Types Available
(BC846-BC848)
For Switching and AF Amplifier Applications

Mechanical Data

Case: SOT-23, Molded Plastic
Terminals: Solderable per MIL-STD-202,
Method 208
Pin Connections and Marking Codes
(See Table & Diagram)
Approx. Weight: 0.008 grams
Mounting Position: Any

Marking Code			
Type	Marking	Type	Marking
BC856A	3A	BC857C	3G
BC856B	3B	BC858A	3J
BC857A	3E	BC858B	3K
BC857B	3F	BC858C	3L



SOT-23		
Dim	Min	Max
A	0.37	0.51
B	1.19	1.40
C	2.10	2.50
D	0.89	1.05
E	0.45	0.61
G	1.78	2.05
H	2.65	3.05
J	0.013	0.15
K	0.89	1.10
L	0.45	0.61
M	0.076	0.178
All Dimensions in mm		

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$-V_{CBO}$	80	V
		50	
		30	
Collector-Emitter Voltage	$-V_{CEO}$	65	V
		45	
		30	
Emitter-Base Voltage	$-V_{EBO}$	5.0	V
Collector Current	$-I_C$	100	mA
Peak Collector Current	$-I_{CM}$	200	mA
Peak Emitter Current	$-I_{EM}$	200	mA
Power Dissipation at $T_{SB} = 50^\circ\text{C}$ (Note 1)	P_d	310	mW
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	$^\circ\text{C}$

Notes: 1. Device mounted on ceramic substrate 0.7mm x 2.5cm² area

Electrical Characteristics

@ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition	
h-Parameters (Note 2)								
Small Signal Current Gain	Current Gain Group A	h_{fe}	—	220	—	—	$V_{CE} = -5.0V, I_C = -2.0mA,$ $f = 1.0kHz$	
		h_{fe}	—	330	—	—		
		h_{fe}	—	600	—	—		
Input Impedance	Current Gain Group A	h_{ie}	1.6	2.7	4.5	k		
		h_{ie}	3.2	4.5	8.5	k		
		h_{ie}	6.0	8.7	15	k		
Output Admittance	Current Gain Group A	h_{oe}	—	18	30	μS		
		h_{oe}	—	30	60	μS		
		h_{oe}	—	60	110	μS		
Reverse Voltage Transfer Ratio	Current Gain Group A	h_{re}	—	1.5×10^{-4}	—	—		
		h_{re}	—	2×10^{-4}	—	—		
		h_{re}	—	3×10^{-4}	—	—		
DC Current Gain (Note 2)	Current Gain Group A		—	90	—	—	$V_{CE} = -5.0V, I_C = -10\mu A$	
			—	150	—			
			—	270	—			
	Current Gain Group A		110	180	220	—	$V_{CE} = -5.0V, I_C = -2.0mA$	
			200	290	450			
			420	520	800			
Thermal Resistance, Junction to Substrate Backside		R_{JSB}	—	—	320	K/W	Note 1	
Thermal Resistance, Junction to Ambient		R_{JA}	—	—	400	K/W	Note 1	
Collector-Emitter Saturation Voltage		$-V_{CE(SAT)}$	—	90 250	300 650	mV	$I_C = -10mA, I_B = -0.5mA$ $I_C = -100mA, I_B = -5.0mA$	
Base-Emitter Saturation Voltage		$-V_{BE(SAT)}$	— —	700 900	—	mV	$I_C = -10mA, I_B = -0.5mA$ $I_C = -100mA, I_B = -5.0mA$	
Base-Emitter Voltage		$-V_{BE}$	600 —	660 —	750 800	mV	$V_{CE} = -5.0V, I_C = -2.0mA$ $V_{CE} = -5.0V, I_C = -10mA$	
Collector-Emitter Cutoff Current		BC856 BC857 BC858 BC856 BC857 BC858	$-I_{CES}$ $-I_{CES}$ $-I_{CES}$ $-I_{CES}$ $-I_{CES}$ $-I_{CES}$ $-I_{CBO}$ $-I_{CBO}$	— — — — — — — —	0.2 0.2 0.2 — — — — —	15 15 15 4.0 4.0 4.0 15 5.0	nA nA nA μA μA μA nA μA	$V_{CE} = -80V$ $V_{CE} = -50V$ $V_{CE} = -30V$ $V_{CE} = -80V, T_j = 125^{\circ}C$ $V_{CE} = -50V, T_j = 125^{\circ}C$ $V_{CE} = -30V, T_j = 125^{\circ}C$ $V_{CB} = -30V$ $V_{CB} = -30V, T_j = 150^{\circ}C$
Gain Bandwidth Product		f_T	—	150	—	MHz	$V_{CE} = -5.0V, I_C = -10mA,$ $f = 100MHz$	
Collector-Base Capacitance		C_{CBO}	—	—	6.0	pF	$V_{CB} = -10V, f = 1.0MHz$	
Noise Figure		NF	—	2.0	10	dB	$V_{CE} = -5.0V, I_C = 200\mu A,$ $R_G = 2k\Omega, f = 1kHz, f = 200Hz$	

- Notes: 1. Device mounted on ceramic substrate 0.7mm x 2.5cm² area.
2. Current gain subgroup "C" is not available for BC856.

