

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Electroacoustics – Hearing aids –  
Part 13: Requirements and methods of measurement for electromagnetic  
immunity to mobile digital wireless devices**

**Électroacoustique – Appareils de correction auditive–  
Partie 13: Exigences et méthodes de mesure de l'immunité électromagnétique  
aux appareils numériques mobiles sans fil**



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INTERNATIONAL  
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COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**ELECTROACOUSTICS –  
HEARING AIDS –****Part 13: Requirements and methods of measurement  
for electromagnetic immunity to mobile digital wireless devices**

## FOREWORD

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International Standard IEC 60118-13 has been prepared by IEC technical committee 29: Electroacoustics.

This fifth edition cancels and replaces the fourth edition published in 2016 and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) it introduces a new measurement method and set of EMC requirements for hearing aids immunity to mobile digital wireless devices;
- b) generic EMC requirements for hearing aids are no longer included – should be covered by other standards as appropriate.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
29/1024/FDIS	29/1031/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60118 series, published under the general title *Electroacoustics – Hearing aids*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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## INTRODUCTION

This part of IEC 60118 specifies methods of measurement and requirements for hearing aid immunity to digital wireless devices. Most hearing aids contain digital signal processors and some can contain wireless transceivers.

Experience in connection with the use of hearing aids in recent times has identified digital wireless devices, such as wireless telephones and GSM mobile phones, as potential sources of disturbance for hearing aids. Interference in hearing aids depends on the emitted power from the digital wireless device as well as the immunity of the hearing aid. The performance criteria in this document will not totally ensure hearing aid users' interference- and noise-free use of wireless telephones, but will establish useable conditions in most situations.

In practice, a hearing aid user, when using a wireless telephone, will seek, if possible, to find a position on the ear, which gives minimum or no interference in the hearing aid. Various test methods have been considered for determining the immunity of hearing aids. When a digital wireless device is used close to a hearing aid, there is an RF near-field illumination of the hearing aid. However, validation investigations in preparing this document have shown that it is possible to establish a correlation between the measured far-field immunity level and the immunity level experienced by an actual hearing aid used in conjunction with a digital wireless device. The use of a far-field test has shown high reproducibility and is considered sufficient to verify and express the immunity of hearing aids. Near-field illumination of the hearing aid (i.e. by generating an RF field using a dipole antenna) could however provide valuable information during the design and development of hearing aids.

It is recognized that the new wireless products introduced have to coexist with existing spectra, potential networks and other wireless products (medical as well as non-medical). This revision does not address the issue of coexistence, and the user of this document shall consult applicable entities for guidance.

In this fifth edition of IEC 60118-13, the field strengths and hearing aid positioning during measurements have been updated for consistency with IEEE C63.19 [1]<sup>1</sup> and ANSI C63.19 [2]. The field strength levels used since the first edition of IEC 60118-13 was published in 1997 have demonstrated, through measurements of more than 1 000 hearing aid models (ref. European Hearing Instrument Manufacturers Association – EHIMA), to be sufficiently high to ensure well-functioning hearing aids in everyday use, with only a small expectation of a few complaints regarding interference from digital wireless devices.

Hearing aids where the outputs are non-acoustic, for example bone conduction hearing aids, are not directly included in this document, but this document can be used if precise descriptions of measurement setups for these types of hearing aids are given by the manufacturer.

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<sup>1</sup> Numbers in square brackets refer to the Bibliography

## ELECTROACOUSTICS – HEARING AIDS –

### Part 13: Requirements and methods of measurement for electromagnetic immunity to mobile digital wireless devices

#### 1 Scope

This part of IEC 60118 covers the relevant EMC phenomena for hearing aids. Hearing aid immunity to high frequency fields originating from digital wireless devices such as mobile phones was identified as one of the most relevant EMC phenomena impacting hearing aids.

#### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60118-0:2015, *Electroacoustics – Hearing aids – Part 0: Measurement of the performance characteristics of hearing aids*

IEC 60318-5, *Electroacoustics – Simulators of human head and ear – Part 5: 2 cm<sup>3</sup> coupler for the measurement of hearing aids and earphones coupled to the ear by means of ear inserts*

IEC 61000-4-3, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-20, *Electromagnetic compatibility (EMC) – Part 4-20: Testing and measurement techniques – Emission and immunity testing in transverse electromagnetic (TEM) waveguides*

#### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

##### 3.1 hearing aid

wearable instrument intended to aid a person with impaired hearing, usually consisting of a microphone, amplifier, signal processor and earphone, powered by a low-voltage battery, and possibly also containing an induction pick-up coil and which is fitted using audiometric and prescriptive methods

Note 1 to entry: Hearing aids can be placed on the body (BW), behind the ear (BTE), in the ear (ITE) or in the canal (ITC).