

Maximum Permissible Exposure Report

FCC ID: 2ALZB-AG1103

Report No. : BTL-FCCP-5-2102T091
Equipment : IEEE 802.11 2X2 MU-MIMO ac/a/b/g/n Wireless LAN +Bluetooth NGFF Module
Model Name : W8997-1216
Brand Name : Marvell
Applicant : SECO S.p.A
Address : Via Achille Grandi 20, 52100 Arezzo Italy

FCC Rule Part(s) : FCC CFR Title 47, Part 2 (2.1091)
FCC Guidelines for Human Exposure IEEE C95.1

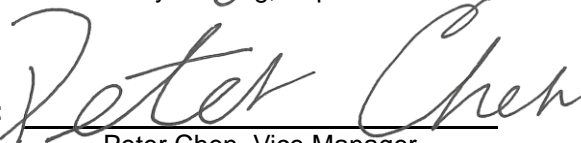
Date of Receipt : 2021/2/9
Date of Test : 2021/2/9 ~ 2021/5/31
Issued Date : 2021/10/6

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

Prepared by


Jerry Chuang, Supervisor

Approved by


Peter Chen, Vice Manager

**BTL Inc.**

No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan

Tel: +886-2-2657-3299

Fax: +886-2-2657-3331

Web: www.newbtl.com

REVISION HISTORY

Report No.	Version	Description	Issued Date
BTL-FCCP-5-2102T091	R00	Original Report.	2021/7/28
BTL-FCCP-5-2102T091	R01	Revised report to address TCB's comments.	2021/8/16
BTL-FCCP-5-2102T091	R02	Revised report to address TCB's comments.	2021/8/26
BTL-FCCP-5-2102T091	R03	Revised report to address TCB's comments.	2021/10/6

Table for Filed Antenna

Antenna	Manufacture	Part number	Type	Frequency Range (MHz)	Gain (dBi)
Main	dynaflex	616	Dipole	2400-2480	1.1
				5000-5800	2.5

Maximum RF OUTPUT POWER

Mode		Maximum Tune-up Power (dBm)
WLAN 2.4 GHz		15.5
RLAN 5 GHz	5.18GHz~5.24GHz	16
	5.26GHz~5.32GHz	16.5
	5.50GHz~5.70GHz	15
	5.745GHz~5.825GHz	15.5
BT		4.5
BLE		2.5

MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi^2} = \frac{EIRP}{4\pi^2}$$

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 center of radiation of the antenna

RESULTS

For BT:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
1.10	1.2882	4.50	2.8184	0.00072269	1	Complies

For BLE:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
1.10	1.2882	2.50	1.7783	0.00045598	1	Complies

For 2.4G WLAN:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
1.10	1.2882	15.50	35.4813	0.00909809	1	Complies

For 5G RLAN:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.50	1.7783	16.5	44.6684	0.01581067	1	Complies

Note:

1. The calculated distance is 20 cm.

Simultaneous Transmission:

Both of the Lora, Bluetooth and Wi-Fi can transmit simultaneously, the formula of calculated the MPE is:
 $CPD1 / LPD1 + CPD2 / LPD2 + \dots \dots \dots \text{etc.} < 1$

CPD: Calculation power density

LPD: Limit of power density

2.4G+BT

Therefore, the worst –case situation calculated as below, which the result is less than “1”.

$$0.00909809/1 + 0.00072269/1 = 0.00982078 < 1$$

5G+BT

Therefore, the worst –case situation calculated as below, which the result is less than “1”.

$$0.01581067/1 + 0.00072269/1 = 0.01653336 < 1$$

End of Test Report