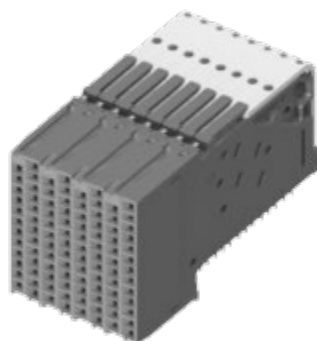


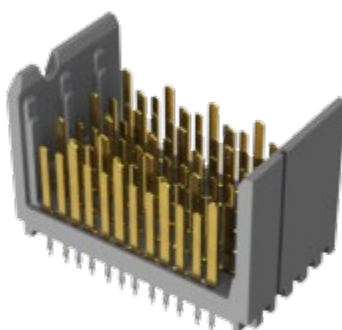


High Speed Characterization Report XCede® HD Second Source Verification

HDTF-6-06-S-RA-HS-100



HDTM-6-06-1-S-VT-0-1



Description:

**Performance Comparison of Samtec and Amphenol ICC
XCede® HD 1.80 mm Backplane Connector, 6-Pair
Vertical HDTM mating to Right-Angle HDTF (100-ohm HS Wafer)**

Series: HDTM / HDTF-RA

Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

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Series: HDTM / HDTF-RA

Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

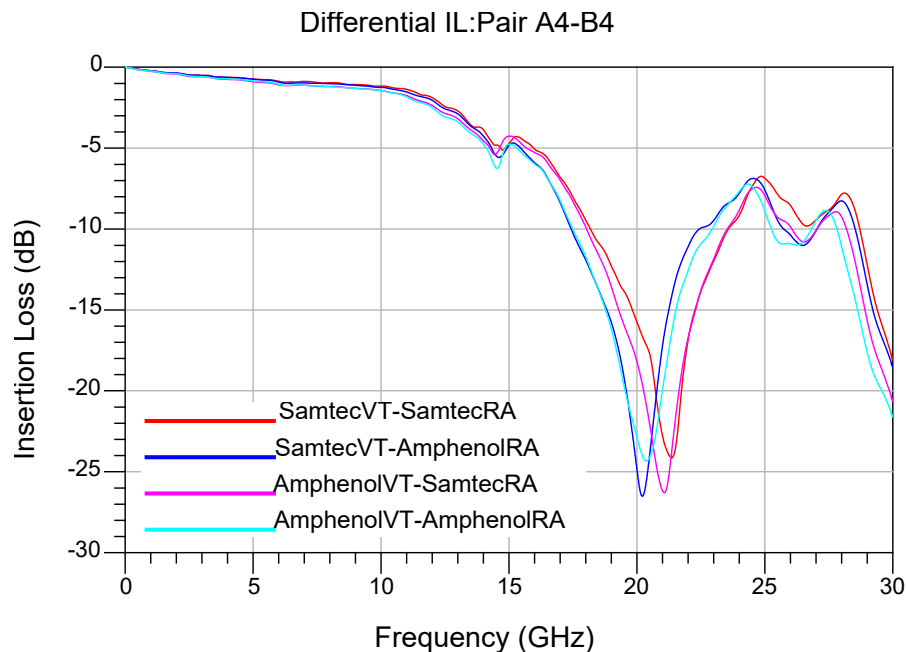
Connector Overview

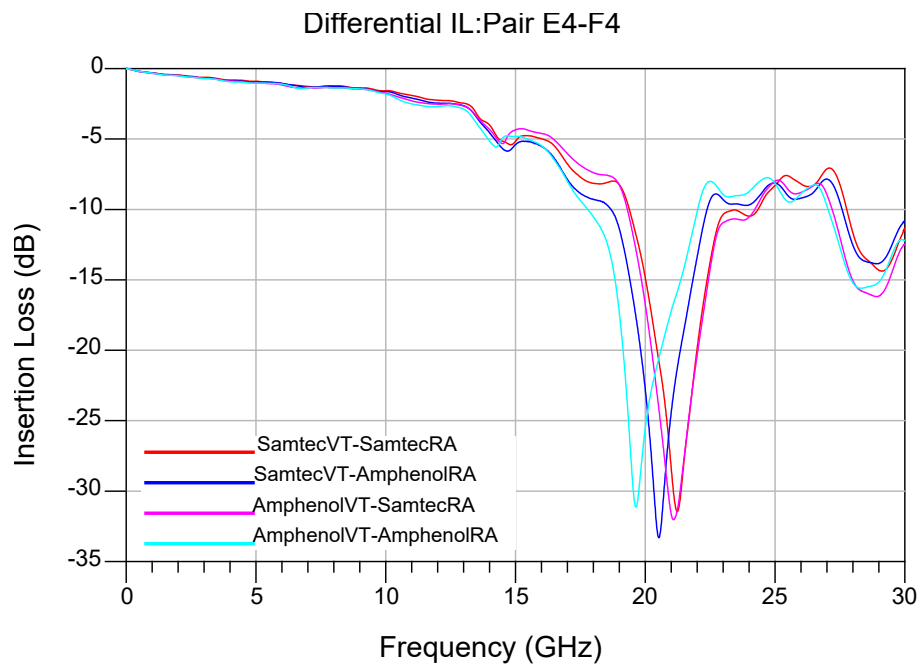
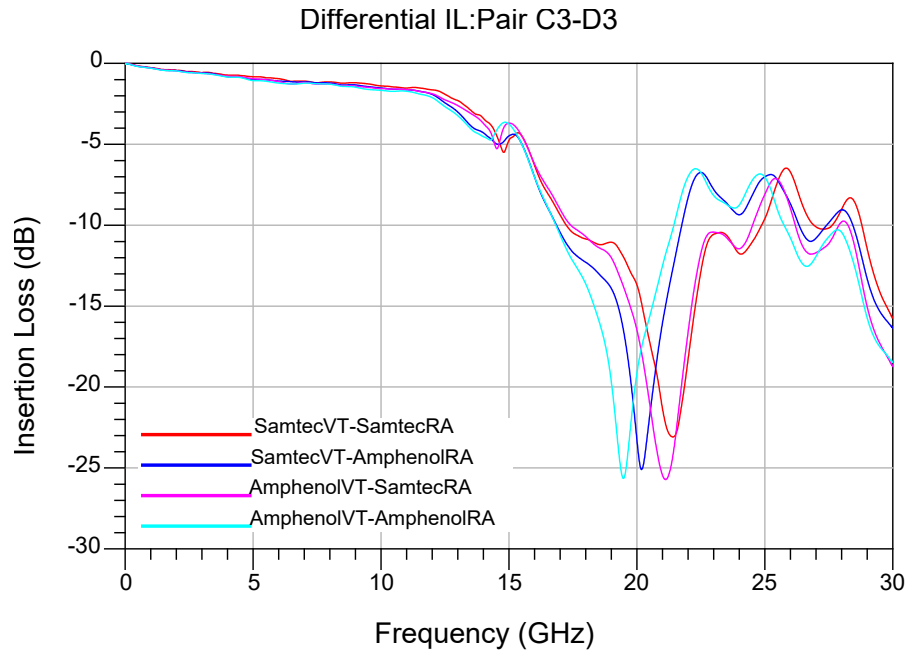
The HDTx series is XCede® HD 1.80 mm HDTF Right-Angle mating to HDTM vertical Backplane Connector. At the time of testing, the HDTx connectors have 3-, 4-, 6-pairs and 4, 6, 8 columns design. It is available for 85 ohms and 100 ohms options. The data in this report is applicable to the 6-Pair, 100-ohm, HS Wafer option.

