Understanding the R&TTE directive (1999/5/CE)

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Contents

Overview

This document explains the establishment of R&TTE directive and what regulations a GSM manufacturer must follow to be in accordance with the Radio and Telecommunications Terminal Equipment directive.

This document is for information purposes only.

1 General Information

1.1 Reference Documents

1.2 Glossary

apparatus refers to any equipment that is either radio equipment or telecommunications terminal equipment or both

telecommunications terminal equipment refers to a product enabling communication or a relevant component thereof which is intended to be connected directly or indirectly by any means whatsoever to interfaces of public telecommunications networks (thus, telecommunications networks used wholly or partly for the provision of publicly available telecommunications services)

radio equipment refers to a product, or relevant component thereof, capable of communication by means of the emission and/or reception of radio waves utilising the spectrum allocated to terrestrial/space radio communication

radio waves refer to electromagnetic waves of frequencies from 9 kHz to 3 000 GHz, propagated in space without artificial guide

interface refers to:

- a network termination point, which is a physical connection point at which a user is provided with access to public telecommunications network, and/or
- an air interface specifying the radio path between radio equipment and their technical specifications;

technical construction file refers to a file describing the apparatus and providing information and explanations as to how the applicable essential requirements have been implemented

harmonised standard refers to a technical specification adopted by a recognised standards body under a mandate from the Commission in conformity with the procedures laid down in Directive 98/34/EC for the purpose of establishing a European requirement, compliance with which is not compulsory

harmful interference refers to interference which endangers the functioning of a radio navigation service or of other safety services or which otherwise seriously degrades, obstructs or repeatedly interrupts a radio communications service operating in accordance with the applicable Community or national regulations

1.3 Abbreviations

Abbreviation	Description
DoC	Declaration of Conformity
EC	European Community
EMC	Electromagnetic compatibility
ES	Electrical Safety
FCC	Federal Communication Commission
IMEI	International Mobile Equipment Identity
ME	Mobile Equipment (= radio equipment)
MII	Ministry of Information Industry
NB	Notified Body
RF	Radio Frequency
R&TTE	Radio and Telecommunications Terminal Equipment
R&TTED	Radio and Telecommunications Terminal Equipment Directive
SAR	Specific Absorption Rate
TCF	Technical Construction File

2 Goal of the R&TTE

The R&TTE directive was created by the European Community to establish a regulatory framework for the placing on the market, free movement and putting into service in the Community of **Radio Equipment and Telecommunications Terminal Equipment (R&TTE).** All national approval regulations and the former directive (98/13/EC) are obsolete.

This directive reduces the control before selling the product as before with the old TTE directive and requires fewer mandatory tests before the sale of a product.

Nevertheless, the use and the installation of radio equipment must still be in accordance with the radio electric rules of each European country.

A product sold in the European Community (EC) must be in accordance with three requirements:

- The protection of the health and the safety of the user (paragraph 3.1.a of the directive 1999/5/CE).
- The protection requirements with respect to electromagnetic compatibility (paragraph 3.1.b of the directive 1999/5/CE).
- The efficient use of the spectrum allocated to terrestrial/space radio communication and orbital resources so as to avoid harmful interference (paragraph 3.2 of the directive 1999/5/CE).

The main points of the directive are that it:

- is specific to radio and telecommunications equipment sold in the European Community
- generates a reduction of the control on products
- has been mandatory since the 8th of April, 2001
- provides harmonization of the procedures in Europe
- eliminates all national approval systems

3 Questions to ask

Before selling a product in Europe, ask and determine the answers to these questions:

- Which directives are applicable to my product?
  - ⇨ R&TTE (reference: http://europa.eu.int/comm/enterprise/rtte/dir99-5.htm)
  - ⇨ Environment
  - ⇨ Automotive
- What are the applicable harmonized standards?
  - ⇨ You must look into the Official journal of the Directive of the European Community (ref: 2001/C 208/04) on the website of the European Community: http://europa.eu.int/comm/enterprise/rtte/harstand.htm). The harmonized standards are the **standards published in the Official Journal** and they explain the process used to develop and to test a product.
- Are the frequencies of my product harmonized?
  - ⇨ **In GSM, yes, they are.** This means that specifications exist to define the use of this mode of communication by using the 900 and 1800MHz frequencies.
- Is the radio interface harmonized?
  - ⇨ **In Europe, for the GSM, yes, it is**. This means that the GSM/DCS frequency bands allocated to each customer by an EC member are identical in the entire European Community.
- Has the user manual been prepared?
  - ⇨ see the description of the applicable annex : Intended use, intended countries and Declaration of Conformity
- Which labels should be used on the product? CE or CE + N°NB
  - ⇨ Depends on the choice of the applicable annex.

