Product Features

- Small size (4X4 mm)
- High gain
- High linearity
- Low cost
- Low Noise Figure

Applications

- Low Noise Amplifier for CATV, Satellite
- Cable Modem
- FTTH (G-PON, GE-PON)
- Optical node

Package Type : QFN4X4

Description

ACQ102 is designed as low cost drive amplifiers for many applications including FTTH, CATV System.
This MMIC is based on Gallium Arsenide Enhancement Mode pHEMT which shows low current draw and very low noise.
The data in this spec sheet is valid only for 75 ohm application. 50 ohm data is in a separate spec sheet.

Electrical Specifications

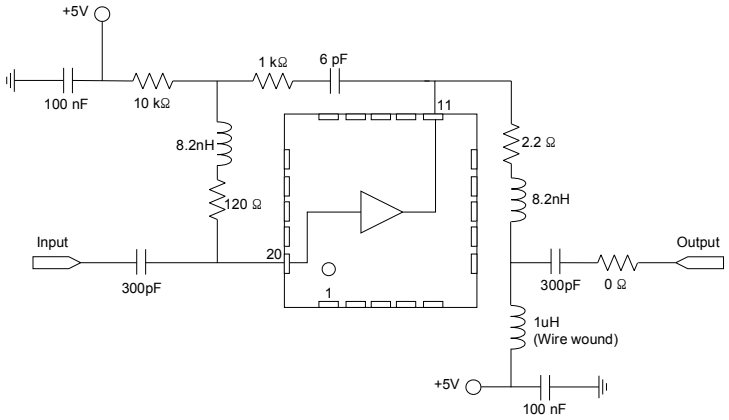
PARAMETER		UNIT	MIN	TYP	MAX	CONDITION
Frequency		MHz	30		1000	-
Gain		dB	20	21.5	-	-
Gain Flatness		dB	-	0.5	1	-
Input Return Loss		dB	-	-15	-8	-
Output Return Loss		dB	-	-15	-10	-
Output IP3		dBm	33	38	-	-
1dB Compression Point		dBm	17	21	-	-
Noise Figure		dB	-	2.5	4	-
CSO	30 ~ 870MHz	dBc	-	-60	-55	135 channel, +30dBmV/ch
CTB		dBc	-	-65	-60	135 channel, +30dBmV/ch
XMOD		dBc	-	-63	-58	135 channel, +30dBmV/ch
DC Current		mA	90	130	170	V_{DD} = +5.0V

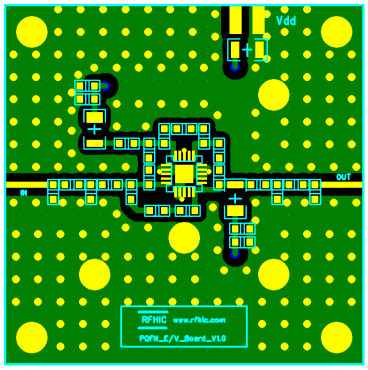
Note
1. Test conditions unless otherwise noted. Test Freq = 500MHz, T=25℃, VDD=5V, 75Ω system
2. OIP3 measured with 2 tones at an output power of +5dBm/tone separated by 1MHz

Absolute Maximum Ratings

PARAMETER	UNIT	MIN	TYP	MAX	CONDITION
Device Voltage	V_{DC}	-	5	10	-
Operating Temperature	℃	-40	-	85	-
Storage Temperature	℃	-50	-	150	-
ESD Human Body Model	-	-	Class 1C	-	-
Moisture sensitivity Level	-	-	MSL1	-	-
Junction temperature	℃	-	-	180	-
Thermal Resistance (Rth)	℃/W	-	70	-	-

