ENGLISH TRANSLATION

OFDMA/TDMA TDD FOR DIGITAL CORDLESS TELEPHONE (sXGP)

ARIB STANDARD

ARIB STD-T118 Version 1.1

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Association of Radio Industries and Businesses

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Foreword

The Association of Radio Industries and Businesses (ARIB) investigates and summarizes the basic technical requirements for various radio systems in the form of “ARIB Standards”. These standards are developed with the participation of and through discussions amongst radio equipment manufacturers, telecommunication operators, broadcasting equipment manufacturers, broadcasters and users.

ARIB Standards include ”government technical regulations” (mandatory standard) that are set for the purpose of encouraging effective use of frequency and preventing interference with other spectrum users, and ”private technical standards” (voluntary standards) that are defined in order to ensure compatibility and adequate quality of radio equipment and broadcasting equipment as well as to offer greater convenience to radio equipment manufacturers, telecommunication operators, broadcasting equipment manufacturers, broadcasters and users.

This ARIB Standard is developed for OFDMA/TDMA TDD FOR DIGITAL CORDLESS TELEPHONE (sXGP). In order to ensure fairness and transparency in the defining stage, the standard was set by consensus at the ARIB Standard Assembly with the participation of both domestic and foreign interested parties from radio equipment manufacturers, telecommunication operators, broadcasting equipment manufacturers, broadcasters and users.

ARIB sincerely hopes that this ARIB Standard will be widely used by radio equipment manufacturers, telecommunication operators, broadcasting equipment manufacturers, broadcasters and users.

NOTE:
Although this ARIB Standard contains no specific reference to any Essential Industrial Property Rights relating thereto, the holders of such Essential Industrial Property Rights state to the effect that the rights listed in the Attachment 1 and 2, which are the Industrial Property Rights relating to this standard, are held by the parties also listed therein, and that to the users of this standard, in the case of Attachment 1, such holders shall not assert any rights and shall unconditionally grant a license to practice such Industrial Property Rights contained therein, and in the case of Attachment 2, the holders shall grant, under reasonable terms and conditions, a non-exclusive and non-discriminatory license to practice the Industrial Property Rights contained therein. However, this does not apply to anyone who uses this ARIB Standard and also owns and lays claim to any other Essential Industrial Property Rights of which is covered in whole or part in the contents of the provisions of this ARIB Standard.

Attachment 1 (Selection of Option 1)

(N/A)

Attachment 2 (Selection of Option 2)

Patent Applicant	Title of the Invention	Application number, etc.	Remarks
KYOCERA Corporation	Base station and radio communication method	Patent application publication No. 2017-220953	JP
KYOCERA Corporation	Communication equipment, communication method, and communication system	Patent application publication No. 2017-216738	JP
OKI Electric Industry Co., Ltd.	Control channel monitoring equipment, methods and programs, and base station	Patent application No. 2017-165105	JP
OKI Electric Industry Co., Ltd.	Control channel monitoring equipment, methods and programs, and base station	Patent application No. 2017-033362	JP

Contents

Chapter 1: General Terms

1.1 Overview

This standard defines requirements for radio equipment used for OFDMA/TDMA TDD for digital cordless telephone (hereinafter referred to as "sXGP* digital cordless telephone") prescribed in Article 49.8.2.3 of Ordinance Regulating Radio Equipment.

* sXGP: shared eXtended Global Platform

1.2 Scope

The standard defines the air interface for sXGP digital cordless telephone as shown in Figure 1-1.

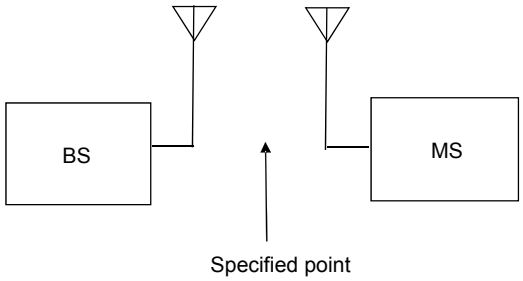


Figure 1-1 Specified point for the air interface

1.3 References

1.3.1 Normative References

The standard refers to the followings regulations.

