

Draft **ETSI EN 301 841-3** V1.2.0 (2014-12)



**VHF air-ground Digital Link (VDL) Mode 2;  
Technical characteristics and methods of measurement  
for ground-based equipment;  
Part 3: Harmonized EN covering the essential requirements  
of article 3.2 of the R&TTE Directive**

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**Reference**REN/ERM-JTFEA-010

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## Foreword

This draft Harmonized 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 produced by ETSI in response to mandate M/405 issued from the European Commission under Directive 98/34/EC [i.4] as amended by Directive 98/48/EC [i.3].

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.2].

The requirements relevant to Directive 1999/5/EC [i.2] are summarized in annex A.

The present document is part 3 of a multi-part deliverable covering VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment, as identified below:

Part 1: "Physical layer and MAC sub-layer";

Part 2: "Upper layers";

**Part 3: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".**

<b>National transposition dates</b>	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
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## Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**may not**", "**need**", "**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).

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# 1 Scope

The present document applies to VDL Mode 2 ground-air digital communications using Differential Eight Phase Shift Keying (D8PSK), intended for channel increments of 25 kHz. The VDL Mode 2 system provides data communication exchanges between aircraft and ground-based systems, operating in the VHF band (117,975 MHz to 137,000 MHz). The scope of the present document is limited to ground based stations.

NOTE 1: The VDL Mode 2 can be used as an Air/Ground sub-network of the Aeronautical Telecommunication Network (ATN) using a band with AM(R)S spectrum allocation.

The present document is intended to cover the provisions of Directive 1999/5/EC [i.2] (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*".

In addition to the present document, other ENs that specify technical requirements in respect of essential requirements under other parts of article 3 of the R&TTE Directive may apply to equipment within the scope of the present document.

NOTE 2: A list of such ENs is included on the web site <http://www.newapproach.org>.

Compliance with relevant aviation regulations may also be required before equipment within the scope of the present document can enter into service.

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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 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] ETSI EN 301 841-1 (V1.4.0) (12-2014): "VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 1: Physical layer and MAC sub-layer".

## 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 TR 100 028 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [i.2] 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.3] 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.4] 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.

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [i.2] and the following apply:

**adjacent channel power:** amount of the modulated RF signal power transmitted outside of the assigned channel

NOTE: Adjacent channel power includes discrete spurious, signal sidebands, and noise density (including phase noise) at the transmitter output.

**adjacent channel rejection:** receiver's ability to demodulate the desired signal and meet the uncorrected BER requirement in the presence of an interfering signal in an adjacent channel

NOTE: The ratio (in dB) between the adjacent interfering signal level and the desired signal level necessary to achieve the specified minimum uncorrected BER, is the Adjacent Channel Rejection (ACR) ratio.

**Aeronautical Mobile Service (AMS):** mobile service between ground based stations and airborne stations, or between aircraft stations, in which survival craft stations may participate

**average transmitter output power:** average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long, compared with the lowest frequency encountered in the modulation, taken under normal operating conditions

**Bit Error Rate (BER):** ratio between the number of erroneous bits received and the total number of bits received

NOTE: The uncorrected BER represents the BER without the benefit of Forward Error Correction (FEC).

**Co-Channel Interference (CCI):** capability of a receiver to demodulate the desired signal and achieve the minimum specified BER performance in the presence of an unwanted signal at the same assigned channel

NOTE: The ratio (in dB) between the wanted signal level and the unwanted signal level is the co-channel interference ratio.

**conducted measurements:** measurements which are made using a direct RF connection to the equipment under test

**environmental profile:** range of environmental conditions under which equipment within the scope of the present document is required to comply with the provisions of the present document

**ground based station:** aeronautical station equipment, in the Aeronautical Mobile Service (AMS), for use with an external antenna and intended for use at a fixed location

**radiated measurements:** measurements which involve the measurement of a radiated field

**spurious emissions:** conducted RF emissions on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information

NOTE: Spurious emissions include parasitic emissions, intermodulation products and frequency conversion products.

