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FMMT618

20V NPN SILICON LOW SATURATION TRANSISTOR IN SOT23

Features

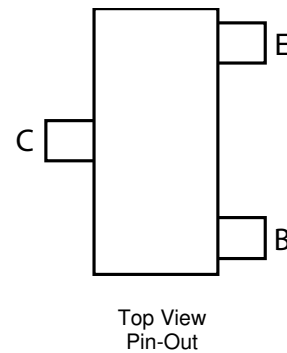
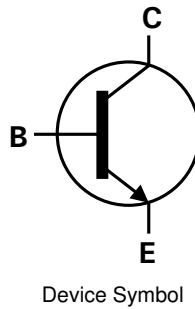
- $BV_{CEO} > 20V$
- $I_C = 2.5A$ Continuous Collector Current
- $R_{CE(SAT)} = 50m\Omega$ for a low equivalent On-Resistance
- 625mW Power dissipation
- h_{FE} characterised up to 6A for high current gain hold up
- Complementary NPN type: FMMT718
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 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 (3)
- Weight 0.008 grams (approximate)

Applications

- DC-DC Modules
- Gate driver
- LED driver

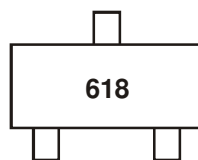


Ordering Information (Note 5)

| 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.)

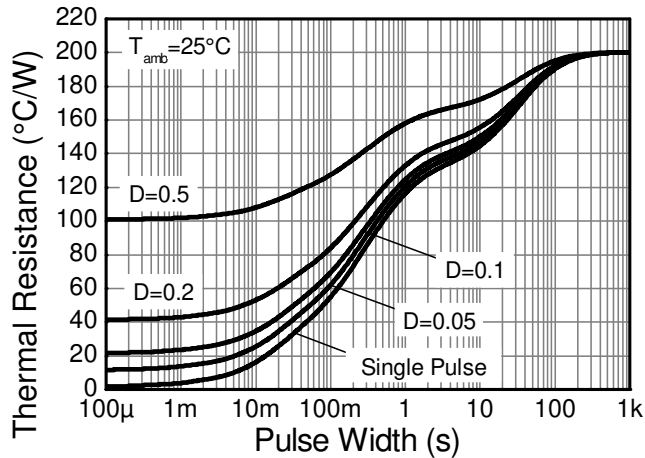
| Characteristic | Symbol | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | 20 | V |
| Collector-Emitter Voltage | V_{CEO} | 20 | V |
| Emitter-Base Voltage | V_{EBO} | 7 | V |
| Continuous Collector Current | I_C | 2.5 | A |
| Peak Pulse Current | I_{CM} | 6 | A |
| Base Current | I_B | 500 | mA |

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

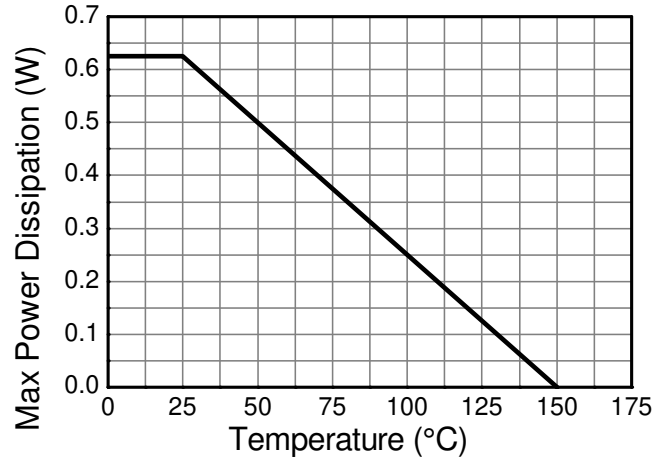
| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------------|---------------------------|
| Power Dissipation (Note 6) | P_D | 625 | mW |
| Power Dissipation (Note 7) | P_D | 806 | mW |
| Thermal Resistance, Junction to Ambient (Note 6) | $R_{\theta JA}$ | 200 | $^\circ\text{C}/\text{W}$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

- 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).

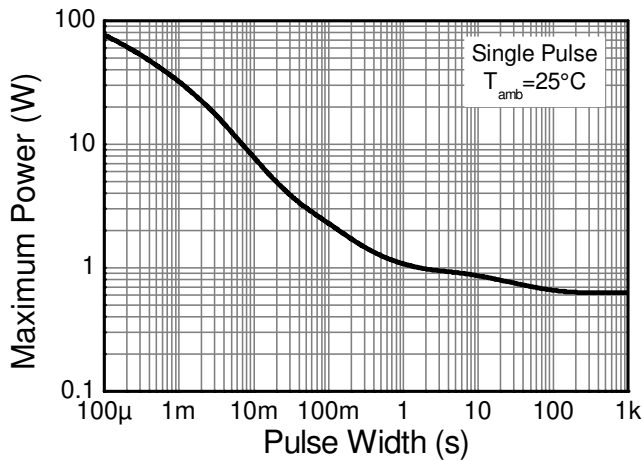
Thermal Characteristics and Derating information



