

RF MOSFET Power Transistor, 100W, 28V

100 - 500 MHz

UF28100H

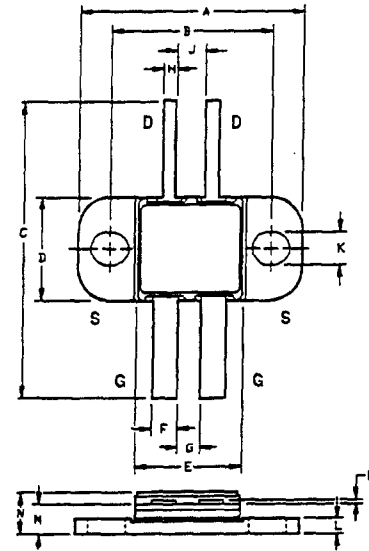
V2.00

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 | θ_{JC} | 0.7 | °C/W |



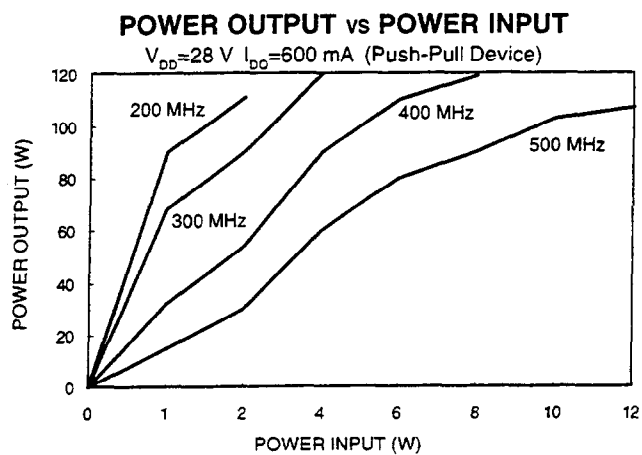
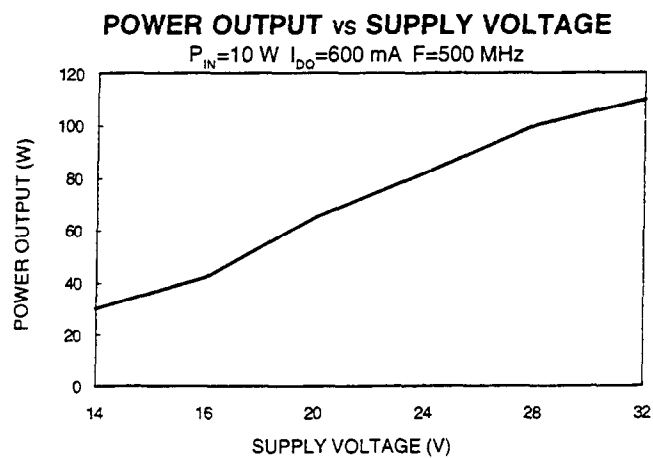
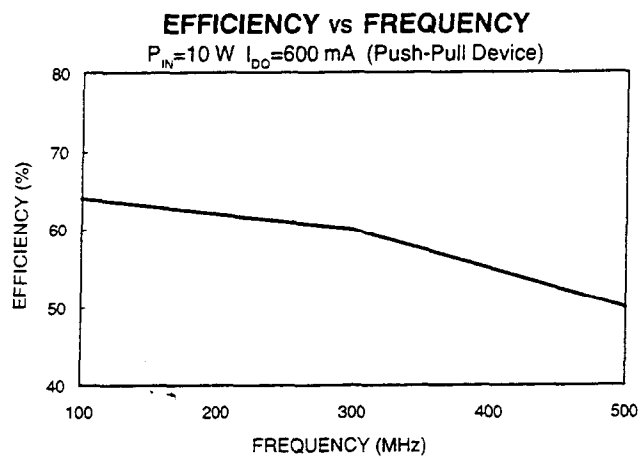
| LETTER | MILLIMETERS | | INCHES | |
|--------|-------------|-------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 22.73 | 22.79 | .895 | .905 |
| B | 16.38 | 16.64 | .645 | .655 |
| C | 29.88 | 29.85 | 1.175 | 1.175 |
| D | 30.43 | 30.29 | .395 | .405 |
| E | 18.64 | 18.90 | .435 | .465 |
| F | 2.41 | 2.67 | .095 | .105 |
| G | 2.82 | 2.54 | .100 | .100 |
| H | 1.14 | 1.40 | .045 | .055 |
| J | 2.79 | 2.28 | .110 | .130 |
| K | 3.32 | 3.30 | .130 | .130 |
| L | 1.40 | 1.65 | .055 | .065 |
| M | 2.67 | 3.30 | .115 | .135 |
| N | 2.64 | 4.27 | .144 | .168 |
| P | .30 | .35 | .014 | .016 |

