Technical Feasibility of 400G Copper Interconnects

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Jan 2014

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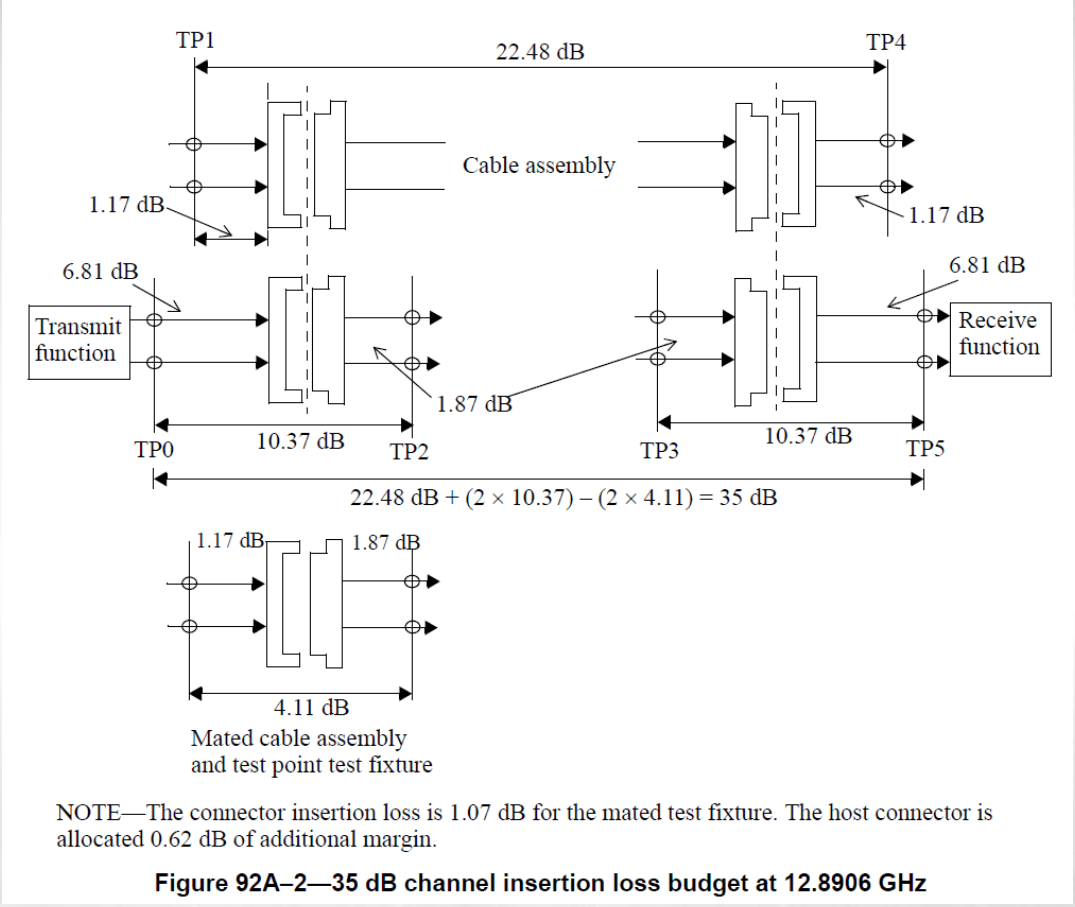
400Gbps Copper Cable Link Budget



NOTE—The connector insertion loss is 1.07 dB for the mated test fixture. The host connector is allocated 0.62 dB of additional margin.

Figure 92A–2—35 dB channel insertion loss budget at 12.8906 GHz

- **Link budget based on IEEE 802.3bj D1.3**

400Gbps Predicted Copper Cable Link Budget

Component	Loss at 12.89 GHz	Total Loss 3m 28 AWG	Total Loss 2m 30 AWG
Host PCB (1 via)	6.81dB	13.62dB	13.62dB
Connector	1.5dB	3.0dB	3.0dB
Paddle Card	0.5dB	1.0dB	1.0dB
Bulk Cable 28 AWG	4.75dB/m	14.25 dB	
Bulk Cable 30 AWG	6.03dB/m		12.06dB
Total		31.87 dB	29.68

