

Features

- Ideally Suited for Automatic Insertion
- Epitaxial Planar Die Construction
- Complementary NPN Types Available (BC807)
- For switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

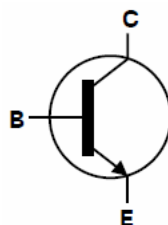
Mechanical Data

- Case: SOT23
- Case 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 208③
- Weight 0.008 grams (approximate)

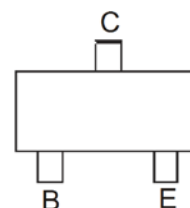
SOT23



Top View



Device Symbol

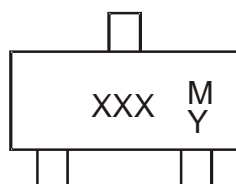

 Top View
Pin-Out

Ordering Information (Note 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BC817-16-7-F	AEC-Q101	K6A	7	8	3,000
BC817-25-7-F	AEC-Q101	K6B	7	8	3,000
BC817-25Q-7-F	Automotive	K6B	7	8	3,000
BC817-40-7-F	AEC-Q101	K6C	7	8	3,000
BC817-40Q-7-F	Automotive	K6C	7	8	3,000
BC817-40Q-13-F	Automotive	K6C	13	8	10,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



XXX = Product Type Marking Code (See table above)
 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	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.)

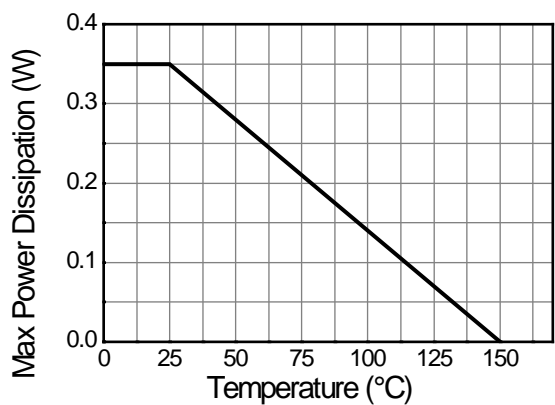
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	310	mW
		350	
Thermal Resistance, Junction to Ambient	R _{JA}	403	°C/W
		357	
Thermal Resistance, Junction to Leads	R _{JL}	350	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150	°C

ESD Ratings (Note 9)

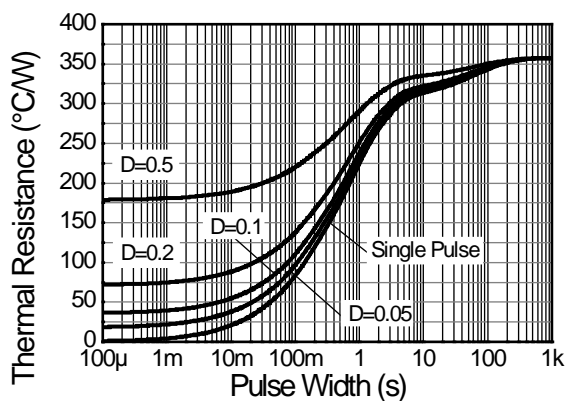
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	• 8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	• 400	V	C

- Notes:
6. 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.
 7. Same as Note 6, except the device is mounted on 15mm X 15mm FR4 PCB.
 8. Thermal resistance from junction to solder-point (at the end of the leads).
 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

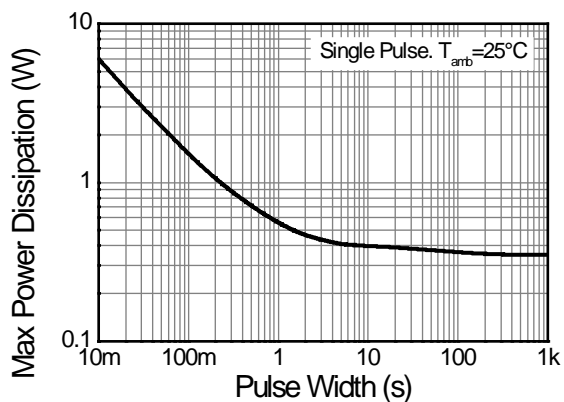
Thermal Characteristics and Derating Information



