cadence®

Model Management with AMM User Guide

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Contents

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Analysis Model Manager

This chapter covers the following topics:

Overview

The Analysis Model Manager (AMM) is aimed at providing universal and consistent analysis model management based on industry standards. AMM provides a common module and a uniform way to manage all known models for Sigrity analysis tools, such as SPEED2000, OptimizePI, PowerDC, PowerSI, and XtractIM.

AMM provides a unified library workflow in managing analysis models including creating, editing, examining, validating, and assigning analysis models. AMM supports building and managing model libraries and working with vendor libraries.

You use AMM to manage libraries of models including device, discrete, VRM, and SPICE models. Models contained in AMM libraries can be assigned to components in a design. The Model Assignment functionality has also been integrated into some of the setup wizards.

Regardless of the Sigrity tools from where it is launched, the AMM user interface is the same.

Launching AMM

AMM and its supported modules, Model Assignment, IBIS Editor, and SPICE Editor are available from various Sigrity Analysis tools.

You can launch AMM in one of the following ways:

In PowerSI, PowerDC, XtractIM, or OptimizePI:

1. Choose *Tools – Analysis Model Manager*.

   OR

2. From the Model Assignment GUI:

   - ❑ Choose the *Assign – Browse model* menu.

     Or

     In the Component pane, right-click and choose the *Browse model* menu from the pop-up menu.

In OptimizePI:

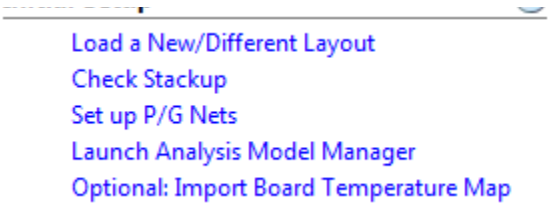
You can also launch AMM in OptimizePI from the Workspace menu:

➡ Choose *Workspace – Capacitor Library – Manager*.

In Power DC:

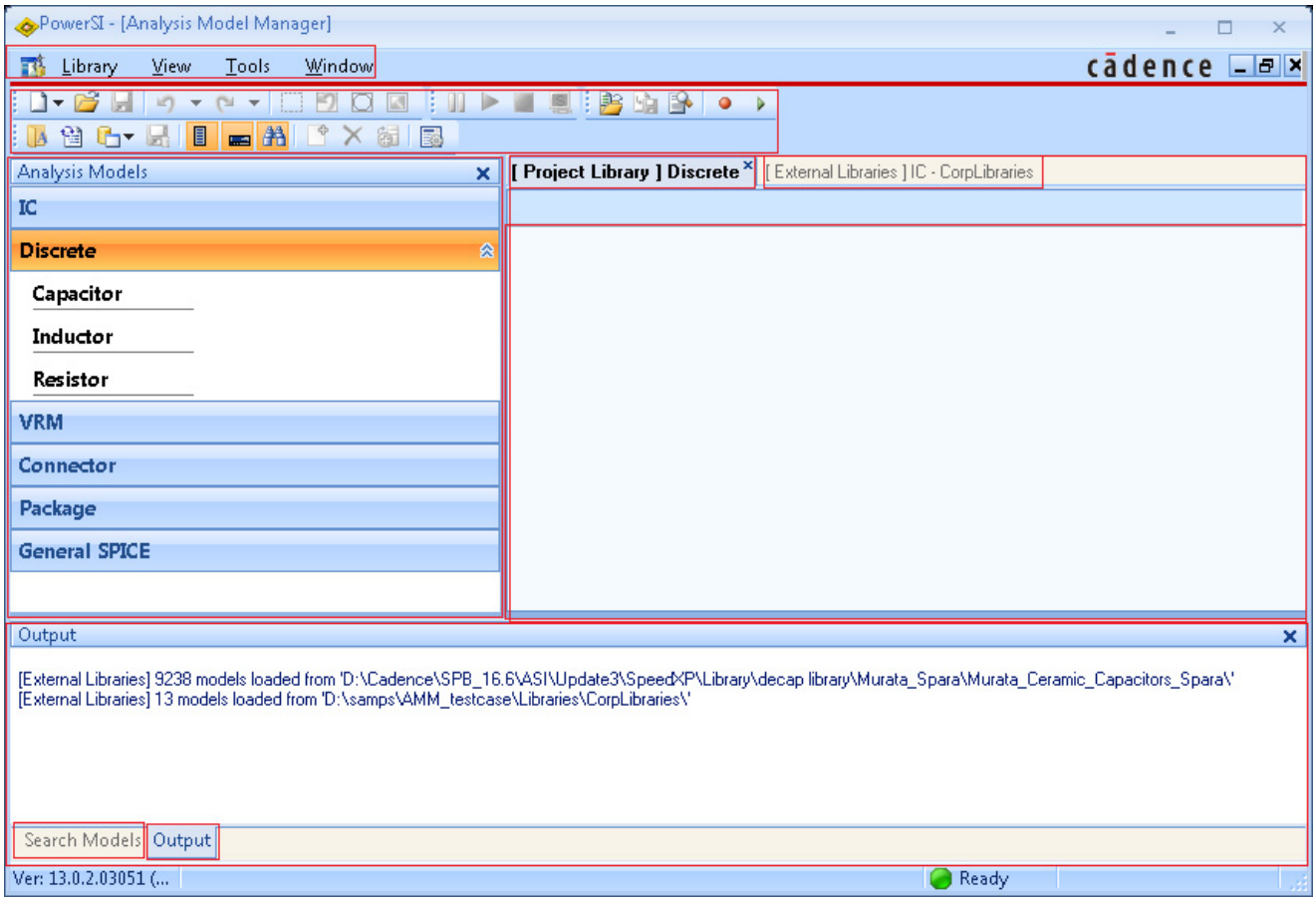
You can also launch AMM from the Workflow pane:

➡ Click *Launch Analysis Model Manager* under the *Initial Setup* section in the Workflow pane.



The AMM User Interface

The Analysis Model Manager user interface is divided into various sections:



- Navigation pane on the left which presents a tree view of the libraries where you select a model category
- Library tabs
- Spreadsheet pane on the right displaying model data
- Editor pane at the bottom
- AMM Toolbar
- AMM menu

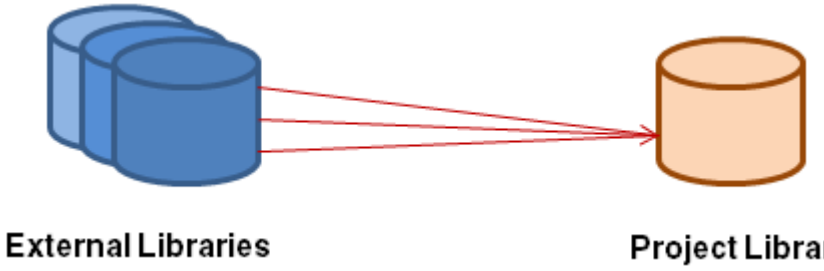
Navigation Pane

This pane lists the categories of models you can manage in AMM, including IC, Discrete (Capacitor, Inductor and Resistor), VRM, Connector, Package and General SPICE. You can also open or import a library file from this pane. When you select an open library under a model category, all the models in the library are displayed in the Spreadsheet pane.

Library Tabs

The Library tabs on top of the Model Data section act as a filter to make certain libraries visible. There are two library tabs:

- **Project Library** — Applicable to the current project only.
  - The Project Library table lists all the available models used or which can be used in the current case.
  - All the libraries or folders must have the same root path, If you load a file or folder from a disk location, you cannot load another folder from a different location.
- **External Library** — Contains all models including company library, vendor library, or any user-created library.
  - The models in External Library are all available for selection.
  - External Library may contain unlimited libraries from different locations.



For a librarian, working on a project library is a viable option. For an end user in an application, the project library is intended for local library work. The project library also automatically stores models as you assign them to components. AMM supports a single project library and multiple *External Libraries*. You can determine the structure and the number of external libraries that work best in your environment. External Libraries can be thought of as Master, Corporate, or other Project libraries. You can also control read or write access with OS level permissions on the directories.

For more information on libraries, see Managing Libraries in AMM.

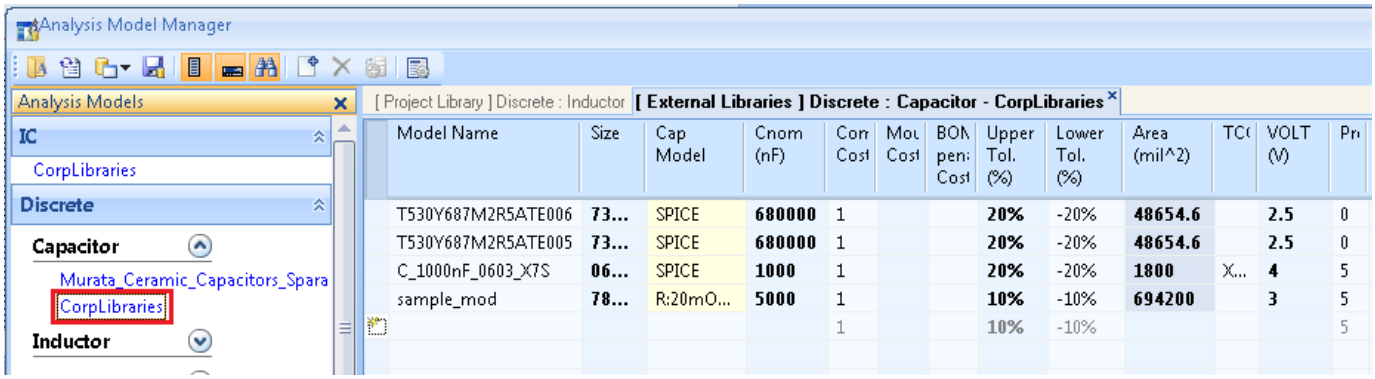
Spreadsheet Pane

The Spreadsheet pane displays detailed information of a library under the selected model category. When you click a top-level model category in the navigation pane, all the models of that category across all of the loaded libraries are displayed.

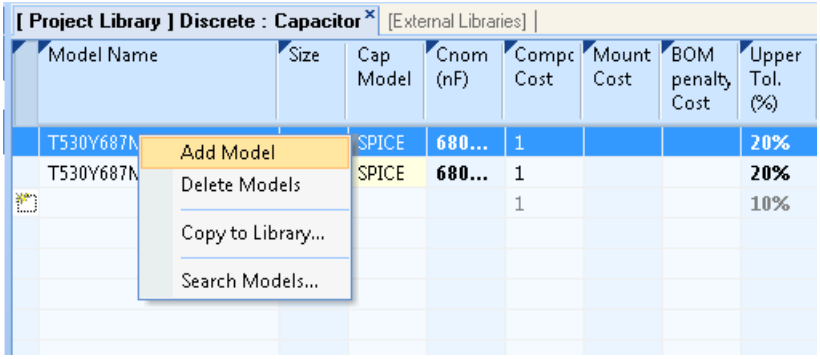
[Project Library] Discrete : Capacitor | [External Libraries] IC

Model Name	Size	Cap Model	Cnom (nF)	Compc Cost	Moun Cost	BC pe Cc	Upper Tol. (%)	Lower Tol. (%)	Area (mil^	TCC	VOL (V)	Pr
0201_10nF_X5R_10%_10V	0201E	SPICE	10	0.004			10%	-10%	200	X5R	10	5
0201_22nF_X5R_10%_6.3V	0201E	SPICE	22	0.005			10%	-10%	200	X5R	6.3	5
0201_33nF_X5R_10%_6.3V	0201E	SPICE	33	0.006			10%	-10%	200	X5R	6.3	5
0201_100nF_X5R_10%_6....	0201E	SPICE	100	0.005			10%	-10%	200	X5R	6.3	5
0201_220nF_X5R_20%_4V	0201E	SPICE	220	0.017			20%	-20%	200	X5R	4	5
0402_10nF_X7R_10%_25V	0402E	SPICE	10	0.002			10%	-10%	800	X7R	25	5
0402_22nF_X7R_10%_50V	0402E	SPICE	22	0.005			10%	-10%	800	X7R	50	5
0402_33nF_X7R_10%_10V	0402E	SPICE	33	0.006			10%	-10%	800	X7R	10	5
0402_47nF_X7R_10%_25V	0402E	SPICE	47	0.006			10%	-10%	800	X7R	25	5
0402_100nF_X5R_10%_10V	0402E	SPICE	100	0.002			10%	-10%	800	X5R	10	5
0402_220nF_X5R_10%_6....	0402E	SPICE	220	0.011			10%	-10%	800	X5R	6.3	5
0402_330nF_X5R_10%_10V	0402E	SPICE	330	0.015			10%	-10%	800	X5R	10	5

You can also select a specific library and see the models for just that library. Depending on which tab is selected, models are displayed either from the project library or external libraries.



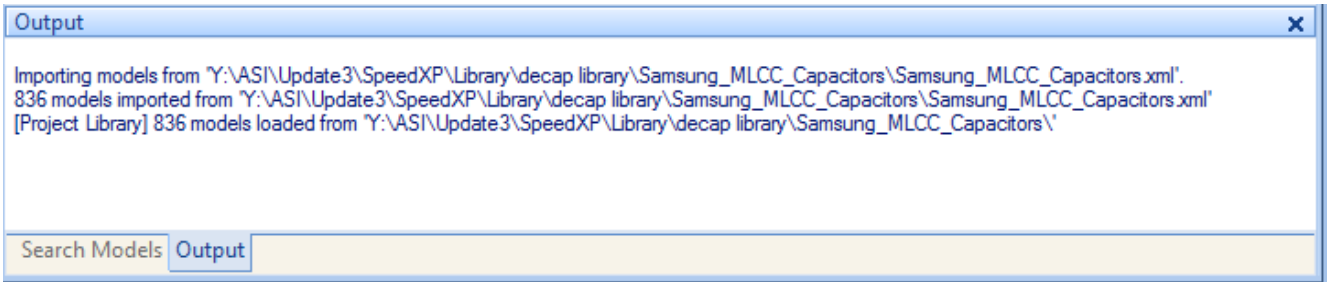
In this pane, you can also *add a model* to the selected model library.



Editor Pane

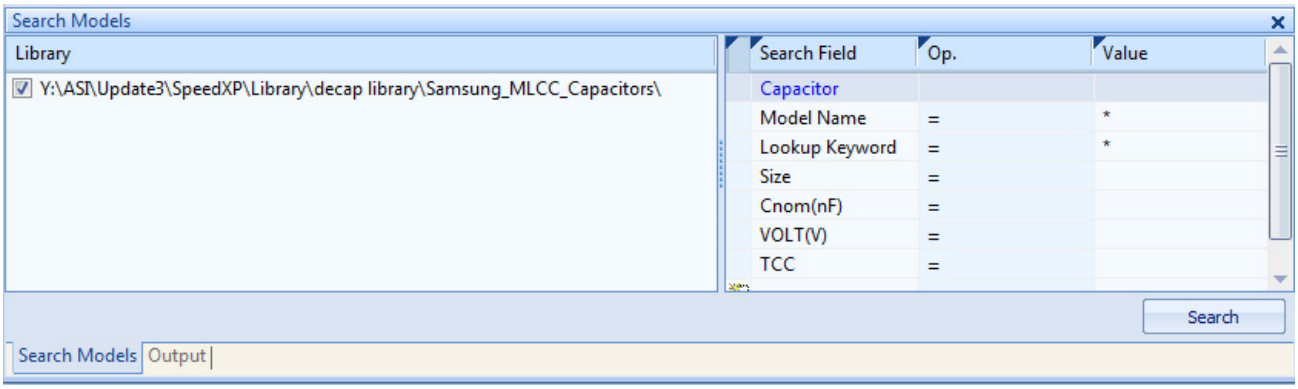
By default, the Editor pane consists of two panes:

- **Output pane:** This pane shows detailed information about the loaded models.



- **Search Models pane:** This pane is further split into two parts:
  - Library section on the left shows the location of the library to be searched when you are searching in an external library, that is when the External Libraries tab is active. When you are searching in the project library, this pane is blank.

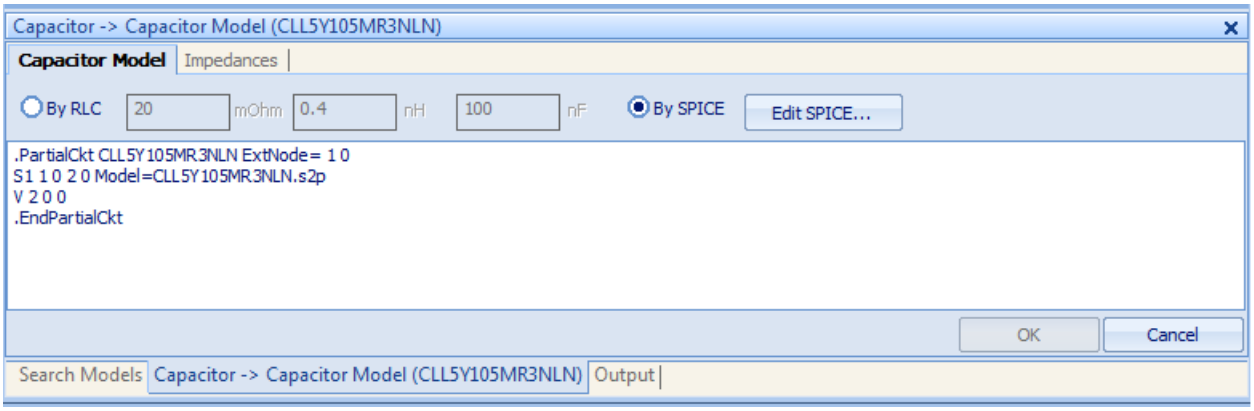
- Search criteria section on the right is used to set the search parameters.



Note: You can select the check box for the library location to select the library in which to search for models.

The Library section does not show each location of each library. If the libraries are stored in a shared path, only the location of the parent folder is shown here.

The Editor pane opens the corresponding property pane when a model is selected in the Spreadsheet pane.



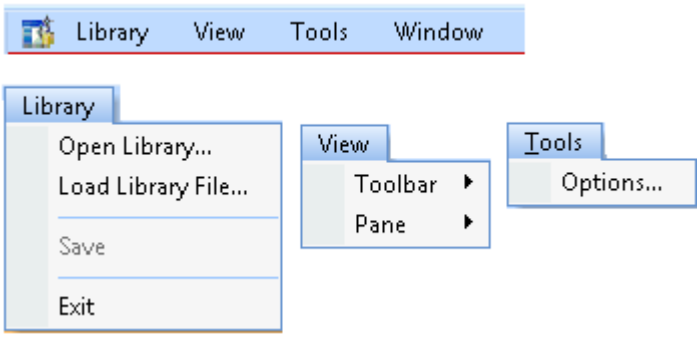
AMM Toolbar

The standard toolbar of the AMM UI provides the common function you can perform in the AMM user interface.

Icon	Description
Open Library	All the libraries within the designated location are loaded into AMM.
Load Library File	The designated library is imported and loaded into AMM.
Opened Library	A drop-down list shows a list of all of the libraries opened for a particular tab— Project Library or External Libraries.
Save Library	Save the currently displayed library.
View Pane Analysis Models	The Navigation pane is hidden. The Spreadsheet pane expands across the upper part of AMM
View Pane Output	Open the Output pane
Search Models	Open the Search Models pane
Add Model	Add a new model
Delete Models	Delete the selected model(s)
Copy to Library	Copy the selected model(s) to target library
Settings	Open the Settings window

AMM Menu

The standard toolbar of the AMM UI provides the common function you can perform in the UI.



Menu Command	Description
Library – Open Library	Open the libraries within the designated location.
Library – Load Library	Import and load the specified library into AMM.
Library – Save	Save the currently displayed library.
View – Toolbar – Standard	Show or hide the standard AMM toolbar
View – Pane – Models/ Output/Search	Show or hide the Output or Search Models panes.
Tools – Options	Opens the *Options* dialog.

Working with AMM

This section covers the following topics:

- Managing Libraries in AMM
- Setting Preference Options

Managing Libraries in AMM

- Types of Libraries in AMM
  - AMMP File
  - AMMX Library Flies
  - Decap XML Library Files
  - Vendor Library Files
- Using Libraries
  - Opening a Library
  - Importing a Library File
  - Removing Libraries
  - Using External Libraries

Types of Libraries in AMM

AMM supports libraries in various file formats, such as AMMP, AMMX, AMM, and XML.

AMMP File

When AMM launches, it looks into the user preference file (`.ammp`) to load an existing set of libraries (a configuration). A *preference* file is supplied to specify the loaded library list and whether to load it or not.

```
▼<AMMP Version="1.0">
  ▼<Library>
     <Lib Path="D:\Cadence\SPB_16.6\ASI\Update2\SpeedXP\Library\decap library\" On="YES"/>
     <Lib Path="D:\decap library\Sigrity_Default_Library\" On="YES"/>
   </Library>
 </AMMP>
```

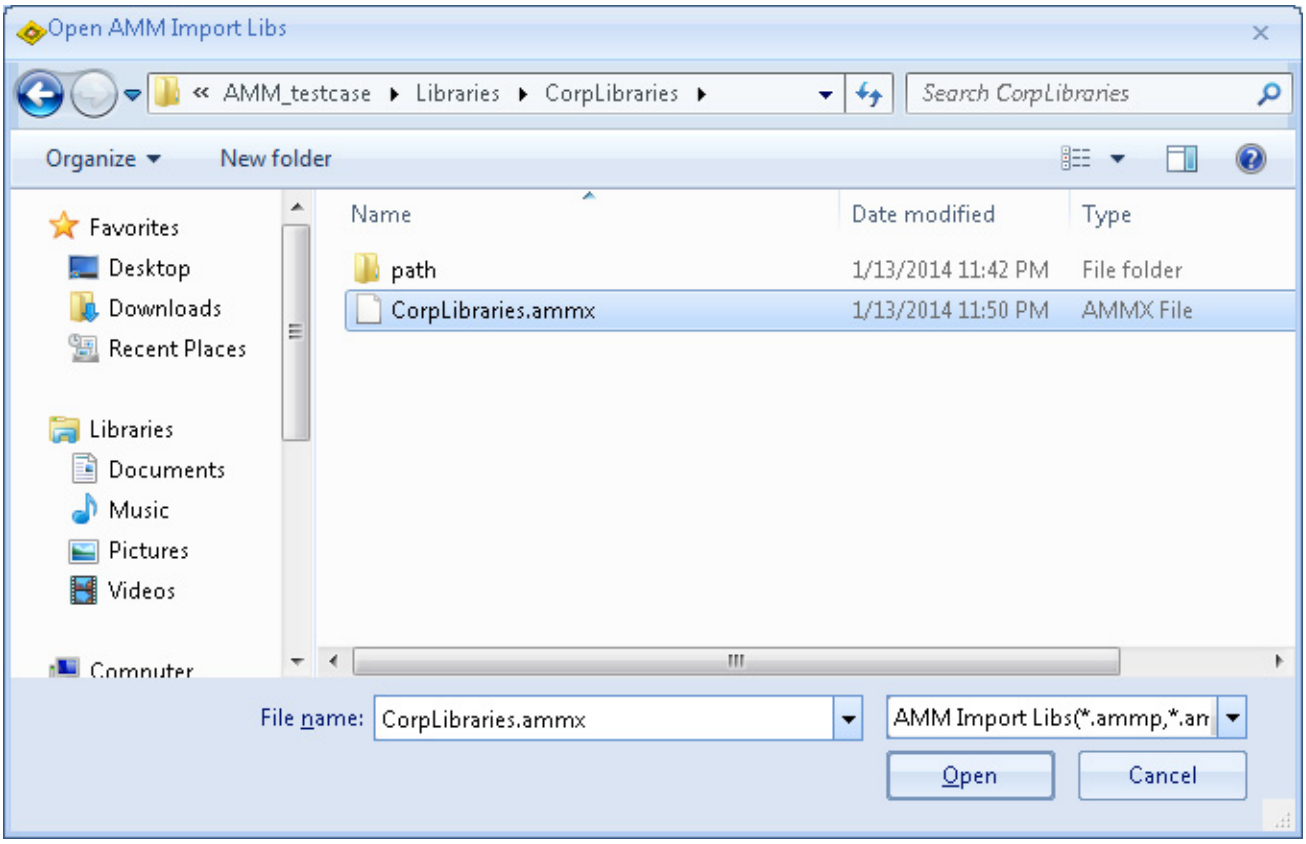
A user preferences file can be:

- **Global**, a common preference file for all designs stored at the location of installed tools
- **Local**, design-specific preference file stored at the same location as the design

If no specific design is open, AMM uses the global preference file to load libraries. If a specific design is open in an analysis tool, and if the design specific preference file exists, AMM uses the design-specific preference file to load the libraries, if such a file exists. If it does not exist, the global preference file is used.

