

RF MOSFET Power Transistor, 1W, 28V

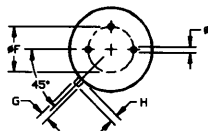
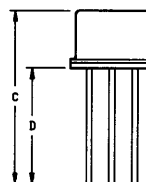
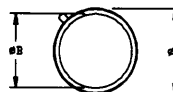
100 - 500 MHz

UF2801KI

V2.00

Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- Lower Noise Floor
- 100 MHz to 500 MHz Operation
- Common Source TO39 Package Configuration



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}	0.7	A
Power Dissipation	P_D	5.1	W
Junction Temperature	T_J	200	°C
Storage Temperature	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

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	65	-	V	$V_{GS}=0.0\text{ V}$, $I_{DS}=1.0\text{ mA}$
Drain-Source Leakage Current	I_{DSS}	-	0.5	mA	$V_{DS}=28.0\text{ V}$, $V_{GS}=0.0\text{ V}$
Gate-Source Leakage Current	I_{GSS}	-	0.5	μA	$V_{GS}=20\text{ V}$, $V_{DS}=0.0\text{ V}$
Gate Threshold Voltage	$V_{GS(TH)}$	2.0	6.0	V	$V_{DS}=10.0\text{ V}$, $I_{DS}=5.0\text{ mA}$
Forward Transconductance	G_M	40	-	mS	$V_{DS}=10.0\text{ V}$, $I_{DS}=50.0\text{ mA}$, $\Delta V_{GS}=1.0\text{ V}$, 80 μs Pulse
Input Capacitance	C_{ISS}	-	3.5	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Output Capacitance	C_{OSS}	-	3.75	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Reverse Capacitance	C_{RSS}	-	1.2	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Power Gain	G_P	10	-	dB	$V_{DS}=28.0\text{ V}$, $I_{DQ}=5.0\text{ mA}$, $P_{OUT}=1.0\text{ W}$, $F=500\text{ MHz}$
Drain Efficiency	η_D	45	-	%	$V_{DS}=28.0\text{ V}$, $I_{DQ}=5.0\text{ mA}$, $P_{OUT}=1.0\text{ W}$, $F=500\text{ MHz}$
Load Mismatch Tolerance	VSWR-T	-	20:1	-	$V_{DS}=28.0\text{ V}$, $I_{DQ}=5.0\text{ mA}$, $P_{OUT}=1.0\text{ W}$, $F=500\text{ MHz}$

Specifications Subject to Change Without Notice.

9-262

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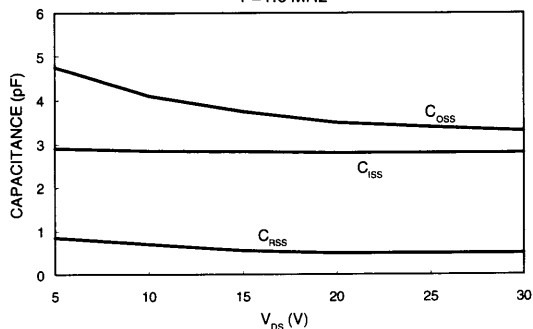
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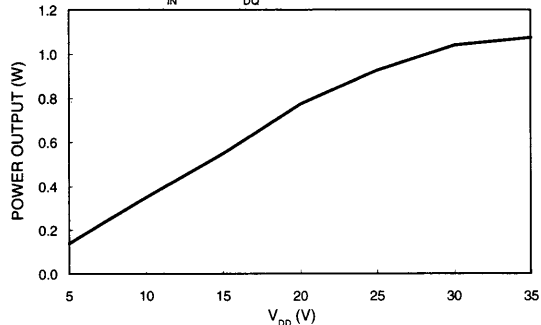
Typical Broadband Performance Curves

CAPACITANCES vs VOLTAGE

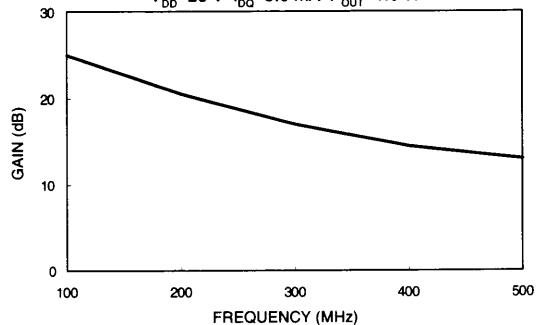
F=1.0 MHz



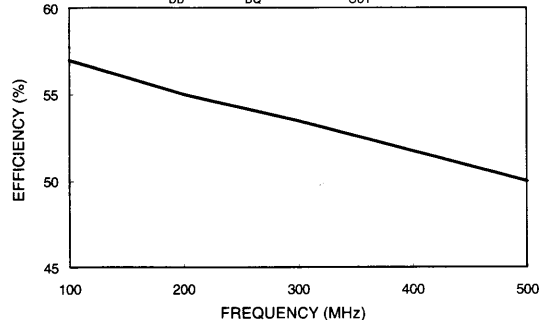
POWER OUTPUT vs VOLTAGE

 $P_{IN}=70$ W $I_{DQ}=5.0$ mA F=500 MHz

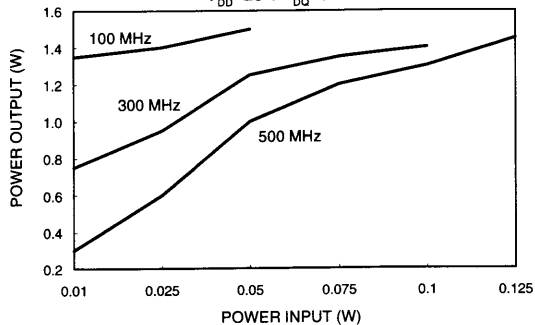
GAIN vs FREQUENCY

 $V_{DD}=28$ V $I_{DQ}=5.0$ mA $P_{OUT}=1.0$ W

EFFICIENCY vs FREQUENCY

 $V_{DD}=28$ V $I_{DQ}=5.0$ mA $P_{OUT}=1.0$ W

POWER OUTPUT vs POWER INPUT

 $V_{DD}=28$ V $I_{DQ}=5.0$ mA

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Typical Device Impedance

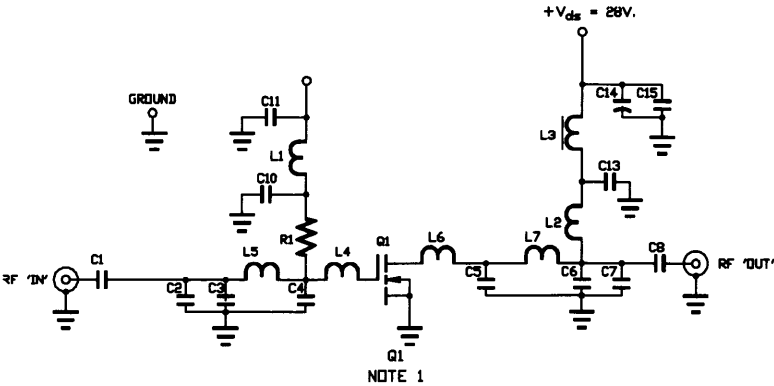
Frequency (MHz)	Z_{IN} (OHMS)	Z_{LOAD} (OHMS)
100	53.2 - j 336.0	13.5 + j 246.0
300	50.8 - j 113.0	12.55 + j 84.0
500	46.9 - j 66.0	11.0 + j 54.0

$V_{DD}=28\text{ V}, I_{DQ}=5.0\text{ mA}, P_{OUT}=1.0\text{ Watts}$

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.

RF Test Fixture



PARTS LIST

C5	3.0pf
C4	5.1pf
C6	9.1pf
C3	6.8pf
C2	8.2pf
C7	11pf
C1, 8, 10, 11,	.015uf
C14, 13, 15	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

Specifications Subject to Change Without Notice.

