

Import SPICE Model into TINA

TI Precision Labs – ADCs

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Download Slides From Web

- This presentation is a step by step method for importing SPICE netlists from other simulators
- Recommended to download the slides and step through the example

All Precision labs slides are downloadable from the Precision labs landing page.

<https://training.ti.com/ti-precision-labs-adcs>

TI Precision Labs - ADCs

- 1 Introduction to Analog-to-Digital Converters (ADCs)
- 2 Analog-to-Digital Converter (ADC) Drive Topologies
- 3 Error and Noise
- 4 AC Specifications
- 5 SAR ADC Input Driver Design
 - 5.1 TI Precision Labs - ADCs: Introduction to SAR ADC Front-End Component Selection
 - 5.2 TI Precision Labs - ADCs: Selecting and Verifying the Driver Amplifier
 - 5.3 TI Precision Labs - ADCs: Building the SAR ADC Model
 - 5.4 TI Precision Labs - ADCs: Refine the RfIt and CfIt Values
 - 5.5 TI Precision Labs - ADCs: Final SAR ADC Drive Simulations
 - 5.6 TI Precision Labs - ADCs: Hands-on Experiment - Amplifier Settling and Charge Bucket Filter Design
 - 5.7 TI Precision Labs - ADCs: Math Behind the R-C Component Selection
- 6 Driving the Reference Input on a SAR ADC
- 7 Low-power SAR ADC System Design
- 8 High-Speed Analog-to-Digital Converter (ADC) Fundamentals

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5.1 TI Precision Labs - ADCs: Introduction to SAR ADC Front-End Component Selection

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Finally, the video covers how you can use a software calculator to find initial amplifier and RC filter values. These values will be used in subsequent videos for TINA SPACE optimization of the circuit.

This slide shows the overall process that we will walk through to select the external components for the SAR ADC. These steps will be covered in several videos.

This video will walk through the first three steps. Let's start by going through an overview of how the SAR

English

Watch the next video in the series:
TI Precision Labs - ADCs: Selecting and Verifying the Driver Amplifier

Details

Date: April 14, 2017

This video walks through the process of selecting the proper bandwidth amplifier and external RC filter components for the input driver circuitry. It also showcases how to use the Analog Engineer's Calculator to select the R and C components.

PDFs for download

- Slides - Intro to SAR ADC Component Selection.pptx
- Quiz - Intro to SAR ADC Component Selection.pptx

Download All

Additional information

- Download the Analog Engineer's Pocket Reference e-book.

Related courses and events

Getting Started with Current Sense Amplifiers, Session 16: Benefits of Integrated Precision Shunt Resistor
Date: May 12, 2015

Let TI GaN revolutionize your next design
Date: February 15, 2017

Motor Drives in Appliances: Why Transforming from High Voltage to Low Voltage?
Date: April 13, 2017

Average Current Mode Control of Bidirectional DCDC

Procedure to import SPICE model into TINA

1. Download Schottky diode SPICE models (.LIB, .CIR or .MOD netlist file) from Manufacturer's website.
2. Open the netlist file and revise the format.
3. Import and Compile the Netlist file in TINA-TI.
4. Create the TINA-TI macromodel (.TSM) by using New Micro Wizard.

Download SPICE model: Product Page on Diodes Inc.

https://www.diodes.com/products/discrete/diodes-and-rectifiers/diodes/schottky-less-than-5a/part/BAT42WS

BAT42WS (Schottky Less th...

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Schottky (Less than .5A)

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PFC Diodes (DIODESTAR)

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Analog

Power Management

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BAT42WS

Schottky

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Product Specifications

Product Parameters

Qualified to AECQ10x	Yes
Automotive Compliant PPAP	No
Configuration	Single
Power Rating	200 mW
Peak Repetitive Reverse Voltage VRRM	30 V
Forward Continuous Current IFM	200 mA

Related Content

Packages

SOD323

Quality & Reliability

RoHS CoFC

RoHS-Product-List.pdf

Technical Documents

SPICE Model

BAT42WS.spice.txt

Recommended Soldering Techniques

TN1.pdf

Step 1:
Download PSpice model.

Note: If the Spice netlist file has a different extension(.lib,.cir or .mod), open it with Notepad directly.

