

STN	Systémy mobilnej komunikácie na palube lietadla (MCOBA). Harmonizovaná norma vzťahujúca sa na základné požiadavky podľa článku 3.2 smernice 2014/53/EÚ.	STN EN 302 480 V2.1.1 87 2480
------------	--	---

Mobile Communication On Board Aircraft (MCOBA) systems; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU

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. 02/17

Obsahuje: EN 302 480 V2.1.1:2016

124199

Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, 2017
Podľa zákona č. 264/1999 Z. z. v znení neskorších predpisov sa môžu slovenské technické normy rozmnožovať a rozširovať iba so súhlasom Úradu pre normalizáciu, metrológiu a skúšobníctvo SR.

ETSI EN 302 480 V2.1.1 (2016-07)



**Mobile Communication On Board Aircraft (MCOBA) systems;
Harmonised Standard covering the essential requirements
of article 3.2 of the Directive 2014/53/EU**

Reference

REN/MSG-TFES-11-30-RED

Keywords

3G, 3GPP, cellular, digital, E-UTRA, GSM, LTE, mobile, radio, regulation, UMTS, UTRA, WCDMA**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 noticeThe 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
<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

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 2016.
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	7
Foreword.....	7
Modal verbs terminology.....	7
Introduction	7
1 Scope	8
2 References	9
2.1 Normative references	9
2.2 Informative references.....	10
3 Definitions, symbols and abbreviations	10
3.1 Definitions.....	10
3.2 Symbols.....	11
3.3 Abbreviations	11
4 Technical requirements specifications	12
4.1 General	12
4.1.1 Environmental profile	12
4.1.2 MCOBA system states.....	12
4.2 Conformance requirements	13
4.2.1 Introduction.....	13
4.2.2 GSM-OBTS performance	15
4.2.2.1 GSM-OBTS maximum output power	15
4.2.2.1.1 Definition.....	15
4.2.2.1.2 Limits	15
4.2.2.1.3 Conformance	15
4.2.2.2 GSM-OBTS output RF spectrum.....	15
4.2.2.2.1 Spectrum due to modulation and wideband noise	15
4.2.2.2.2 Spectrum due to switching transients	16
4.2.2.3 GSM-OBTS radio frequency tolerance.....	16
4.2.2.3.1 Definition.....	16
4.2.2.3.2 Limits	16
4.2.2.3.3 Conformance	16
4.2.2.4 GSM-OBTS controlled MS RF power.....	16
4.2.2.4.1 Definition.....	16
4.2.2.4.2 Limits	16
4.2.2.4.3 Conformance	17
4.2.2.5 GSM-OBTS reference sensitivity level.....	17
4.2.2.5.1 Definition.....	17
4.2.2.5.2 Limits	17
4.2.2.5.3 Conformance	17
4.2.2.6 GSM-OBTS unwanted emissions in the spurious domain	17
4.2.2.6.1 Definition.....	17
4.2.2.6.2 Limits	17
4.2.2.6.3 Conformance	17
4.2.3 UTRA-OBTS performance.....	17
4.2.3.0 Conformance compliance.....	17
4.2.3.1 UTRA-OBTS Spectrum Mask	18
4.2.3.1.1 Definition.....	18
4.2.3.1.2 Limits	18
4.2.3.1.3 Conformance	18
4.2.3.2 UTRA-OBTS Adjacent Channel Leakage power Ratio (ACLR).....	18
4.2.3.2.1 Definition.....	18
4.2.3.2.2 Limits	18
4.2.3.2.3 Conformance	19
4.2.3.3 UTRA-OBTS Transmitter spurious emissions.....	19
4.2.3.3.1 Definition.....	19

