

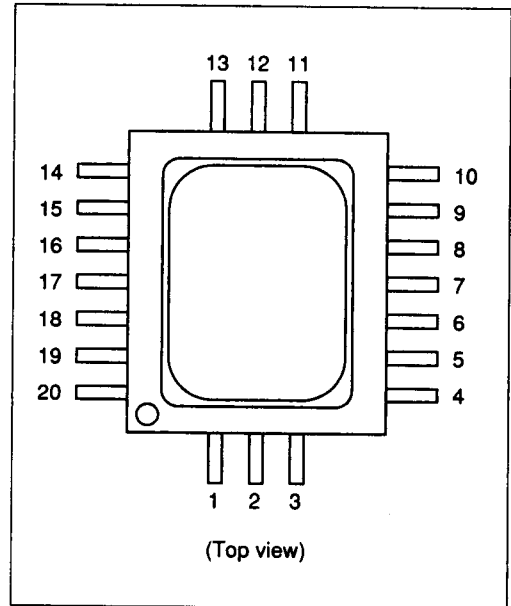
Main Amplifier for Optical Communication

The HA29204 is a fixed gain amplifier for fiber optic system. It achieves a high gain (20 dB) and very wide band width 2.5 GHz.

Features

- Band width; 2.5 GHz
- Typical gain; 20 dB
- 50 Ω line driving capability
- Single power supply of -5.2 V
- 20 pin package containing internal decoupling capacitors and input termination resistors of 50 Ω .

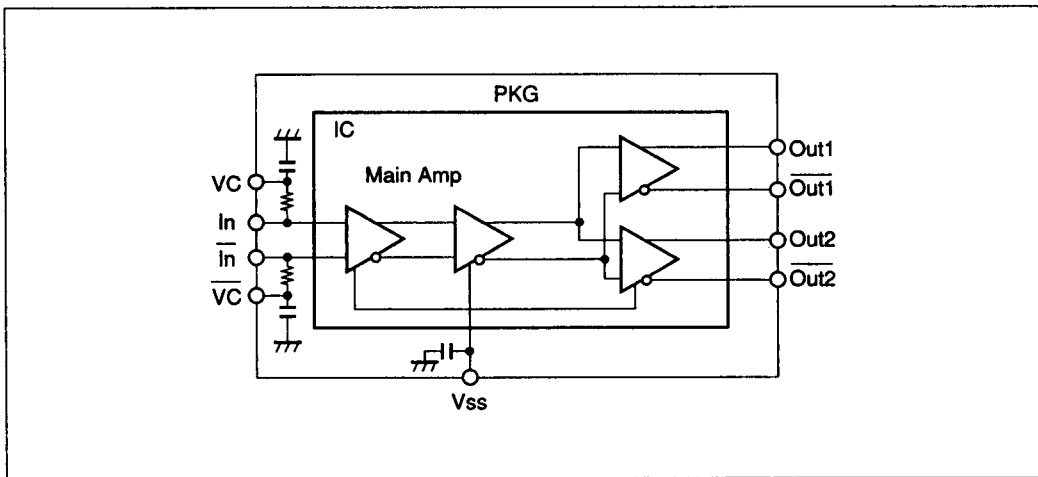
Pin Arrangement



| Pin No. | Symbol | Function |
|---------|--------------------|-----------------------|
| 1 | N/C | Non connection |
| 2 | (V _{SS}) | -5.2 V source input |
| 3 | N/C | Non connection |
| 4 | Out2 | +Signal output |
| 5 | GND | |
| 6 | Out2 | $-$ Signal output |
| 7 | GND | |
| 8 | Out1 | +Signal output |
| 9 | GND | |
| 10 | Out1 | $-$ Signal output |

| Pin No. | Symbol | Function |
|---------|-----------------|------------------------|
| 11 | N/C | Non connection |
| 12 | V _{SS} | -5.2 V source input |
| 13 | N/C | Non connection |
| 14 | VC | +Input level adjust |
| 15 | GND | |
| 16 | In | +Signal input |
| 17 | GND | |
| 18 | In | $-$ Signal input |
| 19 | GND | |
| 20 | VC | $-$ Input level adjust |

