Lead-free Green

FMMT619

50V NPN SILICON LOW SATURATION TRANSISTOR IN SOT23

Features

- V_{CEO} > 50V
- $I_{C(cont)}$ = 2A
- 625mW Power dissipation
- Low Equivalent On Resistance
- Low Saturation Voltage
- h_{FE} Characterised up to 6.0A
- **"Lead-Free", RoHS Compliant (Note 1)**
- **"Green" Devices (Note 2)**

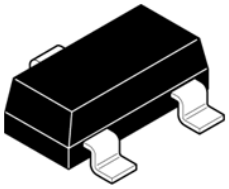
Mechanical Data

- Case: SOT-23
- Case material: "Green" Molding Compound. (Note 2)
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.008 grams (Approximate)

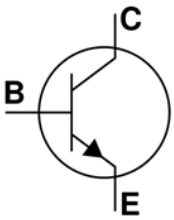
Applications

- DC-DC / DC-AC Modules
- Regulator
- LED driver

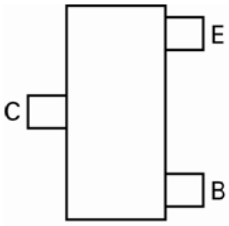
SOT-23



Top view



Device symbol



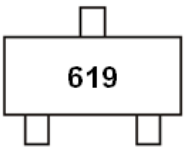
Top View
Pin Configuration

Ordering Information

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT619TA	619	7	8mm embossed	3000 units

Notes: 1. No purposefully added lead.
2. Devices with the PID number starting from PID0155145 are 'Green' products. Halogen and Antimony Free. Diodes Inc.'s "Green" Policy can be found on our website at https://www.diodes.com/

Marking Information



619 = Product Type Marking Code

Maximum Ratings @T_A = 25°C unless otherwise specified

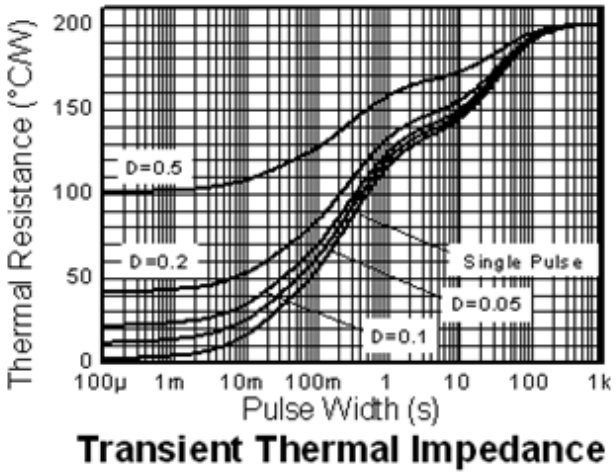
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	2	A
Peak Pulse Current (Note 3)	I_{CM}	6	A
Base Current	I_B	500	mA

Thermal Characteristics

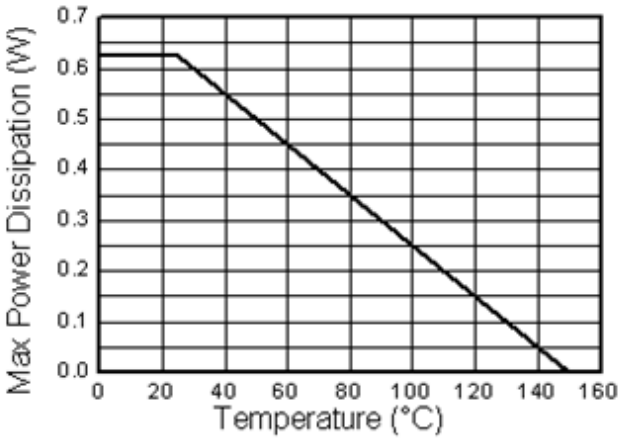
Characteristic	Symbol	Value	Unit
Power Dissipation at T_A = 25°C (Note 4)	P_D	625	mW
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 3. Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤ 2%.
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.

