MITSUBISHI ELECTRIC

< Power GaAs FET >

MGF1941AL

Micro-X type plastic package

DESCRIPTION

The MGF1941AL power MES FET is designed for use in S to Ku band power amplifiers.

FEATURES

High gain and High P1dB

P1dB=15dBm, Glp=10 dB (Typ.) @ f=12GHz

APPLICATION

S to Ku band low noise amplifiers

QUALITY GRADE

GG

RECOMMENDED BIAS CONDITIONS

V_{DS}=3V , I_D=30mA

Outline Drawing

Fig.1

ORDERING INFORMATION

Tape & reel 4,000pcs/reel

RoHS COMPLIANT

MGF1941AL 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	-5	V
V_{GSO}	Gate to source voltage	-5	V
I_D	Drain current	120	mA
PT	Total power dissipation	300	mW
T_{ch}	Channel temperature	175	°C
T_{stg}	Storage temperature	-65 to +150	°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=-30μA	-8	-15	--	V
I_{DSS}	Saturated drain current	V_{GS}=0V,V_{DS}=3V	35	60	120	mA
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS}=3V,I_D=300μA	-0.3	-1.4	-3.5	V
P1dB	Output power at 1dB gain compression	V_{DS}=3V, I_D=30mA, f=12GHz	11	15	--	dBm
Glp	Linear power gain	V_{DS}=3V, I_D=30mA, f=12GHz, Pin=-5dBm	7	10	--	dB
Gs	Associated gain	V_{DS}=3V, I_D=10mA, f=12GHz	--	9	--	dB
NFmin	Minimum noise figure		--	1.2	--	dB

Note : P1B and Glp are tested with sampling inspection.
Gs/NFmin are not tested.

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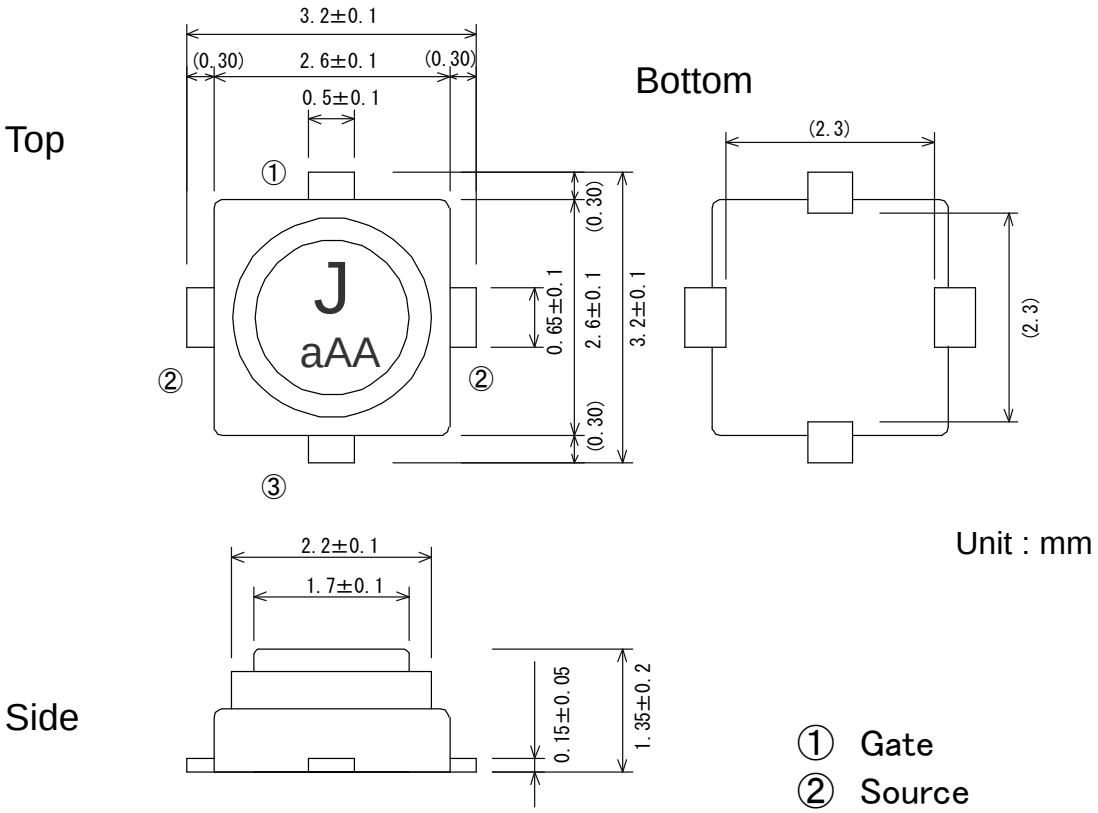
Fig.1



