100BASE-TX

Most of the requirements are governed by ANSI X3.263: 1995 (FDDI TP-PMD Rev 2.2):

(8.4) Isolation requirements - General

LAN cable systems described in this standard are subject to at least four direct electrical safety hazards during their installation and use. These hazards are as follows:

1. Direct contact between LAN components and power, lighting, or communications circuits.
2. Static charge buildup on LAN cables and components.
3. High-energy transients coupled onto the LAN cable system.
4. Voltage potential differences between safety grounds to which various LAN components are connected.

Such electrical safety hazards shall be avoided or appropriately protected against for proper network installation and performance. In addition to provisions for proper handling of these conditions in an operational system, special measures shall be taken to ensure that the intended safety features are not negated during installation of a new network or during modification or maintenance of an existing network.

(8.4.1) UTP isolation requirements

The UTP-PMD shall provide isolation between frame ground and all leads of the UTP-MIC, including those not used by the Active Output Interface and Active Input Interface. This electrical separation shall withstand *at least one* of the following electrical strength tests.

1. 1500 V rms at 50 to 60 Hz for 60 s, applied as specified in subclause 5.3.2 of IEC 950:1991.
2. 2250 VDC for 60 s, applied as specified in subclause 5.3.2 of IEC 950:1991.
3. A sequence of ten 2400 V impulses of alternating polarity, applied at intervals of not less than 1 s. The shape of these impulses shall be 1.2/50 us (1.2 us virtual front time, 50 us virtual time of half value), as defined in IEC 60.

There shall be no insulation breakdown, as defined in subclause 5.3.2 of IEC 950:1991, during the test. The resistance after the test shall be at least 2 Megohms, measured at 500 VDC.

(9 Media signal interface)

(9.1.2) Unshielded twisted pair Active Output Interface

The Unshielded Twisted Pair Active Output Interface shall exhibit the characteristics shown in table 3, figures 12 to 14 and the balance of this clause.

(9.1.2.1) UTP test load

For UTP, the test load shall consist of a single 100 Ohm ± 0,2% resistor connected across the transmit pins of the Active Output Interface. For frequencies <= 100 MHz, the series inductance of the load shall not exceed 20 nH and the parallel capacitance shall not exceed 2 pF.

(9.1.2.2) UTP differential output voltage

For UTP, the differential output voltage, V_{out}, as defined in 9.1.3 and figure 12 shall be:

950 mV <= V_{out} <= 1050 mV

(9.1.3) Waveform overshoot

For the purposes of (9.1), overshoot is defined as the percentage excursion of the differential signal transition beyond its final adjusted value, V_{out} , during the symbol interval following the signal transition. The adjusted value is obtained by performing a straight line best fit to an output waveform consisting of 14 bit times of no transition preceded by a transition from zero to either plus or minus V_{out} as shown in figure 12 (of TP-PMD). Vout is defined to be the intersection of the straight-line best fit for amplitude with the vertical line indicating the start of the transition from 0 V to V_{out}.

The differential signal overshoot shall not exceed 5%. Any overshoot or undershoot transient shall have decayed to within 1% of the steady state voltage within 8.0 ns following the beginning of the differential signal transition.

(9.1.4) Signal amplitude symmetry

The ratio of the + V_{out} magnitude to - V_{out} magnitude shall be between the limits:

0.98 <= $(+V_{out}/-V_{out})$ <= 1.02

(9.1.5) Return loss

The UTP and STP Active Output Interface shall be implemented such that the following return loss characteristics are satisfied for each of the specified line impedances.

1. Greater than 16 dB from 2 MHz to 30 MHz
2. Greater than (16 - 20 log(f / 30 MHz)) dB from 30 MHz to 60 MHz
3. Greater than 10 dB from 60 MHz to 80 MHz

The impedance environment for the measurement of the UTP Active Output Interface return loss shall be 100 ± 15 Ohms. The impedance environments shall be nominally resistive, with a magnitude of phase angle less than 3 ° over the specified measurement frequency range.

(9.1.6) Rise/fall times
For the purposes of (9.1), the Active Output Interface signal rise is defined as a transition from the baseline voltage (nominally zero) to either + V_{out} or - V_{out} . Signal fall is conversely defined as a transition from +V_{out} or - V_{out} to the baseline voltage.
The rise and fall times of the waveform shall be determined as the time difference between the 10% and the 90% voltage levels of the signal transition, where 100% is represented by V_{out} of figure 12 (of TP-PMD).

