



Report No.: HKEM220500046103

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## TEST REPORT

**Application No.:** HKEM2205000461PF  
**Applicant:** C-MER RainsOptics Limited  
**Address of Applicant:** Room 607, 6/F, 17W of Hong Kong Science Park, No. 17 Science Park West Avenue, Shatin, N.T., Hong Kong

**Equipment Under Test (EUT):**  
**EUT Name:** Pocket Smartphone Ophthalmoscope  
**Model No.:** 20D001  
**FCC ID:** 2A8CG-FUNDUSLINK  
**IC:** 28897- FUNDUSLINK  
**HVIN:** FDL1.0  
**Standard(s) :** 47 CFR Part 15, Subpart C  
RSS-247 Issue 2  
RSS-Gen Issue 5

**Date of Receipt:** 2022-06-20  
**Date of Test:** 2022-06-20 to 2022-06-28  
**Date of Issue:** 2022-06-28

|                     |                                                                    |
|---------------------|--------------------------------------------------------------------|
| <b>Test Result:</b> | The submitted sample was found to comply with the test requirement |
|---------------------|--------------------------------------------------------------------|

**Law Man Kit**  
EMC Manager

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 01              |         | 2022-06-28 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                          |  |                                                                                    |                  |
|--------------------------|--|------------------------------------------------------------------------------------|------------------|
| Authorized for issue by: |  |                                                                                    |                  |
|                          |  |   |                  |
|                          |  | <u>Chan Chun Lok /Project Engineer</u>                                             | Date: 2022-06-28 |
|                          |  |  |                  |
|                          |  | <u>Law Man Kit</u><br>/Reviewer                                                    | Date: 2022-06-28 |



## 2 Test Summary

| Radio Spectrum Technical Requirement |                                                              |                          |                       |        |
|--------------------------------------|--------------------------------------------------------------|--------------------------|-----------------------|--------|
| Item                                 | Standard                                                     | Method                   | Requirement           | Result |
| RF Exposure                          | 47 CFR Part 1.1307,<br>47 CFR Part 2.1093,<br>KDB 447498 D04 | KDB447498D04             | KDB447498D04          | PASS   |
| RF Exposure                          | RSS102 Issue 5                                               | RSS-102 Section<br>2.5.1 | RSS-102 Section 2.5.1 | PASS   |

**Declaration of EUT Family Grouping:**

N/A

**Abbreviation:**

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

CH: In this whole report CH means channel.

Volt: In this whole report Volt means Voltage.

Temp: In this whole report Temp means Temperature.

Humid: In this whole report Humid means humidity.

Press: In this whole report Press means Pressure.

N/A: In this whole report not application.



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## 4 General Information

### 4.1 Details of E.U.T.

|                      |                                                                                                                                                                  |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply:        | Adaptor Model: UES06WNCPU-050100SPA<br>Input: AC 100 V - 240 V, 50/60 Hz, 0.2 A<br>Output: DC 5.0 V, 1.0 A<br>or<br>Battery Model: DTP123060<br>Output: DC 3.7 V |
| Test voltage:        | DC 3.7 V                                                                                                                                                         |
| Cable:               | Power Cable: 100.5 cm unshielded 2-wire USB                                                                                                                      |
| Antenna Gain:        | Maximum 3.77 dBi at 2402 MHz, 2.27 dBi at 2442 MHz, 0.67 dBi at 2480                                                                                             |
| Antenna Type:        | PCB Antenna                                                                                                                                                      |
| Bluetooth Version:   | V5.2 LE                                                                                                                                                          |
| Channel Separation:  | 2MHz                                                                                                                                                             |
| Modulation Type:     | GFSK                                                                                                                                                             |
| Number of Channels:  | 40                                                                                                                                                               |
| Operation Frequency: | 2402MHz to 2480MHz                                                                                                                                               |
| Power Class:         | <10mW                                                                                                                                                            |
| Series No.:          | BAA220400010                                                                                                                                                     |
| Firmware Version:    | FDL1.00                                                                                                                                                          |
| Hardware Version:    | FDL1.0                                                                                                                                                           |

