

Low Noise Down Conversion Mixer for PHS

Description

The CXG1061TN is a low noise down conversion mixer MMIC for PHS. This IC is designed using the Sony's GaAs J-FET process.

Features

- High gain $G_c=22$ dB (Typ.)
- Low distortion Input IP3=-13 dBm (Typ.)
- Low LO input power operation $P_{LO}=-15$ dBm
- High image suppression ratio IMR=27 dBc (Typ.)
- LO input matching circuit
- Single 3 V power supply operation
- 10-pin TSSOP package

Function

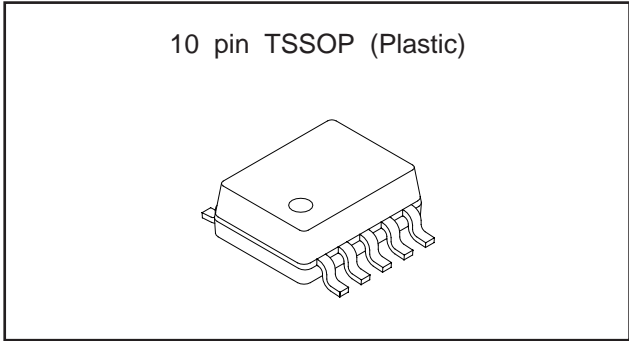
Frequency conversion

Applications

Japan digital cordless telephones (PHS)

Structure

GaAs J-FET MMIC



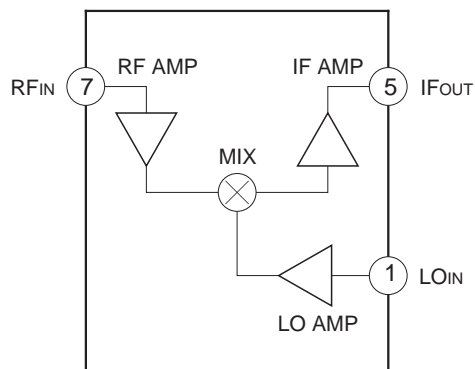
Absolute Maximum Ratings (Ta=25 °C)

- Supply voltage V_{DD} 4.5 V
- Input power P_{IN} +5 dBm
- Operating temperature T_{opr} -35 to +85 °C
- Storage temperature T_{stg} -65 to +150 °C

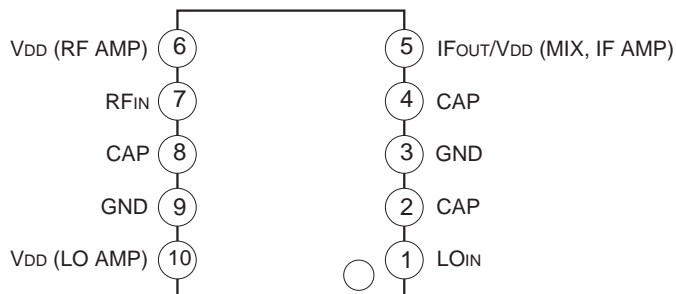
Recommended Operating condition

- Supply voltage V_{DD} 2.7 to 3.3 V

Block Diagram



Pin Configuration



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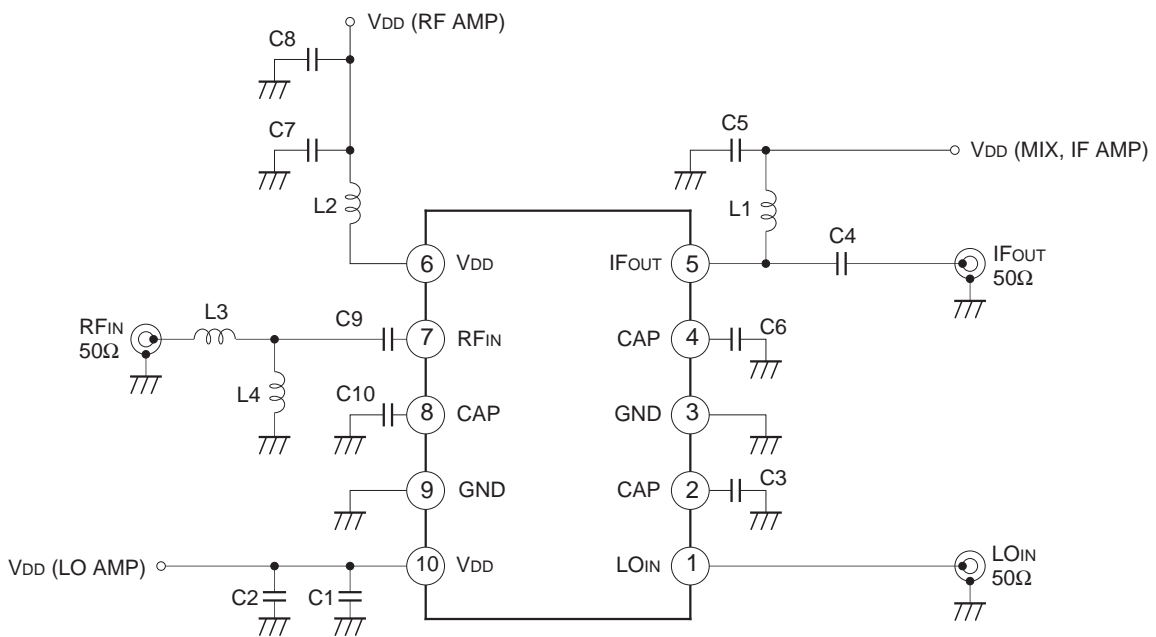
Electrical Characteristics

