

HA31006ANP

SiGe MMIC

High Frequency Low Noise Amplifier

REJ03F0174-0300

Rev.3.00

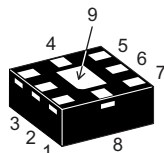
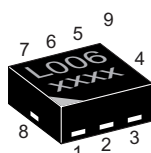
Jul 31, 2007

Features

- Ideal for 2.4 / 5 GHz Band applications. e.g. 2.4 / 5 GHz Band Wireless LAN
- Low Noise (1.3 dB @ 2.4 GHz, 1.7 dB @ 5.2 GHz)
- High Gain (20 dB @ 2.4 GHz, 16 dB @ 5.2 GHz)
- 8 Pin, Lead less, Small mounting area
(HWQFN-8 : $2.0 \times 2.0 \times 0.8$ mm)

Outline

RENESAS package code: PWQN0008ZA-A
(Package name: HWQFN-8 <TNP-8TV>)



1. Vctrl
2. RFout
3. GND
4. GND
5. GND
6. RFin
7. GND
8. GND
9. GND

Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|-----------------------|---------------------|--------------------|------|
| Supply Voltage | V _{CC} | 4 | V |
| Maximum Current | I _{CC} | 15 | mA |
| Maximum Input Power | P _{in max} | +5 | dBm |
| Power Dissipation | P _t | 60 ^{Note} | mW |
| Operating temperature | T _{cop} | -10 to +85 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

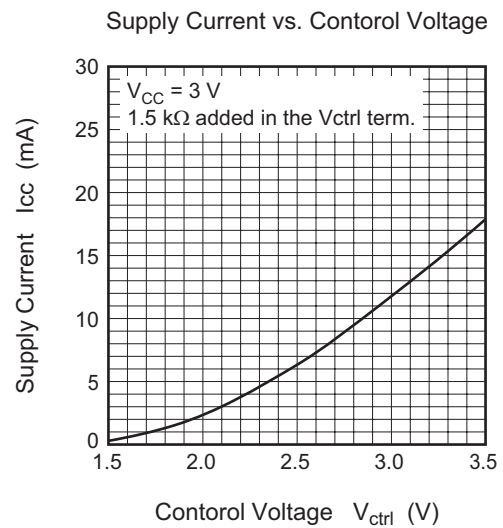
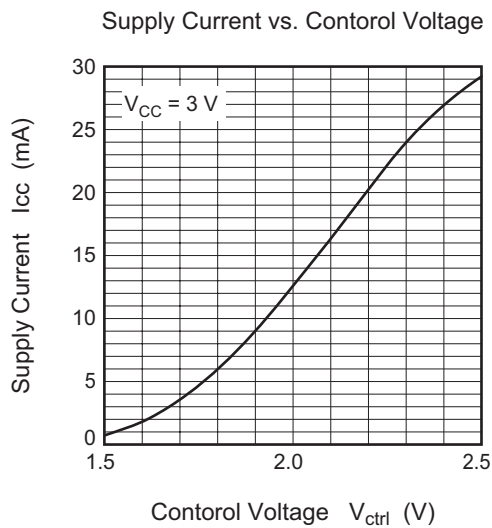
Notes: Specified condition

Electrical Characteristics

(Ta = 25°C)

