

**DESCRIPTION**

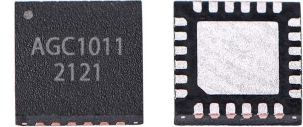
Sanland's AGC1011 is a variable Gain Amplifier with digital Attenuator. The Amplifier has low noise and high linearity achieved through the use of 0.5um GaAs Enhancement-mode pHEMT process. It is housed in a miniature 4.0 x 4.0 mm 24-pin Quad-Flat-Non-Lead (QFN) package. It is designed for optimum use from 0.05GHz up to 1.2GHz. The compact footprint and low profile coupled with low noise, high gain and high linearity make the AGC1011 an ideal choice as a low noise amplifier for CATV network and FTTH network.

**Major Applications**

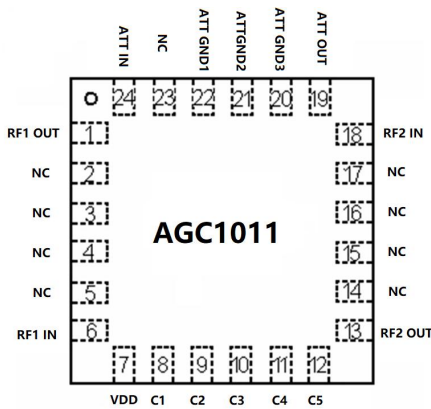
- CATV Network
- FTTH Network
- PON ONU

**KEY FEATURES**

- 40-1218MHz operating frequency range
- High linearity, 60dBc CTB/CSO 135 Channels @ +20dBmV/ch
- 41dB Gain at 55MHz; 41.5dB Gain at 1218MHz
- High dynamic gain range, 24dB Gain Control Range,
- Support 12dBm optical range Single supply, Single +5V Supply
- Low power consumption, 180mA for one RF output at 5V supply voltage
- Lead-free/RoHS compliant QFN4X4-24L package



**Pin Assignment**



**Pin Details**

| Pin | Name    | Description        | Pin | Name     | Description      |
|-----|---------|--------------------|-----|----------|------------------|
| 1   | RF1 OUT | AMP1 RF IN PORT    | 13  | RF2 OUT  | AMP2 RF OUT PORT |
| 2   | N/C     | Not connected      | 14  | N/C      | Not connected    |
| 3   | N/C     | Not connected      | 15  | N/C      | Not connected    |
| 4   | N/C     | Not connected      | 16  | N/C      | Not connected    |
| 5   | N/C     | Not connected      | 17  | N/C      | Not connected    |
| 6   | RF1 IN  | AMP1 RF IN PORT    | 18  | RF2 IN   | AMP2 RF IN PORT  |
| 7   | VDD     | ATT Supply voltage | 19  | ATT OUT  | ATT Inter RF OUT |
| 8   | C1      | ATT Control 1      | 20  | ATT GND3 | ATT RF GND3      |
| 9   | C2      | ATT Control 2      | 21  | ATT GND2 | ATT RF GND2      |
| 10  | C3      | ATT Control 3      | 22  | ATT GND1 | ATT RF GND1      |
| 11  | C4      | ATT Control 4      | 23  | N/C      | Not connected    |
| 12  | C5      | ATT Control 5      | 24  | ATT IN   | ATT Inter RF IN  |

**Absolute Maximum Ratings**

| Parameter  | Rating      | Unit |
|--|-------------|------|
| DC Power Supply  | +5.5        | V    |
| Max. Input Power   | -10         | dBm  |
| Operating Ambient Temperature  | -40 to +85  | °C   |
| Storage Temperature  | -65 to +150 | °C   |
| Max. Junction Temp. (TJ)   | +150        | °C   |
| MSL  | Level 2     |      |
| Operation beyond any one of these limits may cause permanent damage. |             |      |

**Important Note:**

The information provided in this datasheet is deemed to be accurate and reliable only at present time. Sanland Technology Corp. reserves the right to make any changes to the specifications in this datasheet without prior notice.



