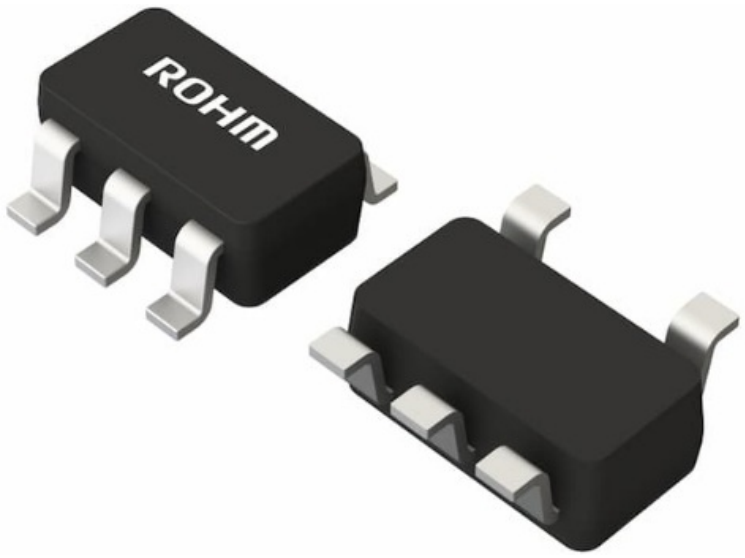
Contents [hide]

ROHM BD87521G-LB Transient Response Simulation



Specifications

- Product Name: ROHM Solution Simulator
- Features: Excellent EMI Immunity, High Output Drive, Rail-to-Rail Input/Output CMOS

Operational Amplifier

Product Usage Instructions

How to Simulate

The simulation settings can be configured from the ‘Simulation Settings’ as shown in Figure 2.

Simulation Settings:

- Simulation Type: Time-Domain
- End Time: Advanced options
- Balanced Convergence Assist: Manual Options
- .temp: 27

Simulation Conditions

Table 2 lists the simulation condition parameters that can be customized for the simulation.

VSOURCE Parameter Setup

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

Op-Amp Model

Table 3 shows the model pin function implemented for the Op-Amp simulation.

Peripheral Components

Bill of Material

Table 4 displays the list of components used in the simulation schematic.

Capacitor Equivalent Circuits

Figure 4 shows the capacitor property editor and equivalent circuit for customization.

ROHM Solution Simulator

Excellent EMI Immunity High Output Drive Rail-to-Rail Input/Output CMOS Operational

Amplifier

BD87521G-LB – Voltage Follower (Sine Wave Input) – Transient Response simulation

- This circuit simulates the transient response to sine wave input with voltage follower 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 voltage follower 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 Ta=25°C. Thus, the simulation result with temperature variances may significantly differ from the result with the one done at 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

