

50V NPN LOW SATURATION POWER TRANSISTOR IN SOT89

Features

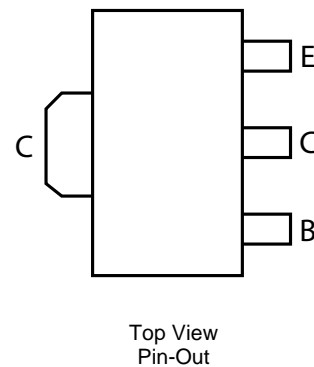
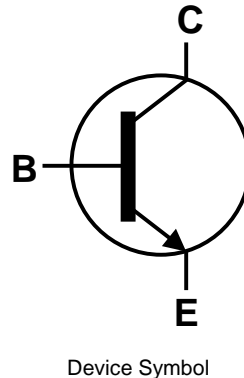
- $BV_{CEO} > 50V$
- $I_C = 3A$ high Continuous Collector Current
- I_{CM} up to 6A Peak Pulse Current
- 2W Power Dissipation
- Low saturation voltage $V_{CE(sat)} < 220mV @ 1A$
- $R_{CE(sat)} = 87m\Omega @ 2.75A$ for a low equivalent on-resistance
- h_{FE} characterised up to 6A for high current gain hold-up
- **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**

Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound
- UL Flammability 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: 0.052 grams (Approximate)

Applications

- Load Management Functions
- Motor Control
- DC-DC / DC-AC Converters

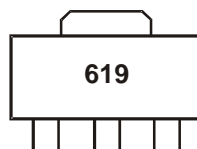


Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX619TA	619	7	12	1,000
FCX619-13R	619	13	12	4,000

- 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



619 = Product Type Marking Code

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

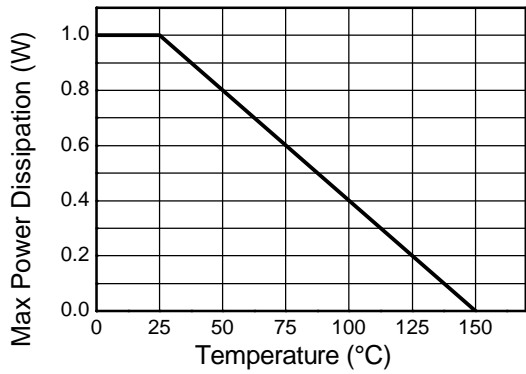
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	50	V
Collector-Emitter Voltage	V _{CEO}	50	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	3	A
Peak Pulse Current	I _{CM}	6	A
Continuous Base Current	I _B	500	mA

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

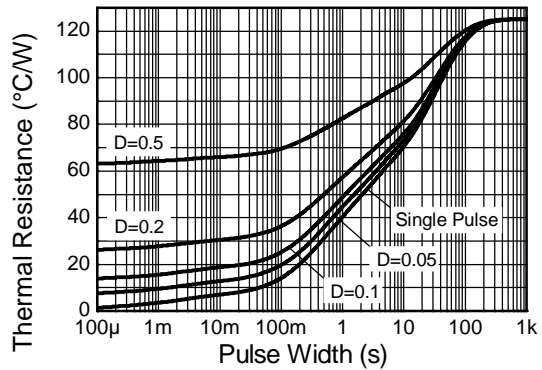
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	1
		(Note 6)	2
Thermal Resistance, Junction to Ambient Air	R _{θJA}	(Note 5)	125
		(Note 6)	62.5
Thermal Resistance, Junction to Leads	R _{θJL}	5.73	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

- Notes:
- For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in steady state condition.
 - Same as note (5), except the device is mounted on 40mm x 40mm x 1.6mm FR4 PCB.
 - Thermal resistance from junction to solder-point (on the exposed collector pad).

