

## RF Power MOSFET Transistor 20W, 100-500 MHz, 28V

Rev. V1

### Features

- N-channel enhancement mode device
- DMOS structure
- Lower capacitances for broadband operation
- Common source configuration
- Lower noise floor

### ABSOLUTE MAXIMUM RATINGS AT 25° C

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	65	V
Gate-Source Voltage	$V_{GS}$	20	V
Drain-Source Current	$I_{DS}$	2.8	A
Power Dissipation	$P_D$	53	W
Junction Temperature	$T_J$	200	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C
Thermal Resistance	$\theta_{JC}$	3.3	°C/W

### TYPICAL DEVICE IMPEDANCES

F (MHz)	$Z_{IN}$ ( $\Omega$ )	$Z_{LOAD}$ ( $\Omega$ )
100	9.5-j60.0	4.0+j68.0
300	5.0-j35.0	40.0+j48.0
500	2.0-j22.0	36.0+j34.0
$V_{DD}=28V, I_{DQ}=200\text{ mA}, P_{OUT}=20.0\text{ W}$		

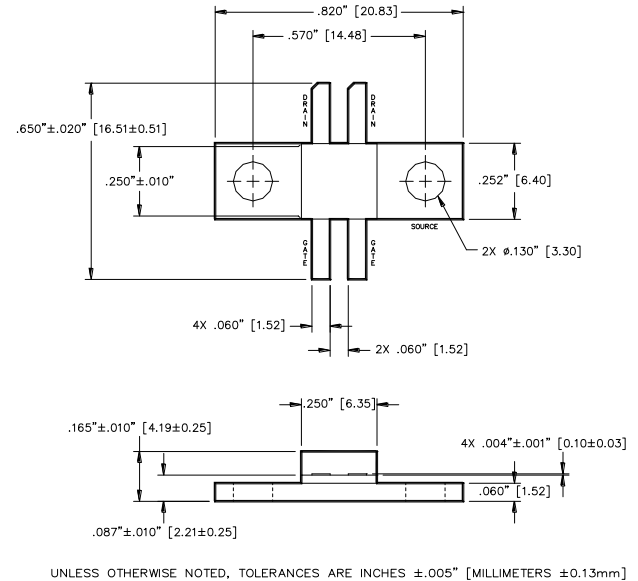
$Z_{IN}$  is the series equivalent input impedance of the device from gate to source.

$Z_{LOAD}$  is the optimum series equivalent load impedance as measured from drain to ground.

### ELECTRICAL CHARACTERISTICS AT 25°C

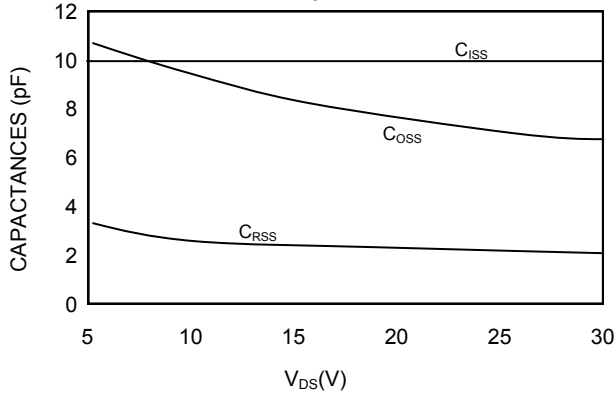
Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	$BV_{DSS}$	65	-	V	$V_{GS} = 0.0\text{ V}, I_{DS} = 4.0\text{ mA}$
Drain-Source Leakage Current	$I_{DSS}$	-	2.0	mA	$V_{DS} = 28.0\text{ V}, V_{GS} = 0.0\text{ V}$
Gate-Source Leakage Current	$I_{GSS}$	-	2.0	$\mu\text{A}$	$V_{GS} = 20.0\text{ V}, V_{DS} = 0.0\text{ V}$
Gate Threshold Voltage	$V_{GS(TH)}$	2.0	6.0	V	$V_{DS} = 10.0\text{ V}, I_{DS} = 200.0\text{ mA}$
Forward Transconductance	$G_M$	.160	-	S	$V_{DS} = 10.0\text{ V}, I_{DS} = 200.0\text{ mA}, \Delta V_{GS} = 1.0\text{V}, 80\ \mu\text{s Pulse}$
Input Capacitance	$C_{ISS}$	-	14	pF	$V_{DS} = 28.0\text{ V}, F = 1.0\text{ MHz}$
Output Capacitance	$C_{OSS}$	-	10	pF	$V_{DS} = 28.0\text{ V}, F = 1.0\text{ MHz}$
Reverse Capacitance	$C_{RSS}$	-	4.8	pF	$V_{DS} = 28.0\text{ V}, F = 1.0\text{ MHz}$
Power Gain	$G_P$	10	-	dB	$V_{DD} = 28.0\text{ V}, I_{DQ} = 200.0\text{ mA}, P_{OUT} = 20.0\text{ W } F = 500\text{ MHz}$
Drain Efficiency	$\eta_D$	50	-	%	$V_{DD} = 28.0\text{ V}, I_{DQ} = 200.0\text{ mA}, P_{OUT} = 20.0\text{ W } F = 500\text{ MHz}$
Load Mismatch Tolerance	VSWR-T	-	20:1	-	$V_{DD} = 28.0\text{ V}, I_{DQ} = 200.0\text{ mA}, P_{OUT} = 20.0\text{ W } F = 500\text{ MHz}$

### Package Outline

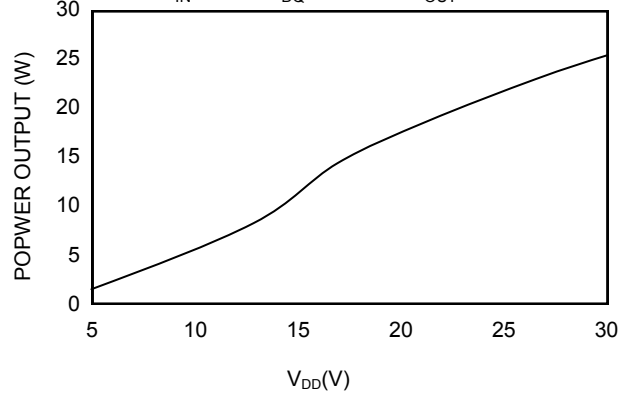


**Typical Broadband Performance Curves**

**CAPACITANCES vs VOLTAGE**  
 $F=1.0\text{MHz}$

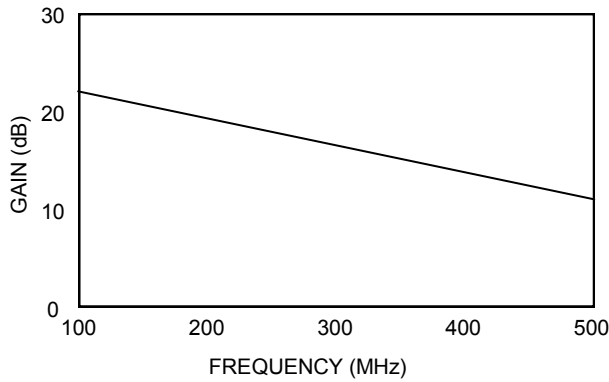


**POWER OUTPUT vs VOLTAGE**  
 $P_{IN}=1.0\text{ W } I_{DQ}=200\text{ mA } P_{OUT}=500\text{ W}$



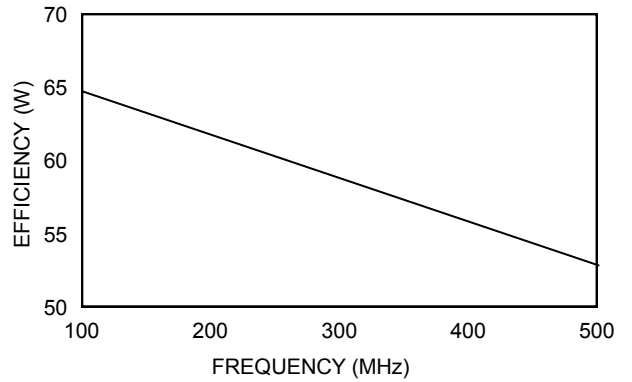
**GAIN vs FREQUENCY**

$V_{DD}=28\text{ V } P_{OUT}=20\text{ W } I_{DQ}=200\text{ mA}$



