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# **Comment Agenda**

## **162 cable assembly**

### **162A-D Annexes**

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# Comment Agenda

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<b>Topic – 162 CA</b>	<b>Comments</b>
CA IL	181
CA ERL and Tr	[68], 44, champion_3ck_01_0720.pdf
CA DC RL	71*, 181, 148, 74, haser_3ck_adhoc_02_061720.pdf
CA CD IL	148*, 181
CA CC RL	73*, 181, 76, haser_3ck_adhoc_02_061720.pdf
CA COM Tr	149
CA COM SNRTX	37*, 70, 77, 152, 11162
<b>Topic-162A</b>	<b>Comments</b>
ILMaxHost( <i>f</i> ) TBD, ILCamin( <i>f</i> ) TBD	182
<b>Topic -162C</b>	<b>Comments</b>
MDI Connector contact map	#1, lusted_3ck_01_0720.pdf

# Comment Agenda

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<b>Topic -162B</b>	<b>Comments</b>
RL	180*,86,87
CMIL	180*,88,89

<b>Topic -162B</b>	<b>Comments</b>
Frequency Range	91*,79,80,81,84,85,87,89,90
FOM <sub>ILD</sub>	83 value, 84 frequency range, 180
ICN	92,93,94,95,96

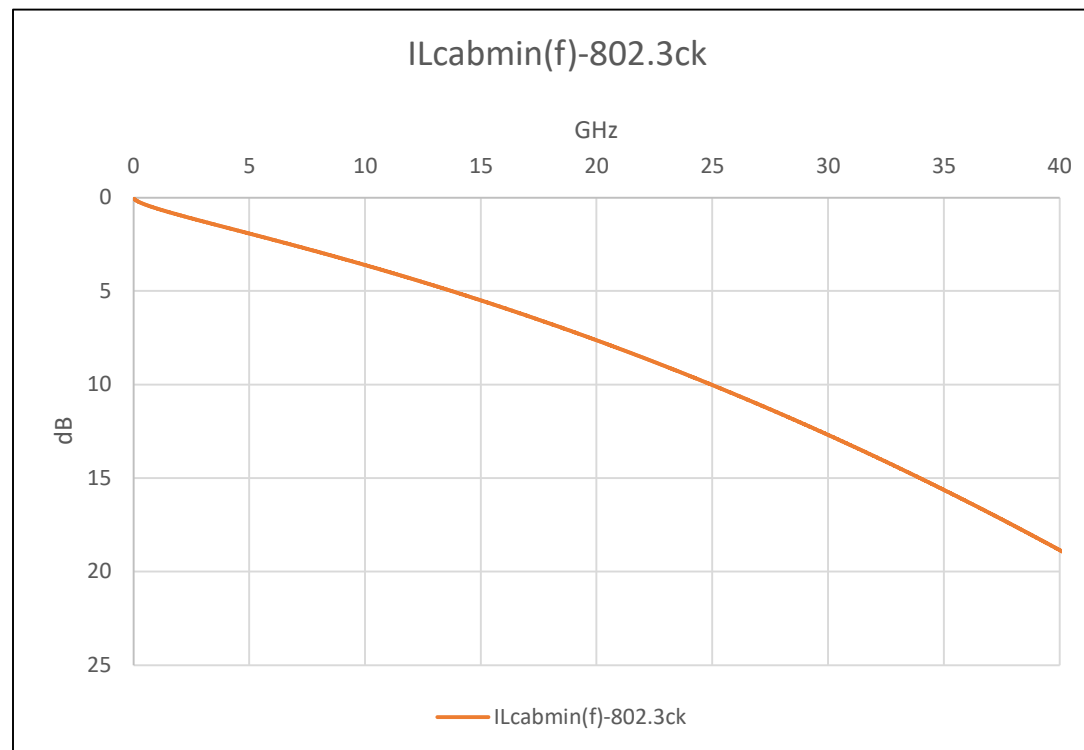
<b>Topic – MDI</b>	<b>Comments</b>
MDI connectors require normative references	232*,233,234,251,252, 253,254

# CA IL minimum - #180

## 162.11.2 Cable assembly insertion loss

The measured insertion loss of a cable assembly shall be greater than or equal to the minimum cable assembly insertion loss given in **TBD** and illustrated in **TBD**.

The measured insertion loss at 26.56 GHz of a cable assembly shall be less than or equal to 19.75 dB.

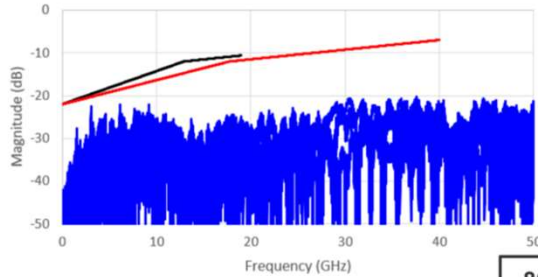


$$IL_{cabmin}(f) = 0.418 \cdot \sqrt{f} + 0.177 \cdot f + 0.0059 \cdot f^2$$

$$IL_{cabmin}(f) = 11 \text{ dB} = 0.418 \cdot \sqrt{26.56} + 0.177 \cdot (26.56) + 0.0059 \cdot 26.56^2$$

# CA DC RL – 71\*, 181, 148, 74,

## Differential to Common-Mode Return Loss:



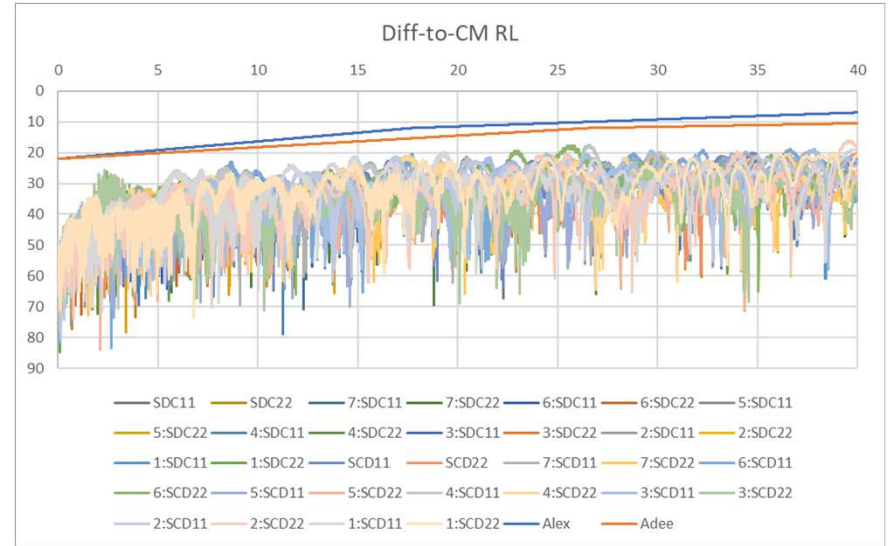
**Key:**  
**BLUE** = POC Data  
**BLACK** = 802.3cd  
**RED** = 802.3ck proposal

#71 haser\_3ck\_adhoc\_02\_061720.pdf

**802.3ck proposal:**

$$\left(22 - \frac{15}{26.56}f\right) \text{ dB} \quad 0.05 \text{ GHz} \leq f < 17.7 \text{ GHz}$$

