

C-002. DC-DC Boost Converter $V_o=800V$, $I_o=20A$

ROHM Solution Simulator Schematic Information



2023. Feb
64UG119E Rev.004

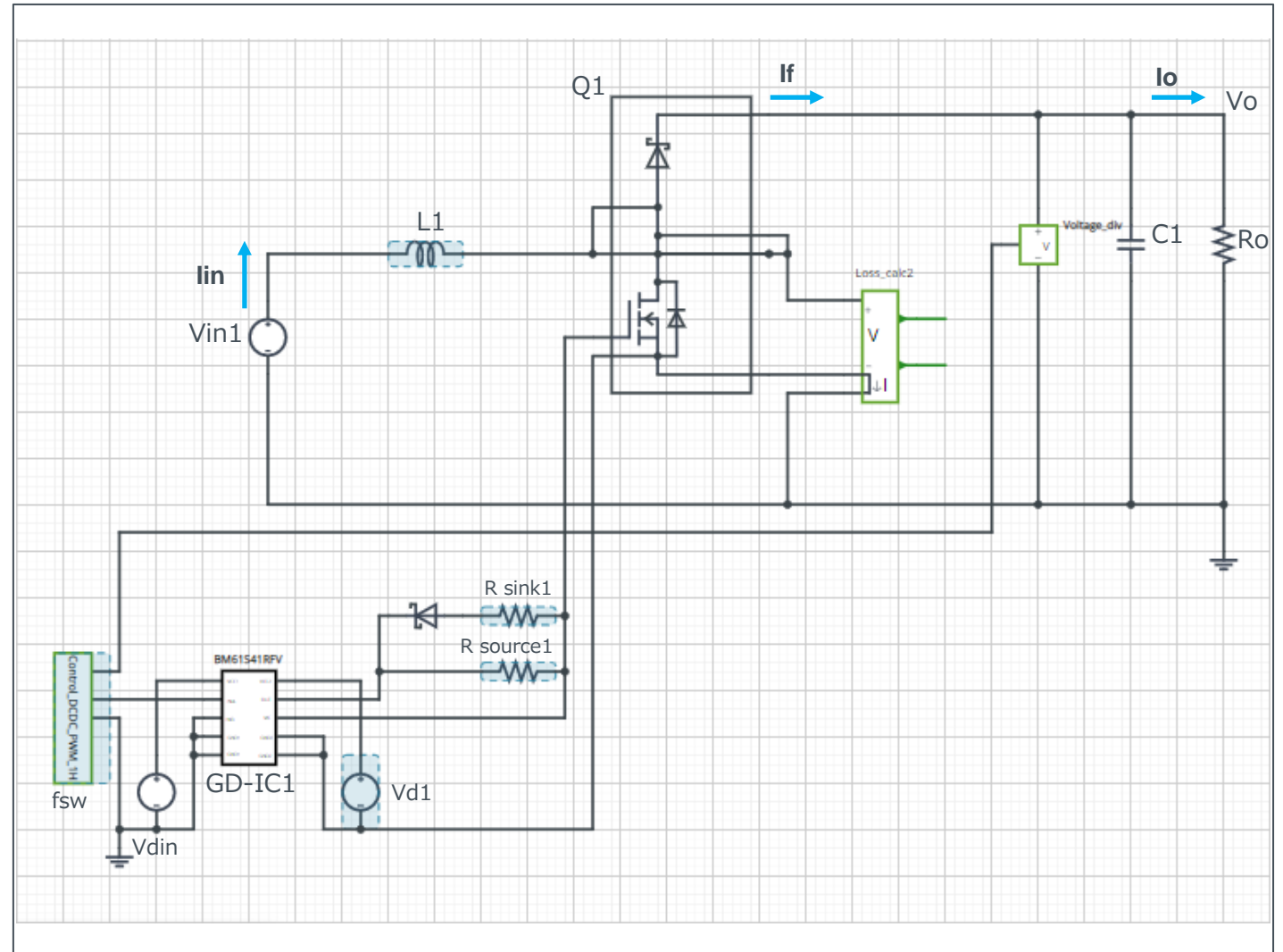
Simulation Parameters

Component name	Component	Default	Simulation Setting Range
Vin1	Input voltage	250Vdc	
Vo	Output voltage	800Vdc	
Io	Output current	20Adc	
fsw	Switching frequency	50kHz	10k – 300kHz
Tj	Temperature	100°C	
Vd1	Gate Drive voltage H	18V	10 – 20V
Vdin	Signal voltage level	5V	

