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## Features

- Ideally Suited for Automatic Insertion
- Complementary PNP Types: BC856W – BC858W
- 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**
- **PPAP capable (Note 4)**

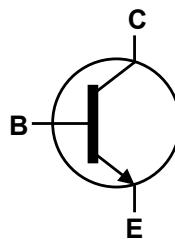
## Mechanical Data

- 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 (E3)
- Weight: 0.006 grams (Approximate)

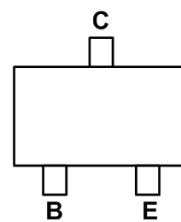
SOT323



Top View



Device Symbol


 Top View  
 Pin-Out

## Ordering Information (Notes 4 & 5)

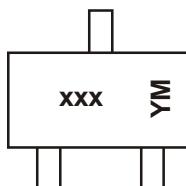
Product	Compliance	Marking	Reel Size (inches)	Quantity per Reel
BC846AW-7-F	AEC-Q101	K1Q	7	3,000
BC846BW-7-F	AEC-Q101	K1R	7	3,000
BC846BWQ-7-F	Automotive	K1R	7	3,000
BC846BW-13-F	AEC-Q101	K1R	13	10,000
BC847AW-7-F	AEC-Q101	K1Q	7	3,000
BC847BW-7-F	AEC-Q101	K1R	7	3,000
BC847BW-13-F	AEC-Q101	K1R	13	10,000

Product	Compliance	Marking	Reel Size (inches)	Quantity per Reel
BC847BWQ-13-F	Automotive	K1R	13	10,000
BC847CW-7-F	AEC-Q101	K1M	7	3,000
BC847CW-13-F	AEC-Q101	K1M	13	10,000
BC847CWQ-7-F	Automotive	K1M	7	3,000
BC848AW-7-F	AEC-Q101	K1Q	7	3,000
BC848BW-7-F	AEC-Q101	K1R	7	3,000
BC848CW-7-F	AEC-Q101	K1M	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/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
5. Tape width is 8mm. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>

## Marking Information


 xxx = Product Type Marking Code  
 (Please see Ordering Information)

YM = Date Code Marking

 Y or  $\overline{Y}$  = Year (ex: A = 2013)

 M or  $\overline{M}$  = 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	0	N	D

**Absolute Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	80	V
		50	
		30	
Collector-Emitter Voltage	V <sub>CEO</sub>	65	V
		45	
		30	
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
		5	
Continuous Collector Current	I <sub>C</sub>	100	mA
Peak Collector Current	I <sub>CM</sub>	200	mA
Peak Base Current	I <sub>BM</sub>	200	mA

**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , 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

**ESD Ratings** (Note 7)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:

- 6. For a device mounted on minimum recommended pad layout 1oz weight copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
- 7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

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

Characteristic			Symbol	Min	Typ	Max	Unit	Test Condition		
Collector-Base Breakdown Voltage	BC846	BV <sub>CBO</sub>	80	—	—	—	V	$I_C = 100\mu\text{A}$		
	BC847		50							
	BC848		30							
Collector-Emitter Breakdown Voltage (Note 8)	BC846	BV <sub>CEO</sub>	65	—	—	—	V	$I_C = 10\text{mA}$		
	BC847		45							
	BC848		30							
Emitter-Base Breakdown Voltage	BC846, BC847	BV <sub>EBO</sub>	6	—	—	—	V	$I_E = 100\mu\text{A}$		
	BC848		5							
DC Current Gain (Note 8)	Current Gain Group	h <sub>FE</sub>	110	180	220	—		$V_{CE} = 5.0\text{V}$ , $I_C = 2.0\text{mA}$		
			200	290	450					
			420	520	800					
Collector Cutoff Current			I <sub>CBO</sub>	—	—	20	nA	$V_{CB} = 30\text{V}$		
						5	μA	$V_{CB} = 30\text{V}$ , $T_A = +150^\circ\text{C}$		
Collector-Emitter Saturation Voltage (Note 8)			V <sub>CE(sat)</sub>	—	90	250	mV	$I_C = 10\text{mA}$ , $I_B = 0.5\text{mA}$		
					200	600		$I_C = 100\text{mA}$ , $I_B = 5.0\text{mA}$		
Base-Emitter Turn-On Voltage (Note 8)			V <sub>BE(on)</sub>	580	660	700	mV	$I_C = 2\text{mA}$ , $V_{CE} = 5\text{V}$		
				—	—	770		$I_C = 10\text{mA}$ , $V_{CE} = 5\text{V}$		
Base-Emitter Saturation Voltage (Note 8)			V <sub>BE(sat)</sub>	—	700	—	mV	$I_C = 10\text{mA}$ , $I_B = 0.5\text{mA}$		
					900			$I_C = 100\text{mA}$ , $I_B = 5\text{mA}$		
Output Capacitance			C <sub>obo</sub>	—	3	4.5	pF	$V_{CB} = 10\text{V}$ , $f = 1.0\text{MHz}$		
Transition Frequency			f <sub>T</sub>	100	300	—	MHz	$V_{CE} = 5\text{V}$ , $I_C = 10\text{mA}$ , $f = 100\text{MHz}$		
Noise Figure			NF	—	—	10	dB	$V_{CE} = 5\text{V}$ , $I_C = 200\mu\text{A}$ $R_S = 2\text{k}\Omega$ , $f = 1\text{kHz}$ $\Delta f = 200\text{Hz}$		

Notes: 8. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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