Simulation Schematic

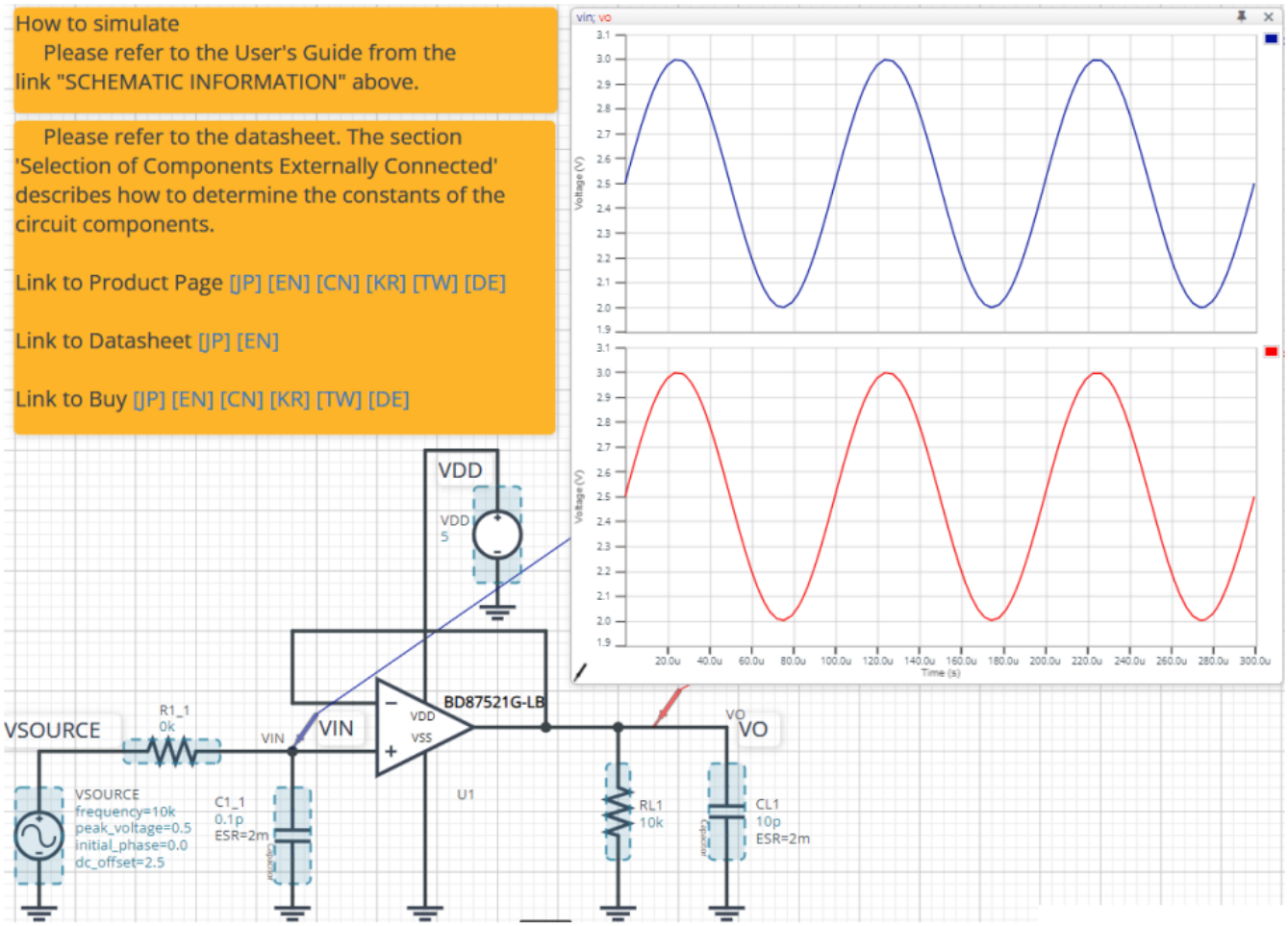


Figure 1. Simulation Schematic

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 simulation convergence issue, you can change advanced options to solve. The temperature is set to 27 °C in the default statement in ‘Manual Options’. You can modify it.

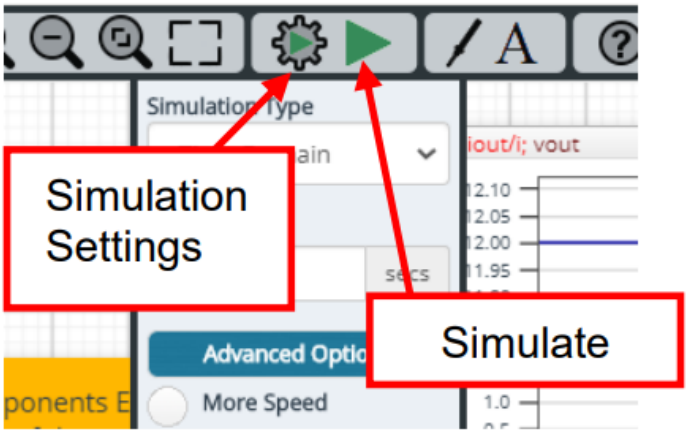


Figure 2. Simulation Settings and execution

Table 1. Simulation settings default setup

Parameters	Default	Note
Simulation Type	Time-Domain	Do not change Simulation Type
End Time	300 µs	–
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	
		Frequency	10k	10	10M	Hz
		Peak_voltage	0.5	VSS	VDD	V
		Initial_phase	0	free		°

VSOURCE	Voltage Source	DC_offset	2.5	VSS	VDD	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	4*(Note 1)*	15*(Note1)*	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.

