Draft ETSI EN 301 489-17 V3.2.6 (2023-06)

**ElectroMagnetic Compatibility (EMC)
standard for radio equipment and services;
Part 17: Specific conditions for
Broadband and Wideband Data Transmission Systems;
Harmonised Standard for ElectroMagnetic Compatibility**

Reference
REN/ERM-EMC-409

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Foreword

This draft Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.12] 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 is part 17 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	18 months after doa

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 specifies technical characteristics and methods of measurements for broadband and wideband data transmission system equipment including the associated ancillary equipment in respect of electromagnetic compatibility, as detailed in table 1.

Technical specifications related to the radio function of the radio equipment are not included in the present document. Such technical specifications are found in the relevant product standards for the effective use of the radio spectrum.

The present document specifies the applicable test conditions, performance assessment and performance criteria for broadband and wideband data transmission systems as detailed in table 1.

NOTE 1: In the context of the present document, broadband and wideband are interchangeable.

Table 1: Radio Technologies in scope of the present document

Technology	ETSI Standard
Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band	ETSI EN 300 328 [i.8]
5 GHz RLAN	ETSI EN 301 893 [i.3]
6 GHz WAS/RLAN	ETSI EN 303 687 [i.2]
Wireless Access Systems (WAS); 5,8 GHz fixed broadband data transmitting systems	ETSI EN 302 502 [i.4]
Multi-Gigabit Wireless Systems (MGWS) in the 60 GHz band	ETSI EN 302 567 [i.6]
Wideband Data Transmission Systems (WDTS) for Fixed Network Radio Equipment operating in the 57 GHz to 71 GHz band	ETSI EN 303 722 [i.5]

Emissions requirements in the present document are specified for frequencies above 9 kHz.

The environmental classification and the emission and immunity requirements used in the present document are as stated in ETSI EN 301 489-1 [1], except for any special conditions included in the present document.

NOTE 2: The relationship between the present document and essential requirements of article 3.1(b) of Directive 2014/53/EU [i.1] is given in annex A.

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 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] ETSI EN 301 489-1 (V2.2.3) (11-2019): "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility".

[2] EN 55032 (2015)+A11 (2020): "Electromagnetic compatibility of multimedia equipment - Emission Requirements" (produced by CENELEC).

2.2 Informative 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.

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] 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.2] ETSI EN 303 687: "6 GHz WAS/RLAN; Harmonised Standard for access to radio spectrum".

[i.3] ETSI EN 301 893: "5 GHz RLAN; Harmonised Standard for access to radio spectrum".

[i.4] ETSI EN 302 502 (V2.1.3): "Wireless Access Systems (WAS); 5,8 GHz fixed broadband data transmitting systems; Harmonised Standard for access to radio spectrum".

[i.5] ETSI EN 303 722: "Wideband Data Transmission Systems (WDTS) for Fixed Network Radio Equipment operating in the 57 GHz to 71 GHz band; Harmonised Standard for access to radio spectrum".

[i.6] ETSI EN 302 567: "Multiple-Gigabit/s radio equipment operating in the 60 GHz band; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU".

[i.7] Void.

[i.8] ETSI EN 300 328: "Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonised Standard for access to radio spectrum".

[i.9] Void.

[i.10] Void.

[i.11] Void.

[i.12] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI EN 301 489-1 [1] and the following apply:

ancillary equipment: electrical or electronic equipment, that is intended to be used with a receiver or transmitter

NOTE 1: It is considered as an ancillary equipment if:

- the equipment is intended for use with a receiver or transmitter to provide additional operational and/or control features to the radio equipment, (e.g. to extend control to another position or location); and
- the ancillary equipment cannot be used without being connected to radio equipment to provide user functions independently of a receiver or transmitter; and

- the receiver or transmitter, to which it is connected, is capable of providing some intended operation such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

NOTE 2: An example of ancillary equipment would be a docking station for radio equipment whose interface is dedicated to a particular product or range of products.

