



**Fixed Radio Systems;
Multipoint Equipment and Antennas;
Part 2: Harmonised Standard for access to radio spectrum**

Document Preview

[ETSI EN 302 326-2 V2.2.0 \(2025-12\)](https://standards.iteh.ai/catalog/standards/etsi/fa4bd193-fbe6-429e-a7c9-0ead8c54aed2/etsi-en-302-326-2-v2-2-0-2025-12)

<https://standards.iteh.ai/catalog/standards/etsi/fa4bd193-fbe6-429e-a7c9-0ead8c54aed2/etsi-en-302-326-2-v2-2-0-2025-12>

ReferenceREN/ATTM-0461

Keywordsaccess, DFRS, DRRS, FWA, multipoint, radio,
system

ETSI650 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	7
Foreword.....	7
Modal verbs terminology.....	8
Introduction	8
1 Scope	10
2 References	11
2.1 Normative references	11
2.2 Informative references.....	11
3 Definition of terms, symbols and abbreviations.....	13
3.1 Terms.....	13
3.2 Symbols.....	17
3.3 Abbreviations	18
4 Framework for requirements	20
4.1 Applicability of requirements.....	20
4.1.0 Requirement selection.....	20
4.1.1 Generality	20
4.1.2 The Equipment Classification (EqC)	20
4.1.3 Asymmetric MP implementations	21
4.2 RF reference architecture	21
4.2.1 Reference block diagram	21
4.2.2 Measure reference points and system loading.....	22
5 Technical requirements specifications	22
5.1 General requirements	22
5.2 Environmental profile.....	22
5.3 Transmitter conformance requirements.....	23
5.3.1 General requirements.....	23
5.3.2 Transmitter output power.....	23
5.3.2.1 General	23
5.3.2.2 Transmitter maximum power and EIRP.....	23
5.3.2.3 Transmitter output power environmental variation.....	23
5.3.3 Transmitter Radio Frequency stability.....	24
5.3.4 Transmitter Radio Frequency spectrum mask and emissions	24
5.3.4.1 Transmitter Radio Frequency spectrum mask.....	24
5.3.4.2 Transmitter discrete CW components exceeding the transmitter Radio Frequency spectrum mask limits	27
5.3.5 Transmitter unwanted emissions in the spurious domain	28
5.3.6 Transmitter power control (ATPC and RTPC).....	29
5.3.6.1 General	29
5.3.6.2 Automatic Transmitter Power Control (ATPC).....	29
5.3.6.3 Remote Transmitter Power Control (RTPC).....	29
5.3.7 Transmitter Remote Frequency Control (RFC)	30
5.3.8 Transmitter Dynamic Change of Modulation Order.....	30
5.4 Receiver conformance requirements	30
5.4.1 General.....	30
5.4.2 Receiver unwanted emissions in the spurious domain.....	30
5.4.3 BER as a function of Receiver input Signal Level (RSL).....	30
5.4.3.1 General	30
5.4.3.2 Single signal performance.....	30
5.4.3.3 Performance with <i>maximum system loading</i> (EqC-PET = D only).....	32
5.4.3.4 Receiver Dynamic range	32
5.4.4 Receiver selectivity.....	33
5.4.4.0 Introduction.....	33
5.4.4.1 Receiver co-channel interference sensitivity.....	33

5.4.4.2	Receiver first adjacent channel interference sensitivity	35
5.4.4.3	Receiver blocking (CW spurious interference sensitivity)	37
5.4.4.4	Receiver radio-frequency intermodulation and Receiver second adjacent channel interference sensitivity	38
5.4.4.4.1	Requirement background	38
5.4.4.4.2	Requirement limit	38
6	Testing for compliance with technical requirements	39
6.1	General	39
6.2	Environmental conditions for testing	39
6.2.1	Generality	39
6.2.2	Minimum profile for <i>indoor</i> use	39
6.2.3	Minimum profile for <i>outdoor</i> use	40
6.3	Transmitter requirements	40
6.3.1	General	40
6.3.1.1	Summary table for transmitter test conditions	40
6.3.1.2	Spectrum analyser settings	42
6.3.2	Transmitter output power	42
6.3.2.1	General	42
6.3.2.2	Transmitter maximum power and EIRP	42
6.3.2.3	Transmitter output power environmental variation	43
6.3.3	Transmitter Radio Frequency stability	43
6.3.4	Transmitter Radio Frequency spectrum mask and emissions	43
6.3.4.1	Transmitter Radio Frequency spectrum mask	43
6.3.4.2	Transmitter Discrete CW components exceeding the transmitter Radio Frequency spectrum mask limit	44
6.3.5	Transmitter unwanted emissions in the spurious domain	44
6.3.6	Transmitter power control (ATPC and RTPC)	45
6.3.6.1	General	45
6.3.6.2	Automatic Transmitter Power Control (ATPC)	45
6.3.6.3	Remote Transmitter Power Control (RTPC)	45
6.3.7	Transmitter Remote Frequency Control (RFC)	46
6.3.8	Transmitter dynamic Change of Modulation Order	46
6.4	Receiver conformance requirements	46
6.4.1	General	46
6.4.2	Receiver unwanted emissions in the spurious domain	48
6.4.3	BER as a function of Receiver input Signal Level (RSL)	48
6.4.3.1	General	48
6.4.3.2	Single signal performance	48
6.4.3.3	Performance at <i>maximum system loading</i> (EqC-PET = D only)	48
6.4.3.4	Receiver dynamic range	48
6.4.4	Receiver selectivity	49
6.4.4.1	Receiver co-channel interference sensitivity	49
6.4.4.2	Receiver first adjacent channel interference sensitivity	49
6.4.4.3	Receiver blocking (CW spurious interference sensitivity)	49
6.4.4.4	Receiver radio-frequency intermodulation and receiver second adjacent channel interference sensitivity	50

