

(C-002-D) DC-DC Boost Converter (Discrete)

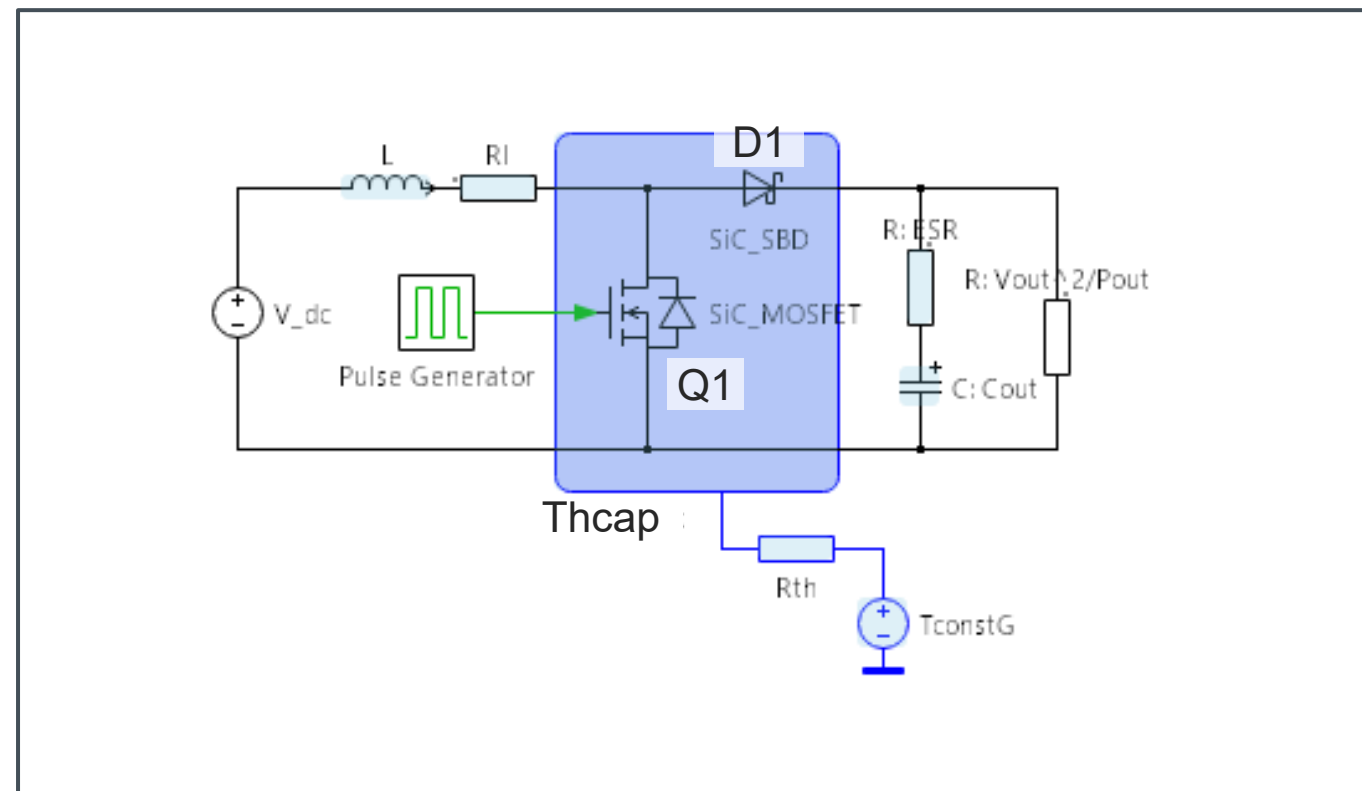
Simulation Parameters (Dialog)

Name	Content	unit	Default Value	Variable Range
L	Inductive Load	H	1.2m	1n ~ 1
RI	Parasitic Resistance	Ω	100m	1u ~ 100m
Cout	Output Capacitor	F	100u	1n ~ 1
Vc_init	Initial Voltage of Cout	V	500	0 ~ 1200
ESR	Equivalent Series Resistance	Ω	10m	1u ~ 100m
Rth	Thermal Resistance	K/W	0.5	1m ~ 100
Thcap	Thermal Capacitance	J/K	10m	1m ~ 100
TGND	Thermal GND Temperature	$^{\circ}\text{C}$	25	-40 ~ 175

Simulation Parameters (Table)

