Ver 0.3 11/02'99
TENTATIVE

800MHz BAND DOWNCONVERTER GaAs MMIC

■GENERAL DESCRIPTION

NJG1708PC1 is a downconverter GaAs MMIC including a 2xLNA, local amplifier and MIXER, designed NJG1708PC1 exhibits mainly for 800MHz band cellular phone.

The Ultra Small & Thin FFP16-C1 package is applied.

■PACKAGE OUTLINE



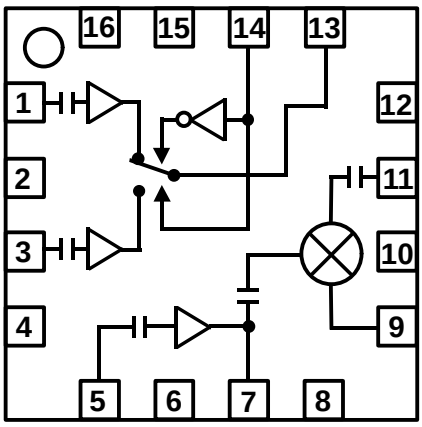
NJG1708PC1

■FEATURES

●Low voltage operation	+3.0V typ.
●Low current consumption	9mA typ.
●High conversion gain	28dB typ. @f_{RF}=820MHz, P_{RF}=-50dBm, f_{LO}=690MHz, P_{LO}=-15dBm
●Low noise figure	1.7dB typ. @f_{RF}=820MHz, f_{LO}=690MHz, P_{LO}=-15dBm
●High Input IP3	-14dBm typ. @f_{RF}=820.0+820.1MHz, f_{LO}=690MHz, P_{LO}=-15dBm
●Ultra Small & Thin Package	FFP16-C1 (Mount Size: 2.5mmX2.5mmX0.85mm)

■BLOCK DIAGRAM

PC1 Type
(Top View)



Pin Connection

1.LNAIN1	9.IFOUT
2.GND	10.GND
3. LNAIN2	11.MIXIN
4.GND	12.GND
5.LOIN	13.LNAOUT
6.GND	14.V_{CTL}
7.V_{LO}	15.GND
8.GND	16.V_{INV}

NOTE: Please note that any information on this catalog will be subject to change.

■ABSOLLUTE MAXIMUM RATINGS

(T_a=+25°C, Z_s=Z_l=50Ω)

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNITS
LNA Voltage	V_{LNA}		5.0	V
Mixer Voltage	V_{MIX}		5.0	V
Local Amplifier Voltage	V_{LO}		5.0	V
Input Power 1	P_{LNAIN}	V_{LNA}=V_{MIX}=V_{LO}=2.7V	+15	dBm
Input Power 2	P_{LOIN}	V_{LNA}=V_{MIX}=V_{LO}=2.7V	+10	dBm
Power Dissipation	P_D		320	mW
Operating Temperature	T_{opr}		-40~+85	°C
Storage Temperature	T_{stg}		-55~+125	°C

■ELECTRICAL CHARACTERISTICS (LNA)

COMMON CONDITIONS: T_a=-20~+75°C, V_{LNA}=3.0V, V_{INV}=3.0V, V_{MIX}=V_{LO}=0V, f_{RF}=820MHz, Z_s=Z_l=50Ω, Measuring Test Circuit (f_{LO}=690MHz)

