

## Description

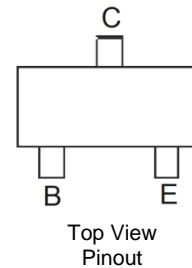
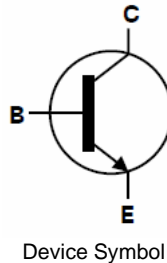
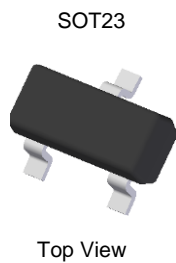
This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of automotive applications.

## Features

- $BV_{CEO} > 45V$
- $I_C = 0.5A$  Continuous Collector Current
- $I_{CM} = 1A$  Peak Pulse Current
- Complementary PNP Types: BC807-xxQ
- Ideally Suited for Automatic Insertion
- Epitaxial Planar Die Construction
- For Switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The BC817-16Q/-25Q/-40Q are suitable for automotive applications requiring specific change control; these parts are AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**  
<https://www.diodes.com/quality/product-definitions/>

## 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 (63)
- Weight 0.008 grams (Approximate)

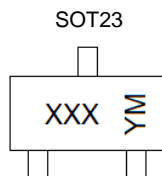


## Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
BC817-16Q-7-F	SOT23	K6A	7	8	3,000	Reel
BC817-25Q-7-F	SOT23	K6B	7	8	3,000	Reel
BC817-40Q-7-F	SOT23	K6C	7	8	3,000	Reel
BC817-40Q-13-F	SOT23	K6C	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 *Ordering Information*)  
 YM = Date Code Marking  
 Y or Y = Year (ex: M = 2025)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2016	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	D	-	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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	45	V
Emitter-Base Voltage	V <sub>EB0</sub>	5.0	V
Collector Current	I <sub>C</sub>	0.5	A
Peak Pulse Collector Current (Single Pulse)	I <sub>CM</sub>	1.0	A
Peak Pulse Base Current (Single Pulse)	I <sub>BM</sub>	200	mA

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

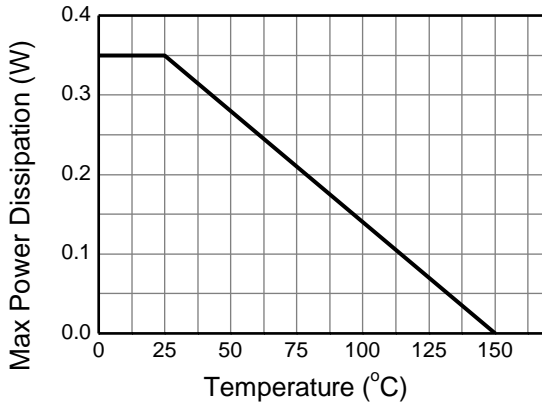
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 5)	310
		(Note 6)	350
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 5)	403
		(Note 6)	357
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	350	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

**ESD Ratings** (Note 8)

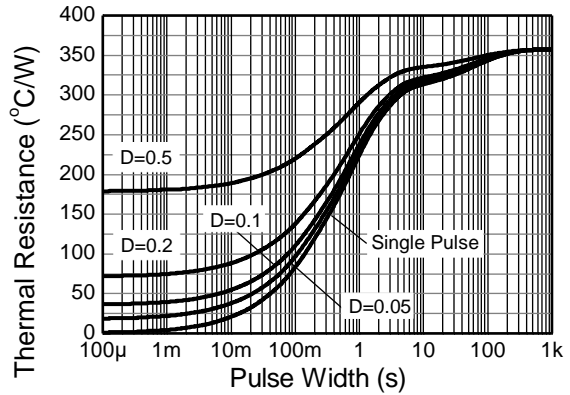
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- 5. For a device mounted on minimum recommended pad layout 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 specification JESD22-A114 and JESD22-A115.