Name	Content	unit	Default Value	Variable Range
Test_time	Test time in simulation	s	0.3	100u ~ 0.5
fs	Switching Frequency	Hz	50k	10k ~ 100k
Vin	Input Voltage	V	400	1 ~ 1000
Vout	Output Voltage	V	800	10 ~ 1200
Pout	Output Power	W	3.3k	1 ~ 10k
Rg_on	Gate Resistance (Source)	Ω	10	0.1 ~ 100
Rg_off	Gate Resistance (Sink)	Ω	3.3	0.1 ~ 100
T_init	Initial Junction Temperature	$^{\circ}\text{C}$	25	-40 ~ 175

Simulation Circuit

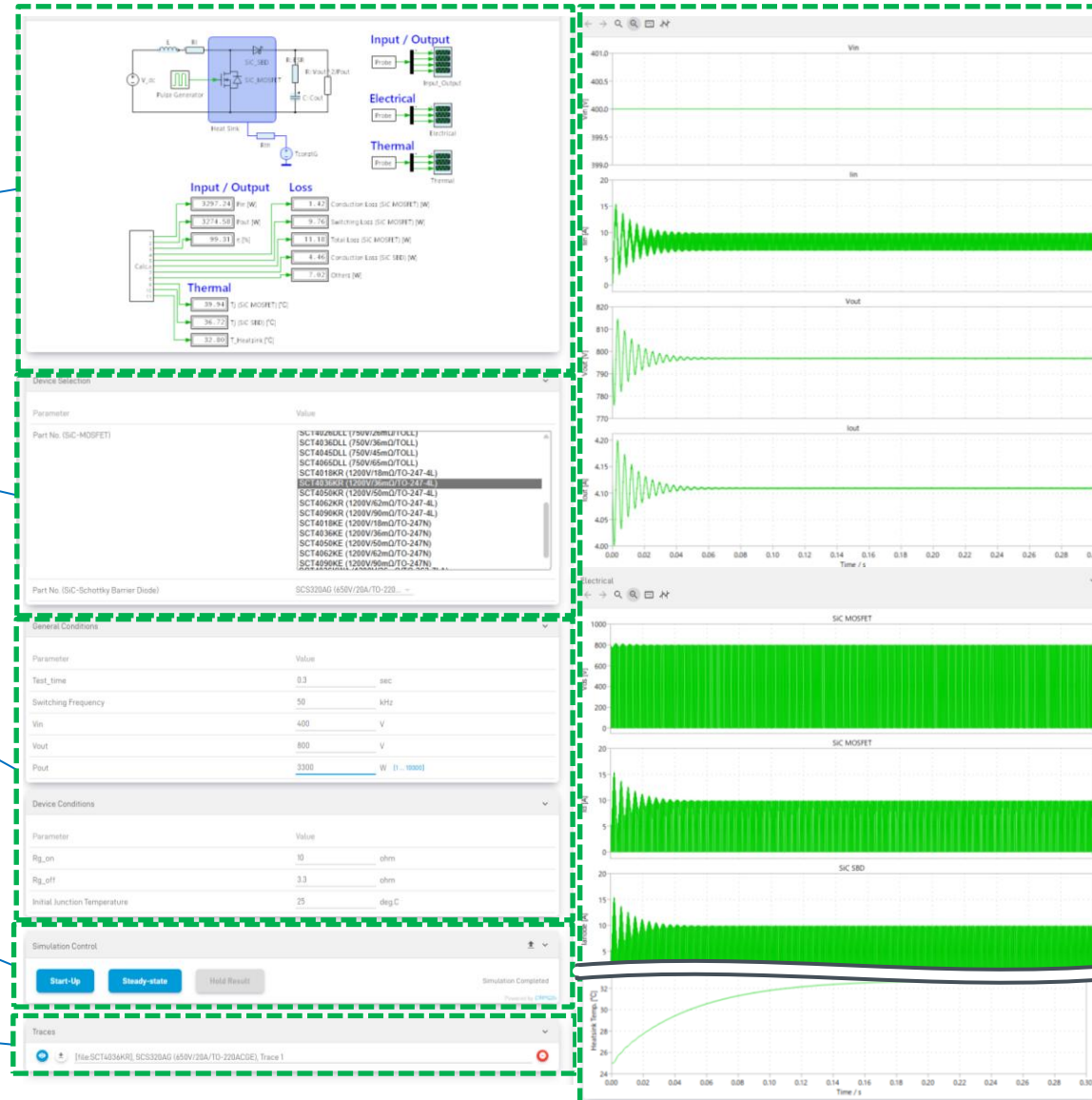


Name	Device Type	Part No.	Specification
Q1	SiC MOSFET	SCT4036KR	1200V/ 43A/ 36m Ω / TO-247-4L
D1	SiC Schottky Barrier Diode	SCS320AG	650V/ 20A/ TO-220ACGE

