C-022. DC-DC Active Clamp Flyback Converter Vin=800V, Vo=24V, Io=10A

ROHM Solution Simulator Schematic Information

2026. Feb.
68UG086E Rev.001

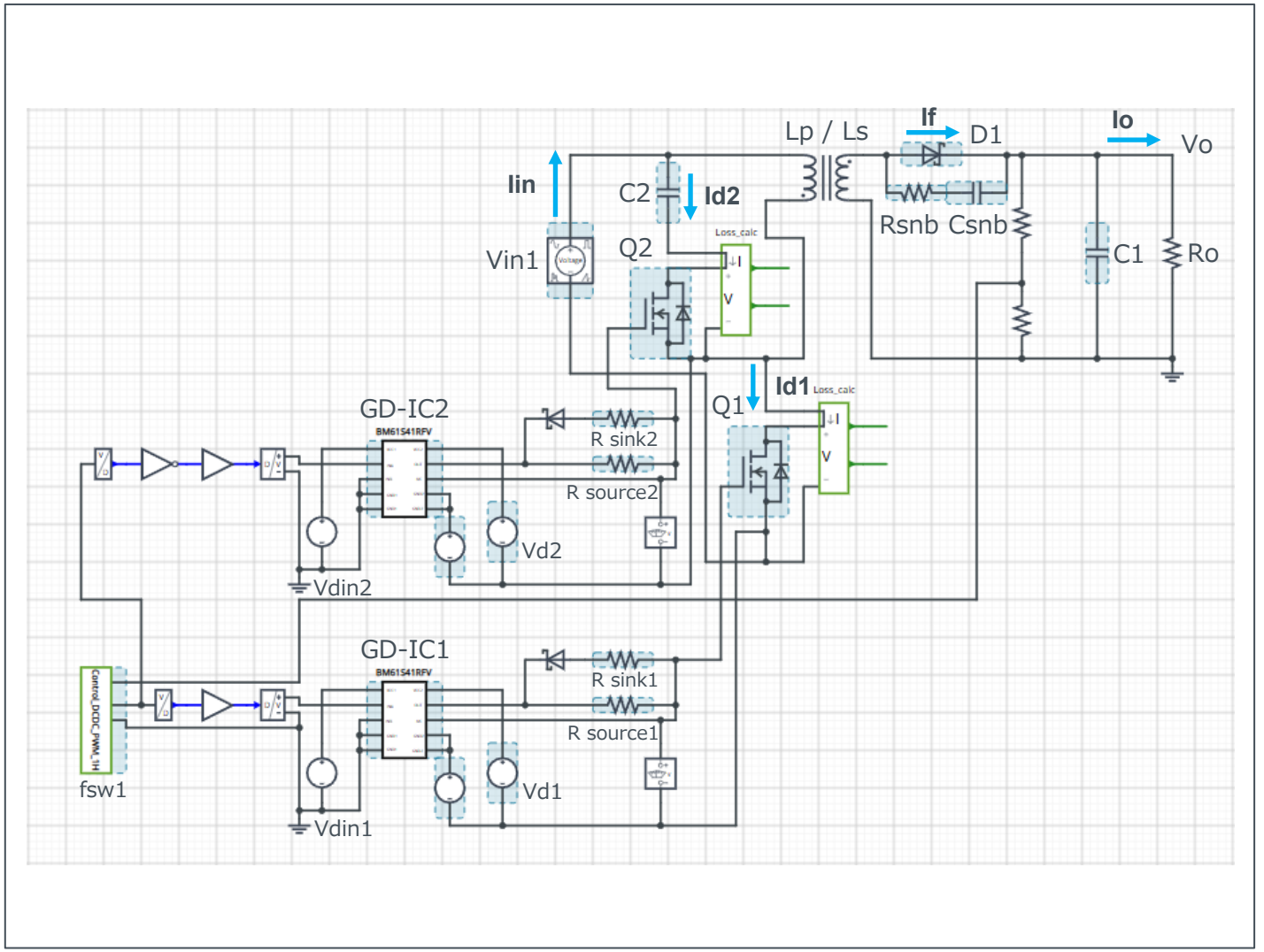
Simulation Parameters

Component name	Component	Default	Simulation Setting Range
Vin1	Input voltage	800Vdc	1 – 800V
Vo	Output voltage	24Vdc	
Io	Output current	10Adc	
fsw1	Switching frequency	100kHz	10k – 300kHz
Tj	Temperature	100°C	
Vd1	Gate drive voltage H	18V	10 – 20V
Vdin	Signal voltage level	5V	
Lp / Ls	Transformer	500µH / 20µH K=0.95	

