

Power MOSFETs

How to use the PLECS model of REXFET

Introduction

This document describes the usage and precautions for the PLECS model of REXFET.

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1. How to use the model

1.1 Install Renesas PLECS model

“REXFET PLECS model set” contain below files and a folder. Please copy all of them to your computer

RenesasPowerMOSLibrary.plecs
RenesasThermalLibrary
info.xml
Notes and Installation.txt

Please refer “Notes and Installation.txt” and follow the install guide.

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*****
* How to Install "Renesas PowerMOS Library" on PLECS
* 1. From the banner menu of Library Browser, go to File>PLECS Preferences... to display the window.
* 2. On "Thermal" tab of "PLECS Preferences" window, click the "+" button in the upper left corner.
* 3. In "Select directory" window, select the folder (including "RenesasThermalLibrary" folder,
*    "info.xml" file, "RenesasPowerMOSLibrary.plecs" file and this file) and click "Select Folder" button.
* 4. In "PLECS Preferences" window, click "Rescan" button, then click "OK" or "Apply" button.
* 5. Restart PLECS as needed.
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1.2 Library Browser

After the PLECS model is installed, "Renesas PowerMOS – (MMMYYYY) " is added as a category to the library browser as shown in Figure 1-1, and product models can be selected from the subcategory.

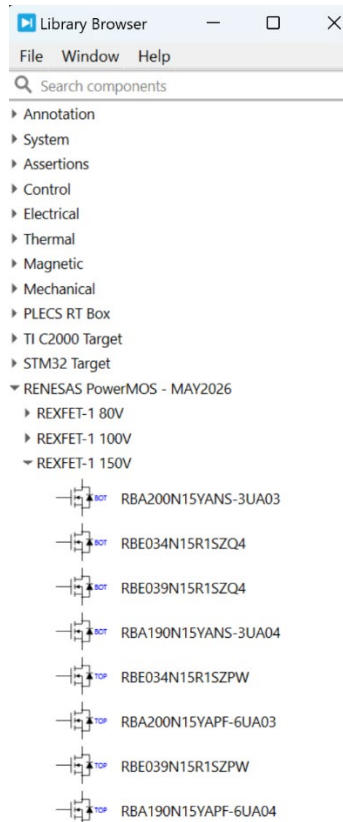


Figure 1-1 Renesas Component Library

2. Precautions for using the model

2.1 REXFET(MOSFET) Symbol and nodes

The symbol has 3 electrical nodes (Drain, Source and Gate) and 1 thermal node(Tc).

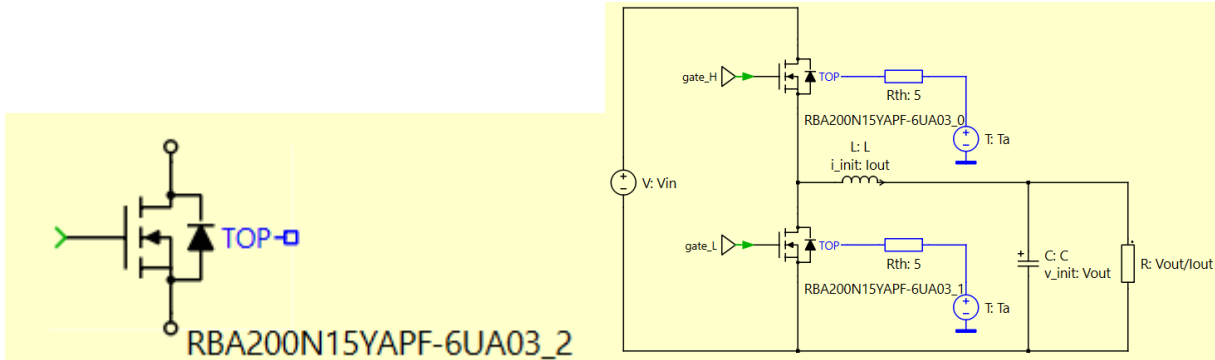


Figure 2-1 The symbol of REXFET PLECS model and circuit example

2.2 Configuration of REXFET model

REXFET model is configured “Channel(MOSFET)” & ”Body diode” Thermal(power loss) model. For conduction loss calculation, it referred gate signal.

Gate	Forward current (IDS)	Reverse current(ISD)
1	Channel (MOSFET)	Channel (MOSFET)
0	NA	Body diode

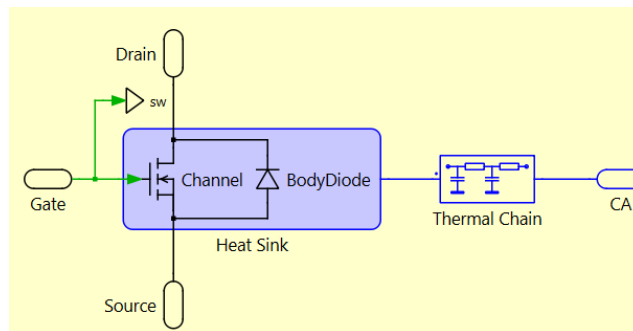


Figure 2-2 The example of model Combinations (Sub system)

2.3 Simulation Parameters

For simulation parameters, the setting of voltage, current, and other simulation conditions, please refer to the datasheet for ratings and recommended values.

