



FCC Radio Test Report

FCC ID:RWO-RZ090510

This report concerns: Class II Permissive Changes

Project No. : 2309C137A
Equipment : Notebook PC
Brand Name : RAZER
Test Model : RZ09-0509
Series Model : N/A
Applicant : Razer Inc.
Address : 9 Pasteur, Suite 100, Irvine, CA92618, USA.
Manufacturer : Razer Inc.
Address : 9 Pasteur, Suite 100, Irvine, CA92618, USA.
Date of Receipt : Dec. 07, 2023
Date of Test : Dec. 11, 2023 ~ Jan. 16, 2024
Issued Date : Jan. 30, 2024
Report Version : R01
Test Sample : Sample No.: DG2023120774, DG2023120780
Standard(s) : FCC CFR Title 47, Part 15, Subpart E

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

Prepared by

:

Vincent Tan

Vincent Tan

Approved by

:

Welly Zhou

Welly Zhou

Room 108, Building 2, No. 1, Yile Road, Songshan Lake Zone, Dongguan City, Guangdong
523000 China.

Tel: +86-769-8318-3000

Web: www.newbtl.com

Service mail: 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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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: 2017 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.

| Table of Contents | Page |
|--|-------------|
| REPORT ISSUED HISTORY | 4 |
| 1 . APPLICABLE STANDARDS | 5 |
| 2 . SUMMARY OF TEST RESULTS | 5 |
| 2.1 TEST FACILITY | 6 |
| 2.2 MEASUREMENT UNCERTAINTY | 6 |
| 2.3 TEST ENVIRONMENT CONDITIONS | 6 |
| 3 . GENERAL INFORMATION | 7 |
| 3.1 GENERAL DESCRIPTION OF EUT | 7 |
| 3.2 TEST MODES | 13 |
| 3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED | 14 |
| 3.4 SUPPORT UNITS | 14 |
| 4 . AC POWER LINE CONDUCTED EMISSIONS | 15 |
| 4.1 LIMIT | 15 |
| 4.2 TEST PROCEDURE | 15 |
| 4.3 DEVIATION FROM TEST STANDARD | 15 |
| 4.4 TEST SETUP | 16 |
| 4.5 EUT OPERATION CONDITIONS | 16 |
| 4.6 TEST RESULTS | 16 |
| 5 . RADIATED EMISSIONS | 17 |
| 5.1 LIMIT | 17 |
| 5.2 TEST PROCEDURE | 18 |
| 5.3 DEVIATION FROM TEST STANDARD | 19 |
| 5.4 TEST SETUP | 19 |
| 5.5 EUT OPERATION CONDITIONS | 20 |
| 5.6 TEST RESULTS - 30 MHZ TO 1000 MHZ | 20 |
| 5.7 TEST RESULTS - ABOVE 1000 MHZ | 20 |
| 6 . MEASUREMENT INSTRUMENTS LIST | 21 |
| APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS | 22 |
| APPENDIX B - RADIATED EMISSION - 30 MHZ TO 1000 MHZ | 25 |
| APPENDIX C - RADIATED EMISSION - ABOVE 1000 MHZ | 28 |

REPORT ISSUED HISTORY

| Report No. | Version | Description | Issued Date | Note |
|----------------------|---------|---------------------------|---------------|---------|
| BTL-FCCP-1-2309C137A | R00 | Original Report. | Jan. 25, 2024 | Invalid |
| BTL-FCCP-1-2309C137A | R01 | Updated the antenna gain. | Jan. 30, 2024 | Valid |

1. APPLICABLE STANDARDS

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of NVLAP:

KDB 987594 D02 U-NII 6GHz EMC Measurement v02r01

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

| FCC CFR Title 47, Part 15, Subpart E | | | | |
|--------------------------------------|--|--------------------------|----------|----------------------|
| Standard(s) Section | Test Item | Test Result | Judgment | Remark |
| 15.207 15.407(b) | AC Power Line Conducted Emissions | APPENDIX A | PASS | ----- |
| 15.407(b) 15.205(a) 15.209(a) | Radiated Emissions | APPENDIX B APPENDIX C | PASS | ----- |
| 15.407(a) | Bandwidth | ----- | PASS | NOTE (5) |
| 15.407(a) | Maximum e.i.r.p. | ----- | PASS | NOTE (5) |
| 15.407(a) | Maximum Power Spectral Density (e.i.r.p.) | ----- | PASS | NOTE (5) |
| 15.407(b) | In-Band Emission (Mask) | ----- | PASS | NOTE (5) |
| 15.407(d) | Contention Based Protocol | ----- | PASS | NOTE (6) |
| 15.407(g) | Frequency Stability | ----- | PASS | NOTE (5) |
| 15.203 15.407(a) | Antenna Requirements | ----- | PASS | NOTE (2) NOTE (3) |

Note:

- (1) "N/A" denotes test is not applicable in this test report.
- (2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.
- (3) The device employ a permanently attached integrated antenna.
- (4) Device Type:
 - ☐ Indoor access point
 - ☐ Subordinate device (operating under control of a low-power indoor access point)
 - ☒ Indoor client (operating under control of a low-power indoor access point)
 - ☐ Dual client (operating under control of either a low-power indoor access point or standard power access point)
 - ☐ Standard power access point
 - ☐ Standard client (operating under control of a Standard power access point)
 - ☐ Fixed client (operating under control of a Standard power access point)
- (5) The antenna gain of EUT is smaller than that of the module. So in this report the worst cases of radiated spurious emissions Above 30 MHz and AC Power Line Conducted Emissions were evaluated and recorded. For the test results of all other test items please refer to module test reports.
- (6) The minimum antenna gain of the EUT is larger than the antenna gain when the module tests Contention Based Protocol, so Contention Based Protocol does not need to re-evaluate the test.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 3 Jinshagang 1st Rd. Shixia, Dalang Town, Dongguan City, Guangdong 523792

BTL's Registration Number for FCC: 162128

BTL's Designation Number for FCC: CN5042

2.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95.45% confidence level (based on a coverage factor (k=2))

The BTL measurement uncertainty as below table:

A. AC power line conducted emissions test:

| Test Site | Method | Measurement Frequency Range | U,(dB) |
|-----------|--------|-----------------------------|--------|
| DG-C02 | CISPR | 150kHz ~ 30MHz | 2.88 |

