

## RF Power MOSFET Transistor 15W, 100-500 MHz, 28V

Rev. V1

### Features

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

### ABSOLUTE MAXIMUM RATINGS AT 25° C

| Parameter            | Symbol        | Rating     | Units |
|----------------------|---------------|------------|-------|
| Drain-Source Voltage | $V_{DS}$      | 65         | V     |
| Gate-Source Voltage  | $V_{GS}$      | 20         | V     |
| Drain-Source Current | $I_{DS}$      | 4.2        | A     |
| Power Dissipation    | $P_D$         | 48.6       | W     |
| Junction Temperature | $T_J$         | 200        | °C    |
| Storage Temperature  | $T_{STG}$     | -55 to 150 | °C    |
| Thermal Resistance   | $\theta_{JC}$ | 3.6        | °C/W  |

### TYPICAL DEVICE IMPEDANCES

| F (MHz) | $Z_{IN}$ ( $\Omega$ ) | $Z_{LOAD}$ ( $\Omega$ ) |
|---------|-----------------------|-------------------------|
| 100     | 6.4-j25.0             | 22.0+j16.0              |
| 300     | 6.5-j12.0             | 15.0+j14.0              |
| 500     | 1.7-j10.5             | 8.0=j10.5               |

$V_{DD}=28V, I_{DQ}=150\text{ mA}, P_{OUT}=15.0\text{ W}$

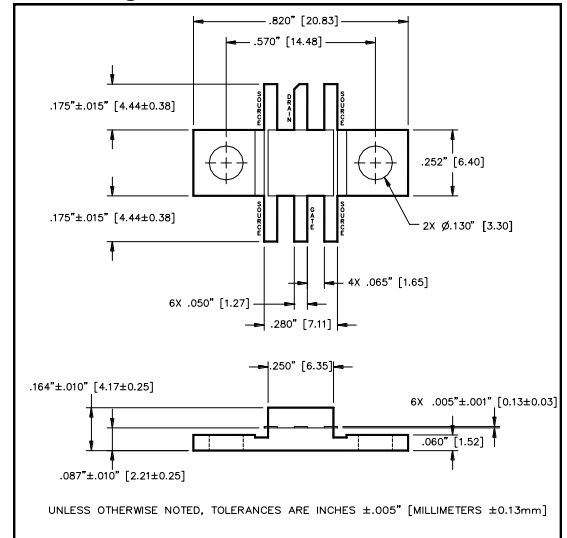
$Z_{IN}$  is the series equivalent input impedance of the device from gate to source.

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

### ELECTRICAL CHARACTERISTICS AT 25°C

| Parameter                      | Symbol       | Min  | Max  | Units         | Test Conditions  |
|--------------------------------|--------------|------|------|---------------|--|
| Drain-Source Breakdown Voltage | $BV_{DSS}$   | 65   | -    | V             | $V_{GS} = 0.0\text{ V}, I_{DS} = 6.0\text{ mA}$  |
| Drain-Source Leakage Current   | $I_{DSS}$    | -    | 3.0  | mA            | $V_{GS} = 28.0\text{ V}, V_{DS} = 0.0\text{ V}$  |
| Gate-Source Leakage Current    | $I_{GSS}$    | -    | 3.0  | $\mu\text{A}$ | $V_{GS} = 20.0\text{ V}, V_{DS} = 0.0\text{ V}$  |
| Gate Threshold Voltage         | $V_{GS(TH)}$ | 2.0  | 6.0  | V             | $V_{DS} = 10.0\text{ V}, I_{DS} = 30.0\text{ mA}$  |
| Forward Transconductance       | $G_M$        | .240 | -    | S             | $V_{DS} = 10.0\text{ V}, I_{DS} = 300.0\text{ mA}, \Delta V_{GS} = 1.0\text{V}, 80\ \mu\text{s Pulse}$ |
| Input Capacitance              | $C_{ISS}$    | -    | 21   | pF            | $V_{DS} = 28.0\text{ V}, F = 1.0\text{ MHz}$   |
| Output Capacitance             | $C_{OSS}$    | -    | 15   | pF            | $V_{DS} = 28.0\text{ V}, F = 1.0\text{ MHz}$   |
| Reverse Capacitance            | $C_{RSS}$    | -    | 7.2  | pF            | $V_{DS} = 28.0\text{ V}, F = 1.0\text{ MHz}$   |
| Power Gain                     | $G_P$        | 10   | -    | dB            | $V_{DD} = 28.0\text{ V}, I_{DQ} = 150.0\text{ mA}, P_{OUT} = 15.0\text{ W } F = 500\text{ MHz}$        |
| Drain Efficiency               | $\eta_D$     | 50   | -    | %             | $V_{DD} = 28.0\text{ V}, I_{DQ} = 150.0\text{ mA}, P_{OUT} = 15.0\text{ W } F = 500\text{ MHz}$        |
| Load Mismatch Tolerance        | VSWR-T       | -    | 20:1 | -             | $V_{DD} = 28.0\text{ V}, I_{DQ} = 150.0\text{ mA}, P_{OUT} = 15.0\text{ W } F = 500\text{ MHz}$        |

