

# A-014. Bridgeless PFC $V_{in}=200V$ , $I_{in}=50A$ , CCM (Synchronous FETs)

ROHM Solution Simulator Schematic Information



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64UG108E Rev.004

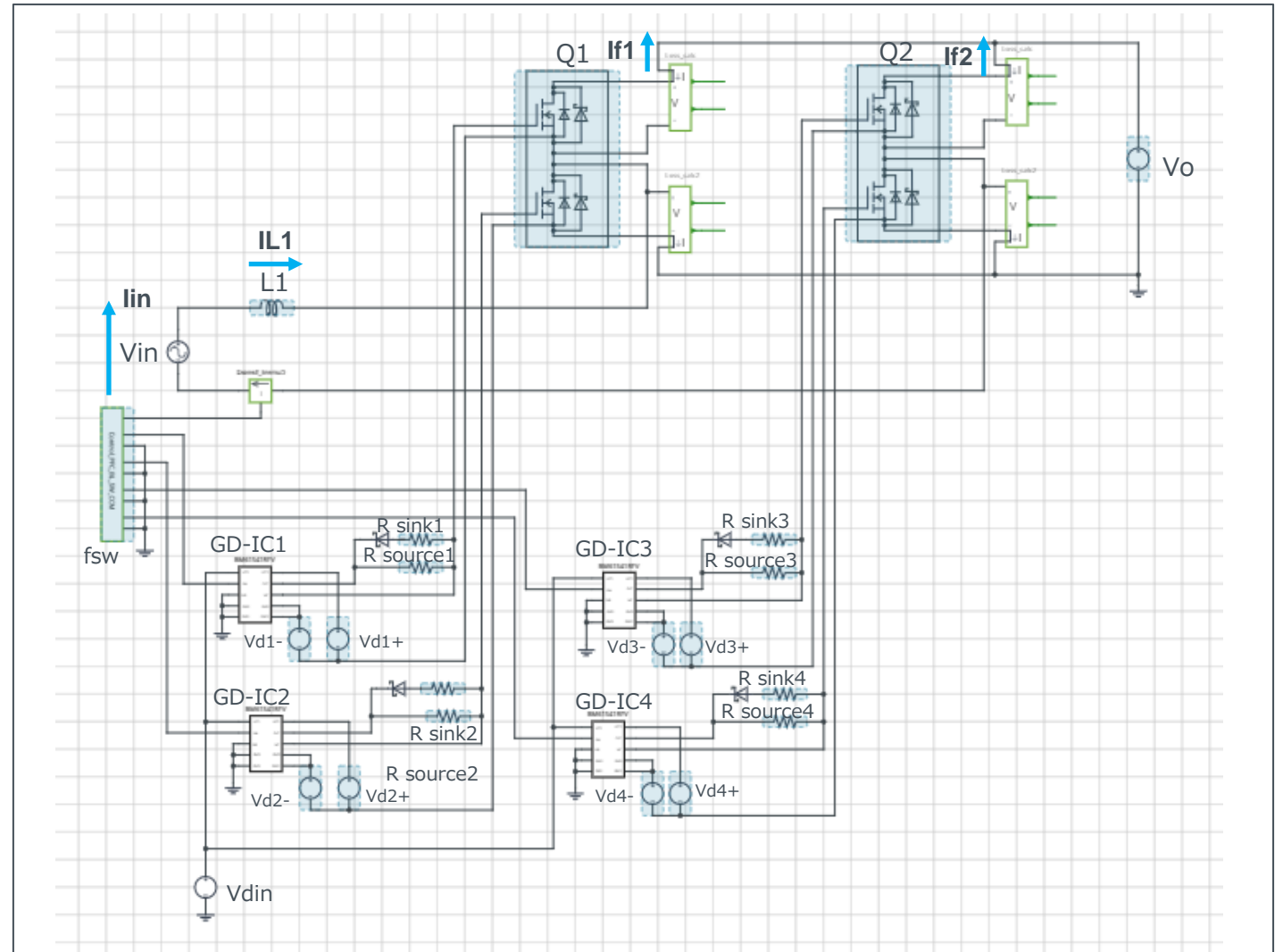
## Simulation Parameters

Parameters	Descriptions	Default	Simulation Setting Range
$V_{in}$	Input voltage	200Vac 50Hz	
$I_{in}$	Input current	50Aac	
$V_o$	Output voltage	500Vdc	300 – 500Vdc
$f_{sw}$	Switching frequency	50kHz	10k – 300kHz
$T_j$	Temperature	100°C	
$V_{d1-4+}$	Gate Drive voltage H	18V	10 – 20V
$V_{d1-4-}$	Gate Drive voltage L	-4V	-4 – 0V
$V_{din}$	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	ESR18 1Ω	0.1 -
R source1-4	Resistor for source	ESR18 2Ω	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.