Equipment Under Test (EUT): equipment subject to the performance requirements of the present document

fixed equipment: equipment intended for use in a fixed location and fitted with one or more antennas

NOTE: The equipment may be fitted with either antenna socket(s) or integral antenna(s) or both.

host: any equipment which has complete user functionality when not connected to the radio equipment part and to which the radio equipment part provides additional functionality and to which connection is necessary for the radio equipment part to offer functionality

plug-in radio device: equipment, including slide-in radio cards, intended to be used with or within a variety of host systems, using their control functions and power supply

portable equipment: radio equipment intended for portable use and powered by integral batteries or battery

NOTE: Devices will typically be handheld.

stand-alone radio equipment: equipment that is intended primarily as communications equipment and that is normally used on a stand-alone basis

vehicular equipment: radio equipment intended for installation and use in a vehicle, and powered by the main battery of the vehicle

3.2 Symbols

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

Pmin	minimum power required to establish a communication link

3.3 Abbreviations

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

AC	Alternating Current
ACK	ACKnowledgement
ARQ	Automatic Retransmission reQuest
DC	Direct Current
EMC	ElectroMagnetic Compatibility
ERM	EMC and Radio spectrum Matters
EUT	Equipment Under Test
FER	Frame Error Rate
MGWS	Multi-Gigabit Wireless Systems
NACK	Not ACKnowledgement
PER	Packet Error Rate
RF	Radio Frequency
RLAN	Radio Local Area Network
WAS	Wireless Access Systems
WDTS	Wideband Data Transmission Systems

4 Test conditions

4.1 General

For the purposes of the present document, the test conditions of ETSI EN 301 489-1 [1], clause 4, shall apply as appropriate. Further product related test conditions for wideband data communications systems are specified in clauses 4.2 to 4.5.

The radio equipment may take forms which may require special software and/or test fixtures. Equipment which requires connection to a host equipment to function shall use a test configuration representative of the EUT's intended use and shall be recorded in the test report.

4.2 Arrangements for test signals

4.2.1 Arrangements for test signals at the input of transmitters

The provisions of ETSI EN 301 489-1 [1], clause 4.2.1 shall apply with the following modifications.

The wanted signals and/or controls required to establish a communication link and shall be representative of the EUTs intended use.

The transmitter shall be operated at maximum rated power.

4.2.2 Arrangements for test signals at the output of transmitters

The provisions of ETSI EN 301 489-1 [1], clause 4.2.2 shall apply with the following modifications.

A suitable companion receiver shall be used to receive messages or to set up a communication link.

4.2.3 Arrangements for test signals at the input of receivers

The provisions of ETSI EN 301 489-1 [1], clause 4.2.3 shall apply with the following modifications.

For radiated immunity tests, the level of the wanted signal at the input of the receiver or the enclosure port of the EUT, shall be 30 dB (±6 dB) above the Pmin for the EUT. For all other tests the level of the wanted signal, required to establish a communication link, shall be representative of the EUT intended use.

NOTE: Simple method to establish the required communication link is establish link, reduce the wanted signal power at the EUT to a point of link failure, then increase the wanted signal level by 30 dB (±6 dB).

4.2.4 Arrangements for test signals at the output of receivers

The measuring equipment for the output signal from the receiver under test shall be located outside the test environment.

It shall be possible to assess the performance of the equipment by appropriately monitoring the receiver output.

If the receiver has an output connector or port providing the wanted output signal, then this port shall be used via a cable, consistent with the standard cable used in normal operation, connected to the external measuring equipment outside the test environment.

A suitable companion transmitter shall be used to transmit messages or to set up a communication link.

4.2.5 Arrangements for testing transmitter and receiver together (as a system)

Standalone receivers and transmitters shall be tested separately. Transceivers shall be tested so that operation in each direction is confirmed.

A suitable companion transceiver or transmitter and receiver shall be used to send and receive messages or to set up a communication link.

Both the EUT and the companion equipment shall transmit the normal test modulation. Further, the output of the radio equipment under test shall be monitored by the test system.

