45V PNP SMALL-SIGNAL TRANSISTOR IN SOT23

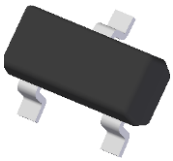
Features

- Ideally Suited for Automatic Insertion
- Epitaxial Planar Die Construction
- Complementary NPN Types: BC817-16/-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 (BC807-40Q).**

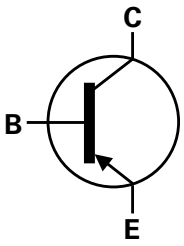
Mechanical Data

- 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 e3
- Weight 0.008 grams (Approximate)

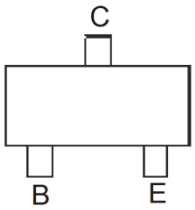
SOT23



Top View



Device Symbol



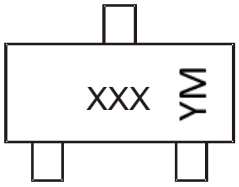
Top View
Pinout

Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
BC807-16-7-F	SOT23	K5A	7	8	3,000	Reel
BC807-25-7-F	SOT23	K5B	7	8	3,000	Reel
BC807-40-7-F	SOT23	K5C	7	8	3,000	Reel
BC807-40-13-F	SOT23	K5C	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 table above)
YM = Date Code Marking
Y or $\overline{Y}$ 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
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°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	310	mW
	(Note 6)		350	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	403	°C/W
	(Note 6)		357	
Thermal Resistance, Junction to Leads	(Note 7)	$R_{\theta JL}$	350	°C/W
Thermal Resistance, Junction to Case	(Note 5)	$R_{\theta JC}$	112	°C/W
	(Note 6)		104	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 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
Electrostatic Discharge – Charged Device Model	ESD CDM	1,000	V	3C

Notes:
5. 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.
6. Same as Note 5, except the device is mounted on 15mm X 15mm FR4 PCB.
7. Thermal resistance from junction to solder-point (at the end of the leads).
8. Refer to JEDEC specifications JESD22-A114, JESD22-A115 and JS-002.

