

SLOVENSKI STANDARD

SIST EN 300 631-1 V1.1.1:2003

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Transmission and Multiplexing (TM); Digital Radio Relay Systems (DRRS); Part 1:
Antennas for Point-to-Point (P-P) radio links in the 1 GHz to 3 GHz band

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European Standard (Telecommunications series)

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European Telecommunications Standards Institute

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Intellectual Property Rights

ETSI has not been informed of the existence of any Intellectual Property Right (IPR) which could be, or could become essential to the present document. However, pursuant to the ETSI Interim IPR Policy, no investigation, including IPR searches, has been carried out. No guarantee can be given as to the existence of any IPRs which are, or may be, or may become, essential to the present document.

Foreword

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

It was decided by TM to split the original document (ETS 300 631, processed through Public Enquiry 88) into two parts. This part 1 deals with Point-to-Point (P-P) antennas while part 2 deals with Point-to-Multipoint (P-M) antennas.

The purpose of the present document is to define the antenna performance standards necessary to ensure optimum frequency co-ordination between services in the re-planned 1 GHz to 3 GHz band. The 3 GHz upper limit has been introduced making reference to the WRC-95 Final Acts [3] and the frequency plans as given in CEPT Recommendation T/R 13-01 [1].

Additional parameters appropriate to system implementation may be subject to agreement between the equipment purchaser and supplier. Further guidance is provided in annex A.

iTeh STANDARD PREVIEW **National transposition dates** **(standards.iteh.ai)**

Date of adoption of this EN:	24 October 1997
Date of latest announcement of this EN (doa):	28 February 1998
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 1998
Date of withdrawal of any conflicting National Standard (dow):	31 August 1998

1 Scope

The present document addresses the requirements for directional fixed beam antennas to be utilized with new Point-to-Point (P-P) systems operating in the frequency band 1 GHz to 3 GHz. Electronically steerable antennas, and circularly polarized antennas will not be considered under the present document.

The application of these Digital Radio Relay Systems (DRRS) is anticipated to be for P-P links in local, regional and national networks, mobile base station connections, customer access links, telemetry and telecontrol (including transportable and offshore use).

Only in exceptional circumstances, after a consultation period with operators and manufactures, a Regulatory Authority may impose tighter requirements than the minimum values given in the present document, in order to maximize the use of the scarce spectrum resources.

2 Normative references

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] CEPT Recommendation T/R 13-01: "Preferred Channel Arrangement for Fixed Services in the range 1-3 GHz".
- [2] ITU-R Recommendation F.746: "Radio-Frequency channel arrangements for radio-relay systems", version Geneva 1994.
- [3] Final Acts of the World Radiocommunications Conference (WRC-95), Geneva 1995.

3 Definitions, symbols and abbreviations

3.1 Definitions

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

antenna: That part of the transmitting or receiving system that is designed to radiate or receive electromagnetic waves.

co-polar pattern: A diagram representing the radiation pattern of a test antenna when the reference antenna is similarly polarized, scaled in dBi or dB relative to the measured antenna gain.

Cross-Polar Discrimination (XPD): The difference between the peak of the co-polarized main beam and the maximum cross-polarized signal over an angle twice the half power beamwidth of the co-polarized main beam.

cross-polar pattern: A diagram representing the radiation pattern of a test antenna when the reference antenna is orthogonally polarized, scaled in dBi, or dB relative to the measured antenna gain.

gain: The ratio of the radiation intensity, in a given direction, to the radiation intensity that would be obtained if the power accepted by the antenna was radiated isotropically.

half power beamwidth: The angle between the two directions at which the measured co-polar pattern is 3 dB below the value on the main beam axis.

isotropic radiator: A hypothetical, lossless antenna having equal radiation intensity in all directions.

main beam: The radiation lobe containing the direction of maximum radiation.

main beam axis: The direction for which the radiation intensity is maximum.

radiation pattern: A diagram relating power flux density at a constant distance from the antenna to the direction relative to the antenna main beam axis.

Radiation Pattern Envelope (RPE): An envelope below which the radiation pattern shall fit.

radome: A cover of dielectric material, intended to protect an antenna from the effects of its physical environment.

