

1.7 to 2.0 GHz Low Noise Amplifier/Down Conversion Mixer

Description

The CXG1013N is a low noise amplifier/down conversion mixer MMIC,designed using the Sony's GaAs J-FET process.

Features

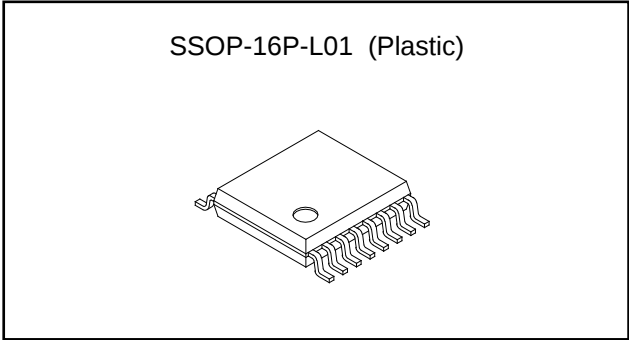
- Low noise
NF=1.8 dB (Typ.) at 1.9 GHz
(low noise amplifier)
- Low distortion
Input IP3=−0.5 dBm (Typ.) at 1.9 GHz
(mixer)
- Low LO input power operation −12 dBm
- Single 3.0V power supply operation
- 16-pin SSOP package

Applications

- Japan digital cordless phone(PHS)
- DECT
- PCN
- PCS

Structure

GaAs J-FET MMIC



Absolute Maximum Ratings (Ta=25 °C)

• Supply voltage	V _{DD}	6	V
• Operating temperature	T _{opr}	−35 to +85	°C
• Storage temperature	T _{stg}	−65 to +150	°C
• Power dissipation	P _D	150	mW
• Current consumption			
I _{DD} (low noise amplifier)		20	mA
I _{DD} (LO amplifier)		10	mA
I _{DD} (mixer,IF amplifier)		20	mA
• Input power	P _{IN}	+5	dBm

Operating Condition

• Supply voltage		3.0	V
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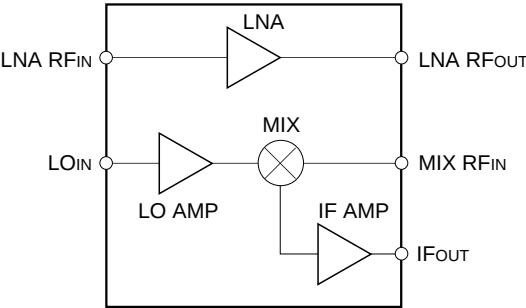
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Electrical Characteristics

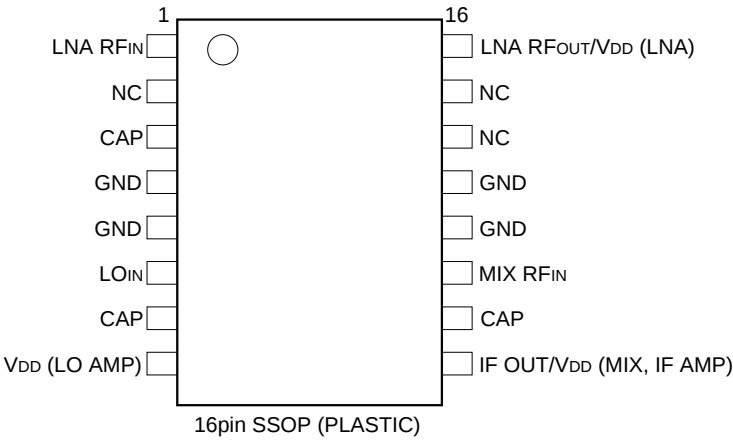
$V_{DD}=3.0\text{ V}$, $f_{RF}=1.9\text{ GHz}$, $f_{LO}=1.66\text{ GHz}$, $P_{LO}=-12\text{ dBm}$, when $50\text{ k}\Omega$ I/O matching; unless otherwise specified
($T_a=25\text{ }^{\circ}\text{C}$)

