

**Nadomešča:
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Pasivne radiofrekvenčne (RF) in mikrovalovne naprave, meritve intermodulacijskega nivoja - 6. del: Meritve pasivne intermodulacije v antenah (IEC 62037-6:2021)

Passive RF and microwave devices, intermodulation level measurement - Part 6: Measurement of passive intermodulation in antennas (IEC 62037-6:2021)

Passive HF- und Mikrowellenbauteile, Messung des Intermodulationspegels - Teil 6: Messung der passiven Intermodulation in Antennen (IEC 62037-6:2021)

Dispositifs RF et à micro-ondes passifs, mesure du niveau d'intermodulation - Partie 6: Mesure de l'intermodulation passive dans les antennes (IEC 62037-6:2021)

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(RF)

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Passive RF and microwave devices, intermodulation level
measurement - Part 6: Measurement of passive intermodulation
in antennas
(IEC 62037-6:2021)

Dispositifs RF et à micro-ondes passifs, mesure du niveau
d'intermodulation - Partie 6: Mesure de l'intermodulation
passive dans les antennes
(IEC 62037-6:2021)

Passive HF- und Mikrowellenbauteile, Messung des
Intermodulationspegels - Teil 6: Messung der passiven
Intermodulation in Antennen
(IEC 62037-6:2021)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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EN IEC 62037-6:2022 (E)**European foreword**

The text of document 46/838/FDIS, future edition 2 of IEC 62037-6, prepared by IEC/TC 46 "Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62037-6:2022.

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-12-28

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

- <https://standards.iteh.ai/catalog/standards/sist/ce54a9e8-03e-40fd-a0ed-cef117567dae/sist-en-iec-62037-6-2022>
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Passive RF and microwave devices, intermodulation level measurement –
Part 6: Measurement of passive intermodulation in antennas

Dispositifs RF et à micro-ondes passifs, mesure du niveau d'intermodulation –
Partie 6: Mesure de l'intermodulation passive dans les antennes

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PASSIVE RF AND MICROWAVE DEVICES,
INTERMODULATION LEVEL MEASUREMENT –****Part 6: Measurement of passive intermodulation in antennas**

FOREWORD

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IEC 62037-6 has been prepared by IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories. It is an International Standard.

This second edition cancels and replaces the first edition published in 2013. This edition constitutes a technical revision.

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

- a) dynamic testing requirements updated to define impact energy and locations to apply impacts to devices under test;

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

Draft	Report on voting
46/838/FDIS	46/859/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. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all the parts in the IEC 62037 series, published under the general title *Passive RF and microwave devices, intermodulation level measurement* can be found on the IEC website.

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 in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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PASSIVE RF AND MICROWAVE DEVICES, INTERMODULATION LEVEL MEASUREMENT –

Part 6: Measurement of passive intermodulation in antennas

1 Scope

This part of IEC 62037 defines the test fixtures and procedures recommended for measuring levels of passive intermodulation generated by antennas, typically used in wireless communication systems. The purpose is to define qualification and acceptance test methods for antennas for use in low intermodulation (low IM) applications.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

No terms and definitions are listed in this document.

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>

3.2 Abbreviated terms

AIM	Active intermodulation
AUT	Antenna under test
ESD	Electrostatic discharge
HPA	High power amplifier
IM	Intermodulation
LNA	Low noise amplifier
PIM	Passive intermodulation
RF	Radio frequency

4 Definitions of antenna as it pertains to PIM

4.1 Antenna

An antenna is that part of a radio transmitting or receiving system which is designed to provide the required coupling between a transmitter or a receiver and the medium in which the radio wave propagates.

The antenna consists of a number of parts or components. These components include, but are not limited to, one or many radiating elements, one or many RF interfaces, a distribution or combining feed network, internal support structures, devices which control or adjust the amplitude/phase response and distribution to the radiating element(s), filters, diplexers, orthomode transducers, polarizers, waveguides, coaxial cables or printed circuits. In addition, peripheral components could also influence the PIM performance of the antenna. These components can include, but are not limited to, mounting brackets, mounting hardware, radome, radome fasteners, thermal insulation and grounding hardware.

4.2 Antenna under test

The antenna hardware can have an effect on the overall antenna PIM performance. Therefore, it is necessary to specify the hardware which is to be part of the antenna under test (AUT).

4.3 Active antenna

An active antenna incorporates active devices such as low noise amplifiers (LNAs), high power amplifiers (HPAs), phase shifters, etc. An active antenna has the additional concern of active intermodulation (AIM) which is typically at a much higher level than PIM. The measurement of PIM in the presence of AIM is not within the scope of this document. If required, the PIM measurement of an active antenna shall be performed on the passive portion of the antenna only.

4.4 Antenna PIM

The antenna PIM is defined as the PIM that is generated by the antenna assembly itself at a reference plane or RF interface. The PIM can be measured in a radiated or conducted (transmissive or reflective) mode.

5 Antenna design and field installation considerations

5.1 Environmental effects on PIM performance

Any hardware located in the nearby environment can significantly influence the PIM performance of an antenna or antenna system. The effect of ferromagnetic materials, dissimilar metallic junctions which are part of neighbouring hardware, such as other antennas, tower structures, aircraft fuselage components, spacecraft thermal control hardware, DC and ESD grounding hardware, non-high pressure mechanical connections, etc., can potentially have a detrimental effect on the PIM performance of the communication system.

5.2 Antenna interface connection

Any interface that is exposed to RF is a potential PIM source and shall be designed to be low PIM. Care shall be taken to ensure that all the mating surfaces are clean. The connections, whether coaxial or waveguide, should be inspected for dirt, metallic filings, sharp protruding material, and other potential contaminants. Any coaxial connections shall be torqued to the manufacturer's specifications to ensure proper metal-to-metal contact pressure is achieved. If waveguide is used, then the flange bolts shall be torqued to the recommended manufacturer's specifications. Careful attention shall be paid to the alignment of the mating coaxial connectors or waveguide flanges.

The materials and combination of materials used in the connectors, including plating, are important for the PIM performance. The use of a soft plating material (e.g. gold, silver, etc.) of sufficient thickness (several skin depths) over a hard-base material (brass, BeCu, etc.) is usually preferable. The number of interfaces (coaxial connectors and adapters) should be minimized. This will reduce the number of metal-to-metal junctions and, thus, the possibility of PIM generation. More information about coaxial connectors can be found in IEC 62037-3.