

The RF Line

PNP Silicon

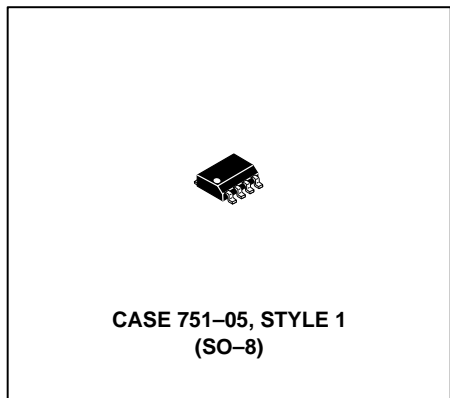
High-Frequency Transistor

... designed for amplifier, oscillator or frequency multiplier applications in industrial equipment. Suitable for use as a Class A, B or C output driver or pre-driver stages in VHF and UHF.

- Low Cost SORF Plastic Surface Mount Package
- Guaranteed RF Specification — $|S_{21}|^2$
- S-Parameter Characterization
- Tape and Reel Packaging Options Available by adding suffix:
R1 suffix = 500 units per reel
R2 suffix = 2,500 units per reel



I_C = -500 mA
SURFACE MOUNT
HIGH-FREQUENCY
TRANSISTOR
PNP SILICON



MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Collector-Emitter Voltage | V _{CEO} | -30 | V |
| Collector-Base Voltage | V _{CBO} | -30 | V |
| Emitter-Base Voltage | V _{EBO} | -3.0 | V |
| Collector Current — Continuous | I _C | -500 | mA |
| Operating and Storage Junction Temperature Range | T _J , T _{stg} | -55 to +150 | °C |

DEVICE MARKING

| |
|----------------|
| MRF5583 = 5583 |
|----------------|

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|------------------|------------|---------------|
| Total Device Dissipation @ T _A = 25°C Derate above 25°C | P _D | 1.0 8.0 | Watt mW/°C |
| Storage Temperature | T _{stg} | 150 | °C |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 125 | °C/W |

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | |
|---|----------------------|-----|---|------|----|
| Collector-Emitter Breakdown Voltage (I _C = -10 mA) | V _{(BR)CEO} | -30 | — | — | V |
| Collector-Base Breakdown Voltage (I _C = -10 μA) | V _{(BR)CBO} | -30 | — | — | V |
| Emitter-Base Breakdown Voltage (I _E = -100 μA) | V _{(BR)EBO} | -3 | — | — | V |
| Collector Cutoff Current (V _{CB} = -20 V) | I _{CBO} | — | — | -1.0 | μA |
| Emitter Cutoff Current (V _{EB} = -2.0 V) | I _{EBO} | — | — | -0.5 | μA |

ON CHARACTERISTICS

| | | | | | |
|---|----------------------|----------------|-------------|---------------|---|
| DC Current Gain (I _C = -40 mA, V _{CE} = -2.0 V) (I _C = -100 mA, V _{CE} = -2.0 V) (I _C = -300 mA, V _{CE} = -5.0 V) | h _{FE} | 20 25 15 | — — — | — 100 — | — |
| Collector-Emitter Saturation Voltage (I _C = -100 mA, I _B = -10 mA) | V _{CE(sat)} | — | — | 0.8 | V |
| Base-Emitter On Voltage (I _C = -100 mA, V _{CE} = -2.0 V) | V _{BE(on)} | — | — | 1.8 | V |

