

RF MOSFET Power Transistor, 20W, 28V

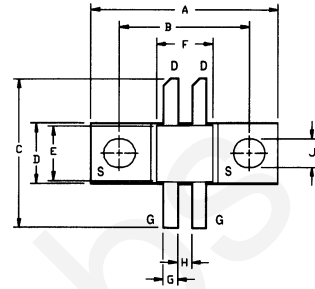
100 - 500 MHz

UF2820P

V2.00

Features

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



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} | 2.8* | A |
| Power Dissipation | P_D | 53 | W |
| Junction Temperature | T_J | 200 | °C |
| Storage Temperature | T_{STG} | -55 to +150 | °C |
| Thermal Resistance | θ_{JC} | 3.3 | °C/W |

| LETTER DIM | MILLIMETERS | | INCHES | |
|---------------|-------------|-------|--------|------|
| | MIN | MAX | MIN | MAX |
| A | 20.70 | 20.96 | .815 | .823 |
| 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 |



Island Labs

Electrical Characteristics at 25°C

| Parameter | Symbol | Min | Max | Units | Test Conditions |
|--------------------------------|--------------|------|------|---------------|---|
| Drain-Source Breakdown Voltage | BV_{DSS} | 65 | - | V | $V_{GS}=0.0\text{ V}, I_{DS}=4.0\text{ mA}^*$ |
| Drain-Source Leakage Current | I_{DSS} | - | 2.0 | mA | $V_{DS}=28.0\text{ V}, V_{GS}=0.0\text{ V}^*$ |
| Gate-Source Leakage Current | I_{GSS} | - | 2.0 | μA | $V_{GS}=20\text{ V}, V_{DS}=0.0\text{ V}^*$ |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 2.0 | 6.0 | V | $V_{DS}=10.0\text{ V}, I_{DS}=200.0\text{ mA}^*$ |
| Forward Transconductance | G_M | .160 | - | S | $V_{DS}=10.0\text{ V}, I_{DS}=200.0\text{ mA}, \Delta V_{GS}=1.0\text{ V}, 80\text{ }\mu\text{s Pulse}^*$ |
| Input Capacitance | C_{ISS} | - | 14 | pF | $V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}^*$ |
| Output Capacitance | C_{OSS} | - | 10 | pF | $V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}^*$ |
| Reverse Capacitance | C_{RSS} | - | 4.8 | pF | $V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}^*$ |
| Power Gain | G_P | 10 | - | dB | $V_{DD}=28.0\text{ V}, I_{DQ}=200.0\text{ mA}, P_{OUT}=20.0\text{ W}, F=500\text{ MHz}$ |
| Drain Efficiency | η_D | 50 | - | % | $V_{DD}=28.0\text{ V}, I_{DQ}=200.0\text{ mA}, P_{OUT}=20.0\text{ W}, F=500\text{ MHz}$ |
| Load Mismatch Tolerance | VSWR-T | - | 20:1 | - | $V_{DD}=28.0\text{ V}, I_{DQ}=200.0\text{ mA}, P_{OUT}=20.0\text{ W}, F=500\text{ MHz}$ |

* Per Side

Specifications Subject to Change Without Notice.

M/A-COM, Inc.

9-275

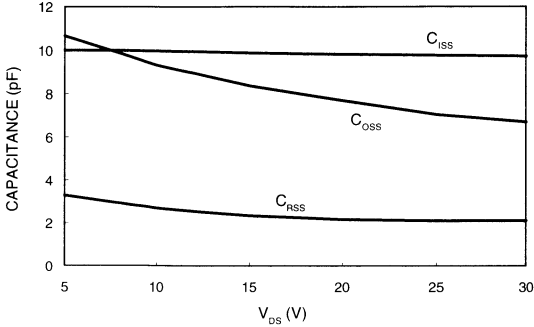
North America: Tel. (800) 366-2266
Fax (800) 618-8883

■ Asia/Pacific: Tel. +81 (03) 3226-1671
Fax +81 (03) 3226-1451

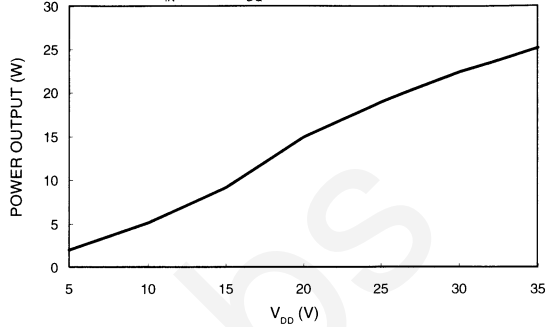
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Typical Broadband Performance Curves