3.2 Abbreviations

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

DRRS	Digital Radio Relay Systems
P-P	Point-to-Point
RPE	Radiation Pattern Envelope
XPD	Cross-Polar Discrimination
UV	Ultra Violet
VSWR	Voltage Standing Wave Ratio

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3.3 Symbols

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

dB	decibel
dBi	decibels relative to an isotropic radiator
MHz	MegaHertz
GHz	GigaHertz

4 Frequency bands

The present document applies to the frequency bands given in CEPT Recommendation T/R 13-01 [1] and ITU-R Recommendation F.746 [2].

5 Classification of antennas

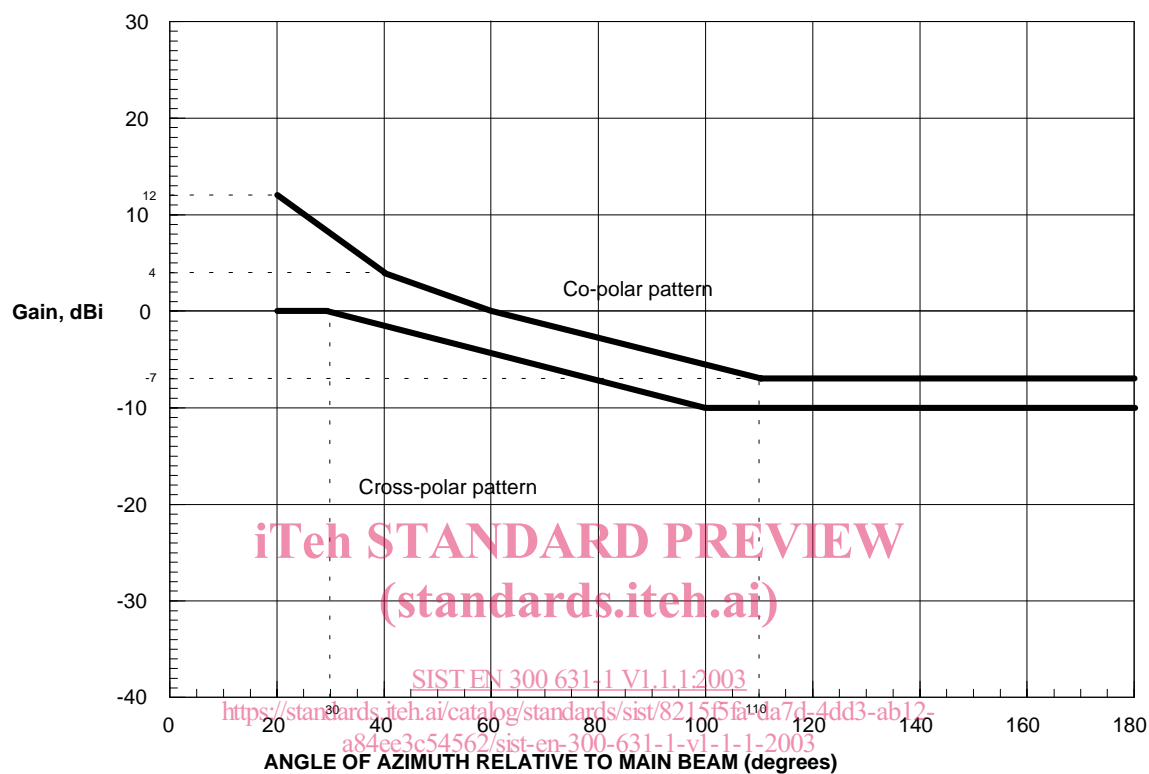
With respect to Radiation Pattern Envelopes (RPEs), three classes of antennas have been identified:

Class 1:	Those antennas required for environments where interference is unlikely.
Class 2:	Those antennas required for use in networks where there is a low interference potential.
Class 3:	Those antennas required for use in networks where there is a high interference potential.

6 Electrical characteristics

6.1 RPE

The choice of antenna depends on the application planned for this band, requirements of the operators and the responsible administration. Figures 1 to 5 give the RPEs for antenna classes 1 to 3.



Angle (degree)	Co-polar (dBi)	Angle (degree)	Cross-polar (dBi)
20	12	20	0
40	4	30	0
110	-7	100	-10
180	-7	180	-10

Figure 1: Class 1 antenna