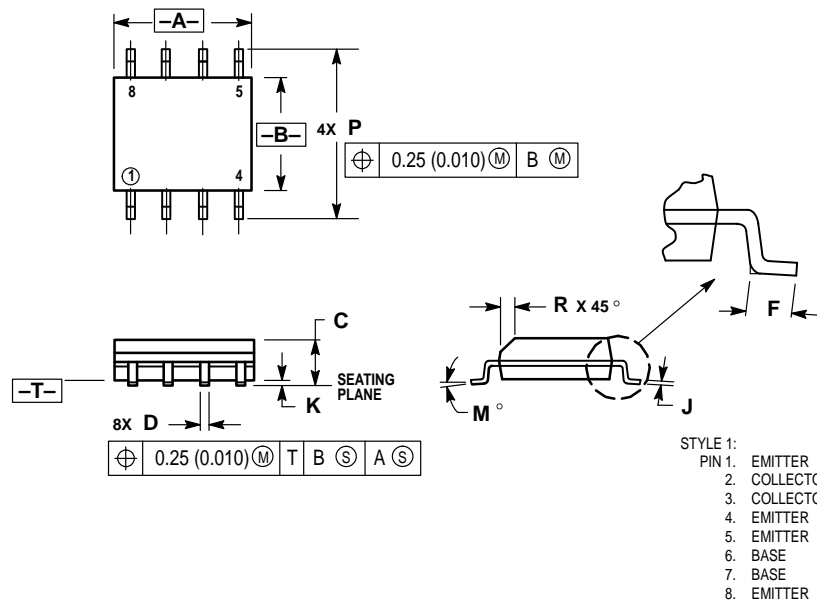
SMALL-SIGNAL CHARACTERISTICS

| | | | | | |
|---|--------------------------------|------|------|---|-----|
| Current-Gain — Bandwidth Product (I _C = -35 mA, V _{CE} = -15 V, f = 100 MHz) | f _T | — | 2100 | — | MHz |
| Insertion Gain (V _{CE} = -15 V, I _C = -35 mA, f = 250 MHz) | S ₂₁ ² | 12.5 | 15.5 | — | dB |

| V _{CE} (Volts) | I _C (mA) | f (MHz) | S ₁₁ | | S ₂₁ | | S ₁₂ | | S ₂₂ | |
|----------------------------|------------------------|------------|-----------------|------|-----------------|-----|-----------------|----|-----------------|------|
| | | | S ₁₁ | ∠ | S ₂₁ | ∠ | S ₁₂ | ∠ | S ₂₂ | ∠ |
| -15 | -35 | 10 | 0.47 | -57 | 64.7 | 155 | 0.01 | 60 | 0.83 | -26 |
| | | 30 | 0.59 | -116 | 42.2 | 126 | 0.02 | 44 | 0.56 | -58 |
| | | 50 | 0.63 | -140 | 28.8 | 113 | 0.02 | 39 | 0.39 | -74 |
| | | 70 | 0.64 | -151 | 21.4 | 105 | 0.02 | 42 | 0.30 | -82 |
| | | 100 | 0.65 | -161 | 15.4 | 97 | 0.02 | 45 | 0.24 | -80 |
| | | 300 | 0.67 | 179 | 5.23 | 79 | 0.05 | 58 | 0.13 | -109 |
| | | 500 | 0.67 | 168 | 3.11 | 66 | 0.07 | 60 | 0.20 | -114 |
| | | 700 | 0.67 | 160 | 2.24 | 57 | 0.09 | 60 | 0.24 | -116 |
| | | 1000 | 0.66 | 146 | 1.54 | 44 | 0.13 | 60 | 0.30 | -123 |

Table 1. Common Emitter S-Parameters


PACKAGE DIMENSIONS



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: MILLIMETER.
 3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
 4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
 5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.80 | 5.00 | 0.189 | 0.196 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 1.35 | 1.75 | 0.054 | 0.068 |
| D | 0.35 | 0.49 | 0.014 | 0.019 |
| F | 0.40 | 1.25 | 0.016 | 0.049 |
| G | 1.27 BSC | | 0.050 BSC | |
| J | 0.18 | 0.25 | 0.007 | 0.009 |
| K | 0.10 | 0.25 | 0.004 | 0.009 |
| M | 0° | 7° | 0° | 7° |
| P | 5.80 | 6.20 | 0.229 | 0.244 |
| R | 0.25 | 0.50 | 0.010 | 0.019 |

**CASE 751-05
ISSUE M**

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