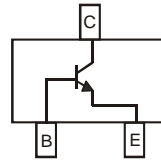


**NPN SURFACE MOUNT SMALL SIGNAL TRANSISTOR**
**Features**

- Ideally Suited for Automated Insertion
- Epitaxial Planar Die Construction
- For Switching, AF Driver and Amplifier Applications
- Complementary PNP Types Available (BC807)
- **Lead, Halogen and Antimony Free, RoHS Compliant**
- **"Green" Device (Notes 3 and 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**



Top View



Device Schematic

**Mechanical Data**

- Case: SOT-23
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating) Solderable per MIL-STD-202, Method 208
- Pin Connections: See Diagram
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	45	V
Emitter-Base Voltage	$V_{EBO}$	5.0	V
Collector Current	$I_C$	800	mA
Peak Collector Current	$I_{CM}$	1000	mA
Peak Emitter Current	$I_{EM}$	1000	mA

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation at $T_{SB} = 50^\circ\text{C}$ (Note 1)	$P_D$	310	mW
Thermal Resistance, Junction to Substrate Backside (Note 1)	$R_{\theta SB}$	320	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient Air (Note 1)	$R_{\theta JA}$	403	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ\text{C}$

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic (Note 2)	Symbol	Min	Max	Unit	Test Condition
DC Current Gain	$h_{FE}$	100	250	—	$V_{CE} = 1.0\text{V}, I_C = 100\text{mA}$
		160	400		
		250	600		
Current Gain Group -16 -25 -40	$h_{FE}$	60	—	—	$V_{CE} = 1.0\text{V}, I_C = 300\text{mA}$
		100	—		
		170	—		
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	0.7	V	$I_C = 500\text{mA}, I_B = 50\text{mA}$
Base-Emitter Voltage	$V_{BE}$	—	1.2	V	$V_{CE} = 1.0\text{V}, I_C = 300\text{mA}$
Collector-Emitter Cutoff Current	$I_{CES}$	—	100 5.0	nA $\mu\text{A}$	$V_{CE} = 45\text{V}$ $V_{CE} = 25\text{V}, T_j = 150^\circ\text{C}$
Emitter-Base Cutoff Current	$I_{EBO}$	—	100	nA	$V_{EB} = 4.0\text{V}$
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	$V_{CB} = 10\text{V}, f = 1.0\text{MHz}$

- Notes:
1. Device mounted on Ceramic Substrate 0.7mm; 2.5cm<sup>2</sup> area.
  2. Short duration pulse test used to minimize self-heating effect.
  3. No purposefully added lead. Halogen and Antimony Free.
  4. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.

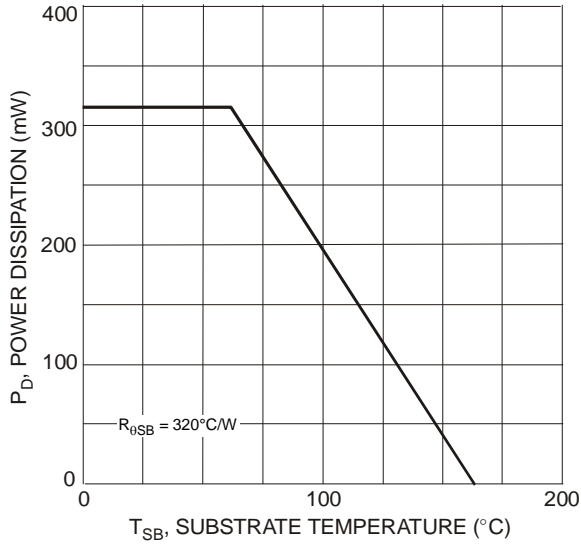


Fig. 1 Power Dissipation vs. Substrate Temperature (Note 1)

