

# FCC Radio Test Report

**FCC ID: 2ALZB-AG1103**

**Report No.** : BTL-FCCP-6-2102T091A  
**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  
  
**Radio Function** : Transmit Simultaneously  
  
**FCC Rule Part(s)** : FCC CFR Title 47, Part 15, Subpart C (15.247)  
**Measurement Procedure(s)** : ANSI C63.10-2013  
  
**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.

**Prepared by** :

*Eric Lee*

Eric Lee, Engineer

**Approved by** :

*Jerry Chuang*

Jerry Chuang, Supervisor



**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](http://www.newbtl.com) Service mail: [btl\\_qa@newbtl.com](mailto:btl_qa@newbtl.com)

**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.

**CONTENTS**

|            |                                                          |    |
|------------|----------------------------------------------------------|----|
| 1          | SUMMARY OF TEST RESULTS                                  | 5  |
| 1.1        | TEST FACILITY                                            | 6  |
| 1.2        | MEASUREMENT UNCERTAINTY                                  | 6  |
| 1.3        | TEST ENVIRONMENT CONDITIONS                              | 6  |
| 2          | GENERAL INFORMATION                                      | 7  |
| 2.1        | DESCRIPTION OF EUT                                       | 7  |
| 2.2        | TEST MODES                                               | 9  |
| 2.3        | BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED | 10 |
| 2.4        | SUPPORT UNITS                                            | 10 |
| 3          | RADIATED EMISSIONS TEST                                  | 11 |
| 3.1        | LIMIT                                                    | 11 |
| 3.2        | TEST PROCEDURE                                           | 12 |
| 3.3        | DEVIATION FROM TEST STANDARD                             | 12 |
| 3.4        | TEST SETUP                                               | 13 |
| 3.5        | EUT OPERATING CONDITIONS                                 | 13 |
| 3.6        | TEST RESULT                                              | 13 |
| 4          | LIST OF MEASURING EQUIPMENTS                             | 14 |
| 5          | EUT TEST PHOTO                                           | 15 |
| 6          | EUT PHOTOS                                               | 15 |
| APPENDIX A | RADIATED EMISSIONS                                       | 16 |

**REVISION HISTORY**

| Report No.           | Version | Description                               | Issued Date | Note    |
|----------------------|---------|-------------------------------------------|-------------|---------|
| BTL-FCCP-6-2102T091A | R00     | Original Report.                          | 2022/11/23  | Invalid |
| BTL-FCCP-6-2102T091A | R01     | Revised report to address TCB's comments. | 2022/12/14  | Invalid |
| BTL-FCCP-6-2102T091A | R02     | Revised report to address TCB's comments. | 2023/1/11   | Valid   |

## 1 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards.

| Standard(s) Section           | Description        | Test Result | Judgement | Remark |
|-------------------------------|--------------------|-------------|-----------|--------|
| 15.205<br>15.209<br>15.247(d) | Radiated Emissions | APPENDIX A  | Pass      | -----  |

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) The report format version is TP.1.1.1.

### 1.1 TEST FACILITY

The test locations stated below are under the TAF Accreditation Number 0659.

The test location(s) used to collect the test data in this report are:

No. 72, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

(FCC DN: TW0659)

☐ C06      ☒ CB21      ☐ CB22

### 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k = 2$ , providing a level of confidence of approximately **95 %**.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2  $U_{\text{CISPR}}$  requirement.

A. Radiated emissions test :

| Test Site | Measurement Frequency Range | $U_1$ (dB) |
|-----------|-----------------------------|------------|
| CB21      | 0.03 GHz ~ 0.2 GHz          | 4.17       |
|           | 0.2 GHz ~ 1 GHz             | 4.72       |
|           | 1 GHz ~ 6 GHz               | 5.21       |
|           | 6 GHz ~ 18 GHz              | 5.51       |
|           | 18 GHz ~ 26 GHz             | 3.69       |
|           | 26 GHz ~ 40 GHz             | 4.23       |

NOTE:

Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

### 1.3 TEST ENVIRONMENT CONDITIONS

| Test Item          | Environment Condition | Test Voltage | Tested by |
|--------------------|-----------------------|--------------|-----------|
| Radiated emissions | Refer to data         | AC 120V      | Mark Wang |

## 2 GENERAL INFORMATION

### 2.1 DESCRIPTION OF EUT

|                         |                                                                                                                                                                                    |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment               | IEEE 802.11 2X2 MU-MIMO ac/a/b/g/n Wireless LAN +Bluetooth NGFF Module                                                                                                             |
| Model Name              | W8997-1216                                                                                                                                                                         |
| Brand Name              | Marvell                                                                                                                                                                            |
| Model Difference        | N/A                                                                                                                                                                                |
| Power Supply Rating     | DC 3.3V from host equipment                                                                                                                                                        |
| 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                                                                                                                                                                             |
| Products Covered        | N/A                                                                                                                                                                                |
| WIFI+BT Module          | Marvell / W8997-1216                                                                                                                                                               |
| Operation Frequency     | BT: 2402 MHz ~ 2480 MHz<br>WLAN: 2412 MHz ~ 2462 MHz<br>UNII-1: 5180 MHz ~ 5240 MHz<br>UNII-2A: 5260 MHz ~ 5320 MHz<br>UNII-2C: 5500 MHz ~ 5700 MHz<br>UNII-3: 5745 MHz ~ 5825 MHz |
| Test Model              | Unity27                                                                                                                                                                            |
| Sample Status           | Engineering Sample                                                                                                                                                                 |
| EUT Modification(s)     | N/A                                                                                                                                                                                |

