Modulation Independent Baseline Text Proposal

Contribution to 802.3dm Task Force

April 17, 2025

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Introduction

- This presentation provides baseline text proposal for the 802.3dm draft
- The proposed text should be independent of the detailed modulation specification and therefore independent of the ACT vs TDD modulation debate
- The proposed text follows the document structure proposed by Natalie
- The proposed text is highlighted in red

- The intention is to make motion to adopt this text as baseline text

Text for 200.8 Physical Medium Dependent (PMD) sublayer, T1

200.8 Physical Medium Dependent (PMD) sublayer, T1

This subclause defines the electrical characteristics of the PMD and specifies PMD-to-MDI interface tests, for differential balanced pair (T1).

200.8.1 Test modes

The MultiG+100M/100M+MultiGBASE-T1 test modes, including the test fixtures, are as specified in 149.5.1.

Editorial Note: The test mode transmit signals may belong in the PMA Clauses (200.6 and 200.7)

Text for 200.9 Physical Medium Dependent (PMD) sublayer, V1

200.9 Physical Medium Dependent (PMD) sublayer, V1

This subclause defines the electrical characteristics of the PMD and specifies PMD-to-MDI interface tests, for coaxial cables (V1).

200.9.1 Test modes

The test modes described in 149.5.1 shall be provided to allow for testing of the transmitter jitter, transmitter distortion, transmitter PSD, transmitter droop, and BER.

Editorial Note: The test mode transmit signals may belong in the PMA Clauses 200.6 and 200.7

200.9.1.1 Test fixtures

The following fixtures, or their equivalents, as shown in Figure 200.9.1.1 - 1, Figure 200.9.1.1 - 2, Figure 200.9.1.1 - 3, and Figure 200.9.1.1 - 3, in stated respective tests, are defined for measuring the transmitter specifications for data communication only.

Figure and Text for V1 Transmitter test fixture 1

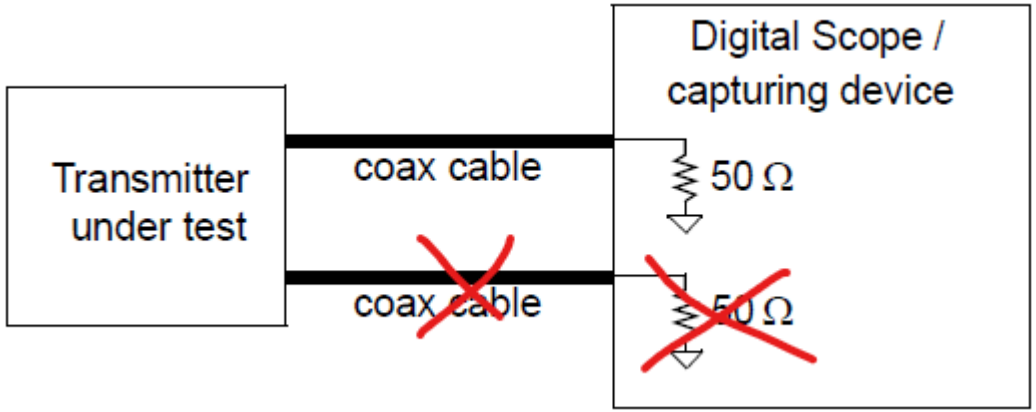

Figure 200.9.1.1—1**—Transmitter test fixture 1 for transmitter droop measurement and transmitter linearity measurement**

Figure and Text for V1 Transmitter test fixture 2

Figure 200.9.1.1—2—Transmitter test fixture 2 for MASTER and SLAVEclock jitter measurement

