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Fixed Radio Systems - Characteristics and requirements for point-to-point equipment and antennas - Part 1: Overview, common characteristics and system-independent requirements

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**Fixed Radio Systems;
Characteristics and requirements for
point-to-point equipment and antennas;
Part 1: Overview, common characteristics and
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Foreword

This draft European Standard (EN) has been produced by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing (ATTM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document is part 1 of a multi-part deliverable covering the Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas, as identified below (see note):

Part 1: "Overview, common characteristics and system-independent requirements";

Part 2: "Digital systems operating in frequency bands from 1 GHz to 86 GHz; Harmonised Standard for access to radio spectrum.

Part 4: "Antennas".

NOTE: In previous regulatory regime of harmonised and non-harmonised standards under Directive 1999/5/EC more parts were published, which have been superseded since Directive 2014/53/EU [i.1] repealed Directive 1999/5/EC;

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1 Scope

The present document applies to Digital Fixed Radio Systems (DFRS) in point-to-point operation with integral and external antennas in the frequency range of 1 GHz to 86 GHz corresponding to the appropriate frequency bands 1,4 GHz to 86 GHz as described in ETSI EN 302 217-2 [18], annex B to annex J.

The present document summarizes:

- all characteristics, principles and, of utmost importance, terms and definitions that are common to all P-P equipment and antennas and its consultation is necessary when using all other parts of ETSI EN 302 217 series;
- all system-dependent requirements for Point-to-Point (P-P) equipment. These requirements are introduced in two different clauses sub-sets:
 - **Main requirements** are requirements that are also related to the "essential requirements" under article 3.2 of Directive 2014/53/EU [i.1] and further detailed in the Harmonised Standard ETSI EN 302 217-2 [18].
 - **Complementary requirements** are requirements that are not related to essential requirements under article 3.2 of Directive 2014/53/EU [i.1]. Nevertheless they have been commonly agreed for proper system operation and deployment when specific deployment conditions or compatibility requirements are present. Compliance to all or some of these requirements is left to manufacturer decision.

Technical background for most of the parameters and requirements referred to in this multi-part deliverable may be found in ETSI TR 101 036-1 [i.16].

Health and safety requirements and EMC conditions and requirements are not considered in the ETSI EN 302 217 series.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

- [1] CENELEC EN 122150: "Sectional Specification: Radio frequency coaxial connectors - Series EIA flange".
- [2] ERC/DEC(00)07: "The shared use of the band 17.7 - 19.7 GHz by the fixed service and earth stations of the fixed-satellite service (space-to-Earth)". ERC Decision, approved 19 October 2000, amended 04 March 2016.
- [3] ETSI EN 300 019-1-0: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-0: Classification of environmental conditions; Introduction".
- [4] ETSI EN 300 019-2-0: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-0: Specification of environmental tests; Introduction".

- [5] ETSI EN 300 019-1-1: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-1: Classification of environmental conditions; Storage".
- [6] ETSI EN 300 019-2-1: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-1: Specification of environmental tests; Storage".
- [7] ETSI EN 300 019-1-2: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-2: Classification of environmental conditions; Transportation".
- [8] ETSI EN 300 019-2-2: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-2: Specification of environmental tests; Transportation".
- [9] ETSI EN 300 019-1-3: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-3: Classification of environmental conditions; Stationary use at weather protected locations".
- [10] ETSI EN 300 019-2-3: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-3: Specification of environmental tests; Stationary use at weather protected locations".
- [11] ETSI EN 300 019-1-4: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-4: Classification of environmental conditions; Stationary use at non-weather protected locations".
- [12] ETSI EN 300 019-2-4: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-4: Specification of environmental tests; Stationary use at non-weather protected locations".
- [13] ETSI EN 300 132-2: "Environmental Engineering (EE); Power supply interface at the input to telecommunications and datacom (ICT) equipment; Part 2: Operated by -48 V direct current (dc)".
- [14] ETSI EN 300 132-3: "Environmental Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 3: Operated by rectified current source, alternating current source or direct current source up to 400 V".
- [15] ETSI EN 301 126-1: "Fixed Radio Systems; Conformance testing; Part 1: Point-to-Point equipment - Definitions, general requirements and test procedures".
- [16] ETSI EN 302 099: "Environmental Engineering (EE); Powering of equipment in access network".
- [17] ETSI EN 301 126-3-1: "Fixed Radio Systems; Conformance testing; Part 3-1: Point-to-Point antennas; Definitions, general requirements and test procedures".
- [18] ETSI EN 302 217-2 (V3.2.0): Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2: Digital systems operating in frequency bands from 1 GHz to 86 GHz; Harmonised Standard for access to radio spectrum".
- [19] ETSI EN 302 217-4 (V2.1.1): "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 4: Antennas".
- [20] CENELEC EN 60835-2-4: "Methods of measurement for equipment used in digital microwave radio transmission systems - Part 2: Measurements on terrestrial radio-relay systems - Section 4: Transmitter/receiver including modulator/demodulator".
- [21] CENELEC EN 60835-2-8: "Methods of measurement for equipment used in digital microwave radio transmission systems - Part 2: Measurements on terrestrial radio-relay systems - Section 8: Adaptive equalizer".
- [22] IEEE 802.3-2012™: "IEEE Standard for Ethernet".
- [23] Recommendation ITU-R F.746: "Radio-frequency arrangements for fixed service systems".

