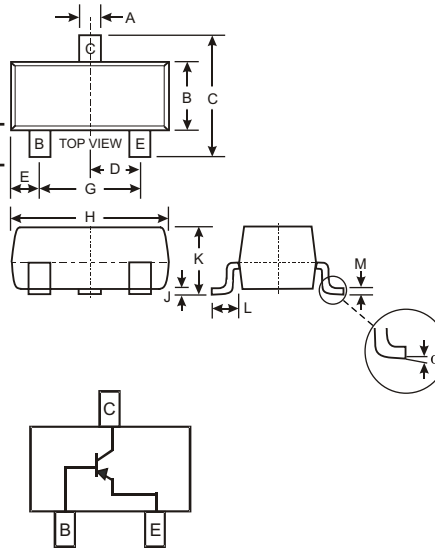


Features

- Ideally Suited for Automatic Insertion
- Complementary NPN Types Available (BC846-BC848)
- For Switching and AF Amplifier Applications
- Also Available in Lead Free Version

Mechanical Data

- Case: SOT-23, Molded Plastic
- Case material - UL Flammability Rating Classification 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 5, on Page 3
- Pin Connections: See Diagram
- Marking Codes (See Table Below & Diagram on Page 3)
- Ordering & Date Code Information: See Page 3
- Approx. Weight: 0.008 grams



SOT-23		
Dim	Min	Max
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
E	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
α	0°	8°
All Dimensions in mm		

Marking Code (Note 2)

Type	Marking	Type	Marking
BC856A	3A, K3A	BC857C	3G, K3G
BC856B	3B, K3B	BC858A	3J, K3J, K3A, K3V
BC857A	3E, K3V, K3A	BC858B	3K, K3K, K3B, K3W
BC857B	3F, K3W, K3B	BC858C	3L, K3L, K3G

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-80 -50 -30	V
Collector-Emitter Voltage	V_{CEO}	-65 -45 -30	V
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 (Note 1)	P_d	300	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_j, T_{STG}	-65 to +150	$^\circ\text{C}$

Notes: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 2. Current gain subgroup "C" is not available for BC856.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 3)	BC856 BC857 BC858	$V_{(BR)CBO}$	-80 -50 -30	— — —	— — —	V	$I_C = 10\mu\text{A}$, $I_B = 0$
Collector-Emitter Breakdown Voltage (Note 3)	BC856 BC857 BC858	$V_{(BR)CEO}$	-65 -45 -30	— — —	— — —	V	$I_C = 10\text{mA}$, $I_B = 0$
Emitter-Base Breakdown Voltage (Note 3)		$V_{(BR)EBO}$	-5	—	—	V	$I_E = 1\mu\text{A}$, $I_C = 0$
H-Parameters							
Small Signal Current Gain	Current Gain Group A B C	h_{fe} h_{fe} h_{fe}	— — —	200 330 600	— — —	— — —	$V_{CE} = -5.0\text{V}$, $I_C = -2.0\text{mA}$, $f = 1.0\text{kHz}$
Input Impedance	Current Gain Group A B C	h_{ie} h_{ie} h_{ie}	— — —	2.7 4.5 8.7	— — —	$k\Omega$ $k\Omega$ $k\Omega$	
Output Admittance	Current Gain Group A B C	h_{oe} h_{oe} h_{oe}	— — —	18 30 60	— — —	μS μS μS	
Reverse Voltage Transfer Ratio	Current Gain Group A B C	h_{re} h_{re} h_{re}	— — —	1.5×10^{-4} 2×10^{-4} 3×10^{-4}	— — —	— — —	
DC Current Gain (Note 3)	Current Gain Group A B C	h_{FE}	125 220 420	180 290 520	250 475 800	—	
Collector-Emitter Saturation Voltage (Note 3)		$V_{CE(SAT)}$	—	-75 -250	-300 -650	mV	
Base-Emitter Saturation Voltage (Note 3)		$V_{BE(SAT)}$	—	-700 -850	—	mV	
Base-Emitter Voltage (Note 3)		$V_{BE(ON)}$	-600 —	-650 —	-750 -820	mV	
Collector-Cutoff Current (Note 3)	BC856 BC857 BC858	I_{CES} I_{CES} I_{CES} I_{CBO} I_{CBO}	— — — — —	— — — — —	-15 -15 -15 -15 -4.0	nA nA nA nA μA	$V_{CE} = -80\text{V}$ $V_{CE} = -50\text{V}$ $V_{CE} = -30\text{V}$ $V_{CB} = -30\text{V}$ $V_{CB} = -30\text{V}$, $T_A = 150^\circ\text{C}$
Gain Bandwidth Product		f_T	100	200	—	MHz	$V_{CE} = -5.0\text{V}$, $I_C = -10\text{mA}$, $f = 100\text{MHz}$
Collector-Base Capacitance		C_{CBO}	—	3	—	pF	$V_{CB} = -10\text{V}$, $f = 1.0\text{MHz}$
Noise Figure		NF	—	2	10	dB	$V_{CE} = -5.0\text{V}$, $I_C = 200\mu\text{A}$, $R_S = 2k\Omega$, $f = 1\text{kHz}$, $\Delta f = 200\text{Hz}$

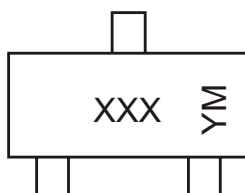
Notes: 3. Short duration pulse test used to minimize self-heating effect.

