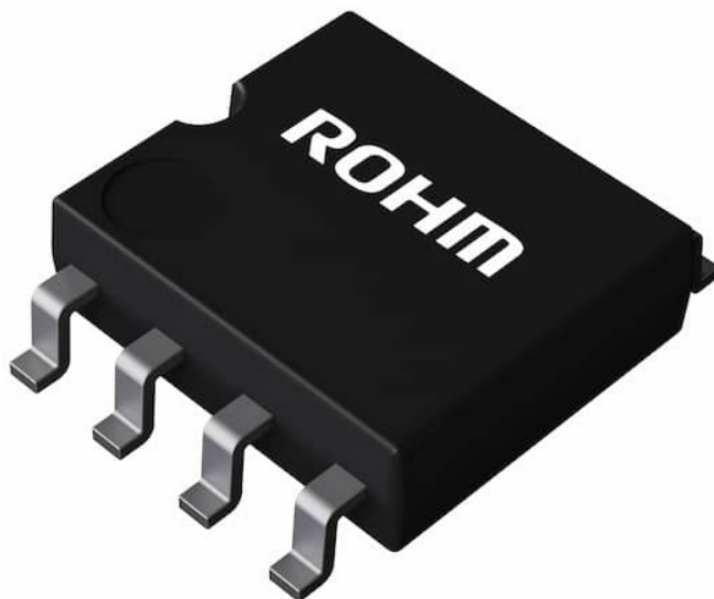


Contents [[hide](#)]

- [1 ROHM LMR1001YF-C Non-Inverting Amplifier](#)
- [2 Specifications](#)
- [3 Product Usage Instructions](#)
- [4 Simulation Schematic](#)
- [5 Op-Amp model](#)
- [6 Peripheral Components](#)
- [7 Recommended Products](#)
- [8 Frequently Asked Questions](#)
- [9 Documents / Resources](#)
 - [9.1 References](#)



ROHM LMR1001YF-C Non-Inverting Amplifier



Specifications

- **Product Name:** ROHM Solution Simulator
- **Type:** Automotive Zero Drift Low Offset Voltage Rail-to-Rail Input/Output CMOS Operational Amplifier

Product Usage Instructions

This circuit simulates the transient response to sine wave input with non-inverting amplifier configured Op-Amps. You can observe the output voltage and how faithfully the sine wave input voltage is reproduced. You can customize the parameters of the components shown in blue, such as VSOURCE, or peripheral components, and simulate the non-inverting amplifier with the desired operating condition.

You can simulate the circuit in the published application note: Operational amplifier, Comparator (Tutorial). [JP] [EN] [CN] [KR]

General Cautions

- **Caution 1:** The values from the simulation results are not guaranteed. Please use these results as a guide for your design.
- **Caution 2:** These model characteristics are specifically at $T_a=25^{\circ}\text{C}$. Thus, the simulation result with temperature variances may significantly differ from the result with the one done at the actual application board (actual measurement).
- **Caution 3:** Please refer to the Application Note of Op-Amps for details of the technical information.
- **Caution 4:** The characteristics may change depending on the actual board design and ROHM strongly recommend to double check those characteristics with actual board where the chips will be mounted on.

Simulation Schematic

How to simulate

Please refer to the User's Guide from the link "SCHEMATIC INFORMATION" above.

Please refer to the datasheet. The section 'Selection of Components Externally Connected' describes how to determine the constants of the circuit components.

