



50V NPN LOW SATURATION TRANSISTOR IN SOT23

Features

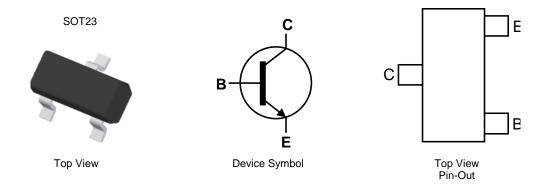
- BV_{CEO} > 50V
- I_C = 1.25A Continuous Collector Current
- 500mW Power Dissipation
- Low Saturation Voltage V_{CE(sat)} < 330mV @ 1.25A
- R_{CE(SAT)} = 160mΩ for a Low Equivalent on-Resistance
- Complementary PNP type: FMMTL720
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: 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 (3)
- Weight 0.008 grams (Approximate)

Applications

- MOSFET Gate Driving
- DC-DC / DC-AC Converters
- Regulator
- LED Driver
- Motor Control



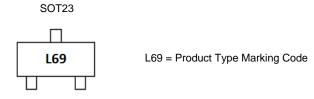
Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMTL619TA	AEC-Q101	L69	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





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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	100	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	lc	1.25	Α
Peak Pulse Current	I _{CM}	2	Α
Base Current	IΒ	200	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	500	mW
Power Dissipation (Note 6)	P _D	675	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{ heta JA}$	250	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R _{0JA}	185	°C/W
Thermal Resistance, Junction to Lead (Note 7)	$R_{ heta JL}$	197	°C/W
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	С

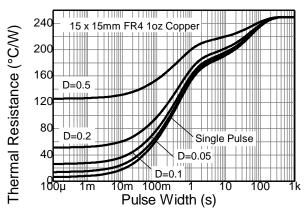
Notes:

- 5. For a device mounted with the collector lead on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air 5. For a device mounted with the collector lead on 15mm x 15mm 102 copper that is conditions whilst operating in a steady-state.
 6. Same as Note 5, except the device is measured at t ≤ 5 seconds.
 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.

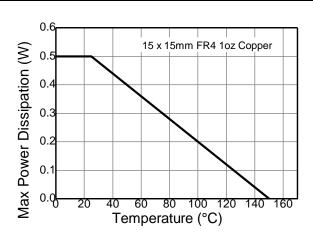




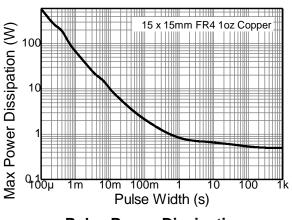
Thermal Characteristics and Derating information



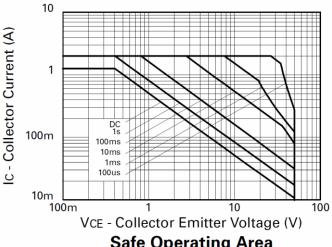
Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation







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

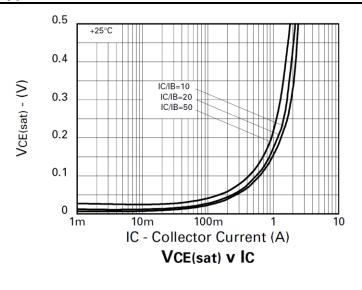
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_CBO	100	210	-	V	$I_{C} = 100 \mu A$
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	50	70	-	V	$I_C = 5mA$
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8.5	-	V	I _E = 100μA
Collector Cut-Off Current	I _{CBO}	-	-	10	nA	V _{CB} = 80V
Emitter Cut-Off Current	I _{EBO}	-	-	10	nA	V _{EB} = 6V
Collector Emitter Cut-Off Current	I _{CES}	-	-	10	nA	V _{CES} = 50V
ON CHARACTERISTICS (Note 9)						
Static Forward Current Transfer Ratio	hFE	200 300 200 100 30	400 450 400 230 50	- - - -	-	$I_{C} = 10 \text{mA}, V_{CE} = 5 \text{V}$ $I_{C} = 200 \text{mA}, V_{CE} = 5 \text{V}$ $I_{C} = 500 \text{mA}, V_{CE} = 5 \text{V}$ $I_{C} = 1 \text{A}, V_{CE} = 5 \text{V}$ $I_{C} = 2 \text{A}, V_{CE} = 5 \text{V}$
Collector-Emitter Saturation Voltage	V _{CE(sat)}	- - -	24 60 100 195	45 100 180 330	mV	$I_C = 100\text{mA}, I_B = 10\text{mA}$ $I_C = 250\text{mA}, I_B = 10\text{mA}$ $I_C = 500\text{mA}, I_B = 25\text{mA}$ $I_C = 1.25, I_B = 125\text{mA}$
Base-Emitter Saturation Voltage	V _{BE(sat)}	-	1020	1100	mV	I _C = 1.25A, I _B = 125mA
Base-Emitter Turn-On Voltage	V _{BE(on)}	-	895	1000	mV	I _C = 1.25A, V _{CE} = 2V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f _T	-	180	-	MHz	I _C = 50mA, V _{CE} = 10V, f = 100MHz
Collector Output Capacitance	C _{obo}	-	6	8	pF	V _{CB} = 10V, f = 1MHz
Turn-On Time	t _(on)	-	182	-	ns	V _{CC} = 10V, I _C = 1A,
Turn-Off Time	t _(Off)	-	379	-	ns	$I_{B1} = -I_{B2} = 10mA$

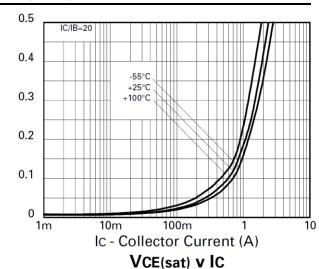
Note: 9. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%.

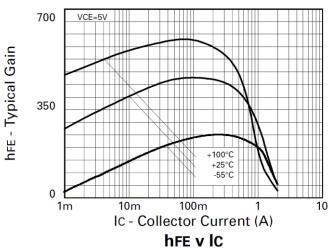


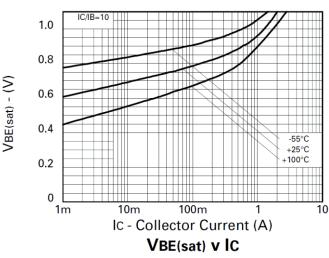
Typical Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

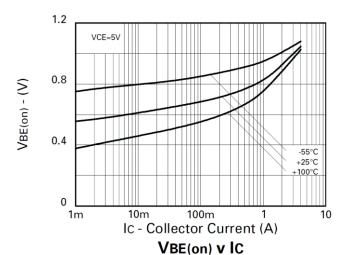
VCE(sat) - (V)







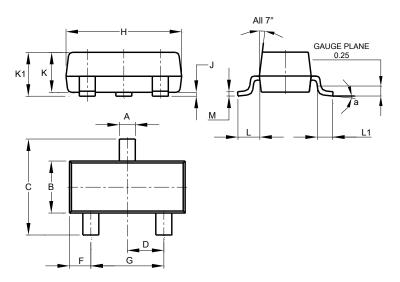






Package Outline Dimensions

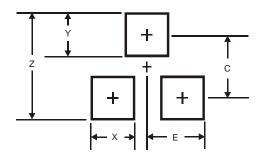
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT23						
Dim	Min	Max	Тур			
Α	0.37	0.51	0.40			
В	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			
Н	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	L 0.45		0.55			
L1	0.25	0.55	0.40			
М	0.085	0.150	0.110			
а	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			
Х	0.8			
Υ	0.9			
С	2.0			
F	1.35			





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