Ansoft's High Frequency Structure Simulator (HFSS)

Beginner's Tutorial

Part (A), Part (B)





HFSS Beginner's Tutorial

Part (A) of the HFSS Beginner's Tutorial will guide you step by step to the completion of your first HFSS model. In Part (B) you will create a second model that is very similar to the first. The repetition of these steps will help you learn HFSS more quickly. The tutorial becomes less detailed as you proceed. After completion of the HFSS Beginner's Tutorial you will be able to make simple HFSS models. The more you use the software, the easier it will become to build different models.



$$d = 27.765$$

 $b = \frac{9}{2}$
 $C = 65 \text{ cm}$
 $T = 15.5 \text{ cm}$
 $H = 20.7 \text{ cm}$
 $hL = \frac{H}{2}$
 $Er = 4 - j$

1) After opening HFSS, L-click on the **Insert HFSS Design** button () at the top of the screen. Your window should look like the picture below:



2) On the menu bar choose **3D Modeler** ... Units ... and select "cm".

Set Model Units	×
Select units: cm	T
Rescale to new units	
ОК	Cancel

Click OK.

3) On the menu bar choose **Project** . . . **Project Variables** . . . **Add** . . and enter the first variable as seen in the window on the next page.

Add Prop	erty						
Name	a	 ✔ Variable ♥ Value 	O Checkbox O Menu	O Netlist O File Name	C Text C VPoint	C Number C Point	C Separator
Value	24.765 cm						
	Enter a number with units, variable, or expressi	ion into the Value fie	eld. Referenced pr	oject variables sh	ould be prefixed	l with a '\$'. Examp	les: 22.4pF.
				•	•		·····
	\$C1, 2*cos(\$x).				·		

4) You should now see one variable in the Project Variables table.

ies:	Projec	:t1	X							×
t Var	riables	Intrinsic Vari	iables Const	tants						
Valu	ue	O Op	timization	C Tuning	C	Sensitivity	🗢 Statist	ics		
		Name		Value	Unit	Descrip	tion	Read-only	Hidden	
\$	\$a		24.765		cm					
				_				5	Z Show Hidder	n
A	Add		Remove						- onow induct	
								01	1 0	
	ies: tVa Val	ies: Projec Variables Value \$a \$a	ies: Project 1 t Variables Intrinsic Vari Value O Op Name \$a Add	ies: Project1 tVariables Intrinsic Variables Const Value O Optimization Name	ies: Project 1 tVariables Intrinsic Variables Constants Value O Optimization O Tuning Name Value \$a 24.765	ies: Project 1 : Variables Intrinsic Variables Constants Value O Optimization O Tuning O Name Value Unit \$a 24.765 cm	Intrinsic Variables Constants Value Optimization Tuning Sensitivity Name Value Unit Descript \$a 24.765 cm	Intrinsic Variables Constants Value Optimization O Tuning Sensitivity O Statist Name Value Unit Description \$a 24.765 cm	ies: Project 1 tVariables Intrinsic Variables Constants Value Optimization Tuning Sensitivity Statistics Name Value Unit Description Read-only \$a 24.765 cm Image: Constants Image: Constants Add Remove Remove Remove Remove	ies: Project1 Variables Intrinsic Variables Constants Value Optimization Tuning Sensitivity Statistics Name Value Unit Description Read-only Hidden \$a 24.765 cm

5) Click Add again and enter the second variable.

Add Prop	erty						×
Name	b	 ✔ Variable C Value 	C Checkbox C Menu	O Netlist O File Name	C Text C VPoint	C Number C Point	○ Separator
Value	\$a/2						
		inte des Malue Ga	U.D.(Luide - Mt Furne	22 4-F
	Enter a number with units, variable, or expression \$C1, 2*cos(\$x).	i into the Value fie	ia. Hererencea pri	oject variables sr	iouia pe prerixea	i with a '\$". Examp	les: 22.4pr,
						ОК	Cancel

6) Enter the rest of the variables on your own.

operties	: Project1					
Project Va	ariables Intrinsic Vari	iables Constants				
⊙ Va	alue C Op	timization C Tuning	C	Sensitivity 🔿 Statist	ics	
	Name	Value	Unit	Description	Read-only	Hidden
	\$a	24.765	cm			
	\$Ь	\$a/2				
	\$c	65	cm			
	\$r	15.5	cm			
	\$H	20.7	cm			
	\$hl	\$H/2				
	Add	Remove			V	Show Hidden
					ОК	Cancel

