

< Low Noise GaAs HEMT >

# MGF4934CM

4pin flat lead package

## DESCRIPTION

The MGF4934CM 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.

## FEATURES

- Low noise figure @ f=12GHz  
NFmin. = 0.50dB (Typ.)
- High associated gain @ f=12GHz  
Gs = 13.0dB (Typ.)

## APPLICATION

S to Ku band low noise amplifiers

## QUALITY GRADE

GG

## RECOMMENDED BIAS CONDITIONS

VDS=2V, ID=10mA

## ORDERING INFORMATION

General part number: MGF4934CM-75

Tape & reel 15000pcs/reel

## RoHS COMPLIANT

MGF4934CM 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
ID	Drain current	IDSS	mA
PT	Total power dissipation	50	mW
Tch	Channel temperature	125	°C
Tstg	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	IG=-10μA	-3.5	--	--	V
I <sub>GSS</sub>	Gate to source leakage current	VGS=-2V, VDS=0V	--	--	50	μA
IDSS	Saturated drain current	VGS=0V, VDS=2V	12	--	60	mA
VGS(off)	Gate to source cut-off voltage	VDS=2V, ID=500μA	-0.1	--	-1.5	V
Gs	Associated gain	VDS=2V, ID=10mA, f=12GHz	11.5	13.0	--	dB
NFmin.	Minimum noise figure		--	0.50	0.75	dB

