

2.4-2.5 GHz Low-Noise Amplifier

SST12LN01



Preliminary Specifications

FEATURES:

- **Suitable Gain:**
 - Typically 12-13 dB gain across 2.4–2.5 GHz
- **Low Noise Figure:**
 - 1.2-1.5 dB across 2.4–2.5 GHz
- **IIP3:**
 - 3 dBm across 2.4–2.5 GHz
- **Low Current Consumption**
 - 12 mA across 2.4–2.5 GHz
- **50Ω Input/Output Matched**
- **Packages available**
 - 16-contact UQFN – 3 mm x 1.6 mm
- **All non-Pb (lead-free) devices are RoHS compliant**

APPLICATIONS:

- **WLAN**
- **Bluetooth**
- **Wireless Network**

PRODUCT DESCRIPTION

The SST12LN01 is a cost effective Low Noise Amplifier (LNA) which does not require external RF-matching components on PCB applications. This device is based on the 0.5μm GaAs PHEMT technology, and complies with 802.11 b/g applications.

SST12LN01 provides high-performance, low-noise, and mild-gain operations within the 2.4–2.5 GHz frequency band. Across this frequency band, this device typically provides 12-13 dB gain.

This LNA cell is equipped with a self DC-biasing scheme, which helps keep the DC consumption very low during operation. A pair of singled-ended, input and output ports is assigned to the LNA cell with a 50 RF match.

The SST12LN01 is offered in a 6-contact UQFN package. See Figure 2 for pin assignments and Table 1 for pin descriptions.