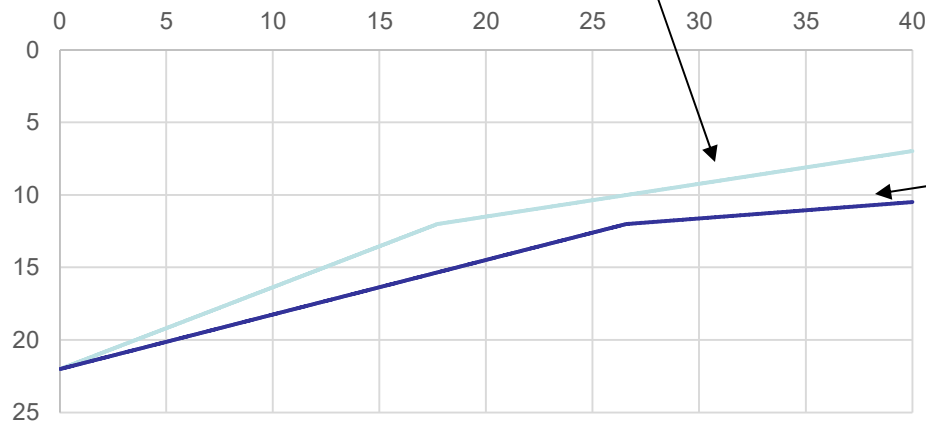
$$\left(16 - \frac{6}{26.56}f\right) \text{ dB} \quad 17.7 \text{ GHz} \leq f \leq 40 \text{ GHz}$$



tracy\_3ck\_01a\_0719.pdf

100 Gbps Copper Cable Measurement  
 and S-Parameter File  
 8 Channel Cable Measurement

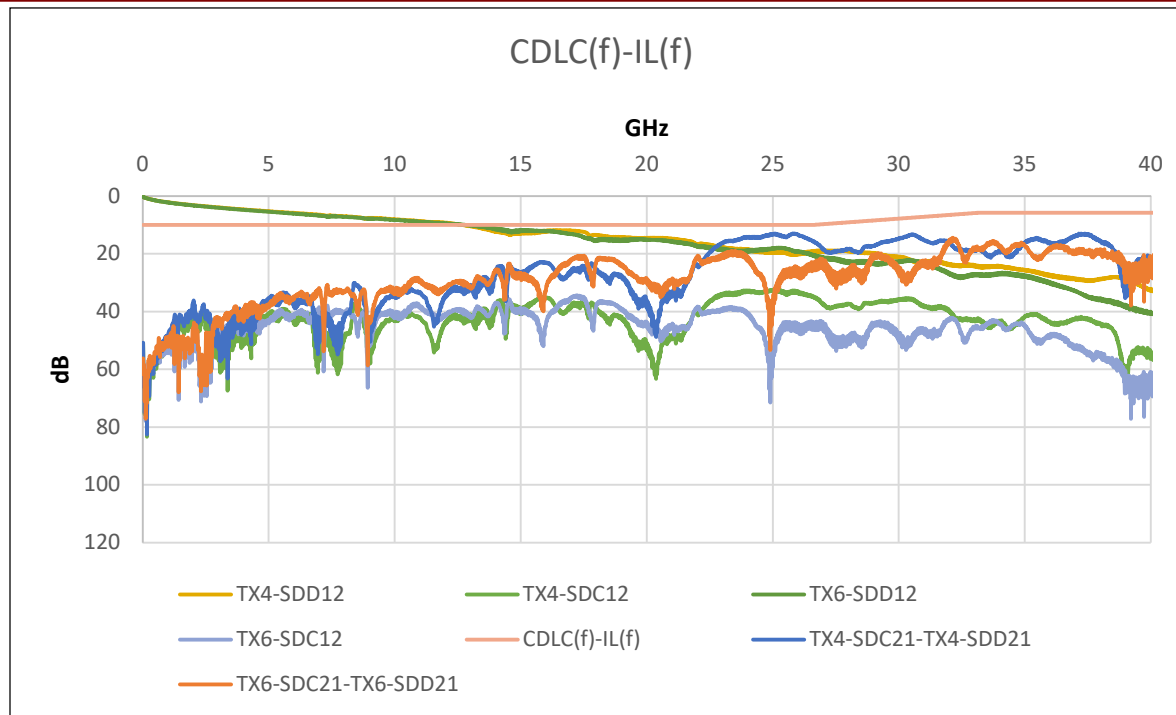
## common to differential mode RL proposals



Alex # 71    Adee - #147

#147 ---CDRL(f) ≥  
 $22 - 10 * f / f_N, 0.01 \leq f \leq f_N$   
 $15 - 3 * f / f_N, f_N < f < 40$   
 Where  
 $f_N = 26.5625$  is the Nyquist frequency in GHz  
 f is the frequency in GHz

# CA CDCL – 148\*, 74



tracy\_3ck\_01a\_0719.pdf

100 Gbps Copper Cable  
Measurement and S-Parameter  
File 8 channel cable measurement

162.11.5 Cable assembly differential to common-mode conversion loss Conversion between differential and common-mode signals can result in degradation of the signal at the receiver, and in introduction of differential noise into the receiver. To limit these effects, the differential to common-mode mode conversion loss, relative to the insertion loss, has to be limited.  $f$

The difference between the cable assembly differential to common-mode conversion loss

and the cable

assembly insertion loss shall meet Equation (162-new).

