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TESTING  
CNAS L0446



Page 1 of 9

# Test Report

Verified code: 415076

Report No.: E20210914342601-8

Customer: Lumi United Technology Co., Ltd.

Address: 8th Floor, JinQi Wisdom Valley, Liuxian Ave, Taoyuan Residential District, Nanshan District, Shenzhen, China

Sample Name: Camera Hub G2H Pro

Sample Model: CH-C01

Receive Sample Date: Sep.15,2021

Test Date: Sep.16,2021 ~ Oct.29,2021

Reference Document: CFR 47, FCC Part 2.1091

Test Result: Pass

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GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2021-11-09

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## 1. GENERAL DESCRIPTION OF EUT


### 1.1 APPLICANT

Name: Lumi United Technology Co., Ltd.  
Address: 8th Floor, JinQi Wisdom Valley, Liuxian Ave., Taoyuan Residential District, Nanshan District, Shenzhen, China

### 1.2 MANUFACTURER

Name: Lumi United Technology Co., Ltd.  
Address: 8th Floor, JinQi Wisdom Valley, Liuxian Ave., Taoyuan Residential District, Nanshan District, Shenzhen, China

### 1.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Camera Hub G2H Pro  
Model No.: CH-C01  
Adding Model: /  
Trade Name: Aqara  
FCC ID: 2AKIT-CHC01  
Power Supply: Input: 5V  1A  
Adapter Specification: /  
Frequency Range: Zigbee: 2405~2475MHz  
2.4G Wi-Fi: 2412~2462MHz  
Transmit Power: Zigbee: 7.61dBm  
2.4G Wi-Fi:  
18.58dBm for 802.11b mode  
24.61dBm for 802.11g mode  
24.51dBm for 802.11n HT20 mode  
Modulation type: Zigbee: OQPSK  
2.4G Wi-Fi: DSSS, OFDM  
Antenna Specification: Zigbee: Internal antenna 1.5dBi gain (Max.)  
2.4G Wi-Fi: Internal antenna 1.5dBi gain (Max.)  
Temperature Range: -10°C ~40°C  
Hardware Version: X1  
Software Version: V1.0.3\_0006.0004  
Sample No: E20210914342601-0005  
I/O Port: /  
Note: /

## 2. LABORATORY AND ACCREDITATIONS

### 2.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add.: No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.  
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### 2.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

**USA** A2LA(Certificate#:2861.01)

**China** CNAS(L0446)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

**Canada** ISED (Company Number: 24897, CAB identifier:CN0069)

**USA** FCC (Registration Number: 759402, Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.grgtest.com>

### 3. EVALUATION METHOD

Exposure category: General population/uncontrolled environment  
 EUT Type: Production Unit  
 Device Type: Mobile Device  
 Refer Standard: KDB 447498 D01 General RF Exposure Guidance v06  
 FCC Part 2 §2.1091

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is  $\leq 1.0$ . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

### 4. LIMITS FOR GENERAL POPULATION/UNCONTROLLEDEXPOSURE

(B)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 <sup>2</sup> ) | Averaging Time[E] <sup>2</sup> , [H] <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|----------------------------------|---|--|
| 0.3-1.34              | 614                               | 1.63                             | (100)*                                  | 30   |
| 1.34-30               | 824/f                             | 2.19/f                           | (180/f)*                                | 30   |
| 30-300                | 27.5                              | 0.073                            | 0.2                                     | 30   |
| 300-1500              | /                                 | /                                | F/1500                                  | 30   |
| 1500-100,000          | /                                 | /                                | 1.0                                     | 30   |

Note: f=frequency in MHz; \*Plane-wave equivalent power density

### 5. CALCULATION METHOD

Predication of MPE limit at a given distance  
 Equation from page 18 of OET Bulletin 65, Edition 97-01  
 $S=PG/4\pi R^2$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to anisotropic radiator

R=distance to the center of radiation of the antenna

From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the maximum gain of the used as following information, the RF power density can be obtained.

| Frequency Band | Antenna type     | Maximum antenna gain |
|----------------|------------------|----------------------|
| 2.4G Wi-Fi     | Internal antenna | 1.5dBi               |
| Zigbee         | Internal antenna | 1.5dBi               |

### 6. ESTIMATION RESULT

#### 6.1 CONDUCTED POWER RESULTS

| Mode   | Channel | Frequency(MHz) | Peak Conducted Output Power (dBm) |
|--------|---------|----------------|-----------------------------------|
| Zigbee | Lowest  | 2405           | 7.61                              |
|        | Middle  | 2440           | 7.58                              |
|        | Highest | 2475           | 7.61                              |

| 2.4G Wi-Fi | Mode              | Frequency(MHz) | Peak Conducted Output Power (dBm) |
|------------|-------------------|----------------|-----------------------------------|
|            | IEEE 802.11b      | 2412           | 18.05                             |
|            |                   | 2437           | 18.55                             |
|            |                   | 2462           | 18.58                             |
|            | IEEE 802.11g      | 2412           | 24.44                             |
|            |                   | 2437           | 24.61                             |
|            |                   | 2462           | 24.50                             |
|            | IEEE 802.11n HT20 | 2412           | 24.24                             |
|            |                   | 2437           | 24.51                             |
|            |                   | 2462           | 24.36                             |

## 6.2 MEASUREMENT RESULTS

### 6.2.1 STANDALONE MPE

Zigbee:

| Mode   | Output power |        | Antenna Gain (dBi) | Antenna Gain (linear) | MPE (mW/cm <sup>2</sup> ) | MPE Limits (mW/cm <sup>2</sup> ) |
|--------|--------------|--------|--------------------|-----------------------|---------------------------|----------------------------------|
|        | (dBm)        | (mW)   |                    |                       |                           |                                  |
| Zigbee | 8            | 6.3096 | 1.5                | 1.4125                | 0.0018                    | 1.0000                           |

2.4G Wi-Fi

| Mode               | Output power |          | Antenna Gain (dBi) | Antenna Gain (linear) | MPE (mW/cm <sup>2</sup> ) | MPE Limits (mW/cm <sup>2</sup> ) |
|--------------------|--------------|----------|--------------------|-----------------------|---------------------------|----------------------------------|
|                    | (dBm)        | (mW)     |                    |                       |                           |                                  |
| IEEE 802.11 b      | 19           | 79.4328  | 1.5                | 1.4125                | 0.0223                    | 1.0000                           |
| IEEE 802.11 g      | 25           | 316.2278 | 1.5                | 1.4125                | 0.0889                    | 1.0000                           |
| IEEE 802.11 n HT20 | 25           | 316.2278 | 1.5                | 1.4125                | 0.0889                    | 1.0000                           |

Remark:

1. Maximum average power including tune-up tolerance;
2. MPE use distance is 20cm from manufacturer declaration of user manual.

### Maximum Simultaneous transmission MPE Ratio for WLAN and Zigbee

| Maximum MPE ratio<br>2.4G | Maximum MPE ratio<br>Zigbee | $\Sigma$ MPE ratios | Limit | Results |
|---------------------------|-----------------------------|---------------------|-------|---------|
| 0.0889                    | 0.0018                      | 0.0907              | 1.000 | Pass    |

Remark:

According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;

$\Sigma$  of MPE ratios  $\leq 1.0$



## 7. CONCLUSION

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

----- End of Report -----