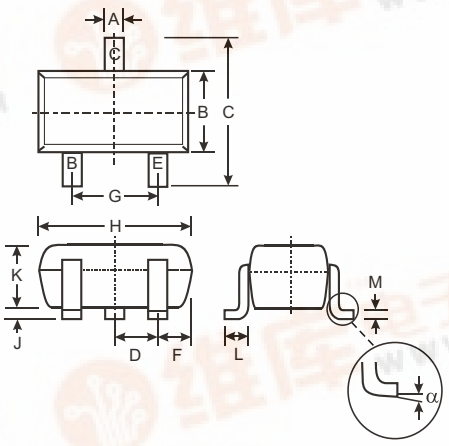
BC846AW - BC848CW

NPN SURFACE MOUNT SMALL SIGNAL TRANSISTOR

Features

- Ideally Suited for Automatic Insertion
- Complementary PNP Types Available (BC856W-BC858W)
- For Switching and AF Amplifier Applications
- **Lead Free/RoHS Compliant (Note 3)**
- **"Green" Device (Note 4 and 5)**



SOT-323		
Dim	**Min**	**Max**
A	0.25	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.18
	0	8
All Dimensions in mm		

Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 5. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Pin Connections: See Diagram
- Marking Codes (See Table Below & Diagram on Page 2)
- Ordering & Date Code Information: See Page 2
- Weight: 0.006 grams (approximate)

Marking Code (Note 2)			
Type	**Marking**	**Type**	**Marking**
BC846AW	K1Q	BC847CW	K1M
BC846BW	K1R	BC848AW	K1J, K1E, K1Q
BC847AW	K1E, K1Q	BC848BW	K1K, K1F, K1R
BC847BW	K1F, K1R	BC848CW	K1L, K1M

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Collector-Base Voltage	BC846 BC847 BC848	V_{CBO}	80 50 30	V
Collector-Emitter Voltage	BC846 BC847 BC848	V_{CEO}	65 45 30	V
Emitter-Base Voltage	BC846, BC847 BC848	V_{EBO}	6.0 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	200	mW
Thermal Resistance, Junction to Ambient (Note 1)		R_{JA}	625	°C/W
Operating and Storage Temperature Range		T_j, T_{STG}	-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 BC846W.
3. No purposefully added lead.
4. Diodes Inc.'s "Green" Policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
5. Product manufactured with date code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior t o date code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

Electrical Characteristics @ $T_A = 25°C$ unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 6)	BC846 BC847 BC848	$V_{(BR)CBO}$	80 50 30	— — —	— — —	V	$I_C = 10$ A, $I_B = 0$
Collector-Emitter Breakdown Voltage (Note 6)	BC846 BC847 BC848	$V_{(BR)CEO}$	65 45 30	— — —	— — —	V	$I_C = 10mA$, $I_B = 0$
Emitter-Base Breakdown Voltage (Note 4)	BC846, BC847 BC848	$V_{(BR)EBO}$	6 5	—	—	V	$I_E = 1$ A, $I_C = 0$
DC Current Gain	Current Gain Group A B (Note 6) C	h_{FE}	110 200 420	180 290 520	220 450 800	—	$V_{CE} = 5.0V$, $I_C = 2.0mA$
Collector-Emitter Saturation Voltage (Note 6)		$V_{CE(SAT)}$	—	90 200	250 600	mV	$I_C = 10mA$, $I_B = 0.5mA$ $I_C = 100mA$, $I_B = 5.0mA$
Base-Emitter Saturation Voltage (Note 6)		$V_{BE(SAT)}$	—	700 900	—	mV	$I_C = 10mA$, $I_B = 0.5mA$ $I_C = 100mA$, $I_B = 5.0mA$
Base-Emitter Voltage (Note 6)		$V_{BE(ON)}$	580 —	660 —	700 770	mV	$V_{CE} = 5.0V$, $I_C = 2.0mA$ $V_{CE} = 5.0V$, $I_C = 10mA$
Collector-Cutoff Current (Note 6)		I_{CBO} I_{CBO}	— —	— —	15 5.0	nA µA	$V_{CB} = 30V$ $V_{CB} = 30V$, $T_A = 150°C$
Gain Bandwidth Product		f_T	100	300	—	MHz	$V_{CE} = 5.0V$, $I_C = 10mA$, $f = 100MHz$
Collector-Base Capacitance		C_{CBO}	—	3.0	4.5	pF	$V_{CB} = 10V$, $f = 1.0MHz$
Noise Figure		NF	—	—	10	dB	$V_{CE} = 5V$, $I_C = 200µA$, $R_S = 2.0k$ $f = 1.0kHz$, $f = 200Hz$

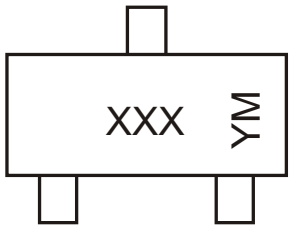
Ordering Information (Note 5 & 7)

Device	Packaging	Shipping
BC84xxW-7-F*	SOT-323	3000/Tape & Reel

*xx = device type, e.g. BC846AW-7.