Devices

Component Name	Component	Default	Simulation Setting Range
Q1,2	SiC MOSFET SJ MOSFET	Selectable	
D1	SiC SBD	Selectable	
GD-IC1,2	Gate Driver	Selectable	
R sink1,2	Resistor for sink	ESR18 2Ω	0.1 -
R source1,2	Resistor for source	ESR18 5Ω	0.1 -
C1	Capacitor	200µF	1µF - 2mF
C2	Capacitor	150nF	1pF - 1mF
Ro	Output Resistor	{Vo/Io}	
Csnb	Snubber capacitor	1nF	
Rsnb	Snubber resistor	100Ω	

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.

C-022. DC-DC Active Clamp Flyback Converter Vin=800V, Vo=24V, Io=10A

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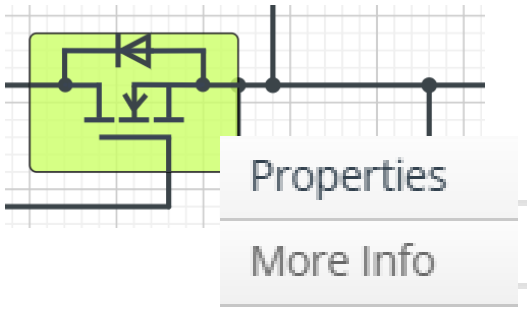
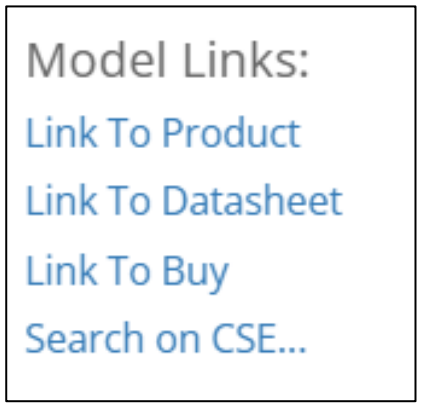
Selectable Devices

Component name	Component
Q1,2	SiC MOSFET

For more information, go to **“More Info”** and click on **“Link to Datasheet”**.





SiC MOSFET part number information

S C T 4 0 3 6 K R

Part No.

Product category 1
SC: SiC discrete device

Product category 2
T: MOSFET

Product generations
2: 2nd Generation
3: 3rd Generation
4: 4th Generation

ON-resistance (Typ.)
013: 13 mΩ
017: 17 mΩ
018: 18 mΩ
022: 22 mΩ
026: 26 mΩ
030: 30 mΩ
036: 36 mΩ
040: 40 mΩ
045: 45 mΩ
060: 60 mΩ
062: 62 mΩ
080: 80 mΩ
105: 105 mΩ
120: 120 mΩ
160: 160 mΩ
280: 280 mΩ
H12: 1150 mΩ

Rated voltage
A: 650 V
D: 750 V
K: 1200 V
N: 1700 V

Package
E: TO-247 (TO-247N) Other than 3rd generation
L: TO-247 (TO-247N) 3rd generation only
R: TO-247-4L
W7: TO-263-7L
WA: TO-263-7LA
Z: TO-3PFM
* JEDEC code. Parentheses indicate ROHM packages.

Product Lineup: SiC MOSFETs

Note) We have not been able to confirm operation with all combinations. Please read the disclaimer carefully.

