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# Variable Gain Amplifier AVG1009

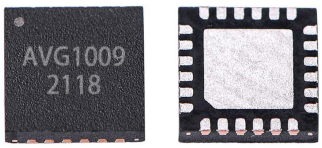
## DESCRIPTION

Sanland's AGC1009 is a variable Gain Amplifier with Voltage Controlled Attenuator. The Amplifier has low noise and high linearity achieved through the use of 0.5um GaAs D-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 AGC1009 an ideal choice as a low noise amplifier for CATV network and FTTH network.

## KEY FEATURES

- 40-1218MHz operating frequency range
- -15dBm to -5dBm Optical Input Range
- Single +5V Supply
- 29dB Gain at 55MHz；34dB Gain at 1000MHz
- 22dB Gain Control Range
- +24dBmV/ch Output at 550MHz
- Lead-free/RoHS compliant QFN4X4—24L package

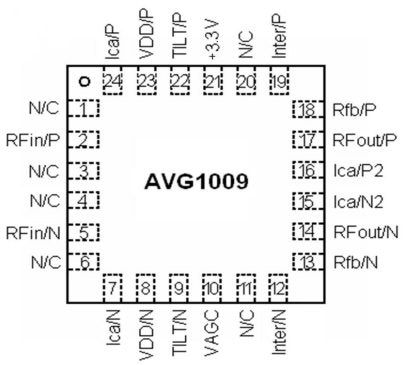
RoHS Compliant & Green Package




## Major Applications

•CATV Network
•FTTH Network
•PON ONU

## Pin Assignment




## Product Outline

| Pin | Function | Description | Pin | Function | Description |
|---|---|---|---|---|---|
| 1 | N/C | Not connected | 13 | Rfb/N | N port Feedback |
| 2 | RFin/P | RFin P port | 14 | RFout/N | RFout N port |
| 3 | N/C | Not connected | 15 | Ica/N2 | N port Current Adjust2 |
| 4 | N/C | Not connected | 16 | Ica/P2 | P port Current Adjust2 |
| 5 | RFin/N | RFin N port | 17 | RFout/P | RFout P port |
| 6 | N/C | Not connected | 18 | Rfb/P | P port Feedback |
| 7 | Ica/N | N port Current Adjust | 19 | Inter/P | P port Inter Pin |
| 8 | VDD/N | N port Supply voltage | 20 | N/C | Not connected |
| 9 | TILT/N | Tilt Connection | 21 | +3.3 | AGC Supply Voltage |
| 10 | VAGC | AGC Control Voltage | 22 | TILT/P | Tilt Connection |
| 11 | N/C | Not connected | 23 | VDD/P | P port Supply voltage |
| 12 | Inter/N | N port Inter Pin | 24 | Ica/P | P port Current Adjust |

## Product Performance (Ta=25℃)

| Symbol | Parameter[1] | Units | Frequency | Min. | Typ. | Max. |
|---|---|---|---|---|---|---|
| G | Trans-Impedance (Max. Gain State) | dB | 0.05 GHz<br>0.87 GHz<br>1GHz | 26.5<br>31.0<br>31.5 | 29.0<br>33.0<br>34.0 | 30.5<br>35.0<br>35.5 |
| GT | Gain Tilt | dB | - | | 7 | - |
| G Range | Gain Control Range | dB | 0.05 GHz<br>0.87 GHz<br>1GHz | 25.5<br>23.0<br>24.0 | 29.0<br>26.0<br>27.0 | 32.0<br>29.0<br>30.0 |
| VAGC | AGC Control Voltage Range | V | | +3 | - | 0 |
| RL | Output Return Loss | dB | 0.05-1 GHz | - | -18 | - |
| EIN[2] | Equivalent Input Noise | pA/rtHz | 0.05-1 GHz | - | 3.2 | - |
| IDD | Attenuator Current | mA | VDD=+5V | 160 | 170 | 180 |

1. All measurements in a 75 Ohm system, unless otherwise specified.
2. Specified at maximum gain($V_{AGC}$=+3V).

## Absolute Maximum Ratings

| Parameter | Absolute Limit |
|---|---|
| Supply Voltage(VDD) | +6V |
| Operating Temperature | -40℃ to +85℃ |
| Storage Temperature | -65℃ to +150℃ |
| Maximum Input Power | +3 dBm |
| MSL | Level 2 |
| Operation of this device above any one of these parameters may cause permanent damage. | |