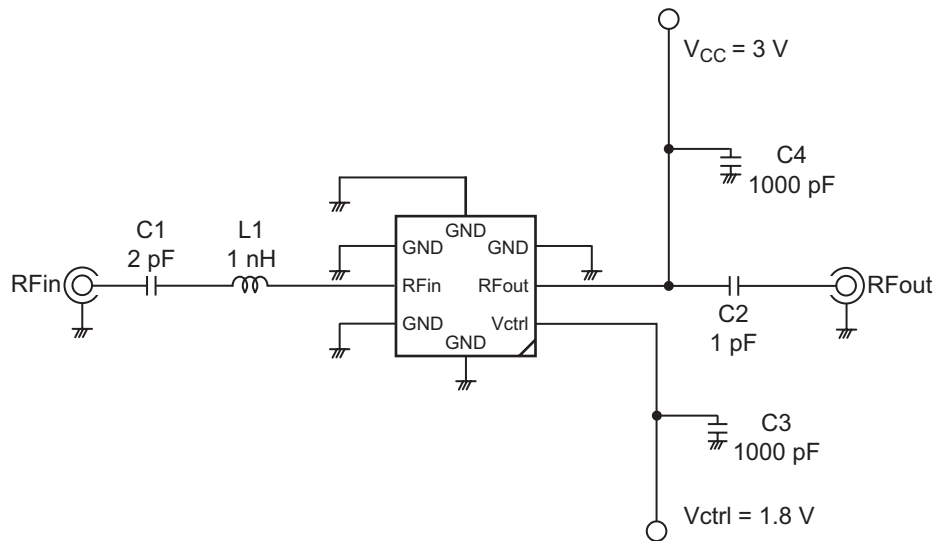
| Item | Symbol | Min. | Typ | Max. | Unit | Test Conditions |
|--------------------|-------------------|------|-----|------|------|--|
| Supply Current | I _{cc} | — | 6 | — | mA | No RF signal |
| Noise Figure | NF | — | 1.3 | — | dB | f = 2.35 to 2.55 GHz V _{CC} = 3 V, V _{ctrl} = 1.8 V |
| | | — | 1.7 | — | | f = 5 to 6 GHz V _{CC} = 3 V, V _{ctrl} = 1.8 V |
| Power Gain | PG | — | 20 | — | dB | f = 2.35 to 2.55 GHz V _{CC} = 3 V, V _{ctrl} = 1.8 V |
| | | — | 16 | — | | f = 5 to 6 GHz V _{CC} = 3 V, V _{ctrl} = 1.8 V |
| Input Return Loss | R _{lin} | — | 11 | — | dB | f = 2.35 to 2.55 GHz V _{CC} = 3 V, V _{ctrl} = 1.8 V |
| | | — | 10 | — | | f = 5 to 6 GHz V _{CC} = 3 V, V _{ctrl} = 1.8 V |
| Output Return Loss | R _{lout} | — | 21 | — | dB | f = 2.35 to 2.55 GHz V _{CC} = 3 V, V _{ctrl} = 1.8 V |
| | | — | 24 | — | | f = 5 to 6 GHz V _{CC} = 3 V, V _{ctrl} = 1.8 V |

Main Characteristics

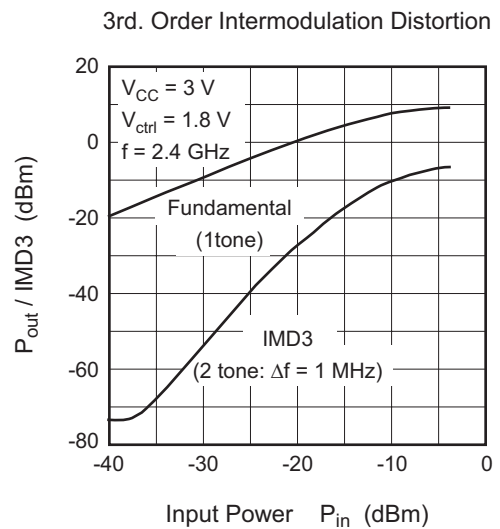
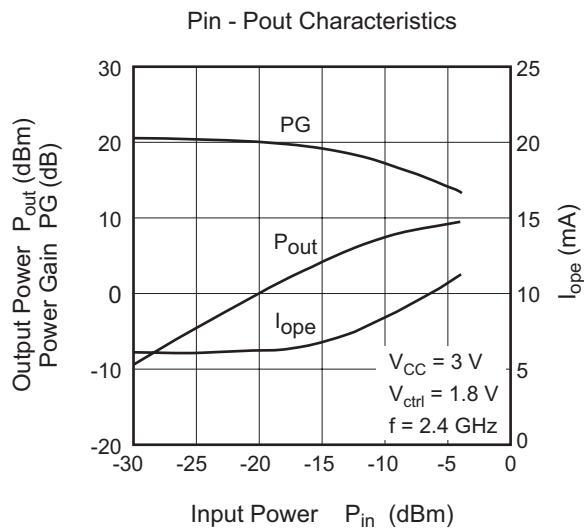