Application Circuit @ 30 ~ 1000MHz, 75ohm System

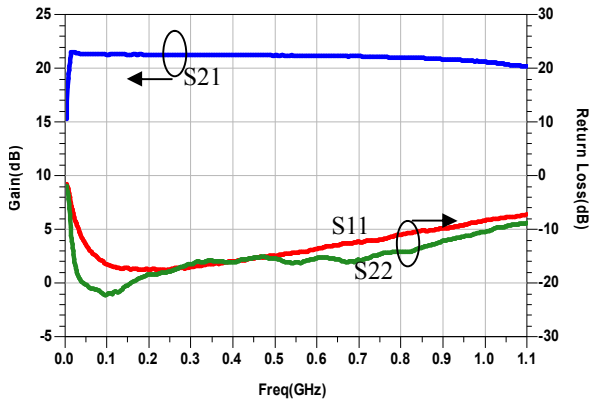




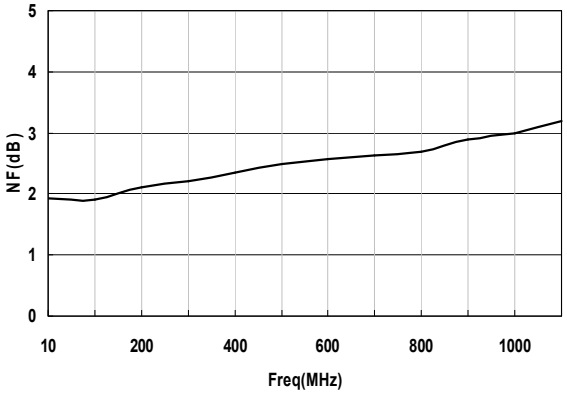
PCB material (FR4), PCB thickness (0.8t),
Via hole (Φ0.6)