AMMX Library Flies

An AMMX file is an external XML file of library data. You can import an existing `.ammx` file from the *Load Library File* menu command.



Decap XML Library Files

These are the old Sigrity library format – a default and several vendor libraries supplied in the installation hierarchy. These libraries can be imported to generate an AMM library. You can load an xml file to load an existing Decap Library.

Vendor Library Files

The following five vendors and the supported file formats are:

Vendor	File Format
Murata	.MOD
Kemet	.CKT
TDK	.MOD

Vendor	File Format
Samsung	.S2P
TaiYoYuDen	.S2P

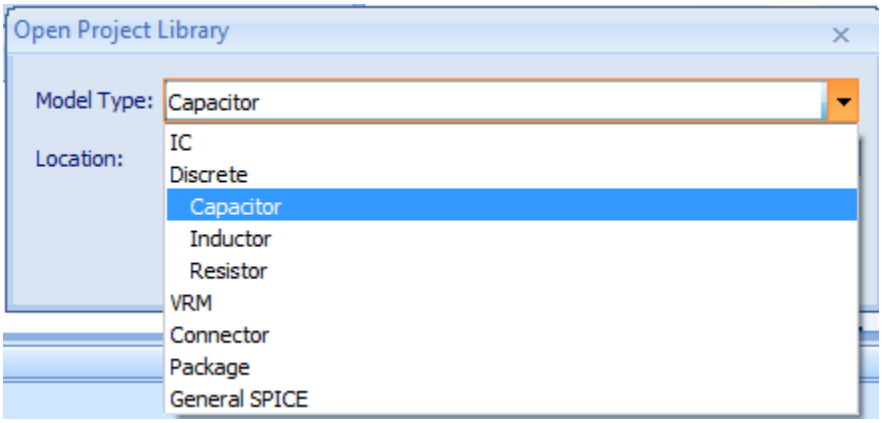
Using Libraries

In AMM, you can either open a library from a specified location or load a library file.

Opening a Library

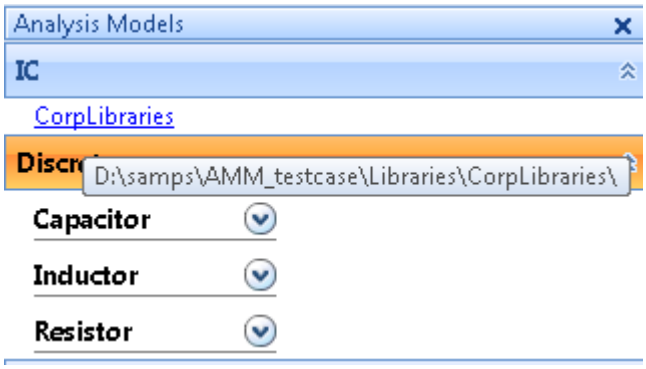
To open a library,

1. Click the Open Library icon or right-click in the navigation pane and select the *Open Library* command from the pop-up menu.
2. In the Open Project Library dialog, select the appropriate model type.



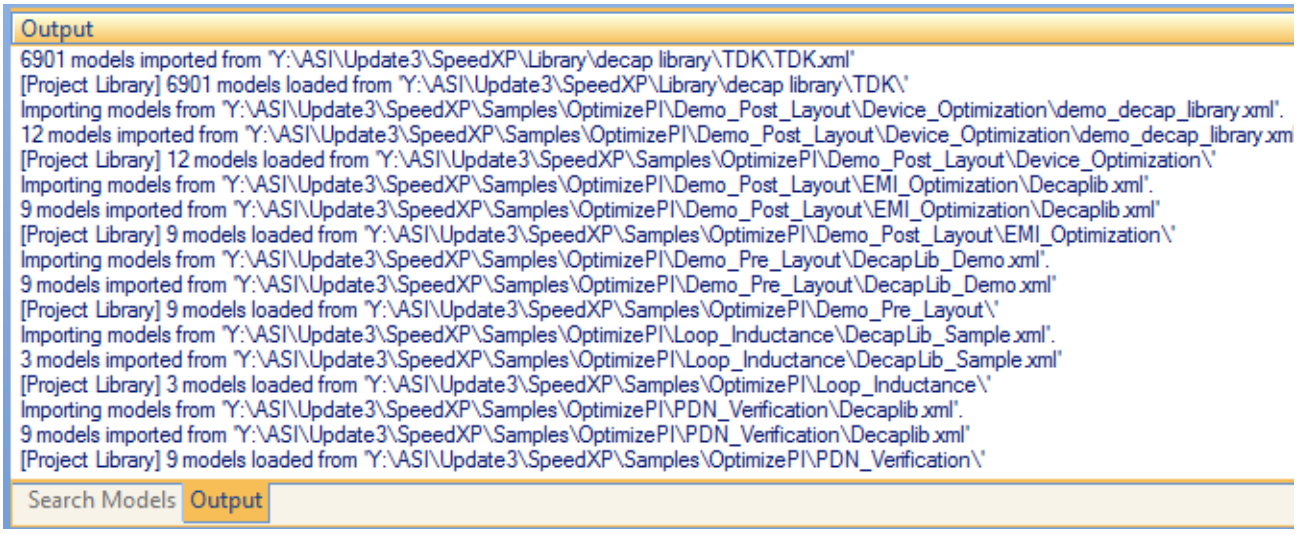
   The Model Type field sets the default model category that will be visible after the library is opened. It does not limit the type of models that can be present in the library. You can keep any type of models in a library.
3. Click the ellipsis next to the Location edit box.
4. In the resultant Browse for Folder dialog, browse to the location of the library to be added.
5. Close the dialog boxes.

The models of the selected model type are populated in the spreadsheet pane of AMM. As you hover the mouse pointer over the library name in the navigation pane, note that the path appears in the tooltip.



6. View the Output tab for details of the models imported in AMM.

   Note that the models are of the type you specified and are imported from the `.xml` files under the specified root folder.



- When the Project Library tab is active, a library is loaded from the location of the project library.
- When the External Library tab is active, a library is loaded from the location of the external libraries.

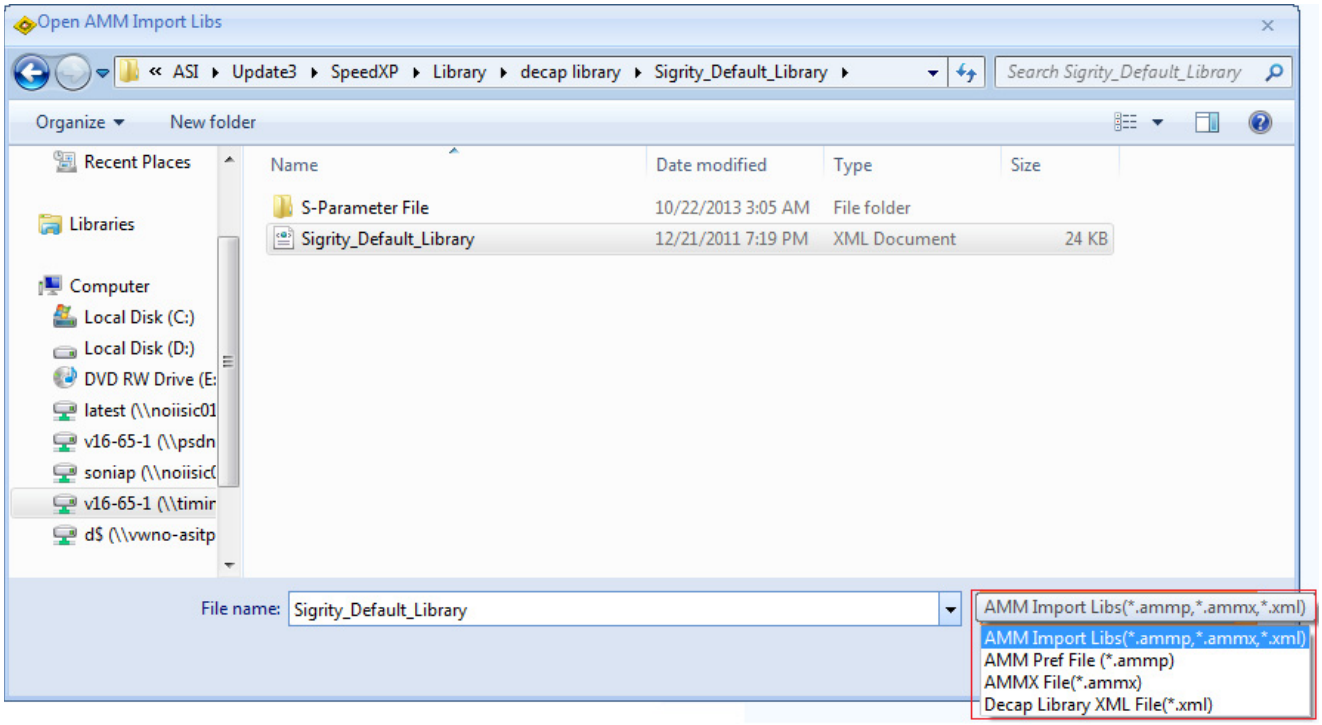
Importing a Library File

You can also reuse existing libraries by importing libraries in AMM. You import or load a library file when you need to import data from a specific library file. You can load a library file in AMM regardless of its location in the hierarchy.

To import a library file:

1. Click the Load Library File icon or right-click in the navigation pane and select the *Load Library* command from the pop-up menu.

- When the Project Library tab is active, models from the specified library file are loaded into the project library.
- When the External Library tab is active, models are loaded from the specified library file to external libraries.

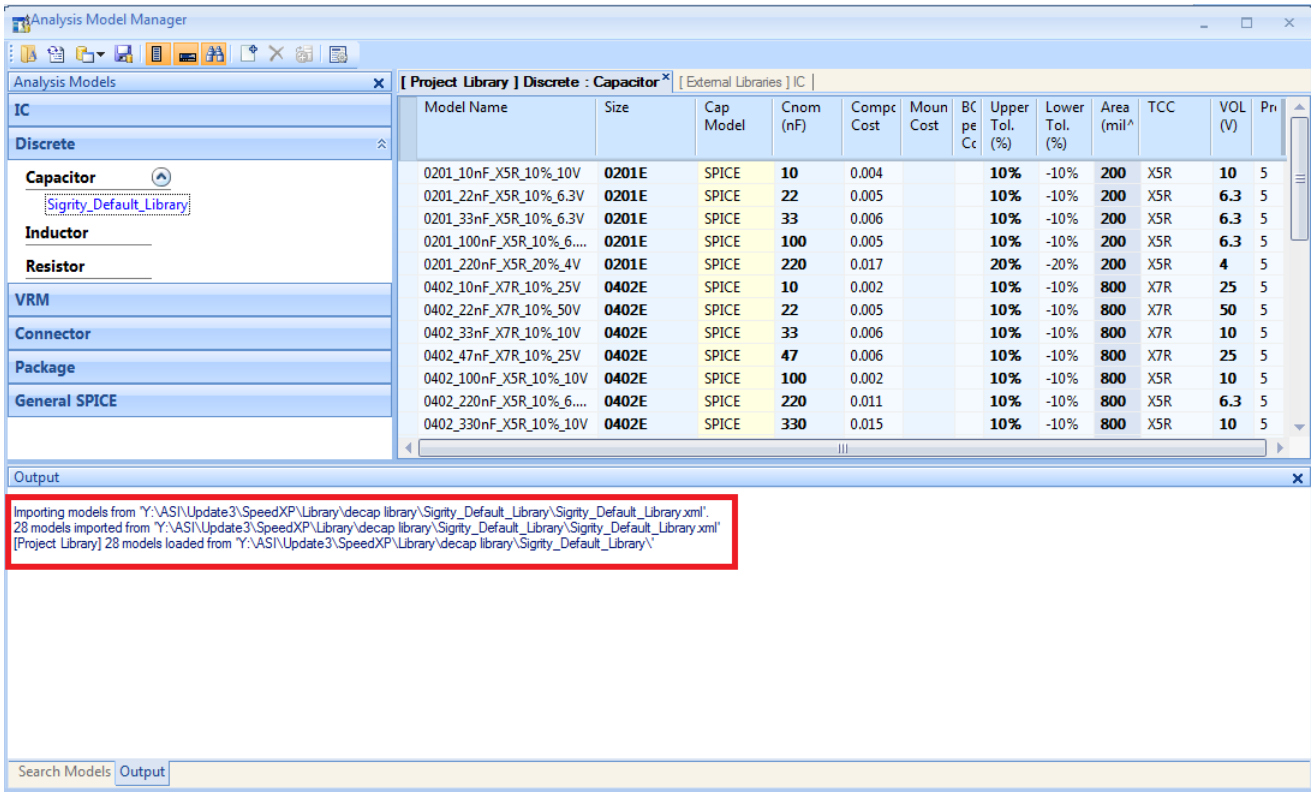


2. Browse to the path containing the library file.

   You can import a library file with one of the following three file extensions:

   - AMMP – AMM loads the library listed in preferred file location (*Tools – Options – General page*)
   - AMMX – AMM imports models from the AMMX file

- ❑ Decap XML – AMM imports models from decap XML file



Models are imported from the selected library into AMM.

Removing Libraries

You can remove a library from the current project. Use one of the following methods to remove a library:

➡ Right-click the library in the Navigation pane and select *Remove Library* from the pop-up menu.

Or

➡ Click the Opened Libraries icon and then in the list of libraries, click the red cross mark close to the name of the library to be removed.

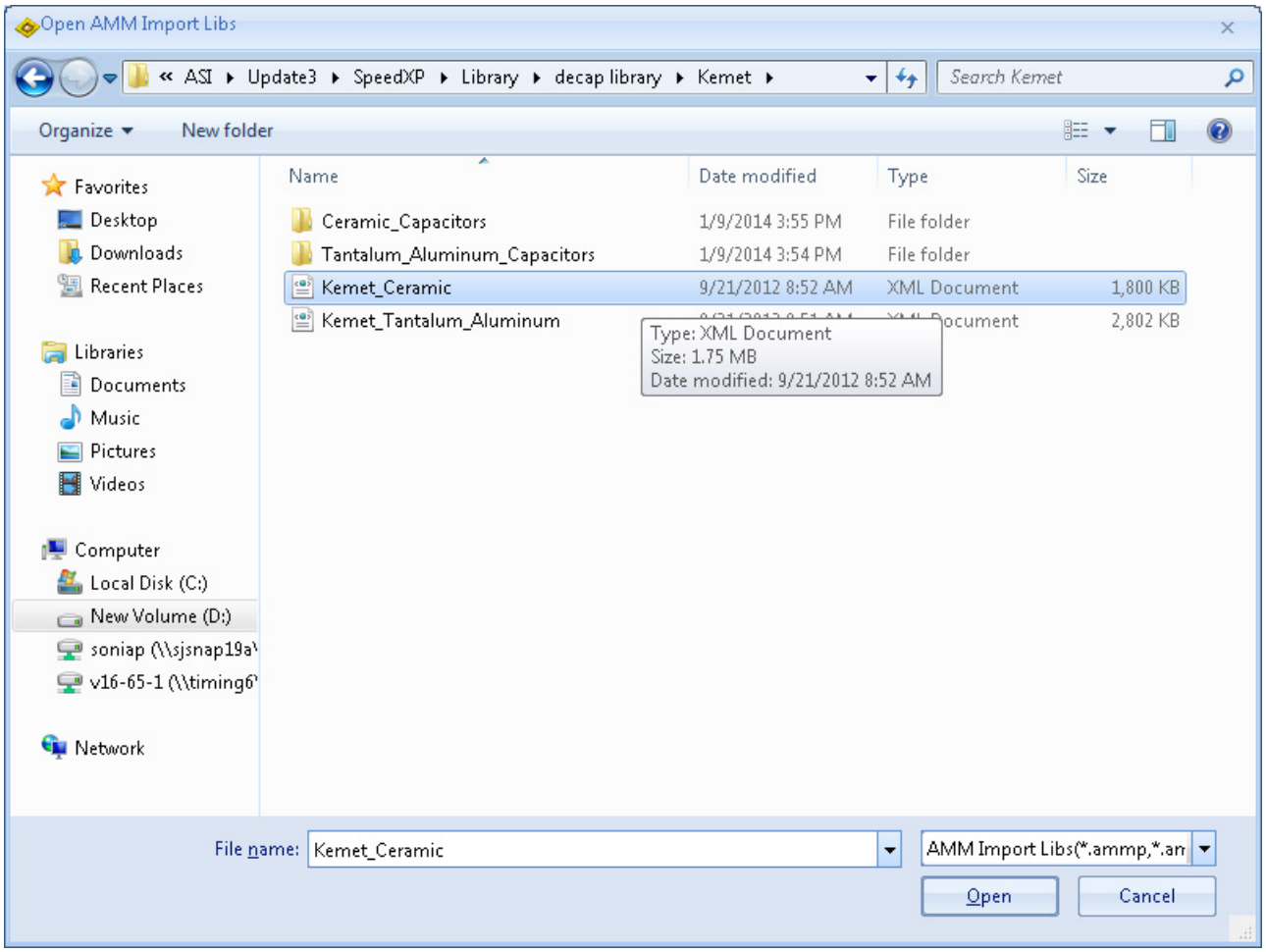
The selected library is removed.

Using External Libraries

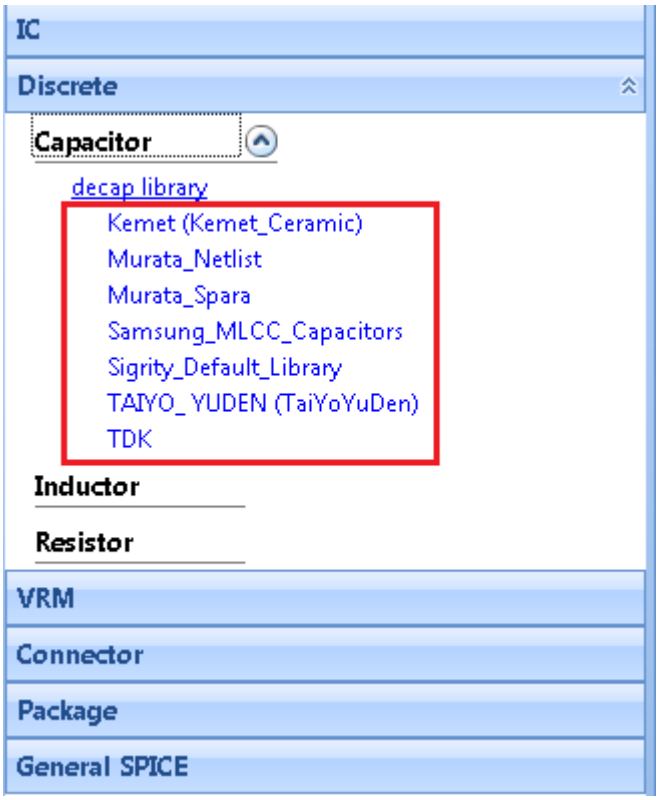
You can work with libraries that are external to the current project. An external library contains all models including company, vendor, or any user-created libraries. An external library can contain any number of libraries from various locations. You need to click the *External Libraries* tab to perform operations on external libraries.

Loading an External Library

You can open or load a library file in the same way as you open or load a project library. You can load a specific library file:



You can also open all the external libraries at a specified location:

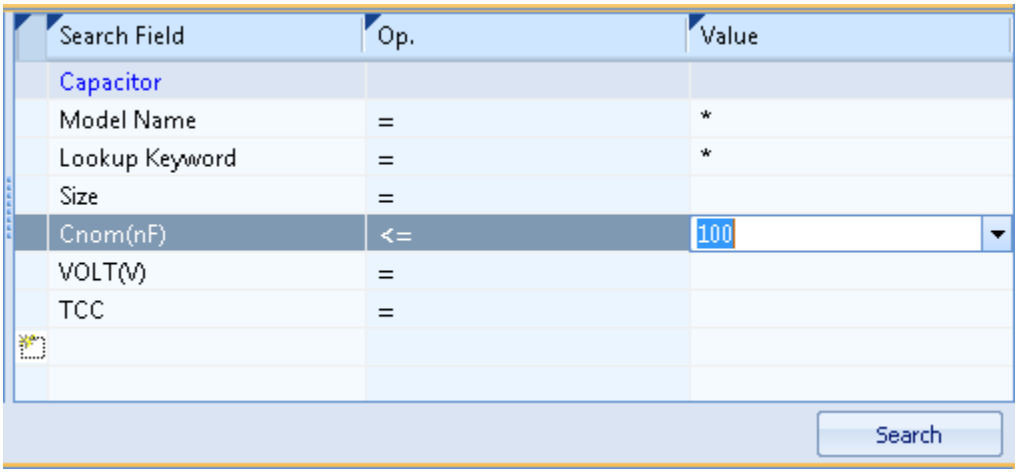


Searching in External Libraries

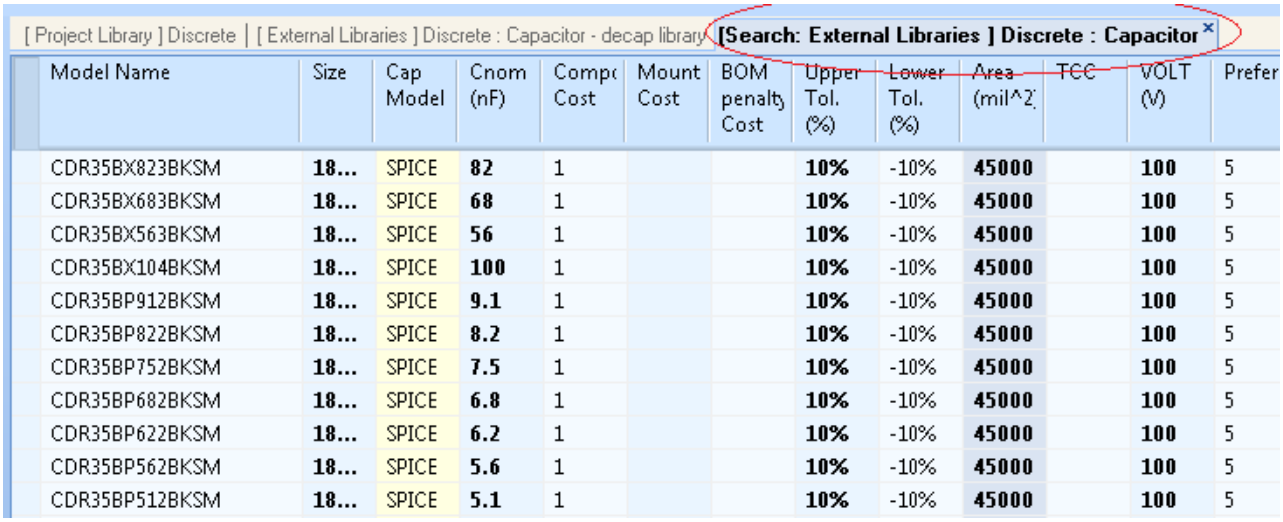
To search an external library for a model based on a specified criteria:

1. Select the external library file in the navigation pane or the parent folder containing all the libraries if you want to search in multiple libraries simultaneously.
2. Right-click in the Spreadsheet pane and choose the *Search Models* command from the pop-up menu.

3. In the Search Models pane, specify the search string and click *Search*.



Search results are displayed in the Search External Libraries tab.