**X 25:** ITU-T standard for the protocols and message formats that define the interface between a terminal and a packet switching network

## 3.2 Abbreviations

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

ACR	Adjacent Channel Rejection
AM	Amplitude Modulation
AM(R)S	Aeronautical Mobile (Route) Service
AMS	Aeronautical Mobile Service
ATN	Aeronautical Telecommunication Network
BER	Bit Error Rate
CCI	Co-Channel Interference
D8PSK	Differential Eight Phase Shift Keying
DSB	Double Side Band
FEC	Forward Error Correction
MAC	Medium Access Control
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
TX	Transmission
VDL	VHF Data Link
VHF	Very High Frequency

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## 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

#### 4.2.1 Transmitter requirements

##### 4.2.1.1 Frequency error

###### 4.2.1.1.1 Requirement

Requirement for frequency tolerance is specified in ETSI EN 301 841-1 [1], clause 6.1.1.

###### 4.2.1.1.2 Conformance

Conformance tests as defined in clause 5.3.1.1 shall be carried out with the limits defined by clause 4.2.1.1.1.

##### 4.2.1.2 Manufacturer's declared output power

###### 4.2.1.2.1 Requirement

Requirement for manufacturer's declared output power is specified in ETSI EN 301 841-1 [1], clause 6.1.2.

###### 4.2.1.2.2 Conformance

Conformance tests as defined in clause 5.3.1.2 shall be carried out with the limits defined by clause 4.2.1.2.1.



### 4.2.1.3 Adjacent channel power

#### 4.2.1.3.1 Requirement

Requirement for adjacent channel power is specified in ETSI EN 301 841-1 [1], clause 6.1.3.

#### 4.2.1.3.2 Conformance

Conformance tests as defined in clause 5.3.1.3 shall be carried out with the limits defined by clause 4.2.1.3.1.

### 4.2.1.4 Conducted spurious emissions

#### 4.2.1.4.1 Requirement

Requirement for conducted spurious emissions is specified in ETSI EN 301 841-1 [1], clause 6.1.4.

#### 4.2.1.4.2 Conformance

Conformance tests as defined in clause 5.3.1.4 shall be carried out with the limits defined by clause 4.2.1.4.1.

### 4.2.1.5 Cabinet radiation

#### 4.2.1.5.1 Requirement

Requirement for cabinet radiation is specified in ETSI EN 301 841-1 [1], clause 6.1.5

#### 4.2.1.5.2 Conformance

Conformance tests as defined in clause 5.3.1.5 shall be carried out with the limits defined by clause 4.2.1.5.1.

### 4.2.1.6 Void

### 4.2.1.7 Intermodulation attenuation

#### 4.2.1.7.1 Requirements

Requirement for Inter-modulation attenuation is specified in ETSI EN 301 841-1 [1], clause 6.1.7.

If the intended use of the base station equipment is not in the special service conditions class as described in that clause, this has to be stated clearly in the user manual and/or in the installation manual.

NOTE: The required class (general - or special service conditions) depends on the local situation and regulatory frequency assignment.

#### 4.2.1.7.2 Conformance

Conformance tests as defined in clause 5.3.1.7 shall be carried out with the limits defined by clause 4.2.1.7.1.

### 4.2.1.8 Void

### 4.2.1.9 RF power release time

#### 4.2.1.9.1 Requirement

Requirement for RF power release time is specified in ETSI EN 301 841-1 [1], clause 6.1.9.

#### 4.2.1.9.2 Conformance

Conformance tests as defined in clause 5.3.1.8 shall be carried out with the limits defined by clause 4.2.1.8.1.

#### 4.2.1.10 Transient behaviour of the transmitter

##### 4.2.1.10.1 Receiver to transmitter turn-around time

###### 4.2.1.10.1.1 Requirement

Requirement for receiver to transmitter turn-around is specified in ETSI EN 301 841-1 [1], clause 6.1.10.1.

###### 4.2.1.10.1.2 Conformance

Conformance tests as defined in clause 5.3.1.10.1 shall be carried out with the limits defined by clause 4.2.1.10.1.1.

##### 4.2.1.10.2 Transmitter to receiver turn-around time

###### 4.2.1.10.2.1 Requirement

Requirement for transmitter to receiver turn-around is specified in ETSI EN 301 841-1 [1], clause 6.1.10.2.

###### 4.2.1.10.2.2 Conformance

Conformance tests as defined in clause 5.3.1.10.2 shall be carried out with the limits defined by clause 4.2.1.10.2.1.

#### 4.2.1.11 Modulation Accuracy - Symbol constellation error

##### 4.2.1.11.1 Requirement

Requirement for symbol constellation error is specified in ETSI EN 301 841-1 [1], clause 6.1.11.

##### 4.2.1.11.2 Conformance

Conformance tests as defined in clause 5.3.1.11 shall be carried out with the limits defined by clause 4.2.1.11.1.