$V_{DD}=3.0\text{ V}$, $f_{RF}=1.9\text{ GHz}$, $f_{LO}=1.66\text{ GHz}$, $P_{LO}=-15\text{ dBm}$, RF input and IF output $50\ \Omega$ matching; unless otherwise specified
($T_a=25\text{ }^\circ\text{C}$)

Item	Symbol	Min.	Typ.	Max.	Unit	Measurement condition
Current consumption	I_{DD}	—	7	9	mA	When no signal
Conversion gain	G_c	19.5	22	24.5	dB	When a small signal
Noise figure	NF	—	3.3	4.5	dB	When a small signal
Input IP3	IIP3	-15.5	-13	—	dBm	$P_{RF}=-40\text{ dBm}$ offset=600 kHz Conversion by the IM3 suppression ratio for two-wave input
Image suppression ratio	IMR	22	27	—	dBc	When $P_{RF}=-40\text{ dBm}$ input
1/2 IF suppression ratio	1/2IFR	35	40	—	dBc	When $P_{RF}=-40\text{ dBm}$ input
LO to RF leak level	P_{LK}	—	-46	-41	dBm	
LO input VSWR	$V_{SWR_{LO}}$	—	2	3.5	—	

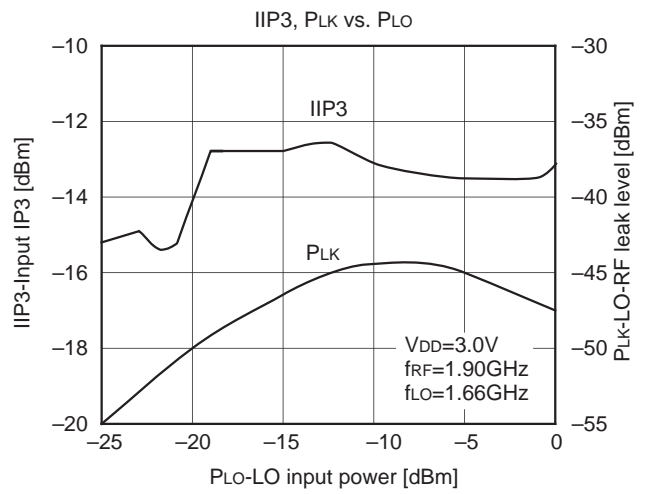
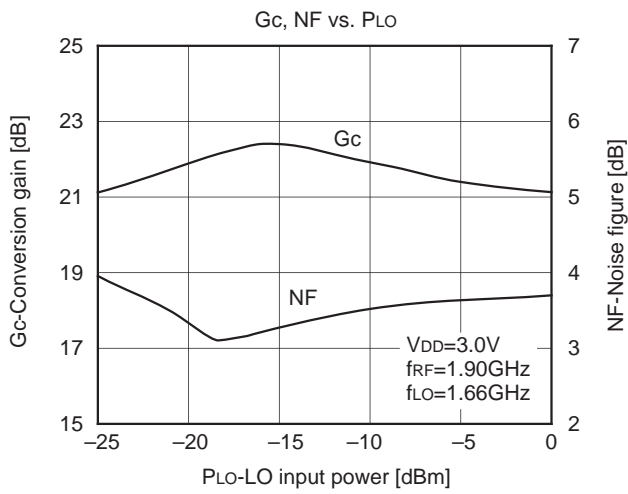
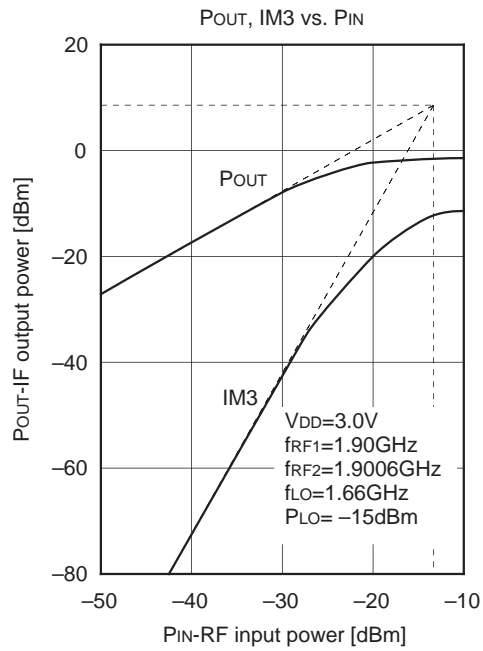
(Note) The values shown above are the specified values on the Sony’s recommended evaluation board.