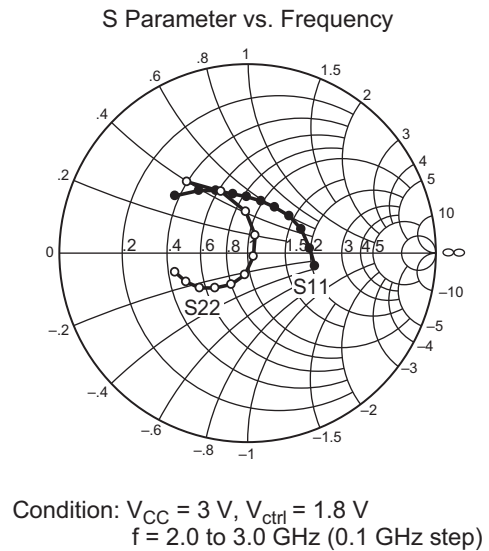
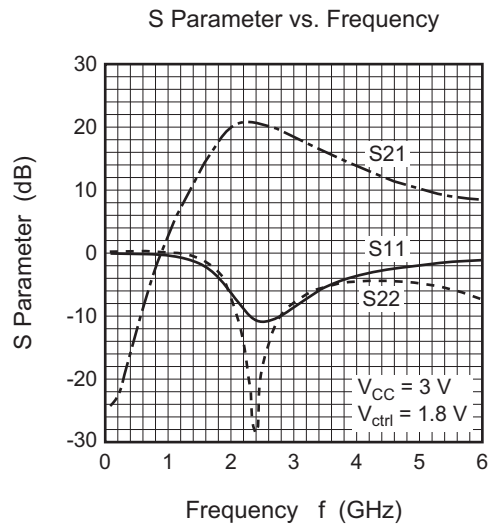
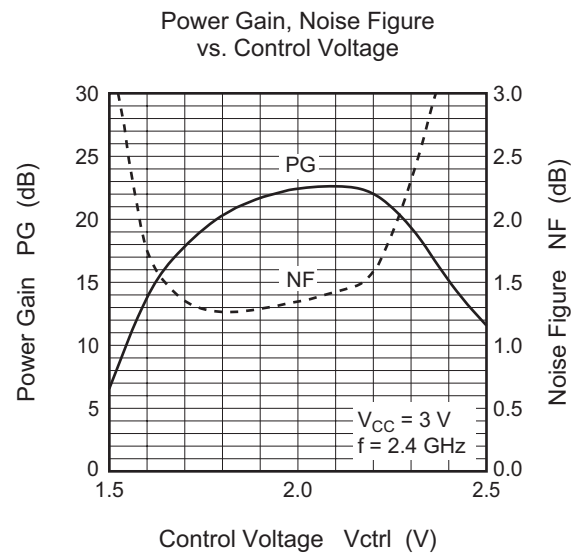
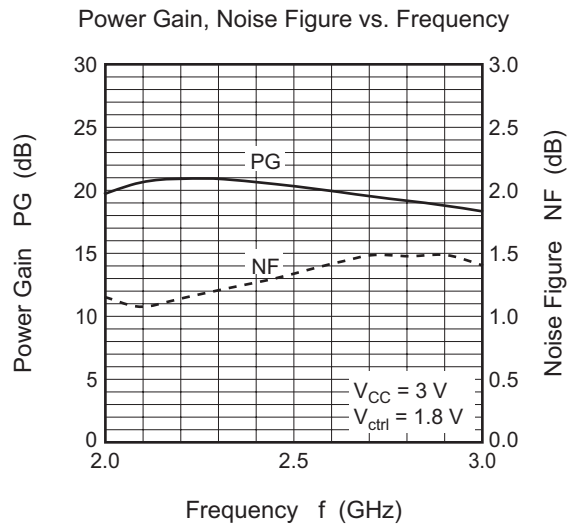
2.4 GHz Characteristics

