

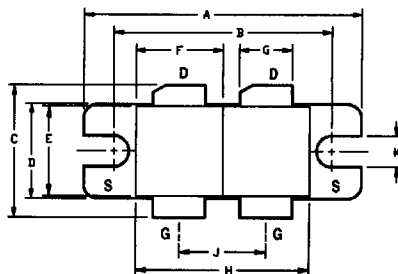
RF MOSFET Power Transistor, 100W, 40V 500 - 1000 MHz

LF40100M

V2.00

Features

- Gold Metallized
- Input Matched
- Resfet Structure
- Lower Capacitances for Broadband Operation
- N-Channel Enhancement Mode Device
- Common Source Configuration
- Push-Pull
- Applications
 - Broadband Linear Operation
 - 500 MHz to 1000 MHz



Absolute Maximum Ratings at 25°C

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	80	V
Gate-Source Voltage	V_{GS}	20	V
Drain-Source Current	I_{DS}	20	A
Power Dissipation	P_D	233	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	0.75	°C/W

LETTER DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	30.35	30.61	1.195	1.205
B	23.65	23.90	.931	.941
C	13.72	14.22	.540	.560
D	9.63	9.88	.379	.389
E	9.40	9.65	.370	.380
F	9.40	9.65	.370	.380
G	5.59	5.84	.220	.230
H	18.80	19.30	.740	.760
J	9.40	9.65	.370	.380
K	3.12	3.38	.123	.133
L	1.47	1.57	.058	.062
M	2.39	2.74	.094	.108
N	5.03	5.69	.198	.224
P	.45	.13	.002	.005

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	80	-	V	$V_{GS}=0.0\text{ V}$, $I_{DS}=40.0\text{ mA}^*$
Drain-Source Leakage Current	I_{DSS}	-	4.0	mA	$V_{DS}=40.0\text{ V}$, $V_{GS}=0.0\text{ V}^*$
Gate-Source Leakage Current	I_{GSS}	-	20	μA	$V_{GS}=20\text{ V}$, $V_{DS}=0.0\text{ V}$
Gate Threshold Voltage	$V_{GS(TH)}$	1.0	6.0	V	$V_{DS}=10.0\text{ V}$, $I_{DS}=200.0\text{ mA}^*$
Forward Transconductance	G_M	1.0	-	S	$V_{DS}=10.0\text{ V}$, $I_{DS}=2.0\text{ mA}$, 300 μs Pulse*
Input Capacitance	C_{ISS}	-	110	pF	$V_{DS}=40.0\text{ V}$, $F=1.0\text{ MHz}$, Reference only.**
Output Capacitance	C_{OSS}	-	50	pF	$V_{DS}=40.0\text{ V}$, $F=1.0\text{ MHz}^*$
Reverse Capacitance	C_{RSS}	-	14	pF	$V_{DS}=40.0\text{ V}$, $F=1.0\text{ MHz}^*$
Power Gain	G_P	10	-	dB	$V_{DS}=40.0\text{ V}$, $I_{DQ}=400\text{ mA}$, $P_{OUT}=100.0\text{ W}$, $F=1.0\text{ GHz}$
Drain Efficiency	η_D	45	-	%	$V_{DS}=40.0\text{ V}$, $I_{DQ}=400\text{ mA}$, $P_{OUT}=100.0\text{ W}$, $F=1.0\text{ GHz}$
Load Mismatch Tolerance	VSWR-T	-	3:1	-	$V_{DS}=40.0\text{ V}$, $I_{DQ}=400\text{ mA}$, $P_{OUT}=100.0\text{ W}$, $F=1.0\text{ GHz}$

* Per side

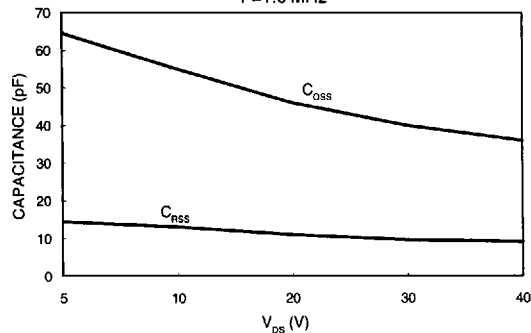
** Note: Due to the internal matching network, this parameter cannot be measured.

Specifications Subject to Change Without Notice.

