

A-013. Bridgeless PFC Vin=200V, Iin=50A, BCM

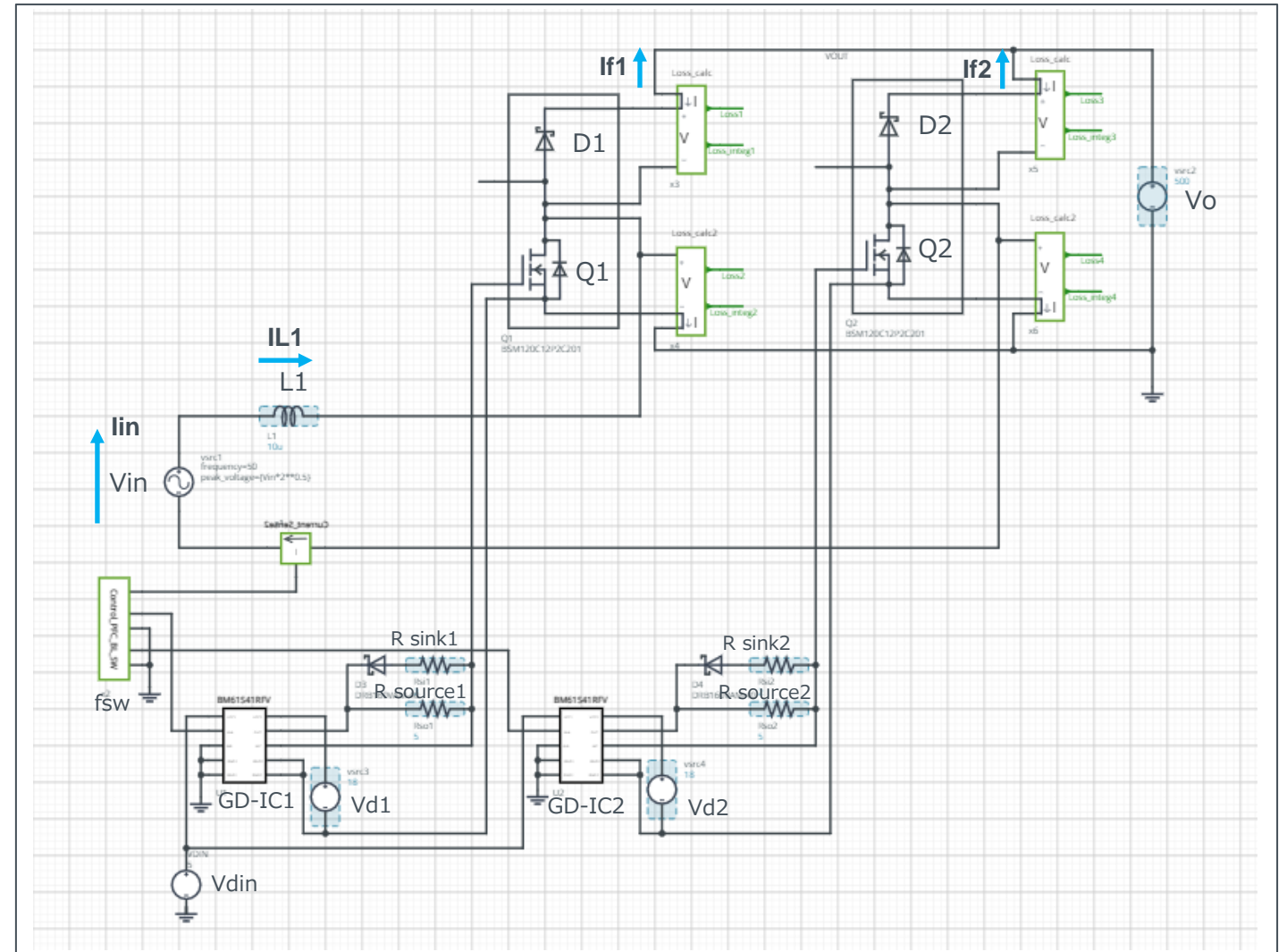
Simulation Parameters

Parameters	Descriptions	Default	Simulation Setting Range
Vin	Input voltage	200Vac 50Hz	
Iin	Input current	50Aac	
Vo	Output voltage	500Vdc	300 – 500Vdc
fsw	Switching frequency	100kHz	Fixed 100k
Tj	Temperature	100°C	
Vd1,2	Gate Drive voltage	18V	10 – 20V
Vdin	Signal voltage level	5V	

