RTC5608 : 2.4 – 2.5 GHz Low Noise Amplifier for 802.11b/g/n

Description

The RTC5608 is a low noise amplifier designed for operating between 2.4 GHz to 2.5 GHz. It delivers 13 dB high gain while giving noise figure 1.1 dB at the full band. The RTC5608 also possesses an enable /disable mode control to save power. The RTC5608 is housed in a tiny 6L QFN-1.5X1.5X0.45 mm^3 plastic package.

Feature

- Frequency Range : 2.4 – 2.5 GHz
- Typical Supply Voltage : 3.3 V
- Small Signal Gain : 13 dB
- Low Noise Figure : 1.1 dB
- On-chip input & output matching
- Enable/Disable Mode Control
- 6L QFN-1.5X1.5X0.45 mm^3 Plastic Package
- RoHS, Pb-free, Halogen Free Compliant
- Moisture Sensitivity Level : MSL-3

Application

- IEEE 802.11b/g/n WLAN networks
- Bluetooth®

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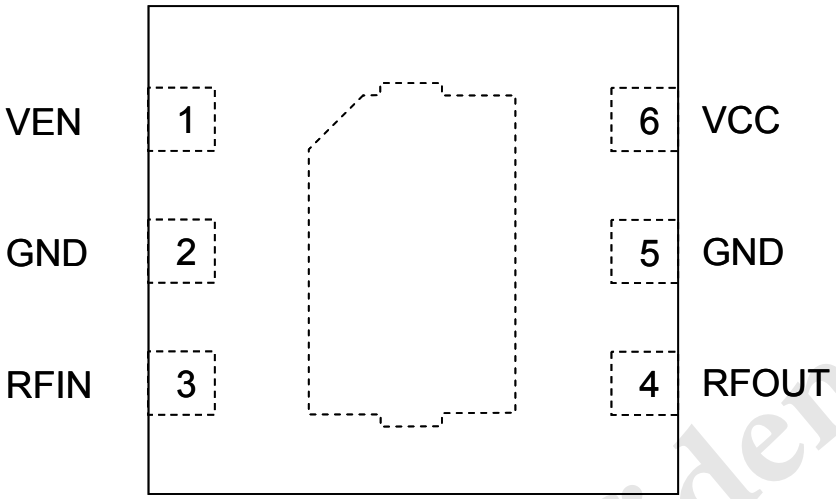
Pin Out (Top View)



Pin Function Description

Pin	Function	Description
1	VEN	Enable control pin
2	GND	Ground
3	RFIN	RF input
4	RFOUT	RF output
5	GND	Ground
6	VCC	Voltage supply

Recommended Operation Range

Parameter	Symbol	Min	Typ	Max	Unit
Operation Frequency	f1	2.4	-	2.5	GHz
Supply Voltage	VCC	3.0	3.3	3.6	V
Enable Control (High)	VEN_H	2.0	3.0	3.5	V
Enable Control (Low)	VEN_L	0	0	0.25	V

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Absolute Maximum Rating

Parameter	Symbol	Rating	Unit
Supply Voltage	VCC	5	V
Enable Control	VEN	4	V
Input Power	RFIN	+5	dBm
Operating Ambient Temperature	T_A	-30 ~ +85	°C
Storage Temperature	T_{STG}	-40 ~ +125	°C

Note : Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only, functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Operation between operation range maximum and absolute maximum for extended periods may affect device reliability.

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Electrical Characteristics

T_A = 25℃, 50Ω system with Vcc=3.3V, Ven=3.0V, freq=2.45GHz , unless otherwise noted

Parameters	Condition	Min	Typ	Max	Units
Enable Mode					
Gain	S21	-	13	-	dB
Noise Figure	Zs=50ohm	-	1.1	-	dB
IIP3	3rd Order Input Intercept Point	-	10	-	dBm
IP1dB	1dB gain compression input power	-	3	-	dBm
Input Return Loss	S11	-	-7	-	dB
Output Return Loss	S22	-	-4	-	dB
Icc	VEN = 3.0V	-	15	-	mA
Ien	VEN = 3.0V	-	0.8	-	mA
Disable Mode					
Loss	VEN = 0 V	-	-12	-	dB
Icc_disable	VEN = 0 V	-	-	1	uA

