

# ETSI EN 301 502 V7.0.1 (2000-08)

---

*Candidate Harmonized European Standard (Telecommunications series)*

**Harmonized EN for Global System  
for Mobile communications (GSM);  
Base Station and Repeater equipment covering essential  
requirements under article 3.2 of the R&TTE directive  
(GSM 13.21 version 7.0.1 Release 1998)**

---



---

Reference

DEN/SMG-021321Q7

---

Keywords

Digital cellular telecommunications system,  
Global System for Mobile communications (GSM)

***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 notice***

Individual copies of the present document can be downloaded from:  
<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF).  
In case of dispute, the reference shall be the printing on ETSI printers of the 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 <http://www.etsi.org/tb/status/>

If you find errors in the present document, send your comment to:  
[editor@etsi.fr](mailto:editor@etsi.fr)

---

***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 2000.  
All rights reserved.

# Contents

|   |    |
|---|----|
| Intellectual Property Rights .....  | 4  |
| Foreword .....  | 4  |
| Introduction .....  | 5  |
| 1 Scope .....   | 7  |
| 2 References .....  | 7  |
| 3 Definitions, symbols and abbreviations .....                                    | 8  |
| 3.1 Definitions .....   | 8  |
| 3.2 Symbols .....   | 8  |
| 3.3 Abbreviations .....   | 8  |
| 4 Technical requirements specifications .....                                     | 8  |
| 4.1 Environmental profile .....   | 8  |
| 4.2 Conformance requirements and essential tests for base station equipment ..... | 8  |
| 4.2.1 Phase error and mean frequency error .....                                  | 8  |
| 4.2.2 Mean transmitted RF carrier power .....                                     | 8  |
| 4.2.3 Transmitted RF carrier power versus time .....                              | 8  |
| 4.2.4 Adjacent channel power .....  | 8  |
| 4.2.5 Spurious emissions from the transmitter antenna connector .....             | 9  |
| 4.2.6 Intermodulation attenuation .....   | 9  |
| 4.2.7 Intra Base Station System intermodulation attenuation .....                 | 9  |
| 4.2.8 Static Reference Sensitivity Level .....                                    | 9  |
| 4.2.9 Multipath Reference Sensitivity Level .....                                 | 9  |
| 4.2.10 Reference Interference Level .....   | 9  |
| 4.2.11 Blocking Characteristics .....   | 9  |
| 4.2.12 Intermodulation characteristics .....                                      | 9  |
| 4.2.13 AM suppression .....   | 9  |
| 4.2.14 Spurious emissions from the receiver antenna connector .....               | 9  |
| 4.2.15 Radiated spurious emissions .....  | 9  |
| 4.3 Conformance requirements and essential tests for repeater equipment .....     | 9  |
| 4.3.1 Spurious emissions .....  | 9  |
| 4.3.2 Intermodulation attenuation .....   | 10 |
| 4.3.3 Out of band gain .....  | 10 |
| 4.3.4 Frequency error .....   | 10 |
| 4.3.5 Phase error .....   | 10 |
| History .....   | 11 |

---

## 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 (<http://www.etsi.org/ipr>).

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 Candidate Harmonized European Standard (Telecommunications series) has been produced by the Special Mobile Group (SMG).

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

The present document covers the general access requirements for base station and repeater equipment for Phase 2 and Phase 2+ Releases 1996, 1997 and 1998.

The present document is based on EN 301 087 (GSM 11.21) [2] and ETS 300 609-4 (GSM 11.26) [3].

