

# TEST REPORT

**Reference No.**..... : WTX24X07170578W001  
**FCC ID**..... : 2ACGT-MSMB  
**Applicant**..... : GUANGZHOU SHANGKE INFORMATION TECHNOLOGY CO., LTD  
**Address**..... : Room 1205-1212, R&F To-Win Building, No.30 Huaxia Road, Tianhe  
District, Guangzhou, Guangdong Province, China  
**Manufacturer**..... : The same as Applicant  
**Address**..... : The same as Applicant  
**Product Name**..... : PC Motherboard  
**Model No.**..... : MS-Challenger B760ITX D5 WIFI  
**Standards**..... : FCC Part 15.407  
**Date of Receipt sample**..... : 2024-07-19  
**Date of Test**..... : 2024-07-19 to 2024-08-30  
**Date of Issue**..... : 2024-08-30  
**Test Report Form No.**..... : WTX\_Part 15\_407W  
**Test Result**..... : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

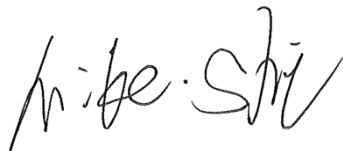
**Prepared By:**

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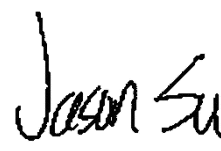
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Approved by:



Jason Su

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Report version

| Version No. | Date of issue | Description |
|-------------|---------------|-------------|
| Rev.00      | 2024-08-30    | Original    |
| /           | /             | /           |

## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

| General Description of EUT |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:              | PC Motherboard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Trade Name:                | /                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Model No.:                 | MS-Challenger B760ITX D5 WIFI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Adding Model(s):           | <p>MS-iCraft Z890 VERTEX, MS-iCraft Z890 ARCTIC, MS-iCraft Z890 PACIFIC, MS-Terminator Z890-A WIFI, MS-Terminator Z890M GKD5 WIFI, MS-Terminator Z890M GKD5 ICE, MS-iCraft Z890ITX WIFI, MS-ESPORT Z890M WIFI, MS-Challenger Z890M WIFI, MS-iCraft B860M CROSS, MS-Terminator B860M WIFI, MS-Terminator B860M WIFI6E, MS-Terminator B860M GKD5 WIFI, MS-Terminator B860M GKD5 ICE, MS-ESPORT B860M Sniper WIFI, MS-ESPORT B860M Gank WIFI, MS-ESPORT B860M ACE WIFI, MS-Challenger H810ITX WIFI, MS-Challenger B860BKB WIFI, MS-Terminator B860YTX WIFI, MS-Terminator B860ITX WIFI, MS-ESPORT H810M Gank WIFI, MS-Challenger H810ITX WIFI, MS-Terminator B850M WIFI, MS-Terminator B850ITX WIFI, MS-Challenger B850M WIFI ICE, MS-iCraft Z790 WiFi V2, MS-iCraft Z790ITX WIFI, MS-Terminator Z790-A WIFI6, MS-Terminator Z790M D5 ICE, MS-iCraft B760M CROSS, MS-Terminator B760M D5 WIFI6E, MS-Terminator H770YTX D5 WIFI, MS-Terminator B760M GKD5 ICE, MS-Terminator B760M D5 WIFI, MS-Terminator B760M D4 ICE, MS-Terminator B760M D4 WIFI6E, MS-Terminator B760M D4 WIFI, MS-Terminator B760ITX D4 WIFI V2, MS-Challenger B760M D5 WIFI, MS-B760M GAMING WIFI ACE, MS-B760M GAMING WIFI GANK, MS-Challenger H610ITX 2LAN, MS-H610M 666 WiFi6 D5, MS-H610M 666 WiFi6 ARGB, MS-H610M 666 WiFi6, MS-eSport B650M WIFI6 ICE, MS-eSport B650ITX WIFI ICE, MS-Terminator B650M WIFI6, MS-Challenger B650M WIFI ICE, MS-Challenger B650M WIFI, MS-Challenger A520M-K WIFI, MS-MoDT 12450H ITX WIFI F, MS-MoDT 12650H ITX WIFI F, MS-MoDT 13420H ITX WIFI F, MS-MoDT 13620H ITX WIFI F, ADV-MoDT 12450H ITX WIFI F, ADV-MoDT 12500H ITX WIFI F, ADV-MoDT 12600H ITX WIFI F, ADV-MoDT 12650H ITX WIFI F, ADV-MoDT 12700H ITX WIFI F, ADV-MoDT 12800H ITX WIFI F, ADV-MoDT 12900H ITX WIFI F, ADV-MoDT 12900HK ITX WIFI F, ADV-MoDT 13420H ITX WIFI F, ADV-MoDT 13500H ITX WIFI F, ADV-MoDT 13600H ITX WIFI F, ADV-MoDT 13620H ITX WIFI F, ADV-MoDT 13700H ITX WIFI F, ADV-MoDT 13800H ITX WIFI F,</p> |

|                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                   | ADV-MoDT 13900H ITX WIFI F, ADV-MoDT 13900HK ITX WIFI F, ADV-MoDT 13420H ITX D5 F, ADV-MoDT 13500H ITX D5 F, ADV-MoDT 13600H ITX D5 F, ADV-MoDT 13620H ITX D5 F, ADV-MoDT 13700H ITX D5 F, ADV-MoDT 13800H ITX D5 F, ADV-MoDT 13900H ITX D5 F, ADV-MoDT 13900HK ITX D5 F, MS-MoDT ADL-P ITX WIFI F, ADV-MoDT ADL-P ITX WIFI F, ADV-MoDT RPL-P ITX D5, ADV-MoDT RPL-HX MATX D4, ADV-MoDT MTL-H ITX LPD5 |
| Rated Voltage:                                                                                                                                                                                                                                                                                                    | DC12V                                                                                                                                                                                                                                                                                                                                                                                                  |
| Battery Capacity:                                                                                                                                                                                                                                                                                                 | /                                                                                                                                                                                                                                                                                                                                                                                                      |
| Power Adapter:                                                                                                                                                                                                                                                                                                    | /                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model MS-Challenger B760ITX D5 WIFI, but the circuit and the electronic construction do not change, declared by the manufacturer.</i> |                                                                                                                                                                                                                                                                                                                                                                                                        |

| Technical Characteristics of EUT                                                                 |                                                                                |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Support Standards:                                                                               | 802.11a, 802.11n-HT20, 802.11n-HT40, 802.11ac-VHT20/40/80, 802.11ax-HE20/40/80 |
| Frequency Range:                                                                                 | 5180-5240MHz                                                                   |
| Max. RF Output Power:                                                                            | Antenna 0: 16.09dBm (Conducted)<br>Antenna 1: 16.08dBm (Conducted)             |
| Type of Modulation:                                                                              | QPSK, 16QAM, 64QAM, 256QAM, 1024QAM                                            |
| Type of Antenna:                                                                                 | External antenna                                                               |
| Antenna Gain:                                                                                    | 4.42dBi                                                                        |
| <i>Note The Antenna Gain is provided by the customer and can affect the validity of results.</i> |                                                                                |

## 1.2 Test Standards

The tests were performed according to following standards:

**FCC Rules Part 15.407:** General technical requirements.

**ANSI C63.10-2013:** American National Standard for Testing Unlicensed Wireless Devices.

**KDB789033 D02 v02r01:** Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-Nii) Devices Part 15, Subparte.

**KDB662911 D01 Multiple Transmitter Output v02r01:** Emissions Testing of Transmitters with Multiple Outputs in the Same Band.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB789033 D02 v02r01. The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

## 1.4 Table for parameters of Test Software setting

Use “DRTU” and follow the instructions given by the manufacturer, you can start to test. 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. Test use the customer default power level, and to measure its highest possible emissions level, more detailed description as follows:

Antenna 0 and Antenna 1

| Mode                | Test Frequency (MHz) |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|                     | NCB: 20MHz           |      |      |      |      |      |      |      |      |      |      |      |      |
|                     | 5180                 | 5200 | 5240 | 5260 | 5300 | 5320 | 5500 | 5580 | 5700 | 5720 | 5745 | 5785 | 5825 |
| 802.11a 6Mbps       | 17.5                 | 17.5 | 17.5 | /    | /    | /    | /    | /    | /    | /    | /    | /    | /    |
| 802.11n-HT20 MCS0   | 16                   | 16   | 16   | /    | /    | /    | /    | /    | /    | /    | /    | /    | /    |
| 802.11ac-VHT20 MCS0 | 16                   | 16   | 16   | /    | /    | /    | /    | /    | /    | /    | /    | /    | /    |
| 802.11ax-HE20 MCS0  | 16                   | 16   | 16   | /    | /    | /    | /    | /    | /    | /    | /    | /    | /    |
| Mode                | NCB: 40MHz           |      |      |      |      |      |      |      |      |      |      |      |      |
|                     | 5190                 | 5230 | 5270 | 5310 | 5510 | 5550 | 5670 | 5710 | 5755 | 5795 |      |      |      |

|                                 |            |    |      |   |      |   |      |   |      |   |      |
|---------------------------------|------------|----|------|---|------|---|------|---|------|---|------|
| 802.11n-HT40<br>MCS0            | 16         | 16 | /    | / | /    | / | /    | / | /    | / |      |
| 802.11ac-VHT4<br>0<br>MCS0      | 16         | 16 | /    | / | /    | / | /    | / | /    | / |      |
| 802.11ax-HE40<br>MCS0           | 16         | 16 | /    | / | /    | / | /    | / | /    | / |      |
| Mode                            | NCB: 80MHz |    |      |   |      |   |      |   |      |   |      |
|                                 | 5210       |    | 5290 |   | 5530 |   | 5610 |   | 5690 |   | 5775 |
| 802.11ac-VHT8<br>0<br>MCS0/Nss2 | 15         |    | 15   |   | /    |   | /    |   | /    |   | /    |
| 802.11ax-HE80<br>MCS0/Nss2      | 15         |    | 15   |   | /    |   | /    |   | /    |   | /    |

## **1.5 EUT Operating during test**

EUT was programmed to be in continuously transmitting mode. During the test, EUT operation to normal function and programs under Android were executed.

## **1.6 Test Facility**

### **Address of the test laboratory**

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C. (518101)

### **FCC – Registration No.: 125990**

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

### **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

## 1.7 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

| Test Mode List                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------|
| Test Mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Description    | Remark                  |
| TM1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 802.11a        | 5180MHz,5200MHz,5240MHz |
| TM2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 802.11n-HT20   | 5180MHz,5200MHz,5240MHz |
| TM3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 802.11ac-VHT20 | 5180MHz,5200MHz,5240MHz |
| TM4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 802.11ax-HE20  | 5180MHz,5200MHz,5240MHz |
| TM5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 802.11n-HT40   | 5190MHz,5230MHz         |
| TM6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 802.11ac-VHT40 | 5190MHz,5230MHz         |
| TM7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 802.11ax-HE40  | 5190MHz,5230MHz         |
| TM8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 802.11ac-VHT80 | 5210MHz                 |
| TM9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 802.11ax-HE80  | 5210MHz                 |
| <p>Note1 : All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report; 802.11ac-VHT20, 802.11ac-VHT40 covered by 802.11n-HT20 and 802.11n-HT40.</p> <p>Note 2: The 5GHz WIFI has two antennas and support Multiple Outputs for 802.11n/ac/ax mode for this report; Antenna 0 Gain is 4.42dBi; Antenna 1 Gain is 4.42dBi;</p> <p>According to KDB 662911, for same directional gain:</p> <p>Directional gain = <math>G_{ANT} + 10 \log(N_{ANT})</math> dBi = <math>4.42 + 10 \log(2)</math> dBi = 7.43dBi</p> |                |                         |

| Test Conditions    |           |
|--------------------|-----------|
| Temperature:       | 22~25 °C  |
| Relative Humidity: | 45~55 %.  |
| ATM Pressure:      | 1019 mbar |

| EUT Cable List and Details |            |                     |                        |
|----------------------------|------------|---------------------|------------------------|
| Cable Description          | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| /                          | /          | /                   | /                      |

| Special Cable List and Details |            |                     |                        |
|--------------------------------|------------|---------------------|------------------------|
| Cable Description              | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| AC Cable                       | 1.5        | Unshielded          | Without Ferrite        |

| Auxiliary Equipment List and Details |              |       |               |
|--------------------------------------|--------------|-------|---------------|
| Description                          | Manufacturer | Model | Serial Number |
| Computer                             | /            | /     | /             |
| Display                              | ASUS         | VG28U | M9LMTF126416  |

## 1.8 Measurement Uncertainty

| Measurement uncertainty        |            |                                |
|--------------------------------|------------|--------------------------------|
| Parameter                      | Conditions | Uncertainty                    |
| RF Output Power                | Conducted  | $\pm 0.42\text{dB}$            |
| Occupied Bandwidth             | Conducted  | $\pm 1.5\%$                    |
| Power Spectral Density         | Conducted  | $\pm 1.8\text{dB}$             |
| Conducted Spurious Emission    | Conducted  | $\pm 2.17\text{dB}$            |
| Conducted Emissions            | Conducted  | 9-150kHz $\pm 3.74\text{dB}$   |
|                                |            | 0.15-30MHz $\pm 3.34\text{dB}$ |
| Transmitter Spurious Emissions | Radiated   | 30-200MHz $\pm 4.52\text{dB}$  |
|                                |            | 0.2-1GHz $\pm 5.56\text{dB}$   |
|                                |            | 1-6GHz $\pm 3.84\text{dB}$     |
|                                |            | 6-18GHz $\pm 3.92\text{dB}$    |

## 1.9 Test Equipment List and Details

| Fixed asset Number                             | Description              | Manufacturer    | Model       | Serial No.     | Cal Date   | Due. Date  |
|------------------------------------------------|--------------------------|-----------------|-------------|----------------|------------|------------|
| WTXE1041A<br>1001                              | Communication Tester     | Rohde & Schwarz | CMW500      | 148650         | 2024-02-24 | 2025-02-23 |
| WTXE1005A<br>1005                              | Spectrum Analyzer        | Agilent         | N9020A      | US471401<br>02 | 2024-03-19 | 2025-03-18 |
| WTXE1084A<br>1001                              | Spectrum Analyzer        | Agilent         | N9020A      | MY543205<br>48 | 2024-02-24 | 2025-02-23 |
| WTXE1004A<br>1-001                             | Spectrum Analyzer        | Rohde & Schwarz | FSP40       | 100612         | 2024-02-27 | 2025-02-26 |
| <input type="checkbox"/> Chamber A: Below 1GHz |                          |                 |             |                |            |            |
| WTXE1005A<br>1003                              | Spectrum Analyzer        | Rohde & Schwarz | FSP30       | 836079/03<br>5 | 2024-02-24 | 2025-02-23 |
| WTXE1001A<br>1001                              | EMI Test Receiver        | Rohde & Schwarz | ESPI        | 101611         | 2024-03-19 | 2025-03-18 |
| WTXE1007A<br>1001                              | Amplifier                | HP              | 8447F       | 2805A034<br>75 | 2024-02-24 | 2025-02-23 |
| WTXE1010A<br>1007                              | Loop Antenna             | Schwarz beck    | FMZB 1516   | 9773           | 2024-02-26 | 2025-02-25 |
| WTXE1010A<br>1006                              | Broadband Antenna        | Schwarz beck    | VULB9163    | 9163-333       | 2024-02-24 | 2025-02-23 |
| <input type="checkbox"/> Chamber A: Above 1GHz |                          |                 |             |                |            |            |
| WTXE1005A<br>1003                              | Spectrum Analyzer        | Rohde & Schwarz | FSP30       | 836079/03<br>5 | 2024-02-24 | 2025-02-23 |
| WTXE1001A<br>1001                              | EMI Test Receiver        | Rohde & Schwarz | ESPI        | 101611         | 2024-03-19 | 2025-03-18 |
| WTXE1065A<br>1001                              | Amplifier                | C&D             | PAP-1G18    | 2002           | 2024-02-27 | 2025-02-26 |
| WTXE1010A<br>1005                              | Horn Antenna             | ETS             | 3117        | 00086197       | 2024-02-26 | 2025-02-25 |
| WTXE1010A<br>1010                              | DRG Horn Antenna         | A.H. SYSTEMS    | SAS-574     | 571            | 2024-03-17 | 2025-03-16 |
| WTXE1003A<br>1001                              | Pre-amplifier            | Schwarzbeck     | BBV 9721    | 9721-031       | 2024-02-29 | 2025-02-28 |
| <input type="checkbox"/> Chamber B:Below 1GHz  |                          |                 |             |                |            |            |
| WTXE1010A<br>1006                              | Trilog Broadband Antenna | Schwarz beck    | VULB9163(B) | 9163-635       | 2024-03-17 | 2027-03-16 |
| WTXE1038A<br>1001                              | Amplifier                | Agilent         | 8447D       | 2944A104<br>57 | 2024-02-24 | 2025-02-23 |

|                                                           |                                |                    |             |                 |            |            |
|-----------------------------------------------------------|--------------------------------|--------------------|-------------|-----------------|------------|------------|
| WTXE1001A<br>1002                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESPI        | 101391          | 2024-02-24 | 2025-02-23 |
| <input checked="" type="checkbox"/> Chamber C: Below 1GHz |                                |                    |             |                 |            |            |
| WTXE1093A<br>1001                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESIB 26     | 100401          | 2024-02-27 | 2025-02-26 |
| WTXE1010A<br>1013-1                                       | Trilog<br>Broadband<br>Antenna | Schwarz beck       | VULB 9168   | 1194            | 2024-04-18 | 2027-04-17 |
| WTXE1007A<br>1002                                         | Amplifier                      | HP                 | 8447F       | 2944A038<br>69  | 2024-02-24 | 2025-02-23 |
| WTXE1010A<br>1007                                         | Loop Antenna                   | Schwarz beck       | FMZB 1516   | 9773            | 2024-02-26 | 2025-02-25 |
| <input checked="" type="checkbox"/> Chamber C: Above 1GHz |                                |                    |             |                 |            |            |
| WTXE1093A<br>1001                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESIB 26     | 100401          | 2024-02-27 | 2025-02-26 |
| WTXE1103A<br>1005                                         | Horn Antenna                   | POAM               | RTF-118A    | 1820            | 2023-03-10 | 2026-03-09 |
| WTXE1103A<br>1006                                         | Amplifier                      | Tonscend           | TAP01018050 | AP22E806<br>235 | 2024-02-27 | 2025-02-26 |
| WTXE1010A<br>1010                                         | DRG Horn<br>Antenna            | A.H. SYSTEMS       | SAS-574     | 571             | 2024-03-17 | 2025-03-16 |
| WTXE1003A<br>1001                                         | Pre-amplifier                  | Schwarzbeck        | BBV 9721    | 9721-031        | 2024-02-29 | 2025-02-28 |
| <input type="checkbox"/> Conducted Room 1#                |                                |                    |             |                 |            |            |
| WTXE1104A<br>1029                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESCI        | 100525          | 2023-12-12 | 2024-12-11 |
| WTXE1002A<br>1001                                         | Pulse Limiter                  | Rohde &<br>Schwarz | ESH3-Z2     | 100911          | 2024-02-24 | 2025-02-23 |
| WTXE1003A<br>1001                                         | AC LISN                        | Schwarz beck       | NSLK8126    | 8126-279        | 2024-02-24 | 2025-02-23 |
| <input checked="" type="checkbox"/> Conducted Room 2#     |                                |                    |             |                 |            |            |
| WTXE1001A<br>1004                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESPI        | 101259          | 2024-02-24 | 2025-02-23 |
| WTXE1003A<br>1003                                         | LISN                           | Rohde &<br>Schwarz | ENV 216     | 100097          | 2024-02-24 | 2025-02-23 |

| Software List                                         |              |        |         |
|-------------------------------------------------------|--------------|--------|---------|
| Description                                           | Manufacturer | Model  | Version |
| EMI Test Software<br>(Radiated Emission)*             | Farad        | EZ-EMC | RA-03A1 |
| EMI Test Software<br>(Conducted Emission Room<br>1#)* | Farad        | EZ-EMC | RA-03A1 |
| EMI Test Software<br>(Conducted Emission Room<br>2#)* | SKET         | EMC-I  | V2.0    |

\*Remark: indicates software version used in the compliance certification testing.

