Design Models

How to Use PSIM Models

ROHM provides PSIM models for simulating electrical circuits. This application note explains how to obtain the PSIM models, import them, and use them in circuit diagrams.

What is PSIM?

Altair® PSIM™ (hereafter “PSIM”) is a circuit simulator developed by Altair Engineering Inc. (USA) for power electronics and motor control. Rapid simulations, an intuitive user interface, waveform analysis function, etc. provide a powerful simulation environment for analysis of power electronics, design of control system circuits, and research on inverter motor drives. PSIM treats semiconductor devices as ideal switches. Therefore, calculations can converge more easily and simulations can be performed more rapidly compared with other simulators that use detailed models for the semiconductor devices.

Note: Altair® and PSIM™ are registered trademark and trademark of Altair Engineering Inc.

How to obtain PSIM models

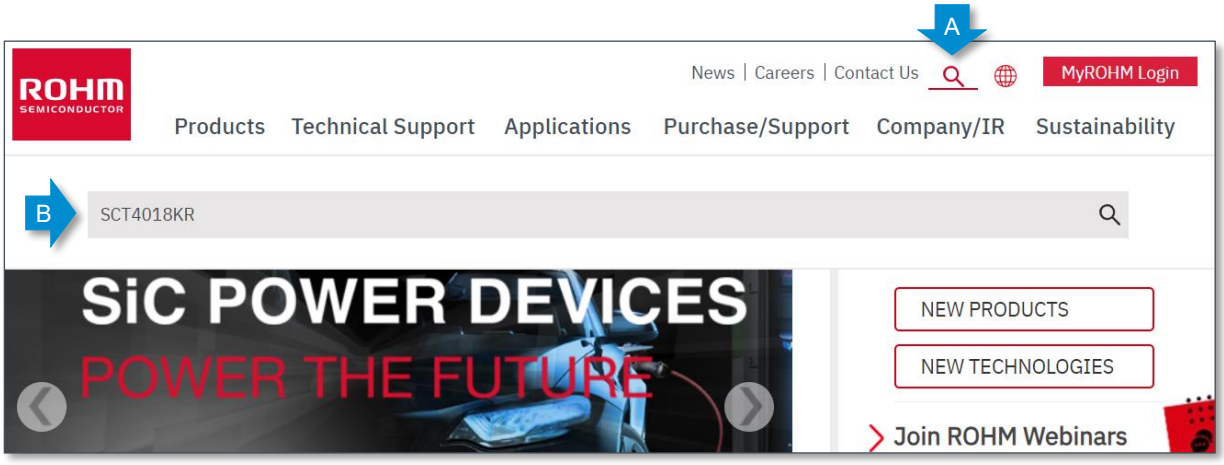
Obtain the PSIM models according to the procedure below.

1. Access ROHM’s home page. → https://www.rohm.com/

2. There are two paths to obtain the PSIM models as follows.

Path a: When the product name is known

a-1. Click the search icon (A) at the top and enter the product name of the PSIM model to obtain in the search field (B).
“SCT4018KR” is used here as an example for explanation.