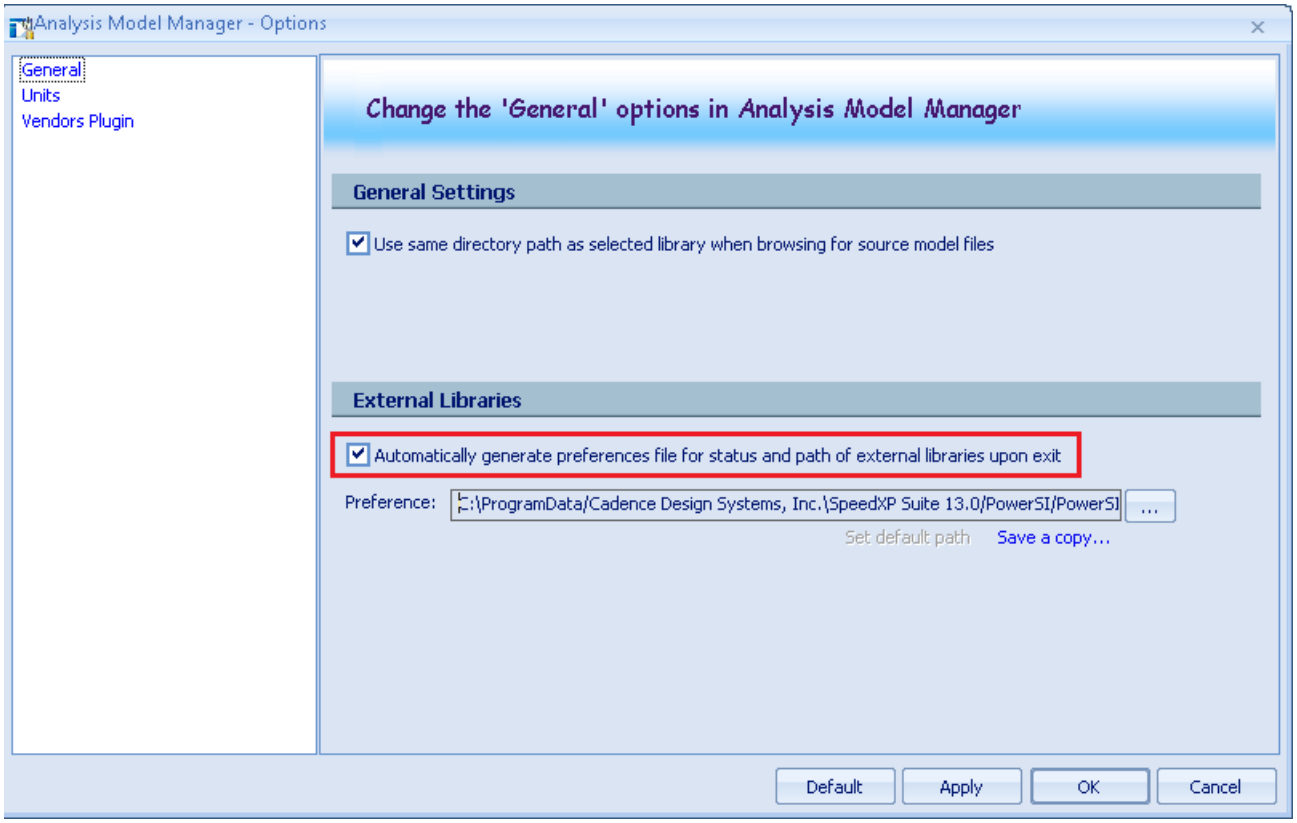
Setting Preference Options

You can specify a few AMM options in the Options dialog. There are three pages in the Options dialog accessible from the *Tools – Options* menu:

- General
- Units
- Vendors

General

Here you set the general options for opening models and libraries.



General Settings: If you want to use the directory path of the selected library for browsing model files, select the corresponding option in the General Settings section.

External Libraries: To generate a preference file (`.ammp`) consisting of the path to the currently open external files upon exiting from the tool, select the corresponding option in the External Libraries section.

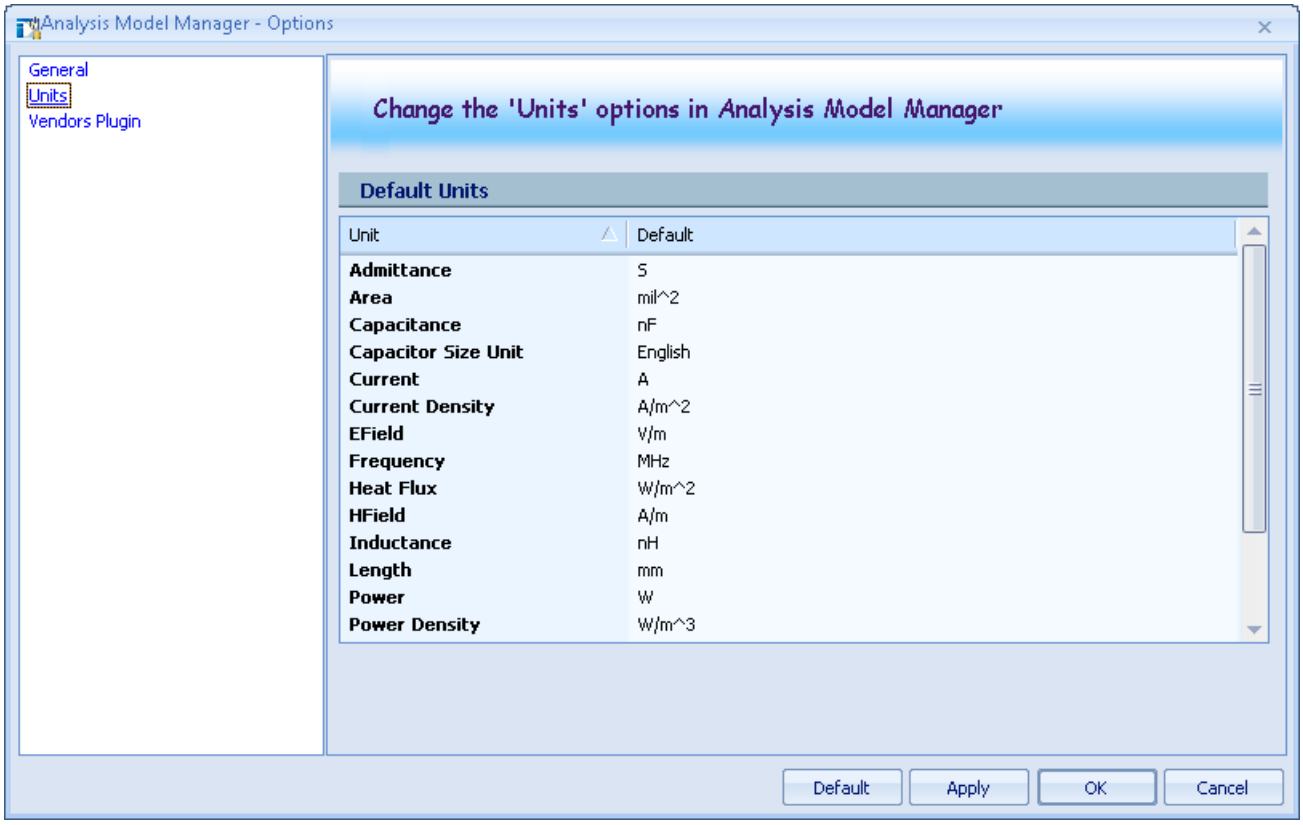
Set default path – Sets the specified path as the default path to save the `.ammp` file.

Save a copy – Saves a copy of the `.ammp` file.

By default, each application generates one `.ammp` (preference) file which is automatically read when the next time the application is launched. You can prevent this behavior by deselecting the option highlighted in the previous screenshot.

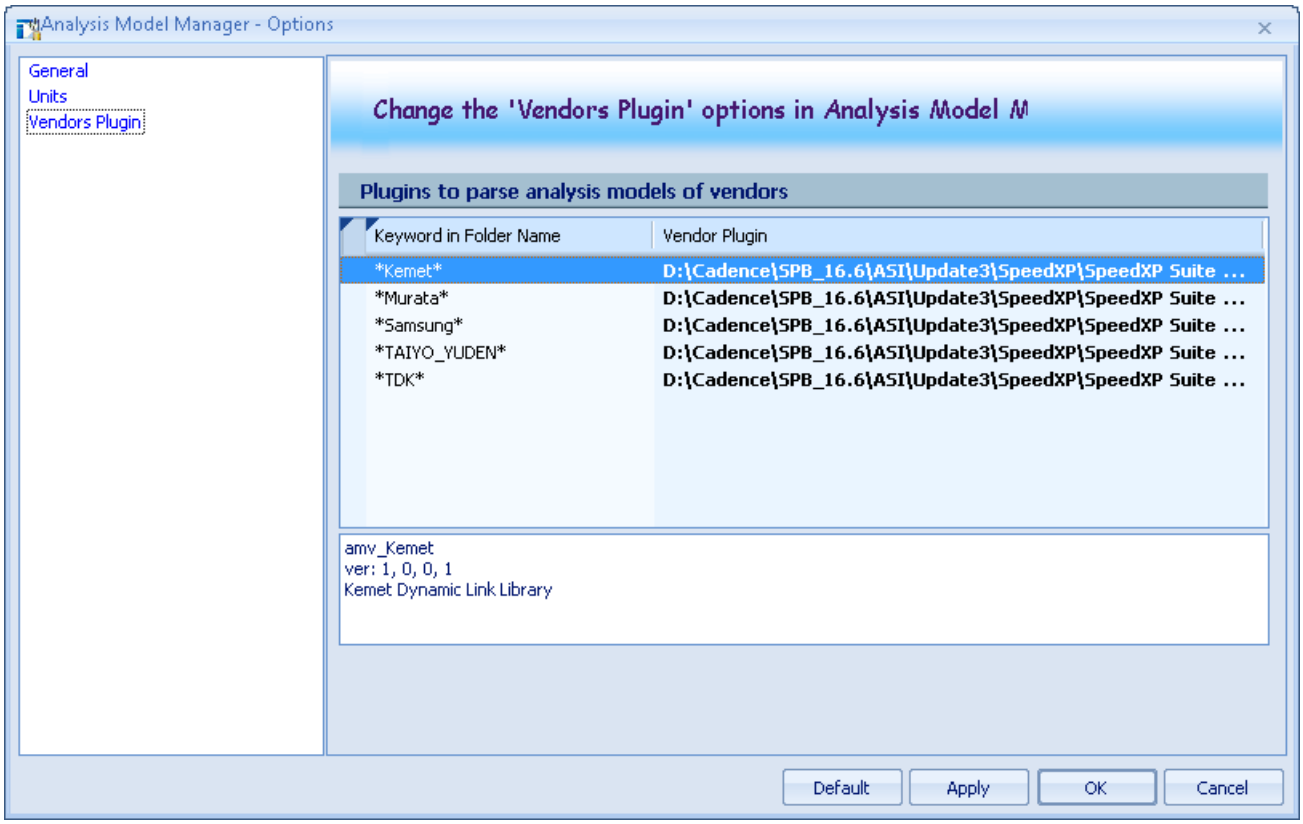
Units

On the Units page, you can change the default units of various parameters of models. For example, you can change the unit of capacitance from `nF` to `F`, `mF`, or `uF`.



Vendors Plugin

AMM supports capacitor models imported through vendor plugins. In this section, you define how to identify a folder as a vendor library in which the plugin will parse the vendor models. If a folder name matches the keywords under the *Keyword in Folder Name* column, the vendor plugin will parse models in the folder. For example, if there are two folders with vendor plugins, *Murata_Netlist* and *Murata_Spara*, and the keyword in the folder name is specified as **Murata**, AMM will use the plugin specified in the corresponding *Vendor Plugin* column to parse models in both the folders.



2

Managing and Assigning Models

This chapter covers the following topics:

Overview

Many organizations have their own tools to manage central libraries. The Analysis Model Manager provides support to manage internal and external (central) libraries. AMM also integrates a model assignment user interface that facilitates faster assignment of models.

This chapter covers the following topics:

- Managing Models in AMM
- Assigning Models using Model Assignment

Managing Models in AMM

This section covers how to manage models in AMM:

- Adding Models
- Removing Models
- Copying Models between Libraries

Adding Models

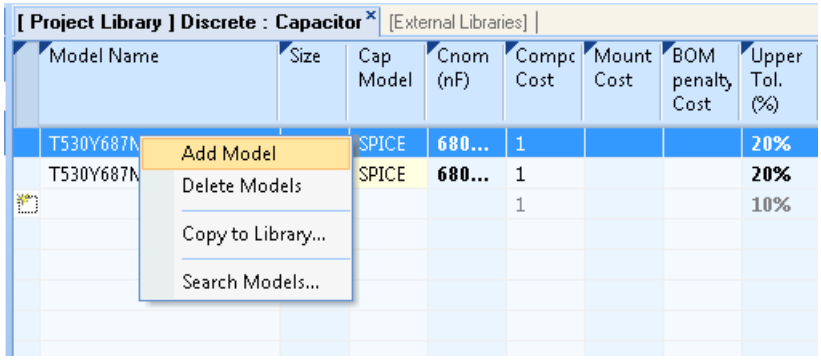
You can add a model to a library in AMM.

To add a model:

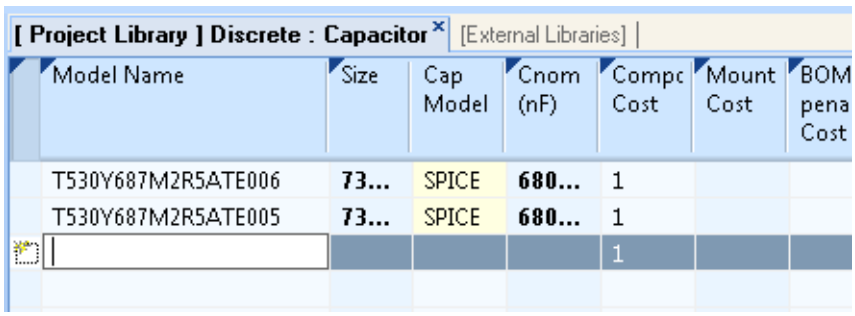
1. Click the Add Model icon from the toolbar

Or

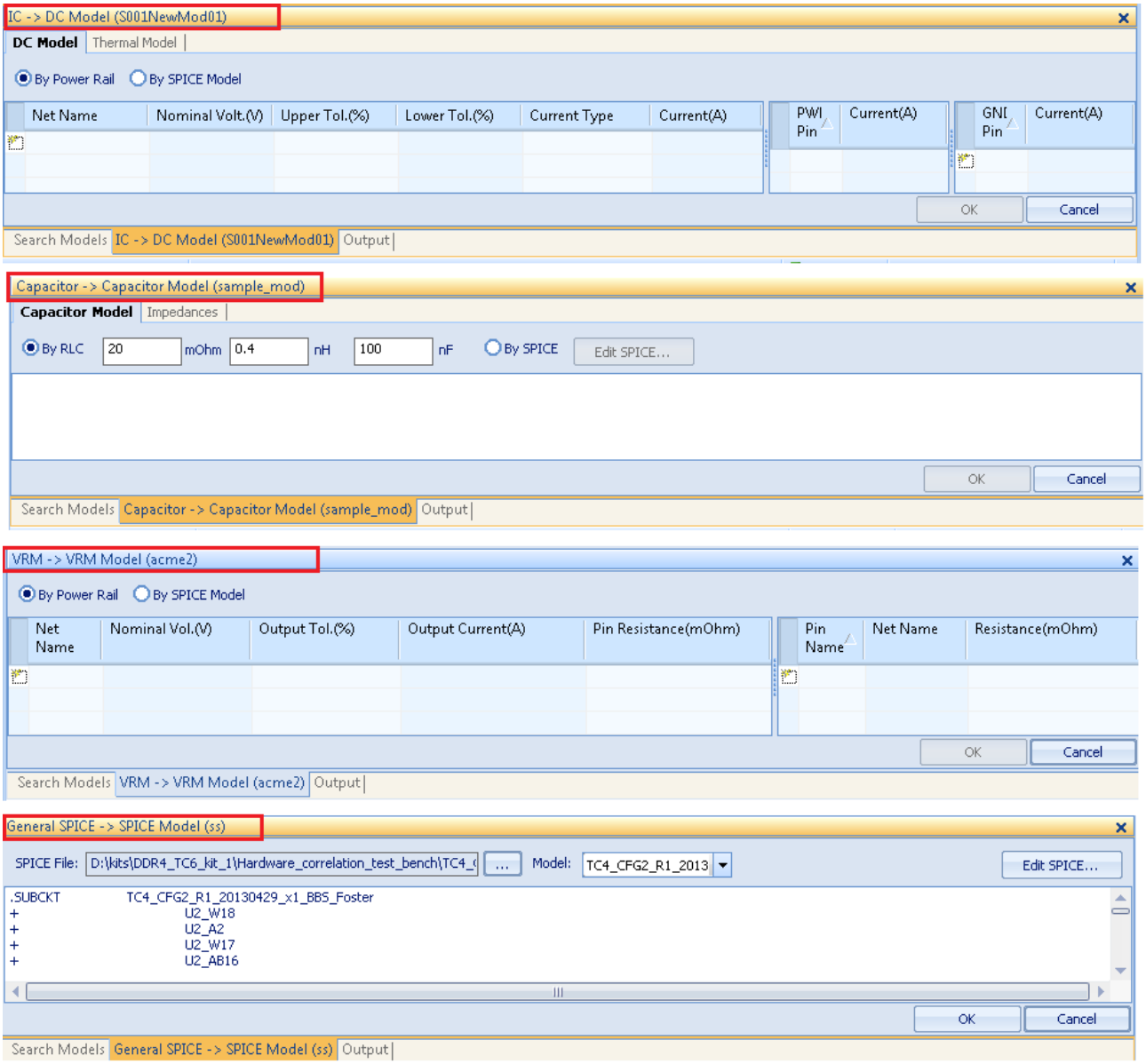
1. Right-click in the Spreadsheet pane and select *Add Model* from the pop-up menu.



A blank model item is automatically added at the end of the list.

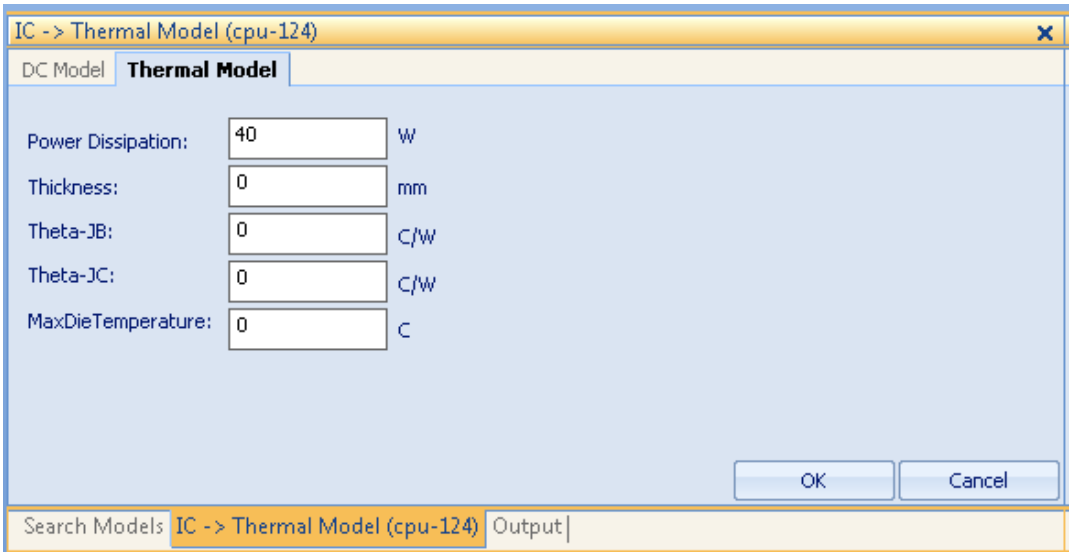


The Model Editing view opens at the bottom of AMM. The view changes based on the model type you select in the navigation pane on the left.



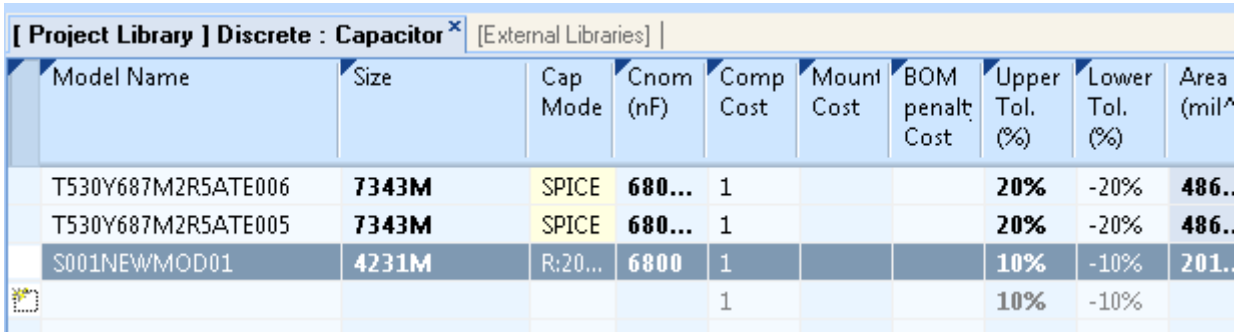
For example, you can switch to the Thermal Model pane by either using the *Thermal Model* tab in the Model Editing section or by selecting the Thermal Model cell back in

the Model Data section in the Spreadsheet pane. You can then specify a value for Power in the Thermal Model fields and save the model.



2. Specify the required parameters to complete the creation of the new model.

   The new model is added to the list.



Removing Models

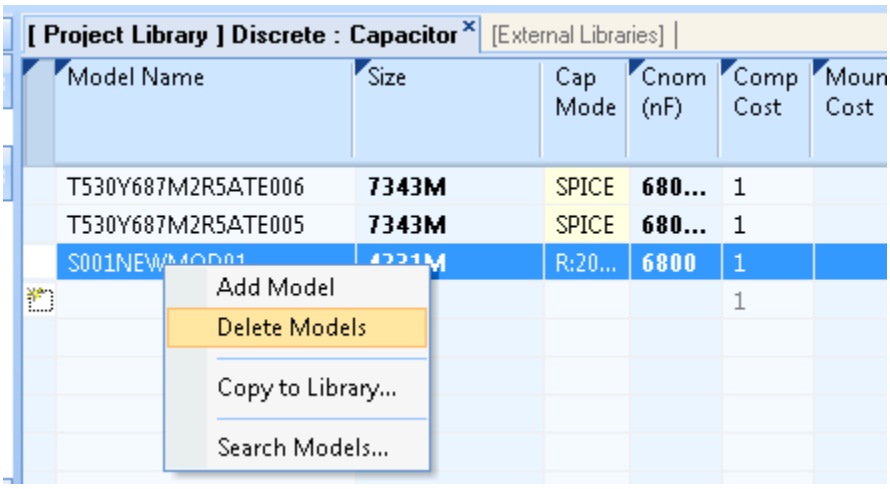
You can also remove existing models from a library.

To remove a model:

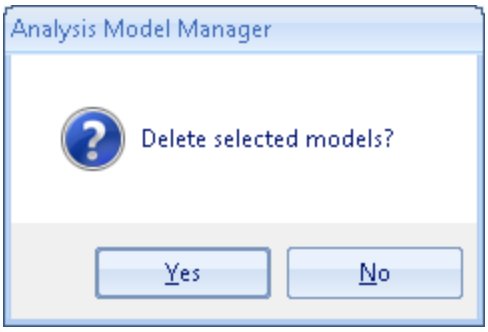
1. Select the desired model(s) and click the *Delete Models* icon from the toolbar,

Or

1. Right-click and select *Delete Models* from the pop-up menu.



2. Click *Yes* to confirm deletion.



The selected model is removed from the library.

Copying Models between Libraries

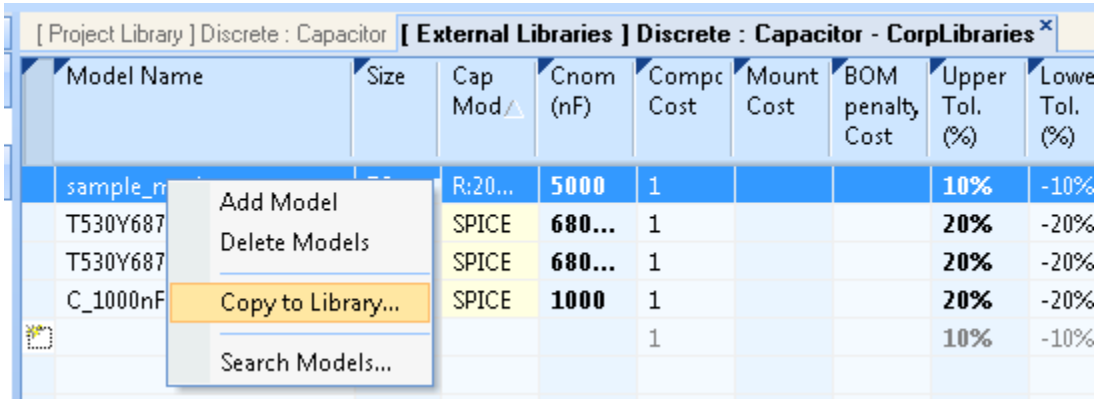
You can copy models between libraries. For example, you can copy a model from an external library to the project library.

