

# A-019. 3-Phase 2-Level Full Bridge PFC 3-wire $V_{in}=200V$ , $P_{IN}=25kW$

ROHM Solution Simulator Schematic Information



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64UG113E Rev.005

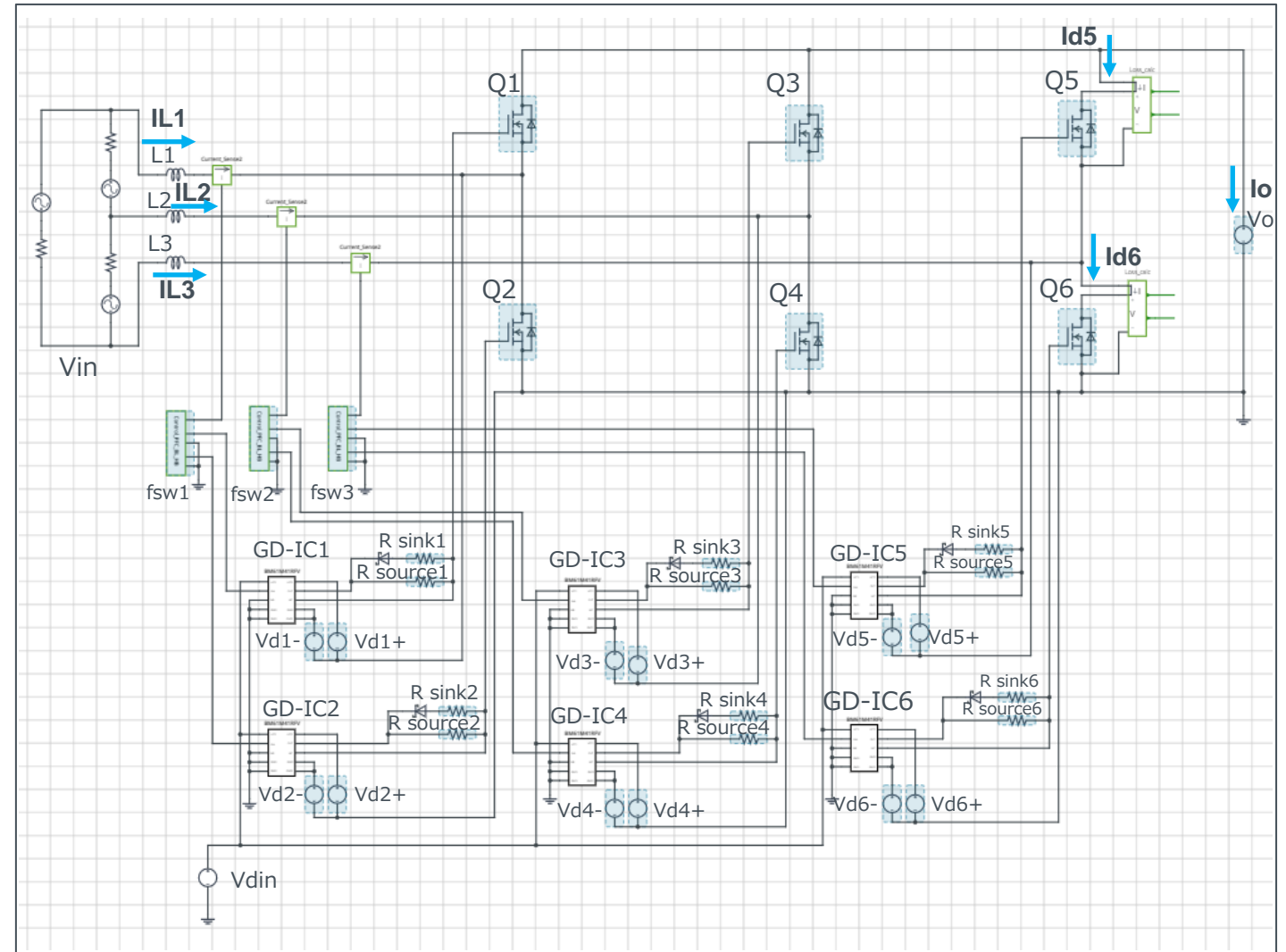
## Simulation Parameters

Parameters	Descriptions	Default	Simulation Setting Range
$V_{in}$	Input voltage	115Vac 50Hz	
$P_o$	Power Output	25kW	
$V_o$	Output voltage	500Vdc	300 – 500Vdc
fsw1,2,3	Switching frequency	20kHz	10k – 300k
$T_j$	Temperature	100°C	
Vd1-6+	Gate Drive voltage H	15V	10 – 20V
Vd1-6-	Gate Drive voltage L	-4V	-4 – 0V
Vdin	Signal voltage level	5V	

