MITSUBISHI ELECTRIC

PRELIMINARY

< Low Noise GaAs HEMT >

MGF4941CL

Micro-X type plastic package

DESCRIPTION

The MGF4941CL 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=25.2GHz
NFmin. = 2.4dB (Typ.)

High associated gain @ f=25.2GHz
Gs = 10.0dB (Typ.)

APPLICATION

K band low noise amplifiers

QUALITY GRADE

GG

RECOMMENDED BIAS CONDITIONS

V_{DS}=1.5V, V_{GS}=0V

ORDERRING INFORMATION

Tape & reel 4000pcs./reel

RoHS COMPLIANT

MGF4941CL is a RoHS compliant product. RoHS compliance is indicated by the letter “G” after the Lot Marking.

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

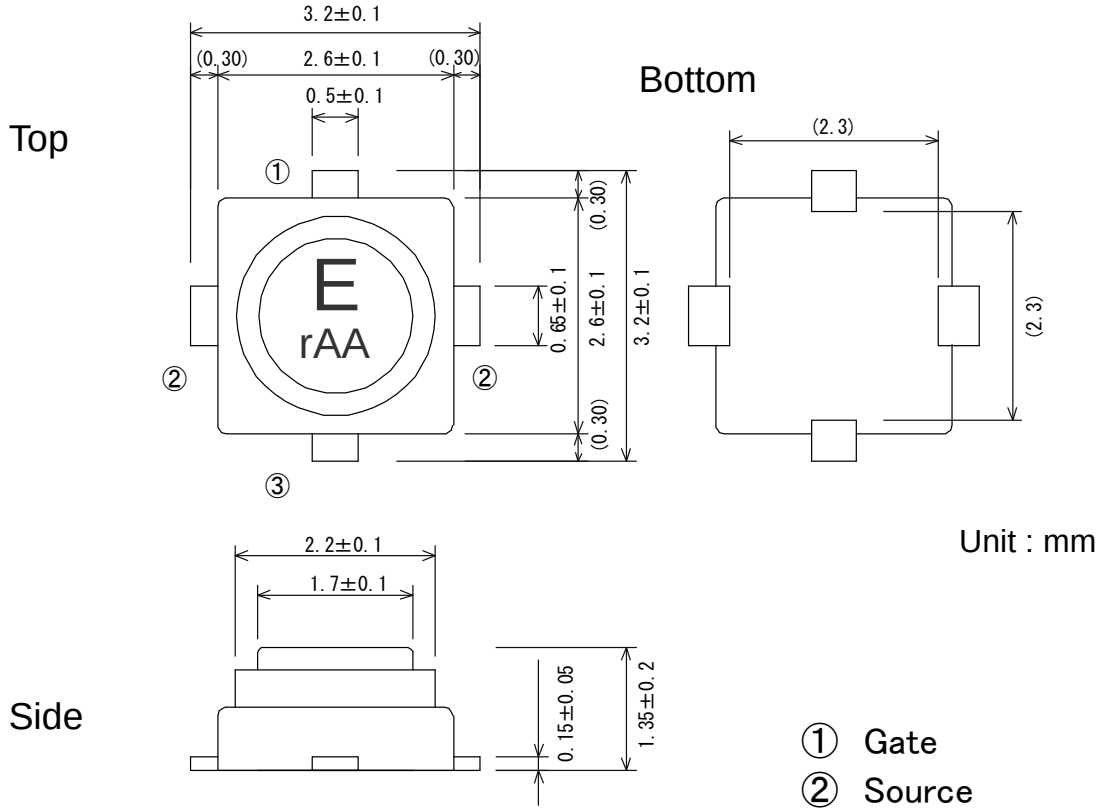
Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-3	V
V_{GSO}	Gate to source voltage	-3	V
I_D	Drain current	55	mA
PT	Total power dissipation	75	mW
T_{ch}	Channel temperature	125	°C
T_{stg}	Storage temperature	-55 to +125	°C

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}=1.5V	15	--	60	mA
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS}=1.5V,I_D=500μA	-0.1	--	-1.5	V
Gs	Associated gain	V_{DS}=1.5V, V_{GS}=0V,f=25.2GHz	7.5	10.0	--	dB
NFmin.	Minimum noise figure		--	2.4	3.8	dB

