MITSUBISHI ELECTRIC

< Low Noise GaAs HEMT >

MGF4934BM

4pin flat lead package

DESCRIPTION

The MGF4934BM super-low noise InGaAs HEMT (High Electron Mobility Transistor) is designed for use in S to Ku band amplifiers.

The 4pin flat lead package is small-thin size, and offers high cost performance.

Outline Drawing

Fig.1

FEATURES

Low noise figure @ f=12GHz
NFmin. = 0.50dB (Typ.)
High associated gain @ f=12GHz
Gs = 12.5dB (Typ.)

APPLICATION

S to Ku band low noise amplifiers

QUALITY GRADE

GG

RECOMMENDED BIAS CONDITIONS

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

ORDERING INFORMATION

General part number: MGF4934BM-75
Tape & reel 15000pcs/reel

RoHS COMPLIANT

MGF4934BM is a RoHS compliant product. RoHS compliance is indicated by the letter “G” after the Lot Marking.

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

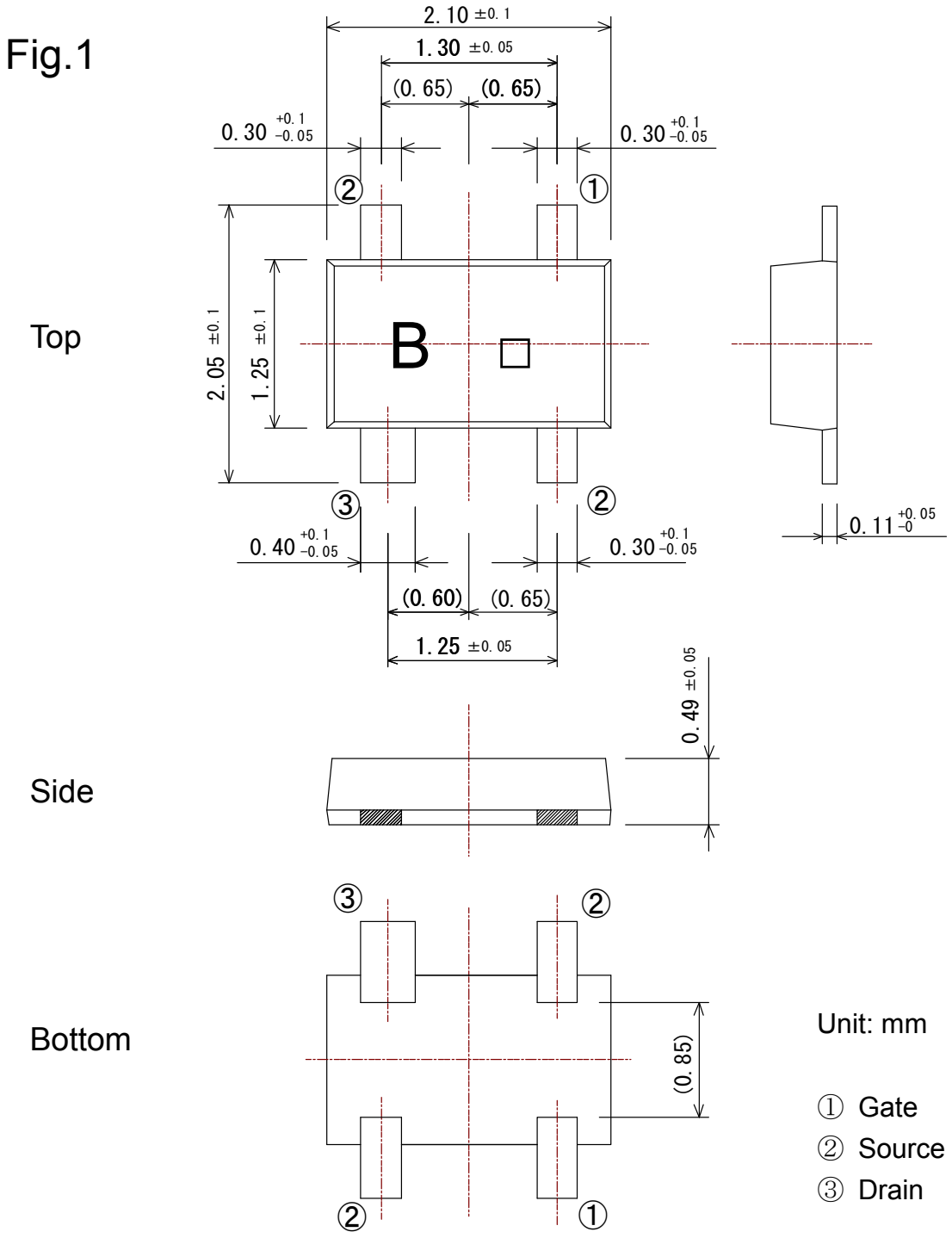
Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-3	V
V_{GSO}	Gate to source voltage	-3	V
I_D	Drain current	IDSS	mA
PT	Total power dissipation	50	mW
T_{ch}	Channel temperature	125	°C
T_{stg}	Storage temperature	-55 to +125	°C

