

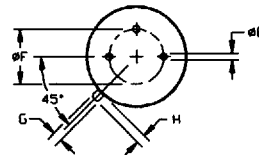
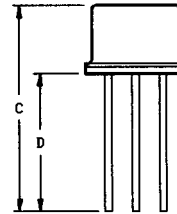
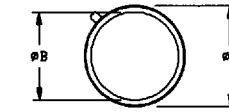
UF2801KI N-Channel RF Power MOSFET

Features

- DMOS Structure
- Lower Capacitances for Broadband Operation
- Lower Noise Floor
- 100 MHz to 500 MHz Operation
- Common Source TO39 Package Configuration ••

Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{ds}	65	V
Gate-Source Voltage	V_{gs}	20	V
Drain-Source Current	I_{ds}	0.7	A
Total Device Dissipation at 25°	P_d	5.1	W
Junction Temperature	T_j	200	°C
Storage Temperature Range	T_{stg}	-55 TO +150	°C
Thermal Resistance	θ_{jc}	34	°C/W



LETTER DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.07	9.19	.357	.362
B	8.15	8.33	.321	.328
C	19.05	44.45	.750	1.750
D	12.70	38.10	.500	1.500
E	.41	.48	.016	.019
F	4.95	5.21	.195	.205
G	.71	.86	.028	.034
H	.74	1.14	.029	.045

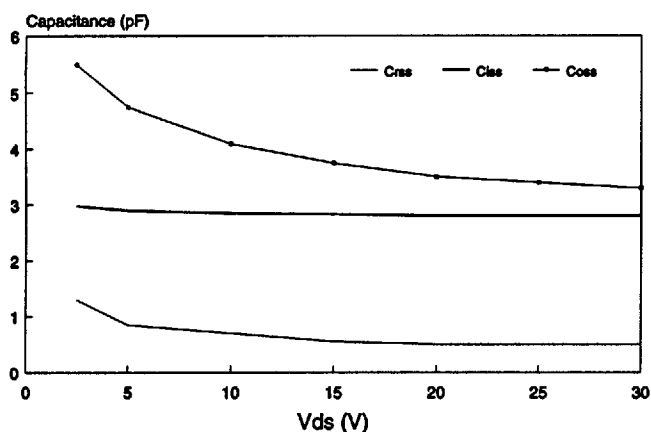
Package Outline

Electrical Characteristics at 25°C

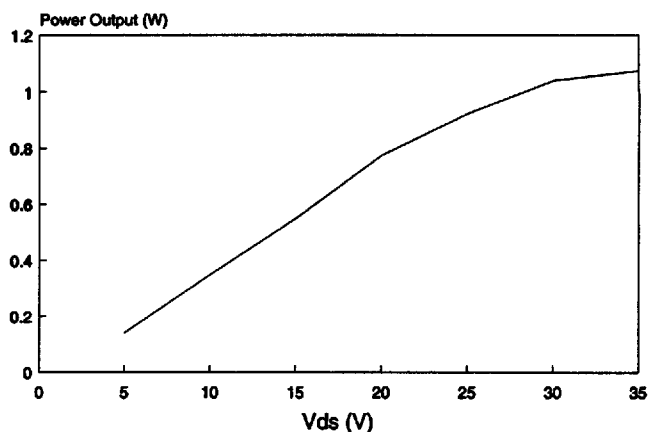
Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{dss}	65		V	$V_{gs}=0V, I_{ds}=1.0 \text{ mA}$
Drain-Source Leakage Current	I_{dss}		0.5	mA	$V_{ds}=28.0V, V_{gs}=0$
Gate-Source Leakage Current	I_{gss}		0.5	μA	$V_{gs}=20.0V, V_{ds}=0$
Threshold Voltage	$V_{gs(th)}$	2	6	V	$V_{ds}=10.0V, I_d=5.0 \text{ mA}$
Forward Transconductance	G_m	40		mS	$V_{ds}=10.0V, I_d=50.0 \text{ mA}, \Delta V_{gs}=1.0V, 80\mu s \text{ Pulse}$
Input Capacitance	C_{iss}		3.5	pF	$V_{ds}=28.0V, f=1.0 \text{ MHz}$
Output Capacitance	C_{oss}		3.75	pF	$V_{ds}=28.0V, f=1.0 \text{ MHz}$
Reverse Capacitance	C_{rss}		1.2	pF	$V_{ds}=28.0V, f=1.0 \text{ MHz}$
Power Gain	P_g	10		dB	$V_{ds}=28.0V, I_{dq}=5.0 \text{ mA}, f=500.0 \text{ MHz}, P_o=1.0W$
Drain Efficiency	η	45		%	$V_{ds}=28.0V, I_{dq}=5.0 \text{ mA}, f=500.0 \text{ MHz}, P_o=1.0W$
Load Mismatch Tolerance	VSWR		20:1	--	$V_{ds}=28.0V, I_{dq}=5.0 \text{ mA}, f=500.0 \text{ MHz}, P_o=1.0W$