- 7) L-click on the Draw Box button (). Now L-click on the graph at 3 different points to make a box of any size.
- 8) If this is done correctly, a dialogue window will open. Enter the following dimensions for the box:

perties	: Project1 - HFSSM	lodel1 - 3D Modeler		
ttribute	Command			
	Name	Value	Unit	Description
	Command	CreateBox		
	Coordinate System	Global		
	Position	-\$b/2 , -\$a/2 , \$H		
	XSize	\$b		
	YSize	\$a		
	ZSize	\$c		
				🦳 Show Hidden
				OK Cancel

Click OK.

Type **Ctrl-D**. You should see a box like the one on the next page.



8) L-click on your box. It should be highlighted in purple like the picture above. This lets the user know that an object has been selected. R-click on the box and choose **Edit...Properties**... under the **Attribute** tab, click on the button with a "0" to change the **Transparency** of your box. Set the Transparency to 0.75.

Name	Value	Unit	Description	Read-only
Name	Box1			
Material	vacuum	22		
Solve Inside				
Orientation	Global			
Model		1		
Display Wireframe				
Color	Edit			
Transparent	0			
Set Tra	insparency	×		
	0.7	5		

Click **OK** twice.

9) L-click on the Draw Cylinder button (). L-click on the graph at 3 different points to make a cylinder of any size. Enter the dimensions seen below.

Command Coordinate System Center Position Axis Badius	CreateCylinder Global 0,0,0	cm	
Coordinate System Center Position Axis Badius	Global 0,0,0	cm	
Center Position Axis Badius	0,0,0	cm	
Axis Badius	7		
Badius	2		
riddids	\$r		
Height	\$H		

Click OK. Type Ctrl-D.

- 10) L-click on the new cylinder to select it. R-click on the cylinder and select **Edit . . . Properties . . .** under the **Attribute** tab, change the **transparency** to 0.75, just like with the box.
- When you are finished changing the cylinder's transparency, L-click on the Draw Cylinder button (
 D. L-click on the graph at 3 different points to make a second cylinder. Enter these dimensions:

Proper	Properties: Project1 - HF55Model1 - 3D Modeler								
Comm	nand Attribute								
,	-								
	Name	Value	Unit	Description					
	Command	CreateCylinder							
	Coordinate System	Global							
	Center Position	0,0,0	cm						
	Axis	Z							
	Radius	\$r							
	Height	\$hl							
				Show Hidden					
				OK Canc	el				

Click **OK**. Type **Ctrl-D**. 12) Select the second smaller cylinder with a L-click. Now, R-click on the cylinder and select Edit... **Properties...** under the **Attribute** tab, change the transparency to 0.50. Now you should see that the small cylinder is inside the large cylinder.



- 13) Now we will change the name of the smaller cylinder. Select the second, smaller cylinder again. Rclick on the cylinder and select **Edit . . . Properties . . .** under the Attribute tab, change the name from "cylinder2" to "Sample". Click **OK**.
- 14) Now we will change the material inside the smaller cylinder. Select the second, smaller cylinder one more time. R-click on the cylinder and select Edit ... Properties ... under the Attribute tab, click the "vacuum" button. Choose Add Material ... in the new window. Enter "load" as the new material name, and change the "relative permittivity" and the "dielectric loss tangent" to 4 and 0.25, respectively. See picture on the next page.

lect I	Definition			Viev	w / I	Edit Material			
Mater	rials Material Filters			M	lateri bad	al Name			
Se Se	Search by Name Search Ci			Prop	perties of the Materials Mate	rial1			
	I		Belative			Name	Туре	Value	Units
Search				Relative Permittivity	Simple	4			
						Relative Permeability	Simple	1	
		Name	Loca			Bulk Conductivity	Simple	0	Siemens/m
	T (0, 0, 0, 0)		0.17			Dielectric Loss Tangent	Simple	0.25	
	l effon (tm)		SysLibrar			Magnetic Loss Tangent	Simple	0	
	tetion_based		SysLibrar			Magnetic Saturation	Simple	0	Gauss
	tin		SysLibrar			Lande G Factor	Simple	2	
	titanium		SysLibrar			Delta H	Simple	0	Oe
	tungsten		SysLibrar						
	vacuum		Project						
	vacuum		SysLibrar						
	water_distilled		SysLibrar						
	water_fresh		SysLibrar						
	water_sea		SysLibrar						
	zinc		SysLibrar						
∎			1						
Vie	ew/Edit Materials	Add Mater	ial			Set Frequenc	cy Depende	ency	
			_			Reset	OK	Can	cel

Click **OK** 3 times.

