



FMMT619

50V NPN SILICON LOW SATURATION TRANSISTOR IN SOT23

Features

- BV_{CEO} > 50V
- I_C = 2A Continuous Collector Current
- 625mW Power Dissipation
- Low Saturation Voltage V_{CE(sat)} < 200mV @ 1A
- $R_{CE(sat)} = 68m\Omega$ for a Low Equivalent On-Resistance
- hFE Characterised up to 6A for High Current Gain Hold-up
- Complementary PNP Type: DIODES™ FMMT720
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- An Automotive-Compliant Part is Available Under Separate Datasheet (FMMT619Q)

Mechanical Data

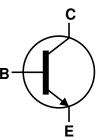
- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (3)
- Weight 0.008 grams (Approximate)

Applications

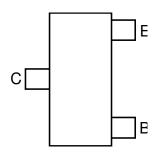
- MOSFET gate driving
- DC-DC / DC-AC converters
- Regulators
- LED drivers
- Motor controls







Device Symbol



Top View Pin-Out

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
Part Number	rackaye	Warking	neer Size (inches)	rape width (illin)	Qty.	Carrier
FMMT619TA	SOT23 (Type DN)	619	7	8	3,000	Reel
FMMT619TC	SOT23 (Type DN)	619	13	8	10,000	Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
- 2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

SOT23 (Type DN)
619

619 = Product Type Marking Code



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	Vcво	50	V
Collector-Emitter Voltage	V _{CEO}	50	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	Ic	2	Α
Peak Pulse Current	I _{CM}	6	Α
Base Current	I _B	500	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	Po	625	mW
Power Dissipation (Note 6)	Po	806	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{0JA}	200	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	Reja	155	°C/W
Thermal Resistance, Junction to Leads (Note 7)	Rejl	194	°C/W
Operating and Storage Temperature Range	TJ, TSTG	-55 to +150	°C

Notes:

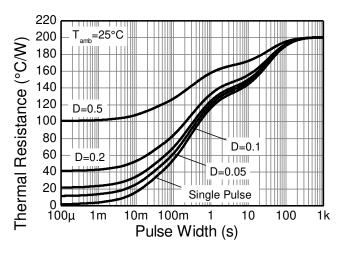
^{5.} For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.

^{6.} Same as Note 5, except the device is measured at $t \le 5$ sec.

^{7.} Thermal resistance from junction to solder-point (at the end of the collector lead).



Thermal Characteristics and Derating Information



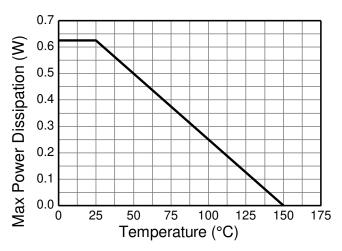


Figure 1. Transient Thermal Impedance

Figure 2. Derating Curve

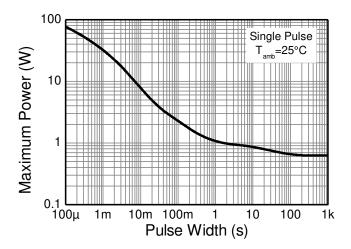


Figure 3. Pulse Power Dissipation



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

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	ВУсво	50	190	_	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage (Note 8)	BVCEO	50	65	_	V	Ic = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8.3	_	V	$IE = 100\mu A$
Collector Cut-off Current	Ісво	_	_	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 8)	ON CHARACTERISTICS (Note 8)					
Static Forward Current Transfer Ratio	hfe	200 300 200 100	400 450 400 225 40	_ _ _ _	_	Ic = 10mA, VcE = 2V Ic = 200mA, VcE = 2V Ic = 1A, VcE = 2V Ic = 2A, VcE = 2V Ic = 6A, VcE = 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 Turn-On Voltage	V _{BE(on)}	_	0.82	1.0	V	$I_C = 2A$, $V_{CE} = 2V$
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	fτ	100	165	_	MHz	$I_C = 50 \text{mA}, V_{CE} = 10 \text{V}$ f = 100MHz
Collector Output Capacitance	Cobo	_	12	20	pF	V _{CB} = 10V, f = 1MHz
Turn-On Time	ton	_	170	_	ns	Vcc = 10V, Ic = 1A
Turn-Off Time	t _{off}		750		ns	$I_{B1} = -I_{B2} = 10mA$

Note: 8. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%.



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

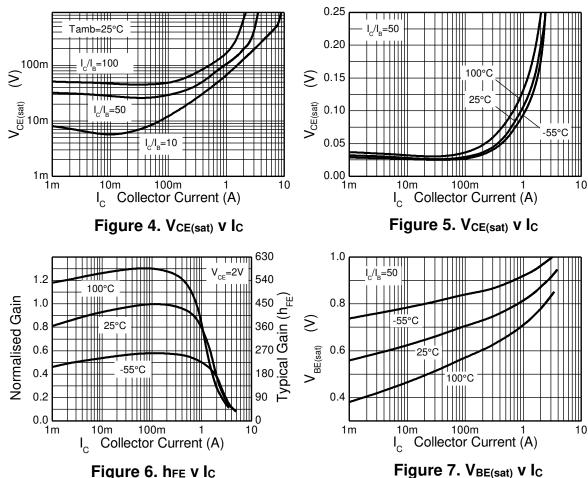


Figure 6. hfe v lc

1.0 8.0 -55°C 0.6 100°C 0.4 10m 100m 1 I_C Collector Current (A) 1m 10

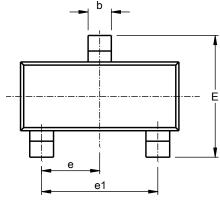
Figure 8. VBE(on) v IC



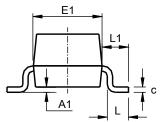
Package Outline Dimensions

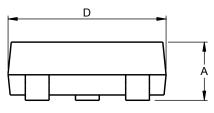
Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23 (Type DN)



SOT23 Type DN				
Dim	Min	Max	Тур	
Α	0.89	1.12	1.00	
A 1	0.01	0.10	0.05	
b	0.30	0.51	0.45	
С	0.08	0.20	0.10	
D	2.80	3.04	3.00	
Е	2.10	2.64	2.42	
E1	1.20	1.40	1.37	
е	0.95 REF			
e1	1.90 REF			
L	0.25	0.60	0.30	
L1	0.45	0.62	0.54	
All Dimensions in mm				

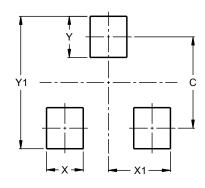




Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23 (Type DN)



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



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