

# RF MOSFET Power Transistor, 100W, 28V

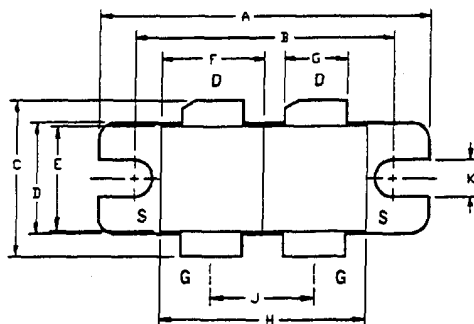
## 100 - 500 MHz

**UF28100M**

V2.00

### Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- High Saturated Output Power
- Lower Noise Figure Than Competitive Devices



### 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 | $I_{DS}$      | 12*         | A     |
| Power Dissipation    | $P_D$         | 250         | W     |
| Junction Temperature | $T_J$         | 200         | °C    |
| Storage Temperature  | $T_{STG}$     | -55 to +150 | °C    |
| Thermal Resistance   | $\theta_{JC}$ | 0.7         | °C/W  |

| LETTER | MILLIMETERS |       | INCHES |       |
|--------|-------------|-------|--------|-------|
|        | MIN         | MAX   | MIN    | MAX   |
| A      | 20.25       | 20.61 | 1.195  | 1.205 |
| B      | 23.65       | 23.90 | .931   | .941  |
| C      | 13.72       | 14.22 | .540   | .560  |
| D      | 9.63        | 9.88  | .379   | .389  |
| E      | 9.48        | 9.65  | .370   | .380  |
| F      | 9.48        | 9.65  | .370   | .380  |
| G      | 5.59        | 5.84  | .220   | .230  |
| H      | 18.80       | 19.20 | .740   | .760  |
| J      | 9.48        | 9.65  | .370   | .380  |
| K      | 3.32        | 3.38  | .129   | .133  |
| L      | 1.47        | 1.57  | .058   | .062  |
| M      | 2.39        | 2.74  | .094   | .108  |
| N      | 5.03        | 5.69  | .198   | .224  |
| P      | .85         | .13   | .032   | .005  |

### Electrical Characteristics at 25°C

| Parameter                      | Symbol       | Min | Max  | Units         | Test Conditions   |
|--------------------------------|--------------|-----|------|---------------|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$   | 65  | -    | V             | $V_{GS}=0.0\text{ V}$ , $I_{DS}=15.0\text{ mA}^*$   |
| Drain-Source Leakage Current   | $I_{DSS}$    | -   | 3.0  | mA            | $V_{DS}=28.0\text{ V}$ , $V_{GS}=0.0\text{ V}^*$  |
| Gate-Source Leakage Current    | $I_{GSS}$    | -   | 3.0  | $\mu\text{A}$ | $V_{GS}=20\text{ V}$ , $V_{DS}=0.0\text{ V}^*$  |
| Gate Threshold Voltage         | $V_{GS(TH)}$ | 2.0 | 6.0  | V             | $V_{DS}=10.0\text{ V}$ , $I_{DS}=300.0\text{ mA}^*$   |
| Forward Transconductance       | $G_M$        | 1.5 | -    | S             | $V_{DS}=10.0\text{ V}$ , $I_{DS}=3000.0\text{ mA}$ , $\Delta V_{GS}=1.0\text{ V}$ , 80 $\mu\text{s}$ Pulse* |
| Input Capacitance              | $C_{ISS}$    | -   | 135  | pF            | $V_{DS}=28.0\text{ V}$ , $F=1.0\text{ MHz}^*$   |
| Output Capacitance             | $C_{OSS}$    | -   | 90   | pF            | $V_{DS}=28.0\text{ V}$ , $F=1.0\text{ MHz}^*$   |
| Reverse Capacitance            | $C_{RSS}$    | -   | 24   | pF            | $V_{DS}=28.0\text{ V}$ , $F=1.0\text{ MHz}^*$   |
| Power Gain                     | $G_P$        | 10  | -    | dB            | $V_{DD}=28.0\text{ V}$ , $I_{DQ}=600.0\text{ mA}$ , $P_{OUT}=100.0\text{ W}$ , $F=500\text{ MHz}$           |
| Drain Efficiency               | $\eta_D$     | 50  | -    | %             | $V_{DD}=28.0\text{ V}$ , $I_{DQ}=600.0\text{ mA}$ , $P_{OUT}=100.0\text{ W}$ , $F=500\text{ MHz}$           |
| Return Loss                    | $R_L$        | 10  | -    | dB            | $V_{DD}=28.0\text{ V}$ , $I_{DQ}=600.0\text{ mA}$ , $P_{OUT}=100.0\text{ W}$ , $F=500\text{ MHz}$           |
| Load Mismatch Tolerance        | VSWR-T       | -   | 30:1 | -             | $V_{DD}=28.0\text{ V}$ , $I_{DQ}=600.0\text{ mA}$ , $P_{OUT}=100.0\text{ W}$ , $F=500\text{ MHz}$           |

