



Z-Wave Alliance Recommendation ZAD12837-1

## Z-Wave Transceivers – Specification of Spectrum Related Components

(2014)

### 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 shall 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**

Region	Center frequency		Data rate	Channel Width
	G.9959	MHz	G.9959	kHz
Australia	$f_{ANZ1}$	919.80	R3	400
	$f_{ANZ2}$	921.40	R2	300
			R1	300
Brazil (see Australia)				
Canada (see USA)				
Chile (see USA)				
China	$f_{CN1}$	868.40	R3	400
			R2	300
			R1	300
European Union	$f_{EU1}$	869.85	R3	400
	$f_{EU2}$	868.40	R2	300
			R1	300
Hong Kong	$f_{HK1}$	919.80	R3	400
			R2	300
			R1	300

Region	Center frequency		Data rate	Channel Width
	G.9959	MHz	G.9959	kHz
India	$f_{IN1}$	865.20	R3	400
			R2	300
			R1	300
Israel	$f_{IL1}$	916.00	R3	400
			R2	300
			R1	300
Japan	$f_{JP1}$	922.50	R3	400
	$f_{JP2}$	923.90	R3	400
	$f_{JP3}$	926.30	R3	400
Korea	$f_{KR1}$	920.90	R3	400
	$f_{KR2}$	921.70	R3	400
	$f_{KR3}$	923.10	R3	400
Malaysia	$f_{MY1}$	868.10	R3	400
			R2	300
			R1	300
Mexico (see USA)				
New Zealand (see Australia)				
Russia	$f_{RU1}$	869.00	R3	400
			R2	300
			R1	300
Singapore (see EU)				
South Africa (see EU)				
Taiwan (see Japan)				
United Arab Emirates (see EU)				

Region	Center frequency		Data rate	Channel Width
	G.9959	MHz	G.9959	kHz
United States of America	f <sub>US1</sub>	916.00	R3	400
	f <sub>US2</sub>	908.40	R2	300
			R1	300