Revise the Netlist of Schottky diode

```
BAT42WS.spice.txt - Notepad
File Edit Format View Help
*SRC=BAT42WS;DI_BAT42WS;Diodes;Si; 30.0V 0.200A 5.00ns Diodes Inc
Schottky Diode
.MODEL DI_BAT42WS D ( IS=87.5u RS=18.1m BV=30.0 IBV=500n
+ CJO=8.88p M=0.333 N=3.51 TT=7.20n )
```

```
BAT42WS.txt - Notepad
File Edit Format View Help
*****
*Revised the original model netlist from Diodes website: BAT42WS.spice.txt*
*****
*SRC=BAT42WS;DI_BAT42WS;Diodes;Si; 30.0V 0.200A 5.00ns Diodes Inc *
*****
.subckt Schottky A K
d1 A K dx
.MODEL dx D(IS=87.5u RS=18.1m BV=30.0 IBV=500n
+ CJO=8.88p M=0.333 N=3.51 TT=7.20n)
.ends|
```

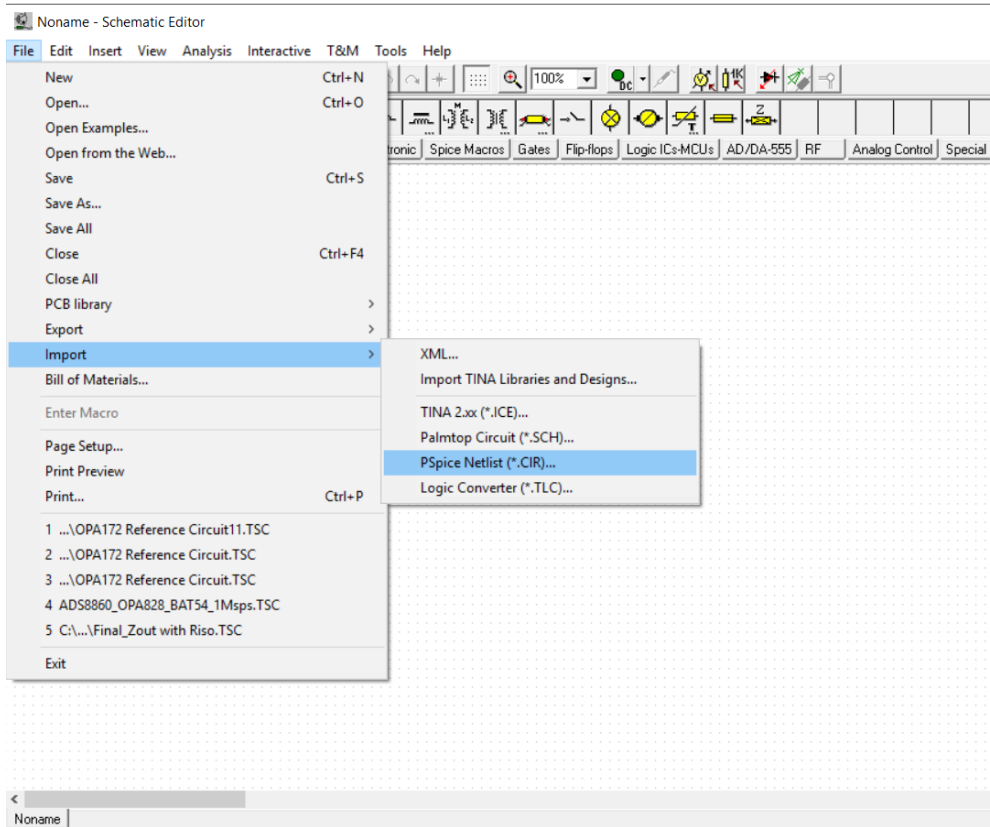
Revised!

Step 2:

- Add pin declaration.
- Modify netlist to this format.