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	-3.5	--	--	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	12	--	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,	11.5	12.5	--	dB
NFmin.	Minimum noise figure	I_D=10mA,f=12GHz	--	0.50	0.80	dB

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

Fig.1



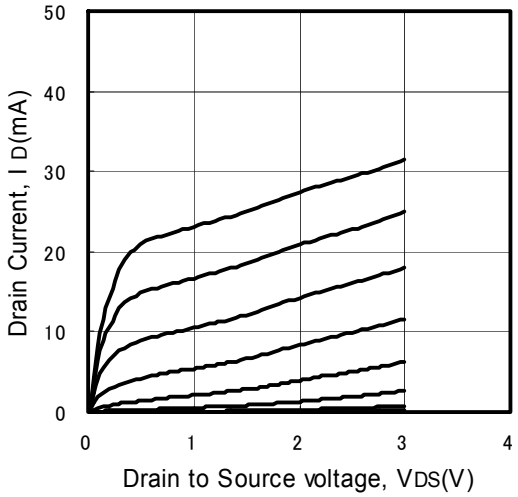
Unit: mm

① Gate
② Source
③ Drain

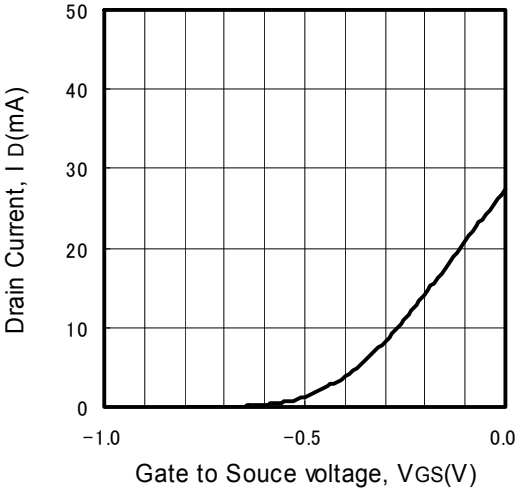
(GD-30)

TYPICAL CHARACTERISTICS (Ta=25°C)

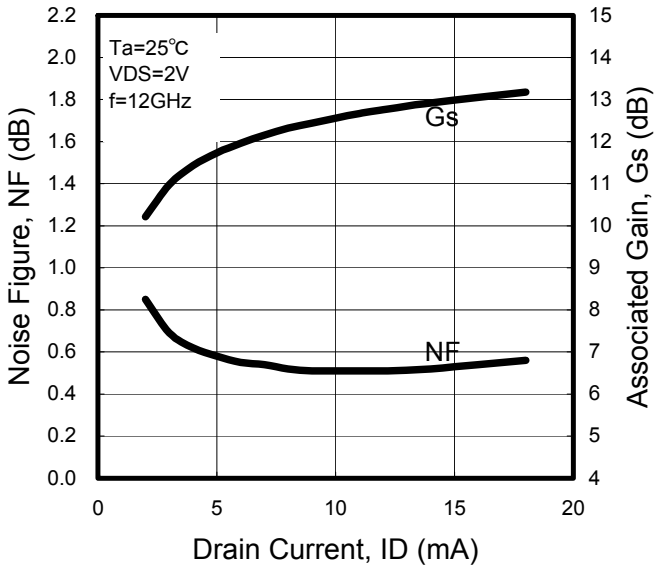
ID vs. VDS
(VGS=~0.1V/STEP)



ID vs. VGS
(VDS=2V)