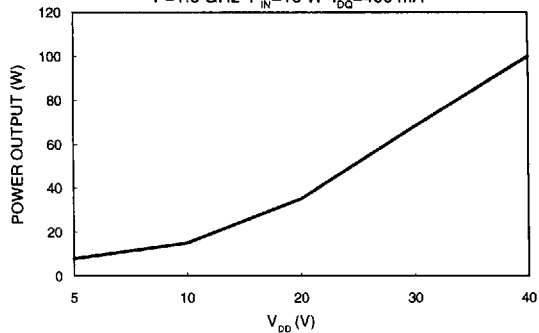
Typical Broadband Performance Curves

CAPACITANCES vs VOLTAGE

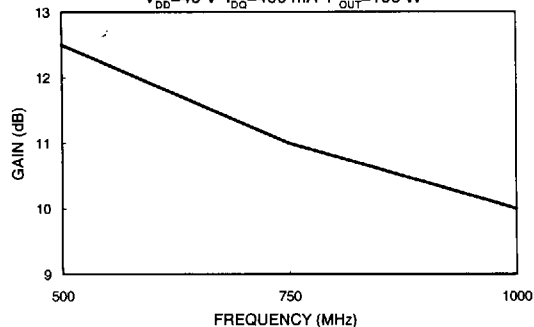
F=1.0 MHz



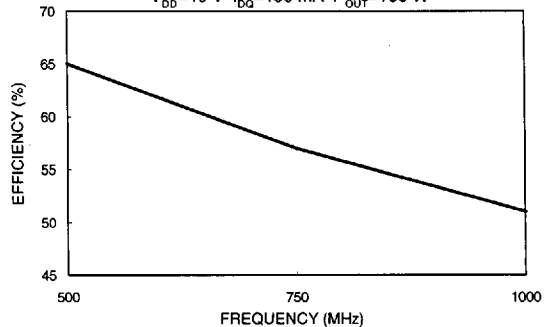
POWER OUTPUT vs VOLTAGE

F=1.0 GHz $P_{IN}=10\text{ W}$ $I_{DQ}=400\text{ mA}$ 

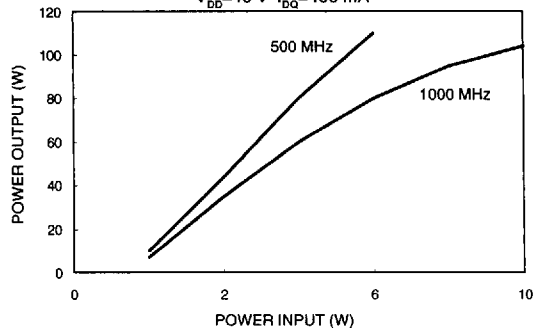
GAIN vs FREQUENCY

 $V_{DD}=40\text{ V}$ $I_{DQ}=400\text{ mA}$ $P_{OUT}=100\text{ W}$ 

EFFICIENCY vs FREQUENCY

 $V_{DD}=40\text{ V}$ $I_{DQ}=400\text{ mA}$ $P_{OUT}=100\text{ W}$ 

POWER OUTPUT vs POWER OUTPUT

 $V_{DD}=40\text{ V}$ $I_{DQ}=400\text{ mA}$ 

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Typical Device Impedance

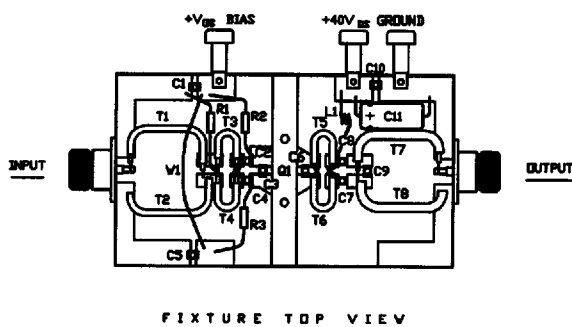
Frequency (MHz)	Z_{IN} (OHMS)	Z_{LOAD} (OHMS)
500	$1.3 + j 5.5$	$5.2 + j 5.0$
640	$1.0 + j 6.5$	$3.3 - j 0.5$
850	$2.4 + j 9.4$	$2.2 - j 3.7$
1000	$3.5 + j 10.5$	$2.2 - j 5.5$

$$V_{DD}=40 \text{ V}, I_{DQ}=400 \text{ mA}, P_{OUT}=100 \text{ Watts}$$

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

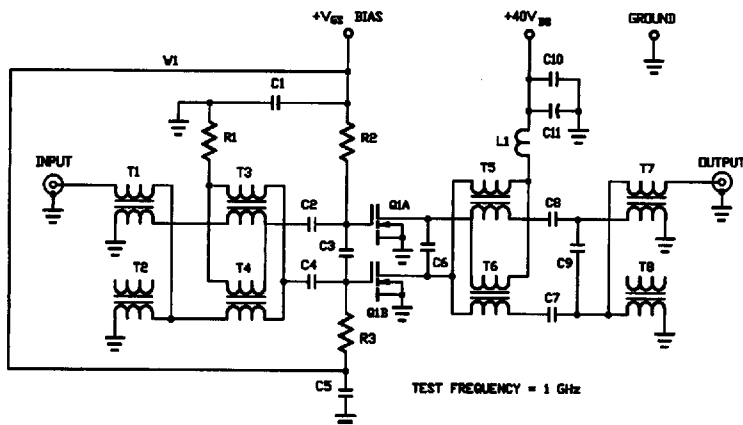
Z_{LOAD} is the optimum series equivalent load impedance as measured from drain to drain.

RF Test Fixture



PARTS LIST

C1 C5 C10	560 pF
C2 C4 C7 C8	33 pF
C3	6.2 pF
C6	11 pF
C9	2.2 pF
C11	50 uF ± 50 V.
T1 T2 T7 T8	1.50" OF 50 OHM COAX
T3 T4 T5 T6	.70" OF 25 OHM COAX
L1	3 TURNS OF NDL 18 AVG DN 125" DIAMETER
R1	10 OHM .50 WATT
R2 R3	56 OHM .50 WATT
V1	2.70" OF NDL 18 AVG
Q1	LF40100M



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