

(B-004-D) DC-AC single-phase 2-Level Full-Bridge Inverter (Discrete)

Simulation Parameters (Dialog)

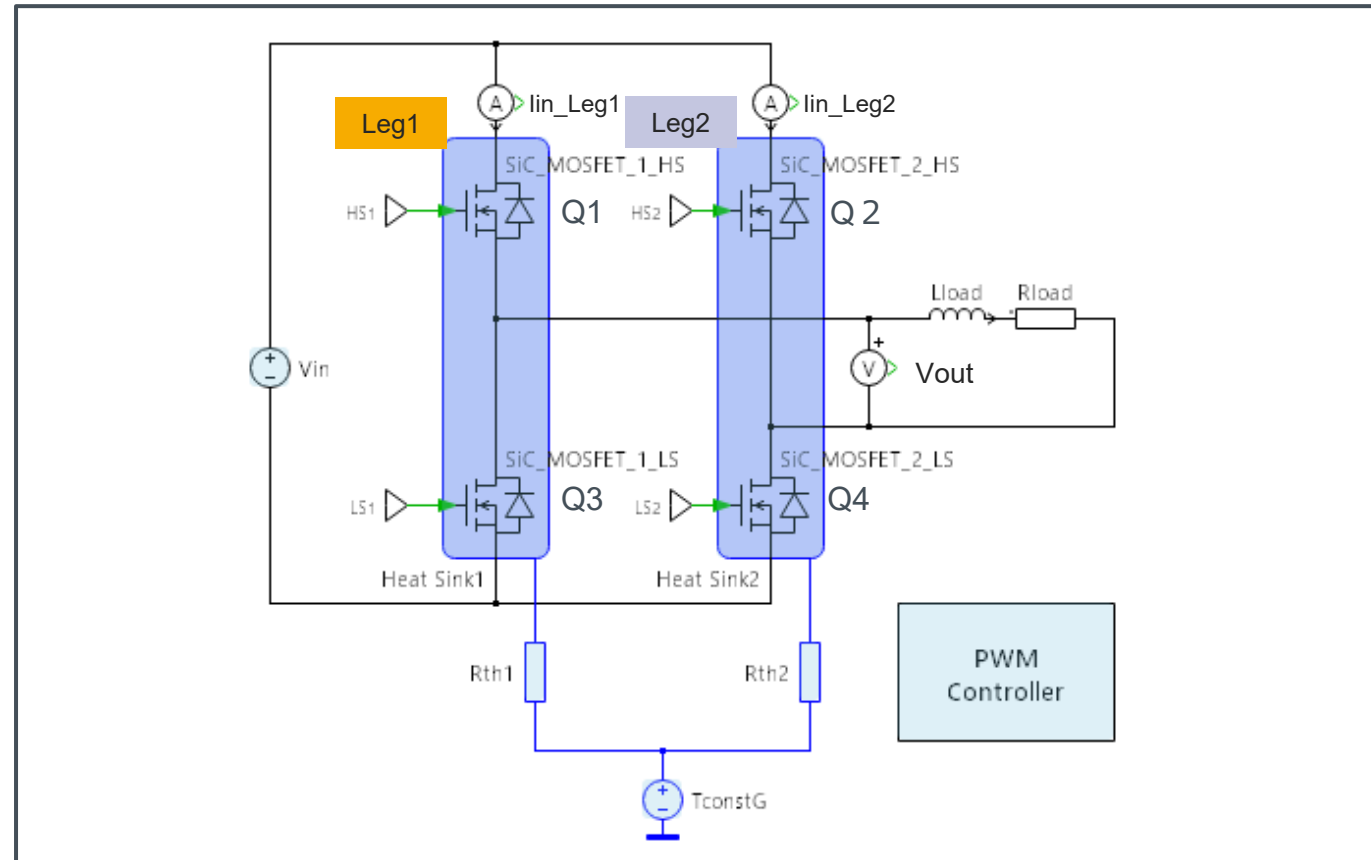
Name	Content	unit	Default Value	Variable Range
Vin	Input Voltage	V	400	100 ~ 1000
fs	Switching Frequency	kHz	20	1~1000
M	Modulation Index	-	0.8	0.1~1
DT	Dead Time	ns	800	100~10000
PWM Controller				
Thcap_1	Thermal Capacitance	J/K	0.1	1m ~ 100
Rth_1	Thermal Resistance	K/W	0.5	1m ~ 100
TGND_1	Thermal GND Temperature	°C	25	-40 ~ 175
Leg1				
Thcap_2	Thermal Capacitance	J/K	0.1	1m ~ 100
Rth_2	Thermal Resistance	K/W	0.5	1m ~ 100
TGND_2	Thermal GND Temperature	°C	25	-40 ~ 175
Leg2				