Measured rise and fall times shall be between the limits:

3.0 ns <= $t_{rise/fall}$ <= 5.0 ns

The difference between the maximum and minimum of all measured rise and fall times shall be <= 0.5 ns.

(9.1.7) Worst case droop of transformer
Baseline Wander tracking by the receiver is dependent on the worst case droop that can be produced by a transmitter. Droop is directly related to the Open Circuit Inductance (OCL) *which varies with temperature, manufacturing tolerance, and bias current*. Worst case Baseline Wander Frames vary the transformer bias, which causes the droop to change with data content. This variation must be accounted for by the receiver to track the Baseline Wander over long frames. Variation in inductance caused by bias of the transformer can be on the order of 2:1.

The minimum inductance measured at the transmit pins of the Active Output Interface shall be greater than or equal to 350 mH with any DC bias current between 0 mA and +8 mA injected *in addition to the DC power unbalance bias*.

(9.1.8) Duty cycle distortion (DCD)
Duty cycle distortion shall be measured at the 50% voltage points on rise and fall transitions of the differential output waveform. The 50% times at the four successive MLT-3 transitions generated by a 01010101 NRZ bit sequence shall be used. The deviations of the 50% crossing times from a best fit to a time grid of 16 ns spacing shall not exceed ± 0.25ns as shown in figure 14 (of TP-PMD).

(9.1.9) Jitter
Peak to peak jitter shall be measured using scrambled HALT line state. Total transmit jitter, including contributions from duty cycle distortion and Baseline Wander, shall not exceed 1.4 ns peak-peak.

(9.1.10) Characteristics of Active Output Interface
Table 3 summarizes the characteristics of the Active Output Interface.

Table 3 – Twisted pair Active Output Interface characteristics

Characteristic	Minimum	Maximum	Units
Differential Signal, UTP, zero-peak	950	1050	MV peak
Signal Amplitude Symmetry (positive/negative)	98	102	%
Rise and Fall Time	3.0	5.0	ns
Rise and Fall Time Symmetry	0	0.5	ns
Duty Cycle Distortion, peak-to-peak	0.0	0.5	ns
Transmit Jitter (HLS)	0.0	1.4	ns
Overshoot	0	5	%

(9.2.2) Differential input impedance
The differential input impedance shall be such that the return loss is as shown below. The requirement is specified for any reflection due to differential signals incident upon RX+/- from a twisted pair having any impedance within the range specified in 11.1.1. [85 to 115 Ohms]. The return loss shall be maintained when the receiver circuit is powered.

1. Greater than 16 dB from 2 MHz to 30 MHz
2. Greater than (16 - 20log(f/30 MHz)) dB from 30 MHz to 60 MHz
3. Greater than 10 dB from 60 MHz to 80 MHz

(9.2.3) Common-Mode Rejection
Receiver shall deliver the proper value for PM_UNITDATA.indication, at the specified Bit Error Rate, for any signal meeting the requirements of (10.1) Receiver. The receiver shall deliver the correct value for E_{cm} applied as shown in figure 16 (of TP-PMD). E_{cm} shall be a 1.0 V peak-to-peak sine wave from 0 MHz to 125 MHz. ***Note that this cannot be met at DC.***

The impedance of the test equipment shall not disrupt the impedance of the channel.

10BASE-T

These characteristics are from IEEE 802.3. It will be clear from inspection that a number of these *required* clauses cannot be met with power over the signal wires, yet conformance to IEEE 802.3 is claimed.

(14.10.4.5.11) Isolation requirements
Isolation, MDI leads to DTE Physical Layer circuits

(14.3.1.1) Isolation requirement
The MAU shall provide isolation between the DTE Physical Layer circuits including frame ground and all MDI leads including those not used by 10BASE-T. This electrical separation shall withstand at least one of the following electrical strength tests.

a) 1500 V rms at 50 Hz to 60Hz for 60s, applied as specified in Section 5.3.2 of IEC 60950: 1991.
b) 2250 Vdc for 60 s, applied as specified in Section 5.3.2 of IEC 60950: 1991.
c) A sequence of ten 2400 V impulses of alternating polarity, applied at intervals of not less than 1 s. The shape of the impulses shall be 1.2/50 μs (1.2 μs virtual front time, 50 μs virtual time of half value), as defined in IEC 60060.

