an AMP company

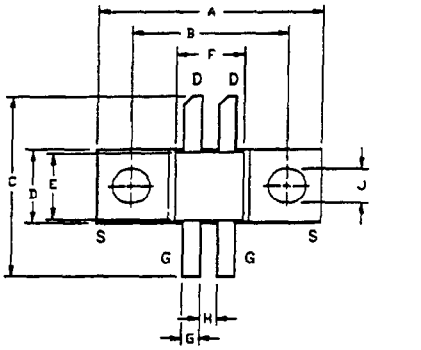
# RF MOSFET Power Transistor, 40W, 28V 100 - 500 MHz

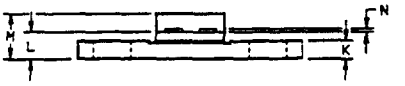
# UF2840P

V2.00

## Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- Common Source Configuration
- Lower Noise Floor




| LETTER DIM | MILLIMETERS MIN | MILLIMETERS MAX | INCHES MIN | INCHES MAX |
|---|---|---|---|---|
| A | 20.70 | 20.96 | .815 | .825 |
| B | 14.35 | 14.61 | .565 | .575 |
| C | 15.67 | 17.45 | .617 | .687 |
| D | 6.27 | 6.53 | .247 | .257 |
| E | 6.22 | 6.48 | .245 | .255 |
| F | 6.22 | 6.48 | .245 | .255 |
| G | 1.40 | 1.65 | .055 | .065 |
| H | 1.40 | 1.65 | .055 | .065 |
| J | 2.92 | 3.18 | .115 | .125 |
| K | 1.40 | 1.65 | .055 | .065 |
| L | 1.96 | 2.46 | .077 | .097 |
| M | 3.61 | 4.37 | .142 | .172 |
| N | .08 | .13 | .003 | .005 |

## 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* | A |
| Power Dissipation | $P_D$ | 116 | W |
| Junction Temperature | $T_J$ | 200 | °C |
| Storage Temperature | $T_{STG}$ | -55 to +150 | °C |
| Thermal Resistance | $\theta_{JC}$ | 1.5 | °C/W |

## Electrical Characteristics at 25°C

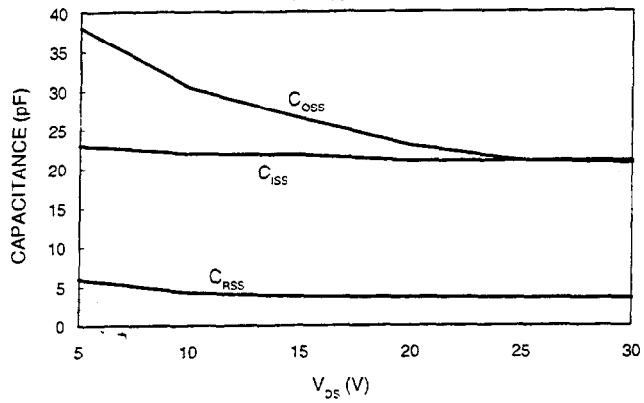
| Parameter | Symbol | Min | Max | Units | Test Conditions |
|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | 65 | - | V | $V_{GS}$=0.0 V, $I_{DS}$=5.0 mA* |
| Drain-Source Leakage Current | $I_{DSS}$ | - | 1.0 | mA | $V_{DS}$=28.0 V, $V_{GS}$=0.0 V* |
| Gate-Source Leakage Current | $I_{GSS}$ | - | 1.0 | µA | $V_{GS}$=20 V, $V_{DS}$=0.0 V* |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 2.0 | 6.0 | V | $V_{DS}$=10.0 V, $I_{DS}$=100.0 mA* |
| Forward Transconductance | $G_M$ | .5 | - | S | $V_{DS}$=10.0 V, $I_{DS}$=1000.0 mA, $\Delta V_{GS}$=1.0 V, 80 µs Pulse* |
| Input Capacitance | $C_{ISS}$ | - | 45 | pF | $V_{DS}$=28.0 V, F=1.0 MHz* |
| Output Capacitance | $C_{OSS}$ | - | 30 | pF | $V_{DS}$=28.0 V, F=1.0 MHz* |
| Reverse Capacitance | $C_{RSS}$ | - | 8 | pF | $V_{DS}$=28.0 V, F=1.0 MHz* |
| Power Gain | $G_P$ | 10 | - | dB | $V_{DD}$=28.0 V, $I_{DQ}$=500.0 mA, $P_{OUT}$=40.0 W, F=500 MHz |
| Drain Efficiency | $\eta_D$ | 50 | - | % | $V_{DD}$=28.0 V, $I_{DQ}$=500.0 mA, $P_{OUT}$=40.0 W, F=500 MHz |
| Load Mismatch Tolerance | VSWR-T | - | 20:1 | - | $V_{DD}$=28.0 V, $I_{DQ}$=500.0 mA, $P_{OUT}$=40.0 W, F=500 MHz |