	Item	Symbol	Min.	Typ.	Max.	Unit	Measurement condition
Low noise amplifier	Current consumption	I _{DD}	—	2.5	3.5	mA	When no signal
	Power gain	G _P	12.5	14.5	16.5	dB	
	Noise figure	NF	—	1.8	2.6	dB	
	Input IP3	IIP3	−8	−5	—	dBm	
	Isolation	I _{SO}	25	30	—	dB	
Mixer	Current consumption	I _{DD}	—	5.5	8.0	mA	When no signal
	Conversion gain	G _C	7	9	11	dB	
	Noise figure	NF	—	7.2	9.2	dB	
	Input IP3	IIP3	−3	−0.5	—	dBm	
	LO to RF leak level	P _{LK}	—	−19	−14	dBm	
Total	Current consumption	I _{DD}	—	8.0	10.0	mA	When no signal

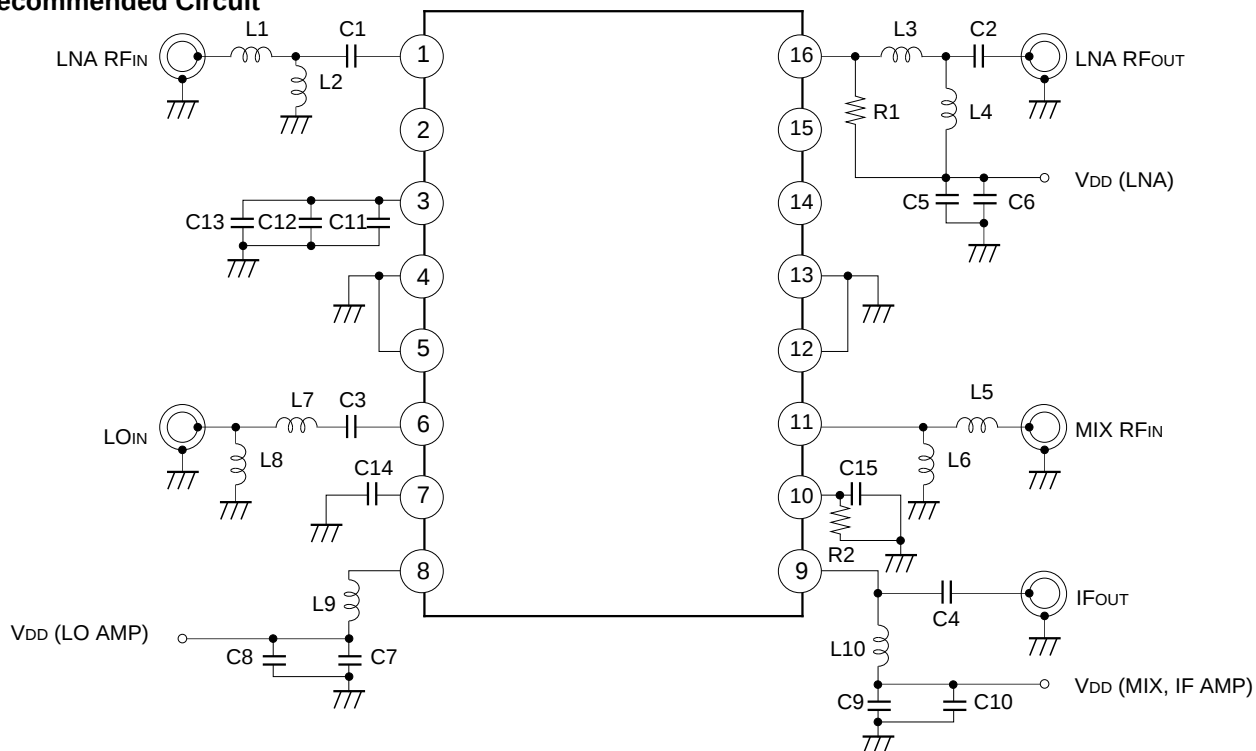
Block Diagram



Pin Configuration



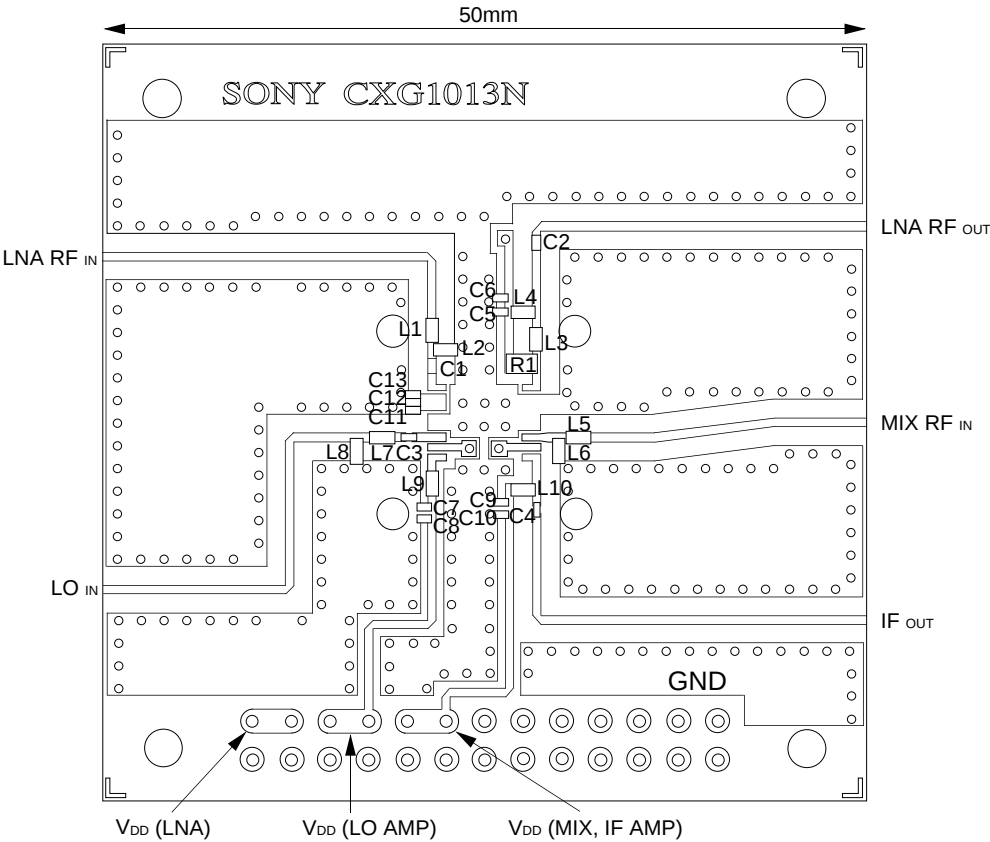
Recommended Circuit



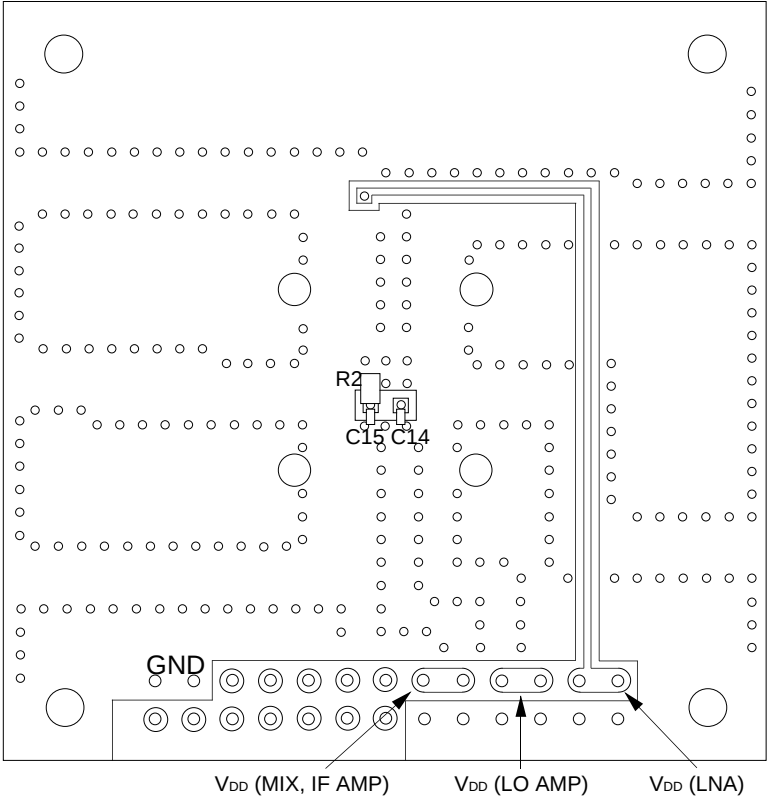
L1	8.2 nH	L10	68 nH	C9	1000 pF
L2	10 nH	C1	100 pF	C10	10 nF
L3	2.2 nH	C2	100 pF	C11	100 pF
L4	2.2 nH	C3	100 pF	C12	1000 pF
L5	8.2 nH	C4	7 pF	C13	10 nF
L6	22 nH	C5	1000 pF	C14	1000 pF
L7	6.8 nH	C6	10 nF	C15	0.1 μF
L8	3.3 nH	C7	1000 pF	R1	1 kΩ
L9	10 nH	C8	10 nF	R2	620 Ω

