

ROHM's Online Design Tool

ROHM Electronic Laboratory User Guide

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•1. What is ROHM Electronic Laboratory?

1.1 Outline

ROHM's Electronic Laboratory is an online design tool that allows circuit designers searching for an IC solution to easily configure circuits and confirm basic circuit operation online before conducting physically evaluations.

It allows arbitrary adjustment of the external constants and input parameters and enables users to generate bills of materials after evaluation, making it possible to greatly reduce the time required for parts selection.

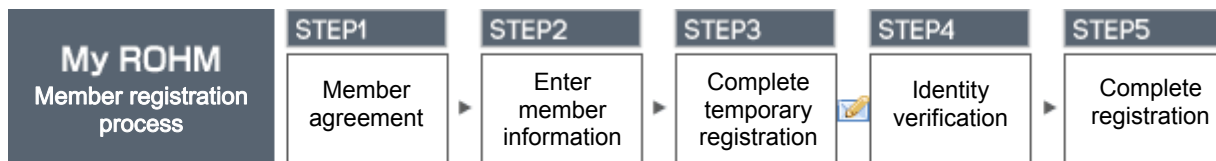
1.2 User Registration

Users are required to register (free of charge) and log into MyROHM in order to use ROHM Electronic Laboratory. New users must enter information on MyROHM and receive and verify identity via email before proceeding to the main registration page.

After completing registration, users can access MyROHM services (i.e. ROHM Electronic Laboratory).

Registration is required only once. Registered users can log into MyROHM using their login ID (e-mail address) and password.

(For details on how to register with MyROHM, please refer to the User Registration section on page 5.)



1.3 Default Language

The default language of ROHM Electronic Laboratory is English. Only the MyROHM user registration and user authentication screens can be displayed in other languages (i.e. Japanese, traditional Chinese, simplified Chinese and Korean).

1.4 Applicable Products

- 1-Chip Switching Regulators with Built-In FET

BD9778F	BD9778HFP	BD9781HFP	BD9001F	BD9006F
BD9006HFP	BD9007F	BD9007HFP	BD9106FVM	BD9107FVM
BD9109FVM	BD95513MUV	BD9120HFN	BD9130NV	BD9130EFJ
BD9132MUV				

- High Current Switching Regulator Controllers with External FET

[BD9018KV](#)

- High Performance PC Power Supply ICs (Switching Regulators)

[BD9533EKN](#) [BD9535MUV](#)

- H-Bridge Motor Drivers

BD6210F	BD6210HFP	BD6211F	BD6211HFP	BD6212FP
BD6212HFP	BD6220F	BD6221F	BD6222FP	BD6222HFP
BD6230F	BD6231F	BD6231HFP	BD6232FP	BD6232HFP

- We will continue adding new products and series

1.5 Notes

- The results provided by ROHM Electronic Laboratory are based on experimental results using ROHM evaluation boards and cannot be guaranteed.
- ROHM Electronic Laboratory specifications are subject to change without notice.

1.6 Questions/Comments

For inquiries and/or comments, please contact us at: <http://www.rohm.com/sim/>

●2. Access Method

ROHM Electronic Laboratory can be accessed using 3 methods:

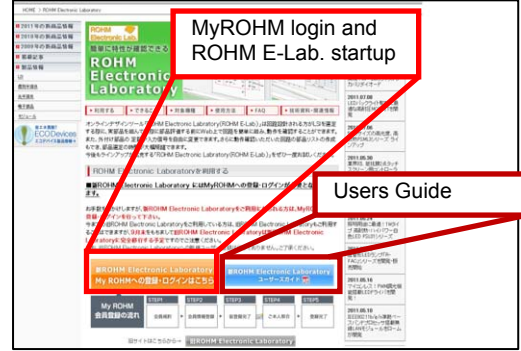
- From ROHM's homepage (<http://www.rohm.com>) (2.1)
- From applicable individual product pages (2.2)
- From a search page (2.3)

