

**150V NPN SILICON LOW SATURATION TRANSISTOR IN SOT23**

**Features**

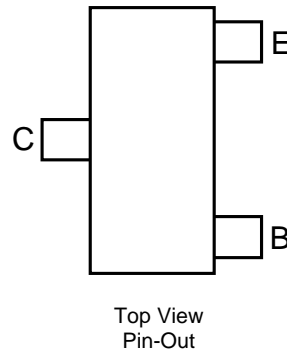
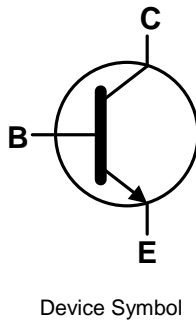
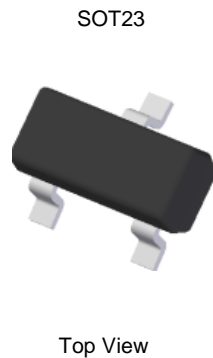
- $BV_{CEO} > 150V$
- Maximum Continuous Collector Current  $I_C = 1A$
- 625mW Power Dissipation
- $h_{FE}$  Characterised up to 3.0A
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([FMMT625Q](#))**

**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: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.008 grams (Approximate)

**Applications**

- DC-DC Modules
- Power Management Functions
- Motor Control and Drive Functions

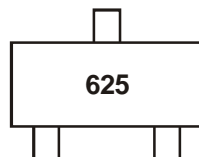


**Ordering Information** (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
FMMT625TA	AEC-Q101	625	7	8	3000 Units

- 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**



625 = Product Type Marking Code

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	150	V
Collector-Emitter Voltage	V <sub>CEO</sub>	150	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Continuous Collector Current	I <sub>C</sub>	1	A
Peak Pulse Current	I <sub>CM</sub>	3	A
Base Current	I <sub>B</sub>	500	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

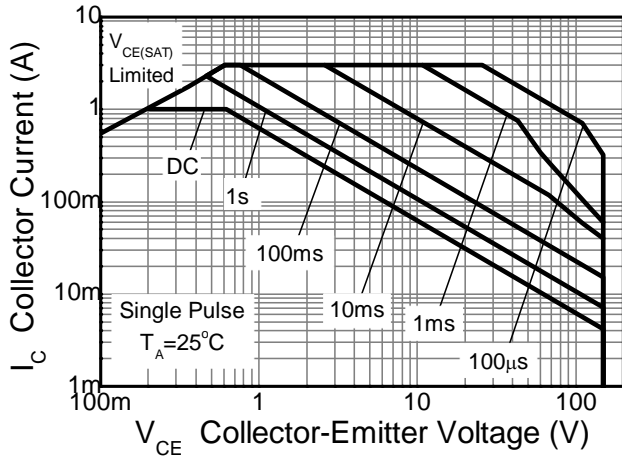
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	625	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	200	°C/W
Thermal Resistance, Junction to Leads (Note 6)	R <sub>θJL</sub>	194	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 7)

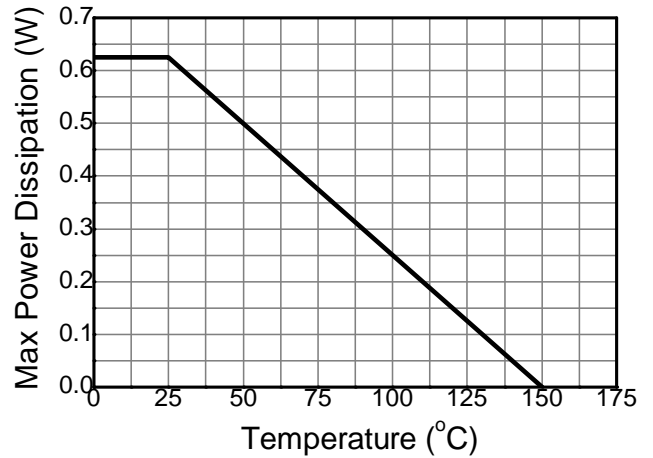
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	≥ 8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

- Notes:
5. For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1 oz copper, in still air conditions.
  6. Thermal resistance from junction to solder-point (at the end of the collector lead).
  7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

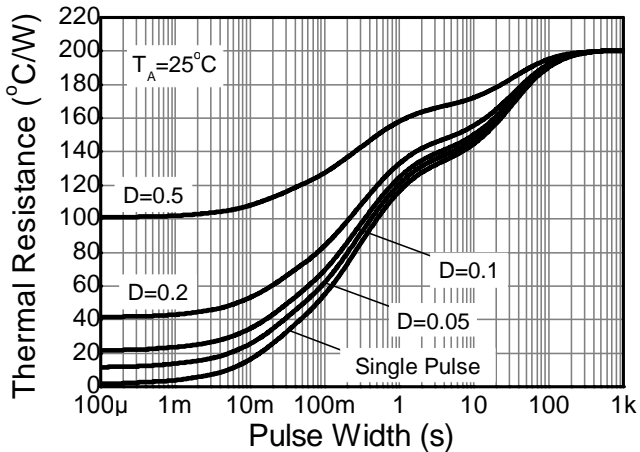
**Thermal Characteristics and Derating information**



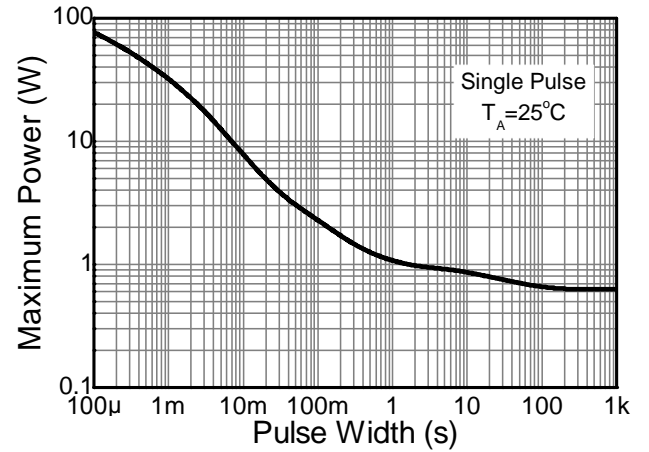