To copy a model between libraries:

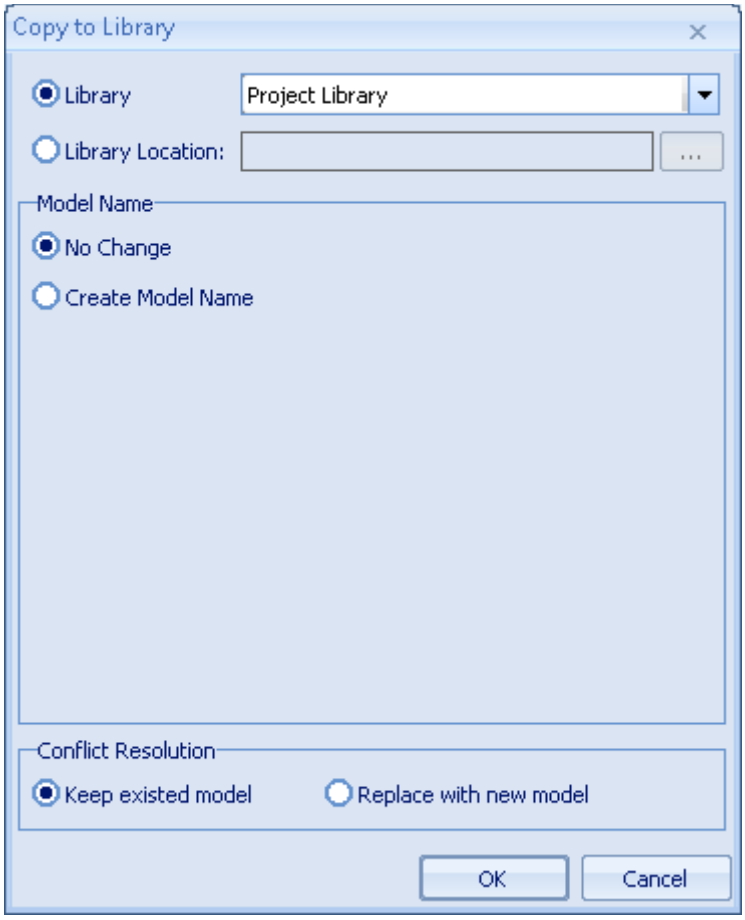
1. Select the desired model(s) and click the Copy to Library icon from the toolbar.

Or

1. Right-click and select *Copy to Library* from the pop-up menu.

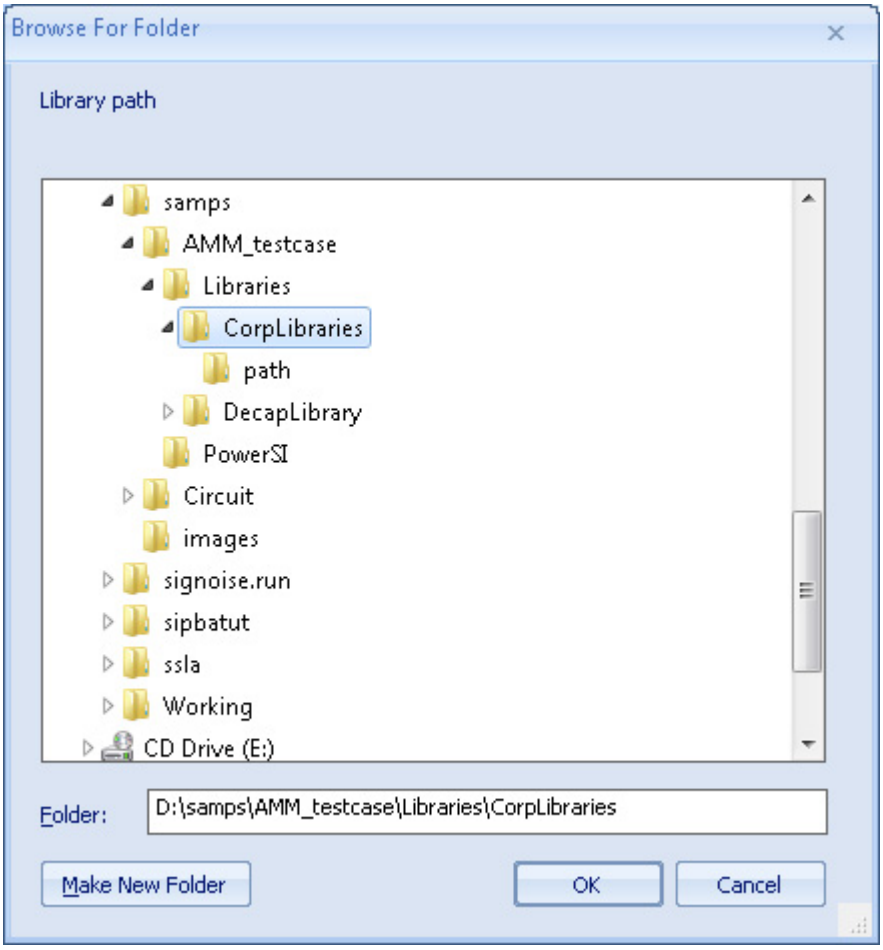


The Copy to Library dialog opens.



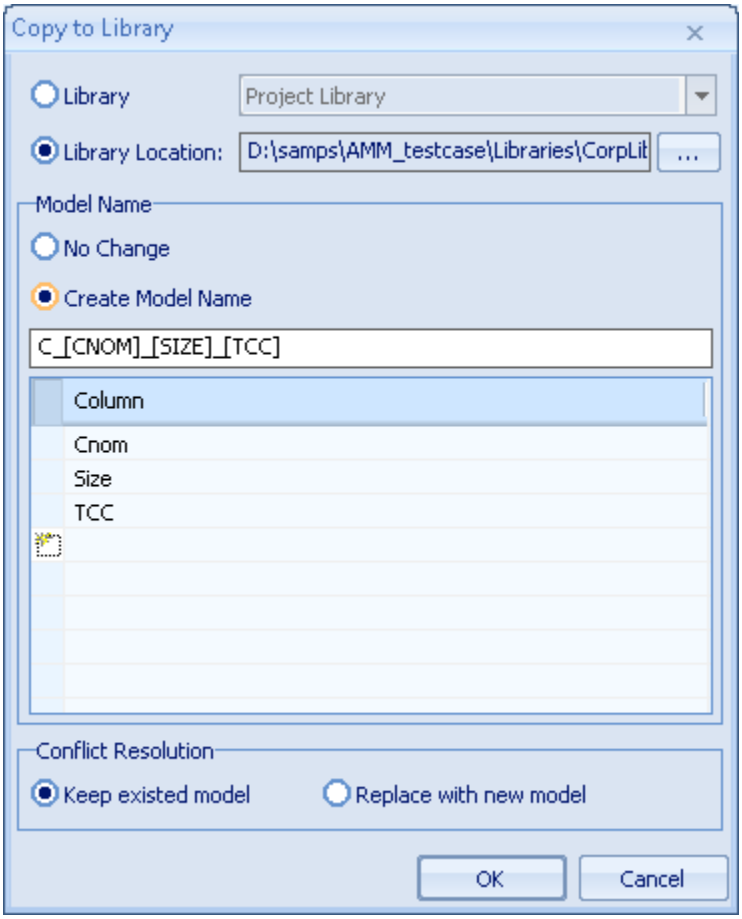
2. To copy the selected model to the current project library, proceed with the default selection, *Library - Project Library*.

If you want to copy to a specific library, browse the location of the library to which you want to copy the selected model.



3. To proceed with the same model name, proceed with the default option, *No Change*.

If you want to rename the copied model, select the Create Model Name option. You can add or delete the parameters you want to include or exclude from the model name.

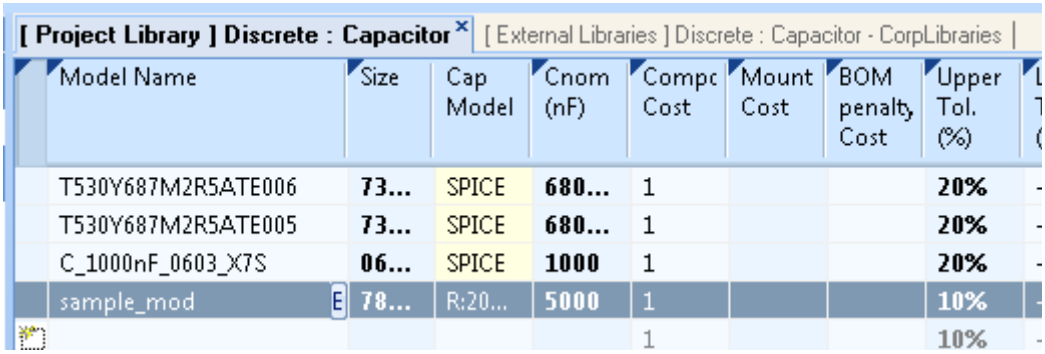


4. Select the *Keep existing model* option so that the existing model in the library is retained when there is a conflict, that is when a model of the same name already exists in the library.

   If you want the selected model to replace an existing model in the library with the new model when there is conflict, select the *Replace with new model* option.

5. Click *OK* to complete the operation.

The selected model is copied to the project library.



Assigning Models using Model Assignment

Model assignment is a key function of Analysis Model Manager. The Model Assignment and AMM functionality are integrated. As you use AMM to manage model libraries, use the Model Assignment dialog to assign models to components.

You can configure External Libraries as required and control read / write capabilities with OS permissions. Model assignment requests search all available libraries. When a model is found and assigned, it is automatically copied to the Project Library. If no Project Library is defined, a placeholder library is retained which can then be saved or discarded.

You can also edit a library and pass those updates to another library.

This section covers:

- Launching the Model Assignment Window
- Finding Models
- Browsing Models
- Assigning Models

Launching the Model Assignment Window

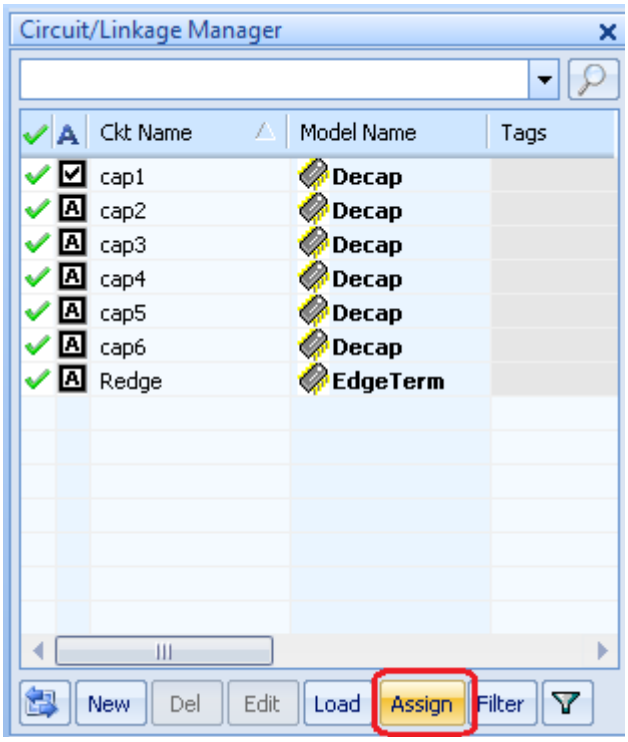
You can launch the Model Assignment window from the Circuit/Linkage Manager in most of the tools, such as PowerSI, SPEED2000, and XtractIM.

In PowerSI, SPEED2000, and XtractIM:

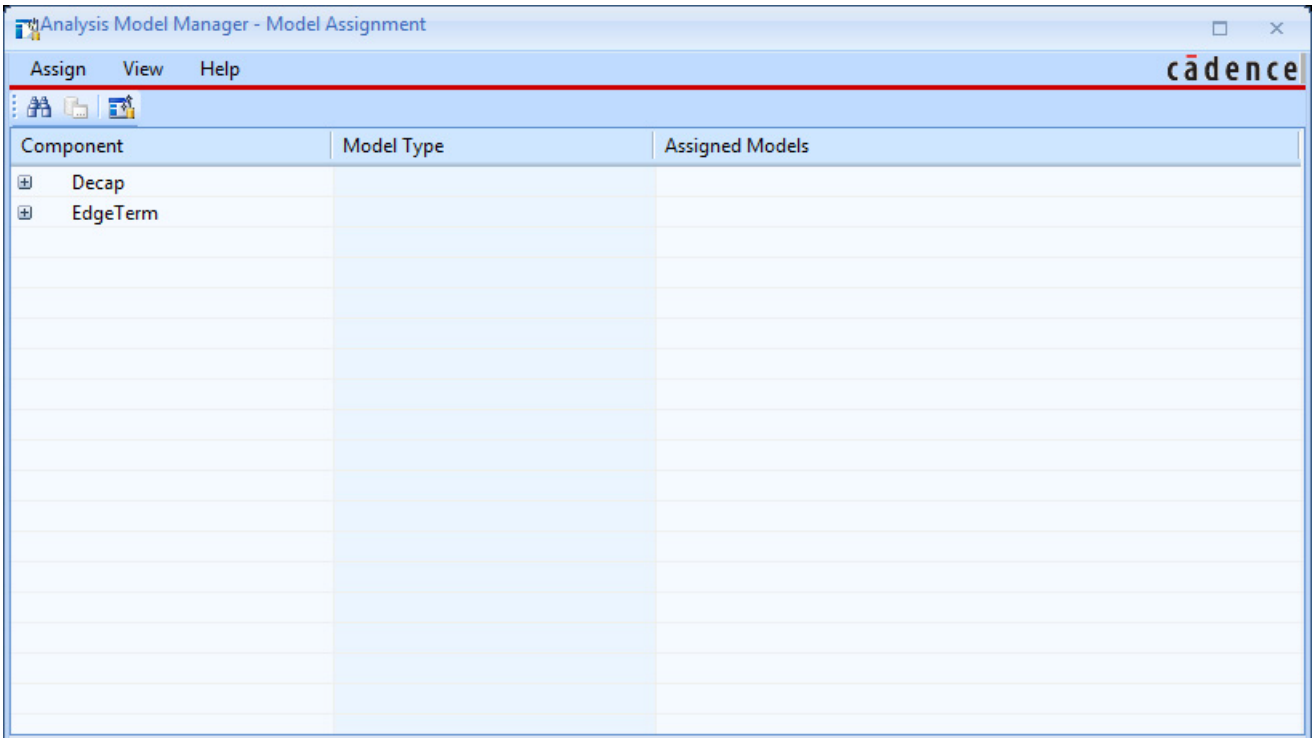
➡ Choose *Tools – Model Assignment*.

Or

➡ Choose *Setup – Circuit/Linkage Manager* and click the *Assign* button.



The Analysis Model Manager – Model Assigned window appears.



Tip

You can also launch the window from the *Assign Capacitor Models* command which is accessible from the Workflow pane and also from the right-click pop-up menu in Circuit/Linkage Manager.

Note: In PowerDC, you can launch the window from the Component wizard and from the *Assign* button in the Editor pane.

Finding Models

You can choose find models for assignment either automatically or manually from the Model Assignment user interface. To automatically find models based on a pre-defined criteria, you use the *Final Model* functionality.

You can use one of the following ways to run the *Find model* functionality:

- Choose the *Assign – Find Models* menu command.
- Right-click and select the *Find Models* command from the pop-up menu.

- Click the *Find Models* button.

Browsing Models

Use the following ways to manually browse models in libraries loaded in AMM:

- Choose the *Assign – Browse Models* menu command.
- Right-click and select the *Browse Models* command from the pop-up menu.
- Click the *Browse Models* button.

Assigning Models

When assigning models, you can select models from the project library or an external library loaded in AMM. Models assigned from external libraries are automatically copied to the project library.

Models can be assigned at the device or instance level. You must assign a device model to each component that you simulate because device models are used during simulation to create circuit simulation models for the nets in your design.

To assign a model from the Model Assignment GUI, you first need to locate the model either using the find model or browse model functionality.

Assigning by Finding

The final model functionality is an automatic model lookup mechanism. The models are matched in the configured libraries by the Lookup Keyword, Model Name, or Manufacturing Part No fields.

To automatically find and assign a model, do the following:

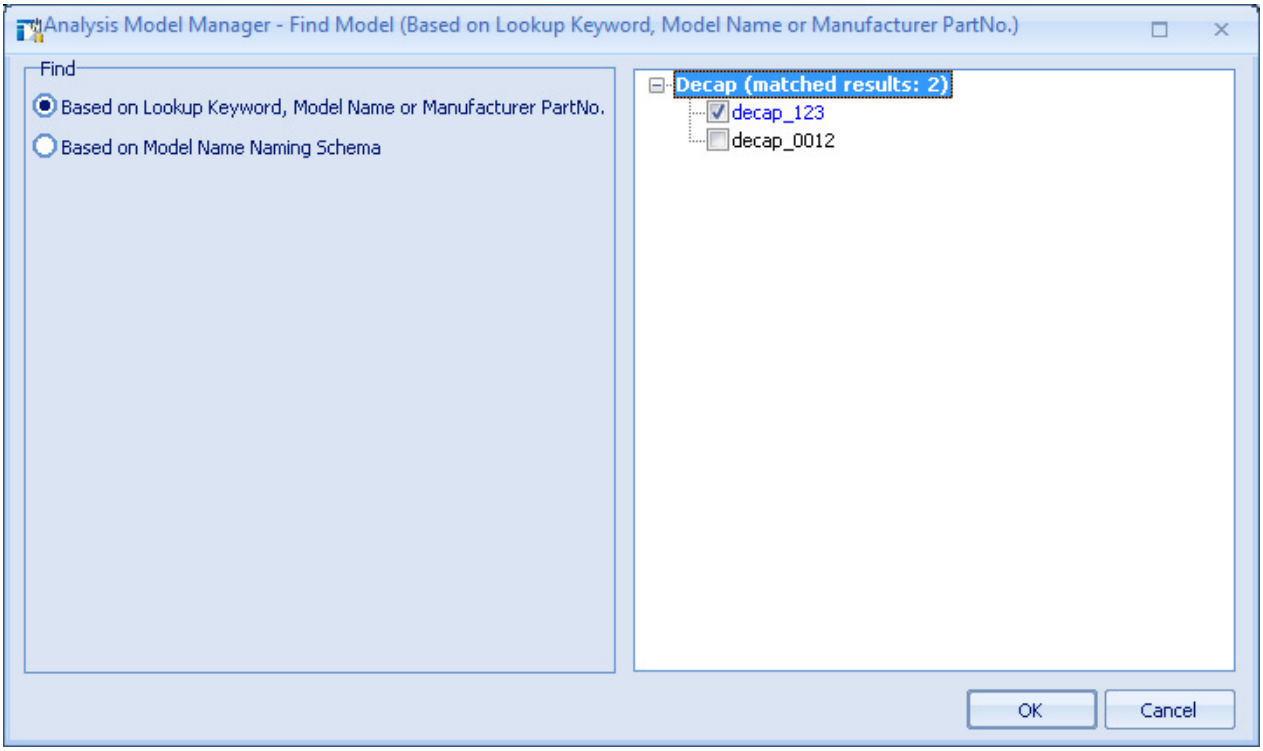
1. In the Model Assignment window, select a component or an instance.
2. Specify the Model Type.

   This field is required for automatically finding the matching model for a component.
3. Click the *Find Model* button.

   The Analysis Model Manager – Find Model window appears with the search results. The title bar of the dialog displays the matching criteria used to find the results:

   - Lookup Keyword
   - Model Name
   - Manufacturer Part Number

   You define the *Lookup Keyword* field when you add a model to a library. You can use model names that match device file names, part numbers, or any other field. It is an optional mechanism to Index the library and to automatically match models with components.



The *Find Model* window contains two panes:

- The left pane lists the rules available to select for finding models
- The right pane shows the search results

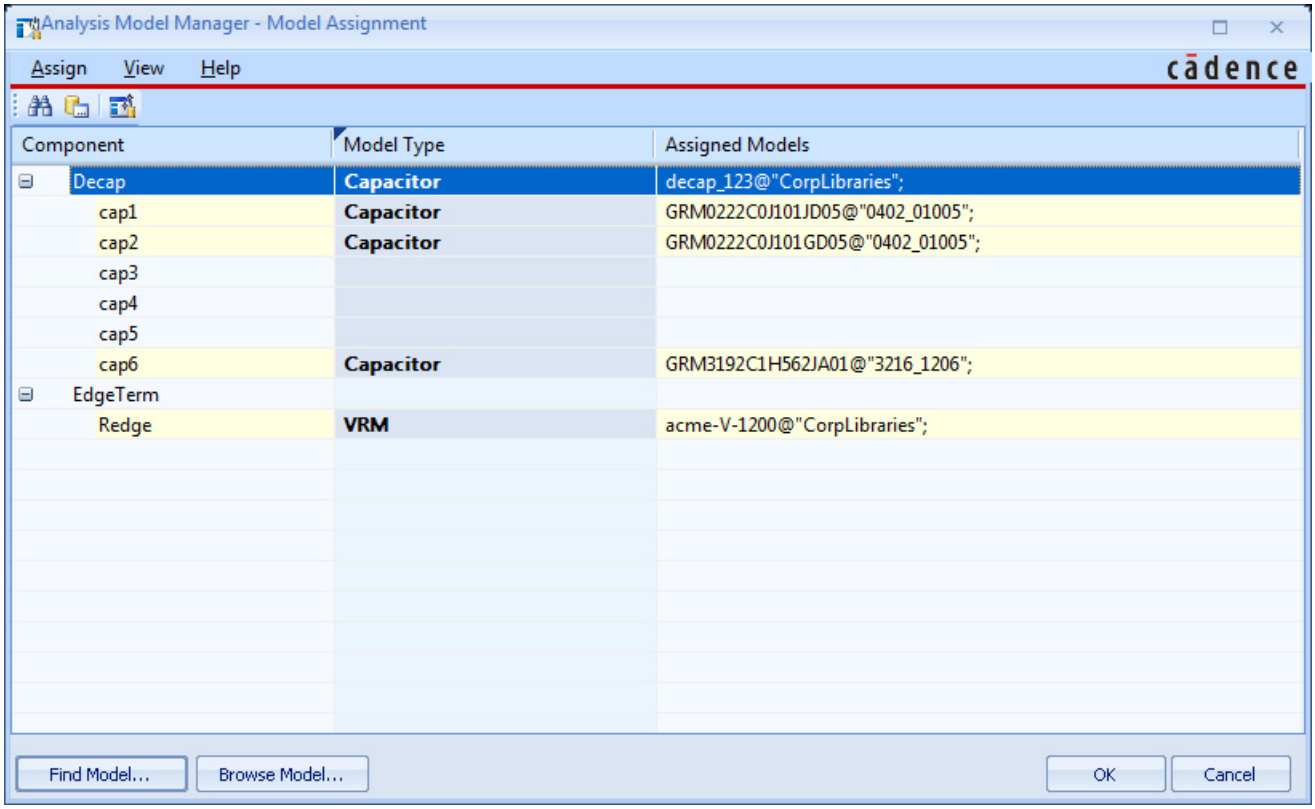
Note: When the model type is *Capacitor*, the Find Model window provides an additional search mechanism to find models based on the naming schema of model names. The options to search are displayed on the left pane and the search results on the right pane. For any other model type, only the search results pane is displayed.

Table 2-1 Find Model

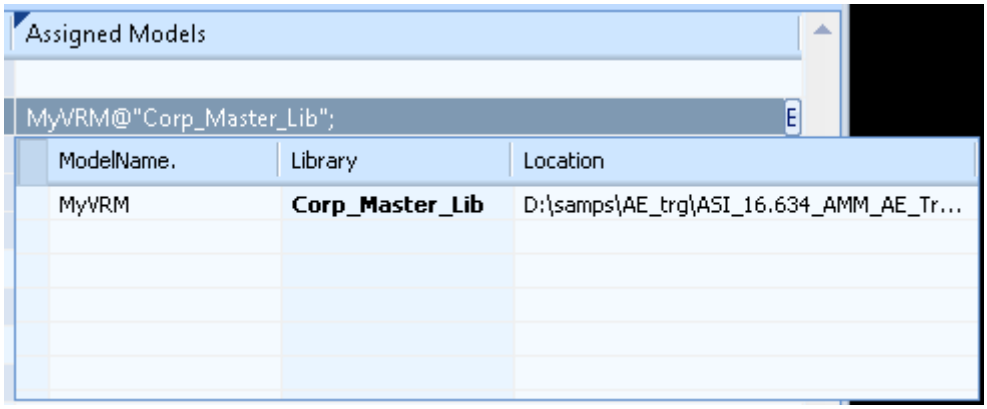
Option	Description
Based on Lookup Keyword, Model Name or Manufacture PartNo.	You can choose the rule to be used to find models. If this rule is selected, a wildcard match is applied to search models from the AMM library. For example, if the name of the component is `ABC123`, the following model names containing the string, `ABC123`, will be listed in the right pane of the window: ■ INTEL-ABC123-AAA ■ ABC-U980-123890 ■ IED980ABC123
Based on Model Naming Schema	If this rule is selected, the models which satisfy the specified naming schema are located. For example, if the name of the component is `CAP_0402_4uf_1.5v` and the naming schema is CAP_[SIZE]_[CNOM]_[VOLT], all the models satisfying the following criteria are listed in the right pane of the window: ■ SIZE = 0402 ■ Cnom = 4uf ■ Voltage = 1.5v

4. Click the *Based on Model Naming Schema* option.
5. Click *Search*.
6. Select the desired model from the list in the right pane and click *OK*.

