cadence®

Allegro X 3D Canvas User Guide

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Allegro 3D Canvas

Allegro® 3D Canvas, lets you visualize and analyze a three-dimensional model of a design as a manufactured output. You can visually check whether the symbol placement, position, and proximity to other symbols is proper and decide if violation of design constraints occur. You can also view mechanical objects such as shields, fans, heat sinks and housings and run checks for verifying any collisions or other placement issues.

Allegro 3D Canvas displays in its own canvas, letting you continue to work with the two-dimensional view in the main canvas. You can interactively zoom, pan, and rotate the 3D design. Enabling the interactivity between 2D design window and 3D canvas lets you edit the design in 2D design window and display the changes in 3D Canvas in real time.

3D canvas also works in a pre-selection use model, in which you choose an object first, then right-click and choose the *3D* command to display a three-dimensional view of the selection set.

This user guide describes features and functionality for the following layout editors:

- Allegro PCB Designer
- Allegro Venture PCB Designer
- Allegro Enterprise PCB Designer (Symphony Team Design Option included in bundle)
- Allegro Physical Viewer Plus
- Allegro Package Designer+

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Why and when to use Allegro 3D Canvas

Allegro 3D Canvas uses a high-quality graphical engine to display 3D models of design objects. You can analyze the design before creating manufacturing outputs or for exchanging information between other 3D applications. When sending design for reviewing or for marketing purposes, you can also adjust the visibility of design objects and layers in 3D Canvas.

There are several other tasks that you can do during design verification in 3D Canvas. The following list gives you an idea of tasks that you can perform in 3D Canvas:

- Hide and show objects
- Control display of cross-sectional layers from the primary stackup
- Control display of zone stackups for a rigid-flex design
- Apply different color themes for viewing design in 3D Canvas
- Set transparency for design layers and mechanical symbols
- Create and save user-specific color theme
- Control highlighting color and modes of various design objects
- Choose symbol representation based on either STEP models or boundary shape (place_bound or DFA_bound) or both
- Set cutting plane for cross-sectional viewing
- Interact between 2D design window and 3D Canvas
- Export 3D graphical data into multiple industry standard CAD formats
- Measure distance between objects to verify the clearance in 3D Canvas
- Perform flex operations like bending and display design according to different bent angles

Scripts are compatible with 3D Canvas and can be used to automate these tasks. You can create a script file (`.scr`) the same way as in the 2D design environment.

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Starting 3D Canvas

See the following topics to start 3D Canvas from PCB Editor or in the stand-alone mode.

- Starting 3D Canvas from PCB Editor
- The pcb3d Command to Start 3D Canvas in Stand-alone Mode

Starting 3D Canvas from PCB Editor

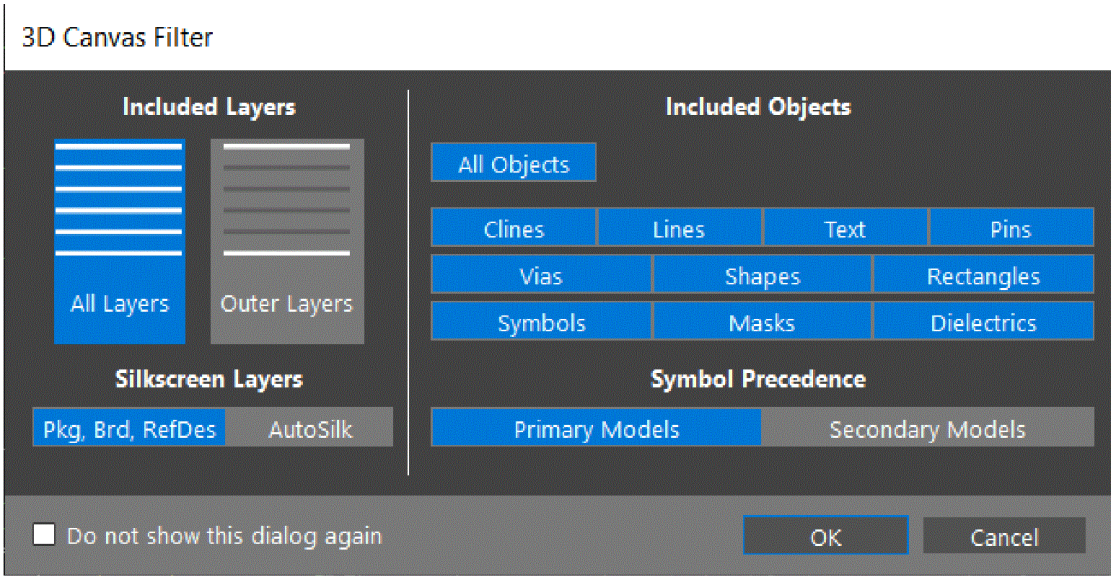
There are three ways to launch 3D canvas:

- Choose *View – 3D Canvas* menu option.
- Click the 3D toolbar icon in the *View* toolbar.

- Type `3d` in the Command window.

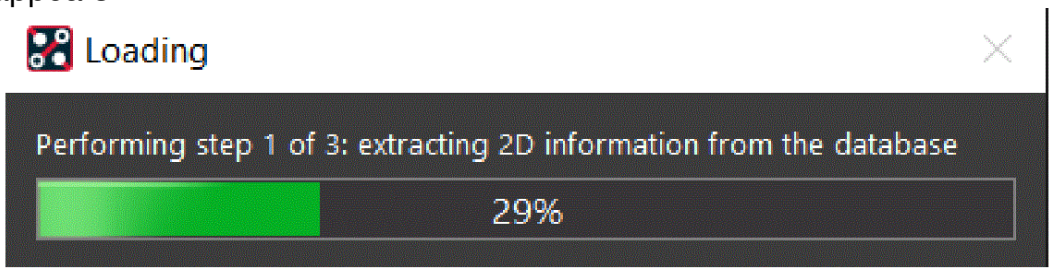
3D Canvas Filter is invoked with options to select objects and layers for viewing in 3D. By default, all the objects and the outermost layers are selected in the filter dialog.

- You can either view all or outermost layers in 3D. In large designs, filtering objects and layers minimizes the loading and rendering time by selecting relevant objects to load into 3D Canvas.
- In addition you can choose to visualize silkscreen layers representation in 3D Canvas. There are two options. You can either select silkscreen layers from Package_Geometry, Board_Geometry, and Components – RefDes class or Manufacturing class.
- You can also choose whether to display primary or secondary models in 3D Canvas in the *Symbol Precedence* section. The Primary STEP model setting is the default behavior.



To launch 3D Canvas directly you can avoid the filter dialog completely by setting the *hide_unified_filter_dialog* environment variable in the User Preferences Editor.

After setting filter, the entire 2D design transforms onto 3D Canvas and a three-stage progress meter appears.



You can cancel invocation of 3D Canvas by pressing `ESC` key.

The pcb3d Command to Start 3D Canvas in Stand-alone Mode

Use the `pcb3d` command to start 3D canvas in the stand-alone mode.

Using this command you can open a single symbol by specifying its reference designator or symbol name as an argument. If an invalid reference designator or symbol name is specified the complete board design opens.

⚠ In stand-alone mode, the commands modifying the database are unavailable, such as model mapping and the move command.

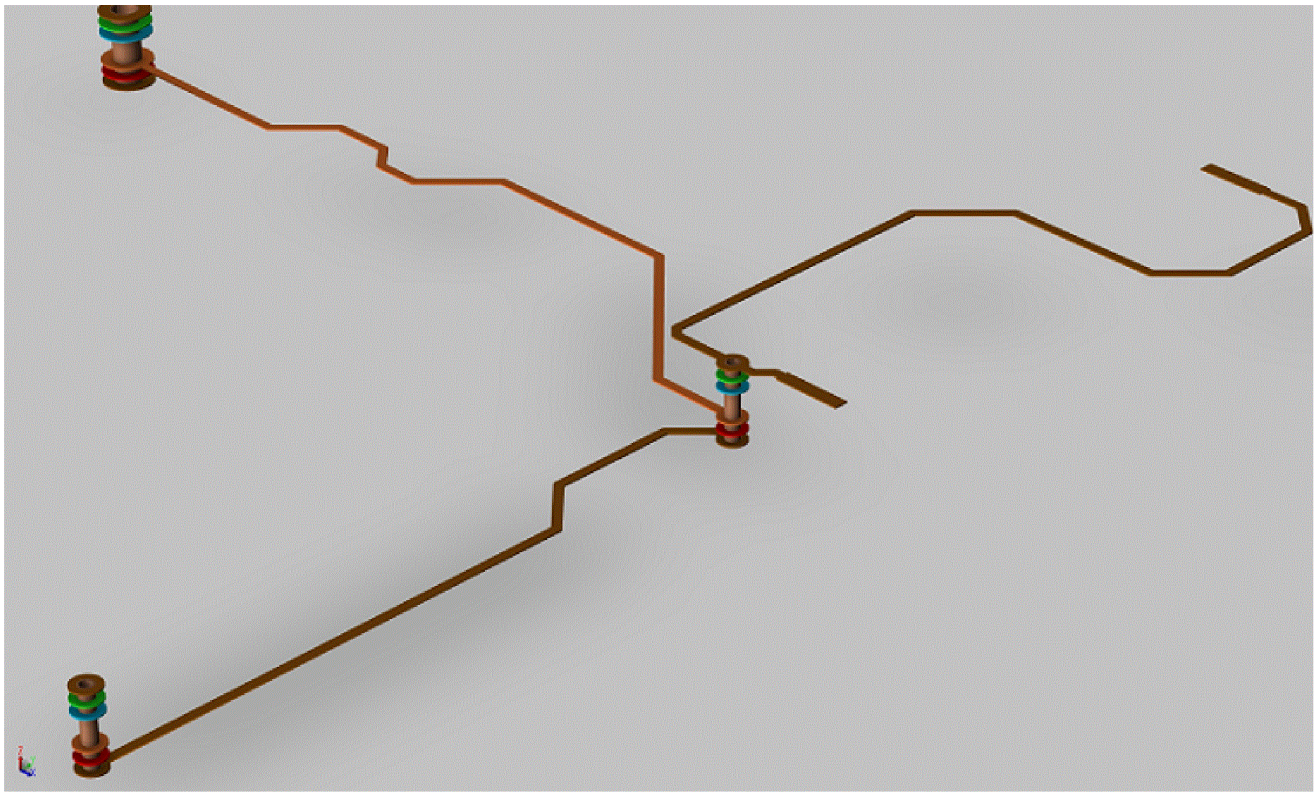
Following are the command line arguments for standalone 3D Canvas:

-f <filename>	Specifies the path of the design
[-r <refdes>]	Specifies the reference designator of the symbol
[-sym <symbol_defintion_name>]	Specifies the name of the symbol definition
[-n <net name>]	Specifies the name of the net
[-i <input file>]	Specifies the path of input XML file that includes multiple design objects.
[-b]	If specified, loads the symbols and the board
[-s <script>]	If specified, plays script on startup (the default extension of script file is .scr)

Examples

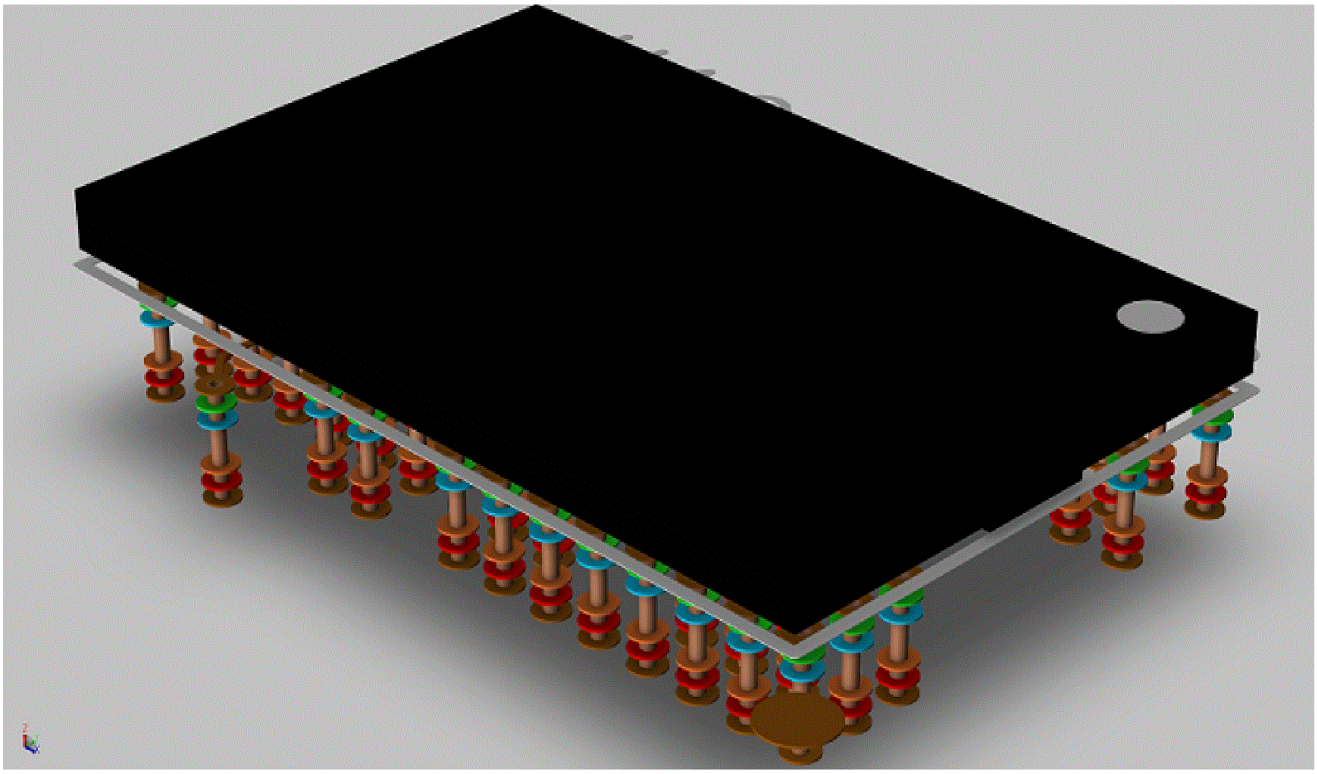
To open a net D4, enter the following at the command prompt:

```
pcb3d -f D:\examples\3d_examples.brd -n D4
```



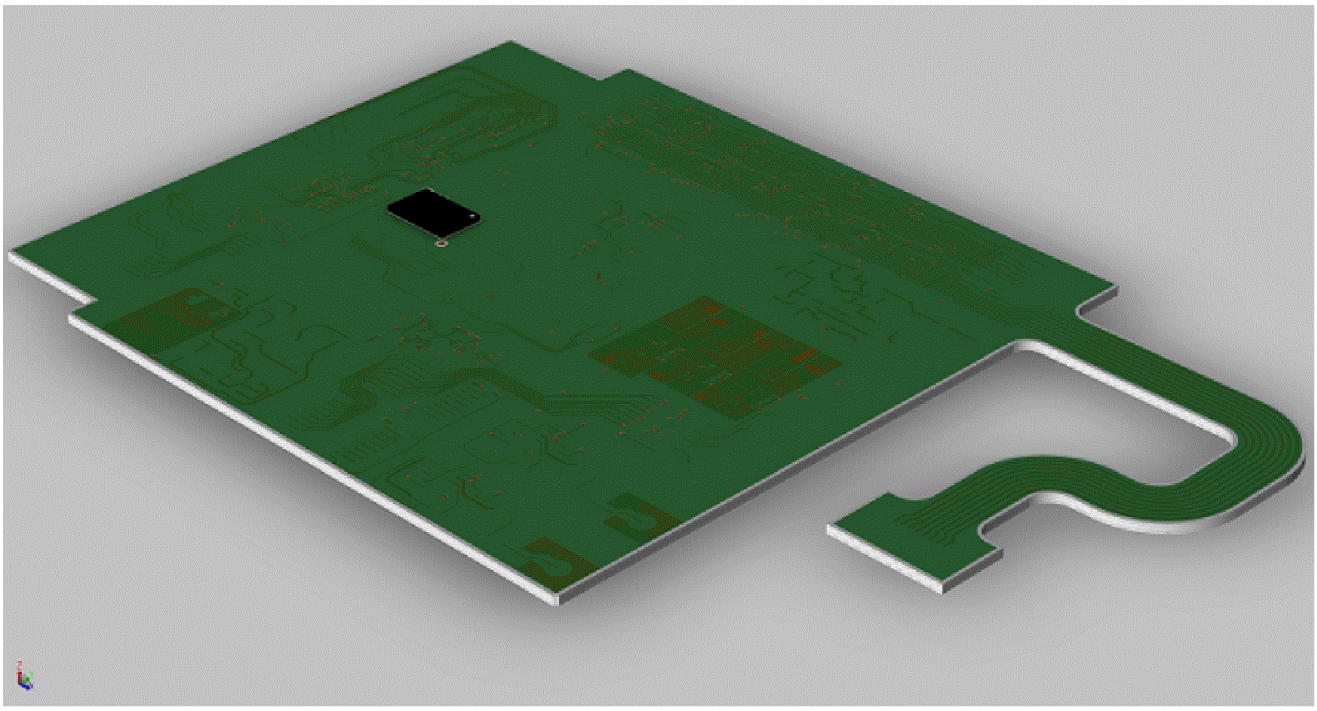
To open a symbol with reference designator U12, enter the following at the command prompt:

```
pcb3d -f D:\examples\3d_examples.brd -r u12
```



To open a symbol U12 along with the board, enter the following at the command prompt:

```
pcb3d -f D:\examples\3d_examples.brd -b -r U12
```

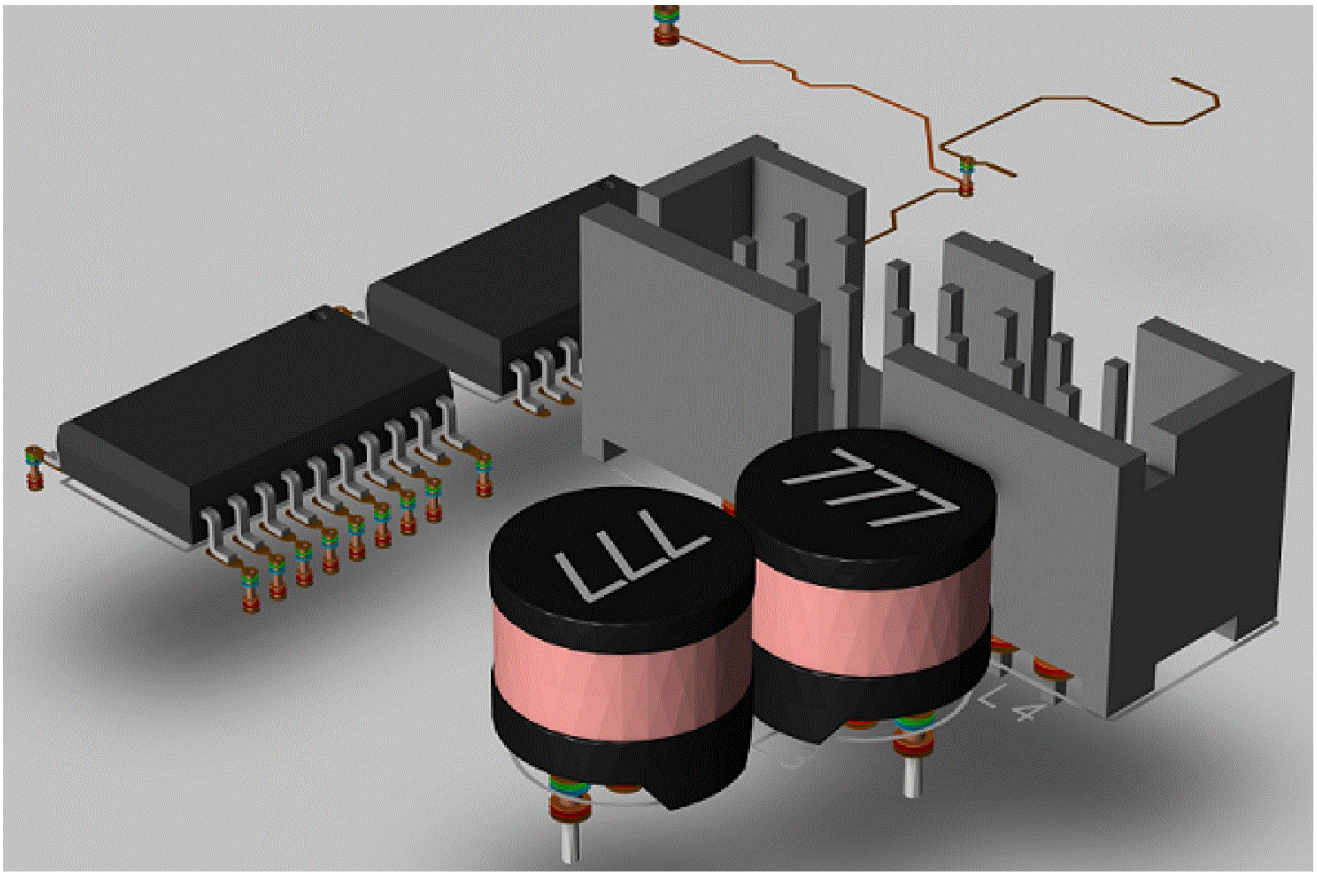


Multiple reference designators can also be opened. You can use the following command:

```
pcb3d -f test.brd -r U1,U2,U3
```

To open multiple design objects in a board from, enter the following at the command prompt:

```
pcb3d -f D:\examples\3d_examples.brd -i test.xml
```



