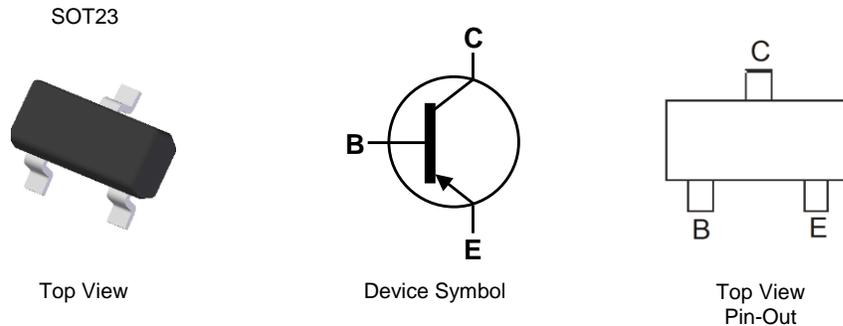


Features

- Ideally Suited for Automatic Insertion
- Complementary NPN Types: BC846 – BC848
- For Switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Case: SOT23
- 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 (63)
- Weight: 0.008 grams (Approximate)



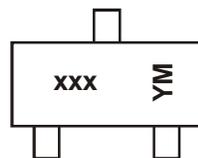
Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Quantity per Reel
BC856A-7-F	AEC-Q101	K3A	7	3,000
BC856B-7-F	AEC-Q101	K3B	7	3,000
BC856B-13-F	AEC-Q101	K3B	13	10,000
BC857A-7-F	AEC-Q101	K3A	7	3,000
BC857B-7-F	AEC-Q101	K3B	7	3,000
BC857B-13-F	AEC-Q101	K3B	13	10,000

Product	Compliance	Marking	Reel Size (inches)	Quantity per Reel
BC857C-7-F	AEC-Q101	K3G	7	3,000
BC857C-13-F	AEC-Q101	K3G	13	10,000
BC858A-7-F	AEC-Q101	K3A	7	3,000
BC858B-7-F	AEC-Q101	K3B	7	3,000
BC858C-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) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



xxx = Product Type Marking Code
(Please see Ordering Information)
YM = Date Code Marking
Y or \bar{Y} = Year (ex: G = 2019)
M or \bar{M} = Month (ex: 9 = September)

Date Code Key

Year Code	2019	2020	2021	2022	2023	2024	2025	2026
Code	G	H	I	J	K	L	M	N

Month Code	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 _{CB0}	-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
Peak Base Current		I _{BM}	-200	mA

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

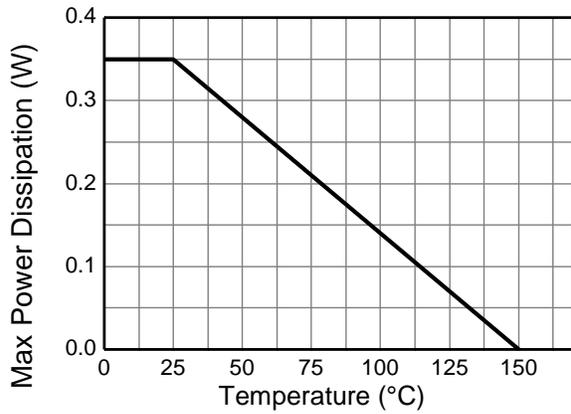
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P _D	310	mW
	(Note 6)		350	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	403	°C/W
	(Note 6)		357	
Thermal Resistance, Junction to Leads	(Note 7)	R _{θJL}	350	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-65 to +150	°C

ESD Ratings (Note 8)

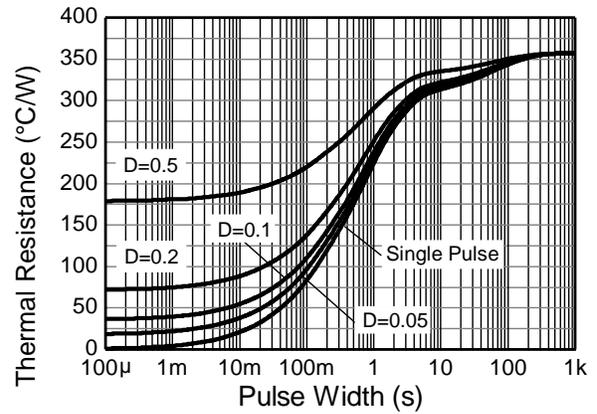
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted on minimum recommended pad layout 1oz copper that is on a single-sided FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as Note 5, except the device is mounted on 15mm × 15mm 1oz copper.
 7. Thermal resistance from junction to solder-point (at the end of the leads).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