Typical S-Parameters

 $V_{DD}=28\text{ V}$, $I_{DS}=25\text{ mA}$

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	0.98	-22.3	1.92	152.9	0.11	69.5	0.97	-20.5
160.00	0.98	-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

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9-266

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RF MOSFET Power Transistor, 5W, 28V

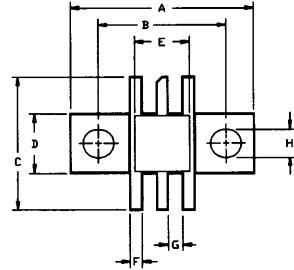
100 - 500 MHz

UF2805B

V2.00

Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- Common Source Configuration
- Lower Noise Floor
- 100 MHz to 500 MHz Operation



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}	1.4	A
Power Dissipation	P_D	14.4	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	12.1	°C/W

LETTER DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	20.70	20.96	.815	.825
B	14.35	14.61	.565	.575
C	14.73	15.24	.580	.600
D	6.27	6.53	.247	.257
E	6.22	6.48	.245	.255
F	1.14	1.40	.045	.055
G	1.52	1.78	.060	.070
H	2.92	3.17	.115	.125
J	1.40	1.65	.055	.065
K	2.03	2.39	.080	.094
L	3.66	4.32	.144	.170
M	.10	.15	.004	.006

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	65	-	V	$V_{GS}=0.0\text{ V}$, $I_{DS}=2.0\text{ mA}$
Drain-Source Leakage Current	I_{DSS}	-	1.0	mA	$V_{DS}=28.0\text{ V}$, $V_{GS}=0.0\text{ V}$
Gate-Source Leakage Current	I_{GSS}	-	1.0	μA	$V_{GS}=20\text{ V}$, $V_{DS}=0.0\text{ V}$
Gate Threshold Voltage	$V_{GS(TH)}$	2.0	6.0	V	$V_{DS}=10.0\text{ V}$, $I_{DS}=10.0\text{ mA}$
Forward Transconductance	G_M	80	-	mS	$V_{DS}=10.0\text{ V}$, $I_{DS}=100.0\text{ mA}$, $\Delta V_{GS}=1.0\text{ V}$, 80 μs Pulse
Input Capacitance	C_{ISS}	-	7	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Output Capacitance	C_{OSS}	-	5	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Reverse Capacitance	C_{RSS}	-	2.4	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Power Gain	G_P	10	-	dB	$V_{DD}=28.0\text{ V}$, $I_{DQ}=50.0\text{ mA}$, $P_{OUT}=5.0\text{ W}$, $F=500\text{ MHz}$
Drain Efficiency	η_D	50	-	%	$V_{DD}=28.0\text{ V}$, $I_{DQ}=50.0\text{ mA}$, $P_{OUT}=5.0\text{ W}$, $F=500\text{ MHz}$
Load Mismatch Tolerance	VSWR-T	-	20:1	-	$V_{DD}=28.0\text{ V}$, $I_{DQ}=50.0\text{ mA}$, $P_{OUT}=5.0\text{ W}$, $F=500\text{ MHz}$

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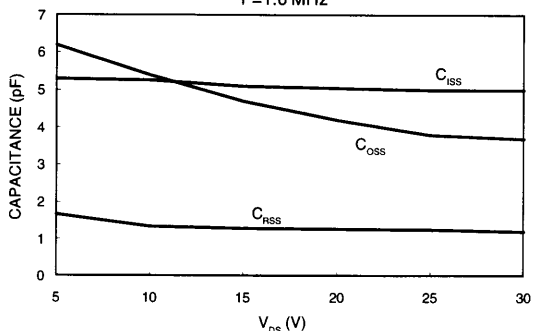
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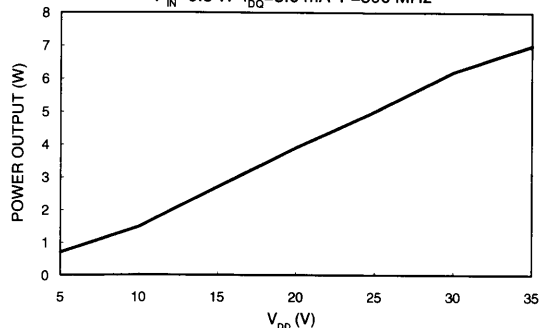
Typical Broadband Performance Curves

CAPACITANCES vs VOLTAGE

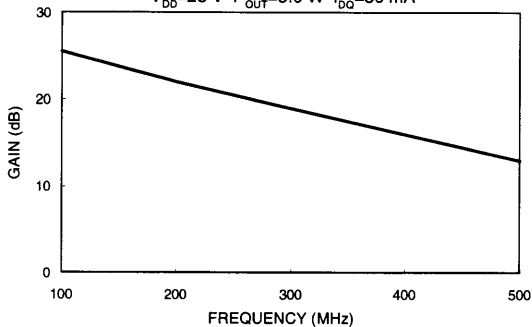
F=1.0 MHz



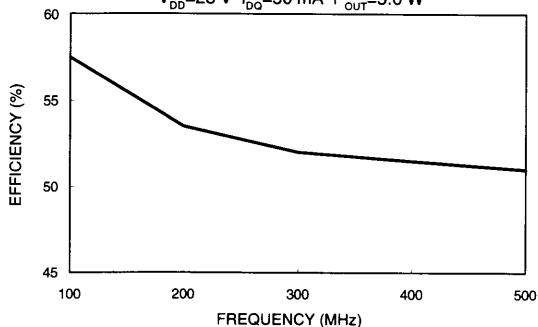
POWER OUTPUT vs VOLTAGE

 $P_{IN}=0.3$ W $I_{DQ}=5.0$ mA F=500 MHz

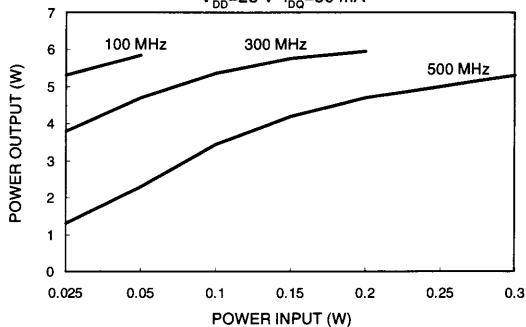
GAIN vs FREQUENCY

 $V_{DD}=28$ V $P_{OUT}=5.0$ W $I_{DQ}=50$ mA

EFFICIENCY vs FREQUENCY

 $V_{DD}=28$ V $I_{DQ}=50$ mA $P_{OUT}=5.0$ W

POWER OUTPUT vs POWER INPUT

 $V_{DD}=28$ V $I_{DQ}=50$ mA

Specifications Subject to Change Without Notice.

Typical Device Impedance

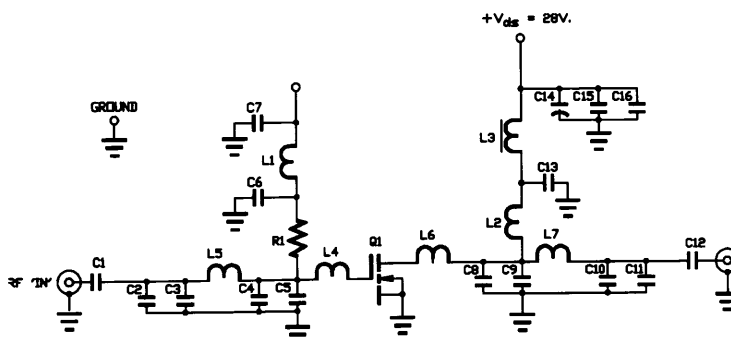
Frequency (MHz)	Z_{IN} (OHMS)	Z_{LOAD} (OHMS)
100	15.0 - j 80.0	35.0 + j 55.0
300	8.0 - j 43.0	29.0 + j 40.0
500	4.0 - j 29.0	28.0 + j 29.0

$$V_{DD}=28\text{ V, } I_{DQ}=50\text{ mA, } P_{OUT}=5.0\text{ Watts}$$

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 drain.