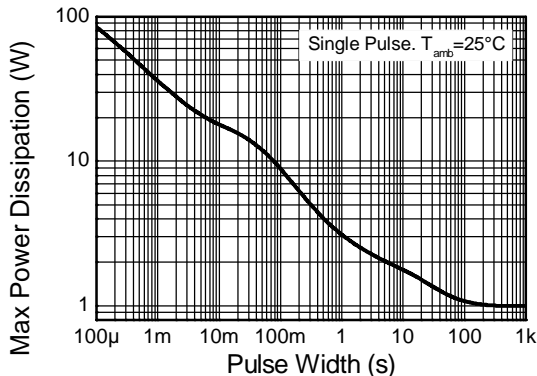
Thermal Characteristics and Derating Information



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	190	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 8)	BV _{CEO}	50	65	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8.3	—	V	I _E = 100μA
Collector Cutoff Current	I _{CBO}	—	—	100	nA	V _{CB} = 40V
Emitter Cutoff Current	I _{EBO}	—	—	100	nA	V _{EB} = 5.6V
Emitter Cutoff Current	I _{CES}	—	—	100	nA	V _{CES} = 40V
DC current transfer Static ratio (Note 8)	h _{FE}	200 300 200 100 —	400 450 400 200 30	—	—	I _C = 10mA, V _{CE} = 2V I _C = 200mA, V _{CE} = 2V I _C = 1A, V _{CE} = 2V I _C = 2A, V _{CE} = 2V I _C = 6A, V _{CE} = 2V
Collector-Emitter Saturation Voltage (Note 8)	V _{CE(sat)}	—	13 150 190 240	25 220 260 320	V	I _C = 100mA, I _B = 10mA I _C = 1A, I _B = 10mA I _C = 2A, I _B = 50mA I _C = 2.75A, I _B = 100mA
Base-Emitter Saturation Voltage (Note 8)	V _{BE(sat)}	—	0.97	1.1	V	I _C = 2.75A, I _B = 100mA
Base-Emitter Turn-on Voltage (Note 8)	V _{BE(on)}	—	0.89	1.0	V	I _C = 2.75A, V _{CE} = 2V
Transitional Frequency	f _T	100	165	—	MHz	I _C = 50mA, V _{CE} = 10V f = 100MHz
Output capacitance	C _{obo}	—	12	20	pF	V _{CB} = 10V, f = 1MHz,
Turn-On Time	t _(on)	—	170	—	ns	V _{CC} = 10V, I _C = 1A
Turn-Off Time	t _(off)	—	750	—	ns	I _{B1} = -I _{B2} = 10mA

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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

