SVENSK STANDARD SS-EN 62232

Fastställd	Utgåva	Sida	Ansvarig kommitté
2018-05-16	1	1 (1+242)	SEK TK 106

Bestämning av radiofrekvent fältstyrka, effekttäthet och SAR i närheten av radiobasstationer i syfte att bedöma exponering för elektromagnetiska fält

Determination of RF field strength, power density and SAR in the vicinity of radiocommunication base stations for the purpose of evaluating human exposure

Som svensk standard gäller europastandarden EN 62232:2017. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62232:2017.

Nationellt förord

Europastandarden EN 62232:2017

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62232, Second edition, 2017 - Determination of RF field strength, power density and SAR in the vicinity of radiocommunication base stations for the purpose of evaluating human exposure**

utarbetad inom International Electrotechnical Commission, IEC.

Beräkningsexempel till standarden finns att laddas ned i form av två Excel-filer från SEKs webbshop.

Tidigare fastställd svensk standard SS-EN 50383, utgåva 2, 2010, SS-EN 50383 AC1, utgåva 1, 2013, SS-EN 50400, utgåva 1, 2006, SS-EN 50400/A1, utgåva 1, 2013, SS-EN 50400 AC1, utgåva 1, 2012, SS-EN 50492, utgåva 1, 2008 och SS-EN 50492/A1, utgåva 1, 2014, gäller ej fr o m 2020-09-27.

ICS 13.280.00; 17.240.00

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
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Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

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Stora delar av arbetet sker internationellt

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Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62232

December 2017

ICS 13.280; 17.240

Supersedes EN 50383:2010, EN 50400:2006, EN 50492:2008

English Version

Determination of RF field strength, power density and SAR in the vicinity of radiocommunication base stations for the purpose of evaluating human exposure (IEC 62232:2017)

Détermination des champs de radiofréquences, densité de puissance et du DAS aux environs des stations de base utilisées pour les communications radio dans le but d'évaluer l'exposition humaine (IEC 62232:2017)

Bestimmung der HF-Feldstärke, der Leistungsdichte und der spezifischen Absorptionsrate (SAR) in der Nachbarschaft von Funkkommunikations-Basisstationen zur Ermittlung der menschlichen Exposition (IEC 62232:2017)

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN 62232:2017 E

SEK Svensk Elstandard

European foreword

The text of document 106/397/FDIS, future edition 2 of IEC 62232, prepared by IEC/TC 106 "Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62232:2017.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2018-06-27
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2020-09-27

This document supersedes EN 50400:2006 + AC:2011 + A1:2012, EN 50383:2010 + AC:2013 and EN 50492:2008 + A1:2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62232:2017 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:

ISO/IEC 17025	NOTE	Harmonized as EN ISO/IEC 17025.
CISPR 16-4-2	NOTE	Harmonized as EN 55016-4-2.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 62209-1	-	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)	EN 62209-1	-
IEC 62209-2	-	Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)	EN 62209-2	-
IEC 62479	-	Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)	EN 62479	-
IEC 62311	-	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)	EN 62311	-

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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DETERMINATION OF RF FIELD STRENGTH, POWER DENSITY AND *SAR* IN THE VICINITY OF RADIOCOMMUNICATION BASE STATIONS FOR THE PURPOSE OF EVALUATING HUMAN EXPOSURE

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62232 has been prepared by IEC technical committee 106: Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure.

This second edition cancels and replaces the first edition published in 2011 and constitutes a technical revision.

The significant changes with respect to the previous edition are the following:

a) Increased frequency range from 110 MHz to 100 GHz (including consideration of ambient sources 100 kHz to 300 GHz);
b) product compliance – determination of compliance boundary information for an RBS product before it is placed on the market;
c) product installation compliance – determination of the total RF exposure levels before the product is put into service;

d) simplified document structure and methods of assessment for new technologies such as LTE–TDD, FDD and WiFi.

This publication contains attached files in the form of a CD-ROM for the paper version and embedded files for the electronic version. These files are intended to be used as a complement and do not form an integral part of the standard.

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

FDIS	Report on voting
106/397/FDIS	106/406/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.

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.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This document addresses the evaluation of radiofrequency (RF) field strength, power density or specific absorption rate (*SAR*) levels in the vicinity of radiocommunication base stations (RBS), also called product or Equipment Under Test (EUT), intentionally radiating in the frequency range 110 MHz to 100 GHz according to the scope (see Clause 1). It does not address the evaluation of current density which exposure guidelines often do not consider to be relevant when evaluating RF fields in the intended RBS operating frequency range.

This document specifies the RF exposure evaluation methods to be used for product compliance, product installation compliance and in-situ RF exposure assessments. It does not define human exposure limits, also called “exposure limits”. When implementing RF exposure assessments, the surveyor refers to the set of exposure limits applicable where exposure takes place.

Clause 2, Clause 3 and Clause 4 address normative references, terms and definitions, and symbols and abbreviated terms, respectively.

Clause 5 provides a quick start guide and details how to use this document.

Clause 6 describes the three main application areas of this document: RF exposure evaluation methods for product compliance, product installation compliance, and in-situ RF exposure assessments. Further details are provided in Annex C.

Clause 7 provides guidelines on how to select the evaluation method. Further details are provided in Annex A.

Clause 8 defines the RF exposure evaluation methods to be used and refers to further details in Annexes B and F.

Clause 9 addresses the estimation of uncertainty and refers to Annex E for further details.

Clause 10 describes reporting requirements for the evaluation or assessment.

Annexes and the bibliography are referenced extensively to provide useful clarifications or guidance.

Additional guidance can be found in IEC TR 62669 which includes a set of worked case studies giving practical examples of the application of this document.

DETERMINATION OF RF FIELD STRENGTH, POWER DENSITY AND *SAR* IN THE VICINITY OF RADIOCOMMUNICATION BASE STATIONS FOR THE PURPOSE OF EVALUATING HUMAN EXPOSURE

1 Scope

This document provides methods for the determination of radio-frequency (RF) field strength and specific absorption rate (*SAR*) in the vicinity of radiocommunication base stations (RBS) for the purpose of evaluating human exposure.

This document:

a) considers intentionally radiating RBS which transmit on one or more antennas using one or more frequencies in the range 110 MHz to 100 GHz;

b) considers the impact of ambient sources on RF exposure at least in the 100 kHz to 300 GHz frequency range;

c) specifies the methods to be used for RF exposure evaluation for compliance assessment applications, namely:

   1) product compliance – determination of compliance boundary information for an RBS product before it is placed on the market;

   2) product installation compliance – determination of the total RF exposure levels in accessible areas from an RBS product and other relevant sources before the product is put into service;

   3) in-situ RF exposure assessment – measurement of in-situ RF exposure levels in the vicinity of an RBS installation after the product has been taken into operation;

d) describes several RF field strength and *SAR* measurement and computation methodologies with guidance on their applicability to address both the in-situ evaluation of installed RBS and laboratory-based evaluations;

e) describes how surveyors, with a sufficient level of expertise, establish their specific evaluation procedures appropriate for their evaluation purpose;

f) provides guidance on how to report, interpret and compare results from different evaluation methodologies and, where the evaluation purpose requires it, determine a justified decision against a limit value;

g) provides short descriptions of the informative example case studies given in the companion Technical Report IEC TR 62669 [1].

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 62209-1, *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 62209-2, *Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)*

IEC 62479, *Assessment of the compliance of low power electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (10 MHz – 300 GHz)*

IEC 62311, *Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)*