

MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGF4951A/4952A

SUPER LOW NOISE InGaAs HEMT (Leadless Ceramic Package)

DESCRIPTION

The MGF4951A 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=12GHz
 MGF4951A : NFmin. = 0.45dB (TYP.)
 MGF4952A : NFmin. = 0.65dB (TYP.)
 High associated gain @ f=12GHz
 Gs = 12.0dB (TYP.)

APPLICATION

C to K band low noise amplifiers.

QUALITY GRADE

GG

RECOMMENDED BIAS CONDITIONS

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

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

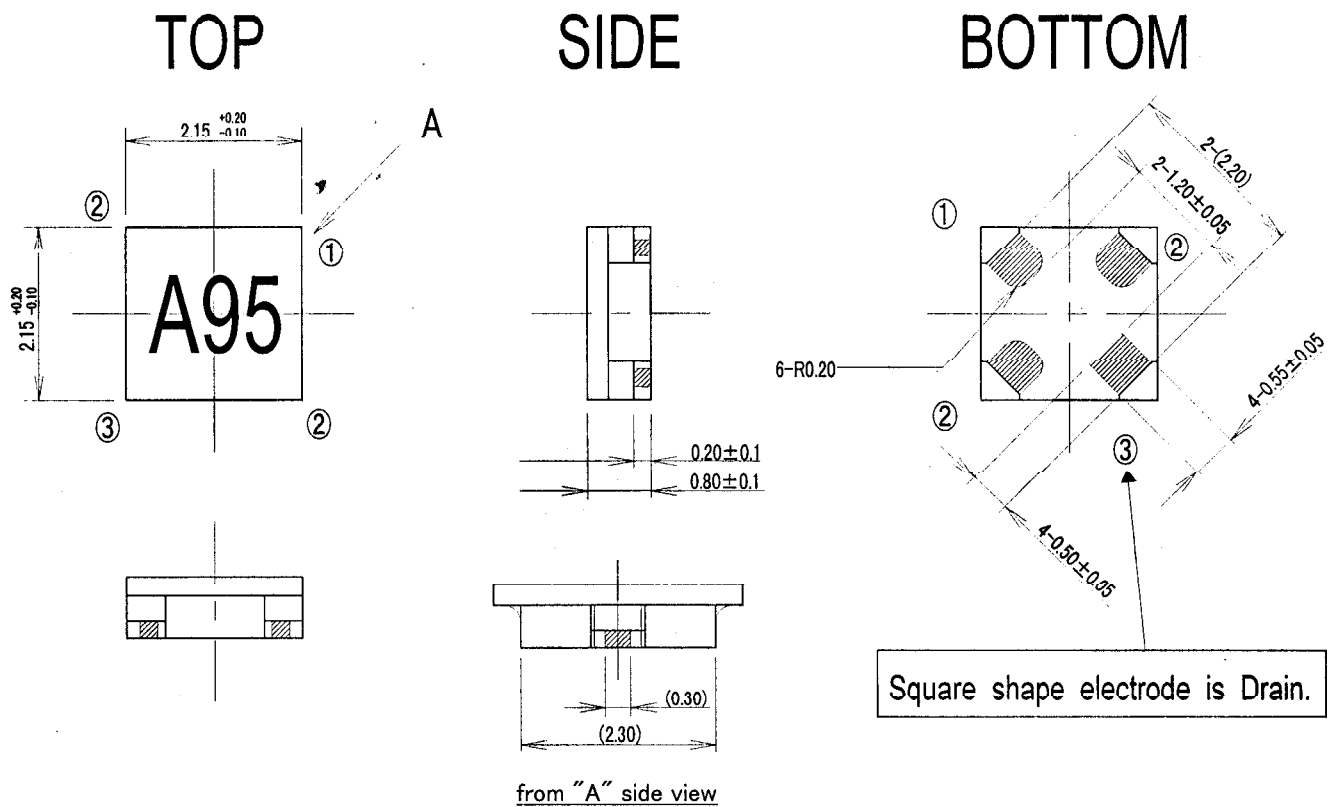
ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

