

# Proposals for Consistency: Figures & Equations

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# Comment #447

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- Comment: Various figures throughout the entire document related to channel parameters (insertion loss (min & max), ICR, ILD, Return loss (including DD, CC, DC, and CD) and return loss's (which have been labeled "reflection coefficients in Clause 85 in D2.0)) and associated with the Tx and Rx output return loss parameters all need to be re-evaluated for consistency
- Suggested Remedy: Update all figures to be self consistent with other figures.  
In all graphs (insertion loss, return loss, and crosstalk) the magnitude of all the y-axis should be positive magnitude. See dambrosia\_02\_0509 on naming nomenclature of charts.

# Comment #448

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- Comment: All equations throughout D2.0 need to be re-evaluated for consistency.
- Suggested Remedy: Update all equations to be self-consistent with other equations.

# Comment on IEEE 802.3-2008

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- Review of 3 latest Stds involving graphs of S-parameters for latest view of “consistency”
  - 10GBASE-CX4
  - 10GBASE-T
  - Backplane Ethernet
- There are consistencies and inconsistencies

# Inconsistencies

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- 10GBASE-T does not plot equations, while 10GBASE-CX4 and Backplane Ethernet do
- Between 10GBASE-CX4 and Backplane Ethernet:
  - X-Axis
    - 10GBASE-CX4: log scale
    - Backplane Ethernet: log & linear scale
    - Minor unit gridlines shown sometimes
    - 10GBASE-CX4 used the same limits for all graphs
    - Backplane Ethernet used two sets of limits
  - Y-Axis
    - 10GBASE-CX4: minimum value at top
    - Backplane Ethernet: both min or max at top
  - “Pass” regions aren’t always indicated
- IEEE P802.3ba doing the same things...

# Proposal for Consistency for Graphs

- For X-axis
  - Use linear scale PJA2
  - 0 to 15 GHz
  - Show major gridlines only
  - Axis labels at the bottom
- For Y-axis
  - Minimum value at top of axis
  - Appropriate axis labels along the axis
- Indicate the “Pass” region
- Remember – graphs only illustrate the equation

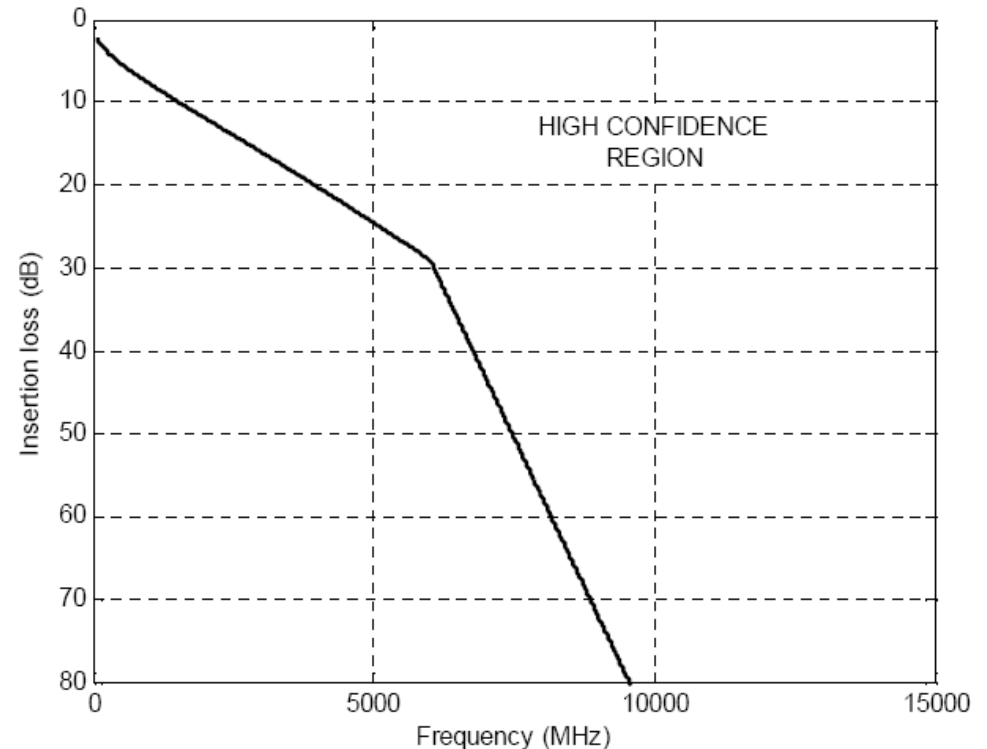


Figure 69B-5—Insertion loss limit for 10GBASE-KR

## Slide 6

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PJA2

Do they all need to be the same?

Is linear the best choice? I would have to look at all the plotted equations to be sure.

Pete Anslow, 4/30/2009

# Equations

## 85.10.4 Cable assembly return loss

The return loss of each pair of the 40GBASE-CR4 and 100GBASE-CR10 cable assembly shall meet the values determined using Equation (85–22) and Equation (85–23).

$$\text{Return loss}(f) \geq 10 \text{ dB} \quad \text{for } 100 \text{ MHz} \leq f < 1250 \text{ MHz} \quad (85-22)$$

$$\text{Return loss}(f) \geq 10 - 7 \times \log_{10}\left(\frac{f}{1250}\right) \text{ dB} \quad \text{for } 1250 \text{ MHz} \leq f \leq 10000 \text{ MHz} \quad (85-23)$$

where  
 $f$  is the frequency in MHz

The minimum cable assembly return loss is illustrated in Figure 85–7.

- The parameter is a function of frequency
- Insertion loss, return loss, crosstalk loss is positive magnitude.
- Declare the units of the parameter.
- Declare units for frequency (if multiple equations for same parameter, use same frequency units for all)
- Declare frequency range for a given equation
- If multiple equations, each equation gets numbered