

# RF MOSFET Power Transistor, 200W, 28V

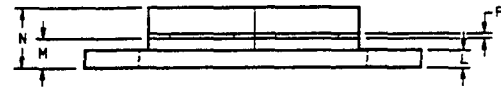
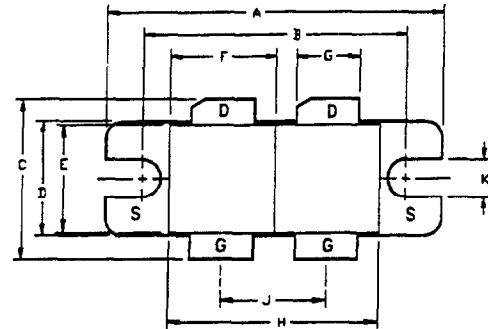
## 2 - 175 MHz

### DU28200M

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 | $I_{DS}$      | 20          | A     |
| Power Dissipation    | $P_D$         | 389         | W     |
| Junction Temperature | $T_J$         | 200         | °C    |
| Storage Temperature  | $T_{STG}$     | -65 to +150 | °C    |
| Thermal Resistance   | $\theta_{JC}$ | 0.45        | °C/W  |

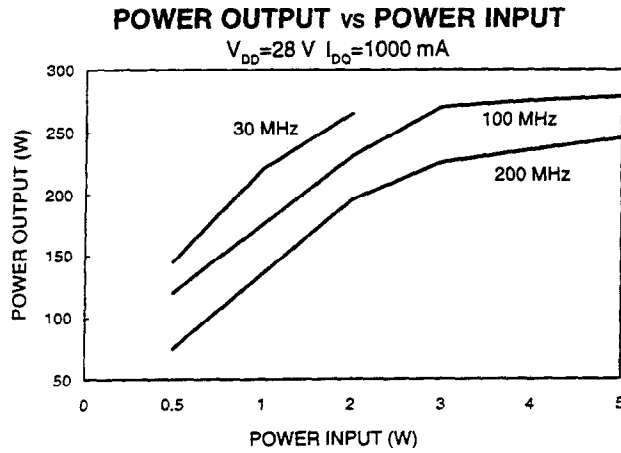
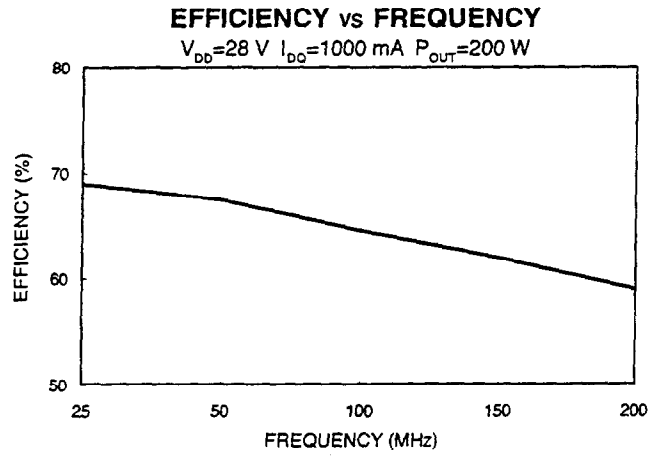
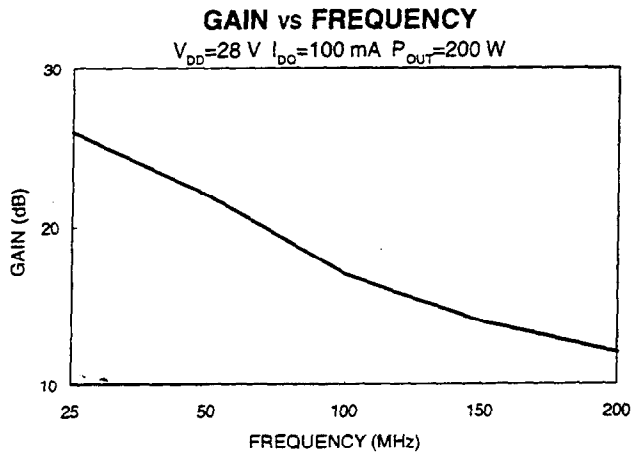
| LETTER DIM | MILLIMETERS |       | INCHES |       |
|------------|-------------|-------|--------|-------|
|            | MIN         | MAX   | MIN    | MAX   |
| A          | 30.35       | 30.61 | 1.195  | 1.205 |
| B          | 23.65       | 23.90 | .931   | .941  |
| C          | 13.72       | 14.22 | .540   | .560  |
| D          | 9.63        | 9.88  | .379   | .389  |
| E          | 9.40        | 9.65  | .370   | .380  |
| F          | 9.40        | 9.65  | .370   | .380  |
| G          | 5.59        | 5.84  | .220   | .230  |
| H          | 18.80       | 19.30 | .740   | .760  |
| J          | 9.40        | 9.65  | .370   | .380  |
| K          | 3.12        | 3.38  | .123   | .133  |
| L          | 1.47        | 1.57  | .058   | .062  |
| M          | 2.39        | 2.74  | .094   | .108  |
| N          | 5.03        | 5.69  | .198   | .224  |
| P          | .05         | .13   | .002   | .005  |

