

Solving for Voltages manually using Solaria/SolariaPCB

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Change to the PCB>Edit Trace dialog

- First select a trace in the PCB>Edit Trace dialog
- Next hit Send Trace to Solaria
- The standard Merge Models dialog will come

<u> </u>					
Merge Models					
_ Incoming Obje	ct Translation	Current Object XYZ Span			
0.00	Translate object X	19			
0.00	Translate object Y	9			
0.00	Translate object Z	0			
Grab and Group Control					
1 Entire Model					
Help					
Apply	Cancel				



Edit Trace					
🔽 Include trace	in voltage sol	ution S	elect Trace		ок
Trace width	0		3552 💌		Save Data
% Coverage	100				Clear Data
Trace Type Electrical Current	Filled area tra Source/Sink	ce La Points For Fi	ayer= 3 illed Trace Heal	ting –	Select Trace
Positive for Curren	nt Source, ne	gative for Cu	irrent draw	_	
No. Current	X	Y	Selected		
1 -5	15.973	2.019189			
					Select location
	-1		- 1		
Add	±	C	ut		
Voltage Source/9	Sink Points				
No. Voltage	X	Y	Selected		
1 3.3	13.13518	6.872			Select location
Add	1	C	ut	Sen	d Trace to Solaria



Solaria Model Generated

- For the highlighted trace, Nodes and Segments are generated
- The Solaria automesher can then mesh the plane

Clear Data	Create Regions
	Modify Region
	Modify Segment
	Mesh
Status	Cancel
Status	
	Clear Data Status

	00			00 0 0	





Solaria Model Generated

- Hit the Modify Region button.
- Hit the Select button and box in the center of a Segment that defines the traces edges.
- Change the Maximum triangle edge length to a reasonable number, like 0.2 inches.
- Hit the Apply button
- Hit OK

Modify Regions		—	\times		
Regions					
Filter	49.417732	Maximum triangle area			
Select	9.9416027	Maximum triangle edge length			
Allow continuous selection					
_ Undo/Redo					
Undo Redo					
Help Apply					
OK Cancel					



The meshed model

Next hit the Mesh button then OK when it is done.







Delete the holes in the plane

- Note: All the holes will reference different Properties. Since they don't have a thickness they will not be part of the Voltage solution
- Put into a Group all the properties other than the plane, the one of interest. This is usually property 1.
- Delete all of these elements.





Solving for Voltages

- Define a new Material with the electrical properties of copper
- Enter the plane thickness in the appropriate Property (usually number 1) and reference the new Material

odel Materials						
Click to jump five materials						
Update	Add	Insert				
Material Name X Conductivity Z Conductivity Density Specific Heat Emissivity Absorption Ablation Temperature Heat of Ablation Absorptivity Coordinate SYS	Units W/(inC) W/(inC) Ibs/(in^3) J/(IbsC) C J/Ibs	Copper Electrical 1511000 1511000 0 0 0 0 0 0 0 0 0 0 0 0				
		1				







Solving for Voltages Apply Current and Voltages

- Apply Nodal heat loads to represent locations of current draw (enter a negative value)
- Define Boundary Nodes at locations where Voltages are introduced







Model solved for Voltages

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Just hit the Solve button to solve for • Voltage drop.





Getting the Joule Heating Power Dissipation

Model Information

Total property heat= .538142786295334 Total non-property heat= 0

- First delete all heat loads in the model sola
- Select Add>Heat Load>Voltage Drop
- dV^2/R is calculated for every element where:
 - dV is the Voltage drop across the element
 - R is the electrical resistance
- Clear Marks The sum of the dV^2/R for each Locate Clear ListBox Nodes element is divided by the element. 🔲 Display Min, Max data only area and a Surface Heat load - All Properties All Groups • All Groups All Prope generated. Help Copy to Clipboard Property 1443 Joule Heating Heat= .538142786295334





19979 Surface heat and 0 Volumetric heat loads generated

Element number

Listbox will expand with dialog size >>>

By element type

Show Data







X

OK

Save Data

Load Data