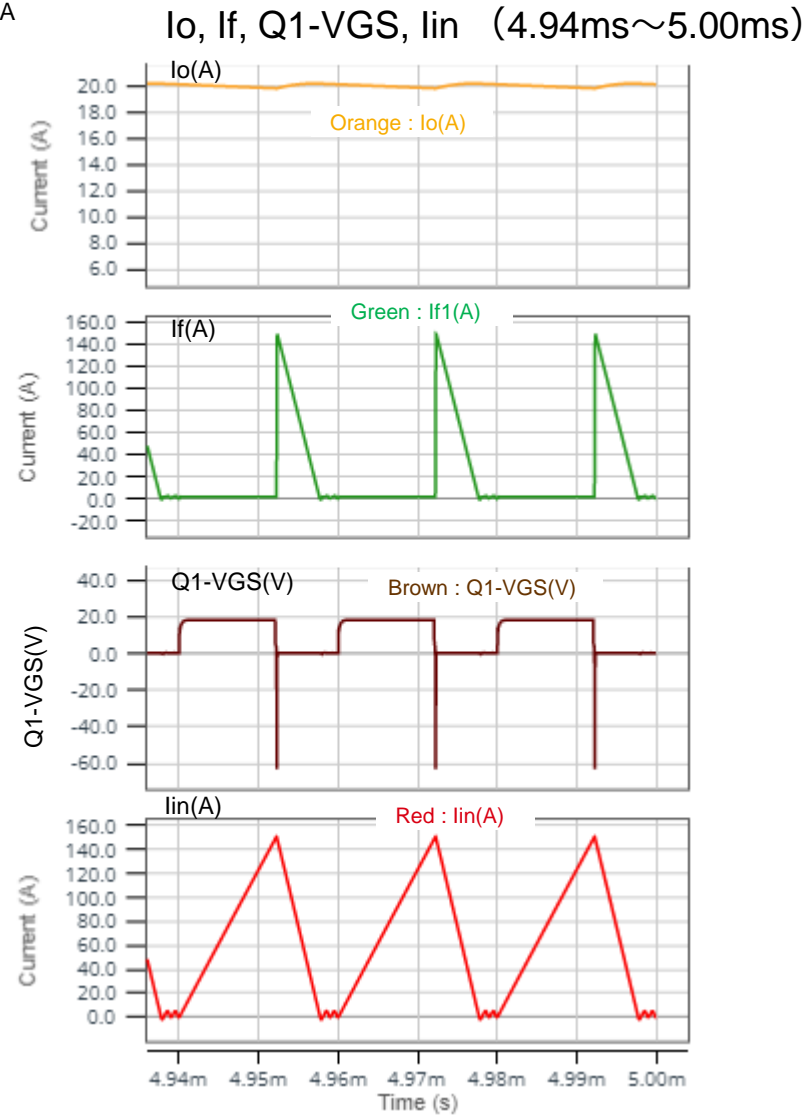
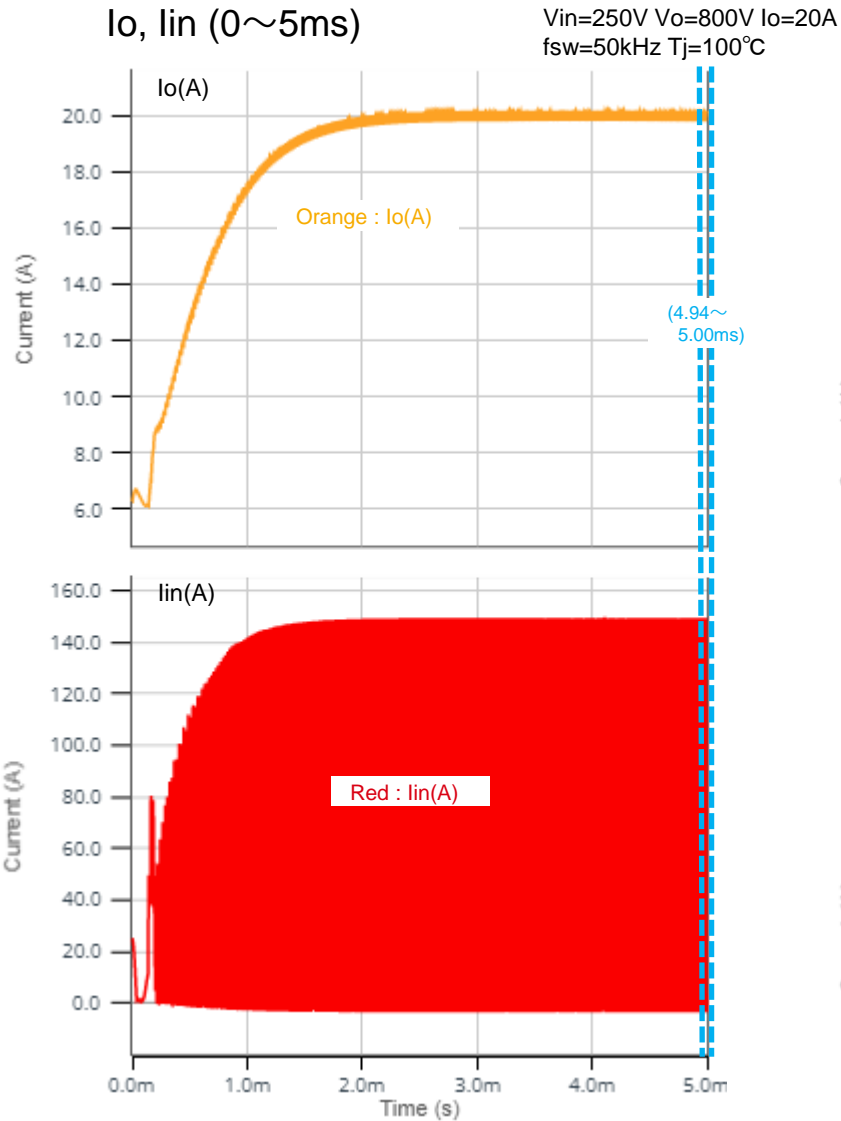
Devices