Since Amphenol has the same products, we tested different mating combinations between Samtec connectors and Amphenol connectors for comparison. The performance is slightly better on the Samtec-RA than Amphenol-RA.

Frequency Domain Summary

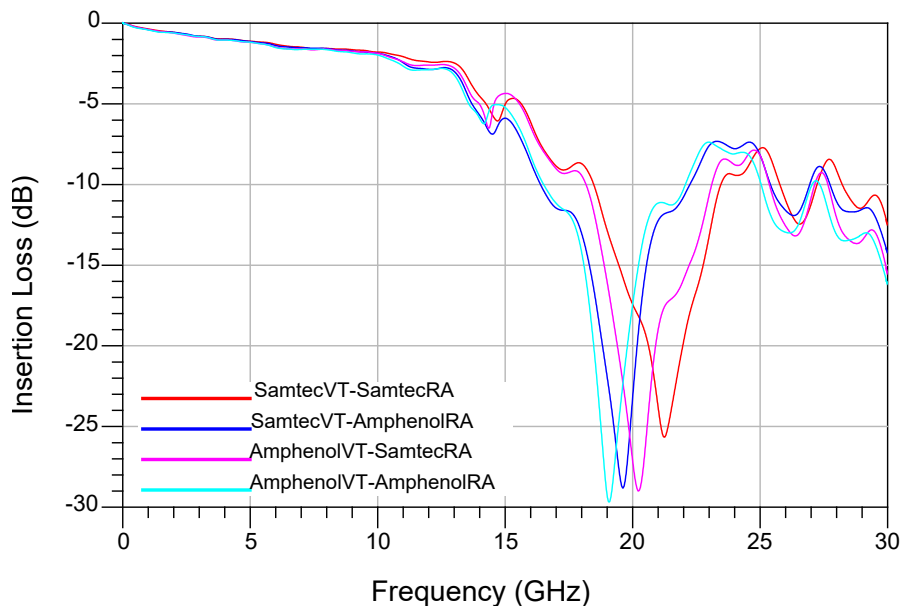
Differential Insertion Loss (IL)



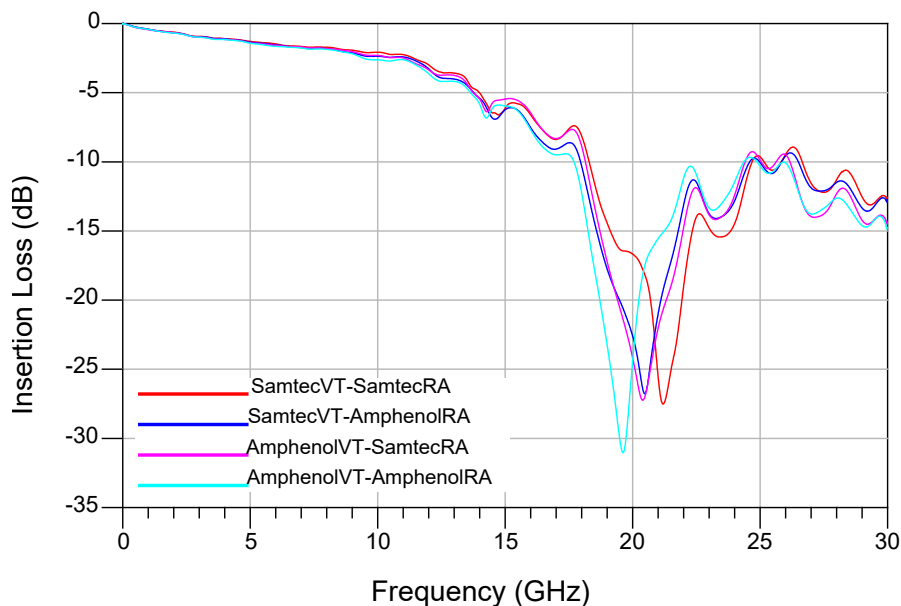
Series: HDTM / HDTF-RA**Description:** Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Series: HDTM / HDTF-RA**Description:** Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Differential IL:Pair G3-H3

