A-011-DOT. Totem-Pole Bridgeless PFC Vin=200V, Iin=100A, Diode Rectification on low frequency leg

ROHM Solution Simulator Schematic Information

2026. Mar.
64UG091E Rev.001

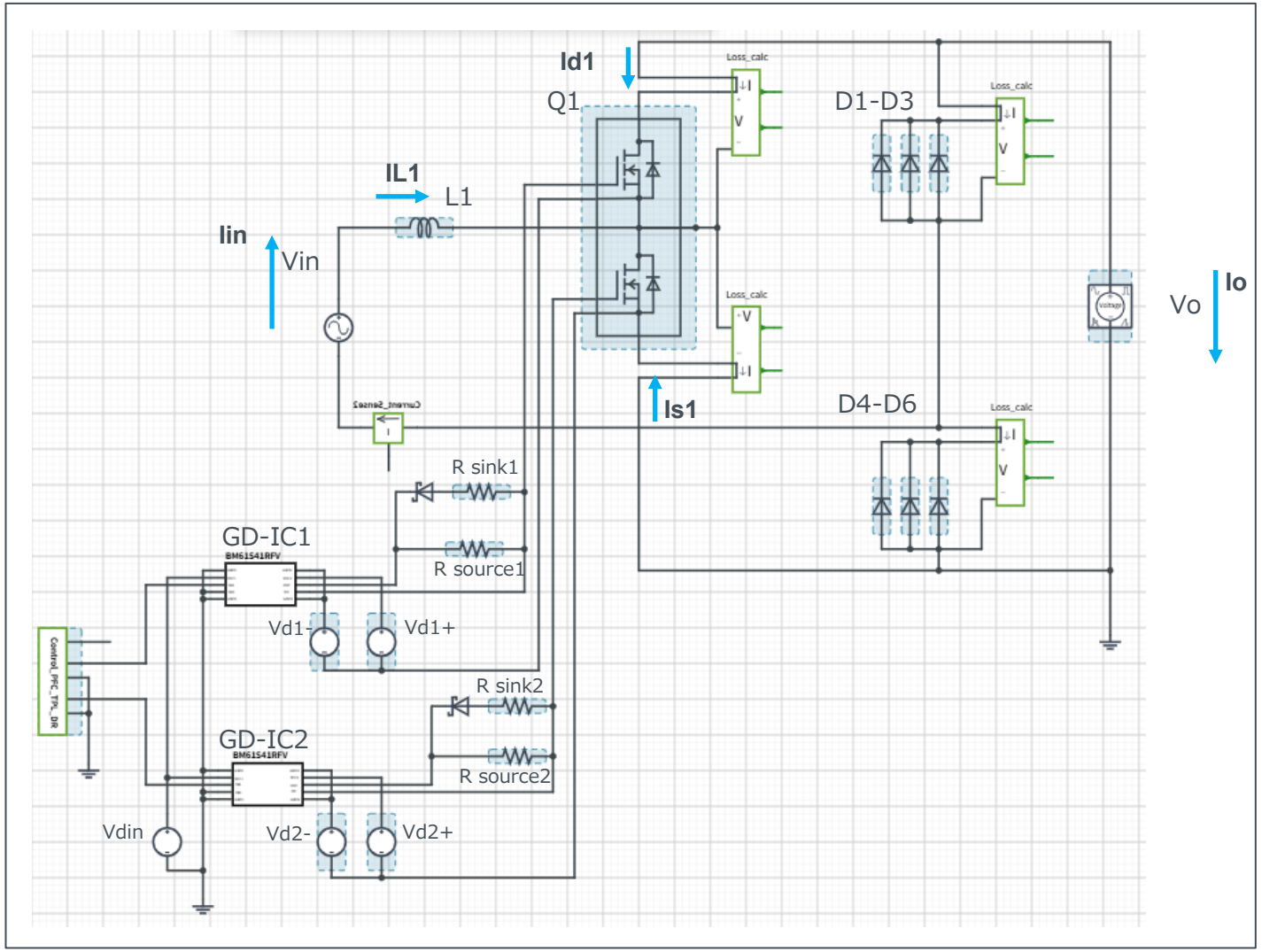
Simulation Parameters

Component name	Component	Default	Simulation Setting Range
Vin	Input voltage	200Vac 50Hz	
Iin	Input current	100Aac	
Vo	Output voltage	400Vdc	300 – 500Vdc
fsw	Switching frequency	50kHz	10k – 300kHz
Tj	Temperature	100°C	
Vd1,2+	Gate Drive voltage H	18V	
Vd1,2-	Gate Drive voltage L	0V	
Vdin	Signal voltage level	5V	

