



Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640

Fax: +86-755-26648637

Website: www.cqa-cert.com

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RF Exposure Evaluation Report

Report No.: CQASZ20201101365E-02
Applicant: Shanghai Yedao Technology Co., Ltd.
Address of Applicant: Room 1301, No. 5 Bibo Road, China (Shanghai) Pilot Free Trade Zone
Equipment Under Test (EUT):
EUT Name: Fixed Location Monitor
Model No.: KL Skyline Gen-9
Brand Name: N/A
FCC ID: 2AX7GKLSKYLINEGEN-9
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2020-11-10
Date of Test: 2020-11-10 to 2021-01-12
Date of Issue: 2021-01-12
Test Result: PASS*

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

Tested By:

Martin Lee

(Martin Lee)

Reviewed By:

Ares Liu

(Ares Liu)

Approved By:

Sheek Luo

(Sheek Luo)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20201101365E-02	Rev.01	Initial report	2021-01-12

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3 General Information

3.1 Client Information

Applicant:	Shanghai Yedao Technology Co., Ltd.
Address of Applicant:	Room 1301, No. 5 Bibo Road, China (Shanghai) Pilot Free Trade Zone
Manufacturer:	Shanghai Yedao Technology Co., Ltd.
Address of Manufacturer:	Room 1301, No. 5 Bibo Road, China (Shanghai) Pilot Free Trade Zone
Factory:	Shenzhen Mediafly Technology Co.,Ltd.
Address of Factory:	1-6 storey (6 storey) A building of -3 Xing Xing science and Technology Park, No.268 stone East Road, paddy field community, Shiyan City, Baoan District, Shenzhen, Guangdong

3.2 General Description of EUT

Product Name:	Fixed Location Monitor
Model No.:	KL Skyline Gen-9
Trade Mark:	N/A
Hardware version:	CTK_56T02_VER1
Software version:	V102
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
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)
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
Product Type:	☐ Mobile ☐ Portable ☒ Fix Location
Test Software of EUT:	SecureCRT (manufacturer declare)
Antenna Type:	internal antenna
Antenna Gain:	3.33dBi
Power Supply:	DC5V

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

According to FCC Part1.1310: 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 part1.1307(b)

TABLE 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)
(A) Limits for Occupational/Controlled Exposures				
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
(B) 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
300–1500			f/1500	30
1500–100,000			1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². 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.

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 WIFI

Antenna Gain: 3.33dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.15 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

IEEE for 802.11b mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	13.05	12.5±1	13.5	22.387
Middle(2437MHz)	14.23	13.5±1	14.5	28.184
Highest(2462MHz)	13.14	12.5±1	13.5	22.387
IEEE for 802.11g mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	8.17	7.5±1	8.5	7.079
Middle(2437MHz)	9.18	8.5±1	9.5	8.913
Highest(2462MHz)	8.07	7.5±1	8.5	7.079
IEEE for 802.11n(HT20) mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	8.50	8.0±1	9.0	7.943
Middle(2437MHz)	9.38	8.5±1	9.5	8.913
Highest(2462MHz)	8.29	7.5±1	8.5	7.079
IEEE for 802.11n(HT40) mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2422MHz)	9.54	9.0±1	10.0	10.000
Middle(2437MHz)	9.19	8.5±1	9.5	8.913
Highest(2452MHz)	8.82	8.0±1	9.0	7.943

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
28.184	3.33	0.0121	1.0	PASS

Note: 1) Refer to report No. CQASZ20201101365E-01 for EUT test Max Conducted average Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (28.184 * 2.15) / (4 * 3.1416 * 20^2) = 0.0121$