### 4.2.2 Receiver requirements

#### 4.2.2.1 Sensitivity

##### 4.2.2.1.1 Requirement

Requirement for sensitivity is specified in ETSI EN 301 841-1 [1], clause 6.2.1.

##### 4.2.2.1.2 Conformance

Conformance tests as defined in clause 5.3.2.1 shall be carried out with the limits defined by clause 4.2.2.1.1.

#### 4.2.2.2 Co-channel interference

##### 4.2.2.2.1 Requirement

Requirement for co-channel interference is specified in ETSI EN 301 841-1 [1], clause 6.2.2.

##### 4.2.2.2.2 Conformance

Conformance tests as defined in clause 5.3.2.2 shall be carried out with the limits defined by clause 4.2.2.2.1.

### 4.2.2.3 First adjacent channel rejection

#### 4.2.2.3.1 Requirement

Requirement for first adjacent channel rejection is specified in ETSI EN 301 841-1 [1], clause 6.2.3.

#### 4.2.2.3.2 Conformance

Conformance tests as defined in clause 5.3.2.3 shall be carried out with the limits defined by clause 4.2.2.3.1.

### 4.2.2.4 Spurious response rejection of signals within the VHF aeronautical band

#### 4.2.2.4.1 Requirement

Requirement for rejection of signals within the VHF aeronautical band is specified in ETSI EN 301 841-1 [1], clause 6.2.4.

#### 4.2.2.4.2 Conformance

Conformance tests as defined in clause 5.3.2.4 shall be carried out with the limits defined by clause 4.2.2.4.1.

### 4.2.2.5 Spurious response rejection of signals outside the VHF aeronautical band

#### 4.2.2.5.1 Requirement

Requirement for rejection of signals outside the VHF aeronautical band is specified in ETSI EN 301 841-1 [1], clause 6.2.5.

#### 4.2.2.5.2 Conformance

Conformance tests as defined in clause 5.3.2.5 shall be carried out with the limits defined by clause 4.2.2.5.1.

### 4.2.2.6 In-band Intermodulation response rejection

#### 4.2.2.6.1 Requirement

Requirement for in-band intermodulation is specified in ETSI EN 301 841-1 [1], clause 6.2.6.

#### 4.2.2.6.2 Conformance

Conformance tests as defined in clause 5.3.2.6 shall be carried out with the limits defined by clause 4.2.2.6.1.

### 4.2.2.7 Blocking or desensitization

#### 4.2.2.7.1 Requirement

Requirement for desired signal dynamic range is specified in ETSI EN 301 841-1 [1], clause 6.2.7.

#### 4.2.2.7.2 Conformance

Conformance tests as defined in clause 5.3.2.7 shall be carried out with the limits defined by clause 4.2.2.7.1.

### 4.2.2.8 Conducted spurious emission

#### 4.2.2.8.1 Requirement

Requirement for conducted spurious emission is specified in ETSI EN 301 841-1 [1], clause 6.2.8.

#### 4.2.2.8.2 Conformance

Conformance tests as defined in clause 5.3.2.8 shall be carried out with the limits defined by clause 4.2.2.8.1.

#### 4.2.2.9 Cabinet radiation

##### 4.2.2.9.1 Requirement

Requirement for cabinet radiation is specified in ETSI EN 301 841-1 [1], clause 6.2.9.

##### 4.2.2.9.2 Conformance

Conformance tests as defined in clause 5.3.2.9 shall be carried out with the limits defined by clause 4.2.2.9.1.

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## 5 Testing for compliance with technical requirements

### 5.1 Environmental conditions for testing

Tests defined in the present document shall be carried out at representative points within the boundary limits of the declared operational environmental profile.

Where technical performance varies subject to environmental conditions, tests shall be carried out under a sufficient variety of environmental conditions (within the boundary limits of the declared operational environmental profile) to give confidence of compliance for the affected technical requirements.

#### 5.1.1 Test power source

The test power source shall meet the requirements of ETSI EN 301 841-1 [1], clause 8.1.

#### 5.1.2 Normal and extreme test conditions

Measurements shall be made under normal test conditions and also, where stated, under extreme test conditions.

The test conditions and procedures shall be as specified in ETSI EN 301 841-1 [1], clauses 8.2.

### 5.2 Interpretation of the measurement results

The interpretation of the results recorded in a test report for the measurements described in the present document shall be as follows:

- the measured value related to the corresponding limit will be used to decide whether an equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be included in the test report;
- the recorded value of the measurement uncertainty shall be, for each measurement, equal to or lower than the figures in tables 1 and 2.