## 2. SUMMARY OF TEST RESULTS

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| FCC Rules                      | Description of Test Item                  | Result    |
|--------------------------------|-------------------------------------------|-----------|
| §15.203; §15.405               | Antenna Requirement                       | Compliant |
| 15.407 (c)                     | Automatically Discontinue Transmission    | Compliant |
| §15.207; §15.407(b)(6)         | Conducted Emission                        | Compliant |
| §15.407(a)(1),(2)              | Power Spectral Density                    | Compliant |
| §15.407(e)                     | Emission Bandwidth and Occupied Bandwidth | Compliant |
| §15.407(a)(1),(2)              | Maximum Conducted Output Power            | Compliant |
| §15.407(b)(1),(2),(3),(4)      | Undesirable emission                      | Compliant |
| §15.205; §15.407(b)(1),(2),(3) | Radiated Emission                         | Compliant |
| §15.407(g)                     | Frequency Stability                       | Compliant |
| §15.407(h)                     | Dynamic Frequency Selection (DFS)         | Compliant |

N/A: Not applicable.

### **3. Antenna Requirement**

---

#### **3.1 Standard Applicable**

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

#### **3.2 Evaluation Information**

This product has two External antennas, fulfill the requirement of this section.

## **4. Automatically Discontinue Transmission**

---

### **4.1 Standard Applicable**

According to FCC Part 15.407(c), the device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

### **4.2 Summary of Test Results**

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

## 5. Power Spectral Density

---

### 5.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.

(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or  $11\text{dBm} + 10 \log B$ , where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

### 5.2 Test Procedure

According to 789033 D02 v02r01 General UNII Test Procedures New Rules v02, the following is the measurement procedure.

For devices operating in the bands 5.15-5.25GHz, 5.25-5.35GHz, and 5.47-5.725GHz, the above procedures make use of 1MHz RBW to satisfy directly the 1MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85GHz, the rules specify a measurement bandwidth of 500kHz. Many spectrum analyzers do not have 500kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1MHz, or 500kHz, "provided that the measured power is integrated over the full

reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1MHz, or 500kHz). If measurements are performed using a reduced resolution bandwidth ( $< 1\text{ MHz}$ , or  $< 500\text{kHz}$ ) and integrated over 1 MHz, or 500kHz bandwidth, the following adjustments to the procedures apply:

- a) Set  $\text{RBW} \geq 1/T$ , where T is defined in section II.B.I.a).
- b) Set  $\text{VBW} \geq 3\text{ RBW}$ .
- c) If measurement bandwidth of Maximum PSD is specified in 500kHz, add  $10\log(500\text{kHz}/\text{RBW})$  to the measured result, whereas  $\text{RBW} (< 500\text{kHz})$  is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1MHz, add  $10\log(1\text{MHz}/\text{RBW})$  to the measured result, whereas  $\text{RBW} (< 1\text{MHz})$  is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100kHz for the sections 5.c) and 5.d) above, since  $\text{RBW}=100\text{kHz}$  is available on nearly all spectrum analyzers.

### 5.3 Summary of Test Results/Plots

Please refer to Appendix C

## 6. Emission Bandwidth and Occupied Bandwidth

---

### 6.1 Standard Applicable

According to 15.407(a) and (e):

(1) For the band 5.15-5.25GHz.

(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or  $11\text{dBm} + 10 \log B$ , where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple colocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(e) Within the 5.725-5.85GHz band, the minimum 6dB bandwidth of U-NII devices shall be at least 500kHz.

### 6.2 Test Procedure

According to 789033 D02 v02r0r section C&D, the following is the measurement procedure.

#### 1. Emission Bandwidth (EBW)

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.

- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

## 2. Minimum Emission Bandwidth for the band 5.725-5.85GHz

Section 15.407(e) specifies the minimum 6dB emission bandwidth of at least 500KHz for the band 5.715-5.85GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100kHz.
- b) Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

## D. 99 Percent Occupied Bandwidth

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v02r01 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:

- 1. Set center frequency to the nominal EUT channel center frequency.
- 2. Set span = 1.5 times to 5.0 times the OBW.
- 3. Set RBW = 1 % to 5 % of the OBW
- 4. Set VBW  $\geq 3 \times$  RBW
- 5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- 6. Use the 99 % power bandwidth function of the instrument (if available).
- 7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency.

Reference No.: WTX24X07170578W001

The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

### **6.3 Summary of Test Results/Plots**

**Please refer to Appendix A**

## 7. Maximum Conducted Output Power

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### 7.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.

(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or  $11\text{dBm} + 10 \log B$ , where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

### 7.2 Test Procedure

According to KDB789033 D02 v02r01 section E, the following is the measurement procedure.

- (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (ii) Set RBW = 1MHz.
- (iii) Set VBW  $\geq$  3MHz.
- (iv) Number of points in sweep  $\geq$  2 Span / RBW. (This ensures that bin-to-bin spacing is  $\leq$  RBW/2, so that

narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle  $\geq$  98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

### **7.3 Summary of Test Results/Plots**

**Please refer to Appendix B**

## 8. Radiated Spurious Emissions

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### 8.1 Standard Applicable

According to §15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of -27dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of -27dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725GHz band: All emissions outside of the 5.47-5.725GHz band shall not exceed an e.i.r.p. of -27dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85GHz band:
  - (i) All emissions shall be limited to a level of -27dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10dBm/MHz at 25MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6dBm/MHz at 5MHz above or below the band edge, and from 5MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

According to §15.407(b)(6), Unwanted emissions below 1GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

According to §15.407(b)(7), The provisions of §15.205 apply to intentional radiators operating under this section.

789033 D02 v02r01 General UNII Test Procedures New Rules v01

If radiated measurements are performed, field strength is then converted to EIRP as follows:

$$\text{EIRP} = ((E \cdot d)^2) / 30$$

where:

- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

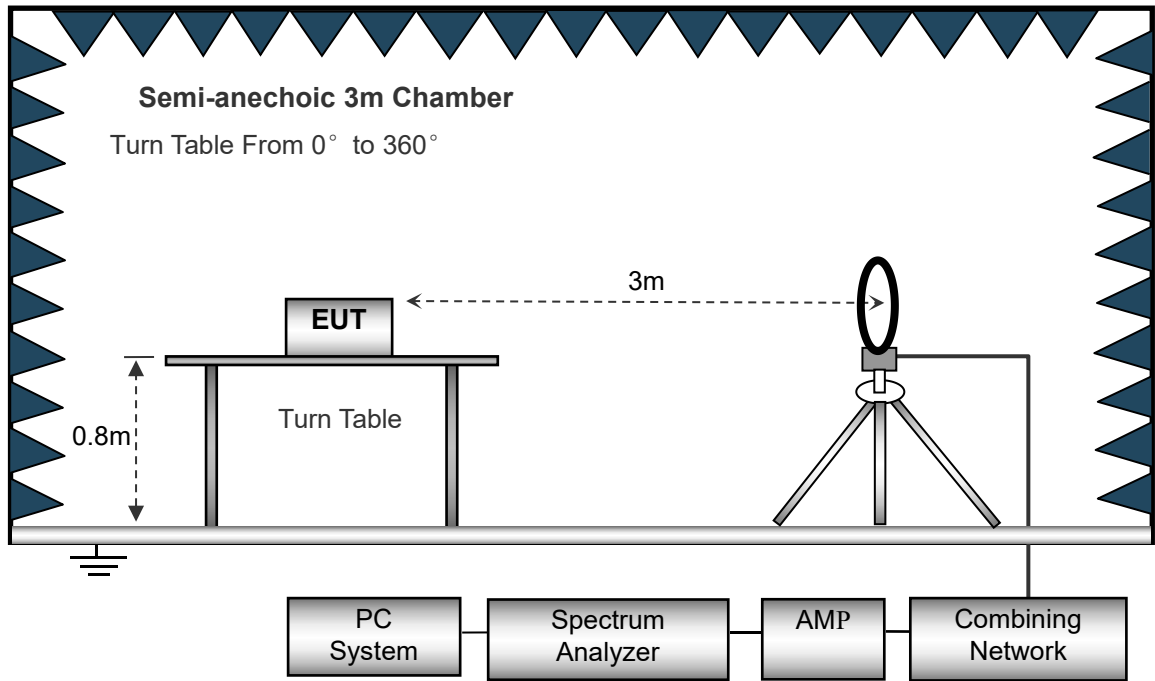
### 8.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.407(b)(6) and FCC Part 15.209 Limit..

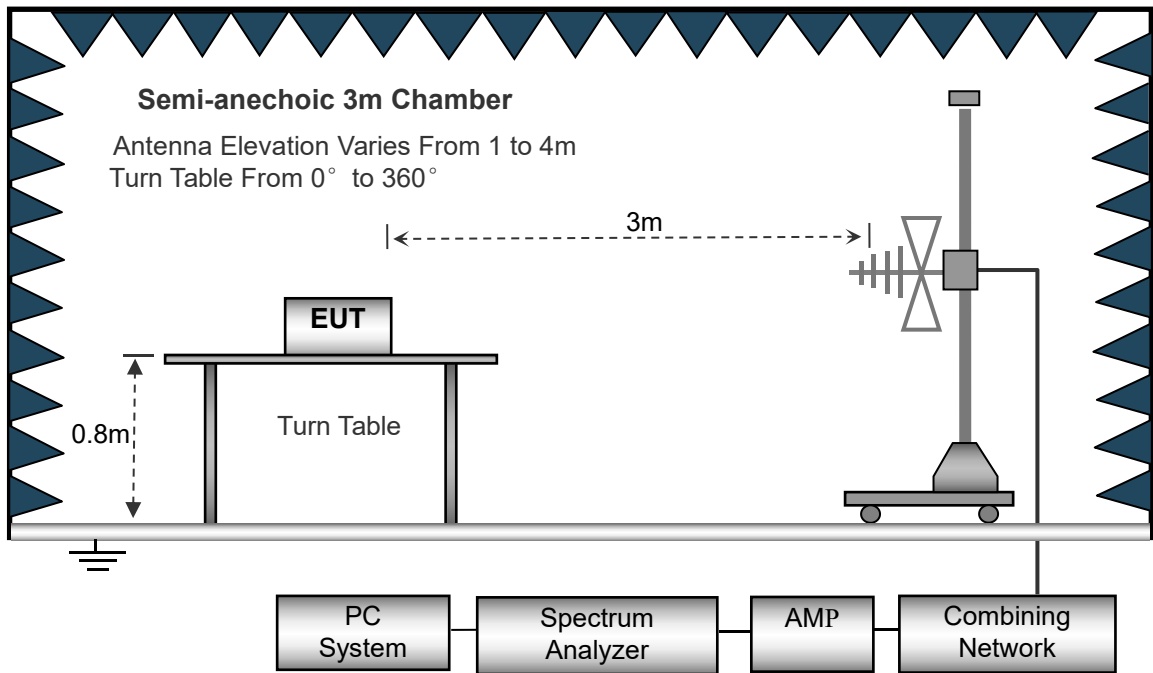
The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

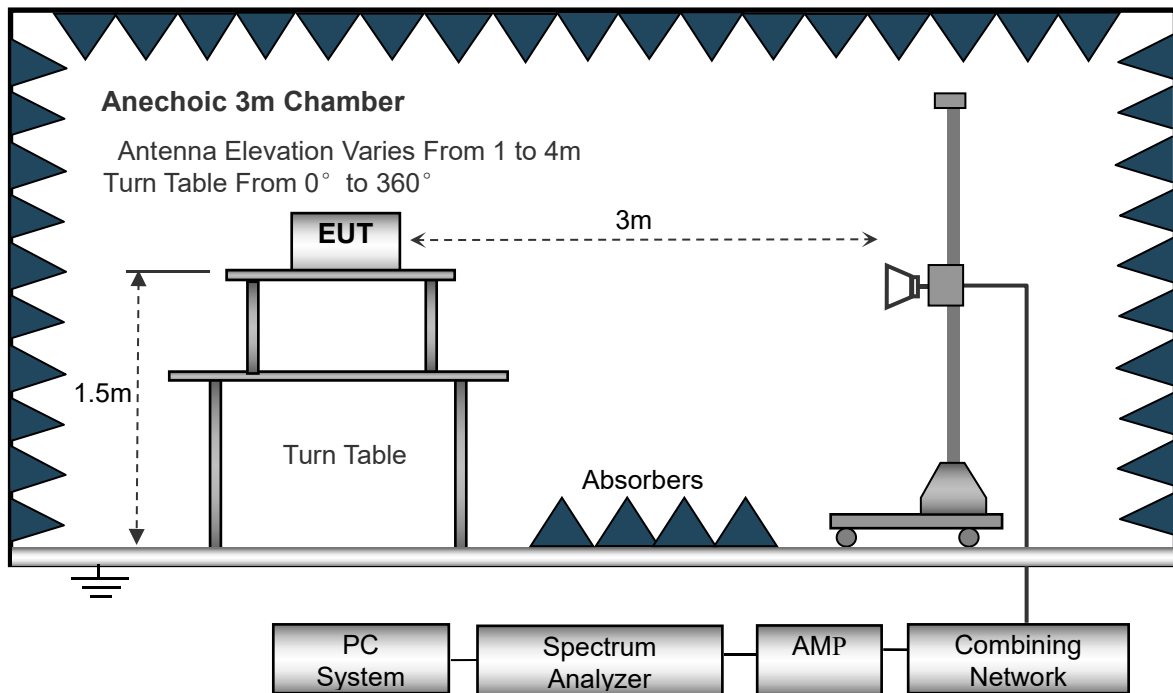
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1GHz.



### 8.3 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:

RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:

RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

### 8.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

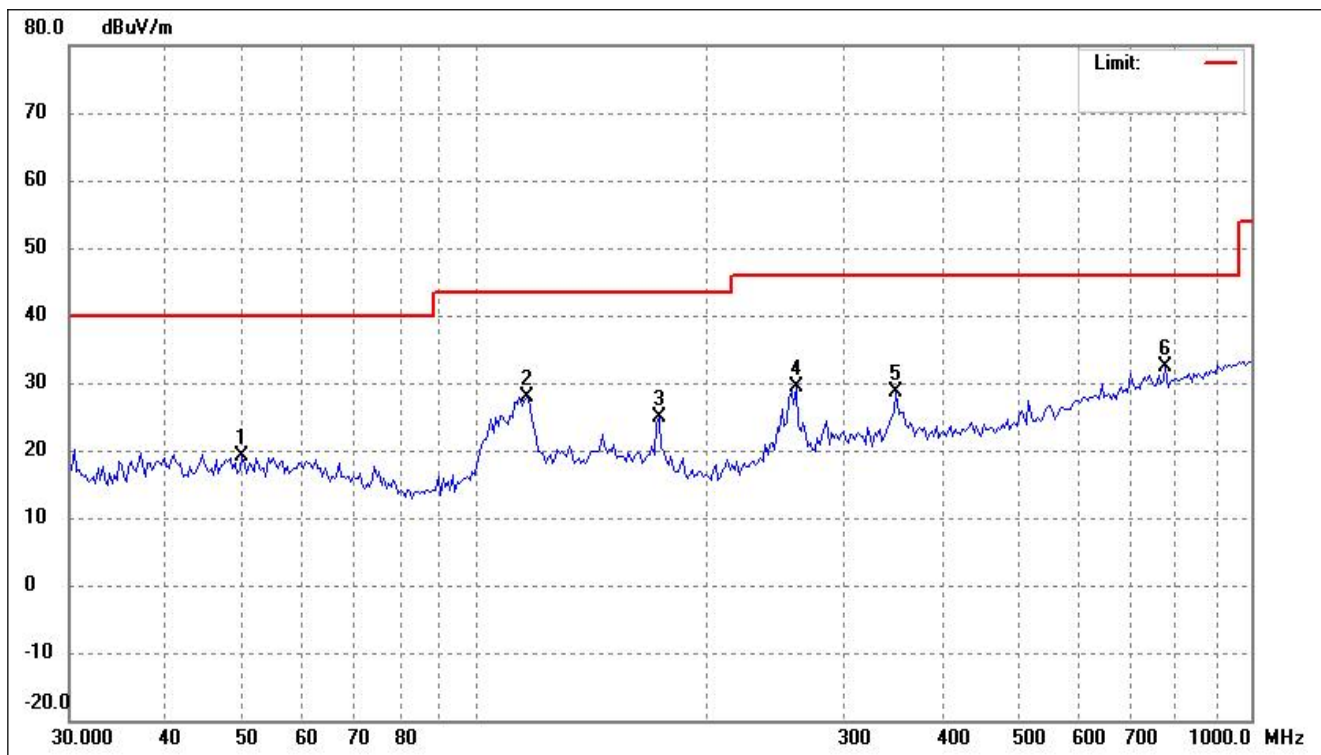
$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

## 8.5 Summary of Test Results/Plots

**Note:** this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

- Spurious Emission From 30MHz to 1GHz
- Antenna 0(Worst case)
- 5150-5250MHz

|              |                     |           |            |
|--------------|---------------------|-----------|------------|
| 802.11a      |                     |           |            |
| Test Channel | 5180MHz(Worst case) | Polarity: | Horizontal |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 50.1080            | 26.65               | -7.59         | 19.06              | 40.00             | -20.94         | -           | -              | peak   |
| 2   | 116.4476           | 38.26               | -10.39        | 27.87              | 43.50             | -15.63         | -           | -              | peak   |
| 3   | 172.5976           | 33.63               | -8.68         | 24.95              | 43.50             | -18.55         | -           | -              | peak   |
| 4   | 259.4434           | 38.66               | -9.31         | 29.35              | 46.00             | -16.65         | -           | -              | peak   |
| 5   | 348.5145           | 35.82               | -7.08         | 28.74              | 46.00             | -17.26         | -           | -              | peak   |
| 6   | 776.4849           | 31.71               | 0.62          | 32.33              | 46.00             | -13.67         | -           | -              | peak   |

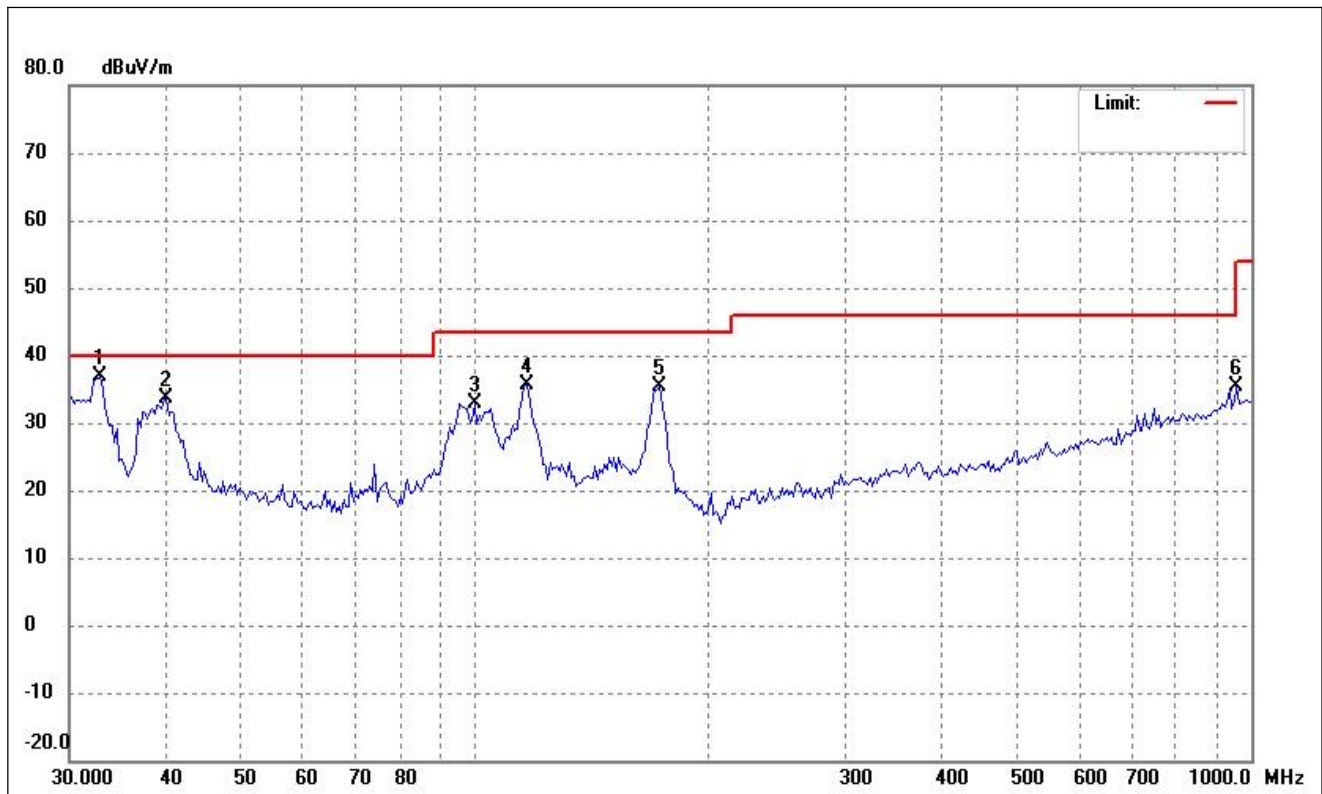
802.11a

Test Channel

5180MHz(Worst case)