[Link to Product Page](#) [JP] [EN] [CN] [KR] [TW] [DE]

[Link to Datasheet](#) [JP] [EN]

[Link to Buy](#) [JP] [EN] [CN] [KR] [TW] [DE]

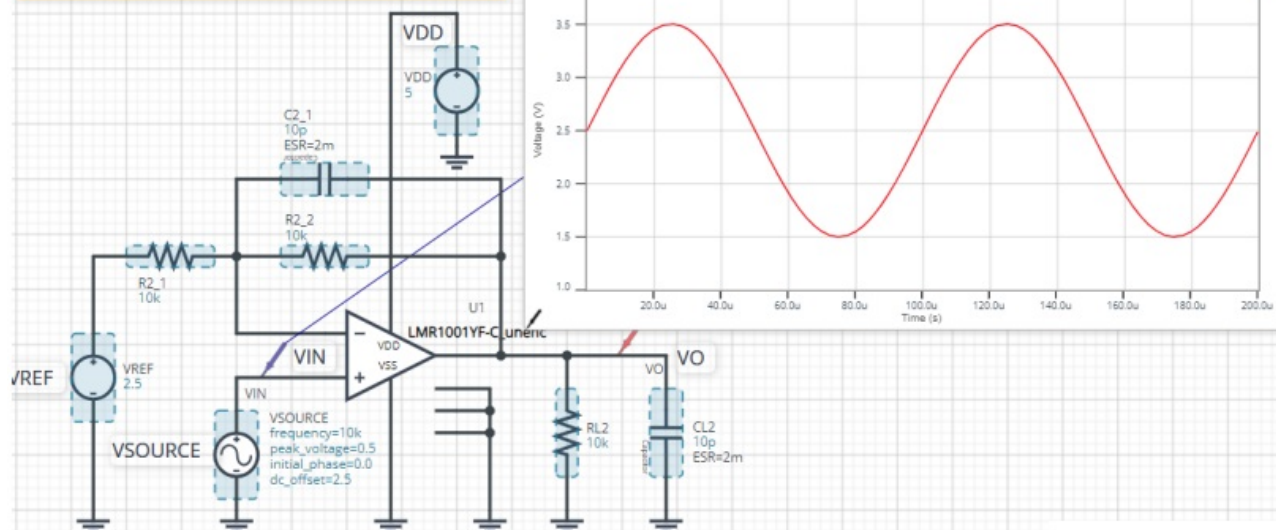


Figure 1. Simulation Schematic

How to simulate

The simulation settings, such as parameter sweep or convergence options, are configurable from the 'Simulation Settings' shown in Figure 2, and Table 1 shows the default setup of the simulation. In case of a simulation convergence issue, you can change the advanced options to solve it. The temperature is set to 27 °C in the default statement in 'Manual Options'. You can modify it.

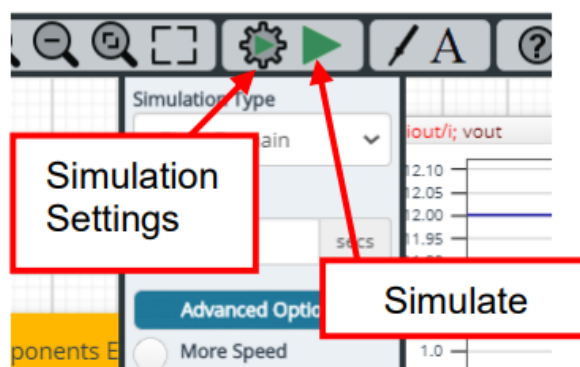


Figure 2. Simulation Settings and execution

Table 1. Simulation settings default setup

Parameters	Default	Note
Simulation Type	Time-Domain	Do not change Simulation Type
End Time	200 us	–
Advanced options	Balanced	–
	Convergence Assist	–
Manual Options	.temp 27	–

Simulation Conditions

Table 2. List of the simulation condition parameters

Instance Name	Type	Parameters	Default Value	Variable Range		Units
				Min	Max	
VSOURCE	Voltage Source	Frequency	10k	10	10M	Hz
		Peak_voltage	0.5	0	5.5	V
		Initial_phase	0	free		°
		DC_offset	2.5	0	5.5	V
		DF	0.0	fixed		1/s
		AC_magnitude	0.0	fixed		V
		AC_phase	0.0	fixed		°
VDD	Voltage Source For Op-Amp	Voltage_level	5	2.7(No te1)	5.5(N ote1)	V
		AC_magnitude	0.0	fixed		V

		AC_phase	0.0	fixed		°
VREF	Voltage Source	Voltage_level	2.5	VSS	VDD	V
		AC_magnitude	0.0	fixed		V
		AC_phase	0.0	fixed		°

(Note 1) Set it to the guaranteed operating range of the Op-Amps.

