

Features

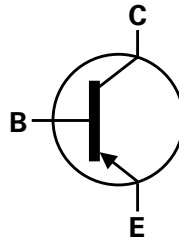
- Ideally Suited for Automatic Insertion
- Epitaxial Planar Die Construction
- Complementary NPN Types: [BC817-16/-25/-40](#)
- For Switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under a separate datasheet ([BC807-40Q](#)).**

Mechanical Data

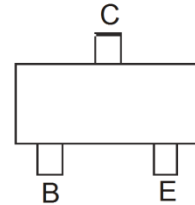
- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per
MIL-STD-202, Method 208 @3
- Weight 0.008 grams (Approximate)



Top View



Device Symbol



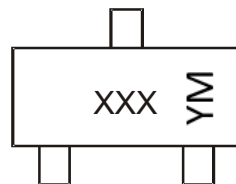
Top View
Pinout

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: N = 2026)
M = Month (ex: 9 = September)

Date Code Key

Year	2005	-	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	S	-	N	P	R	S	T	U	V	W	X	Y

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	310	mW
		350	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	403	$^\circ\text{C/W}$
		357	
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	350	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	112	$^\circ\text{C/W}$
		104	
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
Electrostatic Discharge – Charged Device Model	ESD CDM	1,000	V	3C

- 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 specifications JESD22-A114, JESD22-A115 and JS-002.