RERL: Regulations for Enforcement of the Radio Law,

ORE: Ordinance Regulating Radio Equipment,

NT: Notification of the Ministry of Internal Affairs and Communications (issued in 2001 or later), or the Ministry of Posts and Telecommunications (issued in 2000 or earlier),

OTRCC: Ordinance Concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment.

Chapter 2: Standard System

2.1 Overview of standard system

The sXGP digital cordless telephone system is that based on the TD-LTE system conforming to 3GPP.

2.2 Configuration of standard system

The standard system for sXGP digital cordless telephone consists of BS and MS.

2.2.1 BS

BS is defined as a base station in 3GPP and mainly used at a fixed location.

2.2.2 MS

MS is defined as User Equipment (UE) in 3GPP and operated by instructions from a BS.

2.3 System type of standard system

2.3.1 1.4 MHz system

A 1.4 MHz system refers to the system in which BS and MS use a carrier with an occupied bandwidth of 1.4 MHz.

2.3.2 5 MHz system

A 5 MHz system refers to the system in which BS and MS use a carrier with an occupied bandwidth of 5 MHz.

Chapter 3: Technical Requirements for Radio Equipment

3.1 General conditions

3.1.1 Operating frequency

(RERL, Article 6)
(NT, No.471, 2012, Appended Table No.8-6)

Operating frequency shall be as follows:

a) for 1.4 MHz system: 1897.4 MHz, 1899.2 MHz, 1901.0 MHz

b) for 5 MHz system: 1899.1 MHz

3.1.2 Type of radio waves and use

(NT, No.427, 2012)

The type of radio waves and use shall be as follows:

Type: X7D or X7W

Use: Control channel or traffic channel

3.1.3 Interference prevention function

(RERL, Article 6.2)
(ORE, Article 9.4)

The radio equipment mainly used in the same premises has a function that can automatically send or receive an identification sign.

3.1.4 Identification sign

The identification sign shall be as follows:

a) The length of identification sign shall be 24 bits or more for both BS and MS. The identification sign of a BS shall be 5 or more-digit decimal number starting from 44190. The identification sign of a MS shall be a decimal number starting from 44190, not exceeding 15-digit number.

However, base stations for portable radio communication and broadband mobile radio access systems and MS communicating with land mobile-relay stations or land mobile stations (limited to the stations preforming radio communications by relay) may use the identification signs managed by telecommunications carrier that establishes radio stations for the portable radio communications and broadband mobile radio access systems concerned.

(NT, No.424, 1994)
(NT, No.294, 2017)

b) The first 5 digits of the identification sign in decimal shall be treated as PLMN-ID (Public Land Mobile Network Identifier) specified in 3GPP.

3.1.5 Communication method

(ORE, Article 49.8.2.3)

The communication method shall be as follows:

a) Transmission from a BS to a MS: TDD combining OFDM and TDM

b) Transmission from a MS to a BS: TDD combining OFDM and TDM, or TDD combining SC-FDMA and TDM

3.1.6 Frame structure

a) The structure of frame and sub-frame shall be as shown in Figure 3-1.

(NT, No.294, 2017)

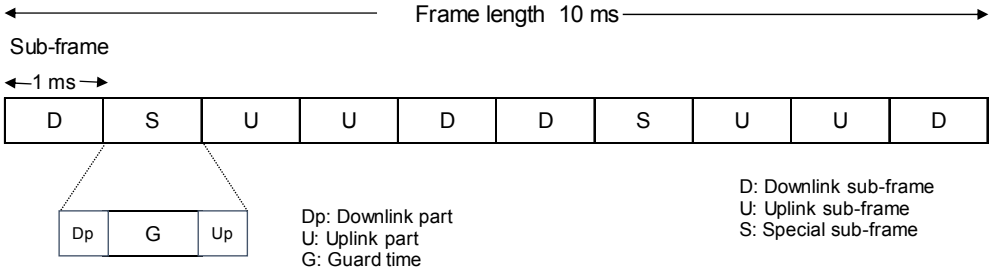


Figure 3-1 Frame structure

b) The guard time in a special sub-frame shall be 643 μs or more.

3.1.7 Cabinet

(ORE, Article 49.8.2.3)

The radio equipment excluding antenna shall be housed in a single cabinet, and the cabinet shall not be opened easily.

