

|                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                 |                                                            |                                                                     |                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------|
| <b>Prüfbericht-Nr.:</b><br>Test report no.:                                                                                                                                                                                                                                                                                                                                                                                                         | CN23D01M (P15C-WiFi)<br>001                                                                                                                                                                                                                                                     | <b>Auftrags-Nr.:</b><br>Order no.:                         | 48215388                                                            | Seite 1 von 38<br>Page 1 of 38           |
| <b>Kunden-Referenz-Nr.:</b><br>Client reference no.:                                                                                                                                                                                                                                                                                                                                                                                                | N/A                                                                                                                                                                                                                                                                             | <b>Auftragsdatum:</b><br>Order date:                       | 2023-02-07                                                          |                                          |
| <b>Auftraggeber:</b><br>Client:                                                                                                                                                                                                                                                                                                                                                                                                                     | Emplus Technologies, Inc<br>Bld B, 10F, No.209, Sec.1, Nangang Rd., Taipei City, Taiwan                                                                                                                                                                                         |                                                            |                                                                     |                                          |
| <b>Prüfgegenstand:</b><br>Test item:                                                                                                                                                                                                                                                                                                                                                                                                                | 11AX Dual band AP                                                                                                                                                                                                                                                               |                                                            |                                                                     |                                          |
| <b>Bezeichnung / Typ-Nr.:</b><br>Identification / Type no.:                                                                                                                                                                                                                                                                                                                                                                                         | WAP385, WAP385-C, EWS356-FIT                                                                                                                                                                                                                                                    |                                                            |                                                                     |                                          |
| <b>Auftrags-Inhalt:</b><br>Order content:                                                                                                                                                                                                                                                                                                                                                                                                           | FCC Part 15C Test report (WiFi 2.4GHz)                                                                                                                                                                                                                                          |                                                            |                                                                     |                                          |
| <b>Prüfgrundlage:</b><br>Test specification:                                                                                                                                                                                                                                                                                                                                                                                                        | FCC 47CFR Part 15: Subpart C Section 15.247                                                                                                                                                                                                                                     |                                                            |                                                                     |                                          |
| <b>Wareneingangsdatum:</b><br>Date of sample receipt:                                                                                                                                                                                                                                                                                                                                                                                               | 2022-06-23                                                                                                                                                                                                                                                                      |                                                            |                                                                     |                                          |
| <b>Prüfmuster-Nr.:</b><br>Test sample no:                                                                                                                                                                                                                                                                                                                                                                                                           | A003286851-013<br>A003286851-013                                                                                                                                                                                                                                                |                                                            |                                                                     |                                          |
| <b>Prüfzeitraum:</b><br>Testing period:                                                                                                                                                                                                                                                                                                                                                                                                             | 2022-07-04 - 2022-08-14                                                                                                                                                                                                                                                         |                                                            |                                                                     |                                          |
| <b>Ort der Prüfung:</b><br>Place of testing:                                                                                                                                                                                                                                                                                                                                                                                                        | EMC/RF Taipei Testing Site                                                                                                                                                                                                                                                      |                                                            |                                                                     |                                          |
| <b>Prüflaboratorium:</b><br>Testing laboratory:                                                                                                                                                                                                                                                                                                                                                                                                     | Taipei Testing Laboratories                                                                                                                                                                                                                                                     |                                                            |                                                                     |                                          |
| <b>Prüfergebnis*:</b><br>Test result*:                                                                                                                                                                                                                                                                                                                                                                                                              | Pass                                                                                                                                                                                                                                                                            |                                                            |                                                                     |                                          |
| <b>überprüft von:</b><br>compiled by:                                                                                                                                                                                                                                                                                                                                                                                                               | <b>genehmigt von:</b><br>authorized by:                                                                                                                                                                                                                                         |                                                            |                                                                     |                                          |
| <b>Datum:</b><br>Date:                                                                                                                                                                                                                                                                                                                                                                                                                              | 2023-02-22                                                                                                                                                                                                                                                                      | <b>Ausstellungsdatum:</b><br>Issue date:                   | 2023-02-22                                                          |                                          |
| <b>Stellung / Position:</b>                                                                                                                                                                                                                                                                                                                                                                                                                         | Assistant Project Engineer                                                                                                                                                                                                                                                      | <b>Stellung / Position:</b>                                | Senior Project Manager                                              |                                          |
| <b>Sonstiges / Other:</b>                                                                                                                                                                                                                                                                                                                                                                                                                           | This report is copied from the report no.: CN22JOHX (P15C-WiFi) 001 by adding model name and changing product name, and removing I/O port (RJ45). Since the changes doesn't affect the RF testing, no evaluation is required. The test results are same as the original report. |                                                            |                                                                     |                                          |
| <b>Zustand des Prüfgegenstandes bei Anlieferung:</b><br>Condition of the test item at delivery:                                                                                                                                                                                                                                                                                                                                                     | Prüfmuster vollständig und unbeschädigt<br>Test item complete and undamaged                                                                                                                                                                                                     |                                                            |                                                                     |                                          |
| <b>* Legende:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1 = sehr gut<br>P(ass) = entspricht o.g. Prüfgrundlage(n)                                                                                                                                                                                                                       | 2 = gut<br>F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | 3 = befriedigend<br>F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | 4 = ausreichend<br>N/A = nicht anwendbar |
| <b>* Legend:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1 = very good<br>P(ass) = passed a.m. test specification(s)                                                                                                                                                                                                                     | 2 = good<br>F(ail) = failed a.m. test specification(s)     | 3 = satisfactory<br>F(ail) = failed a.m. test specification(s)      | 4 = sufficient<br>N/A = not applicable   |
| <b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b><br>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark. |                                                                                                                                                                                                                                                                                 |                                                            |                                                                     |                                          |

## TEST SUMMARY

| Report Section | FCC Clause                  | Test Item                                   | Result |
|----------------|-----------------------------|---------------------------------------------|--------|
| 5.1.1          | 15.247(b) & 15.203          | Antenna Requirement                         | Pass   |
| 5.1.2          | 15.247(b)(3)                | Peak Output Power                           | Pass   |
| 5.1.3          | 15.247(a)(2)                | 6 dB Bandwidth                              | Pass   |
| 5.1.3          | 2.1049                      | 99% Occupied Bandwidth                      | Pass   |
| 5.1.4          | 15.247(e)                   | Power Spectral Density                      | Pass   |
| 5.1.5          | 15.247(d)                   | Conducted Spurious Emissions and Band Edges | Pass   |
| 5.1.6          | 15.247(d) & 15.205 & 15.209 | Radiated Spurious Emissions and Band Edges  | Pass   |
| 5.2.1          | 15.207                      | Mains Conducted Emission                    | Pass   |

**Note:** Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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**APPENDIX A - TEST RESULT OF CONDUCTED**

**APPENDIX B - TEST RESULT OF RADIATED EMISSIONS & MAINS CONDUCTED EMISSION**

**APPENDIX SP - PHOTOGRAPHS OF TEST SETUP**

**APPENDIX EP - PHOTOGRAPHS OF EUT**

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## HISTORY OF THIS TEST REPORT

| Report No.                  | Description      | Date Issued |
|-----------------------------|------------------|-------------|
| CN23D01M<br>(P15C-WiFi) 001 | Original Release | 2023-02-22  |

## 1. General Remarks

### 1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

**Appendix A - Test Result of Conducted**

**Appendix B - Test Result of Radiated Emissions & Mains Conducted Emission**

**Appendix SP - Photographs of Test Setup**

**Appendix EP - Photographs of EUT**

#### Applied Standard and Test Levels

| Radio                                             |
|---------------------------------------------------|
| FCC 47CFR Part 15: Subpart C Section 15.247       |
| FCC 47CFR Part 2: Subpart J Section 2.1049        |
| ANSI C63.10:2013                                  |
| KDB 558074 D01 15.247 Meas Guidance v05r02        |
| KDB 662911 D01 Multiple Transmitter Output v02r01 |

### 1.2 Decision Rule of Conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

## 2. Test Sites

### 2.1 Test Laboratory

Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.  
Taipei City 105  
Taiwan (R.O.C.)

