


**PNP SURFACE MOUNT SMALL SIGNAL TRANSISTOR IN SOT323**

**Features**

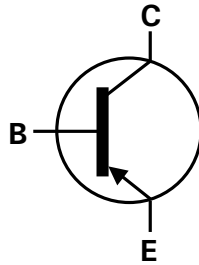
- Ideally Suited for Automatic Insertion
- Complementary NPN Types Available (BC846W – BC848W)
- For switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

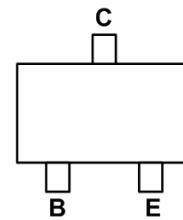
- Case: SOT323
- Case material: molded plastic, "Green" molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 
- Weight: 0.006 grams (Approximate)



Top View



Device Symbol



Top View  
Pin-Out

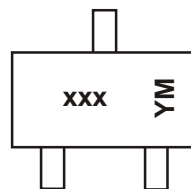
**Ordering Information** (Note 4)

Product	Marking	Reel size (inches)	Quantity per reel
BC856AW-7-F	K3A	7	3,000
BC856BW-7-F	K3B	7	3,000
BC856BW-13-F	K3B	13	10,000
BC857AW-7-F	K3A	7	3,000
BC857BW-7-F	K3B	7	3,000

Product	Marking	Reel size (inches)	Quantity per reel
BC857CW-7-F	K3G	7	3,000
BC858AW-7-F	K3A	7	3,000
BC858BW-7-F	K3B	7	3,000
BC858CW-7-F	K3G	7	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen and Antimony free, "Green" and Lead-Free.
  3. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. Tape width is 8mm. For more packaging details, go to our website at <http://www.diodes.com>.

**Marking Information**



xxx = Product Type Marking Code  
(Please see Ordering Information)  
YM = Date Code Marking  
Y = Year (ex: X = 2010)  
M = Month (ex: 9 = September)

Date Code Key

Year	2010	2011	2012	2013	2014	2015	2016	2017
Code	X	Y	Z	A	B	C	D	E

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

**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	
Continuous 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	

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	200	mW
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	BC856	-80	-	-	V	I <sub>C</sub> = -100nA
		BC857	-50				
		BC858	-30				
Collector-Emitter Breakdown Voltage (Note 6)	BV <sub>CEO</sub>	BC856	-65	-	-	V	I <sub>C</sub> = -10mA
		BC857	-45				
		BC858	-30				
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5	-	-	V	I <sub>E</sub> = -100nA	
DC Current Gain (Note 6)	Current Gain Group	A	125	180	250	-	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA
		B	220	290	475		
		C	420	520	800		
Collector Cutoff Current	I <sub>CBO</sub>	-	-	-15	nA	V <sub>CB</sub> = -30V	
				-4	μA		V <sub>CB</sub> = -30V, T <sub>A</sub> = +150°C
Collector-Emitter Saturation Voltage (Note 6)	V <sub>CE(sat)</sub>	-	-75	-300	mV	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA	
			-250	-650			I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA
Base-Emitter Turn-On Voltage (Note 6)	V <sub>BE(on)</sub>	-600	-650	-750	mV	I <sub>C</sub> = -2mA, V <sub>CE</sub> = -5V	
		-	-	-820			I <sub>C</sub> = -10mA, V <sub>CE</sub> = -5V
Base-Emitter Saturation Voltage (Note 6)	V <sub>BE(sat)</sub>	-	-700	-	mV	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA	
			-850	-950			I <sub>C</sub> = -100mA, I <sub>B</sub> = -5mA
Output Capacitance	C <sub>obo</sub>	-	3	4.5	pF	V <sub>CB</sub> = -10V, f = 1.0MHz	
Transition Frequency	f <sub>T</sub>	100	200	-	MHz	V <sub>CE</sub> = -5V, I <sub>C</sub> = -10mA, f = 100MHz	
Noise Figure	NF	-	-	10	dB	V <sub>CE</sub> = -5V, I <sub>C</sub> = -200μA R <sub>S</sub> = 2kΩ, f = 1kHz Δf = 200Hz	

- Notes:
- For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper in still air condition; the device is measured when operating in a steady-state condition.
  - Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

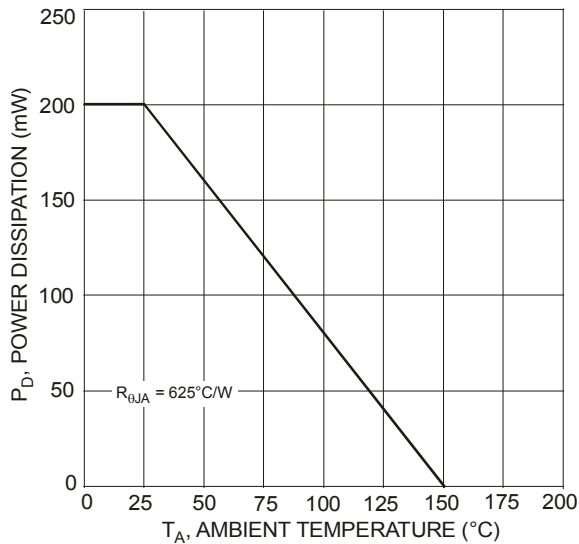


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 5)

