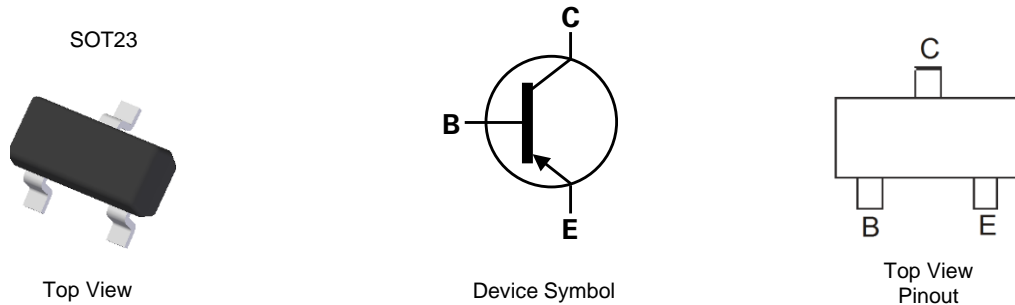


## Features

- Ideally Suited for Automatic Insertion
- Epitaxial Planar Die Construction
- Complementary NPN Types: BC817-xx
- For Switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under separate datasheet ([BC807-40Q](#))**

## Mechanical Data

- Package: SOT23
- Package 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 0.008 grams (Approximate)

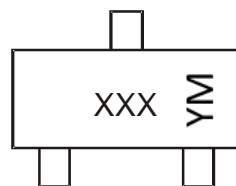


## Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
BC807-16-7-F	SOT23	K5A	7	8	3,000	Reel
BC807-25-7-F	SOT23	K5B	7	8	3,000	Reel
BC807-40-7-F	SOT23	K5C	7	8	3,000	Reel
BC807-40-13-F	SOT23	K5C	13	8	10,000	Reel

- 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 (See table above)  
 YM = Date Code Marking  
 Y or Y or Y = Year (ex: M = 2025)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2005	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	S	-	M	N	P	R	S	T	U	V	W	X

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	$V_{CB0}$	-50	V
Collector-Emitter Voltage	$V_{CEO}$	-45	V
Emitter-Base Voltage	$V_{EB0}$	-5.0	V
Continuous Collector Current	$I_C$	-0.5	A
Peak Collector Current	$I_{CM}$	-1.0	A
Peak Base Current	$I_{BM}$	-200	mA

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

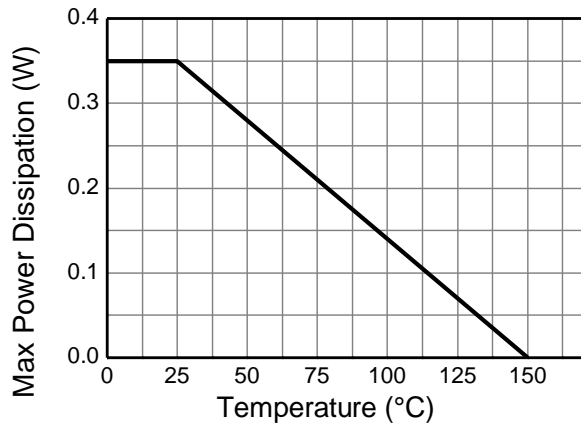
Characteristic	Symbol	Value	Unit
Power Dissipation	$P_D$	(Note 5) 310	mW
		(Note 6) 350	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	(Note 5) 403	$^\circ\text{C/W}$
		(Note 6) 357	
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	350	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**ESD Ratings** (Note 8)

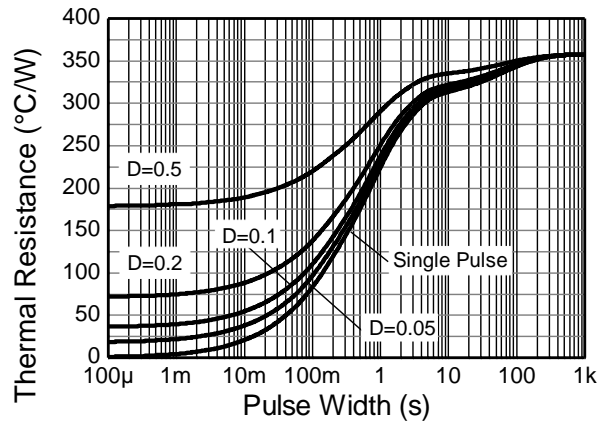
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single-sided 1oz copper in still air condition; device measured when operating in steady-state condition.
  6. Same as Note 5, except the device is mounted on 15mm X 15mm FR4 PCB.
  7. Thermal resistance from junction to solder-point (at the end of the leads).
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

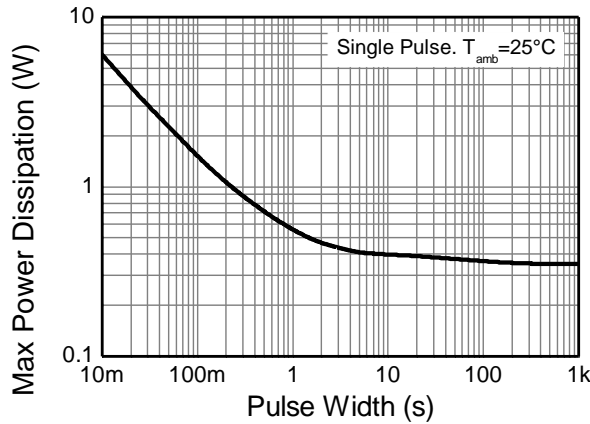
**Thermal Characteristics and Derating Information**



**Figure 1. Derating Curve**



**Figure 2. Transient Thermal Impedance**



**Figure 3. Pulse Power Dissipation**

**Electrical Characteristics** (@ T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV <sub>CB0</sub>	-50	—	—	V	I <sub>C</sub> = -100µA
Collector-Emitter Breakdown Voltage		BV <sub>CE0</sub>	-45	—	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage		BV <sub>EB0</sub>	-5	—	—	V	I <sub>C</sub> = -100µA
Collector-Emitter Cutoff Current		I <sub>CES</sub>	—	—	-100 -5.0	nA µA	V <sub>CE</sub> = -45V V <sub>CE</sub> = -25V, T <sub>J</sub> = +150°C
Emitter-Base Cutoff Current		I <sub>EBO</sub>	—	—	-100	nA	V <sub>EB</sub> = -5.0V
DC Current Gain (Note 9)	BC807-16	h <sub>FE</sub>	100	—	250	—	V <sub>CE</sub> = -1.0V, I <sub>C</sub> = -100mA
	BC807-25		160		400		
	BC807-40		250		600		
	BC807-16		60		—		
BC807-25	100						
BC807-40	170						
Collector-Emitter Saturation Voltage (Note 9)		V <sub>CE(sat)</sub>	—	—	-0.7	V	I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
Base-Emitter Voltage (Note 9)		V <sub>BE(on)</sub>	—	—	-1.2	V	V <sub>CE</sub> = -1.0V, I <sub>C</sub> = -300mA
Gain Bandwidth Product		f <sub>T</sub>	100	—	—	MHz	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA f = 50MHz
Collector-Base Capacitance		C <sub>CB0</sub>	—	—	12	pF	V <sub>CB</sub> = -10V, f = 1.0MHz

