B-006-DOT. 3-Phase 3-Wire Inverter P_{OUT}=5kW (Equipped with DOT-247 Package)

ROHM Solution Simulator Schematic Information

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68UG088E Rev.001

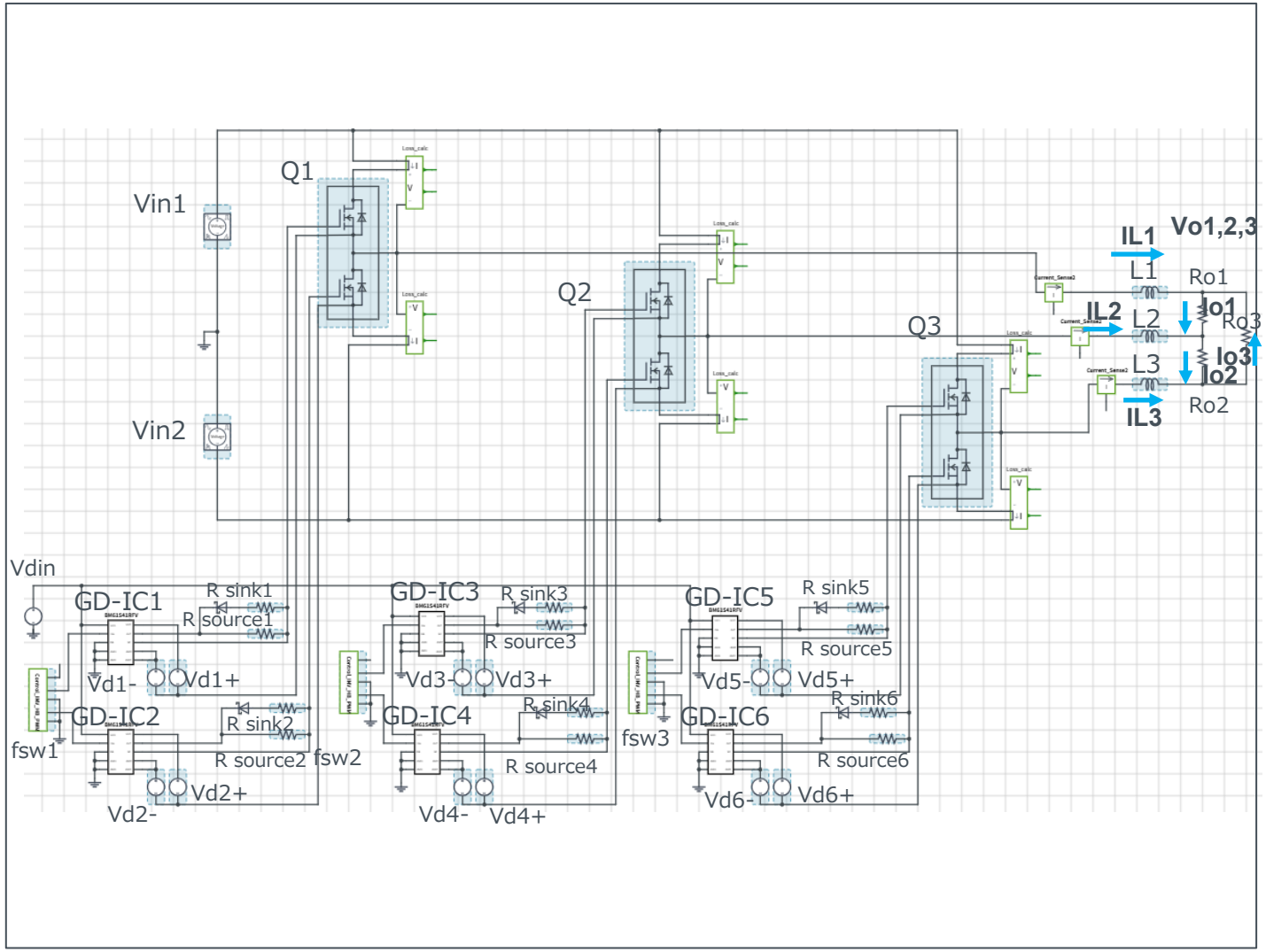
Simulation Parameters

Component name	Component	Default	Simulation Setting Range
Vin1,2	Input voltage	200Vdc	
Vo1-3	Output voltage	200Vac	
fsw1-3	Switching frequency	20kHz	10k – 300kHz
Tj	Temperature	100°C	
Vd1-6+	Gate Drive voltage H	18V	
Vd1-6-	Gate Drive voltage L	0V	
Vdin	Signal voltage level	5V	

Devices

Component Name	Component	Default	Simulation Setting Range
Q1-3	SiC Power Module	Selectable	
GD-IC1-6	Gate Driver	BM61S41RFV-C	
R sink1-6	Resistor for sink	ESR18 2Ω	
R source1-6	Resistor for source	ESR18 5Ω	
L1-3	Inductor	500μH	10μH - 2mH
Ro1-3	Output Resistor	{3*Vo*Vo/Po}	

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.