Polarity:

Vertical

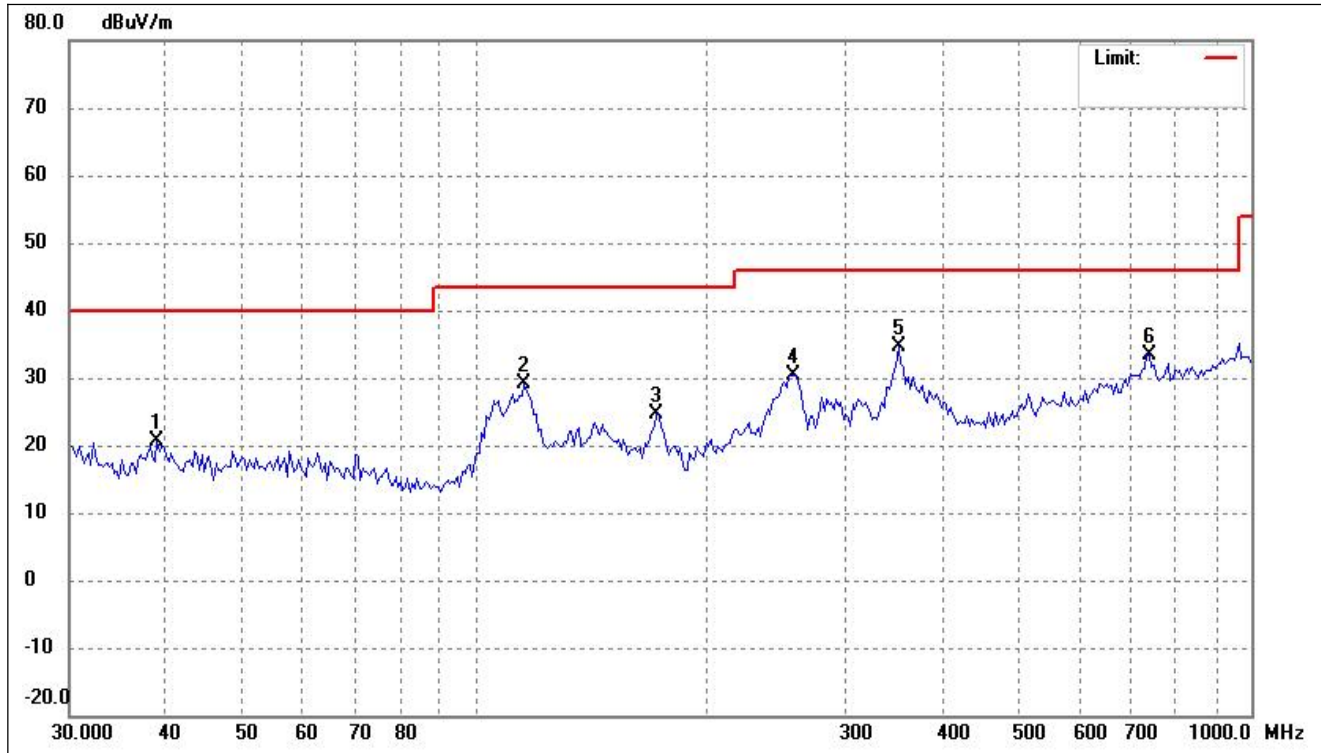


| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 32.8697            | 46.26               | -9.28         | 36.98              | 40.00             | -3.02          | -           | -              | peak   |
| 2   | 40.0173            | 41.70               | -7.95         | 33.75              | 40.00             | -6.25          | -           | -              | peak   |
| 3   | 99.7676            | 44.82               | -12.01        | 32.81              | 43.50             | -10.69         | -           | -              | peak   |
| 4   | 116.4476           | 45.98               | -10.39        | 35.59              | 43.50             | -7.91          | -           | -              | peak   |
| 5   | 172.5976           | 43.97               | -8.68         | 35.29              | 43.50             | -8.21          | -           | -              | peak   |
| 6   | 958.7135           | 32.01               | 3.34          | 35.35              | 46.00             | -10.65         | -           | -              | peak   |

## ➤ Antenna 0+ Antenna 1

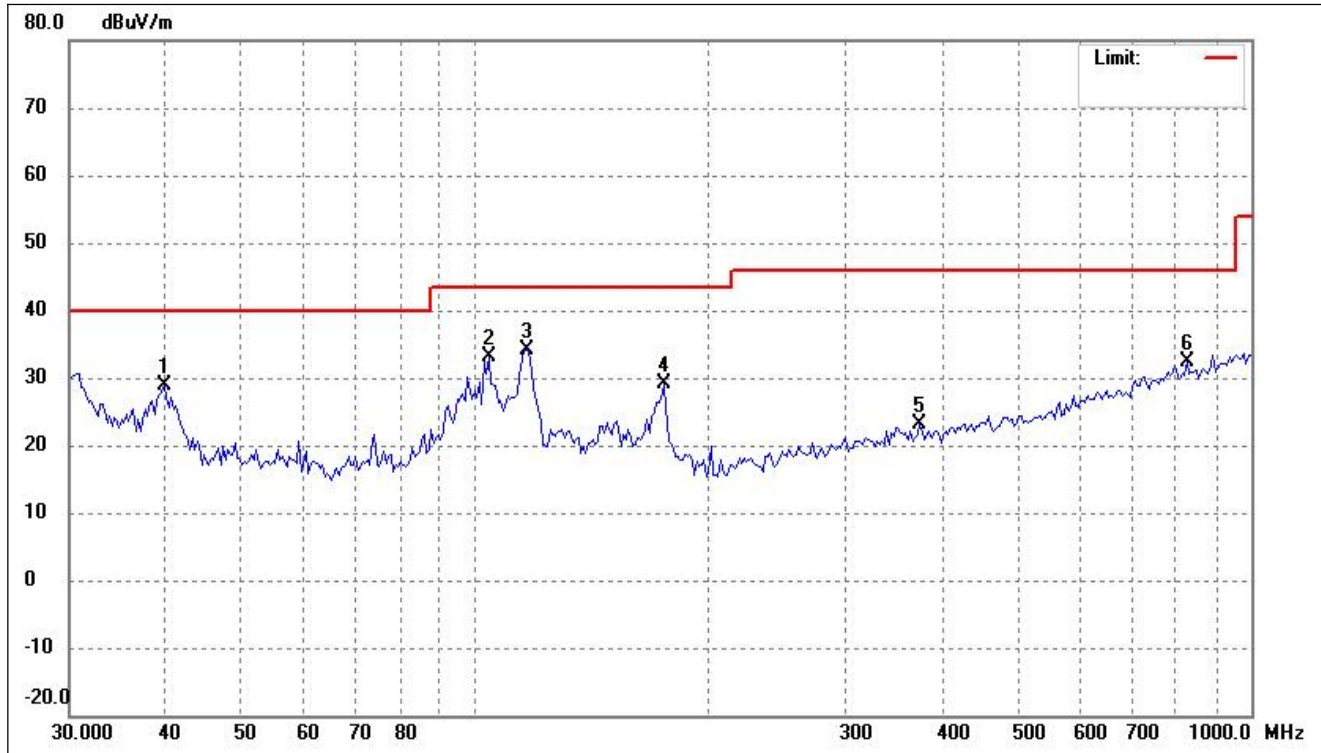
802.11n-HT20

|              |                     |           |            |
|--------------|---------------------|-----------|------------|
| Test Channel | 5180MHz(worst case) | Polarity: | Horizontal |
|--------------|---------------------|-----------|------------|



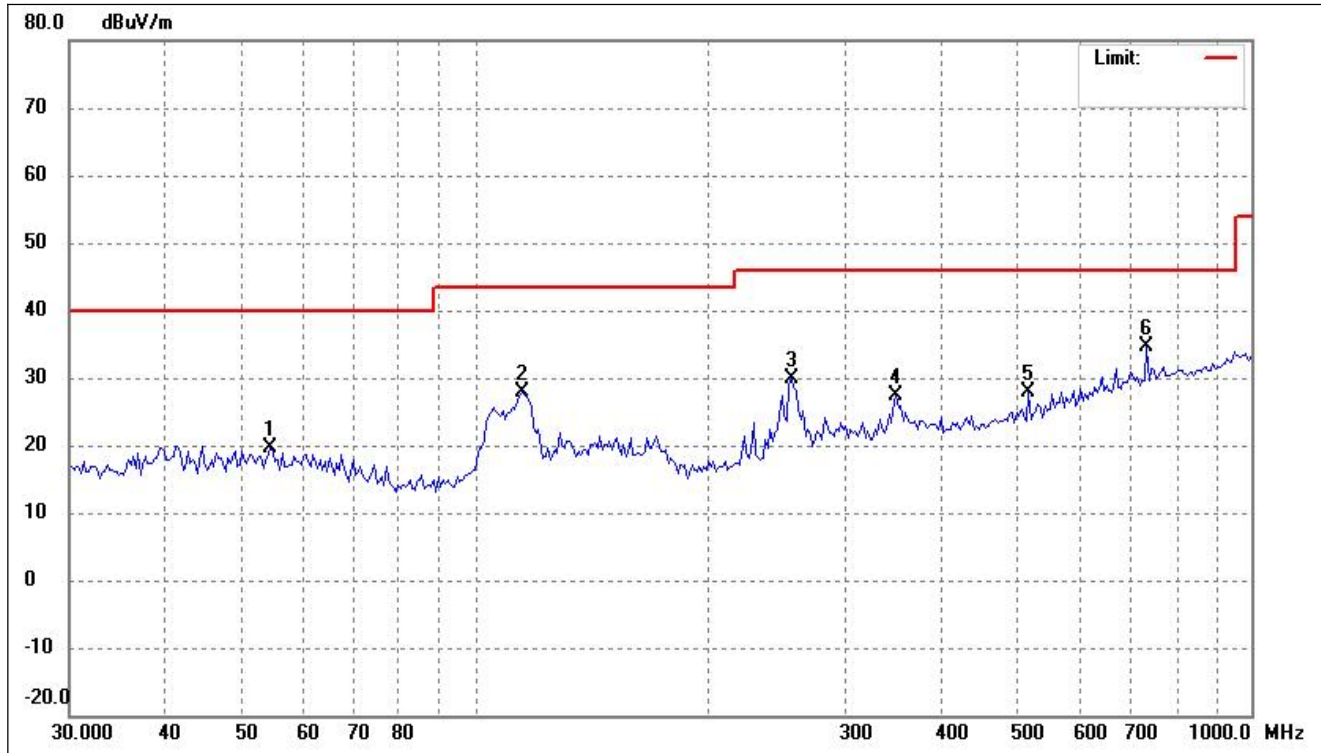
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 38.9081            | 28.81               | -8.19         | 20.62              | 40.00             | -19.38         | -           | -              | peak   |
| 2   | 115.6322           | 39.61               | -10.47        | 29.14              | 43.50             | -14.36         | -           | -              | peak   |
| 3   | 171.3890           | 33.03               | -8.51         | 24.52              | 43.50             | -18.98         | -           | -              | peak   |
| 4   | 257.6266           | 39.84               | -9.38         | 30.46              | 46.00             | -15.54         | -           | -              | peak   |
| 5   | 350.9722           | 41.72               | -7.05         | 34.67              | 46.00             | -11.33         | -           | -              | peak   |
| 6   | 739.2136           | 33.56               | -0.09         | 33.47              | 46.00             | -12.53         | -           | -              | peak   |

|              |                     |           |          |
|--------------|---------------------|-----------|----------|
| 802.11n-HT20 |                     |           |          |
| Test Channel | 5180MHz(worst case) | Polarity: | Vertical |



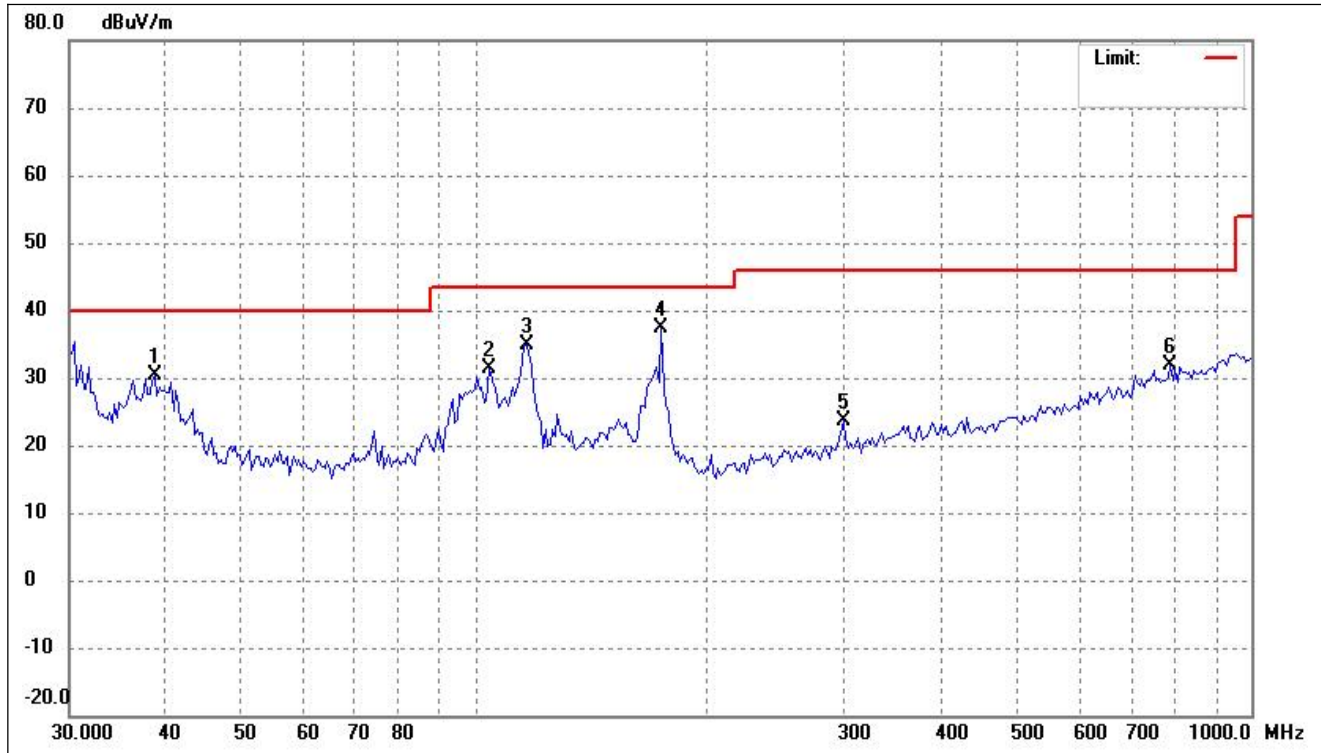
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 39.7371            | 36.89               | -8.01         | 28.88              | 40.00             | -11.12         | -           | -              | peak   |
| 2   | 104.0640           | 44.76               | -11.62        | 33.14              | 43.50             | -10.36         | -           | -              | peak   |
| 3   | 116.4476           | 44.64               | -10.39        | 34.25              | 43.50             | -9.25          | -           | -              | peak   |
| 4   | 175.0404           | 38.06               | -9.03         | 29.03              | 43.50             | -14.47         | -           | -              | peak   |
| 5   | 373.8862           | 29.75               | -6.62         | 23.13              | 46.00             | -22.87         | -           | -              | peak   |
| 6   | 827.1795           | 31.06               | 1.29          | 32.35              | 46.00             | -13.65         | -           | -              | peak   |

|               |                     |           |            |
|---------------|---------------------|-----------|------------|
| 802.11ax-HE20 |                     |           |            |
| Test Channel  | 5180MHz(worst case) | Polarity: | Horizontal |



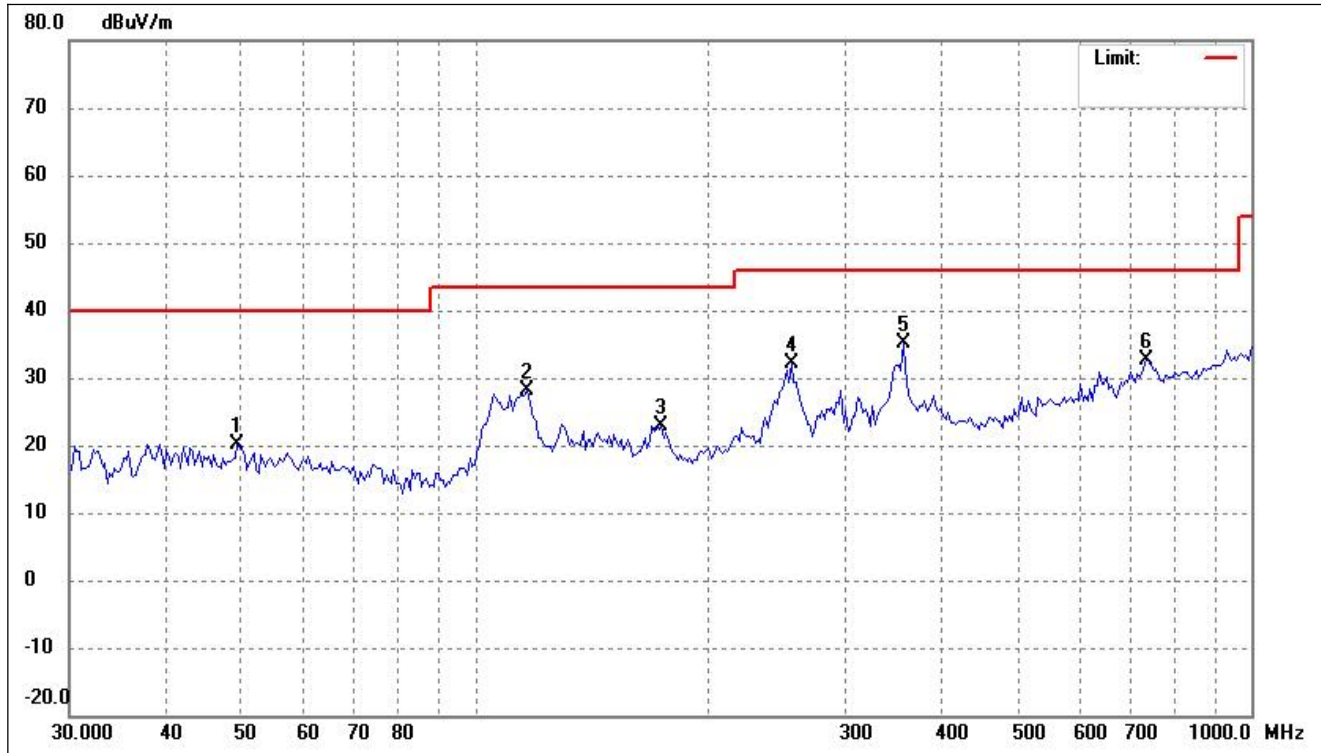
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 54.5167            | 27.65               | -8.07         | 19.58              | 40.00             | -20.42         | -           | -              | peak   |
| 2   | 114.8224           | 38.42               | -10.56        | 27.86              | 43.50             | -15.64         | -           | -              | peak   |
| 3   | 255.8226           | 39.38               | -9.47         | 29.91              | 46.00             | -16.09         | -           | -              | peak   |
| 4   | 348.5145           | 34.45               | -7.08         | 27.37              | 46.00             | -18.63         | -           | -              | peak   |
| 5   | 516.5651           | 32.38               | -4.48         | 27.90              | 46.00             | -18.10         | -           | -              | peak   |
| 6   | 734.0373           | 34.77               | -0.23         | 34.54              | 46.00             | -11.46         | -           | -              | peak   |

|               |                     |           |          |
|---------------|---------------------|-----------|----------|
| 802.11ax-HE20 |                     |           |          |
| Test Channel  | 5180MHz(worst case) | Polarity: | Vertical |