**NOTE:**

- The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
- Channel List:

| BT      |                 |         |                 |         |                 |
|---------|-----------------|---------|-----------------|---------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 00      | 2402            | 27      | 2429            | 54      | 2456            |
| 01      | 2403            | 28      | 2430            | 55      | 2457            |
| 02      | 2404            | 29      | 2431            | 56      | 2458            |
| 03      | 2405            | 30      | 2432            | 57      | 2459            |
| 04      | 2406            | 31      | 2433            | 58      | 2460            |
| 05      | 2407            | 32      | 2434            | 59      | 2461            |
| 06      | 2408            | 33      | 2435            | 60      | 2462            |
| 07      | 2409            | 34      | 2436            | 61      | 2463            |
| 08      | 2410            | 35      | 2437            | 62      | 2464            |
| 09      | 2411            | 36      | 2438            | 63      | 2465            |
| 10      | 2412            | 37      | 2439            | 64      | 2466            |
| 11      | 2413            | 38      | 2440            | 65      | 2467            |
| 12      | 2414            | 39      | 2441            | 66      | 2468            |
| 13      | 2415            | 40      | 2442            | 67      | 2469            |
| 14      | 2416            | 41      | 2443            | 68      | 2470            |
| 15      | 2417            | 42      | 2444            | 69      | 2471            |
| 16      | 2418            | 43      | 2445            | 70      | 2472            |
| 17      | 2419            | 44      | 2446            | 71      | 2473            |
| 18      | 2420            | 45      | 2447            | 72      | 2474            |
| 19      | 2421            | 46      | 2448            | 73      | 2475            |
| 20      | 2422            | 47      | 2449            | 74      | 2476            |
| 21      | 2423            | 48      | 2450            | 75      | 2477            |
| 22      | 2424            | 49      | 2451            | 76      | 2478            |

|    |      |    |      |    |      |
|----|------|----|------|----|------|
| 23 | 2425 | 50 | 2452 | 77 | 2479 |
| 24 | 2426 | 51 | 2453 | 78 | 2480 |
| 25 | 2427 | 52 | 2454 |    |      |
| 26 | 2428 | 53 | 2455 |    |      |

| WLAN 2.4 GHz |                 |         |                 |         |                 |
|--------------|-----------------|---------|-----------------|---------|-----------------|
| Channel      | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 01           | 2412            | 06      | 2437            | 11      | 2462            |
| 02           | 2417            | 07      | 2442            |         |                 |
| 03           | 2422            | 08      | 2447            |         |                 |
| 04           | 2427            | 09      | 2452            |         |                 |
| 05           | 2432            | 10      | 2457            |         |                 |

| WLAN 5 GHz                                                   |                 |                                              |                 |                       |                 |
|--------------------------------------------------------------|-----------------|----------------------------------------------|-----------------|-----------------------|-----------------|
| UNII-1                                                       |                 |                                              |                 |                       |                 |
| IEEE 802.11a<br>IEEE 802.11n (HT20)<br>IEEE 802.11ac (VHT20) |                 | IEEE 802.11n (HT40)<br>IEEE 802.11ac (VHT40) |                 | IEEE 802.11ac (VHT80) |                 |
| Channel                                                      | Frequency (MHz) | Channel                                      | Frequency (MHz) | Channel               | Frequency (MHz) |
| 36                                                           | 5180            | 38                                           | 5190            | 42                    | 5210            |
| 40                                                           | 5200            | 46                                           | 5230            |                       |                 |
| 44                                                           | 5220            |                                              |                 |                       |                 |
| 48                                                           | 5240            |                                              |                 |                       |                 |

| UNII-2A                                                      |                 |                                              |                 |                       |                 |
|--------------------------------------------------------------|-----------------|----------------------------------------------|-----------------|-----------------------|-----------------|
| IEEE 802.11a<br>IEEE 802.11n (HT20)<br>IEEE 802.11ac (VHT20) |                 | IEEE 802.11n (HT40)<br>IEEE 802.11ac (VHT40) |                 | IEEE 802.11ac (VHT80) |                 |
| Channel                                                      | Frequency (MHz) | Channel                                      | Frequency (MHz) | Channel               | Frequency (MHz) |
| 52                                                           | 5260            | 54                                           | 5270            | 58                    | 5290            |
| 56                                                           | 5280            | 62                                           | 5310            |                       |                 |
| 60                                                           | 5300            |                                              |                 |                       |                 |
| 64                                                           | 5320            |                                              |                 |                       |                 |

