This document contains a proposed resolution of comments #385, #183, #184, #185 to 802.3ba Draft D 1.0

Changes in clause 86

In Table 86-8 set {X1, X2, X3, Y1, Y2, Y3} to {0.25, 0.40, 0.45, 0.25, 0.28, 0.40} with editor's note that the numbers are provisional.

Replace clause 86.7.4.7 with the following:

86.7.4.7 Transmitter optical waveform (transmit eye)

[Editor's note (to be removed prior to publication) - *Details of the transmit eye mask measurement are being studied by the Statistical Eye Ad Hoc and consequently the contents of this clause together with the mask parameters in Table 86-8 are provisional.****]***

The required optical transmitter pulse shape characteristics are specified in the form of a mask of the transmitter eye diagram as shown in Figure 86–4. The transmitter optical waveform of a port transmitting the test pattern specified in Table 86-15 shall meet specifications according to the methods specified in 86.7.4.7.1 with the filter nominal reference frequency f_r of 7.5 GHz and filter tolerances as specified for STM-64 in ITU-T G.691. Measurements during system operation or with other patterns, such as TBD signal, are likely to give very similar results.

86.7.4.7.1 Transmitter eye mask

The eye is measured with respect to the mask shown in Figure 86–4 using a receiver with the fourth-order Bessel-Thomson response having a transfer function given by Equation (86–1) and Equation (86–2):

$$H(y) = \frac{105}{105 + 105y + 45y^2 + 10y^3 + y^4} \qquad (86–1)$$

where:

$$y = 2.114p\ ; \quad p = \frac{j\omega}{\omega_r}\ ; \quad \omega_r = 2\pi f_r\ ; \quad f_r = \text{Reference frequency GHz} \qquad (86–2)$$

The Bessel-Thomson receiver is not intended to represent the noise filter used within a compliant optical receiver, but is intended to provide uniform measurement conditions at the transmitter.

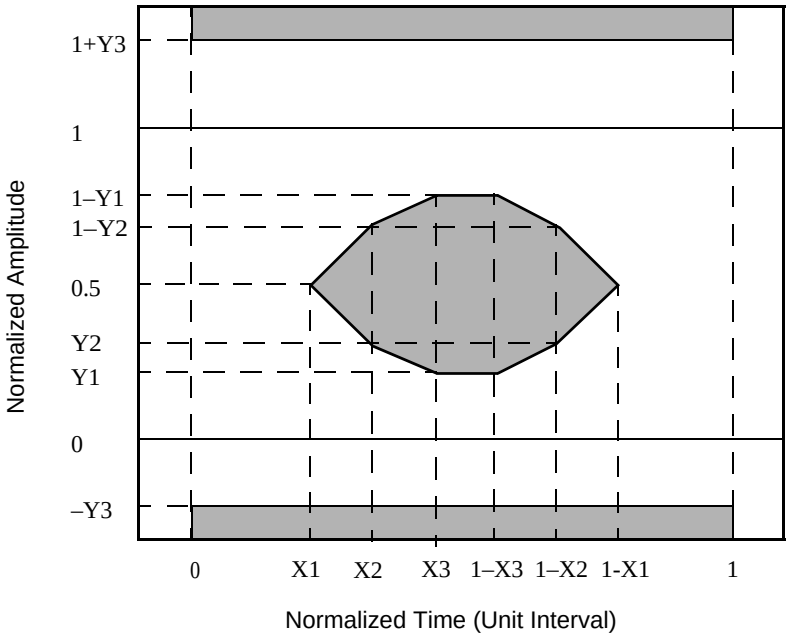

Figure 86–4—Transmitter eye mask definition

Normalized amplitudes of 0 and 1 represent the amplitudes of logic ZERO and ONE respectively. These are defined by the means of the lower and upper halves of the central 0.2 UI of the eye. Normalized times of 0 and 1 on the unit interval scale are determined by the eye crossing means measured at the average value of the optical eye pattern. A clock recovery unit (CRU) should be used to trigger the oscilloscope for mask measurements, as shown in Figure 52-9. It should have a high frequency corner bandwidth as specified in Table 86–16 and a slope of –20 dB/decade. The CRU tracks acceptable levels of low-frequency jitter and wander.