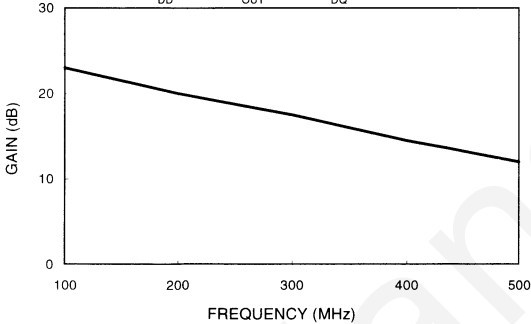
CAPACITANCES vs VOLTAGE
F=1.0 MHz



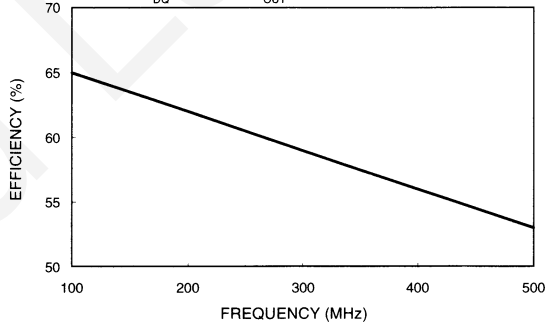
POWER OUTPUT vs VOLTAGE
 $P_{IN}=1.0\text{ W } I_{DO}=200\text{ mA } F=500\text{ MHz}$



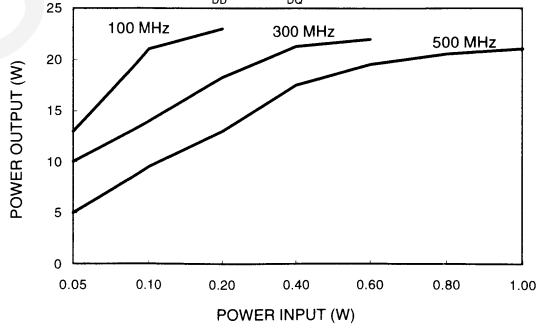
GAIN vs FREQUENCY
 $V_{DD}=28\text{ V } P_{OUT}=20\text{ W } I_{DO}=200\text{ mA}$



EFFICIENCY vs FREQUENCY
 $I_{DO}=200\text{ mA } P_{OUT}=20\text{ W } F=500\text{ MHz}$



POWER OUTPUT vs POWER INPUT
 $V_{DD}=28\text{ V } I_{DO}=200\text{ mA}$



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Typical Device Impedance

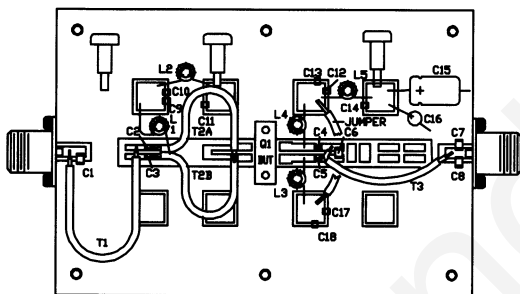
| Frequency (MHz) | Z _{IN} (OHMS) | Z _{LOAD} (OHMS) |
|-----------------|------------------------|--------------------------|
| 100 | 9.5 - j 60.0 | 4.0 + j 68.0 |
| 300 | 5.0 - j 35.0 | 40.0 + j 48.0 |
| 500 | 2.0 - j 22.0 | 36.0 + j 34.0 |

V_{DD}=28 V, I_{DQ}=200 mA, P_{OUT}=20.0 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



PARTS LIST

- C1 11pf
- C2, 3, 4, 5 560pf
- C6 6.8pf
- C7 0.6pf
- C8 2.0PF
- C10, 11, 12, 14, 17 .015uf
- C9, 13, 18 680pf
- C15 50uf 50V.
- C16 0.1uf
- T1 2.50' OF 50 OHM (.085' OD) SEMI RIGID COAX
- T2A, 2B 2.50' OF 25 OHM (.070' OD) SEMI RIGID COAX
- T3 2.10' OF 50 OHM (.085' OD) SEMI RIGID COAX
- L1, 2, 3, 4, 5 14 TURNS OF NO. 28 AWG ON TOROID CORE

