



**FMMT618**

**20V NPN SILICON LOW SATURATION TRANSISTOR IN SOT-23**

**Features**

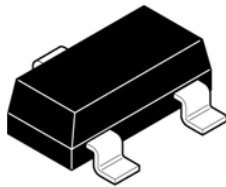
- $V_{CE0} = 20V$
- $I_C = 2.5A$
- 625mW Power dissipation
- Low Equivalent On Resistance
- Low Saturation Voltage
- $h_{FE}$  characterised up to 6.0A
- "Lead Free", RoHS Compliant (Note 1)
- Halogen and Antimony Free, "Green" Devices (Note 2)

**Mechanical Data**

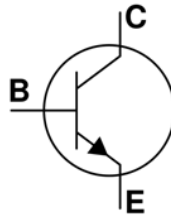
- Case: SOT-23
- Case material: "Green" molding Compound. (Note 2)
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.008 grams (Approximate)

**Applications**

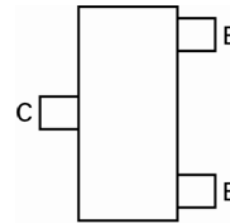
- DC-DC Modules
- Gate driver
- LED driver



SOT-23



Device Symbol



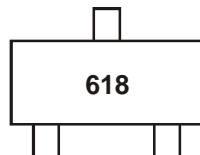
Top View  
Pin Configuration

**Ordering Information** (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT618TA	618	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/>
  3. For packaging details, go to our website at <http://www.diodes.com>.

**Marking Information**



618 = Product Type Marking Code

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

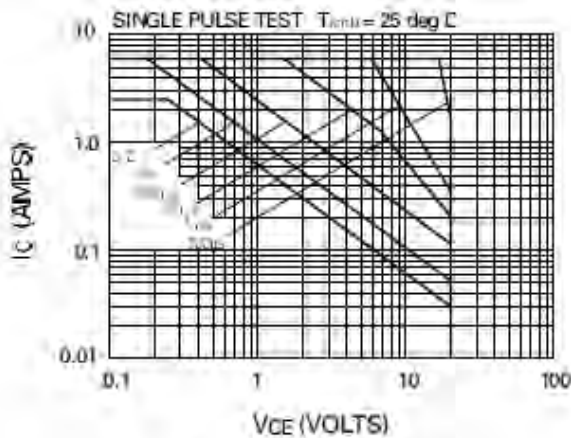
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB0}$	20	V
Collector-Emitter Voltage	$V_{CEO}$	20	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Continuous Collector Current	$I_C$	2.5	A
Peak Pulse Current (Note 4)	$I_{CM}$	6	A
Base Current	$I_B$	500	mA

**Thermal Characteristics**

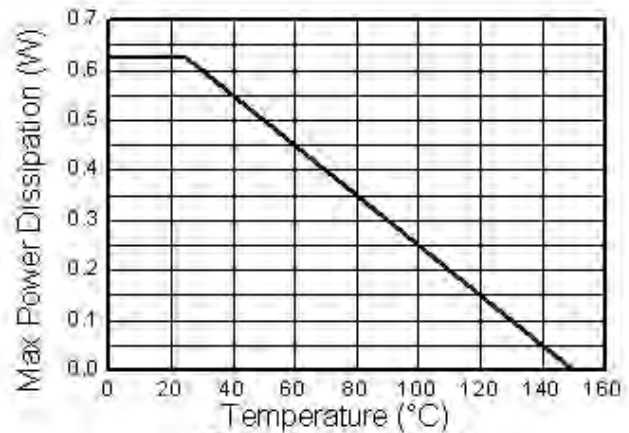
Characteristic	Symbol	Value	Unit
Power Dissipation at $T_A = 25^\circ\text{C}$ (Note 5)	$P_D$	625	mW
Thermal Resistance, Junction to Ambient Air (Note 4) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	200	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

Notes: 4. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .  
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.