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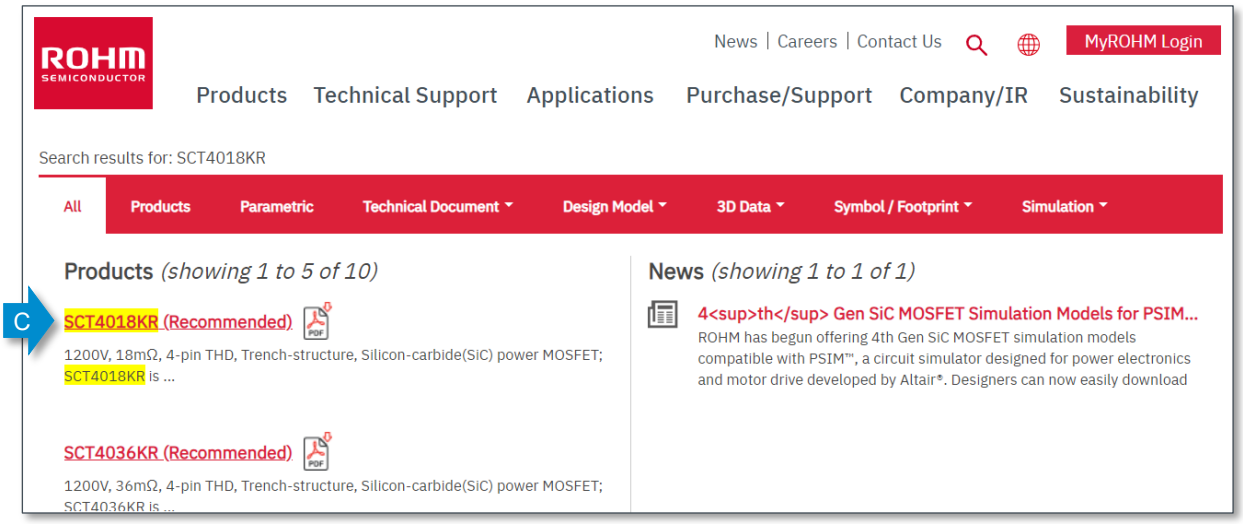
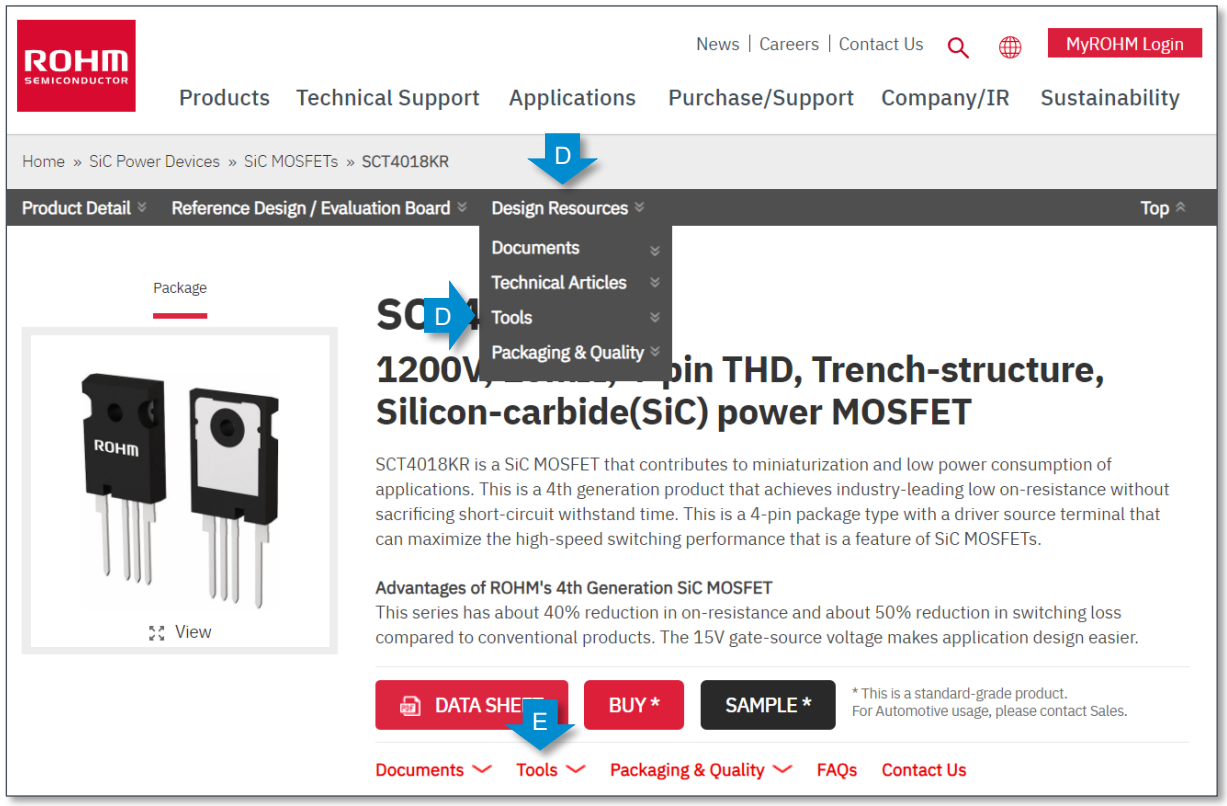
a-2. When the search results are displayed, click on the relevant product name (C).



a-3. When the product page is opened, click “Design Resources” > “Tools” at the top (D) or “Tools” at the bottom (E).



