

MITSUBISHI SEMICONDUCTOR (GaAs FET)
MGF491xG Series

SUPER LOW NOISE InGaAs HEMT

DESCRIPTION

The MGF491xG series super-low-noise HEMT(High Electron Mobility Transistor) is designed for use in L to Ku band amplifiers.

The hermetically sealed metal-ceramic package assures minimum parasitic losses, and has a configuration suitable for microstrip circuits.

The MGF491*G series is mounted in the super 12 tape.

FEATURES

- Low noise figure @f=12GHz
 MGF4916G:NFmin.=0.80dB(MAX.)
 MGF4919G:NFmin.=0.50dB(MAX.)
- High associated gain @f=12GHz
 Gs=12.0dB(MIN.)

APPLICATION

L to Ku band low noise amplifiers.

QUALITY GRADE

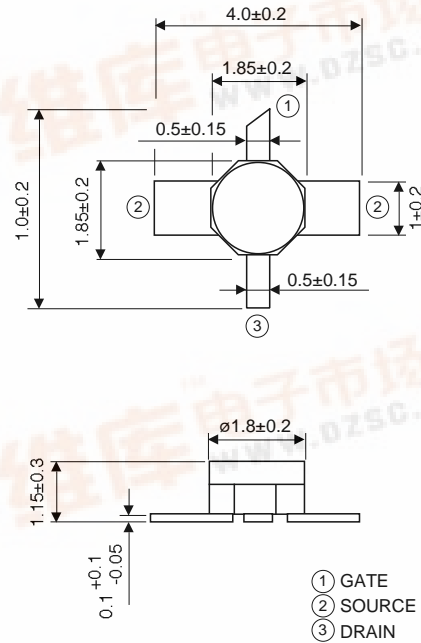
- GG

RECOMMENDED BIAS CONDITIONS

- $V_{DS}=2V, I_D=10mA$
- Refer to Bias Procedure

OUTLINE DRAWING

Unit: millimeters



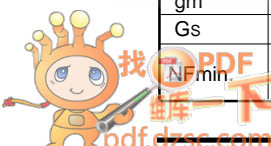
GD-16

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Symbol	Parameter	Ratings	Unit
V _{GDO}	Gate to drain voltage	-4	V
V _{GSO}	Gate to source voltage	-4	V
I _D	Drain current	60	mA
P _T	Total power dissipation	50	mW
T _{ch}	Channel temperature	125	°C
T _{stg}	Storage temperature	-65 to +125	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

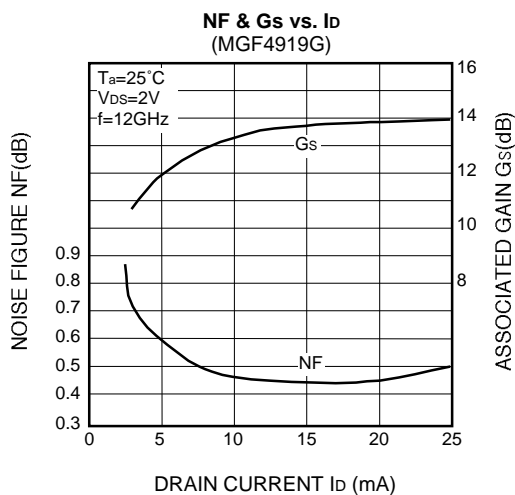
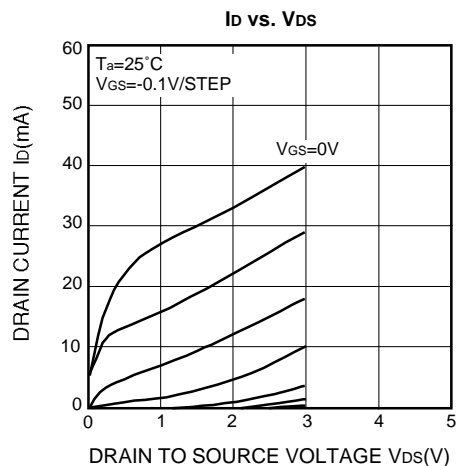
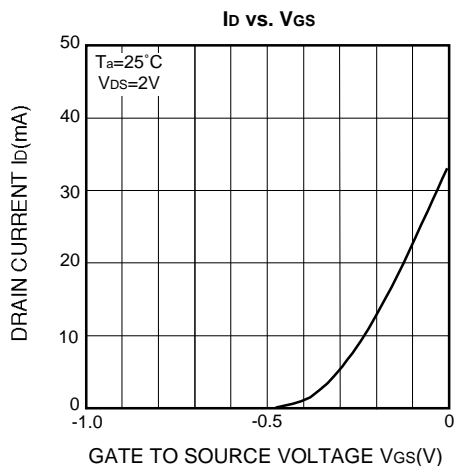
Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
V _{(BR)GDO}	Gate to drain breakdown voltage	I _G =-10μA	-3	-	-	V	
I _{GSS}	Gate to source leakage current	V _{GS} =-2V, V _{DS} =0V	-	-	50	μA	
I _{DSS}	Saturated drain current	V _{GS} =0V, V _{DS} =2V	15	-	60	mA	
V _{GS(off)}	Gate to source cut-off voltage	V _{DS} =2V, I _D =500μA	-0.1	-	-1.5	V	
gm	Transconductance	V _{DS} =2V, I _D =10mA	-	75	-	mS	
G _s	Associated gain	V _{DS} =2V, I _D =10mA	12.0	13.5	-	dB	
NF _{min}	Minimum noise figure	f=12GHz	MGF4916G	-	-	0.80	dB
			MGF4919G	-	-	0.50	dB



