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Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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HA31006ANP

SiGe MMIC
High Frequency Low Noise Amplifier

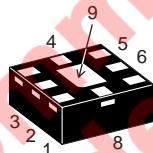
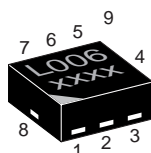
REJ03F0174-0300
Rev.3.00
Jul 31, 2007

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 × 2.0 × 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

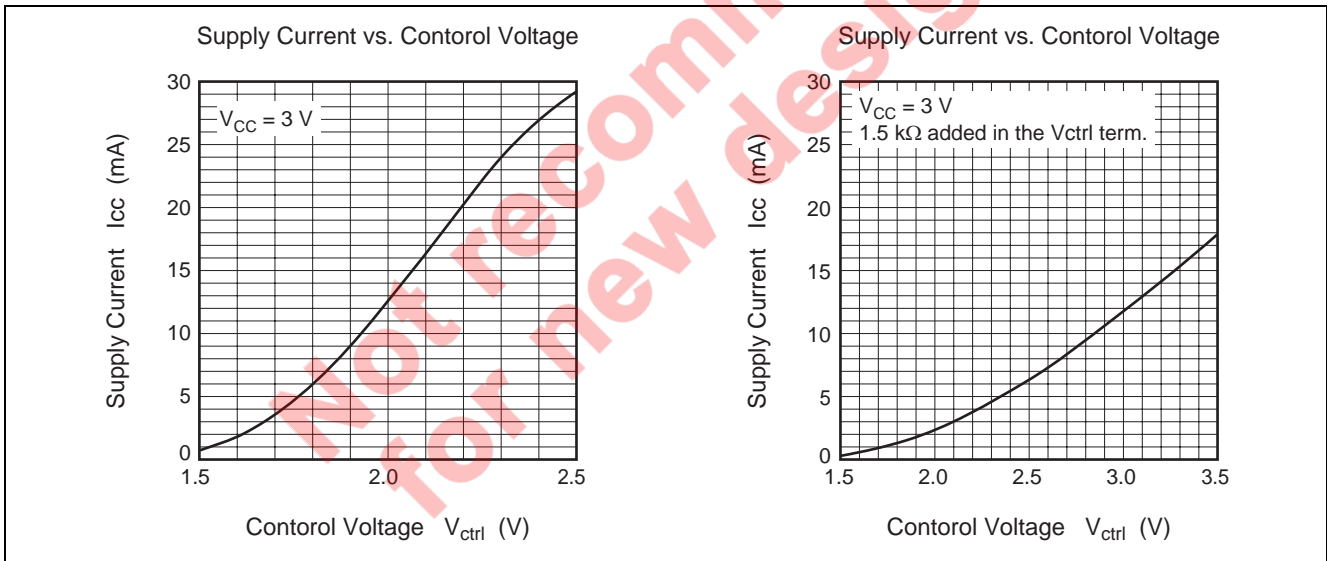
Notes: Specified condition

Electrical Characteristics

(Ta = 25°C)

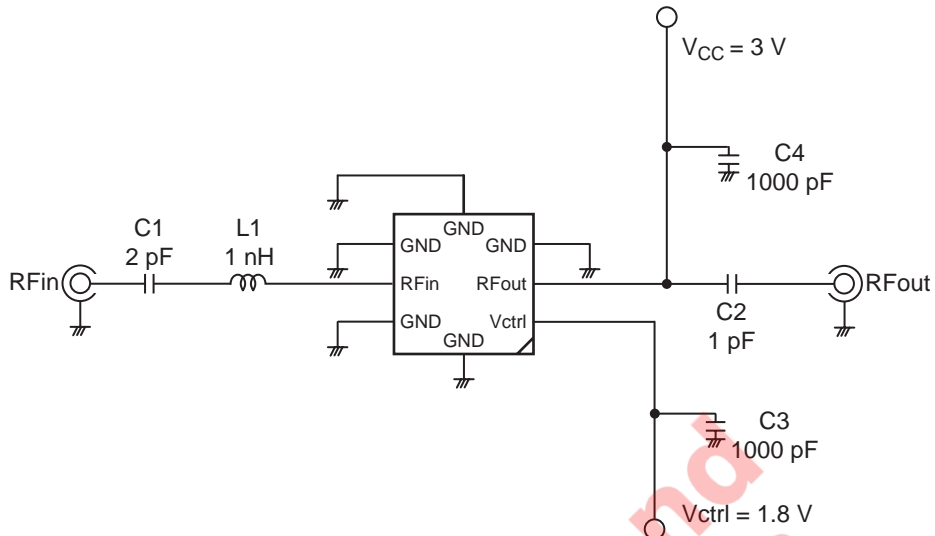
Item	Symbol	Min.	Typ	Max.	Unit	Test Conditions
Supply Current	I _{cc}	—	6	—	mA	No RF signal
Noise Figure	NF	—	1.3	—	dB	f = 2.35 to 2.55 GHz V _{CC} = 3 V, V _{ctrl} = 1.8 V
		—	1.7	—		f = 5 to 6 GHz V _{CC} = 3 V, V _{ctrl} = 1.8 V
Power Gain	PG	—	20	—	dB	f = 2.35 to 2.55 GHz V _{CC} = 3 V, V _{ctrl} = 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

