MITSUBISHI ELECTRIC

< Small Signal InGaP HBT >

MGF3021AM

4pin flat lead package

DESCRIPTION

The MGF3021AM InGaP-HBT(Heterojunction Bipolar Transistor) is designed for use in L to C band amplifiers.

The 4pin flat lead package is small-thin size, and offers high cost performance.

Outline Drawing

FEATURES

G_{LP}=22dB,P_{1dB}=11.0dBm,OIP3=24.0dBm
@ f=2.4GHz,V_{CE}=3V,Ic=14mA

APPLICATION

L to C band low noise amplifiers

QUALITY GRADE

GG

RECOMMENDED BIAS CONDITIONS

V_{CE}=3V, I_C=14mA

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Symbol	Parameter	Ratings	Unit
V_{CBO}	Collector to Base voltage	12.0V	V
V_{CEO}	Collector to Emitter voltage	4.0V	V
V_{EBO}	Emitter to Base voltage	2.0V	V
I_C	Collector current	20	mA
I_B	Base current	10	mA
PT	Total power dissipation	80	mW
T_{ch}	Channel temperature	150	°C
T_{stg}	Storage temperature	-40 to +125	°C

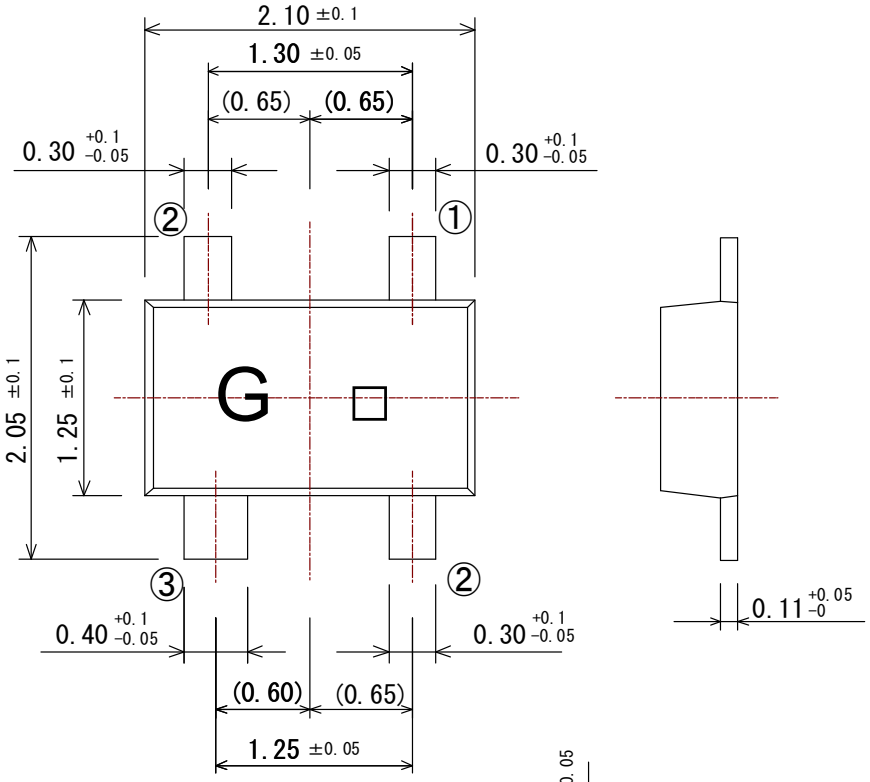
ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX	
h_{FE}	DC Current Gain	V_{CE}=3V,Ic=14mA	90	110	130	
G_{LP}	Linear Power Gain	V_{CE}=3V,Ic=14mA	19.5	22	--	dB
P_{1dB}	Output power at 1dB gain compression	f=2.4GHz	9.5	11	--	dBm
OIP_3	3rd Oder Intermodulation Distortion Output Intercept Point		--	24	--	dBm
Gs	Associated gain	V_{CE}=3V,Ic=4mA	--	17	--	dB
NFmin.	Minimum noise figure	f=2.4GHz	--	1.2	--	dB

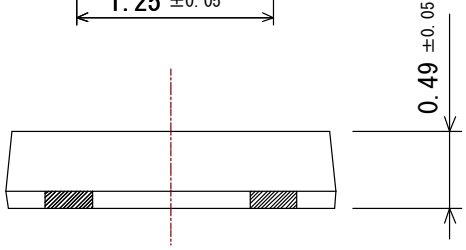
Note 1: OIP_3,Gs and NFmin. @2.4GHz are not tested.
Note 2: G_{LP} and P_{1dB} @2.4GHz are tested with sampling inspection.

