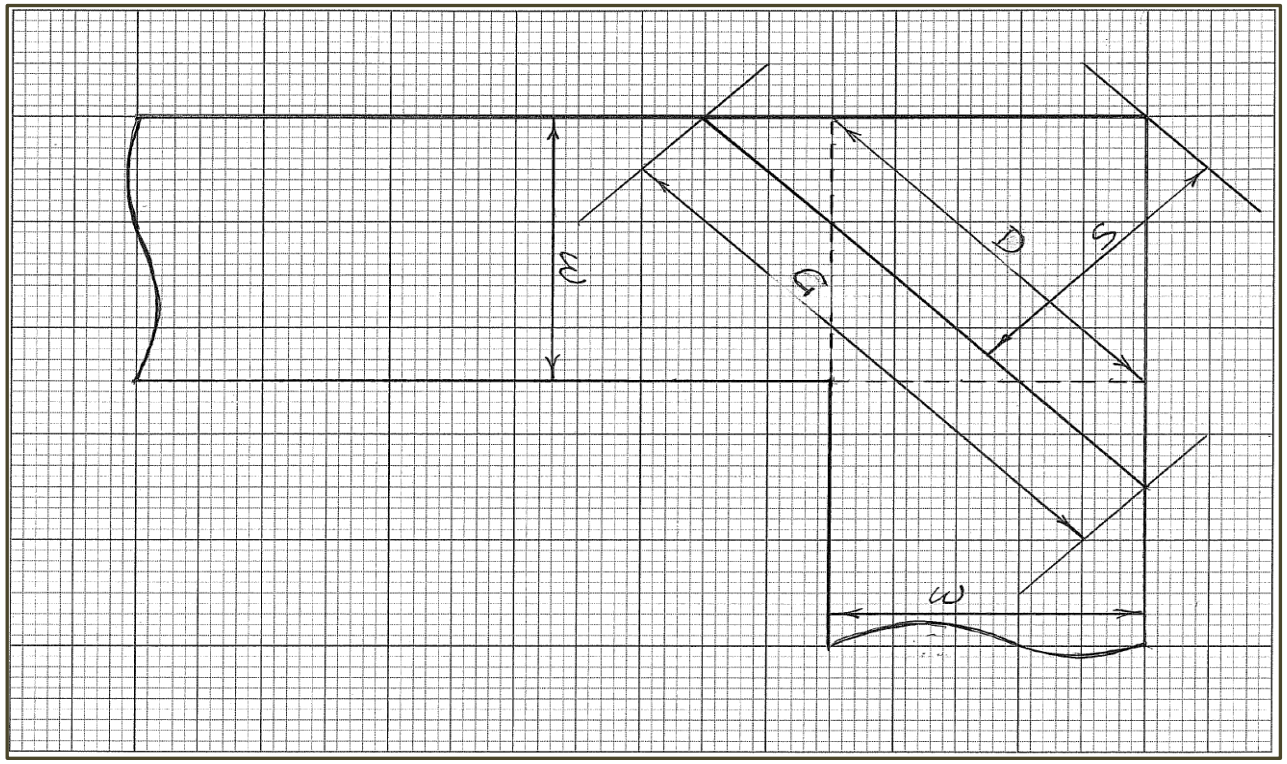
Microstrip Miter Compensation or the Best Bending - Chamfered Routing.

When I needed to draw important RF signals in my PCB design, I preferred to use the Swept Bend Method. But there were always at least two haunting problems. Firstly, it has always been difficult to draw and secondary, always this routing takes a lot of space. On the other hand I did know about the Chamfered Routing, but unfortunately I never had enough time to examine this method in detail. Somehow, I took time and I'm now happy to use this method.

Also I want to share a very simple way how to draw the precision chamfered lines.