$$CDCL(f) - IL(f) \geq$$

$$10, 0.01 \leq f \leq f_N$$

$$27-17*f/f_N, f_N < f \leq 1.25*f_N$$

$$5.75, 1.25*f_N < f < 40$$

Where

$f_N=26.5625$  is the Nyquist frequency in GHz

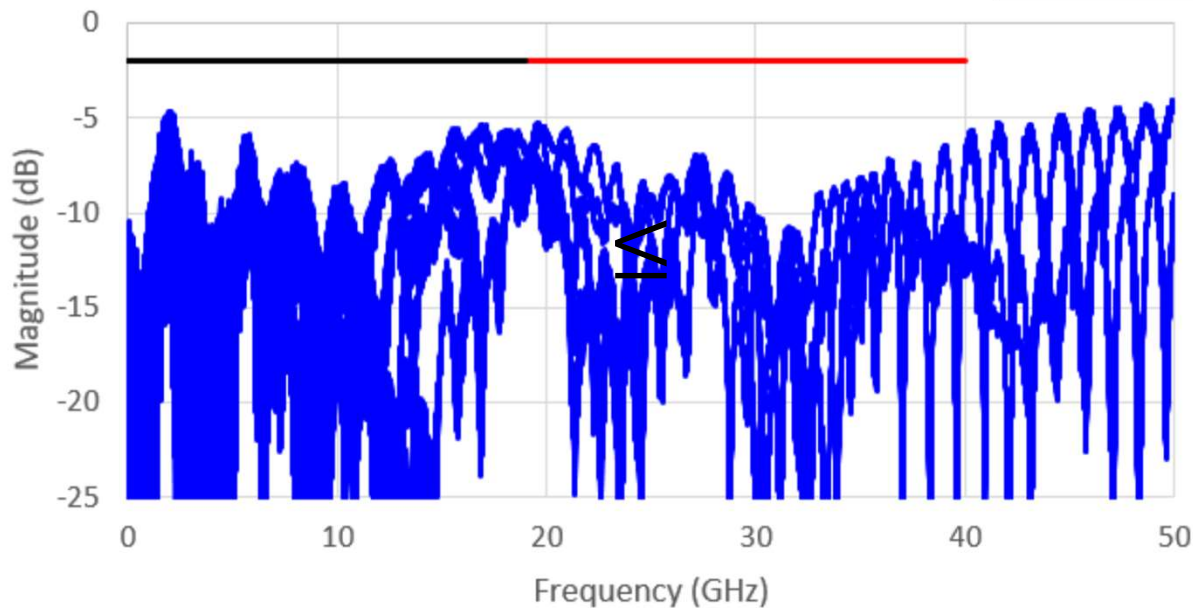
$f$  is the frequency in GHz

CDCL( $f$ ) is the common-mode to differential inversion loss in dB at frequency

# CA CC RL – 73\*,181,76

## Common-Mode to Common-Mode Return Loss:

**Key:**  
**BLUE** = POC Data  
**BLACK\*** = 802.3cd  
**RED** = 802.3ck proposal



**802.3ck proposal:** 2 dB  $0.05 \text{ GHz} \leq f < 40 \text{ GHz}$

**molex**

haser\_3ck\_adhoc\_02\_061720.pdf

# CA COM: SNRTx - #37

Cl 162 SC 162.11.7 P 160 L 42 # 77  
 Haser, Alex Molex  
 Comment Type TR Comment Status D CA COM  
 Fill in TBD for SNR\_Tx  
 SuggestedRemedy:  
 Set SNR\_Tx to 32.52 dB. All lanes of cables must pass COM; need a higher SNR\_Tx value to do so given shared data (see champion\_3ck\_adhoc\_01\_031120)  
 Proposed Response Response Status W  
 PROPOSED ACCEPT  
 The referenced presentation is here:  
[http://www.ieee802.org/3/ck/public/adhoc/mar11\\_20/champion\\_3ck\\_adhoc\\_01\\_031120.pdf](http://www.ieee802.org/3/ck/public/adhoc/mar11_20/champion_3ck_adhoc_01_031120.pdf)  
 Resolve using response to comment #37.

Cl 162 SC 162.11.7 P 160 L 43 # 152  
 Ran, Adeel Intel  
 Comment Type T Comment Status D CA COM  
 SNR\_TX of the CR PHY needs to be somewhat lower than the corresponding CK PHY COM value (33 dB), to account for crosstalk that is introduced by practical host board routing. The mathematical host board model that is used in COM does not introduce any crosstalk.  
 Proposed value is 32.5 dB.  
 SuggestedRemedy:  
 Change TBD to 32.5 dB.  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.  
 Resolve using response to comment #37.

Cl 162 SC 162.11.7 P 160 L 43 # 37  
 Ben Artsi, Liav Marvell Technology  
 Comment Type T Comment Status D CA COM  
 Transmitter signal-to-noise ratio is TBD  
 SuggestedRemedy  
 In benartsi\_3ck\_D1a\_0919 it was shown that an optimized break-out section cross-talk degrades SNR by at least 0.5dB.  
 This degradation is not represented in the "include PCB" section and should be accounted for in setting a proper value of SNR\_Tx in section 162. In Table 163-10 SNR\_Tx is specified to be 33dB and very likely same devices will be used for both sections. For comparison, in section 163 the break-out area crosstalk is included in the interconnect supplied to COM.  
 According to all of the above, set 162 section's SNR\_Tx COM value to be 32.5dB (to account for host board break-out section crosstalk which is not included in the "include PCB" specification). This value correlates to 163 section's SNR\_Tx of 33dB and allows traces and connector crosstalk degradation of an additional 1dB up to TP2 resulting in the 31.5dB already specified in table 162-9 (SNDR = 31.5dB)  
 Proposed Response Response Status W  
 PROPOSED ACCEPT  
 The referenced presentation is here:  
[http://www.ieee802.org/3/ck/public/19\\_09/benartsi\\_3ck\\_D1a\\_0919.pdf](http://www.ieee802.org/3/ck/public/19_09/benartsi_3ck_D1a_0919.pdf)  
 Comments #37, #70, #77, #152 all propose the same remedy.

Cl 162 SC 162.11.7 P 160 L 42 # 70  
 Champion, Bruce TE Connectivity  
 Comment Type T Comment Status D CA COM  
 SNR\_Tx listed at TBD  
 SuggestedRemedy:  
 Change TBD to 32.5 as described in champion\_3ck\_adhoc\_01\_031120.pdf. See presentation  
 Proposed Response Response Status W  
 PROPOSED ACCEPT  
 The referenced ad hoc presentation is here:  
[http://www.ieee802.org/3/ck/public/adhoc/mar11\\_20/champion\\_3ck\\_adhoc\\_01\\_031120.pdf](http://www.ieee802.org/3/ck/public/adhoc/mar11_20/champion_3ck_adhoc_01_031120.pdf)  
 Pending review of the following new presentation:  
[http://www.ieee802.org/3/ck/public/20\\_07/champion\\_3ck\\_02\\_0720.pdf](http://www.ieee802.org/3/ck/public/20_07/champion_3ck_02_0720.pdf)  
 Resolve using response to comment #37.  
 Cl 162 SC 162.11.7 P 160 L 42 # 11162  
 Palkert, Tom Molex  
 Comment Type T Comment Status D CA COM  
 [Comment resubmitted from Draft 1.1. 162.11.7, P160, L0]  
 Need value for SNRTx  
 SuggestedRemedy:  
 Make SNRTx = 33dB (See supporting presentation)  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE  
 Resolve using the response to comment #37.

C#	Proposal	Proposed Response
37	32.5 dB	Accept
70		
77		
152		
11162	33 dB	AIP. Resolve using response to comment #37.



# CA COM Tr - #149

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CI 162      SC 162.11.7      P 159      L 20      # 149  
Ran, Adee      Intel  
Comment Type    T      Comment Status    D      ERL

(cross-clause)

Addressing the value of T<sub>r</sub> used in COM, which is currently TBD.

Tr is not measurable, but it implicitly affects the transmitter specification peak/V<sub>f</sub> which is measurable, and is also TBD in 162, 163 and 120F.

The proposed value for Tr (as used in COM, prior to the device package model) is 7.5 ps. This values matches results of feasible transmitter devices and will enable reasonable values of peak/V<sub>f</sub>.

Note that the value 6.16 ps has been used in prior analysis, but has never been adopted. This latter value is overly aggressive and does not enable feasible design of transmitters. The proposed value has only a mild effect on COM results in comparison.

A presentation supporting this value and possible values for peak/V<sub>f</sub> at Tp0 or TP0a (possibly informative) will be provided.

### *SuggestedRemedy*

Change TBD to 7.5 ps in 162.11.7, in 163.10, and in 120F.4.1.

Proposed Response      Response Status    W

PROPOSED ACCEPT IN PRINCIPLE.

A related presentation was not submitted.  
Resolve using the response to comment 45.

# Comment Agenda - #182

Topic-162A	Comments
ILMaxHost(f) TBD, ILCamin(f) TBD	182

## 162A.4 Transmitter and receiver differential printed circuit board trace loss

The recommended maximum and minimum printed circuit board trace insertion losses are specified in **TBD** and **TBD**, respectively.

Note that the recommended maximum insertion loss allocation for the transmitter or receiver differential controlled impedance printed circuit boards with allowances for ball grid array (BGA) footprint and host connector footprints is 6.875 dB at 26.56 GHz and the recommended minimum insertion loss allocation for the transmitter or receiver differential controlled impedance printed circuit boards is 2.3 dB at 26.56 GHz. The recommended maximum insertion loss allocation for the transmitter or receiver differential controlled impedance printed circuit boards is consistent with the insertion loss from TP0 to TP2 or TP3 to TP5 given in **TBD** and an assumed mated connector loss of 1.6 dB.