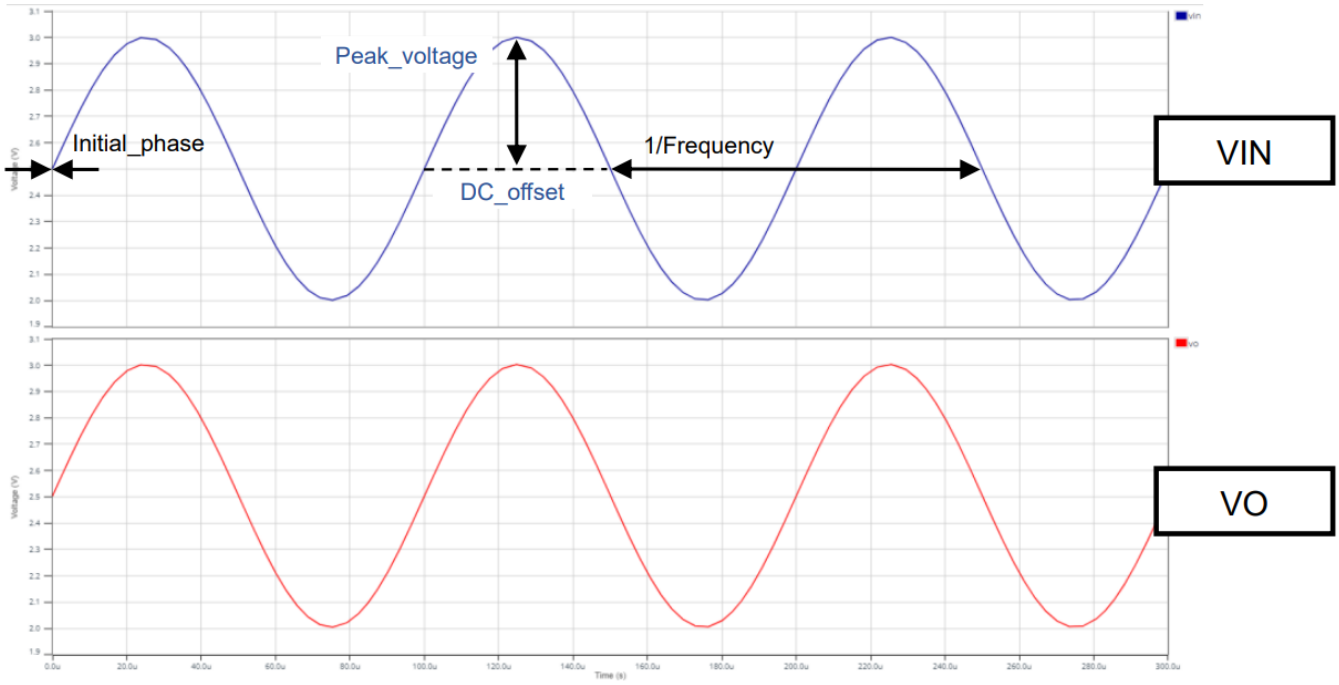


Figure 3. VSOURCE parameters and its waveform

Op-Amp model

Table 3 shows the model pin function implemented. Note that the Op-Amp model is the