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FUNCTIONAL BLOCKS

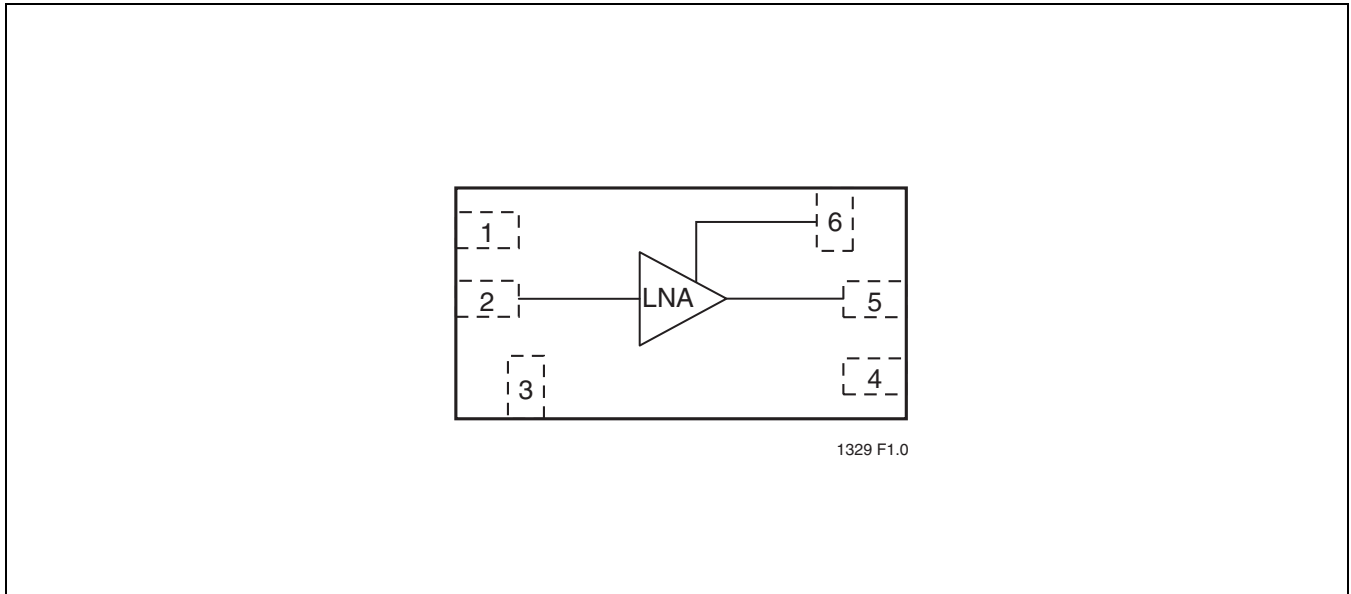


FIGURE 1: Functional Block Diagram

PIN ASSIGNMENTS

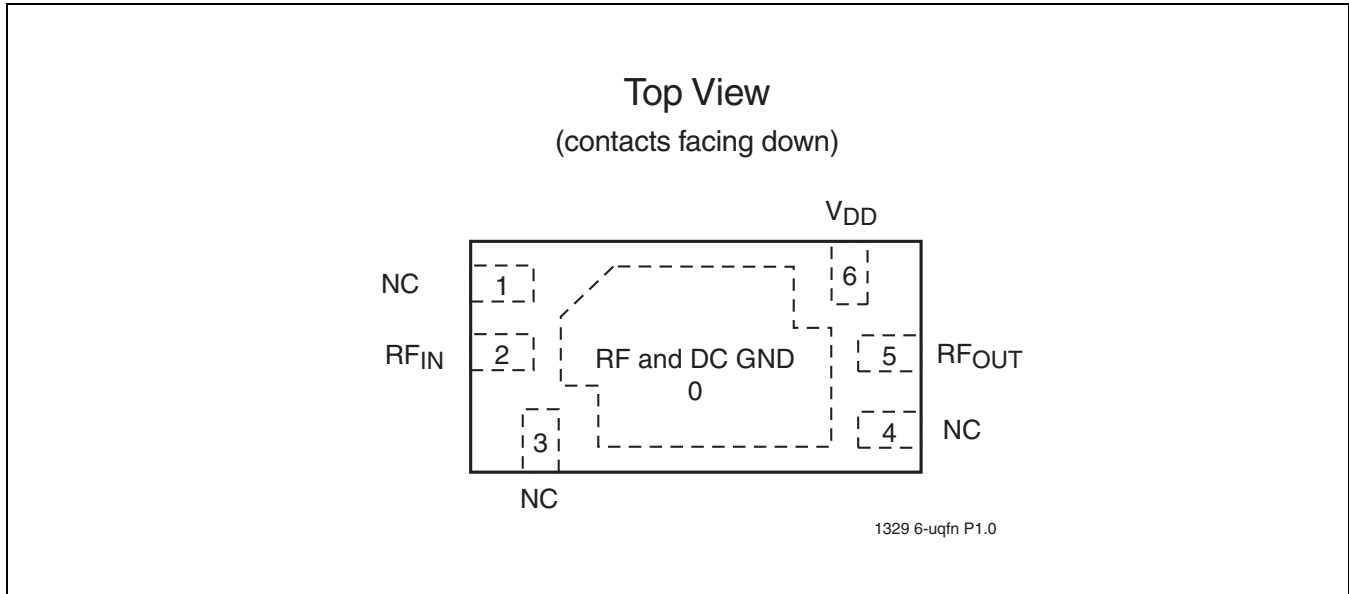


FIGURE 2: Pin Assignments for 16-contact UQFN

PIN DESCRIPTIONS

TABLE 1: Pin Description

Symbol	Pin No.	Pin Name	Type ¹	Function
GND	0	Ground		
NC	1	No Connection		Unconnected pin
RFIN	2		I	2.4G RF input
NC	3	No Connection		Unconnected pin
NC	4	No Connection		Unconnected pin
RFOUT	5		O	2.4G RF output
VDD	6	Power Supply	PWR	

1. I=Input, O=Output

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ELECTRICAL SPECIFICATIONS

The AC and DC specifications for the power amplifier interface signals. Refer to Table 2 for the DC voltage and current specifications. Refer to Figure 3 for the RF performance.

Absolute Maximum Stress Ratings (Applied conditions greater than those listed under “Absolute Maximum Stress Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these conditions or conditions greater than those defined in the operational sections of this data sheet is not implied. Exposure to absolute maximum stress rating conditions may affect device reliability.)

Input power to pin 2 (P_{IN})	+5 dBm
Average output power (P_{OUT}) ¹	-15 dBm
Supply Voltage at pin 6 (V_{DD})	-0.3V to +3.5V
DC supply current (I_{CC})	15 mA
Operating Temperature (T_A)	-40°C to +85°C
Storage Temperature (T_{STG})	-40°C to +120°C
Maximum Junction Temperature (T_J)	+150°C
Surface Mount Solder Reflow Temperature	260°C for 10 seconds

1. Never measure with CW source. Pulsed single-tone source with <50% duty cycle is recommended. Exceeding the maximum rating of average output power could cause permanent damage to the device.

