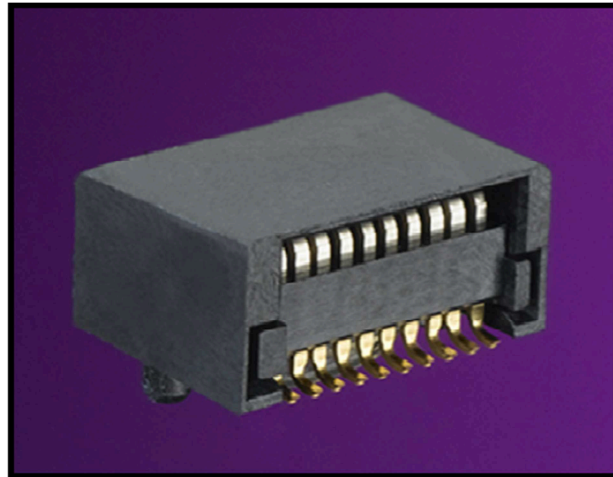




# TEST SUMMARY

## SIGNAL INTEGRITY PERFORMANCE

### ZSFP+ Customer Evaluation Boards (CEBs)



#### 1.0 SCOPE

This Test Summary covers the signal integrity performance of zSFP+ SMT Customer Evaluation Boards, assembled January 2014. The test data has been taken and documented to show the performance upto 28Ghz frequency limit.

#### 2.0 PRODUCT DESCRIPTION

PRODUCT NAME AND PART NUMBER(S)

Series # 170382, zSFP+ SMT Host CEB  
Series # 170071, zSFP+ Edge Card CEB

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DOCUMENT NUMBER: <b>TS-170382-0002</b>	CREATED / REVISED BY: <b>R. Nallan</b>	REVIEWED BY: <b>G. Humbert</b>	APPROVED BY: <b>P. Amleshi</b>

