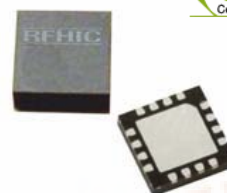


Product Features

- 4-Way Splitter
- Small size (3X3 mm)
- QFN SMD Type package
- Higher productivity
- Lower manufacturing cost
- -63dBc CSO 135 Channels @ +15dBmV/ch
- -77dBc CTB 135 Channels @ +15dBmV/ch
- -78dBc XMD 135 Channels @ +15dBmV/ch
- 5.2 dB Typical Noise Figure
- 75 ohm input and outputs

Application

- Multi Tuner Set-Top Boxes
- Home Gateways
- FTTx (G-PON, GE-PON)



Package : QFN 3X3

Description

AD412 is designed as low cost Active Divider for many applications including FTTH, CATV System.

This MMIC is based on Gallium Arsenide Enhancement Mode pHEMT which shows low current draw and very low noise.

The data in this spec sheet is valid only for 75 ohm application.

Specifications

| PARAMETER | | UNIT | MIN | TYP | MAX | Condition |
|------------------------|-------------|------|-----------|------|-----|---|
| Frequency | | MHz | 50 ~ 1000 | | | |
| Gain | | dB | 5 | 6 | | |
| Gain Flatness | | dB | | 0.4 | 1 | |
| Input Return Loss | | dB | | -10 | | |
| Output Return Loss | | dB | | -12 | | |
| IN&OUT Port Isolation | | dB | | -26 | | |
| OUT&OUT Port Isolation | | dB | | -29 | | |
| Output IP3 | | dBm | 30 | 33 | | |
| 1dB Compression Point | | dBm | 16.3 | 18.3 | | |
| Noise Figure | | dB | | 5.2 | 6 | |
| CSO | 30 ~ 870MHz | dBc | | -63 | -60 | 135 channel @ Input Power +15dBmV/ch |
| CTB | | dBc | | -77 | -70 | |
| XMOD | | dBc | | -78 | -70 | |
| DC Current | | mA | | 220 | | Vdd = 5.0V |