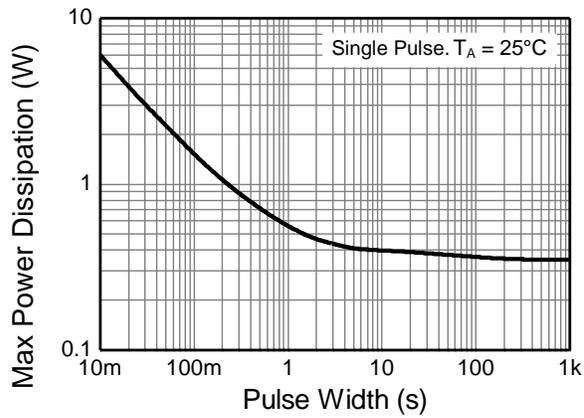
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition		
Collector-Base Breakdown Voltage	BV _{CB0}	BC856	-80	—	—	V	I _C = -10μA	
		BC857	-50					
		BC858	-30					
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	BC856	-65	—	—	V	I _C = -10mA	
		BC857	-45					
		BC858	-30					
Emitter-Base Breakdown Voltage	BV _{EBO}	-5	—	—	V	I _E = -1μA		
Collector Cutoff Current	I _{CBO}	—	—	-15	nA	V _{CB} = -30V		
				-4	μA	V _{CB} = -30V, T _J = +150°C		
Collector Emitter Cutoff Current	I _{CES}	—	—	-15	nA	V _{CE} = -80V		
				BC857		-15	V _{CE} = -50V	
				BC858		-15	V _{CE} = -30V	
Emitter-Base Cutoff Current	I _{EBO}	—	—	-100	nA	V _{EB} = -5V		
Small Signal Current Gain	h _{fe}	—	—	200	—	—	I _C = -2.0mA, V _{CE} = -5V f = 1.0kHz	
				BC856B / BC857B / BC858B				330
				BC857C / BC858C				600
Input Impedance	h _{ie}	—	—	2.7	—	kΩ	I _C = -2.0mA, V _{CE} = -5V f = 1.0kHz	
				BC856B / BC857B / BC858B				4.5
				BC857C / BC858C				8.7
Output Admittance	h _{oe}	—	—	18	—	μS	I _C = -2.0mA, V _{CE} = -5V f = 1.0kHz	
				BC856B / BC857B / BC858B				30
				BC857C / BC858C				60
Reverse Voltage Transfer Ratio	h _{re}	—	—	1.5x10 ⁻⁴	—	—	I _C = -2.0mA, V _{CE} = -5V f = 1.0kHz	
				BC856B / BC857B / BC858B				2x10 ⁻⁴
				BC857C / BC858C				3x10 ⁻⁴
DC Current Gain (Note 9)	h _{FE}	—	125	180	250	—	I _C = -2.0mA, V _{CE} = -5V	
			BC856B / BC857B / BC858B	220	290			475
			BC857C / BC858C	420	520			800
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	—	-75	mV	I _C = -10mA, I _B = -0.5mA		
				-250		-650	I _C = -100mA, I _B = -5.0mA	
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(on)}	—	—	-600	mV	I _C = -2mA, V _{CE} = -5V		
				—		-820	I _C = -10mA, V _{CE} = -5V	
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	—	—	-700	mV	I _C = -10mA, I _B = -0.5mA		
				-850		-1100	I _C = -100mA, I _B = -5mA	
Output Capacitance	C _{obo}	—	3	—	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	—	2	10	dB	V _{CE} = -5V, I _C = -200μA R _S = 2kΩ, f = 1kHz Δf = 200Hz		

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (BC856B) (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