Sample XML File

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>

<input file="D:/demo.brd" wb="false">

 <ref name="U7"/>

 <ref name="U48"/>

 <net name="A7"/>

 <net name="Dhen/"/>
```

```
 <net name="Den/"/>

 <sym name="SAMTEC_TST-107-XX-X-D"/>

 <sym name="TOROID01_3"/>

</input>
```

The `wb` parameter in the input XML file stands for whole board and is the same as the `-b` command line option. If you want to view nets along with symbols in 3D canvas, set the value of `wb` to `false` in input XML file.

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Getting Started with 3D Canvas

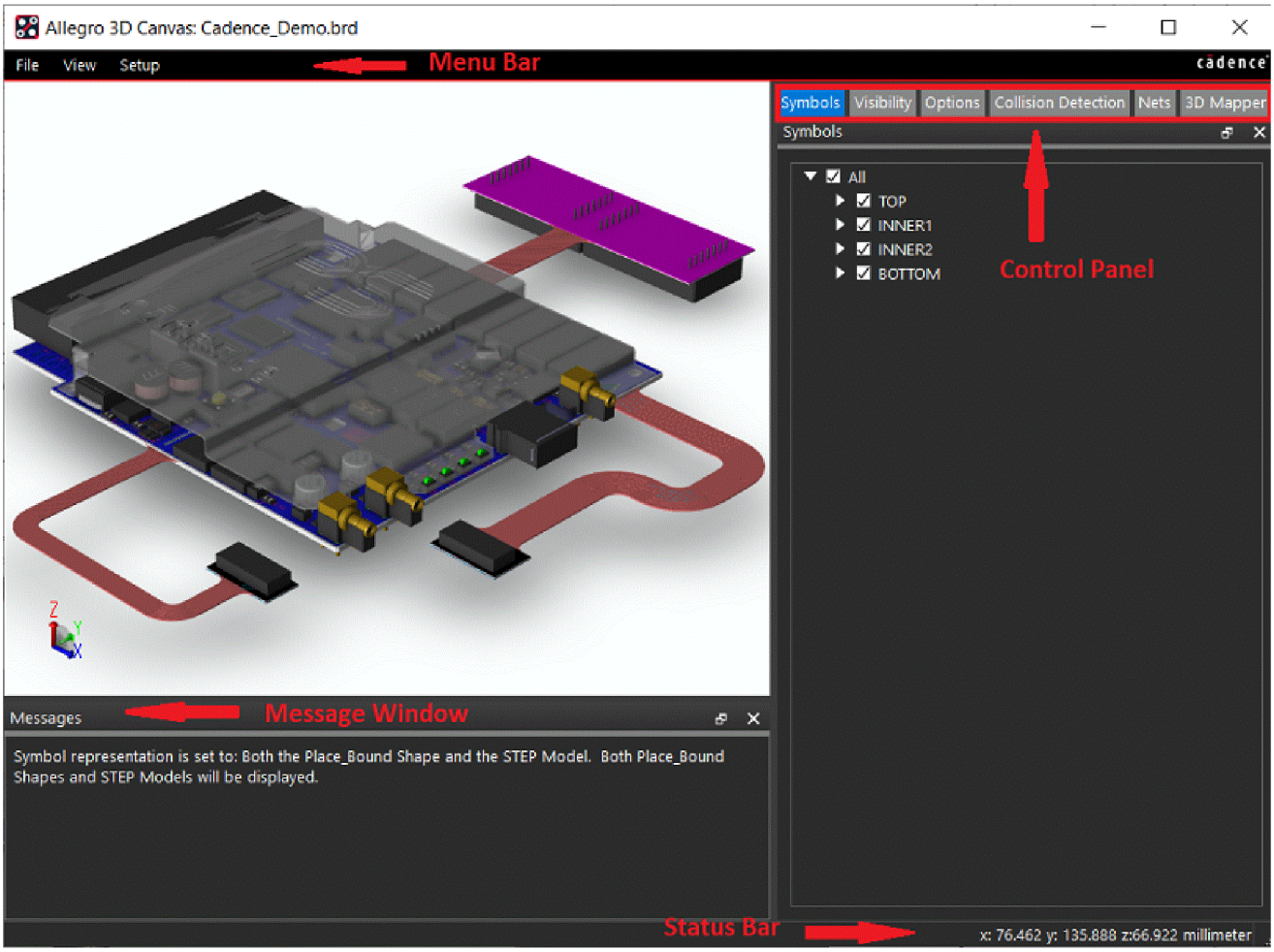
See the following topics to know more about the 3D Canvas interface, menus, and navigating in the application:

- 3D Canvas User Interface
- Navigating in 3D canvas
- 3D Canvas Menus

3D Canvas User Interface

The user-interface of 3D Canvas is similar to PCB Editor. When you launch a design in 3D Canvas, it displays the zoomed-fit isometric view of the design in the window frame. The name of the design is displayed in the title bar.

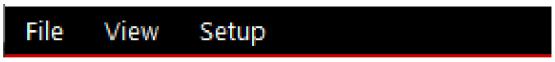
The pull-down menus provide commands to view a design in 3D canvas and also to setup the viewing preferences. You can also use the *NumLock* keys to view 3D design in different orientations.



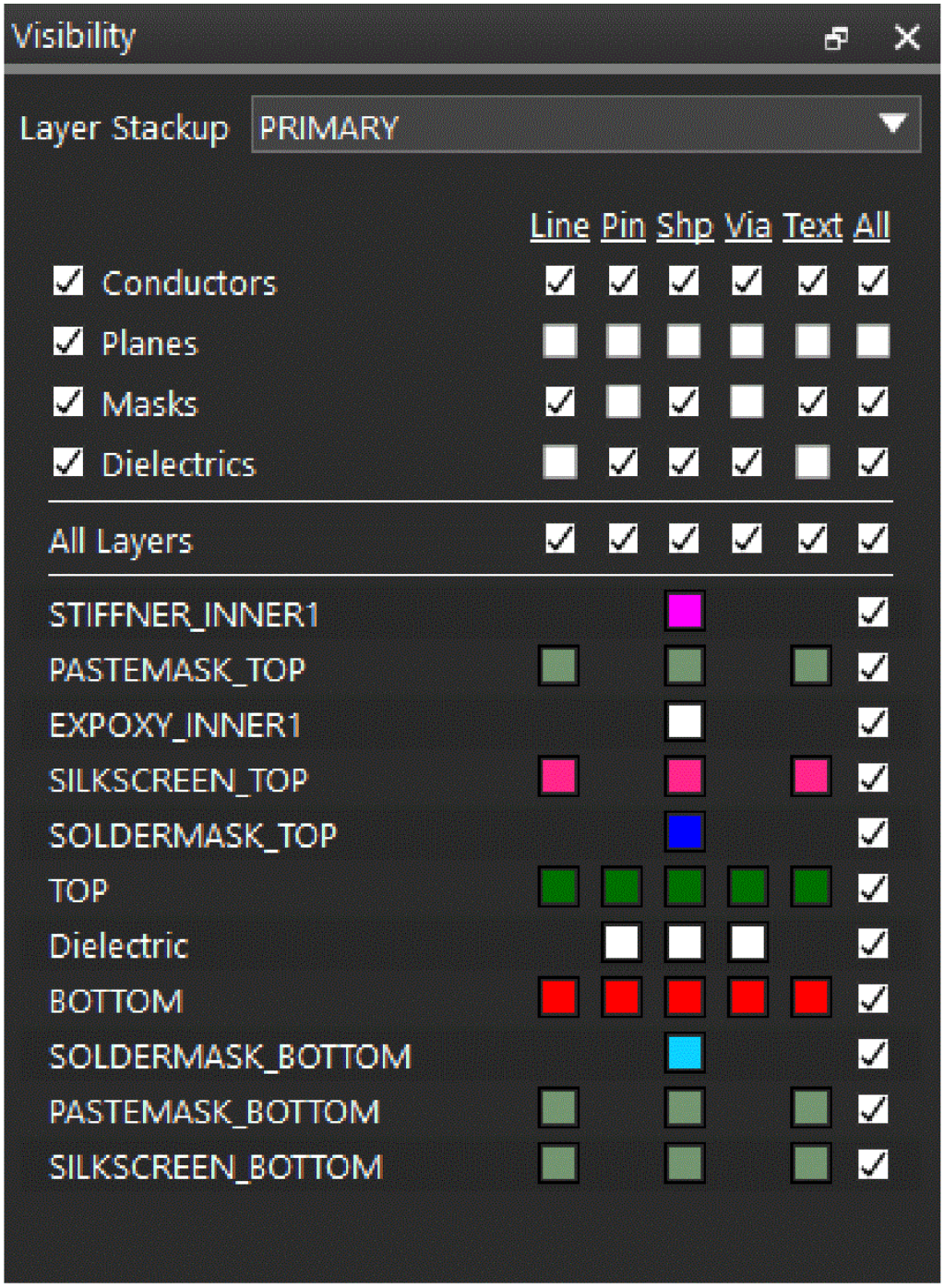
An orientation marker appears in the lower right corner of the canvas that indicates the current spatial orientation of the model in space, showing the X, Y, and Z axis lines. The orientation marker adjusts automatically as you manipulate the viewpoint.

The 3D canvas user-interface has following elements:

- Menu bar: The pull-down menus provide commands for viewing a design and for setting up viewing preferences.

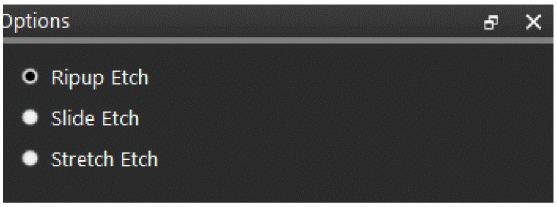


- Control Panel: The control panel has following window panes.
  - Visibility: This window lets you selectively display or hide design layers (conductor, plane, mask, and dielectric) in 3D Canvas. You can turn off or on the visibility of any layer by clicking the associated check box.

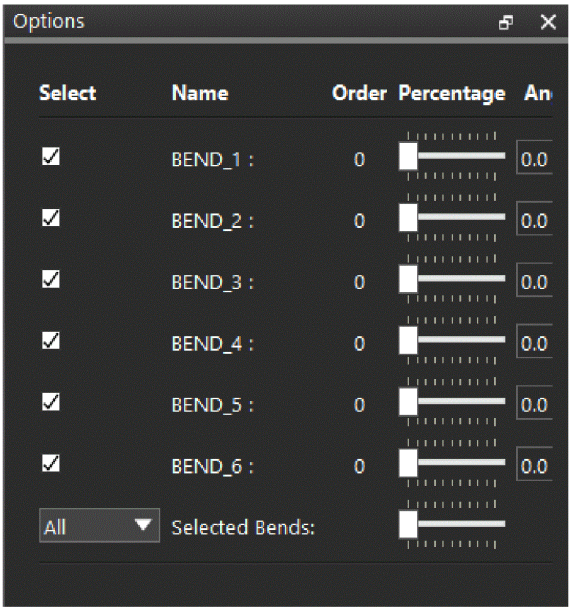


For a rigid-flex design, multiple stackups are available. Select either primary stackup or any flex stackup from the *Layer stackup* pull-down menu to manage the visibility of layers specified in that stackup.

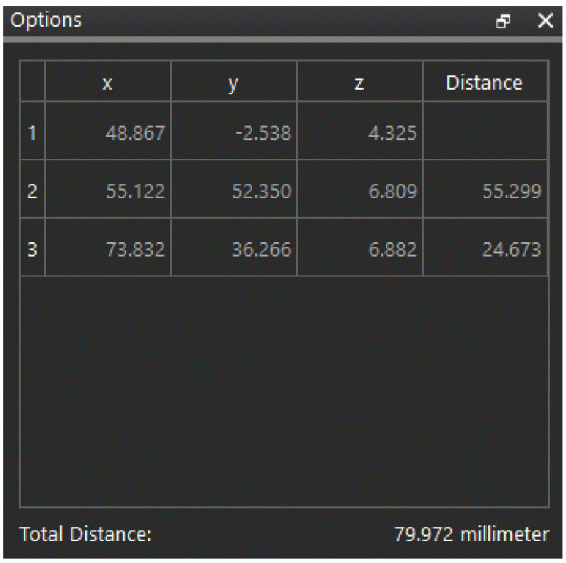
- Options: This window displays options for pop-up menu commands: *Move*, *Bend*, *Measure Path, Measure Closest Distance, and Cutting Plane*. The Options tab becomes active and visible when any of these interactive command is invoked.



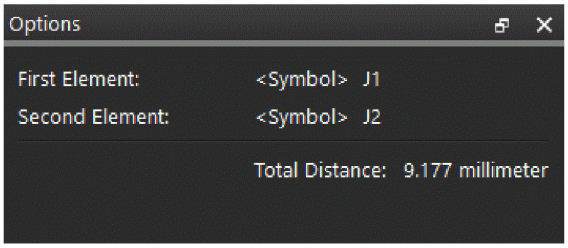
Move options



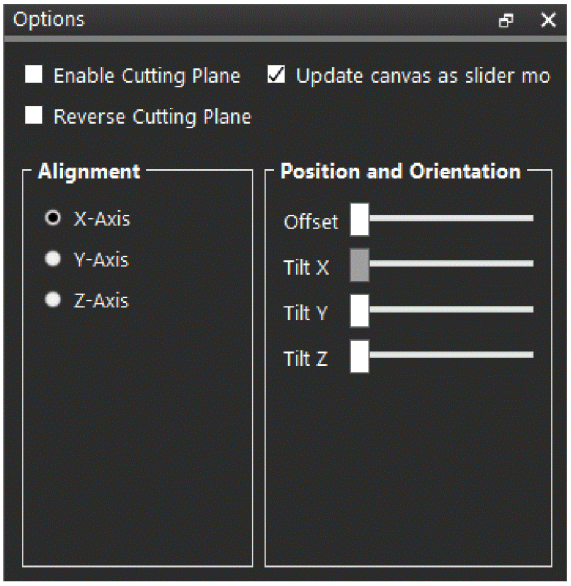
Bend options



Measure path options

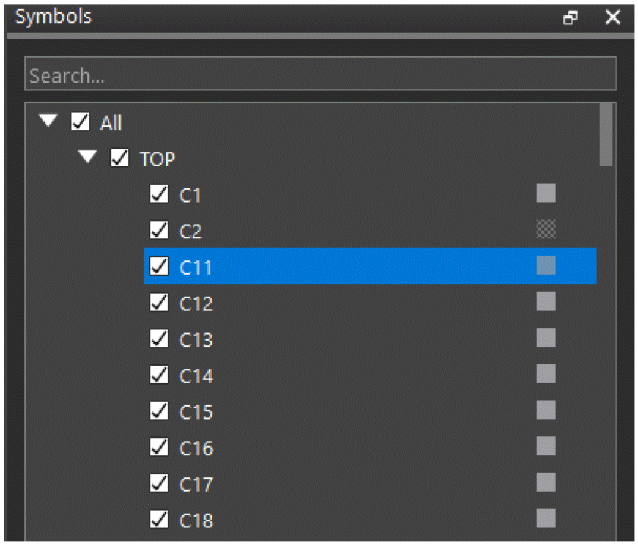


Measure Closest distance options

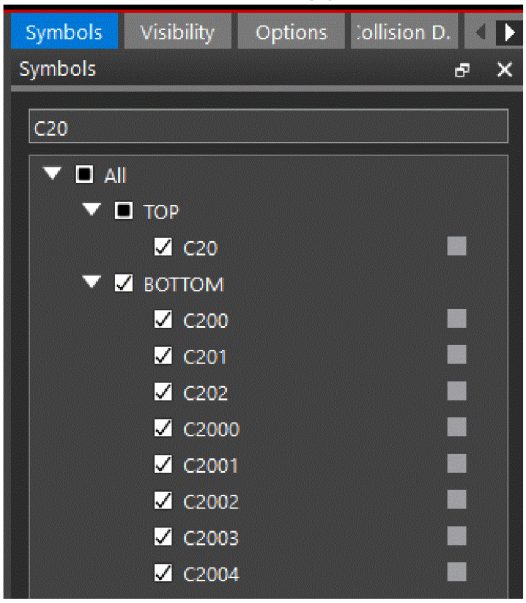


Cutting plane options

- Symbols: This windows controls the visibility of symbols placed on conductor and plane layers. By default, all symbols are visible in 3D canvas. To hide any symbol, uncheck the checkbox associated with its reference designator.

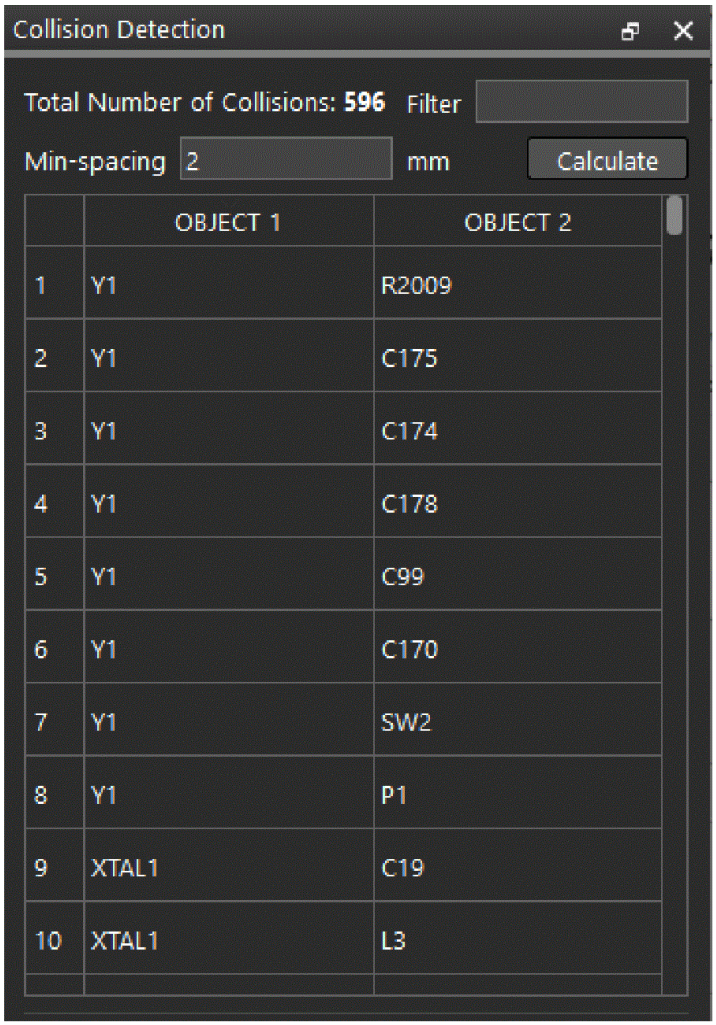


The symbol pane has search filter that returns all the relevant symbols from all the layers. A wildcard (*) is also supported in the search string.

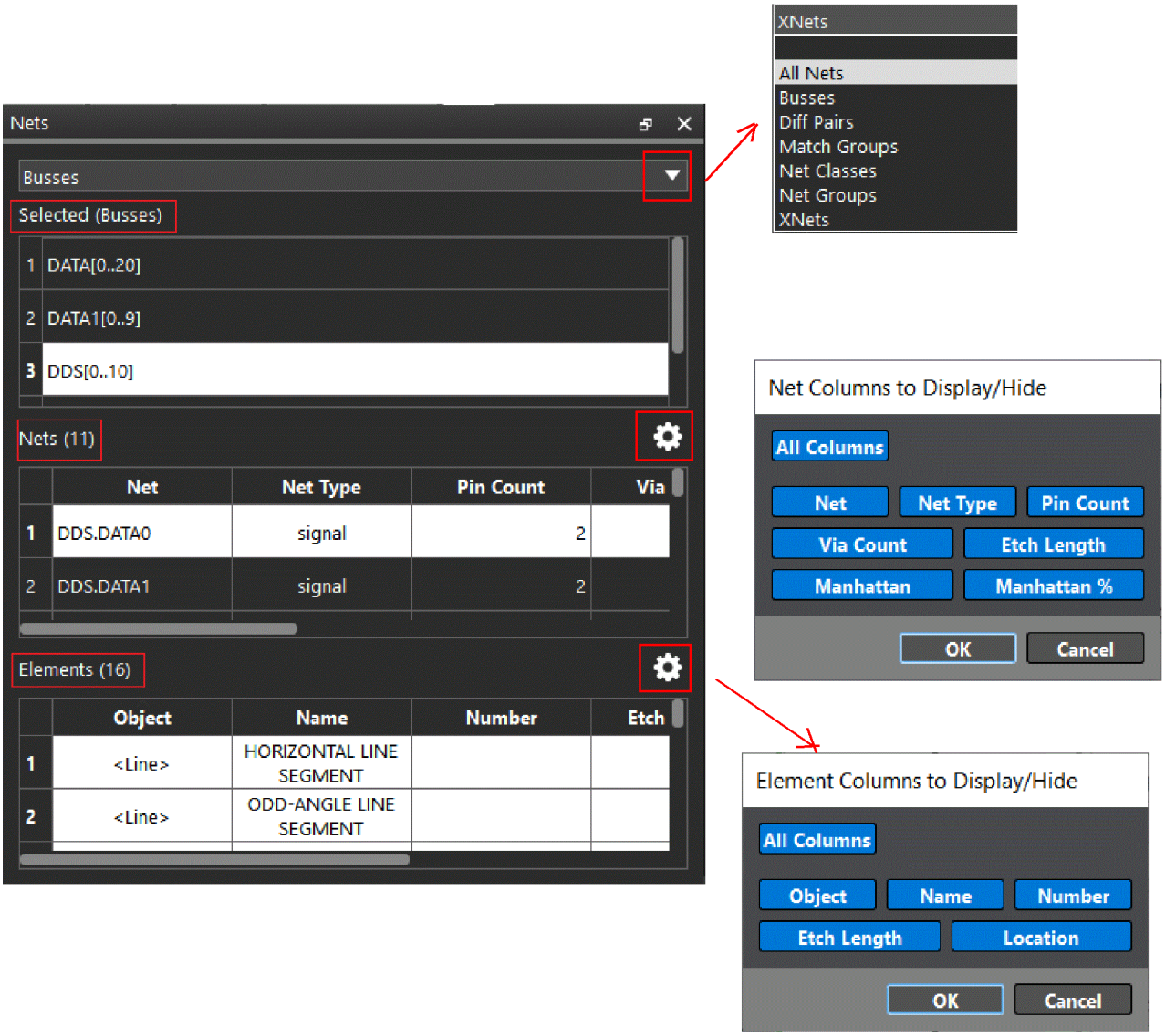


To select more than one symbols you can use `SHIFT` or `CTRL` keys.

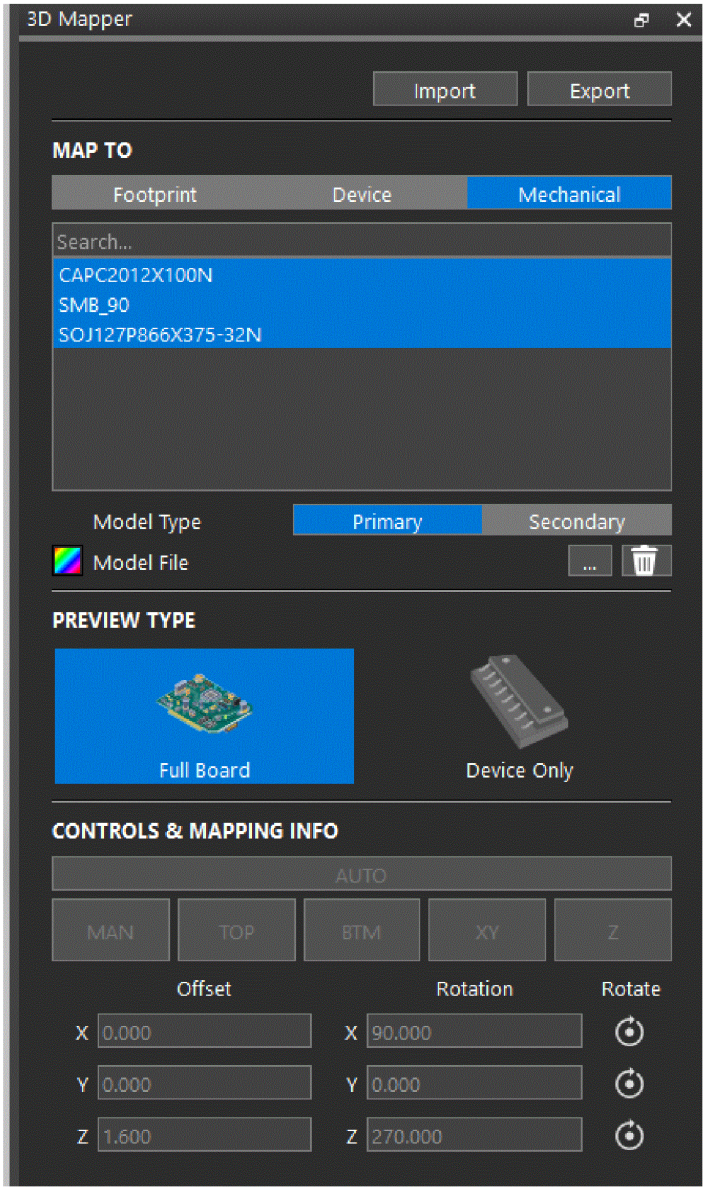
- **Collision Detection**: This window runs checks for verifying overlap between symbols. This check runs only for visible components.



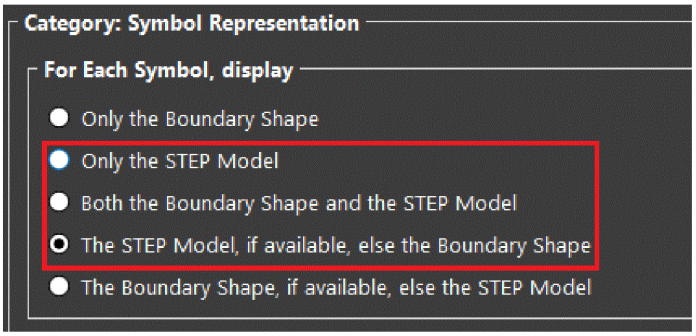
- **Nets**: The *Nets* window controls the selection and display of nets in 3D Canvas. The window has three sections that show information of a net such as name, types, properties, and so on.
  Selected: Lists all the nets that are of the type selected from the pull-down menu. You can choose one of the nets at a time.
  Nets: Lists all the nets and their attributes that are part of the net chosen in the Selected section in a spreadsheet format. The display of attributes can be controlled using the settings icon. Any of the nets can be further selected from this section.
  Elements: Lists all the line segments and their attributes of the selected net in a spreadsheet format. The display of attributes can be controlled using the settings icon.



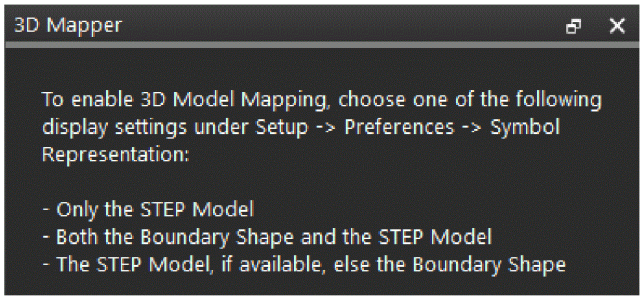
- 3D Mapper: The 3D Mapper window assigns 3D models to footprints, devices, and boards. You can use a variety of native CAD formats such as Solidworks, Siemens NX, Parasolid, Autodesk Inventor, Creo as well as STEP.
  The mapping information for existing symbols and board design can be modified and saved as Allegro 3D mapping file (`.map`).
  You can load 3D models for a single symbol (`.dra`) file or an entire board (`.brd`) file. This window provides options to add or modify 3D models for components and mechanical symbols and to adjust their positions.



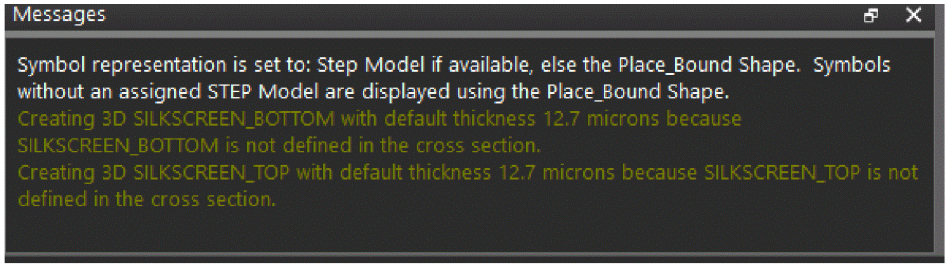
The 3D Mapper is available only if the *Symbol Representation* setting uses any of the STEP model options.



⚠ Choosing the rest of the two symbol representation options does not show the 3D Mapper window.



- Messages window: This window display all types of messages from 3D canvas. You can stop display of new messages by enabling *Silent mode* checkbox in the *Messages* category of the *Allegro 3D Canvas Preferences* dialog.
  If you wish to review the messages later, use *File – Output – Messages* menu option to save them to a text file.
  Messages in 3D canvas follow a color scheme to easily detect their type:
  - Red color: Messages displayed in red color are errors.
  - Yellow color: Messages showing warnings are appeared in pale yellow color.
  - White Color: Messages stating information are displayed in white color.



- Status bar: The Status bar shows the X, Y, and Z coordinates as you move the mouse over the canvas. The points of reference are either of the mouse when it is in a free state or of a selected symbol during the `Move` command. The status bar also displays design units set in the 2D design.

Navigating in 3D canvas

Use mouse buttons to rotate, move, zoom in, zoom out and to measure distance between two objects. 3D Canvas supports following mouse actions terminologies:

Mouse Button	Usage
Left mouse button	Single and group selection
Right mouse button	3D interactive pop-up menu
Middle mouse button	Panning operations
Mouse wheel	Zoom operations
Shift + middle mouse button	Rotate operations

3D Canvas Menus

The following sections describe the command menus in Allegro 3D Canvas window.

⚠ All 3D Canvas menu commands are captured in the `.jrl` file.

Table 4.1: File Menu Commands

This Command...		**Does this...**
File		
Export		Saves the 3D information into industry-related formats. For example, 2D PDF, 3D PDF, STEP, ACIS, and so on.
Output	*Messages*	Saves messages from 3D Canvas to a text file.
Close		Closes 3D Canvas

Table 4.2: View Menu Commands

This Command...		Does this...
View		
Camera	*Zoom Fit*	Sizes the entire design to fit within the Allegro 3D Canvas window
	Top	Sets to display the top of the design
	Bottom	Sets to display the bottom of a design
	Front	Sets to display the front of a design
	Back	Sets to display the back of a design
	Left	Sets to display the left side of a design
	Right	Sets to display the design from the right
	Top Isometric	Sets to display the top isometric view of the design

	Bottom Isometric	Sets to display the bottom isometric view of the design
Windows		
	Messages	Controls display of *Messages* window
	Options	Controls display of *Options* pane
	Visibility	Controls display of *Visibility* pane
	Symbols	Controls display of *Symbols* pane
	Nets	Controls the display of *Nets* pane
	Collision Detection	Controls display of *Collision Detection* pane
	3D Mapper	Controls display of *3D Mapper* pane

Table 4.3: Setup Menu Commands

This Command...	Does this...		
Categories	Provide options to Customizes 3D Canvas capabilities for the following categories:		
	Appearance	Provides controls to edit and save color themes and shadow preferences for 3D canvas.	
		Color Themes	Provides options to set default and custom color themes.
		Highlighting	Provides advanced options to set highlighting preferences. • Mode: Sets highlight mode • Colors: Sets color for models that are in a *Selection* state or in a *Collision* state • Dim intensity: Controls the desaturation intensity for the remaining objects • Reset: Restores the default settings

		Shadows	Controls following shadowing parameters:
			• Ambient shadows
			  ◦ Intensity
			• Simple shadow
			  ◦ Blur
			  ◦ Opaque

		Projection	Provides options to set projection: • Perspective • Orthographic
	Messages	Controls the display of new messages.	
		Silent mode	If enabled prevents new messages to appear in the *Messages* window.
	Interactive	Enables interaction between 2D and 3D canvas	
		Enable 2D/3D Interactive	If enabled, updates 2D design window and 3D Canvas interactively
		Enable Mask Layers Interactive Update	If enabled, updates mask layers interactively when following operations are performed in the 2D design window: • Add/delete/move a pad • Add/delete a cutout • Add/delete objects defined on NCROUTE_PATH or NCROUTE_PLATED subclasses If disabled, all updates are reflected only when design is reload in 3D Canvas.

	Symbol Representation	Specifies options to display based on STEP model or place-bound shape or both • Only the Boundary Shape • Only the STEP model • Both the Boundary Shape and the STEP model • The STEP model, if available, else the Boundary Shape (Default option) • The Boundary Shape, if available, else the STEP model	
		Boundary Shape Source	• DFA Bound • Place Bound ⚠ To view DFA_bound shapes in 3D Canvas, set an environment variable *3d_symbol_include_dfa_bound* in the *Display – 3D* category of the User Preferences Editor. Enabling this variable loads DFA_bound shapes in 3D Canvas.
		Transparency	Sets symbol transparency. By default, the symbols are opaque.
	z0 Position	Set up the position which is considered a origin for Z height calculation in the stackup. You can choose the Z0 position to the lower/upper of a specified conductor or silkscreen layer	
		Show xyz axis at (0,0,0)	Enables visualization for the Z datum.

5

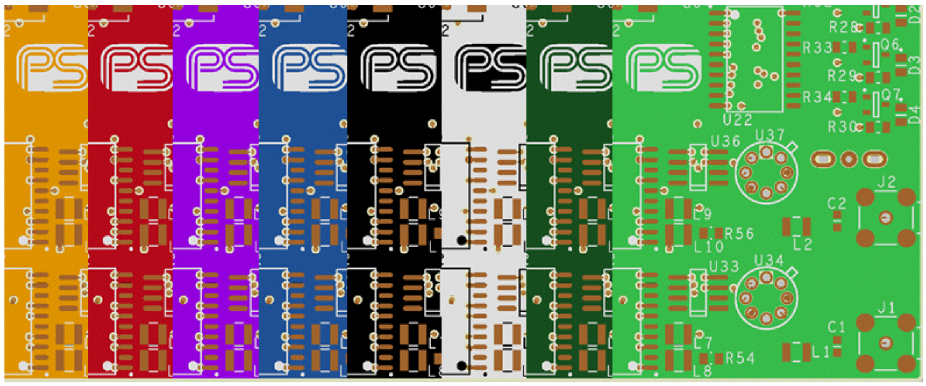
Setting Up 3D Canvas

See the following topics to learn how to set up 3D Canvas:

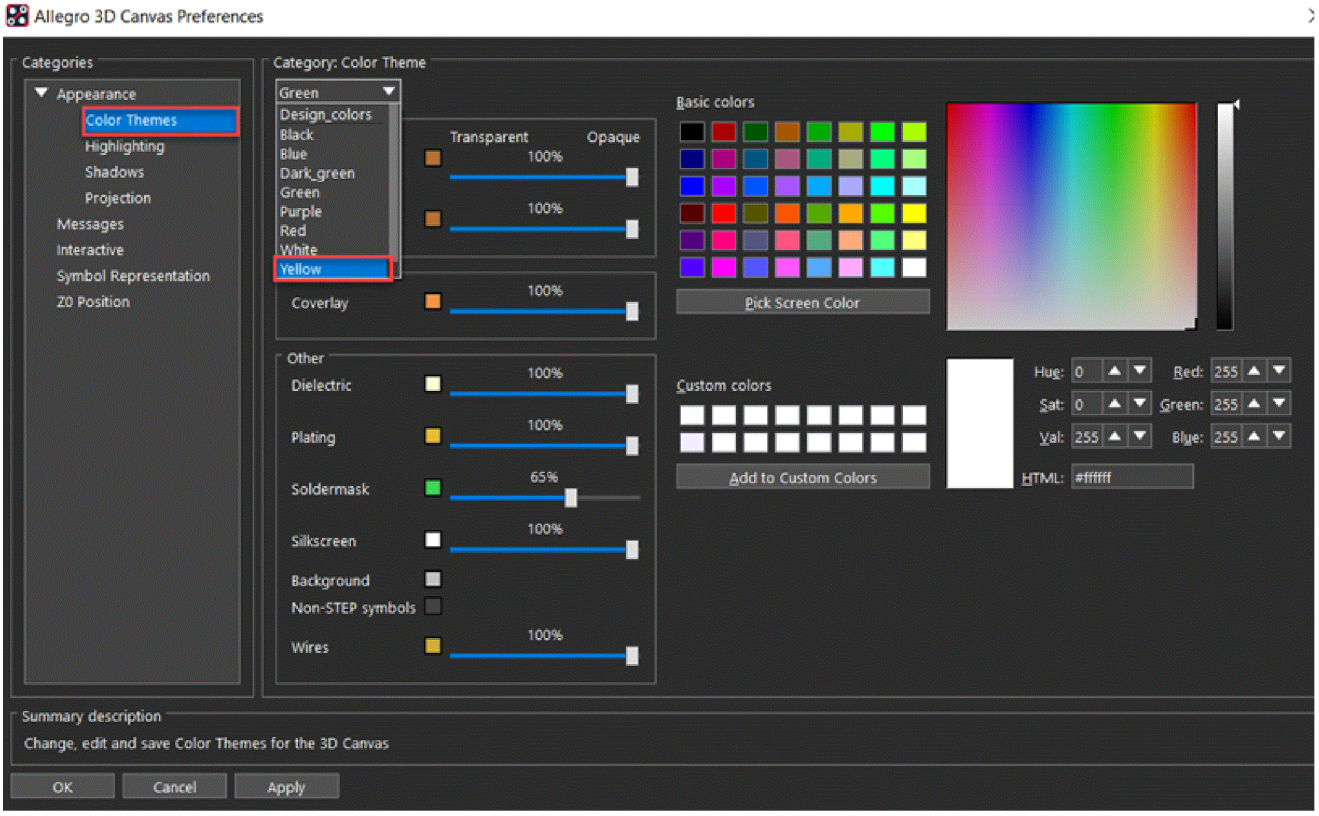
- Customizing Canvas Colors
- Changing Transparency of Layers
- Changing Color of Dielectric Layers
- Changing Color of Coverlay Layers
- Setting Up Color of STEP Models
- Including Pastemask Thickness into STEP Models
- Customizing Highlight Settings
- Mapping 3D Models
- Updating 3D STEP Models for Symbol Libraries

Customizing Canvas Colors

3D Canvas provides a set of color themes to visualize designs in different color combinations. These color themes match with conventional manufactured boards and reflect the standard color combinations for soldermask and silkscreen layers. You can also view the design using the design colors or can create your own custom color theme.



To pick a color theme, choose *Setup – Preferences.* In the *Color Themes* section of the *Allegro 3D Canvas Preferences* dialog, select a color theme from the pull-down list.



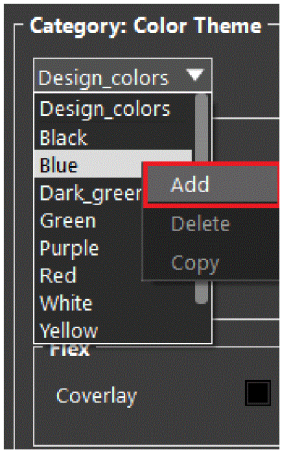
The color settings apply to all the designs that are viewed in 3D Canvas until changed. By default, nine color themes are available. You cannot modify the default themes.

Creating and Modifying a Custom Color Theme

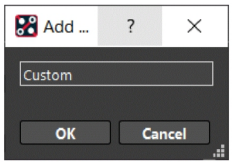