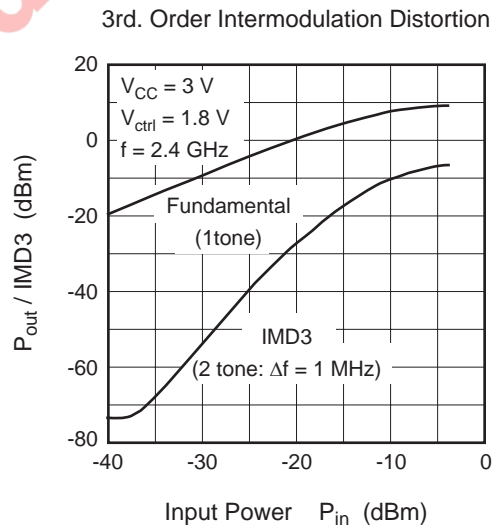
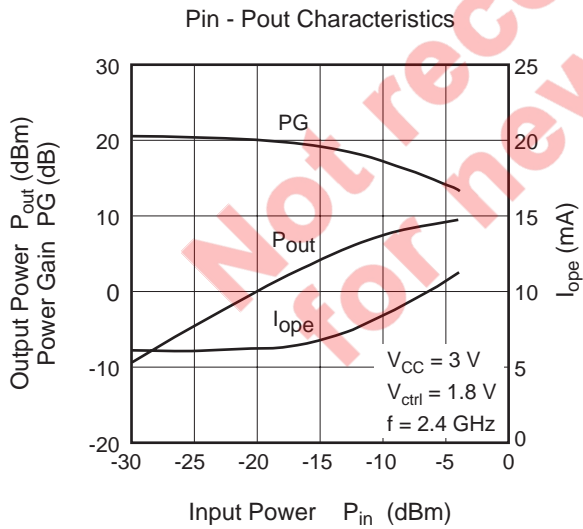


