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Report Template Version: V05
Report Template Revision Date: 2021-11-03

RF Exposure Evaluation Report

Report No.:	CQASZ20240400737E-03
Applicant:	Hesung Innovation Limited
Address of Applicant:	Room 803, Chevalier House, 45-51 Chatham Road South, Tsim Sha Tsui, Kowloon, HongKong
Equipment Under Test (EUT):	
EUT Name:	Smart Ceiling Fan
Model No.:	DR-HCF002S, WDR-CF002S, DTCF02S, DWCF02S, DBCF02S, DCCF02S, DKCF02S, DOCF02S
Test Model No.:	DR-HCF002S
Brand Name:	DREO
FCC ID:	2A3SYCF002S
Standards:	47 CFR Part 1.1307 47 CFR Part 1.1310 447498 D04 Interim General RF Exposure Guidance v01
Date of Receipt:	2024-04-30
Date of Test:	2024-04-30 to 2024-05-13
Date of Issue:	2024-05-15
Test Result:	**PASS***

***In the configuration tested, the EUT complied with the standards specified above**

Tested By: lewis zhou
(Lewis Zhou)

Reviewed By: Timo Lei
(Timo Lei)

Approved By: Alex
(Alex Wang)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20240400737E-03	Rev.01	Initial report	2024-05-15

2 Contents

3 General Information

3.1 Client Information

Applicant:	Hesung Innovation Limited
Address of Applicant:	Room 803, Chevalier House, 45-51 Chatham Road South, Tsim Sha Tsui, Kowloon, HongKong
Manufacturer:	Hesung Innovation Limited
Address of Manufacturer:	Room 803, Chevalier House, 45-51 Chatham Road South, Tsim Sha Tsui, Kowloon, HongKong
Factory:	Hesung Innovation Limited
Address of Factory:	Room 803, Chevalier House, 45-51 Chatham Road South, Tsim Sha Tsui, Kowloon, HongKong

3.2 General Description of EUT

Product Name:	Smart Ceiling Fan
Model No.:	DR-HCF002S, WDR-CF002S, DTCF02S, DWCF02S, DBCF02S, DCCF02S, DKCF02S, DOCF02S
Test Model No.:	DR-HCF002S
Trade Mark:	DREO
Software Version:	V1.0
Hardware Version:	IMB-4N01 V1.0 20231026
EUT Power Supply:	Power supply AC 120V

3.3 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 5.2
Modulation Type:	GFSK
Number of Channel:	40
Transfer Rate:	1Mbps
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	FPC antenna
Antenna Gain:	4.99dBi

3.4 General Description of 2.4G WIFI Classic

Operation Frequency:	2412MHz~2462MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Channel Separation:	5MHz
Transfer Rate:	IEEE for 802.11b: 1Mbps/2Mbps/5.5Mbps/11Mbps IEEE for 802.11g : 6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps IEEE for 802.11n(HT20) : 6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	FPC antenna
Antenna Gain:	4.99dBi

Note：

The above parameters will directly affect the test results. The information is provided by the applicant.

4 MPE Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

The table applies to any RF source (i.e., single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least $\lambda/2\pi$. The thresholds are based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator.For mobile devices that are not exempt per Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP20cm inFormula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{\text{th}}\,(\text{mW}) = ERP_{20\,\text{cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave Dipole.
SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

4.1.2 Test Procedure

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

4.1.3 EUT RF Exposure

1) For BLE

Measurement Data

GFSK mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2402MHz)	4.59	2.44	2.5±1	3.5	2.24
Middle(2440MHz)	4.08	1.93	2.0±1	3	2.00
Highest(2480MHz)	3.66	1.51	1.5±1	2.5	1.78

The ERP of this product is less than 3060mW

Note: 1) Refer to report No. CQASZ20240400737E-01 for EUT test Max Conducted Peak Output Power value.
2) EUT's module is more than 20cm away from the human body.

2) **For 2.4G WIFI Classic**

Measurement Data

11B mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	14.24	12.09	12.0±1	13	19.95
Middle(2437MHz)	13.48	11.33	11.5±1	12.5	17.78
Highest(2462MHz)	14.96	12.81	12.5±1	13.5	22.39
11G mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	8.78	6.63	6.5±1	7.5	5.62
Middle(2437MHz)	8.33	6.18	6.0±1	7	5.01
Highest(2462MHz)	10.37	8.22	8.0±1	9	7.94
11N20 mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	8.33	6.18	6.0±1	7	5.01
Middle(2437MHz)	8.12	5.97	6.0±1	7	5.01
Highest(2462MHz)	9.92	7.77	7.5±1	8.5	7.08

The ERP of this product is less than 3060mW

Note: 1) Refer to report No. CQASZ20240400737E-02 for EUT test Max Conducted AV Output Power value.
2) EUT's module is more than 20cm away from the human body.

*** END OF REPORT ***