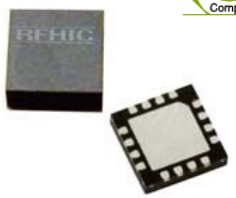
E-pHEMT MMIC AD274

Product Features

- 2-Way Splitter
- 30MHz-1200MHz
- Small size (3X3 mm)
- QFN SMD Type package
- Higher productivity
- Lower manufacturing cost
- -57dBc CSO 135 Channels @ +15dBmV/ch
- -62dBc CTB 135 Channels @ +15dBmV/ch
- -66dBc XMD 135 Channels @ +15dBmV/ch
- 3.5dB Typical Noise Figure
- 75ohm input and outputs

Applications

- Multi Tuner Set-Top Boxes
- Home Gateways
- FTTx (G-PON, GE-PON)



Package Type : QFN 3X3

Description

AD274 is designed as low cost Active Divider 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 75ohm application.

Electrical Specifications

PARAMETER		UNIT	MIN	TYP	MAX	Typ
Frequency		MHz		30 ~ 1000		-
Gain		dB	4.5	5.5	-	4
Gain Flatness		dB		1.4	2	1.6
Input Return Loss		dB	-	-16	-	-12
Output Return Loss		dB	-	-20	-	-20
IN&OUT Port Isolation		dB	-	-30	-	-30
OUT&OUT Port Isolation		dB	-	-20	-	-20
Output IP3		dBm	22	26	-	18
1dB Compression Point		dBm	8	12	-	8
Noise Figure		dB	-	3.5	4.5	3.3
CSO	50 ~ 870MHz	dBc	-	-57	-	-51
CTB	135 channel@	dBc	-	-62	-	-58
XMOD	Input Power +15dBmV/ch	dBc	-	-66	-	-56
DC Current		mA	-	110	-	75
Supply Voltage		V		5		3.3

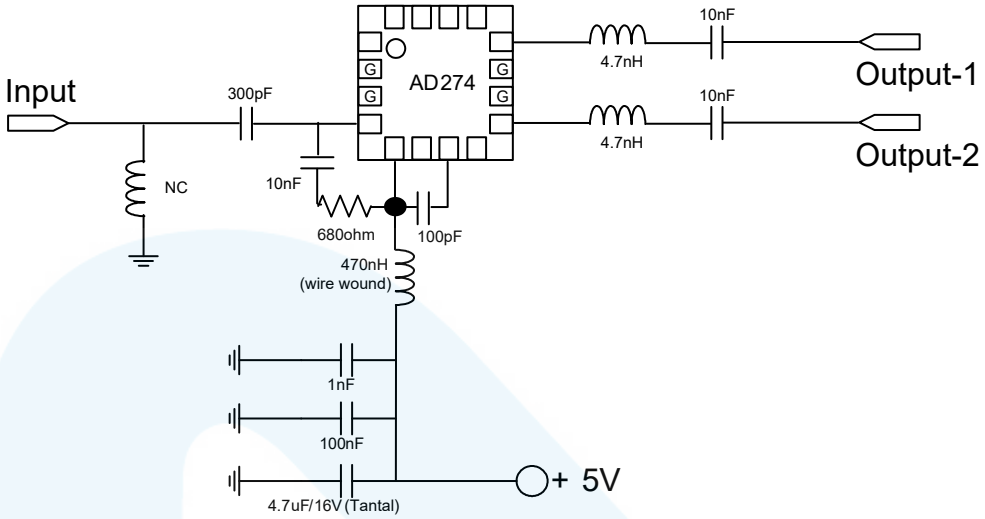
Note
1. Test conditions unless otherwise noted. Test Freq = 500MHz, T=25℃, Vdd=5V, 75Ω system
2. OIP3 measured with 2 tones at an output power of +0dBm/tone separated by 1MHz, Test Freq = 500MHz

