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Naprave za kanalske presledke (WSD) - Brezžični dostopovni sistemi, ki delujejo v frekvenčnem pasu od 470 MHz do 790 MHz - Harmonizirani EN, ki zajema bistvene zahteve člena 3.2 direktive R&TTE

White Space Devices (WSD) - Wireless Access Systems operating in the 470 MHz to 790 MHz frequency band - Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

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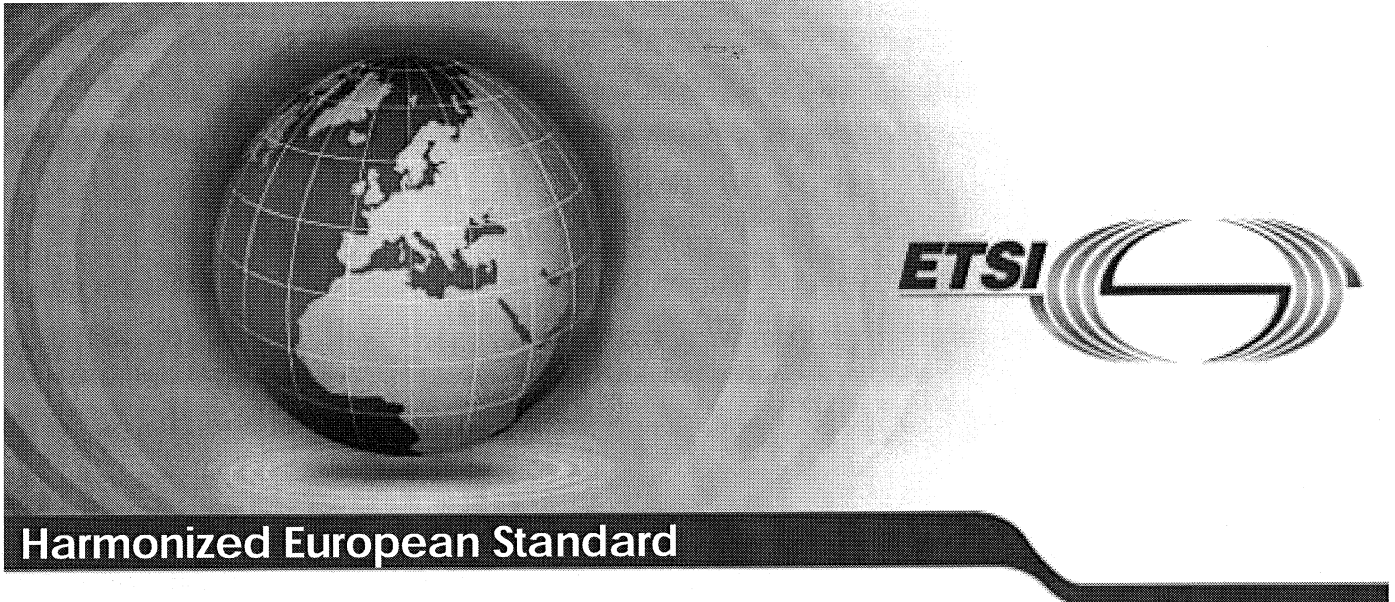
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**White Space Devices (WSD);
Wireless Access Systems operating in the 470 MHz to 790 MHz
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Harmonized EN covering the essential requirements
of article 3.2 of the R&TTE Directive**