Operating Range

Range	Ambient Temp	V_{CC}
Extended	-20 to +80°C	2.9–3.5V

TABLE 2: DC Electrical Characteristics

Symbol	Parameter	Min.	Typ	Max.	Unit
V_{CC}	Supply Voltage at pin 6		3.0		V
I_{CC}	Supply Current 2.4–2.5 GHz		12		mA

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TABLE 3: AC Electrical Characteristics for Configuration

Symbol	Parameter	Min.	Typ	Max.	Unit
F_{L-U}	Frequency range	2400		2550	MHz
G	Small signal gain, 2.4–2.55 GHz	12		13	dB
NF	Noise Figure, 2.4–2.55 GHz	1.14		1.5	dB
IIP3	2.4–2.55 GHz		3		dBm

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TYPICAL PERFORMANCE CHARACTERISTICS

Test Conditions: $V_{DDL} = 3.0V$, $T_A = 25^\circ C$, unless otherwise specified

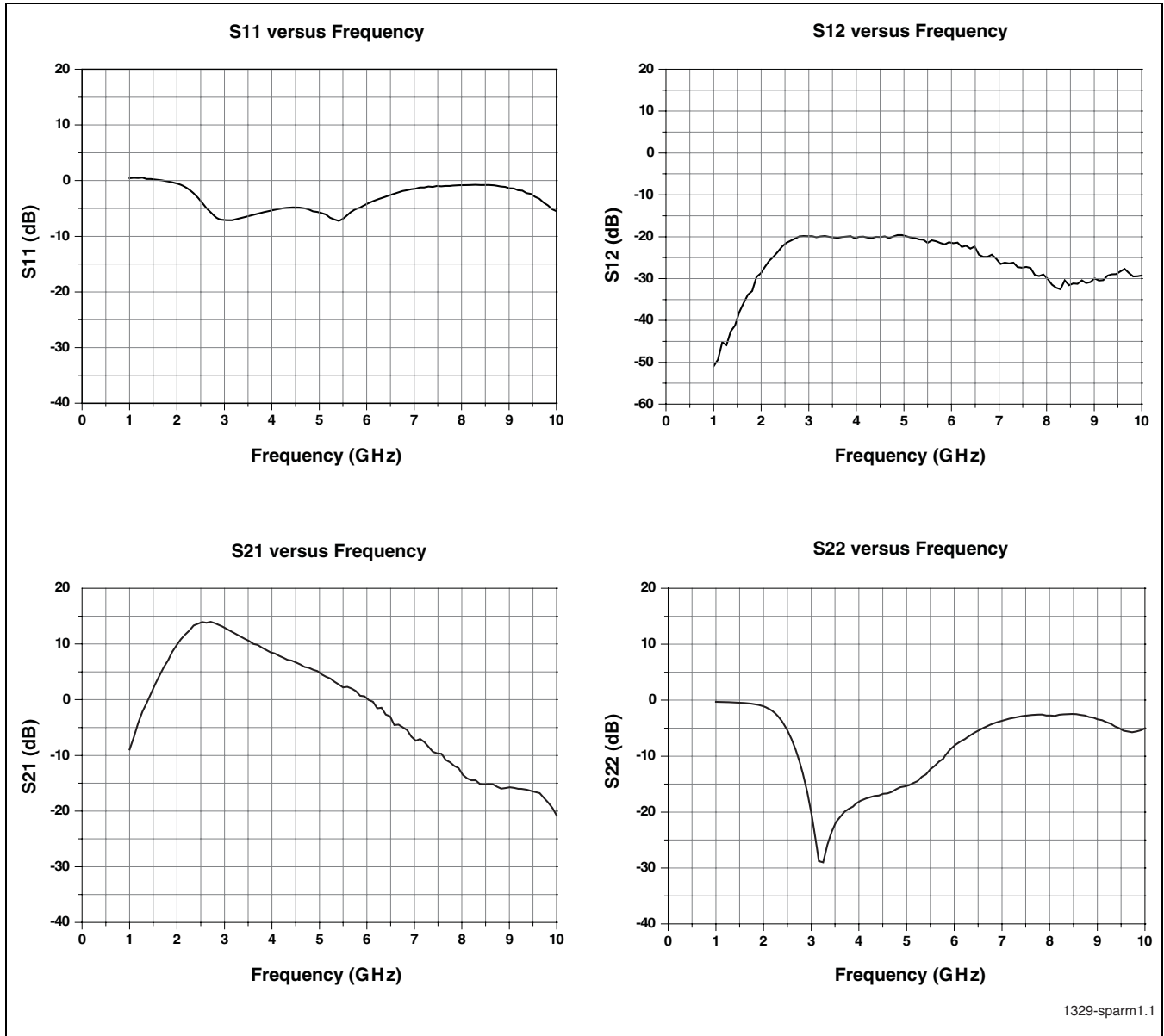


FIGURE 3: S-Parameters



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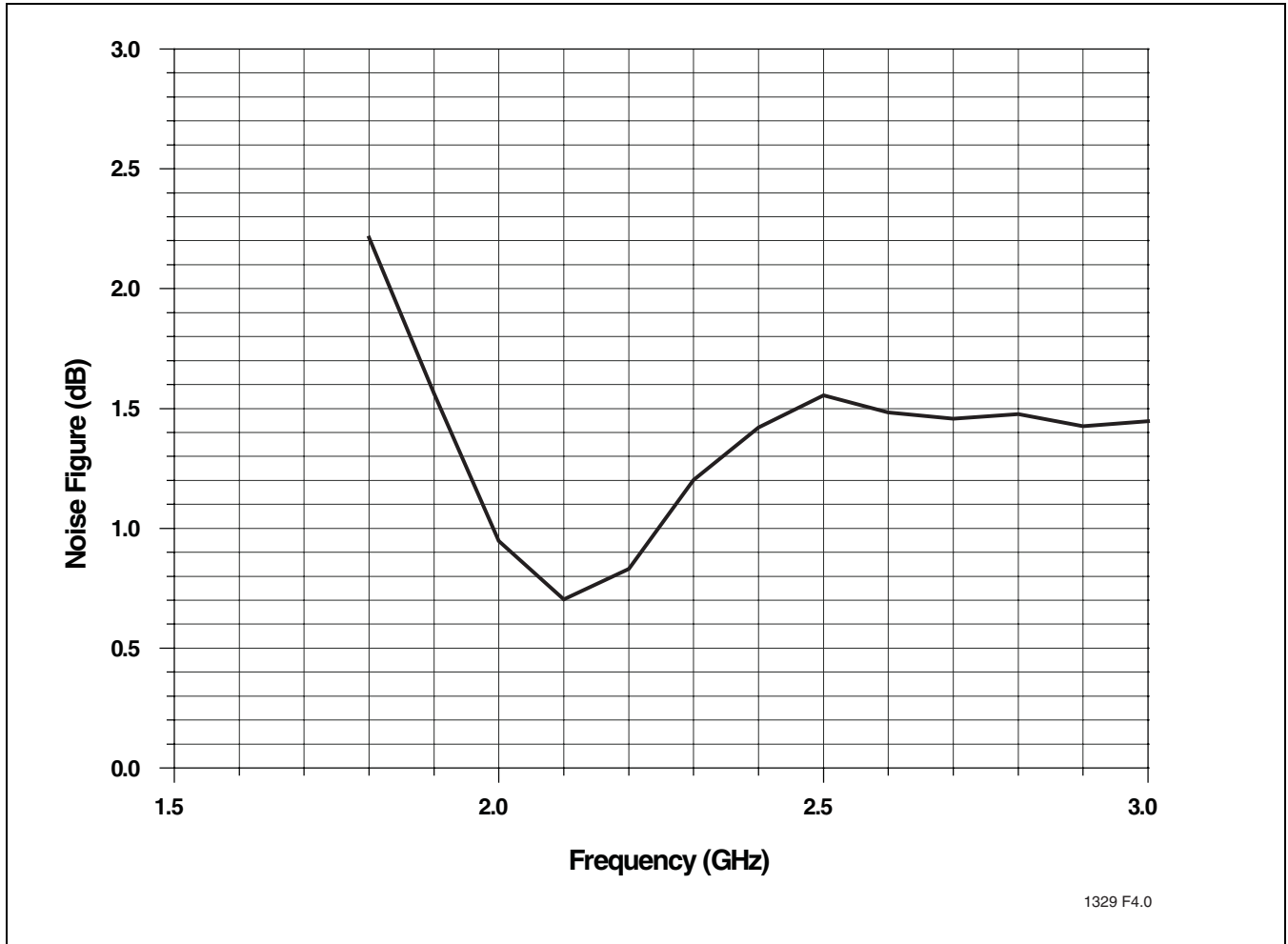


