

Test Report No:
23A0228R-RFUSV17S-A

RF EXPOSURE EVALUATION DECLARATION

Product Name	Communication Module
Brand Name	muRata
Model No.	LBEE5XV1YM
FCC ID	QHQ-LB1YM
Applicant's Name / Address	Laerdal Medical AS Tanke Svilandsgate 30 P.O. Box 377, Stavanger, 4002 Norway
Manufacturer's Name / Address	Murata Manufacturing Co., Ltd. 1-10-1, Higashikotari, Nagaokakyo-shi, Kyoto 617-8555 Japan
Test Method Requested, Standard	FCC CFR Title 47 Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices.
Verdict Summary	IN COMPLIANCE
Documented By	 Amelia Wu
Approved By	 Rueyyan Lin
Date of Receipt	Oct. 11, 2023
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Competences and Guarantees

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General Conditions

1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	Dec. 19, 2023

Permissive Change

Permissive Change	Modifications
Class II Permissive Change (C2PC)	1. Additional platform added (Product: CAN CPU Module 2, Brand: Laerdal Medical AS, Model: 20-19560). 2. Add two same type antennas (Type: dipole, model: 2118909-1) but higher gain for WiFi 2.4GHz/Bluetooth and lower gain for WiFi 5GHz than the original certificate. After evaluating, it was calculated for the test result of RF exposure evaluation and record in the report.

1. General Information

1.1. EUT Description

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
WiFi 2.4 GHz	2400 ~ 2483.5	2412 ~ 2462	802.11b: DSSS 802.11g/n: OFDM
WiFi 5 GHz	5150 ~ 5250 5250 ~ 5350 5470 ~ 5725 5725 ~ 5850	5180 ~ 5240 5260 ~ 5320 5500 ~ 5720 5745 ~ 5825	802.11a/n/ac: OFDM
Bluetooth	2400 ~ 2483.5	2402 ~ 2480	BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK) LE: GFSK

Note: The above EUT information is declared by the manufacturer.

The difference between EUT 1 and EUT 2 is shown as below (please refer to EUT Photograph):

EUT	Shape	Length of antenna cable (mm)
1	Circle	150+50
2	Square	150+100

The cable length of EUT 1 is shorter and evaluated as worst case.

1.2. Testing Location Information

Testing Location Information		
Test Laboratory : DEKRA Testing and Certification Co., Ltd.		
1 (TAF: 3024)	ADD: No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. TEL: +886-3-582-8001 FAX: +886-3-582-8958	
2 (TAF: 3024)	ADD: No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. TEL: +886-3-582-8001 FAX: +886-3-582-8958	
Test site number for address 1 includes HC-SR02. Test site number for address 2 includes HC-CB02, HC-CB03, HC-CB04, HC-SR10 and HC-SR12.		

2. RF Exposure Evaluation

2.1. Test Limit

(A) Test Limit for Occupational / Controlled 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)
0.3-3.0	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) Test Limit 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 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; *Plane-wave equivalent power density

Power Density (S) is calculated by the following formula:

$$S = (P \cdot G) / 4\pi R^2$$

where:

S = power density (in appropriate units, e.g. mW/ cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

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

π = 3.1416

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

2.2. Test Result of RF Exposure Evaluation

Exposure Environment: General Population / Uncontrolled Exposure

Evaluation Mode	E.I.R.P (dBm)	E.I.R.P (mW)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Test Result (PASS/FAIL)
WiFi 2.4 GHz	25.121	325.162	0.065	1.000	PASS
WiFi 5 GHz Band 1	19.610	91.411	0.018	1.000	PASS
WiFi 5 GHz Band 2	23.720	235.505	0.047	1.000	PASS
WiFi 5 GHz Band 3	23.690	233.884	0.047	1.000	PASS
WiFi 5 GHz Band 4	24.730	297.167	0.059	1.000	PASS
Bluetooth BR / EDR	10.180	10.423	0.002	1.000	PASS
Bluetooth LE	10.210	10.495	0.002	1.000	PASS

Distance (cm): 20 for Maximum Permissible Exposure.

Co-location
Conclusion: The formula of calculated the MPE is: $CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$ CPD = Calculation power density LPD = Limit of power density WiFi 2.4 GHz + Bluetooth = $0.065 + 0.002 = 0.067$, therefore the maximum calculations of above situations are less than the "1" limit. WiFi 5 GHz + Bluetooth = $0.059 + 0.002 = 0.061$, therefore the maximum calculations of above situations are less than the "1" limit.

Note:

1. The above EUT information is declared by the manufacturer.
2. The EUT was installed to the host (brand name: Laerdal Medical AS, model: 204-00250) to perform the test.
3. The results are based on the maximum power.