

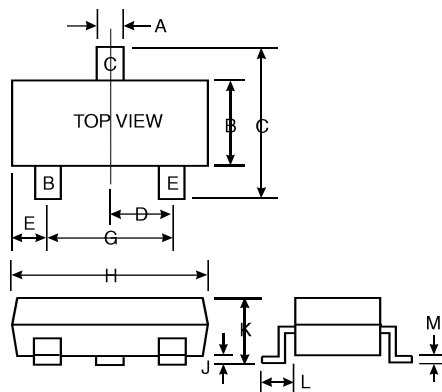
### Features

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<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	BC856 BC857 BC858 -V <sub>CB0</sub>	80 50 30	V
Collector-Emitter Voltage	BC856 BC857 BC858 -V <sub>CE0</sub>	65 45 30	V
Emitter-Base Voltage	-V <sub>EB0</sub>	5.0	V
Collector Current	-I <sub>C</sub>	100	mA
Peak Collector Current	-I <sub>CM</sub>	200	mA
Peak Emitter Current	-I <sub>EM</sub>	200	mA
Power Dissipation at T <sub>SB</sub> = 50°C (Note 1)	P <sub>d</sub>	310	mW
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

Notes: 1. Device mounted on ceramic substrate 0.7mm x 2.5cm<sup>2</sup> area

# Electrical Characteristics

@ T<sub>A</sub> = 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 <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA, f = 1.0kHz	
	B	$h_{fe}$	—	330	—		
	C	$h_{fe}$	—	600	—		
Input Impedance	Current Gain Group A	$h_{ie}$	1.6	2.7	4.5		k
	B	$h_{ie}$	3.2	4.5	8.5		k
	C	$h_{ie}$	6.0	8.7	15		k
Output Admittance	Current Gain Group A	$h_{oe}$	—	18	30		μS
	B	$h_{oe}$	—	30	60		μS
	C	$h_{oe}$	—	60	110		μS
Reverse Voltage Transfer Ratio	Current Gain Group A	$h_{re}$	—	1.5x10 <sup>-4</sup>	—		—
	B	$h_{re}$	—	2x10 <sup>-4</sup>	—		—
	C	$h_{re}$	—	3x10 <sup>-4</sup>	—		—
DC Current Gain (Note 2)	Current Gain Group A	$h_{FE}$	—	90	—	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10μA	
	B	$h_{FE}$	—	150	—	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA	
	C	$h_{FE}$	—	270	—		
	Current Gain Group A	$h_{FE}$	110	180	220		
	B	$h_{FE}$	200	290	450		
	C	$h_{FE}$	420	520	800		
Thermal Resistance, Junction to Substrate Backside	R <sub>JSB</sub>	—	—	320	K/W	Note 1	
Thermal Resistance, Junction to Ambient	R <sub>JA</sub>	—	—	400	K/W	Note 1	
Collector-Emitter Saturation Voltage	-V <sub>CE(SAT)</sub>	—	90	300	mV	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA	
Base-Emitter Saturation Voltage	-V <sub>BE(SAT)</sub>	—	700	—	mV	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA	
Base-Emitter Voltage	-V <sub>BE</sub>	600	660	750	mV	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA	
Collector-Emitter Cutoff Current	BC856	-I <sub>CES</sub>	—	0.2	15	nA	V <sub>CE</sub> = -80V
	BC857	-I <sub>CES</sub>	—	0.2	15	nA	V <sub>CE</sub> = -50V
	BC858	-I <sub>CES</sub>	—	0.2	15	nA	V <sub>CE</sub> = -30V
	BC856	-I <sub>CES</sub>	—	—	4.0	μA	V <sub>CE</sub> = -80V, T <sub>J</sub> = 125°C
	BC857	-I <sub>CES</sub>	—	—	4.0	μA	V <sub>CE</sub> = -50V, T <sub>J</sub> = 125°C
	BC858	-I <sub>CES</sub>	—	—	4.0	μA	V <sub>CE</sub> = -30V, T <sub>J</sub> = 125°C
		-I <sub>CBO</sub>	—	—	15	nA	V <sub>CB</sub> = -30V
		-I <sub>CBO</sub>	—	—	5.0	μA	V <sub>CB</sub> = -30V, T <sub>J</sub> = 150°C
Gain Bandwidth Product	f <sub>T</sub>	—	150	—	MHz	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA, f = 100MHz	
Collector-Base Capacitance	C <sub>CB0</sub>	—	—	6.0	pF	V <sub>CB</sub> = -10V, f = 1.0MHz	
Noise Figure	NF	—	2.0	10	dB	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = 200μA, R <sub>G</sub> = 2kΩ, f = 1kHz, f = 200Hz	