Ordering Information (Note 4)

Device	Packaging	Shipping
BC85xx-7*	SOT-23	3000/Tape & Reel

- Notes:
- For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
*xx = device type, e.g. BC856A-7.
 - For Lead Free version (with Lead Free terminal finish) part number, please add "-F" suffix to part number above.
Example: BC856A-7-F.

Marking Information



XXX = Product Type Marking Code (See Page 1), e.g. K3A = BC856A
 YM = Date Code Marking
 Y = Year ex: N = 2002
 M = Month ex: 9 = September

Date Code Key

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Code	J	K	L	M	N	P	R	S	T	U	V	W

Month	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

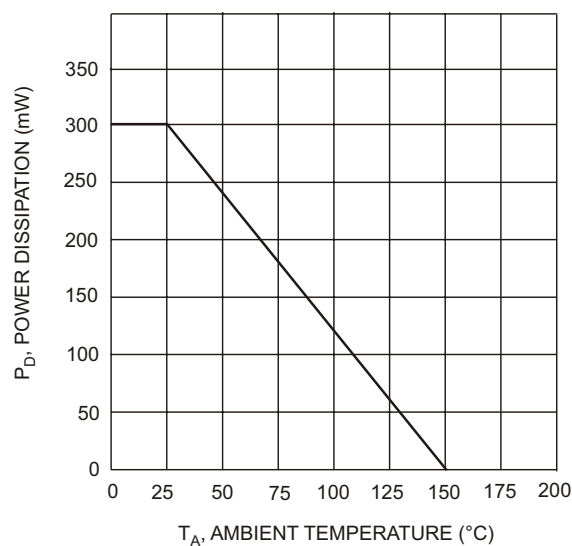


Fig. 1, Max Power Dissipation vs Ambient Temperature

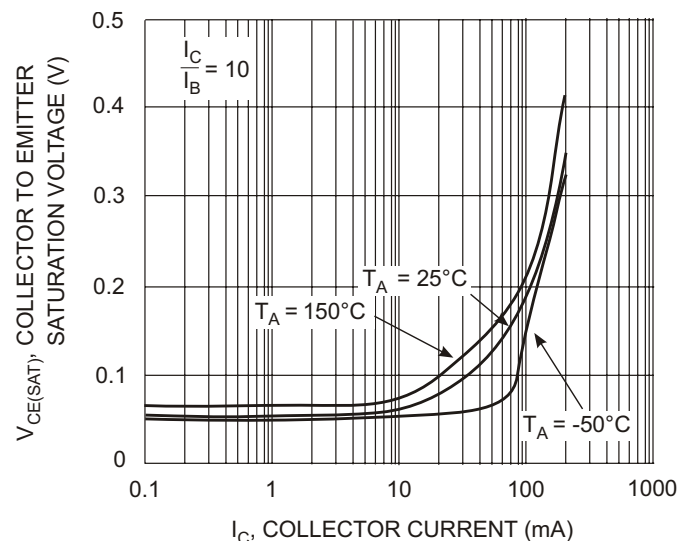


Fig. 2 Collector Emitter Saturation Voltage vs. Collector Current

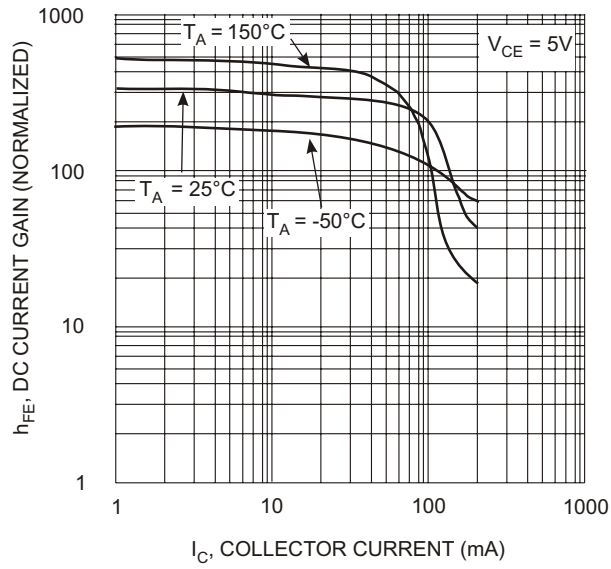


Fig. 3, DC Current Gain vs. Collector Current

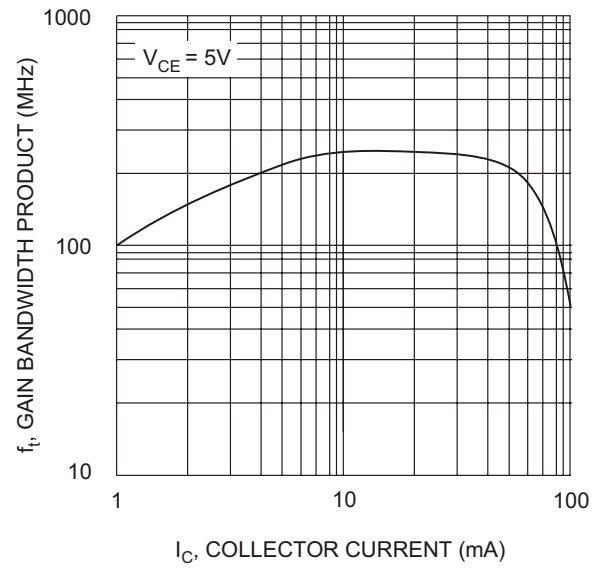


Fig. 4, Gain Bandwidth Product vs Collector Current