The contents of the present document may be subject to continuing work within SMG and may change following formal SMG approval. Should SMG modify the contents of the present document it will then be re-submitted for formal approval procedures by ETSI with an identifying change of release date and an increase in version number as follows:

Version 7.x.y

where:

7 GSM Phase 2+ Release 1998.

x the second digit is incremented for changes of substance, i.e. technical enhancements, corrections, updates, etc..

y the third digit is incremented when editorial only changes have been incorporated in the specification.

| National transposition dates   |                 |
|--|-----------------|
| Date of adoption of this EN:   | 21 July 2000    |
| Date of latest announcement of this EN (doa):  | 31 October 2000 |
| Date of latest publication of new National Standard or endorsement of this EN (dop/e): | 30 April 2001   |
| Date of withdrawal of any conflicting National Standard (dow):                         | 30 April 2001   |

## Introduction

The present document is part of a set of standards designed to fit in a modular structure to cover all radio and telecommunications terminal equipment under the R&TTE Directive [1]. Each standard is a module in the structure. The modular structure is shown in figure 1.

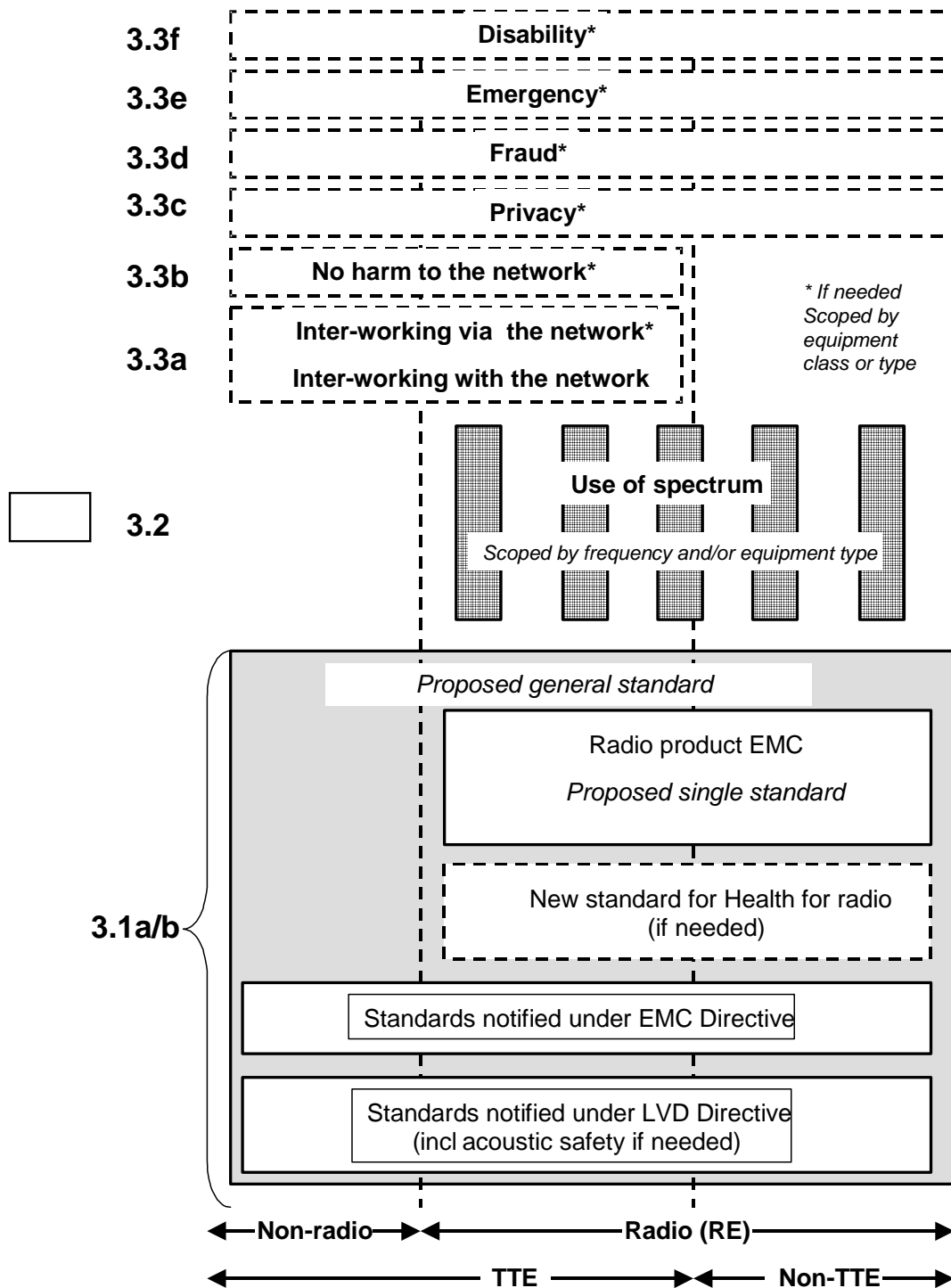


Figure 1: Modular structure for the various standards used under the R&TTE Directive

The left hand edge of the figure shows the different subclauses of Article 3 of the Directive. The essential requirements under Article 3.1a (safety etc.) and 3.1b (EMC) are addressed by a proposed single General Standard that applies to all equipment. The proposed General Standard makes general cross references to those standards already notified under the LVD and EMC Directives that are appropriate for radio equipment and telecommunications terminal equipment and so provides a link to the arrangements under those directives thus avoiding duplication of notifications with potential problems of notifications not being synchronized.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum. The scopes of these standards are specified either by frequency (normally in the case where frequency bands are harmonized) or by radio equipment type.

For article 3.3 various horizontal boxes are shown. Their dotted lines indicate that essential requirements in these areas have to be adopted by the Commission. If such essential requirements are adopted, and as far and as long as they are applicable, they will justify individual standards whose scope is likely to be specified by function or interface type.