Devices

Component name	Component	Default	Simulation Setting Range
Q1	SiC Power Module	Selectable	
D1 – D6	SiC SBD	Selectable	
GD-IC1,2	Gate Driver	BM61S41RFV-C	
R sink1,2	Resistor for sink	ESR18 5Ω	0.1 -
R source1,2	Resistor for source	ESR18 5Ω	0.1 -
L1	Inductor	100µH	10µH - 2mH

Simulation Circuit



Note: The Loss_calc component is a utility module to support power loss calculation and does not affect the simulation results of circuit operation or performance.

A-011-DOT. Totem-Pole Bridgeless PFC Vin=200V, Iin=100A, Diode Rectification on low frequency leg

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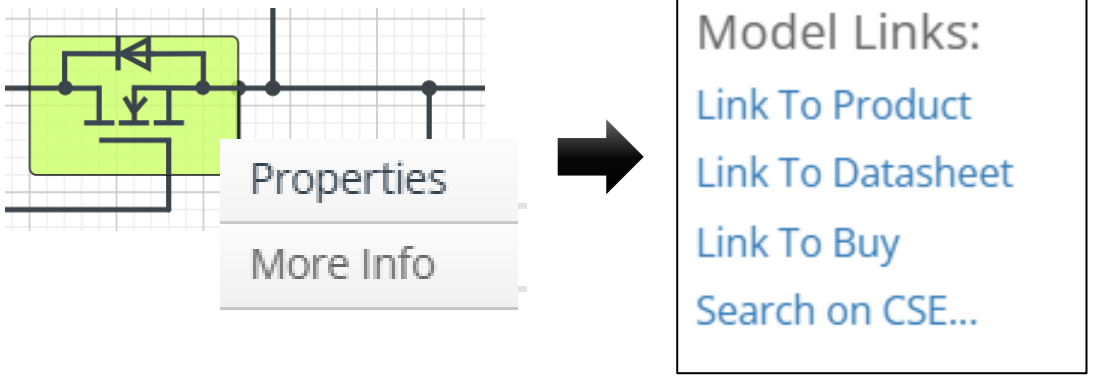
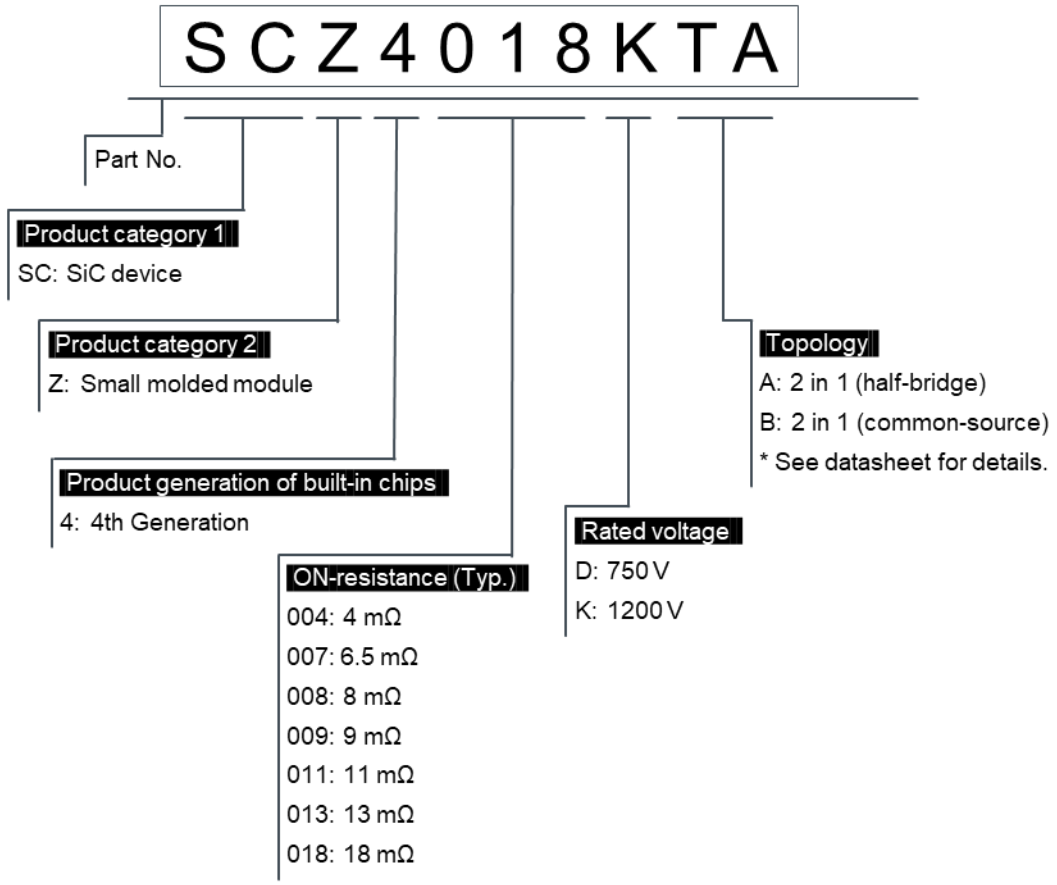
Selectable Devices