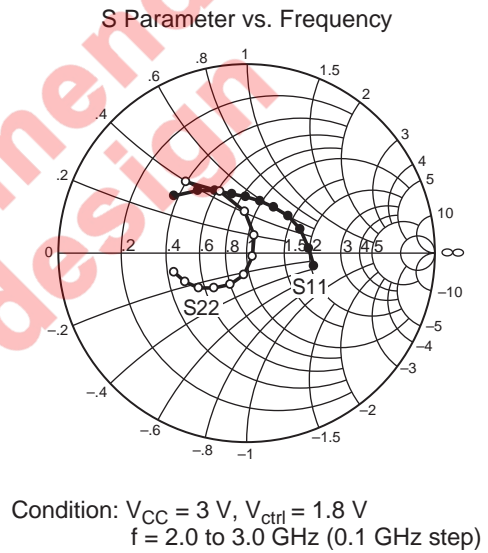
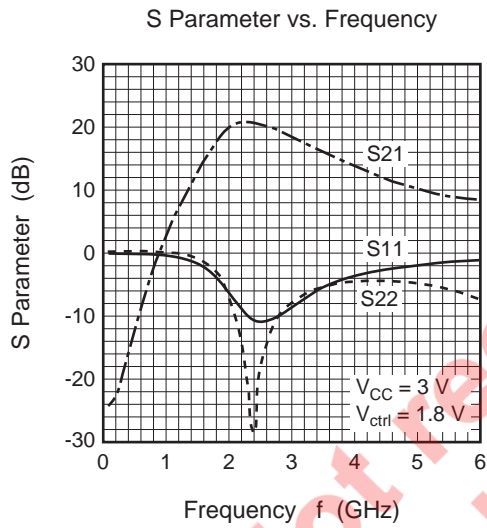
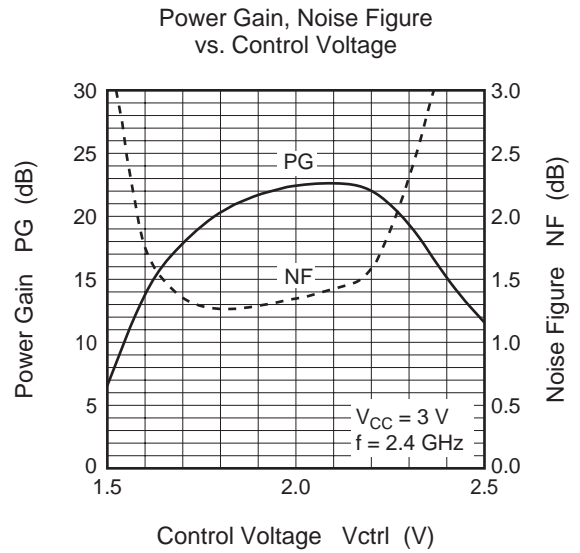
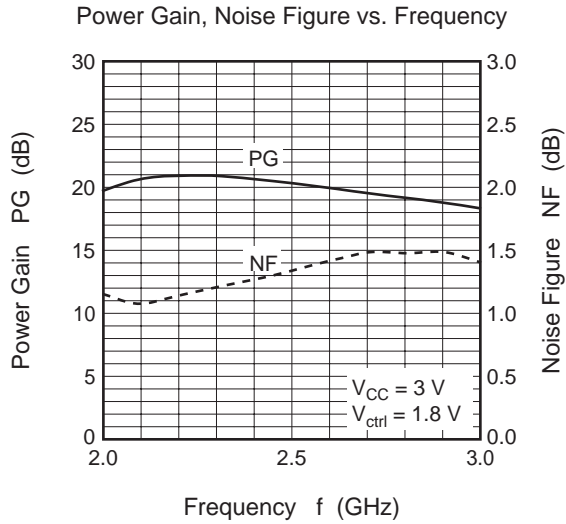
2.4 GHz Characteristics