Step 3: Change the file extension to .cir or .lib.
(BAT42WS.cir)

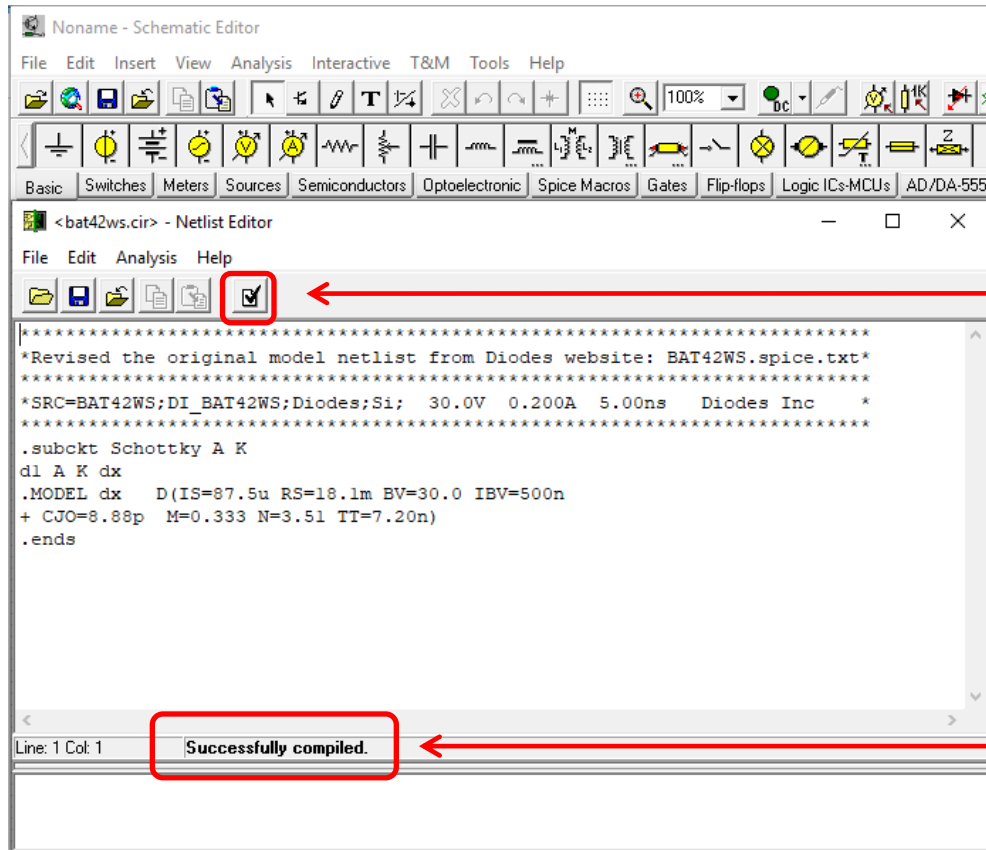
Import and Verify Compatibility with TINA



Step 4:

- Open TINA, and select “File-> Import ->Pspice Netlist(*.CIR)”.
- Select “BAT42WS.cir”.

Import and Verify Compatibility with TINA – Cont'd



Step 5:

Select check-box icon indicated by black arrow.

Step 6:

The netlist format and syntax are compatible with TINA!

Create TINA-TI macromodel for Schottky diode

New Macro Wizard

Select the source of the macro.

Macro Name
BAT42WS

☐ Empty circuit
☐ Current circuit
☒ From file

C:\Users\va0282169\Desktop\BAT42WS.cir

☐ From the Web

Browse

Defaults
Label: SCK#
Parameters:

VHDL
☐ Generate VHDL component

Help < Back Next > Cancel

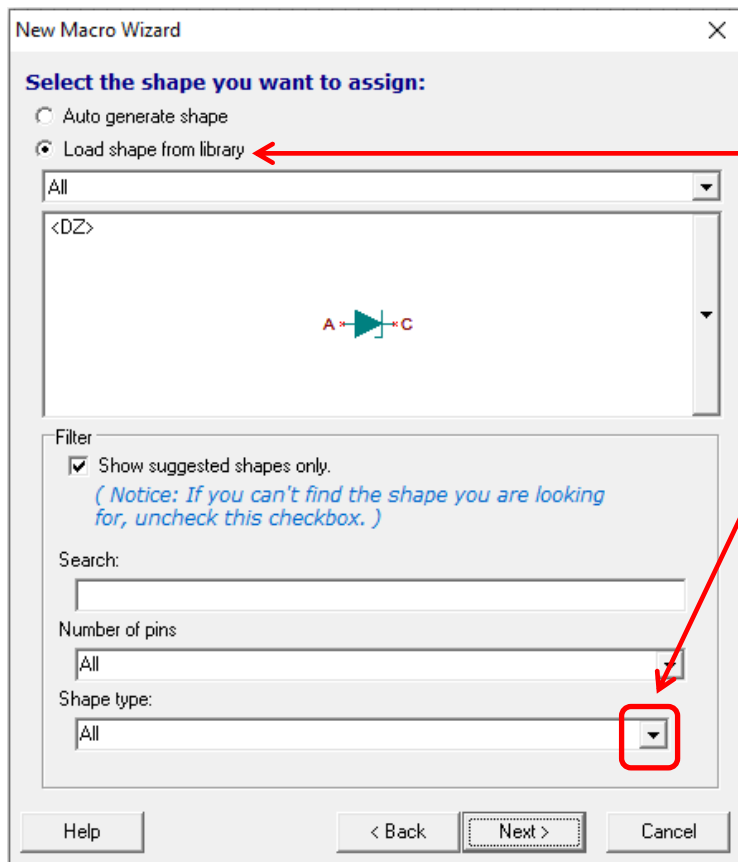
Step 7:

Open TINA9-TI and select “Tools”-> “New Macro Wizard” menu tab.
(shown on left side)

Step 8:

- Enter macromodel name.
- Select “From file”.
- Click the folder icon and navigate to the directory with the netlist.
- Click the “Next” button.

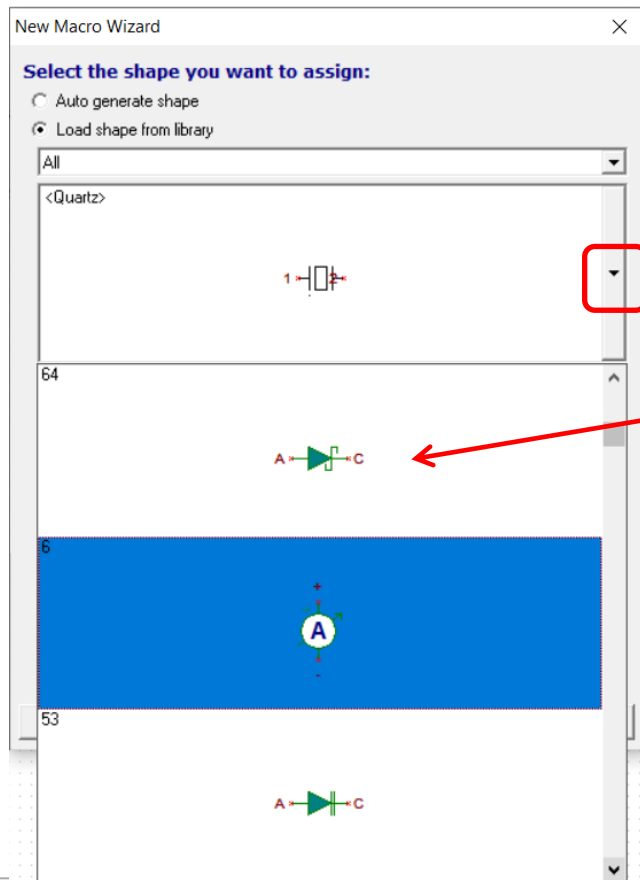
Assign a Symbol for the micromodel



Step 9:

- Select “Load shape from library”.
- May select “Diodes” from Shape type.

