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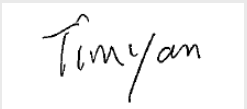
Test report No: 4920711.52

TEST REPORT
Radio Exposure

Identification of item tested	WIFI module
Trademark	HISENSE
Model and /or type reference	MWB414S.05
FCC/IC ID	2A4A3-WASHER2024
Features	3.3 Vdc, 150 mA
Applicant´s name / address	Hisense Ronshen (Guangdong) Refrigerator Co., Ltd. No. 8 Ronggang Road, Ronggui, Shunde, Foshan 528303, China
Test method requested, standard	KDB 447498 D01V06; FCC Part 1.1310
Verdict Summary	COMPLIANCE
Tested by (name & signature)	Harry Deng 
Approved by (name & signature)	Tim Yan 
Date of issue	2024-08-27
Report template No	TRF_EMC 2017-06- FCC_Exposure

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GENERAL CONDITIONS

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.
5. This report will not be used for social proof function in China market.

UNCERTAINTY

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in EN 55016-4-2 (CISPR 16-4-2), EN/IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards.

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

☒ Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.				
☐ Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.				
Decimal separator used in this report	☐	Comma (,)	☒	Point (.)

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	:	Equipment Under Test
QP	:	Quasi-Peak
CAV	:	CISPR Average
AV	:	Average
CDN	:	Coupling Decoupling Network
SAC	:	Semi-Anechoic Chamber
OATS	:	Open Area Test Site
BW	:	Bandwidth
AM	:	Amplitude Modulation
PM	:	Pulse Modulation
HCP	:	Horizontal Coupling Plane
VCP	:	Vertical Coupling Plane
U_N	:	Nominal voltage
*T*x	:	Transmitter
*R*x	:	Receiver
N/A	:	Not Applicable
N/M	:	Not Measured

DOCUMENT HISTORY

Report nr.	Date	Description
4920711.52	2024-07-08	First release.

REMARKS AND COMMENTS

The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item .....:	WIFI module
Trademark.....:	PHILIPS AVENT
Model / Type number.....:	MWB414S.05
FCC ID.....:	2A4A3-WASHER2024
Ratings.....:	3.3 Vdc, 150 mA
Manufacturer/Factory.....:	Qingdao Hisense Communication Co., Ltd. No.218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, Shandong Province, China

RF specification for 2.4 GHz Wi-Fi (base on client's declaration)

Operating frequency range(s).....:	2412-2462 MHz (802.11 b/g/n HT20); 2402-2480 MHz (BLE)
Type of Modulation .....:	802.11b:DSSS(DBPSK/DQPSK/CCK); 802.11g/n:OFDM(BPSK/QPSK/16QAM/64QAM) BLE: GFSK
Maximum RF output power (conducted) .....:	15.83 dBm
E.I.R.P. .....:	14.30 dBm
Antenna type.....:	PCB antenna
Antenna gain.....:	-1.53 dBi
Antenna Delivery .....:	1TX + 1RX
Antenna technology .....:	SISO
Number of channel .....:	11

RF specification for BLE (base on client's declaration)

Operating frequency range(s).....:	2402-2480 MHz
Maximum RF output power (conducted) .....:	2.00 dBm
E.I.R.P. .....:	0.47 dBm
Type of Modulation .....:	GFSK
PHYs.....:	LE 1M
Data Rate.....:	1 Mbit/s
Antenna type.....:	PCB antenna
Antenna gain.....:	-1.53 dBi
Antenna Delivery .....:	1TX + 1RX
Antenna technology .....:	SISO
Number of channel .....:	40

Rated power supply.....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 3.3 V					
	☐	Battery:					
Mounting position.....:	☐	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☒	Other: mounted inside end-product.					

Intended use of the Equipment Under Test (EUT)
The apparatus as supplied for the test is WIFI module which intended for residential use, the product contains electronic circuitry

1.2 Test data

Test Location	DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China FCC Designation Number: CN1324; ISED CAB identifier: CN0130
Date of receipt of test item	2024-06-12
Date (s) of performance of tests	2024-06-12 to 2024-06-25

1.3 The environment(s) in which the EUT is intended to be used

The equipment under test (EUT) is intended to be used in the following environment(s):

☒	Residential (domestic) environment.
☒	Commercial and light-industrial environment.
☐	Industrial environment.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Operating mode description	Used for methos	
		Conducted	Radiated
1	Transmitting at Wi-Fi mode	☒	☒
2	Transmitting at BLE mode	☒	☒
3		☐	☐
Supplemental information: ---			

2.2 Port(s) of the EUT

Port name and description	Connected to / Termination	Cable		
		Length used during test [m]	Attached during test	Shielded
---	---	0	☒	☐
			☐	☐
			☐	☐
Supplemental information: ---				

2.3 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by
Laptop	Latitude 5488	DELL	DEKRA
Supplemental information: ---			

2.4 Test Configuration / Block diagram used for tests

Refer to Annex 3.

3 RF EXPOSURE EVALUATION

3.1 Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)
LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100.000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100.000	--	--	1	30

F= Frequency in MHz

Friis Formula
Friis transmission formula: Pd = (Pout*G)/(4*pi*r^2)

Where
Pd = power density in mW/cm2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
Pi = 3.1416
R = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, 1 mW/cm^2 of FCC and 0.54 mW/cm^2. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

3.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 25 ℃and 50％ RH.

3.3 Test Result

Power Density：

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 20 cm (mW/cm^2)	Limit of Power Density S(mW/cm^2)	Verdict
Mode 1	2400 ~ 2483.5	15.83	0.007	1	PASS
Mode 2	2400 ~ 2483.5	2.0	0.0001	1	PASS
Mode 1+2	2400 ~ 2483.5	---	0.0071	1	PASS

--- END ---