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Contents

Intellectual Property Rights	7
Foreword.....	7
Introduction	7
1 Scope	8
2 References	8
2.1 Normative references	8
2.2 Informative references.....	8
3 Definitions, symbols and abbreviations	9
3.1 Definitions.....	9
3.2 Symbols.....	11
3.3 Abbreviations	11
4 Technical requirements specifications	12
4.1 Environmental profile.....	12
4.2 Conformance requirements	12
4.2.1 Equipment types	12
4.2.1.1 Equipment Type A	12
4.2.1.2 Equipment Type B	12
4.2.2 Nominal Channel Bandwidth and Total Nominal Channel Bandwidth	13
4.2.2.1 Definition	13
4.2.2.2 Requirements	13
4.2.2.3 Conformance	13
4.2.3 RF power and RF power spectral density	13
4.2.3.1 Definitions.....	13
4.2.3.1.1 RF power	13
4.2.3.1.2 RF power spectral density	13
4.2.3.2 Limits	14
4.2.3.3 Conformance.....	14
4.2.4 Transmitter unwanted emissions.....	14
4.2.4.1 Transmitter unwanted emissions outside the 470 MHz to 790 MHz band.....	14
4.2.4.1.1 Definition.....	14
4.2.4.1.2 Limits	14
4.2.4.1.3 Conformance	14
4.2.4.2 Transmitter unwanted emissions within the 470 MHz to 790 MHz band.....	14
4.2.4.2.1 Definition.....	14
4.2.4.2.2 Limits	15
4.2.4.2.3 Conformance	15
4.2.5 Transmitter Reverse Intermodulation	15
4.2.5.1 Definition	15
4.2.5.2 Limits	15
4.2.5.3 Conformance.....	16
4.2.6 Control and monitoring.....	16
4.2.6.1 Controller Database discovery	16
4.2.6.1.1 Definition.....	16
4.2.6.1.2 Requirements.....	16
4.2.6.1.3 Conformance	17
4.2.6.2 Data exchange and compliance with parameters.....	17
4.2.6.2.1 Definitions	17
4.2.6.2.2 Transmission in compliance with parameters.....	19
4.2.6.2.3 Reporting of device parameters	20
4.2.6.2.4 Reporting of channel usage parameters	20
4.2.6.2.5 Functionality of a master WSD to support slave WSDs.....	21
4.2.6.2.6 Conformance	22
4.2.6.3 Master WSD update	22

4.2.6.3.1	Definition.....	22
4.2.6.3.2	Requirements.....	22
4.2.6.3.3	Conformance.....	22
4.2.6.4	Slave WSD update.....	22
4.2.6.4.1	Definition.....	22
4.2.6.4.2	Requirements.....	22
4.2.6.4.3	Conformance.....	23
4.2.7	Receiver spurious emissions.....	23
4.2.7.1	Definition.....	23
4.2.7.2	Limits.....	23
4.2.7.3	Conformance.....	23
4.2.8	Geo-Location capability.....	23
4.2.8.1	Definition.....	23
4.2.8.2	Requirements.....	23
4.2.8.3	Conformance.....	24
4.2.9	Software, Firmware and User Access Restrictions.....	24
4.2.9.1	Definition.....	24
4.2.9.2	Requirement.....	24
4.2.9.3	Conformance.....	24
4.2.10	Security.....	24
4.2.10.1	Definition.....	24
4.2.10.2	Requirements.....	24
4.2.10.3	Conformance.....	25
5	Testing for compliance with technical requirements.....	25
5.1	Conditions for testing.....	25
5.1.1	Normal and extreme test conditions.....	25
5.1.2	Antennas.....	25
5.1.3	Transmit operating modes.....	26
5.1.4	Requirements for the test modulation.....	26
5.1.5	Communication between test TVWSDB, master and slave UUT.....	26
5.1.6	Operational Parameter set.....	27
5.2	Interpretation of measurement results.....	27
5.3	Essential test suites.....	28
5.3.1	Product Information.....	28
5.3.2	RF output power.....	29
5.3.2.1	Test conditions.....	29
5.3.2.2	Test method.....	29
5.3.2.2.1	Conducted measurements.....	29
5.3.2.2.2	Radiated measurements.....	30
5.3.3	Power Spectral Density and Transmitter unwanted emissions within the 470 MHz to 790 MHz band.....	31
5.3.3.1	Test conditions.....	31
5.3.3.2	Test method.....	31
5.3.3.2.1	Conducted measurement.....	31
5.3.3.2.2	Radiated measurement.....	33
5.3.4	Transmitter unwanted emissions outside the 470 MHz to 790 MHz bands.....	33
5.3.4.1	Test conditions.....	33
5.3.4.2	Test method.....	34
5.3.4.2.1	Conducted measurements.....	34
5.3.4.2.2	Radiated measurements.....	35
5.3.5	Transmitter Intermodulation.....	35
5.3.5.1	Measurement Arrangement.....	36
5.3.5.2	Test Method.....	36
5.3.6	Master WSD update.....	36
5.3.6.1	Test conditions.....	36
5.3.6.2	Test method.....	37
5.3.7	Lost connection between the master WSD and the TVWSDB.....	38
5.3.7.1	Test conditions.....	38
5.3.7.2	Test method.....	38
5.3.8	Slave WSD update - specific parameters invalidated.....	39
5.3.8.1	Test conditions.....	39
5.3.8.2	Test method.....	39