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TYPICAL CHARACTERISTICS (Ta=25°C)



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S PARAMETERS (Ta=25°C, Vds=2V, Id=10mA)

Freq. (GHz)	S11		S21		S12		S22		K	MSG/MAG (dB)
	Mag.	Angle	Mag.	Angle	Mag.	Angle	Mag.	Angle		
1	0.990	-22.3	5.775	158.1	0.020	71.9	0.533	-19.2	0.10	28.8
2	0.967	-40.6	5.585	140.6	0.035	61.8	0.514	-33.4	0.19	26.5
3	0.925	-53.2	5.401	128.9	0.051	53.3	0.489	-42.9	0.27	24.3
4	0.874	-70.9	5.161	111.8	0.064	42.4	0.457	-58.2	0.35	21.6
5	0.831	-88.8	4.899	96.8	0.075	29.3	0.424	-71.6	0.43	19.8
6	0.783	-105.7	4.626	80.8	0.083	19.0	0.391	-87.5	0.50	18.1
7	0.743	-120.6	4.316	67.9	0.087	9.1	0.369	-100.6	0.57	16.8
8	0.706	-132.1	4.100	56.4	0.090	4.1	0.357	-110.8	0.64	15.9
9	0.682	-144.7	3.887	43.2	0.093	-6.4	0.357	-122.3	0.69	15.1
10	0.670	-159.1	3.765	30.1	0.094	-14.3	0.351	-133.0	0.72	14.7
11	0.639	-171.8	3.617	17.5	0.095	-24.4	0.339	-143.5	0.80	14.0
12	0.617	175.3	3.526	4.5	0.096	-33.5	0.329	-154.0	0.86	13.5
13	0.591	163.1	3.421	-8.1	0.094	-42.5	0.328	-163.9	0.91	13.0
14	0.571	152.9	3.349	-17.4	0.094	-50.9	0.328	-171.3	0.95	12.7
15	0.565	140.1	3.333	-29.6	0.096	-61.1	0.343	179.5	0.96	12.7
16	0.560	125.8	3.349	-44.4	0.098	-74.1	0.351	170.5	0.98	12.7
17	0.533	109.8	3.356	-59.9	0.101	-88.8	0.337	161.8	1.01	12.5
18	0.484	91.2	3.337	-77.0	0.104	-105.1	0.310	151.6	1.11	12.1

NOISE PARAMETERS (Ta=25°C, Vds=2V, Id=10mA)

Freq. (GHz)	Γopt		Rn ()	NFmin.(dB)		Gs (dB)
	Magn.	Angle(deg.)		MGF4916G	MGF4919G	
4	0.76	49	12.5	0.31	0.24	18.3
8	0.59	95	4.7	0.47	0.35	15.9
12	0.48	139	2.3	0.60	0.45	13.5
14	0.41	166	1.8	0.69	0.50	12.3
18	0.34	-142	1.5	0.88	0.61	9.9