

3D Component Libraries

Ansys Electronics Desktop provides the capability to utilize many ready-made 3D component models. In addition to employing the 3D components from vendors, users can also create their own 3D Components from existing models in Ansys Electronics Desktop.

For example, in Ansys HFSS, users can create 3D components and integrate them into larger assemblies. This modeling approach is particularly useful when dealing with increasingly complex systems. Simulation-ready 3D components are created and stored in libraries that can be added to larger system designs without the need to apply excitations, boundary conditions, and material properties because these simulation properties are already encapsulated in the 3D components. This application note describes the installation and use of 3D Component libraries in Ansys Electronics Desktop.

Preparing a 3D Component Library

The typical folder structure of a 3D component library is shown in Figure 1. The folders are organized by their product categories or series. The 3D Component files present in these folders have the extension *.a3dcomp.

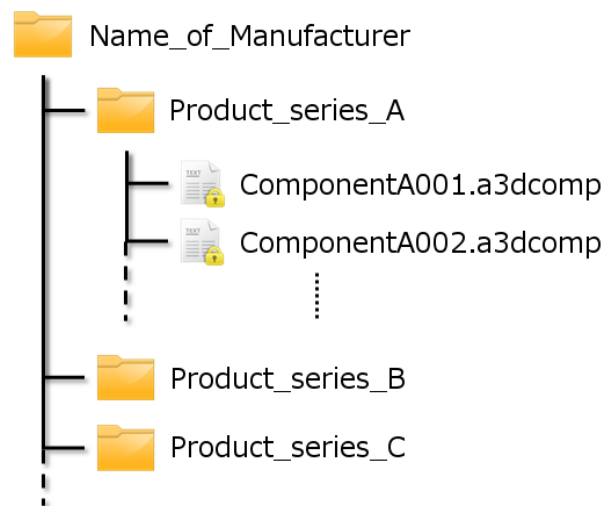


Figure 1 Folder Structure

When you obtain a 3D Component library from a vendor, you need to ensure that the library's folder structure resembles Figure 1. If the vendor's 3D Component library is compressed, extract the files and verify the folder structure. This is important because the same folder structure and file names will appear within the **Component Libraries** window of Ansys Electronics Desktop. The structure and the file names can be changed if required.



Figure 2 : An example of a vendor's 3D component file

If you have a library containing only *.a3dcomp files, it's a good practice to create a folder with the manufacturer or vendor's name to store the *.a3dcomp files.

3D Component Library in Ansys Electronics Desktop

The **Component Libraries** window within Ansys Electronics Desktop displays all the 3D Component libraries/folders. You can add 3D components to one of the library folders (**userlib** or **Personallib**) so that they appear in the **Component Libraries** window for quick and easy access. In Ansys Electronics Desktop, go to the menu item **View** and select the **Component Libraries** option to activate this window.

Upon inserting a design type, this window automatically displays the corresponding 3D Components. For example, when you insert an HFSS design type, the **Component Libraries** window displays the predefined folders for Antennas, Human Body Exteriors, Johanson, Rectangular Waveguides, Surface Mount Devices as well as any vendor components. Similarly, when you insert an Icepak design type, the window displays predefined folders for Fan, Heatsinks, Packages as well as any vendor components.