There shall be no insulation breakdown, as defined in Section 5.3.2 of IEC 60950: 1991, during the test. The resistance after the test shall be at least 2 Megohms, measured at 500 Vdc. *Note that these requirements agree with TP-PMD.*

The Pro Forma PICS provides a good summary for many parameters:

14.10.4.5.12 Transmitter specification

Parameter	Subclause	Req	Value/comment
Peak differential output voltage on TD circuit	14.3.1.2.1	M	2.2 to 2.8 V
Harmonic content, all-ones signal	14.3.1.2.1	M	All harmonics 27 dB below fundamental
Output waveform, with Scaling, of voltage template	14.3.1.2.1	M	Within Figure 14-9 template
Start of TP_IDL waveform, with each specified load, with and without twisted-pair model	14.3.1.2.1	M	Within Figure 14-10 template, overshoot <= +50 mV after excursion below -50 mV
Link test pulse waveform, with each specified load, with and without twisted-pair model	14.3.1.2.1	M	Within Figure 14-10 template, overshoot <= +50 mV after excursion below -50 mV
TD circuit differential output impedance	14.3.1.2.2	M	Reflection <= 15 dB below incident, any simplex link segment
Transmitter added timing jitter: Into 100 Ohms through twisted-pair model Into 100 Ohms	14.3.1.2.3	 M M	 ±3.5 ns max ±8 ns max
Common-mode to differential-mode conversion	14.3.1.2.4	M	>= 29 -17 $\log_{10}$ (f/10) dB, f =1-20 MHz, f in MHz
TD circuit common-mode output voltage	14.3.1.2.5	M	< 50 mV peak
TD circuit common-mode rejection, 15 V peak 10.1 MHz sinusoid	14.3.1.2.6	M	<= 100 mV differential and <= 1 ns jitter
TD circuit fault tolerance	14.3.1.2.7	M	No damage from a short circuit
TD circuit short-circuit current	14.3.1.2.7	M	300 mA max
TD circuit	14.3.1.2.7	M	1000 V min,

common-mode voltage withstand			applied per Figure 14-15
Power cycle behavior	14.3.2.3	M	No extraneous signals on the TD circuit

14.10.4.5.13 Receiver specification

Parameter	Subclause	Req	Value/comment
RD circuit signal acceptance	14.3.1.3.1	M	Figures 14-16, 14-17, template
Received signal jitter accept	14.3.1.3.1	M	At least ±13.5 ns
Receiver added jitter	14.3.1.3.1	M	<= ±1.5 ns, RD to DI circuits
RD circuit link test pulse acceptance	14.3.1.3.2	M	Figure 14-12 template
RD circuit differential noise rejection: Signal (1) Signal (2) Signal (3)	14.3.1.3.2	 M M M	 <= 300 mV peak <=6.2 V peak-to-peak, <= 2 MHz Single cycle <= 6.2 V, either phase, 2 - 15 MHz
Idle detection, RD circuit	14.3.1.3.3	M	Within 2.3 bit times
RD circuit differential input impedance	14.3.1.3.4	M	Reflected signal >= 15 dB below incident, any simplex link segment
RD circuit common-mode rejection	14.3.1.3.5	M	25 V peak-to-peak square wave to add <= 2.5 ns jitter
RD circuit fault tolerance: Short circuit Common-mode voltage	14.3.1.3.6	M M	Indefinite short circuit 1000 V impulse, applied per Figure 14-19

More requirements are contained in the MAU Acceptance Test Suite, IEEE 802.3d. The principal value of these tests is to make certain that the receiver is not affected adversely by noise and other interference. It is apparent that this is very dusty, neglected territory for many, but claims to IEEE 802.3 compliance must deal with them:

"The conformance test suite is intended to detect incorrect implementations of the ISO/IEC 8802-3 standard, clause 14. It comprises two categories of test groups. The first category relates to basic interconnection testing and the second to capability and behavior testing. The test setups, adapters, and instruments used are described."