The model is assigned:



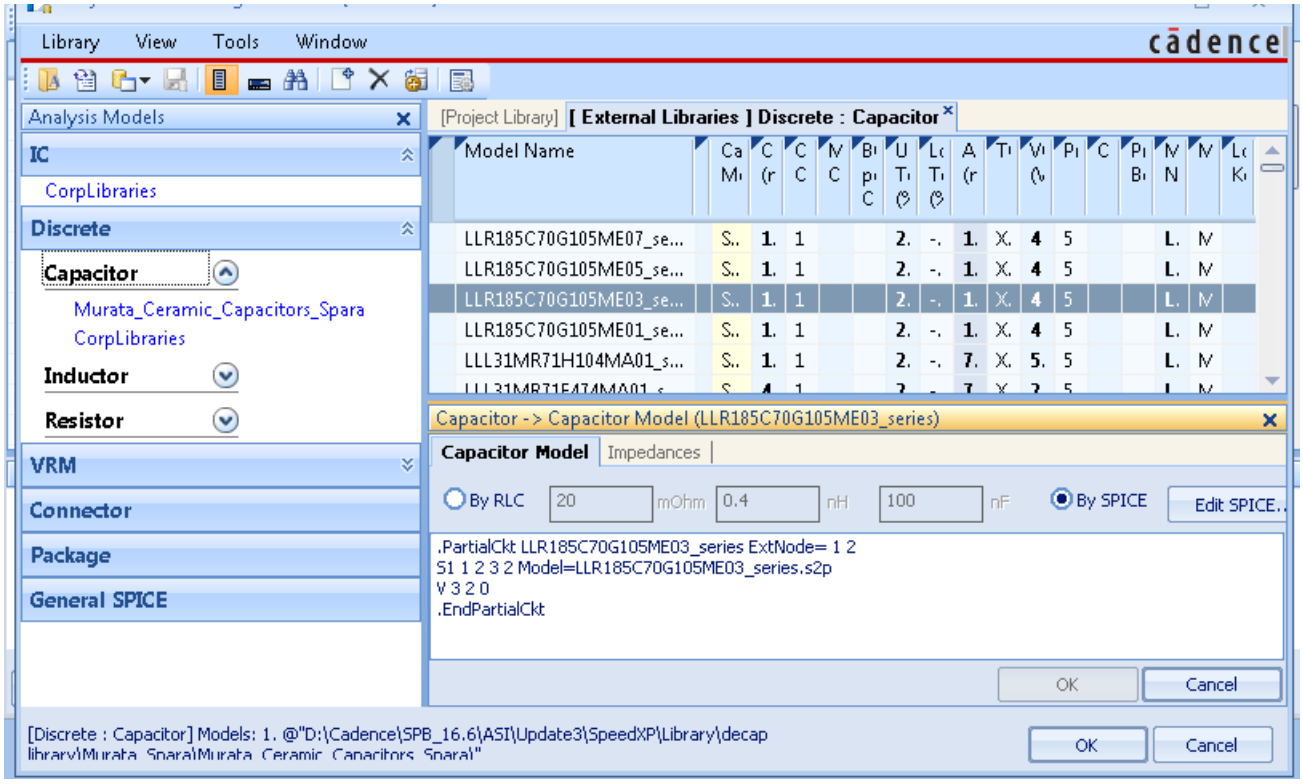
When a model is assigned to a component or an instance, the Assigned Models column displays a string which comprises the model name and the name of the library in which the model resides. As you click the name of an assigned model, a table pops-up displaying the model name, the library name, and the path to the library.



Assigning by Browsing Models in the Library

You can also assign models to components manually by browsing the libraries loaded in AMM.You can select the models from either the project library or the external library. If the model is selected from the external library, the model is copied to the project library automatically after assignment.

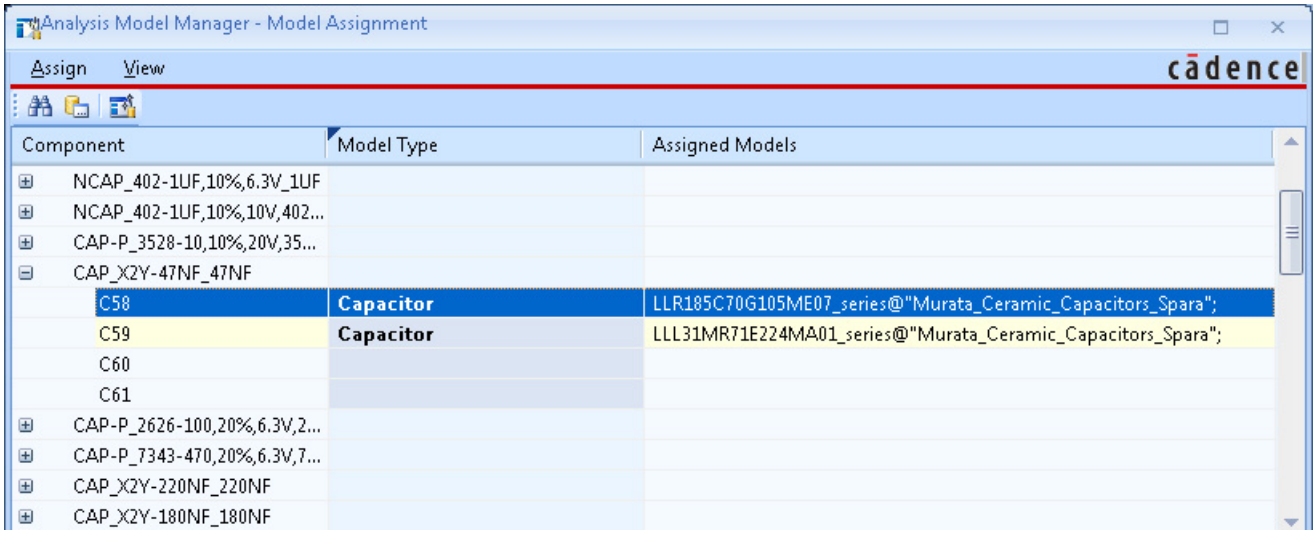
1. Select a component in the Model Assignment window.
2. Click the *Browse* button.
3. In the AMM window, select the desired model.



The detailed information of the selected model is displayed in the Editor pane. At this point, you can even create a new model and assign it to the selected component or instance in the Model Assignment window.

4. Click *OK*.

The selected model is assigned to the component selected in the Model Assignment window. The assigned model and its parent library are saved as a reference.



3

Working with IBIS and SPICE Models

This chapter covers the following topics:

Overview

Analysis Model Management provides a common module and a uniform way to facilitate the management of IBIS, SPICE, and Discrete models.

This chapter covers the following topics:

- IBIS Model Management
  - Launching IBIS Editor
  - The IBIS Editor User Interface
  - IBIS Editor Workflow Functions
- SPICE Model Management
  - Launching SPICE Editor
  - Working with SPICE Editor
- Capacitor Model Management

IBIS Model Management

IBIS Editor facilitates management of and IBIS model files. IBIS Editor is an editing tool that helps you ensure the integrity of the model data circuit simulations. It provides you an easy-to-use editing environment to create, manipulate, and validate models quickly.

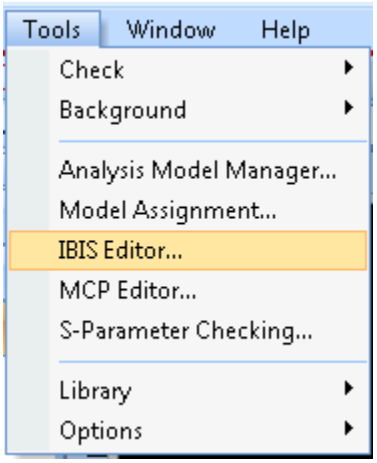
Launching IBIS Editor

You can launch IBIS Editor using one of the following methods:

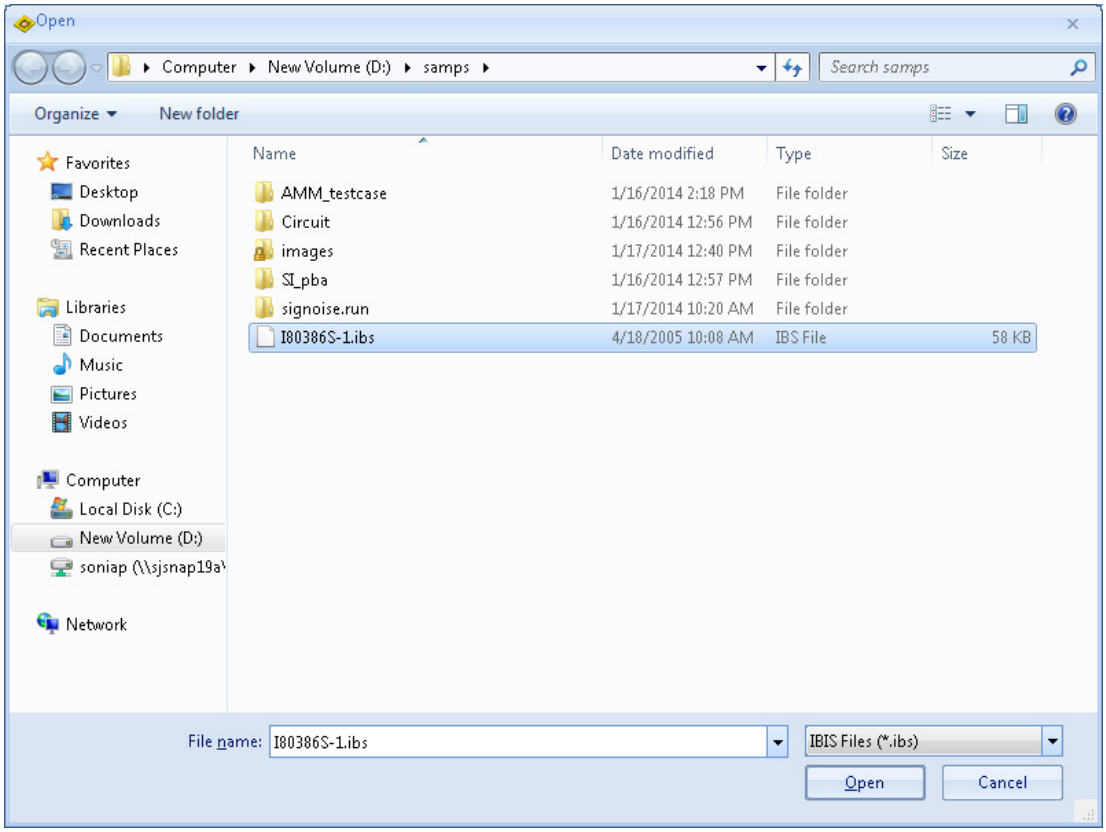
- From the Tools Menu in SPEED2000
- From the Property dialog of SystemSI

From the Tools Menu in SPEED2000

1. Choose the *Tools – IBIS Editor* menu command.



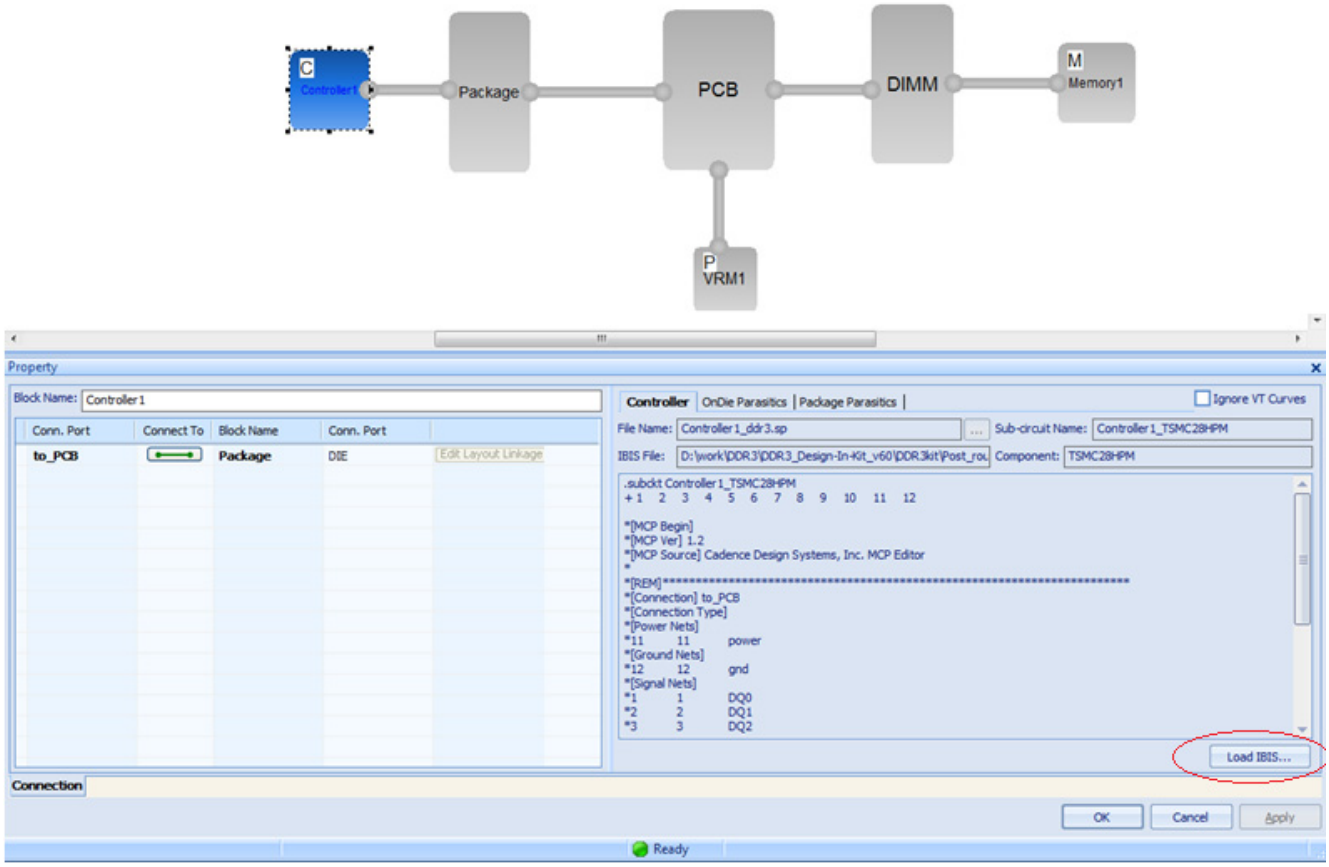
2. Select the IBIS file to open and click *Open*.



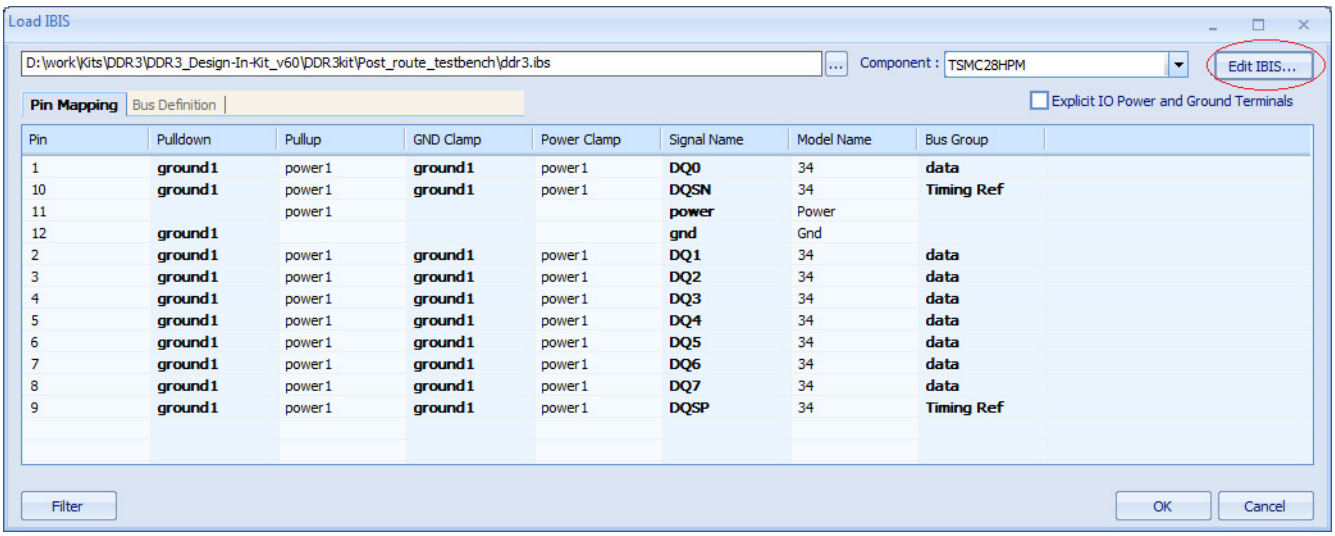
From the Property dialog of SystemSI

1. In a SystemSI design double-click a controller or memory block.

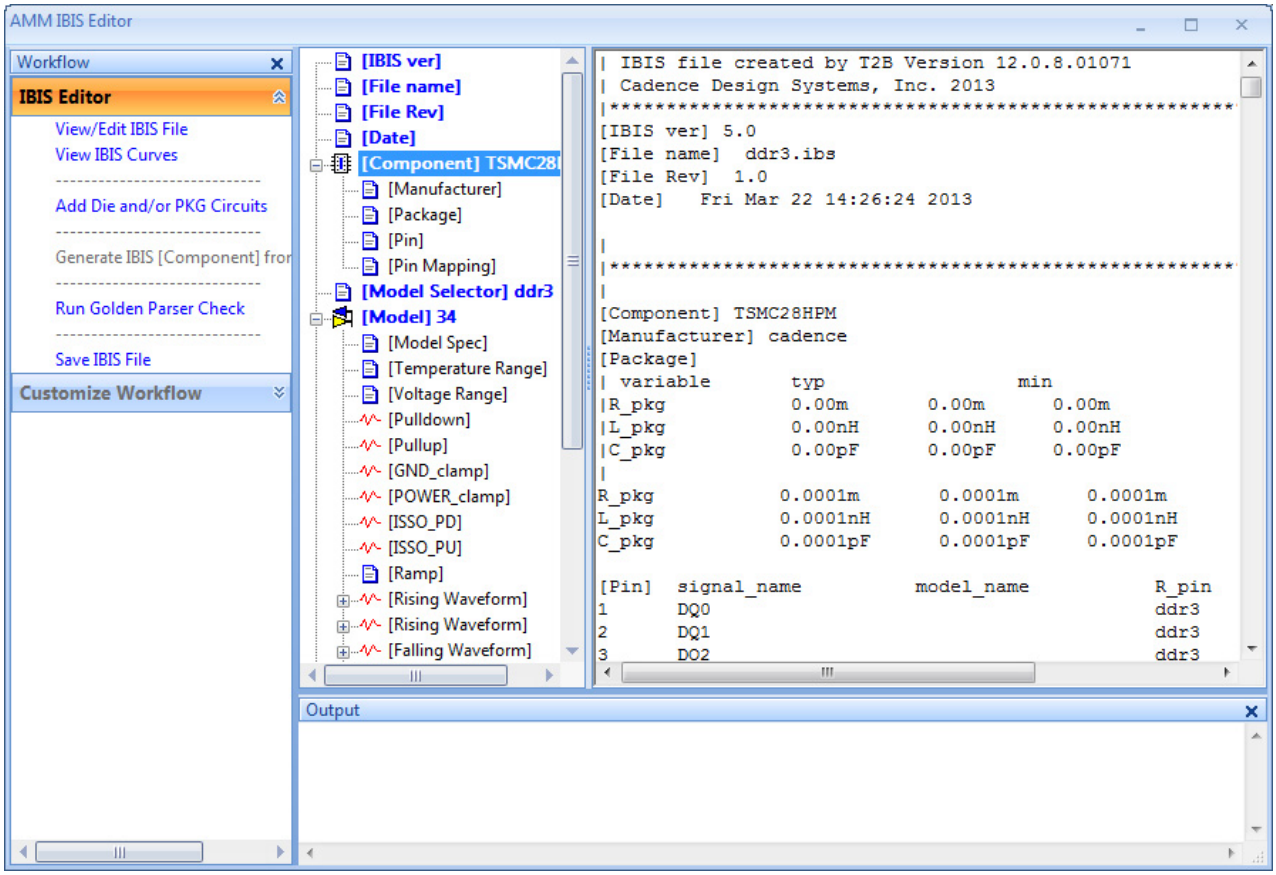
2. Click *Load IBIS*.



3. In the Load IBIS dialog, click *Edit IBIS*.



The AMM IBIS Editor launches.



The IBIS Editor User Interface

The IBIS Editor is divided into three panes:

- The Workflow pane
- The IBIS file pane
- The Output pane

When an IBIS file is loaded, the text editing frame on the right displays the structure and the content of the IBIS file. The left side of the IBIS file pane is a section tree and each tree node is a keyword in the IBIS File. The right side of this pane is the text area.

In the text area, you can edit the content of the IBIS file. The syntax of the text typed in the text area is automatically checked. As you click a keyword in section tree, the cursor jumps to the location of the corresponding line in the text area.

IBIS Editor Workflow Functions

The IBIS Editor workflow provides functions, which help you manage IBIS models. You can view an IBIS file and IBIS curves, add and view die or package circuits.

Viewing or Editing IBIS Files

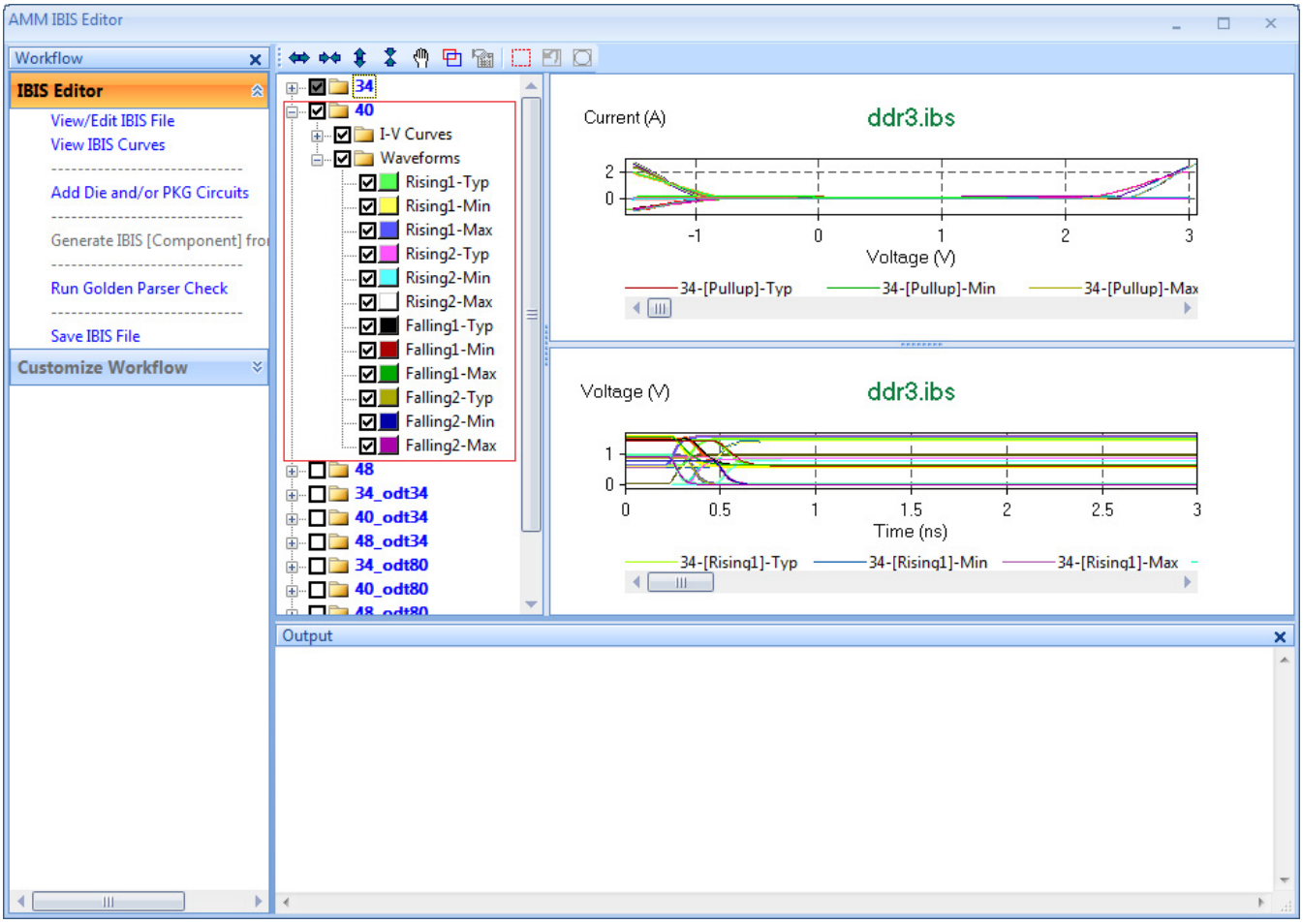
This option displays the contents of the IBIS file in the IBIS file pane, where you can view and edit the IBIS models.

