

**Features**

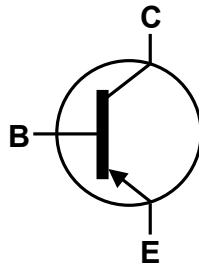
- Ideally Suited for Automatic Insertion
- Complementary NPN Types Available (BC846AW – BC848CW)
- For switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP capable (Note 4)**

**Mechanical Data**

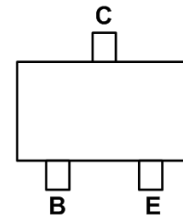
- Case: SOT323
- Case material: molded plastic, "Green" molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.006 grams (Approximate)



Top View



Device Symbol



Top View  
Pin-Out

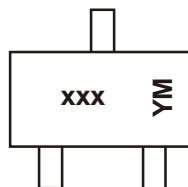
**Ordering Information** (Notes 4 & 5)

Product	Compliance	Marking	Reel Size (inches)	Quantity per Reel
BC856AW-7-F	AEC-Q101	K3A	7	3,000
BC856BW-7-F	AEC-Q101	K3B	7	3,000
BC856BW-13-F	AEC-Q101	K3B	13	10,000
BC857AW-7-F	AEC-Q101	K3A	7	3,000
BC857BW-7-F	AEC-Q101	K3B	7	3,000

Product	Compliance	Marking	Reel Size (inches)	Quantity per Reel
BC857BWQ-13-F	Automotive	K3B	13	10,000
BC857CW-7-F	AEC-Q101	K3G	7	3,000
BC858AW-7-F	AEC-Q101	K3A	7	3,000
BC858BW-7-F	AEC-Q101	K3B	7	3,000
BC858CW-7-F	AEC-Q101	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/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 (See Ordering Information)  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: A = 2013)  
 M or  $\bar{M}$  = 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

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

Characteristic		Symbol	Value	Unit
Collector-Base Voltage	BC856	$V_{CB0}$	-80	V
	BC857		-50	
	BC858		-30	
Collector-Emitter Voltage	BC856	$V_{CE0}$	-65	V
	BC857		-45	
	BC858		-30	
Emitter-Base Voltage		$V_{EBO}$	-5.0	V
Continuous Collector Current		$I_C$	-100	mA
Peak Collector Current		$I_{CM}$	-200	mA
Peak Emitter Current		$I_{EM}$	-200	mA

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

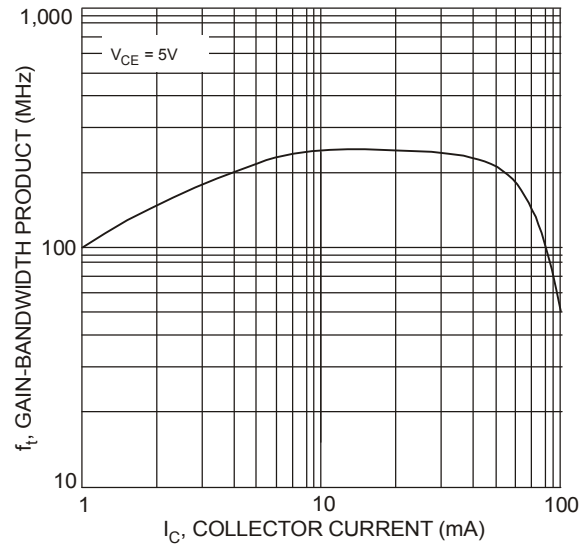
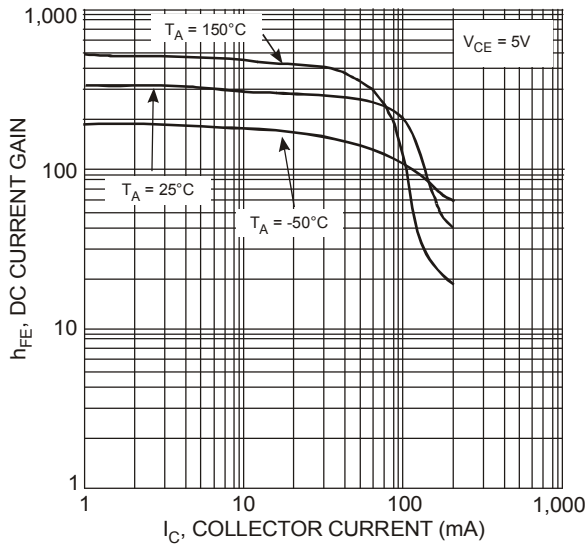
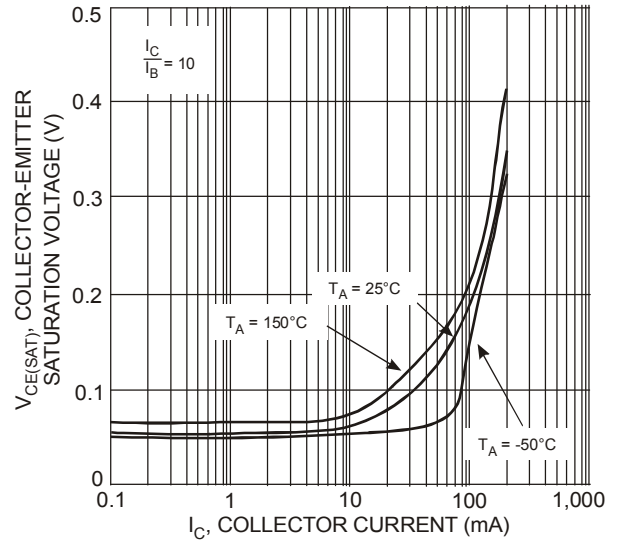
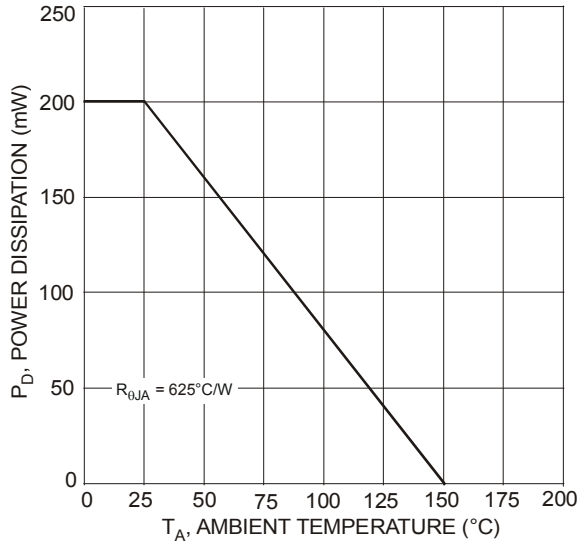
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	$P_D$	200	mW
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	625	$^\circ\text{C/W}$
Operating and Storage Temperature Range		$T_J, T_{STG}$	-65 to +150	$^\circ\text{C}$