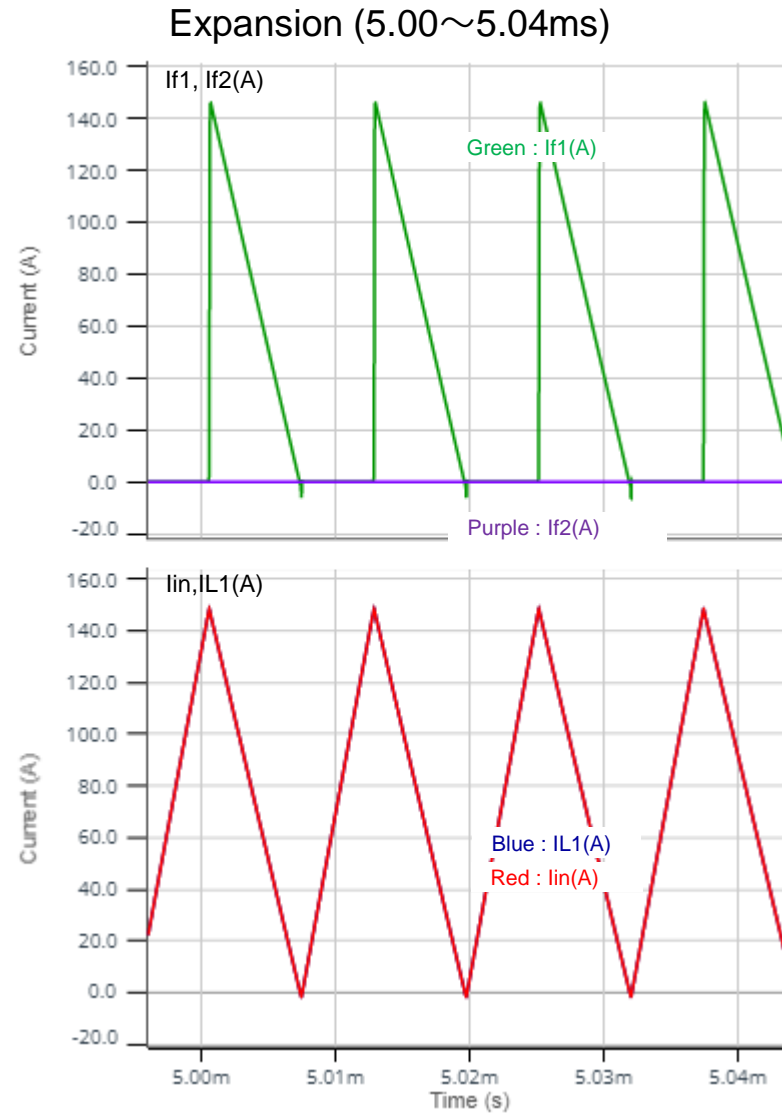
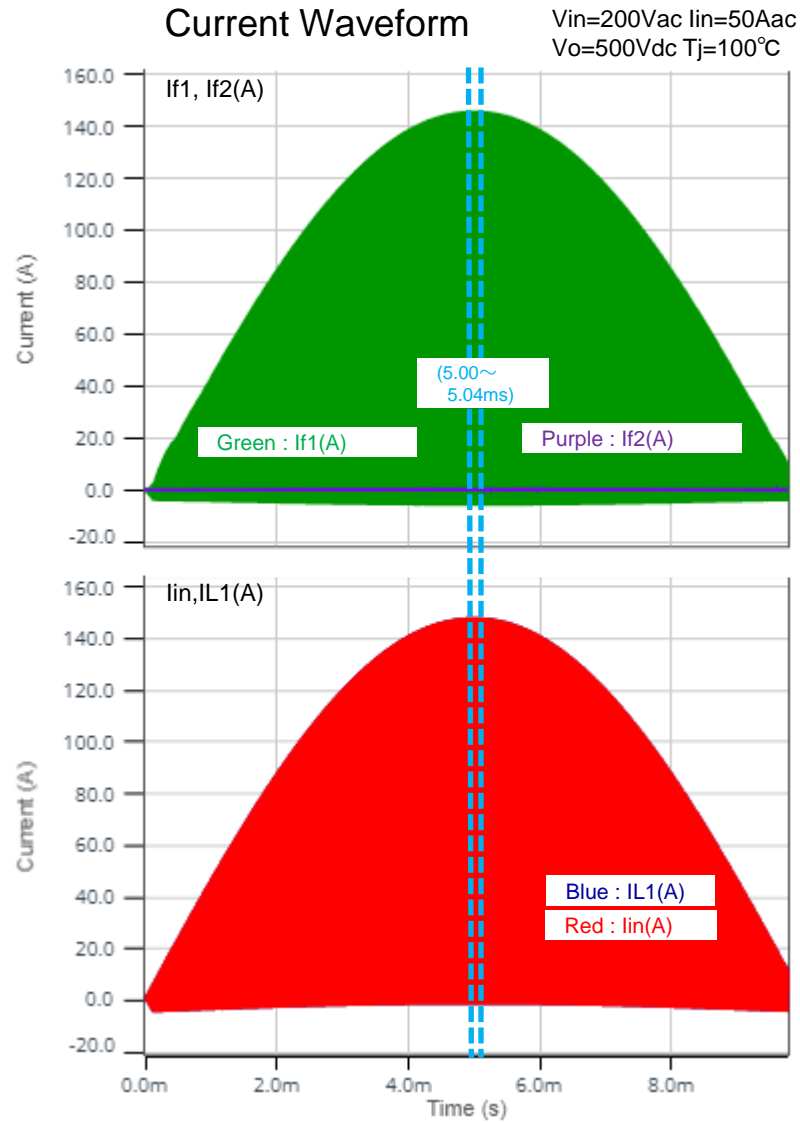
Devices