(6.3.1) Test Signal Definitions. Unless otherwise stated, all AUI–DO signals shall have a 56-bit preamble as defined in 4.2.5 of ISO/IEC 8802-3 : 1993 [3] and Start Frame Delimiter (SFD) preceding the test pattern and a start of idle (SOI) following the test pattern… In addition, unless otherwise stated, all MAU–RD signals are defined across a 100 Ohm resistive load when driven from a 100 Ohm source impedance, have a peak amplitude of 585 mV, and a tolerance on pulse widths of +/- 1 ns. A cross-reference table listing test signals and test cases is shown in A1.2.

Signal Number	Signal Description
1	An AUI–DO signal consisting of a single frame of 512 bits of pseudo-random data.
2a	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 375 mV.
2b	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 565 mV.
2c	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 750 mV.
2d	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 940 mV.
2e	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 1130 mV.
2f	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 1315 mV.
3a	A continuous 5 MHz square wave with a peak amplitude of 375 mV.
3b	A continuous 10 MHz square wave with a peak amplitude of 375 mV.
4	An AUI–DO signal consisting of repeating frames of 1518 bytes of alternating 1's and 0's with a 9.6 us inter-packet gap.
5	An AUI–DO signal consisting of repeating sequences of preamble and SFD followed by Manchester-encoded 1's lasting for 19 ms, followed by a 9.6 us gap.

Signal Number	Signal Description
6	An AUI–DO signal consisting of a single frame of 1518 bytes of pseudo-random data with a minimum pattern length of 511 bits. Amplitude of 318 mV and maximum edge transition times.
7a	A MAU–RD signal consisting of five pairs of sequences of six alternating polarity pulses with a peak amplitude of 585 mV, when measured at the MDI, with a rising edge described by 585 mV * sin(2π * t/PW), and a falling edge described by 585 mV * sin(2π (t – PW/2)/PW), where PW is either 73 ns or 127 ns. The first sequence has a pulse width of 73 ns on the positive polarity and 127 ns on the negative polarity. The second sequence has a pulse width of 127 ns on the positive polarity and 73 ns on the negative polarity. These five pairs of sequences are followed by a continuous series of repeating pair of sequences of six alternating polarity one-half cycle sine-wave pulses with a peak amplitude of 585 mV when measured at the MDI. The first sequence has a pulse width of 23 ns (+1,–0 ns) on the positive polarity and 77 ns on the negative polarity. The second sequence has a pulse width of 77 ns on the positive polarity and 23 ns (+1,–0 ns) on the negative polarity (see Fig 6-3 and Fig 14-16 of ISO/IEC 8802-3 : 1993 [3]). *[Note: this signal is equivalent to 60 cycles of a maximally jittered 5 MHz signal (30 cycles of maximum jitter in each direction) followed by a maximally jittered 10 MHz signal, all at minimum amplitude.]*
7b	A MAU–RD signal consisting of five pairs of sequences of six alternating polarity pulses with a peak amplitude of 585 mV, when measured at the MDI, with a rising edge described by 585 mV * sin(2π* t/PW), and a falling edge described by 585 mV * sin(2π (t – PW/2)/PW), where PW is either 73 ns or 127 ns. The first sequence has a pulse width of 127 ns on the positive polarity and 73 ns on the negative polarity. The second sequence has a pulse width of 73 ns on the positive polarity and 127 ns on the negative polarity. These five pairs of sequences are followed by a continuous series of repeating pair of sequences of six alternating polarity one-half cycle sine-wave pulses with a peak amplitude of 585 mV when measured at the MDI. The first sequence has a pulse width of 77 ns on the positive polarity and 23 ns (+1,–0 ns) on the negative polarity. The second sequence has a pulse width of 23 ns (+1,–0 ns) on the positive polarity and 77 ns on the negative polarity (see Figs 6-3 and 14-16 of 8802-3 : 1993 [3]). *[NOTE: this signal is equivalent to 60 cycles of a maximally jittered 5 MHz signal (30 cycles of maximum jitter in each direction) followed by a maximally jittered 10 MHz signal, all at minimum amplitude.]*