4.2.6 Equipment with an external antenna connector

If access to the antenna connector involves modification or dismantling of the EUT then this clause does not apply.

The EUT may be tested with its antenna removed.

In the case of testing with the antenna removed, the wanted RF input and output signals shall be delivered between the EUT antenna connector and the measuring and/or test equipment by a shielded transmission line, such as a coaxial cable.

4.2.7 Equipment without an external antenna connector (integral antenna)

This clause applies to EUT to which clause 4.2.6 does not apply. Such EUT are generally known as integral antenna or dedicated antenna equipment.

The EUT shall be tested with its antenna fitted in a manner typical of intended use.

4.2.8 Equipment with more than one antenna

If the EUT has more than one antenna port, e.g. separate antennas for Tx and Rx or separate antennas for different operating frequencies or diversity antennas, then:

- If clause 4.2.6 applies to all the antenna ports, then the EUT may be tested according to clause 4.2.6, with all antenna ports treated the same.
- Otherwise it shall be tested according to clause 4.2.7.

NOTE: The reason is that replacing one antenna by a transmission line may affect the operation of any other antennas.

4.3 Exclusion bands

4.3.1 General

The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements when performed in transmit mode of operation.

There shall be no frequency exclusion band applied to emission measurements of the receiver part of transceivers or the standalone receiver under test, and/or associated ancillary equipment.

For EUT that operate above 6 GHz there is no exclusion band specified as test ranges stop at 6 GHz.

NOTE: All of the receiver exclusion band ranges detailed within clauses 4.3.2, 4.3.3 and 4.3.4 also cover the relevant blocking test ranges specified in the relevant product standards for the effective use of the radio spectrum (see table 1).

4.3.2 Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band

The exclusion band for immunity testing of equipment operating in the 2,4 GHz band shall be:

- lower limit of exclusion band = lowest allocated band edge frequency -120 MHz, i.e. 2 280 MHz;
- upper limit of exclusion band = highest allocated band edge frequency +120 MHz, i.e. 2 603,5 MHz.

NOTE: This is based upon a channel size of 40 MHz and a value of n = 3 from ETSI EN 301 489-1 [1], clause 4.3.3. These values also take into account the blocking test frequencies from ETSI EN 300 328 [i.8].

4.3.3 5 GHz RLAN

The exclusion band for immunity testing of equipment operating in the 5 GHz RLAN band shall be:

- lower limit of exclusion band = lowest allocated band edge frequency -320 MHz, i.e. 4 830 MHz;
- as the immunity requirements have an upper frequency range of 6 GHz and any upper edge exclusion band would be greater than this for both the 5 470 MHz to 5 725 MHz and 5 725 MHz to 5 850 MHz bands. Therefore, the test stops at the lower limit of exclusion band (i.e. 4 830 MHz).

NOTE: This is based upon a channel size of 80 MHz and a value of n = 4 from ETSI EN 301 489-1 [1], clause 4.3.3. These values also take into account the blocking test frequencies from ETSI EN 301 893 [i.3].

4.3.4 Wireless Access Systems (WAS); 5,8 GHz fixed broadband data transmitting systems

The exclusion band for immunity testing of wireless access systems operating in the 5,8 GHz band shall be:

- lower limit of exclusion band = lowest allocated band edge frequency -440 MHz, i.e. 5 285 MHz;
- as the immunity requirements have an upper frequency range of 6 GHz and any upper edge exclusion band would be greater than this for the 5,8 GHz band. Therefore, the test stops at the lower limit of exclusion band (i.e. 5 285 MHz).

NOTE: This is based upon a channel size of 40 MHz and a value of n = 11 from ETSI EN 301 489-1 [1], clause 4.3.3. These values also take into account the blocking test frequencies from ETSI EN 302 502 [i.4].