RF Test Fixture



P A R T S L I S T

C8	1.0pf
C9	3.9pf
C4, 10, 11	4.7pf
C2	5.6pf
C3	8.2pf
C5	15pf
C6, 7, 13, 16	680pf
C1, 12	820pf
C15	.01uf
C14	50uf 50V.
R1	10K OHM
Q1	UF2805B
L1	9 TURNS OF NO. 24 AWG
L2	7 TURNS OF NO. 22 AWG
L3	3 TURNS OF NO. 24 AWG ON FERRITE BEAD
L4	1.30' OF 50 OHM TRANSMISSION LINE
L5	.70' OF 50 OHM TRANSMISSION LINE
L6	.20' OF 50 OHM TRANSMISSION LINE
L7	1.85' OF 50 OHM TRANSMISSION LINE

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RF MOSFET Power Transistor, 10W, 28V

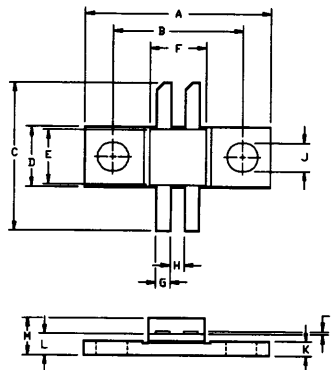
100 - 500 MHz

UF2810P

V2.00

Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- Common Source Configuration
- Lower Noise Floor
- 100 MHz to 500 MHz Operation



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}	1.4*	A
Power Dissipation	P_D	26.9	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	6.5	°C/W

LETTER DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	20.70	20.96	.815	.825
B	14.35	14.61	.565	.575
C	15.67	17.45	.617	.687
D	6.27	6.53	.247	.257
E	6.22	6.48	.245	.255
F	6.22	6.48	.245	.255
G	1.40	1.65	.055	.065
H	1.40	1.65	.055	.065
J	2.92	3.18	.115	.125
K	1.40	1.65	.055	.065
L	1.96	2.46	.077	.097
M	3.61	4.37	.142	.172
N	.08	.13	.003	.005

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	65	-	V	$V_{GS}=0.0\text{ V}, I_{DS}=2.0\text{ mA}^*$
Drain-Source Leakage Current	I_{DSS}	-	1.0	mA	$V_{DS}=28.0\text{ V}, V_{GS}=0.0\text{ V}^*$
Gate-Source Leakage Current	I_{GSS}	-	1.0	μA	$V_{GS}=20\text{ V}, V_{DS}=0.0\text{ V}^*$
Gate Threshold Voltage	$V_{GS(TH)}$	2.0	6.0	V	$V_{DS}=10.0\text{ V}, I_{DS}=10.0\text{ mA}^*$
Forward Transconductance	G_M	80	-	mS	$V_{DS}=10.0\text{ V}, I_{DS}=100.0\text{ mA}, \Delta V_{GS}=1.0\text{ V}, 80\text{ }\mu\text{s Pulse}^*$
Input Capacitance	C_{ISS}	-	7	pF	$V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}^*$
Output Capacitance	C_{OSS}	-	5	pF	$V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}^*$
Reverse Capacitance	C_{RSS}	-	2.4	pF	$V_{DS}=28.0\text{ V}, F=1.0\text{ MHz}^*$
Power Gain	G_P	10	-	dB	$V_{DD}=28.0\text{ V}, I_{DQ}=100.0\text{ mA}, P_{OUT}=10.0\text{ W}, F=500\text{ MHz}$
Drain Efficiency	η_D	50	-	%	$V_{DD}=28.0\text{ V}, I_{DQ}=100.0\text{ mA}, P_{OUT}=10.0\text{ W}, F=500\text{ MHz}$
Load Mismatch Tolerance	VSWR-T	-	20:1	-	$V_{DD}=28.0\text{ V}, I_{DQ}=100.0\text{ mA}, P_{OUT}=10.0\text{ W}, F=500\text{ MHz}$

* Per Side

Specifications Subject to Change Without Notice.

9-270

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Typical Device Impedance

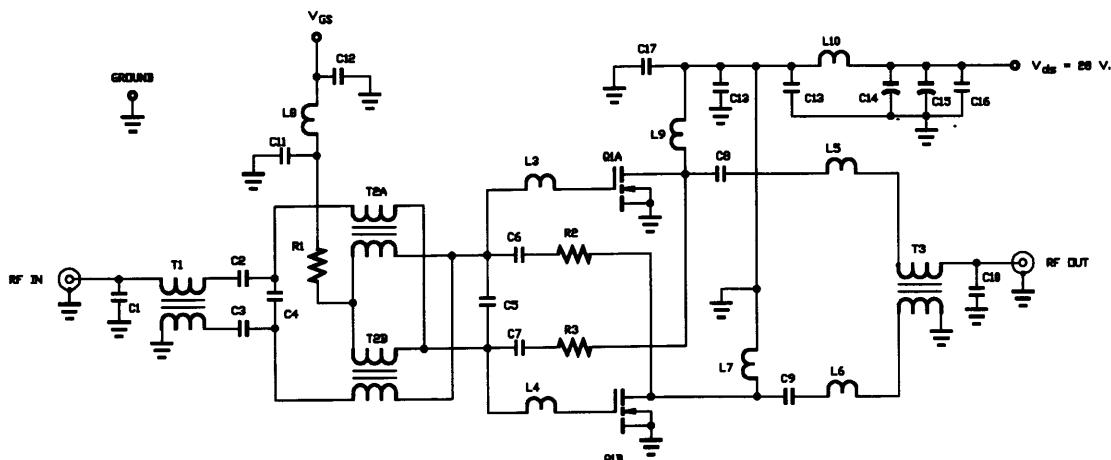
Frequency (MHz)	Z_{IN} (OHMS)	Z_{LOAD} (OHMS)
100	30.0 - j 150.0	70.0 + j 110.0
300	15.0 - j 90.0	55.0 + j 80.0
500	4.2 - j 46.0	48.0 + j 50.0

$$V_{DD}=28 \text{ V}, I_{DQ}=100 \text{ mA}, P_{OUT}=10.0 \text{ Watts}$$

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



P A R T S L I S T

C10	2.7 pF
C5	3.0 PF
C1	6.8 pF
C4	15 pF
C2, 3, 4,	
7, 8, 9	500 pF
C11, 12, 13,	
14, 17	.015 uF
C15	.10 uF
C16	50 uF 50 V.
R1	100 OHM .25 W.
R2, 3	11K OHM .25 W.
T1, 2, 3	2.50' OF 50 OHM SEMI-RIGID COAX
L8, 10	7 TURNS OF NO. 22 AWG WIRE
L7, 9	15 TURNS OF NO. 22 AWG WIRE
L1, 2	.35' OF 50 OHM TRANSMISSION LINE
L3, 4	.70' OF 50 OHM TRANSMISSION LINE
L5, 6	1.0' OF 50 OHM TRANSMISSION LINE
Q1	UF2810P

Specifications Subject to Change Without Notice.

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RF MOSFET Power Transistor, 15W, 28V

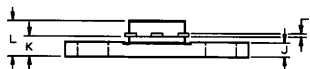
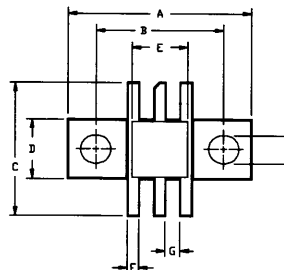
100 - 500 MHz

UF2815B

V2.00

Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- Common Source Configuration
- Lower Noise Floor
- 100 MHz to 500 MHz Operation



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}	4.2	A
Power Dissipation	P_D	48.6	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	3.6	°C/W

LETTER DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	20.70	20.96	.815	.825
B	14.35	14.61	.565	.575
C	14.73	15.24	.580	.600
D	6.27	6.53	.247	.257
E	6.22	6.48	.245	.255
F	1.14	1.40	.045	.055
G	1.52	1.78	.060	.070
H	2.92	3.17	.115	.125
J	1.40	1.65	.055	.065
K	2.03	2.39	.080	.094
L	3.66	4.32	.144	.170
M	.10	.15	.004	.006

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	65	-	V	$V_{GS}=0.0\text{ V}$, $I_{DS}=6.0\text{ mA}$
Drain-Source Leakage Current	I_{DSS}	-	3.0	mA	$V_{DS}=28.0\text{ V}$, $V_{GS}=0.0\text{ V}$
Gate-Source Leakage Current	I_{GSS}	-	3.0	μA	$V_{GS}=20\text{ V}$, $V_{DS}=0.0\text{ V}$
Gate Threshold Voltage	$V_{GS(TH)}$	2.0	6.0	V	$V_{DS}=10.0\text{ V}$, $I_{DS}=30.0\text{ mA}$
Forward Transconductance	G_M	.240	-	S	$V_{DS}=10.0\text{ V}$, $I_{DS}=300.0\text{ mA}$, $\Delta V_{GS}=1.0\text{ V}$, 80 μs Pulse
Input Capacitance	C_{ISS}	-	21	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Output Capacitance	C_{OSS}	-	15	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Reverse Capacitance	C_{RSS}	-	7.2	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Power Gain	G_P	10	-	dB	$V_{DS}=28.0\text{ V}$, $I_{DQ}=150.0\text{ mA}$, $P_{OUT}=15.0\text{ W}$, $F=500\text{ MHz}$
Drain Efficiency	η_D	50	-	%	$V_{DS}=28.0\text{ V}$, $I_{DQ}=150.0\text{ mA}$, $P_{OUT}=15.0\text{ W}$, $F=500\text{ MHz}$
Load Mismatch Tolerance	VSWR-T	-	20:1	-	$V_{DS}=28.0\text{ V}$, $I_{DQ}=150.0\text{ mA}$, $P_{OUT}=15.0\text{ W}$, $F=500\text{ MHz}$

Specifications Subject to Change Without Notice.

