FCC&IC RF Exposure Evaluation

1. Product Information

FCC ID:	2AQUQGE50054
Product name	WiFi Security Camera
Model number	50054
Additional Model No.:	50147
Power supply	AC 120V
Modulation Type	2.4G WIFI
Antenna Type	Ceramic Antenna
Antenna Gain	3dBi
2.4G wifi Operation frequency	2412MHz-2462MHz
Exposure category	General population/uncontrolled environment
EUT Type	Production Unit
Device Type	Fix Device

2. Evaluation method and Limit

According to ANSI/IEEE C95.1-1992, the Criteria Listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

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 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
300-1,500			f/300	6
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

The MPE was calculated at **20 cm** to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

3. Antenna Information

Product can only use antennas certificated as follows provided by manufacturer;

Antenna Type:	2.4G WIFI	Ceramic Antenna
Antenna gain:	2.4G WIFI	3dBi

4. Conducted Power

4.1 Test Setup Block Diagram

4.2 Test Procedure

1) The EUT was directly connected to the spectrum analyser and antenna output port as show in the Block diagram;

2) Reading peak power in peak detector.

4.3 Measurement Equipment

Item	Equipment	Manufacturer	Model No.	Inventory No.	Last Cal.	Next Cal.
1	Spectrum Analyzer	Keysight	N9010A	MY56070788	2019-01-23	2020-01-22

Conducted Power Results

2.4G WIFI

Mode 1	Channel	Frequency (MHz)	Conducted Peak Output Power (dBm)
2.4G WIFI 802.11b	Low	2412	16.71
	Middle	2437	14.68
	High	2462	13.20
2.4G WIFI 802.11g	Low	2412	21.44
	Middle	2437	19.14
	High	2462	18.23
2.4G WIFI 802.11n20	Low	2412	21.07
	Middle	2437	19.07
	High	2462	18.26
2.4G WIFI 802.11n40	Low	2422	20.58
	Middle	2437	19.36
	High	2452	18.74

5. Manufacturing tolerance

2.4G WiFi 11b

Channel	Low	Middle	High
Target (dBm)	16	14	13
Tolerance ±(dB)	1	1	1

2.4G WiFi 11g

Channel	Low	Middle	High
Target (dBm)	21	19	18
Tolerance ±(dB)	1	1	1

2.4G WiFi 11n20

Channel	Low	Middle	High
Target (dBm)	21	19	18
Tolerance ±(dB)	1	1	1

2.4G WiFi 11n40

Channel	Low	Middle	High
Target (dBm)	21	19	18
Tolerance ±(dB)	1	1	1

6. Evaluation Results

FCC:

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)
2.4G WIFI	2412	3	21.44	24.44	0.278	0.055	1.000

Remark:

1. *Output power including tune up tolerance;*
2. *∑(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna include in the simultaneous transmission)/(corresponding MPE limit)], for WIFI + Bluetooth.*
3. *Considering the LoRa /Bluetooth transmitter of the EIRP performance listed in the table above,the aggregated (power density / limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant*

7. Conclusion

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

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