

Features

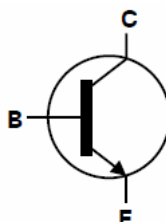
- Ideally Suited for Automatic Insertion
- Complementary PNP Types Available ([BC807-16/-25/-40](#))
- For Switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is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

Mechanical Data

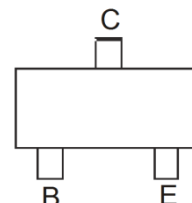
- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 
- Weight 0.008 grams (Approximate)



Top View



Device Symbol

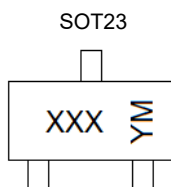

 Top View
Pinout

Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
BC817-16-7-F	SOT23	K6A	7	8	3,000	Reel
BC817-25-7-F	SOT23	K6B	7	8	3,000	Reel
BC817-40-7-F	SOT23	K6C	7	8	3,000	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 $\bar{Y}$ or $\underline{Y}$ = 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°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	50	V
Collector-Emitter Voltage	V _{CEO}	45	V
Emitter-Base Voltage	V _{EBO}	5.0	V
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°C, unless otherwise specified.)

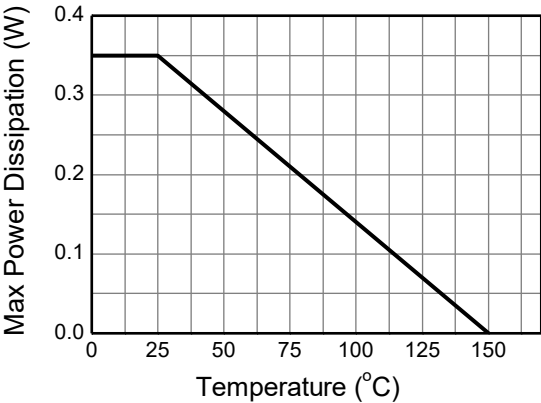
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	310	mW
		350	
Thermal Resistance, Junction to Ambient	R _{θJA}	403	°C/W
		357	
Thermal Resistance, Junction to Leads	R _{θJL}	350	°C/W
Thermal Resistance, Junction to Case	R _{θJC}	112	°C/W
		104	
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to 150	°C

ESD Ratings (Note 8)

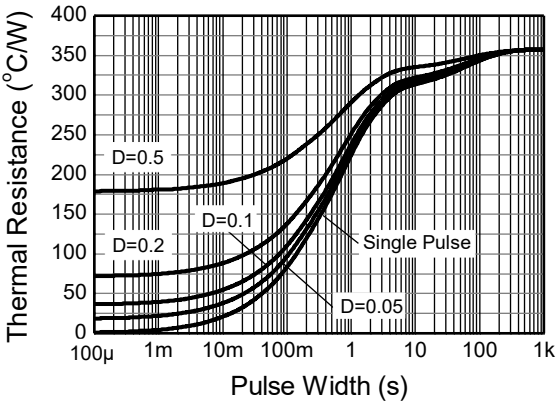
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C
Electrostatic Discharge – Charged Device Model	ESD CDM	1,000	V	B

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

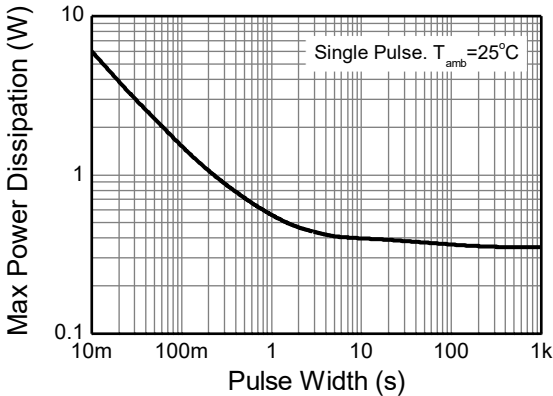
Thermal Characteristics and Derating Information