Simulation Screen Overview

Schematic window

- Dialog parameters setting
- Results display



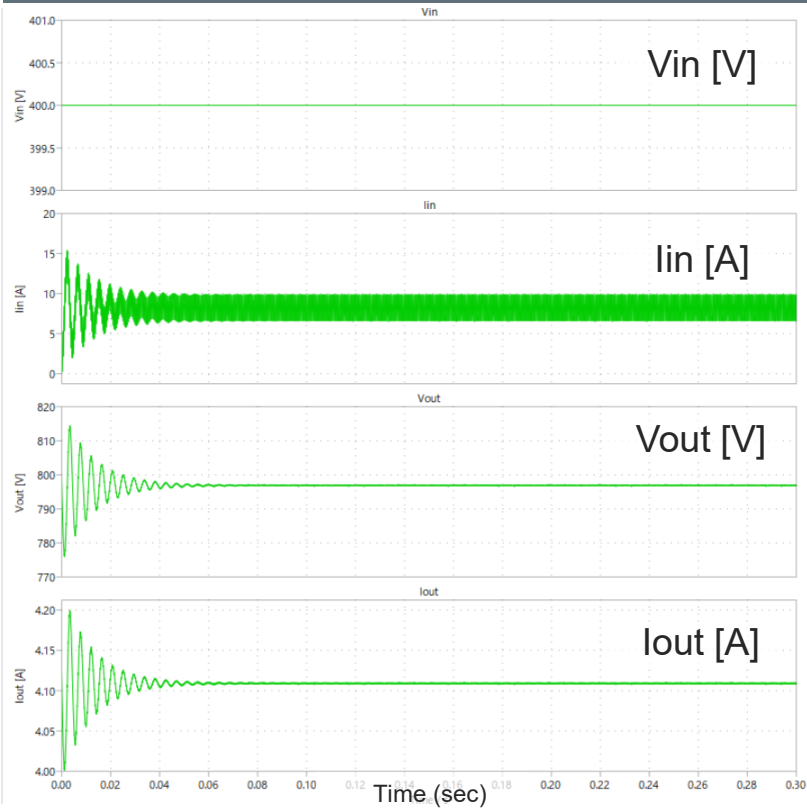
Waveforms

General Conditions

Simulation control

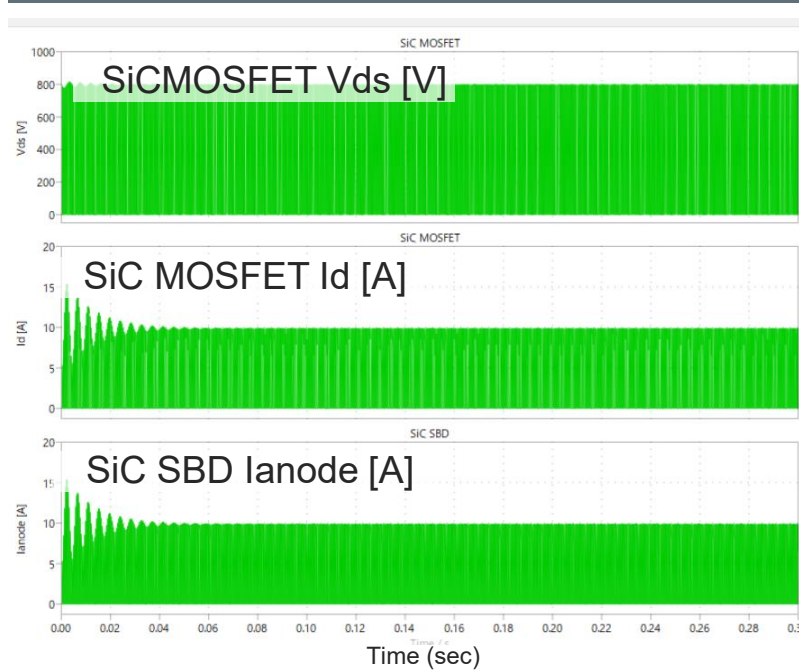
Trace selection

Input and Output



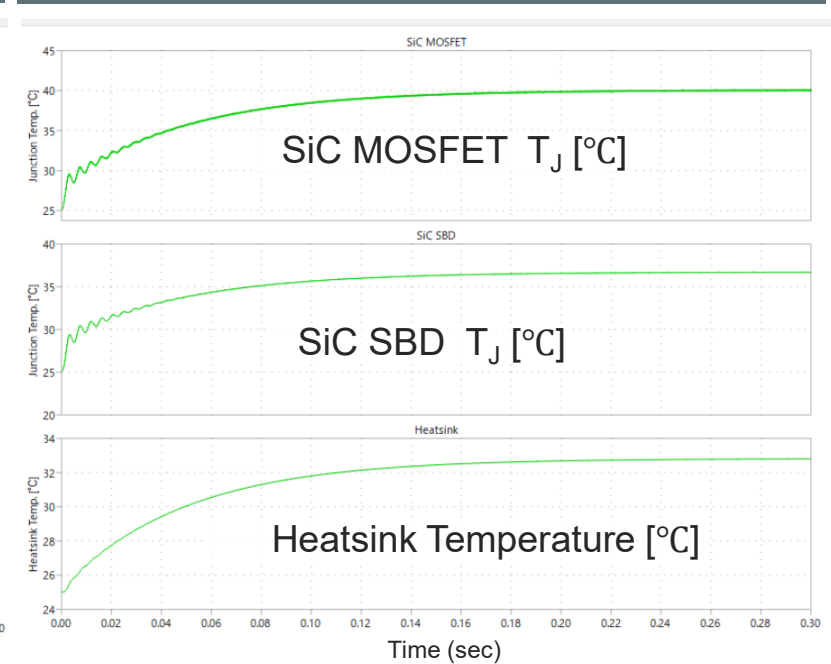
Contents	Results
Input Power : Pin	3.297 kW
Output Power: Pout	3.275 kW
Efficiency: η	99.31 %

Electrical



Contents	Results
Conduction Loss (SiC MOSFET)	1.42 W
Switching Loss (SiC MOSFET)	9.76 W
Total Loss (SiC MOSFET)	11.18 W
Conduction Loss (SiC SBD)	4.46 W
Loss (Others)	7.02 W

Thermal

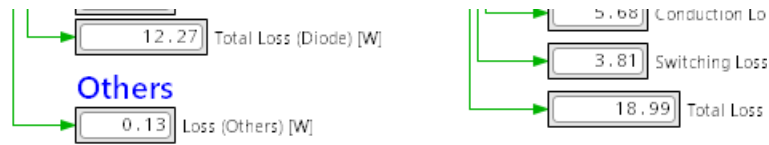


Contents	Results