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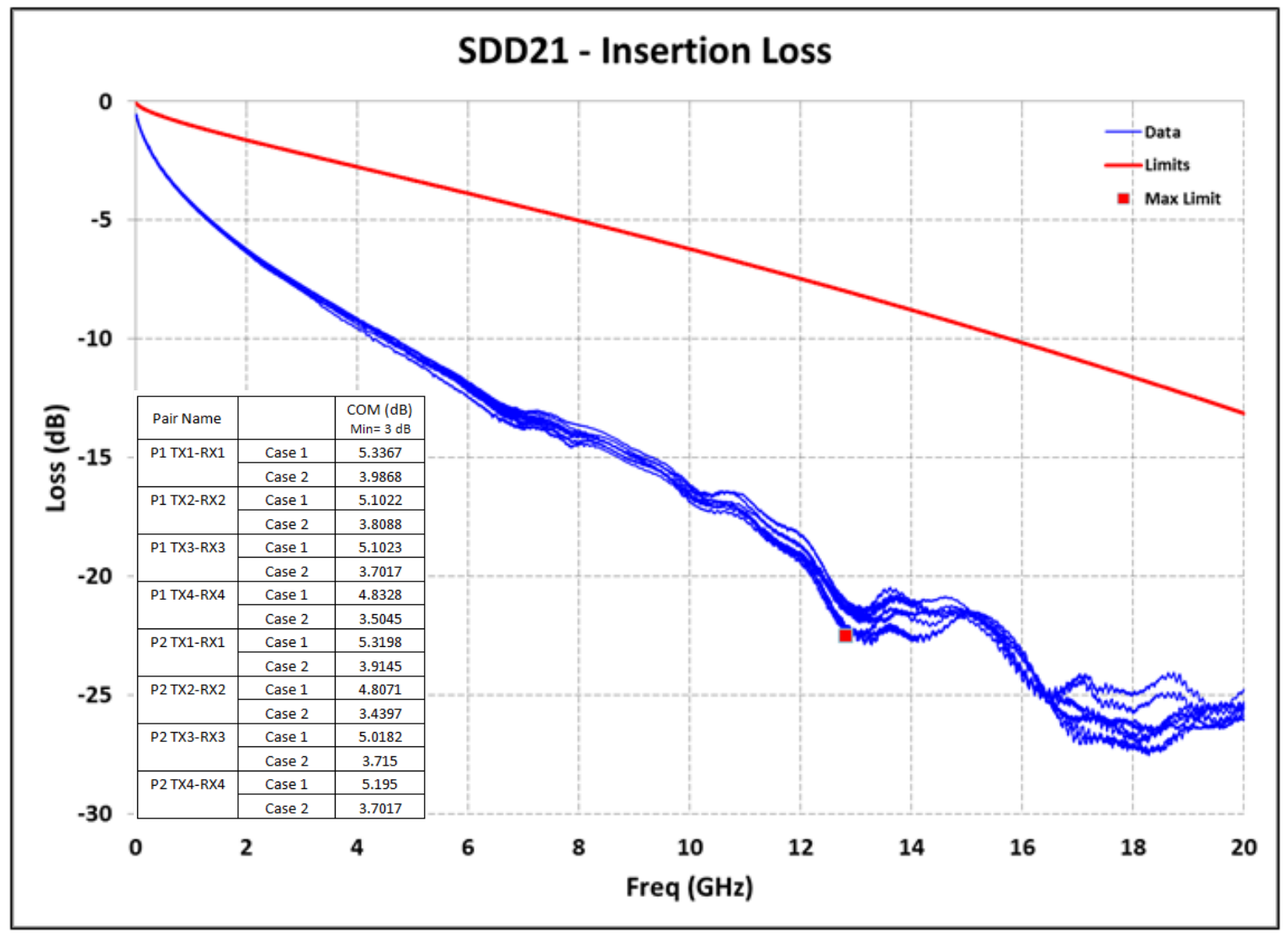