B. Radiated emissions test:

| Test Site | Method | Measurement Frequency Range | Ant. H / V | U,(dB) |
|-----------------|--------|-----------------------------|---------------|--------|
| DG-CB03 (3m) | CISPR | 30MHz ~ 200MHz | V | 4.40 |
| | | 30MHz ~ 200MHz | H | 3.62 |
| | | 200MHz ~ 1,000MHz | V | 4.58 |
| | | 200MHz ~ 1,000MHz | H | 3.98 |

| Test Site | Method | Measurement Frequency Range | U,(dB) |
|-----------------|--------|-----------------------------|--------|
| DG-CB03 (3m) | CISPR | 1GHz ~ 6GHz | 4.08 |
| | | 6GHz ~ 18GHz | 4.62 |

| Test Site | Method | Measurement Frequency Range | U,(dB) |
|-----------------|--------|-----------------------------|--------|
| DG-CB03 (1m) | CISPR | 18 ~ 26.5 GHz | 3.36 |
| | | 26.5 ~ 40 GHz | 3.58 |

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

2.3 TEST ENVIRONMENT CONDITIONS

| Test Item | Temperature | Humidity | Test Voltage | Tested By |
|-------------------------------------|-------------|----------|--------------|-------------|
| AC Power Line Conducted Emissions | 23°C | 54% | AC 120V/60Hz | Hayden Chen |
| Radiated Emissions-30MHz to 1000MHz | 24°C | 41% | AC 120V/60Hz | Allen Tong |
| Radiated Emissions-Above 1000 MHz | 22°C | 41% | AC 120V/60Hz | Max Wang |

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|-----------------------------|---|
| Equipment | Notebook PC |
| Brand Name | RAZER |
| Test Model | RZ09-0509 |
| Series Model | N/A |
| Model Difference(s) | N/A |
| Hardware Version | APF23004_MB1 APF23004_MB2 |
| Software Version | Windows 11 Home |
| Power Source | 1# DC voltage supplied from AC adapter. Model 1: RC30-042 Model 2: RC30-0484 2# Supplied from battery. Model: RC30-0484 |
| Power Rating | 1# Model 1: I/P: 100-240V~ 4A MAX 50/60Hz O/P: 19.5V===14.36A Model 2: I/P: 100-240V~ 4.5A 50/60Hz O/P: 19.5V===16.92A 2# DC 15.4V 5955mAh 91.7Wh |
| Operation Frequency Band(s) | UNII-5: 5925 MHz ~ 6425 MHz UNII-6: 6425 MHz ~ 6525 MHz UNII-7: 6525 MHz ~ 6875 MHz UNII-8: 6875 MHz ~ 7125 MHz |
| Modulation Type | IEEE 802.11ax/be: OFDMA |
| Bit Rate of Transmitter | IEEE 802.11ax: up to 2402 Mbps IEEE 802.11be: up to 5764 Mbps |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

| UNII-5 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE20), IEEE 802.11be(EHT20) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 1 | 5955 | 33 | 6115 | 65 | 6275 |
| 5 | 5975 | 37 | 6135 | 69 | 6295 |
| 9 | 5995 | 41 | 6155 | 73 | 6315 |
| 13 | 6015 | 45 | 6175 | 77 | 6335 |
| 17 | 6035 | 49 | 6195 | 81 | 6355 |
| 21 | 6055 | 53 | 6215 | 85 | 6375 |
| 25 | 6075 | 57 | 6235 | 89 | 6395 |
| 29 | 6095 | 61 | 6255 | 93 | 6415 |

| UNII-5 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE40), IEEE 802.11be(EHT40) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 3 | 5965 | 35 | 6125 | 67 | 6285 |
| 11 | 6005 | 43 | 6165 | 75 | 6325 |
| 19 | 6045 | 51 | 6205 | 83 | 6365 |
| 27 | 6085 | 59 | 6245 | 91 | 6405 |

| UNII-5 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE80), IEEE 802.11be(EHT80) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 7 | 5985 | 39 | 6145 | 71 | 6305 |
| 23 | 6065 | 55 | 6225 | 87 | 6385 |

| UNII-5 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE160), IEEE 802.11be(EHT160) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 15 | 6025 | 47 | 6185 | 79 | 6345 |

| UNII-6 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE20), IEEE 802.11be(EHT20) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 97 | 6435 | 105 | 6475 | 113 | 6515 |
| 101 | 6455 | 109 | 6495 | | |

| UNII-6 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE40), IEEE 802.11be(EHT40) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 99 | 6445 | 107 | 6485 | 115 | 6525 |

| UNII-6 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE80), IEEE 802.11be(EHT80) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 103 | 6465 | | | | |

| UNII-6 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE160), IEEE 802.11be(EHT160) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 111 | 6505 | | | | |

| UNII-7 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE20), IEEE 802.11be(EHT20) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 117 | 6535 | 141 | 6655 | 165 | 6775 |
| 121 | 6555 | 145 | 6675 | 169 | 6795 |
| 125 | 6575 | 149 | 6695 | 173 | 6815 |
| 129 | 6595 | 153 | 6715 | 177 | 6835 |
| 133 | 6615 | 157 | 6735 | 181 | 6855 |
| 137 | 6635 | 161 | 6755 | 185 | 6875 |

| UNII-7 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE40), IEEE 802.11be(EHT40) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 123 | 6565 | 147 | 6685 | 171 | 6805 |
| 131 | 6605 | 155 | 6725 | 179 | 6845 |
| 139 | 6645 | 163 | 6765 | | |

| UNII-7 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE80), IEEE 802.11be(EHT80) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 119 | 6545 | 151 | 6705 | 183 | 6865 |
| 135 | 6625 | 167 | 6785 | | |

| UNII-7 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE160), IEEE 802.11be(EHT160) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 143 | 6665 | 175 | 6825 | | |

| UNII-7 | | | | | |
|-----------------------|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11be(EHT320) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 159 | 6745 | | | | |

| UNII-8 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE20), IEEE 802.11be(EHT20) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 189 | 6895 | 205 | 6975 | 221 | 7055 |
| 193 | 6915 | 209 | 6995 | 225 | 7075 |
| 197 | 6935 | 213 | 7015 | 229 | 7095 |
| 201 | 6955 | 217 | 7035 | 233 | 7115 |

| UNII-8 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE40), IEEE 802.11be(EHT40) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 187 | 6885 | 203 | 6965 | 219 | 7045 |
| 195 | 6925 | 211 | 7005 | 227 | 7085 |

| UNII-8 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE80), IEEE 802.11be(EHT80) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 199 | 6945 | 215 | 7025 | | |

| UNII-8 | | | | | |
|---|-----------------|---------|-----------------|---------|-----------------|
| IEEE 802.11ax(HE160), IEEE 802.11be(EHT160) | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 207 | 6985 | | | | |

3. Table for Filed Antenna:

| Ant. | Manufacturer | P/N | Antenna Type | Connector | Gain (dBi) | Note |
|------|-----------------------------|-----------------|--------------|-----------|------------|--------|
| 1 | Amphenol Taiwan Corporation | BY515A-16-001-C | PIFA | IPEX | 2.82 | UNII-5 |
| | | | | | 3.73 | UNII-6 |
| | | | | | 3.96 | UNII-7 |
| | | | | | 3.20 | UNII-8 |
| 2 | Amphenol Taiwan Corporation | BY515A-16-002-C | PIFA | IPEX | 3.28 | UNII-5 |
| | | | | | 3.36 | UNII-6 |
| | | | | | 3.67 | UNII-7 |
| | | | | | 2.04 | UNII-8 |

Note:

- (1) The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers (2T2R).
- (2) The antenna gain is provided by the manufacturer.
- (3) Ant.1 refers to Main Antenna, Ant.2 refers to Aux Antenna.

