

# A-017. 3-Phase Interleaved PFC $V_{in}=200V$ , $I_{in}=7.5A$ , DCM

ROHM Solution Simulator Schematic Information



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64UG111E Rev.004

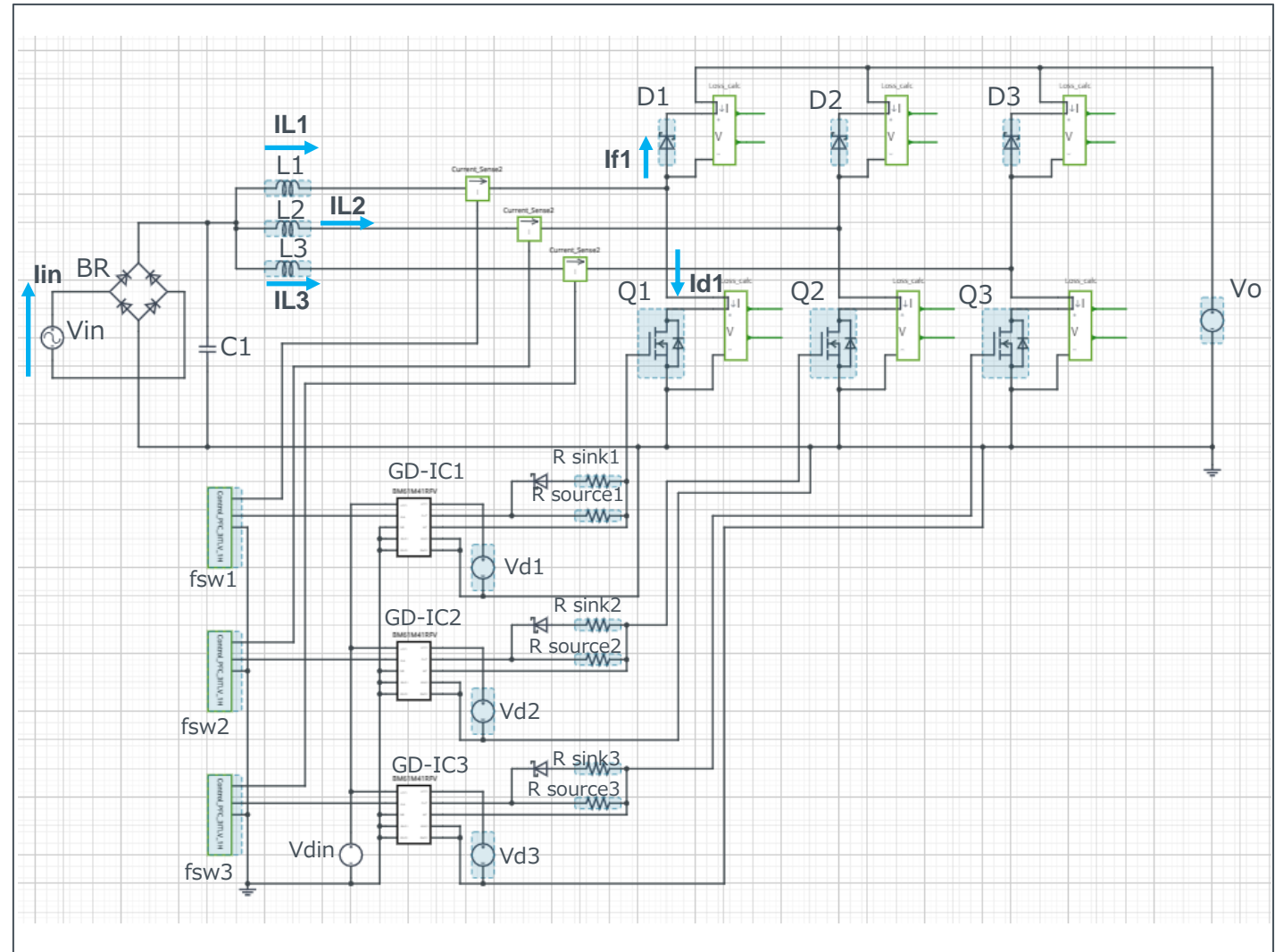
## Simulation Parameters

Parameters	Descriptions	Default	Simulation Setting Range
$V_{in}$	Input voltage	200Vac 50Hz	
$I_{in}$	Input current	7.5Aac	
$V_o$	Output voltage	500Vdc	300 – 500Vdc
fsw1,2,3	Switching frequency	50kHz	10k – 300k
$T_j$	Temperature	100°C	
$V_{d1,2,3}$	Gate Drive voltage	15V	10 – 20V
$V_{din}$	Signal voltage level	5V	