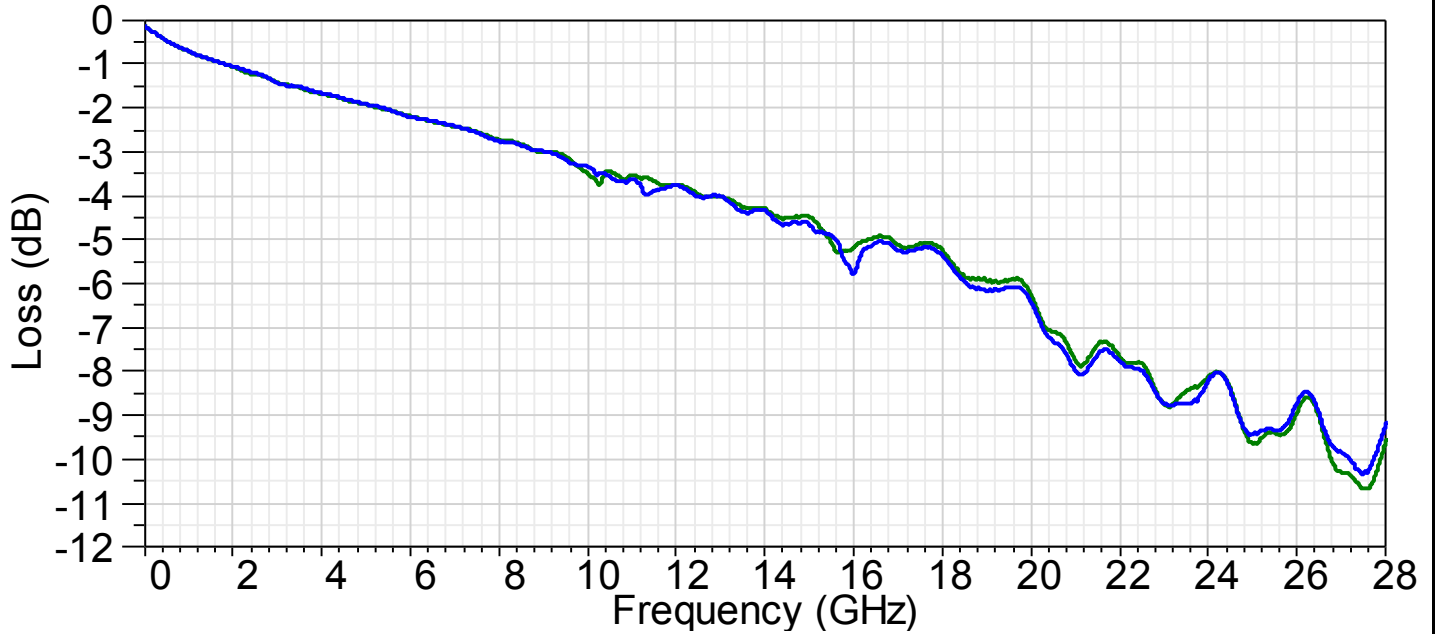


# TEST SUMMARY

## 3.0 PERFORMANCE

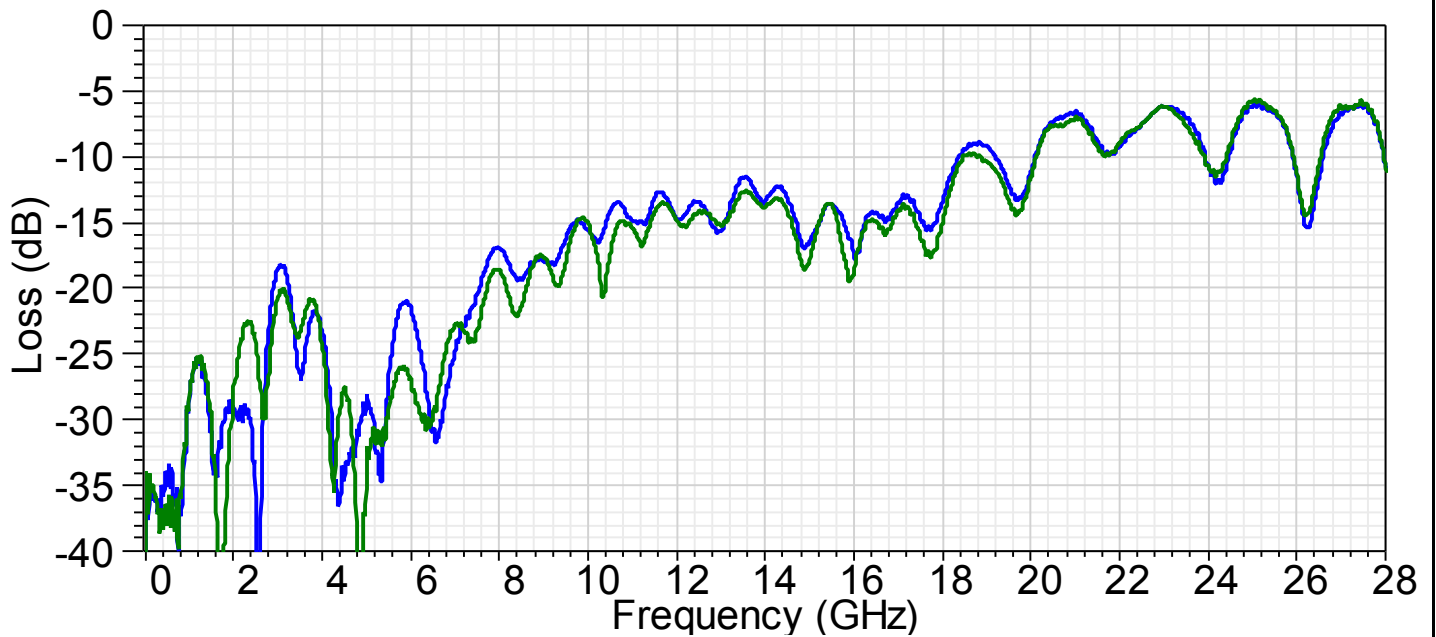
Differential Insertion Loss

- RD+/RD- (GREEN), TD+/TD- (BLUE)



Differential Return Loss

- RD+/RD- (GREEN), TD+/TD- (BLUE)



