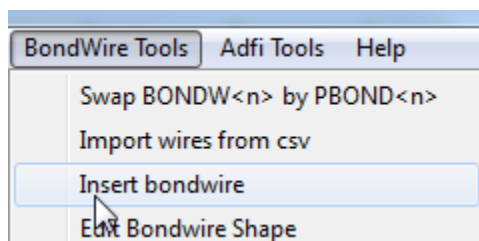


## ***EBOND, EBOND1 to EBOND99, EBondArray1 to EBondArray20, ShapeJedec, Shape... in PBOND\_lib***

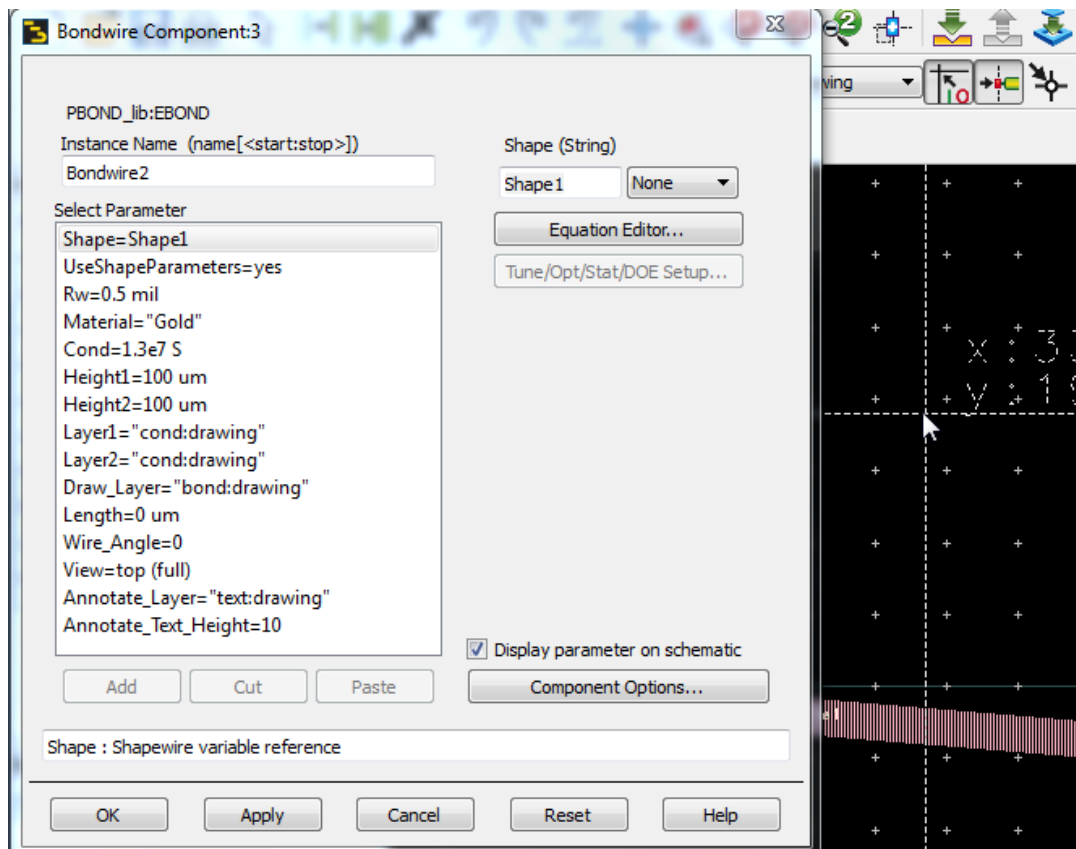
### **EBOND**

The EBOND is a bondwire component similar to SBOND and JBOND for use in ADS Layout and EM simulation only. This component uses a bondwire shape profile instance reference as main input parameter and maintains that profile when transferred to EMPro. The component simulates as a short circuit from schematic.

