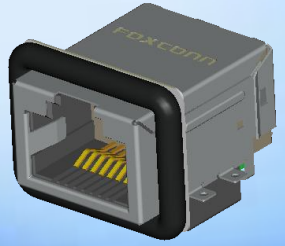
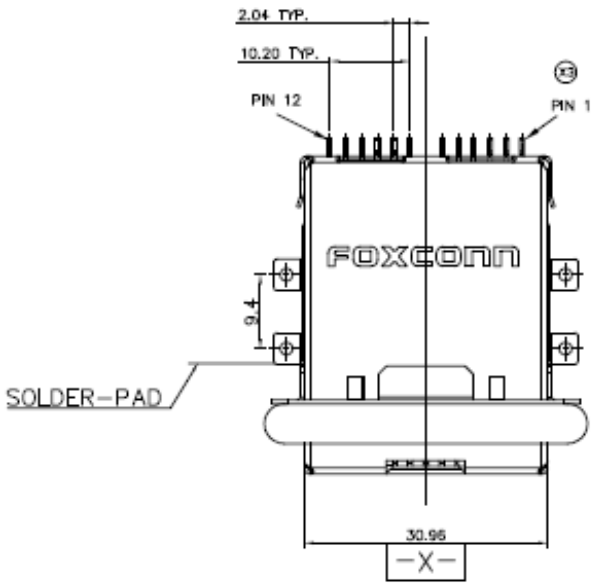
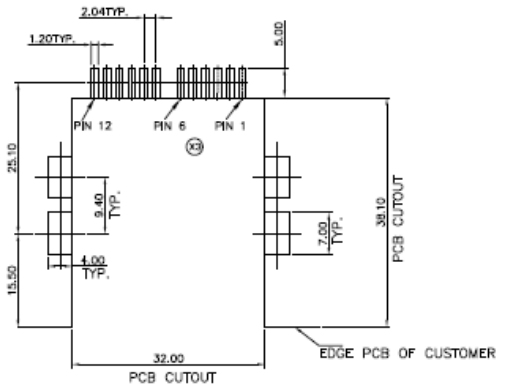
40G ICM Recommendations and Performance