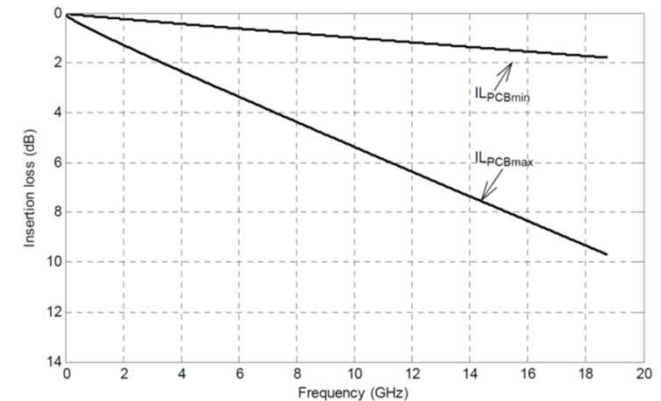
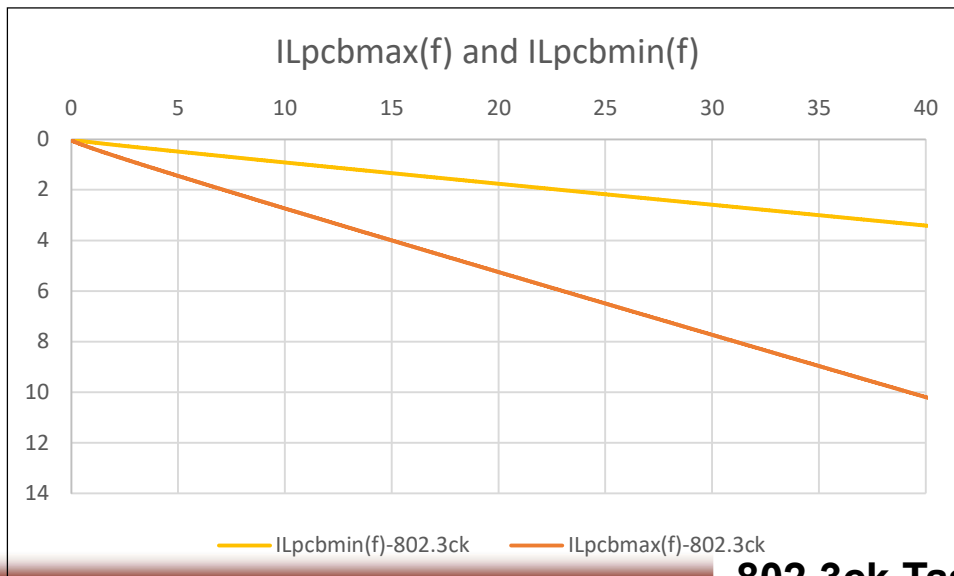


Figure 92A-1—Insertion Loss Tx or Rx PCB max and min



$$IL_{pcbmax}(f_{ghz}) = 0.0176 + 0.1082 * \text{SQRT}(f_{ghz}) + 0.2372 * f_{ghz}$$

$$IL_{pcbmax}(26.56) = 6.875 = 0.0176 + 0.1082 * \text{SQRT}(26.56) + 0.2372 * 26.56$$

$$IL_{pcbmin}(f) = 0.0059 + 0.0361 * \text{SQRT}(f_{ghz}) + 0.0794 * f_{ghz}$$

$$IL_{pcbmin}(26.56) = 2.30 = 0.0059 + 0.0361 * \text{SQRT}(26.56) + 0.0794 * 26.56$$

Editorial license update Annex reference to 162.11.2 ILCamin

# Comment Agenda - #1

Topic -162C	Comments
MDI Connector contact map	#1, lusted_3ck_01_0720.pdf

Pin#	Symbol	Description
1	GND	Ground
2	SL1p	Transmitter Data Non-Inverted
3	SL1n	Transmitter Data Inverted
4	GND	Ground
5	SL3p	Transmitter Data Non-Inverted
6	SL3n	Transmitter Data Inverted
7	GND	Ground
8	SL5p	Transmitter Data Non-Inverted
9	SL5n	Transmitter Data Inverted
10	GND	Ground
11	SL7p	Transmitter Data Non-Inverted
12	SL7n	Transmitter Data Inverted
13	GND	Ground
18	GND	Ground
19	DL6n	Receiver Data Inverted
20	DL6p	Receiver Data Non-Inverted
21	GND	Ground
22	DL4n	Receiver Data Inverted
23	DL4p	Receiver Data Non-Inverted
24	GND	Ground
25	DL2n	Receiver Data Inverted
26	DL2p	Receiver Data Non-Inverted
27	GND	Ground
28	DL0n	Receiver Data Inverted
29	DL0p	Receiver Data Non-Inverted
30	GND	Ground
31	GND	Ground
32	DL1p	Receiver Data Non-Inverted

33	DL1n	Receiver Data Inverted
34	GND	Ground
35	DL3p	Receiver Data Non-Inverted
36	DL3n	Receiver Data Inverted
37	GND	Ground
38	DL5p	Receiver Data Non-Inverted
39	DL5n	Receiver Data Inverted
40	GND	Ground
41	DL7p	Receiver Data Non-Inverted
42	DL7n	Receiver Data Inverted
43	GND	Ground
48	GND	Ground
49	SL6n	Transmitter Data Inverted
50	SL6p	Transmitter Data Non-Inverted
51	GND	Ground
52	SL4n	Transmitter Data Inverted
53	SL4p	Transmitter Data Non-Inverted
54	GND	Ground
55	SL2n	Transmitter Data Inverted
56	SL2p	Transmitter Data Non-Inverted
57	GND	Ground
58	SL0n	Transmitter Data Inverted
59	SL0p	Transmitter Data Non-Inverted
60	GND	Ground

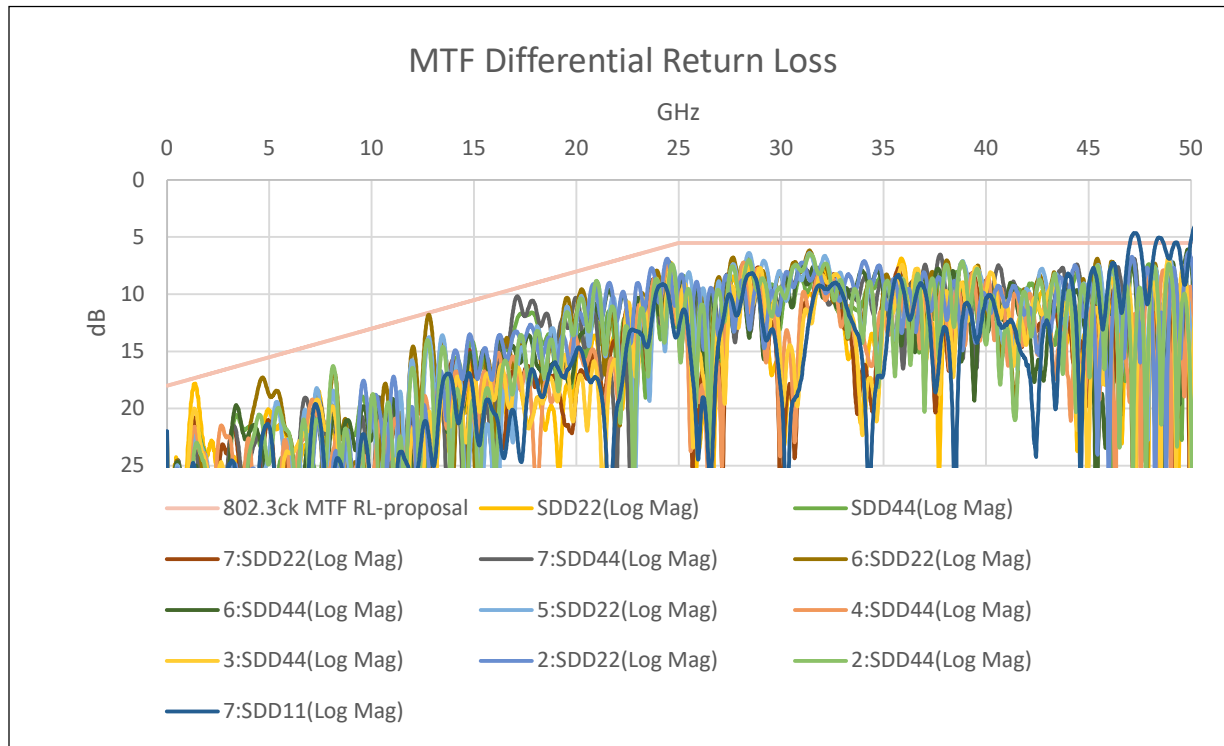
# Comment Agenda

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<b>Topic -162B</b>	<b>Comments</b>
RL	[180],86,87
CMIL	[180],88,89

# #180 - MTF Differential Return Loss

#86,#87 - 162B.1.3.2 Mated test fixtures - **RL (TBD)** - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.



