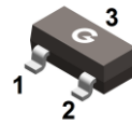


### Features

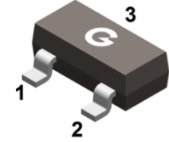
- $BV_{CEO} > 50V$
- $I_C = 2A$  Continuous Collector Current
- 625mW power dissipation
- Low Saturation Voltage  $V_{CE(sat)} < 200mV @ 1A$
- $R_{CE(sat)} = 68m\Omega$  for a low equivalent on-resistance
- $H_{FE}$  characterised up to 6A for high current gain hold-up
- Complementary PNP type: TFMMT720, TFMMT720-3L
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF



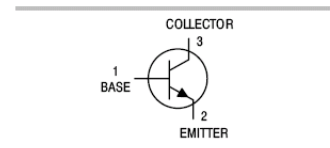
TFMMT619

SOT-23



TFMMT619-3L

SOT-23-3L



### Mechanical Data

- Case: SOT-23, SOT-23-3L
- Molding compound, UL flammability classification rating 94V-0.
- Terminals: Matte tin plated leads, solderable per MIL-STD-202, Method 208.

### Ordering Information

| Part Number | Package   | Shipping               | Marking Code |
|-------------|-----------|------------------------|--------------|
| TFMMT619    | SOT-23    | 3000 pcs / Tape & Reel | 619          |
| TFMMT619-3L | SOT-23-3L | 3000 pcs / Tape & Reel | 619          |

### Maximum Ratings (@ $T_A = 25^\circ C$ unless otherwise specified)

| Symbol                 | Parameter                      | Value | Unit |
|------------------------|--------------------------------|-------|------|
| <b>MAXIMUM RATINGS</b> |                                |       |      |
| $V_{CBO}$              | Collector-Base Voltage         | 50    | V    |
| $V_{CEO}$              | Collector-Emitter Voltage      | 50    | V    |
| $V_{EBO}$              | Emitter-Base Voltage           | 7     | V    |
| $I_C$                  | Collector Current - Continuous | 2     | A    |
| $I_{CM}$               | Peak Pulse Current             | 6     | A    |
| $I_B$                  | Base Current                   | 0.5   | A    |

### Thermal Characteristic

|                          |                                        |             |              |
|--------------------------|----------------------------------------|-------------|--------------|
| $P_D$ (Note 1)           | Total Power Dissipation                | 625         | mW           |
| $P_D$ (Note 2)           | Total Power Dissipation                | 806         | mW           |
| $R_{\theta JA}$ (Note 1) | Thermal resistance Junction-to-ambient | 200         | $^\circ C/W$ |
| $R_{\theta JA}$ (Note 2) | Thermal resistance Junction-to-ambient | 155         | $^\circ C/W$ |
| $R_{\theta JL}$ (Note 3) | Thermal Resistance, Junction to Leads  | 194         | $^\circ C/W$ |
| $T_J$                    | Junction Temperature                   | 150         | $^\circ C$   |
| $T_J, T_{stg}$           | Junction and Storage Temperature       | -55 to +150 | $^\circ C$   |

