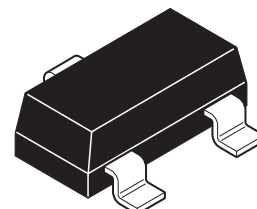


# FMMT596

## SOT 23 PNP silicon planar high voltage transistor

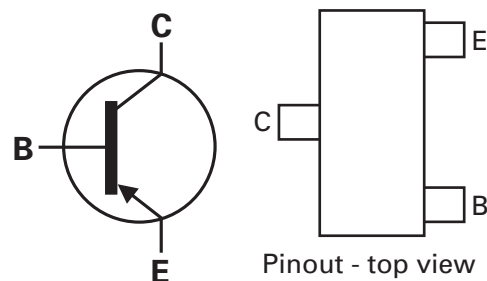
### Ordering information

| Device    | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-----------|--------------------|-----------------|-------------------|
| FMMT596TA | 7                  | 8               | 3,000             |



### Device marking

596



### Absolute maximum ratings

| Parameter                                  | Symbol         | Value       | Unit        |
|--------------------------------------------|----------------|-------------|-------------|
| Collector-base voltage                     | $V_{CBO}$      | -220        | V           |
| Collector-emitter voltage                  | $V_{CEO}$      | -200        | V           |
| Emitter-base voltage                       | $V_{EBO}$      | -5          | V           |
| Peak pulse current                         | $I_{CM}$       | -1          | A           |
| Continuous collector current               | $I_C$          | -0.3        | A           |
| Base current                               | $I_B$          | -200        | mA          |
| Power dissipation at $T_{amb}=25^{\circ}C$ | $P_{tot}$      | 500         | mW          |
| Operating and storage temperature range    | $T_J; T_{stg}$ | -55 to +150 | $^{\circ}C$ |