2.1 From ROHM's homepage (<http://www.rohm.com>)

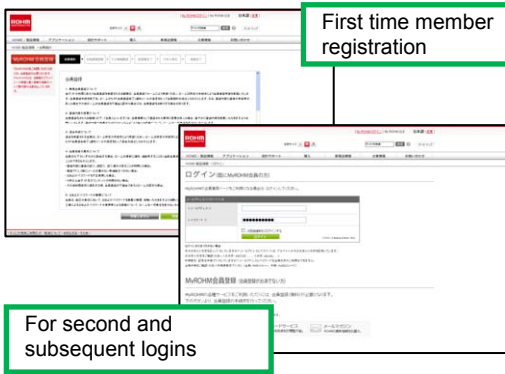
■ Homepage



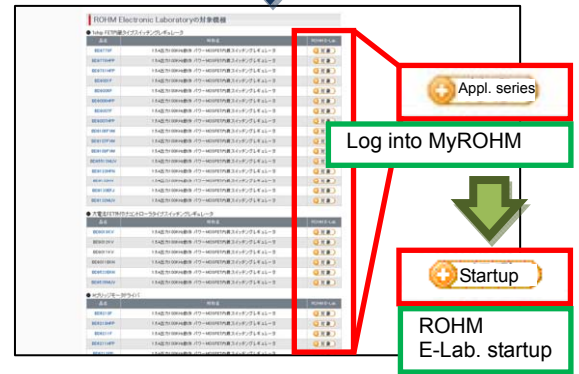
■ E-Lab topics page



■ MyROHM registration and login

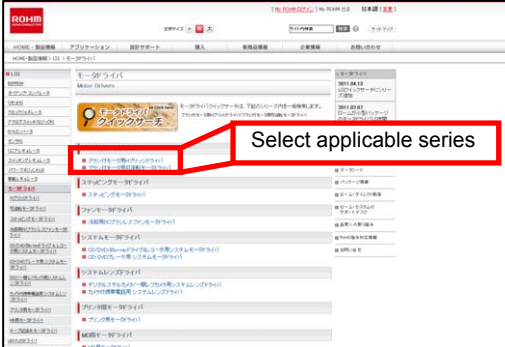


■ eLab startup

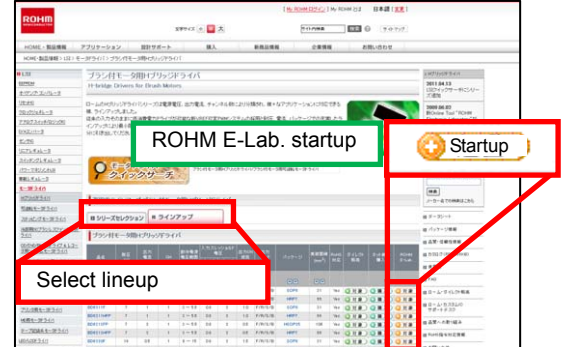


2.2 From lineup pages

■ Individual series page

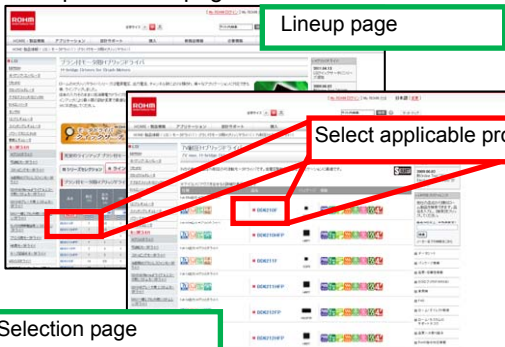


■ eLab startup (if already logged into MyROHM)

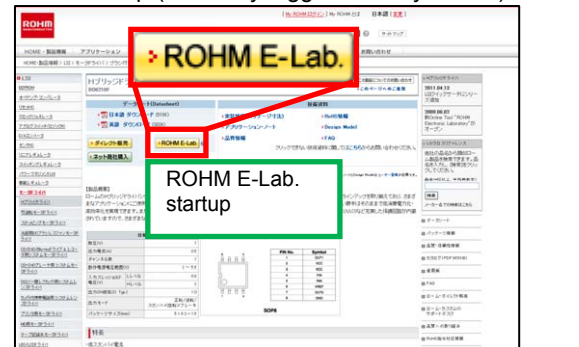


2.3 From individual product pages

■ Lineup selection page



■ eLab startup (if already logged into MyROHM)



