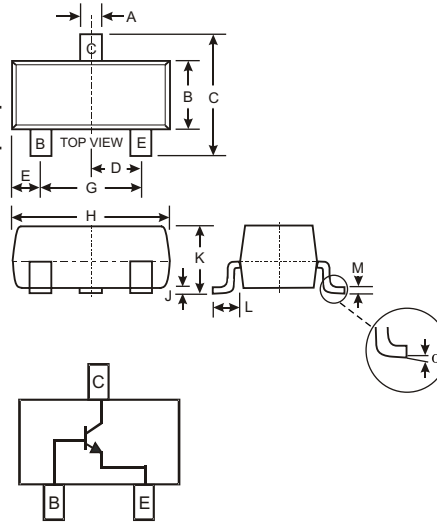


### Features

- Ideally Suited for Automatic Insertion
- Complementary PNP Types Available (BC856-BC858)
- For Switching and AF Amplifier Applications
- **Available in Lead Free/RoHS Compliant Version (Note 3)**

### Mechanical Data

- Case: SOT-23
- Case material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe). Please See Ordering Information, Note 6, on Page 4
- Pin Connections: See Diagram
- Marking Codes (See Table Below & Diagram on Page 4)
- Ordering & Date Code Information: See Page 4
- 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
BC846A	1A, K1Q	BC847C	1G, K1M
BC846B	1B, K1R	BC848A	1J, K1J, K1E, K1Q
BC847A	1E, K1E, K1Q	BC848B	1K, K1K, K1F, K1R
BC847B	1F, K1F, K1R	BC848C	1L, K1L, K1M

### Maximum Ratings @ T<sub>A</sub> = 25°C unless otherwise specified

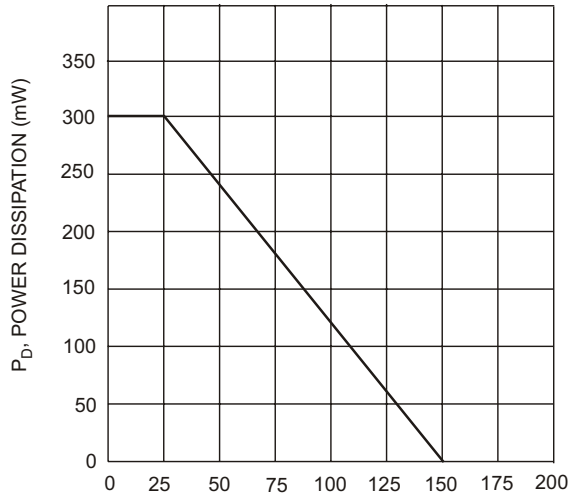
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	BC846 BC847 BC848 V <sub>CB0</sub>	80 50 30	V
Collector-Emitter Voltage	BC846 BC847 BC848 V <sub>CEO</sub>	65 45 30	V
Emitter-Base Voltage	BC846, BC847 BC848 V <sub>EBO</sub>	6.0 5.0	V
Collector Current	I <sub>C</sub>	100	mA
Peak Collector Current	I <sub>CM</sub>	200	mA
Peak Emitter Current	I <sub>EM</sub>	200	mA
Power Dissipation (Note 1)	P <sub>d</sub>	300	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	R <sub>θJA</sub>	417	°C/W
Operating and Storage Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-65 to +150	°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 BC846.
  3. No purposefully added lead.