Publication Date : May, 2012
CSTG-14628

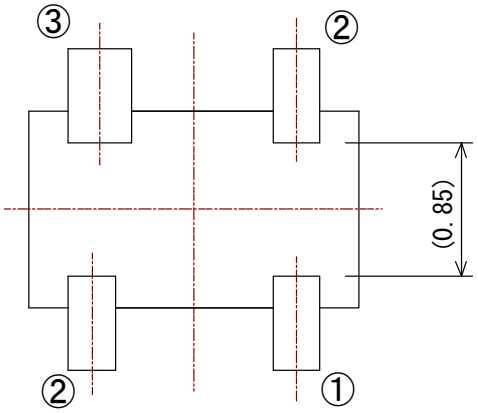
Top



Side



Bottom



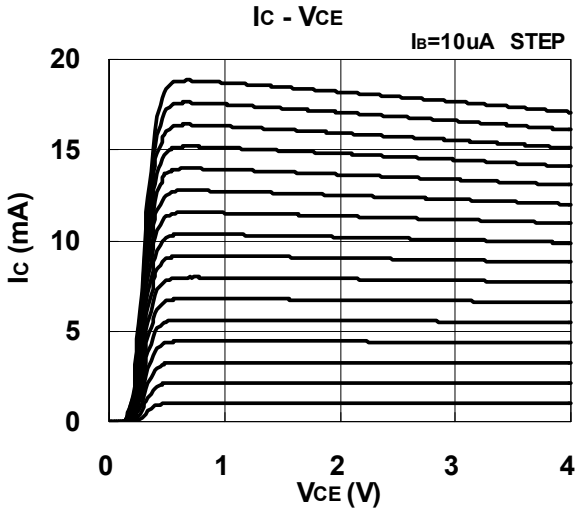
Unit: mm

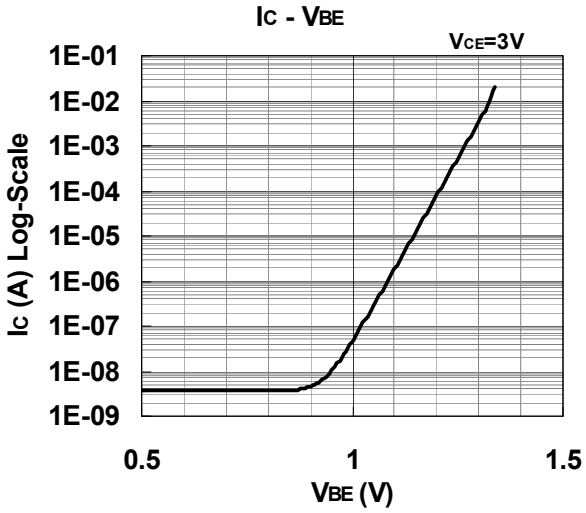
① Base
② Emitter
③ Collector

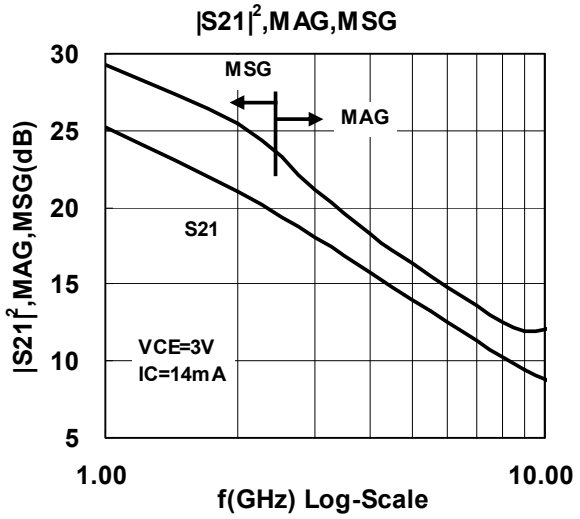
(GD-30)