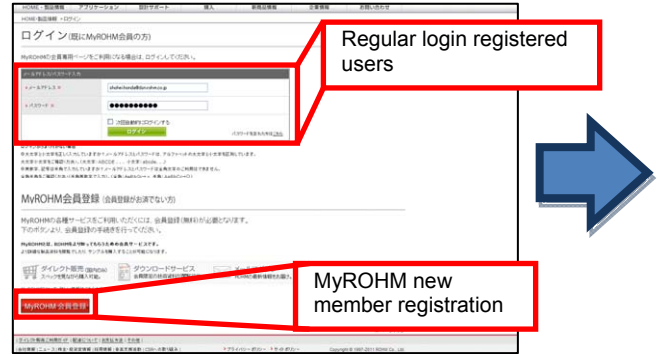
● 3. User registration (for MyROHM)

Registration with MyROHM is required to use ROHM Electronic Laboratory. Once registration is complete, users will be able to download materials such as application notes, data sheets, and design models as well as order products directly.

■ MyROHM link



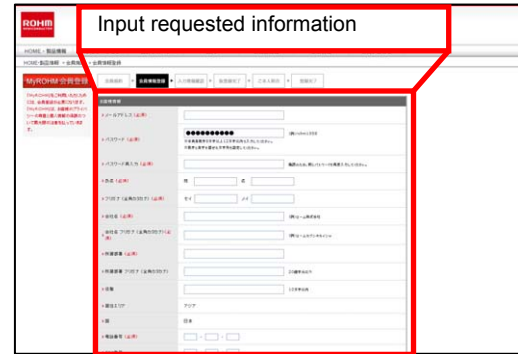
■ MyROHM login screen



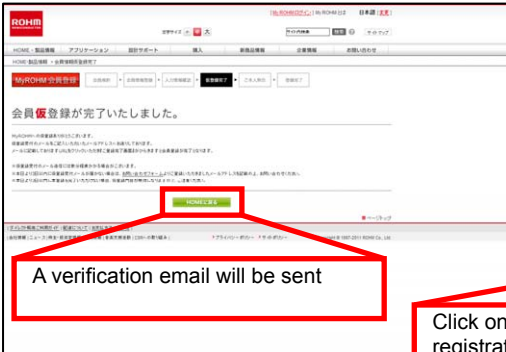
■ Membership agreement



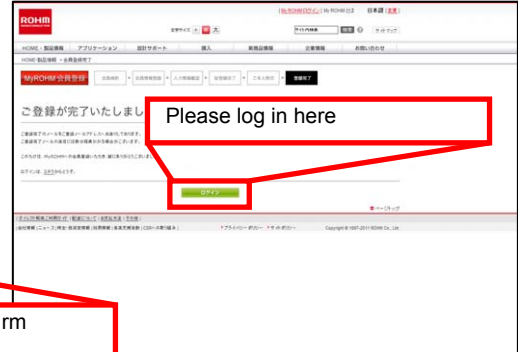
■ Enter the required information and confirm registration details



■ Temporary registration completed



■ Registration completed



4. Usage Instructions

4.1 Logging into MyROHM

As indicated on page 2, registration with MyROHM is required in order to use ROHM Electronic Laboratory. Log into MyROHM before starting ROHM Electronic Laboratory. (For details on MyROHM user registration, see "User Registration" on page 4.)