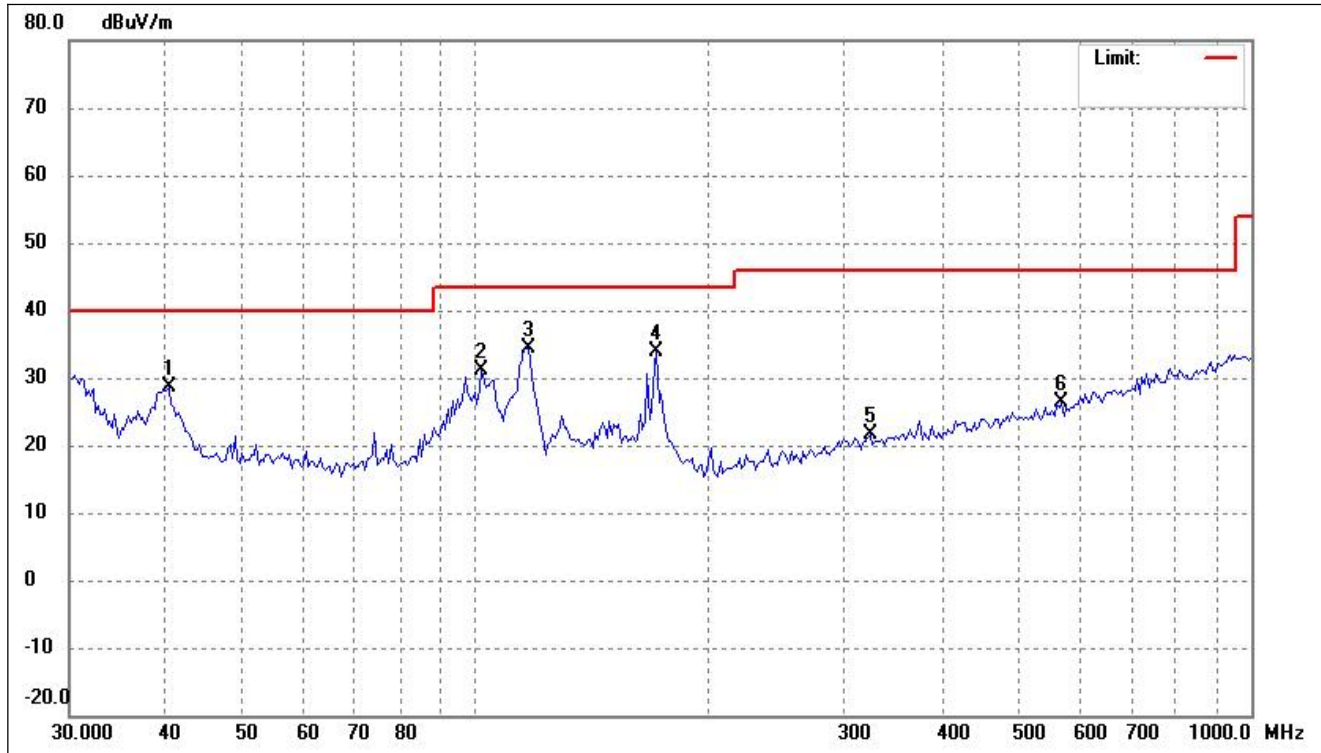
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 38.6357            | 38.51               | -8.25         | 30.26              | 40.00             | -9.74          | -           | -              | peak   |
| 2   | 104.0640           | 42.98               | -11.62        | 31.36              | 43.50             | -12.14         | -           | -              | peak   |
| 3   | 116.4476           | 45.38               | -10.39        | 34.99              | 43.50             | -8.51          | -           | -              | peak   |
| 4   | 173.8147           | 46.21               | -8.85         | 37.36              | 43.50             | -6.14          | -           | -              | peak   |
| 5   | 298.5932           | 31.63               | -7.90         | 23.73              | 46.00             | -22.27         | -           | -              | peak   |
| 6   | 787.4749           | 30.96               | 0.80          | 31.76              | 46.00             | -14.24         | -           | -              | peak   |

|              |                     |           |            |
|--------------|---------------------|-----------|------------|
| 802.11n-HT40 |                     |           |            |
| Test Channel | 5190MHz(worst case) | Polarity: | Horizontal |



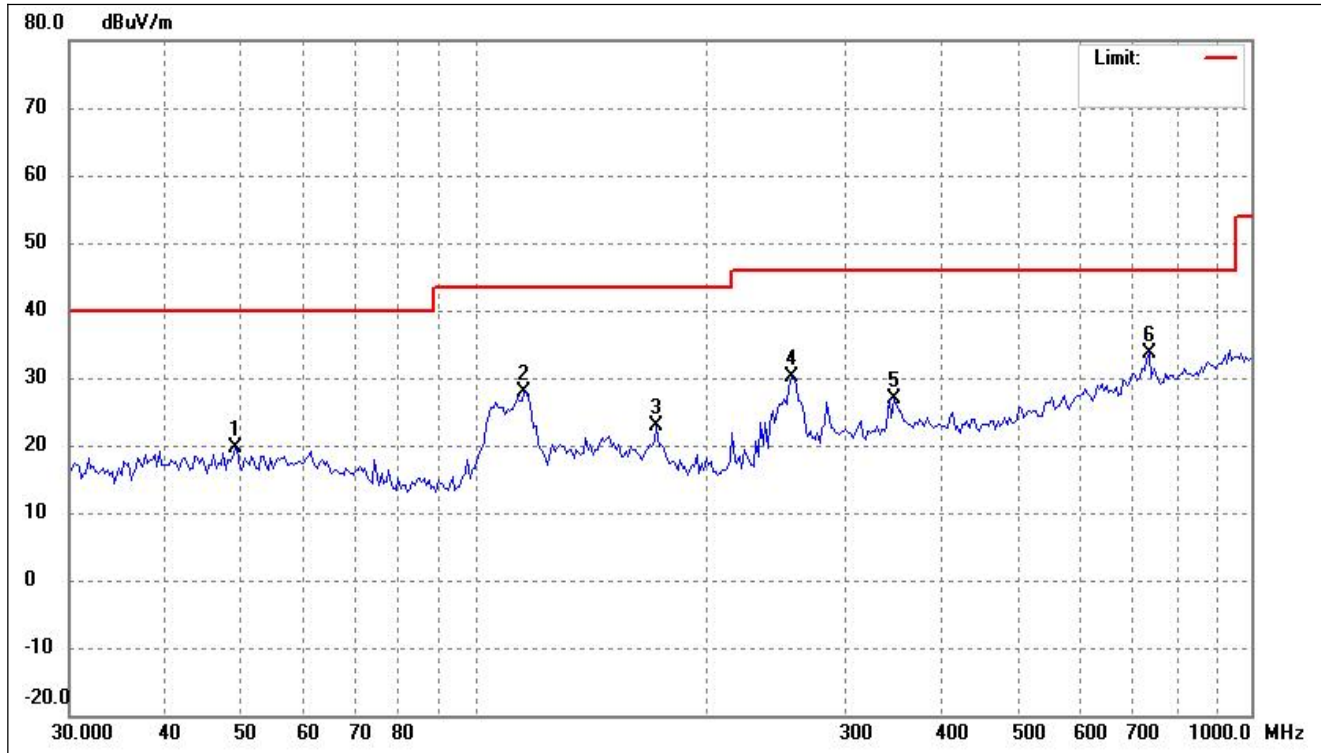
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 49.4087            | 27.74               | -7.63         | 20.11              | 40.00             | -19.89         | -           | -              | peak   |
| 2   | 116.4476           | 38.55               | -10.39        | 28.16              | 43.50             | -15.34         | -           | -              | peak   |
| 3   | 173.8147           | 31.74               | -8.85         | 22.89              | 43.50             | -20.61         | -           | -              | peak   |
| 4   | 255.8226           | 41.55               | -9.47         | 32.08              | 46.00             | -13.92         | -           | -              | peak   |
| 5   | 355.9397           | 42.07               | -6.95         | 35.12              | 46.00             | -10.88         | -           | -              | peak   |
| 6   | 734.0373           | 32.83               | -0.23         | 32.60              | 46.00             | -13.40         | -           | -              | peak   |

|              |                     |           |          |
|--------------|---------------------|-----------|----------|
| 802.11n-HT40 |                     |           |          |
| Test Channel | 5190MHz(worst case) | Polarity: | Vertical |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 40.2995            | 36.59               | -7.96         | 28.63              | 40.00             | -11.37         | -           | -              | peak   |
| 2   | 101.8932           | 43.01               | -11.82        | 31.19              | 43.50             | -12.31         | -           | -              | peak   |
| 3   | 117.2688           | 44.62               | -10.30        | 34.32              | 43.50             | -9.18          | -           | -              | peak   |
| 4   | 171.3890           | 42.28               | -8.51         | 33.77              | 43.50             | -9.73          | -           | -              | peak   |
| 5   | 322.5896           | 28.91               | -7.38         | 21.53              | 46.00             | -24.47         | -           | -              | peak   |
| 6   | 569.9688           | 29.33               | -2.98         | 26.35              | 46.00             | -19.65         | -           | -              | peak   |

|               |                     |           |            |
|---------------|---------------------|-----------|------------|
| 802.11ax-HE40 |                     |           |            |
| Test Channel  | 5190MHz(worst case) | Polarity: | Horizontal |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 49.0627            | 27.24               | -7.65         | 19.59              | 40.00             | -20.41         | -           | -              | peak   |
| 2   | 115.6322           | 38.33               | -10.47        | 27.86              | 43.50             | -15.64         | -           | -              | peak   |
| 3   | 171.3890           | 31.32               | -8.51         | 22.81              | 43.50             | -20.69         | -           | -              | peak   |
| 4   | 255.8226           | 39.71               | -9.47         | 30.24              | 46.00             | -15.76         | -           | -              | peak   |
| 5   | 346.0740           | 33.95               | -7.10         | 26.85              | 46.00             | -19.15         | -           | -              | peak   |
| 6   | 739.2136           | 33.74               | -0.09         | 33.65              | 46.00             | -12.35         | -           | -              | peak   |

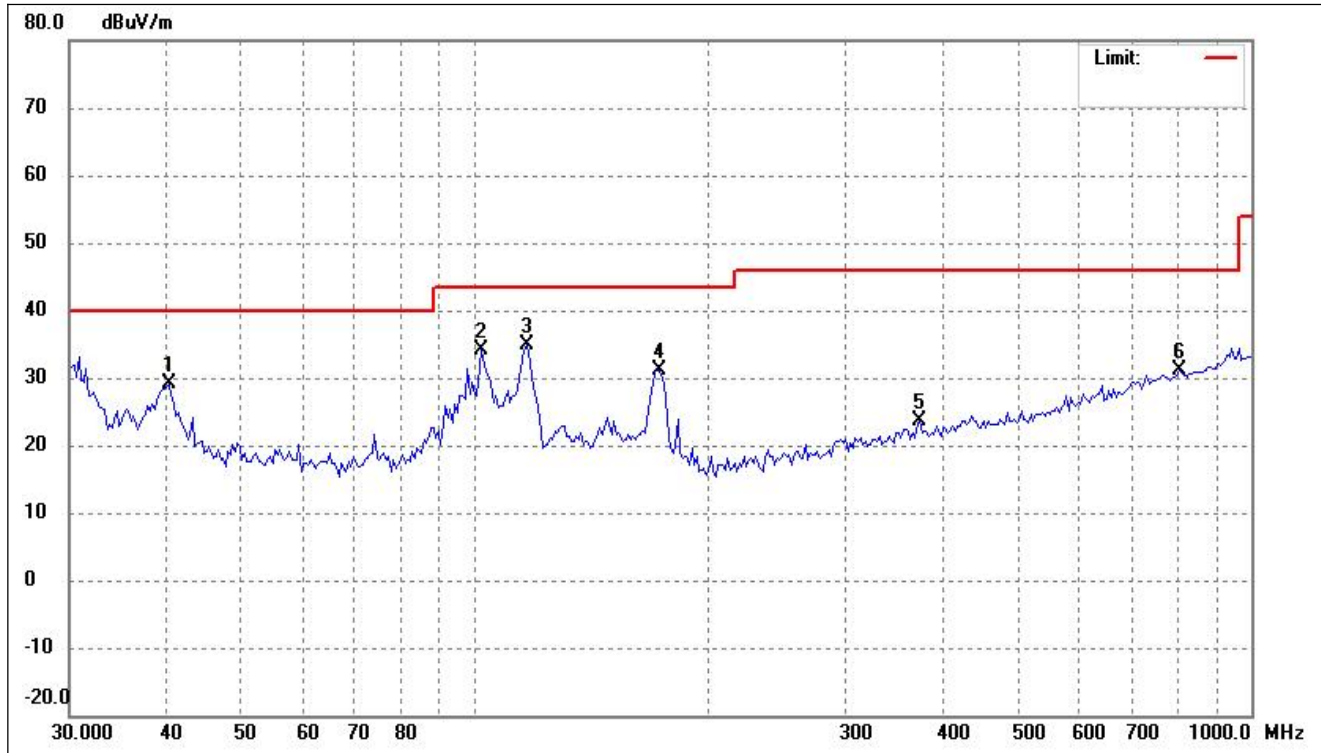
802.11ax-HE40

Test Channel

5190MHz(worst case)

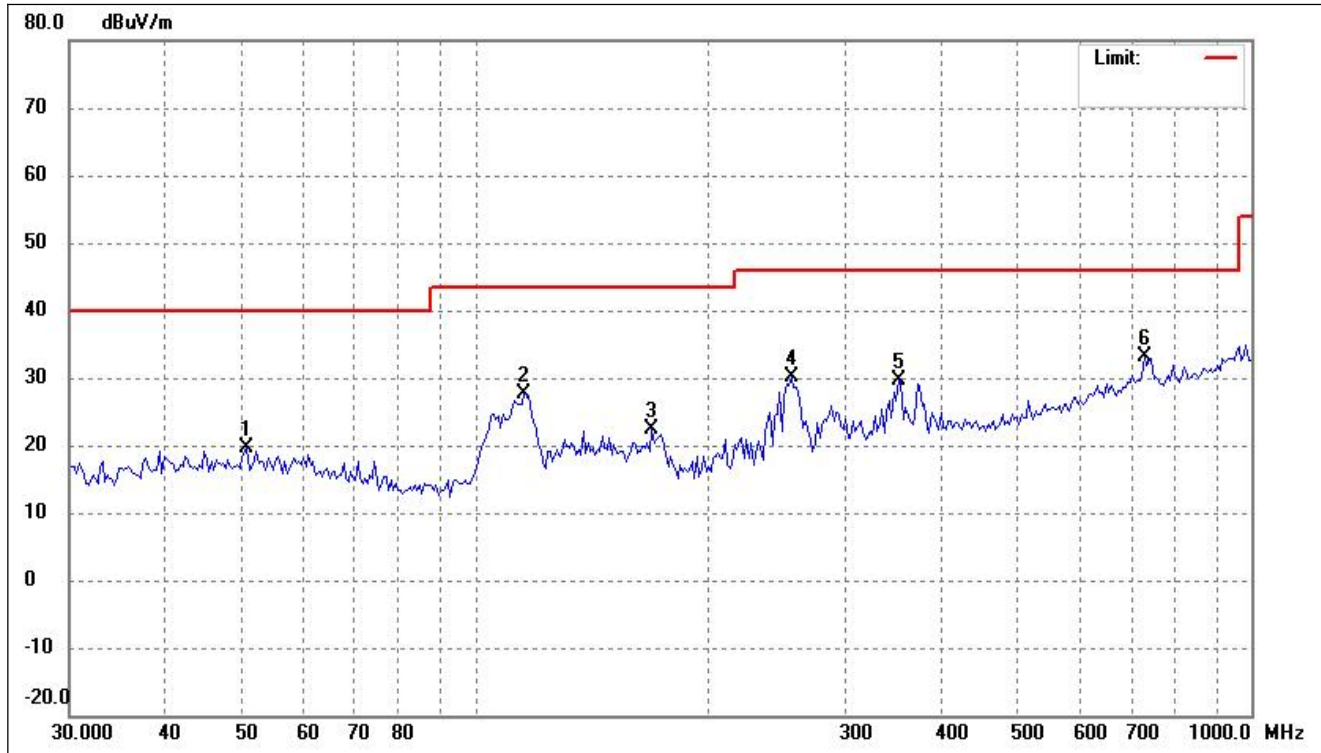
Polarity:

Vertical



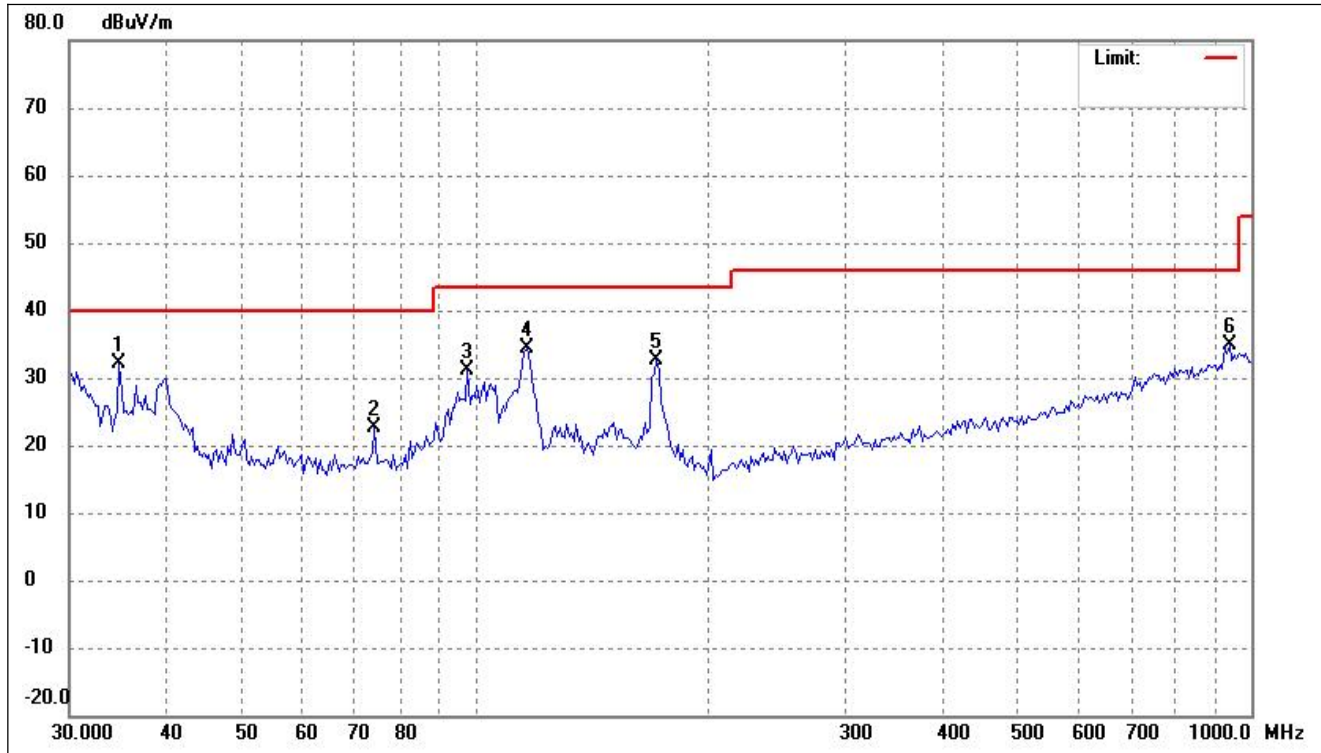
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 40.2995            | 36.98               | -7.96         | 29.02              | 40.00             | -10.98         | -           | -              | peak   |
| 2   | 101.8932           | 45.99               | -11.82        | 34.17              | 43.50             | -9.33          | -           | -              | peak   |
| 3   | 116.4476           | 45.23               | -10.39        | 34.84              | 43.50             | -8.66          | -           | -              | peak   |
| 4   | 171.3890           | 39.52               | -8.51         | 31.01              | 43.50             | -12.49         | -           | -              | peak   |
| 5   | 373.8862           | 30.13               | -6.62         | 23.51              | 46.00             | -22.49         | -           | -              | peak   |
| 6   | 809.9238           | 30.05               | 1.11          | 31.16              | 46.00             | -14.84         | -           | -              | peak   |

|                |                     |           |            |
|----------------|---------------------|-----------|------------|
| 802.11ac-VHT80 |                     |           |            |
| Test Channel   | 5210MHz(worst case) | Polarity: | Horizontal |