In Layout you insert these components by using Insert Bondwire command



The command opens the standard component parameter window for the EBOND component and requests to pick a start and end location in the layout.

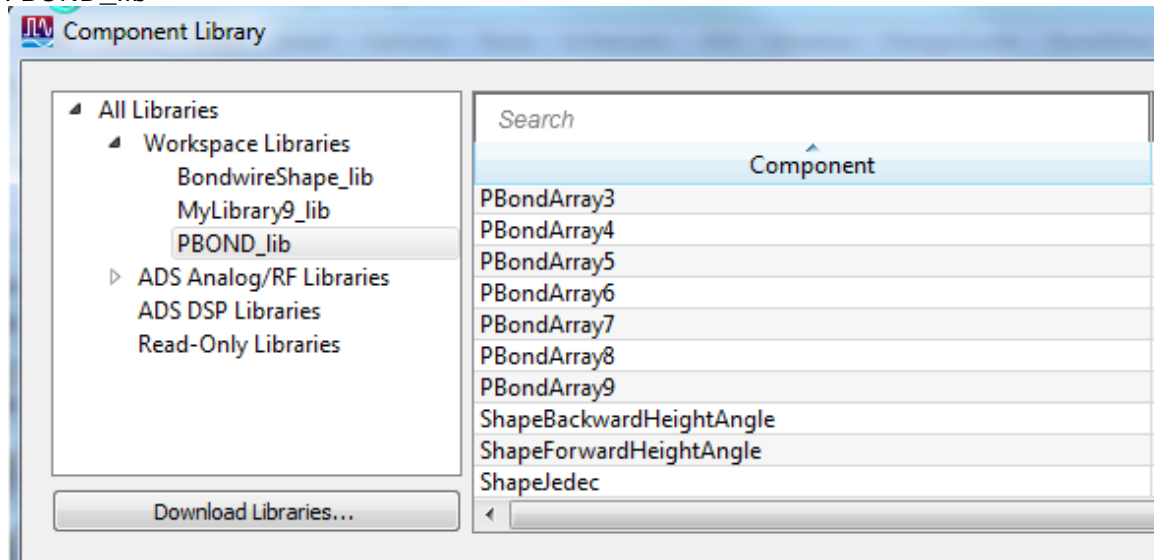


The Shape parameter requires a reference string to the instance name of a profile component defined in the design hierarchy of the current design.

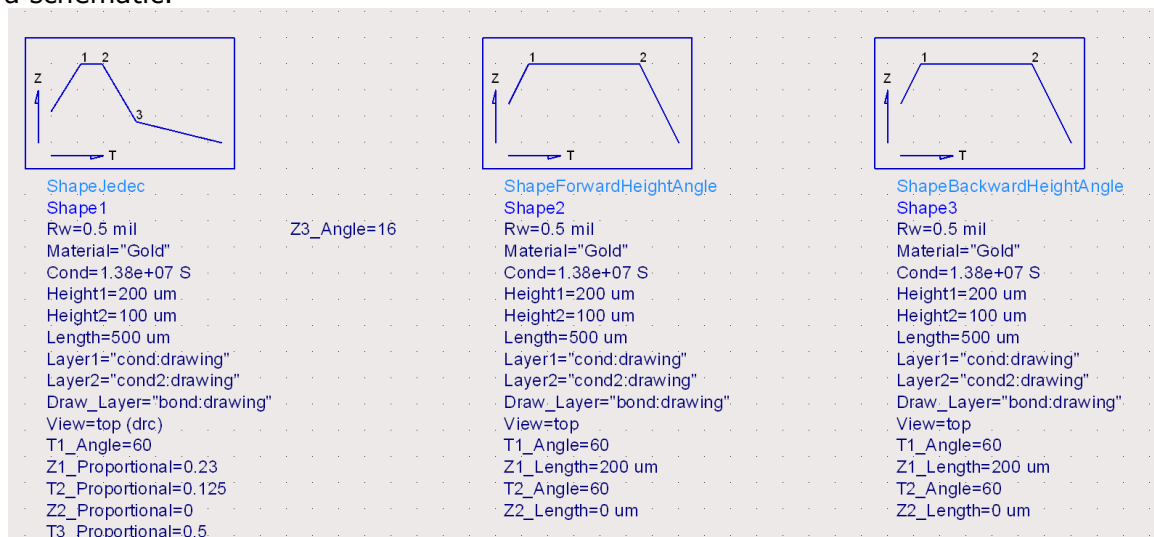
New shape components can be defined by using the EMPro profile editor. Instances of these shape components can be placed in schematic in a similar way like BONDW\_Shape and BONDW\_UserShape for the BONDW and PBOND components.

