CFR Title 47 FCC Part 2.1091

Report Exhibit

Prepared for Yardi Systems Inc.

This report presents the environmental impact of human exposure to radiofrequency radiation for

IoT H4P G3 Hub

Prepared by

Yunus Faziloglu

Sr. Wireless Engineer

Approved by

Ahmed Ait Ahmed

EMC Manager

Issue date: Sep 20, 2024

ACCREDITED
Cert No. 1627-01

This test result relates only to the described test object.
This document shall not be reproduced, except in full, without the written approval of Bureau Veritas Test Lab.
Customer must not use this test report as the product certification of each accreditation body or each national organization.
The test is traceable to national standard or related international standard

Contents

1 Device Under Test Information

1.1 Product Information

Project Number:	EX0965
Applicant Information:	Yardi Systems Inc.
	430 South Fairview Ave Goleta, CA 93117
Test Item Description:	IoT H4P G3 Hub
Model Number:	H4P3-TWC, H4P3-TW
Separation Distance:	20cm
Exposure Category of DUT:	Mobile
Multiple Simultaneous RF Sources:	Yes
Type of Evaluation:	MPE Calculation
Evaluation Method:	447498 D01 General RF Exposure Guidance v06
Deviations from Standard:	None

1.2 Technical Information

Radio Function: Z-Wave Standard	
FCC ID:	2BAL9YDIZW
Exposure Category of Transmitter:	Mobile
Maximum Field Strength:	92.8 dBµV/m at 3m
Maximum EIRP:	0.57mW based on field strength to EIRP conversion; EIRP = FS-104.77+20log(3) = -2.43dBm = 0.57mW
Maximum Tune-up Tolerance:	N/A
Maximum Antenna Gain:	0.3dBi (peak)

Radio Function: Z-Wave Long Range	
FCC ID:	2BAL9YDIZW
Exposure Category of Transmitter:	Mobile
Maximum Conducted Output Power:	16.9mW
Maximum Tune-up Tolerance:	N/A
Maximum Antenna Gain:	0.3dBi (peak)

2 Test Laboratory Information

Location of Test Lab:	One Distribution Center Circle #1 Littleton, MA 01460 (978) 486-8880
Key Contact:	Yunus Faziloglu Yunus.faziloglu@bureauveritas.com
Laboratory Accreditations:	BUREAU VERITAS CONSUMER PRODUCTS SERVICES, INC is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.
ISO/IEC 17025:2017:	1627-01
FCC Test Site Number:	US1028

3 RF Exposure – Determination of Exemption

MPE based Exemption per 447498 D01 General RF Exposure Guidance v06

Z-Wave Standard

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density
P = power input to the antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Maximum peak output power at the antenna terminal:	-2.43	(dBm)
Maximum peak output power at the antenna terminal:	0.571478637	(mW)
Antenna gain(typical):	0	(dBi)
Maximum antenna gain:	1	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	916	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	0.61	(mW/cm^2)
Power density at prediction frequency:	0.000114	(mW/cm^2)

Z-Wave Long Range

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density
P = power input to the antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Maximum peak output power at the antenna terminal:	12.27	(dBm)
Maximum peak output power at the antenna terminal:	16.86553025	(mW)
Antenna gain(typical):	0.3	(dBi)
Maximum antenna gain:	1.071519305	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	920	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	0.61	(mW/cm^2)
Power density at prediction frequency:	0.003595	(mW/cm^2)

Z-Wave Standard and Z-Wave Long Range can not transmit simultaneously.

4 Simultaneous Transmission MPE Evaluation

Device includes previously certifed radio modules with the following details,

FCC ID: 2BAL9YDITRZB, IC: 30221-YDITRZB

Zigbee (antenna gain 2.5dBi)

Power density: 0.0368mW/cm2, Limit: 1.0mW/cm2

BLE (antenna gain 2.5dBi)

Power density: 0.0350mW/cm2, Limit: 1.0mW/cm2

FCC ID: 2ABCB-RPICM4, IC: 20953-RPICM4 (change in ID from FCC ID: 2ABCB-RPIRM0)

2.4GHz WiFi (antenna gain 3.5dBi)

Power density: 0.0154mW/cm2, Limit: 1.0mW/cm2

5GHz WiFi (antenna gain 2.3dBi)

Power density: 0.0223mW/cm2, Limit: 1.0mW/cm2

FCC ID: XMR201807EG95NA, IC: 10224A-2018EG95NA

LTE module (antenna gain 4dBi)

Power density: 0.0160mW/cm2, Limit: 0.47mW/cm2 (worst-case LTE Band 12)

Highest Power Density / Limit Ratios for each radio technology are as follows:

Z-Wave Long Range (worst-case)	WiFi 2.4GHz	WiFi 5GHz	BLE	Zigbee/Thread	LTE Cellular
0.0036 / 0.61 = 0.0059	0.0154 / 1 = 0.0154	0.0223 / 1 = 0.0223	0.0350 / 1 = 0.0350	0.0368 / 1 = 0.0368	0.0160 / 0.47 = 0.0340

Possible simultaneous transmission configurations in the device (including cellular module for worst-case):

ZWave	WiFi 2.4G	WiFi 5G	BLE	Zigbee/Thread	LTE Cellular
X	X		X		X
X		X	X		X
X	X			X	X
X		X		X	X

Combined Power Density / Limit Ratios for simultaneous transmission configurations:

Simult. Tx Config.	Z-Wave	WiFi 2.4GHz	WiFi 5GHz	BLE	Zigbee/ Thread	LTE Cellular	Total	Limit	Result
1	0.0059	0.0154	--	0.0350	--	0.0340	0.0903	1.0	Pass
2	0.0059	--	0.0223	0.0350	--	0.0340	0.0972	1.0	Pass
3	0.0059	0.0154	--	--	0.0368	0.0340	0.0921	1.0	Pass
4	0.0059	--	0.0223	--	0.0368	0.0340	0.0990	1.0	Pass

5 Conclusion

EUT meets the FCC RF exposure limits for general population as a mobile device.

Document Revisions

Issue No.	Summary of Changes	Date Issued	Prepared by	Approved by
1	Original Release	May 1, 2024	YF	AA
2	Added simultaneous transmission MPE evaluation	Jul 3, 2024	YF	AA
3	To address TCB review comments: - Updated Section 1.1 “Multiple Simultaneous RF Sources” to “Yes”	Sep 20, 2024	YF	AA

End of Report