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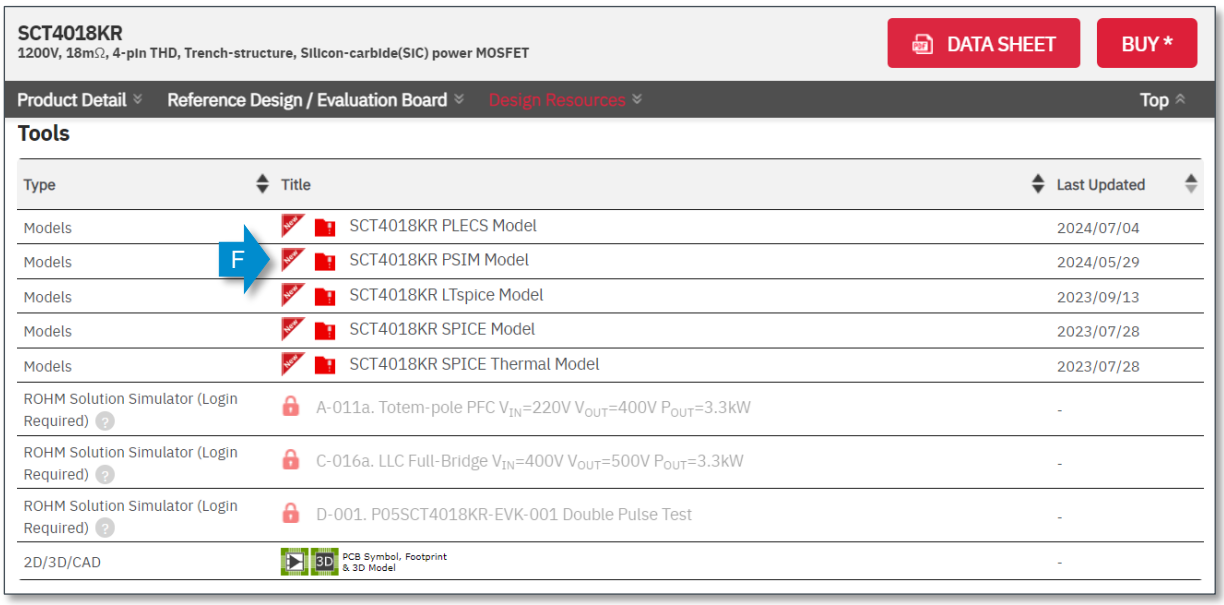
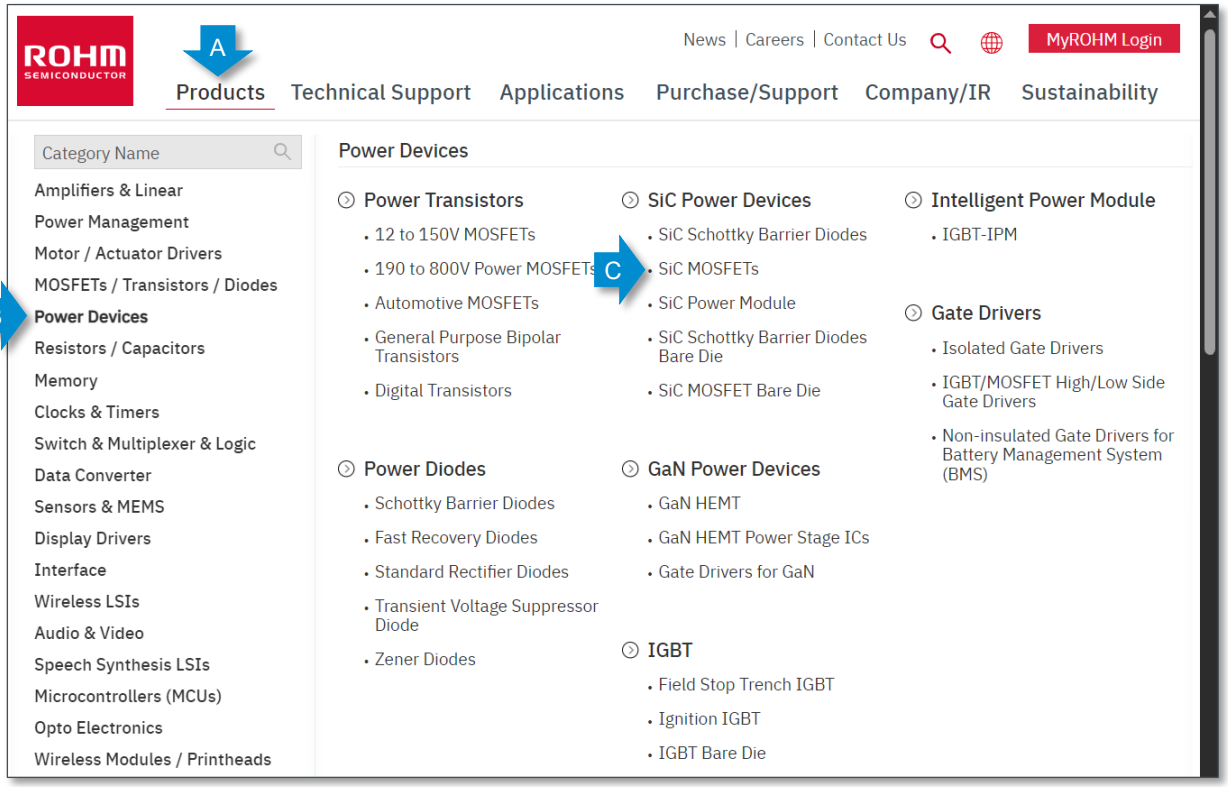
a-4. The page scrolls down and the models and the tools are displayed. Click the relevant PSIM model (F) to download it.