9-272

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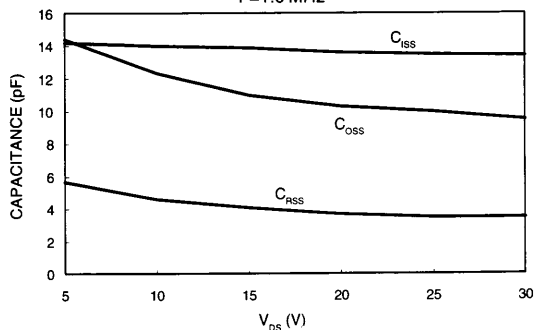
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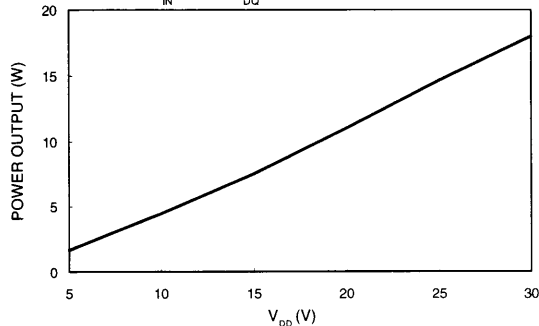
Typical Broadband Performance Curves

CAPACITANCES vs VOLTAGE

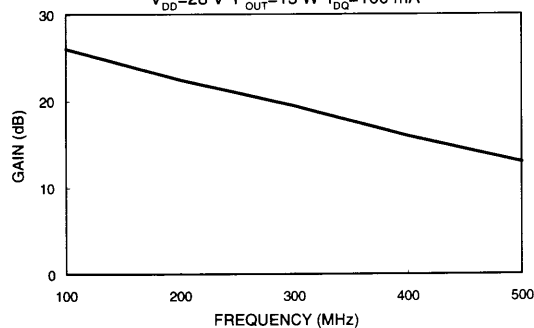
F=1.0 MHz



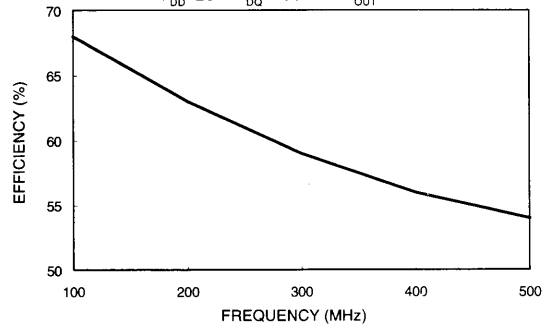
POWER OUTPUT vs VOLTAGE

 $P_{IN}=1.0$ W $I_{DQ}=150$ mA $F=500$ MHz

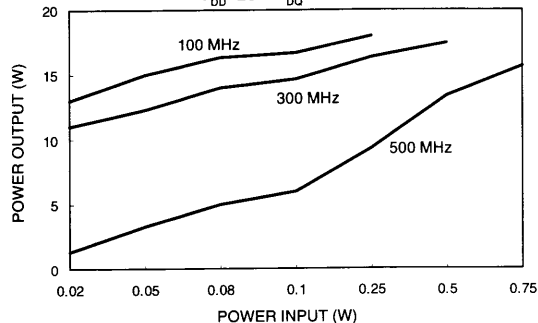
GAIN vs FREQUENCY

 $V_{DD}=28$ V $P_{OUT}=15$ W $I_{DQ}=100$ mA

EFFICIENCY vs FREQUENCY

 $V_{DD}=28$ V $I_{DQ}=150$ mA $P_{OUT}=15$ W

POWER OUTPUT vs POWER INPUT

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

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Typical Device Impedance

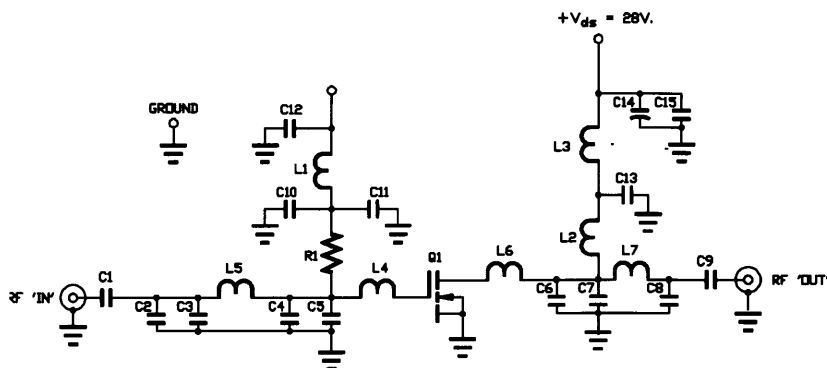
Frequency (MHz)	Z_{IN} (OHMS)	Z_{LOAD} (OHMS)
100	$6.4 - j 25.0$	$22.0 + j 16.0$
300	$6.5 - j 12.0$	$15.0 + j 14.0$
500	$1.7 - j 10.5$	$8.0 + j 10.5$

$$V_{DD}=28 \text{ V}, I_{DO}=150 \text{ mA}, P_{OUT}=15.0 \text{ Watts}$$

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.

RF Test Fixture



PARTS LIST

C7	2.0 pF
C4	3.0pF
C6	3.6pF
C5, 8	5.6pF
C3	9.1pF
C2	13pF
C9	270pF
C1	820pF
C11, 12, 13, 15	.015uF
C10	.10uF
C14	50uF 50V.
R1	10K OHM
Q1	UF2815B
L1, 3	9 TURNS OF NO. 22 AWG
L2	20 TURNS OF NO. 22 AWG
L4	.55' OF 50 OHM TRANSMISSION LINE
L5	.25' OF 50 OHM TRANSMISSION LINE
L6	1.20' OF 50 OHM TRANSMISSION LINE
L7	.10' OF 50 OHM TRANSMISSION LINE

Specifications Subject to Change Without Notice.

RF MOSFET Power Transistor, 20W, 28V

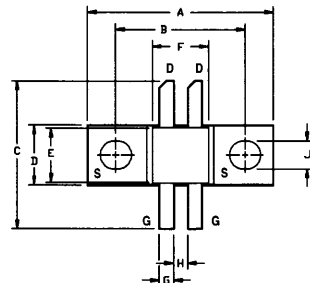
100 - 500 MHz

UF2820P

V2.00

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	θ_{JC}	3.3	°C/W

LETTER DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	20.70	20.96	.815	.825
B	14.35	14.61	.565	.575
C	15.67	17.45	.617	.687
D	6.27	6.53	.247	.257
E	6.22	6.48	.245	.255
F	6.22	6.48	.245	.255
G	1.40	1.65	.055	.065
H	1.40	1.65	.055	.065
J	2.92	3.18	.115	.125
K	1.40	1.65	.055	.065
L	1.96	2.46	.077	.097
M	3.61	4.37	.142	.172
N	.08	.13	.003	.005

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	μA	$V_{GS}=20\text{ V}$, $V_{DS}=0.0\text{ V}^*$
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 μs 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	η_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	-	$V_{DD}=28.0\text{ V}$, $I_{DQ}=200.0\text{ mA}$, $P_{OUT}=20.0\text{ W}$, $F=500\text{ MHz}$

