Certificate Number: 5055.02

MPE REPORT

Report No.: SRTC2021-9004(F)-21030304(I)

Product Name: BACnet IP/MSTP VAV Controller

Product Model: WEB-VA75IBWA24NM, CPO-VA75IBWA24NM

Applicant: Honeywell (Beijing) Technology Solutions Lab Co., Ltd.

Manufacturer: Honeywell (Beijing) Technology Solutions Lab Co., Ltd.

Specification: FCC Part §2.1091, §2.1093, §1.1307(b), §1.1310 (2020)

FCC ID: 2ARTN-00006

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District,

Beijing, P.R.China

Tel: 86-10-57996183 Fax: 86-10-57996388

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1 GENERAL INFORMATION

1.1 Notes of the test report

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1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, P.R.China
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
Tel:	+86 10 57996183
Fax:	+86 10 57996388
Email:	liujiaf@srtc.org.cn

1.3 Applicant's details

Company:	Honeywell (Beijing) Technology Solutions Lab Co., Ltd.
Address:	A1 Building, C&W Industry Zone, No.14 Jiuxianqiao Road, Chaoyang District, Beijing, 100015, P.R. China
City:	Beijing
Country or Region:	China
Contacted person:	Zhang John
Tel:	010 56696736
Fax:	---
Email:	John.Zhang@Honeywell.com

1.4 Manufacturer's details

Company:	Honeywell (Beijing) Technology Solutions Lab Co., Ltd.
Address:	A1 Building, C&W Industry Zone, No.14 Jiuxianqiao Road, Chaoyang District, Beijing, 100015, P.R. China
City:	Beijing
Country or Region:	China
Contacted person:	Zhang John
Tel:	010 56696736
Fax:	---
Email:	John.Zhang@Honeywell.com

2 DESCRIPTION OF THE DEVICE UNDER TEST

2.1 Final Equipment Build Status

Frequency Bands	BT/BLE: 2400MHz – 2483.5MHz WIFI2.4GHz: 2400MHz – 2483.5MHz WIFI5GHz UNII-1: 5150MHz – 5250MHz WIFI5GHz UNII-2A: 5250MHz – 5350MHz WIFI5GHz UNII-2C: 5470MHz – 5725MHz WIFI5GHz UNII-3: 5725MHz – 5850MHz
Mode	BT:GFSK/π/4DQPSK/8DPSK BLE: GFSK WIFI2.4GHz: 802.11b/g/n HT20/n HT40 WIFI5GHz: 802.11a/n HT20/n HT40
Power Supply	Charger or DC Power Supply
Hardware Version	RevA
Software Version	1.0.0.0
IMEI or Sample	#1

Note1: There are two product models provided by manufacturers, but their RF parameters have not changed, and we choose WEB-VA75IBWA24NM as the test model.

Note2: The antenna provide to the EUT, please refer to the following table:

SN	Brand	Model	Antenna gain(dBi)	Frequency range(GHz)	Antenna type	Connecter Type
Ant1	N/A	ANT-DB1-LCD-SMA	2.80	2.402GHz~2.480GHz	Fixed External Antenna	SMA
Ant1	N/A	ANT-DB1-LCD-SMA	4.50	5.150GHz~5.250GHz	Fixed External Antenna	SMA
Ant1	N/A	ANT-DB1-LCD-SMA	4.50	5.250GHz~5.350GHz	Fixed External Antenna	SMA
Ant1	N/A	ANT-DB1-LCD-SMA	4.50	5.470GHz~5.725GHz	Fixed External Antenna	SMA
Ant1	N/A	ANT-DB1-LCD-SMA	2.92	5.725GHz~5.850GHz	Fixed External Antenna	SMA
Ant2	N/A	MPN	-0.31	2.402GHz~2.480GHz	Fixed External	SMA

		ARY113-0012-006-00			Antenna	
Ant2	N/A	MPN ARY113-0012-006-00	1.17	5.150GHz~5.250GHz	Fixed External Antenna	SMA
Ant2	N/A	MPN ARY113-0012-006-00	-0.70	5.250GHz~5.350GHz	Fixed External Antenna	SMA
Ant2	N/A	MPN ARY113-0012-006-00	-1.04	5.470GHz~5.725GHz	Fixed External Antenna	SMA
Ant2	N/A	MPN ARY113-0012-006-00	1.17	5.725GHz~5.850GHz	Fixed External Antenna	SMA

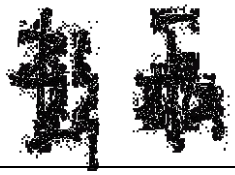
Note: This device uses an antenna with SMA connector, only professional installation will be permitted. The installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

3 REFERENCE SPECIFICATION

Specification	Version	Title
2.1091	2020	Radio frequency radiation exposure evaluation: mobile devices.
2.1093	2020	Radio frequency radiation exposure evaluation: portable devices.
1.1307(b)	2020	Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.
1.1310	2020	Radio frequency radiation exposure limits.
KDB447498	October 23, 2015	RF exposure procedures and equipment authorization policies for mobile and portable devices

4 RESULT SUMMARY

No.	Test case	FCC reference
1	MPE Calculation	FCC Part §2.1091, FCC Part §2.1093, FCC Part §1.1307(b) FCC Part §1.1310 KDB 447498