**PROPOSAL: Differential Return Loss =**

**18-0.5\*f<sub>GHz</sub>    0.05 GHz ≤ f<sub>GHz</sub> < 25 GHz**

**5.5                25 GHz ≤ f<sub>GHz</sub> ≤ 40 GHz**



# #86,87 - MTF Differential Return Loss

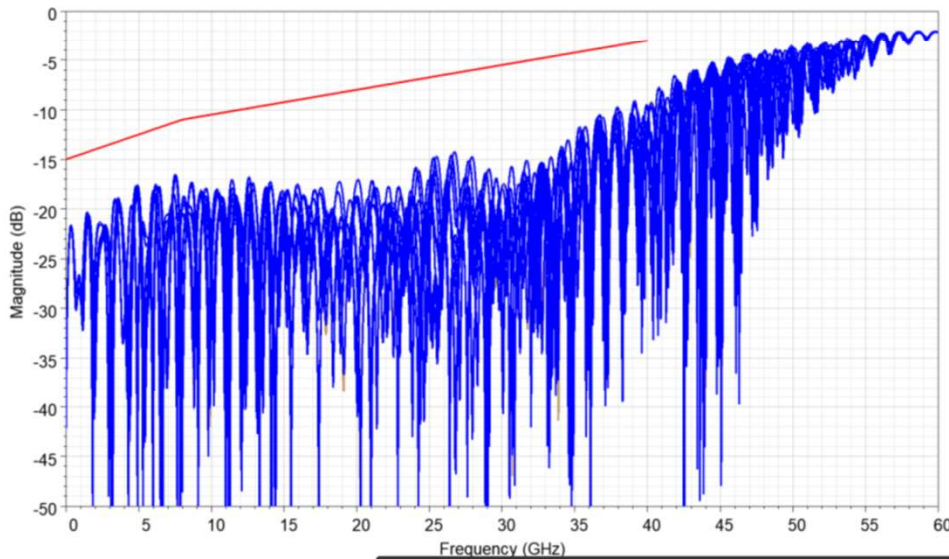
#86,#87 - 162B.1.3.2 Mated test fixtures - **RL (TBD)** - Change from 0.01 GHz  $\leq f_{\text{GHz}} \leq 50$  GHz to **0.05 GHz  $\leq f_{\text{GHz}} \leq 40$  GHz** and update figure.

**SDD11:**

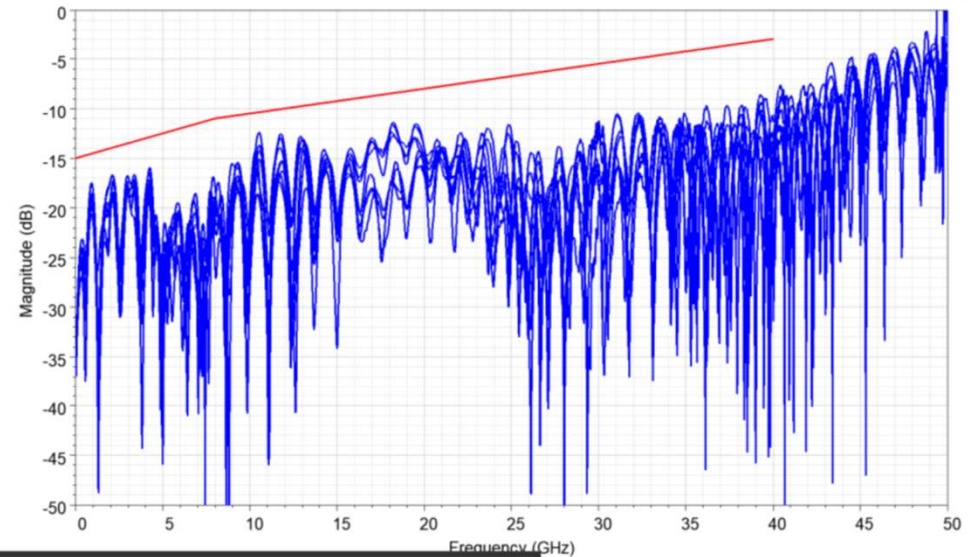
NOTE: 802.3ck D1.2 does not include a limit line for this parameter

**Key:**  
**BLACK** = 802.3ck D1.2  
**RED** = Proposal

Simulated Data:



Measured Data:



Proposal:  $15 - 0.5f$   $f < 8 \text{ GHz}$   
 $13 - 0.25f$   $8 \text{ GHz} \leq f \leq 40 \text{ GHz}$

