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Digital cellular telecommunications system (Phase 2+) (GSM);
GSM/EDGE Radio transmission and reception
(3GPP TS 45.005 version 15.1.0 Release 15)

3GPP™ A GLOBAL INITIATIVE
GSM® GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS

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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
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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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1 Scope

The present document defines the requirements for the transceiver of the pan-European digital cellular telecommunications systems GSM.

Requirements are defined for two categories of parameters:

- those that are required to provide compatibility between the radio channels, connected either to separate or common antennas, that are used in the system. This category also includes parameters providing compatibility with existing systems in the same or adjacent frequency bands;

- those that define the transmission quality of the system.

The present document defines RF characteristics for the Mobile Station (MS) and Base Station System (BSS). The BSS will contain Base Transceiver Stations (BTS), which can be normal BTS,micro-BTS or pico-BTS. The precise measurement methods are specified in 3GPP TS 51.010 and 3GPP TS 51.021.

Unless otherwise stated, the requirements defined in this EN apply to the full range of environmental conditions specified for the equipment (see annex D).

In the present document some relaxations are introduced for GSM 400 MSs, GSM 900 MSs, GSM 700 MSs and GSM 850 MSs which pertain to power class 4, 5 or 6 (see subclause 4.1.1). In the present document these Mobile Stations are referred to as "small MS".

In the present document some relaxations to receiver requirements are introduced for a MS indicating support for Downlink Multi Carrier (DLMC), see 3GPP TS 24.008, when in DLMC configuration. DLMC configurations are specified for only GSM 850, GSM 900, DCS 1800 and PCS 1900.

MSs may operate on more than one of the frequency bands specified in clause 2. These MSs are referred to as "Multi band MSs" in this EN. Multi band MSs shall meet all requirements for each of the bands supported. The relaxation on GSM 400 MSs, GSM 900 MSs, GSM 700 MSs and GSM 850 MSs for a "small MS" are also valid for a multi band MS if it complies with the definition of a small MS.

The RF characteristics of repeaters are defined in annex E of this EN. Annexes D and E are the only clauses of this EN applicable to repeaters. Annex E does not apply to the MS or BSS. The precise measurement methods for repeaters are specified in 3GPP TS 51.026 [35].

The present document also includes specification information for mixed mode operation at 850 MHz and 1900 MHz (MXM 850 and MXM 1900). 850 MHz and 1900 MHz mixed-mode is defined as a network that deploys both 30 kHz RF carriers and 200 kHz RF carriers in geographic regions where the Federal Communications Commission (FCC) regulations are applied or adopted.

The requirements for a MS in a mixed-mode system, MXM 850 and MXM 1900, correspond to the requirements for GSM 850 MS and PCS 1900 MS respectively.

Annex M defines the minimum performance requirements for A-GPS for MSs that support A-GPS. Annex M does not apply to the BSS.

The present document also includes specific requirements for multicarrier BTS, wherever explicitly stated in the text, that apply for all classes of multicarrier BTS (Wide Area, Medium Range and Local Area) if nothing else is stated. All other requirements designated for BTS and normal BTS apply if not otherwise stated. The multicarrier BTS classes have relaxed requirements in the areas of Tx spurious emissions, intermodulation attenuation and, when multicarrier receiver is included, Rx blocking. Usage of multicarrier BTSs in some geographical regions might be subject to regulatory restrictions to protect other radio systems operating in bands of adjacent frequency assignments, in particular for all safety related applications like railway applications. In areas where such systems coexist with multicarrier BTSs, the received interference power originating from multicarrier BTSs might have to be limited.

The document also includes entry points in some tables for the multicarrier BTS requirements to which TS 37.104 [33] for Multi-Standard Radio Base Stations (MSR BS) is referring to as specific GSM/EDGE single-RAT requirements not covered by the general requirements. These entry points are marked with $^{M)}$ and, as described in a note in each applicable table, identify the relevant column(s) that are applicable as MSR BS requirements. In general the requirements for multicarrier BTS equipped with multicarrier receiver also apply to Multi-Standard Radio Base Stations. The GSM requirements for Multi-Standard Radio Base Stations are defined for GSM 850, GSM 900, DCS 1800 and PCS 1900 only. Requirements for other frequency bands and MXM base stations are excluded. Annex P defines the minimum performance

for the receiver in MSR BS.
For equipment not declared as MSR BS the $^{M)}$ indications can be ignored.

The present document defines requirements for the usage of the ER-GSM band. The national implementation might be subject to regulatory coordination agreements to avoid system impacts (RF scenarios for ER-GSM introduction are given in 3GPP TR 45.050).

The present document defines requirements for supporting a low-complexity, low data throughput service in environments experiencing high propagation attenuation as indoors in basements etc. This service, based on EGPRS, with extended coverage is called EC-GSM-IoT. For EC-GSM-IoT, in case no specific requirement is explicitly stated, the requirements for EGPRS apply.

1.1 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[1A] 3GPP TS 25.144: "User Equipment (UE) and Mobile Station (MS) Over the Air Performance Requirements".

[1B] 3GPP TS 34.114: "User Equipment (UE) / Mobile Station (MS) Over The Air (OTA) antenna performance; Conformance testing".

[2] 3GPP TR 43.030: "Radio network planning aspects".

[3] 3GPP TS 43.052: "GSM Cordless Telephony System (CTS); Lower layers of the CTS radio interface; Stage 2".

[4] 3GPP TS 43.059: "Functional Stage 2 description of Location Services in GERAN".

[5] 3GPP TS 43.064: "General Packet Radio Service (GPRS); GPRS Radio Interface Stage 2".

[6] 3GPP TS 44.014: "Individual equipment type requirements and interworking; Special conformance testing functions".

[7] 3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

[7A] 3GPP TS 44.031: "Mobile Station (MS) - Serving Mobile Location Centre (SMLC) Radio Resource LCS Protocol (RRLP)".

[8] 3GPP TS 44.071: "Mobile radio interface layer 3 Location Services (LCS) specification".

[9] 3GPP TS 45.001: "Physical layer on the radio path General description".

[10] 3GPP TS 45.002: "Multiplexing and multiple access on the radio path".

[11] 3GPP TS 45.003: "Channel coding".

[12] 3GPP TS 45.004: "Modulation".

[13] 3GPP TS 45.008: "Radio subsystem link control".

[14] 3GPP TS 45.010: "Radio subsystem synchronization".

[15] 3GPP TS 45.050: "Background for Radio Frequency (RF) requirements".