FIGURE 4: Noise Figure versus Frequency

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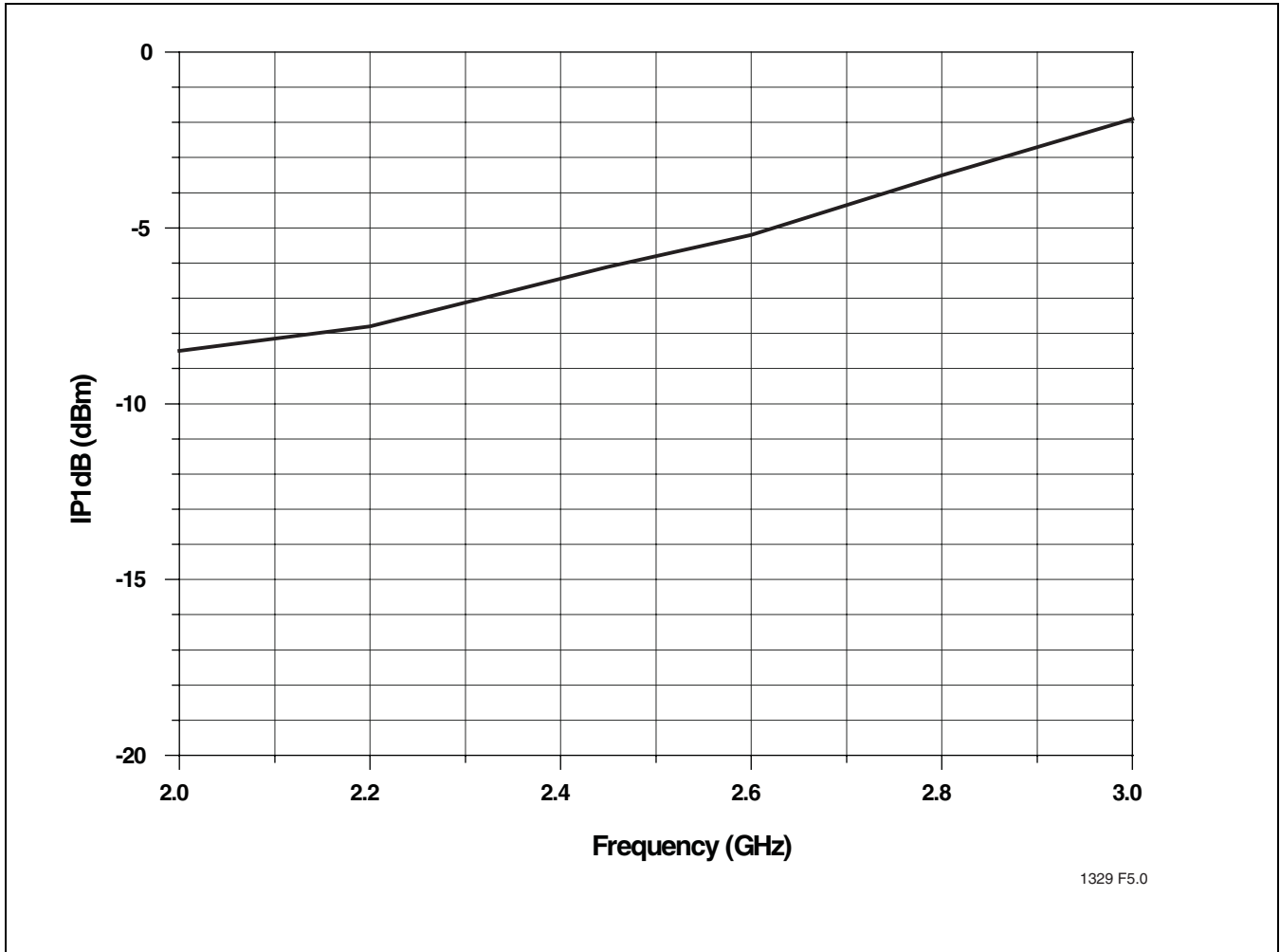