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

Outline Drawing

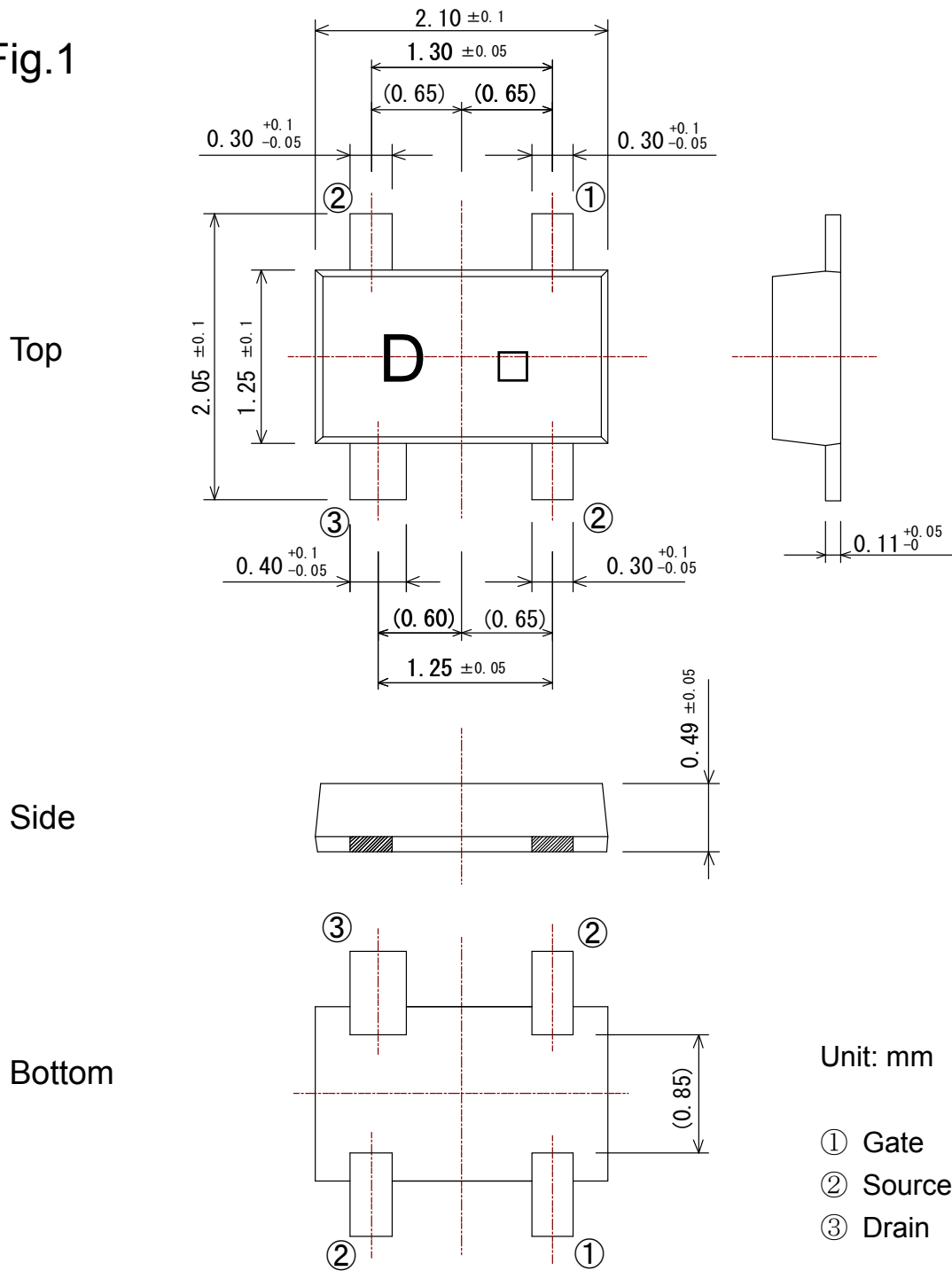
Fig.1

**MITSUBISHI Proprietary**

Not to be reproduced or disclosed without permission by Mitsubishi Electric