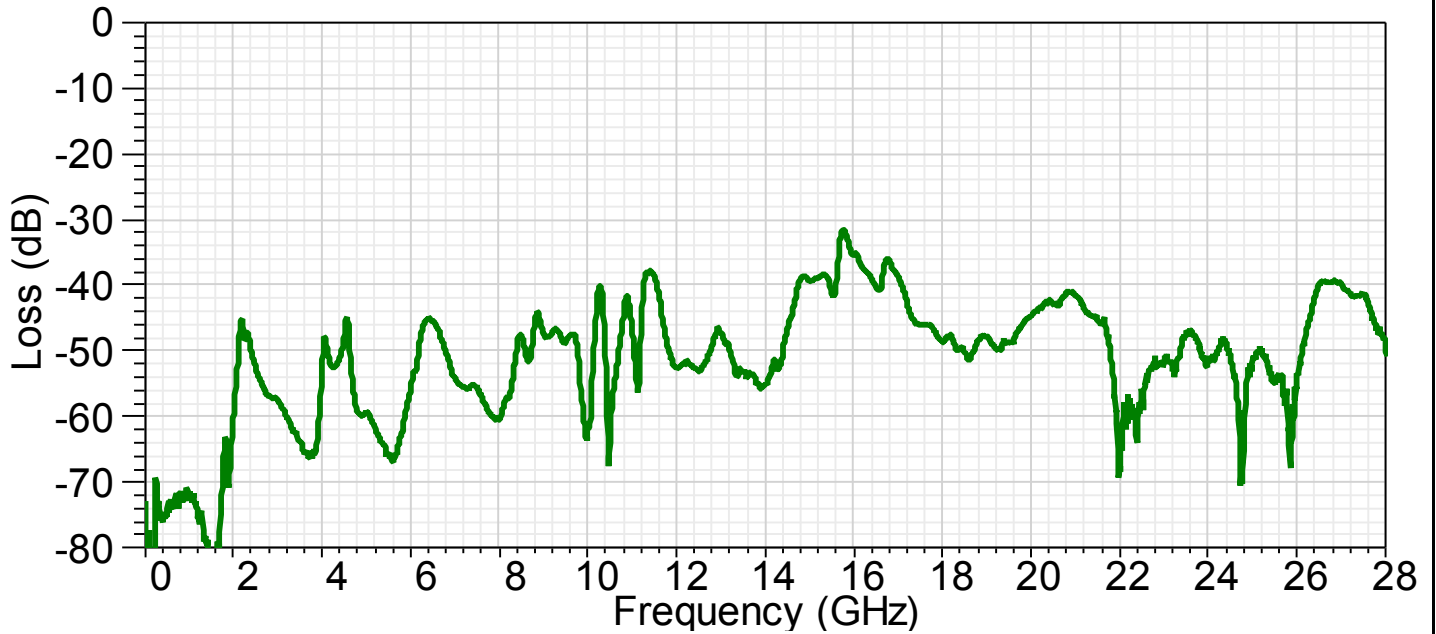
REVISION: <b>A</b>	ECR/ECN INFORMATION: EC No: UCP2014-3773 DATE: 2014 / 13 / 03	TITLE: <b>Signal Integrity Performance zSFP+</b>	SHEET No. <b>2 of 8</b>
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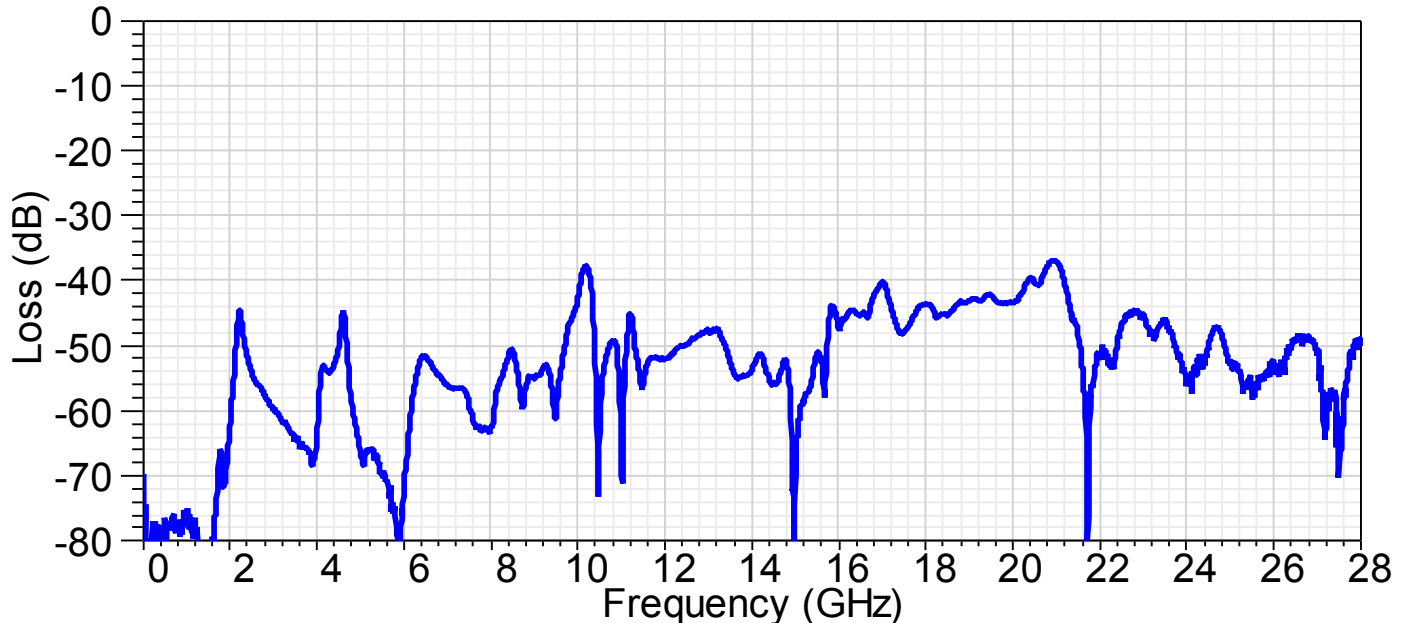
# TEST SUMMARY