Block Diagram



Absolute Maximum Ratings

| Item | Symbol | Rating | Unit |
|---------------------|-----------|------------------|------|
| Supply voltage | V_{SS} | -7.5 to +0.5 | V |
| Input voltage | V_{in} | V_{SS} to -2.0 | V |
| Supply current | I_{SS} | 200 | mA |
| Storage temperature | T_{stg} | -55 to +125 | °C |

Recommended Operating Conditions

| Item | Symbol | Min | Typ | Max | Unit |
|-----------------------|----------|-------|------|-------|------|
| Supply voltage | V_{SS} | -5.46 | -5.2 | -4.94 | V |
| Operating temperature | T_a | 0 | — | +65 | °C |

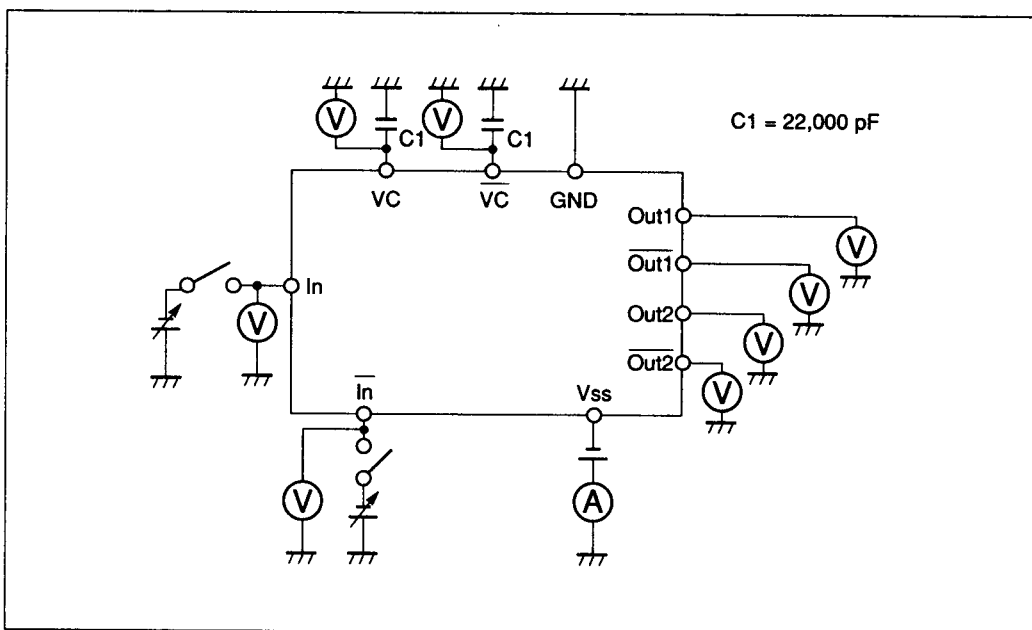
DC Characteristics ($V_{SS} = -5.2 \text{ V} \pm 5\%$)

| Item | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------|-----------|-----|------|-----|------|------------------|
| Input voltage (+) | V_{in+} | — | -3.9 | — | V | Terminal open |
| Input voltage (-) | V_{in-} | — | -3.9 | — | V | Terminal open |
| Offset voltage | V_{off} | — | 50 | — | mV | |
| VCO voltage | V_{co} | — | -3.9 | — | V | VC terminal open |
| Output voltage | V_{out} | — | -2.4 | — | V | |
| Power consumption | P_T | — | 750 | — | mW | |

AC Characteristics

| Item | Symbol | Min | Typ | Max | Unit | Test Condition |
|----------------------|--------------|-----|-----------|-----|----------|-------------------|
| Bandwidth | f_B | — | 2.5 | — | GHz | 3 dB down |
| Gain | G | — | 20 | — | dB | 100 MHz |
| Gain deviation | ΔG_F | — | -1.0/+1.0 | — | dB | 50 MHz to 1.5 GHz |
| Output voltage swing | Vout | — | 0.5 | — | Vp-p | |
| Noise figure | NF | — | 20 | — | dB | |
| Input impedance | Zin | — | 50 | — | Ω | |
| Input VSWR | Vsi | — | 1.6 | — | | 50 MHz to 2.5 GHz |
| Output impedance | Zout | — | 50 | — | Ω | |
| Output VSWR | Vso | — | 1.6 | — | | 50 MHz to 2.5 GHz |

