Maximum Permissible Exposure Report

FCC ID: 2ALZB-AG1103

Report No.	:	BTL-FCCP-5-2102T091A
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	:	2022/8/9
Date of Test	:	2022/8/9 ~ 2022/12/2
Issued Date	:	2023/1/11

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

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-5-2102T091A	R00	Original Report.	2022/11/23	Invalid
BTL-FCCP-5-2102T091A	R01	Revised report to address TCB's comments.	2022/12/14	Invalid
BTL-FCCP-5-2102T091A	R02	Revised report to address TCB's comments.	2023/1/11	Valid

Host device information	
Equipment	Display Unity 27”
Model Name	Unity27
Brand Name	SECO
Model Difference	Differ in product size.
Power Source	DC voltage supplied from AC/DC Adapter.
Power Rating	DC 12V

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
Aux	dynaflex	616	Dipole	2400-2480	1.1
				5000-5800	2.5

The above Antenna information are derived from the antenna data sheet provided by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

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

Note: The values are adopted from test report: BTL-FCCP-1-2102T091, BTL-FCCP-2-2102T091, BTL-FCCP-3-2102T091 and BTL-FCCP-4-2102T091.

MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

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

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 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 + ……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