The PBOND\_lib contains 3 examples shape components: ShapeJedec, ShapeForwardHeightAngle, ShapeBackwardHeightAngle.

Using the component library browser you can find these components in the PBOND\_lib

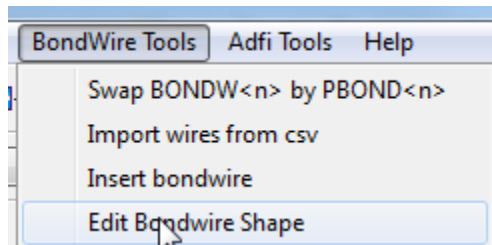


Below you see the symbol representations of these shapes after you insert them into a schematic.



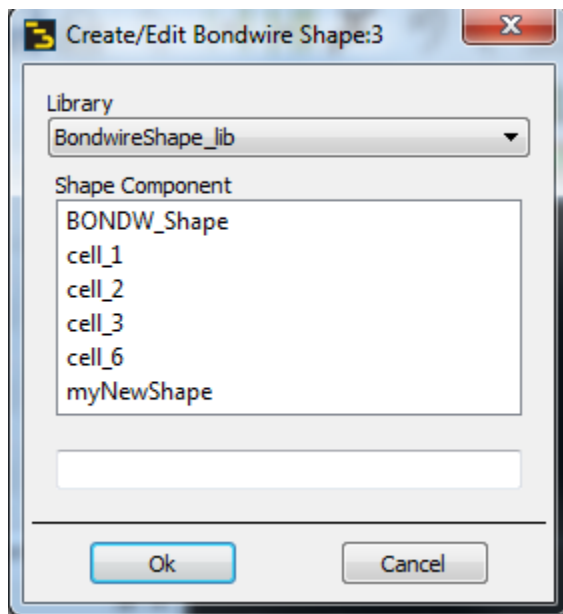
Note: these EMPro based shape components are currently not compatible with the PBOND<n> or PBondArray<n> components. They only work in combination with the PBOND\_lib:EBOND instances.

To define one or more profile shape components that can be used in a similar way to the PBOND\_lib:ShapeJedec component use the Edit Bondwire Shape operation from the BondWire Tools menu.



This opens the Create/Edit Bondwire Shape selection box. From this dialog select an appropriate library from the open list of libraries (writable) and cell name for a new shape component.

For a new shape just type a new name in the entry field and push Ok. To modify the definition of an already existing shape component select the component you want to update from the list.



Note: All open and writable OA libraries can be used as location for these shape components but the library needs to have BondwireUtility\_DKit as parent AEL vocabulary because it requires ael functions only available from that AEL vocabulary. If the library allows this, the library configuration is automatically updated to ensure this. In other cases a popup window requests the user to apply the required update manually.

When a valid shape cell name is selected the Bondwire Profile Definition Editor opens. This allows you to define the number of control points on the profile shape and the default values for their location in the profile part of the box. The bottom part of the window provides a preview of the shape evaluated based on the example length and height difference values. (This is a preview only and is not necessarily providing the real shape of bondwires in an actual design.) The preview window also gives you an indication of the control point you are manipulating in the profile editing part.

