MITSUBISHI ELECTRIC

< GaN HEMT for satellite communication (SATCOM) earth station>

MGFK48G3745A

Ku band internally matched power GaN HEMT
13.75 − 14.5 GHz BAND / 70W Multi-carrier operable

DESCRIPTION

The MGFK48G3745A, GaN HEMT with an N-channel schottky gate, is designed for Ku-band applications with multi-carrier operation.

FEATURES

- High voltage operation : VDS=24V
- High output power : Po=48.3dBm (TYP.) @Pin=42dBm
- High efficiency : PAE=33% (TYP.) @Pin=42dBm
- Wide offset frequency : Up to 400MHz
- Designed for use in Class AB linear amplifiers

APPLICATION

- Amplifier for Ku-band SATCOM

QUALITY

- General & Industrial

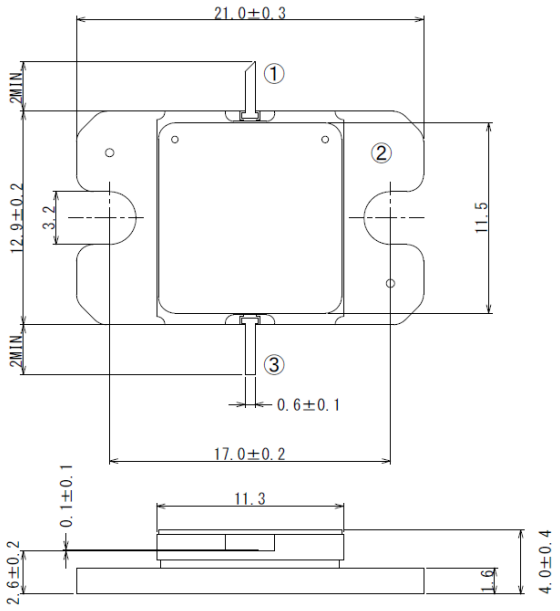
Packaging

- Individual case

RECOMMENDED BIAS CONDITIONS

- Vds=24V
- Ids=1.44A
- Rg=13.3Ω

OUTLINE DRAWING Unit : millimeters



GF-68

① GATE
② SOURCE (FLANGE)
③ DRAIN

Absolute maximum ratings (Ta=25°C)

Symbol	Parameter	Ratings	Unit
Vgso	Gate to Source Voltage at Operating	-10	V
Vds	Drain to source voltage	27	V
IGF	Forward gate current	100	mA
IGR	Reverse gate current	-24	mA
τ	Screw torque	49	N・cm
PT*1	Total power dissipation	225	W
Pin	Input power	≦44	dBm
Tch	Channel temperature	250	°C
Tstg	Storage temperature	-55 to +125	°C
Tc	Maximum case operating temperature	100	°C

*1:Tc=25°C

Recommended operating Condition

Symbol	Parameter	Limit	Unit
Tc	Maximum case operating temperature	85	℃
Vds	Drain to source voltage	≦24	V
IDQ	Drain current without RF drive	1.44	A

Electrical characteristics (Ta=25°C)

Parameter	Symbol	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
Gate to source cut-off voltage	VGS(off)	VDS=24V,ID=28.8mA	-1	-	-5	V
Output Power	Pout *2	VDS=24V,ID(RF off)=1.44A f=13.75 – 14.5GHz *2 : Pin=42dBm *3 : Pin=27dBm	47.3	48.3	-	dBm
Power added efficiency	PAE *2		-	31	-	%
Linear power gain	GLP *3		9	11	-	dB
3rd Order Intermodulation distortion	IM3	Two-tone Test,Po=39.3dBm (Single Carrier Level) Δ f=5MHz(IM3),Δ f=200MHz(IM3-2), Δ f=400MHz(IM3-3)	-25	-	-	dBc
	IM3-2		-24	-	-	
	IM3-3		-24	-	-	
Thermal resistance	Rth(ch-c) *4	ΔVf method	-	0.8	1.0	°C/W

*4 :Channel-case

Specifications are subject to change without notice

ESD *5	Class 0	-199~

*5 :Based on EIAJ ED-4701 C-111A(C=100pF,R=1.5kΩ)

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.

Notes regarding these materials

- These materials are intended as a reference to assist our customers in the selection of the Mitsubishi semiconductor product best suited to the customer's application; they do not convey any license under any intellectual property rights, or any other rights, belonging to Mitsubishi Electric Corporation or a third party.
- Mitsubishi Electric Corporation assumes no responsibility for any damage, or infringement of any third-party's rights, originating in the use of any product data, diagrams, charts, programs, algorithms, or circuit application examples contained in these materials.
- All information contained in these materials, including product data, diagrams, charts, programs and algorithms represents information on products at the time of publication of these materials, and are subject to change by Mitsubishi Electric Corporation without notice due to product improvements or other reasons. It is therefore recommended that customers contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor for the latest product information before purchasing a product listed herein.
  The information described here may contain technical inaccuracies or typographical errors. Mitsubishi Electric Corporation assumes no responsibility for any damage, liability, or other loss rising from these inaccuracies or errors.
  Please also pay attention to information published by Mitsubishi Electric Corporation by various means, including the Mitsubishi Semiconductor home page (http://www.MitsubishiElectric.com/).
- When using any or all of the information contained in these materials, including product data, diagrams, charts, programs, and algorithms, please be sure to evaluate all information as a total system before making a final decision on the applicability of the information and products. Mitsubishi Electric Corporation assumes no responsibility for any damage, liability or other loss resulting from the information contained herein.
- Mitsubishi Electric Corporation semiconductors are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.
- The prior written approval of Mitsubishi Electric Corporation is necessary to reprint or reproduce in whole or in part these materials.
- If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination.
  Any diversion or re-export contrary to the export control laws and regulations of Japan and/or the country of destination is prohibited.
- Please contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor for further details on these materials or the products contained therein.

CTHA-200605-03