Component Name	Component	Default	Simulation Setting Range
Q1, Q2	Power Module	BSM120C12P2C201	
GD-IC1,2	Gate Driver	BM61S41RFV-C	
R sink1,2	Resistor for sink	ESR18 2Ω	0.1 -
R source1,2	Resistor for source	ESR18 5Ω	0.1 -
L1	Inductor	10μH	10μH - 2mH

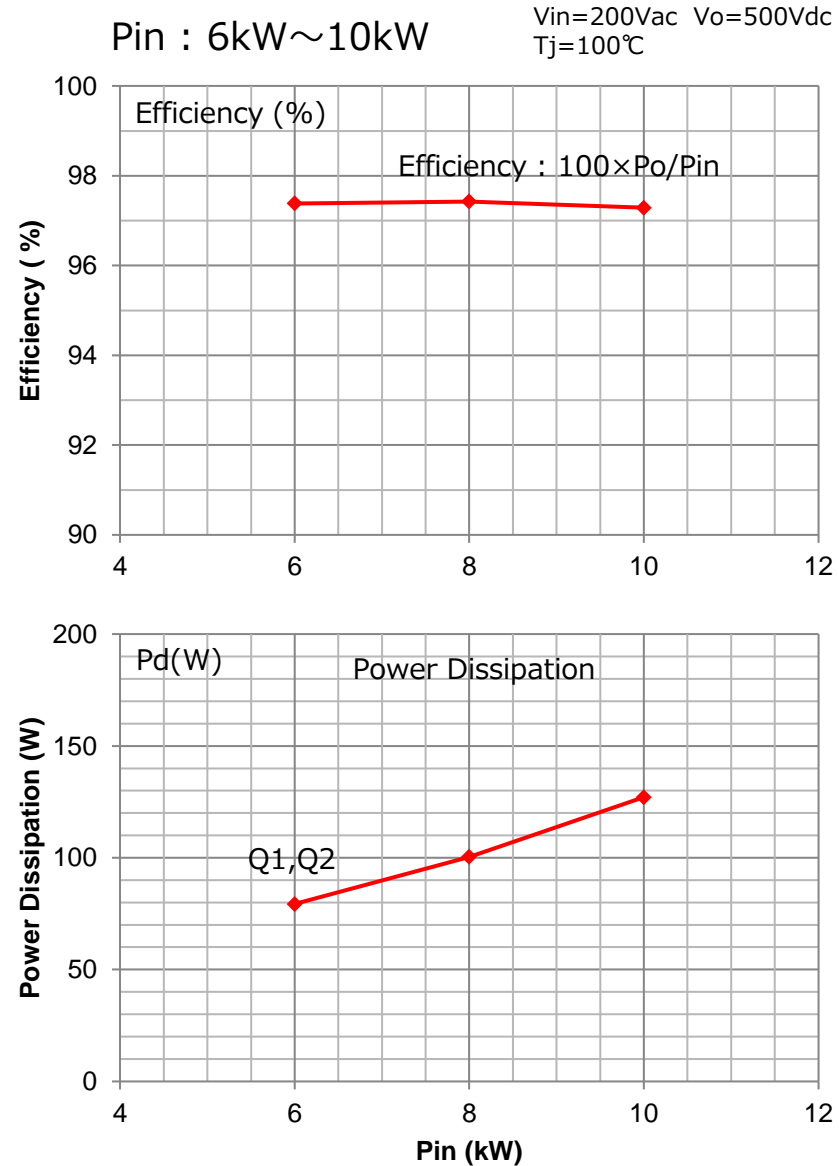
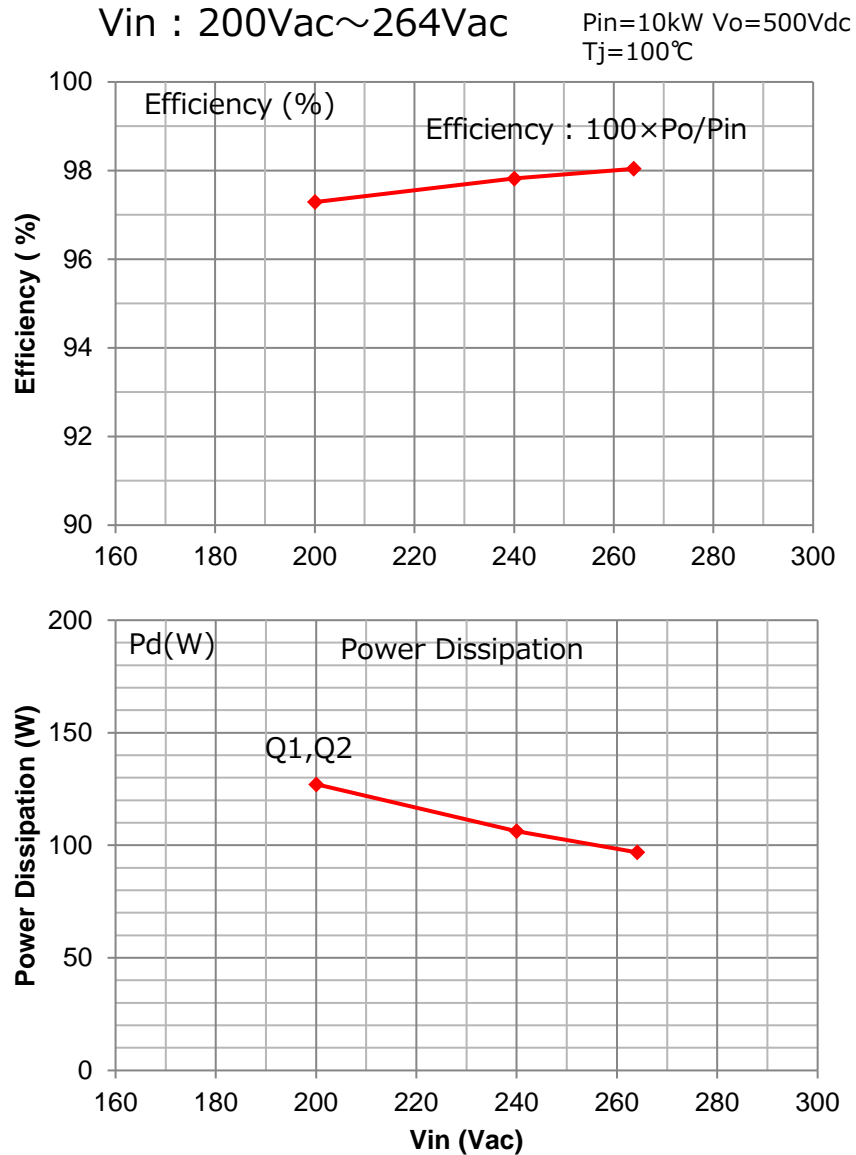
Simulation Circuit