| UNII-2C                                                      |                 |                                              |                 |                       |                 |
|--------------------------------------------------------------|-----------------|----------------------------------------------|-----------------|-----------------------|-----------------|
| IEEE 802.11a<br>IEEE 802.11n (HT20)<br>IEEE 802.11ac (VHT20) |                 | IEEE 802.11n (HT40)<br>IEEE 802.11ac (VHT40) |                 | IEEE 802.11ac (VHT80) |                 |
| Channel                                                      | Frequency (MHz) | Channel                                      | Frequency (MHz) | Channel               | Frequency (MHz) |
| 100                                                          | 5500            | 102                                          | 5510            | 106                   | 5530            |
| 104                                                          | 5520            | 110                                          | 5550            | 122                   | 5610            |
| 108                                                          | 5540            | 118                                          | 5590            |                       |                 |
| 112                                                          | 5560            | 126                                          | 5630            |                       |                 |
| 116                                                          | 5580            | 134                                          | 5670            |                       |                 |
| 120                                                          | 5600            |                                              |                 |                       |                 |
| 124                                                          | 5620            |                                              |                 |                       |                 |
| 128                                                          | 5640            |                                              |                 |                       |                 |
| 132                                                          | 5660            |                                              |                 |                       |                 |
| 136                                                          | 5680            |                                              |                 |                       |                 |
| 140                                                          | 5700            |                                              |                 |                       |                 |



| UNII-3                                                       |                 |                                              |                 |                       |                 |
|--------------------------------------------------------------|-----------------|----------------------------------------------|-----------------|-----------------------|-----------------|
| IEEE 802.11a<br>IEEE 802.11n (HT20)<br>IEEE 802.11ac (VHT20) |                 | IEEE 802.11n (HT40)<br>IEEE 802.11ac (VHT40) |                 | IEEE 802.11ac (VHT80) |                 |
| Channel                                                      | Frequency (MHz) | Channel                                      | Frequency (MHz) | Channel               | Frequency (MHz) |
| 149                                                          | 5745            | 151                                          | 5755            | 155                   | 5775            |
| 153                                                          | 5765            | 159                                          | 5795            |                       |                 |
| 157                                                          | 5785            |                                              |                 |                       |                 |
| 161                                                          | 5805            |                                              |                 |                       |                 |
| 165                                                          | 5825            |                                              |                 |                       |                 |

(3) 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        |

(4) 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.

## 2.2 TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode as listed in below table.

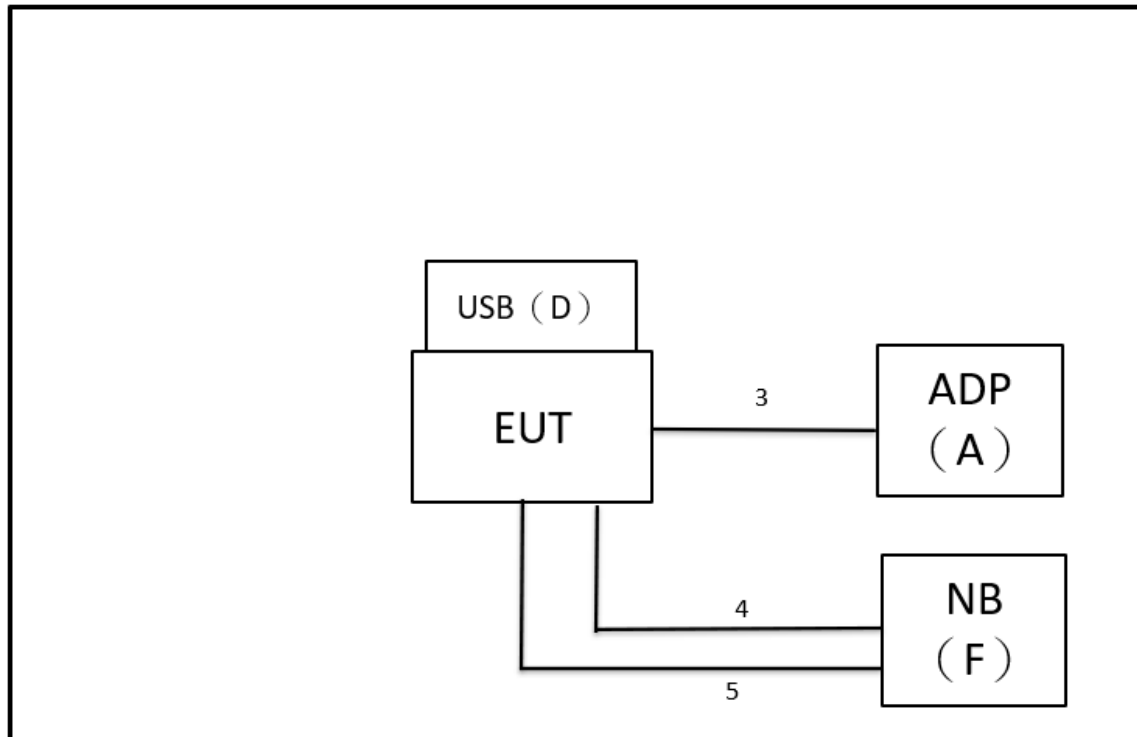
| Test Mode | Description                                       |
|-----------|---------------------------------------------------|
| 1         | IEEE 802.11g_2462MHz+ BT(1 Mbps)_2480MHz          |
| 2         | IEEE 802.11ac (VHT80)_5290MHz+ BT(1 Mbps)_2480MHz |

NOTE:

(1) The highest output powers were set for final test.

## 2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Equipment letters and Cable numbers refer to item numbers described in the tables of clause 2.4.



