

ETSI EN 300 698-2 V1.2.1 (2009-12)

Harmonized European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Radio telephone transmitters and receivers
for the maritime mobile service operating
in the VHF bands used on inland waterways;
Part 2: Harmonized EN covering essential requirements
of article 3.2 of the R&TTE Directive**



Reference

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Foreword

This Harmonized European Standard (Telecommunications series) 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 a mandate from the European Commission issued under Council Directive 98/34/EC (as amended) [i.1] laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Directive 1999/5/EC [i.3] 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 ("the R&TTE Directive").

Technical specifications relevant to Directive 1999/5/EC [i.3] are given in annex A.

The present document is part 2 of a multi-part deliverable covering the radio telephone transmitters and receivers for the maritime mobile service operating in the VHF bands used on inland waterways, as identified below:

- Part 1: "Technical characteristics and methods of measurement";
- Part 2: "Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive";**
- Part 3: "Harmonized EN covering essential requirements of article 3.3 (e) of the R&TTE Directive".

National transposition dates	
Date of adoption of this EN:	30 November 2009
Date of latest announcement of this EN (doa):	28 February 2010
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2010
Date of withdrawal of any conflicting National Standard (dow):	31 August 2010

1 Scope

The present document applies to the radio telephone transmit and receive equipment for the maritime mobile service utilizing class of emission G3E, and possibly G2B, used on inland waterways radio equipment, operating in all or any part of the VHF bands between 156 MHz and 174 MHz.

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".

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 [i.3] may apply to equipment within the scope of the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
 - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
 - for informative references.

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

2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- | | |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] | ETSI EN 300 698-1 (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio telephone transmitters and receivers for the maritime mobile service operating in the VHF bands used on inland waterways; Part 1: Technical characteristics and methods of measurement". |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- | | |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [i.1] | Council 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. |
| [i.2] | ETSI TR 100 028: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics". |

- [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] ITU Radio Regulations (2008).

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions in the R&TTE Directive [i.3], the Radio Regulations [i.4] and the following apply:

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

supplier: entity referred to in the R&TTE Directive [i.3] responsible for the placing on the market of an equipment within the scope of the Directive

3.2 Abbreviations

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

ATIS	Automatic Transmitter Identification System
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency

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 determined by the environmental class of the equipment. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the required operational environmental profile.

4.2 Conformance requirements

4.2.1 Transmitter frequency error

4.2.1.1 Definition

The frequency error is defined in EN 300 698-1 [1], clause 8.1.1.

4.2.1.2 Limit

The transmitter frequency error limit shall be as stated in EN 300 698-1 [1], clause 8.1.3.

4.2.1.3 Conformance

Conformance tests as defined in clause 5.3.1 shall be carried out.

4.2.2 Transmitter carrier power

4.2.2.1 Definition

The carrier power is defined in EN 300 698-1 [1], clause 8.2.1.

The rated output power is the carrier power declared by the manufacturer.

4.2.2.2 Limit

The transmitter carrier power limit shall be as stated in EN 300 698-1 [1], clause 8.2.3.

4.2.2.3 Conformance

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

4.2.3 Transmitter frequency deviation

4.2.3.1 Definition

The frequency deviation is defined in EN 300 698-1 [1], clause 8.3.1.

4.2.3.2 Limit

The transmitter frequency deviation limit shall be as stated in EN 300 698-1 [1], clause 8.3.3.

4.2.3.3 Conformance

Conformance tests as defined in clause 5.3.3 shall be carried out.

4.2.4 Transmitter adjacent channel power

4.2.4.1 Definition

The adjacent channel power is defined in EN 300 698-1 [1], clause 8.8.1.

4.2.4.2 Limit

The transmitter adjacent channel power limit shall be as stated in EN 300 698-1 [1], clause 8.8.3.

4.2.4.3 Conformance

Conformance tests as defined in clause 5.3.4 shall be carried out.

4.2.5 Transmitter conducted spurious emissions conveyed to the antenna

4.2.5.1 Definition

Conducted spurious emissions are defined in EN 300 698-1 [1], clause 8.9.1.

4.2.5.2 Limit

The transmitter conducted spurious emissions conveyed to the antenna limit shall be as stated in EN 300 698-1 [1], clause 8.9.3.

