MITSUBISHI ELECTRIC

< Power GaAs HEMT >

MGF4841CL

Micro-X type plastic package

DESCRIPTION

The MGF4841CL power InGaAs HEMT (High Electron Mobility Transistor) is designed for use in K band amplifiers.

The MGF4841CL is designed for automotive application and AEC-Q101 qualified.

Outline Drawing

Fig.1

FEATURES

High gain and High $P_{out,sat}$

G_{lp}=8.5dB, $P_{out,sat}$=11.5dBm (Typ.) @ f=24.3GHz

APPLICATION

K band low noise amplifiers

QUALITY GRADE

GG

RECOMMENDED BIAS CONDITIONS

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

ORDERING INFORMATION

Tape & reel 4,000pcs/reel

RoHS COMPLIANT

MGF4841CL 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	-4	V
V_{GSO}	Gate to source voltage	-4	V
I_D	Drain current	IDSS	mA
PT	Total power dissipation	130	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	-4	--	--	V
I_{DSS}	Saturated drain current	V_{GS}=0V,V_{DS}=2.5V	30	--	80	mA
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS}=2.5V,I_D=500μA	-0.1	--	-2.0	V
$P_{out,sat}$	Saturation Output Power	V_{DS}=1.5V, V_{GS}=0V f=24.3GHz, P_{in}=7dBm	10.0	11.5	--	dBm
P_{1dB}	Output Power at 1dB gain compression	V_{DS}=1.5V, V_{GS}=0V f=24.3GHz	5.5	7.6	--	dBm
G_{lp}	Linear power gain	V_{DS}=1.5V, V_{GS}=0V f=24.3GHz, Pin=-10dBm	6.0	8.5	--	dB

Note: Pout,sat, P1dB and Glp are tested with sampling inspection.

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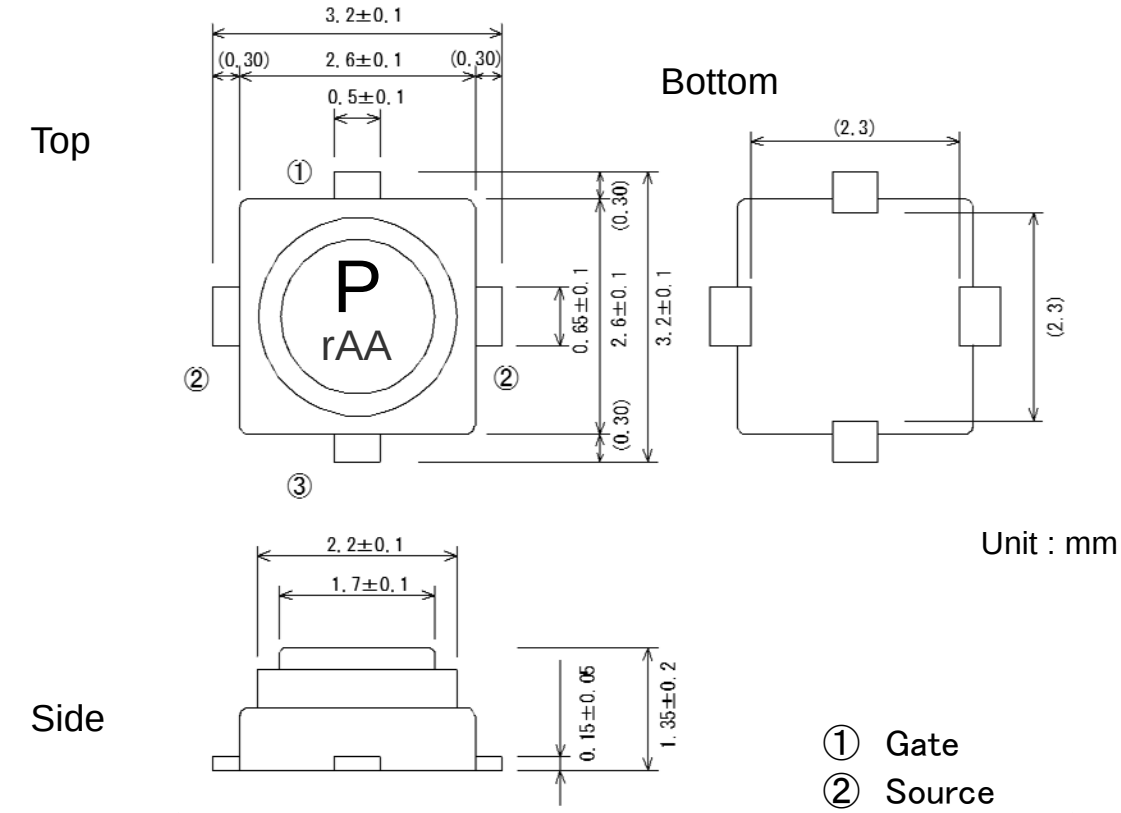
Fig.1



