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IEC Tests Set Tough Standards for Surge Immunity

by Jim Fowler, Patton Electronics Company

The tests designed by the IEC to insure the surge immunity of CE marked products are enough to give manufacturers of “knock-off” data line surge suppressors quite a jolt. They are certainly rigorous enough to separate the contenders from the pretenders in the worldwide surge suppression arena. Here are some specifics about the test requirements, for those who wish to be “grounded” in the facts.

Electrostatic Discharge Test (IEC 801.2)

There are four (4) ESD threat levels described in the 801.2 standard. Level 4 is the most severe condition described where equipment is tested with a directly coupled discharge of 8kV and a radiated discharge of 15kV. IEC 801.2 also specifies the current waveform of the ESD with a fast 0.7 to 1.0 ns rise time and a second peak at 30 ns. The equipment under this test must withstand a transient of 60 ns total duration. The total energy in the pulse is a few hundred microjoules.

Electrical Fast Transient Test (IEC 801.4)

Since EFT is a threat on both power and data lines, the 801.4 has described testing criteria for both. The 801.4 test consists of a series of high speed voltage bursts with a rise time of 5 ns and a total duration of 50ms. These bursts are inserted at a repetition of 5kHz for peak voltages less than 1 kV and at a rate of 2.5kHz for peak voltages of 2kV. The burst length is 15ms with the burst repeated every 300 ms. That means 37.5 pulses at 2kV repeated every 300 ms for one minute. Like the 801.2 tests, there are four levels of severity. For data line environments, 2kV is the maximum threat level according to the standard.

Surge Immunity Test (IEC 801.5)

A few surge waveforms are specified in IEC 801.5, including an open circuit voltage waveform of $1.2 \times 50 \mu\text{s}$ and a short circuit current waveform of $8 \times 20 \mu\text{s}$. Unlike the usual four severity levels defined by the other standards, IEC 801.5 spells out five levels of stress. The fifth level applies specifically to devices that are connected to "Telecommunications Cable and Overhead Power Lines".

Conclusion

The specific manner of application of these tests to surge protectors is that the device must continue to operate after being subjected to the 801.2 and 801.4 tests. Then, it must not only continue to operate, but must clamp 100% of its energy rating without failure during the 801.5 test. Patton secondary surge protectors are rated to at least IEC Level 1 (0.5 KV), and are able to handle energy at this stress level consistently—without failure.

About Patton

Patton Electronics Company is a leading US manufacturer and marketer of data communications equipment,

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including last mile access products, remote access products, short range modems, interface converters and network surge protectors. Patton products are available through a worldwide network of Authorized Patton Distributors, as well as through Patton's own Datacom *Direct* Catalog. The Patton Electronics Web site (www.patton.com) features Patton's Online Catalog, new product information, technical documentation and articles covering many facets of data communications. Patton Electronics is an ISO 9001 certified and BABT approved manufacturer. Patton products are CE marked for sale in EC member countries. For more information or a free data communications catalog, please contact Patton Electronics Company, 7622 Rickenbacker Drive, Gaithersburg, MD, 20879, USA. Phone **(301) 975-1000**. Fax **(301) 869-9293**. Email sales@patton.com. World Wide Web <http://www.patton.com>.