Figure and Text for V1 Transmitter test fixture 3

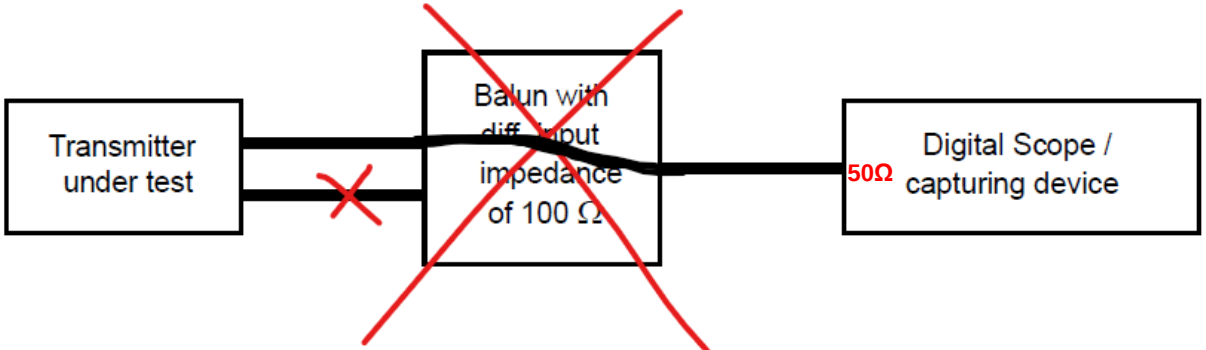

Figure 200.9.1.1—3—Transmitter test fixture 3 for MDI jitter measurement

Figure and Text for V1 Transmitter test fixture 4

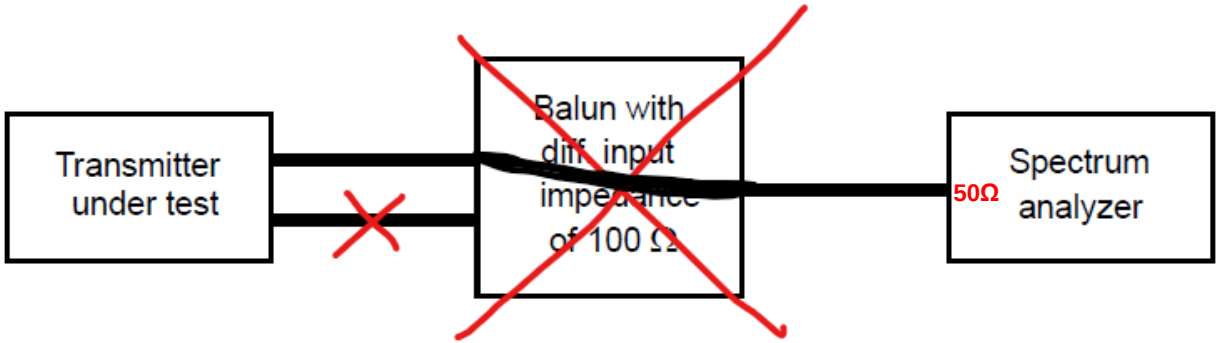

Figure 200.9.1.1—4—Transmitter test fixture 4 for power spectral density measurement and transmit power level measurement

Text for 200.11 Link segment characteristics, T1

200.11 Link segment characteristics, T1

2.5G+100MBASE-T1, 5G+100MBASE-T1, and 10G+100MBASE-T1 are designed to operate over a single shielded balanced pair of conductors that meet the requirements specified in this subclause. The single shielded balanced pair of conductors supports an effective data rate of 2.5 Gb/s, 5 Gb/s, and 10 Gb/s in one direction and simultaneously 100Mb/s in the other direction. The term *link segment* used in this clause refers to a single balanced pair of conductors (cable or backplane) operating in full duplex.

For the three different PHY types, link segment parameters are specified to different upper frequencies, given by the parameter Fmax shown in Equation (200.11–1).

$$F_{max} = TBD \qquad (200.11–1)$$

Text for 200.11.1 Link transmission parameters (T1)

200.11.1 Link transmission parameters

The transmission characteristics for the MultiG+100MBASE-T1 link segment are specified to support operation over automotive temperature and electromagnetic conditions.

