

### FEATURES

- 25 dB Gain
- 40 MHz to 1 GHz Operating Range
- 0.5 dB Gain Flatness
- 24 V Supply
- Supply Current: 430 mA (Typ.)
- Very Low Distortion & Noise
- Robust Design and Insensitive to Voltage Transients
- GaAs Monolithic IC-Based
- Standard SOT-115J Package
- Ruggedized design with integrated ring wave surge protection
- Superior ESD protection, >7kV

### APPLICATIONS

- Distribution Nodes, System Amplifiers, and Line Extenders in CATV Systems

### PRODUCT DESCRIPTION

The ACA2786 is a GaAs Hybrid Amplifier for CATV HFC distribution systems. It consists of two pairs of parallel amplifiers that are optimized for exceptionally low distortion and noise figure with input and output transient voltage protection. The ACA2786 is offered in a standard SOT-115J package.

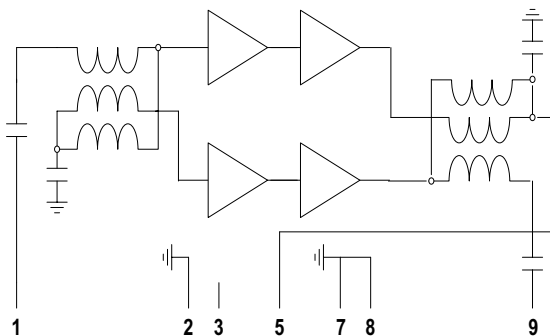


Figure 1: Simplified Hybrid Internal Arrangement

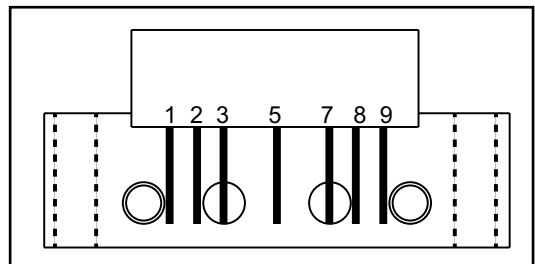


Figure 2: Hybrid Pinout

Table 1: SOT-115J Pinning

| PIN  | Description          |
|------|----------------------|
| 1    | RF Input             |
| 2    | GND                  |
| 3    | GND or No Connection |
| 5    | 24 V                 |
| 7, 8 | GND                  |
| 9    | RF Output            |

**Table 2: Absolute Minimum and Maximum Ratings**

|                                     | Symbol           | Min | Typ | Max  | Unit            | Conditions  |
|-------------------------------------|------------------|-----|-----|------|-----------------|-------------|
| Supply Voltage                      | V <sub>DD</sub>  | -   | +24 | +28  | V <sub>DC</sub> |             |
| RF Power at inputs                  | -                | -   | -   | +70  | dBmV            | single tone |
| Operating mounting Base temperature | T <sub>MB</sub>  | -20 | -   | +100 | °C              |             |
| Storage Temperature                 | T <sub>STG</sub> | -40 |     | +100 | °C              |             |

**Table 3: Operating Ranges**

|              | Symbol | Min | Typ | Max  | Unit | Conditions |
|--------------|--------|-----|-----|------|------|------------|
| RF Frequency | -      | 40  | -   | 1000 | MHz  |            |

**Table 4: Electrical Characteristics**  
**(Test condition: 40 to 1000 GHz, T<sub>MB</sub> = 30°C, 75 Ω loading)**

|                        | Symbol          | Min | Typ        | Max        | Unit | Conditions                       |
|------------------------|-----------------|-----|------------|------------|------|----------------------------------|
| Power Gain             | G <sub>P</sub>  | 24  | 25         | 26         | dB   | f = 1 GHz                        |
| Slope cable equivalent | SL              | -   | 1.5        | -          | dB   | 47 MHz to 1 GHz                  |
| Gain Flatness          | -               | -   | ±0.5       | -          | dB   | 47 MHz to 1 GHz (peak to valley) |
| Input Return Loss      | S <sub>11</sub> | -   | -          | -20<br>-17 | dB   | 40 - 500 MHz<br>500 - 1000 MHz   |
| Output Return Loss     | S <sub>22</sub> | -   | -          | -19<br>-17 | dB   | 40 - 500 MHz<br>500 - 1000 MHz   |
| CTB                    | -               | -   | -70<br>-70 | -65<br>-   | dBc  | See Note 1<br>See Note 2         |
| CSO                    | -               | -   | -70<br>-70 | -65<br>-   | dBc  | See Note 1<br>See Note 2         |
| Noise Figure           | -               | -   | 3.5        | 5.0        | dB   |                                  |
| Supply Current         | -               | -   | 430        | 445        | mA   |                                  |

**Notes:**

(1) 79 analog NTSC channels to 550 MHz + 75 digital QAM channels (at -6 dB offset) with 15.5 dB tilt referenced to +55 dBmV output power at 1GHz.

(2) 79 analog NTSC channels with flat output of +44 dBmV @ 550 MHz plus 53 digital channels to -6 dB offset to 1GHz.