## Devices

Component Name	Component	Default	Simulation Setting Range
Q1 – Q6	SJ-MOSFET	Selectable	
GD-IC1-6	Gate Driver	BM61M41RFV-C	
R sink1-6	Resistor for sink	ESR18 1Ω	0.1 -
R source1-6	Resistor for source	ESR18 2Ω	0.1 -
L1, L2, L3	Inductor	200μH	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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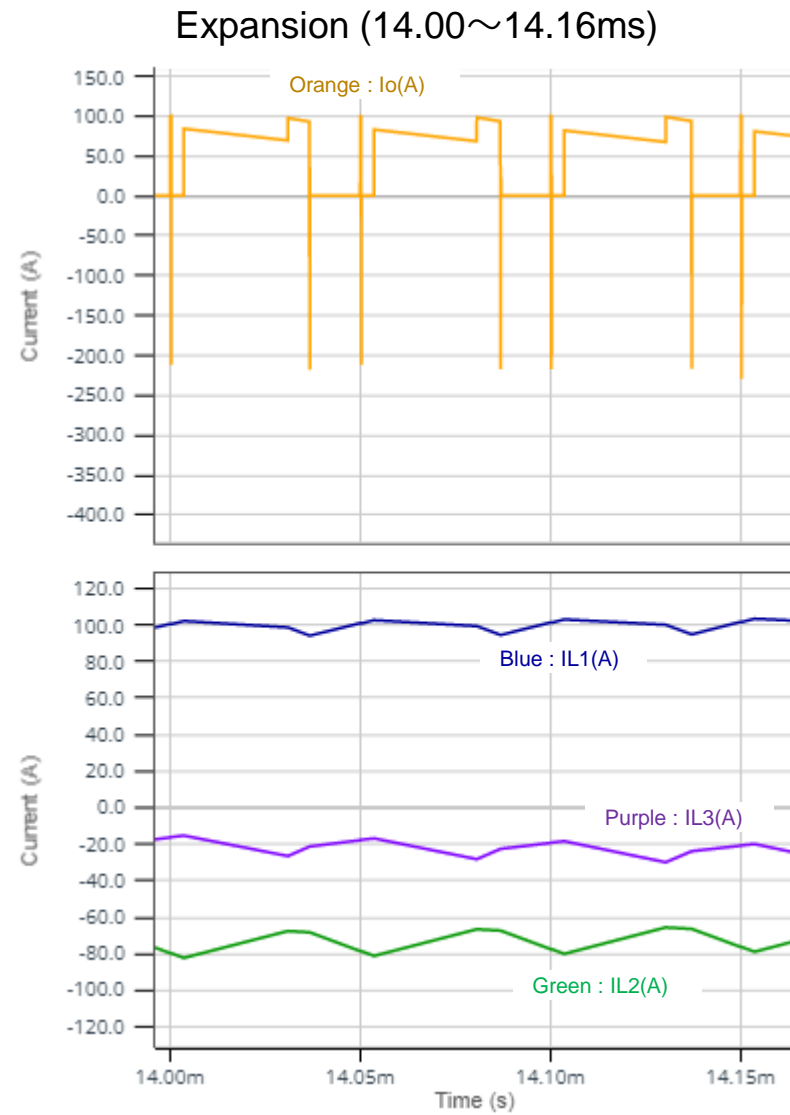