DC Test Circuit



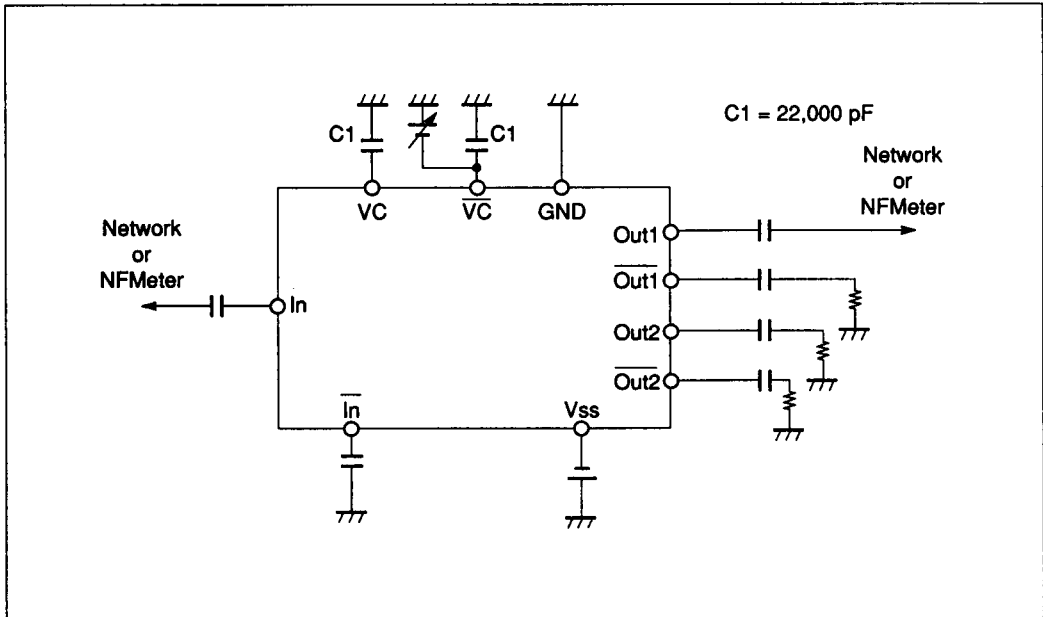
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Packaging Information