Use pop-up menu commands for creating a custom theme. The commands available are *Add*, *Delete*, and *Copy*. Custom themes are added to the end of the pull-down list.

Perform the following steps in the *Color Theme* section to create a custom theme:

1. Choose a theme from the pull-down list.
2. Right-click and choose *Add*.

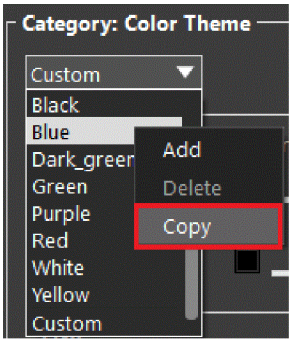


3. Enter the name for a color theme and click *OK*.



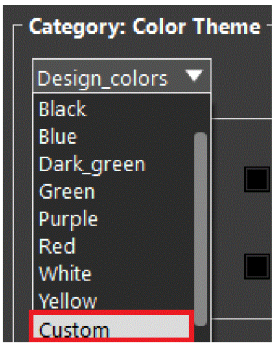
The new theme becomes active the color theme.

4. Click to expand the pull-down list. Select a theme, right-click and choose *Copy*.

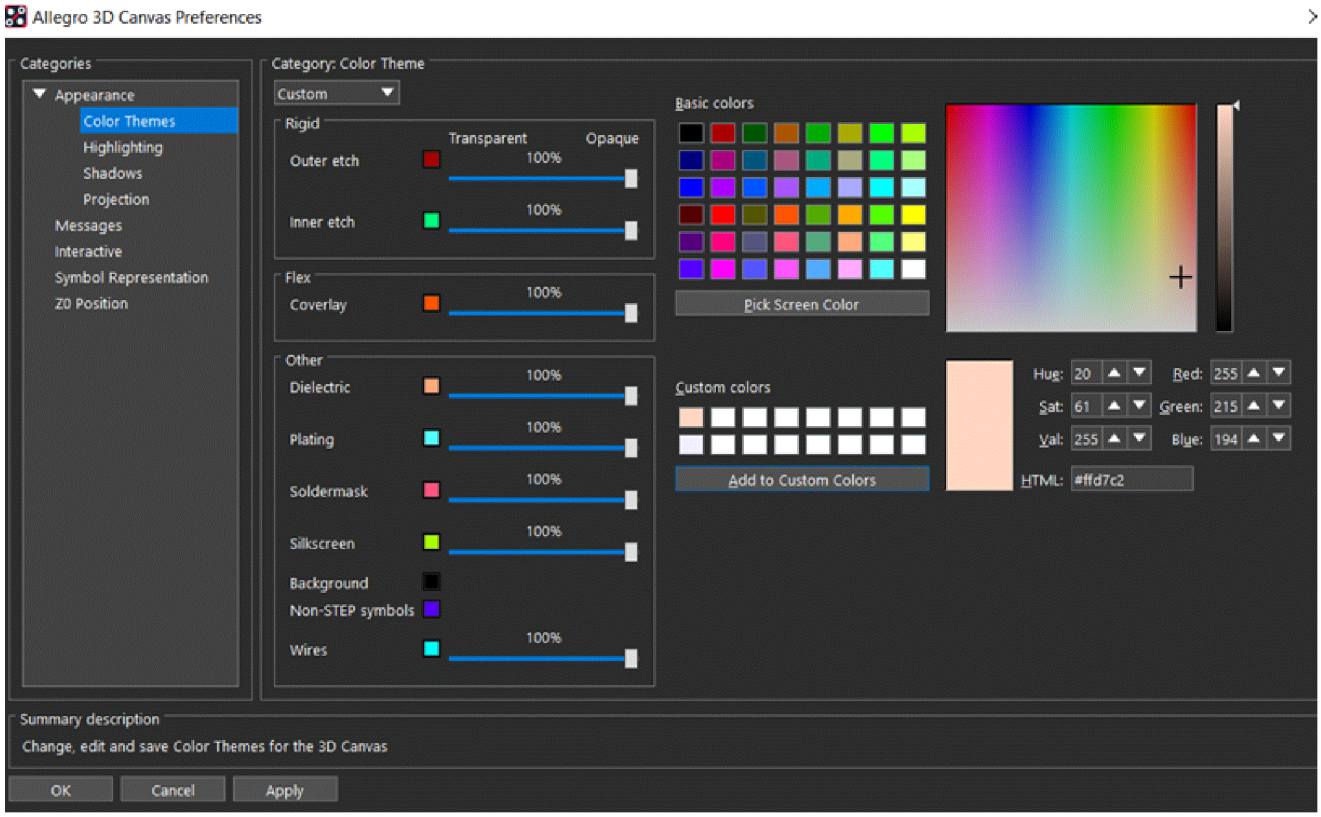


Colors, transparency and opacity values are copied for each layer category.

5. Click the *Custom* theme to apply settings from the selected color theme.

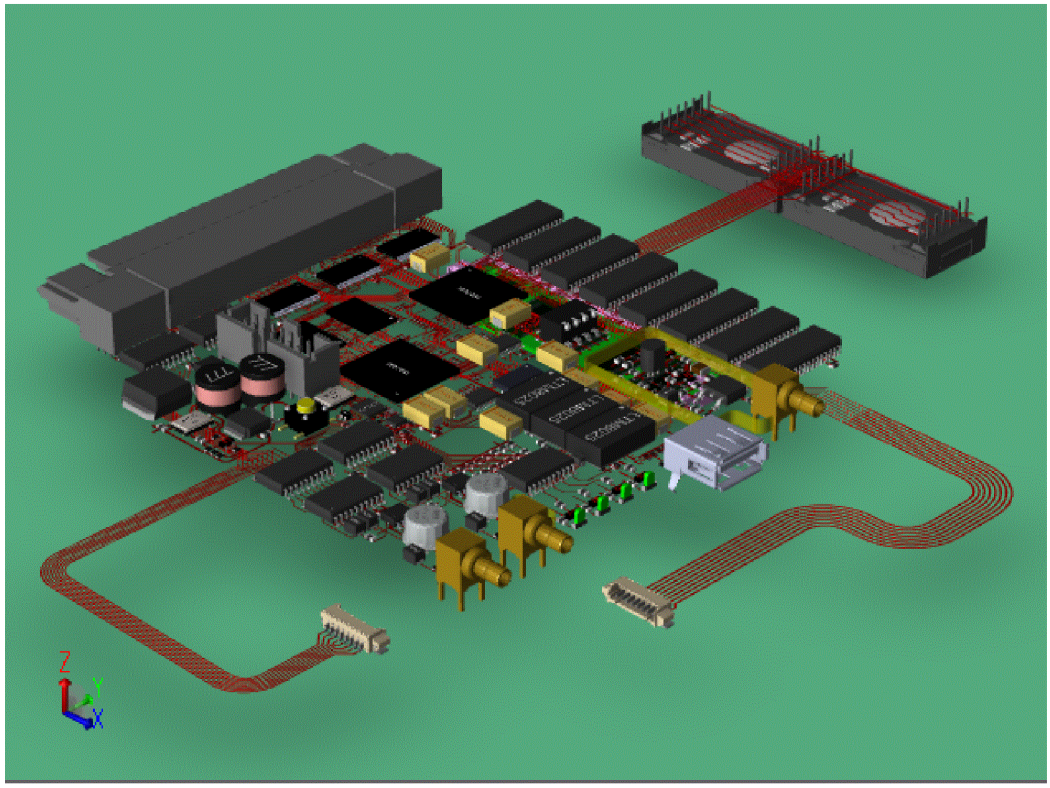


6. To change color of any layer, pick a color either from *Basic colors* or *Custom colors* section and click the color box associated with the layer.

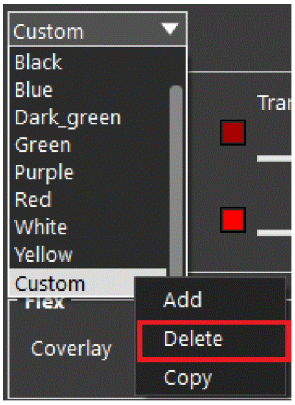


The color of the selected layer changes.

7. Click *OK* in the dialog box to save the custom color theme.
   The color settings are immediately applied to the design opened in 3D Canvas as shown in the following image.



8. To delete any custom theme, right-click and choose Delete.

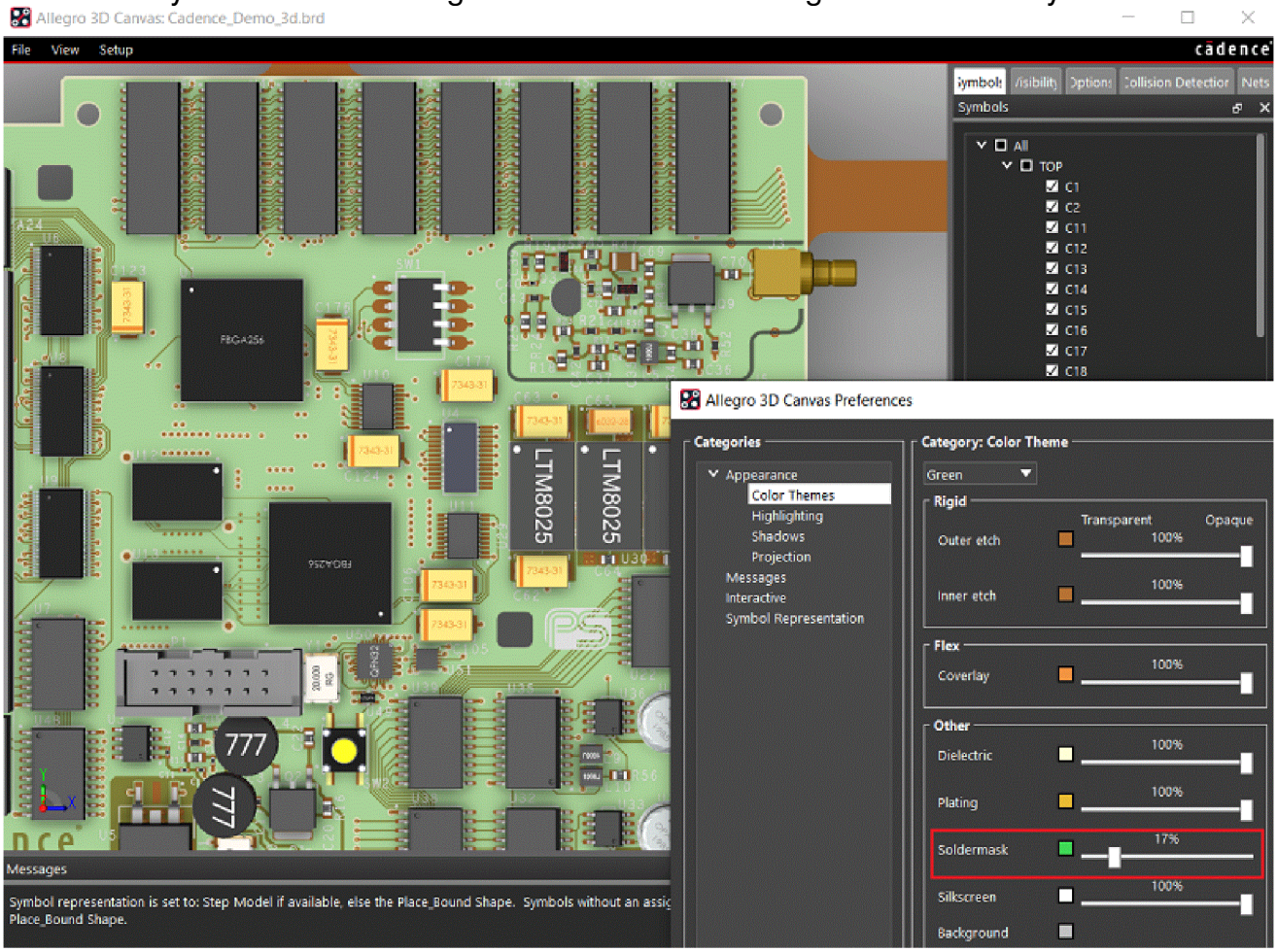


Changing Transparency of Layers

The transparency of objects rendered inside 3D Canvas can be controlled by adjusting the transparency of layer categories. A slider button is available next to the color swatch for each layer category to set the visibility between transparent (0%) and opaque (100%).

⚠ The transparency settings are not available for *Background* and *Non-STEP symbols*.

In the following illustration, the transparency is set to less than 25% for the Soldermask layer for the default color theme *Green*. When viewing the design in 3D Canvas, the symbols placed on the BOTTOM layer are visible enough and can be seen through soldermask layer.



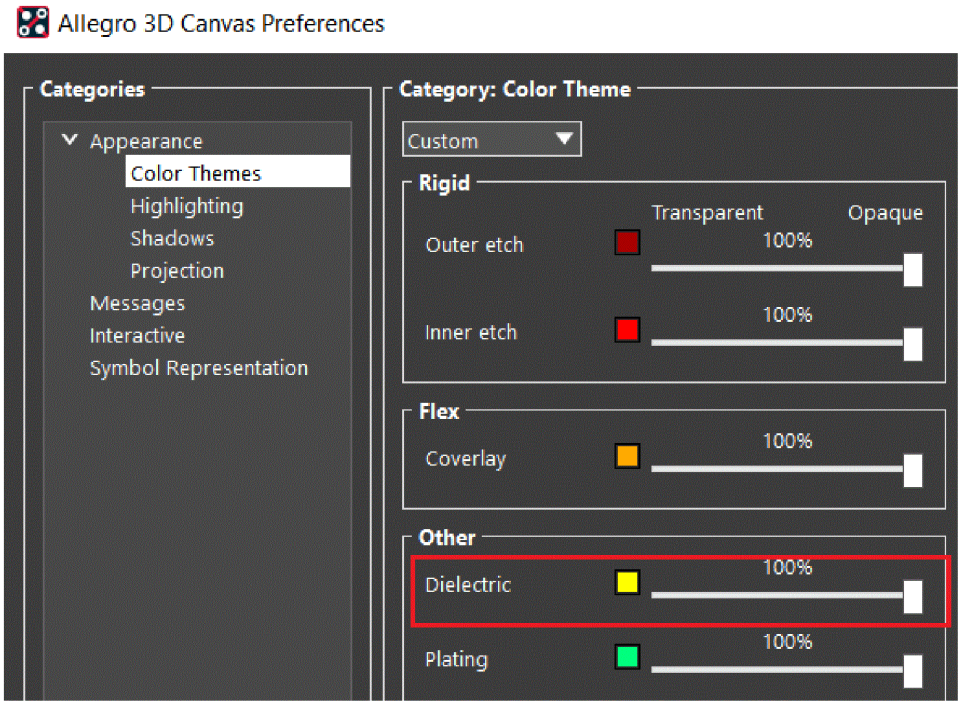
For a custom color theme, the transparency settings:

- Remains unchanged when changing the color of a layer category.
- Use values from the color theme from which it was copied.

- Starts with 100% when creating a new custom color theme.

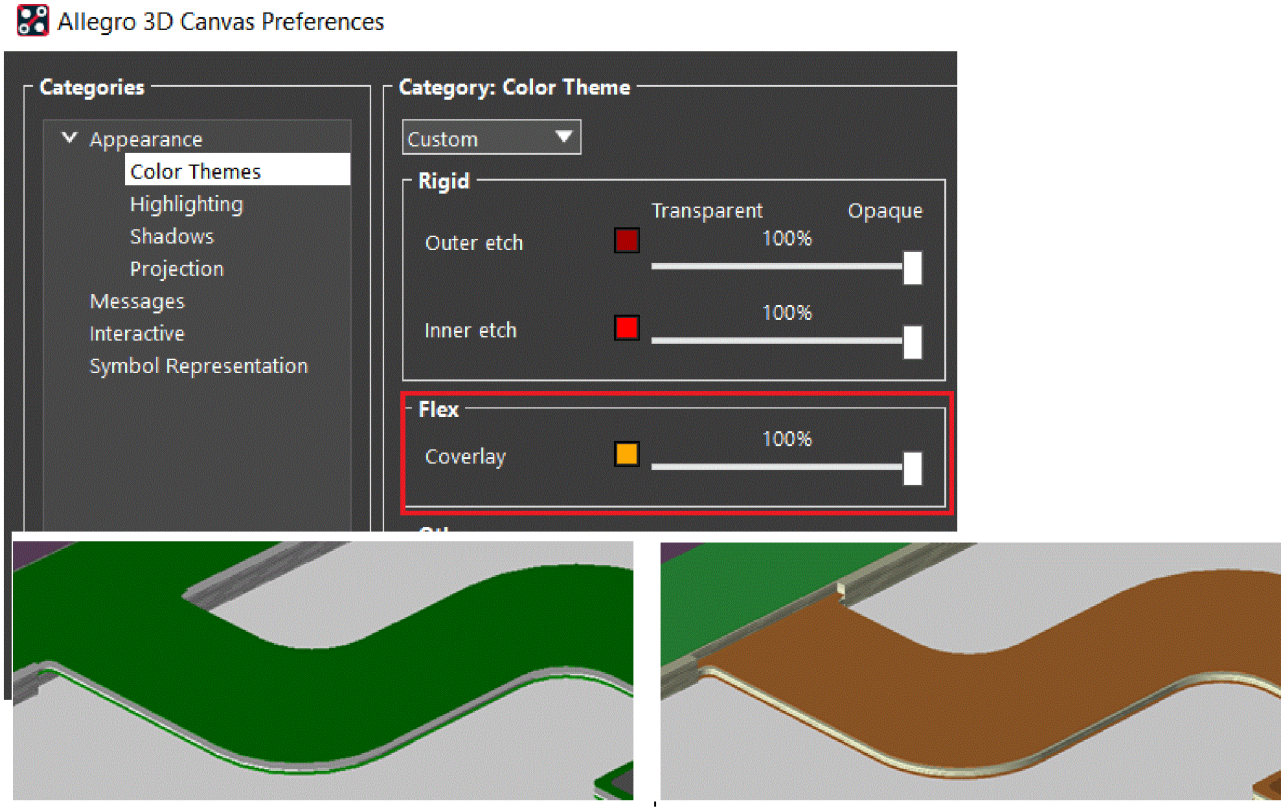
Changing Color of Dielectric Layers

Choose *Setup – Preferences* and select *Appearance*. Create a custom *Color Theme* to change the color of different layers in 3D canvas. Edit the color preferences for *Dielectric* layer for a custom color theme.



Changing Color of Coverlay Layers

3D Canvas display coverlay layers for flex designs in gold color. Choose *Setup – Preferences* and select *Appearance* to create a user-defined color theme and set the color preferences for *Coverlay* layer.



Coverlay color display with custom and default color

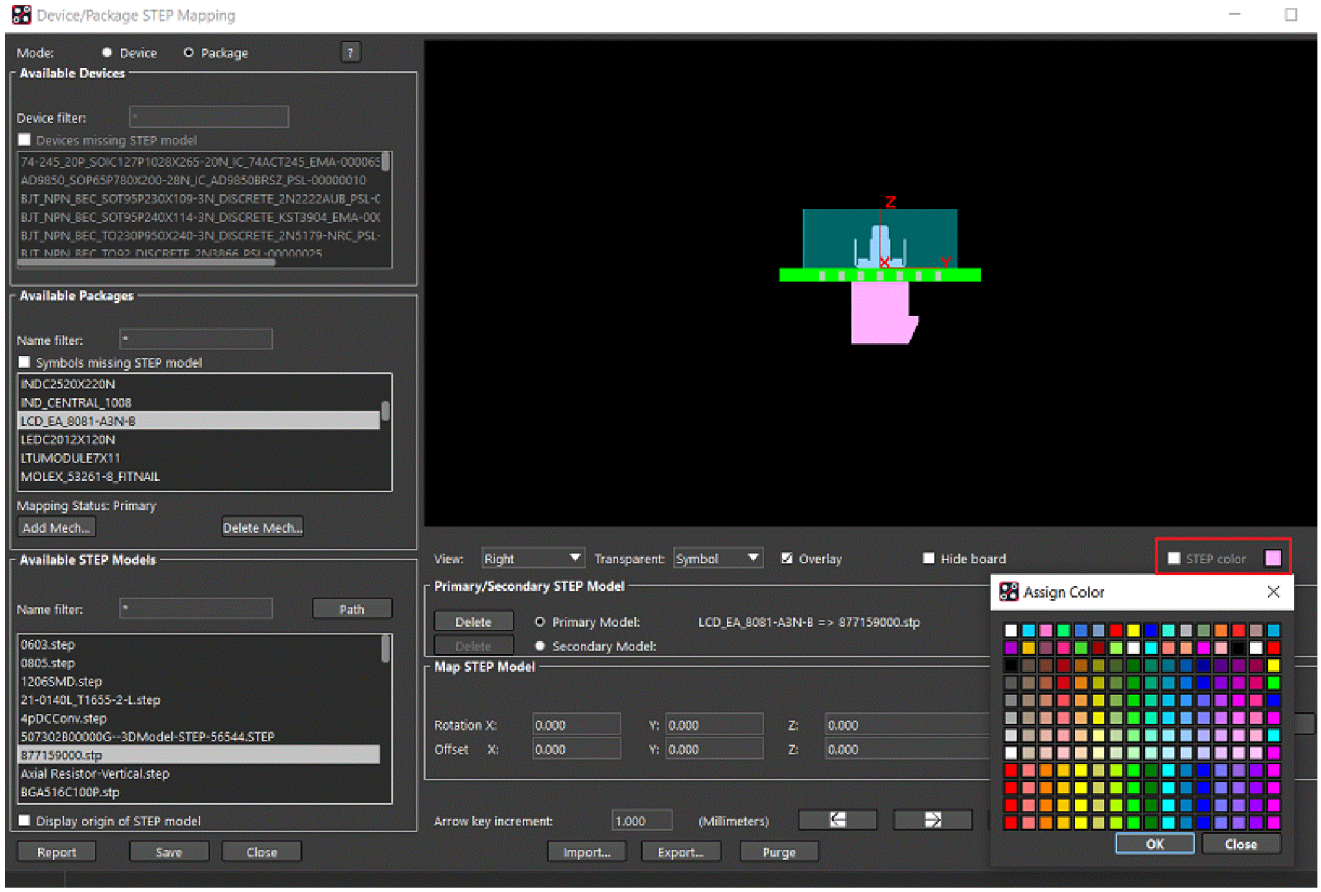
⚠ The coverlay layers are interpreted as negative shapes by 3D canvas. Coverlays specified as positive shapes are not rendered in 3D canvas.

Setting Up Color of STEP Models

3D canvas renders the color of STEP model as set in the *Device/Package STEP Mapping* dialog box. Colors can be assigned for models for which no colors are specified to display them uniquely in 3D Canvas.

To set or change the color of a STEP model in 3D Canvas perform the following steps:

1. Choose *Setup – STEP Package Mapping* menu option to open the mapping UI.
2. Enable the *STEP color* checkbox to display the STEP model with default color.
3. Right-click the color swatch and choose a color for STEP model.



The STEP model is displayed in new color in 3D Canvas.

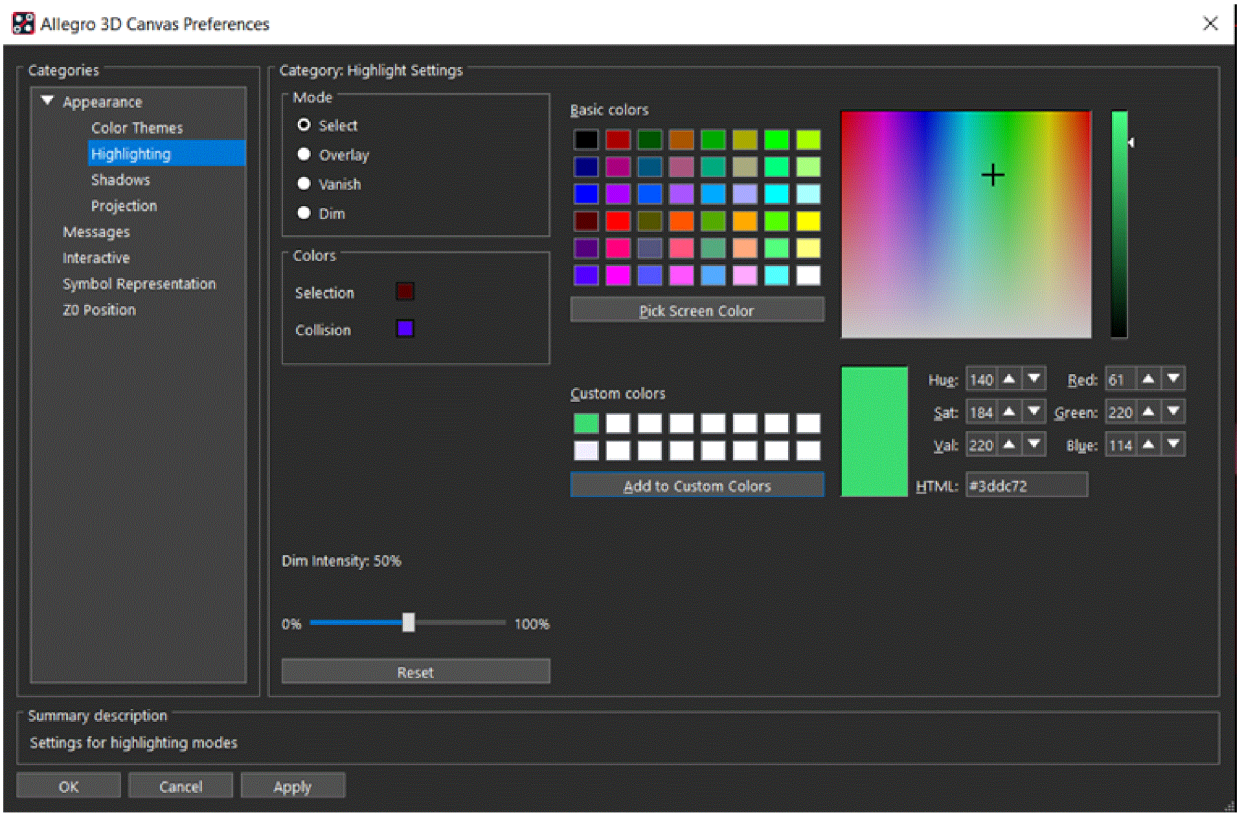
Including Pastemask Thickness into STEP Models

By default, a STEP model is located directly on top of the copper pads. When running checks, 3D Canvas does not take solder paste thickness into account, which may lead to incorrect results.

To adjust the position of STEP models in 3D Canvas so that the thickness of the solder paste can also be included in the z-direction, set an environment variable *enable_3d_symbol_place_on_pastemask* in the *Display – 3D* category of the User Preferences Editor. This variable allows you to place symbols on the pastemask layers and the STEP model position considers pastemask thickness in the z-direction.

Customizing Highlight Settings

In 3D Canvas, an object is highlighted when selected. The object can be selected in multiple ways such as, by direct clicking, by drawing a rectangle to select multiple objects, by selecting an object in 2D canvas, or as a result of collision detection. Highlighting the selected object can be controlled through various options available in the Allegro 3D Canvas Preferences.



⚠ Collision highlighting takes priority over selection highlighting. Any object selected from Collision Detection pane always highlights in the default gold color.

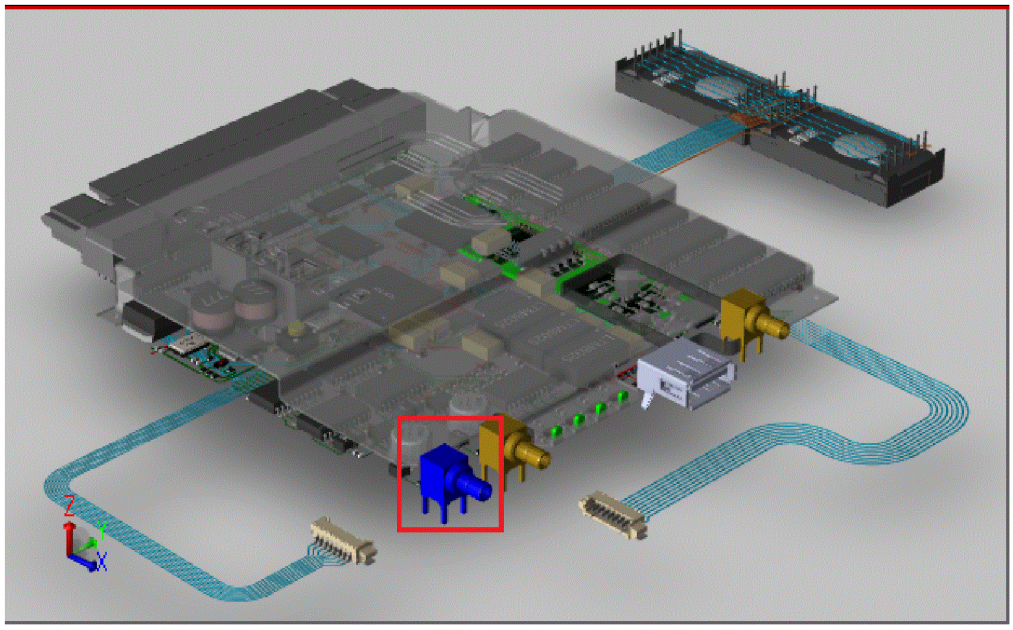
The highlighting preferences include settings for selection color, highlighting modes, and dim intensity.

By default, red color is set as highlighting color. A different color can be picked from the color palette and set by clicking the *Set Selection Color* option.

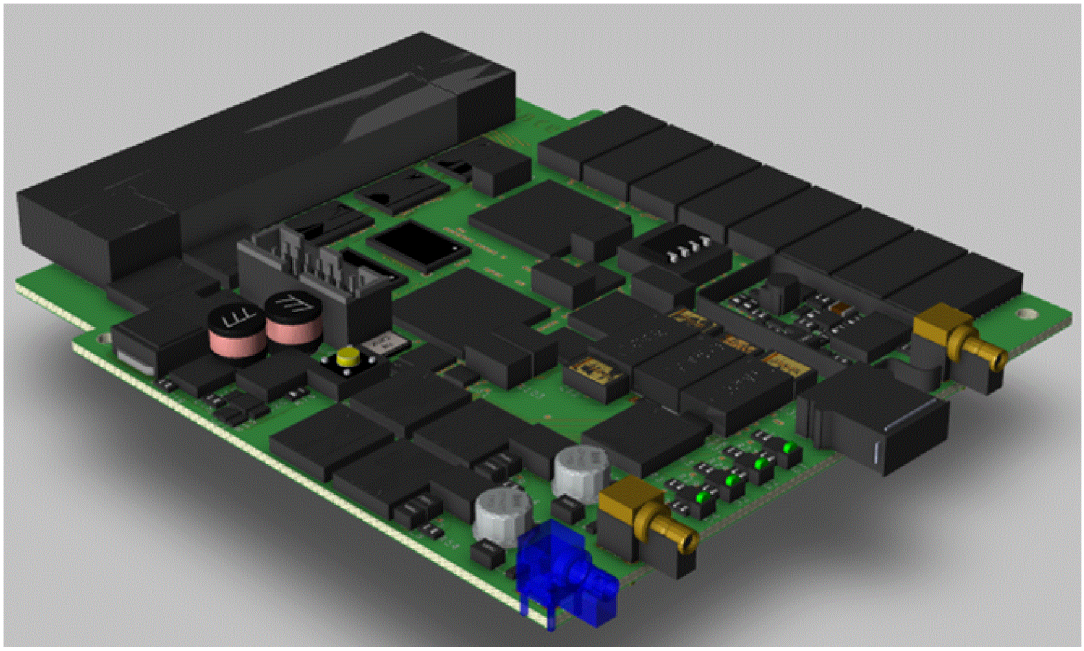
The selection color applies to all modes of the highlighting. Four independent highlighting modes are available and only one can be enabled at a time.

- Select: Highlights object in the selected color. All other objects remain unchanged in 3D

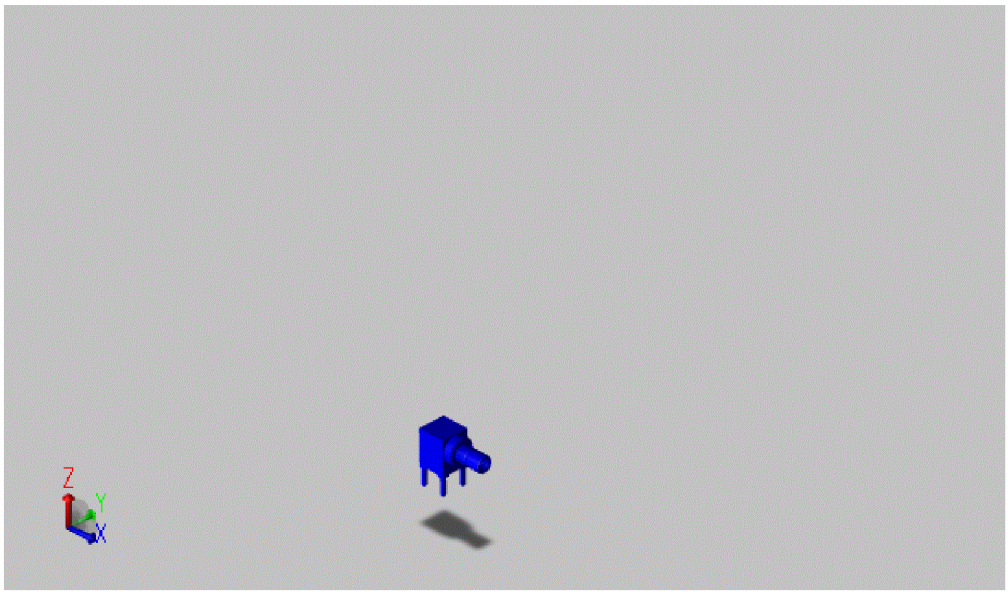
Canvas.



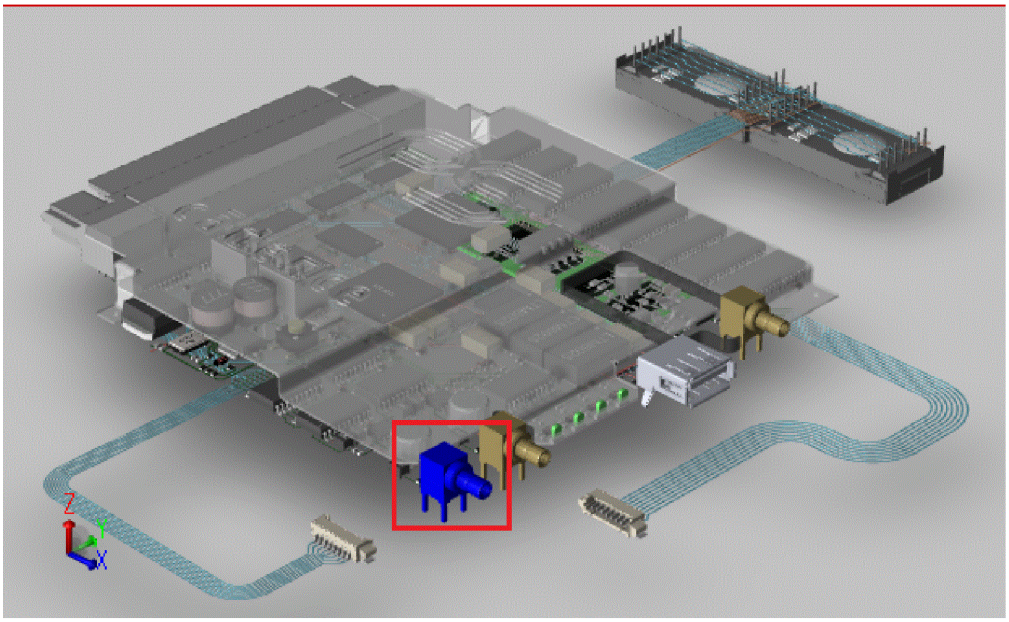
- Overlay: Highlights objects in the selected color. The model turns translucent and always displayed while rotating or moving the design. Use this mode to locate the component that was under other components or on the opposite side of the board.



- Vanish: Highlights object in the selected color. Rest of the objects disappear from 3D Canvas.



- Dim: Highlights object in the selected color. Remaining objects are desaturated in color. The dim intensity can be set between 0 to 100 percent using a slider. A higher intensity increases the darkness of the grey and the amount of desaturation respectively.



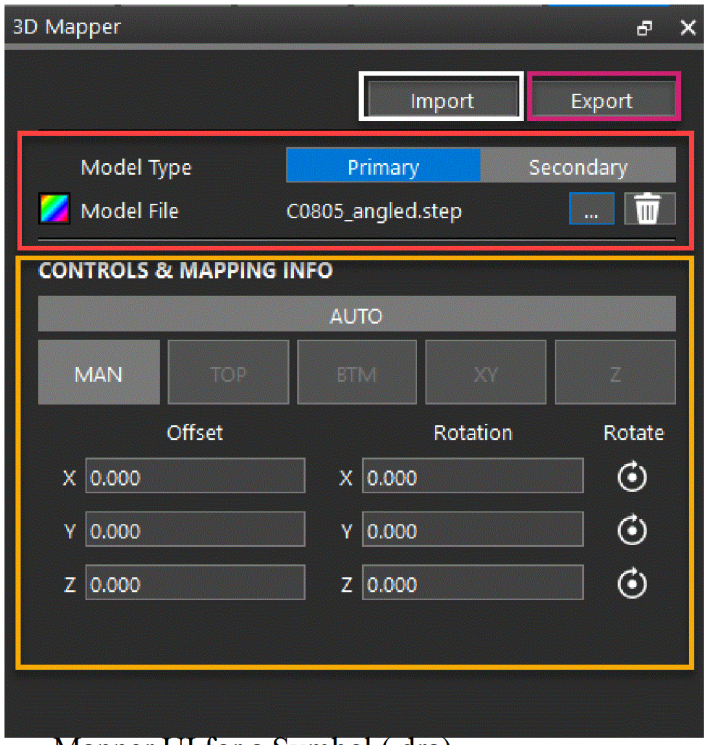
Clicking on an empty space in 3D Canvas removes all effects of highlighting and displays all the objects in 3D Canvas On applying highlight settings are saved and available in subsequent sessions of layout editors. To restore the default settings Reset button can be used.

Mapping 3D Models

The 3D Mapper uses the latest technology to render models in a higher resolution and allows you to select the faces of models during mapping or running measurement routines. Existing footprints with mapped models that used either the Allegro STEP Package Mapper or the Allegro ECAD-MCAD Library Creator can be re-mapped using 3D Mapper. When a board design loads into the 3D Canvas, the *Import* and *Export* options of 3D Mapper can be used to update these models.

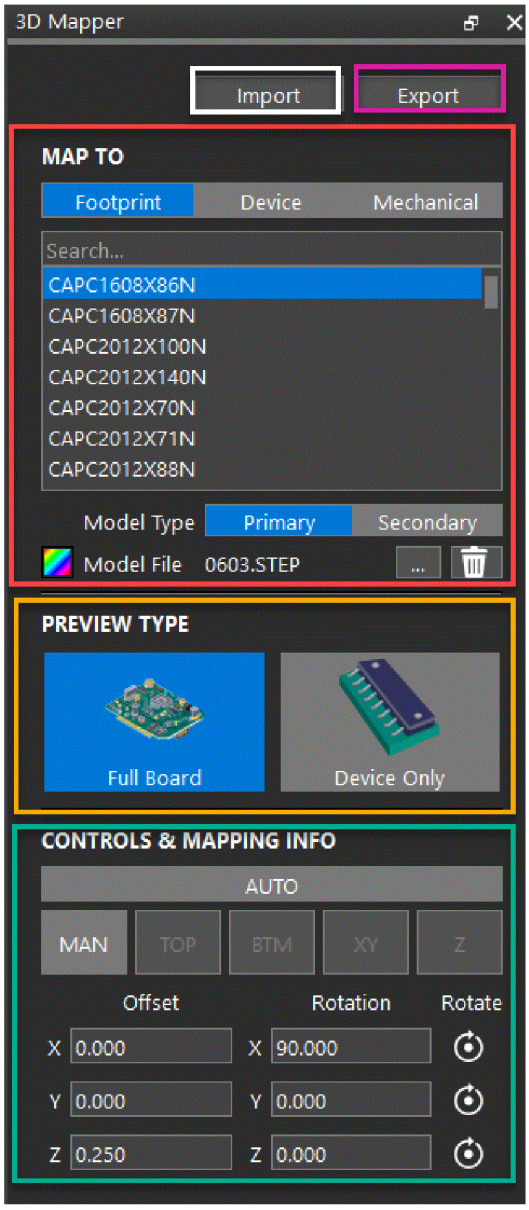
In addition, 3D models assigned through 3D Mapper are saved internally as a part of the database and support both visualization and export functions. The capability of saving a copy of 3D models with the database nullifies the requirement of having them on the disk when exporting STEP models or 3D PDF. As a result, the models mapped using the 3D Mapper can be directly exported.

The 3D mapper window displays options relevant for `.dra` and `.brd` files, which are loaded.



Mapper UI for a Symbol (.dra)

Two additional options are available when a board design is opened. The first is *Map to*, which allows you to select the object you want to map to either *Footprint, Device,* or *Mechanical* from the list which currently exists in the design. The second is the preview of the selected object (footprint, device, or mechanical) in either *Full Board* mode or *Device Only* (Postage Stamp) views.

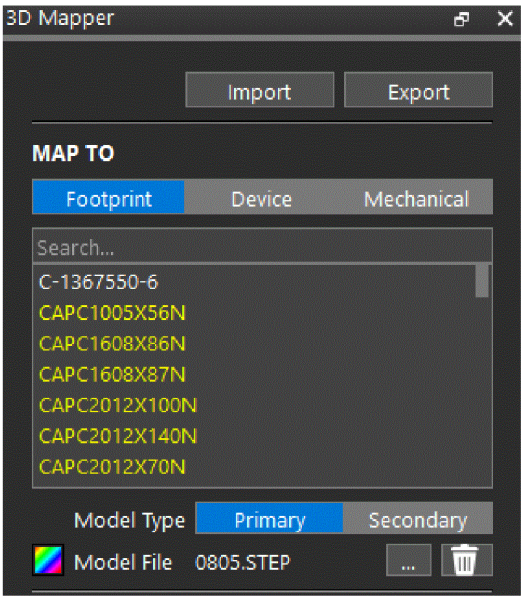


Mapper UI for a Board (.brd)

You can import 3D mapping files (`.map`) that have model information and apply them to the objects in the currently loaded design in 3D Canvas or export a mapping file of the loaded footprint or board design. The *Model Type* field lets you map either the Primary or Secondary model. If a model is assigned to the selected object, the name of the model name is displayed in the *Model File* field. Objects without model assignment, when selected in 3D Canvas, display no value in this field. You can browse to select a new model and map it to the selected footprint or device of a board design.

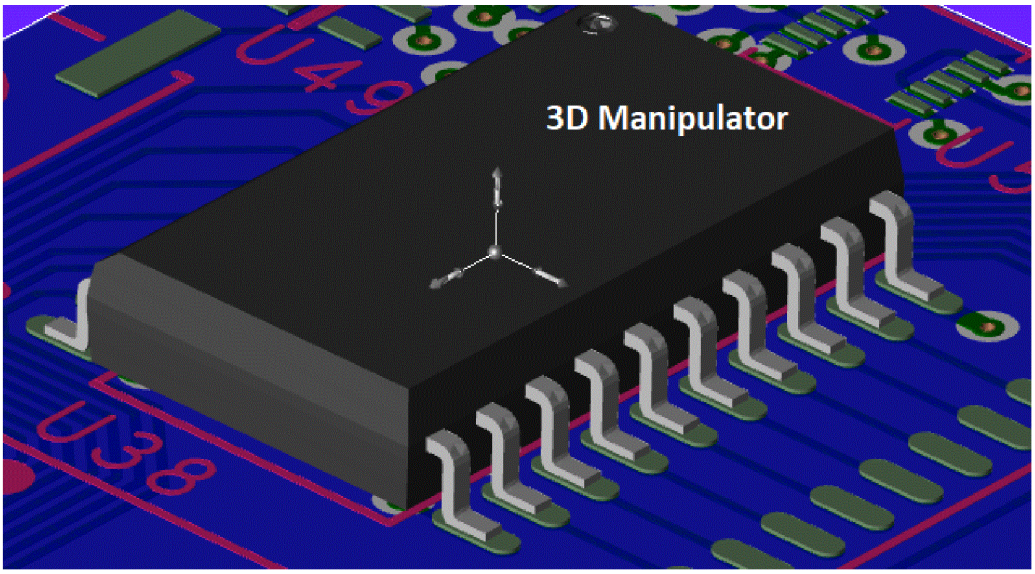
To assign a different color to a model, click the color swatch associated with Model File. It opens a color palette to choose a new color for the model. A delete button is also provided to remove the model assignment. You can assign a color to multiple symbols by first selecting them using `SHIFT` or

CTRL keys and then clicking the color palette. Once you change the color of models their names also start showing in the same color under the list of *Footprint* or *Device* in the *Map to* section. Coloring a group of the same kind of symbols makes it easier to locate and view them in the 3D Canvas.



When you assign a model to an object, the alignment of the model may not match with the actual object because of a datum point mismatch. Both automatic and manual controls are available to adjust the alignment. You can use one of the following alignment controls:

- AUTO: Mapper auto-assigns position of imported models.
- MAN: Clicking this option displays a 3D manipulator controller on the selected object to move its model in any of the three directions simply by clicking and dragging the ends of the manipulator.



- TOP: Click this button and select a face on the model to automatically align the model with the top of the footprint (symbol) copper surface using the selected face.
- BTM: Click this button and select a face on the model to align the model with the bottom of the footprint (symbol) copper surface using the selected face.
- XY: Click this button and select a minimum of two pins on the model and the two pins on the footprint. Click the XY button again and the 3D Mapper automatically aligns the model based on the selections. The XY function works best after using the TOP or BTM functions to align the model face correctly with the footprint. Note that the selection order of the pins and holes must match for the correct alignment to occur.
- Z: Click this option to align the face of the model in the Z direction to something other than the Top or Bottom of a footprint. For example, you can use it to align the underside of a heat sink to the top face of a large BGA chip.

The offset values reflect the current position of the model in all three directions as compared to the model's original datum (0,0). These values can be manually overridden to reposition the model. Similarly, the current rotation of the model is also displayed in all three directions as compared to the model's original position. You can manually specify new values or use the individual rotate icons to turn the model in 90-degree increments.

Updating 3D STEP Models for Symbol Libraries

In a library of footprint symbols (`.dra`), the symbols are usually mapped to 3D Step Models. The model information can be updated for individual symbols. However, for libraries, with a large number of symbols, you can also run a batch command `sym_3d_update` to update 3D STEP model information. Using this batch command, you can update a single symbol or multiple symbols that are defined in a list file or a directory.

Syntax