Viewing IBIS Curves

This option displays the curve and waveform view of the IBIS models. The information displayed in spread across three panes:.

- To the left is the curve organization tree, where the first level is the model name, the second level is the curve type (I-V curves, Waveforms), and the third level is the curve.
- The upper right part displays the I-V curve.
- The lower right part displays the Waveform curve. You can resize the area to display the curve or the waveform. You can also double-click to have a waveform or curve cover the entire display area on the right.

- Combined I-V curves are generated automatically, and are displayed in the I-V curve view.



Adding Die and/or PKG Circuits

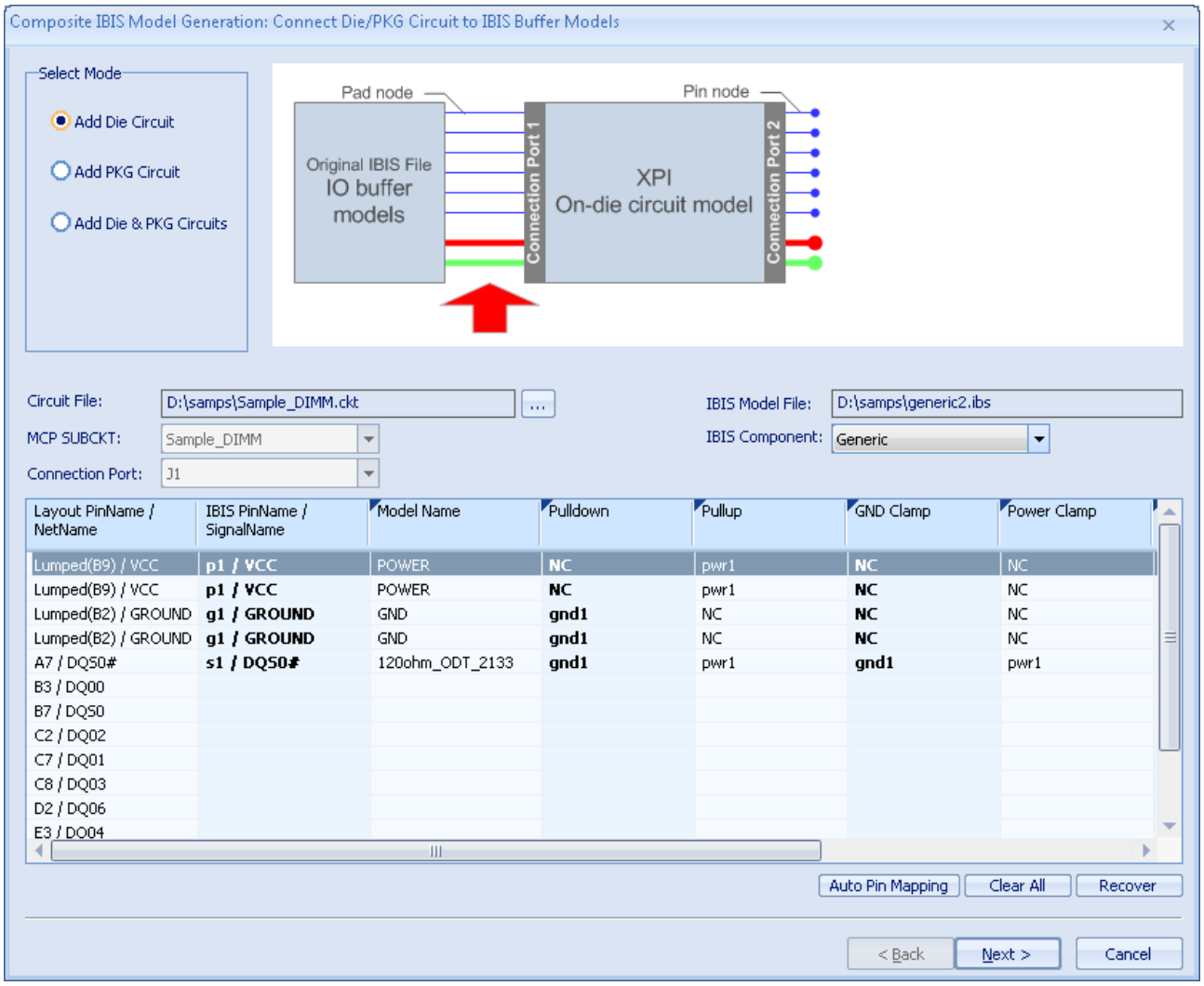
- Adding Die PKG Circuits
- Adding PKG Circuit
- Adding Die and Package Circuits

Adding Die PKG Circuits

To add a die circuit,

1. Select *Add Die and/or PKG Circuits* in the IBIS Editor workflow.

You need to load an XPI PDN circuit file and assign signal models for signal pins.



Field	Description
Auto Pin Mapping	Completes pin mappings according to the information in the MCP header of XPI PDN circuit file.
Clear All	Clears all the model and pin mapping information.
Recover	Discards the modification and reloads the current IBIS file.

2. Specify the circuit file name.

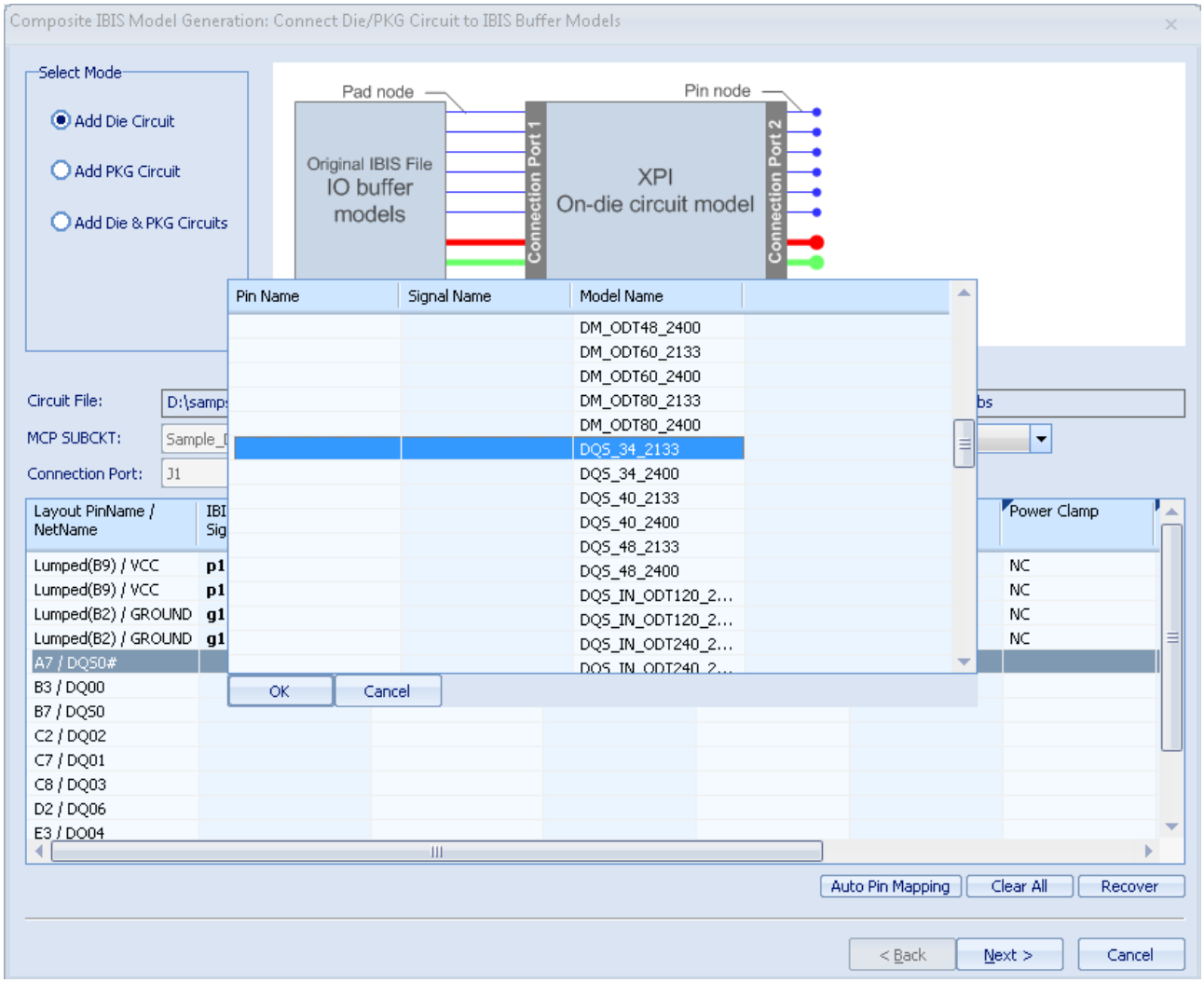
3. Click *Next*.

   You can proceed if there is a good connection, that is there is at least one power, one ground pin, and one signal pin.

4. Click the Edit icon in the Model Name cell for a pin/net.

   A list of available model appears.

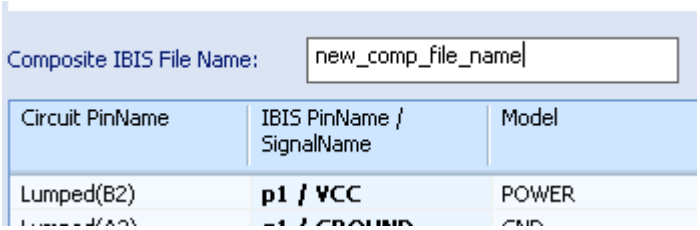
5. Select a model and click *OK*.



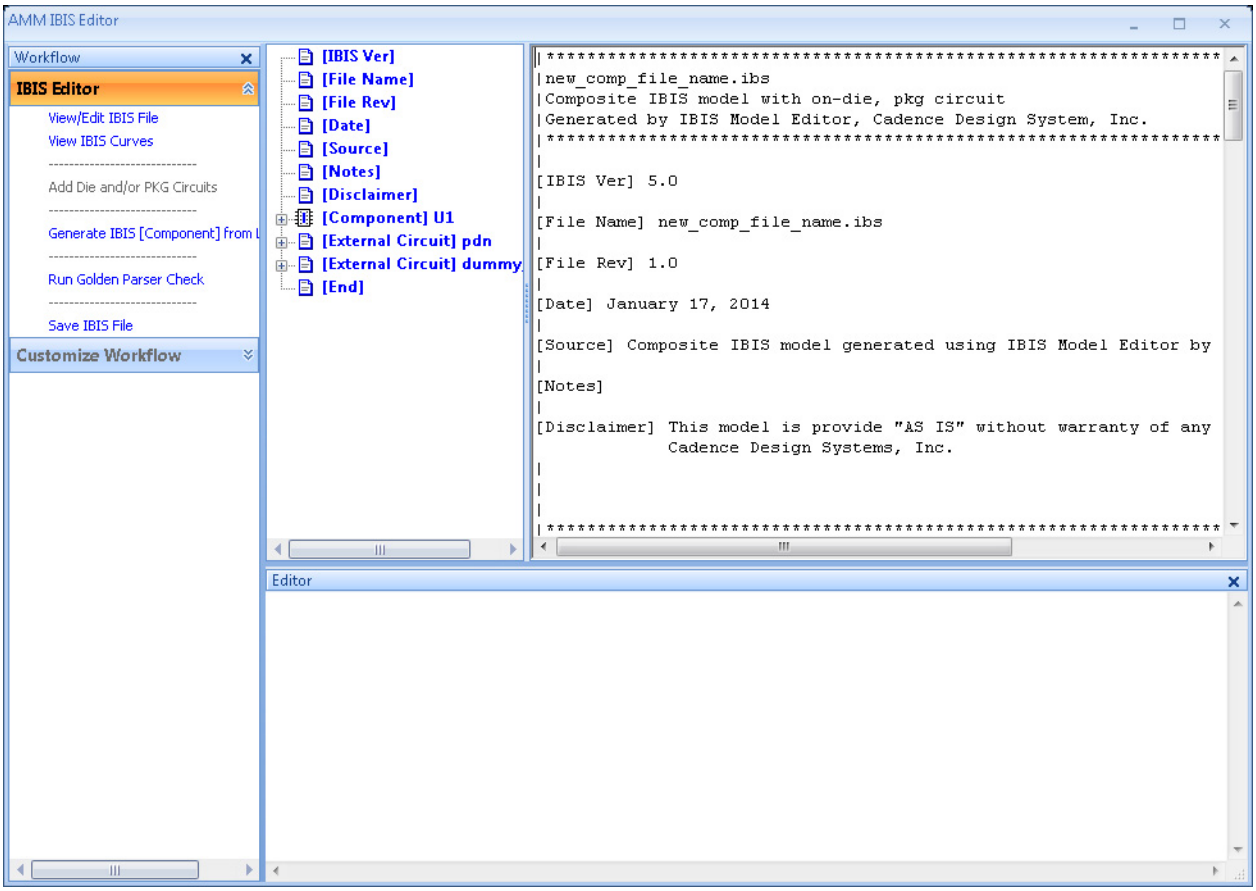
   The corresponding model is assigned.

6. Click *Next*.

7. On Assign Composite IBIS Model Pins dialog, specify a new composite IBIS file name and click *Finish*.

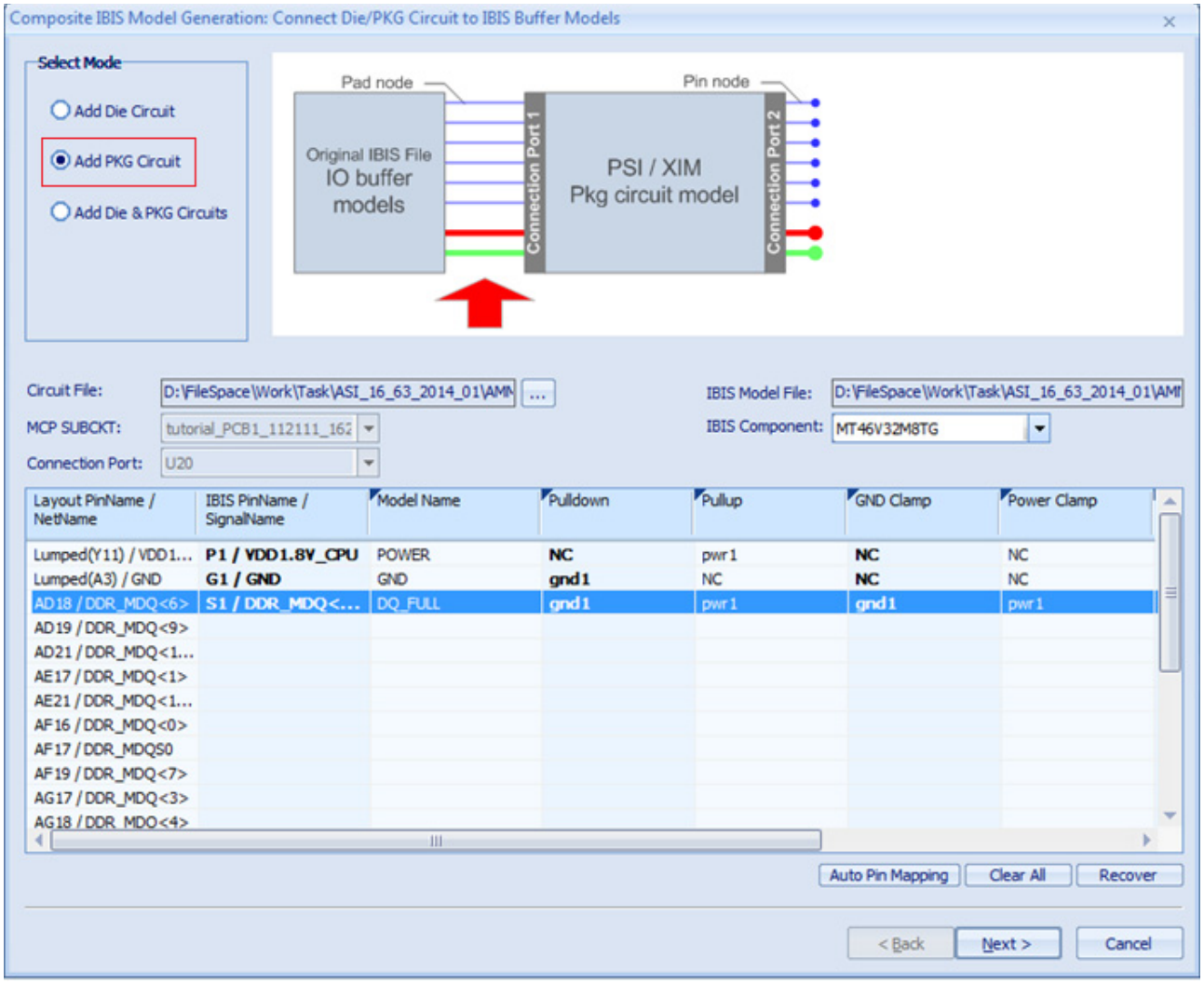


A new IBIS file is generated and populated in IBIS Editor.



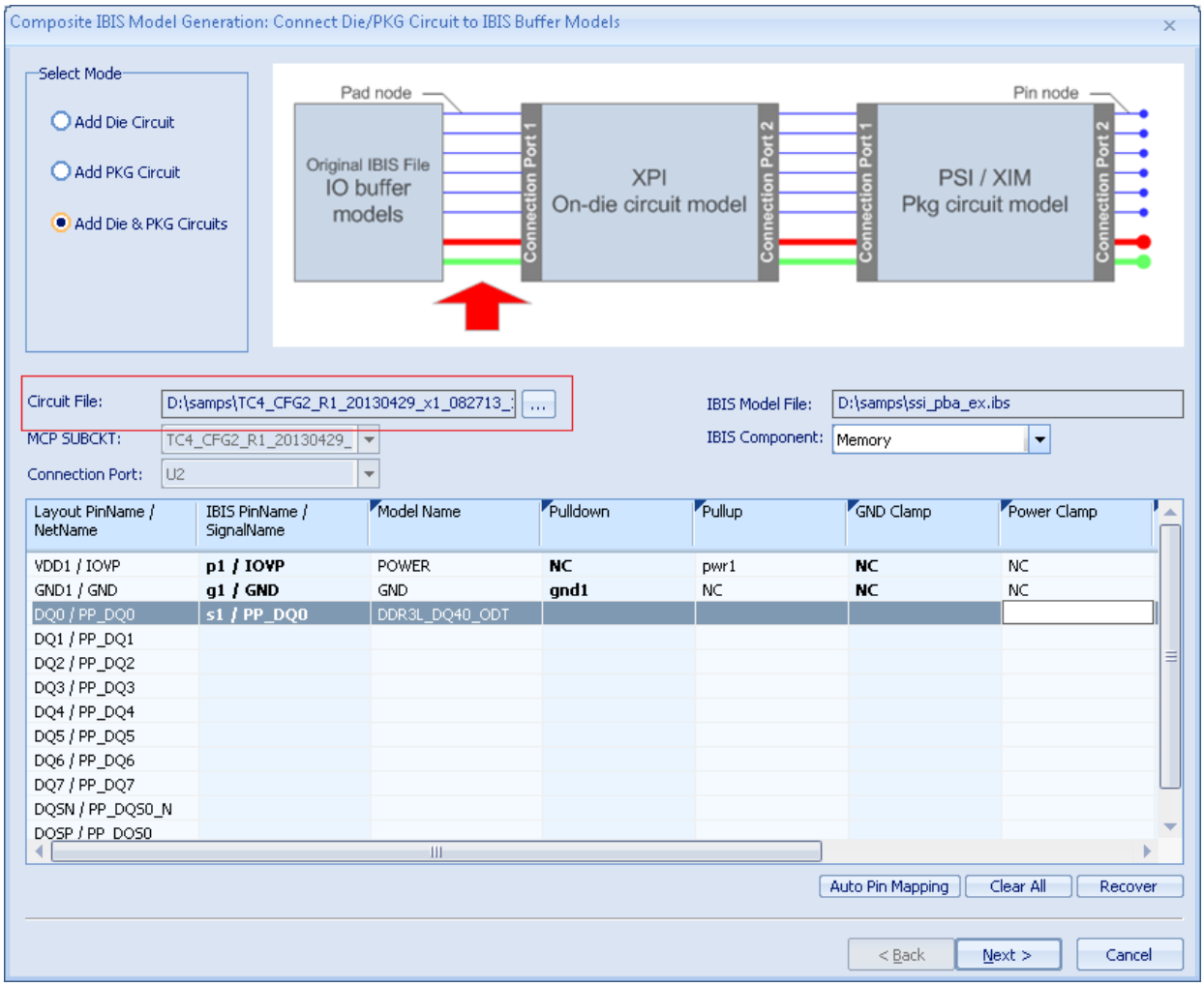
Adding PKG Circuit

Similarly, you can add a package circuit. You need to select *Add PKG circuit* in the Select Mode section. The rest of the procedure is the same as adding a die circuit.



Adding Die and Package Circuits

You can also add die and package circuits together.



To do this, you need to add a PKG circuit file and assign signal models for signal pins.

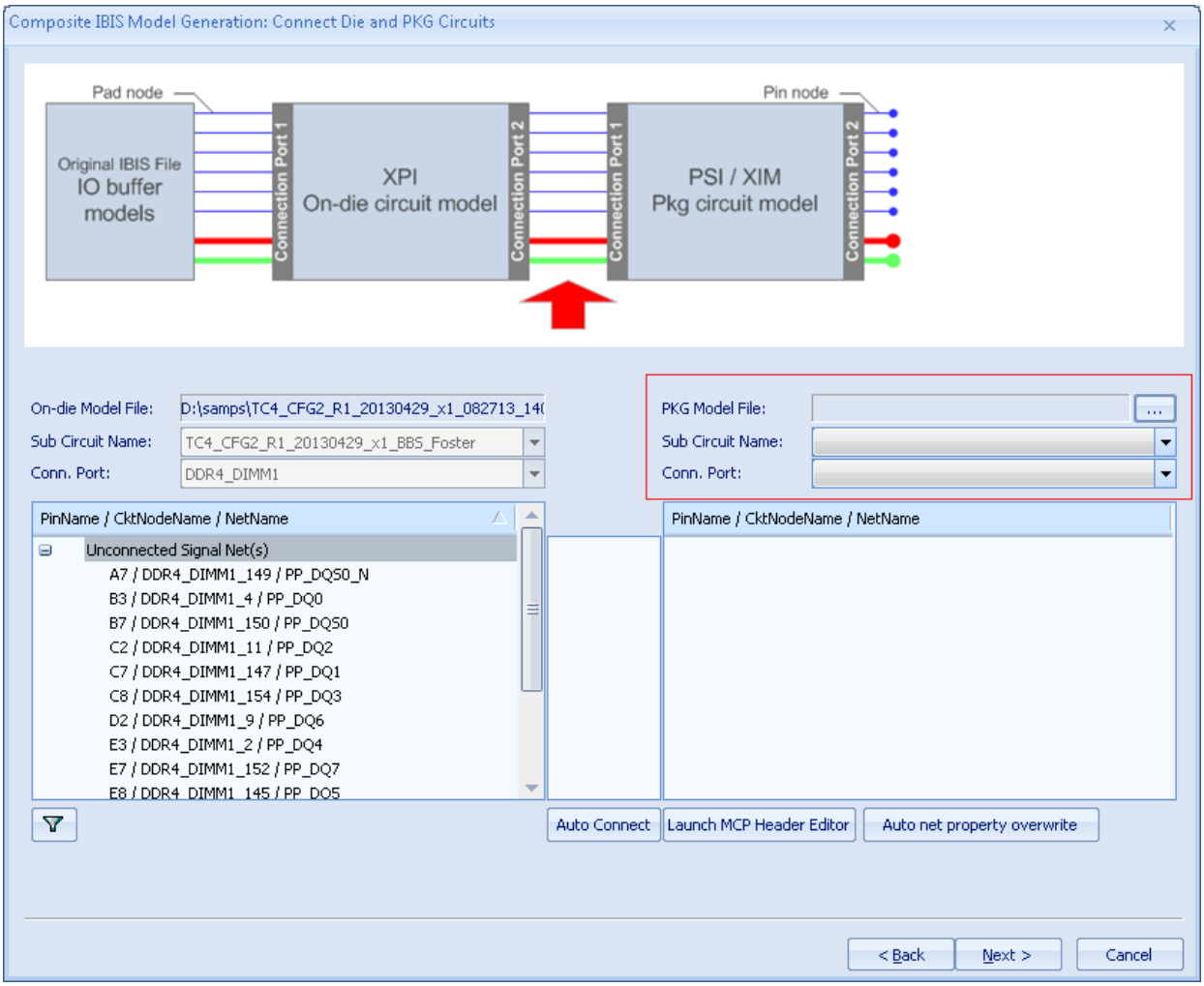
1. Specify a PKG circuit file.

