



**THE DATASHEET OF  
BC807-25-7-F**

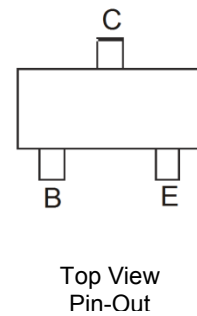
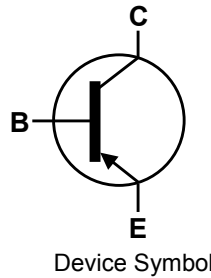


## Features

- Ideally Suited for Automatic Insertion
- Epitaxial Planar Die Construction
- Complementary NPN Types Available (BC817)
- 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 208<sup>(3)</sup>
- Weight 0.008 grams (approximate)

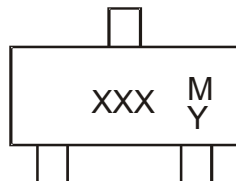


## Ordering Information (Notes 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BC807-16-7-F	AEC-Q101	K5A	7	8	3,000
BC807-25-7-F	AEC-Q101	K5B	7	8	3,000
BC807-40-7-F	AEC-Q101	K5C	7	8	3,000
BC807-40-13-F	AEC-Q101	K5C	13	8	10,000
BC807-40Q-7-F	Automotive	K5C	7	8	3,000
BC807-40Q-13-F	Automotive	K5C	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](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/](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** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB0}$	-50	V
Collector-Emitter Voltage	$V_{CEO}$	-45	V
Emitter-Base Voltage	$V_{EBO}$	-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.)

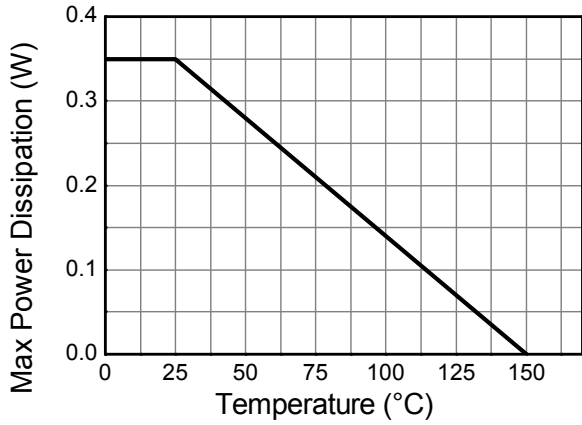
Characteristic	Symbol	Value	Unit
Power Dissipation	$P_D$	(Note 6) 310	mW
		(Note 7) 350	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	(Note 6) 403	$^\circ\text{C/W}$
		(Note 7) 357	
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	350	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**ESD Ratings** (Note 9)

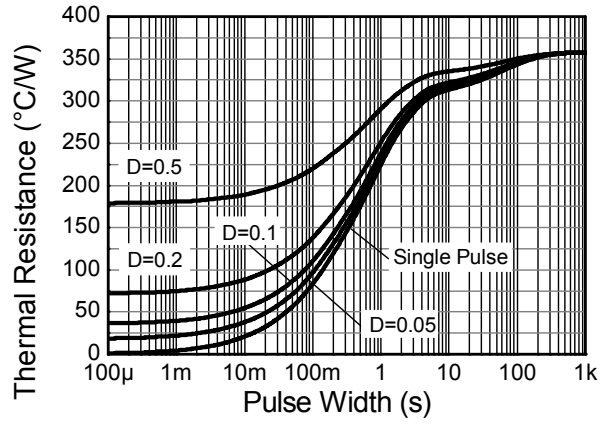
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	$\geq 8,000$	V	3B
Electrostatic Discharge - Machine Model	ESD MM	$\geq 400$	V	C

- 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.