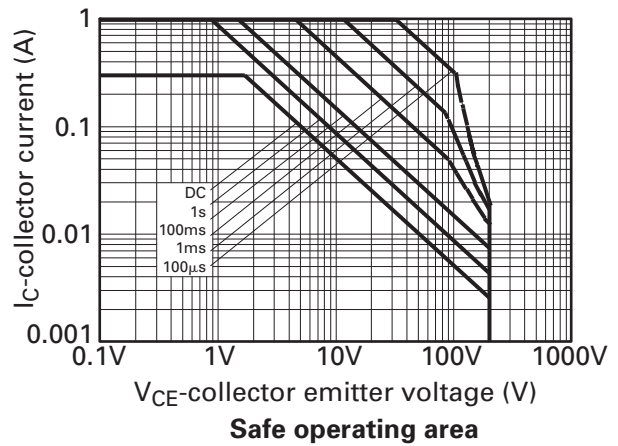
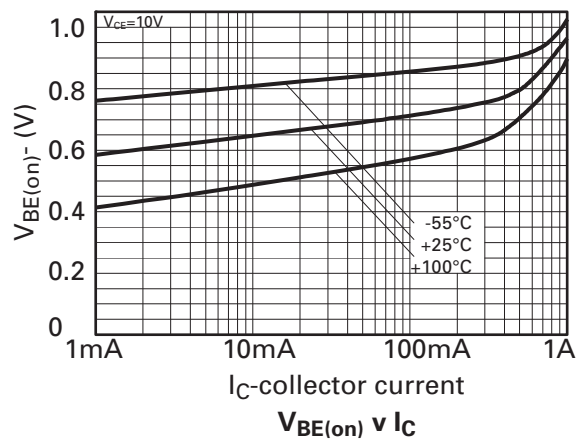
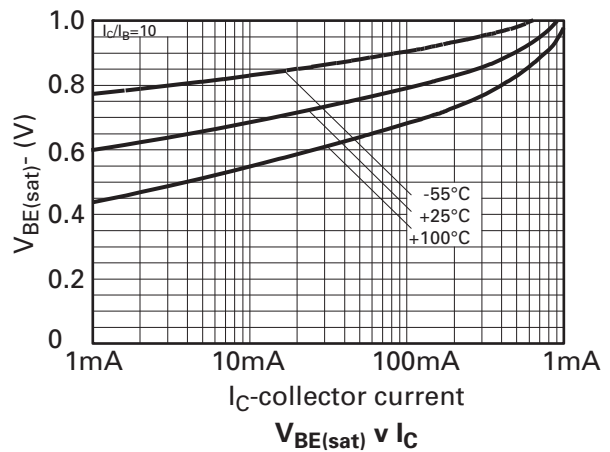
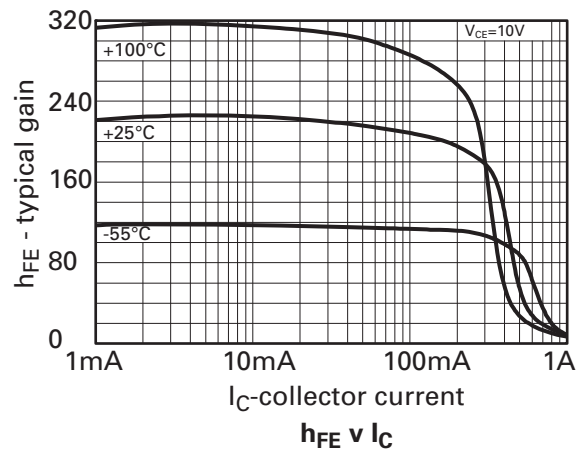
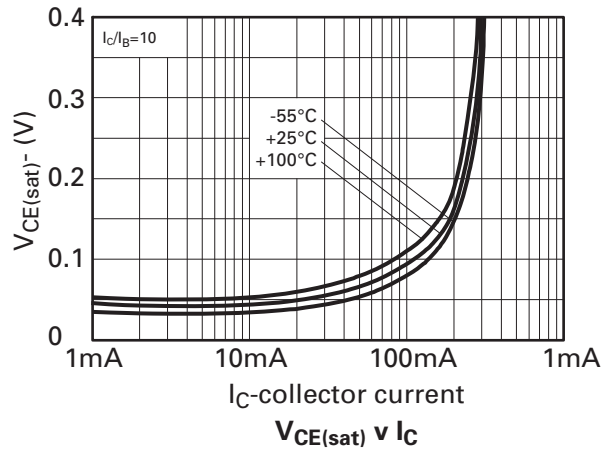
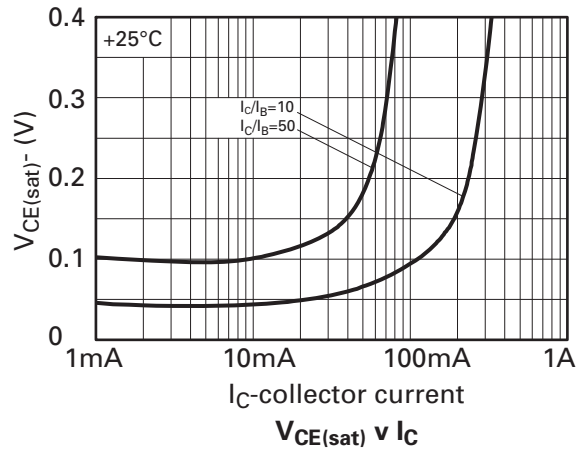
## Electrical characteristics ( $T_{amb} = 25^{\circ}\text{C}$ )

