

## Product Features

- Small size
- NO matching circuit needed
- High efficiency
- Dual supply voltage
- Higher linearity
- Higher productivity
- Lower manufacturing cost
- GaAs MMIC
- 3MHz – 2150MHz
- -63dBc CSO 135 Channels@ output Level +37dBmV
- -60dBc CTB 135 Channels@ output Level +37dBmV
- -70dBc CSO 8 Channels@ output Level +45dBmV
- -73dBc CTB 8 Channels@ output Level +45dBmV

## Applications

- Satellite
- Repeater
- Base Station
- Converter
- CATV
- SMATV



Package : SOIC-8

## Descriptions

The power amplifier is designed for base stations and repeater systems.

GaAs MMIC is used and attached on a copper carrier of 8 pin air cavity package with dual supply voltage

## Operating Ranges

| PARAMETER        | UNIT | MIN | TYP | MAX  |
|------------------|------|-----|-----|------|
| Device Voltage   | VDC  |     | +5  | +5.3 |
| Case Temperature | °C   | -40 | -   | +85  |

## Absolute Minimum and Maximum Ratings

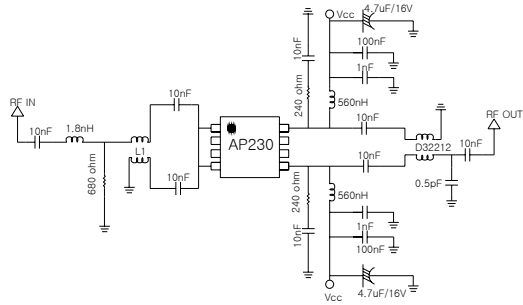
| PARAMETER           | UNIT | MIN | MAX  |
|---------------------|------|-----|------|
| Device Voltage      | VDC  |     | +5.5 |
| Device Current      | mA   |     | +320 |
| RF Input Power      | dBm  |     | +10  |
| Storage Temperature | °C   | -40 | +150 |

## Specifications

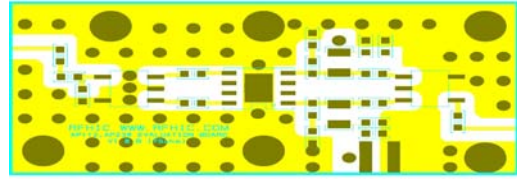
T=25°C, Vcc=5.0V, 75Ω system

| Parameter                            | Units       | Minimum | Typical      | Maximum | Condition                      |
|--------------------------------------|-------------|---------|--------------|---------|--------------------------------|
| Frequency Range                      | MHz         |         | 3MHz~2.15GHz |         |                                |
| Supply Voltage                       | V           |         | 5            |         | Vcc=5V                         |
| Single Ended CATV Evaluation Circuit |             |         |              |         |                                |
| Current                              | mA          | 200     | 220          | 250     |                                |
| S21-Gain                             | dB          |         | 16           |         | 3MHz                           |
| S21-Gain                             | dB          |         | 15           |         | 50MHz                          |
| S21-Gain                             | dB          |         | 14           |         | 2150MHz                        |
| Reverse ( 3 ~ 200MHz )               |             |         |              |         |                                |
| S11-Input Return Loss                | dB          |         | -16          |         |                                |
| S22-Output Return Loss               | dB          |         | -16          |         |                                |
| Noise Figure                         |             |         | 5.5          |         |                                |
| OIP3                                 | dBm         |         | 43           |         | +5dBm/2 tone separated by 1MHz |
| OIP1                                 | dBm         |         | 21           |         | At 100MHz                      |
| Forward ( 50 ~ 870MHz )              |             |         |              |         |                                |
| S11-Input Return Loss                | dB          |         | -11          |         |                                |
| S22-Output Return Loss               | dB          |         | -11          |         |                                |
| OIP3                                 | dBm         |         | 37           |         | +5dBm/2 tone separated by 1MHz |
| OIP1                                 | dBm         |         | 21           |         | At 800MHz                      |
| Noise Figure                         | dB          |         | 4            |         |                                |
| CSO                                  | 50 - 870MHz | dBc     | -63          |         | 135 channels,+37dBmV/ch,Single |
| CTB                                  |             | dBc     | -60          |         | 135 channels,+37dBmV/ch,Single |
| XMD                                  |             | dBc     | -55          |         | 135 channels,+37dBmV/ch,Single |
| CSO                                  | 3 - 150MHz  | dBc     | -70          |         | 8 channels,+45dBmV/ch,Single   |
| CTB                                  |             | dBc     | -73          |         | 8 channels,+45dBmV/ch,Single   |
| XMD                                  |             | dBc     | -70          |         | 8 channels,+45dBmV/ch,Single   |