Component Name	Component	Default	Simulation Setting Range
Q1	SiC Power Module	BSM120C12P2C201 (1200V, 134A, Chopper)	
GD-IC1	Gate Driver	BM61S41RFV-C	
R sink1	Resistor for sink	ESR18 1Ω	0.1 -
R source1	Resistor for source	ESR18 2Ω	0.1 -
L1	Inductor	20μH	10μH - 2mH
C1	Capacitor	20μF	1μF - 1mF
Ro	Output Resistor	{Vo/Io}	

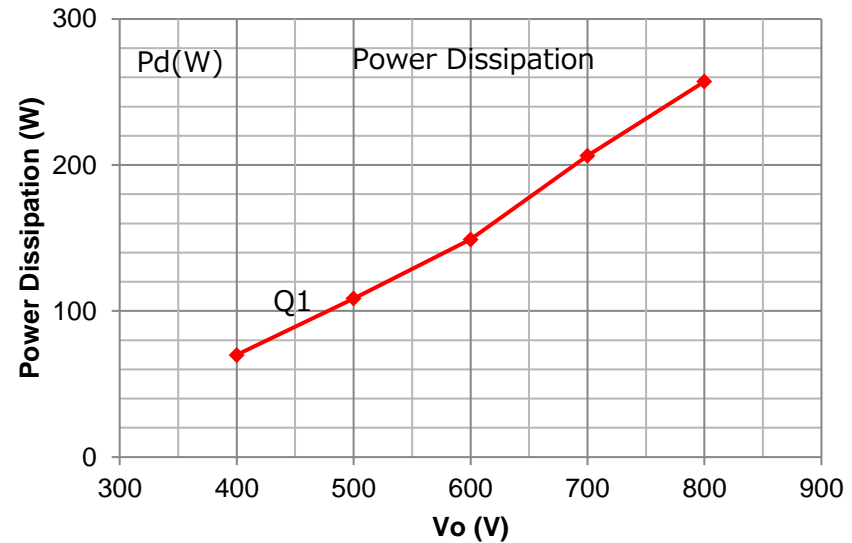
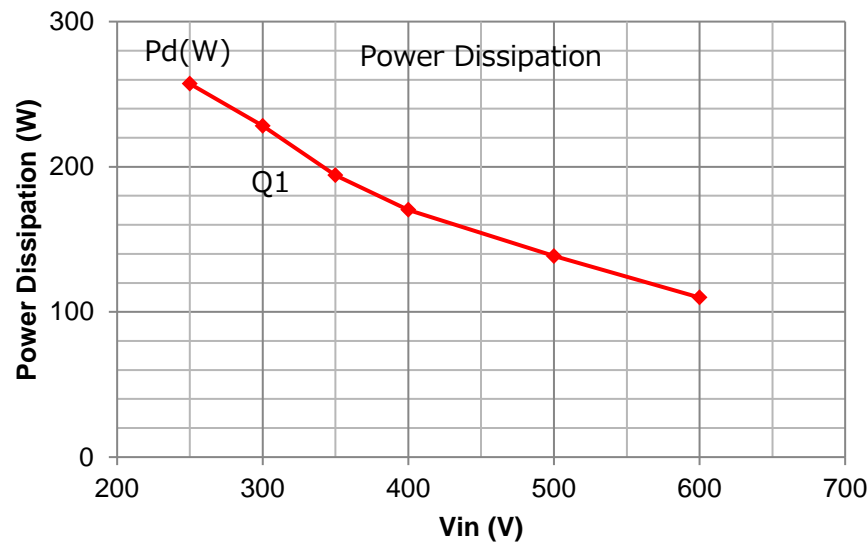
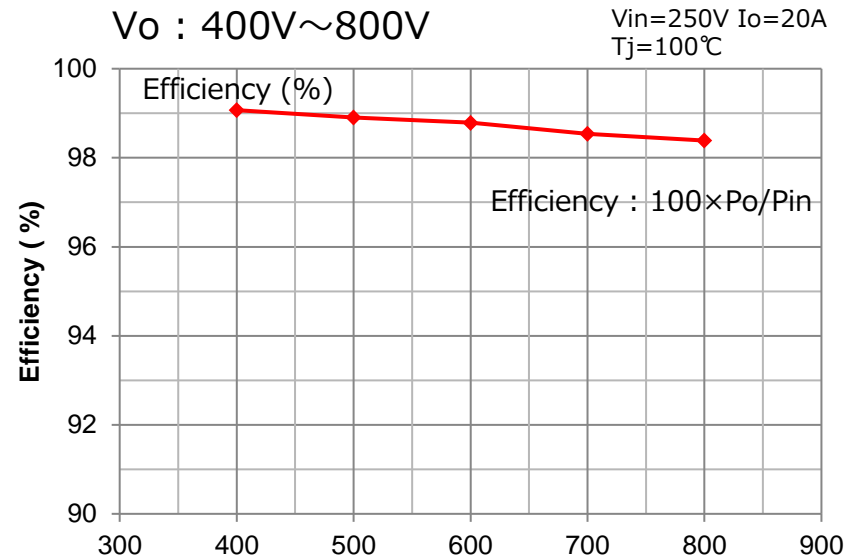
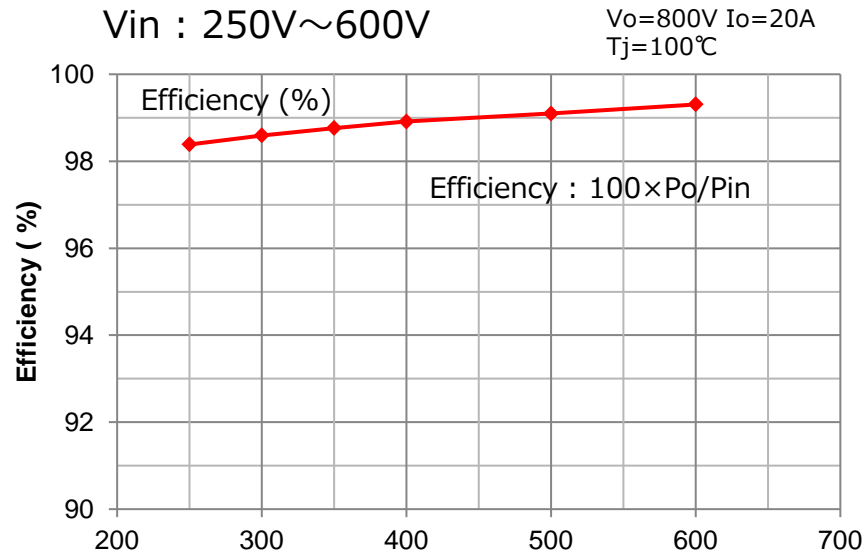
Simulation Circuit