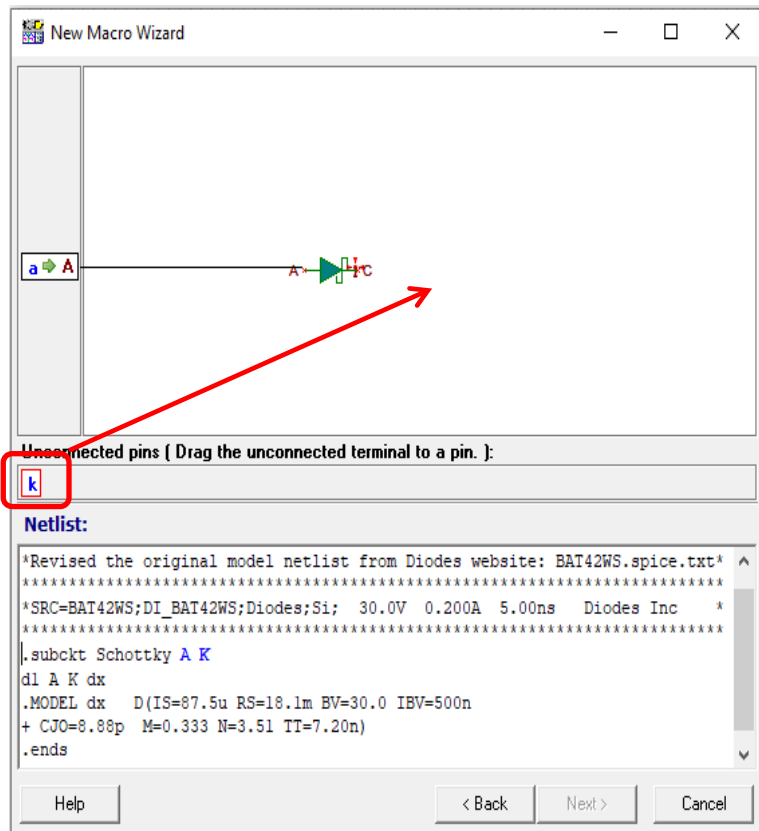
Assign a Symbol for the micromodel – Cont'd



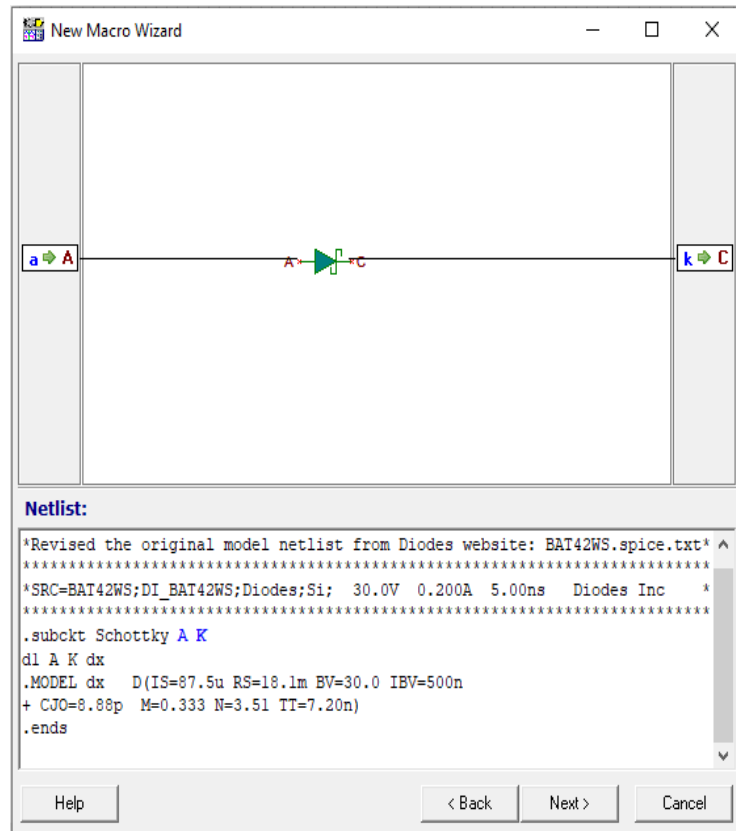
Step 10:

- Select the downward arrow and a drop-down list of symbols appears.
- Select Schottky symbol for the new micromodel.
- Click the “Next” button.

