

20V NPN SILICON LOW SATURATION TRANSISTOR IN SOT23
Features

- $BV_{CEO} > 20V$
- $I_C = 2.5A$ Continuous Collector Current
- $R_{CE(SAT)} = 50m\Omega$ for a low equivalent On-Resistance
- 625mW Power dissipation
- h_{FE} characterised up to 6A for high current gain hold up
- Complementary NPN type: FMMT718
- **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
- PPAP capable (Note 4)

Mechanical Data

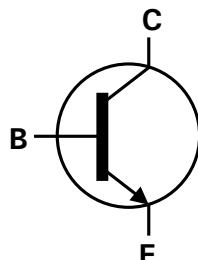
- Case: SOT23
- Case Material: molded plastic, "Green" molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (E3)
- Weight 0.008 grams (approximate)

Applications

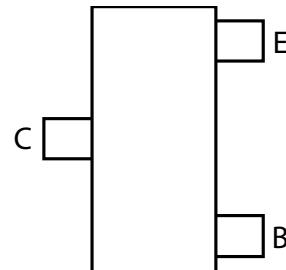
- DC-DC Modules
- Gate driver
- LED driver



Top View



Device Symbol

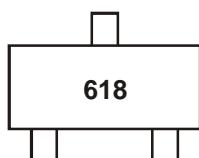

 Top View
 Pin-Out

Ordering Information (Note 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT618TA	AEC-Q101	618	7	8	3,000
FMMT618QTA	Automotive	618	7	8	3,000

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See <http://www.diodes.com> 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
5. 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_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	2.5	A
Peak Pulse Current	I_{CM}	6	A
Base Current	I_B	500	mA

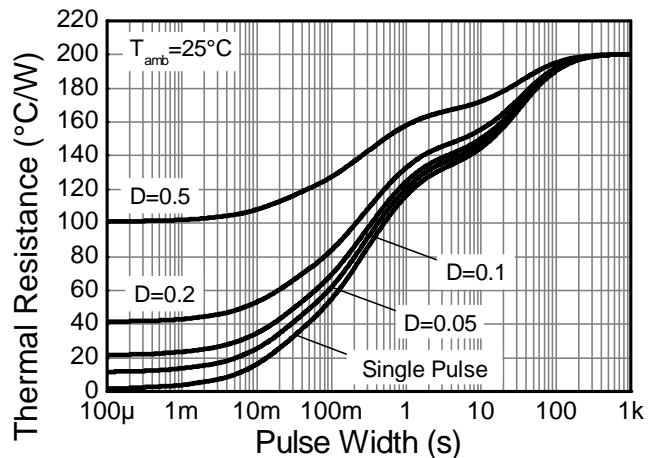
Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	625	mW
Power Dissipation (Note 7)	P_D	806	mW
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	155	°C/W
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	194	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

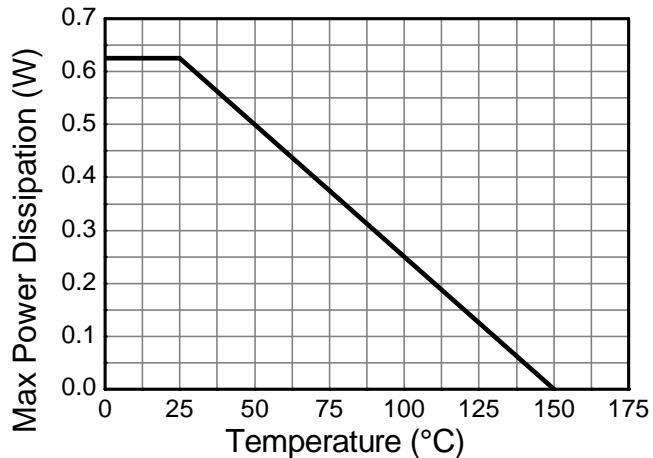
Notes:

- 6. 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.
- 7. Same as note 6, except the device is measured at $t \leq 5$ sec.
- 8. Thermal resistance from junction to solder-point (at the end of the collector lead).

