

BergStak[®] 8mm SMT Vertical Header to SMT Vertical Receptacle vs. PCIe Gen 2 (Simulation Report)

Part Numbers: 61083, 61082

**Signal Integrity Team
Revised January 11, 2009**

- This document shows the electrical performance of a BergStak[®] Connector with 8mm stack height compared against the PCIe Gen 2 Specifications
 - Spec limit lines are shown on the plots of relevant electrical parameters:
 - Return Loss (R.L.)
 - Insertion Loss (I.L.)
 - Near-End Crosstalk (NEXT)
 - Shown are the results for the following wiring pattern:
 - GSSGSSG

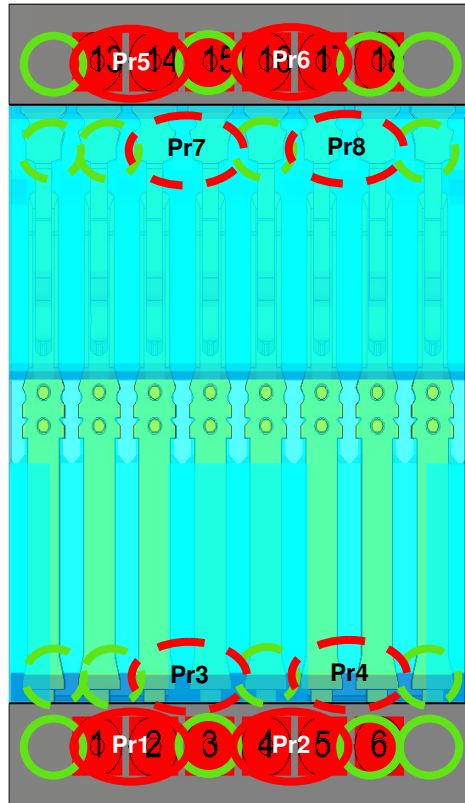
- BergStak[®] 8mm used in a GSSGSSG wiring pattern passes the PCIe Gen 2 spec for stack heights $\leq 8\text{mm}$
- Performance risk will increase on higher stack heights as the crosstalk resonance will move lower in frequency.

- The Bergstak® solid model was analyzed using CST MicroWave Studio software and the results were post-processed using MATLAB in order to compare the performance against the PCIe Gen. 2 specification.

- Simulation Details:
 - Tool used: CST MWS
 - Model was run to a maximum frequency of 20 GHz

 - Touchstone file used to generate results:
“bs_8mm_nud_v3_woren_401_0to20.s24p”
 - Model frequency range: d.c. to 20 GHz in increments of 50 MHz (i.e. 401 points)

GSSGSSG Pattern



Pr1 connects to Pr5, etc.

