TEST REPORT

Report No.: SHATBL2402014W03

Applicant	:	QUNDA Control Technology(Jiangsu)Co.,Ltd.
Product Name	:	Thermostat
Brand Name	:	qunda Controller Expert
Model Name	:	QD-HVAC10(W)(QUNDA)
FCC ID	:	2BFIE-QD-HVAC10W
Test Standard	:	47 CFR Part 2.1093
Date of Test	:	2024.03.10-2024.03.18

Report Prepared by : Jack Suo

(Jack Suo)

Report Approved by : Ghost Li.

(Ghost Li)

Authorized Signatory : Terry Yang

(Terry Yang)

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REVISION HISTORY

Rev.	Issue Date	Revisions	Revised by
00	2024.03.19	Initial Release	Ghost Li

DECLARATION OF REPORT

1. The device has been tested by ATBL, and the test results show that the equipment under test (EUT) is in compliance with the requirements of 47 CFR Part 2.1093. And it is applicable only to the tested sample identified in the report.

2. This report shall not be reproduced except in full, without the written approval of ATBL, this document only be altered or revised by ATBL, personal only, and shall be noted in the revision of the document.

3. The general information of EUT in this report is provided by the customer or manufacture, ATBL is only responsible for the test data but not for the information provided by the customer or manufacture.

4. The results in this report is only apply to the sample as tested under conditions. The customer or manufacturer is responsible for ensuring that the additional production units of this model have the same electrical and mechanical components.

1. GENERAL DESCRIPTION

1.1. Applicant

Name : QUNDA Control Technology(Jiangsu)Co.,Ltd.

Address : NO.888 LongQiao Road,WuJiang Economy Development Area SuZhou,Jiangsu,China

1.2. Manufacturer

Name : QUNDA Control Technology(Jiangsu)Co.,Ltd.

Address : NO.888 LongQiao Road,WuJiang Economy Development Area SuZhou,Jiangsu,China

1.3. Factory

Name : QUNDA Control Technology(Jiangsu)Co.,Ltd.

Address : NO.888 LongQiao Road,WuJiang Economy Development Area SuZhou,Jiangsu,China

1.4. General Information of EUT

General Information	
Equipment Name	Thermostat
Brand Name	qunda Controller Expert
Model Name	QD-HVAC10(W)(QUNDA)
Series Model	QD-HVAC10(W) QD-HVAC10(W2S)(QUNDA) [QD-HVAC10(W)(MECHDOC)]
Model Difference	The same structure, different LOGO, different function (main test model is full function, series model is deletion function)
SN or IMEI Code	202401290023005
Power Input	18-30V~Max.1.5A 50-60Hz
Hardware version	QD-HVAC10
Software version	QD-HVAC10-XSB
Connecting I/O Port(s)	Refer to the remark below.

Remark:

The above information of EUT was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.5. Equipment Specification

For WLAN

Equipment Specification	
Frequency Range	2400~2483.5 MHz
Supported Modes	802.11b/g/n
Supported Bandwidth	20 MHz
Type of Modulation	802.11b: DSSS (DBPSK/DQPSK/CCK) 802.11g/n(HT): OFDM (BPSK/QPSK/16QAM/64QAM)
Antenna Type	PCB Antenna
Antenna Gain	2.54dBi

For BLE

Equipment Specification	
Frequency Range	2400MHz - 2483.5MHz
Number of Channels	40
Carrier Frequency of Each Channel	2402 + n*1 MHz; n = 0 ~ 39
Type of Modulation	GFSK
Antenna Type	PCB Antenna
Antenna Gain	2.54dBi

1.6. Modification of EUT

No modifications are made to the EUT during all test items.

1.7. Laboratory Information

Company Name	:	Shanghai ATBL Technology Co., Ltd.
Address	:	Building 8,No.160 Basheng Road, Waigaoqiao Free Trade Zone, Pudong New Area, Shanghai
Telephone	:	+86(0)21-51298625

1.8. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

Standard	Description
47 CFR Part 15.247	Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.
47 CFR Part 2.1093	Radio frequency radiation exposure evaluation: mobile devices.
KDB 447498 D01 V06	Rf Exposure Procedures And Equipment Authorization Policies For Mobile And Portable Devices

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

2. RF EXPOSURE EVALUATION

2.1. Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
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
300–1,500			f/300	<6
1,500–100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
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
300–1,500			f/1500	<30
1,500–100,000			1.0	<30

Note:

f = frequency in MHz.

* = Plane-wave equivalent power density.

2.2. Formula

Below method describes a theoretical approach to calculate possible exposure to electromagnetic radiation around a base station transceiver antenna. Precise statements are basically only possible either with measurements or complex calculations considering the complexity of the environment (e.g. soil conditions, near buildings and other obstacles) which causes reflections, scattering of electromagnetic fields. The maximum output power (given in EIRP) of a base station is usually limited by license conditions of the network operator. A rough estimation of the expected exposure in power flux density on a given point can be made with the following equation.

$$Pd_{(mW/cm^2)} = \frac{P_{(mW)} * G_{numeric}}{4 * r^2_{(cm)} * \pi}$$

Pd = Power Density

P = Maximum output power

G numeric = Numeric gain of the antenna relative to isotropic antenna

r = distance between the antenna and the point of exposure

2.3. MPE Result

2.3.1. For WLAN

Operating Band	Frequency (MHz)	Ant. Gain (dBi)	Max Conducted Average Output Power (dBm)	EIRP/ERP (dBm)	EIRP/ERP Limit (dBm)	EIRP/ERP (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)	Result
2.4GHz	2437	2.54	24.09	26.63	36.00	460.257	0.09161	1.0000	Pass

2.3.2. For BLE

Operating Band	Frequency (MHz)	Ant. Gain (dBi)	Max Conducted Average Output Power (dBm)	EIRP/ERP (dBm)	EIRP/ERP Limit (dBm)	EIRP/ERP (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)	Result
BLE	2402	2.54	3.58	6.12	36.00	4.093	0.00081	1.0000	Pass

Note:The product supports 2.4G and BLE mode,but not support 2.4G and BLE simultaneous transmission.

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