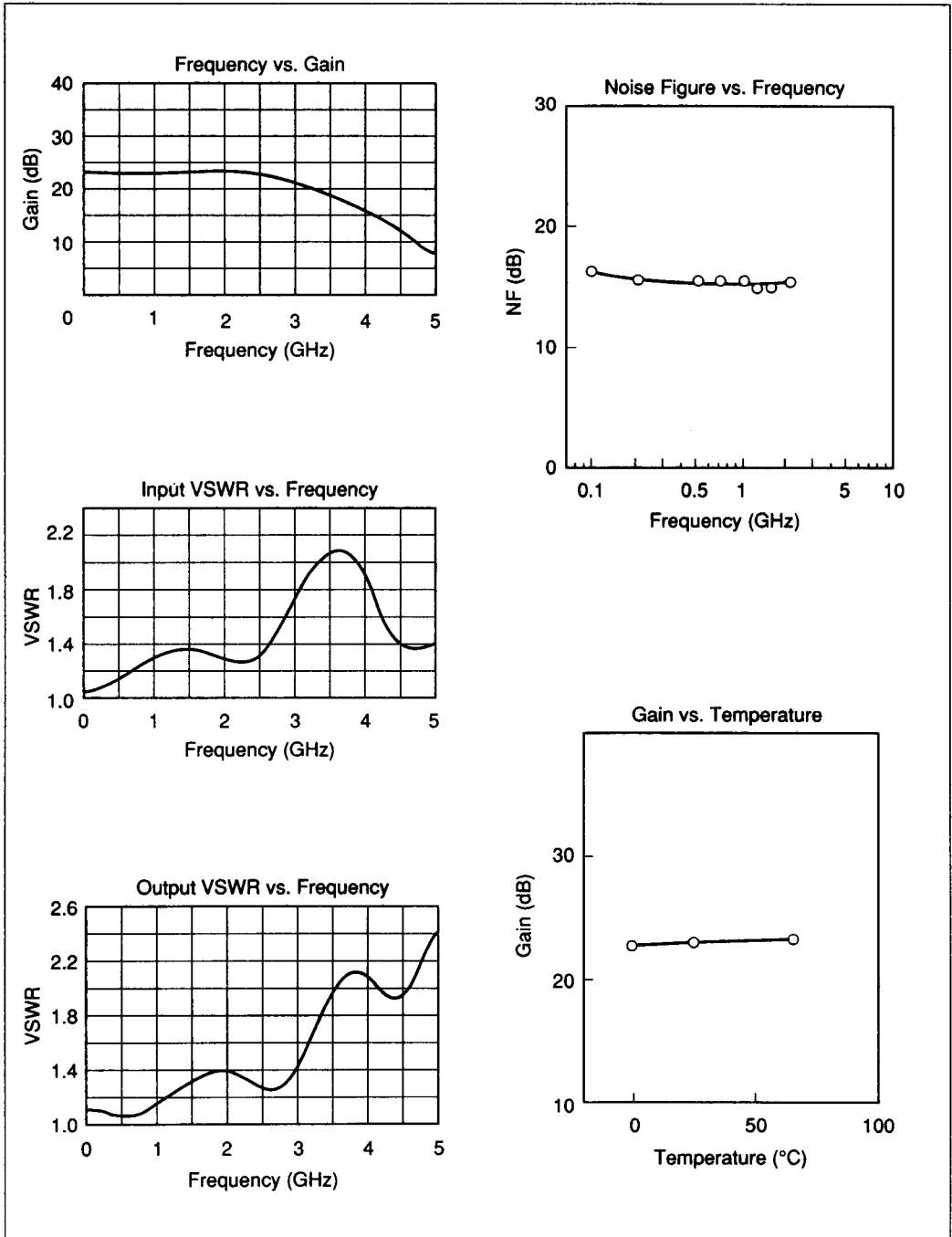
| Part No. | Package |
|----------|---------|
| HA29204 | FG-20 |

HITACHI

AC Test Circuit

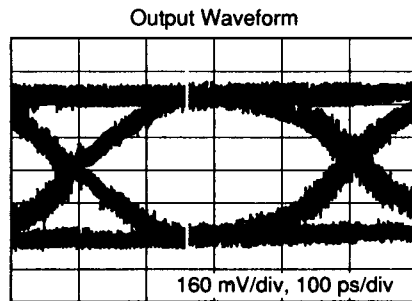
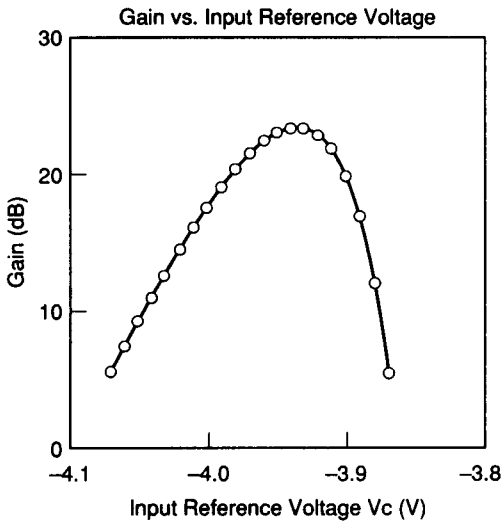
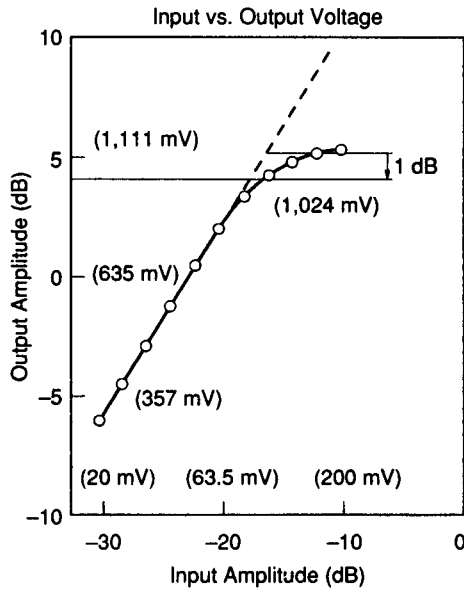


