

RTPGE Test Head Proposal

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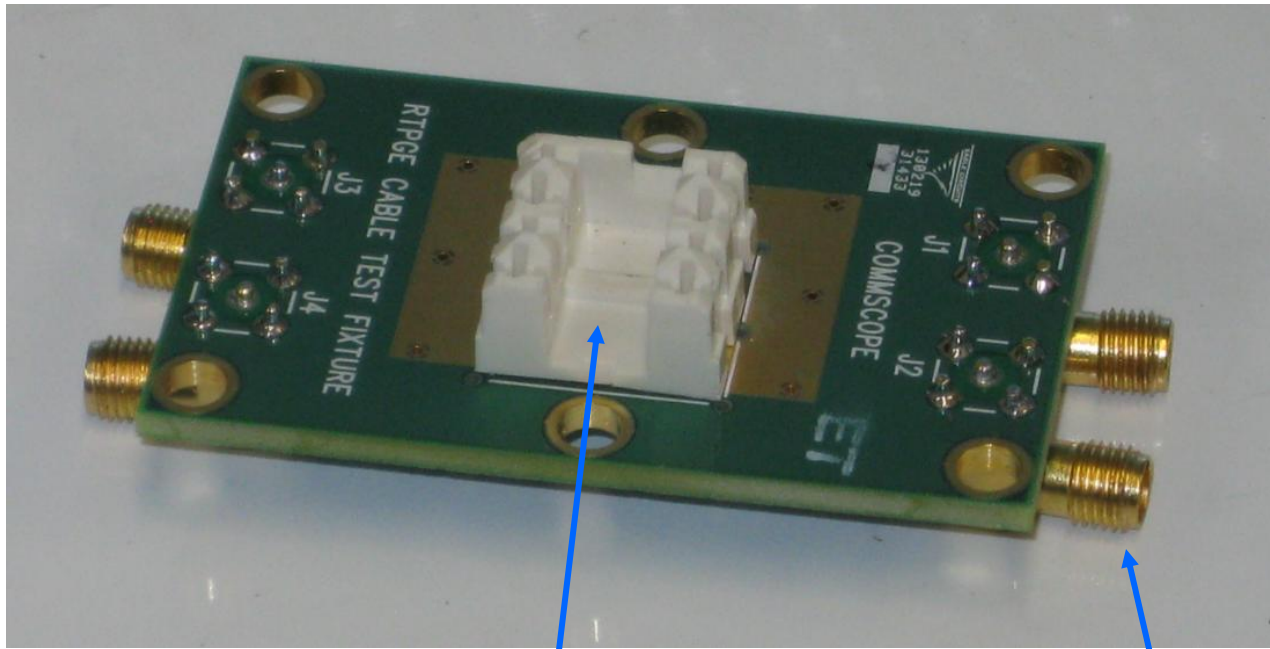
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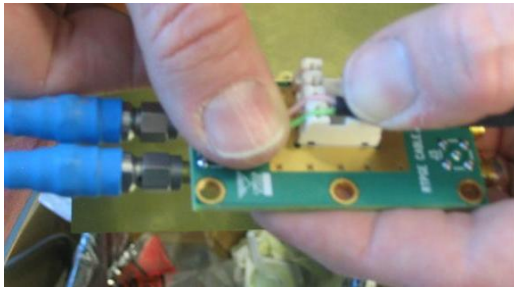
Proposed RTPGE test head