C-022. DC-DC Active Clamp Flyback Converter Vin=800V, Vo=24V, Io=10A

ROHM Solution Simulator Schematic Information

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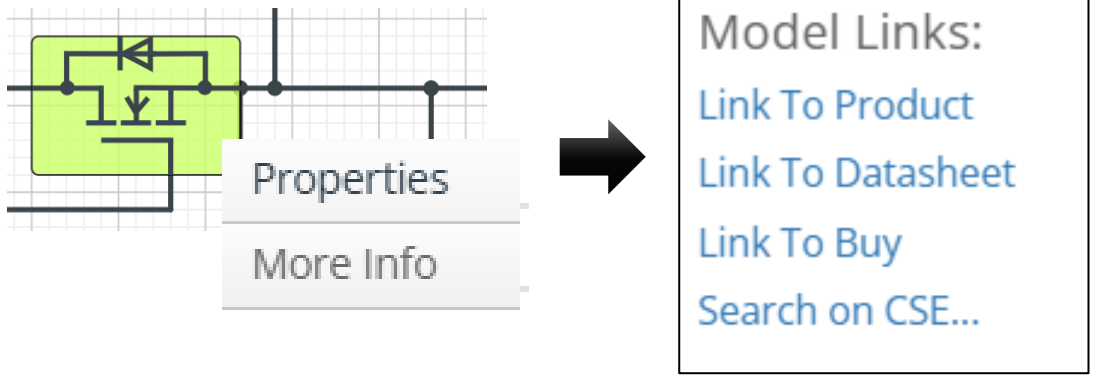
Selectable Devices

Component name	Component	Product
Q1,2	SJ MOSFET	RxxxxKN series RxxxxYN series

For more information, go to **“More Info”** and click on **“Link to Datasheet”**.



SJ MOSFET part number information

Single type

R 6 0 0 4 P N D 3 F R A

Part No.

ROHM

V_{DSS}
52: 525V
60: 600V
65: 650V
80: 800V

I_D
00: < 1A
01: 1A
02: 1A < I_D ≤ 2A
03: 3A
04: 4A
: :
77: 77A
86: 86A

Polarity
N: Nch

Series
A: 1st Gen, For Automotive
C: 1st Gen, For Automotive, Built-in ESD Protection
E: 3rd Gen, Low Noise
J: 3rd Gen, Fast recovery
K: 3rd Gen, Fast switching
P: 1st Gen, For Automotive
R: 3rd Gen, Fast recovery, Low Noise
Y: 4th Gen, Fast switching
V: 4th Gen, Fast recovery

Grade
None: Standard
FRA: Automotive
FRG: Automotive

Package
D3: TO-252
D4: SOT-223-3
H: SOP8
J: TO-263 (LPTS)
X: TO-220FM
X3: TO-220AB
Z: TO-3PF
Z4: TO-247AD (TO-247)

➧ Product Lineup: Super Junction MOSFETs

Note) We have not been able to confirm operation with all combinations. Please read the disclaimer carefully.

C-022. DC-DC Active Clamp Flyback Converter Vin=800V, Vo=24V, Io=10A

ROHM Solution Simulator Schematic Information

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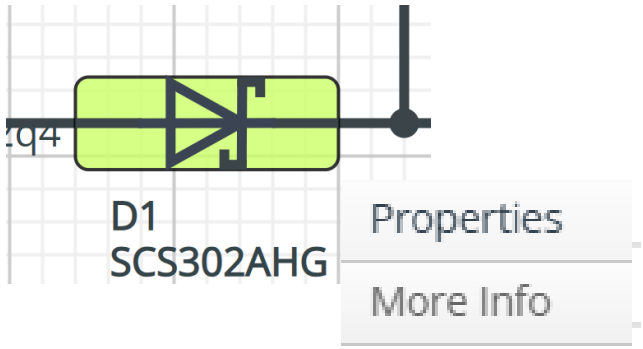
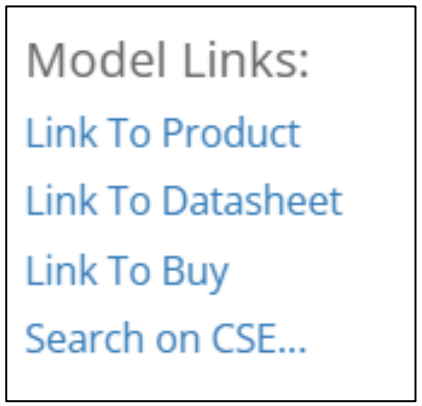
Selectable Devices