1. The analysis of theoretical information.



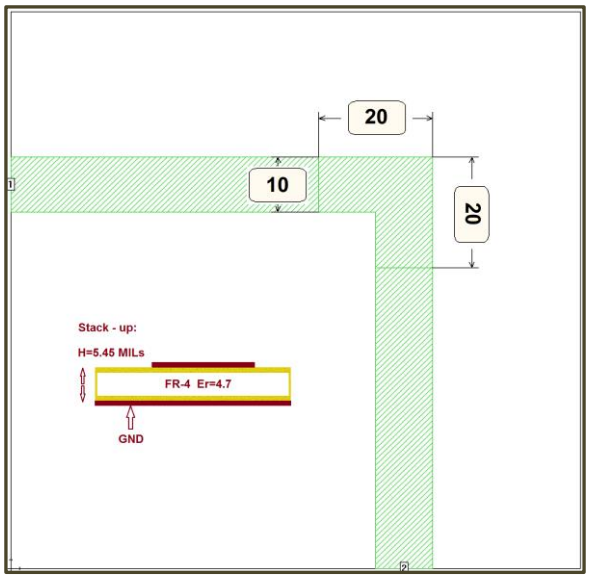
Picture 1. The theoretical information.

The optimum mitered bend equations for microstrip lines were found empirically.

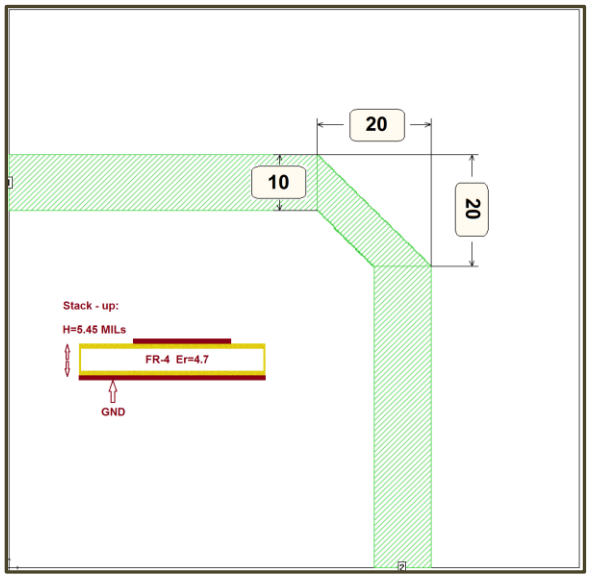
Where:

1. **D = (2^0.5) W;**
2. **S = D / (2^0.5);**
3. **S = W;**
4. **G = 2W;**

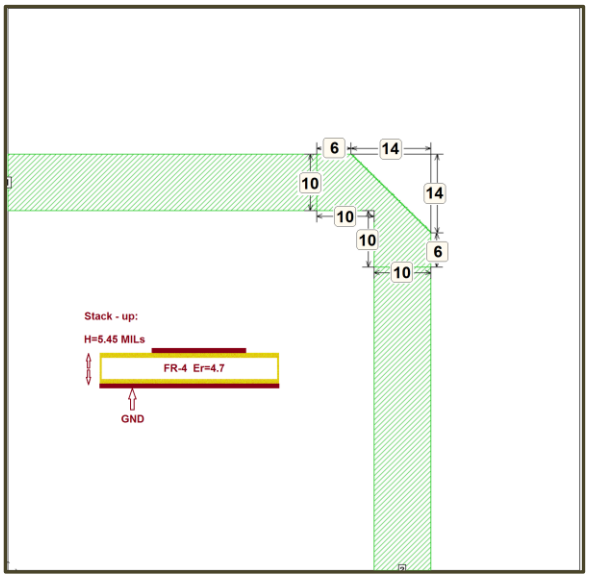
2. Performances. The comparison.



