

RF MOSFET Power Transistor, 120W, 28V

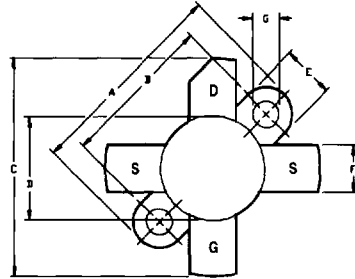
2 - 175 MHz

DU28120U

V2.00

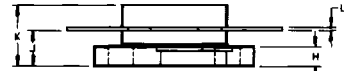
Features

- 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} | 24 | A |
| Power Dissipation | P_D | 269 | W |
| Junction Temperature | T_J | 200 | °C |
| Storage Temperature | T_{STG} | -55 to +150 | °C |
| Thermal Resistance | θ_{JC} | 0.65 | °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 | 25.91 | 26.42 | 1.020 | 1.040 |
| D | 12.60 | 12.85 | .496 | .506 |
| E | 6.22 | 6.48 | .245 | .255 |
| F | 5.59 | 5.84 | .220 | .230 |
| G | 3.05 | 3.30 | .120 | .130 |
| H | 2.21 | 2.59 | .087 | .102 |
| J | 3.91 | 4.42 | .154 | .174 |
| K | 6.53 | 7.34 | .257 | .289 |
| 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 | $V_{GS}=0.0\text{ V}, I_{DS}=30.0\text{ mA}$ |
| Drain-Source Leakage Current | I_{DSS} | - | 6.0 | mA | $V_{DS}=28.0\text{ V}, V_{GS}=0.0\text{ V}$ |
| Gate-Source Leakage Current | I_{GSS} | - | 6.0 | μA | $V_{GS}=20.0\text{ V}, V_{DS}=0.0\text{ V}$ |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 2.0 | 6.0 | V | $V_{DS}=10.0\text{ V}, I_{DS}=600.0\text{ mA}$ |
| Forward Transconductance | G_M | 3.0 | - | S | $V_{DS}=10.0\text{ V}, I_{DS}=6.0\text{ A}, \Delta V_{GS}=1.0\text{ V}, 80\ \mu\text{s Pulse}$ |
| Input Capacitance | C_{ISS} | - | 270 | pF | $V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}$ |
| Output Capacitance | C_{OSS} | - | 240 | pF | $V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}$ |
| Reverse Capacitance | C_{RSS} | - | 48 | pF | $V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}$ |
| Power Gain | G_P | 13 | - | dB | $V_{DD}=28.0\text{ V}, I_{DO}=600\text{ mA}, P_{OUT}=120.0\text{ W}, F=175\text{ MHz}$ |
| Drain Efficiency | η_D | 60 | - | % | $V_{DD}=28.0\text{ V}, I_{DO}=600\text{ mA}, P_{OUT}=120.0\text{ W}, F=175\text{ MHz}$ |
| Load Mismatch Tolerance | VSWR-T | - | 30:1 | - | $V_{DD}=28.0\text{ V}, I_{DO}=600\text{ mA}, P_{OUT}=120.0\text{ W}, F=175\text{ MHz}$ |

Specifications Subject to Change Without Notice.

