

Constraint Regions

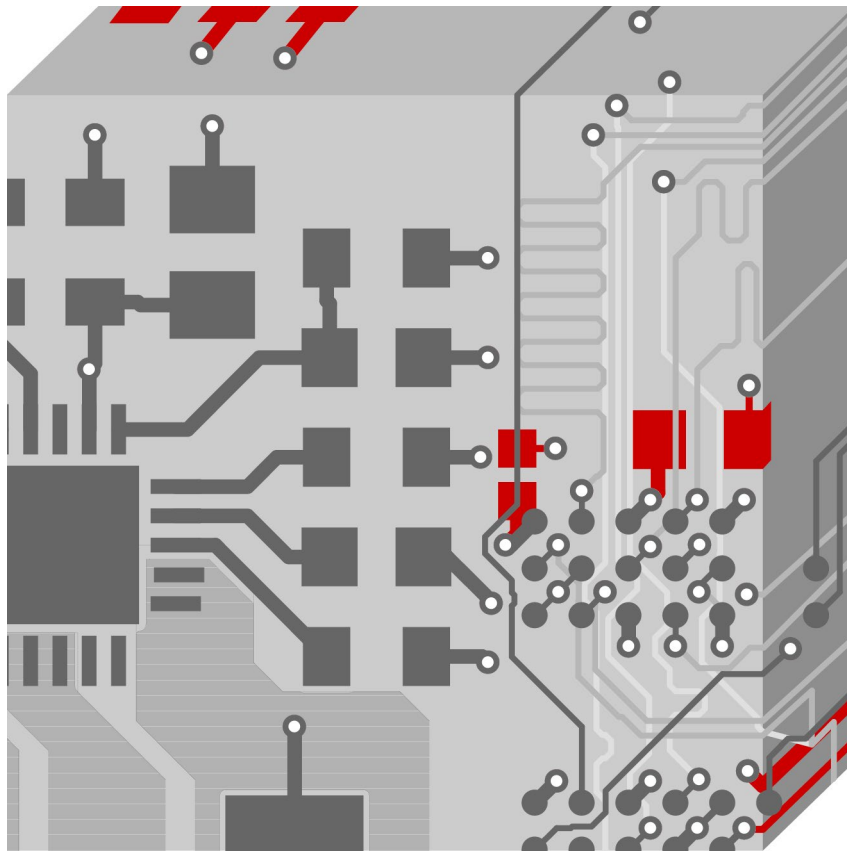


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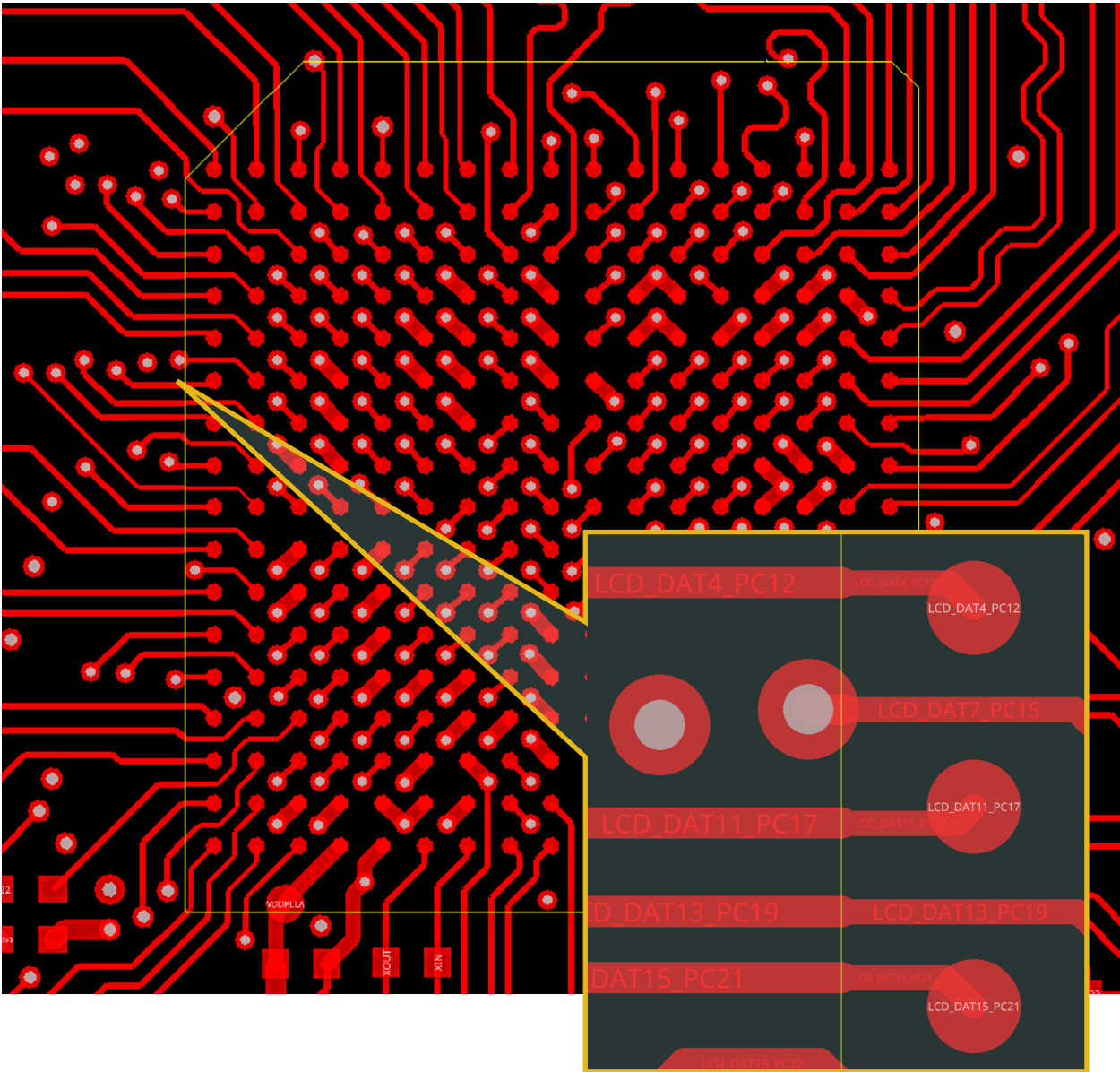
1 Introduction

Constraint regions can be used to define areas on the pcb, in which special constraints can be defined. For example, in a tight BGA region, it is required to use a smaller connect line width, to allow breakout routing.

In a constraint region different spacing rules, physical rules or both can be defined. A constraint region can be defined on a single layer or through the entire board. In this application note it is described, how to create a region in the layout. How to define a rule set in the constraint manager and how to associate the rule set to the constraint region.