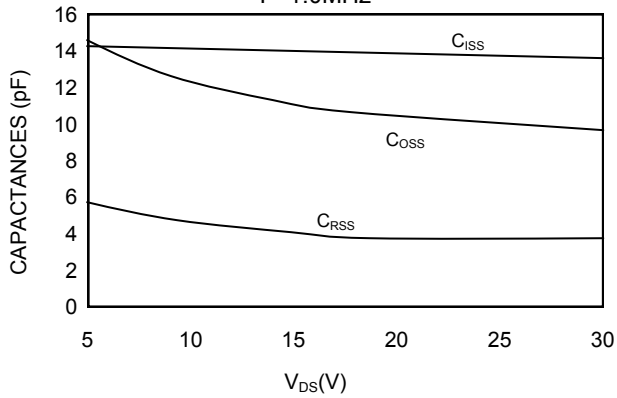
### Package Outline



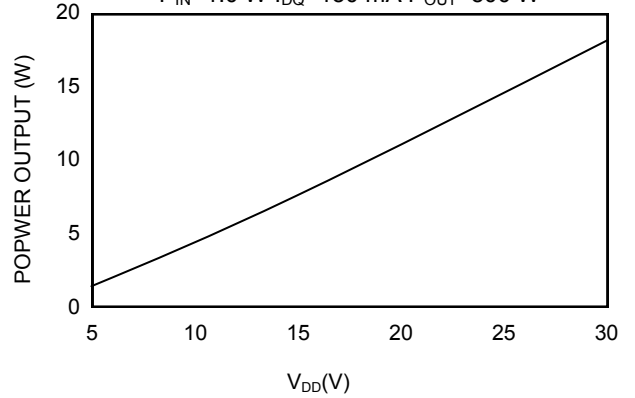
| LETTER<br>DIM | MILLIMETERS |       | INCHES |      |
|---------------|-------------|-------|--------|------|
|               | MIN         | MAX   | MIN    | MAX  |
| A             | 20.70       | 20.96 | .815   | .825 |
| B             | 14.35       | 14.61 | .565   | .575 |
| C             | 14.73       | 15.24 | .580   | .575 |
| D             | 6.27        | 6.53  | .247   | .257 |
| E             | 6.22        | 6.48  | .245   | .255 |
| F             | 1.14        | 1.40  | .045   | .055 |
| G             | 1.52        | 1.78  | .060   | .070 |
| H             | 2.92        | 3.17  | .115   | .125 |
| J             | 1.40        | 1.65  | .055   | .065 |
| K             | 2.03        | 2.39  | .080   | .094 |
| L             | 3.66        | 4.32  | .144   | .170 |
| M             | .10         | .15   | .004   | .006 |