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with ETSI TR 100 028 [i.1] and shall correspond to an expansion factor (coverage factor)  $k = 1,96$  or  $k = 2$  (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Tables 1 and 2 are based on such expansion factors.

**Table 1: Transmitter measurement uncertainty: maximum values**

Measurement uncertainties	Maximum values
Frequency error	$\pm 1 \times 10^{-9}$
Carrier power (normal and extreme test conditions)	$\pm 0,75$ dB
Adjacent channel power	$\pm 2,5$ dB
Conducted spurious emissions: below 1 GHz	$\pm 3$ dB
between 1 GHz and 4 GHz	$\pm 6$ dB
Cabinet radiation	$\pm 6$ dB
Intermodulation attenuation	$\pm 3$ dB
RF power release time	$\pm 20$ % of the limits values
Receiver to transmitter turn-around time	$\pm 20$ % of the limits values
Transmitter to receiver turn-around time	$\pm 20$ % of the limits values
Modulation Accuracy - Symbol constellation error	$\pm 3$ dB

**Table 2: Receiver measurement uncertainty: maximum values**

Measurement uncertainties	Maximum values
Sensitivity	$\pm 3$ dB
Co-channel interference	$\pm 3$ dB
Adjacent channel rejection	$\pm 4$ dB
Spurious response rejection	$\pm 4$ dB
Intermodulation response rejection	$\pm 3$ dB
Blocking and desensitization	$\pm 4$ dB
Conducted spurious emissions: below 1 GHz	$\pm 3$ dB
between 1 GHz and 4 GHz	$\pm 6$ dB
Cabinet radiation	$\pm 6$ dB

For the test methods according to the present document the uncertainty figures are valid to a confidence level of 95 % calculated according to the methods described in ETSI TR 100 028 [i.1].

## 5.3 Essential radio test suites

### 5.3.1 Transmitter test specifications

#### 5.3.1.1 Frequency error

The test procedure specified in clause 9.1.1.2 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.1.2 Manufacturer's declared output power

The test procedure specified in clause 9.1.2 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.1.3 Adjacent channel power

The test procedure specified in clauses 9.1.3.1 to 9.1.3.3 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.1.4 Conducted Spurious emissions

The test procedure specified in clause 9.1.4 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.1.5 Cabinet Radiation

The test procedure specified in clause 9.1.5 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.1.6 Void

#### 5.3.1.7 Inter-modulation attenuation

The test procedure specified in clause 9.1.7 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.1.8 Void

#### 5.3.1.9 RF power release time

The test procedures specified in clause 9.1.9 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.1.10 Transient behaviour of the transmitter

##### 5.3.1.10.1 Receiver to transmitter turn-around time

The test procedure specified in clause 9.1.10.1 of ETSI EN 301 841-1 [1] shall be carried out.

##### 5.3.1.10.2 Transmitter to receiver turn-around time

The test procedure specified in clause 9.1.10.2 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.1.11 Modulation accuracy - Symbol constellation error

The test procedure specified in clause 9.1.11 of ETSI EN 301 841-1 [1] shall be carried out.

### 5.3.2 Receiver test specifications

#### 5.3.2.1 Sensitivity

The test procedure specified in clause 9.2.1 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.2.2 Co-channel interference

The test procedure specified in clause 9.2.2 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.2.3 First Adjacent channel rejection

The test procedure specified in clause 9.2.3 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.2.4 Spurious response rejection of signals within the VHF aeronautical band

The test procedure specified in clause 9.2.4 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.2.5 Spurious response rejection of signals outside the VHF aeronautical band

The test procedure specified in clause 9.2.5 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.2.6 In-band Intermodulation rejection

The test procedure specified in clause 9.2.6 of ETSI EN 301 841-1 [1] shall be carried out.

#### 5.3.2.7 Blocking or desensitization

The test procedure specified in clause 9.2.7 of ETSI EN 301 841-1 [1] shall be carried out.

### 5.3.2.8 Conducted spurious emission

The test procedure specified in clause 9.2.8 of ETSI EN 301 841-1 [1] shall be carried out.

### 5.3.2.9 Cabinet Radiation

The test procedure specified in clause 9.2.9 of ETSI EN 301 841-1 [1] shall be carried out.

