

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

Rev. V1

### Features

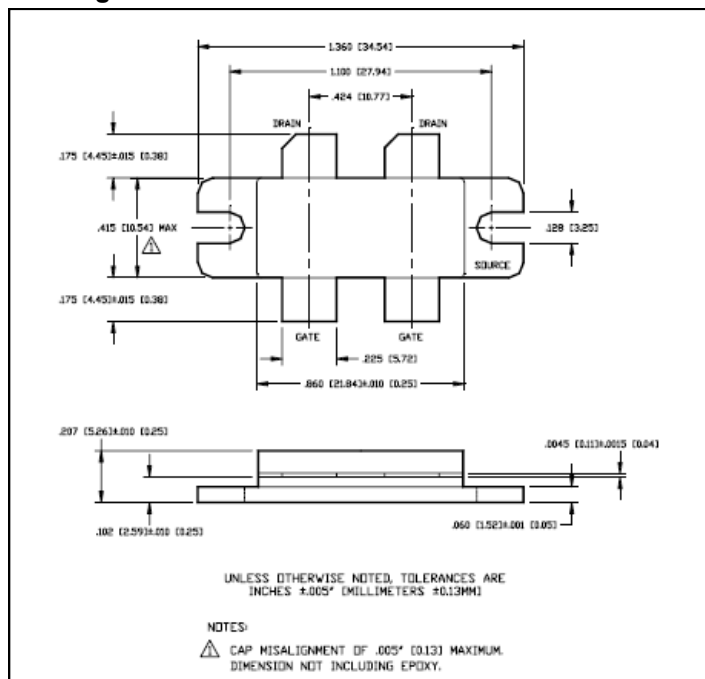
- DMOS structure
- Lower capacitance for broadband operation
- Common source configuration

### ABSOLUTE MAXIMUM RATINGS<sup>1, 2, 3</sup>

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	$\Theta_{JC}$	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.

### Package Outline



### 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	$V_{DD} = 28.0 \text{ V}$ , $I_{DQ} = 400.0 \text{ mA}$ , $P_{OUT} = 150.0 \text{ W}$ , $F = 500 \text{ MHz}$	$\eta_D$	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

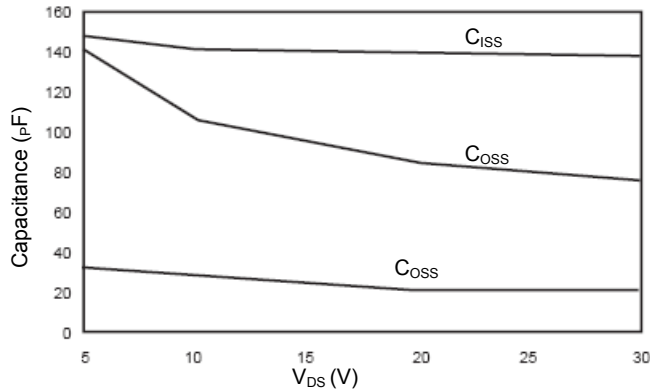
\*\* At all phase angles

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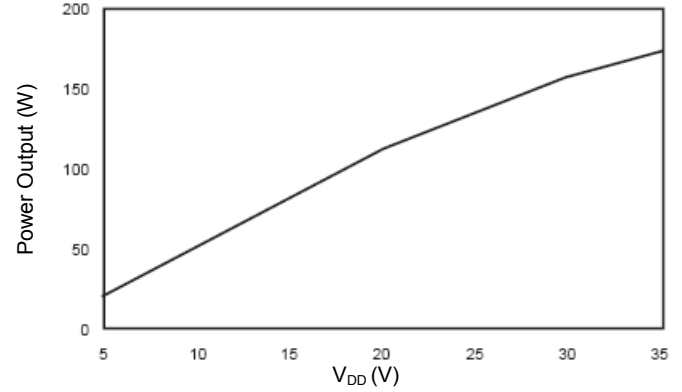
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### Typical Broadband Performance Curves

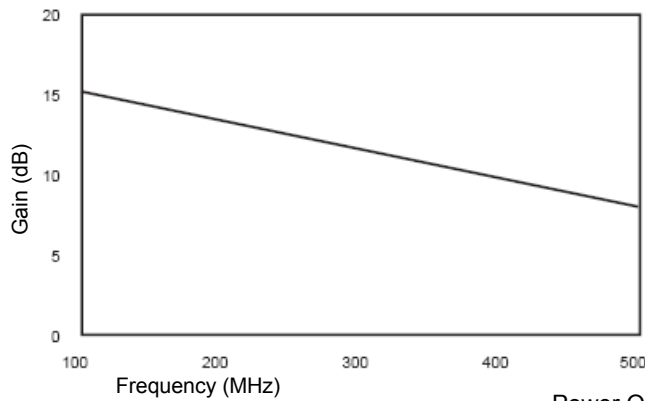
Capacitance vs Voltage  
F=1.0 MHz



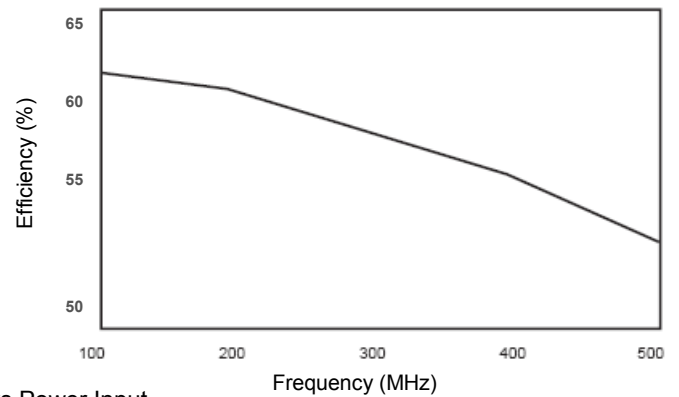
Power Output vs Voltage  
P<sub>IN</sub>=24 W I<sub>DQ</sub>=400 mA F=500 MHz