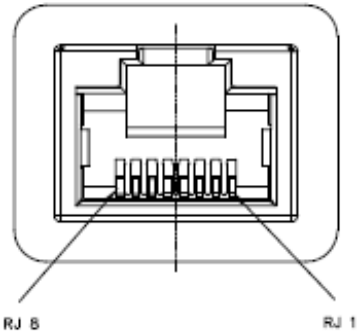
Steve Sedio
Foxconn Interconnect Tech

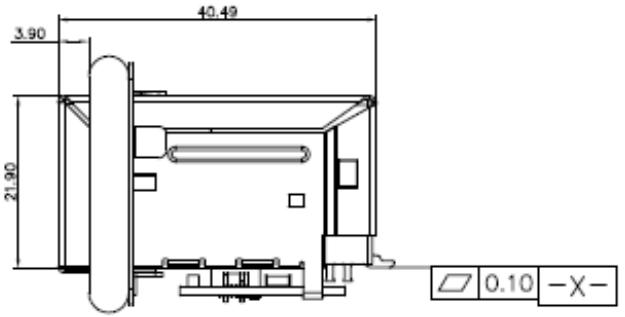
40G ICM proposal specification





SUGGESTED PCB LAYOUT AS VIEWED FROM COMPONENT SIDE

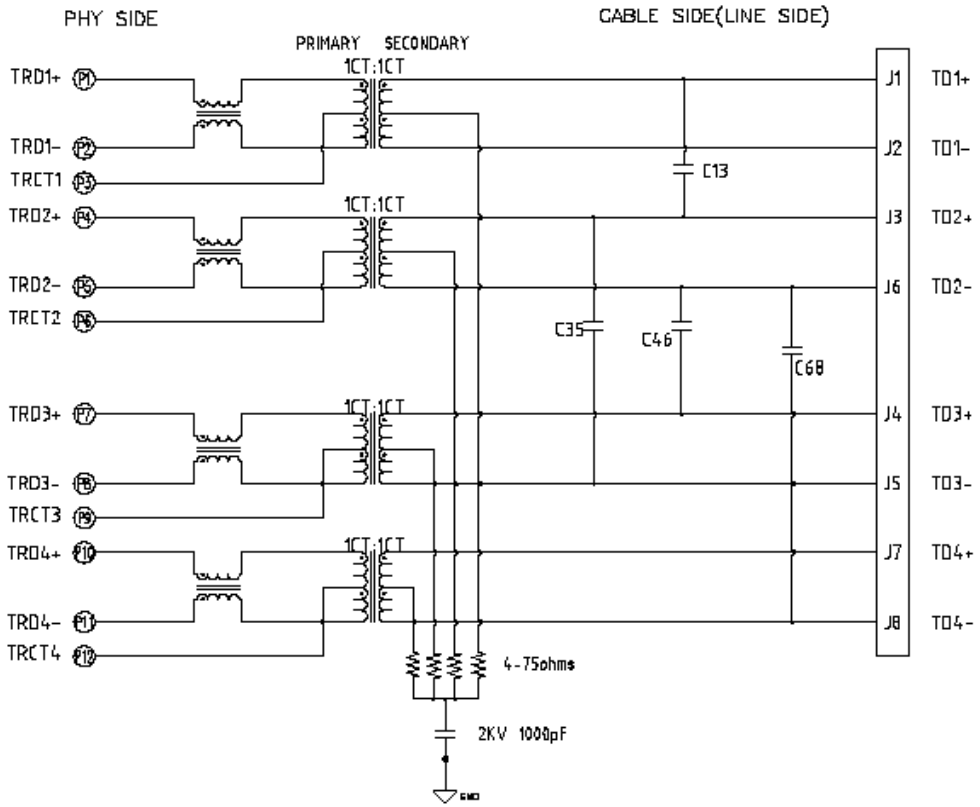




40G ICM proposal specification

1. L.C.R @ 25°C:
   - 1.1 PRIMARY INDUCTANCE(OCL):
     120 uH Min. @100KHz/100mVRMS,0mA DC BIAS
   - 1.2 TURNS RATIO:
     PRIMARY:SECONDARY 1CT:1CT ±2%
2. HIGH FRENQENCY
   - 2.1 IL (INSERTION LOSS)
     1-1600 MHz ,-3.0dB MAX
     1600-2000 MHz ,-4.0dB MAX
   - 2.2 RL (RETURN LOSS):
     1-40 MHz ,-16dB Min
     40-1600 MHz ,-8dB Min
     1600-2000 MHz ,-6dB Min
   - 2.3 CROSS TALK:
     CHANNEL : 1-1600 MHz ,-20dB MIN
3. HI-POT: 2250VDC.
4. HARMFUL MATERIAL CONTROL FOLLOW DOC.NO."EPI12".

SCHEMATIC



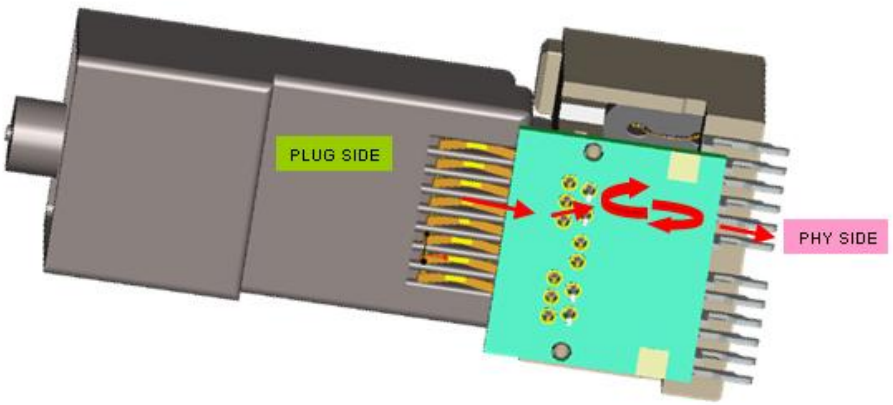
II: Performance design

- Keep tradition FCC RJ45 interface, Shorter track of ICM channel
- Use optimization RJ45 contact terminal.
- Add compensate capacitor to reduce NEXT.

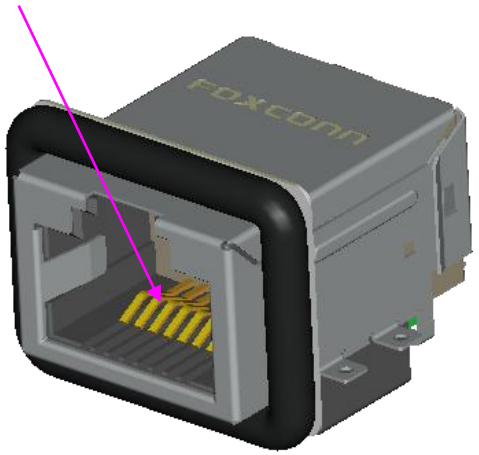
==========

a: Keep tradition FCC RJ45 interface, Shorter track of ICM channel

Shorter track of ICM channel

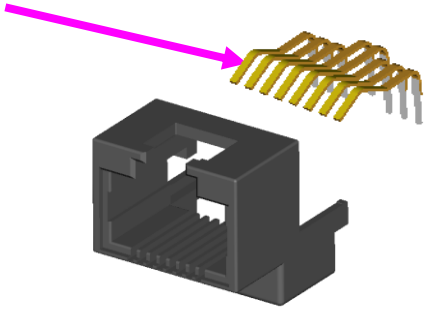


Keep 40G FCC RJ45 interface



II: Performance design

b: Use optimization RJ45 contact terminal.



