

Product Features

- 50MHz ~ 1GHz
- GaAs E-pHEMT
- 22dB Gain
- 2.0 dB Noise Figure
- +18.0 dBm P1dB
- SOT-89 SMT Package
- Single +5V Supply
- Pb Free / RoHS Standard

Applications

- CATV Amplifier



Package Type : SOT-89

Description

AE308 is used from 50MHz to 1GHz frequencies and GaAs E-pHEMT in a low cost SOT-89 package. The package is SOT-89, which is pin-to-pin compatible with industry standard.

Electrical Specifications @ $V_{dc} = 5V$; $T_{case} = 25^{\circ}C$; $Z_S = Z_L = 75\Omega$

| PARAMETER | UNIT | MIN | TYP | MAX | CONDITION | |
|------------------------------------|-------------|-------|-----|------|---------------|--------------------------------|
| Operating Frequency(f_o) | MHz | 50MHz | - | 1GHz | - | |
| Gain (S_{21}) | dB | - | 22 | - | 50MHz ~ 1GHz | |
| Input Return Loss(S_{11}) | dB | - | -15 | - | - | |
| Output Return Loss(S_{22}) | dB | - | -15 | - | - | |
| Output IP3(OIP3) | dBm | 27 | 29 | - | - | |
| 1dB Compression Point(P_{1dB}) | dBm | 17 | 19 | - | 50 ~ 500MHz | |
| | dBm | 15 | 17 | - | 500MHz ~ 1GHz | |
| Output IP2(OIP2) | dBc | 37 | 45 | 54 | 50MHz ~ 1GHz | |
| Noise Figure(NF) | dB | - | 1.5 | - | 50 ~ 800MHZ | |
| | dB | - | 2 | - | 800MHz ~ 1GHz | |
| CSO | 50 ~ 870MHz | dBc | - | -58 | - | 135 channels,+16dBmV/ch,Single |
| CTB | | dBc | - | -64 | - | 135 channels,+16dBmV/ch,Single |
| XMD | | dBc | - | -67 | - | 135 channels,+16dBmV/ch,Single |
| Current | mA | 40 | 55 | 70 | - | |

Note

1. Test conditions unless otherwise noted. $T=25^{\circ}C$, $V_{dc}=5.0V$, 75Ω system
2. OIP3 measured with 2 tones at an output power of 5dBm/tone separated by 1MHz

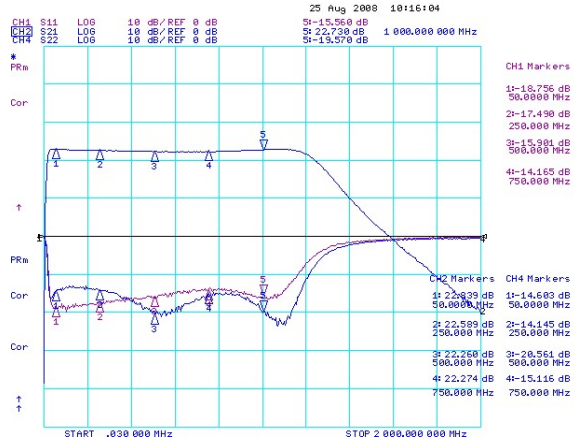
Absolute Maximum Ratings

| PARAMETER | Minimum Rating | Maximum Rating |
|--|----------------|----------------|
| Operating Case Temperature ($^{\circ}C$) | -40 | 85 |
| Storage Temperature ($^{\circ}C$) | -50 | 125 |
| Drain-Source Voltage (V) | - | 7 |

Single-Ended CATV 75ohm Evaluation Circuit : (50MHz ~1GHz)

