

# RF MOSFET Power Transistor, 20W, 28V

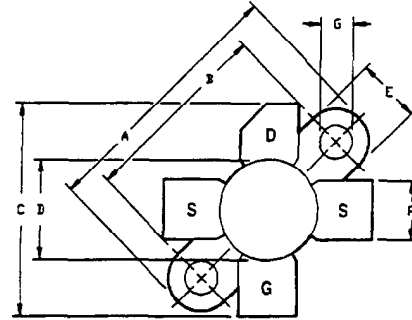
## 2 - 175 MHz

**DU2820S**

V2.00

### Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- High Saturated Output Power
- Lower Noise Figure Than Bipolar 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 | $I_{DS}$      | 24          | A     |
| Power Dissipation    | $P_D$         | 62.5        | W     |
| Junction Temperature | $T_J$         | 200         | °C    |
| Storage Temperature  | $T_{STG}$     | -55 to +150 | °C    |
| Thermal Resistance   | $\theta_{JC}$ | 2.8         | °C/W  |



| LETTER DIM | MILLIMETERS |       | INCHES |      |
|------------|-------------|-------|--------|------|
|            | MIN         | MAX   | MIN    | MAX  |
| A          | 24.64       | 24.89 | .970   | .980 |
| B          | 18.29       | 18.54 | .720   | .730 |
| C          | 20.07       | 20.83 | .790   | .820 |
| D          | 9.47        | 9.73  | .373   | .383 |
| E          | 6.22        | 6.48  | .245   | .255 |
| F          | 5.64        | 5.79  | .222   | .228 |
| G          | 2.92        | 3.30  | .115   | .130 |
| H          | 2.29        | 2.67  | .090   | .105 |
| J          | 4.04        | 4.55  | .159   | .179 |
| K          | 6.58        | 7.39  | .259   | .291 |
| L          | .10         | .15   | .004   | .006 |

### Electrical Characteristics at 25°C

| Parameter                      | Symbol       | Min | Max  | Units         | Test Conditions   |
|--------------------------------|--------------|-----|------|---------------|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$   | 65  | -    | V             | $V_{GS}=0.0\text{ V}, I_{DS}=5.0\text{ mA}$   |
| Drain-Source Leakage Current   | $I_{DSS}$    | -   | 1.0  | mA            | $V_{DS}=28.0\text{ V}, V_{GS}=0.0\text{ V}$   |
| Gate-Source Leakage Current    | $I_{GSS}$    | -   | 1.0  | $\mu\text{A}$ | $V_{GS}=20.0\text{ V}, V_{DS}=0.0\text{ V}$   |
| Gate Threshold Voltage         | $V_{GS(TH)}$ | 2.0 | 6.0  | V             | $V_{DS}=10.0\text{ V}, I_{DS}=100.0\text{ mA}$  |
| Forward Transconductance       | $G_M$        | 500 | -    | mS            | $V_{DS}=10.0\text{ V}, I_{DS}=100.0\text{ mA}, \Delta V_{GS}=1.0\text{ V}, 80\text{ }\mu\text{s Pulse}$ |
| Input Capacitance              | $C_{ISS}$    | -   | 45   | pF            | $V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}$  |
| Output Capacitance             | $C_{OSS}$    | -   | 40   | pF            | $V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}$  |
| Reverse Capacitance            | $C_{RSS}$    | -   | 8    | pF            | $V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}$  |
| Power Gain                     | $G_P$        | 13  | -    | dB            | $V_{DD}=28.0\text{ V}, I_{DQ}=100\text{ mA}, P_{OUT}=20\text{ W}, F=175\text{ MHz}$                     |
| Drain Efficiency               | $\eta_D$     | 60  | -    | %             | $V_{DD}=28.0\text{ V}, I_{DQ}=100\text{ mA}, P_{OUT}=20\text{ W}, F=175\text{ MHz}$                     |
| Load Mismatch Tolerance        | VSWR-T       | -   | 30:1 | -             | $V_{DD}=28.0\text{ V}, I_{DQ}=100\text{ mA}, P_{OUT}=20\text{ W}, F=175\text{ MHz}$                     |

Specifications Subject to Change Without Notice.