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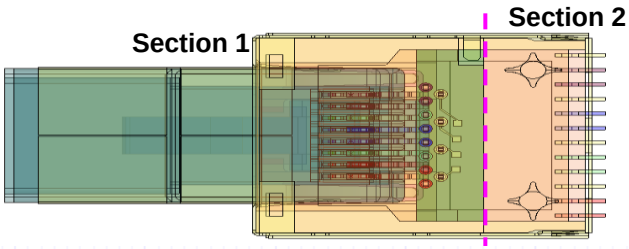
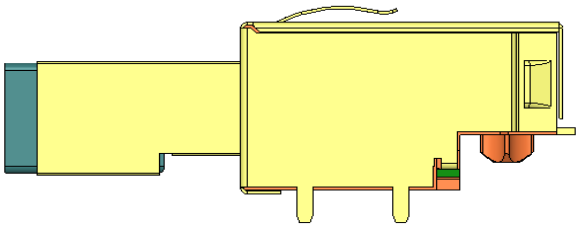
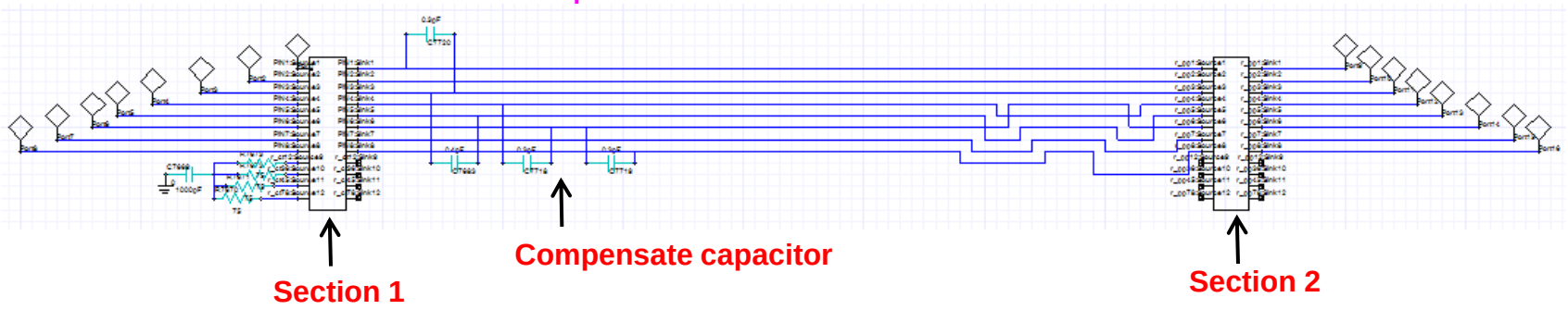
c: Add compensate capacitor to reduce NEXT.