Application 1 : Forward (50MHz ~ 2150MHz)

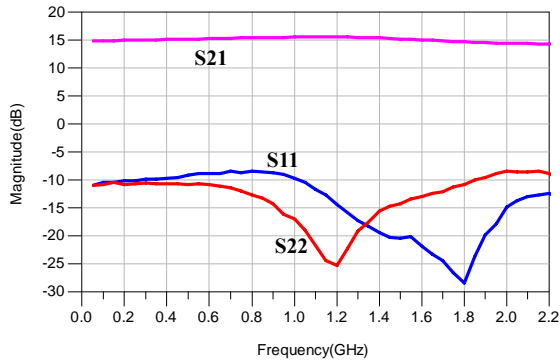


Evaluation Board Layout 50-870MHz

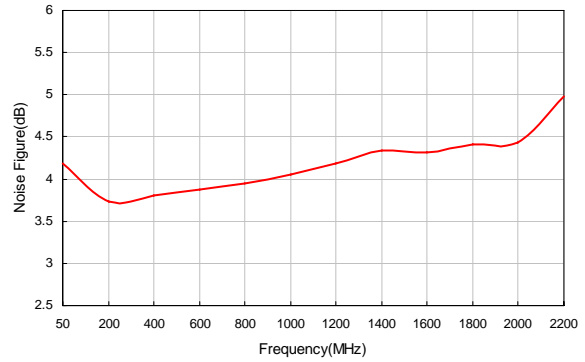


The transformers L1 and L2, used on the RFHIC evaluation board are hand wound baluns with following spec[L1=3.5turn, ferrite core (Ferronics 12-340-k), L2=3.5 turn, ferrite core(TDK,L6 RID 3\*3\*3 H1.2)] was used. φ0.12 1UEW wire was used. An SMT transformer (D32212,D31766), can also be used.

