

# HA22022

## GaAs MMIC Low Noise Amplifier for Micro Wave Application

# HITACHI

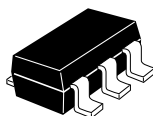
ADE-207-227 (Z)  
1st. Edition  
February 1997

### Features

- Suitable for low noise amplifier of Micro Wave Application(1.5 to 1.9GHz)
- Low voltage and low current operation (3V, 3mA typ.)
- Low noise (1.3 dB typ. @1.5Ghz)
- High power gain (16 dB typ. @1.5GHz)
- Built-in matching circuits ( $50\Omega$ )
- Small surface mount package (MPAK-5)

### Outline

MPAK—5



This document may, wholly or partially, be subject to change without notice.

This Device is sensitive to Electro Static Discharge.  
An Adequate handling procedure is requested.

### CAUTION

This product uses GaAs. Since dust or fume of GaAs is highly poisonous to human body, please do not treat them mechanically in the manner which might expose to the Air. And it should never be thrown out with general industrial or domestic wastes.

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Supply voltage	Vdd	5	V
Maximum current	Idd	6	mA
Power dissipation	Pd	100	mW
Channel temperature	Tch	150	°C
Storage temperature	Tstg	−55 to +125	°C
Operation temperature	Topr	−20 to +70	°C
Maximum input power	Pin max	+15	dBm

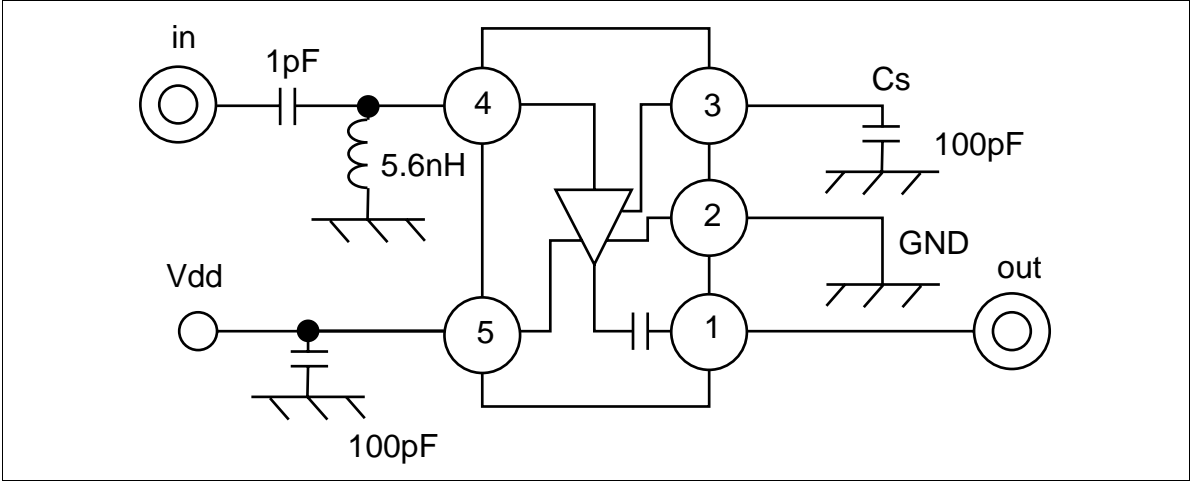
Electrical Characteristics (Ta = 25°C, Vdd = 3V)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions	Pin
Quiescent current	Idd	2	3	5	mA	No signal	
Power gain	PG	14	16	17	dB	f = 1.5 GHz	
Noise figure	NF	—	1.3	2	dB	f = 1.5 GHz	