* Per Side

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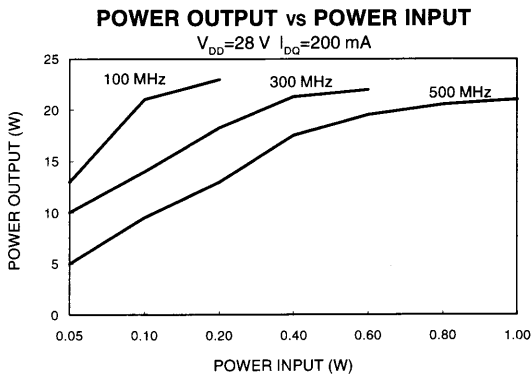
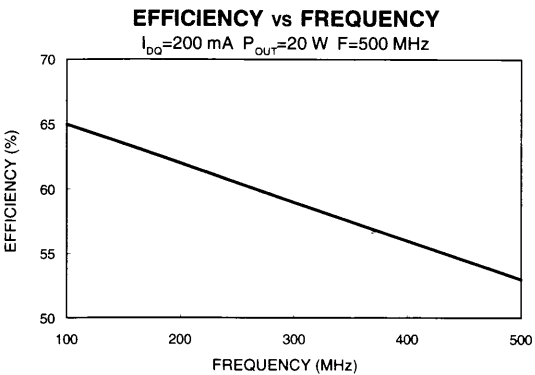
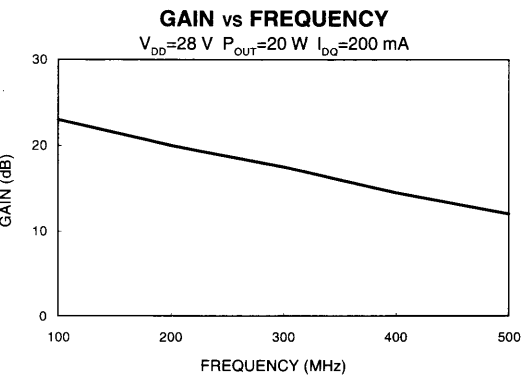
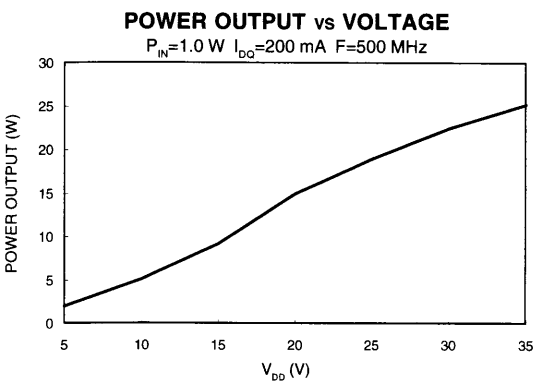
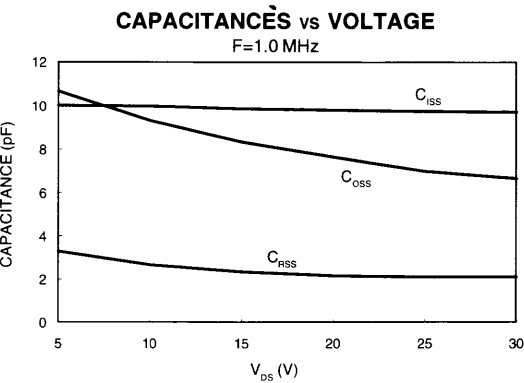
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9-275

Typical Broadband Performance Curves



Typical Device Impedance

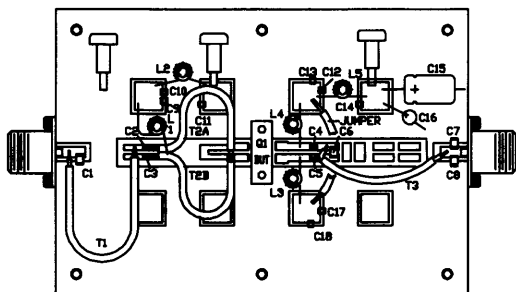
Frequency (MHz)	Z_{IN} (OHMS)	Z_{LOAD} (OHMS)
100	$9.5 - j 60.0$	$4.0 + j 68.0$
300	$5.0 - j 35.0$	$40.0 + j 48.0$
500	$2.0 - j 22.0$	$36.0 + j 34.0$

$$V_{DD}=28 \text{ V}, I_{DO}=200 \text{ mA}, P_{OUT}=20.0 \text{ Watts}$$

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

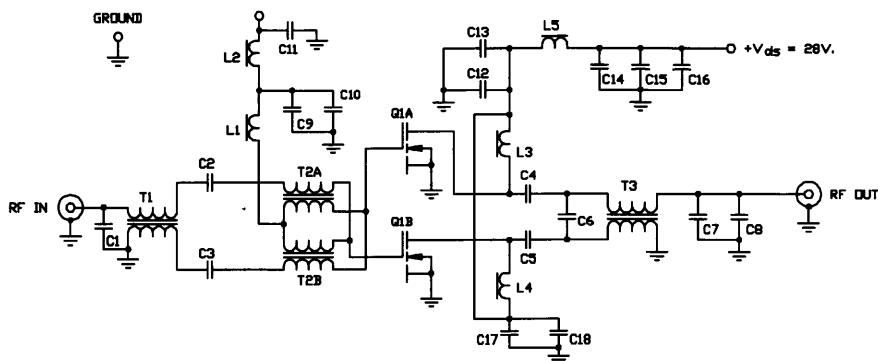
Z_{LOAD} is the optimum series equivalent load impedance as measured from drain to drain.

RF Test Fixture



P A R T S L I S T

C1	11pf
C2, 3, 4, 5	560pf
C6	6.8pf
C7	0.6pf
C8	2.0PF
C10, 11, 12, 14, 17	.015uf
C9, 13, 18	680pf
C15	50uf 50V.
C16	0.1uf
T1	2.50' OF 50 OHM (.085' OD) SEMI RIGID COAX
T2A, 2B	2.50' OF 25 OHM (.070' OD) SEMI RIGID COAX
T3	2.10' OF 50 OHM (.085' OD) SEMI RIGID COAX
L1, 2, 3, 4, 5	14 TURNS OF NO. 28 AWG ON TOROID CORE



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9-277

RF MOSFET Power Transistor, 20W, 28V

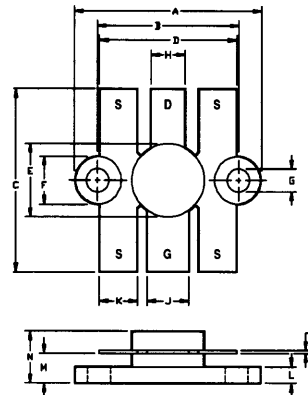
100 - 500 MHz

UF2820R

V2.00

Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- High Saturated Output Power
- Lower Noise Figure Than Competitive Devices



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}	4	A
Power Dissipation	P_D	61	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	2.86	°C/W

LETTER SYM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.64	24.89	.970	.980
B	18.29	18.54	.720	.730
C	23.88	24.38	.940	.960
D	18.16	18.42	.715	.725
E	9.47	9.73	.373	.383
F	6.22	6.48	.245	.255
G	2.92	3.18	.115	.125
H	4.45	4.69	.175	.185
J	5.46	5.72	.215	.225
K	4.95	5.21	.195	.205
L	2.41	2.67	.095	.105
M	4.86	4.57	.160	.180
N	6.38	7.39	.250	.291
P	.10	.15	.004	.006

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	65	-	V	$V_{GS}=0.0\text{ V}$, $I_{DS}=5.0\text{ mA}$
Drain-Source Leakage Current	I_{DSS}	-	1.0	mA	$V_{DS}=28.0\text{ V}$, $V_{GS}=0.0\text{ V}$
Gate-Source Leakage Current	I_{GSS}	-	1.0	μA	$V_{GS}=20\text{ V}$, $V_{DS}=0.0\text{ V}$
Gate Threshold Voltage	$V_{GS(TH)}$	2.0	6.0	V	$V_{DS}=10.0\text{ V}$, $I_{DS}=100.0\text{ mA}$
Forward Transconductance	G_M	.500	-	S	$V_{DS}=10.0\text{ V}$, $I_{DS}=1000.0\text{ mA}$, $\Delta V_{GS}=1.0\text{ V}$, 80 μs Pulse
Input Capacitance	C_{ISS}	-	45	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Output Capacitance	C_{OSS}	-	30	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Reverse Capacitance	C_{RSS}	-	8	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$
Power Gain	G_P	10	-	dB	$V_{DS}=28.0\text{ V}$, $I_{DQ}=100.0\text{ mA}$, $P_{OUT}=20.0\text{ W}$, $F=500\text{ MHz}$
Drain Efficiency	η_D	50	-	%	$V_{DS}=28.0\text{ V}$, $I_{DQ}=100.0\text{ mA}$, $P_{OUT}=20.0\text{ W}$, $F=500\text{ MHz}$
Load Mismatch Tolerance	VSWR-T	-	20:1	-	$V_{DS}=28.0\text{ V}$, $I_{DQ}=100.0\text{ mA}$, $P_{OUT}=20.0\text{ W}$, $F=500\text{ MHz}$

Specifications Subject to Change Without Notice.

