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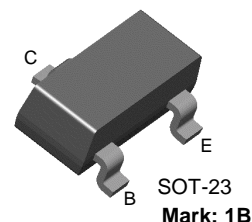
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MMBT2222

MMBT2222

NPN General Purpose Amplifier

- Sourced from process 19.



Absolute Maximum Ratings* $T_a=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Ratings | Units |
|----------------|--|-----------|------------------|
| V_{CEO} | Collector-Emitter Voltage | 30 | V |
| V_{CBO} | Collector-Base Voltage | 60 | V |
| V_{EBO} | Emitter-Base Voltage | 5.0 | V |
| I_C | Collector Current - Continuous | 0.6 | A |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | -55 ~ 150 | $^\circ\text{C}$ |

* This ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- These rating are based on a maximum junction temperature of 150 degrees C.
- These are steady limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Electrical Characteristics $T_a=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|----------------------------|--|--|-----------------------------------|------------|---------------|
| Off Characteristics | | | | | |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage * | $I_C = 10\text{mA}, I_B = 0$ | 30 | | V |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C = 10\mu\text{A}, I_E = 0$ | 60 | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E = 10\mu\text{A}, I_C = 0$ | 5.0 | | V |
| I_{CBO} | Collector Cutoff Current | $V_{CB} = 50\text{V}, I_E = 0$ $V_{CB} = 50\text{V}, I_E = 0, T_a = 125^\circ\text{C}$ | | 10 | μA |
| I_{EBO} | Emitter Cutoff Current | $V_{EB} = 3.0\text{V}, I_C = 0$ | | 10 | nA |
| On Characteristics | | | | | |
| h_{FE} | DC Current Gain | $I_C = 0.1\text{mA}, V_{CE} = 10\text{V}$ $I_C = 1.0\text{mA}, V_{CE} = 10\text{V}$ $I_C = 10\text{mA}, V_{CE} = 10\text{V}$ $I_C = 150\text{mA}, V_{CE} = 10\text{V}^*$ $I_C = 150\text{mA}, V_{CE} = 1.0\text{V}^*$ $I_C = 500\text{mA}, V_{CE} = 10\text{V}^*$ | 35 50 75 100 50 30 | 300 | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage * | $I_C = 150\text{mA}, I_B = 15\text{V}$ $I_C = 500\text{mA}, I_B = 50\text{V}$ | | 0.4 1.6 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C = 150\text{mA}, I_B = 15\text{V}$ $I_C = 500\text{mA}, I_B = 50\text{V}$ | | 1.3 2.6 | V |

Electrical Characteristics (Continued) $T_a=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|-------------------------------------|-------------------------------|--|------|------|-------|
| Small Signal Characteristics | | | | | |
| f_T | Curent Gain Bandwidth Product | $I_C = 20\text{mA}$, $V_{CE} = 20\text{V}$, $f = 100\text{MHz}$ | 250 | | |
| C_{obo} | Output Capacitance | $V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$ | | 8.0 | pF |
| C_{ibo} | Input Capacitance | $V_{EB} = 0.5\text{V}$, $I_C = 0$, $f = 1\text{MHz}$ | | 30 | pF |
| Switching Characteristics | | | | | |
| t_d | Delay Time | $V_{CC} = 30\text{V}$, $V_{BE(OFF)} = 0.5\text{V}$, $I_C = 150\text{mA}$, $I_{B1} = 15\text{mA}$ | | 10 | ns |
| t_r | Rise Time | | | 25 | ns |
| t_s | Storage Time | $V_{CC} = 30\text{V}$, $I_C = 150\text{mA}$, $I_{B1} = I_{B2} = 15\text{mA}$ | | 225 | ns |
| t_f | Fall Time | | | 60 | ns |

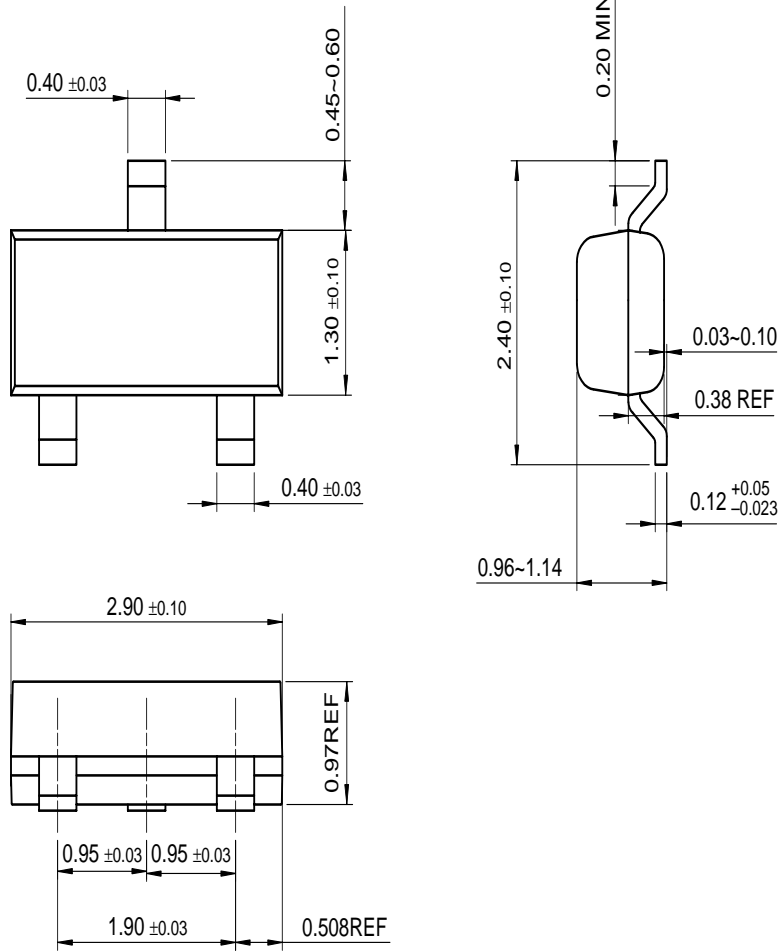
* Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$ **Thermal Characteristics** $T_a=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Max. | Units |
|-----------------|---|------|----------------------|
| P_D | Total Device Dissipation | 350 | mW |
| | Derate above 25°C | 2.8 | mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 357 | $^\circ\text{C/W}$ |

* Device mounted on FR-4PCB $1.6" \times 1.6" \times 0.06"$.

Package Dimensions

SOT-23



Dimensions in Millimeters

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