

## RF Power MOSFET Transistor 120 W, 2 - 175 MHz, 28 V

Rev. V1

### Features

- N-Channel enhancement mode device
- DMOS structure
- Lower capacitances for broadband operation
- High saturated output power
- Lower noise figure than bipolar devices
- RoHS Compliant

### 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 | $I_{DS}$      | 24          | A     |
| Power Dissipation    | $P_D$         | 269         | W     |
| Junction Temperature | $T_J$         | 200         | °C    |
| Storage Temperature  | $T_{STG}$     | -55 to +150 | °C    |
| Thermal Resistance   | $\theta_{JC}$ | 0.65        | °C/W  |

### TYPICAL DEVICE IMPEDANCE

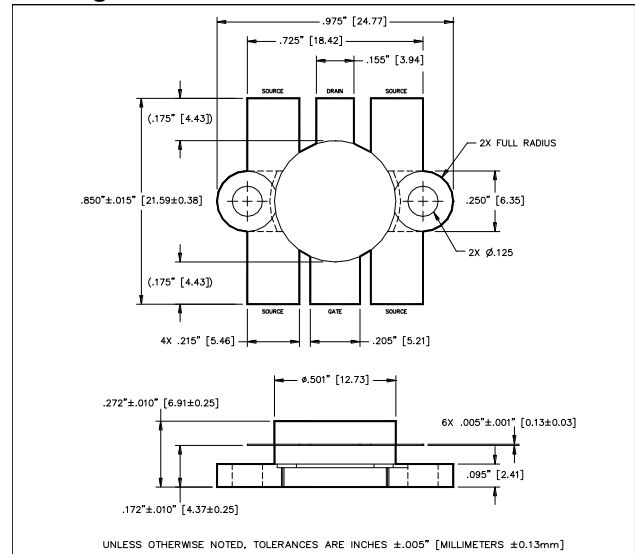
| F (MHz) | $Z_{IN} (\Omega)$ | $Z_{LOAD} (\Omega)$ |
|---------|-------------------|---------------------|
| 30      | 4.0 - j8.0        | 3.4 + j2.4          |
| 50      | 1.0 - j2.5        | 2.2 + j1.3          |
| 100     | 1.0 - j0.5        | 2.2 + j0.0          |

$V_{DD} = 28V$ ,  $I_{DQ} = 600mA$ ,  $P_{OUT} = 120 W$

$Z_{IN}$  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.

### Package Outline

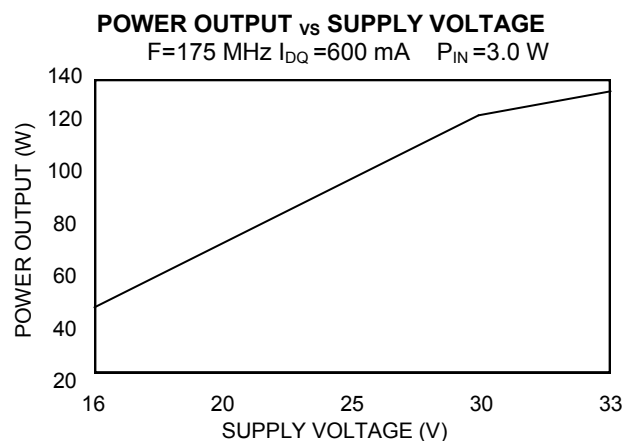
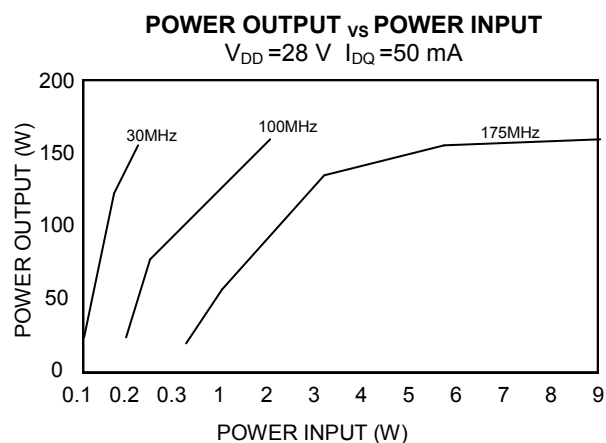
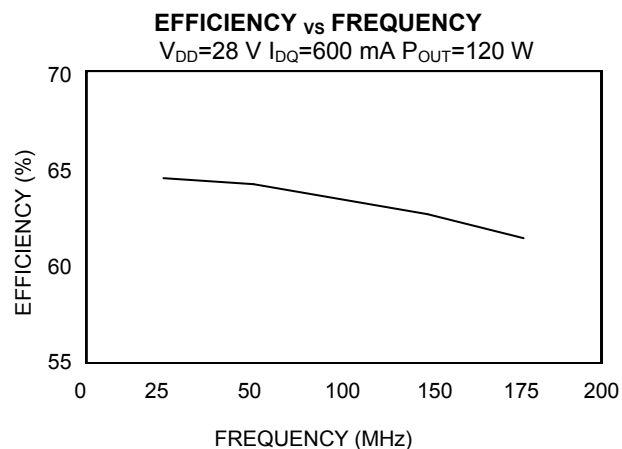
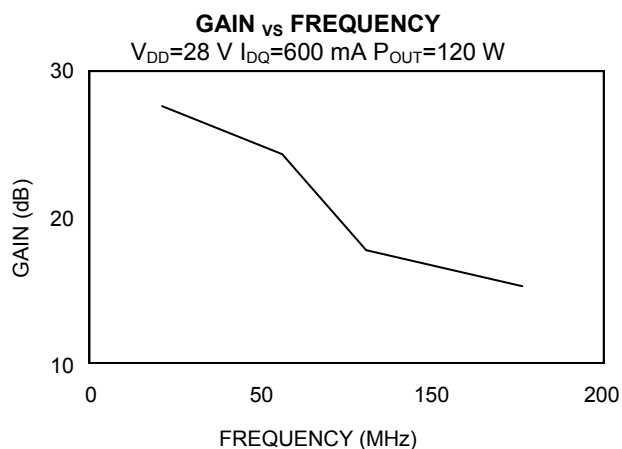