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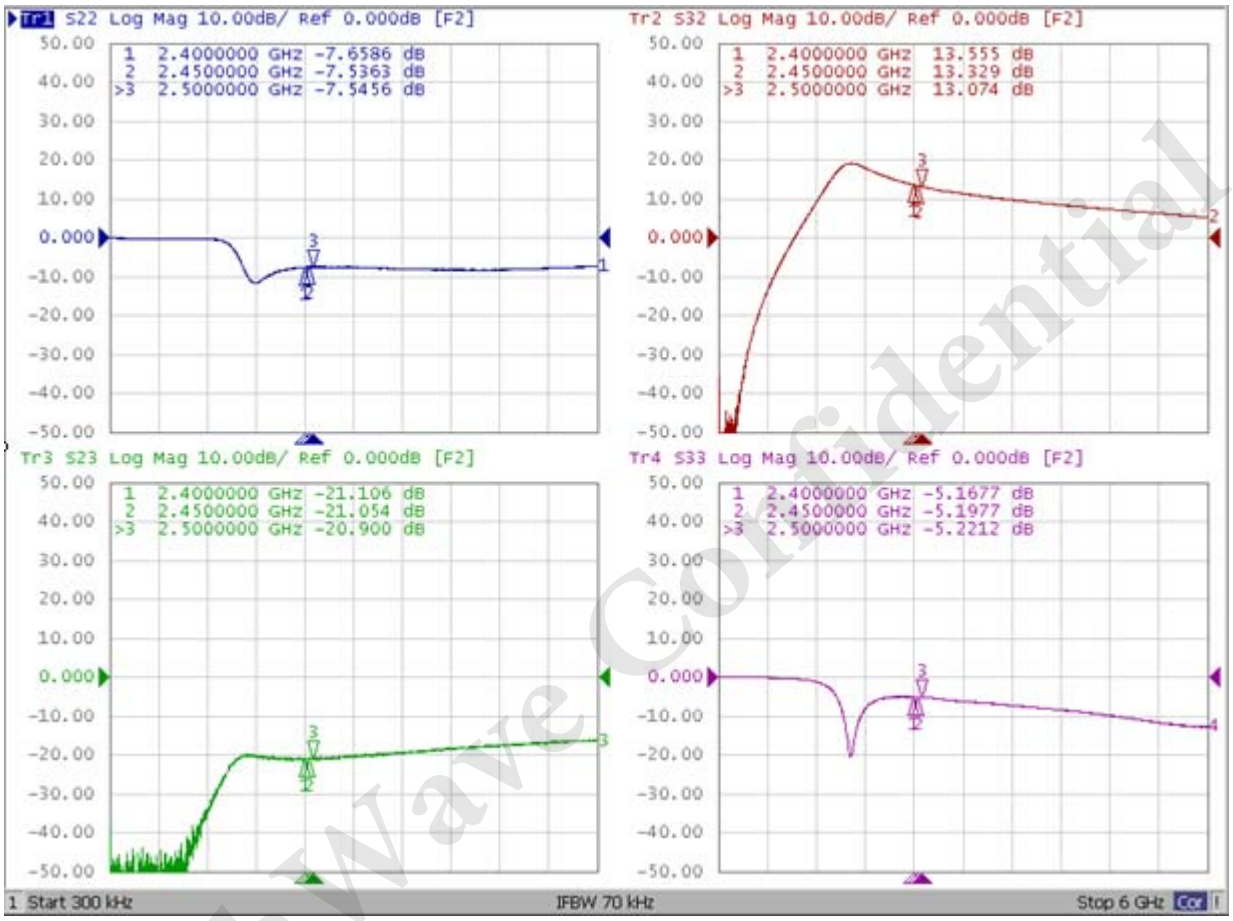
Typical Performance Characteristics (Enable Mode)