UF2801KI N-Channel RF Power MOSFET

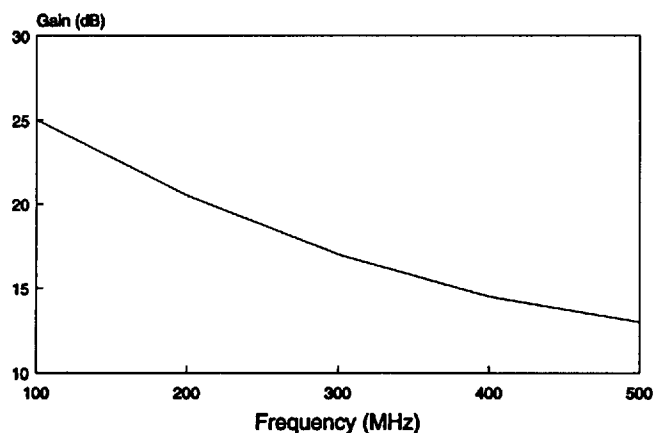
Typical Capacitances vs Voltage
f=1.0 MHz



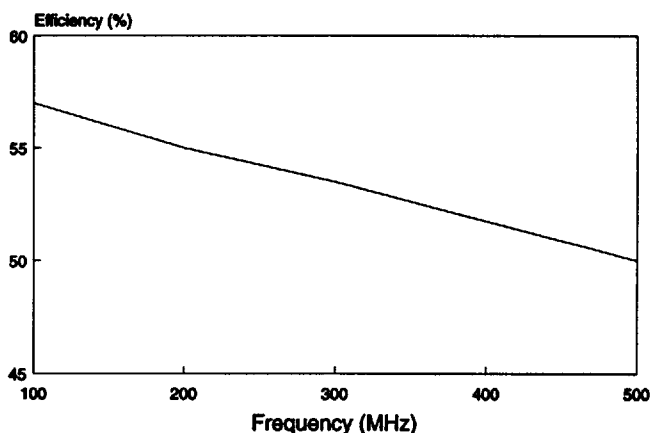
Typical Power Output vs Voltage
f=500MHz Pin=70W Idq=5.0mA



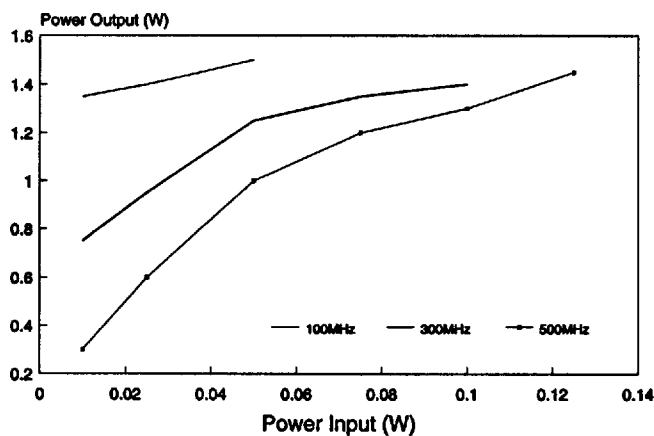
Typical Gain vs Frequency
Vds=28.0V Idq=5.0mA Po=1.0W



Typical Efficiency vs Frequency
Vds=28.0V Idq=5.0mA Po=1.0W



Typical Power Output vs Power Input
Vds=28.0V Idq=5.0mA



UF2801KI N-Channel RF Power MOSFET

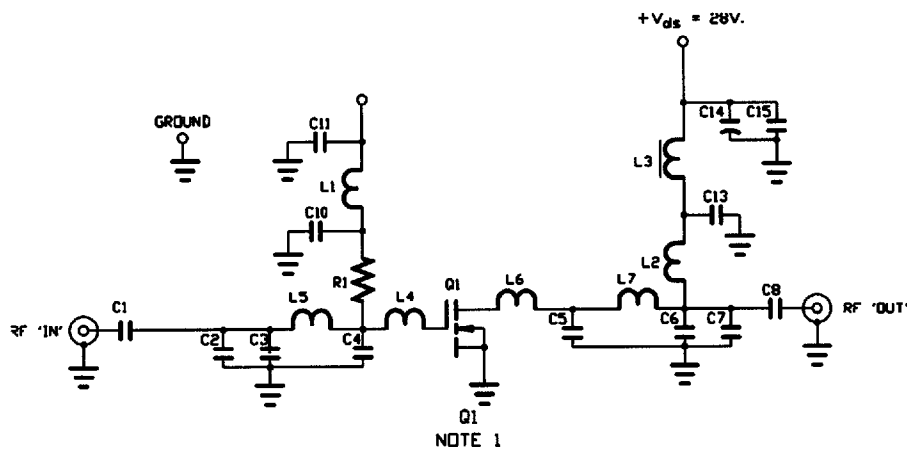
Typical Device Impedance

Frequency (MHz)	Z_{in} (OHMS)	Z_{ol} (OHMS)
100	53.2 - j 336.0	13.5 + j 246.0
300	50.8 - j 113.0	12.55 + j 84
500	46.9 - j 66.0	11.0 + j 54.0

$$V_{ds} = 28.0 \text{ V}, I_{dq} = 5.0 \text{ mA}, P_o = 1.0 \text{ Watts}$$

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

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



PARTS LIST

C5	3.0pf
C4	5.1pf
C6	9.1pf
C3	6.8pf
C2	8.2pf
C7	11pf
C1, 8, 10, 11,	.015uf
13, 15	
C14	50uf 50V.
R1	11K OHM
Q1	UF2801KI
L1, 2, 3	10 TURNS OF NO. 22 AWG
L4	1.50' OF 50 OHM TRANSMISSION LINE
L5	.50' OF 50 OHM TRANSMISSION LINE
L6	.30' OF 50 OHM TRANSMISSION LINE
L7	2.00' OF 50 OHM TRANSMISSION LINE

Test Fixture



UF2801KI N-Channel RF Power MOSFET

Typical S-Parameters

$$V_{ds} = 28.0V, I_{dq} = 25 \text{ mA}$$

FREQUENCY MHz	INP. REFL S11		FORW. TRAN S21		REV. TRAN S12		OUTPL. REFL S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
10.00	1.00	-1.5	1.96	178.6	0.01	82.6	1.00	-1.4
20.00	1.00	-3.0	1.97	177.4	0.02	82.9	1.00	-2.7
30.00	1.00	-4.5	1.97	175.5	0.02	81.6	1.00	-4.2
40.00	1.00	-6.0	1.97	173.6	0.03	82.3	1.00	-5.5
50.00	1.00	-7.5	1.97	171.7	0.04	81.5	1.00	-6.9
60.00	1.00	-8.9	1.96	169.7	0.05	80.0	0.99	-8.3
70.00	0.99	-10.5	1.96	168.0	0.05	79.0	0.99	-9.7
80.00	0.99	-12.0	1.95	166.2	0.06	77.8	0.99	-10.7
90.00	0.99	-13.5	1.96	164.4	0.07	77.2	0.99	-12.5
100.00	0.99	-14.9	1.96	162.4	0.08	76.2	0.99	-13.8
110.00	0.99	-16.3	1.95	160.2	0.08	73.6	0.98	-15.3
120.00	0.99	-17.8	1.94	158.4	0.09	72.8	0.98	-16.6
130.00	0.98	-19.3	1.94	156.5	0.10	71.1	0.98	-17.8
140.00	0.98	-20.8	1.93	154.7	0.10	70.2	0.98	-19.0
150.00	.098	-22.3	1.92	152.9	0.11	69.5	0.97	-20.5
160.00	.098	-22.4	1.92	152.8	0.11	69.2	0.97	-20.4
175.00	0.97	-26.1	1.90	148.8	0.13	66.4	0.96	-23.6
200.00	0.96	-29.5	1.88	144.8	0.14	63.0	0.95	-27.0
225.00	0.95	-33.0	1.85	140.2	0.16	60.1	0.94	-30.1
250.00	0.94	-36.1	1.81	135.9	0.17	56.8	0.92	-33.1
275.00	0.93	-39.7	1.78	132.3	0.18	54.6	0.91	-36.1
300.00	0.92	-42.8	1.75	128.6	0.19	52.0	0.89	-39.0
325.00	0.91	-45.8	1.71	124.7	0.20	49.1	0.88	-41.6
350.00	0.90	-48.5	1.69	121.7	0.21	47.9	0.87	-44.3
375.00	0.89	-50.9	1.67	119.2	0.22	45.8	0.85	-46.5
400.00	0.88	-54.2	1.65	115.9	0.22	44.0	0.84	-48.2
425.00	0.87	-56.9	1.64	112.3	0.23	41.5	0.83	-51.0
450.00	0.87	-59.9	1.64	108.5	0.24	38.7	0.82	-53.1
475.00	0.86	-62.7	1.61	104.9	0.25	36.3	0.81	-54.9
500.00	0.85	-65.3	1.51	101.4	0.25	33.8	0.79	-57.0