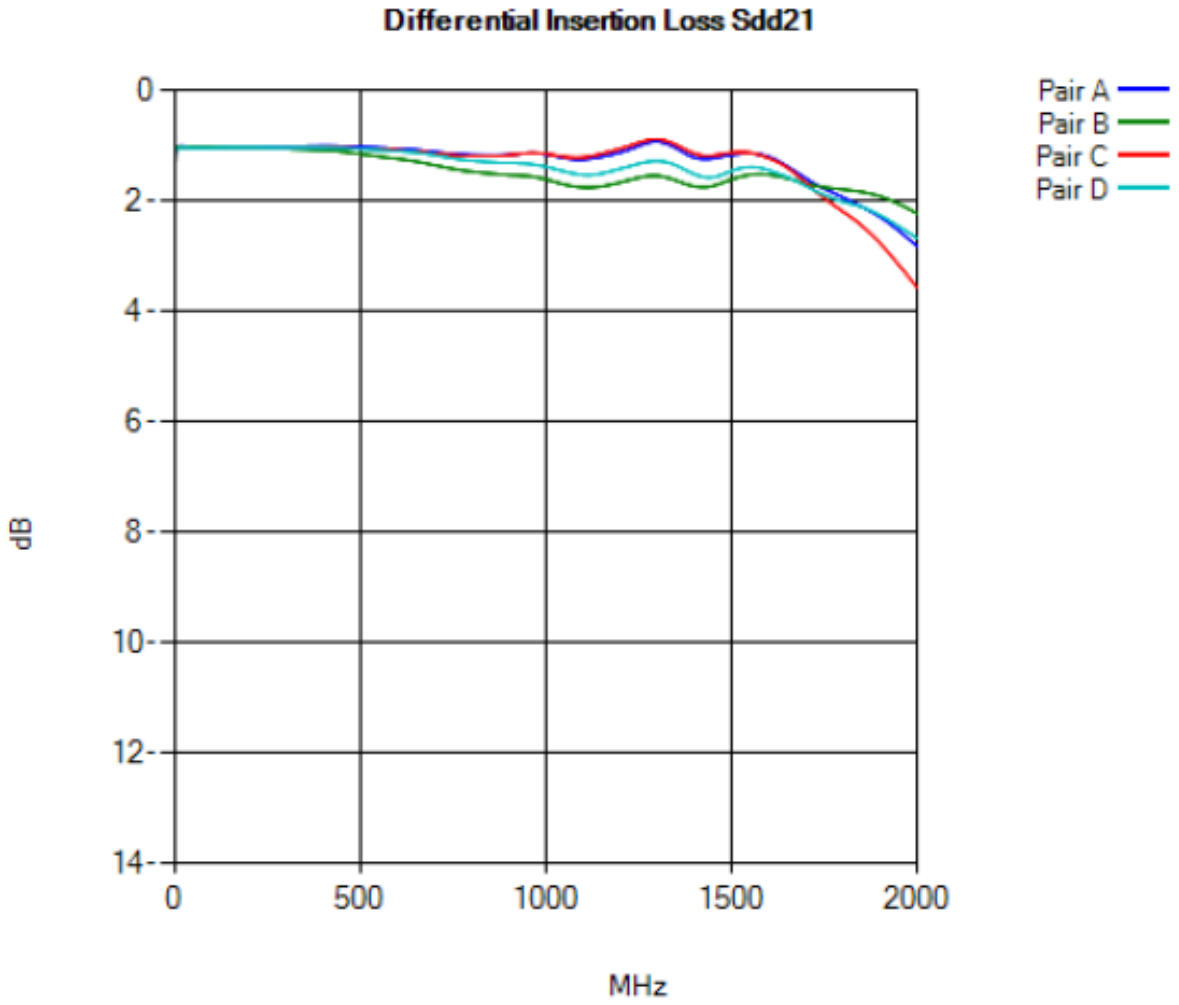




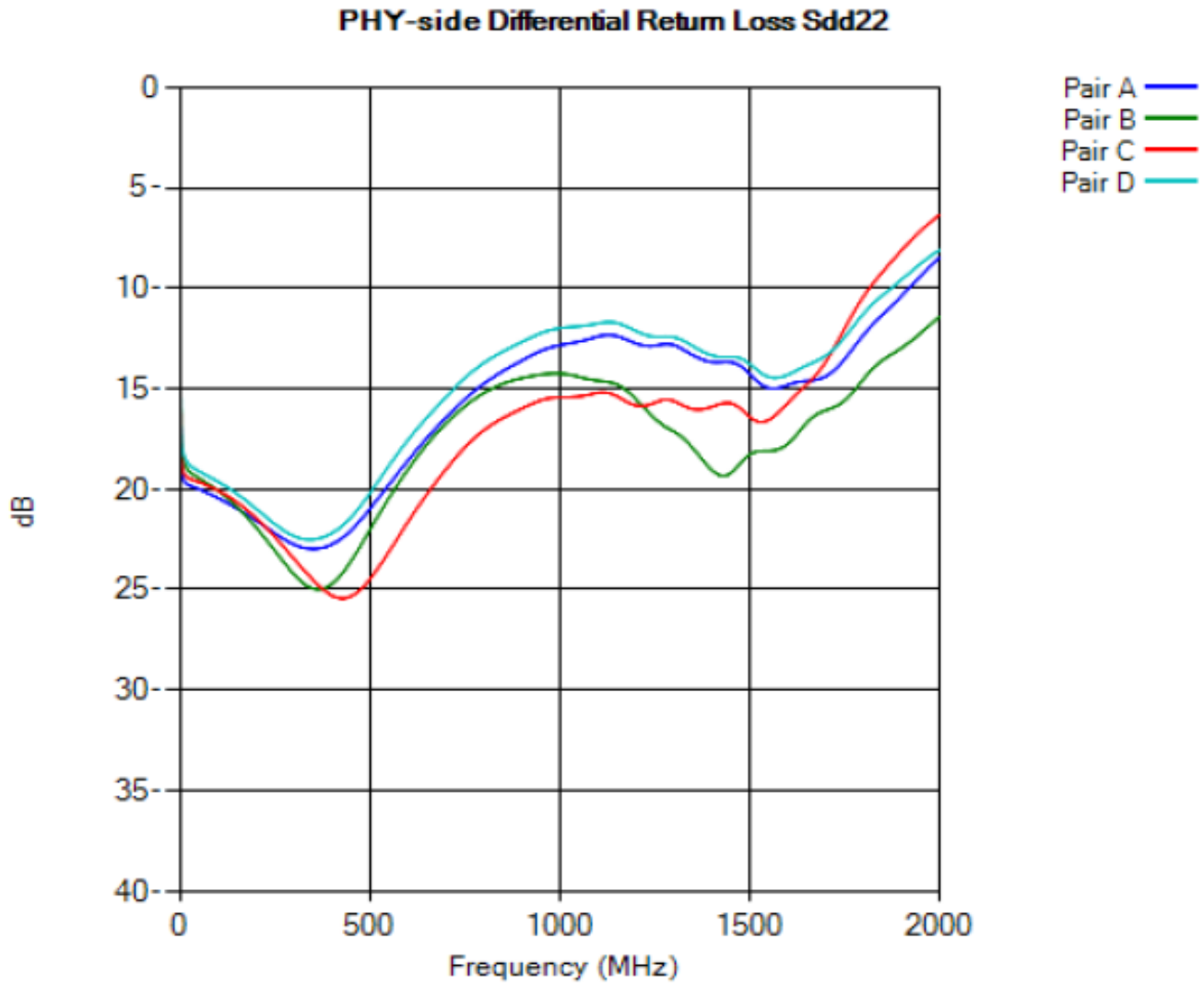


III: Component Testing

