



# SLOVENSKI STANDARD

## SIST ETS 300 197:2000

01-julij-2000

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**Prenos in multipleksiranje (TM) - Parametri radiorelejnih sistemov za prenos digitalnih signalov in analognih video signalov, ki delujejo v frekvenčnem področju 38 GHz**

Transmission and Multiplexing (TM); Parameters for radio relay systems for the transmission of digital signals and analogue video signals operating at 38 GHz

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**ETSI**

European Telecommunications Standards Institute

**ETSI Secretariat**

**Postal address:** F-06921 Sophia Antipolis CEDEX - FRANCE

**Office address:** 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

**X.400:** c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

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

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## Foreword

This European Telecommunication Standard (ETS) has been prepared by the Transmission and Multiplexing (TM) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS specifies the minimum performance parameters for radio equipment operating in the frequency range 37 GHz to 39,5 GHz as specified in the scope. Other Standards cover radiocommunications equipment not listed in Clause 1.

Annex A (Bibliography) provides details of the informative references provided in this ETS.

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## 1 Scope

This European Telecommunication Standard (ETS) covers the minimum performance requirements for terrestrial fixed services radiocommunications equipment, as given below, in the frequency band 37 GHz to 39,5 GHz.

This ETS specifies the performance criteria for the different equipment groups.

The equipment groups are:

- digital signals;
- analogue video signals.

## 2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 019: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment".
- [2] prETS 300 132-1: "Equipment Engineering (EE); Power supply interface at the input to telecommunications equipments Part 1: Interfaces operated by alternating current "AC"". (DE/EE-02001.1)
- [3] prETS 300 132-2: "Equipment Engineering (EE); Power supply interface at the input to telecommunications equipments Part 2: Interfaces operated by direct current "DC"". (DE/EE-02001.2)  
<https://standards.iteh.ai/catalog/standards/sist/8eb37895-1de2-4c47-99a9-719277716100>
- [4] CCITT Recommendation G.703 (1991): "Physical/electrical characteristics of hierarchical digital interfaces".
- [5] CCITT Recommendation G.707 (1991): "Synchronous digital hierarchy bit rates".
- [6] CCITT Recommendation G.708 (1991): "Network node interface for the synchronous digital hierarchy".
- [7] CCITT Recommendation G.709 (1991): "Synchronous multiplexing structure".
- [8] CCITT Recommendation G.781 (1990): "Structure of recommendations on multiplexing equipment for synchronous digital hierarchy (SDH)".
- [9] CCITT Recommendation G.782 (1990): "Types and general characteristics of synchronous digital hierarchy (SDH) multiplexing equipment".
- [10] CCITT Recommendation G.783 (1990): "Characteristics of synchronous digital hierarchy (SDH) multiplexing equipment functional blocks".
- [11] CCITT Recommendation G.784 (1990): "Synchronous digital hierarchy (SDH) management".
- [12] CCIR Recommendation 403: "Intermediate-frequency characteristics for the interconnection of analogue radio-relay systems".
- [13] CCIR Recommendation 749: "Radio frequency channel arrangements for digital and analogue radio-relay systems operating in the 36.0 GHz to 40.5 GHz band".

- [14] CCIR Recommendation 696: "Error performance and availability objectives for hypothetical reference digital sections utilising digital radio-relay systems forming part or all of the medium grade portion of an ISDN connection".
- [15] CCIR Recommendation 697: "Error performance objectives for the local grade portion at each end of an ISDN utilising digital radio-relay systems".

### 3 Abbreviations

For the purposes of this ETS, the following abbreviations apply.

BER	Bit Error Ratio
RF	Radio Frequency
SDH	Synchronous Digital Hierarchy
SRL	Spectrum Reference Level
TMN	Telecommunications Management Network

### 4 General characteristics

#### 4.1 Frequency bands and channel arrangements

##### 4.1.1 Frequency band is in the range 37 GHz to 39,5 GHz

**Channel plan:** The channel plan shall be in accordance with CCIR Recommendation 749 [13] with a basic raster of 3,5 MHz.

##### 4.1.2 Co-polar channel spacing for like carriers

For systems operating on the same antenna (see subclause 4.3 a).

**Table 1: Digital systems**

Minimum Bit Rate (Mbit/s)	2	8	34	34	140/155
Channel Spacing (MHz)	7	14	28	56	140

**Table 2: Analogue systems**

Video Baseband (MHz)	< 3,5	< 6	< 10	< 14
Channel Spacing (MHz)	28	56	56	56

##### 4.1.3 Transmit/receive centre gap

The centre gap shall be taken as a multiple of the basic raster distance of 7 MHz and shall not be less than 56 MHz.

##### 4.1.4 Transmit/receive duplex frequency separation

The transmitter receiver duplex frequency separation shall not be less than 252 MHz (typical separations will be around 1 GHz). Spacing should be in accordance with local administrations' frequency planning rules.

#### 4.2 Performance prediction and objectives (for reference only)

Systems considered in this ETS should meet the CCIR medium grade performance objectives of CCIR Recommendation 696 [14] class 4 and the local grade performance objectives of CCIR Recommendation 697 [15].

The dominant fading mechanism is rain attenuation; performance prediction methods should be based on the latest issues of the following CCIR Recommendations:

Recommendation 453: "The formula for the radio refractive index";

Recommendation 530: "Propagation data and prediction methods required for the design of terrestrial line-of-sight systems";

Recommendation 837: "Characteristics of precipitation for propagation modelling";

Recommendation 838: "Specific attenuation model for rain for use in prediction methods";

Recommendation 840: "Attenuation due to clouds and fog".

#### 4.3 Compatibility requirements between systems

- a) Systems should be required to operate on common hops using either separate antennas or the same antenna.
- b) There should be no requirement to operate transmitting equipment from one manufacturer with receiving equipment from another, or to multiplex different manufacturers equipment on the same antenna.

#### 4.4 Types of installation

The equipment may comprise both radio-relay units in weather protected locations and outdoor units with the Radio Frequency (RF) assemblies located close to the antenna in order to minimise feeder losses.

##### 4.4.1 Environmental conditions

The equipment shall be required to meet either the environmental conditions set out in ETS 300 019 [1], which defines weather protected and non-weather protected locations, classes and test severities, or one of the conditions listed in subclause 4.4.1.2.

##### 4.4.1.1 Equipment within weather protected locations

The most important climatic parameter values for the five classes are given in table 3.

Table 3

Climatic class	3.1	3.2	3.3	3.4	3.5
High air temperature (°C)	+ 40	+ 45	+ 55	+ 70	+ 40
Low air temperature (°C)	+ 5	- 5	- 25	- 40	- 40
High relative humidity (%)	85	95	100	100	100
Low relative humidity (%)	5	5	10	10	10
Air movement (m/s)	5	5	5	5	5
Solar radiation (W/m <sup>2</sup> )	700	700	1 120	1 120	-

Climatic classes 3.1 and 3.2 apply to equipment designed for temperature controlled locations or partially temperature controlled locations respectively. This type of equipment is generally described as "indoor" equipment.

The use of radio-relay equipment covering climatic classes 3.3 (non-temperature controlled locations), 3.4 (sites with heat trap) and 3.5 (sheltered locations) is not mandatory.