**molex**

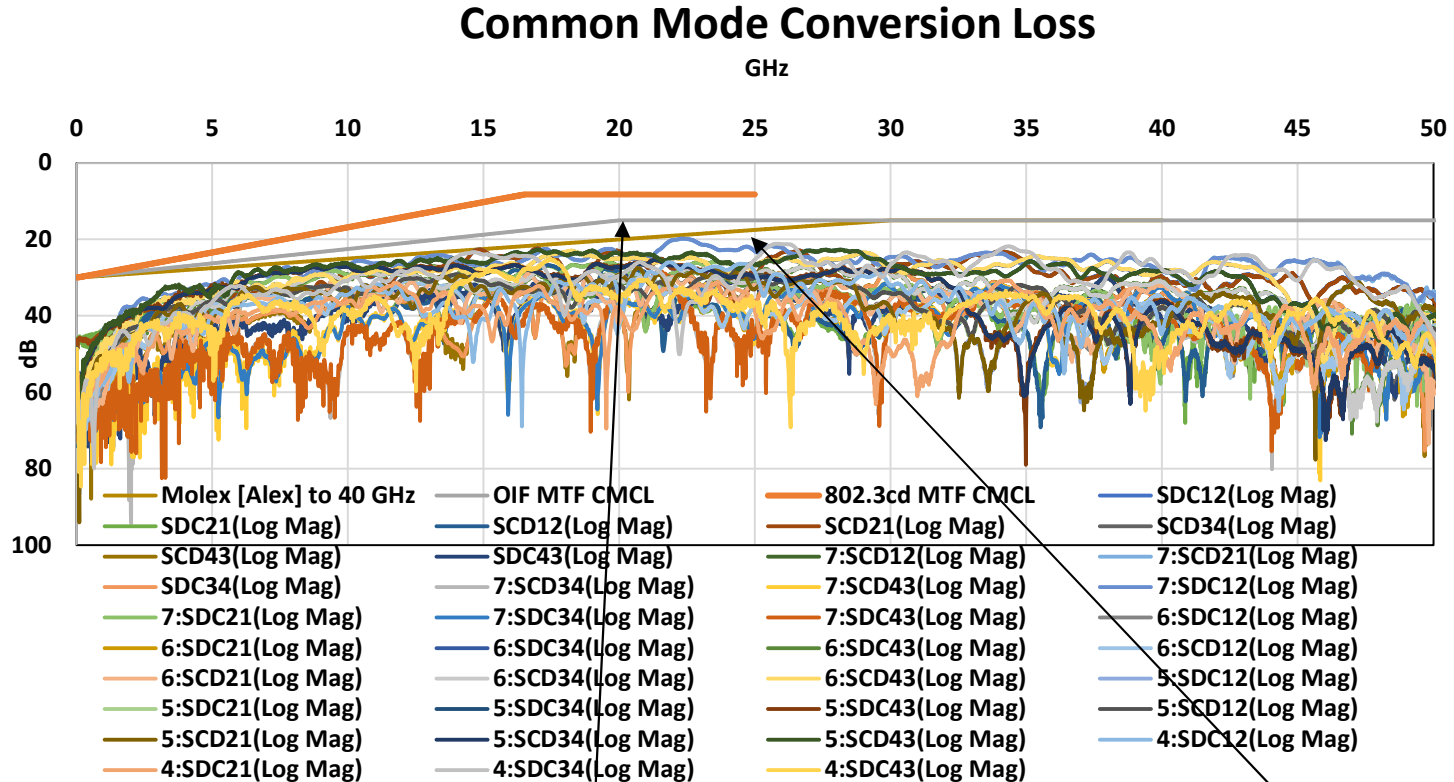
10

[http://www.ieee802.org/3/ck/public/adhoc/jun24\\_20/haser\\_3ck\\_adhoc\\_01c\\_062420.pdf](http://www.ieee802.org/3/ck/public/adhoc/jun24_20/haser_3ck_adhoc_01c_062420.pdf)

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# #180- MTF Common Mode Conversion Loss

#88,#89 - 162B.1.3.4 Mated test fixtures - **CMCIL (TBD)** - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.



**PROPOSAL:** Common Mode Conversion Loss =

$30 - (21/28) * f_{\text{GHz}}$      $0.05 \text{ TBD GHz} \leq f_{\text{GHz}} < 20 \text{ GHz}$

15                       $20 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$

$30 - 0.5f$	$f < 30 \text{ GHz}$
15	$30 \text{ GHz} \leq f \leq 40 \text{ GHz}$

# #88,#89 -162B.1.3.4 Mated test fixtures - CMCIL

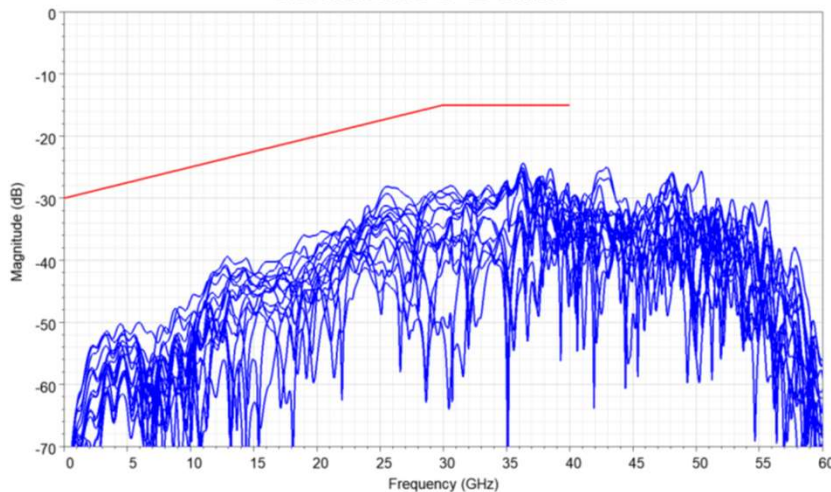
#88,#89 - 162B.1.3.4 Mated test fixtures - **CMCIL (TBD)** - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

## SDC12:

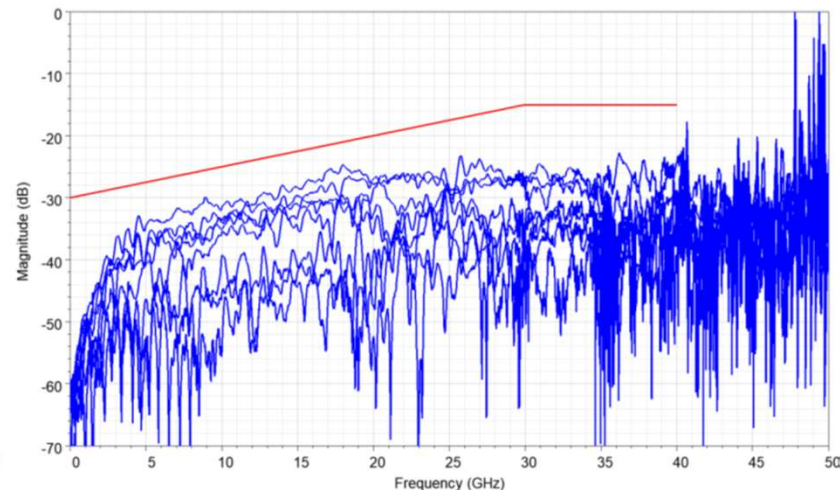
NOTE: 802.3ck D1.2 does not include a limit line for this parameter

**Key:**  
**BLACK** = 802.3ck D1.2  
**RED** = Proposal

Simulated Data:



Measured Data:



Proposal:	$30 - 0.5f$	$f < 30 \text{ GHz}$
	15	$30 \text{ GHz} \leq f \leq 40 \text{ GHz}$

**molex**

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[http://www.ieee802.org/3/ck/public/adhoc/jun24\\_20/haser\\_3ck\\_adhoc\\_01c\\_062420.pdf](http://www.ieee802.org/3/ck/public/adhoc/jun24_20/haser_3ck_adhoc_01c_062420.pdf)



# Comment Agenda

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Topic -162B	Comments
Frequency Range	91*,79,80,81,84,85,87,89,90
FOM <sub>ILD</sub>	83* value, 84 frequency range, 180
ICN	92,93,94,95,96

# Mated Test Fixtures – Frequency Range

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- Proposal -
  - Comments 79,80,81,84,85,87,89,90,91
    - + Specify frequency range 0.05 GHz - 40 GHz to align with available in-house VNA ranges.
    - + For stop frequency; consider VNA ranges, MTF max IL, ICN sensitivity, and receiver BW ( $0.75^* \text{ fb} = \sim 40 \text{ GHz}$ ); comment#91
    - + For start frequency; consider VNA ranges and FOMILD sensitivity.

# Frequency range – 79,80,81,84,85,87,89,90,91

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#79- 162B.1.1.1 Reference IL - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

#80- 162B.1.2.1 Cable assembly test fixture reference IL - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

#81,#82- 162B.1.3.1 Mated test fixtures max and min IL - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

#83,#84 - 162B.1.3.1  $FOM_{\text{ILD}}$   $T_t = \text{TBD} = 6.16 \text{ ps}$ ; change  $f_{\text{min}}$  to  $0.05 \text{ GHz}$ .

#85 - 162B.1.3.1 Mated test fixtures reference IL - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

#85 - 162B.1.3.1 Mated test fixtures reference IL - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

#86,#87 - 162B.1.3.2 Mated test fixtures -  $RL (\text{TBD})$  - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

#88,#89 - 162B.1.3.4 Mated test fixtures -  $CMCIL (\text{TBD})$  - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

#90, - 162B.1.3.5 Mated test fixtures CMDRL - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

#91, - 162B.1.3.6 Mated test fixtures integrated crosstalk noise – Add "Integrated crosstalk RMS noise voltages are measured over N uniformly-spaced frequencies  $f_n$  spanning the frequency range  $50 \text{ MHz}$  to  $40 \text{ GHz}$  with a minimum spacing of  $10 \text{ MHz}$ ." to the end of this section.