Evaluation Board Circuit



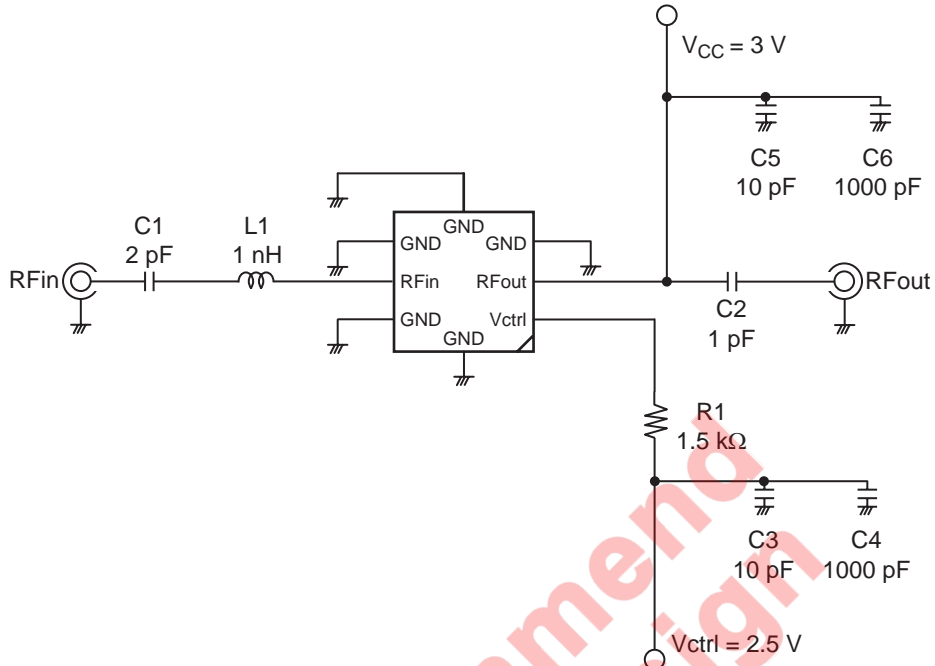
Pin - Pout Characteristics



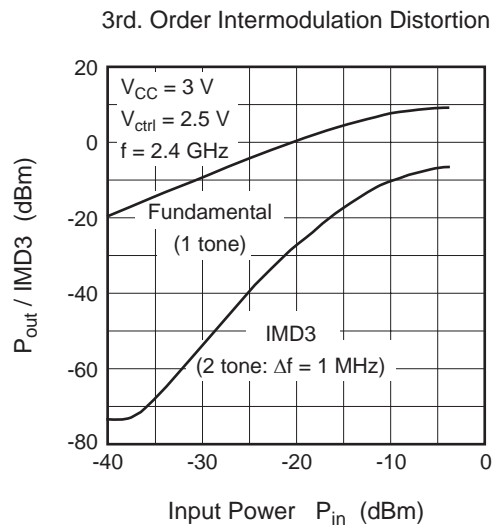
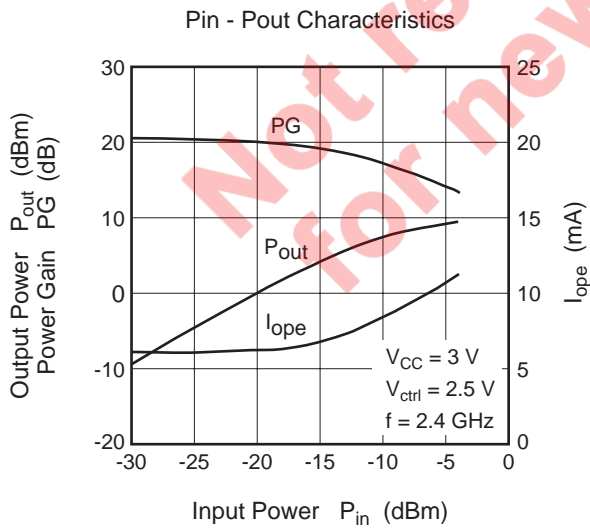


