
HA22022

GaAs MMIC Low Noise Amplifier for Micro Wave Application

HITACHI

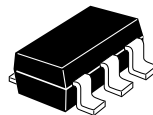
ADE-207-227 (Z)
1st. Edition
February 1997

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 (50Ω)
- 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.

HA22022

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 |

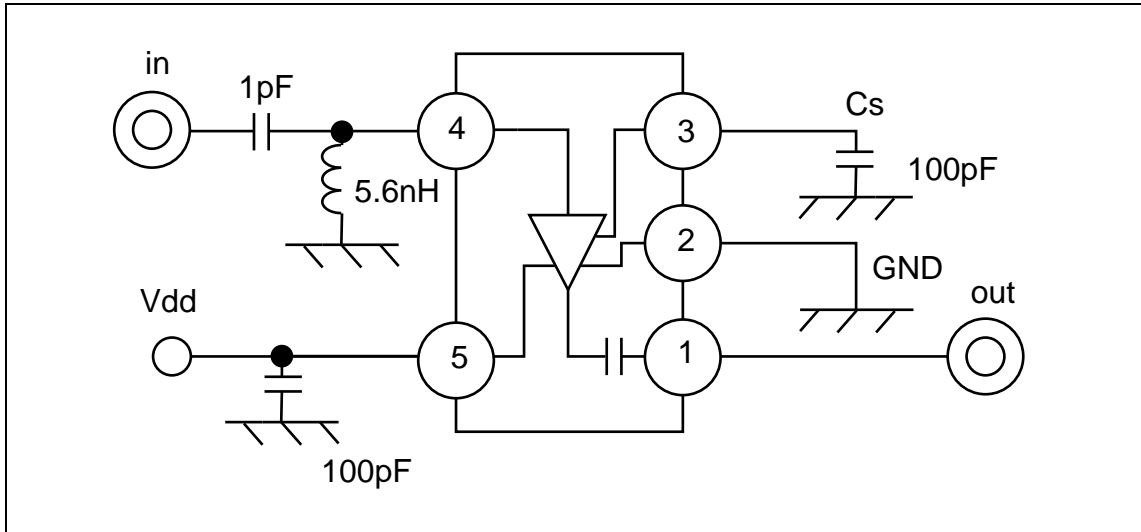
Electrical Characteristics (Ta = 25°C, Vdd = 3V)

| 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 | |

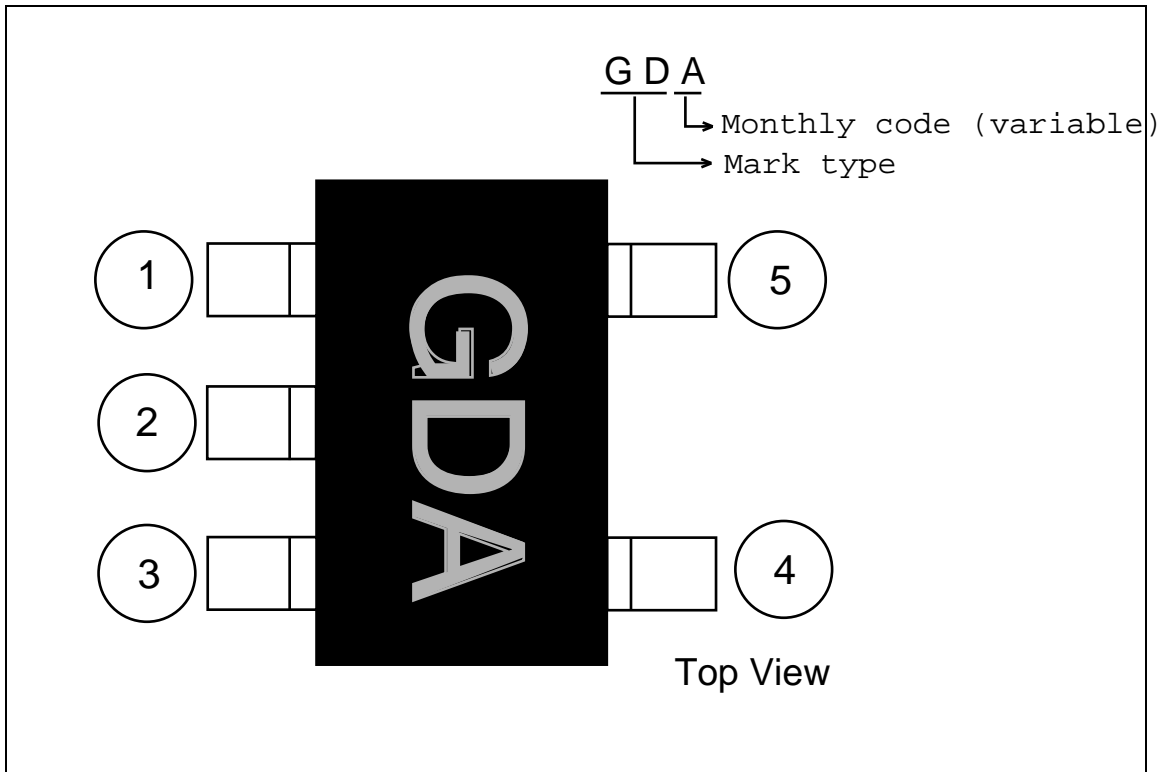
Typical Performance (Ta = 25°C, Vdd = 3V)