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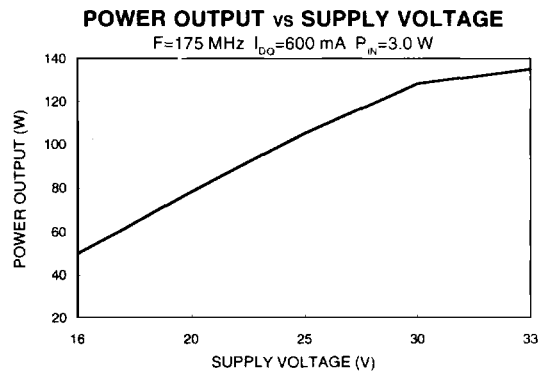
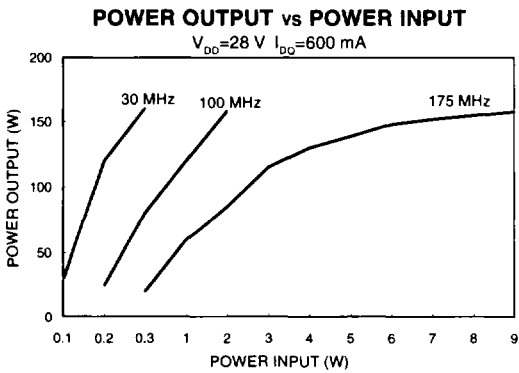
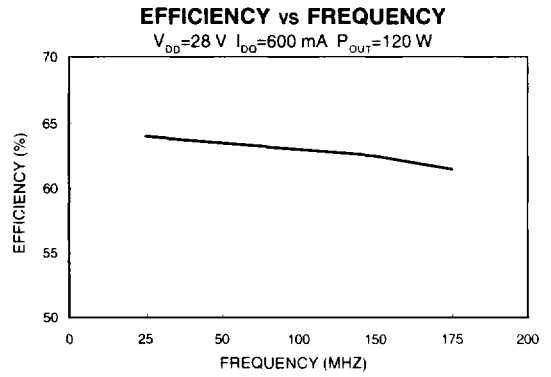
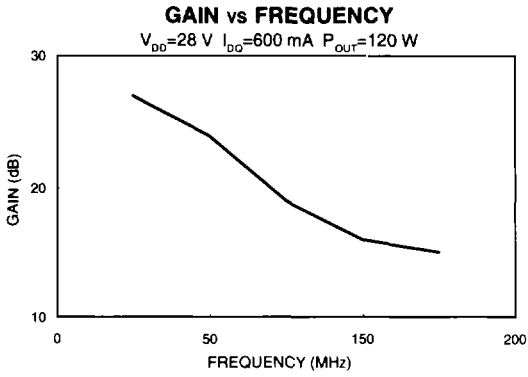
M/A-COM, Inc.

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Typical Broadband Performance Curves



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Typical Device Impedance

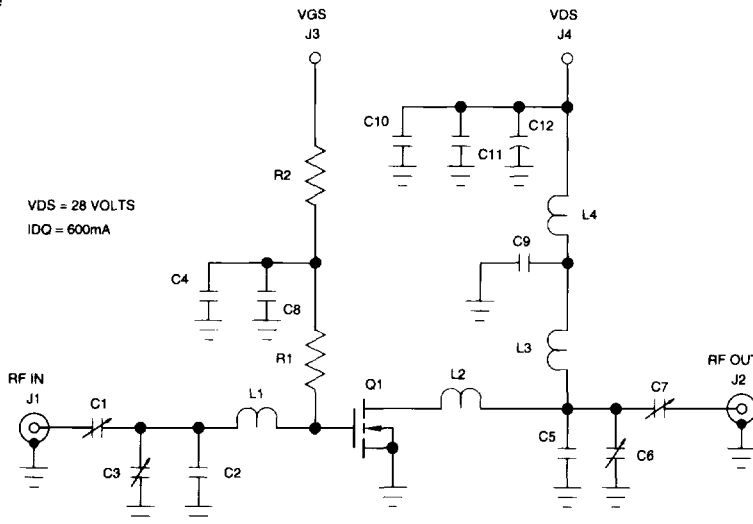
| Frequency (MHz) | Z _{IN} (OHMS) | Z _{LOAD} (OHMS) |
|-----------------|------------------------|--------------------------|
| 30 | 4.0 - j 8.0 | 3.4 + j 2.4 |
| 100 | 1.0 - j 2.5 | 2.2 + j 1.3 |
| 175 | 1.0 - j 0.5 | 2.2 + j 0.0 |

V_{DD}=28 V, I_{DD}=600 mA, P_{OUT}=120 Watts

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

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

RF Test Fixture



PARTS LIST

| | |
|--------|---|
| C1,C6 | TRIMMER CAPACITOR 5-80pF |
| C2,C5 | CAPACITOR 50pF |
| C3 | TRIMMER CAPACITOR 4-40pF |
| C4,C11 | MONOLITHIC CIRCUIT CAPACITOR 0.01uF |
| C7 | TRIMMER CAPACITOR 9-180pF |
| C8,C9 | CAPACITOR 500pF |
| C10 | CAPACITOR 1000pF |
| C12 | ELECTROLYTIC CAPACITOR 50uF 50 VOLT |
| L1,L2 | NO. 12 AWG COPPER WIRE X 0.87" (LOOP 0.4") |
| L3,L4 | 8 TURNS OF NO. 16 AWG ENAMEL WIRE ON 0.25", CLOSE WOUND |
| R1,R2 | RESISTOR 2.7K OHMS 0.25 WATT |
| Q1 | DU28120U |
| BOARD | FR4 0.062" |

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