SLOVENSKI STANDARD

SIST EN 62209-1:2006

december 2006

Izpostavljenost ljudi elektromagnetnim sevanjem brezžičnih komunikacijskih naprav, ki se držijo v roki ali pritrdijo na telo - Modeli človeka, instrumenti in postopki - 1. del: Postopki za določanje stopnje specifične absorpcije (SAR) za ročne naprave, ki se uporabljajo v bližini ušesa (frekvenčno območje od 300 MHz do 3 GHz) (IEC 62209-1:2005)

Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz) (IEC 62209-1:2005)

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62209-1

July 2006

ICS 33.050.10

Supersedes EN 50361:2001

English version

Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)

(IEC 62209-1:2005)

Exposition humaine aux champs radiofréquence produits par les dispositifs de communications sans fils tenus à la main ou portés près du corps – Modèles de corps humain, instrumentation et procédures
Partie 1: Détermination du débit d'absorption spécifique (DAS) produit par les appareils tenus à la main et utilisés près de l'oreille (plage de fréquence de 300 MHz à 3 GHz)
(CEI 62209-1:2005)

Sicherheit von Personen in hochfrequenten Feldern von handgehaltenen und am Körper getragenen schnurlosen Kommunikationsgeräten – Körpermodelle, Messgeräte und Verfahren
Teil 1: Verfahren zur Bestimmung der spezifischen Absorptionsrate (SAR) von handgehaltenen Geräten, die in enger Nachbarschaft zum Ohr benutzt werden (Frequenzbereich von 300 MHz bis 3 GHz)
(IEC 62209-1:2005)

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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

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Ref. No. EN 62209-1:2006 E

Foreword

The text of the International Standard IEC 62209-1:2005, prepared by IEC TC 106, Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure, was submitted to the formal vote and was approved by CENELEC as EN 62209-1 on 2006-03-01 without any modification.

This European Standard supersedes EN 50361:2001.

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)	2007-03-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-03-01

Endorsement notice

The text of the International Standard IEC 62209-1:2005 was approved by CENELEC as a European Standard without any modification.

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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
ISO/IEC Guide	1995	Guide to the expression of uncertainty in measurement	-	-
ISO/IEC 17025	1999	General requirements for the competence of testing and calibration laboratories	EN ISO/IEC 17025[1)]	2000

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[1)] EN ISO/IEC 17025 is superseded by EN ISO/IEC 17025:2005, which is based on ISO/IEC 17025:2005.

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NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC

62209-1

Première édition
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Exposition humaine aux champs radiofréquence produits par les dispositifs de communications sans fils tenus à la main ou portés près du corps – Modèles de corps humain, instrumentation et procédures –

Partie 1: Détermination du débit d'absorption spécifique (DAS) produit par les appareils tenus à la main et utilisés près de l'oreille (plage de fréquence de 300 MHz à 3 GHz)

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Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HUMAN EXPOSURE TO RADIO FREQUENCY FIELDS FROM HAND-HELD AND BODY-MOUNTED WIRELESS COMMUNICATION DEVICES – HUMAN MODELS, INSTRUMENTATION, AND PROCEDURES –

Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)

FOREWORD

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International Standard IEC 62209-1 has been prepared by IEC technical committee 106: Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure.

The text of this standard is based on the following documents:

FDIS	Report on voting
106/84/FDIS	106/88/RVD

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

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

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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INTRODUCTION

The international committees IEC TC 106, CENELEC Technical Committee TC 106x WG1, and IEEE Standards Coordinating Committee 34 (SCC34) worked together informally through common membership to achieve the goal of harmonization, specifically between IEC TC 106 Project Team 62209 for the document "Procedure to Measure the Specific Absorption Rate (SAR) for Hand-Held Mobile Telephones in the Frequency Range of 300 MHz to 3 GHz" and IEEE SCC34 for the IEEE Std 1528 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques" [22][1].

During the process a primary effort involved was to harmonize these two standards

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[1] Numbers in square brackets refer to the bibliography.

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Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)

1 Scope

This International Standard applies to any electromagnetic field (EMF) transmitting device intended to be used with the radiating part of the device in close proximity to the human head and held against the ear, including mobile phones, cordless phones, etc. The frequency range is 300 MHz to 3 GHz.

The objective of this standard is to specify the measurement method for demonstration of compliance with the specific absorption rate (SAR) limits for such devices.

2 Normative references

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ISO/IEC Guide:1995, *Guide to the Expression of Uncertainty in Measurement*

ISO/IEC 17025:1999, *General requirements for the competence of testing and calibration laboratories*

3 Terms and definitions

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

3.1
attenuation coefficient
numerical factor intended to account for attenuation due to the human head or body tissue between the source and a specified point

3.2
average (temporal) absorbed power
value of the time-averaged rate of energy transfer given by

$$\overline{P}_{\text{avg}} = \frac{1}{t_2 - t_1} \int_{t_1}^{t_2} P(t)\,\mathrm{d}t$$

where

t_1 is the start time of the exposure in seconds;

t_2 is the stop time of the exposure in seconds;

$t_2 - t_1$ is the exposure duration in seconds;

$P(t)$ is the instantaneous absorbed power in watts;

$\overline{P}_{avg}$ is the average power in watts.

3.3
axial isotropy
the maximum deviation of the SAR when rotating around the major axis of the probe cover/case while the probe is exposed to a reference wave impinging from a direction along the probe major axis

3.4
basic restriction
restrictions on human exposure to time-varying electric, magnetic, and electromagnetic fields that are based directly on established health effects

NOTE Within the frequency range of this standard, the physical quantity used as a basic restriction is the specific absorption rate (SAR).

3.5
boundary effect (probe)
a change in the sensitivity of an electric-field probe when the probe is located close to (less than one probe-tip diameter) media boundaries

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3.6
complex permittivity
the ratio of the electric flux density in a medium to the electric field strength at a point. The permittivity of biological tissues is frequency dependent.

$$\varepsilon = \frac{|\vec{D}|}{|\vec{E}|} = \varepsilon_r \varepsilon_0$$

where

$\vec{D}$ is the electric flux density in coulombs per square metre;

$\vec{E}$ is electric field in volts per metre;

ε_0 is the permittivity of free space = 8,854 × 10^{-12} farads per metre;

ε_r is the complex relative permittivity: $\varepsilon_r = \varepsilon_r' - j\varepsilon_r'' = \varepsilon_r' + \dfrac{\sigma}{j\omega\varepsilon_0}$.

NOTE For an isotropic medium, the permittivity is a scalar quantity; for an anisotropic medium, it is a tensor quantity.

3.7
conducted output power
the average power supplied by a transmitter to the transmission line of an antenna during an interval of time sufficiently long compared with the period of the lowest frequency encountered in the modulation evaluated under normal operating conditions