| LETTER<br>DIM | MILLIMETERS |       | INCHES |      |
|---------------|-------------|-------|--------|------|
|               | MIN         | MAX   | MIN    | MAX  |
| A             | 24.64       | 24.89 | .970   | .980 |
| B             | 18.29       | 18.54 | .720   | .730 |
| C             | 21.21       | 21.97 | .835   | .865 |
| D             | 12.60       | 12.85 | .496   | .506 |
| E             | 6.22        | 6.48  | .245   | .255 |
| F             | 3.81        | 4.06  | .150   | .160 |
| G             | 5.33        | 5.59  | .210   | .220 |
| H             | 5.08        | 5.33  | .200   | .210 |
| J             | 3.05        | 3.30  | .120   | .130 |
| K             | 2.29        | 2.54  | .90    | .100 |
| L             | 4.06        | 4.57  | .160   | .180 |
| M             | 6.68        | 7.49  | .263   | .295 |
| N             | .10         | .15   | .004   | .006 |

### ELECTRICAL CHARACTERISTICS AT 25°C

| Parameter                      | Symbol       | Min | Max  | Units | Test Conditions                                                                 |
|--------------------------------|--------------|-----|------|-------|---------------------------------------------------------------------------------|
| Drain-Source Breakdown Voltage | $BV_{DSS}$   | 65  | -    | V     | $V_{GS} = 0.0 V$ , $I_{DS} = 3.0 mA$                                            |
| Drain-Source Leakage Current   | $I_{DSS}$    | -   | 6.0  | mA    | $V_{GS} = 28.0 V$ , $V_{DS} = 0.0 V$                                            |
| Gate-Source Leakage Current    | $I_{GSS}$    | -   | 6.0  | μA    | $V_{GS} = 20.0 V$ , $V_{DS} = 0.0 V$                                            |
| Gate Threshold Voltage         | $V_{GS(TH)}$ | 2.0 | 6.0  | V     | $V_{DS} = 10.0 V$ , $I_{DS} = 600.0 mA$                                         |
| Forward Transconductance       | $G_M$        | 3.0 | -    | S     | $V_{DS} = 10.0 V$ , $I_{DS} = 6000.0 mA$ , $\Delta V_{GS} = 1.0V$ , 80 μs Pulse |
| Input Capacitance              | $C_{ISS}$    | -   | 270  | pF    | $V_{DS} = 28.0 V$ , $F = 1.0 MHz$                                               |
| Output Capacitance             | $C_{OSS}$    | -   | 240  | pF    | $V_{DS} = 28.0 V$ , $F = 1.0 MHz$                                               |
| Reverse Capacitance            | $C_{RSS}$    | -   | 48   | pF    | $V_{DS} = 28.0 V$ , $F = 1.0 MHz$                                               |
| Power Gain                     | $G_P$        | 13  | -    | dB    | $V_{DD} = 28.0 V$ , $I_{DQ} = 600 mA$ , $P_{OUT} = 120.0 W$ $F = 175 MHz$       |
| Drain Efficiency               | $\eta_D$     | 60  | -    | %     | $V_{DD} = 28.0 V$ , $I_{DQ} = 600 mA$ , $P_{OUT} = 120.0 W$ $F = 175 MHz$       |
| Load Mismatch Tolerance        | VSWR-T       | -   | 30:1 | -     | $V_{DD} = 28.0 V$ , $I_{DQ} = 600 mA$ , $P_{OUT} = 120.0 W$ $F = 175 MHz$       |