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.



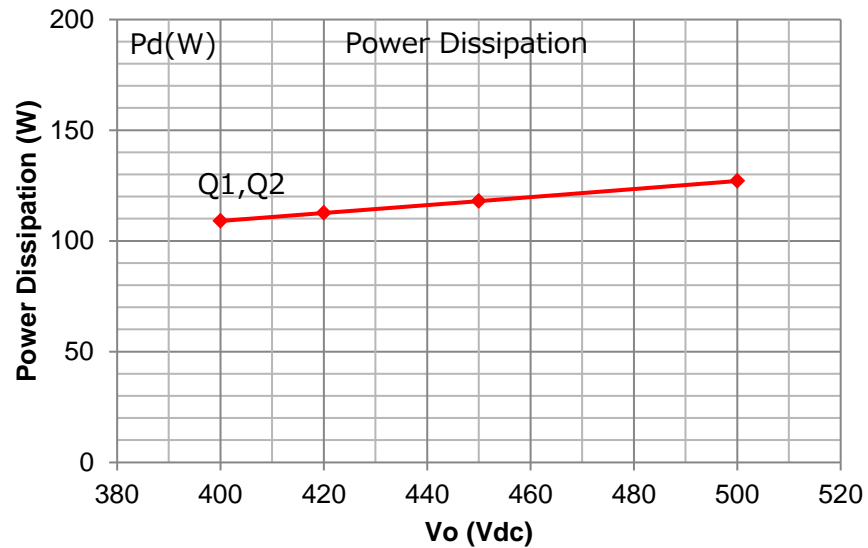
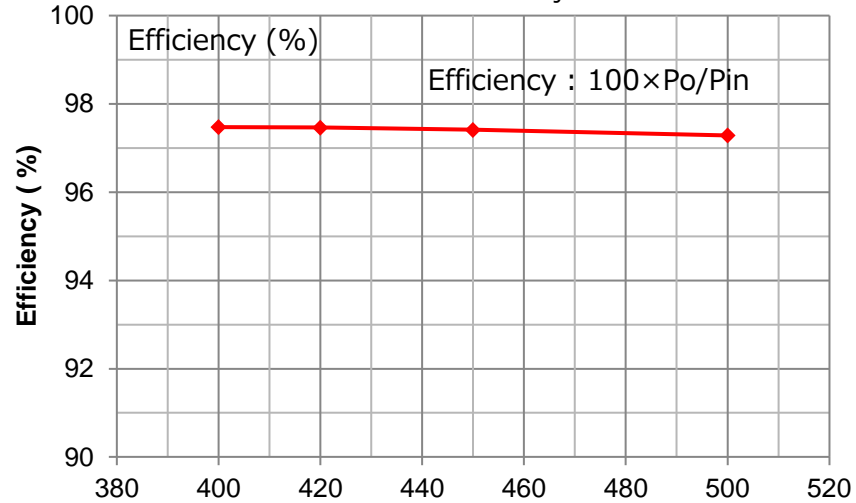
Efficiency, Power Dissipation 1