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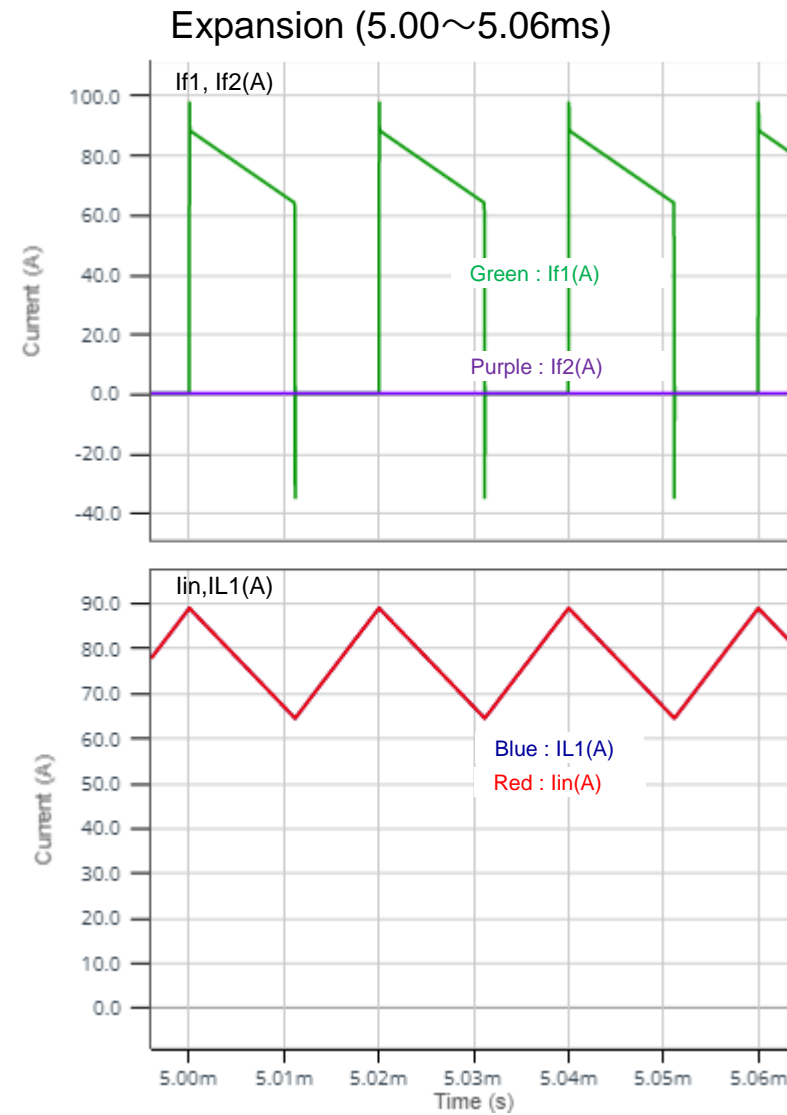
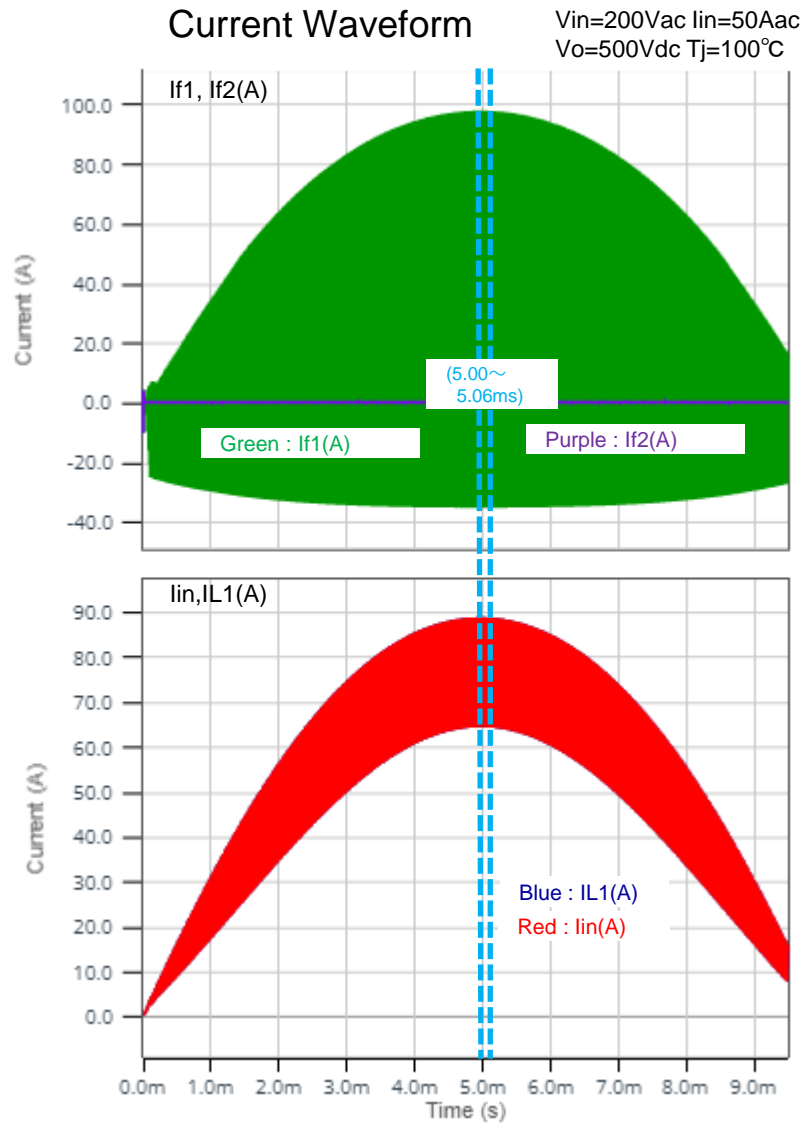


