



RF Exposure Evaluation

For

Bird Home Automation GmbH

IP Door Station

Test Model: D11x Rev 2.0

Prepared for : Bird Home Automation GmbH
Address : Uhlandstr. 165, 10719 Berlin, Germany

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : October 11, 2024

Number of tested samples : 2

Sample number : A240712073-1, A240712073-2

Serial number : Prototype

Date of Test : October 11, 2024 ~ October 25, 2024

Date of Report : October 25, 2024



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**RF Exposure Evaluation****Report Reference No.** : LCSA07154034EB**Date of Issue** : October 25, 2024**Testing Laboratory Name** : Shenzhen LCS Compliance Testing Laboratory Ltd.**Address** : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China**Testing Location/ Procedure** : Full application of Harmonised standards ☒
Partial application of Harmonised standards ☐
Other standard testing method ☐**Applicant's Name** : Bird Home Automation GmbH**Address** : Uhlandstr. 165, 10719 Berlin, Germany**Test Specification****Standard** : FCC KDB publication 447498 D01 General 1 RF Exposure
Guidance v06
FCC CFR 47 part1 1.1310
FCC CFR 47 part2 2.1091**Test Report Form No.** : TRF-4-E-214 A/0**TRF Originator** : Shenzhen LCS Compliance Testing Laboratory Ltd.**Master TRF** : Dated 2011-03**Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.**

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EUT Description : IP Door Station**Trade Mark** : DoorBird**Test Model** : D11x Rev 2.0**Ratings** : 15VDC/1A or PoE IEEE802.3.af**Result** : PASS**Compiled by:**

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RF Exposure Evaluation

Test Report No. : LCSA07154034EA	<u>October 25, 2024</u> Date of issue
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Test Model.....	: D11x Rev 2.0
EUT.....	: IP Door Station
Applicant.....	: Bird Home Automation GmbH
Address.....	: Uhlandstr. 165, 10719 Berlin, Germany
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: Bird Home Automation GmbH
Address.....	: Uhlandstr. 165, 10719 Berlin, Germany
Telephone.....	: /
Fax.....	: /
Factory.....	: Bird Home Automation GmbH
Address.....	: Uhlandstr. 165, 10719 Berlin, Germany
Telephone.....	: /
Fax.....	: /

Test Result	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.





Revision History

Report Version	Issue Date	Revision Content	Revised By
000	October 25, 2024	Initial Issue	--





TABLE OF CONTENTS

Description	Page
1. PRODUCT INFORMATION	6
2. EVALUATION METHOD	7
3. LIMIT	7
3.1 Refer Evaluation Method	7
3.2 Limit	7
4. MPE CALCULATION METHOD	8
5. ANTENNA INFORMATION	8
6. CONDUCTED POWER	8
7. MANUFACTURING TOLERANCE	9
8. MEASUREMENT RESULTS	10
8.1 Standalone MPE	10
8.2 Simultaneous Transmission MPE	10
9. CONCLUSION	10
10. DESCRIPTION OF TEST FACILITY	10
11. MEASUREMENT UNCERTAINTY	11





1. Product Information

Product name	IP Door Station
Test Model	D11x Rev 2.0
Ratings	15VDC/1A or PoE IEEE802.3.af
Hardware Version	/
Software Version	/
Frequency Range	2412MHz ~ 2462MHz
Channel Spacing	5MHz
Channel Number	11 Channels for 20MHz bandwidth (2412~2462MHz) 7 Channels for 40MHz bandwidth (2422~2452MHz)
Modulation Type	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	Internal Antenna, 2.17dBi(max.)
Exposure category	General population/uncontrolled environment
EUT Type	Production Unit
Device Type	Mobile Devices





2. Evaluation Method

Systems operating under the provisions of FCC 47 CFR 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. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3. Limit

3.1 Refer Evaluation Method

[ANSI C95.1-1999](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1091](#): Radiofrequency radiation exposure evaluation: mobile devices

3.2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100)*	30
3.0 – 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





4. MPE Calculation Method

Predication of MPE limit at a given distance

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

$$S=PG/4\pi R^2$$

Where: S=power density

P=power input to 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

5. Antenna Information

EUT can only use antennas certificated as follows provided by manufacturer:

Internal Identification	Antenna type and antenna number	Operate frequency band	Maximum antenna gain
WIFI Antenna	Internal Antenna	2412MHz-2462MHz	2.17dBi
Sensor Modular Antenna	Internal Antenna	24.15-24.25GHz	7.2dBi
BT Antenna	Internal Antenna	2402-2480MHz	1.0dBi

6. Conducted Power

<2.4G WIFI>

Mode	Channel	Frequency(MHz)	Max Conducted Power (dBm)
IEEE 802.11b	1	2412	15.56
	6	2437	15.45
	11	2462	15.18
IEEE 802.11g	1	2412	14.96
	6	2437	14.84
	11	2462	14.65
IEEE 802.11n HT20	1	2412	13.52
	6	2437	13.38
	11	2462	13.21
IEEE 802.11n HT40	3	2422	12.81
	6	2437	12.16
	9	2452	12.83





<BLE>

	Modulation	Channel	Max. Conducted Power (dBm)
BLE	GFSK	LCH	-4.08
		MCH	-3.87
		HCH	-3.98

<Sensor Modular>

	Channel	Max. EIRP (dBm)
Sensor Modular	1	13

7. Manufacturing Tolerance

<2.4G WIFI>

11B (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	15.0	15.0	15.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
11G (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	14.0	14.0	14.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
11N20SISO (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	13.0	13.0	13.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
11N40SISO (Peak)			
Channel	Channel 3	Channel 6	Channel 9
Target (dBm)	12.0	12.0	12.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0

<BLE>

Modulation	Channel	Max. Conducted Power (dBm)	ANT Max. Tune Up Power (dBm)
GFSK	LCH	-4.08	-4.08 $\pm$ 1.0
	MCH	-3.87	-3.87 $\pm$ 1.0
	HCH	-3.98	-3.98 $\pm$ 1.0

<Sensor Modular>

	Channel	Max. EIRP (dBm)	ANT Max. Tune Up Power (dBm)
Sensor Modular	1	13	13 $\pm$ 1.0





8. Measurement Results

8.1 Standalone MPE

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, $r=20\text{cm}$, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW				
IEEE 802.11b	16.0	39.8107	2.17	1.6482	0.0131	1.0000
IEEE 802.11g	15.0	31.6228	2.17	1.6482	0.0104	1.0000
IEEE 802.11n HT20	14.0	25.1189	2.17	1.6482	0.0082	1.0000
IEEE 802.11n HT40	13.0	19.9526	2.17	1.6482	0.0065	1.0000
BLE GFSK	-2.0	0.6310	1.0	1.2589	0.0002	1.0000

Function	EIRP		MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW		
Sensor Modular	14	25.1189	0.00500	1.0000

Remark:

1. Output power including tune-up tolerance;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer;

8.2 Simultaneous Transmission MPE

The sample supports one BT antenna, one WiFi antenna and another sensor module transmitting antenna, so simultaneous transmission needs to be considered. Simultaneous transmission MPE According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations; Σ of MPE ratios ≤ 1.0

mode	Σ MPE ratios	Limit	Results
WIFI+BLE+Sensor Modular	0.0183	1.0	PASS

9. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

10. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

Test Firm Registration Number: 254912.





11. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Output power	1GHz-40GHz	$\pm 0.57\text{dB}$	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

.....THE END OF REPORT.....