3.1.8 Carrier sense

a) It shall be possible to emit radio waves in the sub-frame used for the radio wave emission only when the following reference level is satisfied by the received power measured in two consecutive frames or more for the radio wave from any radio station in other systems

(hereinafter referred to "interference level"). For the case of (b), a BS shall allocate resources to a MS after the carrier sense.

(a) System in which each BS and MS performs carrier sense

for 1.4 MHz system: -62 dBm or lower

for 5 MHz system: -56 dBm or lower

(b) System in which only MS performs carrier sense

for 1.4 MHz system: -68 dBm or lower

for 5 MHz system: -64 dBm or lower

When a MS or a MS is operated by reducing its maximum antenna power, the amount of reduced power may be relaxed up to 20 dB from the above reference level. The carrier sense level in this case shall be the level adding the amount of power reduced from the maximum antenna power to the above reference level. However, a carrier sense level cannot be relaxed when a reduced amount of antenna power is compensated by the antenna gain in section 3.2.5.

(ORE, Article 49.8.2.3)
(NT, No.294, 2017)
(NT, No.424, 1994)

b) The carrier with a minimum interference level shall be selected in the 1.4 MHz system on a priority basis.

c) The interference level measurement shall use the maximum received power for the frequency used for communications and in the occupied time, and employ the value measured just before emitting a radio wave. In addition, the reception bandwidth for measurement shall be equal to or more than the designed transmission bandwidth. For the system in which a BS only performs carrier sense, the interference level shall also use the value measured just before the emission in the case of resource allocation.

d) When MS without carrier sense and those with carrier sense are mixed in the same system, the BS shall determine entirely by the reference level for the system in which only a BS mentioned in the above a) (b) performs carrier sense.

3.1.9 Protection of control channel of private PHS system

a) When a BS prepares to emit a radio wave, a received power is measured for the radio wave for control channel (limited to 1,898.45 MHz and 1,900.25 MHz, hereinafter referred to "private control channel") radiated from a radio station for private PHS system. Then the radio wave shall be emitted only by determining no private control channel when the measured power is below the following reference level.

for 1.4 MHz system: -75dBm or less

for 5 MHz system: -82dBm or less

When a BS or a MS is operated by reducing its maximum antenna power, the amount of reduced power may be relaxed up to 20 dB from the above reference level. The carrier sense level in this case shall be the level adding the amount of power reduced from the maximum antenna power to the above reference level. However, a carrier sense level cannot be relaxed when a reduced amount of antenna power is compensated by the antenna gain in section 3.2.6.

(ORE, Article 49.8.2.3)
(NT, No.294, 2017)
(NT, No.424, 1994)

b) When a BS prepares to emit a radio wave, received power of a radio wave for a private control channel shall be measured for the period corresponding to 300ms or more. When the BS cannot determine the presence or absence of a private control channel, the unit shall determine the presence of the private control channel.

c) Received power of a wave for a private control channel is measured for the period corresponding to 300 ms or more during operation once a day or more, and the existence of the private control channel shall be determined. However, the BS shall continue to use the previous determination result when the existence cannot be determined due to the overlapping radio waves from other radio stations. Continuous radio wave emission shall be allowed during communication until the end of communication even if the presence of private control channel is determined, on condition that a specialized vendor surveys in advance based on section 5.3 in Operation guidelines (Appendix 2) at the time of radio station installation, and operators are notified of the determination result of private control channel existence by displaying it on the system in some way, etc.

3.1.10 Interference avoidance

a) Communication quality shall be monitored adequately during communication.

b) When interference occurs during communication, it shall be possible to avoid interference.

c) Interference shall be avoided by changing resources allocated to a MS by a BS, etc.

3.1.11 Failure detection

(ORE, Article 49.8.2.3)

When a radio wave is continuously radiated because of a radio equipment failure, the radiation shall be automatically stopped.

3.1.12 Finish of communications

(ORE, Article 49.8.2.3)

When operation for the finish of communication is performed on a MS side or the radio wave for speech channel from a BS is not received, the radiation shall be stopped automatically.

3.1.13 Radio wave name display on a MS

When a MS with a display function is in a reception state, it is desirable that a radio wave name on the MS displays the use of 1.9 GHz band sXGP system clearly.

3.1.14 Inter-system synchronization

When other sXGP system is adjacent to the own system and each frame is not synchronized, it is desirable to match the frame synchronization timing each other between the systems in order to reduce mutual interference.

