Interpretation Number: 1-03/06
Topic: 10BASE-T differential output impedance test method
Relevant Clause: 14.3.1.2.2
Classification: Unambiguous

Interpretation Request

This paragraph is taken from the ANSI/IEEE Std 802.3-1996 specification:

14.3.1.2.2 Transmitter differential output impedance

The differential output impedance as measured on the TD circuit shall be such that any reflection, due to differential signals incident upon the TD circuit from a simplex link segment having any impedance within the range specified in 14.4.2.2, shall be at least 15 dB below the incident, over the frequency range of 5.0 MHz to 10 MHz. This return loss shall be maintained at all times when the MAU is powered, including when the TD circuit is sending TP_IDL.

This paragraph is taken from the IEEE Std 1802.3d-1993 specification:

Test Case ID	:	1411.10.07
Test Case Name	:	TD Circuit differential output impedance.
Status	:	Mandatory
Standard Reference	:	14.3.1.2.2
PICS Reference	:	14.10.4.5.12/6
History	:	
Test Purpose	:	To verify the transmitter differential output impedance.
Note	:	See Section 14, Appendix B4.3.2 for measurement details
Test Setup	:	Test setup Q
Test Procedure	:	Using the network analyzer, measure the return loss between 5.0 MHz and 10 MHz with 0.5 MHz steps, utilizing a reference resistance of 100 . Calculate the return loss using a reference resistance of 85 and 111.
Conformance	:	The differential output impedance as measured on the TD circuit shall be such that any reflection, due to differential signals incident upon the TD circuit from a simplex link segment having any impedance within the range specified in 14.4.2.2, shall be at least 15 dB below the incident, over the frequency range of 5.0 MHz to 10 MHz. This return loss shall be maintained at all times when the MAU is in the power-on state, including when the TD circuit is sending TP_IDL.

My Interpretation Request is a clarification of these two sentences in the above paragraphs:

"The differential output impedance as measured on the TD circuit shall be such that any reflection, due to differential signals incident upon the TD circuit from a simplex link segment having any impedance within the range specified in 14.4.2.2, shall be at least 15 dB below the incident, over the frequency range of 5.0 MHz to 10 MHz. This return loss shall be maintained at all times when the MAU is in the power-on state, including when the TD circuit is sending TP_IDL."

Can I have these questions answered:

1. When performing the Return Loss testing, what are the specific test conditions. I understand the MAU is powered on. Is this the only requirement for this testing? (powered on, no link, no packets being transmitted, TX+ & TX- in an idle, off state).

2. Or, when performing the Return Loss testing, should the MAU be powered on and transmitting packets? (I interpret "due to differential signals incident upon the TD circuit" as meaning transmitting)

3. If the MAU should be transmitting packets, is there a recommendation for packet size, IPG (inter packet gap) and data composition (0000s, FFFFs, AAAAs, 5555s or Random Data)?

Interpretation for IEEE Std 802.3-2005 and IEEE Std 1802.3-2001

The standard IEEE Std 802.3-1996 has been superseded several times. The current standard is IEEE Std 802.3-2005. The standard IEEE Std 1802.3d-1993 has also been superseded, the current standard is IEEE Std 1802.3-2001.We have however determined the referenced text is unchanged in this instance as a courtesy we will respond to this request.

The test procedure specified in IEEE Std 1802.3-2001 to measure return loss is unambiguous.