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 _{CBO}	50	—	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage		BV _{CEO}	45	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage		BV _{EBO}	5	—	—	V	I _E = 100μA
Collector-Emitter Cut-Off Current		I _{CES}	—	—	100 5.0	nA μA	V _{CE} = 45V V _{CE} = 25V, T _J = 150°C
Emitter-Base Cut-Off Current		I _{EBO}	—	—	100	nA	V _{EB} = 5.0V
DC Current Gain (Note 9)	BC817-16	h _{FE}	100	—	250	—	V _{CE} = 1.0V, I _C = 100mA
	BC817-25		160		400		
	BC817-40		250		600		
	BC817-16		60		—		
	BC817-25		100		—		V _{CE} = 1.0V, I _C = 300mA
	BC817-40		170				
Collector-Emitter Saturation Voltage (Note 9)		V _{CE(sat)}	—	—	0.7	V	I _C = 500mA, I _B = 50mA
Base-Emitter Voltage (Note 9)		V _{BE}	—	—	1.2	V	V _{CE} = 1.0V, I _C = 300mA
Gain Bandwidth Product		f _T	100	—	—	MHz	V _{CE} = 5.0V, I _C = 10mA, f = 50MHz
Collector-Base Capacitance		C _{cbo}	—	—	12	pF	V _{CB} = 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.)

