

zQSFP+ 28G Pluggable Presentation

IEEE OIF Liaison Ad Hoc

June 29, 2010

Overview

- **Introduction**
- **zQSFP+**
 - Connector Electrical Performance vs Performance Metrics
 - Connector + Module + Host Channel Performance
- **Summary**

Introduction:

Molex and Tyco Electronics (TE) have teamed up to provide a comprehensive interconnect solution.

Molex and TE are working together and sharing key technologies to provide the highest degree of compatibility between our product offerings. Full intermateability testing, both mechanical and SI, will be completed for each of the proposed solutions.

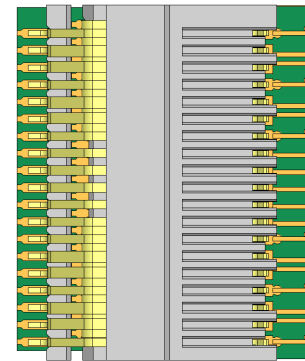
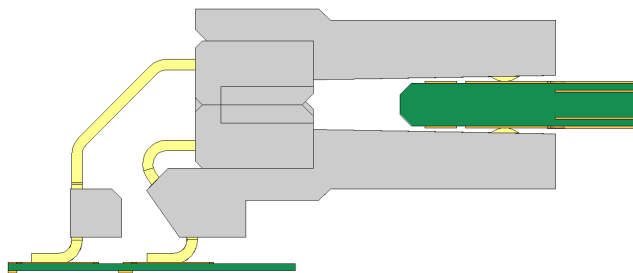
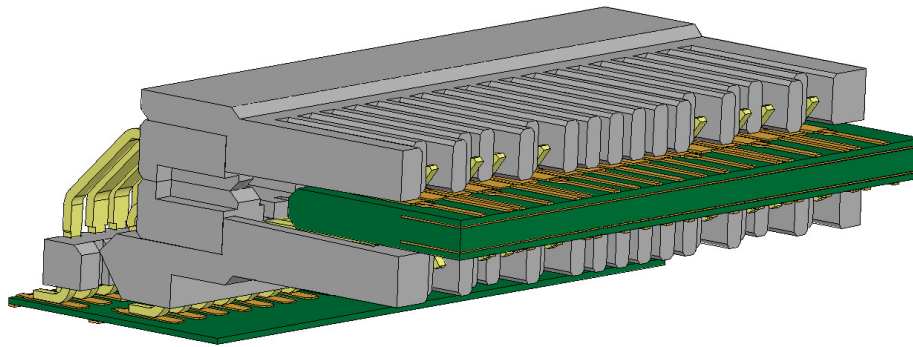
Testable samples of zQSFP+, mounted on test vehicles, will be available in July

zQSFP+ Signal Integrity Data overview

- Summary data is presented for long path (top row) connector only models, and compared to previously-discussed metrics at 14 GHz.
- Channel model performance is also presented, nominal and worst-case, with loss equivalent to existing QSFP+ test fixturing
- Nominal and worst-case channel results are based on PCB mating variation, which causes stub length variation.

