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TEST REPORT

For RF Expose

Report No. .....:	**CHTW25020017**	Report verification:
Project No. .....:	**SHT2412073501W**	
FCC ID..... :	**2BM9Y0001**	
Applicant's name..... :	**Lumicare Medtech Co., Ltd.**	
Address.....:	Level 8, 1A, Zhongcheng Biomedical Industrial Park, No.21 Linhui Road, Pingshan District, Shenzhen, Guangdong, 518122, China	
Product Name ..... :	**RFID Module**	
Trade Mark .....:	LUMICARE	
Model No. .....:	LM-RFR01	
Listed Model(s) .....:	-	
Standard ..... :	**FCC Part 2 (Section 2.1091 & 2.1093)**	
Date of receipt of test sample.....:	Dec. 25, 2024	
Date of testing.....:	Dec. 26, 2024- Feb. 12, 2025	
Date of issue.....:	Feb. 13, 2025	
Result..... .....:	**PASS**	

Compiled by (position+printed name+signature)..:	File administrators Caspar Chen	Caspar Chen
Supervised by (position+printed name+signature)..:	Project Engineer Caspar Chen	Caspar Chen
Approved by (position+printed name+signature)..:	RF Manager Xu yang	Xu Yang

Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd.**
Address.....:	Building 7, Baiwang Idea Factory, No.1051, Songbai Road, Yangguang Community, Xili Subdistrict, Nanshan District, Shenzhen, Guangdong, China

The test report merely correspond to the test sample.

Contents

1. TEST STANDARDS AND REPORT VERSION

1.1. Test standards

The tests were performed according to following standards:
FCC Part 2 (Section 2.1091)- Radiofrequency radiation exposure evaluation: mobile devices.
FCC Part 2 (Section 2.1093)- Radiofrequency radiation exposure evaluation: portable devices.
KDB 447498 D04 Interim General RF Exposure Guidance v01- RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices
FCC Part 1 (Section 1.1307)- Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.

1.2. Report version information

Revision No.	Date of issue	Description
N/A	2025-02-13	Original

2. SUMMARY

2.1. Client Information

Applicant:	Lumicare Medtech Co., Ltd.
Address:	Level 8, 1A, Zhongcheng Biomedical Industrial Park, No.21 Linhui Road, Pingshan District, Shenzhen, Guangdong, 518122, China
Manufacturer:	Lumicare Medtech Co., Ltd.
Address:	Level 8, 1A, Zhongcheng Biomedical Industrial Park, No.21 Linhui Road, Pingshan District, Shenzhen, Guangdong, 518122, China

2.2. Product Description

Product Name:	RFID Module
Trade Mark:	LUMICARE
Model No.:	LM-RFR01
Listed Model(s):	-
Power supply:	DC 5V
Hardware version:	1.0
Software version:	1.0

2.3. Radio Specification Description

Radio function:	RFID
Operation frequency:	13.56MHz
Modulation:	ASK
Channel number:	1
Antenna type:	Directional antenna

Note: Please refer to RF report for detailed technical specifications

2.4. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.
Laboratory Location	Building 7, Baiwang Idea Factory, No.1051, Songbai Road, Yangguang Community, Xili Subdistrict, Nanshan District, Shenzhen, Guangdong, China
Contact information:	Tel: 86-755-26715499 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn

3. RF EXPOSURE

3.1. LIMITS

§ 1.1310 Radiofrequency radiation exposure limits.

a) Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) of this part within the frequency range of 100 kHz to 6 GHz (inclusive).

b) The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatialaverage SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.

c) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

d) Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields

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 Exposures				
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
300–1500	-	-	f/300	6
1500–100,000	-	-	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
300–1500	-	-	f/1500	30
1500–100,000	-	-	1.0	30

Note: f = frequency in MHz

3.2. DETERMINATION OF EXEMPTION

"Blanket" Exemption – §1.1307(b)(3)(i)(A)

- Regardless of the separation distance, the maximum time-averaged power is no more than 1mw.

"MPE" Exemption – §1.1307(b)(3)(i)(C)

- The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.
- Table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits.

RF Source frequency (MHz)	Minimum Distance		Threshold ERP (watts)
	$\lambda_L/2\pi$	$\lambda_H/2\pi$	
0.3-1.34	159 m–35.6 m		1,920 R^2.
1.34-30	35.6 m–1.6 m		3,450 R^2/f^2.
30-300	1.6 m–159 mm		3.83 R^2.
300-1500	159 mm–31.8 mm		0.0128 R^2 f.
1500-100000	31.8 mm–0.5 mm		19.2R^2.
R must be at least λ/2π, where λ is the free-space operating wavelength in meters.			

- For mobile devices that are not exempt per Table 1 of §1.1307(b)(1)(i)(C) and device at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.

$$P_{\text{th}}\,(\text{mW}) = ERP_{20\,\text{cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

"SAR" Exemption – §1.1307(b)(3)(i)(B)

- the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{\text{th}}\,(\text{mW}) = \begin{cases} ERP_{20\,\text{cm}}(d/20\ \text{cm})^x & d \le 20\ \text{cm} \\ ERP_{20\,\text{cm}} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,\text{cm}}\sqrt{f}}\right)$$

And

$$ERP_{20\,\text{cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

3.3. MULTIPLE RF SOURCES ARE EXEMPT

Multiple RF sources are exempt– §1.1307(b)(3)(ii)

a) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required).

b) Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluatedk term) should be used to determine exemption for simultaneous transmission according to Formula below,

$$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1$$

Note: The sum of the ratios of the applicable terms for SAR-based, MPE-based and measured SAR or MPE should be less than 1, to determine simultaneous transmission exposure compliance.

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for Pth, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

Pi = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

Pth,i = the exemption threshold power (Pth) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i.

ERPj = the ERP of fixed, mobile, or portable RF source j.

ERPth,j = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least λ/2π according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

Evaluatedk = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

Exposure Limitk = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from § 1.1310 of this chapter.

3.4. MPE CALCULATION FORMULA

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

4. CALCULATED RESULT OF MAXIMUM CONDUCTED POWER

When the measurement distance is specified at 3 m, the relationship between EIRP and field strength can be expressed by the following formula:

EIRP(dBm)= E(dBμV/m)-95.2

Mode	Frequency (MHz)	Fundamental Emission E (dBμV/m)	EIRP (dBm)
RF ID	13.56	49.05	-46.15

MPE-based Exemption §1.1307(b)(3)(i)(A)					
Operation Mode	Frequency Band (MHz)	Max. EIRP (dBm)	Max. EIRP (mW)	Limit Threshold (mW)	Test Result
RF ID	13.56	-46.15	0.0000243	1	Pass

Note:

1) The exposure evaluation safety distance is 0mm.

5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Reference to the test report No. CHTW25020010

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