MITSUBISHI SEMICONDUTOR <GaAs FET>

MGF4953B

SUPER LOW NOISE InGaAs HEMT (Leadless Ceramic Package)

DESCRIPTION

The MGF4953B super-low noise HEMT (High Electron Mobility Transistor) is designed for use in K band amplifiers.

The lead-less ceramic package assures minimum parasitic losses.

FEATURES

Low noise figure @ f=20GHz
NFmin. = 0.55dB (Typ.)

High associated gain @ f=20GHz
Gs = 10.5dB (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 3000pcs./reel

Outline Drawing

Fig.1

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.

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

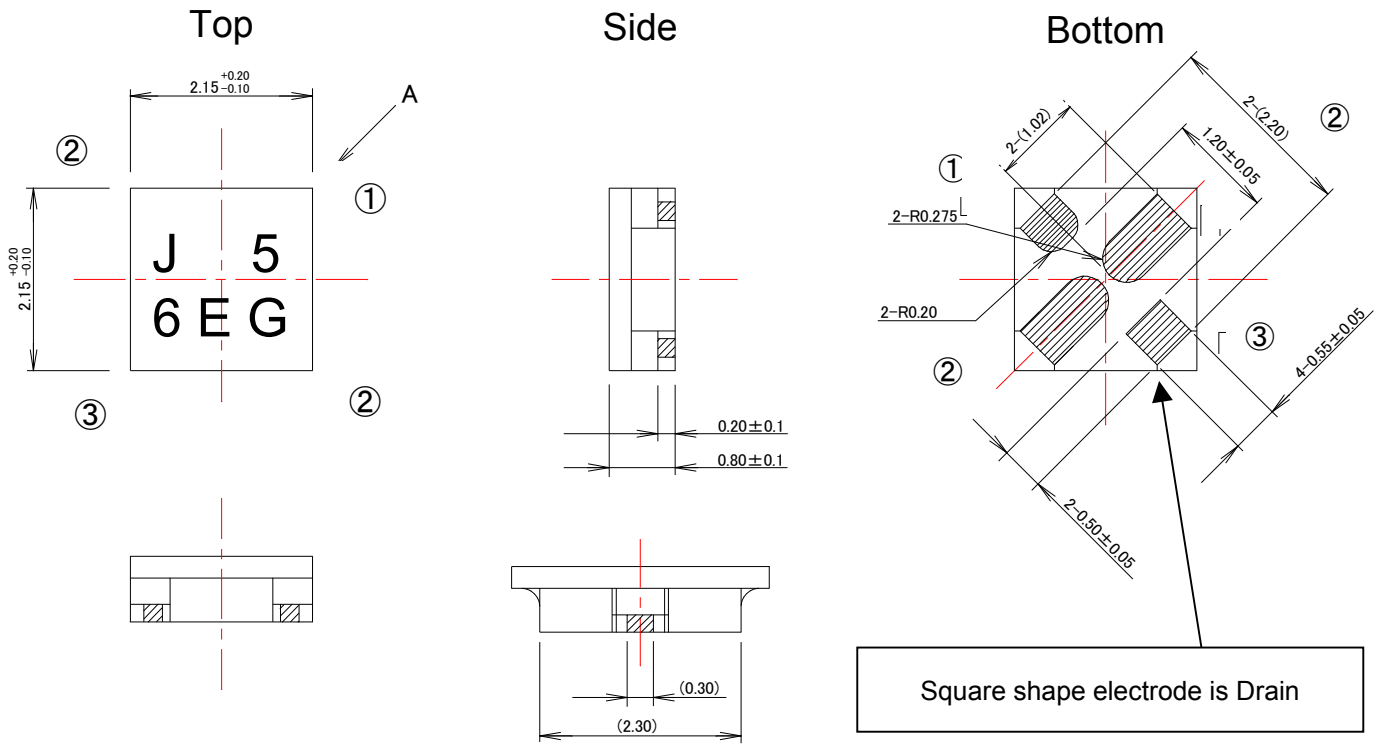
Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-4	V
V_{GSO}	Gate to source voltage	-4	V
I_D	Drain current	60	mA
PT	Total power dissipation	50	mW
T_{ch}	Channel temperature	125	°C
T_{stg}	Storage temperature	-65 to +125	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Synbol	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	9.0	10.5	--	dB
NFmin.	Minimum noise figure	f=20GHz	--	0.55	0.80	dB

