Features

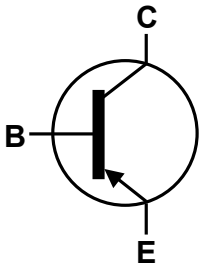
- Ideally Suited for Automatic Insertion
- Complementary NPN Types Available (BC846AW – BC848CW)
- For switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for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

Mechanical Data

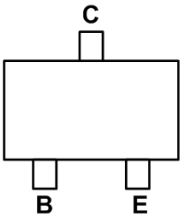
- Case: SOT323
- Case material: molded plastic, "Green" molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.006 grams (Approximate)

SOT323

Top View



Device Symbol



Top View
Pin-Out

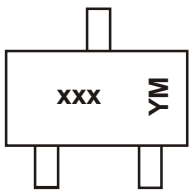
Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel Size (inches)	Quantity per Reel
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 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/.
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 $\overline{Y}$ = 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	O	N	D

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Collector-Base Voltage	BC856	V_{CBO}	-80	V
	BC857		-50	
	BC858		-30	
Collector-Emitter Voltage	BC856	V_{CEO}	-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°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	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-65 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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

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 ≤ 300µs. Duty cycle ≤ 2%

Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

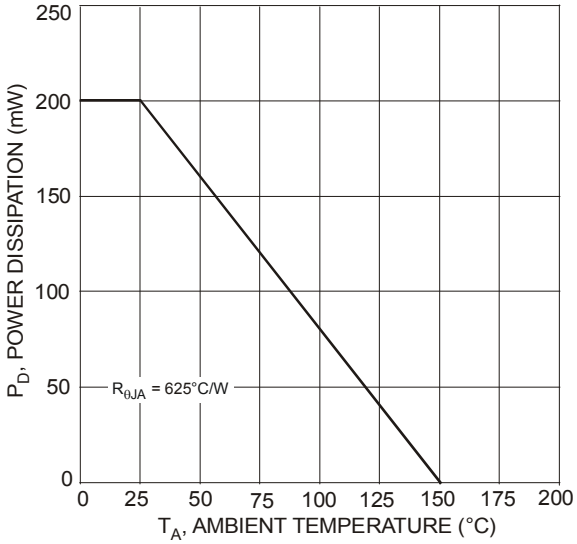


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 5)

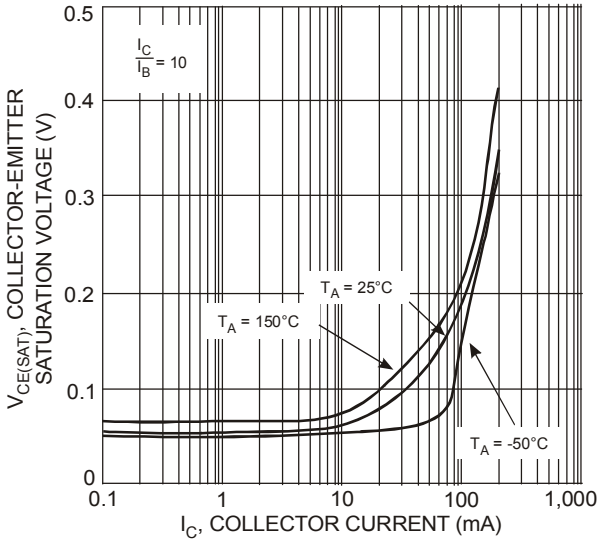


Fig. 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

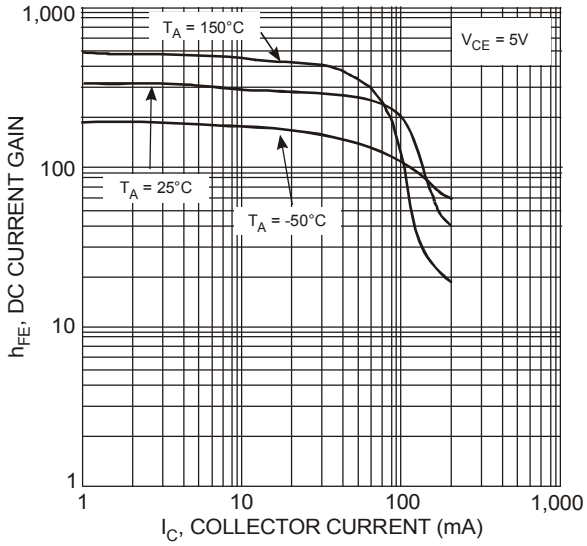


Fig. 3 Typical DC Current Gain (Group B) vs. Collector Current

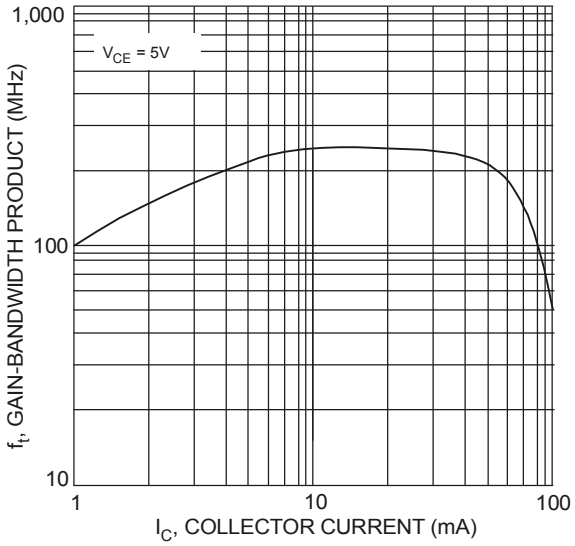
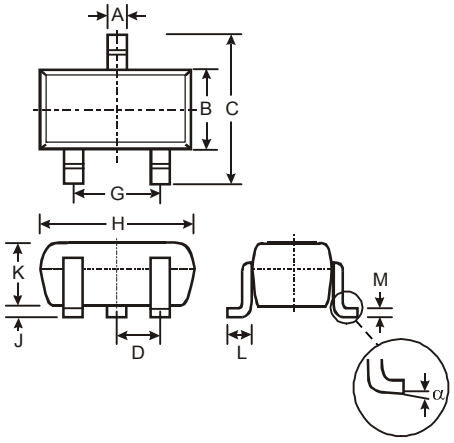


Fig. 4 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

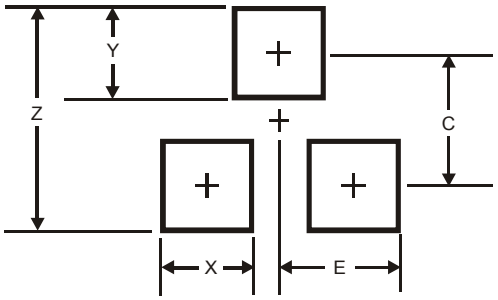
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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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