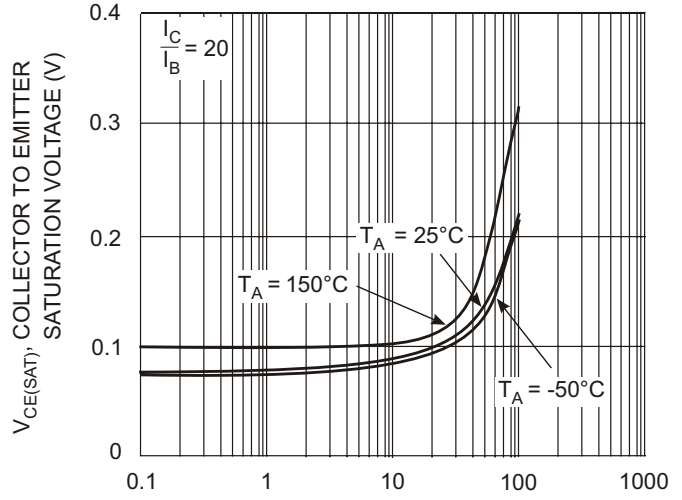
**Electrical Characteristics** @ T<sub>A</sub> = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 4)	BC846 BC847 BC848	V <sub>(BR)CBO</sub>	80 50 30	— — —	— — —	V	I <sub>C</sub> = 10μA, I <sub>B</sub> = 0
Collector-Emitter Breakdown Voltage (Note 4)	BC846 BC847 BC848	V <sub>(BR)CEO</sub>	65 45 30	— — —	— — —	V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0
Emitter-Base Breakdown Voltage (Note 3)	BC846, BC847 BC848	V <sub>(BR)EBO</sub>	6 5	—	—	V	I <sub>E</sub> = 1μA, I <sub>C</sub> = 0
H-Parameters							
Small Signal Current Gain	Current Gain Group A B C	h <sub>fe</sub>	—	220 330 600	— — —	— — —	V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 2.0mA, f = 1.0kHz
Input Impedance	Current Gain Group A B C	h <sub>ie</sub>	—	2.7 4.5 8.7	— — —	kΩ kΩ kΩ	
Output Admittance	Current Gain Group A B C	h <sub>oe</sub>	—	18 30 60	— — —	μS μS μS	
Reverse Voltage Transfer Ratio	A	h <sub>re</sub>	—	1.5x10 <sup>-4</sup>	—	—	
Current Gain Group	B	h <sub>re</sub>	—	2x10 <sup>-4</sup>	—	—	
	C	h <sub>re</sub>	—	3x10 <sup>-4</sup>	—	—	
DC Current Gain	Current Gain Group A B C (Note 4)	h <sub>FE</sub>	110 200 420	180 290 520	220 450 800	—	V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 2.0mA
Collector-Emitter Saturation Voltage (Note 4)		V <sub>CE(SAT)</sub>	—	90 200	250 600	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 (Note 4)		V <sub>BE(SAT)</sub>	—	700 900	—	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 (Note 4)		V <sub>BE(ON)</sub>	580 —	660 —	700 770	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-Cutoff Current (Note 4)	BC846 BC847 BC848	I <sub>CES</sub> I <sub>CES</sub> I <sub>CES</sub> I <sub>CBO</sub> I <sub>CBO</sub>	— — — — —	— — — — —	15 15 15 15 5.0	nA nA nA nA μA	V <sub>CE</sub> = 80V V <sub>CE</sub> = 50V V <sub>CE</sub> = 30V V <sub>CB</sub> = 40V V <sub>CB</sub> = 30V, T <sub>A</sub> = 150°C
Gain Bandwidth Product		f <sub>T</sub>	100	300	—	MHz	V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 10mA, f = 100MHz
Collector-Base Capacitance		C <sub>CBO</sub>	—	3.0	—	pF	V <sub>CB</sub> = 10V, f = 1.0MHz
Noise Figure		NF	—	2	10	dB	V <sub>CE</sub> = 5V, I <sub>C</sub> = 200μA, R <sub>S</sub> = 2.0kΩ, f = 1.0kHz, Δf = 200Hz

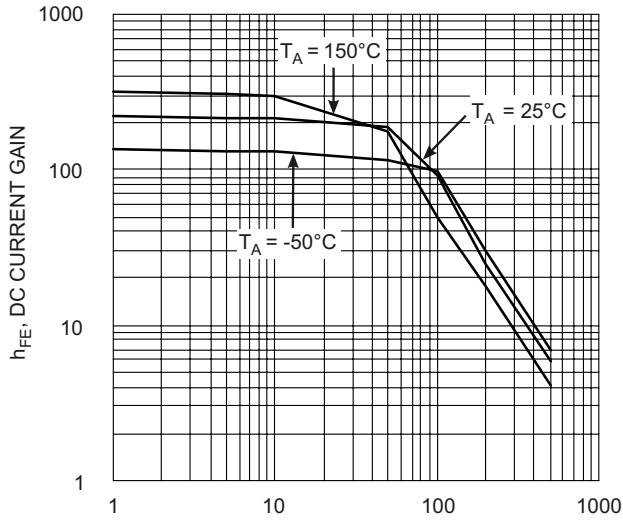
Notes: 4. Short duration pulse test used to minimize self-heating effect.



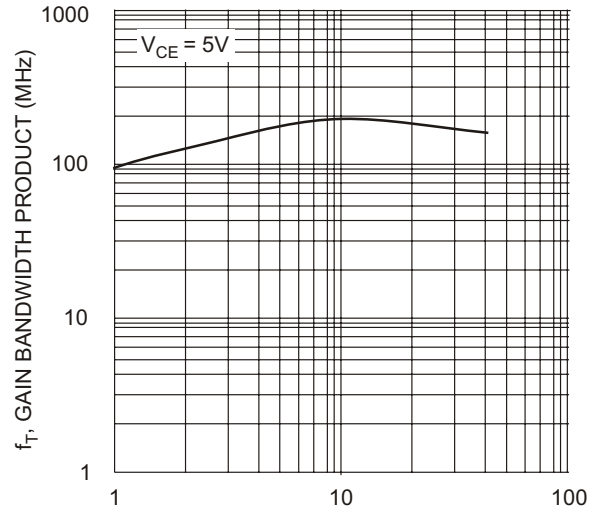
$T_A$ , AMBIENT TEMPERATURE (°C)  
Fig. 1, Max Power Dissipation vs Ambient Temperature



$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current



$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 3, DC Current Gain vs. Collector Current



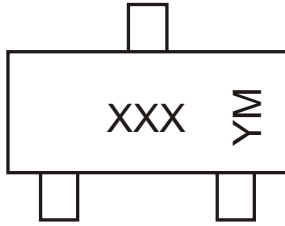
$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 4, Gain Bandwidth Product vs Collector Current

**Ordering Information** (Note 5)

Device	Packaging	Shipping
BC84xx-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. BC846A-7.
  - For Lead Free/RoHS Compliant version part number, please add "-F" suffix to the part number above.  
Example: BC846A-7-F.

**Marking Information**



XXX = Product Type Marking Code (See Page 1), e.g. K1Q or 1A = BC846A  
 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