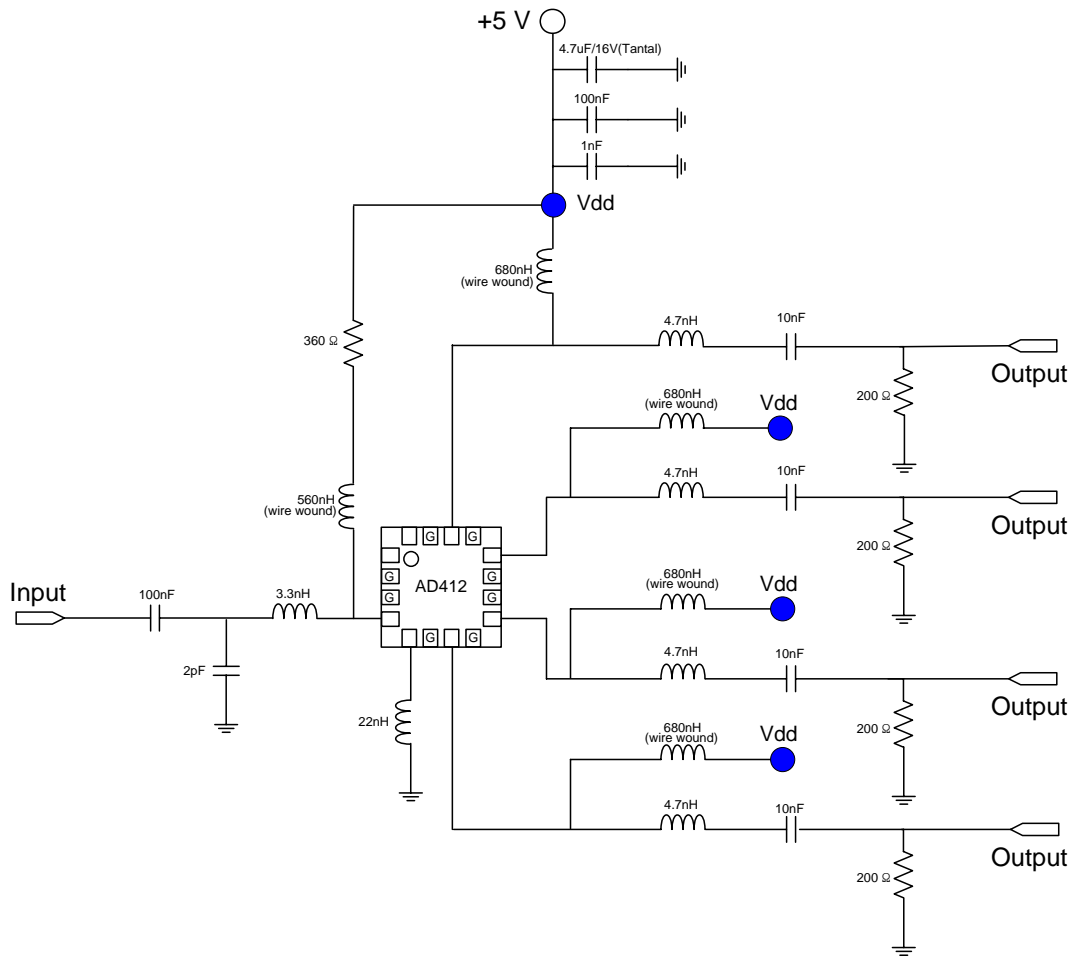
NOTE

1. Test conditions unless otherwise noted. Test Freq = 500MHz, T=25°C, Vdd=5V, 75Ω system
2. OIP3 measured with 2 tones at an output power of +0dBm/tones separated by 1MHz, Test Freq = 500MHz

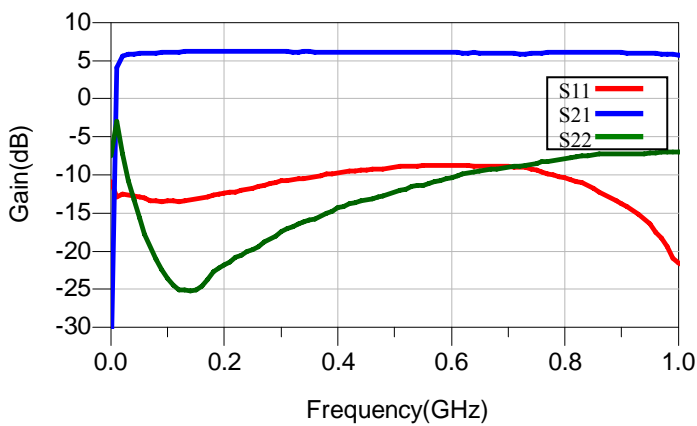
Absolute Minimum and Maximum Ratings

| PARAMETER | UNIT | MIN | TYP | MAX |
|-----------------------|------|-----|-----|------|
| Device Voltage | VDC | | +5 | +5.5 |
| Operating Temperature | °C | -40 | | +85 |
| Storage Temperature | °C | -40 | | +150 |

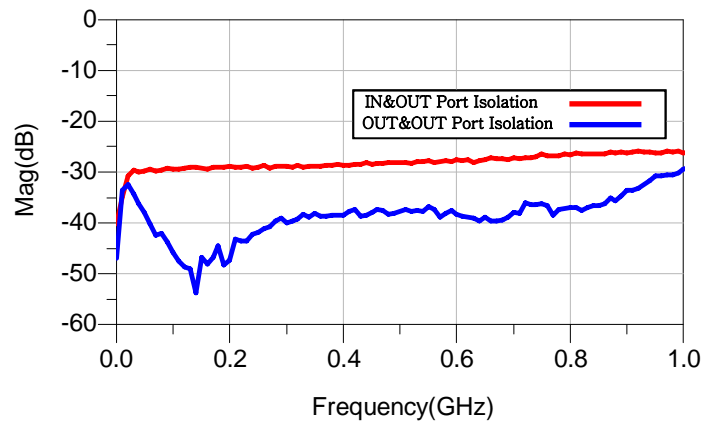
Application Circuit: 50~ 1000MHz, 5v, 75ohm System