It is as well possible to proceed in the reverse order. First defining the constraint set and secondly create the constraint region.

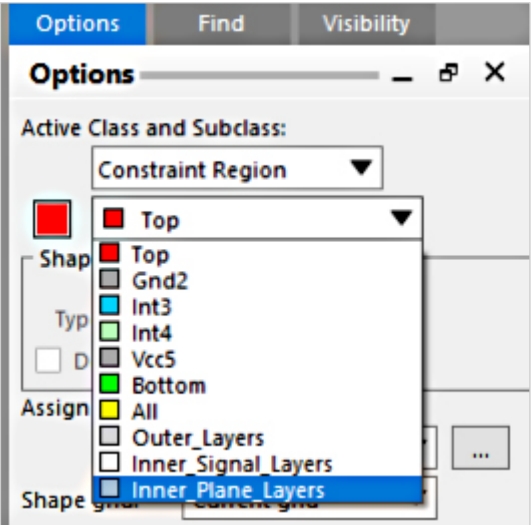
Example



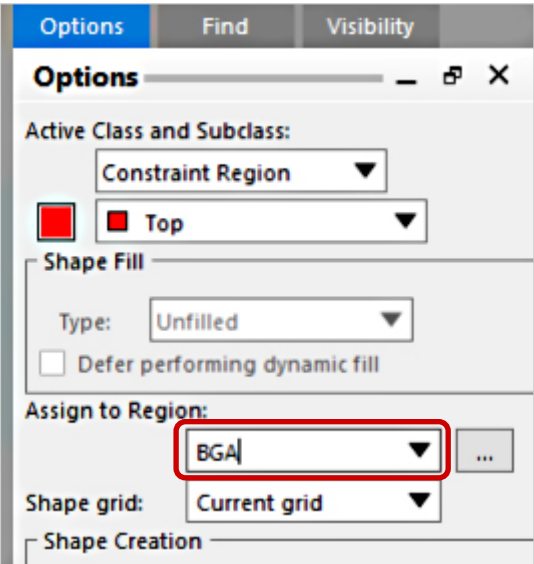
2 Create a Constraint Region

With the add shape command a new constraint region can be added. As class, **Constraint region** has to be selected in the options window and as subclass, the layer on which the region should be placed. It is also possible to create a region on the **Outer_Layers** or the **Inner_Signal_Layers** instead of a single layer. When you want to create a region, which is valid on every layer, select **all** in the subclass menu.

