



RF MOSFET Power Transistor, 15W, 12V

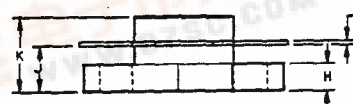
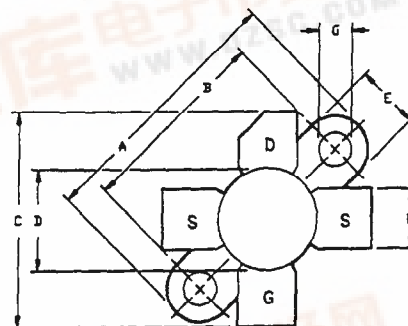
2 - 175 MHz

DU1215S

V2.00

Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- High Saturated Output Power
- Lower Noise Figure Than Bipolar Devices
- Specifically Designed for 12 Volt Applications



Absolute Maximum Ratings at 25°C

| Parameter | Symbol | Rating | Units |
|----------------------|---------------|-------------|-------|
| Drain-Source Voltage | V_{DS} | 40 | V |
| Gate-Source Voltage | V_{GS} | 20 | V |
| Drain-Source Current | I_{DS} | 4 | A |
| Power Dissipation | P_D | 87.5 | W |
| Junction Temperature | T_J | 200 | °C |
| Storage Temperature | T_{STG} | -55 to +150 | °C |
| Thermal Resistance | θ_{JC} | 2 | °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 | 20.07 | 20.83 | .790 | .820 |
| D | 9.47 | 9.73 | .373 | .383 |
| E | 6.22 | 6.48 | .245 | .255 |
| F | 5.64 | 5.79 | .222 | .228 |
| G | 2.92 | 3.30 | .115 | .130 |
| H | 2.29 | 2.67 | .090 | .105 |
| J | 4.04 | 4.55 | .159 | .179 |
| K | 6.58 | 7.39 | .259 | .291 |
| L | .10 | .15 | .004 | .006 |

Electrical Characteristics at 25°C

| Parameter | Symbol | Min | Max | Units | Test Conditions |
|--------------------------------|--------------|-----|------|---------------|---|
| Drain-Source Breakdown Voltage | BV_{DSS} | 40 | - | V | $V_{GS}=0.0\text{ V}, I_{DS}=5.0\text{ mA}$ |
| Drain-Source Leakage Current | I_{DSS} | - | 1.0 | mA | $V_{DS}=15.0\text{ V}, V_{GS}=0.0\text{ V}$ |
| Gate-Source Leakage Current | I_{GSS} | - | 1.0 | μA | $V_{GS}=20.0\text{ V}, V_{DS}=0.0\text{ V}$ |
| Gate Threshold Voltage | $V_{GS(TH)}$ | 2.0 | 6.0 | V | $V_{DS}=10.0\text{ V}, I_{DS}=100\text{ mA}$ |
| Forward Transconductance | G_M | 0.5 | - | S | $V_{DS}=10.0\text{ V}, I_{DS}=1000\text{ mA}, \Delta V_{GS}=1.0\text{ V}$ |
| Input Capacitance | C_{ISS} | - | 50 | pF | $V_{DS}=12.0\text{ V}, F=1.0\text{ MHz}$ |
| Output Capacitance | C_{OSS} | - | 60 | pF | $V_{DS}=12.0\text{ V}, F=1.0\text{ MHz}$ |
| Reverse Capacitance | C_{RSS} | - | 12 | pF | $V_{DS}=12.0\text{ V}, F=1.0\text{ MHz}$ |
| Power Gain | G_P | 9.5 | - | dB | $V_{DD}=12.0\text{ V}, I_{DQ}=100\text{ mA}, P_{OUT}=15\text{ W}, F=175\text{ MHz}$ |
| Drain Efficiency | η_D | 60 | - | % | $V_{DD}=12.0\text{ V}, I_{DQ}=100\text{ mA}, P_{OUT}=15\text{ W}, F=175\text{ MHz}$ |
| Load Mismatch Tolerance | VSWR-T | - | 30:1 | - | $V_{DD}=12.0\text{ V}, I_{DQ}=100\text{ mA}, P_{OUT}=15\text{ W}, F=175\text{ MHz}$ |

Specifications Subject to Change Without Notice.