Thermal Characteristics and Derating Information

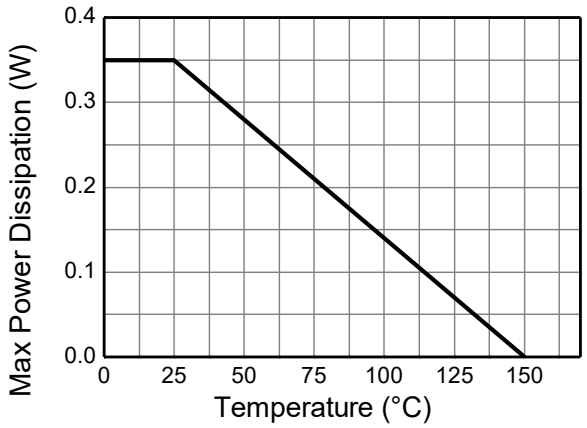


Figure 1. Derating Curve

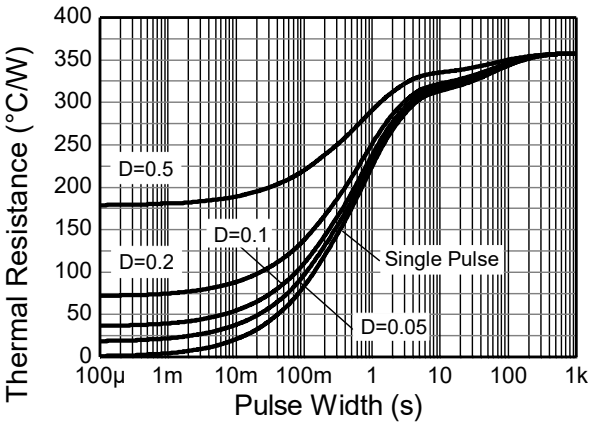


Figure 2. Transient Thermal Impedance

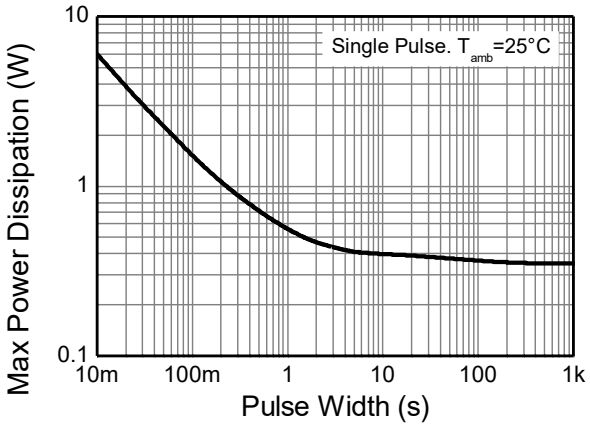


Figure 3. Pulse Power Dissipation

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 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 9)	BC807-16 BC807-25 BC807-40	h_{FE}	100 160 250	—	250 400 600	—	V_{CE} = -1.0V, I_C = -100mA
	BC807-16 BC807-25 BC807-40		60 100 170		—		V_{CE} = -1.0V, I_C = -300mA
Collector-Emitter Saturation Voltage (Note 9)		$V_{CE(sat)}$	—	—	-0.7	V	I_C = -500mA, I_B = -50mA
Base-Emitter Voltage (Note 9)		$V_{BE(on)}$	—	—	-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°C, unless otherwise specified.)