All the different shape commands can be used to create a new constraint region (add rectangular, circular, polygon, ... shape).



Define a name for the constraint region in the options window, for example BGA.

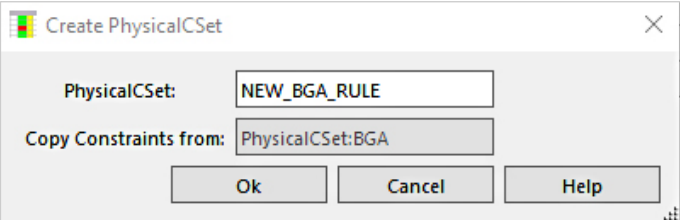
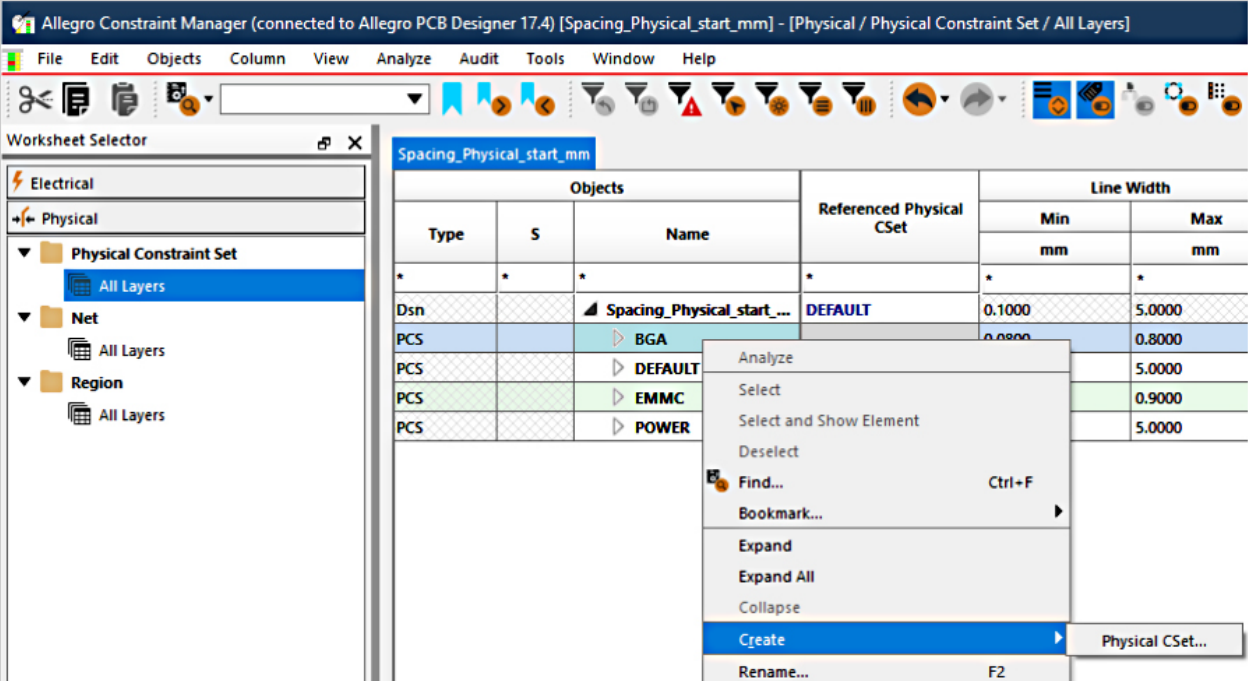


Draw the shape on the desired location on the PCB.