**Name:** Default for ShapeBackwardHeightAngle

**Crossection**

**Radius:** 0.5 mil

**Number of Sides:** 6

**Profile**

Horizontal	Hor. Type	Hor. Ref.	Vertical	Vert. Type	Vert. Ref.
60 deg	Angular	Begin	200 um	Length	End
60 deg	Angular	End	0 m	Length	Previous

**Preview**

**Example Length:** 500 um **Height Difference:** 100 um

OK Cancel

The OK button brings up the second part of the definition. The defaults values for the ADS Layout, Schematic and circuit simulation are defined in this step.

Default parameters for ADS shape component:4

Shape Component PBOND\_lib:ShapeBackwardHeightAngle

Component Instance Name Shape

Material (not used, future for 3D EM) Gold

Cond (Conductivity) 1.38e+07 S

Height1 (pin 1 height in circuit simulation) 200 um

Height2 (pin 2 height in circuit simulation) 100 um

Layer1 (pin 1 layer in layout) cond:drawing

Layer2 (pin 2 layer in layout) cond2:drawing

Draw\_layer (drawing layer in layout) bond:drawing

View (wire view in layout) top

Length (default length XY projection) 500 um

Annotate\_Layer (artwork text layer in layout) text:drawing

Annotate\_Text\_Height (artwork text height in layout) 10

C:\Users\mbrunfau\AppData\Local\Temp\43

Ok Cancel

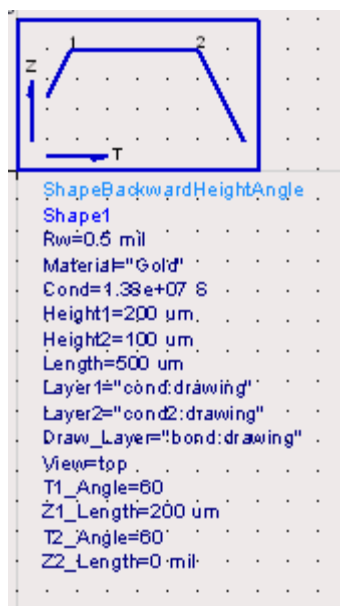
This dialog shows the name of the component the way it is created or updated in the OA library. The next fields allow defining the default values for the other parameters that will be attached to an ADS profile component. These are similar to the bondwire instance based parameters and provide the profile based defaults for the evaluation of a bondwire profile inside the ADS environment.

Name	Description	Units	Default
Component Instance Name	The default prefix for the instances when inserted into a schematic		Shape
Material	(not used, future 3D EM) Material name for bondwire	None	"Gold"
Cond	Conductivity of the bondwire	S	1.38e7
Height1	(for circuit simulation & Layout) pin 1 height	m	200 um
Height2	(for circuit simulation & Layout) pin 2 height	m	100 um
Layer1	(for Layout option) Layer to which the pin 1 is attached	None	cond:drawing
Layer2	(for Layout option) Layer to which the	None	cond2:drawing

	pin 2 is attached		
View	(for Layout option) Determine Top, Side, DRC view in layout	None	top
Length	The default length of a new bondwire if the point based insertion is not used	m	500 um
Annotate_Layer	(for Layout option) Layer for drawing the layout specific bondwire annotation	None	text:drawing
Annotate_Text_Height	(for Layout option) layout specific annotation text height in User Units	None	10

The OK button actually creates or updates the component in the OA library.

To use these shape components which behave like an ADS Variable component, they need to be inserted into the associated schematic of the layout with bondwires, the default schematics of a library or a schematic that will be evaluated in the hierarchical context evaluation of design parameters.

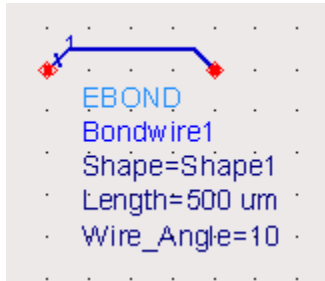


These schematic shape instances don't allow to modify the number of control points on a shape or the way the control points of the shape will behave but you can modify the scaling, length, or angle values for each of the shape profiles control points.

