

LR4 Simulations of Connector Contribution to XLPPI Jitter Budget (ref. comment 793)

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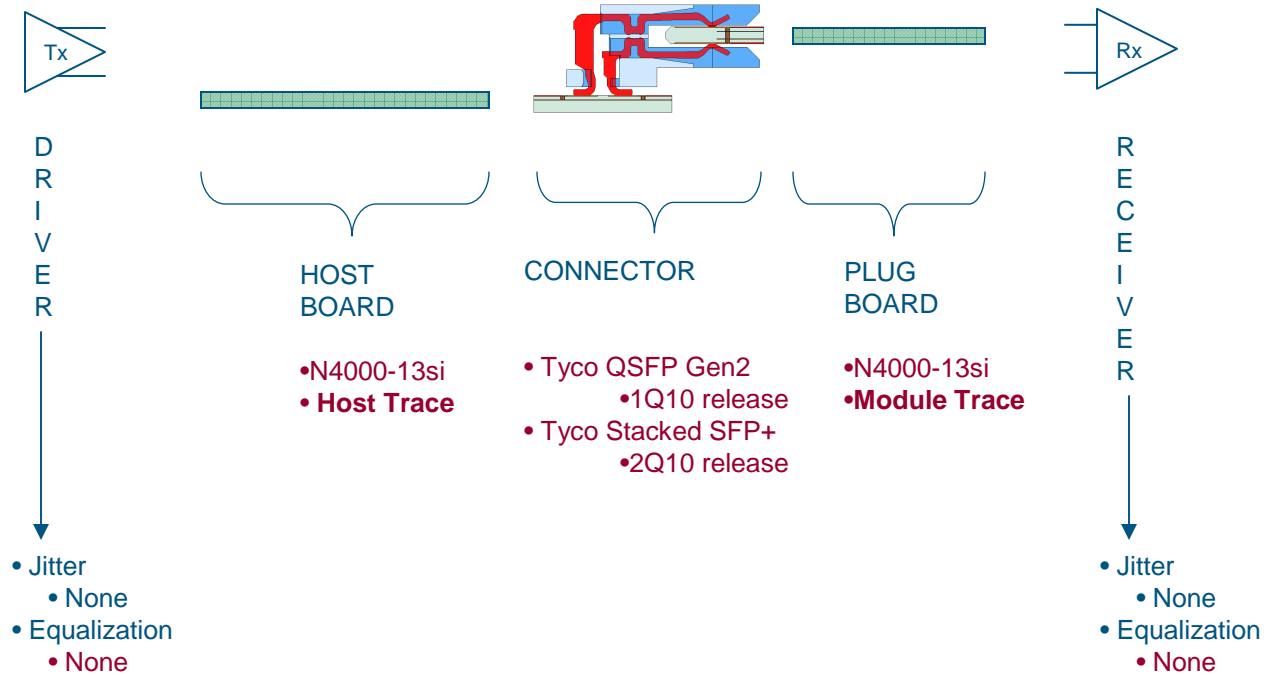
January, 2010

New Orleans IEEE 802.3ba Meeting

Channel Simulation Details

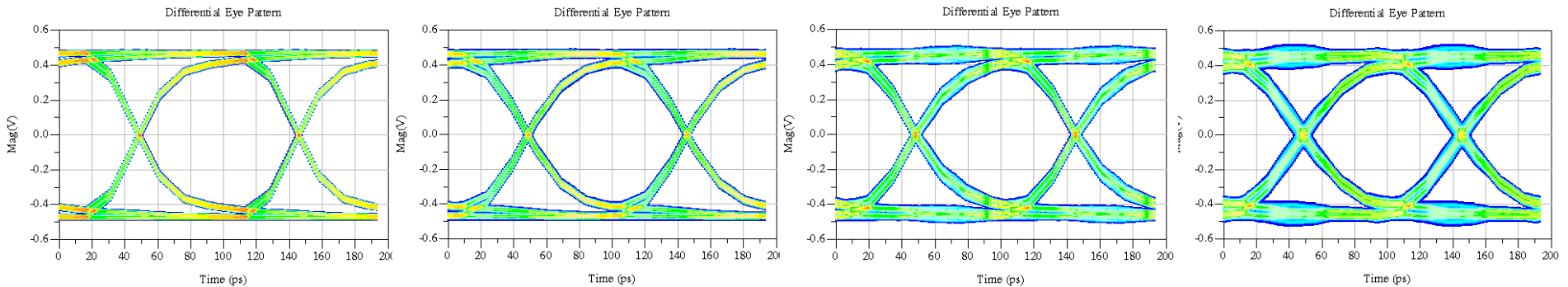
- Various channel simulations have been performed to investigate the connector contribution to channel jitter
 - Connectors are the QSFP SMT connector from Tyco Electronics scheduled for release Q1, 2010 and a hypothetical QSFP connector created from Tyco Electronics SFP+ stacked, 2nd generation connector.
 - Simulations include the following
 - HCB and MCB channel loss
 - FEXT from 3 aggressors (adjacent, below, and diagonal)
 - Statistical Mode or PRBS9 signal
 - No Equalization or Pre-emphasis
 - No source or receiver jitter
 - 10.3125Gbps data rate