Thermal Characteristics and Derating Information

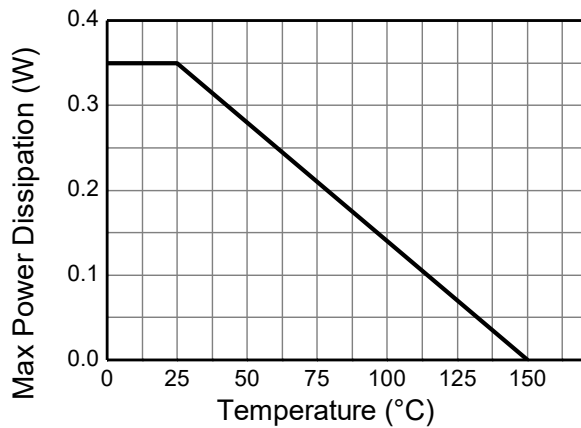


Figure 1. Derating Curve

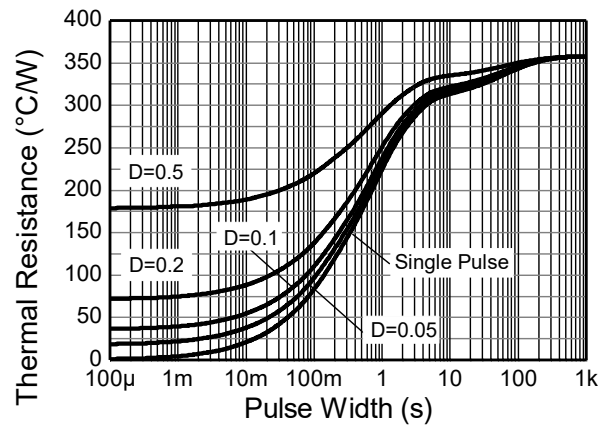


Figure 2. Transient Thermal Impedance

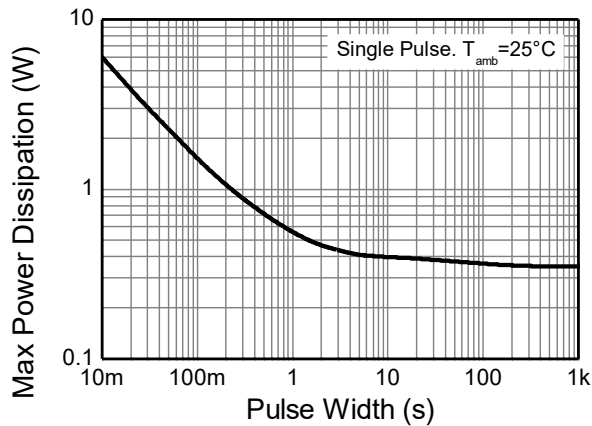


Figure 3. Pulse Power Dissipation

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV_{CBO}	-50	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage		BV_{CEO}	-45	—	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage		BV_{EBO}	-5	—	—	V	$I_E = -100\mu\text{A}$
Collector-Emitter Cutoff Current		I_{CES}	—	—	-100 -5.0	nA μA	$V_{CE} = -45\text{V}$ $V_{CE} = -25\text{V}, T_J = +150^\circ\text{C}$
Emitter-Base Cutoff Current		I_{EBO}	—	—	-100	nA	$V_{EB} = -5.0\text{V}$
DC Current Gain (Note 9)	BC807-16	h_{FE}	100	—	250	—	$V_{CE} = -1.0\text{V}, I_C = -100\text{mA}$
	BC807-25		160		400		
	BC807-40		250		600		$V_{CE} = -1.0\text{V}, I_C = -300\text{mA}$
	BC807-16		60		—		
Collector-Emitter Saturation Voltage (Note 9)		$V_{CE(sat)}$	—	—	-0.7	V	$I_C = -500\text{mA}, I_B = -50\text{mA}$
Base-Emitter Voltage (Note 9)		$V_{BE(on)}$	—	—	-1.2	V	$V_{CE} = -1.0\text{V}, I_C = -300\text{mA}$
Gain Bandwidth Product		f_T	100	—	—	MHz	$V_{CE} = -5.0\text{V}, I_C = -10\text{mA}$ $f = 50\text{MHz}$
Collector-Base Capacitance		C_{CBO}	—	—	12	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$

Note: 9. 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.)