## Truth Lable:

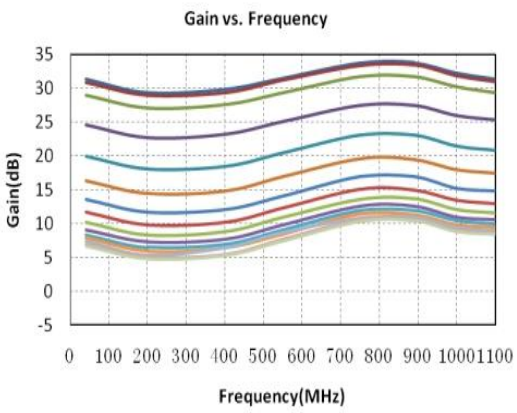
| VAGC | State | Description |
|---|---|---|
| 0V | Max. Gain | The minimum attenuation |
| +3V | Min. Gain | The maximum attenuation |

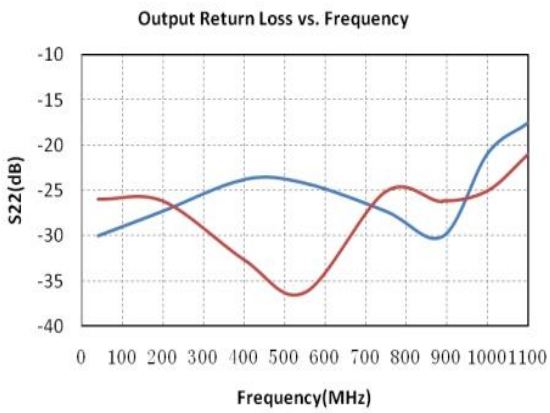
RoHS

**ESD Class 1A**
**ELECTROSTATIC SENSITIVE DEVICE**
**OBSERVE HANDLING PRECAUTIONS**

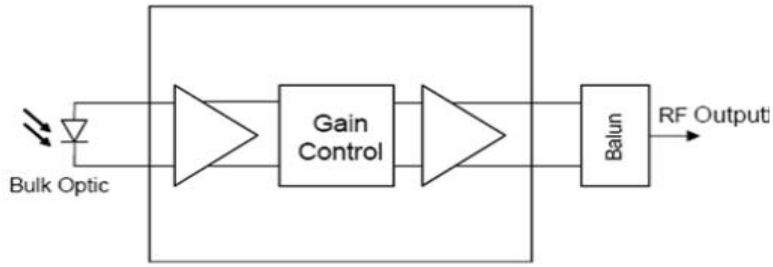
## Typical Peformance

(+25℃,VAGC=0V(Max. Gain) to 3V(Min. Gain))