## Devices

Component Name	Component	Default	Simulation Setting Range
Q1, Q2, Q3	SJ-MOSFET	Selectable	
D1, D2, D3	SiC SBD	Selectable	
GD-IC1,2,3	Gate Driver	BM61M41RFV-C	
R sink1,2,3	Resistor for sink	ESR18 1Ω	0.1 -
R source1,2,3	Resistor for source	ESR18 2Ω	0.1 -
L1, L2, L3	Inductor	300μH	10μH - 2mH
C1	Capacitor	50nF	
BR	Bridge Diode	600V 10A ideal diode	

## 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

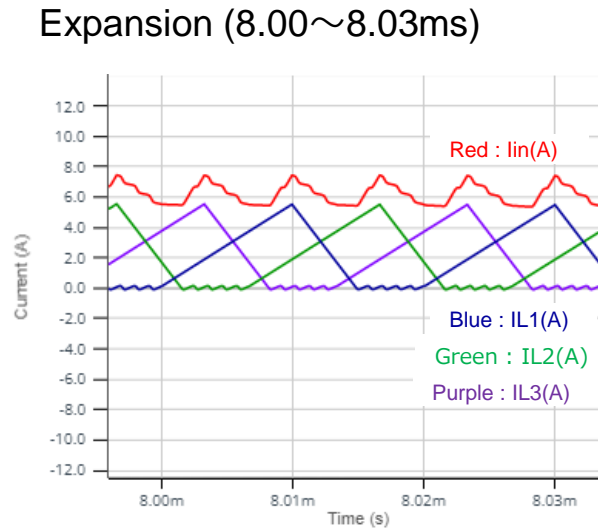
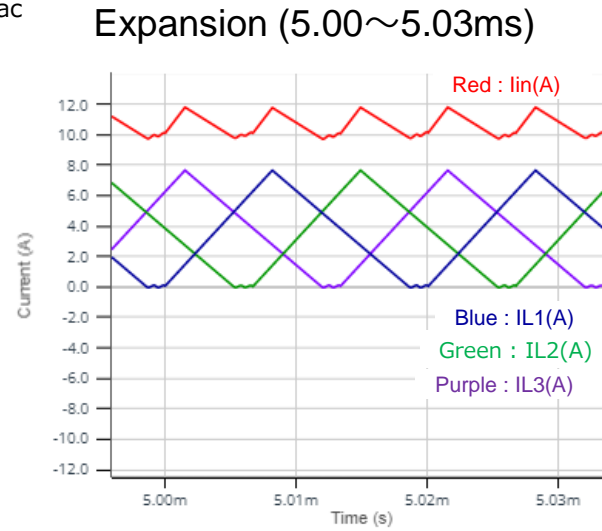
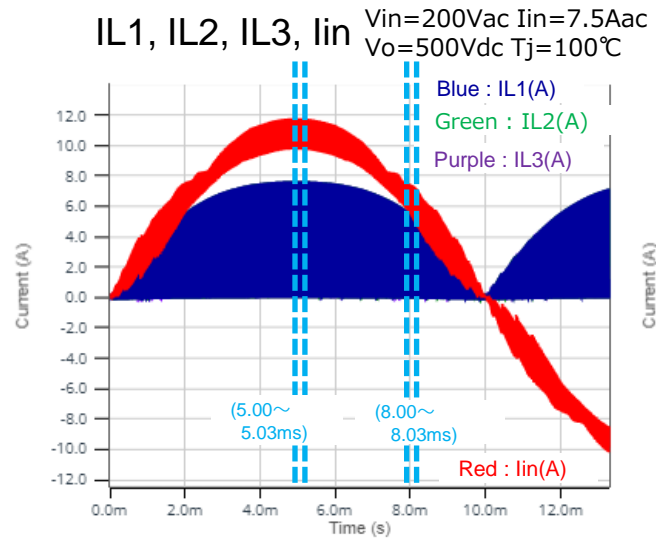
Component name	Component	Product No.	feature
Q1 – Q4	SJ-MOSFET	R6004JNX	600V, 4A
		R6006JNX	600V, 6A
		R6009JNX	600V, 9A
		R6018JNX	600V, 18A
		R6020JNX	600V, 20A
		R6025JNX	600V, 25A
		R6030JNZ4 (*)	600V, 30A
		R6050JNZ4	600V, 50A

