(B-004-DOT) DC-AC single-phase 2-Level Full-Bridge Inverter (DOT247)

ROHM PLECS Simulator
Circuit Information

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68UG107E Rev.001

Simulation Parameters (Dialog)

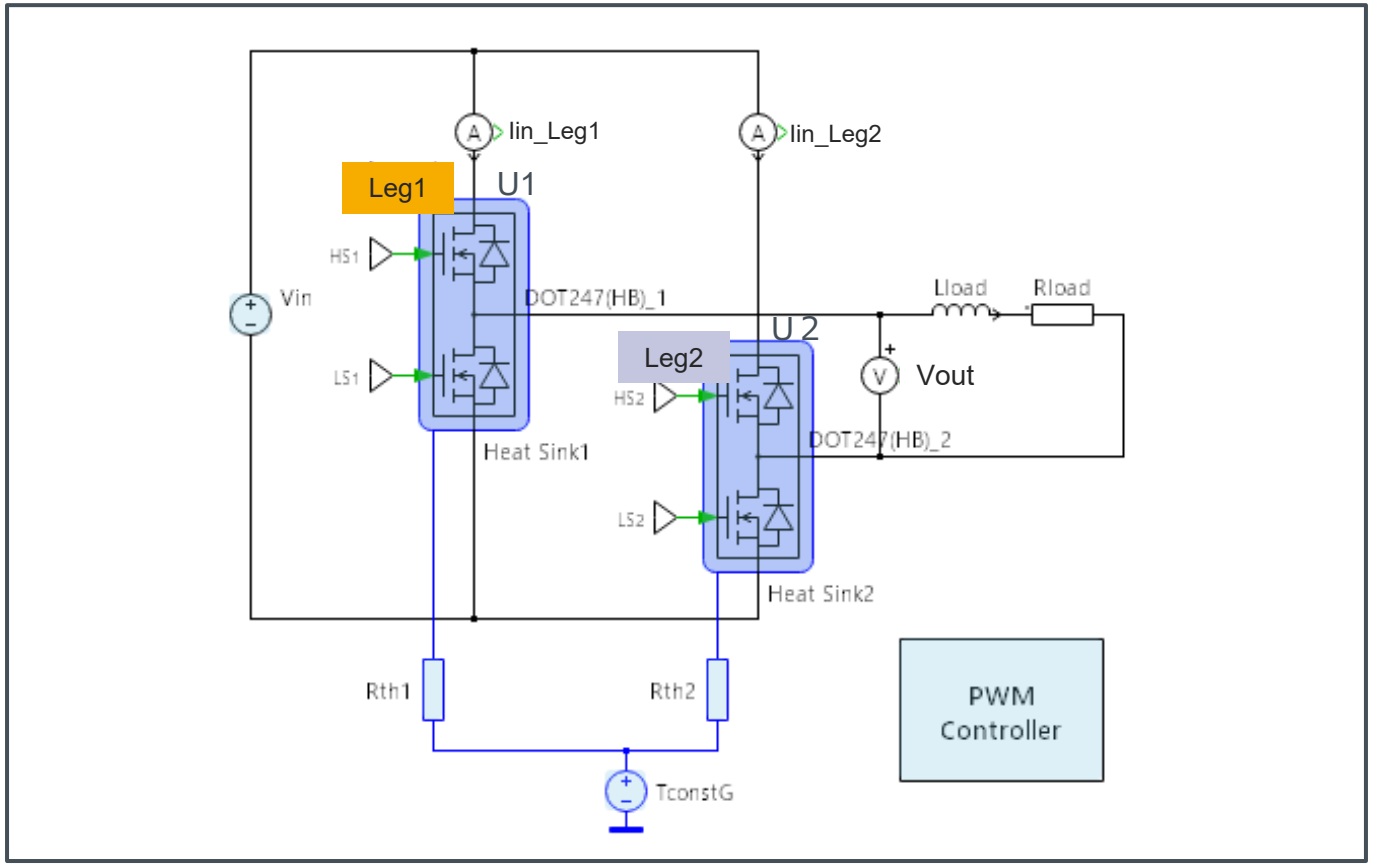
	Name	Content	unit	Default Value	Variable Range
	Vin	Input Voltage	V	400	100 ～ 1000
PWM Controller	fs	Carrier Frequency	Hz	20	1～1000
PWM Controller	M	Modulation Index	-	0.8	0.1～1
PWM Controller	DT	Dead Time	ns	800	100～10k
Leg1	Thcap_1	Thermal Capacitance	J/K	0.1	1m ～ 100
Leg1	Rth_1	Thermal Resistance	K/W	0.5	1m ～ 100
Leg1	TGND_1	Thermal GND Temperature	℃	25	-40 ～ 175
Leg2	Thcap_2	Thermal Capacitance	J/K	0.1	1m ～ 100
Leg2	Rth_2	Thermal Resistance	K/W	0.5	1m ～ 100
Leg2	TGND_2	Thermal GND Temperature	℃	25	-40 ～ 175