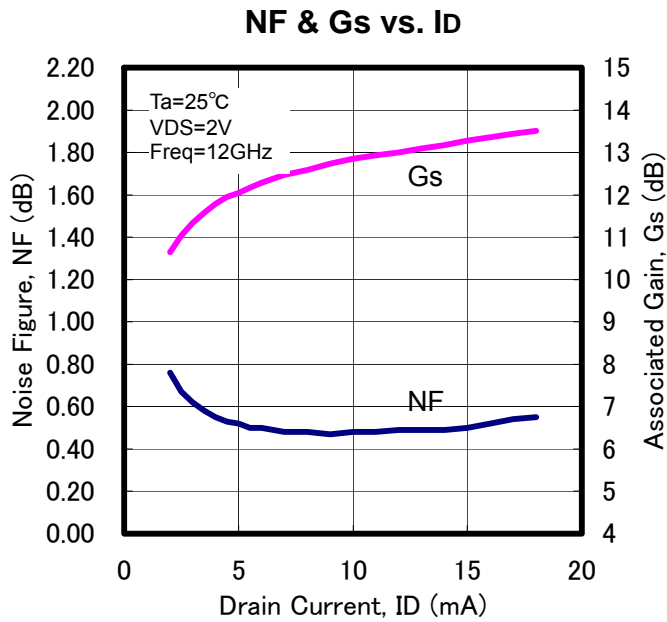
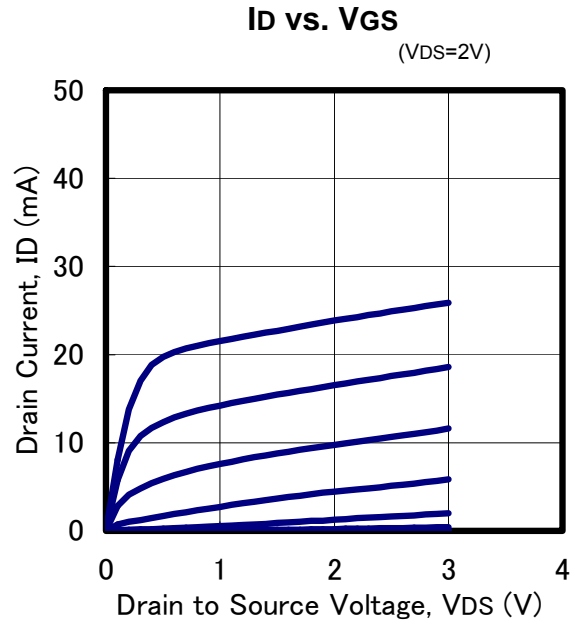
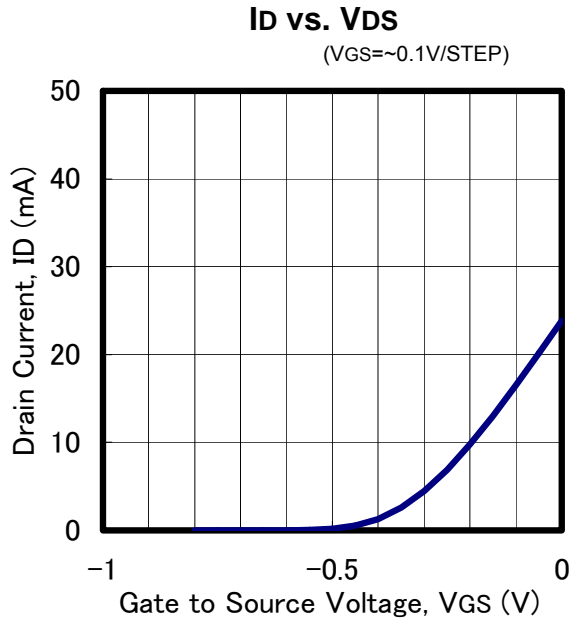
< Low Noise GaAs HEMT >  
**MGF4934CM**  
 4pin flat lead package