\* Default device

## Selectable Devices

Component name	Component	Product No.	feature
D1, D2	SiC SBD	SCS205KG	1200V, 5A
		SCS206AG	650V, 6A
		SCS208AG	650V, 8A
		SCS210AG	650V, 10A
		SCS210KG	1200V, 10A
		SCS212AG	650V, 12A
		SCS215AG	650V, 15A
		SCS215KG	1200V, 15A
		SCS220AG	650V, 20A
		SCS220KG	1200V, 20A
		SCS302AHG (*)	650V, 2A, High surge resistance
		SCS304AHG	650V, 4A, High surge resistance
		SCS306AHG	650V, 6A, High surge resistance
		SCS308AHG	650V, 8A, High surge resistance
		SCS310AHG	650V, 10A, High surge resistance
		SCS312AHG	650V, 12A, High surge resistance
		SCS315AHG	650V, 15A, High surge resistance
		SCS320AHG	650V, 20A, High surge resistance

\* Default device

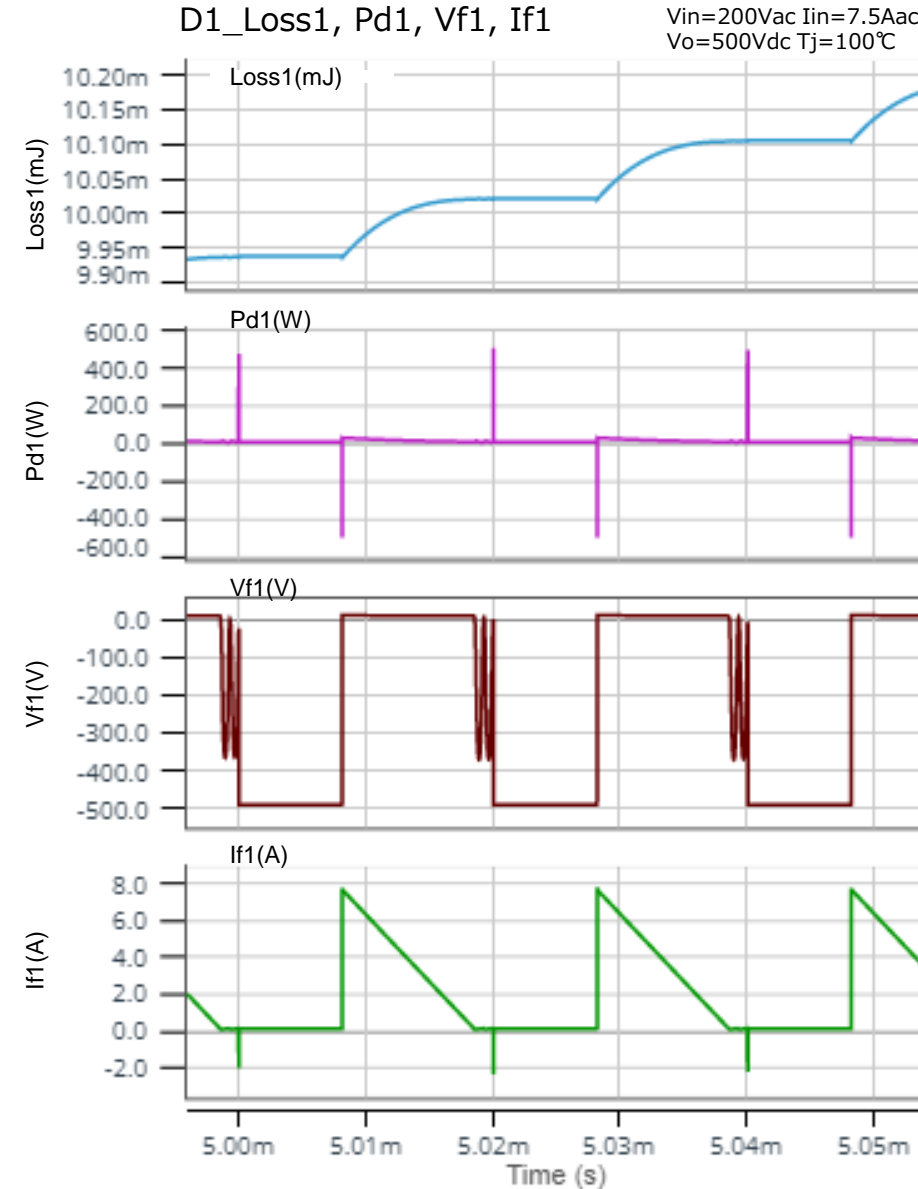
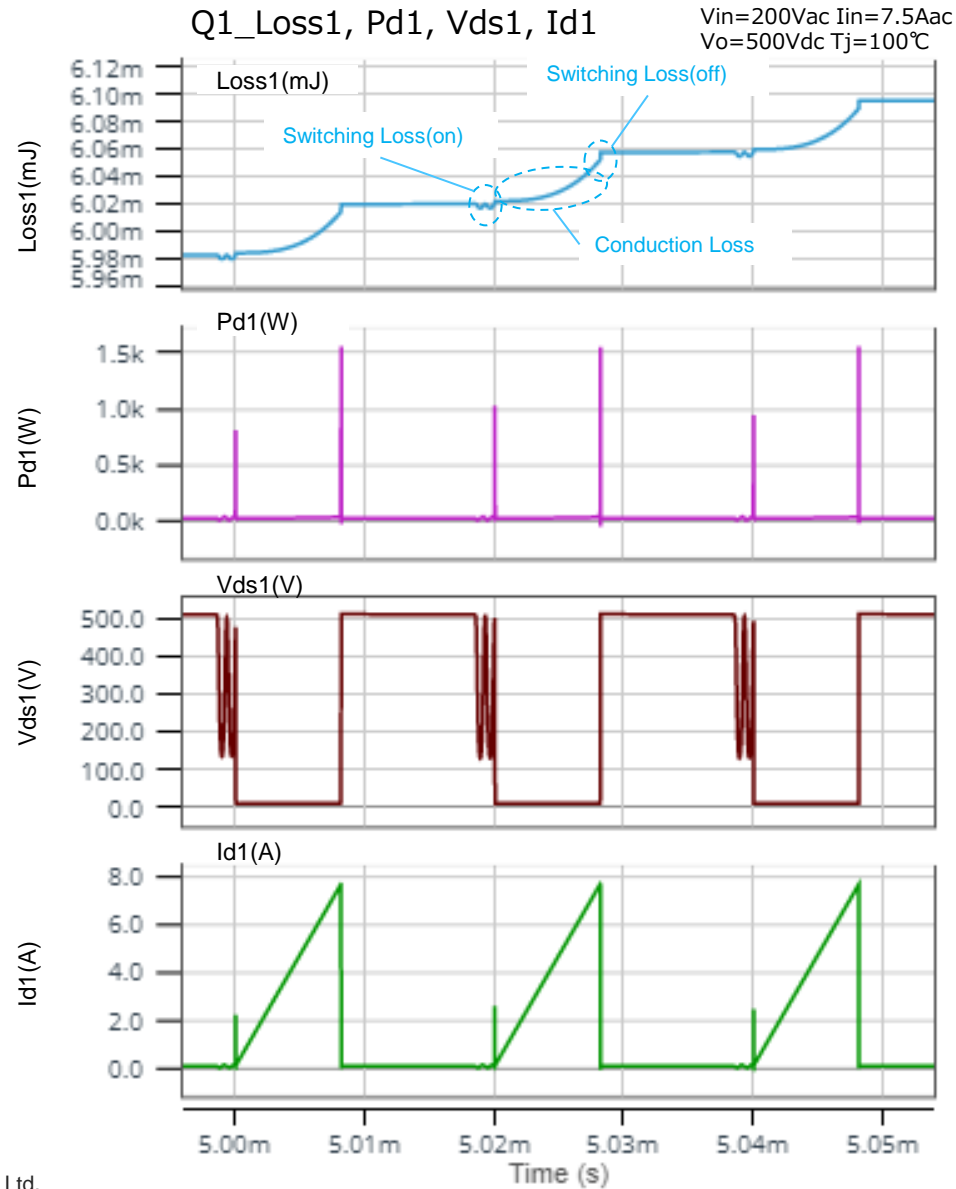