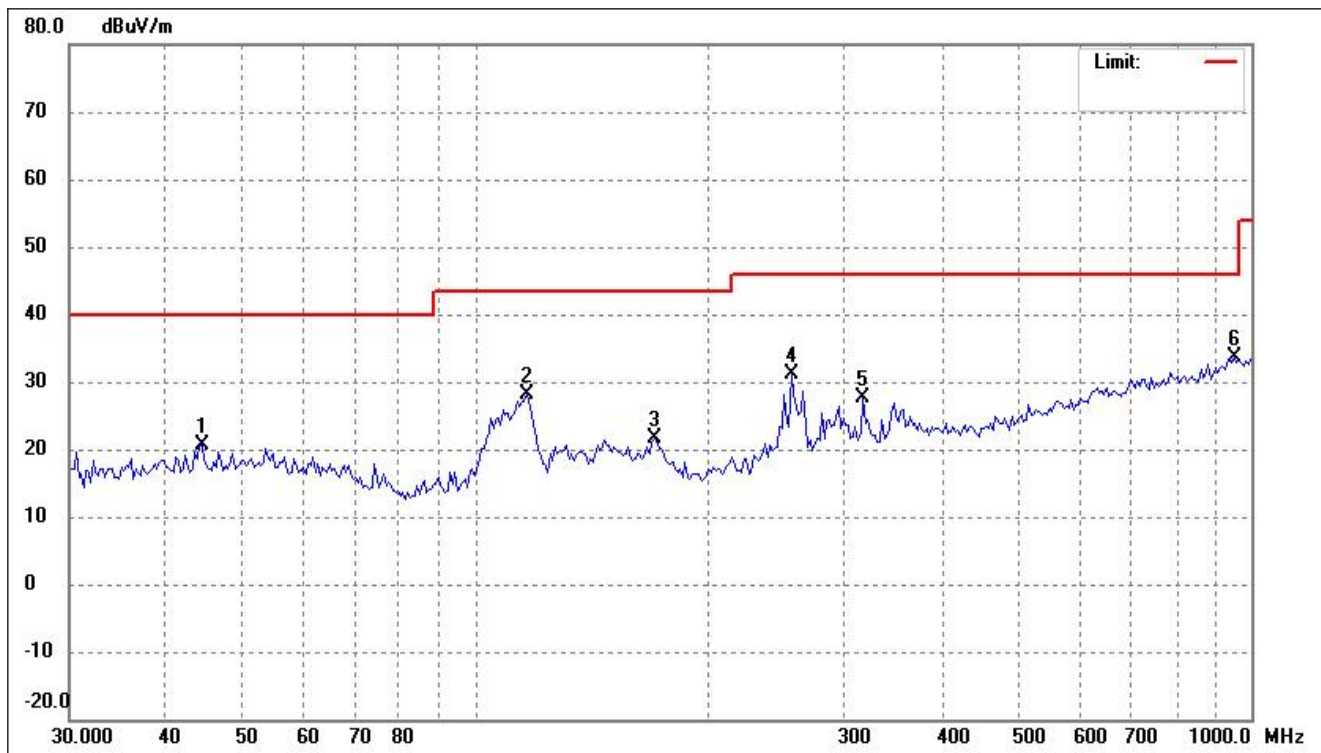
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 50.8172            | 27.40               | -7.67         | 19.73              | 40.00             | -20.27         | -           | -              | peak   |
| 2   | 115.6322           | 38.05               | -10.47        | 27.58              | 43.50             | -15.92         | -           | -              | peak   |
| 3   | 168.9970           | 30.76               | -8.29         | 22.47              | 43.50             | -21.03         | -           | -              | peak   |
| 4   | 255.8226           | 39.57               | -9.47         | 30.10              | 46.00             | -15.90         | -           | -              | peak   |
| 5   | 350.9722           | 36.66               | -7.05         | 29.61              | 46.00             | -16.39         | -           | -              | peak   |
| 6   | 728.8971           | 33.46               | -0.36         | 33.10              | 46.00             | -12.90         | -           | -              | peak   |

|                |                     |           |          |
|----------------|---------------------|-----------|----------|
| 802.11ac-VHT80 |                     |           |          |
| Test Channel   | 5210MHz(worst case) | Polarity: | Vertical |



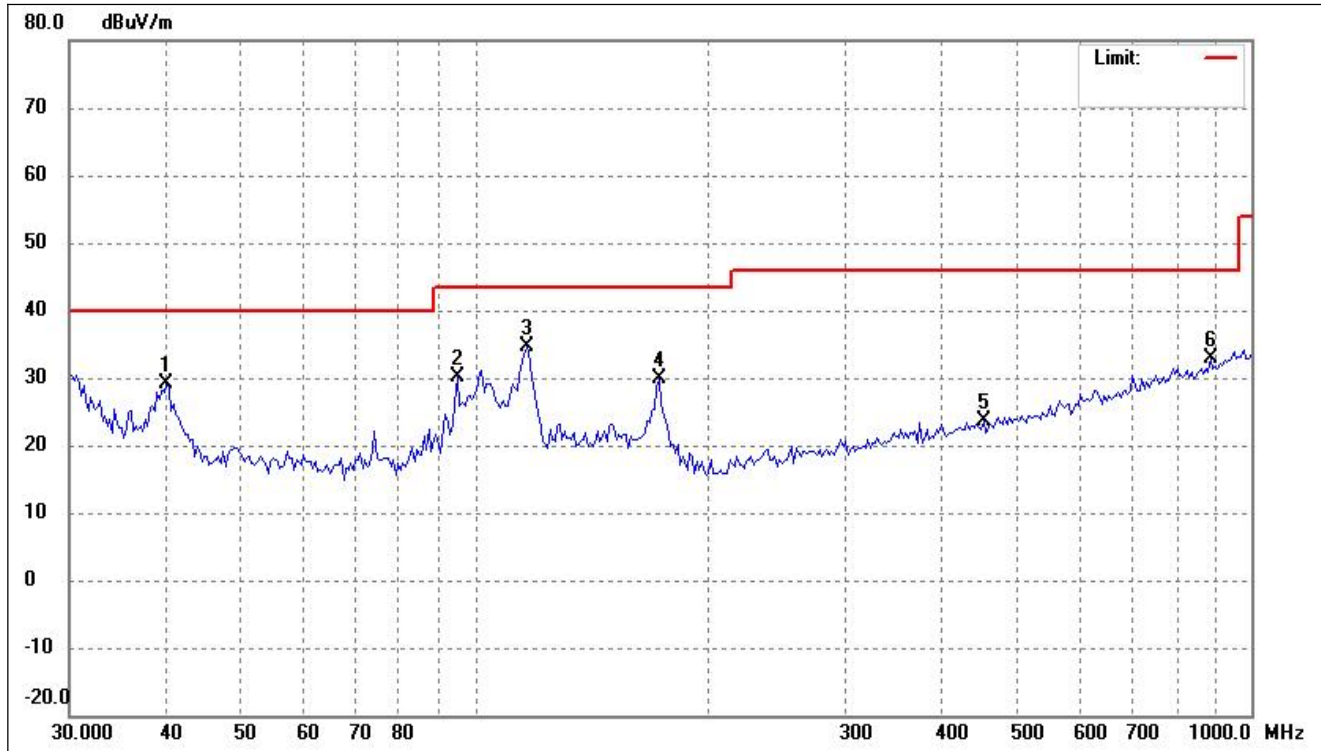
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 34.7705            | 41.29               | -9.05         | 32.24              | 40.00             | -7.76          | -           | -              | peak   |
| 2   | 74.2696            | 33.79               | -11.18        | 22.61              | 40.00             | -17.39         | -           | -              | peak   |
| 3   | 97.6864            | 43.21               | -12.14        | 31.07              | 43.50             | -12.43         | -           | -              | peak   |
| 4   | 116.4476           | 44.87               | -10.39        | 34.48              | 43.50             | -9.02          | -           | -              | peak   |
| 5   | 171.3890           | 41.22               | -8.51         | 32.71              | 43.50             | -10.79         | -           | -              | peak   |
| 6   | 938.7139           | 31.91               | 3.03          | 34.94              | 46.00             | -11.06         | -           | -              | peak   |

|               |                     |           |            |
|---------------|---------------------|-----------|------------|
| 802.11ax-HE80 |                     |           |            |
| Test Channel  | 5210MHz(worst case) | Polarity: | Horizontal |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 44.4657            | 28.49               | -7.96         | 20.53              | 40.00             | -19.47         | -           | -              | peak   |
| 2   | 116.4476           | 38.57               | -10.39        | 28.18              | 43.50             | -15.32         | -           | -              | peak   |
| 3   | 170.1888           | 29.87               | -8.34         | 21.53              | 43.50             | -21.97         | -           | -              | peak   |
| 4   | 255.8226           | 40.66               | -9.47         | 31.19              | 46.00             | -14.81         | -           | -              | peak   |
| 5   | 315.8601           | 35.14               | -7.52         | 27.62              | 46.00             | -18.38         | -           | -              | peak   |
| 6   | 952.0001           | 30.40               | 3.31          | 33.71              | 46.00             | -12.29         | -           | -              | peak   |

|               |                     |           |          |
|---------------|---------------------|-----------|----------|
| 802.11ax-HE80 |                     |           |          |
| Test Channel  | 5210MHz(worst case) | Polarity: | Vertical |

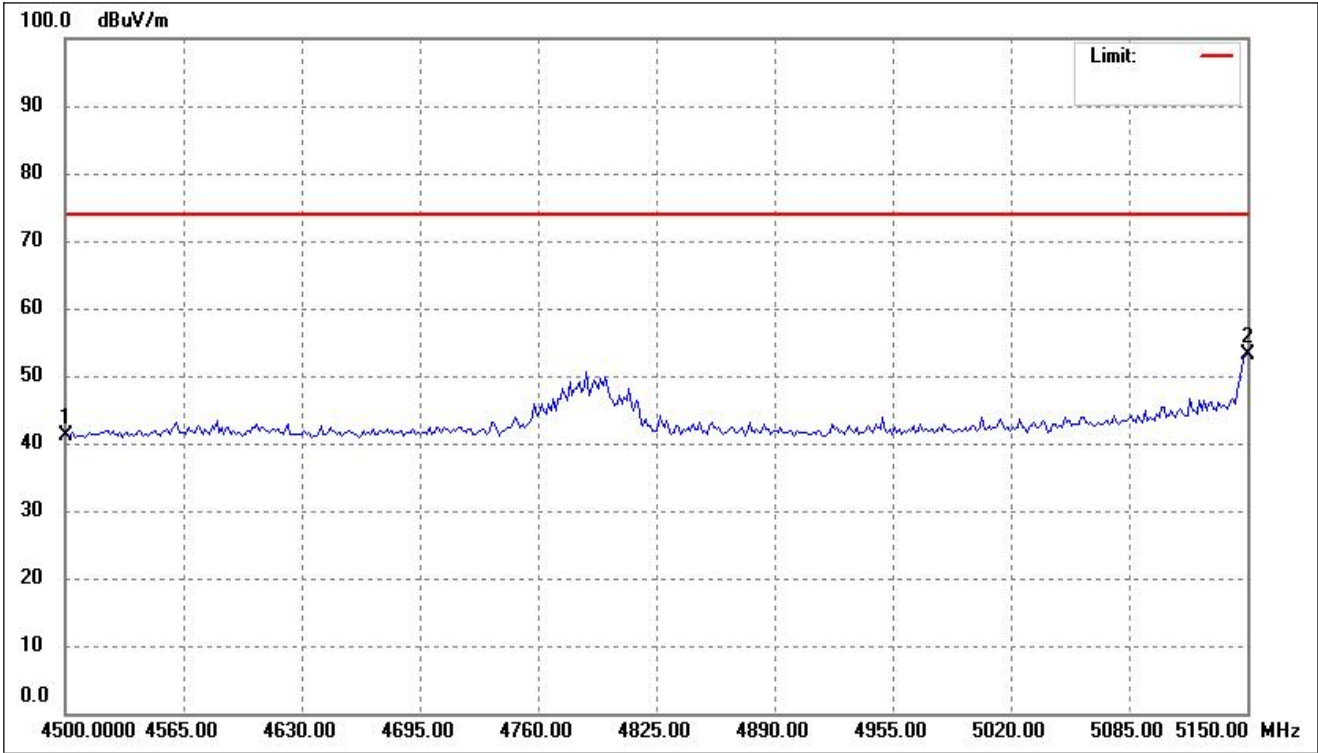


| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 40.0173            | 37.18               | -7.95         | 29.23              | 40.00             | -10.77         | -           | -              | peak   |
| 2   | 94.9788            | 42.42               | -12.30        | 30.12              | 43.50             | -13.38         | -           | -              | peak   |
| 3   | 116.4476           | 44.98               | -10.39        | 34.59              | 43.50             | -8.91          | -           | -              | peak   |
| 4   | 172.5976           | 38.65               | -8.68         | 29.97              | 43.50             | -13.53         | -           | -              | peak   |
| 5   | 452.0013           | 28.78               | -5.17         | 23.61              | 46.00             | -22.39         | -           | -              | peak   |
| 6   | 887.3978           | 30.95               | 1.95          | 32.90              | 46.00             | -13.10         | -           | -              | peak   |

Remark: '-' Means the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

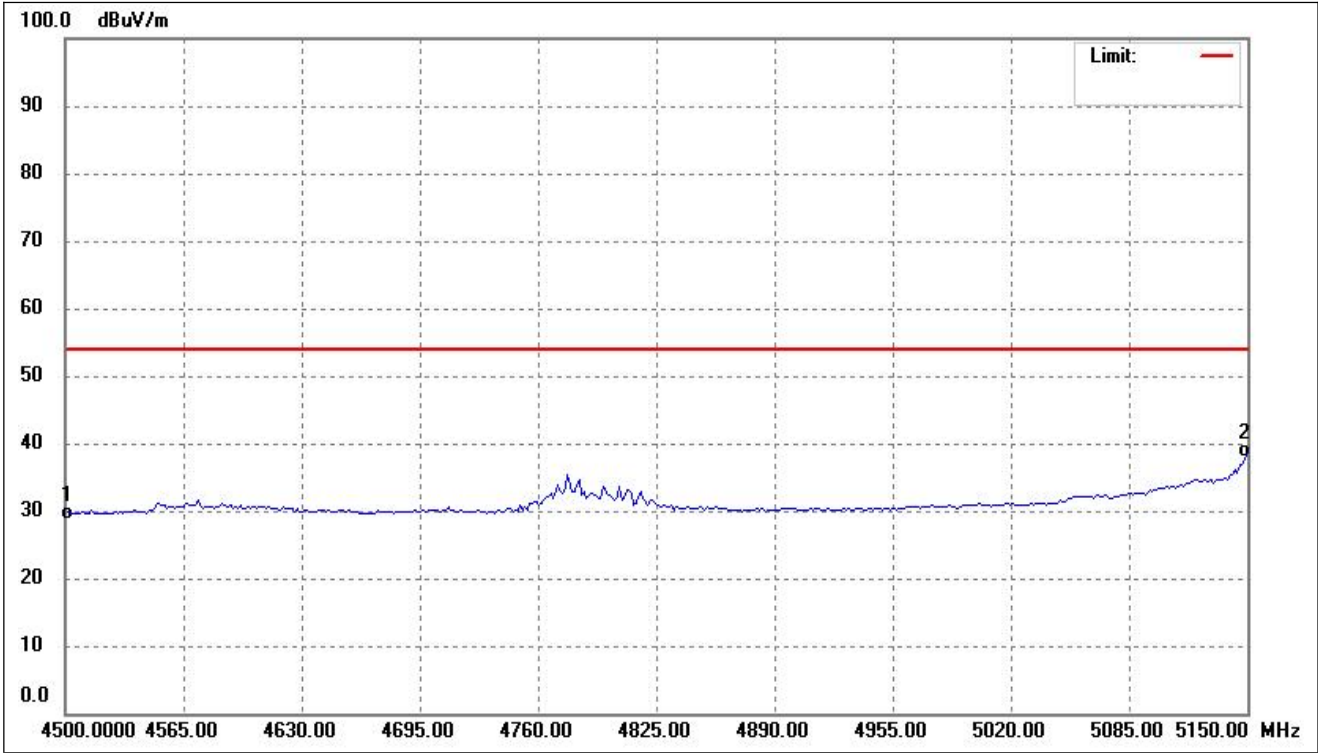
- Spurious Emission above 1GHz
- Antenna 0(worst case)

|                              |                   |           |                        |
|------------------------------|-------------------|-----------|------------------------|
| 802.11a- Restricted Bandedge |                   |           |                        |
| Test Channel                 | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corr.<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Deg.<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------------|----------------|--------|
| 1   | 4500.000           | 54.90               | -13.87        | 41.03              | 74.00             | -32.97         | -           | -              | peak   |
| 2   | 5150.000           | 65.74               | -12.53        | 53.21              | 74.00             | -20.79         | -           | -              | peak   |

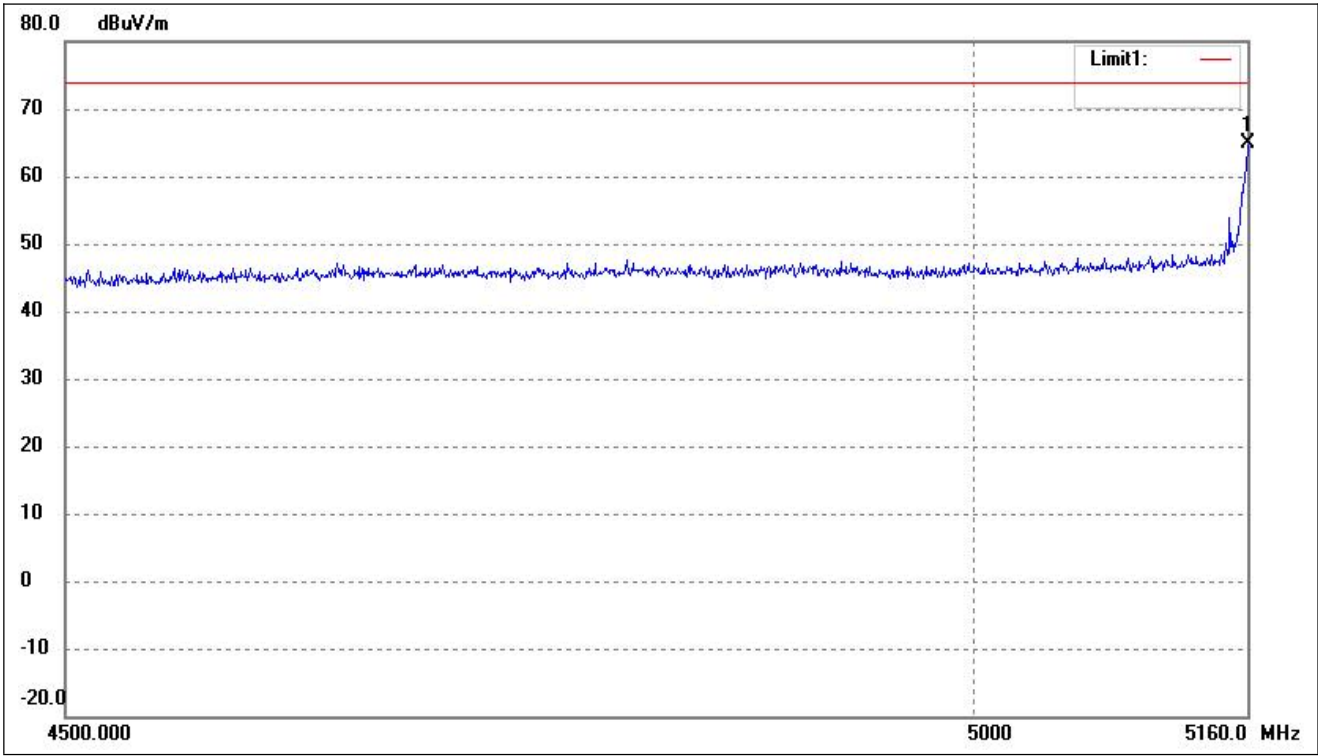
|                              |                   |           |                        |
|------------------------------|-------------------|-----------|------------------------|
| 802.11a- Restricted Bandedge |                   |           |                        |
| Test Channel                 | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 4500.000           | 43.52               | -13.87          | 29.65              | 54.00             | -24.35         | -             | -              | AVG    |
| 2   | 5150.000           | 51.51               | -12.53          | 38.98              | 54.00             | -15.02         | -             | -              | AVG    |