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

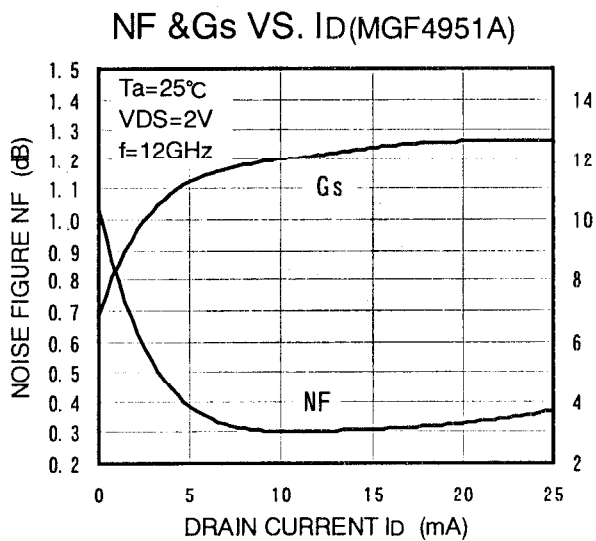
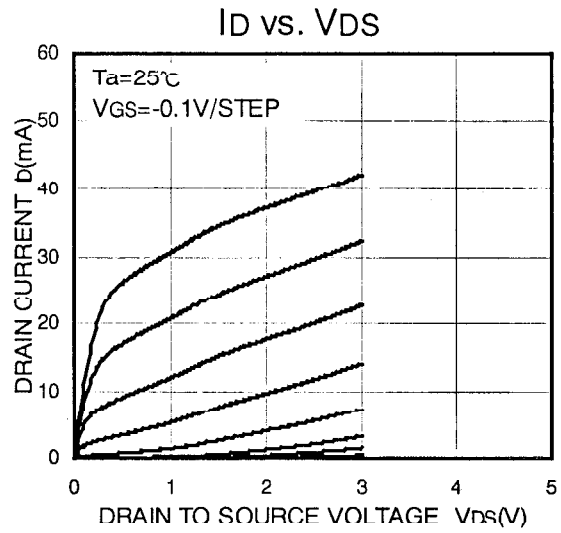
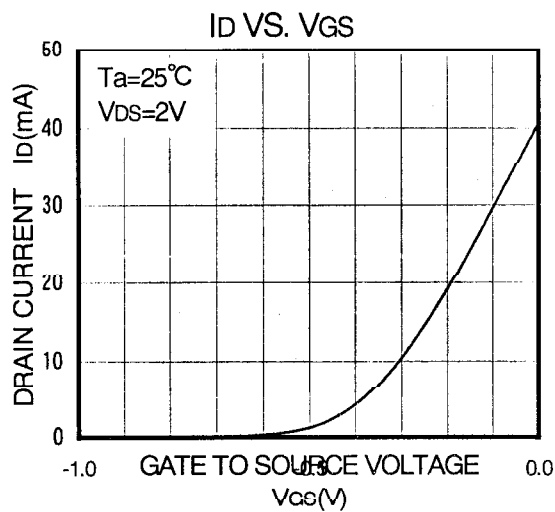
ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX.	
$V_{(BR)GDO}$	Gate to drain breakdown voltage	$I_G=-10\mu A$	-3		--	V
I_{GSS}	Gate to source leakage current	$V_{GS}=-2V, V_{DS}=0V$	--	--	50	μA
I_{DSS}	Saturated drain current	$V_{GS}=0V, V_{DS}=2V$	--	35	--	mA
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS}=2V, I_D=500\mu A$	-0.1	--	-1.5	V
gm	Transconductance	$V_{DS}=2V, I_D=10mA$	--	75	--	mS
Gs	Associated gain	$V_{DS}=2V$	11.0	12.0	--	dB
NFmin.	Minimum noise figure	$I_D=10mA$				
		f=12GHz				
		MGF4951A	--	0.45	0.50	dB
		MGF4952A	--	0.65	0.80	dB

Fig.1



TYPICAL CHARACTERISTICS (Ta=25°C)



MGF4951A/4952A

SUPER LOW NOISE InGaAs HEMT (Leadless Ceramic Package)

S PARAMETERS (Ta=25°C,VDS=2V,ID=10mA)

Freq. (GHz)	S11		S21		S12		S22		K	MSG/MAG (dB)
	Magn.	Angle	Magn.	Angle	Magn.	Angle	Magn.	Angle		
1.0	0.991	-12.7	5.721	157.6	0.034	71.6	0.508	-2.3	0.35	22.3
2.0	0.965	-29.1	5.551	142.5	0.050	63.1	0.478	-17.0	0.38	20.4
3.0	0.880	-45.1	5.240	127.0	0.064	52.4	0.449	-31.9	0.53	19.1
4.0	0.820	-60.4	4.852	111.6	0.076	41.1	0.421	-46.5	0.61	18.0
5.0	0.760	-74.8	4.443	96.8	0.086	30.1	0.395	-60.9	0.70	17.1
6.0	0.696	-88.1	4.052	82.5	0.094	20.0	0.370	-75.1	0.79	16.3
7.0	0.644	-100.4	3.711	68.8	0.101	10.6	0.346	-89.0	0.88	15.7
8.0	0.597	-111.7	3.437	55.5	0.106	1.9	0.324	-102.7	0.97	15.1
9.0	0.554	-122.3	3.235	42.6	0.110	-6.6	0.303	-116.1	1.05	13.3
10.0	0.517	-132.4	3.103	29.8	0.113	-15.0	0.284	-129.3	1.12	12.3
11.0	0.485	-142.4	3.209	16.8	0.115	-23.6	0.266	-142.2	1.18	11.7
12.0	0.461	-152.7	2.995	3.4	0.117	-32.4	0.250	-154.9	1.21	11.3
13.0	0.444	-164.0	2.982	-11.0	0.118	-41.7	0.235	-167.4	1.24	11.1
14.0	0.435	-176.9	2.971	-27.0	0.120	-51.4	0.221	-179.6	1.25	11.0
15.0	0.435	167.8	2.948	-45.9	0.121	-61.9	0.209	168.4	1.25	10.8
16.0	0.444	149.2	2.908	-69.0	0.123	-73.6	0.198	156.7	1.25	10.7
17.0	0.464	126.3	2.861	-98.6	0.126	-87.3	0.188	145.2	1.25	10.6
18.0	0.494	98.2	2.840	-137.5	0.129	-104.8	0.180	134.0	1.22	10.6

Noise Parameters (Ta=25°C,VDS=2V,ID=10mA)

f (GHz)	Γ_{opt}		Rn (Ω)	NF(dB)		Gs (dB)
	Magn.	Angle		MGF4951A	MGF4952A	
12	0.32	132	3.3	0.45	0.65	12.0