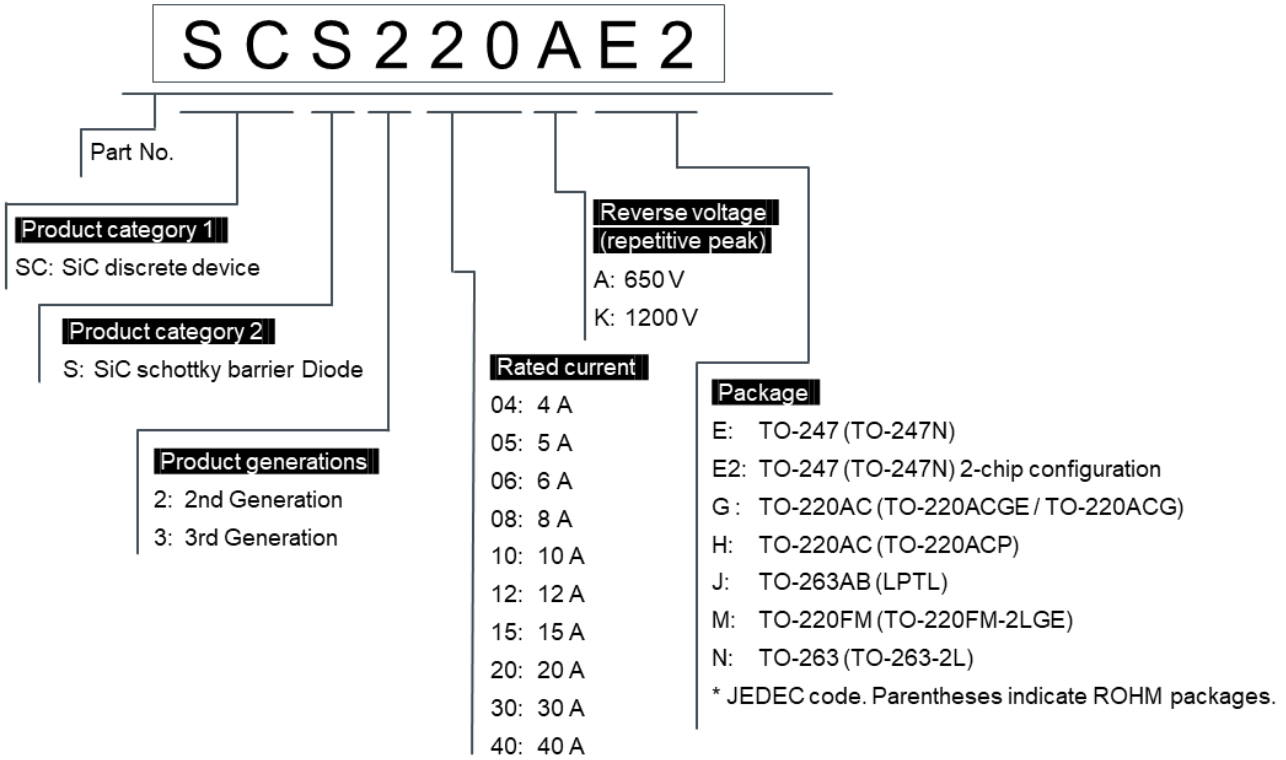
Component name	Component
D1	SiC Schottky Barrier Diode

For more information, go to **“More Info”** and click on **“Link to Datasheet”**.





SiC Schottky Barrier Diode part number information



➧ Product Lineup: SiC Schottky Barrier Diodes

Note) We have not been able to confirm operation with all combinations. Please read the disclaimer carefully.