**Safe Operating Area**



**Derating Curve**



**Transient Thermal Impedance**



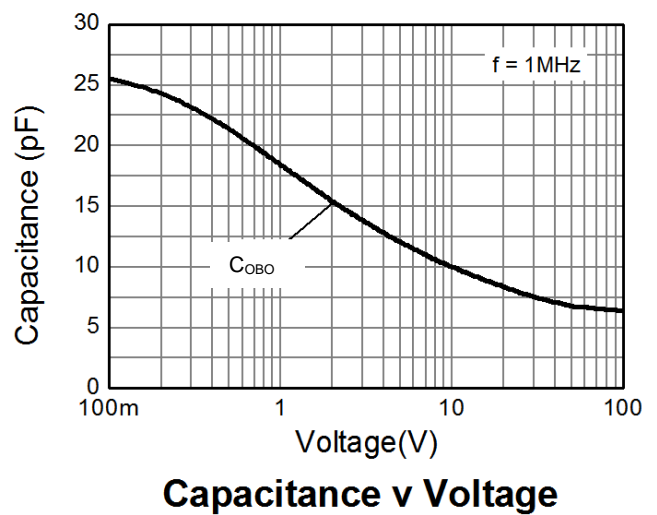
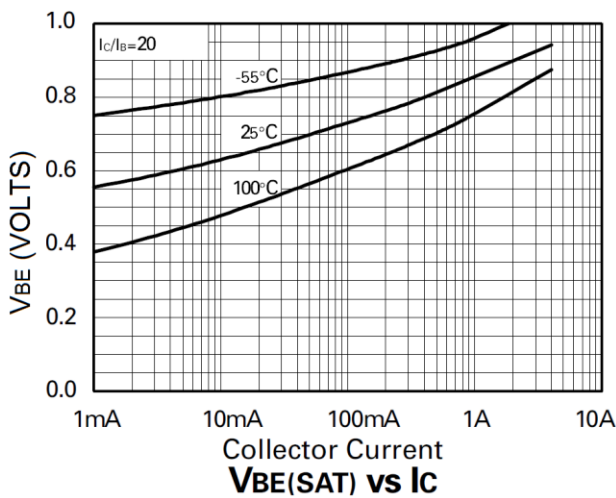
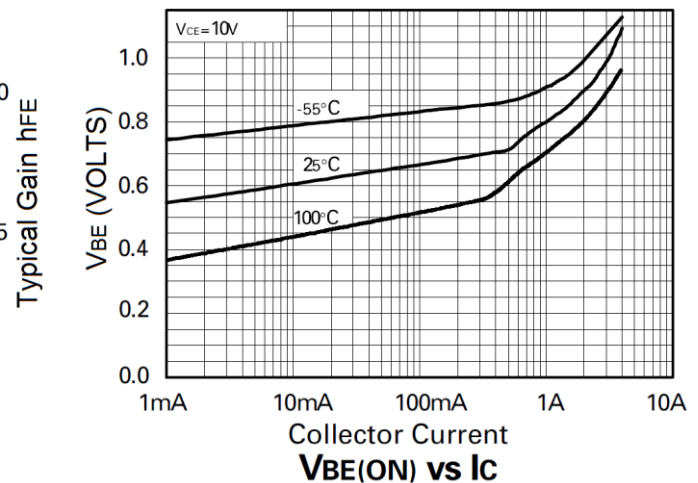
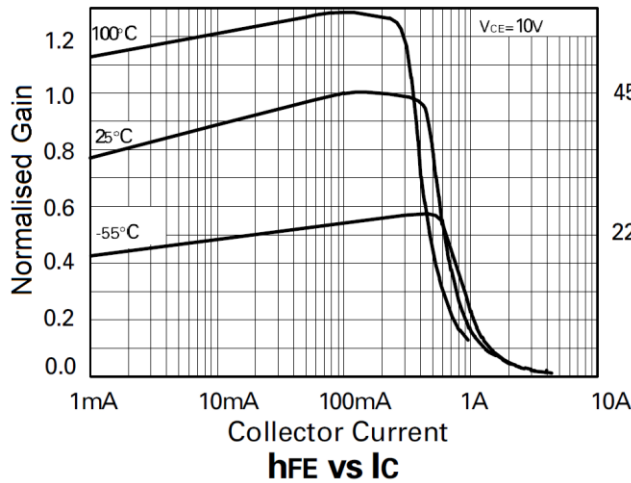
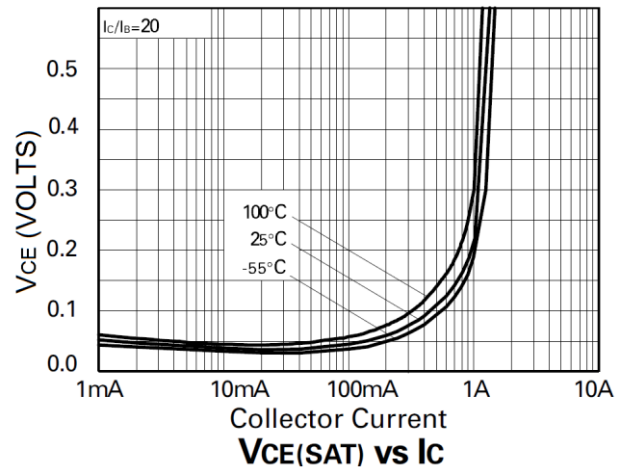
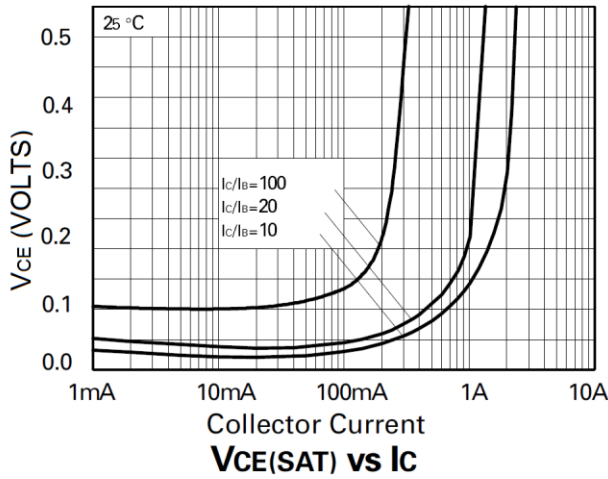
**Pulse Power Dissipation**

