

## DESCRIPTION

The MGF4961B super-low noise HEMT (High Electron Mobility Transistor) is designed for use in K band amplifiers.

## FEATURES

Low noise figure @ f=20GHz  
NFmin. = 0.7dB (Typ.)

High associated gain @ f=20GHz  
Gs = 13.5dB (Typ.)

## APPLICATION

### C to K band low noise amplifiers

### QUALITY GRADE

GG

## RECOMMENDED BIAS CONDITIONS

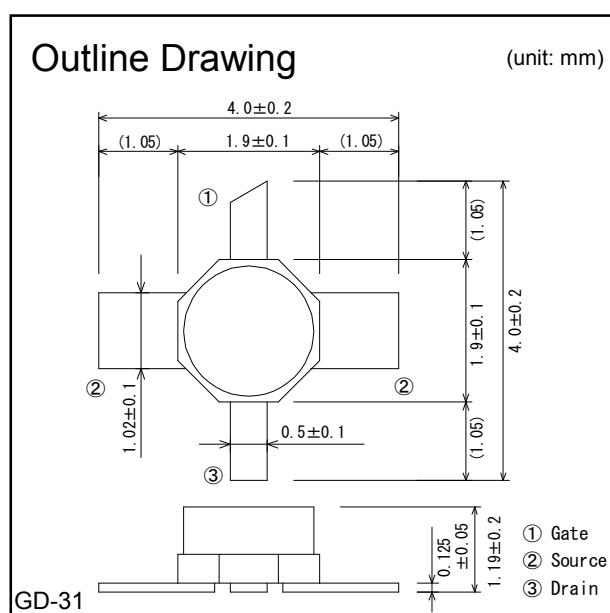
 $V_{DS}=2V, I_D=10mA$ 

## ORDERING INFORMATION

Tape & reel 4000pcs./reel

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ABSOLUTE MAXIMUM RATINGS (Ta=25°C )

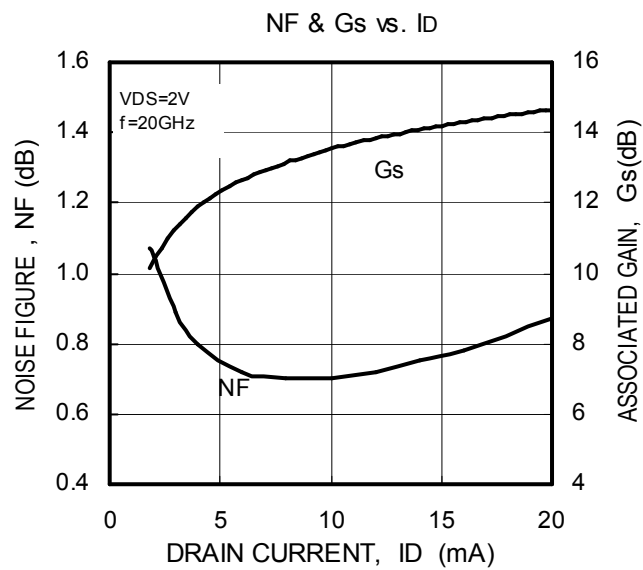
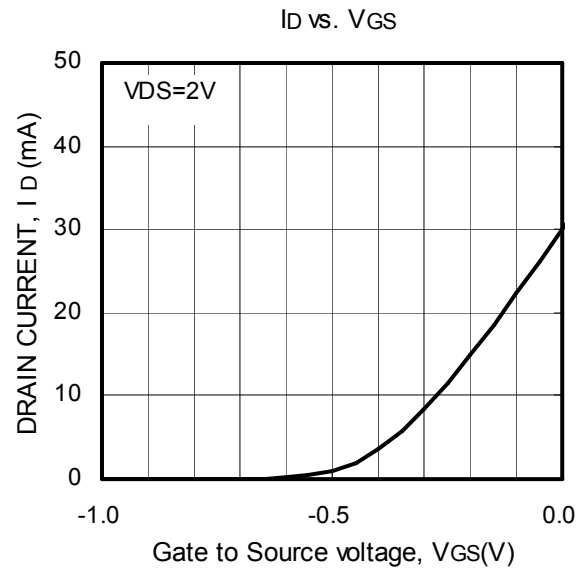
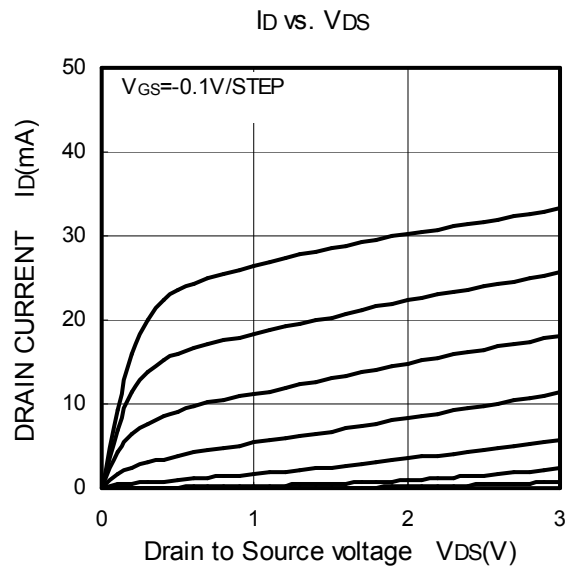
Symbol	Parameter	Ratings	Unit
V <sub>GDO</sub>	Gate to drain voltage	-4	V
V <sub>GSO</sub>	Gate to source voltage	-4	V
I <sub>D</sub>	Drain current	IDSS	mA
PT	Total power dissipation	50	mW
T <sub>ch</sub>	Channel temperature	125	°C
T <sub>stg</sub>	Storage temperature	-55 to +125	°C