Component name	Component
Q1	SiC Power Module (DOT-247)

For more information, go to **“More Info”** and click on **“Link to Datasheet”**.



SiC Power Module part number information



➧ Product Lineup: SiC Power Module

Note) We have not been able to confirm operation with all combinations. Please read the disclaimer carefully.

A-011-DOT. Totem-Pole Bridgeless PFC Vin=200V, Iin=100A, Diode Rectification on low frequency leg

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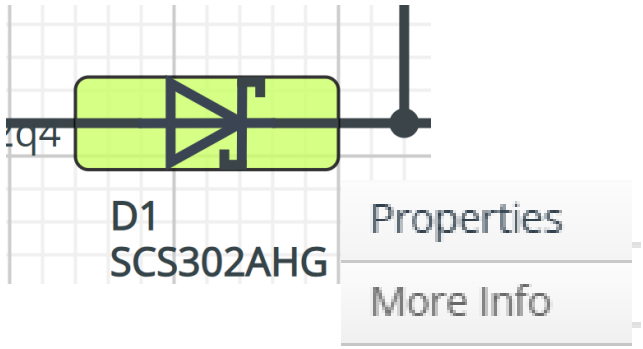
Selectable Devices

Component name	Component
D1 – D6	SiC Schottky Barrier Diode

For more information, go to **“More Info”** and click on **“Link to Datasheet”**.



Model Links:
Link To Product
Link To Datasheet
Link To Buy
Search on CSE...

SiC Schottky Barrier Diode part number information

S C S 2 2 0 A E 2

- Part No.
- **Product category 1**
  - SC: SiC discrete device
- **Product category 2**
  - S: SiC schottky barrier Diode
- **Product generations**
  - 2: 2nd Generation
  - 3: 3rd Generation
- **Rated current**
  - 04: 4 A
  - 05: 5 A
  - 06: 6 A
  - 08: 8 A
  - 10: 10 A
  - 12: 12 A
  - 15: 15 A
  - 20: 20 A
  - 30: 30 A
  - 40: 40 A
- **Reverse voltage (repetitive peak)**
  - A: 650 V
  - K: 1200 V
- **Package**
  - E: TO-247 (TO-247N)
  - E2: TO-247 (TO-247N) 2-chip configuration
  - G : TO-220AC (TO-220ACGE / TO-220ACG)
  - H: TO-220AC (TO-220ACP)
  - J: TO-263AB (LPTL)
  - M: TO-220FM (TO-220FM-2LGE)
  - N: TO-263 (TO-263-2L)
  - * JEDEC code. Parentheses indicate ROHM packages.

➧ Product Lineup: SiC Schottky Barrier Diodes

Note) We have not been able to confirm operation with all combinations. Please read the disclaimer carefully.