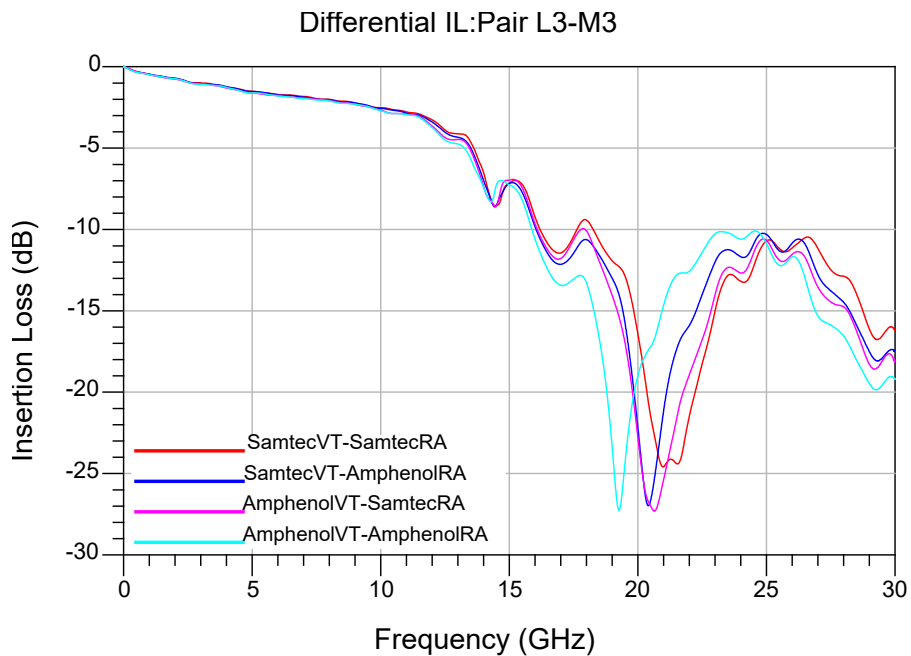


Differential IL:Pair J4-K4



Series: HDTM / HDTF-RA

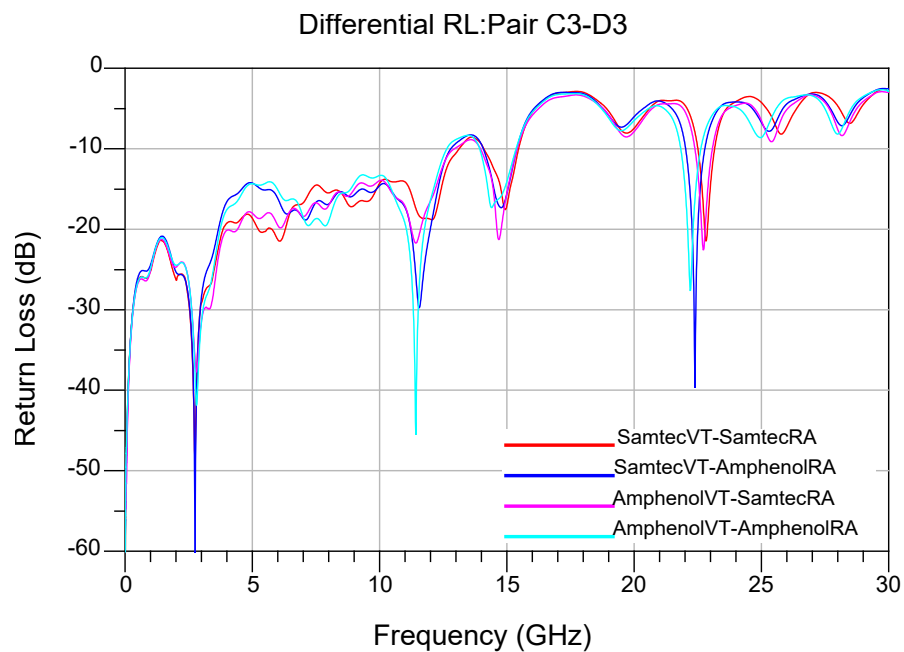
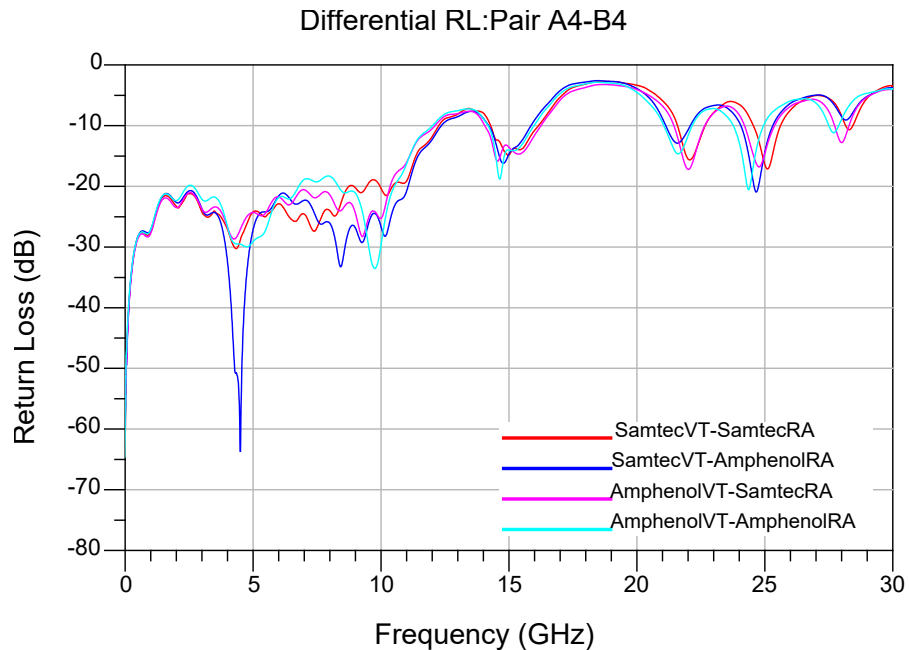
Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

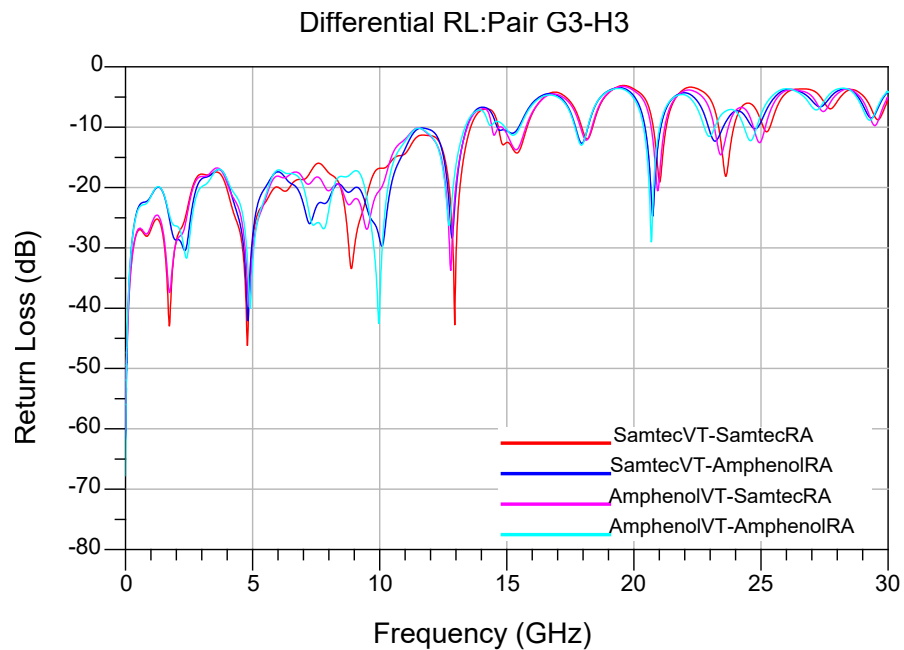
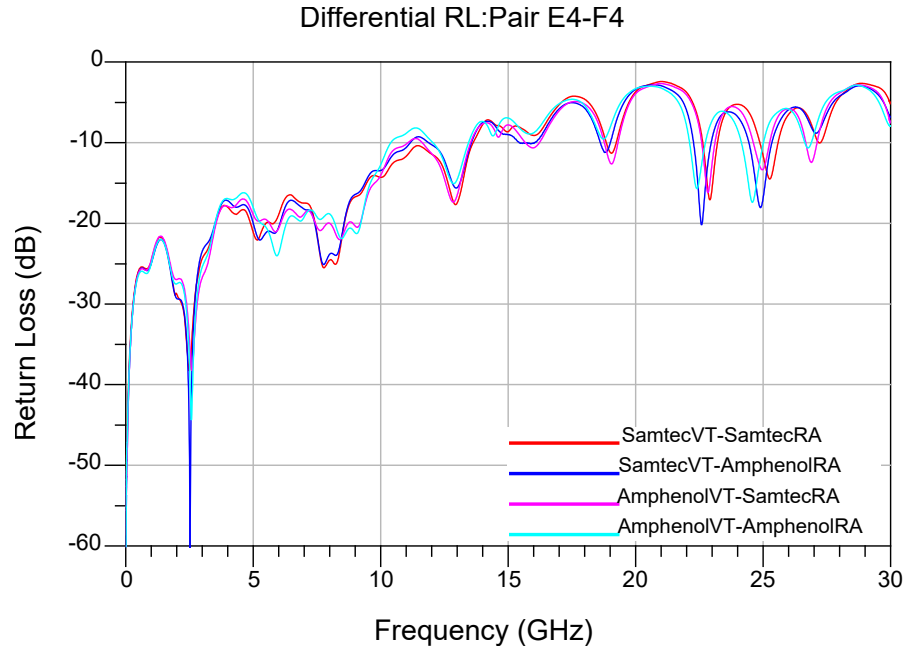