| 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

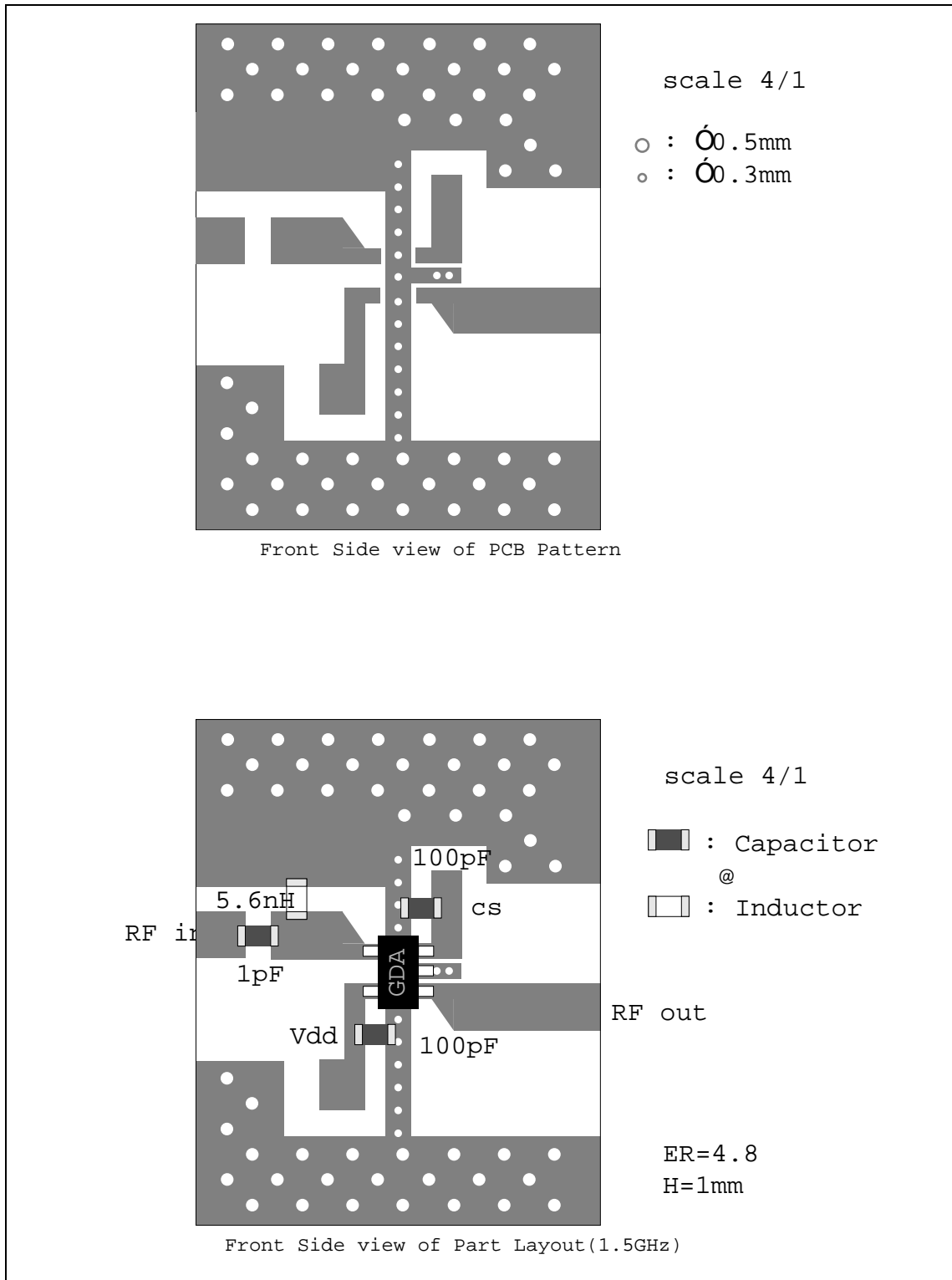


Pin Arrangement

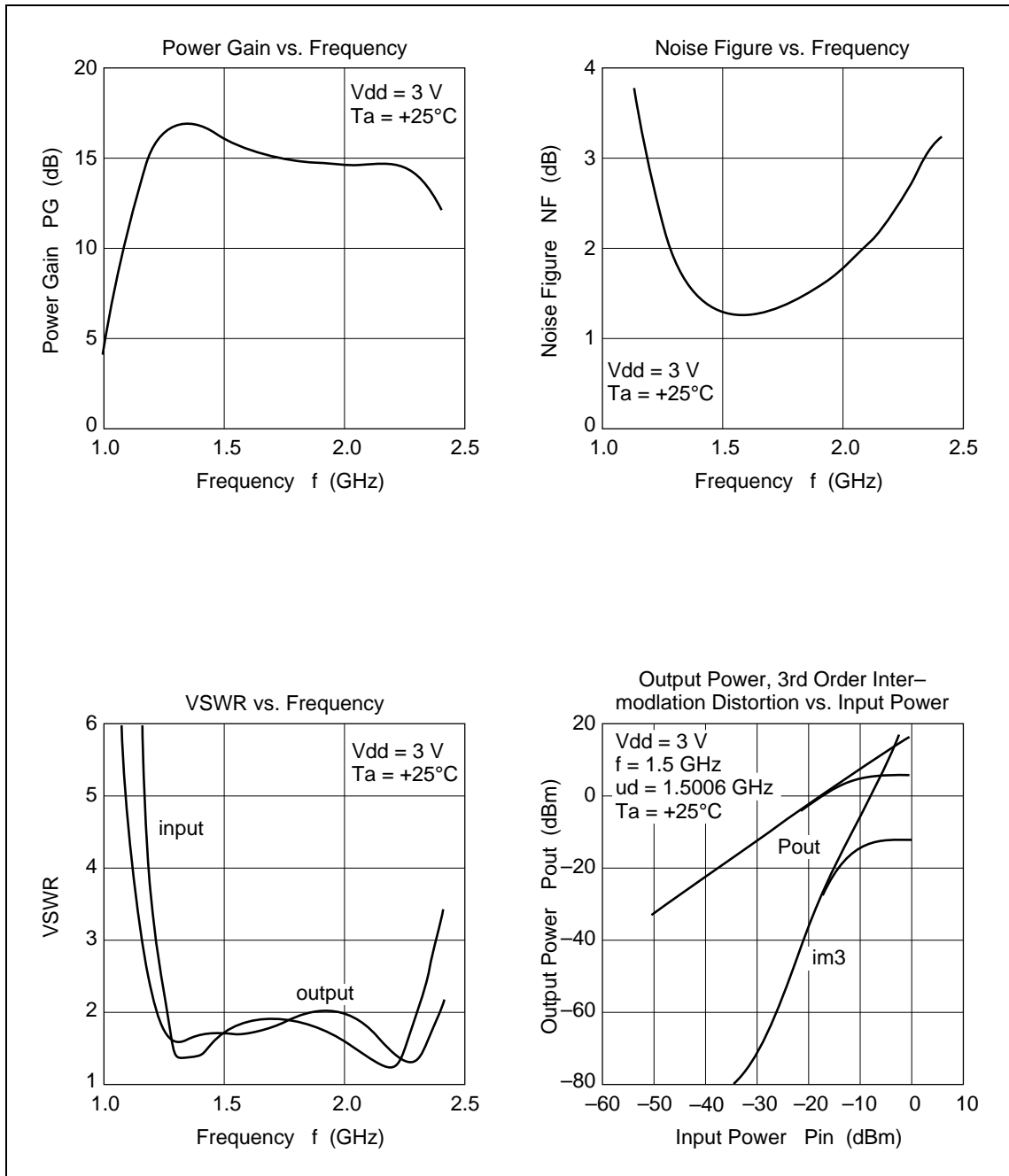


