# SLOVENSKI STANDARD
# SIST EN 301 126-3-1 V1.1.2:2003

**01-december-2003**

---

**Fiksni radijski sistemi ï Preskuģanje skladnosti ï 3-1. del: Antene tipa toļ ka-toļ ka ï Definicije, sploģne zahteve in preskusni postopki**

Fixed Radio Systems; Conformance testing; Part 3-1: Point-to-Point antennas; Definitions, general requirements and test procedures



**Ta slovenski standard je istoveten z: EN 301 126-3-1 Version 1.1.2**



---

**ICS:**

| | | |
|---|---|---|
| 33.060.30 | Radiorelejni in fiksni satelitski komunikacijski sistemi | Radio relay and fixed satellite communications systems |
| 33.120.40 | Antene | Aerials |

**SIST EN 301 126-3-1 V1.1.2:2003** **en**

# ETSI EN 301 126-3-1 V1.1.2 (2002-12)

*European Standard (Telecommunications series)*

# Fixed Radio Systems; Conformance testing; Part 3-1: Point-to-Point antennas; Definitions, general requirements and test procedures

Reference
REN/TM-04158

Keywords
antenna, architecture, DRRS, point-to-point,
SDH, testing, transmission

***ETSI***

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88



***Important notice***

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, send your comment to:
editor@etsi.org

# Contents

# Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

All published ETSI deliverables shall include information which directs the reader to the above source of information.

# Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Transmission and Multiplexing (TM).

The present document defines the type approval testing requirements for the antenna specific parameters, required directly by the relevant radio relay or antenna standard. Harmonized test methods and test report format, for these parameters, are also contained, herein.

In addition to the main body of the present document there are two annexes, namely the Supplier's Declaration (annex A) and the Test report (annex B). The parameters in the two annexes are according to the main body of the present document.

The reason for issuing the present revision is restricted to the editorial correction of the legends in table A.1.2.4.



The present document is part 3, sub-part 1 of a multi-part deliverable covering the Fixed Radio Systems; Conformance testing, as identified below:



Part 1: "Point-to-Point equipment; Definitions, general requirements and test procedures";

Part 2-1: "Point-to-Multipoint equipment; Definitions and general requirements";

Part 2-2: "Point-to-Multipoint equipment; Test procedures for FDMA systems";

Part 2-3: "Point-to-Multipoint equipment; Test procedures for TDMA systems";

Part 2-4: "Point-to-Multipoint equipment; Test procedures for FH-CDMA systems";

Part 2-5: "Point-to-Multipoint equipment; Test procedures for DS-CDMA systems";

Part 2-6: "Point-to-Multipoint equipment; Test procedures for Multi Carrier Time Division Multiple Access (MC-TDMA) systems";

**Part 3-1: "Point-to-Point antennas; Definitions, general requirements and test procedures";**

Part 3-2: "Point-to-Multipoint antennas; Definitions, general requirements and test procedures".

| National transposition dates | |
|---|---|
| Date of adoption of this EN: | 24 March 2000 |
| Date of latest announcement of this EN (doa): | 30 June 2000 |
| Date of latest publication of new National Standard or endorsement of this EN (dop/e): | 31 December 2000 |
| Date of withdrawal of any conflicting National Standard (dow): | 31 December 2000 |

# 1 Scope

The present document details standardized procedures for conformance testing of antennas for point-to-point radio relay systems [1] in order to achieve the approval by the Type Approval Authority.

The procedure for dealing with established products are outside the scope of the present document.

Standardized procedures are required in order to fulfil CEPT/ERC/DEC(97)10 [2] on the mutual recognition, within CEPT, of conformance test of antennas carried out in individual CEPT countries.

The present document is intended to be applied in conjunction with the individual antenna standards and will enable commonality in the presentation of test results, irrespective of the Suppliers/accredited laboratory carrying out the test.

NOTE: The Directive by the EEC [97-149 (COD)] and parallel work within CEPT ERC on mutual recognition, proposes that type approval against essential requirements can be carried out at manufacturers or third party premises. The level of accreditation required needs to be clarified by CEPT.

The conformance tests described in the present document are related to antenna specific parameters required directly by the relevant antenna standards.

Integrated antennas which cannot be separated from the equipment are not covered by the present document.

# 2 References



The following documents contain provisions which, through reference in this text, constitute provisions of the present document.



- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1] ETSI EN 300 833: "Fixed Radio Systems; Point-to-point antennas; Antennas for point-to-point fixed radio systems operating in the frequency band 3 GHz to 60 GHz".

[2] CEPT/ERC/DEC(97)10: "ERC Decision of 30 June 1997 on the mutual recognition of conformity assessment procedures including marking of radio equipment and radio terminal equipment".

[3] ISO/IEC 17025 (1999): "General requirements for the competence of testing and calibration laboratories".

[4] ISO/IEC Guide 28 (1982): "General rules for a model third-party certification system for product".

[5] EN 45002 (1990): "General criteria for the assessment of testing laboratories".

[6] ISO 9001 (1994): "Quality systems - Model for quality assurance in design, development, production, installation and servicing ".

[7] IEC 60835-2-2 (1994): "Methods of measurement for equipment used in digital microwave transmission systems - Part 2: Measurements on terrestrial radio-relay systems - Section 2: Antenna".

[8] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).

[9] ISO/IEC 15498: "Information technology - Data interchange on 90 mm optical diskcartridges - HS-1 format - Capacity: 650 Mbytes per cartridge".

[10] IEC 60169: "Radio-frequency connectors".

# 3 Definitions, symbol and abbreviations

## 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

**accreditation:** formal recognition that a testing laboratory is competent to carry out specific tests or specific types of test.

**accreditation body:** body that conducts and administers a laboratory accreditation system and grants accreditation

**accreditation system:** system that has its own rules of procedure and management for carrying out laboratory accreditation

**accredited laboratory:** testing laboratory which accreditation has been granted in accordance with the ISO/IEC 17025, Guide 28 and EN 45002

**antenna:** that part of the transmitting or receiving system that is designed to radiate and/or receive electromagnetic waves

**approval testing:** approval of the Implementation Under Test (IUT) by the appropriate authority for regulatory purposes. In this context approval implies that the IUT has met the essential requirements of the standard against which it has been tested.



**Complementary Requirements (CR):** all those requirements not part of the essential requirements are complementary requirements.



**conformance testing:** process to verify to what extent the IUT conforms to the standard

**essential requirements:** basic set of parameters and functions which are necessary to meet any regulatory obligations imposed for radio frequency co-ordination

**Implementation Under Test (IUT):** representative sample of the equipment for Conformance Testing

**Optional Requirements (OR):** used in a standard with two different meanings:

1) optional in the sense that the parameter or function itself is mandatory but there is more than one possible value or configuration which may be chosen (e.g. class of Antenna RPE, frequency band(s), etc.). Once an option is selected it becomes mandatory;

2) optional in the sense that the feature is not mandatory (e.g. antenna input connector etc.). However, once such an option has been implemented it becomes mandatory that it conforms to the requirements of the present document.

**supplier:** organization requesting the approval

**Supplier's Declaration (SD):** procedure by which a supplier gives written assurance that a parameter or function conforms to the present document

**type approval authority:** national Regulatory/Licensing Authority

## 3.2 Symbol

For the purposes of the present document, the following symbol applies:

dB decibel

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

| | |
|---|---|
| CR | Complementary Requirement |
| ER | Essential Requirement |
| Ext | Extreme conditions |
| IUT | Implementation Under Test |
| OR | Optional Requirement |
| Ref | Reference conditions |
| RPE | Radiation Pattern Envelope |
| SD | Supplier's Declaration |
| TR | Test Required |
| VSWR | Voltage Standing Wave Retro |
| XPD | Antenna Cross-Polar Discrimination |

# 4 Requirements related to antenna conformance testing

## 4.1 General requirements

In table 1 the generic clauses and parameters are classified, for conformance testing purposes, in terms of the various categories.