Simulation Parameters (Table)

Name	Content	unit	Default Value	Variable Range
Test_time	Test time in simulation	s	0.5	100u ～ 0.5
Iopeak	Output Current (peak)	A	15	1 ～ 100
fr	Output Frequency	Hz	50	50~1M
PF	Power Factor	-	0.9	0.5～1
Rg_on	Gate Resistance (Source) ※	Ω	10	0.1 ～ 100
Rg_off	Gate Resistance (Sink) ※	Ω	10	0.1 ～ 100
T_init	Initial Junction Temperature	℃	25	-40 ～ 175

※ Same value at Leg 1 and 2.

Simulation Circuit



Default Devices

Name	Device Type	Part No.	Specification
U1,2	SiC Power Module	SCZ4008DTA	750V/ 134A/ 8mΩ/ DOT247(Half-bridge)

Simulation Screen Overview

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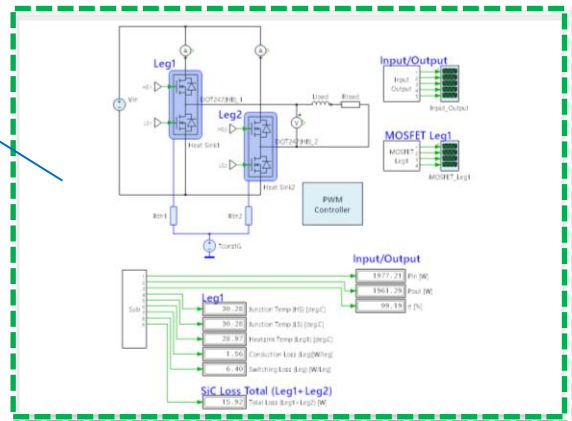
Schematic window
- Dialog parameters setting
- Results display