Series: HDTM / HDTF-RA

Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

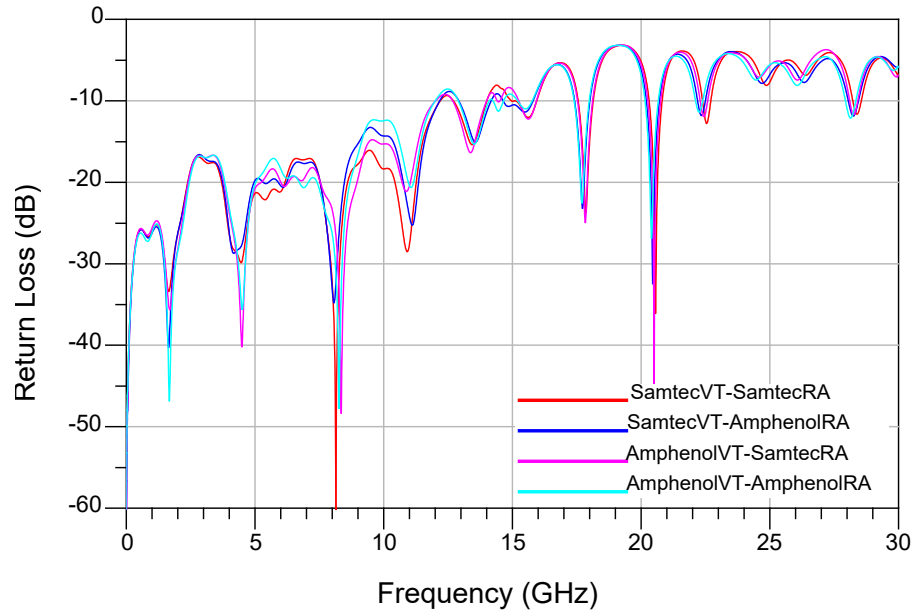
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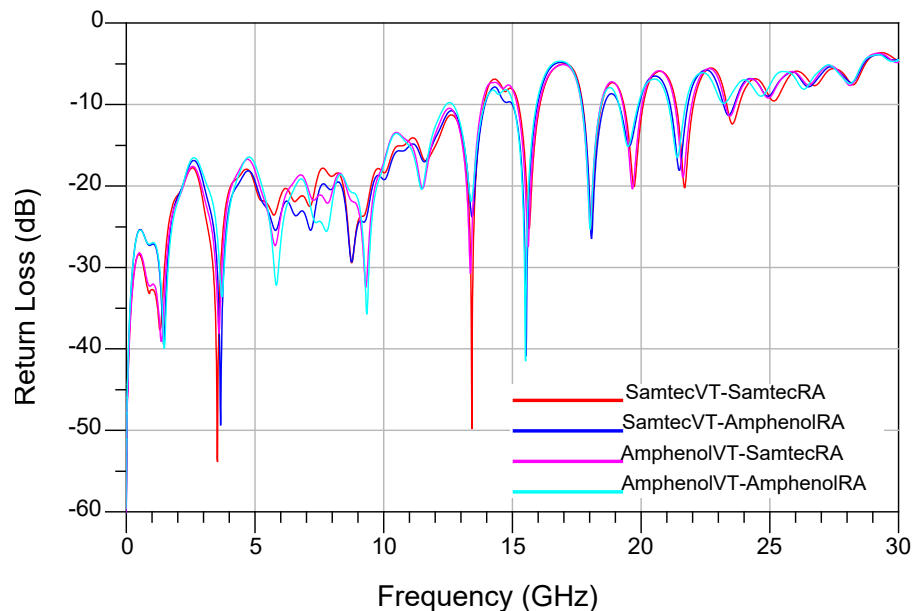
Series: HDTM / HDTF-RA**Description:** Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Series: HDTM / HDTF-RA**Description:** Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Differential RL:Pair J4-K4



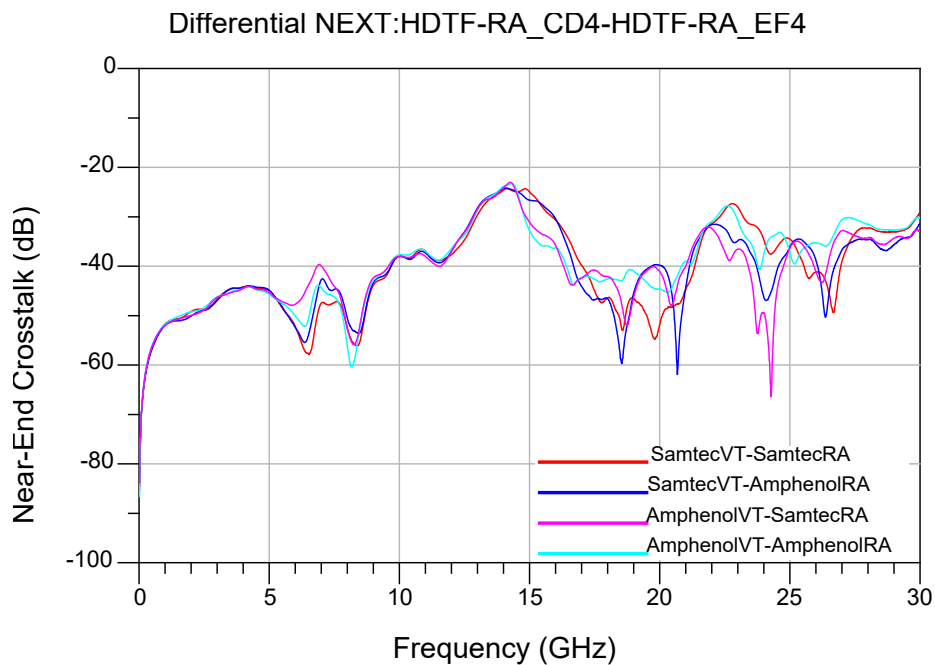
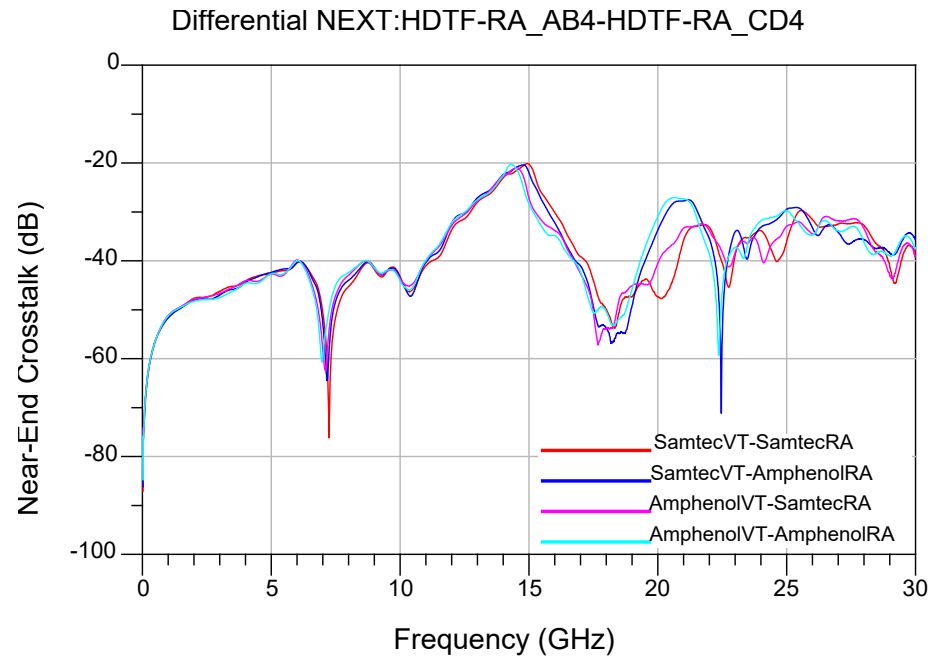
Differential RL:Pair L3-M3