zQSFP+ SMT

Electrical Analysis

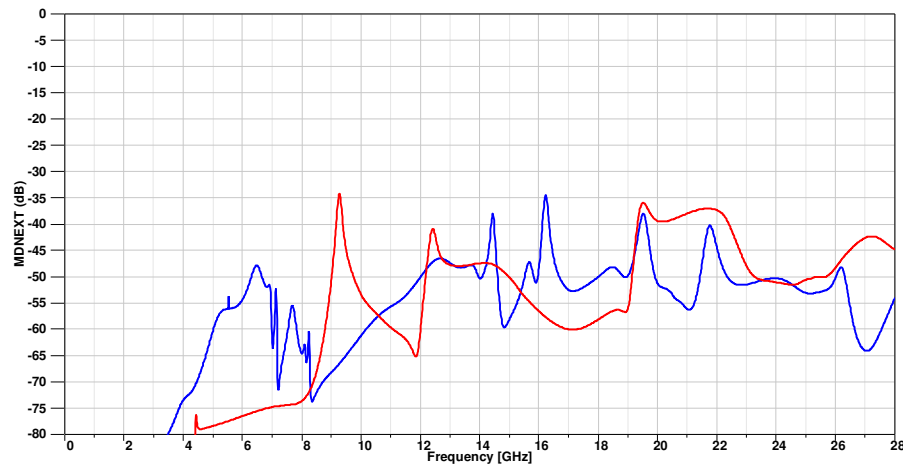


zQSFP+ Connector Long-Path Isolation

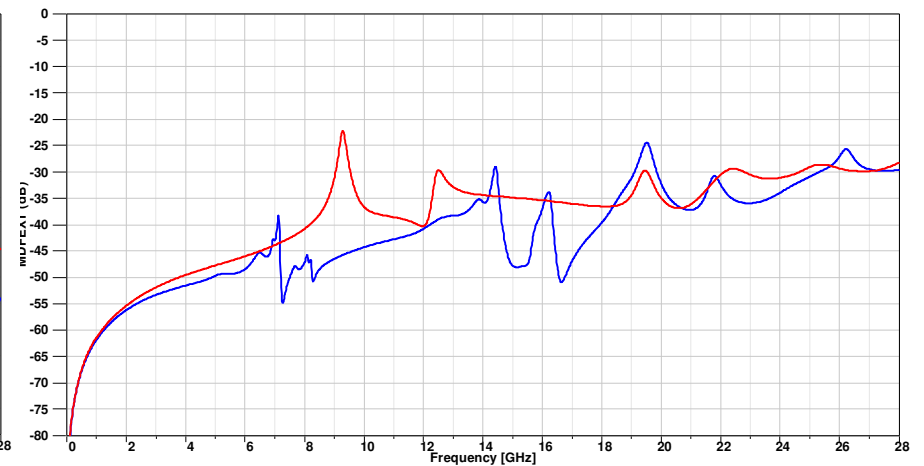
Red = existing QSFP+

Blue = zQSFP+

MDNEXT



MDFEXT



Electrical Performance Metrics

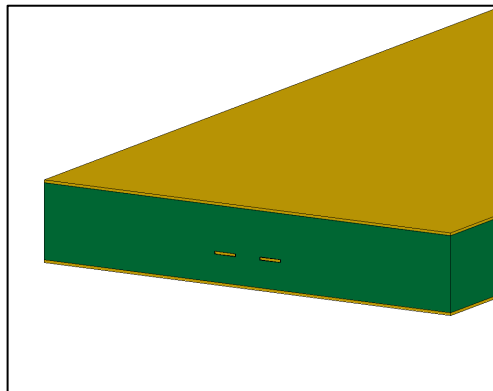
zQSFP+

Performance Metric		Molex /TE zQSFP+ SMT
IL	-1.4dB @ 14GHz	-0.8dB
RL	-12dB up to 14GHz	-14dB
CM conversion	-24dB up to 14GHz	-27dB
ICN	3mV	1.6mV
MDNEXT (ICN)	1mV (rms)	0.5mV
MDFEXT (ICN)	2.8mV (rms)	1.5mV

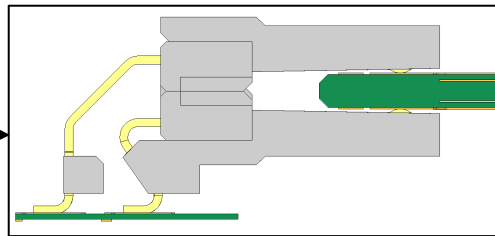
zQSFP+ Channel Performance

Host – Connector – Module

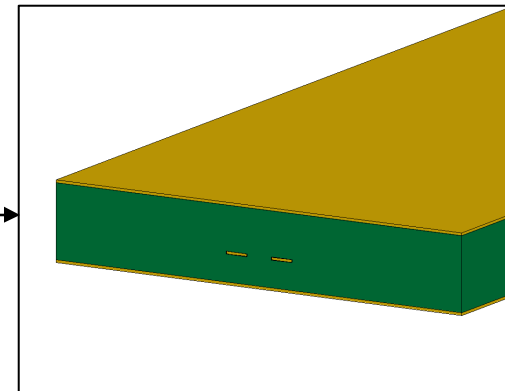
Module Compliance board
(Simulated Host)



zQSFP+
Connector



Host Compliance board
(Simulated Module)