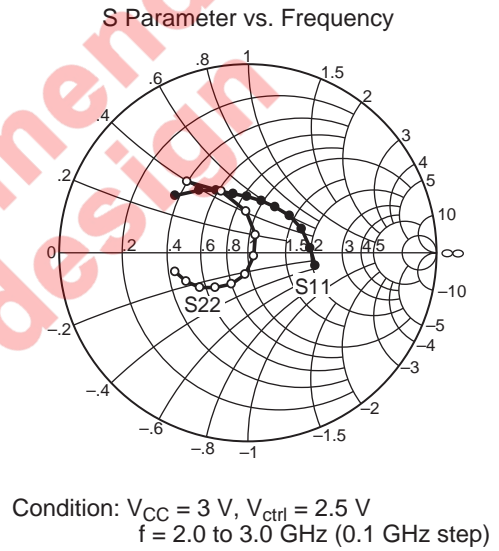
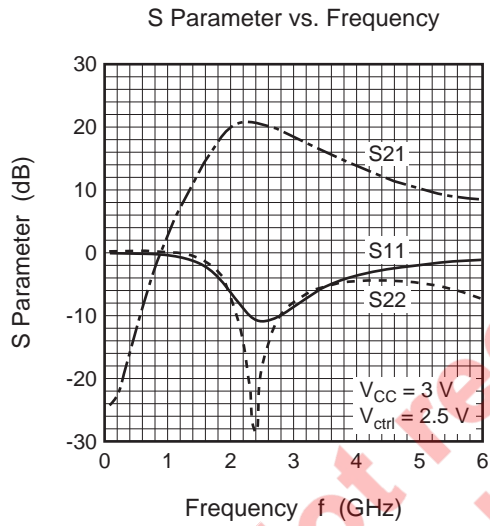
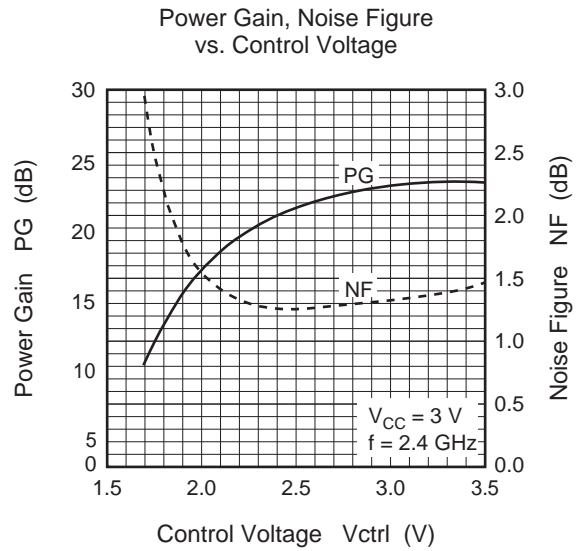
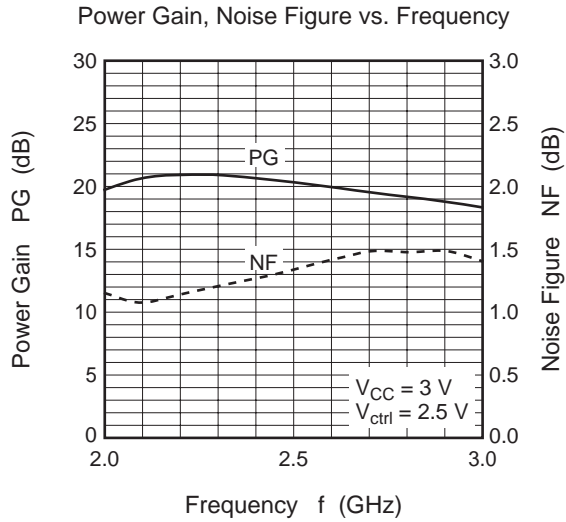
2.4 GHz Characteristics (Vctrl 1.5 kΩ)