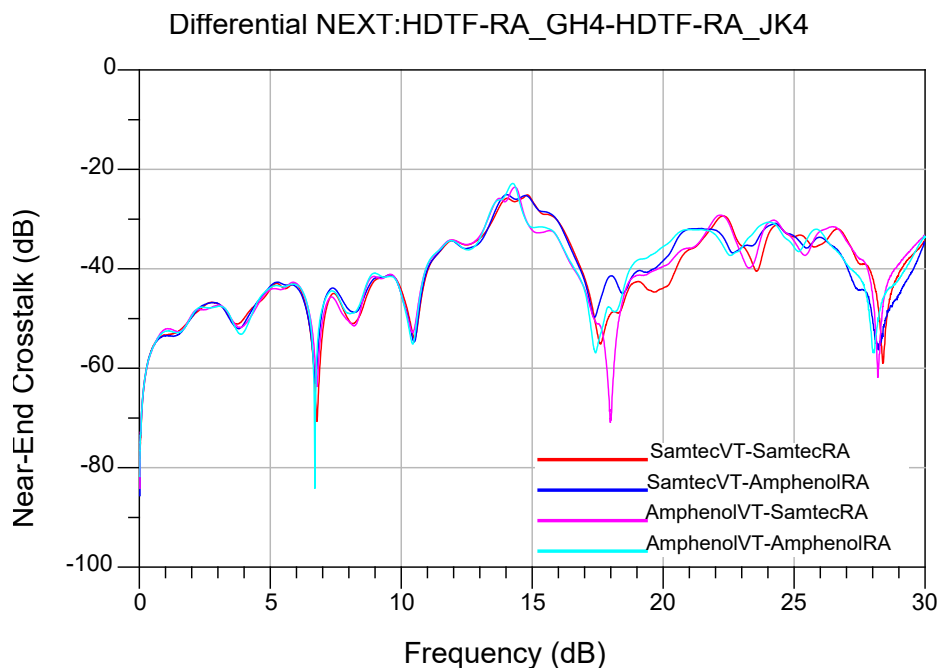
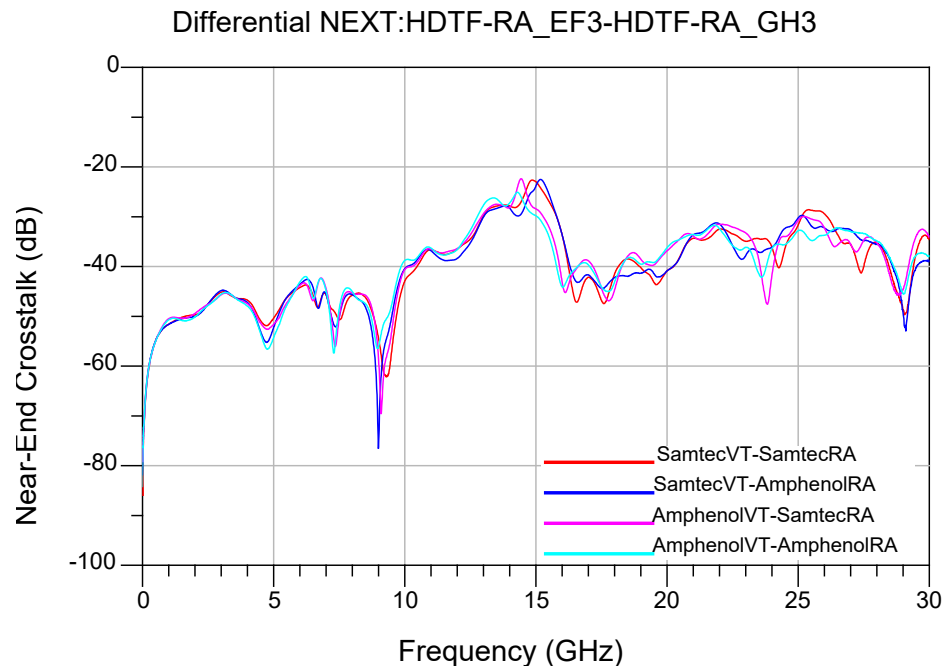


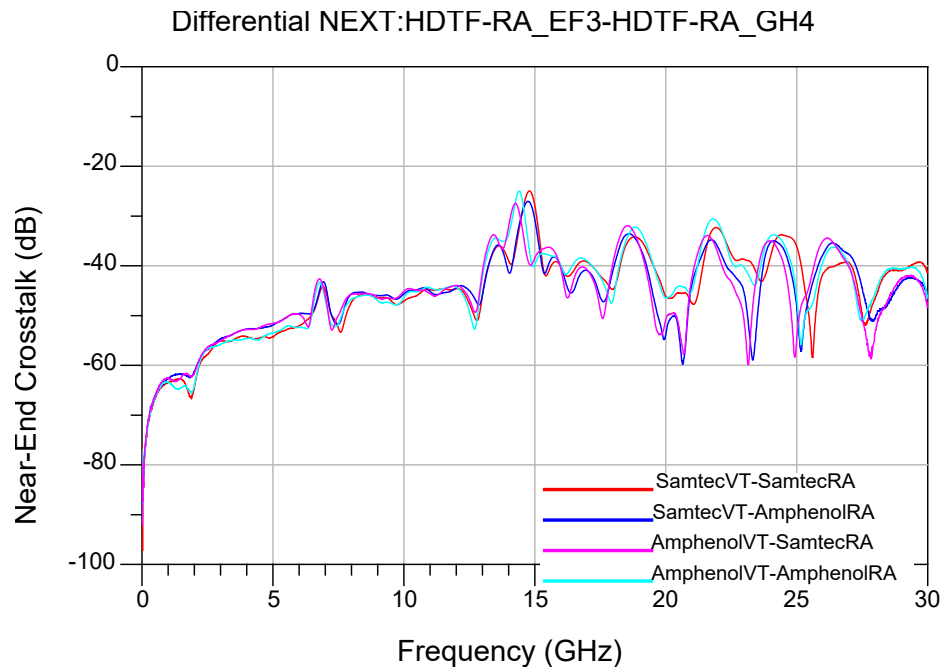
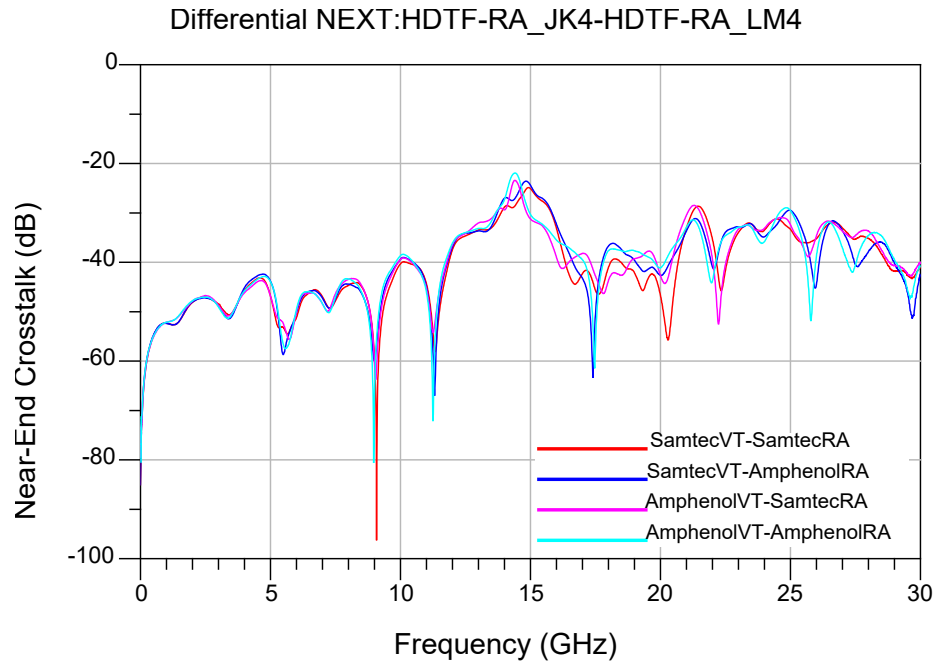
Series: HDTM / HDTF-RA

Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Differential Near End Crosstalk (NEXT)

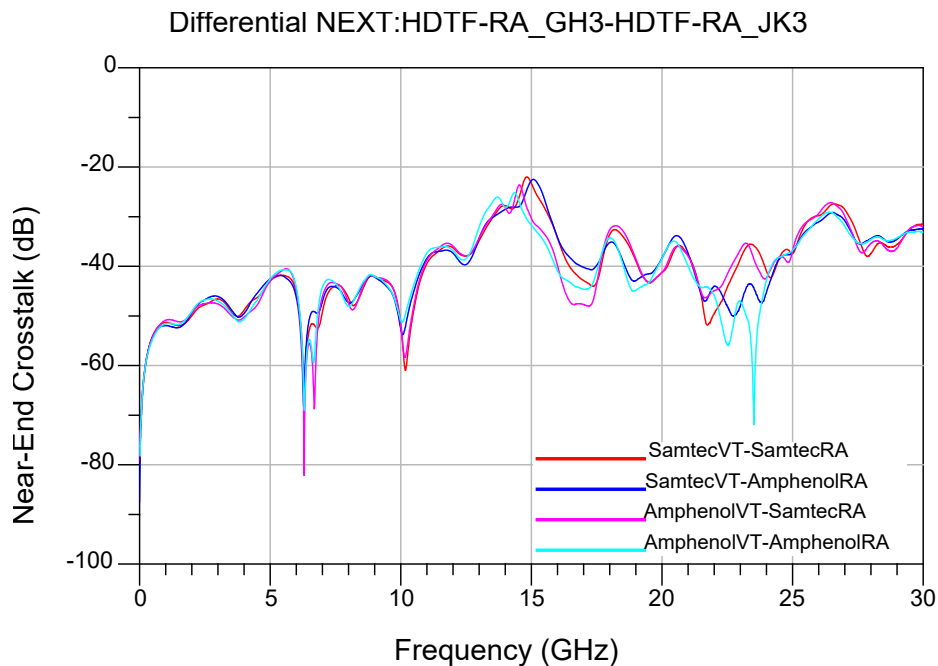


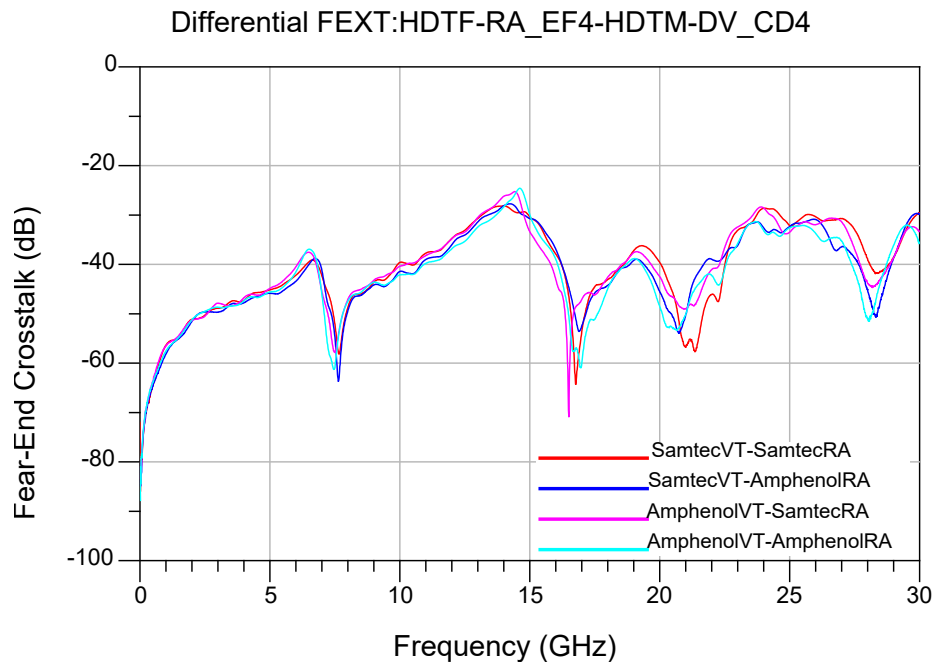
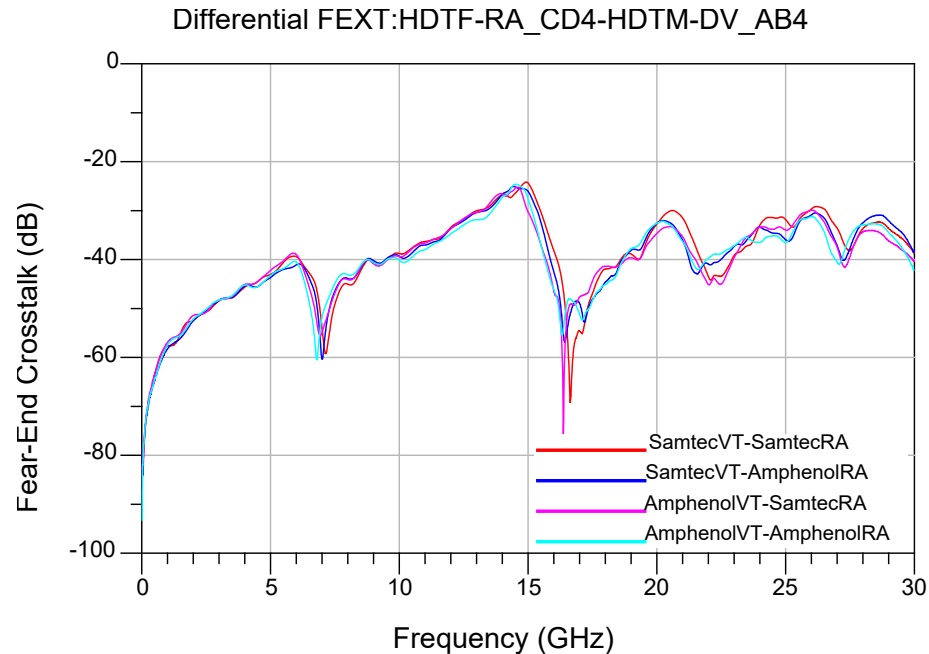
Series: HDTM / HDTF-RA**Description:** Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Series: HDTM / HDTF-RA**Description:** Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Series: HDTM / HDTF-RA