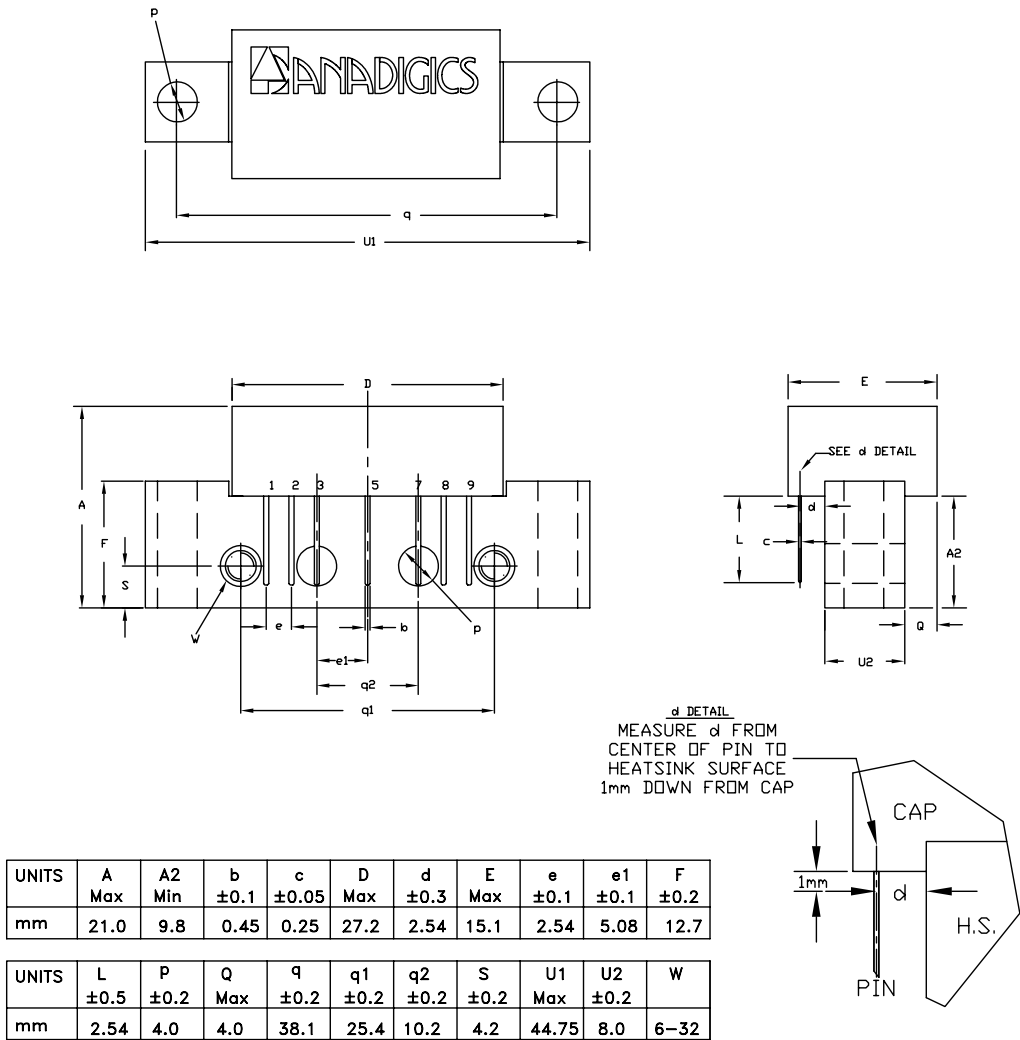


Figure 3: Hybrid Line Amp Physical Outline

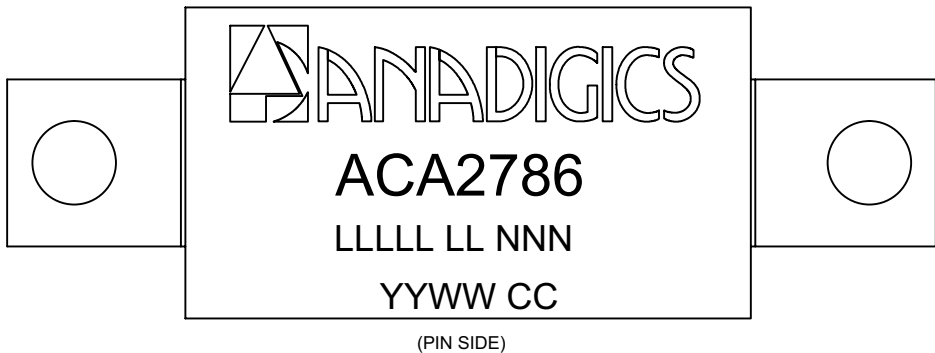


Figure 4: Branding Specification

**ORDERING INFORMATION**

| ORDER<br>NUMBER | TEMPERATURE<br>RANGE | PACKAGE<br>DESCRIPTION | COMPONENT<br>PACKAGING |
|-----------------|----------------------|------------------------|------------------------|
| ACA2786V0       | -20 °C to +100 °C    | SOT-115J               | 100 Piece Box          |
| ACA2786P9       | -20 °C to +100 °C    | SOT-115J               | Special handling       |

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