A Circuit - Right angle bend



B Circuit - 45 degree angle bend



C Circuit - Mitered bend

All dimensions in MILs

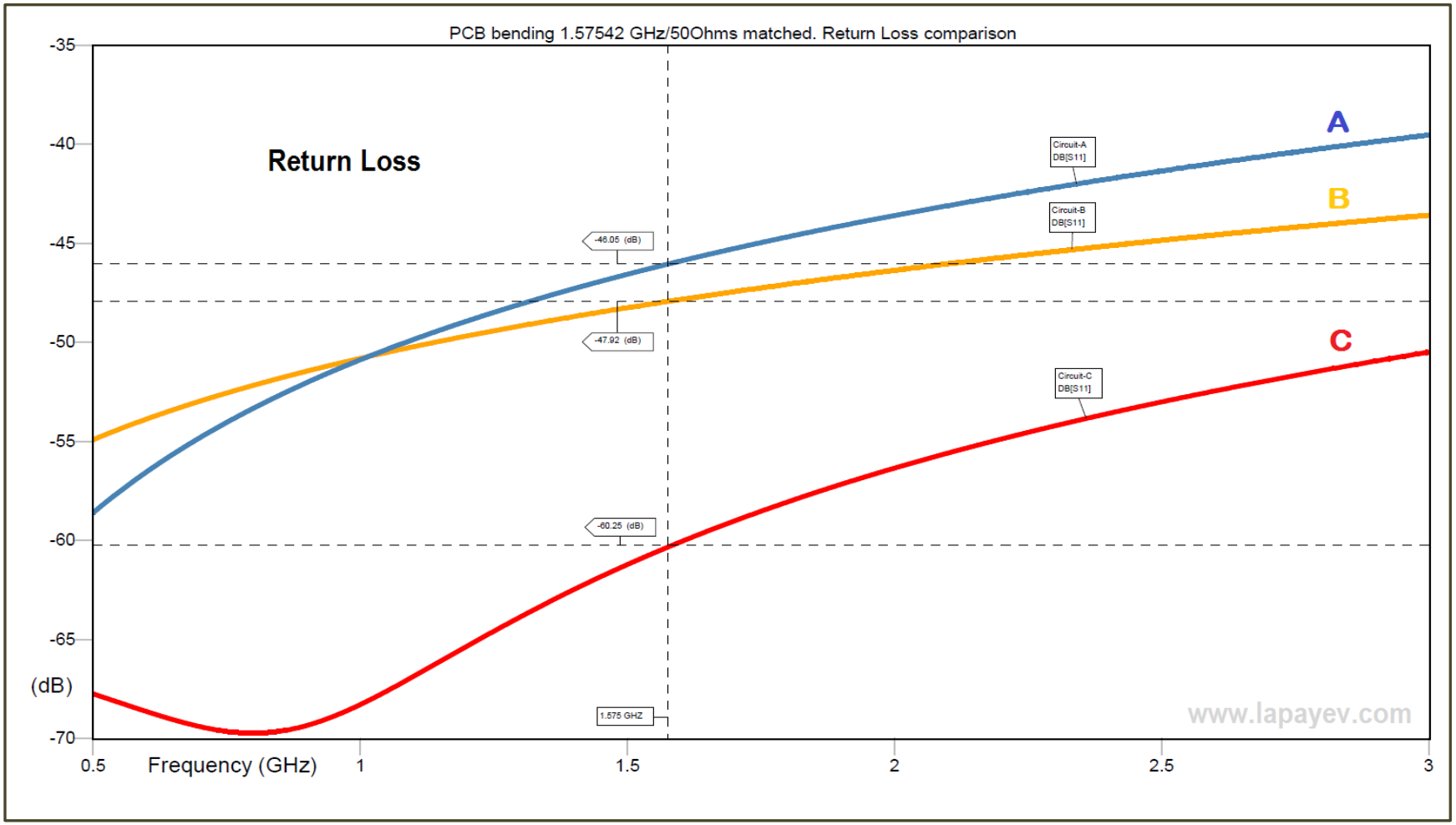


Chart 1. The comparison. Return Loss.

