



SURFACE VEHICLE RECOMMENDED PRACTICE

J2962™-3

FEB2024

Issued 2021-09
Revised 2024-02

Superseding J2962-3 SEP2021

Communication Transceivers Qualification Requirements - Ethernet

RATIONALE

Historically, original equipment manufacturers (OEMs) had their own communication transceiver (or ethernet PHY) qualification requirements that varied over time. The intent of this standard is to minimize test variation and to consolidate requirements among OEMs.

FOREWORD

The purpose of this recommended practice is to define a common test plan for approval of ICs that contain ethernet communication physical layer components (PHYs). This document will define test circuits, bus load requirements, test procedures, and pass/fail criteria to validate PHYs.

NOTE: Understanding of this document requires a working knowledge of ISO EMC publications.

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1. SCOPE

This SAE Recommended Practice covers the requirements for ethernet physical layer (PHY) qualification (and as applicable to other high-speed networks [i.e., Audio Bus, LVDS, Ser-Des, etc.]). Requirements stated in this document provide a minimum standard level of performance for the PHY in the IC to which all compatible ethernet communications PHY shall be designed. When the communications chipset is an ethernet switch with an integrated automotive PHY (xBASE-T1), then the testing shall include performance for all switch PHY ports as well as each controller interface. No other features in the IC are tested or qualified as part of this SAE Recommended Practice. This assures robust serial data communication among all connected devices regardless of supplier.

The goal of SAE J2962-3 is to commonize approval processes of ethernet PHYs across OEMs.

The intended audience includes, but is not limited to, ethernet PHY suppliers, component release engineers, and vehicle system engineers.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1113-12	Electrical Interference by Conduction and Coupling - Capacitive and Inductive Coupling via Lines Other than Supply Lines
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SAE J1213-1	Glossary of Vehicle Networks for Multiplexing and Data Communications
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2.1.2 ISO Publications

Copies of these documents are available online at <https://webstore.ansi.org/>.

ISO 7498	Data Processing Systems - Open Systems Interconnection Standard Reference Model
ISO 7637-1	Road Vehicles - Electrical Disturbances from Conduction and Coupling - Part 1: Definitions and General Considerations
ISO 7637-2	Road Vehicles - Electrical Disturbances from Conduction and Coupling - Part 2: Electrical Transient Conduction Along Supply Lines Only
ISO 7637-3	Road Vehicles - Electrical Disturbances from Conduction and Coupling - Part 3: Electrical Transient Transmission by Capacitive and Inductive Coupling via Lines Other than Supply Lines
ISO 10605	Road Vehicles - Test Methods for Electrical Disturbances from Electrostatic Discharge
ISO 11452-2	Road Vehicles - Component Test Methods for Electrical Disturbances from Narrowband Radiated Electromagnetic Energy - Part 2: Absorber-Lined Shielded Enclosure
ISO 11452-4	Road Vehicles - Component Test Methods for Electrical Disturbances from Narrowband Radiated Electromagnetic Energy - Part 4: Harness Excitation Methods
ISO 11452-9	Road Vehicles - Component Test Methods for Electrical Disturbances from Narrowband Radiated Electromagnetic Energy - Part 9: Portable Transmitters

2.1.3 IEC Publications

Available from IEC Central Office, 3, rue de Varembe, P.O. Box 131, CH-1211 Geneva 20, Switzerland, Tel: +41 22 919 02 11, www.iec.ch.

IEC 61000-4-2	Testing and Measurement Techniques - Electrostatic Discharge Immunity Test
IEC 61000-4-21	Testing and Measurement Techniques - Reverberation Chamber Test Methods
IEC 62228-1	General Part and Conditions
IEC 62228-5	Integrated Circuits - EMC Evaluation of Transceivers - Part 5: Ethernet Transceivers

2.1.4 IEEE Publications

Available from IEEE Operations Center, 445 and 501 Hoes Lane, Piscataway, NJ 08854-4141, Tel: 732-981-0060, www.ieee.org.

IEEE Std 802.3 Clause 96	Physical Coding Sublayer (PCS), Physical Medium Attachment (PMA) Sublayer and Baseband Medium, Type 100BASE-T1
IEEE Std 802.3 Clause 97	Physical Coding Sublayer (PCS), Physical Medium Attachment (PMA) Sublayer, and Baseband Medium, Type 1000BASE-T1
IEEE Std 802.3 Clause 98	Auto-Negotiation for Single Differential-Pair Media
IEEE Std 802.3 Clause 149.7	Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Automotive Electrical Ethernet

2.1.5 Other Publications

CISPR 25	Limits and Methods of Measurement of Radio Disturbance Characteristics for the Protection of Receivers Used On-Board Vehicles
OPEN Alliance Specification	IEEE 100BASE-T1 System Implementation Specification
OPEN Alliance Specification	TC10 Wake-Up and Sleep Specification for Automotive Ethernet

3. DEFINITIONS

The definitions provided in SAE J1213-1 apply to this document. Additional or modified definitions, acronyms, and abbreviations included in this document or relevant to the communication of information in a vehicle are catalogued in this section.

3.1.1 DATA LINK LAYER

Provides the reliable transfer of information across the physical layer. This includes message qualification and error control.