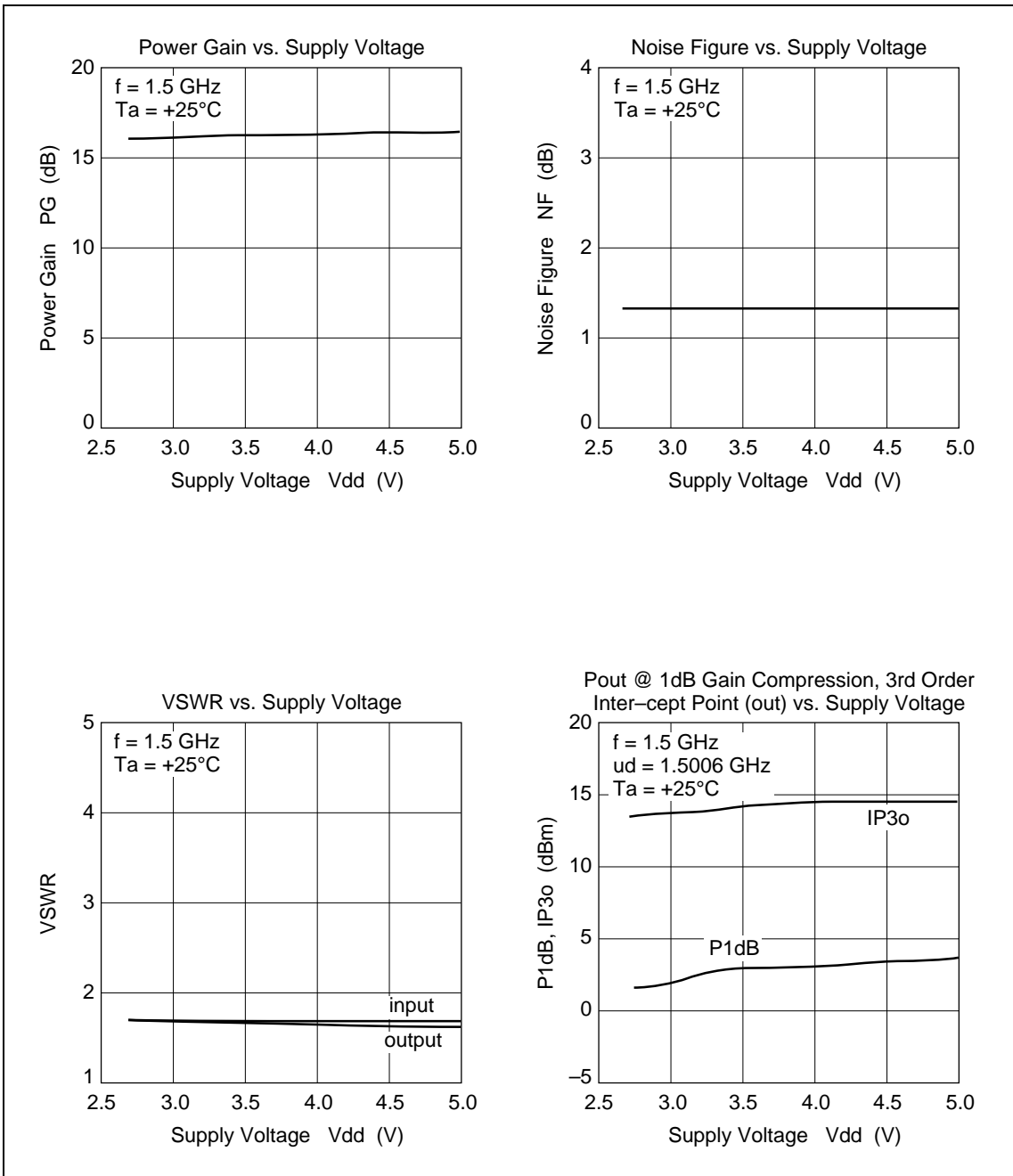
| Pin No. | Pin name | Function |
|---------|----------|----------------------------|
| 1 | RF out | RF output |
| 2 | GND | Ground |
| 3 | Cs | Bypass capacitor (>100 pF) |
| 4 | RF in | RF input |
| 5 | Vdd | Power supply |