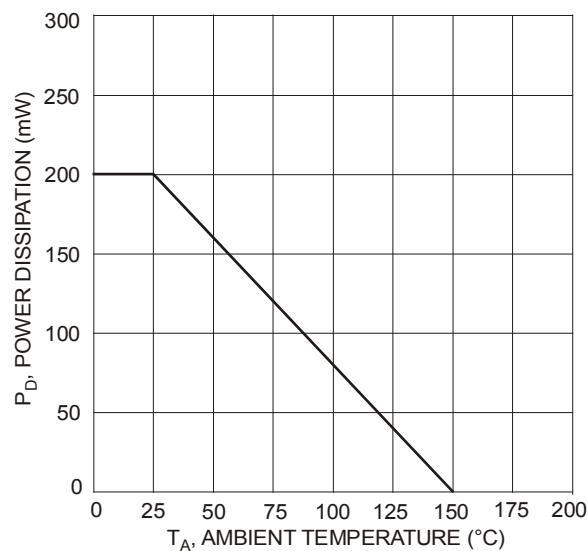


Figure 1 Power Dissipation vs. Ambient Temperature

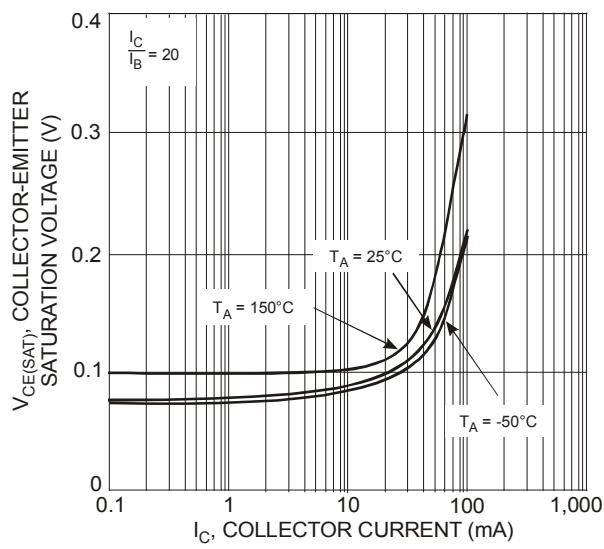


Figure 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

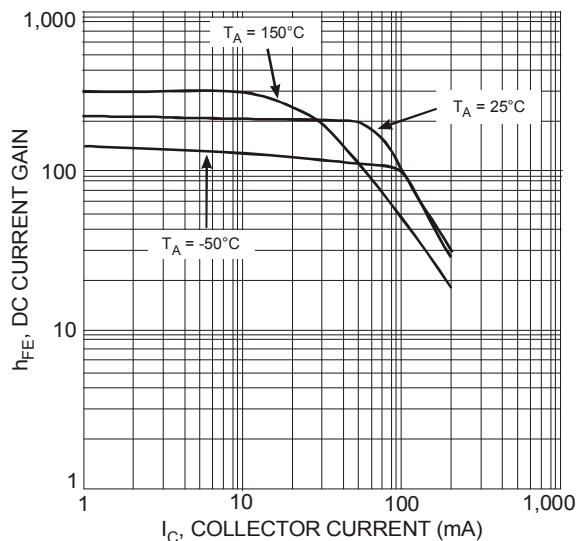


Figure 3 Typical DC Current Gain vs. Collector Current

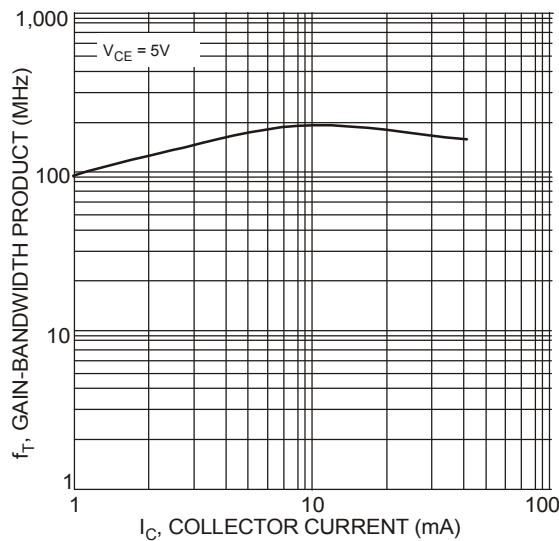
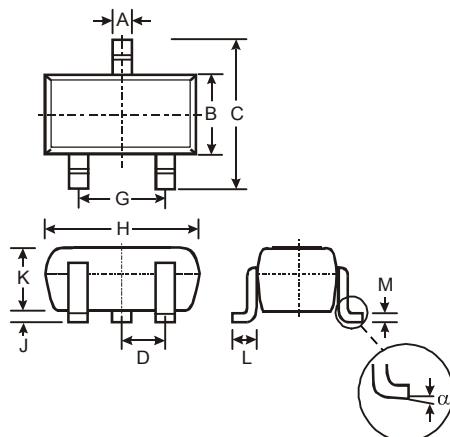


Figure 4 Typical Gain-Bandwidth Product vs. Collector Current

## Package Outline Dimensions

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

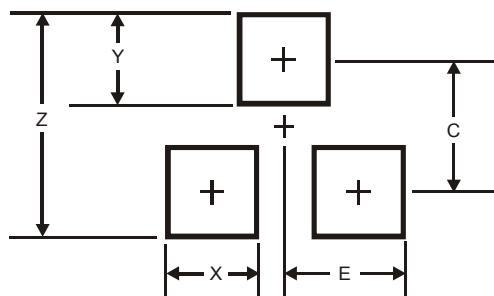


SOT323			
Dim	Min	Max	Typ
A	0.25	0.40	0.30
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	—	—	0.65
G	1.20	1.40	1.30
H	1.80	2.20	2.15
J	0.0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.18	0.11
$\alpha$	0°	8°	—

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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