# IL Frequency range Max – 79, 80, 81,82

#79- 162B.1.1.1 Reference IL - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

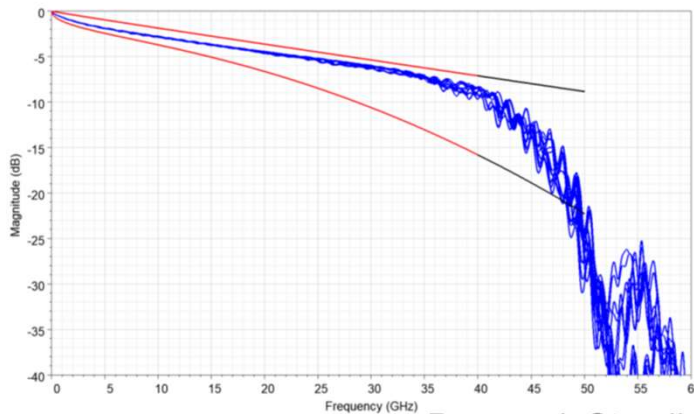
#80- 162B.1.2.1 Cable assembly test fixture reference IL - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

#81,#82- 162B.1.3.1 Mated test fixtures max and min IL - Change from  $0.01 \text{ GHz} \leq f_{\text{GHz}} \leq 50 \text{ GHz}$  to  $0.05 \text{ GHz} \leq f_{\text{GHz}} \leq 40 \text{ GHz}$  and update figure.

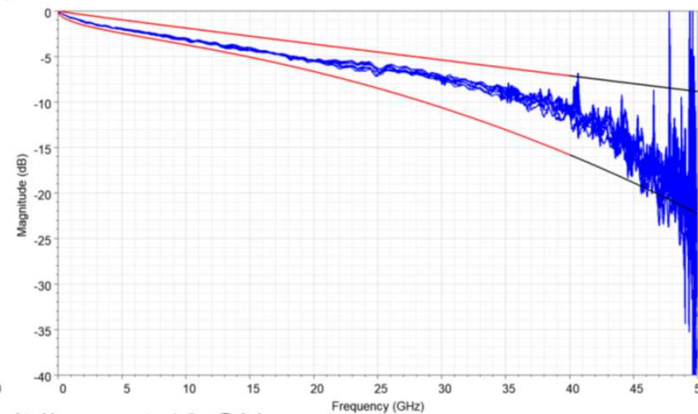
## SDD21:

**Key:**  
**BLACK** = 802.3ck D1.2  
**RED** = Proposal

Simulated Data:



Measured Data:

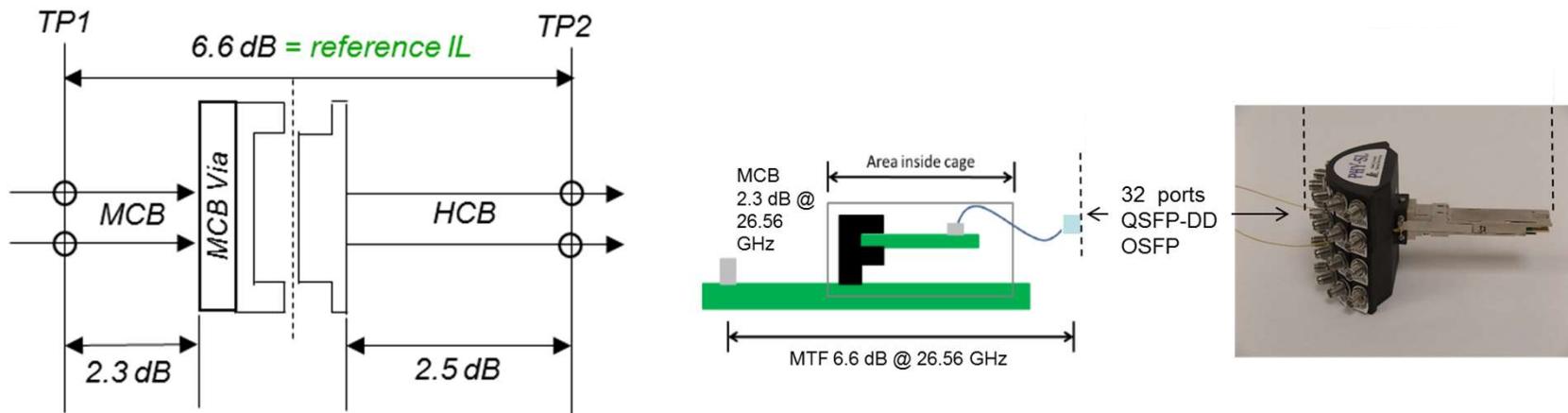


Proposal: Stop limit lines at 40 GHz

# #180 - Mated Test Fixture Specifications

- Measurements with compliant PCB IL - HCB and MCB

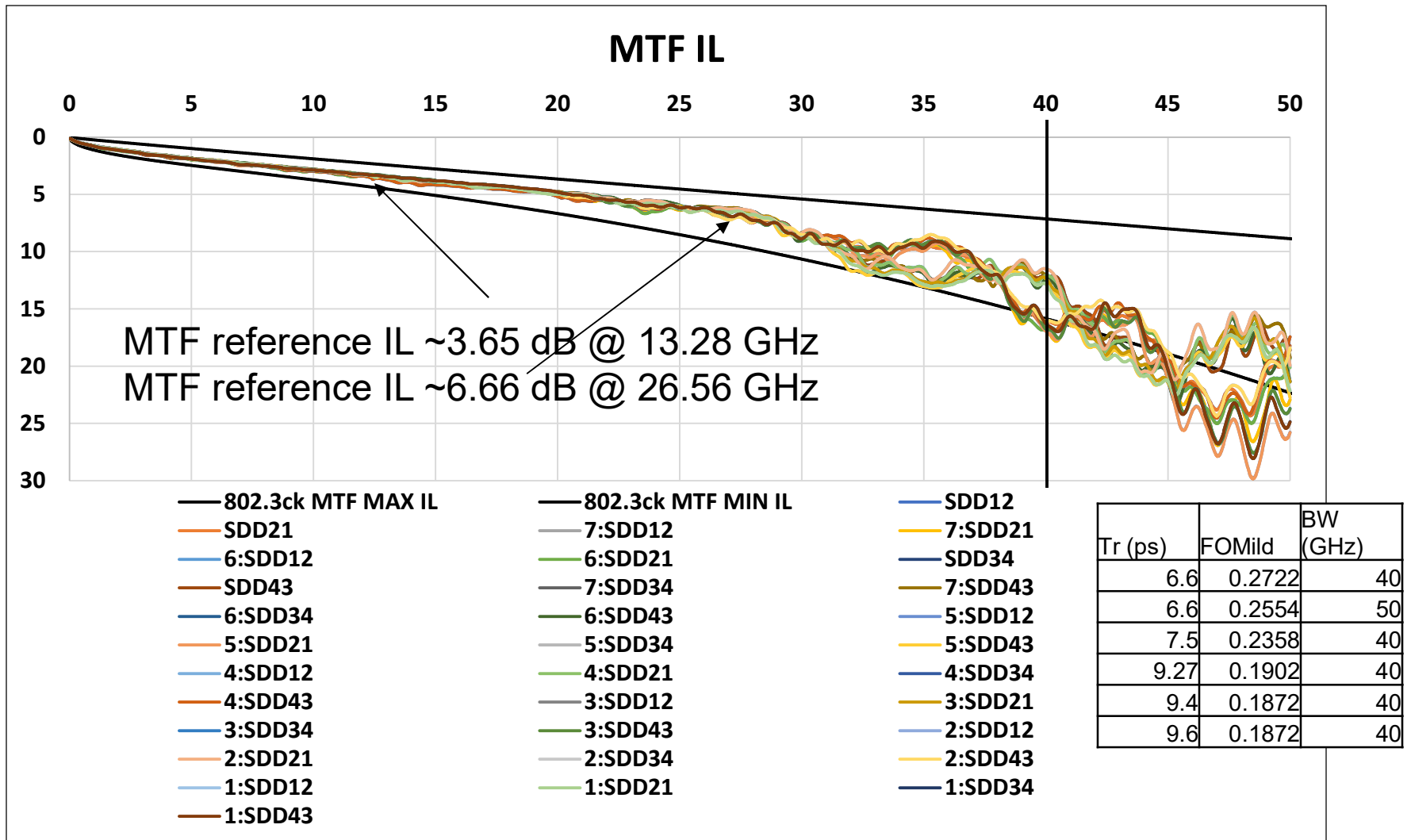
## Mated Test Fixture Adopted in Baseline



