Introduction to Simulation Environment

Targeted simulator: TINA Industrial

About this document

Scope and purpose:

The current document provides guidance on how to get started with the attached behavioral model using the TINA Simulator either by creating a new project from scratch or based on an existing testbench like the one attached to the current archive.

Important note:

This document has been created for general purposes and has NOT been tailored to any specific product. Therefore, the naming of symbols, testbenches and other files will differ from the ones included in the delivery package.

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1. Resources

The minimum files required to follow the steps from this document can be found in the current archive with the following extensions:

- **.lib :** the model code – to be found either as encrypted (to protect Infineon's IP) or unencrypted format
- **.tsm :** schematic symbol view for graphical user interface
- **.tsc** : schematic file which contains one application setup

2. Starting a new project

The instructions presented below assume basic knowledge like opening a schematic and running a simulation. If necessary, please get familiar with simulation environment before proceeding.

2.1. Create a new project

Begin by opening the TINA application. From **File** menu→**New** and a new schematic page will be opened. For example:

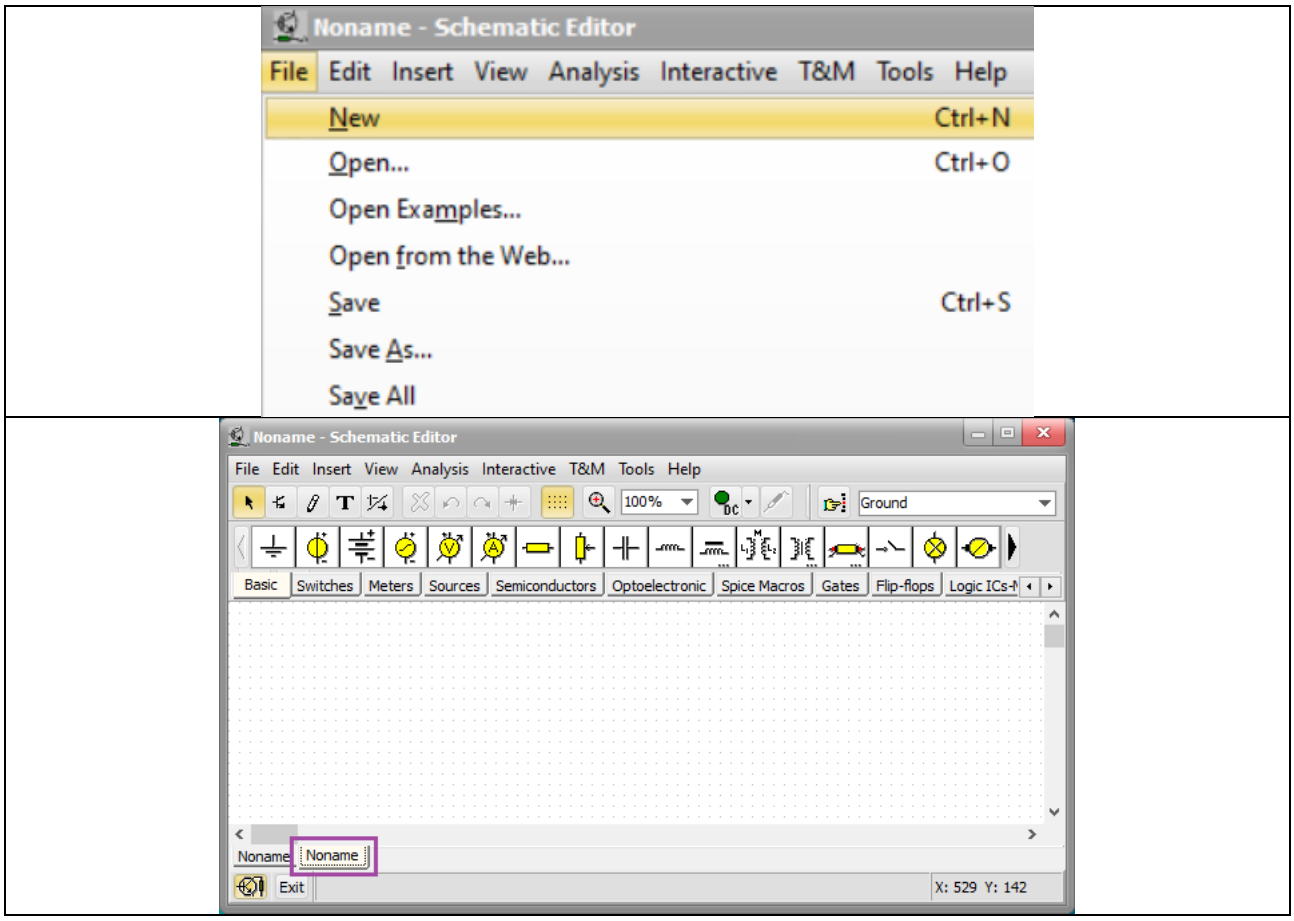


Figure 1 Create new project

2.2. Import of an existing model

To simulate a model in schematic mode, **TINA Industrial** requires two types of input files: **"GENERIC_MODEL.LIB"** (device behavior source code) and **"GENERIC_MODEL.TSM"** (schematic symbol view with device pinout).

