



Test report No. : 4789813598-US-R3-V0
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Issued date : 2021/7/26
FCC ID : 2AAJXQS-IQWIFI6

Maximum Permissible Exposure Report

Product : IQ WiFi 6
Model Name : IQ WiFi 6
FCC ID : 2AAJXQS-IQWIFI6
Test Regulation : 47 CFR FCC Part 2.1091
Received Date : 2021/3/8
Issued Date : 2021/7/26
Applicant : Qolsys Inc.
1900 The Alameda, Suite 420, San Jose, CA 95126
Issued By : Underwriters Laboratories Taiwan Co., Ltd.
Building B and Building E, No. 372-7, Sec. 4, Zhongxing
Rd., Zhudong Township, Hsinchu County, Taiwan



The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report are responsible of the test sample(s) provided by the client only and are not to be used to indicate applicability to other similar products.

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Doc No: 17-EM-F0864 / 5.0



REVISION HISTORY

Original Test Report No.: 4789813598-US-R3-V0

Rev.	Test report No.	Date	Page revised	Contents
Original	4789813598-US-R3-V0	2021/7/26	-	Initial issue



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1. Attestation of Test Results

APPLICANT: Qolsys Inc.
 1900 The Alameda, Suite 420, San Jose, CA 95126

MANUFACTURER: Funing Precision Component Co, Ltd
 Lot B, Que Vo Industrial Zone, Nam Son Ward, Bac Ninh
 City, Bac Ninh Province, Vietnam.

EUT DESCRIPTION: IQ WiFi 6

BRAND: Qolsys

MODEL: IQ WiFi 6

SAMPLE STAGE: Mass-Production

APPLICABLE STANDARDS	
STANDARD	Test Results
47 CFR FCC PART 2.1091	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

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 Project Handler

Date : 2021/7/26

Approved and Authorized By:

Mike Cai
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Date : 2021/7/26

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2. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with KDB 447498 D01 General RF Exposure Guidance v06.

3. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398. The full scope of accreditation can be viewed at http://accreditation.taftw.org.tw/taf/public/basic/viewApplyItems.action?unitNo=3398

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4. Equipment Under Test

4.1. Description of EUT

Product Name	IQ WiFi 6	
Brand Name	Qolsys	
Model Name	IQ WiFi 6	
Operating Frequency	WLAN	2.4GHz: 2412MHz ~ 2462MHz 5GHz: 5180MHz ~ 5240MHz 5260MHz ~ 5320MHz 5500MHz ~ 5720MHz 5745MHz ~ 5825MHz
Modulation	WLAN	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA
Number of Channel	2.4G WLAN 2412 ~ 2462 MHz	11 for 802.11b, 802.11g, 802.11n (HT20)
		7 for 802.11n (HT40)
	5G WLAN 5180 ~ 5240 MHz	4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)
		2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)
		1 for 802.11ac (VHT80), 802.11ax (HE80)
	5G WLAN 5260 ~ 5320 MHz	4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)
2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)		
1 for 802.11ac (VHT80), 802.11ax (HE80)		

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Number of Channel	5G WLAN 5500 ~ 5720 MHz	12 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)
		6 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)
		3 for 802.11ac (VHT80), 802.11ax (HE80),
	5G WLAN 5745 ~ 5825 MHz	5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)
		2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)
		1 for 802.11ac (VHT80), 802.11ax (HE80)
Normal Voltage	120Vac/ 60Hz	
S/N	HHA3210500038	
Software Version	N/A	

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Note:

1. The EUT provides two completed transmitters and two receivers.

Modulation Mode	Tx,Rx Function
802.11a	2TX,2RX
802.11b	2TX,2RX
802.11g	2TX,2RX
802.11n (HT20)	2TX,2RX
802.11n (HT40)	2TX,2RX
802.11ac (VHT20)	2TX,2RX
802.11ac (VHT40)	2TX,2RX
802.11ac (VHT80)	2TX,2RX
802.11ax (HE20)	2TX,2RX
802.11ax (HE40)	2TX,2RX
802.11ax (HE80)	2TX,2RX

2. The EUT contains following accessory devices:

Product	Brand	Model	Description
AC adapter	Sure Power	SW81-120150-01	Input: 100-240V, 50-60 Hz, 0.68A Output: 12V, 1.5A Length: 1.8m
RJ-45 cable	Neiyi	NYS4681	Non-shielded Length: 1.5m
cradle	N/A	N/A	N/A

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual.

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4.2. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Frequency Band (GHz)	Maximum Gain (dBi)
1	Chain (0)	Passive System Alliance	WA-P-LB-02-849	PIFA	2.4~2.4835	3.74
					5.15~5.35	5.42
					5.47~5.725	5.77
					5.725~5.85	5.51
2	Chain (1)	Passive System Alliance	WA-P-LB-03-172	PIFA	2.4~2.4835	3.43
					5.15~5.35	5.17
					5.47~5.725	5.26
					5.725~5.85	5.26

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual.

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5. Requirement

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
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

Note 1: f = frequency in MHz, * means Plane-wave equivalent power density

Note 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Power Density (S) is calculated by the following formula:

$$S = (P \cdot G) / 4\pi R^2$$

where: S = power density (in appropriate units, e.g. mW/ cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

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6. Radio Frequency Radiation Exposure Evaluation

WLAN 2.4GHz

Evaluation Frequency (MHz)	Max. Average power (dBm)	Directional Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Power density @ 26 cm (mW/cm ²)	Limit (mW/cm ²)
2412 ~ 2462	25.71	6.61	32.32	1706.082	0.201	1

WLAN 5GHz

Evaluation Frequency (MHz)	Max. Average power (dBm)	Directional Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Power density @ 26 cm (mW/cm ²)	Limit (mW/cm ²)
5180 ~ 5240	26.33	8.31	34.64	2910.717	0.343	1
5260 ~ 5320	22.62	8.31	30.93	1238.797	0.146	1
5500 ~ 5720	23.46	8.53	31.99	1581.248	0.186	1
5745 ~ 5825	28.29	8.40	36.69	4666.594	0.549	1

Note:

1. Max. EIRP (dBm) = Max. Average power (dBm) + Antenna Gain (dBi)
2. Max. EIRP (mW) = $10^{(\text{Max. EIRP (dBm)} / 10)}$
3. Power density (mW/cm²) = Max. EIRP (mW) / [$4 \times \pi \times (\text{calculated distance})^2$], the calculated distance is 26 cm.

Conclusion:

WLAN 2.4GHz and WLAN 5GHz can transmit simultaneously, the formula of calculated the MPE is:

The formula of calculated the MPE is:

$$\text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2} + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Situation is $(0.201 / 1) + (0.549 / 1) = 0.75$

Therefore the maximum calculations of above situations are less than the “1” limit.

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

END OF REPORT

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