Evaluation Board Circuit



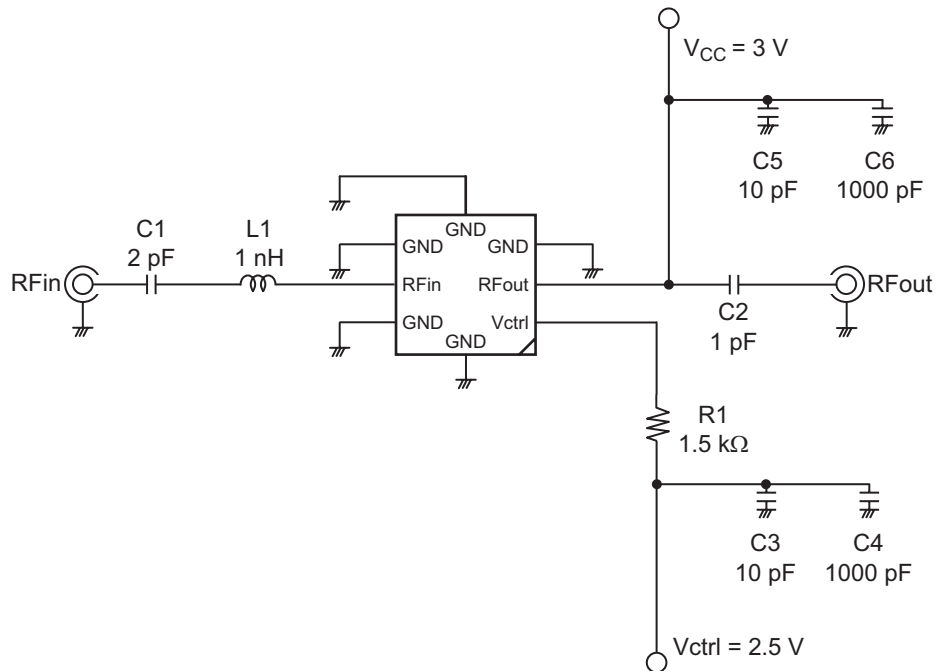
Pin - Pout Characteristics



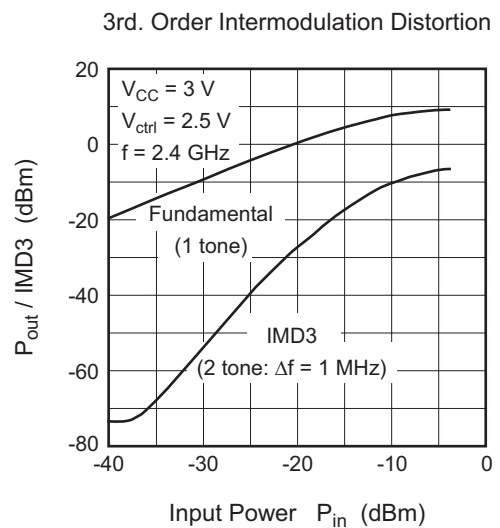
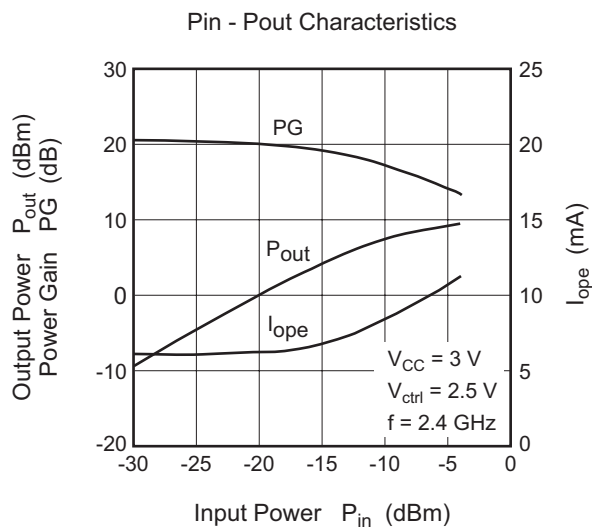


