

# 224G PAM4 CR+/CR Channels and Their Characteristics

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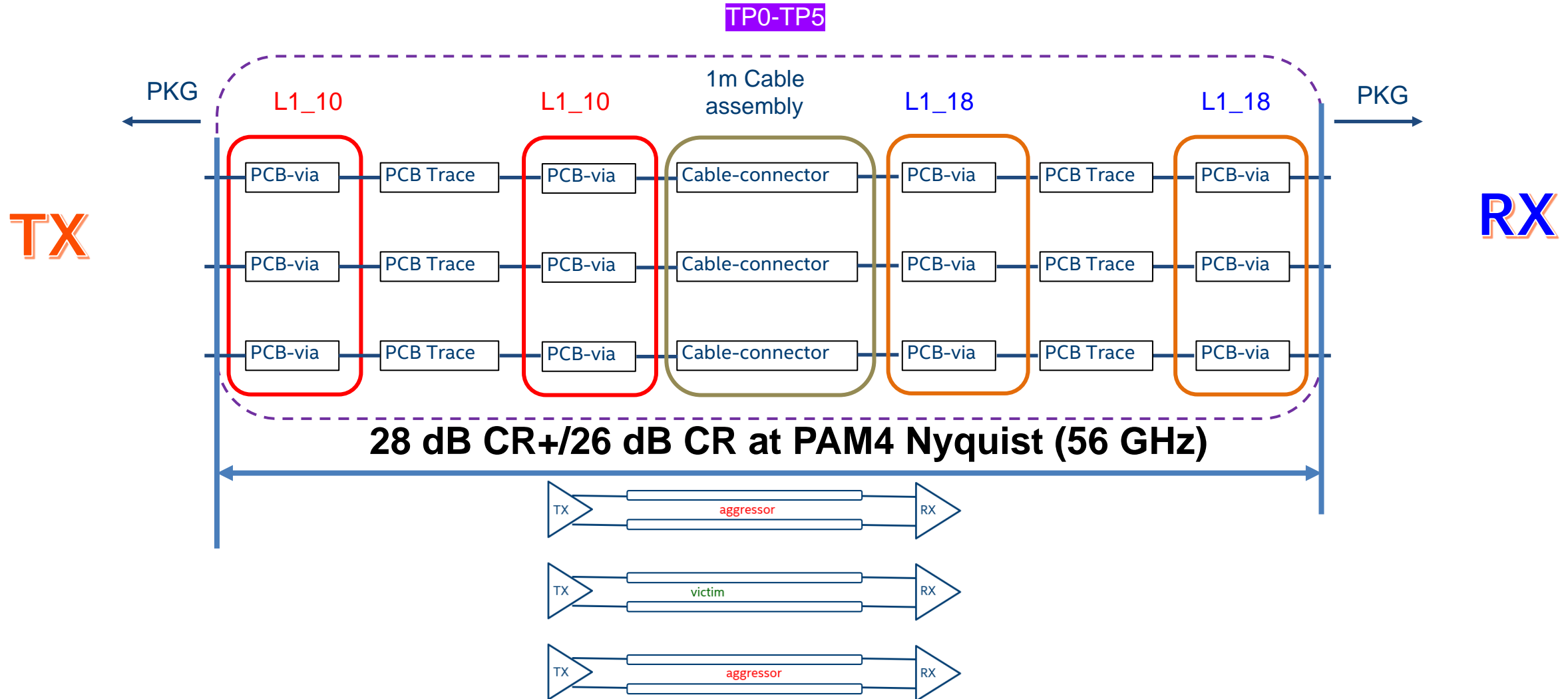
Amphenol