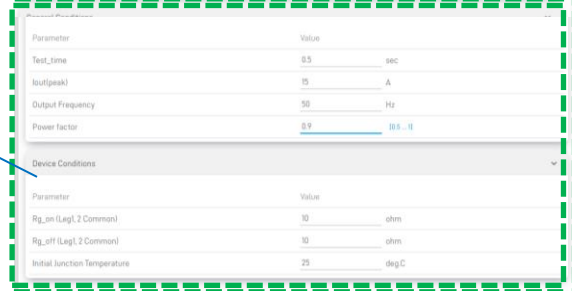
Device selection

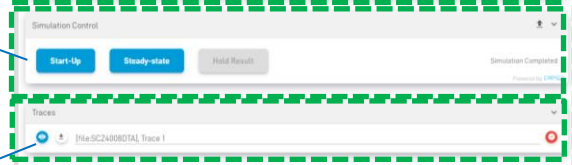
Table parameters setting

Simulation control

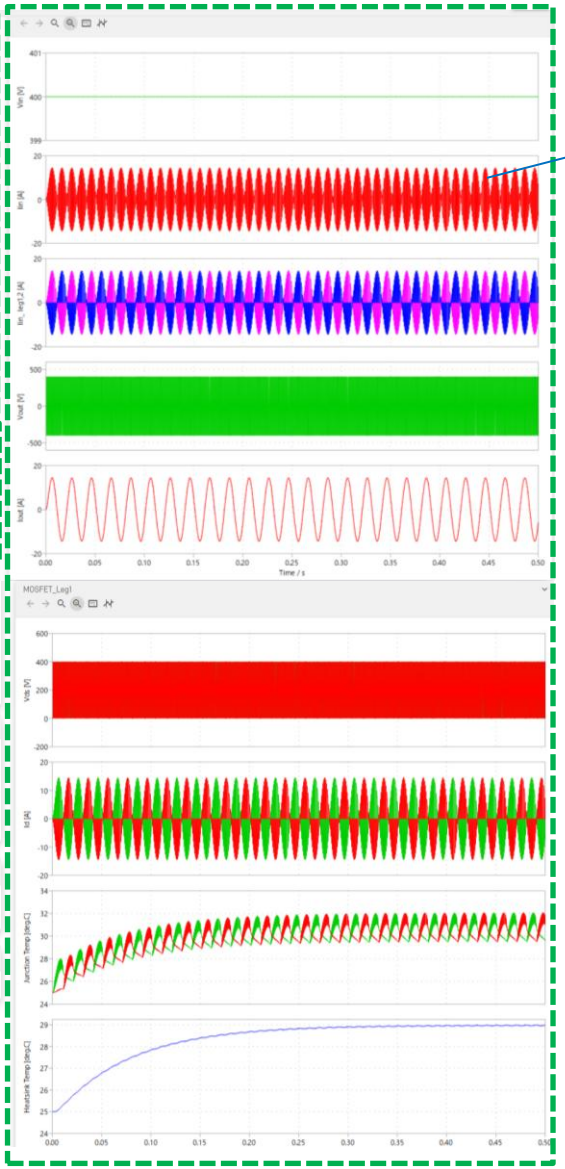
Trace selection







Waveforms



Simulation Results

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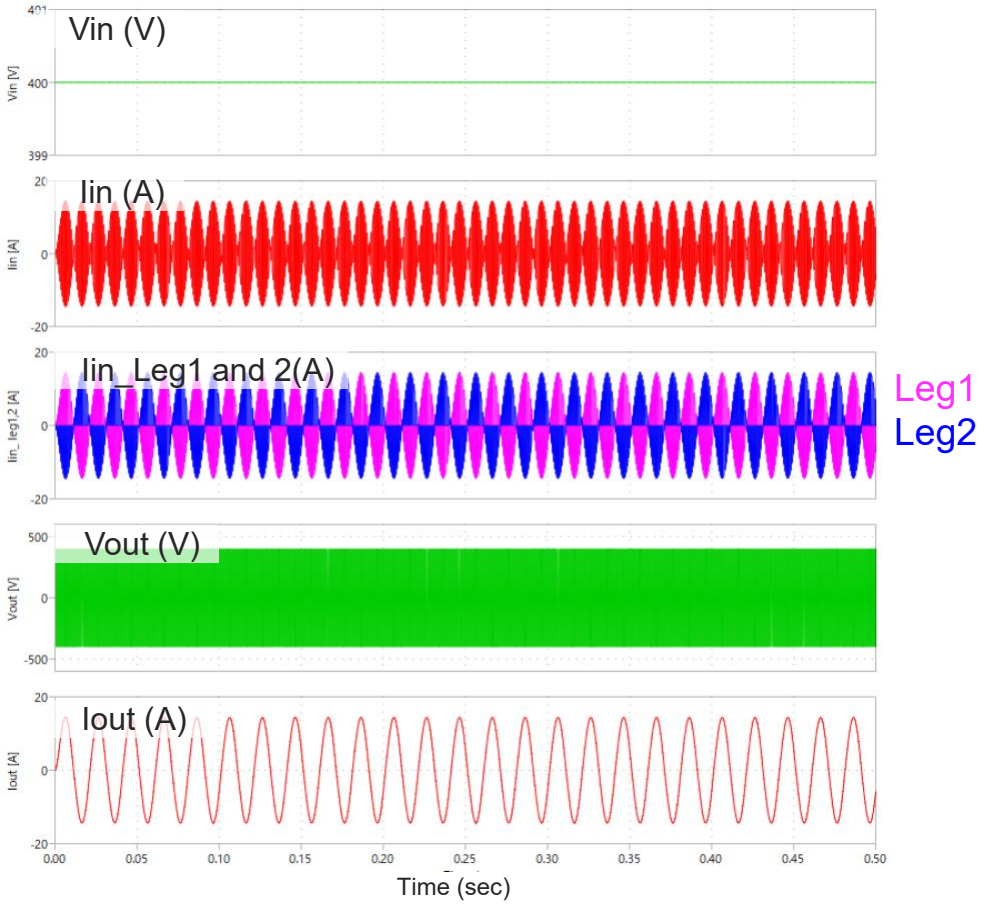
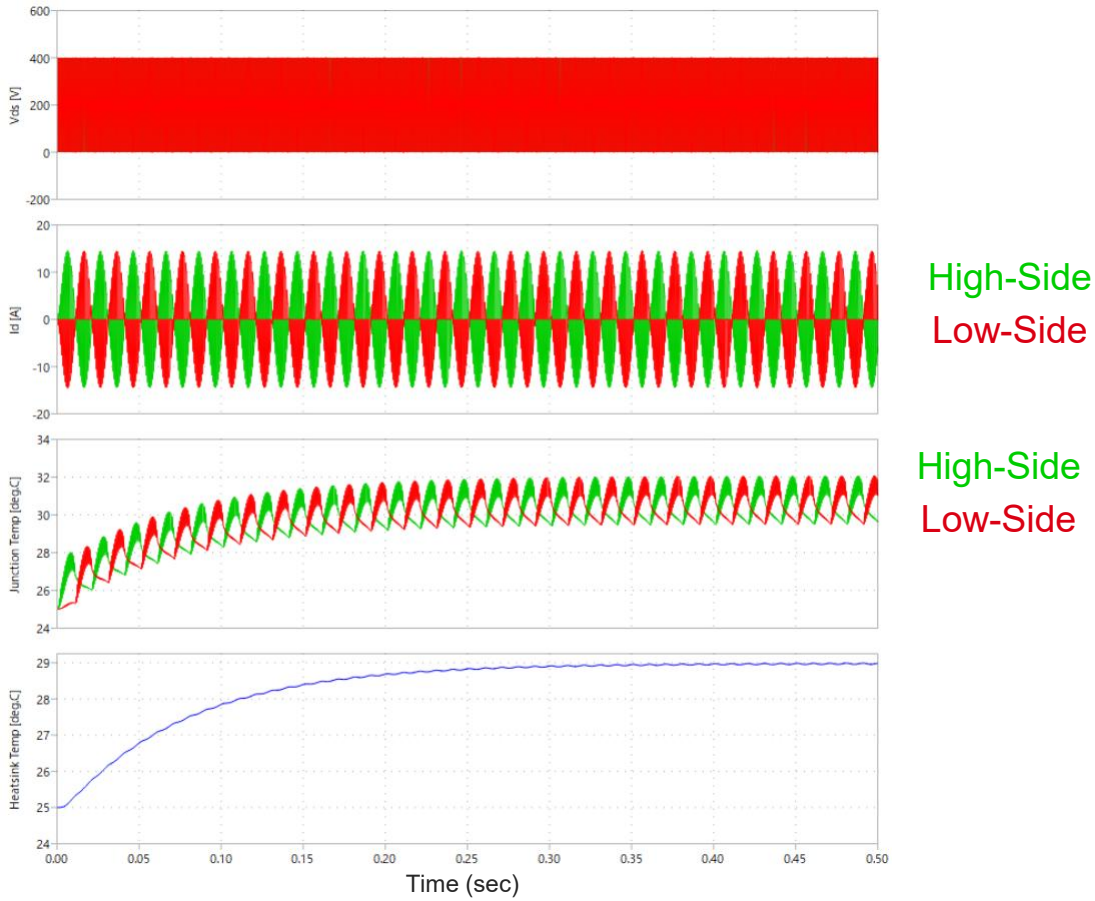
Input and Output



Contents	Results
Input Power : Pin	1.977 (kW)
Output Power: Pout	1.961 (kW)
Efficiency: η	99.19 (%)

MOSFET_Leg 1



Contents	Results
Junction Temp: Tj (HS)	30.28 (℃)
Heatsink Temp: Ths	28.97 (℃)
Conduction Loss: Pcond (Leg)	1.56 (W/Leg)
Switching Loss: Psw (Leg)	6.40 (W/Leg)
Total Loss: Ptotal (Leg1+Leg2)	15.92 (W)

How to change the devices

The figure of “(A-011-D) DC-AC Totem-Pole PFC Diode Rectification (Discrete)” is used as an example in this page.