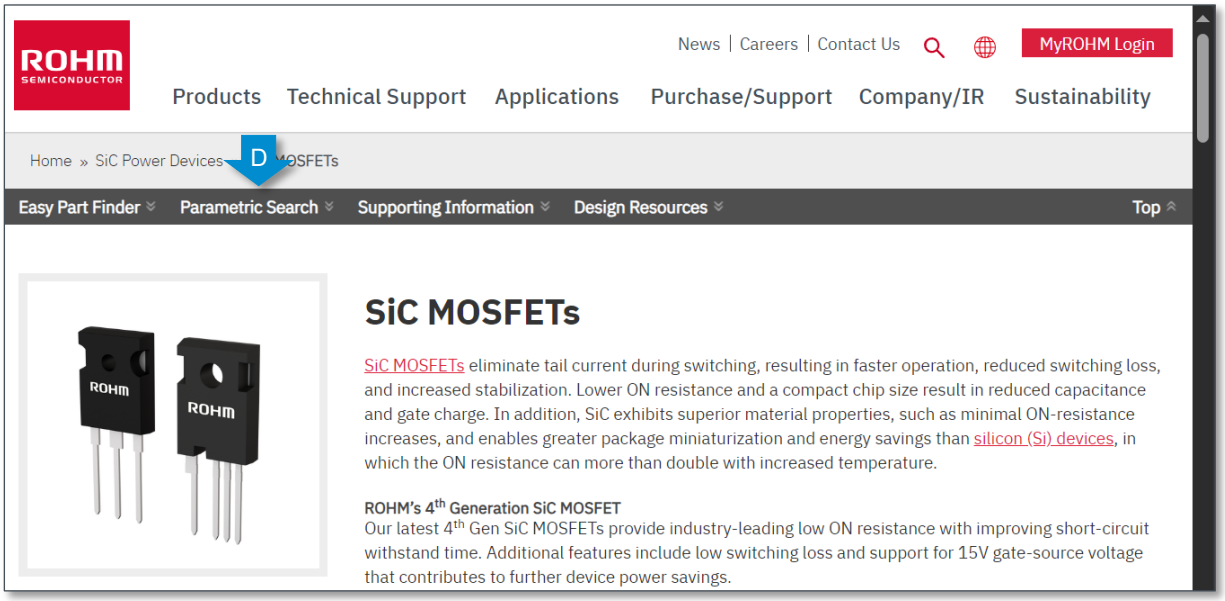


Path b: When the product name is unknown

b-1. Click “Products” (A) in the top menu and select the product category to search. For example, to search SiC MOSFETs, click “Power Devices” (B) and then “SiC MOSFETs” (C).



b-2. When the product family page is opened, click “Parametric Search” (D) at the top.