15) Now we will join the large cylinder and the box into one object. Select the large cylinder. Now hold Ctrl and L-click on the box to select both the large cylinder and the box simultaneously. Your model should look like the one below.



- 16) R-click on the box and choose Edit...Boolean...Unite. Now the large cylinder and box are one object instead of two.
- 17) Let us change the name of the united object. Select the united object. R-click on it and select Edit . . . Properties . . . under the Attribute tab change the name from "cylinder1" to "Chassis".
- 18) Now click on the graph so that nothing is selected and your model looks like the one below.



19) Now we will assign boundaries to the faces of our model. Choose "Face" instead of "Object" on the Selection Mode pull down tab as seen below.

9 🖯		Δ Ο	0 #	9	Γ
•	S	Object	•	* :	t
	Mode	Object			
14		Face			
	י 🔁 '	Edge			
		Vertex			
	_			£	

20) L-click on the Select by Name button (().

21) In the new window choose Chassis and use Ctrl-L-click to choose all faces shown below. As you select the faces, they will be highlighted in purple on the graph.

Select Face	×
Object name: chassis sample	Face ID: Face10 Face11 Face12 Face35 Face36 Face37 Face7 Face9
OK	Cancel

Click OK.

- 22) R-click on the highlighted Chassis and choose Assign Boundary ... Perfect E. Click OK.
- 23) Click on the graph so that nothing is selected. L-click on the Select by Name button (
- 24) In the new window choose Chassis and the face shown below.

Select Face	×
Object name:	Face ID:
chassis sample	Face10 Face11 Face12 Face35 Face36 Face37 Face7 Face9
ОК	Cancel

Click OK.

- 25) R-click on the highlighted face of the Chassis and choose Assign Excitation . . . Wave Port. Click Next \rightarrow Next \rightarrow Finish to create the wave port.
- 26) Click on the Add Solution Set Up button (26). Change the Solution Frequency to 915 MHz.

Solution Setup	×
General Advanced Ports Defaults	
Solution Frequency: 915 MHz 💌	
E Coluz Both Only	
Solve Ports Uniy	
Adaptive Solutions	
Maximum Number of Passes: 3	
Maximum Delta S Per Pass: 0.02	
Lise Defaults	
ОК С	ancel

27) Choose the Add Sweep button (). Click OK in the new window.

28) Now fill out the **Edit Sweep** Window as shown:

Click OK.

C Discrete	DC Extrapolation Options
 Fast 	Minimum Solved Frequency 0.1 GHz
○ Interpolating	Snap Magnitude to 0 or 1 at DC
Error Tolerance 0.5 %	Snapping Tolerance 0.01
Max Solutions 20	Time Domain Calculation
Type: Linear Count	
Start 800 MHz Image: MHz <t< td=""><td>Display >></td></t<>	Display >>
Start 800 MHz Stop 1050 MHz Count 100	Display >>

29) Click the Validate button (29). If no mistakes were made, a window will appear, just as the one below. You must correct your model now, if you have made a mistake.

Validation Check: jimmya - HF55Model1	X
Validation Check completed.	 3D Model Boundaries and Excitations Mesh Operations Analysis Setup Optimetrics Radiation
Abort Close	

Click Close.

- 30) If you have not saved the HFSS model, you should now. Goto the menu bar and choose File ... Save.
- 31) Click on the Analyze button (). This analysis will take about 2 minutes. Save your model again after analysis.
- 32) Goto the menu bar and select **HFSS**...**Results**...**Create Report**. Click OK in the new window. Another window will open and you should click Add Trace so that the window looks like the one below.

