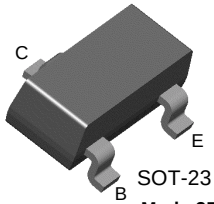
# MMBTH10RG

## NPN RF Transistor

- This device is designed for use in low noise UHF/VHF amplifiers, with collector currents in the 100 μA to 20 mA range in common emitter or common base mode of operations, and in low frequency drift, high output UHF oscillators.
- Sourced from process 42.




SOT-23
**Mark: 3E**

1. Base 2. Emitter 3. Collector

## Absolute Maximum Ratings* $T_a$=25°C unless otherwise noted

| Symbol | Parameter | Ratings | Units |
|---|---|---|---|
| $V_{CEO}$ | Collector-Emitter Voltage | 40 | V |
| $V_{CBO}$ | Collector-Base Voltage | 40 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 4.0 | V |
| $I_C$ | Collector Current - Continuous | 50 | mA |
| $T_J$, $T_{STG}$ | Operating and Storage Junction Temperature Range | -55 ~ 150 | °C |

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

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

## Electrical Characteristics $T_a$=25°C unless otherwise noted

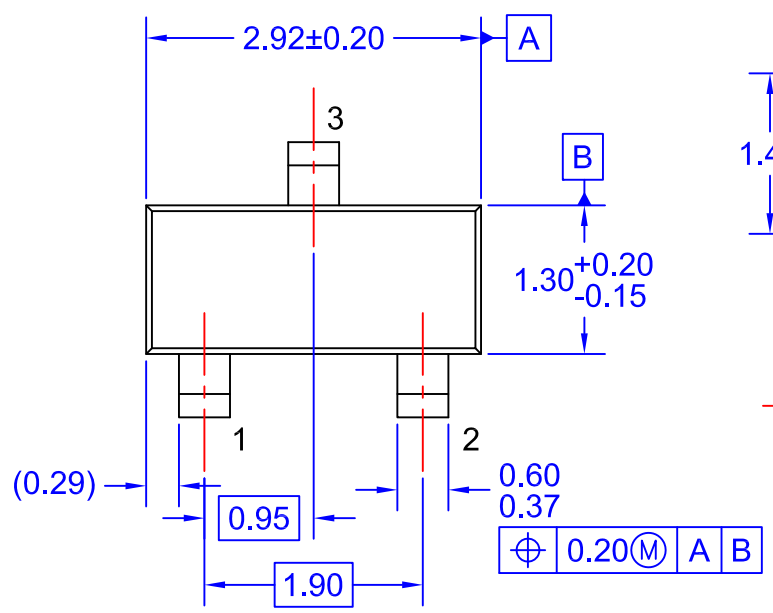
| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|---|---|---|---|---|---|
| **Off Characteristics** | | | | | |
| $V_{(BR)CEO}$ | Collector-Emitter Sustaining Voltage * | $I_C$ = 1.0 mA, $I_B$ = 0 | 40 | | V |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C$ = 10 μA, $I_E$ = 0 | 40 | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E$ = 1.0 μA, $I_C$ = 0 | 4.0 | | V |
| $I_{CBO}$ | Collector Cutoff Current | $V_{CB}$ = 30 V, $I_E$ = 0 | | 100 | nA |
| **On Characteristics** | | | | | |
| $h_{FE}$ | DC Current Gain | $I_C$ = 1.0 mA, $V_{CE}$ = 6.0 V | 50 | 120 | V |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C$ = 10 mA, $I_B$ = 5.0 mA | | 0.2 | V |
| **Small Signal Characteristics** | | | | | |
| $f_T$ | Current Gain - Bandwidth Product | $I_C$ = 2.0 mA, $V_{CE}$ = 10 V, f = 100 MHz | 450 | | MHz |
| $C_{cb}$ | Collector-Base Capacitance | $V_{CB}$ = 10 V, $I_E$ = 0, f = 1.0 MHz | | 0.6 | pF |
| rb'Cc | Collector Base Time Constant | $I_C$ = 5.0 mA, $V_{CB}$ = 10 V, f = 79.8 MHz | | 12 | pS |

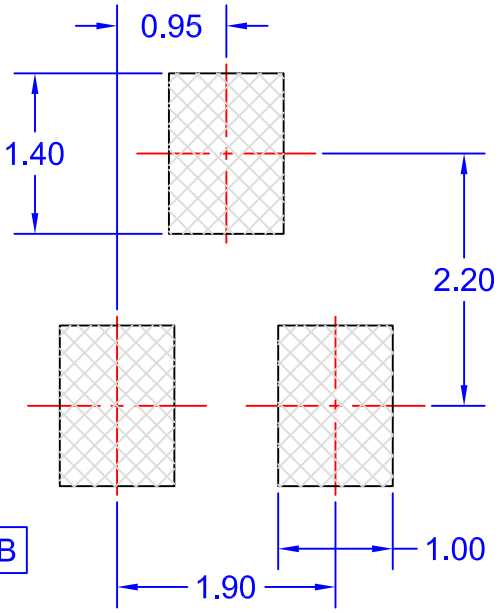
* Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

## Thermal Characteristics $T_a$=25°C unless otherwise noted

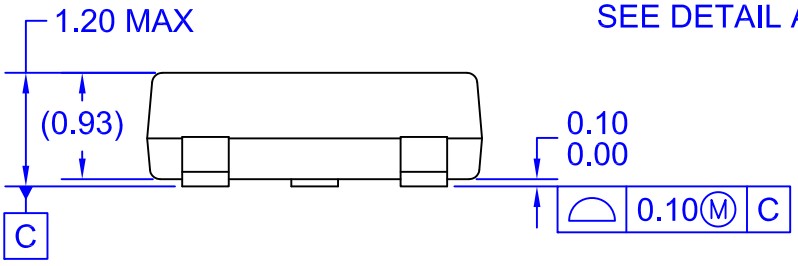
| Symbol | Parameter | Max. | Units |
|---|---|---|---|
| $P_D$ | Total Device Dissipation<br>Derate above 25°C | 225<br>1.8 | mW<br>mW/°C |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 556 | °C/W |

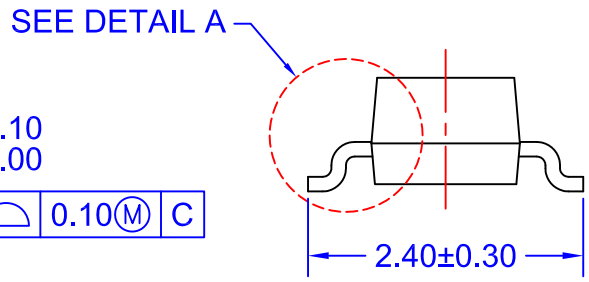
*Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

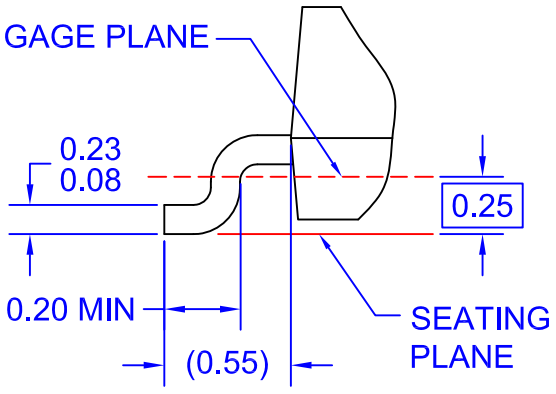



LAND PATTERN
RECOMMENDATION




DETAIL A
SCALE: 2X

NOTES: UNLESS OTHERWISE SPECIFIED

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