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# HA22012

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## GaAs MMIC Low Noise Amplifier for Micro Wave Application

# HITACHI

ADE-207-217 (Z)  
1st. Edition  
July 1996

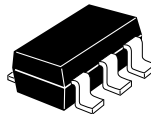
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### Features

- Suitable for low noise amplifier of PHS (1.9 GHz)
- Low voltage and low current operation (3V, 3mA typ.)
- Low noise (1.9 dB typ.)
- High power gain (13.5 dB typ.)
- Built-in input and output matching circuits ( $50\Omega$ )
- Small surface mount package (MPAK-5)

### Outline

MPAK—5



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 +150	°C
Operation temperature	Topr	−20 to +70	°C

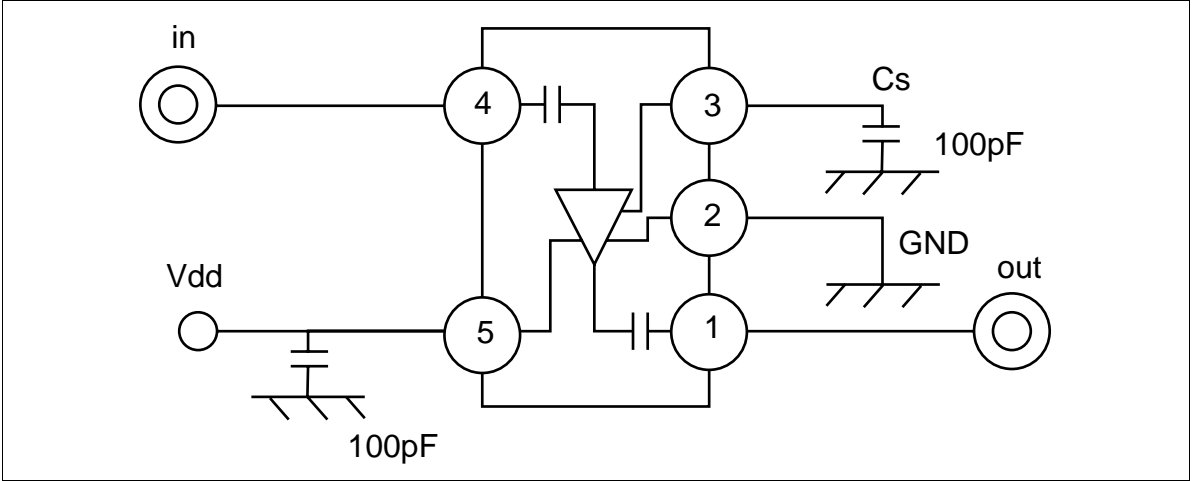
Electrical Characteristics (Ta = 25°C, Vdd = 3V)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions	Pin
Quiescent current	Idd	1.5	3	5.5	mA	No signal	
Power gain	PG	11.5	13.5	16	dB	f = 1.9 GHz	
Noise figure	NF	—	1.9	2.5	dB	f = 1.9 GHz	

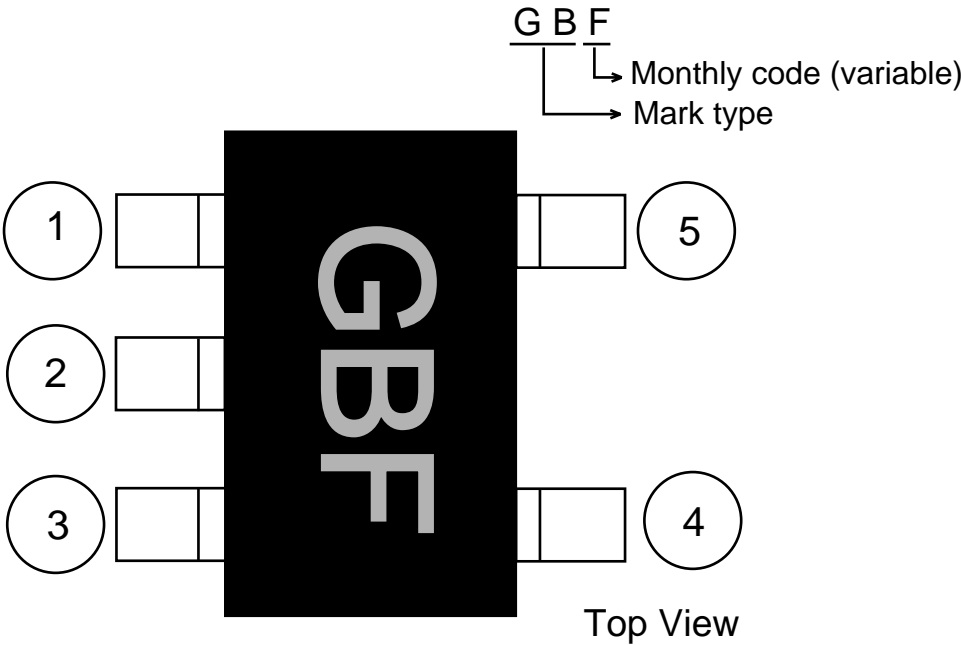
Typical Performance (Ta = 25°C, Vdd = 3V)