S-Parameter



Isolation



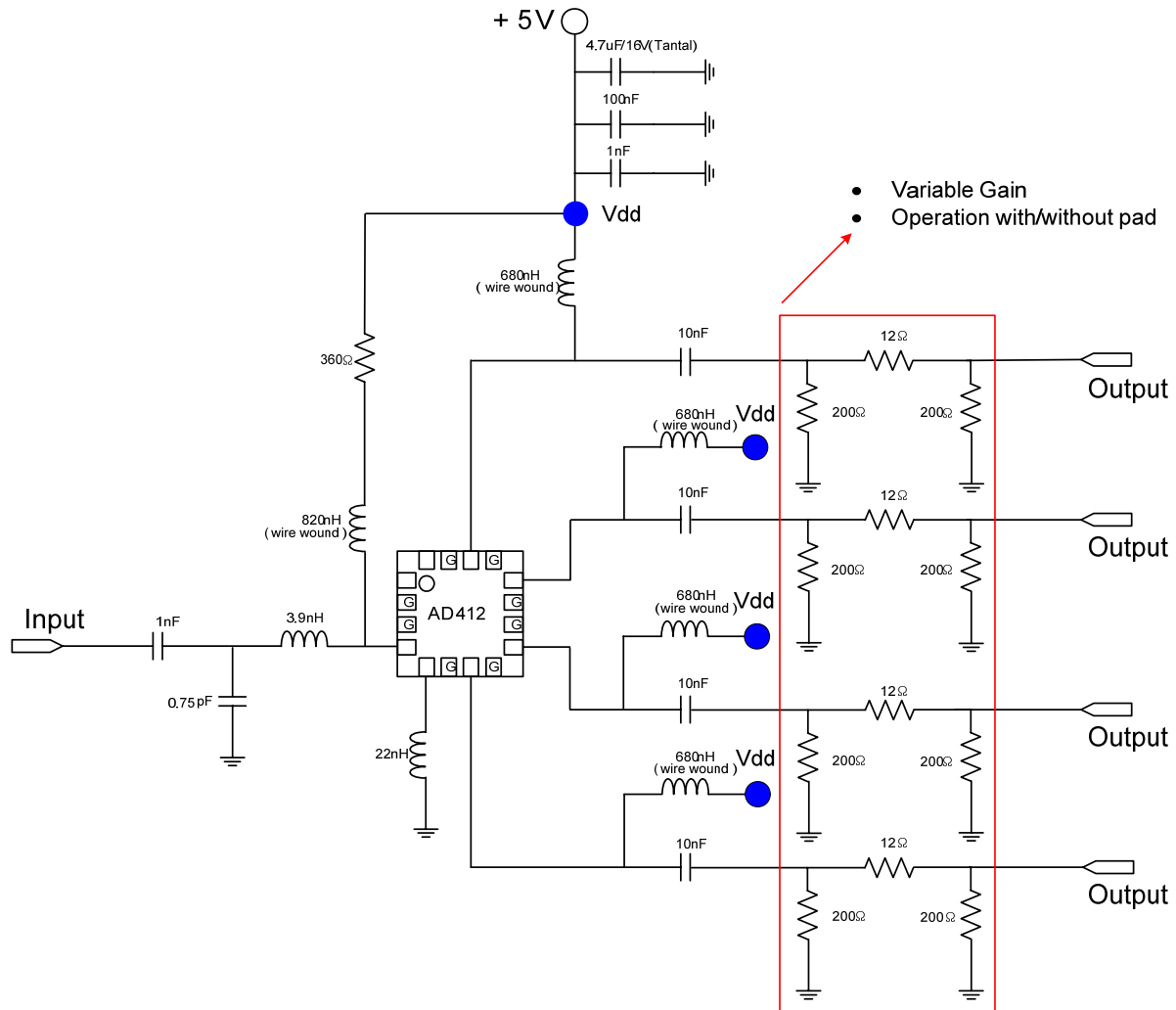
Multi-Tone Test 135CH_FLAT@Input Power +15dBmV/Ch

| Level: Input +15dBmV | | Tilt: 135CH | | | | | | | | |
|----------------------|-----------|-------------|---------|-------|---------|---------|---------|---------|---------|---------|
| FRQ | XMD(NCTA) | CTB_RAW | CTB_COR | N-FLR | CSU_RAW | CSU_COR | CSU_FRQ | CSL_RAW | CSL_COR | CSL_FRQ |
| 55.25 | 80.2 | 81 | 85.4 | 81.7 | 79.2 | 82.8 | 56 | 66.2 | 66.3 | 53.99 |
| 77.25 | 81.2 | 81.3 | 85.7 | 82.2 | 67 | 67.1 | 77.99 | 81.7 | 86 | 76.58 |
| 109.25 | 80.3 | 81.6 | 85.9 | 82.5 | 79.7 | 82.7 | 109.99 | 67.8 | 67.9 | 107.99 |
| 211.25 | 80 | 80.7 | 85 | 81.9 | 74.4 | 75.2 | 212.5 | 69.1 | 69.3 | 209.99 |
| 331.25 | 79.8 | 79.4 | 83.8 | 80.7 | 70.4 | 70.8 | 332.5 | 70 | 70.4 | 329.99 |
| 445.25 | 78.9 | 79.8 | 84.1 | 81.3 | 69.1 | 69.4 | 446.5 | 72 | 72.6 | 443.99 |
| 547.25 | 80 | 78.7 | 83 | 80 | 65.9 | 66 | 548.49 | 72.7 | 73.7 | 545.99 |
| 637.25 | 79.8 | 78.6 | 83 | 80 | 66.1 | 66.3 | 638.5 | 75.3 | 77.2 | 635.99 |
| 745.25 | 78.9 | 78.5 | 82.9 | 79.8 | 65.1 | 65.3 | 746.49 | 76.9 | 79.9 | 744.48 |
| 859.25 | 78.6 | 77.1 | 81.4 | 77.8 | 63.7 | 63.9 | 860.49 | 74.6 | 77.1 | 858.49 |
| | | | | | | | | | | |
| Min | 78.6 | 77.1 | 81.4 | 77.8 | 63.7 | 63.9 | 56 | 66.2 | 66.3 | 53.99 |
| Max | 81.2 | 81.6 | 85.9 | 82.5 | 79.7 | 82.8 | 860.49 | 81.7 | 86 | 858.49 |

