Working Group 3.6.2
Low Voltage Solid State Surge Protective Device Components Working Group

Designation: C62.33-1982

Sponsor: IEEE Power & Energy Society/Surge Protective Devices/Low Voltage

Reaffirmation status and year: 2000

Title: IEEE Standard Test Specifications for Varistor Surge-Protective Devices

Status: Approved Publication of IEEE

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History: BD APP: Sep 17, 1981, ANSI APP: Jul 01, 1983

Abstract: Varistors for surge-protective applications on systems with dc to 420 Hz frequency and voltages equal to or less than 1000 V rms, or 1200 V dc, are covered. Definitions, service conditions, and a series of test criteria for determining the electrical characteristics of the varistors are provided. The tests are intended as design tests and provide a means of comparing various surge-protective devices.

Keywords: varistor, surge protective, devices, R88

Designation: PC62.33

Sponsor: IEEE Power & Energy Society/Surge Protective Devices/Low Voltage

Title: Standard Test Specifications for Varistor Surge-Protective Devices

Status: Revision Project

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History: PAR APP: Mar 21, 2002

Project scope: This revision will apply to varistor components for surge protection: Transient overvoltages EFT ESD System voltages up to 1000 vac Applications up to 100mHz, tests of both polarities Statistical life
evaluations Characteristics of construction evaluation: Monolithic multilayer surface mount Lead

Project purpose: Original This test specification has been developed for the purpose of testing and comparing varistor type surge protective devices. The varistor device is a surge diverter used for limiting transient over voltages in power and communication circuits. Two types of material have been used for many years, silicon carbide, primarily in high voltage arresters, and metal oxide varistors. The interest in low voltage varistors has grown with the trend to highly sophisticated electrical and electronic devices which are exposed to surges from the environment. Initially, there were no standard terms or tests to define or compare these devices. The IEEE Surge Protection Devices Committee formed its Low Voltage Surge Protection Devices Working Group in 1970 to define these parameters. Experts were drawn from many fields in communications and power utilities, electronic manufacturers and users, test equipment manufacturers and laboratories, and producers of varistors themselves. The requirements, experiences and vocabularies of these representatives were melded to produce this document as a guide to potential users of varistor surge protective devices. Proposed

Purpose 1. To include new technology that has come into existence that was not available when C62.33 was last written. 2. Review the Terms and Descriptions to determine if they are sufficient for all the mediums of zinc-oxide Varistors. Maybe some should be added, some deleted (e.g. Will the symbol for multi-layer Varistors be the same as leaded Varistors?). 3. Evaluate the current test topologies to determine if they need updating, eliminated, or other test techniques need to be added (e.g. Multi-layer Varistors are geared toward ESD protection applications). 4. Update and include reliability testing of Varistors (e.g. Use or modify the accelerated aging procedure in C62.34 or C62.11).
Abstract: A two-terminal avalanche junction surge suppressor for surge-protective application on systems with dc to 420-Hz frequency and voltages equal to or less than 1000 V rms or 1200 V dc is considered. The device is a single package that may be assembled from any combination of series and/or parallel diode chips. Definitions, service conditions, and a series of test criteria for determining its electrical characteristics are provided. These devices are used as surge diverters for limiting transient overvoltages in power and communications circuits.

Keywords: Transients, Semiconductor device testing, Power system transients, Avalanche diodes
used to protect sensitive IC components & equipment. Standardized test
methods are needed to insure component performance when subjected to fast
transient events such as ESD and EFT.

Designation: C62.35

Sponsor: IEEE Power & Energy Society/Surge Protective Devices/Low Voltage

Title: Standard Test Specifications for Avalanche Junction Semiconductor
Surge Protective Devices

Status: Superseded

History: PAR APP: Sep 16, 1999

Project scope: Add new test methods for device characterization that are
required for high frequency circuit applications and multiple components
within a single package. These tests will require updating the document to
include new terms, definitions, and device description. Some specific test
methods to be added are ESD Limiting Voltage, Crosstalk, Insertion Loss,
Signal Line Balance, Simultaneous Surge, and Bit error Rate.

Project purpose: These test methods are required to characterize the device
for applications in high speed circuits and determine the effects of data
loss due to crosstalk and insertion loss. Additionally, these tests will
provide the designer with protection effectiveness of the component when
used to protect sensitive IC components & equipment. Standardized test
methods are needed to insure component performance when subjected to fast
transient events such as ESD and EFT.
Title: IEEE Standard Test Specification for Thyristor Diode Surge Protective Devices

Status: Approved Publication of IEEE

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Abstract: This standard applies to two or three terminal, four or five layer, thyristor surge protection devices (SPDs) for application on systems with voltages equal to or less than 1000 V rms or 1200 V dc.