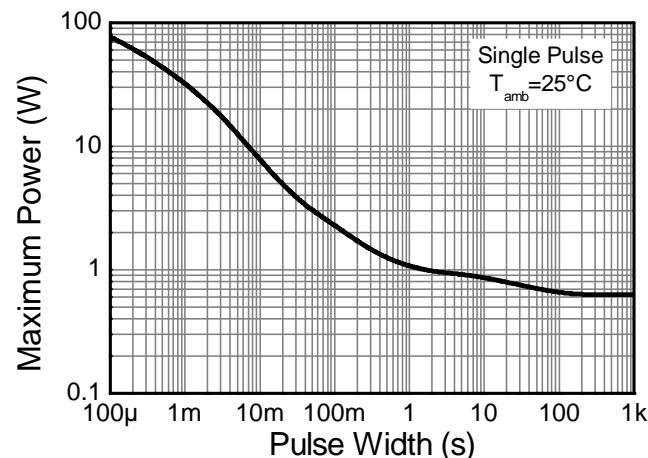
Thermal Characteristics and Derating information



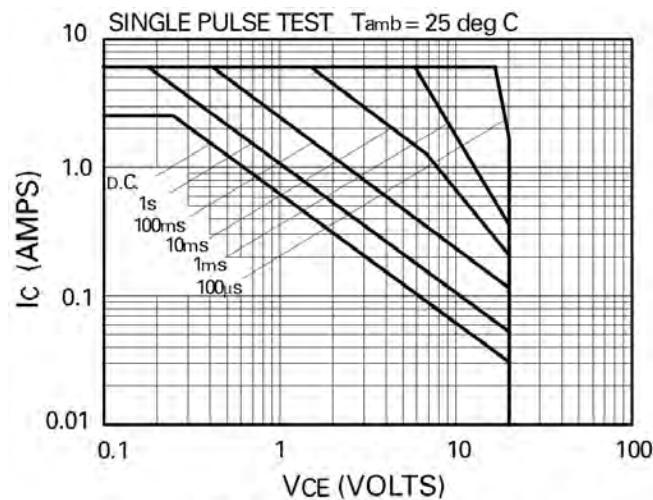
Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation



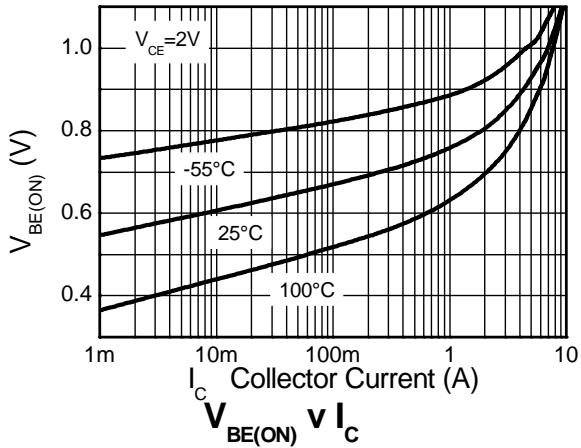
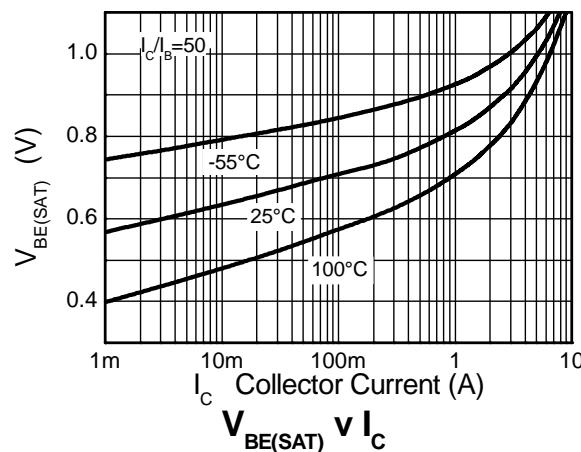
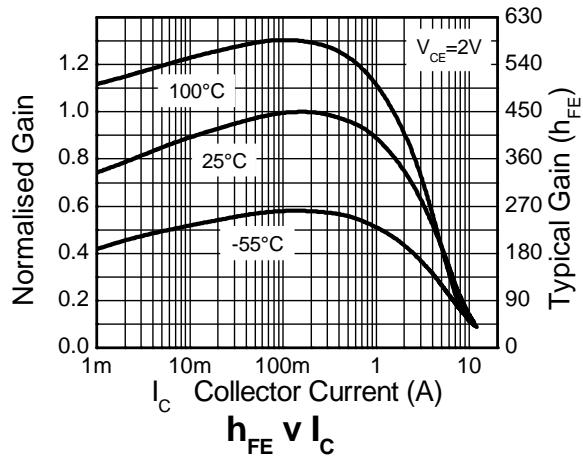
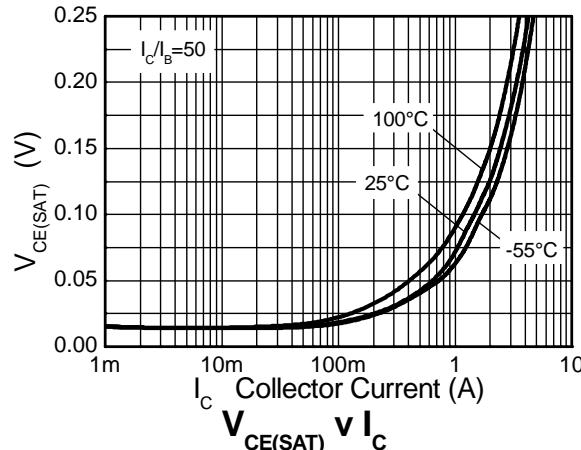
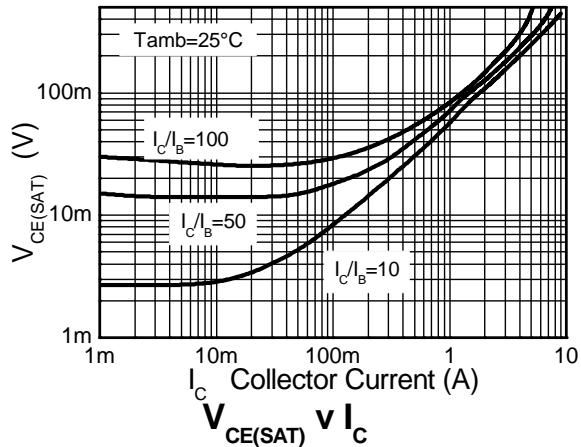
Safe Operating Area

