A-016. Bridgeless PFC Vin=200V, Iin=50A, DCM (Synchronous FETs)

ROHM Solution Simulator Schematic Information

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64UG110E Rev.003

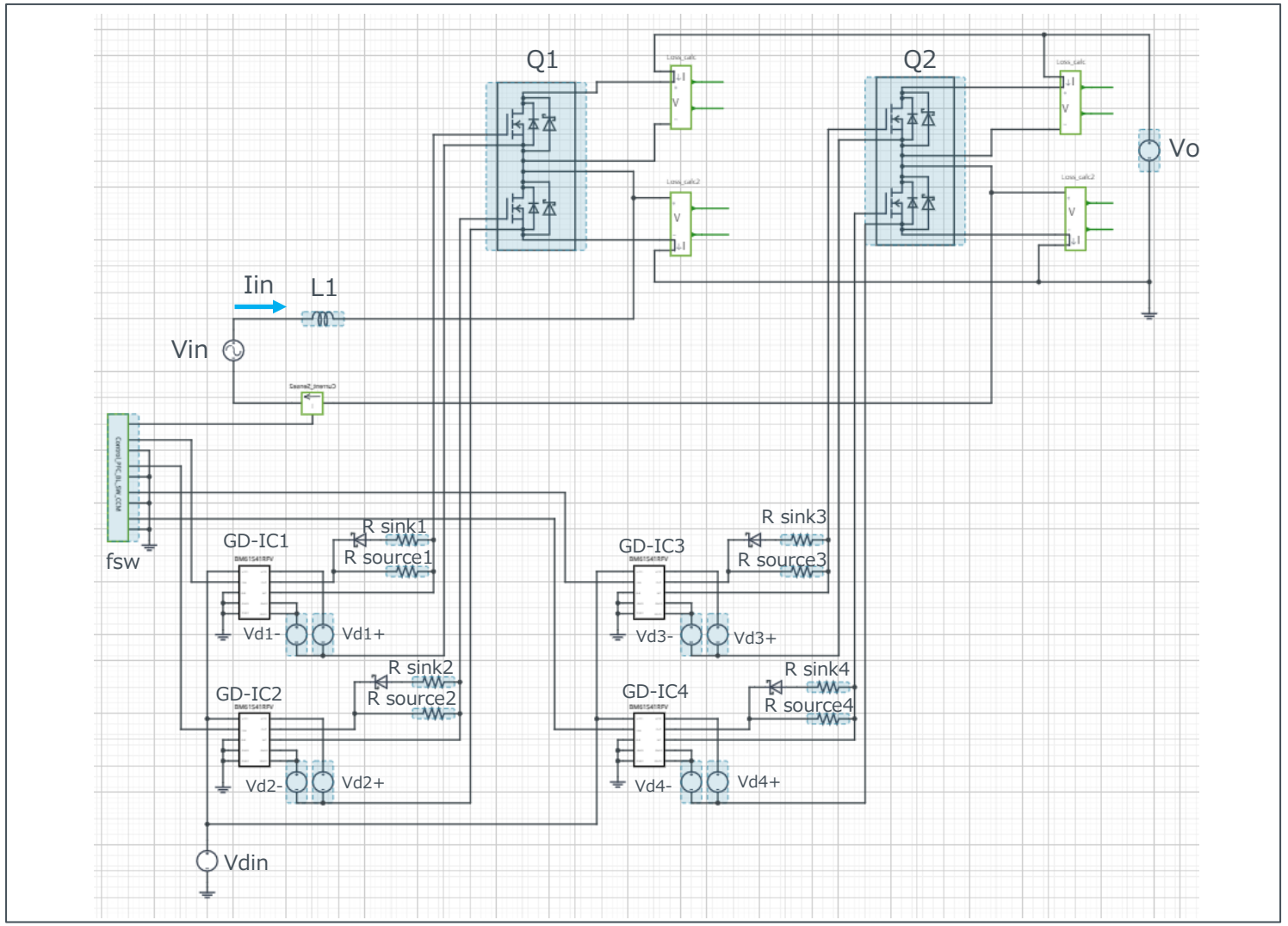
Simulation Parameters

Parameters	Descriptions	Default	Simulation Setting Range
Vin	Input voltage	200Vac 50Hz	
Iin	Input current	50Aac	
Vo	Output voltage	500Vdc	300 – 500Vdc
fsw	Switching frequency	50kHz	10k – 300kHz
Tj	Temperature	100°C	
Vd1-4+	Gate Drive voltage H	18V	10 – 20V
Vd1-4-	Gate Drive voltage L	-4V	-4 – 0V
Vdin	Signal voltage level	5V	

Devices

Component Name	Component	Default	Simulation Setting Range
Q1 – Q2	SiC Power Module	Selectable	
GD-IC1-4	Gate Driver	BM61S41RFV-C	
R sink1-4	Resistor for sink	1Ω	0.1 -
R source1-4	Resistor for source	2Ω	0.1 -
L1	Inductor	25µH	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.