Fig.1

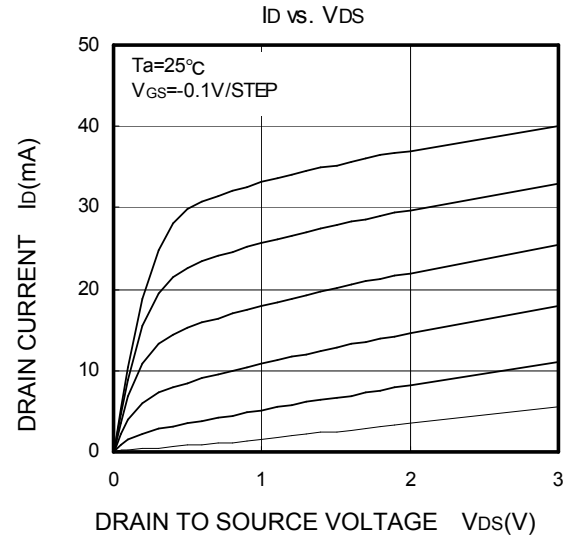
Unit : mm

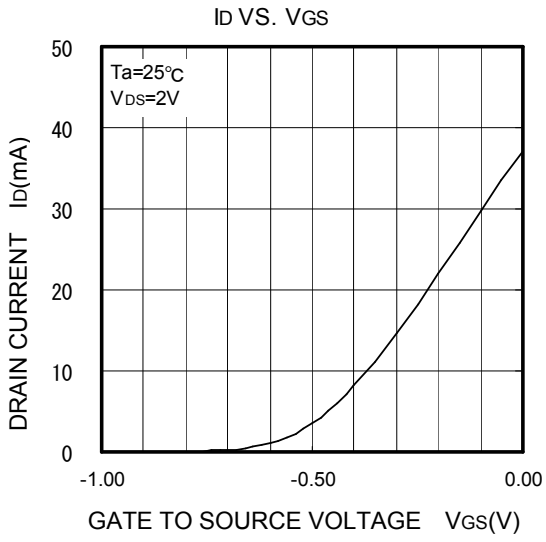


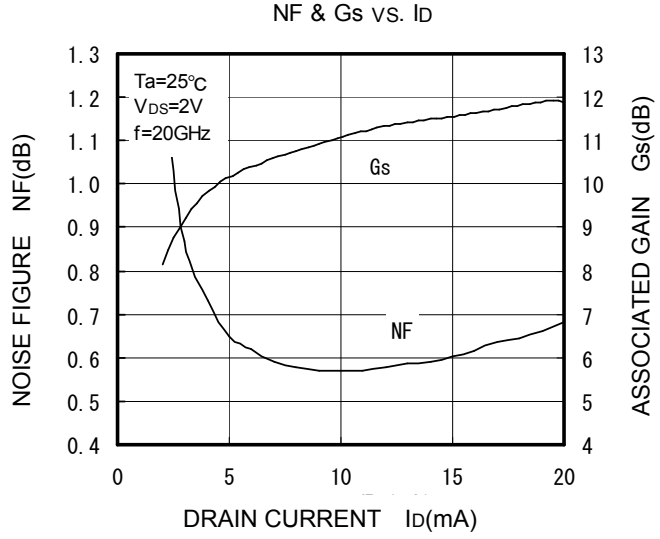
from "A" side view

① Gate
② Source
③ Drain

TYPICAL CHARACTERISTICS (Ta=25°C)







S PARAMETERS

(VDS=2V,ID=10mA, Ta=25°C)

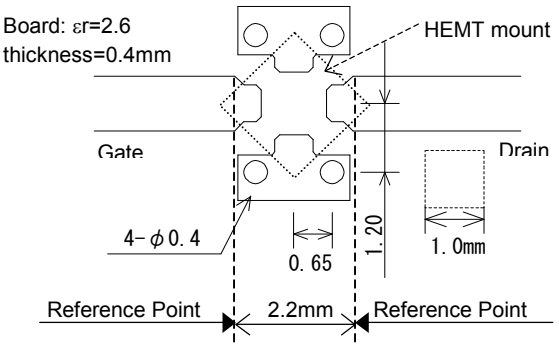
Freq.	S11		S21		S12		S22	
(GHz)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.989	-13.0	4.537	165.8	0.014	78.9	0.637	-9.7
2	0.973	-25.9	4.502	152.9	0.028	71.8	0.629	-19.6
3	0.949	-38.7	4.472	140.4	0.041	62.7	0.621	-29.2
4	0.926	-52.0	4.460	127.3	0.054	53.2	0.608	-39.0
5	0.890	-64.9	4.431	114.9	0.066	44.4	0.592	-48.2
6	0.828	-81.1	4.394	99.8	0.076	33.4	0.539	-60.1
7	0.776	-95.6	4.311	86.3	0.085	24.1	0.505	-70.2
8	0.723	-110.6	4.230	73.2	0.093	15.2	0.469	-80.4
9	0.662	-126.6	4.094	59.9	0.099	5.4	0.423	-90.7
10	0.605	-142.6	3.943	47.4	0.102	-4.0	0.368	-100.2
11	0.551	-158.2	3.826	35.4	0.102	-12.9	0.318	-108.8
12	0.514	-174.5	3.740	23.7	0.100	-19.7	0.279	-116.3
13	0.488	167.0	3.622	11.2	0.099	-28.1	0.232	-126.2
14	0.486	149.0	3.572	-1.1	0.098	-32.1	0.203	-138.3
15	0.480	131.8	3.512	-12.6	0.094	-38.4	0.169	-148.1
16	0.509	113.0	3.425	-26.2	0.099	-43.0	0.148	-175.1
17	0.536	95.1	3.349	-39.1	0.099	-49.9	0.133	157.1
18	0.569	78.2	3.226	-52.1	0.100	-58.5	0.132	120.7
19	0.609	62.7	3.091	-66.1	0.099	-66.5	0.160	92.2
20	0.642	47.3	2.934	-79.2	0.096	-75.2	0.204	67.8
21	0.674	34.3	2.752	-91.8	0.091	-83.8	0.250	50.6
22	0.707	21.1	2.617	-104.8	0.089	-92.5	0.293	37.0
23	0.742	9.2	2.471	-117.4	0.082	-102.8	0.350	23.8
24	0.753	-2.2	2.307	-130.2	0.081	-111.9	0.390	13.5
25	0.775	-12.5	2.139	-142.4	0.072	-118.9	0.430	2.4
26	0.803	-22.5	2.008	-155.0	0.069	-135.9	0.474	-5.7

NOISE PARAMETERS

(VDS=2V,ID=10mA, Ta=25°C)

Freq.	Γopt		Rn	NFmin
(GHz)	(mag)	(ang)		(dB)
18	0.358	-137.2	0.12	0.51
20	0.372	-91.0	0.14	0.55
22	0.390	-47.7	0.63	0.77
24	0.417	-14.9	1.05	1.05
26	0.473	10.5	1.26	1.25

Note) Rn is normalized by 50ohm



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