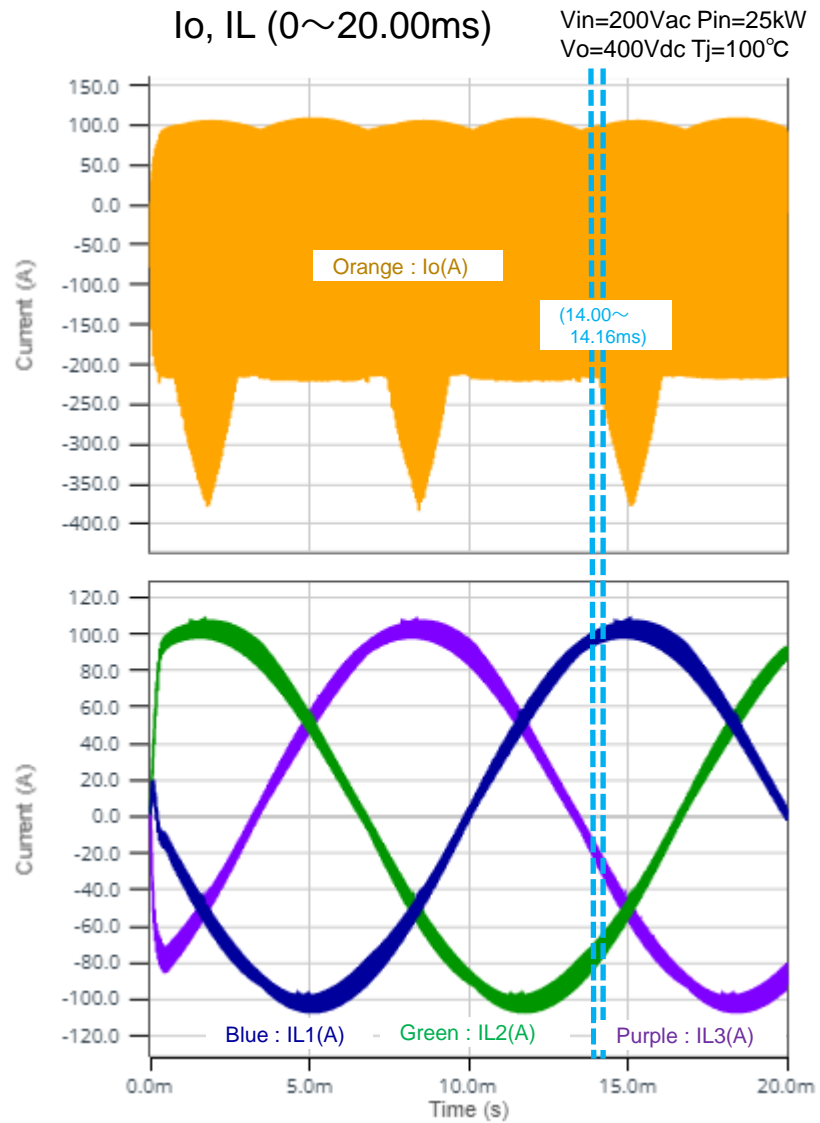
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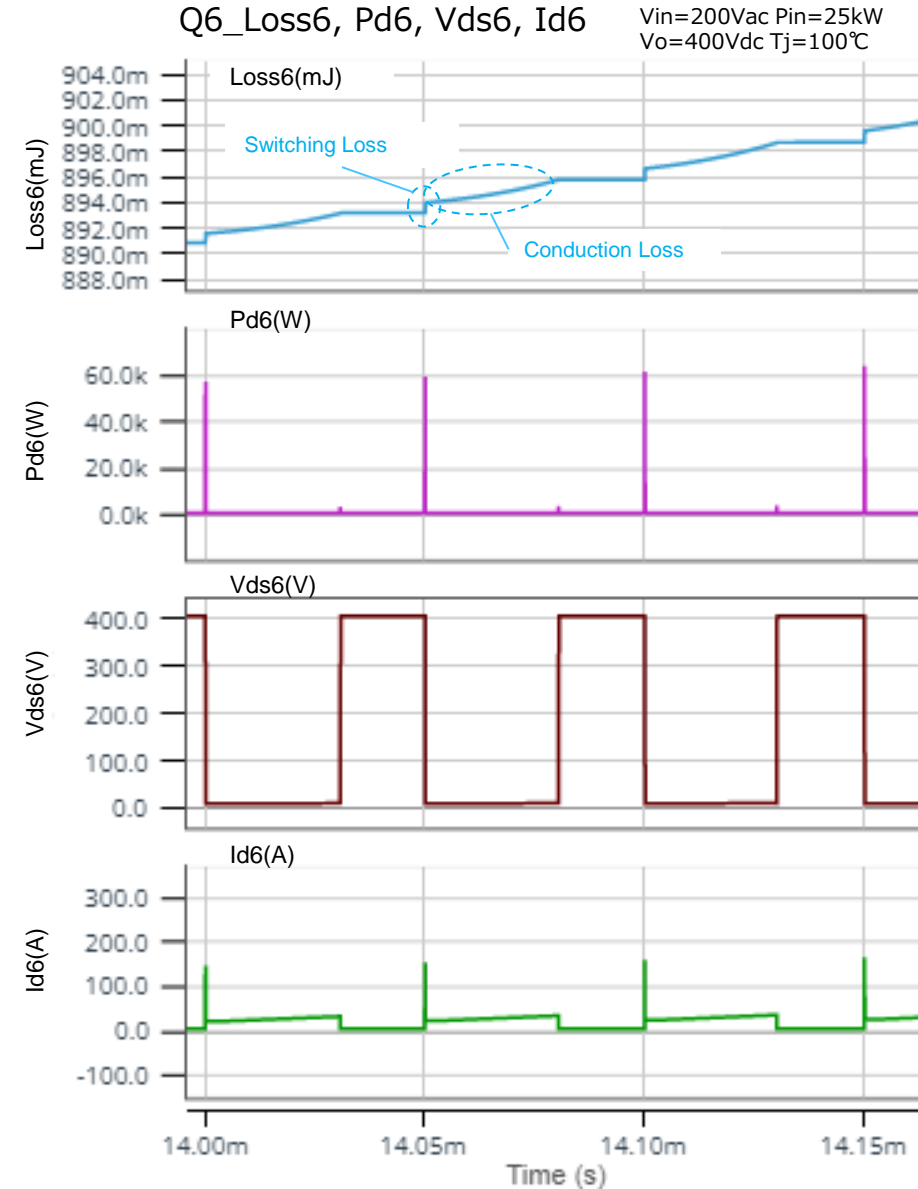
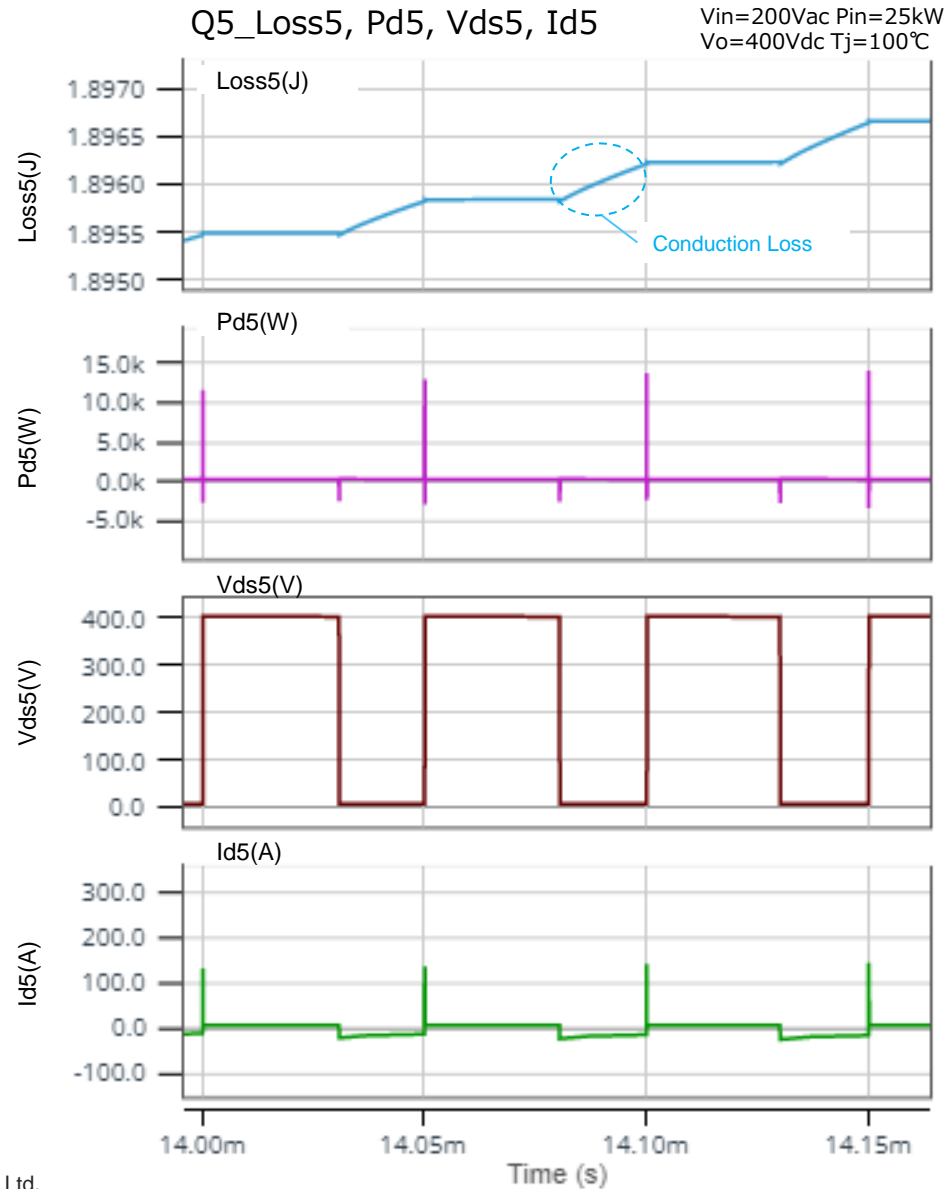
## Selectable Devices