Efficiency, Power Dissipation 2

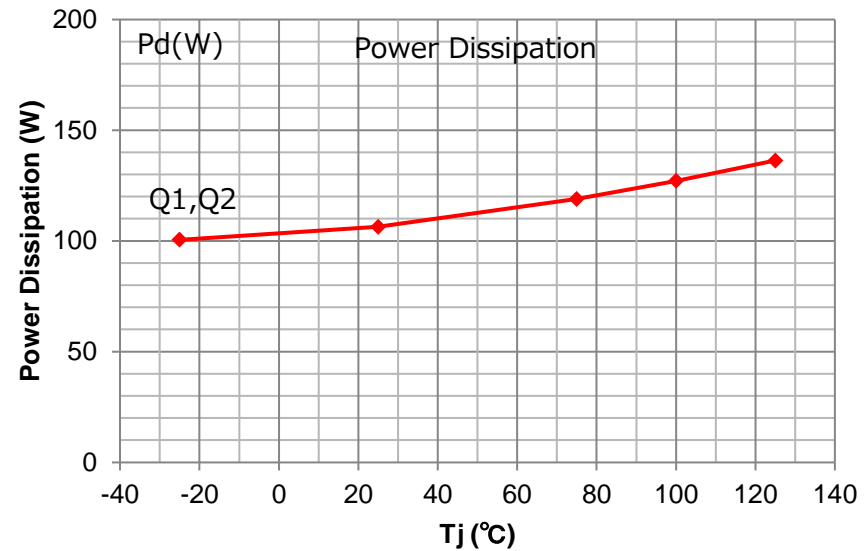
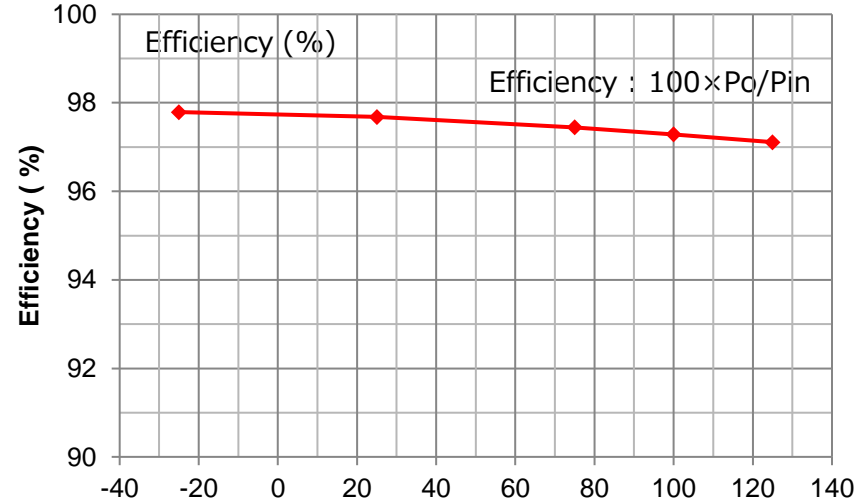