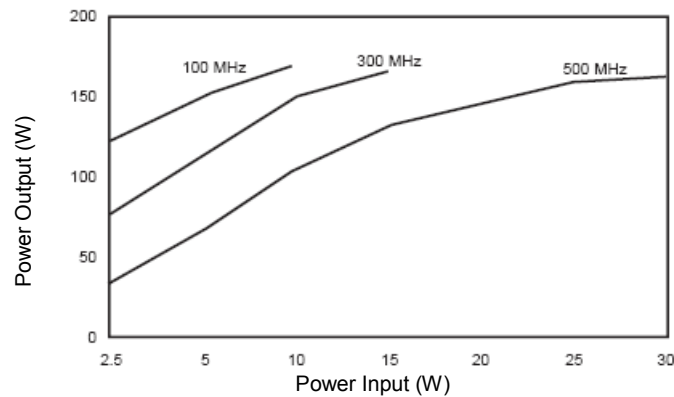
Gain vs Frequency  
V<sub>DD</sub>=28V P<sub>OUT</sub>=100W I<sub>DQ</sub>=400mA



Efficiency vs Frequency  
V<sub>DD</sub>=28V I<sub>DQ</sub>=400mA P<sub>OUT</sub>=150W



Power Output vs Power Input  
V<sub>DD</sub>=28V I<sub>DQ</sub>=400mA



# UF28150J



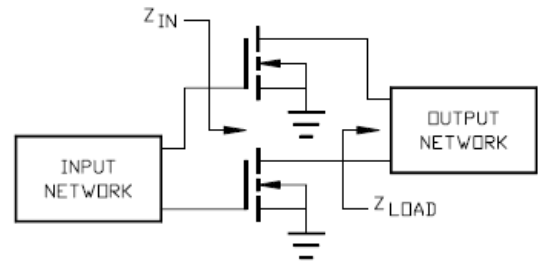
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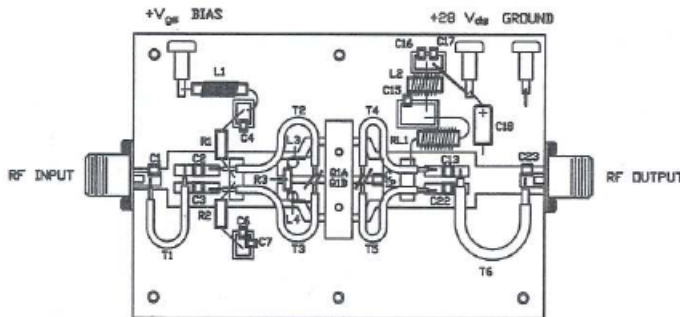
### TYPICAL OPTIMUM DEVICE IMPEDANCES

F (MHz)	Z <sub>IN</sub> (Ω)	Z <sub>LOAD</sub> (Ω)
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

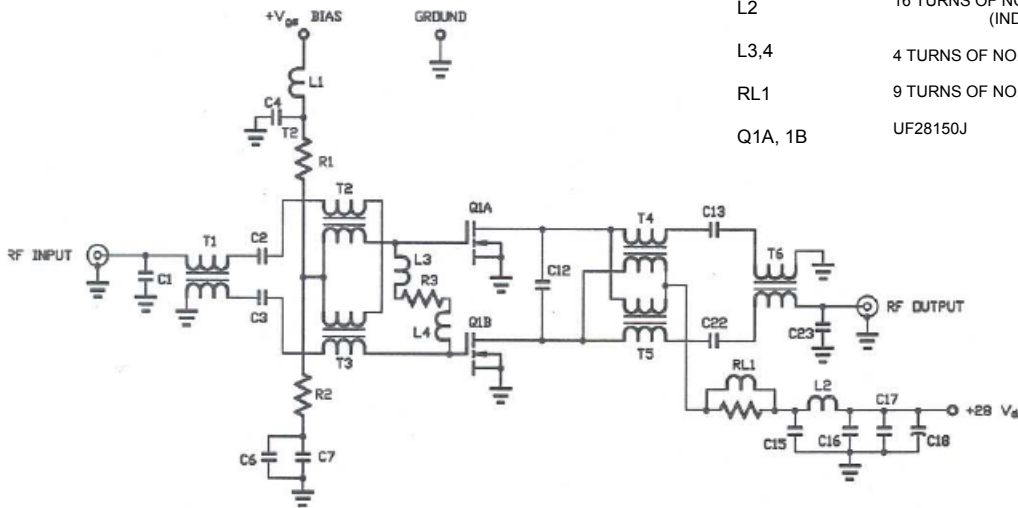
V<sub>DD</sub> = 28V, I<sub>DQ</sub> = 400mA, P<sub>OUT</sub> = 150W



### 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 TORID 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.

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