\* Per Side

Specifications Subject to Change Without Notice.

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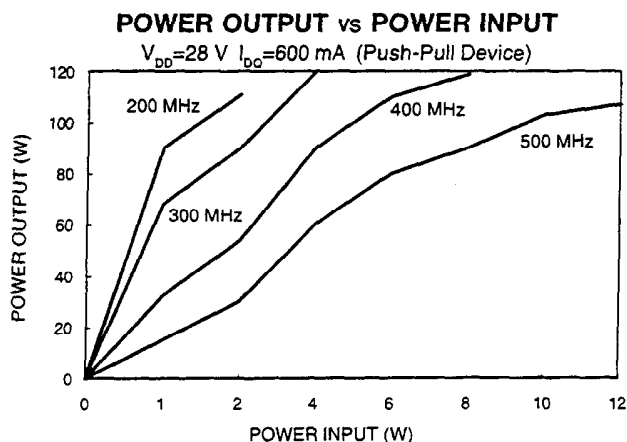
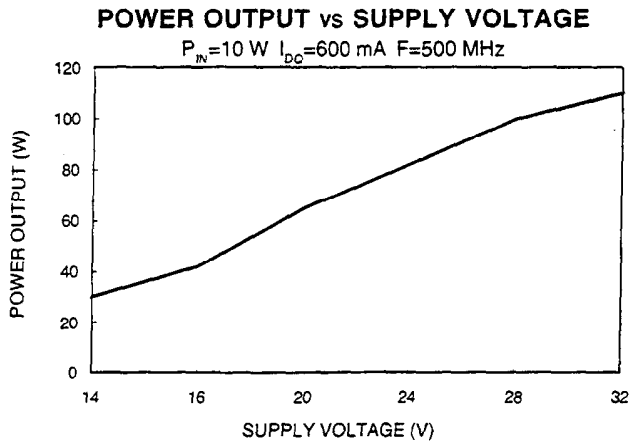
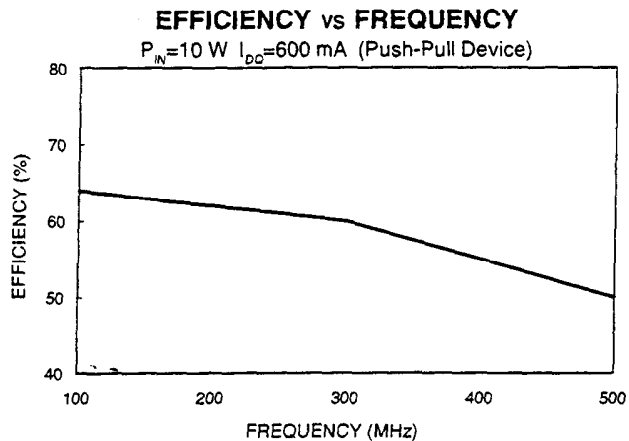
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Typical Broadband Performance Curves