4.3.5 6 GHz RLAN

The exclusion band for immunity testing of equipment operating in 6 GHz WLAN band shall be:

- lower limit of exclusion band = lowest allocated band edge frequency -480 MHz, i.e. 5 465 MHz;
- as the immunity requirements have an upper frequency range of 6 GHz and any upper edge exclusion band would be greater than this for the 5 945 MHz to 6 425 MHz band. Therefore, the test stops at the lower limit of exclusion band (i.e. 5 465 MHz).

NOTE: This is based upon a channel size of 160 MHz and a value of n = 3 from ETSI EN 301 489-1 [1], clause 4.3.3. These values also take into account the blocking test frequencies from ETSI EN 303 687 [i.2].

4.4 Void

4.5 Normal test modulation

The modulated test signal shall represent intended use, and may contain data formatting, error detection and correction information.

5 Performance assessment

5.1 General

The manufacturer should supply at the time of submission of the equipment for test, the information required in ETSI EN 301 489-1 [1], annex C and the following which should be recorded in the test report:

- the operating frequency range(s) of the equipment and, where applicable, band(s) of operation;
- the type of the equipment, for example: stand-alone or plug-in radio device;
- the host equipment to be combined with the radio equipment for testing;
- the minimum performance level under the application of EMC stress (see clause 6.2);
- the normal test modulation, the format, the type of error correction and any control signals e.g. Acknowledgement (ACK)/Not Acknowledgement (NACK) or Automatic Retransmission request (ARQ).

5.2 Arrangements for the assessment of host dependent equipment and plug-in cards

Where the radio equipment part is intended for use with a variety of host systems, a suitable test configuration consisting of either a host system representative of intended use or a test jig that is representative of the range of host systems in which the device may be used. The test jig shall allow the radio equipment part to be powered and stimulated in a way similar to the way it would be powered and stimulated when connected to or inserted into host equipment.

Details of any test jig used should be recorded in the test report.

5.3 Assessment procedures

The performance assessment shall be based upon:

- preservation of function(s);
- the way the resulting loss of function(s) can be recovered;
- unintentional behaviour of the EUT.

The test system shall set up a communications link in the same manner as the Equipment Under Test's (EUT) intended use.

Any user defined data fields in the memory or storage of the EUT shall be filled in a way representative of intended use.

The assessment procedure shall verify that the communications link is maintained and that there is no loss of user control functions or loss of critical stored data.

Where the EUT is capable of operation in multiple frequency bands, each band (e.g. 2,4 GHz and 5 GHz) shall be subject to assessment.

Where the EUT is capable of operating in multiple radio technologies, the operation of each technology shall be assessed.

NOTE: For radio technologies within the scope of the present document that are intended to be permanently operational, assessing the radio in idle mode is not considered necessary.

6 Performance criteria

6.1 General performance criteria

The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

6.2 Performance table

6.2.1 Performance criteria overview

An overview of the different performance criteria applicable to the EUT is given in table 2.

Table 2: Performance criteria

Criteria	During test	After test (i.e. as a result of the application of the test)
A	Shall operate as intended. (See note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.
NOTE: Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2.		

6.2.2 Minimum performance level

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER, the minimum performance level shall be a maximum reduction in the data rate of 10% during the test.

6.3 Performance criteria for Continuous phenomena

The performance criteria A shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.

6.4 Performance criteria for Transient phenomena

The performance criteria B shall apply for transient phenomena, except for voltage dips greater than or equal to 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.

7 Requirements

7.1 Emission

7.1.1 General

The following emission requirements set out in table 3 shall apply.

The EUT test configuration shall be in accordance with ETSI EN 301 489-1 [1], clause 8.1.2.

Table 3: Emission requirements

Phenomenon	Port	Applicability			Reference clause
		Fixed equipment	Vehicular equipment	Portable equipment	
radiated emission	enclosure of EUT and any ancillary equipment	applicable	applicable	applicable	Clause 7.1.2
conducted emission	DC power input/output port	Applicable	applicable	not applicable	ETSI EN 301 489-1 [1], clause 8.3
conducted emission	AC mains input/output port	Applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], clause 8.4
conducted emission	wired network port	Applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], clause 8.7

Portable equipment, or combinations of equipment, capable of being powered for intended use by the main battery of a vehicle shall additionally be considered as vehicular equipment.

