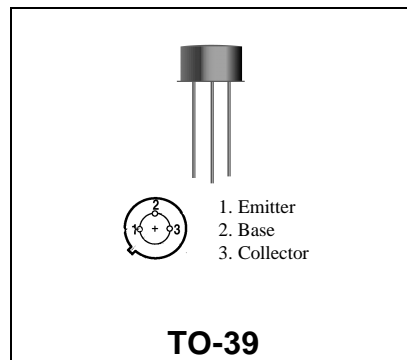


MRF1001A

**RF & MICROWAVE DISCRETE
 LOW POWER TRANSISTORS**

Features

- Silicon NPN, To-39 packaged VHF/UHF Transistor
- $f_{tau} = 3.0 \text{ GHz (typ) @ 300MHz, 14v, 90mA,}$
- $G_{U \text{ max}} = 11.5 \text{ dB (typ) @ 300 MHz, 14v, 90mA}$
- $|S_{21}|^2 = 11 \text{ dB (typ) @ 300 MHz, 14v, 90mA}$



DESCRIPTION:

Silicon NPN transistor, designed for VHF and UHF equipment. Applications include amplifier; pre-driver, driver, and output stages. Also suitable for oscillator and frequency-multiplier functions.

ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}\text{C}$)

| Symbol | Parameter | Value | Unit |
|-----------|------------------------|-------|------|
| V_{CEO} | Collector-Emitter | 20 | Vdc |
| V_{CBO} | Collector-Base Voltage | 30 | Vdc |
| V_{EBO} | Emitter-Base Voltage | 3.5 | Vdc |
| I_C | Collector Current | 200 | mA |

Thermal Data

| | | | |
|-------|--|-------------|---------------------------------|
| P_D | Total Device Dissipation @ $T_A = 25^{\circ}\text{C}$ Derate above 25°C | 1.0 5.71 | Watts mW/ $^{\circ}\text{C}$ |
|-------|--|-------------|---------------------------------|

MRF1001A

ELECTRICAL SPECIFICATIONS (Tcase = 25°C)

STATIC
 (off)

| Symbol | Test Conditions | Value | | | Unit |
|----------|---|-------|------|------|------|
| | | Min. | Typ. | Max. | |
| BVCEO | Collector-Emitter Breakdown Voltage (IC = 5.0 mAdc) | 20 | - | - | Vdc |
| BVEBO | Emitter-Base Breakdown Voltage (IC= 0.1 mAdc) | 3.5 | - | - | Vdc |
| BVCBO | Collector-Base Breakdown Voltage (IC=1.0 mAdc) | 30 | - | - | Vdc |
| ICBO | Collector-Base (VCB = 10 Vdc) | - | 50 | - | μA |
| VCE(sat) | Collector-Emitter Saturation Voltage (IC = 50mA, IC/IB = 10) | - | 100 | - | mV |

(on)

| | | | | | |
|-----|--|----|---|-----|---|
| HFE | DC Current Gain (IC = 50 mAdc, VCE = 5.0 Vdc) | 50 | - | 300 | - |
|-----|--|----|---|-----|---|

DYNAMIC

| Symbol | Test Conditions | Value | | | Unit |
|----------------|---|-------|------|------|------|
| | | Min. | Typ. | Max. | |
| f _T | Current-Gain - Bandwidth Product (IC = 90 mAdc, VCE = 14 Vdc, f = 300 MHz) | - | 3.0 | - | GHz |