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Typical Device Impedance

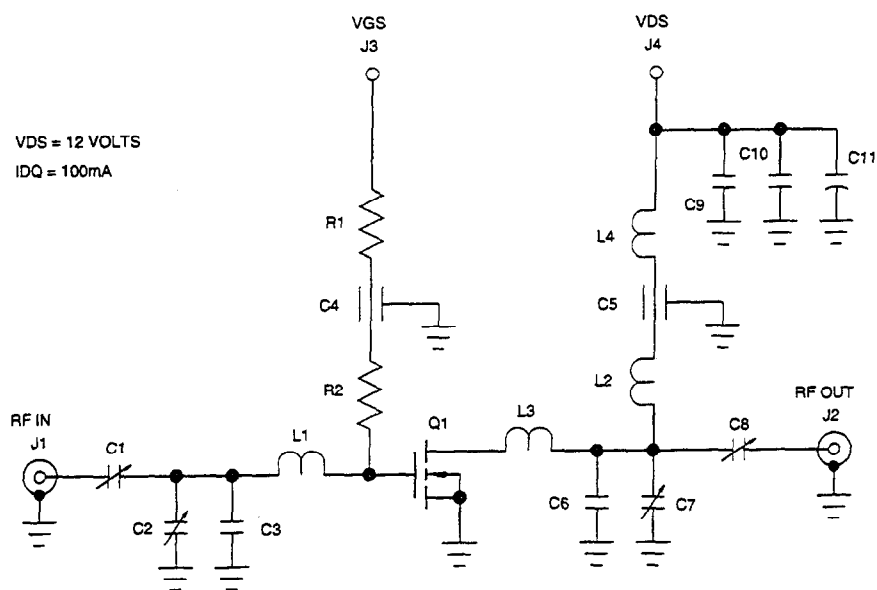
| Frequency (MHz) | Z _{IN} (OHMS) | Z _{LOAD} (OHMS) |
|-----------------|------------------------|--------------------------|
| 30 | 3.0 - j 25 | 4.0 - j 3.0 |
| 100 | 3.0 - j 15 | 3.5 - j 1.5 |
| 175 | 5.0 - j 8 | 4.0 + j 0.0 |

V_{DD}=12 V, I_{DQ}=100 mA, P_{OUT}=15 Watts

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

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

RF Test Fixture



VDS = 12 VOLTS
IDQ = 100mA

PARTS LIST

- C1,C8 TRIMMER CAPACITOR 5-80pF
- C2,C7 TRIMMER CAPACITOR 4-40pF
- C3,C6 SEMCO CAPACITOR 30pF
- C4,C5 FEEDTHROUGH CAPACITOR 0.001uF
- C9 SEMCO CAPACITOR 1000pF
- C10 MONOLITHIC CERAMIC CAPACITOR 0.01uF
- C11 ELECTROLYTIC CAPACITOR 50uF 50 V.
- L1,L3 NO. 12 AWG COPPER WIRE X 1"
- L2 8 TURNS OF NO. 20 AWG ENAMEL WIRE ON '0.25", CLOSE WOUND
- L4 12 TURNS OF NO. 20 AWG ON '0.25", CLOSE WOUND
- R1,R2 RESISTOR 100K OHMS
- Q1 DU1215S
- BOARD FR4 0.062"

