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RF Exposure Evaluation Report

Report No.: CQASZ20240801591E-02
Applicant: Shenzhen Kean Digital Co., Ltd.
Address of Applicant: Room 1001, Rujun Building, No. 105, Zhongxing Road, Ma'antang Community, Bantian Street, Longgang District, Shenzhen
Equipment Under Test (EUT):
EUT Name: Network Video Recorder
Model No.: N48WHR, N48WHE, N44WEK, N44WEV, N44WEW, N48WHV, N48WHW, N48WHY, N48WHZ, N98WHD, N98WHE, N98WHF, N98WHG, N98WHR, N58WHD, N58WHE, N58WHF, N58WHG, N54WHD, N54WHE, N94WHD, N94WHE
Test Model No.: N48WHE
Brand Name: N/A
FCC ID: 2AKL2N98WHE
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
447498 D04 Interim General RF Exposure Guidance v01
Date of Receipt: 2024-08-02
Date of Test: 2024-08-02 to 2024-09-03
Date of Issue: 2024-09-26
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)



The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20240801591E-02	Rev.01	Initial report	2024-09-26

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3 General Information

3.1 Client Information

Applicant:	Shenzhen Kean Digital Co., Ltd.
Address of Applicant:	Room 1001, Rujun Building, No. 105, Zhongxing Road, Ma'antang Community, Bantian Street, Longgang District, Shenzhen
Manufacturer:	Shenzhen Kean Digital Co., Ltd.
Address of Manufacturer:	Room 1001, Rujun Building, No. 105, Zhongxing Road, Ma'antang Community, Bantian Street, Longgang District, Shenzhen
Factory:	Shenzhen Chengan Electronics Co., Ltd.
Address of Factory:	Room 502, Building 46, No. 25, Honghua Road, Gongming Community, Gongming Street, Guangming District, Shenzhen

3.2 General Description of EUT

Product Name:	Network Video Recorder
Model No.:	N48WHR, N48WHE, N44WEK, N44WEV, N44WEW, N48WHV, N48WHW, N48WHY, N48WHZ, N98WHD, N98WHE, N98WHF, N98WHG, N98WHR, N58WHD, N58WHE, N58WHF, N58WHG, N54WHD, N54WHE, N94WHD, N94WHE
Test Model No.:	N48WHE
Trade Mark:	N/A
Software Version:	V1.0
Hardware Version:	V1.0
EUT Power Supply:	Power supply DC12V form adapter

3.3 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 and HT40) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 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 IEEE for 802.11n(HT40) : 13.5Mbps/27Mbps/40.5Mbps/54Mbps/81Mbps/108Mbps/121.5Mbps/135Mbps
Sample Type:	☒ Mobile ☐ Portable

Antenna Type:	FPC antenna, Knife-edge antenna
Antenna Gain:	FPC antenna: 3.42 dBi, Knife-edge antenna: 5 dBi

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 ERP_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

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

For 2.4G WIFI Classic

Module 1 Antenna 1

Measurement Data

11B mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	15.78	13.63	14.0±1	15	31.62
Middle(2437MHz)	14.58	12.43	12.5±1	13.5	22.39
Highest(2462MHz)	14.82	12.67	13.0±1	14	25.12
11G mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	10.58	8.43	8.5±1	9.5	8.91
Middle(2437MHz)	9.85	7.7	8.0±1	9	7.94
Highest(2462MHz)	10.57	8.42	8.5±1	9.5	8.91
11N20 mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	14.68	12.53	13.0±1	14	25.12
Middle(2437MHz)	15.37	13.22	13.5±1	14.5	28.18
Highest(2462MHz)	12.42	10.27	10.5±1	11.5	14.13
11N40 mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2422MHz)	12.1	9.95	10.0±1	11	12.59
Middle(2437MHz)	12	9.85	10.0±1	11	12.59
Highest(2452MHz)	12.45	10.3	10.5±1	11.5	14.13

The ERP of this product is less than 3060mW

Module 2 Antenna 2

Measurement Data

11B mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	14.5	12.35	12.5±1	13.5	22.39
Middle(2437MHz)	14.44	12.29	12.5±1	13.5	22.39
Highest(2462MHz)	14.41	12.26	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)	15.22	13.07	13.5±1	14.5	28.18
Middle(2437MHz)	14.22	12.07	12.5±1	13.5	22.39
Highest(2462MHz)	14.06	11.91	12.0±1	13	19.95
11N20 mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	14.23	12.08	12.5±1	13.5	22.39
Middle(2437MHz)	14.2	12.05	12.5±1	13.5	22.39
Highest(2462MHz)	14.14	11.99	12.0±1	13	19.95
11N40 mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2422MHz)	13.59	11.44	11.5±1	12.5	17.78
Middle(2437MHz)	14.03	11.88	12.0±1	13	19.95
Highest(2452MHz)	14.05	11.9	12.0±1	13	19.95

The ERP of this product is less than 3060mW

Module 2 Antenna 3**Measurement Data**

11B mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	14.51	12.36	12.5±1	13.5	22.39
Middle(2437MHz)	14.33	12.18	12.5±1	13.5	22.39
Highest(2462MHz)	14.51	12.36	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)	14.21	12.06	12.5±1	13.5	22.39
Middle(2437MHz)	14.22	12.07	12.5±1	13.5	22.39
Highest(2462MHz)	14.26	12.11	12.5±1	13.5	22.39
11N20 mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	14.25	12.1	12.5±1	13.5	22.39
Middle(2437MHz)	14.46	12.31	12.5±1	13.5	22.39
Highest(2462MHz)	14.49	12.34	12.5±1	13.5	22.39
11N40 mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2422MHz)	14.12	11.97	12.0±1	12.5	17.78
Middle(2437MHz)	14.07	11.92	12.0±1	13	19.95
Highest(2452MHz)	14.52	12.37	12.5±1	13.5	22.39

The ERP of this product is less than 3060mW

Note: 1) Refer to report No. CQASZ20240801591E-01 for EUT test Max Conducted Peak Output Power value.
2) EUT's module is more than 20cm away from the human body.

Result:

Because EUT has 2 independent WiFi 2.4G modules and 3 antennas, the worst mode is that WiFi 2.4G modules 1 antenna 1 and WiFi 2.4G modules 2 antenna 2, WiFi 2.4G modules 2 antenna 3 transmit at the same time.

WiFi 2.4G modules 1 antenna 1 + WiFi 2.4G modules 2 antenna 2 + WiFi 2.4G modules 2 antenna 3
= 31.62+28.18+22.39 = 82.19 <3060(mW)

*** END OF REPORT ***