Fig.1



(GD-30)

TYPICAL CHARACTERISTICS (Ta=25°C)



# MGF4934CM

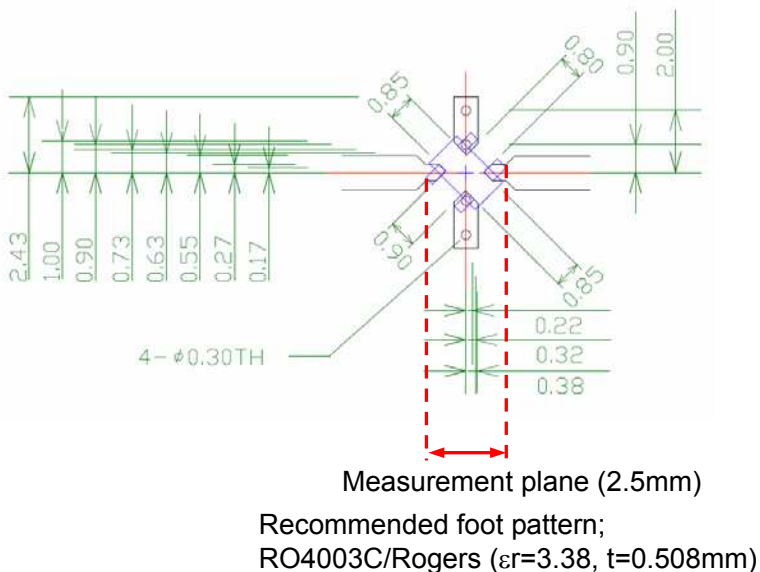
4pin flat lead package

## S PARAMETERS (V<sub>DS</sub>=2V, I<sub>D</sub>=10mA, T<sub>a</sub>=room temperature)

Freq. (GHz)	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.997	-24.9	5.499	155.2	0.031	68.3	0.750	-15.2
2	0.981	-38.3	5.255	141.5	0.037	60.1	0.720	-26.2
3	0.931	-51.7	5.010	127.8	0.043	51.9	0.690	-37.2
4	0.881	-65.1	4.766	114.1	0.049	43.6	0.660	-48.2
5	0.819	-81.5	4.601	98.8	0.057	33.5	0.627	-59.6
6	0.760	-97.5	4.434	83.8	0.062	24.4	0.591	-70.7
7	0.697	-114.1	4.249	68.9	0.065	15.0	0.551	-81.5
8	0.646	-131.5	4.070	54.1	0.070	5.7	0.509	-92.9
9	0.585	-147.6	3.864	40.6	0.068	-2.3	0.467	-102.5
10	0.538	-163.8	3.709	27.4	0.062	-7.5	0.435	-111.8
11	0.516	179.9	3.612	14.5	0.062	-8.9	0.417	-121.6
12	0.498	162.7	3.521	1.4	0.062	-10.4	0.400	-132.4
13	0.491	144.8	3.445	-11.9	0.064	-13.5	0.387	-144.3
14	0.497	128.1	3.424	-25.3	0.064	-13.9	0.392	-155.9
15	0.513	111.8	3.385	-39.3	0.067	-18.8	0.396	-169.8
16	0.547	94.1	3.227	-55.4	0.079	-23.6	0.415	167.7
17	0.579	78.4	3.136	-70.5	0.085	-30.0	0.427	150.4
18	0.611	64.3	2.976	-85.4	0.093	-38.3	0.441	129.8

## Noise Parameter (V<sub>DS</sub>=2V, I<sub>D</sub>=10mA, T<sub>a</sub>=room temperature)

Freq. (GHz)	NFmin (dB)	Γ <sub>opt</sub>		R <sub>n</sub> (Ω)
		(mag)	(ang)	
1	0.20	0.98	-8.9	16.5
2	0.21	0.95	5.3	15.0
3	0.22	0.89	19.5	13.5
4	0.24	0.82	33.7	12.1
5	0.26	0.76	47.9	10.6
6	0.28	0.69	62.1	9.1
7	0.32	0.63	76.3	7.6
8	0.34	0.56	91.5	6.2
9	0.37	0.50	107.8	4.6
10	0.42	0.45	125.1	3.1
11	0.47	0.41	143.3	2.6
12	0.51	0.38	162.5	2.0
13	0.56	0.35	-177.3	2.0
14	0.61	0.35	-156.2	2.4
15	0.65	0.36	-134.2	3.3
16	0.69	0.39	-111.1	4.8
17	0.74	0.43	-88.1	6.2
18	0.79	0.46	-65.0	7.7



**Note:**

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

S PARAMETERS

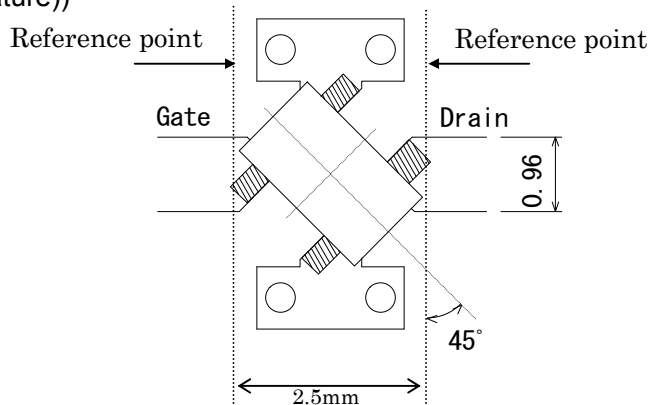
(V<sub>DS</sub>=2V, I<sub>D</sub>=10mA, T<sub>a</sub>=room temperature)