Thermal Characteristics and Derating information



Transient Thermal Impedance



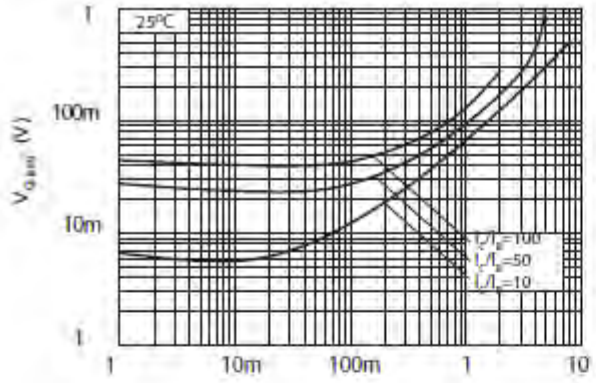
Derating Curve

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	50	190	-	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 5)	$V_{(BR)CEO}$	50	65	-	V	I_C = 10mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	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} = 4V
Collector Emitter Cut-off Current	I_{CES}	-	-	100	nA	V_{CES} =40V
Static Forward Current Transfer Ratio (Note 5)	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 (Note 5)	$V_{CE(sat)}$	- - -	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 (Note 5)	$V_{BE(sat)}$	-	0.87	1.0	V	I_C =2A, I_B = 50mA
Base-Emitter Saturation Voltage (Note 5)	$V_{BE(on)}$	-	0.80	1.0	V	I_C =2A, V_{CE} = 2V
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,
Turn-Off Time	$t_{(off)}$	-	750	-	ns	I_{B1} = -I_{B2} = 10mA

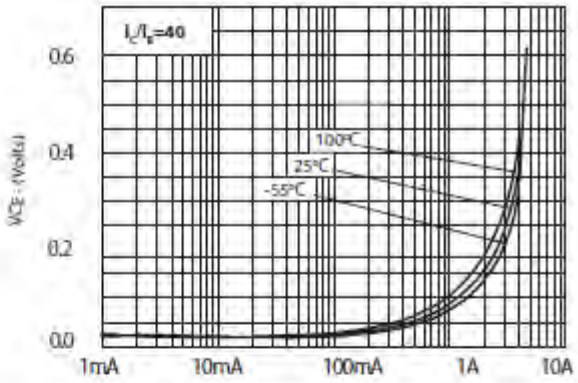
Notes: 5. Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤ 2%

