

RF Power MOSFET Transistor 5 W, 500 - 1000 MHz, 28 V

Rev. V1

Features

- N-Channel enhancement mode device
- DMOS structure
- Lower capacitances for broadband operation
- Common source configuration
- Lower noise floor
- Applications
 - Broadband linear operation
500 MHz to 1400 MHz
- RoHS Compliant

Absolute Maximum Ratings @ 25°C

| Parameter | Symbol | Rating | Units |
|----------------------|---------------|-------------|-------|
| Drain-Source Voltage | V_{DS} | 65 | V |
| Gate-Source Voltage | V_{GS} | 20 | V |
| Drain-Source Current | I_{DS} | 1.4 | A |
| Power Dissipation | P_D | 14.4 | W |
| Junction Temperature | T_J | 200 | °C |
| Storage Temperature | T_{STG} | -65 to +150 | °C |
| Thermal Resistance | θ_{JC} | 12.1 | °C/W |

Typical Device Impedance

| F (MHz) | Z_{IN} (Ω) | Z_{LOAD} (Ω) |
|---------|-----------------------|-------------------------|
| 500 | 4.3 - j29.0 | 27.3 + j28.6 |
| 1000 | 2.2 - j2.75 | 8.0 + j16.0 |
| 1400 | 2.8 - j3.0 | 9.4 + j10.6 |

$V_{DD} = 28V, I_{DQ} = 50mA, P_{OUT} = 5.0 W$

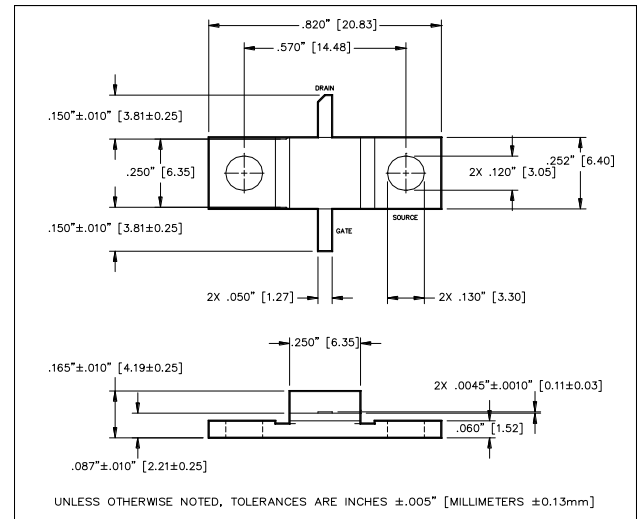
Z_{IN} is the series equivalent input impedance of the device from gate to source.

Z_{LOAD} is the optimum series equivalent load impedance as measured from drain to ground.

Electrical Characteristics @ 25°C

| Parameter | Symbol | Min | Max | Units | Test Conditions |
|--------------------------------|--------------|-----|------|---------|--|
| Drain-Source Breakdown Voltage | BV_{DSS} | 65 | - | V | $V_{GS} = 0.0 V, I_{DS} = 2.0 mA$ |
| Drain-Source Leakage Current | I_{DSS} | - | 1.0 | mA | $V_{GS} = 28.0 V, V_{DS} = 0.0 V$ |
| Gate-Source Leakage Current | I_{GSS} | - | 1.0 | μA | $V_{GS} = 20.0 V, V_{DS} = 0.0 V$ |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 2.0 | 6.0 | V | $V_{DS} = 10.0 V, I_{DS} = 10.0 mA$ |
| Forward Transconductance | G_M | 80 | - | mS | $V_{DS} = 10.0 V, I_{DS} = 100.0 mA, \Delta V_{GS} = 1.0V, 80 \mu s$ Pulse |
| Input Capacitance | C_{ISS} | - | 7 | pF | $V_{DS} = 28.0 V, F = 1.0 MHz$ |
| Output Capacitance | C_{OSS} | - | 5 | pF | $V_{DS} = 28.0 V, F = 1.0 MHz$ |
| Reverse Capacitance | C_{RSS} | - | 2.4 | pF | $V_{DS} = 28.0 V, F = 1.0 MHz$ |
| Power Gain | G_P | 10 | - | dB | $V_{DD} = 28.0 V, I_{DQ} = 50 mA, P_{OUT} = 5.0 W F = 1.0 GHz$ |
| Drain Efficiency | η_D | 50 | - | % | $V_{DD} = 28.0 V, I_{DQ} = 50 mA, P_{OUT} = 5.0 W F = 1.0 GHz$ |
| Load Mismatch Tolerance | VSWR-T | - | 20:1 | - | $V_{DD} = 28.0 V, I_{DQ} = 50 mA, P_{OUT} = 5.0 W F = 1.0 GHz$ |