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 | μA | $V_{GS}=20\text{ V}, V_{DS}=0.0\text{ V}^*$ |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 2.0 | 6.0 | V | $V_{DS}=10.0\text{ V}, I_{DS}=300.0\text{ mA}^*$ |
| Forward Transconductance | G_M | 1.5 | - | S | $V_{DS}=10.0\text{ V}, I_{DS}=3000.0\text{ mA}, \Delta V_{GS}=1.0\text{ V}, 80\text{ }\mu\text{s Pulse}^*$ |
| 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 | η_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

Typical Broadband Performance Curves



Typical Device Impedance

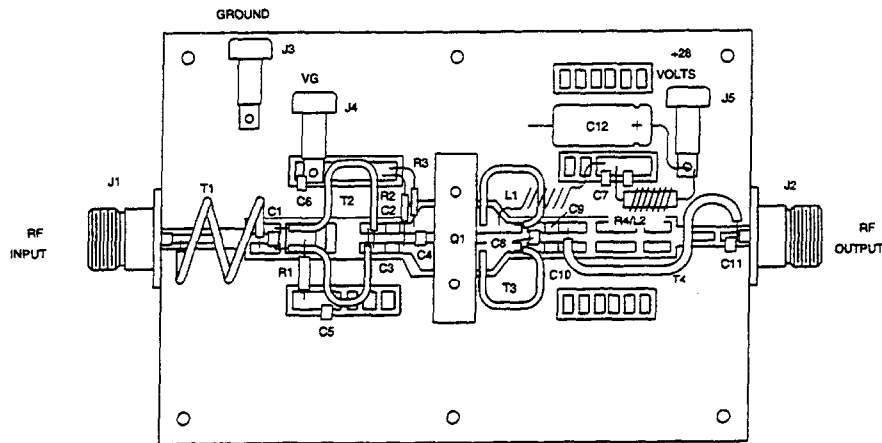
| Frequency (MHz) | Z _{IN} (OHMS) | Z _{LOAD} (OHMS) |
|-----------------|------------------------|--------------------------|
| 100 | 4.5 - j 6.0 | 14.5 + j 0.5 |
| 300 | 2.25 - j 1.75 | 7.5 + j 1.0 |
| 500 | 1.5 + j 5.5 | 3.5 - j 3.5 |

V_{DD}=28 V, I_{DQ}=600 mA, P_{OUT}=100.0 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,C8 | CHIP CAPACITOR, 2.0pF ATC B |
| C2,C3 | CHIP CAPACITOR, 5000pF |
| C4 | CHIP CAPACITOR, 37pF ATC B |
| C5 | CHIP CAPACITOR, 260pF 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 .085" X 3" LONG |
| T2 | 4:1 BALUN TRANSFORMER, 25 OHM SEMI-RIGID COAX .070" X 2.5" LONG |
| T3 | 1:9 BALUN TRANSFORMER, 10 OHM SEMI-RIGID COAX .070" X 2.5" LONG |
| T4 | 1:1 BALUN TRANSFORMER, 50 OHM SEMI-RIGID COAX .085" X 4" LONG |
| Q1 | UF28100H |
| BOARD | ROGERS 5870, .031" THICK |
| J1,J2 | CONNECTOR, TYPE "N" |
| J3,J4,J5 | BANANA JACK |
| HEATSINK | FINNED ALUMINUM, D/N 73050182-03 |