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

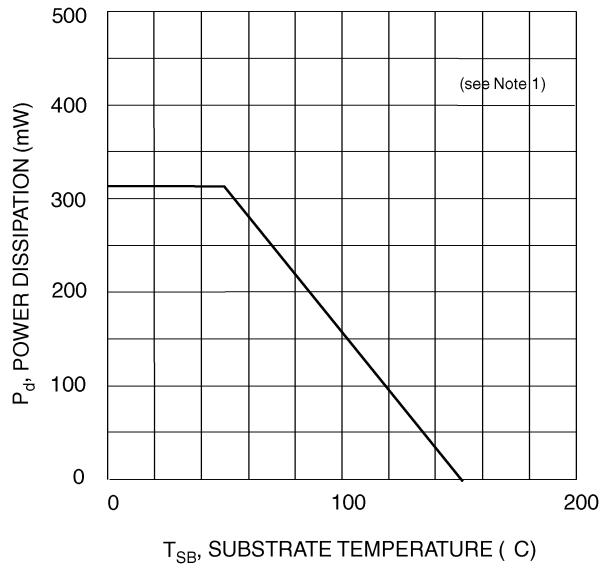


Fig. 1, Power Derating Curve

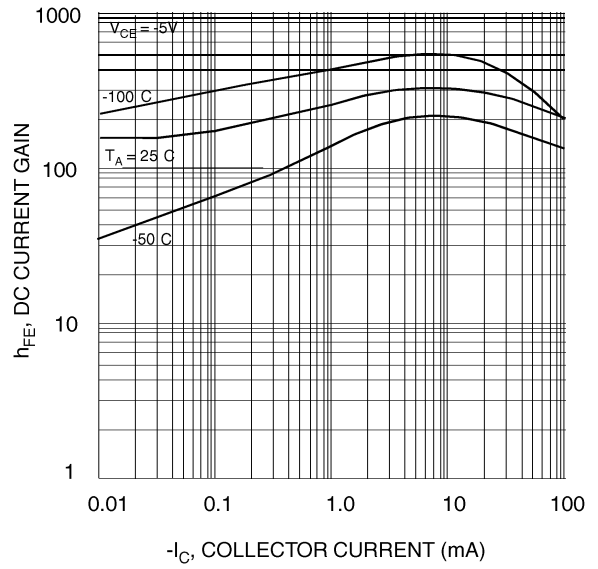


Fig. 2, DC Current Gain vs Collector Current

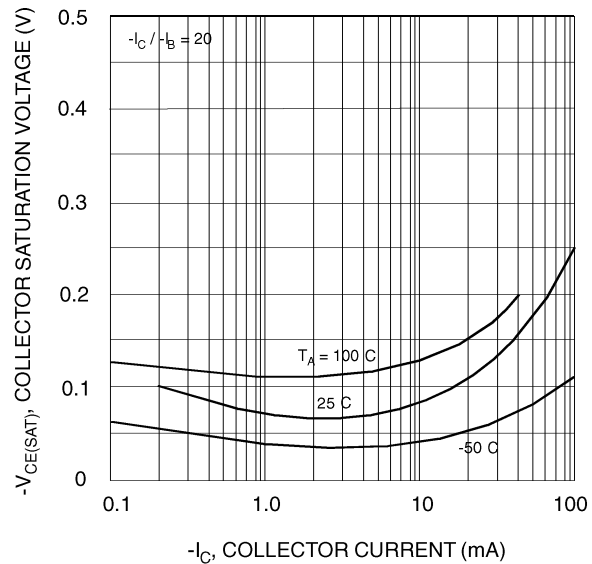


Fig. 3, Collector Saturation Voltage vs Collector Current

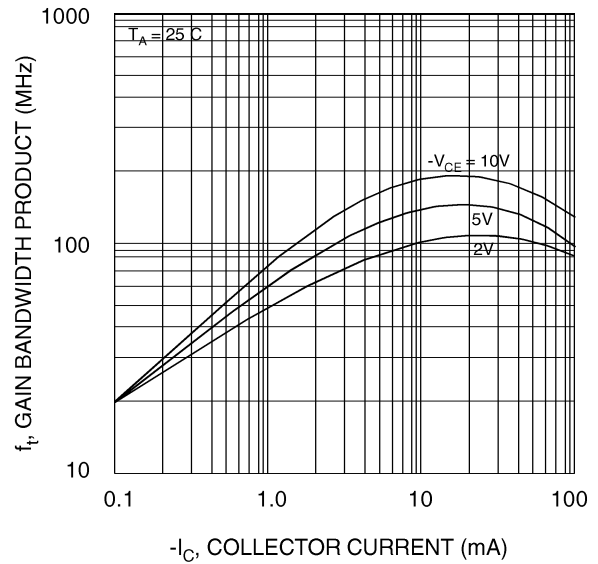


Fig. 4, Gain Bandwidth Product vs Collector Current

Notes: 1. Device mounted on ceramic substrate 0.7mm x 2.5cm<sup>2</sup> area