A-011-DOT. Totem-Pole Bridgeless PFC Vin=200V, Iin=100A, Diode Rectification on low frequency leg

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Selectable Devices

Component name	Component	Product No.	feature
GD-IC1-4	Gate Driver	BM61S41RFV-C	**for SiC MOSFET** Isolation Voltage : 3750 Vrms I/O Delay Time (max) : 65ns Miller Clamp : Built-in UVLO : 14.5V

Note) We have not been able to confirm operation with all combinations. Please read the disclaimer carefully.

Simulation Waveform1

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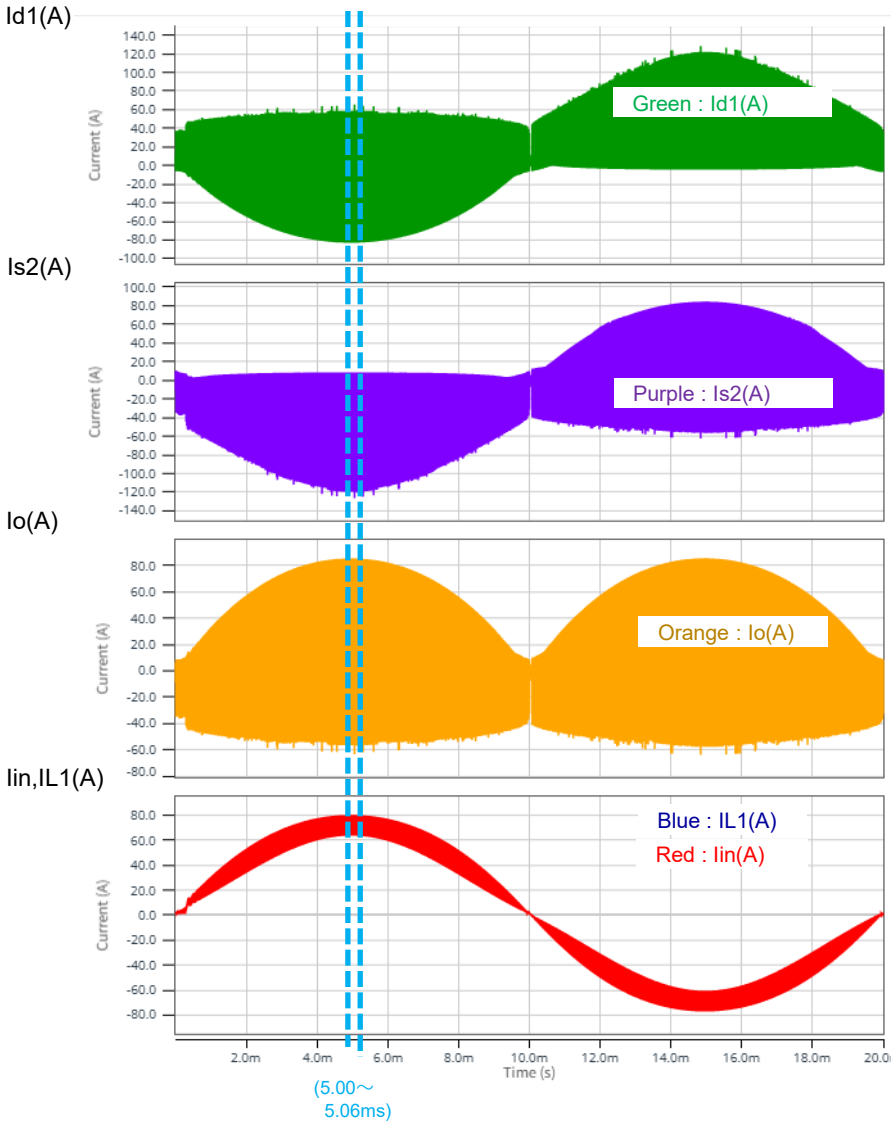
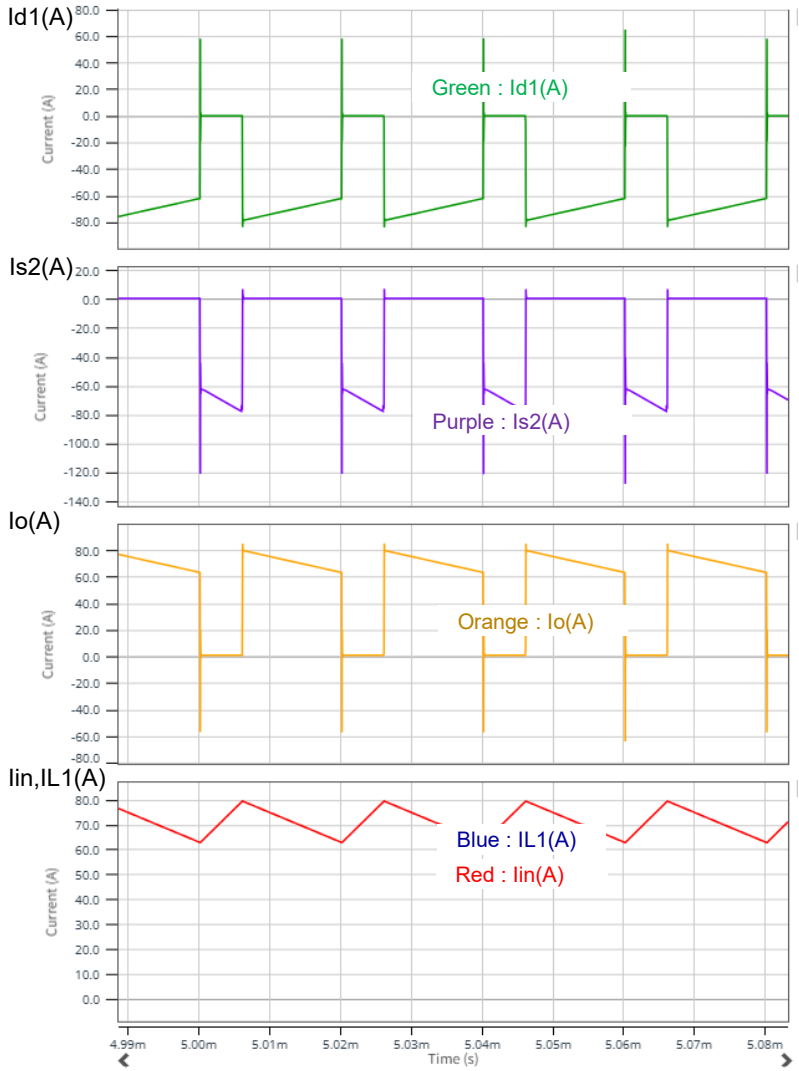
Vin=200Vac Iin=100Aac
Vo=500Vdc Tj=100℃