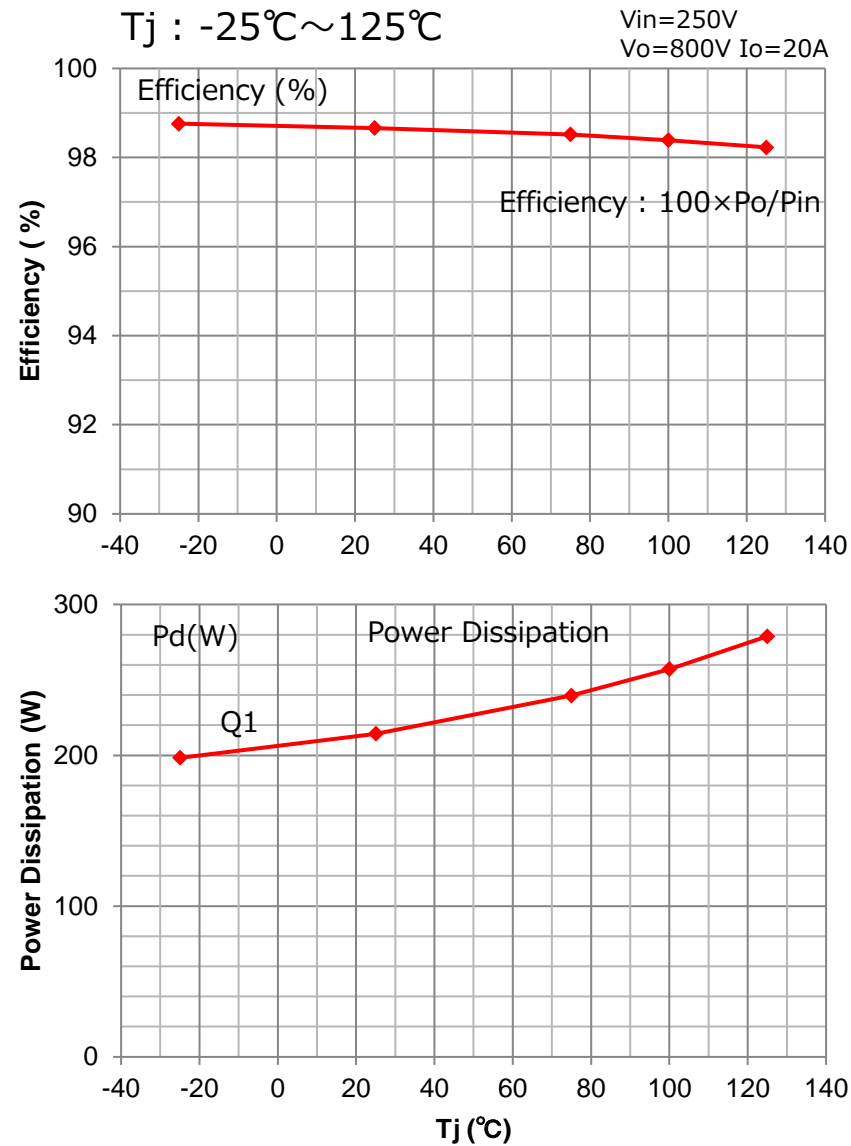


Note: The Loss_calc component is a utility module to support power loss calculation and does not affect the simulation results of circuit operation or performance.