# Simulation Waveform2



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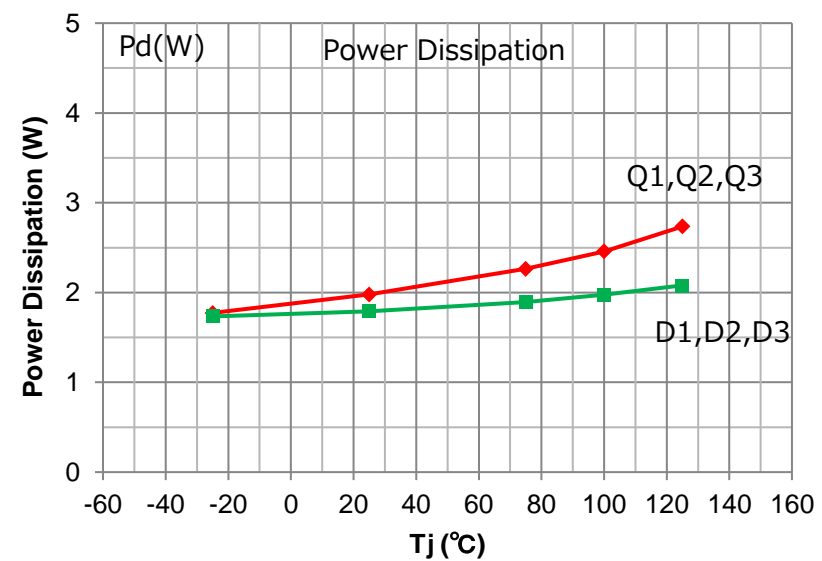