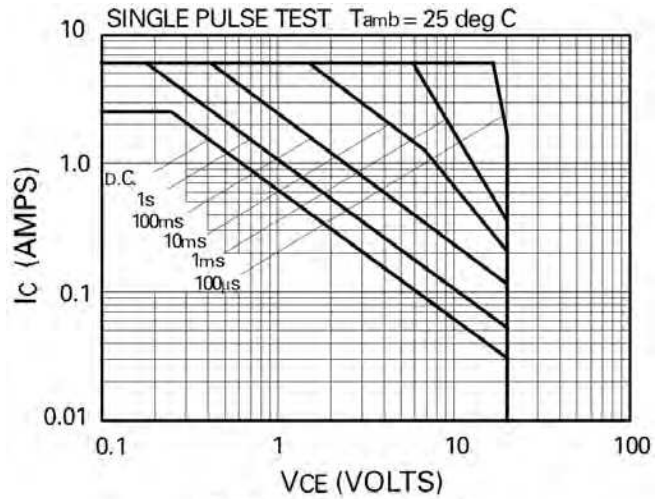
Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation



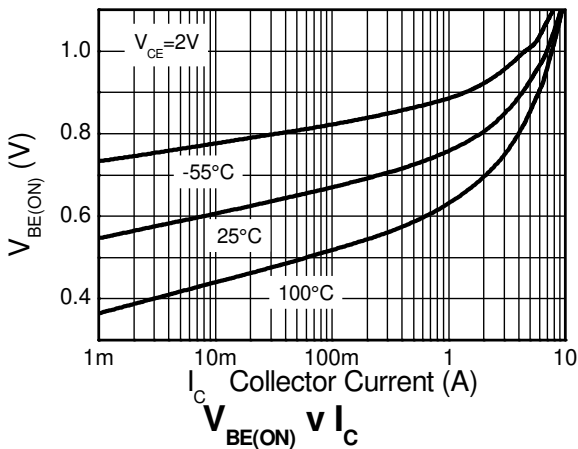
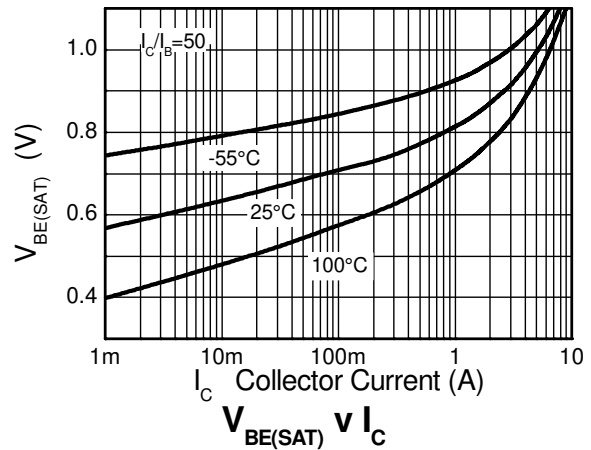
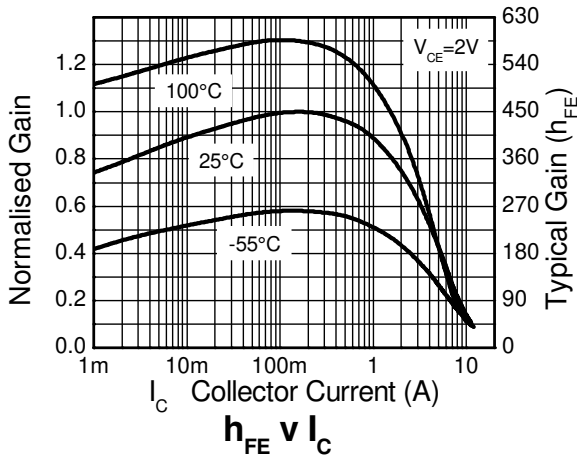
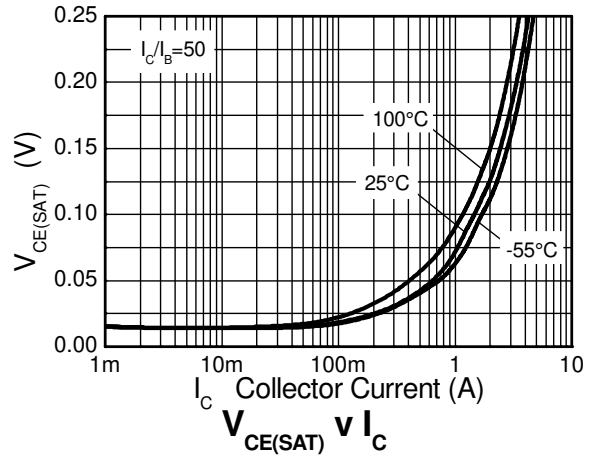
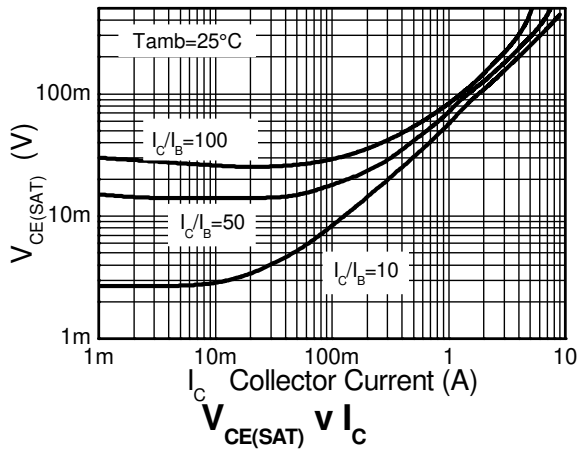
Safe Operating Area

