

< Low Noise GaAs HEMT >

# MGF4964BL

Micro-X type plastic package

## DESCRIPTION

The MGF4964BL super-low noise InGaAs HEMT (High Electron Mobility Transistor) is designed for use in K band amplifiers.

## FEATURES

Low noise figure @ f=20GHz  
NFmin. = 0.65dB (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

## RoHS COMPLIANT

MGF4964BL is a RoHS compliant product. RoHS compliance is indicated by the letter "G" after the Lot Marking.

## ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Symbol	Parameter	Ratings	Unit
VGDO	Gate to drain voltage	-3	V
VGSO	Gate to source voltage	-3	V
VDS	Drain to source voltage	3	V
ID	Drain current	IDSS	mA
PT	Total power dissipation	50	mW
Tch	Channel temperature	125	°C
Tstg	Storage temperature	-55 to +125	°C
Top	Operation temperature	-55 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	$I_G=-10\mu A$	-3	--	--	V
$I_{GSS}$	Gate to source leakage current	$V_{GS}=-2V, V_{DS}=0V$	--	--	50	$\mu A$
$I_{DSS}$	Saturated drain current	$V_{GS}=0V, V_{DS}=2V$	15	--	60	mA
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS}=2V, I_D=500\mu A$	-0.1	--	-1.5	V
Gs	Associated gain	$V_{DS}=2V$ ,	11.5	13.5	--	dB
NFmin.	Minimum noise figure	$I_D=10mA, f=20GHz$	--	0.65	0.90	dB

Note: Gs and NFmin. are tested with sampling inspection.

Thermal resistance (Rth) of this product : 500°C/W

Outline Drawing

Fig.1

## MITSUBISHI Proprietary

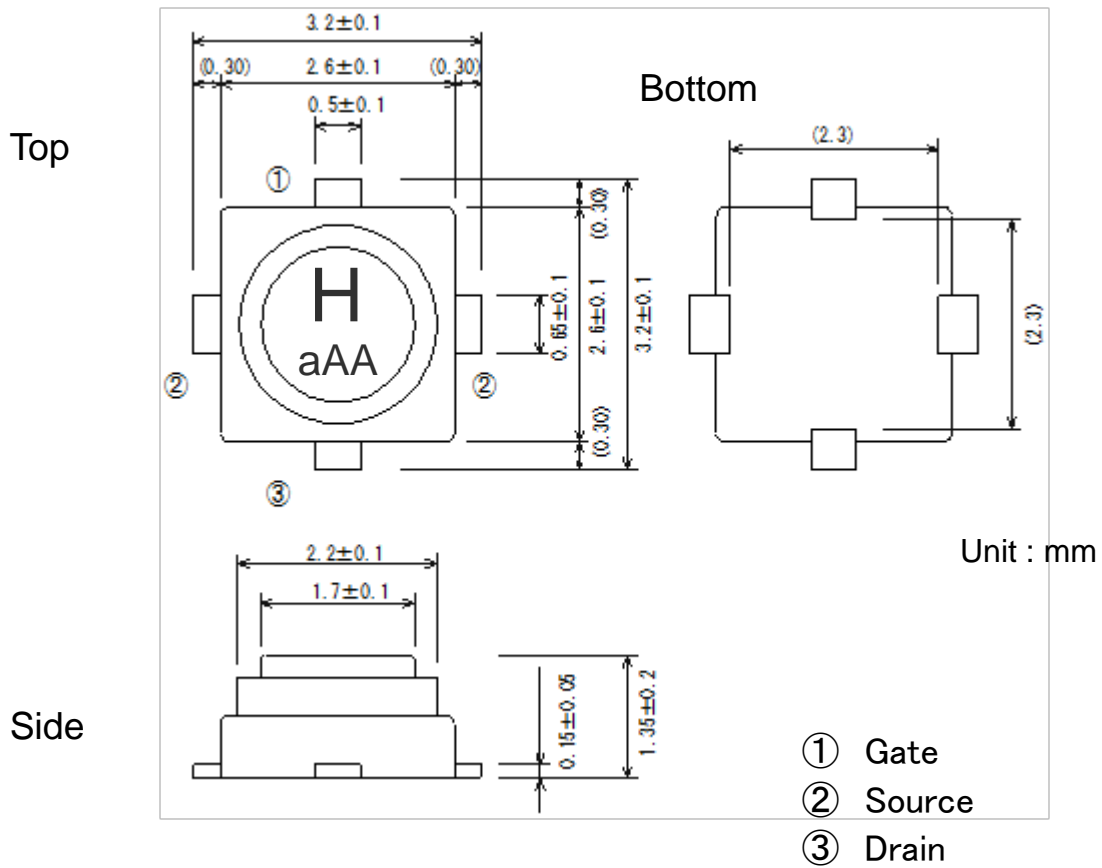
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## CAUTION!

