802.3dj Clause 185A Definitions

Addressing D1.3 comment #408

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Comment addressed

Cl **185A** *SC* **185A.2.4** *P* **843** *L* **35** # 408

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Comment Type **T** *Comment Status* **X**

Text is needed to fill in entries for 185A.2.4.1, 185A.2.4.2, 185A.2.4.3, 185A.2.4.4, 185A.2.4.7, 185A.2.4.9, and 185A.2.4.10

SuggestedRemedy

A contribution with the definitions for these parameters will be provided.

Proposed Response *Response Status* **O**

Overview

Clause 185A.2.4 Contains a number of parameters needing definitions:

- 185A.2.4.1 Effective number of bits (ENOB)
- 185A.2.4.2 Oversampling ratio
- 185A.2.4.3 Local oscillator linewidth
- 185A.2.4.4 X-Y gain error (max)
- 185A.2.4.7 I-Q gain error
- 185A.2.4.9 Bandwidth mismatch (max)
- 185A.2.4.10 Carrier frequency offset (max)

This contribution provides proposed definitions.

Note: The Naming above is copied directly from D1.3 Clause 185A. Although the values are Max in some cases, the definitions themselves should not reference Max, so the naming should be updated as shown in the following slides.

Definitions source

The parameters defined in the following use external IEEE or ITU-T definitions where available

For parameters without references available, this contribution is the source of the definitions

The intention is for the editor to include the text from this contribution in 802.3dj D1.4, with editorial license.

Effective number of bits (ENOB)

ENOB is a measure of the SNR of a real (physical) ADC. ENOB defines the number of bits that a perfect (ideal) ADC would require to produce the same SNR as that of the coherent detector front-end ADC.

Details of ENOB are provided in:

***IEEE Standard for Terminology and Test Methods for Analog-to-Digital Converters*, IEEE Standard 1241-2010, Jan. 2011, section. 9.4**

Oversampling ratio

The oversampling ratio is defined as the ratio by which the ADC sampling rate exceeds the Symbol Rate.

Local oscillator linewidth

The local oscillator linewidth defines the Full Width Half Maximum spectral width of the Rx local oscillator, following the definition in ITU-T G.698.2 (11/2018) section 7.2.8 .

X-Y gain error

The X-Y Gain error specifies the gain difference in dB between the X and Y polarizations.

I-Q gain error

The I-Q Gain error specifies the gain difference in dB between the I and Q phases, for each polarization.

Bandwidth mismatch

This parameter can be removed. The Test system for measuring ETCC should have sufficient electrical bandwidth specified, and additional filtering is provided in the digital signal processing to equalize the bandwidth roll-off.

Bandwidth mismatch (alternate)

The Bandwidth mismatch [X,Y:I,Q] specifies the variation of the 3dB gain frequency points between each of X_I, X_Q, Y_I, and Y_Q

Carrier frequency offset

The Carrier Frequency offset specifies the offset between the Local Oscillator frequency and the central carrier frequency of the received signal from the transmitter under test.

Summary

Definitions are provided for the remaining TBD items in clause 185A

The following definitions should be adopted

- 185A.2.4.1 Effective number of bits (ENOB)
- 185A.2.4.2 Oversampling ratio
- 185A.2.4.3 Local oscillator linewidth
- 185A.2.4.4 X-Y gain error
- 185A.2.4.7 I-Q gain error
- 185A.2.4.10 Carrier frequency offset

“185A.2.4.9 Bandwidth mismatch” has two options

- Remove from D1.4 (slide 10)
- Adopt the definition from this contribution (slide 11)

Thanks!