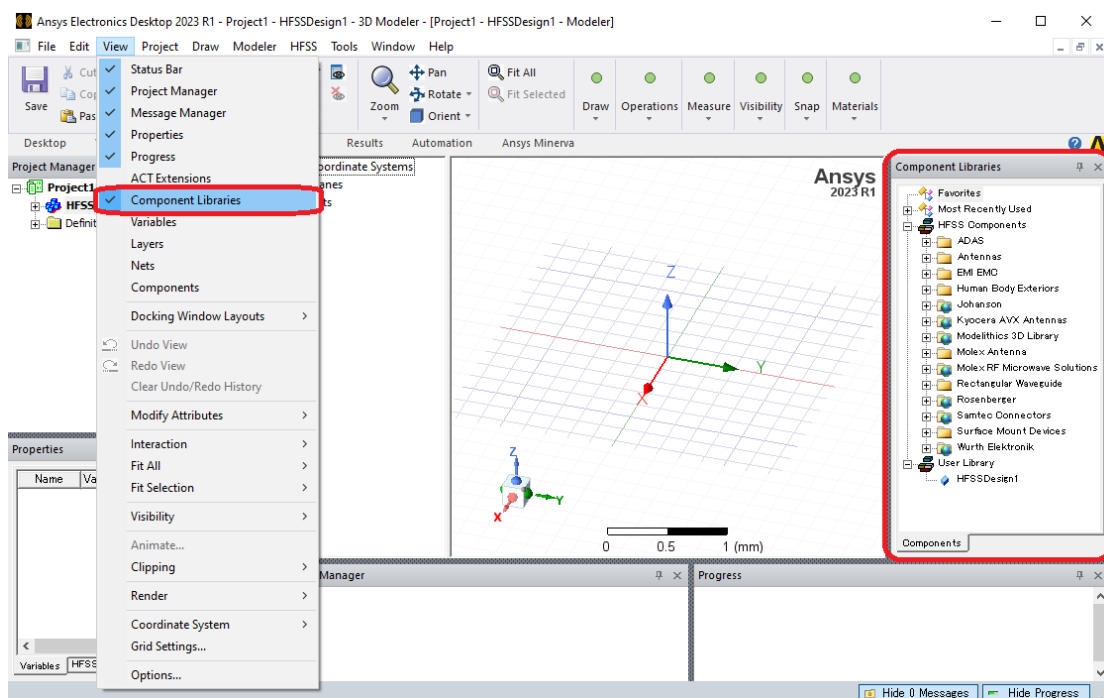


Figure 3 Component Libraries

The component folders are grouped into three libraries — Product Library, User Library and Personal Library which point to the **syslib**, **userlib**, and **PersonalLib** folders respectively. The **syslib** and **userlib** folders are automatically created in the **AnsysEM** installation directory. You need to create the **PersonalLib** folder. Each of these libraries has a specific purpose — **syslib** is for pre-defined components provided by Ansys so do not place your components here; **userlib** is for models that are shared with other users, so it is usually set to a central location for users who have permission to access it; **PersonalLib** is for models that are only accessed by a single user, so you can set it to a convenient location on your local machine.

On the **View** tab, if you click the **General Options** command, the **Options** window appears. Here you can define the paths for these library folders as shown in Figure 4.

