

ETSI EN 302 217-4 V2.2.1 (2025-07)



Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 4: Antennas

ETSI EN 302 217-4 V2.2.1 (2025-07)

<https://standards.iteh.ai/catalog/standards/etsi/07e03e37-c7c3-48c2-bbab-3f5af12e2b01/etsi-en-302-217-4-v2-2-1-2025-07>

Reference

REN/ATTM-0456

Keywords

antenna, DFRS, DRRS, FWS, point-to-point, radio,
regulation, 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 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from the
[ETSI Search & Browse Standards](#) application.

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format on [ETSI deliver](#) repository.

Users should be aware that the present document may be revised or have its status changed,
this information is available in the [Milestones listing](#).

If you find errors in the present document, please send your comments to
the relevant service listed under [Committee Support Staff](#).

If you find a security vulnerability in the present document, please report it through our
[Coordinated Vulnerability Disclosure \(CVD\)](#) program.

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.
In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2025.
All rights reserved.

Contents

Intellectual Property Rights	5
Foreword.....	5
Modal verbs terminology.....	5
1 Scope	6
2 References	6
2.1 Normative references	6
2.2 Informative references.....	7
3 Definition of terms, symbols and abbreviations.....	7
3.1 Terms.....	7
3.2 Symbols.....	7
3.3 Abbreviations	8
4 Technical requirements specifications	8
4.1 Introduction	8
4.2 Templates for definition of Radiation Pattern Envelope (RPE) classes	8
4.3 Environmental profile.....	11
4.4 Radiation Pattern Envelope (RPE)	11
4.4.1 Introduction.....	11
4.4.2 Frequency range 0: 1 GHz to 3 GHz	12
4.4.3 Frequency range 1: 3 GHz to 14 GHz	16
4.4.4 Frequency range 2: 14 GHz to 20 GHz.....	19
4.4.5 Frequency range 3: 20 GHz to 24 GHz.....	21
4.4.6 Frequency range 4: 24 GHz to 30 GHz.....	24
4.4.7 Frequency range 5: 30 GHz to 47 GHz.....	26
4.4.8 Frequency range 6: 47 GHz to 71 GHz.....	30
4.4.9 Frequency range 7: 71 GHz to 86 GHz.....	32
4.4.10 Frequency range 8: 92 GHz to 114,25 GHz.....	35
4.4.11 Frequency range 9: 130 GHz to 175,8 GHz.....	36
4.5 Cross-Polar Discrimination (XPD).....	37
4.5.1 XPD categories	37
4.5.2 XPD category 1.....	37
4.5.3 XPD categories 2 and 3	37
4.5.3.1 Frequency range 1 GHz to 3 GHz	37
4.5.3.2 Frequency range 3 GHz to 174,8 GHz	38
4.6 Antenna gain	39
5 Testing for compliance with technical requirements.....	40
5.1 Environmental conditions for testing	40
5.2 General test prescription.....	40
5.2.1 Wide radio-frequency band covering antennas specification and tests.....	40
5.2.2 <i>Self-alignment tracking</i> antennas	40
Annex A (informative): Additional information.....	41
A.1 Mechanical characteristics	41
A.1.1 Environmental characteristics	41
A.1.2 Wind ratings	41
A.1.3 Antenna stability	41
A.2 Antenna port connectors.....	41
A.3 Return loss at the port connectors	42
A.3.1 Background	42
A.3.2 Typical RL guidelines	42
A.4 Inter-port isolation.....	42
A.5 Antenna labelling	42

Annex B (informative):	Antenna gain and radiation pattern information	43
B.1	Impact of antenna gain on the frequency planning	43
B.2	Typical Gain and Radiation Pattern for circular-symmetric antennas	43
B.2.1	Introduction	43
B.2.2	Gain	44
B.2.3	Radiation pattern	44
Annex C (informative):	Change history	45
History		46

iTech Standards
(<https://standards.iteh.ai>)
Document Preview

[ETSI EN 302 217-4 V2.2.1 \(2025-07\)](https://standards.iteh.ai/catalog/standards/etsi/07e03e37-c7c3-48c2-bbab-3f5af12e2b01/etsi-en-302-217-4-v2-2-1-2025-07)

<https://standards.iteh.ai/catalog/standards/etsi/07e03e37-c7c3-48c2-bbab-3f5af12e2b01/etsi-en-302-217-4-v2-2-1-2025-07>

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are 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 IPR online database](#).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**, **LTE™** and **5G™** logo are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing (ATTM).

The present document is part 4 of a multi-part deliverable covering the Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas. Full details of the entire series can be found in part 1 [2].

National transposition dates

Date of adoption of this EN:	2 July 2025
Date of latest announcement of this EN (doa):	31 October 2025
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2026
Date of withdrawal of any conflicting National Standard (dow):	30 April 2026

Modal verbs terminology

In the present document **"shall"**, **"shall not"**, **"should"**, **"should not"**, **"may"**, **"need not"**, **"will"**, **"will not"**, **"can"** and **"cannot"** are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"must" and **"must not"** are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document defines the characteristics and requirements of antennas for point-to-point radio equipment operating in the frequency range from 1 GHz to 174,8 GHz falling within the scope (see note) of ETSI EN 302 217-2 [i.2].

For technical commonalities that range is here divided into sub-ranges as follows:

Range 0:	1 GHz to 3 GHz;
Range 1:	3 GHz to 14 GHz;
Range 2:	14 GHz to 20 GHz;
Range 3:	20 GHz to 24 GHz;
Range 4:	24 GHz to 30 GHz;
Range 5:	30 GHz to 47 GHz;
Range 6:	47 GHz to 71 GHz;
Range 7:	71 GHz to 86 GHz;
Range 8:	92 GHz to 114,25 GHz;
Range 9:	130 GHz to 174,8 GHz.

The present document is applicable to fixed radio equipment with *integral* (see note) or *dedicated antennas*.

NOTE: For information, ETSI EN 302 217-2 [i.2] includes in its scope only the use of *detachable integral antennas*; *undetachable integral antennas* are not considered due to the present lack of radiated test procedures for the radio equipment parameters.

The present document also applies to *stand-alone antennas*, placed separately on the market. In this case the present document is to be used by radio equipment manufacturers to provide guidance as to the information for the user, as required by article 10 paragraph 8 of Directive 2014/53/EU [i.1], regarding the antenna characteristics required so as the radio equipment, supplied without antenna, can operate as intended in its *technical documentation*.

The present document is applicable to fixed beam antennas, as well as to "*self-alignment tracking*" antenna, with limited tracking range, so that all requirements in the present document are respected throughout the *tracking angle* indicated in the *technical documentation*.

The main body of the present document specifies the characteristics that define the various antenna classes, whilst the annexes provide additional information that is useful to both antenna manufacturers and user/installers.

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.

Referenced documents which are not found to be publicly available in the expected location might be found in the [ETSI docbox](https://standards.etsi.org/ETSI/docbox/).

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long-term validity.