* Per Side

## Typical Broadband Performance Curves

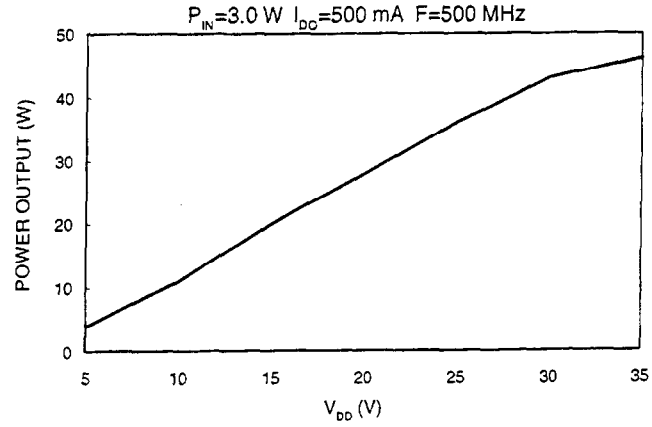
### CAPACITANCES vs VOLTAGE

F=1.0 MHz



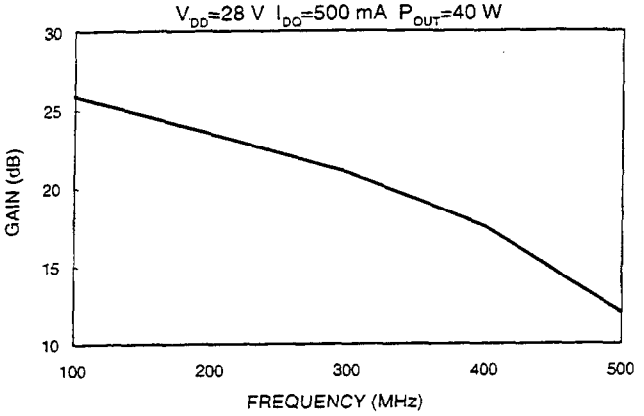

### POWER OUTPUT vs VOLTAGE

$P_{IN}$=3.0 W $I_{DQ}$=500 mA F=500 MHz



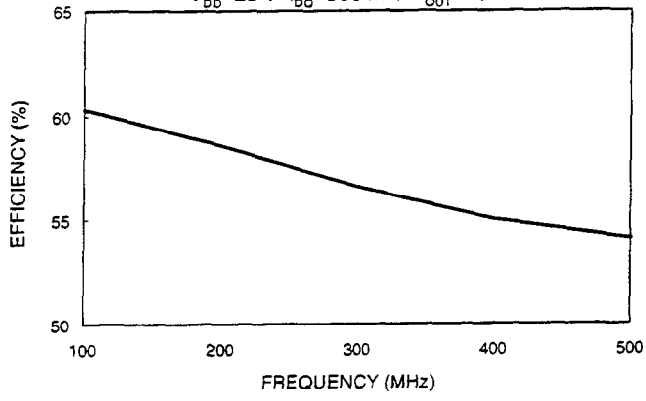

### GAIN vs FREQUENCY

$V_{DD}$=28 V $I_{DQ}$=500 mA $P_{OUT}$=40 W



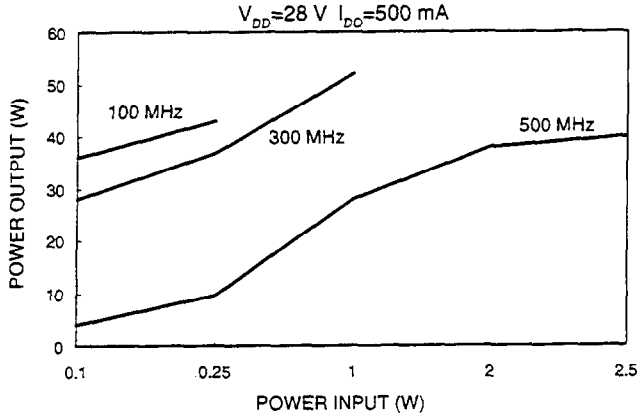

### EFFICIENCY vs FREQUENCY

$V_{DD}$=28 V $I_{DQ}$=500 mA $P_{OUT}$=40 W




### POWER OUTPUT vs POWER INPUT

$V_{DD}$=28 V $I_{DQ}$=500 mA



## Typical Device Impedance

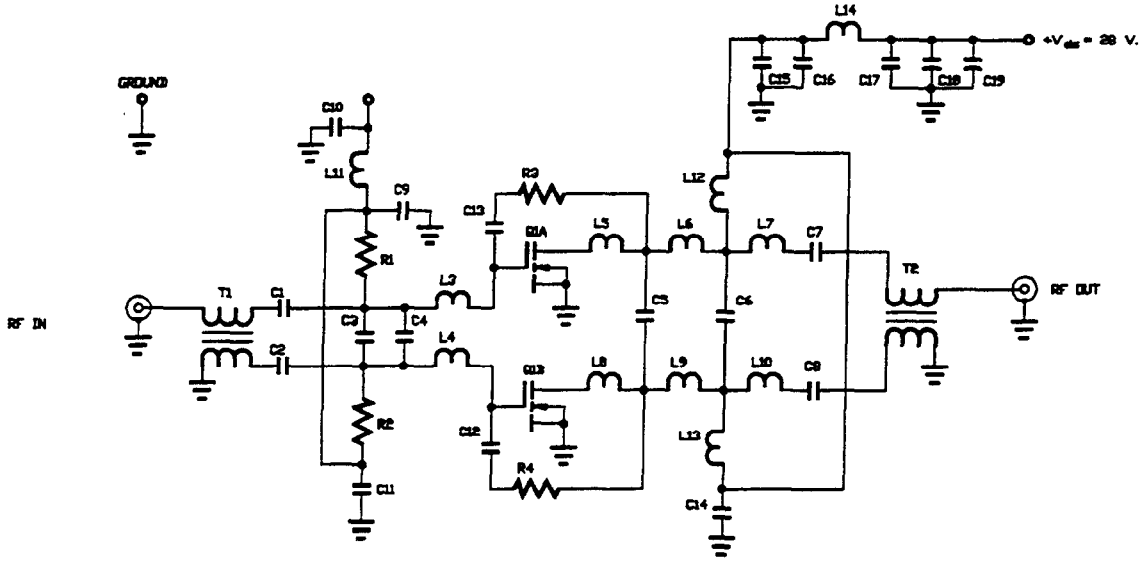
| Frequency (MHz) | $Z_{IN}$ (OHMS) | $Z_{LOAD}$ (OHMS) |
|---|---|---|
| 100 | 6.0 - j 20.0 | 25.0 + j 27.0 |
| 300 | 2.5 - j 5.5 | 13.0 + j 13.0 |
| 500 | 4.0 + j 3.0 | 12.0 + j 5.0 |

