

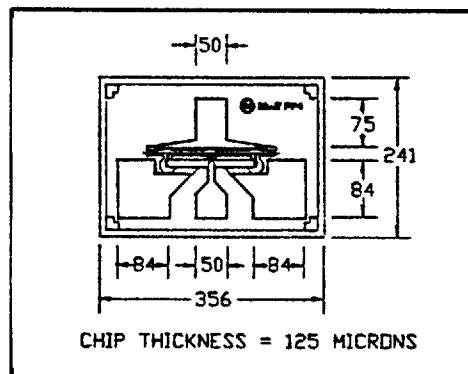


MICROWAVE TECHNOLOGY

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48E D ■ 6124100 0000151 158 ■ MRWV



### FEATURES

- 0.7 dB NOISE FIGURE AT 12GHZ
- HIGH ASSOCIATED GAIN
- 0.3 MICRON REFRACTORY METAL/ GOLD GATE
- 180 MICRON GATE WIDTH
- AVAILABLE BINNED BY IDSS

### RF SPECIFICATIONS

SYMBOL	PARAMETERS AND CONDITIONS	FREQ	UNITS	MIN	TYP	MAX
NFOpt	Optimum Noise Figure VDS=3.0V IDS=12 mA	12GHz	dB		0.7	0.9
GA	Associate Gain at Optimum Noise Figure VDS=3.0 V IDS=12 mA	12GHz	dB	8.5	11.0	
P1dB	Output Power at 1dB Compression VDS=4.5V IDS=0.6 IDSS	12GHz	dBm	10.0	12.0	

### DC SPECIFICATIONS AT Ta=25° C

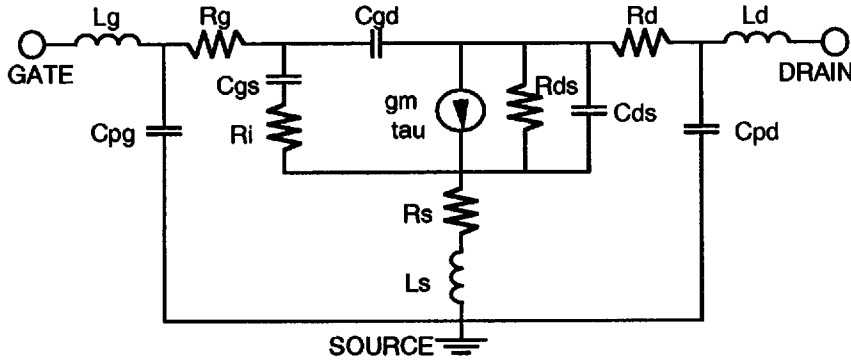
SYMBOL	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
IDSS	Saturated Drain Current VDS=3.0 V VGS=0.0 V	mA	9	35	66
Gm	Transconductance VDS=3.0 V VGS=0.0 V	mS	25	45	
Vp	Pinch-off Voltage VDS=3.0 V IDS=1.0mA	V		-1.5	-4.0
BVGSO	Gate-to-Source Breakdown Voltage IGD=-0.2 mA	V	-5.0	-8.0	
BVGDO	Gate-to-Drain Breakdown Voltage IGD = -0.2 mA	V	-6.0	-8.0	
Rth	Thermal Resistance	°C/W			250

### MAXIMUM RATINGS AT Ta=25° C

SYMBOL	PARAMETERS	UNITS	CONT.OPER.	ABSOLUTE MAX
VDS	Drain to Source Voltage	V	5	7
VGS	Gate to Source Voltage	V	Vp	-6
IDS	Drain Current	mA	Idss	Idss+39
Pin	RF Input Power	mW	90	180
Tch	Channel Temperature	°C	+150	+175
Tst	Storage Temperature	°C	-65 to +150	+175



