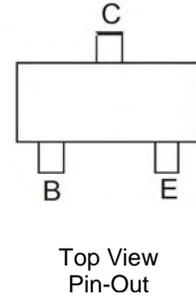
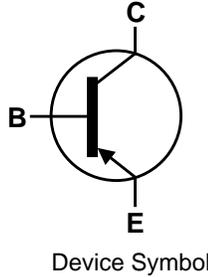


PNP SURFACE MOUNT SMALL SIGNAL TRANSISTOR IN SOT23
Features

- Ideally Suited for Automatic Insertion
- Complementary NPN Types Available (BC846 – BC848)
- For switching and AF Amplifier Applications
- **Lead Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

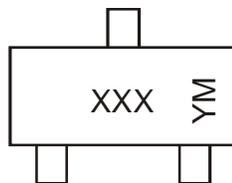
- Case: SOT-23
- UL Flammability Rating 94V-0
- Case material: molded Plastic "Green" Compound
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.008 grams (Approximate)


Ordering Information (Note 3 & 4)

Product	Marking	Reel size (inches)	Quantity per reel
BC856A-7-F	K3A	7	3,000
BC856B-7-F	K3B	7	3,000
BC856BQ-7-F	K3B	7	3,000
BC856B-13-F	K3B	13	10,000
BC857A-7-F	K3A	7	3,000
BC857B-7-F	K3B	7	3,000
BC857BQ-7-F	K3B	7	3,000
BC857B-13-F	K3B	13	10,000

Product	Marking	Reel size (inches)	Quantity per reel
BC857C-7-F	K3G	7	3,000
BC857C-13-F	K3G	13	10,000
BC858A-7-F	K3A	7	3,000
BC858B-7-F	K3B	7	3,000
BC858BQ-7-F	K3B	7	3,000
BC858C-7-F	K3G	7	3,000

- Notes:
1. No purposefully added lead.
 2. Diodes Inc.'s "Green" Policy can be found on our website at <http://www.diodes.com>
 3. Tape width is 8mm. For more packaging details, go to our website at <http://www.diodes.com>.
 4. Products with Q-suffix are automotive grade. All other products are commercial grade.

Marking Information


XXX = Product Type Marking Code,
 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_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 5)	P _D	300	mW
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	417	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-65 to +150	°C

Notes: 5. For a device surface mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper in still air conditions; the device is measured when operating in a steady-state condition.

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_{CBO}	-80	-	-	V	$I_C = -10\mu\text{A}$
	BC857		-50				
	BC858		-30				
Collector-Emitter Breakdown Voltage (Note 6)	BC856	BV_{CEO}	-65	-	-	V	$I_C = -10\text{mA}$
	BC857		-45				
	BC858		-30				
Emitter-Base Breakdown Voltage		BV_{EBO}	-5	-	-	V	$I_E = -1\mu\text{A}$
Collector Cutoff Current		I_{CBO}	-	-	-15	μA	$V_{CB} = -30\text{V}$
					-4		$V_{CB} = -30\text{V}, T_A = 150^\circ\text{C}$
Collector Emitter Cutoff Current	BC856	I_{CES}	-	-	-15	nA	$V_{CE} = -80\text{V}$
	BC857				-15		
	BC858				-15		
Small Signal Current Gain (Note 6)	BC856A / BC857A / BC858A	h_{fe}	-	200	-	-	$I_C = -2.0\text{mA}, V_{CE} = -5\text{V}$ $f = 1.0\text{kHz}$
	BC856B / BC857B / BC858B			330			
	BC857C / BC858C			600			
Input Impedance (Note 6)	BC856A / BC857A / BC858A	h_{ie}	-	2.7	-	k Ω	
	BC856B / BC857B / BC858B			4.5			
	BC857C / BC858C			8.7			
Output Admittance (Note 6)	BC856A / BC857A / BC858A	h_{oe}	-	18	-	μS	
	BC856B / BC857B / BC858B			30			
	BC857C / BC858C			60			
Reverse Voltage Transfer Ratio (Note 6)	BC856A / BC857A / BC858A	h_{re}	-	1.5×10^{-4}	-	-	
	BC856B / BC857B / BC858B			2×10^{-4}			
	BC857C / BC858C			3×10^{-4}			
DC Current Gain (Note 6)	BC856A / BC857A / BC858A	h_{FE}		125		-	$I_C = -2.0\text{mA}, V_{CE} = -5\text{V}$
	BC856B / BC857B / BC858B			220			
	BC857C / BC858C			420			
Collector-Emitter Saturation Voltage (Note 6)			-	-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 6)			-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 6)			-	-700	-	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$
				-850			$I_C = -100\text{mA}, I_B = -5\text{mA}$
Output Capacitance			-	3	-	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$
Transition Frequency			100	200	-	MHz	$V_{CE} = -5\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$
Noise Figure			-	2	10	dB	$V_{CE} = -5\text{V}, I_C = -200\mu\text{A}$ $R_S = 2\text{k}\Omega, f = 1\text{kHz}$ $\Delta f = 200\text{Hz}$

Note: 6. Short duration pulse test used to minimize self-heating effect.