VSOURCE parameter setup

Figure 3 shows how the VSOURCE parameters correspond to the VIN stimulus waveform.

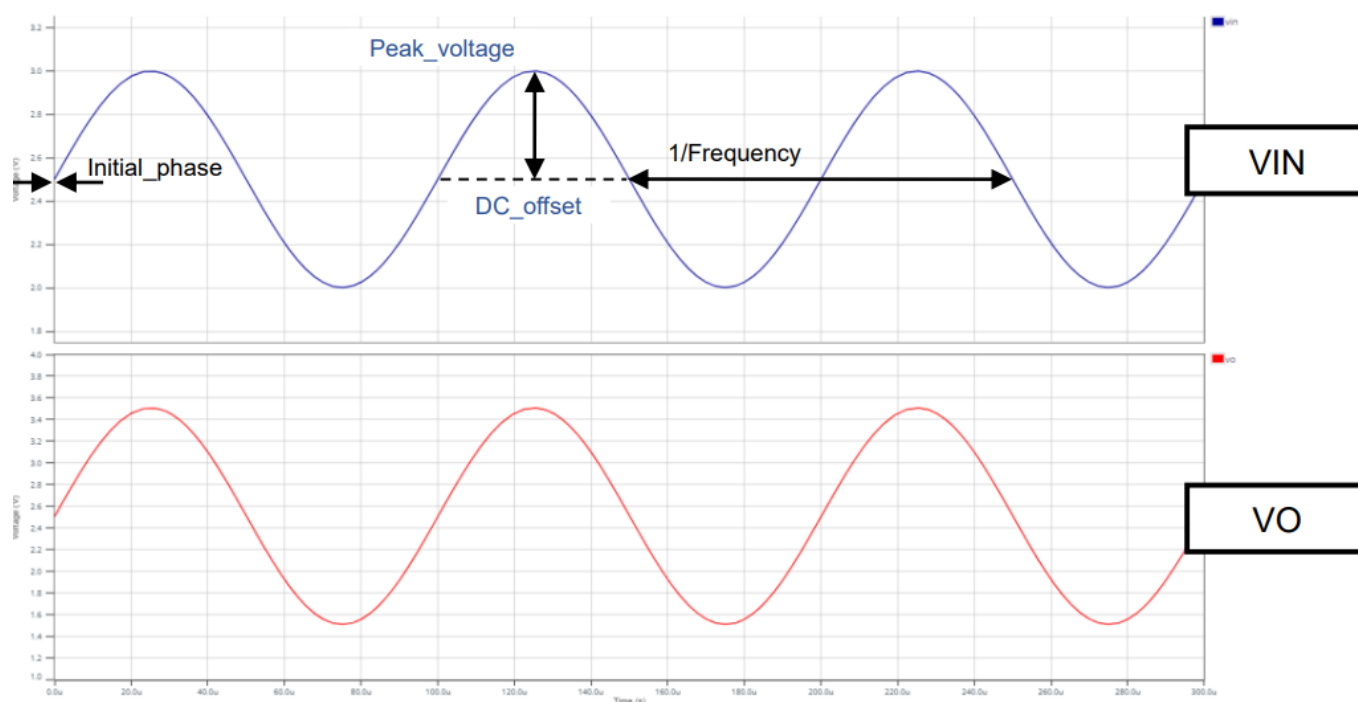


Figure 3. VSOURCE parameters and its waveform

Op-Amp model

Table 3 shows the model pin function implemented. Note that the Op-Amp model is the behavioural model for its input/output characteristics, and neither protection circuits nor functions unrelated to the purpose are implemented.