**Table 1: 'Generic requirements' classification**

| Function or parameter description | Status for conformance | | | Requirement for conformance testing | | | Power supply conditions | | Climatic conditions for test | | Limiting values | Test methods | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ER | CR | OR | SD | TR | SD + TR (note 3) | Ref | Ref + Ext | Ref. (note 1) | Ref + Ext. | | Clause Ref. | IEC 60835-2-2 [7] or other Ref. (note 2) |
| Frequency range | | X | X | X (note 3) | | | | | | | | | |
| Frequency band(s) | | X | X | X (note 3) | | | | | | | | | |
| Class of antenna RPE | | X | X | X (note 3) | | | | | | | | | |
| Radiation Pattern Envelope (RPE) | X | | X | | | X | | | X | | | | IEC 60835-2-2 [7] |
| Antenna Cross-Polar Discrimination (XPD) | X | | X | | | X | | | X | | | | IEC 60835-2-2 [7] |
| Antenna gain | X | | X | | | X | | | X | | | | IEC 60835-2-2 [7] |
| Environmental characteristics | | X | X | X | | | | | | | | | |
| Antenna stability | | X | X | X | | | | | | | | | |
| Antenna input connectors | | X | X | X | | | | | | | | | |
| Return loss/VSWR | | X | | X | | | | | | | | | IEC 60835-2-2 [7] |
| Inter-port isolation | | X | | X | | | | | | | | | IEC 60835-2-2 [7] |

NOTE 1: The environmental conditions at the time of test shall be recorded in the Test Report. This declaration will also guarantee that the essential requirements shall be met for the environmental conditions given in clauses 5.1.5 and 5.1.6.
NOTE 2: Alternative test methods may be agreed prior to testing.
NOTE 3: SD is intended for proper selection among provided options or for information necessary to carry out the test.



Clear distinction is made between "Essential Requirements (ER)" which require "Approval Testing" for regulatory purpose and "Complementary Requirements (CR) or Optional Requirements (OR)" which fulfil the "Conformance Testing" against the relevant standards.

The Type Approval Authority shall require the Supplier's Declaration which encompasses the test report demonstrating essential requirements (radiation pattern, antenna cross polar discrimination and gain), accompanied by evidence of accreditation to an internationally recognized Quality Standard, at least ISO 9001 [6].

The supplier shall be considered legally responsible for any statement in the declaration.

Annex A contains the Supplier's Declaration template for all the parameters in table 1. Annex B contains the Test Report template for the essential requirements listed in table 1.

Test Methods shall be adopted in accordance with IEC 60835-2-2 [7], although suitable test methods may be agreed between the Supplier and the type approval authority, prior to testing. A description of the test method is to be included in the test report.

## 4.2 Implementation under test (IUT)

The IUT presented for Type approval shall be a representative production model.

Testing shall be conducted at point D (D') in figure 1. An appropriate adapter shall be used if required to connect the antenna at point D (D') to the test equipment and the effects of the adapter upon the test results shall be taken into account and declared.

The configuration used during the test shall be provided in the test report clearly indicating point D (D').

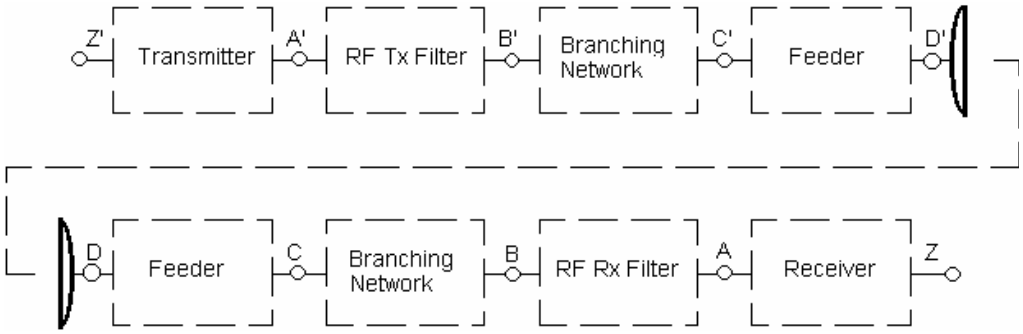


**Figure 1: System block diagram**



# 5 Supplier's Declaration



## 5.1 General characteristics

### 5.1.1 Frequency range(s)

The frequency range(s) from those quoted in the relevant standard shall be stated.

#### 5.1.1.1 Frequency band(s)

The operational frequency band(s) of the antenna shall be stated and measurements shall be carried out as a minimum at the lowest, middle and highest frequency of (each of) the relevant band(s).

### 5.1.2 Class of antenna RPE

The class of antenna RPE from within the declared frequency range of the relevant antenna standard shall be stated.

### 5.1.3 Antenna XPD category

The XPD category of the antenna from within the declared frequency range of the relevant antenna standard shall be stated.

### 5.1.4 Gain category

The gain category from within the declared frequency range of the relevant antenna standard shall be stated.