HS1100

Low Noise Amplifier for Global Navigation Satellite Systems

Features

1）Ultra low noise figure
2）High power gain：19dB
3）3.5kV HBM protection (including RFIN and RFOUT pin)
4) Reduce RF environment interference for 2G/3G/4G/WiFi/Bluetooth/NFC Co-exists
5）Require only one input matching inductor
6）wide operation voltage: 1.4~3.6V
7）wide support frequency: 1550~1615Mhz

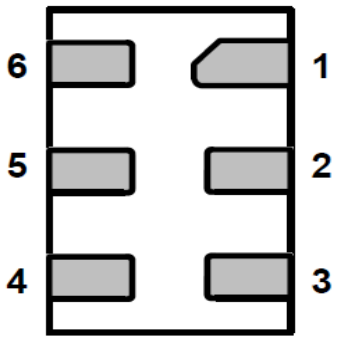
Applications

1）Mobile phones, Table PCs, Note Books, Personal Navigation Device
2）Digital Cameras, Electronic monitor, Internet for things

Introduction

HS1100 has a very excellent performance for co-habitation of different radio system in a same PCB thanks to its high out-of-band linearity and ultra-low noise figure. With wide supporting frequency band, HS1100 can be applied to GPS, GLONASS, Galileo and Beidou system. It require only one input matching inductor and its output matching to 50 ohm was implemented on chip. This makes HS1100 very suitable for high performance and low cost navigation application.

Pin List



Bottom View

1	GND	Ground	Ground
2	GND_RF	Ground	Ground
3	RFIN	Input	RF input port
4	VCC	Power	Power supply
5	EN	Input	Enable pin
6	RFOUT	output	RF output port

Oder Information

Type number	Temperature	Package	Description
HS1100	-40~85	QFN6	QFN 6 pin, 1.5mm*1mm*0.75mm, LEAD pitch=0.5mm; Lead=0.35mm*0.2mm

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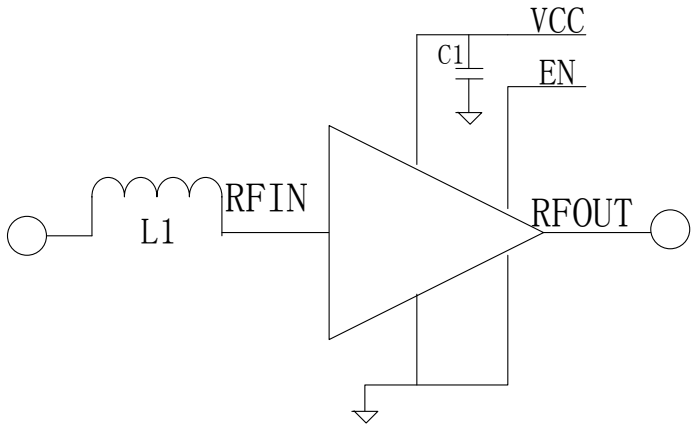
Typical Application Diagram



C1： 470n

L1： 7.2 ~ 10nH, High Q; (Default: 8.2nH， Murata LQW15AN8N2J00D)

Typical Performance

1） ABSOLUTE MAXIMUM RATINGS

VCC/EN to GND	-0.3V to +4.2V
Operating Temperature Range	-40° C to +85° C
Storage Temperature Range	-65° C to +150° C
Lead Temperature (soldering, 10s)	+260° C
Soldering Temperature (reflow)	+260° C
Other Pins to GND Except RFIN	-0.3V to (+ Operating VCC + 0.3V)
RFIN to GND	0.8V
Maximum RF Input Power	+10dBm
ESD	HBM,3.5KV, ALL PIN

2） Enable control

Enable > 1V when VCC>1.7V, Enable > VCC*0.7 when VCC<=1.7V	LNA ON;
ENABLE <0.35V	LNA OFF;

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3）Characteristics

Condition ： VCC=2.8V and Tamb=+25℃, f=1575.42MHz

PARAMETER		CONDITIONS	MIN	TYP	MAX	UNITS
VCC	power supply		1.4		3.6	V
ICC	Supply current	LNA ON		6.9	11	mA
ICC	leakge current	LNA OFF			0.2	uA
Gain	power gain	Zs,Zl=50 ohm		19		dB
Rlin	input return loss	Zs,Zl=50 ohm		12		dB
ISL	Reverse Isolation	Zs,Zl=50 ohm		25		dB
Rlout	output return loss	Zs,Zl=50 ohm		8		dB
NF	Noise figure	Zs,Zl=50 ohm		0.51		dB
Nfjam	Noise figure with jammer	Pjam=-20dBm;Fjam=1850M		1.14		dB
	Noise figure with jammer	Pjam=-20dBm;Fjam=850M		0.72		dB
Kf	Stability factor	Input/Output VSWR=2,3,10,20;frq=10M to 10G	1			
IP1dB	Inband input 1dB-compression point	f=1575.42MHz;		-8		dBm
IIP3	Out-of-band input 3rd-order intercept point	f1= 1712.7MHz;f2=1850MHz;Pin=-20dBm		6.5		dBm
IIP3	Out-of-band input 3rd-order intercept point	f1= 1712.7MHz;f2=1850MHz;Pin=-30dBm		6.3		dBm
IIP2	Out-of-band input 2rd-order intercept point	f1= 824.6MHz;f2=2400MHz;Pin=-20dBm		11		dBm

