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IEEE Standard for Test Methods and Performance Values for Metal-Oxide Varistor Surge Protective Components

IEEE Power and Energy Society

Sponsored by the
Surge Protective Devices Committee

IEEE
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USA

IEEE Std C62.33™-2016
(Revision of IEEE Std C62.33-1982)

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Approved 7 December 2016

IEEE-SA Standards Board

Abstract: Test methods and preferred values for metal-oxide varistor (MOV) surge protective components are covered in this standard and have the following main parameter ranges: packaging (leaded disc-type or surface mount), nominal varistor voltage (5 V to 1200 V), 8/20 surge current rating (10 A to 70 kA), and 8/20 clamping voltage (10 V to 3 kV). With appropriate component selection, these components could be used for the overvoltage protection of power and signal systems having continuous ac voltages (2.5 V rms to 750 V rms), steady-state dc voltages (3.3 V to 1000 V), and peak signal feed voltages (3.5 V to 850 V). Information is given on manufacturer type testing used to determine environmental performance and rated values.

Keywords: clamping voltage, ESD, IEEE C62.33™, leaded, MCOV, metal-oxide varistor, MOV, nominal voltage, surface mount, surge current rating, TOV, varistor

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PDF: ISBN 978-1-5044-3802-5 STD22454
Print: ISBN 978-1-5044-3803-2 STDPD22454

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Introduction

This introduction is not part of IEEE Std C62.33-2016, IEEE Standard for Test Methods and Performance Values for Metal-Oxide Varistor Surge Protective Components.

This test method document has been developed for the purpose of testing and comparing metal-oxide varistor (MOV) surge protective components.

An MOV is a surge diverter used for limiting transient overvoltages in power and communications circuits.

The interest in low-voltage varistors has grown with the trend to highly sophisticated electrical and electronic devices that 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.

Contents

IEEE Standard for Test Methods and Performance Values for Metal-Oxide Varistor Surge Protective Components

1. Scope

This standard covers test methods and performance values for metal-oxide varistor (MOV) surge protective components (SPCs) with the following main parameter ranges:

— Packaging: Leaded disc-type or surface mount

— Nominal varistor voltage: 5 V to 1200 V

— 8/20 surge current rating: 10 A to 70 kA

— 8/20 clamping voltage: 10 V to 3 kV

With appropriate component selection, these components could be used for the overvoltage protection of power and signal systems having the following:

— Continuous ac voltages: 2.5 V rms to 750 V rms

— Steady-state dc voltages: 3.3 V to 1000 V

— Peak signal feed voltages: 5 V to 850 V

Information is given on manufacturer type testing used to determine environmental performance and rated values.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

IEC 60060-2:2010, High voltage test techniques – Part 2: Measuring systems.[1]

IEC 61000-4-2:2001, Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test.

[1]IEC publications are available from the International Electrotechnical Commission (http://www.iec.ch) and the American National Standards Institute (http://www.ansi.org/).