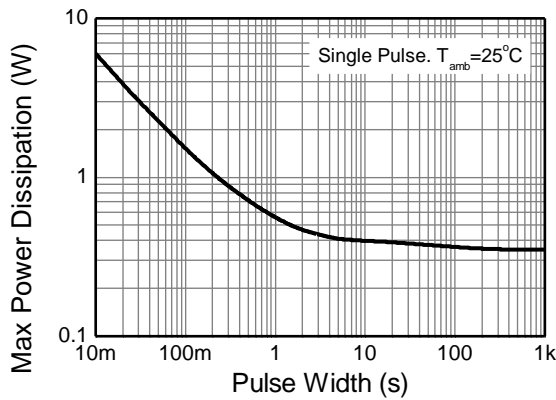
## Thermal Characteristics and Derating Information



**Figure 1. Derating Curve**



**Figure 2. Transient Thermal Impedance**



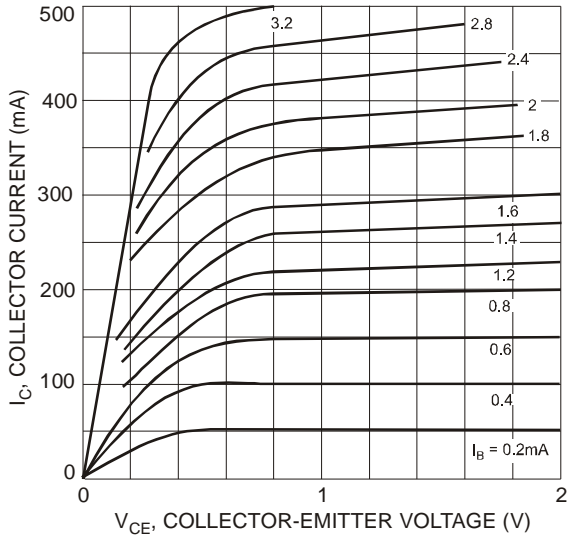
**Figure 3. Pulse Power Dissipation**

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

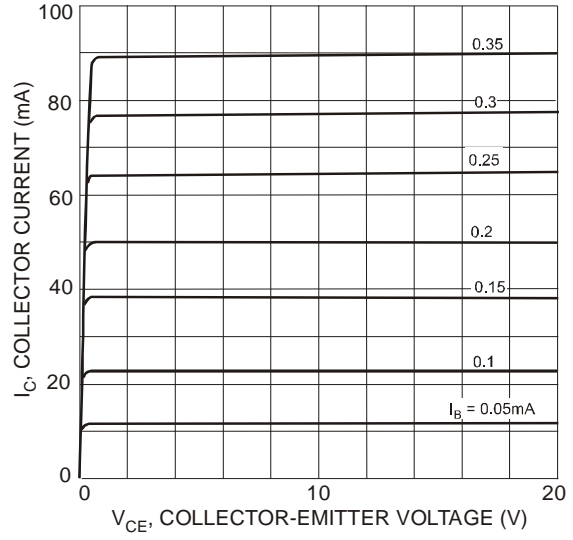
Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV <sub>CB0</sub>	50	—	—	V	I <sub>C</sub> = 100µA
Collector-Emitter Breakdown Voltage (Note 9)		BV <sub>CEO</sub>	45	—	—	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage		BV <sub>EB0</sub>	5	—	—	V	I <sub>C</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)	BC817-16Q BC817-25Q BC817-40Q	h <sub>FE</sub>	100 160 250	—	250 400 600	—	V <sub>CE</sub> = 1.0V, I <sub>C</sub> = 100mA
	BC817-16Q BC817-25Q BC817-40Q		60 100 170		—		—
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</sub>	—	—	1.2	V	V <sub>CE</sub> = 1.0V, I <sub>C</sub> = 300mA
Transition frequency		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%.

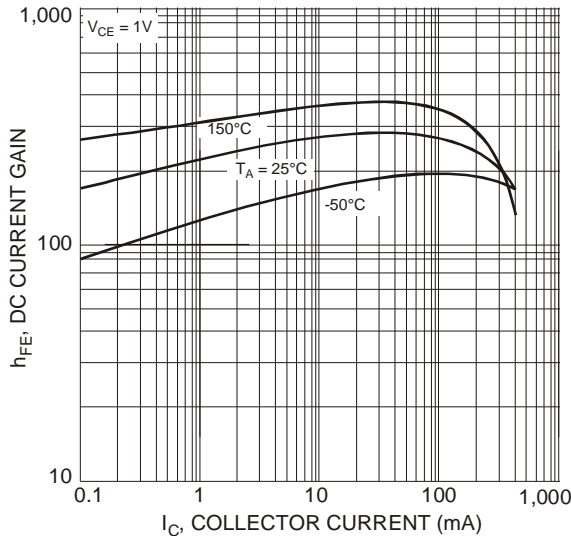
**Typical Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