Component name	Component	Product No.	feature
Q1 – 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

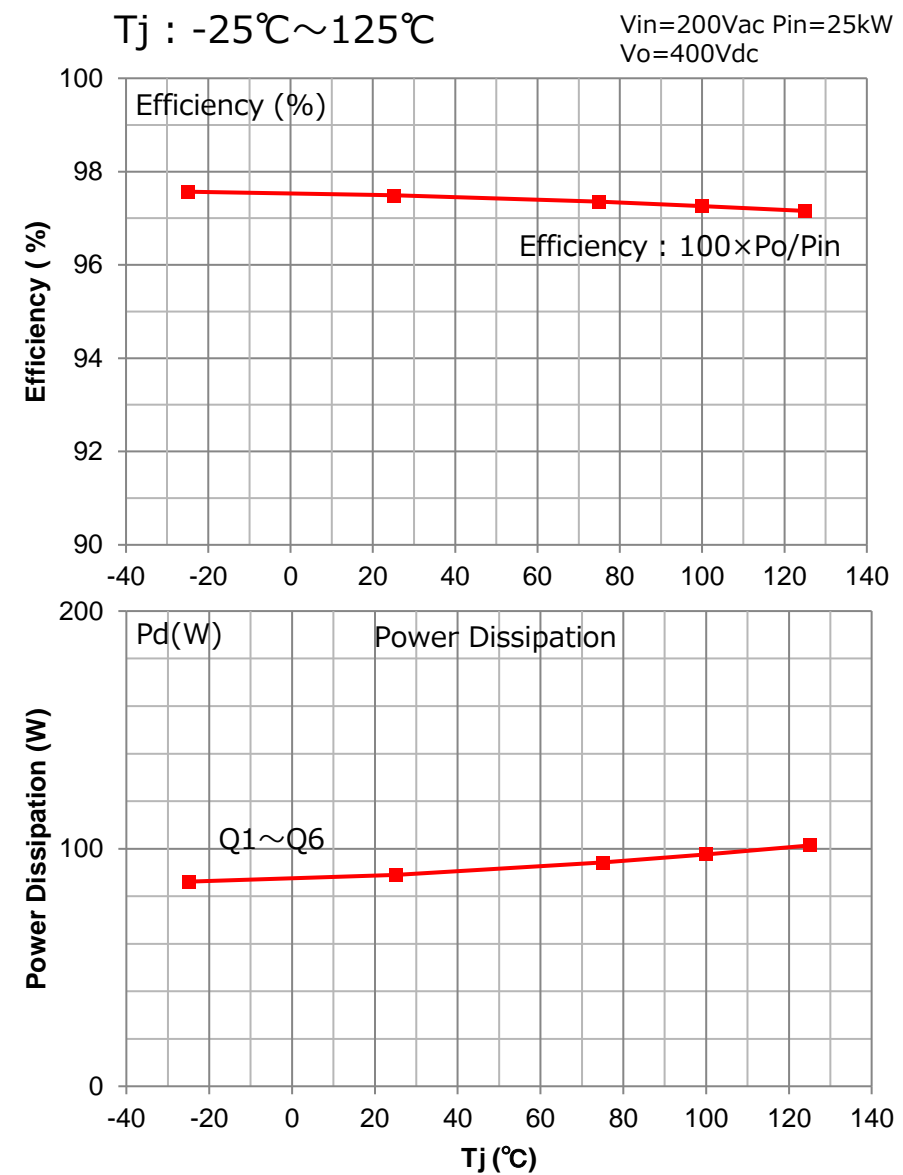
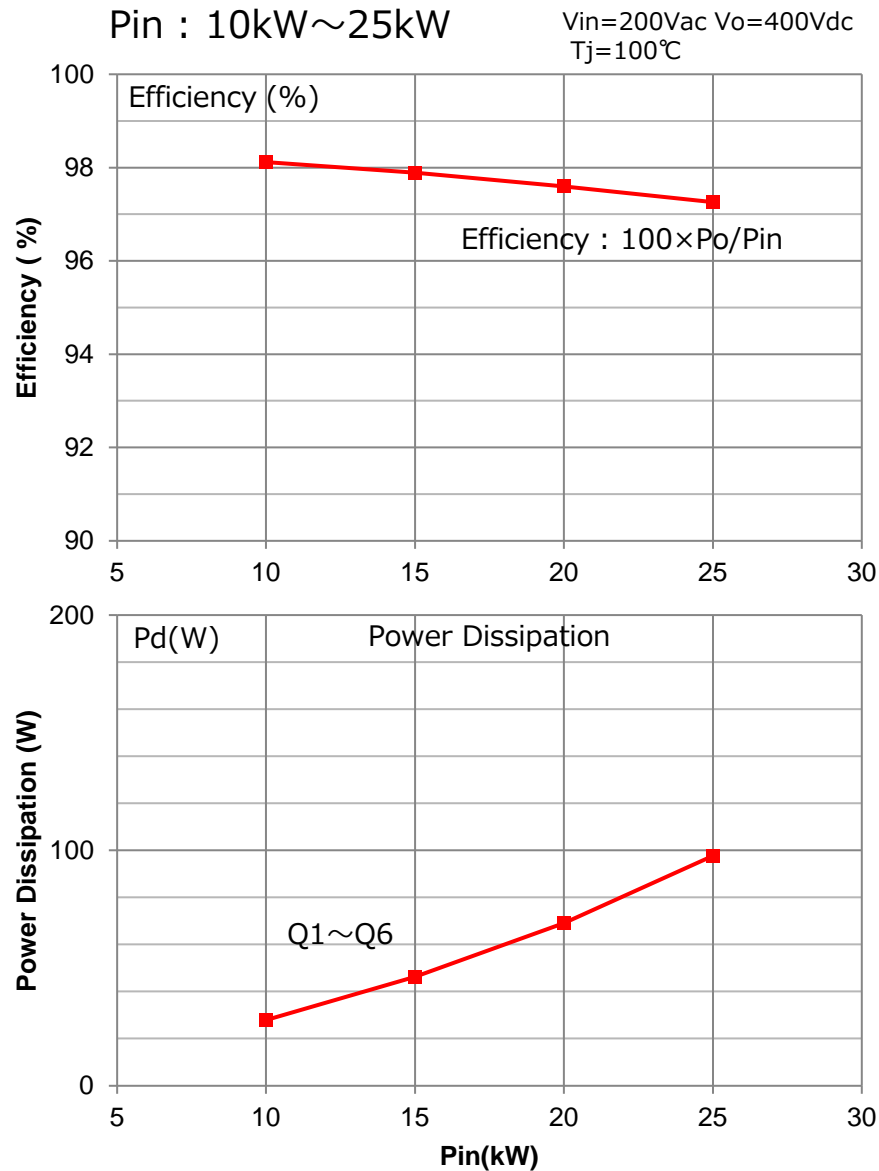