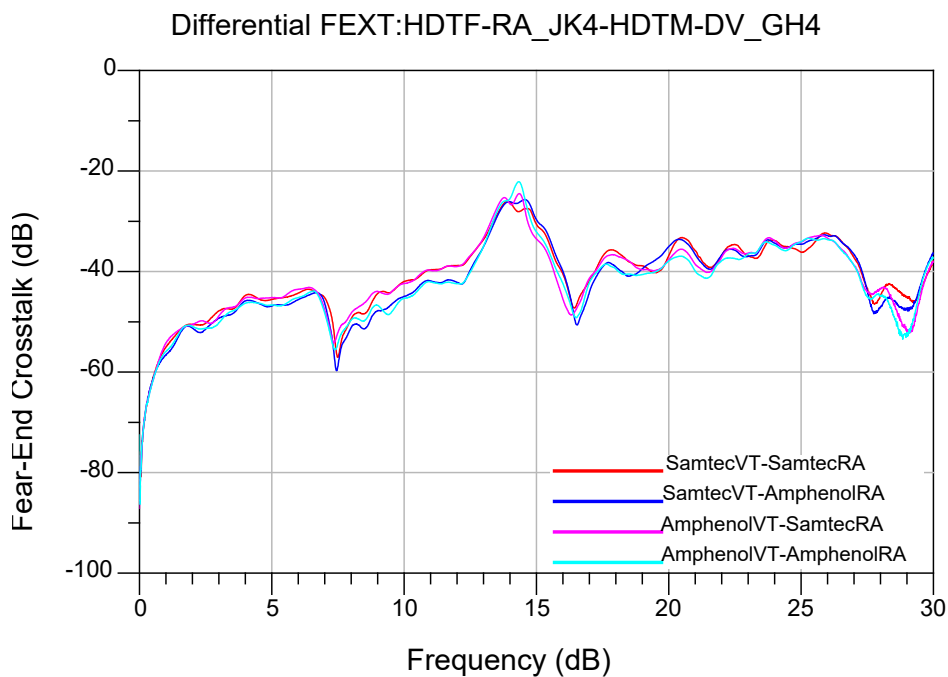
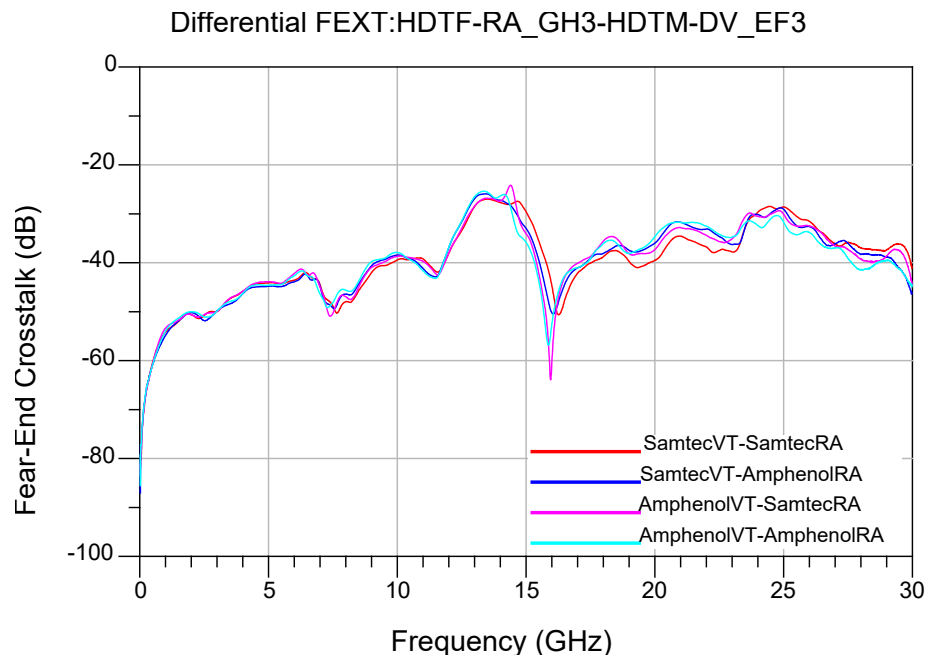
Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

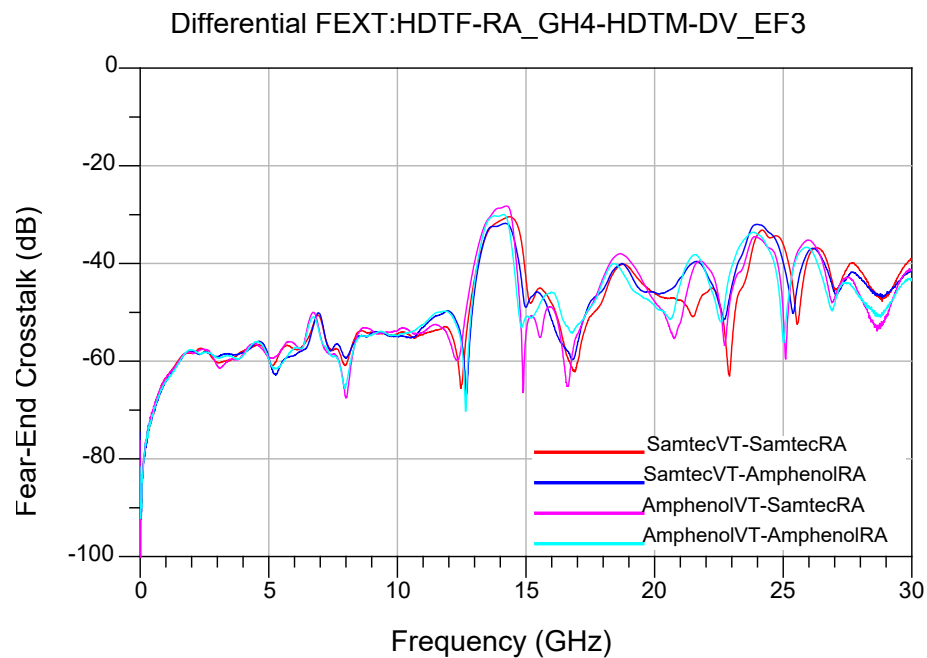
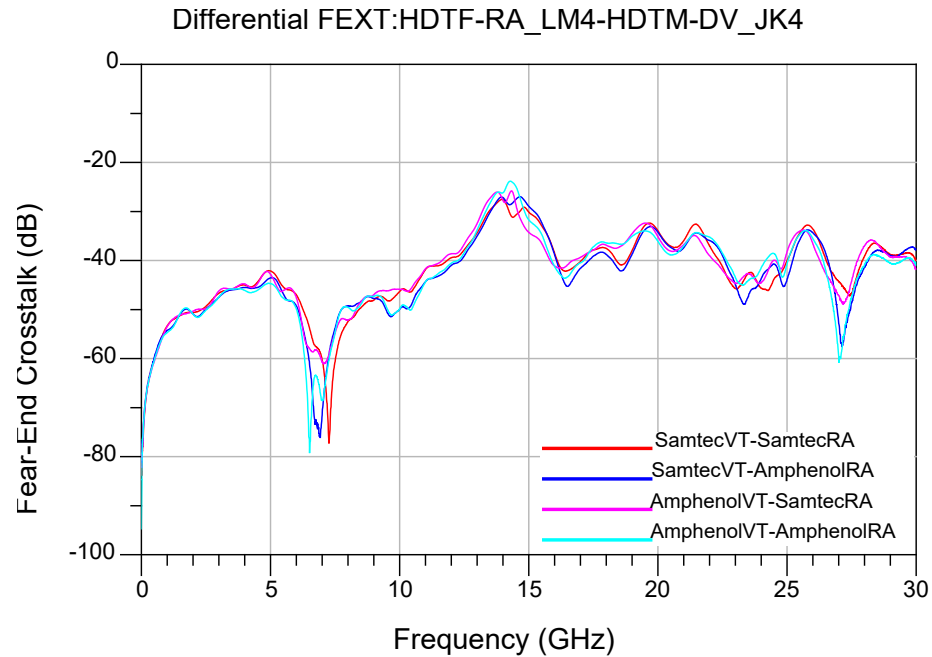


Series: HDTM / HDTF-RA**Description:** Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer**Differential Far End Crosstalk (FEXT)**

