



American National Standard Guide for Construction of Open-Area Test Sites for Performing Radiated Emission Measurements

Accredited by the American National Standards Institute

Sponsored by the
Accredited Standards Committee on Electromagnetic Compatibility, C63

IEEE
3 Park Avenue
New York, NY 10016-5997, USA
7 April 2006

ANSI C63.7-2005
(Revision of ANSI C63.7-1992)

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Secretariat

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Approved 7 October 2005

American National Standards Institute

Abstract: Information that is useful in constructing an open-area test site used to perform radiated emission measurements in the frequency range of 30 MHz to 1000 MHz is provided. Final validity of the test site can only be made by performing site attenuation measurements as described in ANSI C63.4-2003.

Keywords: emission measurement, open-area test sites, radiated emission measurement

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3 Park Avenue, New York, NY 10016-5997, USA

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Print: ISBN 0-7381-4907-1 SH95518
PDF: ISBN 0-7381-4908-X SS95518

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Introduction

This introduction is not part of ANSI C63.7-2005, American National Standard Guide for Construction of Open-Area Test Sites for Performing Radiated Emission Measurements.

ANSI C63.4, American National Standard Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz, has undergone several revisions since the original document covering methods of measurement was produced in 1940. While many improvements were made in this standard up to the current version published in early 2004, the reproducibility of measurements or radiated interference from one open-area test site (OATS) to another had not been completely satisfactory.

In 1982, a concerted effort was organized in Subcommittee One of Accredited Standards Committee C63, to determine how the OATS technique could be improved. Evidence showed that the variability at the time was due, in part, to inadequate: a) control of the site ground plane conductivity, its flatness, site enclosure effects, and certain other characteristics; b) accounting for antenna factors, associated cabling, and balun and equipment under test (EUT) characteristics; and c) consideration of mutual coupling effects between the EUT and the receiving antennas and their images in the conducting ground plane. Accordingly, after over five years of deliberations and investigations, ANSI C63.4 was revised. In the same year, ANSI C63.5 (American National Standard for Radiated Emission Measurements in Electromagnetic Interference (EMI) Control—Calibration of Antennas), ANSI C63.6 (American National Standard for Open Area Test Site Measurements—Guide for Computation of Errors), and ANSI C63.7 (American National Standard Guide for Construction of Open Areas Test Sites for Performing Radiated Emission, Measurements) were first published. All of this occurred in 1988.

In 1992, the next edition of ANSI C63.7 was published. That update included improvements to the text resulting from experience testing at an OATS, which even today serves as the reference test site for performing radiated emission measurements. These measurements continue to be used to determine product compliance to radiated emission limits, although there are other test facilities that are used such as semianechoic chambers, which replicate an OATS as both have conductive ground planes and both are validated using the normalized site attenuation technique contained in ANSI C63.4.

This edition of ANSI C63.7 further improves on the 1992 edition by clarifying and elaborating how: a) cables from the receiving antenna should be routed; b) the metal conducting ground plane should be treated when exposed to the weather; c) choices can be made for the ground plane material; and d) the slope of the ground plane affects the test site.

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