### 2.2 Test Facility

Taipei Testing Laboratories

No.458-18, Sec. 2, Fenliao Rd., Linkou Dist.,  
New Taipei City 244  
Taiwan (R.O.C.)  
FCC Registration No.: 180491  
ISED Registration No.: 25563

## 2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

## 2.4 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

## 2.5 Measurement Uncertainty

All measurement uncertainty values are shown with a coverage factor of  $k=2$  to indicate a 95% level of confidence.

### Emission Measurement Uncertainty

| Parameter                            | Uncertainty   |
|--------------------------------------|---------------|
| Radiated Emission (9 kHz ~ 30 MHz)   | $\pm 1.15$ dB |
| Radiated Emission (30 MHz ~ 200 MHz) | $\pm 1.30$ dB |
| Radiated Emission (200 MHz ~ 1 GHz)  | $\pm 1.30$ dB |
| Radiated Emission (1 GHz ~ 18 GHz)   | $\pm 1.54$ dB |
| Radiated Emission (18 GHz ~ 40 GHz)  | $\pm 2.52$ dB |
| Mains Conducted Emission             | $\pm 1.65$ dB |



### 3. General Product Information

#### 3.1 Product Function and Intended Use

The EUT is a 11AX Dual band AP. It contains a WLAN compatible module enabling the user to communicate data through a Wireless interface.

For details refer to the User Guide, Data Sheet and Circuit Diagram.

#### 3.2 System Details and Ratings

##### Basic Information of EUT

| Item                        | EUT information              |
|-----------------------------|------------------------------|
| Kind of Equipment/Test Item | 11AX Dual band AP            |
| Type Identification         | WAP385, WAP385-C, EWS356-FIT |
| FCC ID                      | 2AL6XWAP385                  |

##### Technical Specification of EUT

| Item                      | EUT information                                                                                                                         |                        |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Operating Frequency       | 2412 MHz ~ 2462 MHz                                                                                                                     |                        |
| Channel Number            | 802.11b/g/n/ac/ax HT20/VHT20/HE20: 11<br>802.11n/ac/ax HT40/VHT40/HE40: 7                                                               |                        |
| Data Rate                 | 802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps<br>802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps<br>802.11n/ac/ax: up to MCS11 |                        |
| Operation Voltage         | 12 Vdc (Adapter)<br>54 Vdc (POE Injector)                                                                                               |                        |
| Modulation                | DSSS (DBPSK, DQPSK, CCK)<br>OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>OFDMA (1024QAM)                                                  |                        |
| Maximum Output Power (mW) | CDD Mode                                                                                                                                | 802.11b: 623.63        |
|                           |                                                                                                                                         | 802.11g: 786.91        |
|                           |                                                                                                                                         | 802.11n HT20: 725.68   |
|                           |                                                                                                                                         | 802.11n HT40: 650.93   |
|                           |                                                                                                                                         | 802.11ac VHT20: 747.48 |
|                           |                                                                                                                                         | 802.11ac VHT40: 656.23 |
|                           |                                                                                                                                         | 802.11ax HE20: 762.57  |
|                           |                                                                                                                                         | 802.11ax HE40: 684.95  |
|                           | Beamforming Mode                                                                                                                        | 802.11ac VHT20: 373.77 |
|                           |                                                                                                                                         | 802.11ac VHT40: 328.14 |
|                           |                                                                                                                                         | 802.11ax HE20: 381.31  |
|                           |                                                                                                                                         | 802.11ax HE40: 342.5   |
| Antenna Information       | Refer to 5.1.1                                                                                                                          |                        |
| Accessory Device          | Refer to 4.4                                                                                                                            |                        |

Note:

1. All models are listed as below.

| Main Model                | Series Model                    | Difference                                                               |
|---------------------------|---------------------------------|--------------------------------------------------------------------------|
| WAP385<br>(Brand: Emplus) | WAP385-C<br>(Brand: Emplus)     | WAP385: 2.5G LANx1 + 1G LANx1 +NOR Flash                                 |
|                           | EWS356-FIT<br>(Brand: EnGenius) | WAP385-C: 2.5G LANx1 (remove 1G LAN + NOR Flash)<br>EWS356-FIT: 1G LANx1 |

### 3.3 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

### 3.4 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

## 4. Test Set-up and Operation Modes

### 4.1 Principle of Configuration Selection

The test modes were adapted accordingly in reference to the instructions for use.

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output expected by the customer and is going to be fixed on the firmware of the final end product.

**Table for Parameters of Test Software Setting**

| 802.11b        |               | 802.11g        |               | 802.11n HT20  |               | 802.11n HT40  |               |
|----------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|
| Channel        | Power Setting | Channel        | Power Setting | Channel       | Power Setting | Channel       | Power Setting |
| 1              | 21.5          | 1              | 21.5          | 1             | 20.5          | 3             | 20            |
| 6              | 23            | 6              | 22.5          | 6             | 22.5          | 6             | 21            |
| 11             | 22            | 10             | 20.5          | 10            | 20.5          | 9             | 19.5          |
|                |               | 11             | 20            | 11            | 19            |               |               |
| 802.11ac VHT20 |               | 802.11ac VHT40 |               | 802.11ax HE20 |               | 802.11ax HE40 |               |
| Channel        | Power Setting | Channel        | Power Setting | Channel       | Power Setting | Channel       | Power Setting |
| 1              | 20.5          | 3              | 20            | 1             | 20.5          | 3             | 20            |
| 6              | 22.5          | 6              | 21            | 6             | 22.5          | 6             | 21            |
| 10             | 20.5          | 9              | 19.5          | 10            | 20.5          | 9             | 19.5          |
| 11             | 19            |                |               | 11            | 19            |               |               |

### 4.2 Carrier Frequency and Channel

802.11b, 802.11g, 802.11n HT20, 802.11ac VHT20, 802.11ax HE20:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 1       | 2412            | 8       | 2447            |
| 2       | 2417            | 9       | 2452            |
| 3       | 2422            | 10      | 2457            |
| 4       | 2427            | 11      | 2462            |
| 5       | 2432            |         |                 |
| 6       | 2437            |         |                 |
| 7       | 2442            |         |                 |

802.11n HT40, 802.11ac VHT40, 802.11ax HE40:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 3       | 2422            | 7       | 2442            |
| 4       | 2427            | 8       | 2447            |
| 5       | 2432            | 9       | 2452            |
| 6       | 2437            |         |                 |

## 4.3 Test Operation and Test Software

Setup for testing: Test samples are provided with a LAN interface which makes it possible to control them through a test software installed on a notebook computer.

This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed as below.

|               |      |
|---------------|------|
| Test Software | QPST |
|---------------|------|

The samples were used as follows:

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A003286851-013

Full test was applied on all test modes, but only worst case was shown.

The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers.

| Modulation Mode | Tx Function |
|-----------------|-------------|
| 802.11b         | 2TX (MIMO)  |
| 802.11g         | 2TX (MIMO)  |
| 802.11n HT20    | 2TX (MIMO)  |
| 802.11n HT40    | 2TX (MIMO)  |
| 802.11ac VHT20  | 2TX (MIMO)  |
| 802.11ac VHT40  | 2TX (MIMO)  |
| 802.11ax HE20   | 2TX (MIMO)  |
| 802.11ax HE40   | 2TX (MIMO)  |

\* The modulation and bandwidth are similar for 802.11n mode HT20/HT40 and 802.11ac mode VHT20/VHT40 and 802.11ax mode HE20/HE40, therefore investigated worse case as representative mode in test report.