4.2.5.3 Conformance

Conformance tests as defined in clause 5.3.5 shall be carried out.

4.2.6 Transient frequency behaviour of the transmitter

4.2.6.1 Definition

The transient frequency behaviour of the transmitter shall be as defined in EN 300 698-1 [1], clause 8.11.1.

4.2.6.2 Limit

The transient frequency behaviour of the transmitter limit shall be as stated in EN 300 698-1 [1], clause 8.11.3.

4.2.6.3 Conformance

Conformance tests as defined in clause 5.3.6 shall be carried out.

4.2.7 Transmitter cabinet radiation and conducted spurious emissions other than those conveyed to the antenna

4.2.7.1 Definition

The transmitter cabinet radiation and conducted spurious emissions other than those conveyed to the antenna shall be as defined in EN 300 698-1 [1], clause 8.12.1.

4.2.7.2 Limit

The transmitter cabinet radiation and conducted spurious emissions other than those conveyed to the antenna limit shall be as stated in EN 300 698-1 [1], clause 8.12.3.

4.2.7.3 Conformance

Conformance tests as defined in clause 5.3.7 shall be carried out.

4.2.8 ATIS encoder frequency error (demodulated signal)

4.2.8.1 Definition

The ATIS encoder frequency error (demodulated signal) shall be as defined in EN 300 698-1 [1], clause B.2.2.1.

4.2.8.2 Limit

The ATIS encoder frequency error (demodulated signal) shall be as stated in EN 300 698-1 [1], clause B.2.2.2.

4.2.8.3 Conformance

Conformance tests as defined in clause 5.3.8 shall be carried out.

4.2.9 ATIS encoder modulation index

4.2.9.1 Definition

The ATIS encoder modulation index shall be as defined in EN 300 698-1 [1], clause B.2.3.1.

4.2.9.2 Limit

The ATIS encoder modulation index shall be as stated in EN 300 698-1 [1], clause B.2.3.3.

4.2.9.3 Conformance

Conformance tests as defined in clause 5.3.9 shall be carried out.

4.2.10 ATIS encoder modulation rate

4.2.10.1 Definition

The ATIS encoder modulation rate shall be as defined in EN 300 698-1 [1], clause B.2.4.1.

4.2.10.2 Limit

The ATIS encoder modulation rate shall be as stated in EN 300 698-1 [1], clause B.2.4.3.

4.2.10.3 Conformance

Conformance tests as defined in clause 5.3.10 shall be carried out.

4.2.11 Receiver maximum usable sensitivity

4.2.11.1 Definition

The maximum usable sensitivity of the receiver is defined in EN 300 698-1 [1], clause 9.3.1.

4.2.11.2 Limit

The receiver maximum usable sensitivity limit shall be as stated in EN 300 698-1 [1], clause 9.3.3.

4.2.11.3 Conformance

Conformance tests as defined in clause 5.4.2 may be carried out.

4.2.12 Receiver co-channel rejection

4.2.12.1 Definition

The co-channel rejection is defined in EN 300 698-1 [1], clause 9.4.1.

4.2.12.2 Limit

The receiver co-channel rejection limit shall be as stated in EN 300 698-1 [1], clause 9.4.3.

4.2.12.3 Conformance

Conformance tests as defined in clause 5.4.3 may be carried out.

4.2.13 Receiver adjacent channel selectivity

4.2.13.1 Definition

The adjacent channel selectivity is defined in EN 300 698-1 [1], clause 9.5.1.

4.2.13.2 Limit

The receiver adjacent channel selectivity limit shall be as stated in EN 300 698-1 [1], clause 9.5.3.

4.2.13.3 Conformance

Conformance tests as defined in clause 5.4.4 may be carried out.

4.2.14 Receiver spurious response rejection

4.2.14.1 Definition

The spurious response rejection is defined in EN 300 698-1 [1], clause 9.6.1.

4.2.14.2 Limit

The receiver spurious response rejection limit shall be as stated in EN 300 698-1 [1], clause 9.6.3.

4.2.14.3 Conformance

Conformance tests as defined in clause 5.4.5 may be carried out.

4.2.15 Receiver intermodulation response

4.2.15.1 Definition

The intermodulation response is defined in EN 300 698-1 [1], clause 9.7.1.