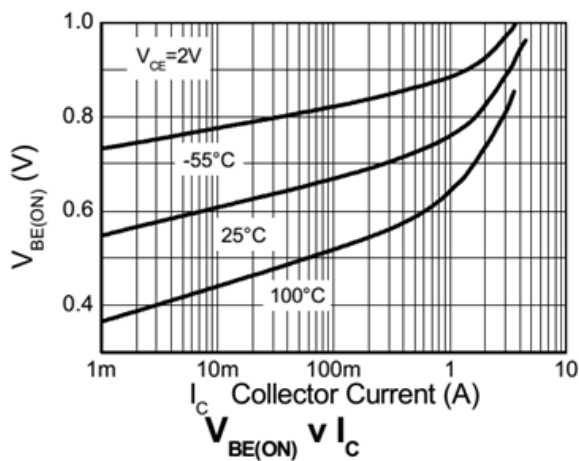
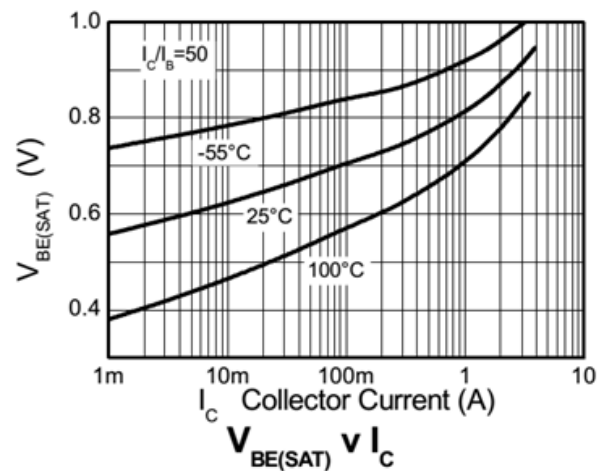
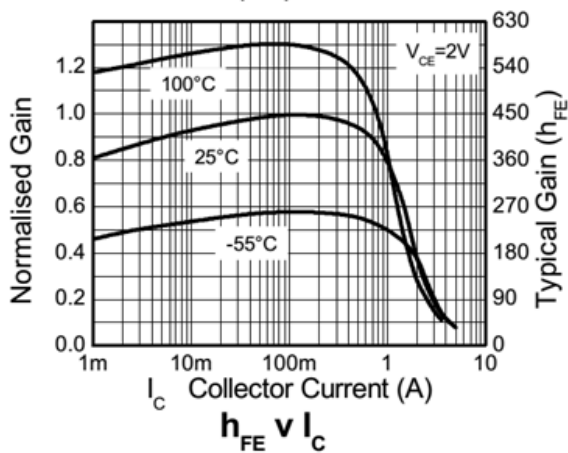
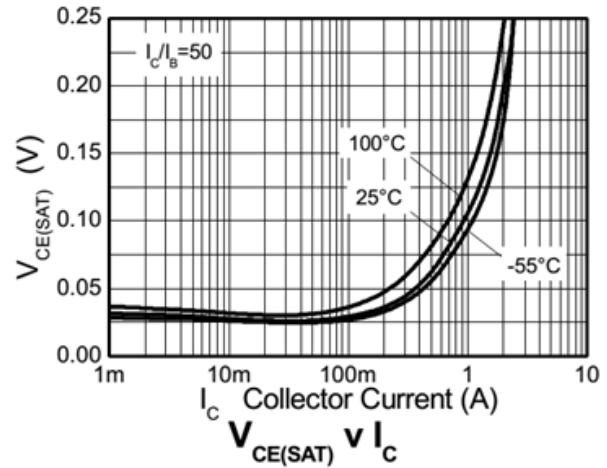
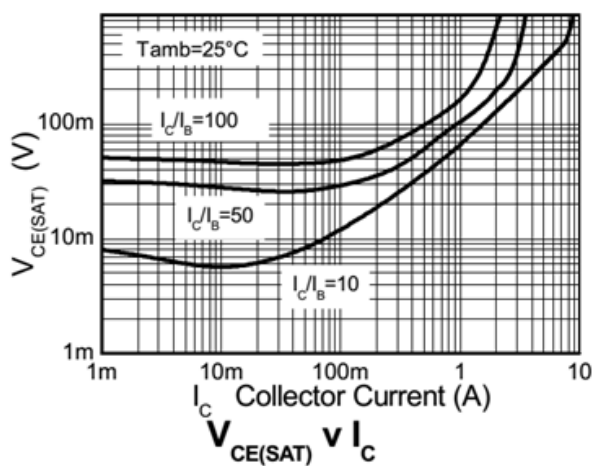
### Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Parameter                                     | Symbol        | Test conditions                                                            | MIN | TYP  | MAX | UNIT          |
|-----------------------------------------------|---------------|----------------------------------------------------------------------------|-----|------|-----|---------------|
| Collector-base breakdown voltage              | $V_{(BR)CBO}$ | $I_C = 100\mu\text{A}, I_E = 0$                                            | 50  | 170  | -   | V             |
| Collector-emitter breakdown voltage (Note 4)  | $V_{(BR)CEO}$ | $I_C = 10\text{mA}, I_B = 0$                                               | 50  | 60   | -   | V             |
| Emitter-base breakdown voltage                | $V_{(BR)EBO}$ | $I_E = 100\mu\text{A}, I_C = 0$                                            | 7   | 10   | -   | V             |
| Collector Cut-Off Current                     | $I_{CBO}$     | $V_{CB} = 40\text{V}, I_E = 0$                                             | -   | -    | 0.1 | $\mu\text{A}$ |
| Emitter cut-off current                       | $I_{EBO}$     | $V_{EB} = 6\text{V}, I_C = 0$                                              | -   | -    | 0.1 | $\mu\text{A}$ |
| Collector Emitter Cut-off Current             | $I_{CES}$     | $V_{CES} = 40\text{V}$                                                     | -   | -    | 0.1 | $\mu\text{A}$ |
| DC Current Gain (Note 4)                      | $h_{FE}$      | $V_{CE} = 2\text{V}, I_C = 10\text{mA}$                                    | 200 | 480  | -   |               |
|                                               |               | $V_{CE} = 2\text{V}, I_C = 200\text{mA}$                                   | 300 | 460  | -   |               |