```
sym_3d_update [-f < symbol file>]|[-c <symbol list file>] [-s <source path>] -o|-d <destination path>
```

Arguments

General	
`-d <destination path>`	The complete path of the location where the updated symbols will be created.
`-o`	Overwrite the existing symbol
Optional	
`[-f <symbol file>]`	The symbol file (`.dra`) to be updated.

`[-c <symbol list file>]`	The configuration file containing symbol names delimited by comma or new line. For example,
	`plcc28.dra, 1206t.dra`
	`soic8.dra, soic14.dra, soic16.dra`

`[-s <source path>]`	The complete path of the location containing the symbols (`.dra`) files to be updated. If not specified, the path variable *psmpath* will be used as the search path. ⚠ Only the first symbol will be checked and updated if duplicate symbols are found.

Notes

- To run the batch command successfully, ensure that mapped 3D models must be available on the search path defined by the *steppath* path variable. A warning message is generated if the path has not been found.
- A log file `sym_3d_update.log` is generated to report the changes.
- Ensure to update the variable *psmpath* with the new destination in the correct order.

Examples

- Update all the symbols under the *psmpath* search path variable

  sym_3d_update -d "C:\symbols_v174"

  sym_3d_update -o

- Update all the symbols within the specified source directory

  sym_3d_update -s "C:\symbols" -d "C:\symbols_v174"

  sym_3d_update -s "C:\symbols" -o

- Update all the symbols listed in the configuration file

  sym_3d_update -c "C:\symbols\symList.txt" -s "C:\symbols" -d "C:\symbols_v174"

  sym_3d_update -c "C:\symbols\symList.txt" -s "C:\symbols" -o

- Update one symbol in the search path

  sym_3d_update -f "plcc28.dra" -s "C:\symbols" -d "C:\symbols_v174"

  sym_3d_update -f "plcc28.dra" -s "C:\symbols" -o

6

Controlling Visibility in 3D Canvas

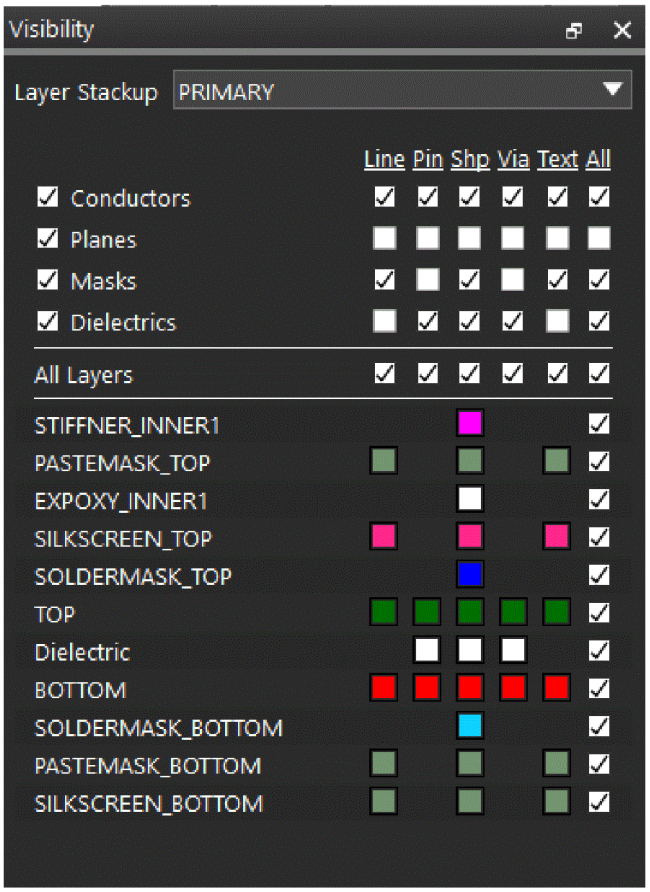
See the following topics to lean how to control visibility in 3D Canvas:

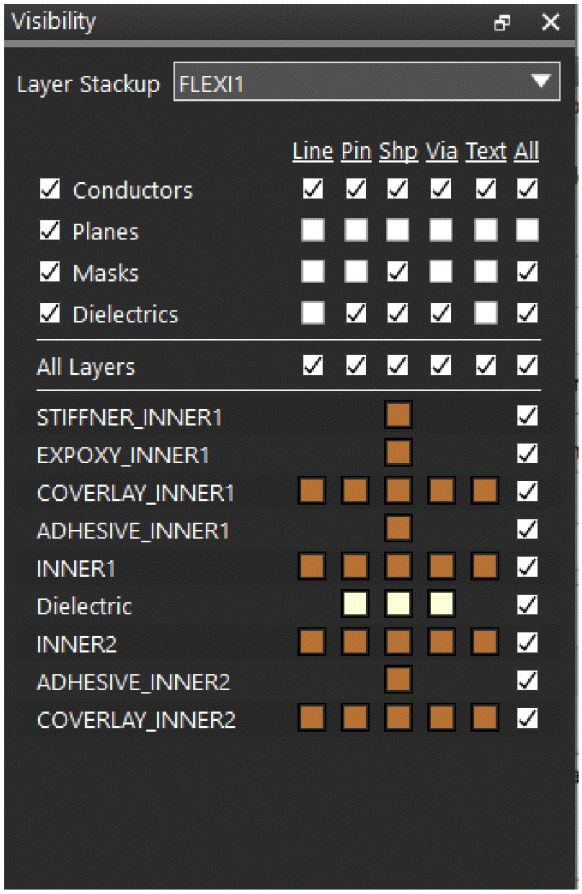
- Controlling Visibility of Design Layers
- Modifying Visibility of Rigid-flex Zones
- Controlling Visibility of Wire Bonds in Chip-on-Board (COB) Designs
- Controlling Visibility and Transparency of Symbols
- Visualizing Unplated Holes in a Symbol
- Z-Origin Visualization

Controlling Visibility of Design Layers

3D Canvas accurately represents a board design in life-like rendering. You can view all the design layers and control their visibility in 3D Canvas.

In *Visibility* window select design layers (conductor, plane, mask, and dielectric) to display or hide them in 3D Canvas. Click the checkbox to turn off or on the visibility of any layer.

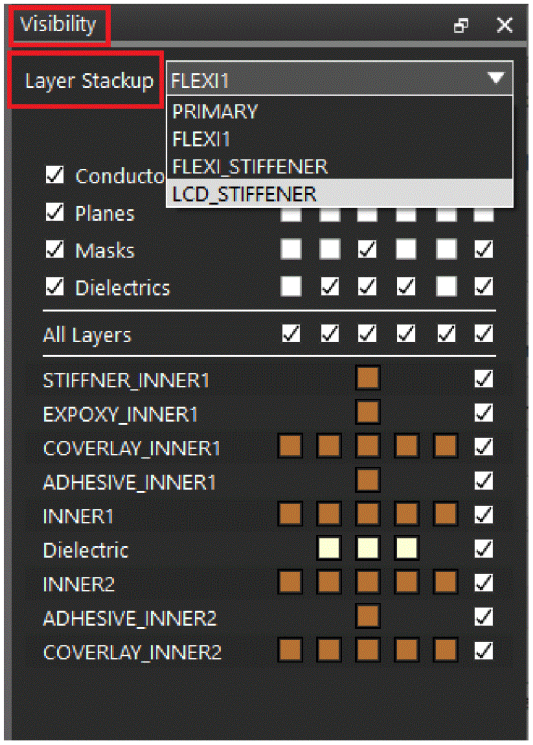




3D Canvas retains the visibility settings within the same session and does not change on reopening a new window of 3D Canvas.

Modifying Visibility of Rigid-flex Zones

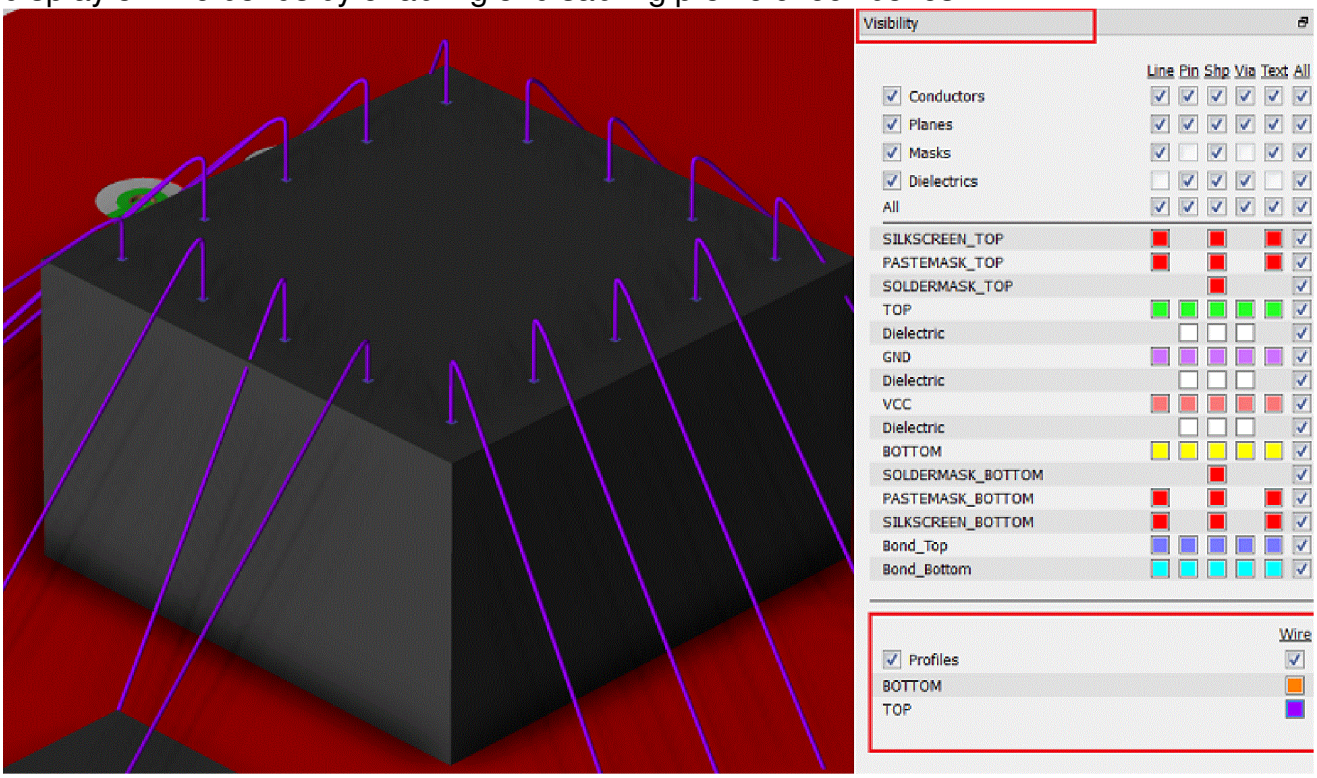
When viewing a rigid-flex design, use the *Layer Stackup* option available in the Visibility window. This option provides you to choose a stackup and manipulate the visibility of layers that fall into that zone.



Controlling Visibility of Wire Bonds in Chip-on-Board (COB) Designs

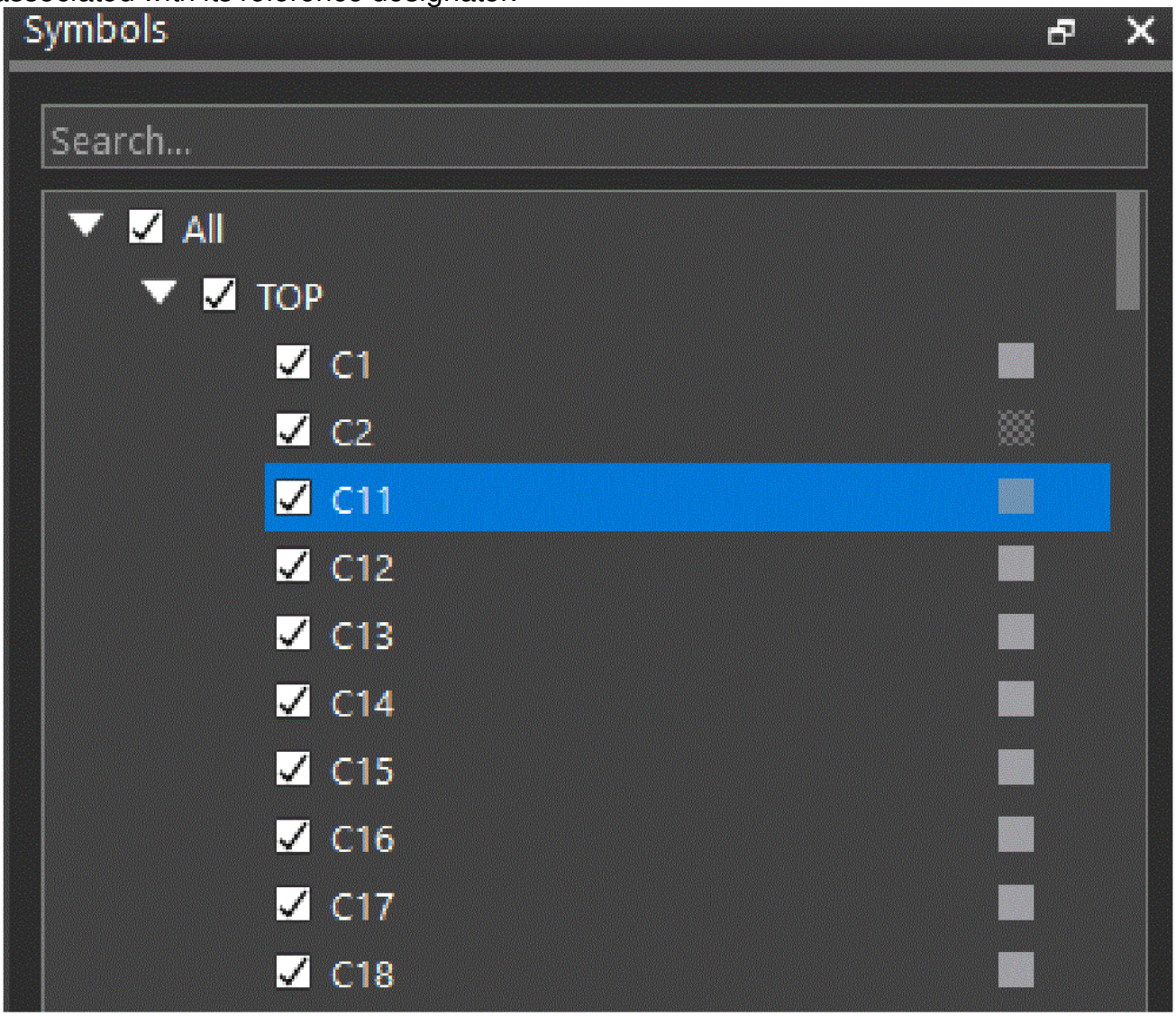
Wire bonds are mainly used to connect a COB die to the bond fingers. In 3D Canvas, when interactivity between 2D and 3D is enabled, you can select, move, and route wire bonds in 2D design window and observe the changes in real time in 3D Canvas.

The color of wire bonds is determined by their profiles. In COB designs, a new section *Profiles* that lists names of the wire bonds profile appears in the bottom of the *Visibility* pane. You can control the display of wire bonds by enabling or disabling profile check boxes.

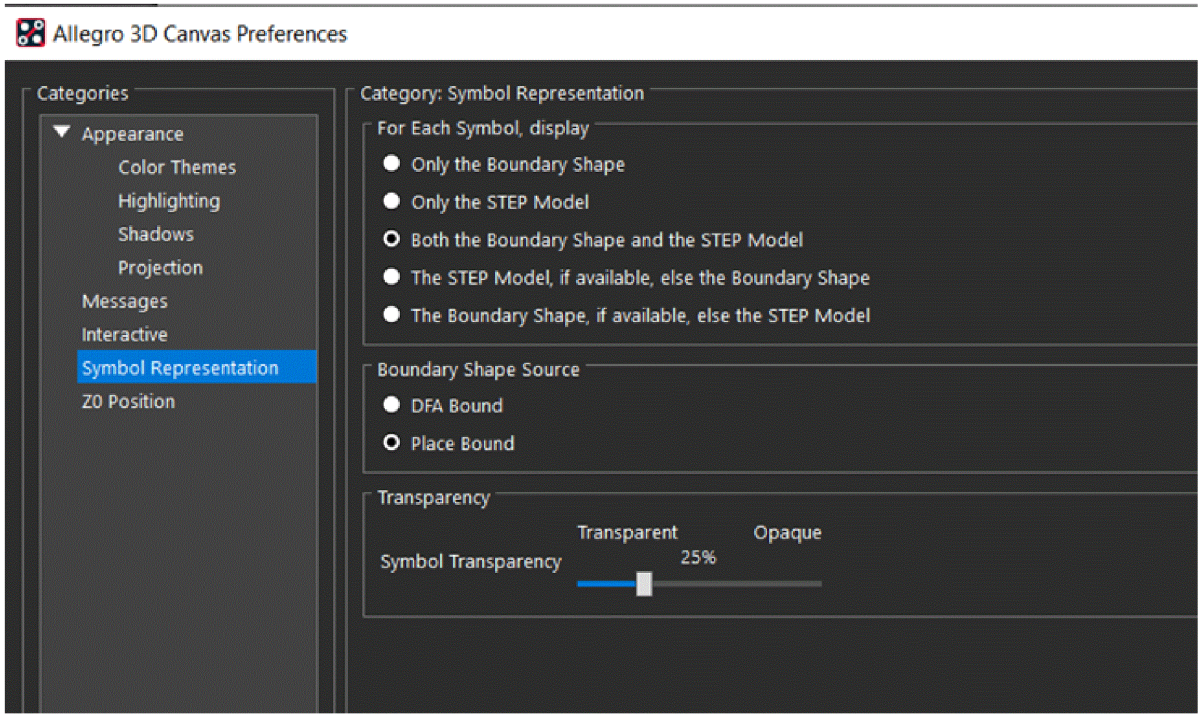


Controlling Visibility and Transparency of Symbols

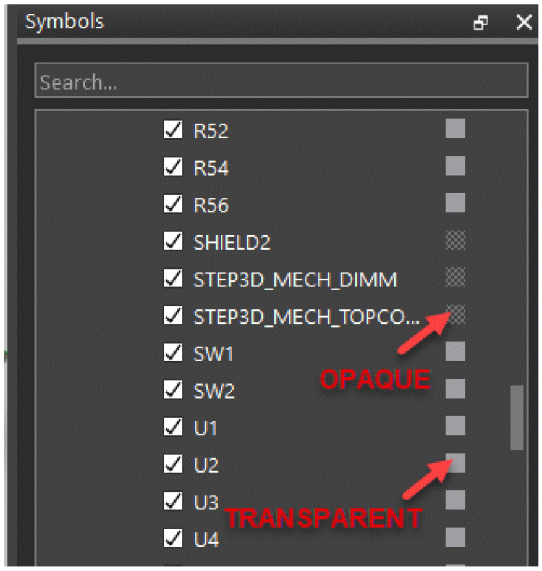
The *Symbols* pane controls the visibility of symbols placed on conductor and plane layers. By default, all symbols are visible in 3D Canvas. To hide any symbol, uncheck the checkbox associated with its reference designator.



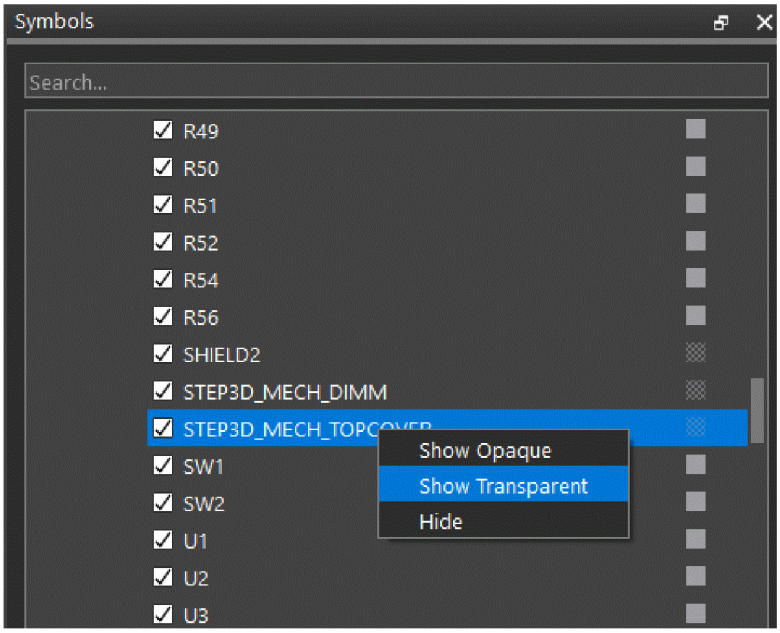
The transparency of the package and mechanical symbols can be adjusted in the Preferences dialog. The transparency settings are applied to all symbols in a design.



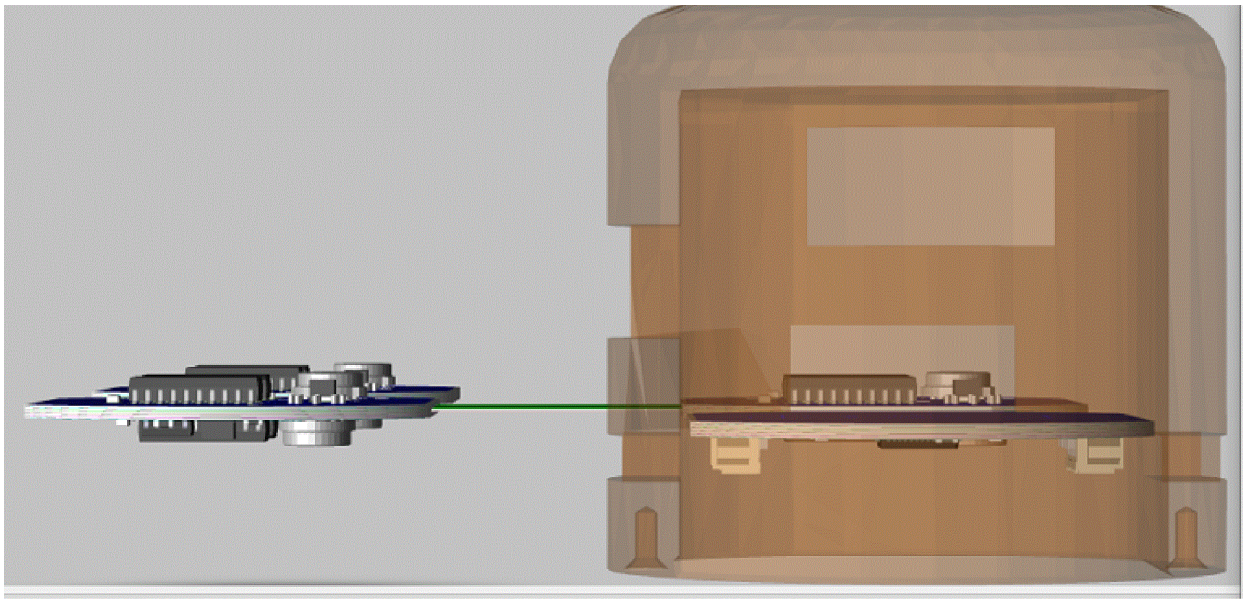
By default in 3D Canvas, mechanical models are loaded in a semi-transparency mode and component symbol models are in a opaque state. The transparency setting for individual symbol models can be controlled by the checkbox across from each symbol in the *Symbols* pane. The transparency is based on the setting of the slider in the Preferences dialog.



You can switch between opaque and transparent state just by clicking the checkbox. The other way to modify the transparency of a symbol is to right-click at the symbol name and change the setting. You can select multiple symbols using SHIFT or CTRL keys.

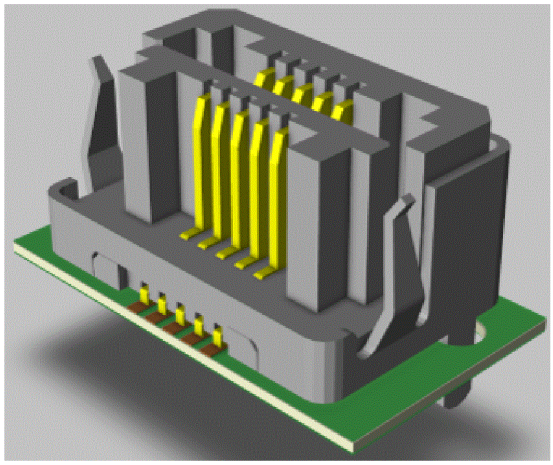


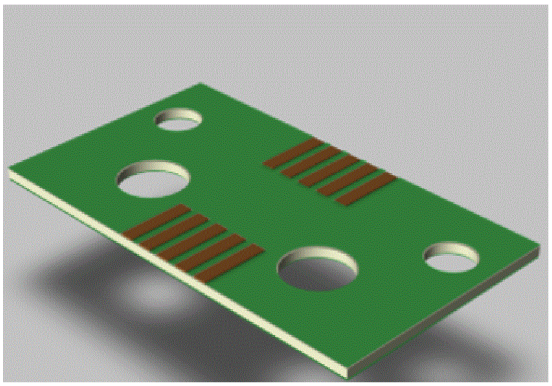
The following image shows a mechanical symbol (enclosure) in a transparent state that often hides other objects and restrict the viewing in 3D Canvas.



Visualizing Unplated Holes in a Symbol

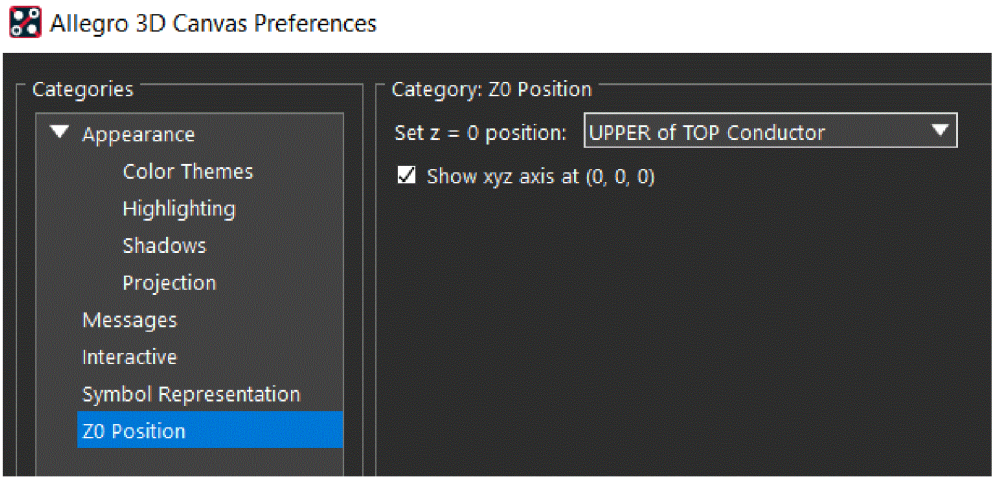
You can open a symbol file (`.dra`) that has unplated holes and visualize the holes explicitly in 3D Canvas.



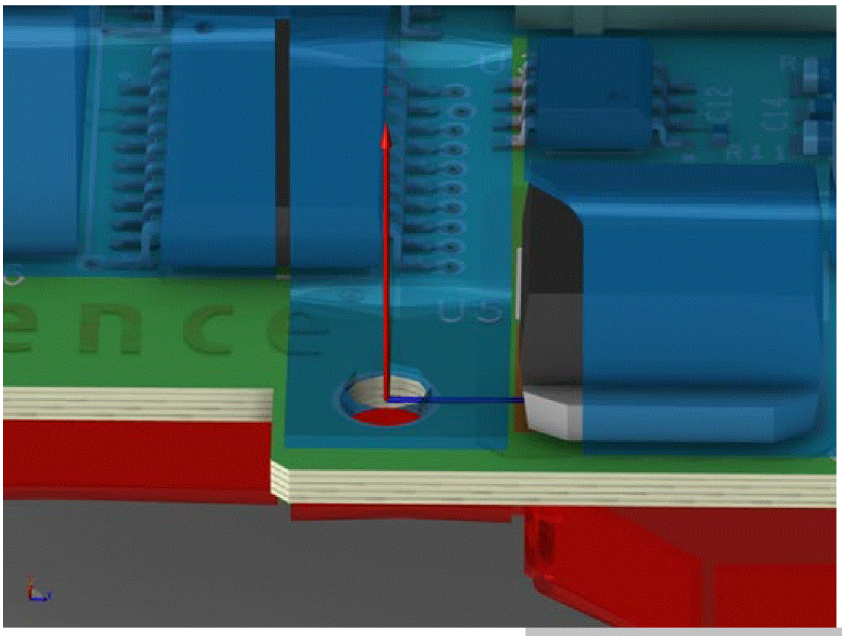


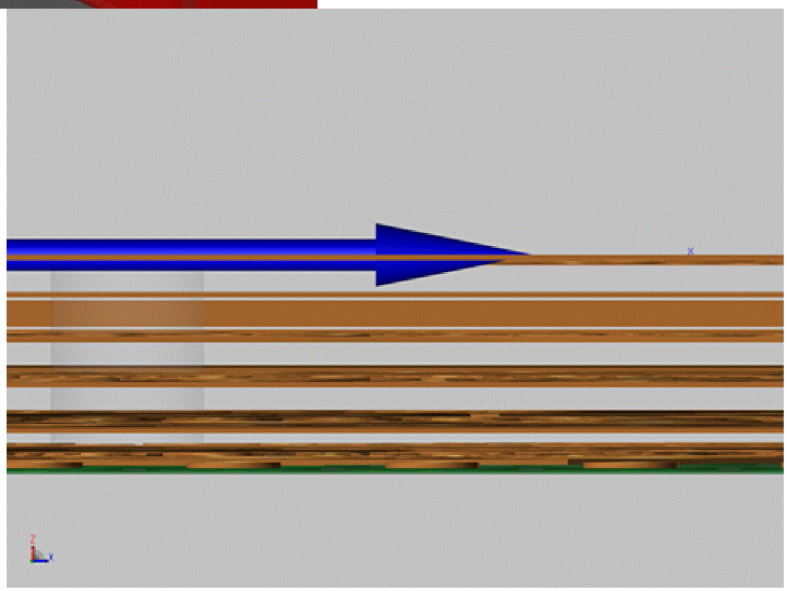
Z-Origin Visualization

The *Z0 Position* enables the visualization of datum (0,0) and sets up the z direction, which is considered a origin for Z height calculation in the stackup. This setting is available under the *Appearance* category of the Preferences dialog box. By default, the value is disabled and set to Upper of Top Conductor layer.



When you enabled the Z0 Position, it is also recognized when files are exported from the 3D Canvas. The position of the 3D CAD model will be reported with respect to X, Y & Z position on the PCB. To observe the best visibility of the Z0 datum, choose *View – Camera – Front*.





7

Working with 3D canvas

3D canvas lets you select, highlight, and crossprobe between 2D design window and 3D Canvas. Following objects are available, by default, in the *3D Selection* filter:

- Clines
- Pins
- Lines
- Text
- Vias
- Symbols
- Shapes
- Masks
- Dielectrics
- Rectangles

Objects not listed in the selection filter can also be viewed in 3D Canvas such as:

- Cavities
- Padstack
- Via structure
- Wire bonds
- Coverlay layers
- Cutouts

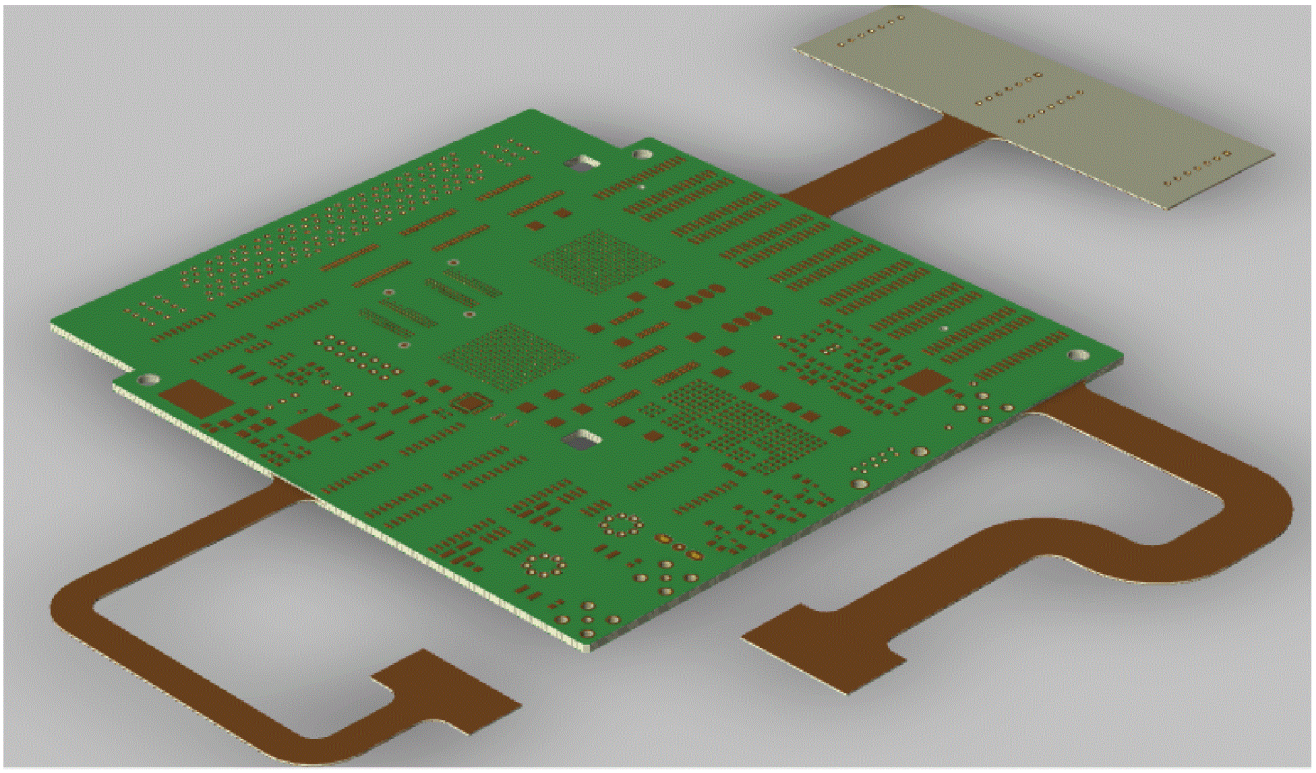
⚠ Some of the design objects are currently not supported in 3D Canvas. For example, cross-hatch shapes, unfilled shapes, negative planes, and counter bore and counter sink backdrills.

Related Topics

- Viewing Objects in 3D Canvas
- Viewing Packages in 3D Canvas
- Viewing Cutouts in 3D Canvas
- Viewing Thickness of Zones
- Viewing Partial Design Area Including Parts of Pins and Vias
- Viewing Symbols in 3D Canvas
- Viewing Nets in 3D Canvas
- 3D Visualization Using Projection
- Cross-sectional Viewing Using Cutting Plane
- Viewing Planes Splitting in Zones

Viewing Objects in 3D Canvas

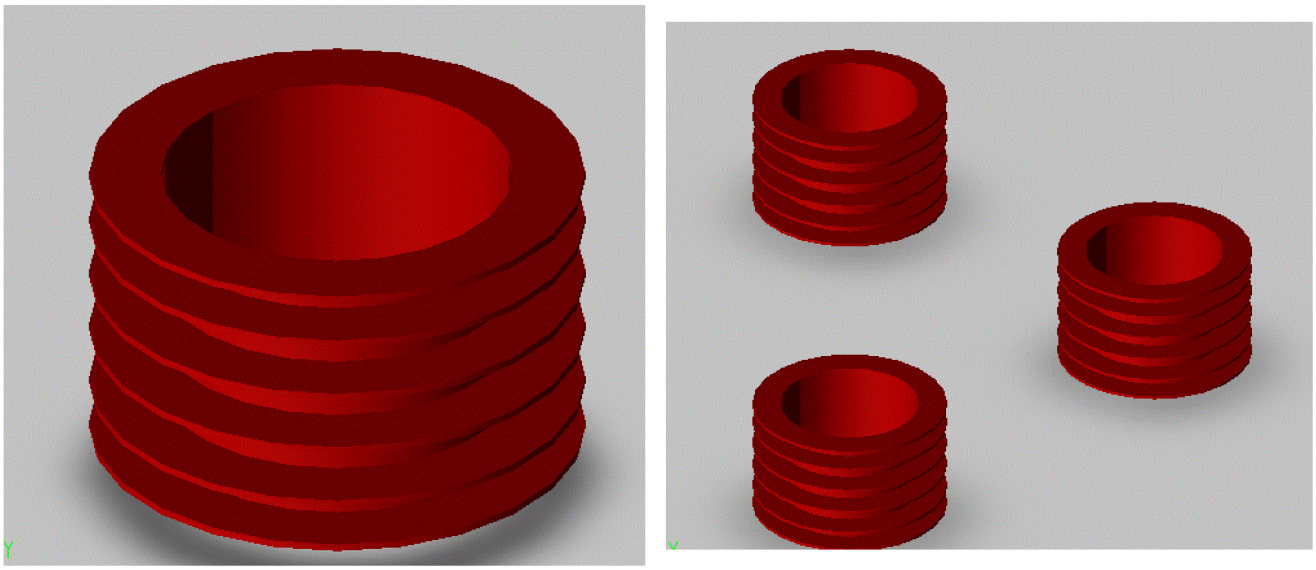
You can select any object in the 2D design window for viewing it in 3D Canvas, such as vias, pins, symbols, nets, and so on. To view all objects of the same type in the design, use *3D Selection* filter available in the toolbar icon. For example, enabling *Pins* only and click the icon. In 3D Canvas, only pins become visible.



View Objects Using Pick Select

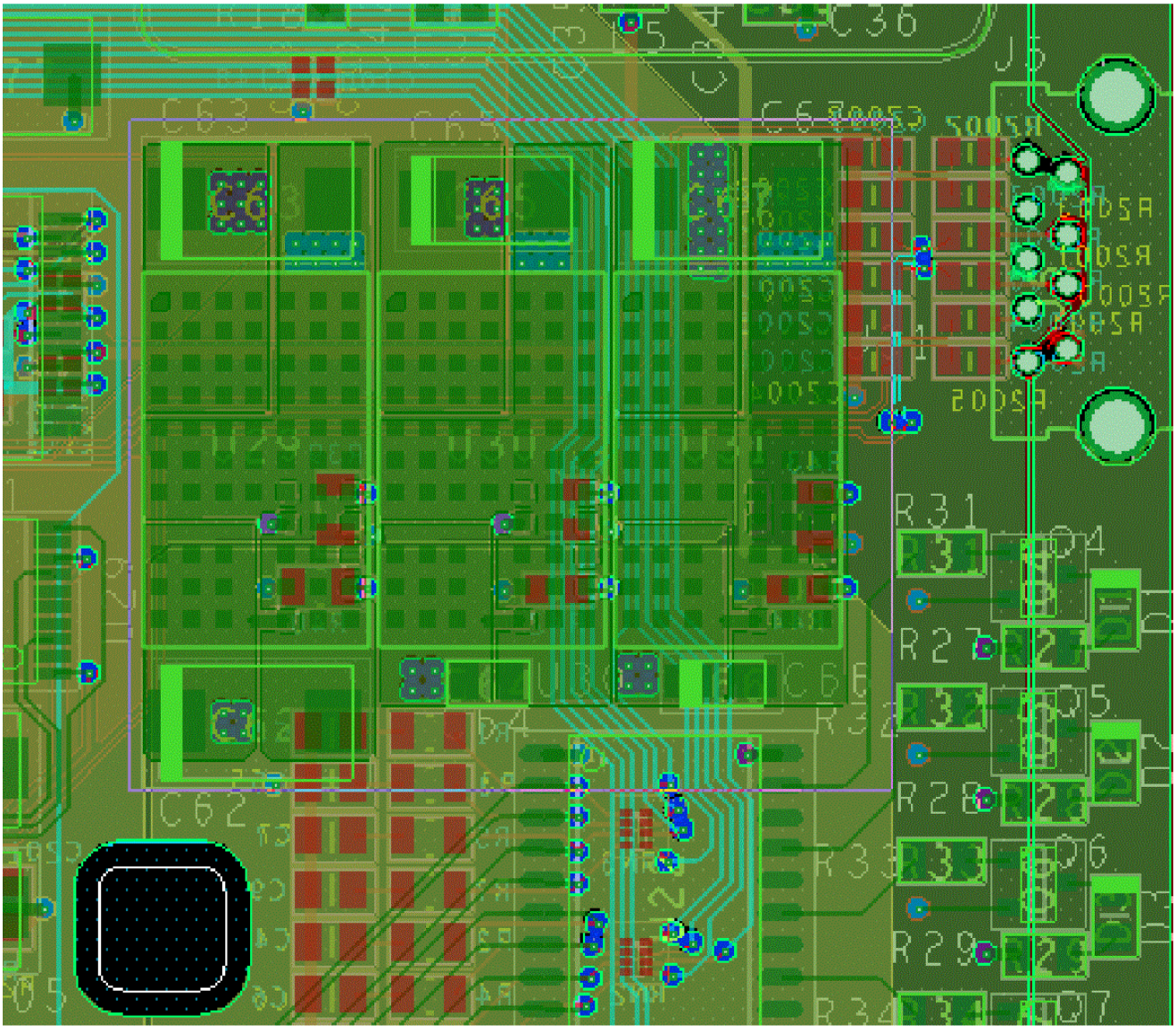
To view a objects in pre-selection mode using the following steps:

1. Enable the check box for an object type in the *Find* filter pane. For example, select *Pins*.
2. Click to select a single or multiple objects in the 2D design window.
3. Right-click and choose *3D Canvas* menu command.
   Only the selected objects are shown in 3D Canvas.



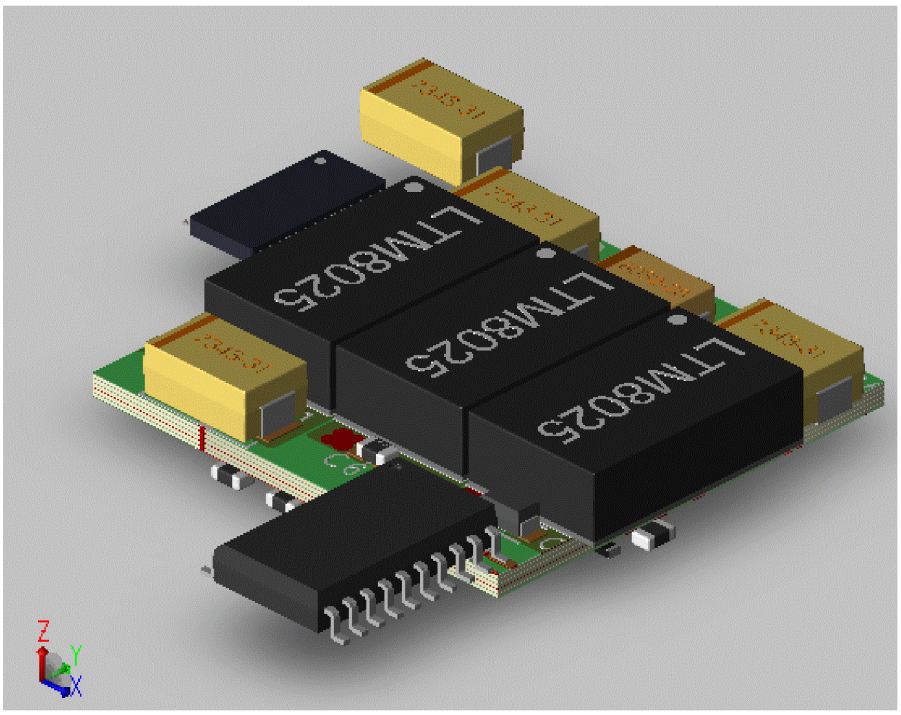
View Objects Using Window Select

To view a section of the design, enable the objects in *Find* filter pane and use standard windows selection method.



The selected section of the design is displayed in 3D Canvas as a complete entity including mask, dielectric, and coverlay layers.

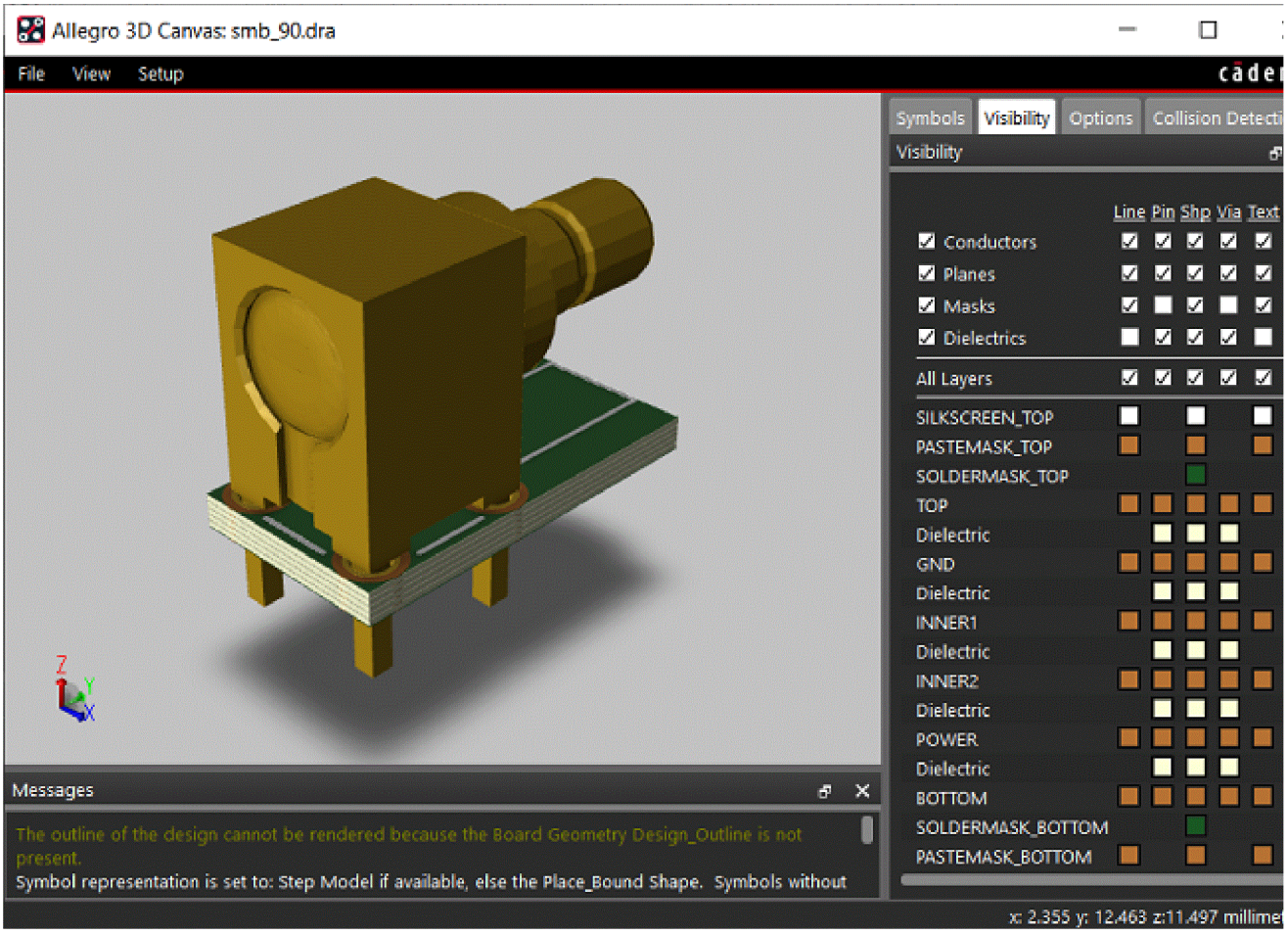
Objects that lies partially inside the selection box are clipped in 3D Canvas at the boundary of selection box.


LTM8025
LTM8025
LTM8025
Z
Y
X

Viewing Packages in 3D Canvas

You cannot open package symbol file in 3D canvas. 3D Canvas does not support symbol files (`.*sm`). However, symbol drawing files (`.dra`) can be opened in 3D canvas.

The features that are not relevant for a symbol drawing remain available, but does not show any results.

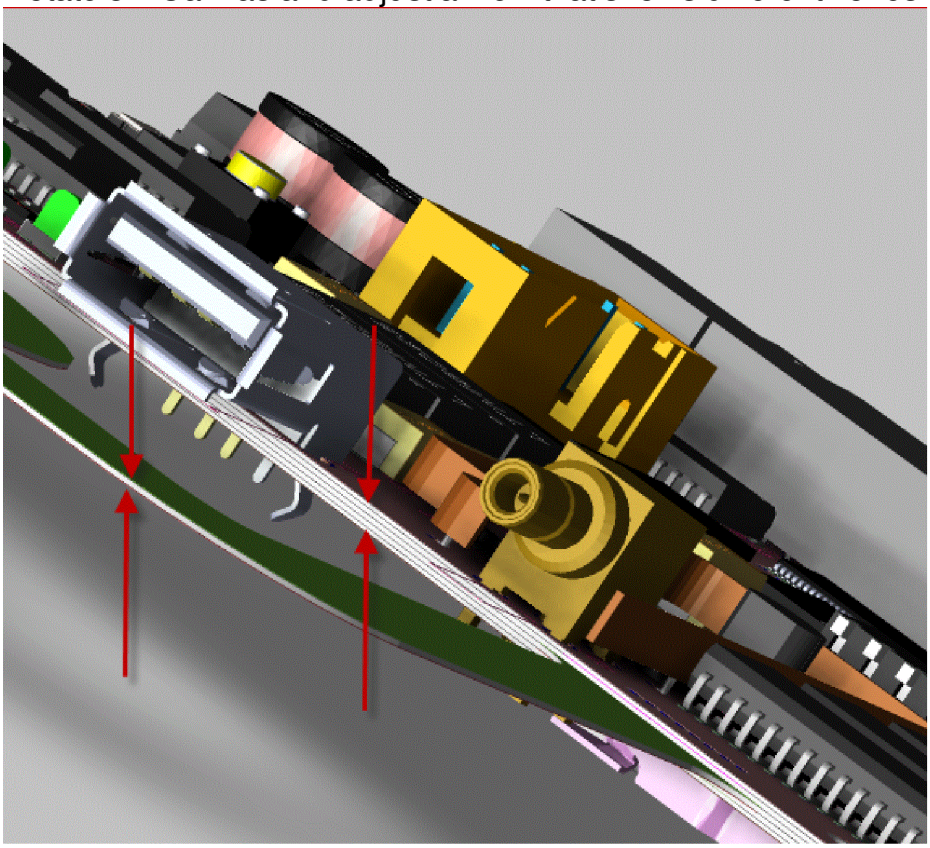


Viewing Cutouts in 3D Canvas

Cutouts are shapes, rectangles, or circles that are defined on BOARD_GEOMETRY class and CUTOUT subclass. Cutouts are supported in 3D Canvas.

Viewing Thickness of Zones

3D Canvas display zones with their actual thicknesses as specified in the *Cross Section Editor*. Rotate 3D Canvas and adjust a view that shows different zones with varied thickness.



Viewing Partial Design Area Including Parts of Pins and Vias

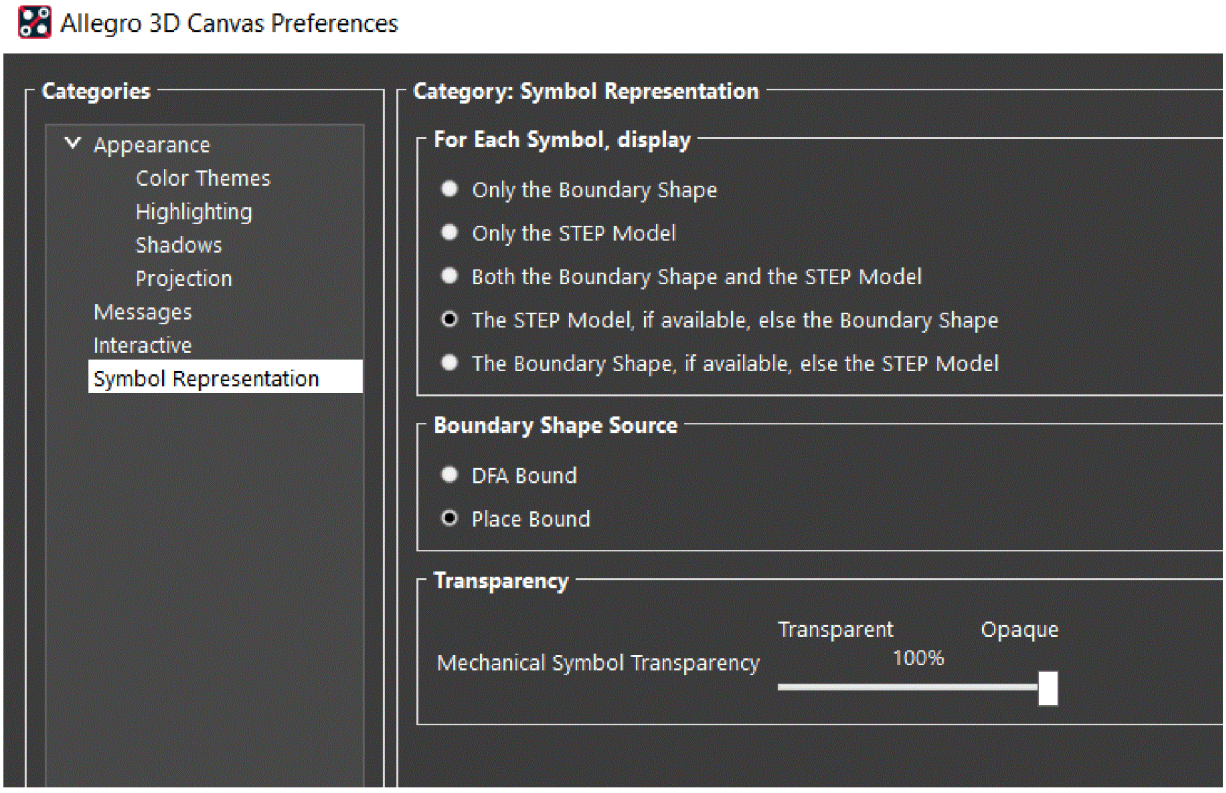
In 3D Canvas, copper shapes and clines are shown to the extent of the selection box. If pins and vias are placed at the edge of the selection box they are not sliced. If any part of a pin or vias falls into the selected area the entire pin or via is displayed in 3D Canvas.

A sectional view of pins or vias can be seen by using cutting plane functionality.

For more information, see Cross-sectional Viewing Using Cutting Plane.

Viewing Symbols in 3D Canvas

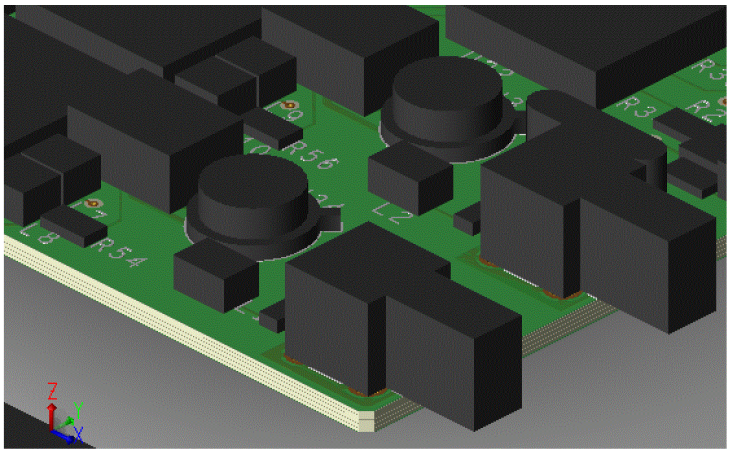
3D canvas provides settings to choose symbol viewing preferences. You can select symbol display based on boundary shape, or STEP model, or both. The boundary shape can either be a DFA_Bound shape or a Place_Bound shape. This setting is available in the *Symbol Representation* category under *Setup – Preferences*.



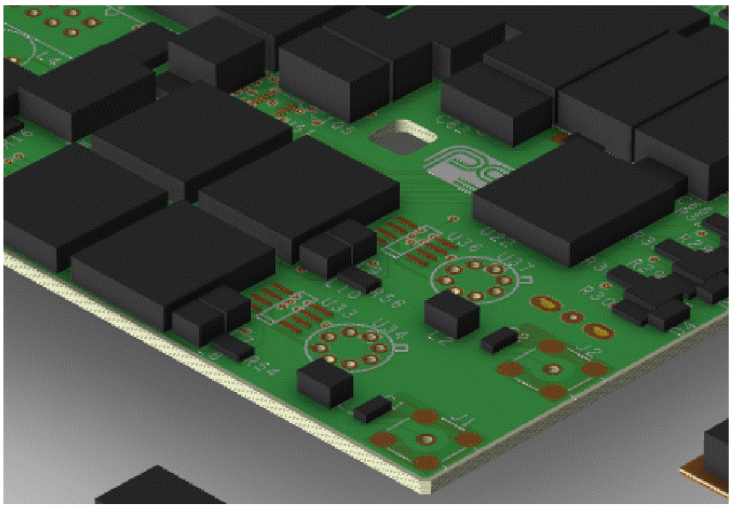
By default, Place_Bound shapes are loaded into 3D Canvas to create 3D models of the symbols. To view DFA_Bound shapes as boundary shape, perform the following two steps:

1. set an environment variable *3d_symbol_include_dfa_bound* in the *Display – 3D* category of the User Preferences Editor.
2. Select *DFA Bound* radio button in the *Boundary Shape Source* section.

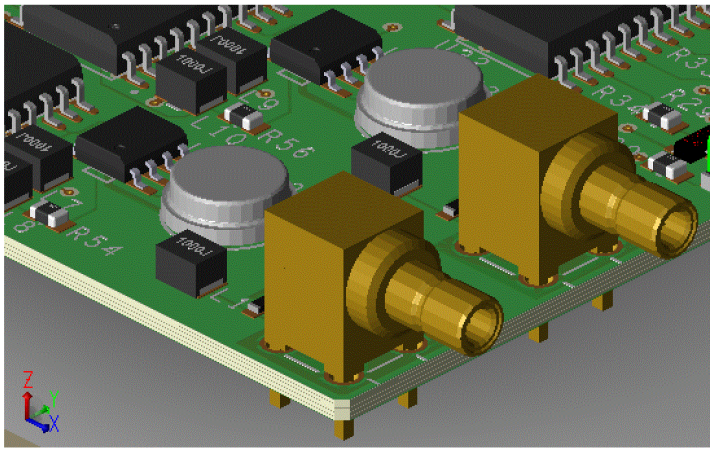
Following illustrations give you an idea on how symbols look with these settings:



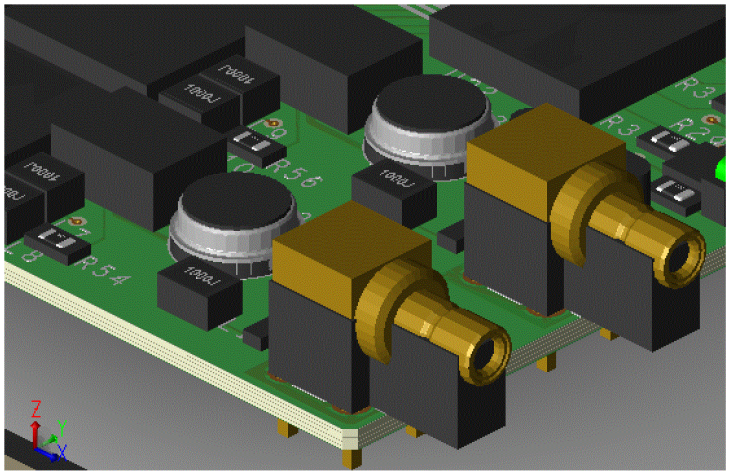
Display symbols using Place_Bound shape as boundary shape



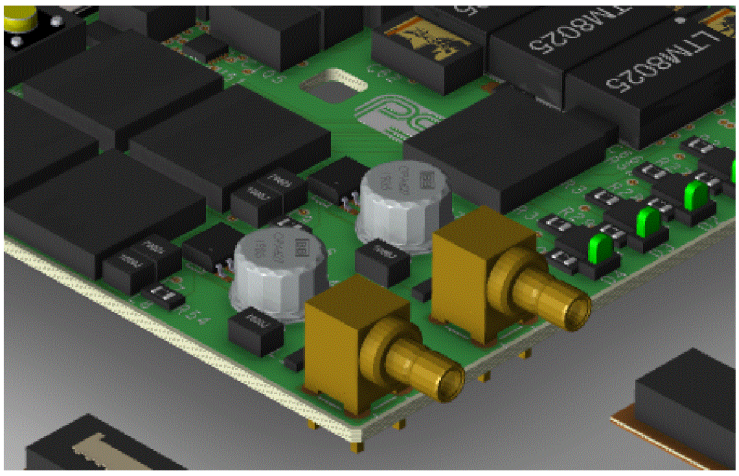
Display symbols using DFA_Bound shape as boundary shape only



Display symbols using STEP model only



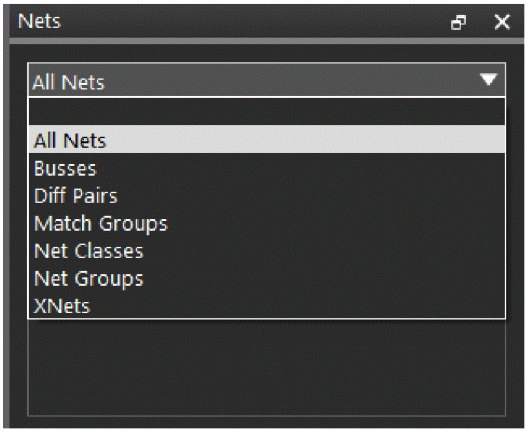
Display symbols using both Place_Bound shape and STEP model



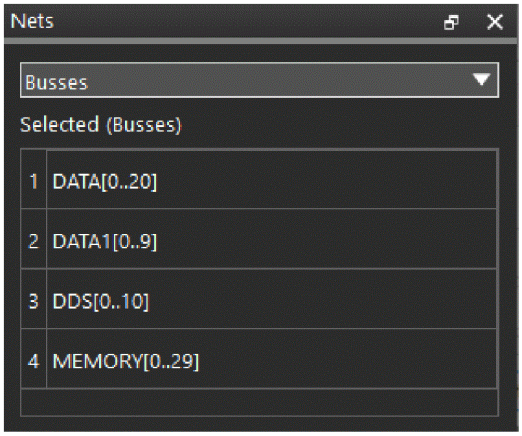
Display symbols using both DFA_Bound shape and STEP model

Viewing Nets in 3D Canvas

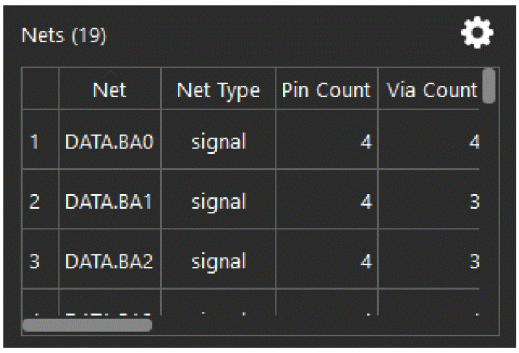
An entire net or any element of it can be selected for viewing in 3D Canvas using the Nets window. You can select *All Nets* and other groups of nets that are used in a design.

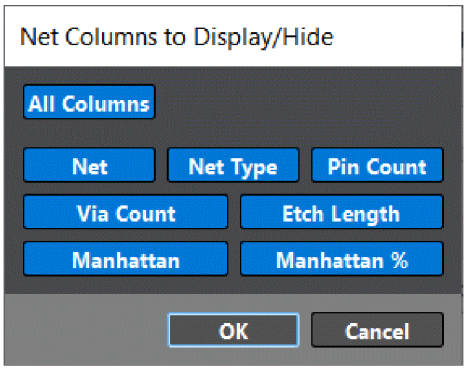


All nets or a group of net when selected from the pull-down menu start showing all the nets of that type in the *Selected* section of the window.

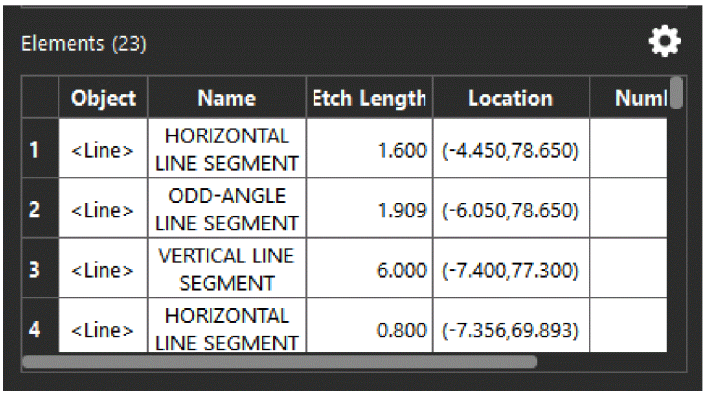


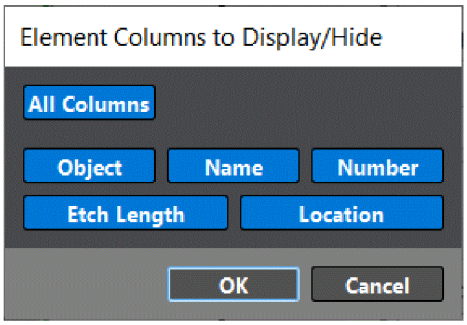
Any group of net can be selected from that list and the nets that are part of that group start displaying in the *Nets* section of the window. Attributes other than the name of nets are also seen in a spreadsheet format. Selecting the column head sort the nets based on the column values. To control the display of columns in that spreadsheet, click the settings icon to open Net Columns to Display/Hide window.





Selecting a net from that *Nets* table highlights that net in 3D Canvas and all its objects become listed in the *Elements* section of the pane with their names, numbers, etch lengths, and locations. You can select to show and hide the display of these attributes using the settings icon.

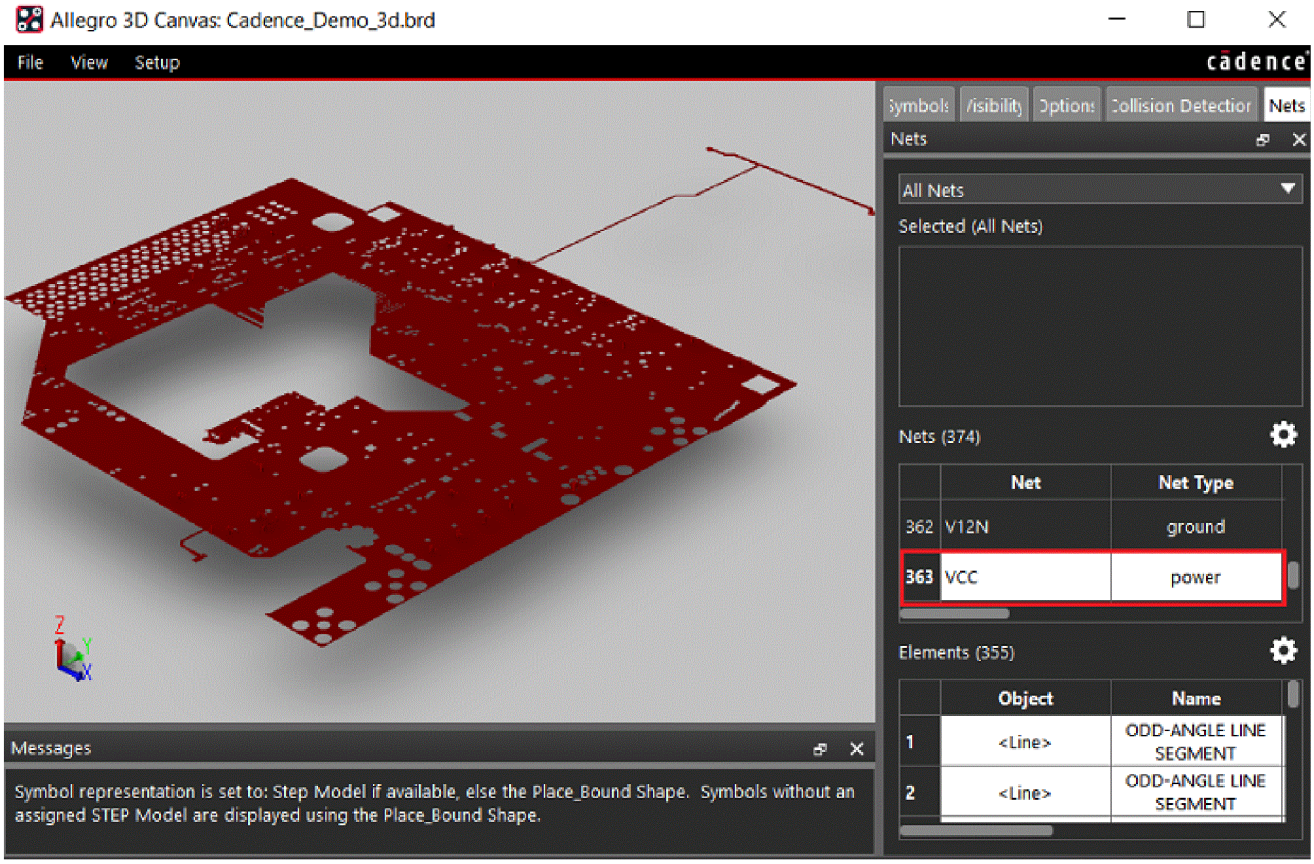




Using the Nets window, entire net or individual elements of a net can be selected to visualize in 3D Canvas.

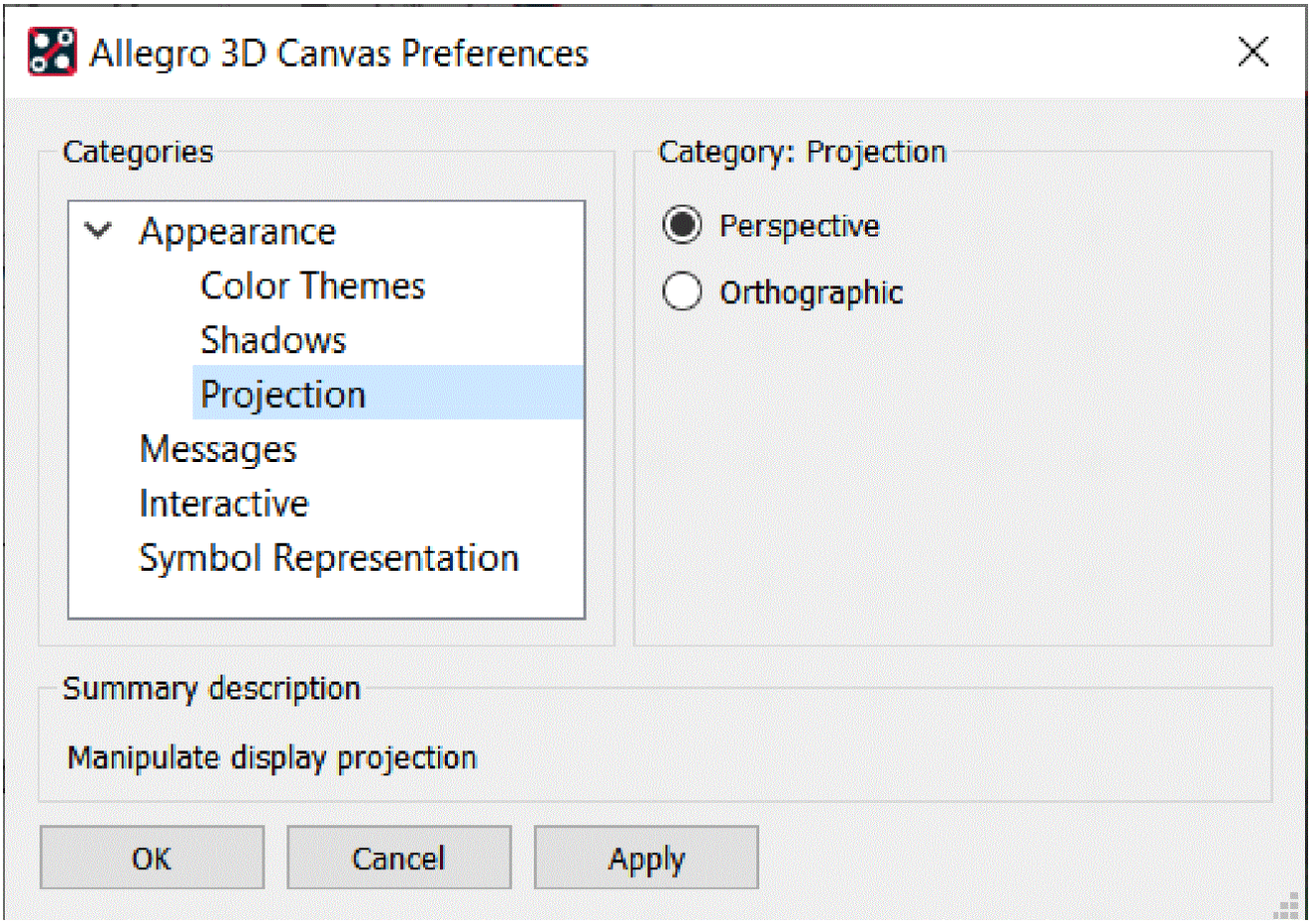
Use *Vanish* highlighting mode when viewing a net in 3D Canvas. If this mode is set only the selected net is visible in the canvas and rest of the objects will not be seen at all.

In the following example, the power net VCC is visualized in the vanish highlighting mode.


Allegro 3D Canvas: Cadence_Demo_3d.brd
File
View
Setup
cadence
Symbols
Visibility
Options
Collision Detection
Nets
Nets
All Nets
Selected (All Nets)
Nets (374)
Net
Net Type
362
V12N
ground
363
VCC
power
Elements (355)
Object
Name
1
<Line>
ODD-ANGLE LINE SEGMENT
2
<Line>
ODD-ANGLE LINE SEGMENT
Messages
Symbol representation is set to: Step Model if available, else the Place_Bound Shape. Symbols without an assigned STEP Model are displayed using the Place_Bound Shape.

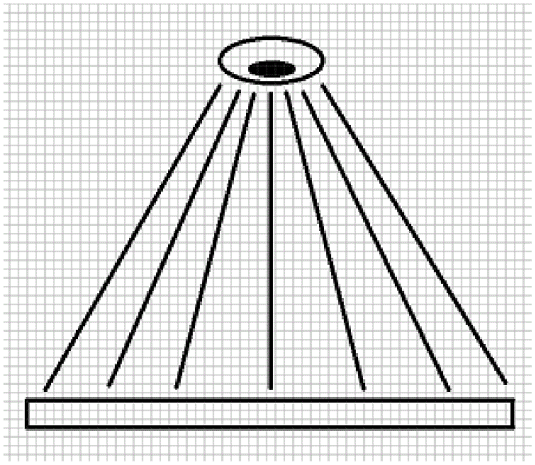
3D Visualization Using Projection

The projection is a method to display 3D graphical data using 2D coordinates of the screen.

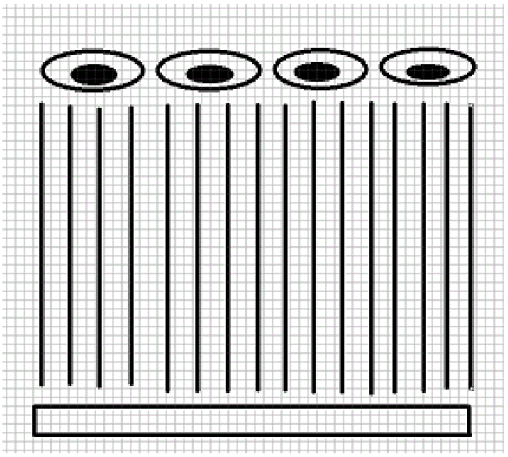


Two types of projection techniques are available:

- Perspective: Provides realistic visualization. Objects which are far away appear smaller than those are near. The perspective view displays the design as if the designer is standing above the center of the assembled board. This option is selected by default.



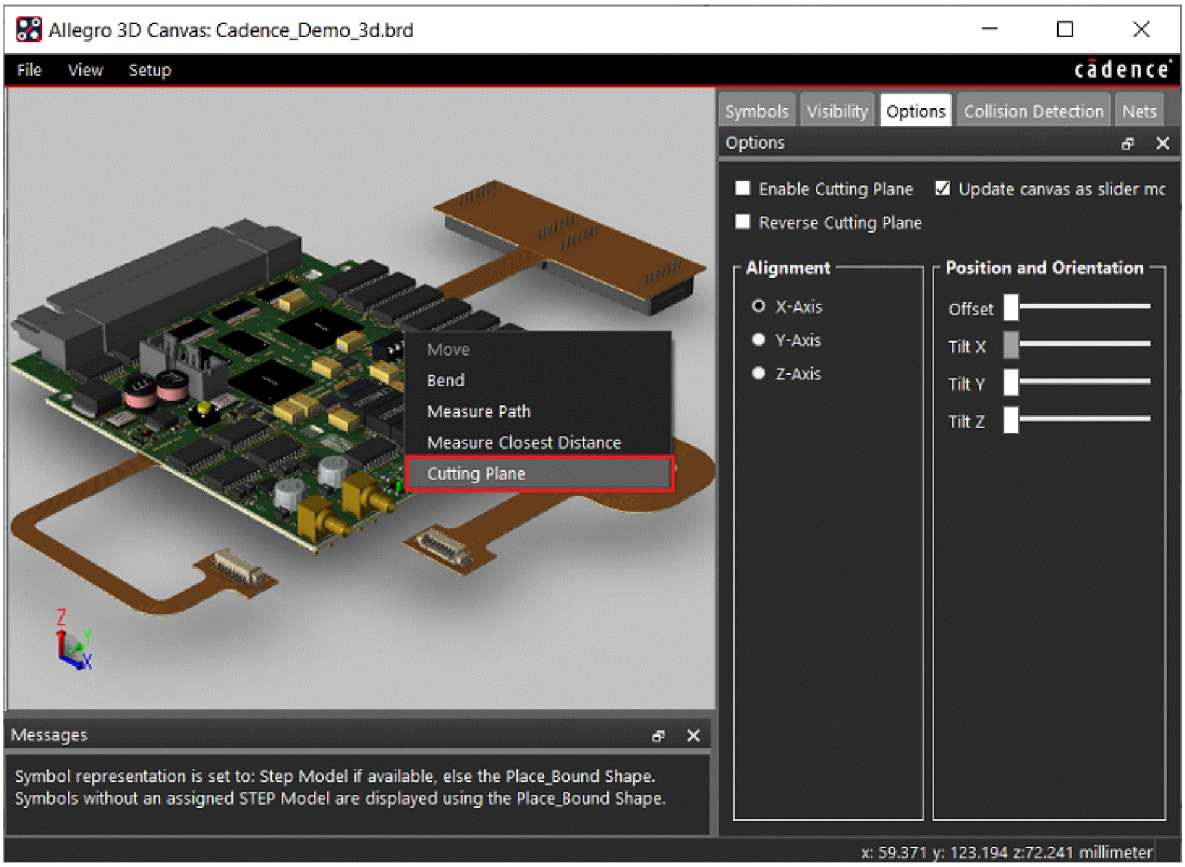
- Orthographic: Provides accurate to-scale visualization. All the objects appear of the same size.
  The orthographic view displays the design as if the designer is standing directly over each object of the board.



Cross-sectional Viewing Using Cutting Plane

A cutting plane is a geometric plane that cuts through the objects in 3D Canvas to create a sectional view showing the internal details of the design that cannot be seen from the outside. The *Reverse Cutting Plane* option lets you cut the plane from the opposite side of the design.

You can use the cutting plane command from the right-click menu.

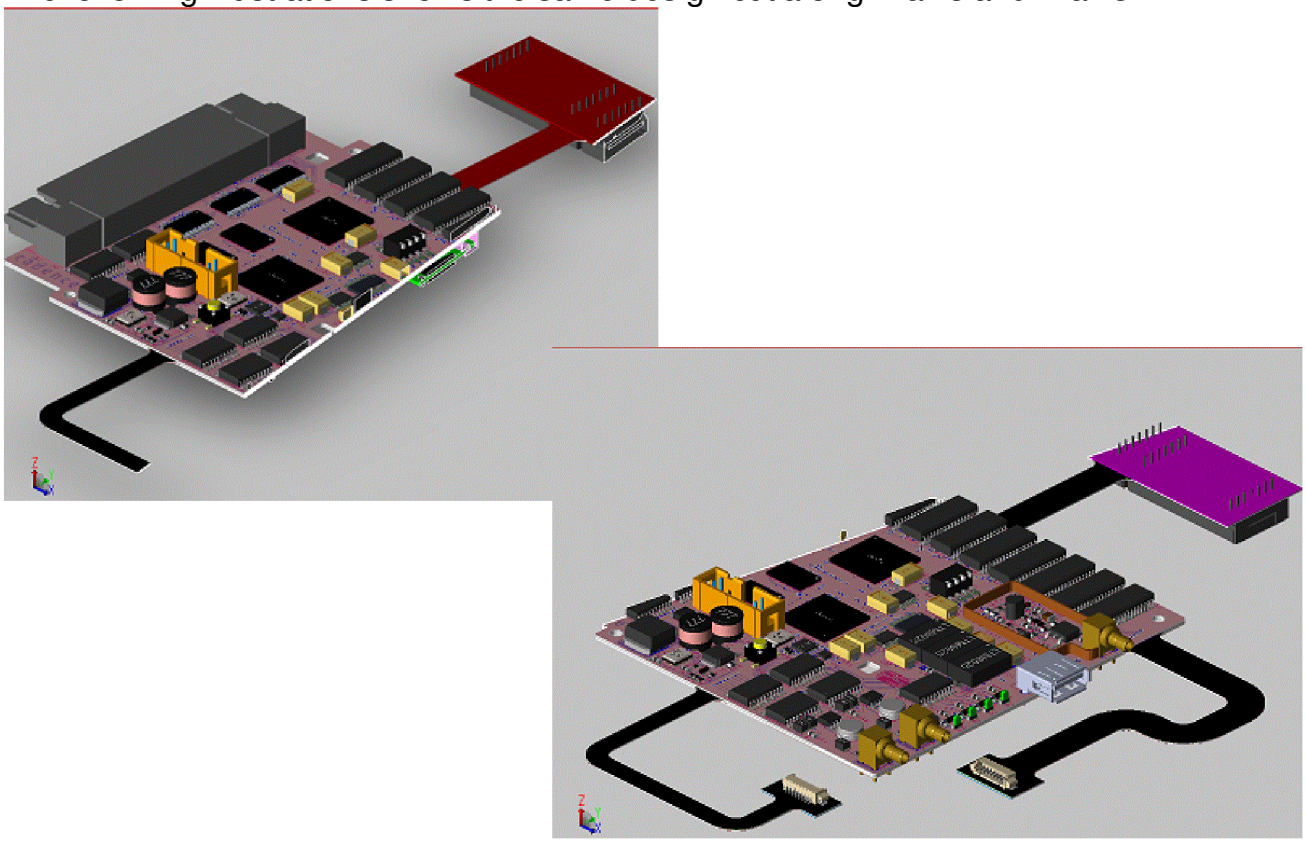


There are three modes to manage the settings:

- Enable: Display the cutting plane.
- Alignment: Determines the axis to which cutting plane is perpendicular. By default, the cutting plane is aligned with X-axis.
- Position and Orientation: Determines the position and tilt applied to the cutting plane. The *Offset* slider represents the position on the selected axis. The *Tilt* sliders provide a way to angle the cutting plane along the non-aligned axis. For example, if the Cutting Plane is

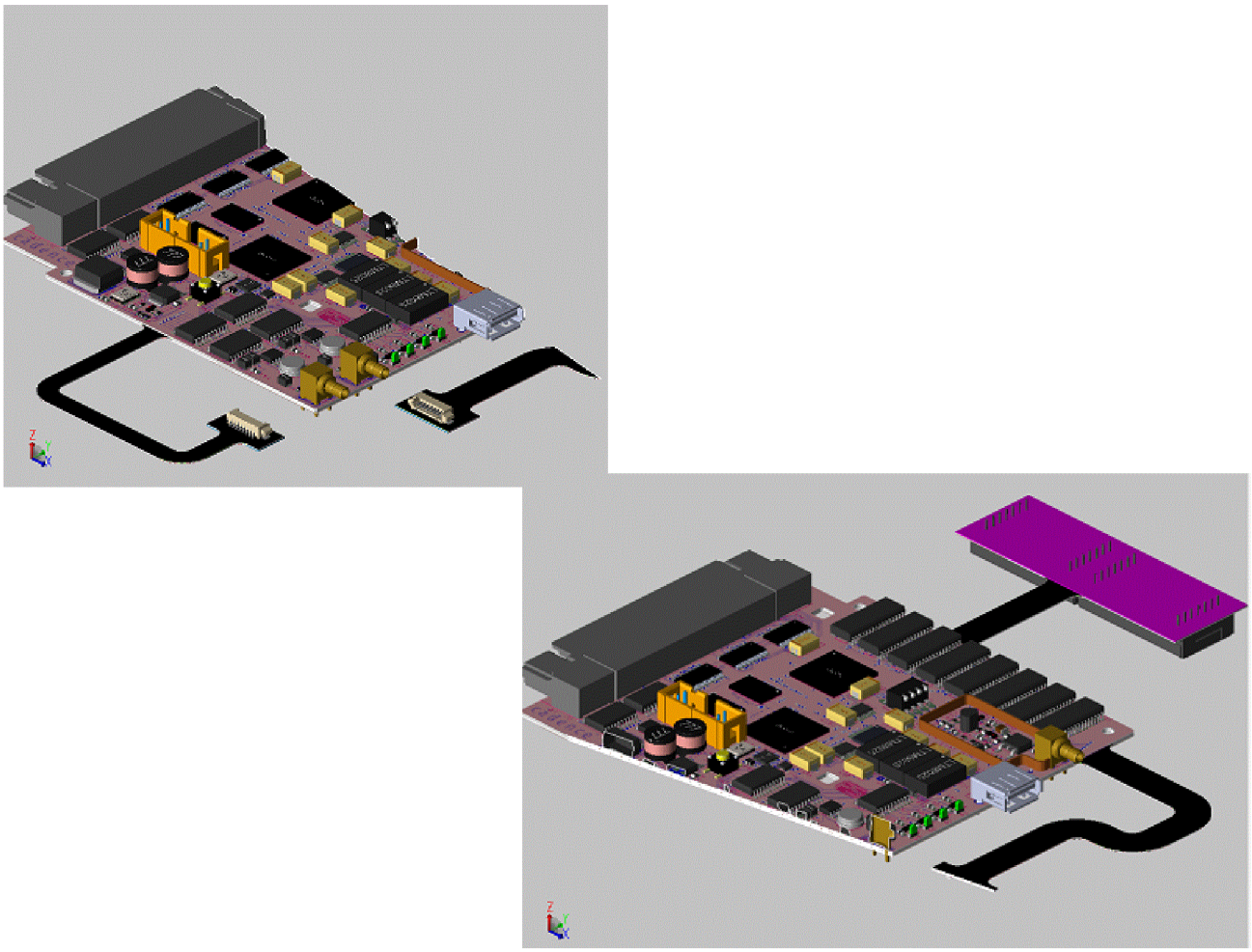
aligned along the Y axis, only the Tilt x, and Tilt z sliders are active.

The following illustrations shows the same design cut along X-axis and Y-axis.



Aligned with X-axis in forward and reverse directions

To cut the design from the other side of the board, enable *Reverse Cutting Plane* option.



Aligned with Y-axis in forward and reverse directions