4.2.15.2 Limit

The receiver intermodulation response limit shall be as stated in EN 300 698-1 [1], clause 9.7.3.

4.2.15.3 Conformance

Conformance tests as defined in clause 5.4.6 may be carried out.

4.2.16 Receiver blocking or desensitization

4.2.16.1 Definition

Blocking is defined in EN 300 698-1 [1], clause 9.8.1.

4.2.16.2 Limit

The receiver blocking or desensitization limit shall be as stated in EN 300 698-1 [1], clause 9.8.3.

4.2.16.3 Conformance

Conformance tests as defined in clause 5.4.7 may be carried out.

4.2.17 Receiver conducted spurious emissions conveyed to the antenna

4.2.17.1 Definition

Conducted spurious emissions are defined in EN 300 698-1 [1], clause 9.9.1.

The level of spurious emissions shall be measured by their power level in a transmission line or antenna.

4.2.17.2 Limit

The receiver conducted spurious emissions conveyed to the antenna limit shall be as stated in EN 300 698-1 [1], clause 9.9.3.

4.2.17.3 Conformance

Conformance tests as defined in clause 5.4.8 may be carried out.

4.2.18 Receiver radiated spurious emissions

4.2.18.1 Definition

The receiver radiated spurious emissions shall be as defined in EN 300 698-1 [1], clause 9.14.1.

4.2.18.2 Limit

The receiver radiated spurious emissions limit shall be as stated in EN 300 698-1 [1], clause 9.14.3.

4.2.18.3 Conformance

Conformance tests as defined in clause 5.4.9 may be carried out.

5 Testing for compliance with technical requirements

5.1 Test conditions, power supply and ambient temperatures

The test conditions and procedures shall be as defined in EN 300 698-1 [1], clauses 5 and 6.

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 table 1.

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [i.2] 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)).

Table 1 is based on such expansion factors.

Table 1: Absolute measurement uncertainties: maximum values

Parameter	Maximum uncertainty
RF frequency	$\pm 1 \times 10^{-7}$
RF power	$\pm 0,75$ dB
Maximum frequency deviation: - within 300 Hz to 6 kHz of audio frequency; - within 6 kHz to 25 kHz of audio frequency	± 5 % ± 3 dB
Deviation limitation	± 5 %
Adjacent channel power	± 5 dB
Conducted spurious emission of transmitter	± 4 dB
Conducted emission of receiver	± 3 dB
Two-signal measurement	± 4 dB
Three-signal measurement	± 3 dB
Radiated emission of transmitter	± 6 dB
Radiated emission of receiver	± 6 dB
Transmitter transient time	± 20 %
Transmitter transient frequency	± 250 Hz
Receiver desensitization (duplex operation)	$\pm 0,5$ dB

5.3 Essential radio test suites

5.3.1 Transmitter frequency error

The test specified in EN 300 698-1 [1], clause 8.1.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.1.2 in order to prove compliance with the requirement.

5.3.2 Transmitter carrier power

The test specified in EN 300 698-1 [1], clause 8.2.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.2.2 in order to prove compliance with the requirement.

5.3.3 Transmitter frequency deviation

The test specified in EN 300 698-1 [1], clause 8.3.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.3.2 in order to prove compliance with the requirement.

5.3.4 Transmitter adjacent channel power

The test specified in EN 300 698-1 [1], clause 8.8.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.4.2 in order to prove compliance with the requirement.

5.3.5 Transmitter conducted spurious emissions conveyed to the antenna

The test specified in EN 300 698-1 [1], clause 8.9.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.5.2 in order to prove compliance with the requirement.

5.3.6 Transient frequency behaviour of the transmitter

The test specified in EN 300 698-1 [1], clause 8.11.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.6.2 in order to prove compliance with the requirement.

5.3.7 Transmitter cabinet radiation and conducted spurious emissions other than those conveyed to the antenna

The test specified in EN 300 698-1 [1], clause 8.12.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.7.2 in order to prove compliance with the requirement.

5.3.8 ATIS encoder frequency error (demodulated signal)

The test specified in EN 300 698-1 [1], clause B.2.2.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.8.2 in order to prove compliance with the requirement.

