

**50V NPN SILICON LOW SATURATION TRANSISTOR IN SOT23**

**Features and Benefits**

- $BV_{CEO} > 50V$
- $I_C = 2A$  Continuous Collector Current
- Low Saturation Voltage  $V_{CE(sat)} < 200mV @ 1A$
- $R_{SAT} = 68m\Omega$  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
- **“Lead-Free”, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free. “Green” Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

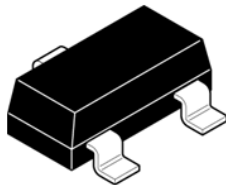
**Mechanical Data**

- Case: SOT23
- Case material: Molded Plastic. “Green” Molding Compound (Note 2) 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
- Weight: 0.008 grams (Approximate)

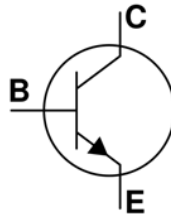
**Applications**

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

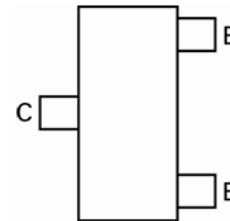
SOT23



Top view



Device symbol



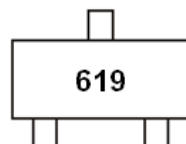
Top View  
Pin Configuration

**Ordering Information**

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

- Notes:
1. No purposefully added lead.
  2. Diodes Inc's “Green” Policy can be found on our website at <https://www.diodes.com/>
  3. FMMT619TA devices starting from datacode 1009, lot number PID0155145 (March 2010) are “Green” products. FMMT619TC devices can not be guaranteed to be “Green”.

**Marking Information**



619 = Product Type Marking Code

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

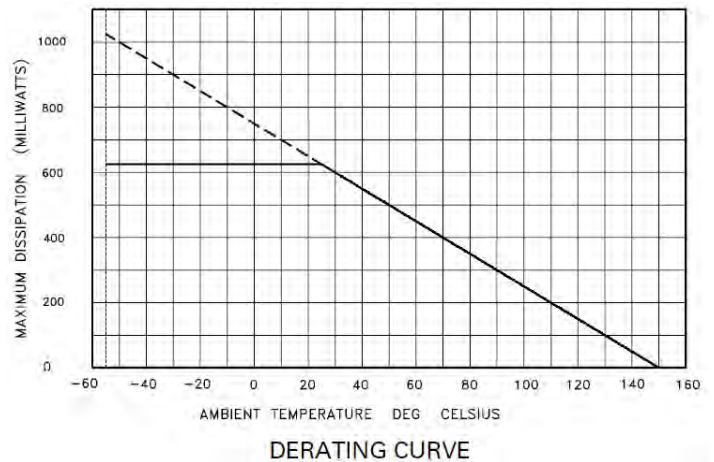
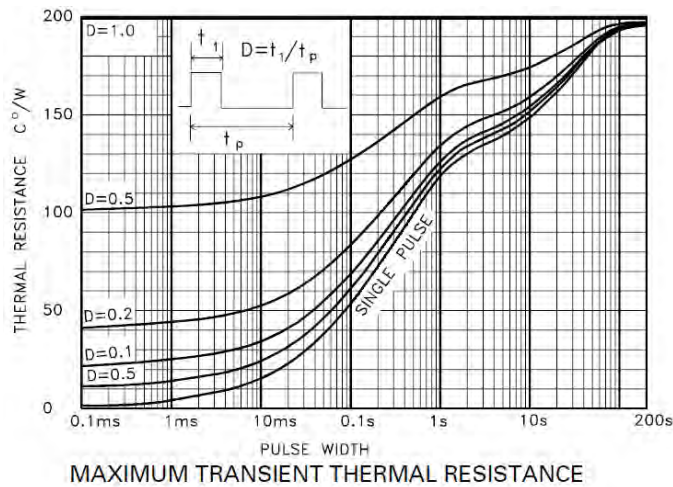
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Continuous Collector Current	I <sub>C</sub>	2	A
Peak Pulse Current	I <sub>CM</sub>	6	A
Base Current	I <sub>B</sub>	500	mA

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	625	mW
Linear Rating Factor		5	mW/°C
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	200	°C/W
Thermal Resistance, Junction to Lead	R <sub>θJL</sub>	194	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
- 4. 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.
  - 5. Thermal resistance from junction to solder-point (at the end of the collector lead).