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## Selectable Devices

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

\* Default device

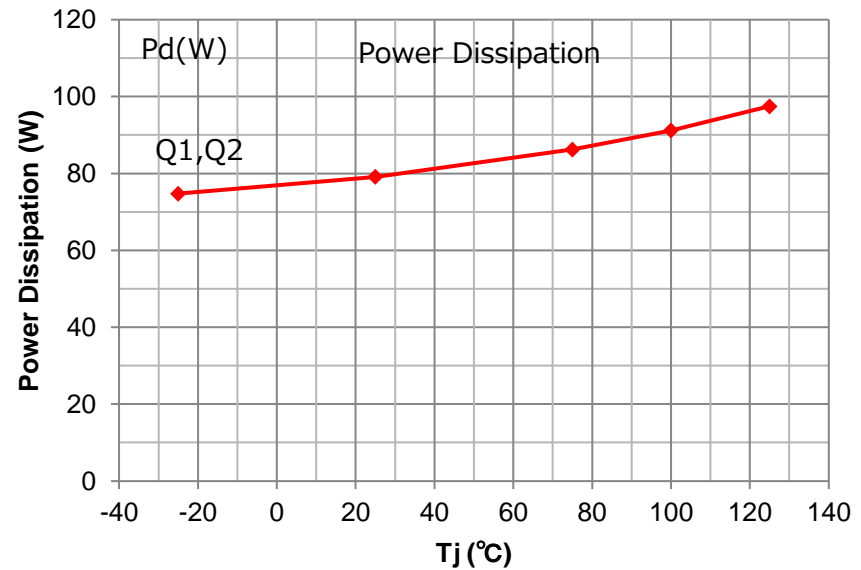
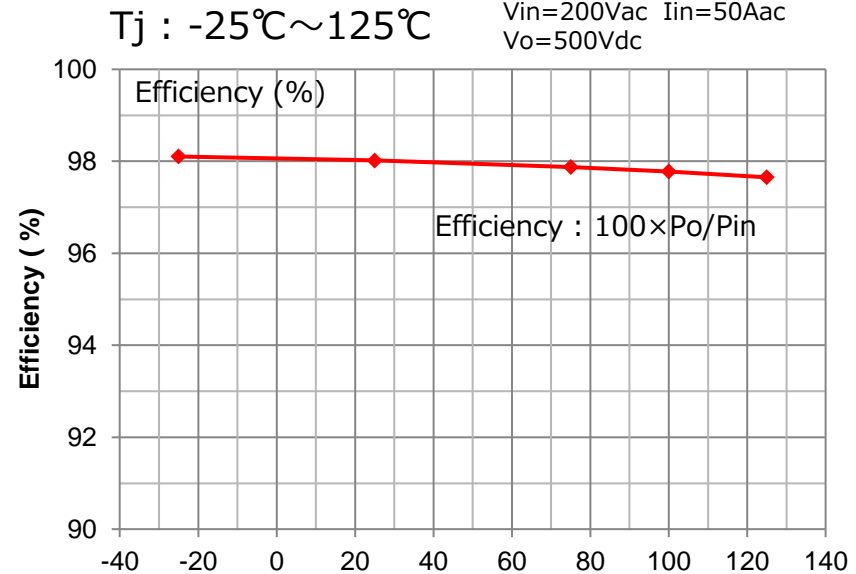
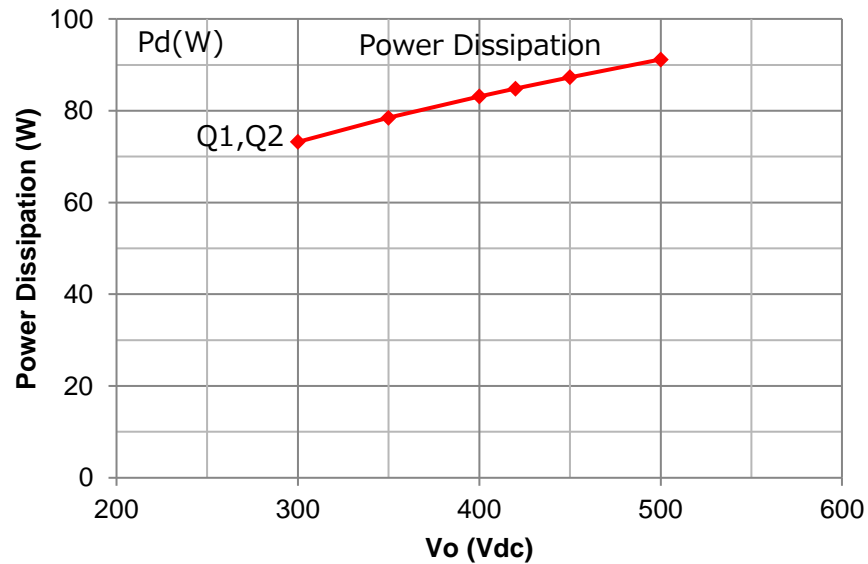
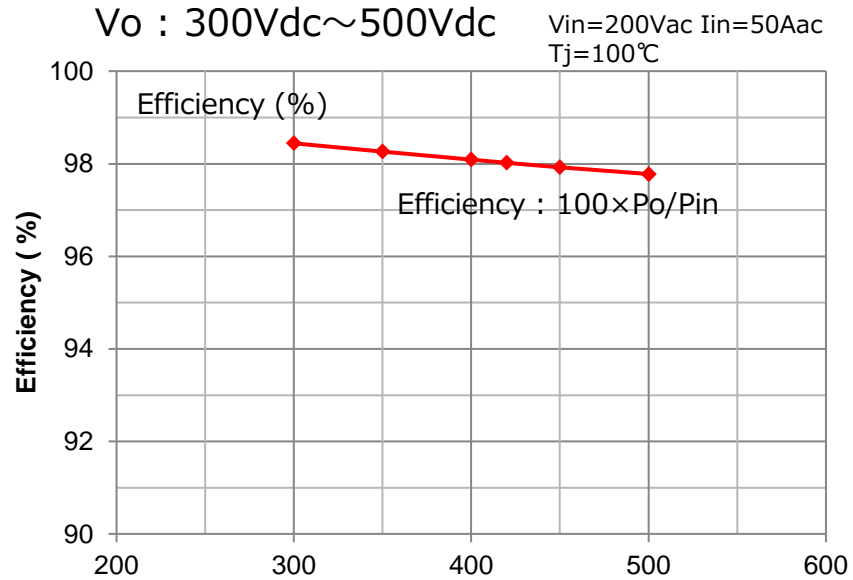