**Caution: ESD Sensitive**  
Appropriate precaution in handling, packaging  
And testing devices must be observed.

**Electrical Characteristics for Application**

(VDD =+5V; unless otherwise noted.)

| Parameter  | Specification |      |       | Units | Notes          |
|--|---------------|------|-------|-------|----------------|
|  | Min           | Typ. | Max   |       |                |
| Freq   | 0.05          | -    | 1.218 | GHz   | 50-1.218GHz    |
| Gain   | -             | 41   | -     | dB    | 50-1.218GHz    |
| Gain Control Range   | -             | 24   | -     | dB    | 0-24           |
| P-1dB  | -             | 20.5 | -     | dB    | At 500MHz/5dBm |
| OIP3   | -             | 34   | -     | dB    | At 500MHz/5dBm |
| Output return loss   | -             | -15  | -     | dB    | 50-1.218GHz    |
| NF   | -             | 0.5  | 0.69  | dB    | At 500MHz/5dBm |
| VDD  | -             | 5    | -     | V     | -              |
| IDD  | 160           | 180  | 200   | mA    | Vdd = 5.0V     |
| Test Conditions: VDD=5V, IDD=55mA Typ. OIP3 Tone Spacing=1MHz, Pout per ton=+5 dBm |               |      |       |       |                |
| TL=25°C, ZS=ZL=50 Ohms   |               |      |       |       |                |

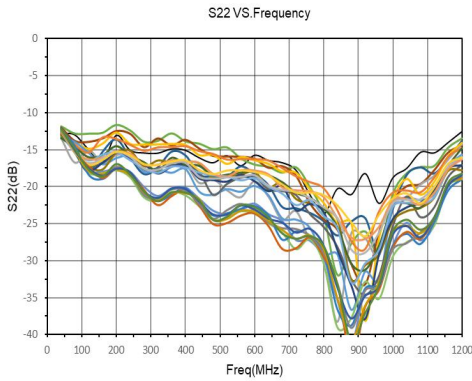
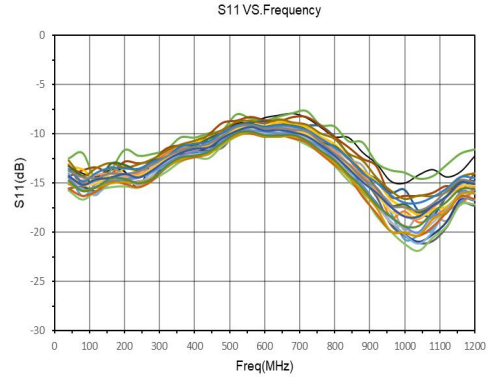
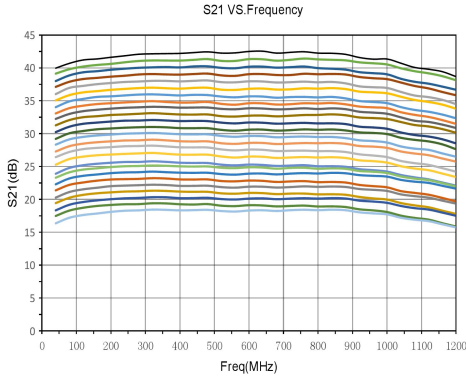
1. All measurements in a 75 Ohm system, unless otherwise specified.
2. Specified at maximum gain.
3. When the control voltage is changed, the attenuation is changed, Attenuation gain deviation is  $\pm 1.5$ dB