Freq. (GHz)	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.990	-16.3	5.156	158.7	0.032	79.5	0.758	-9.2
2	0.985	-30.1	4.971	145.3	0.037	70.2	0.728	-19.5
3	0.930	-43.8	4.787	131.9	0.042	60.9	0.698	-29.9
4	0.860	-57.5	4.602	118.5	0.047	51.6	0.668	-40.3
5	0.802	-72.1	4.470	103.9	0.055	43.4	0.634	-50.0
6	0.737	-87.3	4.343	89.3	0.061	36.2	0.594	-59.5
7	0.668	-103.2	4.212	74.6	0.066	29.7	0.555	-68.9
8	0.599	-119.6	4.042	60.2	0.070	24.0	0.514	-78.3
9	0.533	-136.5	3.852	46.4	0.072	18.9	0.473	-87.3
10	0.477	-152.0	3.672	33.9	0.072	17.3	0.440	-95.2
11	0.442	-168.0	3.537	21.6	0.076	17.1	0.418	-104.2
12	0.421	175.7	3.429	9.5	0.083	17.2	0.400	-114.1
13	0.406	159.0	3.331	-2.4	0.090	15.9	0.383	-124.4
14	0.405	142.8	3.264	-14.1	0.099	14.1	0.375	-135.6
15	0.425	126.5	3.236	-26.9	0.115	10.1	0.379	-150.3
16	0.460	110.8	3.214	-40.8	0.137	5.3	0.403	-168.9
17	0.503	94.9	3.149	-54.5	0.156	-2.2	0.417	172.6
18	0.547	80.2	3.058	-68.3	0.175	-11.2	0.448	153.5

Noise Parameter

(V<sub>DS</sub>=2V, I<sub>D</sub>=10mA, T<sub>a</sub>=room temperature)

Freq. (GHz)	NFmin (dB)	Γ <sub>opt</sub>		R <sub>n</sub> (Ω)
		(mag)	(ang)	
1	0.25	0.97	8.2	17.5
2	0.25	0.97	14.5	15.4
3	0.26	0.94	22.9	14.0
4	0.29	0.91	30.2	12.5
5	0.30	0.88	40.2	11.0
6	0.32	0.82	48.2	9.5
7	0.35	0.74	61.2	8.0
8	0.37	0.65	75.5	6.5
9	0.39	0.57	91.3	5.0
10	0.42	0.49	108.4	3.6
11	0.46	0.44	127.0	2.6
12	0.49	0.39	146.9	1.9
13	0.53	0.34	168.2	1.8
14	0.57	0.30	-169.1	2.0



Board: ε<sub>r</sub>=2.6

Thickness: 0.4mm

(4-φ0.4: through-hole)

**Note:**

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

### **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 measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.

### **Notes regarding these materials**

- These materials are intended as a reference to assist our customers in the selection of the Mitsubishi semiconductor product best suited to the customer's application; they do not convey any license under any intellectual property rights, or any other rights, belonging to Mitsubishi Electric Corporation or a third party.
- Mitsubishi Electric Corporation assumes no responsibility for any damage, or infringement of any third-party's rights, originating in the use of any product data, diagrams, charts, programs, algorithms, or circuit application examples contained in these materials.
- All information contained in these materials, including product data, diagrams, charts, programs and algorithms represents information on products at the time of publication of these materials, and are subject to change by Mitsubishi Electric Corporation without notice due to product improvements or other reasons. It is therefore recommended that customers contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor for the latest product information before purchasing a product listed herein.  
The information described here may contain technical inaccuracies or typographical errors.  
Mitsubishi Electric Corporation assumes no responsibility for any damage, liability, or other loss rising from these inaccuracies or errors.  
Please also pay attention to information published by Mitsubishi Electric Corporation by various means, including the Mitsubishi Semiconductor home page (<http://www.mitsubishielectric.com/>).
- When using any or all of the information contained in these materials, including product data, diagrams, charts, programs, and algorithms, please be sure to evaluate all information as a total system before making a final decision on the applicability of the information and products. Mitsubishi Electric Corporation assumes no responsibility for any damage, liability or other loss resulting from the information contained herein.
- Mitsubishi Electric Corporation semiconductors are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.
- The prior written approval of Mitsubishi Electric Corporation is necessary to reprint or reproduce in whole or in part these materials.
- If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination.  
Any diversion or re-export contrary to the export control laws and regulations of Japan and/or the country of destination is prohibited.
- Please contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor for further details on these materials or the products contained therein.