

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

Rev. V1

Features

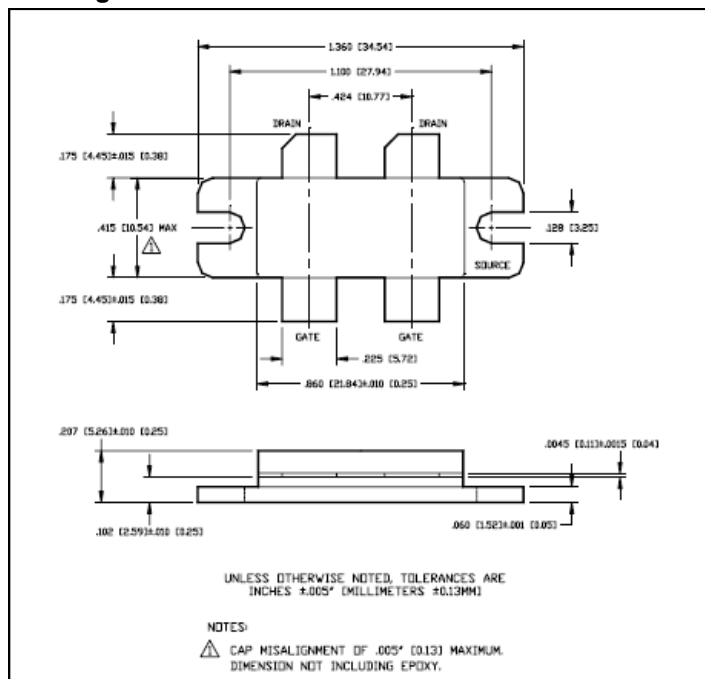
- DMOS structure
- Lower capacitance for broadband operation
- Common source configuration

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.

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

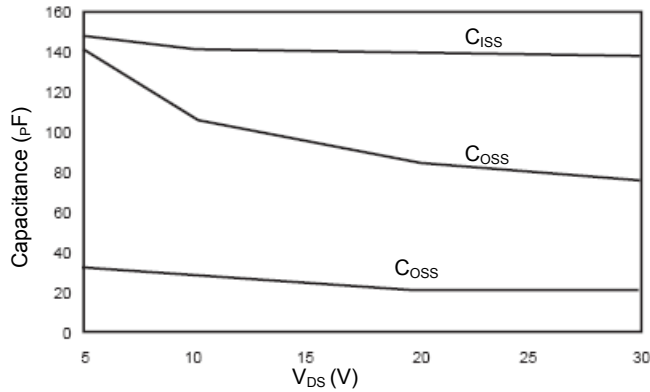
** At all phase angles

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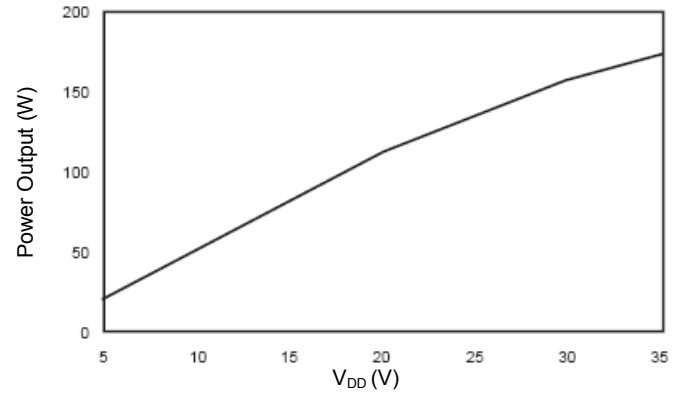
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Typical Broadband Performance Curves

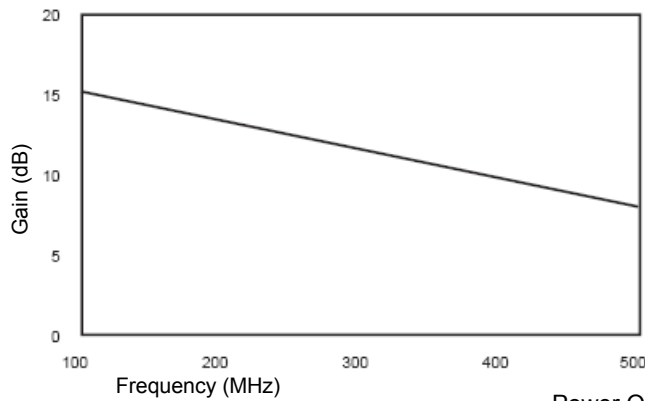
Capacitance vs Voltage
F=1.0 MHz



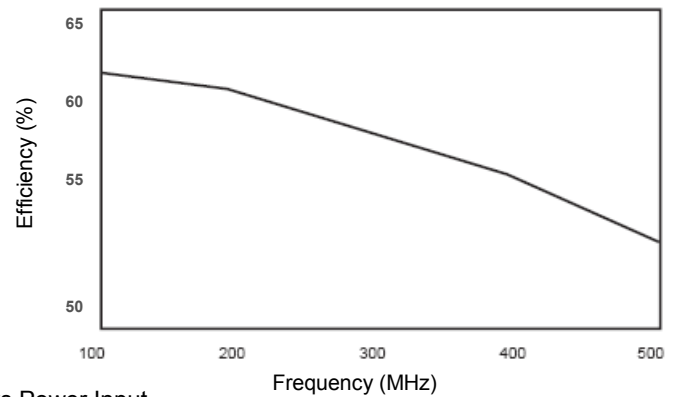
Power Output vs Voltage
P_{IN}=24 W I_{DQ}=400 mA F=500 MHz



