

## Tektronix Test Methods of Implementation:

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## Ethernet 10Base-T PHY

10BaseT has been the cornerstone of the Ethernet revolution. Popularly known as Ethernet, it is now an element of every networked device.

The IEEE 802.3 defines compliance tests for 10BaseT physical layer. These can be categorized as Core tests, Special tests and Advanced tests:

## 10BaseT Core Tests

### Template Test

There are four template tests for 10BaseT:

- MAU (positive) - Integrated or External
- MAU (negative) - Integrated or External
- TP\_IDL
- Link Pulse

The standard permits scaling the MAU templates by a factor of 0.9 to 1.1. The TP\_IDL and Link Pulse tests need to be performed with and without a Twisted Pair Model (TPM) as defined by the standard.

In order to perform these tests the following steps are needed:

1. Set the DUT to transmit required packet
2. Different Test Setups are required for performing template testing
3. Connect the appropriate test fixture offering Balun, Twisted Pair Model (TPM) with 100 ohm as defined by the standards. In addition, loads are required for testing TP\_IDL and Link Pulse
4. Acquire signal through an oscilloscope for testing

The test is performed using the following tools:

- Tektronix DPO7000 Series Oscilloscope
- Tektronix P6247, P6248 High Frequency Differential Probes
- Tektronix TDSET3 Ethernet Test Software (opt for DPO scope)
- TF-GBE - Ethernet Test Fixture ([www.c-h-s.com](http://www.c-h-s.com))

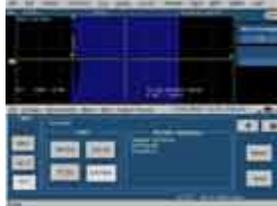


Fig. 13: 10BaseT Template Test

## Peak Differential Output Voltage and Harmonic Content of Ones Tests

In order to perform this test the following steps are needed:

- Set the DUT to transmit required packets
- Connect a fixture offering 100 ohm termination as defined by the standards
- Acquire signal through an oscilloscope for testing

The test is performed using the following tools:

- Tektronix DPO7000 Series Oscilloscope
- Tektronix P6247, P6248 High Frequency Differential Probes
- Tektronix TDSET3 Ethernet Test Software (opt for DPO scope)
- TF-GBE - Ethernet Test Fixture ([www.c-h-s.com](http://www.c-h-s.com))



Fig. 14: 10BaseT O/P Voltage Test

## Jitter Test

In order to perform this test the following steps are needed:

Set the DUT to transmit required packets

While testing jitter without cable, connect a fixture offering 100 ohm termination

While testing jitter with cable, connect a fixture offering Balun, TPM with 100 ohm termination as defined by the standards

Acquire signal through an oscilloscope for testing

The test is performed using the following tools:

- Tektronix DPO7000 Series Oscilloscope
- Tektronix P6247, P6248 High Frequency Differential Probes
- Tektronix TDSET3 Ethernet Test Software (opt for DPO scope)
- TF-GBE - Ethernet Test Fixture ([www.c-h-s.com](http://www.c-h-s.com))

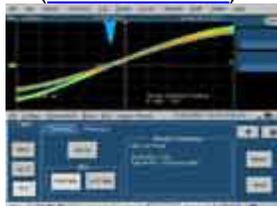


Fig. 15: 10BaseT Jitter Test