Absolute Maximum Ratings

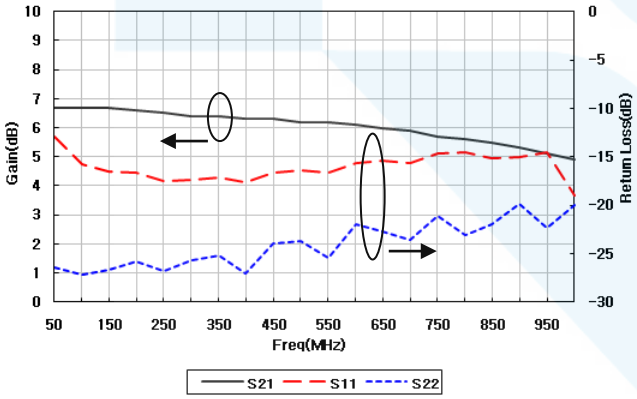
PARAMETER	UNIT	MIN	TYP	MAX
Device Voltage	VDC	-	5	5.5
Operating Case Temperature	℃	-40	-	85
Storage Temperature	℃	-40	-	150
ESD Human Body Model	-	-	Class 1A	-
Moisture sensitivity Level	-	-	MSL1	-
Junction temperature	℃	-	120	180

Thermal Resistance (Rth)	℃/W	-	70	-

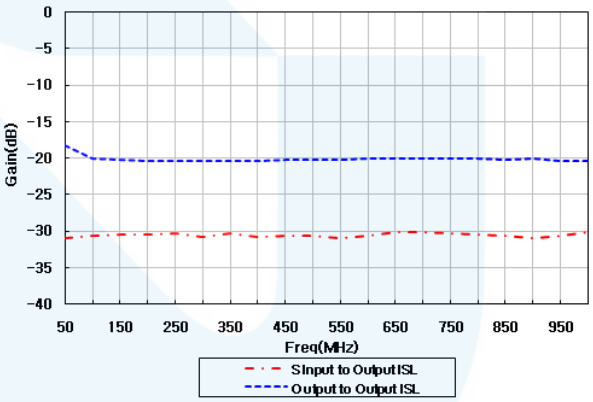
Application Circuit @ 50 ~ 1000MHz, Vdd = +5V, 75ohm System