2.2.1. Importing a .tsm file

- From the Main menu, select **Insert → Macro...**
- In the pop-up window, browse for the **.tsm** file
- Press Open and and place the symbol in the desired schematic

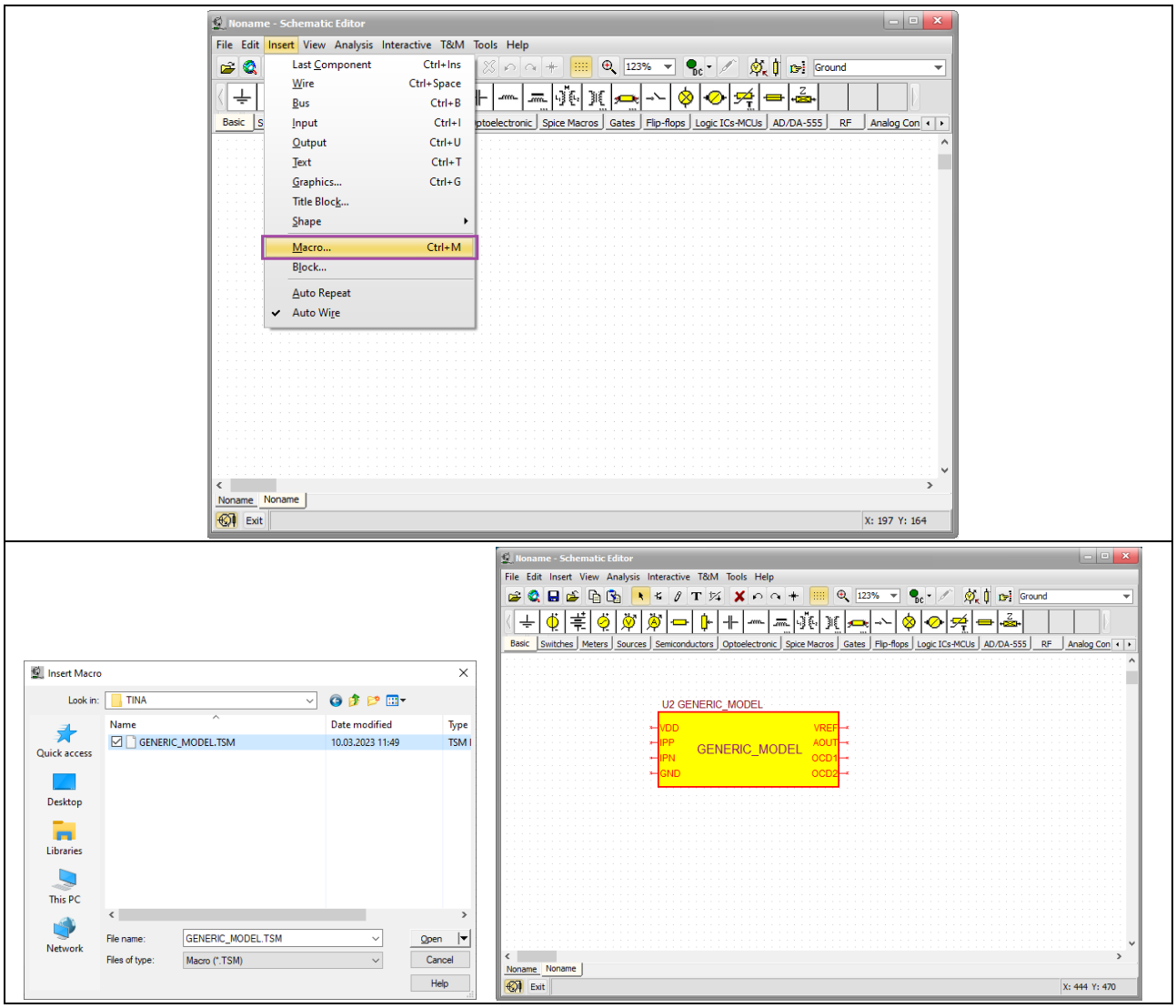


Figure 2 Import .tsm file

2.2.2. Generating a .tsm file

- From **Tools** menu→**New Macro Wizard…**, add the name of the macro **(1)** navigate to the "lib" directory in the package and select the "GENERIC_MODEL.lib" file. **(2)** and press **Next.** (Figure 3)
- In the new window select the name of the sub circuit **(3)** and press **Next** (Figure 3)