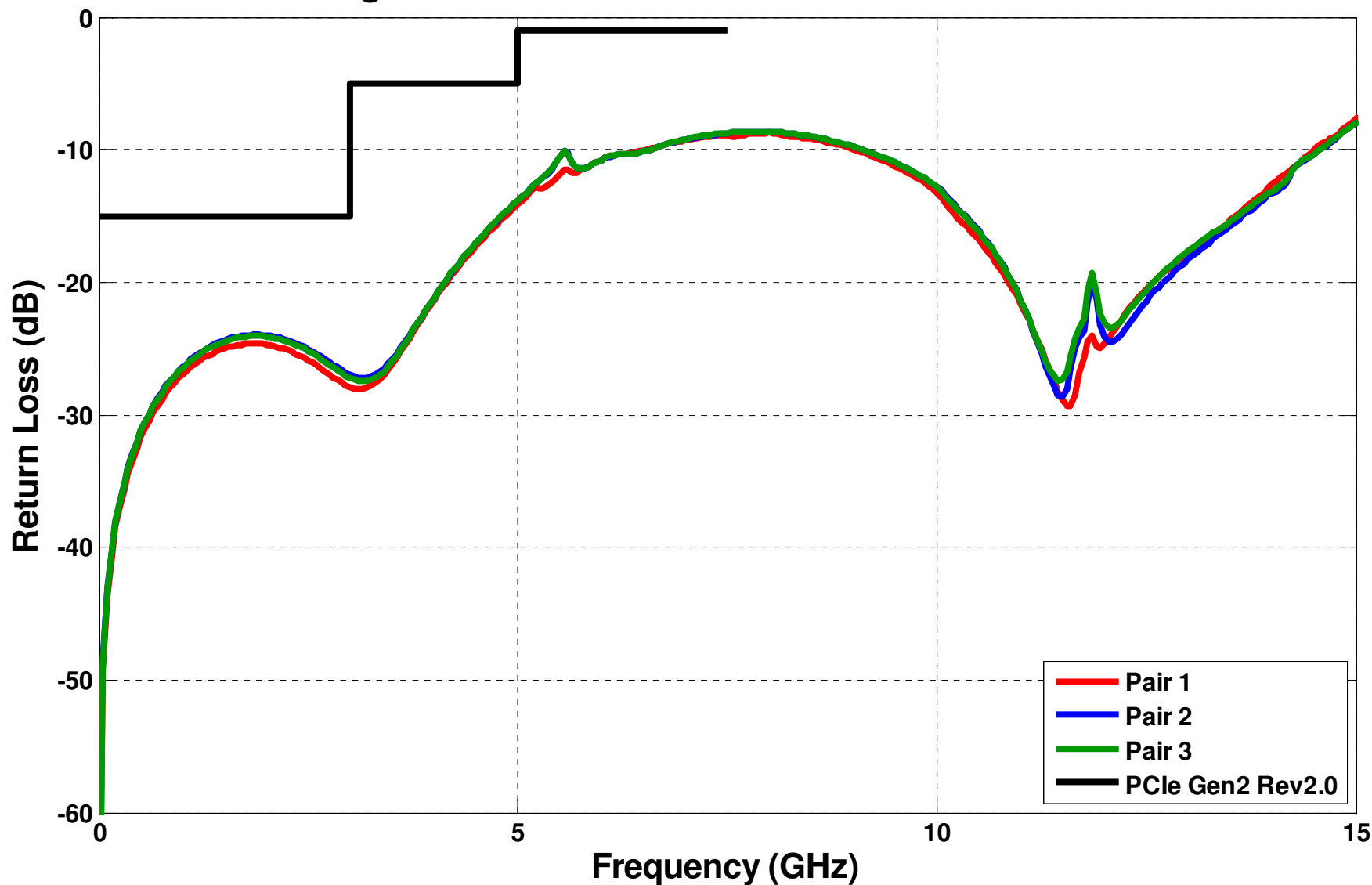
Staggered Pair Pattern (Opposite Side Offset by 1 Pin)

Offsetting pairs by one pin front to back in GSSGSSG pattern reduces crosstalk. Dashed lines show pairs on opposite side.

Differential Return Loss (GSSGSSG Pattern)