Frequency List:

| Channel  | Frequency (MHz) | Channel   | Frequency (MHz) |
|----------|-----------------|-----------|-----------------|
| <b>0</b> | <b>2402</b>     | <b>20</b> | <b>2442</b>     |
| 1        | 2404            | 21        | 2444            |
| 2        | 2406            | 22        | 2446            |
| 3        | 2408            | 23        | 2448            |
| 4        | 2410            | 24        | 2450            |
| 5        | 2402            | 25        | 2452            |
| 6        | 2414            | 26        | 2454            |
| 7        | 2416            | 27        | 2456            |
| 8        | 2418            | 28        | 2458            |
| 9        | 2420            | 29        | 2460            |
| 10       | 2422            | 30        | 2462            |
| 11       | 2424            | 31        | 2464            |
| 12       | 2426            | 32        | 2466            |
| 13       | 2428            | 33        | 2468            |
| 14       | 2430            | 34        | 2470            |
| 15       | 2432            | 35        | 2480            |
| 16       | 2434            | 36        | 2474            |
| 17       | 2436            | 37        | 2476            |
| 18       | 2438            | 38        | 2478            |
| 19       | 2440            | <b>39</b> | <b>2480</b>     |

The frequencies under test are bolded.

## 4.2 Description of Support Units

| Description | Manufacturer              | Model No. | Serial No. |
|-------------|---------------------------|-----------|------------|
| Laptop      | DELL                      | P75F      | 475LXQ2    |
| PuTTY.exe   | C-MER RainsOptics Limited | N/A       | N/A        |

Note: The laptop and the software PuTTY.exe were for the control of the engineering mode.

## 4.3 Modulation configure

| RF software:                                                                          | PuTTY.exe |             |             |         |
|---------------------------------------------------------------------------------------|-----------|-------------|-------------|---------|
| Modulation                                                                            | Packet    | Packet Type | Packet Size | Power   |
| GFSK                                                                                  | Default   | Default     | Default     | Neg4dBm |
| Remark:<br>1. Neg4dBm value was set in test software as maximum output power setting. |           |             |             |         |

#### 4.4 Test Location

All tests were performed at:

SGS Hong Kong Limited  
Unit 2 and 3, G/F, Block A, Po Lung Centre,  
11 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong  
Tel: +852 2305 2570 Fax: +852 2756 4480

No tests were sub-contracted.

#### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **IAS Accreditation (Lab Code: TL-817)**

SGS Hong Kong Limited has met the requirements of AC89, IAS Accreditation Criteria for Testing Laboratories, and has demonstrated compliance with ISO/IEC Standard 17025:2017, General requirements for the competence of testing and calibration laboratories. This organization is accredited to provide the services specified in the scope of accreditation maintained on the IAS website ([www.iasonline.org](http://www.iasonline.org)).

The report must not be used by the client to claim product certification, approval, or endorsement by IAS, NIST, or any agency of the Federal Government.

• **FCC Recognized Accredited Test Firm (CAB Registration No.: 514599)**

SGS Hong Kong Limited has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: HK0015, Test Firm Registration Number: 514599.

• **Industry Canada (Site Registration No.: 26103; CAB Identifier No.: HK0015)**

SGS Hong Kong Limited has been recognized by Department of Innovation, Science and Economic Development (ISED) Canada as a wireless testing laboratory. The acceptance letter from the ISED is maintained in our files. CAB Identifier No: HK0015, Site Registration Number: 26103.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None

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## 5 Radio Spectrum Technical Requirement

### 5.1 RF Exposure

#### 5.1.1 Test Requirement:

CFR 47 Part 1.1307, KDB 447498 D04 Interim General RF Exposure Guidance v01

Limit:

According to FCC Part1.1307 (b)(3): For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

- (A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

#### 5.1.2 Conclusion

The worst-case e.i.r.p for FCC;

| Operation mode | Channel | Frequency (MHz) | Conduct power (including Tune-up tolerance) (dBm) | Antenna Gain (dBi) | Worst Case e.i.r.p (mW) | Exemption Threshold (mW) |
|----------------|---------|-----------------|---------------------------------------------------|--------------------|-------------------------|--------------------------|
| GFSK           | Low     | 2402            | -3.9                                              | 3.77               | 0.97                    | 1                        |
| GFSK           | Middle  | 2442            | -3.6                                              | 2.27               | 0.74                    | 1                        |
| GFSK           | High    | 2480            | -3.6                                              | 0.67               | 0.51                    | 1                        |

Thus, the EUT fulfil the 1mW exemption criteria.