\*\* For Beamforming mode, only the output power is evaluated and presented in this report.

| EUT Configure Mode | Applicable To                      |                                         |                                         |                          | Description |
|--------------------|------------------------------------|-----------------------------------------|-----------------------------------------|--------------------------|-------------|
|                    | Antenna Port Conducted Measurement | Radiated Spurious Emissions above 1 GHz | Radiated Spurious Emissions below 1 GHz | Mains Conducted Emission |             |
| -                  | √                                  | √                                       | √                                       | √                        | -           |

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when position on **Y-plane**.
2. "-" means no effect.
3. Only the worst case of Radiated Spurious Emissions and Mains Conducted Emission tests were verified for POE mode.

**Antenna Port Conducted Measurement**

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode       | Mode                | Available Channel | Tested Channel | Date Rate (Mbps) |
|--------------------------|---------------------|-------------------|----------------|------------------|
| CDD                      | 802.11b             | 1 to 11           | 1, 6, 11       | 1.0              |
|                          | 802.11g             | 1 to 11           | 1, 6, 10, 11   | 6.0              |
|                          | 802.11n HT20        | 1 to 11           | 1, 6, 10, 11   | MCS0             |
|                          | 802.11n HT40        | 3 to 9            | 3, 6, 9        | MCS0             |
|                          | 802.11ac VHT20      | 1 to 11           | 1, 6, 10, 11   | NSS1 MCS0        |
|                          | 802.11ac VHT40      | 3 to 9            | 3, 6, 9        | NSS1 MCS0        |
|                          | 802.11ax HE20_OFDM  | 1 to 11           | 1, 6, 10, 11   | NSS1 MCS0        |
|                          | 802.11ax HE40_OFDM  | 3 to 9            | 3, 6, 9        | NSS1 MCS0        |
|                          | 802.11ax HE20_OFDMA | 1 to 11           | 1, 6, 10, 11   | NSS1 MCS0        |
|                          | 802.11ax HE40_OFDMA | 3 to 9            | 3, 6, 9        | NSS1 MCS0        |
| Beamforming (Power only) | 802.11ac VHT20      | 1 to 11           | 1, 6, 10, 11   | NSS1 MCS0        |
|                          | 802.11ac VHT40      | 3 to 9            | 3, 6, 9        | NSS1 MCS0        |
|                          | 802.11ax HE20_OFDM  | 1 to 11           | 1, 6, 10, 11   | NSS1 MCS0        |
|                          | 802.11ax HE40_OFDM  | 3 to 9            | 3, 6, 9        | NSS1 MCS0        |
|                          | 802.11ax HE20_OFDMA | 1 to 11           | 1, 6, 10, 11   | NSS1 MCS0        |
|                          | 802.11ax HE40_OFDMA | 3 to 9            | 3, 6, 9        | NSS1 MCS0        |

**Radiated Spurious Emissions (Above 1 GHz)**

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Mode                | Available Channel | Tested Channel | Date Rate (Mbps) |
|--------------------|---------------------|-------------------|----------------|------------------|
| Adapter            | 802.11b             | 1 to 11           | 1, 6, 11       | 1.0              |
|                    | 802.11g             | 1 to 11           | 1, 6, 11       | 6.0              |
|                    | 802.11ac VHT20      | 1 to 11           | 1, 6, 11       | NSS1 MCS0        |
|                    | 802.11ac VHT40      | 3 to 9            | 3, 6, 9        | NSS1 MCS0        |
|                    | 802.11ax HE20_OFDM  | 1 to 11           | 1, 6, 11       | NSS1 MCS0        |
|                    | 802.11ax HE40_OFDM  | 3 to 9            | 3, 6, 9        | NSS1 MCS0        |
|                    | 802.11ax HE20_OFDMA | 1 to 11           | 1, 6, 11       | NSS1 MCS0        |
|                    | 802.11ax HE40_OFDMA | 3 to 9            | 3, 6, 9        | NSS1 MCS0        |
| POE                | 802.11g             | 1 to 11           | 1              | 6.0              |

**Radiated Spurious Emissions (Below 1 GHz)**

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Mode    | Available Channel | Tested Channel | Date Rate (Mbps) |
|--------------------|---------|-------------------|----------------|------------------|
| Adapter            | 802.11g | 1 to 11           | 1              | 6.0              |
| POE                | 802.11g | 1 to 11           | 1              | 6.0              |

**Mains Conducted Emission**

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Mode    | Available Channel | Tested Channel | Date Rate (Mbps) |
|--------------------|---------|-------------------|----------------|------------------|
| Adapter            | 802.11g | 1 to 11           | 1              | 6.0              |
| POE                | 802.11g | 1 to 11           | 1              | 6.0              |

**Test Condition**

| Test Item                               | Ambient Temperature | Relative Humidity | Tested by             |
|-----------------------------------------|---------------------|-------------------|-----------------------|
| Conducted Measurement                   | 23.9-25.6 °C        | 56-64 %           | Nick Guan & Andy Chen |
| Radiated Spurious Emissions above 1 GHz | 23.4-24.9 °C        | 61-63 %           | Chuan Chu             |
| Radiated Spurious Emissions below 1 GHz | 23.4-24.9 °C        | 61-63 %           | Chuan Chu             |
| Mains Conducted Emission                | 21.9 °C             | 59 %              | Ray Huang             |

