

<b>STN</b>	<b>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.</b>	<b>STN EN 301 390 V1.3.1</b>  87 1390
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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.

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# ETSI EN 301 390 V1.3.1 (2013-08)



**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**

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## Foreword

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

<b>National transposition dates</b>	
Date of adoption of this EN:	9 August 2013
Date of latest announcement of this EN (doa):	30 November 2013
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2014
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### Major changes with respect to previous version

This revision is consequent to recent revision of CEPT/ERC Recommendation 74-01 [4] and inclusion in other ETSI point-to-point standards of systems with bandwidth wider than 500 MHz, which have some different regulation in ECC/REC(02)05 [5] and Recommendation ITU-R SM.1539 [2].

Therefore alignment is needed on the following arguments:

- Spurious emission domain limits for BWA systems in bands between 1 GHz and 6 GHz
- Boundary between out of band and spurious domains for systems with bandwidths > 500 MHz
- Updated of examples in clause B.2

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# 1 Scope

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 [1] 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 [1] and CEPT/ERC Recommendation 74-01 [4] and ECC Recommendation (02)05 [5].

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

Scope of the present document is to define specific limits at antenna port for spurious emissions 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.

Spurious emissions domain levels and immunity performance at antenna port are also relevant to essential requirements under article 3.2 of Directive 1999/5/EC [i.12] on Radio equipment and Telecommunication Terminals equipment (R&TTE).

The present document complements CEPT/ERC Recommendation 74-01 [4] which gives limits for Unwanted emissions in the Spurious domain with particular regards to "inter Services" operations, while WG TM4 assumed that in some case more protection is required for compatibility among fixed radio systems deployed in the same geographical area.

Additional considerations and background for producing the present document are:

- Recommendation ITU-R SM.329 [1] 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 emissions domain. It recommends different category of level limits applicable to the Fixed Service;
- Recommendation ITU-R SM.1539 [2] describes the application of the boundary concept between out-of-band and spurious emission domains;
- Recommendation ITU-R F.1191 [3] define the application of Radio Regulations [i.13] and SM set of Recommendation ITU-Rs 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 ITU-R Recommendation SM.329-10 [1];
- CEPT/ERC Recommendation 74-01 [4], endorses only the more stringent Category B limits of Recommendation ITU-R SM.329-10 [1];
- after the coming into force of RTTE Directive [i.12] the emissions and immunity at antenna port fall under its article 3.2 requirements for "*effective use of spectrum*" and "*avoidance of harmful interference*" and they are no longer an EMC requirement;
- it is convenient to maintain a single 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.

Some ETSI deliverables for DFRS, sometimes, 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 fix the suitable limits, in annex B, spurious domain emissions are analysed from the point of view of a suitable test method for conformance testing.

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## 2 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.

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

### 2.1 Normative references

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

- [1] Recommendation ITU-R SM.329-12: "Unwanted emissions in the spurious domain".
- [2] 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".
- [3] Recommendation ITU-R F.1191-3: "Necessary and occupied bandwidths and unwanted emissions of digital fixed service systems".
- [4] CEPT/ERC Recommendation 74-01 (2011): "Unwanted emissions in the spurious domain".
- [5] ECC Recommendation (02)05 (2012): "Unwanted emissions".

### 2.2 Informative references

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] ETSI EN 301 126-1: "Fixed Radio Systems; Conformance testing; Part 1: Point-to-Point equipment - Definitions, general requirements and test procedures".
- [i.2] ETSI EN 301 126-2-1: "Fixed Radio Systems; Conformance testing; Part 2-1: Point-to-Multipoint equipment; Definitions and general requirements".
- [i.3] ETSI EN 301 126-2-2: "Fixed Radio Systems; Conformance testing; Part 2-2: Point-to-Multipoint equipment; Test procedures for FDMA systems".
- [i.4] ETSI EN 301 126-2-3: "Fixed Radio Systems; Conformance testing; Part 2-3: Point-to-Multipoint equipment; Test procedures for TDMA systems".
- [i.5] ETSI EN 301 126-2-4: "Fixed Radio Systems; Conformance testing; Part 2-4: Point-to-Multipoint equipment; Test procedures for FH-CDMA systems".

- [i.6] ETSI EN 301 126-2-5: "Fixed Radio Systems; Conformance testing; Part 2-5: Point-to-Multipoint equipment; Test procedures for DS-CDMA systems".
- [i.7] 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".
- [i.8] ETSI EN 302 217-2-2: "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2-2: Digital systems operating in frequency bands where frequency co-ordination is applied; Harmonized EN covering the essential requirements of Article 3.2 of the R&TTE Directive".
- [i.9] ETSI EN 302 217-2-1: "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2-1: System-dependent requirements for digital systems operating in frequency bands where frequency co-ordination is applied".
- [i.10] 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.11] Recommendation ITU-R F.746-10: "Radio-frequency arrangements for fixed service systems".
- [i.12] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).
- [i.13] ITU-R Radio Regulations (2008) Article 1.

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