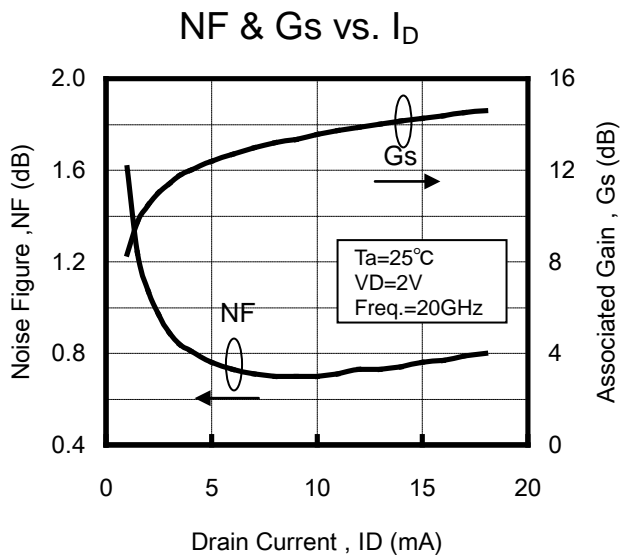
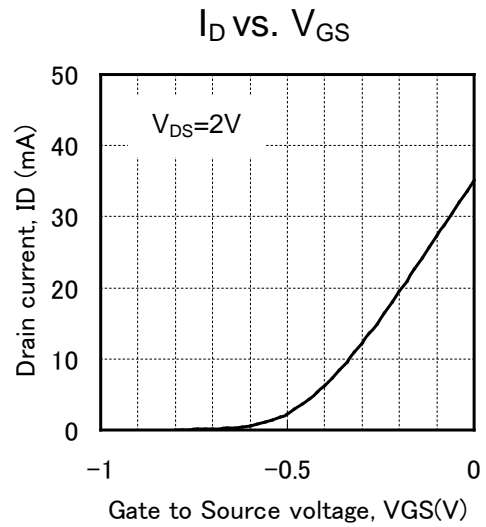
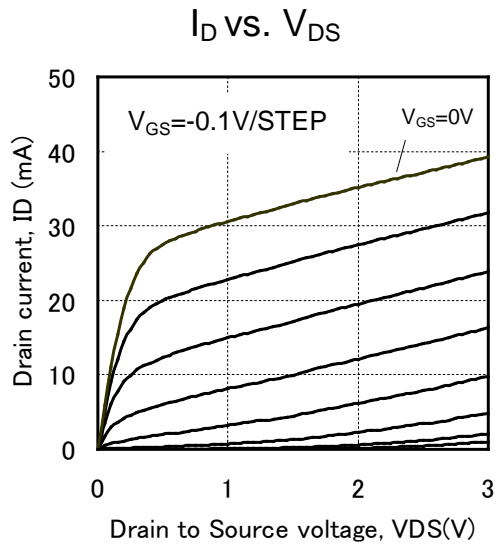
This device is sensitive to ElectroStatic Discharge (ESD). Care should be needed during transport and handling.