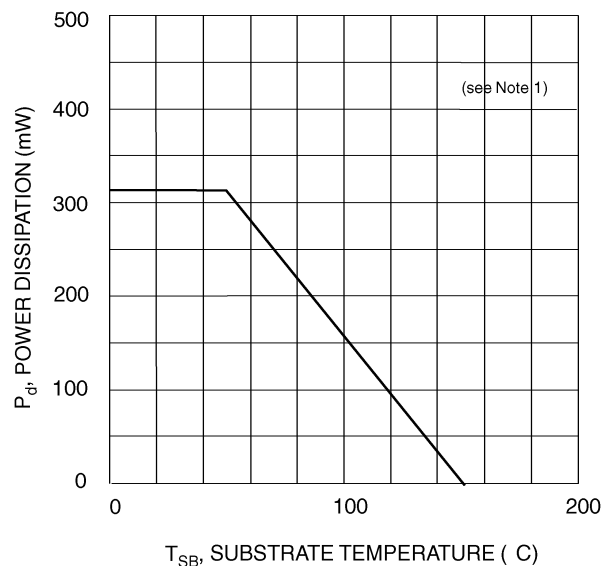


Fig. 1, Power Derating Curve

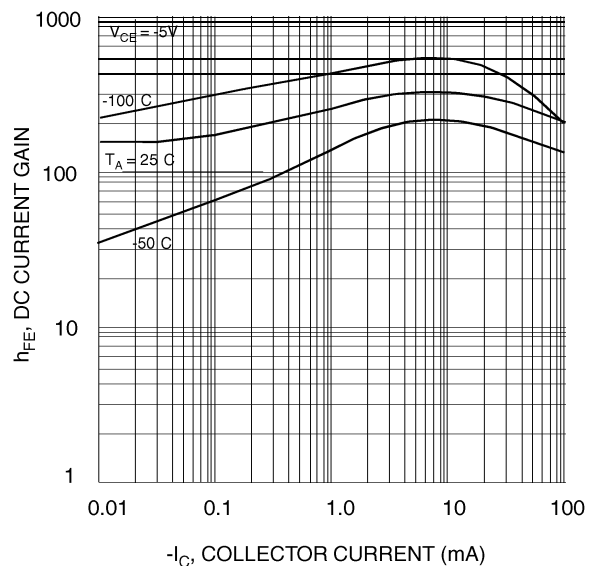


Fig. 2, DC Current Gain vs Collector Current

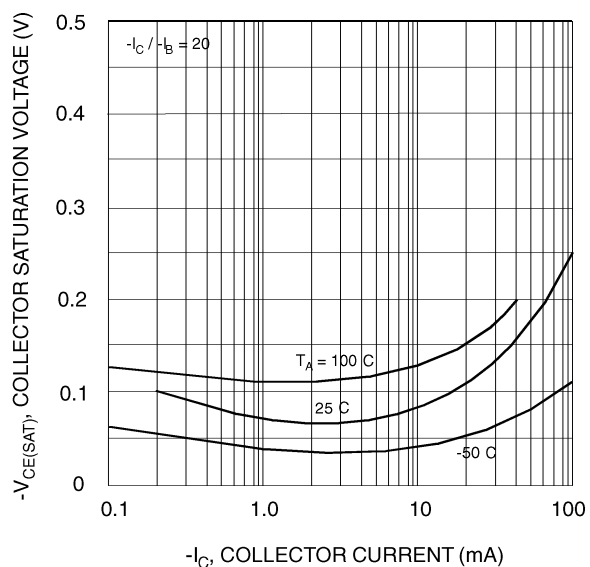


Fig. 3, Collector Saturation Voltage vs Collector Current

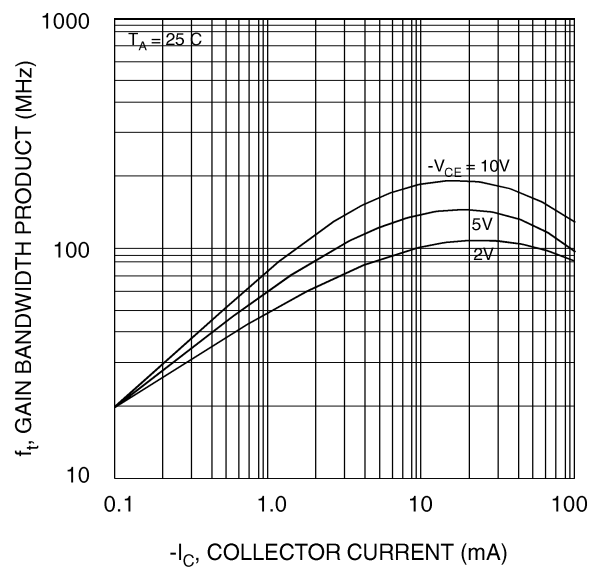


Fig. 4, Gain Bandwidth Product vs Collector Current

Notes: 1. Device mounted on ceramic substrate 0.7mm x 2.5cm² area