Portable or vehicular equipment, or combinations of equipment, capable of being powered for intended use by AC mains shall additionally be considered as fixed equipment.

7.1.2 Special Conditions

The following special conditions set out in table 4 shall apply.

Table 4: Special conditions for EMC emission measurements

Reference to clauses in ETSI EN 301 489-1 [1]	Special product-related conditions, additional to or modifying the test conditions in ETSI EN 301 489-1 [1], clause 8
8.2 Enclosure port	**8.2.1 General** This test is applicable to: • radio equipment; • ancillary equipment incorporated into the radio equipment and tested as a combination with the radio equipment; • ancillary equipment not incorporated in the radio equipment that is assessed separately from its associated radio equipment. **8.2.2 Test Method** The test method shall be in accordance with EN 55032 [2], annex A.2. **8.2.3 Limits** If the EUT is intended to be used in a residential area the class B limits given in EN 55032 [2], annex A, tables A.4 and A.5 shall apply. If the EUT is intended to be used in any other area, the class A limits given in EN 55032 [2], annex A, tables A.2 and A.3 shall apply. The relevant exclusion bands specified in clause 4.3 shall only apply when testing radio equipment and not when ancillary equipment is being tested separately.

7.2 Immunity

7.2.1 General

The following immunity requirements set out in table 5 shall apply.

Table 5: Immunity test requirements

Phenomenon	Port	Applicability			Reference clause	Performance criteria clauses
		Fixed equipment	Vehicular equipment	Portable equipment		
RF electromagnetic field (80 MHz to 6 000 MHz)	enclosure	Applicable	applicable	applicable	ETSI EN 301 489-1 [1], clauses 9.2.1 and 9.2.2	6.3
electrostatic discharge	enclosure	Applicable	applicable	applicable	ETSI EN 301 489-1 [1], clauses 9.3.1 and 9.3.2	6.4
fast transients common mode	signal, wired network and control	Applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], clauses 9.4.1 and 9.4.2	6.4
	DC power	Applicable	not applicable (see note 1)	not applicable		6.4
	AC mains power	Applicable	not applicable	not applicable		6.4
RF common mode 0,15 MHz to 80 MHz	signal, wired network and control	Applicable	applicable	not applicable	ETSI EN 301 489-1 [1], clauses 9.5.1 and 9.5.2	6.3
	DC power	Applicable	applicable	not applicable		6.3
	AC mains power	Applicable	applicable	not applicable		6.3
transients and surges in the vehicular environment	DC power input	not applicable	applicable	not applicable	ETSI EN 301 489-1 [1], clauses 9.6.1 and 9.6.2	6.4 see note 2
voltage dips and interruptions	AC mains power input	Applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], clauses 9.7.1 and 9.7.2	6.4
surges, line to line and line to ground	AC mains power input	Applicable	not applicable	not applicable	ETSI EN 301 489-1 [1], clauses 9.8.1 and 9.8.2	6.4
	wired network	Applicable	not applicable (see note 1)	not applicable		6.4

NOTE 1: This requirement is covered by the transients and surges test on DC power input ports.
NOTE 2: For pulses 3a & 3b, the performance criteria for continuous phenomena shall apply (see clause 6.3).

Portable equipment, or combinations of equipment, capable of being powered for intended use by the main battery of a vehicle shall additionally be considered as vehicular equipment.

Portable or vehicular equipment, or combinations of equipment, capable of being powered for intended use by AC mains shall additionally be considered as fixed equipment.

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

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.12] 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.