4. Table for Antenna Configuration:

| Operating Mode | TX Mode | 2TX |
|-----------------------|---------|-------------------|
| IEEE 802.11ax(HE20) | | V (Ant. 1+Ant. 2) |
| IEEE 802.11ax(HE40) | | V (Ant. 1+Ant. 2) |
| IEEE 802.11ax(HE80) | | V (Ant. 1+Ant. 2) |
| IEEE 802.11ax(HE160) | | V (Ant. 1+Ant. 2) |
| IEEE 802.11be(EHT20) | | V (Ant. 1+Ant. 2) |
| IEEE 802.11be(EHT40) | | V (Ant. 1+Ant. 2) |
| IEEE 802.11be(EHT80) | | V (Ant. 1+Ant. 2) |
| IEEE 802.11be(EHT160) | | V (Ant. 1+Ant. 2) |
| IEEE 802.11be(EHT320) | | V (Ant. 1+Ant. 2) |

3.2 TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

| Pretest Mode | Description |
|--------------|---|
| Mode 1 | Normal Mode |
| Mode 2 | TX BE(EHT320) Mode Channel 159 (UNII-7) |

Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

| AC power line conducted emissions test | |
|--|-------------|
| Final Test Mode | Description |
| Mode 1 | Normal Mode |

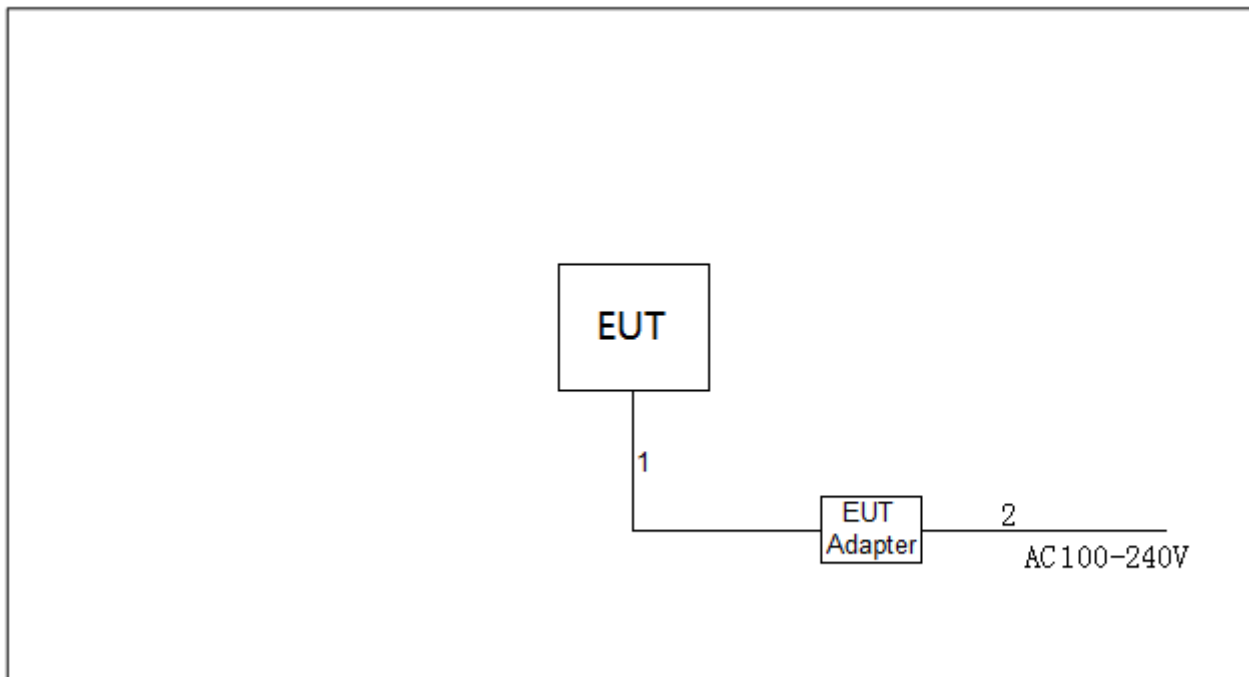
| Radiated emissions test - 30 MHz to 1000 MHz | |
|--|-------------|
| Final Test Mode | Description |
| Mode 1 | Normal Mode |

| Radiated Emissions Test - Above 1GHz | |
|--------------------------------------|---|
| Final Test Mode | Description |
| Mode 2 | TX BE(EHT320) Mode Channel 159 (UNII-7) |

Note:

- (1) This Notebook PC has two mainboards with two adapters. Both mainboard APF23004_MB1 (with adapter RC30-0484) and mainboard APF23004_MB2 (with adapter RC30-042) had been pre-tested and in this report only recorded the worst case.

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 SUPPORT UNITS

| Item | Equipment | Brand | Model No. | Series No. |
|------|-----------|-------|-----------|------------|
| - | - | - | - | - |

| Item | Cable Type | Shielded Type | Ferrite Core | Length |
|------|------------|---------------|--------------|--------|
| 1 | DC Cable | NO | NO | 1.2m |
| 2 | AC Cable | NO | NO | 1.5m |

4. AC POWER LINE CONDUCTED EMISSIONS

4.1 LIMIT

| Frequency (MHz) | Limit (dBμV) | |
|--------------------|--------------|-----------|
| | Quasi-peak | Average |
| 0.15 - 0.5 | 66 to 56* | 56 to 46* |
| 0.5 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

NOTE:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use)
 Margin Level = Measurement Value – Limit Value