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Selectable Devices

Component name	Component	Product No.	feature
Q1 – Q2	SiC Power Module	BSM080D12PC008 (*)	800V, 120A
		BSM120D12PC005	1200V, 120A

* Default device

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

How to change the devices

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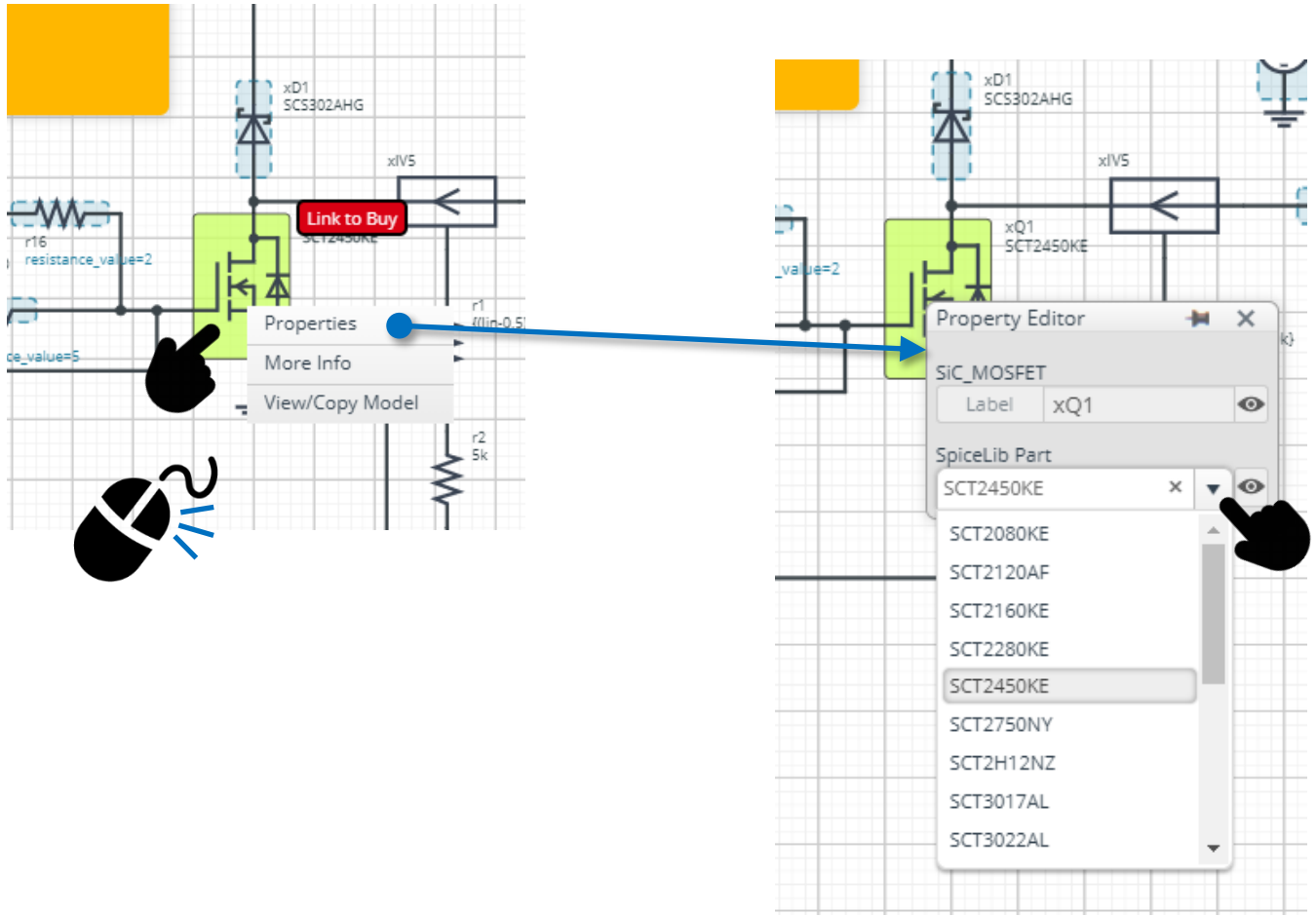
Right-click on the device ⇨ Select Properties ⇨ Pull down “SpiceLib Part” ⇨ Select the product