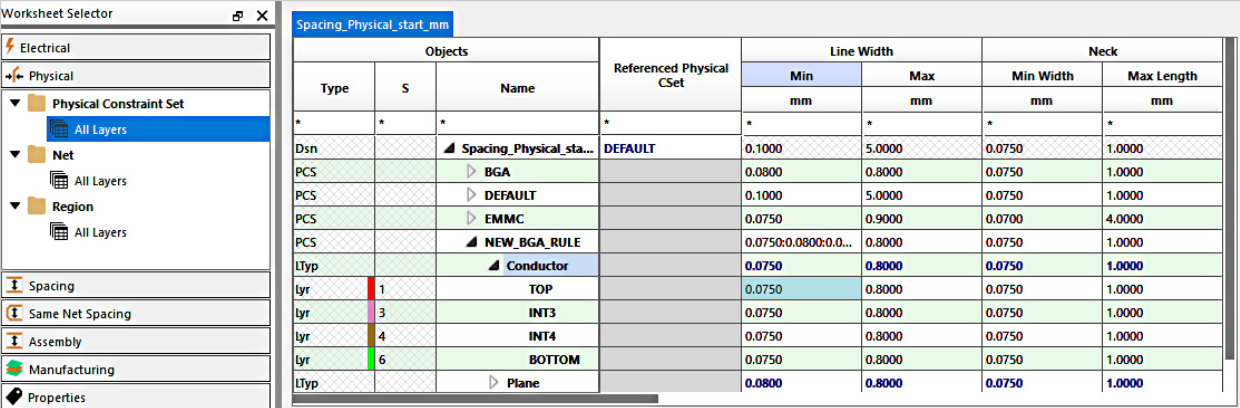
3 Set Up a Rule Set

In the Constraint Manager a new constraint set can be defined to be used in the region.

Right mouse button click on an existing CSet. And select **Create > Physical CSet**. The values from the old CSet will be copied and can be adopted:



Change the physical constraints in the NEW_BGA_RULE as desired:



Note

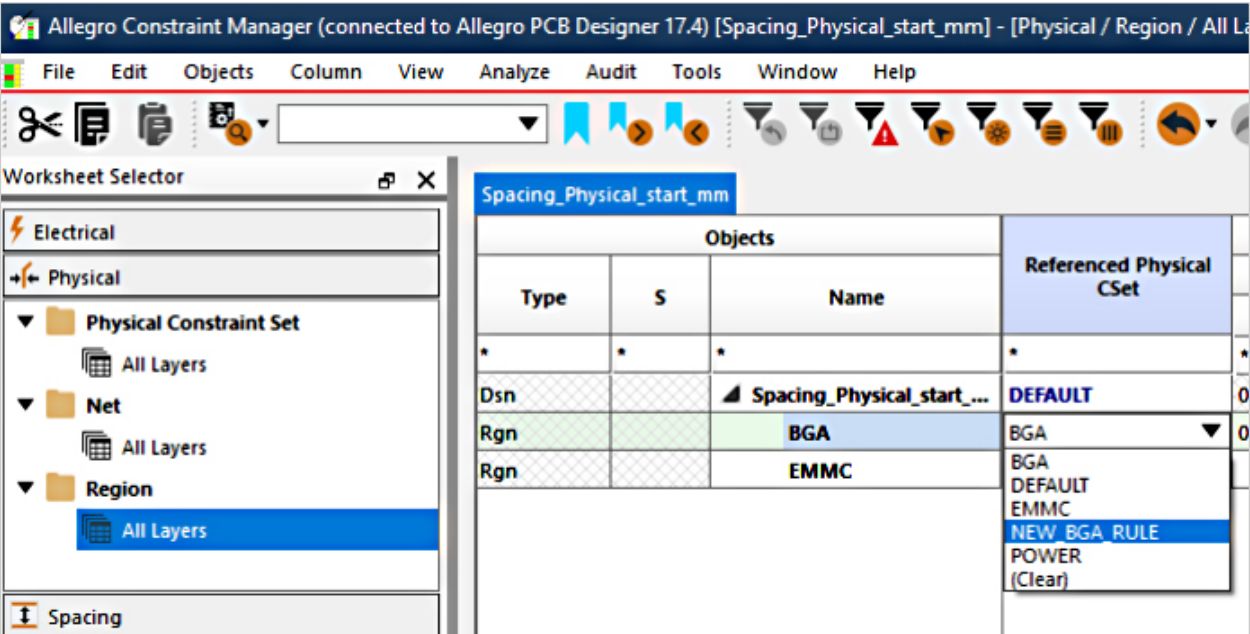
Region rules can only be used for physical, spacing and same net spacing rules.