4.2.3.3.2	Limits	19
4.2.3.3.3	Conformance	19
4.2.3.4	UTRA-OBTS maximum output power	19
4.2.3.4.1	Definition.....	19
4.2.3.4.2	Limits	20
4.2.3.4.3	Conformance	20
4.2.3.5	UTRA-OBTS Transmit intermodulation.....	20
4.2.3.5.1	Definition.....	20
4.2.3.5.2	Limits	20
4.2.3.5.3	Conformance	20
4.2.3.6	UTRA-OBTS Receiver spurious emissions	21
4.2.3.6.1	Definition.....	21
4.2.3.6.2	Limits	21
4.2.3.6.3	Conformance	21
4.2.3.7	UTRA-OBTS Blocking characteristics	21
4.2.3.7.1	Definition.....	21
4.2.3.7.2	Limits	21
4.2.3.7.3	Conformance	21
4.2.3.8	UTRA-OBTS Receiver intermodulation characteristics	22
4.2.3.8.1	Definition.....	22
4.2.3.8.2	Limits	22
4.2.3.8.3	Conformance	22
4.2.3.9	UTRA-OBTS Receiver adjacent channel selectivity	22
4.2.3.9.1	Definition.....	22
4.2.3.9.2	Limits	22
4.2.3.9.3	Conformance	23
4.2.3.10	UTRA-OBTS controlled UE RF power	23
4.2.3.10.1	Definition.....	23
4.2.3.10.2	Limits	23
4.2.3.10.3	Conformance	23
4.2.4	E-UTRA-OBTS performance	23
4.2.4.0	Conformance compliance.....	23
4.2.4.1	E-UTRA-OBTS operating band unwanted emissions	23
4.2.4.1.1	Definition.....	23
4.2.4.1.2	Limits	24
4.2.4.1.3	Conformance	24
4.2.4.2	E-UTRA-OBTS Adjacent Channel Leakage power Ratio (ACLR).....	24
4.2.4.2.1	Definition.....	24
4.2.4.2.2	Limits	24
4.2.4.2.3	Conformance	24
4.2.4.3	E-UTRA-OBTS transmitter spurious emissions	25
4.2.4.3.1	Definition.....	25
4.2.4.3.2	Limits	25
4.2.4.3.3	Conformance	25
4.2.4.4	E-UTRA-OBTS maximum output power	25
4.2.4.4.1	Definition.....	25
4.2.4.4.2	Limits	25
4.2.4.4.3	Conformance	25
4.2.4.5	E-UTRA-OBTS transmit intermodulation	26
4.2.4.5.1	Definition.....	26
4.2.4.5.2	Limits	26
4.2.4.5.3	Conformance	26
4.2.4.6	E-UTRA-OBTS receiver spurious emissions.....	26
4.2.4.6.1	Definition.....	26
4.2.4.6.2	Limits	26
4.2.4.6.3	Conformance	26
4.2.4.7	E-UTRA-OBTS Blocking characteristics	26
4.2.4.7.1	Definition.....	26
4.2.4.7.2	Limits	26
4.2.4.7.3	Conformance	27
4.2.4.8	E-UTRA-OBTS receiver intermodulation characteristics.....	27
4.2.4.8.1	Definition.....	27

4.2.4.8.2	Limits	27
4.2.4.8.3	Conformance	27
4.2.4.9	E-UTRA-OBTS Adjacent Channel Selectivity (ACS) and narrow-band blocking.....	27
4.2.4.9.1	Definition.....	27
4.2.4.9.2	Limits	27
4.2.4.9.3	Conformance	27
4.2.4.10	E-UTRA-OBTS controlled UE RF power	27
4.2.4.10.1	Definition.....	27
4.2.4.10.2	Limits	28
4.2.4.10.3	Conformance	28
4.2.5	NCU Transmitter Performance	28
4.2.5.1	NCU maximum mean power spectral density.....	28
4.2.5.1.1	Definition.....	28
4.2.5.1.2	Limits	28
4.2.5.1.3	Conformance	28
4.2.5.2	NCU power flatness	28
4.2.5.2.1	Definition.....	28
4.2.5.2.2	Limits	29
4.2.5.2.3	Conformance	29
4.2.5.3	NCU out-of-band emissions.....	29
4.2.5.3.1	Definition.....	29
4.2.5.3.2	Limits	29
4.2.5.3.3	Conformance	29
4.2.5.4	NCU spurious emissions	29
4.2.5.4.1	Definition.....	29
4.2.5.4.2	Limits	30
4.2.5.4.3	Conformance	30
4.2.6	MCOBA system performance.....	30
4.2.6.1	MCOBA Unwanted emissions in the out-of-band domain	30
4.2.6.1.1	Definition.....	30
4.2.6.1.2	Limits	30
4.2.6.2	MCOBA Unwanted emissions in the spurious domain.....	30
4.2.6.2.1	Definition.....	30
4.2.6.2.2	Limits	31
4.2.6.3	MCOBA Cessation of emission	31
4.2.6.3.1	Definition.....	31
4.2.6.3.2	Specification.....	31
5	Testing for compliance with technical requirements.....	31
5.1	Interpretation of results and measurement uncertainty.....	31
5.1.1	Environmental conditions for testing	31
5.1.2	Interpretation of the measurement results	31
5.1.3	Measurement options.....	33
5.2	Essential radio test suites.....	33
5.2.1	GSM-OBTS Performance.....	33
5.2.1.1	GSM-OBTS controlled MS RF power.....	33
5.2.1.1.1	Test purpose	33
5.2.1.1.2	Methods of measurement.....	33
5.2.2	UTRA-OBTS Transmitter Performance	34
5.2.2.1	UTRA-OBTS controlled UE RF power	34
5.2.2.1.1	Test purpose	34
5.2.2.1.2	Methods of measurement.....	35
5.2.3	E-UTRA-OBTS Transmitter Performance	35
5.2.3.1	E-UTRA-OBTS-controlled UE RF power	35
5.2.3.1.1	Test Purpose	35
5.2.3.1.2	Test Procedure.....	35
5.2.4	NCU Transmitter Performance	36
5.2.4.1	NCU maximum mean power spectral density.....	36
5.2.4.1.1	Test purpose	36
5.2.4.1.2	Methods of measurement.....	36
5.2.4.2	NCU power flatness	37
5.2.4.2.1	Test purpose	37

5.2.4.2.2	Methods of measurement.....	37
5.2.5	MCOBA Transmitter Performance.....	38
5.2.5.1	Unwanted emissions in the out-of-band domain	38
5.2.5.1.1	Test purpose	38
5.2.5.1.2	Methods of measurement.....	38
5.2.5.2	Unwanted emissions in the spurious domain	40
5.2.5.2.1	Test purpose	40
5.2.5.2.2	Methods of measurement.....	40
5.2.5.3	Cessation of emissions	41
5.2.5.3.1	Test purpose	41
5.2.5.3.2	Methods of measurement.....	41
Annex A (normative):	Relationship between the present document and the essential requirements of Directive 2014/53/EU	43
Annex B (normative):	Environmental conditions	45
B.1	General	45
B.2	Environmental conformance requirements.....	45
B.3	Environmental test conditions	45
Annex C (informative):	System Description	46
C.1	High level System Description.....	46
C.2	OBTS.....	47
C.3	RF Screening	47
C.4	Dedicated antenna system	47
C.5	Dedicated antenna installation.....	48
Annex D (informative):	Bibliography.....	49
History		50

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 (<https://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 Harmonised European Standard (EN) has been produced by ETSI Technical Committee Mobile Standards Group (MSG).

For non EU countries the present document may be used for regulatory (Type Approval) purposes.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.9] 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.

National transposition dates	
Date of adoption of this EN:	21 April 2016
Date of latest announcement of this EN (doa):	31 July 2016
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 January 2017
Date of withdrawal of any conflicting National Standard (dow):	31 January 2018

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.

Introduction

The present document is part of a set of standards developed by ETSI that are designed to fit in a modular structure to cover radio equipment within the scope of the Radio Equipment Directive 2014/53/EU [i.1]. The present document is produced following the guidance in ETSI EG 203 336 [i.2] as applicable.

1 Scope

The present document applies to the following equipment types:

- 1) An Onboard Base Transceiver System (OBTS) supporting GSM, UMTS or LTE communication protocols including specific functions for restricting the transmit power of the MSs or UEs, respectively associated with the OBTS.
- 2) Network Control Unit (NCU) preventing direct connection of the onboard mobile terminals with mobile networks on the ground by raising the noise floor in the cabin.

These Base stations are capable of operating in all or any part of the frequency bands given in table 1-1.

Table 1-1: Base station operating bands

Band designation	Direction of transmission	Base Station operating bands
UTRA I	BS Transmit	2 110 MHz to 2 170 MHz (UMTS)
	BS Receive	1 920 MHz to 1 980 MHz (UMTS)
E-UTRA 3	BS Transmit	1 805 MHz to 1 880 MHz (LTE)
	BS Receive	1 710 MHz to 1 785 MHz (LTE)
DCS 1800	BS Transmit	1 805 MHz to 1 880 MHz (GSM)
	BS Receive	1 710 MHz to 1 785 MHz (GSM)

These NCU is capable of operating in all of the frequency bands given in table 1-2.

Table 1-2: NCU operating bands

NCU operating bands	Comment
460 MHz to 470 MHz	
791 MHz to 821 MHz	LTE
921 MHz to 960 MHz	GSM
1 805 MHz to 1 880 MHz	GSM / LTE
2 110 MHz to 2 170 MHz	UMTS
2 570 MHz to 2 620 MHz	LTE
2 620 MHz to 2 690 MHz	LTE

It applies to equipment for continuous and discontinuous transmission of data and digital speech.

The present document applies only to radio equipment using a dedicated transmitting antenna that is designed as an indispensable part of the system for usage on board an aircraft.

The system covered by the present document operates in accordance with the operational requirements as outlined in the Commission Decision 2013/654/EU [i.3].

The present document contain requirements to demonstrate that Radio equipment both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

In addition to the present document, other ENs that specific technical requirements in respect of essential requirements under other parts of Article 3 of the Radio Equipment Directive may apply to equipment within the scope of the present document.

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

The present document does not cover equipment compliance with relevant civil aviation regulations. In this respect, a MCOBA system, for its installation and operation on board an aircraft is subject to additional national or international civil aviation airworthiness certification requirements, for example to EUROCAE ED-14E [i.6].

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 301 908-14 (V11.1.1) (05-2016): "IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 14: Evolved Universal Terrestrial Radio Access (E-UTRA) Base Stations (BS)".
- [2] ETSI TS 145 005 (V12.5.0) (04-2015): "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception (3GPP TS 45.005 version 12.5.0 Release 12)".
- [3] ETSI TS 145 010 (V12.0.0) (10-2014): "Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronization (3GPP TS 45.010 version 12.0.0 Release 12)".
- [4] ETSI TS 145 008 (V12.4.0) (01-2015): "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control (3GPP TS 45.008 version 12.4.0 Release 12)".
- [5] ETSI TS 136 141 (V12.9.0) (10-2015): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing (3GPP TS 36.141 version 12.9.0 Release 12)".
- [6] ETSI TS 151 021 (V12.3.0) (01-2015): "Digital cellular telecommunications system (Phase 2+); Base Station System (BSS) equipment specification; Radio aspects (3GPP TS 51.021 version 12.3.0 Release 12)".
- [7] ETSI EN 301 908-3 (V11.1.2) (07-2016): "IMT cellular networks; Harmonized Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 3: CDMA Direct Spread (UTRA FDD) Base Stations (BS)".
- [8] ETSI EN 301 908-18 (V11.1.1) (07-2016): "IMT cellular networks; Harmonized Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 18: E-UTRA, UTRA and GSM/EDGE Multi-Standard Radio (MSR) Base Station (BS)".
- [9] ETSI TS 125 141 (V12.7.0) (10-2015): "Universal Mobile Telecommunications System (UMTS); Base Station (BS) conformance testing (FDD) (3GPP TS 25.141 version 12.7.0 Release 12)".
- [10] ETSI TS 125 331 (V12.7.0) (10-2015): "Universal Mobile Telecommunications System (UMTS); Radio Resource Control (RRC); Protocol specification (3GPP TS 25.331 version 12.7.0 Release 12)".
- [11] ETSI TS 136 101 (V12.9.0) (10-2015): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception (3GPP TS 36.101 version 12.7.0 Release 12)".
- [12] ETSI TS 136 331 (V12.7.0) (10-2015): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification (3GPP TS 36.331 version 12.7.0 Release 12)".
- [13] ETSI TS 125 133 (V12.8.0) (07-2015): "Universal Mobile Telecommunications System (UMTS); Requirements for support of radio resource management (FDD) (3GPP TS 25.133 version 12.8.0 Release 12)".

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 (Radio Equipment Directive).
- [i.2] ETSI EG 203 336 (V1.1.1) (08-2015): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU".
- [i.3] Commission Decision 2013/654/EU amending Decision 2008/294/EC to include additional access technologies and frequency bands for mobile communications services on aircraft (MCA services), 12.11.2013.
- [i.4] CEPT/ERC/REC 74-01 (01-2011) (equivalent to Recommendation ITU-R SM.329-12): "Unwanted emissions in the spurious domain".
- [i.5] ETSI TR 100 028 (all parts) (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [i.6] EUROCAE ED-14 (Equivalent to RTCA DO-160G (12-2010)): "Environmental Conditions and Test Procedures for Airborne Equipment".
- [i.7] 3GPP2 C.S0011-C (V2.0): "Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Stations".
- [i.8] ETSI TS 125 104 (V12.6.0) (10-2015): "Universal Mobile Telecommunications System (UMTS); Base Station (BS) radio transmission and reception (FDD) (3GPP TS 25.104 version 12.6.0 Release 12)".
- [i.9] 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.
- [i.10] ETSI EN 301 908-1 (V11.1.1) (07-2016): "IMT cellular networks; Harmonized Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Introduction and common requirements".

koniec náhľadu – text ďalej pokračuje v platenej verzii STN