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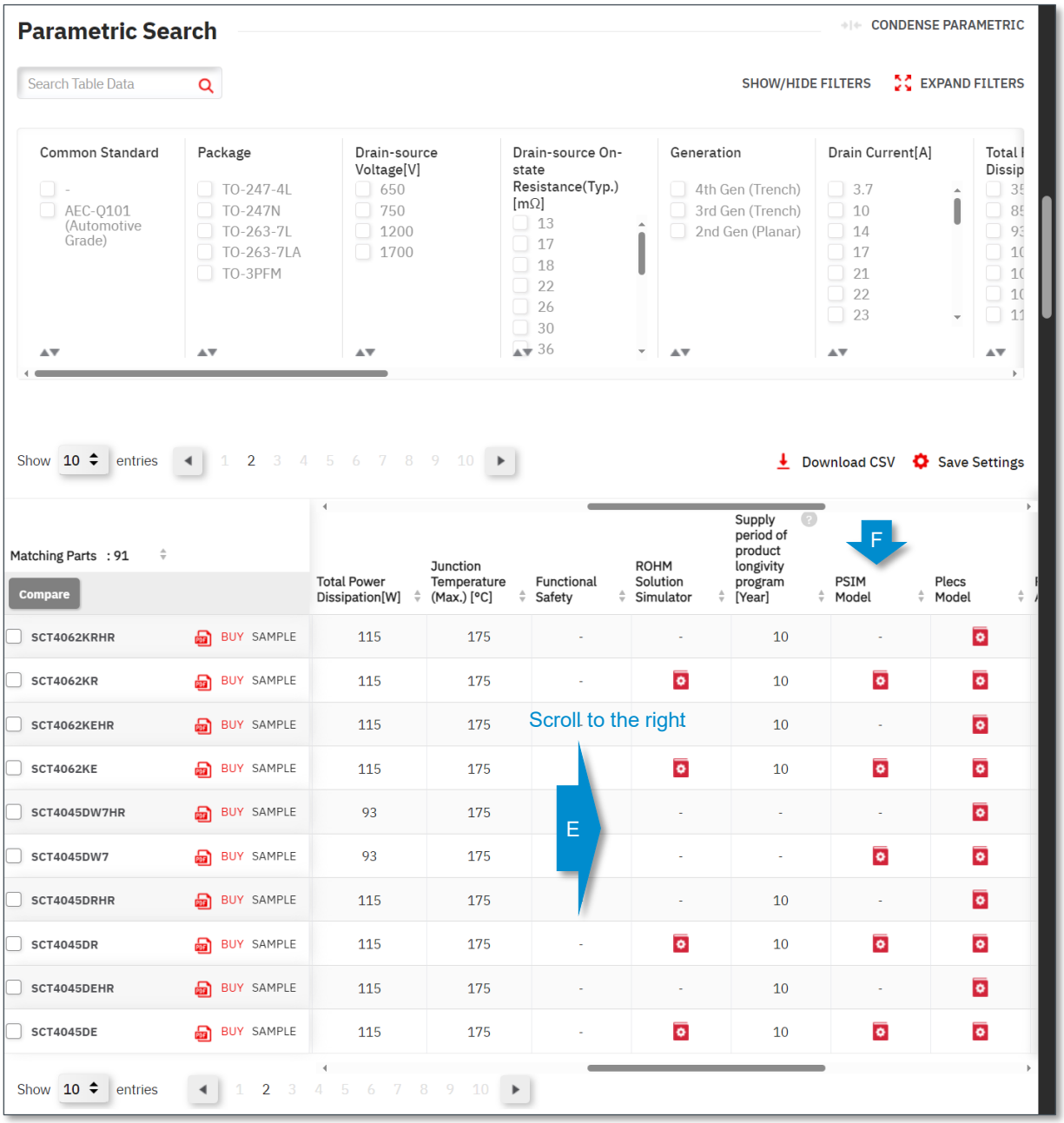
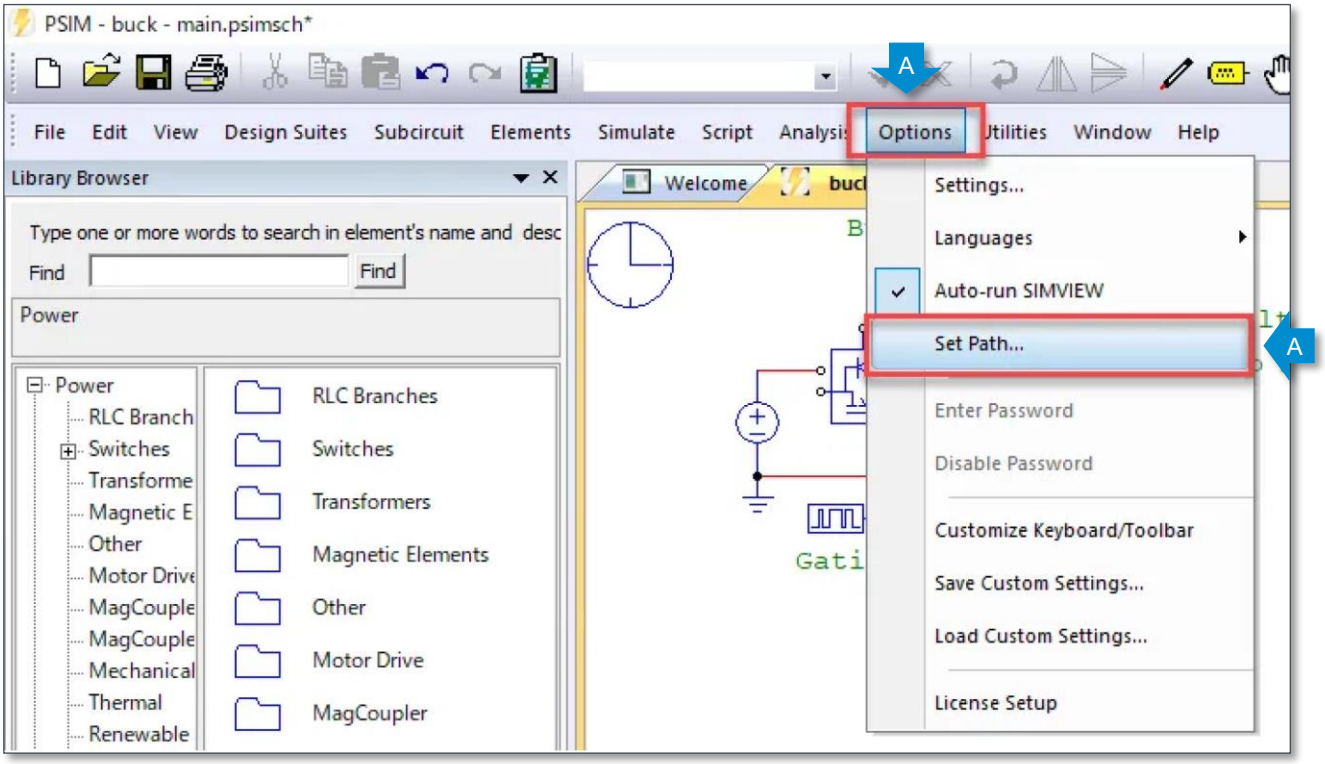
b-3. Scroll the list to the right (E) to display the “PSIM Model” column (F). The icons indicate products for which a model is available. Click the icon to download the model file.