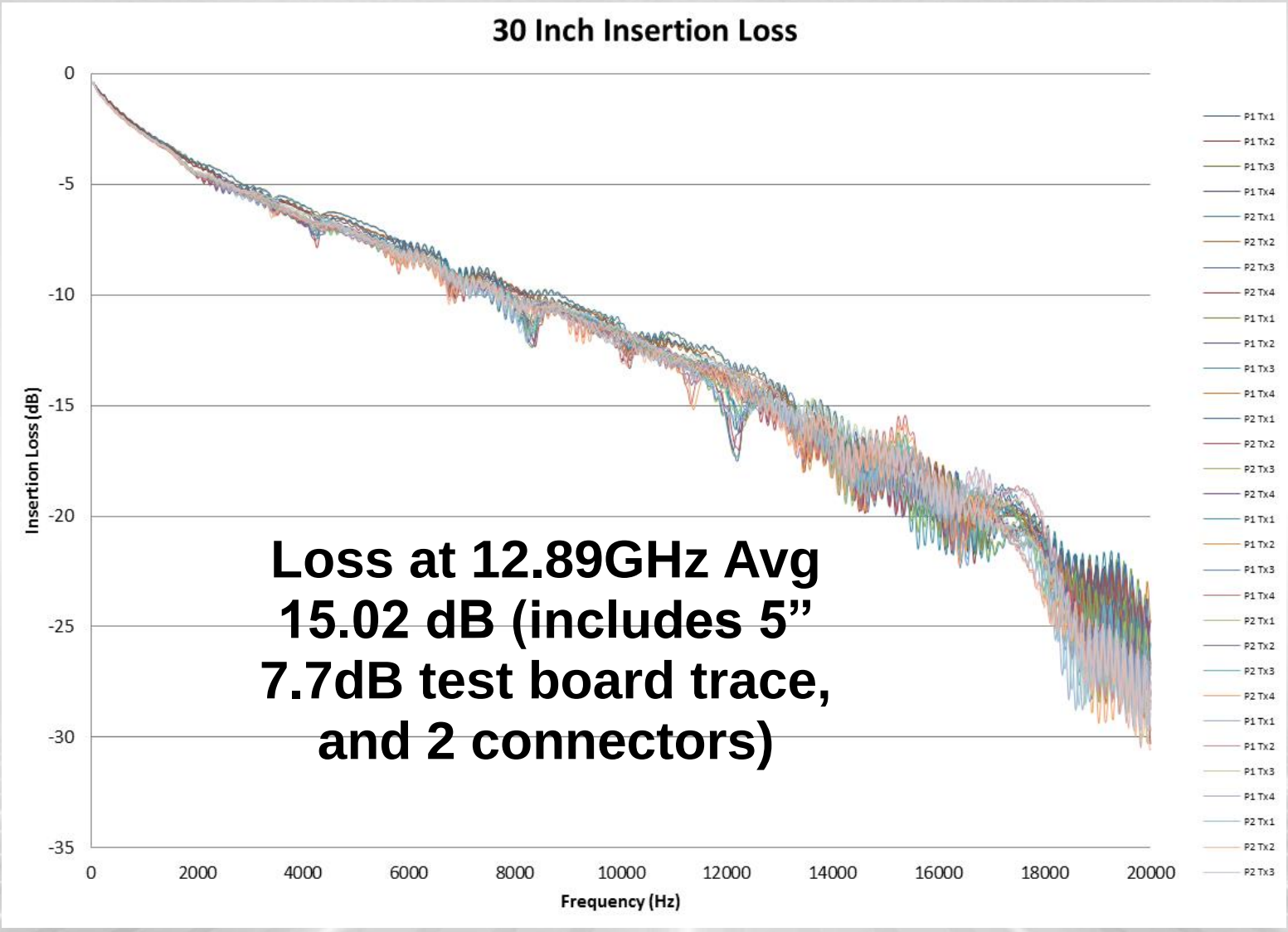
100Gbps Copper Cable