4.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

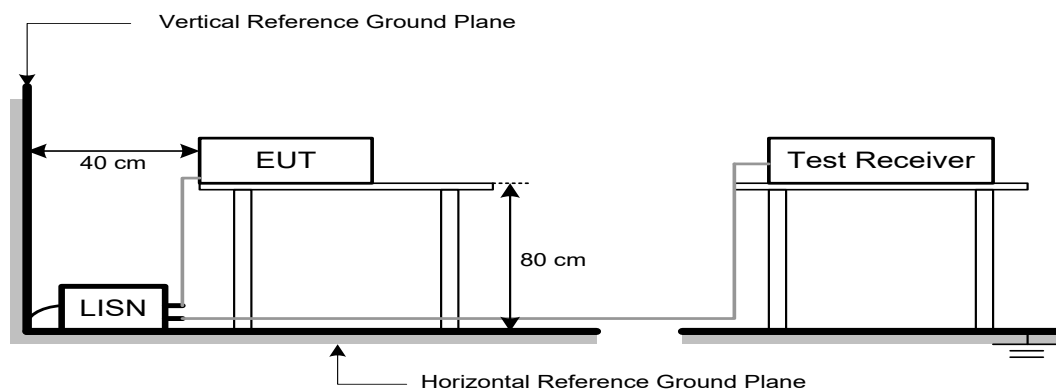
The following table is the setting of the receiver:

| Receiver Parameter | Setting |
|--------------------|----------|
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 kHz |

4.3 DEVIATION FROM TEST STANDARD

No deviation

4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting/TX mode.

4.6 TEST RESULTS

Please refer to the APPENDIX A.

5. RADIATED EMISSIONS

5.1 LIMIT

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

LIMITS OF RADIATED EMISSIONS MEASUREMENT (30 MHz to 1000 MHz)

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS (Above 1000 MHz)

| Frequency (MHz) | EIRP Limit (dBm/MHz) | Equivalent Field Strength at 3m (dBμV/m) |
|-----------------|----------------------|--|
| 5925-7125 | Average: -27 | 68.2 |

NOTE:

(1) The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$

(2)

$$FS_{\text{limit}} = FS_{\text{max}} - 20\log\left(\frac{d_{\text{limit}}}{d_{\text{measure}}}\right)$$

$$20\log(d_{\text{limit}}/d_{\text{measure}}) = 20\log(3/1.5) = 6 \text{ dB.}$$

5.2 TEST PROCEDURE

- a. 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)
- b. 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)
- c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; 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.
- d. 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).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- f. 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.
- g. 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 1 GHz)
- h. 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 1 GHz)
- i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

The following table is the setting of the receiver:

| Spectrum Parameters | Setting |
|------------------------|---------------------------------|
| Start ~ Stop Frequency | 9 kHz~150 kHz for RBW 200 Hz |
| Start ~ Stop Frequency | 0.15 MHz~30 MHz for RBW 9 kHz |
| Start ~ Stop Frequency | 30 MHz~1000 MHz for RBW 100 kHz |

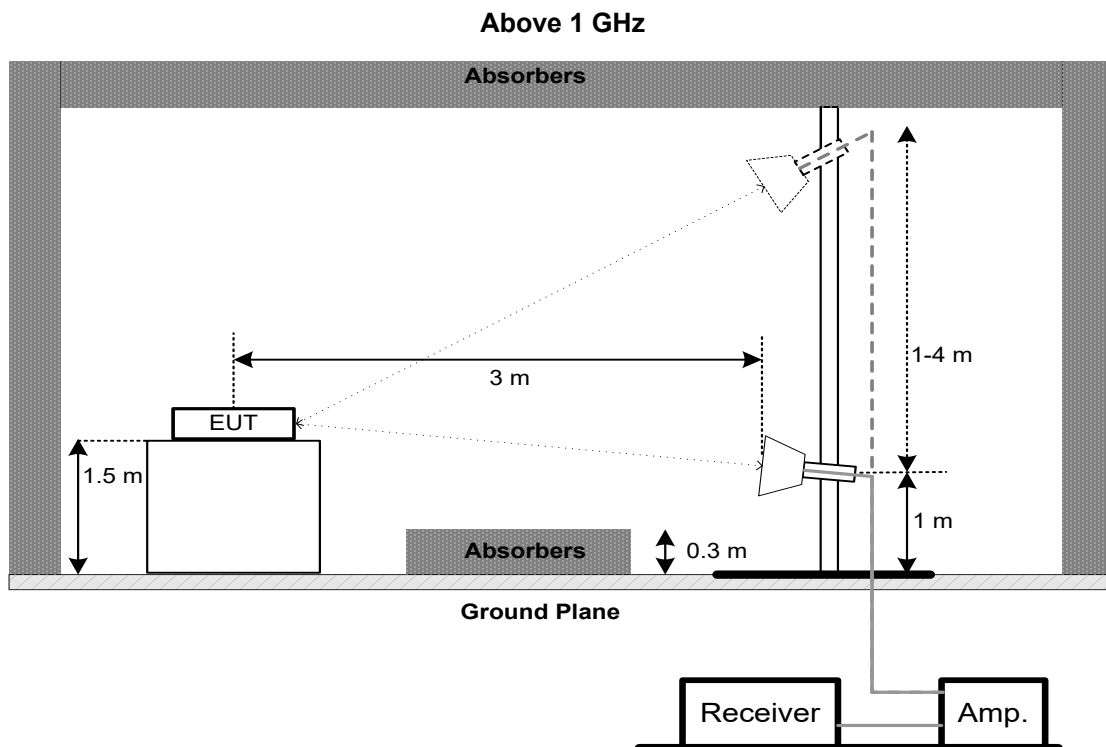
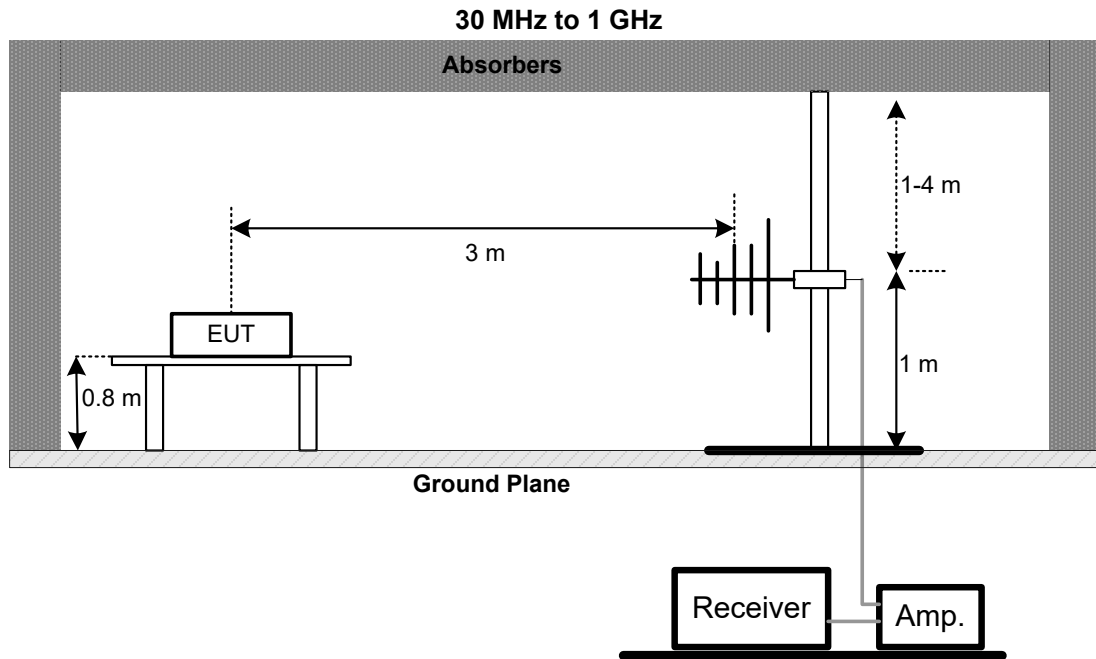
| Spectrum Parameters | Setting |
|--|--|
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic or 40 GHz, whichever is lower |
| RBW / VBW (Emission in restricted band) | 1 MHz / 3 MHz for PK value 1 MHz / 1/T Hz for AVG value |