9-278

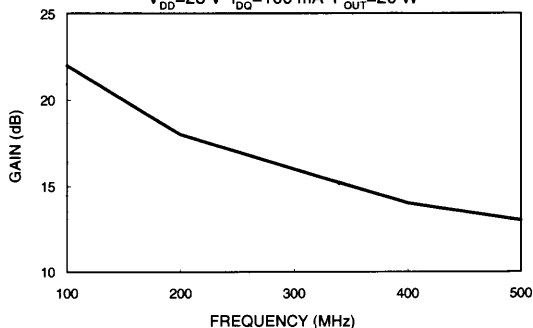
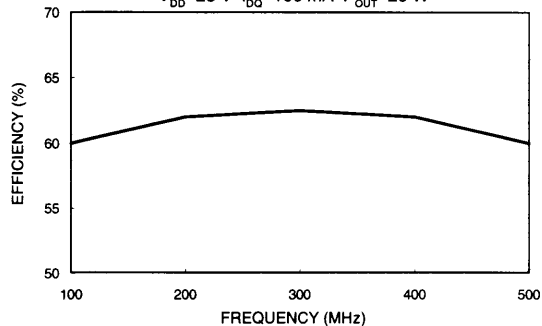
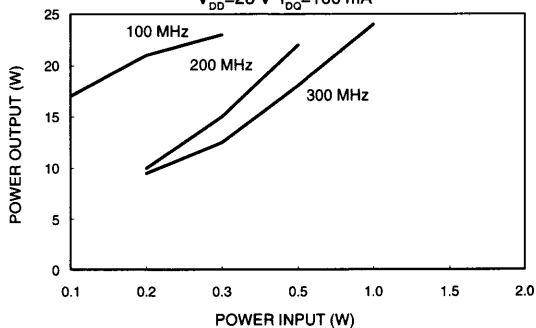
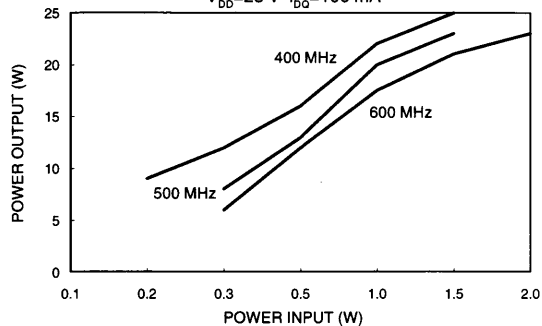
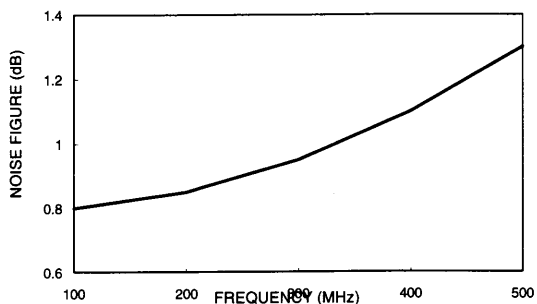
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Typical Broadband Performance Curves

GAIN vs FREQUENCY $V_{DD}=28\text{ V}$ $I_{DQ}=100\text{ mA}$ $P_{OUT}=20\text{ W}$ **EFFICIENCY vs FREQUENCY** $V_{DD}=28\text{ V}$ $I_{DQ}=100\text{ mA}$ $P_{OUT}=20\text{ W}$ **POWER OUTPUT vs POWER INPUT** $V_{DD}=28\text{ V}$ $I_{DQ}=100\text{ mA}$ **POWER OUTPUT vs POWER INPUT** $V_{DD}=28\text{ V}$ $I_{DQ}=100\text{ mA}$ **NOISE FIGURE vs FREQUENCY** $V_{DD}=28\text{ V}$ $I_{DQ}=100\text{ mA}$ 

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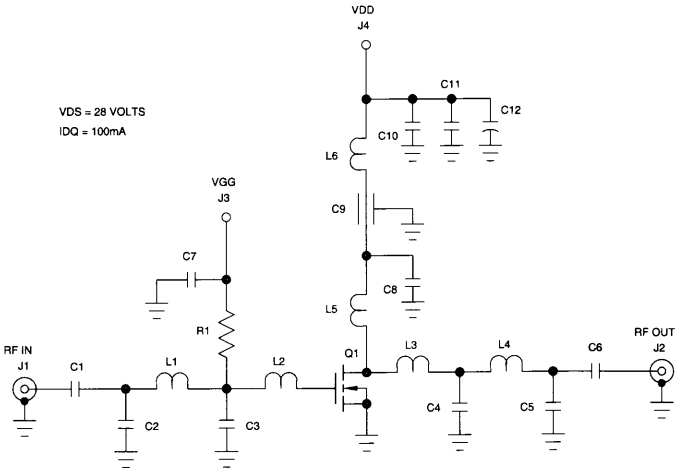
Typical Device Impedance

Frequency (MHz)	Z_{IN} (OHMS)	Z_{LOAD} (OHMS)
100	8.0 - j 16.0	12.0 + j 6.0
200	5.5 - j 8.0	9.3 + j 6.0
300	4.0 - j 3.8	6.8 + j 5.5
400	3.0 - j 2.0	4.5 + J 4.5
500	2.0 + J 1.0	3.0 + j 3.0

$V_{DD}=28\text{ V}, I_{DQ}=100\text{ mA}, P_{OUT}=20.0\text{ Watts}$

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 source.

RF Test Fixture



PARTS LIST

C1,C6,C10	CAPACITOR 1000pF
C7	
C2,C5	CAPACITOR 10pF
C3	CAPACITOR 30pF
C4	CAPACITOR 25pF
C8	CAPACITOR 500pF
C9	FEEDTHROUGH CAPACITOR 500pF
C11	MONOLITHIC CERAMIC CAPACITOR 0.1uF
C12	ELECTROLYTIC CAPACITOR 50uF 50 VOLTS
L1	0.25" X 0.63" HAIRPIN, NO. 22 AWG
L2	0.25" X 0.20" MICROSTRIP LINE
L3	0.25" X 0.40" MICROSTRIP LINE
L4	0.30" X 0.06" HAIRPIN, NO. 18 AWG
L5	6 TURNS OF NO. 20 AWG ON 0.30", CLOSE WOUND
L6	12 TURNS OF NO. 20 AWG ON 0.30", CLOSE WOUND
R1	RESISTOR 12K OHMS 0.25 WATT
Q1	UF2820R
BOARD	FR4 0.062"

RF MOSFET Power Transistor, 40W, 28V

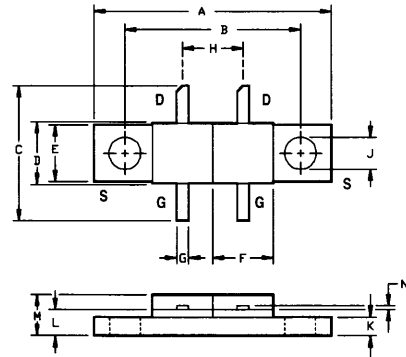
100 - 500 MHz

UF2840G

V2.00

Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- High Saturated Output Power
- Lower Noise Figure Than Competitive Devices



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}	4*	A
Power Dissipation	P_D	116	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	1.52	°C/W

LETTER DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.64	24.89	.970	.980
B	18.29	18.54	.720	.730
C	13.72	14.22	.540	.560
D	6.22	6.48	.245	.255
E	5.72	5.97	.225	.235
F	6.22	6.48	.245	.255
G	1.14	1.40	.045	.055
H	6.22	6.48	.245	.255
J	3.18	3.43	.125	.135
K	1.78	2.03	.070	.080
L	2.34	2.84	.092	.112
M	3.99	4.75	.157	.187
N	.08	.15	.003	.006