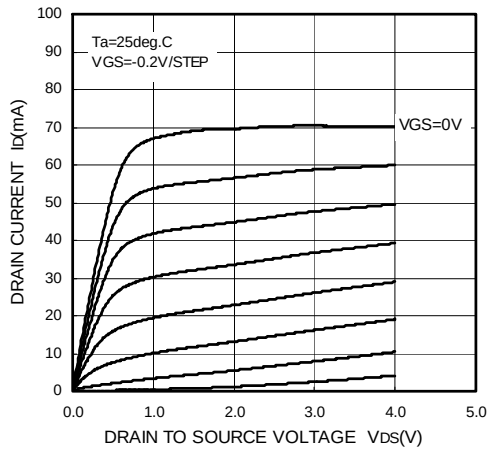
Unit : mm

① Gate
② Source
③ Drain

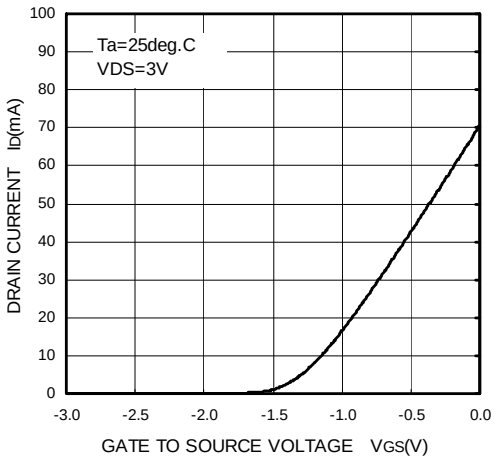
(GD-32)

TYPICAL CHARACTERISTICS (Ta=25℃)

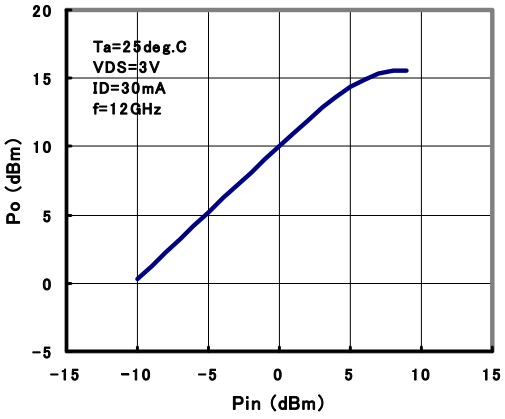
I_D vs. V_{DS}



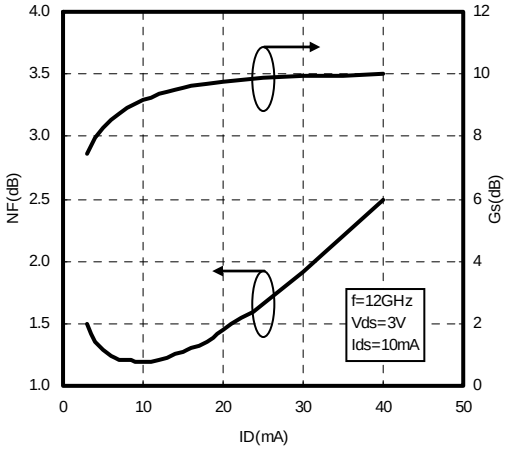
I_D vs. V_{GS}



Po vs. Pin



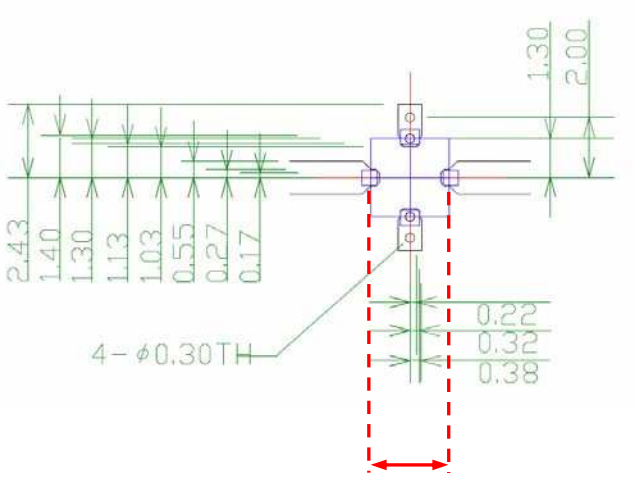
NF , Gs vs. ID



S PARAMETERS

(Conditions:VDS=3V,ID=30mA,Ta=25deg.C)