Simulation Parameters (Table)

Name	Content	unit	Default Value	Variable Range
Test_time	Test time in simulation	s	0.5	100u ~ 0.5
Ipeak	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	6.8	0.1 ~ 100
Rg_off	Gate Resistance (Sink) ※	Ω	6.8	0.1 ~ 100
T_init	Initial Junction Temperature	°C	25	-40 ~ 175

※ Same value at Leg 1 and 2.

Simulation Circuit



Default Devices

Name	Device Type	Part No.	Specification
Q1~Q4	SiC-MOSFET	SCT4065DR	750V/25A/65mΩ/TO-247-4L

Simulation Screen Overview

Schematic window

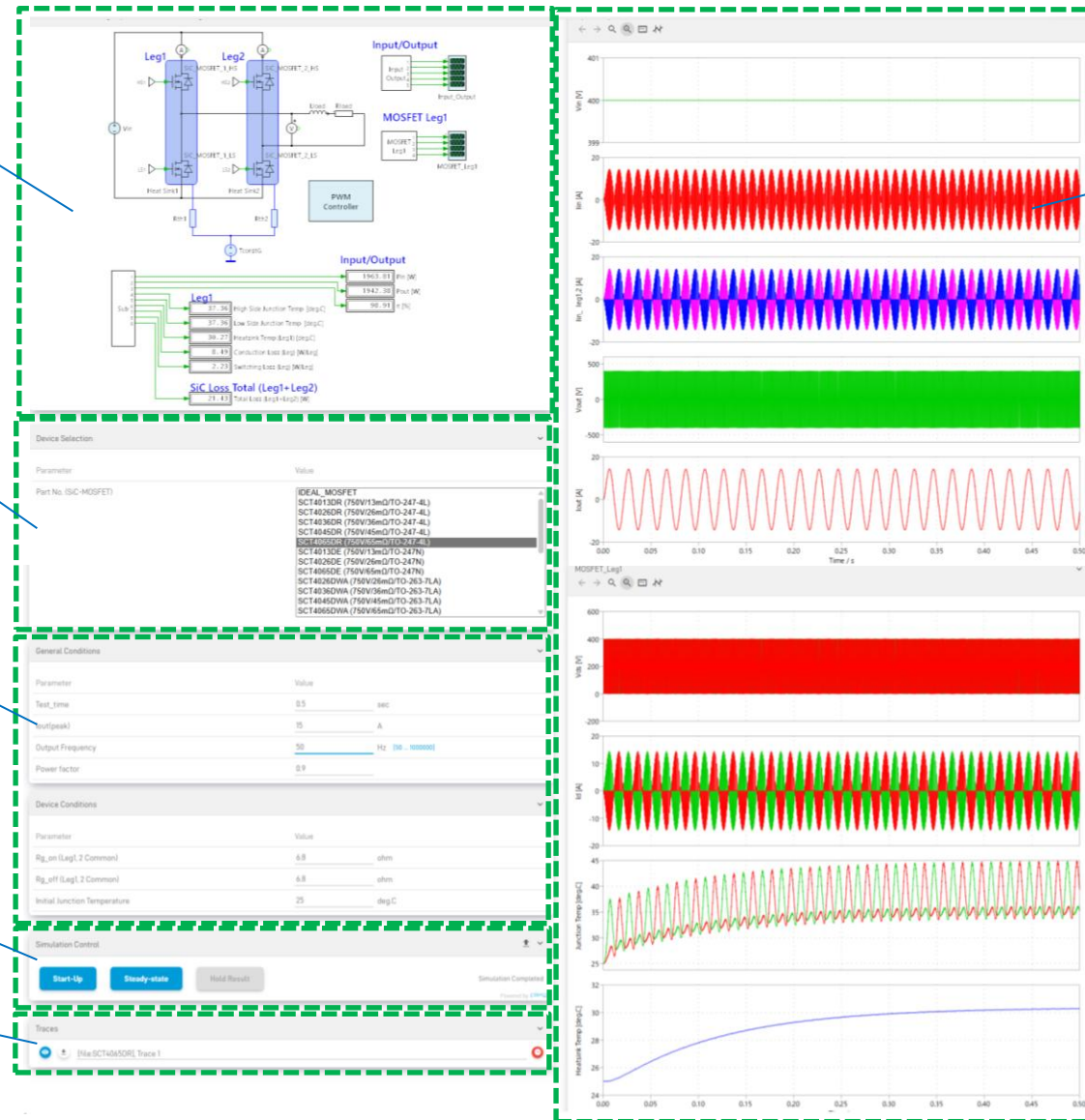
- Dialog parameters setting
- Results display

