IEC 62037-3

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INTERNATIONAL STANDARD

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colour inside

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

Dispositifs RF et à micro-ondes passifs, mesure du niveau d'intermodulation – Partie 3: Mesure de l'intermodulation passive dans les connecteurs coaxiaux

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CONTENTS

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PASSIVE RF AND MICROWAVE DEVICES, INTERMODULATION LEVEL MEASUREMENT –

Part 3: Measurement of passive intermodulation in coaxial connectors

FOREWORD

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International Standard IEC 62037-3 has been prepared by technical committee 46: Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories.

This bilingual version (2014-01) corresponds to the monolingual English version, published in 2012-07.

The text of this standard is based on the following documents:

FDIS	Report on voting
46/417/FDIS	46/433/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

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PASSIVE RF AND MICROWAVE DEVICES, INTERMODULATION LEVEL MEASUREMENT –

Part 3: Measurement of passive intermodulation in coaxial connectors

1 Scope

This part of IEC 62037 defines the impact test on coaxial connectors to evaluate their robustness against weak connections and particles inside the connector as independently as possible from the effects of cable PIM (passive intermodulation).

For other connectors (e.g. panel mounted connectors), the cable can be replaced by an adequate transmission-line (e.g. airline, stripline). In order to evaluate the effects of mechanical stresses on the connectors, a series of impacts is applied to the connectors while measuring the PIM.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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, *Passive r.f. and microwave devices, intermodulation level measurement – Part 1: General requirements and measuring methods*[1]

IEC 62037-4, *Passive r.f. and microwave devices, intermodulation level measurement – Part 4: Measurement of passive intermodulation in coaxial cables*[2]

3 Abbreviations

DUT Device under test

IM Intermodulation

PIM Passive intermodulation

4 Test method

4.1 Samples for testing

One of two setups may be used.

NOTE Correct assembly methods and techniques are critical to the proper operation of the connector on the cable.

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1 To be published.

2 To be published.

a) Setup 1 – Multi-port DUT

In order to minimize the effect of the transmission line, a short assembly should be tested. Identical connectors should be assembled to each end. An assembly, as short as physically practical, should be constructed.

b) Setup 2 – One port DUT

A single connector can be assembled on a length of transmission line for which it is designed, loss or low loss, that exhibits at least 10 dB of attenuation in one direction at the lowest frequency in the receive band.

4.2 Connection of unit

The unit should be connected as described in the IEC 62307-1 base document.

4.3 Setup 1 – Fixed frequency test considerations

Due to the phase interaction of the connectors and the length of the transmission line (configuration A) when measured in the reverse (reflected) mode, the frequency at which maximum PIM occurs within the band can vary and shall be determined.

An accepted method of sweeping is to fix F1 at the low end of the transmit band and step F2 down, starting at the top of the band for all combination of frequencies that result in IM in the receive band. If desired, this procedure can be reversed by fixing F1 at the highest frequency in the transmit band and then stepping F2 up, starting at the bottom of the band.

If fixed frequency is used, assemblies of varying lengths shall be made to ensure that the PIM adds in-phase. Assemble 2 additional DUTs. The first one is to be $\lambda/6$ longer and the second one is to be $\lambda/3$ longer at the receive frequency of test. The PIM of the three (3) assemblies is measured to determine which DUT exhibits maximum PIM. The impact test shall be performed on this DUT.

Multiple fixed frequency may be used in lieu of varying the cable length.

The impact test is to be conducted at the frequency where the maximum PIM is measured.

The cable used as a load should be verified as having suitable PIM performance prior to being used in testing as measured by IEC 62037-4.

4.4 Setup 2 considerations

The cable used as a load should be verified as having suitable PIM performance prior to being used in testing as measured by IEC 62037-4.

4.5 Impacts

Mount the DUT as shown in Figure 1. A minimum of five (5) impacts in accordance with Table 1 should be applied. (See Figure 1 for impact setup and Figure 2 for description of drop mass and tube.)

