

C-009. DC-DC Buck Synchro Converter 2-Phase

$V_o=250V$, $I_o=200A$

ROHM Solution Simulator Schematic Information



2023. Feb
64UG126E Rev.004

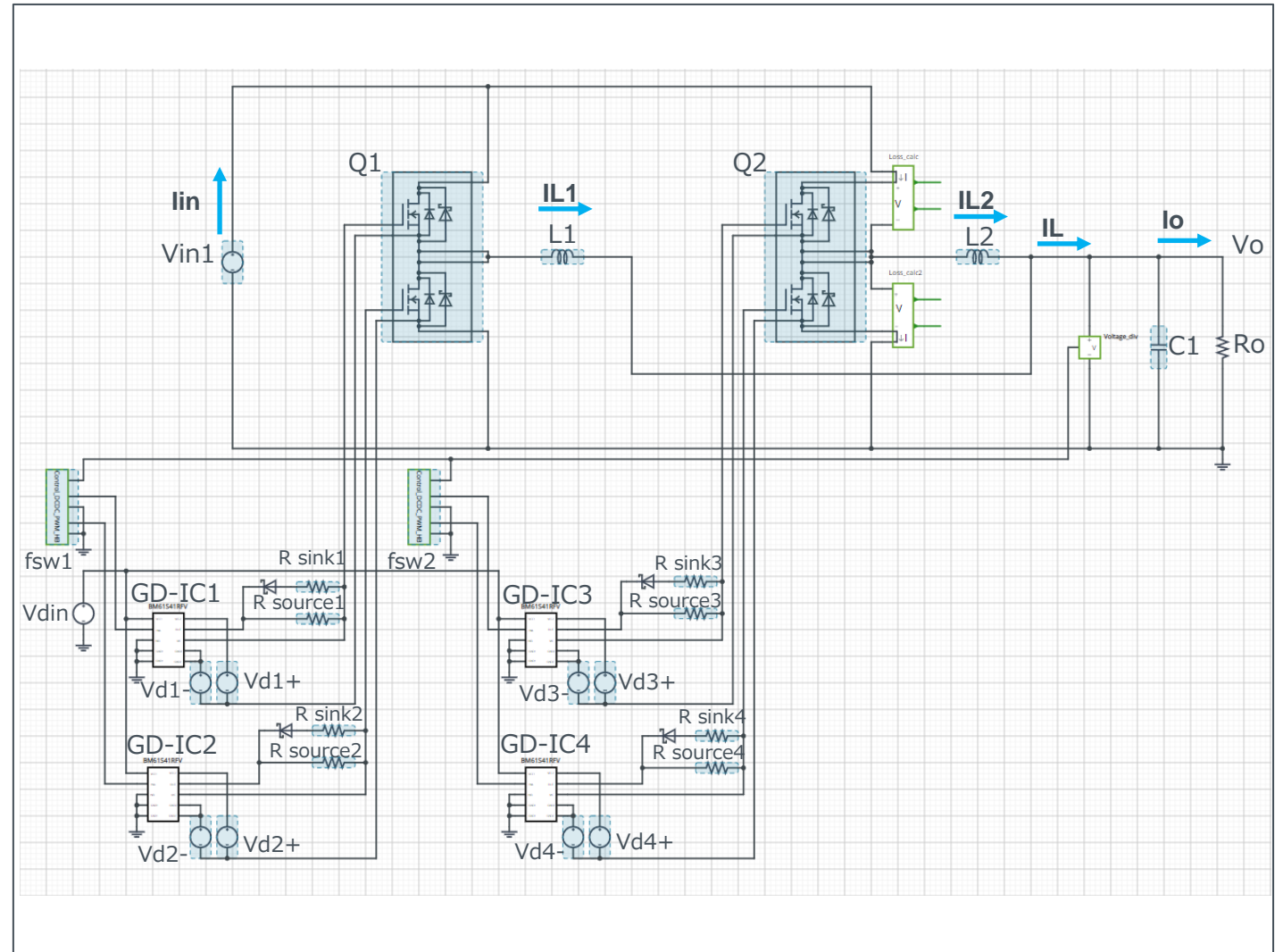
Simulation Parameters

Component name	Component	Default	Simulation Setting Range
Vin1	Input voltage	800Vdc	
Vo	Output voltage	250Vdc	
Io	Output current	200Adc	
fsw1,2	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
Q1,2	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 -
L1,2	Inductor	100μH	10μH - 2mH
C1	Capacitor	10μF	1μF - 1mF
Ro	Output Resistor	{Vo/Io}	