200.11.1.1 Insertion loss

The insertion loss of each MultiG+100MBASE-T1 link segment shall meet the values determined using Equation (200.11-2).

$$Insertion\ loss(\mathrm{f}) \leq TBD\ (dB) \qquad (200.11\text{–}2)$$

where

f is the frequency in MHz; $1 \leq f \leq F\mathrm{max}$

The insertion loss is illustrated in Figure TBD.

Text for 200.11.1 Link transmission parameters (T1)

200.11.1.2 Differential characteristic impedance

The nominal differential characteristic impedance of the link segment is 100 Ohm.

200.11.1.3 Return loss

The return loss of each MultiG+100MBASE-T1 link segment shall meet the values determined using Equation (200.11-2).

$$Return\ loss(\mathrm{f}) \leq TBD\ (dB) \qquad (200.11\text{–}3)$$

where

f is the frequency in MHz; 1 ≤ *f* ≤ Fmax

The return loss is illustrated in Figure TBD.

Text for 200.11.1 Link transmission parameters (T1)

200.11.1.4 Coupling attenuation

The coupling attenuation of each MultiG+100MBASE-T1 link shall be as specified in 149.7.1.4.

200.11.1.5 Screening attenuation

The screening attenuation of each MultiG+100MBASE-T1 link shall be as specified in 149.7.1.5.

200.11.1.6 Maximum link delay

The maximum link delay of each MultiG+100MBASE-T1 link shall be as specified in 149.7.1.6.

200.11.2 Coupling parameters between link segments

The coupling parameters between link segments shall be as specified in 149.7.2.

200.11.2.1 Power sum alien near-end crosstalk (PSANEXT)

The PSANEXT shall be as specified in 149.7.2.1.

200.11.2.2 Power sum alien attenuation to crosstalk ratio far-end (PSAACRF)

The PSAACRF shall be as specified in 149.7.2.2.

Text for 200.12 Link segment characteristics, V1

200.12 Link segment characteristics, V1

2.5G+100MBASE-V1, 5G+100MBASE-V1, and 10G+100MBASE-V1 are designed to operate over a single coaxial cable that meet the requirements specified in this subclause. The single coaxial cable supports an effective data rate of 2.5 Gb/s, 5 Gb/s, and 10 Gb/s in one direction and 100Mb/s in the other direction. The term *link segment* used in this clause refers to a coaxial cable operating in full duplex.

For the three different PHY types, link segment parameters are specified to different upper frequencies, given by the parameter Fmax shown in Equation (200.11–1).

Text for 200.12.1 Link transmission parameters (V1)

200.12.1 Link transmission parameters

The transmission characteristics for the MultiG+100MBASE-V1 link segment are specified to support operation over automotive temperature and electromagnetic conditions.

200.12.1.1 Insertion loss

The insertion loss of each MultiG+100MBASE-V1 link segment shall meet the values determined using Equation (200.12-1).

$$Insertion\ loss(\mathrm{f}) \leq TBD\ (dB) \qquad (200.12\text{–}1)$$

where

f is the frequency in MHz; $1 \leq f \leq F\mathrm{max}$

The insertion loss is illustrated in Figure TBD.

Text for 200.12.1 Link transmission parameters (V1)

200.12.1.2 ~~Differential~~ Single ended characteristic impedance

The nominal characteristic impedance of the link segment is 50 Ohm.

200.12.1.3 Return loss

The return loss of each MultiG+100MBASE-V1 link segment shall meet the values determined using Equation (200.12-2).

$$Return\ loss(\mathrm{f}) \leq TBD\ (dB) \qquad (200.12\text{–}2)$$

where

f is the frequency in MHz; 1 ≤ *f* ≤ Fmax

The return loss is illustrated in Figure TBD.

Text for 200.12.1 Link transmission parameters (V1)

200.12.1.4 Coupling attenuation

The coupling attenuation is not defined for coaxial cables.