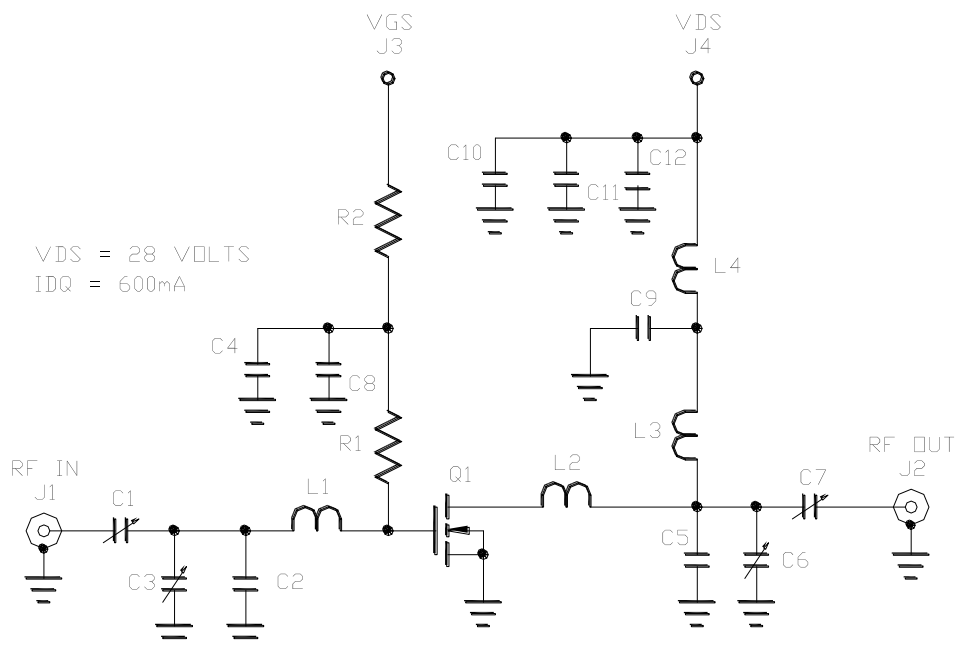
## Typical Broadband Performance Curves



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### TEST FIXTURE SCHEMATIC



### PARTS LIST

|        |                                                             |
|--------|-------------------------------------------------------------|
| C1,C6  | TRIMMER CAPACITOR 5-80pF                                    |
| C2,C5  | CAPACITOR 50pF                                              |
| C3     | TRIMMER CAPACITOR 4-40pF                                    |
| C4,C11 | MONOLITHIC CIRCUIT CAPACITOR 0.01uF                         |
| C7     | TRIMMER CAPACITOR 9-180pF                                   |
| C8,C9  | CAPACITOR 500pF                                             |
| C10    | CAPACITOR 1000pF                                            |
| C12    | ELECTROLYTIC CAPACITOR 50uF 50 VOLT                         |
| L1,L2  | NO. 12 AWG COPPER WIRE X 0.87" (LOOP 0.4")                  |
| L3,L4  | 8 TURNS OF NO. 16 AWG ENAMEL WIRE ON<br>Ø0.25", CLOSE WOUND |
| R1,R2  | RESISTOR 2.7K OHMS 0.25 WATT                                |
| Q1     | DU28120T                                                    |
| BOARD  | FR4 0.062"                                                  |

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