## 4.4 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

**Accessory of EUT**

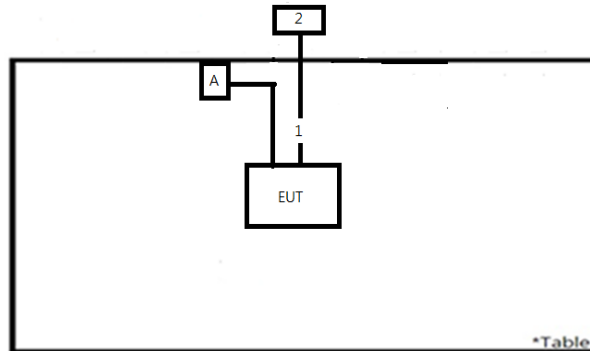
None

**Support Unit**

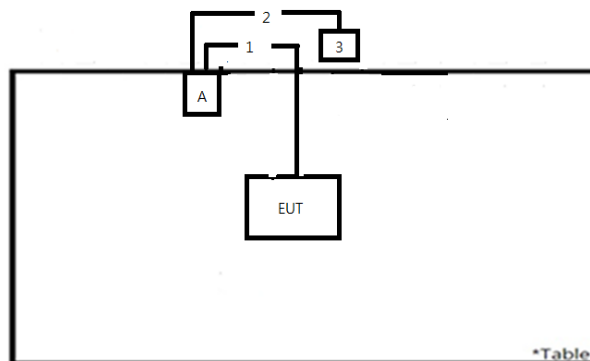
| Support Unit |             |          |                 |          |          |                    |             |                 |
|--------------|-------------|----------|-----------------|----------|----------|--------------------|-------------|-----------------|
| No           | Description | Brand    | Model           | S/N      | Shielded | Ferrite Core (Qty) | Length (cm) | Remark          |
| Adapter Mode |             |          |                 |          |          |                    |             |                 |
| A            | Adapter     | Emplus   | MU18D112Q150-A1 | N/A      | NO       | NO                 | 100         | Radiated        |
| 1            | RJ 45       | TUV      | TUV-01          | N/A      | -        | -                  | -           |                 |
| 2            | Notebook    | Lenovo   | 81BL            | MP1DCD6Y | -        | -                  | -           |                 |
| A            | Adapter     | ITE      | MU18D1120150-A1 | N/A      | NO       | NO                 | 150         | Mains Conducted |
| 1            | LAN Cable   | TUV      | TUV-01          | NO       | NO       | NO                 | 300         |                 |
| 2            | Notebook    | Lenovo   | 81BL            | MP1DCD6Y | -        | -                  | -           |                 |
| POE Mode     |             |          |                 |          |          |                    |             |                 |
| A            | POE Adapter | Emplus   | EPA5006GAT      | N/A      | NO       | NO                 | 50          | Radiated        |
| 1            | RJ 45       | TUV      | TUV-01          | N/A      | -        | -                  | -           |                 |
| 2            | RJ 45       | TUV      | TUV-02          | N/A      | -        | -                  | -           |                 |
| 3            | Notebook    | Lenovo   | 81BL            | MP1DCD6Y | -        | -                  | -           |                 |
| A            | POE Adapter | EnGenius | EPA5006GAT      | N/A      | NO       | NO                 | 50          | Mains Conducted |
| 1            | LAN Cable   | TUV      | TUV-01          | NO       | NO       | NO                 | 300         |                 |
| 2            | LAN Cable   | TUV      | TUV-02          | NO       | NO       | NO                 | 100         |                 |
| 3            | Notebook    | Lenovo   | 81BL            | MP1DCD6Y | -        | -                  | -           |                 |