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B-006-DOT. 3-Phase 3-Wire Inverter P_{OUT}=5kW (Equipped with DOT-247 Package)

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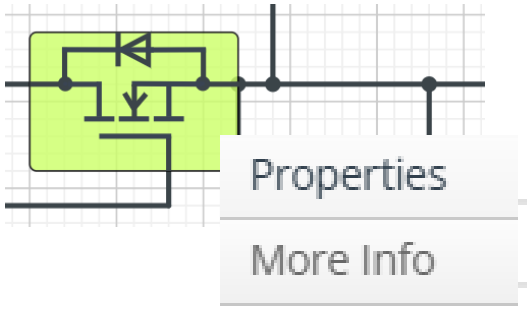
Selectable Devices

Component name	Component
Q1 - 3	SiC Power Module (DOT-247)

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 Power Module part number information

S C Z 4 0 1 8 K T A

- Part No.
- **Product category 1**
  SC: SiC device
- **Product category 2**
  Z: Small molded module
- **Product generation of built-in chips**
  4: 4th Generation
- **ON-resistance (Typ.)**
  004: 4 mΩ
  007: 6.5 mΩ
  008: 8 mΩ
  009: 9 mΩ
  011: 11 mΩ
  013: 13 mΩ
  018: 18 mΩ
- **Rated voltage**
  D: 750 V
  K: 1200 V
- **Topology**
  A: 2 in 1 (half-bridge)
  B: 2 in 1 (common-source)
  * See datasheet for details.

Product Lineup: SiC Power Module

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

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Selectable Devices

Component name	Component	Product No.	feature
GD-IC1-6	Gate Driver	BM61S41RFV-C	**for SiC MOSFET** Isolation Voltage : 3750 Vrms I/O Delay Time (max) : 65ns Miller Clamp : Built-in UVLO : 14.5V