Vo : 400Vdc~500Vdc Vin=200Vac Iin=50Aac
Tj=100°C



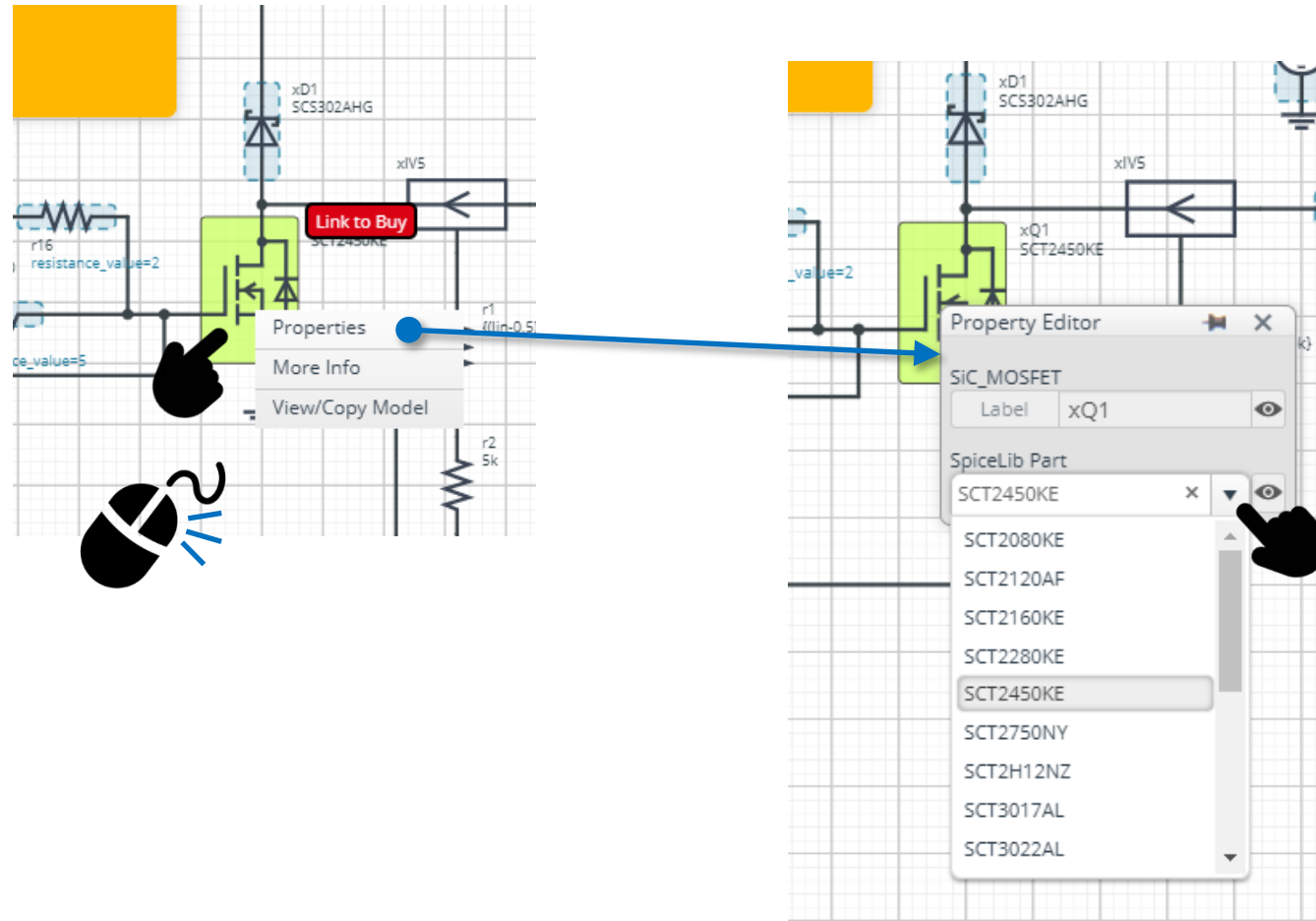
Tj : -25°C~125°C

Vin=200Vac Iin=50Aac
Vo=500Vdc



How to change the devices

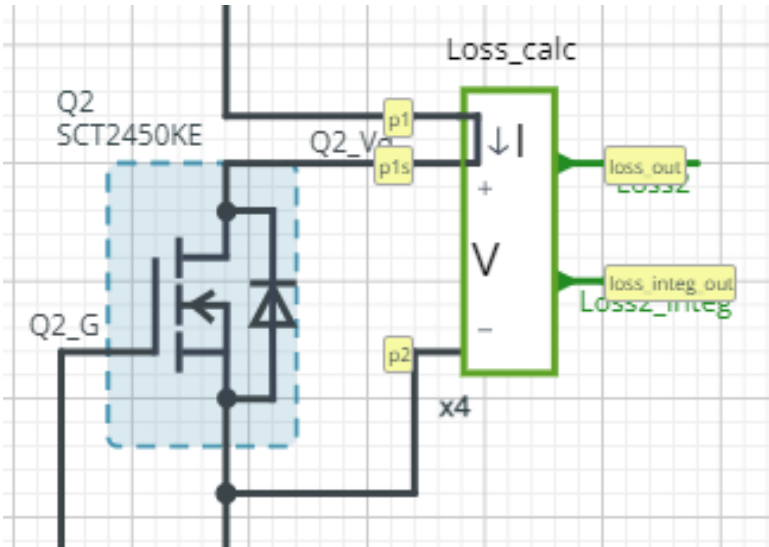
Right-click on the device → Select Properties → Pull down “SpiceLib Part” → Select the product



