

Interpretation Number: 04-03/05
Topic: Isolation requirements
Relevant Clause: 8.3.2.1 and 12.10.1
Classification: Not a request for interpretation

Interpretation Request

Recently, I was informed that the following tests have to perform on Notebook Computer, but didn't realize what purpose of the test criteria, and how to do.

To get you clear picture, I also attached the testing setup Condition (tested at from conductive parts to LAN signal pins), which is requested by clients, for your reference. Besides, could you please specify what's meaning of the followings? And are test criteria and test setup condition properly applied to Notebook Computer with built-in LAN card?

- MAU:
- AUI cable:
- Coaxial:

As far as Product Safety's (IEC 60950:1999) views, LAN (Local Area Network) is considered a SELV (Safety Extra Low Voltage <42.4Vdc or <60 Vrms) circuit, since it is just data transmission line under very low Working voltage (3~ 5Vdc max), and there is no probability that isolation break down would occur by outdoor/outside electrical shock/lightning.

From IEC standard's point, page 209, table 18, as attached, it is No requirement to do Electrical Strength or 500Vac max if applicable. Therefore, pls help advise the appropriate testing criteria on Notebook Computer, for me.

IEEE 802.3

Clause 8.3.2 MAU Electrical Characteristics

Clause 8.3.2.1 Electrical Isolation

The MAU must provide isolation between thw AUI cable and coaxial trunk cable. This isolation shall withstand at least one of the following electrical strength tests:

- a) 1500Vrms at 50~60 Hz for 60s, applied as specified in 5.3.2 of IEC 60950:1991.
- b) 2250Vdc for 60s, applied as specified in 5.3.2 of IEC 60950:1991
- c) -----

There shall be no isolation breakdown, as defined in 5.3.2 of IEC 60950:1991, during the test. The resistance after the test shall be at least 2M ohm, measured at 500Vdc....

IEEE 802.3

Clause 12.10 Safety

Clause 12.10.1 Isolation (which is the same requirement as clause 8.3.2.1)

Let me summary my question for you and IEEE committee review.

Background

1. This issue happened to Notebook Computer with built-in LAN device.
2. NB industrial request Electric isolation test for Notebook Computer, which is based on IEEE standard, clause 12.10.1 (at first was clause 8.3.2.1)
3. The clause 12.10.1 (or clause 8.3.2.1) states the test is derived from IEC 950 standard (One of Product Safety criteria)

Impact:

1. Notebook computer with built-in LAN device can't pass the test
2. Notebook computers have to modify all the design, but it is hard to comply with requirements of EMC/ EMI (Electric Magnetic

Compatibility/ Immunity)

Clarification:

1. Clarify the test criteria derived from IEEE (clause 12.10.1 and clause 8.3.2.1) whether apply to NB equipment
2. Clarify the test criteria derived from IEC 950 (clause 5.3.2) whether are consistent with IEEE committee

According to IEC 950 standard, the Electric strength for isolation verification test is not necessary, and only if the working voltage of equipment exceeds 42.4Vdc or 60Vrms then the electric strength will apply. As attached IEC standard, clause 5.3.2, it is no need to perform the test or 500Vac max.

As well-known of LAN device, there is no hazardous voltage exists and it is generally working at 3 to 5 volt. From Safety's (IEC 950) view, we consider the LAN a Safety Extra Low Voltage Circuit which is always working under 42.4Vdc or 60Vrms. Instead, modem devise will consider a Telecommunication Network Voltage circuit which is probably working at 120Vrms to 150 Vrms. In this case, isolation is indeed required to separate from user accessible parts. In other works, 1000Vac (1500Vac for Norway or Sweden because different power distribution system) test will be required for worldwide regulatory requirements. Besides, the sufficient isolation distance is needed as well.

Note – The first two paragraphs of this request were modified from that received to remove reference to company names and clients not relevant to the request.

Interpretation for IEEE Std 802.3-2002

This request is being returned to you because the questions asked do not constitute a request for interpretation but instead a request for consultation. Generally, an interpretation request is submitted when the wording of a specific clause or portion of a standard is ambiguous or incomplete. The request should state the two or more possible interpretations or the lack of completeness of the text. While you referred to subclause 8.3.2.1 and 12.10.1, you have not indicated any problem with the text.