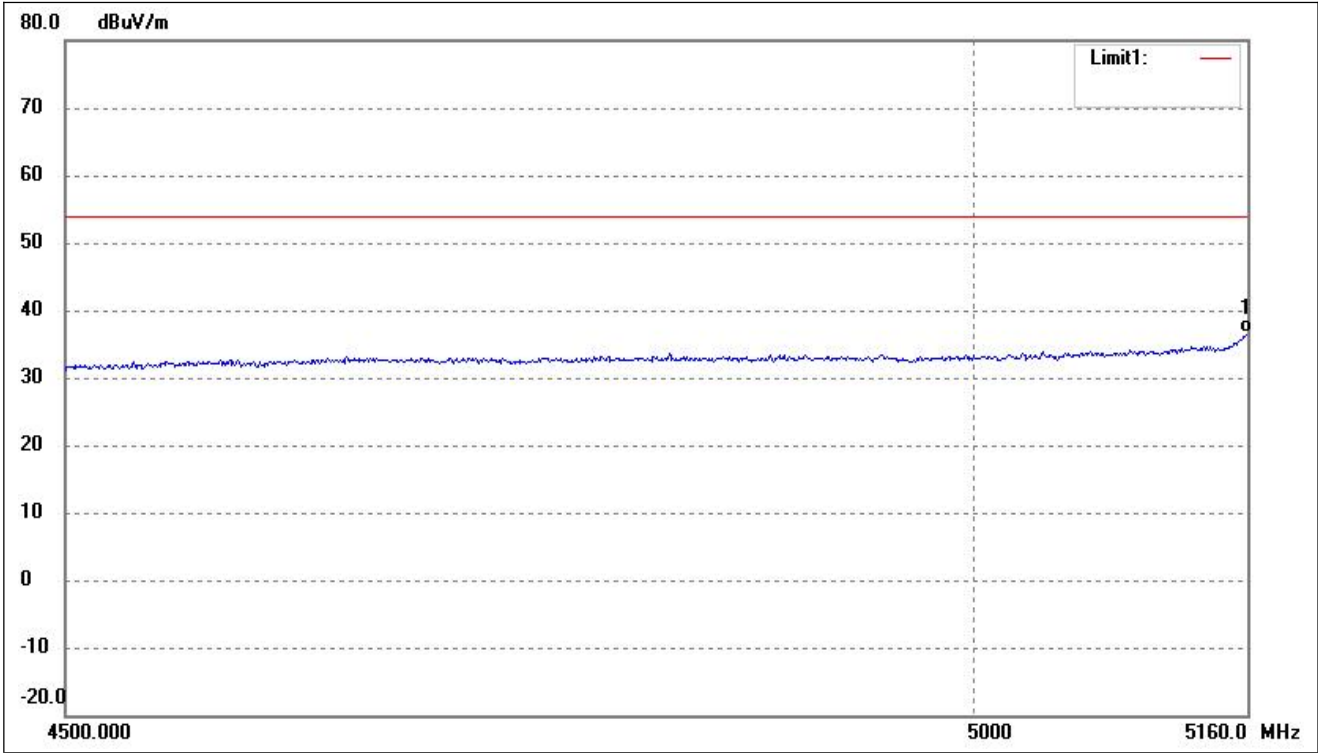
➤ Antenna 0 & Antenna 1

|                                   |                   |           |                        |
|-----------------------------------|-------------------|-----------|------------------------|
| 802.11n-HT20- Restricted Bandedge |                   |           |                        |
| Test Channel                      | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



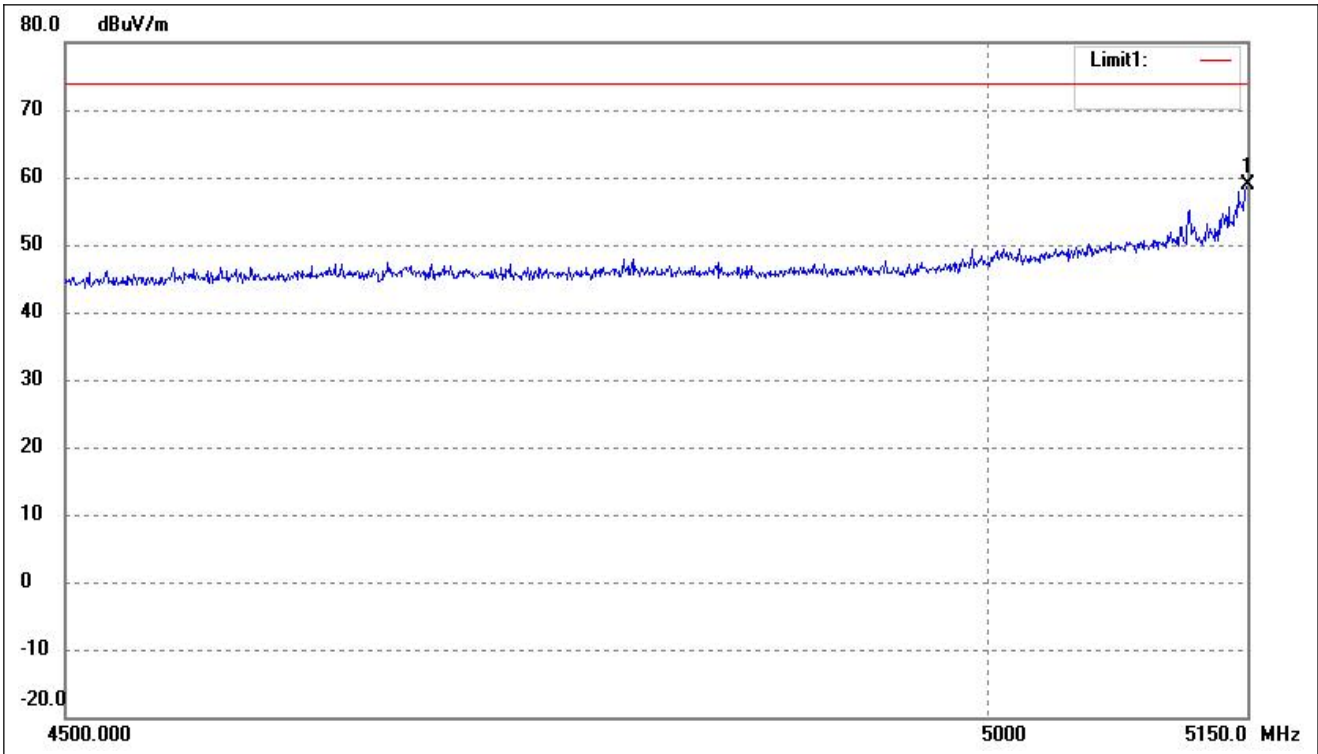
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 5160.000           | 69.76               | -4.76           | 65.00              | 74.00             | -9.00          | -             | -              | peak   |

|                                   |                   |           |                        |
|-----------------------------------|-------------------|-----------|------------------------|
| 802.11n-HT20- Restricted Bandedge |                   |           |                        |
| Test Channel                      | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



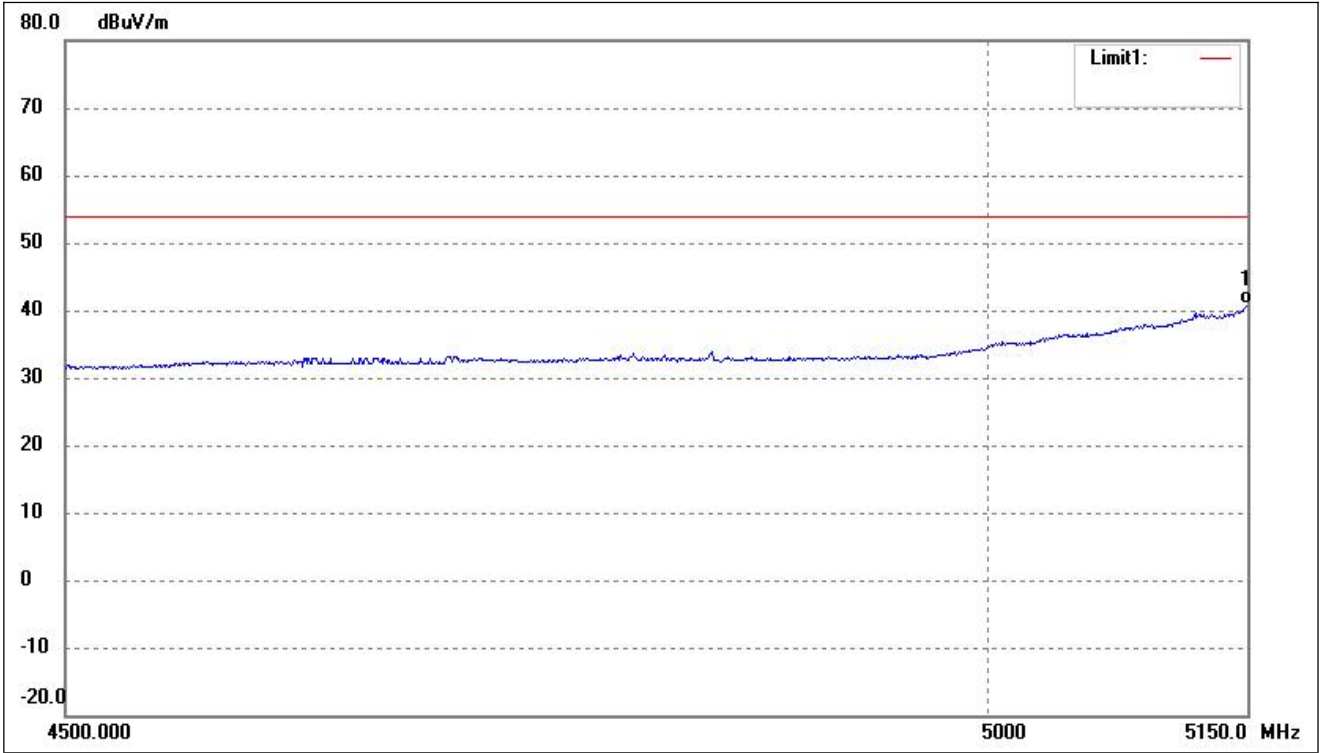
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 5160.000           | 41.41               | -4.76           | 36.65              | 54.00             | -17.35         | -             | -              | AVG    |

|                                    |                   |           |                        |
|------------------------------------|-------------------|-----------|------------------------|
| 802.11ax-HE20- Restricted Bandedge |                   |           |                        |
| Test Channel                       | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



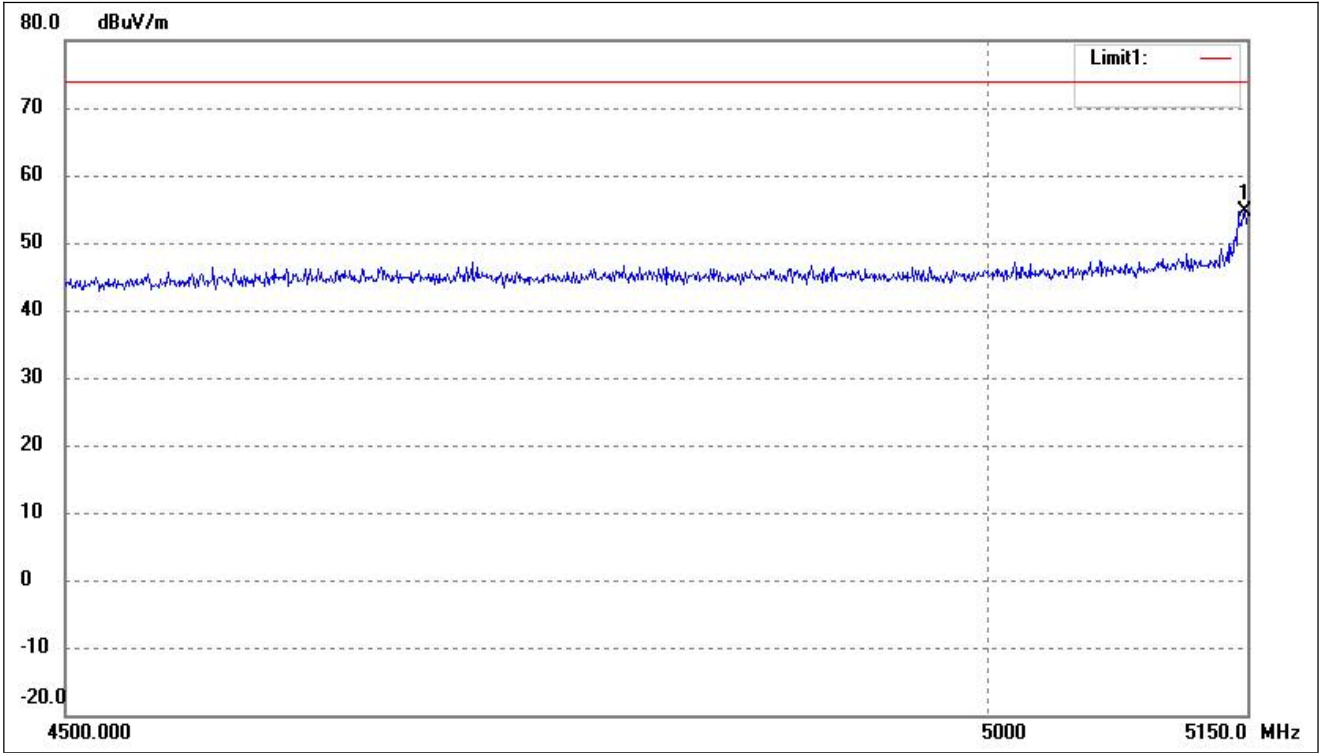
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 5150.000           | 63.69               | -4.77           | 58.92              | 74.00             | -15.08         | -             | -              | peak   |

|                                    |                   |           |                        |
|------------------------------------|-------------------|-----------|------------------------|
| 802.11ax-HE20- Restricted Bandedge |                   |           |                        |
| Test Channel                       | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



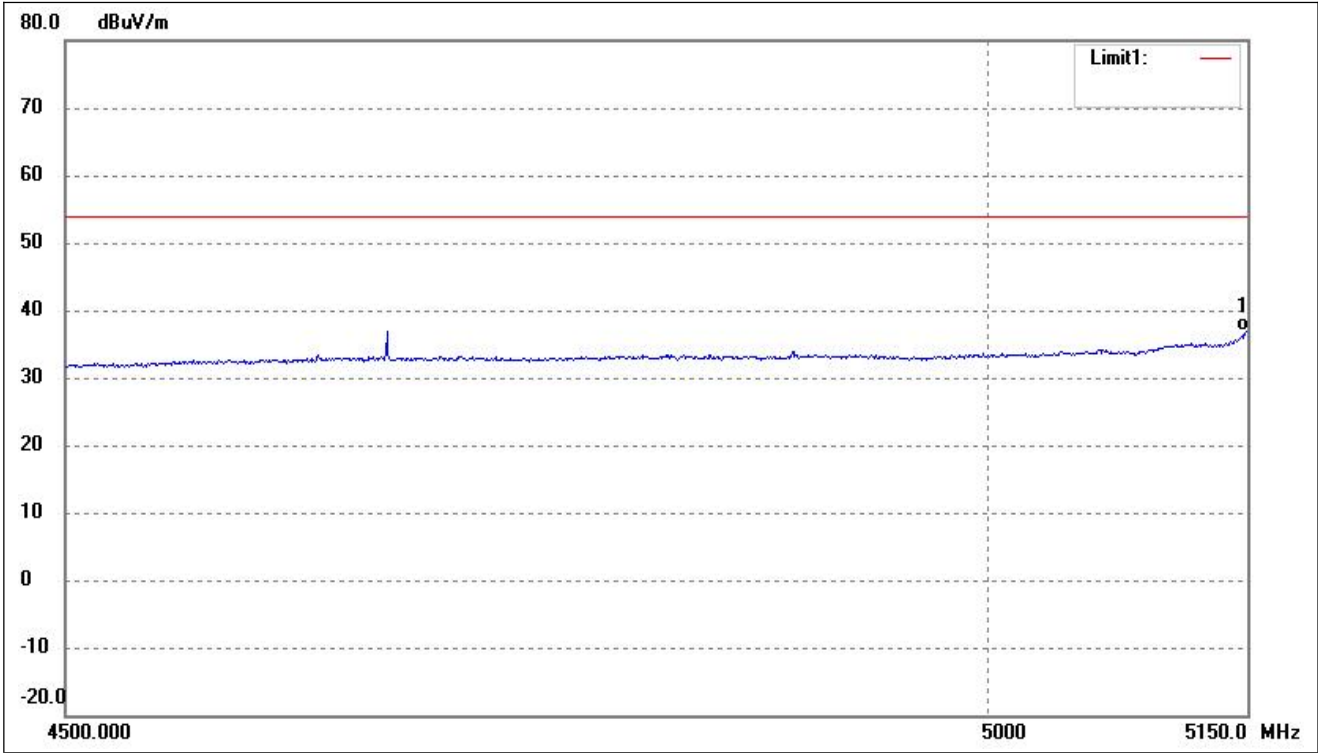
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 5150.000           | 45.59               | -4.77           | 40.82              | 54.00             | -13.18         | -             | -              | AVG    |

|                                   |                   |           |                        |
|-----------------------------------|-------------------|-----------|------------------------|
| 802.11n-HT40- Restricted Bandedge |                   |           |                        |
| Test Channel                      | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



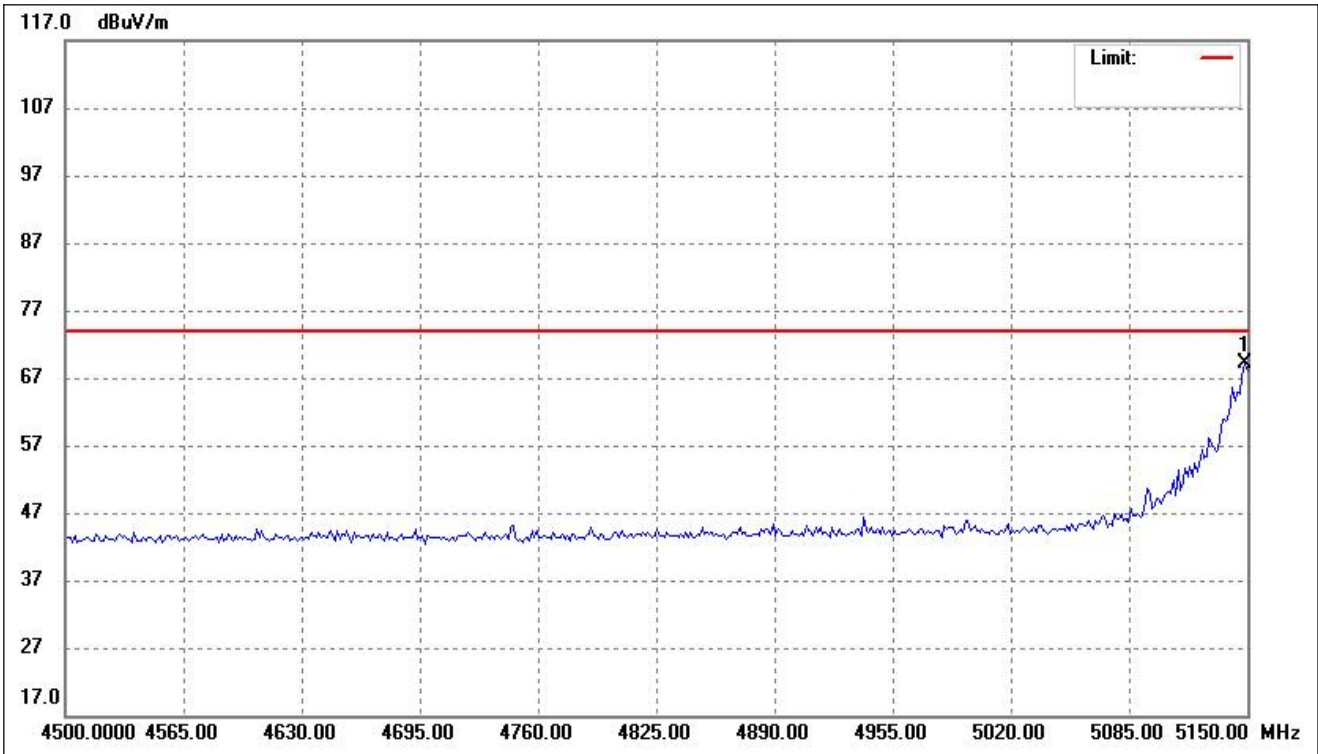
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 5148.610           | 59.44               | -4.77           | 54.67              | 74.00             | -19.33         | -             | -              | peak   |

|                                   |                   |           |                        |
|-----------------------------------|-------------------|-----------|------------------------|
| 802.11n-HT40- Restricted Bandedge |                   |           |                        |
| Test Channel                      | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 5150.000           | 41.63               | -4.77           | 36.86              | 54.00             | -17.14         | -             | -              | AVG    |

|                                    |                   |           |                        |
|------------------------------------|-------------------|-----------|------------------------|
| 802.11ax-HE40- Restricted Bandedge |                   |           |                        |
| Test Channel                       | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