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Selectable Devices

Component name	Component	Product No.	feature
GD-IC1,2	Gate Driver	BM61S41RFV-C (*)	**for SiC MOSFET** Isolation Voltage : 3750 Vrms I/O Delay Time (max) : 65ns Miller Clamp : Built-in UVLO : 14.5V
		BM61M41RFV-C	**for SJ-MOS / IGBT** Isolation Voltage : 3750 Vrms I/O Delay Time (max) : 65ns Miller Clamp : Built-in UVLO : 7.4V

* Default device

Simulation Waveform

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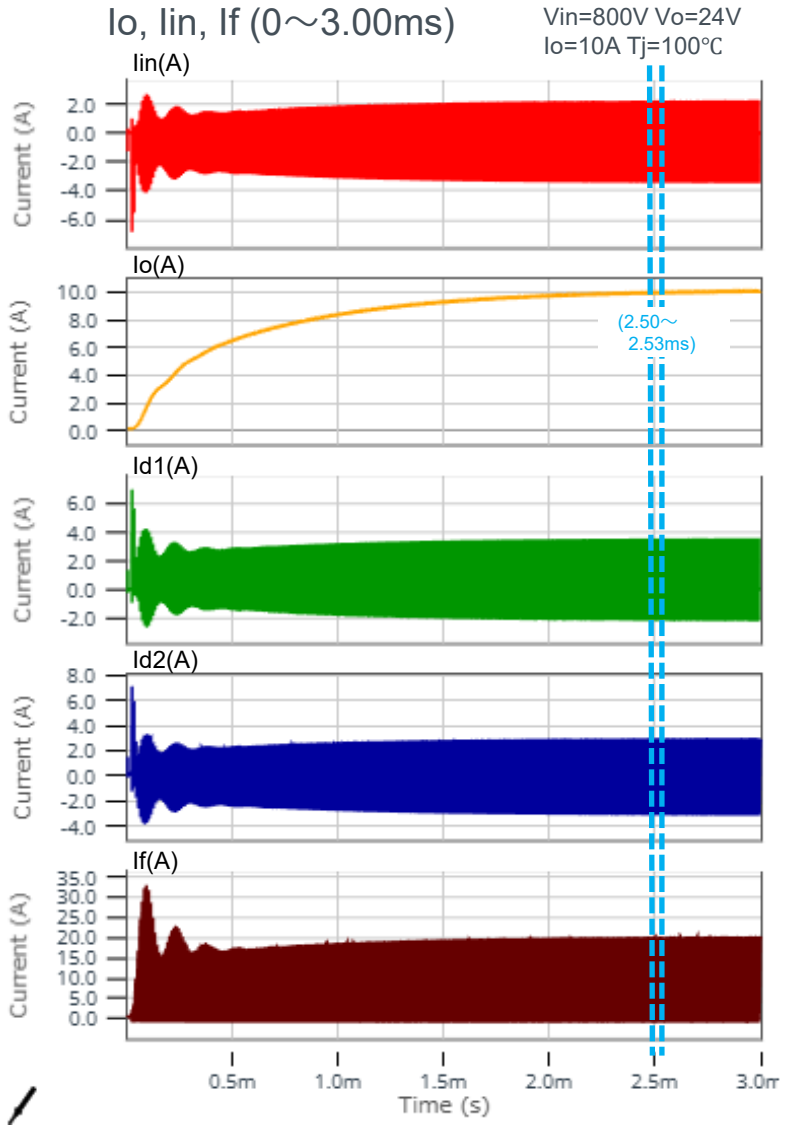
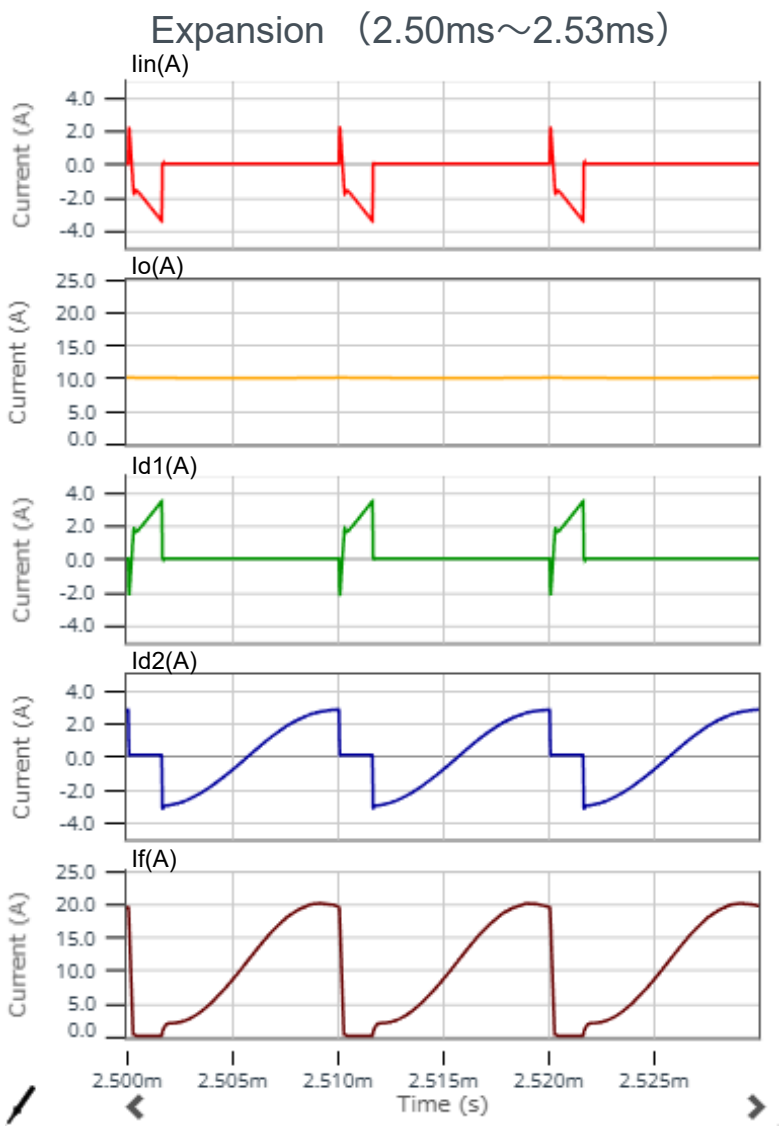
Q1 : SiC MOSFET
SCT4062KE
Q2 : SiC MOSFET
SCT4090KE
D1 : SiC SBD
SCS320AG





