

Vodafone Ireland



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## **Network Interface Publication**

**Submission in compliance with Article 4.2 of Directive  
1999/5/EC (R&TTE Directive)**

# Introduction

This document contains the radio interface specification for Vodafone Ireland's GSM and 3G interfaces for the purpose of informing the designers of telecommunications equipment seeking to supply compatible equipment. The information contained in this document refers only to those specifications that support publicly available services at the time of writing of the latest version of this document.

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# 1 Scope

## 1.1 Requirement to publish network interface details

In compliance with S.I. 240 of 2001<sup>1</sup> and in accordance with Article 4.2 of the Radio and Telecommunications Terminal Equipment (R&TTE) Directive, public telecommunications network operators are required to publish accurate and adequate technical specifications about their interfaces. The information supplied must be sufficiently detailed to allow the design of telecommunications terminal equipment capable of using all services provided through the corresponding interfaces. To fulfil this obligation, this document contains the relevant information necessary to specify Vodafone Ireland Ltd GSM and 3G radio network interfaces that support publicly available services at the time of this publication.

## 2 References

- (1) Directive 1999/5/EC of the European Parliament and the Council of 9th March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.
- (3) ETSI TR 101 730 Publication of interface specification under Directive 1999/5/EC; Guidelines for describing analogue interfaces.
- (4) ETSI TR 101 730 Access and Terminals (AT); Digital access to the public telecommunications network; publication of interface specification under Directive 1999/5/EC; Guidelines for describing digital interfaces.
- (5) ETSI EG 201 838 Electromagnetic Compatibility and Radio spectrum matters; Publication of interface specifications under Directive 1999/5/EC; Guidelines for describing radio access interfaces.

The specifications identified in the tables below refer to the current ETSI/3GPP standards which can be found at [www.etsi.org](http://www.etsi.org) or [www.3gpp.org](http://www.3gpp.org).

## 3 Definitions

Definitions and abbreviations used in this document are consistent with those found in ETSI TS 123 002 (release 1999).

## 4 Background Information

This document will be reviewed annually on the 1<sup>st</sup> of September and will be republished as necessary.

Use of these specifications is covered by the ETSI IPR policy. Full details of this policy are available from ETSI (see A.6 in ETSI EG 201 838).

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(1) <sup>1</sup> SI 240 of 2001 entitled European Communities (Radio Equipment and Telecommunications Terminal Equipment) Regulations 2001, signed into law in Ireland on 5 June 2001.

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## 5 Description

### 5.1 General

For details on the interface characteristics, refer to ETSI 123 002 (revised 1999)

### 5.2 The Network Termination Point

The Network Termination Point (NTP) for GSM terminal equipment (which is the physical connection point at which a user is provided with access to the Irish public telecommunication network) is defined as the antenna of the mobile terminal.

### 5.3 Transmission Layer Characteristics

The following radio frequency carrier bands are currently available on the Vodafone Ireland radio networks:

#### 2G Radio frequency carrier bands

Standard or primary GSM 900 Band, P-GSM	890 – 915 MHz: mobile transmit, base receive
	935 – 960 MHz: base transmit, mobile receive
Extended GSM 900 band, E-GSM *	880 – 915 MHz: mobile transmit, base receive
	925 – 960 MHz: base transmit, mobile receive
DCS 1 800 Band	1710 – 1785 MHz: mobile transmit, base receive
	1805 – 1880 MHz: base transmit, mobile receive

\* (includes Standard GSM 900 Band)

Details of the specific RF channel arrangements, together with the requirements on the transmitter and receiver are given in GSM 05.05 (Digital cellular telecommunications system (Phase 2+); Radio subsystem link control)

#### 3G Radio frequency carrier bands

3G FDD Band	1950-1965 MHz: mobile transmit, base receive
	2140-2155 MHz: base transmit, mobile receive