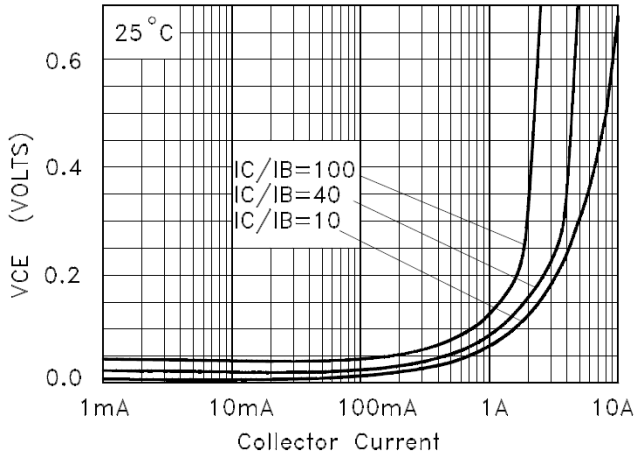


FIG. 1 $V_{CE(SAT)}$ vs I_C

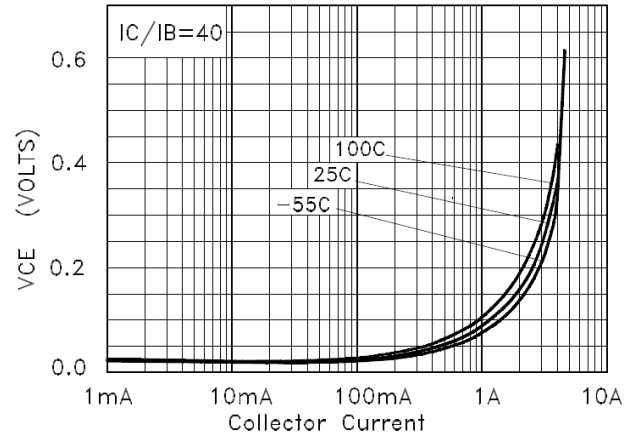


FIG. 2 $V_{CE(SAT)}$ vs I_C

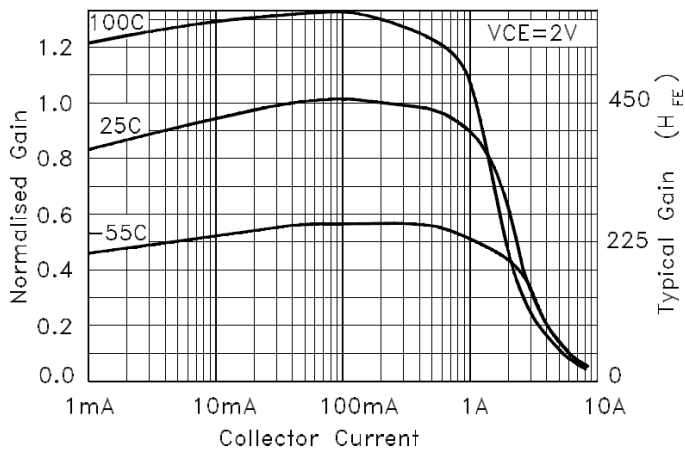


FIG. 3 H_{FE} vs I_C

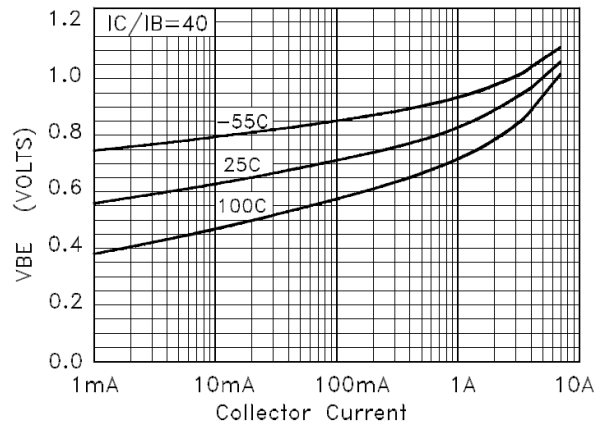


FIG. 4 $V_{BE(SAT)}$ vs I_C

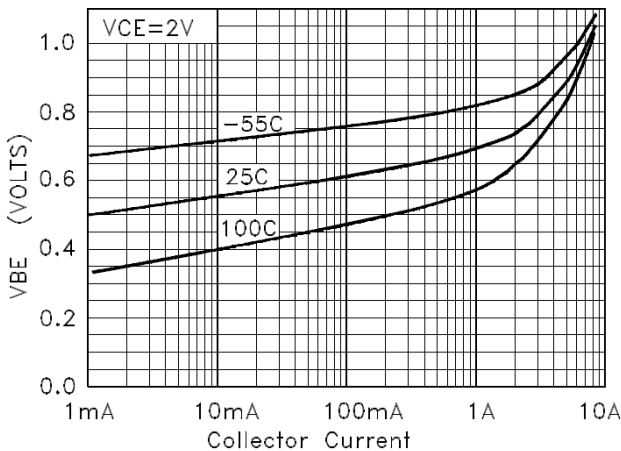
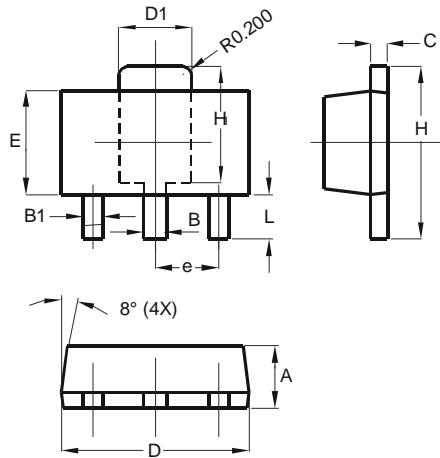


FIG. 5 $V_{BE(ON)}$ vs I_C

Package Outline Dimensions

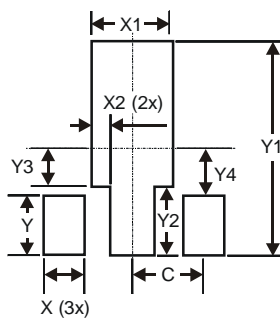
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
E	2.29	2.60
e	1.50 Typ	
H	3.94	4.25
H1	2.63	2.93
L	0.89	1.20
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)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500

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