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IEEE Standard for the Surge Parameters of Isolating Transformers Used in Networking Devices and Equipment

IEEE Power and Energy Society

Sponsored by the
Surge Protective Devices Committee

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IEEE Std C62.69™-2016

IEEE Standard for the Surge Parameters of Isolating Transformers Used in Networking Devices and Equipment

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IEEE Power and Energy Society

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Abstract: Terms, test methods, test circuits, measurement procedures, and preferred result values for the surge mitigation parameters of isolating transformers used in networking devices and equipment are set in this standard. Three types of isolating transformer are considered: mains low frequency power, high frequency power (switching mode power supplies) and signal (e.g., Ethernet data).

Keywords: 1.2/50, breakdown, IEEE C62.69™, impulse voltage, insulation, insulation resistance, lightning overvoltage, surge, transformer

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Introduction

This introduction is not part of IEEE Std C62.69™-2016, IEEE Standard for the Surge Parameters of Isolating Transformers Used in Networking Devices and Equipment.

Optical fiber to the home has been gradually replacing the wire feed telephone service since about 2005. Fiber to the home deployment rapidly increased from 2010 onward. Along with the increase of installations there was a reported increase in the failures of home networking equipment [B27], [B28], and [B24] due to lightning overvoltages.[1] Failures of the Ethernet Local Area Network (LAN) ports have been attributed to use of inappropriate surge protective devices (SPDs) and lack of insulation coordination, which caused the breakdown of transformers, associated wiring, and connectors. This is a global problem with home networking equipment failures being reported in Japan [B26] and the U.S. [B23].

[1] The numbers in brackets correspond to those of the bibliography in Annex A.

Contents

IEEE Standard for the Surge Parameters of Isolating Transformers Used in Networking Devices and Equipment

1. Overview

1.1 Scope

This standard sets terms, test methods, test circuits, measurement procedures, and preferred result values for the surge parameters of isolating transformers used in networking devices and equipment. Three types of isolating transformer are considered: mains low frequency power, high frequency power (switching mode power supplies) and signal (e.g., Ethernet data). The surge parameters of the isolating transformer insulation barrier covered by this standard are as follows:

— Rated impulse voltage

— Input winding to output winding capacitance

— Insulation resistance

Additional parameters for signal isolating transformers are as follows:

— Core saturation voltage-time product

— Rated input winding rms current for a given temperature rise