|                                               |               | $V_{CE} = 2\text{V}, I_C = 1\text{A}$                                      | 200 | 400  | -   |               |
|                                               |               | $V_{CE} = 2\text{V}, I_C = 2\text{A}$                                      | 100 | 225  | -   |               |
|                                               |               | $V_{CE} = 2\text{V}, I_C = 6\text{A}$                                      | -   | 40   | -   |               |
| Collector-Emitter Saturation Voltage (Note 4) | $V_{CE(sat)}$ | $I_C = 0.1\text{A}, I_B = 10\text{mA}$                                     | -   | 10   | 20  | mV            |
|                                               |               | $I_C = 1\text{A}, I_B = 10\text{mA}$                                       | -   | 125  | 200 |               |
|                                               |               | $I_C = 2\text{A}, I_B = 50\text{mA}$                                       | -   | 150  | 220 |               |
| Base-emitter saturation Voltage (Note 4)      | $V_{BE(sat)}$ | $I_C = 2\text{A}, I_B = 50\text{mA}$                                       | -   | 0.87 | 1.0 | V             |
| Base-emitter turn-on voltage                  | $V_{BE(on)}$  | $I_C = 3\text{A}, V_{CE} = 2\text{V}$                                      | -   | 0.9  | 1.0 | V             |
| Transition frequency                          | $f_T$         | $V_{CE} = 10\text{V}, I_C = 50\text{mA}$<br>$f = 50\text{MHz}$             | 100 | 165  | -   | MHz           |
| Output capacitance                            | $C_{obo}$     | $V_{CB} = 10\text{V}, f = 1\text{MHz}$                                     | -   | 12   | 20  | pF            |
| Turn-On Time                                  | $t_{(on)}$    | $V_{CC} = 10\text{V}, I_C = 1\text{A}$<br>$I_{B1} = -I_{B2} = 10\text{mA}$ | -   | 170  | -   | ns            |
| Turn-Off Time                                 | $t_{(off)}$   |                                                                            | -   | 750  | -   | ns            |