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

Fig.1



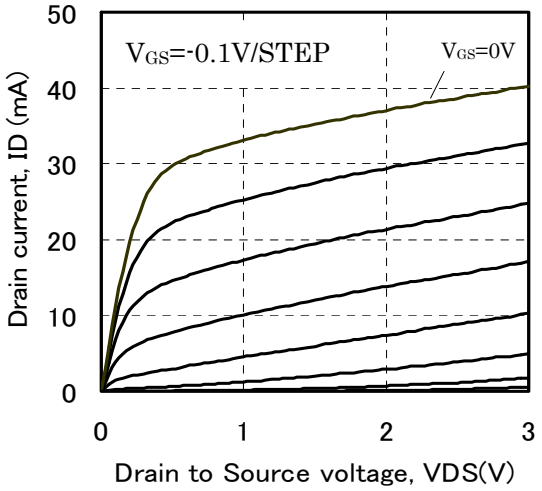
Unit : mm

① Gate
② Source
③ Drain

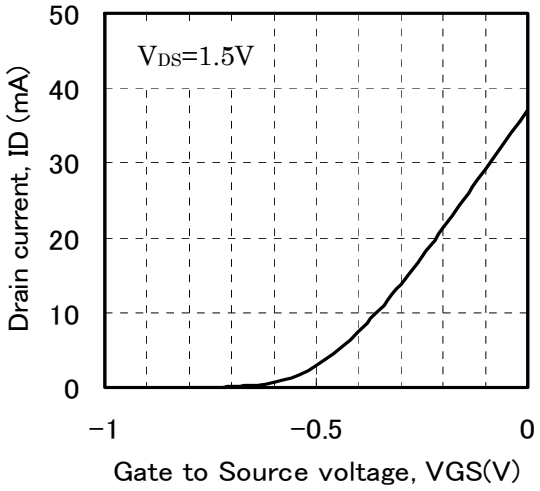
(GD-32)

TYPICAL CHARACTERISTICS (Ta=25°C)

I_D vs. V_{DS}

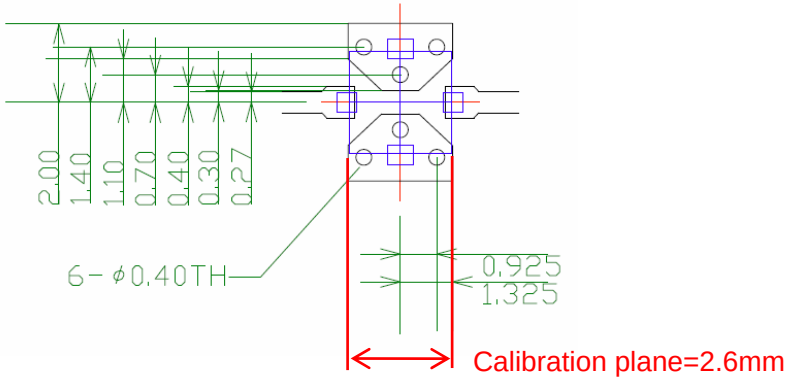


I_D vs. V_{GS}



S PARAMETERS (Ta=25°C, VDS=1.5V, VGS=0V)

Freq.	S11		S21		S12		S22	
(GHz)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.991	−16.4	6.159	163.9	0.011	76.4	0.583	−11.9
2	0.969	−32.6	5.982	148.6	0.023	68.1	0.578	−23.3
3	0.939	−47.6	5.736	134.0	0.033	58.2	0.569	−33.5
4	0.893	−60.7	5.511	120.2	0.042	49.2	0.565	−44.4
5	0.865	−75.0	5.284	106.8	0.049	40.6	0.543	−52.4
6	0.819	−88.0	5.024	94.1	0.056	32.8	0.528	−59.0
7	0.778	−101.1	4.864	81.5	0.063	24.9	0.510	−65.5
8	0.722	−113.8	4.721	69.0	0.069	17.0	0.491	−72.9
9	0.657	−126.4	4.595	57.1	0.075	9.3	0.473	−80.6
10	0.586	−139.8	4.479	44.8	0.080	1.9	0.454	−89.0
11	0.516	−155.5	4.354	32.3	0.084	−6.0	0.431	−97.0
12	0.463	−173.4	4.250	19.9	0.089	−12.2	0.405	−104.4
13	0.427	165.7	4.137	7.6	0.094	−19.3	0.372	−111.9
14	0.412	144.9	4.026	−5.1	0.098	−26.4	0.336	−119.7
15	0.412	125.2	3.945	−17.6	0.103	−33.7	0.292	−128.0
16	0.417	106.1	3.850	−30.1	0.109	−41.6	0.242	−137.0
17	0.443	85.6	3.743	−43.9	0.115	−49.4	0.181	−150.6
18	0.469	66.2	3.562	−57.3	0.119	−57.9	0.124	−171.2
19	0.504	46.1	3.348	−70.8	0.123	−66.8	0.089	145.5
20	0.554	26.7	3.118	−83.8	0.124	−75.4	0.108	94.1
21	0.617	8.0	2.884	−96.8	0.126	−84.0	0.158	67.1
22	0.682	−6.1	2.639	−109.3	0.124	−93.2	0.218	47.1
23	0.750	−16.1	2.415	−121.3	0.123	−101.3	0.279	30.0
24	0.791	−24.6	2.200	−132.7	0.122	−108.4	0.334	16.0
25	0.812	−32.1	1.996	−143.1	0.120	−115.3	0.393	4.6
26	0.844	−39.1	1.830	−152.4	0.119	−122.0	0.442	−3.8



Recommended foot pattern; RO4350B/Rogers (εr=3.48, t=0.254mm)

Note

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

(Reference)

Flow	Item	Comment
	Wafer Process	
	Wafer Test (DC)	100% Test
	Visual Inspection	
	Chip Separation	
	Die / Wire bonding	
	Internal Visual Inspection	
	Sealing	
	Separation	
	DC Test, Marking	100% Test, Ta=25deg.C
	RF Test (1)	S-parameter, 100% Test, Ta=25deg.C
	RF Test (2)	Noise figure, Sampling Test
	QAT	
	Taping, Shipping	

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