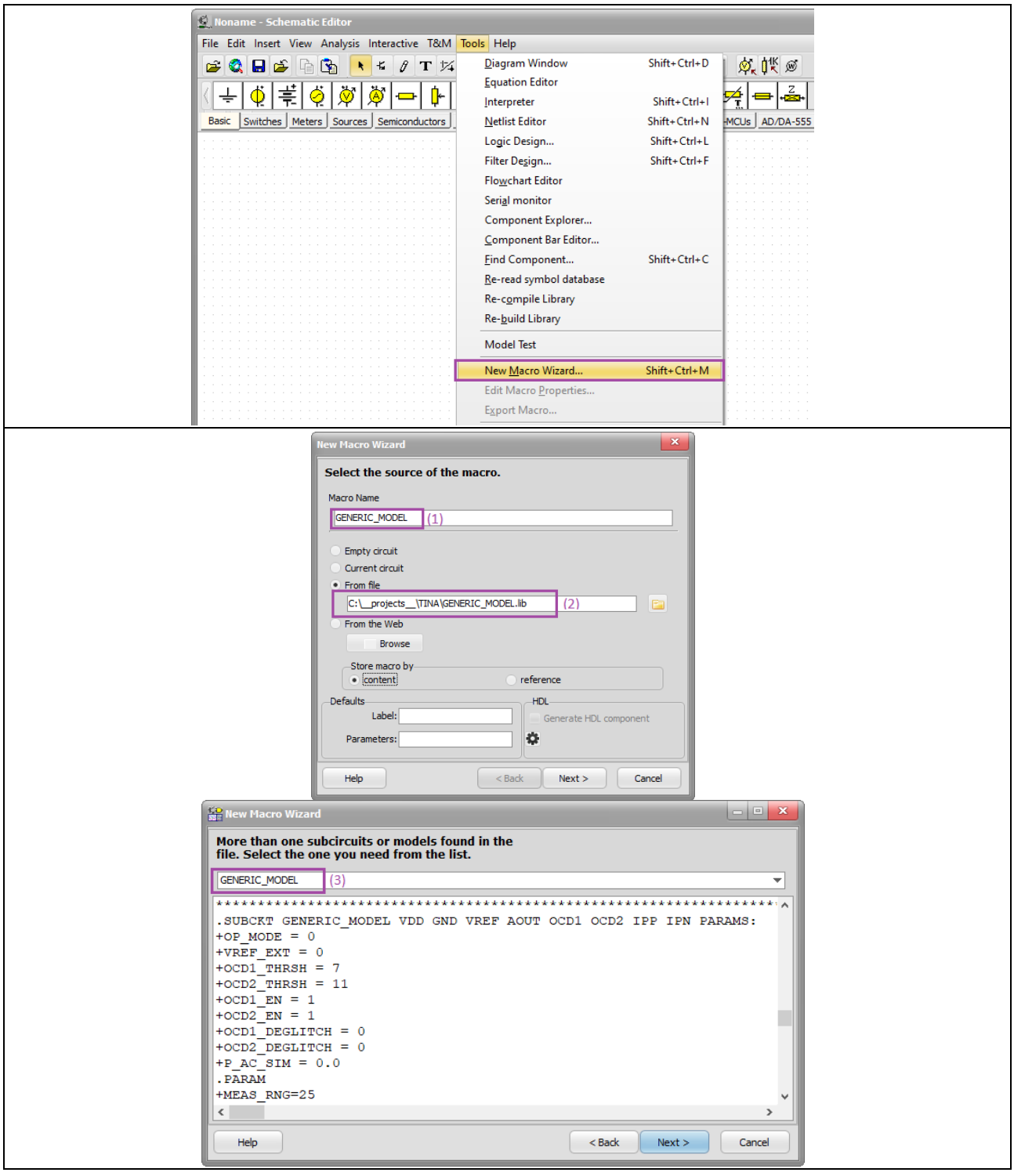


Figure 3 Select a .lib file

- In the new window select the shape of the new generated macro (Figure 4). You can either choose from an existing macro or let the program auto generate it. After choosing the desired shape click **Next**