## 4.5 Test Setup Diagram

<Radiated Spurious Emissions mode>  
Adapter Mode

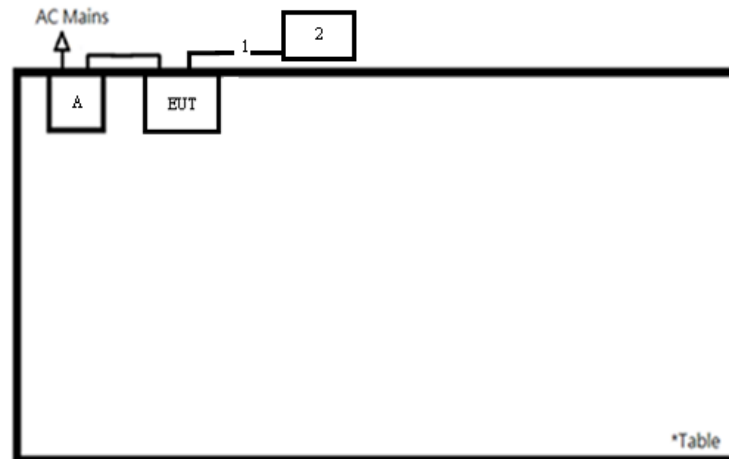


POE Mode

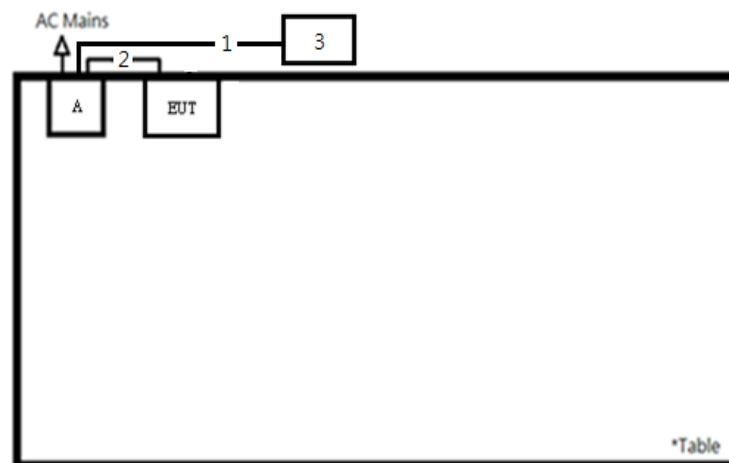


**<Mains Conducted Emission mode>**

**Adapter Mode**



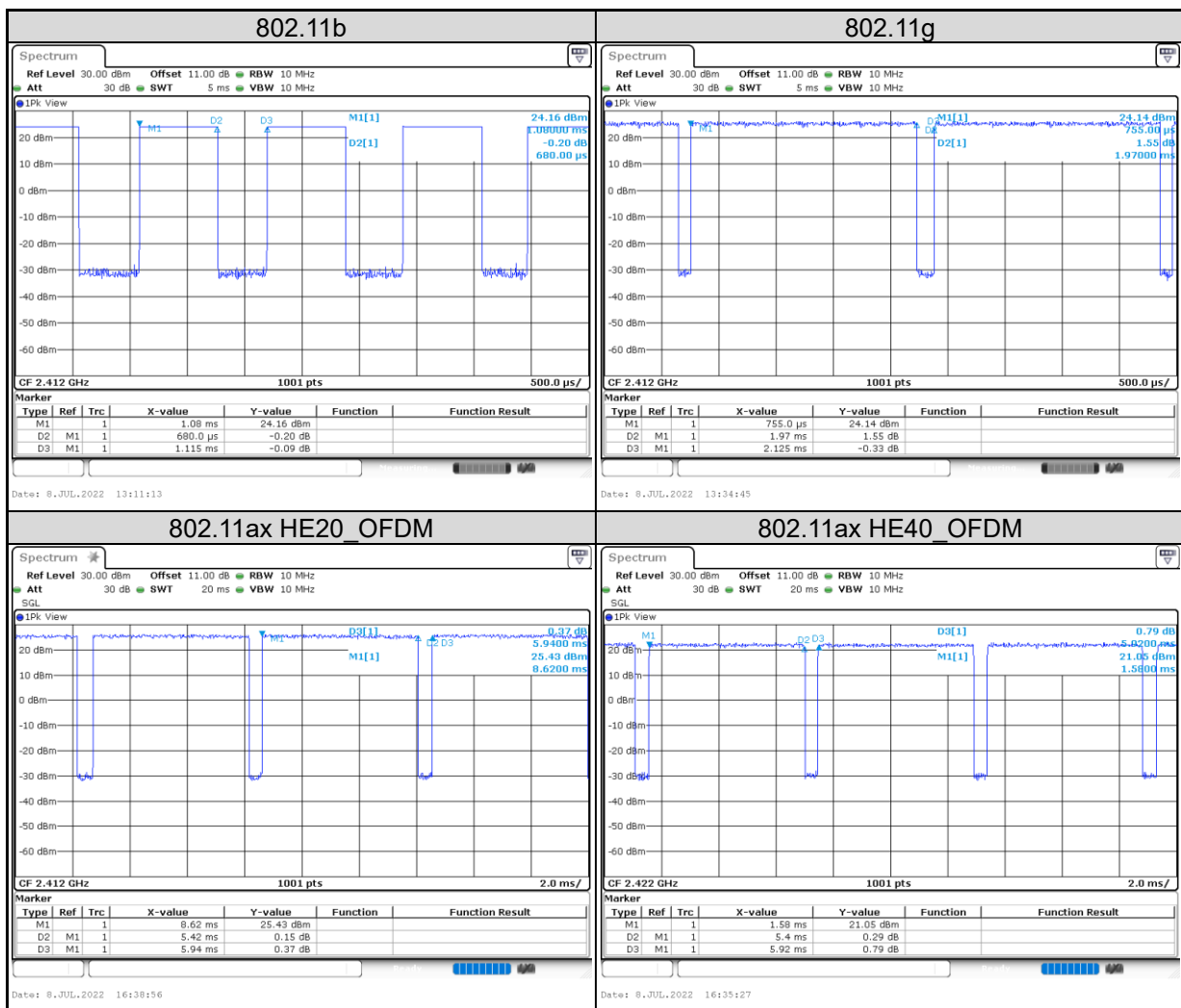
**POE Mode**

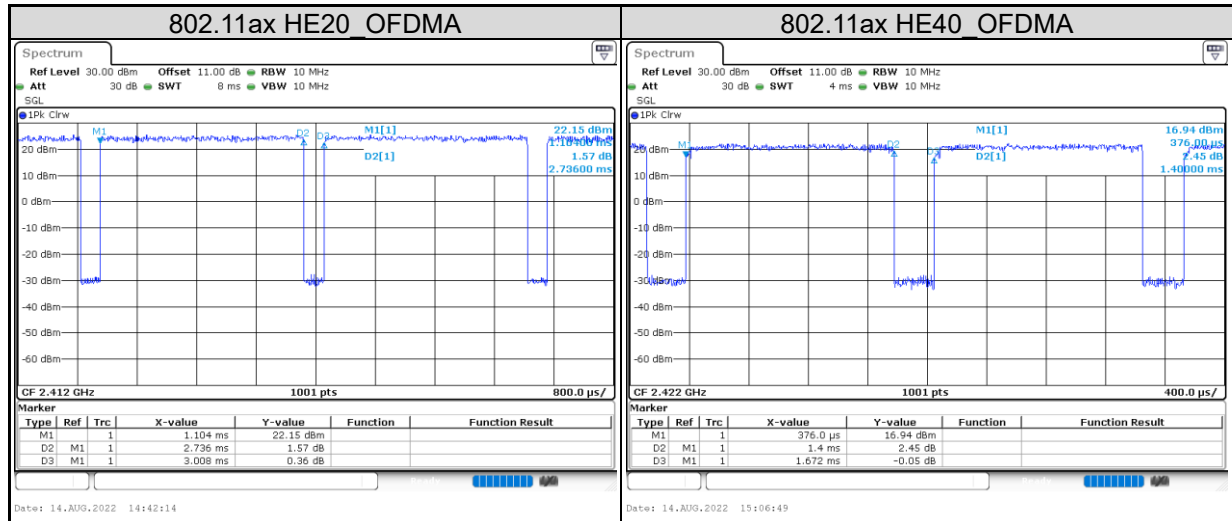




## 4.6 Duty Cycle of Test Signal

| Mode                | On + Off Time (ms) | On Time (ms) | Duty Cycle (%) | Duty Factor (dB) |
|---------------------|--------------------|--------------|----------------|------------------|
| 802.11b             | 1.12               | 0.68         | 60.99          | 2.15             |
| 802.11g             | 2.13               | 1.97         | 92.71          | 0.33             |
| 802.11ax HT20_OFDM  | 5.94               | 5.42         | 91.25          | 0.40             |
| 802.11ax HT40_OFDM  | 5.92               | 5.40         | 91.22          | 0.40             |
| 802.11ax HT20_OFDMA | 3.01               | 2.74         | 90.96          | 0.41             |
| 802.11ax HT40_OFDMA | 1.67               | 1.40         | 83.73          | 0.77             |





## 5. Test Results

### 5.1 Transmitter Requirement & Test Suites

#### 5.1.1 Antenna Requirement

**Requirement** Use of approved antennas only

According to the manufacturer declaration, the EUT's antenna specifications are described as below.  
The antenna is used with no possibility of replacement with a non-approved antenna by the end-user.  
Therefore, the EUT is considered to comply with this provision.

| ANT              |                                                                                                 | Gain (dBi) | Antenna Type |
|------------------|-------------------------------------------------------------------------------------------------|------------|--------------|
| 1                |                                                                                                 | 4.44       | PIFA         |
| 2                |                                                                                                 | 4.93       | PIFA         |
| Max Peak Gain    |                                                                                                 | 4.93       | -            |
| CDD Mode         | Power Directional Gain =                                                                        | 4.93       | -            |
|                  | PSD Directional Gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] =$   | 7.70       | -            |
| Beamforming Mode | Power Directional Gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] =$ | 7.70       | -            |
|                  | PSD Directional Gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] =$   | 7.70       | -            |

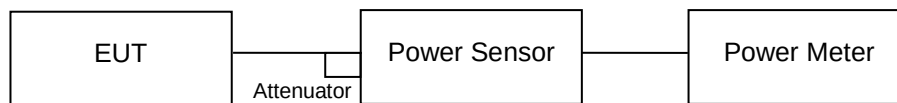
Refer to EUT photo for details.

### 5.1.2 Peak Output Power

**Limit** 1 watt (30 dBm)

**Kind of Test Site** Shielded room

#### Test Setup



#### Test Instruments

| Kind of Equipment | Manufacturer | Type    | S/N     | Calibration Date | Calibration Due Date | Test Date |           |
|-------------------|--------------|---------|---------|------------------|----------------------|-----------|-----------|
|                   |              |         |         |                  |                      | From      | Until     |
| Power Meter       | Anritsu      | ML2495A | 1901008 | 2022/3/15        | 2023/3/14            | 2022/7/8  | 2022/8/14 |
| Power Sensor      | Anritsu      | MA2411B | 1725269 | 2022/3/15        | 2023/3/14            | 2022/7/8  | 2022/8/14 |

#### Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

## Test Result

### Peak Output Power

#### CDD Mode

##### <802.11b>

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 1       | 2412                    | 24.10                   | 23.58 | 26.86       | 485.07 | 30          |
| 6       | 2437                    | 25.12                   | 24.75 | 27.95       | 623.63 | 30          |
| 11      | 2462                    | 24.61                   | 24.58 | 27.61       | 576.15 | 30          |

##### <802.11g>

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 1       | 2412                    | 26.13                   | 25.76 | 28.96       | 786.91 | 30          |
| 6       | 2437                    | 26.16                   | 25.38 | 28.80       | 758.19 | 30          |
| 10      | 2457                    | 24.89                   | 25.11 | 28.01       | 632.66 | 30          |
| 11      | 2462                    | 24.65                   | 24.94 | 27.81       | 603.63 | 30          |

##### <802.11n HT20>

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 1       | 2412                    | 25.98                   | 24.91 | 28.49       | 706.02 | 30          |
| 6       | 2437                    | 25.91                   | 25.26 | 28.61       | 725.68 | 30          |
| 10      | 2457                    | 25.89                   | 25.02 | 28.49       | 705.84 | 30          |
| 11      | 2462                    | 24.32                   | 24.78 | 27.57       | 571.00 | 30          |

##### <802.11n HT40>

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 3       | 2422                    | 25.25                   | 24.15 | 27.75       | 594.98 | 30          |
| 6       | 2437                    | 25.14                   | 25.11 | 28.14       | 650.93 | 30          |
| 9       | 2452                    | 24.58                   | 23.94 | 27.28       | 534.82 | 30          |

**<802.11ac VHT20>**

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 1       | 2412                    | 26.07                   | 25.05 | 28.60       | 724.47 | 30          |
| 6       | 2437                    | 26.02                   | 25.41 | 28.74       | 747.48 | 30          |
| 10      | 2457                    | 25.98                   | 25.13 | 28.59       | 722.11 | 30          |
| 11      | 2462                    | 24.44                   | 24.92 | 27.70       | 588.43 | 30          |

**<802.11ac HT40>**

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 3       | 2422                    | 25.38                   | 24.15 | 27.82       | 605.16 | 30          |
| 6       | 2437                    | 25.21                   | 25.11 | 28.17       | 656.23 | 30          |
| 9       | 2452                    | 24.70                   | 23.94 | 27.35       | 542.86 | 30          |