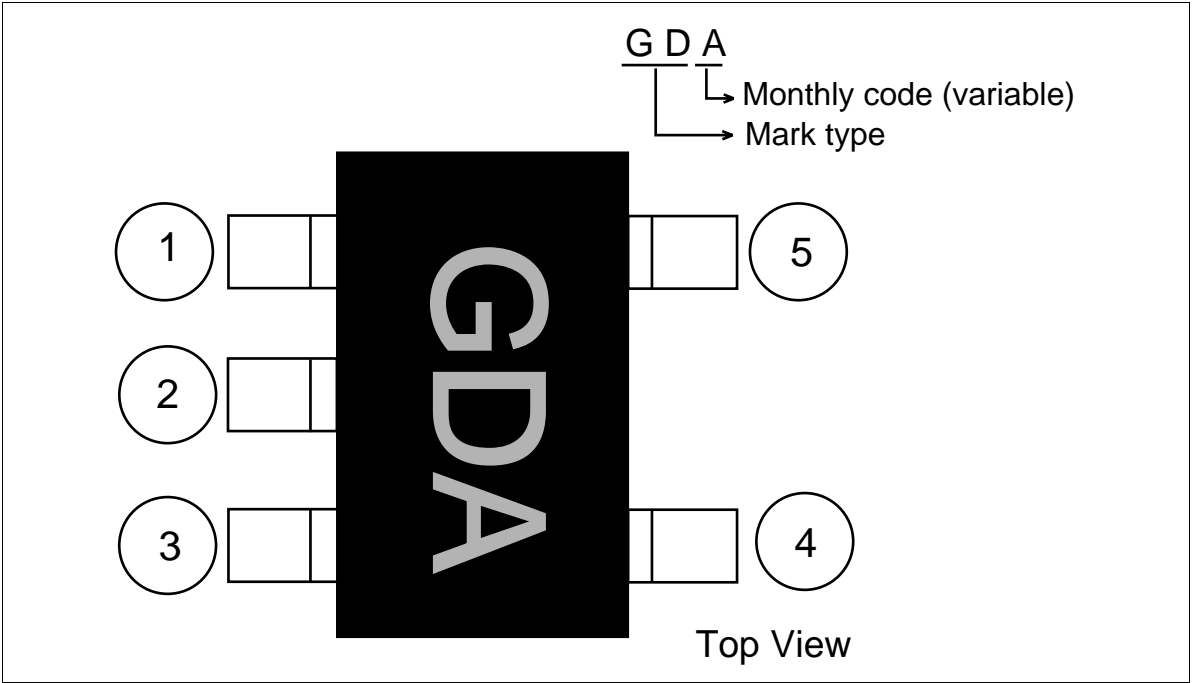
Typical Performance (Ta = 25°C, Vdd = 3V)

Item	Symbol	Typ	Unit	Test Conditions	Pin
VSWR (input)	VSWR in	1.7	—	f = 1.5 GHz	4
VSWR (output)	VSWR out	1.7	—	f = 1.5 GHz	1
3rd order intermodulation distortion	IM3	58	dB	f = 1.5 GHz, Pin = −30 dBm	

Block Diagram

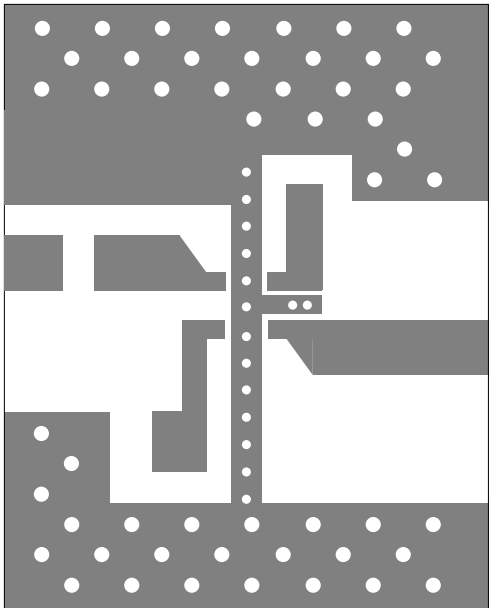


Pin Arrangement



Pin No.	Pin name	Function
1	RF out	RF output
2	GND	Ground
3	Cs	Bypass capacitor (>100 pF)
4	RF in	RF input
5	Vdd	Power supply