Typical Performance @ VDD=5V, ID=120mA, T=25℃, 75ohm System

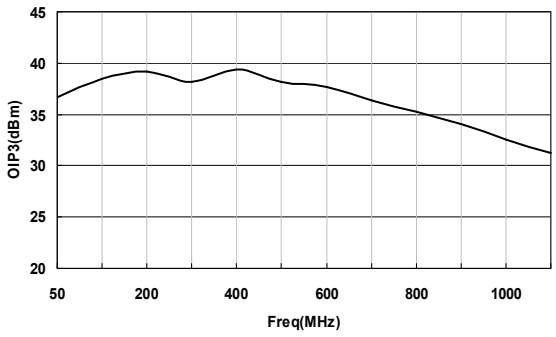
S-Parameter



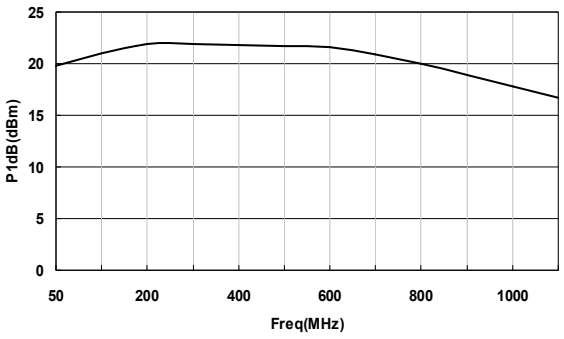
Noise Figure vs Frequency



OIP3 vs Frequency

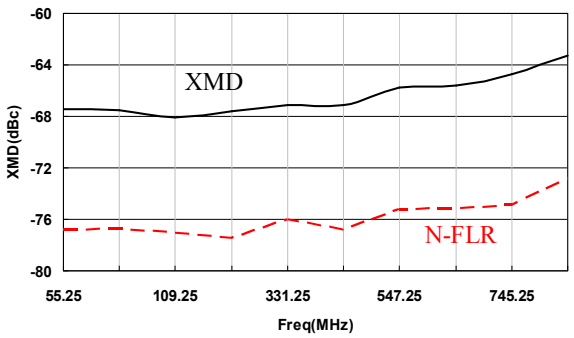


P1dB vs Frequency

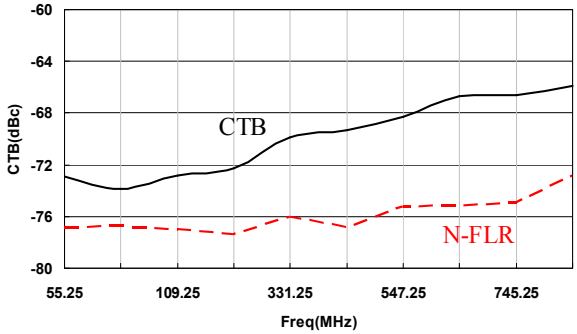


Multi-Tone Test : 135CH_FLAT@Output Power +30dBmV/Ch

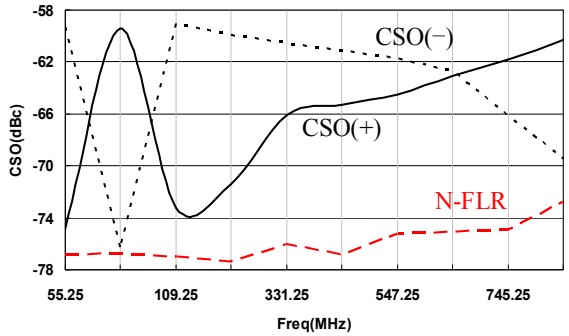
XMD vs Frequency



CTB vs Frequency

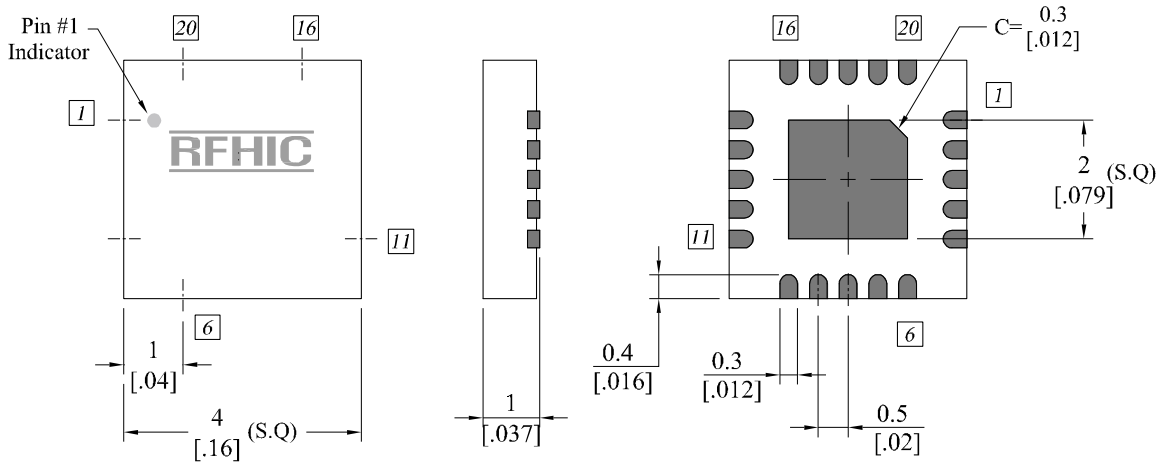


CSO vs Frequency



Package Dimension (Type: QFN4x4)

* Unit: mm[inch] | Tolerance ±0.2[.008]



▲ Top View ▲ Side View ▲ Bottom View

Pin Description							
Pin No	**Function**	**Pin No**	**Function**	**Pin No**	**Function**	**Pin No**	**Function**
1	N/C	6	N/C	11	RF Output / VDD (+5V)	16	N/C
2	N/C	7	N/C	12	N/C	17	N/C
3	N/C	8	N/C	13	N/C	18	N/C
4	N/C	9	N/C	14	N/C	19	N/C
5	N/C	10	N/C	15	N/C	20	RF Input / Bias Control

***N/C: Not Connected**

*** Mounting Configuration Notes**

1. Ground / thermal via holes are critical for the proper performance of this device.
2. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
3. Mounting screws can be added near the part to fasten the board to a heatsink. Ensure that the ground / thermal via hole region contacts the heatsink.
4. Do not put solder mask on the backside of the PCB in the region where the board contacts the heatsink.
5. RF trace width depends upon the PCB material and construction.
6. Use 1 oz. Copper minimum.

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
ACQ102	2014.04.22	1.4	Absolute Maximum Ratings (Delete Tj Typ)	-
ACQ102	2012.09.10	1.3	New datasheet format	-
ACQ102	2010.12.24	1.2	Absolute Rating Specifications updated	-

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