How to change the devices

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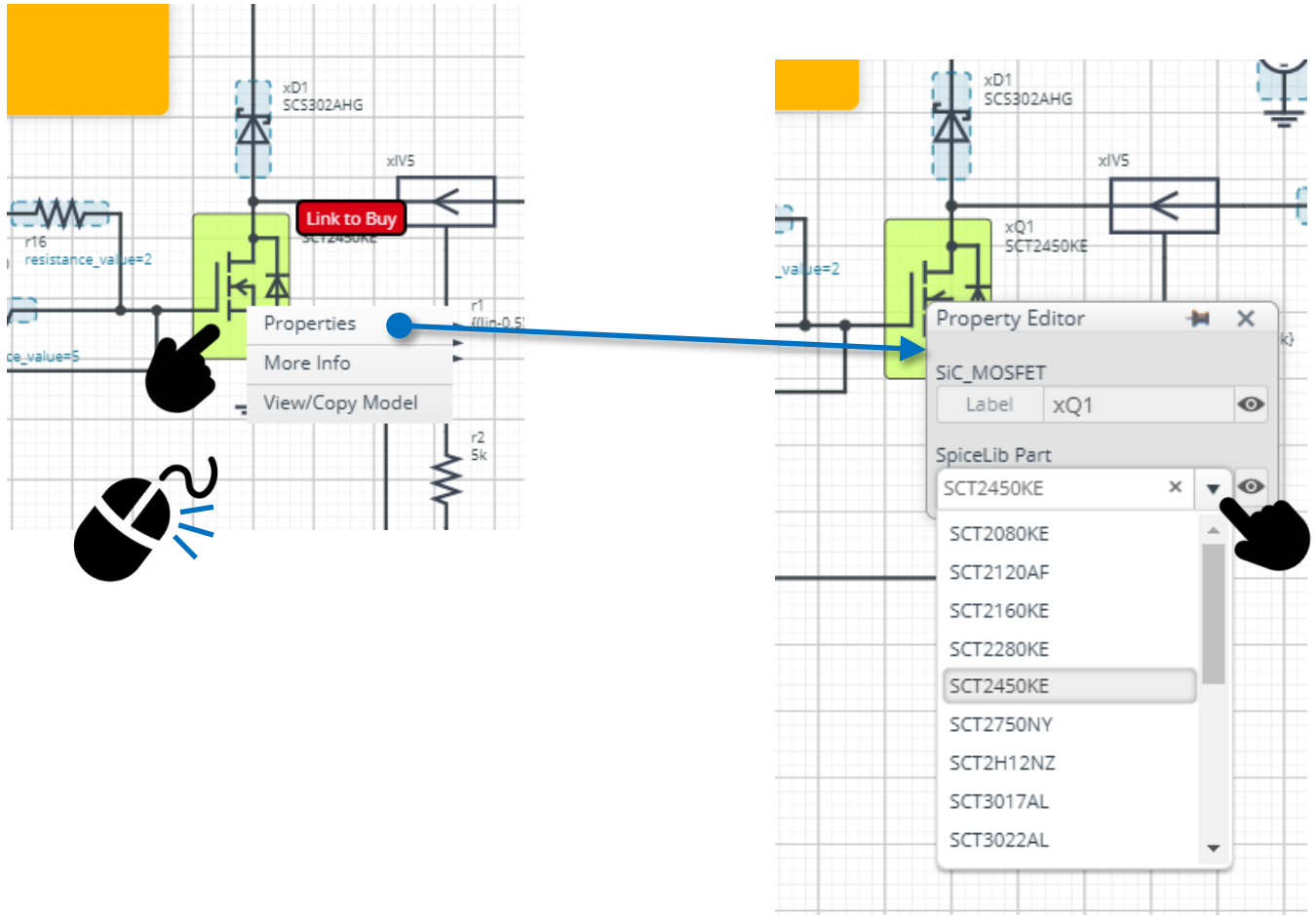
Right-click on the device ⇨ Select Properties ⇨ Pull down “SpiceLib Part” ⇨ Select the product



Loss Calculation Model

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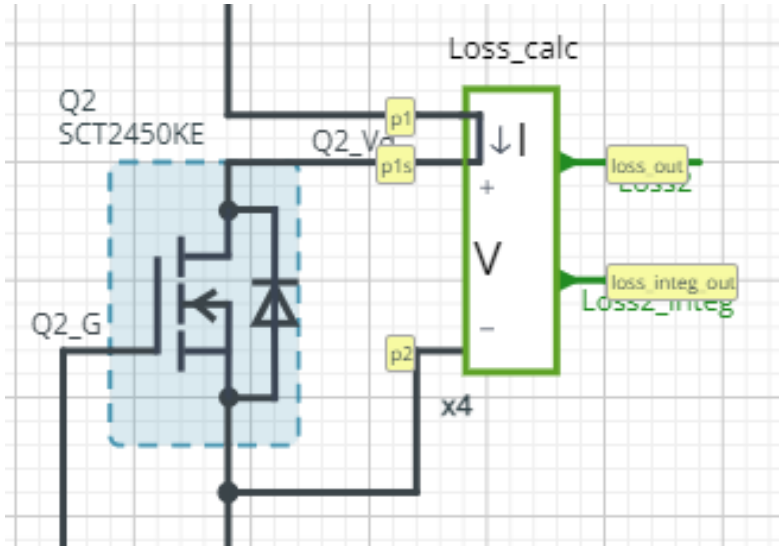
Loss Calculation Model outputs the instantaneous value of power loss and its integration.

