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American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

Amendment 1: Test Site Validation

C63®

Accredited Standards Committee C63® — Electromagnetic Compatibility

Accredited by the
American National Standards Institute

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ANSI C63.4a-2017
(Amendment to ANSI C63.4-2014)

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Secretariat
Institute of Electrical and Electronics Engineers, Inc.

Approved 15 September 2017
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Abstract: U.S. consensus standard methods are specified in Annex D of this amendment for validating standard test sites and alternative test sites used for measurement of radiated radio-frequency (RF) signals and noise emitted from electrical and electronic devices in the frequency range of 30 MHz to 1 GHz. In addition, various updates are made to equations in 4.5, Annex F, Annex G, and Annex N.

Keywords: Annex D, ANSI C63.4, normalized site attenuation, NSA, site attenuation, site validation

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Introduction

This introduction is not part of ANSI C63.4a-2017, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz—Amendment 1: Test Site Validation.

Following several recent interpretation requests, in late 2015 the ASC C63® Main Committee directed ASC C63® Subcommittee 1 to prepare a fast-track amendment primarily concerned with Annex D on test site validations of the 2014 edition of ANSI C63.4 (ANSI C63.4-2014). The scope of this fast-track amendment project was limited mainly to topics raised by the interpretation requests. At the time that this amendment was developed, a separate routine maintenance project for ANSI C63.4-2014 overall was also in progress in ASC C63® Subcommittee 1; other issues and topics outside the scope of this amendment project may be considered in that ANSI C63.4 overall review and revision project. This amendment forms a permanent addition to ANSI C63.4, and as such it is subject to the ASC C63® normal maintenance procedures for any future updates. The contents of this amendment are not expected to be changed by the other ANSI C63.4 revision project that is ongoing at the time of preparation of this document.

This amendment mainly updates the test site validation procedures in Annex D in ANSI C63.4-2014 and corrects equations in several annexes. At the May 2017 meeting of ASC C63®, another addition to the amendment was approved. This addition corrected the value of the separation distance between the receiving antenna and the equipment under test. The latter correction brought it back to what was in previous editions of ANSI C63.4. Hence, this amendment combines changes in the Annex D test site evaluation, corrections to equations in annexes, and a correction to a separation distance value in the main body of the standard.

The more significant updates to Annex D consist of the following:

— Corrected the equation for calculating the measured NSA value [i.e., Equation (D.1) of ANSI C63.4-2014]

— Added text to clarify the single-position NSA geometry for validation of standard test sites, which previously was indicated mainly by the measurement setup figures and NSA tables

— Added requirements for maximum frequency step size for both the discrete frequency method and the swept frequency method; also quantified the existing requirement for the receive antenna height scan rate for the swept frequency method

— For the swept frequency method, added the requirement to report in tabular format those measured NSA values that are within 1 dB of the site acceptability criterion

— Removed the provision from D.3 for moving the antenna inward from the periphery for the left and right positions in horizontal polarization

— Added equations to be used for calculating theoretical NSA for an ideal site, which can be used for frequencies and/or geometries other than those listed in the tables

— Expanded the tables of theoretical NSA for an ideal site by adding values for a 5 m measurement distance (for example, CISPR 32:2015 [B53] allows a 5 m measurement distance),[a] for greater transmit antenna heights (for validating test volumes taller than 2 m), and for the frequency increments specified in the measurement procedures subclauses (i.e., D.4 and D.5)

— Updated the figures and added a top-view figure for vertical polarization [i.e., Figure D.3 b)], depicting the re-orientations of the transmit antenna and the receive antenna for the left and right positions of the transmit antenna

[a] Numbers in brackets correspond to those of the bibliography in Annex O of ANSI C63.4-2014.

In addition to the Annex D changes, updates to various equations in Annex F, Annex G, and Annex N and the antenna to equipment under test separation distance value in 4.5 of ANSI C63.4-2014 are provided in this amendment.

Based on a recently issued interpretation,[b] the measurement distance criterion for electric field strength measurements (1 GHz to 40 GHz) with horn antennas in 4.5.5 (and in table footnotes in 4.5.1) of ANSI C63.4-2014 is modified to as it was in the 1992 edition of ANSI C63.4, and consistent with CISPR 16-1-4[c] and CISPR 16-2-3 [B14].

[b] Clause 4.5 Horn antenna aperture, June 2017 (http://c63.org/documents/misc/posting/new_interpretations.htm).

[c] Information on references can be found in Clause 2 of ANSI C63.4-2014.

Contents

List of Tables and Figures