Insulation Displacement Contact

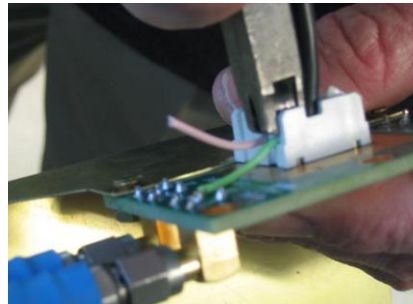
2 pair punch block

4 SMA ports



Push conductors into slots

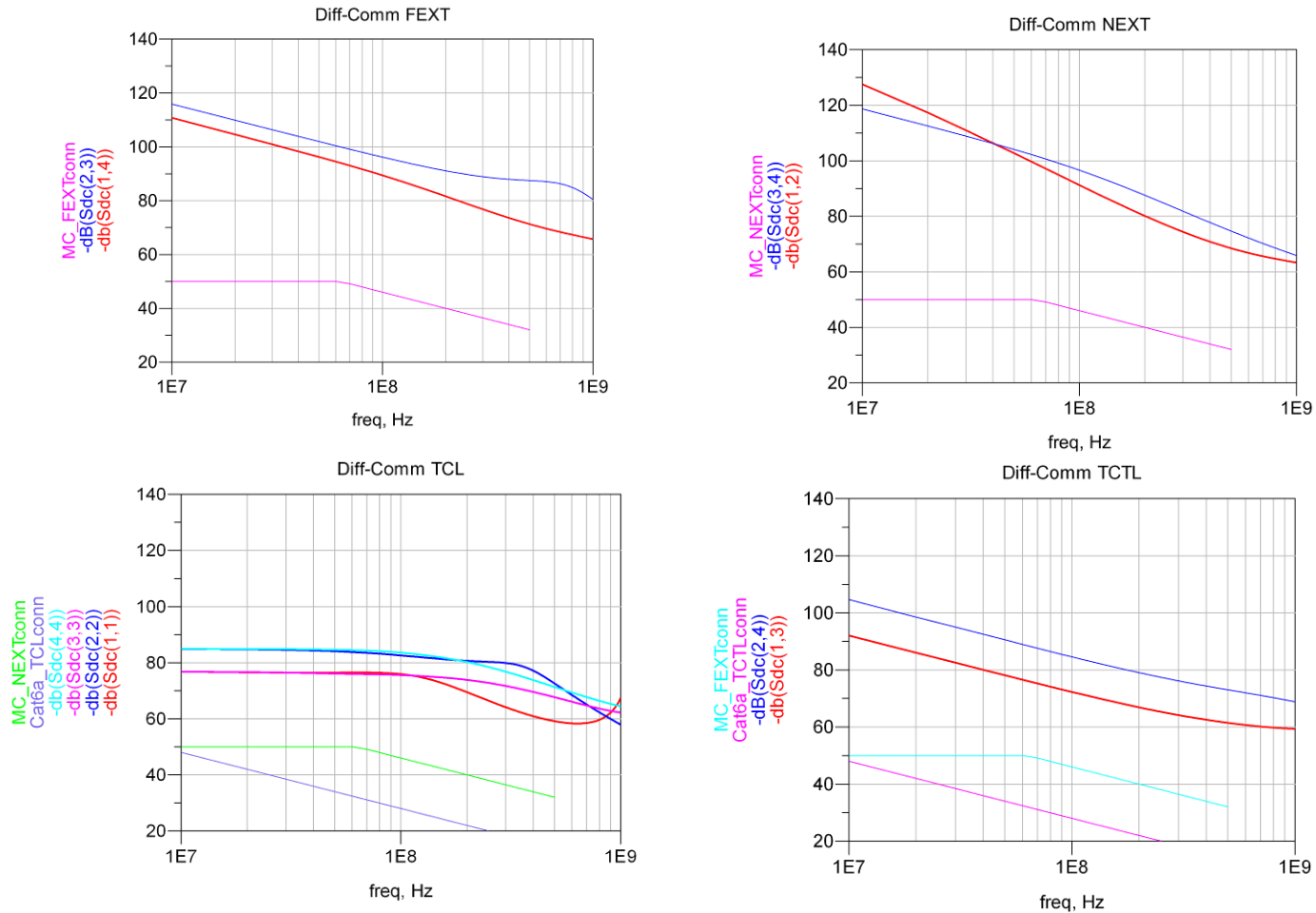
Punch conductors down



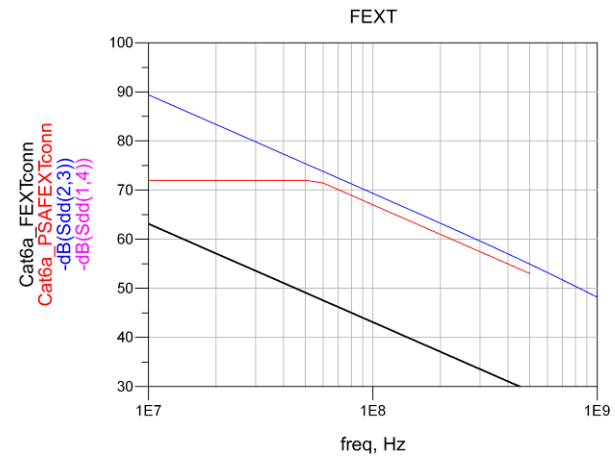
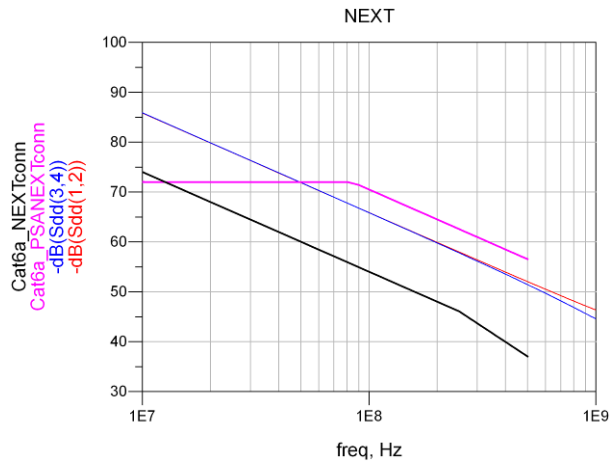
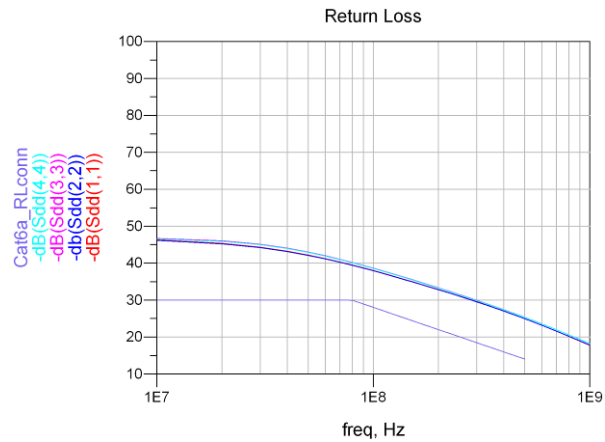
Trim ends with fine edge cutter



