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Globalni sistem mobilnih komunikacij (GSM) - 4. del: Harmonizirani EN za ponavljalnike GSM (repetitorje), ki zajema bistvene zahteve člena 3.2 direktive R&TTE

Global System for Mobile communications (GSM) - Part 4: Harmonized EN for GSM Repeaters covering the essential requirements of article 3.2 of the R&TTE Directive

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Foreword

This Harmonized European Standard (EN) has been produced by ETSI Technical Committee Mobile Standards Group (MSG).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [i.1] as amended by Directive 98/48/EC [i.7].

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].

See article 5.1 of Directive 1999/5/EC [i.2] for information on presumption of conformity and Harmonised Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

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

The present document is part 4 of a multi-part deliverable covering the Global System for Mobile communications (GSM), as identified below:

I-ETS 300 609-1: "Radio aspects (GSM 11.21 version 4.14.1)",

ETS 300 609-2: "Signalling aspects (GSM 11.23 version 4.9.1)";

ETS 300 609-3: "Transcoder aspects (GSM 11.24 version 4.3.1)";

EN 300 609-4: "Harmonized EN for GSM Repeaters covering the essential requirements of article 3.2 of the R&TTE Directive".

National transposition dates

Date of adoption of this EN:	2 November 2012
Date of latest announcement of this EN (doa):	28 February 2013
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2013
Date of withdrawal of any conflicting National Standard (dow):	31 August 2014

Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the R&TTE Directive [i.2]. The modular structure is shown in EG 201 399 [i.3].

1 Scope

The present document applies to the following radio equipment types:

- 1) Repeaters for GSM.

These radio equipment types are capable of operating in all or any part of the frequency bands given in table 1-1.

Table 1-1: GSM Repeater frequency bands

	Direction of transmission	GSM Repeater relevant frequency bands
P-GSM900	Downlink	935 MHz to 960 MHz
	Uplink	890 MHz to 915 MHz
E-GSM900	Downlink	925 MHz to 960 MHz
	Uplink	880 MHz to 915 MHz
R-GSM900	Downlink	921 MHz to 960 MHz
	Uplink	876 MHz to 915 MHz
DCS1800	Downlink	1 805 MHz to 1 880 MHz
	Uplink	1 710 MHz to 1 785 MHz
GSM450	Downlink	460,4 MHz to 467,6 MHz
	Uplink	450,4 MHz to 457,6 MHz
GSM480	Downlink	488,8 MHz to 496 MHz
	Uplink	478,8 MHz to 486 MHz

NOTE 1: In some circumstances, for instance when an operator (or more than one operator who co-ordinate the use of repeaters), is not allocated a complete band as defined in table 1-1, it may be necessary to restrict the frequency range of operations of repeaters. In these circumstances, the test of "Gain outside pass band" in annex C may be used to verify the performance of the repeater.

NOTE 2: A repeater is designed to operate in one or several pass bands within the MS and BTS relevant transmit bands.

The present document covers requirements for GSM Repeaters for 3GPP Release 8, 9 and 10.

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 [i.2] may apply to equipment within the scope of the present document.

NOTE 3: A list of such ENs is included on the web site <http://www.newapproach.org>.

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 reference 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] Void.
- [2] ETSI TS 151 026 (V10.3.0) (03/2012): "Digital cellular telecommunications system (Phase 2+); Base Station System (BSS) equipment specification; Part 4: Repeaters (3GPP TS 51.026 version 10.3.0 Release 10)".
- [3] ETSI TS 151 021 (V10.5.0) (07/2012): "Digital cellular telecommunications system (Phase 2+); Base Station System (BSS) equipment specification; Radio aspects (3GPP TS 51.021 version 10.5.0 Release 10)".
- [4] ITU-R Recommendation SM.329-11 (01/2011): "Unwanted emissions in the spurious domain".
- [5] ETSI TS 151 010-1 (V9.9.0) (05/2012): "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP TS 51.010-1 version 9.9.0 Release 9)".
- [6] ETSI TS 145 004 (V10.0.0) (04/2011): "Digital cellular telecommunications system (Phase 2+); Modulation (3GPP TS 45.004 version 10.0.0 Release 10)".