Notes:

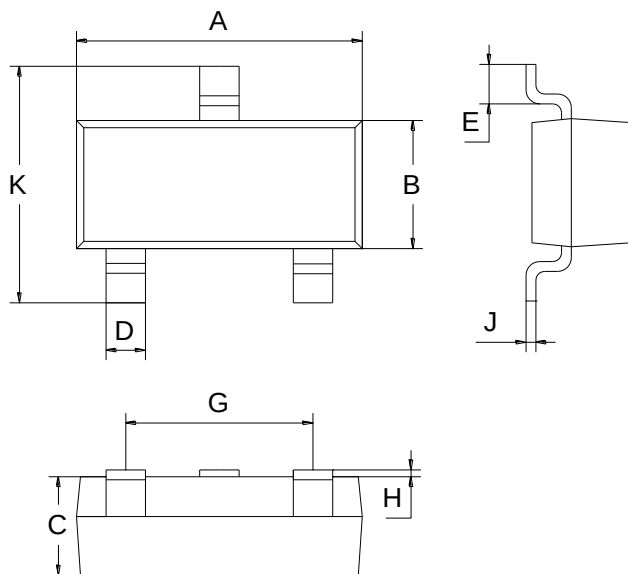
1. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition
2. Same as note 1, except the device is measured at  $t \leq 5$  sec
3. Thermal resistance from junction to solder-point (at the end of the collector lead)
4. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$

Ratings and Characteristic Curves (@  $T_A = 25^\circ\text{C}$  unless otherwise specified)



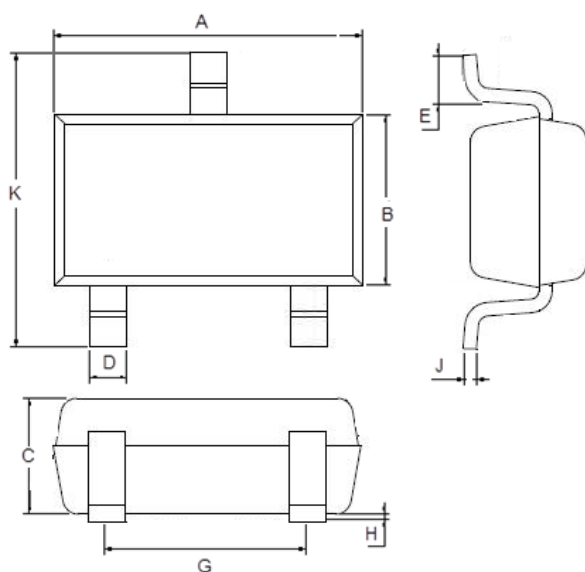
**Package Outline Dimensions** (unit: mm)

**SOT-23**



| SOT-23 |      |      |
|--------|------|------|
| Dim    | Min  | Max  |
| A      | 2.70 | 3.10 |
| B      | 1.10 | 1.50 |
| C      | 0.9  | 1.1  |
| D      | 0.3  | 0.5  |
| E      | 0.35 | 0.48 |
| G      | 1.80 | 2.00 |
| H      | 0.02 | 0.1  |
| J      | 0.05 | 0.15 |
| K      | 2.20 | 2.60 |

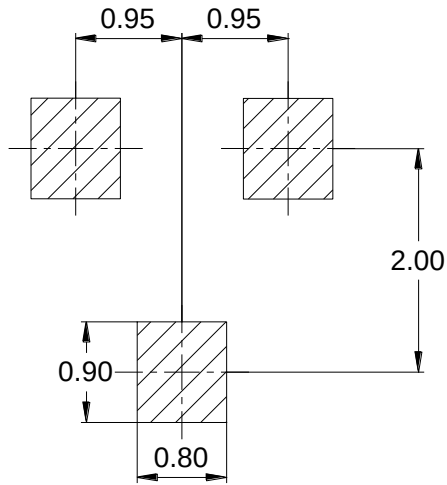
**SOT-23-3L**



| SOT-23-3L            |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.80 | 3.00 |
| B                    | 1.50 | 1.70 |
| C                    | 1.00 | 1.20 |
| D                    | 0.35 | 0.45 |
| E                    | 0.35 | 0.55 |
| G                    | 1.80 | 2.00 |
| H                    | 0.02 | 0.10 |
| J                    | 0.10 | 0.20 |
| K                    | 2.60 | 3.00 |
| All Dimensions in mm |      |      |

**SOLDERING FOOTPRINT** (unit: mm)

**SOT-23**



**SOT-23-3L**