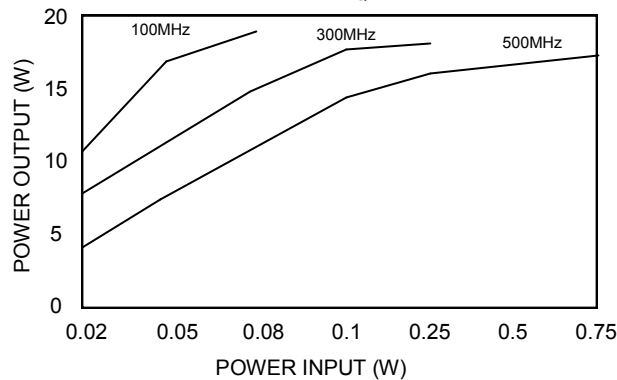
**EFFICIENCY vs FREQUENCY**

$I_{DD}=200\text{ mA } P_{OUT}=20\text{ W } F=500\text{ MHz}$



**POWER OUTPUT vs POWER INPUT**

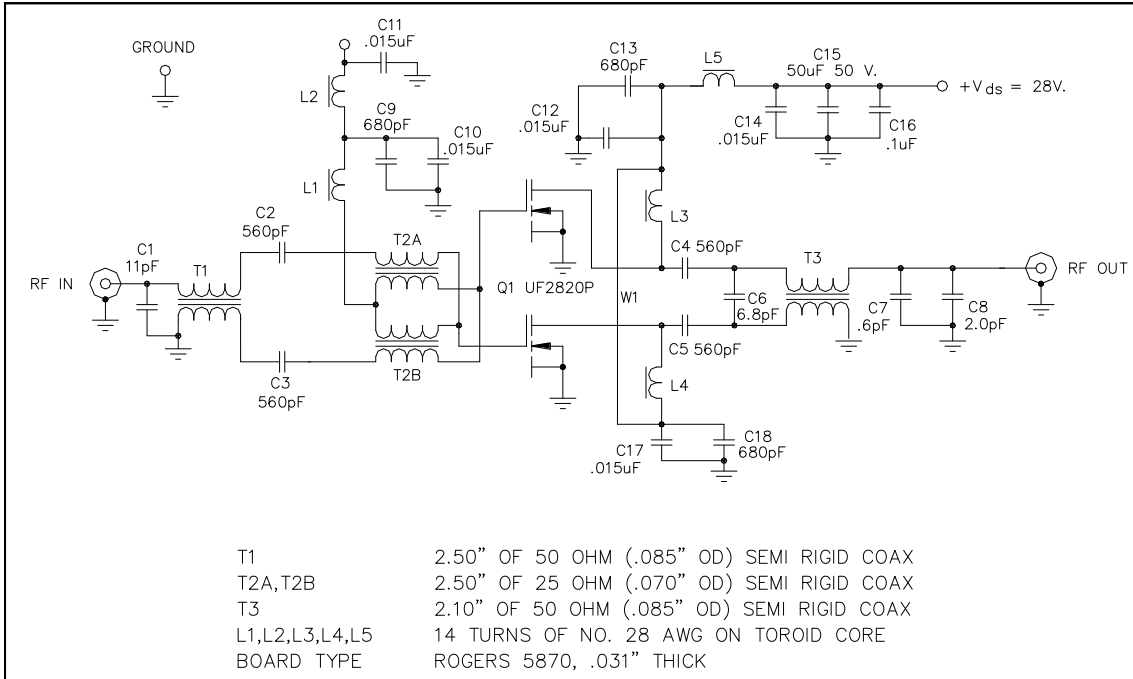
$V_{DD}=28\text{ V } I_{DQ}=150\text{ mA}$



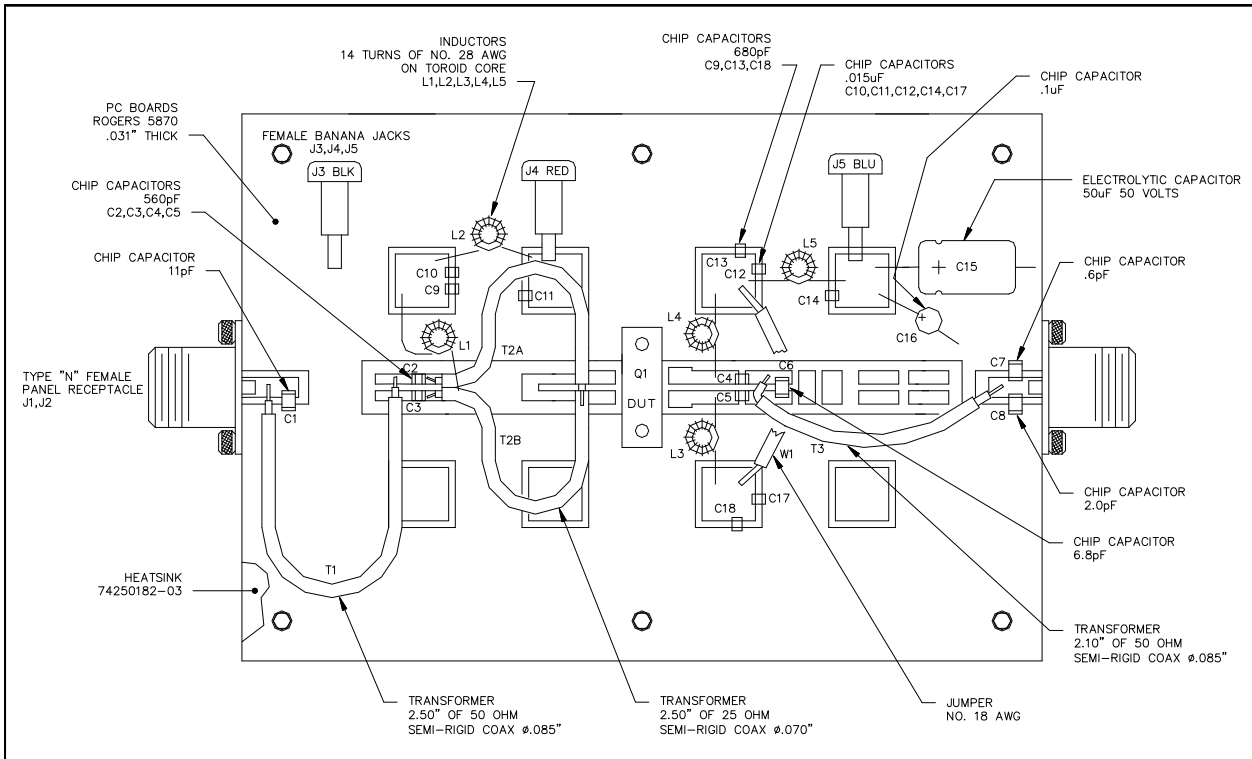
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### TEST FIXTURE SCHEMATIC



### TEST FIXTURE ASSEMBLY



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