Recommended Evaluation Board

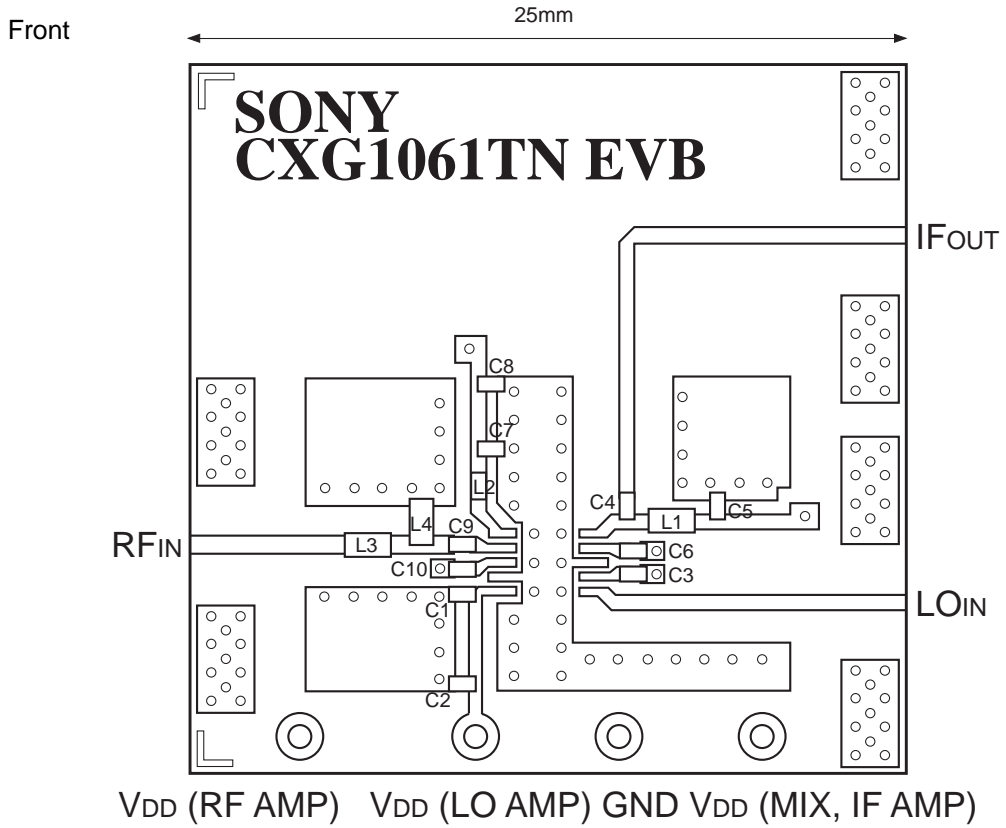


L1	82 nH	C4	5 pF
L2	3.9 nH	C5	1000 pF
L3	12 nH	C6	0.1 μF
L4	10 nH	C7	13 pF
C1	18 pF	C8	1000 pF
C2	1000 pF	C9	3 pF
C3	18 pF	C10	1000 pF