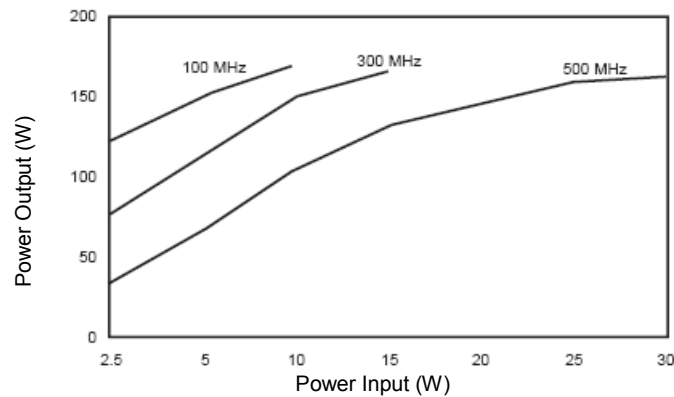
Gain vs Frequency
V_{DD}=28V P_{OUT}=100W I_{DQ}=400mA



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



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



UF28150J



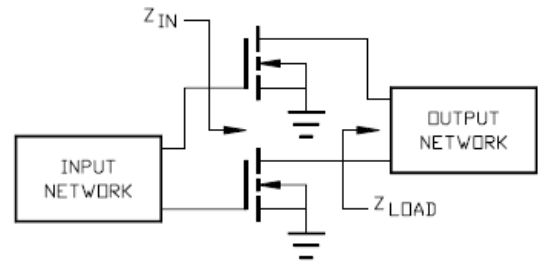
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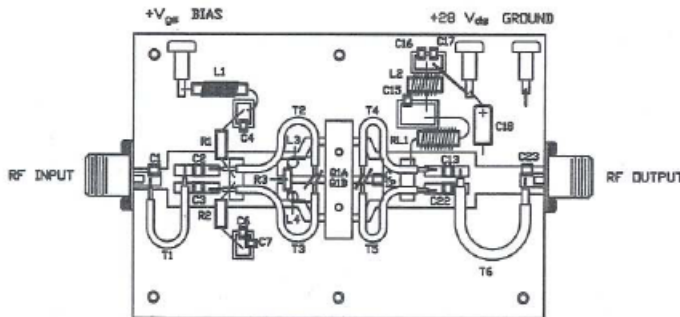
TYPICAL OPTIMUM DEVICE IMPEDANCES

F (MHz)	Z _{IN} (Ω)	Z _{LOAD} (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

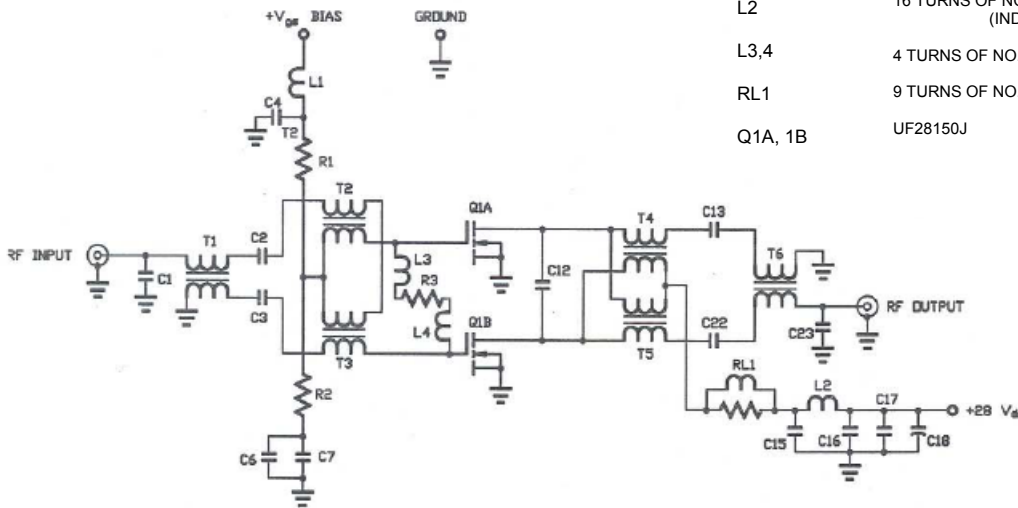
V_{DD} = 28V, I_{DQ} = 400mA, P_{OUT} = 150W



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 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.