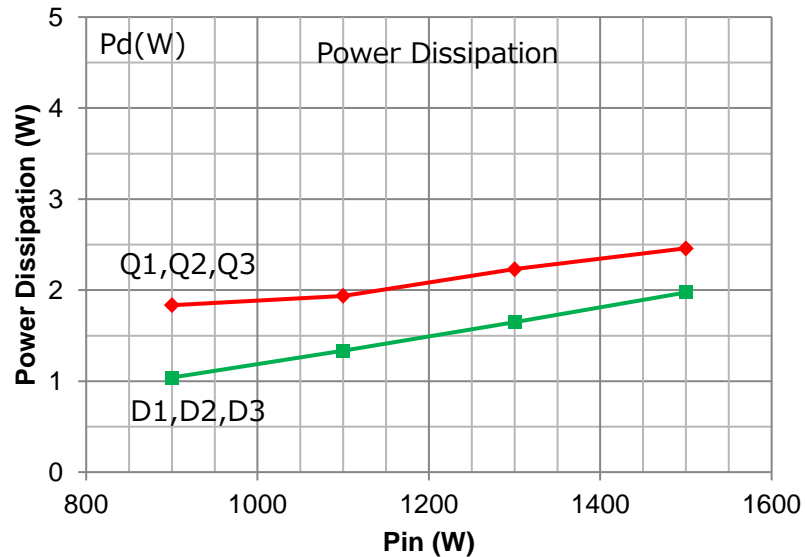
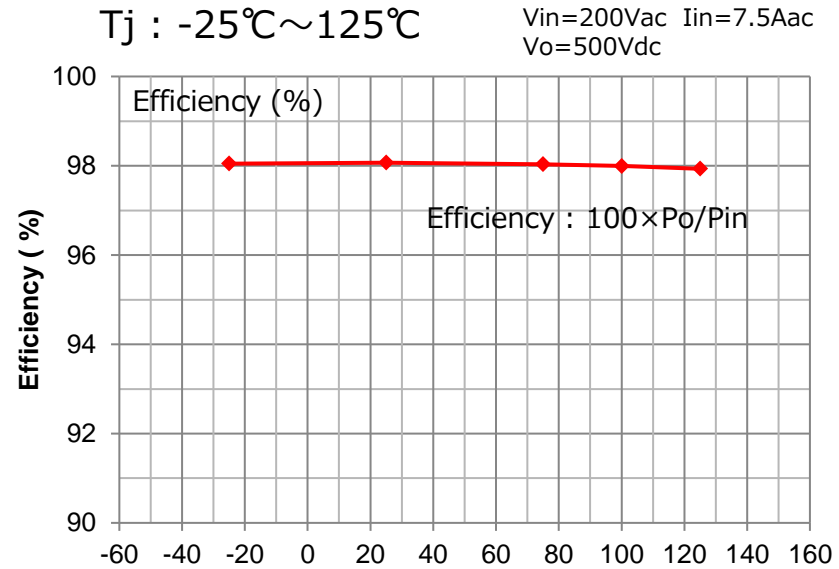
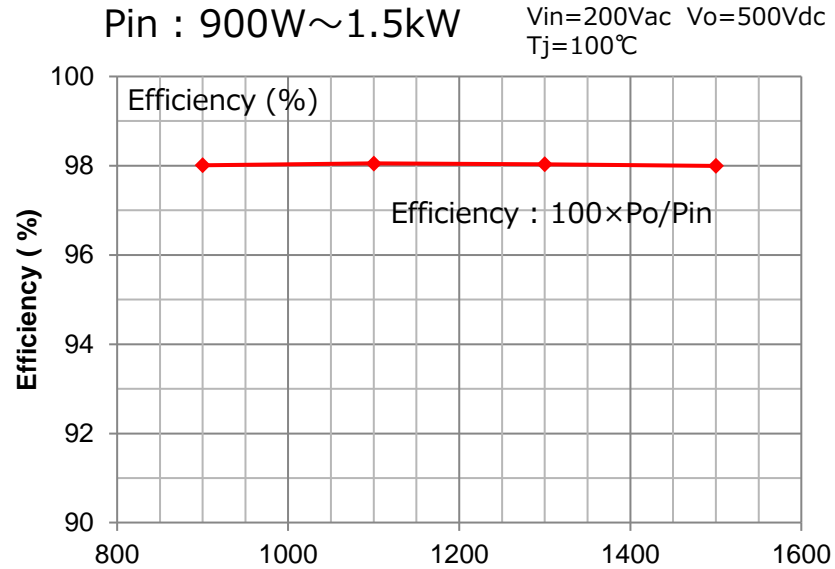


