



**SLOVENSKI STANDARD**  
**SIST EN 2591-222:2008**  
**01-marec-2008**

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5 YfcbUj h\_U!`9`Ya Ybh`YY\_hf] b\ `]b`cdh] b\ `dcj YnUj `!`DfYg\_i gbY`a YrcXY!`&&&"  
XY.`JbYyYbc`g`UV`Yb`Yf`@L

Aerospace series - Elements of electrical and optical connection - Test methods - Part 222: Insertion Loss (I.L.)

Luft- und Raumfahrt - Elektrische und optische Verbindungselemente - Prüfverfahren - Teil 222: Einfügungsdämpfung

**iTeh STANDARD PREVIEW**

Série aérospatiale - Organes de connexion électrique et optique - Méthodes d'essais - Partie 222 : Pertes d'insertion

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**ICS:**

49.060

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**en**

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ICS 49.060

English Version

**Aerospace series - Elements of electrical and optical connection  
- Test methods - Part 222: Insertion Loss (I.L.)**

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optique - Méthodes d'essais - Partie 222 : Pertes d'insertion

Luft- und Raumfahrt - Elektrische und optische  
Verbindungselemente - Prüfverfahren - Teil 222:  
Einfügungsdämpfung

This European Standard was approved by CEN on 27 April 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

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## Foreword

This document (EN 2591-222:2007) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2008, and conflicting national standards shall be withdrawn at the latest by June 2008.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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## 1 Scope

This standard specifies a measurement method of insertion loss, in the required frequency bandwidth of coax contacts or connectors with characteristic impedance.

It shall be used together with EN 2591-100.

The measurement is carried out according to vectorial method using “S” parameters (see definition in Annex A).

## 2 Normative references

The following referenced documents are indispensable for the application 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.

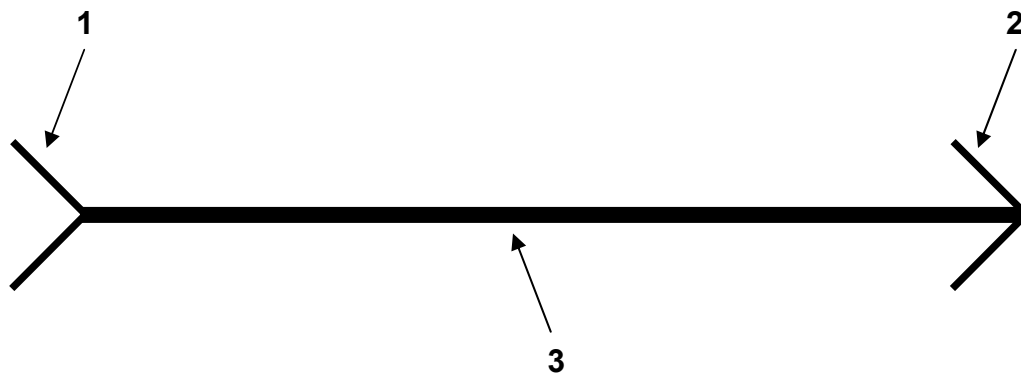
EN 2591-100, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 100: General.*

## 3 Preparation of specimens

The sampling shall include, for each specified cable, a minimum of two section of coaxial cable with connector in both ends.

The first section called “Reference” is constituted as follow (see Figure 1):

- (600 ± 5) mm of coaxial cable
- 1 male coaxial connector (SMA, N or TNC type ...)
- 1 female coaxial connector (SMA, N or TNC type ...)



### Key

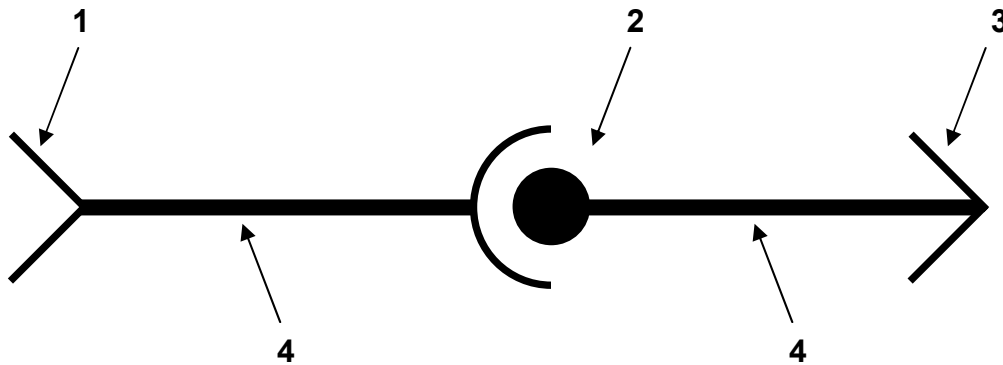
- 1 Coaxial (Std) female connector
- 2 Coaxial (Std) male connector
- 3 Coaxial cable; Lg. = (600 ± 5) mm

Figure 1

The coaxial connectors shall be selected to offer optimum performances for each used cable and measured frequency range. They must have a reflection coefficient better than 0,1 (– 20 dB) in the test frequency range.

It is necessary to use the same type of connector on each section of cable.

The second section called “Measure” (see Figure 2) is constituted by the same elements as “Reference Section”, the sample to be measured shall be installed in the middle of the section of the cable.



