



Z-Wave Alliance Recommendation ZAD12837-10

Z-Wave transceivers - Specification of spectrum related components

(March 21, 2018)

Scope

This Recommendation provides guidelines pertaining to spectrum usage of the short range narrowband digital radiocommunication transceivers complying with ITU-T Recommendation G.9959. ITU-T Recommendation G.9959 contains the system architecture, physical layer (PHY) and medium access control layer (MAC) specifications for G.9959 compliant transceivers.

References

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

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'.

Abbreviations

This Recommendation uses the following abbreviations:

AL	Always Listening
FL	Frequently Listening
ISM	Frequency bands for Industrial, Scientific and Medical use
kbit/s	kilo bit per second
MAC	medium access control
MHz	Mega Hertz
PHY	physical layer
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

RF Profiles

ITU-T Recommendation G.9959 specifies transceiver operation in license-free RF bands including bands designated for ISM (industrial, scientific and medical) applications.

ITU-T Recommendation G.9959 defines the PHY, MAC and LLC layer specification for short range narrowband digital radiocommunications transceivers. G.9959 does not define actual frequencies.

This Recommendation specifies frequencies for specific regions.

A compliant G.9959 node must operate in license-free RF bands such as the ISM bands. The regional frequency allocations and bandwidth requirements are described in Table 1. A G.9959 transceiver may support 1, 2 or 3 dedicated RF channels depending on the availability of channels in the specific region. Table 1 defines specific values for the frequencies referred in Table 7-1 and Table A-1 found in ITU-T G.9959.

Table 1 – Center frequency and bandwidth requirements

Geographical area	Centre frequency		Data rate	Channel width	Regulatory reference
	G.9959	MHz	G.9959	kHz	
Australia, New Zealand	f_{ANZ1}	919.80	R3	400	AS/NZS 4268
	f_{ANZ2}	921.40	R2	300	
			R1	300	
Brazil	f_{ANZ1}	919.80	R3	400	ANATEL Resolution 506
	f_{ANZ2}	921.40	R2	300	
			R1	300	
Chile, El Salvador, Paraguay, Peru, Uruguay, Dominican Republic, Venezuela	f_{ANZ1}	919.80	R3	400	
	f_{ANZ2}	921.40	R2	300	
			R1	300	
Malaysia	f_{ANZ1}	919.80	R3	400	MCMC MTSFBTC T007: 2014
	f_{ANZ2}	921.40	R2	300	
			R1	300	
Vietnam	f_{ANZ1}	919.80	R3	400	
	f_{ANZ2}	921.40	R2	300	
			R1	300	
China, Morocco	f_{CN1}	868.40	R3	400	ETSI EN 300 220, CNAS, CMIIT 2016DJ7232
			R2	300	
			R1	300	
Algeria, Armenia, Bahrain, Egypt, European Union, French Guiana, Georgia, Indonesia, Kazakhstan, Kuwait, Lebanon, Libya, Maldives, Mauritius, Nigeria, Oman, Philippines, Turkmenistan, Qatar, Saudi Arabia, UAE, Yemen	f_{EU1}	869.85	R3	400	ETSI EN 300 220
	f_{EU2}	868.40	R2	300	
			R1	300	

Geographical area	Centre frequency		Data rate	Channel width	Regulatory reference
	G.9959	MHz	G.9959	kHz	
Jordan	f_{EU1}	869.85	R3	400	ETSI EN 300 220.
	f_{EU2}	868.40	R2	300	
			R1	300	
South Africa	f_{EU1}	869.85	R3	400	ETSI EN 300 220, ICASA
	f_{EU2}	868.40	R2	300	
			R1	300	
Uzbekistan	f_{EU1}	869.85	R3	400	Uz.SMT.01.334.1961745
	f_{EU2}	868.40	R2	300	
			R1	300	
Hong Kong (China)	f_{HK1}	919.80	R3	400	HKTA 1035
			R2	300	
			R1	300	
India	f_{IN1}	865.20	R3	400	CSR 564 (E)
			R2	300	
			R1	300	
Israel	f_{IL1}	916.00	R3	400	
			R2	300	
			R1	300	
Costa Rica	f_{JP1}	922.50	R3	400	
	f_{JP2}	923.90	R3	400	
	f_{JP3}	926.30	R3	400	
Japan	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)	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	
Taiwan (China)	f_{KR1}	920.90	R3	400	Used f_{JP} until May 2017
	f_{KR2}	921.70	R3	400	
	f_{KR3}	923.10	R3	400	
Thailand	f_{KR1}	920.90	R3	400	
	f_{KR2}	921.70	R3	400	
	f_{KR3}	923.10	R3	400	
Macau	f_{KR1}	920.90	R3	400	
	f_{KR2}	921.70	R3	400	
	f_{KR3}	923.10	R3	400	
Singapore	f_{KR1}	920.90	R3	400	IMDA TS SRD
	f_{KR2}	921.70	R3	400	
	f_{KR3}	923.10	R3	400	

Geographical area	Centre frequency		Data rate	Channel width	Regulatory reference
	G.9959	MHz	G.9959	kHz	
Russian Federation	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, Colombia, Ecuador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St Kitts & Nevis, Suriname, Trinidad & Tobago, Turks & Caicos Islands, United States of America	f_{US1}	916.00	R3	400	FCC CFR47 Part 15.249
	f_{US2}	908.40	R2	300	
			R1	300	

Note: G.9959 specifies that R1 must apply an offset of 20kHz to the center frequency stated in this frequency list.