## PERFORMANCE

Near-end Differential Crosstalk



Far-end Differential Crosstalk



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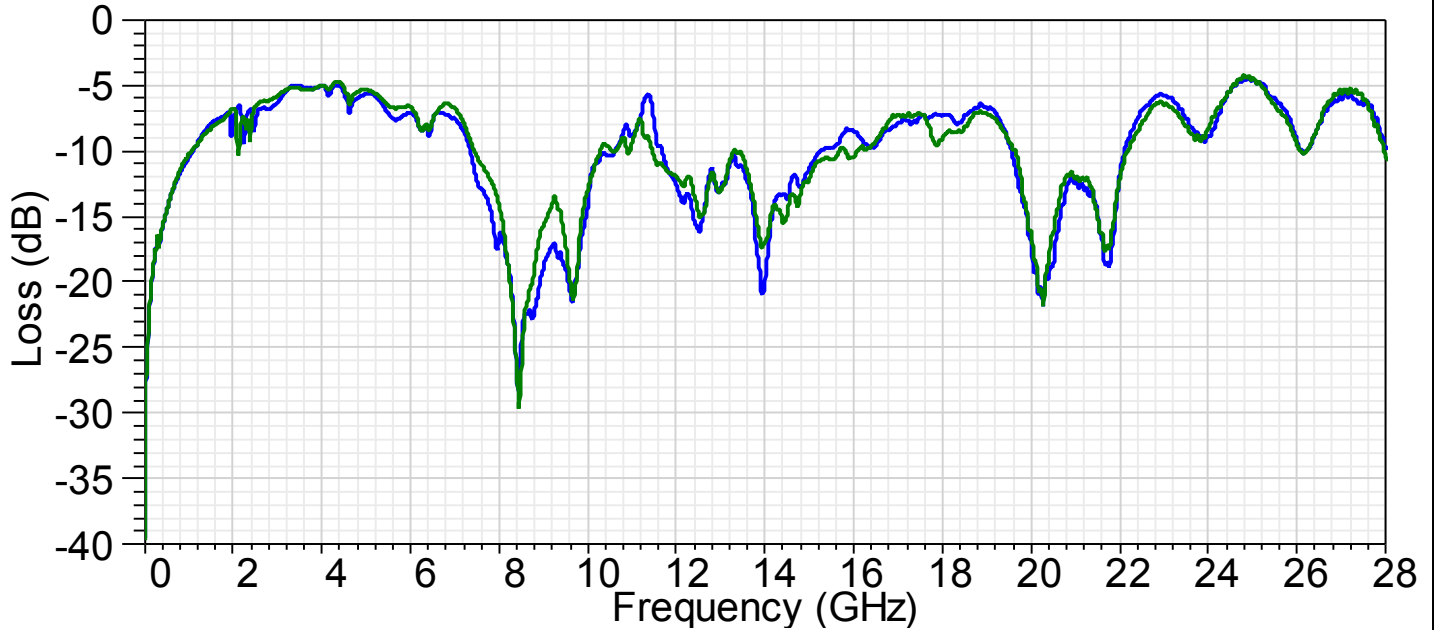


