SLOVENSKI STANDARD
SIST TBR 023:2002

01-september-2002

Elektromagnetna združljivost (EMC) in zadeve v zvezi z radijskim spektrom (ERM) - Prizemni letalski telekomunikacijski sistem (TFTS) - Tehniļne zahteve za TFTS

Electromagnetic compatibility and Radio spectrum Matters (ERM); Terrestrial Flight Telecommunications System (TFTS); Technical requirements for TFTS

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: TBR 023 Edition 1

SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/c173187-36bb-44c1-8724-2554455203cd/sist-tbr-023-2002

ICS:

33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general
49.090	Oprema in instrumenti v zraļ nih in vesoljskih plovilih	On-board equipment and instruments

SIST TBR 023:2002 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

SIST TBR 023:2002

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/cf373187-36bb-44c1-8724-2554455203cd/sist-tbr-023-2002

SIST TBR 023:2002

TECHNICAL BASIS for REGULATION

TBR 23

March 1998

Source: ERM

Reference: DTBR/ERM-RP05-002

ICS: 33.020

Key words: Radio, terminal, testing, TFTS, type approval

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Terrestrial Flight Telecommunications System (TFTS); Technical requirements for TFTS

SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/cf373187-36bb-44c1-8724-

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
Internet: secretariat@etsi.fr - http://www.etsi.fr - http://www.etsi.org

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

Copyright Notification: No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 1998. All rights reserved.

SIST TBR 023:2002

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/cf373187-36bb-44c1-8724-2554455203cd/sist-tbr-023-2002

Whilst every care has been taken in the preparation and publication of this document, errors in content, typographical or otherwise, may occur. If you have comments concerning its accuracy, please write to "ETSI Editing and Committee Support Dept." at the address shown on the title page.

SIST TBR 023:2002

Contents

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/cf373187-36bb-44c1-8724-2554455203ed/sist-tbr-023-2002

SIST TBR 023:2002

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/cf373187-36bb-44c1-8724-2554455203cd/sist-tbr-023-2002

SIST TBR 023:2002

Foreword

This Technical Basis for Regulation (TBR) has been produced by the Electromagnetic compatibility and Radio spectrum Matters (ERM) Technical Committee of the European Telecommunications Standards Institute (ETSI).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 83/189/EEC (as amended) 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 Council Directive Directive 91/263/EEC on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity ("the TTE Directive").

Technical specifications relevant to the TTE Directive are given in Annex A.

Introduction

This TBR provides the essential requirements of Article 4e (effective use of the radio frequency spectrum) of Council Directive 91/263/EEC on the approximation of the laws of the Member States concerning telecommunications Terminal Equipment, including the mutual recognition of their conformity for the Terrestrial Flights Telecommunications System (TFTS) Avionic Termination (AT), Article 4d (protection of the public telecommunications network from harm) has been considered for the TFTS ground station only as it has been determined that the AT cannot harm to the public telecommunications network.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/cf373187-36bb-44c1-8724-2554455203cd/sist-tbr-023-2002

SIST TBR 023:2002

Blank page

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/cf373187-36bb-44c1-8724-2554455203cd/sist-tbr-023-2002

SIST TBR 023:2002

1 Scope

This Technical Basis for Regulation (TBR) specifies the technical requirements to be provided by terminal equipment of the Terrestrial Flight Telecommunications System (TFTS) capable of, and intended for, connection to a public telecommunication network. The TFTS operates in the frequency spectrum 1 670 MHz to 1 675 MHz (ground to-air) and 1 800 MHz to 1 805 MHz (air to ground). The modulation technique is $\pi/4$ DQPSK. The system is cellular in nature and the available spectrum supports up to 164 radio channels which may be reused between cells. Each radio channel supports four voice telephone circuits with a 9,6 kbit/s voice coding algorithm. TFTS mobile stations are airborne equipment and they are also subject to a separate certification process for aircraft.

The objective of this TBR is to define the minimum requirements for conformance testing of the TFTS Avionic Termination (AT). This includes testing of the radio interface in terms of Radio Frequency (RF) parameters.

This TBR covers the essential requirements of the Terminal Directive 91/263/EEC [6] Articles 4d and 4e.

This TBR does not include any interworking requirements under Article 4f.

Council Directive 91/263/EEC [6] Articles 4a and 4b [6] are subject to proof of conformity outside of the scope of this TBR and, therefore, are not covered by this TBR.

Telephony for TFTS is not a justified case and therefore there are no requirements on voice quality in relation to Article 4g of Directive 91/263/EEC [6].

There are no technical requirements which are specific to the equipment in terms of Article 4c of Directive 91/263/EEC [6]. Other technical aspects of Electromagnetic compatibility and (EMC) performance are the subject of normal aircraft equipment certification and are specified in EUROCAE ED-14C [4] (RTCA-DO160C). The applicable test categories are specified in ARINC Characteristic 752 [3].

iTeh STANDARD PREVIEW
(standards.iteh.ai)

EN 300 789 [5] constitutes the conformance specification for the radio characteristics of the AT. The set of requirements in EN 300 789 [9] and the set of requirements in this TBR are not necessarily identical.

SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/cf373187-36bb-44c1-8724-2554455203cd/sist-tbr-023-2002

2 Normative references

This TBR incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this TBR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 326-2 (1996): "Radio Equipment and Systems (RES); Terrestrial Flight Telephone System (TFTS); Part 2: Speech services, radio interface".

[2] ETR 028: "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".

[3] ARINC Characteristic 752 (January 1993): "Terrestrial Flight Telephone System (TFTS) Airborne Radio Subsystem".

[4] EUROCAE ED-14C: "Environmental Conditions and Test Procedures for Airborne Equipment".

[5] EN 300 789 (1997): "Radio Equipment and Systems (RES); Terrestrial Flight Telecommunications System (TFTS); Avionic Termination Radio Testing Specification".

[6] Council directive of 29 April 1991 on the approximation of the laws of Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity (91/263/EEC) ("The TTE Directive").

SIST TBR 023:2002

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of this TBR, the following definitions apply:

out-of-band emission: Emission on a frequency or frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

spurious emission: Emission 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. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

unwanted emissions: Consist of spurious emissions and out-of-band emissions.

necessary bandwidth: For a given class of emission, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions.

occupied bandwidth: The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage P/2 of the total mean power of a given emission.

95 % confidence level: 1,96 times the total standard deviation, based on the Student t factor.

continuous modulation mode: See subclause 6.6.3.

iTeh STANDARD PREVIEW

suppressed modulation mode: See subclause 6.6.4.

(standards.iteh.ai)

burst mode: Transmission with one or more of the traffic.channels unused.

SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/cf373187-36bb-44c1-8724-2554455203cd/sist-tbr-023-2002

3.2 Symbols

For the purposes of this TBR, the following symbols apply:

ppm	parts per million
π/4 DQPSK	π/4 Differential Quaternary Phase Shift Keying

3.3 Abbreviations

For the purposes of this TBR, the following abbreviations apply:

AT	Avionic Termination
BCCH	Broadcast Control CHannel
BER	Bit Error Ratio
EMC	ElectroMagnetic Compatibility
GS	Ground Station (of the TFTS system)
PRBS	Pseudo Random Bit Sequence
RF	Radio Frequency
TFTS	Terrestrial Flight Telecommunications System
WOW	Weight On Wheels

4 Requirements

This TBR covers the essential requirements of the TTE Directive [6] Articles 4d and 4e.

For guidance, Article 4d refers to the protection of the public telecommunications network from harm, Article 4e refers to the effective use of the radio frequency spectrum.

SIST TBR 023:2002

EN 300 789 [5] provides methods for the radio tests of conformance of the Avionic Termination (AT) to ETS 300 326-2 [1] but contains no tests for the essential requirements of Article 4d of the TTE Directive [6].

4.1 Transmitter power output

4.1.1 Requirement

ETS 300 326-2 [1] subclauses 8.8.2.2.1 and 8.8.2.5.

The nominal mean transmit power shall be +40 dBm (+2, -1 dB) at the antenna port. The lowest value of the mean transmit power shall be 75 ± 2 dB below nominal. The automatic power control shall adjust the output power relative to the nominal mean level in the range +0 to -75 dB in equal steps of 5 dB. The tolerance of each step shall be ±2 dB.

When Weight On Wheels (WOW) is TRUE, the mean power level shall be reduced to +25 (+4, -3 dB) dBm, also measured at the antenna port.

4.1.2 Justification for requirement

Effective use of the RF spectrum.

The purpose of the test is to verify that the AT output powers both with and without automatic power control action are within the ranges specified in subclause 4.1.1 when measured at the antenna port. This ensures that the AT will not cause interference to other ground stations in the TFTS network by transmitting at too high a power level.

4.2 Transmitter frequency accuracy

iTeh STANDARD PREVIEW
(standards.iteh.ai)

4.2.1 Requirement

ETS 300 326-2 [1] subclause 8.8.1.3.1.

SIST TBR 023:2002
https://standards.iteh.ai/catalog/standards/sist/cf373187-36bb-44c1-8724-25584453203c/sist-tbr-023-2002

The fractional error between the actual transmitted frequency or the centre frequency of the receiver and the nominal frequency shall be less than 2×10^{-7}.

4.2.2 Justification for requirement

Effective use of the RF spectrum.

The purpose of the test is to verify the ability of the AT to transmit the signal on the correct frequency assignment for the channel on which it is transmitting within the tolerances defined in subclause 4.2.1 in order to prevent interference to other TFTS channels.

4.3 RF spectrum mask

4.3.1 Requirement

ETS 300 326-2 [1] subclause 8.8.2.4.

The spectrum mask shall be less than the limits specified in table 1 as the maximum power level at several frequencies above and below the nominal transmit frequency. The frequency offsets shall be measured from the nominal centre frequency, not from the actual value, and power levels are given relative to the transmit power at the nominal frequency.