# Efficiency, Power Dissipation



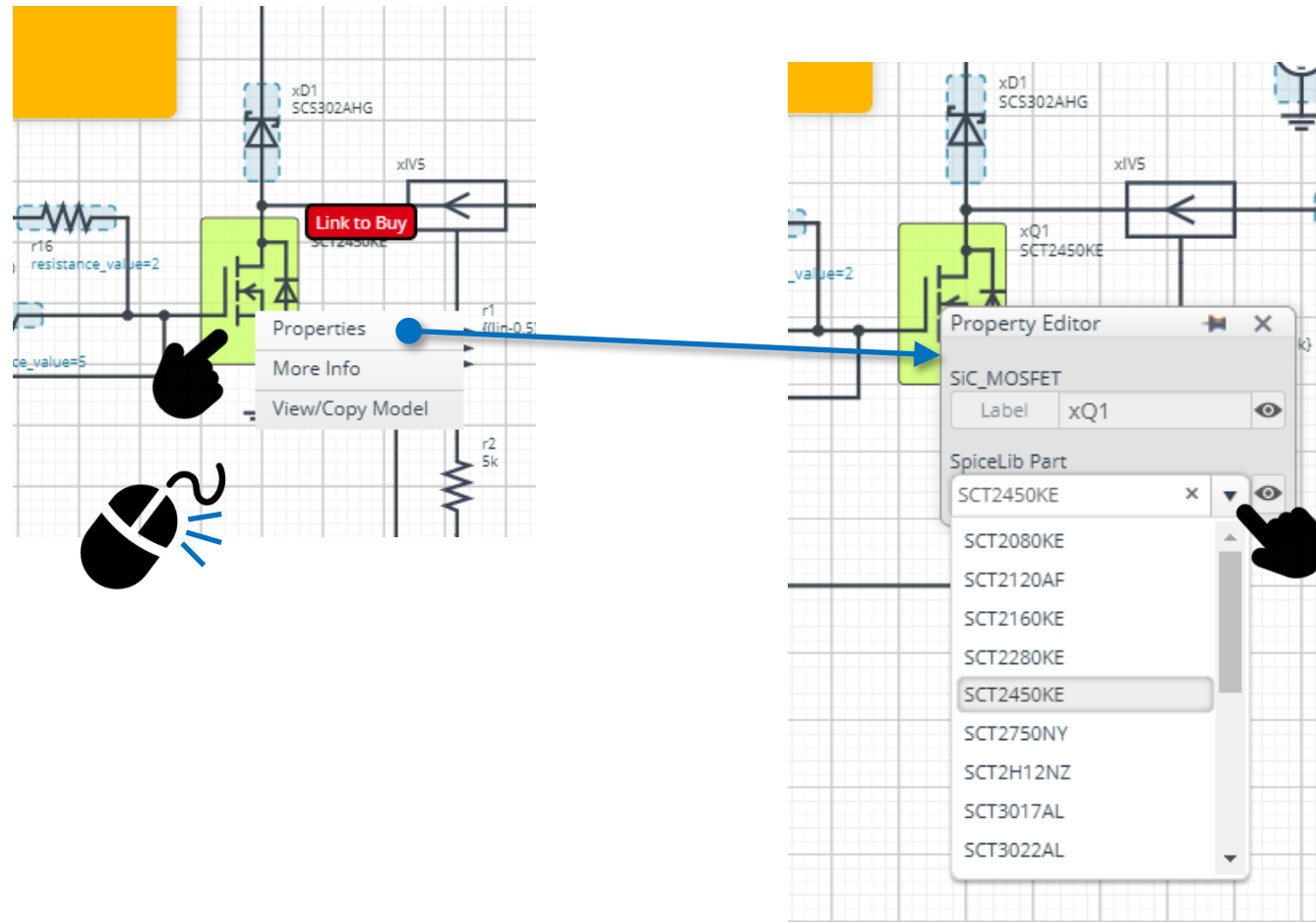
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# How to change the devices

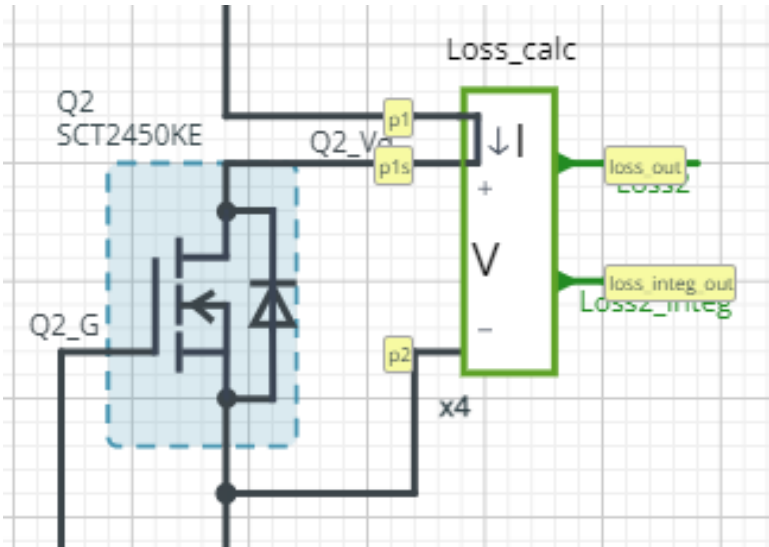
Right-click on the device → Select Properties → Pull down “SpiceLib Part” → Select the product