## 5.4 Call Control/Mobility Management/Radio Resources Procedures

### 5.4.1 Characteristics of the Physical Layer on the Radio Path (Layer 1)

The characteristics of the physical layer on the radio path (i.e. layer 1) are defined by the following GSM technical specifications:

#### 2G Radio Interface

GSM Spec.	Title
GSM 04.04	Digital cellular telecommunications; Layer 1; General Requirements
GSM 05.01	Digital cellular telecommunications system (Phase 2+); Physical layer on the radio path: General Description
GSM 05.02	Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path
GSM 05.03	Digital cellular telecommunications system (Phase 2+); Channel coding
GSM 05.04	Digital cellular telecommunications system; Modulation
GSM 05.05	Digital cellular telecommunications system (Phase 2+); Radio transmission and reception
GSM 05.08	Digital cellular telecommunications system (Phase 2+); Radio subsystem link control
GSM 05.10	Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronisation

#### 3G Radio Interface

The relevant 3GPP Specifications are:

3GPP Spec	Title
TS 25.201	Universal Mobile Telecommunications System (UMTS); Physical layer - General description
TS 25.211	Physical channels and mapping of transport channels onto physical channels (FDD)
TS 25.212	Multiplexing and channel coding (FDD)
TS 25.213	Spreading and modulation (FDD)
TS 25.214	Physical layer procedures (FDD)
TS 25.215	Physical layer – Measurements (FDD)
TS 25.221	Physical channels and mapping of transport channels onto physical channels (TDD)
TS 25.222	Multiplexing and channel coding (TDD)
TS 25.223	Spreading and modulation (TDD)
TS 25.224	Physical layer procedures (TDD)
TS 25.225	Physical layer – Measurements (TDD)

### 5.4.2 Data Link Layer (Layer 2) protocol

The data link layer (layer 2) protocol of the mobile station – network interface is defined by the following GSM technical specifications:

GSM Spec.	Title
GSM 04.05	Digital cellular telecommunications system; Data Link (DL) layer; General aspects
GSM 04.06	Digital cellular telecommunications system (Phase 2+); Mobile Station – Base Station System (MS – BSS) interface; Data Link (DL) layer specification

### 5.4.3 Radio Link Control & Medium Access Control (RLC/MAC Layer 3) protocol

The RLC/MAC (layer 3) protocol of the mobile station – network interface is defined by the following GSM technical specifications:

GSM Spec	3GPP Spec	Title
GSM 04.07	24.007	Mobile radio interface signalling layer 3; General Aspects
GSM 04.08	24.008	Mobile radio interface Layer 3 specification; Core network protocols; Stage 3
GSM 04.10	24.010	Mobile Radio Interface Layer 3 - Supplementary Services Specification - General Aspects
GSM 04.11	24.011	Point-to-Point (PP) Short Message Service (SMS) support on Mobile Radio Interface
GSM 04.12	24.012	Digital cellular telecommunications system (Phase 2); general aspects; Short Message Service Cell Broad cast (SMSCB); support on the mobile radio interface
GSM 04.22	24.022	Radio Link Protocol (RLP) for circuit switched bearer and teleservices

## 5.5 Bearer Services

Bearer Services (BS) offered by the Vodafone Network are described in the following specifications:

GSM Spec	3GPP Spec	Title
GSM 02.02	22.002	Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)
	23.091	Circuit Switched Data Bearer Services

#### Note:

BS 20 as detailed in this specification is independent of any nominal rate and is used for HSCSD (High Speed Circuit Switched Data) on the Vodafone Ireland Network.

### 5.5.1 High Speed Circuit Switched Data (HSCSD)

The HSCSD service provided by Vodafone Ireland is defined by the following GSM technical Specifications:

GSM Spec	3GPP Spec	Title
GSM 02.34	22.034,	High Speed Circuit Switched Data (HSCSD)
GSM 03.34	23.034	

The HSCSD service provided by the Vodafone Ireland GSM network supports up to 4 consecutive Time Slots (TS). Each TS can support either 9.6Kbps or 14.4Kbps giving a maximum data rate of 57.6Kbps.