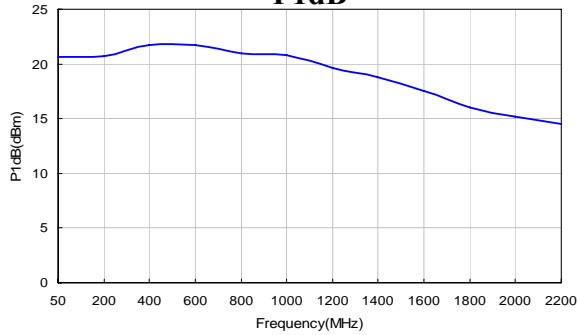
S-Parameters



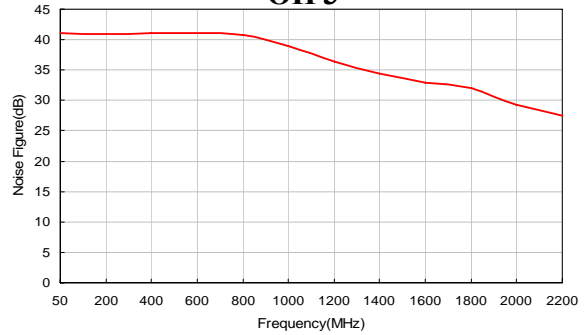
Noise Figure



P1dB



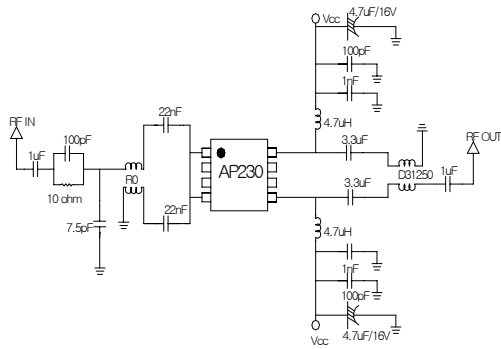
OIP3



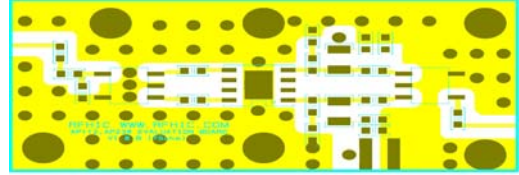
Level: +37dBmV      Tilt: 135CH FLAT

| FRQ    | XMD(NCTA) | CTB_RAW | CTB_COR | N-FLR | CSU_RAW | CSU_COR | CSU_FRQ | CSL_RAW | CSL_COR | CSL_FRQ |
|--------|-----------|---------|---------|-------|---------|---------|---------|---------|---------|---------|
| 55.25  | 59.8      | 69.4    | 69.5    | 84.7  | 83.8    | 88.1    | 56      | 68.7    | 68.8    | 54      |
| 77.25  | 59.9      | 68.7    | 68.8    | 85.1  | 69.3    | 69.5    | 78      | 84.5    | 88.8    | 76.51   |
| 109.25 | 60.1      | 66.4    | 66.4    | 84.9  | 82.9    | 87.2    | 109.99  | 69.1    | 69.2    | 107.99  |
| 211.25 | 60.4      | 66.2    | 66.2    | 83.8  | 80.9    | 83.9    | 212.49  | 68.7    | 68.8    | 209.99  |
| 331.25 | 60.4      | 65.6    | 65.6    | 82.7  | 76.9    | 78.2    | 332.49  | 69.3    | 69.5    | 329.99  |
| 445.25 | 61.2      | 66.2    | 66.2    | 83.4  | 76.5    | 77.6    | 446.5   | 71.7    | 72      | 443.99  |
| 547.25 | 62.9      | 66.7    | 66.8    | 81.7  | 74.8    | 75.7    | 548.5   | 72.5    | 73      | 545.98  |
| 637.25 | 63.4      | 66.2    | 66.3    | 82.3  | 75.4    | 76.5    | 638.5   | 75.2    | 76.2    | 635.99  |
| 745.25 | 64.5      | 65.5    | 65.6    | 81.4  | 73.4    | 74.2    | 746.49  | 76.1    | 77.5    | 743.98  |
| 859.25 | 64.8      | 65.1    | 65.3    | 80.3  | 72      | 72.8    | 860.49  | 75.8    | 78      | 857.99  |

Application 2 : Reverse (3MHz ~ 200MHz)

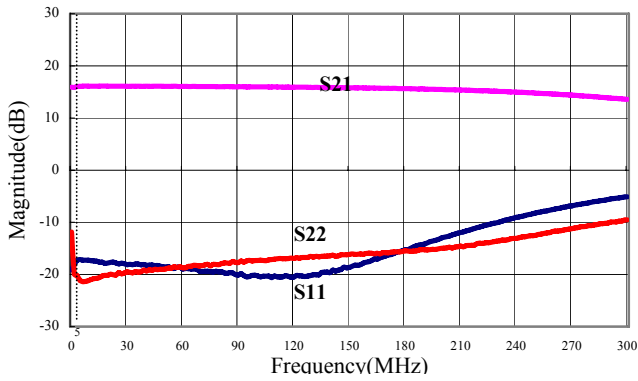


Evaluation Board Layout 5-200MHz

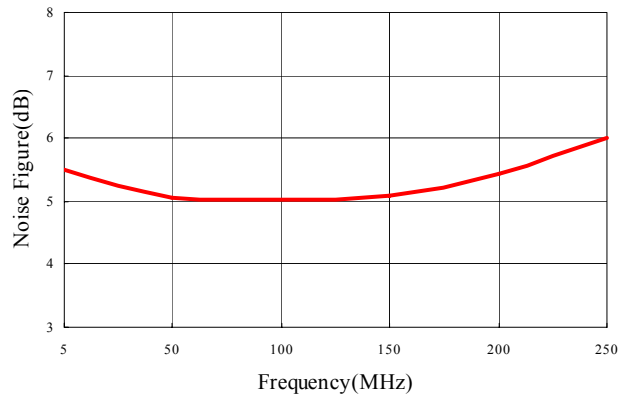


The transformers L1 and L2, used on the RFHIC evaluation board are hand wound baluns with following spec[L1=6 turn, ferrite core (TAIYO-YUDEN BF56 1.9\*3.4\*2.0), L2=3.5 turn, ferrite core(TDK,L6 RID 3\*3\*3 H1.2)] was used.  $\phi$ 0.12 1UEW wire was used. An SMT transformer (D31044,D31766), can also be used.