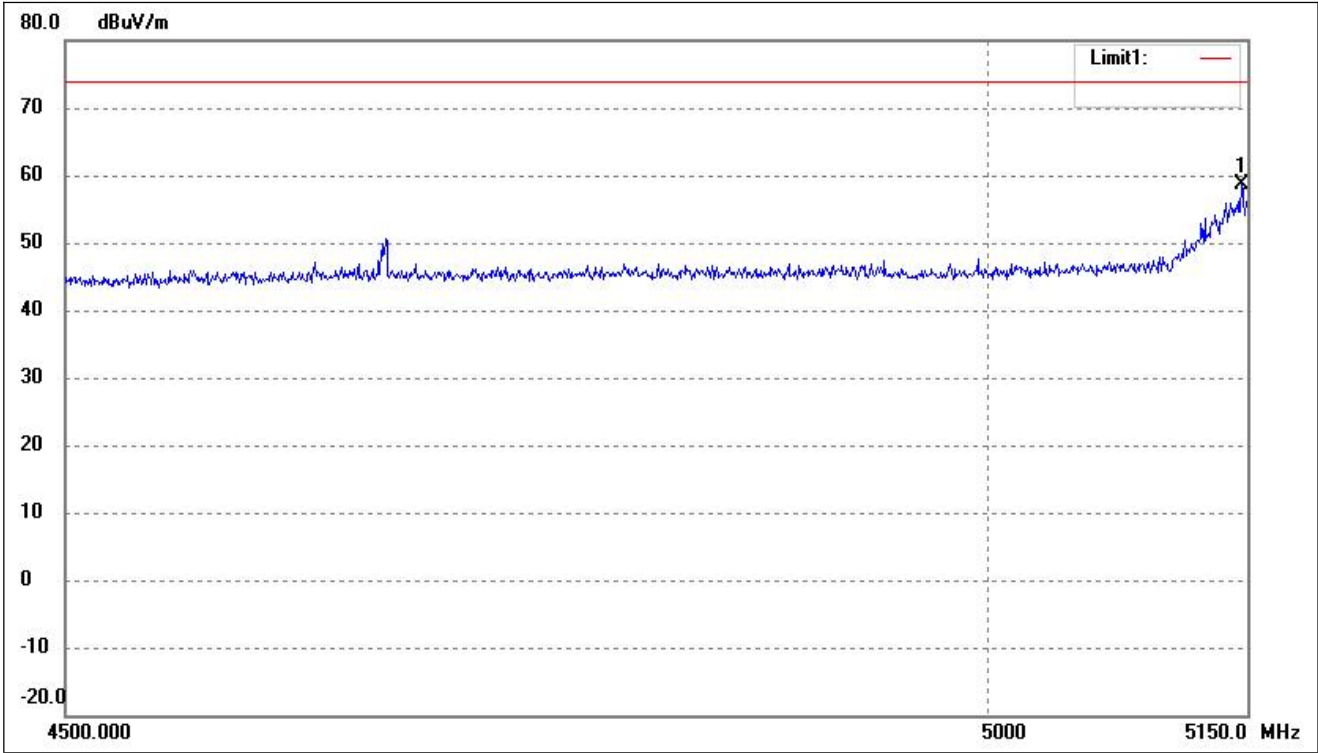
| No. | Frequency | Reading  | Correct | Result   | Limit    | Margin | Degree | Height | Remark |
|-----|-----------|----------|---------|----------|----------|--------|--------|--------|--------|
|     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   | ( )    | (cm)   |        |
| 1   | 5148.697  | 80.87    | -11.66  | 69.21    | 74.00    | -4.79  | -      | -      | peak   |

|                                    |                   |           |                        |
|------------------------------------|-------------------|-----------|------------------------|
| 802.11ax-HE40- Restricted Bandedge |                   |           |                        |
| Test Channel                       | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



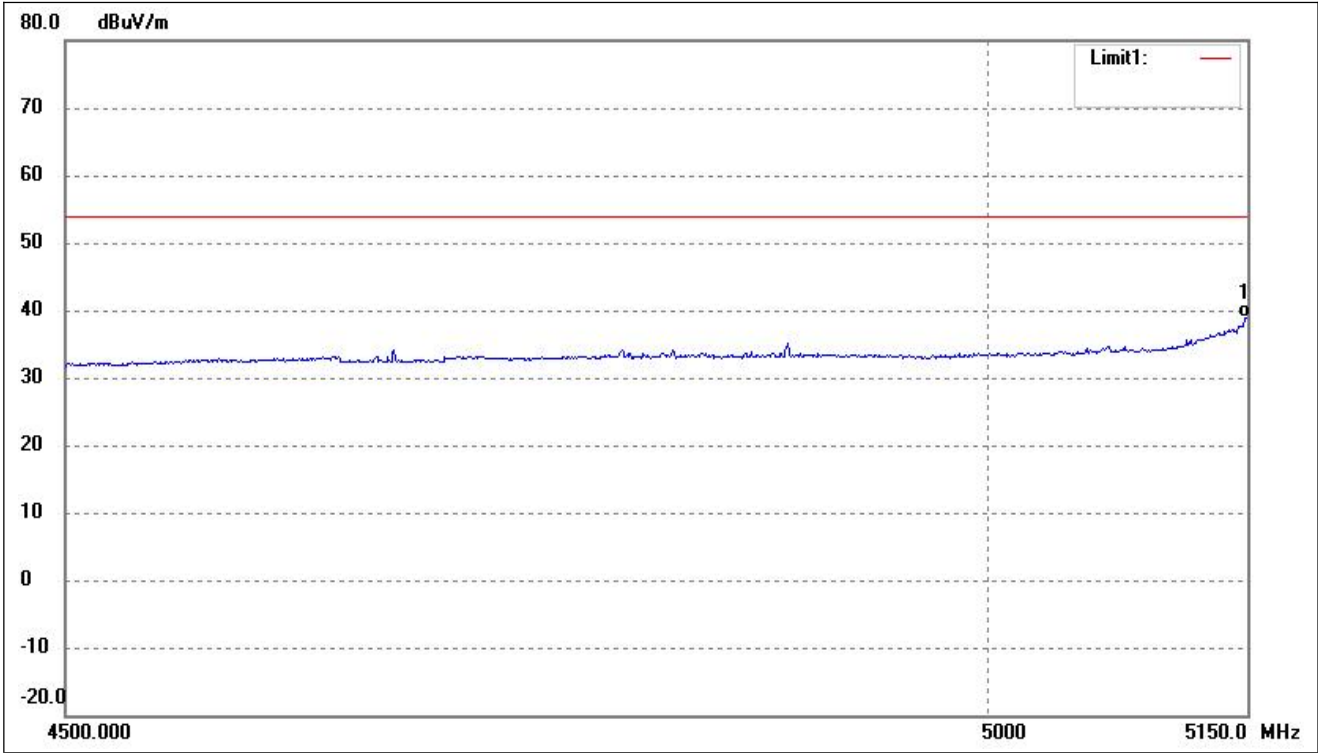
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 5150.000           | 59.06               | -11.65          | 47.41              | 54.00             | -6.59          | -             | -              | AVG    |

|                                     |                   |           |                        |
|-------------------------------------|-------------------|-----------|------------------------|
| 802.11ac-VHT80- Restricted Bandedge |                   |           |                        |
| Test Channel                        | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



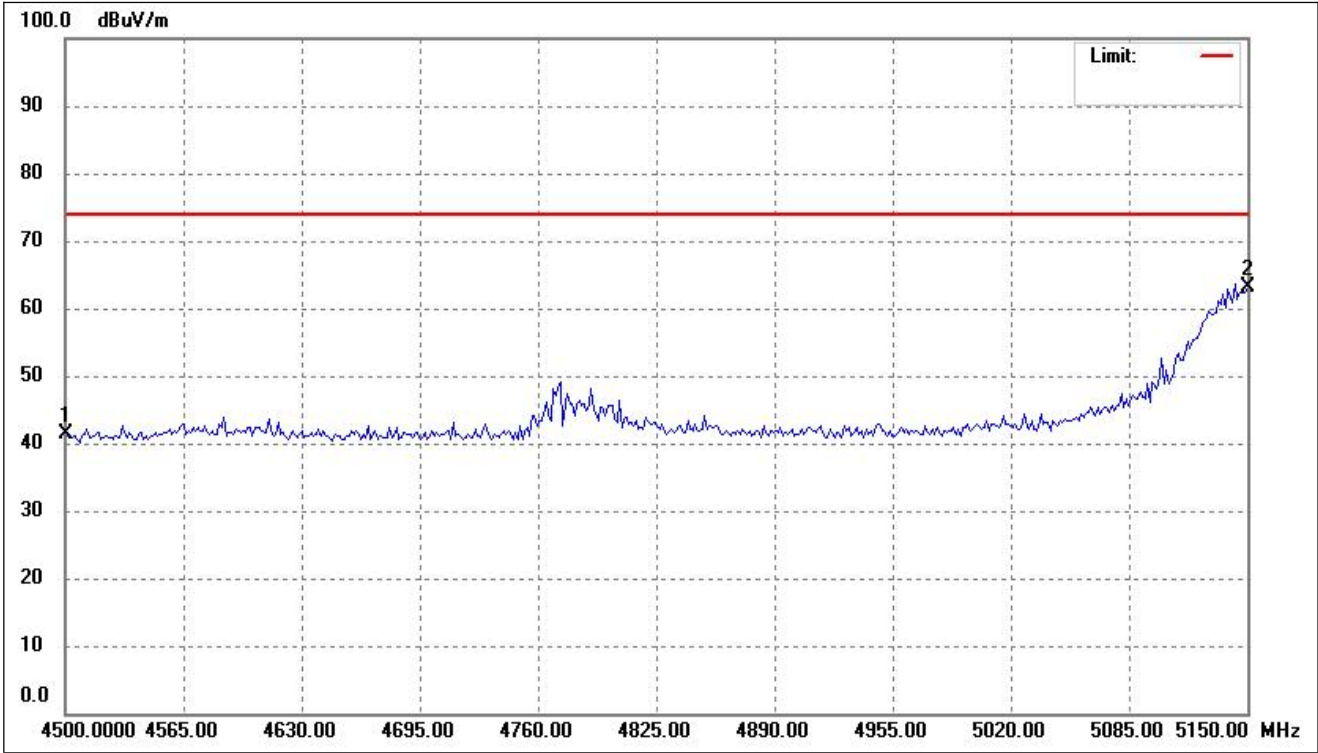
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 5146.527           | 63.51               | -4.78           | 58.73              | 74.00             | -15.27         | -             | -              | peak   |

|                                     |                   |           |                        |
|-------------------------------------|-------------------|-----------|------------------------|
| 802.11ac-VHT80- Restricted Bandedge |                   |           |                        |
| Test Channel                        | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



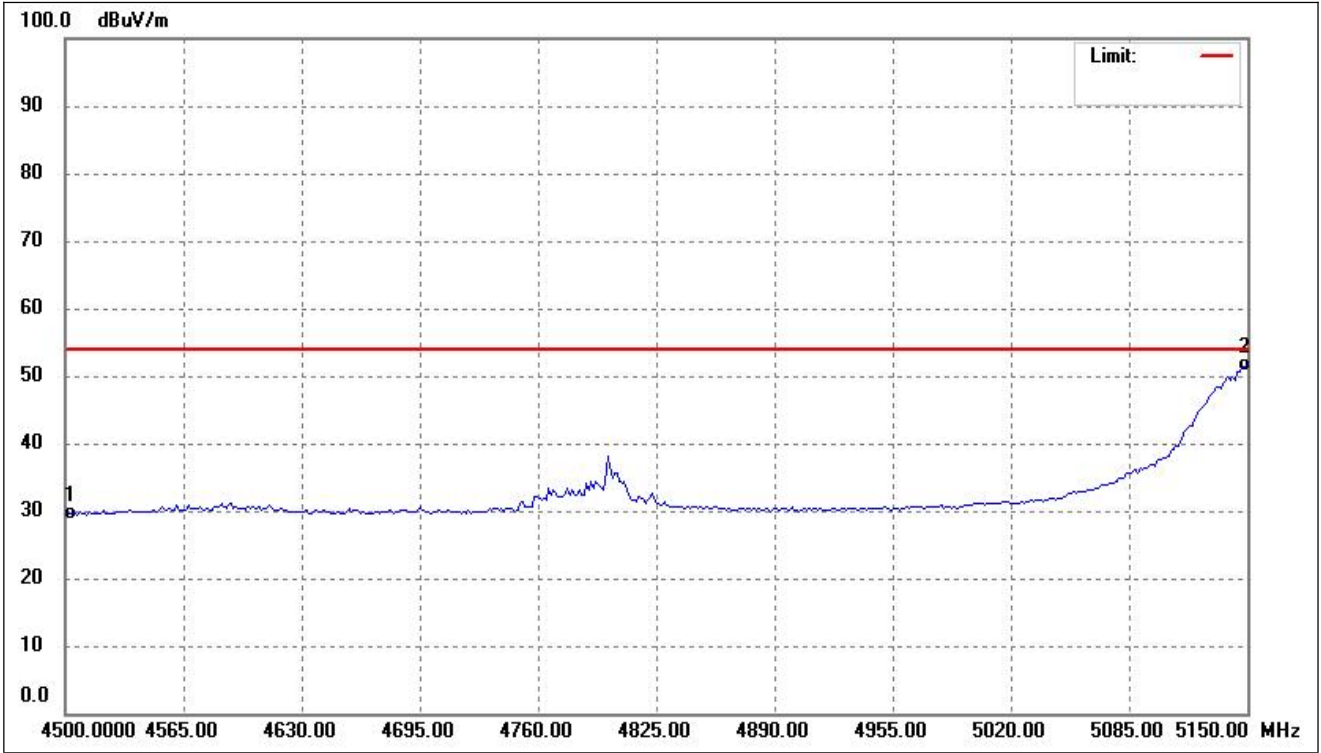
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 5148.610           | 43.64               | -4.77           | 38.87              | 54.00             | -15.13         | -             | -              | AVG    |

|                                    |                   |           |                        |
|------------------------------------|-------------------|-----------|------------------------|
| 802.11ax-HE80- Restricted Bandedge |                   |           |                        |
| Test Channel                       | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 4500.000           | 55.23               | -13.87          | 41.36              | 74.00             | -32.64         | -             | -              | peak   |
| 2   | 5150.000           | 75.60               | -12.53          | 63.07              | 74.00             | -10.93         | -             | -              | peak   |

|                                    |                   |           |                        |
|------------------------------------|-------------------|-----------|------------------------|
| 802.11ax-HE80- Restricted Bandedge |                   |           |                        |
| Test Channel                       | band 5.15-5.25GHz | Polarity: | Horizontal(worst case) |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 4500.000           | 43.42               | -13.87          | 29.55              | 54.00             | -24.45         | -             | -              | AVG    |
| 2   | 5150.000           | 64.13               | -12.53          | 51.60              | 54.00             | -2.40          | -             | -              | AVG    |

*Note: The Restricted Bandedge was tested in Horizontal /Vertical and the worst case position data was reported.*

Remark: ‘-’Means’ the test Degree and Height is not recorded by the test software and only show the worst case in the test report.

Reference No.: WTX24X07170578W001

- For the frequency band 5.15-5.25GHz(802.11a)
- Antenna 0
- Harmonics And Spurious Emissions

| Frequency<br>(MHz)       | Reading<br>(dBuV/m) | Correct<br>dB | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Polar<br>H/V | Detector |
|--------------------------|---------------------|---------------|--------------------|-------------------|----------------|--------------|----------|
| Low Channel (5180MHz)    |                     |               |                    |                   |                |              |          |
| 10360                    | 54.21               | 7.11          | 61.32              | 74                | -12.68         | H            | PK       |
| 10360                    | 37.36               | 7.11          | 44.47              | 54                | -9.53          | H            | AV       |
| 10360                    | 56.22               | 7.11          | 63.33              | 74                | -10.67         | V            | PK       |
| 10360                    | 37.75               | 7.11          | 44.86              | 54                | -9.14          | V            | AV       |
| Middle Channel (5200MHz) |                     |               |                    |                   |                |              |          |
| 10400                    | 55.84               | 7.22          | 63.06              | 74                | -10.94         | H            | PK       |
| 10400                    | 36.65               | 7.22          | 43.87              | 54                | -10.13         | H            | AV       |
| 10400                    | 55.25               | 7.22          | 62.47              | 74                | -11.53         | V            | PK       |
| 10400                    | 37.13               | 7.22          | 44.35              | 54                | -9.65          | V            | AV       |
| High Channel (5240MHz)   |                     |               |                    |                   |                |              |          |
| 10480                    | 56.61               | 7.69          | 64.30              | 74                | -9.70          | H            | PK       |
| 10480                    | 38.12               | 7.69          | 45.81              | 54                | -8.19          | H            | AV       |
| 10480                    | 56.97               | 7.69          | 64.66              | 74                | -9.34          | V            | PK       |
| 10480                    | 38.90               | 7.69          | 46.59              | 54                | -7.41          | V            | AV       |

- Out of Band edge for 5150-5250MHz

| Test CH. | Test Segment | Result  | Limit   |
|----------|--------------|---------|---------|
|          | MHz          | dBm/MHz | dBm/MHz |
| Lowest   | Below 5150   | -38.68  | -27     |
| Highest  | Above 5350   | -40.12  | -27     |

Note: the data just list the worst cases

- For the frequency band 5.15-5.25GHz, (802.11a)
- Antenna 1
- Harmonics And Spurious Emissions

| Frequency                | Reading  | Correct | Result   | Limit    | Margin | Polar | Detector |
|--------------------------|----------|---------|----------|----------|--------|-------|----------|
| (MHz)                    | (dBuV/m) | dB      | (dBuV/m) | (dBuV/m) | (dB)   | H/V   |          |
| Low Channel (5180MHz)    |          |         |          |          |        |       |          |
| 10360                    | 56.43    | 7.11    | 63.54    | 74       | -10.46 | H     | PK       |
| 10360                    | 40.04    | 7.11    | 47.15    | 54       | -6.85  | H     | AV       |
| 10360                    | 56.81    | 7.11    | 63.92    | 74       | -10.08 | V     | PK       |
| 10360                    | 40.36    | 7.11    | 47.47    | 54       | -6.53  | V     | AV       |
| Middle Channel (5200MHz) |          |         |          |          |        |       |          |
| 10400                    | 54.18    | 7.22    | 61.40    | 74       | -12.60 | H     | PK       |
| 10400                    | 37.54    | 7.22    | 44.76    | 54       | -9.24  | H     | AV       |
| 10400                    | 56.53    | 7.22    | 63.75    | 74       | -10.25 | V     | PK       |
| 10400                    | 38.94    | 7.22    | 46.16    | 54       | -7.84  | V     | AV       |
| High Channel (5240MHz)   |          |         |          |          |        |       |          |
| 10480                    | 55.36    | 7.69    | 63.05    | 74       | -10.95 | H     | PK       |
| 10480                    | 40.22    | 7.69    | 47.91    | 54       | -6.09  | H     | AV       |
| 10480                    | 56.18    | 7.69    | 63.87    | 74       | -10.13 | V     | PK       |
| 10480                    | 38.16    | 7.69    | 45.85    | 54       | -8.15  | V     | AV       |

- Out of Band edge for 5150-5250MHz

| Test CH.                                 | Test Segment | Result  | Limit   |
|------------------------------------------|--------------|---------|---------|
|                                          | MHz          | dBm/MHz | dBm/MHz |
| Lowest                                   | Below 5150   | -42.87  | -27     |
| Highest                                  | Above 5350   | -39.31  | -27     |
| Note: the data just list the worst cases |              |         |         |

- For the frequency band 5.15-5.25GHz (802.11n HT20)
- Antenna 0&Antenna 1
- Harmonics And Spurious Emissions

| Frequency<br>(MHz)       | Reading<br>(dBuV/m) | Correct<br>dB | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Polar<br>H/V | Detector |
|--------------------------|---------------------|---------------|--------------------|-------------------|----------------|--------------|----------|
| Low Channel (5180MHz)    |                     |               |                    |                   |                |              |          |
| 10360                    | 55.33               | 7.11          | 62.44              | 74                | -11.56         | H            | PK       |
| 10360                    | 40.02               | 7.11          | 47.13              | 54                | -6.87          | H            | AV       |
| 10360                    | 54.80               | 7.11          | 61.91              | 74                | -12.09         | V            | PK       |
| 10360                    | 36.87               | 7.11          | 43.98              | 54                | -10.02         | V            | AV       |
| Middle Channel (5200MHz) |                     |               |                    |                   |                |              |          |
| 10400                    | 55.75               | 7.22          | 62.97              | 74                | -11.03         | H            | PK       |
| 10400                    | 40.24               | 7.22          | 47.46              | 54                | -6.54          | H            | AV       |
| 10400                    | 56.17               | 7.22          | 63.39              | 74                | -10.61         | V            | PK       |
| 10400                    | 39.07               | 7.22          | 46.29              | 54                | -7.71          | V            | AV       |
| High Channel (5240MHz)   |                     |               |                    |                   |                |              |          |
| 10480                    | 56.90               | 7.69          | 64.59              | 74                | -9.41          | H            | PK       |
| 10480                    | 37.95               | 7.69          | 45.64              | 54                | -8.36          | H            | AV       |
| 10480                    | 54.32               | 7.69          | 62.01              | 74                | -11.99         | V            | PK       |
| 10480                    | 38.01               | 7.69          | 45.70              | 54                | -8.30          | V            | AV       |

- Out of Band edge 5150-5250MHz

| Test CH.                                 | Test Segment | Result  | Limit   |
|------------------------------------------|--------------|---------|---------|
|                                          | MHz          | dBm/MHz | dBm/MHz |
| Lowest                                   | Below 5150   | -42.27  | -27     |
| Highest                                  | Above 5350   | -40.41  | -27     |
| Note: the data just list the worst cases |              |         |         |