The tube should be vertical to the axis of the DUT to ±3˚.

The points of impact should cover as many different areas along the length of the connector as possible, but it is not necessary to rotate or otherwise disconnect and reposition the DUT.

The PIM is measured prior to, during, and after the impact.

Table 1 – Impact information for some popular connectors

Connector interface	Mass (min.) g	Drop height (min.) mm
7-16	30	300
N	30	300
TNC	30	300
SMA	30	300

The length dimension of the brass rod shall be greater than its diameter.

The given values are guidelines, and other connectors can be used as determined between customer and supplier.

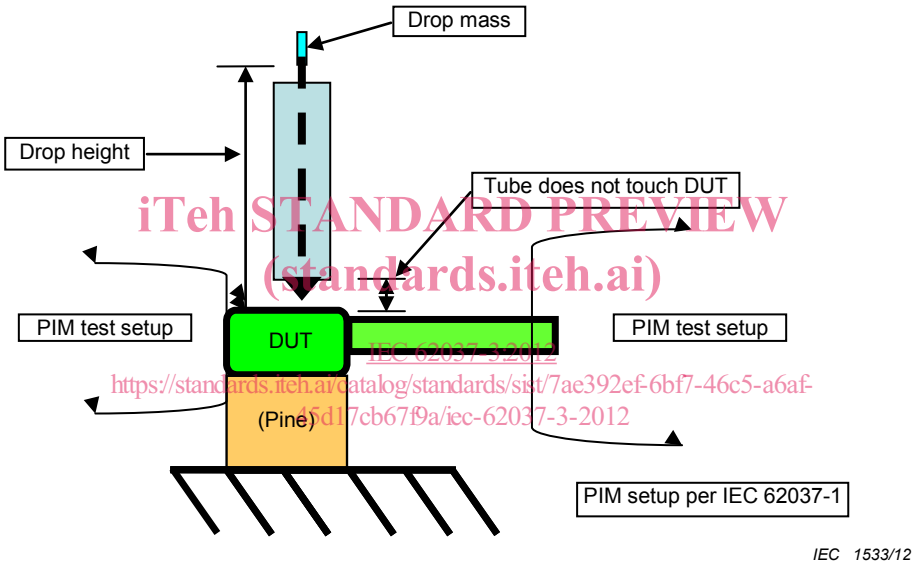

Figure 1 – Impact test illustration

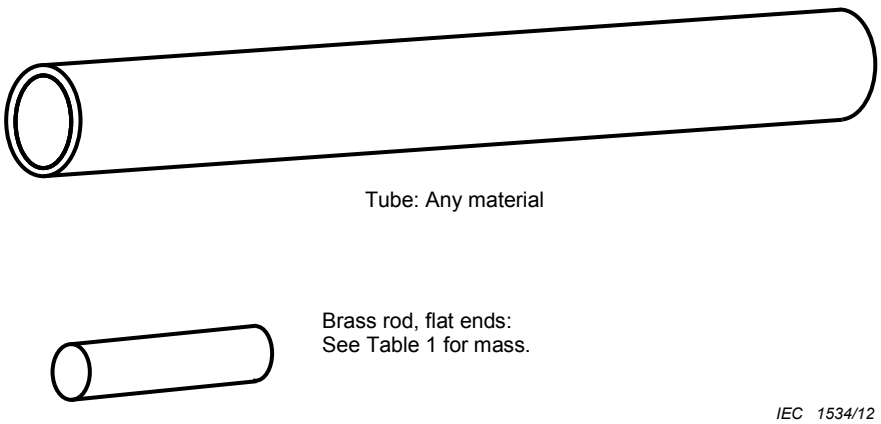

Figure 2 – Impact device

5 Report

The report should document the height, mass, and distance dropped if different from the table and the PIM values prior to each impact, during impact, and after impact.

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