| Receiver Parameters | Setting |
|------------------------|-------------------------------------|
| Start ~ Stop Frequency | 9 kHz~90 kHz for PK/AVG detector |
| Start ~ Stop Frequency | 90 kHz~110 kHz for QP detector |
| Start ~ Stop Frequency | 110 kHz~490 kHz for PK/AVG detector |
| Start ~ Stop Frequency | 490 kHz~30 MHz for QP detector |
| Start ~ Stop Frequency | 30 MHz~1000 MHz for QP detector |
| Start ~ Stop Frequency | 1 GHz~40 GHz for PK/AVG detector |

5.3 DEVIATION FROM TEST STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX B.

5.7 TEST RESULTS - ABOVE 1000 MHZ

Please refer to the APPENDIX C.

Remark:

- (1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

6. MEASUREMENT INSTRUMENTS LIST

| AC Power Line Conducted Emissions | | | | | |
|-----------------------------------|-------------------------|--------------|-----------------------|------------|------------------|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | EMI Test Receiver | R&S | ESR3 | 103027 | Jun. 16, 2024 |
| 2 | TWO-LINE V-NETWORK | R&S | ENV216 | 101447 | Dec. 22, 2024 |
| 3 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |
| 4 | Cable | N/A | SFT205-NMNM-9M-001 | 9M | Nov. 27, 2024 |
| 5 | 643 Shield Room | ETS | 6*4*3 | N/A | N/A |

| Radiated Emissions - 30 MHz to 1 GHz | | | | | |
|--------------------------------------|-----------------------------|-------------------|--------------------------|------------|------------------|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Trilog-Broadband Antenna | Schwarzbeck | VULB 9168 | 1462 | Dec. 13, 2024 |
| 2 | Attenuator | EMC INSTRUMENT | EMCI-N-6-06 | AT-06009 | Dec. 13, 2024 |
| 3 | Preamplifier | EMC INSTRUMENT | EMC001330 | 980863 | Nov. 17, 2024 |
| 4 | Cable | RegalWay | LMR400-NMNM-12.5 m | N/A | Jul. 04, 2024 |
| 5 | Cable | RegalWay | LMR400-NMNM-3m | N/A | Jul. 04, 2024 |
| 6 | Cable | RegalWay | LMR400-NMNM-0.5m | N/A | Jul. 04, 2024 |
| 7 | Receiver | Agilent | N9038A | MY52130039 | Dec. 22, 2024 |
| 8 | Positioning Controller | MF | MF-7802 | N/A | N/A |
| 9 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |
| 10 | 966 Chamber room | CM | 9*6*6 | N/A | May 17, 2024 |

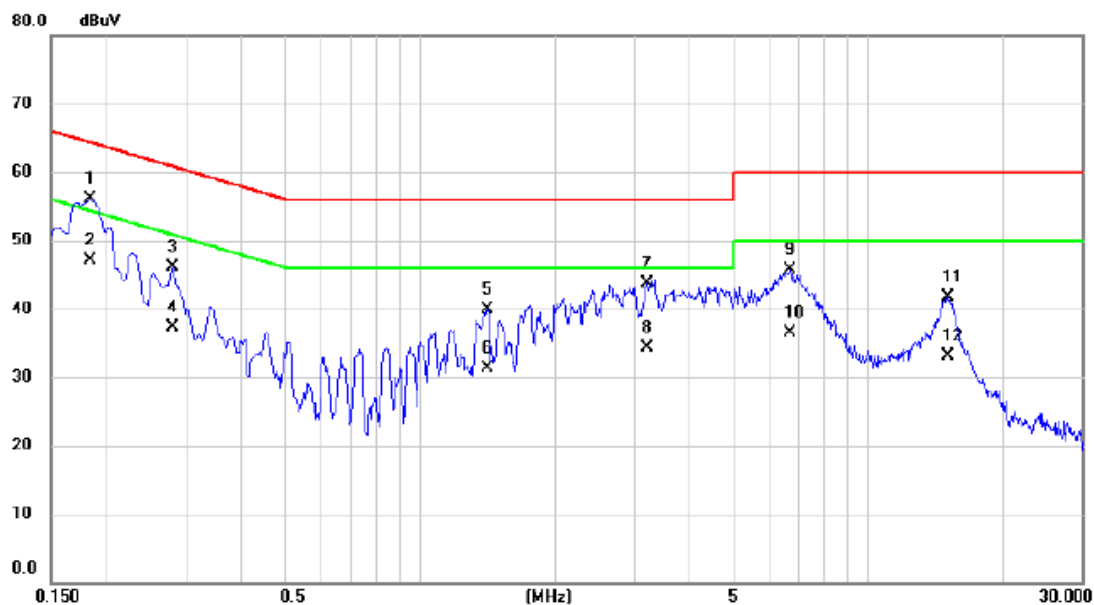
| Radiated Emissions - Above 1 GHz | | | | | |
|----------------------------------|--------------------------------|-------------------|---------------------------------|------------|------------------|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Receiver | Agilent | N9038A | MY52130039 | Jan. 07, 2024 |
| 2 | Preamplifier | EMC INSTRUMENT | EMC118A45SE | 980888 | Nov. 17, 2024 |
| 3 | EXA Spectrum Analyzer | Keysight | N9010A | MY55150209 | Jun. 16, 2024 |
| 4 | Double Ridged Guide Antenna | ETS | 3115 | 75789 | May 31, 2024 |
| 5 | Cable | RegalWay | A81-SMAMSMAM-12.5M | N/A | Aug. 08, 2024 |
| 6 | Cable | RegalWay | RWLP50-4.0A-NMRASM -2.5M | N/A | Aug. 08, 2024 |
| 7 | Cable | RegalWay | RWLP50-4.0A-NMRASM RA-0.8M | N/A | Aug. 08, 2024 |
| 8 | Low Noise Amplifier | CONNPHY | CLN-18G40G-4330-K | 619413 | Jul. 06, 2024 |
| 9 | Cable | RegalWay | RWLP50-2.6A-2.92M2.9 2M-1.1M | N/A | Jul. 26, 2024 |
| 10 | Cable | Tonscend | HF160-KMKM-3M | N/A | Jul. 26, 2024 |
| 11 | Broad-Band Horn Antenna | Schwarzbeck | BBHA9170(3m) | 9170-319 | Jun. 20, 2024 |
| 12 | 966 Chamber room | CM | 9*6*6 | N/A | May 17, 2024 |
| 13 | Positioning Controller | MF | MF-7802 | N/A | N/A |
| 14 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |

Remark "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

| | | | |
|-----------|-------------|-------|------|
| Test Mode | Normal Mode | Phase | Line |
|-----------|-------------|-------|------|

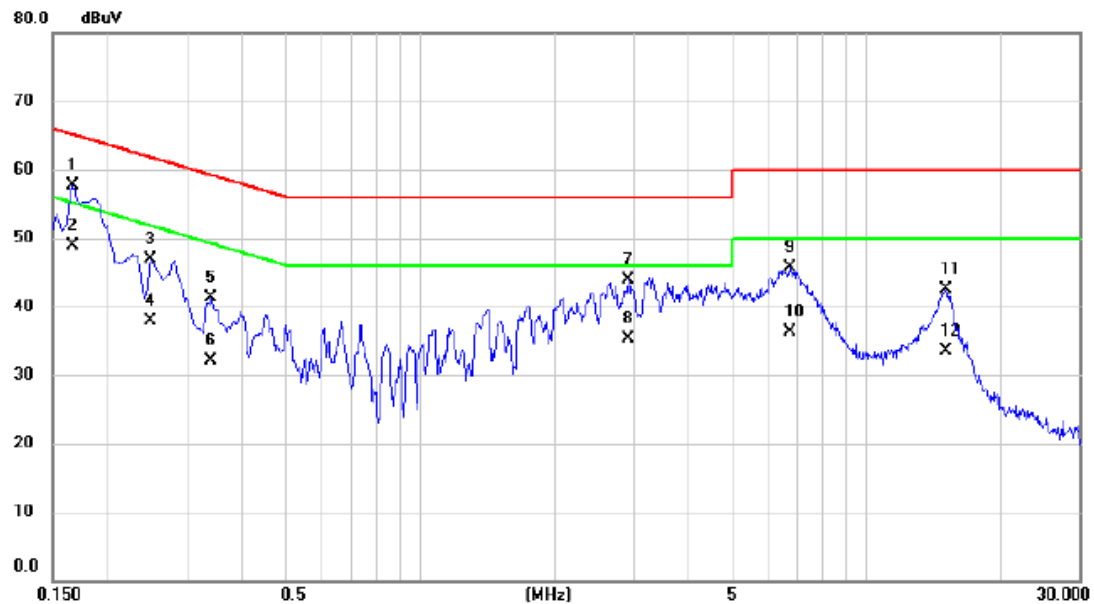


| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Margin | | |
|-----|-----|---------|---------------|----------------|-------------|-------|--------|----------|---------|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1838 | 46.37 | 9.74 | 56.11 | 64.31 | -8.20 | QP | |
| 2 | * | 0.1838 | 37.40 | 9.74 | 47.14 | 54.31 | -7.17 | AVG | |
| 3 | | 0.2805 | 36.31 | 9.77 | 46.08 | 60.80 | -14.72 | QP | |
| 4 | | 0.2805 | 27.50 | 9.77 | 37.27 | 50.80 | -13.53 | AVG | |
| 5 | | 1.4168 | 30.11 | 9.83 | 39.94 | 56.00 | -16.06 | QP | |
| 6 | | 1.4168 | 21.40 | 9.83 | 31.23 | 46.00 | -14.77 | AVG | |
| 7 | | 3.2055 | 33.70 | 9.91 | 43.61 | 56.00 | -12.39 | QP | |
| 8 | | 3.2055 | 24.30 | 9.91 | 34.21 | 46.00 | -11.79 | AVG | |
| 9 | | 6.6863 | 35.55 | 10.10 | 45.65 | 60.00 | -14.35 | QP | |
| 10 | | 6.6863 | 26.50 | 10.10 | 36.60 | 50.00 | -13.40 | AVG | |
| 11 | | 15.0675 | 31.40 | 10.31 | 41.71 | 60.00 | -18.29 | QP | |
| 12 | | 15.0675 | 22.80 | 10.31 | 33.11 | 50.00 | -16.89 | AVG | |

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.
- (3) The test result has included the cable loss.

| | | | |
|-----------|-------------|-------|---------|
| Test Mode | Normal Mode | Phase | Neutral |
|-----------|-------------|-------|---------|