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] 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] 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] ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of Harmonized Standards for application under the R&TTE Directive".
- [i.4] Void.
- [i.5] ETSI TR 100 028 (all parts) (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [i.6] ETSI TS 145 005 (V10.4.0): "Digital cellular telecommunications system (Phase 2+); Radio Transmission and reception (3GPP TS 45.005 version 10.4.0 Release 10)".
- [i.7] 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.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

broadband repeater: repeater which is designed for operation on any combination of ARFCNs (up to a specified maximum number) within the relevant band of the repeater

channelized repeater: repeater which is designed for operation on a specified subset of ARFCNs within the operating band of the repeater

NOTE: The subset of ARFCNs may be determined during the manufacture of the repeater, or may be programmable.

pass band: frequency range that the Repeater operates in with operational configuration

NOTE 1: This frequency range can correspond to one or several consecutive nominal channels. If they are not consecutive each subset of channels have to be considered as an individual pass band.

NOTE 2: The Repeater can have one or several pass bands.

relevant band: frequency band of GSM Repeater declared by the manufacturer according to the designations in table 1-1

repeater: bi-directional Radio Frequency (RF) amplifier which can amplify and transmit a received Mobile Station (MS) signal in the GSM MS transmit band, simultaneously it can amplify and transmit a radiated or conducted received Base Transceiver Station (BTS) RF signal in the GSM BTS transmit band

repeater system using frequency shift: repeater system consisting of two different elements, a master unit close to the BTS and at least one remote unit close to the area to be covered

NOTE: The master unit amplifies the channels from the BTS and shifts them to different GSM channels. In the remote unit the shifted channels from the master unit will be transferred back to the original channels and amplified. This is valid for the downlink signals as well as for the uplink signals.

Subchannel Power Imbalance Ratio on Downlink (SCPIR_DL): As defined in TS 145 004 [6], clause 6.

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3.2 Abbreviations (standards.iteh.ai)

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

AQPSK	Adaptive Quadrature Phase Shift Keying
ARFCN	Absolute Radio Frequency Channel Number
BSS	Base Station System
BTS	Base Transceiver Station
CW	Continuous Wave
DUT	Device Under Test
EVM	Error Vector Magnitude
GMSK	Gaussian Minimum Shift Keying
MS	Mobile Station
PSK	Phase Shift Keying
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RF	Radio Frequency
RMS	Root Mean Square
RSS	Root Sum of the Squares
SCPIR_DL	Subchannel Power Imbalance Ratio on Downlink

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.

For guidance on how a supplier can declare the environmental profile, see annex B.

4.2 Conformance requirements

4.2.1 Conducted spurious emissions

4.2.1.1 Definition

This test measures the conducted spurious emissions at the antenna ports.

4.2.1.2 Limit

This requirement applies to all antenna ports of the repeater, at maximum gain, and with the following input signals:

- without any RF input signal;
- with a continuous sinusoidal RF signal at a level which will result, when measured, in the maximum rated RF output power per channel, as declared by the manufacturer RF input signal.

The measured power shall not exceed:

- -36 dBm (250 nW) in the frequency band 9 kHz to 1 GHz;
- -30 dBm (1 μ W) in the frequency band 1 GHz to 12,75 GHz.

Table 4.2.1.2-1: Measurement bandwidth for spurious emissions

Band	Frequency offset (offset from carrier)	Measurement bandwidth
In the relevant BTS transmit Band or MS transmit band	≥ 100 kHz	3 kHz
100 kHz to 50 MHz	-	10 kHz
50 MHz to 500 MHz outside the relevant transmit band	(offset from edge of the relevant transmit band) > 0 MHz ≥ 2 MHz ≥ 5 MHz	10 kHz 30 kHz 100 kHz
Above 500 MHz outside the relevant transmit band	(offset from edge of the relevant transmit band) > 0 MHz ≥ 2 MHz ≥ 5 MHz ≥ 10 MHz ≥ 20 MHz ≥ 30 MHz	10 kHz 30 kHz 100 kHz 300 kHz 1 MHz 3 MHz

4.2.1.3 Conformance

Conformance tests described in clause 5.3.1 shall be carried out.

4.2.2 Radiated spurious emissions

4.2.2.1 Definition

This test measures the effective power of spurious emissions radiated by the cabinet and structure.