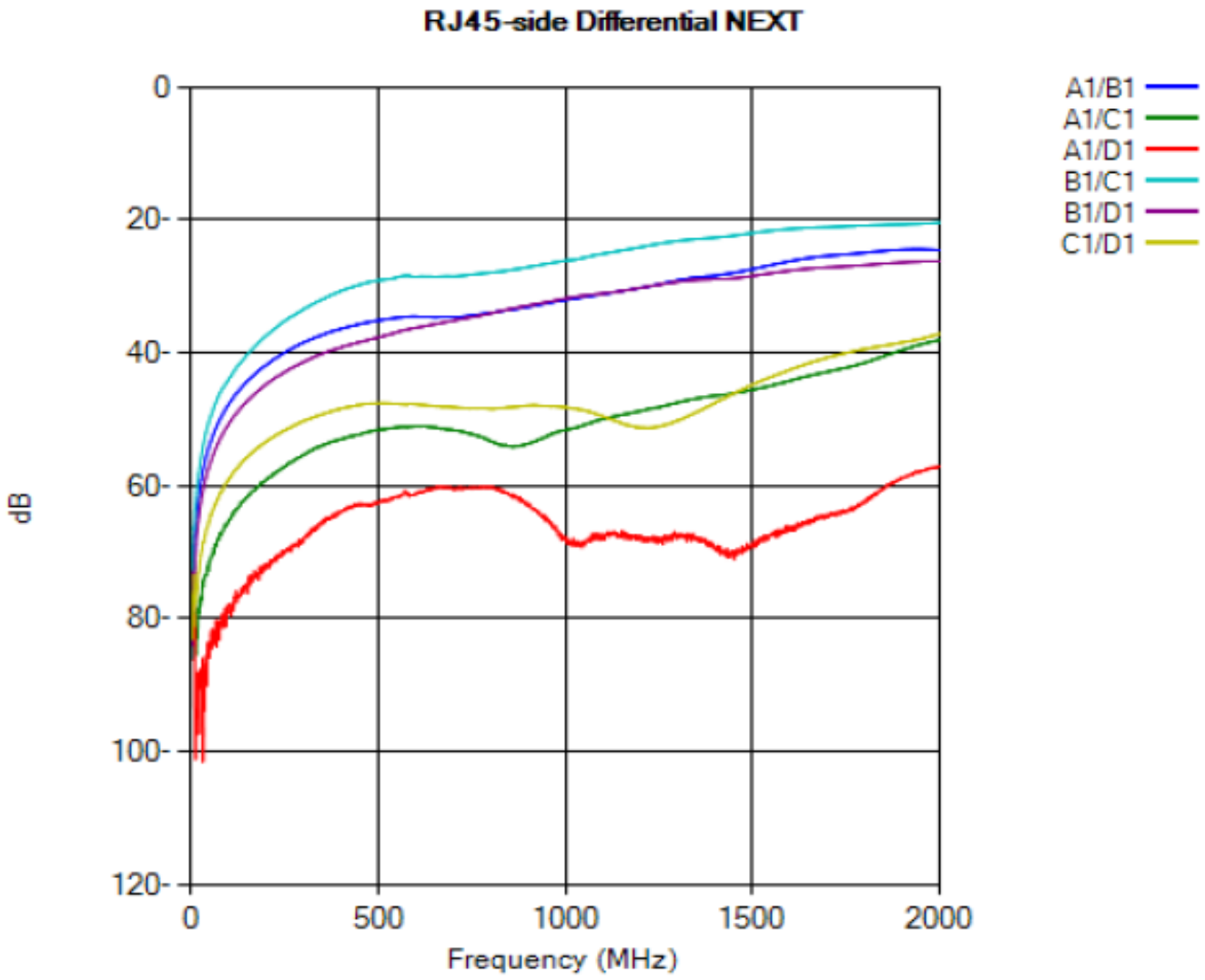
1-2GHz bandwidth S-parameter, Good IL&RL&NEXT&FEXT electrical performance.