**<802.11ax HE20\_OFDM>**

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 1       | 2412                    | 26.23                   | 25.09 | 28.71       | 742.61 | 30          |
| 6       | 2437                    | 26.13                   | 25.47 | 28.82       | 762.57 | 30          |
| 10      | 2457                    | 26.09                   | 25.21 | 28.68       | 738.34 | 30          |
| 11      | 2462                    | 24.56                   | 24.99 | 27.79       | 601.26 | 30          |

**<802.11ax HE40\_OFDM>**

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 3       | 2422                    | 25.57                   | 24.28 | 27.98       | 628.50 | 30          |
| 6       | 2437                    | 25.36                   | 25.20 | 28.29       | 674.69 | 30          |
| 9       | 2452                    | 24.87                   | 24.05 | 27.49       | 561.00 | 30          |

**<802.11ax HE20\_OFDMA>**

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 1       | 2412                    | 25.92                   | 25.69 | 28.82       | 761.52 | 30          |
| 6       | 2437                    | 25.99                   | 25.28 | 28.66       | 734.48 | 30          |
| 10      | 2457                    | 25.33                   | 25.15 | 28.25       | 668.53 | 30          |
| 11      | 2462                    | 25.15                   | 25.40 | 28.29       | 674.08 | 30          |

**<802.11ax HE40\_OFDMA>**

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 3       | 2422                    | 25.83                   | 24.73 | 28.33       | 679.99 | 30          |
| 6       | 2437                    | 25.45                   | 25.24 | 28.36       | 684.95 | 30          |
| 9       | 2452                    | 25.40                   | 24.58 | 28.02       | 633.81 | 30          |

**Beamforming Mode**

**<802.11ac VHT20>**

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 1       | 2412                    | 23.06                   | 22.04 | 25.59       | 362.26 | 30          |
| 6       | 2437                    | 23.01                   | 22.40 | 25.73       | 373.77 | 30          |
| 10      | 2457                    | 22.97                   | 22.12 | 25.58       | 361.08 | 30          |
| 11      | 2462                    | 21.43                   | 21.91 | 24.69       | 294.23 | 30          |

**<802.11ac VHT40>**

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 3       | 2422                    | 22.37                   | 21.14 | 24.81       | 302.60 | 30          |
| 6       | 2437                    | 22.20                   | 22.10 | 25.16       | 328.14 | 30          |
| 9       | 2452                    | 21.69                   | 20.93 | 24.34       | 271.45 | 30          |

<802.11ax HE20\_OFDM>

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 1       | 2412                    | 23.22                   | 22.08 | 25.70       | 371.33 | 30          |
| 6       | 2437                    | 23.12                   | 22.46 | 25.81       | 381.31 | 30          |
| 10      | 2457                    | 23.08                   | 22.20 | 25.67       | 369.19 | 30          |
| 11      | 2462                    | 21.55                   | 21.98 | 24.78       | 300.65 | 30          |

<802.11ax HE40\_OFDM>

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 3       | 2422                    | 22.56                   | 21.27 | 24.97       | 314.27 | 30          |
| 6       | 2437                    | 22.35                   | 22.19 | 25.28       | 337.37 | 30          |
| 9       | 2452                    | 21.86                   | 21.04 | 24.48       | 280.52 | 30          |

<802.11ax HE20\_OFDMA>

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 1       | 2412                    | 22.91                   | 22.68 | 25.81       | 380.79 | 30          |
| 6       | 2437                    | 22.98                   | 22.27 | 25.65       | 367.26 | 30          |
| 10      | 2457                    | 22.32                   | 22.14 | 25.24       | 334.29 | 30          |
| 11      | 2462                    | 22.14                   | 22.39 | 25.28       | 337.06 | 30          |

<802.11ax HE40\_OFDMA>

| Channel | Channel Frequency (MHz) | Peak Output Power (dBm) |       | Total Power |        | Limit (dBm) |
|---------|-------------------------|-------------------------|-------|-------------|--------|-------------|
|         |                         | Ant 1                   | Ant 2 | (dBm)       | (mW)   |             |
| 3       | 2422                    | 22.82                   | 21.72 | 25.32       | 340.02 | 30          |
| 6       | 2437                    | 22.44                   | 22.23 | 25.35       | 342.50 | 30          |
| 9       | 2452                    | 22.39                   | 21.57 | 25.01       | 316.93 | 30          |



### Average Power

#### CDD Mode

##### <802.11b>

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 1       | 2412                    | 21.35               | 20.92 | 24.15       | 260.05 |
| 6       | 2437                    | 22.74               | 22.18 | 25.48       | 353.13 |
| 11      | 2462                    | 21.72               | 22.02 | 24.88       | 307.81 |

##### <802.11g>

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 1       | 2412                    | 21.85               | 21.27 | 24.58       | 287.08 |
| 6       | 2437                    | 22.55               | 21.96 | 25.28       | 336.92 |
| 10      | 2457                    | 20.32               | 20.51 | 23.43       | 220.11 |
| 11      | 2462                    | 20.02               | 20.16 | 23.10       | 204.21 |

##### <802.11n HT20>

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 1       | 2412                    | 20.37               | 19.62 | 23.02       | 200.52 |
| 6       | 2437                    | 22.08               | 21.09 | 24.62       | 289.96 |
| 10      | 2457                    | 20.01               | 20.05 | 23.04       | 201.39 |
| 11      | 2462                    | 18.46               | 18.63 | 21.56       | 143.09 |

##### <802.11n HT40>

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 3       | 2422                    | 19.75               | 19.17 | 22.48       | 177.01 |
| 6       | 2437                    | 20.62               | 20.12 | 23.39       | 218.15 |
| 9       | 2452                    | 19.12               | 19.02 | 22.08       | 161.46 |

**<802.11ac VHT20>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 1       | 2412                    | 20.45               | 19.78 | 23.14       | 205.98 |
| 6       | 2437                    | 22.16               | 21.16 | 24.70       | 295.05 |
| 10      | 2457                    | 20.09               | 20.13 | 23.12       | 205.13 |
| 11      | 2462                    | 18.57               | 18.76 | 21.68       | 147.11 |

**<802.11ac VHT40>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 3       | 2422                    | 19.88               | 19.17 | 22.55       | 179.88 |
| 6       | 2437                    | 20.70               | 20.12 | 23.43       | 220.29 |
| 9       | 2452                    | 19.18               | 19.02 | 22.11       | 162.59 |

**<802.11ax HE20\_OFDM>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 1       | 2412                    | 20.57               | 19.85 | 23.24       | 210.63 |
| 6       | 2437                    | 22.27               | 21.21 | 24.78       | 300.78 |
| 10      | 2457                    | 20.15               | 20.24 | 23.21       | 209.20 |
| 11      | 2462                    | 18.63               | 18.86 | 21.76       | 149.86 |

**<802.11ax HE40\_OFDM>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 3       | 2422                    | 19.94               | 19.28 | 22.63       | 183.35 |
| 6       | 2437                    | 20.79               | 20.21 | 23.52       | 224.90 |
| 9       | 2452                    | 19.27               | 19.05 | 22.17       | 164.88 |

**<802.11ax HE20\_OFDMA>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 1       | 2412                    | 20.36               | 19.82 | 23.11       | 204.58 |
| 6       | 2437                    | 21.87               | 20.95 | 24.44       | 278.27 |
| 10      | 2457                    | 19.92               | 20.14 | 23.04       | 201.45 |
| 11      | 2462                    | 20.19               | 19.96 | 23.09       | 203.56 |

**<802.11ax HE40\_OFDMA>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 3       | 2422                    | 19.83               | 19.21 | 22.54       | 179.53 |
| 6       | 2437                    | 20.68               | 20.25 | 23.48       | 222.88 |
| 9       | 2452                    | 18.98               | 19.09 | 22.05       | 160.16 |