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BC856	$BV_{CB0}$	-80	-	-	V	$I_C = -100\text{nA}$
	BC857		-50				
	BC858		-30				
Collector-Emitter Breakdown Voltage (Note 7)	BC856	$BV_{CE0}$	-65	-	-	V	$I_C = -10\text{mA}$
	BC857		-45				
	BC858		-30				
Emitter-Base Breakdown Voltage		$BV_{EBO}$	-5	-	-	V	$I_E = -100\text{nA}$
DC Current Gain (Note 7)	Current Gain Group	A	125	180	250	-	$V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$
		B	220	290	475		
		C	420	520	800		
Collector Cutoff Current		$I_{CBO}$	-	-	-15	nA	$V_{CB} = -30\text{V}$
					-4	$\mu\text{A}$	$V_{CB} = -30\text{V}, T_A = +150^\circ\text{C}$
Collector-Emitter Saturation Voltage (Note 7)		$V_{CE(sat)}$	-	-75	-300	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$
				-250	-650		$I_C = -100\text{mA}, I_B = -5.0\text{mA}$
Base-Emitter Turn-On Voltage (Note 7)		$V_{BE(on)}$	-600	-650	-750	mV	$I_C = -2\text{mA}, V_{CE} = -5\text{V}$
			-	-	-820		$I_C = -10\text{mA}, V_{CE} = -5\text{V}$
Base-Emitter Saturation Voltage (Note 7)		$V_{BE(sat)}$	-	-700	-	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$
				-850	-950		$I_C = -100\text{mA}, I_B = -5\text{mA}$
Output Capacitance		$C_{obo}$	-	3	4.5	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$
Transition Frequency		$f_T$	100	200	-	MHz	$V_{CE} = -5\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$
Noise Figure		NF	-	-	10	dB	$V_{CE} = -5\text{V}, I_C = -200\mu\text{A}$ $R_S = 2\text{k}\Omega, f = 1\text{kHz}$ $\Delta f = 200\text{Hz}$

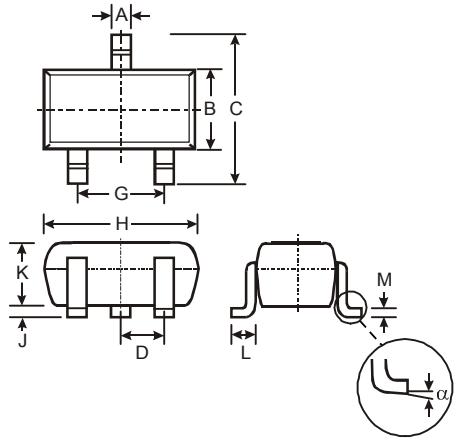
- Notes:
6. For a device mounted on minimum recommended pad layout 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  7. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$

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



**Package Outline Dimensions**

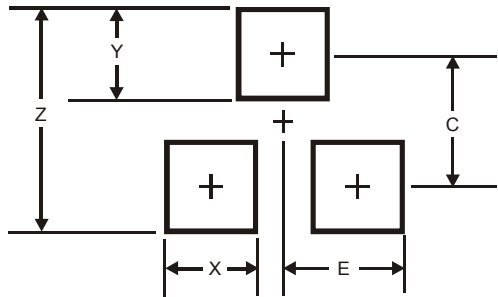
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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