The bottom of the figure shows the relationship of the standards to radio equipment and telecommunications terminal equipment. A particular equipment may be radio equipment, telecommunications terminal equipment or both. The General Standard will always apply to it, and a radio spectrum standard will apply if it is radio equipment. An article 3.3 standard will apply as well only if the relevant essential requirement is adopted by the Commission and if the equipment in question lies within the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the Directive may be covered in just the General Standard or in a set of standards that includes the General Standard.

The modularity principle has been taken because:

- it minimizes the number of standards needed. Because equipment may, in fact, have multiple interfaces and functions it is not practicable to produce a single standard for each possible combination of functions that may occur in an equipment;
- it provides scope for standards under articles 3.2 and 3.3 to be added when new frequency bands are agreed or when the Commission takes decisions under article 3 without requiring alteration of standards that are already published;
- it clarifies, simplifies and promotes the usage of Harmonized Standards as the relevant means of conformity assessment.

---

# 1 Scope

The present document specifies minimum technical performance requirements for the following radio equipment type:

- 1 GSM Base Station System.
- 2 GSM Repeater equipment

This radio equipment type is for operation within the Digital cellular telecommunications system in the GSM 900 and/or DCS 1800 frequency bands as shown in table 1.

**Table 1: Frequency bands for GSM900 and DCS1800 Base Station System**

|                 | <b>TX:</b>      | <b>RX:</b>      |
|-----------------|-----------------|-----------------|
| <b>P-GSM900</b> | 935 - 960 MHz   | 890 - 915 MHz   |
| <b>E-GSM900</b> | 925 - 960 MHz   | 880 - 915 MHz   |
| <b>R-GSM900</b> | 921 - 960 MHz   | 876 - 915 MHz   |
| <b>DCS1800</b>  | 1805 - 1880 MHz | 1710 - 1785 MHz |

with a channel separation of 200 kHz, utilising constant envelope modulation and carrying traffic channels according to the Time Division Multiple Access (TDMA) principle.

The present document is intended to cover the provisions of:

- 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",

of Directive 1999/5/EC (R&TTE Directive) [1].

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

---

# 2 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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- For this Release 1998 document, references to GSM documents are for Release 1998 versions (version 7.x.y).

