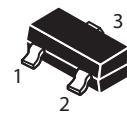
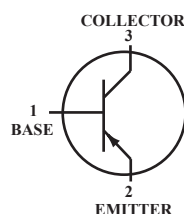


General Purpose Transistor PNP Silicon

Pb Lead(Pb)-Free



SOT-23

Maximum Ratings

| Rating | Symbol | Value | Unit |
|---|---------------|-------------|--------------------|
| Collector-Base Breakdown Voltage | $V_{(BR)CEO}$ | -60 | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CBO}$ | -80 | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -5.0 | V |
| Collector Current | I_C | -1.0 | A |
| Power Dissipation $T_A=25^{\circ}\text{C}$ | P_D | 500 | mW |
| Junction Temperature Range | T_J | +150 | $^{\circ}\text{C}$ |
| Storage Temperature Range | T_{STG} | -55 to +150 | $^{\circ}\text{C}$ |

Device Marking

FMMT591=591

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ Unless Otherwise noted)

| Characteristics | Symbol | Min | Typ | Max | Unit |
|-----------------|--------|-----|-----|-----|------|
|-----------------|--------|-----|-----|-----|------|

Off Characteristics

| | | | | | |
|--|---------------|------|---|------|---------------|
| Collector-Emitter Breakdown Voltage ¹ $I_C = -1.0\text{mA}, I_B = 0$ | $V_{(BR)CEO}$ | -60 | - | - | V |
| Collector-Base Breakdown Voltage $I_C = -100\mu\text{A}, I_E = 0$ | $V_{(BR)CBO}$ | -80 | - | - | V |
| Collector Cutoff Current $I_C = 0, I_E = -100\mu\text{A}$ | $V_{(BR)EBO}$ | -5.0 | - | - | V |
| Collector Cut-off Current $V_{CB} = -60\text{V}, I_E = 0$ | I_{CBO} | - | - | -0.1 | μA |
| Emitter Cut-off Current $V_{EB} = -4.0\text{V}, I_C = 0$ | I_{EBO} | - | - | -0.1 | μA |

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ Unless Otherwise noted)

| Characteristics | Symbol | Min | Typ | Max | Unit |
|-----------------|--------|-----|-----|-----|------|
|-----------------|--------|-----|-----|-----|------|

On Characteristics ⁽¹⁾

| | | | | | |
|---|--|------------------------|------------------|--------------------|---|
| DC Current Gain $V_{CE} = -5.0\text{V}, I_C = -1.0\text{mA}$ $V_{CE} = -5.0\text{V}, I_C = -500\text{mA}$ $V_{CE} = -5.0\text{V}, I_C = -1.0\text{A}$ $V_{CE} = -5.0\text{V}, I_C = -2.0\text{A}$ | h_{FE1} h_{FE2} h_{FE3} h_{FE4} | 100 100 80 15 | - - - - | - 300 - - | - |
| Collector-Emitter Saturation Voltage $I_C = -500\text{mA}, I_B = -50\text{mA}$ $I_C = -1.0\text{A}, I_B = -100\text{mA}$ | $V_{CE(sat)}$ | - | - | -0.3 -0.6 | V |
| Base-Emitter Saturation Voltage $I_C = -1.0\text{A}, I_B = -100\text{mA}$ | $V_{BE(sat)}$ | - | - | -1.2 | V |
| Base-Emitter Saturation Voltage $V_{CE} = -5.0\text{A}, I_C = -1.0\text{A}$ | V_{BE} | - | - | -1.0 | V |

Small-signal Characteristics

| | | | | | |
|---|----------|-----|---|----|-----|
| Transition Frequency $V_{CE} = -10\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$ | f_T | 150 | - | - | MHz |
| Output Capacitance $V_{CB} = -10\text{V}, f = 1.0\text{MHz}$ | C_{ob} | - | - | 10 | pF |