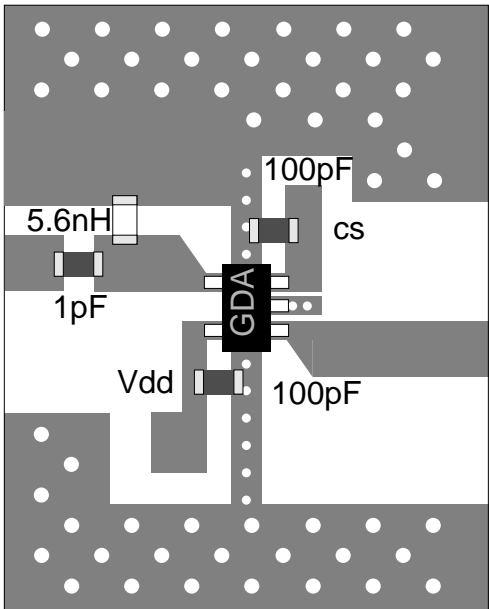
Pattern Layout



Front Side view of PCB Pattern



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- :  $\phi 0.5\text{mm}$
- :  $\phi 0.3\text{mm}$



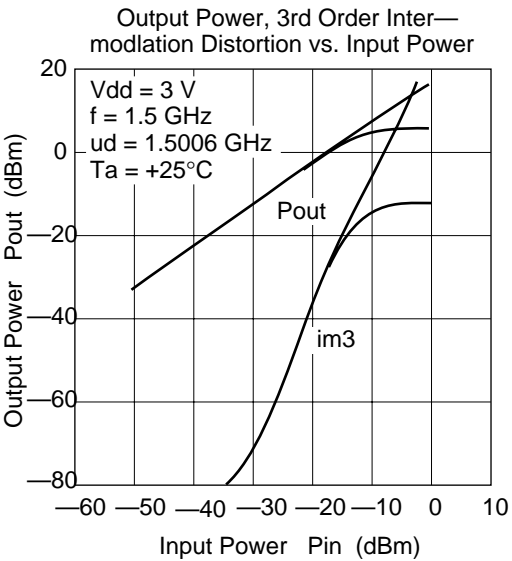
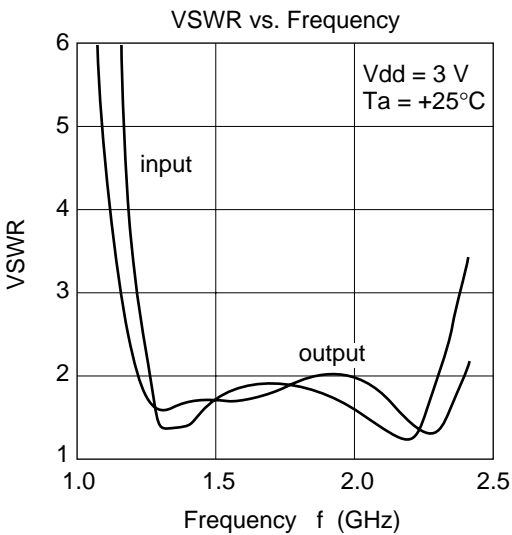
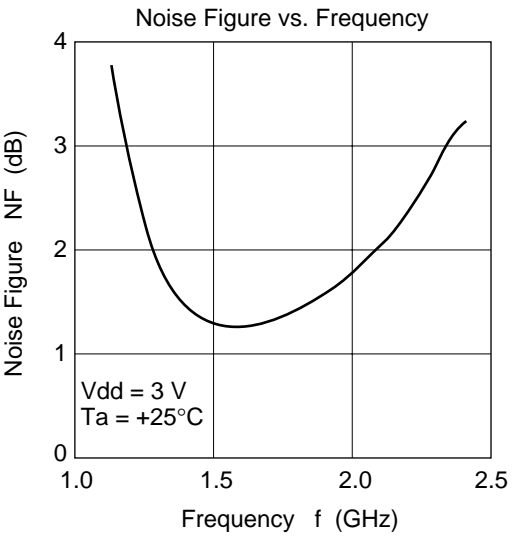
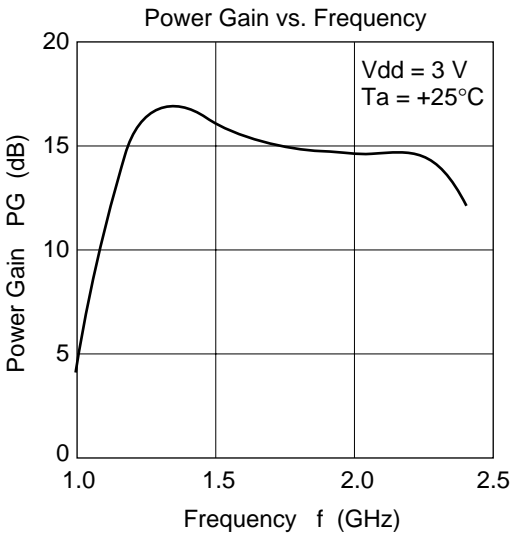
Front Side view of Part Layout(1.5GHz)