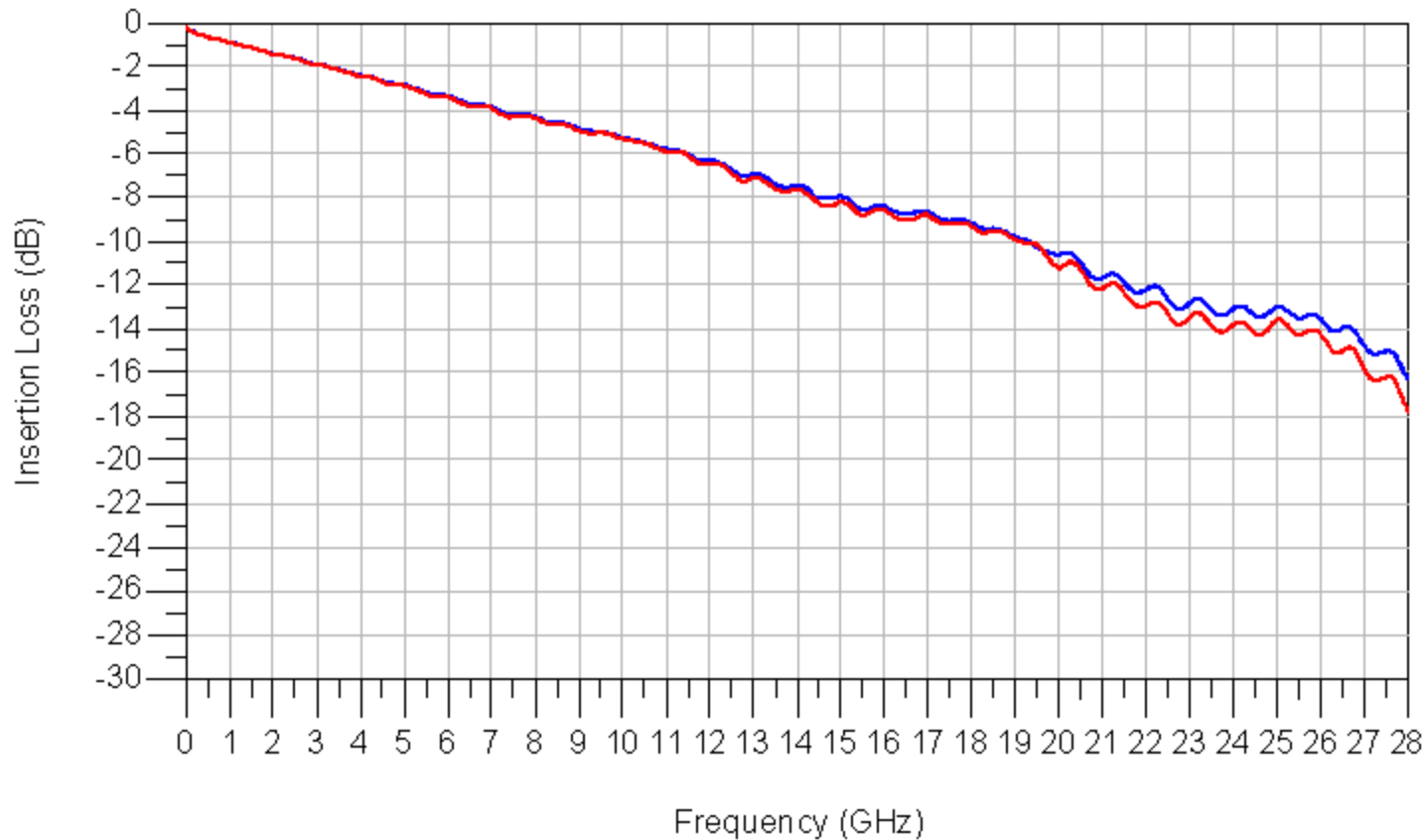
2.125 dB (@ 12.5 GHz, 77mm length)
(Nelco 4000-13SI material)

