MITSUBISHI ELECTRIC

< Low Noise GaAs HEMT >

MGF4963BL

Micro-X type plastic package

DESCRIPTION

The MGF4963BL super-low noise InGaAs HEMT (High Electron Mobility Transistor) is designed for use in K band amplifiers.

Outline Drawing

Fig.1

FEATURES

Low noise figure @ f=20GHz
NFmin. = 0.70dB (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

ORDERRING INFORMATION

Tape & reel 4000pcs./reel

RoHS COMPLIANT

MGF4963BL is a RoHS compliant product. RoHS compliance is indicated by the letter “G” after the Lot Marking.

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

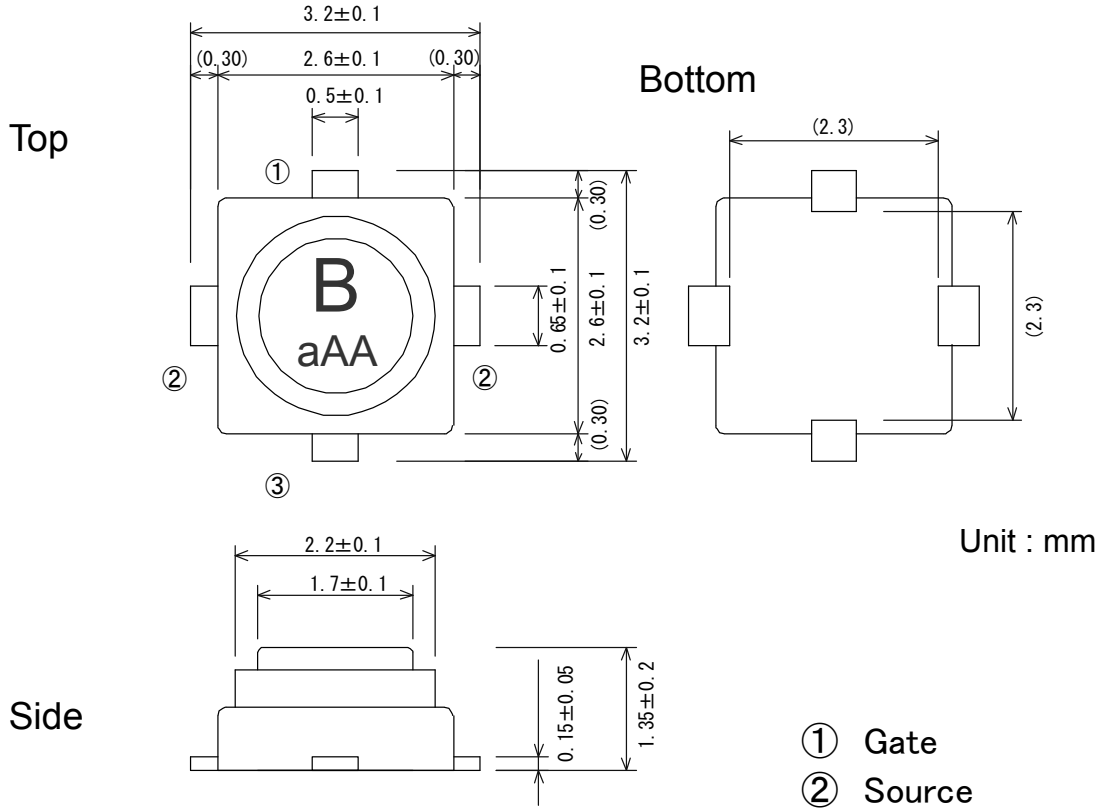
Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-3	V
V_{GSO}	Gate to source voltage	-3	V
I_D	Drain current	IDSS	mA
PT	Total power dissipation	50	mW
T_{ch}	Channel temperature	125	°C
T_{stg}	Storage temperature	-55 to +125	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX	
$V_{(BR)GDO}$	Gate to drain breakdown voltage	I_G=-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
Gs	Associated gain	V_{DS}=2V, I_D=10mA,f=20GHz	11.0	13.5	--	dB
NFmin.	Minimum noise figure		--	0.70	0.95	dB

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

Fig.1



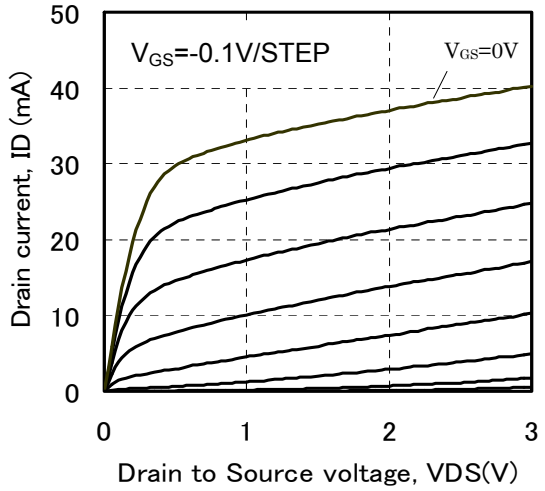
Unit : mm

① Gate
② Source
③ Drain

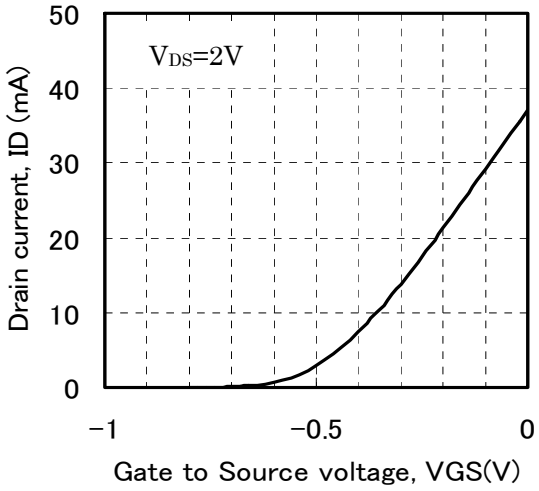
(GD-32)