HFSS Simulation Balance



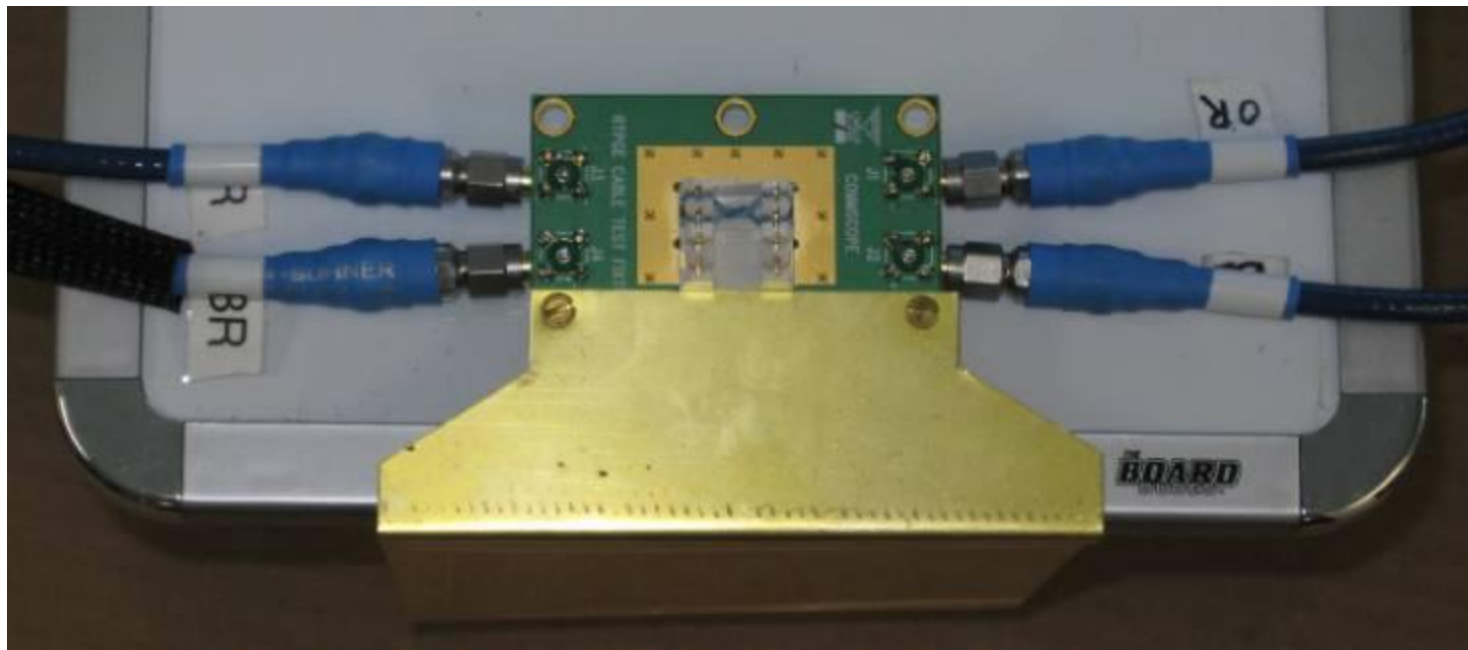
HFSS Simulation Differential



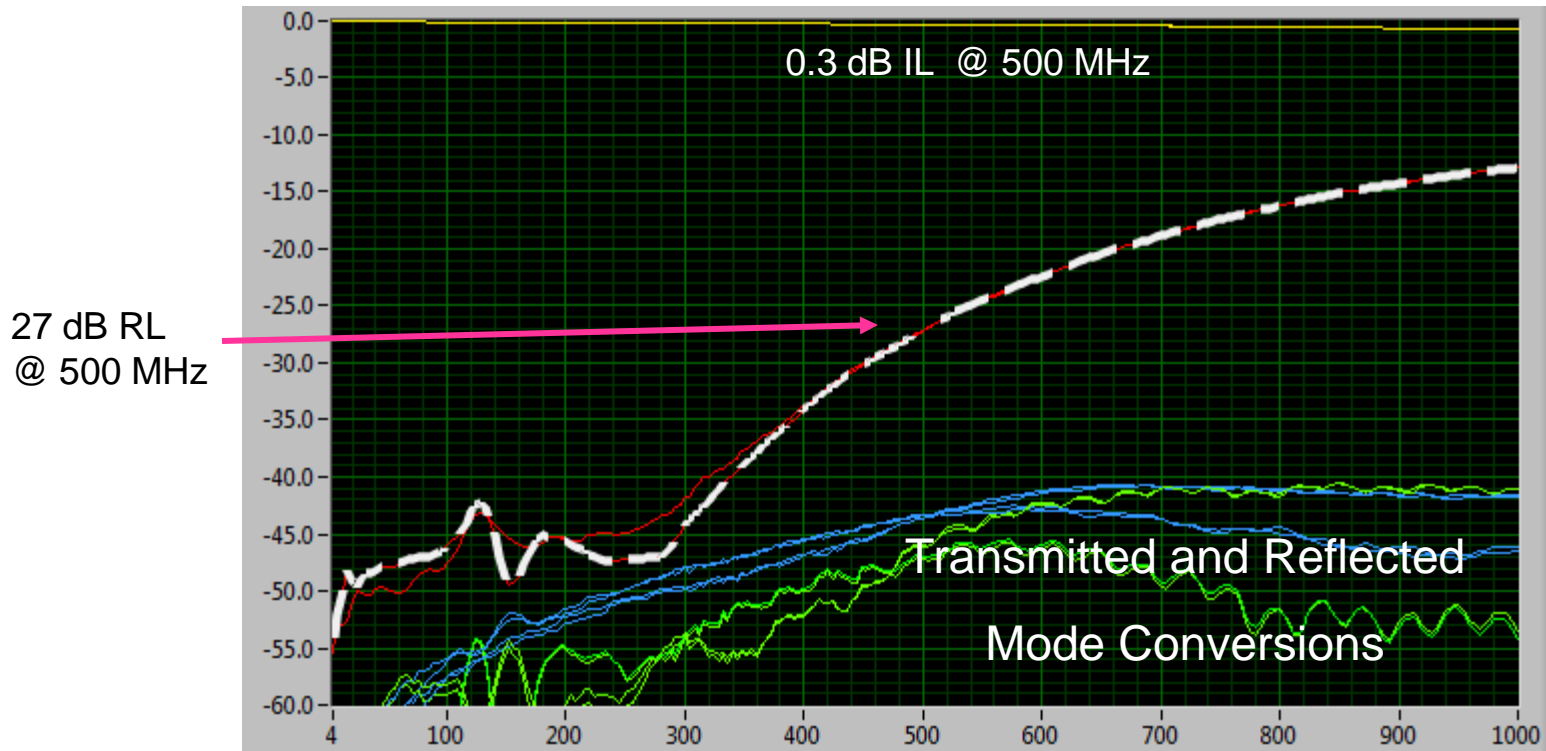
The easiest way to measure the head with a 4 port Network Analyzer:

Using a single 100 Ω pair punched in as a left-to-right-pair-thru connection

- Differential RL better than 27 dB with tight entry
- Differential IL better than 0.3 dB
- Mode conversion better than 43 dB with centered punch