3.2 Requirements for transmitter

3.2.1 Modulation method

(ORE, Article 49.8.2.3)

The modulation method shall be as follows:

a) BS

BPSK, QPSK, 16QAM, 64QAM, or 256QAM

b) MS

BPSK, QPSK, 16QAM, or 64QAM

3.2.2 Frequency tolerance

(ORE, Article 5, Appended Table No.1)

The frequency tolerance shall be 0.25 ppm.

3.2.3 Permissible values for occupied bandwidth

(ORE, Article 6, Appended Table No.2)

a) for 1.4 MHz system: The permissible value for occupied bandwidth shall be 1.4 MHz.

b) for 5 MHz system: The permissible value for occupied bandwidth shall be 5 MHz.

3.2.4 Antenna power

(ORE, Article 49.8.2.3)

a) for 1.4 MHz system: The antenna power shall be 100 mw or less.

b) for 5 MHz system: The antenna power shall be 200 mW or less for a BS, and 100 mw or less for a MS, respectively.

3.2.5 Tolerance of antenna power

(ORE, Article 14)

The tolerance of antenna power shall be within -47% (lower limit) to +87% (upper limit) for a BS, and within -79% (lower limit) to +87% (upper limit) for a MS.

3.2.6 Absolute gain of antenna

(ORE, Article 49.8.2.3)

The absolute gain of a transmit antenna shall be 4 dBi or less. However, when the equivalent isotropic radiated power is equal to or less than the value obtained by adding the maximum antenna power to the antenna with 4 dBi absolute gain, the shortage can be compensated by the antenna gain.

3.2.7 Permissible values for unwanted emission intensity in the out-of-band domain

(ORE, Article 7, Appended Table No.3)

a) 1.4 MHz system

Frequency range	Unwanted emission intensity
0.7 MHz ~ 1.7 MHz detuning from a center frequency	-13.7 dBm/30 kHz or less
1.7MHz ~ 3.2MHz detuning from a center frequency	-10 dBm/MHz or less
3.2MHz ~ 3.5MHz detuning from a center frequency	-25 dBm/MHz or less
1895.040 ~ 1896.192MHZ and 1901.952 ~ 1903.104MHz	-12 dBm/1.152 MHz or less

b) 5 MHz system

Frequency range	Unwanted emission intensity*
2.5MHz ~ 3.5MHz detuning from center frequency	-15 dBm/30 kHz or less
3.5MHz ~ 6.1MHz detuning from a center frequency	-10 dBm/MHz or less
6.1MHz~ ~ 7.3MHz detuning from a center frequency	-29（-13）dBm/MHz or less
7.3MHz ~ 12.5MHz detuning from a center frequency	-36（-25）dBm/MHz or less
1895.040 ~ 1896.192MHz and 1901.952 ~ 1903.104MHz	-12 dBm/1.152 MHz or less

* The number in parentheses is a specified value for a MS.

3.2.8 Permissible value for unwanted emission intensity in the spurious domain

(ORE, Article 7, Appended Table No.3)

The permissible value shall be -36 dBm/MHz or less.

3.2.9 Carrier off time leakage power

(ORE, Article 49.8.2.3)

The carrier off time leakage power shall be 80 nW or less.

3.2.10 Conditions for radio wave emission

(ORE, Article 49.8.2.3)

A radio wave shall be emitted only when the identification sign specified in § 3.1.4 is stored. Communications shall be connected by transmitting or receiving the relevant identification sign.

3.2.11 Permissible values for Specific Absorption Rate on the human body (excluding the head and both hands)

(ORE, Article 14.2)

(OTRCC, Article 6 and 25, Appended table No.1)

Specific Absorption Rate (SAR)* on the human body (excluding the head and both hands) by a radio wave emitted from radio equipment (multiple radio waves; when radio waves are emitted from other transmitters in the same cabinet at the same time) shall be 2 W/kg (4 W/kg in limbs) or less. However, this provision shall not apply to the following radio equipment.

* SAR refers to the absorbed energy in any 10 grams of the human tissue exposed to an electromagnetic field over 6 minutes divided by 10 grams and further divided 6 minutes. The same shall apply hereinafter.

a) Radio equipment with the mean radiated power of 20 mW or less. In the case of multiple radio wave emissions, the power corresponds to the sum of mean power.

b) Radio equipment used at a distance exceeding 20 cm between transmit antenna and the human body (excluding the head and both hands).