**Typical Broadband Performance Curves**

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

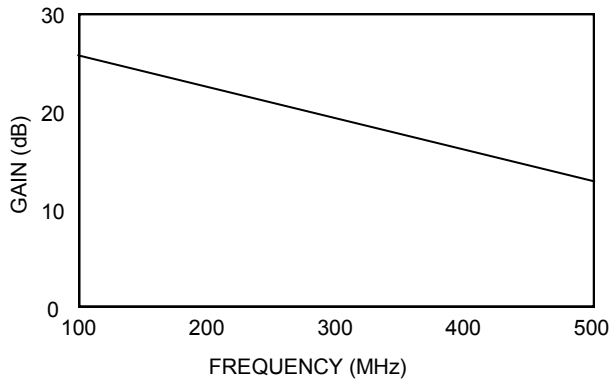


**POWER OUTPUT vs VOLTAGE**  
 $P_{IN}=1.0\text{ W } I_{DQ}=150\text{ mA } P_{OUT}=500\text{ W}$



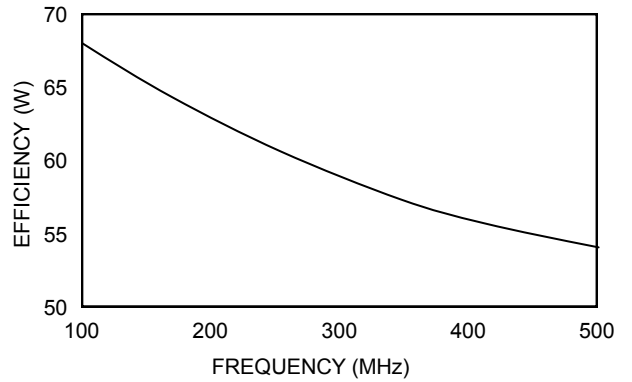
**GAIN vs FREQUENCY**

$V_{DD}=28\text{ V } P_{OUT}=15\text{ W } I_{DQ}=100\text{ mA}$



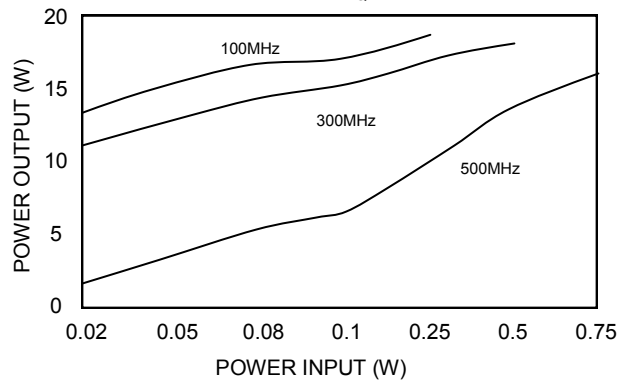
**EFFICIENCY vs FREQUENCY**

$V_{DD}=28\text{ V } I_{DQ}=150\text{ mA } P_{OUT}=15\text{ W}$



**POWER OUTPUT vs POWER INPUT**

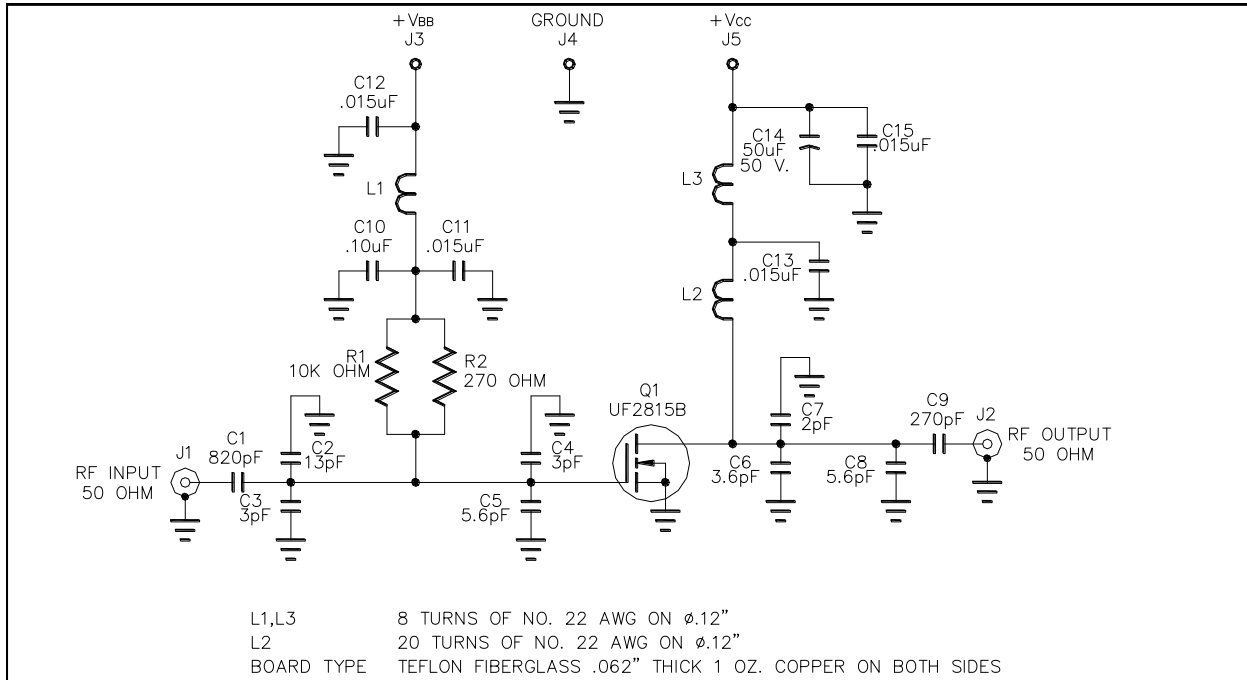
$V_{DD}=28\text{ V } I_{DQ}=150\text{ mA}$