Item	Symbol	Typ	Unit	Test Conditions	Pin
VSWR (input)	VSWR in	1.6	—	f = 1.9 GHz	4
VSWR (output)	VSWR out	1.6	—	f = 1.9 GHz	1
3rd order intermodulation distortion	IM3	58	dB	f = 1.9 GHz, UD = 1.9006 Ghz Pin = −30 dBm	

Block Diagram

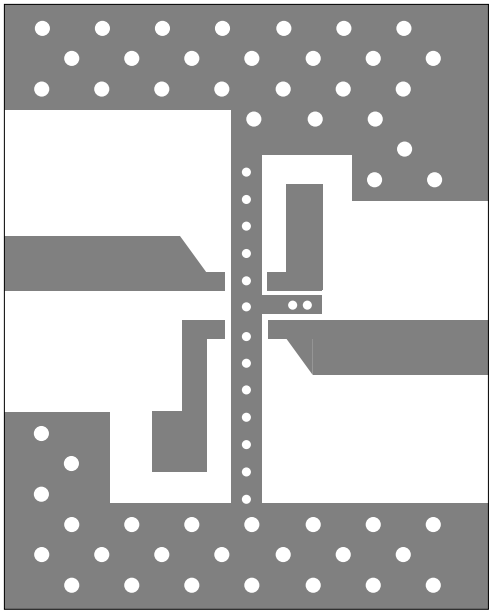


Pin Arrangement



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

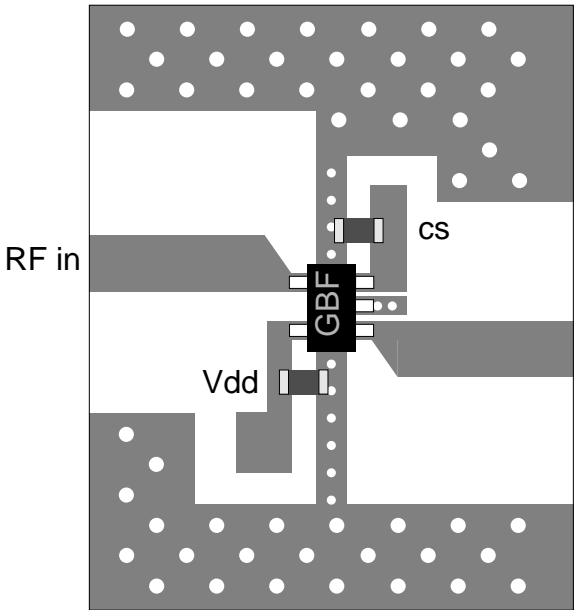
Pattern Layout



Front Side view of PCB Pattern