- In the new window choose the order of the pins on the symbol. You can move them **up**, **down**, **left** or **right**. After choosing the desired pin order click **Next.**
- After that you can save the symbol as a .tsm file.

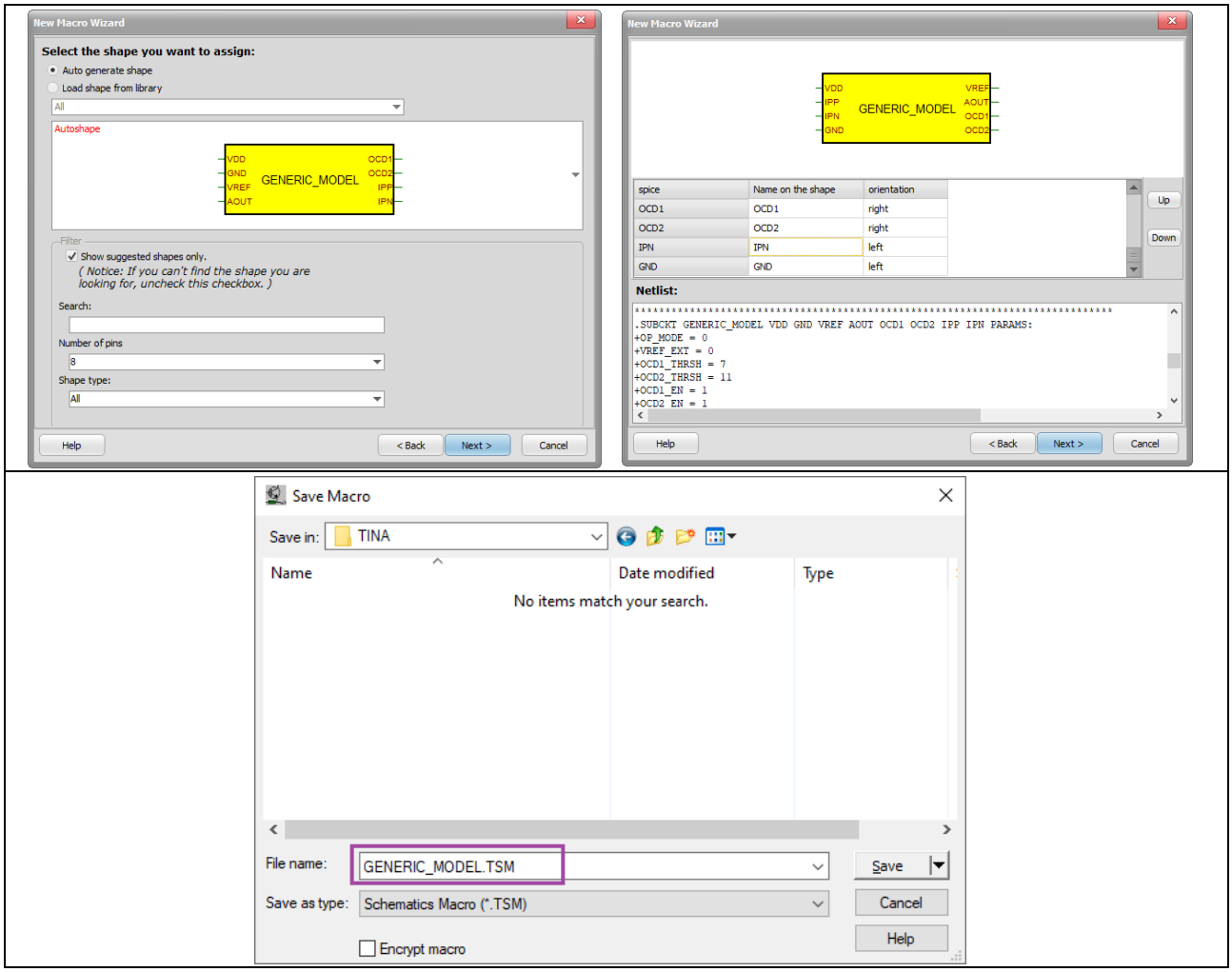
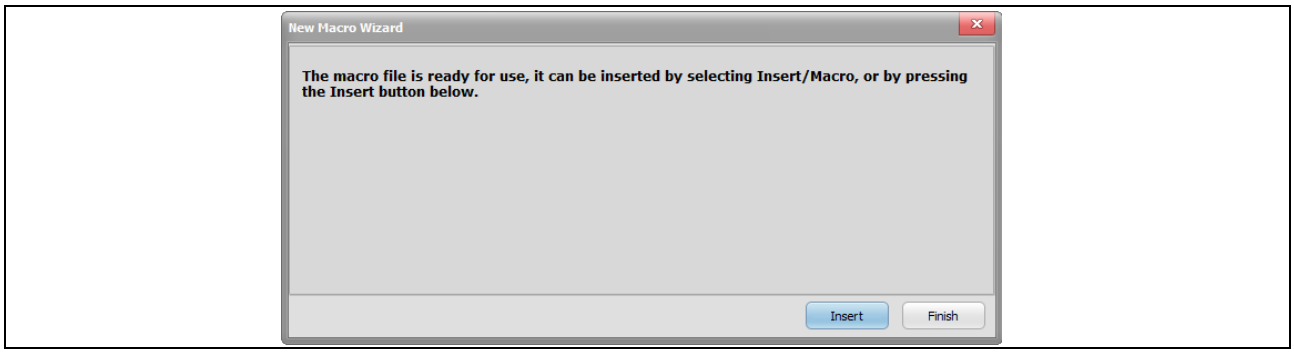