- Are the tests defined in the harmonized standards have been performed on the product?
  - ⇨ see the applicable standards

Then the notification process can start with two cases:

- If harmonization of the standards does not exist, the manufacturer must use a notified body
- If harmonization of the standards exists, the manufacturer can do the notification by using a notified body or directly by sending a letter to each government of each country where the product will be sold
  - ⇨ **For GSM products, no notification process is requested**. Collect each document defined in the Annex III into a specific file.

These questions summarize the conformity assessment process before selling a product in Europe. The next paragraph will describe the process for a **GSM application**.

4 Conformity assessment procedure for a GSM product

4.1 Choice of the annex

The CE label changes depending on the evaluation procedure chosen by the manufacturer.

There are four evaluation procedures, described in article 10 of the directive (reference : http://europa.eu.int/comm/enterprise/rtte/dir99-5.htm).

You will find hereafter the description of the evaluation procedures related to GSM products only.

Text of the Directive:

- Article 10 (4): Where a manufacturer has applied the harmonized standards referred to in Article 5 (1), radio equipment not within the scope of paragraph 3 shall be subject to the procedures described in any one of Annexes III, IV or V at the choice of the manufacturer.
- Article 5 (1): Where apparatus meets the relevant harmonized standards or parts thereof whose reference numbers have been published in the *Official Journal of the European Communities*, Member States shall presume compliance with those of the essential requirements referred to in Article 3 as are covered by the said harmonized standards or parts thereof.

Explanation of Article 10 (4) and Article 5 (1): If a manufacturer has applied the harmonized standards published in the Official Journal of the EC, its radio

equipment, if it is using the spectrum allocated to terrestrial/space radio communications, shall be subject to the procedures described in any one of Annexes III, IV, or V, at the choice of the manufacturer.

In the case of GSM equipment, the standards used to check that a product is in accordance with the essential requirements defined in the directive, are **harmonized**.

Then, the applicable annex for the certification process will be the Annex III, the Annex IV or the Annex V of the R&TTE Directive (reference Annex A of this document).

For GSM products only, we recommended to use Annex III of the Directive since it is easy and fast to implement.

4.2 Tests part

Refer to Appendix B to determine which standards apply to the GSM ME.

To allow the sale of equipment in the EC, perform radio, EMC, safety and SAR tests the ME. To ensure confidence in the validity of the tests, it is recommended to perform all tests in an accredited laboratory.

4.3 Administrative part

4.3.1 Technical Construction File (TCF)

To sell a GSM product in the EC, a manufacturer must produce a file called the **TCF (Technical Construction File).** It contains the following documents concerning the ME:

- Electrical schematics
- PCB layout
- BOM
- Mechanical schematics
- Specifications
- User manual
- Tests reports performed according to the harmonized standards
- Declaration of conformity ; see Appendix C for details.

(Please see R&TTED Annex III included in Appendix A of this document for more information).

The manufacturer or his authorized representative established within the Community or the person responsible for placing the apparatus on the market must keep the TCF for a period ending at least 10 years after the last apparatus

has been manufactured at the disposal of the relevant national authorities of any Member States for inspection.

The European governments are permitted access to the TCF in case of inspection after a complaint.

4.3.2 Notification

The manufacturer does not have to use a notified body to perform the notification procedure of a product.

Notification procedure consists for a manufacturer to notify a Member State that an apparatus will be sold in the Member State, only if the frequency bands are not harmonized. This is not the case for GSM or DCS apparatus. Therefore, a manufacturer is not obliged to notify a Member State that the GSM terminal equipment will be placed on the Member State's national market.

4.3.3 IMEI number

A manufacturer can use either of the following methods to obtain an IMEI number:

- a notified body (payment required)
- the BABT (no payment required)

4.3.4 Certification

With the R&TTE directive no certificate is issued. The "certificate" is now the **DoC** and the CE label on the apparatus.