# TEST SUMMARY

## PERFORMANCE

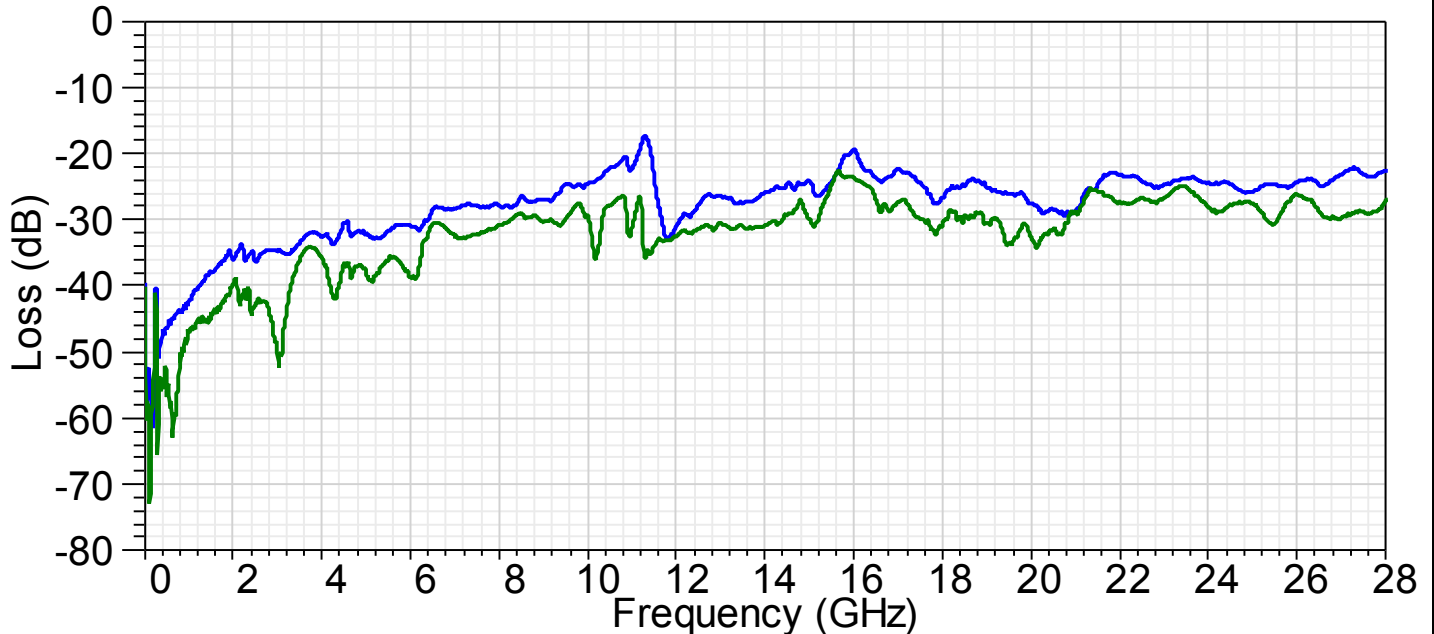
Common Mode Return Loss

- RD+/RD- (GREEN), TD+/TD- (BLUE)



Differential-to-Common Mode Thru Conversion Loss

- RD+/RD- (GREEN), TD+/TD- (BLUE)



Variation (imbalance) of coupled trace lengths in host measurement fixture contributes to mode conversion (See sheet 8).

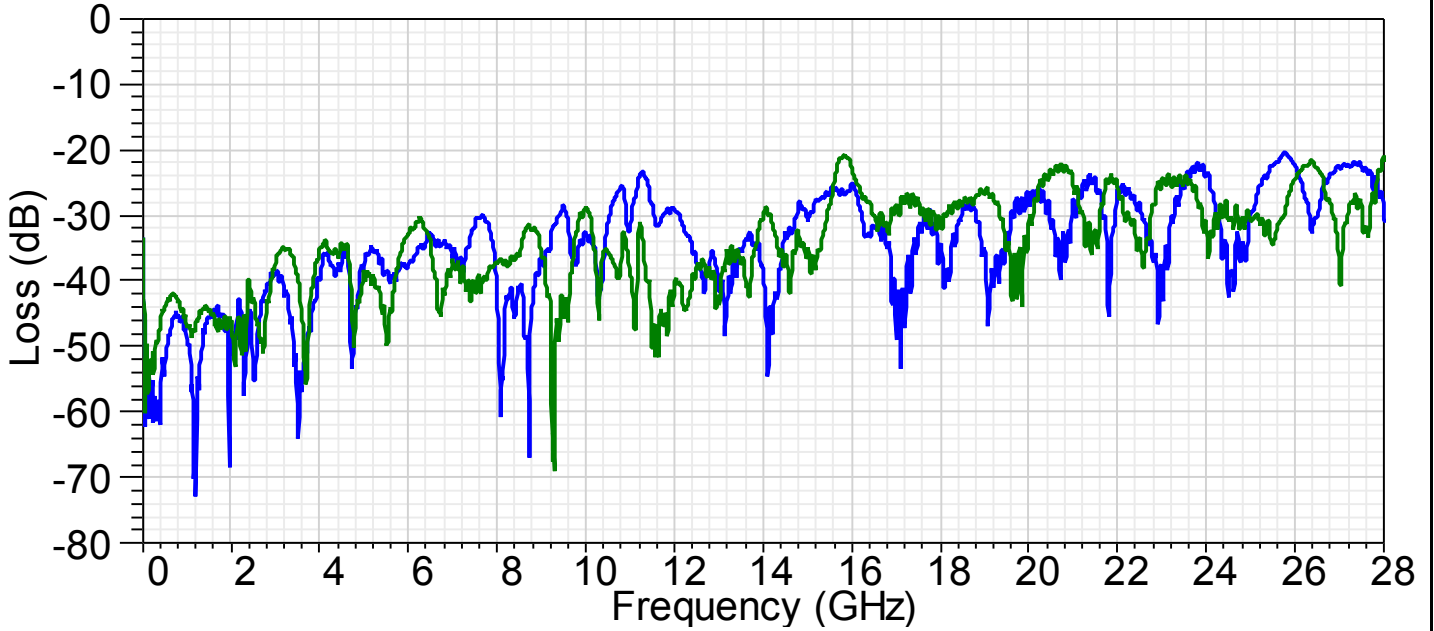
REVISION: <b>A</b>	ECR/ECN INFORMATION: EC No: UCP2014-3773 DATE: 2014 / 13 / 03	TITLE: <b>Signal Integrity Performance zSFP+</b>	SHEET No. <b>4 of 8</b>
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# TEST SUMMARY