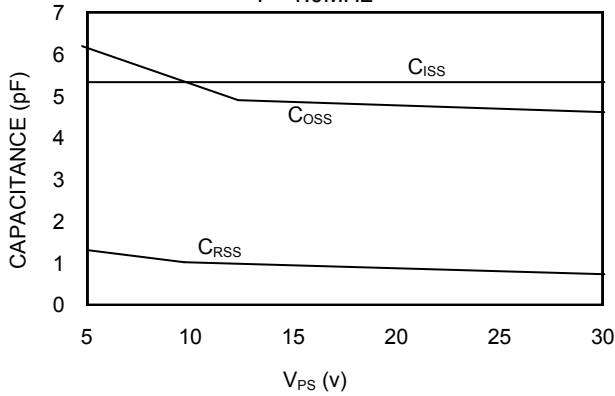
Package Outline



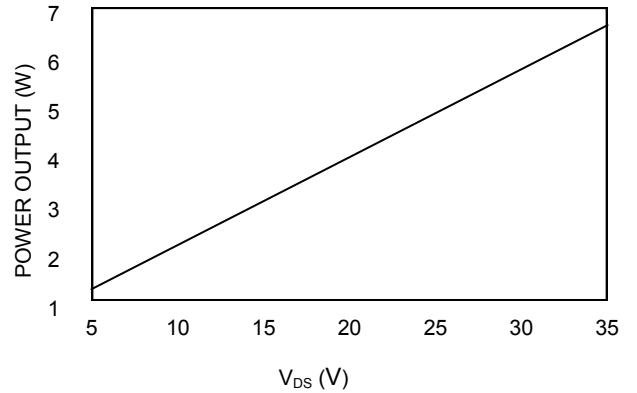
| LETTER DIM. | MILLIMETERS | | INCHES | |
|-------------|-------------|-------|--------|------|
| | MIN | MAX | MIN | MAX |
| A | 20.70 | 20.96 | .815 | .825 |
| B | 14.35 | 14.61 | .565 | .575 |
| C | 13.72 | 14.22 | .540 | .560 |
| D | 6.27 | 6.53 | .247 | .257 |
| E | 6.22 | 6.48 | .245 | .255 |
| F | 6.22 | 6.48 | .245 | .255 |
| G | 1.14 | 1.40 | .045 | .055 |
| H | 2.92 | 3.18 | .115 | .125 |
| J | 1.40 | 1.65 | .055 | .065 |
| K | 1.96 | 2.46 | .077 | .097 |
| L | 3.61 | 4.37 | .142 | .172 |
| M | .08 | .15 | .003 | .006 |

Typical Broadband Performance Curves

CAPACITANCES vs VOLTAGE
 $F = 1.0 \text{ MHz}$

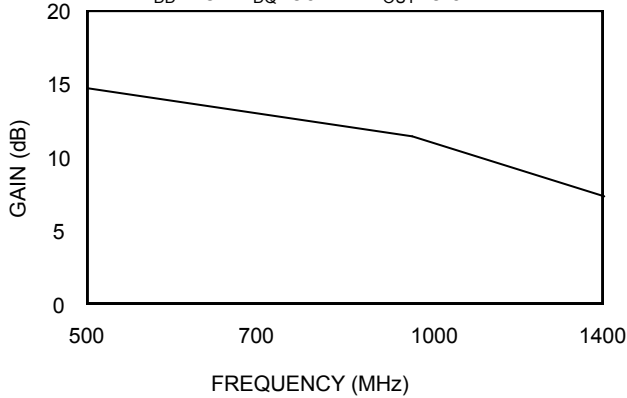


POWER OUTPUT vs VOLTAGE
 $F = 1.0 \text{ GHz } P_{IN} = 0.5 \text{ W } I_{DQ} = 50 \text{ mA}$