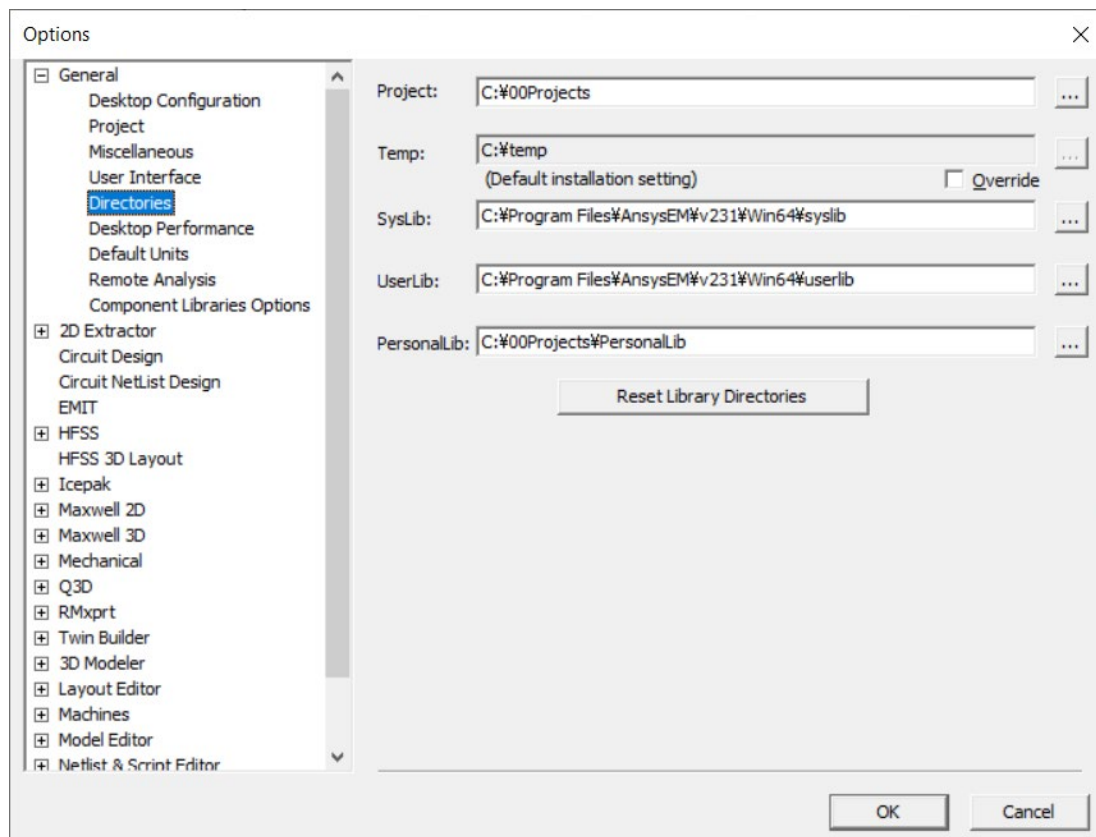


Figure 4 Options dialog

Place your vendor components in the **3DComponents** folder under **PersonalLib** or **userlib** (if you have administrative privileges). Create the **3DComponents** folder if it is not present so that the components you add here will appear in the **Component Libraries** window for easy access.

When you create a 3D component in Ansys HFSS (or Ansys Icepak) and export it to one of these two libraries (PersonalLib or userlib), a **3DComponents** folder is automatically generated.

Remember, you can access 3D components from anywhere on your machine. However, it is convenient to store your components in the **3DComponents** folder under **userlib** or **PersonalLib** because you can readily access them from the **Component Libraries** window and place them in your target design.

Adding a 3D Component Library to a Target Design

Once a 3D component is available in the **Component Libraries** window you can easily add it to the target design as follows:

1. Add the component using one of the following operations:
 - Double-click the 3D Component
 - Drag and Drop the 3D Component
 - Right-click the 3D Component and select the **Place Component** option from the short-cut menu

The **Insert 3D Component** window appears.