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Simulation Waveform1

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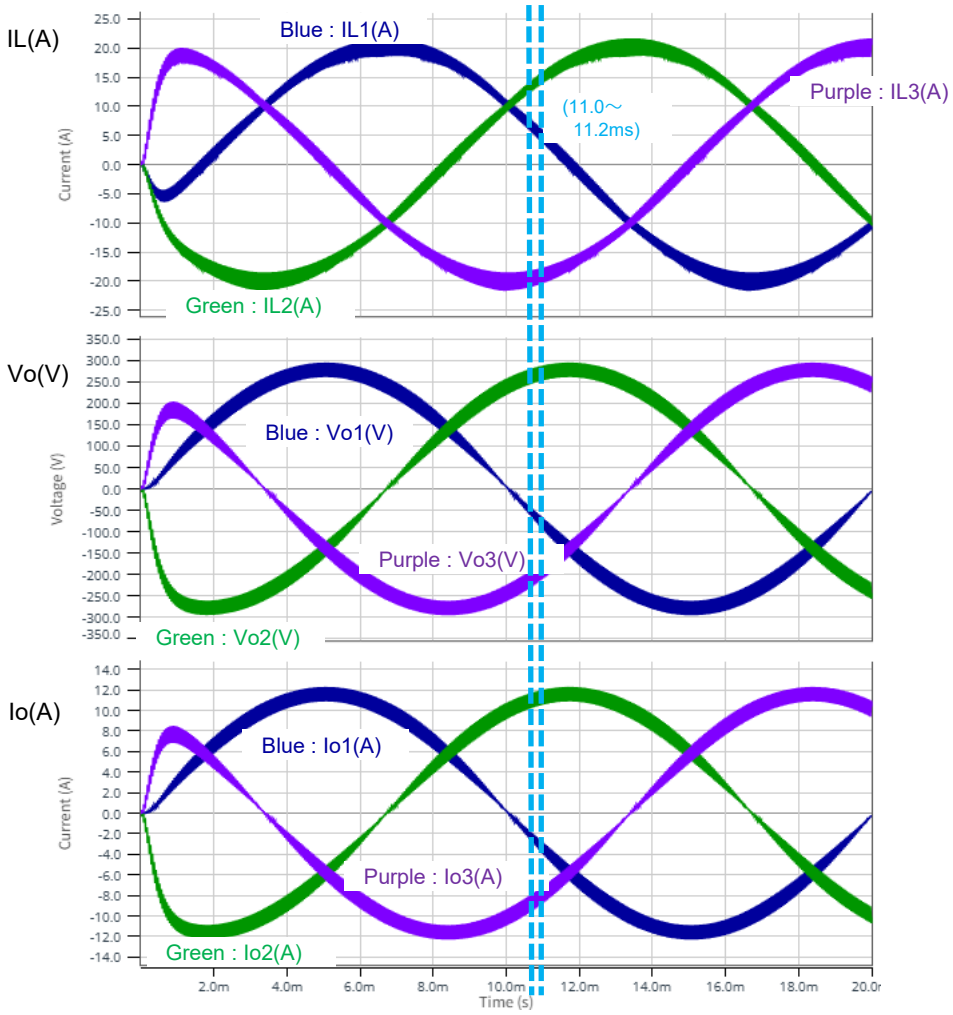
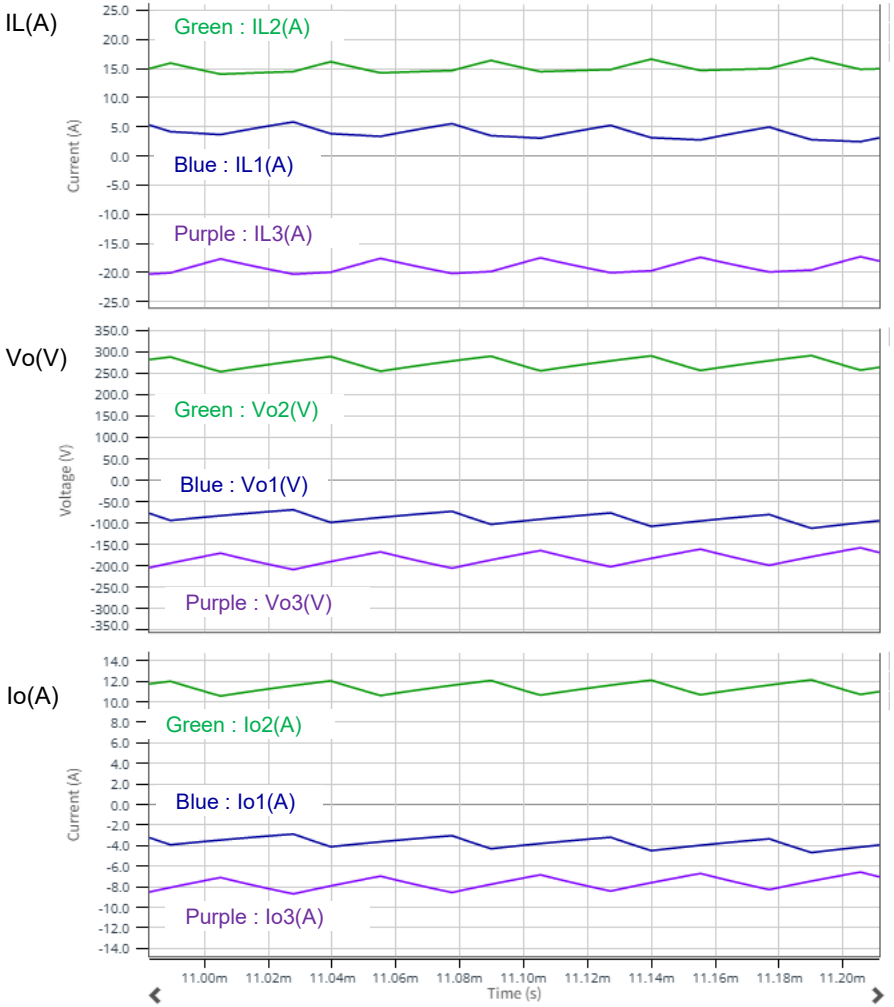
Q1-3 : SiC Power Module
SCZ4004DTA

Vin=200Vdc+200Vdc
Po=5kW Vo=200Aac Tj=100℃

IL, Vo, Io (0～20.0ms)



Expansion (11.0～11.2ms)