scale 4/1

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



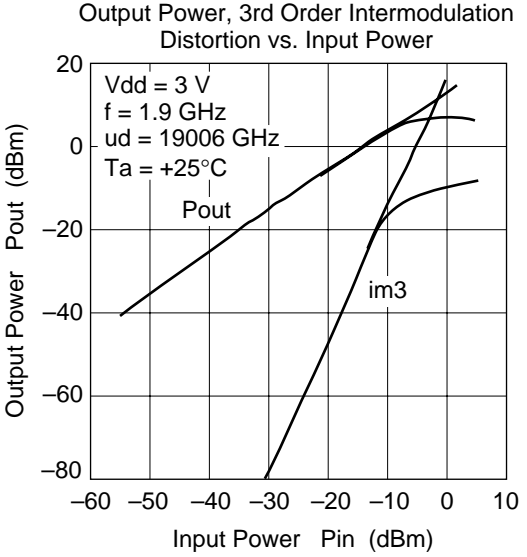
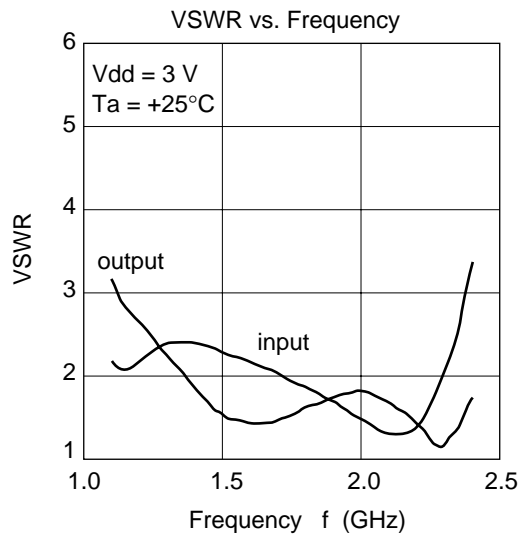
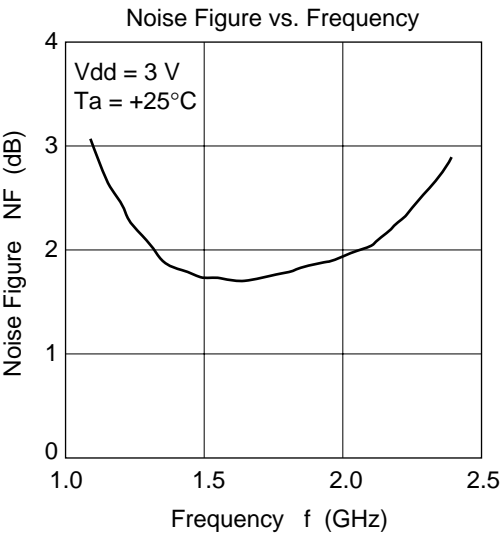
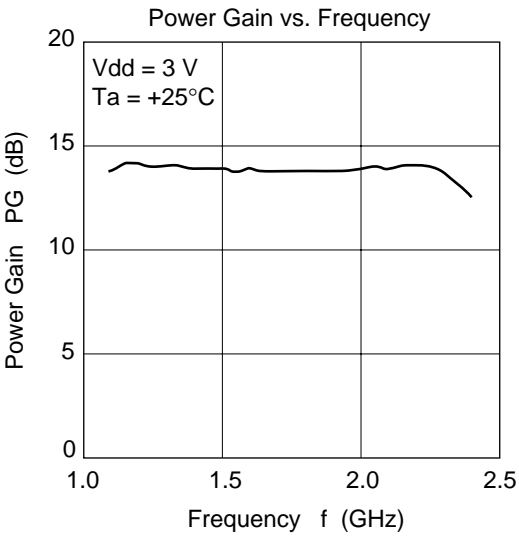
Front Side view of Part Layout

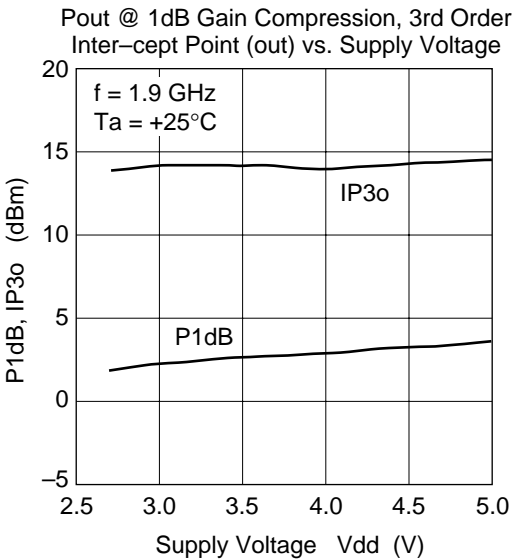
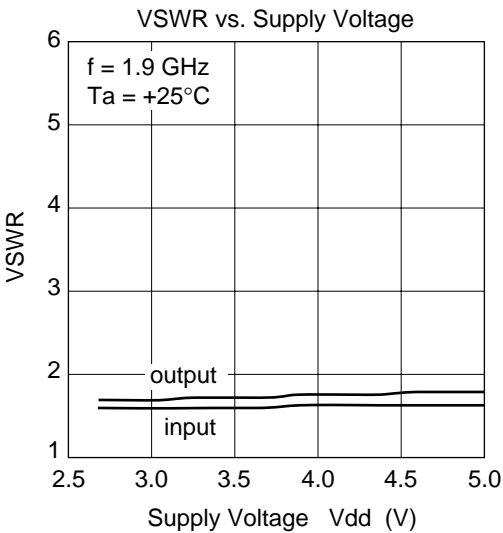
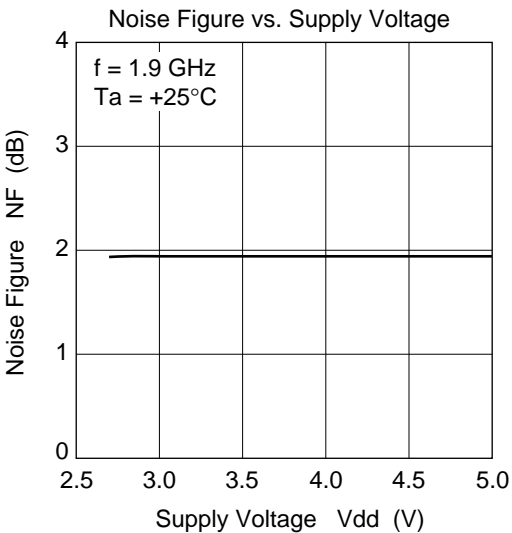
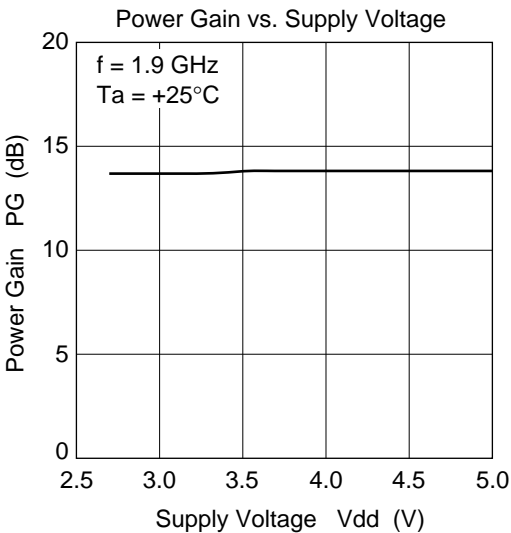
scale 4/1