🛦 Traces		
I Freq d	Y B(S(WavePort1,WavePort1))	Y1 Add BlankTrace Hemove Trace Remove All Traces
Context Design: HFSSModel1 Solution: Setup1 : Sweep1 Domain: Sweep TDR Options	Sweeps X Y Category: Quantity: Variables Output Variables SParameter Y Parameter Y Parameter VSWR Gamma Port Zo	Port1.WavePort1) ang ang_rad dB im mag re
Output Variables	Add Trace	Set Terminations Replace Trace
App	Done	Cancel

Click Done and the following graph will appear.



- 33) Now we will try to see how the electric field is distributed inside the Chassis. Click on the Draw Line button ().
- 34) When the window below opens, click yes.



When you create a non-model object, HFSS is able to use the previous solution, because no materials are assigned to non-model objects.

35) We will define a line from the origin of the graph to the top of the Chassis congruous with the Z-axis. L-click on the origin of the graph.



- 36) Your line will look like the picture at the top left of this page right now. Move the cursor so that your line is congruent with the Z-axis. Your line will turn a light blue color like the picture at the top right of this page. Move the cursor so that the line ends at the top of the Chassis. When your line is positioned correctly it will look exactly like the picture at the top right of this page. Notice the circular dot at the endpoint of the line. This indicates that you are centered with the top face of the top of the Chassis. To complete the line double L-click. An **attributes** window opens. Click **OK**.
- 37) Click on the Select by Name button ((S)). Choose Polyline 1.

Select Object	×
Name:	
Polyline1 sample	_
OK	Cancel

38) R-click on the graph and choose Plot Fields ... Mag_E.

Create Field P	lot		×
Name:	Mag_E1	Fields Calculat	or
	🔲 Specify Name	Category: Standard	V
Design:	HFSSModel1	Quantity	In Volume
Solution: Plot Folder: Intrinsic Va Freq Phase	Setup1 : LastAdaptiv E Field Specify Folder ariables 0.915GHz Odeg Save As Default	Mag_E Mag_H Mag_Jvol Mag_Jsurf ComplexMag_E ComplexMag_Jvol ComplexMag_Jsurf Vector_E Vector_H Vector_H Vector_Jvol Vector_Jsurf Vector_Sarf Vector_SAR Average_SAR	All chassis sample AllObjects
<u> </u>) Done Cancel	

Click Done.

39) Go to the menu bar and select View . . . Coordinate System . . . Hide. Now we can see our line clearly.



40) We will create a graph for the line. (Electric Field vs. Normalized Distance from the bottom of the Chassis to the top.) Go to the menu bar and select HFSS ... Results ... Create Report. In the new window change Report Type to "Fields".

Create Report		X
Target Design:	HFSSModel1	7
Report Type:	Fields	•
Display Type:	Rectangular Plot	•
0	K Cancel	

Click OK.

41) In the new window click **Add Trace**. Click **Done**.



Notice that the wave propagates periodically at the top of the Chassis until it reaches the Sample, where the energy is dissipated.

42) To return to our model, go to the menu bar and select Window . . . 1 (the name of your file will be here).



44) Click on the Select by Name button ((S)). Choose sample and Face 46.





45) R-click on the graph and select Plot Fields . . . Mag_E. In the new window click Done.



This concludes Part (A) of the HFSS Beginner's Tutorial. Save your file and exit the program.



- 1) Open HFSS. L-click on the **Insert HFSS Design** button (
- 2) On the menu bar choose **3D Modeler** ... Units ... and select "cm".

Set Model Units	×
Select units:	
Rescale to new units	
OK Cancel	

3) On the menu bar choose **Project . . . Project Variables . . . Add** . . . and follow the directions to add all variables that are in the table below.

Name	Value	Unit	Description	Read-only	Hidden
\$a ¢⊾	24.760	cm			
30	\$a/2				
\$C	/3.8/6	cm			
\$1	15.235	cm			
\$H	121.87	cm			
\$hg	\$H-\$b-30.47 cm				
\$hl	20.31	cm			
φrii	20.31	Cill			

4) L-click on the Draw Box button (). Now L-click on the graph at 3 different points to make a box. Enter the following dimensions.

roperties	: Project1 - HFSSM	1odel1 - 3D Modeler			×
Attribute	Command				
_					
	Name	Value	Unit	Description	
	Command	CreateBox			
	Coordinate System	Global			
	Position	0cm , -\$a/2 , \$hg			
	XSize	\$c			
	YSize	\$a			
	ZSize	\$b			
				🔲 Show Hidden	
				OK Cance	el .