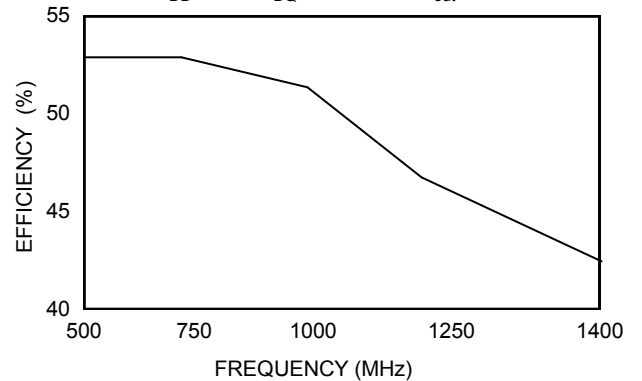
GAIN vs FREQUENCY

$V_{DD} = 28 \text{ V } I_{DQ} = 50 \text{ mA } P_{OUT} = 5.0 \text{ W}$



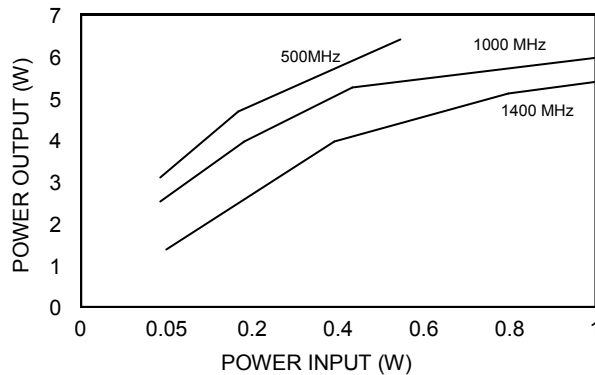
EFFICIENCY vs FREQUENCY

$V_{DD} = 28 \text{ V } I_{DQ} = 50.0 \text{ mA } P_{out} = 5.0 \text{ W}$



POWER OUTPUT vs POWER INPUT

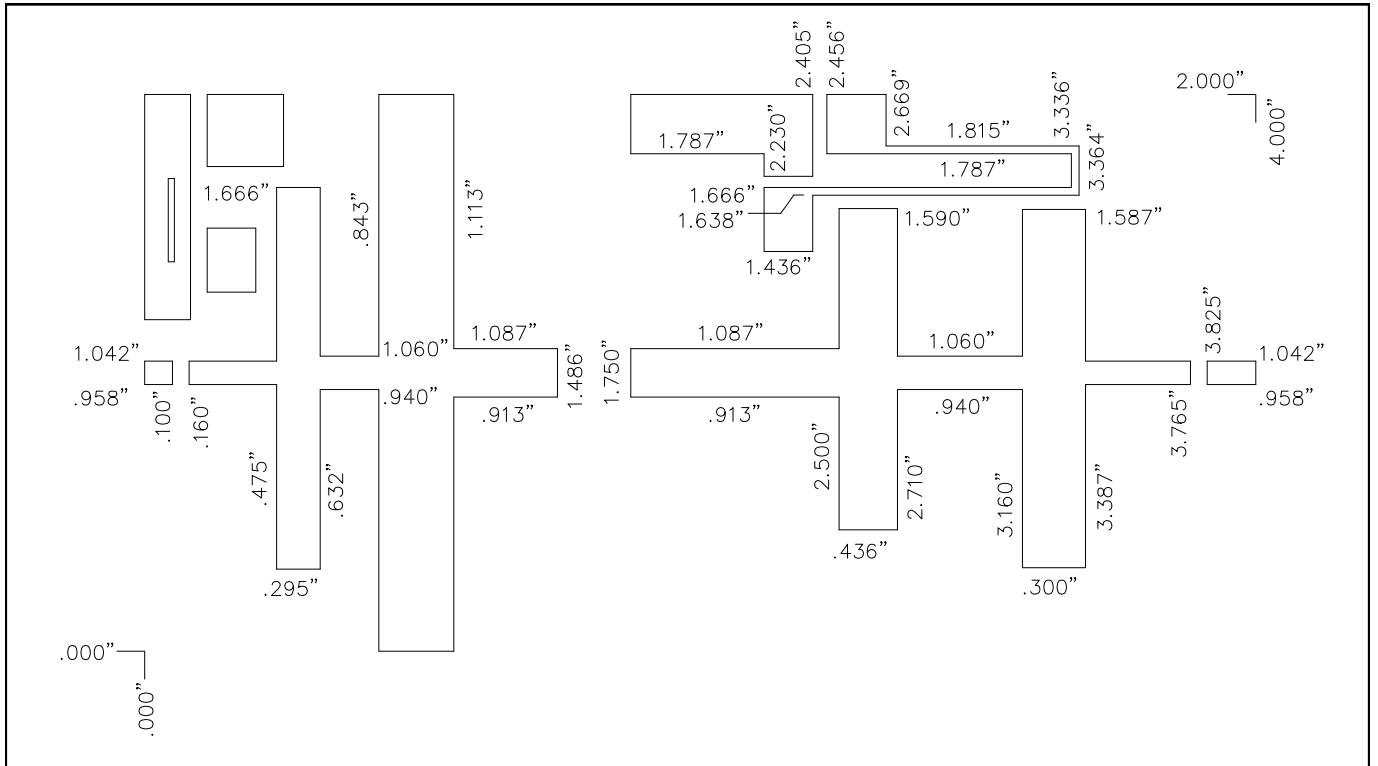
$V_{DD} = 28 \text{ V } I_{DQ} = 50 \text{ mA}$