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

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## Loss calculation model 'Loss\_calc'



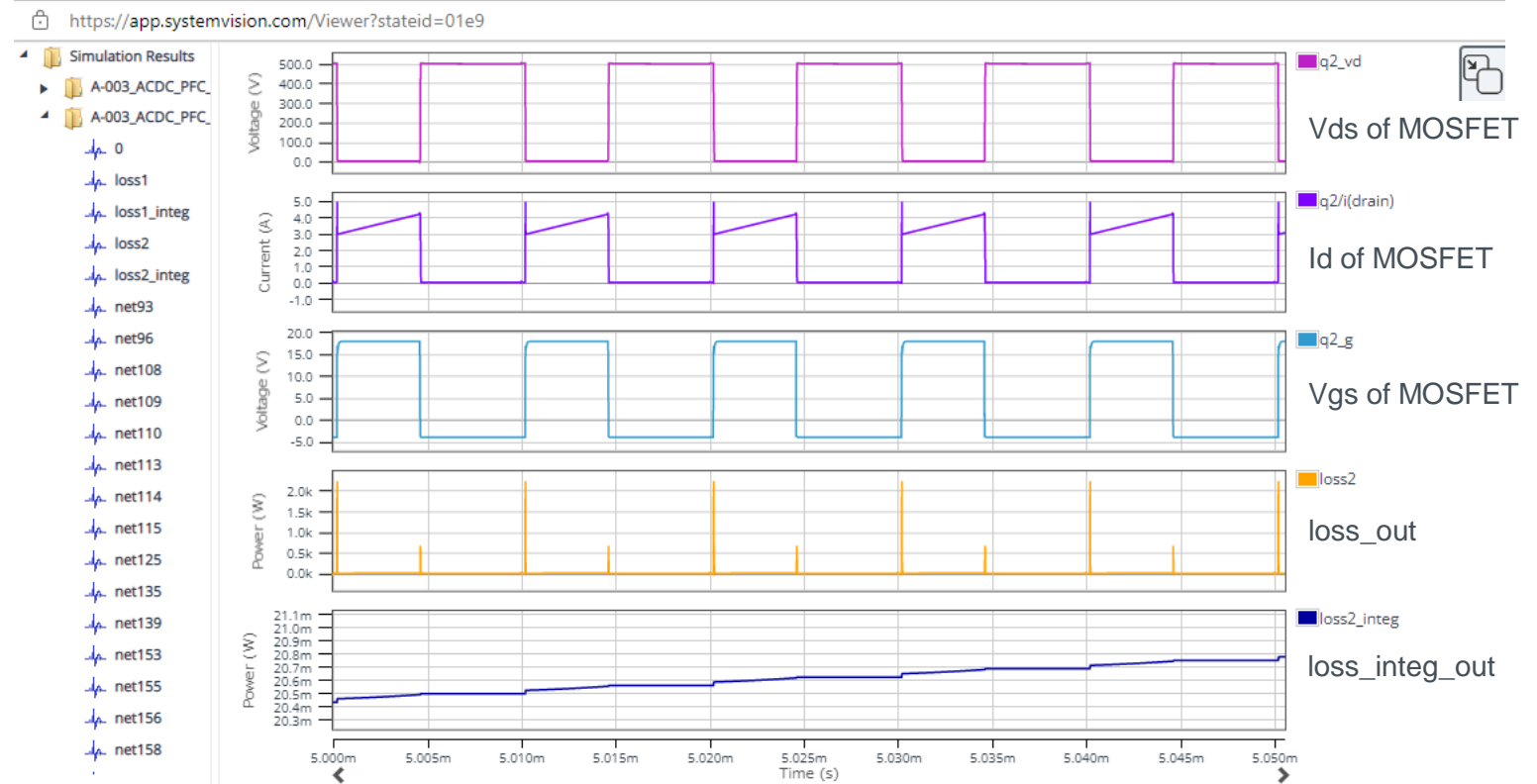
$$loss\_out(t) = I(t) \times V(t)$$

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

I : Current through p1 to p1s

V : Voltage between p1s and p2

## Waveform example



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