## 2.4 SUPPORT UNITS

| Item | Equipment | Brand                  | Model No.    | Series No. | Remarks                    |
|------|-----------|------------------------|--------------|------------|----------------------------|
| A    | Adapter   | DELTA ELECTRONICS INC. | ADT-060A12AA | N/A        | Supplied by test requester |
| D    | USB       | Transcend              | JetFlash790  | N/A        | Supplied by test requester |
| F    | NB        | HP                     | TPN-I119     | N/A        | Furnished by test lab.     |

| Item | Shielded | Ferrite Core | Length | Cable Type  | Remarks                    |
|------|----------|--------------|--------|-------------|----------------------------|
| 3    | NO       | NO           | 1.5m   | Power Cable | Supplied by test requester |
| 4    | NO       | NO           | 1.8m   | HDMI        | Furnished by test lab.     |
| 5    | NO       | NO           | 1m     | cable       | Furnished by test lab.     |

### 3 RADIATED EMISSIONS TEST

#### 3.1 LIMIT

In case the emission fall within the restricted band specified on 15.205, then the 15.209 limit in the table below has to be followed.

##### LIMITS OF RADIATED EMISSIONS MEASUREMENT (9 kHz to 1000 MHz)

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009~0.490     | 2400/F(KHz)                       | 300                           |
| 0.490~1.705     | 24000/F(KHz)                      | 30                            |
| 1.705~30.0      | 30                                | 30                            |
| 30~88           | 100                               | 3                             |
| 88~216          | 150                               | 3                             |
| 216~960         | 200                               | 3                             |
| 960~1000        | 500                               | 3                             |

##### LIMITS OF RADIATED EMISSIONS MEASUREMENT (Above 1000 MHz)

| Frequency (MHz) | Radiated Emissions (dBuV/m) |         | Measurement Distance (meters) |
|-----------------|-----------------------------|---------|-------------------------------|
|                 | Peak                        | Average |                               |
| Above 1000      | 74                          | 54      | 3                             |

##### NOTE:

- (1) The limit for radiated test was performed according to FCC Part 15, Subpart C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following:  
 Measurement Value = Reading Level + Correct Factor  
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)  
 Margin Level = Measurement Value - Limit Value  
 Calculation example:

| Reading Level |   | Correct Factor |   | Measurement Value |
|---------------|---|----------------|---|-------------------|
| 19.11         | + | 2.11           | = | 21.22             |

| Measurement Value |   | Limit Value |   | Margin Level |
|-------------------|---|-------------|---|--------------|
| 21.22             | - | 54          | = | -32.78       |

| Spectrum Parameter                         | Setting                                         |
|--------------------------------------------|-------------------------------------------------|
| Attenuation                                | Auto                                            |
| Start Frequency                            | 1000 MHz                                        |
| Stop Frequency                             | 10th carrier harmonic                           |
| RBW / VBW<br>(Emission in restricted band) | 1MHz / 3MHz for Peak,<br>1MHz / 1/T for Average |

| Mode    | VBW(Hz) |
|---------|---------|
| BT (1M) | 1300    |
| BT (2M) | 2200    |
| BT (3M) | 2700    |

| 2.4G WLAN Mode      | VBW(Hz) |
|---------------------|---------|
| IEEE 802.11b        | 300     |
| IEEE 802.11g        | 360     |
| IEEE 802.11n (HT20) | 300     |
| IEEE 802.11n (HT40) | 470     |

| 5G RLAN Mode          | VBW(Hz) |
|-----------------------|---------|
| IEEE 802.11a          | 360     |
| IEEE 802.11n (HT20)   | 300     |
| IEEE 802.11n (HT40)   | 470     |
| IEEE 802.11ac (VHT80) | 1000    |

| Spectrum Parameter     | Setting                           |
|------------------------|-----------------------------------|
| Attenuation            | Auto                              |
| Start ~ Stop Frequency | 9KHz~90KHz for PK/AVG detector    |
| Start ~ Stop Frequency | 90KHz~110KHz for QP detector      |
| Start ~ Stop Frequency | 110KHz~490KHz for PK/AVG detector |
| Start ~ Stop Frequency | 490KHz~30MHz for QP detector      |
| Start ~ Stop Frequency | 30MHz~1000MHz for QP detector     |