3.2.12 Permissible values for Specific Absorption Rate on the human head

(ORE, Article 14.2)

(OTRCC, Article 6 and 25, Appended table No.1)

Specific Absorption Rate on the human head by a radio wave emitted from radio equipment (multiple radio waves; when radio waves are emitted from other transmitters in the same cabinet

at the same time) shall be 2 W/kg or less. However, this provision shall not apply to the following radio equipment.

a) Radio equipment with the mean radiated power of 20 mW or less. In the case of multiple radio wave emissions, the power corresponds to the sum of mean power.

b) Radio equipment for a portable use, excluding that which transmits a radio wave near the human head.

3.3 Requirements for receiver

3.3.1 Limits on secondary radiated emissions, etc.

(ORE, Article 24)

The limits on secondary radiated emissions, etc. shall be as follows:

a) 30 MHz ~ 1 GHz: The mean power shall be 2 nW/100 kHz or less.

b) 1 GHz ~ 12.75 GHz: The mean power shall be 20 nW/100 kHz or less.

3.4 Connection with telecommunication lines

(Ordinance Concerning Terminal Facilities etc. Article 9)
(NT No.424, 1994)

Radio equipment connected with telecommunication lines shall comply with the following conditions.

a) Radio equipment between one part comprising terminal equipment and the other part shall have an identification sign with 24 bits or more.

b) Except for specific cases, communication channels shall be set only in an idle state of a radio wave to be used by determining whether the radio wave is available or not.

However, radio equipment to be used is not required to be accommodated in one cabinet.

Chapter 4: Methods of Measurement

The methods of measurement shall be in accordance with the paragraph 1, item 1 (3) in the OTRCC Appended Table No.1, or be equivalent to or better method than those. However, test methods for items which are not specified in the above shall be based on commonly used methods.

Chapter 5: System for interconnection

This standard does not specify protocols. The requirements for systems designed for interconnection shall be in accordance with the latest version of the standard “sXGP (shared XGP) Specification”’ defined by XGP Forum.

When the provisions in the Specification overlap with those in Chapter 3 of this standard, the requirements shall conform to the standard.

Appendix 1: Test Items related to Specified Radio Equipment

(OTRCC, Attached Table No.1)
(NT, No.88 2004, Attached/Annexed Table No.82)

The followings are test items related to technical regulations conformity certification of radio equipment used for sXGP digital cordless telephone.

(1) Transmitter

Frequency deviation

Occupied frequency bandwidth

Spurious emission or unwanted emission intensity

Antenna power deviation

Power when carrier is not being transmitted

Specific Absorption Rate (SAR) (Note)

Note: Limited to the case where provisions in the text of ORE Article 14-2 paragraph (1) or (2) are applied to.

(2) Receiver

Limits on secondary radiated emission, etc.,

(3) Other equipment

Carrier sense function

Appendix 2: Operation Guidelines

1 Purpose

This operation guidelines cover operations of radio stations for sGXP digital cordless telephone system using frequencies in the range from 1,893.5 MHz to 1,906.1 MHz (hereinafter referred to as "1.9 GHz band"). The purpose of the guidelines is to avoid harmful radio interference with radio stations using the same frequency band for TDMA narrow-band digital cordless telecommunications (hereinafter referred to as "PHS digital cordless telephone"), TDMA broadband digital enhanced cordless telecommunications (hereinafter referred to as "DECT digital cordless telephone") and public PHS, and to ensure effective use of radio frequency and convenience for users.

Here, harmful radio interference refers to causing continuous and serious damage to a function of other radio equipment.

2 Scope of application

The operation guidelines apply to the radio station users and vendors engaged in the manufacture, sales, implementation, operation and maintenance of radio stations (hereinafter referred to as "specialized vendors") for sXGP digital cordless telephone.

3 System covered by the operation guidelines

The operation guidelines apply to radio equipment used for sXGP digital cordless telephone.

4 Specification of issues

4.1 Operation manual

The operation manual for radio equipment used for sXGP digital cordless telephone shall contain a caution notice as shown in the following text box and the meaning of product labelling mentioned below.