Evaluation Board Circuit



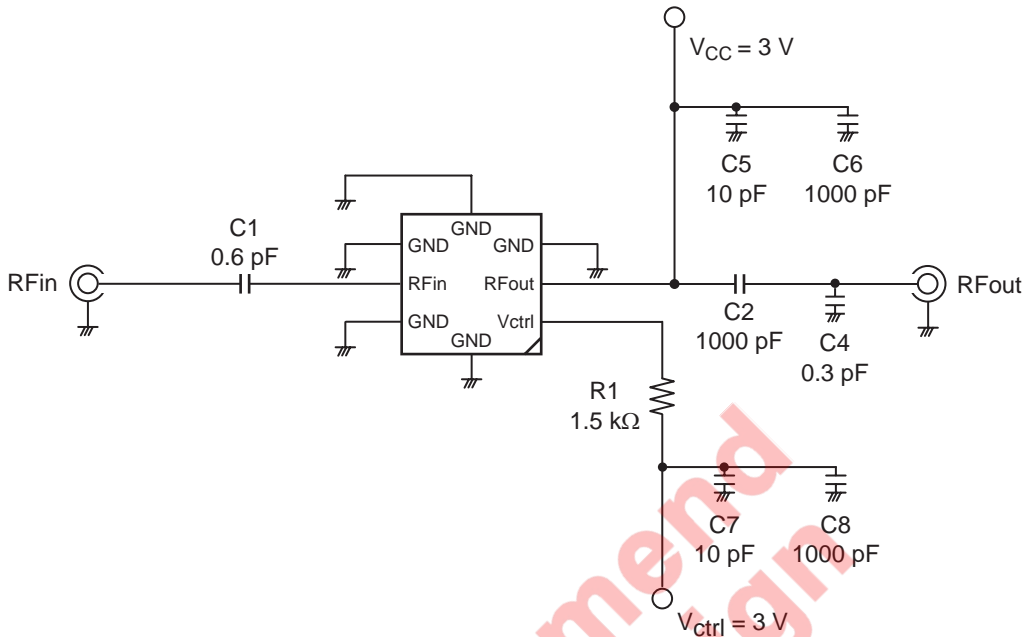
Pin - Pout Characteristics



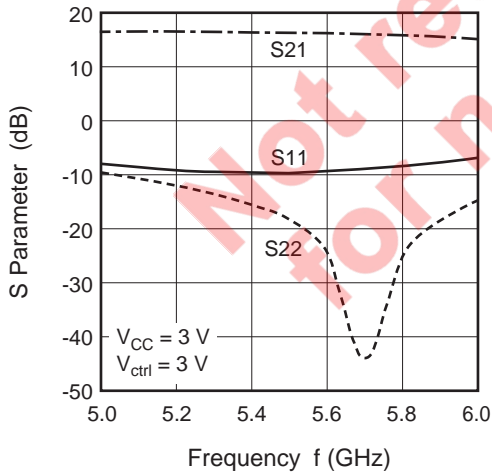


5 GHz Characteristics

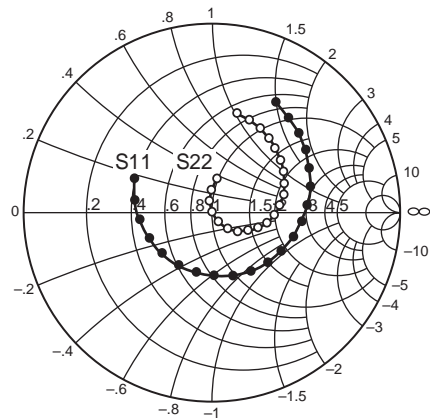
Evaluation Board Circuit



S Parameter vs. Frequency



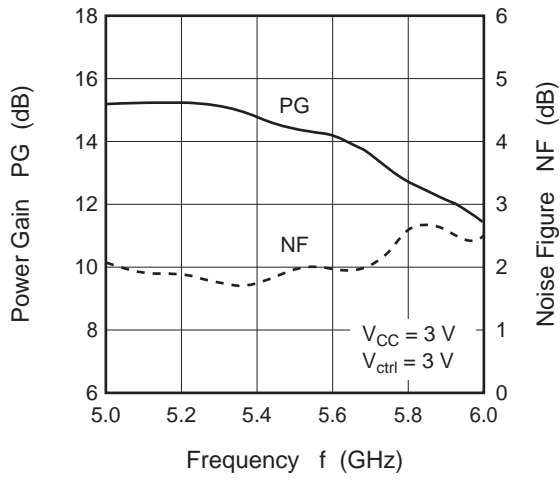
S Parameter vs. Frequency



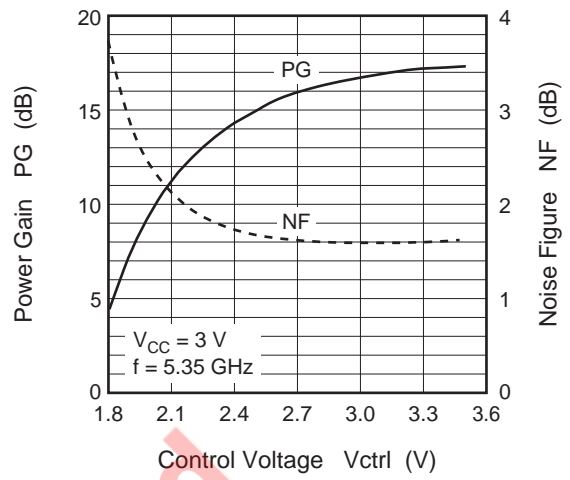
Condition: $V_{CC} = 3\text{ V}$, $V_{ctrl} = 3\text{ V}$
 $f = 4.0\text{ to }6.0\text{ GHz (0.1 GHz step)}$