## 5.2 RF Exposure

### 5.2.1 Test Requirement:

RSS-102 Section 2.5.1

Limit:

All transmitters are exempt from routine SAR and RF exposure evaluations provided that they comply with the requirements of sections 2.5.1 or 2.5.2 of RSS-102 Issue 5, March 2015. If the equipment under test (EUT) meets the requirements of sections 2.5.1 or 2.5.2, applicants are only required to submit a properly signed declaration of compliance.

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

| Table 1: SAR evaluation — Exemption limits for routine evaluation based on frequency and separation distance |                                 |                                 |                                 |                                 |                                 |
|--------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Frequency (MHz)                                                                                              | Exemption Limits (mW)           |                                 |                                 |                                 |                                 |
|                                                                                                              | At separation distance of ≤5 mm | At separation distance of 10 mm | At separation distance of 15 mm | At separation distance of 20 mm | At separation distance of 25 mm |
| ≤300                                                                                                         | 71 mW                           | 101 mW                          | 132 mW                          | 162 mW                          | 193 mW                          |
| 450                                                                                                          | 52 mW                           | 70 mW                           | 88 mW                           | 106 mW                          | 123 mW                          |
| 835                                                                                                          | 17 mW                           | 30 mW                           | 42 mW                           | 55 mW                           | 67 mW                           |
| 1900                                                                                                         | 7 mW                            | 10 mW                           | 18 mW                           | 34 mW                           | 60 mW                           |
| 2450                                                                                                         | 4 mW                            | 7 mW                            | 15 mW                           | 30 mW                           | 52 mW                           |
| 3500                                                                                                         | 2 mW                            | 6 mW                            | 16 mW                           | 32 mW                           | 55 mW                           |
| 5800                                                                                                         | 1 mW                            | 6 mW                            | 15 mW                           | 27 mW                           | 41 mW                           |

  

| Frequency (MHz) | Exemption Limits (mW)           |                                 |                                 |                                 |                                  |
|-----------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|
|                 | At separation distance of 30 mm | At separation distance of 35 mm | At separation distance of 40 mm | At separation distance of 45 mm | At separation distance of ≥50 mm |
| ≤300            | 223 mW                          | 254 mW                          | 284 mW                          | 315 mW                          | 345 mW                           |
| 450             | 141 mW                          | 159 mW                          | 177 mW                          | 195 mW                          | 213 mW                           |
| 835             | 80 mW                           | 92 mW                           | 105 mW                          | 117 mW                          | 130 mW                           |
| 1900            | 99 mW                           | 153 mW                          | 225 mW                          | 316 mW                          | 431 mW                           |
| 2450            | 83 mW                           | 123 mW                          | 173 mW                          | 235 mW                          | 309 mW                           |
| 3500            | 86 mW                           | 124 mW                          | 170 mW                          | 225 mW                          | 290 mW                           |
| 5800            | 56 mW                           | 71 mW                           | 85 mW                           | 97 mW                           | 106 mW                           |

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For limb-worn devices where the 10-gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.

### 5.2.2 Conclusion

By using linear interpolation to determine the limit for the worse separation distance of  $\leq 5$  mm at

2402 MHz:

$$\text{Limit} = 4 + (2450-2402) \times ((7-4) / (2450-1900)) = 4.26 \text{ mW}$$

2442 MHz

$$\text{Limit} = 4 + (2450-2442) \times ((7-4) / (2450-1900)) = 4.04 \text{ mW}$$

2480 MHz:

$$\text{Limit} = 4 + (2480-2450) \times ((2-4) / (3500-2450)) = 3.94 \text{ mW}$$

The e.i.r.p is calculated with the formula:

$$10^{\wedge} ((\text{Conductive power} + \text{Antenna gain})/10)$$

Refer to the conductive power measurement in report HKEM220500046102:

| Operation mode | Channel | Frequency (MHz) | Conduct power (including Tune-up tolerance) (dBm) | Antenna Gain (dBi) | Worst Case e.i.r.p (mW) |
|----------------|---------|-----------------|---------------------------------------------------|--------------------|-------------------------|
| GFSK           | Low     | 2402            | -3.9                                              | 3.77               | 0.97                    |
| GFSK           | Middle  | 2442            | -3.6                                              | 2.27               | 0.74                    |
| GFSK           | High    | 2480            | -3.6                                              | 0.67               | 0.51                    |

Which are below the exemption limit.



## **6 Photographs**

### **6.1 EUT Constructional Details (EUT Photos)**

Refer to the appendices external, internal and setup photos.

- End of the Report -