behavioral 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

Peripheral Components

Bill of Material

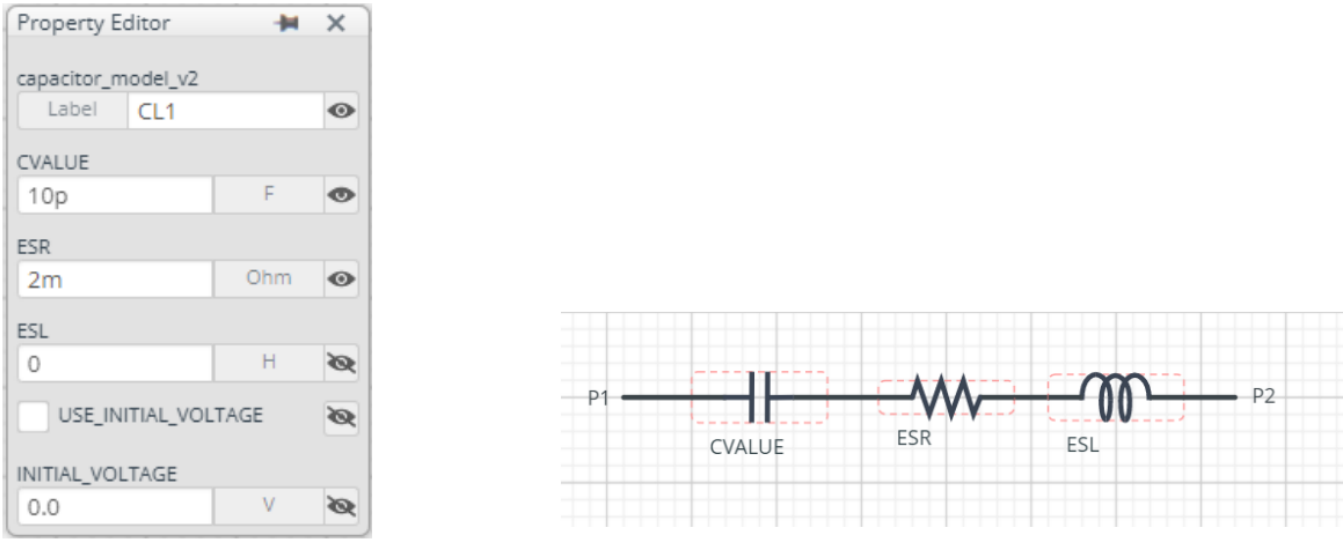
- Table 4 shows the list of components used in the simulation schematic. Each of the capacitors has the parameters of equivalent circuit shown below. The default values of equivalent components are set to zero except for the ESR of C. You can modify the values of each component.

Table 4. List of capacitors used in the simulation circuit

Type	Instance Name	Default Value	Variable Range		Units
			Min	Max	
Resistor	R1_1	0	0	10	kΩ
	RL1	10k	1k	1M, NC	Ω

Capacitor	C1_1	0.1	0.1	22	pF
	CL1	10	free, NC		pF

Capacitor Equivalent Circuits



(a) Property editor (b) Equivalent circuit

Figure 4. Capacitor property editor and equivalent circuit

The default value of ESR is 2m Ω.

(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 adequate value of parameters.

Recommended Products

Op-Amp

- BD87521G-LB : 1ch Excellent EMI Immunity High Output Drive Rail-to-Rail I/O CMOS Op-Amp. [JP] [EN] [CN] [KR] [TW] [DE]
- BD87522FJ-LB : 2ch Excellent EMI Immunity High Output Drive Rail-to-Rail I/O CMOS Op-Amp. [JP] [EN] [CN] [KR] [TW] [DE]
- BD87524FV-LB: 4ch Excellent EMI Immunity High Output Drive 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.

General Precaution

1. Before you use our Products, you are requested to carefully read this document and fully understand its contents. ROHM shall not be in any way responsible or liable for failure, malfunction or accident arising from the use of any ROHM's Products against warning, caution or note contained in this document.
2. All information contained in this document is current as of the issuing date and subject to change without any prior notice. Before purchasing or using ROHM's Products, please confirm the latest information with a ROHM sales representative.
3. The information contained in this document is provided on an "as is" basis and ROHM does not warrant that all information contained in this document is accurate and/or 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 inaccuracy or errors of or concerning such information.

Notice – WE

FAQS

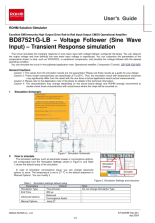
Q: Can I change the default values of components in the simulation?

A: Yes, you can modify the values of each component within the specified variable ranges.

Q: What is the default value of ESR for capacitors?

A: The default value of ESR is 2m. Note that these parameters can take any positive value or zero in simulation but it does not guarantee the operation.

Documents / Resources

	ROHM BD87521G-LB Transient Response Simulation [pdf] User Guide BD87521G-LB, BD87521G-LB Transient Response Simulation, BD87521 G-LB, Transient Response Simulation, Response Simulation, Simulation

References

- User Manual

ROHM

BD87521G-LB, BD87521G-LB Transient Response Simulation, Response Simulation, ROHM, Simulation, Transient Response Simulation

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