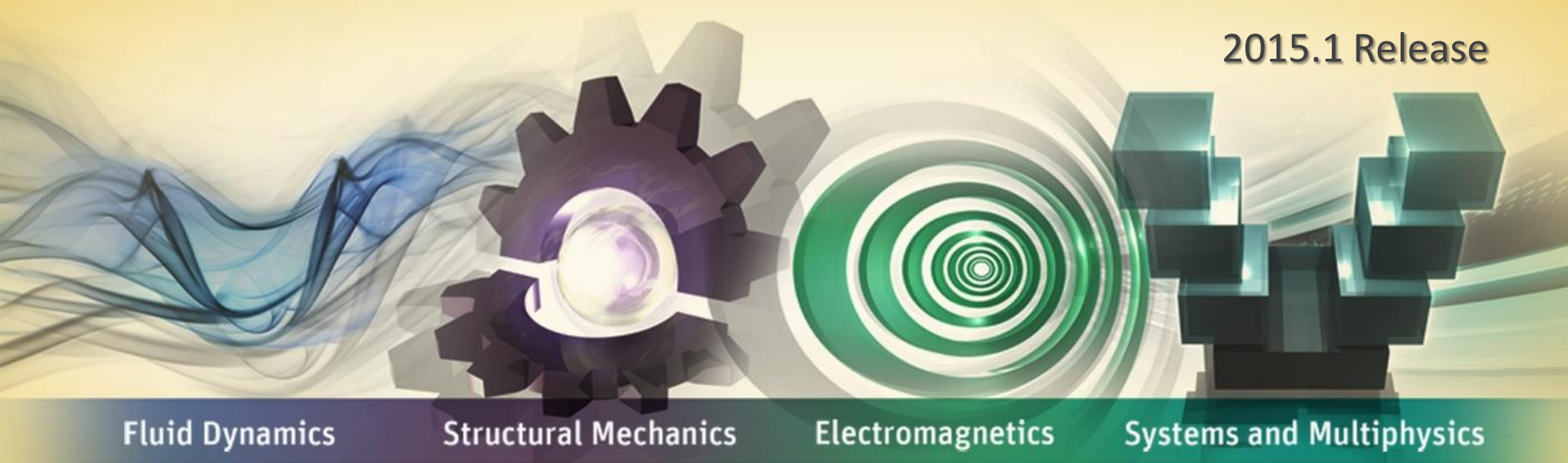


Workshop 6: Package/PCB Merge

2015.1 Release



Introduction to ANSYS SIwave

SIwave PKG on PCB Merge Example

- **Package on PCB Simulation**

- This example shows you how to connect a package onto a PCB for system level simulation
- You will learn how to:
 - Place a package onto a PCB design

- **ANSYS SIwave Design Environment**

- The following features of the ANSYS SIwave Design Environment are used to create this passive device model
 - Pre-processing
 - Merging a package design with a PCB design

Example – Package on PCB

- **Package Rotation Information**

- Package rotation information can be obtained from you layout tool
- Let's assume you are working in Cadence APD/Allegro environment.
 - Click on the package instance on the PCB. The info you will get from Allegro/APD should look like this:

```
LISTING: 1 element(s)

      < COMPONENT INSTANCE >

Reference Designator: U2
Package Symbol:      BGA44_XYZ

Component Class:     IC
Device Type:         X23646-003
Value:               NextGen Package

Placement Status:    PLACED
origin-xy:           (8500.0 -4500.0)
rotation: 0.000 degrees
not_mirrored
```