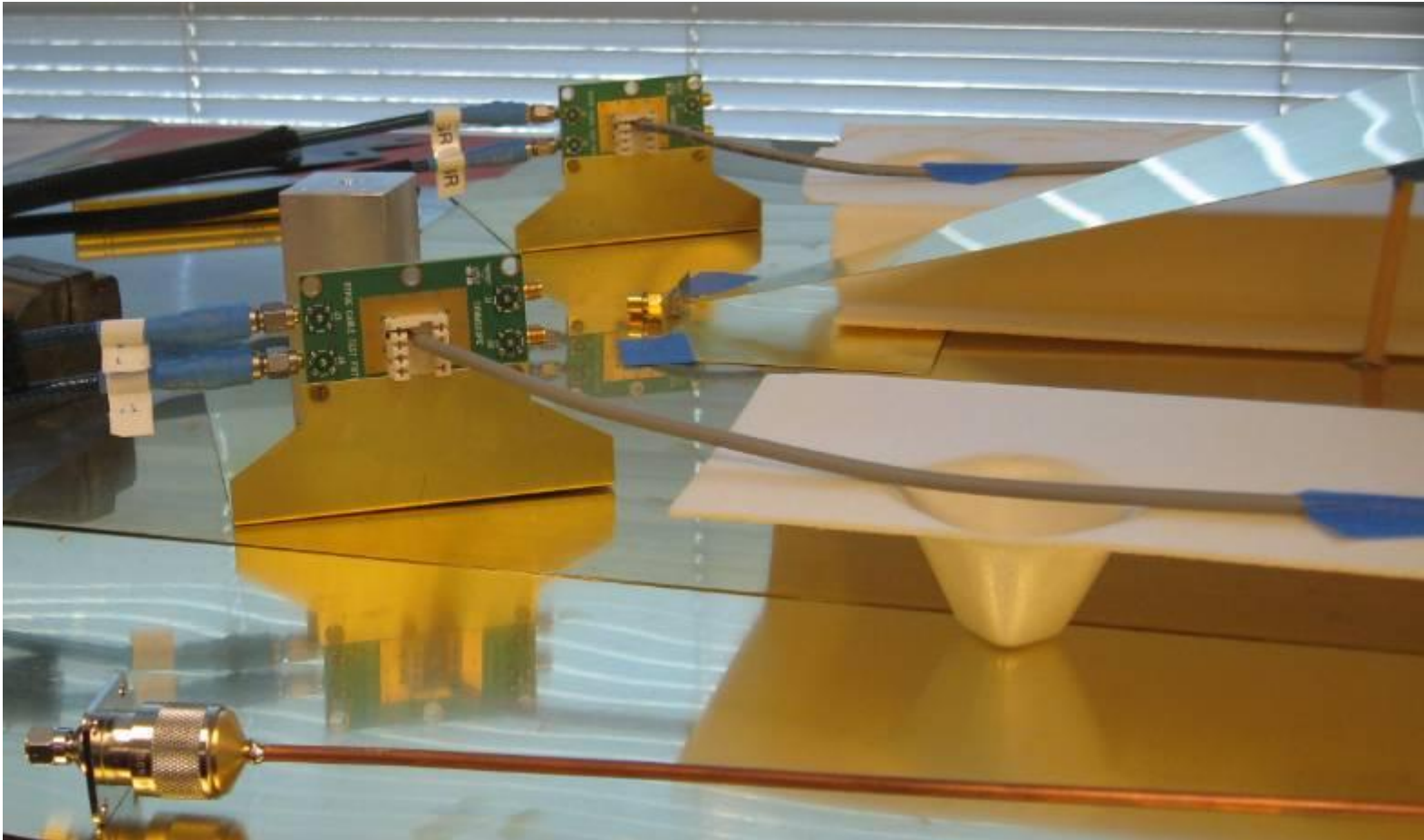


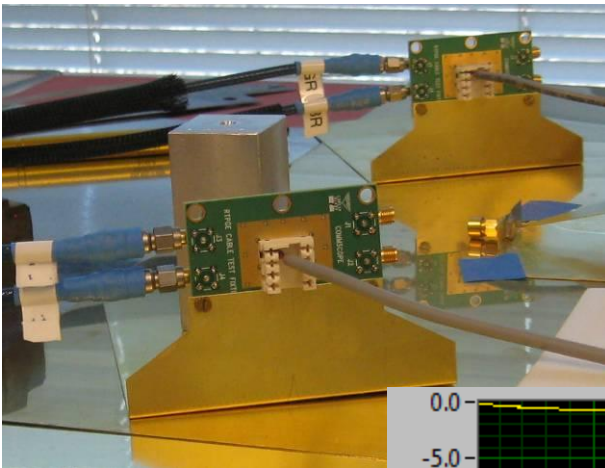
Direct 4 port RTPGE Test Head measurement plots



Mixed Mode plots $Z_{DM} = 100\Omega$ $Z_{CM} = 25\Omega$

CommScope channel measurement Setup - Heads mounted on ground reference holder plates shown driving 1 pair cable 4 cm over brass reference plane
(note: EMC stripline is not part of this measurement)