This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Mr. Li Bin 
Tested by: Mr. Tong Daocheng 	Issued date: 20210615

5 TEST RESULTS

5.1 Average Power Output Test Result

BT

Modulation type	Conducted Average Power(dBm)		
	2402MHz	2440MHz	2480MHz
GFSK	2.38	3.17	3.20
π4DQPSK	-1.96	-1.61	-1.92
8DPSK	-1.98	-1.60	-1.92

BLE

Modulation type	Conducted Average Power(dBm)		
	2402MHz	2440MHz	2480MHz
GFSK (LE 1Mbps)	-4.28	-3.89	-5.20

WLAN 2.4G

Modulation type	Conducted Average Power		
	2412MHz (Ch1)	2442MHz (Ch7)	2472MHz (Ch13)
11b	16.41	16.37	16.38
11g	15.02	14.98	15.24
11n HT20	14.48	14.46	14.85
Modulation type	Conducted Average Power(dBm)		
	2422MHz (Ch3)	2442MHz (Ch7)	2462MHz (Ch11)
11n HT40	15.37	15.42	15.52

WLAN 5G

U-NII-1

Test Mode	Conducted Average Power(dBm)		
	5180MHz	5200MHz	5240MHz
802.11a	13.89	14.48	15.27
802.11n HT20	13.44	14.04	14.86
802.11ac VHT20	11.83	12.25	13.19
Test Mode	Conducted Average Power(dBm)		
	5190MHz	5230MHz	
802.11n HT40	13.58	14.65	
802.11ac VHT40	12.06	13.01	
Test Mode	Conducted Average Power(dBm)		
	5210MHz		
802.11ac VHT80	12.20		

U-NII-2A

Test Mode	Conducted Average Power(dBm)		
	5260MHz	5300MHz	5320MHz
802.11a	14.82	15.29	15.76
802.11n HT20	14.50	14.80	15.38
802.11ac VHT20	12.66	13.07	13.60
Test Mode	Conducted Average Power(dBm)		
	5270MHz	5310MHz	
802.11n HT40	14.36	14.98	
802.11ac VHT40	12.71	13.28	
Test Mode	Conducted Average Power(dBm)		
	5290MHz		
802.11ac VHT80	12.69		

U-NII-2C

Test Mode	Conducted Average Power(dBm)		
	5500MHz	5580MHz	5700MHz
802.11a	15.75	15.83	15.48
802.11n HT20	15.37	15.50	14.78
802.11ac VHT20	13.63	13.73	13.02
Test Mode	Conducted Average Power(dBm)		
	5510MHz	5670MHz	
802.11n HT40	15.61	15.59	
802.11ac VHT40	13.74	13.67	
Test Mode	Conducted Average Power(dBm)		
	5610MHz		
802.11ac VHT80	12.95		

U-NII-3

Test Mode	Conducted Average Power(dBm)		
	5745MHz	5785MHz	5825MHz
802.11a	15.74	15.15	15.49
802.11n HT20	15.11	14.80	14.99
802.11ac VHT20	13.67	13.04	13.50
Test Mode	Conducted Average Power(dBm)		
	5755MHz	5795MHz	
802.11n HT40	15.24	14.91	
802.11ac VHT40	13.46	13.12	
Test Mode	Conducted Average Power(dBm)		
	5775MHz		
802.11ac VHT80	13.09		

5.2 Calculation result

FCC LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

(A) Limits for Occupational/Controlled Exposure ☐

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm2)	Averaging Time |E|2, |H|2 or S (minutes)
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f^2	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

(B) Limits for General Population/Uncontrolled Exposure ☑

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm2)	Averaging Time |E|2, |H|2 or S (minutes)
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f^2	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

Calculation procedure:

According to §2.1091, §2.1093, §1.1307(b) and §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

The $S = PG / (4\pi R^2)$

Where S = power density in mW/cm^2

P = transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

The calculations in the table below use the highest gain of antenna for client EUT. These calculations represent worst case in terms of the exposure levels.

Band	Freq. (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit
BT	2480	2.80	3.20	6.00	3.98	0.001	1.000	0.001
BLE	2440	2.80	-3.89	-1.09	0.78	0.001	1.000	0.001
WLAN2.4GHz Band	2472	2.80	16.41	19.21	83.37	0.017	1.000	0.017
WLAN5.2GHz Band	5240	4.50	15.27	19.77	94.84	0.019	1.000	0.019
WLAN5.3GHz Band	5320	4.50	15.76	20.26	106.17	0.021	1.000	0.021
WLAN5.6GHz Band	5580	4.50	15.83	20.33	107.89	0.021	1.000	0.021
WLAN5.8GHz Band	5745	2.92	15.74	18.66	73.45	0.015	1.000	0.015

Note:

For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.

Worst Simultaneous Transmission Result

BT Power Density / Limit	WLAN Power Density / Limit	Σ(Power Density / Limit) of BT+ WLAN
0.001	0.021	0.022

Note: Simultaneous Transmission Limit=Power Density_1/ limit_1 + Power Density_2/ limit_2<1

According to the KDB447498 D01 section 7.1 determine the device is exclusion from SAR test.

---End of Test Report---