INTERNATIONAL STANDARD

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1999-09

RF connectors, connector cable assemblies and cables – Intermodulation level measurement

Connecteurs, cordons, câbles – Mesures du niveau d'intermodulation

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For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary* (IEV).

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* See web site address on title page.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RF CONNECTORS, CONNECTOR CABLE ASSEMBLIES AND CABLES – INTERMODULATION LEVEL MEASUREMENT

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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6) Attention is drawn to the possibility that some of the elements of this technical specification may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62037 has been prepared by IEC technical committee 46: Cables, wires, waveguides, r.f. connectors, and accessories for communication and signalling.

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

FDIS	Report on voting
46/94/FDIS	46/97/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.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

The committee has decided that this publication remains valid until 2009. At this date, in accordance with the committee's decision, the publication will be

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- withdrawn;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

A bilingual version of this publication may be issued at a later date.

RF CONNECTORS, CONNECTOR CABLE ASSEMBLIES AND CABLES – INTERMODULATION LEVEL MEASUREMENT

1 Scope and object

This technical specification is applicable to the intermodulation (IM) level measurement of r.f. connectors, connector cable assemblies and cables.

The object of the test procedure given in this technical specification is to characterize the level of unwanted signals caused by the presence of two or more transmitting signals in passive r.f. components.

2 Level of intermodulation products

The basic theory of the generation of intermodulation products in r.f. circuits is well described in the literature.

In the case of passive r.f. components, intermodulation distortion is caused by sources of nonlinearity of mostly unknown nature, location and behaviour. A few examples are inter-metallic contacts, choice of materials, corrosion products, dirt, etc. Most of these effects are subject to changes over time due to mechanical stress, temperature changes, variations in material characteristics (cold flow, etc.), climatic changes and so on.

The generation of intermodulation products does not necessarily follow the law of the usual non-linear equation of quadratic form. Therefore, accurate calculation to other power levels causing the intermodulation is not possible.

On the other hand, generation of intermodulation is inherently not frequency selective. This allows for the testing of r.f. components at appropriate frequencies within the band of operation.

3 Principle of test procedure

For the test, signals of frequencies f_1 and f_2 with equal specified test port power level are combined and fed to the device under test (DUT). The test signals should contain at least 10 dB less harmonic or self-intermodulation signal level than the expected level generated in the DUT.

The intermodulation products of order $(f_1 \pm f_2)$ or $(2f_2 \pm f_1)$ etc. are measured with a calibrated receiver.

In most cases, the third order intermodulation signals represent the worst case condition of unwanted signals generated; therefore the measurement of these signals characterizes the DUT in a sufficient way. However, the test set-ups given in this technical specification are suitable for measuring other intermodulation products.