5.3.9 ATIS encoder modulation index

The test specified in EN 300 698-1 [1], clause B.2.3.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.9.2 in order to prove compliance with the requirement.

5.3.10 ATIS encoder modulation rate

The test specified in EN 300 698-1 [1], clause B.2.4.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.10.2 in order to prove compliance with the requirement.

5.4 Other test specifications

5.4.1 General

The requirements in clauses 4.2.11 to 4.2.18 inclusive have been set on the assumption that the test specifications in clauses 5.4.2 to 5.4.9 will be used to verify the performance of the equipment.

5.4.2 Receiver maximum usable sensitivity

The test specified in EN 300 698-1 [1], clause 9.3.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.11.2 in order to prove compliance with the requirement.

5.4.3 Receiver co-channel rejection

The test specified in EN 300 698-1 [1], clause 9.4.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.12.2 in order to prove compliance with the requirement.

5.4.4 Receiver adjacent channel selectivity

The test specified in EN 300 698-1 [1], clause 9.5.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.13.2 in order to prove compliance with the requirement.

5.4.5 Receiver spurious response rejection

The test specified in EN 300 698-1 [1], clause 9.6.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.14.2 in order to prove compliance with the requirement.

5.4.6 Receiver intermodulation response

The test specified in EN 300 698-1 [1], clause 9.7.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.15.2 in order to prove compliance with the requirement.

5.4.7 Receiver blocking or desensitization

The test specified in EN 300 698-1 [1], clause 9.8.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.16.2 in order to prove compliance with the requirement.

5.4.8 Receiver conducted spurious emissions conveyed to the antenna

The test specified in EN 300 698-1 [1], clause 9.9.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.17.2 in order to prove compliance with the requirement.

5.4.9 Receiver radiated spurious emissions

The test specified in EN 300 698-1 [1], clause 9.14.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.18.2 in order to prove compliance with the requirement.

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)

Harmonized Standard EN 300 698-2						
The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive						
Requirement			Requirement Conditionality		Test Specification	
No	Description	Reference: Clause No	U/C	Condition	E/O	Reference: Clause No
1	Transmit frequency error	4.2.1	U		E	5.3.1
2	Transmit carrier power	4.2.2	U		E	5.3.2
3	Transmit frequency deviation	4.2.3	U		E	5.3.3
4	Transmit adjacent channel power	4.2.4	U		E	5.3.4
5	Transmit conducted spurious	4.2.5	U		E	5.3.5
6	Transient frequency behaviour	4.2.6	U		E	5.3.6
7	Transmit cabinet radiation	4.2.7	U		E	5.3.7
8	ATIS encoder frequency error	4.2.8	U		E	5.3.8
9	ATIS encoder modulation index	4.2.9	U		E	5.3.9
10	ATIS encoder modulation rate	4.2.10	U		E	5.3.10
11	Receiver maximum usable sensitivity	4.2.11	U		O	5.4.2

Harmonized Standard EN 300 698-2 The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive						
Requirement			Requirement Conditionality		Test Specification	
No	Description	Reference: Clause No	U/C	Condition	E/O	Reference: Clause No
12	Receiver co channel rejection	4.2.12	U		O	5.4.3
13	Receiver adjacent channel rejection	4.2.13	U		O	5.4.4
14	Receiver spurious response rejection	4.2.14	U		O	5.4.5
15	Receiver intermodulation response	4.2.15	U		O	5.4.6
16	Receiver blocking or desensitization	4.2.16	U		O	5.4.7
17	Receiver conducted spurious emissions	4.2.17	U		O	5.4.8
18	Receiver radiated spurious emissions	4.2.18	U		O	5.4.9

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 technical 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.

Annex B (informative): The EN title in the official languages

The enlargement of the European Union (EU) resulted in a requirement from the EU for a larger number of languages for the translation of the titles of Harmonized Standards and mandated ENs that are to be listed in the Official Journal to support the implementation of this legislation.

For this reason the title translation concerning the present document can be consulted via the [e-approval](#) application.

History

Document history		
V1.1.1	August 2000	Publication
V1.2.1	August 2009	One-step Approval Procedure OAP 20091129; 2009-08-01 to 2009-11-30
V1.2.1	December 2009	Publication