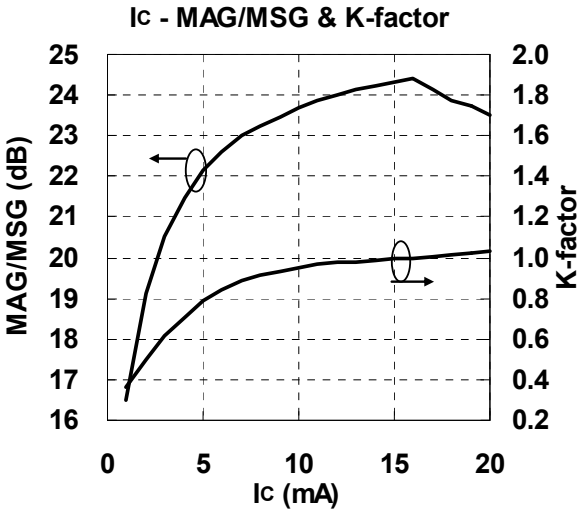
(Reference data)

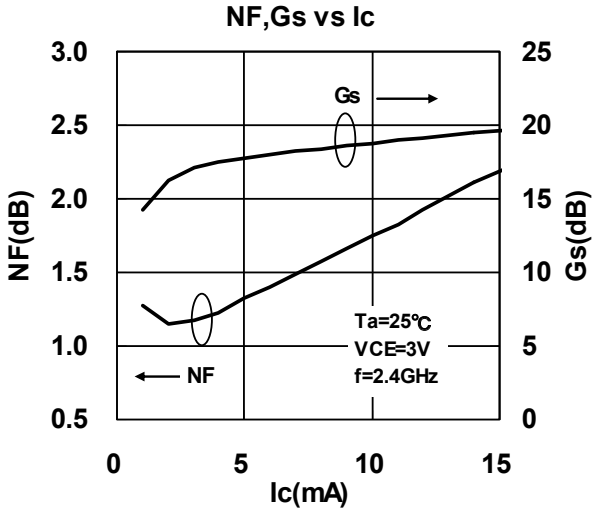
TYPICAL CHARACTERISTICS (Ta=25°C)





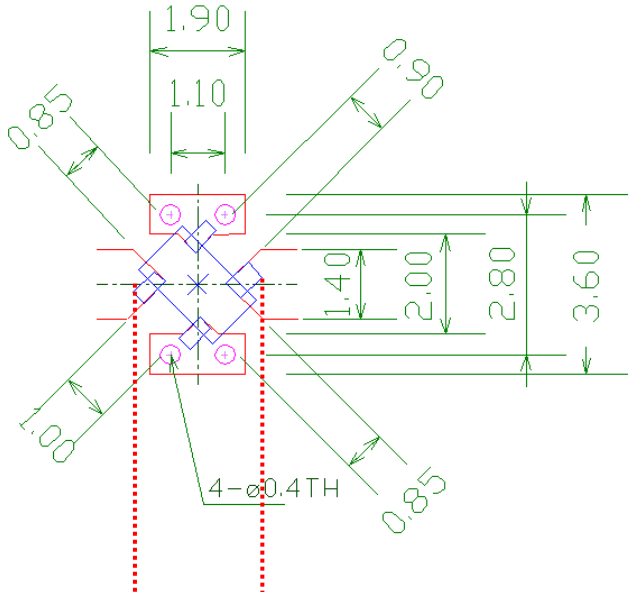






(Conditions:VCE=3V,IC=14mA,Ta=25deg.C)