4 dB trace (@ 12.5 GHz, 143 mm length) ,
(Nelco 4000-13SI material)

Channel Block Diagram

zQSFP+ Longest Path Channel Insertion Loss

Differential Insertion Loss (Nominal & Worst Case)



Red – worst-case

Blue - nominal

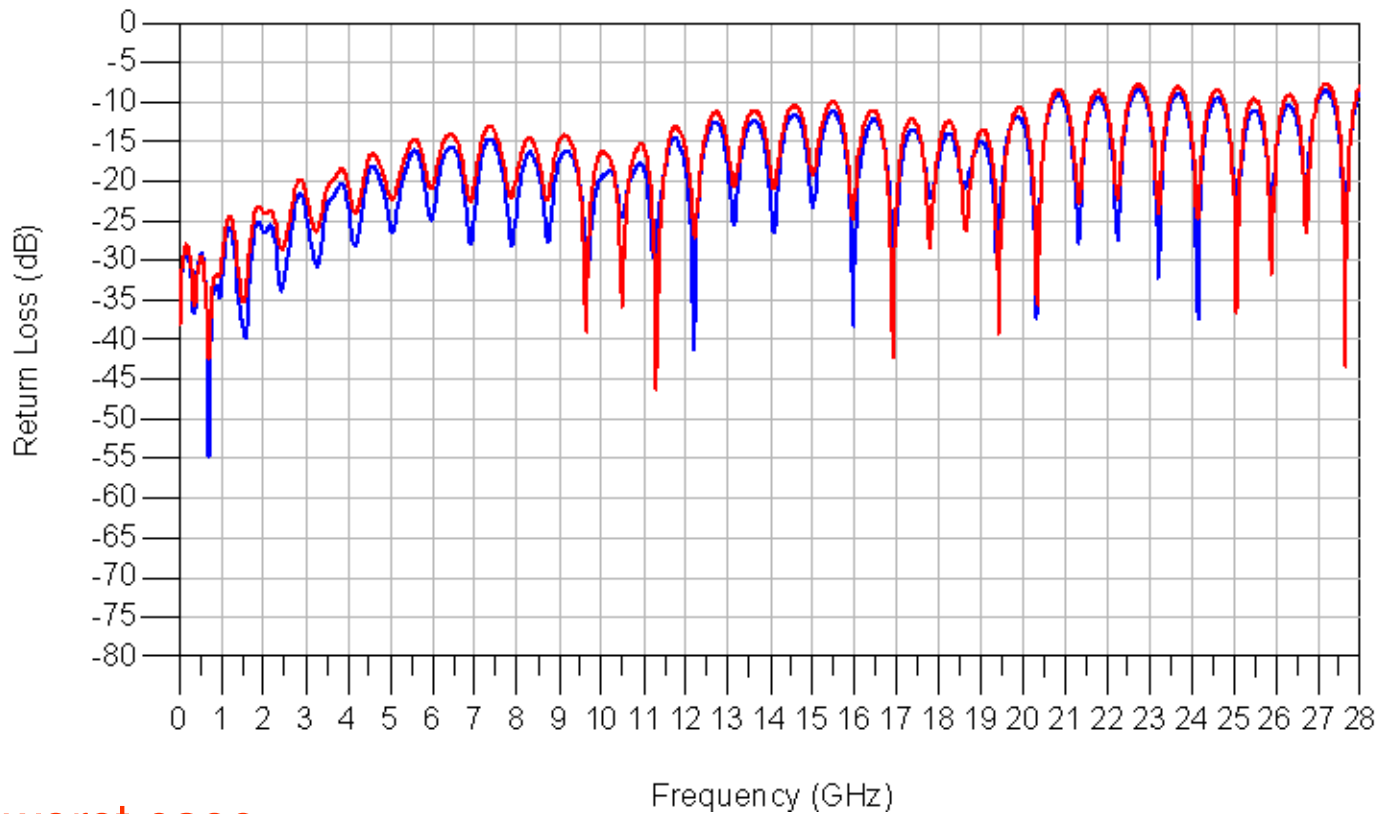


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zQSFP+ Longest Path Channel Return Loss