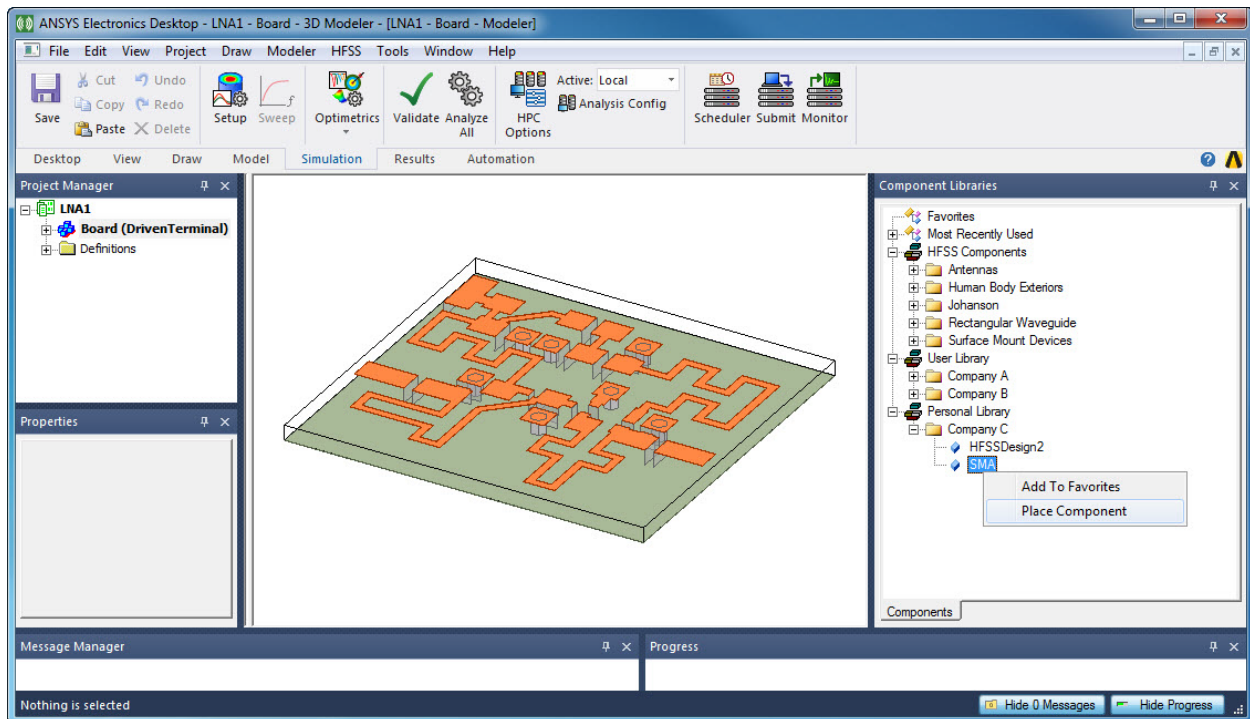


Figure 5 Placing a 3D Component

2. On the **Insert 3D Component** window, adjust or define the initial values of the parameters if required.

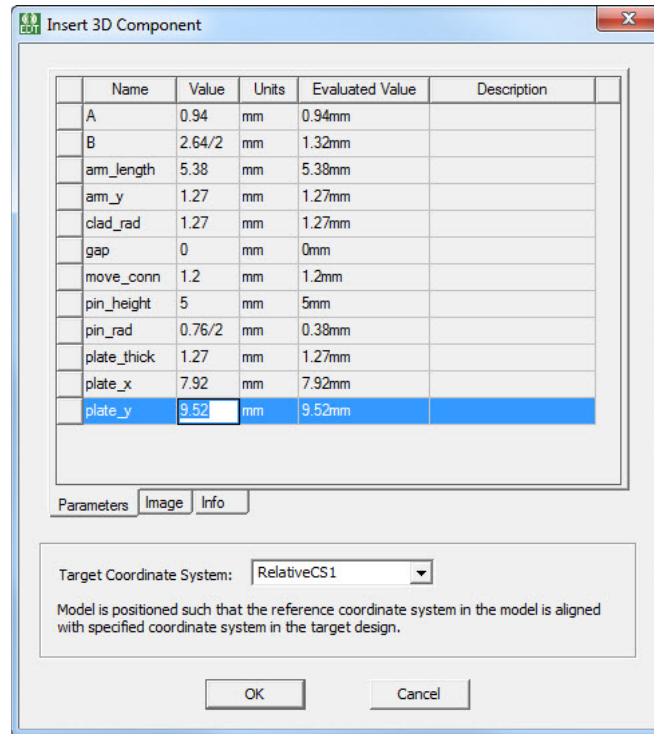


Figure 6 Insert 3D Component Dialog

- Finally, choose the appropriate coordinate system from the **Target Coordinate System** drop-down menu.

