RF Exposure Assessment

For

W-LAN + Bluetooth Module 1PJ

FCC ID: VPYLBEE5ZZ1PJ
IC ID: 772C-LBEE5ZZ1PJ

Assessment Reference: MDE_JABIL_2006_MPE_02

Test Laboratory:
7layers GmbH
Borsigstraße 11
40880 Ratingen
Germany

Table of Contents

0 Summary

0.1 Technical Report Summary

Type of Report
RF Exposure Assessment for a W-LAN + Bluetooth radio module.

Applicable FCC and ISED Rules

For RF Exposure:

OET Bulletin 65 Edition 97-01 August 1997
FCC 47 CFR §1.1307
FCC 47 CFR §1.1310
RSS-102 Issue 5 – March 2015

Report version control			
Rev Version	**Release date**	**Changes**	**Version validity**
-	2022-06-30	Initial version	Valid

Responsible for Report:

1 Administrative Data

1.1 Testing Laboratory

Company Name:	7layers GmbH
Address	Borsigstr. 11 40880 Ratingen Germany

1.2 Project Data

Responsible for assessment and report:	Andreas Tübel
Date of Report:	2022-06-20

1.3 Applicant Data

Company Name:	Murata Manufacturing Co., Ltd
Address:	10-1, Higashikotari 1-chome, Nagaokakyo-shi, Kyoto 617-8555, Japan
Contact Person:	Freddy Lemmens

1.4 Manufacturer Data

Company Name:	Murata Manufacturing Co., Ltd
Address:	10-1, Higashikotari 1-chome, Nagaokakyo-shi, Kyoto 617-8555, Japan
Contact Person:	Freddy Lemmens

2 Test object Data

2.1 General EUT Description

Equipment under Test	1PJ
Kind of Device:	W-LAN + Bluetooth Module
FCC ID:	VPYLBEE5ZZ1PJ
IC ID:	772C-LBEE5ZZ1PJ

General product description:

The EUT is W-LAN + Bluetooth radio module.

3 Evaluation Results

3.1 RF Exposure Evaluation for Module

Standards
OET Bulletin 65 Edition 97-01 August 1997
RSS-102 Issue 5 – March 2015

3.1.1 Test limits

As specified in Table 1B of 47 CFR 1.1310 – Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure.

Frequency range (MHz)	*Power density (mW/cm²)*
300 – 1,500	f/1500
1,500 – 100,000	1.0

Limits specified per RSS-102, Issue 5.

Frequency range (MHz)	*Power density (W/m²)*	*Power density (mW/cm²)*
300 – 6000	$0.02619\ f^{0.6834}$	*mW/cm² = W/m² * 0.1*

Equation OET bulletin 65, page 18, edition 97-01: $S = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$

Where:

S = power density
P = power input to the antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the centre of radiation of the antenna

3.1.2 Test Protocol

					G		P			S	
Operational Bands	Mode	Duty Cycle	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain -numeric- (mW/cm²)	Output Power - conducted- (dBm)	Output Power - conducted - (mW)	Equivalent conducted output power (mW)	IC Limit (mW/cm²)	FCC Limit (mW/cm²)	Power Density value (mW/cm²)
2.4GHZ	WLAN	100%	2462	2.8	1.9055	17.80	60.26	60.26	0.5442	1.00	**0.0228**
5.0GHz	WLAN	100%	5825	3.8	2.3988	11.90	15.49	15.49	0.9803	1.00	**0.0074**
2.4GHz	BT	100%	2441	2.8	1.9055	5.40	3.47	3.47	0.5410	1.00	**0.0013**
2.4GHz	BLE	100%	2440	2.8	1.9055	-2.90	0.51	0.51	0.5409	1.00	**0.0002**

Distance to Antenna (R) in cm:	**20**

3.1.3 Conclusion

Margin to FCC Limit (mW/cm²)	Margin to IC Limit (mW/cm²)	Minimum Distance to be ensured cm (FCC)	Minimum Distance to be ensured cm (IC)
0.9772	**0.5213**	**3.0227**	**4.0976**
0.9926	**0.9729**	**1.7195**	**1.7367**
0.9987	**0.5397**	**0.7251**	**0.9858**
0.9998	**0.5407**	**0.2789**	**0.3792**