*Note: this EUT was tested in the low, high channel and the worst case position data was reported.*

- For the frequency band 5.15-5.25GHz (802.11ax HE20)
- Antenna 0&Antenna 1
- Harmonics And Spurious Emissions

| Frequency<br>(MHz)       | Reading<br>(dBuV/m) | Correct<br>dB | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Polar<br>H/V | Detector |
|--------------------------|---------------------|---------------|--------------------|-------------------|----------------|--------------|----------|
| Low Channel (5180MHz)    |                     |               |                    |                   |                |              |          |
| 10360                    | 57.22               | 7.11          | 64.33              | 74                | -9.67          | H            | PK       |
| 10360                    | 39.20               | 7.11          | 46.31              | 54                | -7.69          | H            | AV       |
| 10360                    | 56.23               | 7.11          | 63.34              | 74                | -10.66         | V            | PK       |
| 10360                    | 37.76               | 7.11          | 44.87              | 54                | -9.13          | V            | AV       |
| Middle Channel (5200MHz) |                     |               |                    |                   |                |              |          |
| 10400                    | 54.52               | 7.22          | 61.74              | 74                | -12.26         | H            | PK       |
| 10400                    | 40.00               | 7.22          | 47.22              | 54                | -6.78          | H            | AV       |
| 10400                    | 56.89               | 7.22          | 64.11              | 74                | -9.89          | V            | PK       |
| 10400                    | 37.19               | 7.22          | 44.41              | 54                | -9.59          | V            | AV       |
| High Channel (5240MHz)   |                     |               |                    |                   |                |              |          |
| 10480                    | 57.28               | 7.69          | 64.97              | 74                | -9.03          | H            | PK       |
| 10480                    | 37.88               | 7.69          | 45.57              | 54                | -8.43          | H            | AV       |
| 10480                    | 54.67               | 7.69          | 62.36              | 74                | -11.64         | V            | PK       |
| 10480                    | 38.59               | 7.69          | 46.28              | 54                | -7.72          | V            | AV       |

- Out of Band edge 5150-5250MHz

| Test CH.                                 | Test Segment | Result  | Limit   |
|------------------------------------------|--------------|---------|---------|
|                                          | MHz          | dBm/MHz | dBm/MHz |
| Lowest                                   | Below 5150   | -36.28  | -27     |
| Highest                                  | Above 5350   | -39.45  | -27     |
| Note: the data just list the worst cases |              |         |         |

- For the frequency band 5.15-5.25GHz (802.11n HT40)
- Antenna 0&Antenna 1
- Harmonics And Spurious Emissions

| Frequency<br>(MHz)     | Reading<br>(dBuV/m) | Correct<br>dB | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Polar<br>H/V | Detector |
|------------------------|---------------------|---------------|--------------------|-------------------|----------------|--------------|----------|
| Low Channel (5190MHz)  |                     |               |                    |                   |                |              |          |
| 10380                  | 57.40               | 7.89          | 65.29              | 74                | -8.71          | H            | PK       |
| 10380                  | 39.45               | 7.89          | 47.34              | 54                | -6.66          | H            | AV       |
| 10380                  | 54.57               | 7.89          | 62.46              | 74                | -11.54         | V            | PK       |
| 10380                  | 36.70               | 7.89          | 44.59              | 54                | -9.41          | V            | AV       |
| High Channel (5230MHz) |                     |               |                    |                   |                |              |          |
| 10460                  | 54.67               | 7.97          | 62.64              | 74                | -11.36         | H            | PK       |
| 10460                  | 36.77               | 7.97          | 44.74              | 54                | -9.26          | H            | AV       |
| 10460                  | 56.52               | 7.97          | 64.49              | 74                | -9.51          | V            | PK       |
| 10460                  | 40.03               | 7.97          | 48.00              | 54                | -6.00          | V            | AV       |

- Out of Band edge for 5150-5250MHz

| Test CH.                                 | Test Segment | Result  | Limit   |
|------------------------------------------|--------------|---------|---------|
|                                          | MHz          | dBm/MHz | dBm/MHz |
| Lowest                                   | Below 5150   | -38.25  | -27     |
| Highest                                  | Above 5350   | -40.36  | -27     |
| Note: the data just list the worst cases |              |         |         |

- For the frequency band 5.15-5.25GHz (802.11ax HE40)
- Antenna 0&Antenna 1
- Harmonics And Spurious Emissions

| Frequency              | Reading  | Correct | Result   | Limit    | Margin | Polar | Detector |
|------------------------|----------|---------|----------|----------|--------|-------|----------|
| (MHz)                  | (dBuV/m) | dB      | (dBuV/m) | (dBuV/m) | (dB)   | H/V   |          |
| Low Channel (5190MHz)  |          |         |          |          |        |       |          |
| 10380                  | 55.08    | 7.89    | 62.97    | 74       | -11.03 | H     | PK       |
| 10380                  | 36.51    | 7.89    | 44.40    | 54       | -9.60  | H     | AV       |
| 10380                  | 57.23    | 7.89    | 65.12    | 74       | -8.88  | V     | PK       |
| 10380                  | 37.49    | 7.89    | 45.38    | 54       | -8.62  | V     | AV       |
| High Channel (5230MHz) |          |         |          |          |        |       |          |
| 10460                  | 55.54    | 7.97    | 63.51    | 74       | -10.49 | H     | PK       |
| 10460                  | 40.38    | 7.97    | 48.35    | 54       | -5.65  | H     | AV       |
| 10460                  | 56.49    | 7.97    | 64.46    | 74       | -9.54  | V     | PK       |
| 10460                  | 40.07    | 7.97    | 48.04    | 54       | -5.96  | V     | AV       |

- Out of Band edge for 5150-5250MHz

| Test CH.                                 | Test Segment | Result  | Limit   |
|------------------------------------------|--------------|---------|---------|
|                                          | MHz          | dBm/MHz | dBm/MHz |
| Lowest                                   | Below 5150   | -41.28  | -27     |
| Highest                                  | Above 5350   | -40.32  | -27     |
| Note: the data just list the worst cases |              |         |         |

- Out of Band edge for 5725-5850MHz

| Test CH.                                 | Test Segment | Result  | Limit   |
|------------------------------------------|--------------|---------|---------|
|                                          | MHz          | dBm/MHz | dBm/MHz |
| Lowest                                   | Below 5715   | -41.36  | -27     |
|                                          | 5715 to 5725 | -38.69  | -17     |
| Highest                                  | 5850 to 5860 | -36.14  | -17     |
|                                          | Above 5860   | -41.28  | -27     |
| Note: the data just list the worst cases |              |         |         |

- For the frequency band 5.15-5.25GHz(802.11ac-VHT80)
- Antenna 0&Antenna 1
- Harmonics And Spurious Emissions

| Frequency | Reading  | Correct | Result   | Limit    | Margin | Polar | Detector |
|-----------|----------|---------|----------|----------|--------|-------|----------|
| (MHz)     | (dBuV/m) | dB      | (dBuV/m) | (dBuV/m) | (dB)   | H/V   |          |
| 5210MHz   |          |         |          |          |        |       |          |
| 10420     | 55.55    | 7.53    | 63.08    | 74       | -10.92 | H     | PK       |
| 10420     | 39.21    | 7.53    | 46.74    | 54       | -7.26  | H     | AV       |
| 10420     | 54.60    | 7.53    | 62.13    | 74       | -11.87 | H     | PK       |
| 10420     | 39.41    | 7.53    | 46.94    | 54       | -7.06  | H     | AV       |

- Out of Band edge for 5150-5250MHz

| Test CH.                                 | Test Segment | Result  | Limit   |
|------------------------------------------|--------------|---------|---------|
|                                          | MHz          | dBm/MHz | dBm/MHz |
| Lowest                                   | Below 5150   | -39.39  | -27     |
| Highest                                  | Above 5350   | -40.25  | -27     |
| Note: the data just list the worst cases |              |         |         |

- For the frequency band 5.15-5.25GHz (802.11ax HE80)
- Antenna 0&Antenna 1
- Harmonics And Spurious Emissions

| Frequency | Reading  | Correct | Result   | Limit    | Margin | Polar | Detector |
|-----------|----------|---------|----------|----------|--------|-------|----------|
| (MHz)     | (dBuV/m) | dB      | (dBuV/m) | (dBuV/m) | (dB)   | H/V   |          |
| 5210MHz   |          |         |          |          |        |       |          |
| 10420     | 56.60    | 7.53    | 64.13    | 74       | -9.87  | H     | PK       |
| 10420     | 38.62    | 7.53    | 46.15    | 54       | -7.85  | H     | AV       |
| 10420     | 56.64    | 7.53    | 64.17    | 74       | -9.83  | H     | PK       |
| 10420     | 36.50    | 7.53    | 44.03    | 54       | -9.97  | H     | AV       |

- Out of Band edge for 5150-5250MHz

| Test CH.                                 | Test Segment | Result  | Limit   |
|------------------------------------------|--------------|---------|---------|
|                                          | MHz          | dBm/MHz | dBm/MHz |
| Lowest                                   | Below 5150   | -41.58  | -27     |
| Highest                                  | Above 5350   | -39.31  | -27     |
| Note: the data just list the worst cases |              |         |         |

*Note: Testing is carried out with frequency rang 9kHz to 40GHz, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*

## **9. Frequency Stability**

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### **9.1 Standard Applicable**

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

### **9.2 Test Procedure**

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

### **9.3 Summary of Test Results/Plots**

**Please refer to Appendix D**

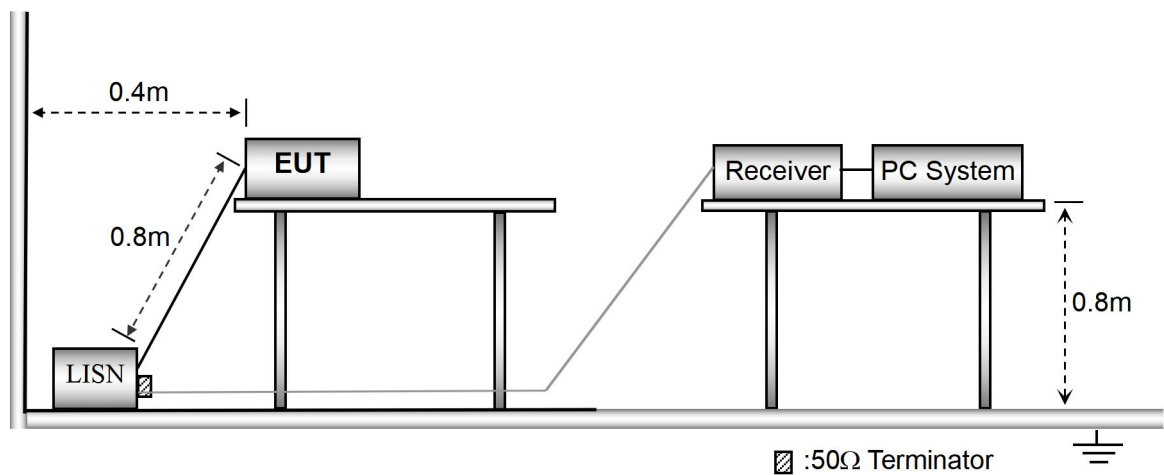
## 10 Conducted Emissions

### 10.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

### 10.2 Basic Test Setup Block Diagram



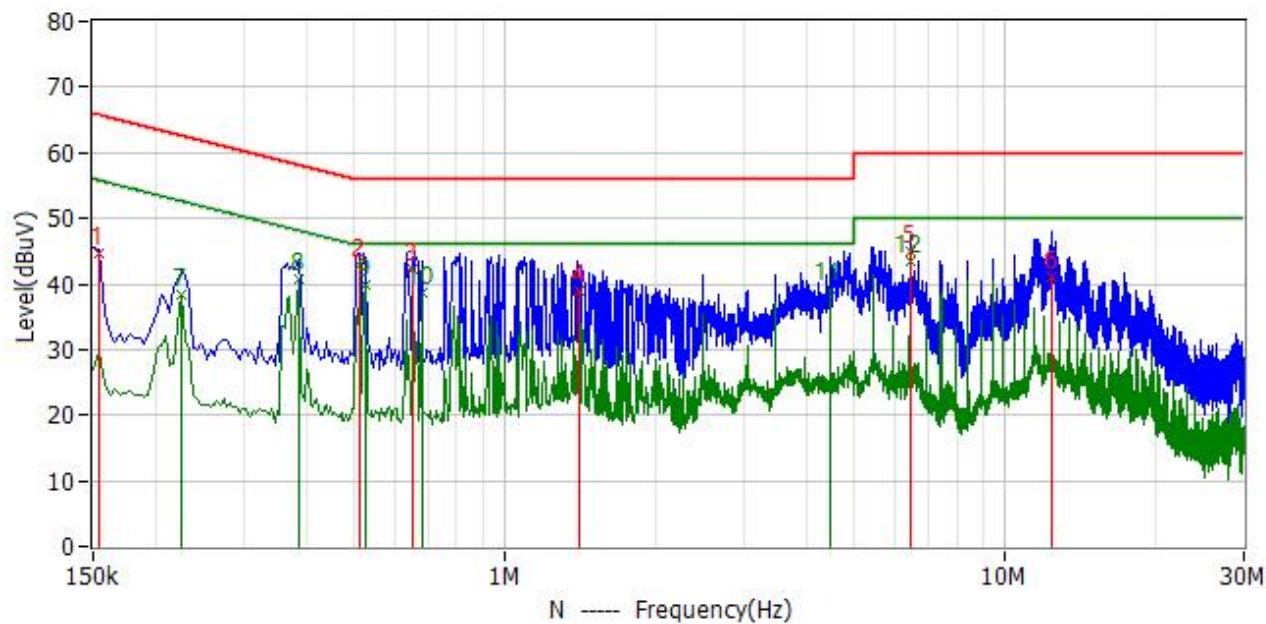
### 10.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

|                                   |        |
|-----------------------------------|--------|
| Start Frequency.....              | 150kHz |
| Stop Frequency.....               | 30MHz  |
| Sweep Speed.....                  | Auto   |
| IF Bandwidth.....                 | 10kHz  |
| Quasi-Peak Adapter Bandwidth..... | 9kHz   |
| Quasi-Peak Adapter Mode.....      | Normal |

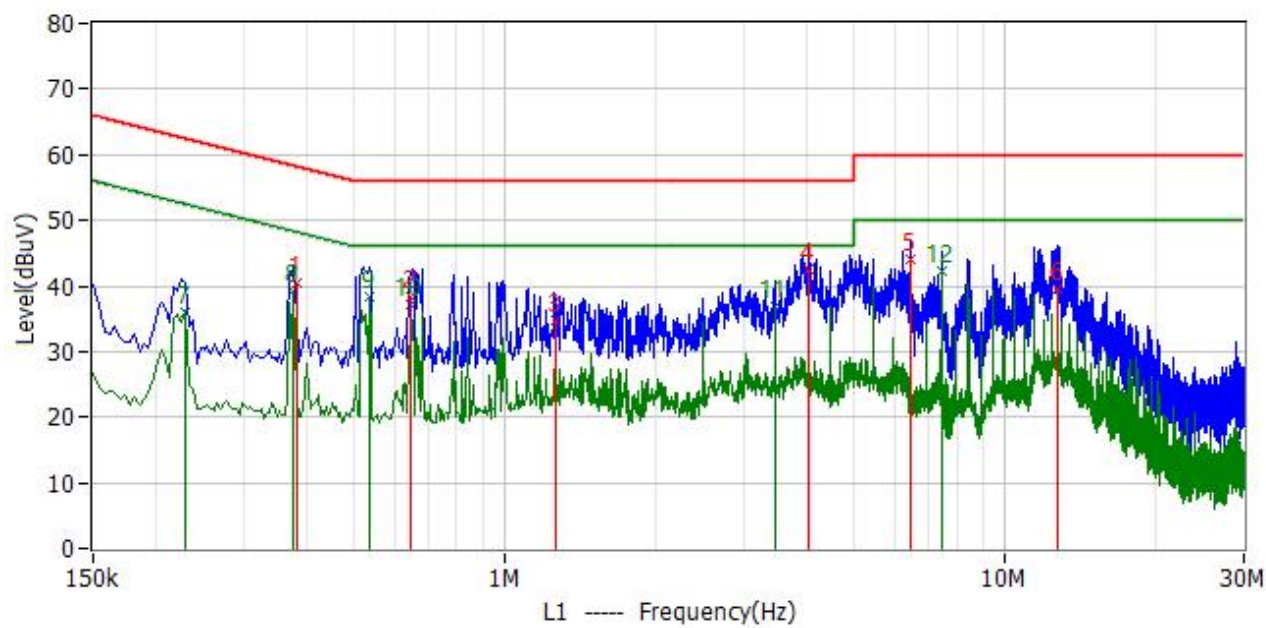
### 10.4 Summary of Test Results/Plots

|           |               |             |           |         |
|-----------|---------------|-------------|-----------|---------|
| Test Mode | Communication | AC120V 60Hz | Polarity: | Neutral |
|-----------|---------------|-------------|-----------|---------|



| No. | Frequency  | Reading dBuV | Factor dB | Level dBuV | Limit dBuV | Delta dB | Detector |
|-----|------------|--------------|-----------|------------|------------|----------|----------|
| 1   | 154.000kHz | 34.8         | 9.7       | 44.5       | 65.8       | -21.3    | QP       |
| 2   | 514.000kHz | 33.0         | 9.7       | 42.7       | 56.0       | -13.3    | QP       |
| 3   | 654.000kHz | 32.5         | 9.7       | 42.2       | 56.0       | -13.8    | QP       |
| 4   | 1.402MHz   | 29.5         | 9.6       | 39.1       | 56.0       | -16.9    | QP       |
| 5   | 6.446MHz   | 35.1         | 9.7       | 44.8       | 60.0       | -15.2    | QP       |
| 6   | 12.386MHz  | 31.1         | 9.8       | 40.9       | 60.0       | -19.1    | QP       |
| 7*  | 226.000kHz | 28.7         | 9.6       | 38.3       | 52.6       | -14.3    | AV       |
| 8*  | 386.000kHz | 31.0         | 9.6       | 40.6       | 48.1       | -7.5     | AV       |
| 9*  | 526.000kHz | 30.1         | 9.7       | 39.8       | 46.0       | -6.2     | AV       |
| 10* | 682.000kHz | 28.9         | 9.7       | 38.6       | 46.0       | -7.4     | AV       |
| 11* | 4.462MHz   | 29.7         | 9.6       | 39.3       | 46.0       | -6.7     | AV       |
| 12* | 6.446MHz   | 33.6         | 9.7       | 43.3       | 50.0       | -6.7     | AV       |

|           |               |             |           |      |
|-----------|---------------|-------------|-----------|------|
| Test Mode | Communication | AC120V 60Hz | Polarity: | Line |
|-----------|---------------|-------------|-----------|------|



| No. | Frequency  | Reading<br>dBuV | Factor<br>dB | Level<br>dBuV | Limit<br>dBuV | Delta<br>dB | Detector |
|-----|------------|-----------------|--------------|---------------|---------------|-------------|----------|
| 1   | 382.000kHz | 30.8            | 9.6          | 40.4          | 58.2          | -17.8       | QP       |
| 2   | 646.000kHz | 28.7            | 9.7          | 38.4          | 56.0          | -17.6       | QP       |
| 3   | 1.262MHz   | 25.2            | 9.6          | 34.8          | 56.0          | -21.2       | QP       |
| 4   | 4.034MHz   | 32.8            | 9.6          | 42.4          | 56.0          | -13.6       | QP       |
| 5   | 6.454MHz   | 34.2            | 9.7          | 43.9          | 60.0          | -16.1       | QP       |
| 6   | 12.694MHz  | 29.8            | 9.8          | 39.6          | 60.0          | -20.4       | QP       |
| 7*  | 230.000kHz | 26.5            | 9.6          | 36.1          | 52.4          | -16.3       | AV       |
| 8*  | 378.000kHz | 29.8            | 9.6          | 39.4          | 48.3          | -9.0        | AV       |
| 9*  | 534.000kHz | 28.8            | 9.7          | 38.5          | 46.0          | -7.5        | AV       |
| 10* | 650.000kHz | 27.6            | 9.7          | 37.3          | 46.0          | -8.7        | AV       |
| 11* | 3.474MHz   | 27.2            | 9.6          | 36.8          | 46.0          | -9.2        | AV       |
| 12* | 7.446MHz   | 32.5            | 9.7          | 42.2          | 50.0          | -7.8        | AV       |

## APPENDIX PHOTOGRAPHS

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Please refer to “ANNEX”

\*\*\*\*\* END OF REPORT \*\*\*\*\*