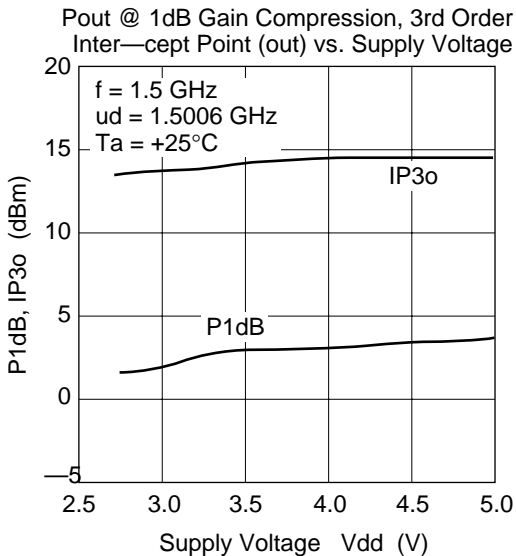
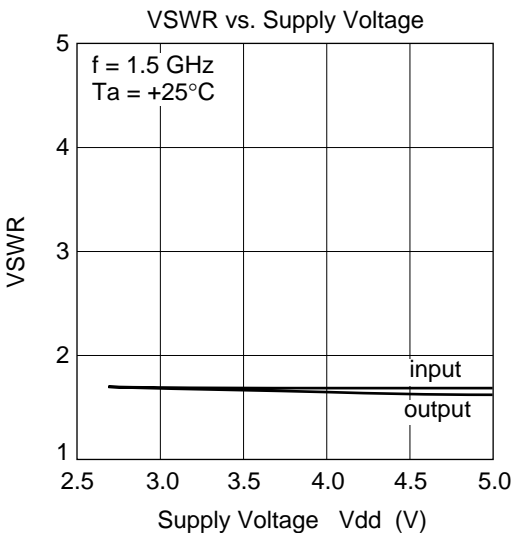
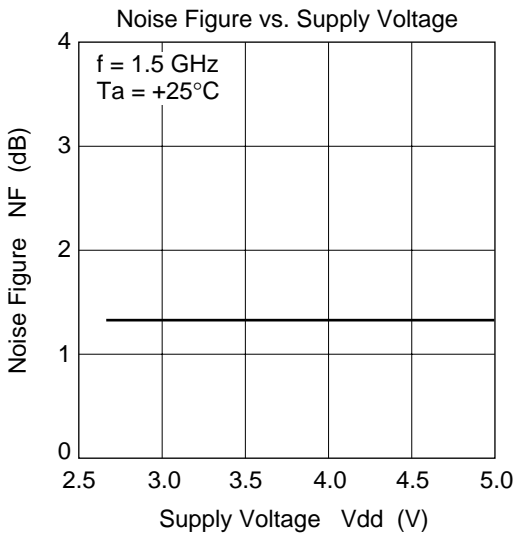
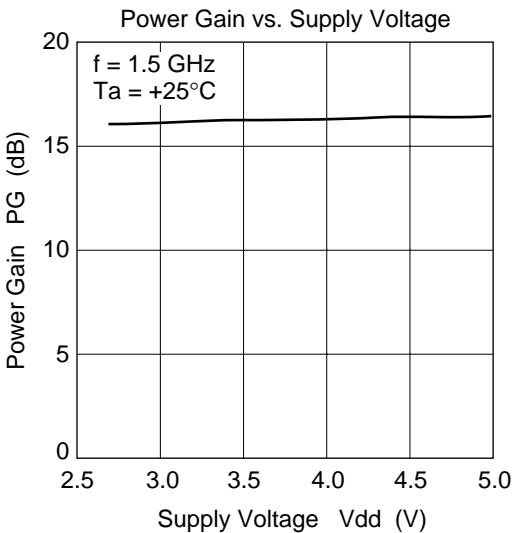
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