

STN	Pevné rádiové systémy Systémy spojenia bod-bod a viacbodové systémy Nežiaduce emisie v rušivej oblasti a medze odolnosti prijímača na porte zariadenie/anténa digitálnych pevných rádiových systémov	STN EN 301 390 V2.1.1 87 1390
------------	---	---

Fixed Radio Systems; Point-to-point and Multipoint Systems; Unwanted emissions in the spurious domain and receiver immunity limits at equipment/antenna port of Digital Fixed Radio Systems

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 05/22

Obsahuje: EN 301 390 V2.1.1:2021

ETSI EN 301 390 V2.1.1 (2021-11)



**Fixed Radio Systems;
Point-to-point and Multipoint Systems;
Unwanted emissions in the spurious domain and
receiver immunity limits at equipment/antenna
port of Digital Fixed Radio Systems**

Reference

REN/ATTM-0452

Keywords

emission, FWS, immunity, multipoint, point-to-point

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:

<http://www.etsi.org/standards-search>

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 at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

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 2021.
All rights reserved.

Contents

Intellectual Property Rights	4
Foreword.....	4
Modal verbs terminology.....	5
Introduction	5
1 Scope	6
2 References	6
2.1 Normative references	6
2.2 Informative references.....	7
3 Definition of terms, symbols and abbreviations.....	8
3.1 Terms.....	8
3.2 Symbols.....	9
3.3 Abbreviations	10
4 Transmitter unwanted emissions in the spurious domain at antenna port.....	11
4.1 Background	11
4.2 Limits	11
4.2.0 Generality	11
4.2.1 Point-to-point equipment	12
4.2.2 Multipoint equipment	12
4.2.3 Broadband Wireless Access equipment operating between 1 GHz and 6 GHz.....	12
5 Receiver spurious emissions at the antenna port.....	12
6 Spurious domain emissions test method.....	12
7 Receiver immunity at antenna port	12
7.0 Definitions	12
7.1 Limits	13
7.2 Receiver immunity test method.....	14
Annex A (informative): Application of CEPT/ERC Recommendation 74-01.....	15
A.0 Introduction	15
A.1 Frequency range of applicability	15
A.2 Level limits.....	17
A.3 Reference bandwidths	18
A.4 Detailed application of the reference bandwidths reported in table A.3	23
A.4.0 Foreword	23
A.4.1 P-P and P-MP systems with fundamental emissions from 30 MHz to 1 GHz.....	23
A.4.2 P-P and P-MP systems with fundamental emissions from 1 GHz to 21,2 GHz	23
A.4.3 P-P and P-MP systems with fundamental emissions above 21,2 GHz	24
Annex B (informative): Measurement background	25
B.1 Spectrum analyser capability.....	25
B.2 Application examples.....	26
History	32

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 Web server (<https://ipr.etsi.org/>).

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™** and **LTE™** 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).

National transposition dates	
Date of adoption of this EN:	25 November 2021
Date of latest announcement of this EN (doa):	28 February 2022
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2022
Date of withdrawal of any conflicting National Standard (dow):	31 August 2022

Major changes with respect to previous version

This revision is consequent to 2019 revision of CEPT/ERC Recommendation 74-01 [1], which revised the resolution bandwidth staircase for the limits of *unwanted emissions in the spurious domain* also for system with *channel separation* higher than 28 MHz and added specific limits for "*channels-aggregation*" systems as defined in ETSI EN 302 217-2 [i.7]. In addition, standing the poor penetration of multipoint systems in the so-called HD FS (High Density Fixed Service) bands (see 5.547 in the Radio Regulations [i.12]), limits for multipoint equipment with fundamental emission above 21,2 GHz have also been aligned to those required by CEPT/ERC Recommendation 74-01 [1].

Examples in clause B.2 have been updated as appropriate.

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.

Introduction

The term Spurious emissions is used for simplicity elsewhere in the present document but with the more broader meaning of "*unwanted emissions in the spurious domain*" introduced by Recommendation ITU-R SM.329-12 [i.13] for clarifying the Radio Regulation definitions and the application of recommended limits for all *unwanted emissions*; it also recommends that spurious emissions limits apply to all unwanted emissions falling in the spurious domain.

Therefore the present document deals with limits for *unwanted emissions in the spurious domain* at antenna port of Digital Fixed Radio Systems (DFRS) as defined by Recommendation ITU-R SM.329-12 [i.13], CEPT/ERC Recommendation 74-01 [1] and ECC Recommendation (02)05 [i.18].

Moreover it covers characteristics of immunity from interference at receiver's antenna port.

Unwanted emissions in the spurious domain and immunity performance at antenna port are also relevant to essential requirements under article 3.2 of Directive 2014/53/EU [i.11] on Radio Equipment (RED).

