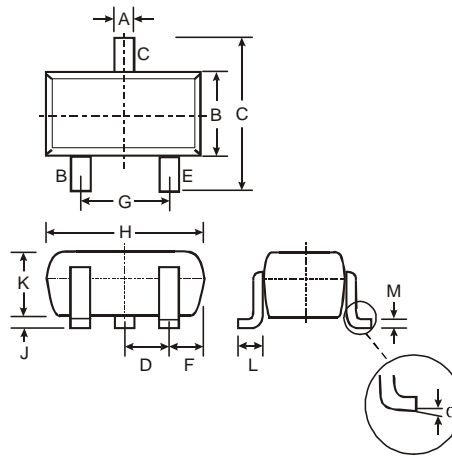


**Features**

- Ideally Suited for Automated Insertion
- Complementary NPN Types Available (BC846W-BC848W)
- For Switching and AF Amplifier Applications
- **Lead Free/RoHS Compliant (Note 3)**
- "Green" Device (Note 4 and 5)

**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 Code: See Table Below & Diagram on Page 3
- Ordering & Date Code Information: See Page 3
- Weight: 0.006 grams (approximate)



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
α	0°	8°
<b>All Dimensions in mm</b>		

Marking Code (Note 2)			
Type	Marking	Type	Marking
BC856AW	K3A	BC857CW	K3G
BC856BW	K3B	BC858AW	K3J, K3A, K3V
BC857AW	K3V, K3A	BC858BW	K3K, K3B, K3W
BC857BW	K3W, K3B	BC858CW	K3L, K3G

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	BC856 -80	V
		BC857 -50	
		BC858 -30	
Collector-Emitter Voltage	V <sub>CEO</sub>	BC856 -65	V
		BC857 -45	
		BC858 -30	
Emitter-Base Voltage	V <sub>EBO</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 (Note 1)	P <sub>d</sub>	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	R <sub>θJA</sub>	625	°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 BC856W.
  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](http://www.diodes.com/products/lead_free/index.php).
  5. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 6)	BC856 BC857 BC858 $V_{(BR)CBO}$	-80 -50 -30	— — —	— — —	V	$I_C = 10\mu\text{A}, I_B = 0$
Collector-Emitter Breakdown Voltage (Note 6)	BC856 BC857 BC858 $V_{(BR)CEO}$	-65 -45 -30	— — —	— — —	V	$I_C = 10\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage (Note 6)	$V_{(BR)EBO}$	-5	—	—	V	$I_E = 1\mu\text{A}, I_C = 0$
DC Current Gain (Note 6)      Current Gain Group	A B C $h_{FE}$	125 220 420	180 290 520	250 475 800	—	$V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$
Collector-Emitter Saturation Voltage (Note 6)	$V_{CE(SAT)}$	—	-75 -250	-300 -650	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5.0\text{mA}$
Base-Emitter Saturation Voltage (Note 6)	$V_{BE(SAT)}$	—	-700 -850	— -950	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5.0\text{mA}$
Base-Emitter Voltage (Note 6)	$V_{BE(ON)}$	-600 —	-650 —	-750 -820	mV	$V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$ $V_{CE} = -5.0\text{V}, I_C = -10\text{mA}$
Collector-Cutoff Current (Note 6)	$I_{CBO}$ $I_{CBO}$	— —	— —	-15 -4.0	nA $\mu\text{A}$	$V_{CB} = -30\text{V}$ $V_{CB} = -30\text{V}, T_A = 150^\circ\text{C}$
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	4.5	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$
Noise Figure	NF	—	—	10	dB	$V_{CE} = -5.0\text{V}, I_C = 200\mu\text{A}$ , $R_S = 2\text{k}\Omega, f = 1\text{kHz}$ , $\Delta f = 200\text{Hz}$

Notes: 6. Short duration pulse test used to minimize self-heating effect.