Table 86–16—Clock recovery unit high frequency corner bandwidth

Signaling speed per lane	High frequency corner bandwidth
10.3125 GBd	4 MHz
25.78125 GBd	10 MHz

The transmitter shall achieve a hit ratio lower than 5×10^{-5} hits per sample, where “hits” are the number of samples within the grey areas of Figure 68–6, and the sample count is the total number of samples from 0 UI to 1 UI. Some illustrative examples are provided in 86.7.4.7.2.

Further information on optical eye pattern measurement procedures may be found in IEC 61280-2-2.

86.7.4.7.2 Transmitter eye mask acceptable hit count examples (informative)

If an oscilloscope records 1350 samples/screen, and the time-base is set to 0.2 UI per division with 10 divisions across the screen, and the measurement is continued for 200 waveforms, then a transmitter that averages less than 6.75 hits is compliant. i.e.,

$$\frac{5 \times 10^{-5} \times 200 \times 1350}{0.2 \times 10} = 6.75 \qquad (86\text{–}3)$$

Likewise, if a measurement is continued for 1000 waveforms, then an average of less than 33.75 hits is compliant. An extended measurement is expected to give a more accurate result, and a single reading of 6 hits in 200 waveforms would not give a statistically significant pass or fail.

The hit ratio limit has been chosen to avoid misleading results due to transmitter and oscilloscope noise.

Changes in clause 87

In Table 87-7 set {X1, X2, X3, Y1, Y2, Y3} to {0.25, 0.40, 0.45, 0.25, 0.28, 0.40} with editor's note that the numbers are provisional.

Replace clause 87.7.8 with the following:

87.7.8 Transmitter optical waveform (transmit eye)

[Editor's note (to be removed prior to publication) - *Details of the transmit eye mask measurement are being studied by the Statistical Eye Ad Hoc and consequently the contents of this clause together with the mask parameters in Table 87-7 are provisional.*
*Note: clause 87.7.5.3 refers to this clause for its reference receiver bandwidth requirement. Depending upon the results of the Statistical Eye Ad Hoc, this may or may not be appropriate.****]***

The required optical transmitter pulse shape characteristics are specified in the form of a mask of the transmitter eye diagram as shown in Figure 86–4. The transmitter optical waveform of a port transmitting the test pattern specified in Table 87-10 shall meet specifications according to the methods specified in 86.7.4.7.1 with the filter nominal reference frequency f_r of 7.5 GHz and filter tolerances as specified for STM-64 in ITU-T G.691. Measurements during system operation or with other patterns, such as TBD signal, are likely to give very similar results.

Changes in clause 88

In Tables 88-7 and 88-11 set {X1, X2, X3, Y1, Y2, Y3} to {0.25, 0.40, 0.45, 0.25, 0.28, 0.40} with editor's note that the numbers are provisional.

Replace clause 88.8.8 with the following:

88.8.8 Transmitter optical waveform (transmit eye)

[Editor's note (to be removed prior to publication) - *Details of the transmit eye mask measurement are being studied by the Statistical Eye Ad Hoc and consequently the contents of this clause together with the mask parameters in Tables 88-7 and 88-11 are provisional.*

Note: clause 88.8.5.3 refers to this clause for its reference receiver bandwidth requirement. Depending upon the results of the Statistical Eye Ad Hoc, this may or may not be appropriate.]

The required optical transmitter pulse shape characteristics are specified in the form of a mask of the transmitter eye diagram as shown in Figure 86–4. The transmitter optical waveform of a port transmitting the test pattern specified in Table 88-14 shall meet specifications according to the methods specified in 86.7.4.7.1 with the filter nominal reference frequency f_r of 18.75 GHz and filter tolerances TBD. Measurements during system operation or with other patterns, such as TBD signal, are likely to give very similar results.