Additional considerations and background for producing the present document are:

- Recommendation ITU-R SM.329-12 [i.13] considers emissions from any system, including digital modulation and allows options for the definition of the frequency boundary between *out-of-band domain* and *spurious domain*. It recommends different category of level limits applicable to the Fixed Service;
- Recommendation ITU-R SM.1539-1 [i.14] describes the application of the boundary concept between out-of-band and spurious domains;
- Recommendation ITU-R F.1191-3 [i.15] defines the application of Radio Regulations [i.12] and the concepts of out-of-band, unwanted and spurious emissions to DFRS, clarify the applicability for the boundary between out-of-band and Spurious emissions domains but maintain the same possible limit options provided by Recommendation ITU-R SM.329-12 [i.13];
- CEPT/ERC Recommendation 74-01 [1] endorses only the more stringent Category B limits of Recommendation ITU-R SM.329-12 [i.13];
- for the purpose of Directive 2014/53/EU [i.11], the emissions and immunity at antenna port fall under its article 3.2 requirements for "effective use of spectrum" and "avoidance of harmful interference";
- it is convenient to maintain a single ETSI EN covering these parameters instead of replicating them on each single product standard, avoiding possible deviation from what required by other CEPT and ITU-R normative;
- limits for *unwanted emissions in the spurious domain* are supposed to be fixed in view of inter-working compatibility among various Fixed Radio Systems in same or different band exploited in the same area;
- the measurement of the required limits should also be feasible in a suitable and cost effective conformance test (annex B gives also information in this field);
- it is necessary that DFRS receivers provide a minimum level of immunity at antenna port towards possible interference at any frequency band of practical interest;
- a suitable and easy to perform criterion for DFRS receivers immunity at antenna port may be considered the application of a CW interference.

1 Scope

The scope of the present document is to define specific limits at antenna port for *unwanted emissions in the spurious domain* and receiver immunity for suitable inter-working of Digital Fixed Radio Systems (i.e. Point-to-point and Multipoint systems) in the same or in different frequency band whenever allocated to Fixed Service in the range 9 kHz to 300 GHz.

However systems with fundamental emission below 30 MHz are not considered relevant for Digital Fixed Radio Systems and are outside the scope of the present document.

The present document adopts CEPT/ERC Recommendation 74-01 [1] which gives limits for Unwanted emissions in the Spurious domain with particular regards to "inter Services" operations.

In addition, it is recognized the need for a general requirement for receiver immunity to relatively high interference signals generated by any source and at any frequency in the same range identified as *spurious domain* by CEPT/ERC Recommendation 74-01 [1].

Some ETSI deliverables for DFRS provide limits for both "external" and "internal" spurious domain emissions and the latter are outside the scope of the present document. Moreover the limits for emissions given in the present document do not prevent more stringent requirement given in those deliverables for intra-system purpose (i.e. local Transmitter to Receiver interference usually referred as "internal").

In order to help the understanding of limits given in CEPT/ERC Recommendation 74-01 [1], in annex B, *unwanted emissions in the spurious domain* are analysed from the point of view of a suitable test method for conformance testing.

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 a specific reference, only the cited version applies. For a non-specific reference, 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 at <https://docbox.etsi.org/Reference>.

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

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

- [1] CEPT/ERC Recommendation 74-01 (2019): "Unwanted emissions in the spurious domain".
- [2] Void.
- [3] ETSI EN 301 126-1: "Fixed Radio Systems; Conformance testing; Part 1: Point-to-Point equipment - Definitions, general requirements and test procedures".
- [4] ETSI EN 301 126-2-1: "Fixed Radio Systems; Conformance testing; Part 2-1: Point-to-Multipoint equipment; Definitions and general requirements".
- [5] ETSI EN 301 126-2-2: "Fixed Radio Systems; Conformance testing; Part 2-2: Point-to-Multipoint equipment; Test procedures for FDMA systems".
- [6] ETSI EN 301 126-2-3: "Fixed Radio Systems; Conformance testing; Part 2-3: Point-to-Multipoint equipment; Test procedures for TDMA systems".
- [7] ETSI EN 301 126-2-4: "Fixed Radio Systems; Conformance testing; Part 2-4: Point-to-Multipoint equipment; Test procedures for FH-CDMA systems".

- [8] ETSI EN 301 126-2-5: "Fixed Radio Systems; Conformance testing; Part 2-5: Point-to-Multipoint equipment; Test procedures for DS-CDMA systems".
- [9] ETSI EN 301 126-2-6: "Fixed Radio Systems; Conformance testing; Part 2-6: Point-to-Multipoint equipment; Test procedures for Multi Carrier Time Division Multiple Access (MC-TDMA) systems".

2.2 Informative references

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

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

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] Void.
- [i.2] Void.
- [i.3] Void.
- [i.4] Void.
- [i.5] Void.
- [i.6] Void.
- [i.7] ETSI EN 302 217-2: "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".
- [i.8] ETSI EN 302 217-1: "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 1: Overview, common characteristics and requirements not related to access to radio spectrum".
- [i.9] ETSI TR 101 036-1: "Fixed Radio Systems; Generic wordings for standards on DFRS (Digital Fixed Radio Systems) characteristics; Part 1: General aspects and point-to-point equipment parameters".
- [i.10] Recommendation ITU-R F.746-10: "Radio-frequency arrangements for fixed service systems".
- [i.11] 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.12] ITU-R Radio Regulations (2020).
- [i.13] Recommendation ITU-R SM.329-12: "Unwanted emissions in the spurious domain".
- [i.14] Recommendation ITU-R SM.1539-1: "Variation of the boundary between the out-of-band and spurious domains required for the application of Recommendations ITU-R SM.1541 and ITU-R SM.329".
- [i.15] Recommendation ITU-R F.1191-3: "Necessary and occupied bandwidths and unwanted emissions of digital fixed service systems".
- [i.16] ECC Report 100: "Compatibility Studies in the Band 3400- 3800 MHz between Broadband Wireless Access (BWA) Systems and other Services".

[i.17] EC REF:Ares(2019)5616840 - Further response to the EC on ERC/REC 74-01 for ETSI X-band radar standards.

NOTE: Available as [ECC\(20\)093 Annex 14](#) (CEPT website password required).

[i.18] ECC Recommendation (02)05 (2012): "Unwanted emissions".

koniec náhľadu – text ďalej pokračuje v platenej verzii STN