International Telecommunication Union

ITU-R

Radiocommunication Sector of ITU

Recommendation ITU-R SM.2104-0
(08/2017)

Guidelines for narrow-band wireless home networking transceivers Specification of spectrum related components

SM Series
Spectrum management

Foreword

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SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	**Spectrum management**
SNG	Satellite news gathering
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Note: *This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.*

Electronic Publication
Geneva, 2017

RECOMMENDATION ITU-R SM.2104-0

Guidelines for narrow-band wireless home networking transceivers Specification of spectrum related components

(2017)

Scope

This Recommendation provides guidelines pertaining to spectrum usage of Narrow-Band Wireless Home Networking (NWHN) transceivers complying with Recommendation ITU-T G.9959 which contains the system architecture, physical (PHY) layer and medium access control (MAC) layer specifications for Recommendation ITU-T G.9959 compliant transceivers.

Keywords

Short range devices, narrow-band wireless home networking

Abbreviations (see also Annex 1)

SRD:	short range device
NWHN:	narrow-band wireless home networking
MAC layer:	medium access control layer
PHY layer:	PHYsical layer

The ITU Radiocommunication Assembly,

considering

a) that allocation of frequency bands to the radio services or designation to the radiocommunication systems of the frequencies falls into the responsibility of ITU-R;

b) that ITU-R has not yet considered suitable frequencies to be designated and used by NWHN transceivers;

c) that Recommendation ITU-T G.9959 – Short range narrowband digital radiocommunication transceivers – PHY & MAC layer specifications, was published by ITU-T in 2012;

d) that Recommendation ITU-T G.9959 does not list frequencies where G.9959 devices should operate;

e) that ITU-T Study Group 15 has developed a proposal for a draft Recommendation ITU-R G.WNB-FREQ to cover the frequency usage issues related to NWHN transceivers and has sent this draft recommendation to ITU-R,

recommends

1 that the guidelines provided in Annex 1 to this Recommendation may be considered for the use of spectrum by Narrow-Band Wireless Home Networking (NWHN) transceivers operating in line with Recommendation ITU-T G.9959.

Annex 1

1 References

The following ITU Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Guidelines document. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T and ITU-R Recommendations is regularly published.

[1] Recommendation ITU-T G.9959 – Short range narrowband digital radiocommunication transceivers – PHY & MAC layer specifications

[2] Recommendation ITU-R SM.1896 – Frequency ranges for global or regional harmonization of short-range devices (SRDs)
This Recommendation, which is subject to regular updates, could be considered as a possible home for the frequencies to be used and regionally or globally harmonised for NWHN.

[3] Report ITU-R SM.2153 – Technical and operating parameters and spectrum use for short-range radiocommunication devices
This Report is a kind of database for frequencies used for SRDs in many countries, and it can also be considered for presenting any frequency used by NWHN.

2 Definitions

This Recommendation uses the following definitions:

Channel: A transmission path between nodes. One channel is considered to be one transmission path. Logically a channel is an instance of the communications medium used for the purpose of passing data between two or more nodes.

Node: Any network device that contains a G.9959 transceiver. In the context of this Recommendation, use of the term ‘node’ without a qualifier means ‘G.9959 node’.

3 Abbreviations

This Recommendation uses the following abbreviations:

AL Always Listening

FL Frequently Listening

ISM Industrial, Scientific and Medical

MAC medium access control

PHY physical

R1 Type 1 of supported data rate, i.e. 9.6 kbit/s

R2 Type 2 of supported data rate, i.e. 40 kbit/s

R3 Type 3 of supported data rate, i.e. 100 kbit/s

RF Radio Frequency

4 Frequencies and bandwidths

Recommendation ITU-T G.9959 defines the PHY and MAC layer specifications for short range narrowband digital radiocommunication transceivers, however it does not list frequencies where G.9959 devices operate.

Recommendation ITU-R SM.1896 [2] and Report ITU-R SM.2153 [3] provide the bands at which the short range devices operate on a regional or global basis. Some of these frequencies may be considered for the NWHN devices.

A compliant G.9959 node can also operate in the license exempt, un-protected RF bands such as the frequencies designated in the Radio Regulations for ISM applications. The possible regional and national frequency designations and bandwidth requirements are described in Table 1 below. A G.9959 transceiver supports 1, 2 or 3 channels (each channel is associated with a centre frequency) depending on the availability of channels in the specific region or country. Table 1 is related to the Tables 7-1 and A.1 of Recommendation ITU-T G.9959.

