

Test Report

Verified code: 186281

Report No.: E20220309137001-7

Customer: Lumi United Technology Co., Ltd

Address: B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District,
Nanshan District, Shenzhen, China

Sample Name: Curtain Driver E1

Sample Model: CM-M01

Receive Sample Date: Mar.11,2022

Test Date: Mar.12,2022 ~ May.09,2022

Reference Document: CFR 47, FCC Part 2.1091 Radiofrequency radiation exposure evaluation:
mobile devices.
KDB 447498 D01 General RF Exposure Guidance v06.

Test Result: Pass

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Reviewed by:

Jiang Tao

Approved by: Xiao Liang

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-05-23

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1. GENERAL DESCRIPTION OF EUT

1.1. APPLICANT

Name: Lumi United Technology Co., Ltd
Address: B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District, Nanshan District, Shenzhen, China

1.2. MANUFACTURER

Name: Lumi United Technology Co., Ltd
Address: B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District, Nanshan District, Shenzhen, China

1.3. FACTORY

Name: SHENZHEN 3NORD DIGITAL TECHNOLOGY CO.,LTD
Address: 401,ZONE 101A,WORKSHOP 15,ZHONGFU ROAD,TANGXIAYONG COMMUNITY,YANLUO STREET,BAOAN DISTRICT,SHENZHEN CITY,GUANGDONG PROVINCE,P.R.C.

1.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Curtain Driver E1
Model No.: CM-M01
Adding Model: /
Trade Name: Aqara
FCC ID: 2AKIT-CMM01
Power Supply: 5V $\overline{\text{---}}$ 1.5A power from USB cable or DC 3.70V power from battery
Rechargeable Lithium-ion Battery
Battery Specification: Product Model: DH0406CLM
Nominal Voltage: 3.70Vdc, Rated Capacity: 6000mAh, Rated Energy: 22.2Wh
Charging Voltage Limit: 4.20Vdc
Frequency Band: 2405MHz-2475MHz
Transmit Power: 8.05 dBm
Modulation type: O-QPSK
Antenna Specification: FPC antenna with 1dBi gain (Max)
Temperature Range: 0°C ~ +25°C
Hardware Version: T0
Software Version: V0.0.0_2424
Sample No: E20220309137001-0002
Motor1:
Note1: Manufacturer: SHENZHEN WEIZHEN MOTOR DEVELOPMENT CO.,LTD.
Model: WRK-500CA-17280B
Technical data: DC9.0V, 720mA Max. 5500 $\pm$ 10% rpm/min.

Note2:

Motor2:

Manufacturer: Peak Industrial Ltd.

Model: PR-500EV-17280

Technical data: DC9.0V,500mA Max.5500 $\pm$ 10% rpm/min.

Note3:

This report records motor 1 (WRK-500CA-17280B) maximum current 720mA data .

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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 Guangguang Road Xinlan Community, Guanlan Street, Longhua District
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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>

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3. EVALUATION METHOD

Exposure category: General population/uncontrolled environment

EUT Type: Production Unit

Device Type: Mobile Device

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 ≤ 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.

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4. LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE

(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 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)*	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

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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, $d=0.2\text{m}$, 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
Zigbee	FPC antenna	1dBi

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6. ESTIMATION RESULT

6.1. CONDUCTED POWER RESULTS

Zigbee			
Antenna	Mode	Frequency(MHz)	Peak Conducted Output Power (dBm)
Antenna 1	Zigbee	2405	8.05
		2440	8.00
		2475	7.94

6.2. MANUFACTURING TOLERANCE

Frequency (MHz)	Zigbee
	2405
Target (dBm)	8.0
Tolerance $\pm$ (dB)	1.0

6.3. MEASUREMENT RESULTS

6.3.1. STANDALONE MPE

Zigbee						
Antenna 1						
Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	(dBm)	(mW)				
Zigbee	9.0	7.9433	1	1.2589	0.0020	1.0000

Remark: 1. Maximum peak conducted output power including tune-up tolerance;
 2. MPE use distance is 20cm from manufacturer declaration of user manual.

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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 -----