

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

Part 2: Measurement of radiated emissions — TEM cell and wideband TEM cell method

The European Standard EN 61967-2:2005 has the status of a
British Standard

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National foreword

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

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 22, an inside back cover and a back cover.

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**Integrated circuits -
Measurement of electromagnetic emissions, 150 kHz to 1 GHz
Part 2: Measurement of radiated emissions -
TEM cell and wideband TEM cell method
(IEC 61967-2:2005)**

Circuits intégrés -
Mesure des émissions
électromagnétiques, 150 kHz à 1 GHz
Partie 2: Mesure des émissions
rayonnées -
Méthode de cellule TEM et
cellule TEM à large bande
(CEI 61967-2:2005)

Integrierte Schaltungen -
Messung von elektromagnetischen
Aussendungen im Frequenzbereich
von 150 kHz bis 1 GHz
Teil 2: Messung der abgestrahlten
Aussendungen -
TEM-Zellen- und Breitband-TEM-
Zellenverfahren
(IEC 61967-2:2005)

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 47A/722/FDIS, future edition 1 of IEC 61967-2, 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 61967-2 on 2005-09-01.

This part of EN 61967 is to be read in conjunction with EN 61967-1.

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) | 2006-07-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2008-09-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61967-2:2005 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 61000-4-20	NOTE	Harmonized as EN 61000-4-20:2003 (not modified).
CISPR 16-1-1	NOTE	Harmonized as EN 55016-1-1:2004 (not modified).
CISPR 16-1-2	NOTE	Harmonized as EN 55016-1-2:2004 (not modified).
CISPR 16-1-4	NOTE	Harmonized as EN 55016-1-4:2004 (not modified).
CISPR 16-1-5	NOTE	Harmonized as EN 55016-1-5:2004 (not modified).
CISPR 16-2-1	NOTE	Harmonized as EN 55016-2-1:2004 (not modified).
CISPR 16-2-2	NOTE	Harmonized as EN 55016-2-2:2004 (not modified).
CISPR 16-2-3	NOTE	Harmonized as EN 55016-2-3:2004 (not modified).
CISPR 16-2-4	NOTE	Harmonized as EN 55016-2-4:2004 (not modified).

CONTENTS

Foreword.....	2
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 General	6
5 Test conditions	6
5.1 General	6
5.2 Supply voltage.....	6
5.3 Frequency range	6
6 Test equipment.....	6
6.1 General	6
6.2 Shielding	6
6.3 RF measuring instrument	6
6.4 Preamplifier.....	7
6.5 TEM cell.....	7
6.6 Wideband TEM/GTEM cell	7
6.7 50-Ohm termination	7
6.8 System gain	7
7 Test set-up	7
7.1 General	7
7.2 Test configuration	7
7.3 Test PCB.....	8
8 Test procedure	11
8.1 General	11
8.2 Ambient measurement	11
8.3 DUT operational check	11
8.4 DUT emissions measurement	11
9 Test report	12
9.1 General	12
9.2 Measurement conditions	12
10 IC emissions reference levels	12
Annex A (informative) Example calibration & set-up verification sheet	13
Annex B (informative) TEM cell and wideband TEM cell descriptions	14
B.1 TEM cell.....	14
B.2 Wideband GTEM cell	14
Annex C (informative) Calculation of dipole moment from measured data.....	15
C.1 General	15
C.2 Dipole moment calculation	15

Annex D (informative) Specification of emissions data	17
D.1 General	17
D.2 Specification of emission levels.....	17
D.3 Presentation of results	17
D.4 Examples	17
Annex ZA (normative) Normative references to international publications with their corresponding European publications.....	22
Bibliography	20
Figure 1 – TEM cell test set-up.....	8
Figure 2 – GTEM cell test set-up	8
Figure 3 – IC Test printed circuit board.....	10
Figure D.1 – Emission characterization levels.....	18
Figure D.2 – Maximum Emission Level G8f.....	19
Table 1 – Pin loading recommendations	9

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

**Part 2: Measurement of radiated emissions –
TEM cell and wideband TEM cell method**

1 Scope

This test procedure defines a method for measuring the electromagnetic radiation from an integrated circuit (IC). The IC being evaluated is mounted on an IC test printed circuit board (PCB) that is clamped to a mating port (referred to as a wall port) cut in the top or bottom of a transverse electromagnetic (TEM) or wideband gigahertz TEM (GTEM) cell. The test board is not inside the cell, as in the conventional usage, but becomes a part of the cell wall. This method is applicable to any TEM or GTEM cell modified to incorporate the wall port; however, the measured radio frequency (RF) voltage will be affected by many factors. The primary factor affecting the measured RF voltage is the septum to IC test board (cell wall) spacing.

This procedure was developed using a 1 GHz TEM cell with a septum to floor spacing of 45 mm and a GTEM cell with average septum to floor spacing of 45 mm over the port area. Other cells may not produce identical spectral output but may be used for comparative measurements, subject to their frequency and sensitivity limitations. A conversion factor may allow comparisons between data measured on TEM or GTEM cells with different septum to floor spacing.

The IC test board controls the geometry and orientation of the operating IC relative to the cell and eliminates any connecting leads within the cell (these are on the backside of the board, which is outside the cell). For the TEM cell, one of the 50 Ω ports is terminated with a 50 Ω load. The other 50 Ω port for a TEM cell, or the single 50 Ω port for a GTEM cell, is connected to the input of a spectrum analyser or receiver that measures the RF emissions emanating from the integrated circuit and impressed onto the septum of the cell.

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 60050-131:2002, *International Electrotechnical Vocabulary (IEV) – Part 131: Circuit theory*

IEC 60050-161:1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

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

3 Terms and definitions

For the purposes of this document, the definitions in IEC 61967-1, IEC 60050-131 and IEC 60050-161 apply.

4 General

The RF voltage appearing at the input to the spectrum analyser is related to the electromagnetic radiation potential of the IC and of the electronic module of which it would be a part. The intent is to provide a quantitative measure of the RF emissions from ICs for comparison or other purposes.

5 Test conditions

5.1 General

The test conditions shall meet the requirements as described in IEC 61967-1. In addition, the following test conditions shall apply.

5.2 Supply voltage

The supply voltage shall be as specified by the IC manufacturer. If the users of this procedure agree to other values, they shall be documented in the test report.

5.3 Frequency range

The effective frequency range of this radiated emissions procedure is affected by the test cell used. For a 1 GHz TEM cell, the range is 150 kHz to 1 GHz. For a wideband TEM cell (GTEM), the range is 150 kHz to 1 GHz, or as limited by the GTEM and test PCB characteristics.

6 Test equipment

6.1 General

The test equipment shall meet the requirements as described in IEC 61967-1. In addition, the following test equipment requirements shall apply.

6.2 Shielding

Double shielded or semi-rigid coaxial cable may be required depending on the local ambient conditions. For extreme ambient environments, operation in a shielded room may be required.

6.3 RF measuring instrument

A spectrum analyser or EMI receiver shall be used. The spectrum analyser or receiver resolution bandwidth shall be 9 kHz or 10 kHz and the video bandwidth shall not be less than three times the resolution bandwidth. Measurements shall be made with a peak detector and presented in units of dB μ V [for 50 Ω system: (dBm readings) + 107 = dB μ V]. For spectrum analysers, the frequency band of interest shall be swept in calibrated or coupled mode (auto sweep).