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How to change the devices

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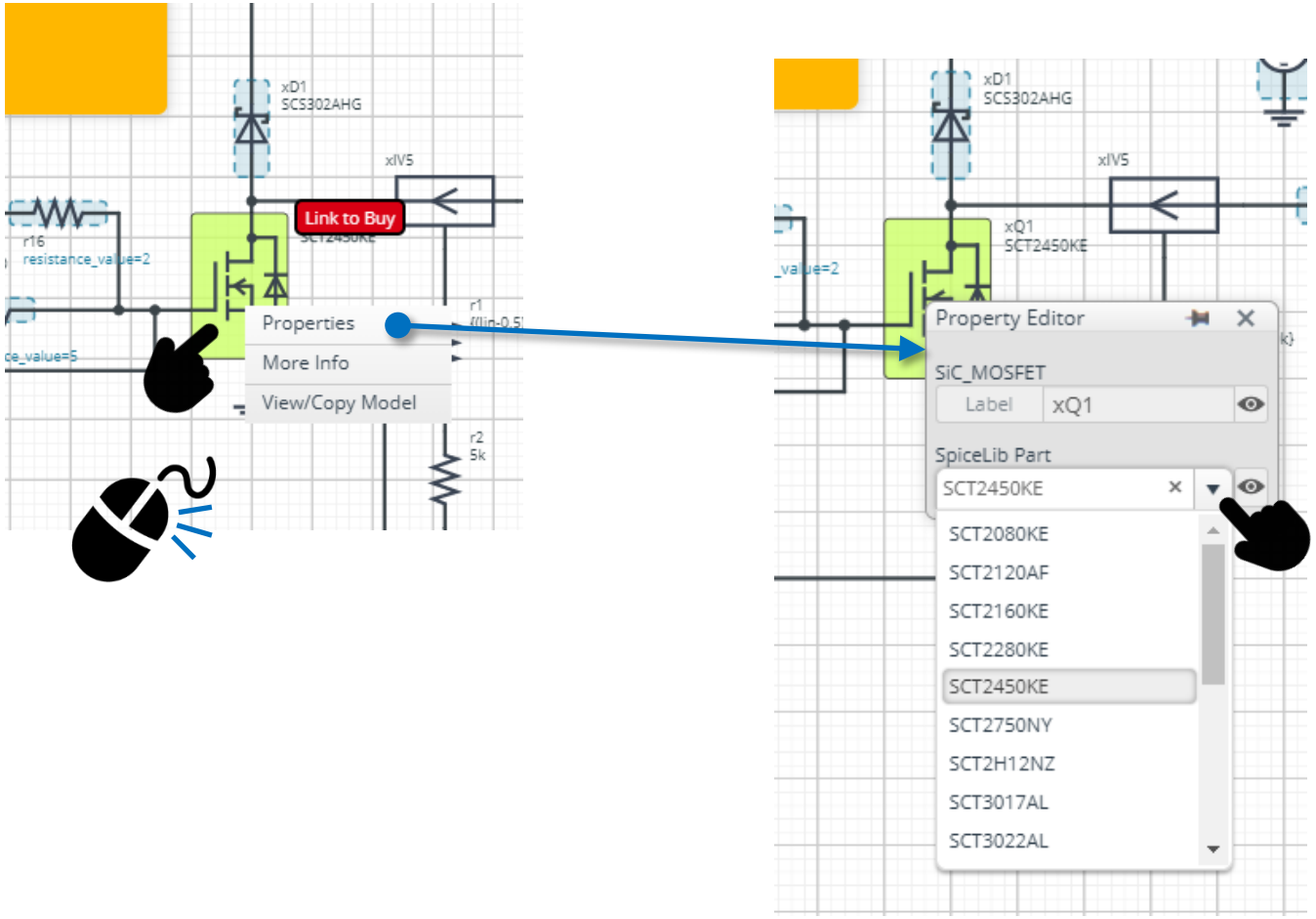
Right-click on the device ⇨ Select Properties ⇨ Pull down “SpiceLib Part” ⇨ Select the product



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Loss Calculation Model

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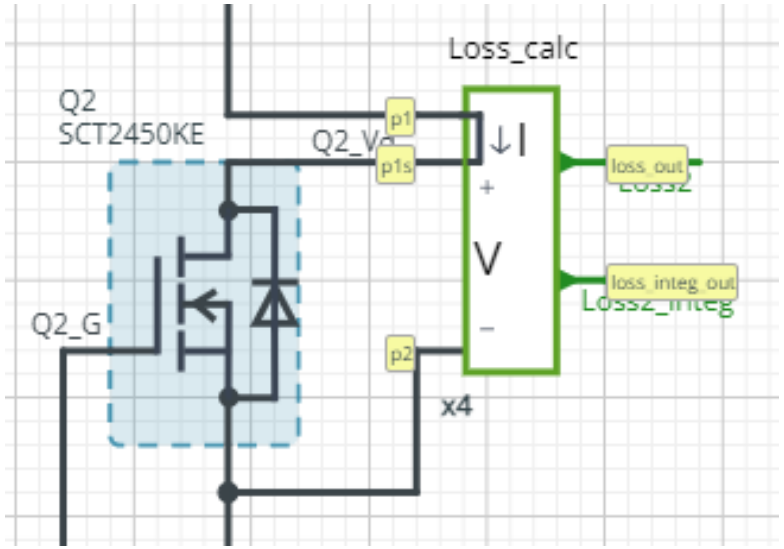
Loss Calculation Model outputs the instantaneous value of power loss and its integration.