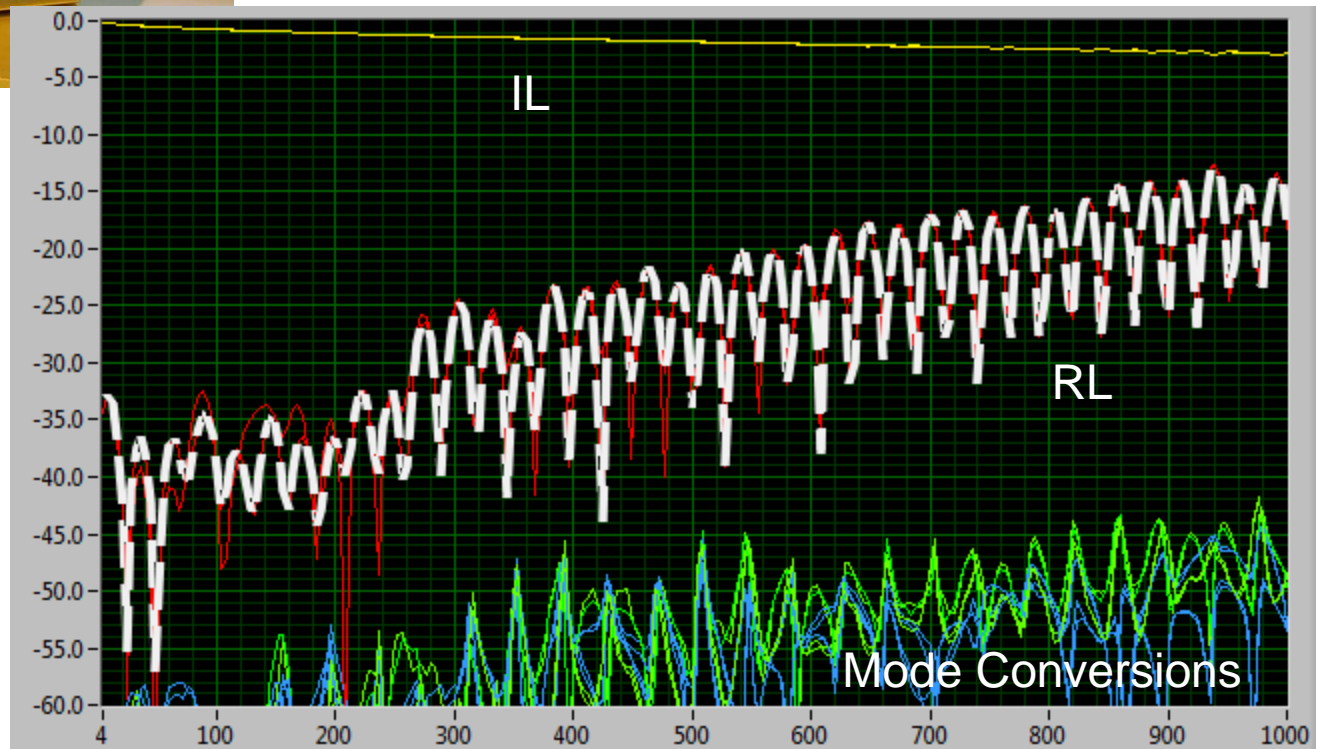




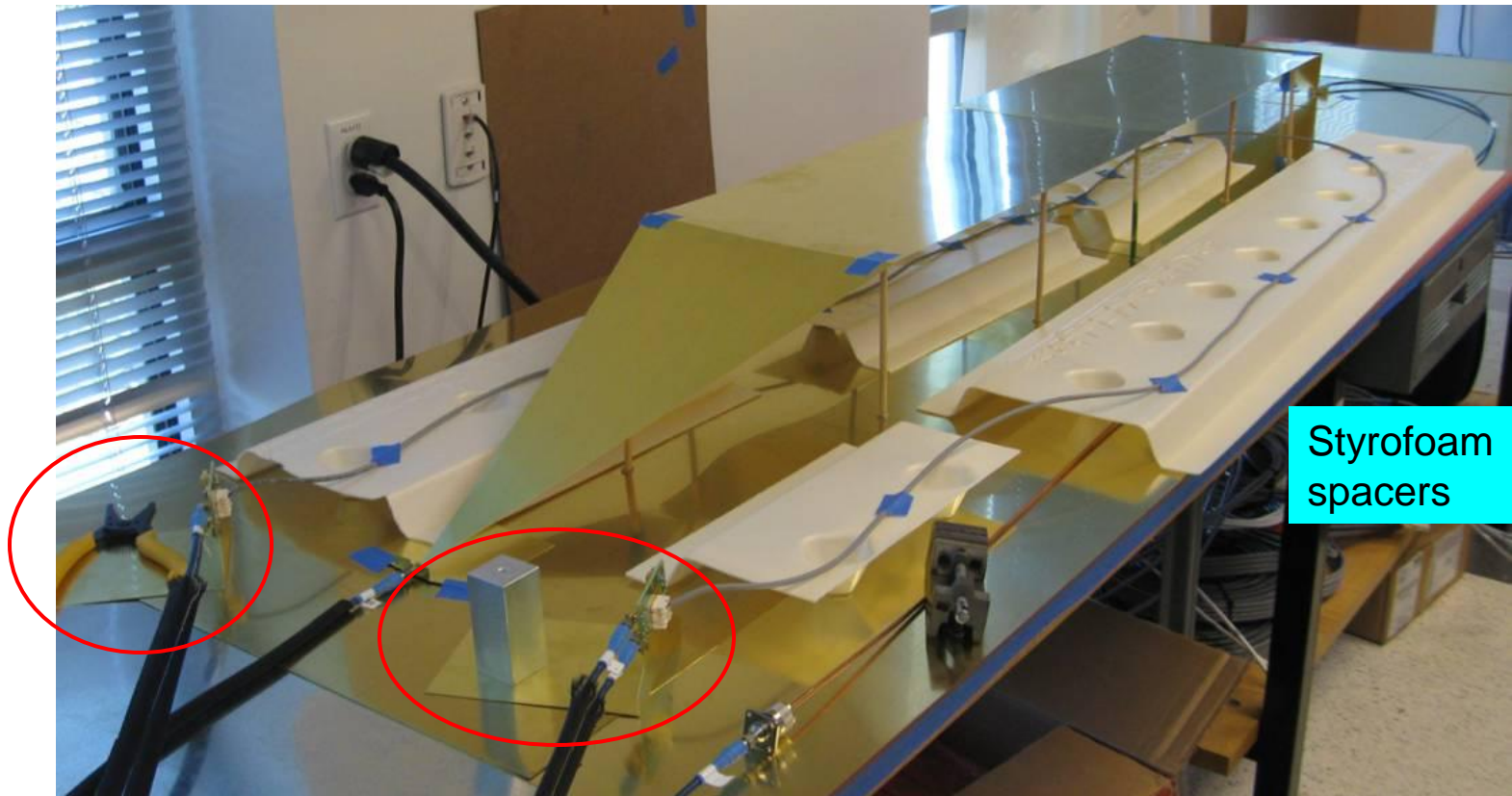
3.5 meter 1 pair 100 Ω cable result

(a short cable has high margins to channel specs and is a good reference for accuracy study)

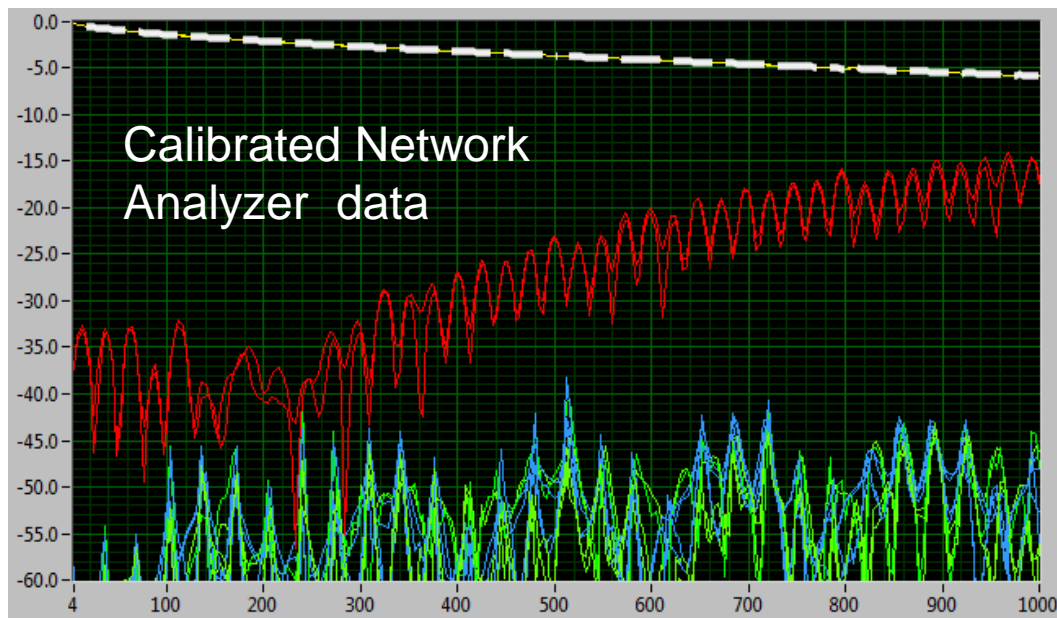
Suitable for
direct EMC work
out to 1 GHz