The simulation parameters for this device are as follows (Fig. 2-3)

Ambient Temperature
Gate resistance (on)
Gate resistance (off)
Channel ON resistance*
Channel Initial state(On/Off)
BodyDiode Forward voltage*
BodyDiode On Resistance*

*Only for circuit operation simulation, not used for Thermal(power loss) calculation. (Refer PLECS manual). Same default value is set to all PN.

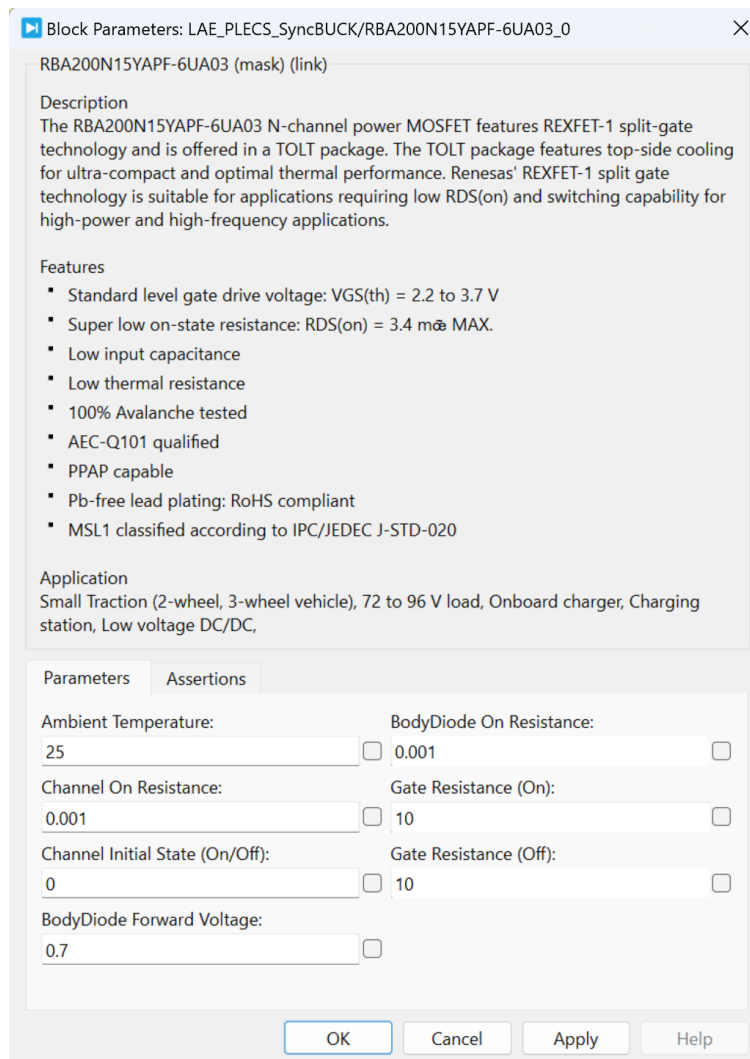


Figure 2-3 Simulation Parameters

2.4 Probe Parameters

For Probe function in PLECS, REXFET model has below parameter.

Item	Description	Channel / Body diode
Eon + Eoff	Switching loss (Turn ON + OFF)	Channel
Err	Reverse Recovery loss	Body diode
Cond	Conduction loss Cond_Ch + Cond_Bd	Channel + Body diode
Id	Drain current	Channel + Body diode
Vds	Darain to Source Voltage	Channel + Body diode
Vgs	Gate signal	N/A
Tj	Junction Temperature	Channel + Body diode
Cond_Ch	Conduction loss of Channel	Channel
Cond_Bd	Conduction loss of Channel	Body diode

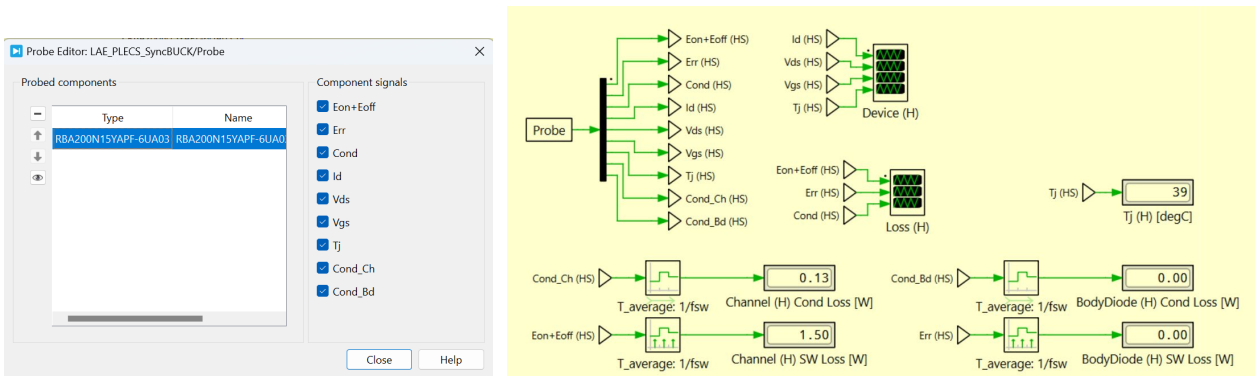


Figure 2-4 Probe parameter and connection example

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	May.27.2026	-	First edition

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