- Rotation value must be entered in merge GUI dialog later during merge process

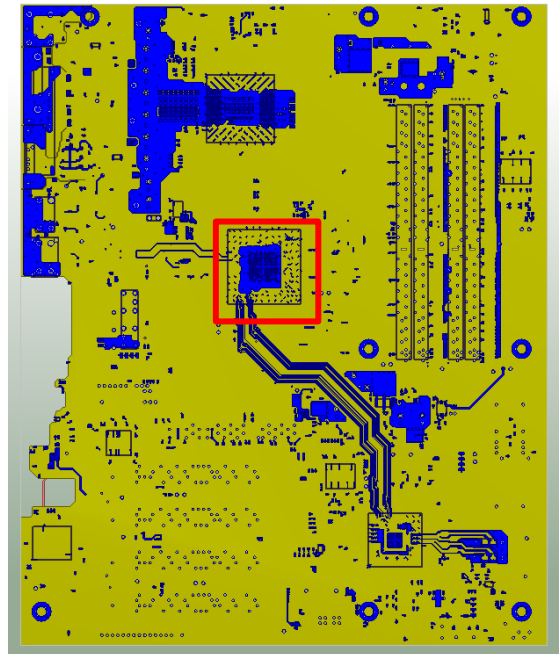
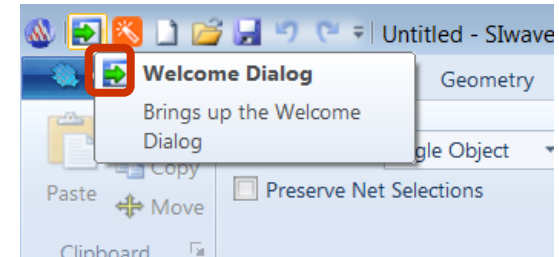
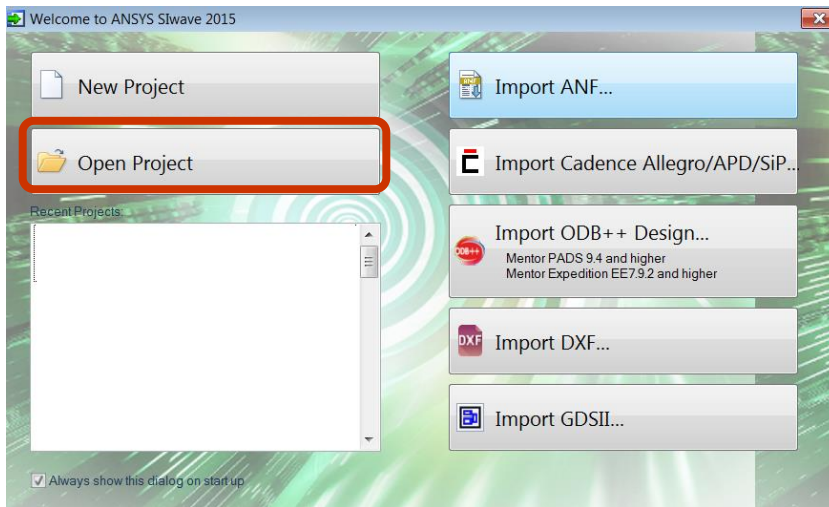
Example – Package on PCB

• Starting Slwave

- To launch Slwave, click the Microsoft **Start** Button, select: **All Programs > ANSYS Electromagnetics > ANSYS Electromagnetics Suite 16.1 > ANSYS Slwave 2015.1**

The Welcome Window will appear

Otherwise click on the Welcome Dialog Button



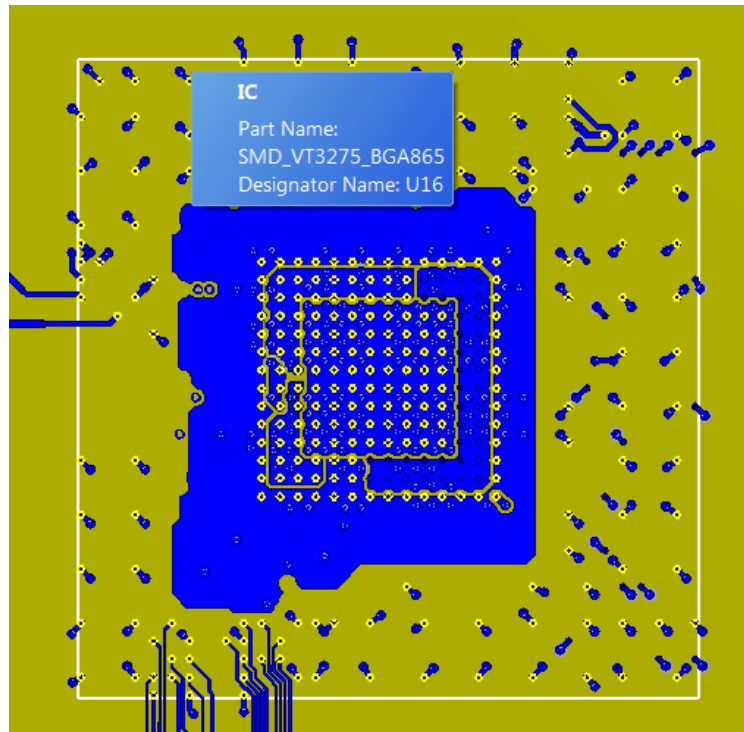
• Open a Slwave Project

- Click the Open Project box
 - Navigate to the training files and choose : **PCB.siw**
- The package footprint is surrounded in red in the image at right

Example – Package on PCB

- **PCB Project**

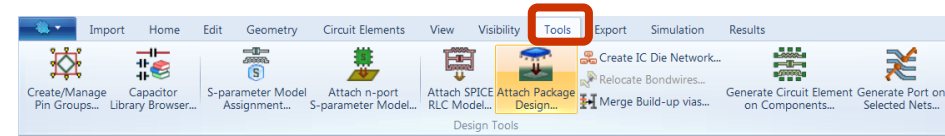
- This is a 4-layer PCB, the package foot print is at the center of the PCB. We will place a 4-layer package at that location.
- Hover the mouse over the package location and note package Part Name
 - Part Name: **SMD_VT3275_BGA865**
 - Designator Name: **U16**
- Package X and Y offset information will be recorded as a part of Designator name
- Rotation values must be put in merge GUI dialog