**Keep Safety first in your circuit designs!**  
Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measure such as (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX	
V <sub>(BR)GDO</sub>	Gate to drain breakdown voltage	I <sub>G</sub> =-10μA	-3	--	--	V
I <sub>GSS</sub>	Gate to source leakage current	V <sub>GS</sub> =-2V, V <sub>DS</sub> =0V	--	--	50	μA
I <sub>DSS</sub>	Saturated drain current	V <sub>GS</sub> =0V, V <sub>DS</sub> =2V	15	--	60	mA
V <sub>GS(off)</sub>	Gate to source cut-off voltage	V <sub>DS</sub> =2V, I <sub>D</sub> =500μA	-0.1	--	-1.5	V
G <sub>s</sub>	Associated gain	V <sub>DS</sub> =2V, I <sub>D</sub> =10mA f=20GHz	11.5	13.5	--	dB
NF <sub>min.</sub>	Minimum noise figure		--	0.70	0.95	dB

## TYPICAL CHARACTERISTICS (Ta=25°C)



## S PARAMETERS

(Ta=25°C, VDS=2V, ID=10mA)

Freq. (GHz)	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.991	-16.4	4.743	162.8	0.015	76.9	0.658	-13.0
2	0.967	-32.5	4.652	146.3	0.028	66.2	0.643	-25.8
3	0.928	-48.5	4.525	129.9	0.041	54.8	0.622	-38.9
4	0.886	-64.5	4.403	113.8	0.052	43.4	0.596	-51.4
5	0.835	-80.3	4.252	98.3	0.059	33.1	0.571	-63.0
6	0.782	-98.8	4.089	81.6	0.065	21.3	0.541	-76.5
7	0.729	-115.0	3.885	66.6	0.068	11.7	0.517	-87.6
8	0.682	-130.4	3.665	52.2	0.067	2.6	0.492	-98.0
9	0.637	-145.0	3.437	39.2	0.066	-6.2	0.474	-106.1
10	0.563	-155.8	3.265	28.3	0.063	-15.5	0.461	-116.0
11	0.536	-165.2	3.248	17.1	0.051	-21.9	0.461	-121.0
12	0.527	-175.0	3.266	5.0	0.043	-19.3	0.479	-128.9
13	0.520	172.8	3.303	-8.4	0.047	-17.7	0.480	-139.8
14	0.509	160.4	3.422	-21.6	0.047	-15.3	0.487	-147.7
15	0.474	145.5	3.542	-36.3	0.044	-19.1	0.489	-157.0
16	0.459	129.1	3.659	-52.3	0.052	-15.0	0.482	-167.4
17	0.449	104.5	3.881	-68.5	0.058	-26.7	0.488	-177.8
18	0.445	74.9	4.101	-89.4	0.062	-44.4	0.473	164.4
19	0.473	40.8	4.063	-111.4	0.059	-68.0	0.402	143.4
20	0.534	8.1	3.940	-134.0	0.052	-93.8	0.325	118.7
21	0.597	-21.4	3.685	-157.2	0.050	-125.1	0.251	86.6
22	0.657	-44.1	3.324	179.7	0.046	-155.7	0.198	46.3
23	0.695	-64.0	2.969	158.8	0.058	169.5	0.216	3.2
24	0.696	-79.4	2.570	138.3	0.065	148.6	0.247	-27.3
25	0.686	-93.5	2.294	119.4	0.082	128.7	0.289	-45.2
26	0.656	-105.2	2.038	100.1	0.095	118.8	0.346	-56.5

## NOISE PARAMETERS

(VDS=2V, ID=10mA, Ta=25°C)

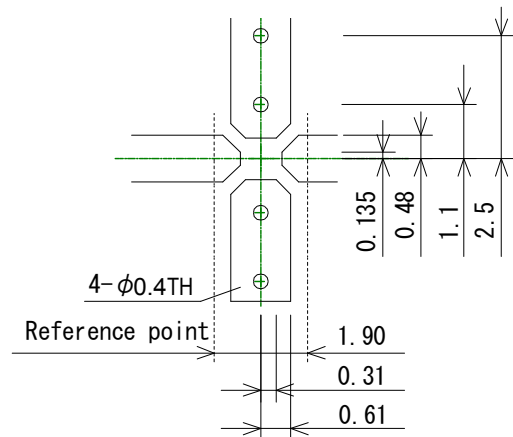
Freq. (GHz)	$\Gamma_{opt}$		Rn	NFmin (dB)
	(mag)	(ang)		
12	0.525	144.8	0.08	0.43
13	0.462	166.2	0.09	0.47
14	0.403	-174.0	0.11	0.51
15	0.348	-155.5	0.12	0.55
16	0.297	-138.3	0.13	0.58
17	0.249	-122.1	0.14	0.61
18	0.204	-106.8	0.15	0.64
19	0.186	-72.3	0.19	0.67
20	0.168	-39.5	0.23	0.70
21	0.223	-14.6	0.29	0.80
22	0.276	17.5	0.35	0.89
23	0.296	36.8	0.39	0.97
24	0.315	55.2	0.43	1.05
25	0.333	72.9	0.47	1.13
26	0.350	89.9	0.51	1.20

Note) Rn is normalized by 50ohm

S parameter measurement:

Board:  $\epsilon_r=2.6$ 

Thickness = 0.4mm



(Unit: mm)

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