Signal Number	Signal Description
8a 8b	A MAU–RD signal consisting of a repeating pair of sequences of five alternating polarity trapezoidal pulses with a peak amplitude of 3.1 V, when measured at the MDI, and a rise and fall slope of 0.5 V/ns. The first sequence has a pulse width of 23 ns (+1,–0 ns) on the positive polarity and 77 ns on the negative polarity. The second sequence has a pulse width of 77 ns on the positive polarity and 23 ns (+1,–0 ns) on the negative polarity (see Figs 6-4 and 14-16 of 8802-3 : 1993 [3]). A MAU–RD signal consisting of a continuous series of repeating pair of sequences of five alternating polarity trapezoidal pulses with a peak amplitude of 3.1 V, when measured at the MDI, and a rise and fall slope of 0.5 V/ns. The first sequence has a pulse width of 77 ns on the positive polarity and 23 ns (+1,–0 ns) on the negative polarity. The second sequence has a pulse width of 23 ns (+1,–0 ns) on the positive polarity and 77 ns on the negative polarity (see Figs 6-4 and 14-16 of 8802-3 : 1993 [3]).
9	A MAU–RD signal consisting of a continuous 10 MHz sine wave with a peak amplitude of 585 mV when measured at the MDI.
10	A MAU–RD signal consisting of a continuous series of repeating pair of sequences of five alternating polarity trapezoidal pulses with a peak amplitude of 3.1 V, when measured at the MDI, and a rise and fall slope of 0.5 V/ns. The first sequence has a pulse width of 127 ns on the positive polarity and 73 ns on the negative polarity. The second sequence has a pulse width of 73 ns on the positive polarity and 127 ns on the negative polarity (see Figs 6-5 and 14-17 of 8802-3 : 1993 [3]).
11a 11b 11c 11d 11e 11f 11g	A MAU–RD signal consisting of a continuous 1 MHz sine wave with a peak amplitude of 299 mV when measured across a 121 Ohm resistive load. A MAU–RD signal consisting of a continuous 5 MHz sine wave with a peak amplitude of 299 mV when measured across a 121 Ohm resistive load. A MAU–RD signal consisting of a continuous 10 MHz sine wave with a peak amplitude of 312 mV when measured across a 121 Ohm resistive load. A MAU–RD signal consisting of a continuous 15 MHz sine wave with a peak amplitude of 423 mV when measured across a 121 Ohm resistive load. A MAU–RD signal consisting of a continuous 20 MHz sine wave with a peak amplitude of 769 mV when measured across a Ohm resistive load. A MAU–RD signal consisting of a continuous 25 MHz sine wave with a peak amplitude of 1.416 V when measured across a 121 Ohm resistive load. A MAU–RD signal consisting of a continuous 30 MHz sine wave with a peak amplitude of 2.411 V when measured across a 121 Ohm resistive load.
12a 12b 12c	A MAU–RD signal consisting of a continuous 0.5 MHz sine wave with a peak-to-peak amplitude of 6.1 V. A MAU–RD signal consisting of a continuous 1 MHz sine wave with a peak-to-peak amplitude of 6.1 V. A MAU–RD signal consisting of a continuous 1.9 MHz sine wave with a peak-to-peak amplitude of 6.1 V.