Mar 22th, 2022

# Method and Objectives

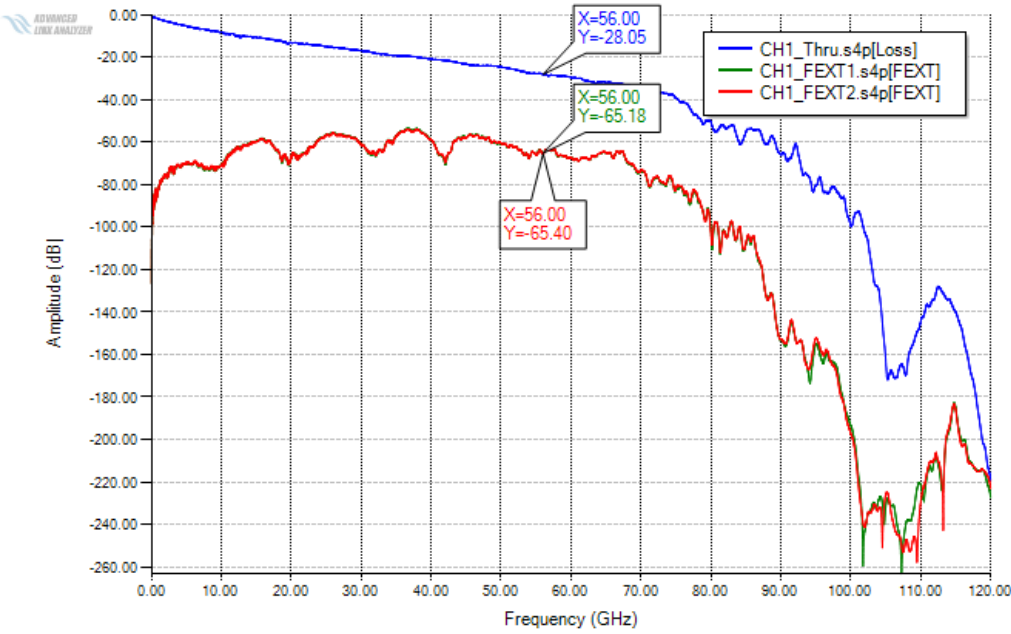
- Two channels, 28 dB CR+, and 26 dB CR (BGA-to-BGA, at 56 GHz, the Nyquist of 224G-PAM4) supporting 1 m cable, were built/synthesized (they are subjected to further improvements).
- They will be used to conduct simulations/modelings (e.g., COM) to demonstrate the 802.3df CR+/CR-PAM4 feasibility and solution space, using the reference die and package models/parameters (see [mli\\_3df\\_02a\\_220316](#)) extracted from test chips/packages.

# 224 Gbps-PAM4 CR+/CR Channel Structure



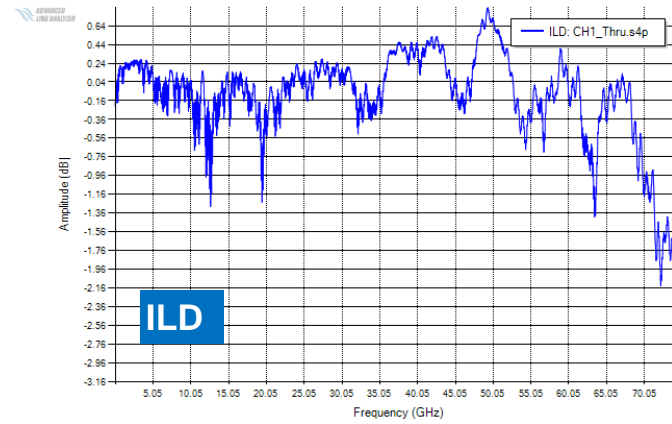
# 224 Gbps-PAM4 CR+ Channel Characteristics

Channel Viewer: [29] FR: Sdd21

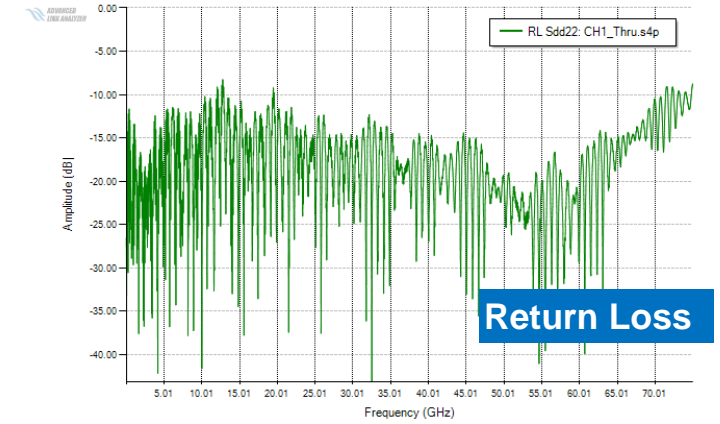


- IL: 28.05dB @ 56GHz
- ILD  $\approx$  1dB (<56GHz)
- RL  $\approx$  10dB (<56GHz)
- FEXT < 54dB (<56GHz)