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

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

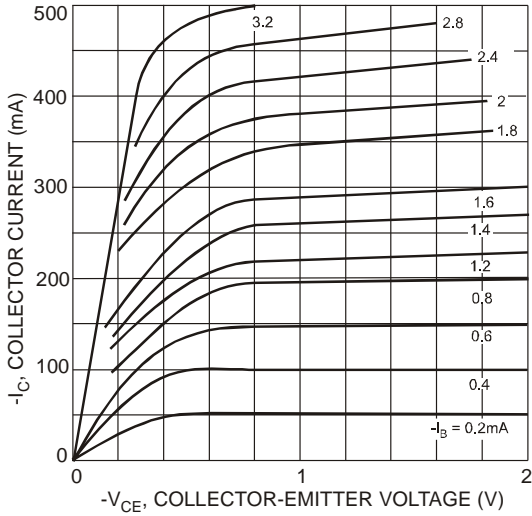


Figure 4. Typical Collector Current vs. Collector-Emitter Voltage

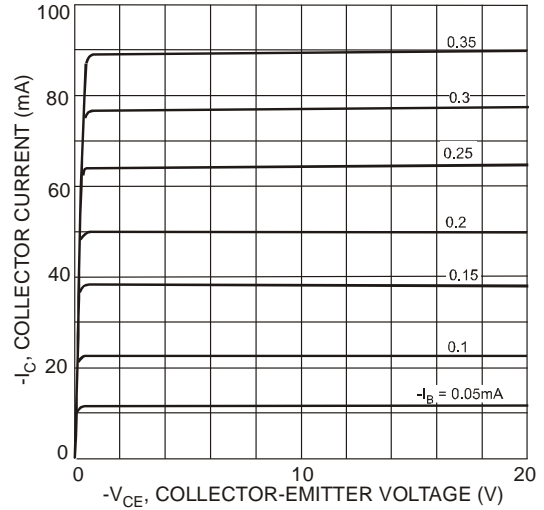


Figure 5. Typical Collector Current vs. Collector-Emitter Voltage

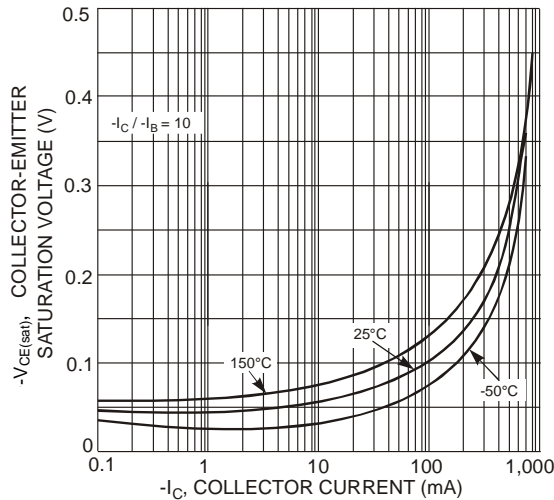


Figure 6. Typical Collector-Emitter Saturation Voltage vs. Collector Current

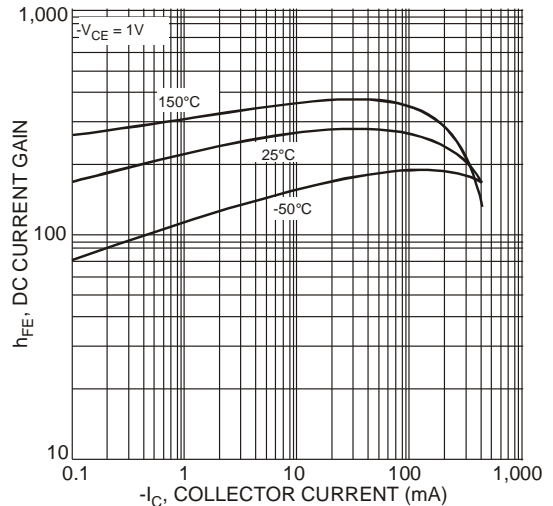


Figure 7. Typical DC Current Gain vs. Collector Current

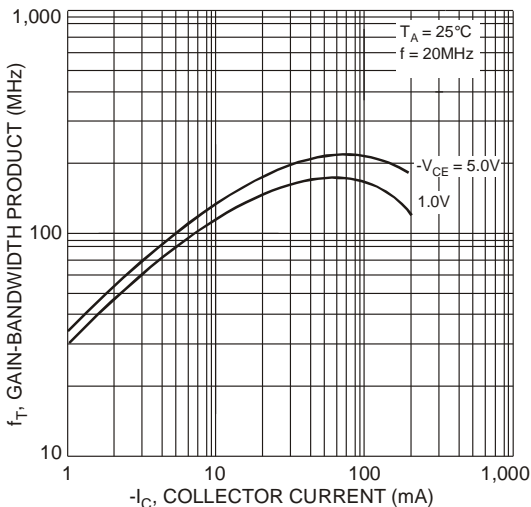
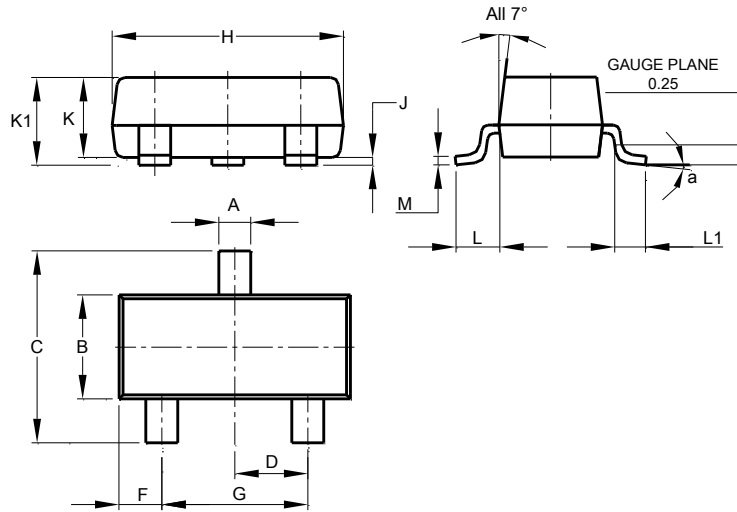


Figure 8. Typical Gain-Bandwidth Product vs. Collector Current

## Package Outline Dimensions

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

**SOT23**

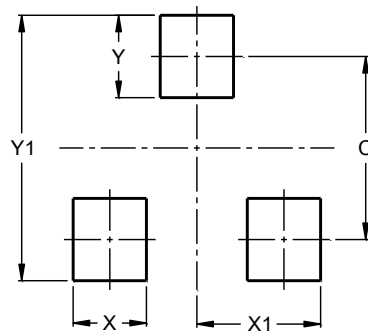


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

## 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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