200.12.1.5 Screening attenuation

Where coaxial cabling is used, the minimum screening attenuation for a link segment is TBD dB for all frequencies between 30 MHz and Fmax MHz. Screening attenuation is tested as specified in IEC 62153-4-7 using triaxial tube-in-tube method. Additional screening attenuation test methodologies are defined in Annex 149A.

200.12.1.6 Maximum link delay

The maximum link delay of each MultiG+100MBASE-V1 link shall be TBD.

Text for 200.12.2 Coupling parameters between link segments

200.12.2 Coupling parameters between link segments

200.12.2.1 Power sum alien near-end crosstalk (PSANEXT)

The power sum ANEXT loss between a disturbed link segment and the disturbing link segment shall meet the values determined using Equation (200.12-3).

$$PSANEXT\ loss(\mathrm{f}) > TBD\ (dB) \qquad (200.12\text{–}3)$$

where

f is the frequency in MHz; 1 ≤ *f* ≤ 4000

The PSANEXT loss is illustrated in Figure TBD.

Text for 200.12.2 Coupling parameters between link segments

200.12.2.2 Power sum alien attenuation to crosstalk ratio far-end (PSAACRF)

The power sum AACRF between a disturbed link segment and the disturbing link segment shall meet the values determined using Equation (200.12-4).

$$\mathrm{PSAACRF}\ loss(\mathrm{f}) > TBD\ (dB) \qquad (200.12\text{–}4)$$

where

f is the frequency in MHz; 1 ≤ *f* ≤ 4000

The PSAACRF loss is illustrated in Figure TBD.

Text for 200.13 MDI specification, T1

200.13 MDI specification, T1

200.13.1 MDI connectors

The MDI connectors are as specified in 149.8.1.

This presentation proposes no changes to the adopted text in Clause 200.13.2 on "MDI electrical specification"

200.13.3 MDI fault tolerance

The MDI fault tolerance shall comply with 96.8.3.

Text for 200.14 MDI specification, V1

200.14 MDI specification, V1

200.14.1 MDI connectors

Where coaxial cabling is used, the mechanical interface to the coaxial cabling is a single pin connector with a shield. Further specification of the mechanical interface is beyond the scope of this standard.

200.14.2 MDI electrical specification

200.14.2.1 MDI return loss

The MDI return loss for coax cables is as specified in 200.13.2.1.

200.14.3 MDI fault tolerance

The MDI fault tolerance shall comply with TBD.

Text for 200.15 Environmental specifications

200.15 Environmental specifications

The environmental specifications for *MultiG+100M/100M+MultiGBASE-T1/V1* are as specified in 149.9.

200.15.1 General safety

The general safety specifications for *MultiG+100M/100M+MultiGBASE-T1/V1* are as specified in 149.9.1.

200.15.2 Network safety

The network safety specifications for *MultiG+100M/100M+MultiGBASE-T1/V1* are as specified in 149.9.2.

200.15.2.1 Environmental safety

The environmental safety specifications for *MultiG+100M/100M+MultiGBASE-T1/V1* are as specified in 149.9.2.1.

200.15.2.2 Electromagnetic compatibility

The electromagnetic compatibility safety specifications for *MultiG+100M/100M+MultiGBASE-T1/V1* are as specified in 149.9.2.2.

Request for Straw Poll

Regarding the text proposed on slides 4-22 of *jonsson_3dm_01_04_17_25*

- I am ready to vote in favor of adopting this text as baseline text
- I am ready to vote for adopting some of this text, but not all clauses
- I would vote against adopting this text as baseline text
- I agree with the text in principle, but need more time to review the text in detail
- I need more information before voting on adopting this text

Potential Motion

Move to adopt the text in slides 4-22 of *jonsson_3dm_01_04_17_25* for the 802.3dm draft, with editorial license for the editor to appropriately integrate the text in the draft.

M: Ragnar Jonsson

S:

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