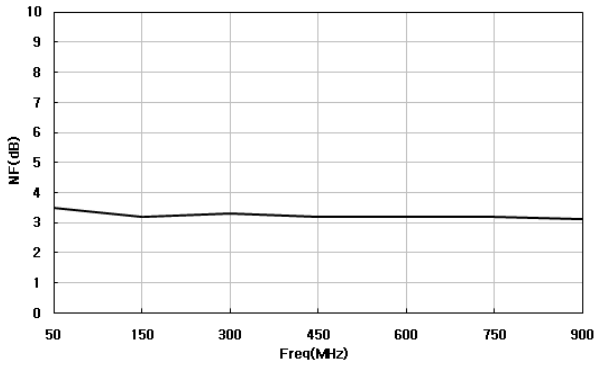
S-Parameter



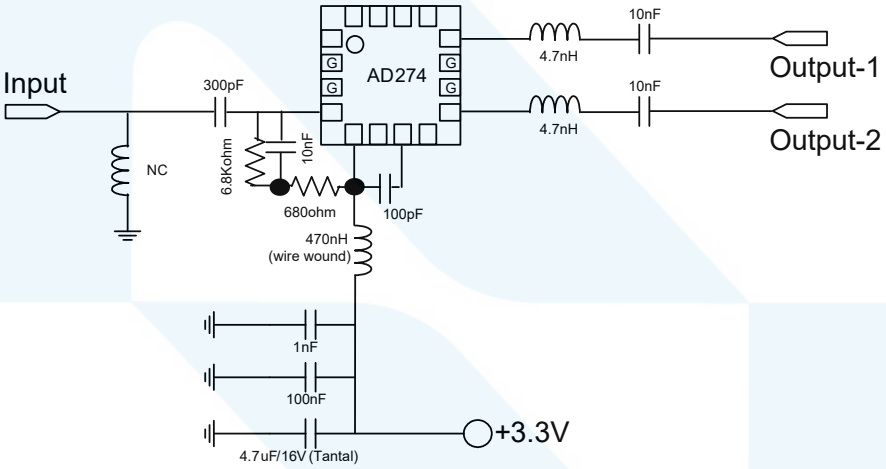
Isolation



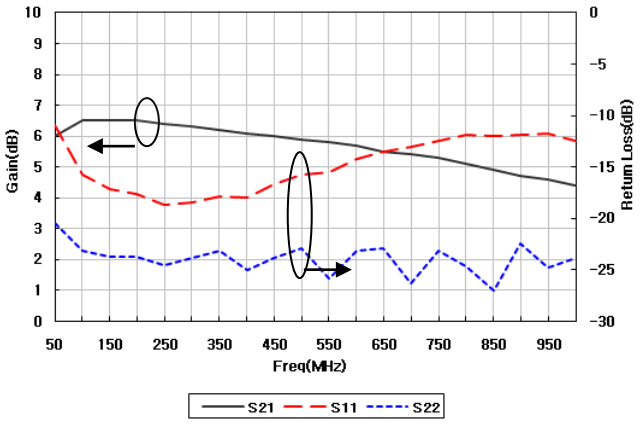
Noise Figure



Application Circuit @ 50 ~ 1000MHz, +3.3V, 75ohm System



S-Parameter



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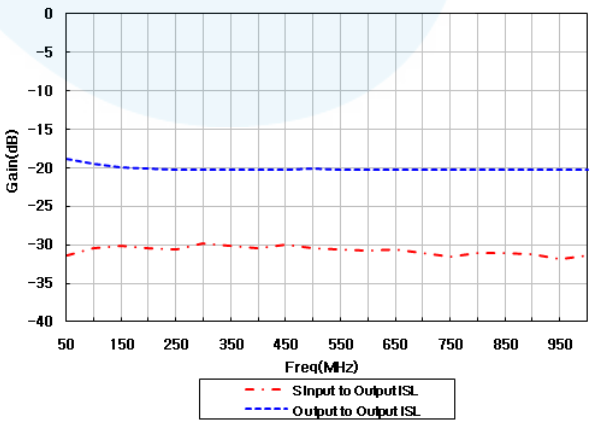
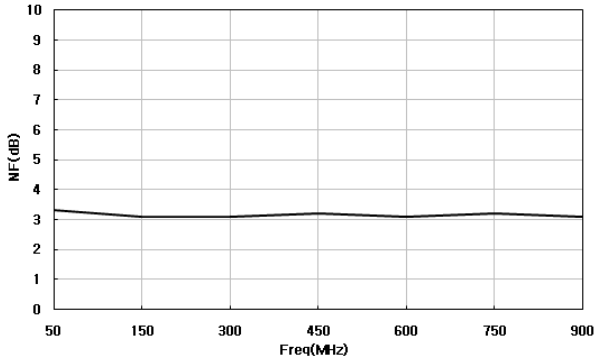


