RF Power MOSFET Transistor
60 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_{DS}</td>
<td>12</td>
<td>A</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>P_{D}</td>
<td>159</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>-55 to +150</td>
<td>°C</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>θ_{JC}</td>
<td>1.1</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>9.0 - j4.0</td>
<td>6.0 + j0.0</td>
</tr>
<tr>
<td>50</td>
<td>6.0 - j5.8</td>
<td>5.0 + j2.0</td>
</tr>
<tr>
<td>100</td>
<td>4.0 - j4.2</td>
<td>4.0 + j3.0</td>
</tr>
<tr>
<td>200</td>
<td>1.0 - j1.0</td>
<td>2.0 + j1.9</td>
</tr>
</tbody>
</table>

Z_{IN} = 28V, I_{DD} = 300mA, P_{OUT} = 60 W

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>
</tr>
</thead>
<tbody>
<tr>
<td>Drain-Source Breakdown Voltage</td>
<td>V_{DSS}</td>
<td>65</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>Drain-Source Leakage Current</td>
<td>I_{DSS}</td>
<td>3.0</td>
<td>mA</td>
<td>V_{DS} = 0.0 V , I_{DS} = 15.0 mA</td>
</tr>
<tr>
<td>Gate-Source Leakage Current</td>
<td>I_{GSS}</td>
<td>3.0</td>
<td>μA</td>
<td>V_{GS} = 20.0 V , V_{GS} = 0.0 V</td>
</tr>
<tr>
<td>Gate Threshold Voltage</td>
<td>V_{G(S)}</td>
<td>2.0</td>
<td>6.0</td>
<td>V</td>
</tr>
<tr>
<td>Forward Transconductance</td>
<td>G_{M}</td>
<td>1.5</td>
<td>-</td>
<td>S</td>
</tr>
<tr>
<td>Input Capacitance</td>
<td>C_{ISS}</td>
<td>135</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>120</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>24</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>
</tr>
<tr>
<td>Drain Efficiency</td>
<td>η_{D}</td>
<td>60</td>
<td>-</td>
<td>%</td>
</tr>
<tr>
<td>Load Mismatch Tolerance</td>
<td>VSWR-T</td>
<td>30:1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

V_{DD} = 28V, I_{DQ} = 300mA, P_{OUT} = 60 W F = 175 MHz

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

MA-COM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit www.macom.com for additional data sheets and product information.
Typical Broadband Performance Curves

GAIN vs FREQUENCY
V_{DD}=28 V \hspace{0.1cm} I_{DO}=300 mA \hspace{0.1cm} P_{OUT}=60 W

EFFICIENCY vs FREQUENCY
V_{DD}=28 V \hspace{0.1cm} I_{DO}=300 mA \hspace{0.1cm} P_{OUT}=60 W

POWER OUTPUT vs POWER INPUT
V_{DD}=28 V \hspace{0.1cm} I_{DO}=300 mA
DU2860U

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

TEST FIXTURE SCHEMATIC

VDS = 28 VOLTS
IDQ = 300 mA

RF IN

C1

C3

C2

L1

R1

Q1

Q2

C4

C5

C7

C6

C9

RF OUT

J1

J2

J3

J4

J5

J6

J7

J8

TEST FIXTURE ASSEMBLY

FEED-THROUGH CAPACITOR
600 pF (C100)

RESISTOR
5.1 kΩ 5 W

PC BOARD
FR-4 0.063” THICK

TRIMMER CAPACITOR
10 - 100 pF

CAPACITOR
56 pF (C2, C9) UNELCO

FINISH: HEATSHINK
ALUMINUM
13050152-04

HEATSHINK
COBRE
7350293-01

INDUCTOR
NO. 12 4 AWG COPPER
WIRE X 1” (LOOP .5”)

INDUCTOR
NO. 12 4 AWG COPPER
WIRE X 1” (LOOP .5”)

CAPACITOR
100 nF UNELCO

TRIMMER CAPACITOR
12 - 631 F

TRIMMER CAPACITOR
20 - 100 pF

TYPE “N” FEMALE PANEL RECEPTACLE (10-32)

SEE OUTPUT DETAIL

---

MACOM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit www.macom.com for additional data sheets and product information.

For further information and support please visit:
https://www.macom.com/support
M/A-COM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with M/A-COM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.