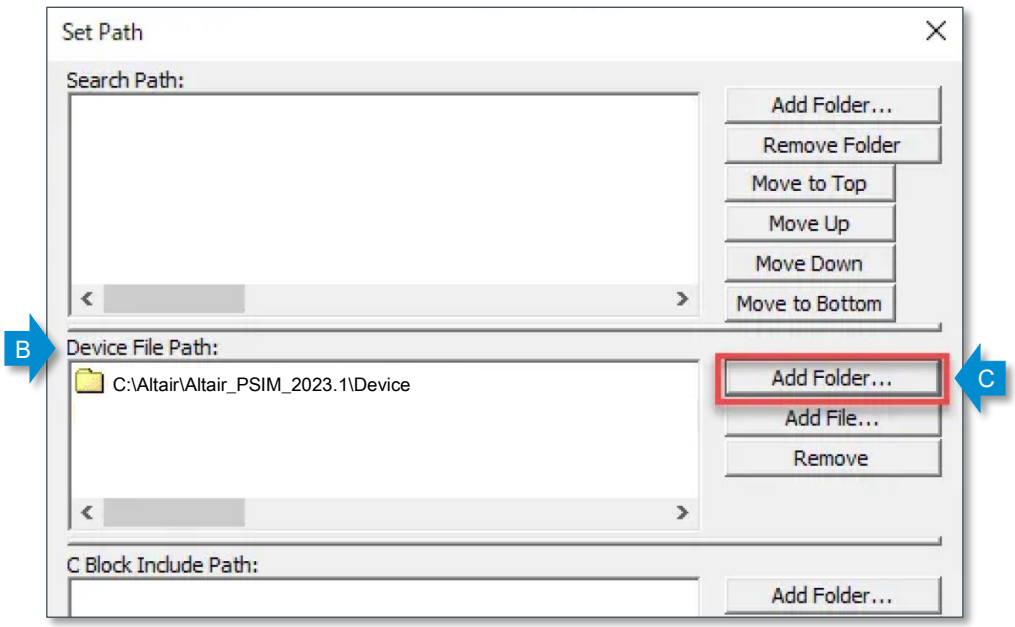
How to import models

1. The downloaded ZIP folder contains an XML file for the thermal device. Copy the file to any folder where you save PSIM models.
   As an example, the file is saved to the “G:\data\PSIM_Training\import_device\PSIM_xml” folder.

2. In the menu, select “Options” > “Set Path...” (A).



3. When the “Set Path” window is opened, click “Add Folder...” (C) for “Device File Path” (B).



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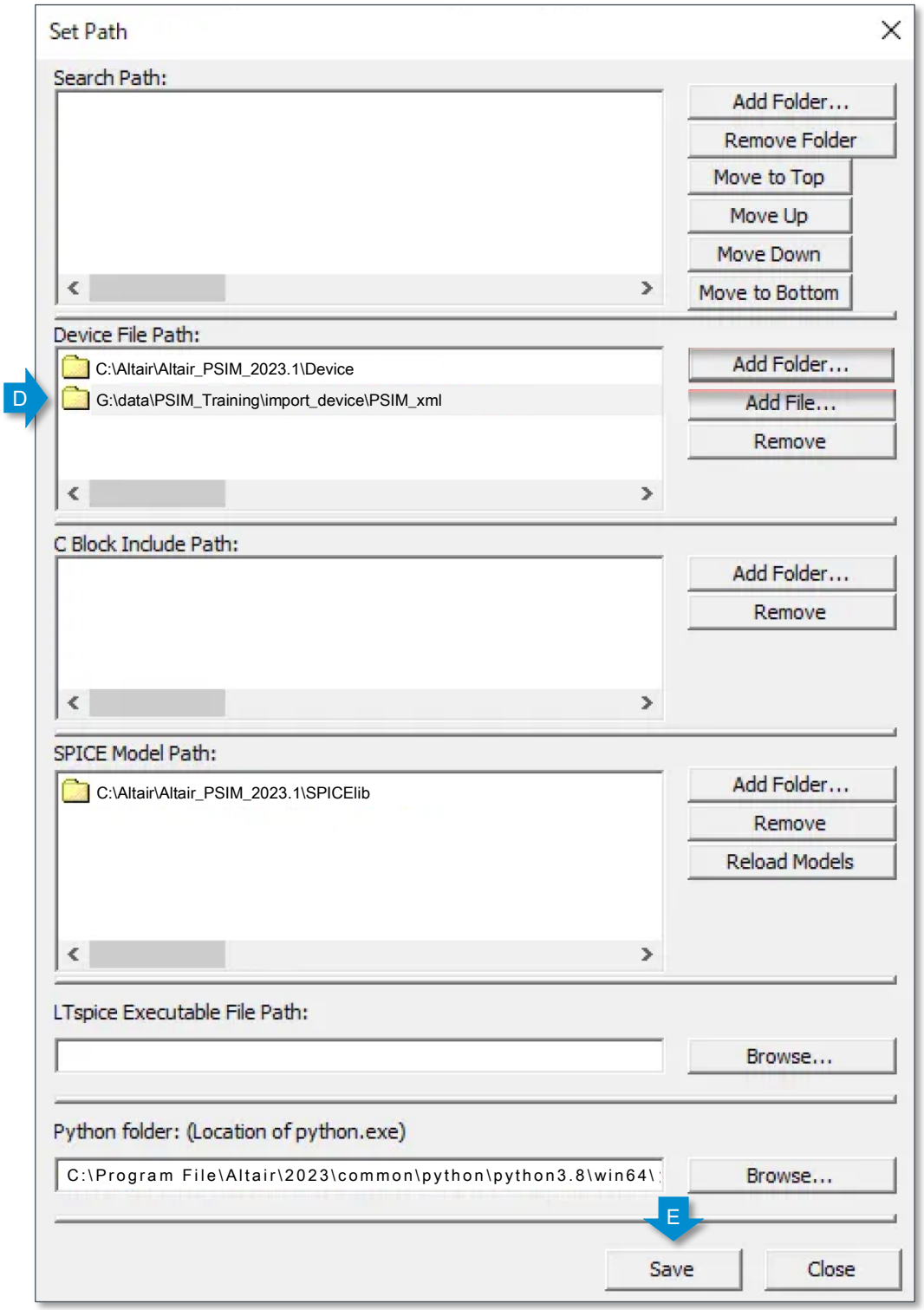
4. When the folder selection window is opened, select the folder where you saved the file in step 1.

