

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

Rev. V1

Features

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

ABSOLUTE MAXIMUM RATINGS^{1, 2, 3}

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	65	V
Gate-Source Voltage	V_{GS}	20	V
Drain-Source Current	I_{DS}	16*	A
Power Dissipation	P_D	389	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-65 to +150	°C
Thermal Resistance	Θ_{JC}	0.45	°C/W

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

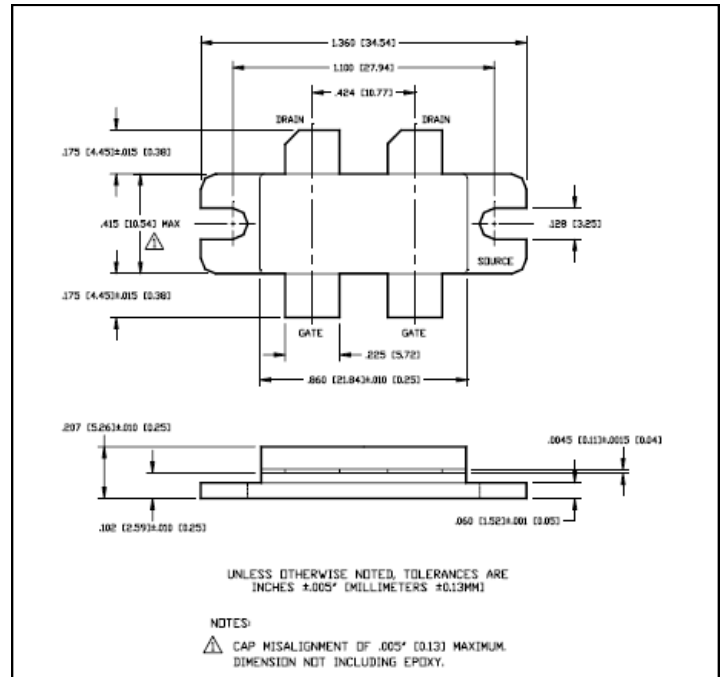
Parameter	Test Conditions	Units	Min.	Max.
Drain-Source Breakdown Voltage	$V_{GS} = 0.0 \text{ V}$, $I_{DS} = 20.0 \text{ mA}^*$	BV_{DSS}	65	—
Drain-Source Leakage Current	$V_{DS} = 28.0 \text{ V}$, $V_{GS} = 0.0 \text{ V}^*$	I_{DSS}	—	4.0
Gate-Source Leakage Current	$V_{GS} = 20 \text{ V}$, $V_{DS} =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

Notes:

* Per side

** At all phase angles

Package Outline

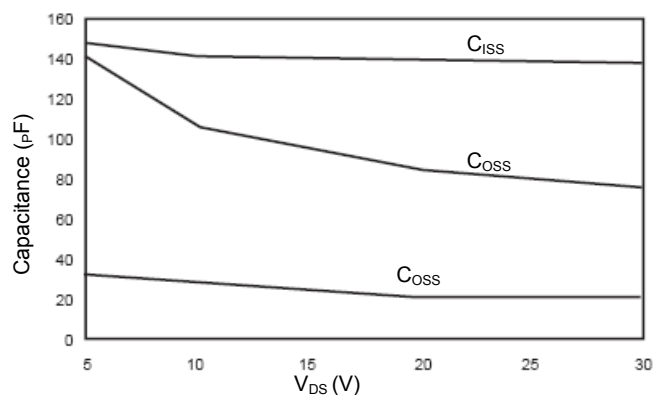


RF Power MOSFET Transistor 150 W, 100 - 500 MHz, 28 V

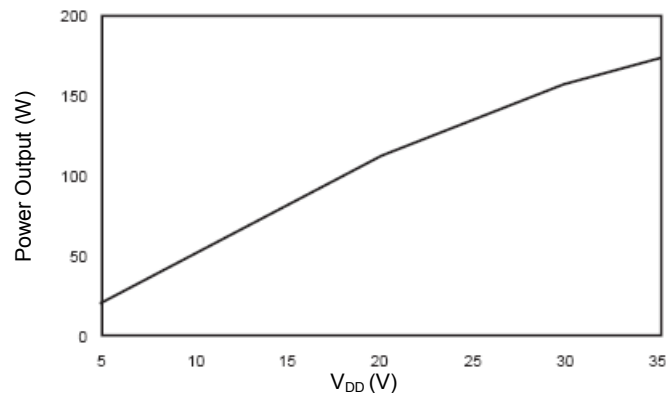
Rev. V1

Typical Broadband Performance Curves

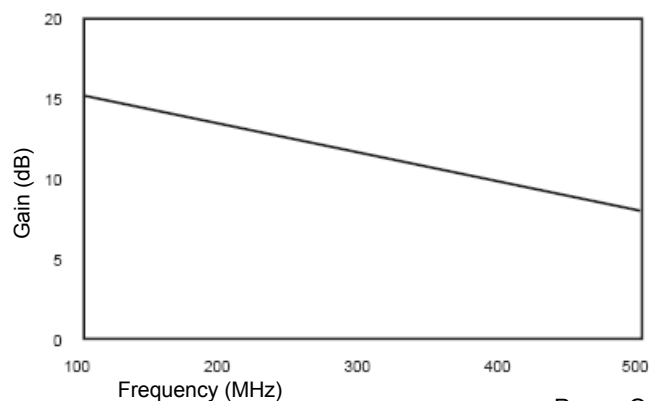
Capacitance vs Voltage
 $F=1.0\text{ MHz}$



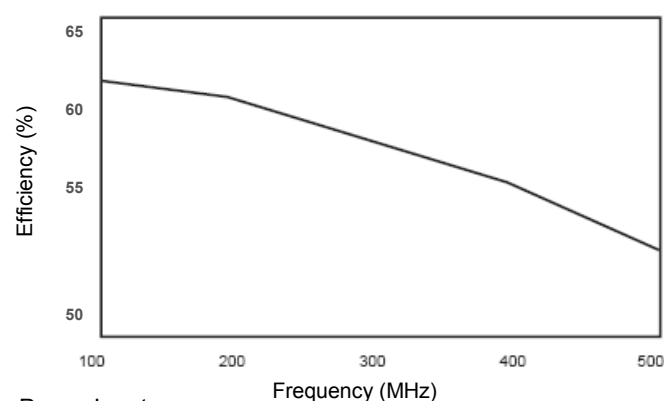
Power Output vs Voltage
 $P_{IN}=24\text{ W}$ $I_{DQ}=400\text{ mA}$ $F=500\text{ MHz}$



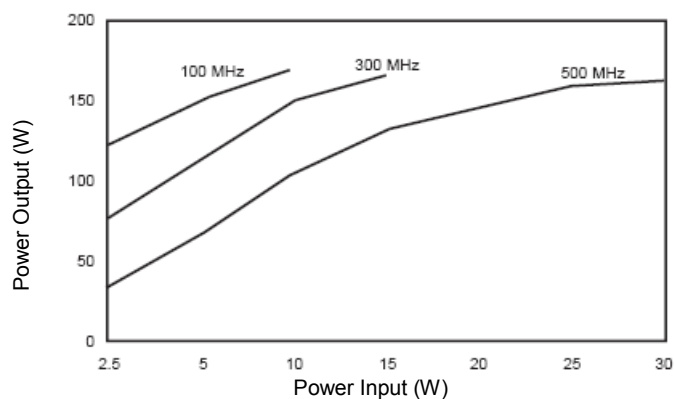
Gain vs Frequency
 $V_{DD}=28\text{ V}$ $P_{OUT}=100\text{ W}$ $I_{DQ}=400\text{ mA}$



Efficiency vs Frequency
 $V_{DD}=28\text{ V}$ $I_{DQ}=400\text{ mA}$ $P_{OUT}=150\text{ W}$