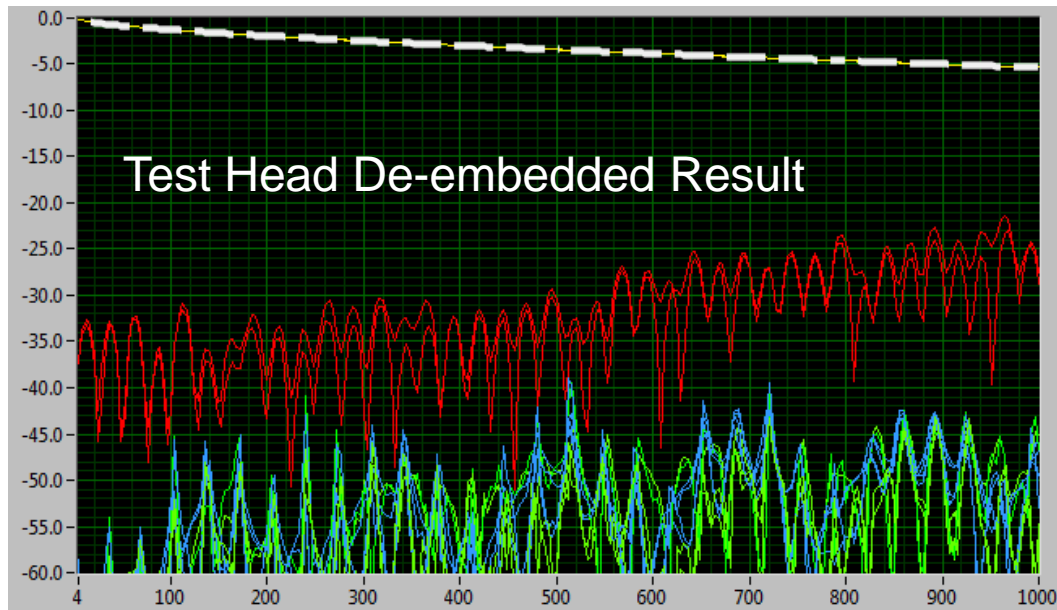
Typical 1 pair cable laid out and back 4 cm over the reference plane between near end and far end port pairs (note: the EMC stripline is not in use)



A small weight (block and pliers in this case) stabilizes the head positions and provides good electrical reference contact if metals are not tarnished.



Test Head De-embedding
provides high accuracy for 4
port Network Analyzer data

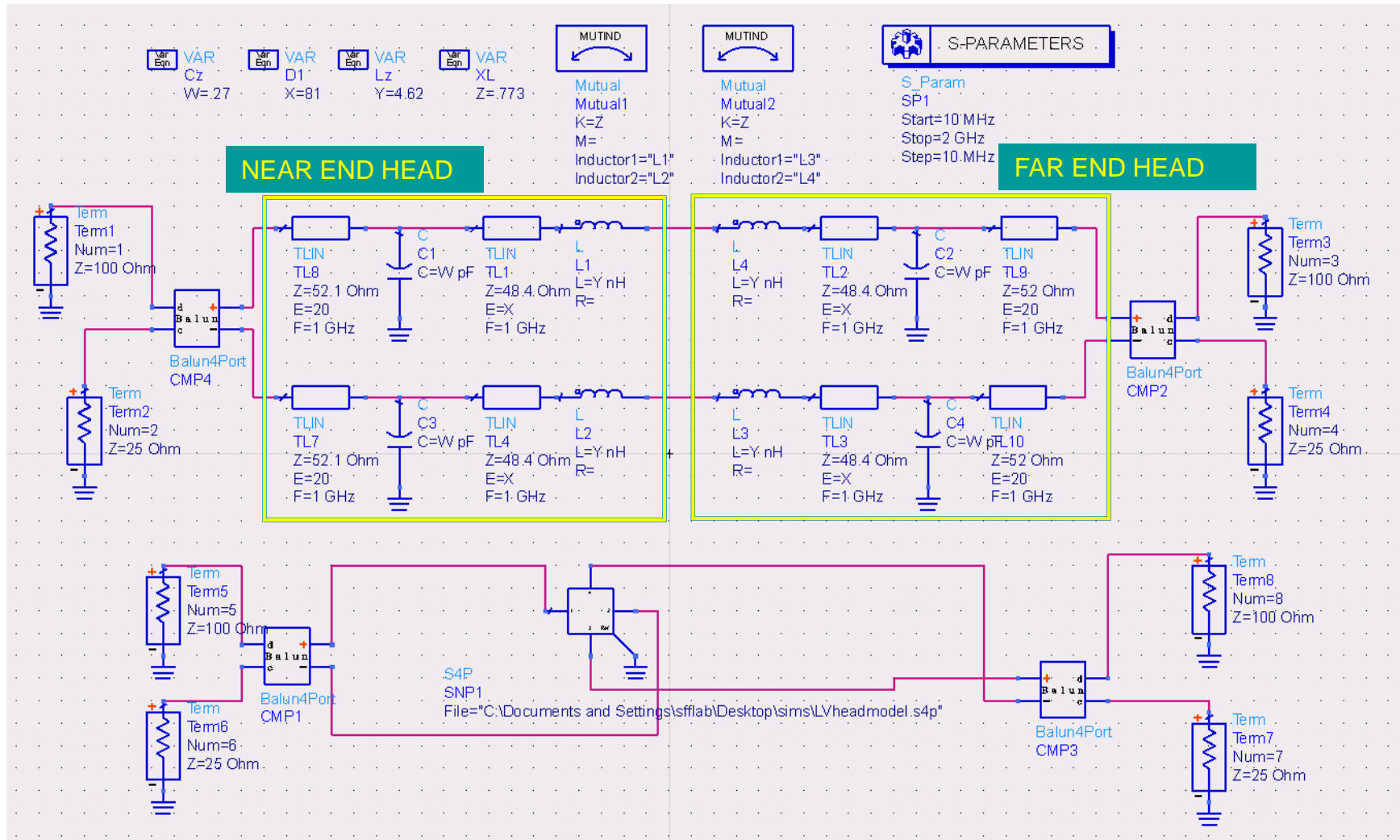


(4 meter cable measurement
with no connections provides
high margin result)