Device selection

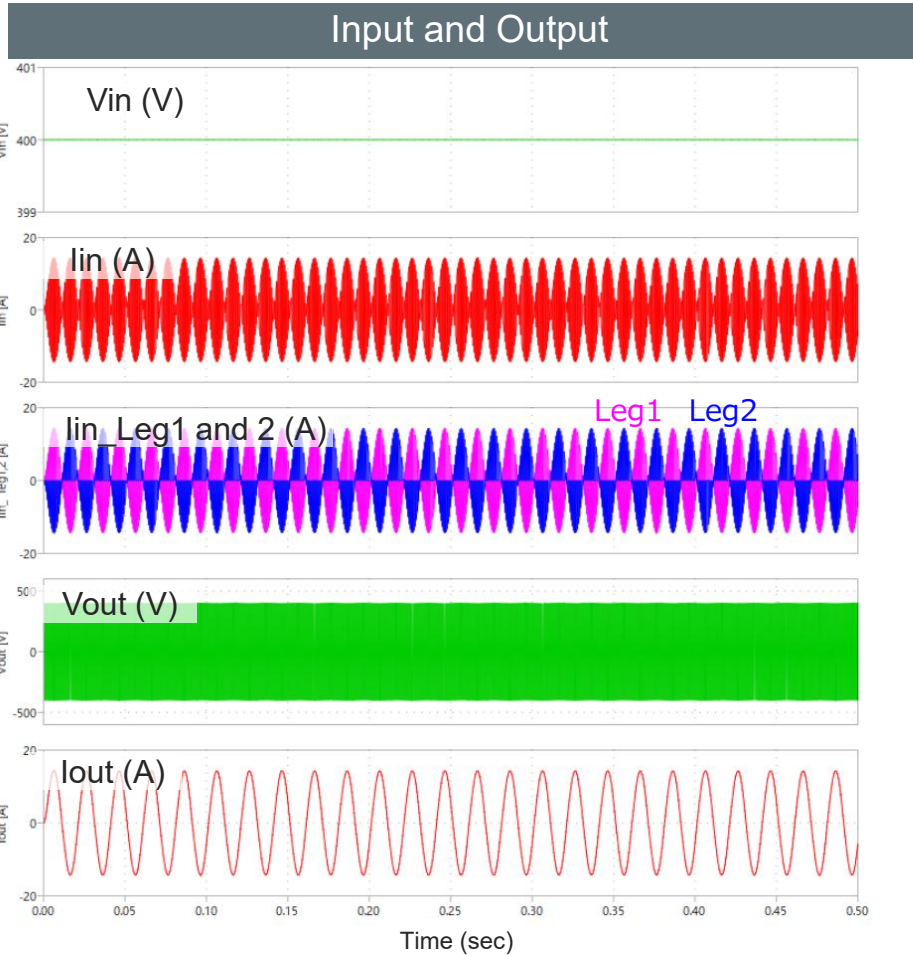
Table parameters setting

Simulation control

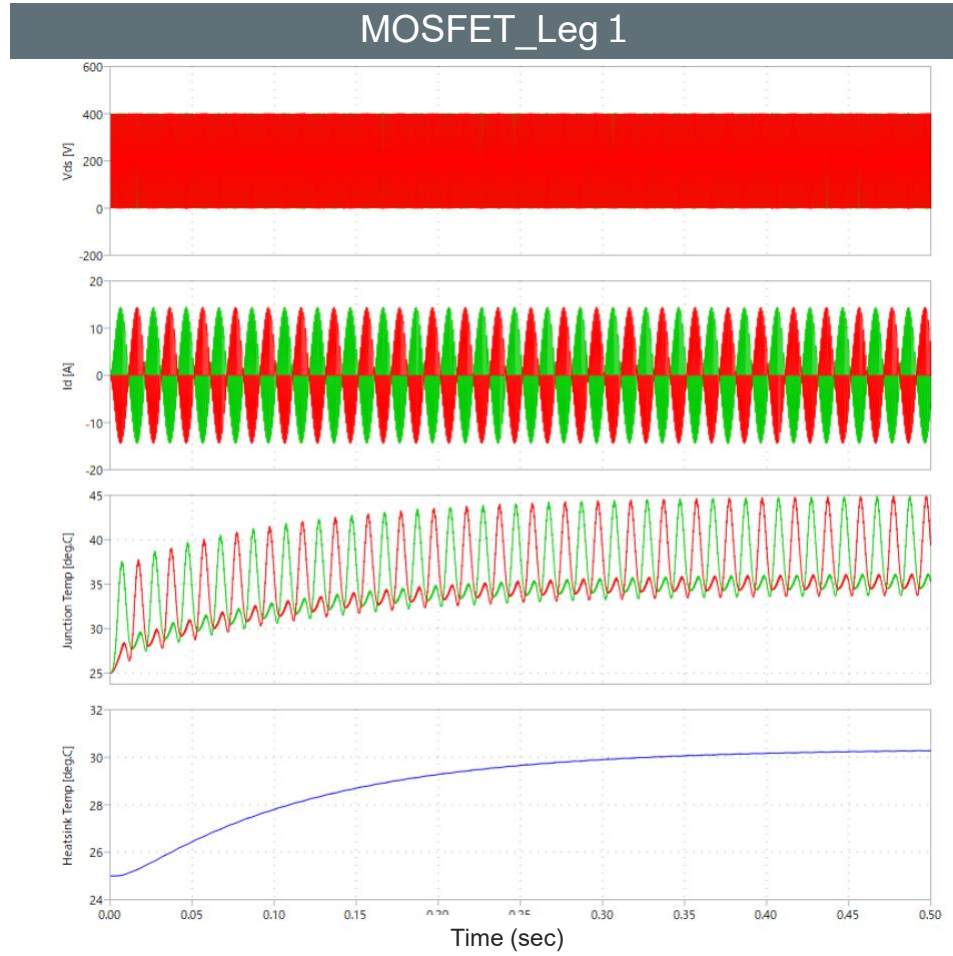
Trace selection



Waveforms



Contents	Results
Input Power : Pin	1.964(kW)
Output Power: Pout	1.942 (kW)
Efficiency: η	98.91 (%)



Contents	Results
Junction Temp: Tj (HS)	37.36 (°C)
Heatsink Temp: Ths	30.27 (°C)
Conduction Loss: Pcond (Leg)	8.49 (W/Leg)
Switching Loss: Psw (Leg)	2.23 (W/Leg)
Total Loss: Ptotal (Leg1+Leg2)	21.43 (W)

How to change the devices

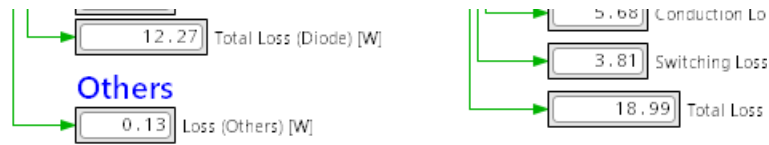
The figure of "(A-011-D) DC-AC Totem-Pole PFC Diode Rectification (Discrete)" is used as an example in this page.