FIGURE 5: Input P1dB versus Frequency



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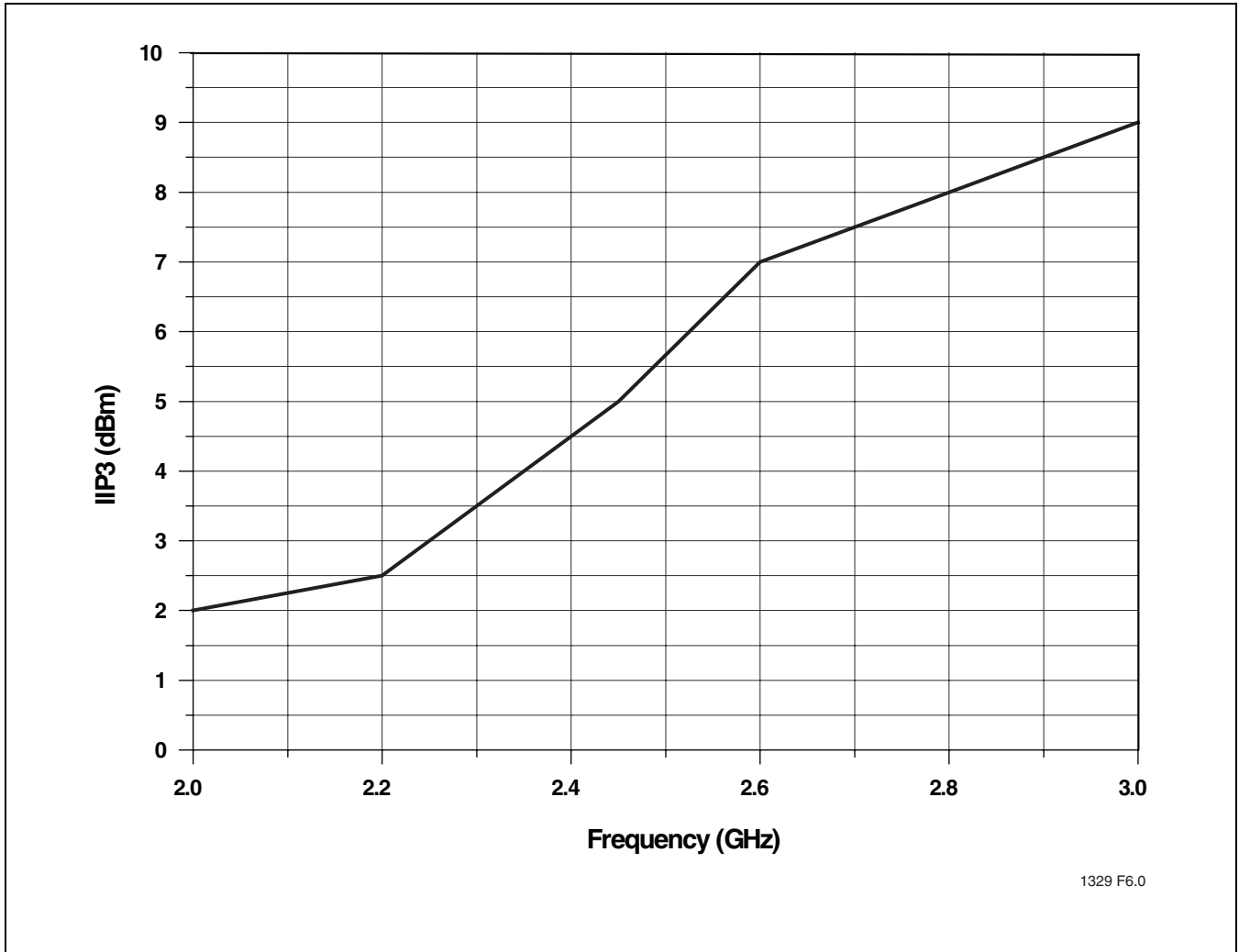