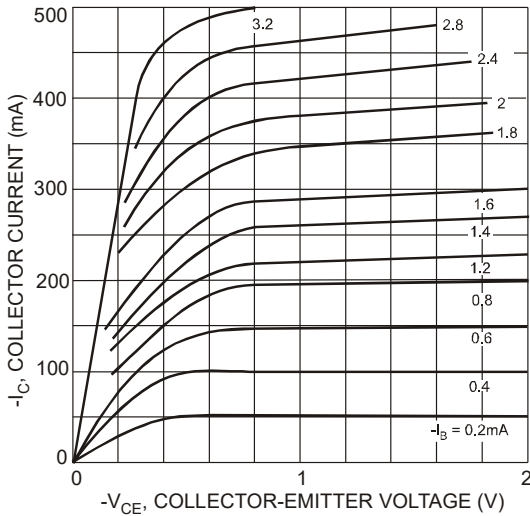


Figure 4. Typical Collector Current vs. Collector-Emitter Voltage

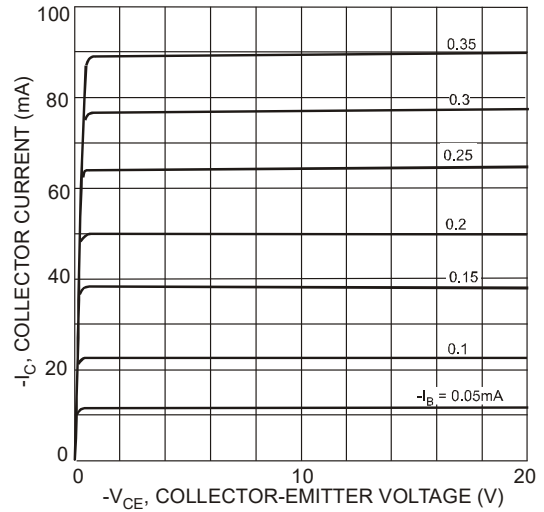


Figure 5. Typical Collector Current vs. Collector-Emitter Voltage

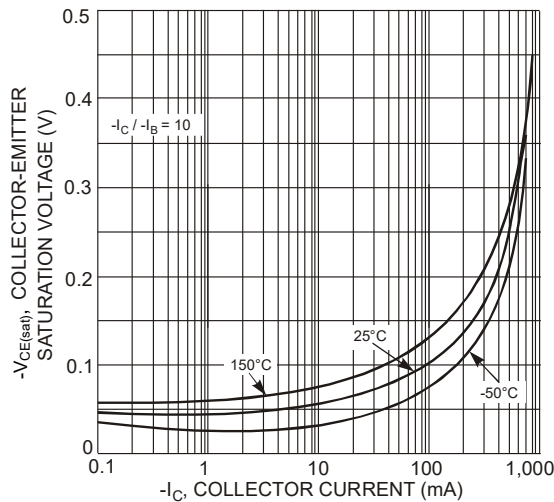


Figure 6. Typical Collector-Emitter Saturation Voltage vs. Collector Current

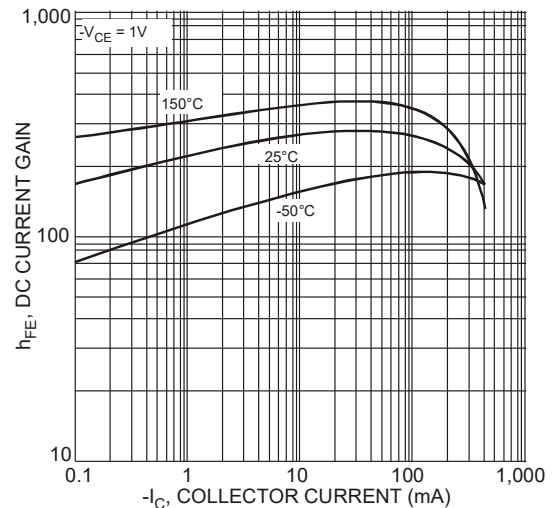


Figure 7. Typical DC Current Gain vs. Collector Current

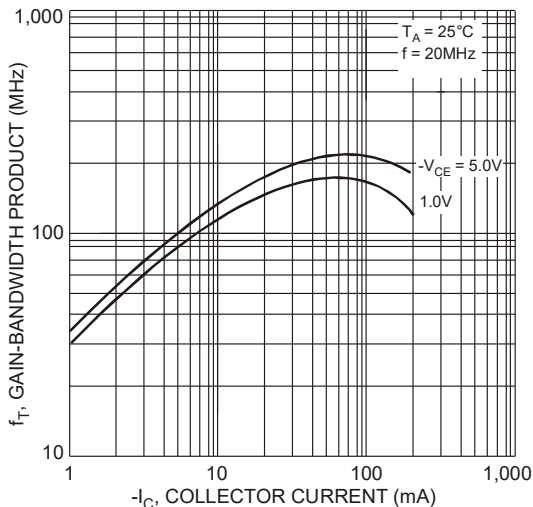
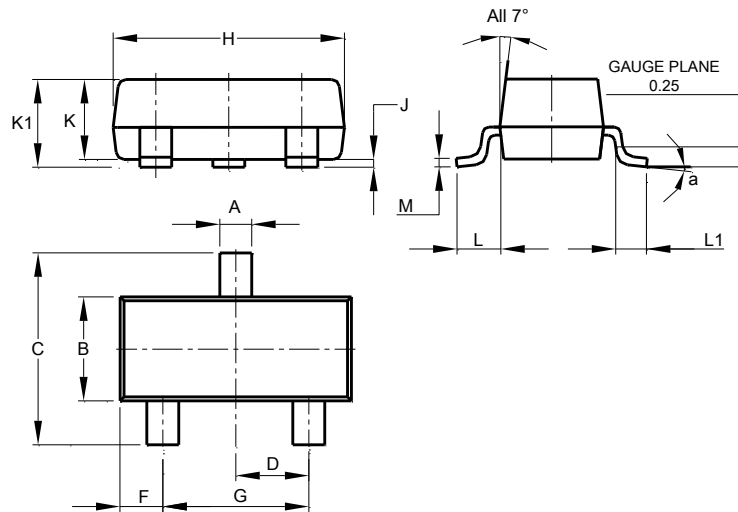


Figure 8. Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

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

SOT23

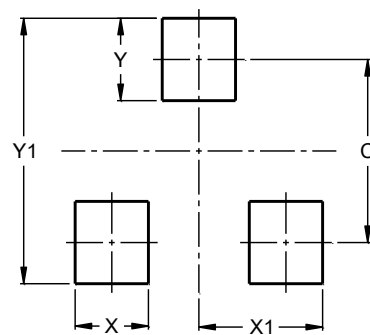


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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