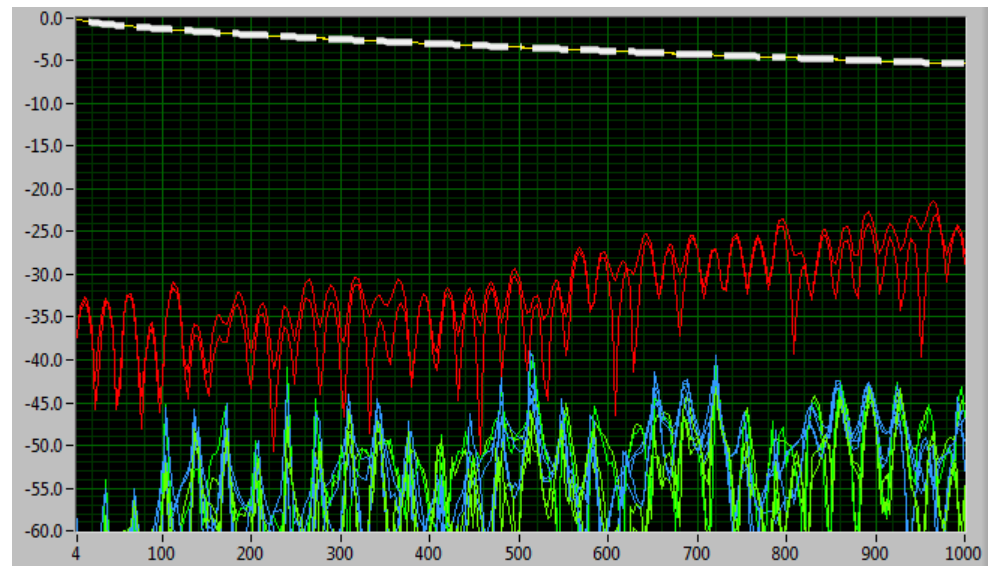
** Custom software controlled
and processed results shown

Alternate de-embedding model derived to match the 4 port THRU measurement using Agilent ADS

(preliminary)



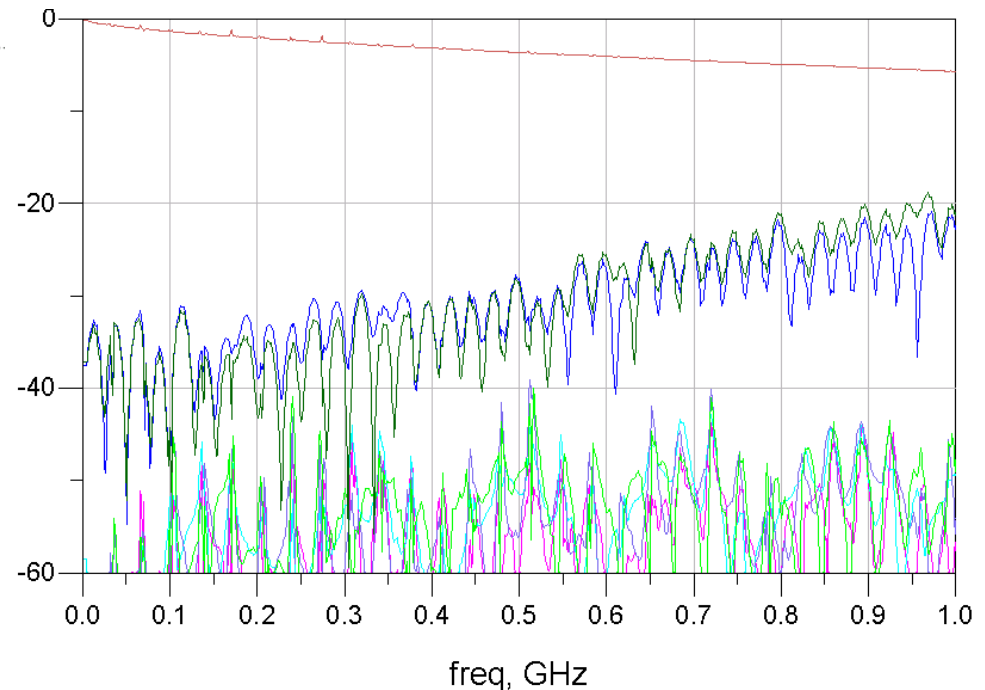
Custom software code
de-embedded result



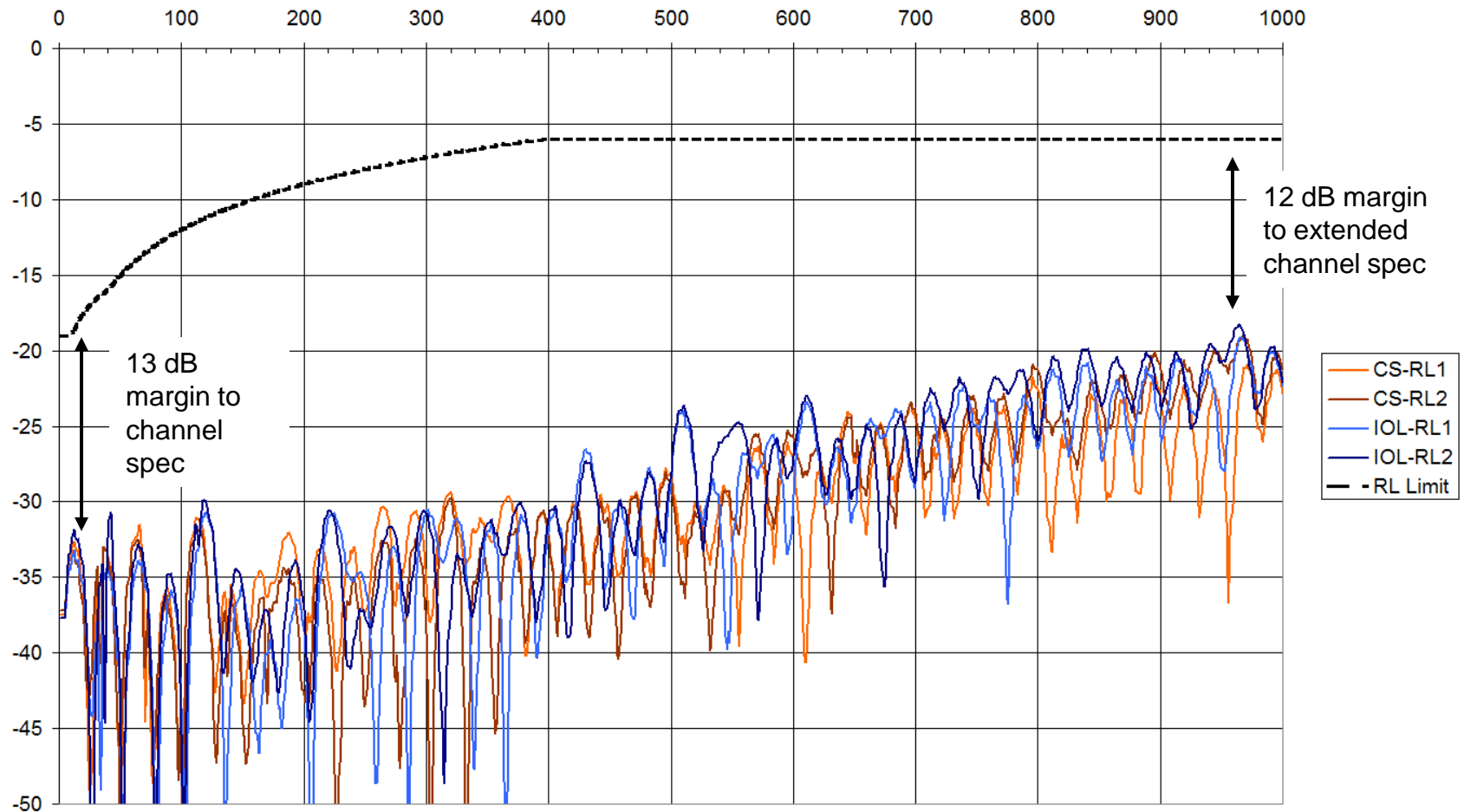
Result using similar de-
embedding model coded
in Agilent ADS



dB(S(1,3))
dB(S(3,3))
dB(S(3,4))
dB(S(3,2))
dB(S(1,4))
dB(S(1,2))
dB(S(1,1))