5.35 GHz Characteristics

Power Gain, Noise Figure vs. Frequency

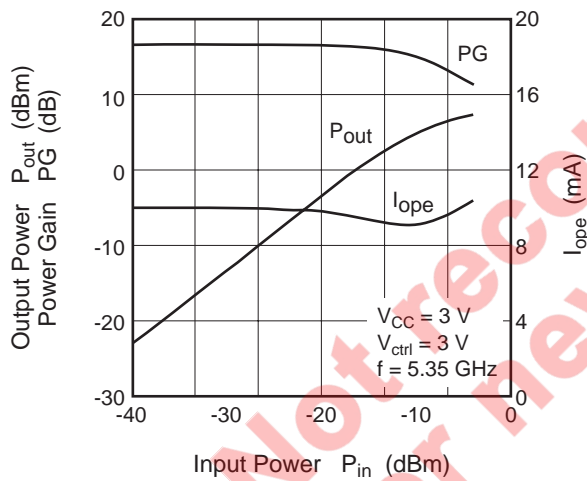


Power Gain, Noise Figure vs. Control Voltage

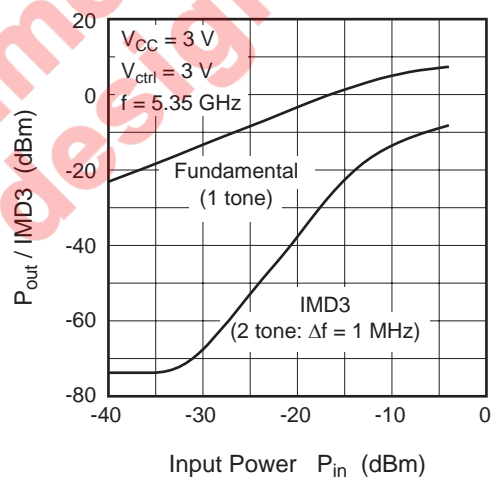


Pin - Pout Characteristics

Pin - Pout Characteristics

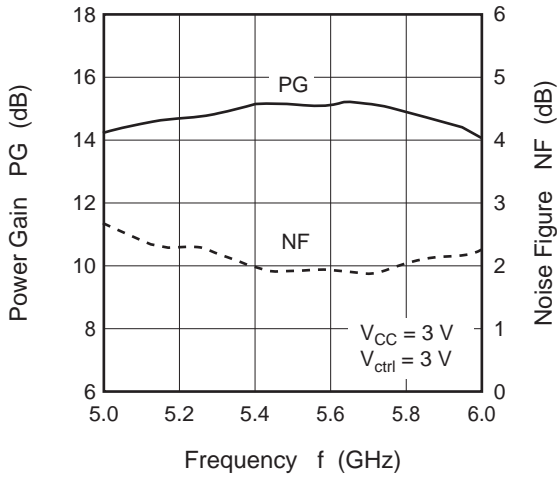


3rd. Order Intermodulation Distortion

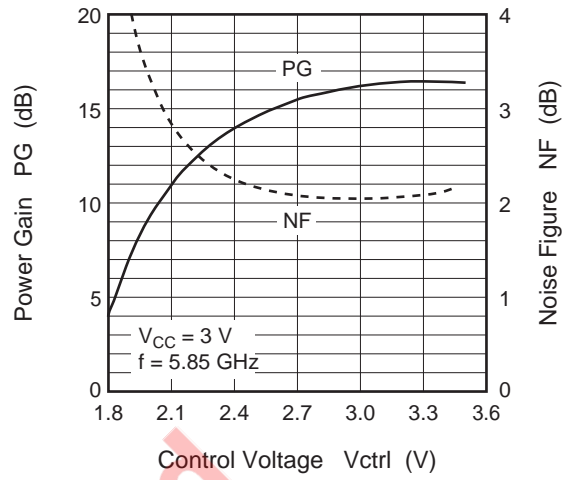


5.85 GHz Characteristics

Power Gain, Noise Figure vs. Frequency

