

MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGF4953A/MGF4954A

SUPER LOW NOISE InGaAs HEMT (Leadless Ceramic Package)

DESCRIPTION

The MGF4953A/MGF4954A super-low noise HEMT (High Electron Mobility Transistor) is designed for use in C to K band amplifiers.

The lead-less ceramic package assures minimum parasitic losses.

FEATURES

- Low noise figure @ $f=12\text{GHz}$
MGF4953A : $\text{NFmin.} = 0.45\text{dB (Typ.)}$
MGF4954A : $\text{NFmin.} = 0.65\text{dB (Typ.)}$
- High associated gain @ $f=12\text{GHz}$
 $G_s = 13.5\text{dB (Typ.)}$

APPLICATION

- C to K band low noise amplifiers

QUALITY GRADE

- GG

RECOMMENDED BIAS CONDITIONS

- $V_{DS}=2\text{V}$, $I_D=10\text{mA}$

Outline Drawing

Fig.1

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

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	60	mA
P_T	Total power dissipation	50	mW
T_{ch}	Channel temperature	125	°C
T_{stg}	Storage temperature	-65 to +125	°C

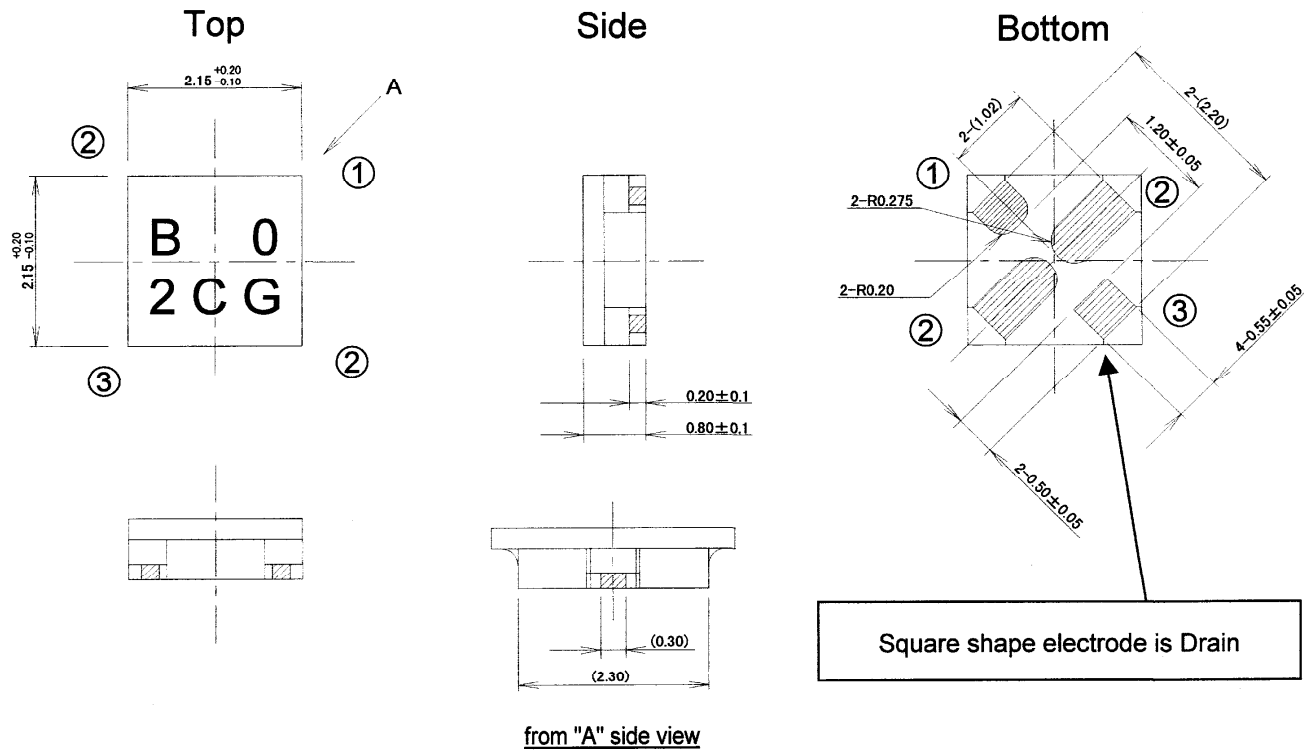
ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX.	
$V_{(BR)GDO}$	Gate to drain breakdown voltage	$I_G=-10\mu\text{A}$	-3	--	--	V
I_{GSS}	Gate to source leakage current	$V_{GS}=-2\text{V}, V_{DS}=0\text{V}$	--	--	50	μA
I_{DSS}	Saturated drain current	$V_{GS}=0\text{V}, V_{DS}=2\text{V}$	10	--	60	mA
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS}=2\text{V}, I_D=500\mu\text{A}$	-0.1	--	-1.5	V
g_m	Transconductance	$V_{DS}=2\text{V}, I_D=10\text{mA}$	--	70	--	mS
G_s	Associated gain	$V_{DS}=2\text{V}, I_D=10\text{mA}$	12.0	13.5	--	dB
NFmin.	Minimum noise figure	$f=12\text{GHz}$				
		MGF4953A	--	0.45	0.50	dB
		MGF4954A	--	0.65	0.80	dB

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Fig.1

Unit : mm



- ① Gate
- ② Source
- ③ Drain

S PARAMETERS

(Ta=25°C, VDS=2V, ID=10mA)

f (GHz)	S11		S21		S12		S22	
	Magn.	Angle	Magn.	Angle	Magn.	Angle	Magn.	Angle
4.0	0.913	-47.9	5.312	133.3	0.056	51.2	0.522	-43.9
5.0	0.844	-62.3	5.273	121.7	0.069	42.7	0.521	-52.6
6.0	0.815	-75.8	5.033	108.8	0.075	33.9	0.524	-69.6
7.0	0.827	-89.1	4.740	98.5	0.080	26.0	0.481	-78.7
8.0	0.826	-99.4	4.541	89.3	0.087	19.8	0.483	-84.6
9.0	0.801	-107.7	4.420	80.3	0.096	13.9	0.472	-91.6
10.0	0.764	-115.5	4.348	72.1	0.105	6.5	0.444	-97.3
11.0	0.725	-127.0	4.334	62.3	0.115	-1.0	0.416	-107.2
12.0	0.698	-140.9	4.256	51.5	0.119	-10.1	0.402	-119.6
13.0	0.669	-153.9	4.168	40.8	0.126	-18.3	0.382	-130.7
14.0	0.641	-168.8	4.095	30.8	0.141	-27.2	0.326	-143.6
15.0	0.612	-168.1	3.743	18.4	0.143	-37.3	0.249	-165.1
16.0	0.570	-155.3	3.366	16.2	0.137	-48.3	0.181	-174.7
17.0	0.594	-152.8	3.986	6.3	0.132	-51.7	0.202	-168.3
18.0	0.577	-141.4	3.960	-8.5	0.139	-57.1	0.212	-176.8