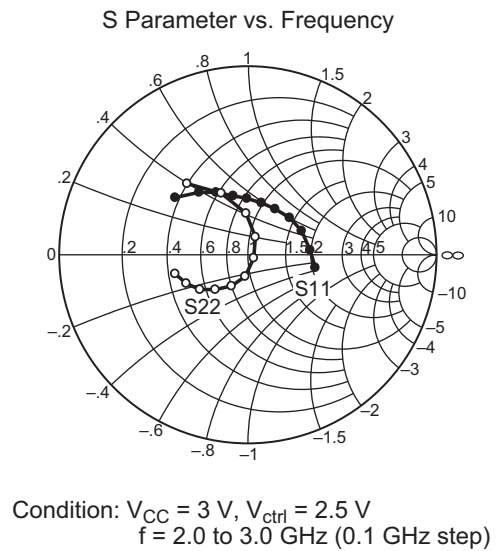
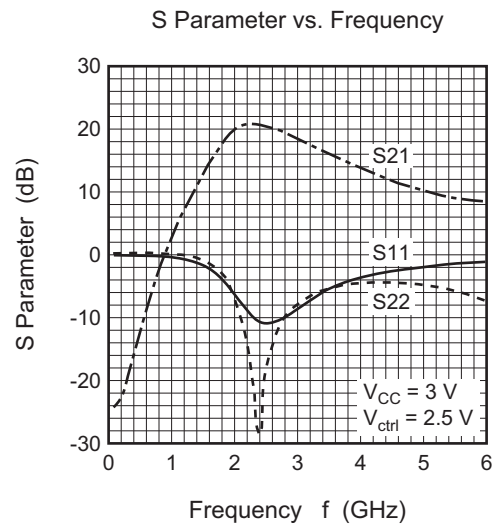
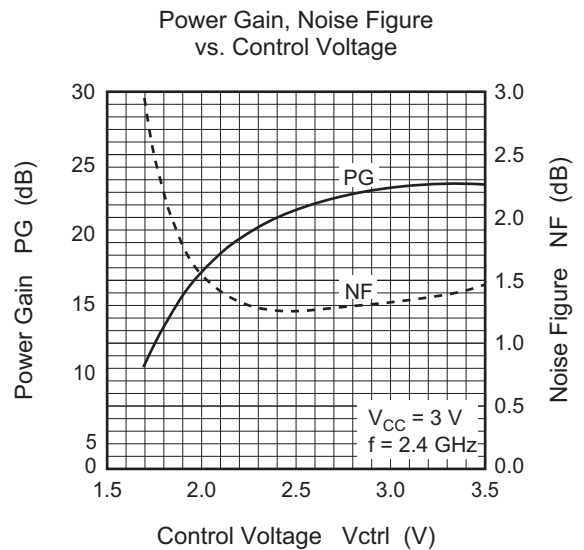
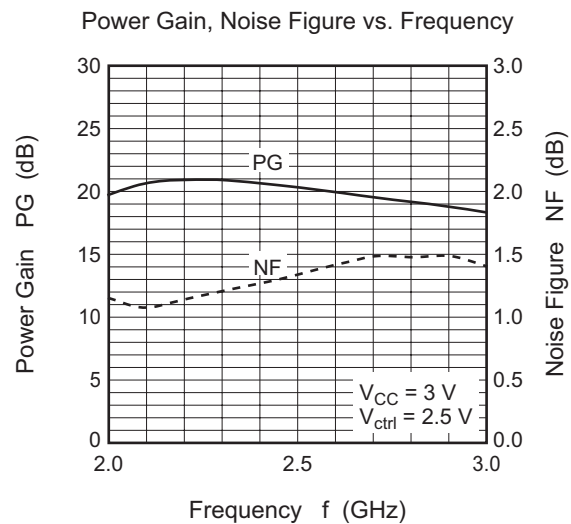
2.4 GHz Characteristics (V_{ctrl} 1.5 k Ω)