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

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Loss calculation model 'Loss_calc'



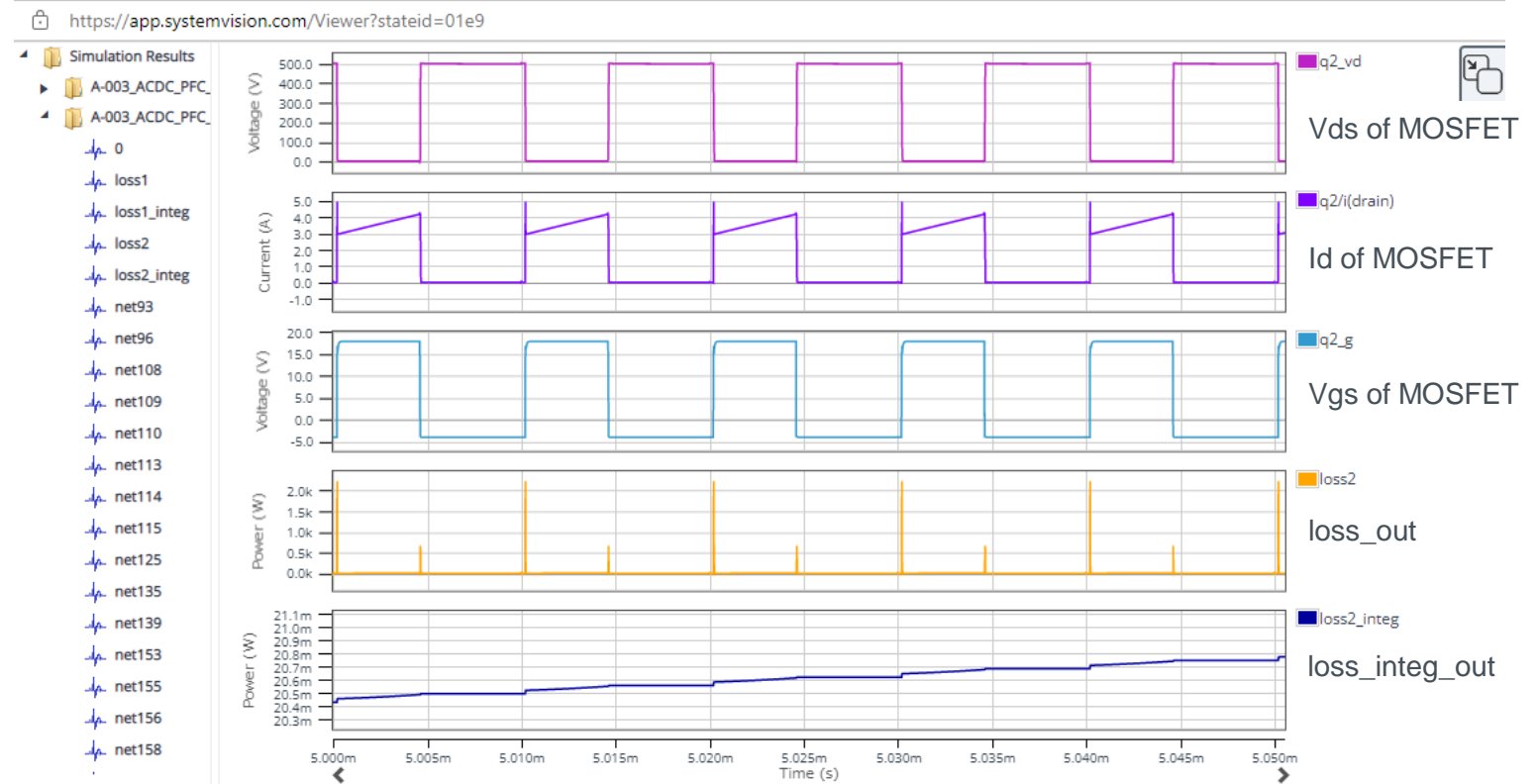
$$loss_out(t) = I(t) \times V(t)$$

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

I : Current through p1 to p1s

V : Voltage between p1s and p2

Waveform example



Notes

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