5.3.9	Slave WSD update - loss of communication with master WSD	40
5.3.9.1	Test conditions	40
5.3.9.2	Test method	40
5.3.10	Receiver spurious emission	40
5.3.10.1	Test conditions	40
5.3.10.2	Test method	41
5.3.10.2.1	Conducted measurements	41
5.3.10.2.2	Radiated measurements	42
5.3.11	Control and monitoring functions	42
5.3.11.1	TVWSDB discovery	42
5.3.11.1.1	Test condition	42
5.3.11.1.2	Test method 1	43
5.3.11.1.3	Test method 2	43
5.3.11.1.4	Test method 3	44
5.3.11.1.5	Test method 4	44
5.3.11.1.6	Test method 5	44
5.3.11.2	Transmission in compliance with parameters, provision of device parameters, provision of channel usage parameters and master WSD functionality in support of slave WSDs.....	45
5.3.11.2.1	Test condition	45
5.3.11.2.2	Test method 1	46
5.3.11.2.3	Test method 2	46
5.3.11.2.4	Test method 3	47
5.3.11.2.5	Test method 4	47
5.3.11.2.6	Test method 5	48
5.3.11.2.7	Test method 6	48
5.3.12	Geo-location accuracy	48
5.3.12.1	Test conditions	49
5.3.12.2	Test method	50

Annex A (normative):	HS Requirements and conformance Test specifications Table (HS-RTT).....	51
-----------------------------	--	-----------

Annex B (normative):	Test sites and arrangements for radiated measurement	54
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B.1	Radiation test sites	54
B.1.1	Open Area Test Site (OATS)	54
B.1.2	Semi Anechoic Room	55
B.1.3	Fully Anechoic Room (FAR)	56
B.1.4	Measurement Distance	57
B.2	Antennas	58
B.2.1	Measurement antenna	58
B.2.2	Substitution antenna	58
B.3	Test fixture	59
B.3.1	Conducted measurements and use of test fixture	59
B.3.2	Description of the test fixture	59
B.3.3	Using the test fixture for relative measurements	59
B.4	Guidance on the use of radiation test sites	59
B.4.1	Power supplies for the battery powered UUT	60
B.4.2	Site preparation	60
B.5	Coupling of signals	60
B.5.1	General	60
B.5.2	Data Signals	60

Annex C (normative):	General description of measurement	61
-----------------------------	---	-----------

C.1	Conducted measurements	61
C.2	Radiated measurements	61
C.3	Substitution measurement	62

Annex D (normative):	Listing of approved TVWSDBs.....	63
Annex E (informative):	Nominal Channel Bandwidth and Total Bandwidth.....	64
Annex F (informative):	Application form for testing.....	66
F.1	Information as required by EN 301 598 V1.1.1, clause 5.3.1	66
Annex G (informative):	Bibliography.....	70
History		71

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Foreword

This draft Harmonized European Standard (EN) has been produced by ETSI Technical Committee Broadband Radio Access Networks (BRAN), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document has been produced by ETSI in response to mandates M/284 and M/512 issued from the European Commission under Directive 98/34/EC [i.1] as amended by Directive 98/48/EC [i.2].