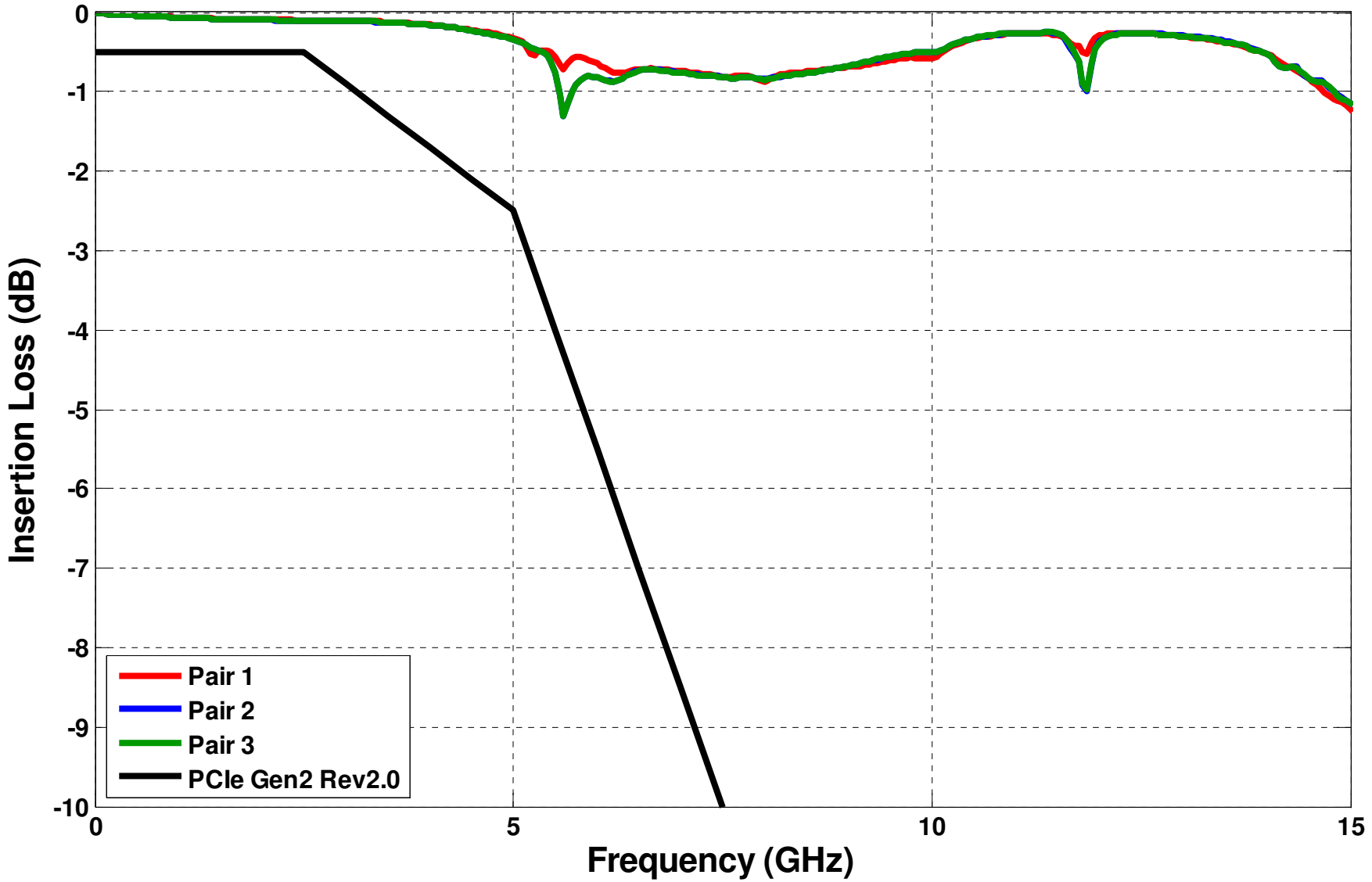
BergStak 8 mm - DIFFERENTIAL RETURN LOSS



Differential Insertion Loss (GSSGSSG Pattern)



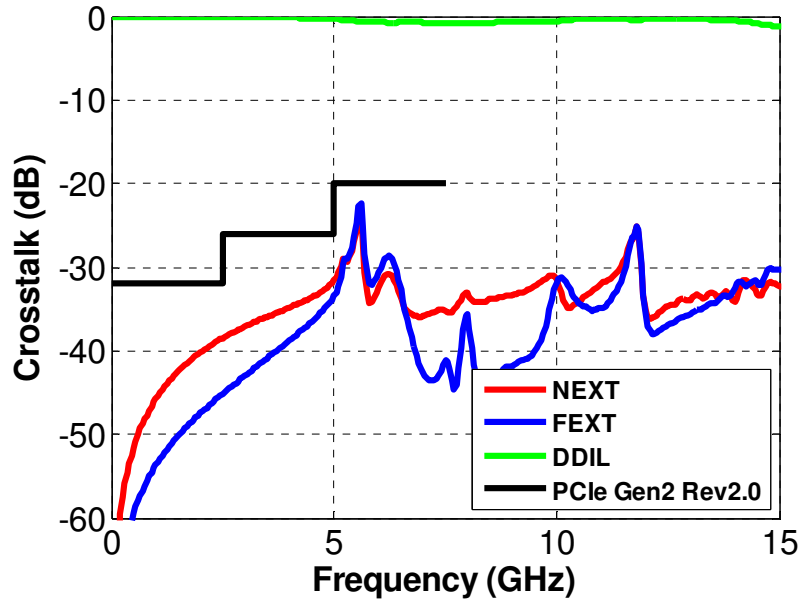
BergStak 8 mm - DIFFERENTIAL INSERTION LOSS