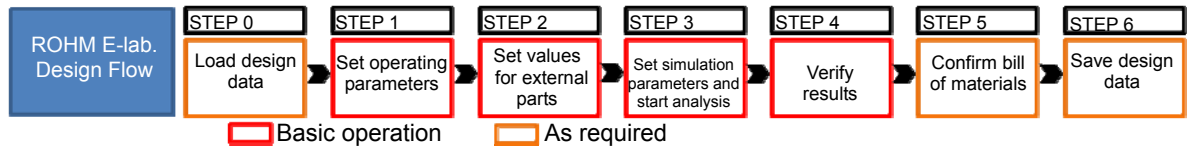
4.2 Starting the ROHM Electronic Laboratory design tool

Once you have logged into MyROHM, start ROHM Electronic Laboratory as described on page 3.

4.3 Design using Switching Regulators

Instructions on designing circuits and performing evaluation using switching regulators will be noted here.

The basic design flow is as follows (with some possible omissions of intervening steps)



4.3.1 Design Requirements (Set operating parameters)

Set the operating parameters, such as the input and output voltages

Item	Value	Unit	Min. Value	Max. Value
Input Voltage 1	13.2	V	7	35
Output Voltage 1	3.3	V	1	VIN1
Max Output Current 1	1	A	0.001	2
Switching Frequency 1	100	KHz	50	500

Callouts: ① Set the operating parameters (points to the table), ② Apply the set parameters to the circuit (points to 'Adjust Condition'), ③ Click to set the values for the external parts (points to 'Go to "Setting value of parts"').

4.3.2 External Constants (Set values for external parts)

Set the values for the external components (e.g. resistors, capacitors)

Parts List	Value	Unit	Min. Value	Max. Value
R_VBAT_INT	1	megohm	0.1	100
CIN	220	uF	47	1000
R_CIN_ESR	10	megohm	1	200
C28	1	uF	1	10
L1	20	uH	15	3000
R_LL_LDR	10	megohm	0.1	100
C32	330	uF	100	1000
R_CO_ESR	10	megohm	1	10000
R1	20	megohm	0	300
R2	10	megohm	3	30

Callouts: ① Set parts values (points to the table), ② Apply the set values to the circuit (points to 'Adjust Parts Value'), ③ Go to simulation settings (points to 'Go to "Simulation Settings"').

4.3.3 Simulation Settings (Set simulation parameters and start analysis)
Set the analysis time and frequency range, then begin analysis.

① Set the parameters for analysis

② Select the analysis type

- Analysis Description (Switching Regulators)
 - Steady-State Analysis (SS)
 - Transient Analysis (Tran)
 - AC Analysis (AC)

4.3.4 Waveforms (Confirm results)

The waveforms and analysis results are displayed. Waveforms can be zoomed in and out.

① Change the output node. (Press Select Probe to apply)

② Set the waveform output range. (Press Zoom to apply)

Press Zoom Reset to display the entire waveform

The output waveforms are displayed

4.3.5 Design Summary (Confirm bill of materials)

The bill of materials is displayed. Bills of materials can be downloaded as CSV files.

① Create a bill of materials

Scroll vertically

② Download the bill of materials as a CSV file

The bill of materials is displayed

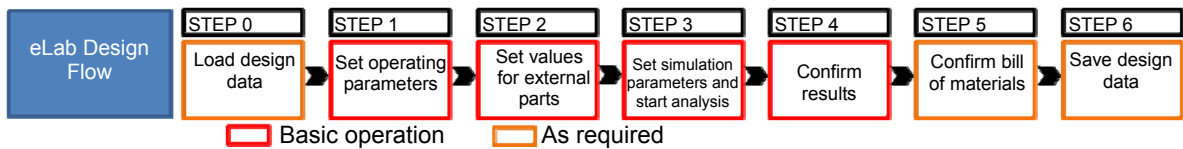
Design	Ref/Des	Quantity	Vendor Name	Parts No.	Value	Type
1	-	1	ROHM	BD9778HFP	-	IC
2	C1	1	-	-	100nF	Capacitor
3	C2	1	-	-	9F	Capacitor
4	C2B	1	-	-	1µF	Capacitor
5	C3	1	-	-	9F	Capacitor
6	C3B	1	-	-	220µF	Capacitor
7	C4	1	-	-	330µF	Capacitor
8	CT	1	-	-	100nF	Capacitor
9	D1	1	-	-	Virtual Diode	Diodes
10	L1	1	-	-	33µH	Inductor
11	R1	1	-	-	22kOhm	Resistor
12	R2	1	-	-	10kOhm	Resistor
13	R3	1	-	-	7.5kOhm	Resistor
14	R4	1	-	-	1kOhm	Resistor
15	-	-	-	-	-	Resistor

4.3.6 Save/Load Designs (Save/load design data)

Design data can be saved for later use.