Note: 2.3 dB MCB PCB includes test point IL  
and MCB Via allowance is 0.2 dB

[http://www.ieee802.org/3/ck/public/20\\_07/diminico\\_3ck\\_01\\_0720.pdf](http://www.ieee802.org/3/ck/public/20_07/diminico_3ck_01_0720.pdf)

# In support of IL Frequency range Max – 79, 80, 81,82



- Measurements with compliant PCB IL - HCB and MCB

# IL frequency range min- FOM<sub>ILD</sub> 83, 84

## FOM<sub>ILD</sub>:

Parameter	Value
$f_b$	53.125 GHz
$T_r$	<b>6.16 ps</b> TBD
$f_r$	0.75 x fb
$f_{start}$	<b>0.05 GHz*</b>
$f_{stop}$	40 GHz
FOM <sub>ILD</sub> Limit	<b>0.18 dBrms</b>

\* The current D1.2 specification identifies  $f_{start} = 0.01$  GHz (see next slide for more information)

**Key:**  
 Legacy Pair  
 DD Pair  
 Proposed Value

Pair	Simulated	Measured
1 (Tx1)	0.040	
2 (Tx3)	0.042	
3 (Tx5)	0.046	
4 (Tx7)	0.053	
5 (Tx6)	0.040	0.132
6 (Tx8)	0.045	0.121
7 (Tx2)	0.072	0.099
8 (Tx4)	0.064	0.093
9 (Rx4)	0.043	
10 (Rx2)	0.040	
11 (Rx8)	0.051	
12 (Rx6)	0.047	
13 (Rx7)	0.047	0.110
14 (Rx5)	0.042	0.133
15 (Rx3)	0.062	0.118
16 (Rx1)	0.069	0.114
MAX	<b>0.072</b>	<b>0.133</b>

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- 7 #83 -  $T_t = \text{TBD} = 6.16$  (TBD) ps;  
 #84 - change  $f_{min}$  to 0.05 GHz

[http://www.ieee802.org/3/ck/public/adhoc/jun24\\_20/haser\\_3ck\\_adhoc\\_01c\\_062420.pdf](http://www.ieee802.org/3/ck/public/adhoc/jun24_20/haser_3ck_adhoc_01c_062420.pdf) 23

# ICN Frequency Range - 91

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#91, - 162B.1.3.6 Mated test fixtures integrated crosstalk noise –  
Add "Integrated crosstalk RMS noise voltages are measured over N uniformly-spaced frequencies  $f_n$  spanning the frequency range 50 MHz to 40 GHz with a minimum spacing of 10 MHz." to the end of this section..

Editors proposal; change first paragraph 162B.1.3.6 Mated test fixtures integrated crosstalk noise to read;

The SFP112 mated test fixture integrated near-end crosstalk noise voltage for the disturber near-end crosstalk loss is determined according to the method in 110B.1.3.7, given the disturber near-end crosstalk loss  $NEXT_{loss}(f)$  is measured over N uniformly spaced frequencies  $f_n$  spanning the frequency range 50 MHz to 40 000 MHz with maximum frequency spacing of 10 MHz, and the parameters shown in Table 162B–1. The mated test fixture integrated near-end crosstalk noise voltage shall meet the specification in Table 162B–2.

Editors proposal; change 2nd paragraph 162B.1.3.6 Mated test fixtures integrated crosstalk noise to read;

The multi-lane mated test fixtures integrated crosstalk noise voltages is determined using Equation (92–44) through Equation (92–48), given the multiple disturber near-end crosstalk loss  $MNEXT_{loss}(f)$  and multiple disturber far-end crosstalk loss  $MDFEXT_{loss}(f)$  are measured over N uniformly-spaced frequencies  $f_n$  spanning the frequency range 50 MHz to 40 000 MHz with a maximum frequency spacing of 10 MHz, and the parameters shown in Table 162B–3 . The Multi-lane mated test fixture integrated crosstalk noise shall meet the specifications in Table 162B–4.



# ICN -92,93,94,95,96

**-#92-  $T_{nt}$ =6.16 (TBD) ps, #93-  $T_{ft}$ =6.16 (TBD)ps, #94 -  $ICN_{FEXT}$ =4.2mV, #95 -  $ICN_{NEXT}$  =1.5 mV, #96 -  $ICN_{Total}$  =4.4 mV**

Max Values	Simulated			Measured		
Victim	$ICN_{NEXT}$	$ICN_{FEXT}$	$ICN_{Total}$	$ICN_{NEXT}$	$ICN_{FEXT}$	$ICN_{Total}$
$f_{stop} = 40$ GHz	1.031	3.072	3.188	0.973	3.840	3.961
$f_{stop} = 50$ GHz	1.108	3.138	3.293	1.019	3.857	3.989

Parameter	Value
$f_b$	53.125 GHz
$f_r$	0.75 x $f_b$
$f_{min}$	<b>0.05 GHz</b>
$f_{max}$	<b>40 GHz</b>
$A_{nt}, A_{ft}$	600 mV
$T_{nt}, T_{ft}$	<b>6.16 ps</b> TBD
$ICN_{NEXT}$ Limit	<b>1.5 mV*</b>
$ICN_{FEXT}$ Limit	<b>4.2 mV*</b>
$ICN_{Total}$ Limit	<b>4.4 mV*</b>

- The ICN values calculated with a 40 GHz stop frequency are roughly the same as those calculated with a 50 GHz stop frequency
- This is due to the decay of the weighting function over this frequency band
- Calculating ICN all the way to 50 GHz has a minimal impact on the results
- Recommendation: For ICN,  $f_{stop} = 40$  GHz
- NOTE:  $0.75 \times f_b = 39.84$  GHz

\* No change from 802.3cd spec

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[http://www.ieee802.org/3/ck/public/adhoc/jun24\\_20/haser\\_3ck\\_adhoc\\_01c\\_062420.pdf](http://www.ieee802.org/3/ck/public/adhoc/jun24_20/haser_3ck_adhoc_01c_062420.pdf) 25

802.3ck Task Force

# MDI - 232,233,234,251,252, 253,254

Topic – MDI	Comments
MDI connectors require normative references	232,233,234,251,252, 253,254

- **MDI connectors require normative references. We need these references to close on MDI connector naming.**

## 1.3 Normative references

*Insert the following new references in alphanumeric order:*

DSFP MSA Dual small form factor pluggable module, Rev. 1.0.<sup>1</sup>

OSFP MSA Specification for OSFP octal small form factor pluggable module, Rev 3.0.<sup>2</sup>

QSFP112 TBD

QSFP-DD MSA QSFP-DD Hardware Specification for QSFP double density 8x pluggable transceiver, Rev 5.0.<sup>3</sup>

QSFP-DD800 MSA QSFP-DD Specification for 800G operation, Rev 1.0.<sup>4</sup>

SFP112 TBD

SFP-DD MSA SFP-DD Hardware Specification for SFP double density 2X pluggable transceiver, Rev 3.0.<sup>5</sup>

*Editor's note: Some references above are placeholders for required references to be provided at a later date.*