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	65	-	V	$V_{GS}=0.0\text{ V}$, $I_{DS}=5.0\text{ mA}$ *
Drain-Source Leakage Current	I_{DSS}	-	1.0	mA	$V_{DS}=28.0\text{ V}$, $V_{GS}=0.0\text{ V}$ *
Gate-Source Leakage Current	I_{GSS}	-	1.0	μA	$V_{GS}=20\text{ V}$, $V_{DS}=0.0\text{ V}$ *
Gate Threshold Voltage	$V_{GS(TH)}$	2.0	6.0	V	$V_{DS}=10.0\text{ V}$, $I_{DS}=100.0\text{ mA}$ *
Forward Transconductance	G_M	.500	-	S	$V_{DS}=10.0\text{ V}$, $I_{DS}=1.0\text{ A}$, $\Delta V_{GS}=1.0\text{ V}$, 80 μs Pulse*
Input Capacitance	C_{ISS}	-	45	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$ *
Output Capacitance	C_{OSS}	-	30	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$ *
Reverse Capacitance	C_{RSS}	-	8	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}$ *
Power Gain	G_P	10	-	dB	$V_{DS}=28.0\text{ V}$, $I_{DS}=500.0\text{ mA}$, $P_{OUT}=40.0\text{ W}$, $F=500\text{ MHz}$
Drain Efficiency	η_D	50	-	%	$V_{DS}=28.0\text{ V}$, $I_{DS}=500.0\text{ mA}$, $P_{OUT}=40.0\text{ W}$, $F=500\text{ MHz}$
Load Mismatch Tolerance	VSWR-T	-	30:1	-	$V_{DS}=28.0\text{ V}$, $I_{DS}=500.0\text{ mA}$, $P_{OUT}=40.0\text{ W}$, $F=500\text{ MHz}$

* Per Side

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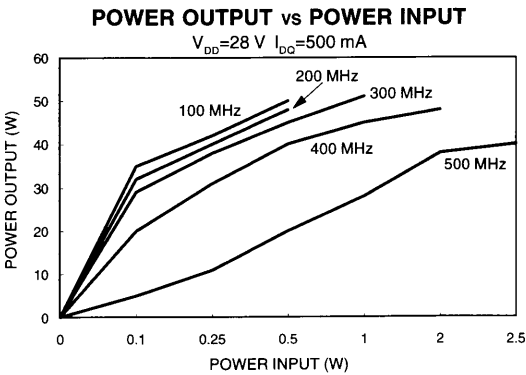
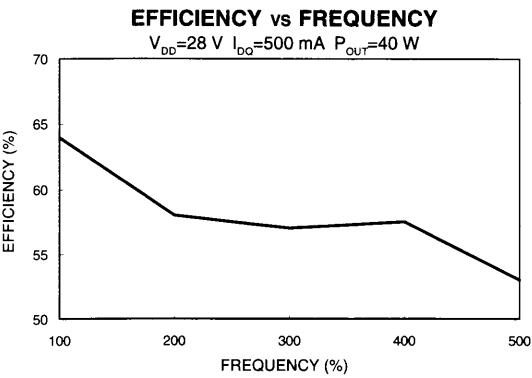
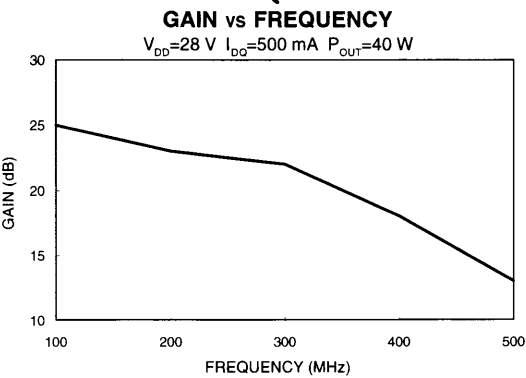
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9-281

Typical Broadband Performance Curves



Typical Device Impedance

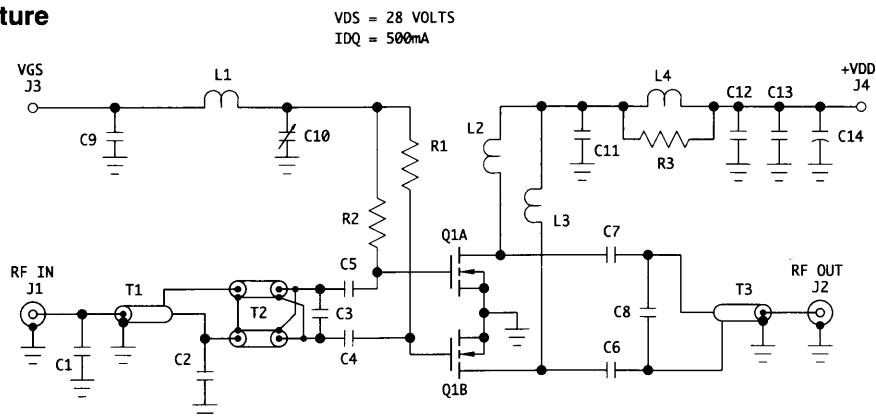
Frequency (MHz)	Z_{IN} (OHMS)	Z_{LOAD} (OHMS)
100	6.0 - j 20.0	25.0 + j 27.0
200	3.5 - j 11.5	16.5 + j 19.5
300	2.5 - j 5.5	13.0 + j 13.0
400	3.0 + j 0.0	12.0 + j 9.0
500	4.0 + j 3.0	12.0 + j 5.0

$$V_{DD}=28\text{ V}, I_{DQ}=500\text{ mA}, P_{OUT}=40.0\text{ Watts}$$

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 ground.

RF Test Fixture



PARTS LIST

C1,C3	CAPACITOR 15pF
C2	CAPACITOR 7pF
C4,C5,C6,	CHIP CAPACITOR 620pF ATC
C7	
C8	CHIP CAPACITOR 9.1pF ATC
C9,C12	CAPACITOR 1000pF
C10	TRIMMER CAPACITOR 2-500pF
C11	CAPACITOR ATC 500pF
C13	MONOLITHIC CERAMIC CAPACITOR 0.1uF
C14	ELECTROLYTIC CAPACITOR 50uF 50 V.
L1	4 TURNS OF NO. 22 AWG ON '0.35"
L2,L3	6 TURNS OF NO. 22 AWG ON '0.35"
L4	8 TURNS OF NO. 22 AWG ON R3
R1,R2	RESISTOR 12K OHMS 0.25 WATT
R3	RESISTOR 33 OHMS 3 WATTS
T1	50 OHM SEMI-RIGID COAX 2.1" X '0.085"
T2	25 OHM SEMI-RIGID COAX 2X 2.3" X '0.070"
T3	25 OHM SEMI-RIGID COAX 3.3" X '0.070"
Q1	UF2840G
BOARD	FR4 0.062"

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9-283

RF MOSFET Power Transistor, 40W, 28V

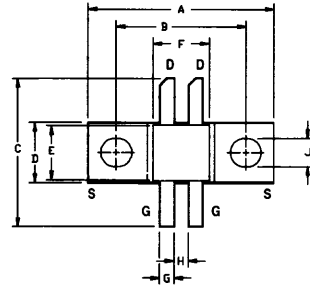
100 - 500 MHz

UF2840P

V2.00

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}	4*	A
Power Dissipation	P_D	116	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	1.5	°C/W

LETTER DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	20.70	20.96	.815	.825
B	14.35	14.61	.565	.575
C	15.67	17.45	.617	.687
D	6.27	6.53	.247	.257
E	6.22	6.48	.245	.255
F	6.22	6.48	.245	.255
G	1.40	1.65	.055	.065
H	1.40	1.65	.055	.065
J	2.92	3.18	.115	.125
K	1.40	1.65	.055	.065
L	1.96	2.46	.077	.097
M	3.61	4.37	.142	.172
N	.08	.13	.003	.005

