Ethernet Compliance Test Fixture

User Manual

EN01B

SIGLENT TECHNOLOGIES CO.,LTD

Contents

Test equipment

Required Equipment

The Ethernet electrical compliance test measurements require the following equipment:

- Oscilloscope (SDS7000A): Oscilloscope's bandwidth larger than 2GHz, and with the Ethernet Compliance Test Application software that has installed the option key (SDS7000A-CT-100BASE-T option for 100BASE-TX, SDS7000A-CT-1000BASE-T option for 1000BASE-T).
- FX-ETH kit: FX-ETH kit is the Ethernet Electrical Compliance Test Fixture from Siglent that provides the physical connection and test points after the DUT enters the test mode.
- Differential probe or SMA cables:
  - Differential probe (e.g., SAP2500D or SAP5000D): bandwidth greater than 2 GHz for probing signals;
  - SMA cables: connects from the oscilloscope to the test fixture for probing signals.
- Vector Network Analyzer: VNA is used for MDI return loss test.
- USB Connection Cable: The cable is used to connect the USB Host port on the oscilloscope to the USB Device port on the network analyzer, so that the oscilloscope can control and configure the network analyzer and obtain the return loss test data.
- Arbitrary waveform generator: On the 1000BASE-T compliance tests, when the DUT enters Test Mode 1 or Test Mode 4, for the Peak Output Voltage tests, Template tests, Droop tests, Transmitter Distortion tests with disturbing signal, a dual- channels arbitrary waveform generator which outputs the required disturbing signals.
- Jitter test cable: On the 1000BASE-T compliance tests, when the DUT enters Slave mode, for the jitter tests with TX_TCLK, a 103m long cable is required to connect the DUT to the Link Partner.

Delivery Checklist

The FX-ETH kit includes the items listed in Table 1. When you receive the FX-ETH, firstly, verify that all items listed on the checklist have been received. If you notice any omissions or damage, please contact your nearest Siglent customer service center or distributor as soon as possible. If you fail to contact us immediately in case of omissions or damage, we will not be responsible for replacement.

Table 1 FX-ETH Kit Checklist

Item name	Quantities
User Manual	1
Test Fixture Board	1
UTP RJ45 Cable（6 inches）	1
50Ω Terminators（SMA）	8
SMA cables	4
BNC-SMA Adaptors	4
Jumpers	12

Introduction to FX-ETH Test Fixture

FX-ETH kit is the Ethernet Electrical Compliance Test Fixture which cooperates with software for 100 BASE-TX and 1000 BASE-T ethernet compliance validation on SDS7000A.

The test fixture board shown in Figure 1 which consists of 10 sections, every section has some specific functions, which are clearly marked on the board to help user to use the test fixture.

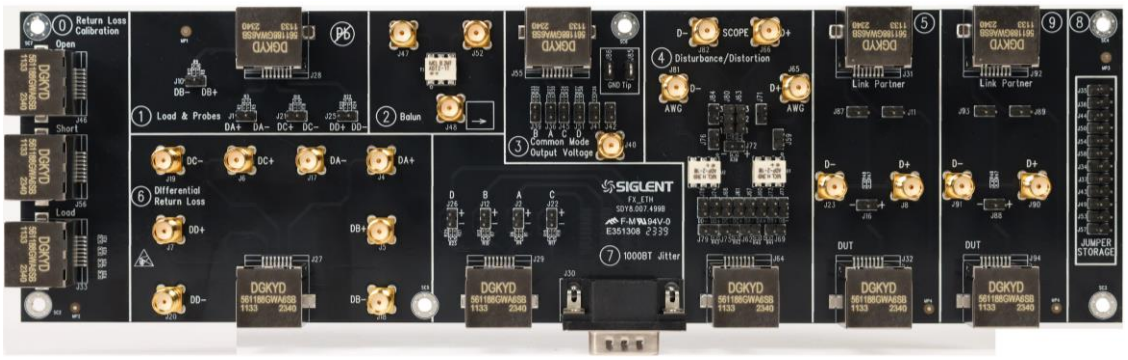

Figure 1 Ethernet Electrical Compliance Test Fixture Board

Every section on the board is described as follows:

Section 0: Return loss calibration section. The vector network analyzer can be calibrated for Open, Short, and Load when DUT runs return loss tests.

Section 1: Supports most of the Ethernet Compliance tests for 100 BASE-TX and 1000 BASE-T by using a differential probe.

Section 2: Differential to single-ended signal conversion by using a balun, which supports return loss tests by using one Port on the VNA.

Section 3: Supports for 1000 BASE-T MDI common-mode output voltage tests.

Section 4: Supports Test Mode 1 and Test Mode 4 on 1000BASE-T compliance tests with disturbing signals.

Section 5: Under 100 BASE-TX compliance tests, the Link Partner such as the SDS7000A oscilloscope transmits at 100Mbps. The DUT transmitter should then emit the following waveform to support the compliance tests.

Section 6: Supports most of the Ethernet Compliance tests for 100 BASE-TX and 1000 BASE-T by using two SMA cables.

Section 7: Supports 1000 BASE-T jitter tests.

Section 8: Jumper storage section, which can store 12 jumpers.

Section 9: Under 100 BASE-TX compliance tests, the Link Partner such as the SDS7000A oscilloscope transmits at 100Mbps. The DUT transmitter should then emit the following waveform to support the compliance tests. Compare to Section 5, The TX and RX signals on the Ethernet Connectors of Section 9 are swapped, which will support some specific application for 100 BASE-TX compliance tests.

About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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