Table 3. Op-Amp model pins used for the simulation

Pin Name	Description
+IN	Non-inverting input
-IN	Inverting input
VDD	Positive power supply
VSS	Negative power supply / Ground
OUT	Output
NC1	No connection inside
NC2	No connection inside
NC3	No connection inside

Peripheral Components

Bill of Materials

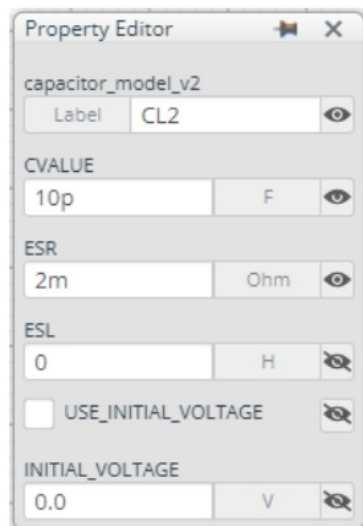
Table 4 shows the list of components used in the simulation schematic. Each of the capacitors has the parameters of equivalent circuit shown below. The default values of equivalent components are set to zero except for the ESR of C. You can modify the values of each component.

Table 4. List of capacitors used in the simulation circuit

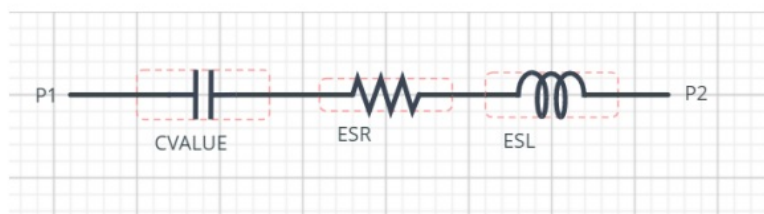
Type	Instance Name	Default Value	Variable Range		Units
			Min	Max	
Resistor	R2_1	10k	1k	1M	Ω
	R2_2	10k	1k	1M	Ω
	RL2	10k	1k	1M, N C	Ω

Capacitor	C2_1	10	0.1	100	pF
	CL2	10	free, NC		pF

Capacitor Equivalent Circuits



(a) Property editor



(b) Equivalent circuit

The default value of ESR is 2 mΩ.

(Note 2) These parameters can take any positive value or zero in simulation, but it does not guarantee the operation of the IC in any condition. Refer to the datasheet to determine the adequate value of parameters.

Recommended Products

Op-Amp

- **LMR1001YF-C:** Automotive Zero Drift Low Offset Voltage Rail-to-Rail I/O CMOS Op-Amp. [JP] [EN] [CN] [KR] [TW] [DE]
- **LMR1001YG-C:** Automotive Zero Drift Low Offset Voltage Rail-to-Rail I/O CMOS Op-Amp. [JP] [EN] [CN] [KR] [TW] [DE]
- **LMR1002F-LB:** Automotive Zero Drift Low Offset Voltage Rail-to-Rail I/O CMOS Op-Amp. [JP] [EN] [CN] [KR] [TW] [DE]

Technical Articles and Tools can be found in the Design Resources on the product web page.