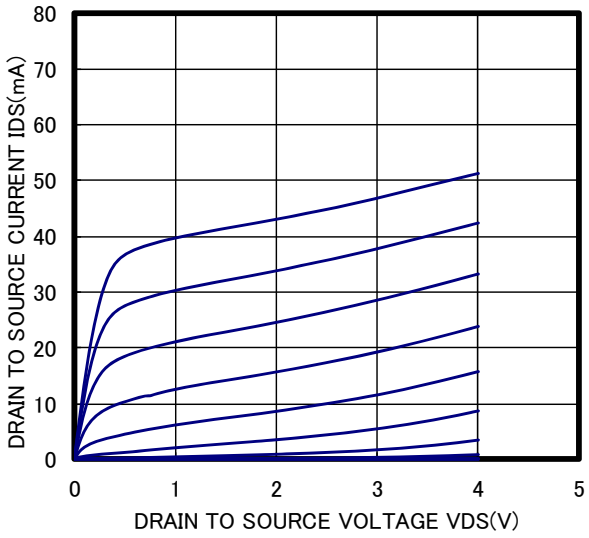
Unit : mm

① Gate
② Source
③ Drain

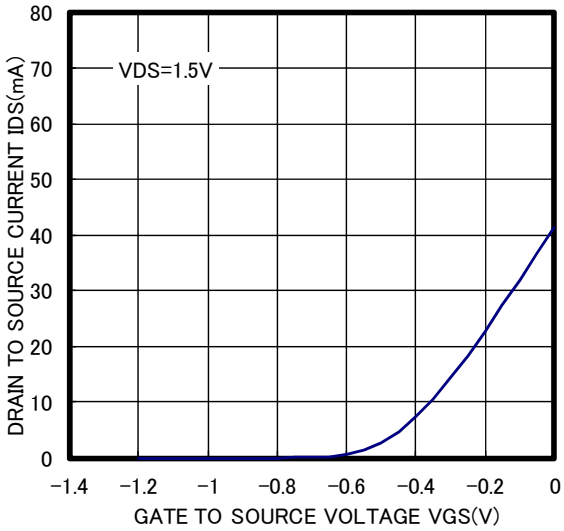
(GD-32)

TYPICAL CHARACTERISTICS (Ta=25°C)