FIGURE 6: Input IP3 versus Frequency

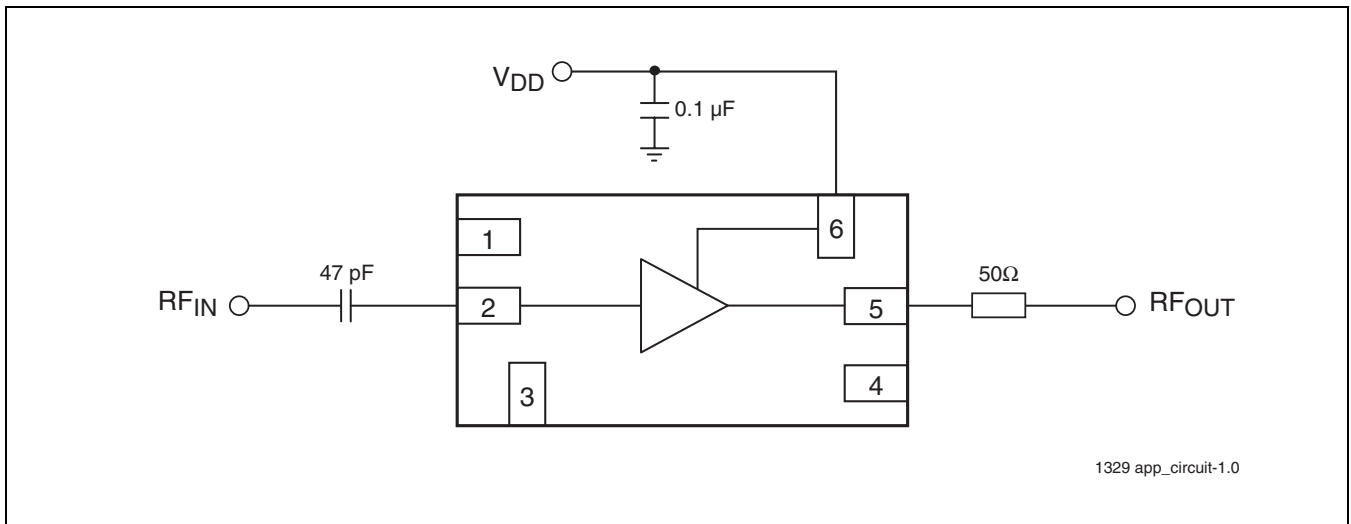


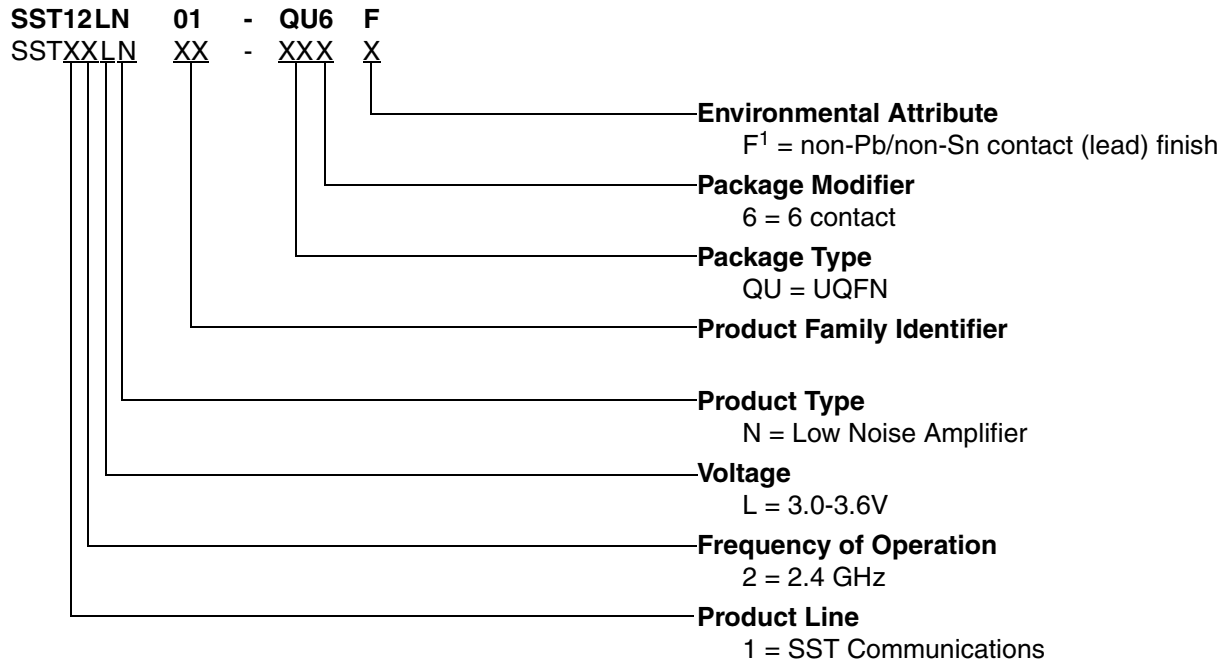
FIGURE 7: Typical Application Circuit



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PRODUCT ORDERING INFORMATION