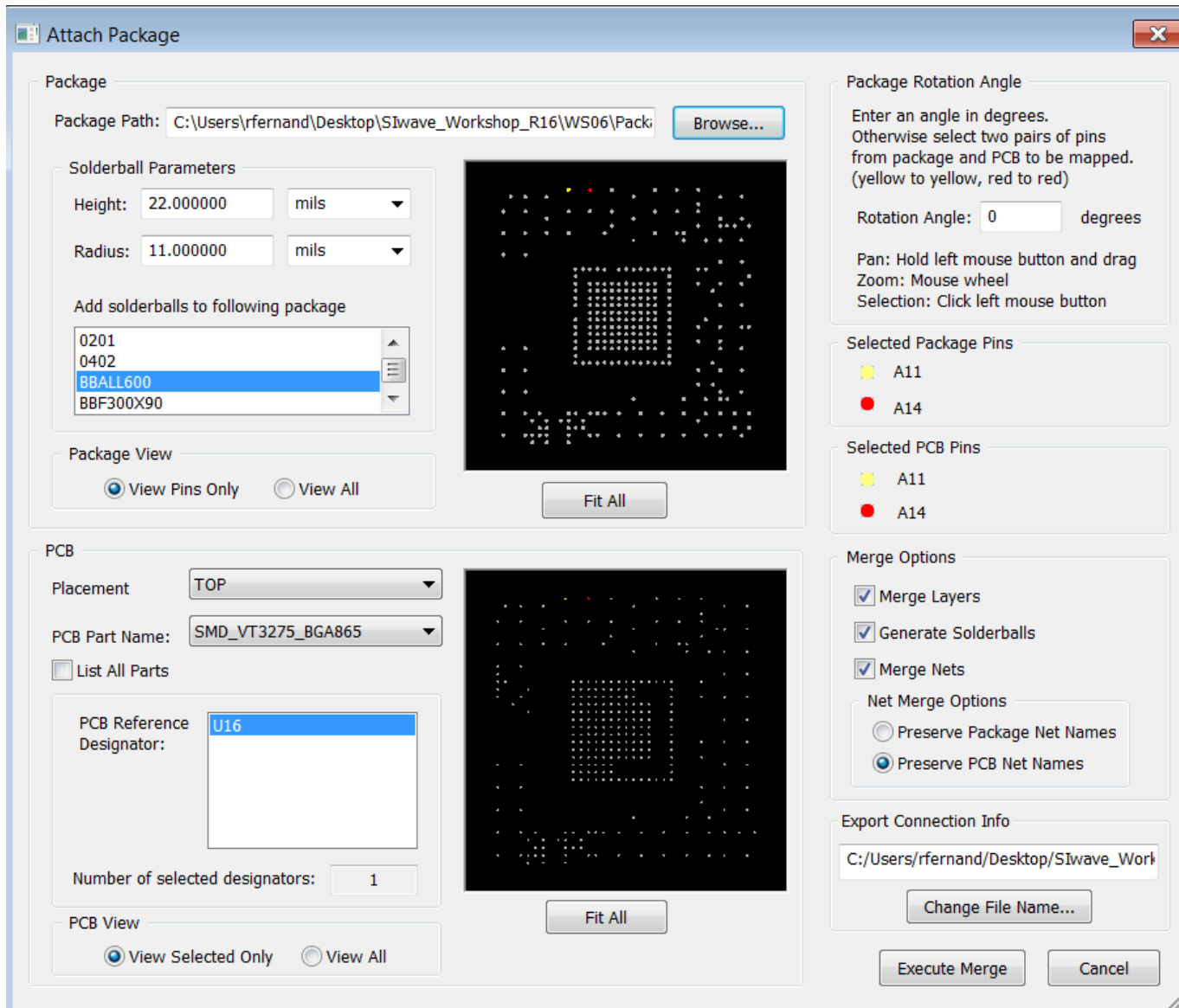
Example – Package on PCB

• Launch Package/PCB Merge Utility

- To launch the Merger utility:
 - From the **Tools** tab, Click **Attach Package Design**
 - Click on the **Browse...** button
 - Browse to the folder that contains **Package.siw** file
 - After highlighting **Pacakge.siw** click **Open**
 - Under PCB Part Name select **SMD_VT3275_BGA865**
 - Under PCB reference designator select and highlight **U16**
- There are two methods of aligning the package:
 - First:
 - Under Package Placement Parameters, select Top and Rotation Angle: **0**
 - Under Merge Options select : **Preserve PCB Net Names**
 - A warning will show up during merge process asking to verify that the angle of rotation is correct, press **Yes** to proceed (After **Execute Merge** button is clicked).
 - Second:
 - Locate two matching pins in both the package and the PCB.
 - Select the pins by clicking on them in the pin map
 - Once selected the GUI will automatically pick the angle
- Under Solderball Parameters at Package Padstack, select **BBALL600**
 - Solderball Height: **22 mils**
 - Solderball Radius: **11 mils**
- Click **Execute Merge**
- Click **Yes** to physically merge the package



Example – Package on PCB



Example – Package on PCB

- **Merge the Package onto the PCB**

- View Merged package on PCB
- You can see that this is a 8-layer design now from the Layers tab of the GUI
- You can perform the different analysis options that are described in workshops 1 to 5 with this merged design.

Note: Only one package can be merged to each side of the PCB, if more then one package is merged to the PCB the second package will be placed on long solderballs that extend through the first packages layers to the PCB.