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IIP2	Out-of-band input 2rd-order intercept point	f1= 824.6MHz;f2=2400MHz;Pin=-30dBm		11		dBm
Harmonic	LTE band-13 2nd Harmonic	f=787.76MHz;Pin=-25dBm ; fH2=1575.52MHz		-72		dBm
Ton	Turn-on time			3		uS
Toff	Turn-off time			2		uS

Condition : VCC=1.8V and Tamb=+25℃, f=1575.42MHz

PARAMETER		CONDITIONS	MIN	TYP	MAX	UNITS
VCC	power supply		1.4		3.6	V
ICC	Supply current	LNA OFF		6.5	10	mA
ICC	leakge current	LNA ON			0.2	uA
Gain	power gain	Zs,Zl=50 ohm	17.3	18.5		dB
Rlin	input return loss	Zs,Zl=50 ohm		12		dB
ISL	Reverse Isolation	Zs,Zl=50 ohm		25		dB
Rlout	output return loss	Zs,Zl=50 ohm		8		dB
NF	Noise figure	Zs,Zl=50 ohm		0.53		dB
Nfjam	Noise figure with jammer	Pjam=-20dBm;Fjam=1850M		1.2		dB
	Noise figure with jammer	Pjam=-20dBm;Fjam=850M		0.8		dB
Kf	Stability factor	Input/Output VSWR=2,3,10,20;frq=10M to 10G	1			
IP1dB	Inband input 1dB-compression point	f=1575.42MHz;		-12		dBm
IIP3	Out-of-band input 3rd-order intercept point	f1= 1712.7MHz;f2=1850MHz; Pin=-20dBm		1		dBm

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IIP3	Out-of-band input 3rd-order intercept point	f1= 1712.7MHz;f2=1850MHz; Pin=-30dBm		3.5		dBm
IIP2	Out-of-band input 2rd-order intercept point	f1= 824.6MHz;f2=2400MHz;Pin=-20dBm		10		dBm
IIP2	Out-of-band input 2rd-order intercept point	f1= 824.6MHz;f2=2400MHz;Pin=-30dBm		10		dBm
Harmonic	LTE band-13 2nd Harmonic	f=787.76MHz;Pin=-25dBm; fH2=1575.52MHz		-70		dBm
Ton	Turn-on time	Stable to 10% of final gain value		3		uS
Toff	Turn-off time	Stable to 10% of final gain value		2		uS

ORDER INFORMATION

Part Number	Temperature	Package	Mark	RoHS
HS1100XX	-40~85	1.5mm*1.0mm*0.75mm,0.5mm Pitch		

Package Outline

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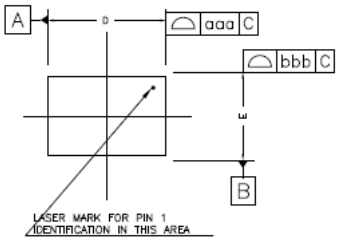
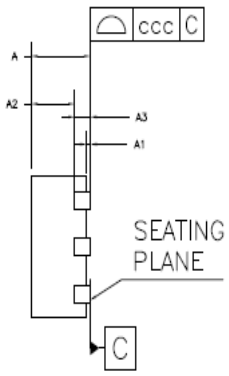
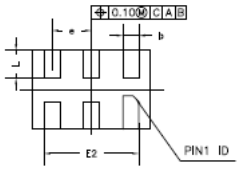


TOP VIEW



* CONTROLLING DIMENSION : MM

SYMBOL	MILLIMETER			INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80	0.028	0.030	0.032
A1	---	---	0.05	---	---	0.002
A2	0.50	0.55	0.60	0.020	0.022	0.024
A3	0.20 REF.			0.008 REF.		
b	0.17	0.20	0.23	0.007	0.008	0.009
D	1.50 bsc			0.060 bsc		
E	1.00 bsc			0.040 bsc		
E2	1.15	1.20	1.25	0.046	0.048	0.050
L	0.30	0.35	0.40	0.012	0.014	0.016
e	0.50 bsc			0.020 bsc		
TOLERANCES OF FORM AND POSITION						
aaa	0.10			0.004		
bbb	0.10			0.004		
ccc	0.05			0.002		



BOTTOM VIEW

SIDE VIEW

NOTES :
1.ALL DIMENSIONS ARE IN MILLIMETERS.
2.DIE THICKNESS ALLOWABLE IS 0.305 mm MAXIMUM(.012 INCHES MAXIMUM)
3.DIMENSIONING & TOLERANCES CONFORM TO ASME Y14.5M. -1994.
4.THE PIN #1 IDENTIFIER MUST BE PLACED ON THE TOP SURFACE OF THE PACKAGE BY USING INDENTATION MARK OR OTHER FEATURE OF PACKAGE BODY.
5.EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.
6.PACKAGE WARPAGE MAX 0.08 mm.
7.APPLIED FOR EXPOSED PAD AND TERMINALS. EXCLUDE EMBEDDING PART OF EXPOSED PAD FROM MEASURING.
8.APPLIED ONLY TO TERMINALS.

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