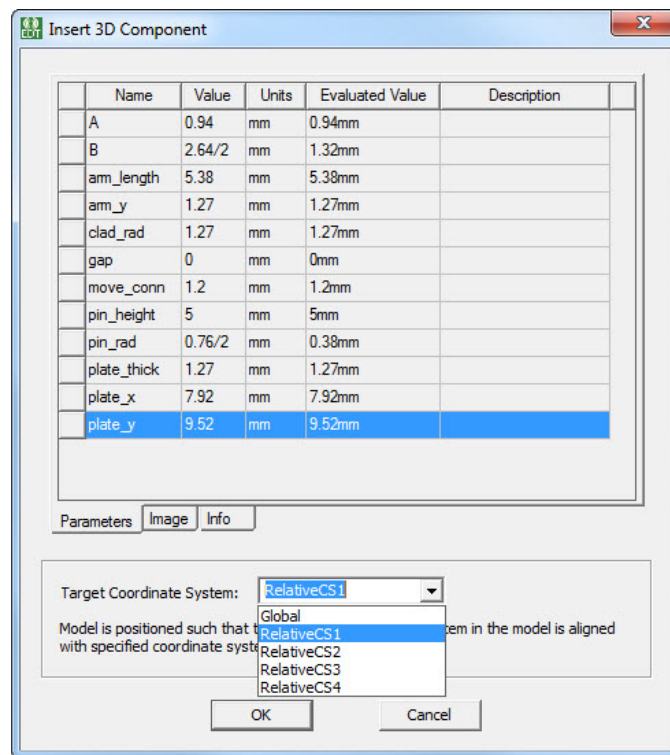


Figure 7 Coordinate System Selection

4. Press **Enter** to add the component to the target design.

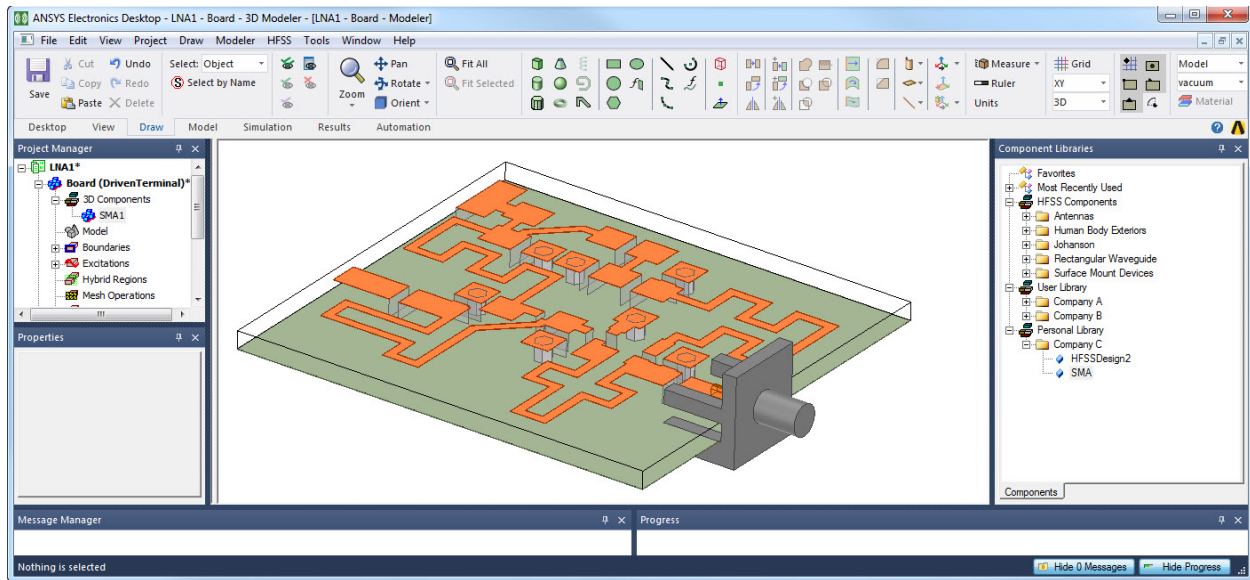


Figure 8 3D Component added to the Target Design

You can perform **Arrange** or **Duplicate** operations on a 3D Component model as a whole. The objects that make up the 3D Component are not editable.