**Beamforming Mode**

**<802.11ac VHT20>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 1       | 2412                    | 17.44               | 16.77 | 20.13       | 103.00 |
| 6       | 2437                    | 19.15               | 18.15 | 21.69       | 147.54 |
| 10      | 2457                    | 17.08               | 17.12 | 20.11       | 102.57 |
| 11      | 2462                    | 15.56               | 15.75 | 18.67       | 73.56  |

**<802.11ac VHT40>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 3       | 2422                    | 16.87               | 16.16 | 19.54       | 89.95  |
| 6       | 2437                    | 17.69               | 17.11 | 20.42       | 110.15 |
| 9       | 2452                    | 16.17               | 16.01 | 19.10       | 81.30  |

**<802.11ax HE20\_OFDM>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 1       | 2412                    | 17.56               | 16.84 | 20.23       | 105.32 |
| 6       | 2437                    | 19.26               | 18.20 | 21.77       | 150.40 |
| 10      | 2457                    | 17.14               | 17.23 | 20.20       | 104.61 |
| 11      | 2462                    | 15.62               | 15.85 | 18.75       | 74.93  |

**<802.11ax HE40\_OFDM>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 3       | 2422                    | 16.93               | 16.27 | 19.62       | 91.68  |
| 6       | 2437                    | 17.78               | 17.20 | 20.51       | 112.46 |
| 9       | 2452                    | 16.26               | 16.04 | 19.16       | 82.45  |

**<802.11ax HE20\_OFDMA>**

| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 1       | 2412                    | 17.35               | 16.81 | 20.10       | 102.30 |
| 6       | 2437                    | 18.86               | 17.94 | 21.43       | 139.14 |
| 10      | 2457                    | 16.91               | 17.13 | 20.03       | 100.73 |
| 11      | 2462                    | 17.18               | 16.95 | 20.08       | 101.78 |

**<802.11ax HE40\_OFDMA>**

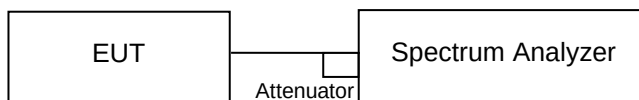
| Channel | Channel Frequency (MHz) | Average Power (dBm) |       | Total Power |        |
|---------|-------------------------|---------------------|-------|-------------|--------|
|         |                         | Ant 1               | Ant 2 | (dBm)       | (mW)   |
| 3       | 2422                    | 16.82               | 16.20 | 19.53       | 89.77  |
| 6       | 2437                    | 17.67               | 17.24 | 20.47       | 111.45 |
| 9       | 2452                    | 15.97               | 16.08 | 19.04       | 80.09  |

### 5.1.3 6 dB Bandwidth and 99% Occupied Bandwidth

**Limit** The minimum 6 dB bandwidth shall be at least 500 kHz.

**Kind of Test Site** Shielded room

#### Test Setup



#### Test Instruments

| Kind of Equipment | Manufacturer | Type  | S/N    | Calibration Date | Calibration Due Date | Test Date |           |
|-------------------|--------------|-------|--------|------------------|----------------------|-----------|-----------|
|                   |              |       |        |                  |                      | From      | Until     |
| Spectrum Analyzer | R&S          | FSV40 | 101512 | 2022/2/24        | 2023/2/23            | 2022/7/8  | 2022/8/14 |

#### Test Procedure

- Set resolution bandwidth (RBW) = 100 kHz
- Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
- For 99% occupied bandwidth measurement, the transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to PEAK. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean power of a given emission.

#### Test Results

Please refer to Appendix A.

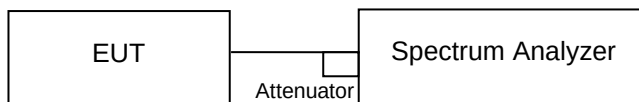
## 5.1.4 Power Spectral Density

### Limit

The power spectral density shall not be greater than 8 dBm in any 3 kHz band.

**Kind of Test Site**                      Shielded room

### Test Setup



### Test Instruments

| Kind of Equipment | Manufacturer | Type  | S/N    | Calibration Date | Calibration Due Date | Test Date |           |
|-------------------|--------------|-------|--------|------------------|----------------------|-----------|-----------|
|                   |              |       |        |                  |                      | From      | Until     |
| Spectrum Analyzer | R&S          | FSV40 | 101512 | 2022/2/24        | 2023/2/23            | 2022/7/8  | 2022/8/14 |

### Test Procedure

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- Set the VBW  $\geq 3 \times \text{RBW}$ .
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

### Test Results

Please refer to Appendix A.

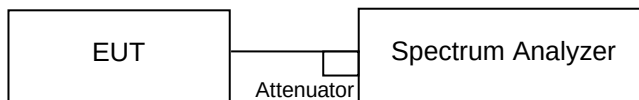
## 5.1.5 Conducted Spurious Emissions and Frequency Band Edges Measured in 100 kHz Bandwidth

### Limit

20 dB (below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.)

**Kind of Test Site**                      Shielded room

### Test Setup



### Test Instruments

| Kind of Equipment | Manufacturer | Type  | S/N    | Calibration Date | Calibration Due Date | Test Date |           |
|-------------------|--------------|-------|--------|------------------|----------------------|-----------|-----------|
|                   |              |       |        |                  |                      | From      | Until     |
| Spectrum Analyzer | R&S          | FSV40 | 101512 | 2022/2/24        | 2023/2/23            | 2022/7/8  | 2022/8/14 |

### Test Procedure

Measurement procedure REF

1. Set the RBW = 100 kHz.
2. Set the VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

Measurement procedure OOBE

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

### Test Results

Please refer to Appendix A.

## 5.1.6 Radiated Spurious Emissions and Band Edges

### Limit

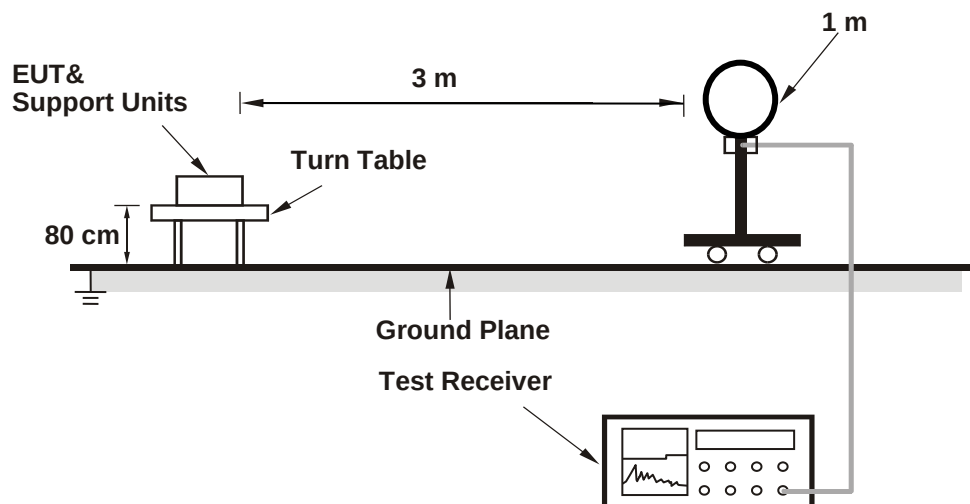
Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

Emissions radiated outside the restricted and authorized frequency bands must either comply with the radiated emission limits specified for the restricted bands or in §15.247(d).