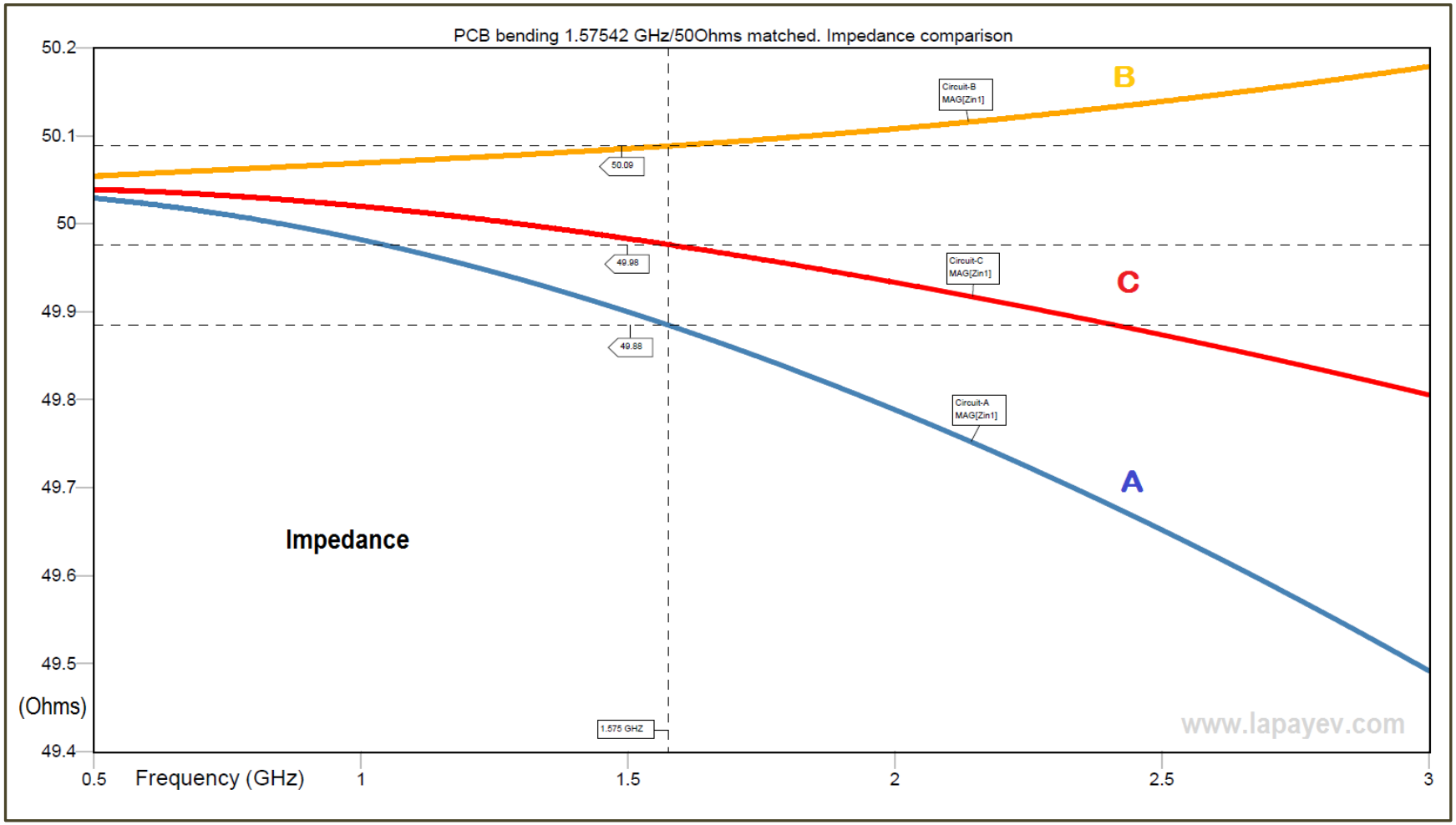