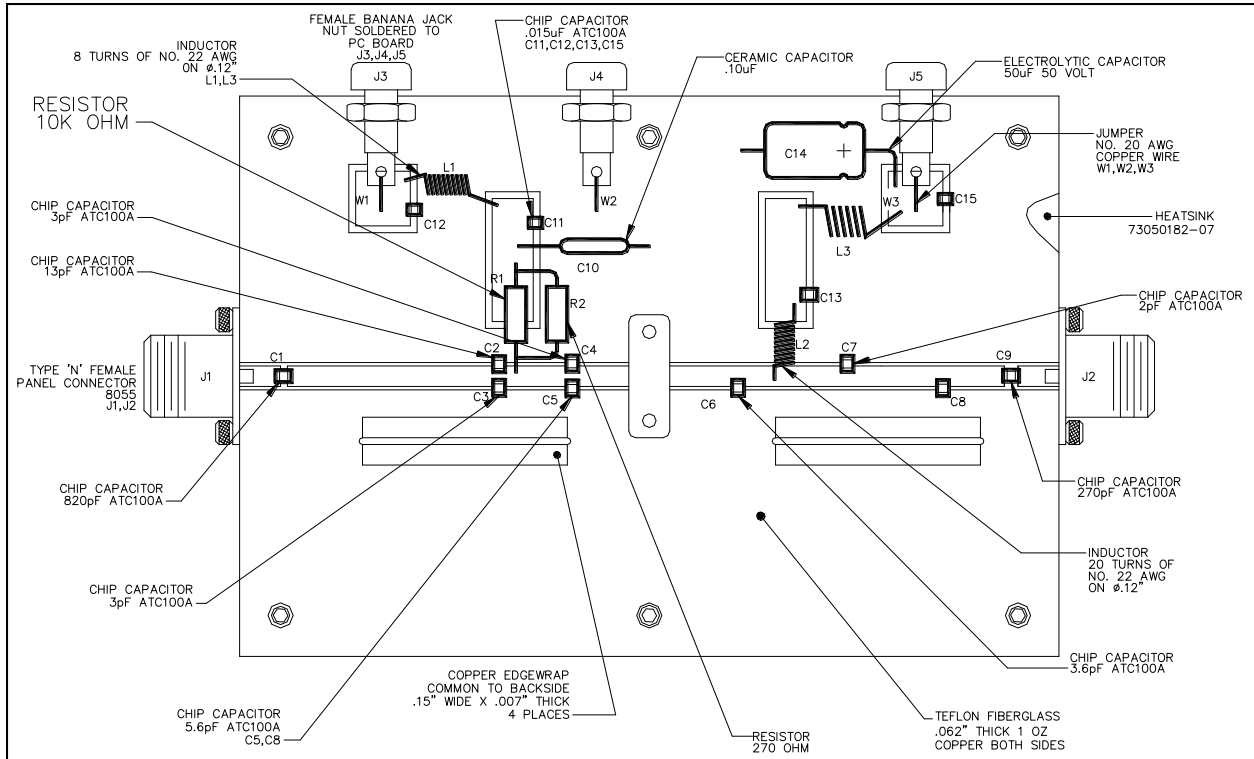
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### TEST FIXTURE SCHEMATIC



### TEST FIXTURE ASSEMBLY



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