



RF Exposure Evaluation Declaration

FCC ID: VPYLB1PJ

APPLICANT: Murata Manufacturing Co., Ltd.

Application Type: Certification

Product: W-LAN + Bluetooth Module

Model No.: LBEE5ZZ1PJ

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

Reviewed By : *Kevin Guo*
(Kevin Guo)

Approved By : *Marlin Chen*
(Marlin Chen)



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
1710WSU01606	Rev. 01	Initial report	12-11-2017	Valid

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name:	W-LAN + Bluetooth Module
Model No.:	LBEE5ZZ1PJ
Brand Name:	Murata
Work Voltage	DC 3.3V
WiFi Specification	802.11 a/b/g/n/ac
Bluetooth Specification	v4.1 dual mode

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	W-LAN + Bluetooth 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	15.35	0.0068	1
802.11b/g/n	2412 ~ 2462	21.85	0.0305	1
802.11a/n/ac	5180 ~ 5825	17.23	0.0105	1

CONCULISON:

The max Power Density at R (20 cm) = $0.0068\text{mW/cm}^2 < 1\text{ mW/cm}^2$ for Bluetooth.

The max Power Density at R (20 cm) = $0.0305\text{mW/cm}^2 < 1\text{ mW/cm}^2$ for 2.4G WLAN.

The max Power Density at R (20 cm) = $0.0105\text{mW/cm}^2 < 1\text{ mW/cm}^2$ for 5G WLAN.

Therefore, the Min Safety Distance is 20cm.



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