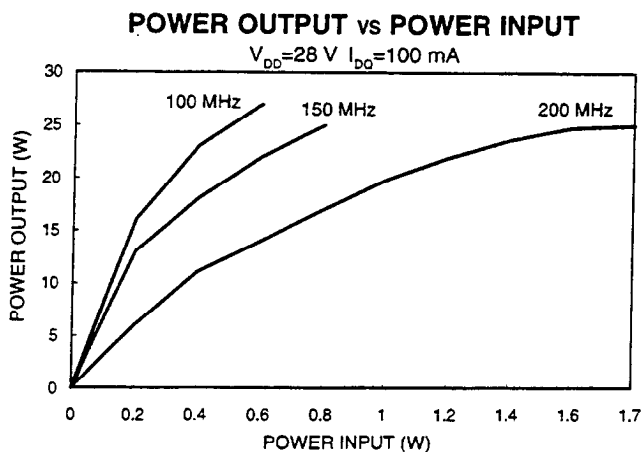
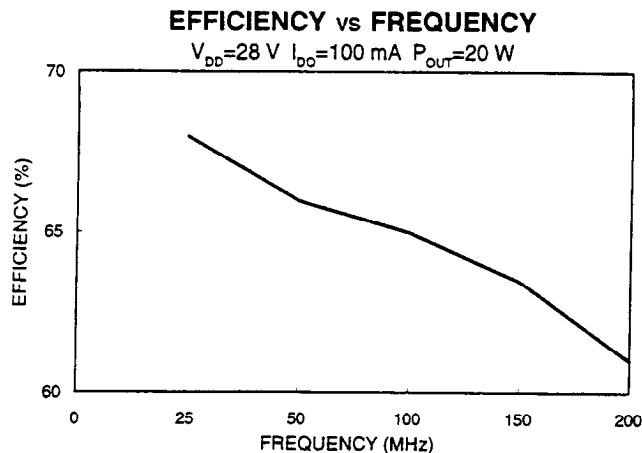
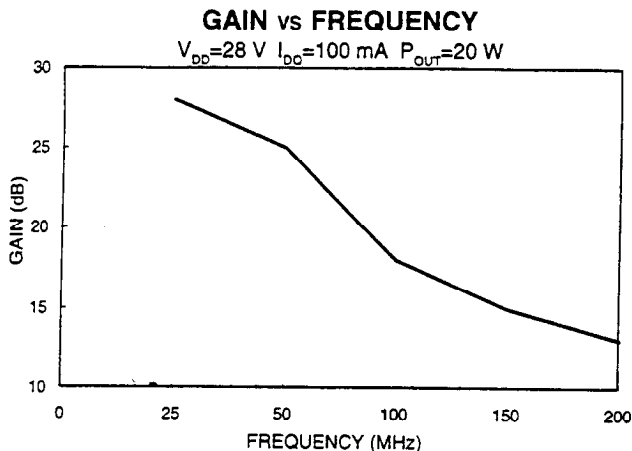
**M/A-COM, Inc.**

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Typical Broadband Performance Curves



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Typical Device Impedance

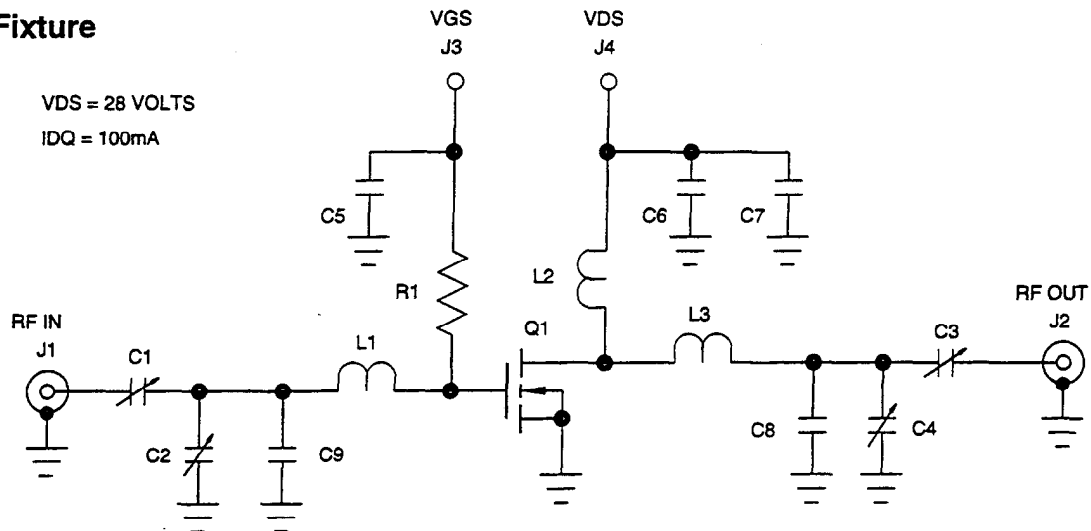
| Frequency (MHz) | Z <sub>IN</sub> (OHMS) | Z <sub>LOAD</sub> (OHMS) |
|-----------------|------------------------|--------------------------|
| 30              | 17.5 - j 13.0          | 16.0 + j 2.5             |
| 50              | 15.0 - j 15.5          | 15.0 + j 4.0             |
| 100             | 8.0 - j 14.0           | 12.0 + j 6.0             |
| 200             | 5.5 - j 8.0            | 9.25 + j 6.0             |

V<sub>DD</sub>=28 V, I<sub>DQ</sub>=100 mA, P<sub>OUT</sub>=20 Watts

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

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

RF Test Fixture



PARTS LIST

|       |  |
|-------|--|
| C1,C3 | TRIMMER CAPACITOR 5-80pF                               |
| C2,C4 | TRIMMER CAPACITOR 3-30pF                               |
| C5,C6 | CAPACITOR 0.01uF                                       |
| C7    | CAPACITOR 0.001uF                                      |
| C8    | CAPACITOR 5.6pF  |
| C9    | CAPACITOR 10pF   |
| L1,L3 | 2 TURNS OF NO. 20 ENAMEL WIRE ON '0.25"<br>CLOSE WOUND |
| L2    | 7 TURNS OF NO. 20 ENAMEL WIRE ON '0.25"<br>CLOSE WOUND |
| R1    | RESISTOR 100K OHMS                                     |
| Q1    | DU2820S  |
| BOARD | FR4 0.062"   |

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