Typical Electrical Characteristics

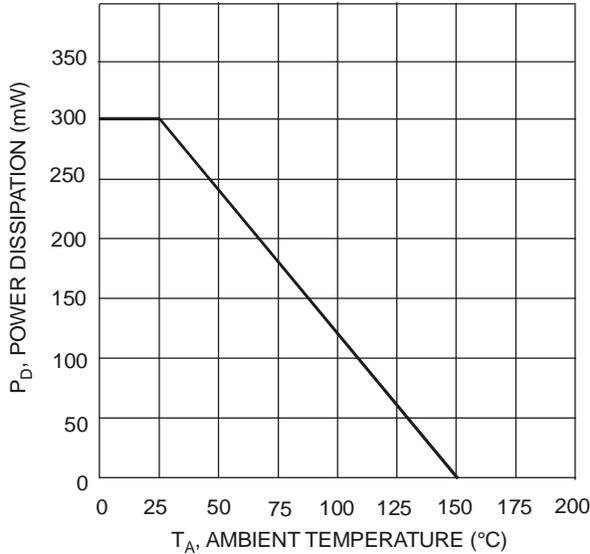


Fig. 1, Max Power Dissipation vs Ambient Temperature

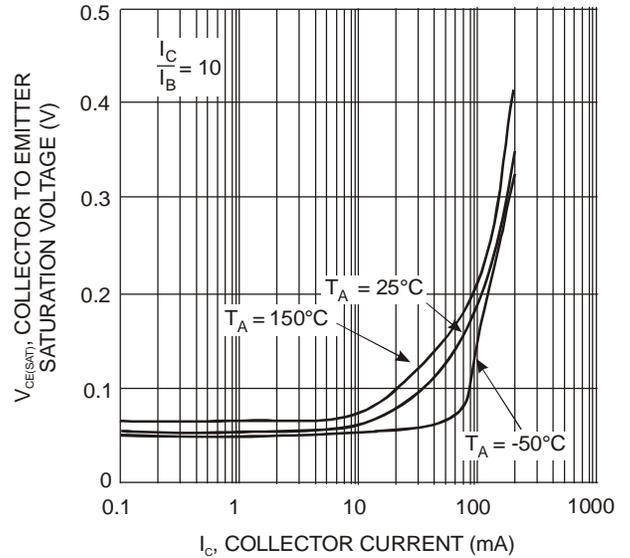


Fig. 2 Collector Emitter Saturation Voltage vs. Collector Current

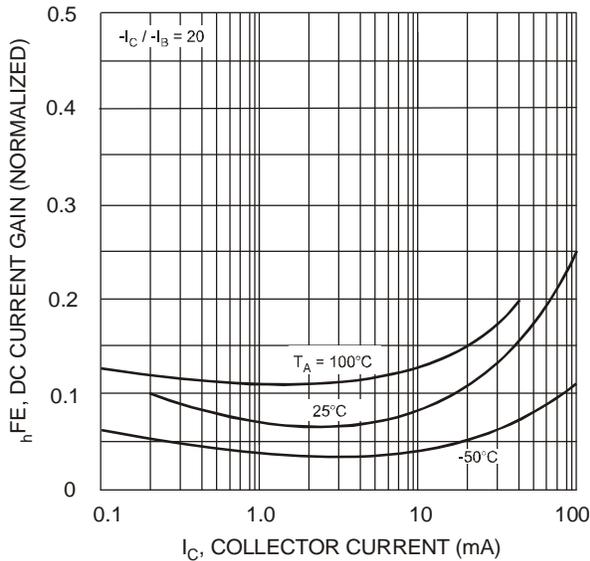


Fig. 3, DC Current Gain vs. Collector Current

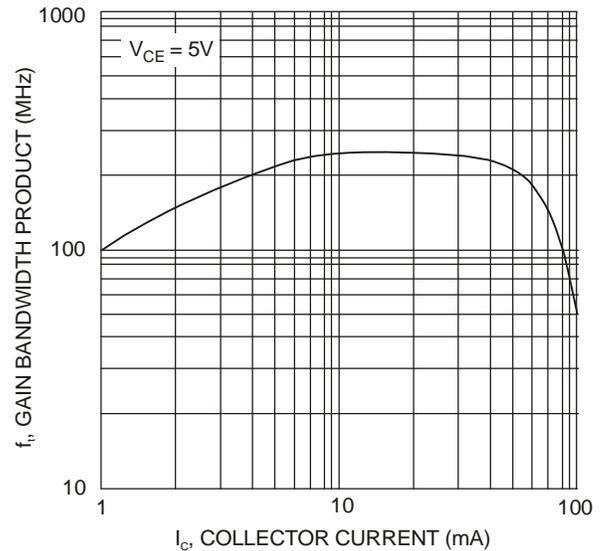
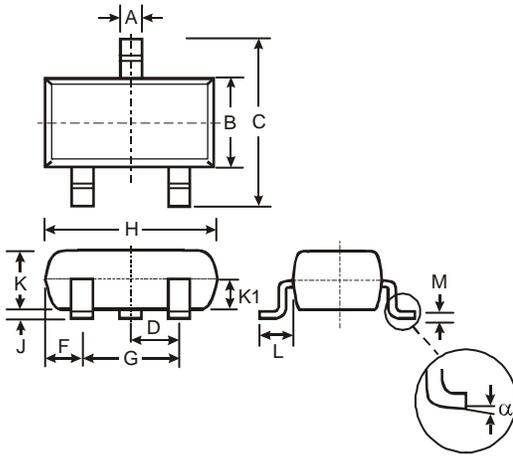


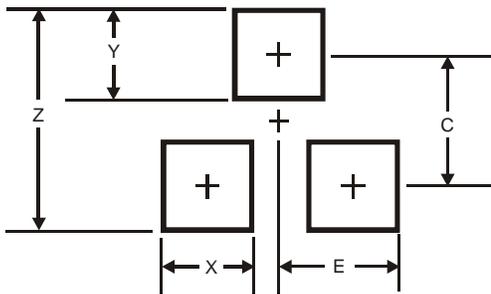
Fig. 4, Gain Bandwidth Product vs Collector Current

Package Outline Dimensions



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	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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