Evaluation Board Circuit



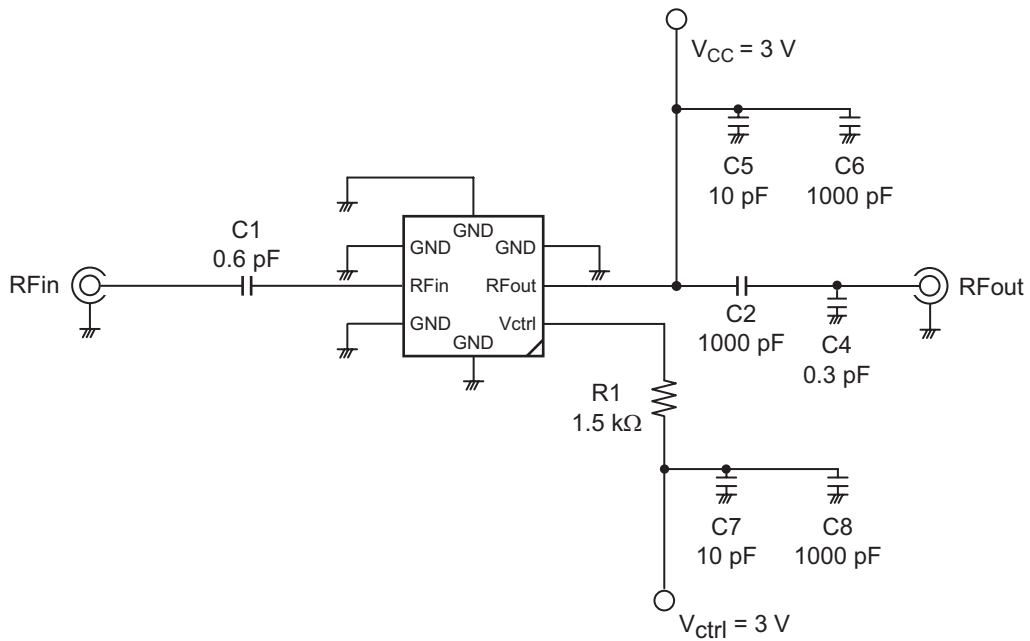
Pin - Pout Characteristics



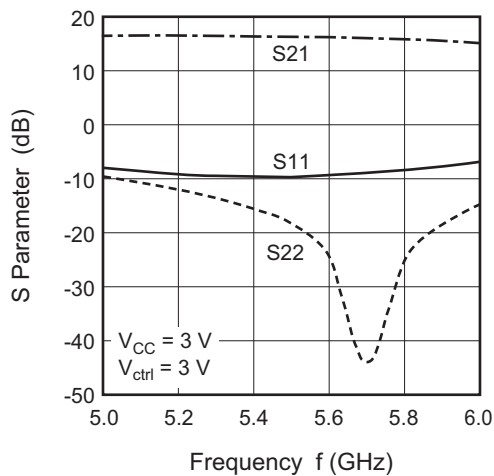


5 GHz Characteristics

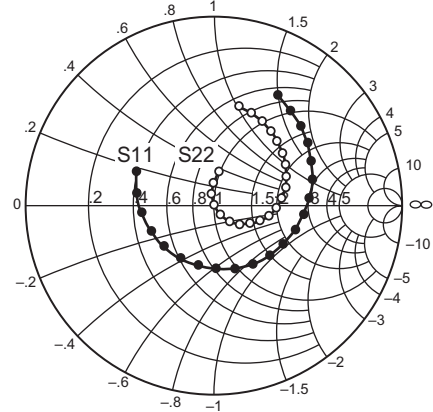
Evaluation Board Circuit



S Parameter vs. Frequency

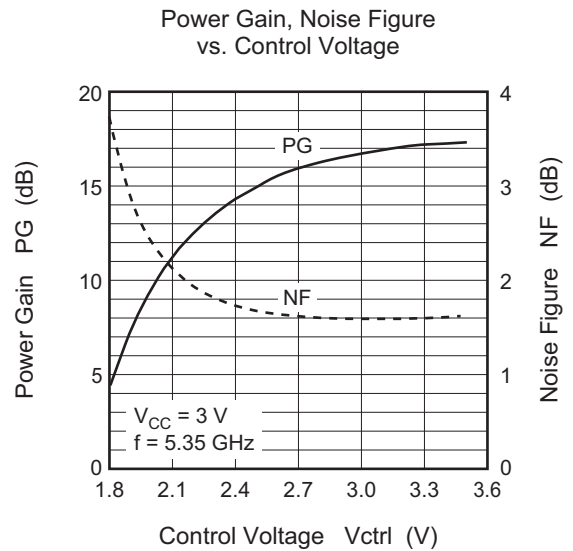
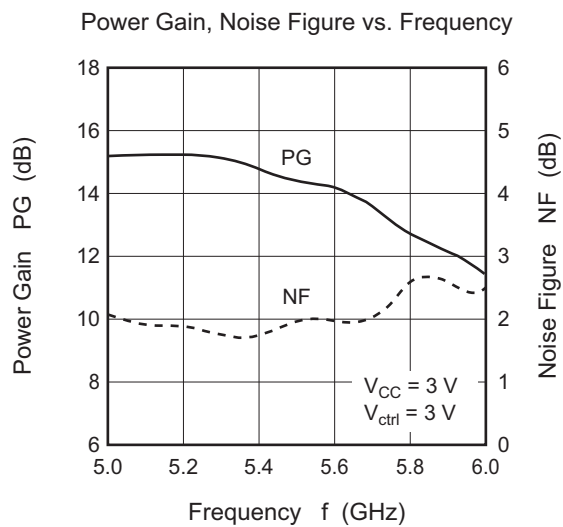


S Parameter vs. Frequency

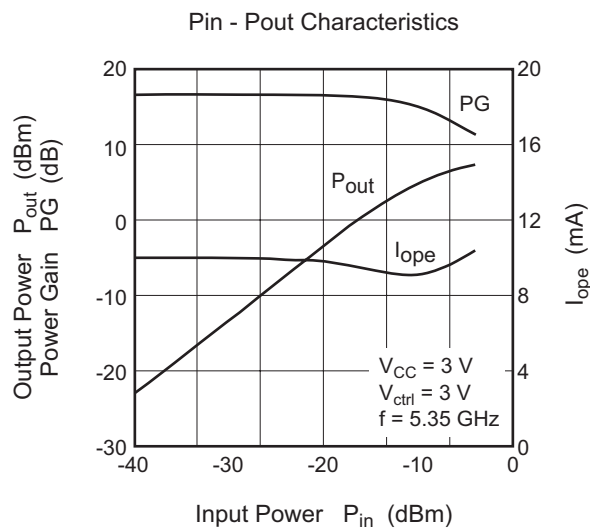


Condition: $V_{CC} = 3\text{ V}$, $V_{ctrl} = 3\text{ V}$
 $f = 4.0\text{ to }6.0\text{ GHz (0.1 GHz step)}$