Fig.1



(GD-32)

TYPICAL CHARACTERISTICS (Ta=25°C)

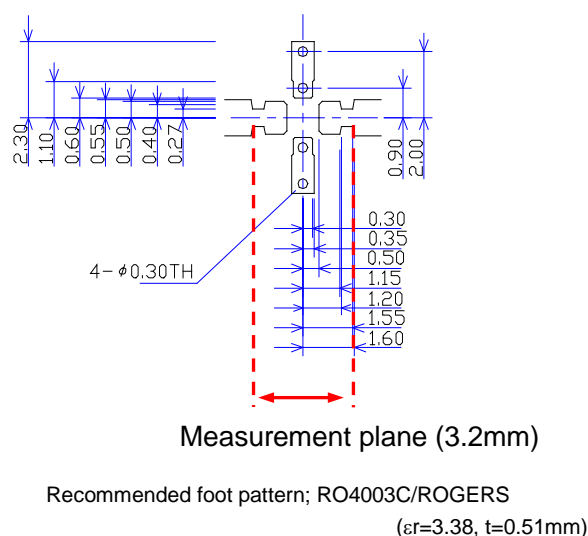


**S PARAMETERS** ( $T_a=25^\circ\text{C}$ ,  $V_{DS}=2\text{V}$ ,  $I_D=10\text{mA}$ )

Freq. (GHz)	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
2	0.977	-31.7	4.626	146.7	0.024	65.5	0.592	-26.1
3	0.952	-47.5	4.519	130.5	0.034	53.4	0.576	-39.3
4	0.918	-63.5	4.528	114.1	0.044	41.5	0.553	-51.9
5	0.877	-79.7	4.467	98.0	0.052	29.7	0.526	-65.0
6	0.831	-96.3	4.400	81.8	0.060	18.4	0.497	-77.9
7	0.781	-113.7	4.353	65.5	0.066	6.6	0.464	-91.4
8	0.724	-132.0	4.221	49.2	0.071	-6.6	0.422	-105.5
9	0.659	-149.5	4.063	33.7	0.071	-19.3	0.379	-118.0
10	0.606	-167.7	3.928	18.4	0.070	-31.3	0.340	-131.5
11	0.568	175.1	3.829	4.1	0.069	-41.6	0.310	-143.9
12	0.516	158.1	3.706	-9.4	0.060	-55.1	0.271	-153.2
13	0.524	139.7	3.731	-24.6	0.063	-60.3	0.270	-171.2
14	0.520	124.1	3.821	-38.7	0.050	-65.4	0.277	-179.1
15	0.541	105.9	3.870	-55.1	0.044	-67.7	0.292	165.4
16	0.559	85.8	3.818	-72.6	0.049	-70.7	0.311	143.4
17	0.588	68.0	3.828	-90.8	0.052	-76.2	0.356	123.9
18	0.614	47.4	3.571	-109.2	0.060	-92.2	0.371	97.6
19	0.630	30.5	3.404	-124.6	0.057	-108.3	0.384	78.9
20	0.641	13.1	3.335	-142.0	0.055	-123.9	0.408	62.7
21	0.666	-3.8	3.280	-157.7	0.053	-137.5	0.425	44.4
22	0.669	-20.0	3.218	-174.6	0.055	-160.0	0.457	29.9
23	0.656	-37.0	3.141	166.5	0.056	-178.4	0.474	16.2
24	0.646	-54.3	3.138	148.2	0.055	147.5	0.482	1.1
25	0.611	-69.1	3.143	129.0	0.059	124.6	0.537	-8.4
26	0.572	-88.1	3.038	106.4	0.057	98.0	0.552	-25.0

**NOISE PARAMETERS** ( $T_a=25^\circ\text{C}$ ,  $V_{DS}=2\text{V}$ ,  $I_D=10\text{mA}$ )

Freq. (GHz)	$\Gamma_{opt}$		Rn	NF min (dB)
	(mag)	(ang)		
6	0.73	64.1	0.20	0.23
7	0.67	78.7	0.16	0.24
8	0.61	94.4	0.12	0.25
9	0.56	111.0	0.09	0.27
10	0.51	128.5	0.06	0.28
11	0.47	146.9	0.04	0.30
12	0.43	166.1	0.03	0.33
13	0.40	-174.1	0.04	0.35
14	0.38	-153.8	0.05	0.39
15	0.37	-133.1	0.07	0.43
16	0.37	-112.1	0.10	0.47
17	0.38	-91.1	0.13	0.52
18	0.40	-69.8	0.17	0.57
19	0.44	-48.4	0.21	0.62
20	0.49	-26.5	0.26	0.67
21	0.56	-4.4	0.30	0.72



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