

FEATURES

- 21 dB Gain
- 40 MHz to 870 MHz Operating Range
- 0.2 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 SOT115J Package

APPLICATIONS

- Distribution Nodes and Line Extenders in CATV Systems

PRODUCT DESCRIPTION

The ACA3742 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. The ACA3742 is offered in a standard SOT115J package.

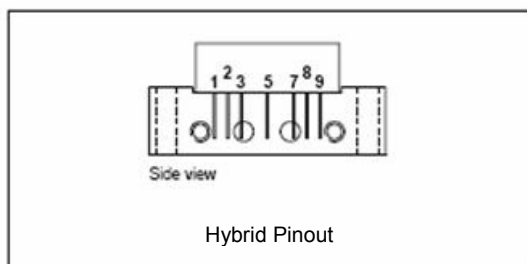
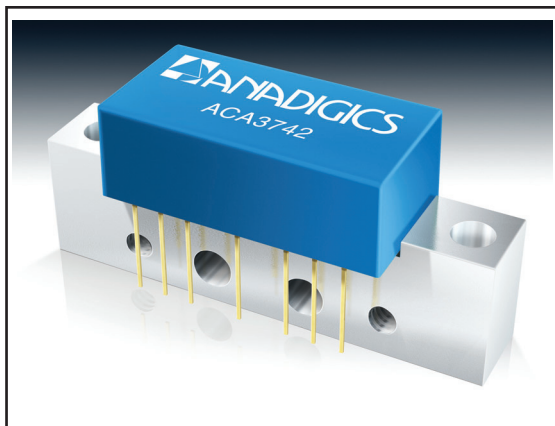


Figure 2: Hybrid Pinout

Table 1: SOJ115J Pinning

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

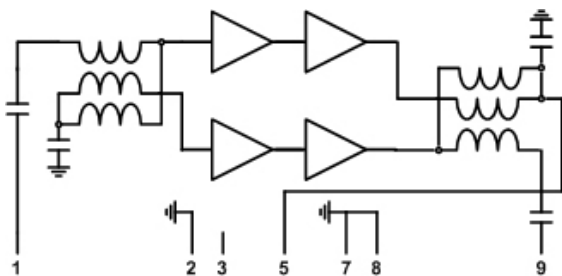


Figure 1: Simplified Hybrid Internal Arrangement

Table 2: Absolute Minimum and Maximum Ratings

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

Table 3: Operating Ranges

| | Symbol | Min | Typ | Max | Unit | Conditions |
|--------------|--------|-----|-----|-----|------|------------|
| RF Frequency | - | 40 | - | 870 | MHz | |

Table 4: Electrical Characteristics(Test condition: 40 to 870 MHz, T_{MB} = 30°C, 75 Ω loading, see note 1)

| | Symbol | Min | Typ | Max | Unit | Conditions |
|------------------------|-----------------|------|-----------|------------|------|---|
| Power Gain | G _P | 19.5 | 21 | 22.0 | dB | |
| Slope cable equivalent | SL | - | 0.4 | - | dB | |
| Gain Flatness | FL | - | ± 0.2 | - | dB | See Note 2 |
| Input Return Loss | S ₁₁ | - | - | -20 -17 | dB | 45 MHz to 100 MHz 100 MHz to 870 MHz |
| Output Return Loss | S ₂₂ | - | - | -20 -17 | dB | 45 MHz to 100 MHz 100 MHz to 870 MHz |
| CTB | - | - | -73 | -68 | dBc | See Note 1 |
| CSO | - | - | -76 | -68 | dBc | See Note 1 |
| XMOD | - | - | -68 | - | dBc | See Note 1 |
| Noise Figure | - | - | 3.5 | 5.0 | dB | |
| Supply Current | - | 410 | 430 | 445 | mA | |

Note:

1. 79 flat NTSC analog channels at +48 dBmV/Ch output power, plus 52 flat NTSC analog channels at 38 dBmV/Ch.
2. Deviation (peak-to-valley) from best fit line between 40 MHz and 870 MHz.

S-Parameters Data Plots:

Figure 3: Input Return Loss vs. Frequency

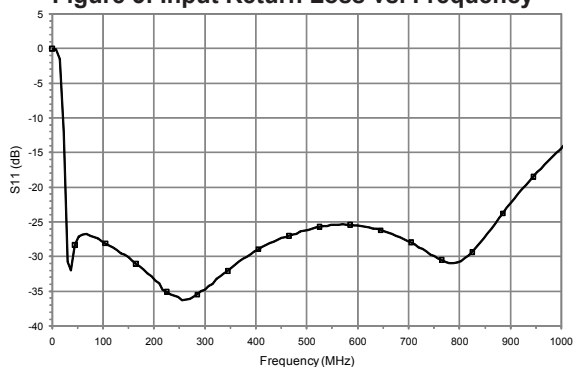


Figure 4: Gain vs. Frequency

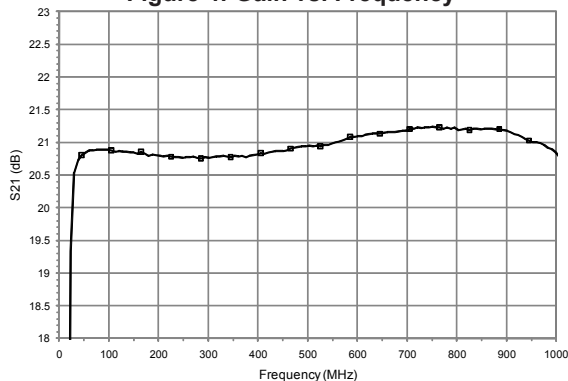


Figure 5: Output Return Loss vs. Frequency

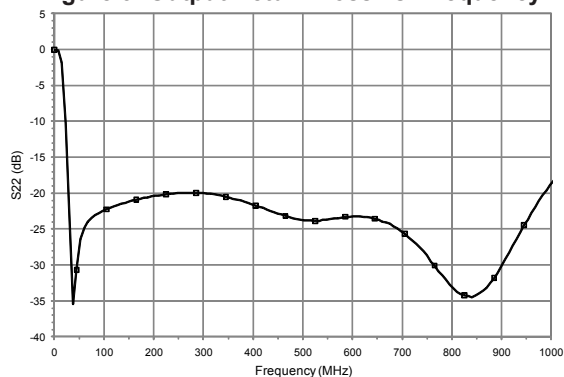
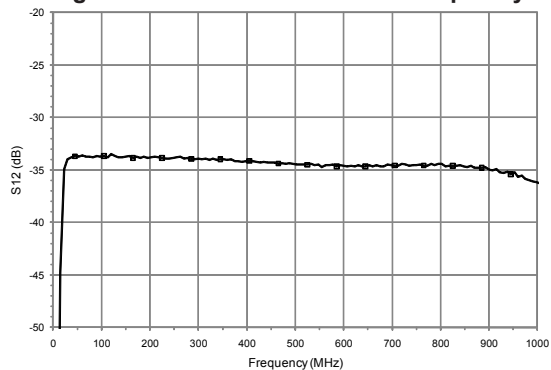
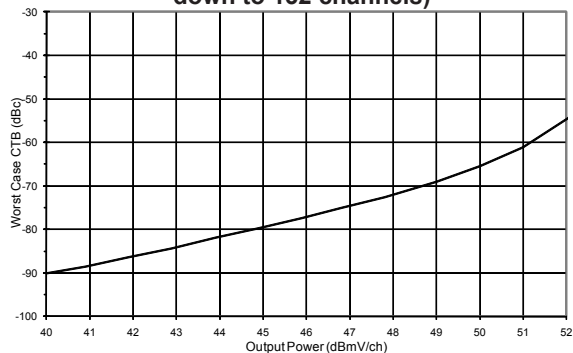


Figure 6: Reverse Isolation vs. Frequency

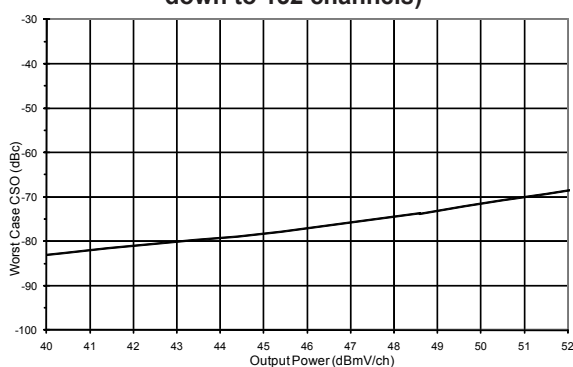


Distortion Data Plots:

**Figure 7: CTB (worst case) vs. Output Power
(79 flat channels at stated power +10 dB
down to 132 channels)**



**Figure 8: CSO (worst case) vs. Output Power
(79 flat channels at stated power +10 dB
down to 132 channels)**



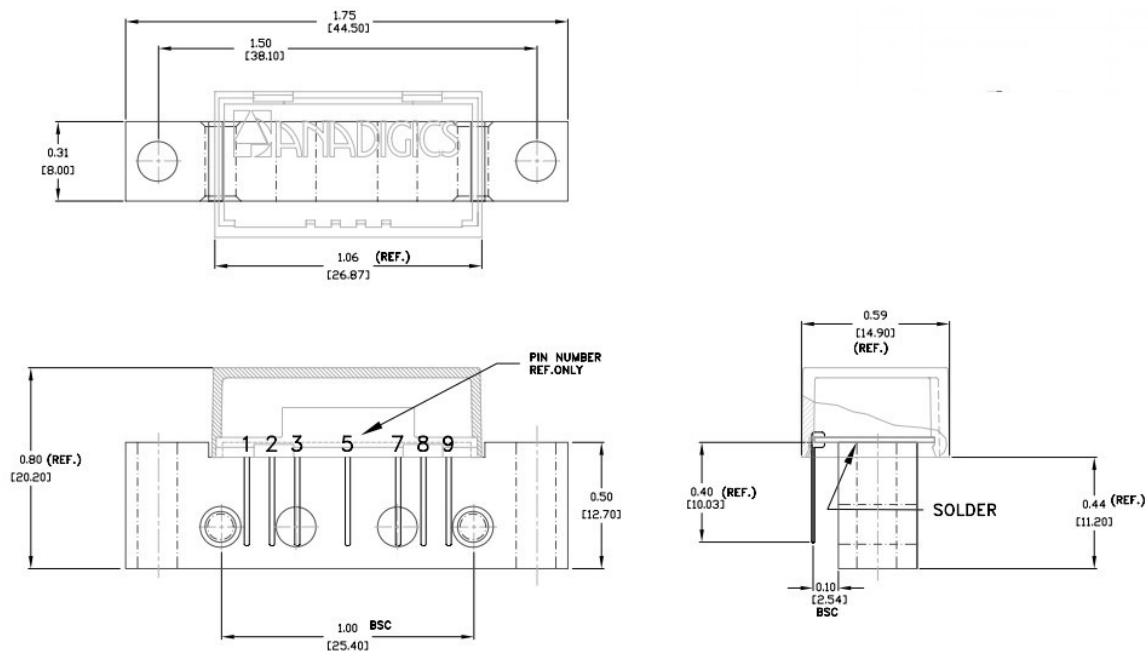


Figure 9: Hybrid Line Amp Physical Outline

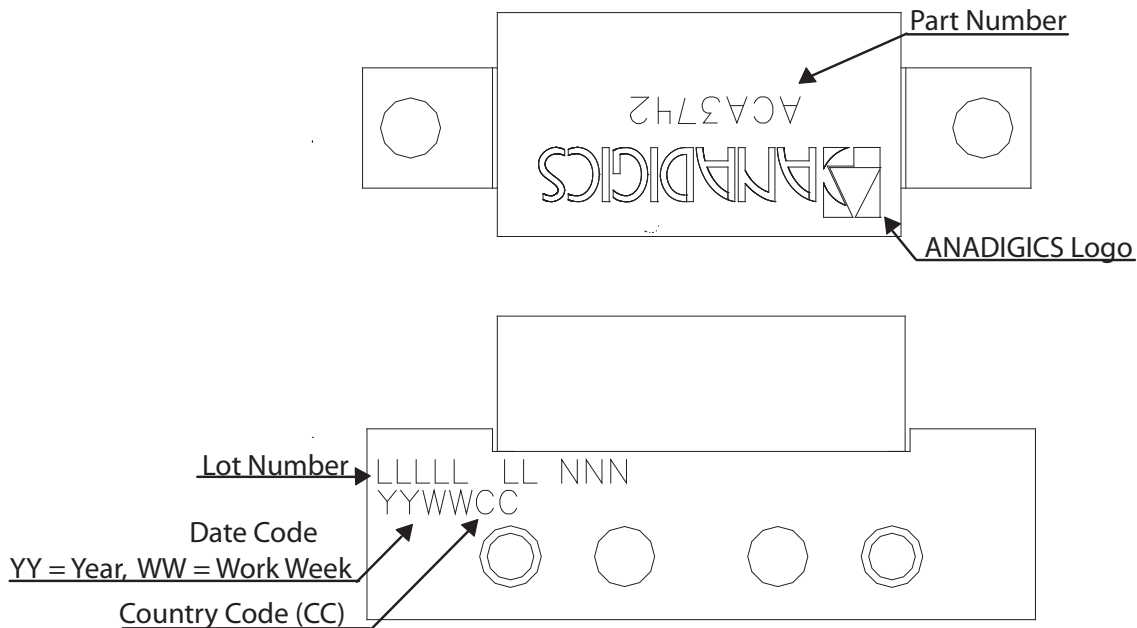


Figure 10: Branding Specification

ORDERING INFORMATION

| ORDER NUMBER | TEMPERATURE RANGE | PACKAGE DESCRIPTION | COMPONENT PACKAGING |
|-------------------------|------------------------------|--------------------------------|--------------------------------|
| ACA3742RJ6V0 | -20 °C to +100 °C | SOT115J Hybrid Amplifier | 100 Piece Box |
| ACA3742RJ6Q9 | -20 °C TO +100 °C | SOT115J Hybrid Amplifier | 25 Piece Box |
| ACA3742RJ6P9 | -20 °C to +100 °C | SOT115J Hybrid Amplifier | Special handling |

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