Simulation Configuration



LR4 XLPPI Channel Simulation, Statistical Mode

ADS Channel Simulator (No FEXT Contribution, 30ps tr)



Eye Height (% Height)

82.2

Eye Height (% Height)

76.7

Eye Height (% Height)

74.0

Eye Height (% Height)

71.2

Eye Width (% UI)

96.5

Eye Width (% UI)

94.5

Eye Width (% UI)

93.5

Eye Width (% UI)

88.5

PP Jitter

2.9E-12

PP Jitter

3.9E-12

PP Jitter

5.8E-12

PP Jitter

9.7E-12

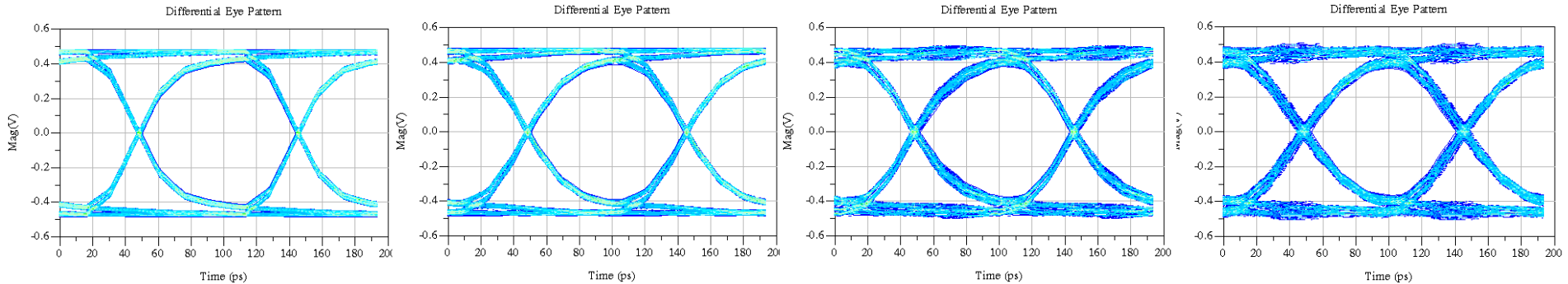
**Compliance Boards
Only**

QSFP SMT

SFP+ Stacked

**QSFP Stacked
(Preliminary Model)**

LR4 XLPPI Channel Simulation, PRBS9 Signal ADS Channel Simulator (No FEXT Contribution, 30ps)



Eye Height (% Height)

82.6

Eye Height (% Height)

77.9

Eye Height (% Height)

75.3

Eye Height (% Height)

72.9

Eye Width (% UI)

96.5

Eye Width (% UI)

96.0

Eye Width (% UI)

94.5

Eye Width (% UI)

90.5

PP Jitter

2.9E-12

PP Jitter

3.4E-12

PP Jitter

5.3E-12

PP Jitter

9.2E-12

**Compliance Boards
Only**

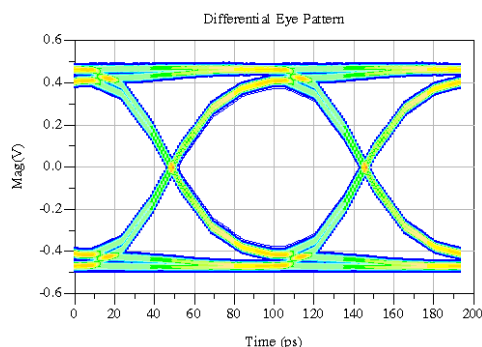
QSFP SMT

SFP+ Stacked

**QSFP Stacked
(Preliminary Model)**

LR4 XLPPI Channel Simulation, Statistical Mode

ADS Channel Simulator (3 FEXT signals Included, 30ps tr)



Eye Height (% Height)

74.9

Eye Width (% UI)

93.5

PP Jitter

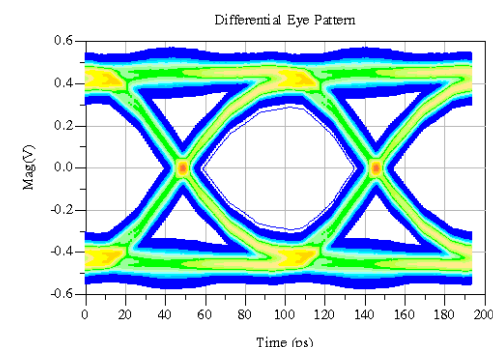
4.8E-12

**Compliance Boards
Only**

QSFP SMT

SFP+ Stacked

**QSFP Stacked
(Preliminary Model)**



Eye Height (% Height)

58.0

Eye Width (% UI)