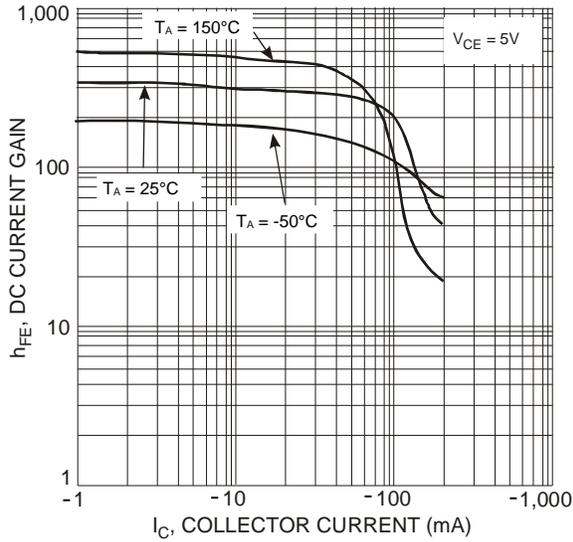


Figure 1 Typical DC Current Gain vs. Collector Current

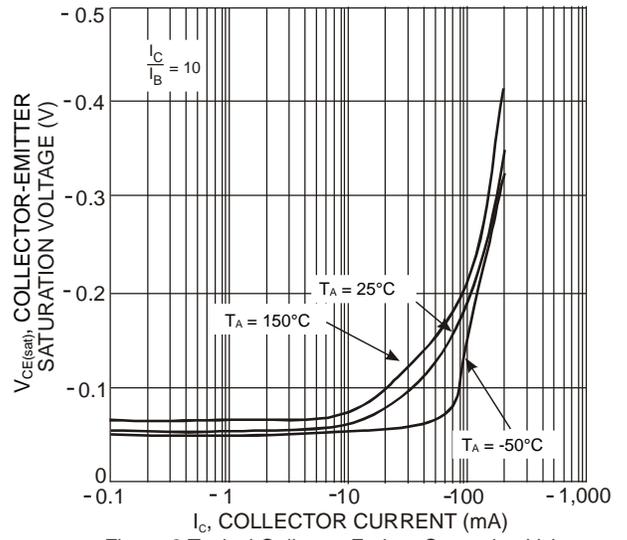


Figure 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

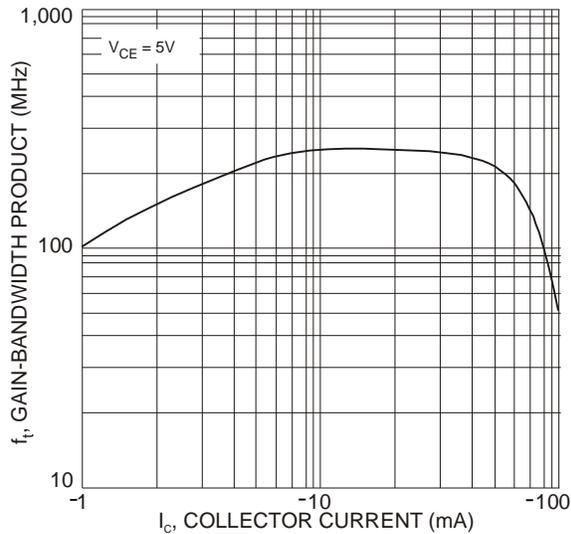
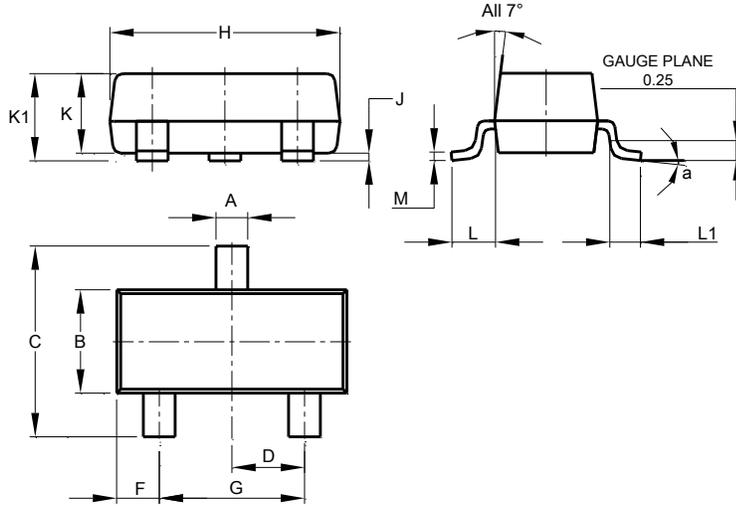


Figure 3 Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23

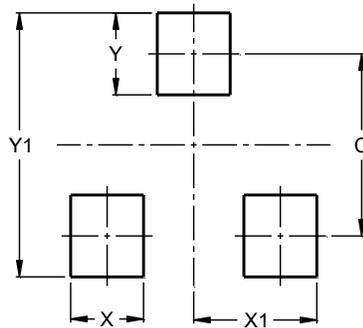


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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