This DoC must be accessible to everyone. Also, add the DoC in one of the following:

- user manual
- website of the manufacturer

Warning: Keep ten original copies of the DoC in the TCF, in case of demand from an operator, a customer or the EC relevant authorities.

Note: In the case of using Annex IV for the certification process, the certificate issued by the notified body will say that the TCF is complete and it will list the pieces of the TCF presented. **This certificate from the notified body is not the R&TTE Certificate.** It is only an expert opinion on the documents of the TCF.

With the R&TTE directive, the manufacturer is responsible for the product and thus ensuring that it conforms to the directive prior to entering the EC market.

4.3.5 CE label

Which CE label is applicable?

1. For telecommunication terminal equipment not containing any radio transmitter and for radio receivers, refer to the following table:

Conformity assessment	Label
Annex II (Internal control of the manufacturer)	CE
Annex IV (TCF) or Annex V (Full assurance quality)	CE N° ON

2. For radio transmitters (i.e. GSM products), refer to the following table:

Conformity assessment	Use of the frequency band	
	Is harmonised	*Is not harmonised*
Annex III: 2 cases	Label	Label
*i.Radio tests described (or defined) in the harmonised standards (for **products with a Wavecom module**)*	CE	CE ①
ii. Radio tests not described (or non defined) in the harmonised standards	CE N° ON	CE N° ON ①
Annex IV (TCF) or Annex V (Full assurance quality)	CE N° ON	CE N° ON ①

ON = Organisme notifié = Notified body = NB.

5 The future

The harmonized standards applicable to apparatus change continuously. These changes are updated when the Official Journal concerning the Directive is published.

Many websites discuss the R&TTE directive. These are the most important websites:

- http://europa.eu.int/comm/enterprise/rtte/
- http://www.rtte.net

Appendix A: Description of the annexes of the R&TTE Directive

Annexe II (Basis)

This annex is used for:

- radio equipment using unharmonized frequencies to communicate
- for telecommunication terminal equipments which do not contain a radio transmitter
- radio receivers

Process:

1. The manufacturer must establish the technical documentation described at point 2 and he or his authorised representative established within the Community must keep it for a period ending at least 10 years after the last product has been manufactured at the disposal of the relevant national authorities of any Member State for inspection purposes.
2. The technical documentation includes:
    - general description of the product,
    - conceptual design and manufacturing drawings and schemes of components, sub-assemblies, circuits, etc....
    - descriptions and explanations necessary for the understanding of said drawings and schemes and the operation of the product,
    - explanations to know how the product operates,
    - list of the standards referred to in Article 5, applied in full or in part, and descriptions and explanations of the solutions adopted to meet the essential requirements of the Directive where such standards referred to in Article 5 have not been applied or do not exist,
    - results of design calculations made, examinations carried out, etc.,
    - test reports
3. The tests could be performed in an accredited laboratory or by the manufacturer. The tests could be chosen by the accredited laboratory or by the manufacturer depending on the frequency used and based on the experience of each parts.
4. The manufacturer or his authorized representative must keep a copy of the declaration of conformity (DoC) with the technical documentation.

5. The manufacturer must take all measures necessary in order that the manufacturing process ensures compliance of the manufactured products with the technical documentation referred to in point 2 and with the requirements of this Directive that apply to them.
6. The manufacturer must then affix on his product the label **CE** alone.

Annex III (Mandatory for GSM products)

This annex is applicable when the:

- ME is a radio transmitter
- frequencies used by a product are harmonized
- applicable standards are harmonized

To summarize, this certification procedure is based on an internal control of the manufacturing of the product and on the achievement of specific radio tests on the product.

Process:

1. The manufacturer must establish the technical documentation described at point 2 and he or his authorized representative established within the Community must keep it for a period ending at least 10 years after the last product has been manufactured at the disposal of the relevant national authorities of any Member State for inspection purposes.
2. Technical documentation:
    - General description of the product
    - User manual of the ME
    - Conceptual design and manufacturing drawings and schemes of components, sub-assemblies, circuits, etc.... (Electrical schematics, Mechanicals schematics, PCB layout and BOM of the ME)
    - Descriptions and explanations necessary for the understanding of drawings and schemes and the operation of the product
    - Specifications of the ME
    - Explanations of how the product operates
    - List of the standards referred to in Article 5, applied in full or in part, and descriptions and explanations of the solutions adopted to meet the essential requirements of the Directive where such standards referred to in Article 5 have not been applied or do not exist
    - Results of design calculations made, examinations carried out, etc.,
    - Test reports performed
    - Declaration of conformity (DoC) of the ME