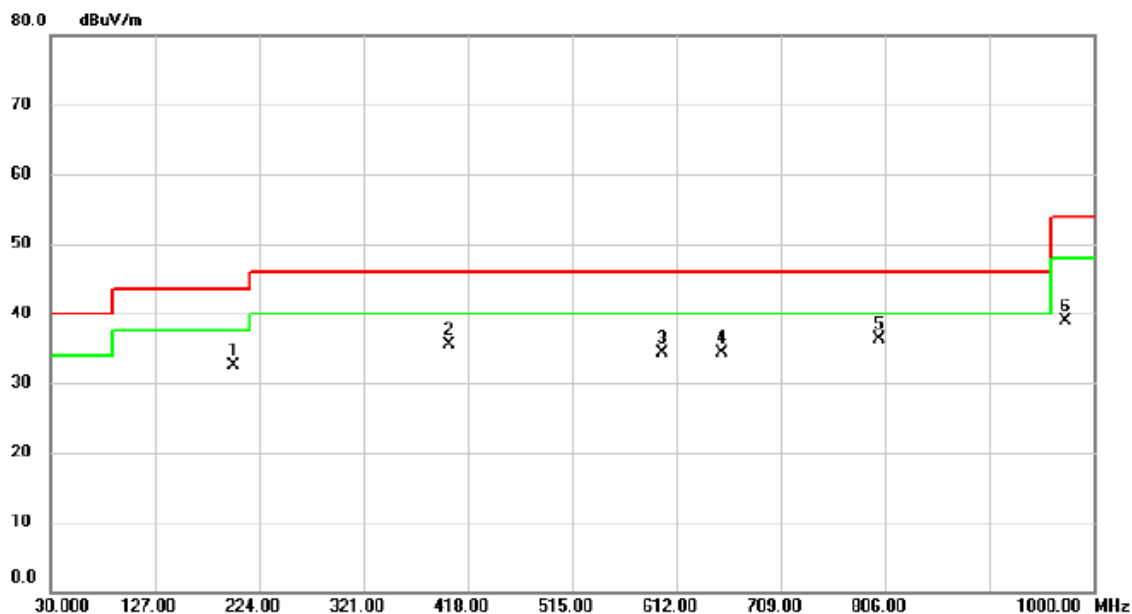
| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Margin | | |
|-----|-----|---------|---------------|----------------|-------------|-------|--------|----------|---------|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1658 | 48.10 | 9.59 | 57.69 | 65.17 | -7.48 | QP | |
| 2 | * | 0.1658 | 39.40 | 9.59 | 48.99 | 55.17 | -6.18 | AVG | |
| 3 | | 0.2490 | 37.27 | 9.61 | 46.88 | 61.79 | -14.91 | QP | |
| 4 | | 0.2490 | 28.30 | 9.61 | 37.91 | 51.79 | -13.88 | AVG | |
| 5 | | 0.3390 | 31.64 | 9.64 | 41.28 | 59.23 | -17.95 | QP | |
| 6 | | 0.3390 | 22.40 | 9.64 | 32.04 | 49.23 | -17.19 | AVG | |
| 7 | | 2.9198 | 34.15 | 9.75 | 43.90 | 56.00 | -12.10 | QP | |
| 8 | | 2.9198 | 25.60 | 9.75 | 35.35 | 46.00 | -10.65 | AVG | |
| 9 | | 6.7245 | 35.83 | 9.96 | 45.79 | 60.00 | -14.21 | QP | |
| 10 | | 6.7245 | 26.30 | 9.96 | 36.26 | 50.00 | -13.74 | AVG | |
| 11 | | 15.0428 | 32.24 | 10.18 | 42.42 | 60.00 | -17.58 | QP | |
| 12 | | 15.0428 | 23.40 | 10.18 | 33.58 | 50.00 | -16.42 | AVG | |

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.
- (3) The test result has included the cable loss.

APPENDIX B - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

| | | | |
|-----------|-------------|--------------|----------|
| Test Mode | Normal Mode | Polarization | Vertical |
|-----------|-------------|--------------|----------|

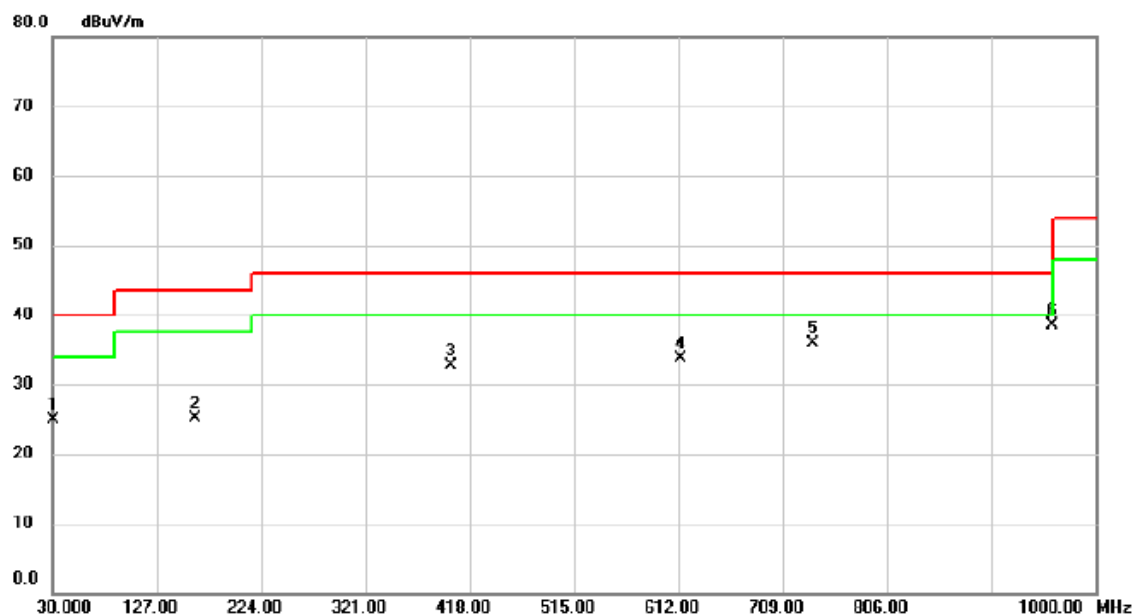


| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Margin dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|--------------|----------|---------|
| 1 | | 200.2350 | 46.89 | -14.47 | 32.42 | 43.50 | -11.08 | peak | |
| 2 | | 400.5400 | 43.57 | -8.07 | 35.50 | 46.00 | -10.50 | peak | |
| 3 | | 597.9350 | 38.09 | -3.73 | 34.36 | 46.00 | -11.64 | peak | |
| 4 | | 654.1950 | 37.27 | -2.87 | 34.40 | 46.00 | -11.60 | peak | |
| 5 | * | 800.6650 | 37.71 | -1.37 | 36.34 | 46.00 | -9.66 | peak | |
| 6 | | 973.3250 | 38.35 | 0.57 | 38.92 | 54.00 | -15.08 | peak | |

REMARKS:

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

| | | | |
|-----------|-------------|--------------|------------|
| Test Mode | Normal Mode | Polarization | Horizontal |
|-----------|-------------|--------------|------------|



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Margin | | |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 30.0000 | 37.91 | -13.07 | 24.84 | 40.00 | -15.16 | peak | |
| 2 | | 162.8900 | 36.08 | -11.00 | 25.08 | 43.50 | -18.42 | peak | |
| 3 | | 400.5400 | 40.85 | -8.07 | 32.78 | 46.00 | -13.22 | peak | |
| 4 | | 614.4250 | 37.11 | -3.45 | 33.66 | 46.00 | -12.34 | peak | |
| 5 | | 736.1600 | 37.50 | -1.51 | 35.99 | 46.00 | -10.01 | peak | |
| 6 | * | 959.7450 | 38.08 | 0.47 | 38.55 | 46.00 | -7.45 | peak | |