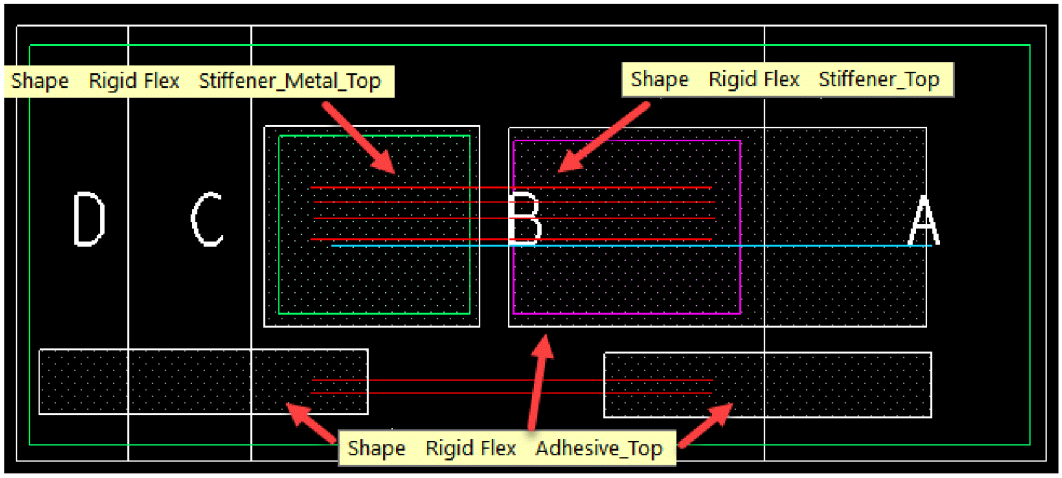
Viewing Planes Splitting in Zones

In rigid-flex designs, zones are created to design flex parts, which must have a different stackup than the rigid PCB. Different zones may have a different number of layers in their stackup. As a result, a shape that encompasses several zone boundaries is pertinent to have an incorrect display of z-height in the 3D environment if the differences in zone stackups are not considered.

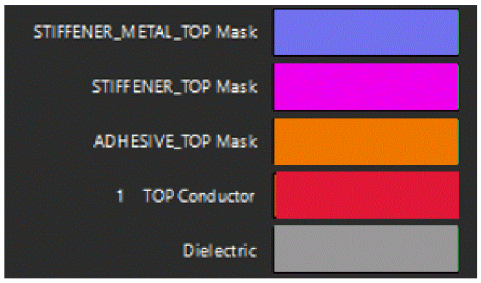
3D Canvas calculates the z-height for a zone based on its stackup and displays the correct z-heights of shapes. It splits the shapes that span multiple zone boundaries on all layers and placed them at the correct z-height in each zone.

The following example illustrates how 3D Canvas splits shapes that straddle across four zones.

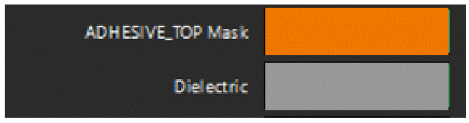
The sample board design is divided into A, B, C, and D zones. Zone B has five layers and Zone D has only a conductor layer in its stackup.



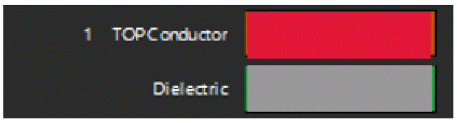
B



A



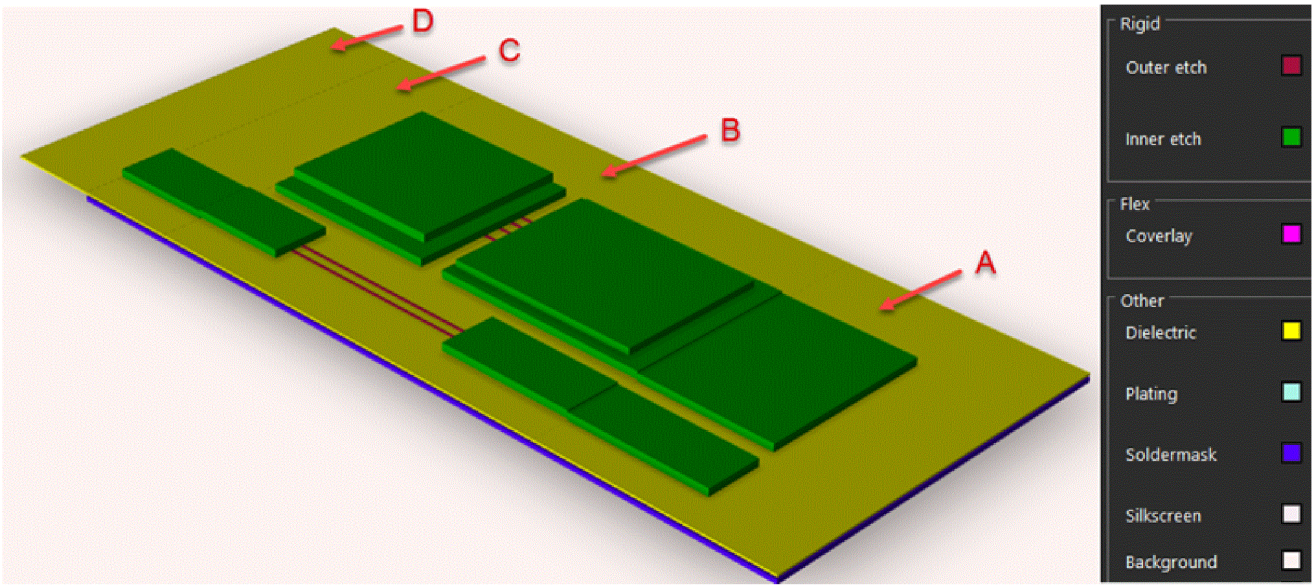
D



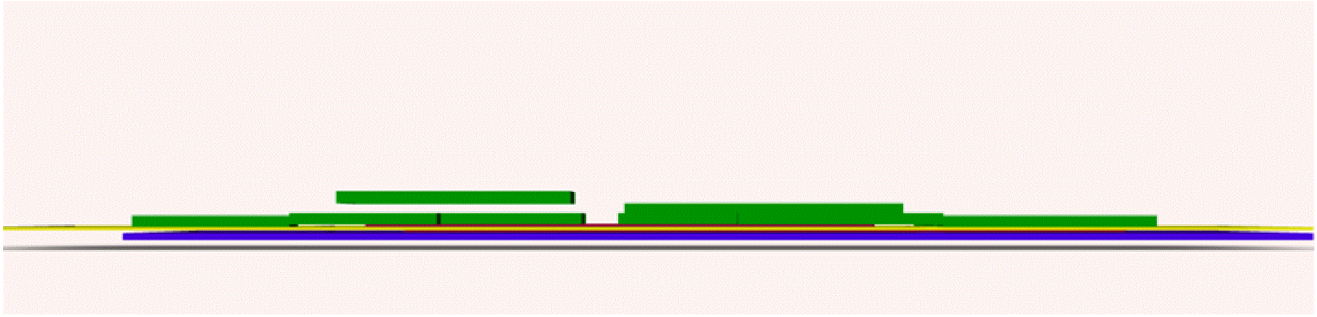
C

Adhesive_Top shapes are created in each zone. Zone B has two additional shapes, Stiffener_Top and Stiffener_Metal_Top. Zone B and A also contain cline segments on the `Top` and `Bottom` layers.

When you open this design in 3D Canvas you see that every shape has been assigned the correct z-height and placement according to the zone. The following images show the top isometric and front view of the design in 3D Canvas.



Top isometric view



Front view

The following table summarizes the display of shapes in each zone:

Zone	Display Results
D	The ADHESIVE_TOP layer is not defined in the stackup and not displayed in 3D Canvas. The shape Adhesive_Top straddles zones D and C splits at the boundary. The part of this shape that lies in zone D is discarded in 3D Canvas.
C	The ADHESIVE_TOP layer is defined in the stackup and displayed in 3D Canvas. The z-height of the Adhesive_Top shape is derived from the stackup and is different than Zone B.

B	Both mask and conductor layers are defined in the stackup and displayed in 3D Canvas. The shape Adhesive_Top is placed on the top of the `Top` conductor layer. The Adhesive_Top shape that resides only in zone B shows the correct z-height. The second Adhesive_Top shape that straddles zones A and B splits at the boundary and is placed at the correct z-heights in each zone. The shape Stiffener_Top shows the correct z-height and is placed directly on top of the Adhesive_Top shape. The Stiffener_Metal_Top shape shows the correct z-height and floats above the Adhesive_Top shape. It is because of the position of the `STIFFENER_TOP` layer in the stackup.
A	The `ADHESIVE_TOP` layer is defined in the stackup and displayed in 3D Canvas. The z-height of the Adhesive_Top shape is derived from the stackup and is different than Zone B.

8

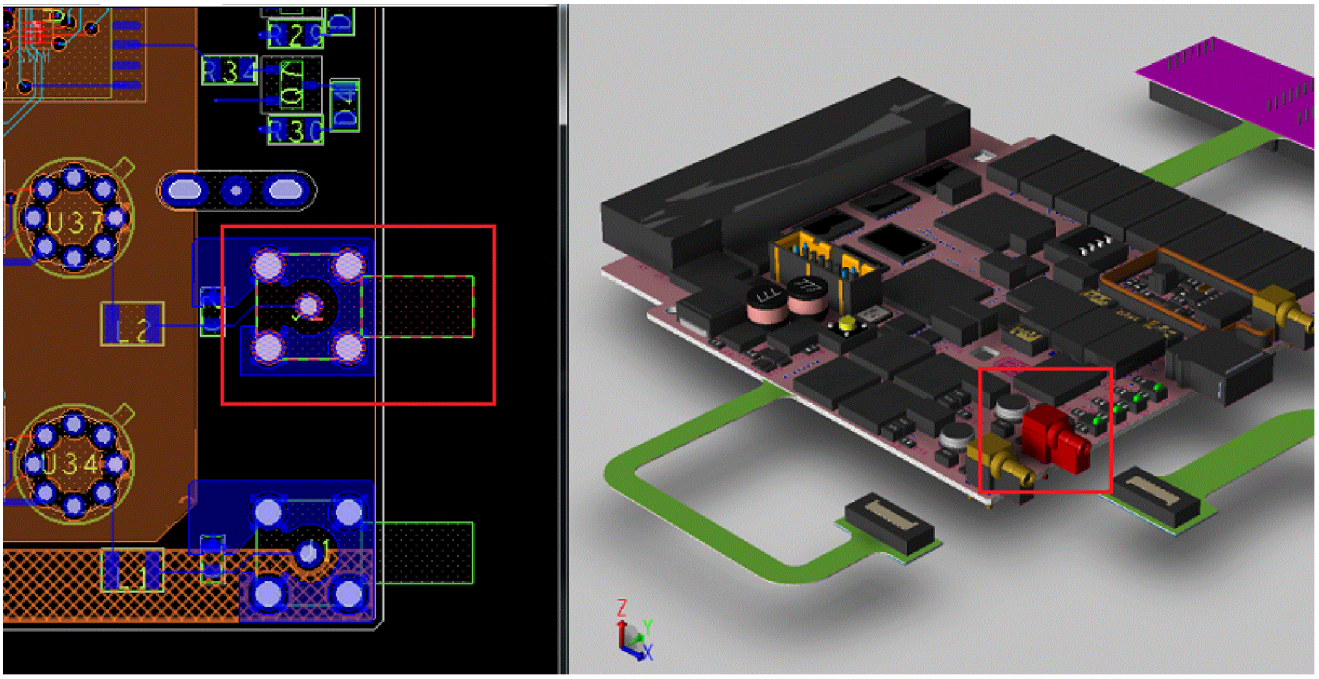
Design Tasks In 3D Canvas

See the following topics to learn more about design tasks in 3D Canvas:

- Cross-probing Between 3D and 2D canvas
- Moving Symbols Interactively in 3D Canvas
- Visualizing Bend Areas of Rigid-flex Designs in 3D Canvas
- Updating Mask Layers Interactively

Cross-probing Between 3D and 2D canvas

Cross-probing is simple between 3D Canvas and 2D design window. Selecting an object on 3D Canvas also gets selected and highlighted on the 2D design window.

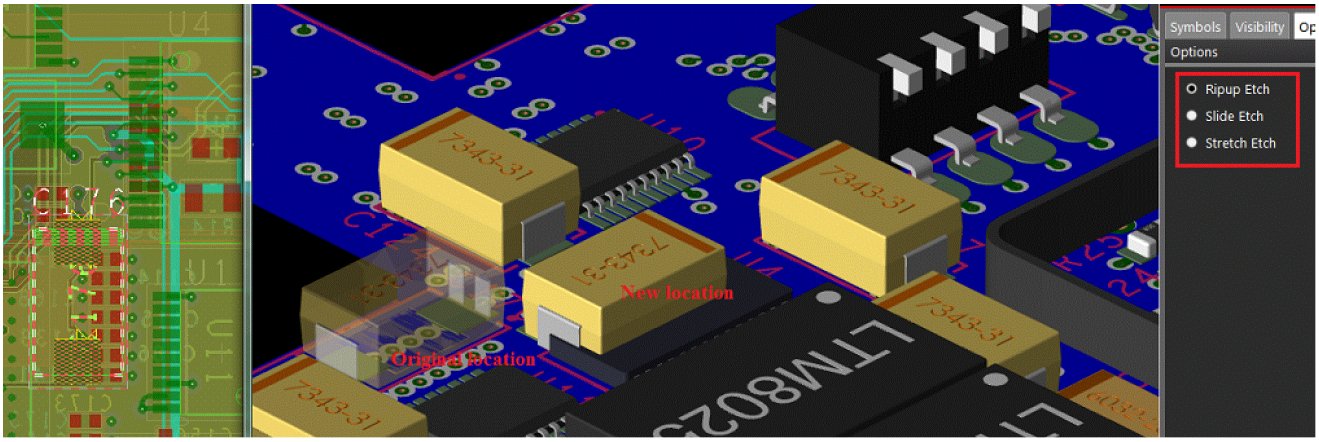


Moving Symbols Interactively in 3D Canvas

The move operation in 3D Canvas works the same way it does in 2D design window. The `move` command options in 3D Canvas are synchronized with the application mode set in the 2D canvas.

To move an object in 3D Canvas, do the following:

1. Enable the *2D/3D Interactive* option in the *Interactive* category of the *Allegro 3D Canvas Preferences* dialog box.
2. Select a symbol in 3D Canvas, right-click, and choose *Move*.
   The symbol attaches to the cursor and the command options become available in the *Options* pane. In the 2D design window the symbol gets highlighted.

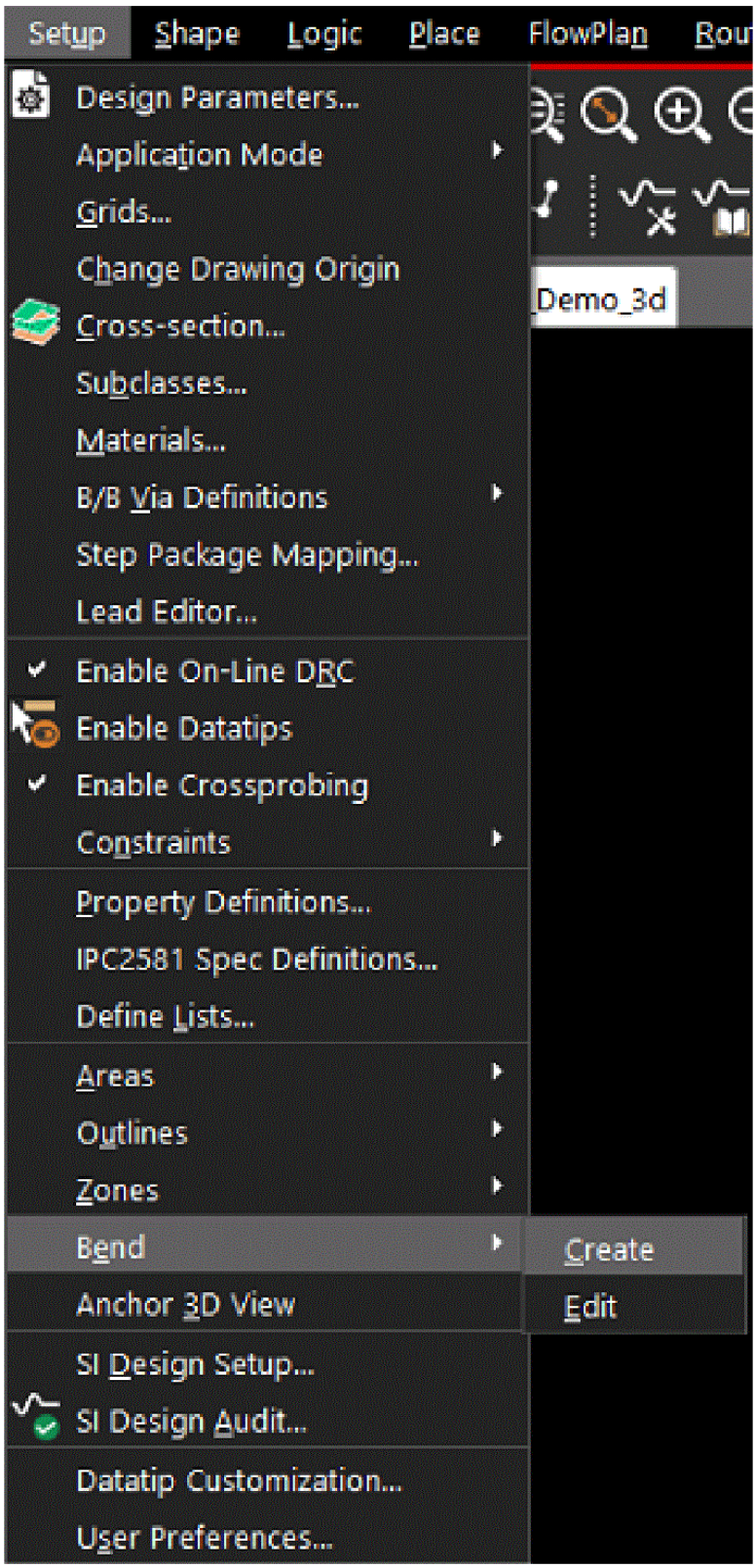


3. Click to place the symbol at a new location.
   The symbol is placed to its new location in both 2D design window and 3D canvas.

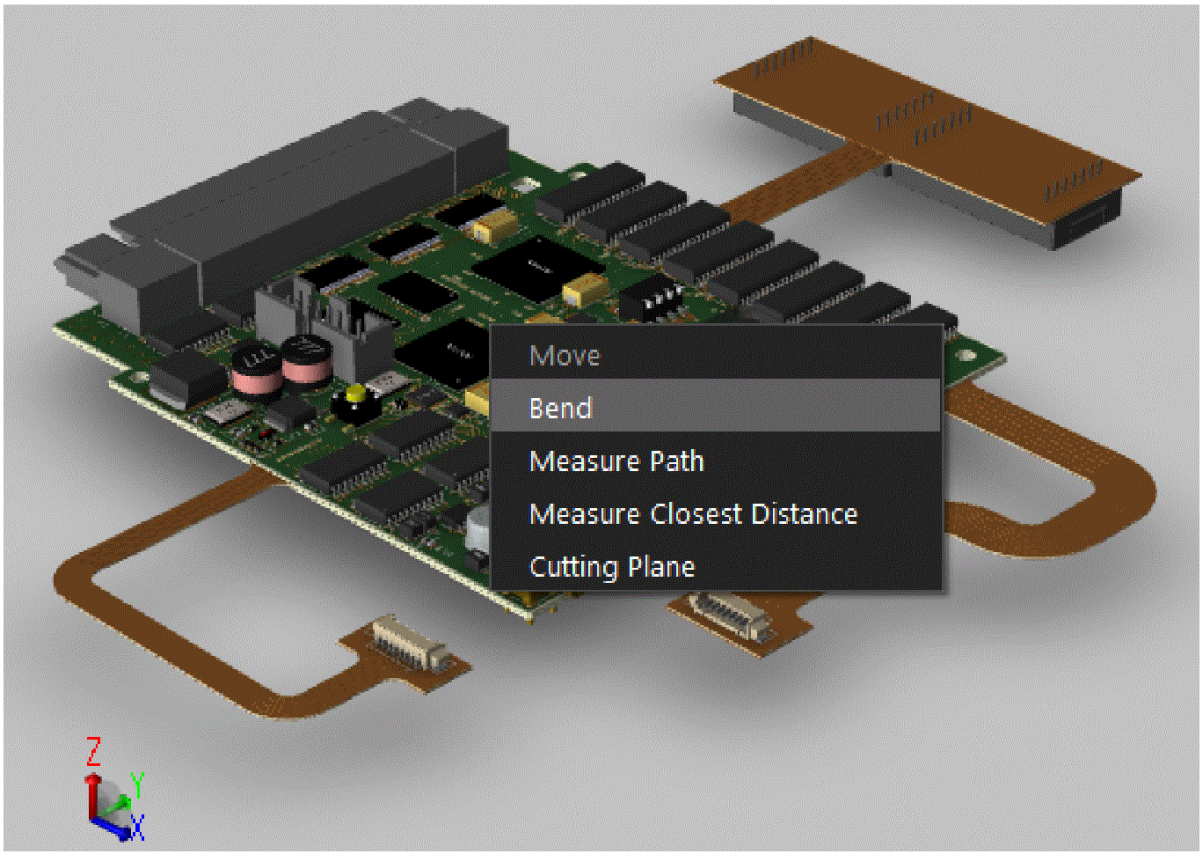
Visualizing Bend Areas of Rigid-flex Designs in 3D Canvas

In 2D design window rigid-flex designs are in a flat state. 3D Canvas lets you analyze rigid-flex designs in their intended state. You can bend the specified areas and runs checks to verify placement and clearances.

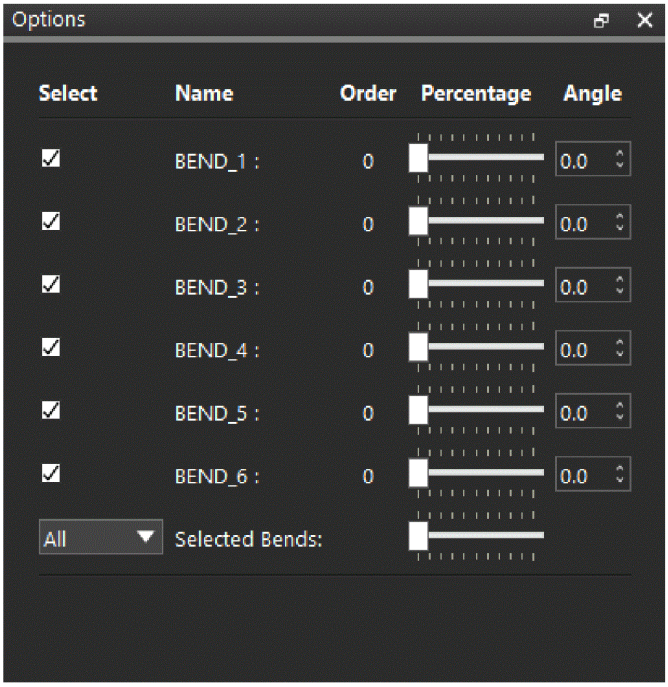
To enable bending capability in 3D Canvas, you must specify bend areas and 3D anchor point in 2D design window. Choose *Setup – Anchor 3D View* to add anchor points in the design. In a rigid-flex design, anchor point is placed in the rigid part or either side of a bend line. When bending the design in 3D canvas, all the objects that are on the other side of bending line moves, but the area containing the anchor point remains stationary.The commands to create bend areas and anchor point are available in *Setup* menu.



Once set, the *Bend* command becomes active on right-click.



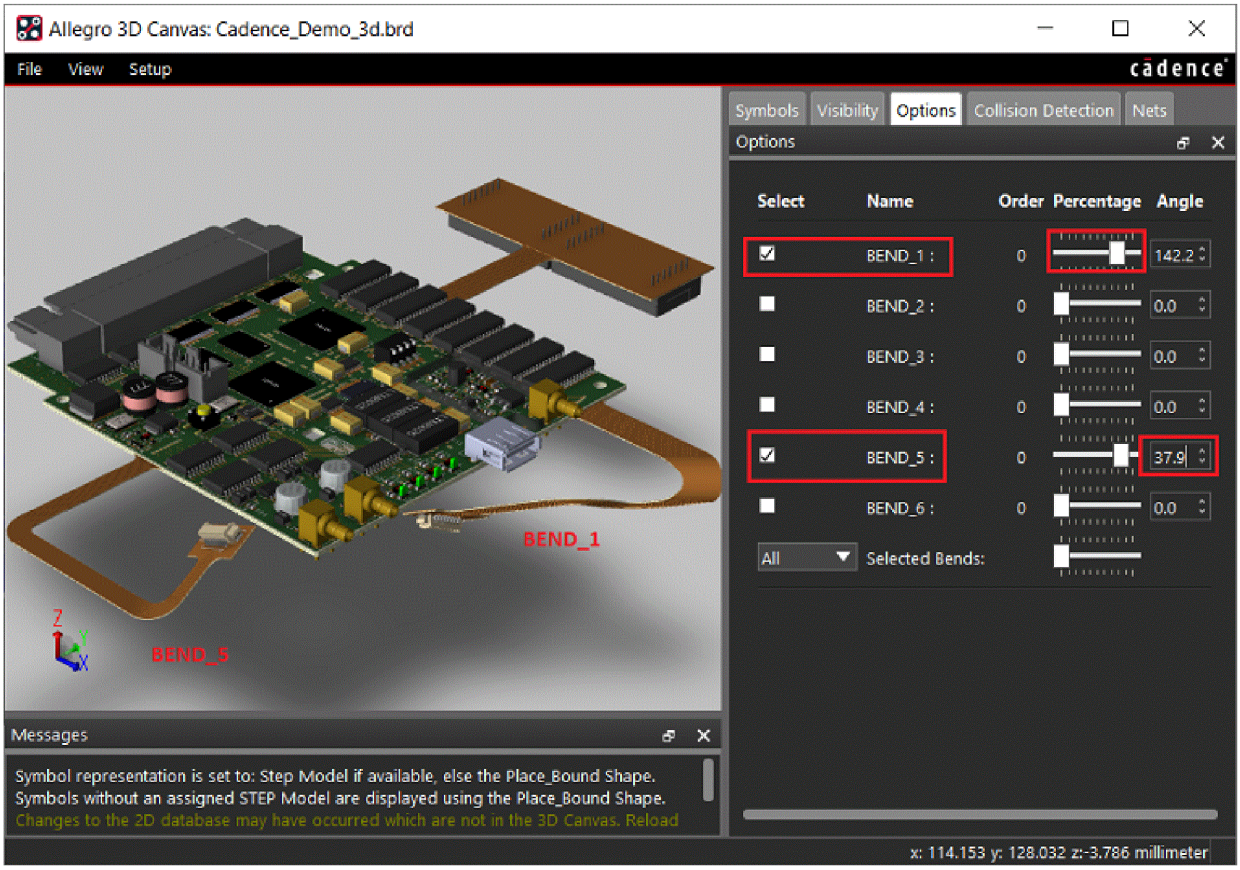
Selecting the *Bend* command, changes the *Options* pane. All bends areas specified in the design are listed and sorted in bend order. You can either bend a single bend area separately or enable multiple bends for bending for using the *Selected Bend* option.



To perform bending, use anyone of the following methods:

- Drag the *Percentage* slider to the right
- Click in the slider area
- Specify the value for *Angle*.

A progress meter is displayed at the bottom during the transformation. Entering an angle greater than the specified angle of the bend stops the bending at the specified angle.



Right-click and choose *Done* to apply the bending. You can revert the bending by either moving the slider to the left, or by clicking at the left end of the slider area, or by entering 0 value for angle.

Updating Mask Layers Interactively

You can make changes to the mask layers and view the changes in 3D canvas. Choose the *Enable Mask Layers Interactive Update* checkbox in the *Interactive* category of the *Allegro 3D canvas Preferences* dialog box.

In 2D design window performing the following operations on the mask layers are simultaneously seen in 3D Canvas:

- Add/delete/move a pad
- Add/delete a cutout
- Add/delete objects defined on NCROUTE_PATH or NCROUTE_PLATED subclasses

If *Enable Mask Layers Interactive Update* is disabled, all the updates are reflected on reloading 3D Canvas.

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Resolving Design Issues in 3D Canvas

3D Canvas provides a realistic three-dimensional approach to analyze and verify complex and dense designs. You can run checks in three dimension that cannot be performed in the conventional 2D design window. For example, you can run and visualize clearances between 3D models or between 3D model and 2D elements, distance between two points in a design, and so on.

See the following topics to learn how to resolve design issues in 3D Canvas:

- Checks to Measure Collision Between Objects
- Measuring Distance Between Objects

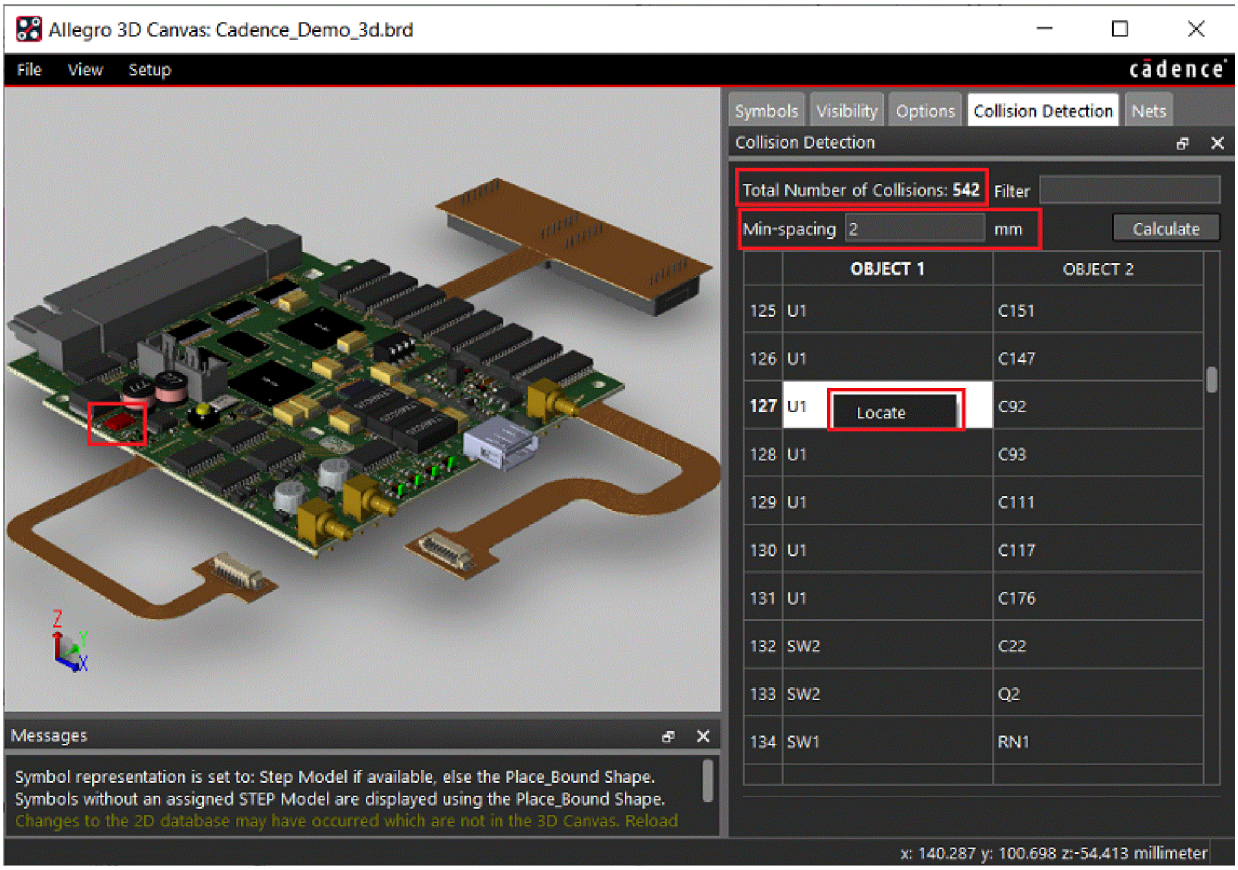
Checks to Measure Collision Between Objects

While viewing a design in 3D Canvas you can run collision checks to see if there are any clash between objects. Objects if overlapped can be checked and are reported depending on the minimum spacing value set in the *Collision Detection* pane. This feature is useful when viewing multi-zoned rigid-flex designs to check if any interferences exists when the design is in bent state.