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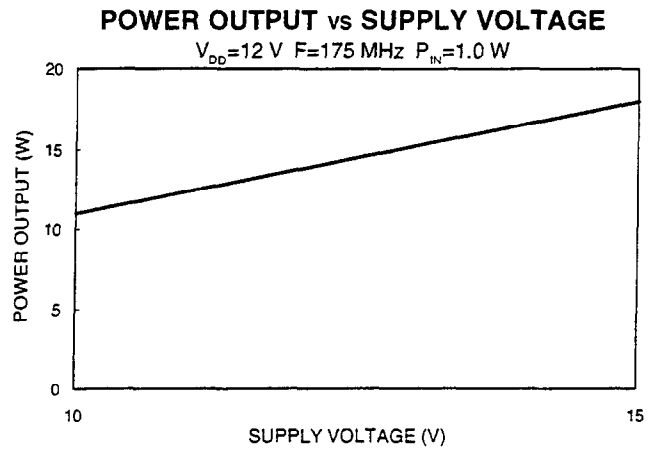
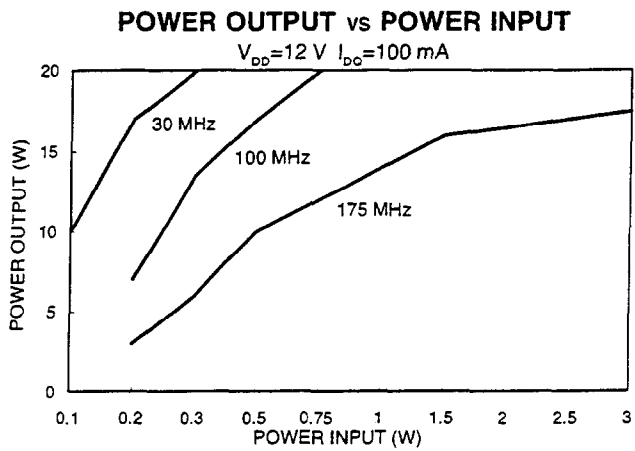
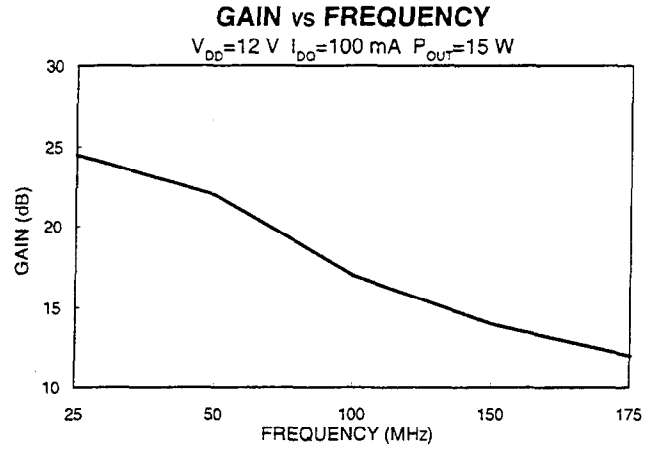
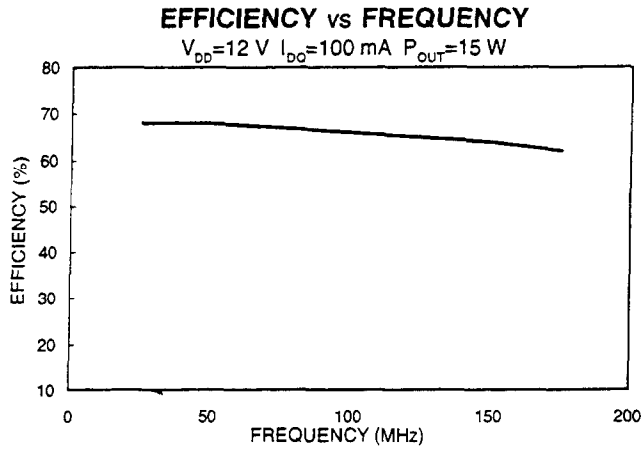
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Typical Broadband Performance Curves



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