Annex A (informative):	Relationship between the present document and the essential requirements of Directive 2014/53/EU	51
-------------------------------	---	-----------

Annex B (normative):	Test report in relation to flexible systems applications	53
-----------------------------	---	-----------

B.1	Wide radio-frequency band covering units specification and tests	53
-----	--	----

B.2	Multirate/Multiformat covering equipment specification and tests	56
-----	--	----

Annex C (normative):	Equipment classification (EqC) and system capacity	57
-----------------------------	---	-----------

C.1	General	57
-----	---------------	----

C.2	EqC description	57
-----	-----------------------	----

C.2.1	Void	57
-------	------------	----

C.2.2	Primary Equipment Type (EqC-PET)	57
-------	--	----

C.2.3	Secondary Equipment Type (EqC-SET)	57
C.2.4	Equivalent Modulation Order (EqC-EMO)	58
C.2.5	Channel Separation (EqC-ChS)	58
C.2.6	Frequency Range (EqC-FR)	59
C.2.7	Station Type (EqC-STN)	59
C.3	System capacity	59
C.3.1	General	59
C.3.2	Capacity of equipment with EqC-PET = T, O or M	60
C.3.3	Capacity of equipment with EqC-PET = F	60
C.3.4	Capacity of equipment with EqC-PET = D	61
C.4	Summary of Equipment Profiles in the scope of present document	61
Annex D (informative):	Transmitter Radio Frequency Spectrum mask background for ATPC and/or RTPC implementation	64
D.0	Introduction	64
D.1	ATPC impact	64
D.2	RTPC Impact	65
Annex E (informative):	Overview of technology features of multipoint systems	66
E.1	General	66
E.2	Network topology	66
E.3	Multiplexing methods	66
E.4	Multiple access methods	67
E.5	Duplex methods	67
E.6	Modulation methods	68
E.6.1	Modulation techniques	68
E.6.2	Equivalent Modulation Order (EMO)	68
E.7	Error correction	69
E.8	Other relevant system characteristics	69
Annex F (informative):	Frequency bands	70
F.1	Frequency ranges	70
F.2	Frequency ranges CEPT applications	71
Annex G (informative):	Summary Table of EqC codes subject to the conformance assessment	73
G.1	The right to copy	73
Annex H (informative):	System architecture	74
H.1	General architecture	74
H.2	Point-to-MultiPoint (P-MP) architectures	74
H.3	Mesh (or MP-MP) architectures	76
Annex I (informative):	Mixed-mode operation	77
I.1	Introduction	77
I.2	General description of <i>mixed-mode</i> systems	77
I.3	Background for transmitter and receiver requirements operating in <i>mixed-mode</i>	77
I.3.1	Requirements summary	77
I.3.2	Transmitter Radio Frequency spectrum masks for <i>mixed-mode</i> systems	77
I.3.3	Receiver adjacent channel interference sensitivity	79

I.3.4	Receiver co-channel interference sensitivity	79
Annex J (informative):	Antennas	80
J.1	Antenna generality	80
J.2	Antenna profiles	80
Annex K (informative):	Typical reference model for BER, MGBR and EMO.....	81
K.1	General	81
K.2	Interface X'_1 to X'_N	82
K.3	Payload processing block	82
K.4	Multiple access block	83
K.5	Outer error correcting block	83
K.6	Inner error correcting block.....	83
K.7	Modulator	84
K.8	Choice of reference point for BER, MGBR and EMO	84
K.9	Examples	84
K.9.1	16 QAM TDMA system with 3/4 rate convolutional coding	84
K.9.2	16 QAM TDMA system with 1/2 rate convolutional coding and 204/188 Reed Solomon coding	85
K.9.3	16 QAM TDMA system with 1/2 rate turbo coding.....	85
K.9.4	16 QAM FDMA system with 1/2 rate convolutional coding	85
Annex L (informative):	Test interpretation and measurement uncertainty	86
Annex M (informative):	Bibliography.....	87
Annex N (informative):	Change history	88
History		89

ETSI EN 302 326-2 V2.2.0 (2025-12)

<https://standards.iteh.ai/catalog/standards>

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 draft Harmonised 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 Standardisation Request deliverable Approval Procedure (SRdAP).

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.4] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU 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.1].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in Table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive and associated EFTA regulations.

The present document covers characteristics and requirements for fixed multipoint radio equipment using a variety of access and duplex methods and operating at a variety of bit rates in frequency bands as specified in the present document.

The present document is part 2 of a multi-part deliverable covering the Fixed Radio Systems; Multipoint Equipment and Antennas, as identified below:

Part 1: "Overview and Requirements for Digital Multipoint Radio Systems";

Part 2: "Harmonised Standard for access to radio spectrum";

Part 3: "Multipoint Antennas".

NOTE: Part 1 is no longer maintained and referenced in other parts of the series.