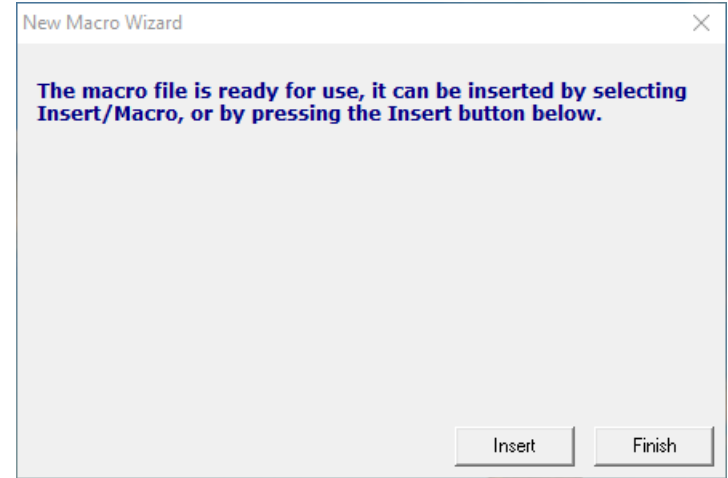
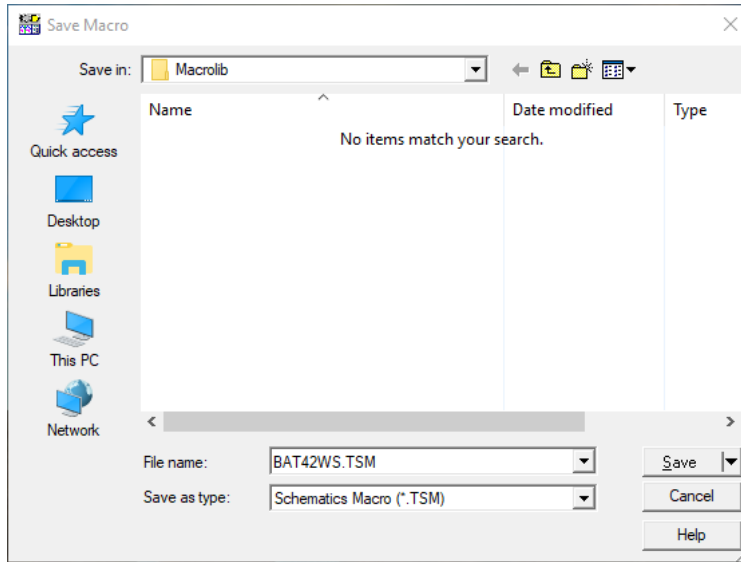
Assign pins for new micromodel



Step 11:
Assign Pins.



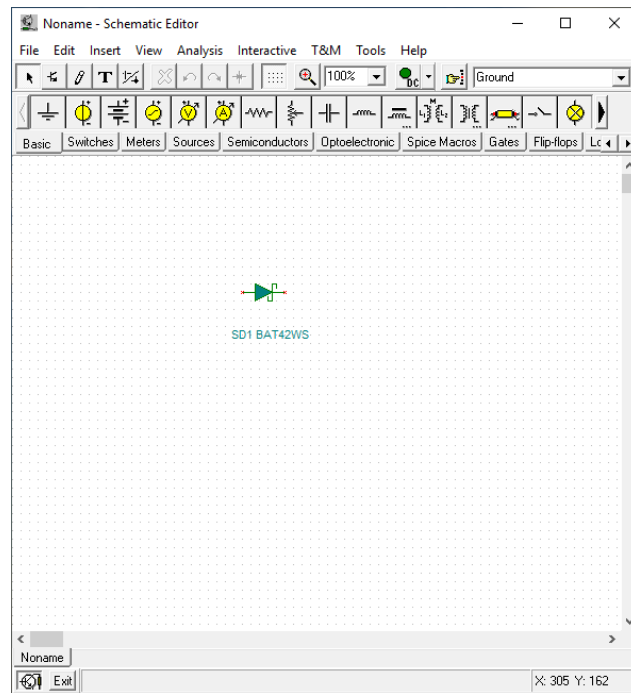
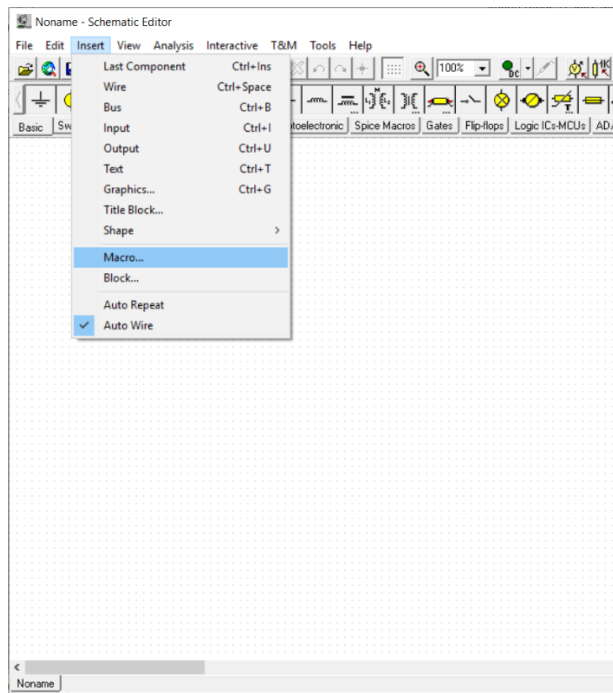
TINA-TI macromodel for Schottky diode is created