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonized Standard under the Directive 1999/5/EC [i.3].

See article 5.1 of Directive 1999/5/EC [i.3] for information on presumption of conformity and Harmonized Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

The requirements relevant to Directive 1999/5/EC [i.3] are summarized in annex A.

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
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Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the R&TTE Directive [i.3]. The modular structure is shown in EG 201 399 [i.4].

The methods and principles used in the present document for the operation of TV White Space devices in the band 470 MHz to 790 MHz are taken from the ECC Report 186 [i.5], which explains the regulatory principles under which it is envisaged such devices will be permitted to operate in Europe.

1 Scope

The present document applies to TV white space (TVWS) devices controlled by a white space database and which operate in the TV Broadcast Band 470 MHz to 790 MHz.

The present document applies to the following radio equipment types:

- 1) Master white space device
- 2) Slave white space device

The present document applies to TVWS devices with integral, dedicated or external antennas, where TVWS devices using external antennas are intended only for fixed use.

The present document is intended to cover the provisions of Directive 1999/5/EC [i.3] (R&TTE Directive), Article 3.2, which states that "..... radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

NOTE: A list of such ENs is included on the web site <http://www.newapproach.org>.

2 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 at <http://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.

2.1 Normative references

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

- [1] NIMA Technical Report TR8350.2 (1984, including amendment 1 of 03 January 2000 and amendment 2 of 23 June 2004): "Department of Defense World Geodetic System 1984. Its Definition and Relationships with Local Geodetic Systems".

NOTE: Available at <http://earth-info.nga.mil/GandG/publications/tr8350.2/wgs84fin.pdf>.

- [2] ETSI TR 100 028-1 (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1".
- [3] ETSI TR 100 028-2 (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2".

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] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services.

- [i.2] Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 amending Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.
- [i.3] 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.4] ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of Harmonized Standards for application under the R&TTE Directive".
- [i.5] ECC Report 186: "Technical and operational requirements for the operation of white space devices under geo-location approach", January 2013.
- [i.6] ETSI TR 102 273-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties; Part 2: Anechoic chamber".
- [i.7] ETSI TR 102 273-3: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties; Part 3: Anechoic chamber with a ground plane".
- [i.8] ETSI TR 102 273-4: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties; Part 4: Open area test site".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

altitude: height above mean sea level or above ground level

association: process whereby a slave WSD provides its device parameters to a master WSD and initially identifies itself to its serving master WSD

channel usage parameters: parameters sent by a WSD to inform the TVWSDB of the actual radio resources that will be used by both the master and the slave WSDs

dedicated antenna: removable antenna supplied and assessed with the radio equipment, designed as an indispensable part of the equipment

device parameters: parameters that specify the technical characteristics of an individual WSD, and its location

Digital Terrestrial Television (DTT): platform for the delivery of digital TV content via terrestrial broadcasting

DTT channel: 8 MHz channel in accordance with the European harmonized DTT channel raster

external antenna: removable antenna which is designed for use with a broad range of radio equipment and has not been designed for use with a specific product

NOTE: An external antenna is not assessed together with the equipment against the requirements of the present document.

generic operational parameters: transmission parameters communicated by a master WSD to any slave WSD within the coverage area of that master WSD to allow it to operate as required

geographic validity: geographic area within which the operational parameters for a geo-located WSD are valid

geo-location capability: capability of a WSD to determine and report the latitude, longitude and altitude coordinates of its antenna

geo-location uncertainty: 3D position error defined by the difference in metres between the point reported by the WSD device to the TVWSDB and the actual position of the WSD antenna

horizontal geo-location capability: capability of a WSD to determine and report the latitude and longitude coordinates of its antenna

in-block emissions: intended emissions that fall within a single or multiple DTT channel(s)

integral antenna: antenna designed as a fixed part of the equipment, without the use of an external connector, which cannot be disconnected from the equipment by a user with the intent to connect another antenna

