

INTERNATIONAL STANDARD

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**Passive RF and microwave devices, intermodulation level measurement –
Part 2: Measurement of passive intermodulation in coaxial cable assemblies**

**Dispositifs RF et à micro-ondes passifs, mesure du niveau d'intermodulation –
Partie 2: Mesure de l'intermodulation passive dans les cordons coaxiaux**

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IEC 62037-2:2021
<https://standards.iteh.ai/catalog/standards/sist/c51a20a0-1c41-454f-b561-647e0fd1154cd/iec-62037-2-2021>





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647e0fd154cd/iec-62037-2-2021

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.040.20; 33.120.10

ISBN 978-2-8322-1048-1

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PASSIVE RF AND MICROWAVE DEVICES,
INTERMODULATION LEVEL MEASUREMENT –****Part 2: Measurement of passive intermodulation
in coaxial cable assemblies**

FOREWORD

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IEC 62037-2 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 2012. This edition constitutes a technical revision.

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

- a) criteria for application of mechanical stress revised to be a function of advertised cable bend radius.

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

Draft	Report on voting
46/835/FDIS	46/856/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 2: Measurement of passive intermodulation in coaxial cable assemblies

1 Scope

This part of IEC 62037 defines a procedure to measure levels of passive intermodulation generated by a coaxial cable assembly.

This test method is applicable to jumper cables, i.e. cable assemblies intended to provide interface flexibility between rigid devices. It is also used to evaluate cable assemblies that are subjected to motion in operation.

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 62037-1:2021, *Passive RF and microwave devices, intermodulation level measurement – Part 1: General requirements and measuring methods*

[https://standards.iteh.ai/catalog/standards/sist/c3fa20a6-fe41-434f-b561-](https://standards.iteh.ai/catalog/standards/sist/c3fa20a6-fe41-434f-b561-647e0f1154cd/iec-62037-1-2021)

IEC 62037-3, *Passive RF and microwave devices, intermodulation level measurement – Part 3: Measurement of passive intermodulation in coaxial connectors*

IEC 62037-4, *Passive RF and microwave devices, intermodulation level measurement – Part 4: Measurement of passive intermodulation in coaxial cables*

3 Terms, definitions and abbreviations

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 <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.2 Abbreviations

DUT Device under test

PIM Passive intermodulation

4 Test method

4.1 General

The connector and cable shall meet their appropriate requirements.

- a) The connector used for this test shall comply with its specification when subjected to the impact test specified in IEC 62037-3
- b) The cable used for this test shall comply with its specification when subjected to its specified bend test when tested in accordance with IEC 62037-4.

4.2 Test conditions

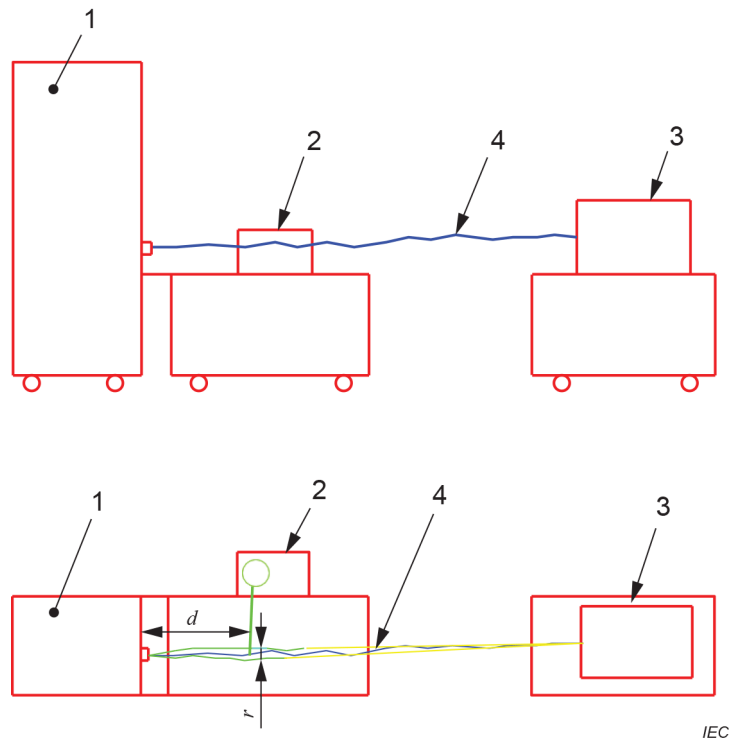
Set-up 1 and set-up 2 are applicable in this PIM-test. Either set-up 1 (reverse method, see IEC 62037-1:2021, 6.2.2), or set-up 2 (forward method, see IEC 62037-1:2021, 6.2.3), may be used for cable assemblies, provided that the attenuation of the assembly is not greater than 1 dB. For higher attenuation, the reverse method shall be used.

The connector under test should be clamped and mechanically secured to prevent its movement during the test.

A mechanical rotational stress is applied to the DUT. This mechanical stress is defined by a distance d , between the end of the cable-entry (the last rigid mechanical point of the connector) and the point of the deflection and circular movement around the cable axis with a radius r .

This test shall be performed on each end independently. An example of a test set-up is shown in Figure 1. The cable movement is depicted in Figure 2. The cable attachment to the termination should be supported.

The radius, r is determined by the nominal outside diameter ϕ of the cable shown in Figure 2.



Key

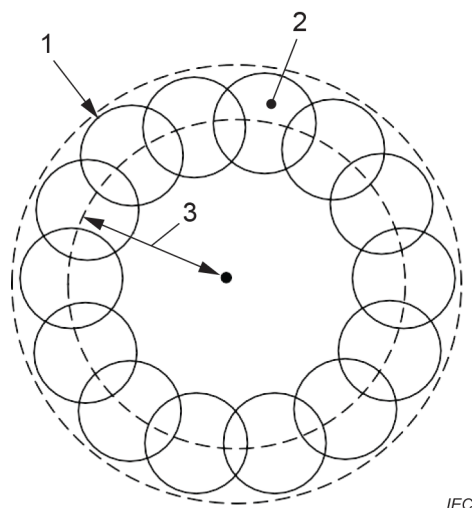
- 1 PIM test set-up
- 2 moving unit
- 3 termination
- 4 DUT

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Figure 1 – PIM test set-up example



Key

- 1 cable DUT
- 2 circular movement of cable
- 3 radius of deflection, r

Figure 2 – Rotation of cable

The distance d (Figure 1) is related to the flexibility of a cable represented by its specified repeated bending radius. If not otherwise specified, the parameters of distance and radius shall be calculated as follows:

$d = 4 \times$ specified repeated bending radius of cable

r (rotational radius) = \varnothing (diameter of cable) + 10 mm

Distance (d) and rotational radius (r) may be changed as long as the angle exiting the connector is maintained.

The movement of the cable shall be carried out with a minimum of 3 cycles in the clockwise and then 3 cycles in the counterclockwise direction at a rate of (5 ± 2) s per revolution.

Torsion shall not be applied to the cable.

5 Procedure

The procedure is as follows:

- a) calibrate the set-up;
- b) connect the DUT to the set-up;
- c) read the PIM before applying mechanical stress;
- d) apply mechanical stress to the DUT;
- e) read the maximum PIM level while applying mechanical stress to the DUT;

NOTE If using a spectrum analyzer, it is helpful to use the “max-hold” function.

- f) stop the mechanical stress;
- g) read the PIM level after applying mechanical stress.

6 Report

The report should include the following:

- a) radius;
 - b) distance from the PIM tester;
 - c) PIM levels prior to rotation;
 - d) PIM levels during rotation;
 - e) PIM levels after rotation.
-

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