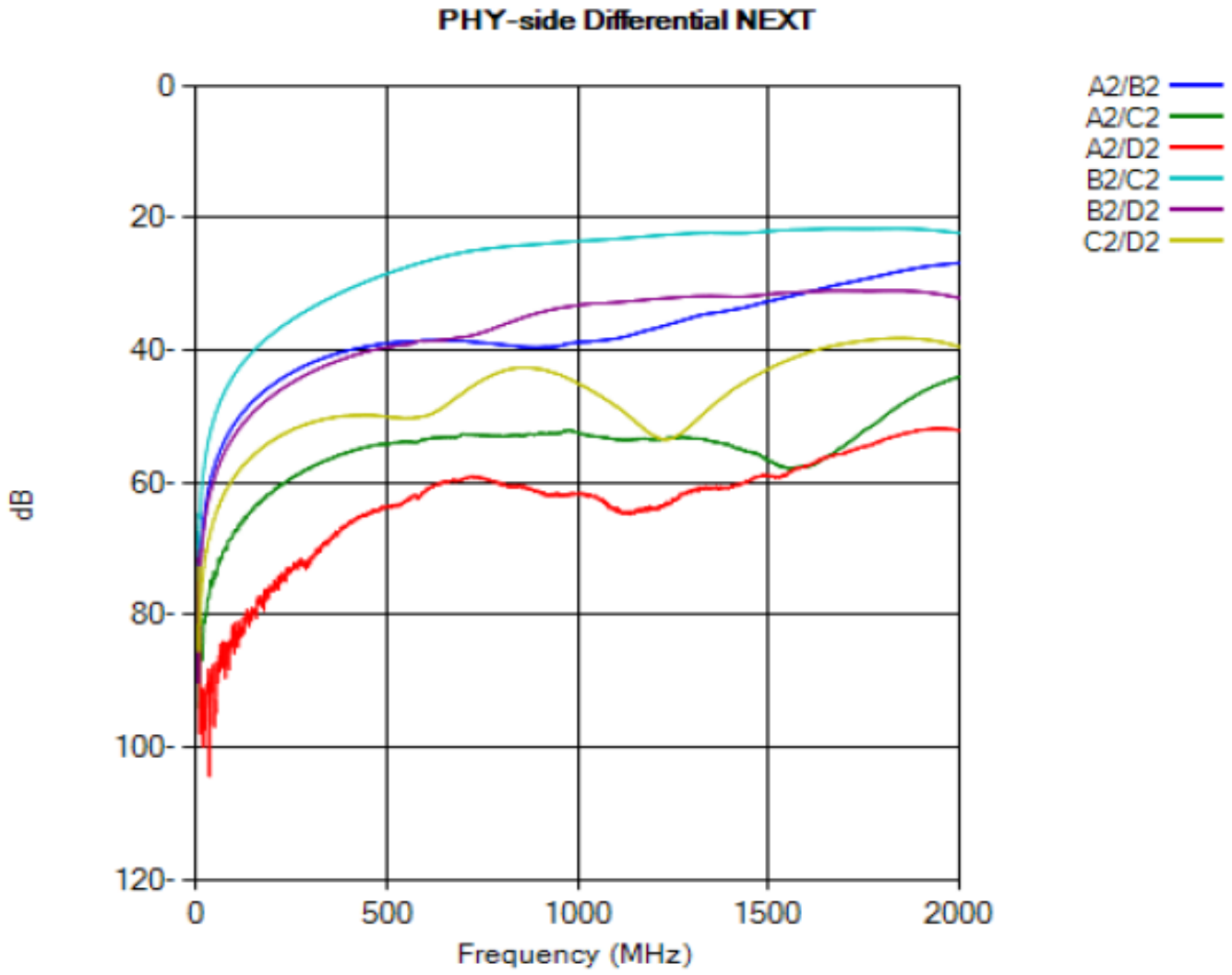

RJ45-side Differential Return Loss Sdd11
Pair A
Pair B
Pair C
Pair D
dB
0
5
10
15
20
25
30
35
40
0
500
1000
1500
2000
MHz


