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Watch:
Length Matching



Watch:
Differential Pairs

v8.16

PROTEUS DESIGN SUITE

HIGH SPEED DESIGN

Proteus PCB Design software includes full support for serpentine routing and net tuning as well as specific design rules and routing modes for differential pair routing.

LENGTH MATCHING

As signal speeds get faster and operating currents lower, the integrity of the signal becomes an increasingly necessary consideration during PCB layout.

Proteus PCB Design fully supports the automatic matching of track lengths with a powerful and easy to use feature set. This includes the ability to have track segments in multiple matchgroups which is needed for routing topologies like the DDR3 fly-by configuration.

→ Intuitive

Length matching takes place via a simple select and match user interface. In this way, routes can quickly be matched against each other or set to a specified distance.

→ Accurate

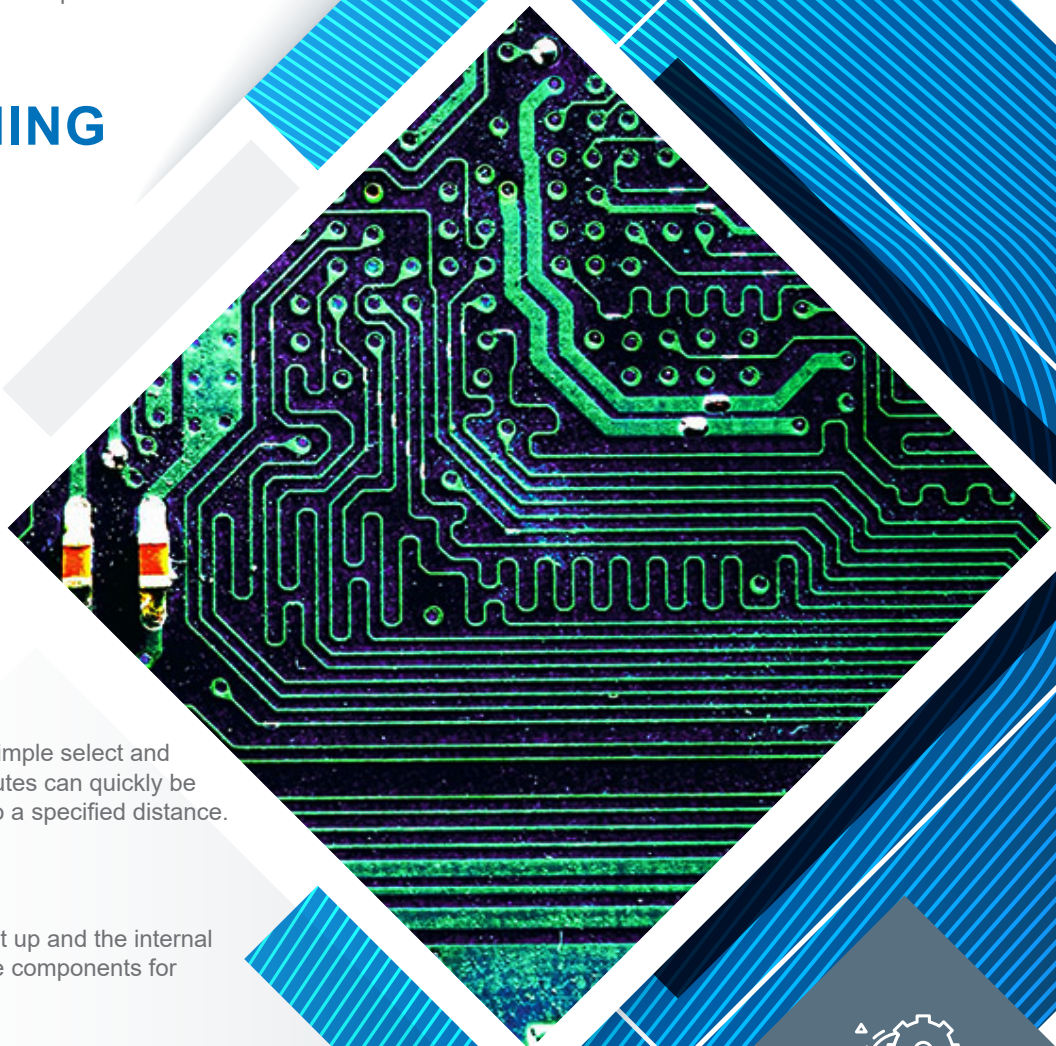
Matchgroup tolerances are easily set up and the internal signal distances can be added to the components for improved accuracy.

→ Configurable

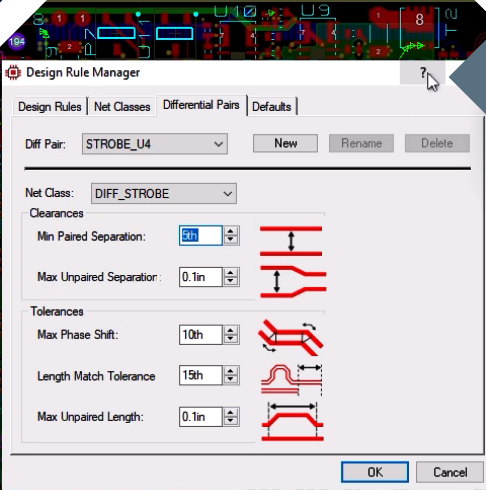
The topology of the serpentine segments is fully configurable via a single dialogue form and the serpentes themselves can be re-positioned on the route with a standard mouse drag.

→ Auditable

The live matchgroup viewer lists all length matched tracks along with any deviance from target length. A dedicated length match report can be produced at any time in the Project Notes module and the pre-production checker will also warn of any routes outside tolerance.



HIGH SPEED DESIGN



DIFFERENTIAL PAIRS

Proteus fully supports the routing of differential pairs via a dedicated route mode. Advanced design rules are also in place to allow the user to specify clearances between the routed pair as well as define maximum unpaired lengths and phase tolerance criteria.

ROUTING

The differential pair routing mode lets you simply click on one of the source pads and route to the destination with both tracks routing at the same time. With BGA's where you have a controlled fanout you can route normally and then switch to diff pair routing mode and start the pair from the fanout vias. Routing is fully design rule aware and both curved and mitred cornering is supported.

AUTOMATIC SKEW CORRECTION

Often the lengths of the two tracks will differ after the diff pair is routed around a corner. In such cases the signals are no longer equal and opposite and corrective action is needed. Proteus will automatically apply phase matching for you once you complete the differential pair routing by adding small serpentine segments to equalise the track lengths.

Rules

Advanced design rules let the user specify clearances between the routed pair as well as letting you define maximum unpaired lengths and phase tolerance criteria.

Tuning

Differential pairs can be length matched against other differential pairs or to a target length. Serpentine segments will be automatically added to both routes to extend their length.

Visualiser

The phase can be visualized directly on the differential pair via the display phase offset command. This will show green, yellow or red segments on the routes to indicate where signals are out of phase.

Reporting

A dedicated differential pair report checks for total length compliance as well as both maximum and total length out of phase and unpaired distance.



LENGTH MATCHING

DIFFERENTIAL PAIRS

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