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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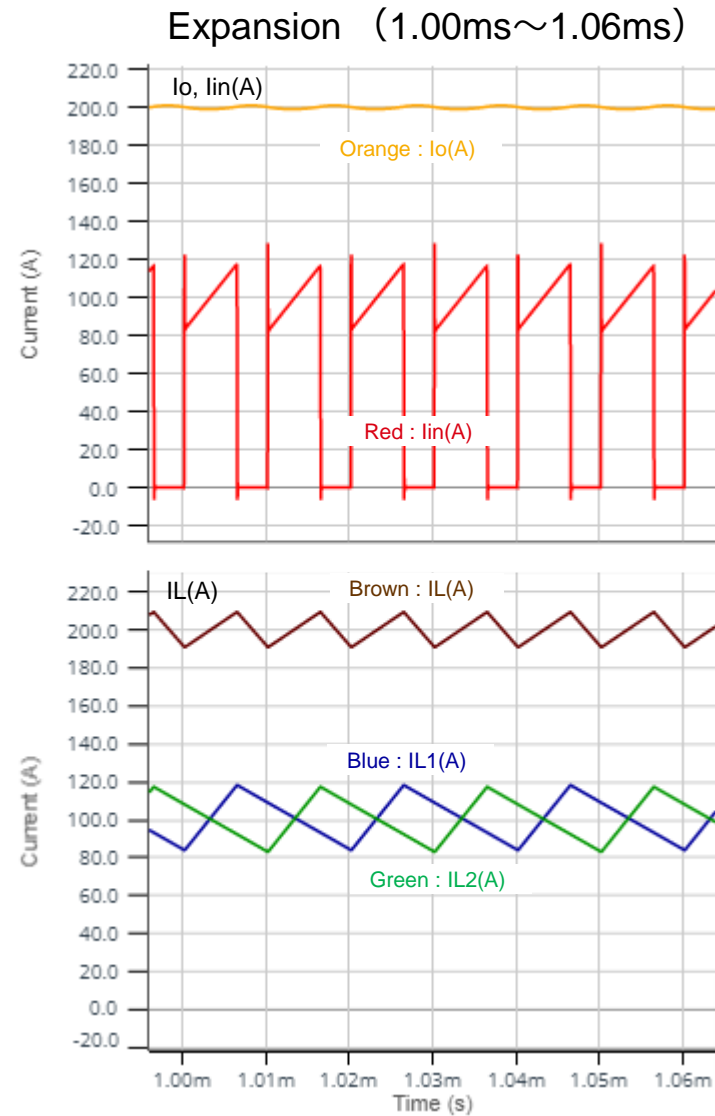
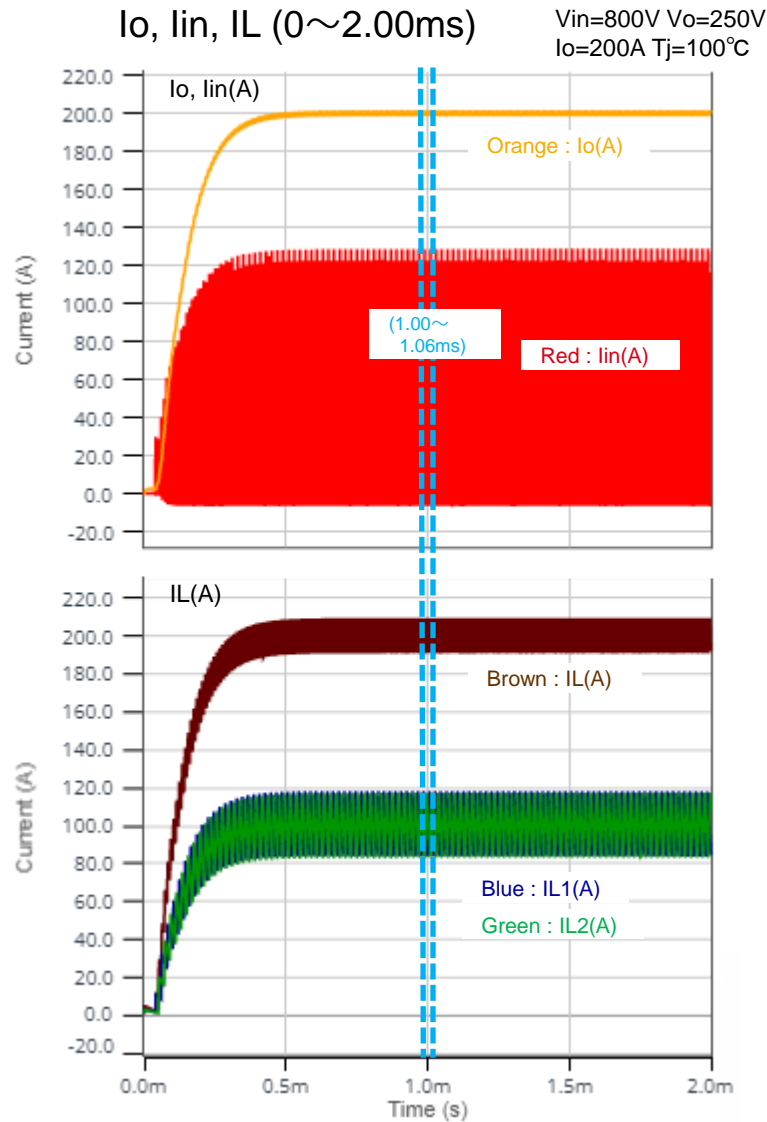
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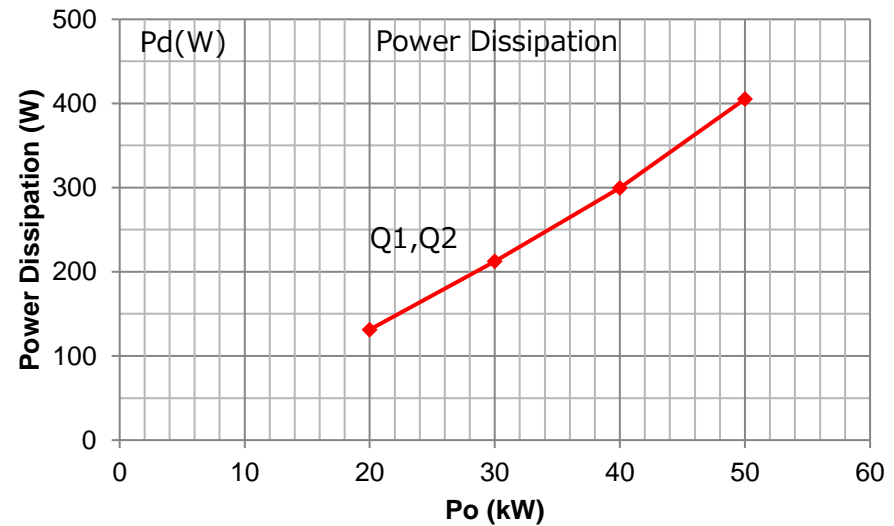
