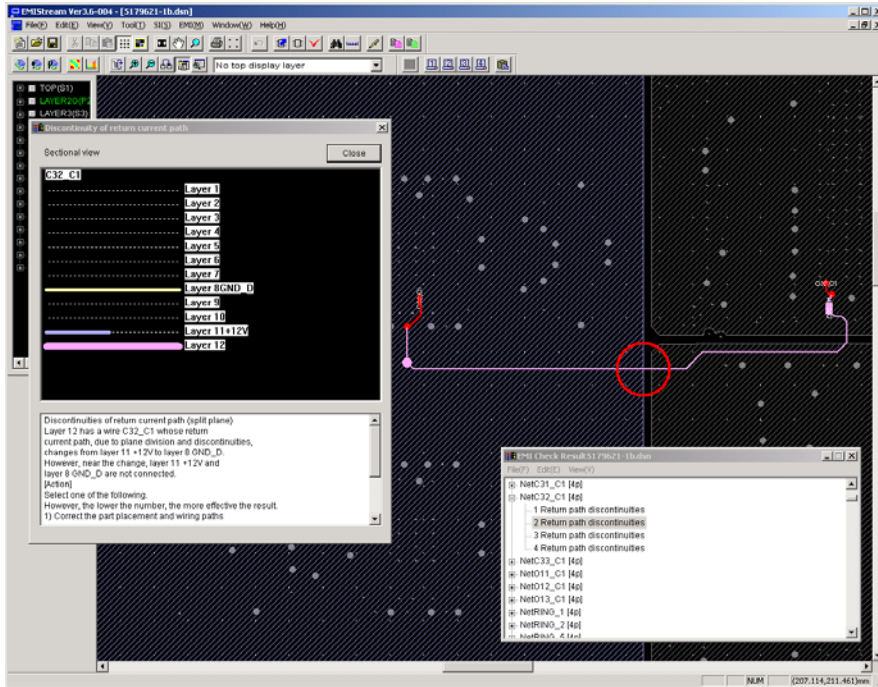


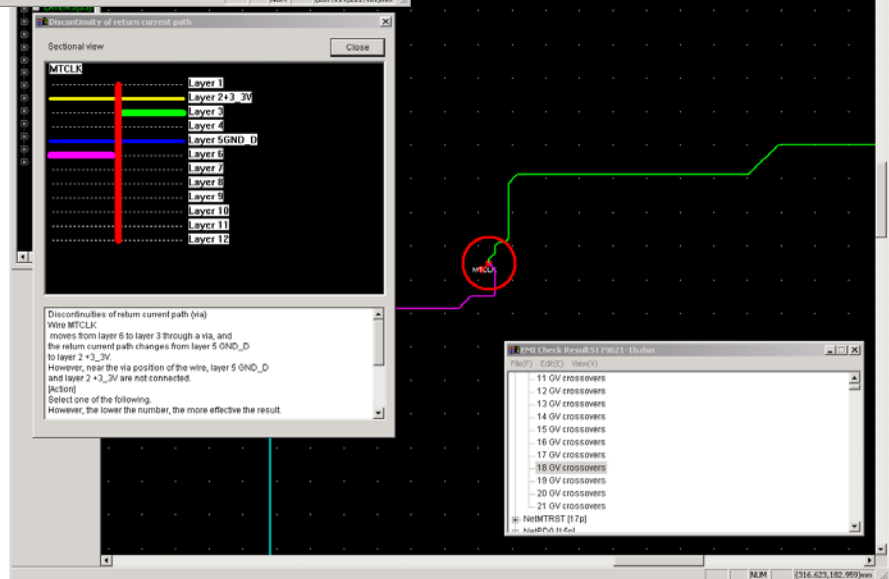


Return Current Discontinuity Identification



- Plane Crossing
- Corrective Action Recommendations
- Indication at All Points

- Discontinuities due To Via Transition
- Corrective Action Recommendations
- Indication at All Points



Product Concept

High speed design considerations are being applied to an increased number of signals. It is becoming extremely difficult to ensure that these signals have been routed with the minimal current loop lengths possible. Current CAD tools do not check to ensure that plane splits and voids have not been crossed nor do they check to see if reference planes have changed. EMIStream provides a method of identifying all locations that have a Return Current Path issue. The issue can be a signal crossing a split or void. It also can be a signal transitioning from one layer to another where the planes of the associated signal layers are not properly coupled. This increases the current loop path of the signal, resulting in higher noise levels being induced into the planes.



Return Current Discontinuity Identification

Product Features

Current loop lengths of signals are increased if there is any change in the return path that is normally created in the adjacent plane or planes. High speed return currents are induced into the adjacent plane and follow the path of least inductance. This path is usually directly below the signal trace.

When the return path is disrupted, the current loop length is increased. This causes an increase in the noise of the planes.

Plane Splits / Void Crossing

All points where a signal crosses a split between planes or a void within a plane are identified. Once these locations are identified, corrective action can be implemented in the form of rerouting signals, adjusting plane boundaries, or local coupling of the planes. Suggestions are provided in the popup window with the associated explanation of the discontinuity.

Reference Plane Changes

One aspect of return current discontinuity, that is extremely hard to identify, is caused by signal transitions to different layers. When a signal transitions through a via, two things occur. First some of the energy couples into adjacent planes as noise. Secondly, and our primary concern, is that the loop length is increased.

For example, a signal changes from layer-3 to layer-8. For this example the reference plane is at GND potential. The length of the loop depends on the proximity of the stitching via to the transition via. If the planes are of different potentials, then the loop length is dependant on the shortest distance to a capacitor that couples these potentials together.

CAD Interfaces

Cadence Allegro
Mentor BoardStation
Mentor Expedition
Pads PowerPCB
Zuken

System Requirements Minimum

OS: Windows 2000 / XP
CPU: Pentium III 500 MHz
RAM: 64 MB
Disk: 20 MB



KAW

39 Simon Street, #4, Nashua, NH 03060
603-886-8711 Tel; 603-881-8763 Fax
www.kaw.com/emistream