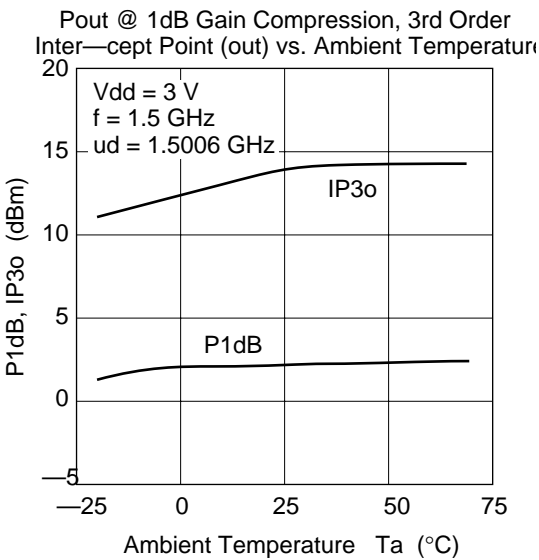
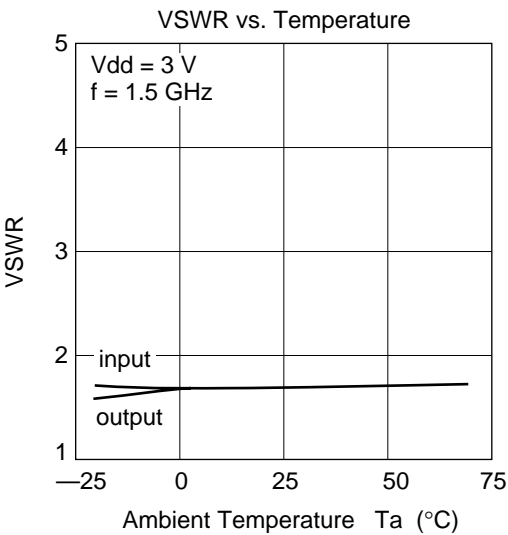
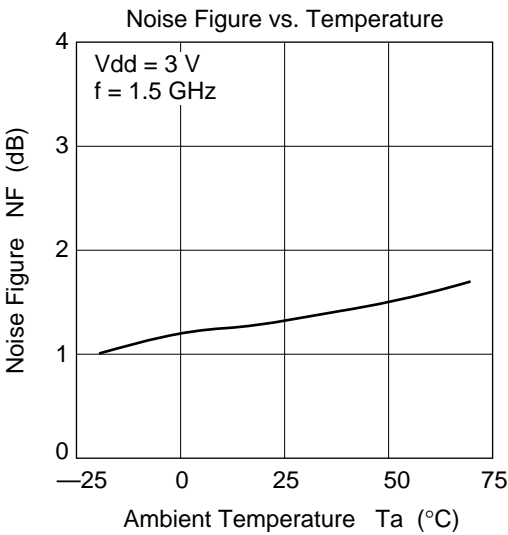
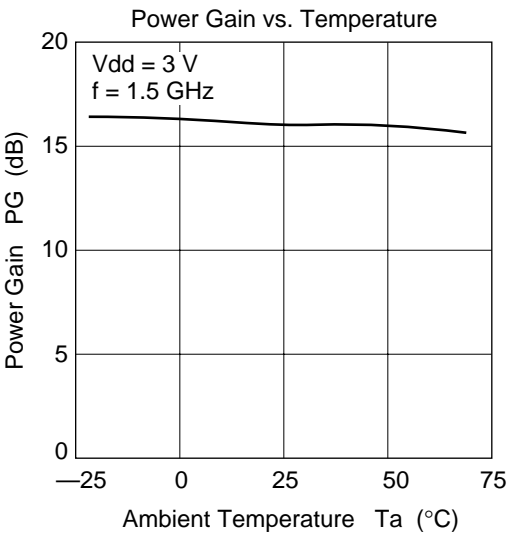
-  : Capacitor
-  : Inductor