Differential-to-Common Mode Return Loss

▪ RD+/RD- (GREEN), TD+/TD- (BLUE)



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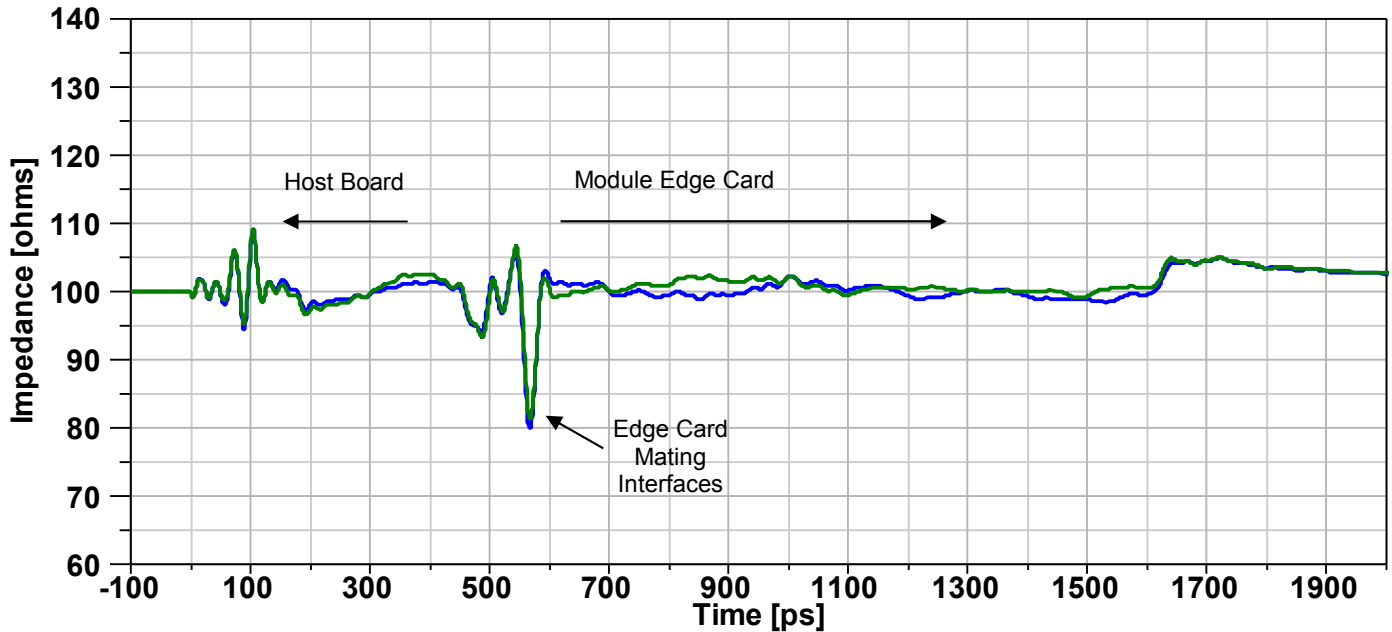
# TEST SUMMARY