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

The HS Requirements and conformance Test specifications Table (HS-RTT) in table A.1 serves a number of purposes, as follows:

- it provides a statement of all the requirements in words and by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it provides a statement of all the test procedures corresponding to those requirements by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it qualifies each requirement to be either:
  - Unconditional: meaning that the requirement applies in all circumstances; or
  - Conditional: meaning that the requirement is dependent on the manufacturer having chosen to support optional functionality defined within the schedule.
- in the case of Conditional requirements, it associates the requirement with the particular optional service or functionality;
- it qualifies each test procedure to be either:
  - Essential: meaning that it is included with the Essential Radio Test Suite and therefore the requirement shall be demonstrated to be met in accordance with the referenced procedures;
  - Other: meaning that the test procedure is illustrative but other means of demonstrating compliance with the requirement are permitted.

**Table A.1: HS Requirements and conformance Test specifications Table (HS-RTT)**

<b>Harmonized Standard ETSI EN 301 841-3</b>						
The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive [i.2]						
<b>Requirement</b>			<b>Requirement Conditionality</b>		<b>Test Specification</b>	
<b>No</b>	<b>Description</b>	<b>Reference: Clause No</b>	<b>U/C</b>	<b>Condition</b>	<b>E/O</b>	<b>Reference: Clause No</b>
1	Frequency error	4.2.1.1	U		E	5.3.1.1
2	Carrier power	4.2.1.2	U		E	5.3.1.2
3	Adjacent channel power	4.2.1.3	U		E	5.3.1.3
4	Conducted spurious emissions (TX)	4.2.1.4	U		E	5.3.1.4
5	Cabinet radiation	4.2.1.5	U		E	5.3.1.5
6	Intermodulation attenuation	4.2.1.7	U		E	5.3.1.7
7	RF power release time	4.2.1.9	U		E	5.3.1.9
8	Transient behaviour	4.2.1.10	U		E	5.3.1.10
9	Symbol constellation error	4.2.1.11	U		E	5.3.1.11
10	Sensitivity	4.2.2.1	U		E	5.3.2.1
11	Co-channel interference	4.2.2.2	U		E	5.3.2.2
12	First Adjacent channel rejection	4.2.2.3	U		E	5.3.2.3
13	Spurious response rejection	4.2.2.4	U		E	5.3.2.4
		4.2.2.5				5.3.2.5
14	In-band Intermodulation response rejection	4.2.2.6	U		E	5.3.2.6
15	Blocking or desensitization	4.2.2.7	U		E	5.3.2.7
16	Conducted spurious emissions	4.2.2.8	U		E	5.3.2.8
17	Cabinet radiation	4.2.2.9	U		E	5.3.2.9



**Key to columns:****Requirement:**

**No** A unique identifier for one row of the table which may be used to identify a requirement or its test specification.

**Description** A textual reference to the requirement.

**Clause Number** 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 to be *unconditionally* applicable (U) or is *conditional* upon the manufacturers claimed functionality of the equipment (C).

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

**Test Specification:**

**E/O** Indicates whether the test specification forms part of the Essential Radio Test Suite (E) or whether it is one of the Other Test Suite (O).

**NOTE:** All tests whether "E" or "O" are relevant to the requirements. Rows designated "E" collectively make up the Essential Radio Test Suite; those designated "O" make up the Other Test Suite; for those designated "X" there is no test specified corresponding to the requirement. The completion of all tests classified "E" as specified with satisfactory outcomes is a necessary condition for a presumption of conformity. Compliance with requirements associated with tests classified "O" or "X" is a necessary condition for presumption of conformity, although conformance with the requirement may be claimed by an equivalent test or by manufacturer's assertion supported by appropriate entries in the technical construction file.

**Clause Number** Identification of clause(s) defining the test specification in the present document unless another document is referenced explicitly. Where no test is specified (that is, where the previous field is "X") this field remains blank.

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## Annex B (informative): Bibliography

- Commission Regulation (EC) No 1265/2007 of 26 October 2007 laying down requirements on air-ground voice channel spacing for the single European sky (Text with EEA relevance), OJEU L283, 27.10.2007, p. 25-36.
- ICAO annex 10 volume V (July 2001, including amendments up to amendment 86): "Aeronautical Radio Frequency Spectrum Utilization".
- Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC (EMC Directive).
- Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).

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## History

<b>Document history</b>		
V1.1.1	November 2011	Publication
V1.2.0	December 2014	EN Approval Procedure AP 20150421: 2014-12-22 to 2015-04-21