**DEVICE EQUIVALENT CIRCUIT MODEL**



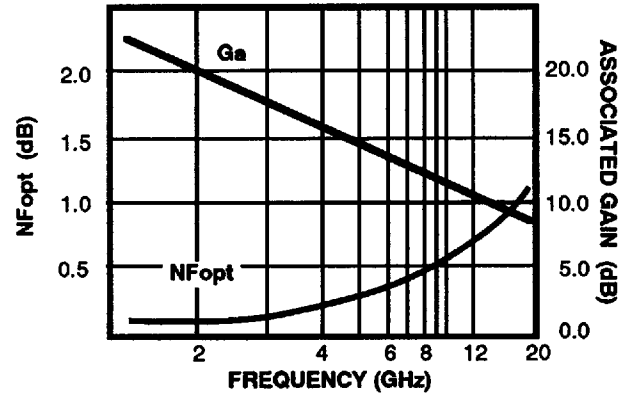
- Gate Bond Wire Inductance,  $L_g = 0.22$  nH
- Gate Pad Capacitance,  $C_{pg} = 0.07$
- Gate Resistance,  $R_g = 2.0$   $\Omega$
- Gate-Source Capacitance,  $C_{gs} = 0.18$  pF
- Channel Resistance,  $R_i = 8.0$   $\Omega$
- Gate-Drain Capacitance,  $C_{gd} = 0.02$  pF
- Transconductance,  $g_m = 50$  mS
- Transit time,  $\tau = 0.7$  psec
- Source Resistance,  $R_s = 4.33$   $\Omega$
- Source Inductance,  $L_s = 0.05$  nH
- Drain-Source Resistance,  $R_{ds} = 315$   $\Omega$
- Drain-Source Capacitance,  $C_{ds} = 0.002$  pF
- Drain Resistance,  $R_d = 6.99$   $\Omega$
- Drain Pad Capacitance,  $C_{pd} = 0.04$  pF
- Drain Inductance,  $L_d = 0.34$  nH

**TYPICAL NOISE PARAMETERS**

$V_{DS} = 3.0$  V,  $I_{DS} = 12$  mA

FREQUENCY MHz	NF MIN dB	GAMMA OPT		Rn/50
		MAG	ANGLE	
1000	0.08	0.97	6.7	0.38
2000	0.13	0.92	12.9	0.36
4000	0.26	0.85	25.7	0.35
6000	0.39	0.79	38.0	0.34
8000	0.51	0.75	49.8	0.33
12000	0.75	0.69	71.1	0.32
15000	0.92	0.67	84.7	0.30
18000	1.08	0.66	96.2	0.29

**NOISE FIGURE AND ASSOCIATED GAIN VS. FREQUENCY**



**TYPICAL COMMON SOURCE SCATTERING PARAMETERS**

$V_{DS} = 3.0$  V,  $I_{DS} = 12$  mA. = 50%  $I_{DSS}$

FREQUENCY (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1000	.99	-10.4	3.74	170.6	.01	84.4	.78	-4.2
2000	.98	-20.5	3.69	162.8	.03	77.4	.77	-8.2
3000	.97	-30.8	3.68	154.6	.04	71.8	.76	-12.4
4000	.95	-41.1	3.61	146.1	.06	65.5	.74	-16.7
5000	.92	-51.0	3.54	138.0	.07	61.2	.72	-20.1
6000	.91	-61.2	3.49	130.3	.08	56.7	.70	-23.7
7000	.89	-71.8	3.43	122.2	.09	51.3	.67	-27.6
8000	.86	-82.8	3.33	114.0	.10	45.9	.64	-31.7
9000	.83	-93.3	3.18	106.6	.10	39.6	.61	-35.7
10000	.80	-103.6	3.07	99.7	.12	33.0	.57	-38.9
12000	.76	-121.9	2.89	86.5	.11	23.6	.49	-45.3
14000	.74	-139.0	2.72	72.9	.11	20.0	.44	-51.9
16000	.73	-156.3	2.49	60.1	.12	11.1	.38	-60.3
18000	.73	-169.8	2.32	49.8	.12	3.6	.32	-69.9
20000	.72	176.4	2.16	38.7	.12	-5.3	.26	-77.7
22000	.73	165.7	2.05	28.3	.12	-8.0	.23	-89.7
24000	.74	156.0	1.92	17.3	.12	-13.7	.21	-110.8
26000	.75	145.6	1.85	6.2	.13	-20.4	.18	-133.2

MWT-HEMT 10/91