1. Measured under pulsed conditions, Pulse width = 300 μs , Duty cycle $\leq 2\%$.

TYPICAL TRANSIENT CHARACTERISTICS

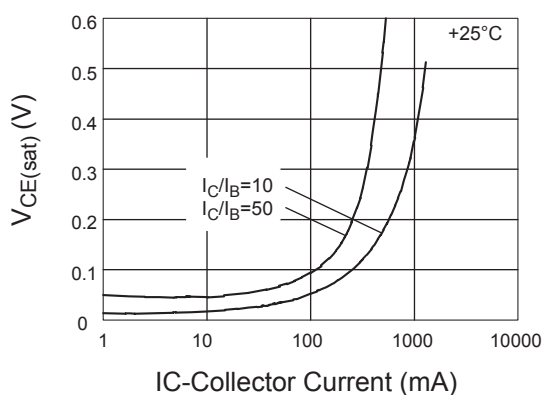


Fig.1 $V_{CE(sat)}$ vs I_C

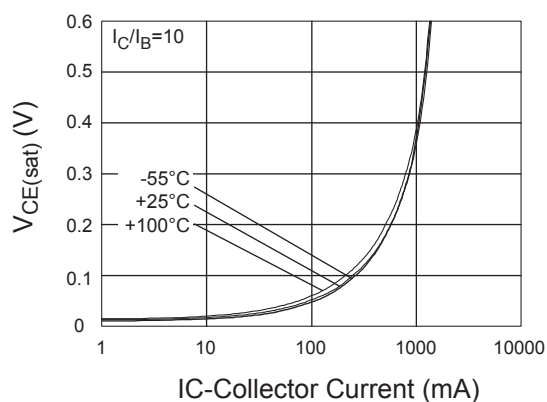


Fig.2 $V_{CE(sat)}$ vs I_C

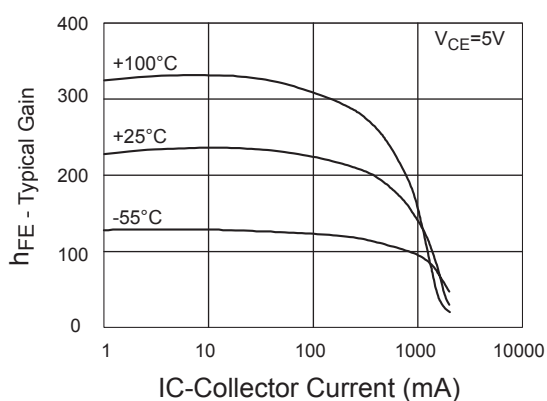


Fig.3 h_{FE} vs I_C

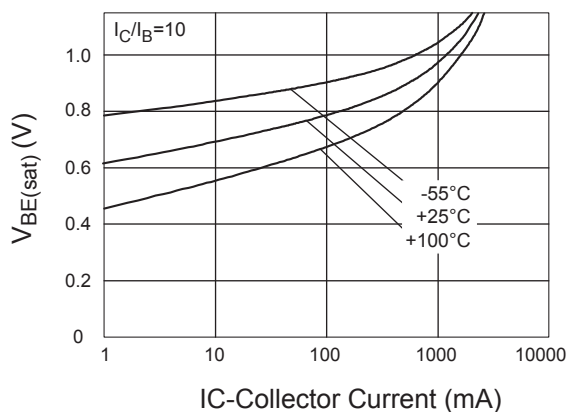


Fig.4 $V_{BE(sat)}$ vs I_C

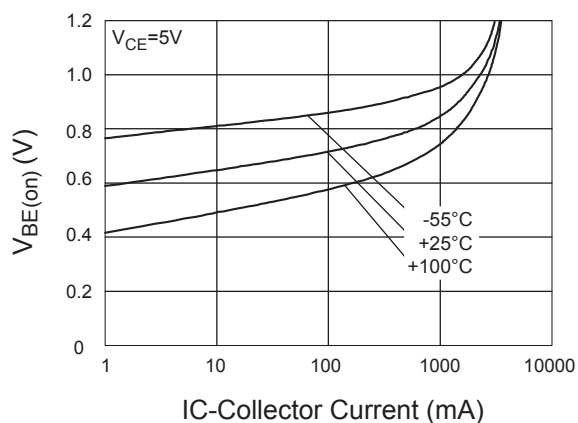


Fig.5 $V_{BE(on)}$ vs I_C

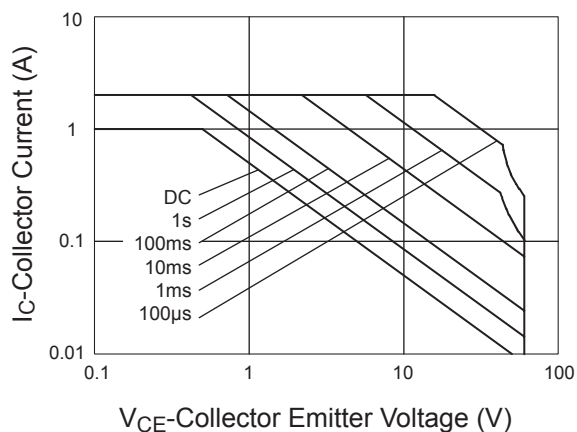
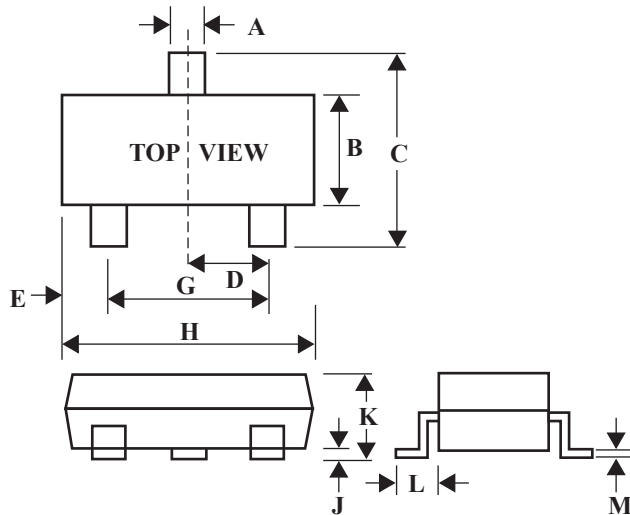


Fig.6 Safe Operating Area

SOT-23 Package Outline Dimensions

Unit:mm



| Dim | Min | Max |
|-----|-------|------|
| A | 0.35 | 0.51 |
| B | 1.19 | 1.40 |
| C | 2.10 | 3.00 |
| D | 0.85 | 1.05 |
| E | 0.46 | 1.00 |
| G | 1.70 | 2.10 |
| H | 2.70 | 3.10 |
| J | 0.01 | 0.13 |
| K | 0.89 | 1.10 |
| L | 0.30 | 0.61 |
| M | 0.076 | 0.25 |