Differential Return Loss (Nominal & Worst Case)



Red - worst case

Blue - nominal

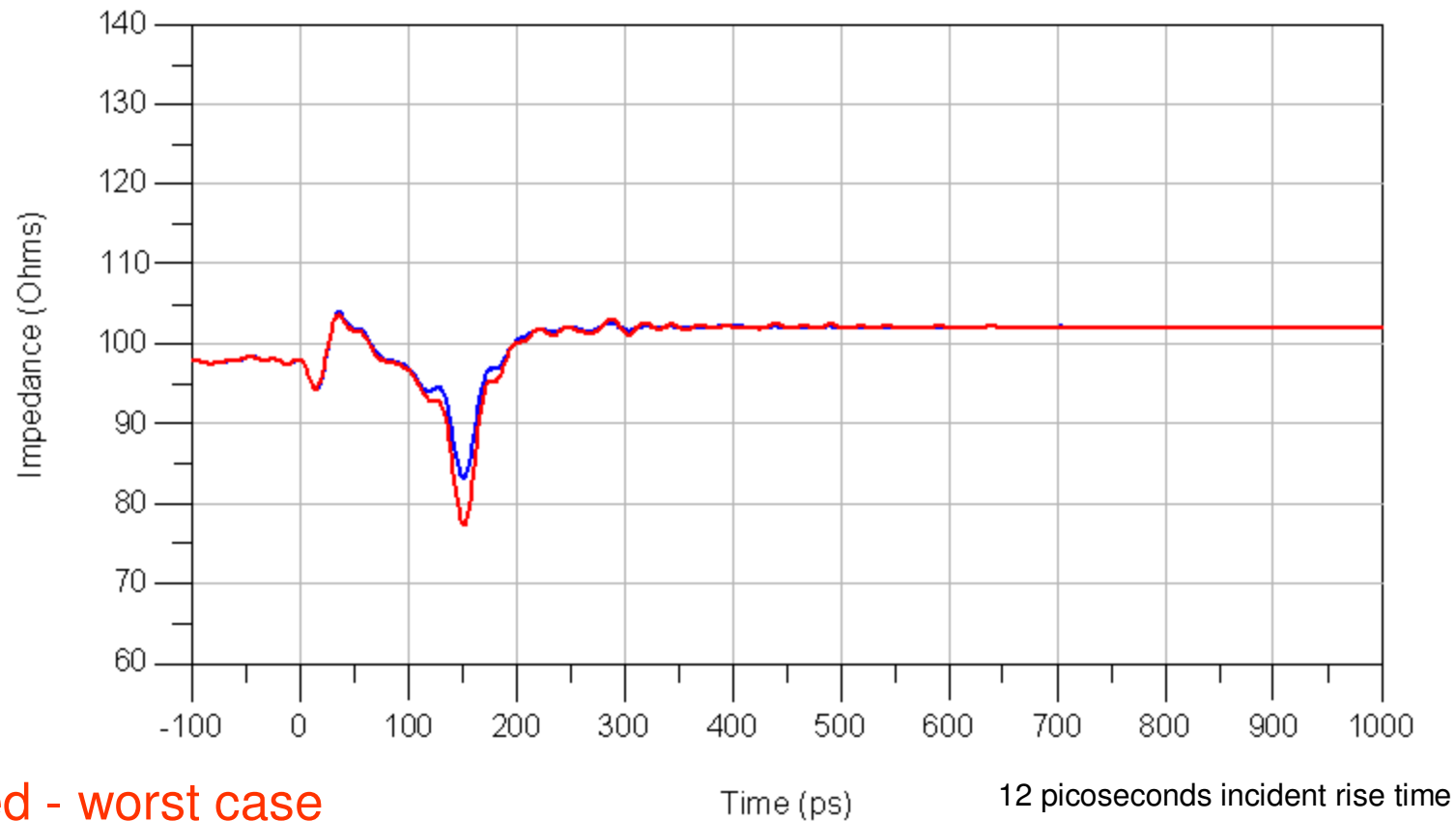


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zQSFP+ Longest Path Channel Impedance