# Efficiency, Power Dissipation



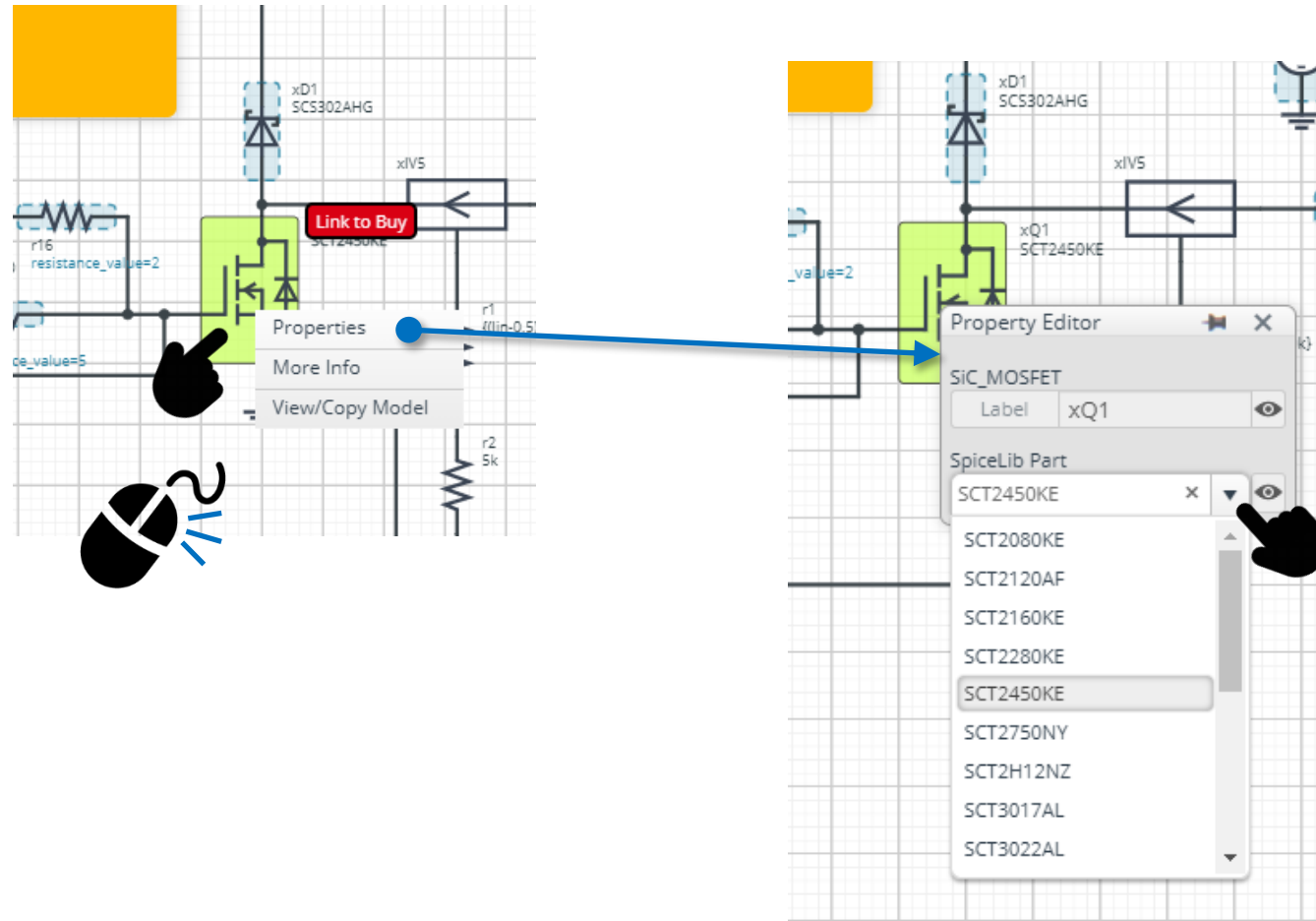
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# How to change the devices

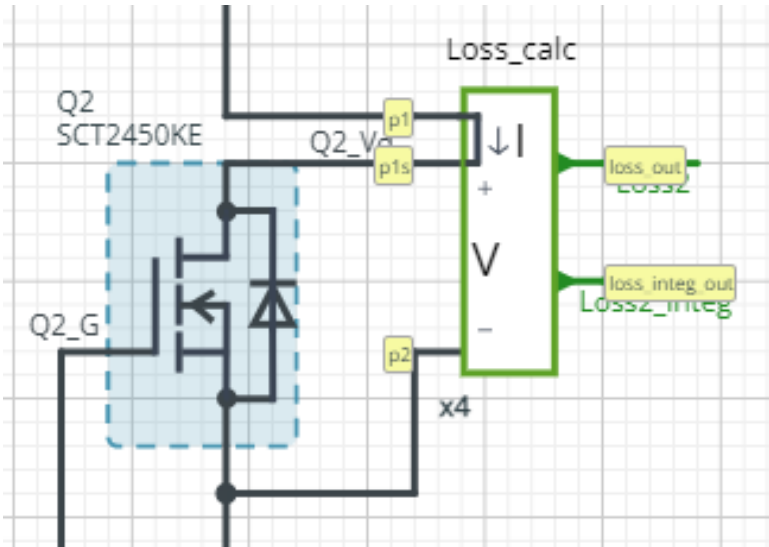
Right-click on the device → Select Properties → Pull down “SpiceLib Part” → Select the product