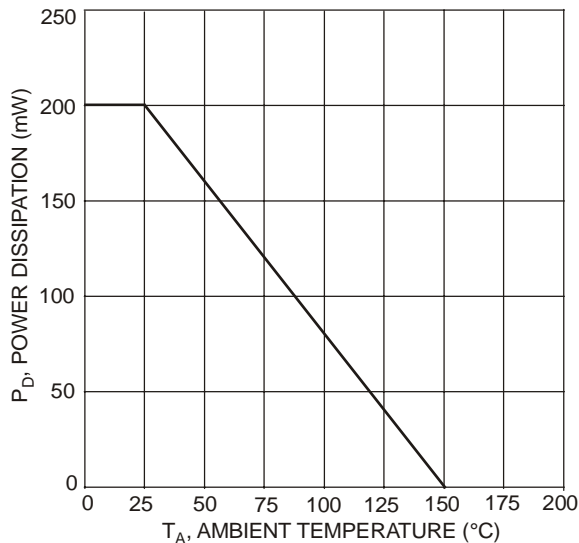


Fig. 1, Max Power Dissipation vs. Ambient Temperature

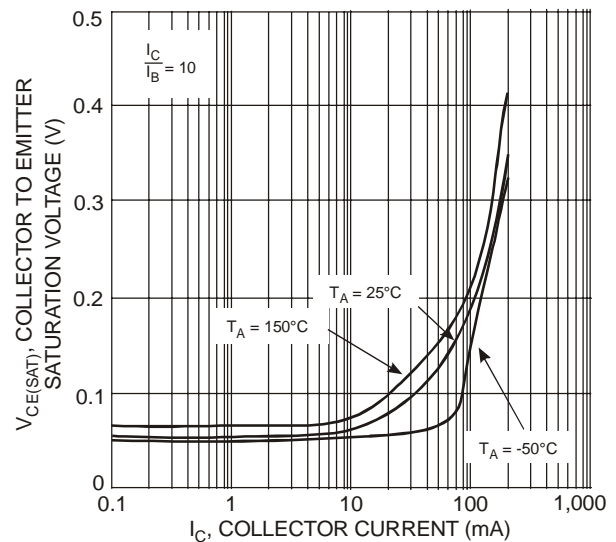


Fig. 2 Collector Emitter Saturation Voltage vs. Collector Current

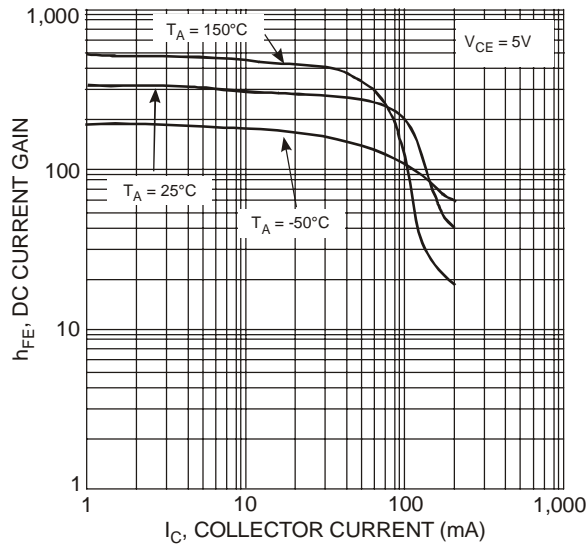


Fig. 3, DC Current Gain (Group B) vs. Collector Current

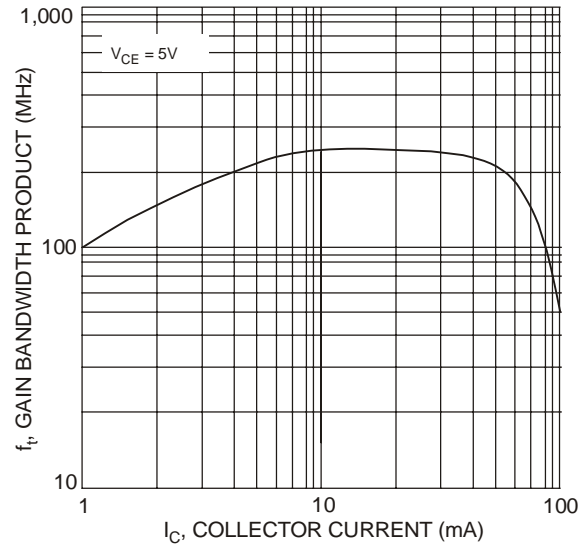


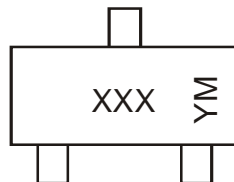
Fig. 4, Gain Bandwidth Product vs. Collector Current

## Ordering Information (Note 5 & 7)

Device	Packaging	Shipping
BC85xxW-7-F	SOT-323	3000/Tape & Reel

Notes: 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. K3A = BC856AW  
 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	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Code	1	2	3	4	5	6	7	8	9	O	N	D			

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