Series: HDTM / HDTF-RA

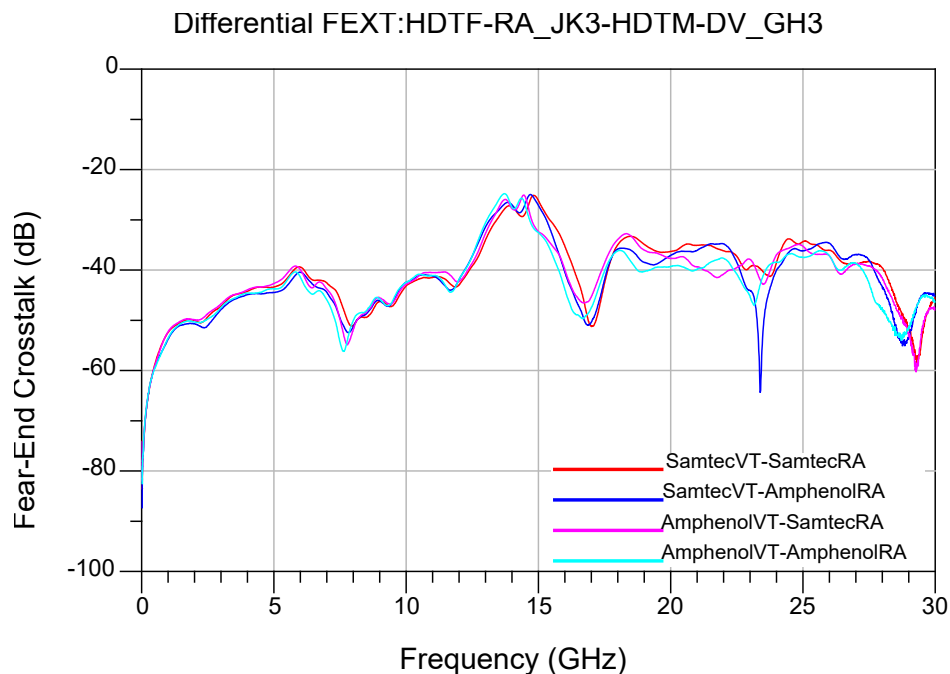
Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer



Series: HDTM / HDTF-RA**Description:** Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Series: HDTM / HDTF-RA

Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer



Series: HDTM / HDTF-RA

Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Appendix A – Product and Test System Descriptions

Product Description

Product test samples are press-fit HDTx Series connectors. The part number is HDTF-6-06-S-RA-HS-100 and HDTM-6-06-1-S-VT-0-1. The HDTx Series connectors are available for standard or high-speed wafers. The modular design provides flexibility in applications. A photo of the test articles mounted to SI test boards is shown below.

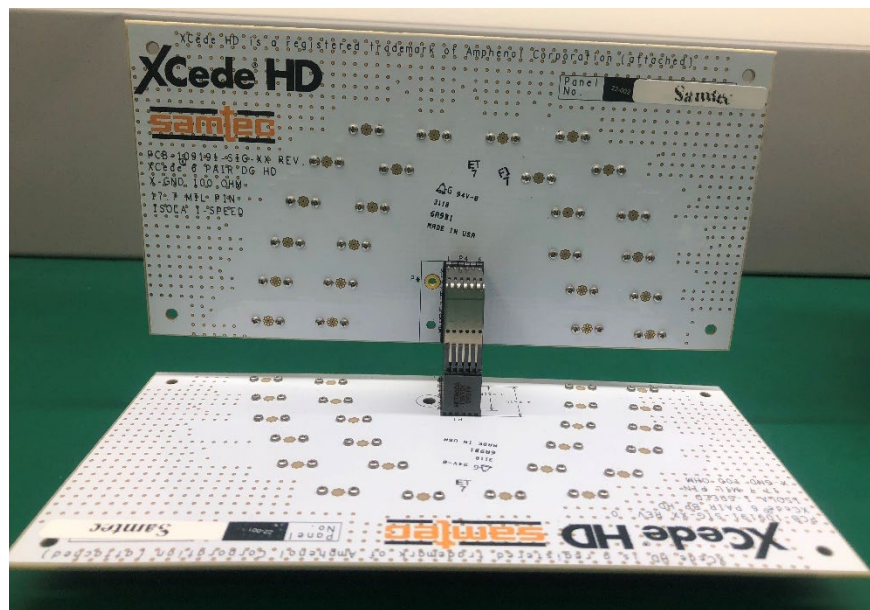


Figure 1: Test Boards and Samples

Series: HDTM / HDTF-RA

Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Appendix B – Test and Measurement Setup

For frequency domain measurements, the test instrument is the Keysight N5227A PNA-L network analyzer. Frequency domain data are obtained directly from the instrument and figures are generated by Keysight ADS. The network analyzer is configured as follows:

Start Frequency – 10 MHz

Stop Frequency – 50 GHz

Number of points – 5000

IFBW – 700 Hz

N5227A Measurement Setup

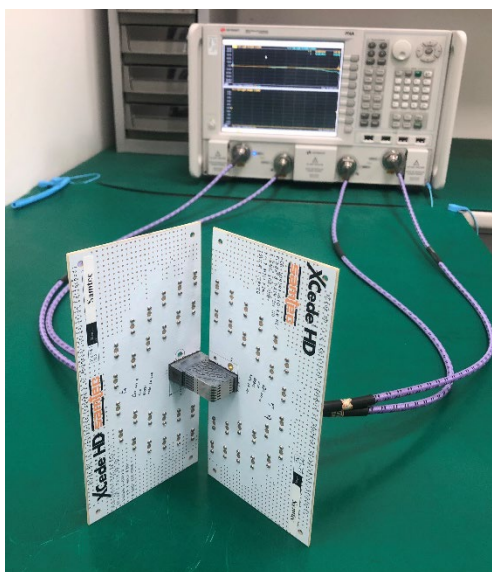


Figure 2: Measurement Setup

Test Instruments

<u>QTY</u>	<u>Description</u>
1	Keysight N5227A PNA-L Network Analyzer (10 MHz to 67 GHz)
1	Keysight N4694-60003 ECAL Module (10 MHz to 67 GHz)

Test Cables & Adapters

<u>QTY</u>	<u>Description</u>
4	Gore 0F0CACB036.0-LF (DC to 67 GHz)

Series: HDTM / HDTF-RA

Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Appendix C - Frequency Domain Measurements

Frequency (S-Parameter) Domain Procedures

The quality of any data taken with a network analyzer is directly related to the quality of the calibration standards and the use of proper test procedures. For this reason, extreme care is taken in the design of the through calibration standards, the SI test boards, and the selection of the PCB vendor.

A coaxial SOLT calibration is performed using a N4694-60003 ECAL module. Then DUT measurements are performed under SOLT calibration. The measurements include the effect of test fixture. The measurements of the 2X THRU line standards are required to remove the test fixture effect.

Series: HDTM / HDTF-RA

Description: Performance Comparison of Samtec and Amphenol ICC XCede® HD
1.80 mm Backplane Connector, 6-Pair, 100-ohm HS Wafer

Appendix D – Glossary of Terms

ADS – Advanced Design Systems

DUT – Device under test

FEXT – Far-End Crosstalk

NEXT – Near-End Crosstalk

PCB – Printed Circuit Board

SE – Single-Ended

SI – Signal Integrity

SOLT – acronym used to define Short, Open, Load & Thru Calibration Standards