FMMT619

50V NPN SILICON LOW SATURATION TRANSISTOR IN SOT23

Features and Benefits

- BV_{CEO} > 50V
- I_C = 2A Continuous Collector Current
- Low Saturation Voltage $V_{CE(sat)}$ < 200mV @ 1A
- R_{SAT} = 68mΩ for a low equivalent on-resistance
- h_{FE} characterised up to 6A for high current gain hold-up
- 625mW power dissipation due to SuperSOT package
- Complementary NPN type: FMMT720
- **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**

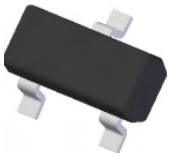
Mechanical Data

- Case: SOT23
- Case material: Molded Plastic. "Green" Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper plated Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.008 grams (Approximate)

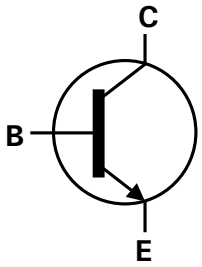
Applications

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

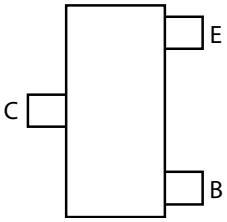
SOT23



Top view



Device symbol



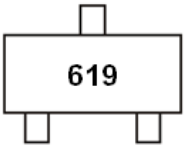
Top View
Pin Configuration

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT619TA	619	7	8	3,000
FMMT619TC	619	13	8	10,000

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/ 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

Marking Information



619 = Product Type Marking Code

Maximum Ratings @T_A = 25°C unless otherwise specified

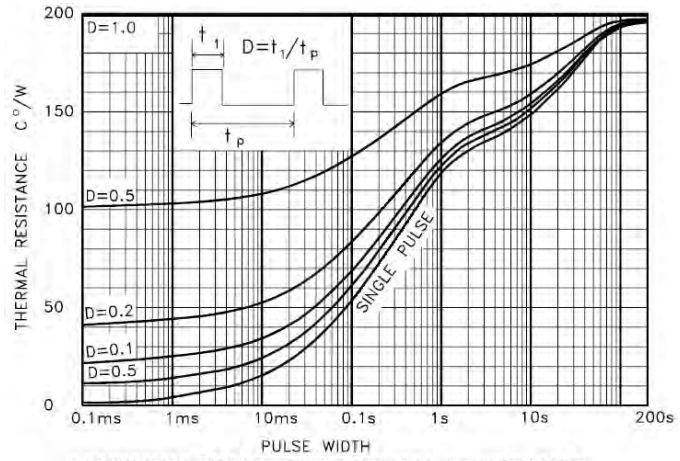
Characteristic		Symbol	Value	Unit
Collector-Base Voltage		V_{CBO}	50	V
Collector-Emitter Voltage		V_{CEO}	50	V
Emitter-Base Voltage		V_{EBO}	7	V
Continuous Collector Current	(Note 5)	I_C	2	A
Peak Pulse Current		I_{CM}	6	A
Base Current		I_B	500	mA

Thermal Characteristics @T_A = 25°C unless otherwise specified

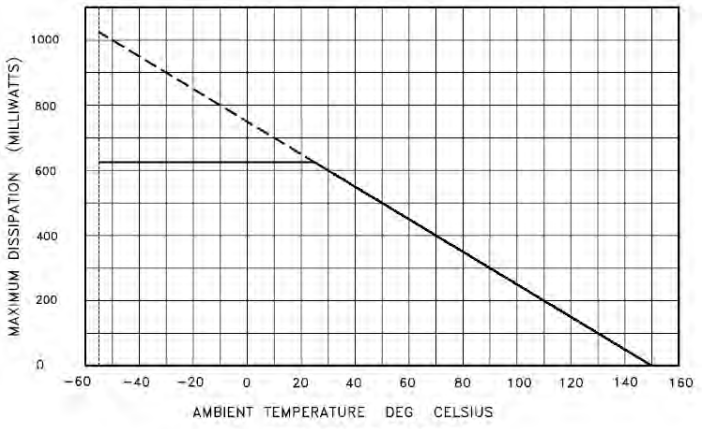
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Rating Factor	(Note 5)	P_D	625 5	mW mW/°C
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Lead	(Note 6)	$R_{\theta JL}$	194	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes: 5. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
6. Thermal resistance from junction to solder-point (at the end of the collector lead).