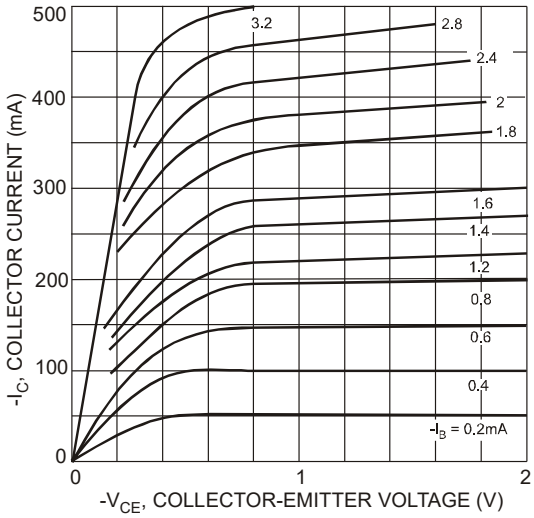


Figure 4. Typical Collector Current vs. Collector-Emitter Voltage

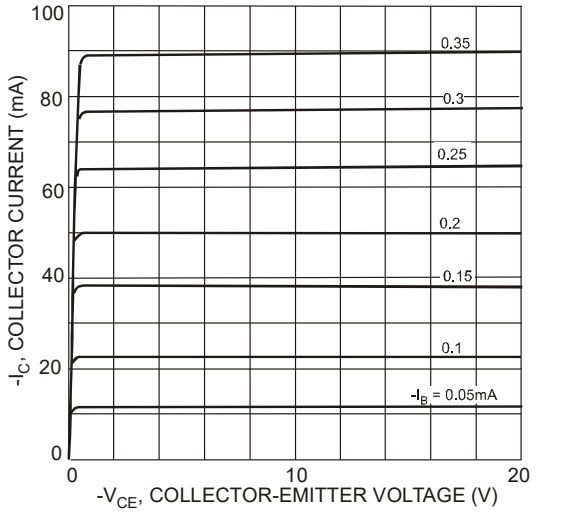


Figure 5. Typical Collector Current vs. Collector-Emitter Voltage

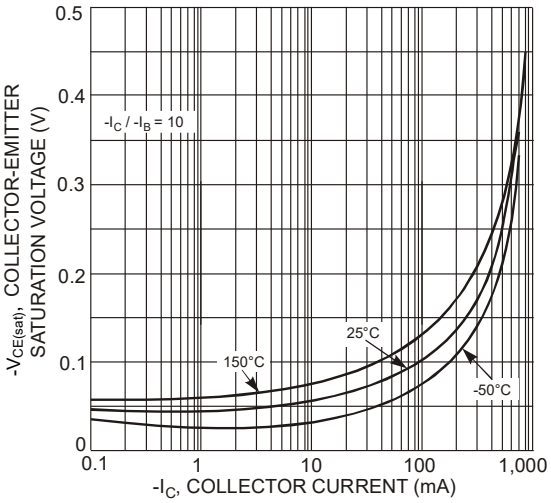


Figure 6. Typical Collector-Emitter Saturation Voltage vs. Collector Current

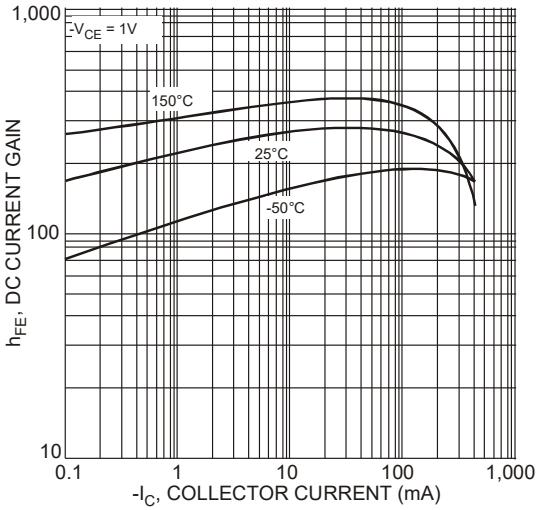


Figure 7. Typical DC Current Gain vs. Collector Current

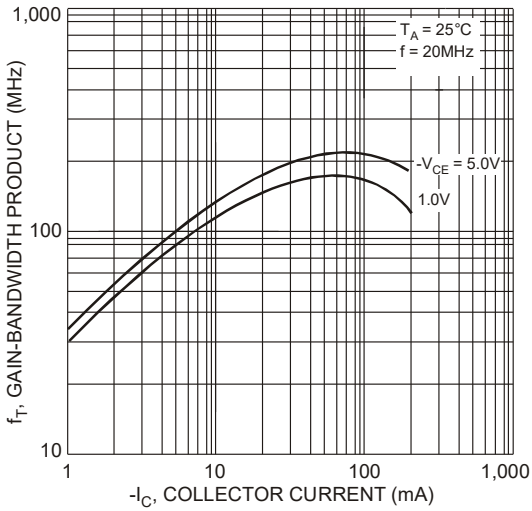
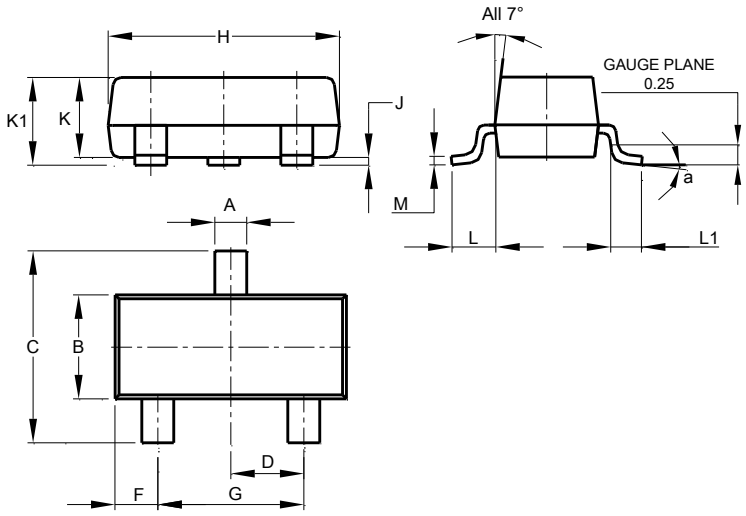


Figure 8. Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

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

SOT23

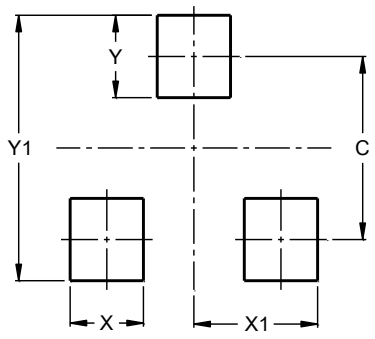


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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