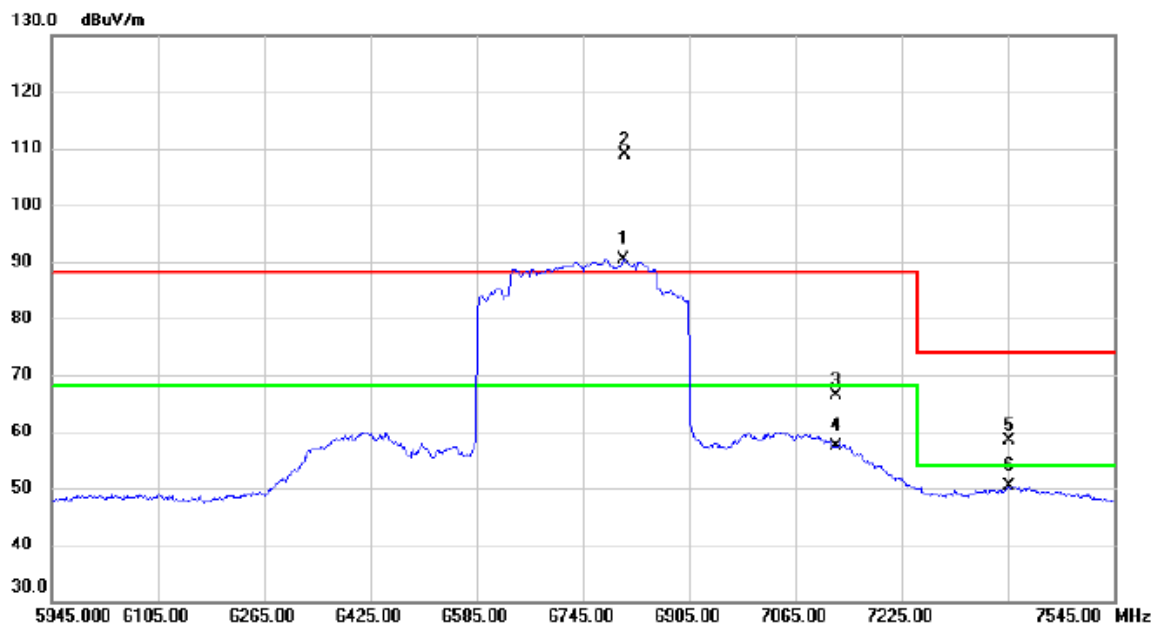
REMARKS:

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

APPENDIX C - RADIATED EMISSION - ABOVE 1000 MHZ

| | | | |
|-----------|---------------------------------------|--------------|----------|
| Test Mode | UNII-7_TX BE(EHT320) Mode Channel 159 | Polarization | Vertical |
|-----------|---------------------------------------|--------------|----------|



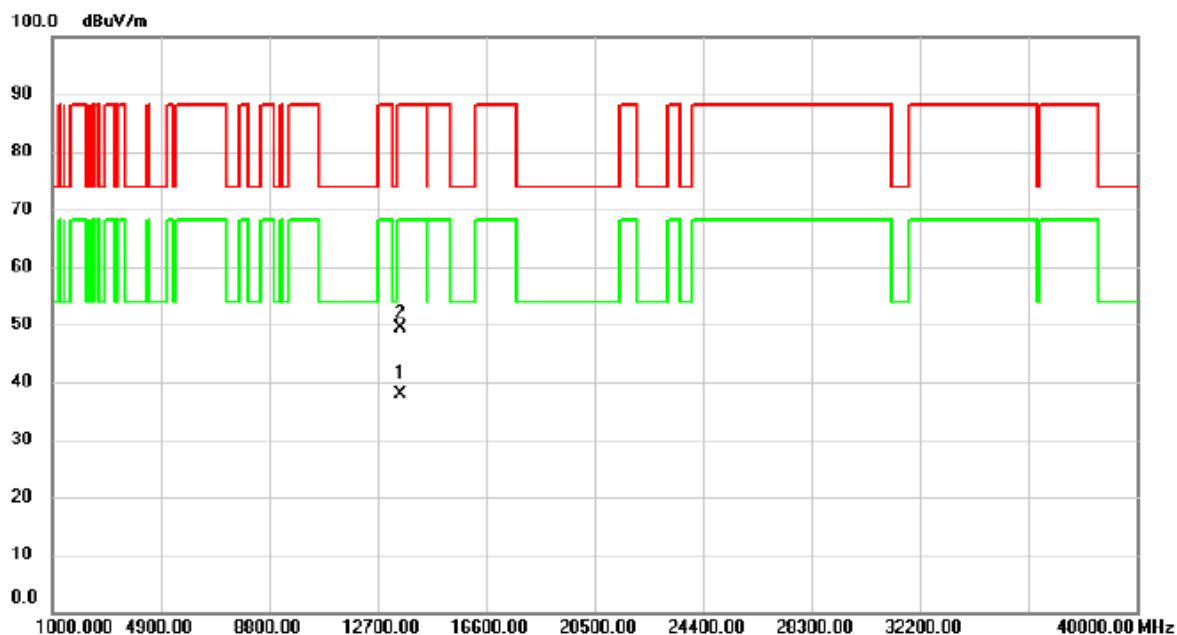
| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Margin dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|--------------|----------|----------|
| 1 | * | 6805.800 | 74.98 | 15.45 | 90.43 | 68.20 | 22.23 | AVG | No Limit |
| 2 | X | 6807.400 | 93.38 | 15.45 | 108.83 | 88.20 | 20.63 | peak | No Limit |
| 3 | | 7125.000 | 50.62 | 15.71 | 66.33 | 88.20 | -21.87 | peak | |
| 4 | | 7125.000 | 41.76 | 15.71 | 57.47 | 68.20 | -10.73 | AVG | |
| 5 | | 7385.000 | 42.83 | 15.58 | 58.41 | 74.00 | -15.59 | peak | |
| 6 | | 7385.000 | 34.80 | 15.58 | 50.38 | 54.00 | -3.62 | AVG | |

REMARKS:

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

| | | | |
|-----------|---------------------------------------|--------------|----------|
| Test Mode | UNII-7_TX BE(EHT320) Mode Channel 159 | Polarization | Vertical |
|-----------|---------------------------------------|--------------|----------|



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Margin | | |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | * | 13489.69 | 30.45 | 7.51 | 37.96 | 68.20 | -30.24 | AVG | |
| 2 | | 13490.99 | 41.93 | 7.51 | 49.44 | 88.20 | -38.76 | peak | |

REMARKS:

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

End of Test Report