**Voltage and attenuation value comparison table**

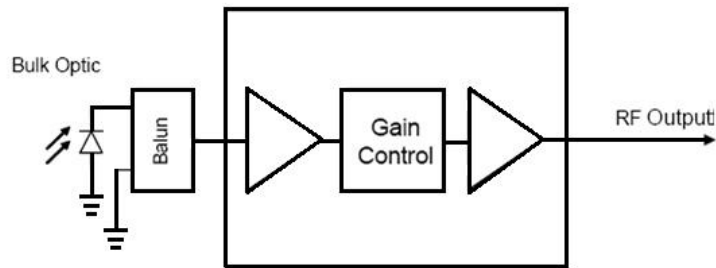
| Control Voltage |      |      |      |      | Attenuation |
|-----------------|------|------|------|------|-------------|
| C1              | C2   | C3   | C4   | C5   | RF1-RF2     |
| Low             | Low  | Low  | Low  | Low  | 0           |
| High            | Low  | Low  | Low  | Low  | 1dB         |
| Low             | High | Low  | Low  | Low  | 2dB         |
| High            | High | Low  | Low  | Low  | 3dB         |
| Low             | Low  | High | Low  | Low  | 4dB         |
| High            | Low  | High | Low  | Low  | 5dB         |
| Low             | High | High | Low  | Low  | 6dB         |
| High            | High | High | Low  | Low  | 7dB         |
| Low             | Low  | Low  | High | Low  | 8dB         |
| High            | Low  | Low  | High | Low  | 9dB         |
| Low             | High | Low  | High | Low  | 10dB        |
| High            | High | Low  | High | Low  | 11dB        |
| Low             | Low  | High | High | Low  | 12dB        |
| High            | Low  | High | High | Low  | 13dB        |
| Low             | High | High | High | Low  | 14dB        |
| High            | High | High | High | Low  | 15dB        |
| High            | High | High | Low  | High | 16dB        |
| Low             | Low  | Low  | High | High | 17dB        |
| High            | Low  | Low  | High | High | 18dB        |
| Low             | High | Low  | High | High | 19dB        |
| High            | High | Low  | High | High | 20dB        |
| Low             | Low  | High | High | High | 21dB        |
| High            | Low  | High | High | High | 22dB        |
| Low             | High | High | High | High | 23dB        |
| High            | High | High | High | High | 24dB        |

Note:  $V_{low}=0\sim 0.5V$  @100 $\mu$ A Max  
 $V_{high}=+3$  to  $+5V$  @100 $\mu$ A Max  
 $V_{dd}=5V\pm 0.2V$ @5mA Max(PIN7)

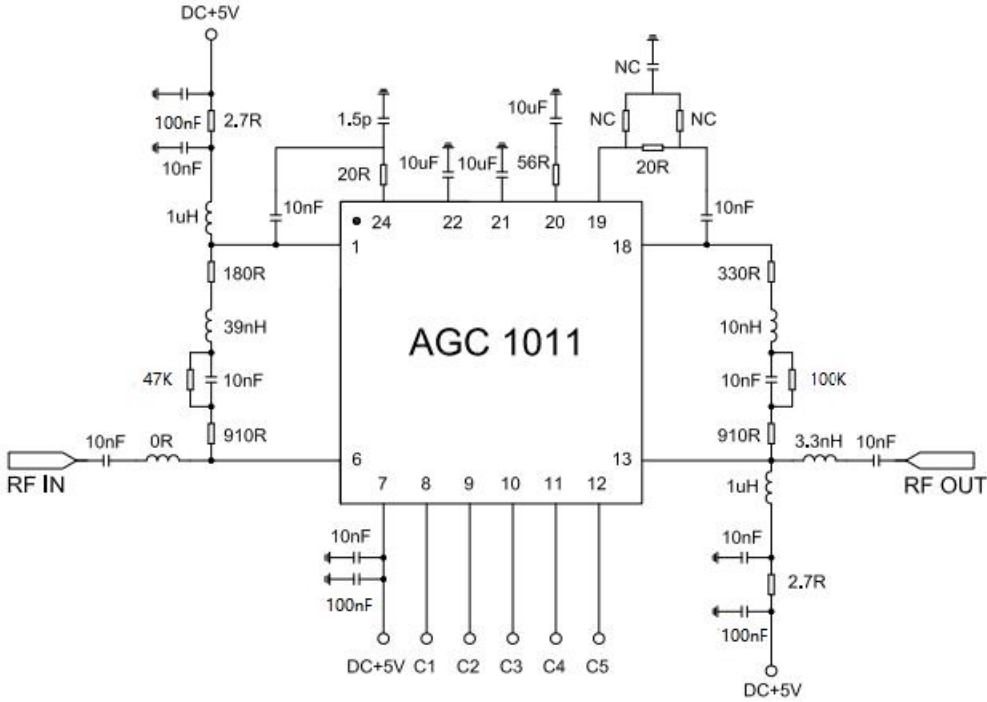
**Typical Performance (+25°C)**



**Application Schematic**



**Application Circuit**



**QFN4X4-24L Package Outline Dimension**