#### Electrical Characteristics at 25°C

| Parameter                      | Symbol       | Min | Max  | Units         | Test Conditions   |
|--------------------------------|--------------|-----|------|---------------|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$   | 65  | -    | V             | $V_{GS}=0.0\text{ V}$ , $I_{DS}=25.0\text{ mA}^*$   |
| Drain-Source Leakage Current   | $I_{DSS}$    | -   | 5.0  | mA            | $V_{DS}=28.0\text{ V}$ , $V_{GS}=0.0\text{ V}^*$  |
| Gate-Source Leakage Current    | $I_{GSS}$    | -   | 5.0  | $\mu\text{A}$ | $V_{GS}=20.0\text{ V}$ , $V_{DS}=0.0\text{ V}^*$  |
| Gate Threshold Voltage         | $V_{GS(TH)}$ | 2.0 | 6.0  | V             | $V_{DS}=10.0\text{ V}$ , $I_{DS}=500.0\text{ mA}^*$   |
| Forward Transconductance       | $G_M$        | 2.5 | -    | S             | $V_{DS}=10.0\text{ V}$ , $I_{DS}=5.0\text{ A}$ , $\Delta V_{GS}=1.0\text{ V}$ , 80 $\mu\text{s}$ Pulse* |
| Input Capacitance              | $C_{ISS}$    | -   | 225  | pF            | $V_{DS}=28.0\text{ V}$ , $F=1.0\text{ MHz}^*$   |
| Output Capacitance             | $C_{OSS}$    | -   | 200  | pF            | $V_{DS}=28.0\text{ V}$ , $F=1.0\text{ MHz}^*$   |
| Reverse Capacitance            | $C_{RSS}$    | -   | 40   | pF            | $V_{DS}=28.0\text{ V}$ , $F=1.0\text{ MHz}^*$   |
| Power Gain                     | $G_P$        | 13  | -    | dB            | $V_{DD}=28.0\text{ V}$ , $I_{DQ}=1000\text{ mA}$ , $P_{OUT}=200.0\text{ W}$ , $F=175\text{ MHz}$        |
| Drain Efficiency               | $\eta_D$     | 55  | -    | %             | $V_{DD}=28.0\text{ V}$ , $I_{DQ}=1000\text{ mA}$ , $P_{OUT}=200.0\text{ W}$ , $F=175\text{ MHz}$        |
| Load Mismatch Tolerance        | VSWR-T       | -   | 10:1 | -             | $V_{DD}=28.0\text{ V}$ , $I_{DQ}=1000\text{ mA}$ , $P_{OUT}=200.0\text{ W}$ , $F=175\text{ MHz}$        |

\* Per Side

Typical Broadband Performance Curves



Typical Device Impedance

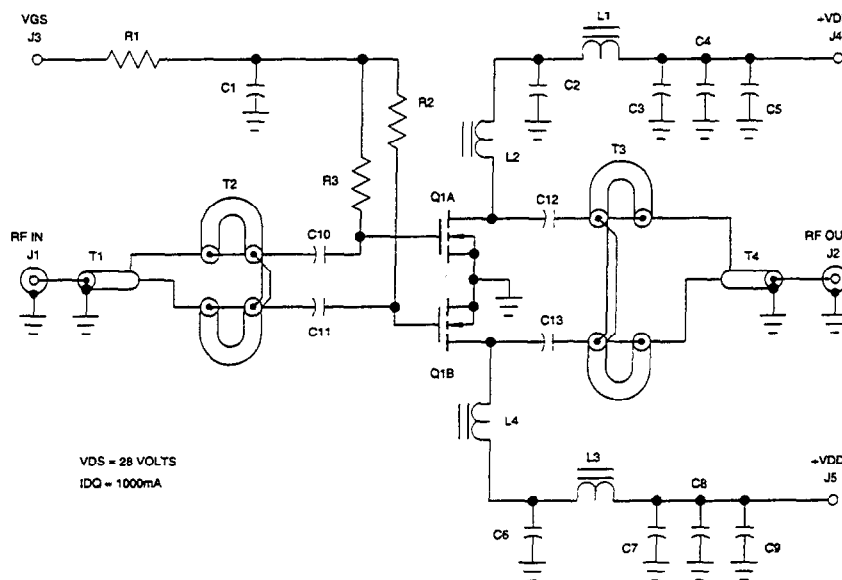
| Frequency (MHz) | Z <sub>IN</sub> (OHMS) | Z <sub>LOAD</sub> (OHMS) |
|-----------------|------------------------|--------------------------|
| 30              | 2.7 - j 4.8            | 7.2 - j 1.9              |
| 100             | 1.6 - j 3.0            | 5.25 - j 1.4             |
| 150             | 1.5 - j 2.0            | 5.0 - j 0.7              |
| 175             | 1.6 - j 1.0            | 5.2 - j 0.6              |
| 200             | 1.8 - j 0.5            | 5.5 - j 0.5              |

V<sub>DD</sub>=28 V, I<sub>DD</sub>=1000 mA, P<sub>OUT</sub>=200 Watts

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

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

RF Test Fixture



VDS = 28 VOLTS  
IDQ = 1000mA

PARTS LIST

- C1,C2,C5, UNELCO CAPACITOR 1000pF
- C6,C9, CAPACITOR 50uF
- C3, CAPACITOR 0.1uF
- C4,C8, CAPACITOR 0.1uF
- C7, ELECTROLYTIC CAPACITOR 50uF 50 V.
- C10,C11, CAPACITOR ATC 500pF
- C12,C13, CAPACITOR 2X ATC 500pF
- L1,L3, 1 TURN OF NO. 14 AWG THROUGH BINOCULAR CORE
- L2,L4, 4 TURNS OF NO. 14 AWG THROUGH BINOCULAR CORE
- R1, RESISTOR 6800 OHM 0.5 WATT
- R2,R3, RESISTOR 2700 OHM 0.5 WATT
- T1,T4, 1:1 BALUN 50 OHM COAX X 4"
- T2,T3, TWO SECTIONS, 4" EACH OF 25 OHM COAX, CONNECTED IN A 9:1 CONFIGURATION
- Q1, DU28200M
- BOARD, FR4 0.062"