Typical Characteristics



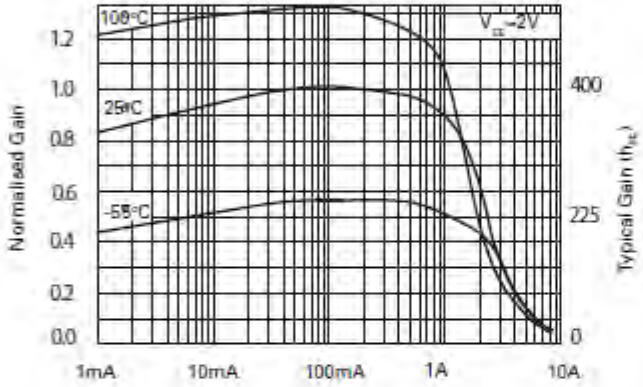
IC - Collector Current

$V_{CE(sat)}$ v I_C



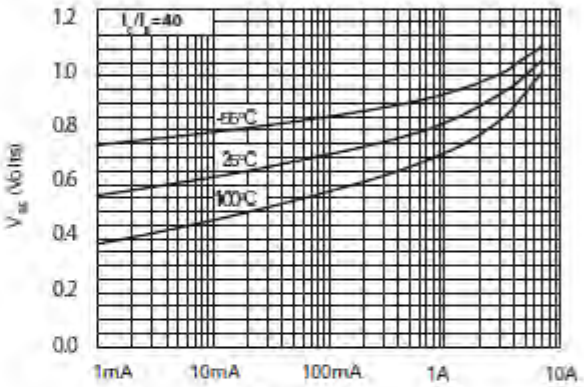
Collector Current

$V_{CE(sat)}$ v I_C



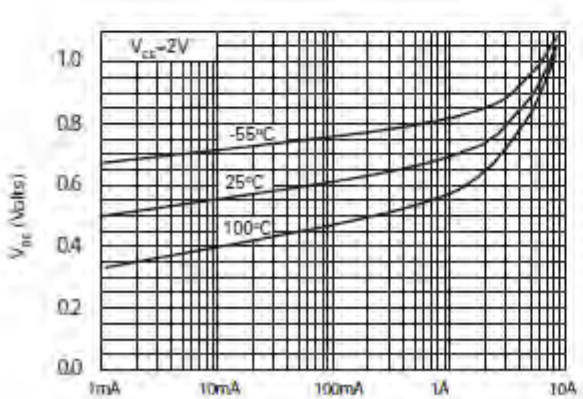
Collector Current

H_{FE} vs I_C



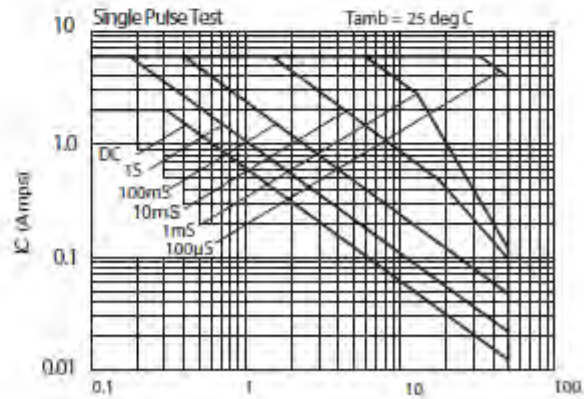
Collector Current

$V_{BE(sat)}$ v I_C



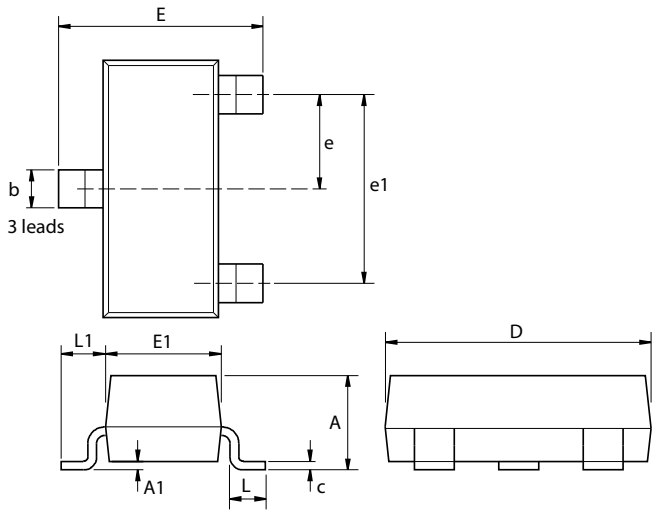
Collector Current

$V_{BE(ON)}$ v I_C



Safe Operating Area

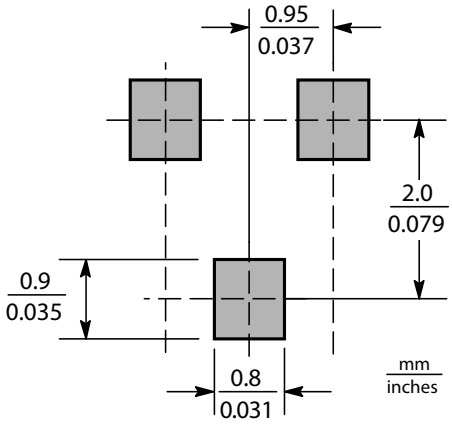
Package Outline Dimensions



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



IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or

2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

www.diodes.com