BS EN 61000-4-2:2009

BSI Standards Publication

Electromagnetic compatibility (EMC)

Part 4-2 : Testing and measurement techniques — Electrostatic discharge immunity test

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National foreword

This British Standard is the UK implementation of EN 61000-4-2:2009. It is identical to IEC 61000-4-2:2008. It supersedes BS EN 61000-4-2:1995, which will be withdrawn on 1 March 2012.

The UK participation in its preparation was entrusted by Technical Committee GEL/210, EMC - Policy committee, to Subcommittee GEL/210/12, EMC basic, generic and low frequency phenomena Standardization.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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English version

Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test

(IEC 61000-4-2:2008)

Compatibilité électromagnétique (CEM) - Partie 4-2: Techniques d'essai et de mesure - Essai d'immunité aux décharges électrostatiques (CEI 61000-4-2:2008)

Elektromagnetische Verträglichkeit (EMV) - Teil 4-2: Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen die Entladung statischer Elektrizität (IEC 61000-4-2:2008)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 77B/574/FDIS, future edition 2 of IEC 61000-4-2, prepared by SC 77B, High frequency phenomena, of IEC TC 77, Electromagnetic compatibility, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61000-4-2 on 2009-03-01.

This European Standard supersedes EN 61000-4-2:1995 + A1:1998 + A2:2001.

The main changes with respect to EN 61000-4-2:1995 are the following:

– the specifications of the target have been extended up to 4 GHz. An example of target matching these requirements is also provided;

– information on radiated fields from human-metal discharge and from ESD generators is provided;

– measurement uncertainty considerations with examples of uncertainty budgets are given too.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2009-12-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2012-03-01

Annex ZA has been added by CENELEC..

Endorsement notice

The text of the International Standard IEC 61000-4-2:2008 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 61000-6-1	NOTE Harmonized as EN 61000-6-1:2007 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60050-161	-[1)]	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-	-
IEC 60068-1	-[1)]	Environmental testing - Part 1: General and guidance	EN 60068-1	1994[2)]

[1)] Undated reference.

[2)] Valid edition at date of issue.

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INTRODUCTION

IEC 61000-4 is a part of the IEC 61000 series, according to the following structure:

Part 1: General

General consideration (introduction, fundamental principles)

Definitions, terminology

Part 2: Environment

Description of the environment

Classification of the environment

Compatibility levels

Part 3: Limits

Emission limits

Immunity limits (in so far as they do not fall under the responsibility of the product committees)

Part 4: Testing and measurement techniques

Measurement techniques

Testing techniques

Part 5: Installation and mitigation guidelines

Installation guidelines

Mitigation methods and devices

Part 6: Generic standards

Part 9: Miscellaneous

Each part is further subdivided into several parts, published either as international standards or as technical specifications or technical reports, some of which have already been published as sections. Others will be published with the part number followed by a dash and a second number identifying the subdivision (example: IEC 61000-6-1).

This part of IEC 61000 is an International Standard which gives immunity requirements and test procedures related to electrostatic discharge.

ELECTROMAGNETIC COMPATIBILITY (EMC) ±

Part 4-2: Testing and measurement techniques ± Electrostatic discharge immunity test

1 Scope

This part of IEC 61000 relates to the immunity requirements and test methods for electrical and electronic equipment subjected to static electricity discharges, from operators directly, and from personnel to adjacent objects. It additionally defines ranges of test levels which relate to different environmental and installation conditions and establishes test procedures.

The object of this standard is to establish a common and reproducible basis for evaluating the performance of electrical and electronic equipment when subjected to electrostatic discharges. In addition, it includes electrostatic discharges which may occur from personnel to objects near vital equipment.

This standard defines:

– typical waveform of the discharge current;
– range of test levels;
– test equipment;
– test setup;
– test procedure;
– calibration procedure;
– measurement uncertainty.

This standard gives specifications for test performed in "laboratories" and "post-installation tests" performed on equipment in the final installation.

This standard does not intend to specify the tests to be applied to particular apparatus or systems. Its main aim is to give a general basic reference to all concerned product committees of the IEC. The product committees (or users and manufacturers of equipment) remain responsible for the appropriate choice of the tests and the severity level to be applied to their equipment.

In order not to impede the task of coordination and standardization, the product committees or users and manufacturers are strongly recommended to consider (in their future work or revision of old standards) the adoption of the relevant immunity tests specified in this standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050(161), *International Electrotechnical Vocabulary (IEV) ± Chapter 161: Electromagnetic compatibility*

IEC 60068-1, *Environmental testing ± Part 1: General and guidance*

3 Terms and definitions

For the purposes of this part of IEC 61000, the following terms and definitions apply and are applicable to the restricted field of electrostatic discharge; not all of them are included in IEC 60050(161) [IEV].

3.1
air discharge method
method of testing in which the charged electrode of the test generator is moved towards the EUT until it touches the EUT

3.2
antistatic material
material exhibiting properties which minimize charge generation when rubbed against or separated from the same or other similar materials

3.3
calibration
set of operations which establishes, by reference to standards, the relationship which exists, under specified conditions, between an indication and a result of a measurement

NOTE 1 This term is based on the "uncertainty" approach.

NOTE 2 The relationship between the indications and the results of measurement can be expressed, in principle, by a calibration diagram.

[IEV 311-01-09]

3.4
conformance test
test on a representative sample of the equipment with the objective of determining whether the equipment, as designed and manufactured, can meet the requirements of this standard

3.5
contact discharge method
method of testing in which the electrode of the test generator is kept in contact with the EUT or coupling plane and the discharge is actuated by the discharge switch within the generator

3.6
coupling plane
metal sheet or plate, to which discharges are applied to simulate electrostatic discharge to objects adjacent to the EUT; HCP: Horizontal Coupling Plane; VCP: Vertical Coupling Plane

3.7
degradation (of performance)
undesired departure in the operational performance of any device, equipment or system from its intended performance

NOTE The term "degradation" can apply to temporary or permanent malfunction.

[IEV 161-01-19]

3.8
direct application
application of the discharge directly to the EUT

3.9
electromagnetic compatibility (EMC)
ability of an equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment

[IEV 161-01-07]