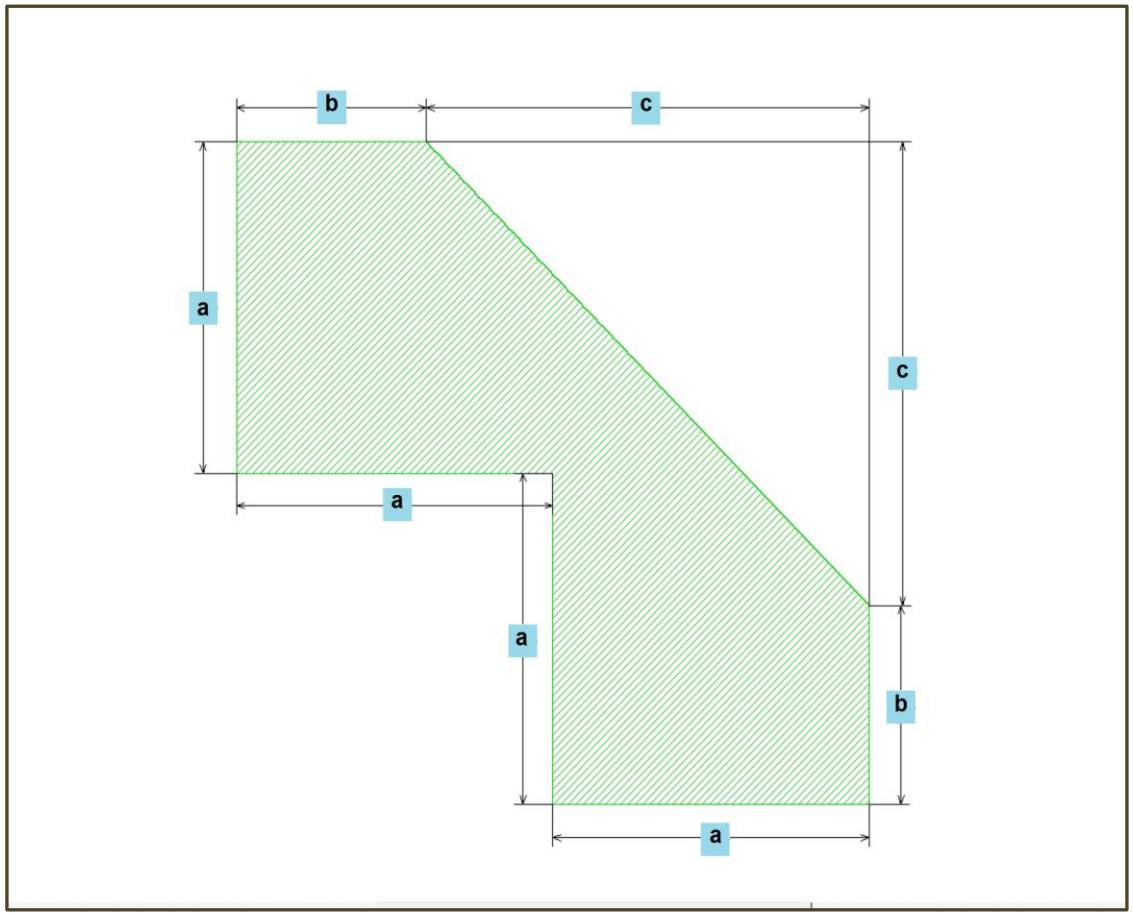