Figure 4 Generate a new symbol

- After the symbol is saved a new window appears and the symbol could be added to a schematic (**Insert** button)



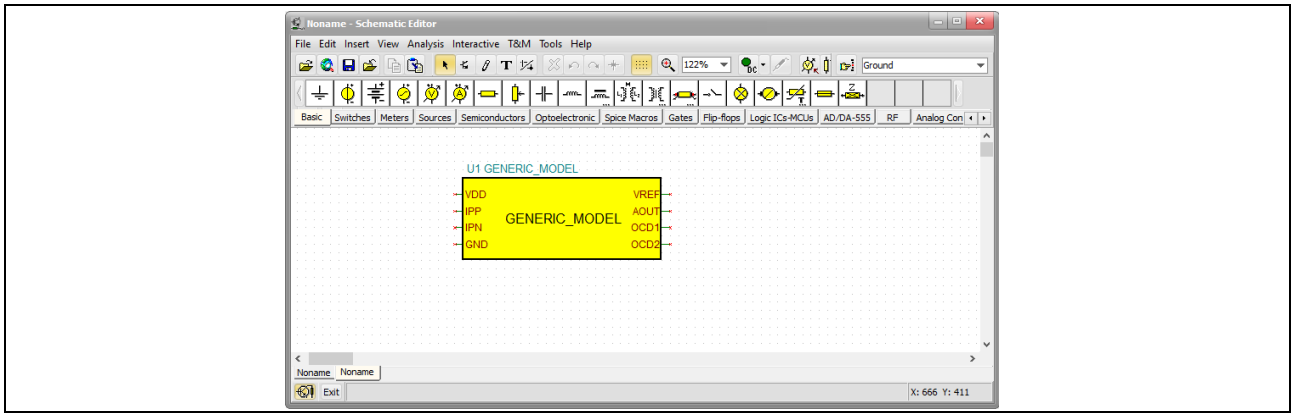


Figure 5 Insert the new symbol

2.3. Set up and run a transient analysis

A Transient Analysis will evaluate the behavior of the circuit in the time domain, similar to what an oscilloscope displays in the lab. To perform this analysis, follow the next steps:

- From the main menu select **Analysis** and choose **Transient**
- **Transient Analysis** dialog box appears, set the **End display** time and press **OK** to perform the analysis

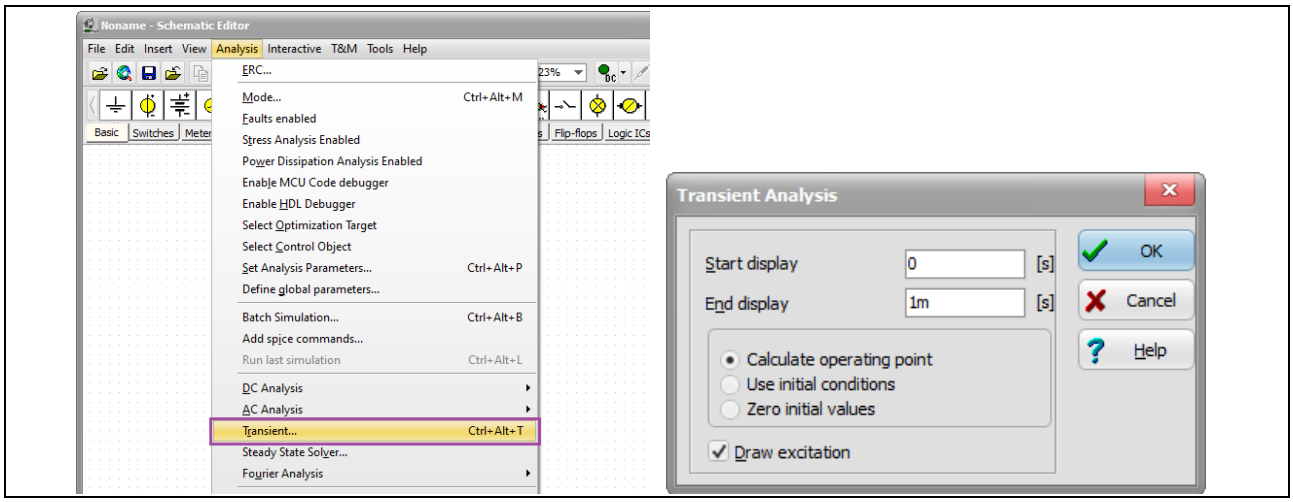


Figure 6 New simulation profile

2.4. Set up model parameters

To change the model parameters, follow the next steps:

- Select the symbol and double click on on it.
- A new window will pop up
- Identify **Subckt Parameters** tab and click the three dots
- In the **Macro Parameter Editor** window choose the parameter and change the value

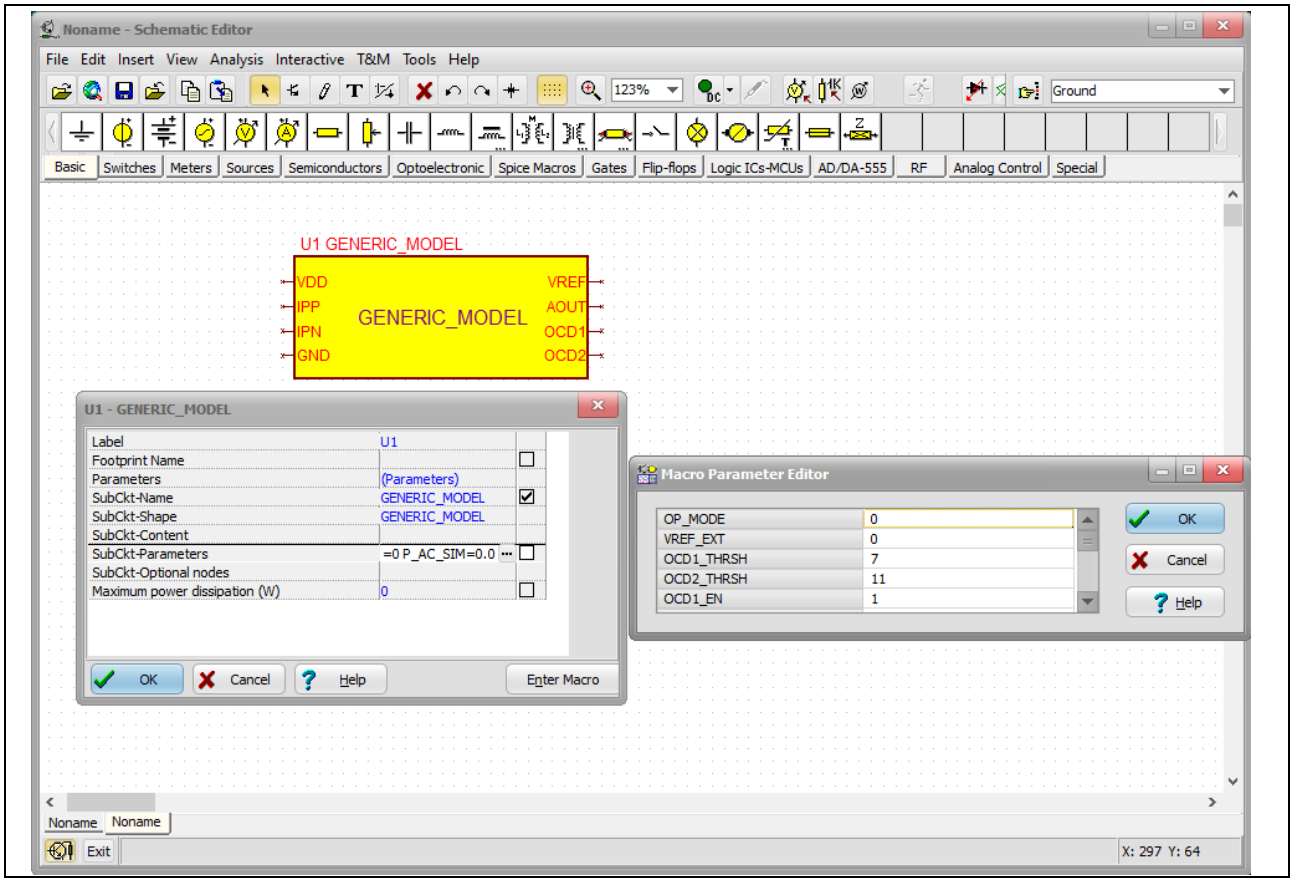


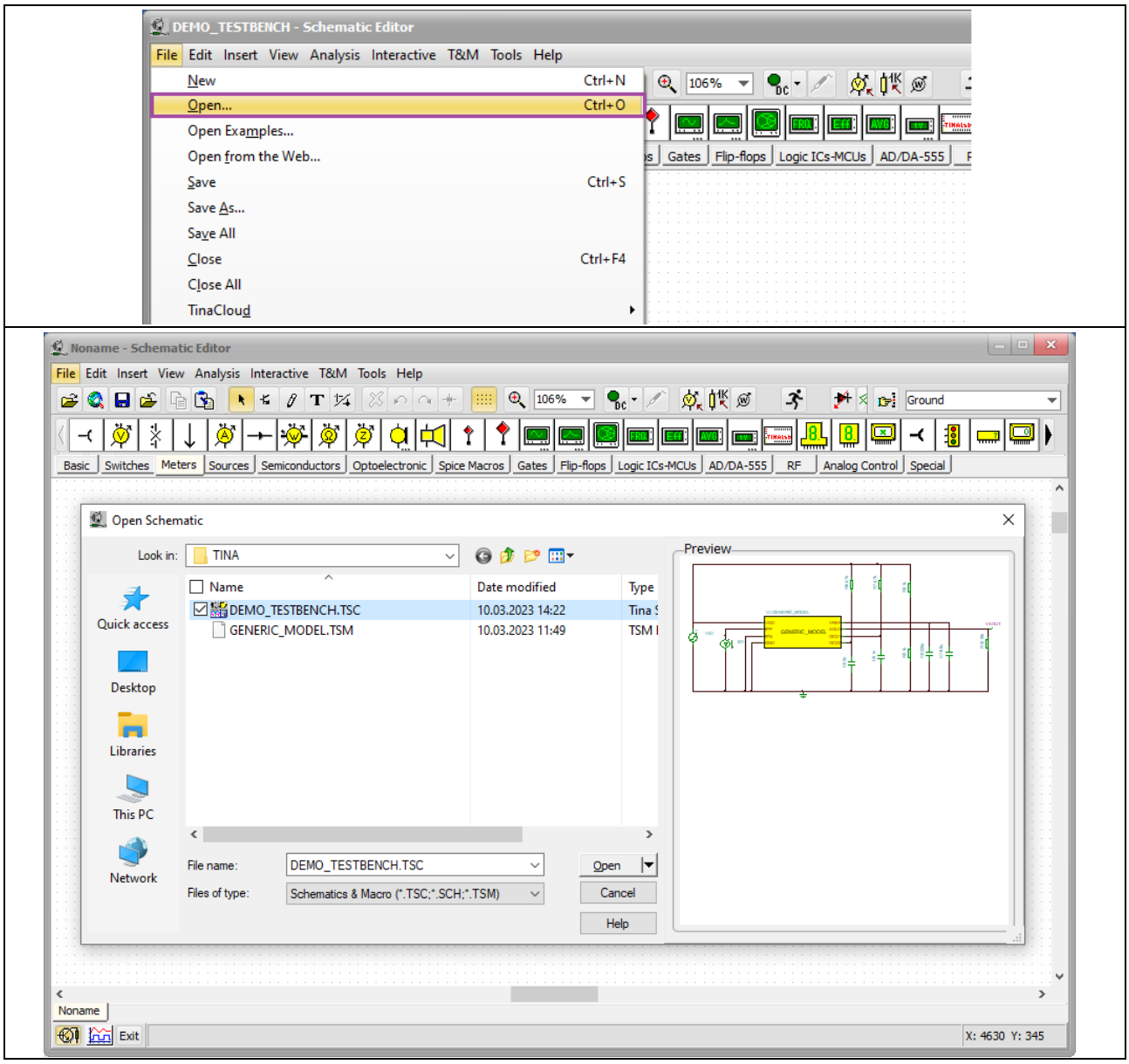
Figure 7 Change the parameters values

3. Opening an existing schematic

Typically, the model is delivered with an attached demo testbench which is already configured and is ready for use.

3.1. Transient simulation considerations

Open the TINA application and from the **File** menu select **Open.** In the browse window locate and open the "DEMO_TESTBENCH.tsc" file from the Infineon-GenericModel-SimulationModel-L1-TINA-v01_00-EN package directory. For example:



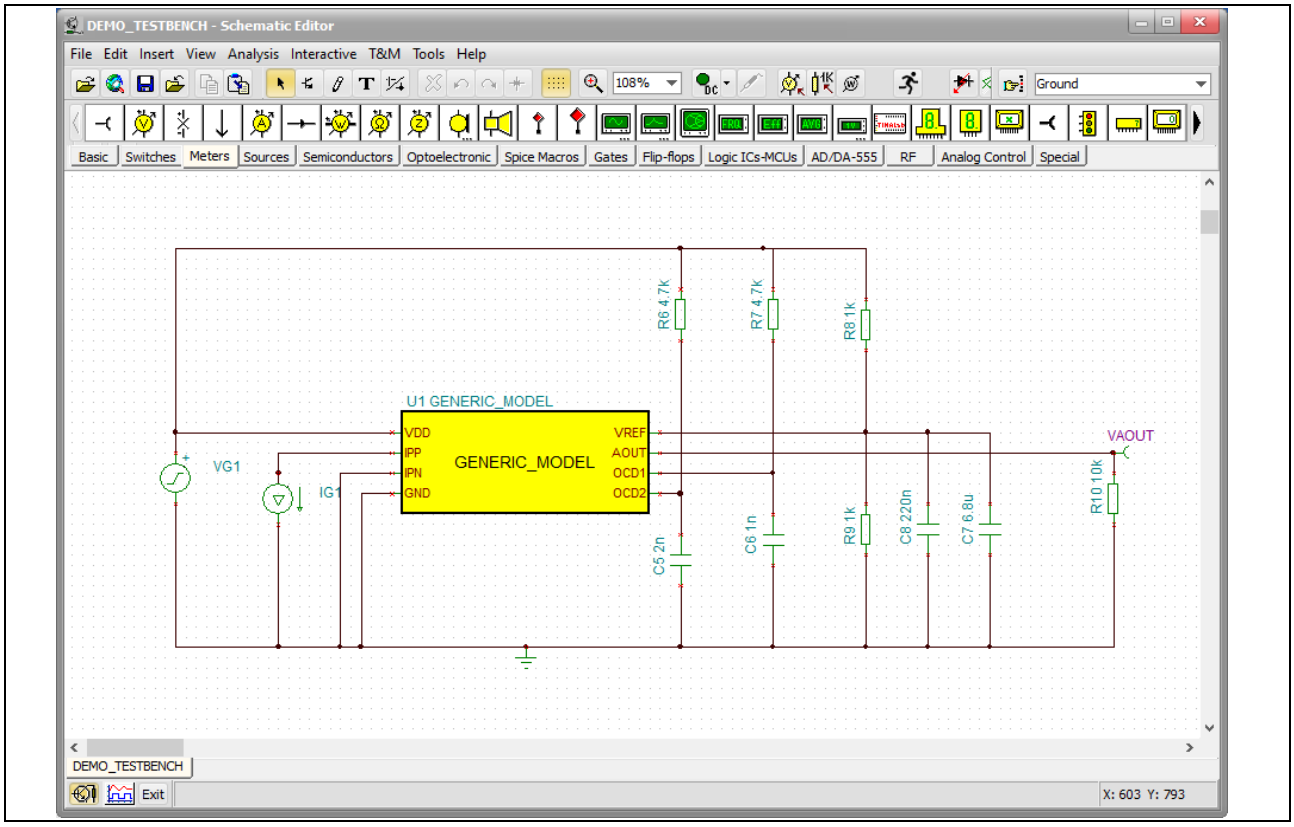


Figure 8 Open an existing schematic

- To start a simulation, select from the main menu **Analysis → Transient** and click **OK**

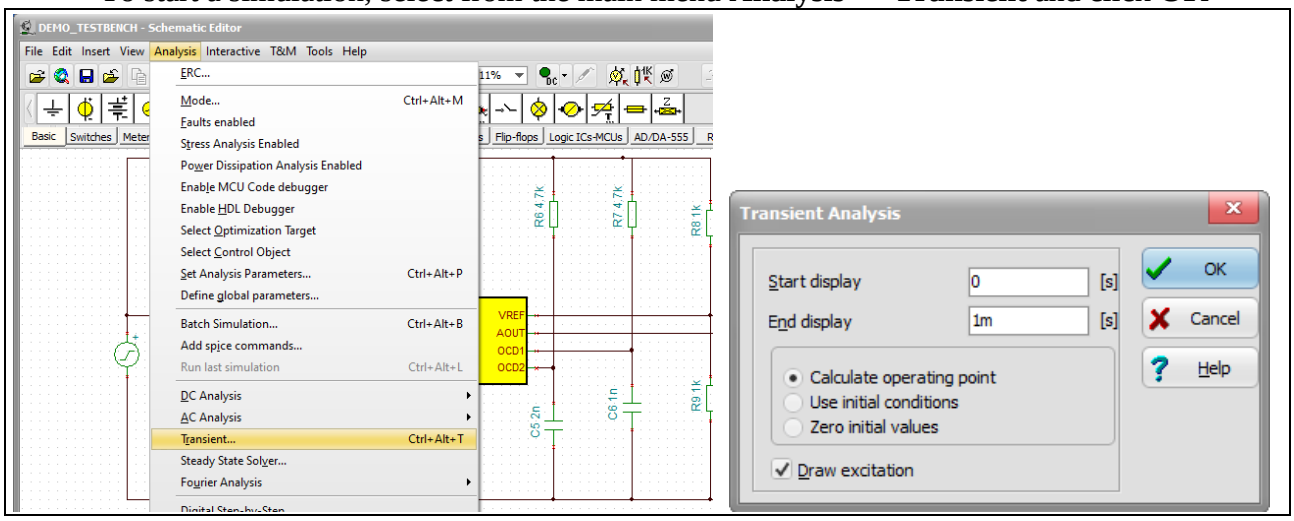


Figure 9 Start a simulation

- After the simulation reaches 100% a new window will pop up and some waveforms will be plotted automatically