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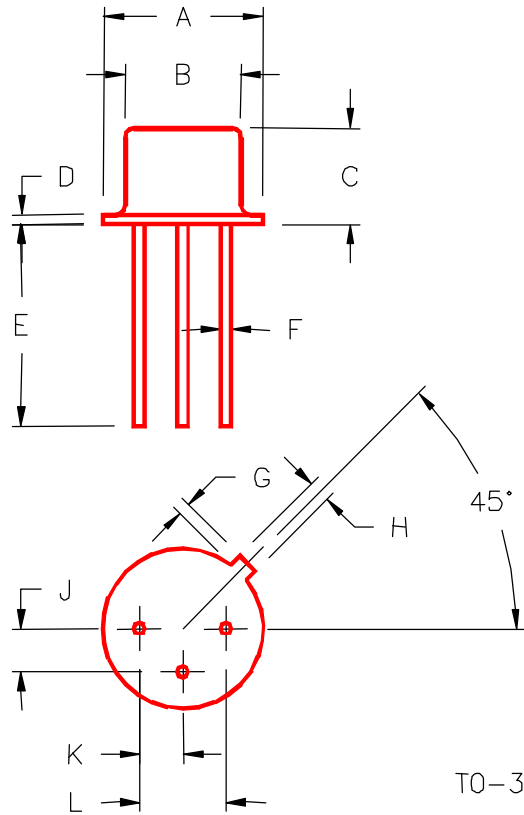
FUNCTIONAL

| Symbol | Test Conditions | | Value | | | Unit |
|--------------|-----------------------------|---|-------|-------|------|------|
| | | | Min. | Typ. | Max. | |
| $G_{U \max}$ | Maximum Unilateral Gain (1) | IC = 90 mAdc, VCE = 14Vdc, f = 300 MHz | - | 11.5 | - | dB |
| MAG | Maximum Available Gain | IC = 90 mAdc, VCE = 14Vdc, f = 300 MHz | - | 11.7 | - | dB |
| $ S_{21} ^2$ | Insertion Gain | IC = 90 mAdc, VCE = 14Vdc, f = 300 MHz | 10 | 11.13 | - | dB |

Table 1. Common Emitter S-Parameters, @ VCE = 14 V, IC = 90 mA

| f (MHz) | S11 | | S21 | | S12 | | S22 | |
|------------|------|---------------|-----|---------------|------|---------------|------|---------------|
| | S11 | $\angle \phi$ | S21 | $\angle \phi$ | S12 | $\angle \phi$ | S22 | $\angle \phi$ |
| 100 | .165 | -17 | 9.7 | 98 | .058 | 79 | .411 | -32 |
| 200 | .113 | -77 | 5.2 | 80 | .115 | 73 | .302 | -36 |
| 300 | .061 | 63 | 3.6 | 76 | .169 | 76 | .298 | -42 |
| 400 | .003 | -49 | 2.7 | 66 | .225 | 68 | .287 | -67 |
| 500 | .063 | 117 | 2.3 | 57 | .281 | 61 | .235 | -80 |
| 600 | .069 | 140 | 1.9 | 54 | .320 | 60 | .245 | -90 |
| 700 | .135 | 150 | 1.9 | 48 | .397 | 58 | .232 | -104 |
| 800 | .179 | 144 | 1.7 | 39 | .447 | 49 | .237 | -124 |
| 900 | .282 | 146 | 1.6 | 33 | .476 | 44 | .215 | -157 |
| 1000 | .362 | 132 | 1.5 | 36 | .510 | 47 | .220 | -177 |

PACKAGE STYLE M246



T0-39

| | MINIMUM INCHES/MM | MAXIMUM INCHES/MM | | MINIMUM INCHES/MM | MAXIMUM INCHES/MM |
|---|----------------------|----------------------|---|----------------------|----------------------|
| A | .350/8,89 | .370/9,40 | J | .095/2,41 | .105/2,67 |
| B | .315/8,00 | .335/8,51 | K | .095/2,41 | .105/2,67 |
| C | .240/6,10 | .260/6,60 | L | .190/4,83 | .210/5,33 |
| D | .015/0,38 | .045/1,14 | | | |
| E | .500/12,70 | | | | |
| F | .016/0,41 | .019/0,48 | | | |
| G | .029/0,74 | .040/1,02 | | | |
| H | .028/0,71 | .034/0,86 | | | |