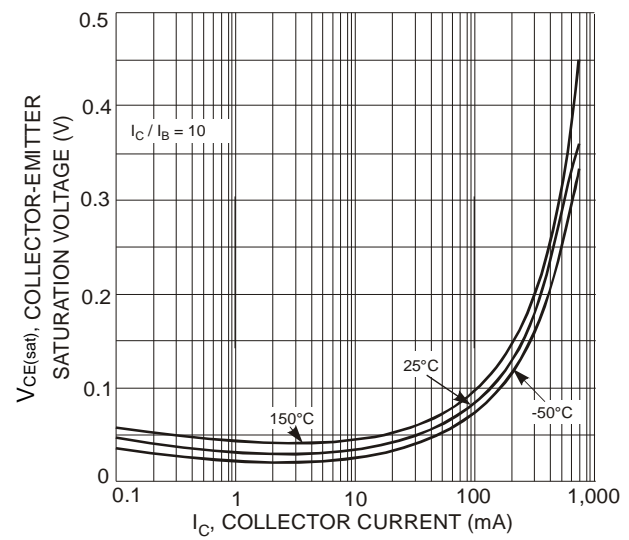
**Figure 4.  $I_C$  v  $V_{CE}$**



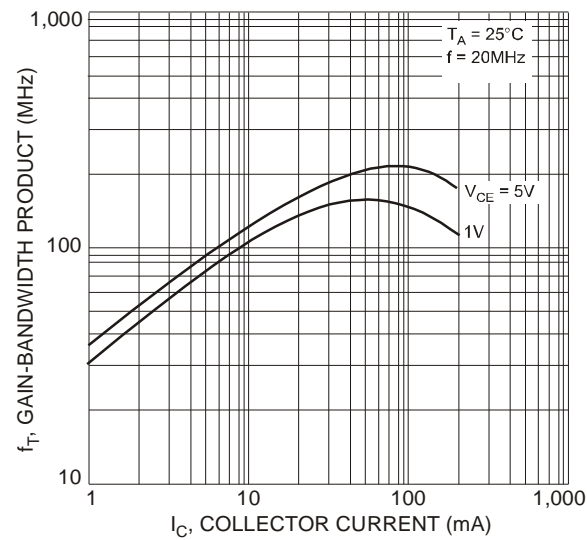
**Figure 5.  $I_C$  v  $V_{CE}$**



**Figure 6.  $h_{FE}$  v  $I_C$**



**Figure 7.  $V_{CE(sat)}$  v  $I_C$**

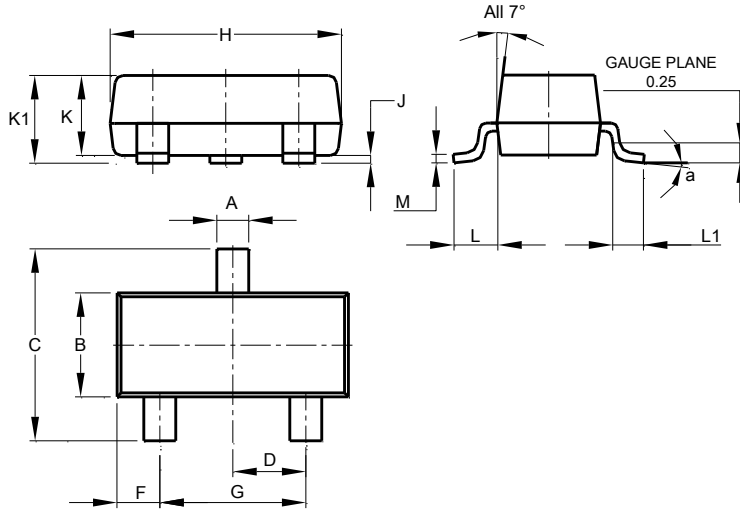


**Figure 8.  $f_T$  v  $I_C$**

**Package Outline Dimensions**

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

**SOT23**

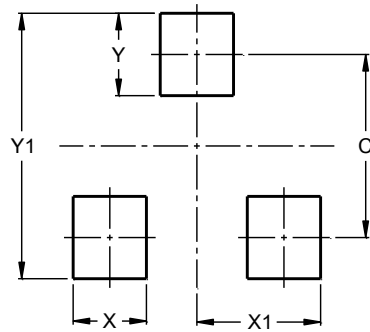


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**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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