5. When the selection is completed, the folder path (D) is displayed in “Device File Path”. Finally, click “Save” (E).

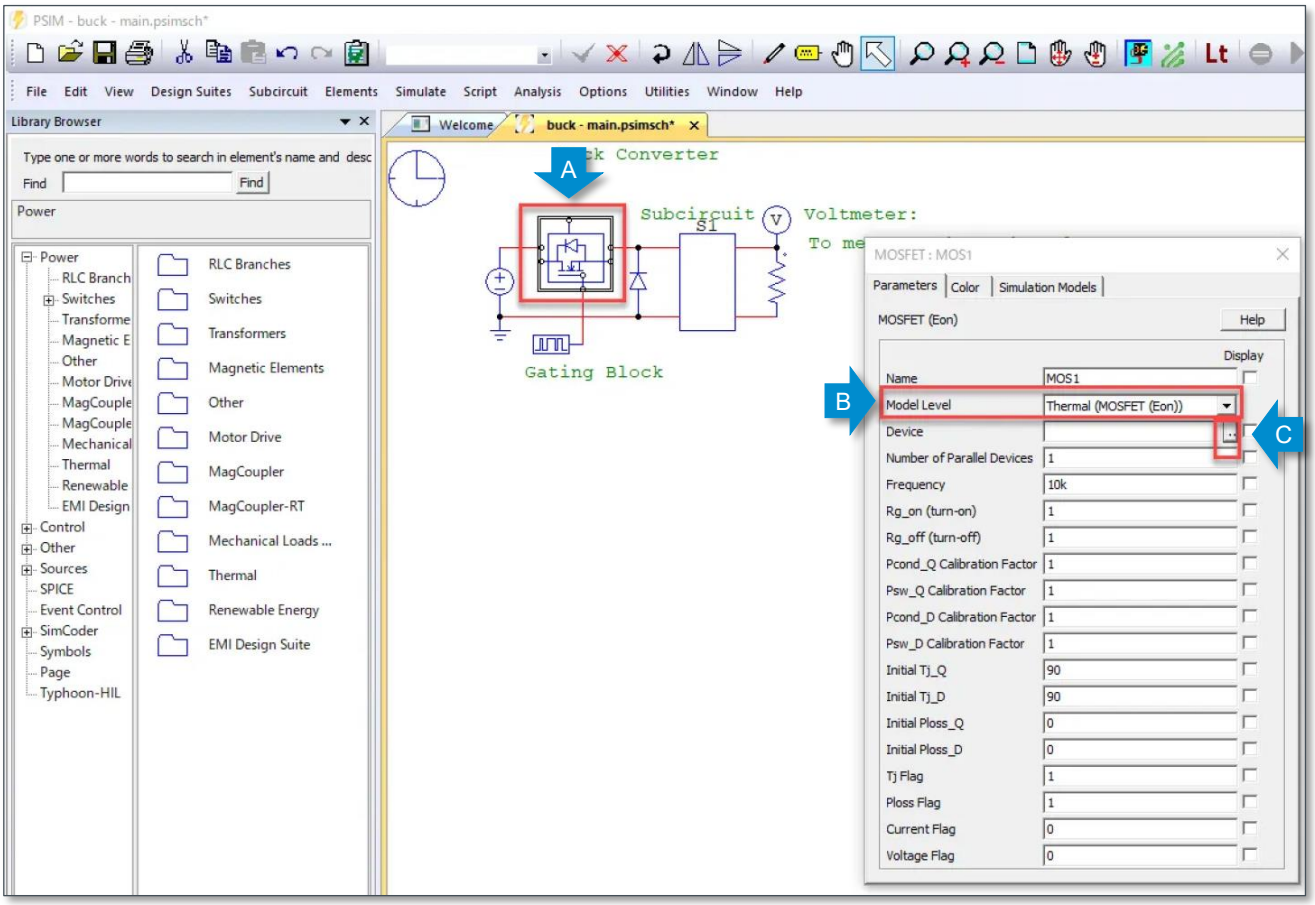


6. To activate the selected folder, close PSIM and then restart it. The imported thermal xml file can now be used in PSIM.