4.4 Design using H-bridge Drivers

Here, the design procedure for H-bridge Drivers is described. The design flow is similar to Switching Regulators.



4.4.1 Design Requirements (Set the operating parameters)

Set the operating parameters, such as application mode and input/output voltages

Item	Value	Unit	Min. Value	Max. Value
Supply Voltage 1	5.0	V	3	5.5
VREF Voltage 1	5.0	V	VCC1	VCC1
PWM Frequency 1	25	KHz	20	100
Duty Cycle 1	0.5		0.1	0.9

● Description of Application Modes

Direct PWM=>VREF terminal is connected to VCC and PWM signal is input directly to the control input pin

Battery Driven=>VREF is set using Zener diode in the case of battery drive or large power source voltage fluctuations

Regulated=>VREF is set through resistor voltage division of R1 and R2 in cases where a stable power source is used

4.4.2 External Constants (Set the values for external parts)
Set the values for the external parts (i.e. resistors, capacitors)

Setting value of parts

Part	Value	Unit	Min. Value	Max. Value
C1	10	uF	10	10000
S1 Nominal Current	0.00	A	0.1	1.5
S1 Moment of inertia	1	mg-mm ²	0.1	400
S1 Armature Inductance	12	ohm	0.1	2000
S1 Armature Resistance	12	ohm	0.1	1000
S1 Nominal Torque	20	mNm	5	10000
S2 Linear torque coefficient	0.00	uNm/s	0	30000
S2 Quadratic Torque Coefficient	20	uNm/s ²	0	50000

Simulation Settings

Go to Simulation Settings

③ Go to simulation settings

① Set the parts values

② Apply the set values to the circuit

Circuit diagram (reflects the set parameters)

4.4.3 Simulation Settings (Set the simulation parameters and begin analysis)
Start analysis.

Simulation Settings

Start Only

Start / Brake

Start / Reverse

Start / Reverse / Brake

● Analysis Types (H-bridge)

- Start Only
- Start / Brake
- Start / Reverse
- Start / Reverse / Brake

① Select the analysis type

4.4.4 Waveforms (Results verification)
Select and display waveforms of analysis results. Waveforms can be zoomed in and out.

Wave Form (Start / Reverse / Brake)

Active Probe: VFIN X axis: Time[sec] Y axis: Voltage[V]

Active Probe: RIN X axis: Time[sec] Y axis: Voltage[V]

① Change the output node. (Press Select Probe to apply)

② Set the waveform output range. (Press Zoom to apply)

Press Zoom Reset to display the entire waveform

The output waveforms are displayed

4.4.5 Design Summary (Confirm bill of materials)

The bill of materials is displayed. Bills of materials can be downloaded as CSV files.

Bill Of Materials

Design	RefDes	Quantity	Vendor Name	Parts No.	Value	Type
1	-	1	ROHM	BD6210F	-	IC
2	C1	1	-	-	10uF	Capacitor
3	D1	1	-	-	-	-
4	R1	1	-	-	100kohm	Resistor

4.4.6 Save/Load Designs (Save/load design data)

Design data can be saved for later use.

Save Designs / Load Designs

Save Design Data: Design Name: test, Design Condition: testtest

Load Design Data: Design Name: test

Delete Design Data: Design Name: test

Design Name	Product Name	Save Date & Time	Design Comment
test	BD6210F	2011.09.10 15:09:57	testtest

5. Supplementary Information

- If you are using internet under proxy environment, Please make HTTP1.1 setting usable on your web browser.

Notes

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