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RF Exposure Evaluation Report

Report No. : CQASZ20190500013EX-02

Applicant: SHENZHEN SHINYLOAM ELECTRONICS CO.,LTD

Address of Applicant: No.22, Kukeng Dafu industry zone, Kukeng Community, Guanlan Street, Longhua, Shenzhen, China, 518110

Manufacturer: SHENZHEN SHINYLOAM ELECTRONICS CO.,LTD

Address of Manufacturer: No.22, Kukeng Dafu industry zone, Kukeng Community, Guanlan Street, Longhua, Shenzhen, China, 518110

Equipment Under Test (EUT):

Product: Panoramic wireless IP camera

All Models: SYL-P2, SYL-P1, SYL-D1, SYL-P2, SYL-P3, SYL-P6, SYL-P8, SYL-P9

Test Model No.: SYL-P2

Brand Name: SHINYLOAM

FCC ID: 2ASVY-SYLP2

Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498D01 General RF Exposure Guidance v06

Date of Test: 2019-03-19 to 2019-05-29

Date of Issue: 2019-05-29

Test Result : PASS*

Tested By:

Daisy Kim

(Martin Lee)

Reviewed By:

Aaron Ma

(Aaron Ma)

Approved By:

Jack Ai
(Jack Ai)



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

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.

2 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190500013EX-02	Rev.01	Initial report	2019-05-29

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4 General Information

4.1 Client Information

Applicant:	SHENZHEN SHINYLOAM ELECTRONICS CO.,LTD
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4.2 General Description of EUT

Product Name:	Panoramic wireless IP camera
Model No.:	SYL-P2
Trade Mark:	SHINYLOAM
Hardware version:	V1.1
Software version:	V1.0
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(H40): 2422MHz~2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM IEEE for 802.11n(HT20): OFDM IEEE for 802.11n(HT40): OFDM
Product Type:	☐ Mobile ☐ Portable ☒ Fix Location
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type	IPEX Antenna
Antenna Gain	2.0dBi
Power Supply:	DC 5V from adapter
Adapter Information:	Model: HP-050100A1-3C Input: 100-240V 50/60Hz 0.3A Output: 5V 1000mA

5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 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.

5.1.2 Test Procedure

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

5.2 1.1.3 EUT RF Exposure Evaluation

1) For WIFI

Antenna Gain: 2.0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.58 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

802.11b				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	15.514	16	16	39.811
Middle(2437MHz)	15.425	15.5	16	39.811
Highest(2462MHz)	15.987	16	16	39.811
802.11g				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	16.466	16.5	17	50.119
Middle(2437MHz)	16.173	16.5	17	50.119
Highest(2462MHz)	16.625	17	17	50.119
802.11n(HT20)				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	15.903	16	16	39.811
Middle(2437MHz)	15.172	15.5	16	39.811
Highest(2462MHz)	14.993	15	16	39.811
802.11n(HT40)				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2422MHz)	15.379	15.5	16	39.811
Middle(2437MHz)	15.410	15.5	16	39.811
Highest(2452MHz)	15.052	15.5	16	39.811

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
50.119	2.0	0.0158	1.0	PASS

Note: 1) Refer to report No. CQASZ20190500013EX-01 for EUT test Max Conducted Peak Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (50.119 * 1.58) / (4 * 3.1416 * 20^2) = 0.0158$