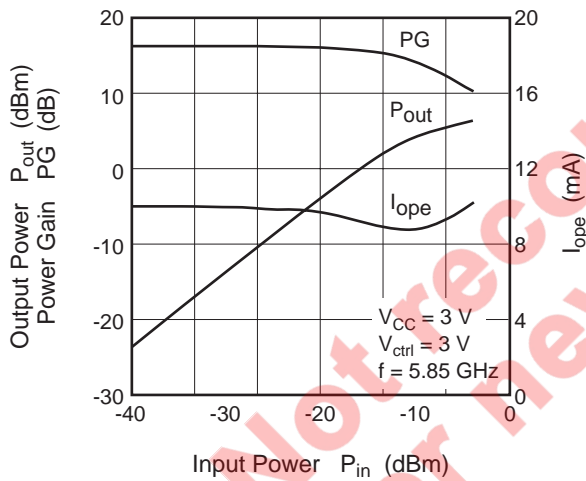


Power Gain, Noise Figure vs. Control Voltage

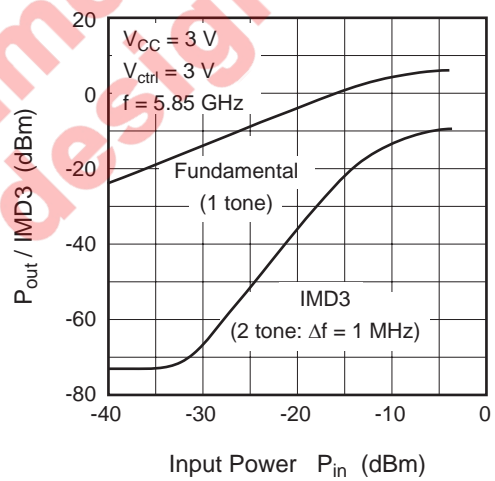


Pin - Pout Characteristics

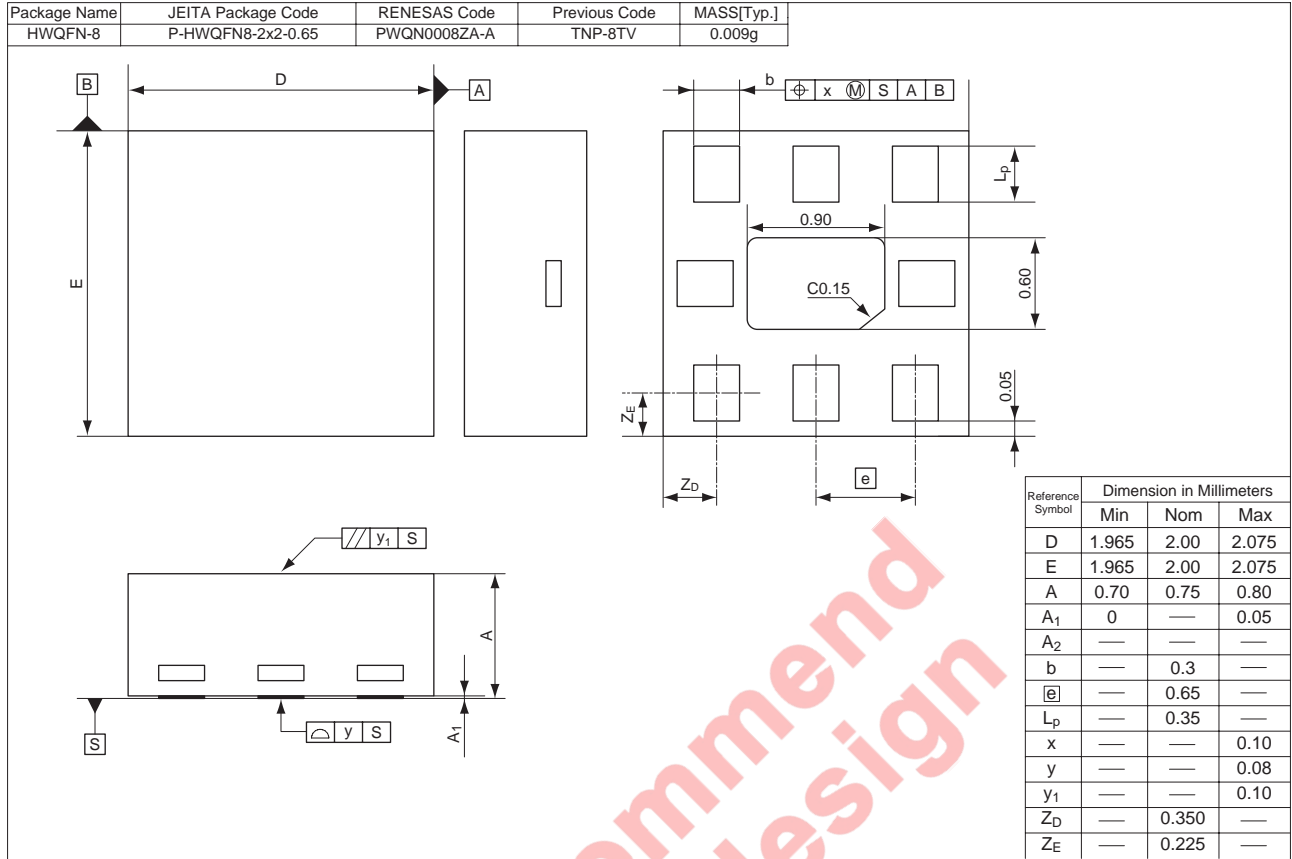
Pin - Pout Characteristics



3rd. Order Intermodulation Distortion



Package Dimensions



Ordering Information

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

Not recommended for new design

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