RF Power MOSFET Transistor
150 W, 100 - 500 MHz, 28 V

Features
- DMOS structure
- Lower capacitance for broadband operation
- Common source configuration

ABSOLUTE MAXIMUM RATINGS

<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_{DS}</td>
<td>16*</td>
<td>A</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>P_{D}</td>
<td>389</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>0.45</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. M/A-COM does not recommend sustained operation near these maximum limits.
3. At 25°C Tcase, unless noted.

ELECTRICAL SPECIFICATIONS: 25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Units</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain-Source Breakdown Voltage</td>
<td>V_{DS} = 0.0 V, I_{DS} = 20.0 mA*</td>
<td>BV_{DSS}</td>
<td>65</td>
<td>—</td>
</tr>
<tr>
<td>Drain-Source Leakage Current</td>
<td>V_{DS} = 28.0 V, V_{GS} = 0.0V*</td>
<td>I_{DSS}</td>
<td>—</td>
<td>4.0</td>
</tr>
<tr>
<td>Gate-Source Leakage Current</td>
<td>V_{GS} = 20 V, V_{DS} = 0.0 V*</td>
<td>I_{GSS}</td>
<td>—</td>
<td>4.0</td>
</tr>
<tr>
<td>Gate Threshold Voltage</td>
<td>V_{DS} = 10.0 V, I_{DS} = 400.0 mA*</td>
<td>V_{GS(TH)}</td>
<td>2.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Forward Transconductance</td>
<td>V_{DS} = 10.0 V, I_{DS} = 4000.0 mA, \Delta V_{GS} = 1.0 V, 80μs pulse*</td>
<td>G_{M}</td>
<td>2.0</td>
<td>—</td>
</tr>
<tr>
<td>Input Capacitance</td>
<td>V_{DS} = 28.0 V, F = 1.0 MHz*</td>
<td>C_{ISS}</td>
<td>—</td>
<td>180</td>
</tr>
<tr>
<td>Output Capacitance</td>
<td>V_{DS} = 28.0 V, F = 1.0 MHz*</td>
<td>C_{OSS}</td>
<td>—</td>
<td>120</td>
</tr>
<tr>
<td>Reverse Capacitance</td>
<td>V_{DS} = 28.0 V, F = 1.0 MHz*</td>
<td>C_{RSS}</td>
<td>—</td>
<td>32</td>
</tr>
<tr>
<td>Power Gain</td>
<td>V_{DD} = 28.0 V, I_{DQ} = 400.0 mA, P_{OUT} = 150.0 W, F = 500 MHz</td>
<td>G_{P}</td>
<td>8</td>
<td>—</td>
</tr>
<tr>
<td>Drain Efficiency</td>
<td>V_{DD} = 28.0 V, I_{DQ} = 400.0 mA, P_{OUT} = 150.0 W, F = 500 MHz</td>
<td>η_{D}</td>
<td>55</td>
<td>—</td>
</tr>
<tr>
<td>Load Mismatch Tolerance</td>
<td>V_{DD} = 28.0 V, I_{DQ} = 400.0 mA, P_{OUT} = 150.0 W, F = 500 MHz</td>
<td>VSWR-T</td>
<td>—</td>
<td>10:1**</td>
</tr>
</tbody>
</table>

Notes:
* Per side
** At all phase angles
UF28150J

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Typical Broadband Performance Curves

- Capacitance vs Voltage
  F=1.0 MHz
  \( C_{oss} \)
  \( C_{oss} \)
  \( C_{oss} \)

- Power Output vs Voltage
  \( P_{in} = 24 \text{ W} \), \( I_{dQ} = 400 \text{ mA} \)
  \( F = 500 \text{ MHz} \)

- Gain vs Frequency
  \( V_{dd} = 28 \text{ V} \), \( P_{out} = 100 \text{ W} \), \( I_{dQ} = 400 \text{ mA} \)

- Efficiency vs Frequency
  \( V_{dd} = 28 \text{ V} \), \( I_{dQ} = 400 \text{ mA} \), \( P_{out} = 150 \text{ W} \)

- Power Output vs Power Input
  \( V_{dd} = 28 \text{ W} \), \( I_{dQ} = 400 \text{ mA} \)

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**TYPICAL OPTIMUM DEVICE IMPEDANCES**

<table>
<thead>
<tr>
<th>F (MHz)</th>
<th>Z_{IN} (Ω)</th>
<th>Z_{LOAD} (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>3.7 - j5.9</td>
<td>3.0 - j0.7</td>
</tr>
<tr>
<td>300</td>
<td>2.7 - j5.9</td>
<td>2.6 - j0.55</td>
</tr>
<tr>
<td>500</td>
<td>2.5 - j2.9</td>
<td>2.5 - j0.5</td>
</tr>
</tbody>
</table>

V_{DD} = 28V, I_{DQ} = 400mA, P_{OUT} = 150W

**HANDLING PROCEDURES: STATIC SENSITIVITY**

Please observe the following precautions to avoid damage:
DMOS devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.
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Rev. V1

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