# Efficiency, Power Dissipation



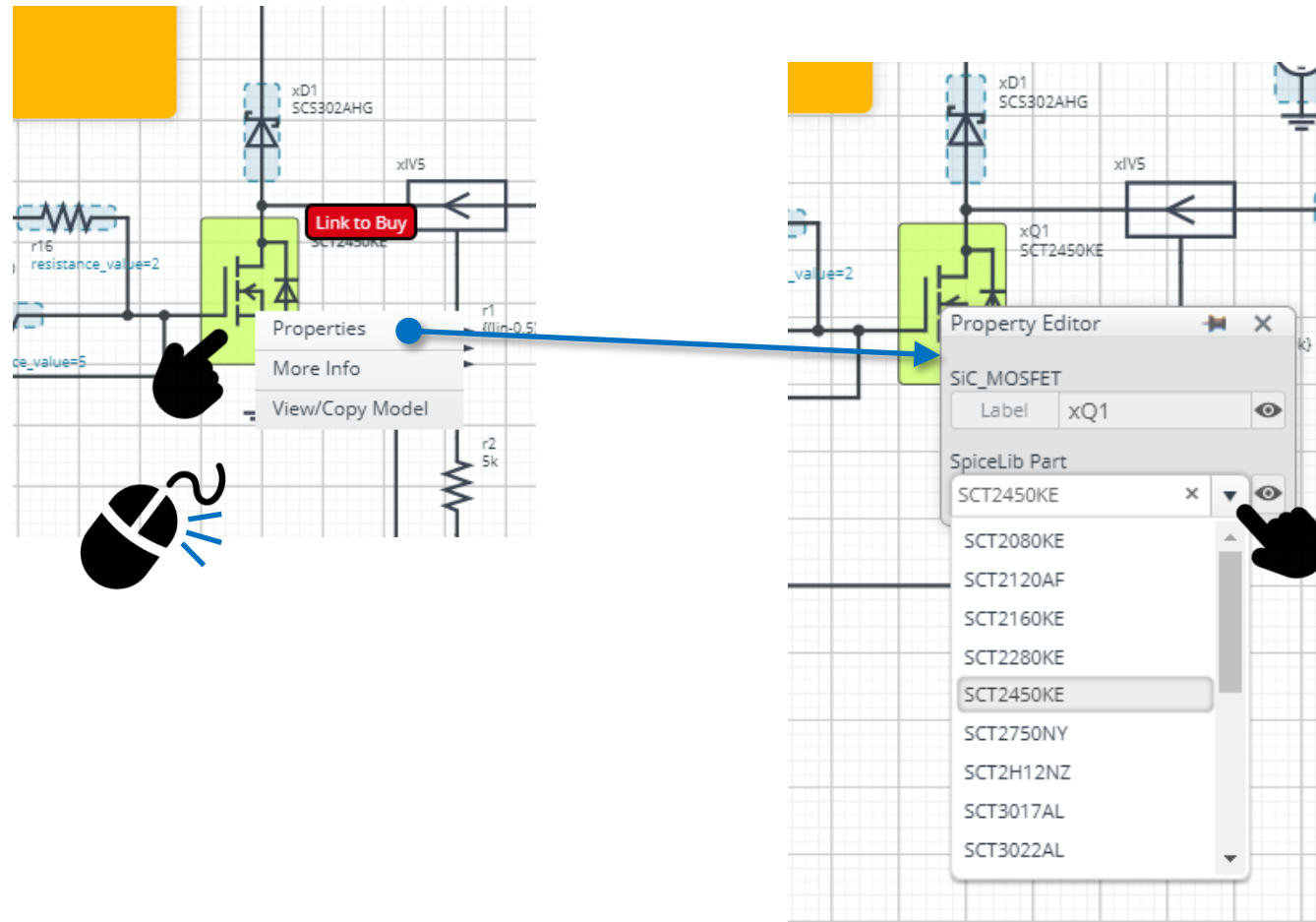
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# How to change the devices

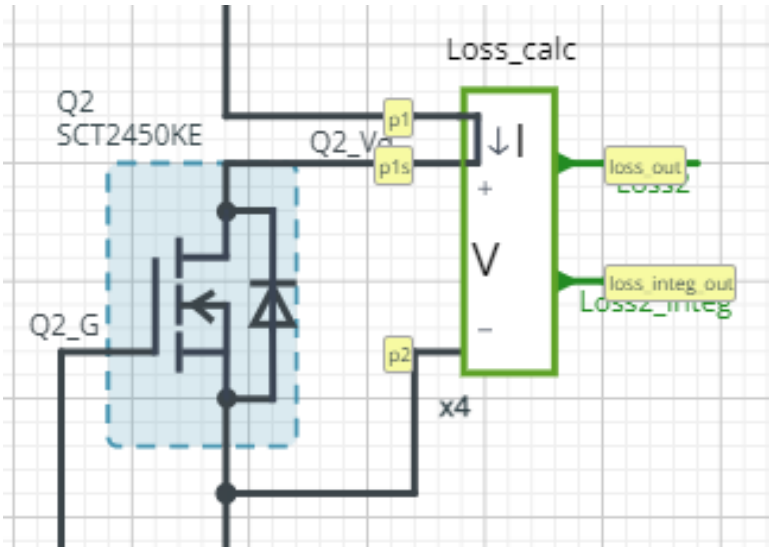
Right-click on the device → Select Properties → Pull down “SpiceLib Part” → Select the product