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|----------------------|-----|------|-----|------|---|
| Collector-Base Breakdown Voltage | BV _{CBO} | 20 | 100 | - | V | I _C = 100μA |
| Collector-Emitter Breakdown Voltage (Note 9) | BV _{CEO} | 20 | 27 | - | V | I _C = 10mA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 7 | 8.3 | - | V | I _E = 100μA |
| Collector Cut-off Current | I _{CBO} | - | - | 100 | nA | V _{CB} = 20V |
| Emitter Cut-off Current | I _{EBO} | - | - | 100 | nA | V _{EB} = 4V |
| Collector Emitter Cut-off Current | I _{CES} | - | - | 100 | nA | V _{CES} = 20V |
| Static Forward Current Transfer Ratio (Note 9) | h _{FE} | 200 | 400 | - | - | I _C = 10mA, V _{CE} = 2V |
| | | 300 | 450 | - | | I _C = 200mA, V _{CE} = 2V |
| | | 200 | 340 | - | | I _C = 2A, V _{CE} = 2V |
| | | 100 | 150 | - | | I _C = 6A, V _{CE} = 2V |
| Collector-Emitter Saturation Voltage (Note 9) | V _{CE(sat)} | - | 8 | 15 | mV | I _C = 0.1A, I _B = 10mA |
| | | - | 70 | 150 | | I _C = 1A, I _B = 10mA |
| | | - | 130 | 200 | | I _C = 2.5A, I _B = 50mA |
| Base-Emitter Saturation Voltage (Note 9) | V _{BE(sat)} | - | 0.89 | 1.0 | V | I _C = 2.5A, I _B = 50mA |
| Base-Emitter Saturation Voltage (Note 9) | V _{BE(on)} | - | 0.83 | 1.0 | V | I _C = 2.5A, V _{CE} = 2V |
| Transition Frequency | f _T | 100 | 140 | - | MHz | I _C = 50mA, V _{CE} = 10V, f = 100MHz |
| Collector Output Capacitance | C _{obo} | - | 23 | 30 | pF | V _{CB} = 10V, f = 1MHz |
| Turn-On Time | t _(on) | - | 170 | - | ns | V _{CC} = 10V, I _C = 1A, I _{B1} = -I _{B2} = 10mA |
| Turn-Off Time | t _(off) | - | 400 | - | ns | |

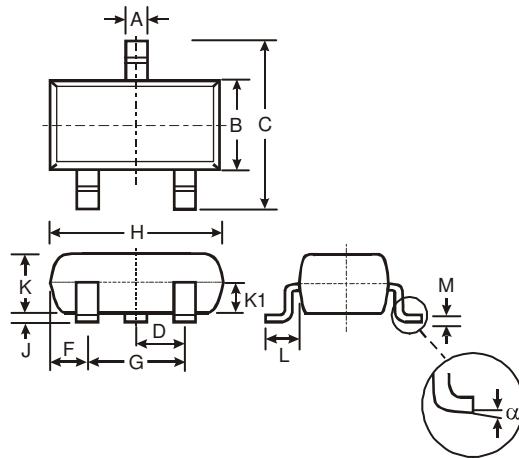
Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

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



Package Outline Dimensions

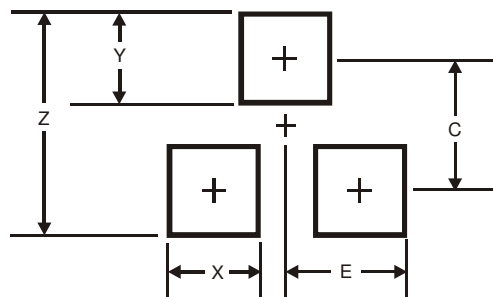
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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 |
| α | 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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