NF & Gs vs. ID



MGF4934BM

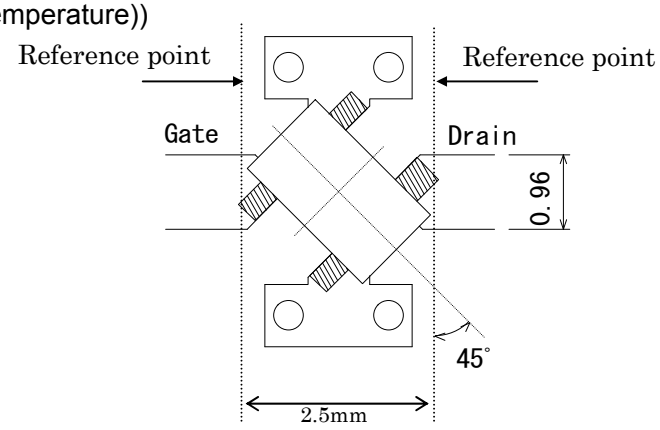
4pin flat lead package

S PARAMETERS (VDS=2V,ID=10mA,Ta=room temperature)

Freq.	S11		S21		S12		S22	
(GHz)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.986	-14.0	4.534	163.6	0.014	79.1	0.676	-11.0
2	0.961	-27.8	4.478	148.2	0.027	70.5	0.663	-22.3
3	0.918	-41.9	4.394	132.8	0.038	61.9	0.638	-32.7
4	0.863	-59.4	4.523	116.2	0.052	50.3	0.580	-45.1
5	0.808	-72.1	4.309	102.2	0.060	43.3	0.559	-53.8
6	0.748	-85.2	4.148	88.6	0.067	36.9	0.530	-62.2
7	0.683	-98.1	4.015	75.1	0.073	30.5	0.496	-70.0
8	0.613	-111.9	3.860	61.9	0.078	25.3	0.454	-76.5
9	0.543	-126.8	3.744	49.0	0.082	20.9	0.411	-83.1
10	0.474	-142.9	3.644	35.8	0.087	17.1	0.364	-91.0
11	0.421	-160.9	3.552	22.8	0.092	14.0	0.321	-100.6
12	0.395	177.9	3.488	9.6	0.100	11.1	0.278	-114.7
13	0.395	154.9	3.396	-4.0	0.111	7.6	0.239	-133.9
14	0.433	132.9	3.295	-17.6	0.122	2.2	0.214	-159.5
15	0.491	114.0	3.183	-31.5	0.133	-4.2	0.219	170.8
16	0.559	97.5	3.056	-45.9	0.144	-11.1	0.256	144.4
17	0.630	83.0	2.886	-60.6	0.154	-18.6	0.315	122.4
18	0.692	70.3	2.662	-74.9	0.161	-26.6	0.379	104.1
19	0.739	60.2	2.401	-87.7	0.169	-34.2	0.440	88.4
20	0.787	52.4	2.198	-98.5	0.174	-42.1	0.484	73.6
21	0.828	45.4	2.060	-109.9	0.179	-50.4	0.527	60.5
22	0.866	39.4	1.940	-120.6	0.180	-58.5	0.575	47.9
23	0.894	33.7	1.810	-131.4	0.183	-65.4	0.632	35.7
24	0.921	26.1	1.710	-142.1	0.184	-71.5	0.695	25.4
25	0.937	16.9	1.632	-152.9	0.187	-78.0	0.770	16.7
26	0.936	5.9	1.541	-165.3	0.186	-86.0	0.846	8.8

Noise Parameter (V_{DS}=2V,I_D=10mA, Ta=room temperature))

Freq.	NFmin	Γopt		Rn
(GHz)	(dB)	(mag)	(ang)	(Ω)
1	0.25	0.99	7.2	17.0
2	0.26	0.98	11.1	15.5
3	0.27	0.95	18.0	13.5
4	0.29	0.92	27.4	12.0
5	0.31	0.89	38.5	10.5
6	0.33	0.82	53.1	9.0
7	0.36	0.75	68.2	7.5
8	0.38	0.67	83.3	6.0
9	0.41	0.60	100.2	4.5
10	0.43	0.53	115.2	3.0
11	0.48	0.47	131.4	2.0
12	0.51	0.42	150.3	1.5
13	0.54	0.37	167.7	1.5
14	0.58	0.35	-178.8	1.5



Board: εr=2.6

Thickness: 0.4mm

(4- ϕ 0.4: through-hole)

Note:

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

S PARAMETERS

(VDS=0V,VGS=0V,Ta=room temperature)