Q1 : SiC Power Module
SCZ4004DTA

Id1, Is2, Io, Iin, IL1



Expansion (5.00～5.06ms)



How to change the devices

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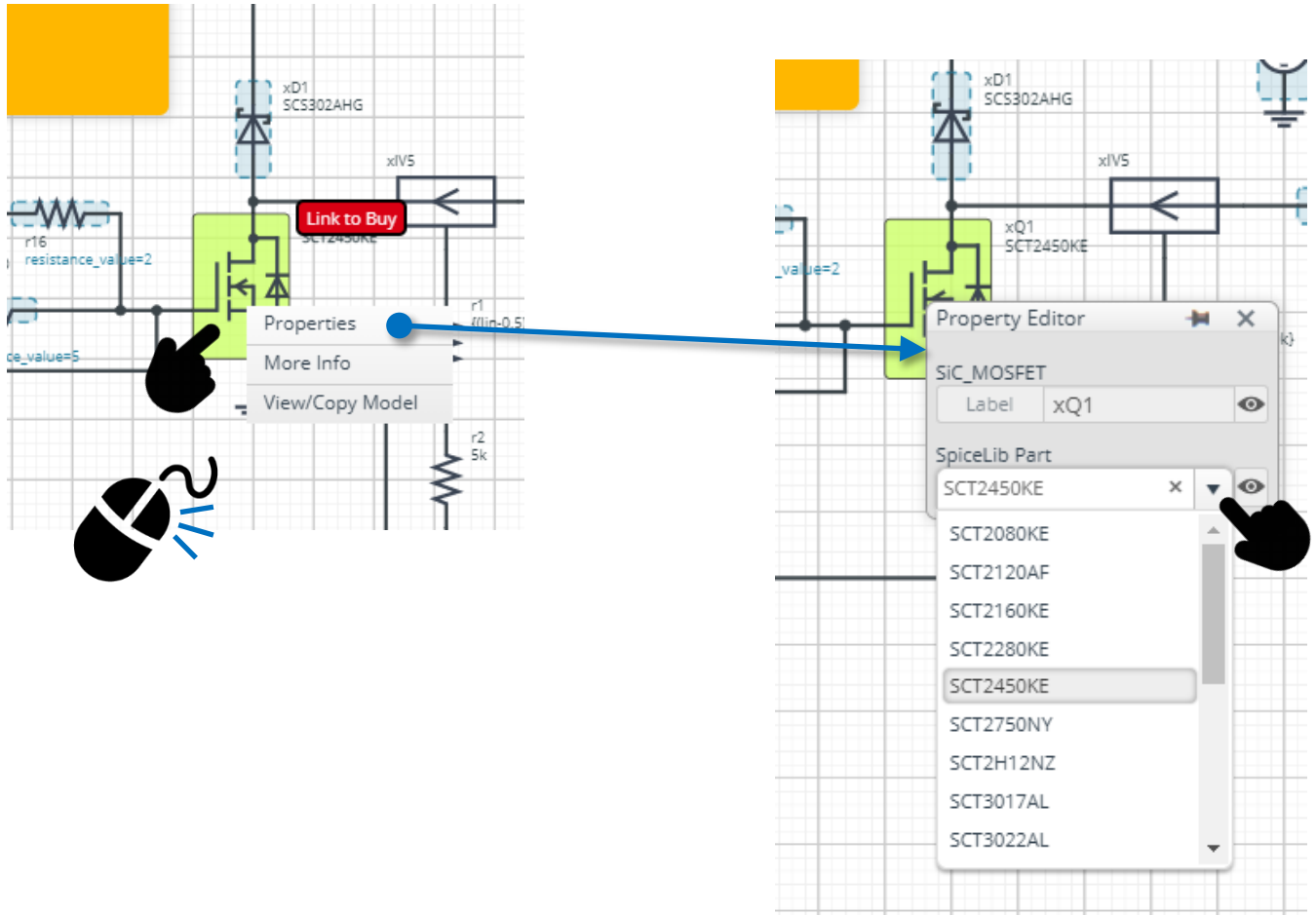
Right-click on the device ⇨ Select Properties ⇨ Pull down “SpiceLib Part” ⇨ Select the product



Loss Calculation Model

Loss Calculation Model outputs the instantaneous value of power loss and its integration.

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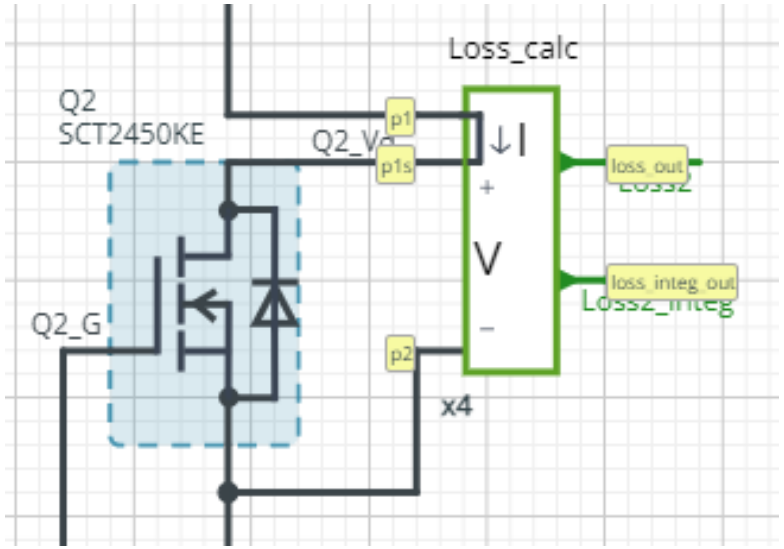
Loss calculation model 'Loss_calc'