Keywords: test specification, thyristor surge protective devices
Working Group Number 3.6.2 – 1 – LV Solid State SPD Components

Designation: C62.37.1-2000

Sponsor: IEEE Power & Energy Society/Surge Protective Devices/Low Voltage

Title: IEEE Guide for the Application of Thyristor Surge Protective Devices

Status: Approved Publication of IEEE, Published Date: Apr 18, 2001

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Project scope: This Guide is intended to complement the IEEE Standard Test Specification for Thyristor Diode Surge Protective Devices (ANSI/IEEE C62.37-1996) The definitions used are the same. This publication contains information on basic function and component description, general terms and definitions, electrical environment, comparative SPD technologies, parameter interpretation and application, example designs.

Project purpose: This application guide applies to Thyristor Surge Protective Devices components used in systems with voltages up to 1000Vrms or 1200Vdc. These components are designed to limit overvoltages and divert surge currents by limiting the voltage and switching to a low impedance actions. Although telecommunication circuits are the main application of Thyristor SFDs, this guide will also provide useful information for other protection applications. When properly applied it protects telecommunication circuits from failure and damage.

Abstract: Applications information on fixed voltage and gated thyristor surge protective devices(SFDs) are provided. Key device parameters and their sensitivities are explained. Several worked telecommunication circuit design examples are given.

Keywords: "application guide, telecommunication circuits, thyristor surge protection devices"
Working Group Number 3.6.2 – 1 – LV Solid State SPD Components

Designation:  PC62.39

Sponsor: IEEE Power & Energy Society/Surge Protective Devices/Low Voltage

Title: Test Methods for Self-Restoring Current Limiter Components used in Telecommunication Surge Protectors

Status: New Standard Project

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Project scope: This standard sets terms, test methods and measurement procedures for series connected, self-restoring current limiter components used in low-voltage telecommunication circuit surge protectors. It is only applicable for components in telecommunications circuits with voltages equal to or less than 1000 V rms or 1200 V dc. The self-restoring current limiters covered by this standard have the following properties: · Excessive current causes a transition from a low-resistance state to a high-resistance state · Reverts to a low-resistance state when the excessive current ends · Directly operated by the current flow through the component · Solid-state (no moving parts) · Withstands specified levels of impulse · Withstands specified AC voltage levels when in the high-resistance state Examples of this type of current limiter technology are positive temperature coefficient step-function thermistors of ceramic or polymeric material and silicon semiconductor based electronic circuits. This standard does not cover self-restoring current limiter components used in other applications, such as heaters, inrush-current limiters or sensing devices. Current interrupting type components, which reduce the current to zero by a mechanical circuit break, are not covered by this standard. In this standard, a telecommunications circuit is a circuit that uses metallic conductors to handle the remote transmission of information, such as data, communications and signalling.

Project purpose: The test criteria and terms of this standard provide a means of component comparison and a common engineering language for users and manufacturers of self-restoring current limiter components intended for use in low-voltage telecommunication circuit surge protectors. The test and measurement of low-voltage telecommunication (data, communications, and signalling) surge protectors is given in IEEE Standard C62.36. This standard provides the corresponding component tests for the surge protector non-surge and active tests.
Designation: PC62.69

Sponsor: IEEE Power & Energy Society/Surge Protective Devices/Low Voltage

Title: Standard Specifications for Self-Restoring Current Limiter Components used in Telecommunication Surge Protectors

Status: New Standard Project

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Project scope: This standard provides performance criteria and tables of preferred values for performance for series-connected, self-resetting current limiter components used in low-voltage telecommunication circuit surge protectors. It is only applicable for components in telecommunications circuits with voltages equal to or less than 1000 V rms or 1200 V dc. The test circuits used for performance measurement are from IEEE PC62.39 (Test Methods for Self-Restoring Current Limiter Components used in Telecommunication Surge Protectors) The self-restoring current limiters covered by this standard have the following properties: · Excessive current causes a transition from a low-resistance state to a high-resistance state · Reverts to a low-resistance state when the excessive current ends · Directly operated by the current flow through the component · Solid-state (no moving parts) · Withstands specified levels of impulse · Withstands specified AC voltage levels when in the high-resistance state Examples of this type of current limiter technology are positive temperature coefficient step-function thermistors of ceramic or polymeric material and semiconductor based electronic circuits. This standard does not cover self-resetting current limiter components used in other applications, such as heating, inrush-current limiting or temperature sensing. Current interrupting type components, which reduce the current to zero by a mechanical circuit break, are not covered by this standard. In this standard, a telecommunications circuit is a circuit that uses metallic conductors to handle the remote transmission of information, such as data, communications and signalling.

Project purpose: The performance values of this standard provide a means of component specification for users and manufacturers of self-restoring current limiter components intended for use in low-voltage telecommunication circuit surge protectors. The specification of low-voltage telecommunication (data, communications, and signaling) surge protectors is given in IEEE Standard C62.64. This standard provides the corresponding component specifications for the surge protector current limiting and transmission specifications.
PC62.33 - Standard Test Specifications for Varistor Surge-Protective Devices
31 December 2008

PC62.35 - Standard Test Specifications for Avalanche Junction Semiconductor Surge Protective Devices
31 December 2007

PC62.37.1 - Guide for the Application of Thyristor Surge Protective Device Components
31 December 2010

31 December 2010.

31 December 2010