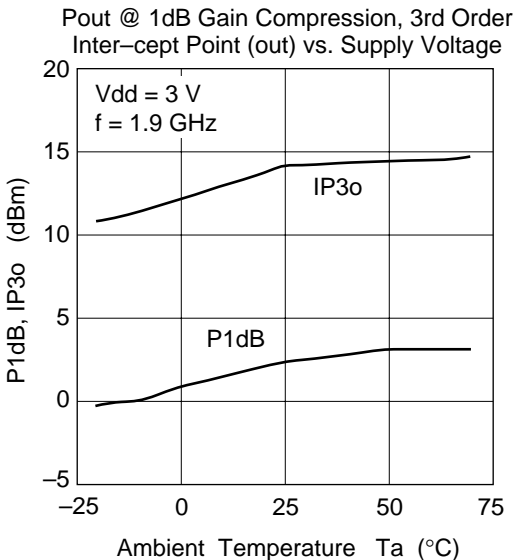
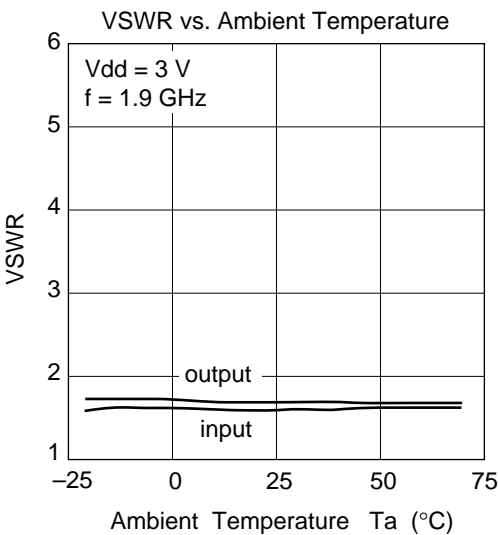
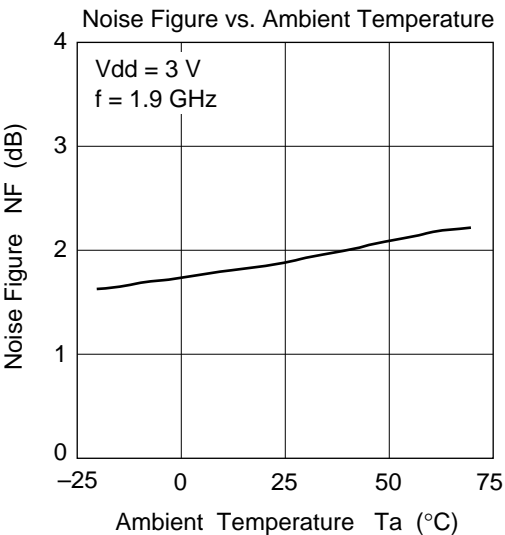
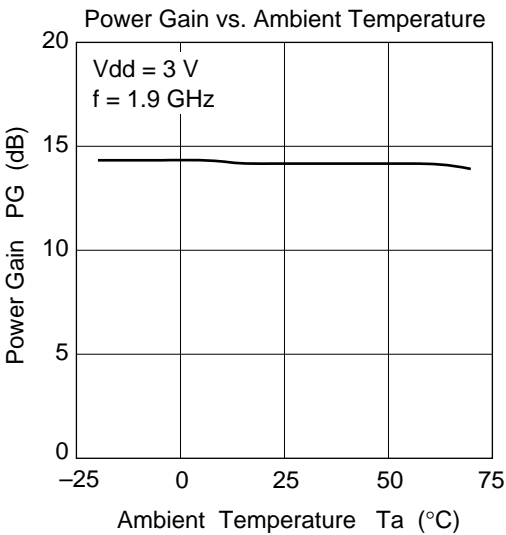
- ▬ : Capacitor (100pF)