1. Environmental suffix "F" denotes non-Pb/non-Sn solder. SST non-Pb/non-Sn solder devices are "RoHS Compliant".

Valid combinations for SST12LN01

SST12LN01-QU6F

SST12LN01 Evaluation Kits

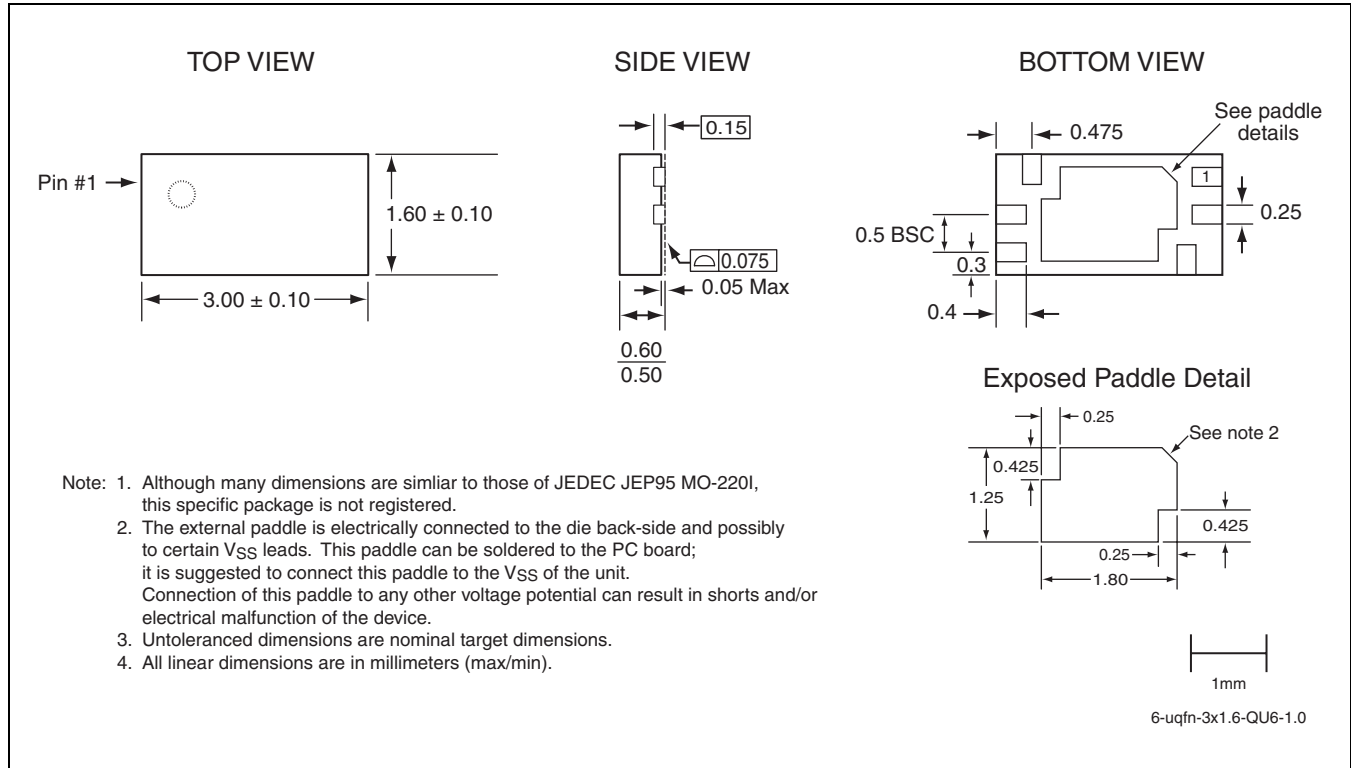
SST12LN01-QU6F-K

Note: Valid combinations are those products in mass production or will be in mass production. Consult your SST sales representative to confirm availability of valid combinations and to determine availability of new combinations.



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PACKAGING DIAGRAMS



**FIGURE 8: 6-contact Ultra-thin Quad Flat No-lead (UQFN)
SST Package Code: QU6**

TABLE 4: Revision History

Revision	Description	Date
00	• Initial release of data sheet	Sep 2006



2.4-2.5 GHz Low-Noise Amplifier SST12LN01

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