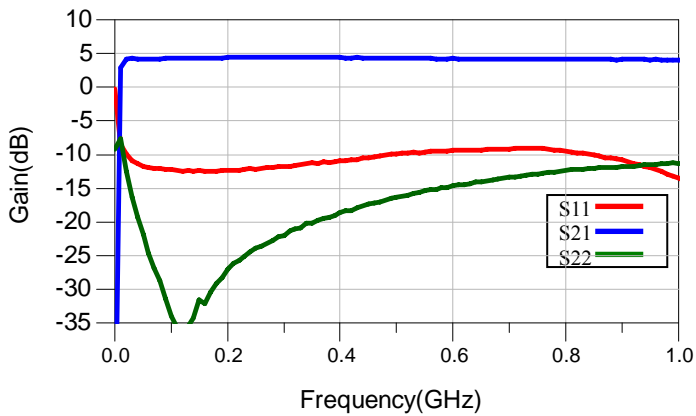
Ⓢ Specifications (Insert Pad)

| Parameter | Unit | Typical Data | Condition |
|------------------------|------|--------------|-------------------------|
| Frequency | MHz | 50~1000 | |
| Supply Voltage | V | 5 | |
| Gain | dB | 4.3 | |
| Gain Flatness | dB | 0.3 | |
| Input Return Loss | dB | -10 | |
| Output Return Loss | dB | -15 | |
| IN&OUT Port Isolation | dB | -27 | |
| OUT&OUT Port Isolation | dB | -30 | |
| OIP3 | dBm | 30 | |
| P1dB | dBm | 16 | |
| Noise Figure | dB | 5.2 | |
| CSO | dBc | -64 | 135 channel, +15dBmV/ch |
| CTB | dBc | -74 | 135 channel, +15dBmV/ch |
| XMOD | dBc | -78 | 135 channel, +15dBmV/ch |
| DC Current | mA | 220 | Vdd = 5.0V |

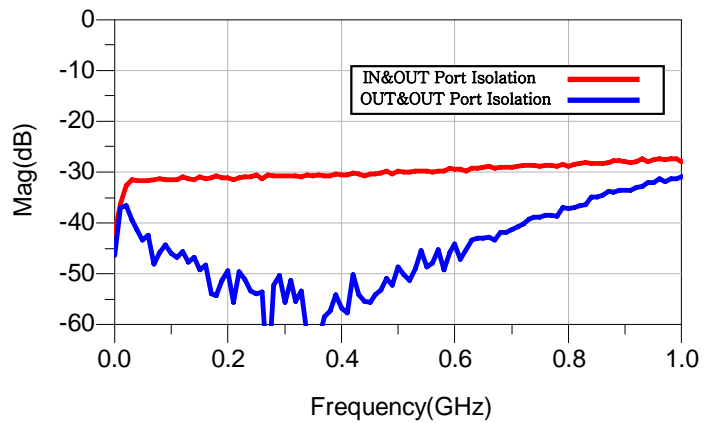
Application Circuit: 50~ 1000MHz, 5v, 75ohm System (Insert Pad)