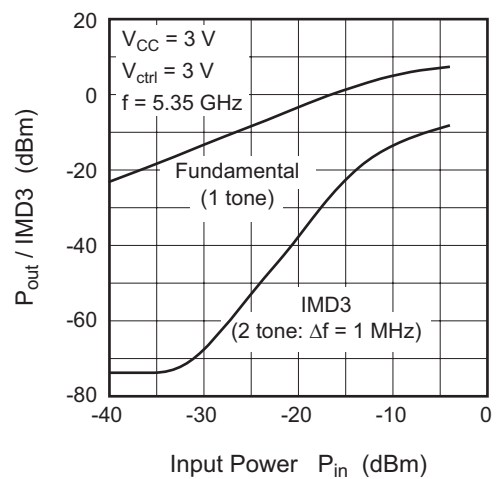
5.35 GHz Characteristics



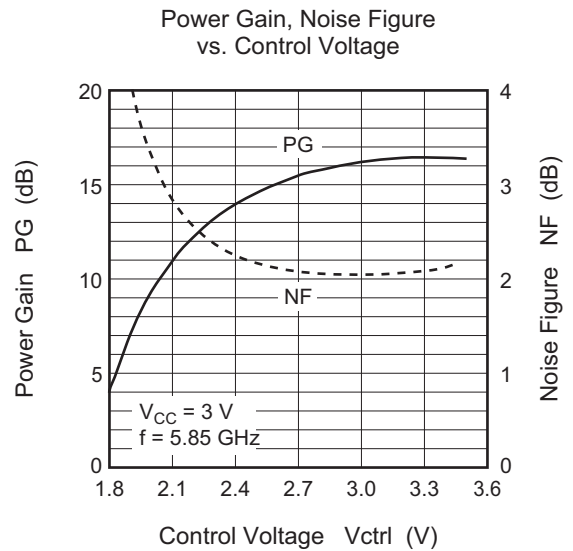
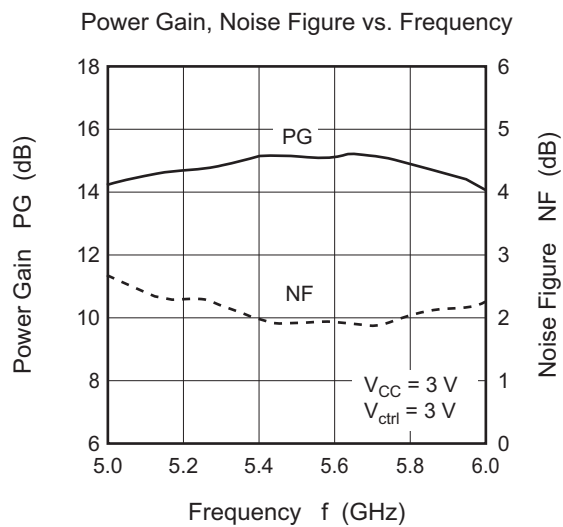
Pin - Pout Characteristics



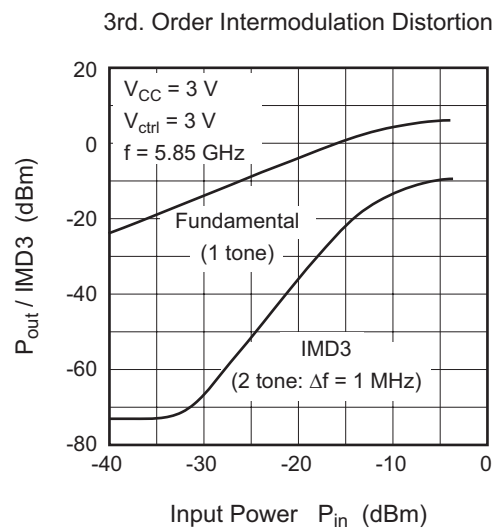
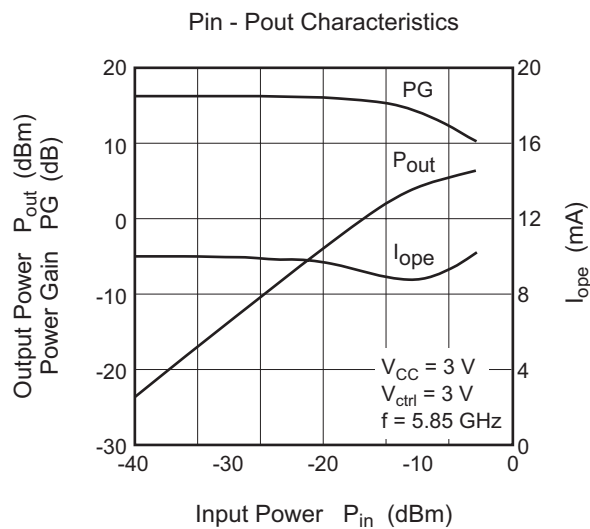
3rd. Order Intermodulation Distortion