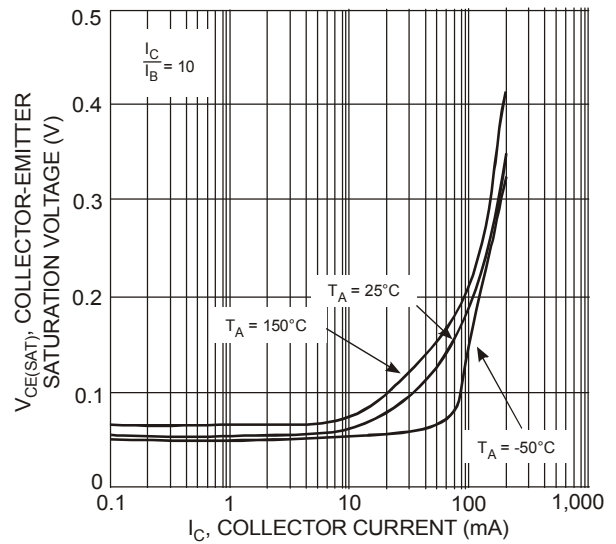


Fig. 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

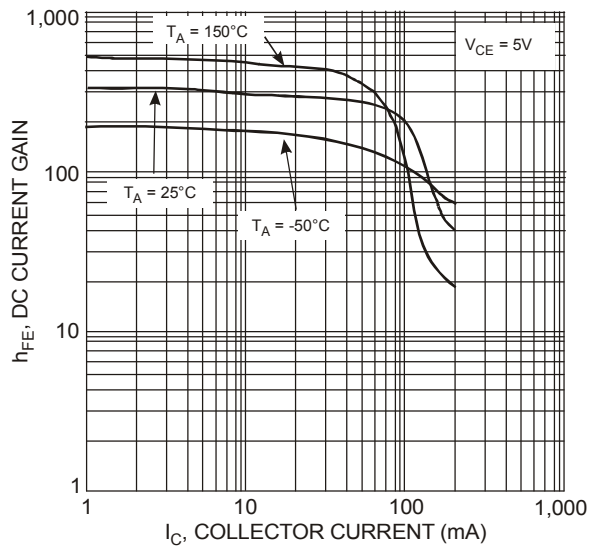


Fig. 3 Typical DC Current Gain (Group B) vs. Collector Current

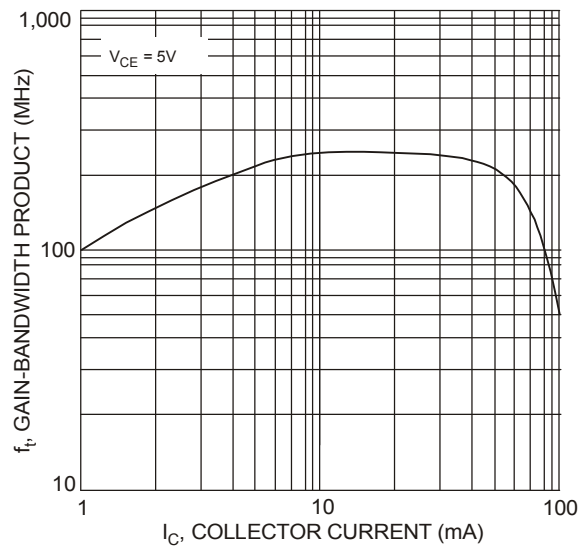
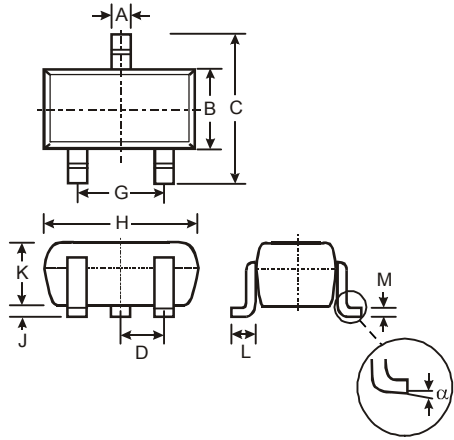


Fig. 4 Typical Gain-Bandwidth Product vs. Collector Current

**Package Outline Dimensions**

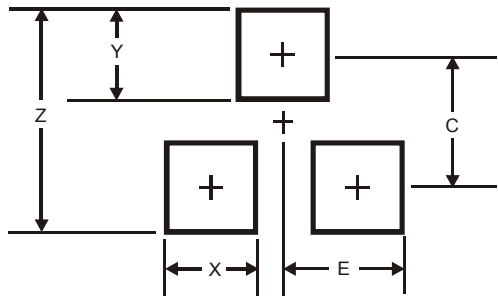
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT323			
Dim	Min	Max	Typ
A	0.25	0.40	0.30
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	-	-	0.65
G	1.20	1.40	1.30
H	1.80	2.20	2.15
J	0.0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
Z	2.8
X	0.7
Y	0.9
C	1.9
E	1.0

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