13a 13b 13c 13d	A MAU–RD signal consisting of a single cycle 2 MHz sine wave with a peak-to-peak amplitude of 6.1 V preceded and followed by 4 BT of silence. A MAU–RD signal consisting of a single cycle 5 MHz sine wave with a peak-to-peak amplitude of 6.1 V preceded and followed by 4 BT of silence. A MAU–RD signal consisting of a single cycle 10 MHz sine wave with a peak-to-peak amplitude of 6.1 V preceded and followed by 4 BT of silence. A MAU–RD signal consisting of a single cycle 15 MHz sine wave with a peak-to-peak amplitude of 6.1 V preceded and followed by 4 BT of silence.
14	A MAU–RD signal consisting of a single packet of 512 bits of pseudo-random data, with only 2.3 BT of SOI following the data, followed by a continuous 10 MHz sine wave with a peak amplitude of 312 mV starting at a phase angle of 180 degrees (i.e. test signal 11c starting in the negative going direction) (see Fig 6-6).
15	A MAU–RD signal consisting of a single frame of 512 bits of pseudo-random data. Amplitude of 585 mV peak and maximum edge transition times.
16	A MAU–RD signal consisting of repeating frames of 512 bits of pseudo-random data. Amplitude of 585 mV peak, maximum edge transition times and an inter-packet gap of 9.6 us.
17	A 25 V peak-to-peak square wave with maximum frequency of 500 kHz and with edges no slower than 4 ns (20–80%).
18	An AUI–DO signal consisting of a single packet of 512 bits of pseudo-random data, repeating every 1 ms for a total signal duration of 151 ms.
19a 19b	An AUI–DO signal consisting of a single frame of 512 bits of Manchester-encoded 1's. An AUI–DO signal consisting of a single frame of 512 bits of Manchester-encoded alternating 1's and 0's.
20	An AUI–DO signal consisting of a single frame of 512 bits of pseudo-random data. Amplitude of 159 mV peak and maximum edge transition times.
21a 21b 21c 21d 21e 21f 21g	A continuous 30 Hz sine wave with a peak amplitude of 3.0 V. A continuous 20 kHz sine wave with a peak amplitude of 3.0 V. A continuous 40 kHz sine wave with a peak amplitude of 3.0 V. A continuous 500 kHz sine wave with a peak amplitude of 200 mV. A continuous 1 MHz sine wave with a peak amplitude of 200 mV. A continuous 5 MHz sine wave with a peak amplitude of 200 mV. A continuous 10 MHz sine wave with a peak amplitude of 200 mV.

Signal Number	Signal Description
22a	A continuous 30 Hz sine wave with a peak amplitude of 3.0 Vac and a dc offset of 2.5 V.
22b	A continuous 20 kHz sine wave with a peak amplitude of 3.0 Vac and a dc offset of 2.5 V.
22c	A continuous 40 kHz sine wave with a peak amplitude of 3.0 Vac and a dc offset of 2.5 V.
22d	A continuous 30 Hz sine wave with a peak amplitude of 3.0 Vac and a dc offset of –2.5 V.
22e	A continuous 20 kHz sine wave with a peak amplitude of 3.0 Vac and a dc offset of –2.5 V.
22f	A continuous 40 kHz sine wave with a peak amplitude of 3.0 Vac and a dc offset of –2.5 V.
22g	A continuous 500 kHz sine wave with a peak amplitude of 200 mVAC and a dc offset of 5.3 V.
22h	A continuous 1 MHz sine wave with a peak amplitude of 200 mV ac and a dc offset of 5.3 V.
22I	A continuous 5 MHz sine wave with a peak amplitude of 200 mV ac and a dc offset of 5.3 V.
22j	A continuous 10 MHz sine wave with a peak amplitude of 200 mV ac and a dc offset of 5.3 V.
22k	A continuous 500 kHz sine wave with a peak amplitude of 200 mV ac and a dc offset of –5.3 V.
22l	A continuous 1 MHz sine wave with a peak amplitude of 200 mV ac and a dc offset of –5.3 V.
22m	A continuous 5 MHz sine wave with a peak amplitude of 200 mV ac and a dc offset of –5.3 V.
22n	A continuous 10 MHz sine wave with a peak amplitude of 200 mV ac and a dc offset of –5.3 V.
23a	An AUI–DO signal consisting of a single frame of 512 bits of Manchester-encoded 1's, with the signal remaining HI for 1.6 BT after the last low-to-high transition (see Fig 6-7). Amplitude of 375 mV peak.
23b	An AUI–DO signal consisting of a single frame of 512 bits of Manchester-encoded 1's, with the signal remaining HI for 1.6 BT after the last low-to-high transition (see Fig 6-7). Amplitude of 1170 mV peak.

Signal Number	Signal Description
24a	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 585 mV.
24b	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 1.0 V.
24c	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 1.5 V.
24d	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 2.0 V.
24e	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 2.5 V.
24f	An AUI–DO signal consisting of repeating frames of 512 bits of pseudo-random data separated by a 4.7 us inter-packet gap with a peak amplitude of 3.1 V.
25	An AUI–DO signal consisting of repeating frames of 48 bits of data and an inter-packet gap of 50 us.
26	An AUI–DO signal consisting of repeating sequences of preamble and SFD followed by Manchester-encoded 1's lasting 7.5 ms, followed by a 9.6 us gap.

The required results of the various tests and the test setups are contained in the Standard.