Click **OK**. Type **Ctrl-D** to see your new box.



5) Select the box and change the **Transparency** to 0.75 as illustrated below.

Name	Value	Unit	Description	Read-only
Name	Box1			
Material	vacuum			
Solve Inside				
Orientation	Global			
Model				
Display Wireframe				
Color	Edit			
Transparent	0			
Set Tra	nsparency	×		
	0.75	-		-

6) L-click on the Draw Cylinder button (). L-click on the graph at 3 different points to make a cylinder. Enter these dimensions:

Name	Value	Unit	Description
Command	CreateCylinder		
Coordinate System	Global		
Center Position	0,0,0	cm	
Axis	Z		
Radius	\$r		
Height	\$H		

Click **OK**. Type **Ctrl-D**.

- 7) Change the new cylinder's transparency to 0.75, just like with the box.
- 8) Draw another cylinder with the following dimensions:

Name	Value	Unit	Description
Command	CreateCylinder		
Coordinate System	Global		
Center Position	0,0,0	cm	
Axis	Z		
Radius	\$r		
Height	\$hl		

Type **Ctrl-D**. Your graph should look like the one below.



9) Select the second smaller cylinder. R-click on it and select **Edit . . . Properties** This time we will change the transparency, name, and material all at once. Change the transparency to 0.50, the name from "cylinder2" to "Sample", and the material according to the window below.

late	rial Name				
oad					
Pro	perties of the Materials Mate	rial1			Filter Properties by
	Name	Туре	Value	Units	Ansoft Products
F	Relative Permittivity	Simple	3.6		All products
	Relative Permeability	Simple	1		✓HFSS
F	Bulk Conductivity	Simple	0	Siemens/m	
F	Dielectric Loss Tangent	Simple	0.19/3.6		
	Magnetic Loss Tangent	Simple	0		
	Magnetic Saturation	Simple	0	Gauss	
	Lande G Factor	Simple	2		
	Delta H	Simple	0	Oe	
					Select Ansoft Product
	Set Frequen	cy Depende	ency		Validate Now

Click **OK** 3 times.

10) Now we will join the large cylinder and the box into one object. Select both the large cylinder and the box simultaneously. R-click on the box and choose Edit...Boolean...Unite. Your model will change from left to right as follows:



- 11) Change the name of the united object from "cylinder1" to "Chassis".
- 12) Now we will assign boundaries to the faces of our model. Click on the graph so that nothing is selected. Choose "Face" instead of "Object" on the Selection Mode pull down tab as seen below.

9 🖯		۵	0	0	₽	٩	F
•	S	Obj	ject		•	* ::	t
	Mode	ОЬј	iect			7	-7
		Fac	e				
- <u>-</u>	י ح _	JEdg	je		- K	-4	
	E(Ver	tex		-		
	_	: (7	<u> </u>	4	

- 13) L-click on the Select by Name button (\bigcirc).
- 14) In the new window choose Chassis and use Ctrl-L-click to choose all faces highlighted in the picture on the next page.



- 15) R-click on the highlighted Chassis and choose Assign Boundary ... Perfect E. Click OK.
- 16) L-click on the Select by Name button (
- 17) In the new window choose Chassis and Face 12.

Select Face	×	
Object name: Chassis Sample	Face ID: Face11 Face35 Face36 Face37 Face7 Face8 Face9	
ОК	Cancel	HHA

Click OK.

- 18) R-click on the highlighted face of the Chassis and choose Assign Excitation . . . Wave Port. Click Next \rightarrow Next \rightarrow Finish to create the wave port.
- 19) To visualize the different face assignments, go to the menu bar and choose HFSS . . . Boundary Display (Solver View). Check the following two visibility boxes in the new window.

PerfE1	User Defined	Visible to solver.	~	
WavePort1	User Defined	Visible to solver.		
outer	Default	Overridden by other boundaries. Invi		
r	Default	Overridden by other boundaries. Invi		

Now your graph should look like the one below.



Click Close and the colors will disappear.