NOTE: An integral antenna may be fitted internally or externally. In the case where the antenna is external, a non-detachable cable can be used.

master operational parameters: transmission parameters communicated from a TVWSDB to a master WSD to allow it to operate as required

master WSD: geo-located WSD that is able to communicate directly with a TVWSDB and with WSDs

out-of-block emissions: unwanted emissions that fall within the 470 MHz to 790 MHz band

regulatory domains: geographical area where a set of regulatory rules applies

NOTE: This is normally a country.

slave operational parameters: transmission parameters communicated from a TVWSDB via a master WSD to enable a slave WSD to operate as required

slave WSD: WSD that is only able to communicate with other WSDs, when under the control of a master WSD

sleep mode: mode of operation for which the WSD is inactive but is not powered-down

specific operation parameters: transmission parameters communicated from a TVWSDB to a specific WSD (master or slave), taking account of the device parameters of that specific WSD

test equipment: equipment that provides the means to operate and control a UUT for the purposes of testing against the requirements contained in the present document

test master WSD: test equipment that emulates the functionalities of a master WSD for the purposes of testing a slave WSD against the requirements contained in the present document

test slave WSD: test equipment that emulates the functionalities of a slave WSD for the purposes of testing a master WSD against the requirements contained in the present document

test White Space database: test equipment that emulates the functionalities of a TVWSDB for the purposes of testing a WSD against the requirements contained in the present document

time validity: period of time when a set of operational parameters is valid, determined by the $T_{ValStart}$ and T_{ValEnd} parameters contained in the said operational parameter set

TV white spaces: frequencies within the 470 MHz to 790 MHz band which have been identified by a TVWSDB for use by a WSD

TV White Space Database (TVWSDB): database system approved by the relevant national regulatory authority which can communicate with WSDs and provide information on TV white space availability

UHF TV band: 470 MHz to 790 MHz band

NOTE: This corresponds to DTT channels 21 to 60.

vertical geo-location capability: capability of a WSD to determine and report the altitude of its antenna

3.2 Symbols

For the purposes of the present document, the following symbols apply:

A_{ch}	Number of active transmit chains
dB	decibel
dBc	decibel relative to carrier
dBm	decibel relative to 1 milliwatt
f	Frequency of measurement
f_c	Centre frequency of the assigned channel
F_{UUT}	Centre frequency of the Unit Under Test
F_{INT}	Centre frequency of the Interfering signal
P_0	Maximum RF power in a given 8 MHz channel
P_1	Maximum RF power in a given 100 kHz channel
RBW	Resolution Bandwidth
T_{Dur}	Time duration of the operational parameters
T_{ValEnd}	Absolute time of the end of the period of validity of the operational parameters
$T_{ValStart}$	Absolute time of the start of the period of validity of the operational parameters

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AC	Alternating Current
BW	Bandwidth
DC	Direct Current
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
DTT	Digital Terrestrial Television
EIRP	Equivalent Isotropically Radiated Power
ERP	Effective Radiated Power
FAR	Fully Anechoic Room
GHz	GigaHertz
GNSS	Global Navigation Satellite System
IP	Internet Protocol
LPDA	Logarithmic Periodic Dipole Antenna
MHz	MegaHertz
OATS	Open Area Test Site
OUI	Organizationally Unique Identifier
PER	Packet Error Ratio
R&TTE	Radio equipment and Telecommunications Terminal Equipment
RF	Radio Frequency
RMS	Root Mean Square
SAR	Semi Anechoic Room
TE	Test Equipment
TV	Television
TVWS	TV White Space
TVWSDB	TV White Space Database
UE	User Equipment
UHF	Ultra High Frequency
UUID	Universally Unique Identifier
UUT	Unit Under Test
VSWR	Voltage Standing Wave Ratio
WSD	White Space Device

4 Technical requirements specifications

4.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the supplier. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profile.