Thermal Characteristics and Derating information



MAXIMUM TRANSIENT THERMAL RESISTANCE



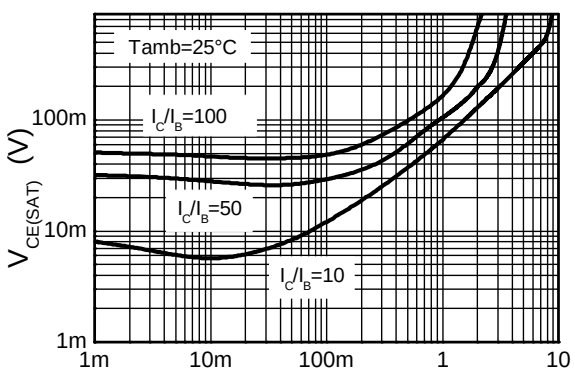
DERATING CURVE

Electrical Characteristics @T_A = 25°C unless otherwise specified

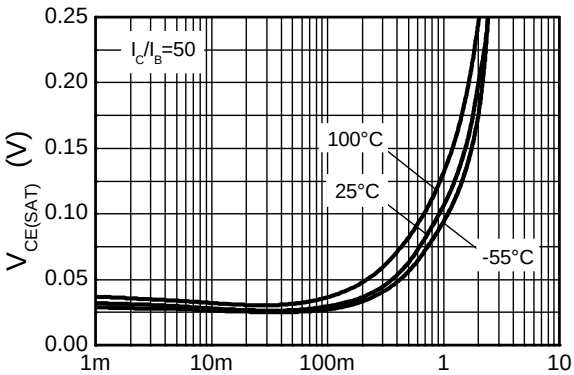
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	50	190	-	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 7)	BV_{CEO}	50	65	-	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.3	-	V	I_E = 100µA
Collector Cut-off Current	I_{CBO}	-	-	100	nA	V_{CB} = 40V
Emitter Cut-off Current	I_{EBO}	-	-	100	nA	V_{EB} = 6V
Collector Emitter Cut-off Current	I_{CES}	-	-	100	nA	V_{CES} = 40V
ON CHARACTERISTICS (Note 7)						
Static Forward Current Transfer Ratio	h_{FE}	200 300 200 100 -	400 450 400 225 40	- - - - -	-	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	$V_{CE(sat)}$	- - -	10 125 150	20 200 220	mV	I_C = 0.1A, I_B = 10mA I_C = 1A, I_B = 10mA I_C = 2A, I_B = 50mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	-	0.87	1.0	V	I_C = 2A, I_B = 50mA
Base-Emitter Saturation Voltage	$V_{BE(on)}$	-	0.80	1.0	V	I_C = 2A, V_{CE} = 2V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	100	165	-	MHz	I_C = 50mA, V_{CE} = 10V, f = 100MHz
Collector 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, I_{B1} = -I_{B2} = 10mA
Turn-Off Time	$t_{(off)}$	-	750	-	ns	