Noise Figure



Multi-Tone Test : 135CH_FLAT@Input Power +15dBmV/Ch, Sdd=+5V

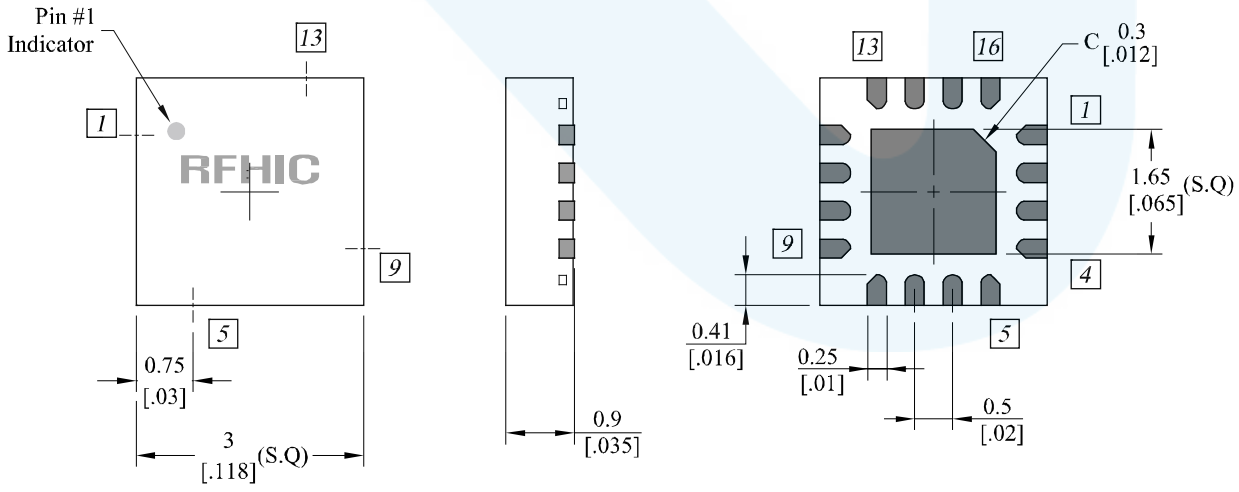
Level : Input +15dBmV Tilt : 135CH										
FRQ	**XMOD**	**CTB RAW**	**CTB COR**	**N-FLR**	**CSU RAW**	**CSU COR**	**CSU FRQ**	**CSL RAW**	**CSL COR**	**CSL FRQ**
55.25	75.3	67.7	72.1	68.2	67.5	71.9	55.99	57.7	58.1	53.99
77.25	76.2	67.7	72	68.2	57.5	57.8	77.99	68.1	72.4	76.37
109.25	76.6	68	72.3	68.4	67.7	72	109.99	57.4	57.8	107.99
211.25	75.1	67.3	71.7	68.4	66.4	70.8	212.49	58.2	58.6	209.99
331.25	74.1	65.4	69.7	66.7	65.4	69.7	331.99	57.5	58	329.99
547.25	71.7	66.2	70.5	68.4	67.1	71.4	446.49	58.7	59.2	443.98
637.25	70.7	64.6	68.9	66.3	65.1	69.4	547.99	58.5	59.3	545.98
745.25	68.8	63.7	67.3	66.1	64.1	68.4	638.48	59.7	60.8	635.98
859.25	68.3	63.8	68.1	65.8	63.2	66.2	746.49	61.9	63.8	743.99
Min	66.7	62.7	67	64.6	57.5	57.8	55.99	57.4	57.8	53.99
Max	76.6	68	72.3	68.4	67.7	72	860.48	68.1	72.4	858.49

Multi-Tone Test : 135CH_FLAT@Input Power +15dBmV/Ch, Vdd = +3.3V

Level : Input +15dBmV Tilt : 135CH_FLAT										
FRQ	**XMOD**	**CTB RAW**	**CTB COR**	**N-FLR**	**CSU RAW**	**CSU COR**	**CSU FRQ**	**CSL RAW**	**CSL COR**	**CSL FRQ**
55.25	64.2	66.2	70.5	67.8	66.7	71	56	53.3	53.5	53.99
77.25	64.1	66.2	70.5	67.8	52.5	52.7	77.99	67.5	71.8	76.07
109.25	64.3	66.2	70.6	68.1	65.5	68.5	109.99	52.8	52.9	107.99
211.25	63.3	64	65.9	68.3	62.8	64	212.49	52.8	53	209.98
331.25	62.4	62.4	64.3	66.7	61.1	62.6	332.49	51.4	51.5	329.99
445.25	61	60.7	61.7	67.8	59	59.6	446.49	51	51	443.98
547.25	59.5	60.8	62.1	66.6	57.2	57.8	548.49	51.4	51.5	545.98
637.25	58.5	58.4	59.1	66.2	54.7	55	638.48	52.1	52.3	635.98
745.25	57.1	58.7	59.7	66	52.7	52.9	746.49	54.1	54.4	743.98
859.25	56.4	58.7	60	64.6	51.8	52.1	860.49	60.1	62	858.49
Min	56.4	58.4	59.1	64.6	51.8	52.1	56	51	51	53.99
Max	64.3	66.2	70.6	68.3	66.7	71	860.49	67.5	71.8	858.49

Package Dimensions (Type: QFN3x3)

* 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	NC	5	Bias/Port1	9	Output-2	13	NC
2	GND	6	NC	10	GND	14	NC
3	GND	7	Port2	11	GND	15	NC
4	Input	8	NC	12	Output-1	16	NC

*** 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
AD274	2016.11.09	1.1	Pin Description revised	-
AD274	2013.02.20	1.0	-	-
AD274	2013.01.08	0.2	Changed by a new dimension form	Preliminary
AD274	2012.09.10	0.1	Changed by a new document form	Preliminary

Certification

This product is manufactured by a company that is certified for the AS9100D quality management system.