S-Parameter



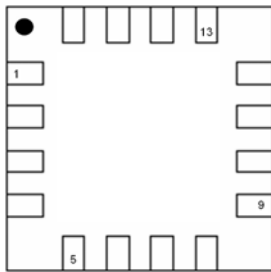
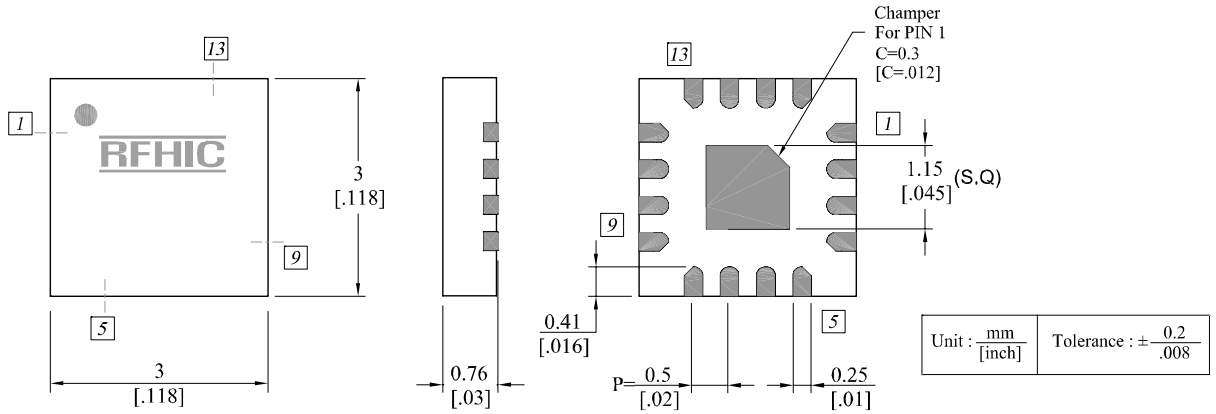
Isolation



Multi-Tone Test 135CH_FLAT@Input Power +15dBmV/Ch

| Level: +15dBmV | | Tilt: 135CH_FLAT | | | | | | | | |
|----------------|-----------|------------------|---------|-------|---------|---------|---------|---------|---------|---------|
| FRQ | XMD(NCTA) | CTB_RAW | CTB_COR | N-FLR | CSU_RAW | CSU_COR | CSU_FRQ | CSL_RAW | CSL_COR | CSL_FRQ |
| 55.25 | 78.1 | 79.1 | 83.4 | 79.7 | 77.4 | 81.8 | 55.99 | 64.6 | 64.8 | 54 |
| 77.25 | 78.8 | 79.1 | 83.4 | 79.8 | 66 | 66.2 | 78 | 79.5 | 83.8 | 76.38 |
| 109.25 | 78 | 79.4 | 83.7 | 80.3 | 78.3 | 82.6 | 109.99 | 65.8 | 66 | 108 |
| 211.25 | 79.2 | 78.6 | 83 | 79.5 | 74.4 | 76.1 | 212.5 | 66.7 | 67 | 209.99 |
| 331.25 | 80.5 | 77.6 | 81.9 | 78.4 | 70.1 | 70.7 | 332.49 | 65.8 | 66.1 | 329.99 |
| 445.25 | 81.9 | 78.3 | 82.6 | 79.3 | 68.7 | 69 | 446.49 | 67.4 | 67.7 | 443.99 |
| 547.25 | 83 | 77 | 81.3 | 77.8 | 66.5 | 66.9 | 548.5 | 67.1 | 67.5 | 545.99 |
| 637.25 | 85.7 | 76.8 | 81.1 | 77.9 | 66.3 | 66.6 | 638.5 | 69.3 | 70 | 635.99 |
| 745.25 | 87.3 | 76.3 | 80.7 | 77 | 64.9 | 65.1 | 746.49 | 72.8 | 74.7 | 743.99 |
| 859.25 | 91 | 74.6 | 78.9 | 75.6 | 64 | 64.3 | 860.49 | 73.9 | 78.3 | 858.49 |
| | | | | | | | | | | |
| Min | 78 | 74.6 | 78.9 | 75.6 | 64 | 64.3 | 55.99 | 64.6 | 64.8 | 54 |
| Max | 91 | 79.4 | 83.7 | 80.3 | 78.3 | 82.6 | 860.49 | 79.5 | 83.8 | 858.49 |

Package Dimensions (Type :QFN3)



| Pin No | Function |
|--------------|----------------|
| 4 | Input |
| 5 | Input Matching |
| 7 | Output - 1 |
| 9 | Output - 2 |
| 12 | Output - 3 |
| 14 | Output - 4 |
| 2, 3, 10, 11 | GND |
| Other | NC |

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