**Thermal Characteristics and Derating information**

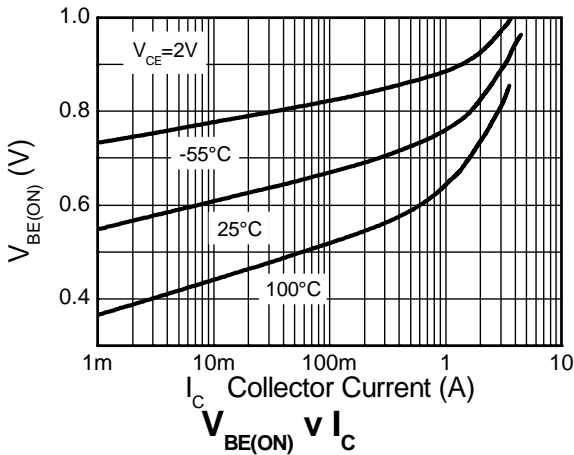
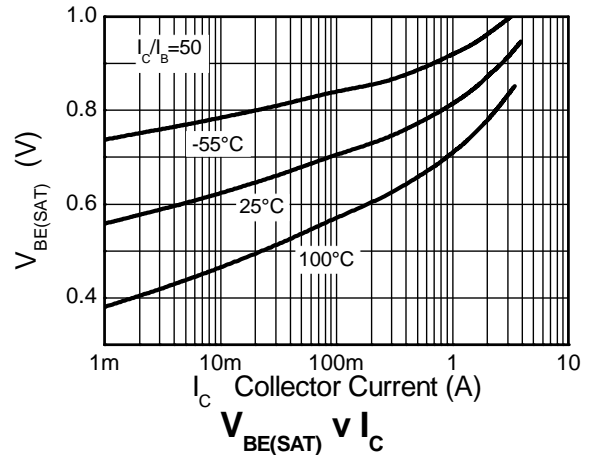
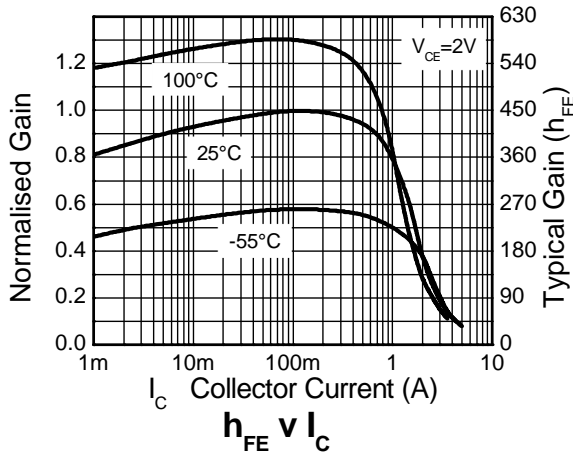
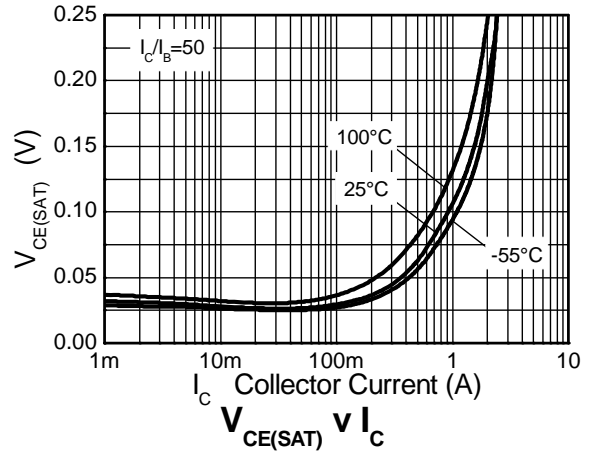
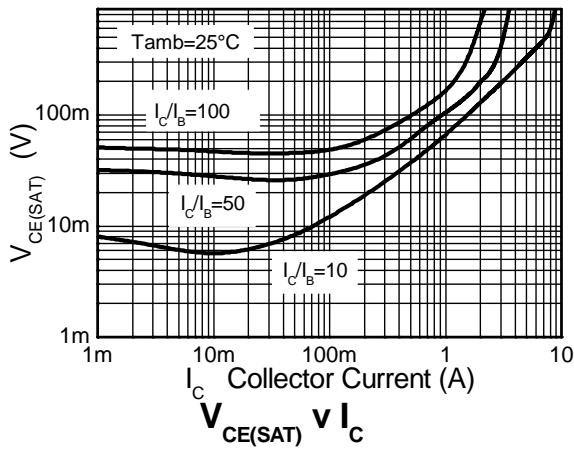