The frequency band used by this radio equipment is also used by radio stations for different types of digital cordless telephone including PHS radio station.

1 This device is designed so as to minimize the risk of radio interference with other radio stations in the same frequency band, but in the event harmful radio interference with other radio station occurs, the user of this device should stop operation immediately and contact the service desk indicated below to discuss ways of avoiding radio interference (such as installing partitions, etc.).

2 In case of any other problems, contact also the service desk indicated below:

Service desk: _____

4.2 Catalogs, brochures and websites

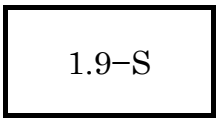
Catalogs, brochures, websites, etc. of the radio equipment for sXGP digital cordless telephone shall describe a caution notice similar to that in the operation manual and the meaning of the product labelling mentioned in section 4.3.

4.3 Product labelling

The BS used for sXGP digital cordless telephone shall indicate "1.9 GHz band radio station type for digital cordless telephone" on the radio equipment body, using the abbreviated symbol shown below.

If the indication cannot be placed on the radio equipment body due to restrictions on physical size, mounting form, or design, the same contents may be displayed by a sticker.

(This indication shall also apply to a MS if possible.)



"1.9−": denotes the radio station for digital cordless telephone using the 1.9 GHz band.

"S": indicates the radio station type of digital cordless telephone (See section 4.3.1 for details).

Radio equipment accommodating more than one radio station types has a notation such as "P/S", which separates the symbol indicating the radio station type for digital cordless telephone by a slash.

4.3.1 Radio station type for digital cordless telephone

Table Annex 2-1 shows the radio station type for digital cordless telephone covered by the operation guidelines.

Table Annex 2-1 Radio station type for digital cordless telephone

Radio station	Symbol	Standard
sXGP digital cordless telephone	S	ARIB STD-T118

Table Annex 2-2 shows the type and symbol of other digital cordless telephone radio stations using the same frequency band.

Table Annex 2-2 Radio station type for other digital cordless telephone using the same frequency band

Radio station	Symbol	Standard
PHS digital cordless telephone	P	RCR STD-28
DECT digital cordless telephone	D	ARIB STD-T101

4.3.2 Indication methods, etc.

(1) Indication method

No particular specification. Indication method can adopt adhesive sticker use, printing on equipment model nameplate, embossment on enclosure, electronic display or others.

(2) Size, aspect ratio, ground color, use of frame

No particular specification.

(3) Material

No particular specification. However, material should be resistant to peel-off and stain.

(4) Font, and color of letter or symbol

No particular specification. However, it should be easy to read and understand.

4.4 Packaging box

"1.9 GHz band radio station type for digital cordless telephone" shall be indicated on an individual packaging box for a BS of radio equipment in format similar to that of product labelling. This provision does not apply to a packaging box intended for transport only.

5 Coordinated response

5.1 Cooperation for avoiding radio interference

If the radio station used for sXGP digital cordless telephone causes harmful radio interference to other radio stations using the same frequency band, users and specialized vendors shall cooperate to avoid radio interference in good faith. At that time full attention shall be given to the protection of the "PHS base stations and radio stations relaying communications between PHS base stations and land mobile stations" in operation.

5.2 Priority of the existing radio stations

When a latecomer intends to establish a radio station for sXGP digital cordless telephone in the areas where other radio stations using the same frequency band has been already operated or where introduction of such radio station has been decided, the latecomer shall have the responsibility for coordinating proper measures to avoid radio interference.

5.3 Specialized vendors' action

Specialized vendors shall conduct the following preliminary survey, when radio stations used for sXGP digital cordless telephone are supplied.

(1) Measuring a received level of PHS control channel (limited to 1,898.45 MHz and 1900.25 MHz) and confirming that the level fully meet a carrier sense level.

(2) Trying a transition to a new control channel of the neighboring PHS digital cordless telephone when the level does not meet the carrier sense level.

(3) Examining operations by reducing maximum antenna power of a BS or a MS, and redesigning when the transition to the new control channel is difficult.

(4) Confirming presence or absence of a radio station for DECT digital cordless telephone, and taking measures such as enough separation from the BS when the wireless unit exists. In addition, explaining the possibility of interference to users.

