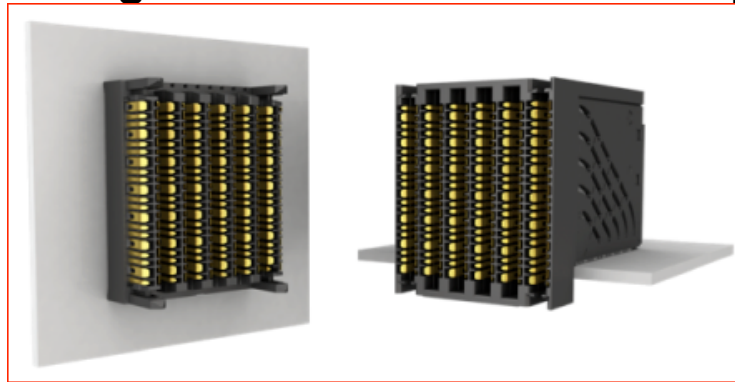


## ExaMAX – Designed for 85 and 100 ohm Applications



ExaMAX is specified to have a characteristic impedance of 92 ohms when driven differentially, yet most high speed differential applications are either 100 ohms or 85 ohms. Can ExaMAX be used in 100 ohm applications?

The simple answer is YES! Figure 1 shows the results of a full wave simulation that has been correlated to measured data. 4 differential pairs (corresponding to the 4 rows in the connector) are plotted and are compared to the OIF channel requirements for return loss. OIF CEI-28G does not specify return loss for only the connector, so each discontinuity in the channel must be engineered for a “small” mismatch to meet the channel level return loss specification. Examax has been successfully designed into channels which comply with the OIF-CEI-28G requirements.

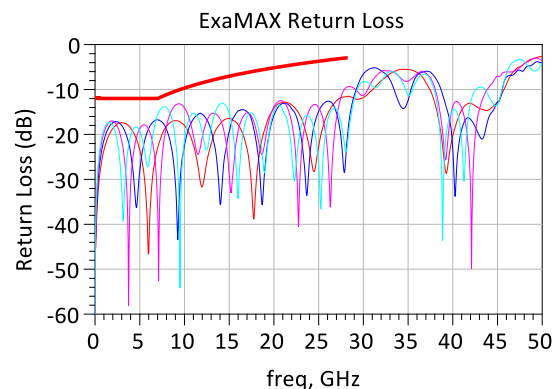


Figure 1. ExaMAX Return Loss in 100 Ohm System (OIF CEI-28G)

Consider the other major discontinuities in a high speed channel, PCB vias and IC packages. Even well designed differential vias can have an impedance of 80 ohms and SERDES packages have a similar (or worse) impedance mismatch. In fact, PCB vias and IC package impedance

characteristics were one of the driving factors in the development of 85 ohm systems like PCI Express. So will ExaMAX work in 85 ohm systems?

The simple answer is again, YES! Figure 2 shows the same data as Figure 1 with the exception that the reference impedance was changed to 85 ohms differential. PCI Express 4.0 is currently in development and includes an 85 ohm connector return loss requirement which is plotted for comparison.

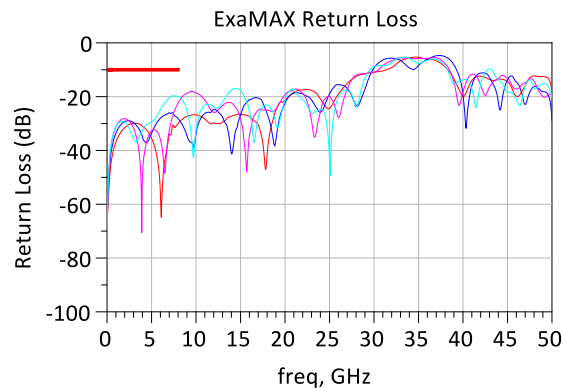


Figure 2. ExaMAX Return Loss in 85 Ohm System (PCIe Gen 4)

Achieving return loss compliance in both 85 ohm and 100 ohm systems is the result of much more than targeting “the middle ground” of 92 ohms. The key to this performance is the painstaking attention to controlling reflections at all geometry transitions in the connector. The result is an impedance variation within the connector of only 6 ohms at a 15 ps risetime. By minimizing internal reflections ExaMAX is able to meet return loss specifications in 85 and 100 ohm systems.

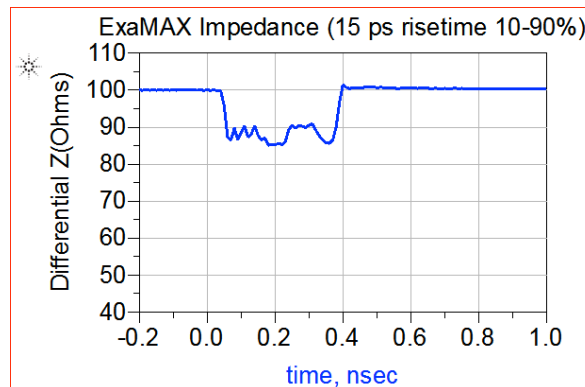


Figure 3. Examax Impedance Profile (longest row)