- [24] Recommendation ITU-R F.1668: "Error performance objectives for real digital fixed wireless links used in 27 500 km hypothetical reference paths and connections".
- [25] Recommendation ITU-R F.1703: "Availability objectives for real digital fixed wireless links used in 27 500 km hypothetical reference paths and connections".
- [26] Recommendation ITU-R P.530: "Propagation data and prediction methods required for the design of terrestrial line-of-sight systems".
- [27] Recommendation ITU-T G.703: "Physical/electrical characteristics of hierarchical digital interfaces".
- [28] Recommendation ITU-T G.704: "Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels".
- [29] Recommendation ITU-T G.707: "Network node interface for the synchronous digital hierarchy (SDH)".
- [30] Recommendation ITU-T G.708: "Sub STM-0 network node interface for the synchronous digital hierarchy (SDH)".
- [31] Recommendation ITU-T G.826: "End-to-end error performance parameters and objectives for international, constant bit-rate digital paths and connections".
- [32] Recommendation ITU-T G.828: "Error performance parameters and objectives for international, constant bit-rate synchronous digital paths".
- [33] Recommendation ITU-T G.829: "Error performance events for SDH multiplex and regenerator sections".
- [34] Recommendation ITU-T G.957: "Optical interfaces for equipment and systems relating to the synchronous digital hierarchy".
- [35] Recommendation ITU-T I.356: "B-ISDN ATM layer cell transfer performance".
- [36] Recommendation ITU-T I.357: "B-ISDN semi-permanent connection availability".
- [37] Recommendation ITU-T O.151: "Error performance measuring equipment operating at the primary rate and above".
- [38] Recommendation ITU-T O.181: "Equipment to assess error performance on STM-N interfaces".
- [39] Recommendation ITU-T O.191: "Equipment to measure the cell transfer performance of ATM connections".
- [40] Recommendation ITU-T V.11: "Electrical characteristics for balanced double-current interchange circuits operating at data signalling rates up to 10 Mbit/s".
- [41] Recommendation ITU-T V.24: "List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)".
- [42] Recommendation ITU-T V.28: "Electrical characteristics for unbalanced double-current interchange circuits".
- [43] Recommendation ITU-T Y.1540: "Internet protocol data communication service - IP packet transfer and availability performance parameters".

2.2 Informative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.
- [i.2] ETSI TR 101 035: "Transmission and Multiplexing (TM); Synchronous Digital Hierarchy (SDH) aspects regarding Digital Radio Relay Systems (DRRS)".
- [i.3] ETSI TR 102 243-1: "Fixed Radio Systems; Representative values for transmitter power and antenna gain to support inter- and intra-compatibility and sharing analysis; Part 1: Digital point-to-point systems".
- [i.4] CEPT/ERC/REC 12-03: "Harmonized radio frequency channel arrangements for digital terrestrial fixed systems operating in the band 17,7 GHz to 19,7 GHz".
- [i.5] Void.
- [i.6] CEPT/ECC/REC(02)06: "Channel arrangements for digital Fixed Service Systems operating in the frequency range 7 125-8 500 MHz".
- [i.7] CEPT/ECC/Report 80: "Enhancing harmonisation and introducing flexibility in the spectrum regulatory framework".
- [i.8] CEPT/ECC/Report 198: "Adaptive modulation and ATPC operations in fixed point-to-point systems - Guideline on coordination procedures".
- [i.9] CEPT/ERC/REC 14-01: "Radio-frequency channel arrangements for high capacity analogue and digital radio-relay systems operating in the band 5 925 MHz - 6 425 MHz".
- [i.10] CEPT/ERC/REC 14-02: "Radio-frequency channel arrangements for high, medium and low capacity digital fixed service systems operating in the band 6 425 - 7 125 MHz".
- [i.11] ETSI EN 301 489-1: "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU".
- [i.12] ETSI EN 301 489-4: "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 4: Specific conditions for fixed radio links and ancillary equipment; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU".
- [i.13] ETSI EN 302 217-1 (V2.1.1): "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 1: Overview and system-independent common characteristics".

NOTE: Previous superseded version of the present document not applicable in Directive 2014/53/EU [i.1] regime.

- [i.14] Void.
- [i.15] ETSI EN 300 119 (all parts): "Environmental Engineering (EE); European telecommunication standard for equipment practice".