3.1.2 ELECTRONIC CONTROL UNIT (ECU)

An on- or off-vehicle electronic assembly from which automotive ethernet messages may be sent and/or received.

3.1.3 MAY

The word “may” is used to indicate an option.

3.1.4 PROTOCOL

Formal set of conventions or rules for the exchange of information between ECUs. This includes the specification of frame administration, frame transfer, and physical layer.

3.1.5 RADIATED EMISSIONS

Radiated emissions consist of energy that emanates from the communications bus wires. Electric field strength in dBμV/m is the typical measure of radiated emissions.

3.1.6 RADIATED IMMUNITY

A property that ensures that the communications bus wires should not suffer degraded functional operation within its intended electromagnetic environment.

3.1.7 SHALL

The word “shall” is to be used in the following ways:

- a. To state a binding requirement on the communications interfaces which comprise the ECU, which is verifiable by external manipulation and/or observation of an input or output.
- b. To state a binding requirement upon an ECU that is verifiable through a review of the document.

3.1.8 SHOULD

The word “should” is used to denote a preference or desired conformance.

3.1.9 WAKE-UP PULSES (WUP)

When a PHY supports OPEN Alliance TC10 wake up, this pattern of signals on the communications link brings the PHY out of sleep low-power state to wake state.

4. ACRONYMS

ALSE	absorber-lined shielded enclosure
AM	amplitude modulation
AN	artificial network
BCI	bulk current injection
CBCI	common mode BCI
CW	continuous wave
DBCI	differential mode BCI
DUT	device under test
EMC	electromagnetic compatibility
ESD	electrostatic discharge
Gbps	gigabits per second
ICI	inductive conducted immunity
ISO	International Standardization Organization
JUTP	jacketed unshielded twisted pair (wiring)
Kbps	kilobits per second
LED	light emitting diode
Mbps	megabits per second
MCU	microprocessor control unit
MII	media independent interface
PAMn	pulse amplitude modulation (level n)
PEP	peak envelope power (sensor)
PK	peak
QP	quasi-peak
RE	radiated emissions
RMII	reduced media independent interface
RGMII	reduced gigabit media independent interface
SGMII	serial gigabit media independent interface
STP	shielded twisted pair (wiring)
UTP	unshielded twisted pair (wiring)
Vbatt	power supply for the ECUs present in a communication network (12 V nominal)
WUP	wake-up pulses

5. REQUIRED TEST CIRCUIT

5.1 Primary and Monitor Devices Under Test (DUTs)

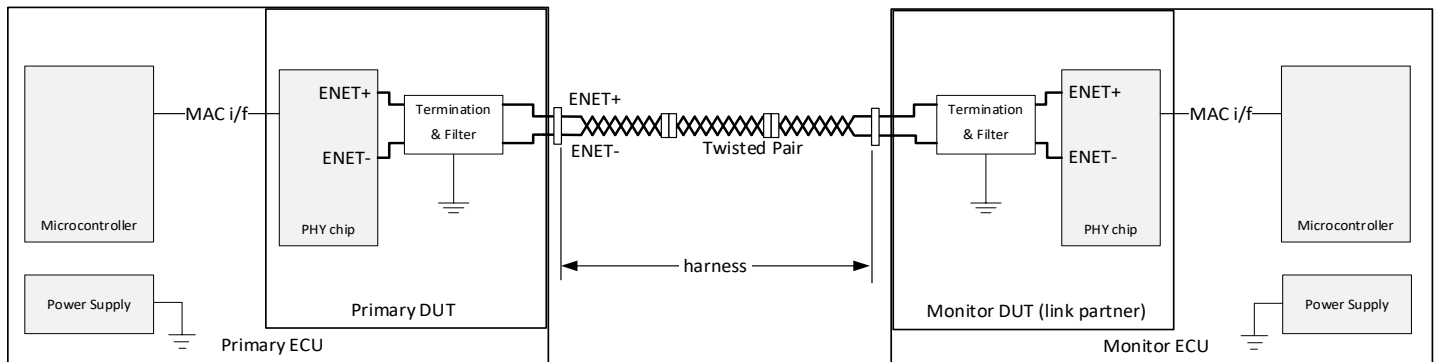


Figure 1 - Example of typical testing setup

5.1.1 Microcontroller Based DUT Behavior

5.1.1.1 The monitor DUT is the link partner to the primary DUT (see [Figure 1](#)).

5.1.1.2 The monitor DUT initiates traffic and indefinitely reattempts communication.

5.1.1.3 The primary DUT responds to traffic initiated from the monitor DUT.

5.1.1.4 Data transmission shall be a minimum of 90% of the available bandwidth in both directions.

5.1.1.5 The primary DUT configuration settings and registers shall be the same throughout all testing phases (i.e., there are no special settings for a particular test). Certain test modes (such as low-power mode) that might allow different settings shall be documented in the test procedure.

5.1.1.6 The monitor DUT configuration settings and registers shall be the same throughout all testing phases (i.e., there are no special settings for a particular test).

5.1.1.7 For devices with multiple MAC interfaces, the tests for RF disturbance immunity (see [Section 11](#)), nearby RF disturbance immunity (see [Section 12](#)), and radiated emissions (see [Section 8](#)) need to be tested for each interface separately.

5.1.1.8 For multiport devices, all ports need to be tested with each MAC configuration in the tests for RF disturbance immunity (see [Section 11](#)), nearby RF disturbance immunity (see [Section 12](#)), and radiated emissions (see [Section 8](#)). All active ports need to be enabled.

5.1.1.9 At least two samples of the primary DUT shall be tested. The preference is that three samples should be tested through the whole suite of tests.

- Any failures in the primary DUT samples shall be considered a failure (as described in [5.4.3](#)) for compliance according to this SAE Recommended Practice.
- If the monitor DUT is identical in design and configuration to the primary DUT, it shall be considered the second sample for all tests except electrostatic discharge (ESD), bulk current injection (BCI), and nearby RF.

5.1.1.10 The primary DUT shall provide a means to determine link status. The method shall be one of the following:

- The link indication status LED that can be observed via closed circuit camera or oscilloscope during testing. The link indication shall remain on while the link partners are actively linked in communications. The link status shall be off when the link-up has been lost.
- The primary DUT board shall provide a means to read the PHY link status via an interface that could be observed outside the test chamber. One example is to provide an interface that could be used to send status registers over fiber optic cable to outside the test chamber.

5.1.1.11 The primary DUT shall provide a means to determine fault status. The method shall be one of the following:

- The fault indication status LED that can be observed via closed circuit camera or oscilloscope during testing. The fault indication shall remain on while the fault is present. The fault indication shall be off when no faults are present.
- The primary DUT board shall provide a means to read the PHY fault status via an interface that could be observed outside the test chamber. One example is to provide an interface that could be used to send status registers over fiber optic cable to outside the test chamber.

5.1.1.12 The primary DUT settings for PSD shall be set to the same level throughout all tests. The specific setting shall be measured and documented in the test report.

5.1.1.13 Electromagnetic shielding shall be documented for the primary and monitor DUTs.

- The preferred shielding would be plastic or no enclosure.
- If metal shielding is used, then the details about grounding of the enclosure shall be documented.

5.1.2 Primary and Monitor DUT Application Circuit

The MDI interface circuit for the primary and monitor DUTs should be similar. The diagram in [Figure 2](#) is for illustrative reference. The PHY vendor shall recommend the optimal circuit design that performs best with the chipset. This includes impedance balance, tolerance stack-up, and other design characteristics. The optimal design shall be documented in the test report.

The interface circuit (including ESD) components shall be selected to comply with IEEE MDI return loss requirements.

See [Appendix A](#) for informative guidelines regarding board layout.

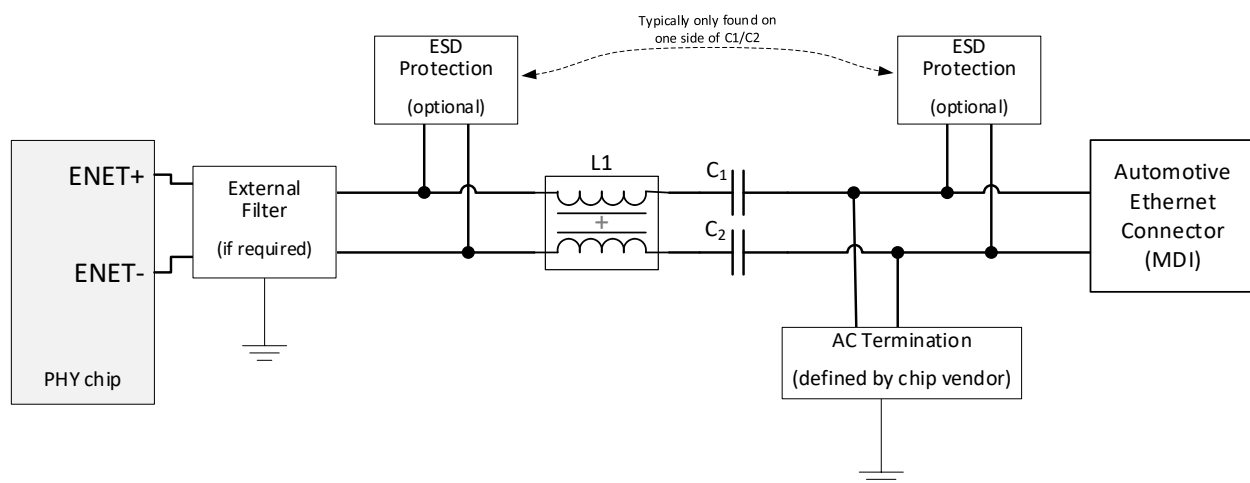


Figure 2 - Primary DUT or monitor DUT example circuit (informative)

Table 1 - Typical PHY interface component values

Ref	Typical Value	Tolerance	Voltage Rating	Comments
L1 (100 Mbps)	~200 μ H	Refer to OPEN Alliance for requirement	≥ 50 V	Automotive CMC
C1, C2 (100 Mbps)	100 nF	$\pm 10\%$	≥ 100 V	
L1 (1 Gbps)	~80 μ H to ~100 μ H	Refer to OPEN Alliance for requirement	≥ 50 V	Optional with shielded twisted pair as recommended by chipset vendor
C1, C2 (1 Gbps)	10 nF, 100 nF	$\pm 10\%$	≥ 100 V	As determined by the PHY vendor

5.2 Primary and Monitor DUT ESD Protection Options

PHY vendor shall propose one or more ESD protection options (including no external components).

The PHY vendor shall clearly document each ESD protection option so that developers may use the reference design in their product development. The documentation shall include schematics, component selection, and board layout guidance.

5.3 Network Harness Requirements

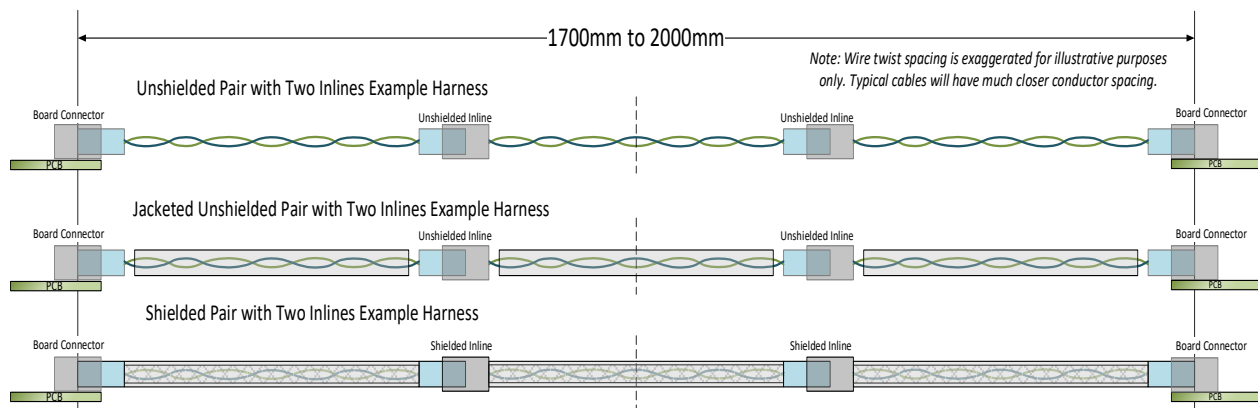
The test circuit consists of a cable that conforms to cable properties listed in Clause 96.7 (100 Mbps) and/or Clause 97.6 (1 Gbps) of the latest published version of IEEE 802.3.

5.3.1 Cable for 10 Mbps, 100 Mbps, or 1 Gbps

The test cable shall be 1.7 to 2.0 m in overall length and include two in-line connectors equally spaced in the cable sample (see [Figure 3A](#) for example). These in-line interconnects represent a typical vehicle wiring harness, and also shall be required for the inductive coupled immunity testing (see Section [10](#)). Each cable segment which makes up the cable harness shall have a length within 10% of the length of the other two segments.

The cable harness with the two in-lines shall be used for all the tests. A second harness may be used in inductive coupled immunity testing (see Section [10](#)), which allows the removal of the connector plastic shell. All test harnesses shall be assembled according to the requirements listed above.

For devices with multiple communications interfaces, each interface shall have wiring with in-line connectors to the link partner. All communication lines shall be actively communicating during testing.

**Figure 3A - Double inline cable harness examples**

The cable properties, connector designations, and configuration details shall be included in the final test report. A supplier shall confirm that the DUT passes with at least one of the cable systems described in this section. More cable types may be tested and documented at the supplier's discretion. A supplier might include results for shielded and unshielded cables or various different connector/cable brands. Each cable type tested shall be fully documented in the test report.

5.3.2 100 Mbps (Refer to IEEE 802.3 - Clause 96.7) Link Segment Properties

- Unshielded without jacket (UTP): Preferred cable type.
- Jacketed and unshielded (JUTP): If only tested with jacket, then jacket will be required for using this PHY in future applications.

5.3.3 1 Gbps (Refer to IEEE 802.3 - Clause 97.6) Link Segment Properties

- JUTP: Preferred cable type.
- Shielded twisted pair (STP): If only tested with shield, then shield will be required for this PHY to be used in future applications.

5.3.4 Cable for 2.5 Gbps, 5.0 Gbps, or 10 Gbps (Multigigabit)

The test cable shall be 1.7 to 2.0 m in overall length and include one in-line connector near the middle in the cable sample (see [Figure 3B](#) for example). These in-line interconnect represents a typical vehicle wiring harness, and also shall be required for the inductive coupled immunity testing (see Section [10](#)).

The cable harness with the one in-line shall be used for all the tests at speed grades above 1 Gbps. A second harness may be used in inductive coupled immunity testing (see Section [10](#)), which allows the removal of the connector plastic shell. All test harnesses shall be assembled according to the requirements listed above.

For devices with multiple communications interfaces, each interface shall have wiring with in-line connectors to the link partner. All communication lines shall be actively communicating during testing.

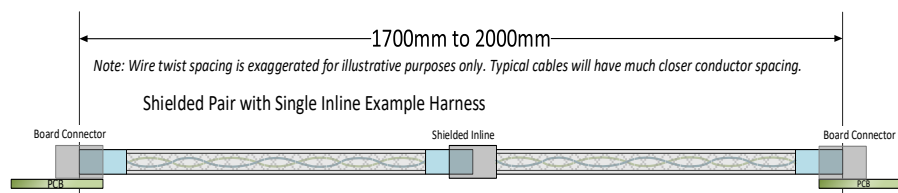


Figure 3B - Single inline cable harness example

The cable properties, connector designations, and configuration details shall be included in the final test report. A supplier shall confirm that the DUT passes with at least one of the cable systems described in this section. More cable types may be tested and documented at the supplier discretion. As an option, a supplier might include results for shielded and unshielded cables or various different connector/cable brands. Each cable type tested shall be fully documented in the test report.

5.3.5 2.5 Gbps (Refer to IEEE 802.3 - Clause 149.7) Link Segment Properties

- STP

5.3.6 5.0 Gbps (Refer to IEEE 802.3 - Clause 149.7) Link Segment Properties

- STP

5.3.7 10.0 Gbps (Refer to IEEE 802.3 - Clause 149.7) Link Segment Properties

- STP

5.4 Pass/Fail Acceptance Methodology

Non-normative method description: For communications channels, it is expected that the traffic flow is not adversely affected by external electromagnetic compatibility (EMC) noise sources.

With respect to active mode communications, there is little difference between packet loss and linkup status. When the link is active and the PHYs are “linked” together as shown by a status indicator of the PHY chipset, then the amount of interference that disrupts individual packets is very near to disabling the link status completely. Therefore, for the purpose of this document, link loss should be considered the same as packet loss.

The following sections define the acceptance methodology used in this document. The final acceptance requirements are as described in [5.4.3](#), [5.4.4](#), and [5.4.5](#)

5.4.1 Waveform Comparison Pass/Fail Criteria

The following are the pass/fail acceptance criteria for potentially destructive testing for handling ESD (see [6.2](#)), active ESD (see [6.3](#)), active DCC (see Section [7](#)), and BCI (see Section [9](#)). The following requirements shall be met after the test has completed. Since the tests could potentially affect the circuitry of the DUTs, a comparison of output waveforms is done to ensure no damage has occurred to the MDI circuit.

The DUT shall generate a pattern of repeated transitions for pre- and post-test comparison. Before and after test scope plots shall be provided with test results. Set the scope as per [Table 2](#). The plots shall contain at least one “+1” to “-1” edge and one “-1” to “+1” edge.

- All after-test plots shall be compared with the pre-test plot taken before the test.
- The overlay of the pre-test and after-test plots shall not deviate by more than $\pm 10\%$ of the measured peak-to-peak voltage of the pre-test plot, as shown in [Figure 5](#).
- Each DUT shall have a unique set of plots for comparison (i.e., post-test plots for DUT#2 shall not be compared with the pre-test plots for DUT#1).

Test point is as shown in [Figure 4](#). The primary DUT shall be the generic PHY as shown in [5.1.2](#); the monitor DUT shall be a 100 Ω passive differential termination. (Each line is 50 Ω passive termination to ground.) The test point is measured at the termination. All DUTs to be evaluated shall have waveform plots measured before and after testing. Intermediate plots are optional and would help the testing authority to determine if certain tests led to degradation of the circuitry.

Table 2 - Test mode reporting settings

PHY	10BASE-T1	100BASE-T1	1000BASE-T1	2.5/5.0/10 Gbps
Test Mode Pattern	Mode 1	Mode 2	Mode 2	Mode 2, Square Wave
Scope Horizontal Setting	100 ns/div	10 ns/div	5 ns/div	5 ns/div
Scope Vertical Setting ⁽¹⁾⁽²⁾	0.2 V/div	0.2 V/div	0.2 V/div	0.2 V/div

⁽¹⁾ The full peak-to-peak waveform shall be shown on the plot even if the vertical setting must be adjusted.

⁽²⁾ When adjusting vertical setting, all plots in the report shall be shown at the same scaling for vertical and horizontal settings for comparison.

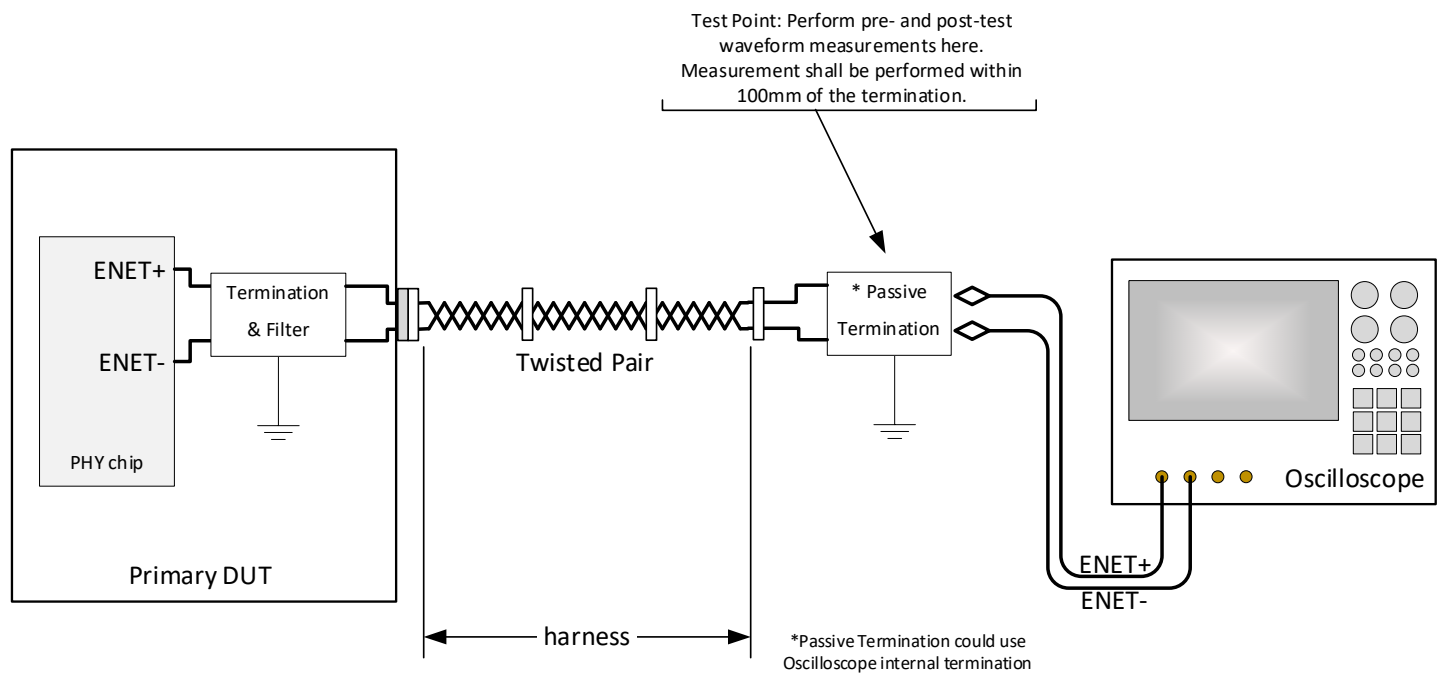


Figure 4 - ESD circuit configuration for waveform measurement

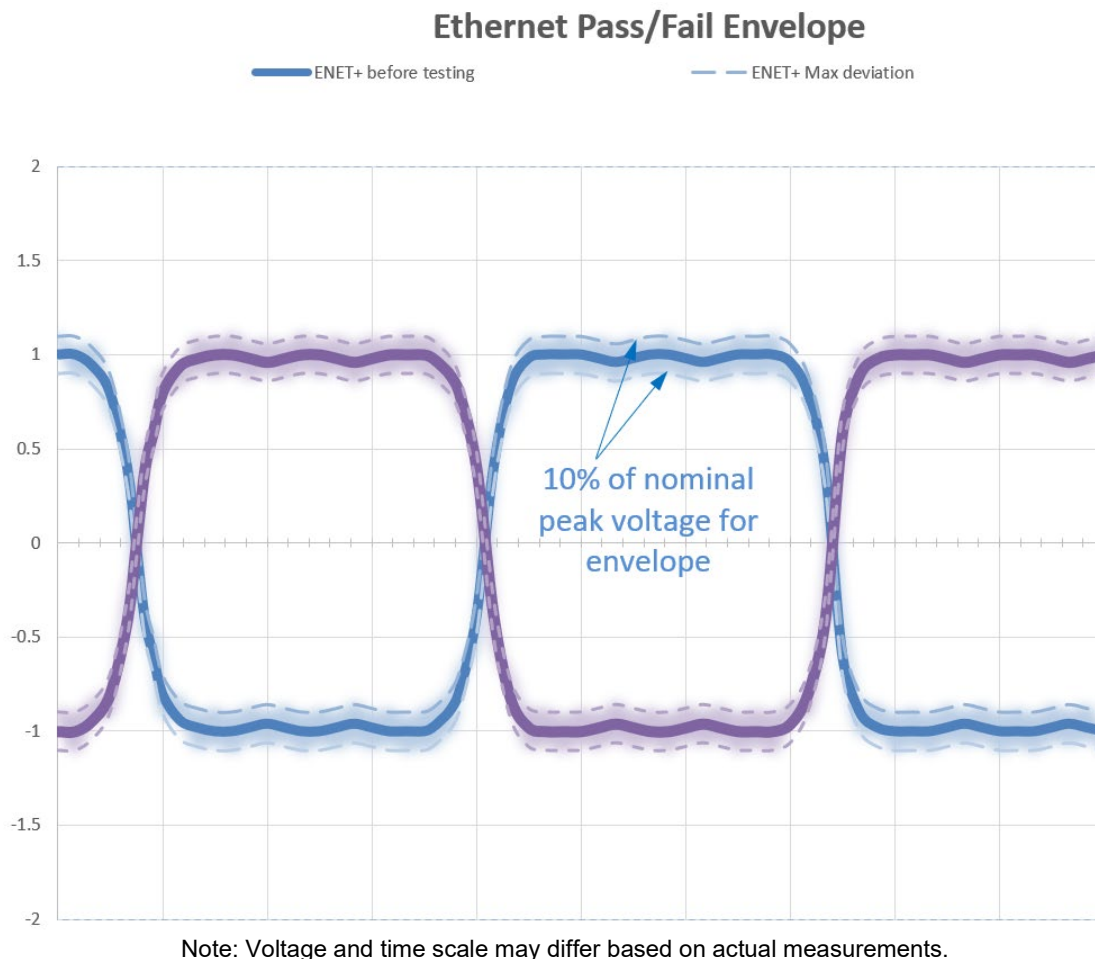


Figure 5 - Waveform plot example - pass fail criteria for before/after plots

5.4.1.1 Waveform Performance Testing Procedure

Place chipset in test mode as listed in [Table 1](#) and measure the waveform at the connector pins of the monitor DUT in order to get a stable/repeatable signal. While in the test mode, the waveform plot might only show two levels (not multiple PAM levels).

5.4.1.2 Acceptance Criteria

5.4.1.2.1 Prior to any potential destructive testing of the DUTs, each DUT shall be measured according to the setup shown in [Figure 4](#) to determine a baseline pre-test measurement.

5.4.1.2.2 The pre-test peak voltage measurements shall be used to set the $\pm 10\%$ region. For example, if the peak voltage measured in pre-testing is 1.1 V (peak), then the post-test measurements shall not deviate more than 0.11 V from the original waveform sample in order to be judged as passing.

5.4.1.2.3 Referring to the diagram in [Figure 5](#), the post-test sample waveform shall not deviate more than 10% of nominal peak signal voltage after testing has been performed.

5.4.1.2.4 Intermediate plots should be taken throughout the testing procedures, but only the final plot for each DUT shall be required in the documentation report along with the initial pre-test plot.

5.4.2 Communications Disruption Pass/Fail Criteria

The primary and monitor DUTs shall be placed in the testing chamber according to the test setups described in Sections [9](#), [10](#), [11](#), and [12](#). The DUTs shall be set up to communicate as according to [5.1.1.2](#) and [5.1.1.3](#). The DUTs shall be evaluated during testing to ensure that communications are not disrupted beyond the criteria described in [5.4.3](#) and [5.4.4](#).

5.4.2.1 Normal Operation Mode Test Sequence

During normal mode operation, the DUT(s) are expected to operate without failures (as defined in [5.4.3](#)) when exposed to an external interference field as described in the steps shown in [Figure 6](#).

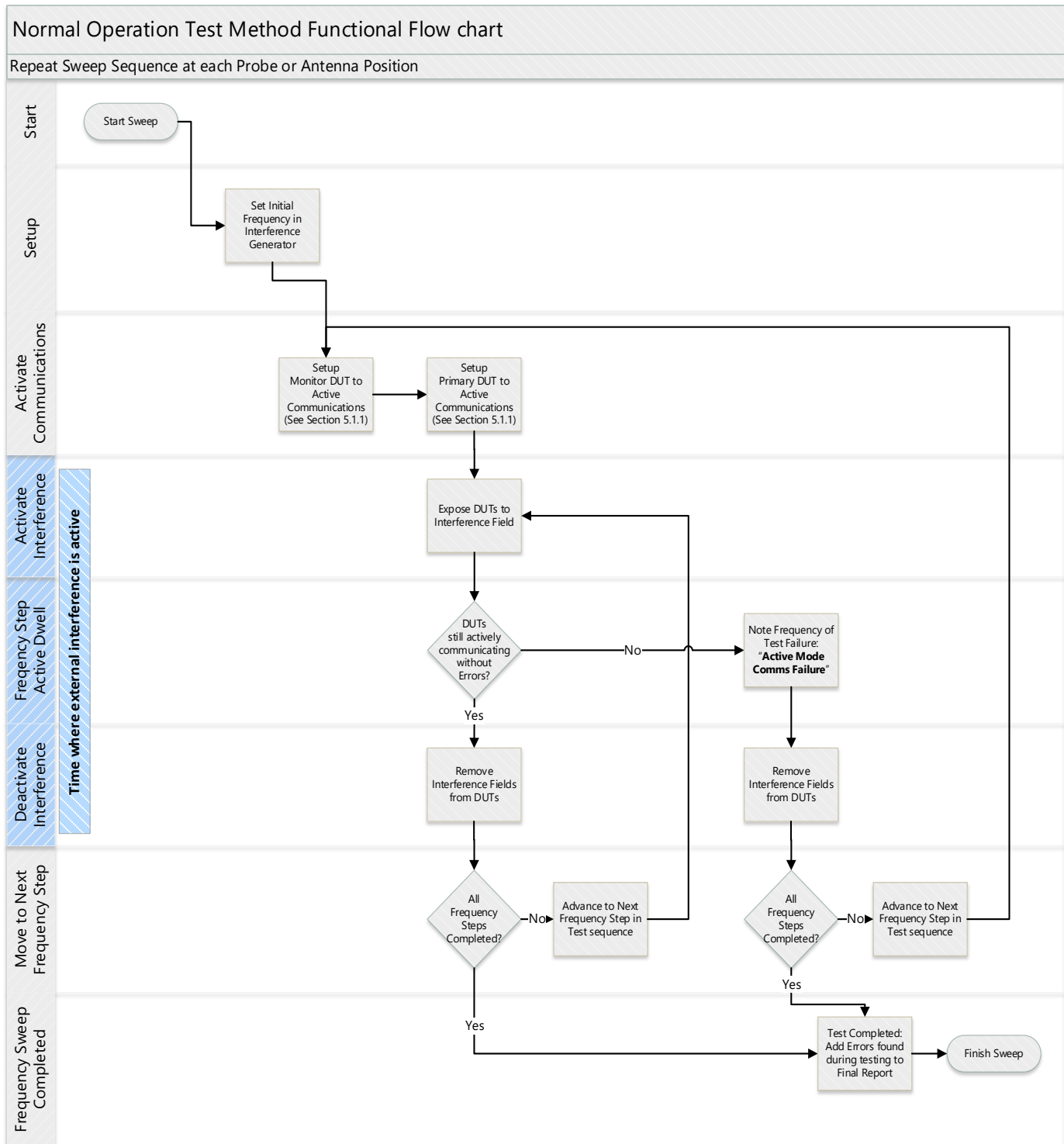


Figure 6 - Normal operation test method functional flow chart

5.4.3 Active Mode Pass/Fail Criteria

The acceptance criteria for non-destructive testing radiated emissions (see Section [8](#)), BCI (see Section [9](#)), inductive coupled immunity (see Section [10](#)), RF disturbance (see Section [11](#)), and nearby RF disturbance (see Section [12](#)) is as follows:

5.4.3.1 Acceptance Criteria

In order to have passing test results, all the following conditions shall be met:

- 5.4.3.1.1 PHY device damage is never acceptable.
- 5.4.3.1.2 User intervention (power cycle) is never acceptable during testing.
- 5.4.3.1.3 During testing, no unexpected reset of the primary or monitor DUT PHY shall be allowed.
- 5.4.3.1.4 No loss of link during testing. A link status LED indicator or an optical communications link outside of chamber shall be required for confirmation.

Non-normative note: Occasional loss of packets is allowed in the case of 10Base-T1S if communications recover without power cycling or resetting the primary DUT once the test sequence completes. Therefore, for the purpose of this document, link loss should be considered the same as packet loss with link self-recovery. The test plan should define what is acceptable means to report such losses.

5.4.4 Sleep Modes Sequences

5.4.4.1 Wake/Sleep Overview (Normative)

For devices that support wake/sleep, the immunity testing shall also include test cases for the low-power/sleep mode to ensure that the communications channel does not wake up inadvertently when sleeping, and also confirms that device does not enter sleep without being commanded.

Wake/sleep conformance shall be confirmed in testing for BCI (see Section [9](#)), RF disturbance (see Section [11](#)), and nearby RF disturbance (see Section [12](#)).

It shall possible to determine unambiguously the “active” or “sleep mode” states throughout the testing. Determining wake/sleep status may be accomplished in many ways, including, but not limited to:

- Observable change in current draw by the primary DUT.
- LED connected to INH output.
- Channel activity LEDs that indicate communications is occurring.
- Response message(s) received from primary DUT to monitor DUT could be monitored during test via optical link from equipment outside chamber.
- Message traffic counters (registers) could be monitored during test where a state change could be noted.
- TC10 register readings that indicate each port state(s) could be read via optical link from outside equipment.

5.4.4.1.1 Relevant Terms

- a. Unwanted sleep: During active mode testing, the exposure to external fields shall not cause the DUT to enter the low-power sleep mode. Typically, this should be caught during normal active mode testing. There is no need for a specific test here.
- b. Unwanted wake up: The DUT should be placed into sleep mode, and then the EMC interference pattern shall be injected through the full sweep similar to active mode testing. The DUT should not wake at any time throughout the sweep in order to pass this testing.
- c. Wanted wake up: At each frequency step in the sweep, the command to sleep is issued and confirmed prior to an external field being applied. Then, the external field is activated, and while in the presence of the field, the DUT shall be commanded by another link partner to wake (using a wake-up pulse [WUP]), which should exit low-power mode. In order to pass and move to next frequency step, the DUT shall wake. This testing could be very time consuming at all frequency steps due to setting the initial conditions for each step. Requirements should include timing allowed for successful wake up (i.e., it shall wake up in the presence of interference within the dwell time window, but not necessarily according to the strict timing in TC10).
- d. Wanted sleep: The DUT is placed in active mode at the beginning of each frequency step. Then, the external field is activated, and while in the presence of the field, a link partner should send a command to sleep while the external field is present. Failure would be that device does not enter low-power mode as commanded. Requirements should include timing allowed for successful sleep (i.e., it shall sleep in the presence of interference within the dwell time window, but not necessarily according to the strict timing in TC10).

5.4.4.2 DUT Configuration for Wake/Sleep

- The DUT and the PHY in the DUT shall be capable of being configured to wake on WUPs as defined in OPEN Alliance TC10.
- The DUT PHY shall be capable of being placed into sleep mode with wake ups enabled.
- A method to determine the active mode or sleep (low-power) state of the PHYs shall be easily determined during each testing phase.
- For switch devices with multiple ports, the test should only cover the case where all ports are in the same wake/sleep mode together. It should not be necessary to test individual port wake/sleep status.
- Individual ports shall not be evaluated for wake/sleep, but the entire switch (all ports) shall be expected to either remain in wake or sleep together. It shall not be required to test all the ports individually.

5.4.4.3 Separate Wake/Sleep Test Method Procedures (Normative)

5.4.4.3.1 Unwanted Sleep Test Sequence

The following test only applies to devices that support TC10 wake/sleep features. The purpose of this test is to ensure that the DUT does not enter sleep mode until requested by a TC10 sleep command. The normal mode test sequence should catch this error state, so no specific test sequence needs to be defined for this.