4.2 Conformance requirements

To meet the essential requirements under article 3.2 of the R&TTE Directive [i.3] ten essential parameters have been identified. Table 1 provides a cross reference between these essential parameters and the corresponding technical requirements for equipment within the scope of the present document. To fulfil an essential parameter the compliance with all the corresponding technical requirements in table 1 shall be verified.

Table 1: Cross references

Essential parameter	Corresponding technical requirements
Spectrum emission mask and Output power	4.2.2 Nominal Channel Bandwidth and Total Nominal Channel Bandwidth 4.2.3 RF power and RF power spectral density 4.2.4 Transmitter Unwanted Emissions
Other transmitter parameters	4.2.5 Transmitter Reverse Intermodulation
Control and monitoring functions	4.2.6 Control and monitoring functions
Receiver parameters	4.2.7 Receiver spurious emissions
Autonomous Geolocation (Optional)	4.2.8 Geo-location capability 4.2.9 Software, Firmware and User Access Restrictions 4.2.10 Security requirements

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4.2.1 Equipment types

For the purpose of the present document, two equipment types have been defined.

NOTE: It is envisaged that a WSD which is not fixed, will operate with an integral or dedicated antenna.

4.2.1.1 Equipment Type A

A Type A WSD is a device that is intended for fixed use only. This type of equipment can have integral, dedicated or external antennas.

4.2.1.2 Equipment Type B

A Type B WSD is a device that is not intended for fixed use and which has an integral antenna or a dedicated antenna.

The equipment and the antenna shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

In the case of dedicated antennas, the manufacturer has to specify the antennas that have been assessed together with the equipment against the requirements of the present document. That information shall be included in the user documentation. The use of other antennas is prohibited.

4.2.2 Nominal Channel Bandwidth and Total Nominal Channel Bandwidth

4.2.2.1 Definition

A Nominal Channel is defined as one or more contiguous DTT channels that are used by a WSD for its wanted transmissions.

The Nominal Channel Bandwidth is the bandwidth of a Nominal Channel. The Nominal Channel Bandwidth is a multiple of 8 MHz.

The Total Nominal Channel Bandwidth is the sum of all of the Nominal Channel Bandwidths used simultaneously by a WSD.

NOTE: A WSD may operate in a single DTT channel, or it may operate simultaneously in a group of contiguous DTT channels, multiple non-contiguous DTT channels, or a mixture of contiguous and non-contiguous DTT channels. See the examples in annex E.

4.2.2.2 Requirements

The lower and upper edge frequencies of a nominal channel shall coincide with the European harmonized DTT channel raster shown in figure 1.

DTT channel raster (MHz)	470 to 478	478 to 486	486 to 494	...	766 to 774	774 to 782	782 to 790
DTT channel numbers	21	22	23	...	58	59	60

Figure 1: European harmonized DTT channel raster

The Nominal Channel Bandwidth used by a WSD shall not exceed the Maximum Nominal Channel Bandwidth specified by the TVWSDB (see clause 4.2.5.3).

The Total Nominal Channel Bandwidth used by a WSD shall not exceed the Maximum Total Nominal Channel Bandwidth specified by the TVWSDB (see clause 4.2.5.3).

4.2.2.3 Conformance

Conformance tests as defined in clause 5.3.2 shall be carried out.

4.2.3 RF power and RF power spectral density

4.2.3.1 Definitions

4.2.3.1.1 RF power

The RF power is the mean Equivalent Isotropically Radiated Power (EIRP) averaged over the time period of a transmission burst.

4.2.3.1.2 RF power spectral density

The RF power spectral density is the mean Equivalent Isotropically Radiated Power (EIRP) over a bandwidth of 100 kHz or 8 MHz within a Nominal Channel (in-block) and averaged over the time period of a transmission burst.