   Ensure that there are at least one power, one ground pin, and one signal pin.

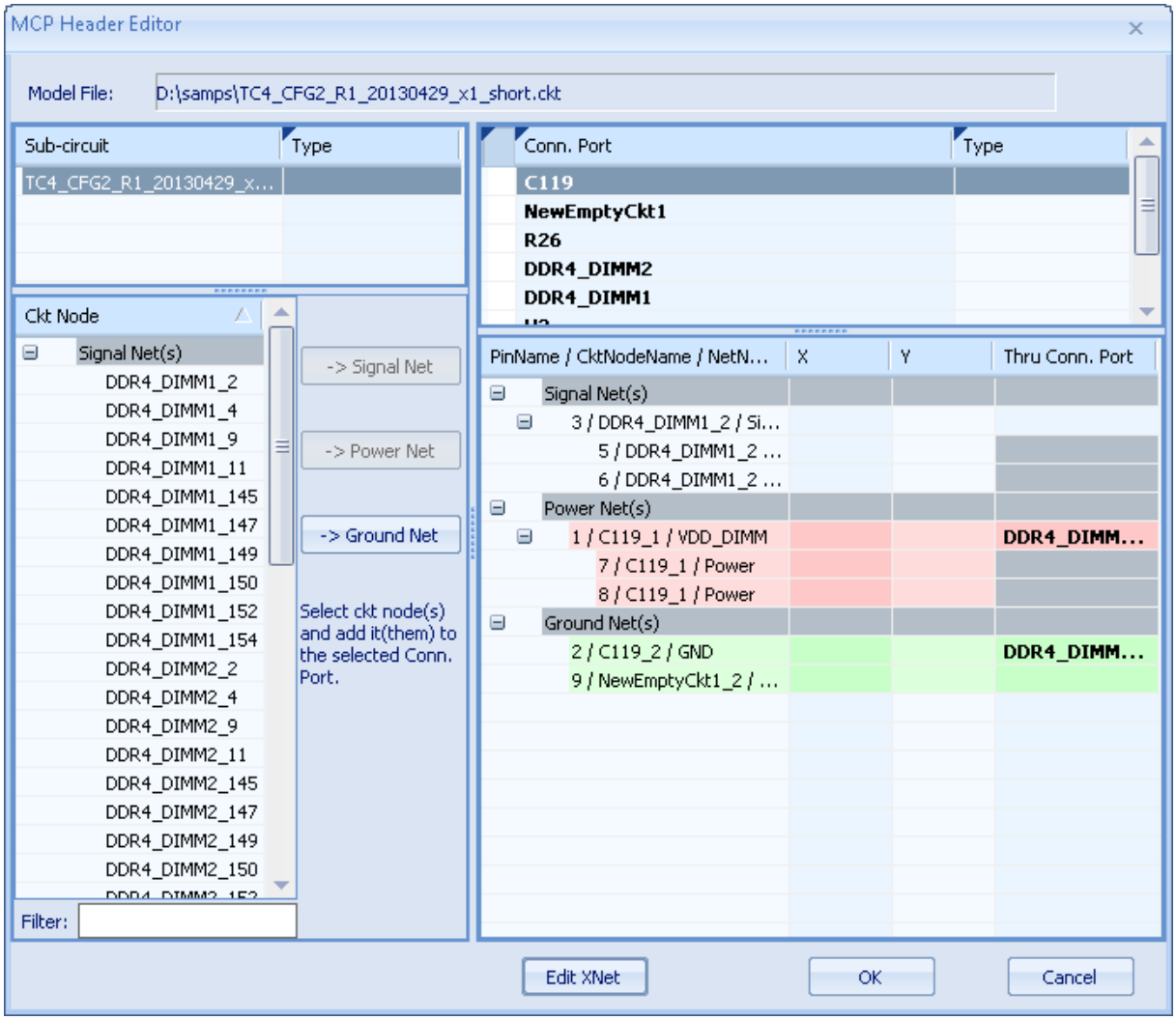
2. Click *Next*.

3. Select the PKG model file (`.ckt`).

.

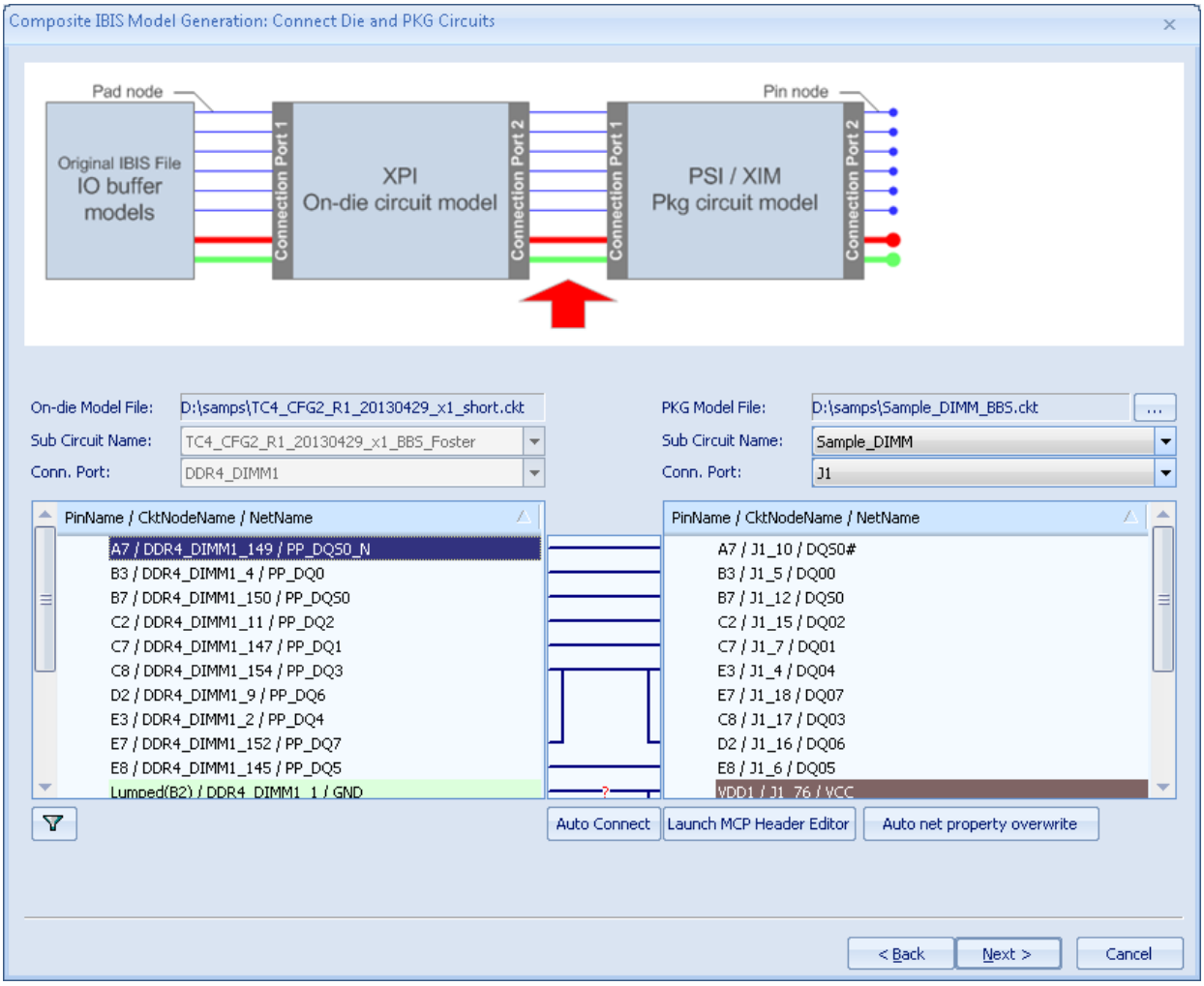


The MCP Header Editor dialog appears for connecting the PDN and PKG circuits. It displays the unconnected signal and power and ground nets.



4. Select the circuit nodes (signal/power/ground net) and add them to the selected connectivity port and click *OK*.

5. Connect the on-die circuit model nodes with the PKG circuit model nodes either manually or using the Auto Connect feature, which you can access by clicking the *Auto Connect* button.

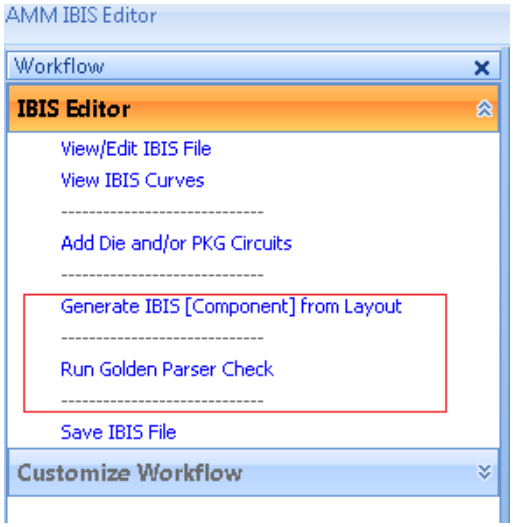


Finally, the Assign Composite IBIS Model Pins dialog appears. This is where you specify a new IBIS file name and component name.

6. Click *Finish*.

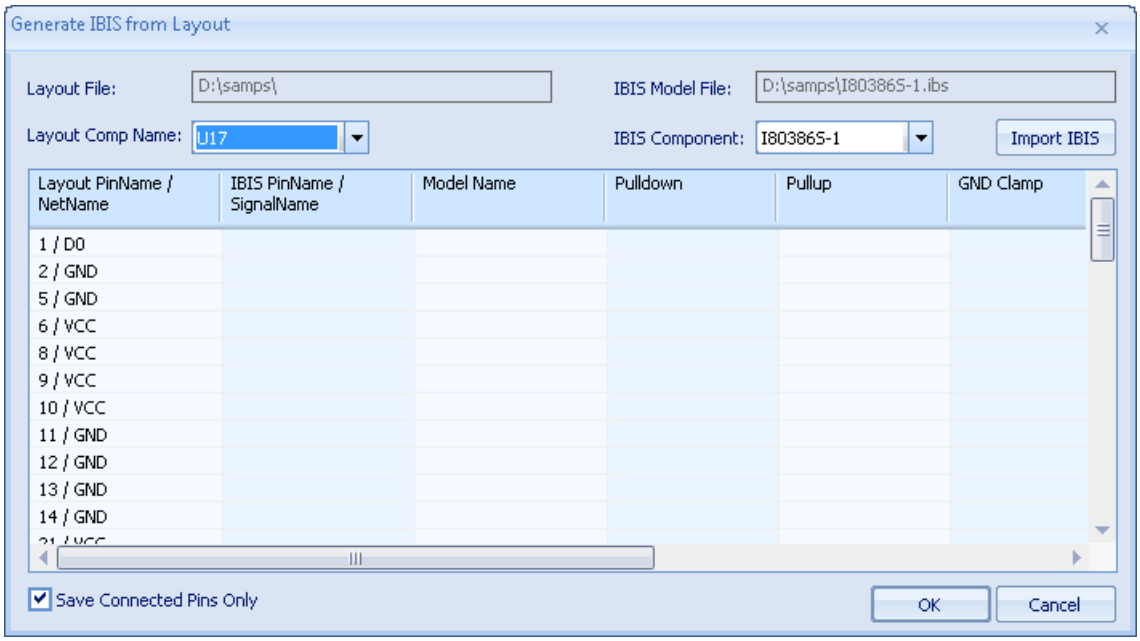
Generating IBIS Component from Layout

The workflow provides the ability to generate an IBIS model from the layout.



This option is enabled only when the layout component information is provided from a board (`.brd`) file by Allegro Sigrity SI or a `.spd` file by other Sigrity tools.

.

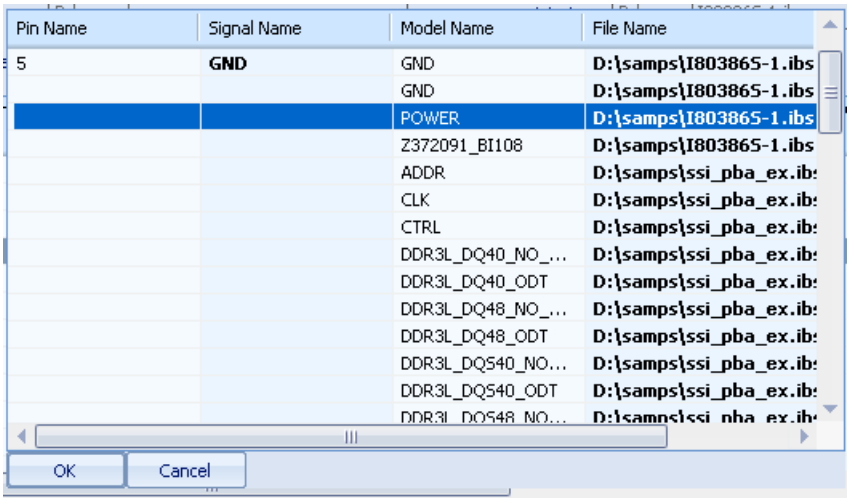


The layout components are loaded from the calling application, such as Allegro Sigrity SI and the IBIS components are in the current IBIS file.

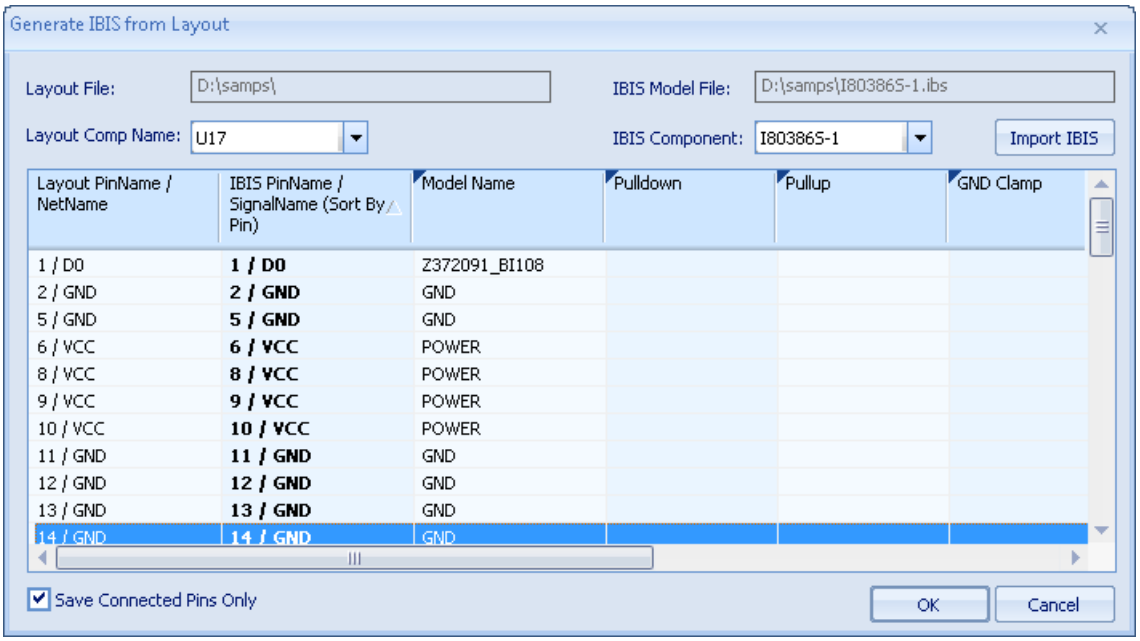
Note: The pin names and the net names must be consistent between layout and IBIS file.

You can import more models from other IBIS file into current IBIS text using the *Import IBIS* function. These models are used for assigning models.

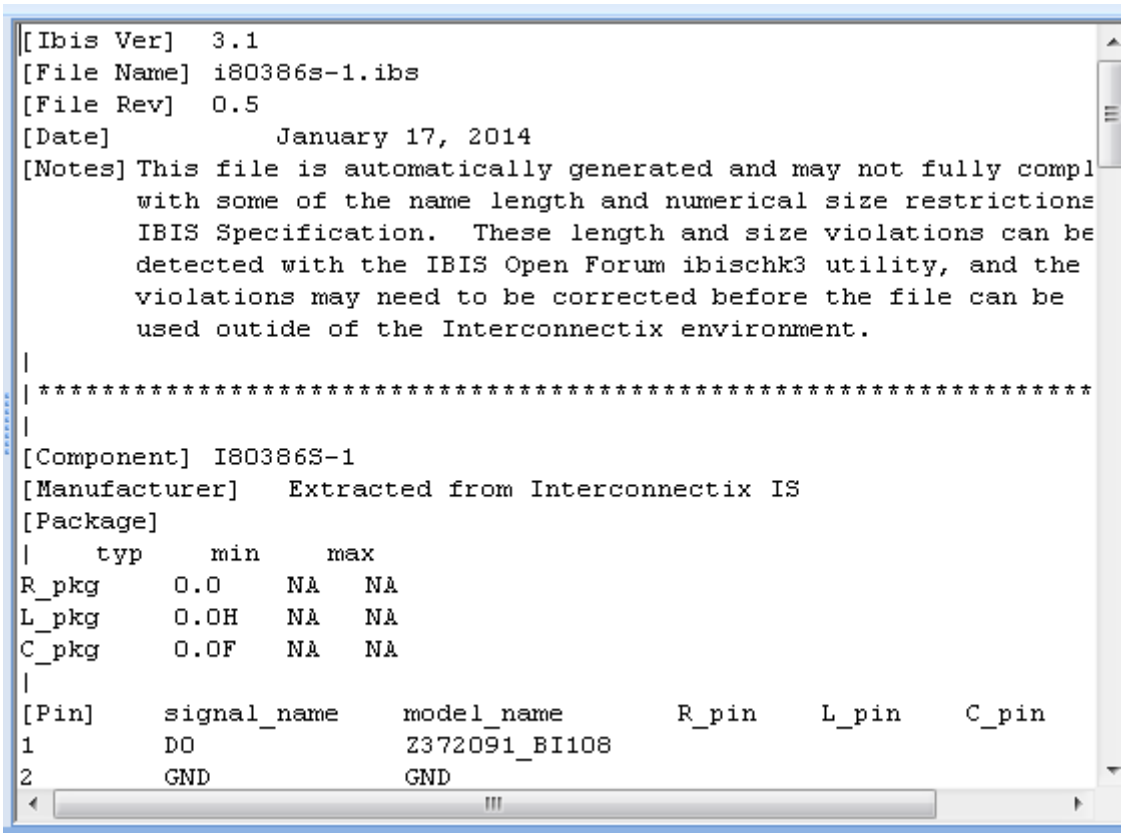
1. Click the Edit icon in the Model Name cell for a layout net.
2. Select a model from the IBIS models file for the corresponding pin/net from the layout.



3. Click *OK*.



4. Click *OK* to close the Generate IBIS from Layout dialog.



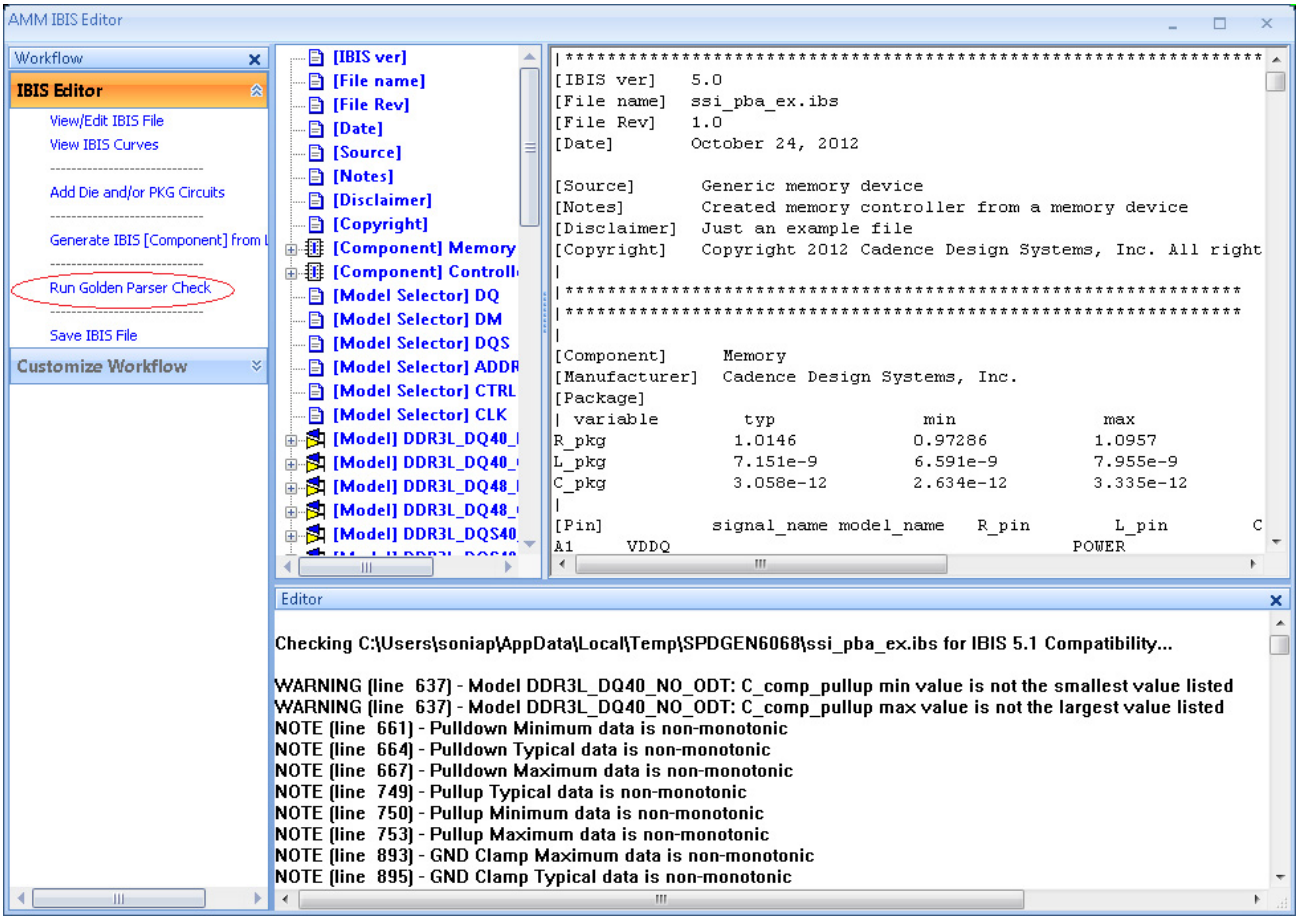
```
[Ibis Ver]  3.1
[File Name] i80386s-1.ibs
[File Rev]  0.5
[Date]          January 17, 2014
[Notes] This file is automatically generated and may not fully compl
        with some of the name length and numerical size restrictions
        IBIS Specification.  These length and size violations can be
        detected with the IBIS Open Forum ibischk3 utility, and the
        violations may need to be corrected before the file can be
        used outide of the Interconnectix environment.
|
|*****************************************************************
|
[Component] I80386S-1
[Manufacturer]   Extracted from Interconnectix IS
[Package]
|    typ     min     max
R_pkg      0.0     NA    NA
L_pkg      0.0H    NA    NA
C_pkg      0.0F    NA    NA
|
[Pin]     signal_name     model_name        R_pin     L_pin     C_pin
1         DO              Z372091_BI108
2         GND             GND
```

The new IBIS file will contains only those components that you selected from the layout.

Running Golden Parser Check

Use golden parser to check the integrity of the IBIS models file.

The result of model parsing are displayed in the Editor pane.



All the warnings and errors encountered in the IBIS file are listed along with the line numbers on which they were found. You can double-click an error/warning message to jump to the corresponding line in the IBIS file and edit the file.

Saving the IBIS File

Use this command to save the IBIS file.

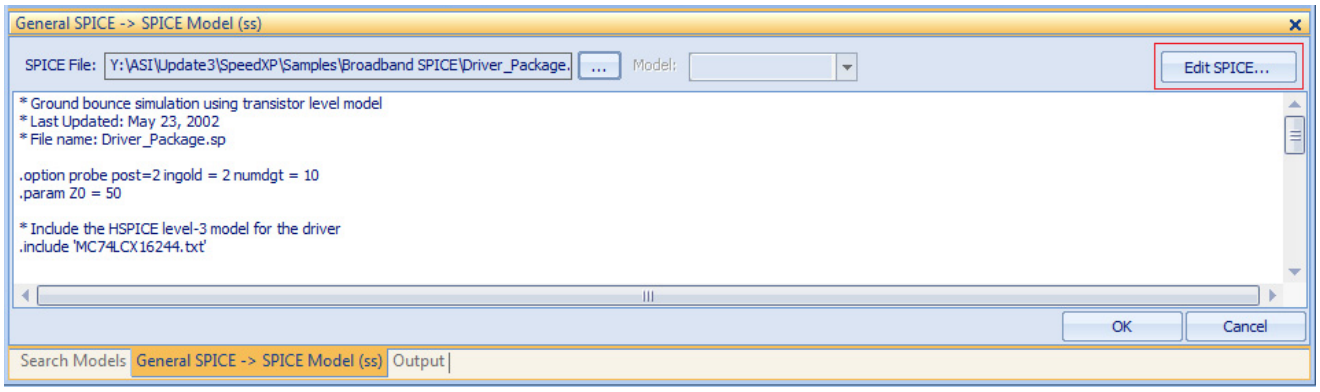
SPICE Model Management

SPICE Editor is a supported module of Analysis Model Manager. SPICE Editor facilitates management of SPICE model files and helps you ensure the integrity of the model data. It provides you an easy-to-use editing environment to create and validate models quickly.