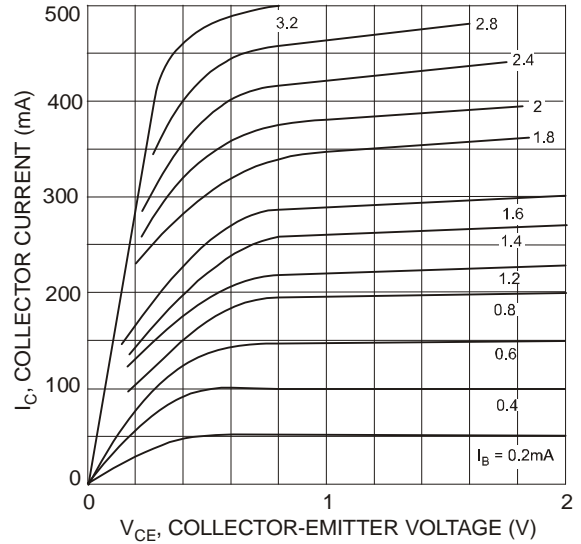


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

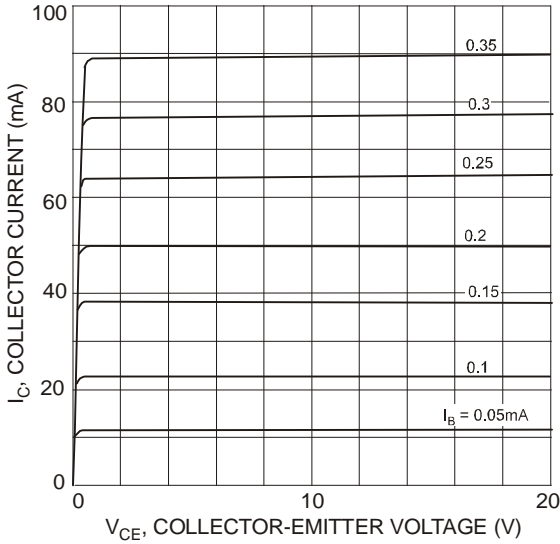


Fig. 3 Typical Collector Current vs. Collector-Emitter Voltage

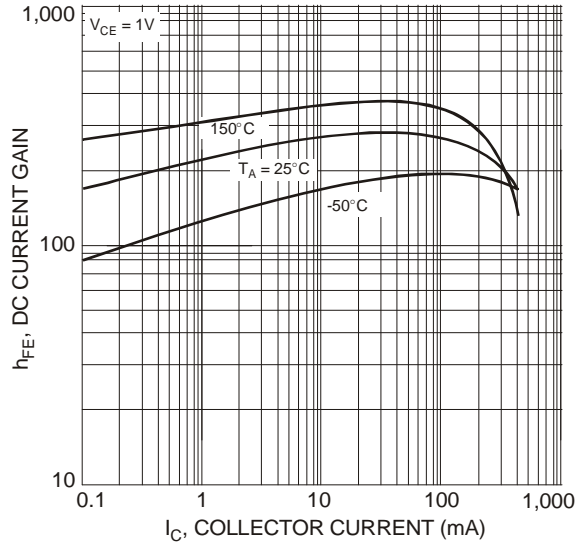


Fig. 4 Typical DC Current Gain vs. Collector Current

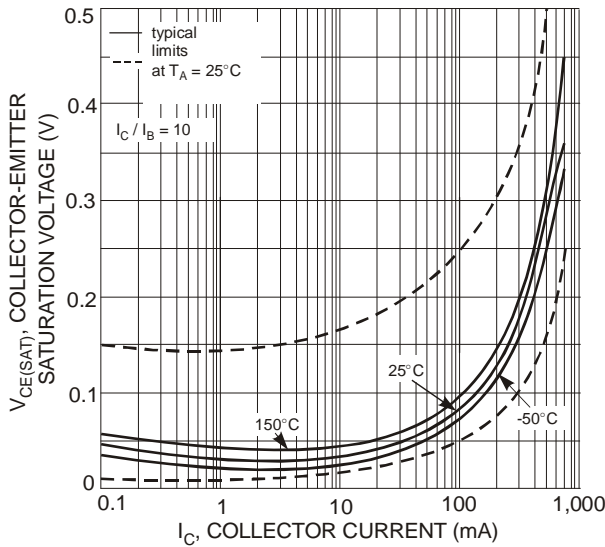


Fig. 5 Typical Collector-Emitter Saturation Voltage vs. Collector Current

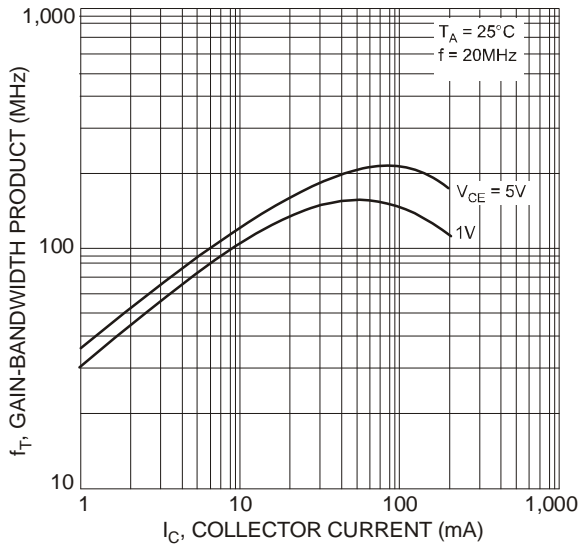


Fig. 6 Gain-Bandwidth Product vs. Collector Current

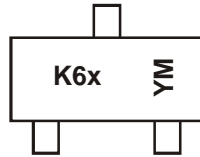
### Ordering Information (Note 5)

Part Number	Case	Packaging
BC817-xx-7-F	SOT-23	3000/Tape & Reel

\*xx = gain group, e.g. BC817-16-7-F.

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

### Marking Information



K6x = Product Type Marking Code:

K6A = BC817-16

K6B = BC817-25

K6C = BC817-40

YM = Date Code Marking

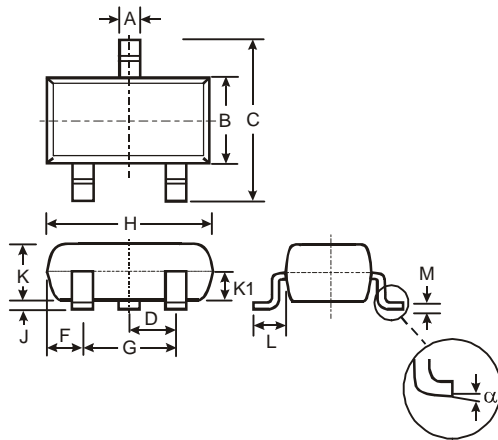
Y = Year (ex: T = 2006)

M = Month (ex: 9 = September)

Date Code Key

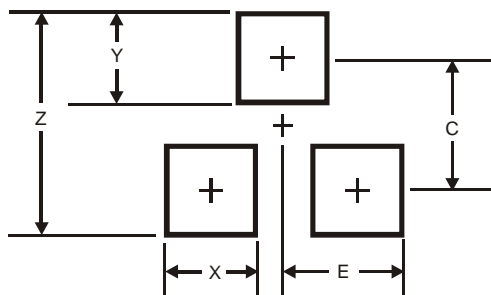
Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Code	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	A	B	C
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
Code	1	2	3	4	5	6	7	8	9	O	N	D						

### Package Outline Dimensions



SOT-23			
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°	-
<b>All Dimensions in mm</b>			

### Suggested Pad Layout



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

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