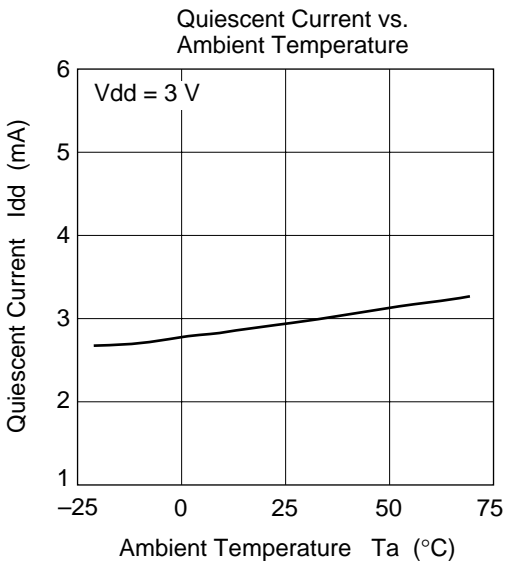
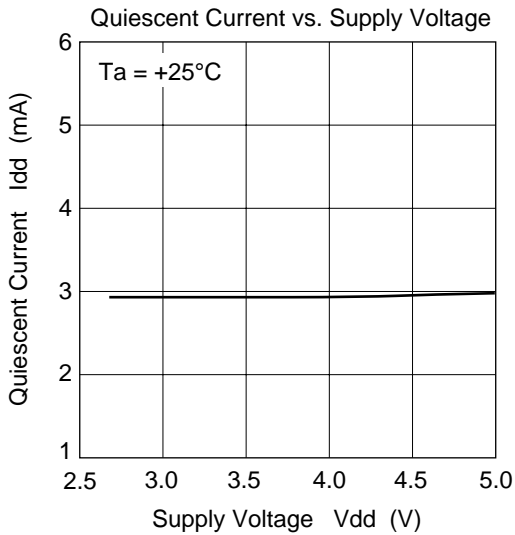
ER=4.8  
H=1mm

Main Characteristics



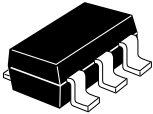
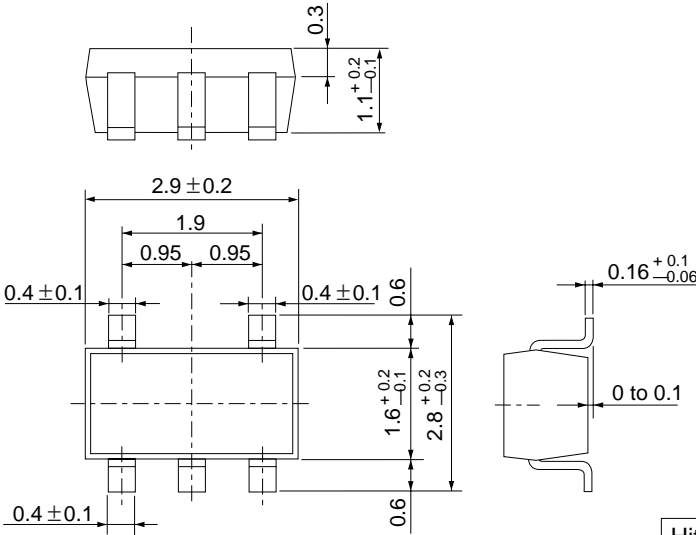






Package Dimentions

Unit: mm



Hitachi code	MPAK—5
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