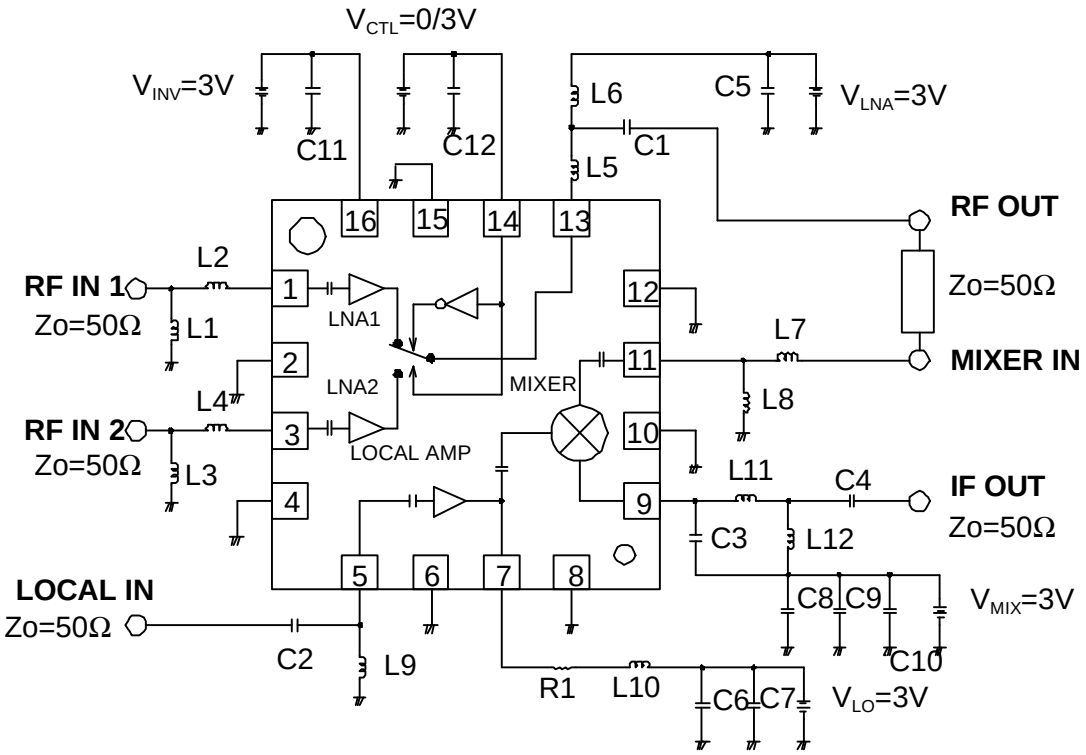
PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Operating Frequency	freq		800	820	900	MHz
LNA Voltage	V_{LNA}		2.5	3.0	4.5	V
LNA Current	I_{LNA}	P_{RF}, P_{LO}=OFF	-	3.0	4.0	mA
LNA Operating Voltage (LOW)	$V_{CTL(L)}$		-	0	0.8	V
LNA Operating Voltage (HIGH)	$V_{CTL(H)}$		2.4	3.0	-	V
Small Signal Gain	Gain		14.0	15.5	18.0	dB
Noise Figure	NF		-	1.4	-	dB
Gain Flatness	G_{flat}	f_{RF}=810±10MHz f_{RF}=893.5±4.5MHz f_{RF}=877.5±7.5MHz	-	-	0.5	dB
Output 3rd order Intercept point	OIP3	f_{RF}=820.0+820.1MHz	-	13.0	-	dBm
Isolation	ISO		-	30.0	-	dB
RF IN VSWR	$VSWR_i$		-	1.5	2.0	-
RF OUT VSWR	$VSWR_o$		-	2.0	-	-

■ELECTRICAL CHARACTERISTICS (MIXER)