T_A = 25℃, 50Ω system with VCC = 3.3 V, VEN = 3.0 V,

(1) S-Parameter



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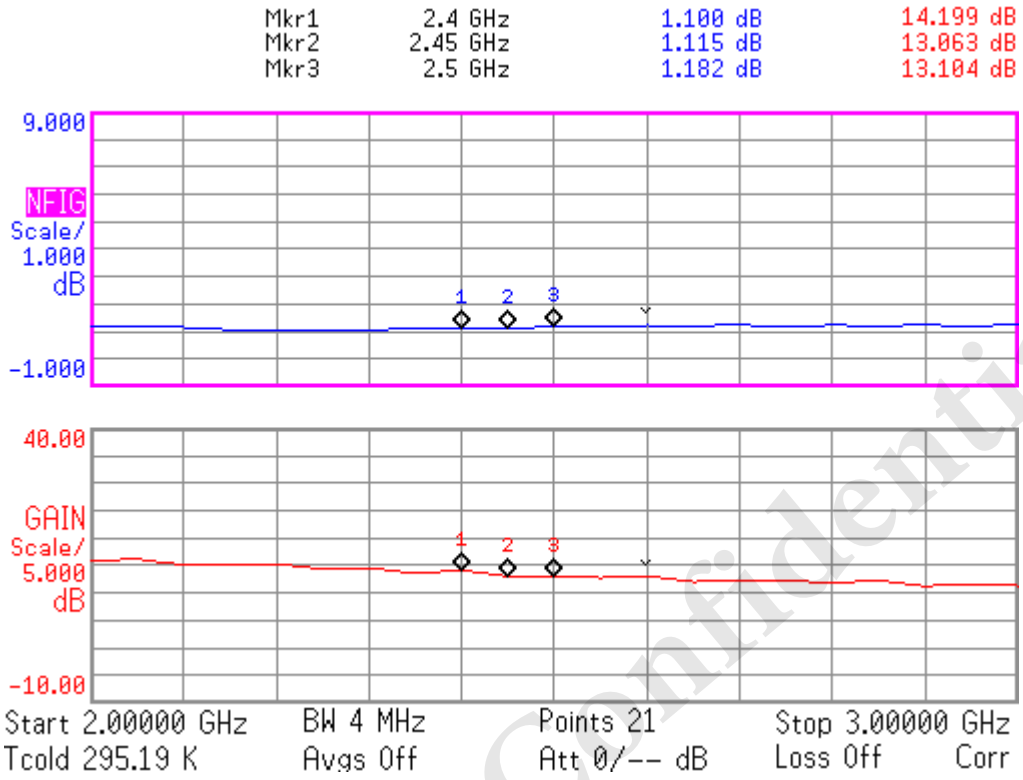
(2) Noise Figure



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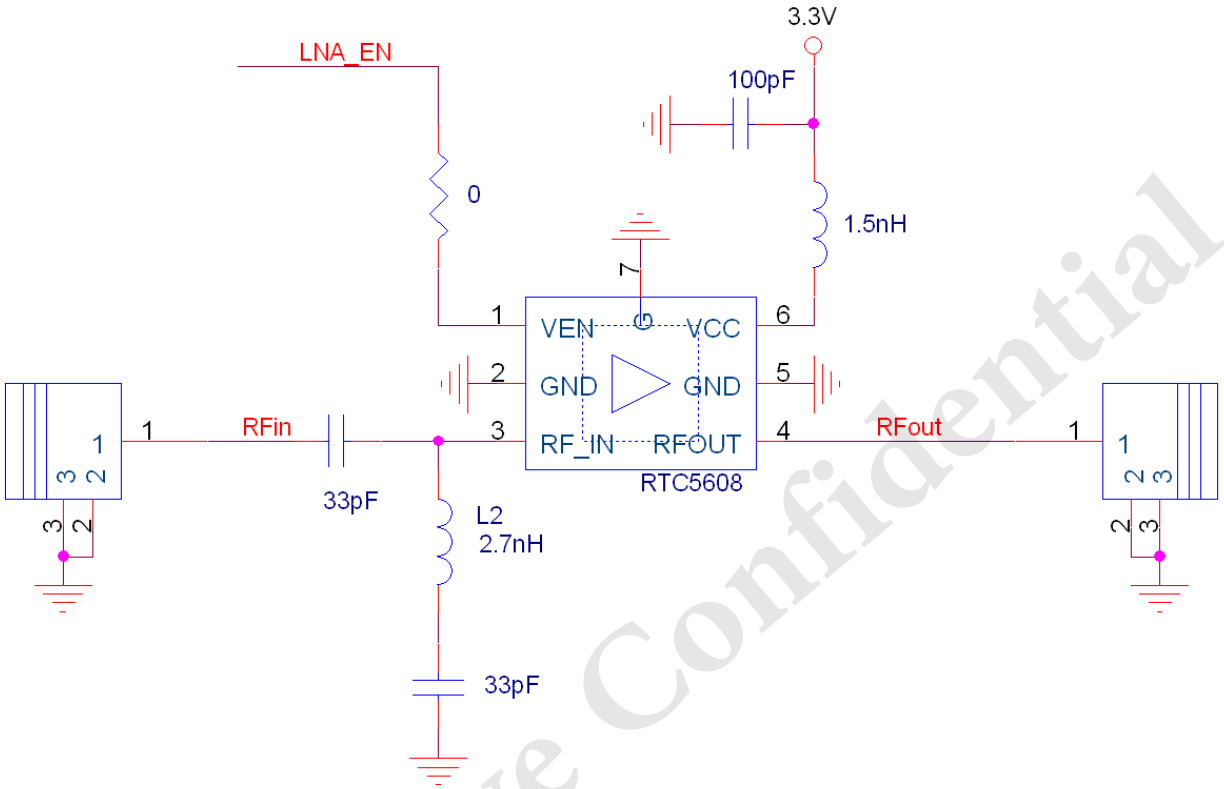
Application Circuit