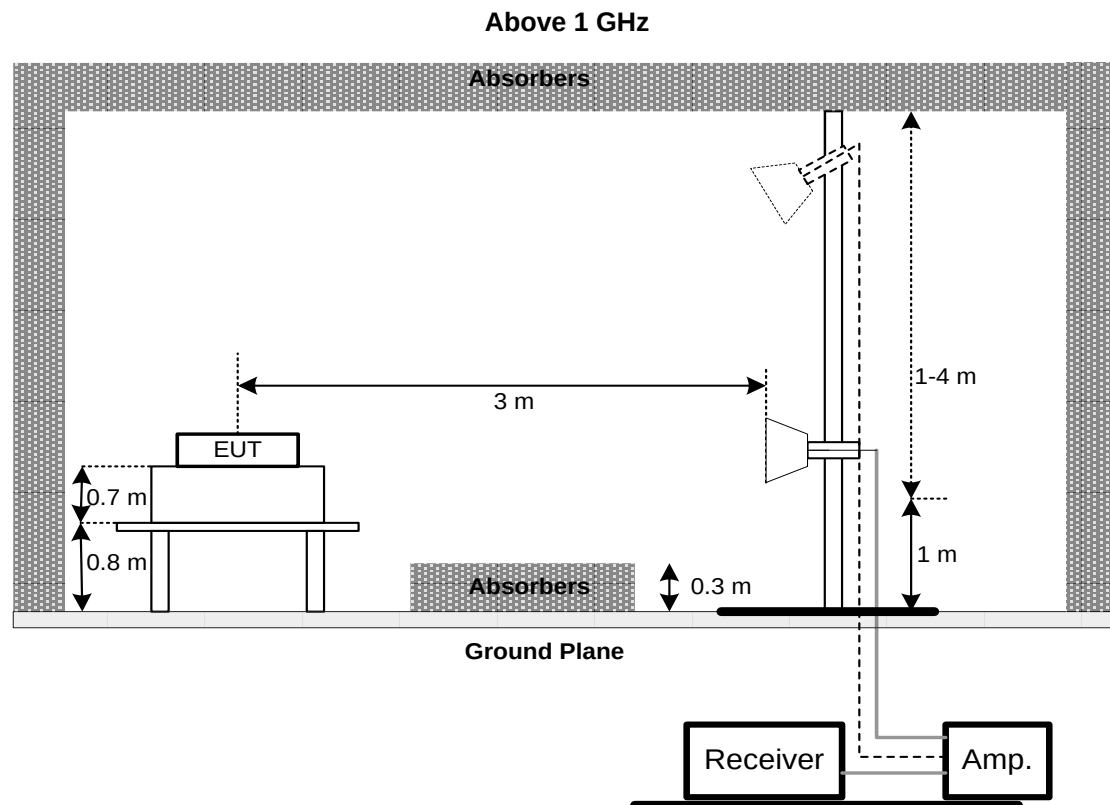
### 3.2 TEST PROCEDURE

- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- For the actual test configuration, please refer to the related Item – EUT TEST PHOTO.

### 3.3 DEVIATION FROM TEST STANDARD

No deviation.

## 3.4 TEST SETUP



## 3.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 3.6 TEST RESULT

Please refer to the APPENDIX A.

#### 4 LIST OF MEASURING EQUIPMENTS

| Radiated Emissions |                      |                 |                             |             |                 |                  |
|--------------------|----------------------|-----------------|-----------------------------|-------------|-----------------|------------------|
| Item               | Kind of Equipment    | Manufacturer    | Type No.                    | Serial No.  | Calibrated Date | Calibrated Until |
| 1                  | Preamplifier         | EMCI            | EMC330N                     | 980850      | 2022/9/19       | 2023/9/18        |
| 2                  | Preamplifier         | EMCI            | EMC118A45SE                 | 980819      | 2022/3/8        | 2023/3/7         |
| 3                  | Preamplifier         | EMCI            | EMC184045SE                 | 980882      | 2022/2/9        | 2023/2/8         |
| 4                  | Preamplifier         | EMCI            | EMC001340                   | 980555      | 2022/4/6        | 2023/4/5         |
| 5                  | Test Cable           | EMCI            | EMC104-SM-SM-1000           | 220319      | 2022/3/15       | 2023/3/14        |
| 6                  | Test Cable           | EMCI            | EMC104-SM-SM-3000           | 220322      | 2022/3/15       | 2023/3/14        |
| 7                  | Test Cable           | EMCI            | EMC104-SM-SM-7000           | 220324      | 2022/3/15       | 2023/3/14        |
| 8                  | EXA Signal Analyzer  | keysight        | N9020B                      | MY57120120  | 2022/3/7        | 2023/3/6         |
| 9                  | Loop Ant             | Electro-Metrics | EMCI-LPA600                 | 274         | 2022/6/16       | 2023/6/15        |
| 10                 | Horn Antenna         | RFSPIN          | DRH18-E                     | 211202A18EN | 2022/5/18       | 2023/5/17        |
| 11                 | Horn Ant             | Schwarzbeck     | BBHA 9170D                  | 1136        | 2022/5/18       | 2023/5/17        |
| 12                 | Log-bicon Antenna    | Schwarzbeck     | VULB9168                    | 1369        | 2022/5/20       | 2023/5/19        |
| 13                 | 6dB Attenuator       | EMCI            | EMCI-N-6-06                 | AT-N0625    | 2022/5/20       | 2023/5/19        |
| 14                 | Test Cable           | EMCI            | EMC101G-KM-K M-3000         | 220329      | 2022/3/15       | 2023/3/14        |
| 15                 | Test Cable           | EMCI            | EMC102-KM-KM-1000           | 220327      | 2022/3/15       | 2023/3/14        |
| 16                 | Measurement Software | EZ              | EZ EMC (Version NB-03A1-01) | N/A         | N/A             | N/A              |

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.  
All calibration period of equipment list is one year.

## **5 EUT TEST PHOTO**

Please refer to document Appendix No.: TP-2102T091A-FCCP-1 (APPENDIX-TEST PHOTOS).