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Circuit Information



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Device Selection



Device Selection	
Parameter	Value
Part No. (SiC-MOSFET)	SCT4065DR (750V/65mΩ/TO-247-3)
Part No. (SiC-Schottky Barrier Diode)	SCS320AG (650V/20A/TO-220-3)



Device Selection	
Parameter	Value
Part No. (SiC-MOSFET)	SCT4065DR (750V/65mΩ/TO-247-3)
Part No. (SiC-Schottky Barrier Diode)	SCS320AG (650V/20A/TO-220-3)

Available Device Lists	
SCT4036DWA (750V/36mΩ/TO-263-7LA)	
SCT4045DWA (750V/45mΩ/TO-263-7LA)	
SCT4065DWA (750V/65mΩ/TO-263-7LA)	
SCT4013DLL (750V/13mΩ/TOLL)	
SCT4026DLL (750V/26mΩ/TOLL)	
SCT4036DLL (750V/36mΩ/TOLL)	
SCT4045DLL (750V/45mΩ/TOLL)	

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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Circuit Information

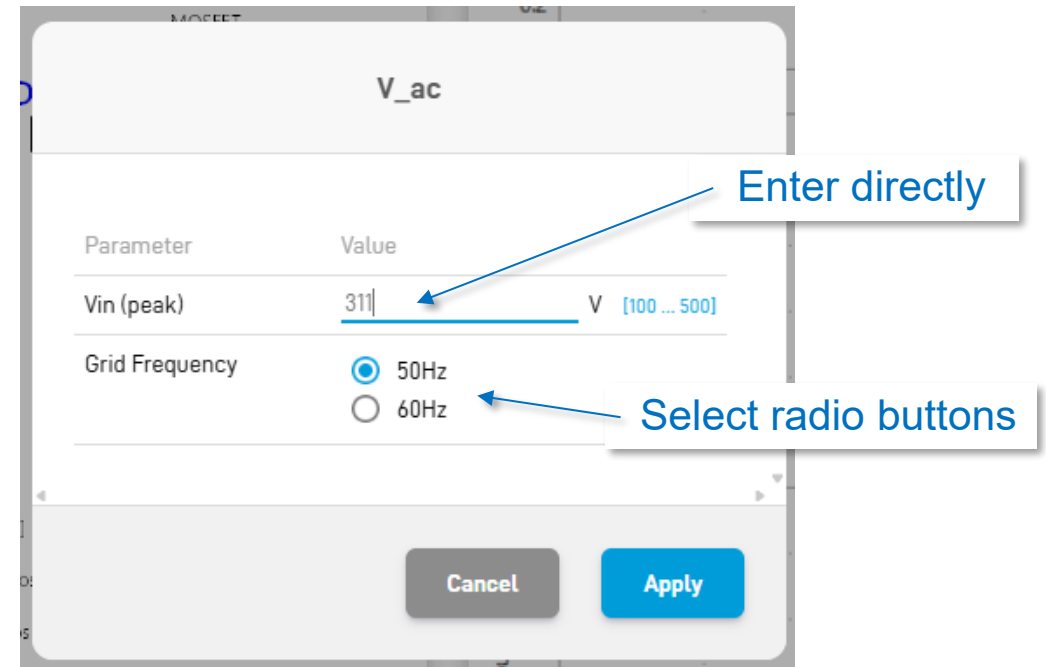


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- Symbols whose parameters can be changed are colored light-blue in the circuit diagram.
- Over your mouse cursor to the symbol that you want to change the parameter and the symbol color is turned to blue (e.g. "V_ac" symbol in the below).
- Click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

General Conditions

Parameter	Value
Test_time	1 sec
Switching Frequency	60000 Hz

Device Conditions

General Conditions

Parameter	Value
Test_time	1 sec
Switching Frequency	<u>20000</u> Hz [10000 ... 100000]

Device Conditions

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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