Table 1 is also consistent with tables given in references [2] and [3]. Specific references are provided in the Table.

TABLE 1

Centre frequency and bandwidth requirements in different geographical areas

Geographical area	**Centre frequency**		**Data rate**	**Channel width**	**Regulatory reference**
	G.9959	MHz	G.9959	kHz	
Australia, New Zealand See Annex 2/[2] See Table 11/[3]	f_{ANZ1}	919.80	R3	400	AS/NZS 4268
	f_{ANZ2}	921.40	R2	300	
			R1	300	
Brazil See Annex 2/[2] See Table 11/[3]	f_{ANZ1}	919.80	R3	400	ANATEL Resolution 506
	f_{ANZ2}	921.40	R2	300	
			R1	300	
El Salvador, Paraguay, Peru, Uruguay See Annex 2/[2] See Table 11/[3]	f_{ANZ1}	919.80	R3	400	
	f_{ANZ2}	921.40	R2	300	
			R1	300	
China See Annex 2/[2] See Row 14, Appendix 9, Annex 2/[3]	f_{CN1}	868.30	R3	400	
			R2	300	
			R1	300	
Armenia, Egypt, European Union, French Guiana (French Department of), Indonesia, Kazakhstan, Lebanon, Libya, Mauritius, Nigeria, Qatar, Saudi Arabia, UAE, Yemen See Annex 2/[2] See Table 11/[3]	f_{EU1}	869.85	R3	400	ETSI EN 300 220
	f_{EU2}	868.40	R2	300	
			R1	300	
Jordan See Annex 2/[2] See Table 11/[3]	f_{EU1}	869.85	R3	400	ETSI EN 300 220 Note: Approval certificate expires on May 11, 2017.
	f_{EU2}	868.40	R2	300	
			R1	300	
Singapore See Annex 2/[2] See Table 11/[3]	f_{EU1}	869.85	R3	400	ETSI EN 300 220, TS SRD
	f_{EU2}	868.40	R2	300	
			R1	300	

TABLE 1 (*end*)

Centre frequency and bandwidth requirements in different geographical areas

Geographical area	Centre frequency		Data rate	Channel width	Regulatory reference
	G.9959	MHz	G.9959	kHz	
South Africa See Annex 2/[2] See Table 11/[3]	f_{EU1}	869.85	R3	400	ETSI EN 300 220, ICASA
	f_{EU2}	868.40	R2	300	
			R1	300	
Hong Kong (China) See Annex 2/[2] See Appendix 9, Annex 2/[3]	f_{HK1}	919.80	R3	400	HKTA 1035
			R2	300	
			R1	300	
India See Annex 2/[2] See Table 11/[3]	f_{IN1}	865.20	R3	400	CSR 564 (E)
			R2	300	
			R1	300	
Israel See Annex 2/[2] See Table 11/[3]	f_{IL1}	916.00	R3	400	
			R2	300	
			R1	300	
Costa Rica See Annex 2/[2] See Table 11/[3]	f_{JP1}	922.50	R3	400	
	f_{JP2}	923.90	R3	400	
	f_{JP3}	926.30	R3	400	
Japan See Annex 2/[2] See Table 11/[3]	f_{JP1}	922.50	R3	400	ARIB T96, ARIB STD-T108
	f_{JP2}	923.90	R3	400	
	f_{JP3}	926.30	R3	400	
Korea (Republic of) See Annex 2/[2] See Row 15 Table 19/[3]	f_{KR1}	920.90	R3	400	Clause 2, Article 58-2 of Radio Waves Act
	f_{KR2}	921.70	R3	400	
	f_{KR3}	923.10	R3	400	
Malaysia See Annex 2/[2] See Row 14, Appendix 9, Annex 2/[3]	f_{MY1}	868.10	R3	400	ETSI EN 300 220, SKMM WTS SRD
			R2	300	
			R1	300	
Russian Federation See Annex 2/[2] See Table 33/[3]	f_{RU1}	869.00	R3	400	ETSI EN 300 220, GKRCh
			R2	300	
			R1	300	
Argentina, Bahamas, Barbados, Bermuda, Bolivia, British Virgin Islands, Canada, Cayman Islands, Chile, Colombia, Ecuador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St Kitts & Nevis, Suriname, Trinidad & Tobago, Turks & Caicos Islands, USA See Annex 2/[2] See Table 11/[3]	f_{US1}	916.00	R3	400	FCC CFR47 Part 15.249
	f_{US2}	908.40	R2	300	
			R1	300	