f	S11		S21		S12		S22		K	MAG/MSG
(GHz)	Mag.	Angle	Mag.	Angle	Mag.	Angle	Mag.	Angle		(dB)
1	0.981	-20.3	5.081	159.6	0.016	78.2	0.567	-11.2	0.21	25.0
2	0.933	-40.4	4.936	140.0	0.031	67.1	0.549	-22.2	0.38	22.0
3	0.862	-60.6	4.742	120.8	0.045	56.7	0.520	-32.9	0.54	20.3
4	0.780	-81.1	4.509	102.2	0.056	47.1	0.482	-43.4	0.70	19.1
5	0.694	-102.4	4.265	84.0	0.066	38.0	0.440	-53.8	0.85	18.1
6	0.610	-124.3	3.982	66.6	0.073	30.2	0.394	-63.2	1.00	17.4
7	0.547	-149.6	3.689	49.0	0.079	22.2	0.340	-76.0	1.12	14.6
8	0.499	-174.0	3.389	32.7	0.083	14.8	0.288	-87.7	1.27	13.0
9	0.480	162.9	3.117	17.6	0.087	9.4	0.243	-100.4	1.37	11.9
10	0.480	142.0	2.904	3.5	0.091	5.7	0.209	-114.9	1.43	11.1
11	0.505	123.1	2.720	-10.8	0.098	1.6	0.185	-135.0	1.39	10.7
12	0.548	106.4	2.569	-25.2	0.107	-3.6	0.177	-162.1	1.29	10.6
13	0.588	90.2	2.393	-39.4	0.113	-10.5	0.176	168.8	1.24	10.3
14	0.633	76.4	2.277	-53.3	0.122	-16.3	0.215	147.8	1.11	10.7
15	0.670	62.2	2.142	-69.1	0.131	-24.9	0.287	125.6	1.00	11.8
16	0.722	53.0	1.968	-84.2	0.135	-33.3	0.354	103.6	0.90	11.6
17	0.761	41.1	1.799	-98.6	0.140	-40.8	0.423	88.8	0.82	11.1
18	0.788	30.8	1.614	-113.4	0.143	-49.7	0.506	74.5	0.74	10.5



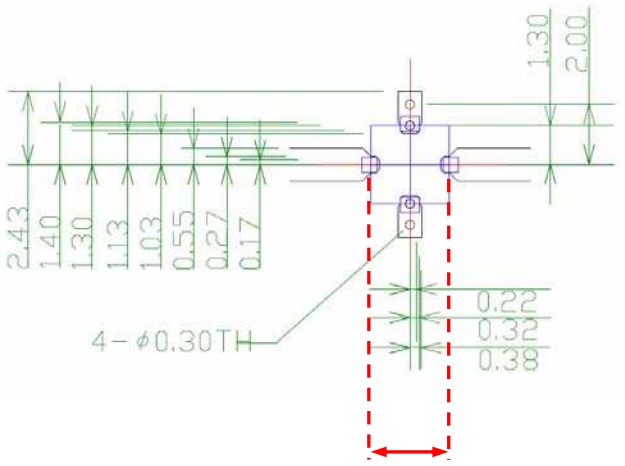
Measurement plane (2.6mm)

Recommended foot pattern;
RO4003C/Rogers (εr=3.38, t=0.508mm)

S PARAMETERS

(Conditions:VDS=3V,ID=10mA,Ta=25deg.C)

f	S11		S21		S12		S22		K	MAG/MSG
(GHz)	Mag.	Angle	Mag.	Angle	Mag.	Angle	Mag.	Angle		(dB)
1	0.988	-17.8	3.647	161.6	0.019	77.8	0.625	-11.5	0.16	22.8
2	0.955	-35.7	3.602	143.8	0.038	66.0	0.609	-23.0	0.29	19.8
3	0.907	-54.0	3.549	125.9	0.054	54.5	0.581	-34.5	0.41	18.1
4	0.845	-73.0	3.478	108.0	0.069	43.2	0.544	-46.1	0.54	17.0
5	0.776	-92.9	3.394	90.2	0.081	32.1	0.498	-57.9	0.66	16.2
6	0.698	-113.8	3.266	72.6	0.090	21.8	0.445	-69.2	0.81	15.6
7	0.629	-138.1	3.101	54.1	0.096	11.1	0.384	-83.6	0.95	15.1
8	0.570	-161.9	2.904	37.0	0.098	1.1	0.325	-97.2	1.12	12.6
9	0.535	174.6	2.706	21.0	0.097	-6.2	0.272	-111.8	1.29	11.2
10	0.522	153.1	2.535	5.8	0.094	-10.7	0.234	-127.8	1.45	10.3
11	0.534	132.8	2.382	-9.3	0.095	-13.9	0.211	-148.2	1.51	9.8
12	0.568	114.5	2.249	-24.4	0.099	-17.3	0.207	-173.7	1.46	9.6
13	0.604	97.1	2.091	-39.2	0.101	-22.4	0.212	159.9	1.44	9.2
14	0.642	82.1	1.981	-53.6	0.107	-25.9	0.250	140.7	1.32	9.3
15	0.673	67.1	1.844	-69.7	0.114	-32.4	0.322	120.7	1.20	9.4
16	0.724	57.1	1.685	-84.9	0.118	-39.5	0.386	99.9	1.06	10.0
17	0.761	44.9	1.531	-99.4	0.122	-45.4	0.450	85.7	0.96	11.0
18	0.787	34.2	1.364	-114.1	0.126	-53.4	0.528	72.0	0.86	10.3



Measurement plane (2.6mm)

Recommended foot pattern;
RO4003C/Rogers (εr=3.38, t=0.508mm)

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