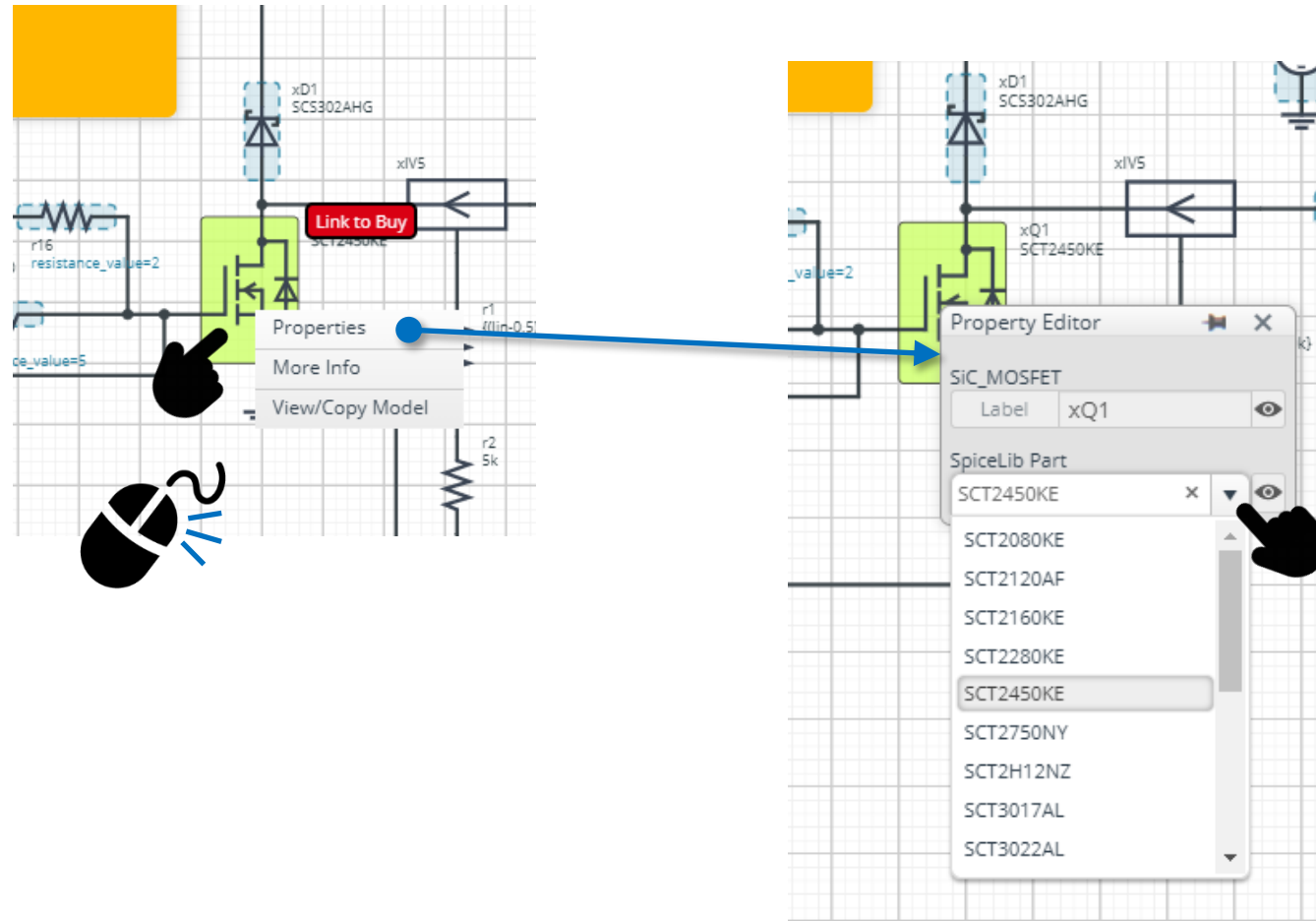
Efficiency, Power Dissipation 1





How to change the devices

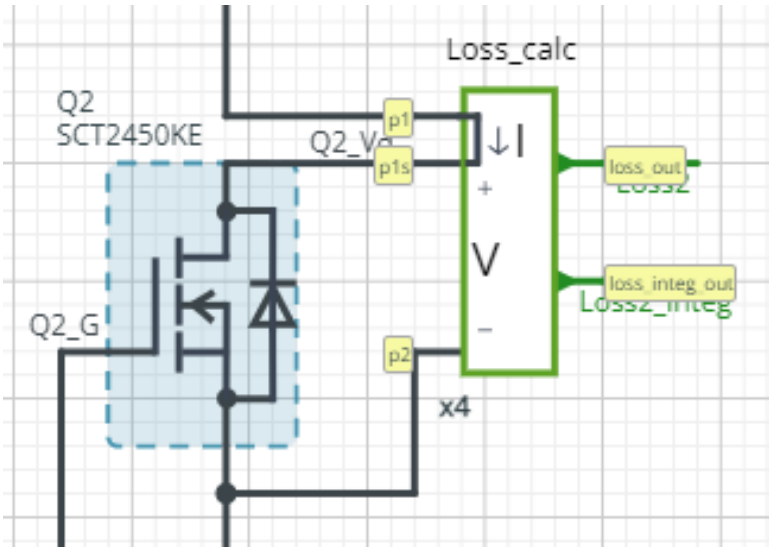
Right-click on the device → Select Properties → Pull down “SpiceLib Part” → Select the product



