

<b>STN</b>	<b>Režim 2 digitálneho spoja VHF (VDL) vzduch-zem. Technické charakteristiky a meracie metódy na pozemné zariadenia. Časť 3: Harmonizovaná EN vzťahujúca sa na základné požiadavky podľa článku 3.2 smernice R&amp;TTE.</b>	<b>STN EN 301 841-3 V1.2.1</b>  87 1841
------------	---	---

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

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

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/15

Obsahuje: EN 301 841-3 V1.2.1:2015

**121649**



# ETSI EN 301 841-3 V1.2.1 (2015-04)



**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**

---

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

---

**Keywords**

aeronautical, AM, DSB, radio, testing, VHF

**ETSI**

---

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

---

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

---

**Important notice**

---

The present document can be downloaded from:  
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at  
<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:  
<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

---

**Copyright Notification**

---

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.  
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2015.  
All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.  
**3GPP™** and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.  
**GSM®** and the GSM logo are Trade Marks registered and owned by the GSM Association.

# Contents

Intellectual Property Rights .....	5
Foreword.....	5
Modal verbs terminology.....	5
1 Scope .....	6
2 References .....	6
2.1 Normative references .....	6
2.2 Informative references.....	6
3 Definitions and abbreviations.....	7
3.1 Definitions.....	7
3.2 Abbreviations .....	8
4 Technical requirements specifications .....	8
4.1 Environmental profile.....	8
4.2 Conformance requirements .....	8
4.2.1 Transmitter requirements .....	8
4.2.1.1 Frequency error .....	8
4.2.1.1.1 Requirement .....	8
4.2.1.1.2 Conformance .....	8
4.2.1.2 Manufacturer's declared output power .....	8
4.2.1.2.1 Requirement .....	8
4.2.1.2.2 Conformance .....	8
4.2.1.3 Adjacent channel power .....	8
4.2.1.3.1 Requirement .....	8
4.2.1.3.2 Conformance .....	9
4.2.1.4 Conducted spurious emissions .....	9
4.2.1.4.1 Requirement .....	9
4.2.1.4.2 Conformance .....	9
4.2.1.5 Cabinet radiation .....	9
4.2.1.5.1 Requirement .....	9
4.2.1.5.2 Conformance .....	9
4.2.1.6 Void.....	9
4.2.1.7 Intermodulation attenuation .....	9
4.2.1.7.1 Requirements .....	9
4.2.1.7.2 Conformance .....	9
4.2.1.8 Void.....	9
4.2.1.9 RF power release time.....	9
4.2.1.9.1 Requirement .....	9
4.2.1.9.2 Conformance .....	9
4.2.1.10 Transient behaviour of the transmitter .....	9
4.2.1.10.1 Receiver to transmitter turn-around time.....	9
4.2.1.10.2 Transmitter to receiver turn-around time.....	10
4.2.1.11 Modulation Accuracy - Symbol constellation error .....	10
4.2.1.11.1 Requirement .....	10
4.2.1.11.2 Conformance .....	10
4.2.2 Receiver requirements .....	10
4.2.2.1 Sensitivity .....	10
4.2.2.1.1 Requirement .....	10
4.2.2.1.2 Conformance .....	10
4.2.2.2 Co-channel interference .....	10
4.2.2.2.1 Requirement .....	10
4.2.2.2.2 Conformance .....	10
4.2.2.3 First adjacent channel rejection.....	10
4.2.2.3.1 Requirement .....	10
4.2.2.3.2 Conformance .....	10
4.2.2.4 Spurious response rejection of signals within the VHF aeronautical band .....	10
4.2.2.4.1 Requirement .....	10

4.2.2.4.2	Conformance .....	10
4.2.2.5	Spurious response rejection of signals outside the VHF aeronautical band .....	11
4.2.2.5.1	Requirement .....	11
4.2.2.5.2	Conformance .....	11
4.2.2.6	In-band Intermodulation response rejection .....	11
4.2.2.6.1	Requirement .....	11
4.2.2.6.2	Conformance .....	11
4.2.2.7	Blocking or desensitization .....	11
4.2.2.7.1	Requirement .....	11
4.2.2.7.2	Conformance .....	11
4.2.2.8	Conducted spurious emission .....	11
4.2.2.8.1	Requirement .....	11
4.2.2.8.2	Conformance .....	11
4.2.2.9	Cabinet radiation .....	11
4.2.2.9.1	Requirement .....	11
4.2.2.9.2	Conformance .....	11
5	Testing for compliance with technical requirements .....	11
5.1	Environmental conditions for testing .....	11
5.1.1	Test power source .....	12
5.1.2	Normal and extreme test conditions .....	12
5.2	Interpretation of the measurement results .....	12
5.3	Essential radio test suites .....	13
5.3.1	Transmitter test specifications .....	13
5.3.1.1	Frequency error .....	13
5.3.1.2	Manufacturer's declared output power .....	13
5.3.1.3	Adjacent channel power .....	13
5.3.1.4	Conducted Spurious emissions .....	13
5.3.1.5	Cabinet Radiation .....	13
5.3.1.6	Void .....	13
5.3.1.7	Inter-modulation attenuation .....	13
5.3.1.8	Void .....	13
5.3.1.9	RF power release time .....	13
5.3.1.10	Transient behaviour of the transmitter .....	13
5.3.1.10.1	Receiver to transmitter turn-around time .....	13
5.3.1.10.2	Transmitter to receiver turn-around time .....	13
5.3.1.11	Modulation accuracy - Symbol constellation error .....	13
5.3.2	Receiver test specifications .....	13
5.3.2.1	Sensitivity .....	13
5.3.2.2	Co-channel interference .....	13
5.3.2.3	First Adjacent channel rejection .....	14
5.3.2.4	Spurious response rejection of signals within the VHF aeronautical band .....	14
5.3.2.5	Spurious response rejection of signals outside the VHF aeronautical band .....	14
5.3.2.6	In-band Intermodulation rejection .....	14
5.3.2.7	Blocking or desensitization .....	14
5.3.2.8	Conducted spurious emission .....	14
5.3.2.9	Cabinet Radiation .....	14
<b>Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT) .....</b>		<b>15</b>
<b>Annex B (informative): Bibliography .....</b>		<b>17</b>
History .....		18

---

## Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://ipr.etsi.org>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

---

## Foreword

This Harmonized European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

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".**

National transposition dates	
Date of adoption of this EN:	21 April 2015
Date of latest announcement of this EN (doa):	31 July 2015
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 January 2016
Date of withdrawal of any conflicting National Standard (dow):	31 January 2016

---

## 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 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.

---

## 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 <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.

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

- [1] ETSI EN 301 841-1 (V1.4.1) (04-2015): "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

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] 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.
- 

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**