



SANMINA - SCI®

PCB FABRICATION

Opti-Via™ Technology for Improved Signal Integrity at Higher Frequencies

Optimize vias to optimize performance.

Reduce undesired signal responses and improve signal integrity with Opti-Via™ technology.



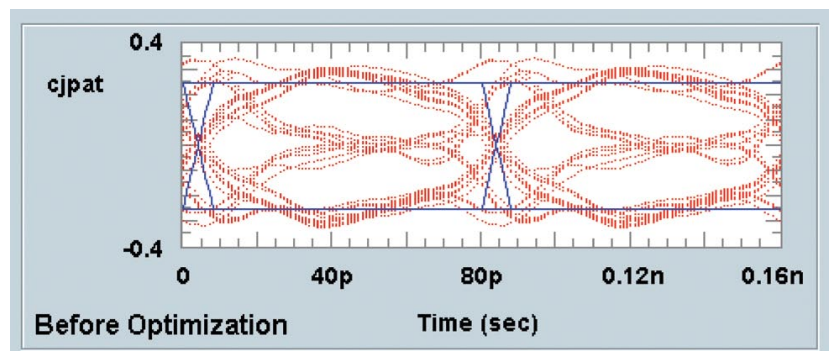
Opti-Vias™ are a family of engineered via structures whose S-parameters have been optimized for high-frequency applications, including radio frequency (RF) and high-speed, point-to-point, single-ended and differential data links. The patent-pending optimization algorithms used to enhance their performance depend on a number of factors that include the type of via (micro-via, blind-via, plated through-hole via, sub-composite via, etc.), whether a mixed or fixed dielectric construction is being used, and the locations (in the stack up) of the layers on which high-speed signals are routed.

Opti-Via Algorithms Application

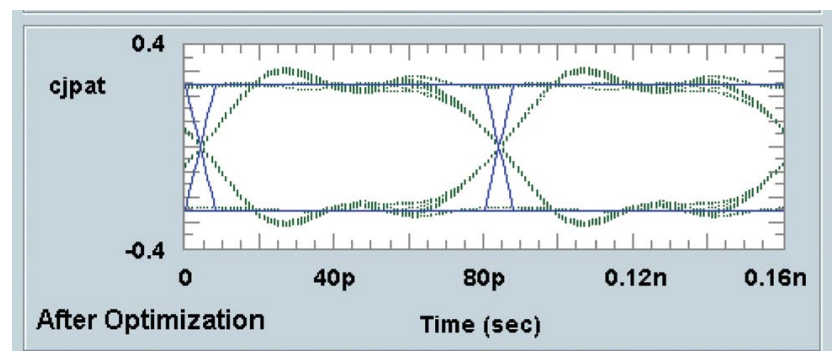
For complex structures, more than a dozen different via regions are improved in the optimization process. Two commonly used via-optimization techniques are the removal of non-functional pads and via backdrilling. In many cases, the first does not provide enough improvement and the second is not always a cost-effective solution. In these cases, application of the Opti-Via algorithms can often improve the performance to an acceptable level without having to resort to unusual geometries that are difficult and expensive to manufacture.

Benefits of Opti-Via:

- Optimize performance for high-frequency applications
- Improve performance without resorting to unusual or hard-to-manufacture geometries
- Minimize the need for power-hungry, active signal conditioning circuits



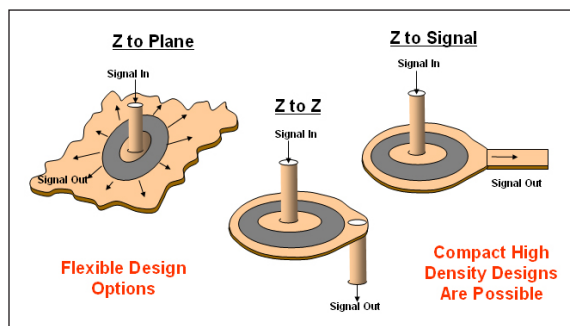
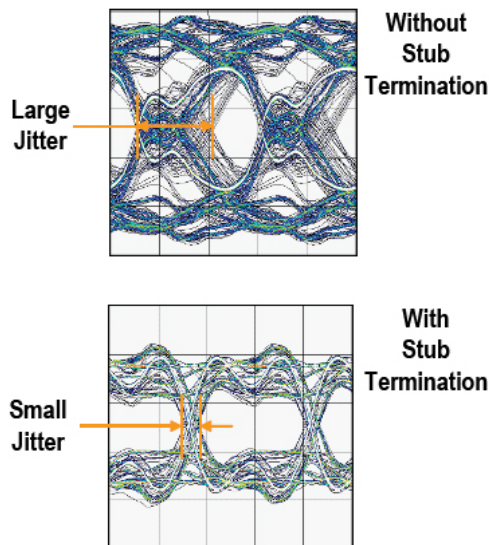
A typical through-hole via



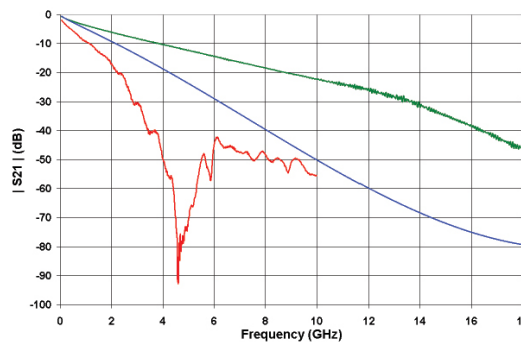
A backdrilled hole with a controlled depth

During the optimization process, special emphasis is placed on improving performance in the critical 500 MHz – 10 GHz frequency range, using via structure sizes and shapes that are compatible with existing Sanmina-SCI® design and manufacturing processes that include Sanmina-SCI's patented Buried Capacitance® power distribution planes. By using Opti-Vias, the need for expensive, power-hungry, active-signal conditioning circuits can also be minimized or replaced by passive-compensation techniques based on Sanmina-SCI's patented Annular Buried Resistor™ (ABR) technology.

Opti-Vias significantly improve the signal integrity performance of high-speed interconnects. Plus, undesired signal responses such as crosstalk, jitter and inter-symbol interference are significantly reduced. Via losses at 5 GHz (corresponding to an aggregate throughput of 10 Gb/s per differential pair) can be reduced by as much as 40 dB (100x improvement).



Annular Buried Resistors ABR™



Improved frequency as a result of Backdrilling techniques

As one of the world's largest manufacturers of high-technology PCBs, Sanmina-SCI has significant experience designing and manufacturing boards using industry-leading technologies. We offer these technologies in each of our fabrication sites worldwide and provide design for manufacturability (DFM) support for our customers in pre-design and layout phases to ensure the smooth integration of new and cost-saving technologies to the production process.

About Sanmina-SCI

Sanmina-SCI Corporation is a leading electronics contract manufacturer serving the fastest-growing segments of the global Electronics Manufacturing Services (EMS) market. Recognized as a technology leader, Sanmina-SCI provides end-to-end manufacturing solutions, delivering unsurpassed quality and support to OEMs primarily in the communications, defense and aerospace, industrial and semiconductor systems, medical instrumentation, multimedia, enterprise computing and storage, and automotive technology sectors. Sanmina-SCI has facilities strategically located in key regions throughout the world. More information regarding the company is available at www.sanmina-sci.com.



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