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	65	-	V	$V_{GS}=0.0\text{ V}$, $I_{DS}=5.0\text{ mA}^*$
Drain-Source Leakage Current	I_{DSS}	-	1.0	mA	$V_{DS}=28.0\text{ V}$, $V_{GS}=0.0\text{ V}^*$
Gate-Source Leakage Current	I_{GSS}	-	1.0	μA	$V_{GS}=20\text{ V}$, $V_{DS}=0.0\text{ V}^*$
Gate Threshold Voltage	$V_{GS(TH)}$	2.0	6.0	V	$V_{DS}=10.0\text{ V}$, $I_{DS}=100.0\text{ mA}^*$
Forward Transconductance	G_M	.5	-	S	$V_{DS}=10.0\text{ V}$, $I_{DS}=1000.0\text{ mA}$, $\Delta V_{GS}=1.0\text{ V}$, 80 μs Pulse*
Input Capacitance	C_{ISS}	-	45	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}^*$
Output Capacitance	C_{OSS}	-	30	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}^*$
Reverse Capacitance	C_{RSS}	-	8	pF	$V_{DS}=28.0\text{ V}$, $F=1.0\text{ MHz}^*$
Power Gain	G_P	10	-	dB	$V_{DD}=28.0\text{ V}$, $I_{DQ}=500.0\text{ mA}$, $P_{OUT}=40.0\text{ W}$, $F=500\text{ MHz}$
Drain Efficiency	η_D	50	-	%	$V_{DD}=28.0\text{ V}$, $I_{DQ}=500.0\text{ mA}$, $P_{OUT}=40.0\text{ W}$, $F=500\text{ MHz}$
Load Mismatch Tolerance	VSWR-T	-	20:1	-	$V_{DD}=28.0\text{ V}$, $I_{DQ}=500.0\text{ mA}$, $P_{OUT}=40.0\text{ W}$, $F=500\text{ MHz}$

* Per Side

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9-284

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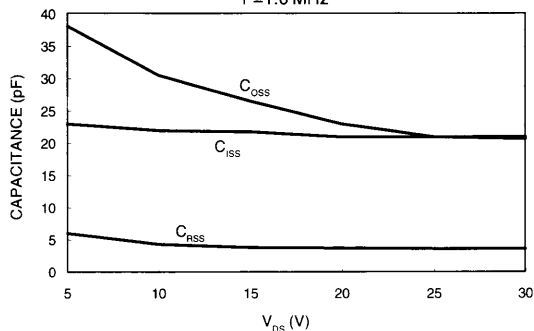
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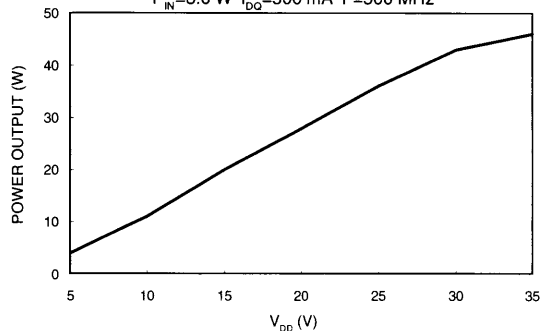
Typical Broadband Performance Curves

CAPACITANCES vs VOLTAGE

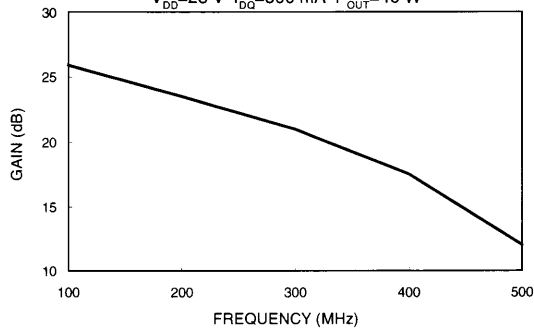
F=1.0 MHz



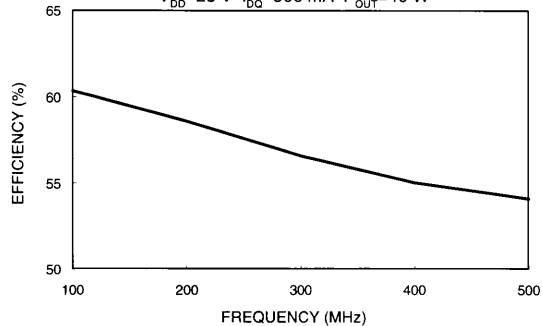
POWER OUTPUT vs VOLTAGE

 $P_{IN}=3.0$ W $I_{DQ}=500$ mA F=500 MHz

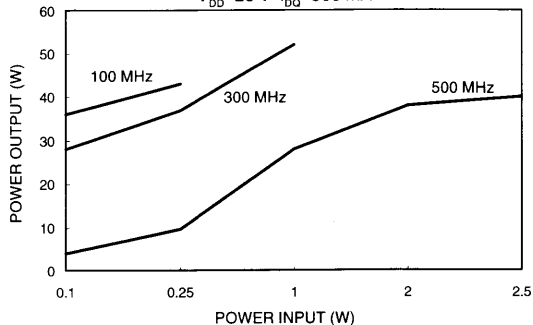
GAIN vs FREQUENCY

 $V_{DD}=28$ V $I_{DQ}=500$ mA $P_{OUT}=40$ W

EFFICIENCY vs FREQUENCY

 $V_{DD}=28$ V $I_{DQ}=500$ mA $P_{OUT}=40$ W

POWER OUTPUT vs POWER INPUT

 $V_{DD}=28$ V $I_{DQ}=500$ mA

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Typical Device Impedance

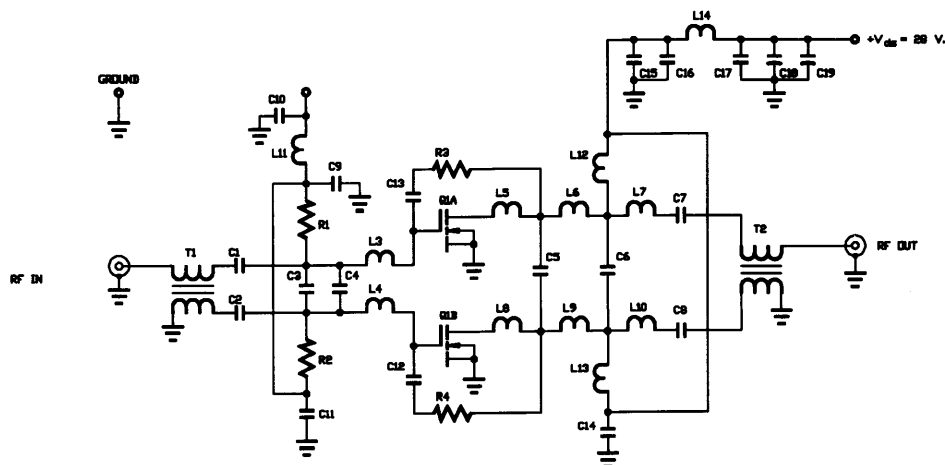
Frequency (MHz)	Z_{IN} (OHMS)	Z_{LOAD} (OHMS)
100	$6.0 - j 20.0$	$25.0 + j 27.0$
300	$2.5 - j 5.5$	$13.0 + j 13.0$
500	$4.0 + j 3.0$	$12.0 + j 5.0$

$$V_{DD}=28 \text{ V, } I_{DQ}=500 \text{ mA, } P_{OUT}=40.0 \text{ Watts}$$

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



P A R T S L I S T

C3, 5	10.0 pF
C6	11.0 pF
C4	18 pF
C1, 2, 7, 8, 12, 13	470 pF
C7, 9, 10, 11, 14, 15	.015 uF
C18	.10 uF
C16	1.0 uF
C19	50 uF 50 V.
R1, 2	100 OHM .25 W.
R3, 4	270 OHM .25 W.
T1, 2	2.50' OF 25 OHM SEMI-RIGID COAX
L11, 14	7 TURNS OF NO. 22 AVG WIRE
L12, 13	15 TURNS OF NO. 22 AVG WIRE
L7, 10	.15' OF 50 OHM TRANSMISSION LINE
L6, 9	.25' OF 50 OHM TRANSMISSION LINE
L5, 8	.30' OF 50 OHM TRANSMISSION LINE
L4	.35' OF 50 OHM TRANSMISSION LINE
L1, 2	.50' OF 50 OHM TRANSMISSION LINE
Q1	UF2840P

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9-286

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