Loss calculation model ‘Loss_calc’



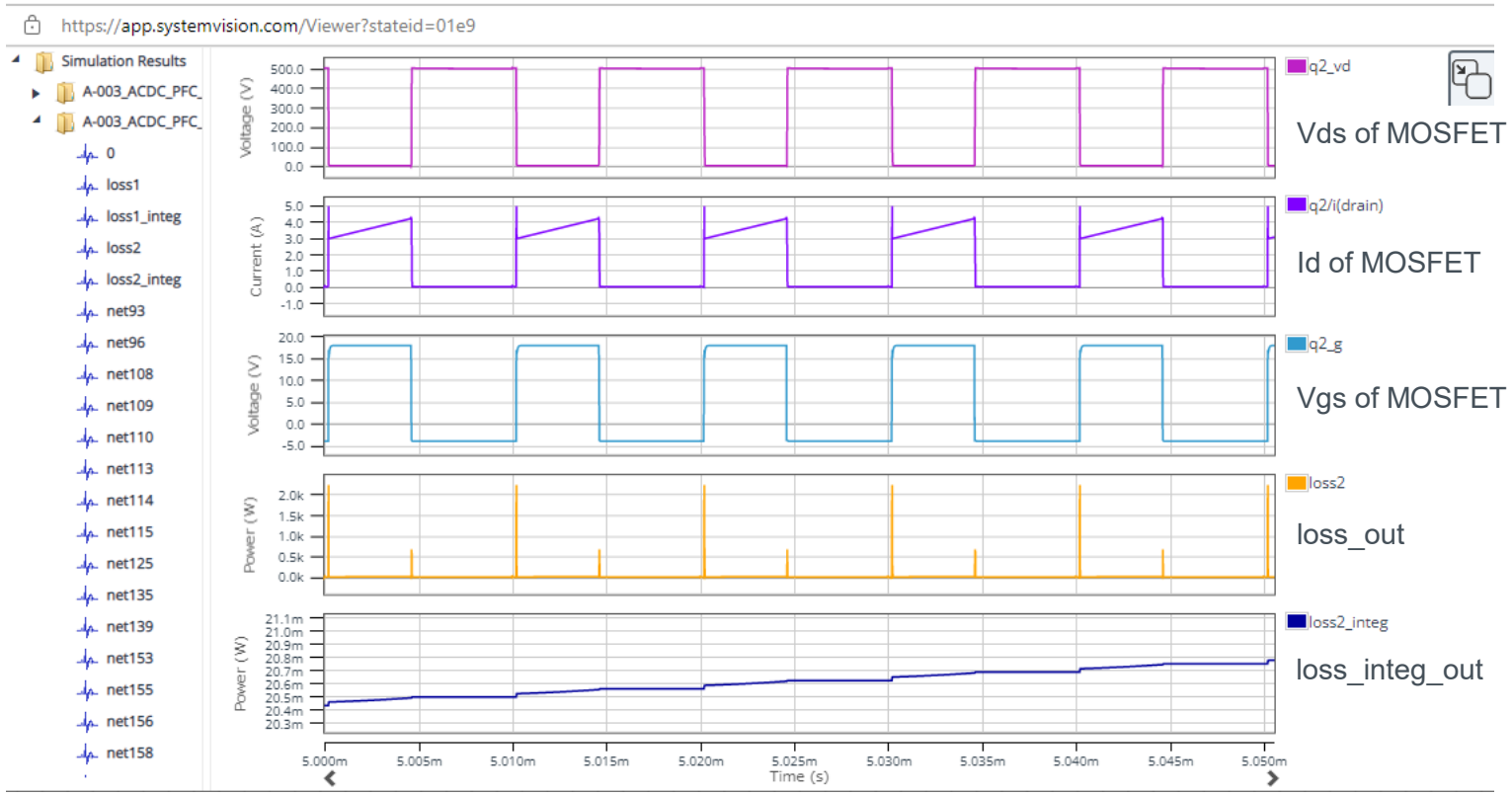
$$loss_out(t) = I(t) \times V(t)$$

$$loss_integ_out = \int_0^t loss_out(t)dt$$

I : Current through p1 to p1s

V : Voltage between p1s and p2

Waveform example



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