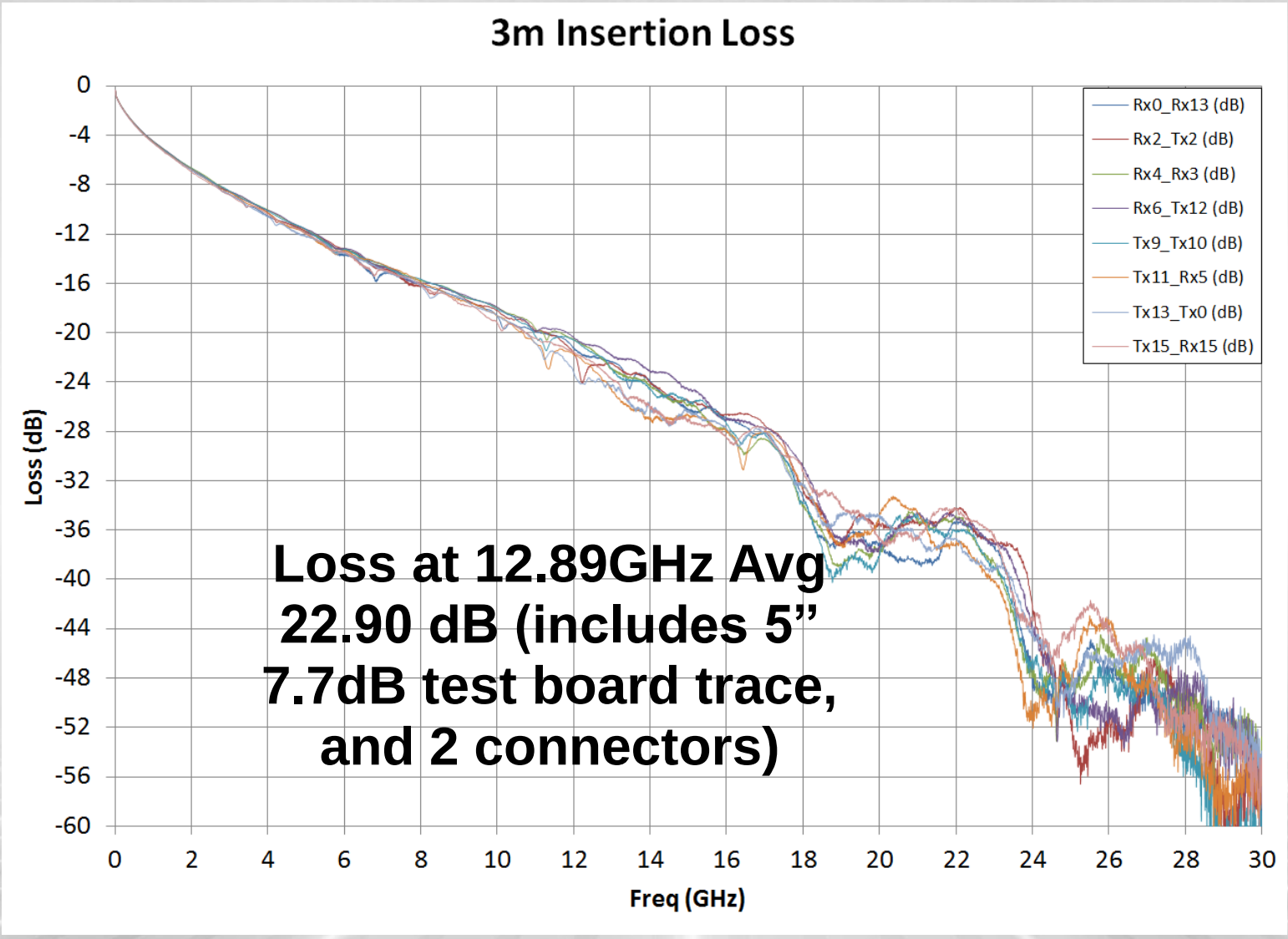


Pair Name		COM (dB) Min= 3 dB
P1 TX1-RX1	Case 1	5.3367
	Case 2	3.9868
P1 TX2-RX2	Case 1	5.1022
	Case 2	3.8088
P1 TX3-RX3	Case 1	5.1023
	Case 2	3.7017
P1 TX4-RX4	Case 1	4.8328
	Case 2	3.5045
P2 TX1-RX1	Case 1	5.3198
	Case 2	3.9145
P2 TX2-RX2	Case 1	4.8071
	Case 2	3.4397
P2 TX3-RX3	Case 1	5.0182
	Case 2	3.715
P2 TX4-RX4	Case 1	5.195
	Case 2	3.7017

400Gbps Copper Cable



400Gbps Copper Cable



400Gbps Copper Cable

- **16X25 Copper cable can provide connectivity for 400Gbps**
  - Low power
  - No thermal management necessary
  - Aggregate cable assemblies(Octopus), 16x25 to 4 QSFP28+ ends

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