Notes: 7. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%

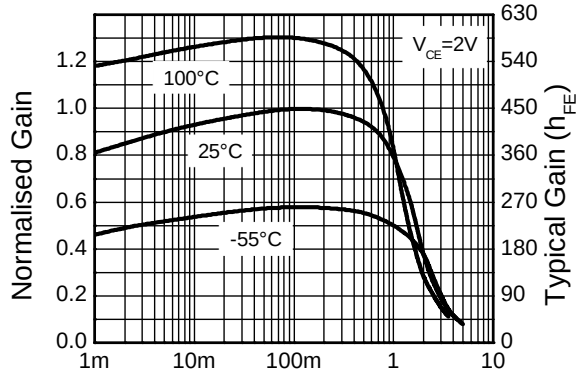
Typical Electrical Characteristics



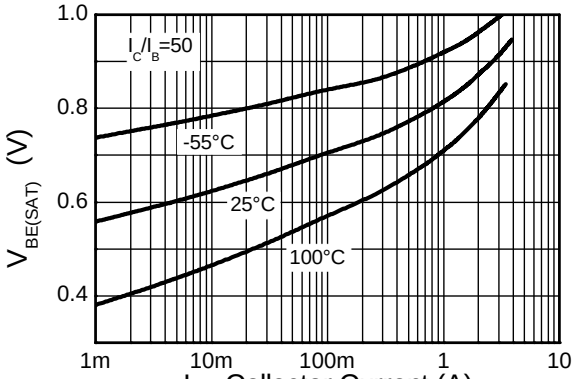
$V_{CE(SAT)}$ v I_C



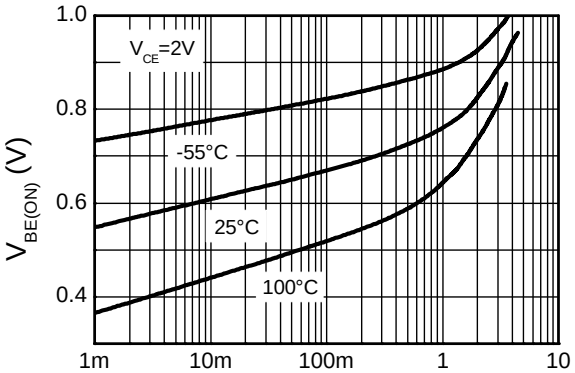
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

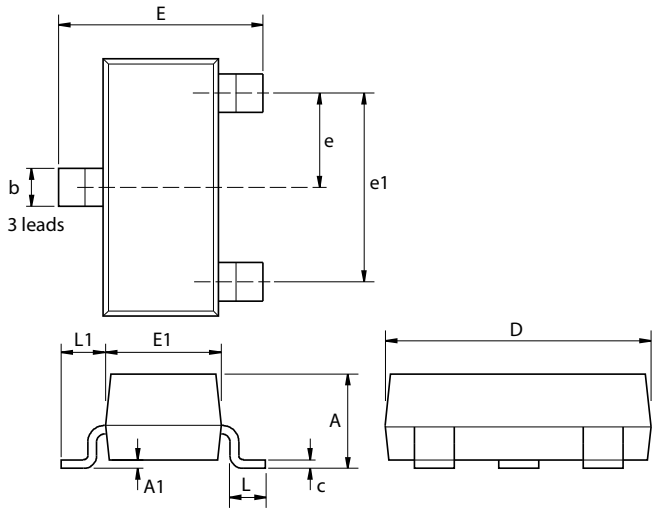


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

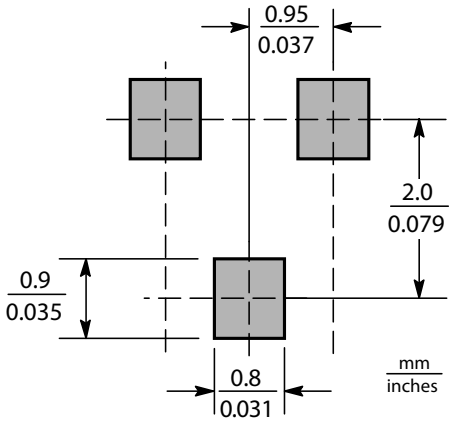
Package Outline Dimensions



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
c	0.085	0.20	0.003	0.008	L	0.25	0.60	0.0098	0.0236
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.037 NOM		-	-	-	-	-

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

Suggested Pad Layout



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