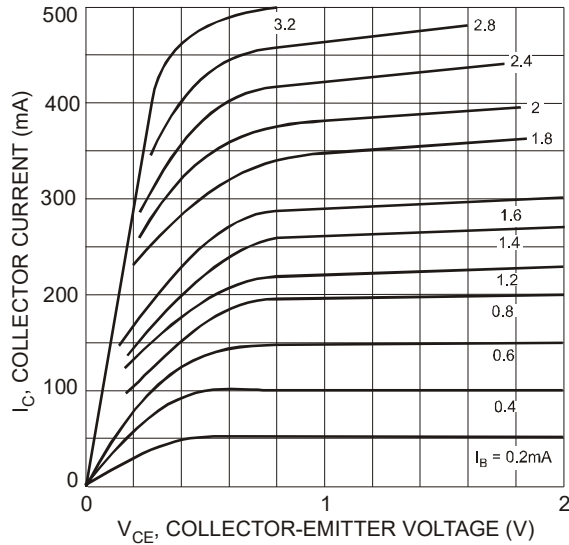


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

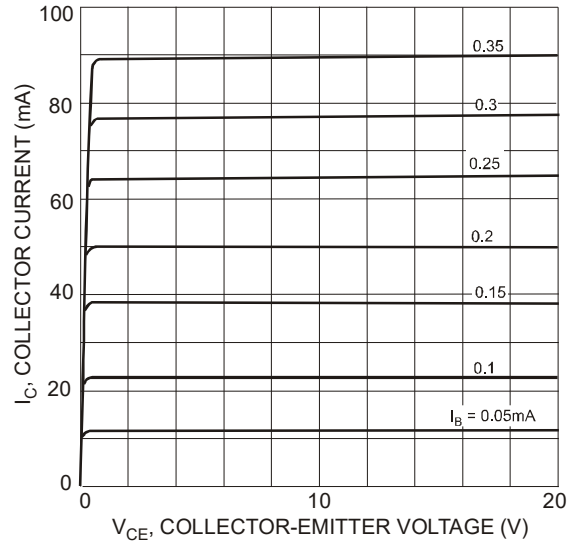


Figure 2 Typical Collector Current vs. Collector-Emitter Voltage

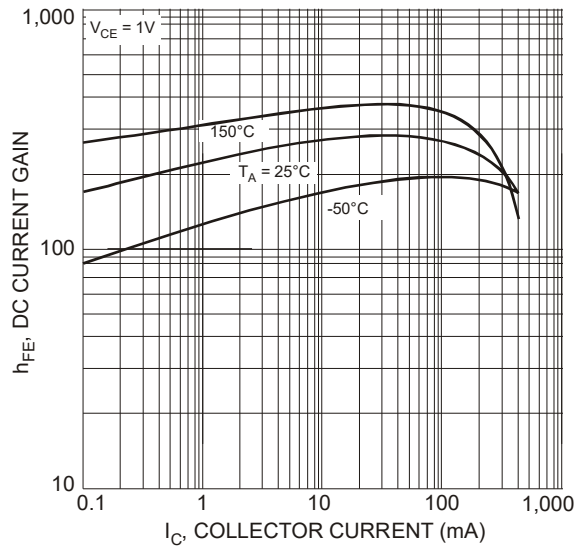


Figure 3 Typical DC Current Gain vs. Collector Current

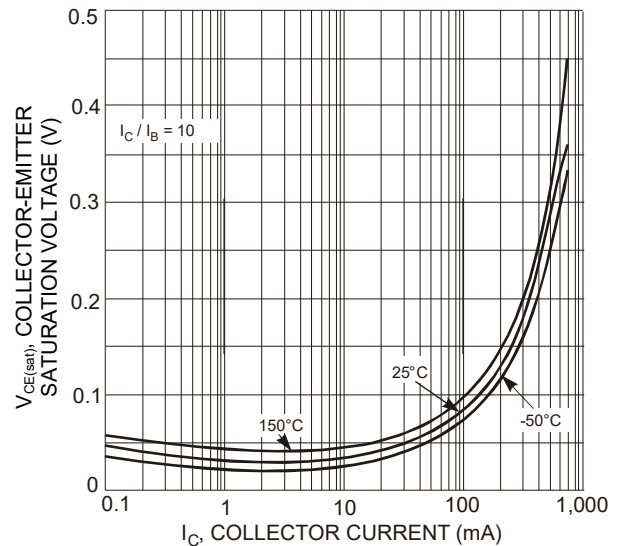


Figure 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

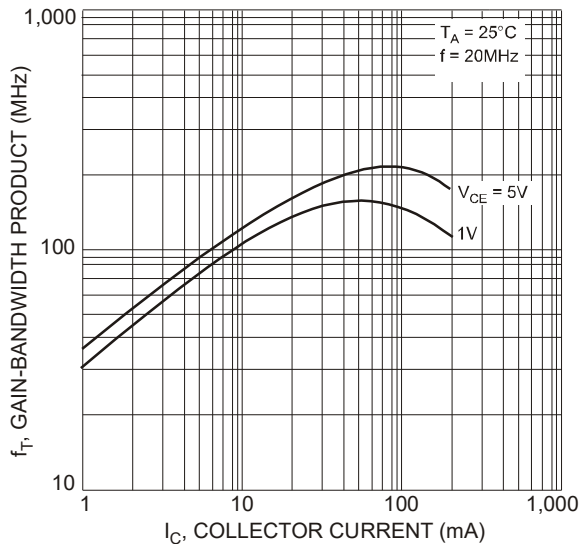
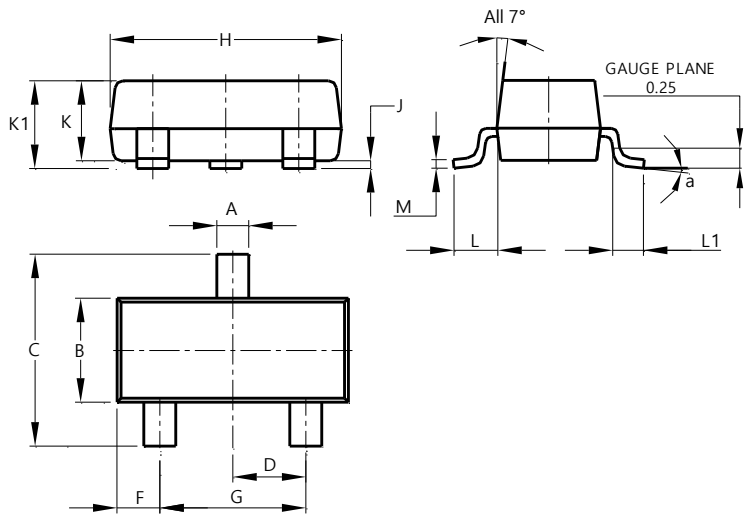


Figure 5 Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

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

SOT23

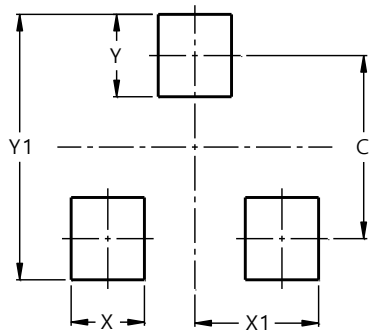


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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