### 5.5.2 General Packet Radio Service (GPRS)

The GPRS service provided by Vodafone Ireland is defined by the following GSM technical specifications:

### 3GPP Release 99 specifications for 2G and 3G

3GPP Rel.99	Description
22.060	General Packet Radio Service (GPRS); Service description; Stage 1
23.060	General Packet Radio Service (GPRS); Service description; Stage 1

## 5.6 Supplementary Services

3GPP Rel.99	DESCRIPTION	Code
22.072 , 23.072 , 24.072	Call Deflection (CD)	*66#
22.081, 23.081, 24.081	Line identification supplementary (CLI) services Suppress for a single call: CLIP CLIR COLP COLR Invoke for a single call: CLIP CLIR COLP COLR	*30# number Send *31# number Send *76# number Send *77# number Send  *30# number Send *31# number Send *76# number Send *77# number Send
22.082 , 23.082 , 24.082	Call Forwarding (CF) Supplementary Services  CFU CF Busy CF No Reply CF Not Reachable All CF All Conditional CF	#21* number # #67* number # #61* number # #62* number # #002* number # #004* number #
22.083 , 23.083 , 24.083	Call Waiting (CW) and Call Hold (HOLD) supplementary services  Wait	*43# Send
22.085 , 23.085 , 24.085	Closed User Group (CUG) supplementary services	Subscription Based
22.088 , 23.088 , 24.088	Call Barring (CB) supplementary services	Subscription Based
22.090 , 23.090 , 24.090	Unstructured Supplementary Service Data (USSD)	Subscription Based

## 5.7 Teleservices (TS)

### 3GPP Release 99 specifications for 2G and 3G

3GPP Rel.99	Description
22.003	Circuit Teleservices supported by a Public Land Mobile Network (PLMN)
22.014	Multimedia Messaging Service (MMS)
22.041	Operator Determined Call Barring
22.066	Support of Mobile Number Portability (MNP)
23.040	Technical realization of Short Message Service (SMS)
23.041	Technical realization of Cell Broadcast Service (CBS)
23.014	Support of Dual Tone Multi Frequency (DTMF) signalling

### 3GPP Release 99 specifications for 2G only

GSM Rel.99	Description
GSM 03.46	Technical Realisation of Facsimile Group 3 Service

#### 5.7.1 Wireless Application Protocol (WAP)

The Vodafone Ireland Network supports circuit switched (CS) WAP and also packet switched WAP on the GPRS bearer. The WAP service complies with the specification of the WAP Forum, Release 1.1.

## 5.8 Other Characteristics

For guidance on harmonized standards and other technical specifications for Radio equipment and Telecommunications Terminal Equipment (R&TTE) covering requirements under Article 3.1 of Directive 1999/5/EC (Health and Safety and ElectroMagnetic Compatibility), refer to ETSI EG 201 450 V1.1.1 (2000-09).

The following ETSI specifications are of particular relevance:

- ES 59005: "Considerations for the evaluation of human exposure to Electromagnetic Fields (EMFs) from Mobile Telecommunication Equipment (MTE) in the frequency range 30 MHz - 6 GHz".
- ETSI ETS 300 342-1 (1997): "Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC) for European digital cellular telecommunications system (GSM 900 MHz and DCS 1 800 MHz); Part 1: Mobile and portable radio and ancillary equipment".
- ETSI ETS 300 342-2 (1994): "Radio Equipment and Systems (RES); ElectroMagnetic Compatibility (EMC) for European digital cellular telecommunications system (GSM 900 MHz and DCS 1 800 MHz); Part 2: Base station radio and ancillary equipment".
- ETSI ETS 300 342-3 (1999): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) for European digital cellular telecommunications system (GSM 900 MHz and DCS 1 800 MHz); Part 3: Base station radio and ancillary equipment and repeaters meeting Phase 2 GSM requirements".