

Project-2 (end-of-line rule) (10%)

Please see a picture below, which describes this rule. Let's say

EOL spacing between objects 1 and 2 is at least 1 (um).

Length of end is 0.6 (um) (i.e., if the width of object-1 is smaller & equal than 0.6, consider.)

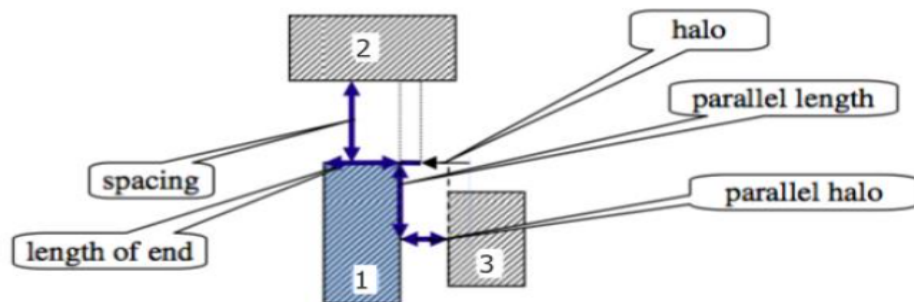
Parallel length from the top of edge 1 is 0.7 (um).

Parallel halo away from object-1 is 0.4 (um)

End of Line Rule

■ EOL spacing applied to objects 1 and 2:

- As object 3 overlaps the parallel length from the top of edge 1, EOL spacing between objects 1 and 2 will be required.
- Object 3 must remain outside the parallel halo.



Another simpler picture for EOL is below:

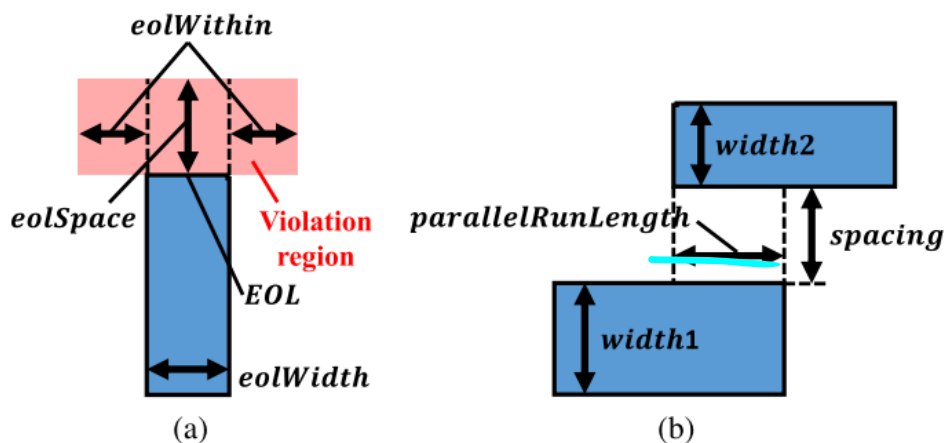
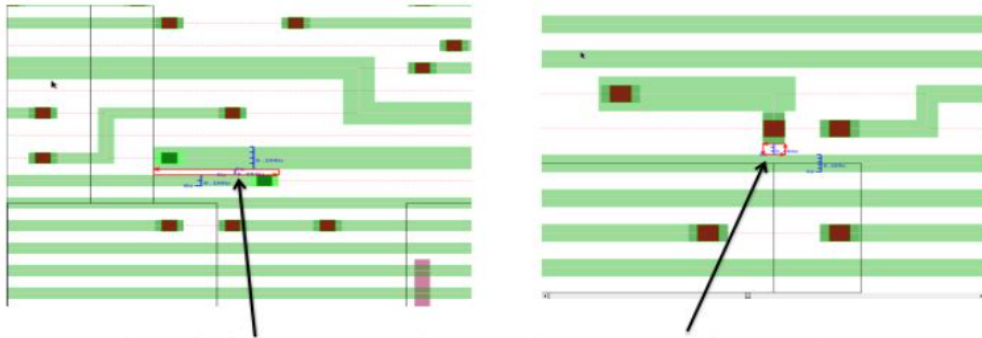


Fig. 2. Example of (a) **EOL** spacing and (b) parallel-run spacing.

EOL Spacing: A metal end is an EOL if its width is shorter than eolWidth. EOL is required to preserve a spacing greater than or equal to eolSpace beyond the EOL anywhere less than the eolWithin distance, as Fig. 2(a) shows

Below is a layout sample which has an end-of-line error.

Min Spacing and End-Of-Line Spacing Violation Examples



Example **minimum spacing** and **EOL spacing** violations between routing objects in congested areas. Many such violations are in the vicinity of pins assigned an NDR rule.

45

Mentor
graphics

In this project, please write down your algorithms for this checking. Then, implement it to read the following layout patterns (using the format defined in project-1) to see if there are EOL errors. In this exercise, it is totally up to you if you want to use Boost APIs.

Layout patterns are described below.

number_of_layers 1

layer 1 M1

end_of_layer

number_of_rectangles 6

1 0 4.0, 7.8 0.6

1 0 1.0, 6.1 1.6

1 2.0 2.0, 4.0 2.6

1 7.0 1.0, 14 1.6

1 10.4 0.8, 11 1.8

1 8.6 2.2, 14 2.8

end_of_rectangle

Please read in this file to build your data structure, then, check if there is/are end-of-line DRC errors.

The layout looks like below:

