



40GBASET EMC

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Motivation

- Electrical systems must pass EMC testing.
- Use of shielded cable and connectors a first for 10G+ projects.
- Provide a test that exhibits the quality of magnetics, connectors and cables in a setup that is related to the required EMC test setup.
- If the setup passes the proposed test, proceed with the required EMC testing.

Proposed test to exhibit the EMI-suppression quality of magnetics, connectors and cables.

- Use the test setup and levels for conducted and radiated immunity per manufacturers' requirements.
- Provide a new test mode in the PHY:
 - Transmitters of the link partners are off.
 - Each link partner of the cable under test measures maximum 0 to peak voltage from user defined start time to user defined end time.
 - The voltages to test are:
 - Common mode voltage and
 - Differential mode voltage.
 - The two voltages are measured to a precision of TBD percent.
 - The test fails, if
 - the common mode voltage exceeds a threshold of TBD mV or
 - the differential mode voltage exceeds a threshold of TBD mV.
- Measurement precision and thresholds are determined by the manufacturer.
- Under user control, the PHY can be reset
 - for each test frequency. (The peak voltages are recorded for a detailed view of the induced voltages at each frequency.) OR
 - once at the start of a test. (The peak voltages are read at the end for a global view.)

10GBASET test for common-mode noise rejection

- 55.5.4.3 Common-mode noise rejection
 - This specification is provided to limit the sensitivity of the PMA receiver to common-mode noise from the cabling system. Common-mode noise generally results when the cabling system is subjected to electromagnetic fields.
 - The common-mode noise can be *simulated* using the cable clamp test defined in 40.6.1.3.3. A 6 dBm sine wave signal from 80 MHz to 1000 MHz can be used to *simulate* an external electromagnetic field. Operational requirements of the transceiver during the test are *determined by the manufacturer*. A system integrating a 10GBASE-T PHY may perform this test.
- Suggestion: drop this paragraph
 - Cable clamp test defined in 40.6.1.3.3. (GPHY standard!) does not “simulate” conditions during EMC-immunity tests.
 - Operational requirements not specified in IEEE but are specified in relevant EMC standards and determined by the manufacturers.
 - This additional test has questionable value for customer acceptance.