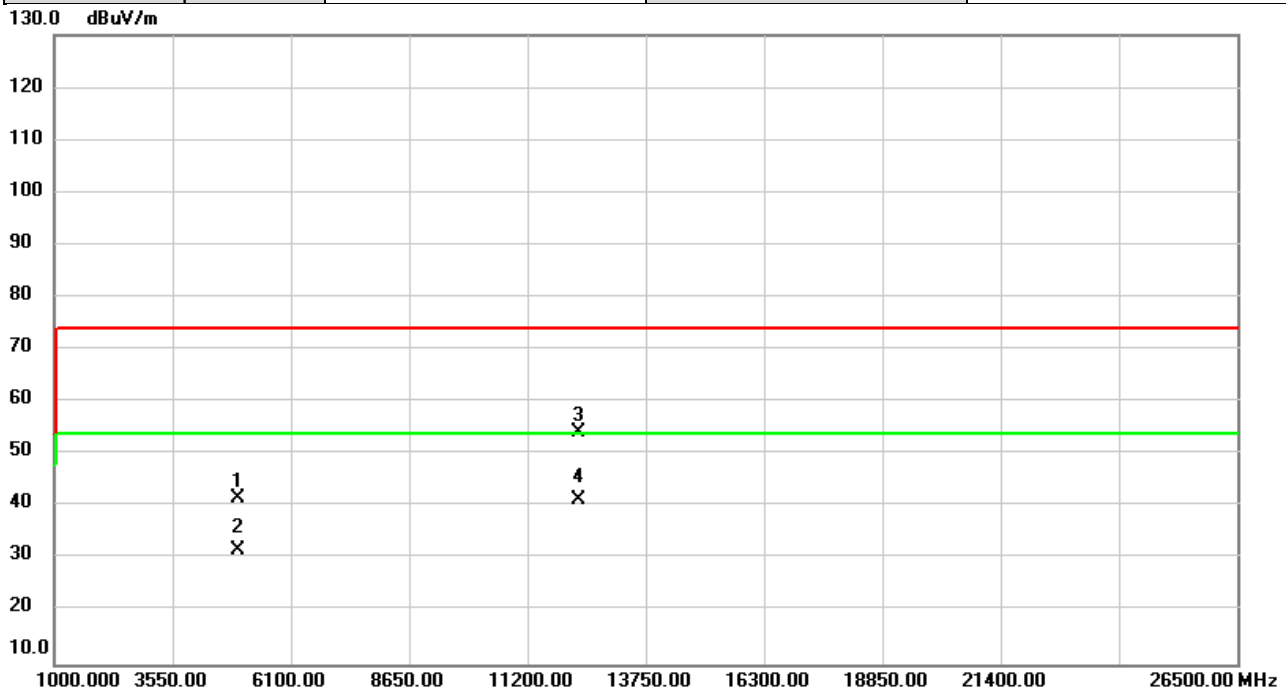
## **6 EUT PHOTOS**

Please refer to document Appendix No.: EP-2102T091A-2 (APPENDIX-EUT PHOTOS).

## APPENDIX A    RADIATED EMISSIONS



|                |                                             |              |           |
|----------------|---------------------------------------------|--------------|-----------|
| Test Mode      | IEEE 802.11g_2462MHz+<br>BT(1 Mbps) 2480MHz | Test Date    | 2022/11/9 |
| Test Frequency | 2462MHz+2480MHz                             | Polarization | Vertical  |
| Temp           | 23°C                                        | Hum.         | 53%       |

