



45V NPN SMALL SIGNAL TRANSISTOR IN SOT23

Features

- Ideally Suited for Automatic Insertion
- Epitaxial Planar Die Construction
- Complementary PNP 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
- Automotive-Compliant Parts Are Available Under Separate Datasheet (<u>BC817-16Q_40Q</u>)

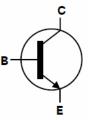
Mechanical Data

- 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 [®]
- Weight 0.008 grams (Approximate)

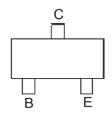








Device Symbol



Top View Pin-Out

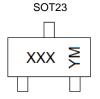
Ordering Information (Note 4)

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
BC817-40-7-F	AEC-Q101	K6C	7	8	3,000

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. 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: C = 2015)
M = Month (ex: 9 = September)

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Code	С	D	Е	F	G	I		J	K	L	М	N
	1	1	1		1		1	1			1	
NA (1)	1	E - 1:	B.4	A	B.4			A	Cam	0-4	Nav	Dec
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec



Absolute Maximum Ratings (@TA = +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	Ic	0.5	Α
Peak Collector Current	I _{CM}	1.0	Α
Peak Base Current	I _{BM}	200	mA

Thermal Characteristics (@TA = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	D-	310	mW
Fower Dissipation	(Note 6)	PD	350	IIIVV
Thermal Resistance, Junction to Ambient	(Note 5)	D	403	°C/W
Thermal Resistance, Junction to Ambient	(Note 6)	R _{0JA}	357	C/VV
Thermal Resistance, Junction to Leads (Note 7)		$R_{\theta JL}$	350	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-65 to +150	°C

ESD Ratings (Note 8)

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	С

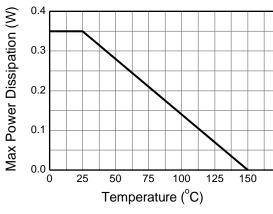
Notes:

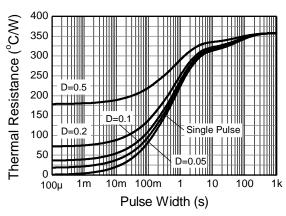
- 5. For a device mounted on minimum recommended pad layout FR-4 PCB with high coverage of single sided 1oz copper; device is measured under still air conditions whilst operating in a steady-state
- still air conditions whilst operating in a steady-state.

 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.



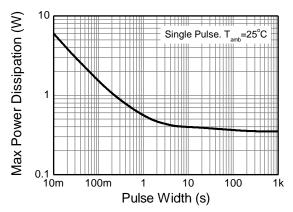
Thermal Characteristics and Derating Information





Derating Curve

Transient Thermal Impedance



Pulse Power Dissipation



Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Charac	teristic	Symbol	Min	Тур	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 Cut-Off Current		ICES	_	_	100 5.0	nΑ μΑ	V _{CE} = 45V V _{CE} = 25V, T _J = +150°C
Emitter-Base Cut-Off Current		I _{EBO}	_	_	100	nA	V _{EB} = 5.0V
200 40 44 40	BC817-16 BC817-25 BC817-40	h	100 160 250		250 400 600		V _{CE} = 1.0V, I _C = 100mA
DC Current Gain (Note 9)	BC817-16 BC817-25 BC817-40	h _{FE}	60 100 170	_	_	_	V _{CE} = 1.0V, I _C = 300mA
Collector-Emitter Saturation Volta	ge (Note 9)	V _{CE(SAT)}	_	_	0.7	V	I _C = 500mA, I _B = 50mA
Base-Emitter Voltage (Note 9)		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		Ссво	_	_	12	pF	V _{CB} = 10V, f = 1.0MHz

Note:

9. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%.



Typical Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

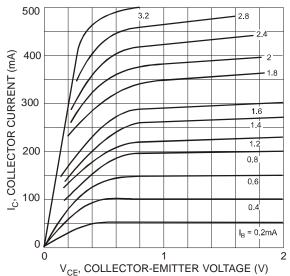
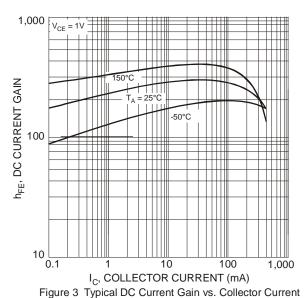


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage



1,000

T_A = 25°C

Figure 5 Gain-Bandwidth Product vs. Collector Current

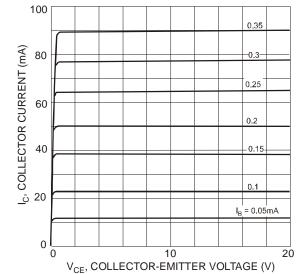


Figure 2 Typical Collector Current vs. Collector-Emitter Voltage

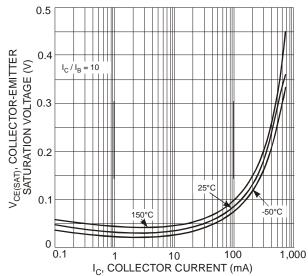
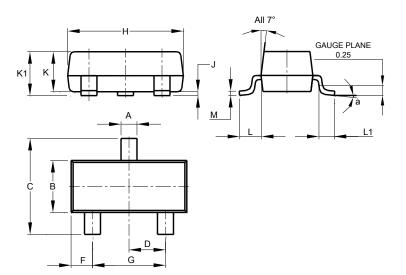


Figure 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current



Package Outline Dimensions

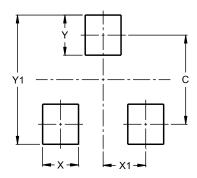
Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.



SOT23							
Dim	Min	Max	Тур				
Α	0.37	0.51	0.40				
В	1.20	1.40	1.30				
С	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				
Η	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				
М	0.085	0.150	0.110				
а	0°	8°					
All	All Dimensions in mm						

Suggested Pad Layout

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



Dimensions	Value (in mm)
С	2.0
Х	0.8
X1	1.35
Y	0.9
Y1	29



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