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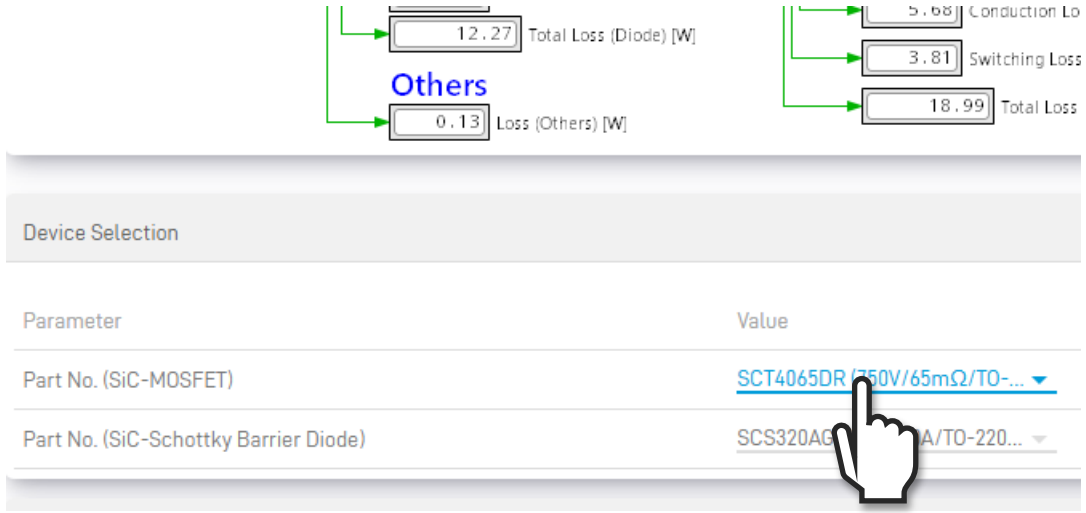
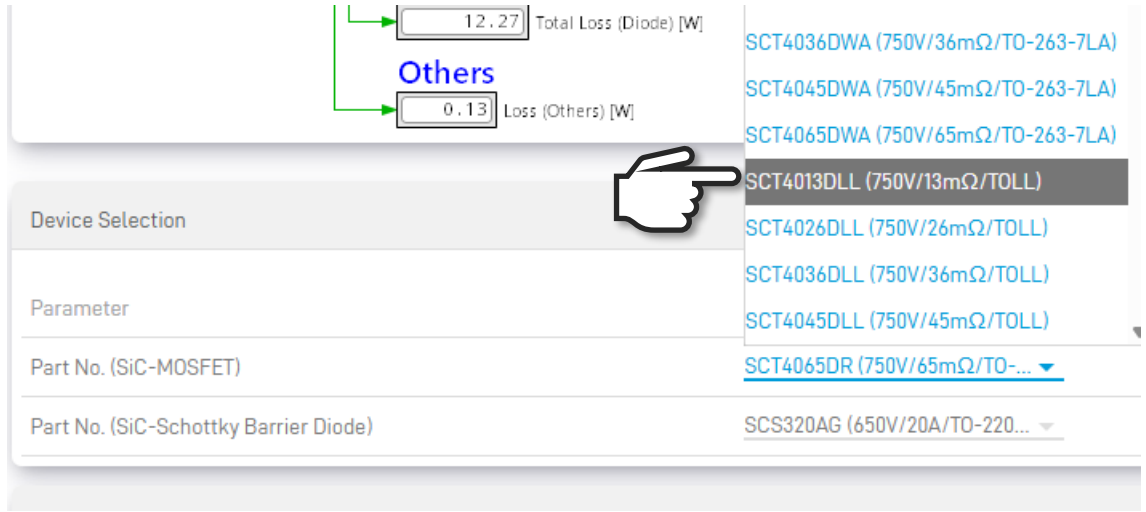
Device Selection



Over your mouse cursor to the device name that you want to change and click the left button of the mouse.



Available device lists are appeared like the above, and you can select a favorite device from these.

How to change Dialog parameters

The figure of “(A-011-D) DC-AC Totem-Pole PFC Diode Rectification (Discrete)” is used as an example in this page.