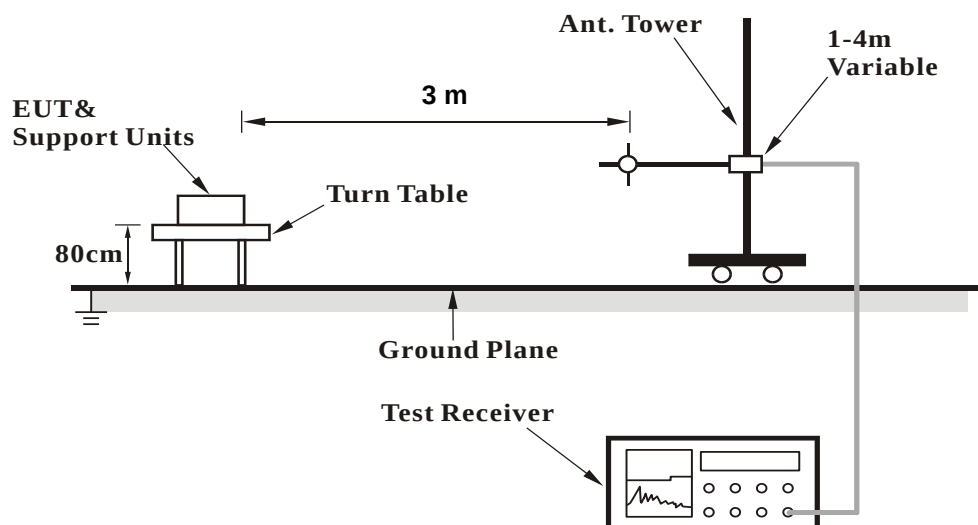
**Kind of Test Site** 3m Semi-Anechoic Chamber

### Test Setup

#### <Radiated Emissions below 30 MHz>

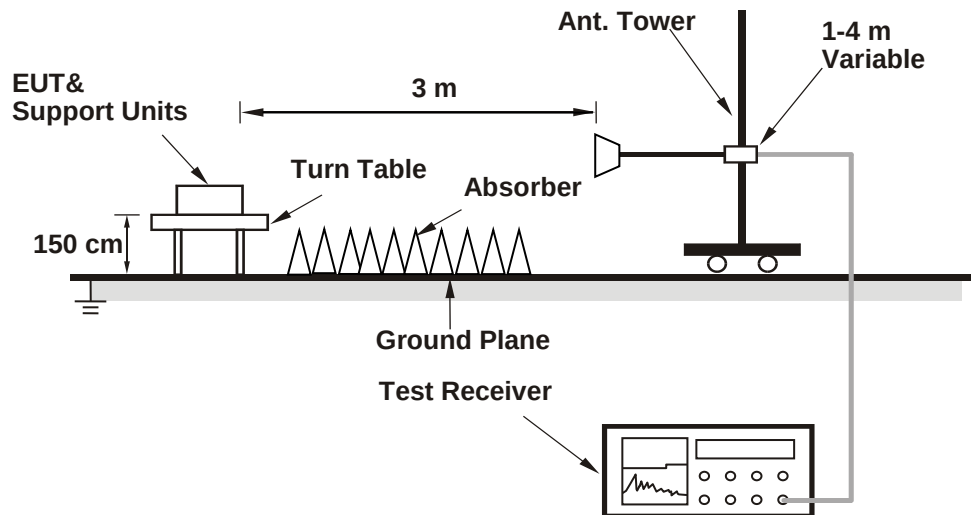


#### <Radiated Emissions 30 MHz to 1 GHz>





<Radiated Emissions above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

**Test Instruments**

| Kind of Equipment  | Manufacturer   | Type        | S/N         | Calibration Date | Calibration Due Date |
|--------------------|----------------|-------------|-------------|------------------|----------------------|
| Above 1 GHz        |                |             |             |                  |                      |
| Signal Analyzer    | R&S            | FSV40       | 101508      | 2022/4/13        | 2023/4/12            |
| Horn Antenna       | ETS-Lindgren   | 3117        | 00218930    | 2021/12/20       | 2022/12/19           |
| HF-AMP + AC source | EMCI           | EMC051845SE | 980633      | 2022/2/16        | 2023/2/15            |
| HF-AMP + AC source | EMCI           | EMC184045SE | 980657      | 2022/2/16        | 2023/2/15            |
| Horn Antenna       | SCHWARZBECK    | BBHA 9170   | 00887       | 2022/3/29        | 2023/3/28            |
| 30 MHz ~ 1 GHz     |                |             |             |                  |                      |
| Receiver           | R&S            | ESR7        | 102108      | 2022/4/28        | 2023/4/27            |
| Bilog Antenna      | SCHWARZBECK    | VULB-9168   | 00951       | 2022/4/6         | 2023/4/5             |
| LF-AMP             | Agilent        | 8447D       | 2944A107722 | 2022/3/22        | 2023/3/21            |
| Below 30 MHz       |                |             |             |                  |                      |
| Receiver           | R&S            | ESR7        | 102108      | 2022/4/28        | 2023/4/27            |
| Microwave Cable    | SUCOFLEX 104EA | 800056/4EA  | 804680/4    | 2022/3/22        | 2023/3/21            |
| Loop Antenna       | SCHWARZBECK    | FMZB 1519B  | 00215       | 2021/12/8        | 2022/12/7            |

**Test Procedures****For Radiated Emissions below 30 MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel (OPEN), perpendicular (CLOSE), and ground-parallel (GROUND) orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

## Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

**For Radiated Emissions above 30 MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. 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 from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

## Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98 %) or 10 Hz (Duty cycle  $\geq 98$  %) for Average detection (AV) at frequency above 1 GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The Radiated Emissions testing was performed in the X(E1), Y(H) and Z(E2) axis orientation. The worst-case Axis orientation is recorded in this test report.

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**Test Results**

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)  
Level (dBuV/m) = Reading (dBuV) + Factor (dB/m)

Please refer to Appendix B.

## 5.2 Mains Emission

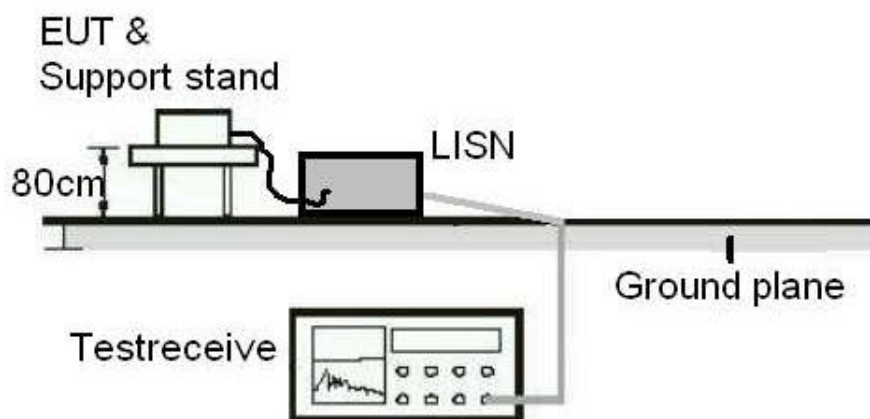
### 5.2.1 Mains Conducted Emission

#### Limit

Mains Conducted Emission as defined in §15.207 must comply with the mains conducted emission limits.

Kind of Test Site                      Shielded room

#### Test Setup



#### Test Instruments

| Kind of Equipment  | Manufacturer    | Type   | S/N     | Calibration Date | Calibration Due Date |
|--------------------|-----------------|--------|---------|------------------|----------------------|
| Two-Line V-Network | Rohde & Schwarz | ENV216 | 101938  | 2021/9/23        | 2022/9/22            |
| EMI Test Receiver  | R&S             | ESCI   | 1816063 | 2021/11/15       | 2022/11/14           |

#### Test Procedures

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

#### Test Results

Please refer to Appendix B.