Step 12:

- Click the “Next” button.
- Save the new micromodel file(.TSM)

Place and Use new micromodel



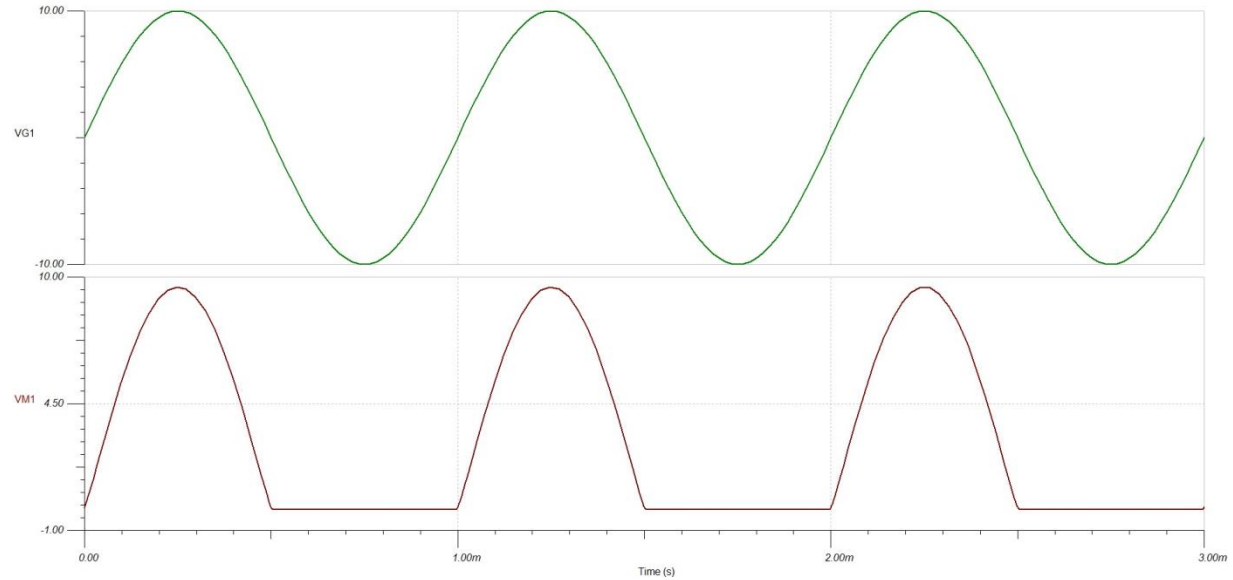
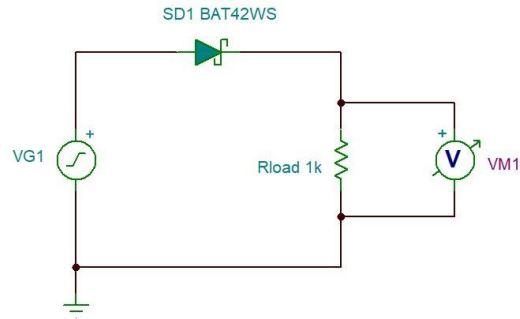
Step 13:

- Select “Insert” -> “Micro...” in TINA, Find your micromodel file(.TSM), Insert to the schematic.

Verify new micromodel



New micromodel Verification.TSC



Step 14:

- Verify new micromodel with Transient Analysis in TINA-TI.

Thanks for your time!



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