Recommended Evaluation Board

Front

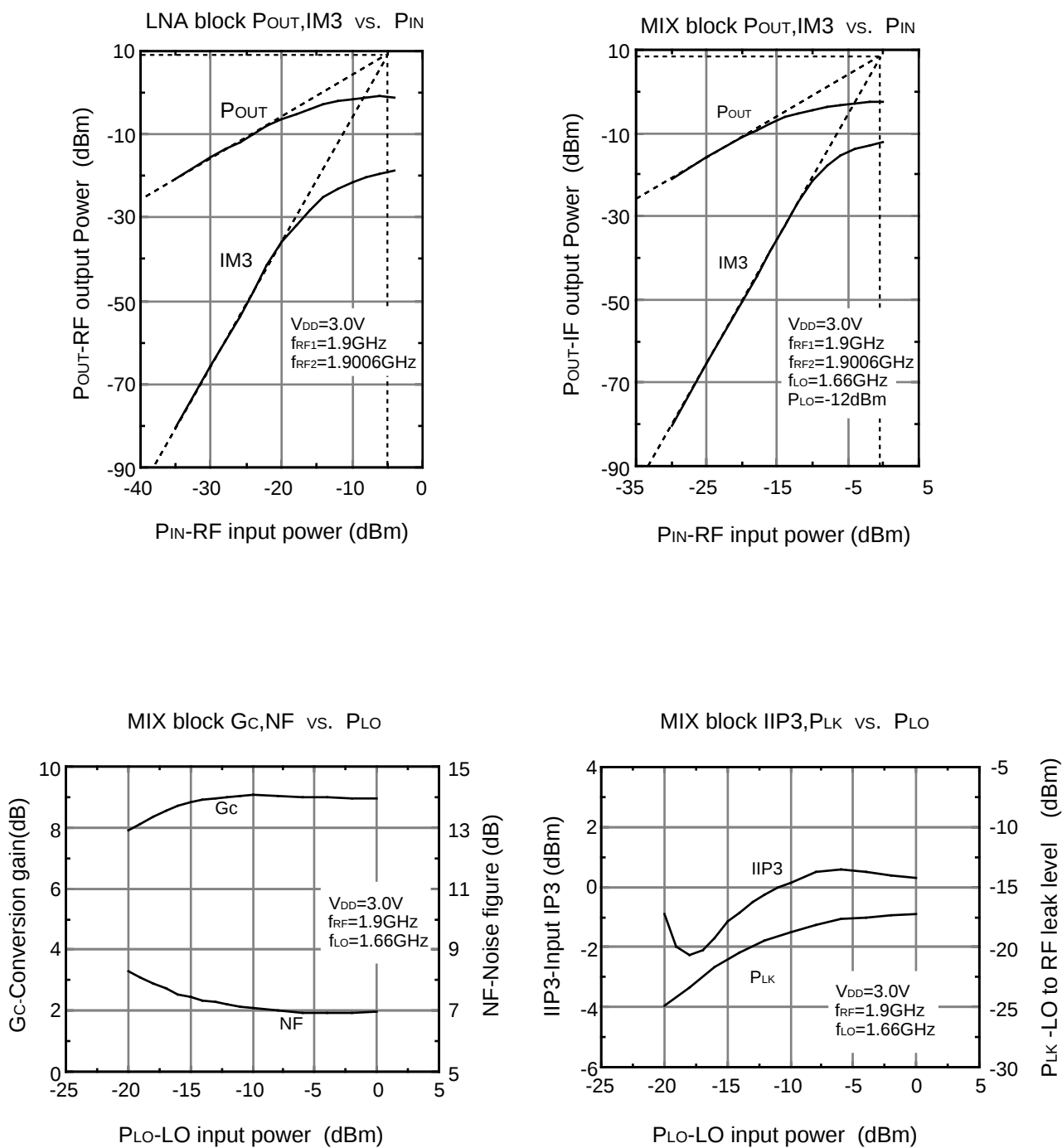


Back



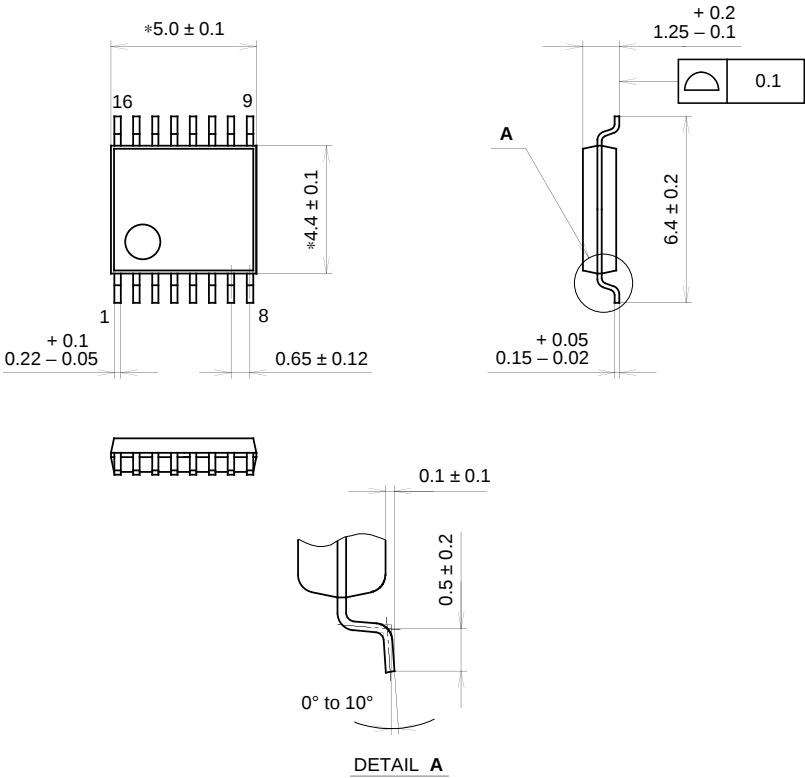
Glass fabric-base epoxy 4-layer board(2 × 0.3mm thickness)
GND for the 2nd and 3rd layers.

Example of Representative Characteristics (Ta=25 °C)



Package Outline Unit : mm

16PIN SSOP (PLASTIC)



NOTE: Dimension “*” does not include mold protrusion.

PACKAGE STRUCTURE

SONY CODE	SSOP-16P-L01
EIAJ CODE	SSOP016-P-0044
JEDEC CODE	_____

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	PALLADIUM PLATING
LEAD MATERIAL	COPPER
PACKAGE WEIGHT	0.1g