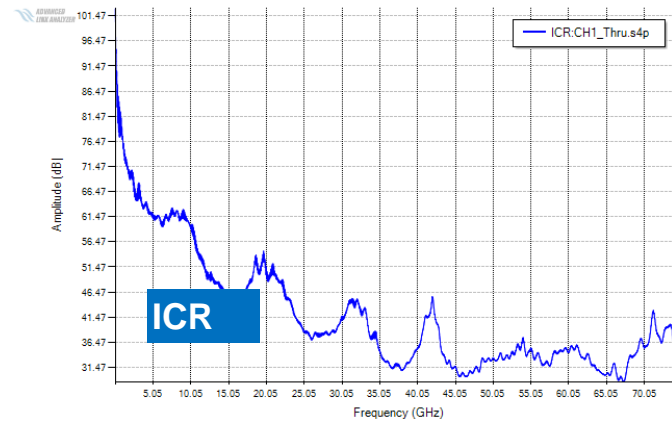
Channel Viewer: [8] CP: ILD



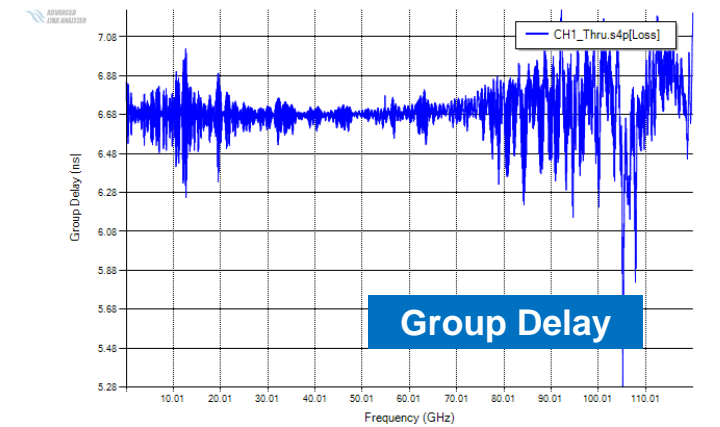
Channel Viewer: [9] CP: Return Loss



Channel Viewer: [10] CP: ICR

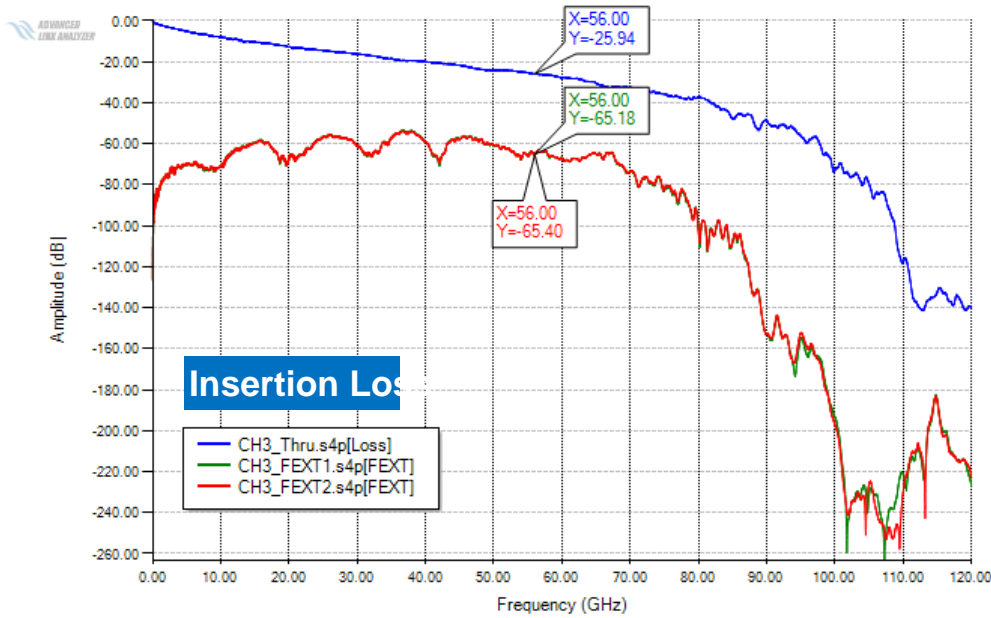


Channel Viewer: [27] FR: Sdd21



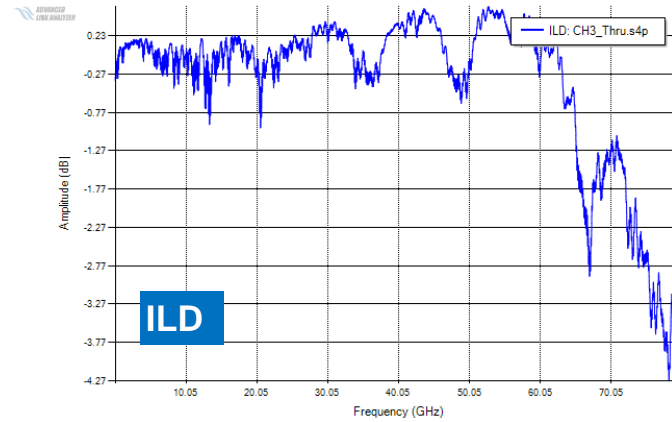
# 224 Gbps-PAM4 CR Channel Characteristics

Channel Viewer: [12] FR: Sdd21