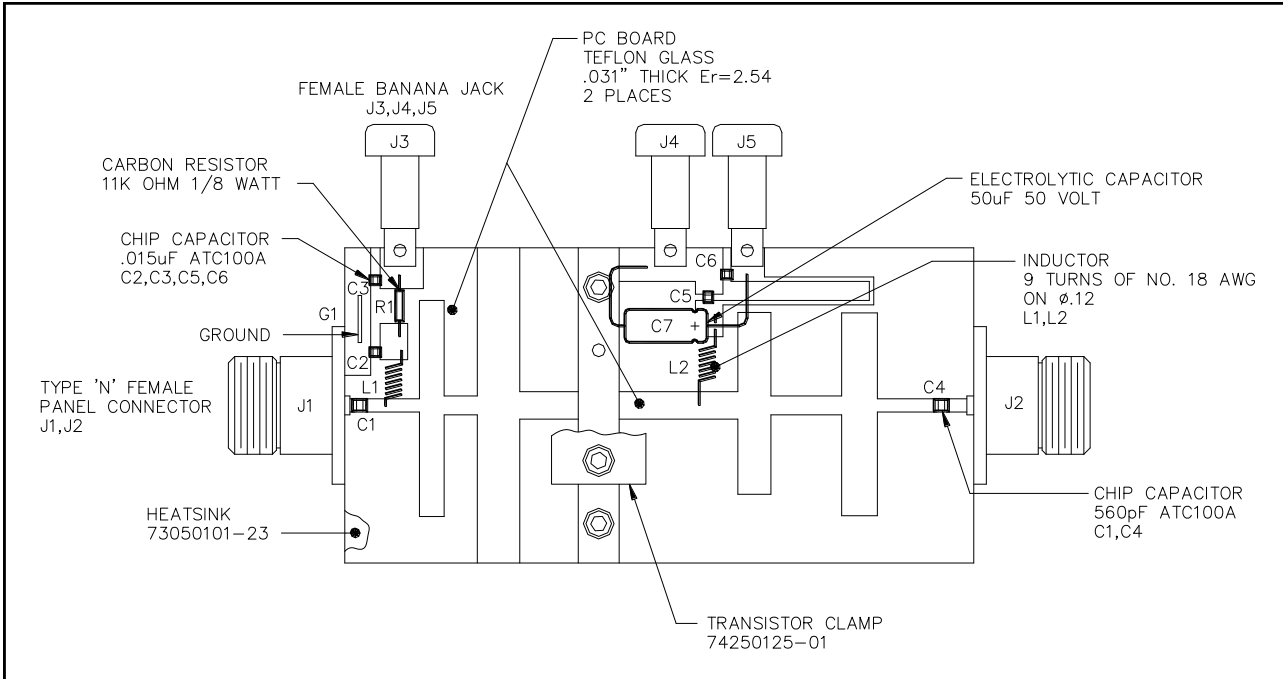
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TEST FIXTURE CIRCUIT DIMENSIONS



TEST FIXTURE ASSEMBLY



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