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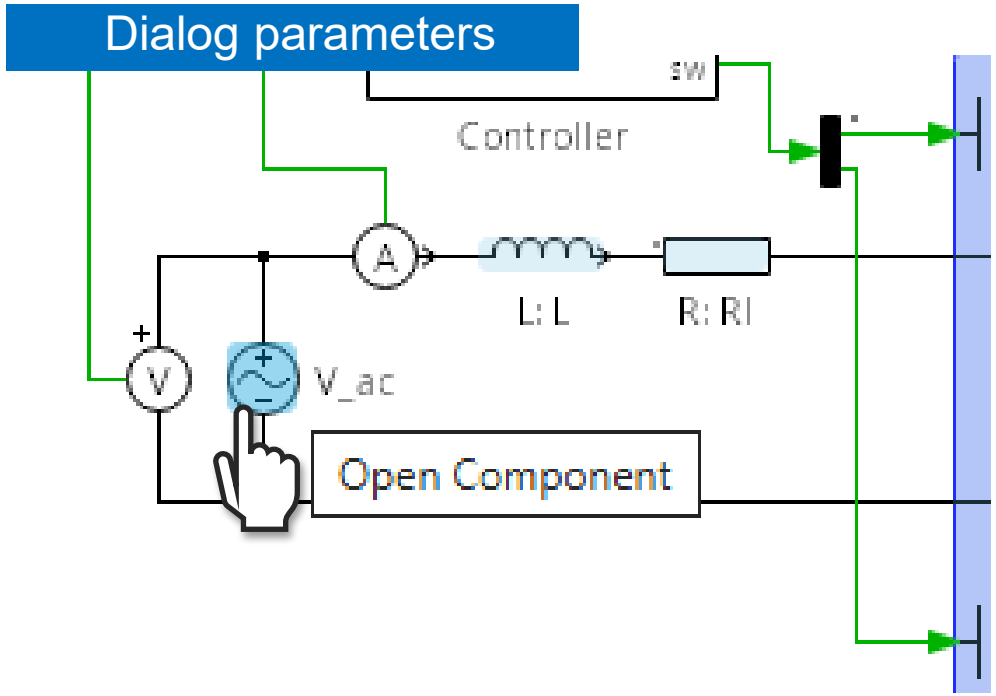
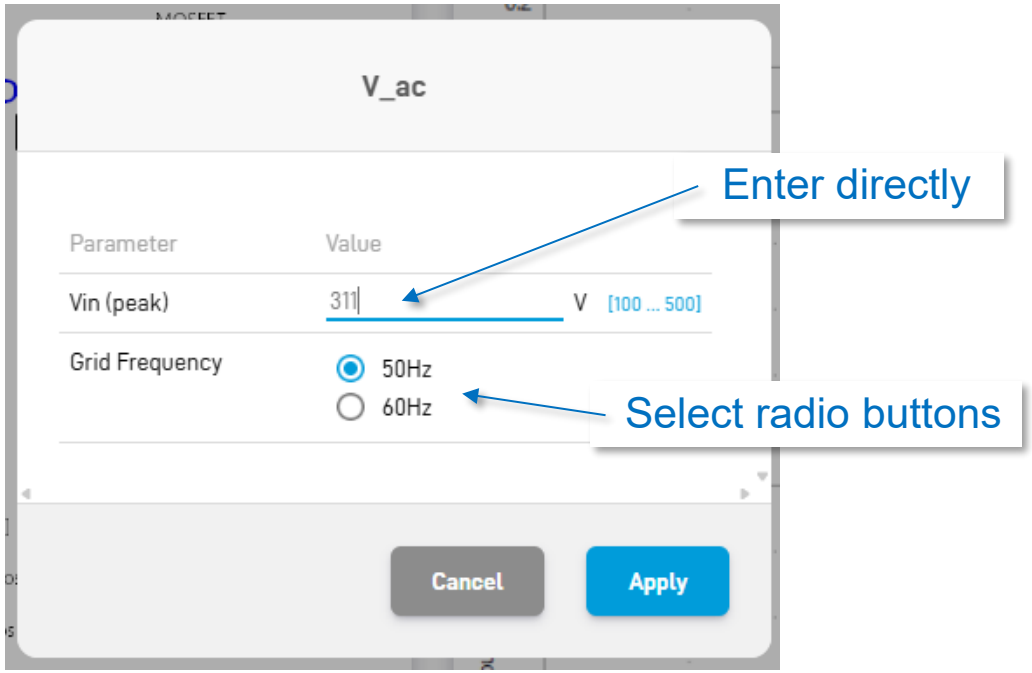
- Symbols whose parameters can be changed are colored light-blue in the circuit diagram.
- Over your mouse cursor to the symbol that you want to change the parameter and the symbol color is turned to blue (e.g. “V_ac” symbol in the below).
- Click the mouse’s left button.



