

# INTERNATIONAL STANDARD



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





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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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IEC 62232 has been prepared by IEC technical committee 106: Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure. It is an International Standard.

This third edition cancels and replaces the second 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) increased frequency range, from 110 MHz to 300 GHz (including consideration of ambient sources from 100 kHz to 300 GHz);
- b) specification of assessment procedures based on the actual maximum approach including methods for the validation of monitoring counter and control features;
- c) introduction of assessment methods relevant to 5G technologies and BS using beam-steering such as massive MIMO systems;
- d) clarification of criteria for exposure from multiple sources;

- e) restructuring of Annex B (Evaluation methods) for better readability;
- f) update of the requirements and procedures for power density measurements in laboratory conditions;
- g) update of simplified assessment formulas for dish antennas used in radio relays and microwave links;
- h) compatibility with ICNIRP-2020 [1]<sup>1</sup> exposure limits.

This document contains attached files that are cited in Figure B.30 and G.4.4.3. These files can be downloaded from <https://www.iec.ch/tc106/supportingdocuments>.

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

Draft	Report on voting
106/576/FDIS	106/590/RVD

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 ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at <http://www.iec.ch/standardsdev/publications>.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](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.

**IMPORTANT – The "colour inside" logo on the cover page of this document 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.**

<sup>1</sup> Numbers in square brackets refer to the Bibliography.

## INTRODUCTION

This document addresses the evaluation of RF field strength, power density and specific absorption rate (SAR) levels in the vicinity of base stations (BS), also called products or equipment under test (EUT), intentionally radiating in the radio frequency (RF) range 110 MHz to 300 GHz in accordance with the scope, see Clause 1. It does not address the evaluation of current density.

RF exposure evaluation methods to be used for product compliance, product installation compliance and in-situ RF exposure assessments are specified in this document. Exposure limits are not specified in this document. The entity conducting RF exposure assessments refers to the set of exposure limits applicable where exposure takes place. Examples of applicable exposure limits considered in this document are provided in the Bibliography, for example ICNIRP-2020 [1], ICNIRP-1998 [2], IEEE Std C95.1™-2019 [3] and Safety Code 6 [4].

NOTE In this document, "ICNIRP" used without "-1998 or "-2020" applies to both [1] and [2].

This document is based on IEC 62232:2017 leveraging guidelines and lessons learned from the implementation guide IEC TR 62669:2019 [5]. In particular, it specifies how to implement the actual maximum approach.

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

Clause 5 provides advice on how to use this document, including a quick-start guide.

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. It includes the key requirements for assessing RF exposure based on using the actual maximum approach. It also includes simplified criteria for putting BS into operation. Further details are provided in Annex C, Annex D and Annex E.

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

Clause 8 specifies the RF exposure evaluation methods to be used and refers to further details in Annex B, Annex C, Annex F and Annex H.

Clause 9 addresses the estimation of uncertainty and refers to Annex G and Annex H 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 62669:2019 [5], which includes a set of case studies providing practical examples of the application of this document.