20) Click on the Add Solution Set Up button (🖉). Change the Solution Frequency to 915 MHz.

olution Setup	1
General Advanced Ports Defaults	
Solution Frequency: 915 MHz 💌	
Solve Ports Only	
Adaptive Solutions	
Maximum Number of Passes: 3	
Maximum Delta S Per Pass: 0.02	
Use Defaults	
	ancel

- 21) Choose the Add Sweep button (). Click OK in the new window.
- 22) Now fill out the Edit Sweep Window:

O Discrete	DC Extrapolation Options Extrapolate to DC
 Fast 	Minimum Solved Frequency 0.1 GHz
C Interpolating	Snap Magnitude to 0 or 1 at DC
Error Tolerance 0.5 %	Snapping Tolerance 0.01
Max Solutions 20	Time Domain Calculation
Frequency Setup	Frequency
Type: Linear Count 💌	
Start 800 MHz 💌	Display >>
Start 800 MHz Stop 1050 MHz	Display >>
Start800MHzStop1050MHzCount100	Display >>

Click OK.

- 23) Click the **Validate** button (23), to check your work.
- 24) Save your model. Click on the **Analyze** button (). Allow the computer to work for 5 minutes and then save your model again.
- 25) Goto the menu bar and select **HFSS**...**Results**...**Create Report**. Click OK in the new window. Another window will open and you should choose **Add Trace** so that the window looks like the one below.

🛦 Traces			<u>_0×</u>
Y Freq	Y dB(S(WavePort1,WavePort1))	Y1	Add Blank Trace Remove Trace Remove All Traces
Context Design: HFSSModel1 Solution: Setup1 : Sweep1 Domain: Sweep TDR Options	Sweeps X Y Category: Category: Variables Output Variables S Parameter Y Parameter Z Parameter VSWR Gamma Port Zo	Quantity: S(WavePort1,WavePort1)	Function: ang ang_rad dB im mag re
Output Variables		Set T Add Trace Replace Trace	erminations
A	pply Done	Cancel	

Click Done and the following graph will appear.



- 46) Now we will try to see how the electric field is distributed inside the Chassis. Click on the Draw Line button (
- 47) When the window below opens, click yes.



48) We will define a line from the origin of the graph to the top of the Chassis congruous with the Z-axis. L-click on the origin of the graph.



- 49) Define your line as shown above. Remember to double L-click to create the endpoint for the line.
- 50) Click on the Select by Name button (). Choose Polyline 1.

Select Object	×
Name: chassis Polyline1	
sample	
OK	Cancel

- 51) R-click on the graph and choose **Plot Fields . . . Mag_E**. In the new window click **Done**.
- 52) Go to the menu bar and select View . . . Coordinate System . . . Hide. Now we can see our line clearly.



53) We will create a graph for the line. (Electric Field vs. Normalized Distance from the bottom of the Chassis to the top.) Go to the menu bar and select HFSS ... Results ... Create Report. In the new window change Report Type to "Fields".

Create Report		×
Target Design:	HFSSModel1	Y
Report Type:	Fields	•
Display Type:	Rectangular Plot	•
01	< Cancel	

Click OK.

54) In the new window click **Add Trace**. Click **Done**.



Compare this graph with the one from Part (A). The waveguide in this model merges into the resonating chamber from the side.

- 55) To return to our model, go to the menu bar and select Window . . . 1 (the name of your file will be here).
- 56) Change the **Selection Mode** to **Face**.

0		۵	O	0	Ħ	9	F
-	S	ОЬ	ject		•	t :	t
-	Mode	Obj	ject		_	4	-2
1 1		Fac	e				
	-	Edg	je			-4	
		Ver	tex		-		
	_	i		17	5,	L.,	

57) Click on the Select by Name button (S). Choose sample and Face 46.





58) R-click on the graph and select **Plot Fields ... Mag_E**. In the new window click Done.



59) We will create one more line. Click on the Draw Line button (1).

- 60) Define a line through the center of the wave-guide starting at the center of the front face of the waveguide and ending at the back of the Chassis. See picture below.
- 61) Click on the Select by Name button ((S)). Choose Polyline 2.
- 62) R-click on the graph and choose Plot Fields ... Mag_E. In the new window click Done.



63) We will create a graph for the line. (Electric Field vs. Normalized Distance) Go to the menu bar and select HFSS . . . Results . . . Create Report. In the new window change Report Type to "Fields".

Create Report		×
Target Design:	HFSSModel1	~
Report Type:	Fields	•
Display Type:	Rectangular Plot	•
	Cancel	

Click OK.