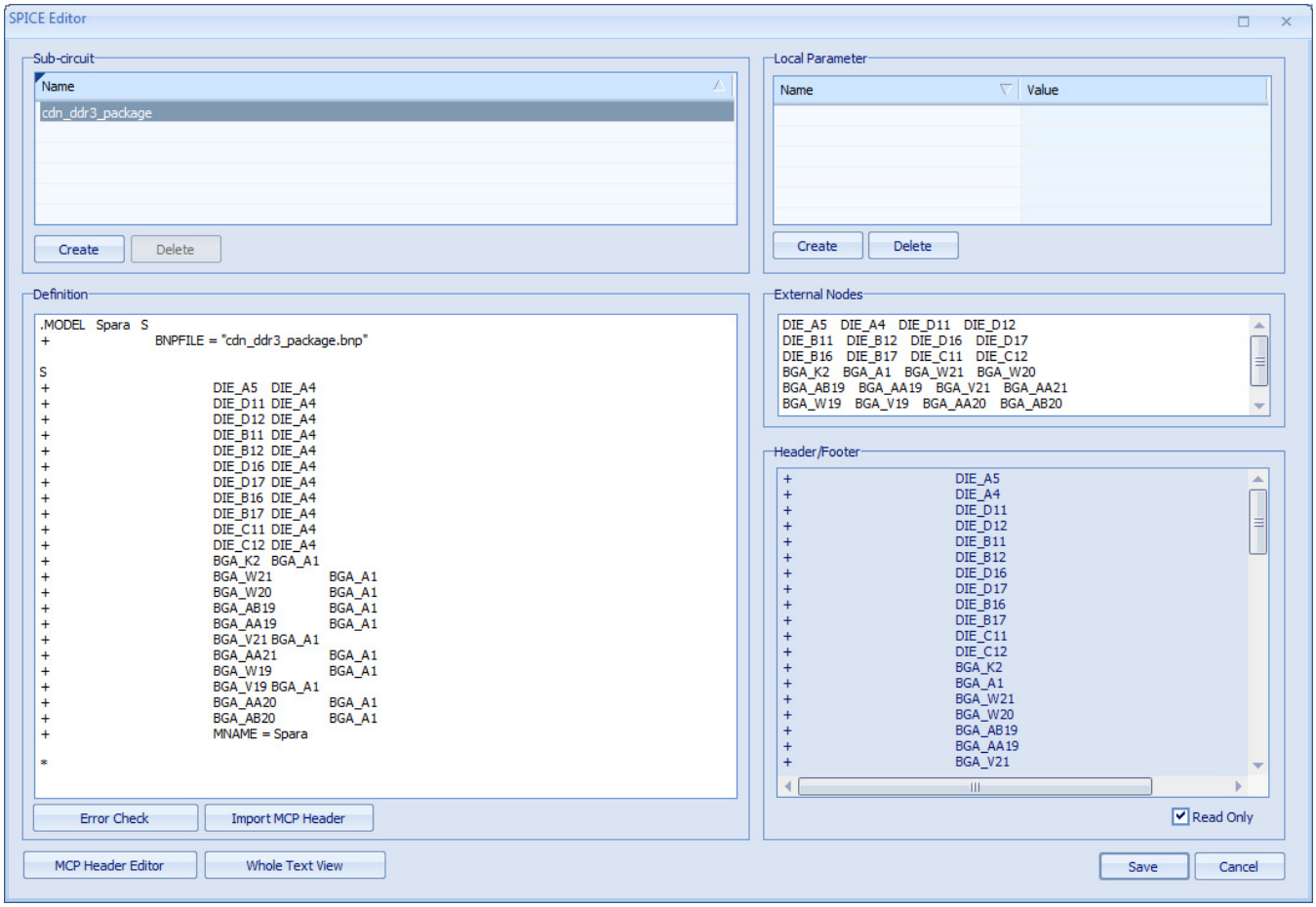
Launching SPICE Editor

You can launch IBIS Editor from the AMM user interface. To launch SPICE Editor:

1. Open the library containing SPICE models in AMM.
2. Select a model name from the list.
3. Click the *Edit* button in the Setup dialog of SPICE model, the SPICE Editor will pop up and load the selected SPICE file automatically.



The SPICE Editor launches with the spice circuit file.



Working with SPICE Editor

In SPICE Editor, you can perform the following functions:

- Create a New Sub-circuit
- Edit Model Definition
- Create or Delete a Local Parameter
- Edit MCP Header Information
- View Whole Text of the Model File

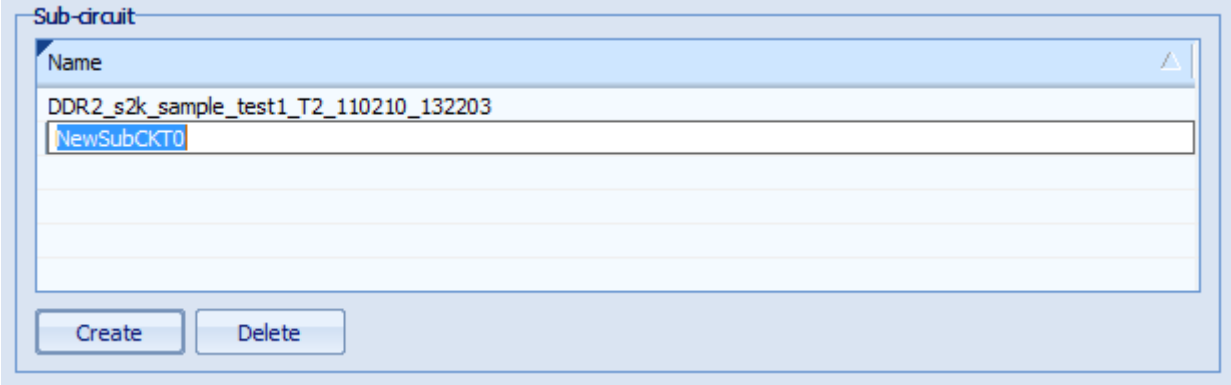
Create a New Sub-circuit

You can create a new sub-circuit in SPICE Editor.

1. Click *Create*.

   A new blank line appears

2. Specify a name and press Enter.

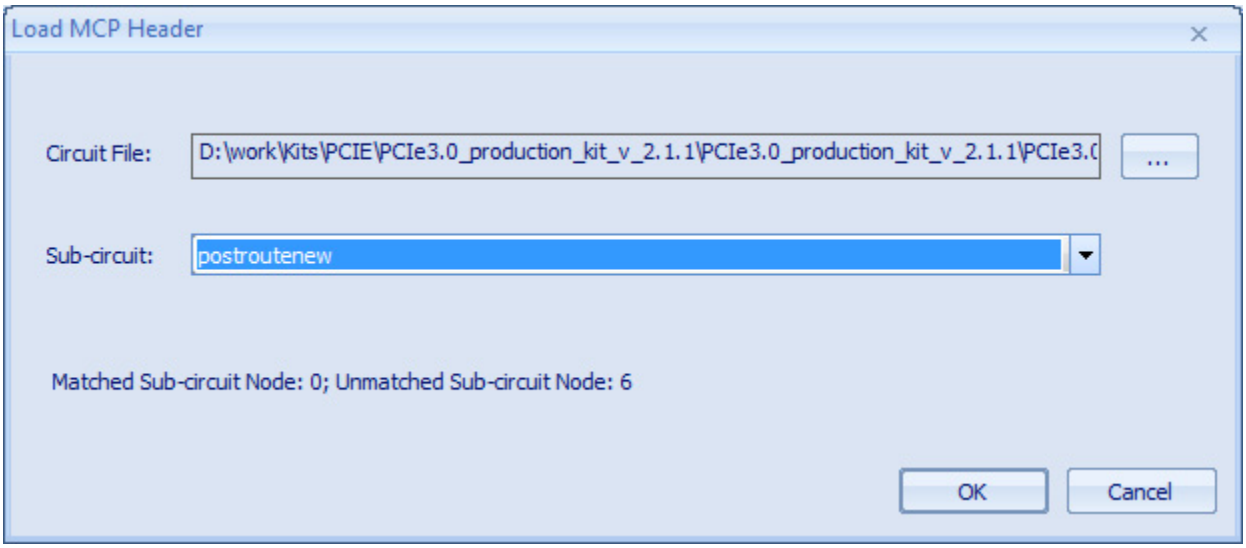


You can also delete the selected sub-circuits. Observe that the External Nodes, Definition, Local Parameter, and Header/Footer information is refreshed based on the selected sub-circuit. By default, the first sub-circuit is selected.

Edit Model Definition

You can edit the model definition in the *Definition* edit area. You can import MCP header information from a sub-circuit of any other circuit file.

1. Click *Import MCP Header*.

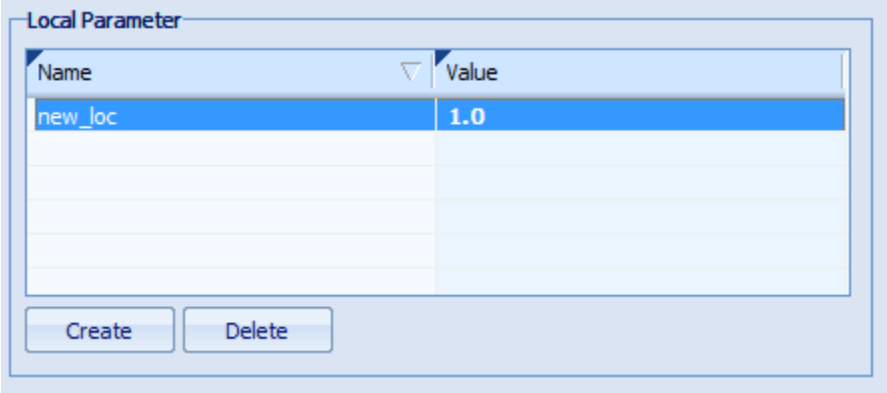


2. In the Load MCP Header dialog, select the circuit file and then the sub-circuit name and click *OK*.

When a sub-circuit is selected, the number of sub-circuit nodes matched or unmatched with those in current sub-circuit is displayed. Also, the original MCP header information in the definition is replaced by the imported MCP header.

Create or Delete a Local Parameter

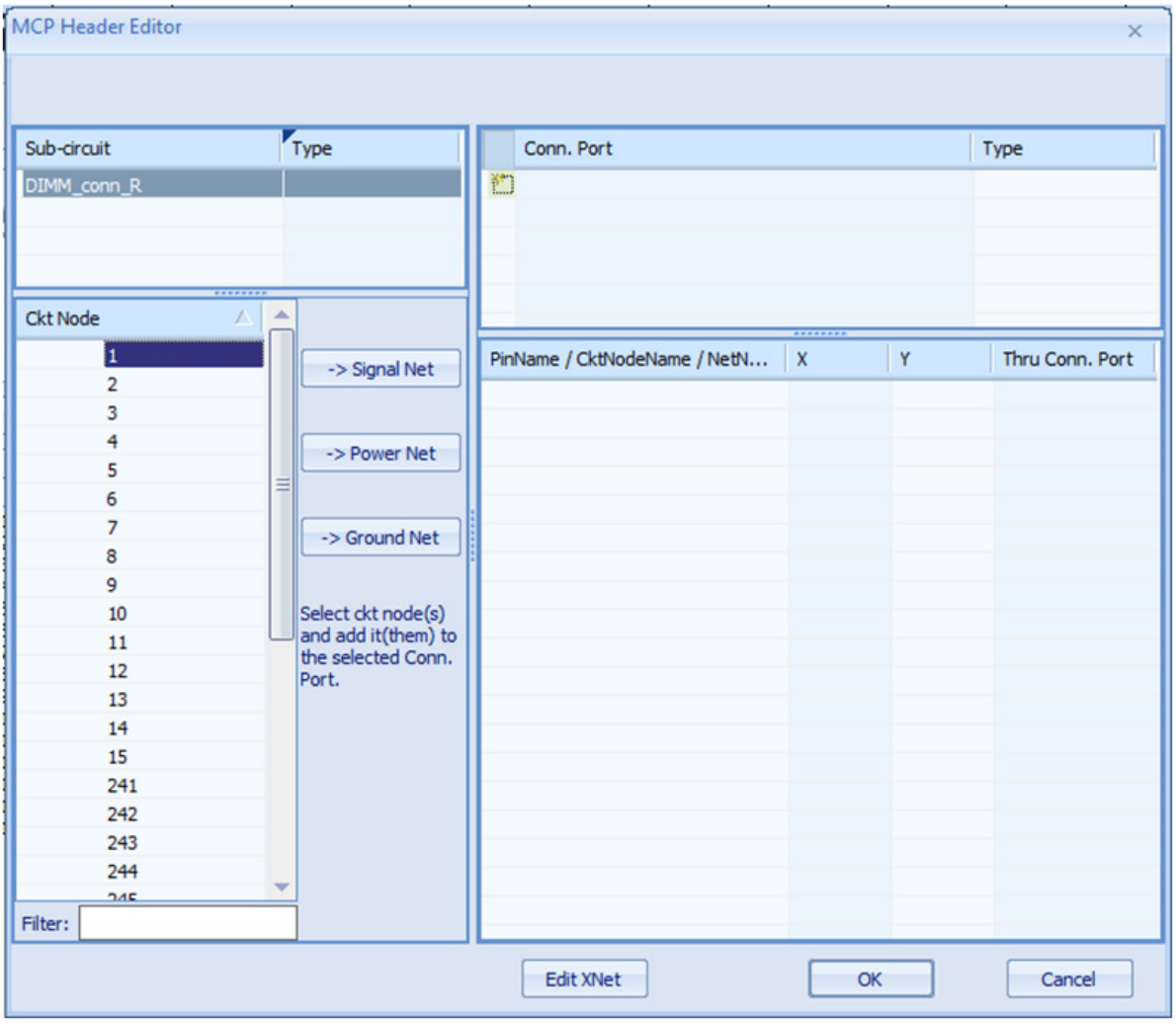
You can also create or delete a local parameter.



Edit MCP Header Information

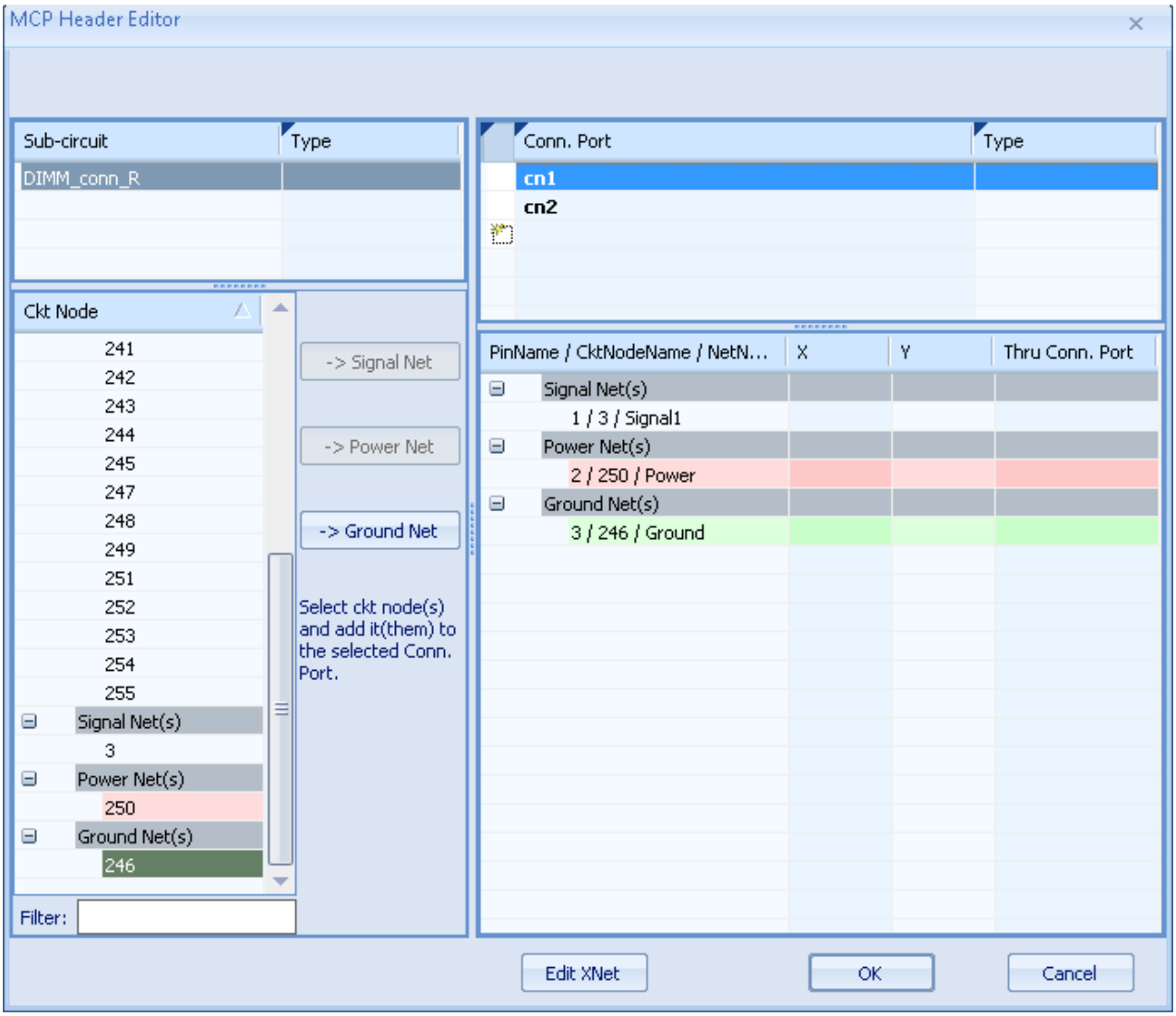
MCP header information can be edited in the MCP Header Editor.

1. Click *MCP Header Editor* to open the MCP Header Editor.

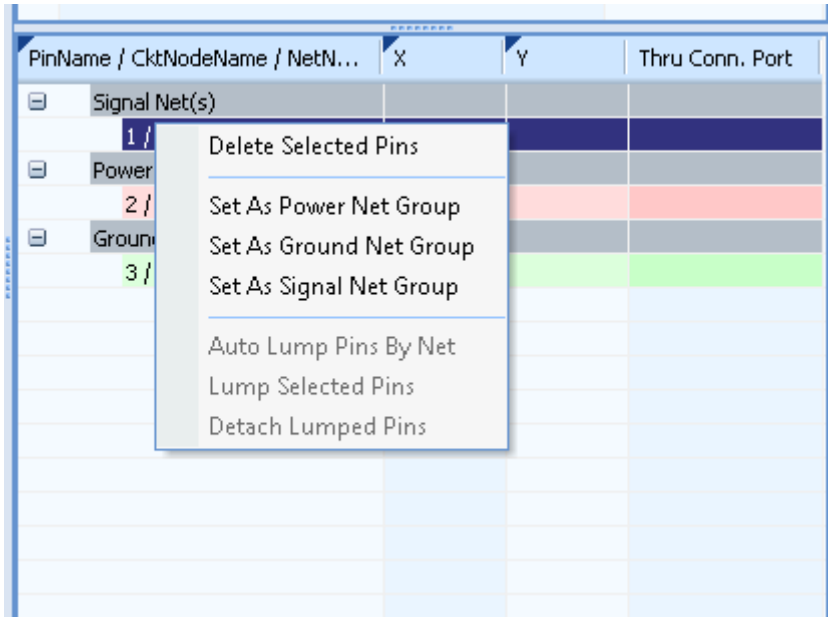


2. Add a connectivity port or select an existing connectivity port.
3. Select a circuit node from the list and add it to the selected connectivity port as a signal, power, or ground net.

4. Repeat step 3 for adding more signal/power/ground nets.



You can also delete a selected pin/net from the list or move it from one group to another.

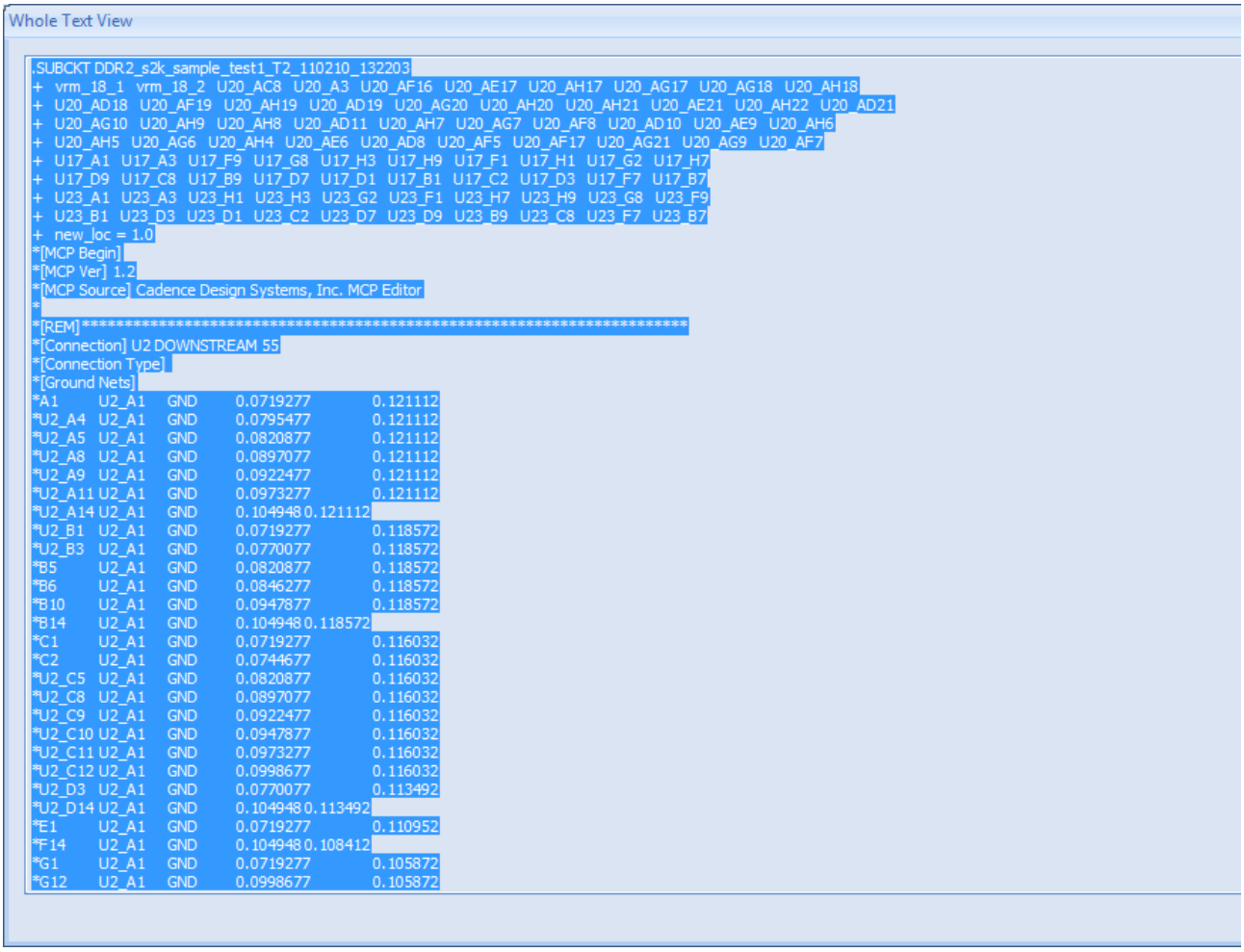


5. Click *OK* to close the MCP Header Editor dialog.
6. Click Save in SPICE Editor to save the changes you have made.

View Whole Text of the Model File

SPICE Editor provides a quick view of the complete text of the sub-circuit file.

➡ Click the *Whole Text View* button to open Whole Text View.



Capacitor Model Management

Refer to the *Working with Capacitor Libraries* chapter of *OptimizePI User Guide* (OptimizePI_UG.pdf). You can access this user guide from *Help – Documents* menu of the Allegro Sigrity tool.