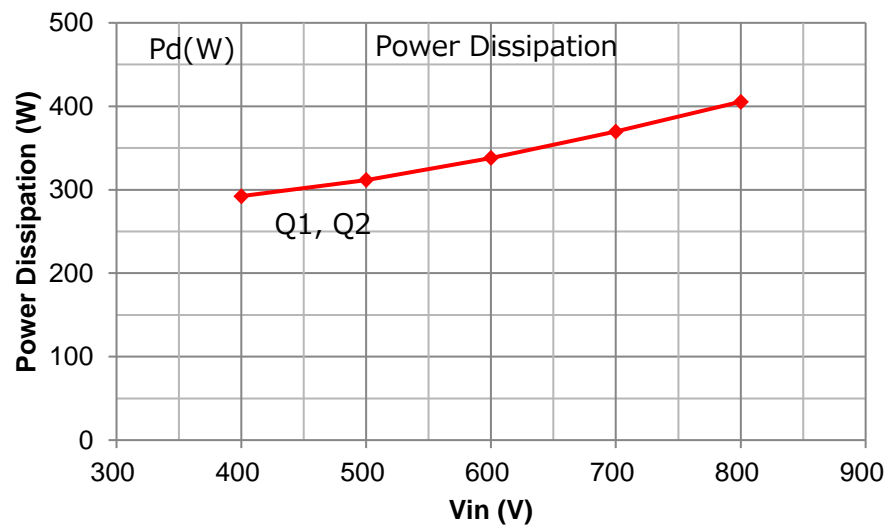
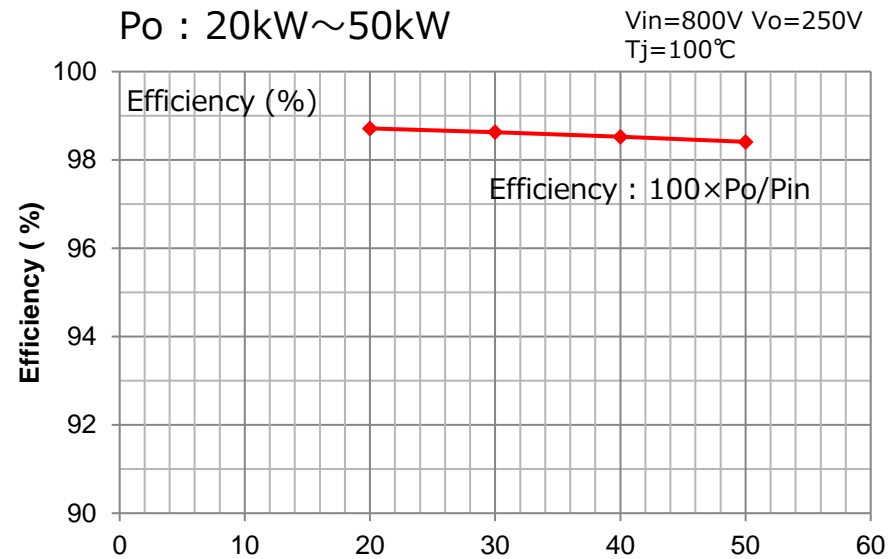
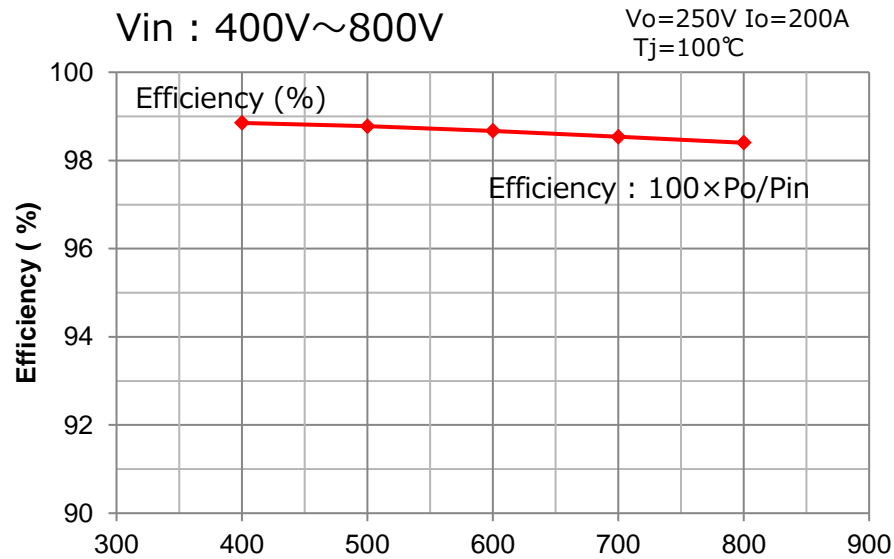
Selectable Devices