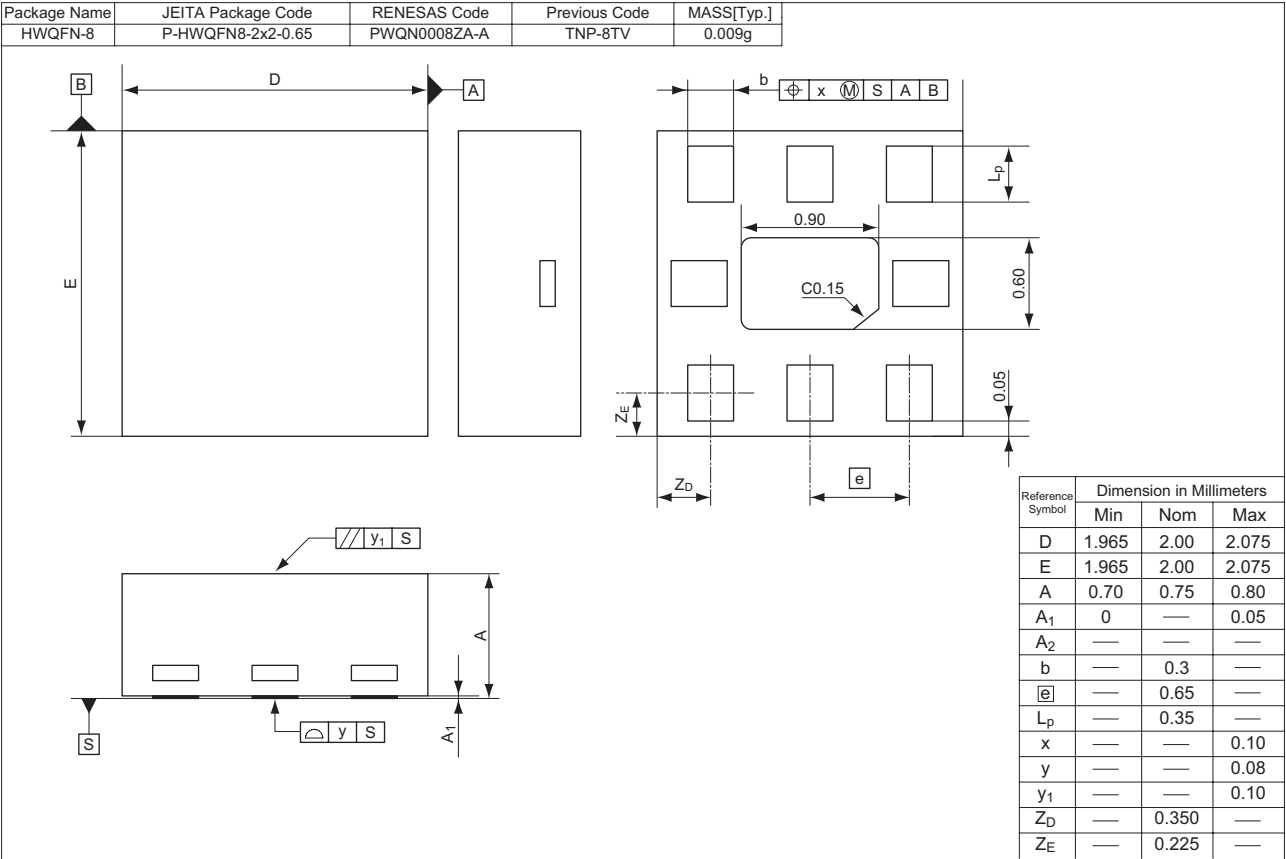
5.85 GHz Characteristics



Pin - Pout Characteristics



Package Dimensions



Ordering Information

| Part No. | Quantity | Shipping Container |
|----------------|-----------|----------------------------------|
| HA31006ANPTL-E | 3000 pcs. | φ178 mm reel, 8 mm emboss taping |

Notes:

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