## PERFORMANCE

### Time Domain

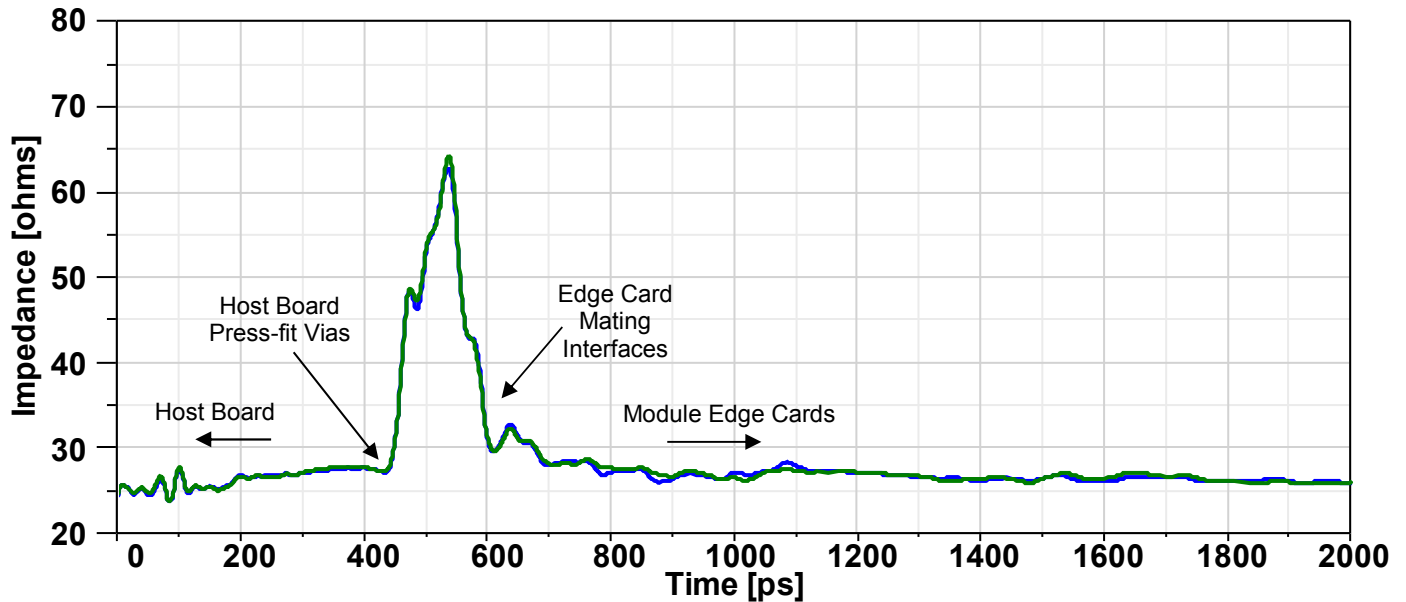
#### Differential TDR Response

- Rise-time of 18ps (20-80%) at connector launch to provide high resolution of performance
- **RD+/RD- (GREEN), TD+/TD- (BLUE)**



#### Common Mode TDR Response

- Rise-time of 18ps (20-80%) at connector launch to provide high resolution of performance
- **RD+/RD- (GREEN), TD+/TD- (BLUE)**

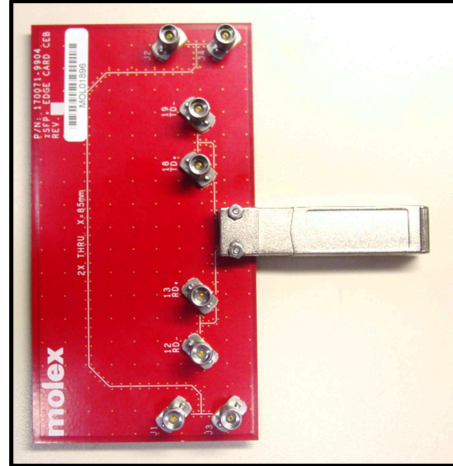
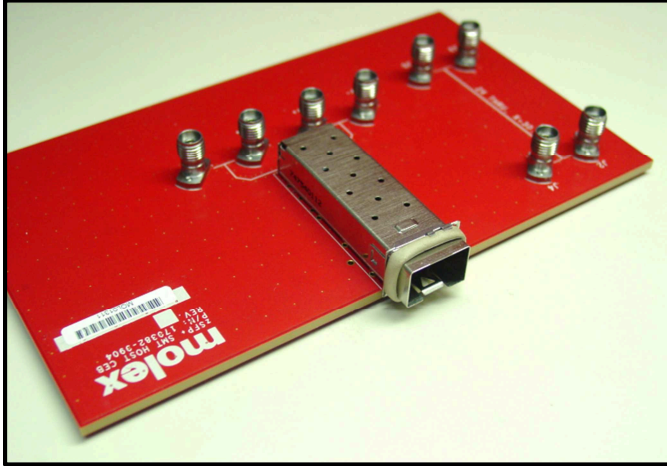