#### Key

- 1 Coaxial (Std) female connector
- 2 Device under test
- 3 Coaxial (Std) male connector
- 4 Coaxial cable; Lg. =  $2 \times (300 \pm 2,5)$  mm

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**Figure 2**

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## 4 Apparatus

The apparatus shall comprise measuring equipment which includes (see Figure 3):

- vector network analyser
- calibration kit
- standard precision adapters
- a  $75 \Omega$  kit of transformation, to perform measurement from  $50 \Omega$  network analyser, when it is necessary.

## 5 Procedure

### 5.1 Calibration

Select measure frequency range and sampling points number.

Carry out the complete calibration of network analyser, Part 1 and Part 2 (“S” Parameters,  $S_{11}$ ,  $S_{12}$ ,  $S_{21}$  and  $S_{22}$ )

Using calibration kit according to instructions specified by network analyser manufacturer.

## 5.2 Measurement

Connect reference section on network analyser, using if necessary, standard precision adapter. Perform the measurement, and run the curves tracer or record the values ( $S_{12}$ ,  $S_{21}$  parameters).

Move "reference section", connect the "measure section" on the equipment, run the measurement and curve tracer, or record the values as above.

## 6 Requirement

Sample insertion loss, which is measured, is the result of: (measured insertion loss – reference insertion loss).

Insertion loss shall not exceed the values specified in the product standard. (The insertion loss of one contact or connector shall be the insertion loss of the contact or connector pair divided by two).

## 7 Detail to be specified

The following items shall be specified:

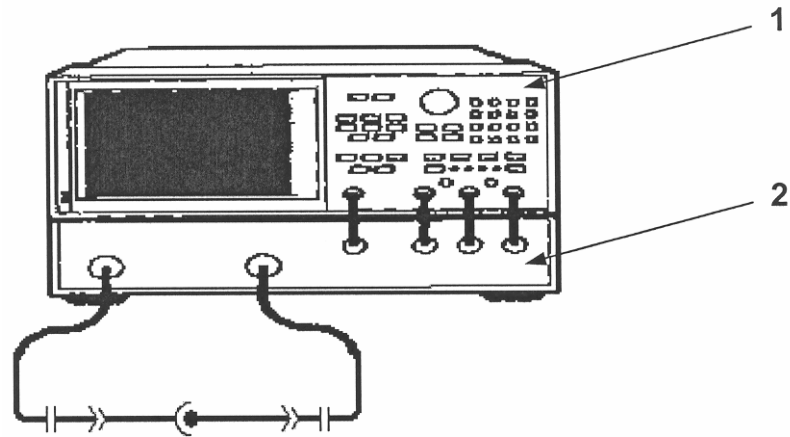
- coaxial devices (contact or connector) part numbers
- coaxial cables part number
- standard coaxial connectors part number
- network analyser, manufacturer, type and serial number
- frequency range
- sampling point number
- standard precision adapter part number
- measurement impedance (50  $\Omega$  or 75  $\Omega$ )
- for coaxial contact, connection length
- wiring instruction and tooling
- for thread coupling connectors, the coupling torque of the coupling ring.

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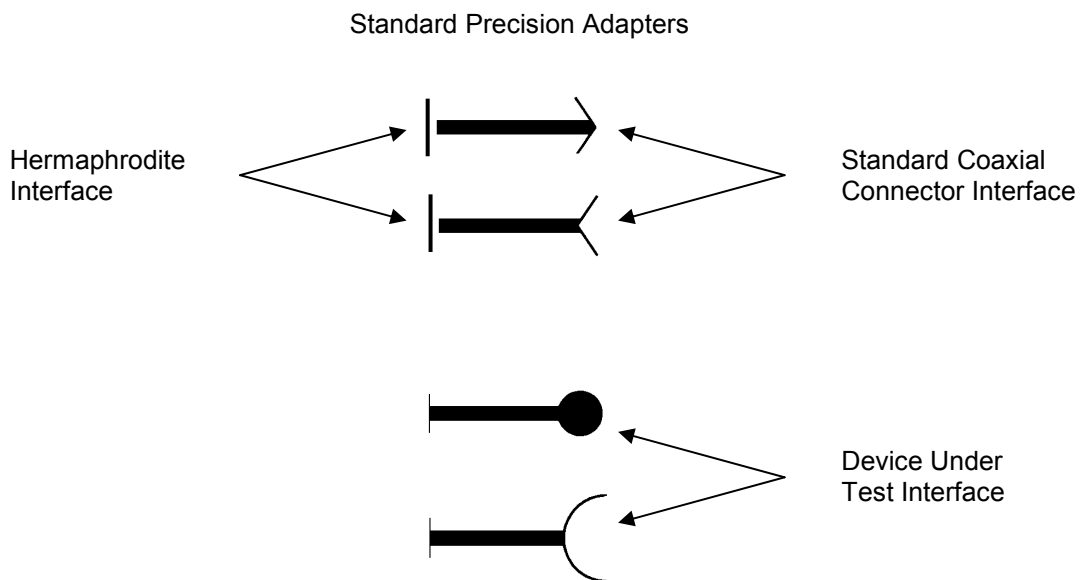
**Key**

- 1 Vector network analyser
- 2 RF generator and "S" parameter test set

**Legend**

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Precision hermaphroditic connectors  
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**Figure 3**