Loss calculation model ‘Loss_calc’



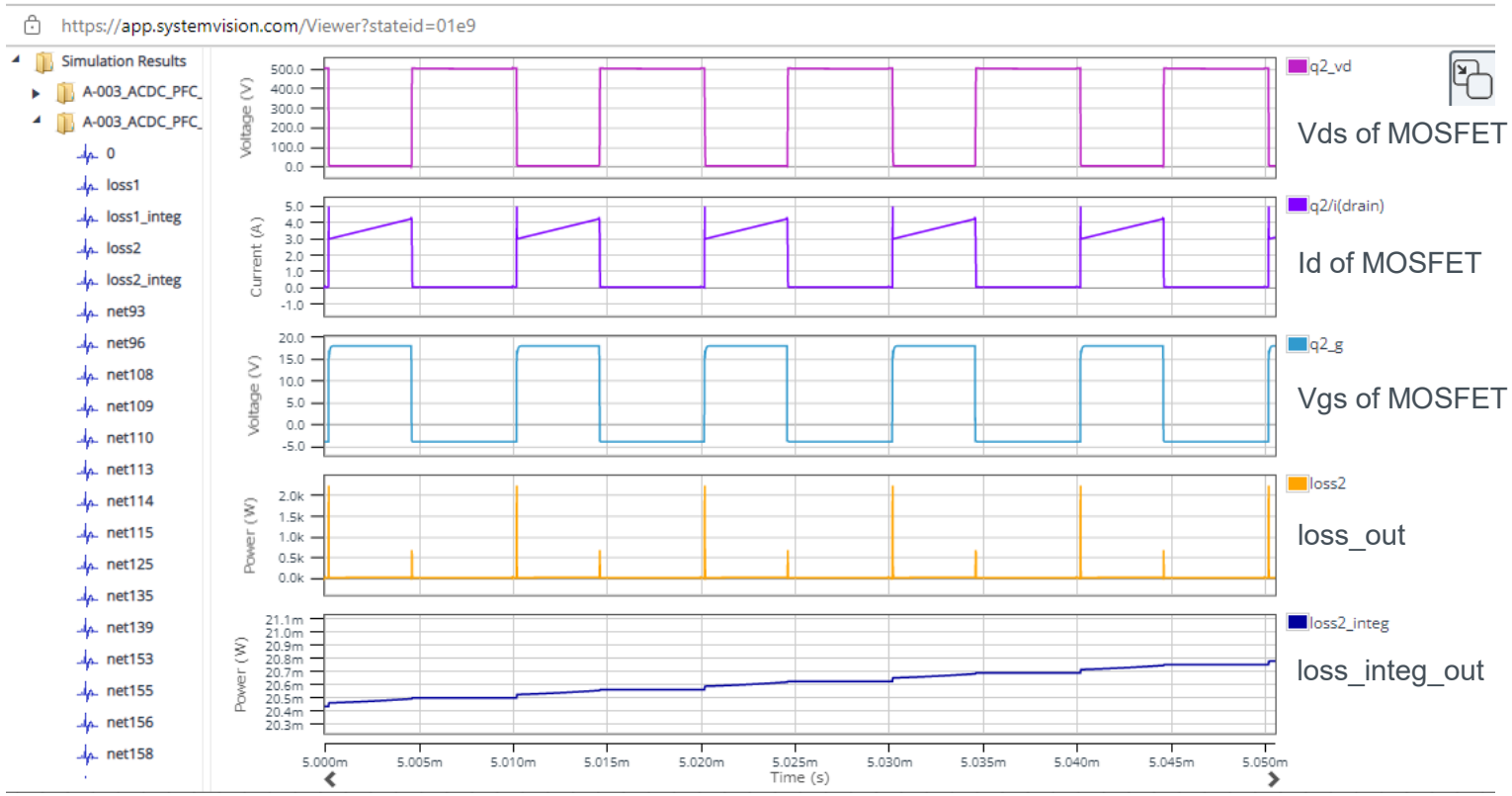
$$loss\_out(t) = I(t) \times V(t)$$

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

I : Current through p1 to p1s

V : Voltage between p1s and p2

Waveform example



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