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

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Loss calculation model 'Loss_calc'



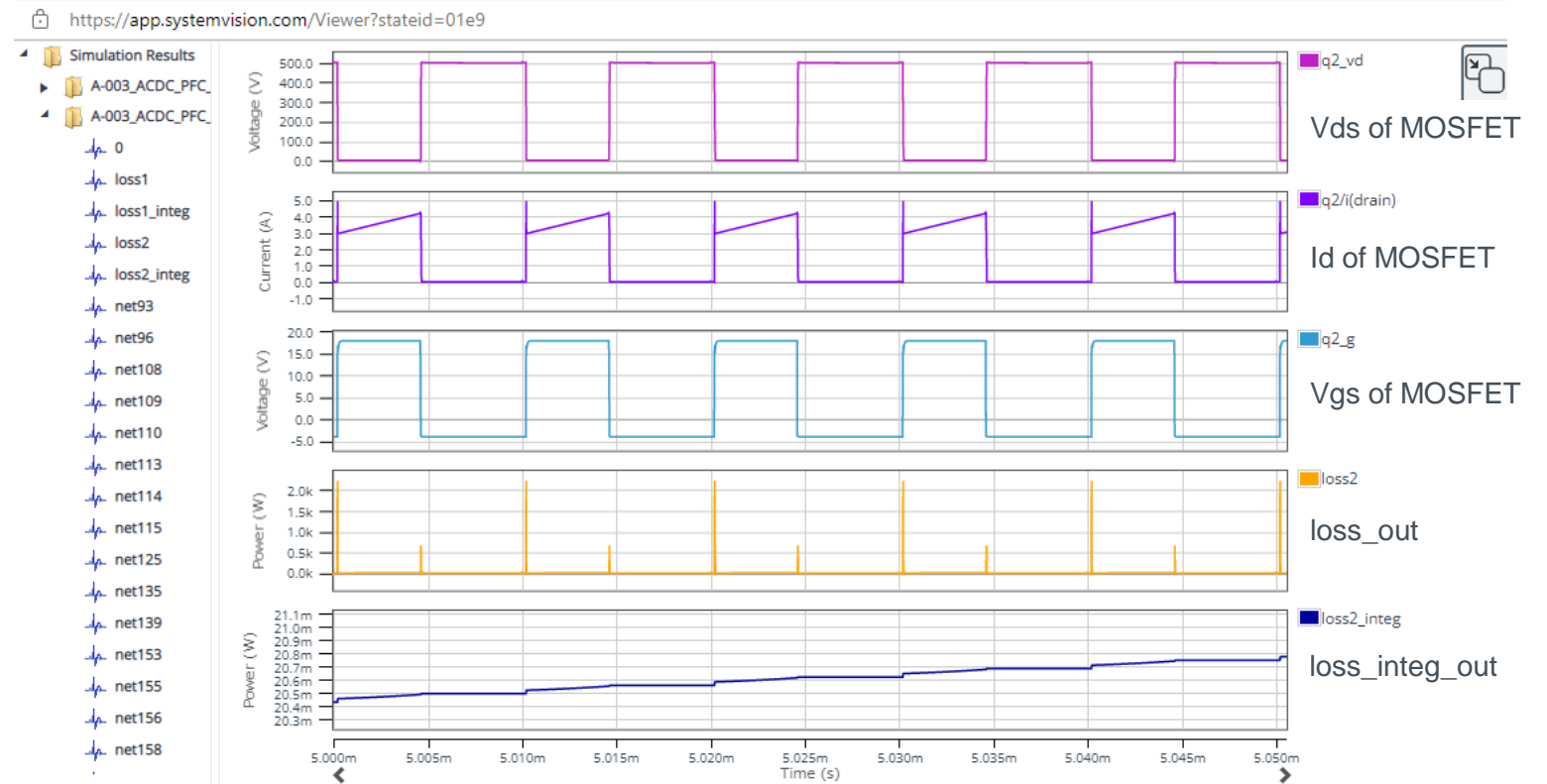
$$loss_out(t) = I(t) \times V(t)$$

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

I : Current through p1 to p1s

V : Voltage between p1s and p2

Waveform example



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