

The RF Line

UHF Power Transistor

... designed primarily for wideband, large-signal output and driver amplifier stages to 1.0 GHz.

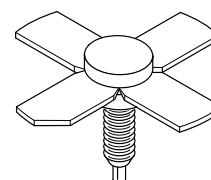
- Designed for Class A Linear Power Amplifiers
- Specified 25 Volt, 900 MHz Characteristics:
Output Power — 1.5 Watts
Power Gain — 8.0 dB Min, Class AB
- Gold Metallization for Improved Reliability

MRF1029

1.5 W, TO 1.0 GHz
LINEAR
UHF POWER TRANSISTOR
NPN SILICON

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|-----------|---------------|------------------------------|
| Collector-Emitter Voltage | V_{CEO} | 30 | Vdc |
| Collector-Base Voltage | V_{CBO} | 60 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 4.0 | Vdc |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 14.5 0.084 | Watts W/ $^\circ\text{C}$ |
| Operating Junction Temperature | T_J | 200 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -65 to +150 | $^\circ\text{C}$ |



CASE 244-04, STYLE 1
(.280 SOE)

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|-----|--------------------|
| Thermal Resistance, Junction to Case ($T_C = 70^\circ\text{C}$) | $R_{\theta JC}$ | 12 | $^\circ\text{C/W}$ |

ELECTRICAL CHARACTERISTICS

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

OFF CHARACTERISTICS

| | | | | | |
|--|---------------|-----|---|-----|------|
| Collector-Emitter Breakdown Voltage ($I_C = 10\text{ mA}$, $I_B = 0$) | $V_{(BR)CEO}$ | 30 | — | — | Vdc |
| Collector-Emitter Breakdown Voltage ($I_C = 10\text{ mA}$, $V_{BE} = 0$) | $V_{(BR)CES}$ | 60 | — | — | Vdc |
| Collector-Base Breakdown Voltage ($I_C = 10\text{ mA}$, $I_E = 0$) | $V_{(BR)CBO}$ | 60 | — | — | Vdc |
| Emitter-Base Breakdown Voltage ($I_E = 5.0\text{ mA}$, $I_C = 0$) | $V_{(BR)EBO}$ | 4.0 | — | — | Vdc |
| Collector Cutoff Current ($V_{CB} = 25\text{ V}$, $I_E = 0$) | I_{CBO} | — | — | 1.0 | mAdc |

ON CHARACTERISTICS

| | | | | | |
|---|----------|----|---|----|---|
| DC Current Gain ($I_C = 250\text{ mA}$, $V_{CE} = 5.0\text{ V}$) | h_{FE} | 20 | — | 80 | — |
|---|----------|----|---|----|---|

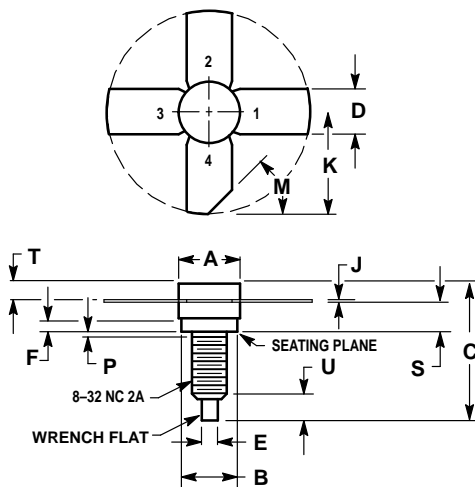
DYNAMIC CHARACTERISTICS

| | | | | | |
|--|----------|---|---|------|----|
| Output Capacitance ($V_{CB} = 28\text{ V}$, $I_E = 0$, $f = 1.0\text{ MHz}$) | C_{ob} | — | — | 4.75 | pF |
|--|----------|---|---|------|----|

FUNCTIONAL TESTS

| | | | | | |
|--|----------|--------------------------------|-----|---|----|
| Common-Emitter Amplifier Power Gain ($V_{CE} = 25\text{ V}$, $P_{out} = 1.5\text{ W}$, $f = 900\text{ MHz}$, $I_C = 0.2\text{ A}$) | G_{PE} | 8.0 | 9.3 | — | dB |
| Load Mismatch ($V_{CE} = 25\text{ V}$, $I_C = 0.2\text{ A}$, $P_{out} = 1.5\text{ W}$, $f = 900\text{ MHz}$, Load VSWR = $\infty:1$, All Phase Angles) | ψ | No Degradation in Output Power | | | |


PACKAGE DIMENSIONS



| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 7.06 | 7.26 | 0.278 | 0.286 |
| B | 6.20 | 6.50 | 0.244 | 0.256 |
| C | 14.99 | 16.51 | 0.590 | 0.650 |
| D | 5.46 | 5.96 | 0.215 | 0.235 |
| E | 1.40 | 1.65 | 0.055 | 0.065 |
| G | 1.52 | — | 0.060 | — |
| J | 0.08 | 0.17 | 0.003 | 0.007 |
| K | 11.05 | — | 0.435 | — |
| M | 45° | NOM | 45° | NOM |
| P | — | 1.27 | — | 0.050 |
| S | 3.00 | 3.25 | 0.118 | 0.128 |
| T | 1.40 | 1.77 | 0.055 | 0.070 |
| U | 2.92 | 3.68 | 0.115 | 0.145 |

STYLE 1:
PIN 1. EMITTER
2. BASE
3. EMITTER
4. COLLECTOR

CASE 244-04
ISSUE J

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Literature Distribution Centers:
USA: Motorola Literature Distribution; P.O. Box 20912; Phoenix, Arizona 85036.
EUROPE: Motorola Ltd.; European Literature Centre; 88 Tanners Drive, Blakelands, Milton Keynes, MK14 5BP, England.
JAPAN: Nippon Motorola Ltd.; 4-32-1, Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan.
ASIA PACIFIC: Motorola Semiconductors H.K. Ltd.; Silicon Harbour Center, No. 2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.