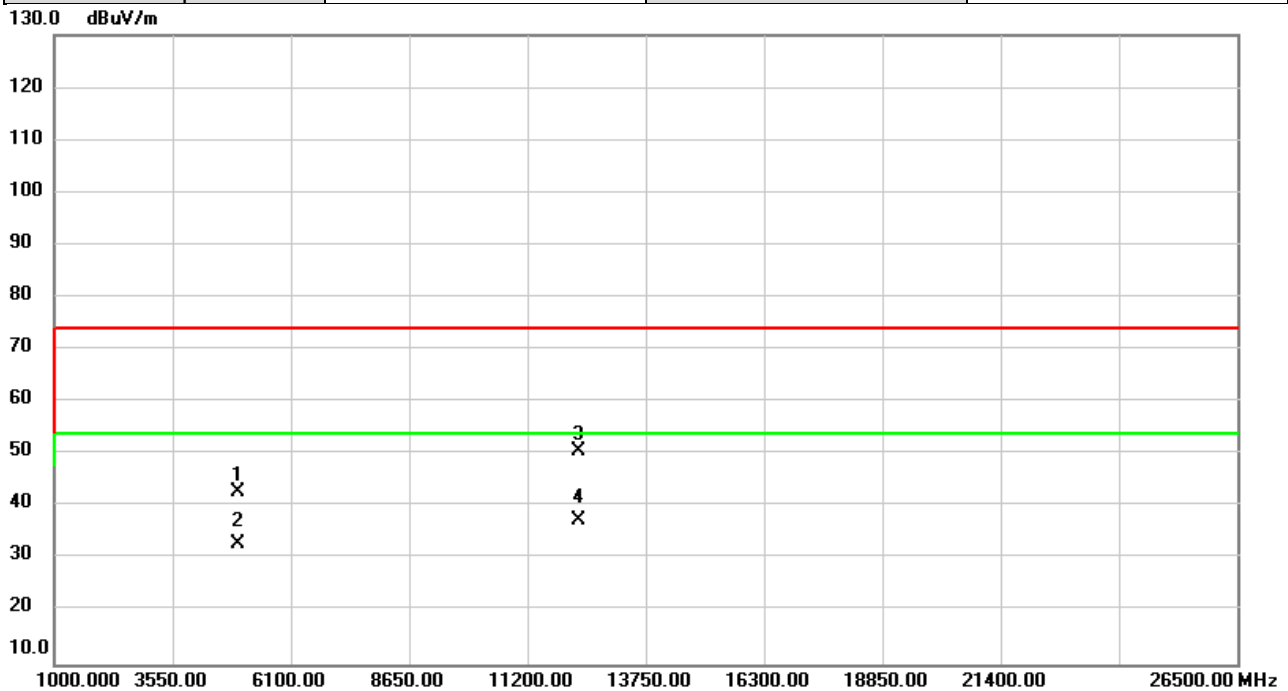


| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measure-ment | Limit  | Over   |          |         |
|-----|-----|----------|---------------|----------------|--------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m       | dBuV/m | dB     | Detector | Comment |
| 1   |     | 4960.000 | 40.54         | 1.18           | 41.72        | 74.00  | -32.28 | peak     |         |
| 2   |     | 4960.000 | 30.58         | 1.18           | 31.76        | 54.00  | -22.24 | AVG      |         |
| 3   |     | 12310.00 | 47.30         | 7.02           | 54.32        | 74.00  | -19.68 | peak     |         |
| 4   | *   | 12310.00 | 34.24         | 7.02           | 41.26        | 54.00  | -12.74 | AVG      |         |

## REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

|                |                                             |              |            |
|----------------|---------------------------------------------|--------------|------------|
| Test Mode      | IEEE 802.11g_2462MHz+<br>BT(1 Mbps) 2480MHz | Test Date    | 2022/11/9  |
| Test Frequency | 2462MHz+2480MHz                             | Polarization | Horizontal |
| Temp           | 23°C                                        | Hum.         | 53%        |

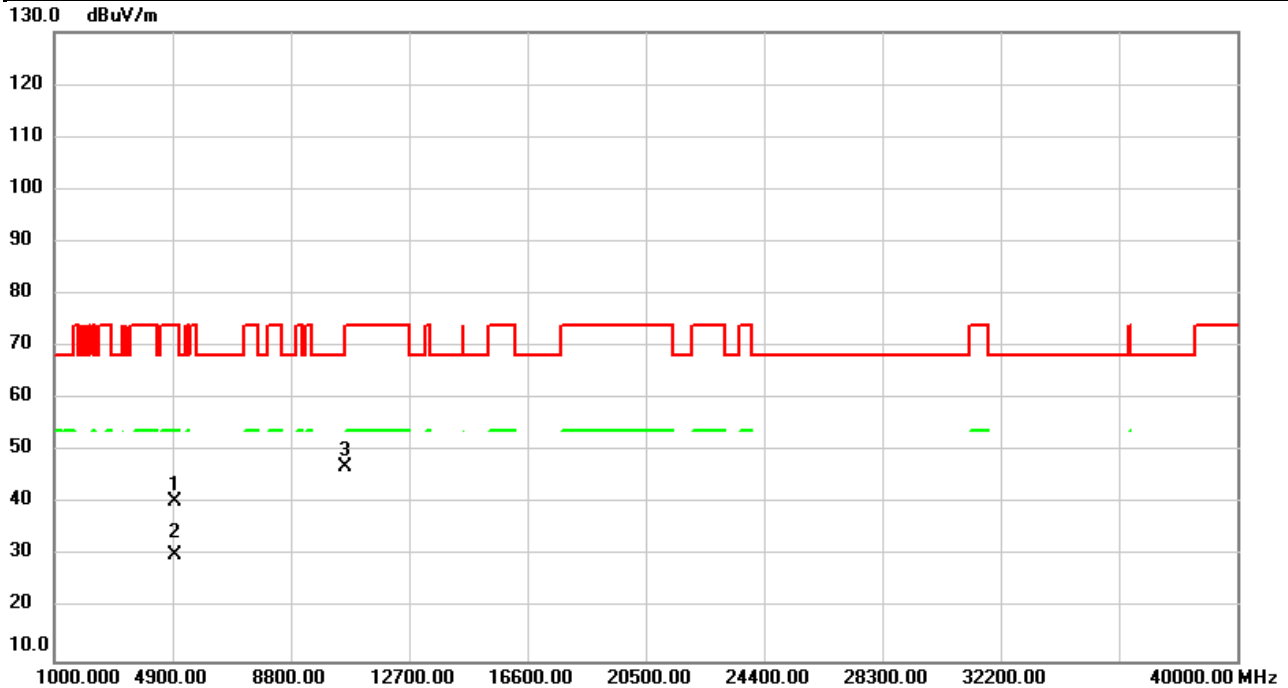


| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 4960.000     | 41.71                    | 1.18                    | 42.89                      | 74.00           | -31.11     | peak     |         |
| 2   |     | 4960.000     | 31.86                    | 1.18                    | 33.04                      | 54.00           | -20.96     | AVG      |         |
| 3   |     | 12310.00     | 43.72                    | 7.02                    | 50.74                      | 74.00           | -23.26     | peak     |         |
| 4   | *   | 12310.00     | 30.46                    | 7.02                    | 37.48                      | 54.00           | -16.52     | AVG      |         |

## REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

|                |                                                          |              |           |
|----------------|----------------------------------------------------------|--------------|-----------|
| Test Mode      | IEEE 802.11ac<br>(VHT80) 5290MHz +<br>BT(1 Mbps) 2480MHz | Test Date    | 2022/11/9 |
| Test Frequency | 5290MHz+2480MHz                                          | Polarization | Vertical  |
| Temp           | 23°C                                                     | Hum.         | 53%       |

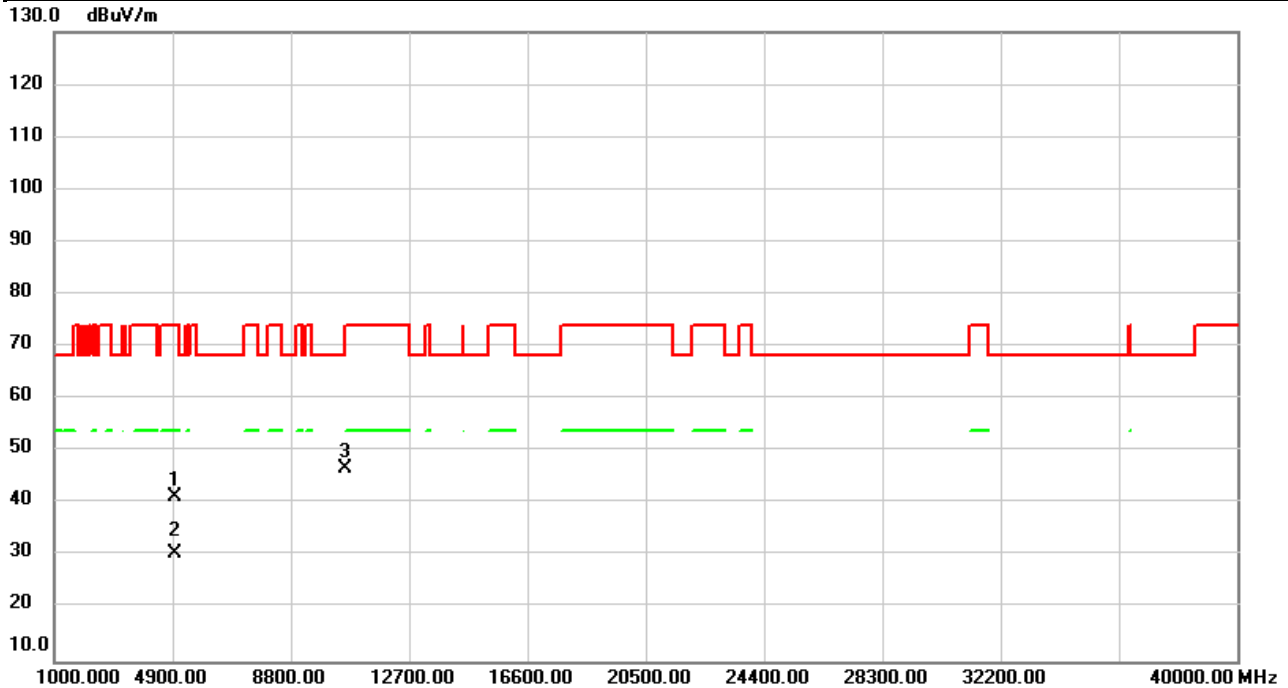


| No. | Mk. | Freq.    | Reading<br>Level | Correct<br>Factor | Measure-<br>ment | Limit  | Over   |          |         |
|-----|-----|----------|------------------|-------------------|------------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV             | dB                | dBuV/m           | dBuV/m | dB     | Detector | Comment |
| 1   |     | 4960.000 | 39.18            | 1.18              | 40.36            | 74.00  | -33.64 | peak     |         |
| 2   |     | 4960.000 | 29.19            | 1.18              | 30.37            | 54.00  | -23.63 | AVG      |         |
| 3   | *   | 10580.00 | 41.43            | 5.69              | 47.12            | 68.20  | -21.08 | peak     |         |

## REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

|                |                                                          |              |            |
|----------------|----------------------------------------------------------|--------------|------------|
| Test Mode      | IEEE 802.11ac<br>(VHT80) 5290MHz +<br>BT(1 Mbps) 2480MHz | Test Date    | 2022/11/9  |
| Test Frequency | 5290MHz+2480MHz                                          | Polarization | Horizontal |
| Temp           | 23°C                                                     | Hum.         | 53%        |



| No. | Mk. | Freq.    | Reading<br>Level | Correct<br>Factor | Measure-<br>ment | Limit  | Over   |          |         |
|-----|-----|----------|------------------|-------------------|------------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV             | dB                | dBuV/m           | dBuV/m | dB     | Detector | Comment |
| 1   |     | 4960.000 | 40.14            | 1.18              | 41.32            | 74.00  | -32.68 | peak     |         |
| 2   |     | 4960.000 | 29.37            | 1.18              | 30.55            | 54.00  | -23.45 | AVG      |         |
| 3   | *   | 10580.00 | 40.98            | 5.69              | 46.67            | 68.20  | -21.53 | peak     |         |

## REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

**End of Test Report**