Results of two 4 m samples cut from the same cable measured with these Test Heads in separate Labs

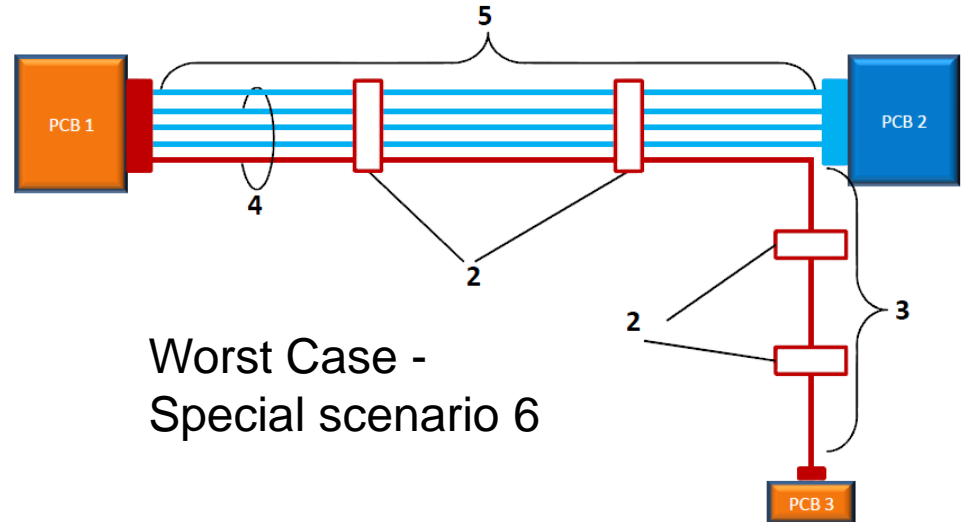


Demonstrates consistency and accuracy

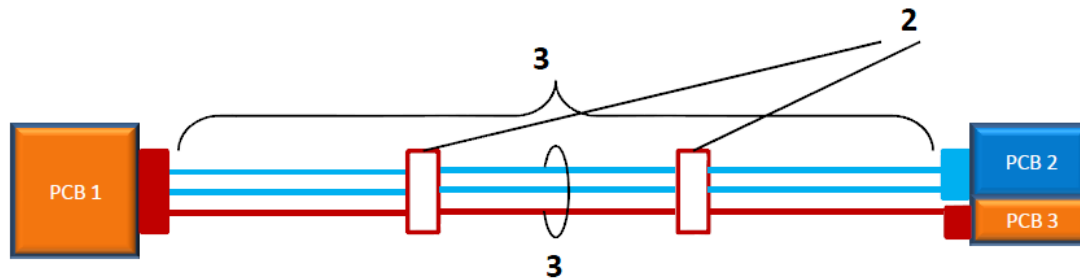
Also:

2 Recommended Test Configurations

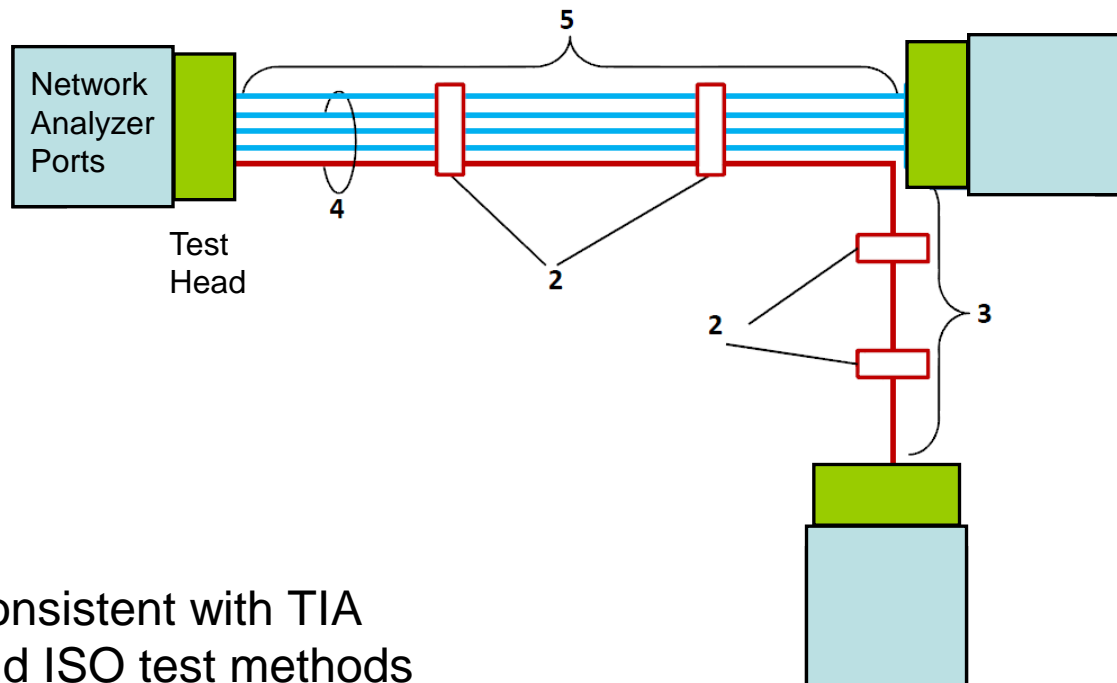
(from Phoenix meeting)



Additional worst case - common scenario 1A



Worst Case - Special scenario 6 Testing using Test Head



Consistent with TIA
and ISO test methods

Conclusions and Proposals

Utilize this IDC test head for:

- easy consistent test of channels
- EMC work out to 1 GHz

Focus on testing the 2 worst case
Channel configurations