The example above shows a profile instance Shape1 of the PBOND\_lib:ShapeBackwardHeightAngle component. For this shape definition the height of control point 1 in the symbol is referenced against the end point (pin 2 location) of the bondwire. The angle off the front segment has an angle of 60 degrees with respect to pin 1. Control point 2 has a height parameter Z2\_Length which is defined by a fixed length with respect to control point 1. The angle of the end segment from point 2 to the end is defined with pin 2 as reference. This is T2\_Angle. Each control point parameter starts with a T or Z character indicating the

direction it controls. The number after the T or Z is the control point number as shown in the symbol representation. The final Angle, Length or Proportional fragment define if the parameter is representing either an angle, a fixed distance in T or Z direction or distance value proportional to the projected XY length of the wire. Each of these is represented against begin point (pin), end point or the previous control point.

## ***EBOND Symbol***



## ***Parameters***

Name	Description	Units	Default
Shape	Shapewire variable reference		Shape1
UseShapeParameters	Ignore instance parameters and use the Shape parameter values if they exist? If set to yes parameters below are always overruled by the values provided by the Shape setting		Yes
Rw	Radius wire	m	0.5 mil
Material	(not used, future 3D EM) Material name for bondwire	None	“Gold”
Cond	Conductivity of the bondwire	S	1.3e7
Height1	(for circuit simulation & Layout) pin 1 height	m	100 um
Height2	(for circuit simulation & Layout) pin 2 height	m	100 um
Layer1	(for Layout option) Layer to which the pin 1 is attached	None	cond:drawing
Layer2	(for Layout option) Layer to which the pin 2 is attached	None	cond:drawing
Length	Projected length of bondwire from pin1 to pin 2	m	500 um
Wire_Angle	Angle from x axis (Direction: ang<=90 : outward; ang>90 : inward)	deg	0

View	(for Layout option) Determine Top, Side, DRC view in layout		
Annotate_Layer	(for Layout option) Layer for drawing the layout specific bondwire annotation	None	text:drawing
Annotate_Text_Height	(for Layout option) layout specific annotation text height in User Units	None	10
<p>Note 1: Instance based parameters Rw to Annotate_Text_Height only have influence if UseShapeParameters = No or if the profile is not defining that value. A warning message is displayed if you modify one of these instance parameters while UseShapeParameters=Yes.</p> <p>Note 2: Shape instances of BONDW_Shape and BONDW_UserShape also work as profile but cannot be edited or redefined with the bondwire profile editing capability.</p>			

## EBOND1 to EBOND99

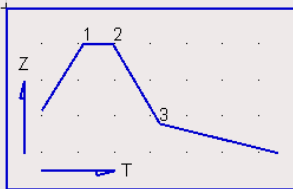
The EBOND<n> components provide prototype bondwire components for Layout, 3D and EM simulations only. These components are equivalent to the PBOND<n> but maintain the EMPro profile definition in a transfer to EMPro. No circuit simulation model is supported when used from a schematic. The profiles that can be used are the same as used by the EBOND component.



## EBondArray1 to EBondArray20

The EBondArray<n> components provide parallel arrays of bondwires for Layout, 3D and EM simulations only. These components are similar to the PBondArray<n> but maintain the EMPro profile definition in a transfer to EMPro. No circuit simulation model is supported from schematic. The profiles are profiles as defined for the EBOND component.





ShapeJedec

Shape1

Rw=0.5 mil

Material="Gold"

Cond=1.38e+07 S

Height1=200 um

Height2=100 um

Length=500 um

Layer1="cond:drawing"

Layer2="cond2:drawing"

Draw\_Layer="bond:drawing"

View=top

T1\_Angle=60

Z1\_Proportional=0.3

T2\_Proportional=0.125

Z2\_Proportional=0

T3\_Proportional=0.5

Z3\_Angle=15