**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

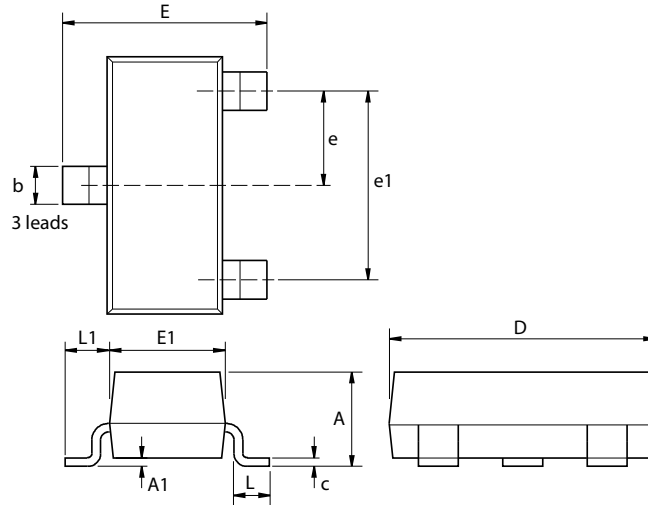
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$BV_{CBO}$	50	190	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 6)	$BV_{CEO}$	50	65	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	5	8.3	-	V	$I_E = 100\mu\text{A}$
Collector Cut-off Current	$I_{CBO}$	-	-	100	nA	$V_{CB} = 40\text{V}$
Emitter Cut-off Current	$I_{EBO}$	-	-	100	nA	$V_{EB} = 4\text{V}$
Collector Emitter Cut-off Current	$I_{CES}$	-	-	100	nA	$V_{CES} = 40\text{V}$
<b>ON CHARACTERISTICS (Note 6)</b>						
Static Forward Current Transfer Ratio	$h_{FE}$	200	400	-	-	$I_C = 10\text{mA}, V_{CE} = 2\text{V}$
		300	450	-		$I_C = 200\text{mA}, V_{CE} = 2\text{V}$
		200	400	-		$I_C = 1\text{A}, V_{CE} = 2\text{V}$
		100	225	-		$I_C = 2\text{A}, V_{CE} = 2\text{V}$
		-	40	-		$I_C = 6\text{A}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	10	20	mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}$
		-	125	200		$I_C = 1\text{A}, I_B = 10\text{mA}$
		-	150	220		$I_C = 2\text{A}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	-	0.87	1.0	V	$I_C = 2\text{A}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(on)}$	-	0.80	1.0	V	$I_C = 2\text{A}, V_{CE} = 2\text{V}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	$f_T$	100	165	-	MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$
Collector Output Capacitance	$C_{obo}$	-	12	20	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(on)}$	-	170	-	ns	$V_{CC} = 10\text{V}, I_C = 1\text{A}, I_{B1} = -I_{B2} = 10\text{mA}$
Turn-Off Time	$t_{(off)}$	-	750	-	ns	

Notes: 6. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$

**Typical Electrical Characteristics**



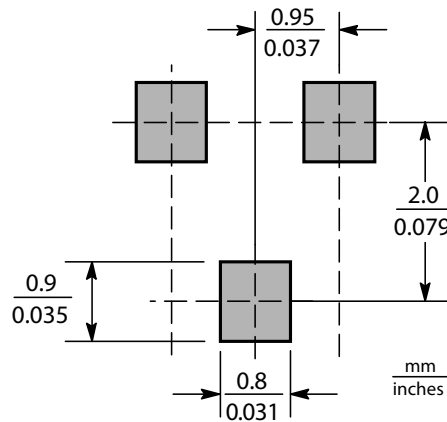
**Package Outline Dimensions**



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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