T _j (SiC MOSFET)	39.94 °C
T _j (SiC SBD)	36.72 °C
T_Heatsink	32.80 °C

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.

Device Selection



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



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

- [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.

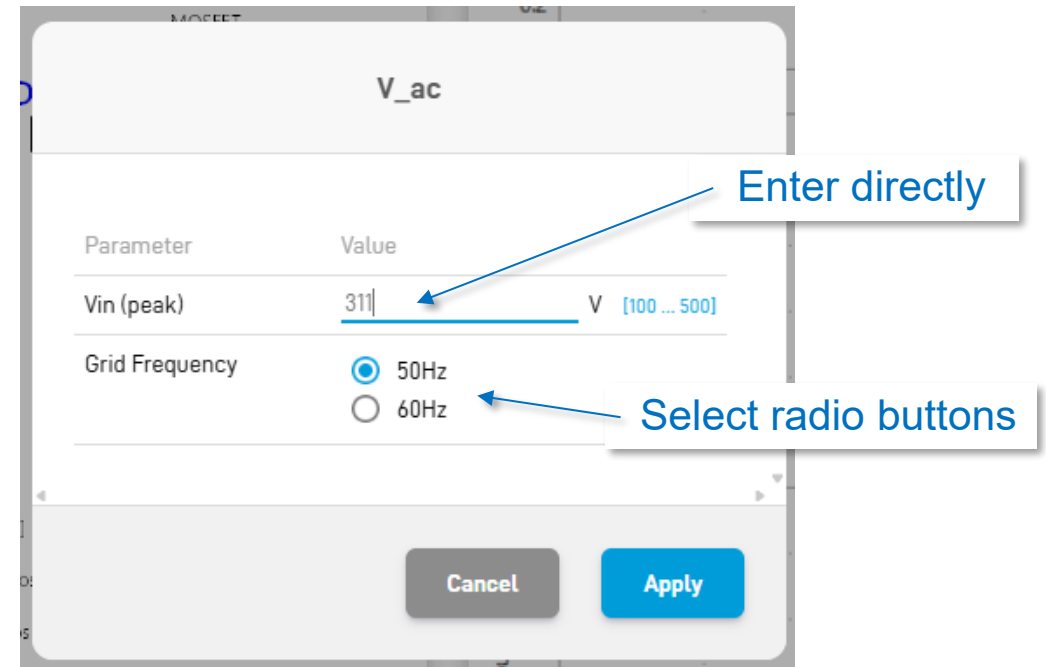
How to change Dialog parameters

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

- 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.

ROHM PLECS Simulator
Circuit Information



2026 March
68UG111E Rev.001

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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