Freq.	S11		S21		S12		S22	
(GHz)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.995	-12.5	0.008	96.4	0.008	97.7	0.673	165.1
2	0.990	-24.6	0.018	100.5	0.018	100.7	0.673	152.1
3	0.991	-37.5	0.032	99.5	0.032	98.9	0.671	138.7
4	0.983	-53.3	0.051	92.5	0.051	94.0	0.694	127.4
5	0.976	-67.1	0.074	85.0	0.075	85.5	0.697	112.5
6	0.961	-81.0	0.099	76.0	0.100	76.5	0.704	97.6
7	0.951	-95.7	0.130	65.5	0.131	65.3	0.719	83.4
8	0.940	-112.3	0.163	53.6	0.163	54.3	0.730	70.8
9	0.913	-130.9	0.196	41.0	0.198	41.3	0.745	59.2
10	0.902	-151.8	0.229	27.1	0.230	27.3	0.759	49.3
11	0.887	-175.9	0.256	12.0	0.257	12.7	0.774	41.2
12	0.883	159.0	0.274	-2.5	0.273	-2.7	0.783	34.8
13	0.884	134.4	0.276	-16.9	0.278	-17.2	0.794	29.2
14	0.889	112.1	0.268	-30.5	0.270	-30.2	0.800	24.0
15	0.896	93.6	0.257	-42.0	0.256	-42.0	0.807	18.7
16	0.907	78.5	0.241	-51.5	0.241	-51.1	0.811	13.2
17	0.911	66.4	0.228	-59.6	0.227	-59.8	0.807	7.1
18	0.919	55.9	0.221	-67.5	0.221	-67.4	0.815	0.6
19	0.924	47.1	0.217	-76.6	0.218	-76.5	0.817	-6.9
20	0.919	38.7	0.204	-87.1	0.204	-86.9	0.814	-14.8
21	0.921	31.2	0.192	-95.0	0.193	-95.3	0.810	-23.2
22	0.924	24.3	0.179	-103.1	0.179	-103.2	0.811	-31.2
23	0.928	18.1	0.168	-110.3	0.168	-110.6	0.817	-39.2
24	0.950	11.6	0.159	-116.7	0.157	-116.3	0.816	-46.5
25	0.970	5.4	0.149	-122.1	0.150	-122.1	0.830	-53.8
26	0.978	-1.5	0.141	-128.2	0.141	-128.3	0.844	-61.8

(VDS=0V,VGS=-2.5V,Ta=room temperature)

Freq.	S11		S21		S12		S22	
(GHz)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.993	-9.6	0.022	78.7	0.022	79.0	0.998	-10.6
2	0.996	-18.9	0.044	68.6	0.044	68.8	1.000	-21.3
3	0.992	-28.3	0.065	59.8	0.065	59.2	0.991	-31.2
4	0.987	-39.7	0.092	48.4	0.092	48.4	0.984	-42.1
5	0.981	-49.5	0.112	38.8	0.112	38.8	0.986	-51.5
6	0.975	-59.1	0.131	28.8	0.130	29.1	0.980	-60.6
7	0.968	-68.8	0.150	19.2	0.150	19.2	0.975	-70.1
8	0.963	-79.2	0.169	7.7	0.168	8.0	0.968	-80.7
9	0.949	-89.9	0.185	-4.5	0.186	-4.3	0.959	-92.1
10	0.943	-102.2	0.200	-18.4	0.200	-18.5	0.949	-105.6
11	0.932	-117.2	0.209	-34.7	0.209	-34.4	0.943	-121.1
12	0.929	-134.6	0.207	-52.4	0.207	-52.8	0.932	-139.6
13	0.932	-155.8	0.187	-73.4	0.188	-73.6	0.928	-160.7
14	0.938	-179.2	0.148	-96.3	0.149	-96.7	0.942	176.8
15	0.940	156.2	0.091	-119.2	0.091	-119.3	0.947	153.6
16	0.948	133.1	0.033	-137.6	0.034	-136.8	0.953	132.4
17	0.951	112.7	0.018	9.9	0.018	9.0	0.957	112.9
18	0.952	95.4	0.058	0.6	0.058	0.5	0.965	94.8
19	0.956	80.9	0.091	-11.2	0.090	-11.3	0.964	79.2
20	0.951	68.1	0.117	-24.5	0.118	-24.3	0.960	64.6
21	0.953	57.2	0.138	-37.5	0.137	-37.3	0.954	50.5
22	0.946	47.5	0.150	-49.7	0.150	-49.6	0.947	37.4
23	0.950	38.8	0.157	-60.4	0.157	-60.2	0.952	24.9
24	0.965	30.8	0.161	-69.7	0.161	-70.1	0.963	13.3
25	0.982	23.3	0.162	-77.8	0.162	-77.6	0.981	1.6
26	0.993	15.4	0.163	-85.8	0.163	-85.8	0.995	-10.3

Note:

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