f	S11		S21		S12		S22		K	MAG/MSG
(GHz)	Mag.	Angle	Mag.	Angle	Mag.	Angle	Mag.	Angle		(dB)
1	0.491	-65.0	18.143	120.5	0.021	60.2	0.778	-26.4	0.57	29.3
2	0.268	-102.9	11.227	91.6	0.032	54.0	0.636	-34.3	0.91	25.4
3	0.164	-141.1	7.949	72.8	0.043	51.2	0.579	-40.5	1.07	21.1
4	0.137	173.6	6.137	57.3	0.054	47.7	0.546	-47.9	1.14	18.3
5	0.163	136.7	5.021	43.3	0.065	43.1	0.513	-56.3	1.18	16.3
6	0.203	111.4	4.254	30.4	0.077	37.9	0.491	-64.3	1.19	14.8
7	0.263	96.8	3.705	17.4	0.089	31.5	0.455	-75.1	1.18	13.6
8	0.326	85.2	3.270	5.1	0.100	24.3	0.414	-85.9	1.18	12.6
9	0.384	76.7	2.974	-6.8	0.112	16.9	0.380	-98.4	1.14	12.0
10	0.442	69.1	2.768	-19.1	0.123	9.4	0.369	-114.3	1.06	12.0
11	0.501	61.8	2.578	-32.2	0.135	0.8	0.353	-132.6	0.98	12.8
12	0.552	54.2	2.401	-45.8	0.145	-7.9	0.354	-154.5	0.92	12.2
13	0.579	46.2	2.235	-58.3	0.154	-17.8	0.358	-174.7	0.89	11.6
14	0.611	39.3	2.134	-72.9	0.164	-28.0	0.405	166.5	0.78	11.1
15	0.627	31.7	1.953	-88.1	0.167	-38.8	0.452	146.0	0.74	10.7
16	0.620	24.2	1.762	-102.2	0.169	-47.9	0.490	127.0	0.78	10.2
17	0.633	18.8	1.579	-115.7	0.178	-56.6	0.503	109.3	0.78	9.5
18	0.645	13.1	1.395	-126.1	0.180	-66.2	0.514	96.8	0.80	8.9

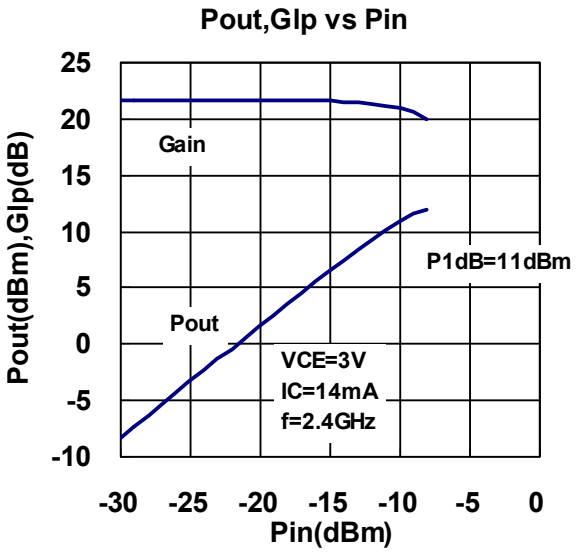


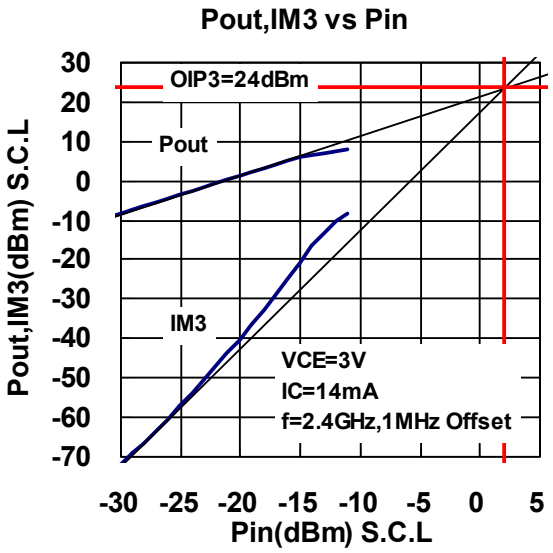
Measurment plane

Recommended foot pattern;FR4(εr=4.6@1MHz,t=0.8mm)

(Reference data)

TYPICAL CHARACTERISTICS (Ta=25°C)





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.

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 in accuracies 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 ore 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.