PHY-side Differential Return Loss Sdd22
dB
0
5
10
15
20
25
30
35
40
0
500
1000
1500
2000
Frequency (MHz)
Pair A
Pair B
Pair C
Pair D

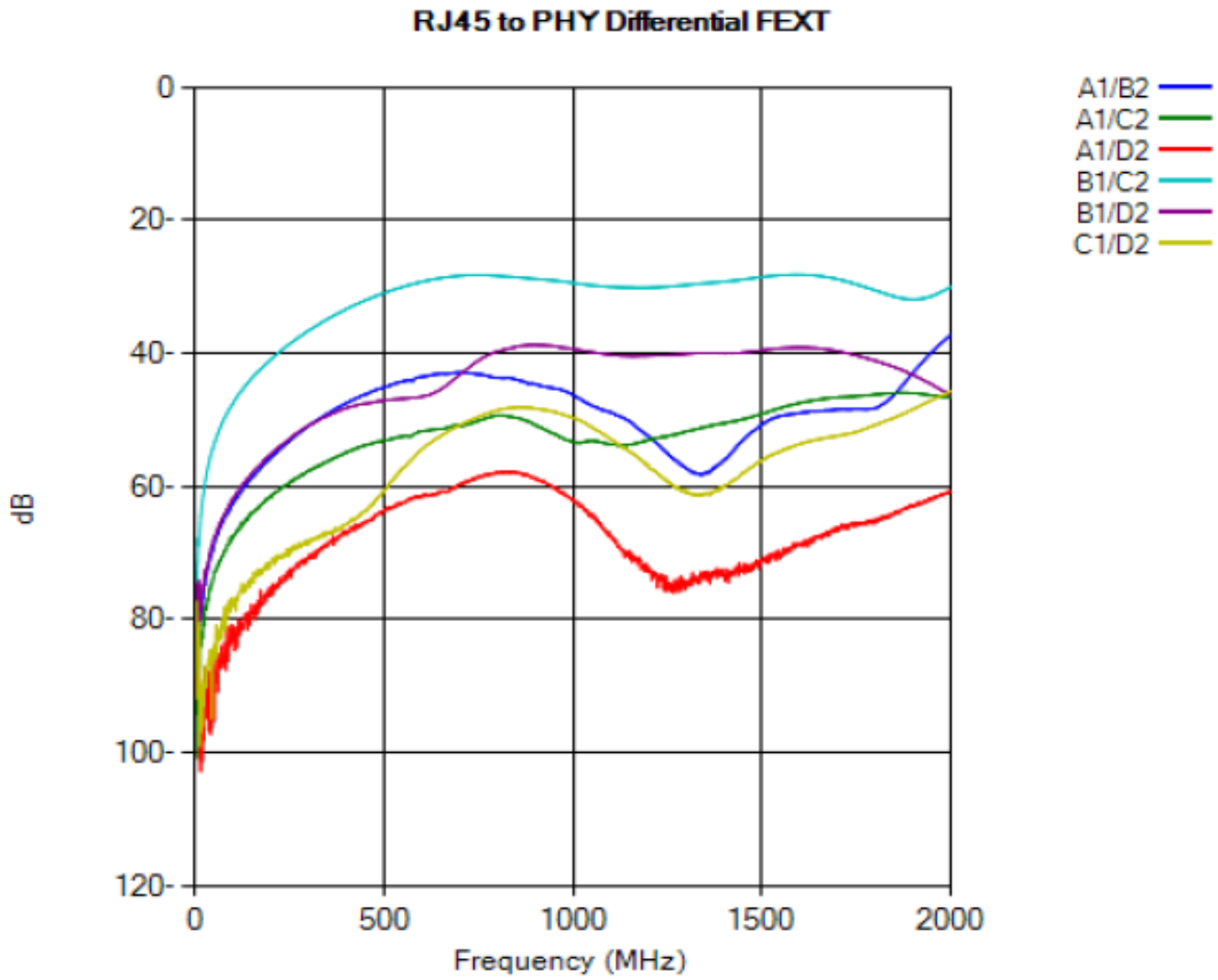
III: Component Testing



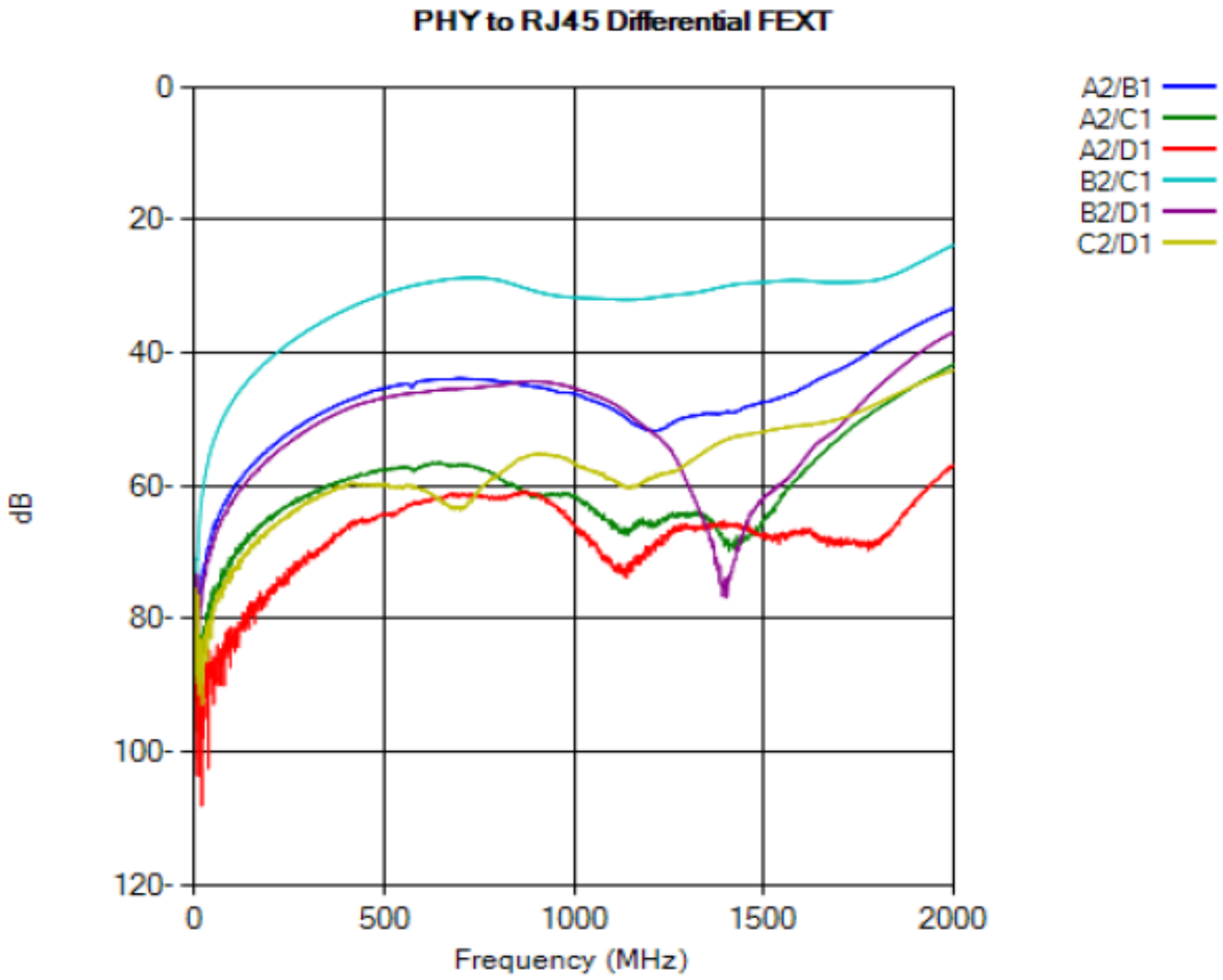
III: Component Testing



III: Component Testing



III: Component Testing



III: Component Testing

Work with Broadcom & Commscope for 40G project

Two Prototype Channels

ComScope Cat8 Cable & Plug

A panel for mounting jacks

Foxconn 40G Base-T ICM

The channel jacks plug into the rear in this orientation

A release tab is in the front, but it is very tiny

III: Component Testing

Better Common mode and differential mode performance comparison AR45 type

SUMMARY: MAXIMUM MEASURED VOLTAGES, CAT8.x S/FTP, F/FTP

Description	Common Mode (mV_{Pk})	Differential Mode (mV_{Pk})	DM/CM, dB
30m Channel CAT8.2 S/FTP ARJ45	140@120MHz	12@120MHz	-21.3
10m Channel CAT8.2 S/FTP ARJ45	90@90MHz	9@90MHz	-20
26m Cable CAT8.2 S/FTP ARJ45	25@100MHz	5@100MHz	-14
2m Cable CAT8.2 S/FTP ARJ45 Taped to metal rack	200@100MHz	20@100MHz	-20
2m Cable CAT8.2 S/FTP With ARJ45, Hanging, coiled	50@240MHz	8@240MHz	-15.9
30m Channel CAT8 Prototype F/FTP, CAT8 Prototype RJ45	52@120MHz	11@120MHz	-13.5
10m Channel CAT8 Prototype F/FTP, CAT8 Prototype RJ45	65@80MHz	13@80MHz	-14

The End