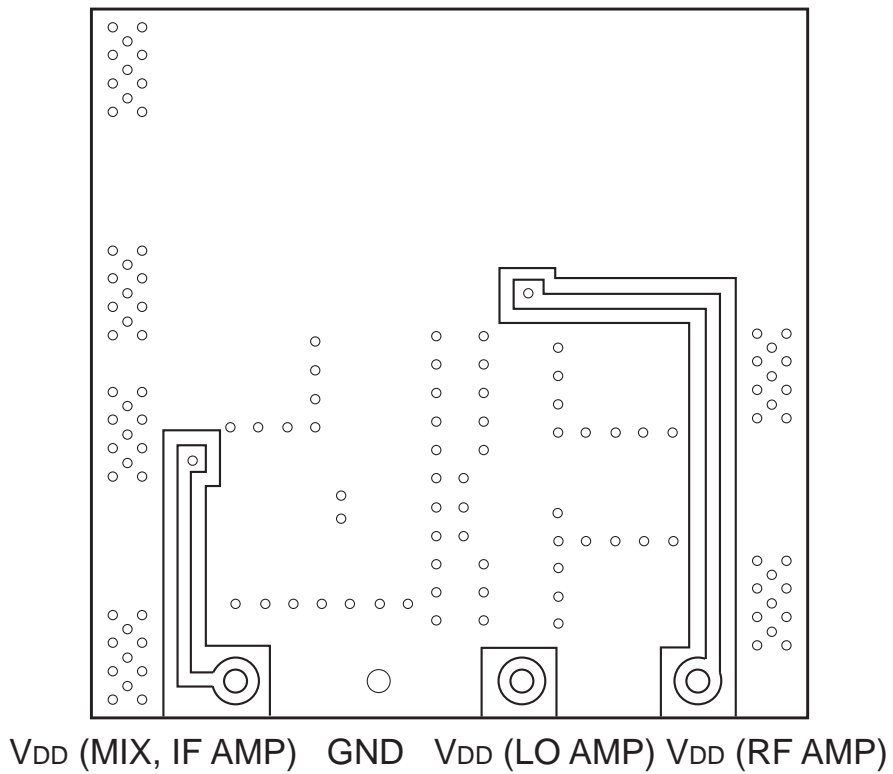
Example of Representative Characteristics (Ta=25 °C)



Recommended Evaluation Board



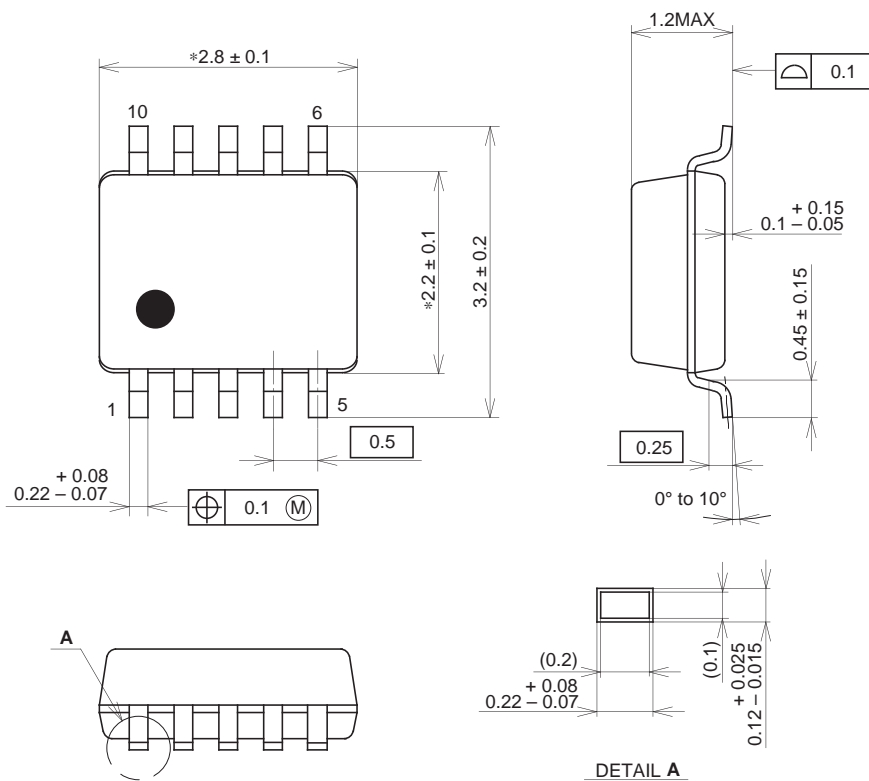
Back



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

Package Outline Unit : mm

10PIN TSSOP(PLASTIC)



NOTE: Dimension "*" does not include mold protrusion.

PACKAGE STRUCTURE

SONY CODE	TSSOP-10P-L01
EIAJ CODE	_____
JEDEC CODE	_____

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE MASS	0.02g