3. All essential radio test suites must be carried out by the manufacturer in an accredited laboratory or by using his own in-house facilities.
4. To know the essential radio tests, the manufacturer has two choices:
    i. Refer to the defined tests the in harmonized standards.
    ii. If the harmonized standard used does not give a definitive answer about the essential radio tests, a notified body has to be called in to determine them. The manufacturer uses a notified body to determine which tests have to be performed.
5. The manufacturer or his authorized representative established within the Community or the person responsible for placing the apparatus on the market must declare that these tests have been carried out and that the apparatus complies with the essential requirements. **This declaration made by the manufacturer is called the Declaration of Conformity.**
6. The manufacturer must then affix on his product the label **CE** alone if he does not use a NB throughout the process. Otherwise, he must affix the label **CE + the NB's EC identifier.**

Annex IV (optional for GSM products)

This annex is applicable when the:

- ME are telecommunication terminal equipments do not contain any radio transmitters, radio receivers or radio transmitters
- standards applicable to a product are not harmonized
- frequencies bands are harmonized
- manufacturer needs an **external approval** of the tests performed on his application and of the TCF

The differences between this annex and Annex III for the GSM products is that all the TCF are presented to a notified body for a review to be sure that no tests or documents are missing.

Using this annex is useful when a manufacturer has modified something in his product and needs the approval of the notified body on the tests performed to validate these changes.

In that case, the manufacturer can use a notified body who will define the tests to do on the ME to check that it is compliant with the essential requirements of the Directive.

Process :

1. The manufacturer must establish the technical documentation described at point 2 and he or his authorized representative established within the Community must keep it for a period ending at least 10 years after the last product has been manufactured at the disposal of the relevant national authorities of any Member State for inspection purposes.

2. Technical file called **Technical construction File** made of:
    - A general description of the product
    - The user manual of the ME
    - The conceptual design and manufacturing drawings and schemes of components, sub-assemblies, circuits, etc.... (Electrical schematics, Mechanicals schematics, PCB layout and BOM of the ME)
    - The descriptions and explanations necessary for the understanding of said drawings and schemes and the operation of the product
    - The specifications of the ME
    - The explanations to know how the product operates,
    - A list of the standards referred to in Article 5, applied in full or in part, and descriptions and explanations of the solutions adopted to meet the essential requirements of the Directive where such standards referred to in Article 5 have not been applied or do not exist
    - The results of design calculations made, examinations carried out, etc.
    - The test reports performed
    - The Declaration of conformity of the ME
3. The manufacturer, his authorized representative established within the Community or the person responsible for placing the apparatus on the market, must present the file to one or more notified bodies, each of the notified bodies must be informed of others who have received the file.
4. The notified body must review the file and if it is considered that it has not been properly demonstrated that the requirements of the Directive have been met, the notified body may issue an opinion to the manufacturer, his representative or the person responsible for placing the apparatus on the market and must inform the other notified bodies who have received the file accordingly.
5. Such an opinion must be given within four weeks of receipt of the file by the notified body. On receipt of this opinion, or after the end of the four-week period, the apparatus may be placed on the market, without prejudice to Articles 6(4) and 9(5).
6. The manufacturer must then affix on his product the label **CE + the NB's EC identifier.**

Annex V

This annex is applicable for all the ME (telecommunication terminal equipments not containing any radio transmitter or radio receivers or radio transmitters).

This certification procedure is also called Full Quality Assurance System.

This process greatly restricts the manufacturer.

Process:

- The manufacturer must install an approved quality system for design, manufacture and final product inspection and testing in accordance to the criteria defined in the directive in Annex V paragraph 3.
- This quality system is subject to a EC surveillance under the responsibility of a notified body.

The CE mark will be: **CE + NB' EC identifier**.

Appendix B: Essential requirements for a GSM product

A product must be in accordance with these three requirements:

- The protection of the health and the safety of the user (paragraph 3.1.a of the directive 1999/5/CE).
- The protection requirements with respect to electromagnetic compatibility (paragraph 3.1.b of the directive 1999/5/CE).
- The efficient use of the spectrum allocated to terrestrial/space radio communication and orbital resources so as to avoid harmful interference (paragraph 3.2 of the directive 1999/5/CE).

