

6367254 MOTOROLA SC (XSTRS/R F)

96D 82029 D

T-31-15

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--------------------------------|-----------|-------|------|
| Collector-Emitter Voltage | V_{CE0} | 15 | Vdc |
| Collector-Base Voltage | V_{CB0} | 30 | Vdc |
| Emitter-Base Voltage | V_{EB0} | 3.0 | Vdc |
| Collector Current — Continuous | I_C | 350 | mAdc |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--|-----------------|-----|----------------------------|
| Total Device Dissipation FR-5 Board,* $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 225 | mW |
| Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | 1.8 | $^\circ\text{C}/\text{mW}$ |
| Total Device Dissipation Alumina Substrate,** $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 300 | mW |
| Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | 2.4 | $^\circ\text{C}/\text{mW}$ |
| Junction and Storage Temperature | T_J, T_{stg} | 150 | $^\circ\text{C}$ |

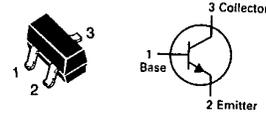
*FR-5 = 1.0 x 0.75 x 0.62 in.

**Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

DEVICE MARKING

MMBT918 = 3B

MMBT918

CASE 318-02/03, STYLE 6
SOT-23 (TO-236AA/AB)

VHF/UHF TRANSISTOR

NPN SILICON

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

| Characteristic | Symbol | Min | Max | Unit |
|---|---------------|-----|------------|------|
| OFF CHARACTERISTICS | | | | |
| Collector-Emitter Breakdown Voltage ($I_C = 3.0 \text{ mAdc}, I_B = 0$) | $V_{(BR)CEO}$ | 15 | — | Vdc |
| Collector-Base Breakdown Voltage ($I_C = 1.0 \mu\text{Adc}, I_E = 0$) | $V_{(BR)CBO}$ | 30 | — | Vdc |
| Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}, I_C = 0$) | $V_{(BR)EBO}$ | 3.0 | — | Vdc |
| Collector Cutoff Current ($V_{CB} = 15 \text{ Vdc}, I_E = 0$) | I_{CBO} | — | 50 | nAdc |
| ON CHARACTERISTICS | | | | |
| DC Current Gain ($I_C = 3.0 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$) | h_{FE} | 20 | — | — |
| Collector-Emitter Saturation Voltage ($I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$) | $V_{CE(sat)}$ | — | 0.4 | Vdc |
| Base-Emitter Saturation Voltage ($I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$) | $V_{BE(sat)}$ | — | 1.0 | Vdc |
| SMALL-SIGNAL CHARACTERISTICS | | | | |
| Current-Gain — Bandwidth Product ($I_C = 4.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 100 \text{ MHz}$) | f_T | 600 | — | MHz |
| Output Capacitance ($V_{CB} = 0 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$) ($V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$) | C_{obo} | — | 3.0 1.7 | pF |
| Input Capacitance ($V_{EB} = 0.5 \text{ Vdc}, I_C = 0, f = 1.0 \text{ MHz}$) | C_{ibo} | — | 2.0 | pF |
| Noise Figure ($I_C = 1.0 \text{ mAdc}, V_{CE} = 6.0 \text{ Vdc}, R_S = 50 \Omega$, $f = 60 \text{ MHz}$) (Figure 1) | NF | — | 6.0 | dB |
| Power Output ($I_C = 8.0 \text{ mAdc}, V_{CB} = 15 \text{ Vdc}, f = 500 \text{ MHz}$) | P_{out} | 30 | — | mW |
| Common-Emitter Amplifier Power Gain ($I_C = 6.0 \text{ mAdc}, V_{CB} = 12 \text{ Vdc}, f = 200 \text{ MHz}$) | G_{pe} | 11 | — | dB |

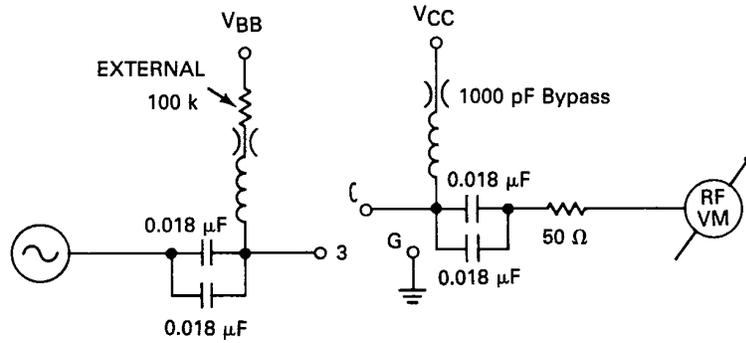
MOTOROLA SMALL-SIGNAL SEMICONDUCTORS

6367254 MOTOROLA SC (XSTRS/R F)
MMBT918

96D 82030 D

T-31-15

FIGURE 1 — NF, G_{pe} MEASUREMENT CIRCUIT 20-200



NF Test Conditions

- I_C = 1.0 Amp
- V_{CE} = 6.0 Volts
- R_S = 50 Ω
- f = 60 MHz

G_{pe} Test Conditions

- I_C = 6.0 mA
- V_{CE} = 12 Volts
- f = 200 MHz