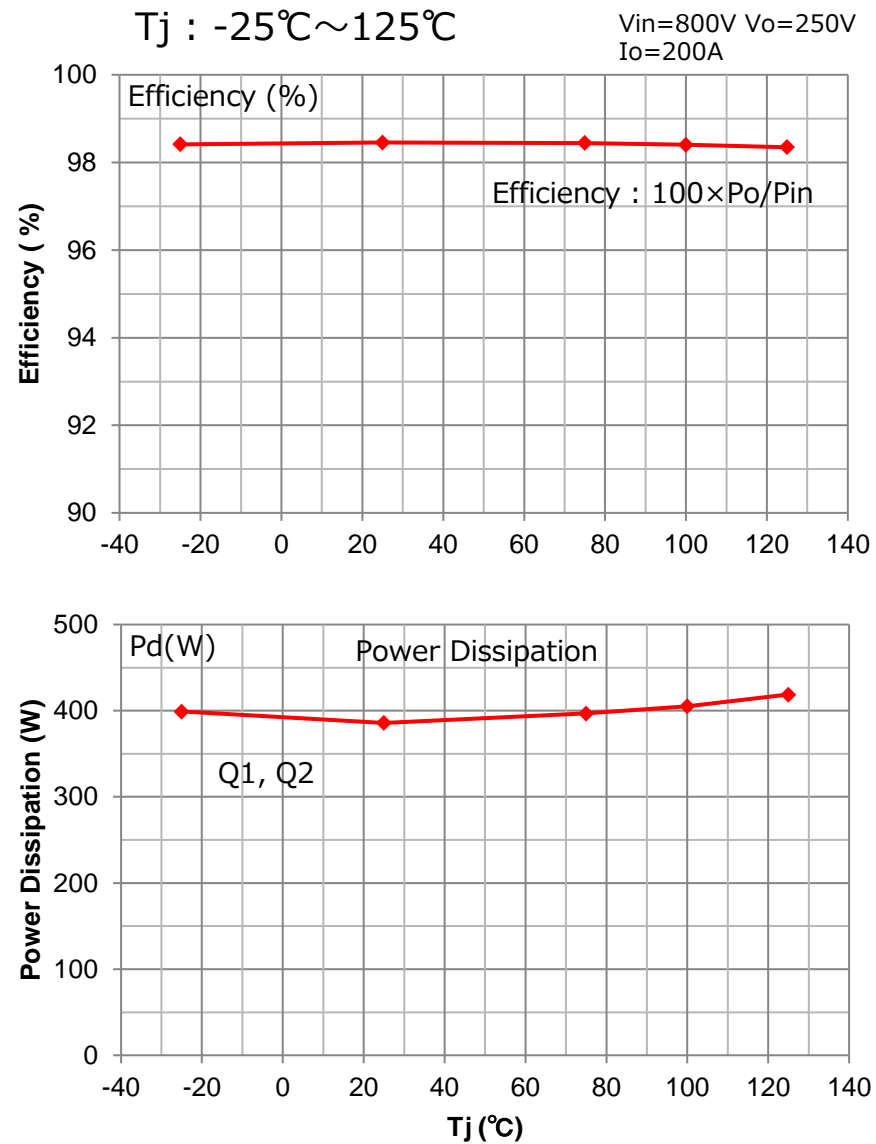
Component name	Component	Product No.	feature
Q1,2	SiC Power Module	BSM080D12P2C008	800V, 120A
		BSM120D12P2C005 (*)	1200V, 120A