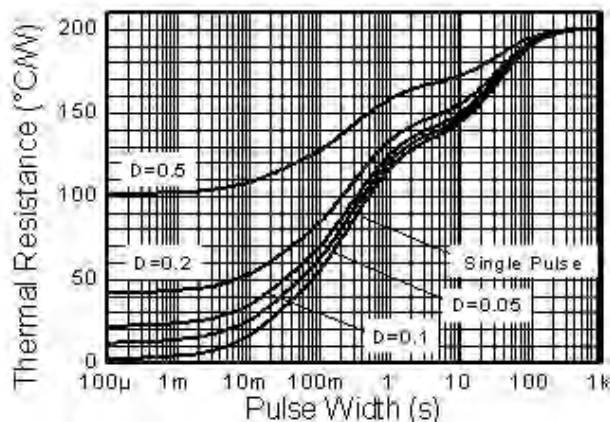
**Thermal Characteristics and Derating information**



**Safe Operating Area**



**Derating Curve**



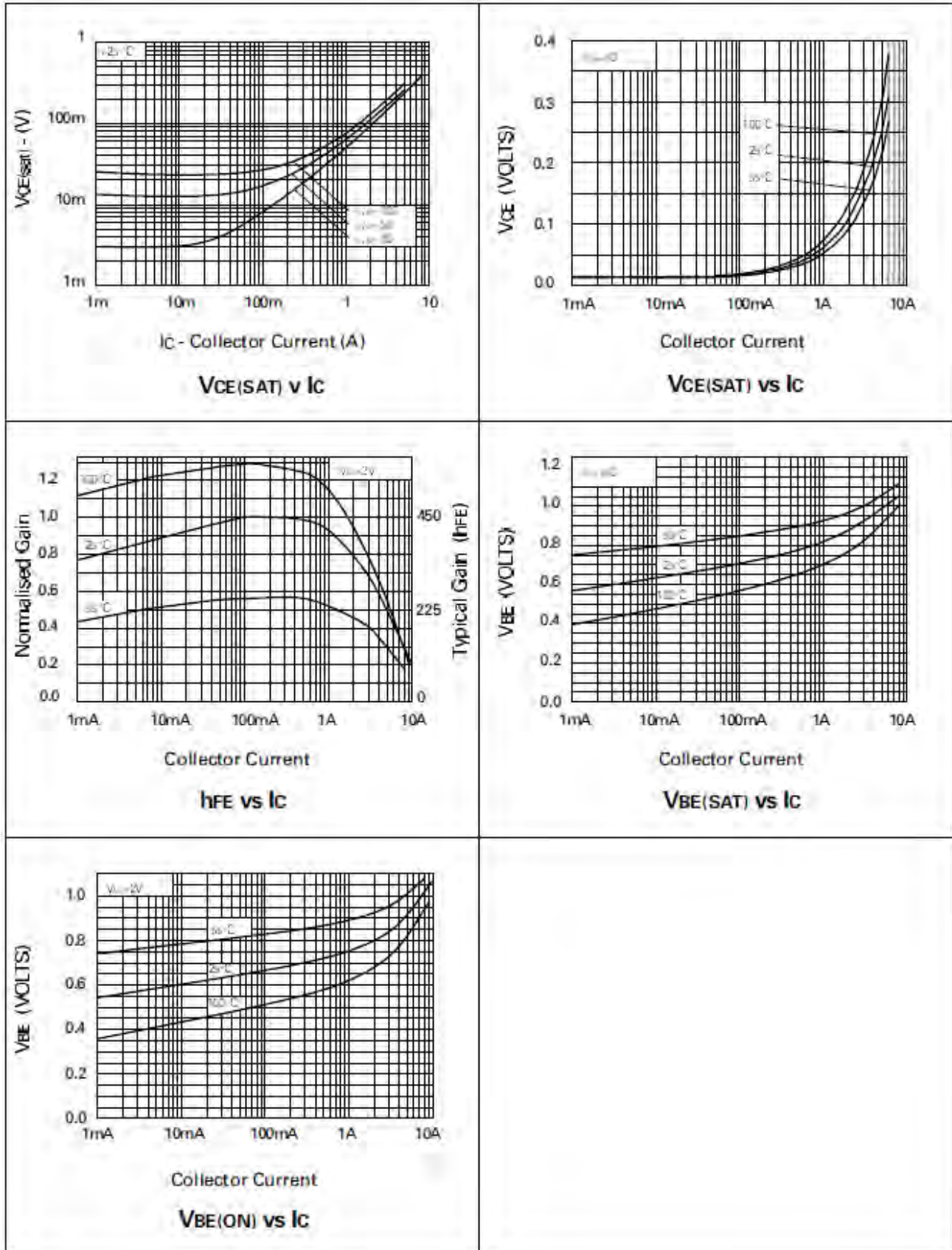
**Transient Thermal Impedance**

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

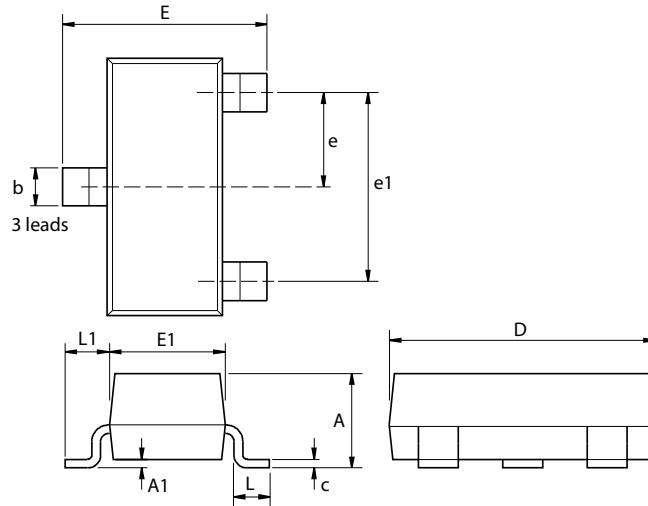
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	20	100	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 6)	$V_{(BR)CEO}$	20	27	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	8.3	-	V	$I_E = 100\mu\text{A}$
Collector Cut-off Current	$I_{CBO}$	-	-	100	nA	$V_{CB} = 16\text{V}$
Emitter Cut-off Current	$I_{EBO}$	-	-	100	nA	$V_{EB} = 4\text{V}$
Collector Emitter Cut-off Current	$I_{CES}$	-	-	100	nA	$V_{CES} = 16\text{V}$
Static Forward Current Transfer Ratio (Note 6)	$h_{FE}$	200 300 200 100	400 450 360 180	- - - -	-	$I_C = 10\text{mA}, V_{CE} = 2\text{V}$ $I_C = 200\text{mA}, V_{CE} = 2\text{V}$ $I_C = 2\text{A}, V_{CE} = 2\text{V}$ $I_C = 6\text{A}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 