RF Power MOSFET Transistor
80 W, 2 - 175 MHz, 28 V

Features
- N-channel enhancement mode device
- DMOS structure
- Lower capacitances for broadband operation
- High saturated output power
- Lower noise figure than bipolar devices
- RoHS Compliant

ABSOLUTE MAXIMUM RATINGS AT 25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain-Source Voltage</td>
<td>V_DS</td>
<td>65</td>
<td>V</td>
</tr>
<tr>
<td>Gate-Source Voltage</td>
<td>V_GS</td>
<td>20</td>
<td>V</td>
</tr>
<tr>
<td>Drain-Source Current</td>
<td>I_D</td>
<td>16</td>
<td>A</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>P_D</td>
<td>206</td>
<td>W</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>T_J</td>
<td>200</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T_STG</td>
<td>-65 to +150</td>
<td>°C</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>θ_JC</td>
<td>0.85</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

TYPICAL DEVICE IMPEDANCE

<table>
<thead>
<tr>
<th>F (MHz)</th>
<th>Z_IN (Ω)</th>
<th>Z_LOAD (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>5.4 - j4.4</td>
<td>5.7 + j4.7</td>
</tr>
<tr>
<td>50</td>
<td>2.5 - j4.4</td>
<td>3.4 + j3.5</td>
</tr>
<tr>
<td>100</td>
<td>1.6 - j3.4</td>
<td>2.4 + j2.4</td>
</tr>
<tr>
<td>175</td>
<td>0.7 - j1.2</td>
<td>1.7 + j0.8</td>
</tr>
</tbody>
</table>

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.

ELECTRICAL CHARACTERISTICS AT 25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min</th>
<th>Max</th>
<th>Units</th>
<th>Test Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain-Source Breakdown Voltage</td>
<td>B(V_DS)</td>
<td>65</td>
<td>-</td>
<td>V</td>
<td>V_DS = 0.0 V , I_DS = 20.0 mA</td>
</tr>
<tr>
<td>Drain-Source Leakage Current</td>
<td>I_DSS</td>
<td>-</td>
<td>4.0</td>
<td>mA</td>
<td>V_DS = 28.0 V , V_GS = 0.0 V</td>
</tr>
<tr>
<td>Gate-Source Leakage Current</td>
<td>I_GSS</td>
<td>-</td>
<td>4.0</td>
<td>μA</td>
<td>V_DS = 20.0 V , V_GS = 0.0 V</td>
</tr>
<tr>
<td>Gate Threshold Voltage</td>
<td>V_G(SIH)</td>
<td>2.0</td>
<td>6.0</td>
<td>V</td>
<td>V_DS = 10.0 V , I_DS = 400.0 mA</td>
</tr>
<tr>
<td>Forward Transconductance</td>
<td>G_M</td>
<td>2.0</td>
<td>-</td>
<td>S</td>
<td>V_DS = 10.0 V , I_DS = 4.0 A , ΔV_GS = 1.0V, 80 μs Pulse</td>
</tr>
<tr>
<td>Input Capacitance</td>
<td>C_RS</td>
<td>-</td>
<td>180</td>
<td>pF</td>
<td>V_DS = 28.0 V , F = 1.0 MHz</td>
</tr>
<tr>
<td>Output Capacitance</td>
<td>C_OSS</td>
<td>-</td>
<td>160</td>
<td>pF</td>
<td>V_DS = 28.0 V , F = 1.0 MHz</td>
</tr>
<tr>
<td>Reverse Capacitance</td>
<td>C_RSS</td>
<td>-</td>
<td>32</td>
<td>pF</td>
<td>V_DS = 28.0 V , F = 1.0 MHz</td>
</tr>
<tr>
<td>Power Gain</td>
<td>G_P</td>
<td>13</td>
<td>-</td>
<td>dB</td>
<td>V_DD = 28.0 V , I_DD = 400 mA , P_OUT = 60.0 W F =175 MHz</td>
</tr>
<tr>
<td>Drain Efficiency</td>
<td>η_D</td>
<td>60</td>
<td>-</td>
<td>%</td>
<td>V_DD = 28.0 V , I_DD = 400 mA , P_OUT = 60.0 W F =175 MHz</td>
</tr>
<tr>
<td>Load Mismatch Tolerance</td>
<td>VSWR-T</td>
<td>-</td>
<td>30:1</td>
<td>-</td>
<td>V_DD = 28.0 V , I_DD = 400 mA , P_OUT = 60.0 W F =175 MHz</td>
</tr>
</tbody>
</table>
Typical Broadband Performance Curves

**GAIN vs FREQUENCY**

- $V_{DD}=28\text{ V}$
- $I_{DO}=400\text{ mA}$
- $P_{OUT}=80\text{ W}$

**EFFICIENCY vs FREQUENCY**

- $V_{DD}=28\text{ V}$
- $I_{DO}=400\text{ mA}$
- $P_{OUT}=80\text{ W}$

**POWER OUTPUT vs POWER INPUT**

- $V_{DD}=28\text{ V}$
- $I_{DO}=400\text{ mA}$

**POWER OUTPUT vs SUPPLY VOLTAGE**

- $I_{DO}=400\text{ mA}$
- $F=175\text{ MHz}$
- $P_{IN}=3.0\text{ W}$

For further information and support please visit:
https://www.macom.com/support
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TEST FIXTURE SCHEMATIC

VGS J3

C12

C11

C10

L4

L3

C9

C8

RF OUT J2

RF IN J1

L1

Q1

L2

C7

C6

VDS = 28 VOLTS
IDQ = 400mA

C1, C3 TRIMMER CAPACITOR 4-40pF
C2, C9, C10 CAPACITOR 50pF
C4, C11 CAPACITOR 1000pF
C5 MONOLITHIC CIRCUIT CAPACITOR 0.01μF
C6, C8 TRIMMER CAPACITOR 9-180pF
C7 CAPACITOR 15pF
C12 ELECTROLYTIC CAPACITOR 50μF 50 VOLT
L1 NO. 12 AWG COPPER WIRE X 1.18" (LOOP 0.5")
L2 NO. 12 AWG COPPER WIRE X 1" (LOOP 0.4")
L3, L4 8 TURNS OF NO. 18 AWG ENAMEL WIRE ON
Ø0.25", CLOSE WOUND
R1 RESISTOR 300 OHMS 0.5 WATT
R2 RESISTOR 2.7K OHMS 0.25 WATT
Q1 DU2880T
BOARD FR4 0.062"