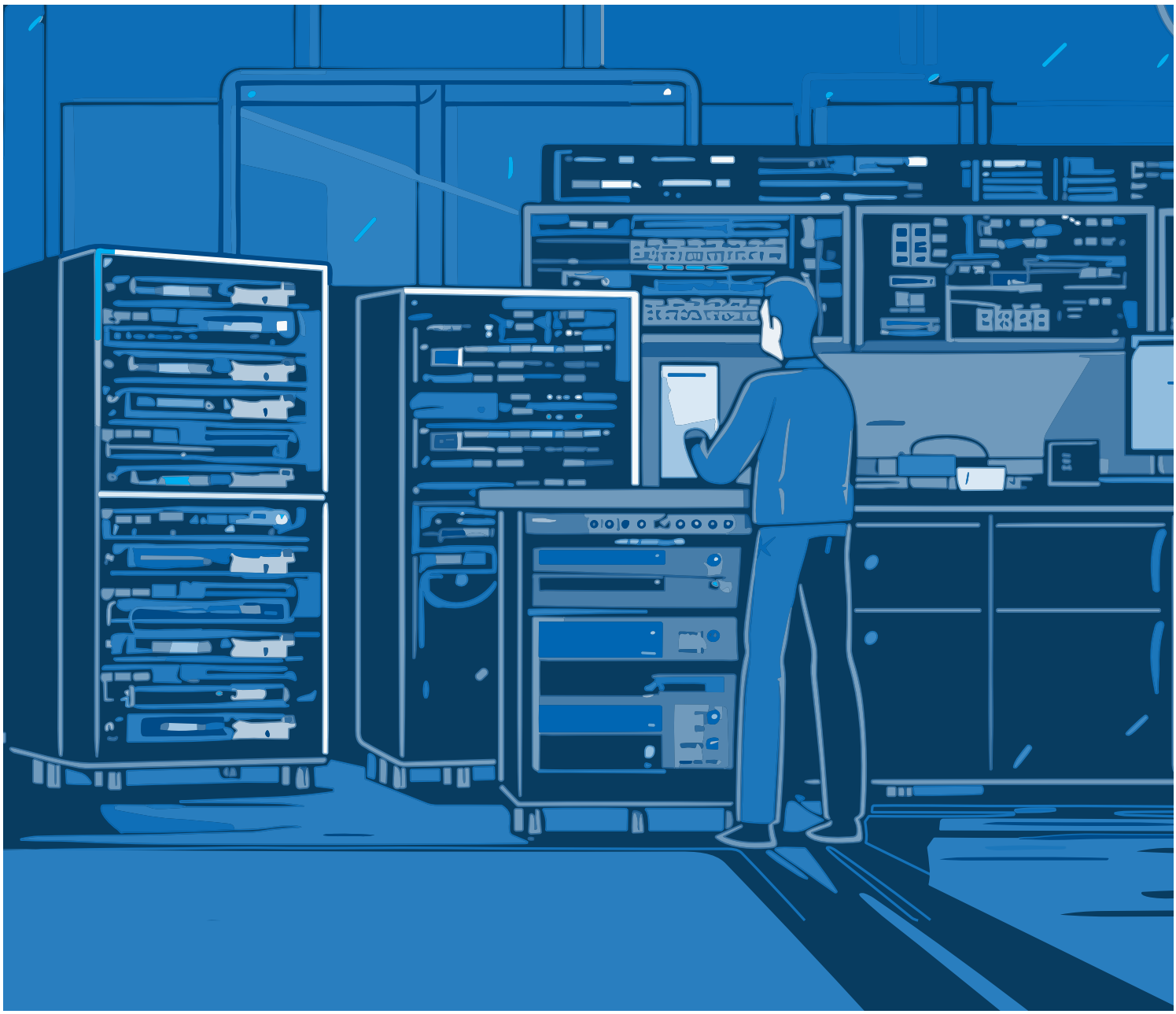
Webinar

An Introduction to Signal Integrity in Embedded Computing Applications - Q&A



(Photo source: Mouser)

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Question 1

Can you suggest connectors for board-to-board connection (one board on top of another) that are suitable for 1 Mbit/s signaling... or can you confirm that each connector is Ok for this?

Answer

Just about any Samtec mated connector pair can handle the 1 Mbps. The question to ask is how many signal pins, ground pins and mating height you need. Samtec's PCI/104-Express™ Standard Connectors may be a good place to start. Contact us directly at SIG@samtec.com for more information.

Question 2

Comment: For decent signal you usually need much more than 2x bit/symbol rate! The question being asked is, I think - Typically, what bandwidth is required to transmit a given bit rate, e.g 1Mbit/s?

Answer

Typically the BW is at least 2x the data rate or bit rate at a minimum. But as you said, more is better.

Question 3

Comment: Insertion loss for short traces is due to poor impedance match correct? Question: What are the main causes of insertion loss for short pcb traces?

Answer

In general, that is correct. It could also depend on your data rates, layout, grounding, laminate selection, material dielectrics other effects.

Question 4

For what reasons would different pulse width be used for insertion loss measurement (ie. what do different measurements mean)?

Answer

The different IL and RL plots we showed during the presentations correspond to different set-ups in the channel. It may be different mating heights, pin-out or even different channel pairs within the same interconnect showing how signal pair 1 differs from signal pair 2 and so forth. For TDR measurement, changing rise times and fall times of the pulses give the test engineer insight to how a system operate in different environments or data rates.

Question 5

Slide "Return losses": according to formula it turns out that the less Preflected is, the greater the Return Losses are? Can you please clarify the formula shown. (note for Matt: looks like there's minus sign missing in front of the '10log')?

Answer

The formula is correct. In an absolute sense, RL is a positive number. In practice, it's always shown as a negative number. The name "Retuen Loss" can be confusing. Ideally, a signal trace of any transmission lines carries power with no loss because of perfect matching. If that happens, Preflected = 0 and RL = infinity. On the other hand, an open means Preflected = Pin. That makes RL = 0. So what does that mean? RL values are opposite of what we typically think of in terns of 'loss'.

Question 6

Samtec obviously understands SI. But what about protocols? How do you support PCIe and CXL?

Answer

That's as interesting question. We offer standard interconnect solutions that comply with the latest specifications from PCI-SIG. These are available from Mouser here. We also have a number of high-speed interconnect solution like Samtec AcceleRate® HD Ultra-Dense Mezzanine Strips that support the latest Ethernet protocols. Additionally, our technical experts are regular contributors to PCI-SIG and IEEE 802.3 specifications, we can help OEMs identify silicon-to-silicon channels that support PCIe 6.0, 200 GbE, or any other high-speed protocol.

Question 7

How are the bleeding edge speed rates like 112 and 224 Gbps PAM4 affecting the industry?

Answer

The switch to 112/224 Gbps PAM4 data rates definitely make the SI challenges difficult. However, the increased data rates also illustrate the challenges product designers face at the rethink their system architectures. A good example is Samtec's Flyover® QSFP Cable Systems. Faster data rates mean shorter trace lengths unless you add retimers. Samtec's Flyover Technology makes for an alternatve solution at higher data rates.