Protection of the health and the safety of the user

For the **safety of the user**, the applicable standard for the GSM products is in the Official Journal of the European Community. This is the **EN60950:2000** (safety of information technology equipment).

The applicable standard for the **protection of the health** of the user is the **EN 50360:2001** (product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300MHz – 3GHz)). This standard is mandatory from the 26th of July, 2001. The methods used for the measurements are explained in the standard **EN 50361** (Basic standard for the measurement of Specific Absorption Rate (SAR) related to human exposure to electromagnetic fields from mobiles phones (300MHz – 3GHz)).

Electromagnetic Compatibility

The applicable standards for the GSM products are **EN 301 489-1 v1.3.1** (09-2001) and the **EN 301 489-7** (09-2000).

Efficient use of the spectrum

The applicable standards from the 26th of July, 2001 for GSM products are:

- **EN 301 419-1 v4.1.1** (03-2000)
- **EN 301 511 v7.0.1** (12-2000)

There are approximately 518 tests:

- Radio tests in conducted and radiated mode
- SIM tests
- Audio tests
- MMI tests (SMS and AOC tests)
- Protocol tests
- Resource radio tests
- Mobility management tests
- Call control tests

Appendix C: Declaration of Conformity

Each manufacturer must put the company stamp on this document before distributing it.

Following is a fac-simile of the Declaration of Conformity template. A similar document must be created for notification procedure.

EC-Declaration of Conformity

Manufacturer / responsible person:

Address:

declares that the product:

Type:

Model:

Intended use:

complies with the essential requirements of Article 3 of the R&TTE 1999/5/EC Directive, if used for its intended use and that the following standards has been applied:

1 Safety (Article 3.1.a of the R&TTE Directive)
applied standard(s) **EN 60950:2000** Issue **2000**
EN 50360:2001 Issue **2001**

2 Electromagnetic compatibility (Article 3.1.b of the R&TTE Directive)
applied standard(s) **EN 301 489-1** Issue **1.3.1**
EN 301 489-7

3 efficient use of the radio frequency spectrum (Article 3.2 of the R&TTE Directive)
applied standard(s) **EN 301 419-1** Issue **4.1.1**
EN 301 511 Issue **7.0.1**

(Place and date of the declaration of conformity)

(Name and signature)

Appendix D: Countries where the Directive is applicable

European Community	Other European countries
Belgium	Switzerland
Denmark	Norway
France	Iceland
Greece	Hungary
United Kingdom	Czech Republic
Spain	Slovenia
Portugal	Estonia
Italy	Latvia
Germany	Slovakia
Ireland	Malta
Luxembourg	Bulgaria
Netherlands	
Austria	
Finland	
Sweden	

Appendix E: Outside of Europe

America:

- USA: RF and EMC: FCC parts 15 (emission only) and 24. European standards are a good basis. ES : contact UL or MET Lab on a voluntary basis. ES is not applicable to GSM products, because these are considered as low power RF transmission products.
- Canada: RF and EMC : comparable to the US. ES : CSA requirements
- Mexico : RF and EMC : FCC part 15 is a good basis, but still particular requirements. ES : ?
- Other countries: RF and EMC : European standards are a good basis, but still complementary testing.

Africa:

- South Africa: RF and EMC : tendency to align on European Standards
- Israel Jordan : RF : tendency to align on European Standards
- Others countries : Wet finger and contacts persons – projects

Asia:

- Hong-Kong: is aligned to Europe
- Japan:
  - RF : a complicated matter (specifications are under development), but more and more based on European standards.
  - EMC : a great part of European standards are 'acceptable', but they prefer FCC standards.
  - ES : ?
- Korea:
  - RF and EMC : take the way of the European standards
  - ES: ?
- Taiwan:
  - RF and EMC : good consideration for European standards, but strange EMC legislation
  - ES : ?
- China : MII is applicable (a part of EMC, RF, SAR and ES European standards)
- Singapore:
  - RF and EMC : European standards are a good basis, but still particular test requirements
  - ES: ?
- Others : Wet finger and contacts persons – projects

Australia and New-Zealand:

- RF and EMC : European standards are applicable. ES: ?