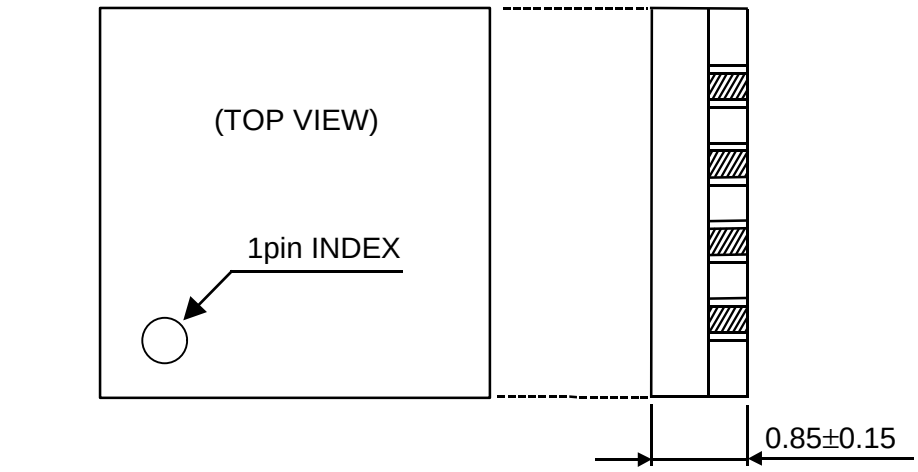
COMMON CONDITIONS: T_a=-20~+75°C, V_{LNA}=0V, V_{MIX}=V_{LO}=3.0V, V_{INV}=0V, f_{RF}=820MHz, f_{LO}=690MHz, P_{RF}=-30dBm, P_{LO}=-15dBm, Z_s=Z_l=50Ω, Measuring Test Circuit (f_{LO}=690MHz)

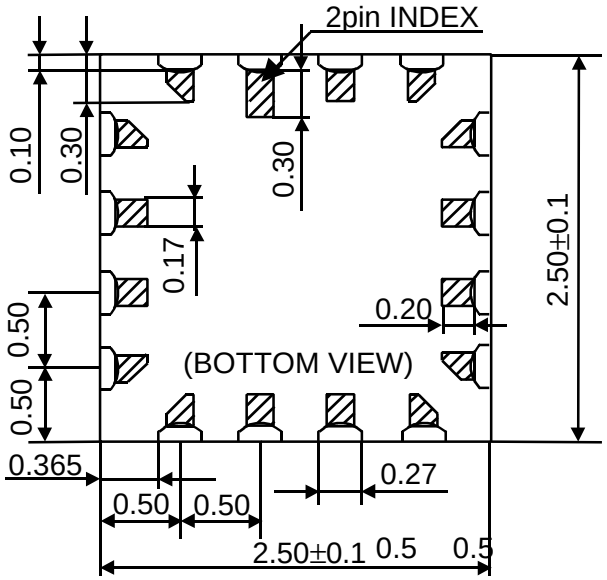
PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Operating Frequency	freq		800	820	900	MHz
Mixer Voltage	V_{MIX}		2.5	3.0	4.5	V
Mixer Current	I_{MIX}	P_{RF}, P_{LO}=OFF	-	5.0	6.7	mA
Local Amplifier Current	I_{LO}	P_{RF}, P_{LO}=OFF	-	1.0	2.0	mA
Conversion Gain	G_c		-	12.0	-	dB
Noise Figure	NF		-	5.0	6.0	dB
Output 3rd order Intercept point	OIP3	f_{RF}=820.0+820.1MHz	-	+14.5	-	dBm
Local Leak	Pleak	P_{LO}=-10dBm	-	-26.0	-20.0	dBm

■RECOMMENDED CIRCUIT



■PACKAGE OUTLINE (FFP16)





UNITS : mm
PCB : Ceramic
OVER COART : Epoxy resin
LEAD SURFACE : Au

Cautions on using this product

This product contains Gallium-Arsenide (GaAs) which is a harmful material.

- Do NOT eat or put into mouth.
- Do NOT dispose in fire or break up this product.
- Do NOT chemically make gas or powder with this product.
- To waste this product, please obey the relating law of your country.

This product may be damaged with electric static discharge (ESD) or spike voltage. Please handle with care to avoid these damages.

- The product specifications and descriptions listed in this catalog are subject to change without prior notice.
- New Japan Radio have no responsibilities on any violation of the right of the patent by the third party who contains the information and drawing in this catalog.
- This product is not designed for the system requiring high reliability, such as space or air system, submarine cable system, nuclear power plant control system or medical instrument for life keeping.
  If you are planning to use in the system above, please ask for our sales representatives.
- The technology or freights of this device may be controlled by the regulation on the Foreign Export and the Foreign Export Control Law.

MEMO

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