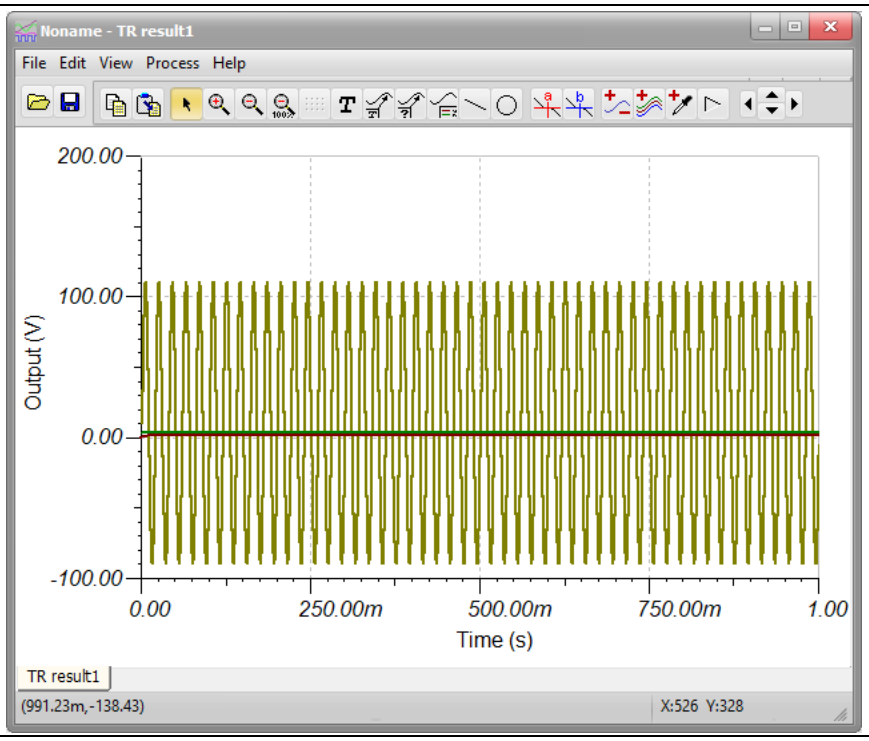


Figure 10 Plot signals

- From The main menu, select **View → Separate curves**

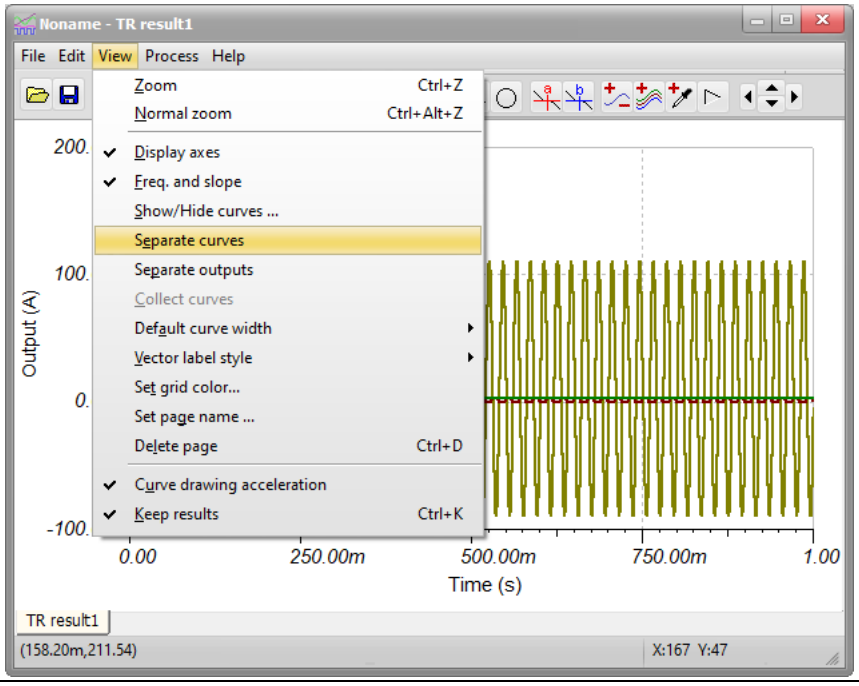


Figure 11 Separate curves

- From The main menu, select **Edit → Post-processor…**

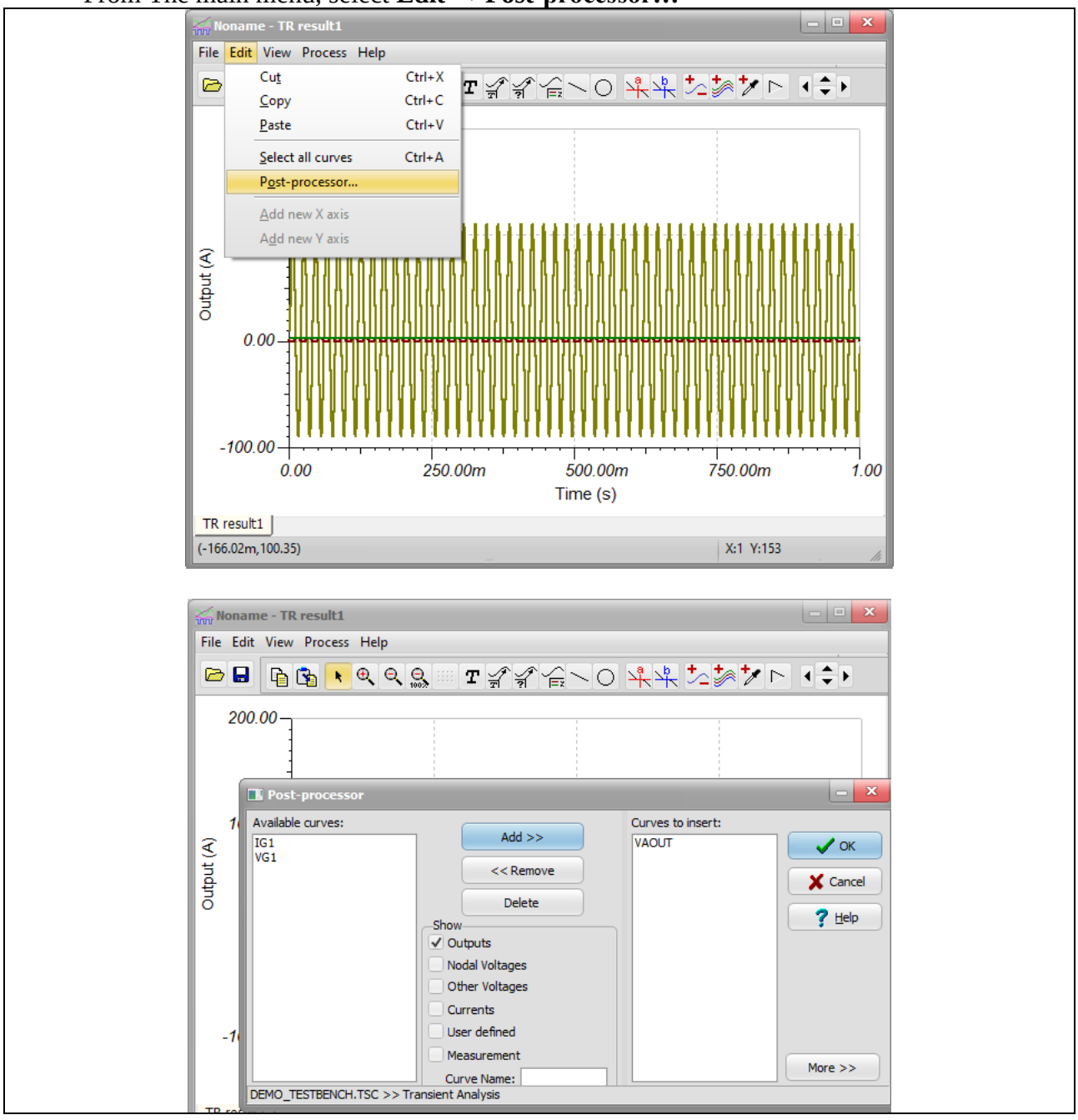


Figure 12 Select more waveforms to be plotted

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Revision history

Document version	Date of release	Description of changes
Rev 1.0	2023-03-10	GettingStarted released