



RF Exposure Evaluation Declaration

FCC ID: VPYLBEE59B1LV

APPLICANT: Murata Manufacturing Co., Ltd.

Application Type: Certification

Product: Communication Module

Model No.: Type1LV

FCC Classification: FCC Part 15 Spread Spectrum Transmitter(DSS)
Digital Transmission System (DTS)
Unlicensed National Information Infrastructure (NII)

Test Procedure(s): KDB 447498 D01v06

Test Date: March 28, 2019

Reviewed By:

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Approved By:

Robin Wu

(Robin Wu)



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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Revision History

| Report No. | Version | Description | Issue Date | Note |
|---------------|---------|----------------|------------|-------|
| 1901WSU002-U6 | Rev. 01 | Initial report | 03-28-2019 | Valid |
| | | | | |

1. PRODUCT INFORMATION

1.1. Equipment Description

| | |
|--------------------------|--------------------------------|
| Product Name: | Communication Module |
| Model No.: | Type1LV |
| Brand Name: | MURATA |
| Work Voltage: | DC 3.3V |
| Wi-Fi Specification: | 802.11 a/b/g/n/ac |
| Bluetooth Specification: | BR / EDR / LE 1Mbps / LE 2Mbps |

Note: Work voltage for test fixture is DV 5V.

2. RF Exposure Evaluation

2.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm ²) | Average Time (Minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| (A) Limits for Occupational/ Control Exposures | | | | |
| 300-1500 | -- | -- | f/300 | 6 |
| 1500-100,000 | -- | -- | 5 | 6 |
| (B) Limits for General Population/ Uncontrolled Exposures | | | | |
| 300-1500 | -- | -- | f/1500 | 6 |
| 1500-100,000 | -- | -- | 1 | 30 |

f= Frequency in MHz

Calculation Formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Test Result of RF Exposure Evaluation

| | |
|-----------|------------------------|
| Product | Communication Module |
| Test Item | RF Exposure Evaluation |

| Test Mode | Frequency Band (MHz) | Maximum EIRP (dBm) | Power Density at R = 20 cm (mW/cm ²) | Limit (mW/cm ²) |
|----------------|----------------------|--------------------|--|-----------------------------|
| Bluetooth | 2402 ~ 2480 | 10.83 | 0.0024 | 1 |
| 802.11b/g/n/ac | 2412 ~ 2462 | 19.83 | 0.0191 | 1 |
| 802.11a/n/ac | 5180 ~ 5825 | 19.92 | 0.0195 | 1 |

CONCLUSION:

The max Power Density at R (20 cm) = $0.0024 \text{ mW/cm}^2 < 1 \text{ mW/cm}^2$ for Bluetooth.

The max Power Density at R (20 cm) = $0.0191 \text{ mW/cm}^2 < 1 \text{ mW/cm}^2$ for 2.4G WLAN.

The max Power Density at R (20 cm) = $0.0195 \text{ mW/cm}^2 < 1 \text{ mW/cm}^2$ for 5G WLAN.

Therefore, the Min Safety Distance is 20cm.

_____ The End _____

Appendix A – Test Setup Photograph

Refer to “1901WSU002-UT” file.

Appendix B – EUT Photograph

Refer to “1901WSU002-UE” file.