4 Associate the Rule Set to the Constraint Region

In the physical workbook a region folder is available in the Constraint Manager. The name of the created region is listed in the Constraint Manager.

In this example, BGA was created in chapter 2.

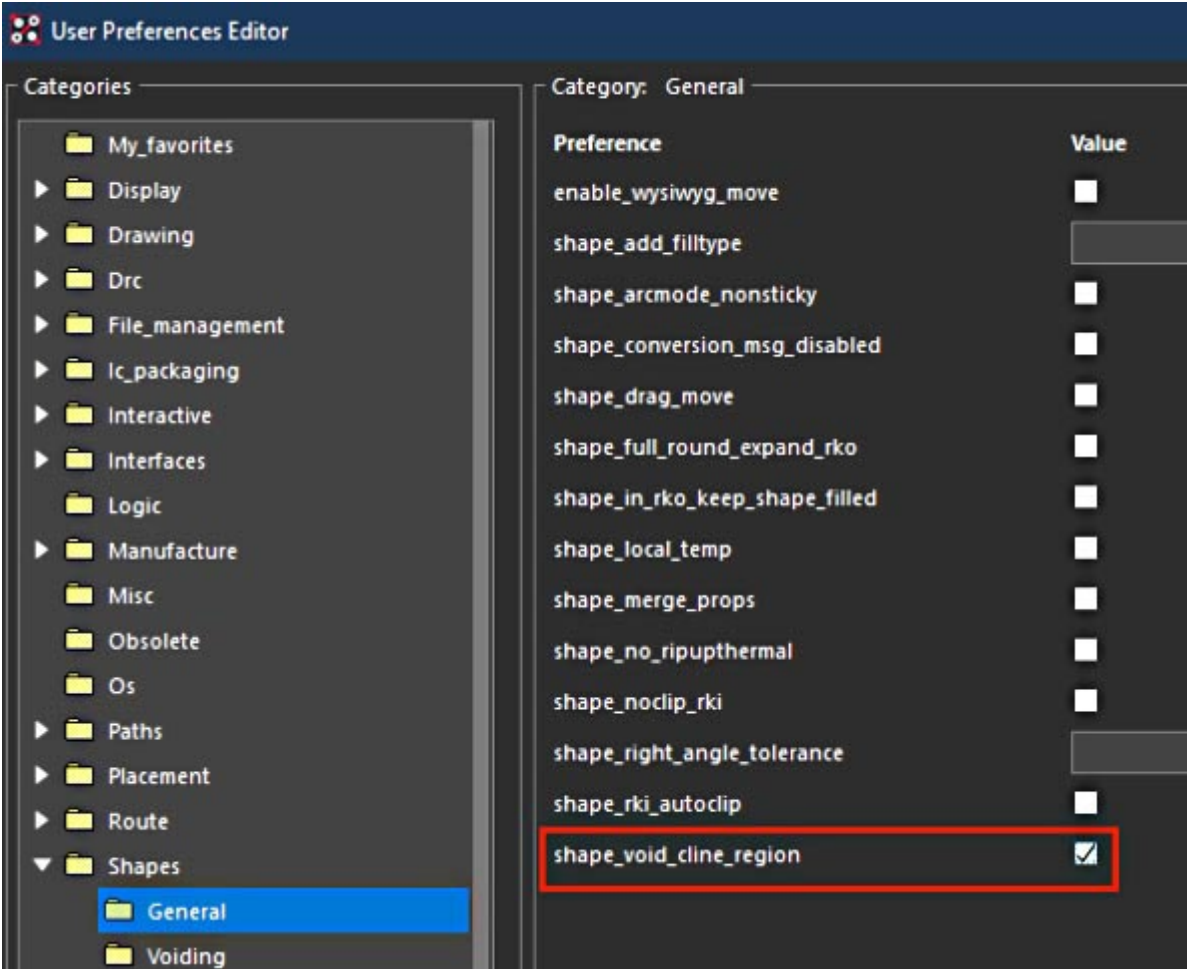
For the defined region (BGA) a rule set can be referenced. For example, the NEW_BGA_RULE constraint set can be referenced. Or you can also define the values manually in the different fields.