Notice

1. The information contained in this document is intended to introduce ROHM Group (hereafter referred to as ROHMM) products. When using ROHM products, please verify the latest specifications or datasheets before use.
2. ROHM products are designed and manufactured for use in general electronic equipment and applications (such as Audio Visual equipment, Office Automation equipment, telecommunication equipment, home appliances, amusement devices, etc.) or specified in the datasheets. Therefore, please contact the ROHM sales representative before using ROHM products in equipment or devices requiring extremely high reliability and whose failure or malfunction may cause danger or injury to human life or body or other serious damage (such as medical equipment, transportation, traffic, aircraft, spacecraft, nuclear power controllers, fuel control, automotive equipment including car accessories, etc. hereafter referred to as Specific Applications).
3. Unless otherwise agreed in writing by ROHM in advance, ROHM shall not be in any way responsible or liable for any damages, expenses, or losses incurred by you or third parties arising from the use of ROHM Products for Specific Applications.
4. Electronic components, including semiconductors, can fail or malfunction at a certain rate. Please be sure to implement, at your responsibility, adequate safety measures, including but not limited to fail-safe design against physical injury, and damage to any property, which a failure or malfunction of products may cause.
5. The information contained in this document, including application circuit examples and their constants, is intended to explain the standard operation and usage of ROHM products, and is not intended to guarantee, either explicitly or implicitly, the operation of the product in the actual equipment it will be used. As a result, you are solely responsible for it, and you must exercise your independent verification and judgment in the use of such information contained in this document. ROHM shall not be in any way responsible or liable for any damages, expenses, or losses incurred by you or third parties arising from the use of such information.
6. When exporting ROHM products or technologies described in this document to other countries, you must abide by the procedures and provisions stipulated in all applicable export laws and regulations, such as the Foreign Exchange and Foreign Trade Act and the US Export Administration Regulations, and follow the necessary procedures

under these provisions.

7. The technical information and data described in this document, including typical application circuits, are examples only and are not intended to guarantee to be free from infringement of third parties intellectual property or other rights. ROHM does not grant any license, express or implied, to implement, use, or exploit any intellectual property or other rights owned or controlled by ROHM or any third parties concerning the information contained herein.
8. No part of this document may be reprinted or reproduced in any form by any means without the prior written consent of ROHM.
9. All information contained in this document is current as of the date of publication and subject to change without notice. Before purchasing or using ROHM products, please confirm the latest information with the ROHM sales representative.
10. ROHM does not warrant that the information contained herein is error-free. ROHM shall not be in any way responsible or liable for any damages, expenses, or losses incurred by you or third parties resulting from errors contained in this document.

Thank you for accessing ROHM product information

More detailed product information and catalogues are available. Please contact us.

ROHM Customer Support System

- <https://www.rohm.com/contactus>
- www.rohm.com
- © 2023 ROHM Co., Ltd. All rights reserved.

Frequently Asked Questions

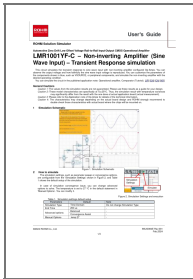
Q: Can I change the simulation type in the settings?

A: It is recommended not to change the Simulation Type from the default Time-Domain setting.

Q: What is the purpose of the Op-Amp model pins NC1, NC2, and NC3?

A: These pins signify no connection inside the Op-Amp model and are not used for any functions within the simulation.

Documents / Resources



[ROHM LMR1001YF-C Non Inverting Amplifier \[pdf\]](#) User Guide
LMR1001YF-C, LMR1001YF-C Non Inverting Amplifier, LMR1001YF-C,
Non Inverting Amplifier, Inverting Amplifier, Amplifier

References

- [User Manual](#)

ROHM

Amplifier, inverting Amplifier, LMR1001YF-C, LMR1001YF-C Non Inverting Amplifier, Non-inverting Amplifier,
ROHM

Leave a comment

Your email address will not be published. Required fields are marked *

Comment *

Name

Email

Website

☐ Save my name, email, and website in this browser for the next time I comment.

Post Comment

Search:

e.g. whirlpool wrf535swhz

Search

[Manuals+](#) | [Upload](#) | [Deep Search](#) | [Privacy Policy](#) | [@manuals.plus](#) | [YouTube](#)

This website is an independent publication and is neither affiliated with nor endorsed by any of the trademark owners. The "Bluetooth®" word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. The "Wi-Fi®" word mark and logos are registered trademarks owned by the Wi-Fi Alliance. Any use of these marks on this website does not imply any affiliation with or endorsement.