To run the collision checks, specify minimum spacing value and click *Calculate*. The value of minimum spacing depends on the design specifications. If not defined, 3D Canvas runs the check with default spacing constraint value.

⚠ Only visible objects are considered while running collision checks.

In the *Collision Detection* pane, the total number of collisions and the list of all the objects are displayed. To view any object, select any object cell, right-click and choose *Locate*. The object gets highlighted and blink a few times.



To speed up collision checking, turn off all the layers except TOP in the Visibility pane.

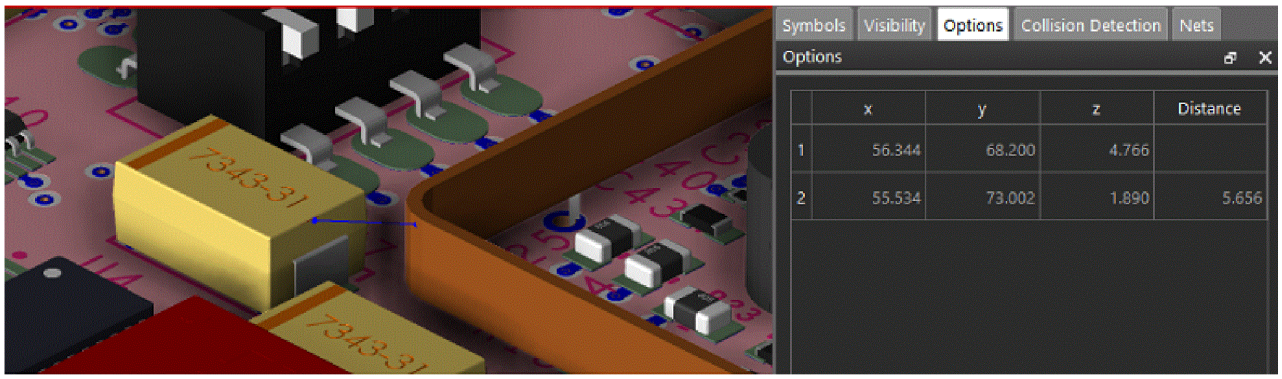
Measuring Distance Between Objects

You can measure distance between objects using two different ways:

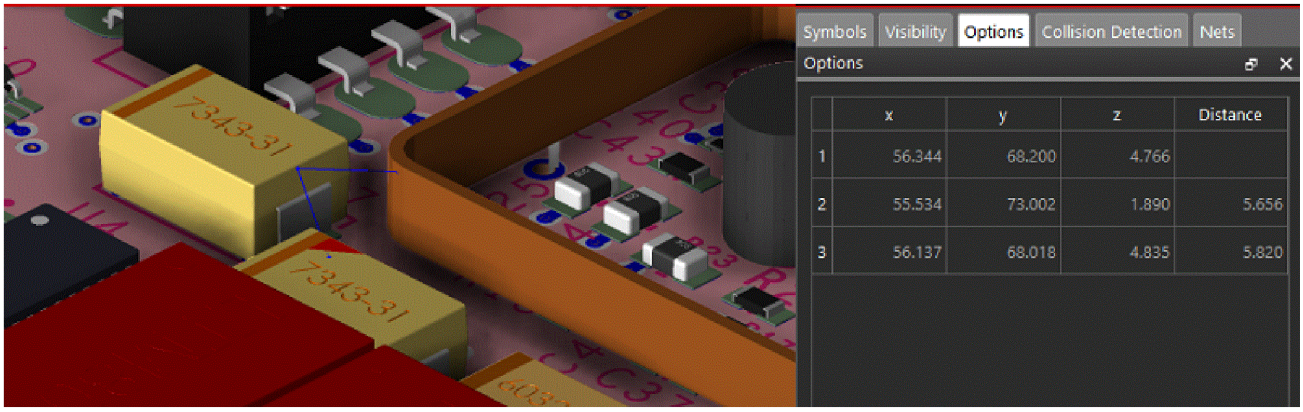
Using Measure Path

The *Measure Path* command, available on the pop-up menu measures distance between surface or points of the design objects or the STEP models. When measuring between multiple points the calculations become additive.

1. Right-click anywhere on 3D Canvas to invoke the command.
   As the cursor moves either selectable design surfaces or objects highlight, or triangular sections of STEP models highlight.
2. Click to select an object or surface.
   A blue dot starts appearing as a visual marker on 3D Canvas. The *Options* tab also changes and displays X, Y & Z location of the mouse click in a tabular format.



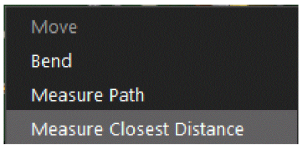
3. Select another object or surface.
   Another blue dot is added at the second selection point and a blue line appears between the two selected points.
4. Click to select one more object.
   This process continues for each and every selection point. The location of the selection points gets added to the *Options* tab and the total distance traced along the path of the measurement points are also displayed.



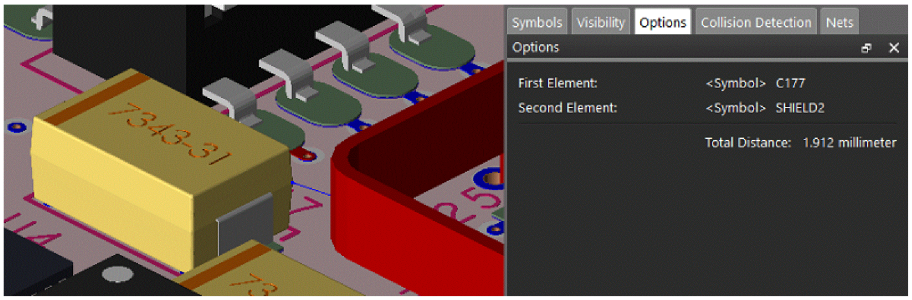
5. Right-click and choose *Done* to exit the command.
   All the visual markers are removed from the canvas.

Using Measure Closest Distance

The *Measure Closest Distance* command, available on the on the pop-up menu measures the shortest distance between two objects. The command looks around the selected objects to pick the closest edge for measuring distance between them. Any design object can be selected to measure closest distance between them and the surrounding objects.



Select two objects and view the closest distance between them in the *Options* tab.



Right-click and choose *Next* to select another set of objects.

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3D Canvas Output

For exchanging information across various 3D applications, you can export 3D geometry and structural information of a design from 3D Canvas.

Following industry formats are supported:

File name	File extension	Stand for..	Use for...
ACIS files	Spatial's ACIS solid modeling format, which stores three-dimensional geometry information.		To transfer native data between CAD systems using spatial software, such as 3D Canvas and Sigrity.
	`.sab`	Standard ACIS Binary	
	`.sat`	Standard ACIS Text	
ACIS Assembly files	A standard for storing 3D part and assembly designs.		To transfer native data between CAD systems using spatial software, such as 3D Canvas and Sigrity.
	`.asat`	Assemble SAT	
HMF files	`.hmf`	HOOPS Metadata file	
HSF files	`.hsf)`	HOOPS Stream file	
IGES files	A neutral file format designed to transfer 2D and 3D drawing data between dissimilar CAD systems.		Conveying 3D designs with bend areas.
	`.iges`	Initial Graphics Exchange Specification	
	`.igs`	Initial Graphics Exchange Specification (Generic)	

JPEG files	.jpeg	Joint Photographic Experts Group format	
OBJ files	`.obj`	Wavefront model file	
PDF 2D	`.pdf`	Portable Document Format	
PDF 3D	`.pdf`	Portable Document Format	Conveying 3D designs with bend areas and for marketing purposes. This option is available only on Windows platform.
PNG files	`.png`	Portable Network Graphic format	
STL files	`.stl`	STereoLithography file	
STEP files	A CAD file format used to share 3D models (of symbols or designs) between CAD systems.		Conveying 3D designs with bend areas and for engineering purposes.
	`.step`	Standard for the Exchange of Product model data	
	`.stp`		

⚠ For 3D PDF, IGES, and STEP formats, 3D Canvas exports only selected objects. If none of the objects is selected, 3D Canvas exports all the objects that are enabled in *Visibility* and *Symbols* panes.

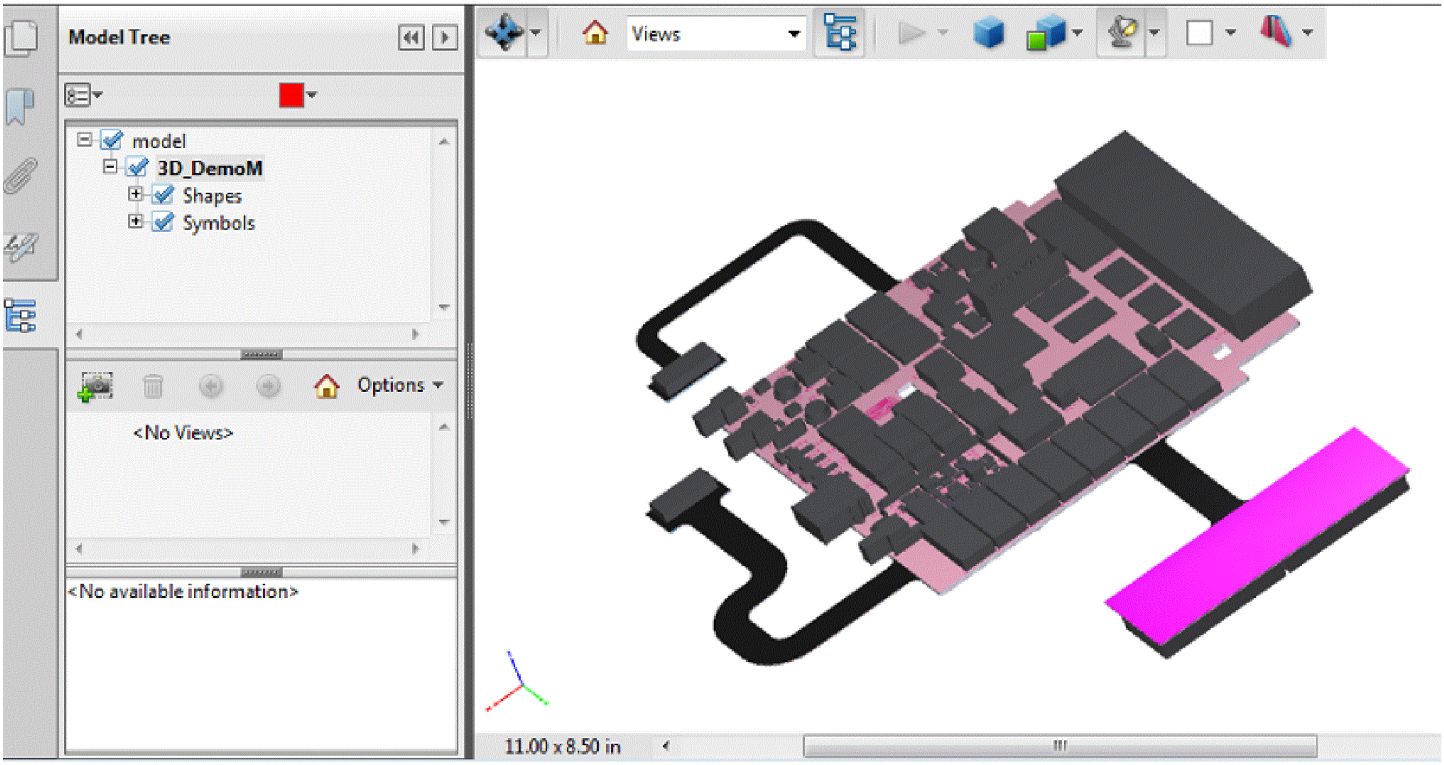
Generating and Viewing 3D PDF

3D PDF is a standard Adobe PDF document that contains interactive 3D CAD data that includes text, 2D graphics, and 3D graphics.

ⓘ Exporting a 3D PDF is supported only on Windows platform.

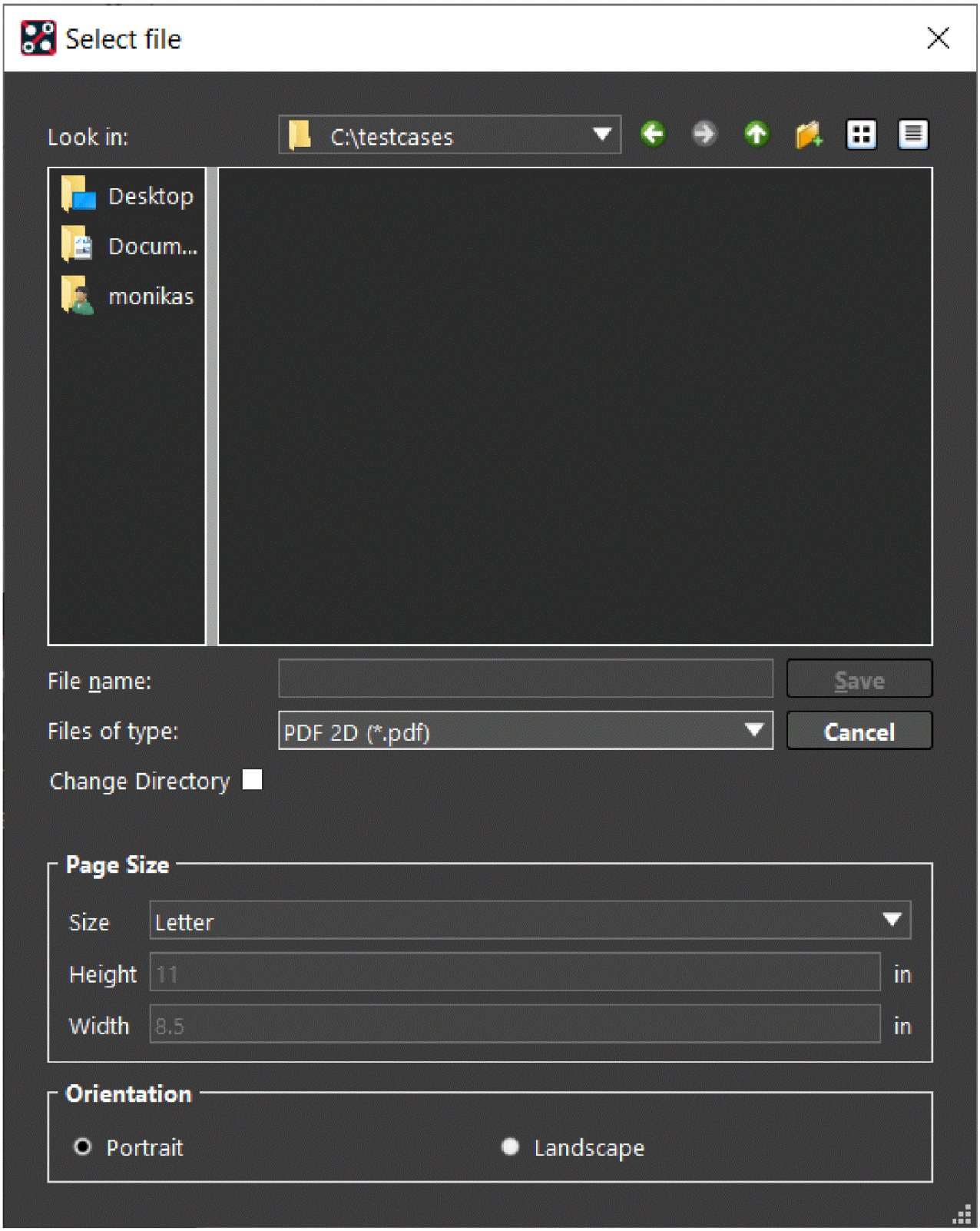
You can view 3D PDF using the free Adobe reader. The images loaded into the Adobe reader can be rotated in the same manner as in any 3D CAD system and lets you view all sides of the board design or an assembly. Additionally, you can enable or disable visibility of different objects of the

design from the tree view available on the left side of the Adobe reader.



Generating 2D PDF

When exporting a 2D PDF, 3D canvas provides additional options to select *Paper Size* and *Orientation*. You can also change the destination directory when saving a 2D PDF.


Select file
Look in:
C:\testcases
Desktop
Docum...
monikas
File name:
Save
Files of type:
PDF 2D (*.pdf)
Cancel
Change Directory
Page Size
Size
Letter
Height
11
in
Width
8.5
in
Orientation
Portrait
Landscape

Controlling 3D Output

Exporting graphical information from complex and dense designs require additional memory and is time consuming. To enhance the user experience, 3D canvas limits the number of child nodes for all the design objects in the exported output. By default, only 1000 child nodes for any design objects are exported from 3D Canvas.

For example, if a design has 2000 pins exporting all of them in a 3D output may cause delay in the export process. With default settings, 3D Canvas shows only the total number of pins under *Pins* node and cannot be selected individually.

You can, however, increase the number of child nodes by setting an environment variable *pcb3d_export_max_children_per_node*. The maximum value of this variable is 5000.

⚠ This environment variable is supported only for 3D PDF, STEP and IGES formats.

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Troubleshooting 3D Canvas

Following is a list of topics that describes troubleshooting issues in 3D Canvas:

- 3D Canvas remains blank
- 3D Canvas and 2D design window are not synchronized
- With the interactive mode enabled, on deleting the boundary shape of a symbol in 2D design window, changes are not reflected in 3D Canvas
- Opening a design in 3D Canvas, some symbols are not displayed
- Unable to rotate the symbol in 3D canvas while optimizing clearance
- Using 3D mice with 3D Canvas
- Shapes set to crosshatch views as solid in 3D Canvas

3D Canvas remains blank

If you see an blank canvas in the viewer for all the designs, set an environment variable *pcb3d_override_driver_type* to one of the following values.

- *3ddriver*
- *opengl*
- *opengl2*

Setting *pcb3d_override_driver_type* overrides the default display driver. You can set the environment variable either in the `PCBENV` directory or at the operating system level. When setting the variable at the system use the following values.

For UNIX:

- *x11*

For Windows:

- *dx9*
- *dx11*
- *msw*

Example

Enter the following in the PCB Editor command window to change the display driver.