Typical Performance ($T_a = 25^\circ\text{C}$, $V_{SS} = -5.2\text{ V}$)

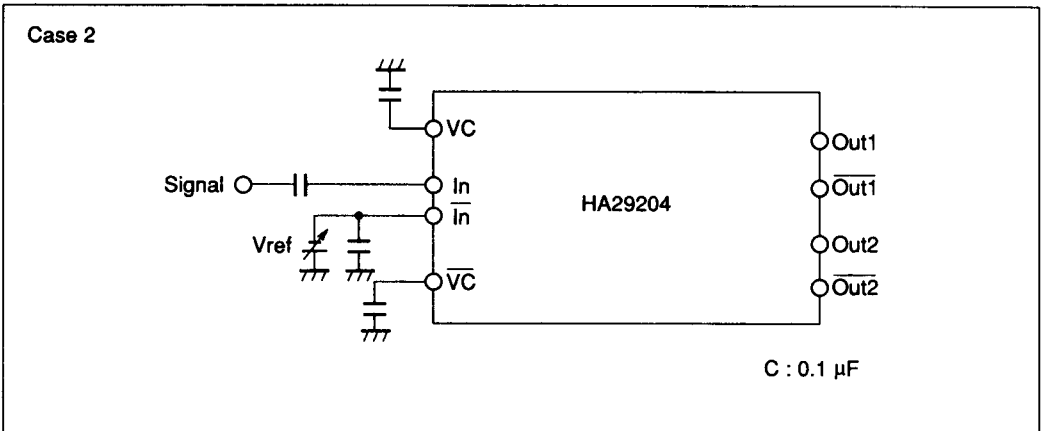
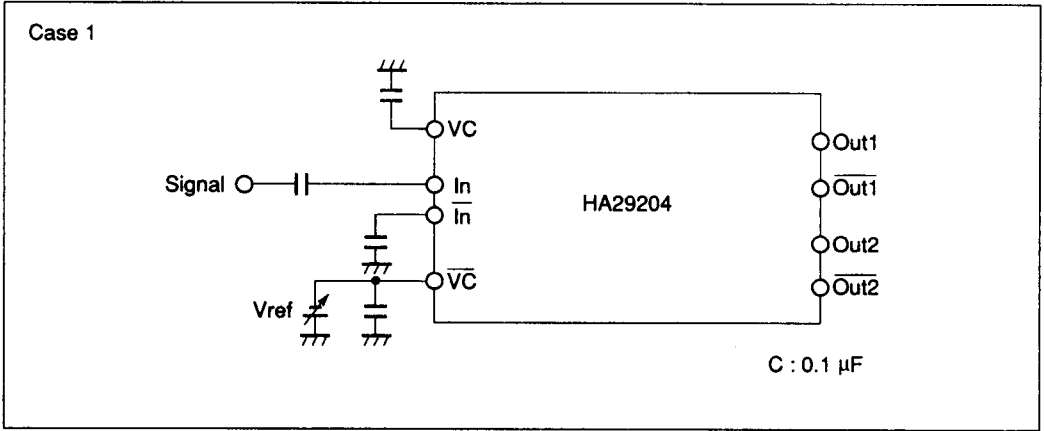


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Typical Performance ($T_a = 25^\circ\text{C}$, $V_{SS} = -5.2\text{ V}$) (cont)



Application Circuit



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