# Space cap3d couple capacitance reduction note

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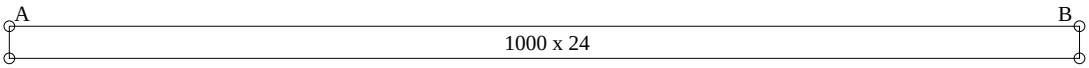
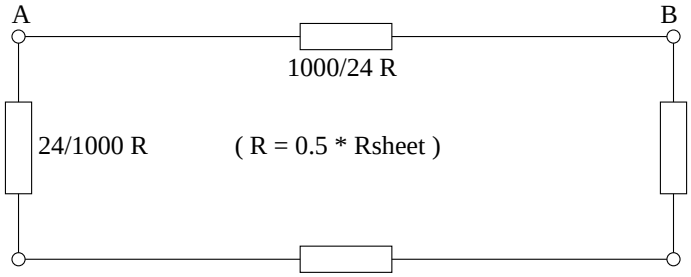
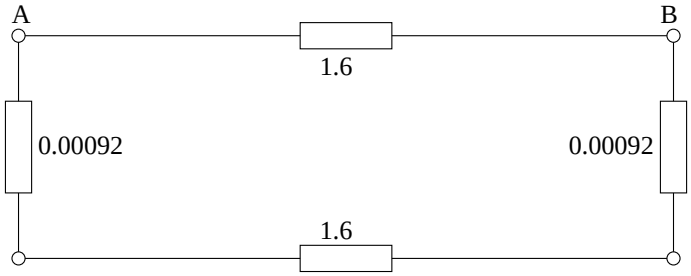
Given the following example layout of a high resistive conductor:



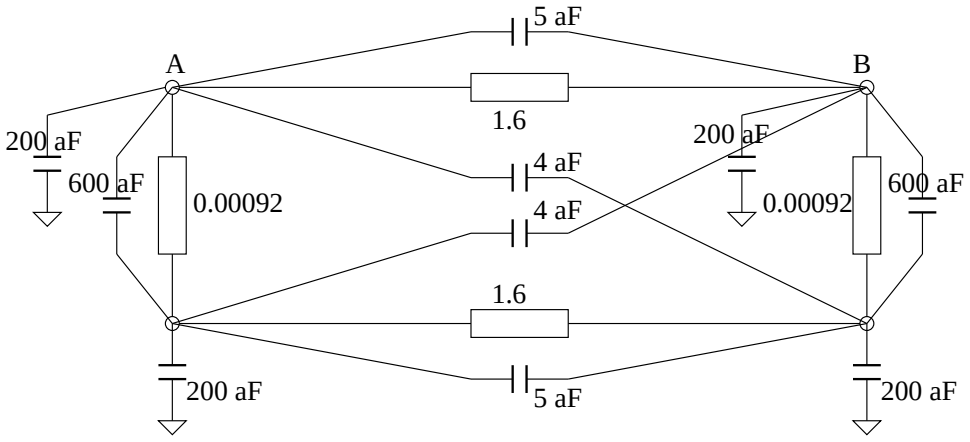

Given a Rsheet, the resistor network can be calculated as follows:



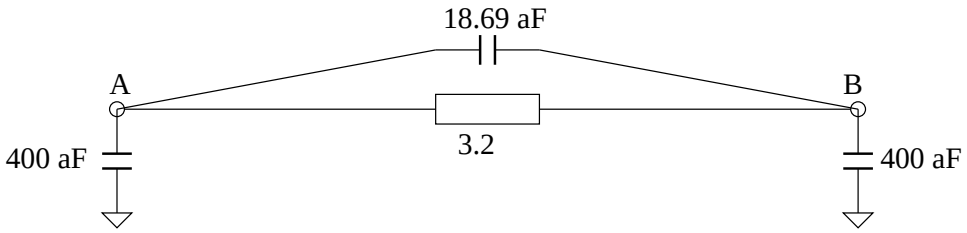

For a Rsheet of 0.077 Ohm/square (using parameter low_sheet_res=0.05) the following resistor network is the result:




I shall explain what happens with the couple capacitances when reducing the network when doing a cap3d extraction of the above layout.
The following network can be the result of the -rC3 extraction:

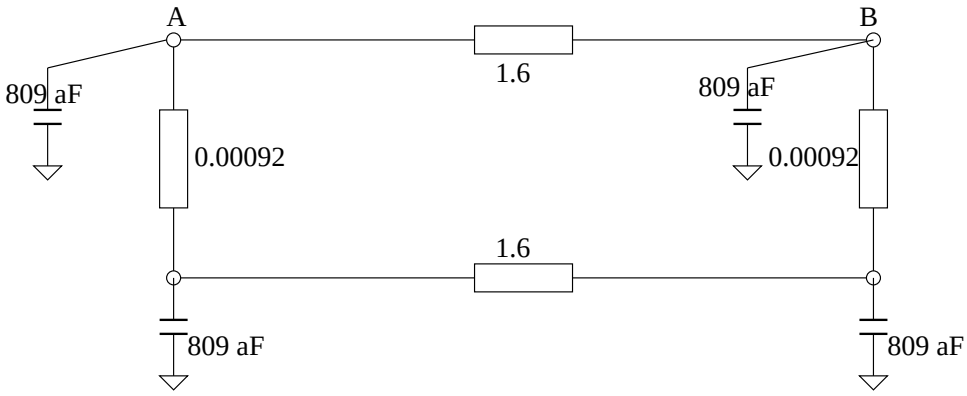


After reduction, the following network is the result of the -rC3 extraction:

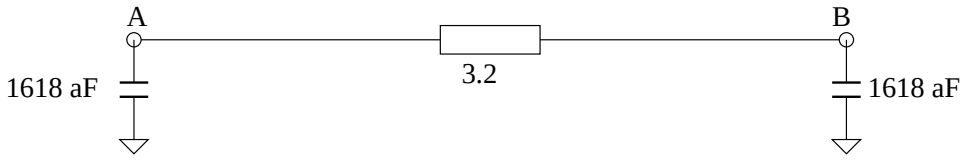



You see that the 600 aF couple capacitances have a small effect (+ 0.69 aF) on the resulting couple capacitance between nodes A and B.

When we extract the above example with options -rc3, we get:




After reduction:




You see that the 600 aF couple capacitances have a big effect on the ground capacitances when we do an extraction with options -rc3.

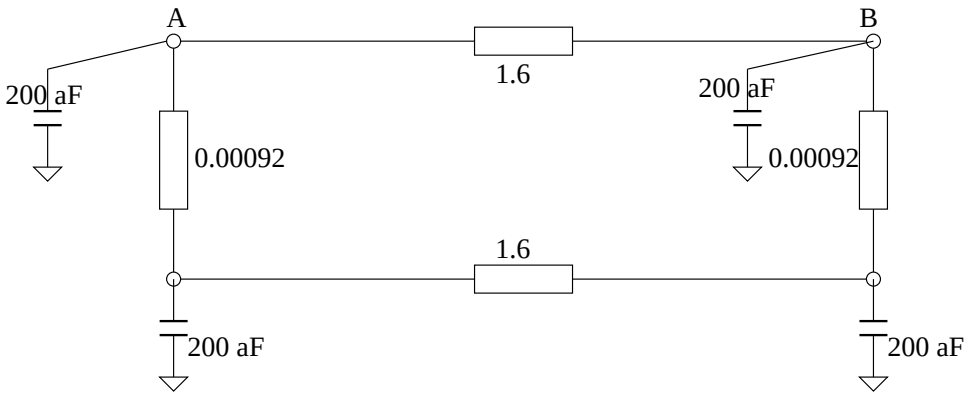
## Note

See next page, note about change in option **-c** extraction mode.

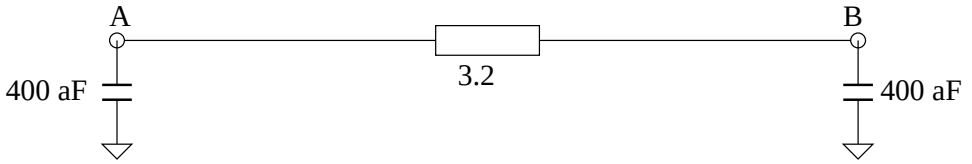
## Note about update of option -c mode

The *space* option **-c** mode, extract capacitances to ground, is now changed. The coupling capacitances in the same conductor (node group) are now not more folded to the ground node, but skipped. In cap3d mode, most nodes of the same node group are already in one group, because cap3d mode is processed after a number of be_windows are ready.
In case groups are later on connected to each other, then the coupling capacitances are removed when the group becomes ready.

Thus, for the new option **-c** mode (see previous example) the network before the reduction (with skipped couple caps) shall be:




And after reduction:




## Note

See also next application note (report).