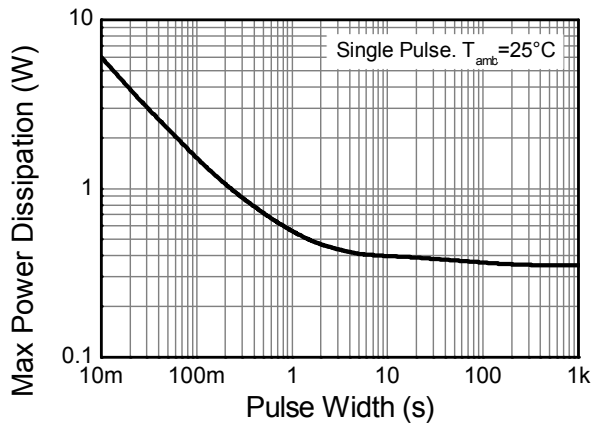
**Thermal Characteristics and Derating Information**



**Derating Curve**



**Transient Thermal Impedance**



**Pulse Power Dissipation**

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV <sub>CBO</sub>	-50	—	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage		BV <sub>CEO</sub>	-45	—	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage		BV <sub>EBO</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 10)	BC807-16 BC807-25 BC807-40	h <sub>FE</sub>	100 160 250	—	250 400 600	—	V <sub>CE</sub> = -1.0V, I <sub>C</sub> = -100mA
	BC807-16 BC807-25 BC807-40		60 100 170		—		
Collector-Emitter Saturation Voltage (Note 10)		V <sub>CE(SAT)</sub>	—	—	-0.7	V	I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
Base-Emitter Voltage (Note 10)		V <sub>BE</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>CBO</sub>	—	—	12	pF	V <sub>CB</sub> = -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.)

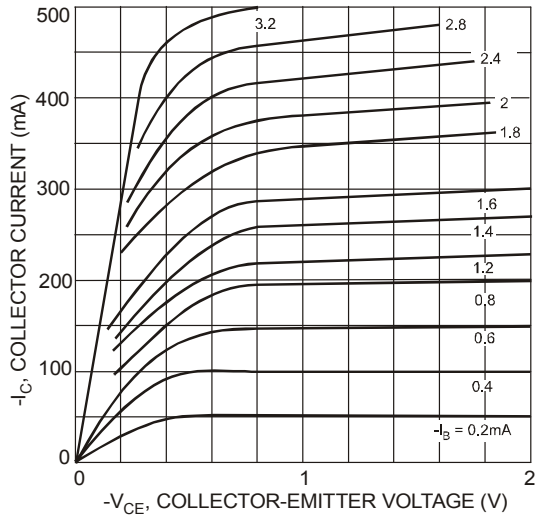


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

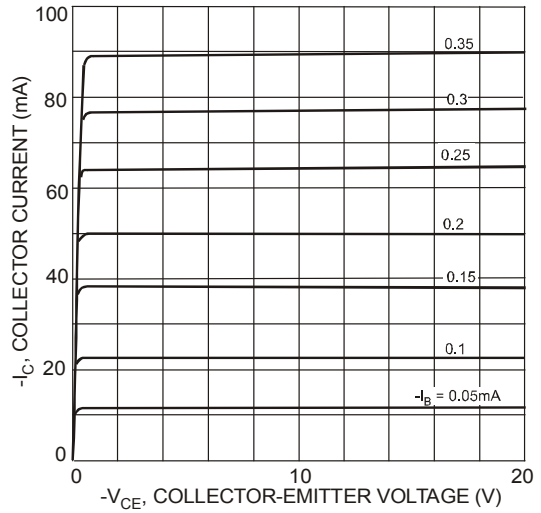


Figure 2 Typical Collector Current vs. Collector-Emitter Voltage

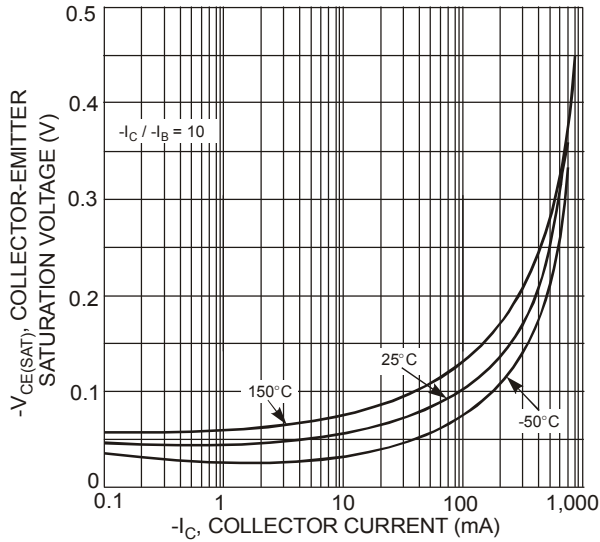


Figure 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

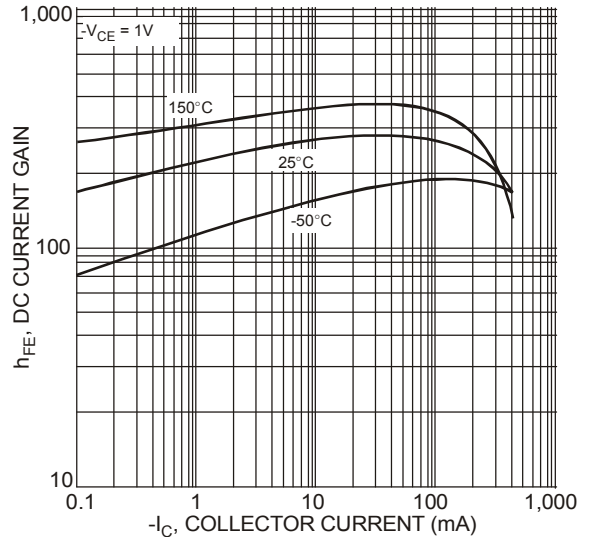


Figure 4 Typical DC Current Gain vs. Collector Current

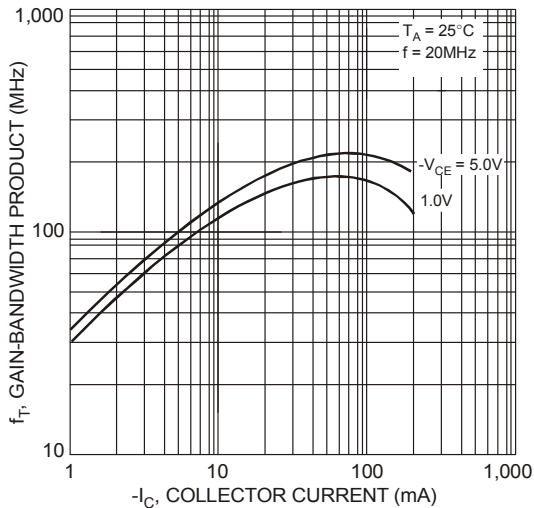
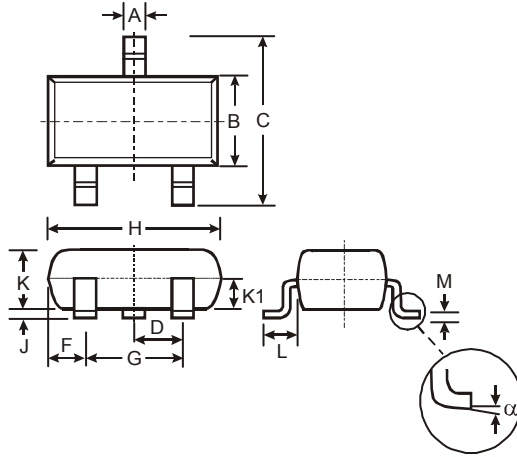


Figure 5 Typical Gain-Bandwidth Product vs. Collector Current

**Package Outline Dimensions**

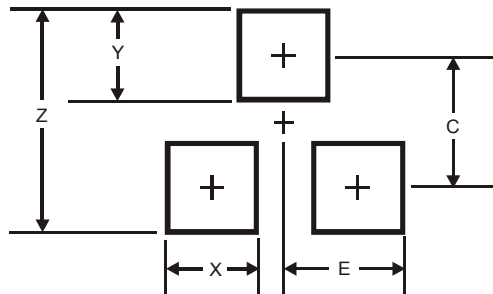
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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