Chart 2. The comparison. Impedance.

3. The Practice Drawing.

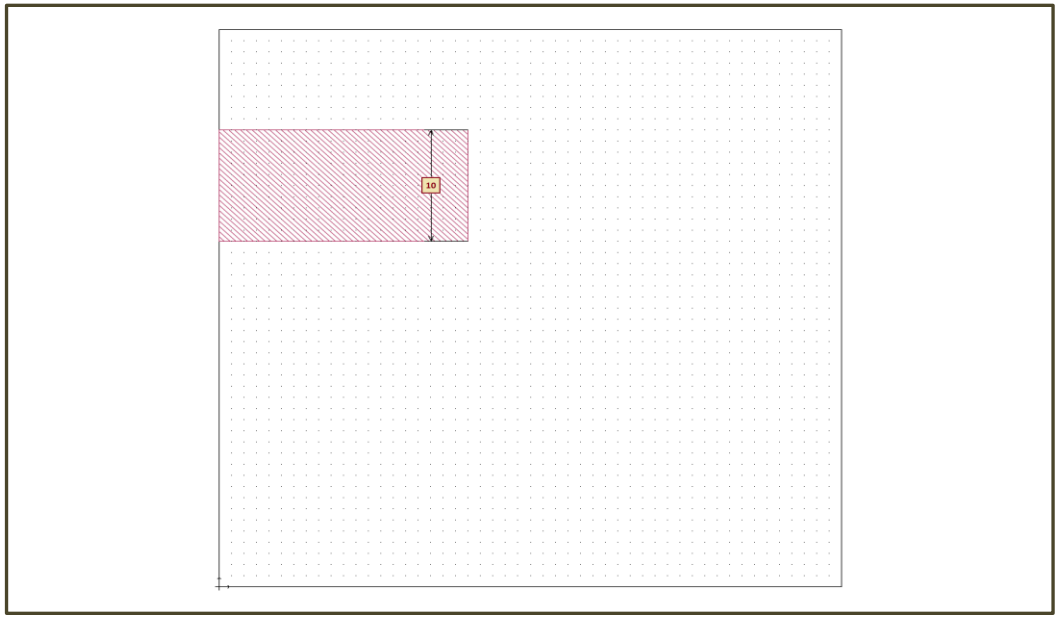


Picture 2. The main aspect ratio.

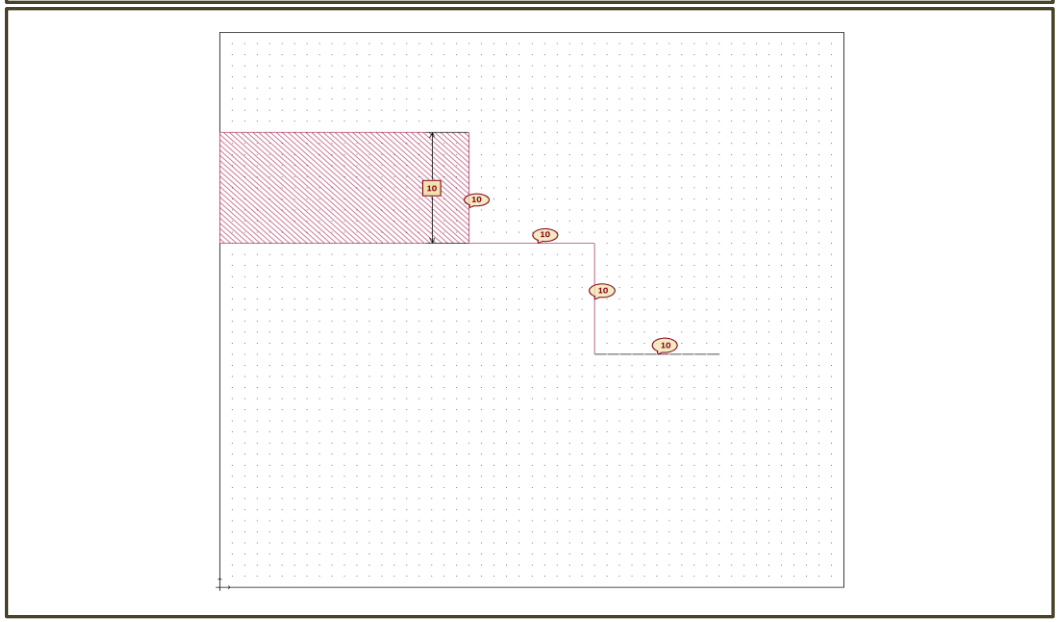
Where:

1. **b = 0.6a;**
2. **c = 1.4a;**

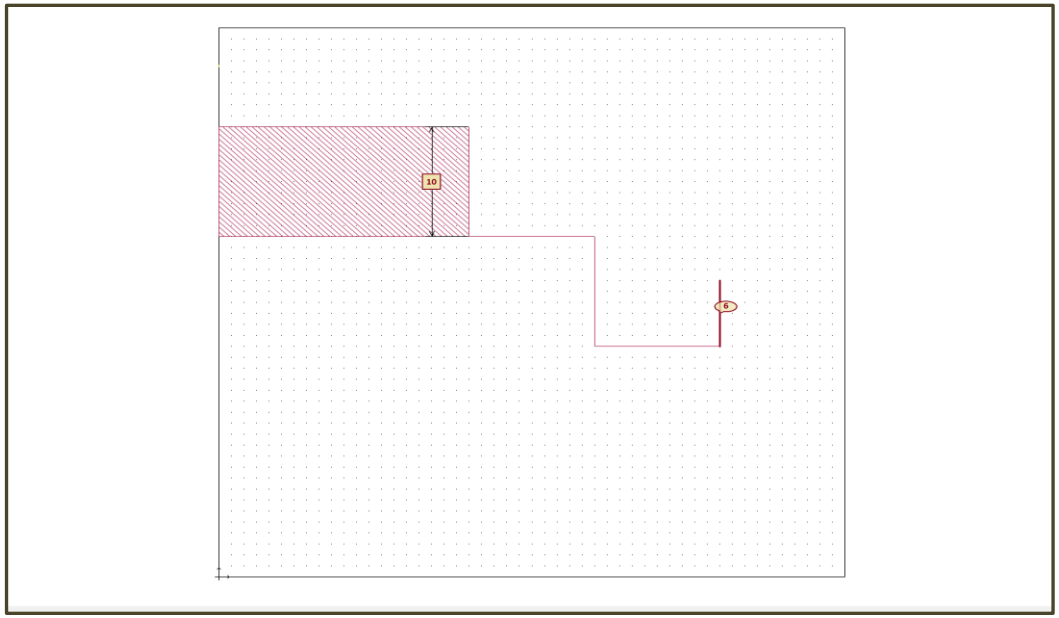
STEP 1



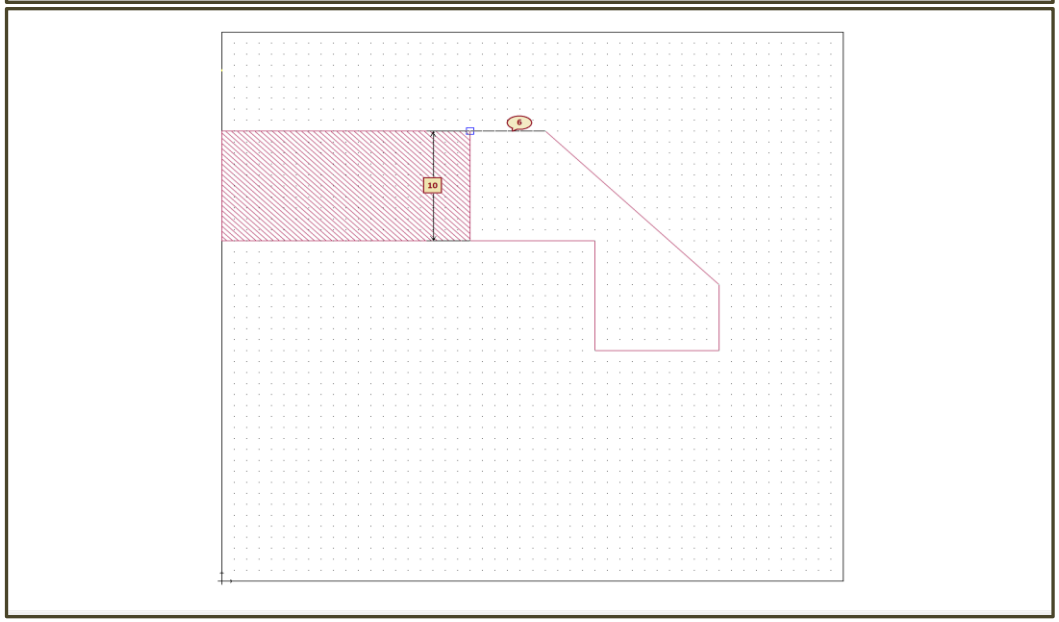
STEP 2



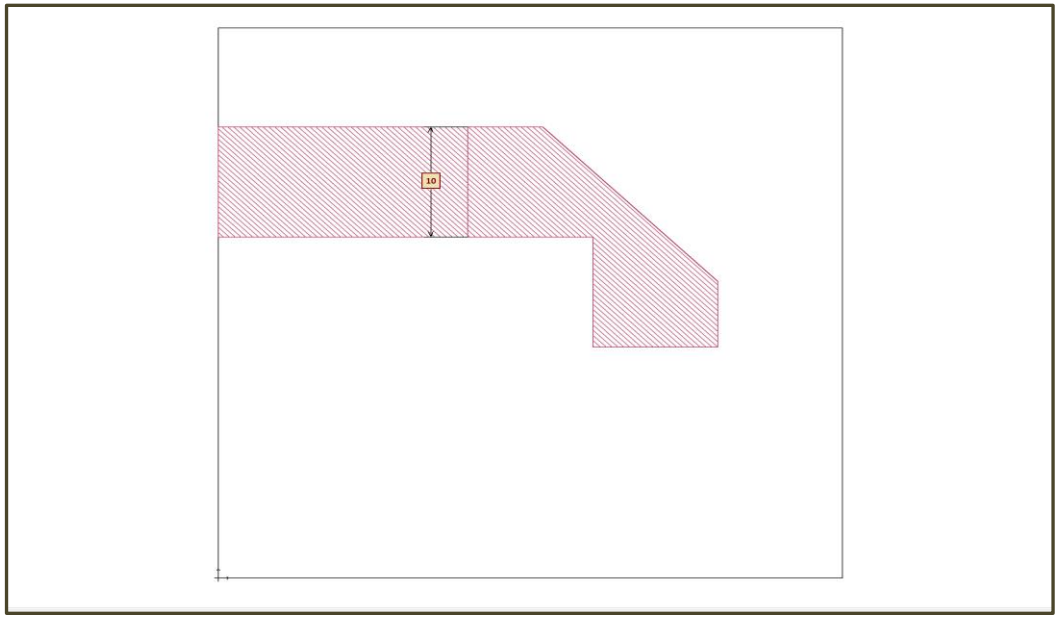
STEP 3



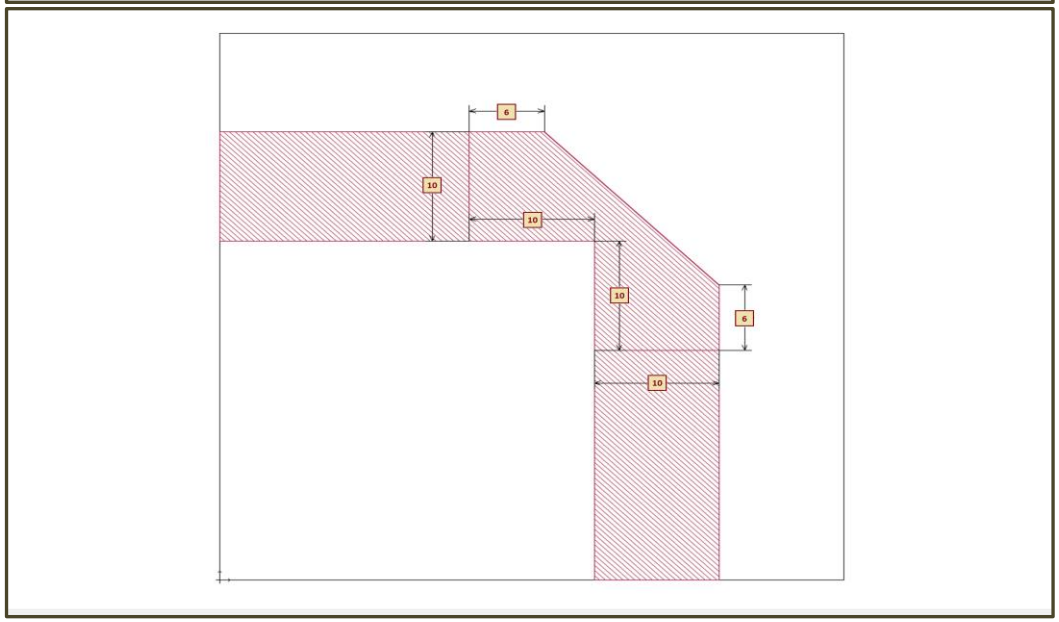
STEP 4



STEP 5



STEP 6, The Finish.



Needs note: The **ALTIUM Designer** has the Chamfered Routing feature now, the link: **http://techdocs.altium.com/display/ADOH/Chamfered+Routing**

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