



BSI Standards Publication

**Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Vector measurement-based systems (Frequency range of 30 MHz to 6 GHz)**

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## National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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## PUBLICLY AVAILABLE SPECIFICATION

### PRE-STANDARD



**Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Vector measurement-based systems (Frequency range of 30 MHz to 6 GHz)**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MEASUREMENT PROCEDURE FOR THE ASSESSMENT OF  
SPECIFIC ABSORPTION RATE OF HUMAN EXPOSURE TO RADIO  
FREQUENCY FIELDS FROM HAND-HELD AND BODY-MOUNTED  
WIRELESS COMMUNICATION DEVICES –****Vector measurement-based systems  
(Frequency range of 30 MHz to 6 GHz)**

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

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

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## INTRODUCTION

This Publicly Available Specification (PAS) specifies the requirements for vector measurement-based systems to measure the Specific Absorption Rate (SAR) of devices that are used in close proximity to the human body or head.

This PAS is published in order to make available the current state of the technology. It is planned to publish a standard as Part 3 of the IEC 62209 series. When IEC 62209-3 is published this PAS will be withdrawn.

This PAS acknowledges the need for fast and accurate systems to determine the human exposure to radio frequency fields from hand-held and body mounted wireless communication devices.

As SAR measurement systems are used for showing compliance with national and international exposure limits the test procedures have to be standardized. The standardization is necessary to achieve comparable results for the approval process.

Vector measurement-based systems and protocols can differ from traditional SAR measurement systems and protocols. These systems use more advanced field reconstruction methods, allowing the application of indirect measurement approaches in which the SAR is evaluated in three dimensions from a limited number of measurement points which may be located in a limited part of the volume of interest, or even outside this volume. Such new SAR assessment approaches result in significantly reduced SAR measurement times.

# MEASUREMENT PROCEDURE FOR THE ASSESSMENT OF SPECIFIC ABSORPTION RATE OF HUMAN EXPOSURE TO RADIO FREQUENCY FIELDS FROM HAND-HELD AND BODY-MOUNTED WIRELESS COMMUNICATION DEVICES –

## Vector measurement-based systems (Frequency range of 30 MHz to 6 GHz)

### 1 Scope

This Publicly Available Specification (PAS) specifies protocols and test procedures for the reproducible measurement of the peak spatial-average specific absorption rate (psSAR) induced inside a simplified model of the head or the body by radio-frequency (RF) transmitting devices, with a defined uncertainty. It provides requirements for systems using vector measurement-based systems. Such systems determine the psSAR by 3D field reconstruction within the volume of interest by specifying the requirements for the measurement system, calibration, uncertainty assessment and validation methods. The protocols and procedures apply for a significant majority of people including children during use of hand-held and body-worn wireless communication devices.

This PAS is applicable to any wireless communication device intended to be used at a position near the human head or body at distances up to and including 200 mm. This PAS can be employed to evaluate SAR compliance of different types of wireless communication devices used next to the ear, in front of the face, mounted on the body, combined with other RF-transmitting or non-transmitting devices or accessories (e.g. belt-clip), or embedded in garments. The overall applicable frequency range is from 30 MHz to 6 GHz.

The system validation procedures provided within this PAS cover frequencies from 600 MHz to 6 GHz.

NOTE Some specifications (e.g., validation antennas and other procedures or requirements) are not yet defined over the full frequency range within the scope of this document but will be included in a future revision.

The device categories covered include but are not limited to mobile telephones, cordless microphones, auxiliary broadcast devices and radio transmitters in personal computers, desktop, laptop devices, multi-band, multi-antenna, and push-to-talk devices.

### 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.

ISO/IEC Guide 98-3, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

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

IEC 62209-1:2016, *Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Part 1: Devices used next to the ear (Frequency range of 300 MHz to 6 GHz)*