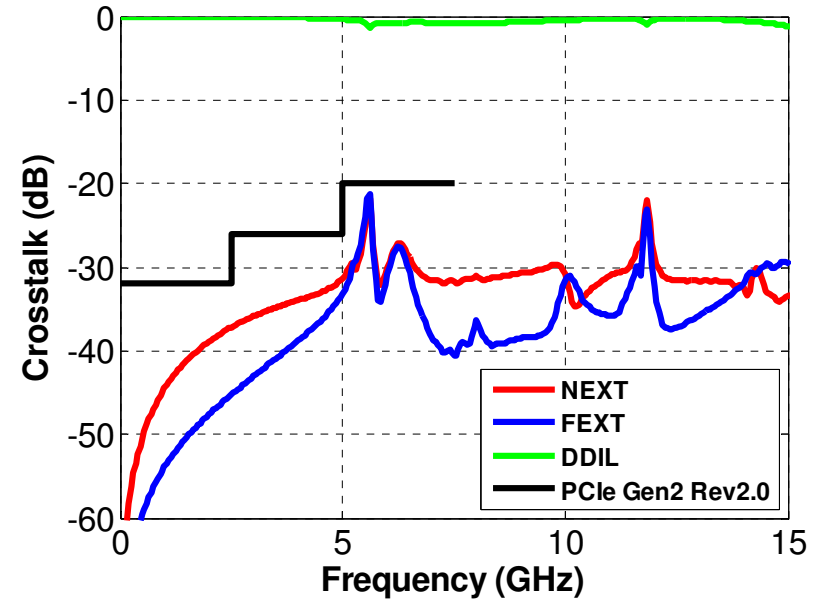
Power Sum Crosstalk (GSSGSSG Pattern)



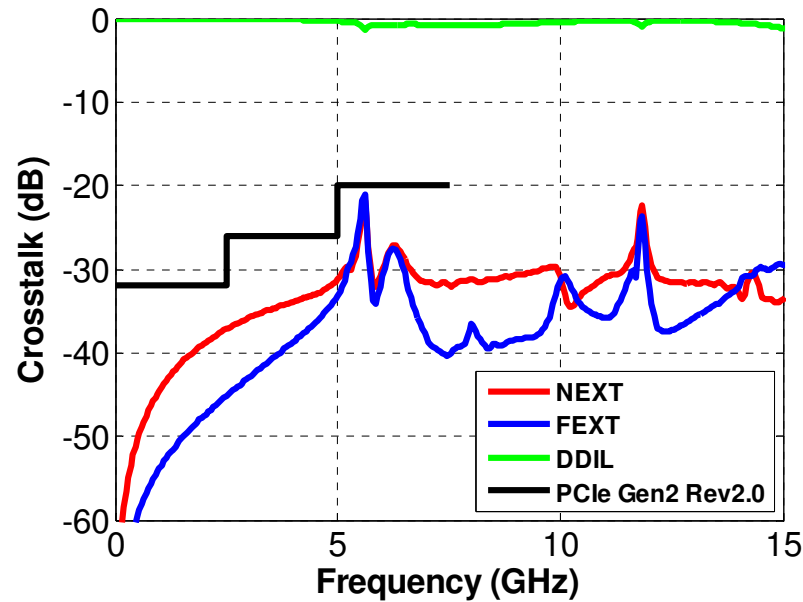
Pair 1 - POWER SUM X-TALK



Pair 2 - POWER SUM X-TALK



Pair 3 - POWER SUM X-TALK



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