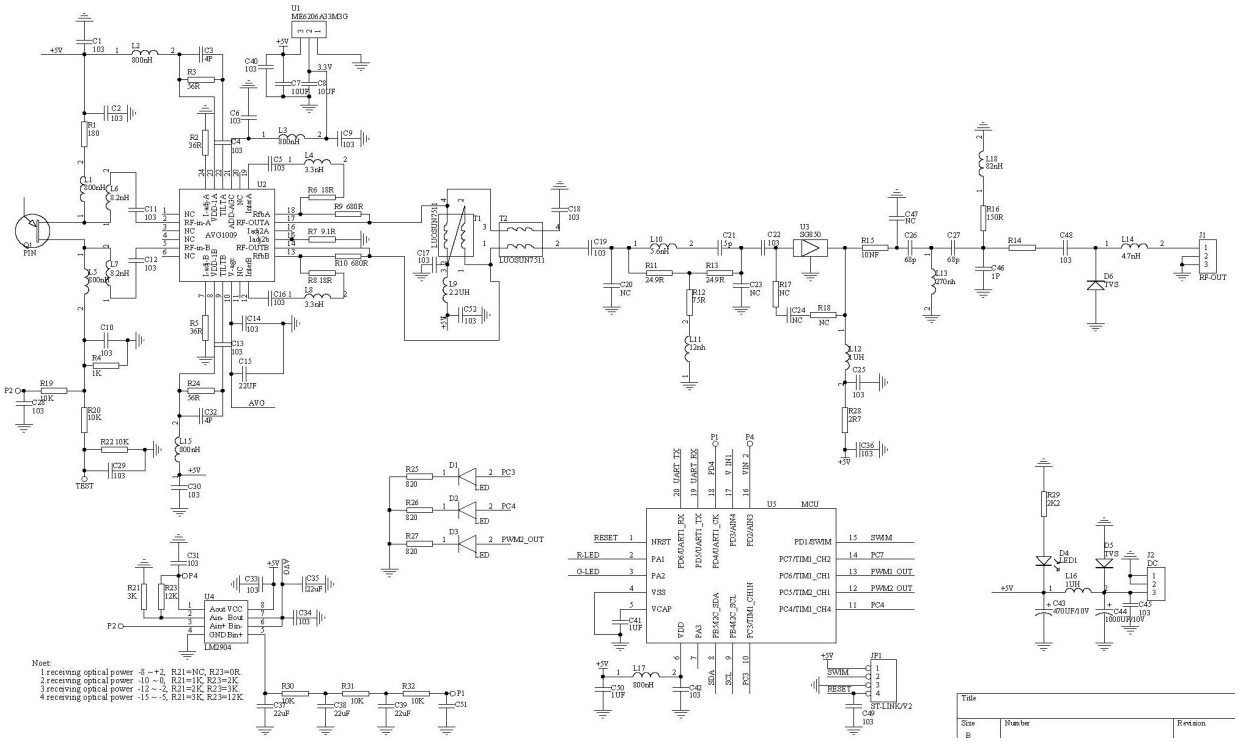


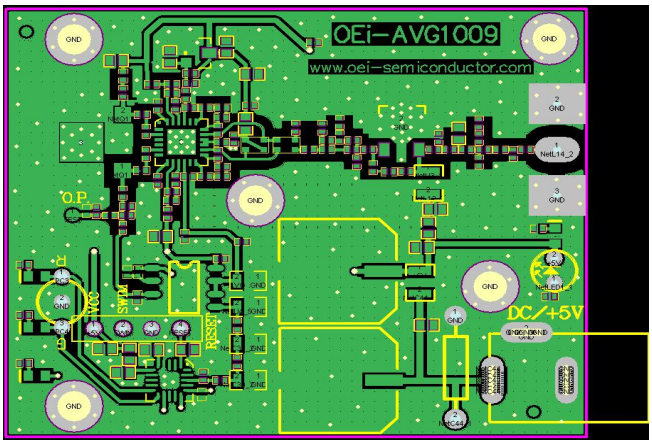
## Application Schematic



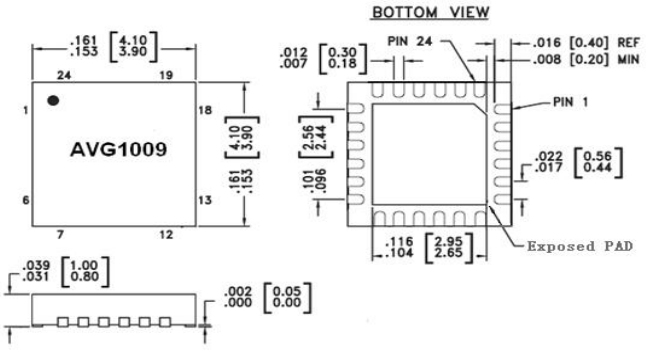

## Application Circuit

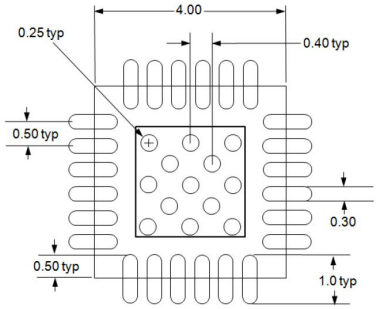


## Recommended PCB




## QFN4X4-24L Package Outline Dimension




All dimension are in mm

1. Dimension applies to metallized terminal and is measured between 0.25 and 0.30 from terminal tip.
2. Coplanarity applies to the exposed heat sink slug as well as the terminals.
3. Dimensions are in millimeters.