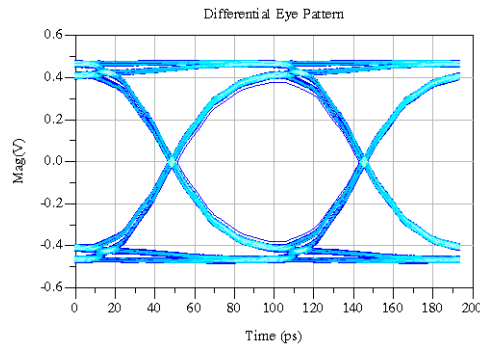
78.5

PP Jitter

1.2E-11

LR4 XLPPI Channel Simulation, PRBS9 Signal

ADS Channel Simulator (3 FEXT signals Included, 30ps tr)



Eye Height (% Height)

75.9

Eye Width (% UI)

94.5

PP Jitter

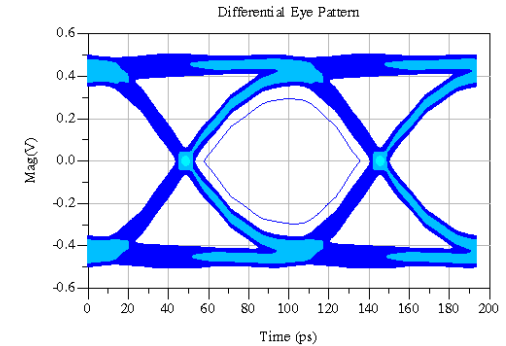
3.4E-12

**Compliance Boards
Only**

QSFP SMT

SFP+ Stacked

**QSFP Stacked
(Preliminary Model)**



Eye Height (% Height)

59.2

Eye Width (% UI)

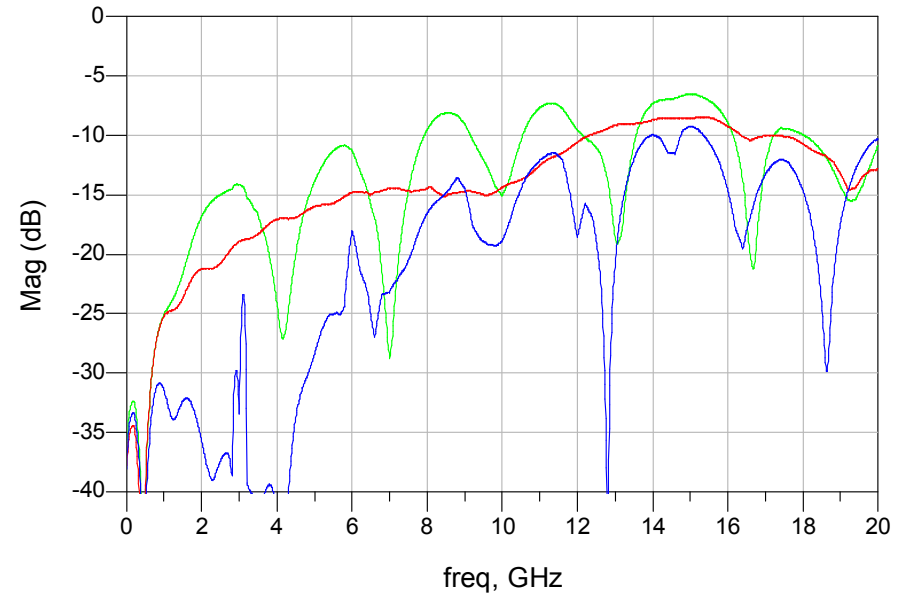
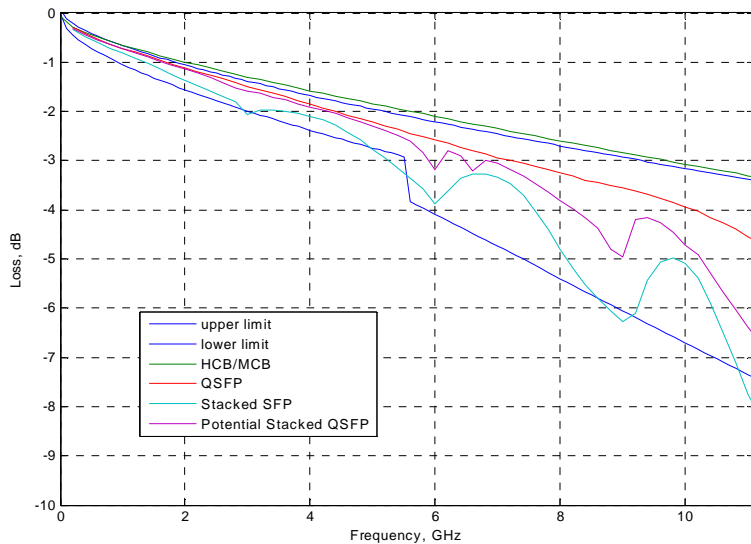
80.5

PP Jitter

8.7E-12

LR4 XLPP Channel Simulation

SDD21 and SDD11, Connectors with HCB and MCB Loss



Dk Green: HCB+MCB Traces
Red: QSFP SMT
Aqua: Stacked SFP+, Gen1
Violet: Stacked QSFP Connector,
based on Stacked SFP+ Gen2

Red: QSFP SMT
Green: Stacked SFP+, Gen1
Blue: Stacked QSFP Connector,
based on Stacked SFP+ Gen2