Table A.1: Relationship between the present document and the essential requirements of Directive 2014/53/EU [i.1]

Harmonised Standard ETSI EN 301 489-17					
Requirement				Requirement Conditionality	
No	**Description**	**Essential requirements of Directive**	**Clause(s) of the present document**	**U/C**	**Condition**
1	Emissions: Enclosure of ancillary equipment measured on a standalone basis	3.1(b)	7.1	U	
2	Emissions: DC power input/output ports	3.1(b)	7.1	C	Only applies to fixed and vehicular equipment where the equipment has DC power input and/or output ports with a cable length greater than 3 m or from a vehicle power supply
3	Emissions: AC mains power input/output ports	3.1(b)	7.1	C	Only applies to fixed equipment where the equipment has AC mains power input and/or output ports
4	Emissions: Wired network ports	3.1(b)	7.1	C	Only applies to fixed equipment with a cable length greater than 3m
5	Immunity: Radio frequency electromagnetic field (80 MHz to 6 000 MHz)	3.1(b)	7.2	U	
6	Immunity: Electrostatic discharge	3.1(b)	7.2	U	
7	Immunity: Fast transients common mode	3.1(b)	7.2	C	Only applies to fixed equipment
8	Immunity: Radio frequency common mode	3.1(b)	7.2	C	Only applies to fixed and/or vehicular equipment
9	Immunity: Transients and surges in the vehicular environment	3.1(b)	7.2	C	Only applies to vehicular equipment
10	Immunity: Voltage dips and interruptions	3.1(b)	7.2	C	Only applies to fixed equipment where the equipment has AC mains power input ports
11	Immunity: Surges, line to line and line to ground	3.1(b)	7.2	C	Only applies to fixed equipment

Key to columns:

Requirement:

No A unique identifier for one row of the table which may be used to identify a requirement.

Description A textual reference to the requirement.

Essential requirements of Directive

Identification of article(s) defining the requirement in the Directive.

Clause(s) of the present document

Identification of clause(s) defining the requirement in the present document unless another document is referenced explicitly.

Requirement Conditionality:

U/C Indicates whether the requirement is unconditionally applicable (U) or is conditional upon the manufacturer's claimed functionality of the equipment (C).

Condition Explains the conditions when the requirement is or is not applicable for a requirement which is classified "conditional".

Presumption of conformity stays valid only as long as a reference to the present document is maintained in the list published in the Official Journal of the European Union. Users of the present document should consult frequently the latest list published in the Official Journal of the European Union.

Other Union legislation may be applicable to the product(s) falling within the scope of the present document.

Annex B (informative): Change history

Version	Information about changes
3.1.1	Radiated immunity testing to a continuous sweep between 80 MHz and 6 000 MHz at 3 V/m, as opposed to the previous frequency range of 80 MHz to 1 000 MHz and 1 400 MHz to 2 700 MHz in earlier editions. New derivations of exclusion bands more closely linked to the operational characteristics of the radio link(s) in the EUT. New test arrangement for systems with multiple antennas.
3.2.1	Change to definition of performance criteria. Mapping of requirements to ETSI EN 301 489-1.
3.2.2	Removing manufacturer defined test conditions. Change of the signal strength of the test signals at the input of the receiver. Deletion of narrowband responses section as not applicable to technologies within the scope of the present document. Improve readability and accuracy of table 4. Annex B deleted with information updated and transferred to scope statement.
3.3.1	Removal of flicker and fluctuations requirements as these are covered by EN 61000-3-2 and EN 61000-3-3. Scope increased to cover equipment operating in the 57 GHz to 71 GHz band that falls with the scope of article 3.2 standards ETSI EN 303 722. Scope and title amended to cover both Broadband and Wideband equipment. Scope of radiated emissions requirements expanded to cover enclosure port of radio equipment. Annex A aligned with content of standard.

History

Document history				
V1.1.1	September 2000	Publication		
V1.2.1	August 2002	Publication		
V1.3.2	April 2008	Publication		
V2.1.1	May 2009	Publication		
V2.2.1	September 2012	Publication		
V3.1.1	February 2017	Publication		
V3.2.4	September 2020	Publication		
V3.2.5	August 2022	EN Approval Procedure	AP 20221121:	2022-08-23 to 2022-11-21
V3.2.6	June 2023	EN Approval Procedure	AP 20230926:	2023-06-28 to 2023-09-26