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 _C = 100μA
Collector-Emitter Cutoff Current		I _{CES}	—	—	100 5.0	nA μA	V _{CE} = 45V V _{CE} = 25V, T _J = +150°C
Emitter-Base Cutoff Current		I _{EBO}	—	—	100	nA	V _{EB} = 5.0V
DC Current Gain (Note 10)	BC817-16	h _{FE}	100	—	250	—	V _{CE} = 1.0V, I _C = 100mA
	BC817-25		160		400		
	BC817-40		250		600		
	BC817-16		60		—		V _{CE} = 1.0V, I _C = 300mA
		BC817-25	100				
		BC817-40	170				
Collector-Emitter Saturation Voltage (Note 10)		V _{CE(SAT)}	—	—	0.7	V	I _C = 500mA, I _B = 50mA
Base-Emitter Voltage (Note 10)		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: 10. Measured under pulsed conditions. Pulse width • 300μs. Duty cycle • 2%.

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

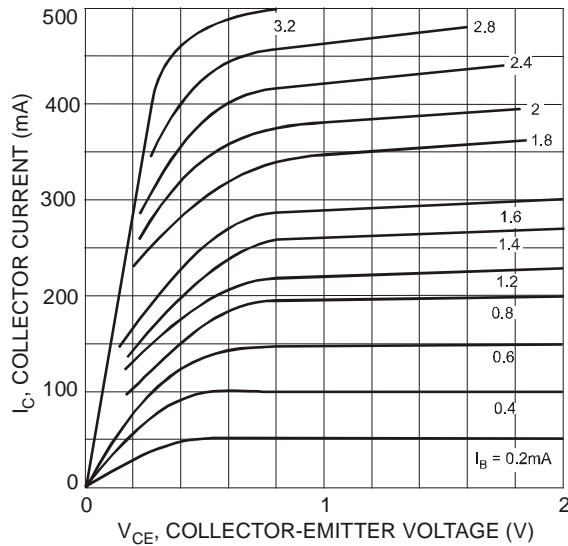


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

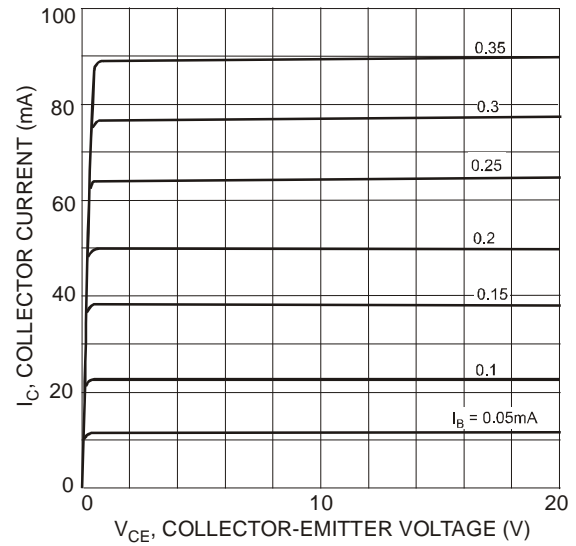


Figure 2 Typical Collector Current vs. Collector-Emitter Voltage

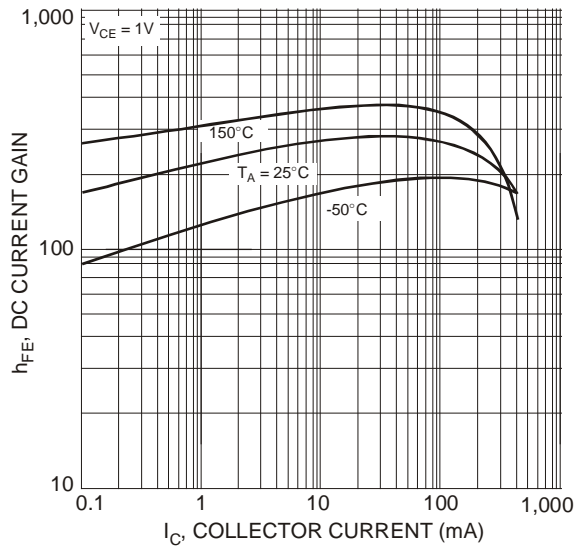


Figure 3 Typical DC Current Gain vs. Collector Current

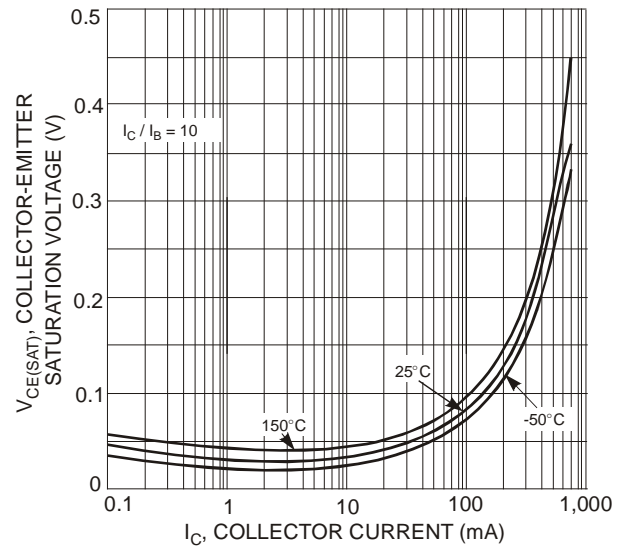


Figure 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

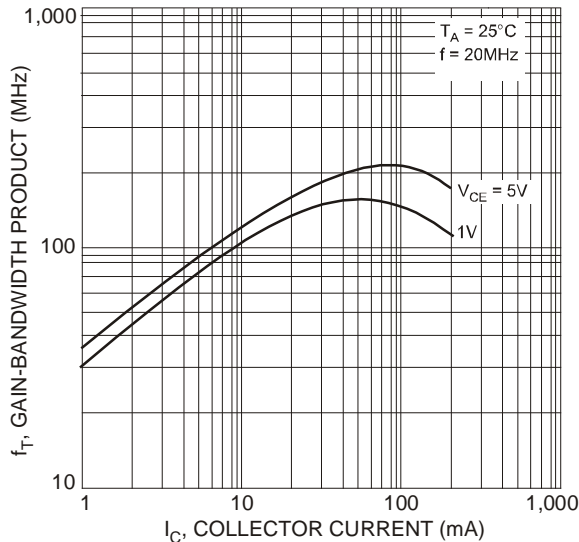
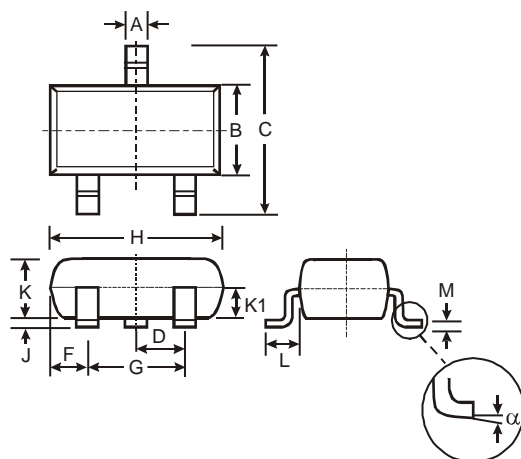


Figure 5 Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

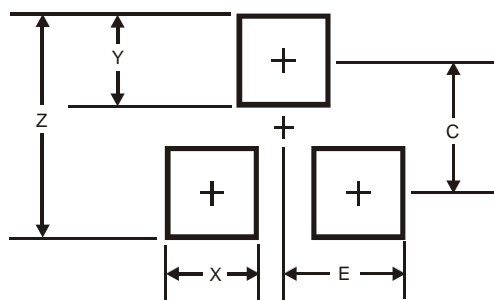
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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

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