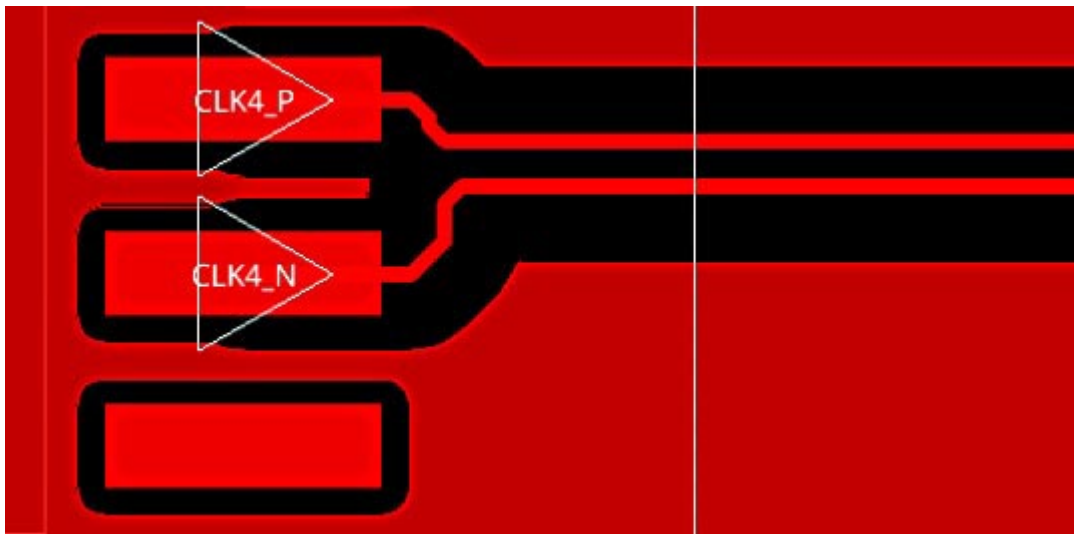
5 Shape to Line Spacing in Regions

Per default the more conservative value is used for complete clines, crossing constraint regions. For example., when inside the constraint region the spacing should be 0.1mm and outside 0.3mm, the spacing of the complete Cline to the shape will be 0.3mm.

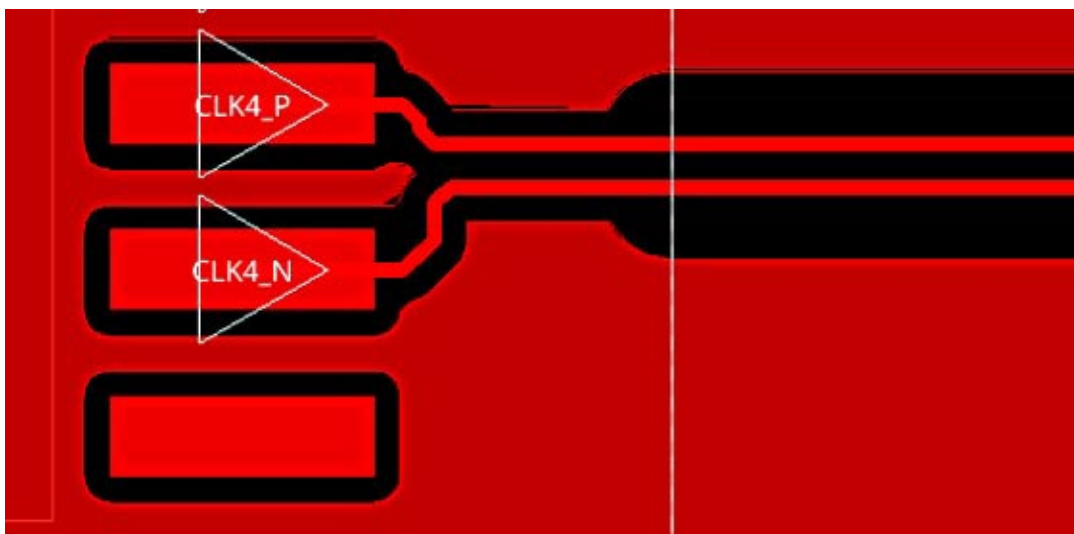
To use the tighter spacing within the constraint region, the User Preference `shape_void_cline_region` has to be set:



Behavior without `shape_void_cline_region`:



Behavior when `shape_void_cline_region` is set:



6 More About

FlowCAD offers a webinar recording that deepens the reflections on physical and spacing rules. Constraint regions and net classes, or class-to-class relationships are shown. Additionally, via configurations, pad/pad connection and interlayer spacing are discussed.

» Watch the FlowCAD Webinar in [English language](#) | in [German language](#)