

Integrated circuits — Measurement of electromagnetic emissions, 150 kHz to 1 GHz —

Part 1: General conditions and definitions

The European Standard EN 61967-1:2002 has the status of a
British Standard

ICS 31.200

National foreword

This British Standard is the official English language version of EN 61967-1:2002. It is identical with IEC 61967-1:2002.

The UK participation in its preparation was entrusted to Technical Committee EPL/47, Semiconductors, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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**Integrated circuits -
Measurement of electromagnetic emissions,
150 kHz to 1 GHz
Part 1: General conditions and definitions
(IEC 61967-1:2002)**

Circuits intégrés -
Mesure des émissions électromagnétiques,
150 kHz à 1 GHz
Partie 1: Conditions générales et définitions
(CEI 61967-1:2002)

Integrierte Schaltungen -
Messung von elektromagnetischen
Aussendungen im Frequenzbereich
von 150 kHz bis 1 GHz
Teil 1: Allgemeine Bedingungen
und Definitionen
(IEC 61967-1:2002)

This European Standard was approved by CENELEC on 2002-05-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

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

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Foreword

The text of document 47A/632/FDIS, future edition 1 of IEC 61967-1, prepared by SC 47A, Integrated circuits, of IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61967-1 on 2002-05-01.

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) 2003-02-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2005-05-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annexes A, B and C are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61967:2002 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61000-4-3	NOTE	Harmonized as EN 61000-4-3:1996 (modified).
IEC 61000-4-6	NOTE	Harmonized as EN 61000-4-6:1996 (not modified).
IEC 61967-4	NOTE	Harmonized as EN 61967-4:2002 (not modified).

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INTEGRATED CIRCUITS – MEASUREMENT OF ELECTROMAGNETIC EMISSIONS, 150 kHz to 1 GHz –

Part 1: General conditions and definitions

1 Scope

This part of IEC 61967 provides general information and definitions on measurement of conducted and radiated electromagnetic disturbances from integrated circuits. It also provides a description of measurement conditions, test equipment and set-up as well as the test procedures and content of the test reports. A test method comparison table is included as annex A to assist in selecting the appropriate measurement method(s).

The object of this standard is to describe general conditions in order to establish a uniform testing environment and obtain a quantitative measure of RF disturbances from integrated circuits (IC). Critical parameters that are expected to influence the test results are described. Deviations from this standard are noted explicitly in the individual test report. The measurement results can be used for comparison or other purposes.

Measurement of the voltage and current of conducted RF emissions or radiated RF disturbances, coming from an integrated circuit under controlled conditions, yields information about the potential for RF disturbances in an application of the integrated circuit.

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*

CISPR 16-1:1999, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1: Radio disturbance and immunity measuring apparatus*

CISPR 25:1995, *Limits and methods of measurement of radio disturbance characteristics for the protection of receivers used on board vehicles*

ANSI C63.2:1996, *American Standard for Electromagnetic Noise and Field Strength Instrumentation, 10 Hz to 40 GHz – Specifications*

3 Definitions

For the purpose of this part of IEC 61967, the following definitions, taken mostly from IEC 60050(161), apply.

3.1

artificial network

AN

agreed reference load impedance (simulated), presented to the EUT by networks (for example, extended power or communication lines) across which the RF disturbance voltage is measured and which isolates the apparatus from the power supply or loads in that frequency range

[IEV 161-04-05, modified]

3.2

associated equipment

transducers (for example, probes, networks and antennas) connected to a measuring receiver or test generator; also transducers (for example, probes, networks, and antennas) which are used in the signal or disturbance transmission path between an EUT and measuring equipment or a (test-) signal generator

3.3

auto sweep

fastest calibrated sweep which a spectrum analyser will automatically select based on start frequency, stop frequency, resolution bandwidth and video bandwidth

3.4

broadband emission

emission which has a bandwidth greater than that of a particular measuring apparatus or receiver

[IEV 161-06-11, modified]

3.5

common mode voltage

asymmetrical voltage

mean of the phasor voltages appearing between each conductor and a specified reference, usually earth or frame

[IEV 161-04-09]

3.6

common mode current

in a cable having more than one conductor, including shields and screens, if any, the magnitude of the sum of the phasors representing the currents in each conductor

[IEV 161-04-39]

3.7

conducted emissions

transients and/or other disturbances observed on the external terminals of a device during its normal operation

3.8

continuous disturbance

RF disturbance with a duration of more than 200 ms at the IF-output of a measuring receiver, which causes a deflection on the meter of a measuring receiver in quasi-peak detection mode which does not decrease immediately

[IEV 161-02-11, modified]

3.9
device under test
DUT

device, equipment or system being evaluated

NOTE As used in this standard, DUT refers to a semiconductor device being tested.

3.10
die shrink

amount of shrink of the mask used to produce the integrated circuit (IC) expressed as a percentage or dimensions relative to the original artwork layout (drawn size)

3.11
differential mode current

in a two-conductor cable, or for two particular conductors in a multi-conductor cable, half the magnitude of the difference of the phasors representing the currents in each conductor

[IEV 161-04-38]

3.12
differential mode voltage

voltage between any two of a specified set of active conductors

[IEV 161-04-08]

3.13
discontinuous disturbance

for counted clicks, disturbance with a duration of less than 200 ms at the IF-output of a measuring receiver, which causes a transient deflection on the meter of a measuring receiver in quasi-peak detection mode

[IEV 161-02-28, modified]

3.14
electrically small PCB

printed circuit board, whose dimension is smaller than $\lambda/2$, for example, 100 mm to 150 mm at 1 GHz

3.15
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]

3.16
electromagnetic emission

phenomenon by which electromagnetic energy emanates from a source

3.17
electromagnetic radiation
radiated emissions

1. phenomena by which energy in the form of electromagnetic waves emanates from a source into space
2. energy transferred through space in the form of electromagnetic waves

[IEV 161-01-10]