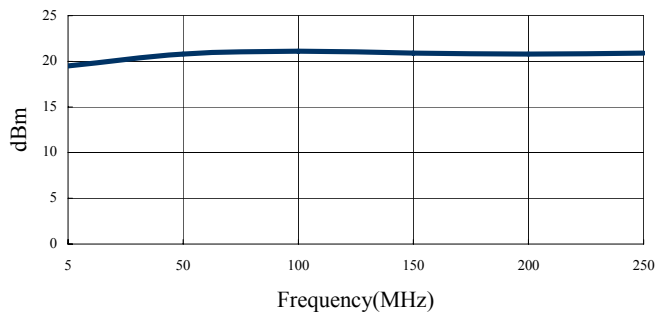
S-Parameters



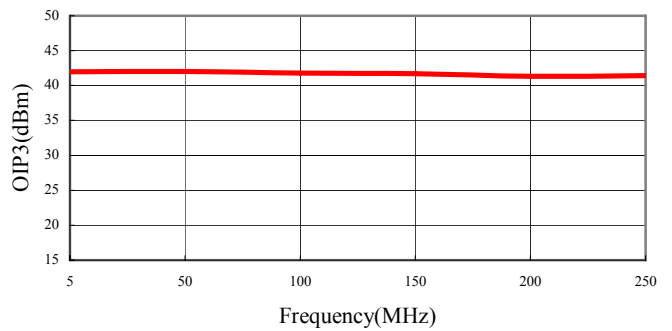
Noise Figure



P1dB



OIP3



| FRQ | XMD(NCTA) | CTB_RAW | CTB_COR | N-FLR | CSU_RAW | CSU_COR | CSU_FRQ | CSL_RAW | CSL_COR | CSL_FRQ |
|-----|-----------|---------|---------|-------|---------|---------|---------|---------|---------|---------|
| 7   | 72.2      | 79.9    | 80.1    | 93.6  | 92.4    | 96.7    | 7.63    | 71.7    | 71.7    | 5.99    |
| 31  | 72.8      | 78.6    | 78.8    | 92.1  | 78.1    | 78.4    | 32      | 76.6    | 76.8    | 29.99   |
| 49  | 72.1      | 79.8    | 80.1    | 91.8  | 78.2    | 78.4    | 49.99   | 90.5    | 94.8    | 48.31   |

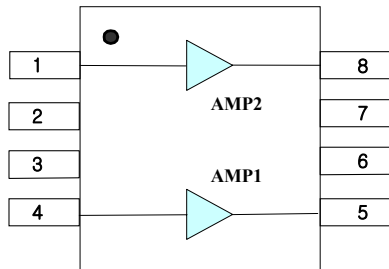
**ESD Protection**

For a safe use in all situations, it is recommended to have proper ESD control techniques while the device is being handled. Here are some recommended precautions;

- Person at a workbench should be earthed via a wrist strap and a resistor.
- All mains-powered equipment should be connected to the mains via an earth-leakage switch.
- Equipment cases should be grounded.
- Relative humidity should be maintained between 40% and 50%.
- An ionizer is recommended.
- Keep static materials, such as plastic envelopes and plastic trays etc. away from the workbench

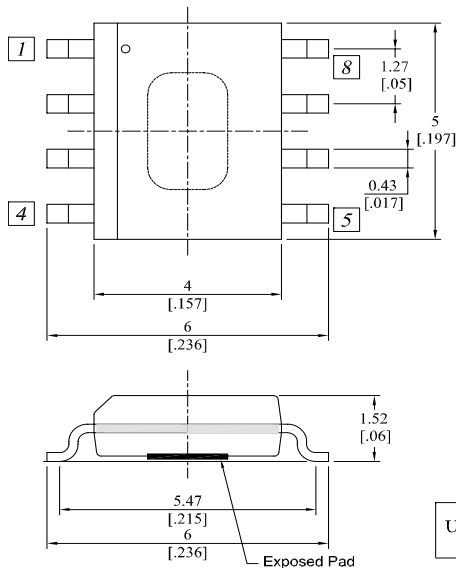
**Package : SOIC-8 Type**

Block Diagram

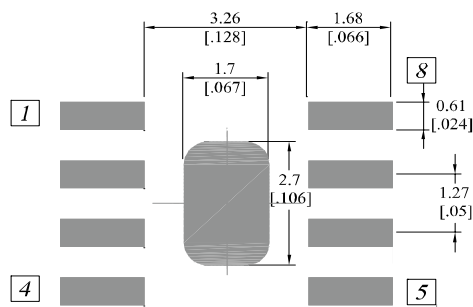


| PIN No       | Description |
|--------------|-------------|
| 1            | RF IN(2)    |
| 5            | RF OUT(1)   |
| 4            | RF IN(1)    |
| 8            | RF OUT(2)   |
| 2, 3, 6, 7   | GND         |
| Exposed slug | GND         |

**Package Dimensions (Type: SOIC-8)**



Recommended Pattern



|  |                                    |
|--|------------------------------------|
| Unit : $\frac{\text{mm}}{\text{[inch]}}$ | Tolerance : $\pm \frac{0.2}{.008}$ |
|--|------------------------------------|

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