REVISION: <b>A</b>	ECR/ECN INFORMATION: EC No: UCP2014-3773 DATE: 2014 / 13 / 03	TITLE: <b>Signal Integrity Performance zSFP+</b>	SHEET No. <b>6 of 8</b>
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# TEST SUMMARY

## 4.0 FIXTURES AND TEST EQUIPMENT



### Board Information

Material: FR408HR  
 Thickness: 3.0mm  
 Layers: 6  
 High Speed Traces

High-Speed Signals on Layer 5  
 Referenced to Layer 6  
 0.007" dielectric thickness between layers 5 and 6  
 25mm single-ended length on Host Board  
 80mm single-ended length on Edge Card  
 Artwork available upon request (Revision A)

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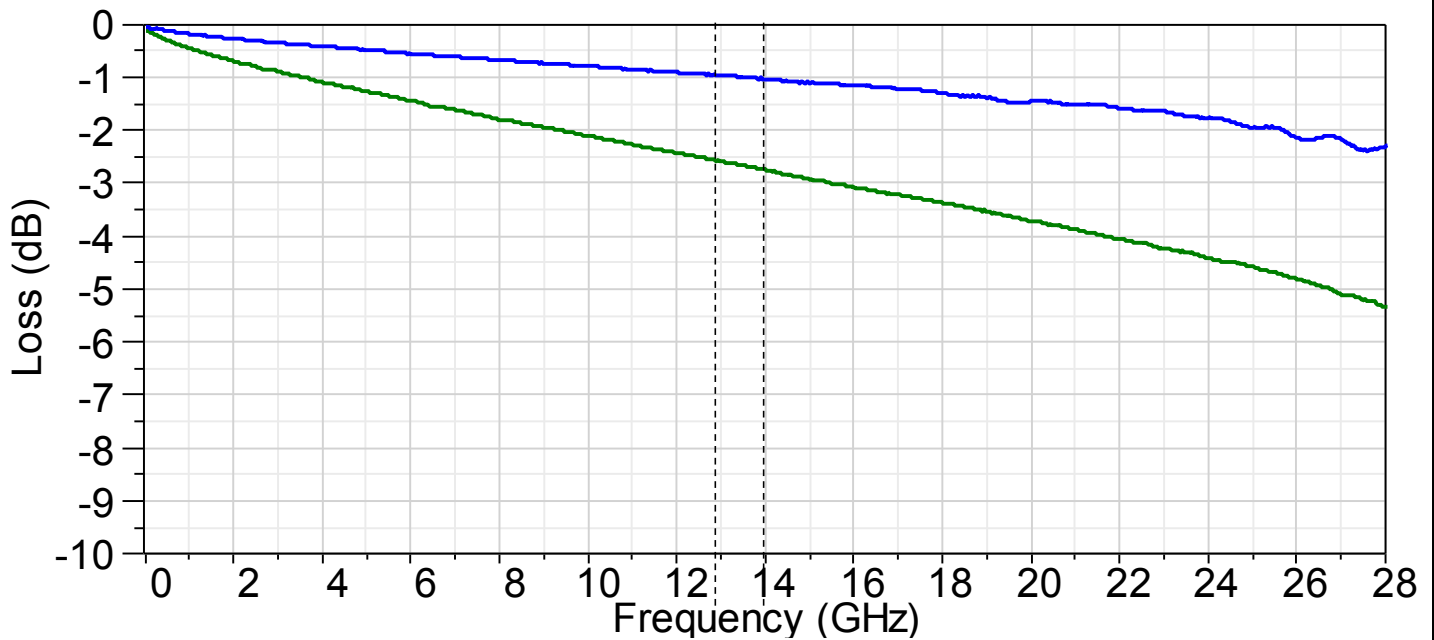
# TEST SUMMARY

## CALIBRATION INFORMATION

In order to measure the zSFP+ CEB channel, a calibration at the end of 2.92mm connector cables was done from 10MHz to 28GHz.

Measured 2x straight line loss for differential traces, then divided data by 2 to obtain the 1x trace loss:

**BLUE = J2J3 to J4J5 (Host Board), GREEN = 1J3 to J2J4 (Edge Card)**



<b>M1: SDD21@ 12.89Ghz</b>
Host Board: -0.98 dB
Edge Card: -2.63dB

<b>M2: SDD21@14.0Ghz</b>
Host Board: -1.05 dB
Edge Card: -2.80dB

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