Differential Impedance (Nominal & Worst Case)

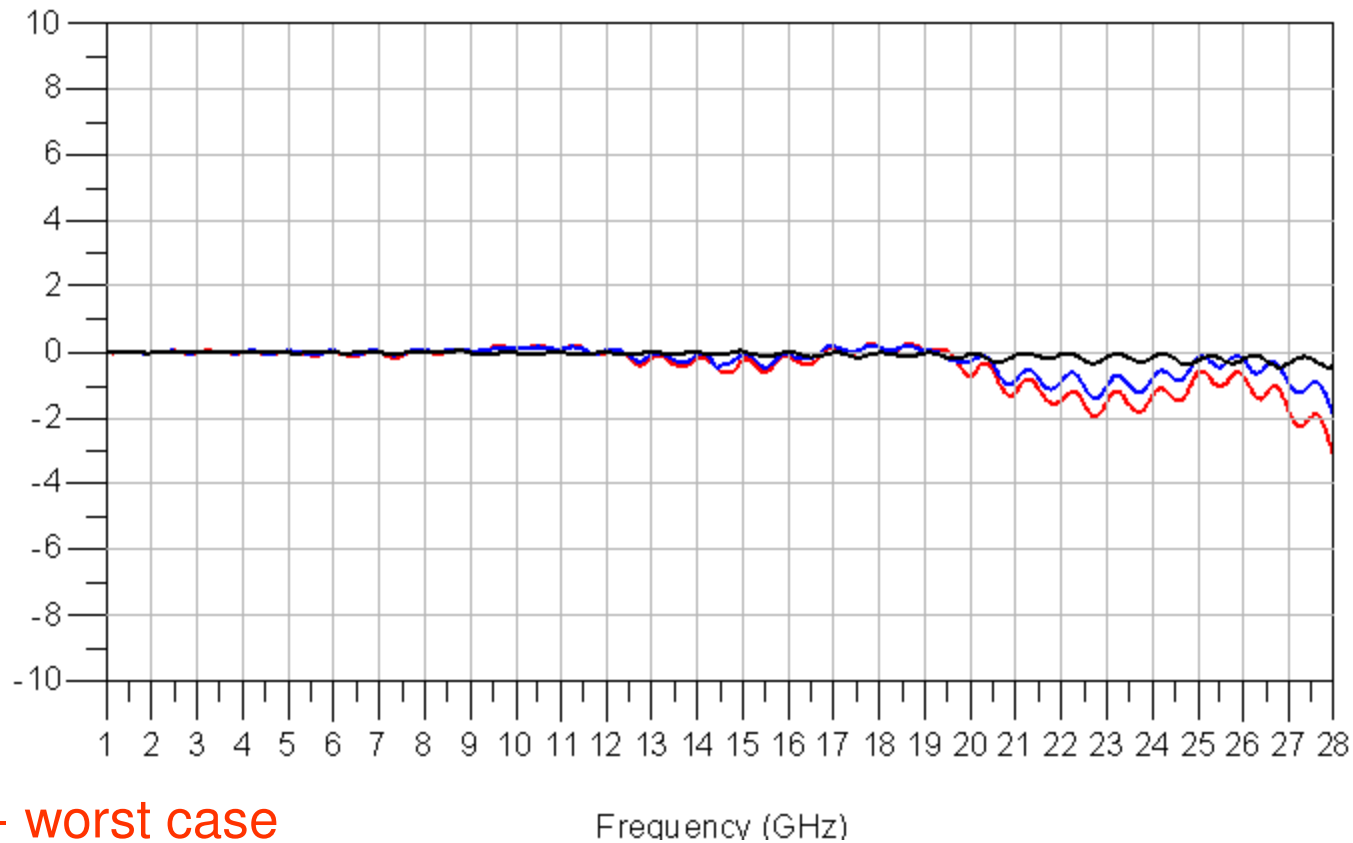


Red - worst case

Blue - nominal

zQSFP+ Longest Path Channel IL Deviation

Differential Insertion Loss Deviation (Nominal, Worst Case and Channel Only)



