MITSUBISHI ELECTRIC

< Low Noise GaAs HEMT >

MGFC4419S

Die Chip formed product (Space grade)

DESCRIPTION

The MGFC4419S super-low noise InGaAs HEMT (High Electron Mobility Transistor) is designed for space use in C to K band amplifiers.

This product is provided by die chip form.

FEATURES

Low noise figure @f=12GHz
NFmin. = 0.35dB (Typ.)
High associated gain @ f=12GHz
Gs = 13.5dB (Typ.)

APPLICATION

C to K band low noise amplifiers

QUALITY GRADE

Space grade

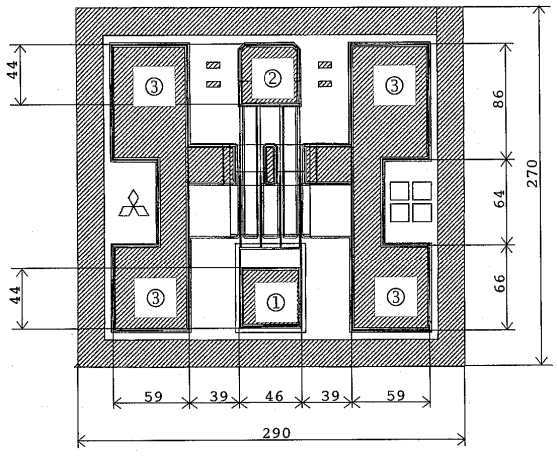
RECOMMENDED BIAS CONDITIONS

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

RoHS COMPLIANT

MGFC4419S is a RoHS compliant product.

Outline Drawing Unit : μm



Chip Thickness : 105^{+35}_{-30} μm

①:Gate
②:Drain
③:Source

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=-10μA	-3.2	--	--	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	10	--	60	mA
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS}=2V,I_D=500μA	-0.1	--	-1.5	V
Gs	Associated gain	V_{DS}=2V,ID=10mA f=12GHz	12.0	13.5	--	dB
NFmin.	Minimum noise figure		--	0.35	0.50	dB

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TECHNICAL NOTE

1. Characteristics and quality assurance

1.1 Electrical characteristics

a. DC characteristics on spec. sheet show the test conditions and values using wafer-prober. DC characteristics are tested 100%devices.

b. RF characteristics are tested using the corresponding packaged FET. When more then 80% of the samples satisfy the value of RF characteristics on spec. sheet, that wafer is accepted for shipment.

1.2 Quality assurance and reliability

a. Mechanical characteristics are tested using corresponding package with sampling test.

b. Visual inspection is complied with MITSUBISHI's technical note.

c. The electrical characteristics and the quality assurance test are sampling test. And so the shipped chips are contained some sub-standard articles.

d. After opening the packing, the quality of chips is influenced storage conditions. Our recommended storage conditions and period is as follows:

Ta=25±3°C

MITSUBISHI's packing + Desiccator	6 months
Opened packing + Desiccator	2 months

In the desiccator, leave the chips in the pack keeping up side up and store in a clean and dry environment, preferable dry N2.

e. Packing quantity: 25pcs. /each pack

1.3 Others

The device shall not be returned in the following case.

a. Inadequate storage
b. Mishandling
c. Incorrect die/wire bonding
d. RF characteristics failure rate then 30%.
e. Exceed the recommended storage period
f. Visual failure rate less than 10%

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 ore 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.

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