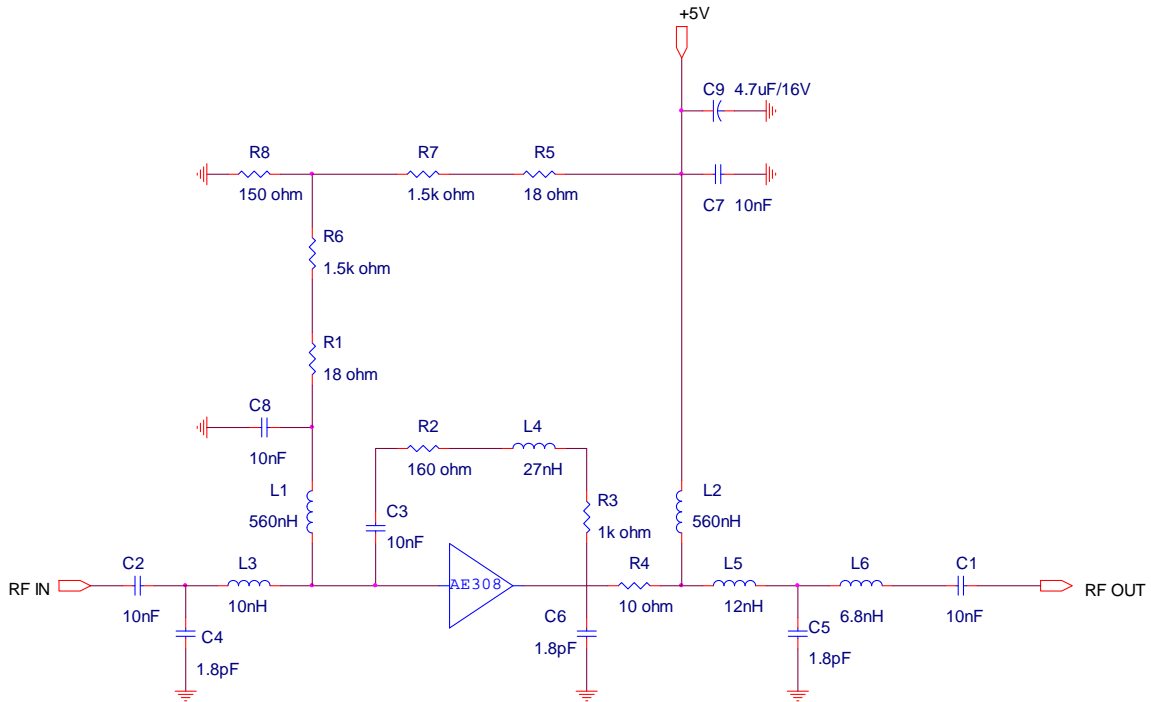
Typical RF Performance @ 25 °C

| PARAMETER | UNIT | TYPICAL | | |
|------------------------------------|------|---------|-----|------|
| Operating Frequency(f_o) | MHz | 50 | 450 | 1000 |
| Gain (S_{21}) | dB | 22 | 22 | 22 |
| Input Return Loss(S_{11}) | dB | -15 | -15 | -15 |
| Output Return Loss(S_{22}) | dB | -15 | -15 | -15 |
| Output IP3(OIP3) | dBm | 29 | 30 | 28 |
| 1dB Compression Point(P_{1dB}) | dBm | 19 | 19 | 17 |
| Output IP2(OIP2) | dBc | 45 | 42 | 54 |
| Noise Figure(NF) | dB | 1.3 | 1.5 | 2 |
| CSO ⁽¹⁾ | dBc | -58 | | |
| CTB ⁽¹⁾ | dBc | -64 | | |
| XMD ⁽¹⁾ | dBc | -67 | | |
| Supply Voltage | V | 5 | | |
| Current | mA | 40~70 | | |



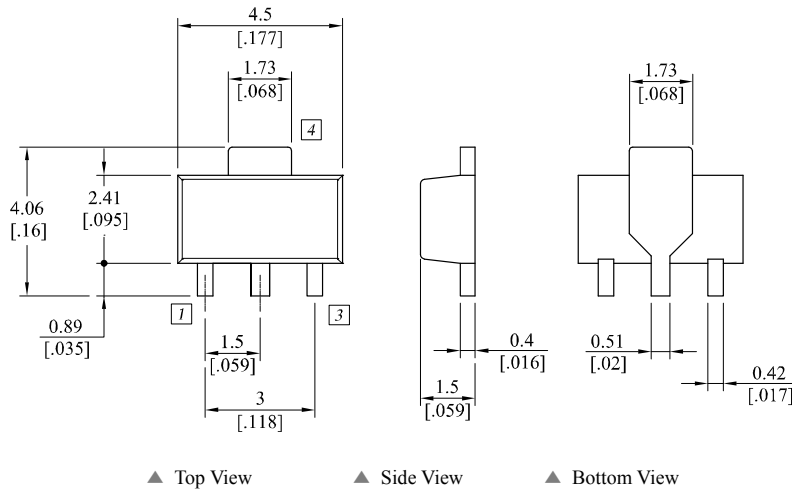
(1) 135channels, 16dBmV/ch, Single

Application Circuit @ 50MHz~1GHz



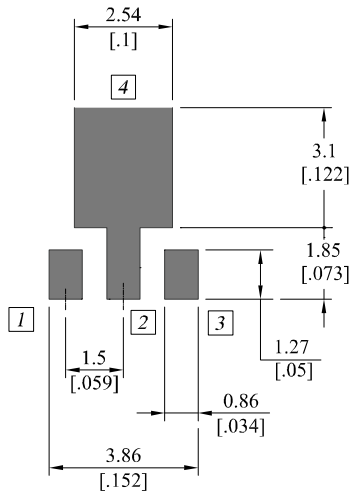
Package Dimensions (Type: SOT-89)

* Unit: mm[inch] | Tolerance ± 0.2 [.008]

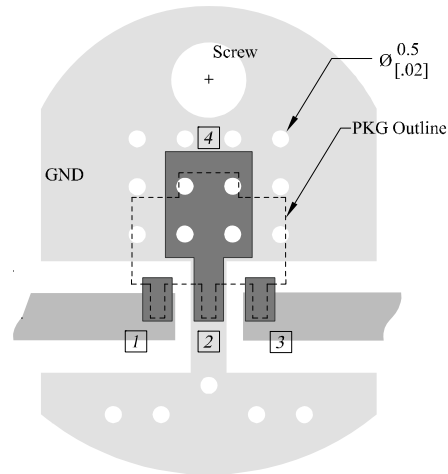


| Pin Description | | | |
|-----------------|---------------|--------|----------|
| Pin No | Function | Pin No | Function |
| 1 | Input | 4 | GND |
| 2 | GND | | - |
| 3 | Output / Bias | | - |

Recommended Pattern



Recommended Mounting Configuration



* Mounting Configuration Notes

1. Ground / thermal via holes are critical for the proper performance of this device.
2. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
3. Mounting screws can be added near the part to fasten the board to a heatsink. Ensure that the ground / thermal via hole region contacts the heatsink.
4. Do not put solder mask on the backside of the PCB in the region where the board contacts the heatsink.
5. RF trace width depends upon the PCB material and construction.
6. Use 1 oz. Copper minimum.

Revision History

| Part Number | Release Date | Version | Modification | Data Sheet Status |
|--------------------|---------------------|----------------|----------------------|--------------------------|
| AE308 | 2012.10.17 | 1.4 | New datasheet format | - |
| AE308 | 2012.2.18 | 1.3 | - | - |
| | | | | |

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