When you select the 3D Component model from the **Project Manager** window, the relevant editing commands such as **Arrange**, **Duplicate** etc., become active on the **Draw** tab of the ribbon in Ansys HFSS or Ansys Icepak.

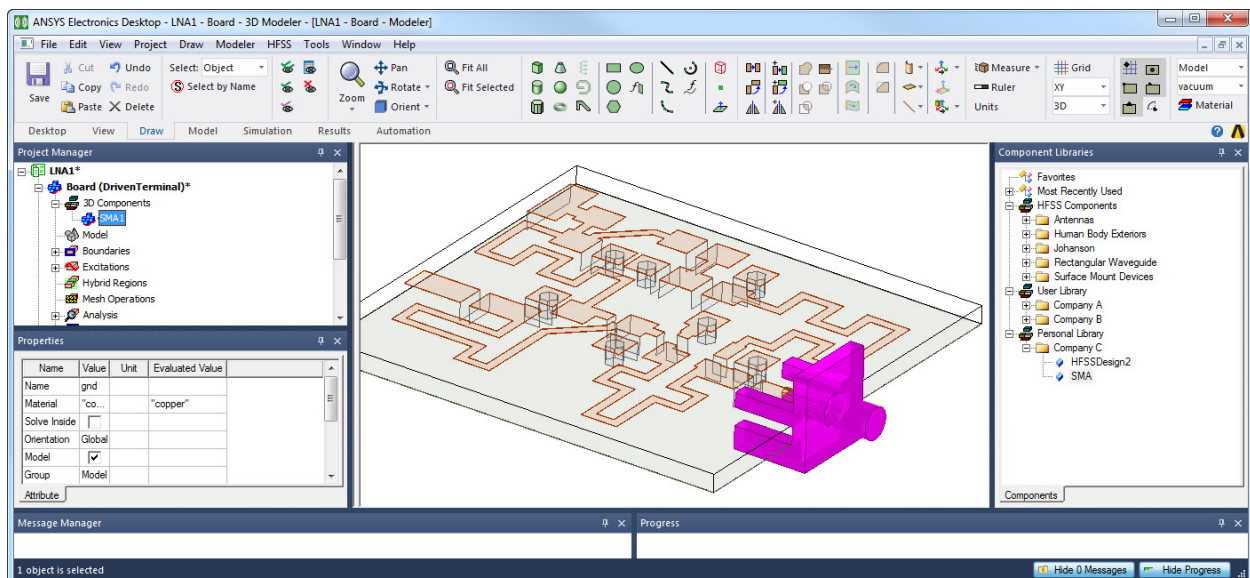


Figure 9 Editing 3D Components

Alternative Approach to Add a 3D Component

To add components that are not located in the standard library locations, perform the following steps in Ansys HFSS or Ansys Icepak:

1. On the **Model** tab, press the **Browse 3D Components** option.

This command opens the **Browse 3D Components** window.

2. Navigate to the desired folder, select the component and press **Open**.
3. Adjust the parameter values and select the desired coordinate system on the **Insert 3D Component** window and press **Enter** to add the component to the target design.

Features of 3D Component Library Models

This section briefly describes some of the basic features of 3D Components.

Version Compatibility

3D Component models are forward or upward compatible allowing seamless integration with newer versions of Ansys as well as the version in which the 3D components were created.

Product-specific

3D Component models cannot be shared among different Ansys products. For example, if you create a 3D component in Ansys HFSS, you can use it only for a target design in Ansys HFSS but not in Ansys Icepak; and vice versa.

Solution Type Compatibility

A target design should have the same solution type as the 3D Component model. So if a 3D Component model includes excitations or boundary conditions that depend upon a specific solution type, you need to select the same solution type to load the model. For example, if an HFSS 3D Component model has wave port excitations, the target design should employ the **Modal** solution type. Similarly, if the 3D component model has lumped port excitations, the target design should use the **Terminal** solution type.