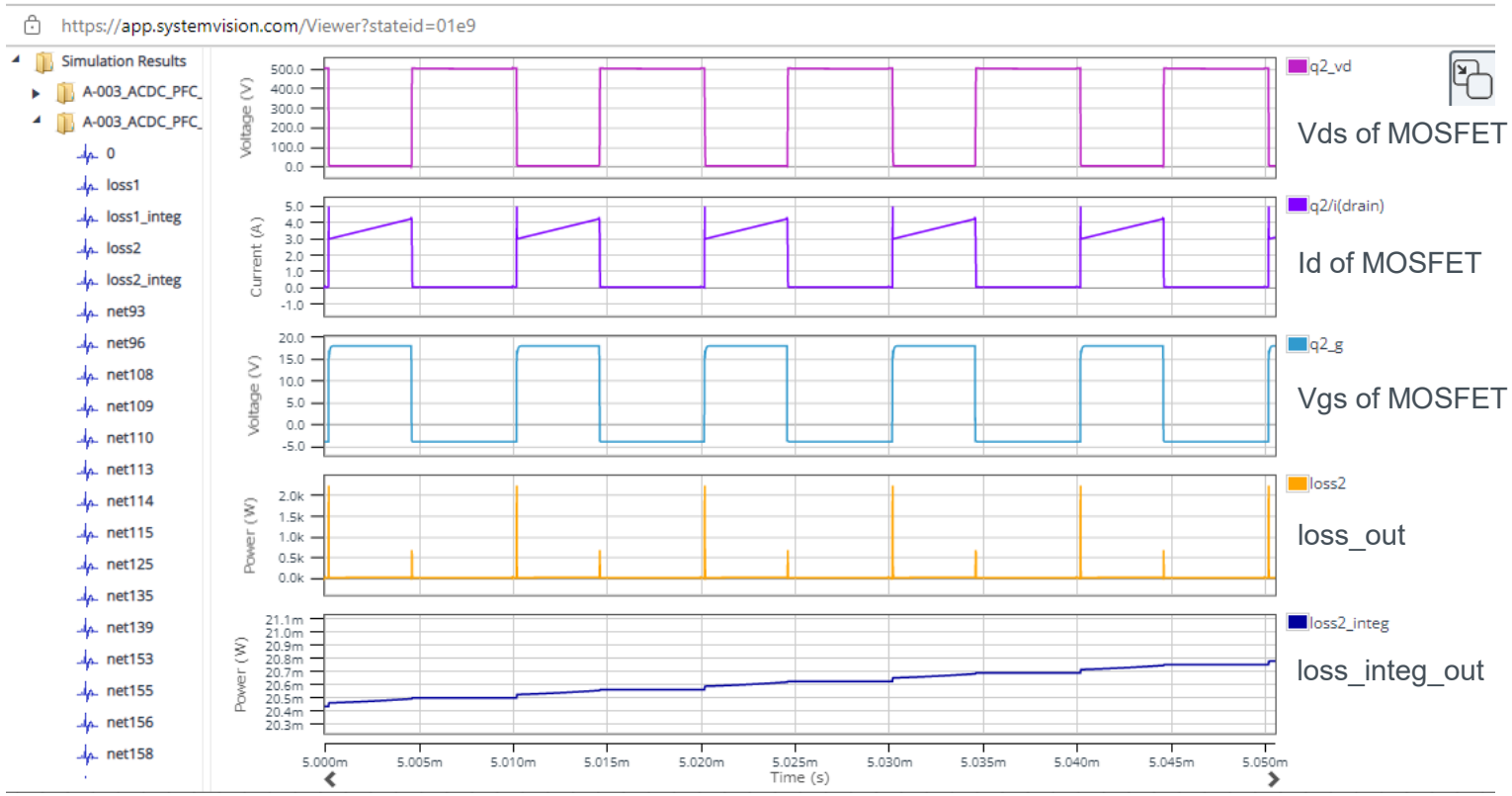
$$loss\_out(t) = I(t) \times V(t)$$

$$loss\_integ\_out = \int_0^t loss\_out(t)dt$$

I : Current through p1 to p1s

V : Voltage between p1s and p2

Waveform example



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