6)	$V_{CE(sat)}$	- - -	8 70 130	15 150 200	mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}$ $I_C = 1\text{A}, I_B = 10\text{mA}$ $I_C = 2.5\text{A}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage (Note 6)	$V_{BE(sat)}$	-	0.89	1.0	V	$I_C = 2.5\text{A}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage (Note 6)	$V_{BE(on)}$	-	0.79	1.0	V	$I_C = 2.5\text{A}, V_{CE} = 2\text{V}$
Transition Frequency	$f_T$	100	140	-	MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$
Collector Output Capacitance	$C_{obo}$	-	23	30	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(on)}$	-	170	-	ns	$V_{CC} = 10\text{V}, I_C = 1\text{A},$
Turn-Off Time	$t_{(off)}$	-	400	-	ns	$I_{B1} = -I_{B2} = 10\text{mA}$

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

**Typical Characteristics**



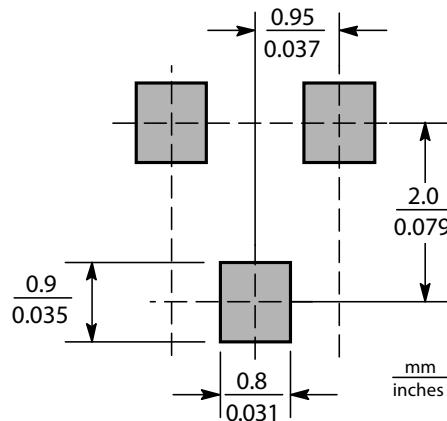
**Package Outline Dimensions**



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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