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	150	300	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 8)	$BV_{CEO}$	150	175	—	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	5	8.3	—	V	$I_E = 100\mu\text{A}$
Collector Cut-off Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 130\text{V}$
Emitter Cut-off Current	$I_{EBO}$	—	—	100	nA	$V_{EB} = 5\text{V}$
Collector Emitter Cut-off Current	$I_{CES}$	—	—	100	nA	$V_{CES} = 130\text{V}$
Static Forward Current Transfer Ratio (Note 8)	$h_{FE}$	200 300 30 —	400 450 45 15	— — — —	—	$I_C = 10\text{mA}, V_{CE} = 10\text{V}$ $I_C = 200\text{mA}, V_{CE} = 10\text{V}$ $I_C = 1\text{A}, V_{CE} = 10\text{V}$ $I_C = 3\text{A}, V_{CE} = 10\text{V}$
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(SAT)}$	— — —	26 110 180	50 200 300	mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}$ $I_C = 0.1\text{A}, I_B = 1\text{mA}$ $I_C = 1\text{A}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage (Note 8)	$V_{BE(SAT)}$	—	0.85	1.0	V	$I_C = 1\text{A}, I_B = 50\text{mA}$
Base-Emitter Turn-on Voltage (Note 8)	$V_{BE(ON)}$	—	0.74	1.0	V	$I_C = 1\text{A}, V_{CE} = 10\text{V}$
Transition Frequency	$f_T$	100	135	—	MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$
Collector Output Capacitance	$C_{OBO}$	—	6	10	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(ON)}$	—	160	—	ns	$V_{CC} = 50\text{V}, I_C = 500\text{mA},$
Turn-Off Time	$t_{(OFF)}$	—	1500	—	ns	$I_{B1} = -I_{B2} = 50\text{mA}$

Note 8: Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

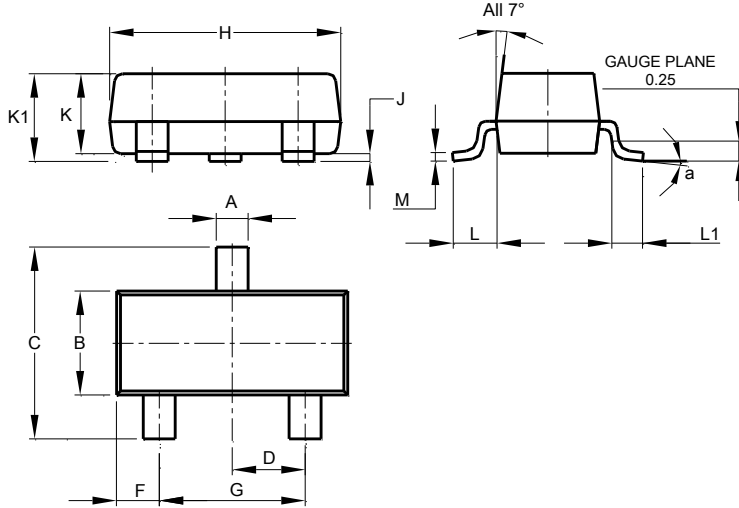
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



**Package Outline Dimensions**

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

**SOT23**

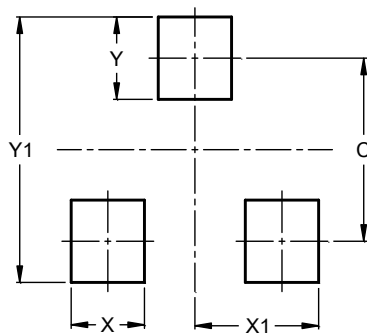


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT23**



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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