

# Cabling Return Loss

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# Supporters

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- George Zimmerman
- Paul Langner
- Kamal Dalmia
- Pete Cibula
- Keith Kosanovich
- Peter Wu
- Paul Kish
- CME consulting
- Aquantia
- Aquantia
- Intel
- Leviton
- Marvell
- Belden

# Overview

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- Diversity of cabling channels under consideration can be overwhelming
- Many individual specifications are close but not identical
- Contribution suggests harmonization may be possible to reduce modeling complexity and improve market breadth

# Possible Channel Configurations

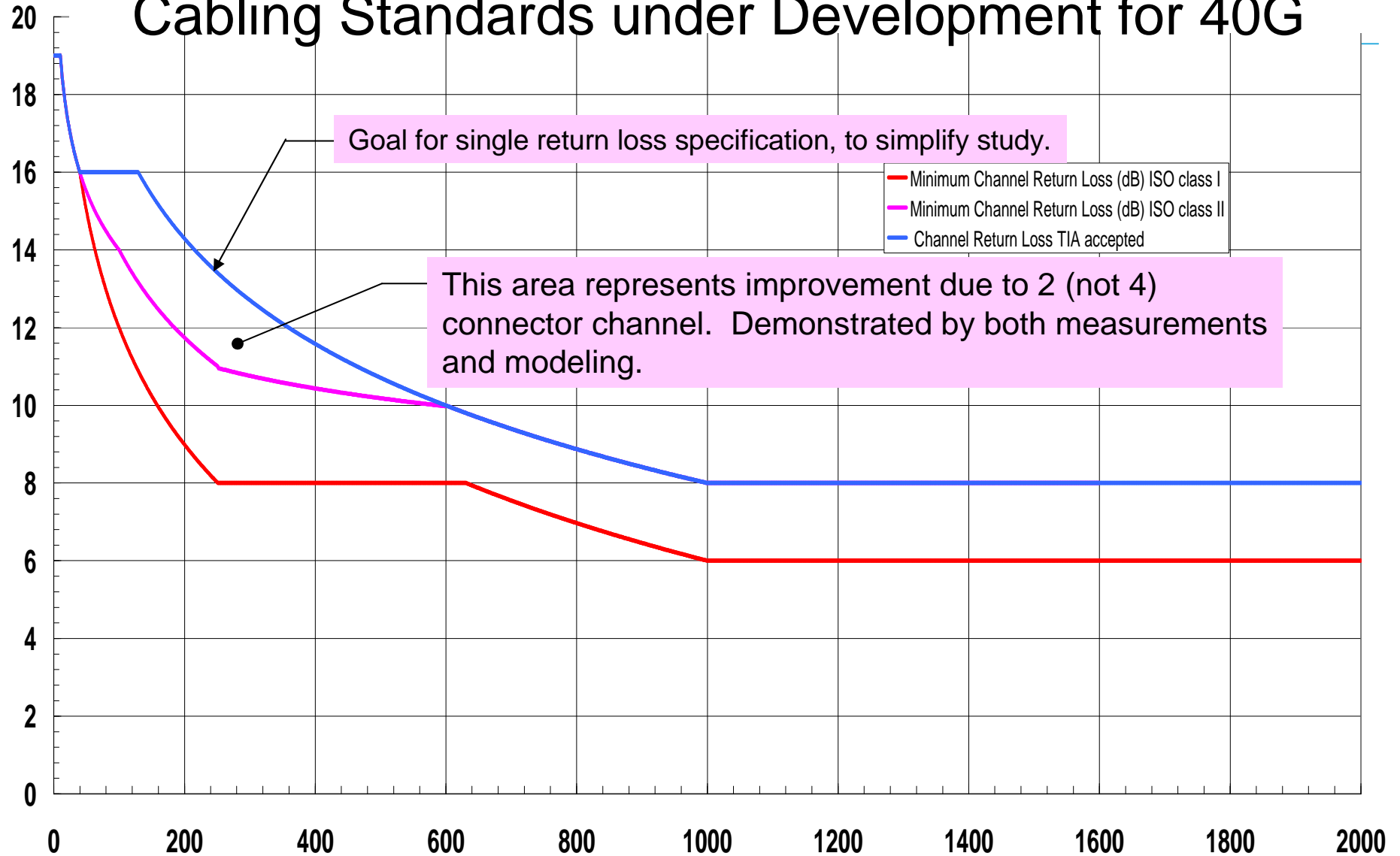
- “X-Axis” – Cable classes
  - A: ISO Class 1, up to 30m (x-y-z)
  - B: ISO Class 2, up to 30m (x-y-z)
  - C: TIA Category 8, up to 30m (x-y-z)
    - Can this be merged with A?
- “Y-Axis” – Topologies/lengths
  - D: Short channels
    - 150mm-3m-150mm (“really short”) – Worst case reflection #1
    - 0.5m-3m-0.5m (“pretty short”) - Worst case reflection #2
    - 3m - Endpoint to TOR
    - 5m TOR-adjacent
  - E: Other target channels
    - 1m-10m-1m (ISO short reference channel)
    - 30m
    - 30m single patch cord (assuming there is one that meets IL...)
    - 30m asymmetric #1 (1m-26m-3m) – Data center configuration #1
    - 30m asymmetric #3 (1m-24m-5m) – Data center configuration #2
- “Z-Axis” Improvements/Relaxations on A, B, C (reference grimwood\_01\_0513\_40GBT.pdf); “What if” scenarios
  - Improvements
    - 2, 4, 6 dB improved RL
    - 2, 4 dB improved PSNEXT (A,C)
    - Coupling attenuation (Example: Class I/Class II – Contributions show that cabling “far exceeds” current specification)
  - Relaxations
    - Bandwidth (1.6GHz vs. 2.0GHz)
    - Others TBD

From *Potential Path Forward for Channel Modeling Ad Hoc* (G. Zimmerman)

There are 1584 different cabling channels described by this slide!!!! (including additional channel topologies from cabling ad hoc)

# Channel Return Loss

## Cabling Standards under Development for 40G



# TIA category 8 channel limits

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From <http://www.ieee802.org/3/minutes/mar13/index.html>

Attachment C9, PN-568-C.2-1 Draft 0.7

Also including effects of June 2013 TIA TR42.7 meeting, not liaised yet

TIA category 8 return loss

1 to 10 MHz      RL := 19.0

10 to 40 MHz    RL :=  $24 - 5 \cdot \log(f)$

40 to 130 MHz    RL := 16.0

130 to 1000 MHz RL :=  $35 - 9 \cdot \log(f)$

1000 to 2000 MHz RL := 8.0

# Questions

## And Answers