Note:
5. Product manufactured with date code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to date code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.
6. Short duration pulse test to minimize self-heating effect.
7. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



XXX = Product Type Marking Code (See Page 1), e.g. K1Q = BC846AW
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	2010	2011	2012
Code	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z

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

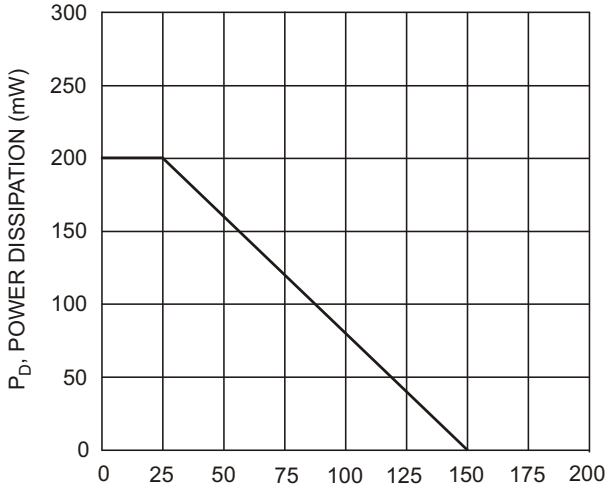


Fig. 1, Max Power Dissipation vs Ambient Temperature

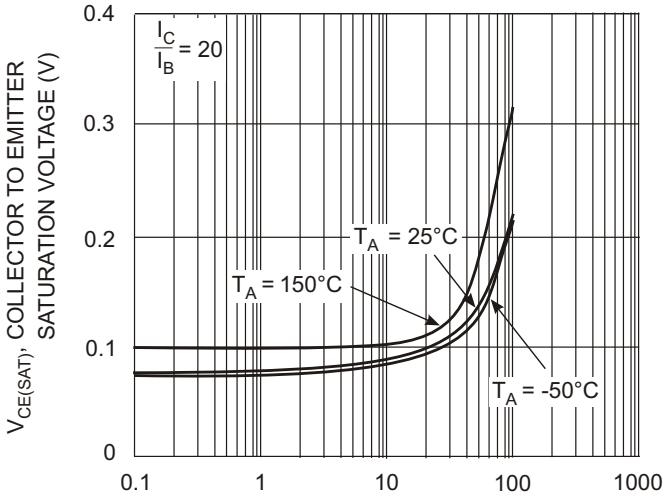


Fig. 2 Collector Emitter Saturation Voltage vs. Collector Current

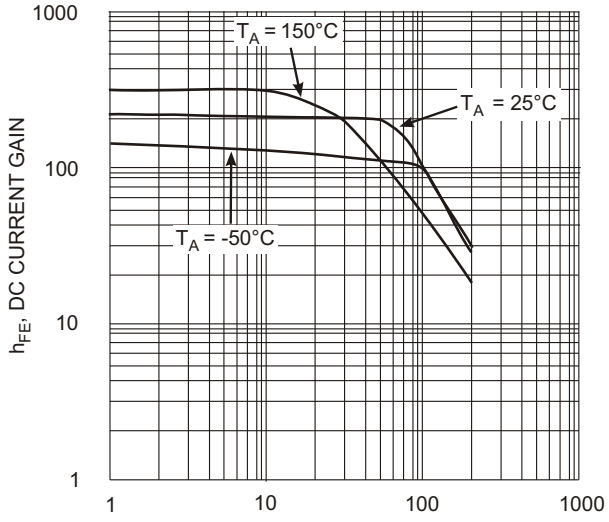


Fig. 3, DC Current Gain vs. Collector Current

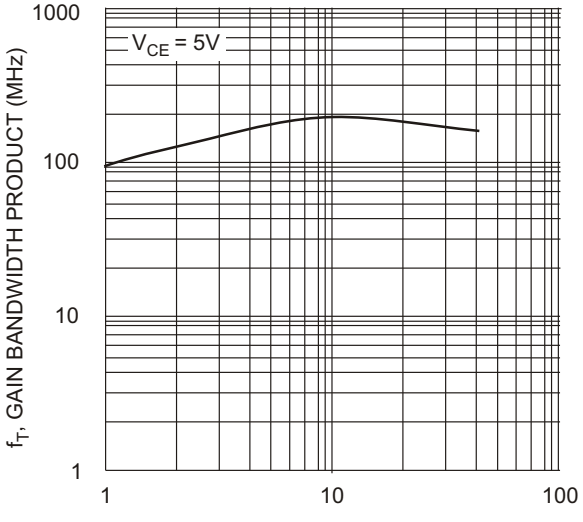


Fig. 4, Gain Bandwidth Product vs Collector Current