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**Determining the peak spatial-average specific absorption rate (SAR) in the human body from wireless communications devices, 100 kHz to 10 GHz -
Part 1: General requirements for using the finite-difference time-domain (FDTD) method for SAR calculations**

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FOREWORD

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This document is published as an IEC/IEEE Dual Logo standard.

This second edition cancels and replaces the first edition published in 2017. This edition constitutes a technical revision.

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

- a) specification of a SAR averaging algorithm for the calculation of the psSAR from computational results for arbitrarily shaped homogeneous phantoms, which avoids inconsistencies with respect to the algorithm for SAR averaging algorithm specified in IEC/IEEE 62209-1528 for SAR measurement methods;
- b) provision of SHA-256 checksums for all supplemental files;
- c) addition of brief informative discussion on developmental stages of IEC and IEEE computational modelling standards for SAR evaluations.

This standard contains attached files in the form of CAD models and reference results described in Annex B and Annex D. Download links and checksums for these files can be found in Annex E.

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

Draft	Report on voting
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Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with the rules given in the ISO/IEC Directives, Part 2, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications/.

A list of all parts in the IEC/IEEE 62704 series, published under the general title *Determining the peak spatial-average specific absorption rate (SAR) in the human body from wireless communications devices, 100 kHz to 10 GHz*, can be found on the IEC website.

Future documents in this series will carry the new general title as cited above. Titles of existing documents in this series will be updated at the time of the next edition.

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- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

Computational techniques have reached a level of maturity which allows their use in specific absorption rate (SAR) assessment of wireless communication devices. Some wireless communication devices are used in situations where SAR measurement is extremely complex or not possible at all. The benefits of consensus standards to users and regulators include standardized and accepted protocols, anatomically correct body models, verification and validation techniques, benchmark data, reporting format and means for estimating the computational uncertainty in order to produce valid, accurate, repeatable, and reproducible data.

1 Scope

This part of IEC/IEEE 62704 defines the methodology for the application of the finite-difference time domain (FDTD) technique when used for determining the peak spatial-average specific absorption rate (psSAR) in the human body exposed to wireless communication devices with known uncertainty. It defines methods to validate the computational model of the device under test (DUT) and to assess its uncertainty when used in SAR simulations. Moreover, it defines procedures to determine the psSAR in a cubical volume and to verify the correct implementation of the FDTD simulation software. The applicable frequency range is 100 kHz to 10 GHz.

This document does not recommend specific SAR limits; these are found elsewhere, for example, in the guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) [1]¹ or in IEEE Std C95.1 [2].

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/IEEE 62209-1528:2020, *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 - Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz)*

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