TYPICAL CHARACTERISTICS (Ta=25°C)

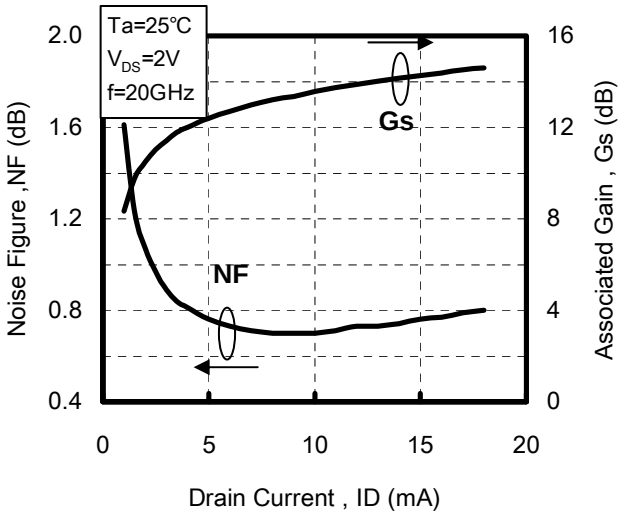
I_D vs. V_{DS}



I_D vs. V_{GS}



NF & Gs vs. I_D

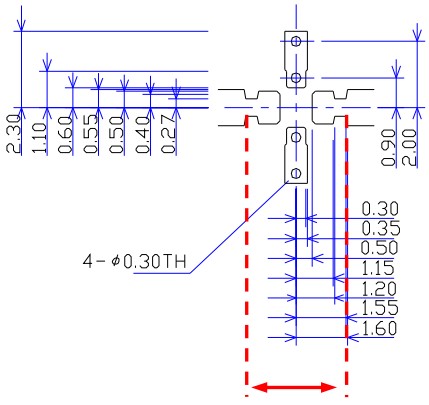


S PARAMETERS (Ta=25°C, VDS=2V, ID=10mA)

Freq. (GHz)	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.991	-16.9	5.095	162.1	0.014	78.6	0.645	-13.4
2	0.963	-33.4	4.942	145.3	0.027	63.9	0.632	-26.8
3	0.934	-50.1	4.893	128.5	0.038	52.8	0.613	-40.5
4	0.876	-65.8	4.799	111.5	0.049	40.7	0.599	-56.2
5	0.836	-82.8	4.684	94.4	0.058	28.5	0.565	-70.7
6	0.781	-99.4	4.469	78.3	0.064	16.0	0.533	-82.9
7	0.732	-117.3	4.277	62.5	0.067	4.6	0.489	-93.7
8	0.683	-133.8	4.030	47.5	0.068	-7.2	0.444	-102.8
9	0.640	-149.7	3.863	33.6	0.065	-16.9	0.401	-110.8
10	0.595	-165.5	3.710	19.6	0.063	-25.7	0.369	-119.9
11	0.547	179.7	3.639	6.4	0.058	-33.1	0.345	-129.0
12	0.516	162.4	3.664	-7.5	0.057	-36.5	0.344	-140.3
13	0.490	143.1	3.728	-22.1	0.056	-42.9	0.330	-152.9
14	0.500	121.1	3.797	-38.8	0.057	-49.9	0.317	-169.4
15	0.522	99.8	3.819	-56.6	0.059	-58.8	0.313	170.5
16	0.557	78.9	3.696	-75.6	0.060	-68.7	0.315	145.4
17	0.576	61.8	3.471	-94.8	0.059	-81.8	0.343	122.8
18	0.601	47.8	3.076	-112.3	0.059	-92.8	0.378	98.5
19	0.628	39.2	2.770	-124.1	0.058	-104.7	0.413	79.1
20	0.658	27.9	2.725	-135.5	0.060	-116.5	0.448	63.4
21	0.656	16.2	2.741	-150.1	0.062	-130.9	0.489	52.7
22	0.640	2.4	2.741	-165.8	0.065	-146.3	0.516	42.8
23	0.624	-12.0	2.734	178.2	0.063	-162.7	0.546	32.4
24	0.601	-29.9	2.742	161.0	0.063	-174.9	0.543	20.4
25	0.576	-47.3	2.723	142.9	0.064	167.4	0.518	8.1
26	0.552	-67.6	2.683	124.2	0.062	149.4	0.492	-5.2

NOISE PARAMETERS (Ta=25°C, VDS=2V, ID=10mA)

Freq. (GHz)	NF min (dB)	Γopt		Rn
		(mag)	(ang)	
6	0.29	0.680	63.7	0.15
7	0.30	0.620	79.7	0.12
8	0.31	0.570	96.9	0.10
9	0.33	0.510	115.1	0.08
10	0.36	0.470	134.2	0.06
11	0.39	0.430	154.0	0.04
12	0.41	0.400	174.2	0.04
13	0.43	0.370	-165.2	0.05
14	0.46	0.360	-144.6	0.06
15	0.50	0.360	-124.3	0.10
16	0.53	0.370	-104.1	0.13
17	0.58	0.390	-84.4	0.19
18	0.64	0.420	-65.3	0.25
19	0.68	0.470	-46.7	0.31
20	0.73	0.530	-28.8	0.38
21	0.77	0.610	-11.7	0.46



Measurement plane (3.2mm)

Recommended foot pattern; RO4003C/ROGERS
(εr=3.38, t=0.51mm)

Note: We are ready to provide nonlinear model for ADS and MWO users. If you are interested, please contact our sales offices.

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