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

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## Loss calculation model 'Loss\_calc'



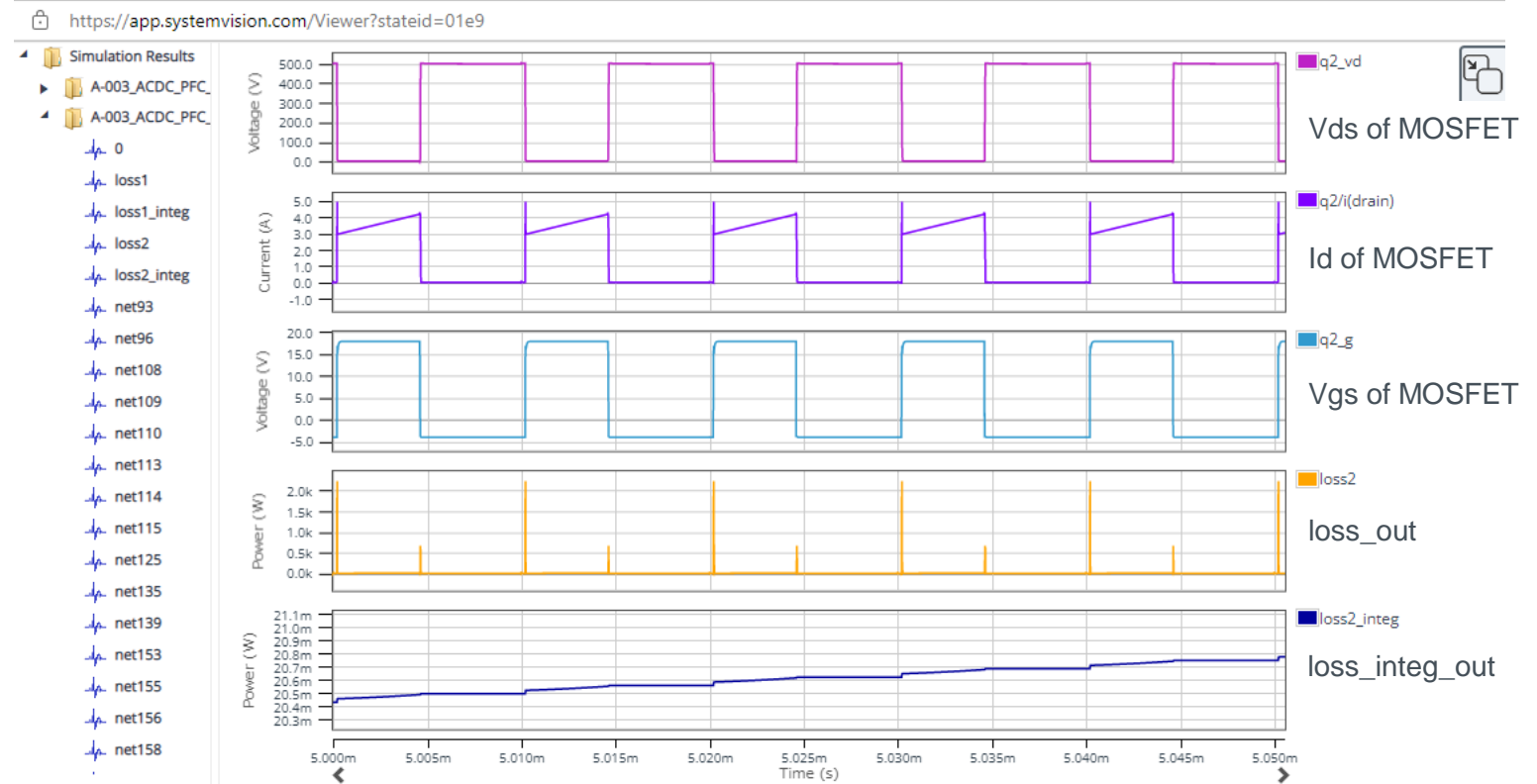
$$loss\_out(t) = I(t) \times V(t)$$

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

I : Current through p1 to p1s

V : Voltage between p1s and p2

## Waveform example



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