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}	20	100	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	20	27	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.3	-	V	$I_E = 100\mu\text{A}$
Collector Cut-off Current	I_{CBO}	-	-	100	nA	$V_{\text{CB}} = 20\text{V}$
Emitter Cut-off Current	I_{EBO}	-	-	100	nA	$V_{\text{EB}} = 4\text{V}$
Collector Emitter Cut-off Current	I_{CES}	-	-	100	nA	$V_{\text{CES}} = 20\text{V}$
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	200	400	-	-	$I_C = 10\text{mA}, V_{\text{CE}} = 2\text{V}$
		300	450	-	-	$I_C = 200\text{mA}, V_{\text{CE}} = 2\text{V}$
		200	340	-	-	$I_C = 2\text{A}, V_{\text{CE}} = 2\text{V}$
		100	150	-	-	$I_C = 6\text{A}, V_{\text{CE}} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{\text{CE}(\text{sat})}$	-	8	15	mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}$
		-	70	150		$I_C = 1\text{A}, I_B = 10\text{mA}$
		-	130	200		$I_C = 2.5\text{A}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{\text{BE}(\text{sat})}$	-	0.89	1.0	V	$I_C = 2.5\text{A}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{\text{BE}(\text{on})}$	-	0.83	1.0	V	$I_C = 2.5\text{A}, V_{\text{CE}} = 2\text{V}$
Transition Frequency	f_T	100	140	-	MHz	$I_C = 50\text{mA}, V_{\text{CE}} = 10\text{V}, f = 100\text{MHz}$
Collector Output Capacitance	C_{obo}	-	23	30	pF	$V_{\text{CB}} = 10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(\text{on})}$	-	170	-	ns	$V_{\text{CC}} = 10\text{V}, I_C = 1\text{A}, I_{B1} = -I_{B2} = 10\text{mA}$
Turn-Off Time	$t_{(\text{off})}$	-	400	-	ns	

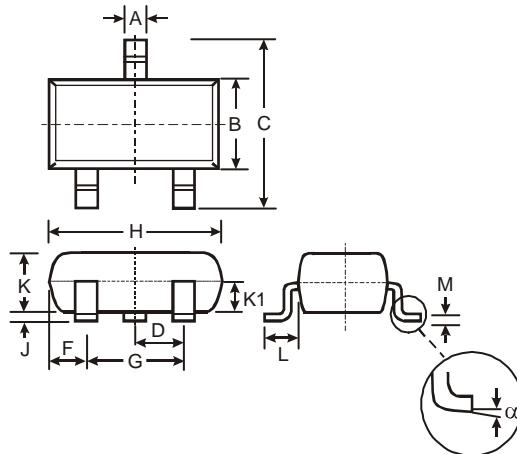
Notes: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

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



Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

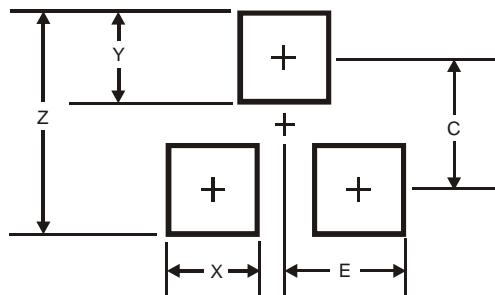


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
alpha	0°	8°	-

All Dimensions in mm

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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