(5) Avoiding sXGP system installation which cannot determine presence or absence of private control channel by radio waves of other radio stations in the same system.

6 Influence on implantable medical devices

It is desirable to take appropriate actions in accordance with the "Guidelines for the prevention of influence by various types of radio equipment on implantable medical devices" in order to prevent influence on implantable medical devices.

7 Method for allocating International Mobile Subscriber Identity (IMSI)

An International Mobile Subscriber Identity (IMSI) shall be a decimal number of up to 15 digits composing of 3 digits for mobile country code (MCC: "441"), 2 digits for mobile network code (MNC: "90") and 9 or 10 digits for mobile subscription identification number (MSIN).

LAND MOBILE RADIO ASSOCIATION CORPORATION JAPAN administrates the IMSI allocation, etc. (Refer to Appendix 4: Method for allocating IMSI).

Appendix 3: Compliance with Radiation Protection

1 Safety facility for radio wave signal intensity

(RERL, Article 21-3)

When radio equipment is installed at the place where radio wave signal intensity coming from the radio equipment exceeds the value shown in Table Annex 3-1, easy entering and exiting the place shall not be allowed except for operators. Here, the radio wave signal intensity refers to the electric field intensity, power flux density and magnetic field intensity (hereinafter the same), and the place is limited to that where people get together, pass through, or come in and out.

However, this shall not apply to the radio equipment in the following radio station.

a) Radio equipment with mean power of 20 mW or less

b) Mobile radio station equipment

c) Radio equipment for temporary established radio stations in the case of emergency such as earthquake, typhoon, flood, tsunami, snow damage, fire, riot and others

(RERL, Attached Table 2-3-2)

Table Annex 3-1 Reference value of the electromagnetic field intensity (Re: RERL, Article 21-3-6)

Frequency	Electric field intensity (V/m)	Magnetic field intensity (A/m)	Power flux density (mW/cm^2)	Average time (minute)
Exceeding 1.5 GHz and 300 GHz or less	61.4	0.163	1	6

2 Calculation method for radio wave signal intensity radiated from radio equipment

(NT, No.300, 1999)

The power flux density is calculated by the following equation for evaluating radio wave signal intensity radiated from radio equipment. Calculations are made at each point with at least λ/10 [m] intervals from the transmitting antenna position in the horizontal direction and at positions with at least 10 cm intervals from the range of 10 cm to 200 cm above the ground in the vertical direction, and the maximum value is obtained. However, each calculation point must be at least 10 cm away from the transmitting antenna and a metal object.

$$S = (PG) / (40\pi R^2) \times K$$

Here,

(1) S: Power flux density [mW/cm^2]
(2) P: Antenna input power [W] (Transmission output minus feeder loss & mismatching loss)
Note: For a pulse wave, time average value of antenna input power is used.
(3) G: Power ratio of absolute gain of transmit antenna in the maximum radiation direction

(4) R: Distance between an antenna and a calculation point [m]
(5) K: Reflection coefficient
a) K = 2.56: taking account of the refection from the ground
b) K = 4: taking account of the refection from other than the ground such as water surface
c) K = 1: taking account of no reflection

3 Certification of compliance with the standard value of radio wave signal intensity

Table Annex 3-2 shows the parameters of radio station for OFDMA/TDMA TDD broadband digital cordless telephone.

Table Annex 3-2 Parameters of radio station for OFDMA/TDMA TDD broadband digital cordless telephone

Antenna power	Antenna gain	Power ratio of antenna gain
200 mW (maximum)	4 dBi	2.51

In the radio station for OFDMA/TDMA TDD digital cordless telephone, time average value of antenna input power being a pulse wave may be used. However, the maximum value of 200 mW is applied for the certification of compliance. Since there is no need to consider the reflection from the ground, the power flux density S radiated from radio equipment is given by the following.

$$S = (PGK) / (40\pi R^2) = (0.2*2.51*1) / (40\pi*0.1*0.1) = 0.399 \text{ [mW/cm2]}$$

The calculated result conforms to the permissible value of radio wave signal intensity (1 mW/cm^2) shown in Table Annex 3-1.

When more than one radio waves from other radio equipment accommodated in the same cabinet are emitted simultaneously, the sum of ratio of power flux density to the reference value shall be calculated. If the sum does not exceed 1, the power flux density can be considered to be compliant with the permissible value.