```
set pcb3d_override_driver_type=3ddriver
```

⚠ If you face the similar issue, contact Cadence customer support for more information and assistance.

3D Canvas and 2D design window are not synchronized

Enabling and disabling the interactive mode in succession while manipulating objects in 2D design window can result is 3D Canvas being out of sync with the 2D design window, and following message is displayed.

```
Changes to the 2D database may have occurred which are not in the 3D Canvas. Reload 3D Canvas to
resynchronize the information.
```

To resolve this, restart 3D Canvas.

With the interactive mode enabled, on deleting the boundary shape of a symbol in 2D design window, changes are not reflected in 3D Canvas

With interactive mode enabled, on deleting or modifying the boundary shape of a symbol in 2D design window, changes are not reflected dynamically in 3D Canvas.

To view the updated symbol, restart 3D Canvas.

Depending on whether or not a STEP model was associated with the symbol, either the STEP model is displayed, or no symbol is displayed in 3D Canvas.

Opening a design in 3D Canvas, some symbols are not displayed

This may happen if the design contains RF symbols. 3D Canvas does not support displaying 3D models of RF symbols.

Unable to rotate the symbol in 3D canvas while optimizing clearance

3D Canvas does not support the *Rotate* and *Mirror* commands during the move operation.

Besides this, with interactive mode enabled, functions such as thieving, editing symbol properties, modifying stack-up, dynamic pads suppression, and updating STEP models, are also not supported in 3D Canvas.

Using 3D mice with 3D Canvas

For viewing designs and performing tasks in 3D Canvas, use 2D mouse. 3D mice does not work in 3D Canvas.

Shapes set to crosshatch views as solid in 3D Canvas

3D Canvas rendered crosshatch shapes rendered as solid.

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Opening a design in 3D Canvas