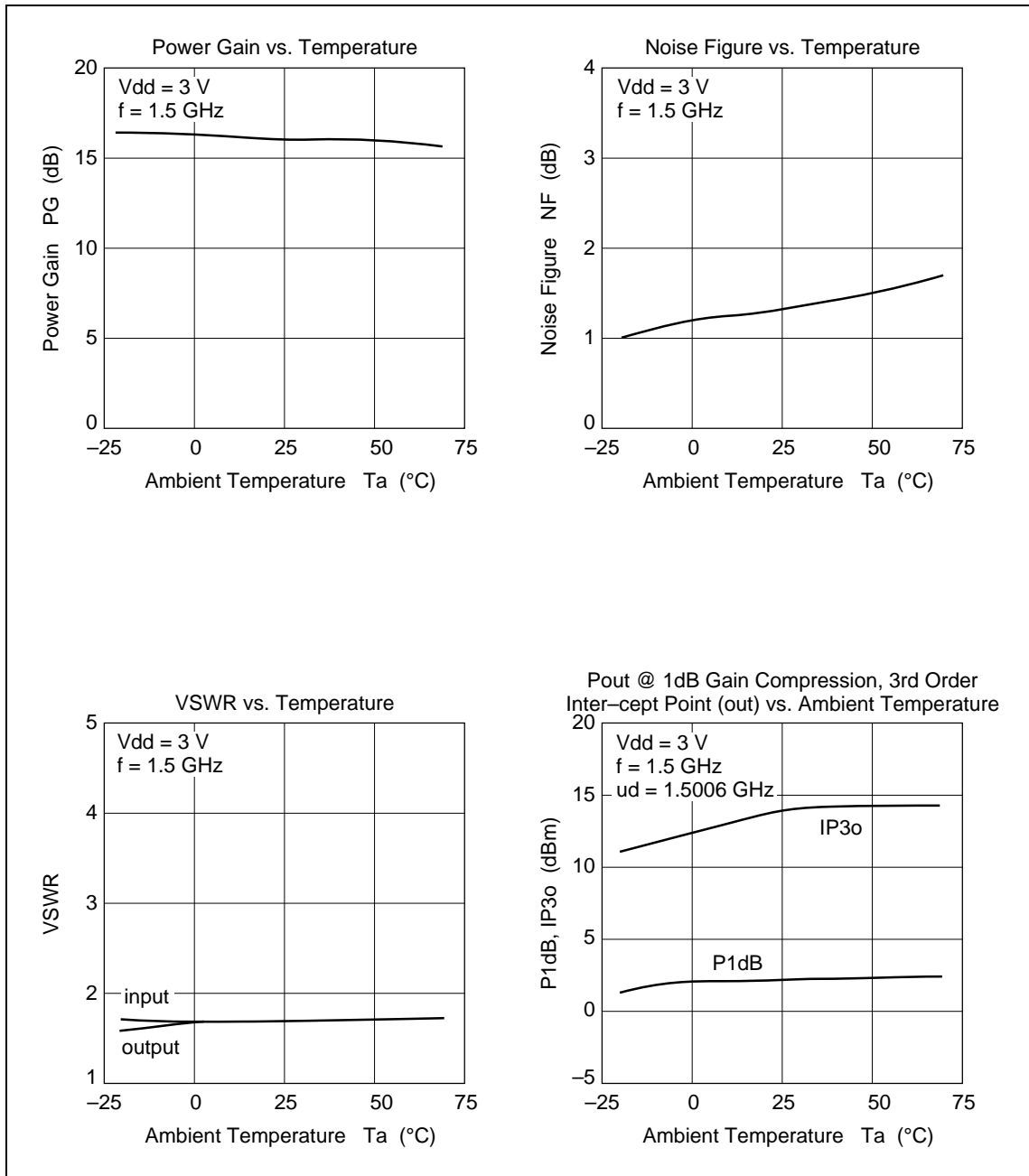
Pattern Layout

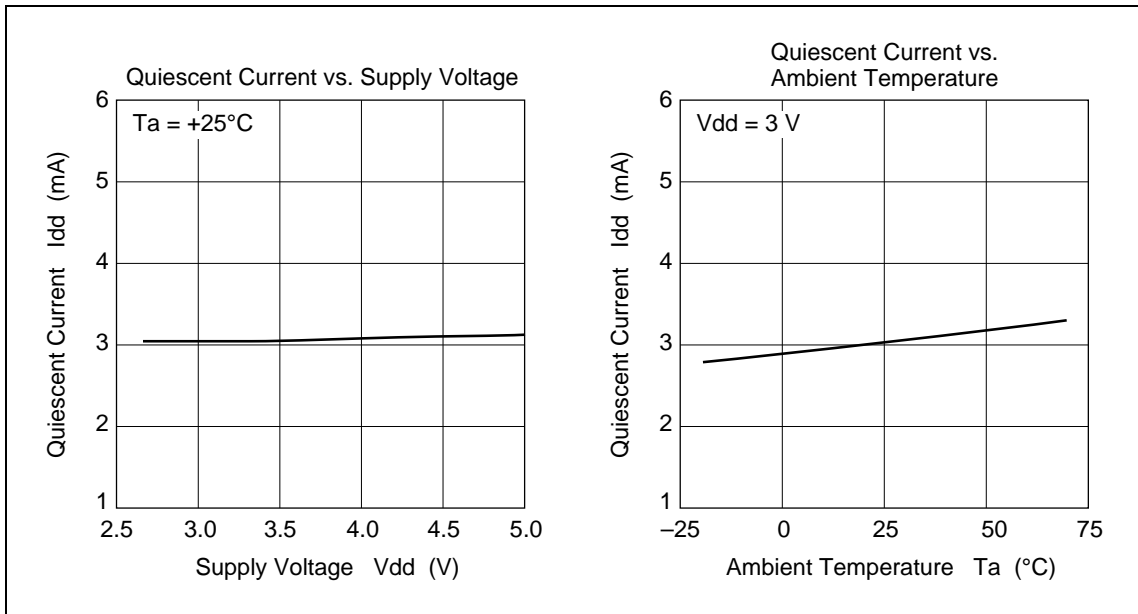


Main Characteristics





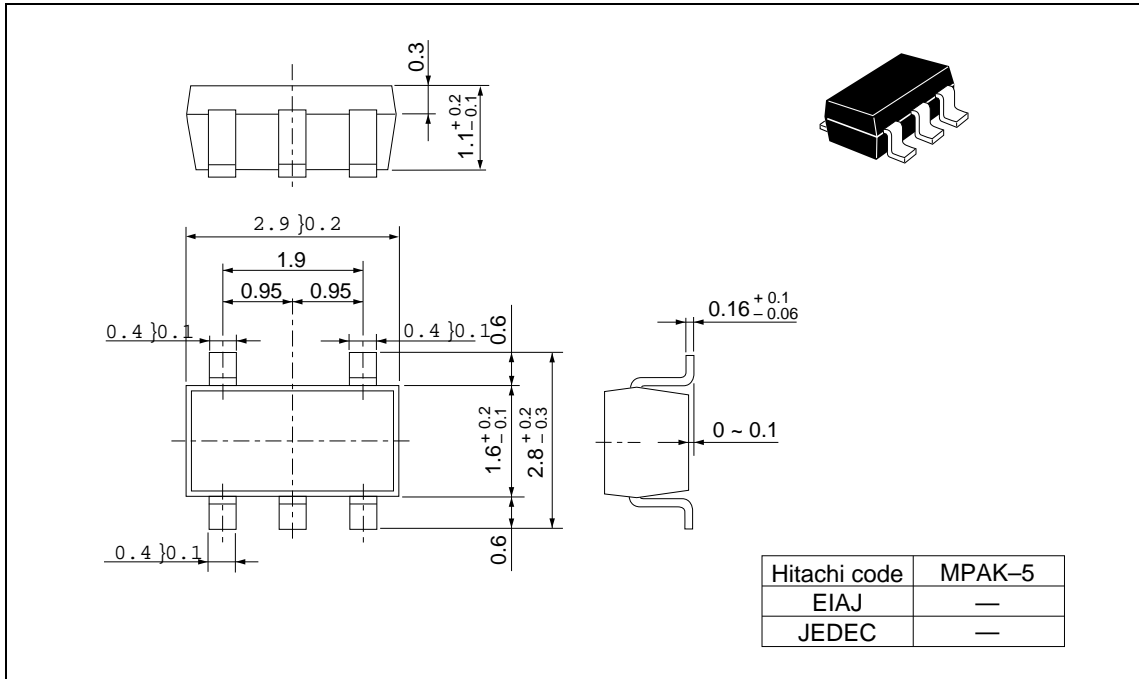




HA22022

Package Dimentions

Unit: mm



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.

When using this document, keep the following in mind:

1. This document may, wholly or partially, be subject to change without notice.
2. All rights are reserved: No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without Hitachi's permission.
3. Hitachi will not be held responsible for any damage to the user that may result from accidents or any other reasons during operation of the user's unit according to this document.