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

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## Loss calculation model 'Loss\_calc'



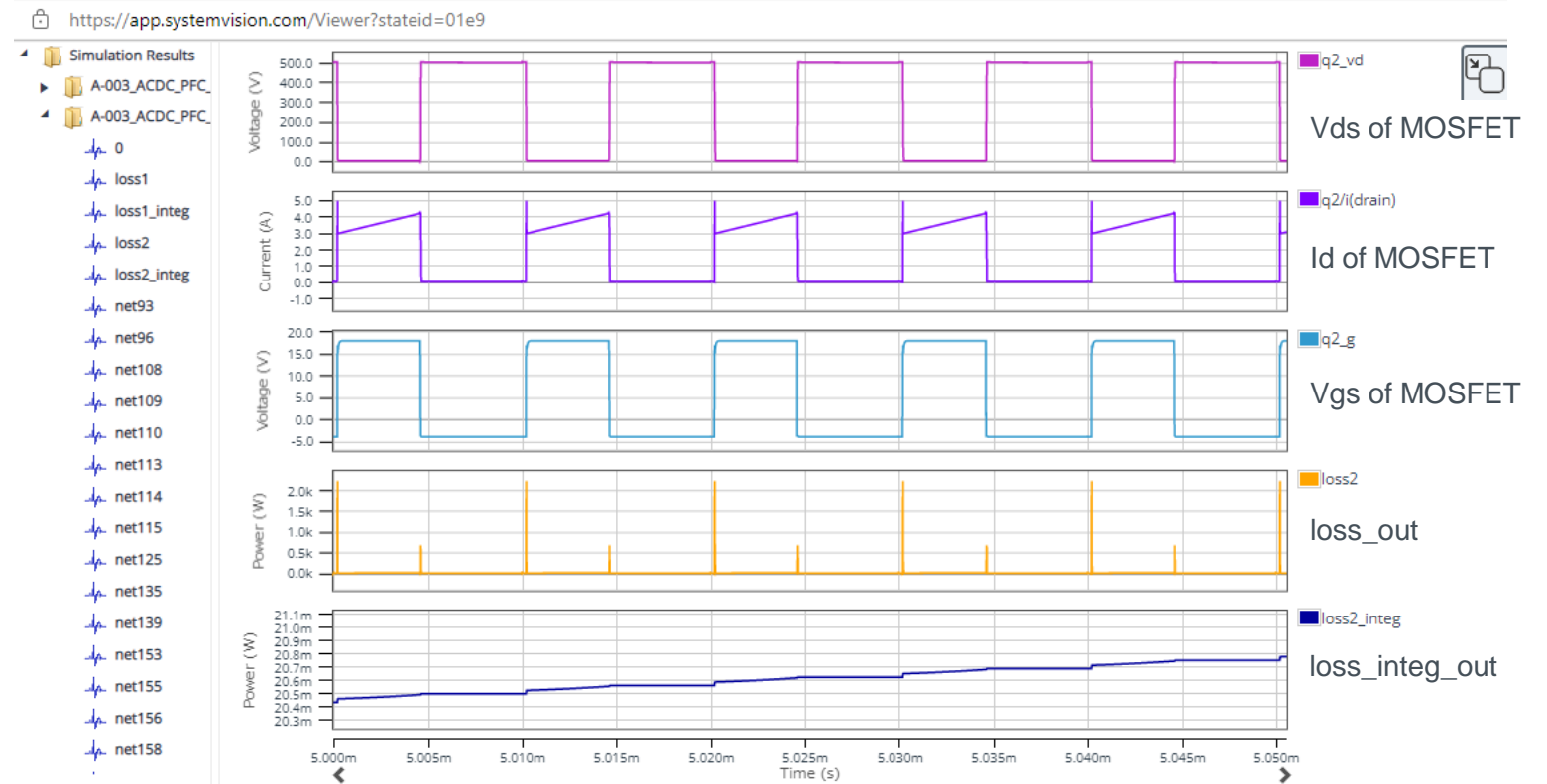
$$loss\_out(t) = I(t) \times V(t)$$

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

I : Current through p1 to p1s

V : Voltage between p1s and p2

## Waveform example



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