| Parameter                             | Symbol                           | Min.                   | Typ.                  | Max.          | Unit   | Conditions                                                                                                                                                                                                           |
|---------------------------------------|----------------------------------|------------------------|-----------------------|---------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-base breakdown voltage      | $V_{(BR)CBO}$                    | -220                   |                       |               | V      | $I_C = -100\mu\text{A}$                                                                                                                                                                                              |
| Collector-emitter breakdown voltage   | $V_{(BR)CEO}$                    | -200                   |                       |               | V      | $I_C = -10\text{mA}^{(*)}$                                                                                                                                                                                           |
| Emitter-base breakdown voltage        | $V_{(BR)EBO}$                    | -5                     |                       |               | V      | $I_E = -100\mu\text{A}$                                                                                                                                                                                              |
| Collector cut-off current             | $I_{CBO}$                        |                        |                       | -100          | nA     | $V_{CB} = -200\text{V}$                                                                                                                                                                                              |
| Emitter cut-off current               | $I_{EBO}$                        |                        |                       | -100          | nA     | $V_{EB} = -4\text{V}$                                                                                                                                                                                                |
| Collector-emitter cut-off current     | $I_{CES}$                        |                        |                       | -100          | nA     | $V_{CES} = -200\text{V}$                                                                                                                                                                                             |
| Collector-emitter saturation voltage  | $V_{CE(sat)}$                    |                        |                       | -0.2<br>-0.35 | V<br>V | $I_C = -100\text{mA}$ , $I_B = -10\text{mA}$ ,<br>$I_B = -250\text{mA}$ ,<br>$I_B = -25\text{mA}^{(*)}$                                                                                                              |
| Base-emitter saturation voltage       | $V_{BE(sat)}$                    |                        |                       | -1.0          | V      | $I_C = -250\text{mA}$ , $I_B = -25\text{mA}^{(*)}$                                                                                                                                                                   |
| Base-emitter turn-on voltage          | $V_{BE(on)}$                     |                        |                       | -0.9          | V      | $I_C = -250\text{mA}$ ,<br>$V_{CE} = -10\text{V}^{(*)}$                                                                                                                                                              |
| Static forward current transfer ratio | $h_{FE}$                         | 100<br>100<br>85<br>35 |                       | 300           |        | $I_C = -1\text{mA}$ , $V_{CE} = -10\text{V}$<br>$I_C = -100\text{mA}$ , $V_{CE} = -10\text{V}^{(*)}$<br>$I_C = -250\text{mA}$ , $V_{CE} = -10\text{V}^{(*)}$<br>$I_C = -400\text{mA}$ , $V_{CE} = -10\text{V}^{(*)}$ |
| Transition frequency                  | $f_T$                            | 150                    |                       |               | MHz    | $I_C = -50\text{mA}$ , $V_{CE} = -10\text{V}$ ,<br>$f = 100\text{MHz}$                                                                                                                                               |
| Output capacitance                    | $C_{obo}$                        |                        |                       | 10            | pF     | $V_{CB} = -10\text{V}$ , $f = 1\text{MHz}$                                                                                                                                                                           |
| Switching times                       | $t_d$<br>$t_r$<br>$t_s$<br>$t_f$ |                        | 22<br>19<br>472<br>70 |               | ns     | $I_C = -200\text{mA}$ , $V_{CC} = -80\text{V}$<br>$I_{b1} = I_{b2} = -20\text{mA}$                                                                                                                                   |
| Switching times                       | $t_d$<br>$t_r$<br>$t_s$<br>$t_f$ |                        | 44<br>31<br>665<br>76 |               | ns     | $I_C = -100\text{mA}$ , $V_{CC} = -80\text{V}$<br>$I_{b1} = I_{b2} = -10\text{mA}$                                                                                                                                   |

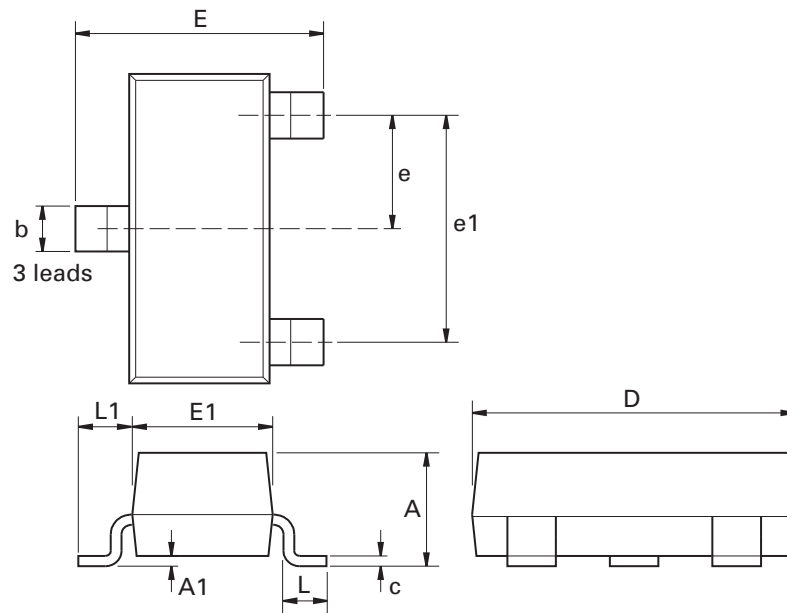
### NOTES:

(\*) Measured under pulsed conditions. Pulse width =  $300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

## Typical characteristics



## Package outline - SOT23



| 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

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|                                   |                                                                                |
|-----------------------------------|--------------------------------------------------------------------------------|
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| "Not recommended for new designs" | Device is still in production to support existing designs and production       |
| "Obsolete"                        | Production has been discontinued                                               |

### Datasheet status key:

|                       |                                                                                                                                                                                                             |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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