* Default device



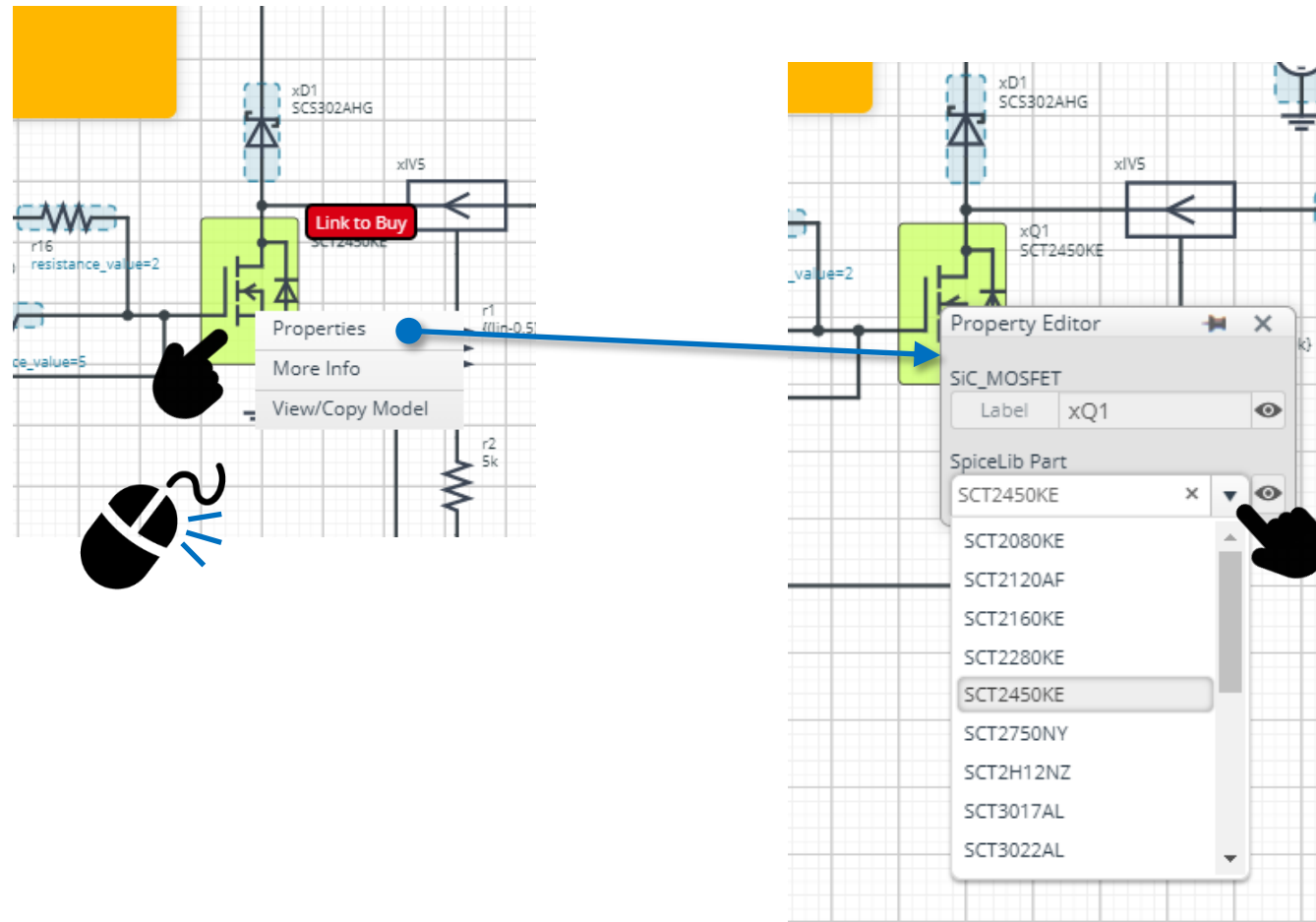
Efficiency, Power Dissipation 1





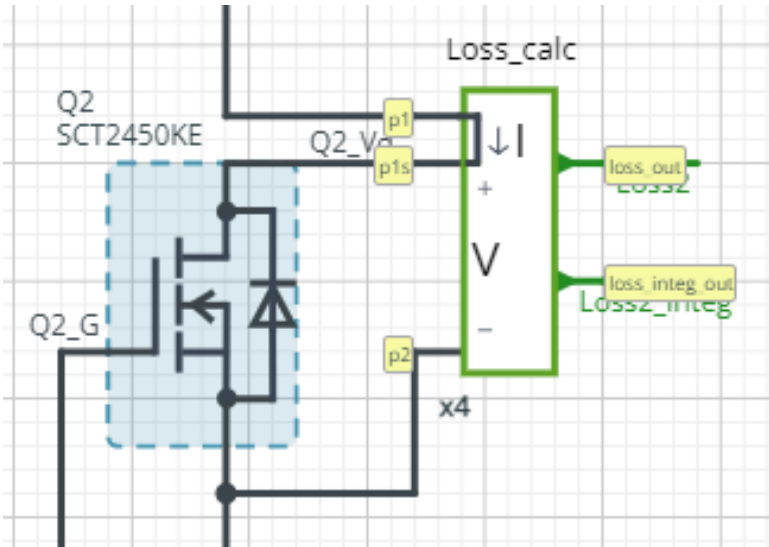
How to change the devices

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.