Red - worst case

Blue - nominal

Black - channel only



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zQSFP+ Longest Path Channel ICN

Red = existing QSFP+

Blue = zQSFP+

Integrated Crosstalk Noise Calculation:

0.6V diff amplitude

3 FE aggressors: 1 adjacent, 1 diagonal, 1 vertical

3 NE aggressors: 1 adjacent, 1 diagonal, 1 2nd tier adjacent

25/28G: 9.6ps 20-80 rise time, 18.75GHz 3dB rcvr bandwidth, 10MHz to 28GHz integration

MDNEXT target: 1.0 mV

MDFEXT target: 2.8mV

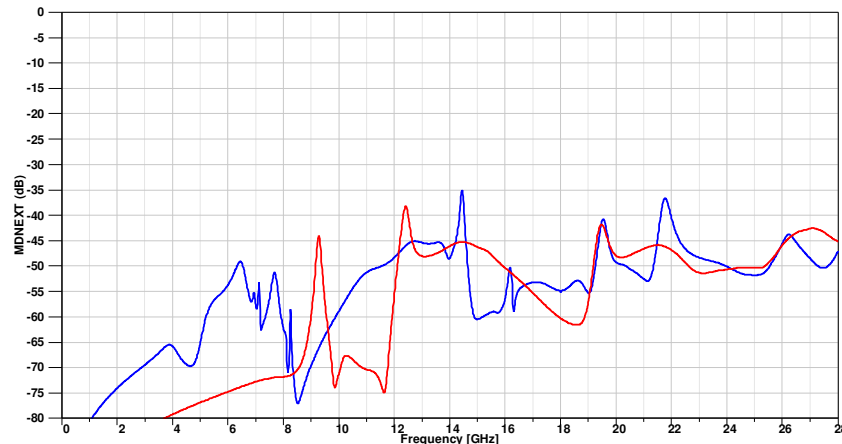
Series	14G (14.0625Gbps)	25/28G (25.78125Gbps)
zQSFP+	QSFP+ MDNEXT: 0.4mV MDFEXT: 2.1mV Total ICN: 2.1mV	zQSFP+ MDNEXT: 0.5mV MDFEXT: 1.5mV Total ICN: 1.6mV

zQSFP+ Short-Row ICN

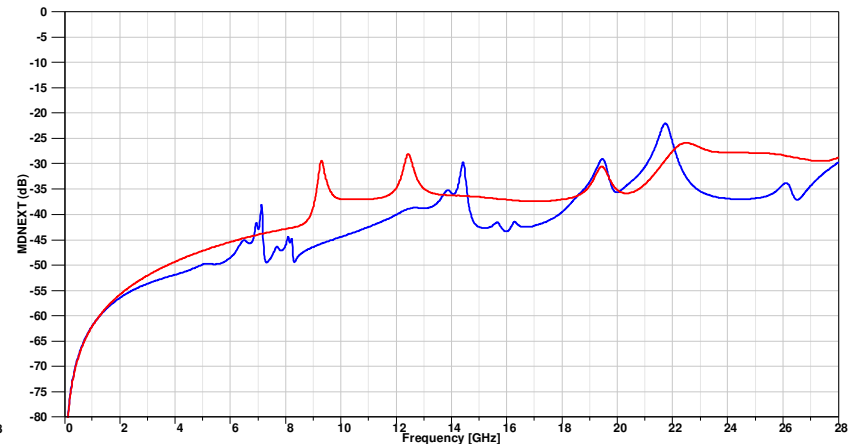
Red = existing QSFP+

Blue = zQSFP+

MDNEXT



MDFEXT



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Summary

- Molex and TE are working together to develop zQSFP+
- zQSFP+ data has been presented
- Test samples will be available in July