For example, in the case of radio equipment including a radio station A for OFDMA/TDMA TDD digital cordless telephone and a radio station B for Low power data communication system in the same cabinet, the power flux density of the radio station A is set S_A and the reference value is set S_1, and the power flux density of the radio station B is set S_B and the reference value is set S_2. Then the calculation is made as follows:

$$(S_A / S_1) + (S_B / S_2) \leqq 1$$

In the case of being accommodated with a radio station for 2.4 GHz Low power data communication system together, it is considered that the power flux density of the low power data communication system does not exceed 0.601 (mW/cm2) by the above expression. According to the power flux density formula, the power flux density can be considered to be compliant with the permissible value when the equivalent isotropic radiated power of that system does not exceed 0.755 (W).

Setting of system parameters should be considered to comply with the radio wave protection guidelines in accordance with the operation mode of the radio station for OFDMA/TDMA TDD digital cordless telephone. When they are not compatible, a countermeasure such as establishing safety facilities is required.

Appendix 4: Management Methods for Identification Signs

This appendix describes management methods for identification signs used for MS of sXGP digital cordless telephone as a guideline.

A part of the number zone assigned to telecommunication carries, etc. based on the Regulations for Telecommunications Numbers (MIC Ordinance) is allocated to the identification sign used for MS of sXGP digital cordless telephone, which is a decimal number starting from 44190 less than 15-digit number (MIC Notification No.294, 2017). Therefore, the effective use of identification signs in accordance with the regulations is required.

LAND MOBILE RADIO ASSOCIATION CORPORATION JAPAN (hereinafter referred to as "RMK") examines whether or not an applicant can manage identification signs in accordance with the regulations and issues identification signs. It is desirable that the applicant organizes a method for managing identification signs in advance from the following point of view and prepares the explanation document.

This explanation document should be submitted in the case of the first application or change of the management method.

(1) Management methods for identification signs

Identification signs shall be managed as follows:

a) When a SIM card storing identification signs is issued to a user, the identification signs shall be set additionally to a managing system which identifies MS without delay.

b) When the above SIM card is lost or damaged, or the use of the relevant SIM card is discontinued, identification signs stored in the managing system which identifies MS are set to be deleted without delay.

c) The identification signs deleted in the above process shall be reusable for a different SIM.

(2) Management for reporting utilization status of identification signs

The utilization status of the designated identification signs shall be collected on a regular basis. Then it can be confirmed that the signs are unused for a long period of time actually.

In addition, the volume of usable identification signs shall be managed so that a sequential report can be made at the request of RMK.

[Reference] Method for obtaining identification sign (IMSI)

RMK has started to issue identification signs since May 1, 2018. Application procedures have some different parts from those for the existing digital cordless telephone (e.g. private PHS, etc.). In order to prevent an applicant from being confused at the time of the application, the current application procedures are introduced below (RMK's documents are described as a reference, because they may change).

As described in this standard "Appendix 2, Paragraph 7: Method for allocating International Mobile Subscriber Identity (IMSI), an applicant inquires RMK (main office) about the issue of identification signs and then can acquire an application form. An application fee should be confirmed because the fee is different between RMK members and non-members.

The following two documents are required for the application.

(1) Request for the grant of identification signs (Document sent from RMK)

Entry items and method are shown below.

- Type : Fill in "Radio equipment used for MS of OFDMA/TDMA TDD digital cordless telephone
- Manufacture's name or user's name : Fill in an applicant name, etc.
- Desired number of radio equipment to be granted : Fill in the required number of identification signs Up to 50,000 units per application
- Equipment type or name : No description needed for sXGP system

(2) Document explaining management methods for identification signs in the corporation (Free format)

See items related to the management methods for identification signs in the previous page for document preparation.

RMK issues the following document after examining the above submitted document. Then the applicant obtains identification signs.

(1) Certificate of designation for identification numbers (Issued by RMK)

The identification signs allocated by RMK are issued by the certificate of designation for identification numbers. Described items and contents are as follows.

- Designated person : Name of applicant
- Type : Radio equipment used for MS of OFDMA/TDMA TDD digital cordless telephone
- Equipment type and name : Not described for sXGP
- Designated identification number : Granted numbers are described.
- Designated date : Date of issue

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