Loss calculation model 'Loss_calc'



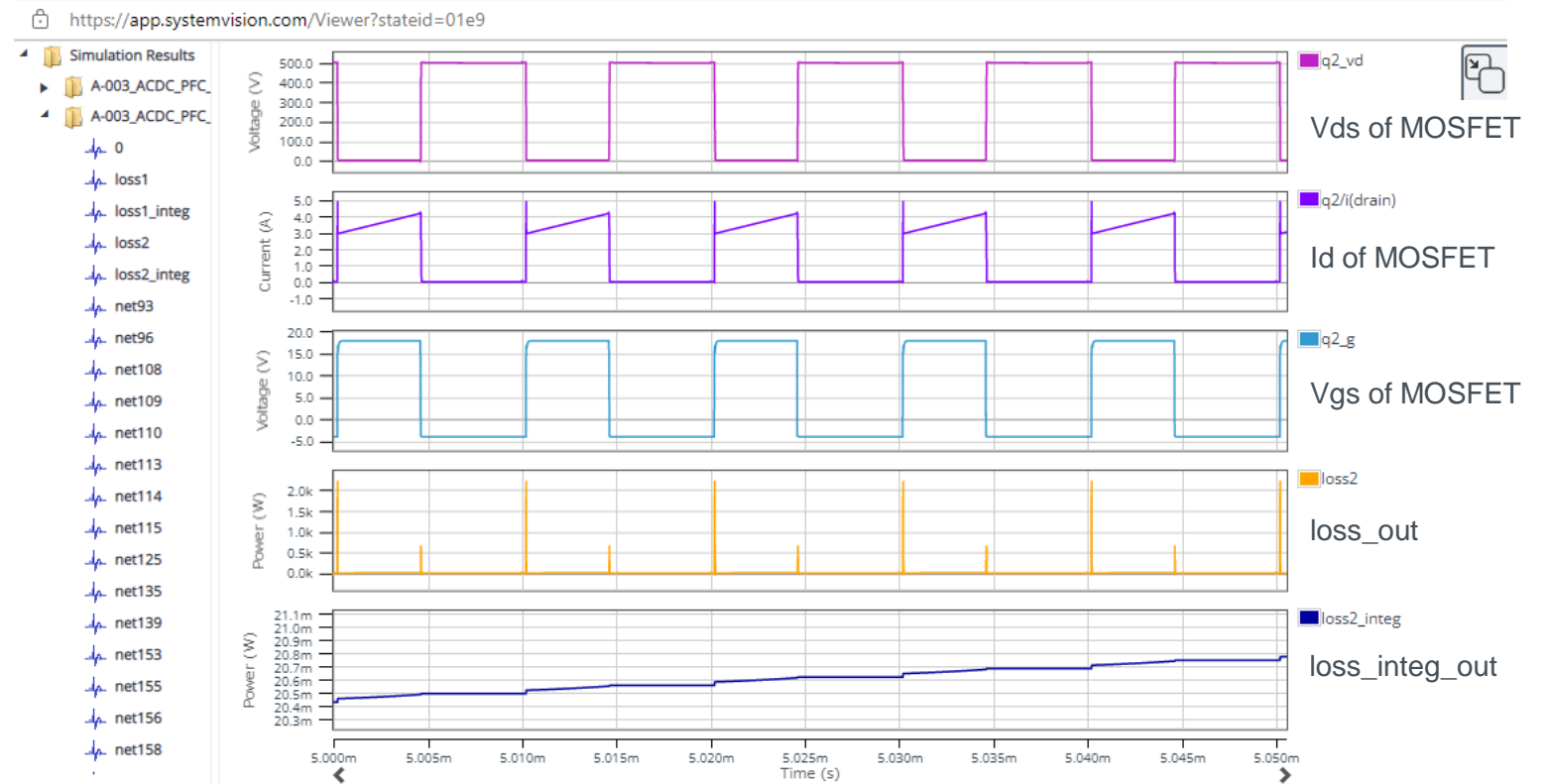
$$loss_out(t) = I(t) \times V(t)$$

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

I : Current through p1 to p1s

V : Voltage between p1s and p2

Waveform example



Notes

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