4. Circuitry and other examples described herein are meant merely to indicate the characteristics and performance of Hitachi's semiconductor products. Hitachi assumes no responsibility for any intellectual property claims or other problems that may result from applications based on the examples described herein.
5. No license is granted by implication or otherwise under any patents or other rights of any third party or Hitachi, Ltd.
6. **MEDICAL APPLICATIONS:** Hitachi's products are not authorized for use in **MEDICAL APPLICATIONS** without the written consent of the appropriate officer of Hitachi's sales company. Such use includes, but is not limited to, use in life support systems. Buyers of Hitachi's products are requested to notify the relevant Hitachi sales offices when planning to use the products in **MEDICAL APPLICATIONS**.

HITACHI

Hitachi, Ltd.
Semiconductor & IC Div.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100, Japan
Tel: Tokyo (03) 3270-2111
Fax: (03) 3270-5109

For further information write to:

Hitachi America, Ltd.
Semiconductor & IC Div.
2000 Sierra Point Parkway
Brisbane, CA. 94005-1835
U S A
Tel: 415-589-8300
Fax: 415-583-4207

Hitachi Europe GmbH
Electronic Components Group
Continental Europe
Dornacher Straße 3
D-85622 Feldkirchen
München
Tel: 089-9 91 80-0
Fax: 089-9 29 30 00

Hitachi Europe Ltd.
Electronic Components Div.
Northern Europe Headquarters
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA
United Kingdom
Tel: 0628-585000
Fax: 0628-778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 0104
Tel: 535-2100
Fax: 535-1533

Hitachi Asia (Hong Kong) Ltd.
Unit 706, North Tower,
World Finance Centre,
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon
Hong Kong
Tel: 27359218
Fax: 27306071