ER=4.8  
H=1mm

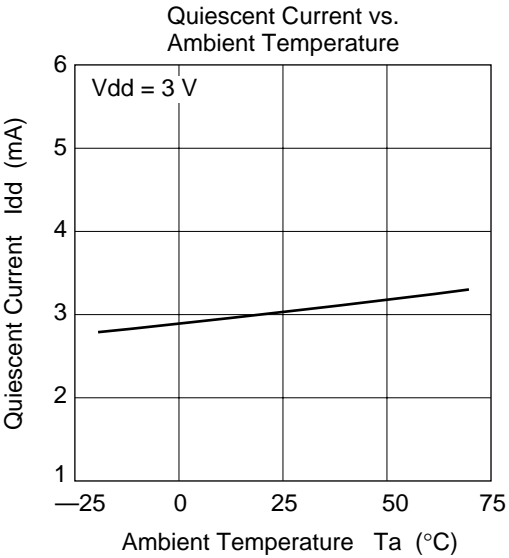
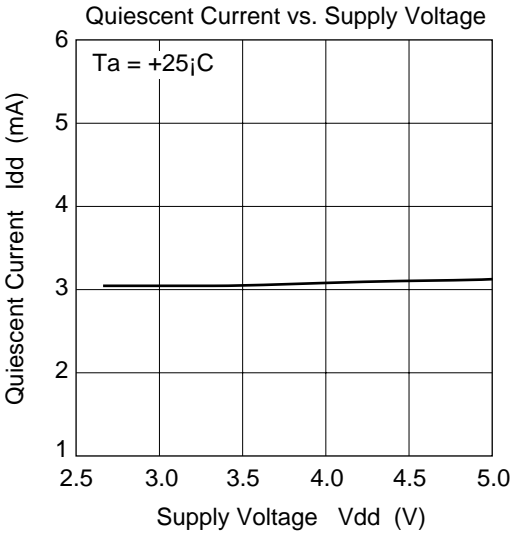
Main Characteristics





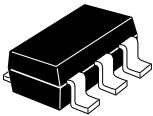
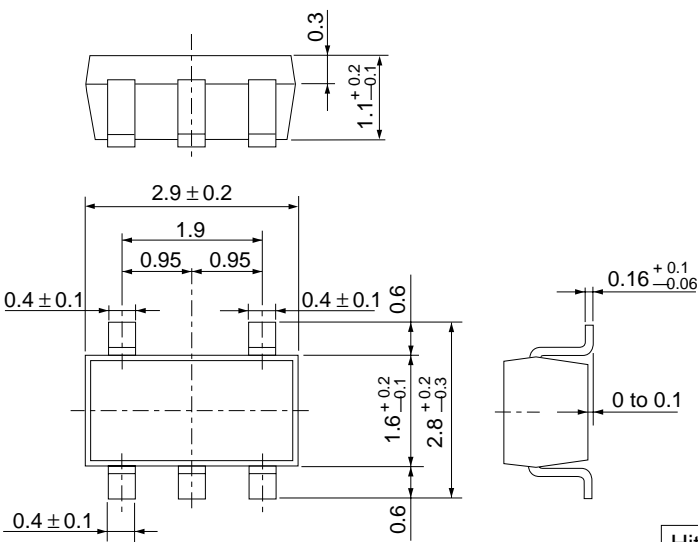






Package Dimintions

Unit: mm



Hitachi code	MPAK—5
EIAJ	
JEDEC	

## Cautions

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