- [1] 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).
- [2] EN 301 087 (1999-11): "Digital cellular telecommunications system (Phase 2 & Phase 2+); Base Station System (BSS) equipment specification; Radio aspects (GSM 11.21 version 7.2.0)".
- [3] ETS 300 609-4 (Edition 4): "Digital cellular telecommunications system (Phase 2 and Phase 2+); Base Station System (BSS) equipment specification; Part 4: Repeaters (GSM 11.26 version 5.2.1)".

---

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions in the R&TTE Directive [1], and the following term and definition applies:

**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.

### 3.2 Symbols

There are no special symbols used in the present document.

### 3.3 Abbreviations

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

|       |   |
|-------|---|
| R&TTE | Radio and Telecommunications Terminal Equipment |
| RE    | Radio Equipment                                 |

---

## 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 required operational environmental profile.

### 4.2 Conformance requirements and essential tests for base station equipment

#### 4.2.1 Phase error and mean frequency error

The requirements and tests in EN 301 087 [2], subclause 6.2, except subclause 6.2.4.

#### 4.2.2 Mean transmitted RF carrier power

The requirements and tests in EN 301 087 [2], subclause 6.3, except subclause 6.3.4.

#### 4.2.3 Transmitted RF carrier power versus time

The requirements and tests in EN 301 087 [2], subclause 6.4, except subclause 6.4.4.

#### 4.2.4 Adjacent channel power

The requirements and tests in EN 301 087 [2], subclause 6.5, except subclause 6.5.1.4 and 6.5.2.4.



#### 4.2.5 Spurious emissions from the transmitter antenna connector

The requirements and tests in EN 301 087 [2], subclause 6.6, except subclause 6.6.1.4, 6.6.2.1.4 and 6.6.2.2.4.

#### 4.2.6 Intermodulation attenuation

The requirements and tests in EN 301 087 [2], subclause 6.7, except subclause 6.7.4.

#### 4.2.7 Intra Base Station System intermodulation attenuation

The requirements and tests in EN 301 087 [2], subclause 6.8, except subclause 6.8.4.

#### 4.2.8 Static Reference Sensitivity Level

The requirements and tests in EN 301 087 [2], subclause 7.3, except subclause 7.3.4.

#### 4.2.9 Multipath Reference Sensitivity Level

The requirements and tests in EN 301 087 [2], subclause 7.4, except subclause 7.4.4.

#### 4.2.10 Reference Interference Level

The requirements and tests in EN 301 087 [2], subclause 7.5, except subclause 7.5.4.

#### 4.2.11 Blocking Characteristics

The requirements and tests in EN 301 087 [2], subclause 7.6, except subclause 7.6.4.

#### 4.2.12 Intermodulation characteristics

The requirements and tests in EN 301 087 [2], subclause 7.7, except subclause 7.7.4

#### 4.2.13 AM suppression

The requirements and tests in EN 301 087 [2], subclause 7.8, except subclause 7.8.4.

#### 4.2.14 Spurious emissions from the receiver antenna connector

The requirements and tests in EN 301 087 [2], subclause 7.9, except subclause 7.9.4.

#### 4.2.15 Radiated spurious emissions

The requirements and tests in EN 301 087 [2], clause 8, except subclause 8.4.

### 4.3 Conformance requirements and essential tests for repeater equipment

#### 4.3.1 Spurious emissions

The requirements and tests in ETS 300 609-4 [3], clause 5.

### 4.3.2 Intermodulation attenuation

The requirements and tests in ETS 300 609-4 [3], clause 6.

### 4.3.3 Out of band gain

The requirements and tests in ETS 300 609-4 [3], clause 7.

### 4.3.4 Frequency error

The requirements and tests in ETS 300 609-4 [3], clause 8.

### 4.3.5 Phase error

The requirements and tests in ETS 300 609-4 [3], clause 9.

---

## History

| Document history |             |  |
|------------------|-------------|--|
| V7.0.0           | March 2000  | One-step Approval Procedure OAP 20000721: 2000-03-22 to 2000-07-21 |
| V7.0.1           | August 2000 | Publication  |
|                  |             |  |
|                  |             |  |
|                  |             |  |