Loss Calculation Model

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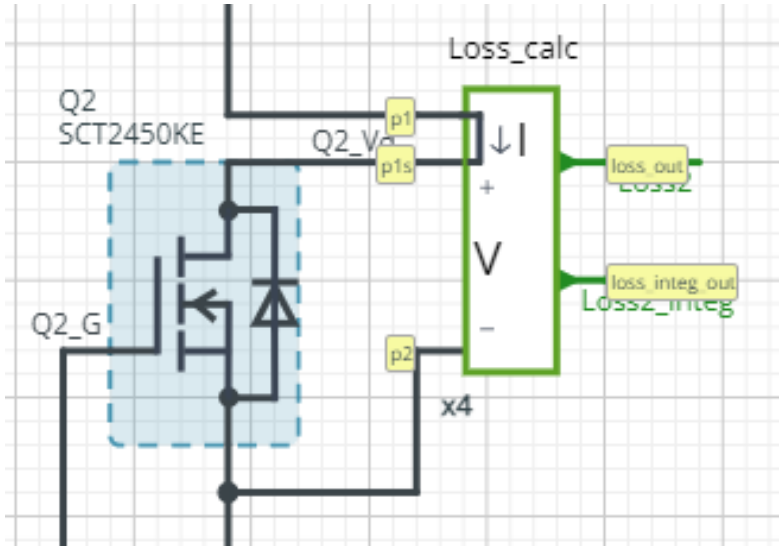
Loss Calculation Model outputs the instantaneous value of power loss and its integration.

Loss calculation model ‘Loss_calc’



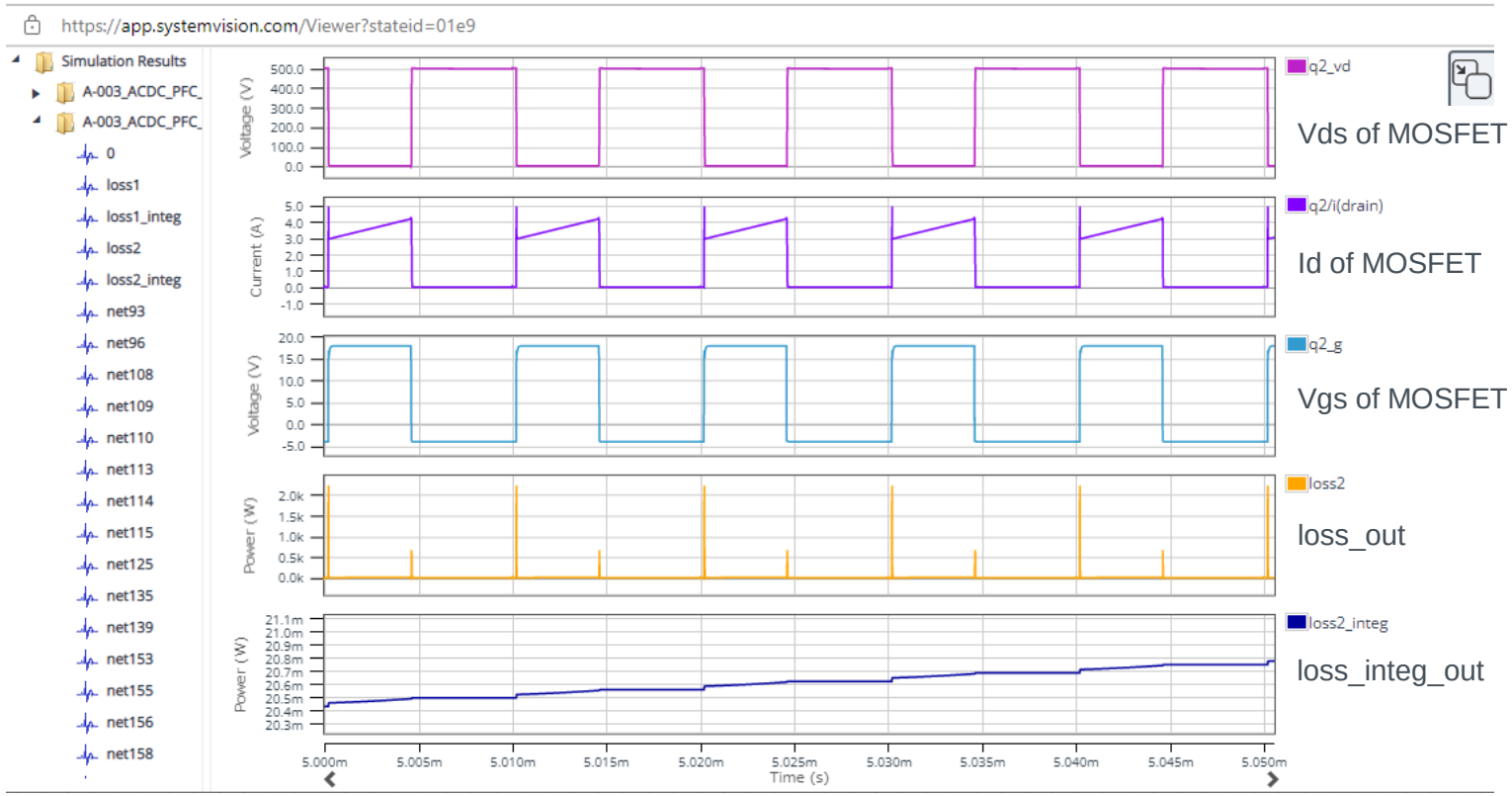
$$loss\_out(t) = I(t) \times V(t)$$

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

I : Current through p1 to p1s

V : Voltage between p1s and p2

Waveform example



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