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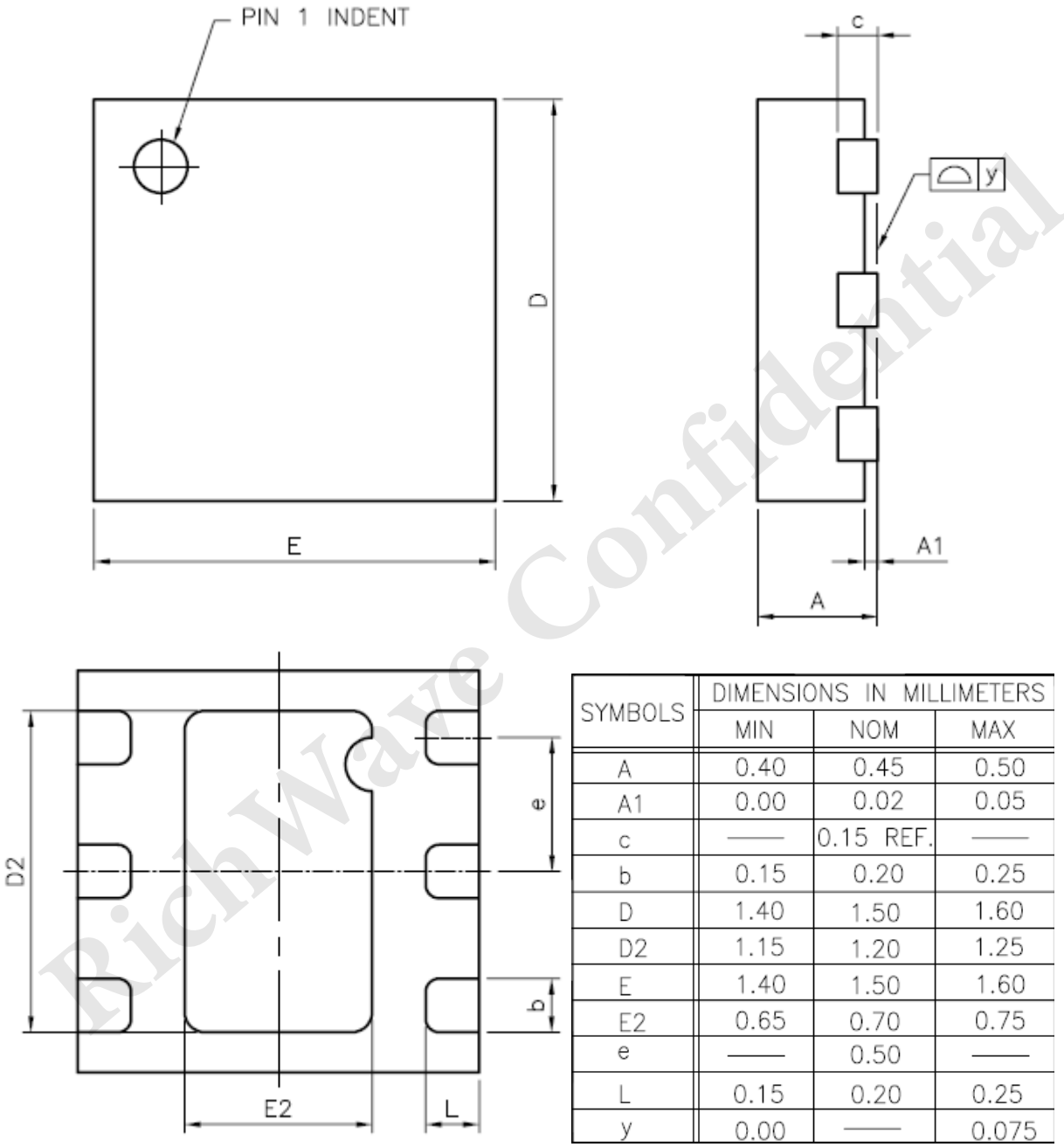
Package Outline Dimension