64) In the new window make sure you choose Polyline 2, and then click Add Trace. Click Done.



This concludes the HFSS Beginner's Tutorial. Save your file and exit the program. Good Luck with your modeling!

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易迪拓培训课程列表: http://www.edatop.com/peixun/rfe/129.html



射频工程师养成培训课程套装

该套装精选了射频专业基础培训课程、射频仿真设计培训课程和射频电 路测量培训课程三个类别共 30 门视频培训课程和 3 本图书教材; 旨在 引领学员全面学习一个射频工程师需要熟悉、理解和掌握的专业知识和 研发设计能力。通过套装的学习,能够让学员完全达到和胜任一个合格 的射频工程师的要求…

课程网址: http://www.edatop.com/peixun/rfe/110.html

ADS 学习培训课程套装

该套装是迄今国内最全面、最权威的 ADS 培训教程,共包含 10 门 ADS 学习培训课程。课程是由具有多年 ADS 使用经验的微波射频与通信系 统设计领域资深专家讲解,并多结合设计实例,由浅入深、详细而又 全面地讲解了 ADS 在微波射频电路设计、通信系统设计和电磁仿真设 计方面的内容。能让您在最短的时间内学会使用 ADS,迅速提升个人技 术能力,把 ADS 真正应用到实际研发工作中去,成为 ADS 设计专家...



课程网址: http://www.edatop.com/peixun/ads/13.html



HFSS 学习培训课程套装

该套课程套装包含了本站全部 HFSS 培训课程,是迄今国内最全面、最 专业的 HFSS 培训教程套装,可以帮助您从零开始,全面深入学习 HFSS 的各项功能和在多个方面的工程应用。购买套装,更可超值赠送 3 个月 免费学习答疑,随时解答您学习过程中遇到的棘手问题,让您的 HFSS 学习更加轻松顺畅…

课程网址: http://www.edatop.com/peixun/hfss/11.html

CST 学习培训课程套装

该培训套装由易迪拓培训联合微波 EDA 网共同推出,是最全面、系统、 专业的 CST 微波工作室培训课程套装,所有课程都由经验丰富的专家授 课,视频教学,可以帮助您从零开始,全面系统地学习 CST 微波工作的 各项功能及其在微波射频、天线设计等领域的设计应用。且购买该套装, 还可超值赠送 3 个月免费学习答疑…



课程网址: http://www.edatop.com/peixun/cst/24.html



HFSS 天线设计培训课程套装

套装包含 6 门视频课程和 1 本图书,课程从基础讲起,内容由浅入深, 理论介绍和实际操作讲解相结合,全面系统的讲解了 HFSS 天线设计的 全过程。是国内最全面、最专业的 HFSS 天线设计课程,可以帮助您快 速学习掌握如何使用 HFSS 设计天线,让天线设计不再难…

课程网址: http://www.edatop.com/peixun/hfss/122.html

13.56MHz NFC/RFID 线圈天线设计培训课程套装

套装包含 4 门视频培训课程,培训将 13.56MHz 线圈天线设计原理和仿 真设计实践相结合,全面系统地讲解了 13.56MHz 线圈天线的工作原理、 设计方法、设计考量以及使用 HFSS 和 CST 仿真分析线圈天线的具体 操作,同时还介绍了 13.56MHz 线圈天线匹配电路的设计和调试。通过 该套课程的学习,可以帮助您快速学习掌握 13.56MHz 线圈天线及其匹 配电路的原理、设计和调试…



详情浏览: http://www.edatop.com/peixun/antenna/116.html

我们的课程优势:

- ※ 成立于 2004 年, 10 多年丰富的行业经验,
- ※ 一直致力并专注于微波射频和天线设计工程师的培养,更了解该行业对人才的要求
- ※ 经验丰富的一线资深工程师讲授,结合实际工程案例,直观、实用、易学

联系我们:

- ※ 易迪拓培训官网: http://www.edatop.com
- ※ 微波 EDA 网: http://www.mweda.com
- ※ 官方淘宝店: http://shop36920890.taobao.com

专注于微波、射频、大线设计人才的培养 **房迪拓培训** 官方网址: http://www.edatop.com

淘宝网店:http://shop36920890.taobao.cor