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Typical Device Impedance

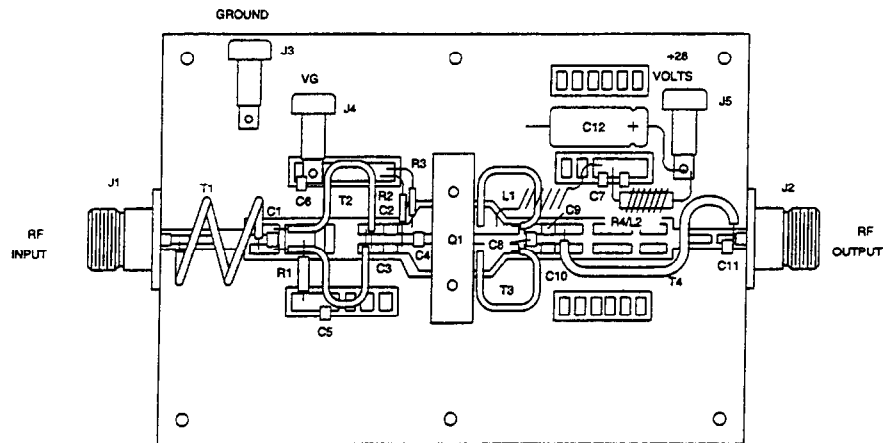
| Frequency (MHz) | Z <sub>IN</sub> (OHMS) | Z <sub>LOAD</sub> (OHMS) |
|-----------------|------------------------|--------------------------|
| 100             | 4.5 - j 6.0            | 14.5 + j 0.5             |
| 300             | 2.25 - j 1.75          | 7.5 + j 1.0              |
| 500             | 1.5 + j 5.5            | 3.5 - j 3.5              |

V<sub>DD</sub>=28 V, I<sub>DD</sub>=600 mA, P<sub>OUT</sub>=100.0 Watts

Z<sub>IN</sub> is the series equivalent input impedance of the device from gate to gate.

Z<sub>LOAD</sub> is the optimum series equivalent load impedance as measured from drain to drain.

RF Test Fixture



PARTS LIST

|          |  |
|----------|--|
| C1,C8    | CHIP CAPACITOR, 2.0pF ATC B  |
| C2,C3    | CHIP CAPACITOR, 5000pF   |
| C4       | CHIP CAPACITOR, 37pF ATC B   |
| C5       | CHIP CAPACITOR, 250pF ATC B  |
| C6,C7    | CHIP CAPACITOR, .015uF   |
| C9,C10   | CHIP CAPACITOR, 560pF ATC B  |
| C11      | CHIP CAPACITOR, 0.6pF ATC B  |
| C12      | ELECTROLYTIC CAPACITOR, 50uF 50 VOLTS                              |
| R1,R4    | RESISTOR, 27 OHM .25 WATT  |
| R2,R3    | RESISTOR, 22K OHM .25 WATT   |
| L1       | INDUCTOR, 5 TURNS OF NO. 18 AWG ON .10"                            |
| L2       | INDUCTOR, 10 TURNS OF NO. 22 AWG ON R4                             |
| T1       | 1:1 BALUN TRANSFORMER, 50 OHM SEMI-RIGID COAX<br>.085" X 3" LONG   |
| T2       | 4:1 BALUN TRANSFORMER, 25 OHM SEMI-RIGID COAX<br>.070" X 2.5" LONG |
| T3       | 1:9 BALUN TRANSFORMER, 10 OHM SEMI-RIGID COAX<br>.070" X 2.5" LONG |
| T4       | 1:1 BALUN TRANSFORMER, 50 OHM SEMI-RIGID COAX<br>.085" X 4" LONG   |
| Q1       | UF28100M   |
| BOARD    | ROGERS 5870, .031" THICK   |
| J1,J2    | CONNECTOR, TYPE 'N'  |
| J3,J4,J5 | BANANA JACK  |
| HEATSINK | FINNED ALUMINUM, D/N 73050182-03                                   |

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