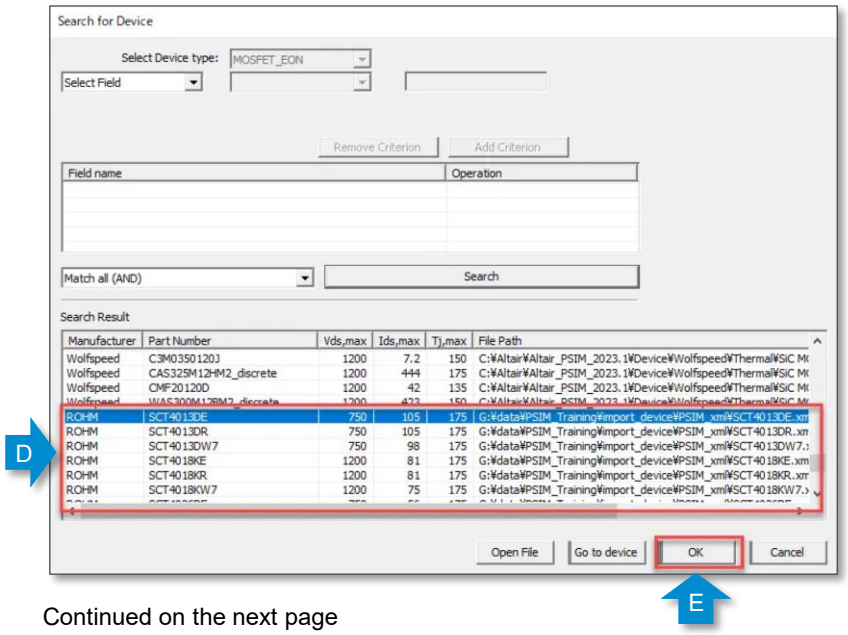
How to use models in circuit diagrams

1. For example, open “buck-main.psimsch”, an example dc-dc circuit diagram. Select MOSFET (A) and change the parameter for “Model Level” (B) from “1” to “Thermal (MOSFET(Eon))”.

2. Click “...” (C) for “Device”.



3. Select the added thermal device (D) and then click “OK” (E).



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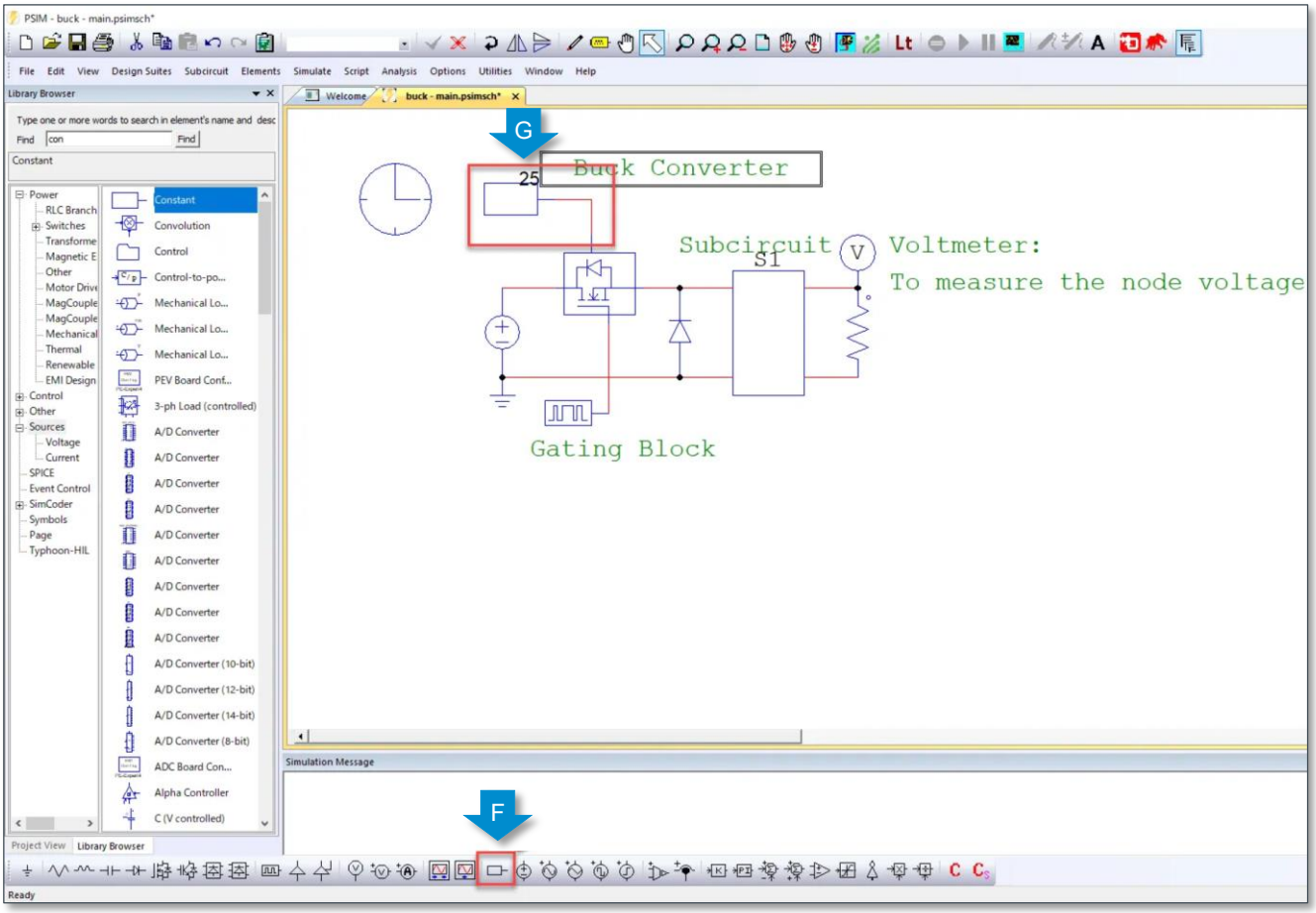
4. Check the connection and add environment temperature (G) to the thermal device using a constant block (F).



5. Perform a PSIM simulation.

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