- A new window like the below is opened.
- You can change the parameters by entering the value directly* or selecting radio buttons.
- Push “Apply” button after changing all parameters.



*Note: Parameters can be entered directly are limited by Min. and Max. values to avoid unexpected system errors.
(e.g. “Vin(peak)” is limited between 100 and 500V in the above.)

How to change Table parameters

The figure of “(A-011-D) DC-AC Totem-Pole PFC Diode Rectification (Discrete)” is used as an example in this page.

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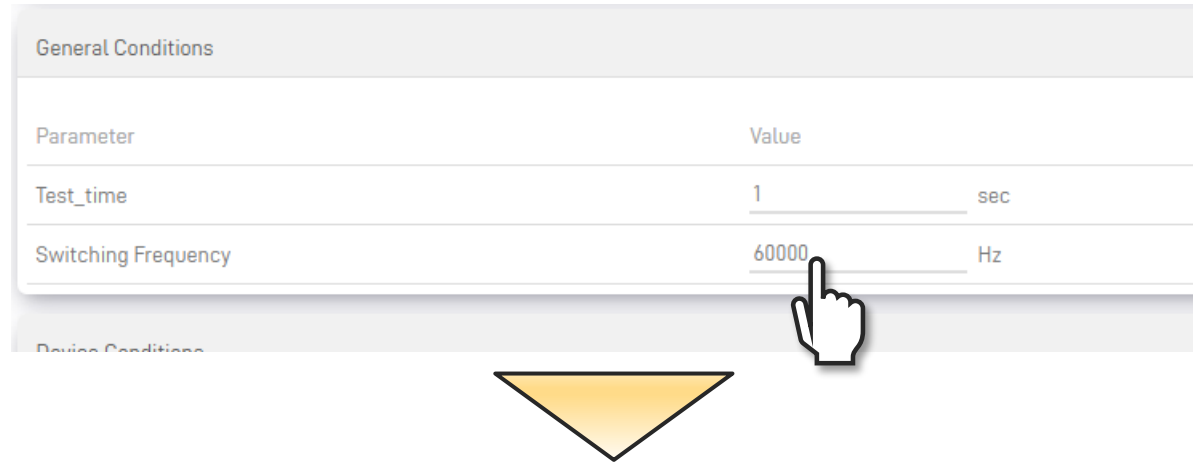
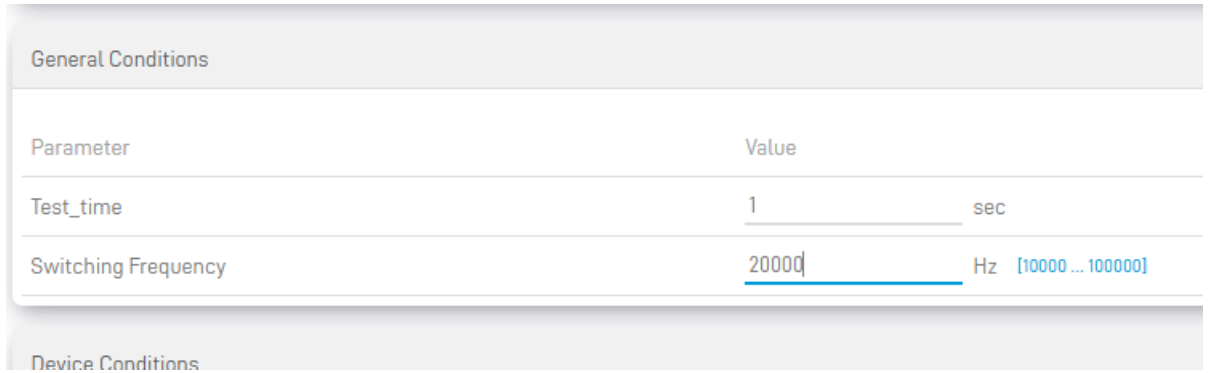
Table parameters





Choose the parameter that you want change on the parameter tables (e.g. ”60kHz” of Switching Frequency in the left figure.)

- A blue under-line and variable range of the parameter are appeared.
- Then, you can change the parameters by entering the value directly ” (e.g. “60kHz” was changed to “20kHz”).

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