$V_{DD}$=28 V, $I_{DQ}$=500 mA, $P_{OUT}$=40.0 Watts

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

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

## RF Test Fixture




P A R T S L I S T

| | |
|---|---|
| C3, 5 | 10.0 pf |
| C6 | 11.0 pf |
| C4 | 18 pf |
| C1, 2, 7, 8, 12, 13 | 470 pf |
| C7, 9, 10, 11, 14, 15 | .015 uf |
| C18 | .10 uf |
| C16 | 1.0 uf |
| C19 | 50 uf 50 V. |
| R1, 2 | 100 OHM .25 W. |
| R3, 4 | 270 OHM .25 W. |
| T1, 2 | 2.50" OF 25 OHM SEMI-RIGID COAX |
| L11, 14 | 7 TURNS OF NO. 22 AWG WIRE |
| L12, 13 | 15 TURNS OF NO. 22 AWG WIRE |
| L7, 10 | .15" OF 50 OHM TRANSMISSION LINE |
| L6, 9 | .25" OF 50 OHM TRANSMISSION LINE |
| L5, 8 | .30" OF 50 OHM TRANSMISSION LINE |
| L4 | .35" OF 50 OHM TRANSMISSION LINE |
| L1, 2 | .50" OF 50 OHM TRANSMISSION LINE |
| Q1 | UF2840P |