IEC PAS 63151

Edition 1.0 2018-01

PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

colour inside

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)

IEC PAS 63151:2018-01(en)

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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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IEC PAS 63151 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 PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	**Report on voting**
106/410/DPAS	106/420/RVDPAS

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of 3 years starting from the publication date. The validity may be extended for a single period up to a maximum of 3 years, at the end of which it shall be published as another type of normative document, or shall be withdrawn.

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.

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 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 When IEC 62209-3 is published this PAS will be withdrawn.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)*

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 equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)*

IEC TR 62630:2010, *Guidance for evaluating exposure from multiple electromagnetic sources*

IEC/IEEE 62704 (all parts), *Determining the peak spatial-average specific absorption rate (SAR) in the human body from wireless communications devices, 30 MHz to 6 GHz*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62209-1, IEC 62209-2 and the following 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
vector probe
probe which measures both the magnitude and phase of an electric or magnetic field

3.2
scalar probe
probe which measures only the amplitude of the electric or magnetic field

3.3
vector measurement-based system
system consisting of multiple sensors which together provide information about the amplitude distribution or the amplitude and phase distribution of the electric or magnetic fields over a specified volume

3.4
analysis bandwidth (of a signal analyser)
maximum frequency span of observation for a system capable of spectral analysis. The analysis bandwidth is generally characterized by a certain flatness (± tolerance) of the responses of the system in the defined range of frequencies

4 Symbols and abbreviated terms

For the purposes of this document, the symbols and abbreviated terms in IEC 62209-1 and IEC 62209-2 apply.

5 Overview of the measurement procedure

The objective of this clause is to give the user of this PAS a quick overview about the test procedures in this PAS. The user of the PAS shall refer to the respective clauses for more details when using the flowchart.

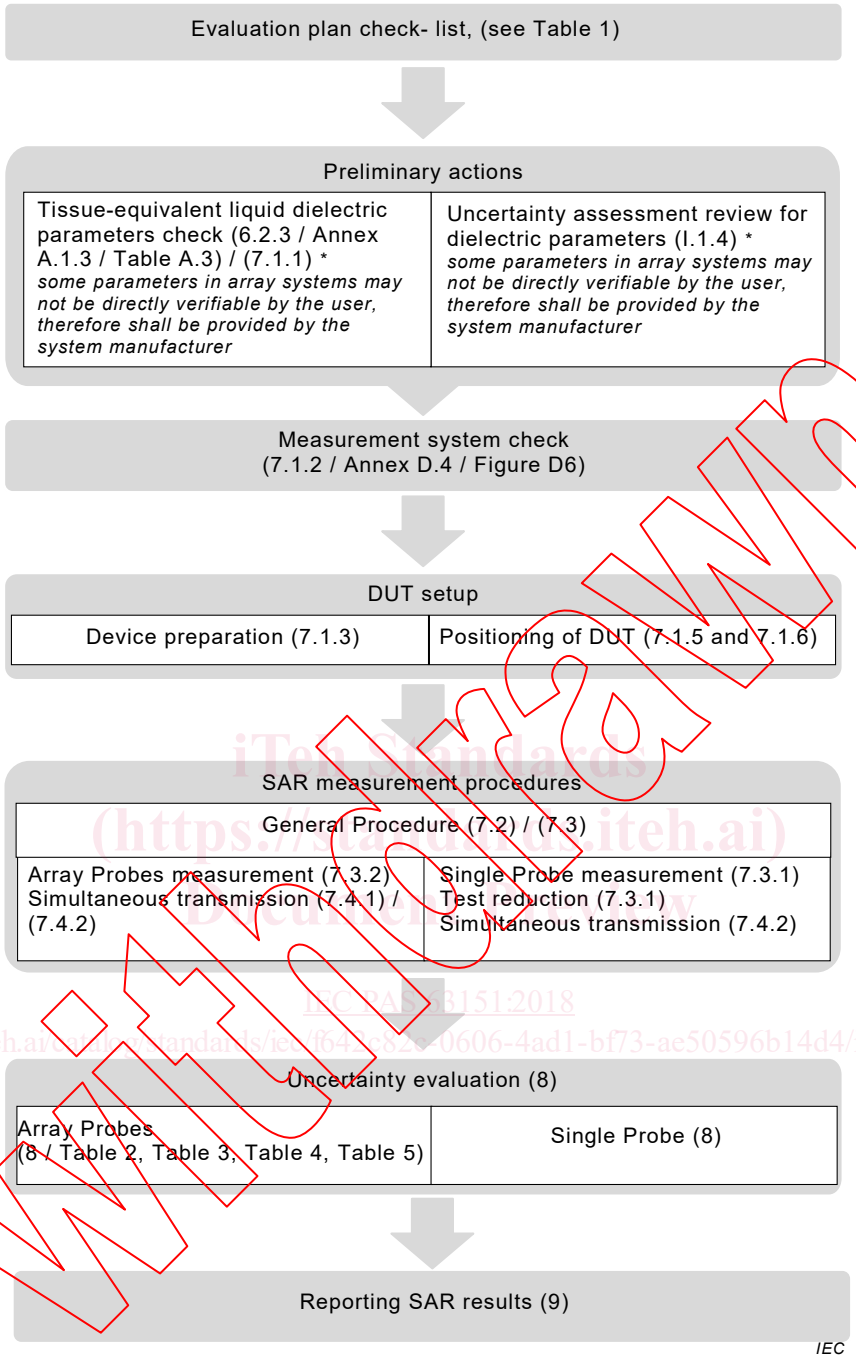

Figure 1 – Evaluation plan checklist