

## 1 Cover Page

# RF MPE REPORT

**Application No.:** SHEM2102001582CR  
**FCC ID:** VPYCMABZ  
**IC:** 772C-CMABZ  
**Applicant:** Murata Manufacturing Co., Ltd.  
**Address of Applicant:** 10-1, Higashikotari 1-chome, Nagaokakyo-shi Kyoto 617-8555 Japan  
**Manufacturer:** Murata Manufacturing Co., Ltd.  
**Address of Manufacturer:** 10-1, Higashikotari 1-chome, Nagaokakyo-shi Kyoto 617-8555 Japan  
**Factory:** Shenzhen Murata Technology Co., Ltd.  
**Address of Factory:** 15 Cuijing Road, Shenzhen Grand Industrial Zone, PingShan New District, Shenzhen, Guangdong, China

**Equipment Under Test (EUT):**

**EUT Name:** LoRa module  
**Model No.:** CMWX1ZZABZ  
**Trade Mark:** Murata  
**Standard(s) :** FCC Rules 47 CFR §2.1091  
 KDB447498 D01 General RF Exposure Guidance v06  
 RSS-102 Issue 5 Amendment 1 (February 2, 2021)  
**Date of Receipt:** 2021-02-26  
**Date of Test:** 2021-08-07 to 2021-08-11  
**Date of Issue:** 2021-08-16

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

*Parlan Zhan*

Parlan Zhan  
Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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Revision Record			
Version	Description	Date	Remark
00	Original	2021-08-16	/

<b>Authorized for issue by:</b>   <hr/> <b>Bill Wu / Project Engineer</b>			
	 <hr/> <b>Parlam Zhan /Reviewer</b>		



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## 2 Contents

	Page
<b>1 COVER PAGE</b> .....	<b>1</b>
<b>2 CONTENTS</b> .....	<b>3</b>
<b>3 GENERAL INFORMATION</b> .....	<b>4</b>
3.1 GENERAL DESCRIPTION OF E.U.T. ....	4
3.2 TECHNICAL SPECIFICATIONS .....	4
3.3 TEST LOCATION .....	5
3.4 TEST FACILITY.....	5
<b>4 TEST STANDARDS AND LIMITS</b> .....	<b>6</b>
4.1 FCC RADIOFREQUENCY RADIATION EXPOSURE LIMITS: .....	6
4.2 IC RADIOFREQUENCY RADIATION EXPOSURE LIMITS: .....	6
<b>5 MEASUREMENT AND CALCULATION</b> .....	<b>7</b>
5.1 MAXIMUM TRANSMIT POWER .....	7
5.2 MPE CALCULATION .....	8



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### 3 General Information

#### 3.1 General Description of E.U.T.

Power supply:	DC 3.3V
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#### 3.2 Technical Specifications

Operation Frequency:	125kHz Channel: 902.3-914.9MHz 500kHz Channel: 903-914.2MHz
Modulation Technique:	LoRa
Spread Factor (SF):	125kHz Channel: 7-10 500kHz Channel: 7-12
Number of Channel:	125kHz Channel: 64 channels 500kHz Channel: 8 channels
Channel Space:	125kHz Channel: 200KHz 500kHz Channel: 1.6MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	2 dBi (Provided by manufacturer)



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### 3.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch  
588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China  
Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

### 3.4 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

- **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory  
Company Number: 8617A

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.



## 4 Test Standards and Limits

### 4.1 FCC Radiofrequency radiation exposure limits:

According to §1.1310, the limit for general population/uncontrolled exposures

Frequency	Power density(mW/cm <sup>2</sup> )	Averaging time(minutes)
300MHz~1.5GHz	f/1500	30
1.5GHz~100GHz	1.0	30

### 4.2 IC Radiofrequency radiation exposure limits:

According to RSS-102 section 2.5.2, RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $4.49/f^{0.5}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

For 915MHz device, the limit of worse case is 1.38 W



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## 5 Measurement and Calculation

### 5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM210200158201.

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
125kHz Channel	902.3	18.61	72.61
	908.5	18.71	<b>74.30</b>
	914.9	18.65	73.28
500kHz Channel	903	17.98	62.81
	907.8	17.88	61.38
	914.2	17.94	62.23



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## 5.2 MPE Calculation

For FCC:

According to the formula  $S=P/4\pi R^2$ , we can calculate S which is MPE.

Note:

- 1) P (mW)
- 2) R = distance to the center of radiation of antenna (in meter) = 20cm
- 3) MPE limit = 0.61mW/cm<sup>2</sup>

The max. antenna gain is 2 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
74.3	1.585	20	0.02343	0.61	Pass

For IC:

$$E.I.R.P.= P \cdot G = 0.074 \times 1.585 = 0.12W < 1.38W$$

So the device is exclusion from SAR test.

**--End of the Report--**



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