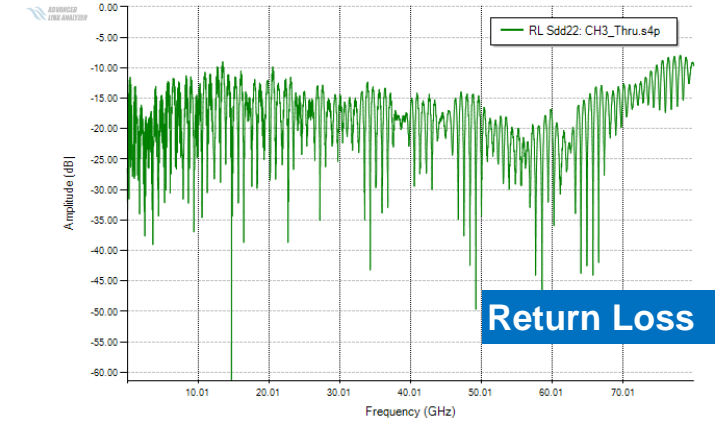


- IL: 25.94dB @ 56GHz
- ILD  $\approx$  1dB (<56GHz)
- RL  $\approx$  10dB (<56GHz)
- FEXT < 54dB (<56GHz)

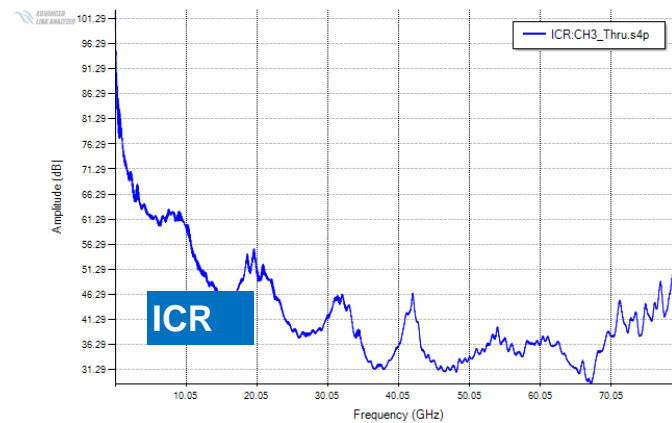
Channel Viewer: [14] CP: ILD



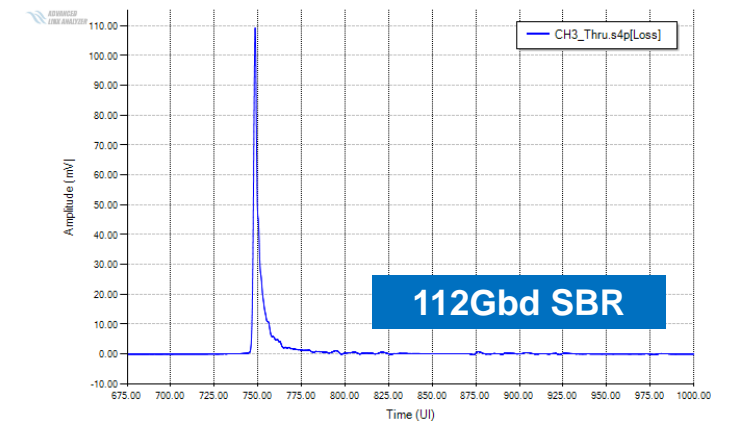
Channel Viewer: [15] CP: Return Loss



Channel Viewer: [16] CP: ICR



Channel Viewer: [17] SBR: Sdd21



# Thank You!