Power Output vs Power Input
 $V_{DD}=28\text{ V}$ $I_{DQ}=400\text{ mA}$

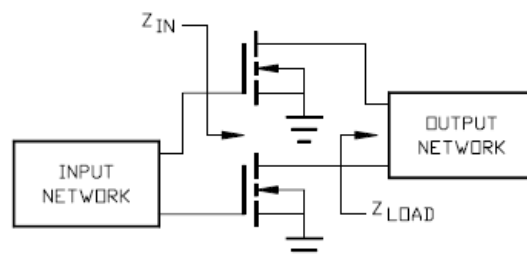


RF Power MOSFET Transistor 150 W, 100 - 500 MHz, 28 V

Rev. V1

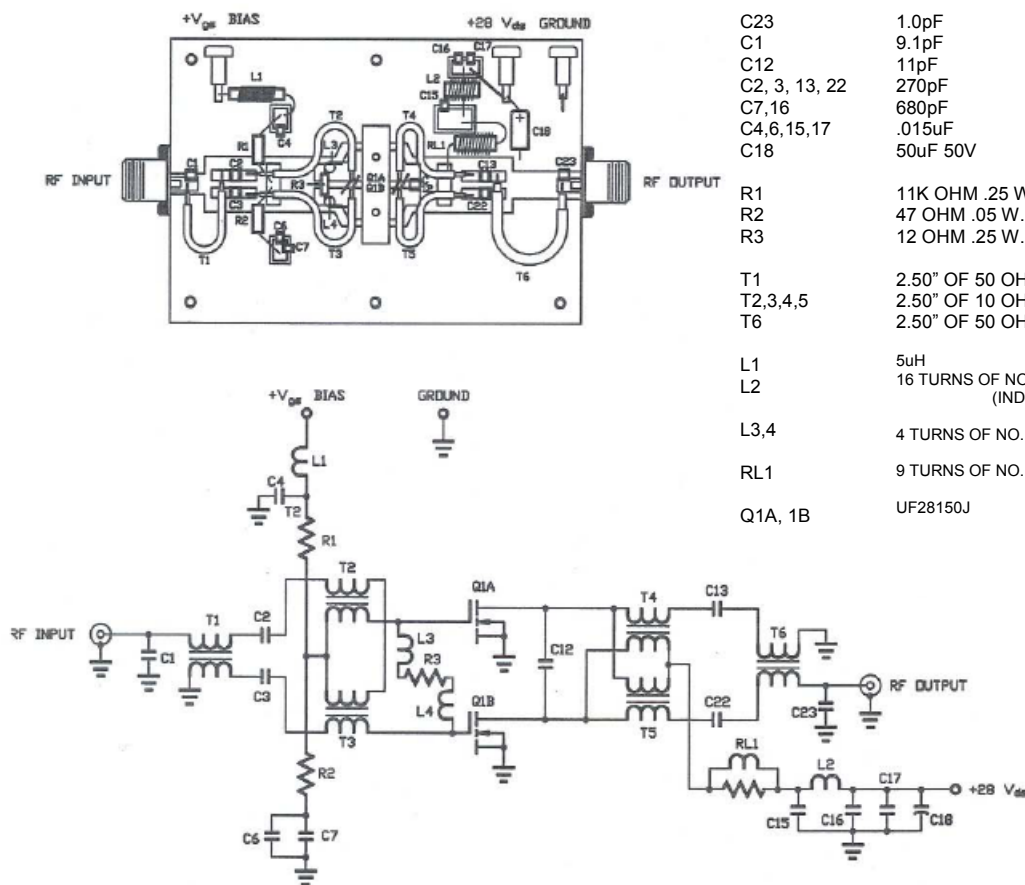
TYPICAL OPTIMUM DEVICE IMPEDANCES

F (MHz)	$Z_{IN} (\Omega)$	$Z_{LOAD} (\Omega)$
100	3.7 - j5.9	3.0 - j0.7
300	2.7 - j5.9	2.6 - j0.55
500	2.5 - j2.9	2.5 - j0.5
$V_{DD} = 28V$, $I_{DQ} = 400mA$, $P_{OUT} = 150W$		



PARTS LIST

C23	1.0pF
C1	9.1pF
C12	11pF
C2, 3, 13, 22	270pF
C7,16	680pF
C4,6,15,17	.015uF
C18	50uF 50V
R1	11K OHM .25 W. 10%
R2	47 OHM .05 W. 10%
R3	12 OHM .25 W. 10%
T1	2.50" OF 50 OHM (.85" OD) SEMI-RIGID CABLE
T2,3,4,5	2.50" OF 10 OHM (.70" OD) SEMI-RIGID CABLE
T6	2.50" OF 50 OHM (.141" OD) SEMI-RIGID CABLE
L1	5uH
L2	16 TURNS OF NO. 18 AWG ON TOROID CORE (INDIANA GENERAL F6278-Q1)
L3,4	4 TURNS OF NO. 18 AWG ON .125 DIAMETER
RL1	9 TURNS OF NO. 18 AWG ON 15 OHM 2 W. 10% RESISTOR
Q1A, 1B	UF28150J



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.

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 estoppel 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.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[MACOM:](#)

[UF28150J](#)