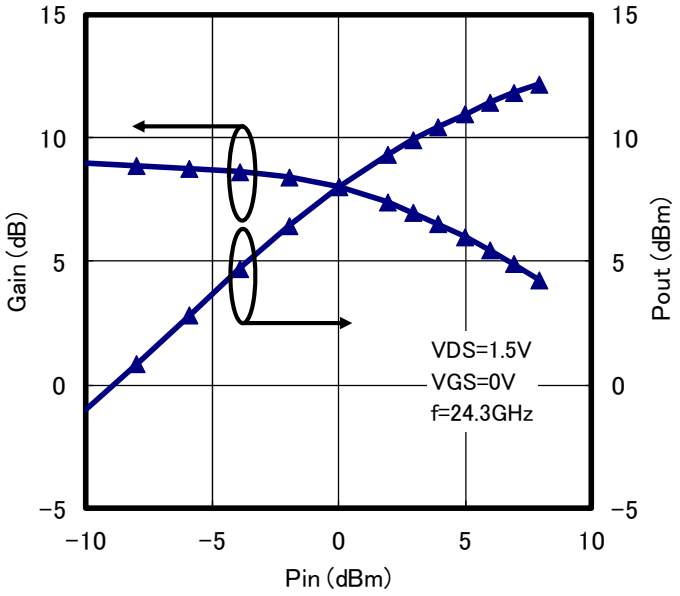
ID vs. VDS



ID vs. VGS

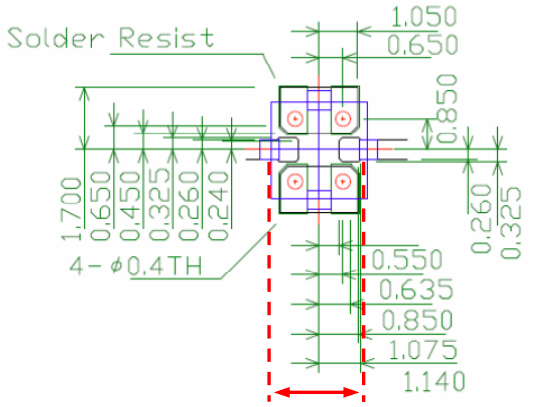


Pin vs. Pout



S PARAMETERS (VDS=1.5V, VGS=0V, Ta=room temperature)

Freq.	S11		S21		S12		S22	
(GHz)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.993	−17.7	6.972	161.6	0.011	77.3	0.528	−13.0
2	0.963	−35.0	6.742	144.4	0.022	66.1	0.518	−25.6
3	0.922	−51.5	6.436	127.9	0.031	56.1	0.503	−37.6
4	0.877	−66.7	6.101	112.6	0.040	46.8	0.498	−48.3
5	0.829	−81.5	5.799	97.7	0.048	37.7	0.485	−58.6
6	0.781	−95.8	5.503	83.2	0.055	29.2	0.471	−68.4
7	0.733	−109.8	5.222	69.1	0.061	20.8	0.456	−77.9
8	0.683	−123.4	4.957	55.3	0.067	11.9	0.439	−87.0
9	0.631	−136.1	4.698	42.3	0.072	3.8	0.421	−95.0
10	0.578	−148.3	4.485	29.9	0.076	−3.8	0.405	−101.9
11	0.534	−160.5	4.339	17.4	0.081	−11.1	0.393	−109.1
12	0.492	−173.4	4.223	4.8	0.086	−18.1	0.381	−116.8
13	0.453	171.5	4.120	−8.2	0.092	−26.3	0.363	−124.7
14	0.410	155.4	4.055	−21.1	0.096	−34.4	0.349	−131.7
15	0.371	136.0	3.996	−34.6	0.104	−42.7	0.328	−140.3
16	0.354	113.1	3.919	−48.9	0.110	−51.5	0.294	−151.8
17	0.353	87.9	3.838	−63.7	0.118	−60.6	0.248	−162.2
18	0.389	60.9	3.721	−78.7	0.127	−71.0	0.188	−174.3
19	0.450	36.1	3.586	−94.1	0.137	−82.4	0.107	171.6
20	0.531	14.7	3.428	−110.0	0.143	−96.0	0.017	130.5
21	0.623	−4.4	3.213	−126.4	0.143	−109.4	0.089	−22.8
22	0.695	−21.6	2.928	−142.3	0.142	−122.5	0.190	−37.0
23	0.768	−36.9	2.639	−157.6	0.139	−134.6	0.286	−48.8
24	0.820	−50.0	2.352	−172.2	0.131	−146.3	0.383	−59.8
25	0.851	−61.7	2.091	174.3	0.125	−156.9	0.465	−69.8
26	0.883	−72.9	1.835	161.5	0.117	−166.4	0.521	−80.1



Measurement plane (2.6mm)

- Recommended foot pattern;
  RO4350B/ROGERS(er=3.48, t=0.254mm)

Note:
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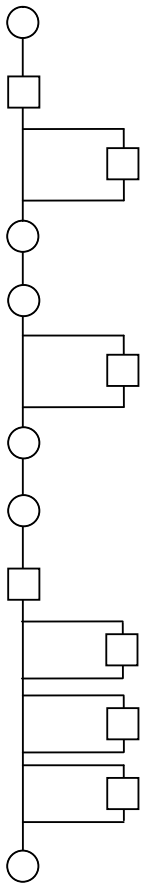
(Reference)

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, Sampling Test, Ta=25deg.C
	RF Test (2)	Glp, Pout,sat, P1dB, Sampling Test, Ta=25deeg.C
	QAT	
	Taping, Shipping	

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