SYMBOLS	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.40	0.45	0.50
A1	0.00	0.02	0.05
c	——	0.15 REF.	——
b	0.15	0.20	0.25
D	1.40	1.50	1.60
D2	1.15	1.20	1.25
E	1.40	1.50	1.60
E2	0.65	0.70	0.75
e	——	0.50	——
L	0.15	0.20	0.25
y	0.00	——	0.075

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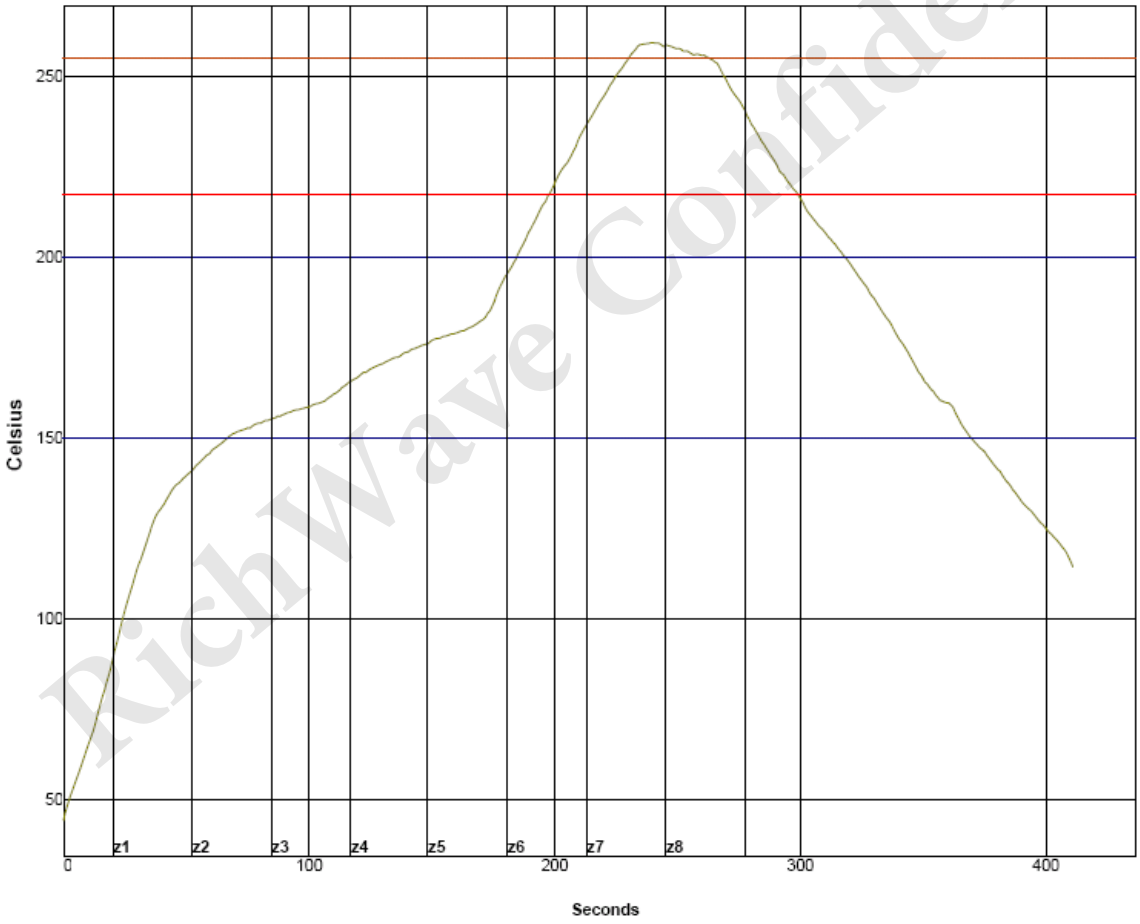
Recommended Solder Reflow Profiles

Average ramp-up rate (200˚C to peak)	3˚C/second max.
Preheat temperature 175 (+/-25) ˚C	60~120secs
Temperature maintained above 217˚C	60~150secs
Time within 5˚C of actual peak temperature	30 seconds min.
Peak temperature range	(260 +2/-2)˚C
Ramp down rate	6˚C/second max.
Time 25˚C to peak temperature	8 minutes max.

* Follow JEDEC spec J-STD-020D



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