

|                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                        |                                                                                            |                                                                                                                |                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>Prüfbericht-Nr.:</b><br><i>Test report no.:</i>                                                                                                                                                                                                                                                                                                                                                                                                         | <b>CN21F00V 001</b>                                                                                                                                                                                                                                    | <b>Auftrags-Nr.:</b><br><i>Order no.:</i>                                                  | 168294786                                                                                                      | Seite 1 von 22<br><i>Page 1 of 22</i> |
| <b>Kunden-Referenz-Nr.:</b><br><i>Client reference no.:</i>                                                                                                                                                                                                                                                                                                                                                                                                | N/A                                                                                                                                                                                                                                                    | <b>Auftragsdatum:</b><br><i>Order date:</i>                                                | 2020-12-07                                                                                                     |                                       |
| <b>Auftraggeber:</b><br><i>Client:</i>                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Cooper Lighting LLC</b><br>1121 Highway 74 South, Peachtree City, Georgia 30269, United States Of America                                                                                                                                           |                                                                                            |                                                                                                                |                                       |
| <b>Prüfgegenstand:</b><br><i>Test item:</i>                                                                                                                                                                                                                                                                                                                                                                                                                | In-Wall Smart Switch                                                                                                                                                                                                                                   |                                                                                            |                                                                                                                |                                       |
| <b>Bezeichnung / Typ-Nr.:</b><br><i>Identification / Type no.:</i>                                                                                                                                                                                                                                                                                                                                                                                         | HIWMAS1BLE40AWH, HIWMAS1BLE40AWH-C                                                                                                                                                                                                                     |                                                                                            |                                                                                                                |                                       |
| <b>Auftrags-Inhalt:</b><br><i>Order content:</i>                                                                                                                                                                                                                                                                                                                                                                                                           | FCC and IC approval                                                                                                                                                                                                                                    |                                                                                            |                                                                                                                |                                       |
| <b>Prüfgrundlage:</b><br><i>Test specification:</i>                                                                                                                                                                                                                                                                                                                                                                                                        | CFR47 FCC Part 15: Subpart C Section 15.247 RSS-247 Issue 2 February 2017<br>CFR47 FCC Part 15: Subpart C Section 15.207 RSS-Gen Issue 5 March 2019<br>CFR47 FCC Part 15: Subpart C Section 15.209 RSS-102 Issue 5 March 2015<br>CFR47 FCC Part 2.1091 |                                                                                            |                                                                                                                |                                       |
| <b>Wareneingangsdatum:</b><br><i>Date of sample receipt:</i>                                                                                                                                                                                                                                                                                                                                                                                               | 2020-12-10                                                                                                                                                                                                                                             | Please refer to photo documents                                                            |                                                                                                                |                                       |
| <b>Prüfmuster-Nr.:</b><br><i>Test sample no.:</i>                                                                                                                                                                                                                                                                                                                                                                                                          | A002964799-001<br>A002964799-002                                                                                                                                                                                                                       |                                                                                            |                                                                                                                |                                       |
| <b>Prüfzeitraum:</b><br><i>Testing period:</i>                                                                                                                                                                                                                                                                                                                                                                                                             | 2021-01-04 – 2021-01-15                                                                                                                                                                                                                                |                                                                                            |                                                                                                                |                                       |
| <b>Ort der Prüfung:</b><br><i>Place of testing:</i>                                                                                                                                                                                                                                                                                                                                                                                                        | TÜV Rheinland (Shenzhen) Co., Ltd.                                                                                                                                                                                                                     |                                                                                            |                                                                                                                |                                       |
| <b>Prüflaboratorium:</b><br><i>Testing laboratory:</i>                                                                                                                                                                                                                                                                                                                                                                                                     | TÜV Rheinland (Shenzhen) Co., Ltd.                                                                                                                                                                                                                     |                                                                                            |                                                                                                                |                                       |
| <b>Prüfergebnis*:</b><br><i>Test result*:</i>                                                                                                                                                                                                                                                                                                                                                                                                              | Pass                                                                                                                                                                                                                                                   |                                                                                            |                                                                                                                |                                       |
| <b>geprüft von:</b><br><i>tested by:</i>                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>genehmigt von:</b><br><i>authorized by:</i>                                                                                                                                                                                                         |                                                                                            |                                                                                                                |                                       |
| <b>Datum:</b><br><i>Date:</i> 2021-02-02                                                                                                                                                                                                                                                                                                                                                                                                                   | <br>Signed by: Alex Lan                                                                                                                                             |                                                                                            | <br>Signed by: Winnie Hou |                                       |
| <b>Stellung / Position</b>                                                                                                                                                                                                                                                                                                                                                                                                                                 | Senior Project Engineer                                                                                                                                                                                                                                | <b>Ausstellungsdatum:</b><br><i>Issue date:</i> 2021-02-02                                 | Department Manager                                                                                             |                                       |
| <b>Sonstiges / Other:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                        |                                                                                            |                                                                                                                |                                       |
| FCC ID: 2AKCY-HIWMAS1BLE40A<br>IC: 4706A-HIWMASBLE40 HVIN: HIWMAS1BLE40A                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                        |                                                                                            |                                                                                                                |                                       |
| <b>Zustand des Prüfgegenstandes bei Anlieferung:</b><br><i>Condition of the test item at delivery:</i>                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                        | <b>Prüfmuster vollständig und unbeschädigt</b><br><i>Test item complete and undamaged:</i> |                                                                                                                |                                       |
| * Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft<br>P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet<br>Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor<br>P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable N/T = not tested                        |                                                                                                                                                                                                                                                        |                                                                                            |                                                                                                                |                                       |
| <b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b><br><i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i> |                                                                                                                                                                                                                                                        |                                                                                            |                                                                                                                |                                       |

## ***Test Summary***

**5.1.1 ANTENNA REQUIREMENT**

RESULT: Pass

**5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER**

RESULT: Pass

**5.1.3 CONDUCTED POWER SPECTRAL DENSITY**

RESULT: Pass

**5.1.4 99%dB BANDWIDTH**

RESULT: Pass

**5.1.5 6dB BANDWIDTH**

RESULT: Pass

**5.1.6 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHz BANDWIDTH**

RESULT: Pass

**5.1.7 RADIATED SPURIOUS EMISSION**

RESULT: Pass

**5.1.8 CONDUCTED EMISSION ON AC MAINS**

RESULT: Pass

**6.1.1 ELECTROMAGNETIC FIELDS**

RESULT: Pass

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# 1 General Remarks

## 1.1 Complementary Materials

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

Appendix A: Photographs of the Test Set-up

Appendix B: Test Results of Conducted & Radiated Testing

# 2 Test Sites

## 2.1 Test Facilities

**TÜV Rheinland (Shenzhen) Co., Ltd.**

No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, People's Republic of China

FCC Registration No.: 694916

IC Registration No.: 25069

## 2.2 List of Test and Measurement Instruments

**Table 1: List of Test and Measurement Equipment**

| <b>Radio Spectrum Testing</b>                |                     |                   |                   |                   |
|----------------------------------------------|---------------------|-------------------|-------------------|-------------------|
| <b>Equipment</b>                             | <b>Manufacturer</b> | <b>Model No.</b>  | <b>Serial No.</b> | <b>Cal. Until</b> |
| Wireless Connectivity Tester                 | Rohde & Schwarz     | CMW270            | 101375            | 2021-08-30        |
| Signal Analyzer                              | Rohde & Schwarz     | FSV 40            | 101441            | 2021-08-30        |
| Control PC                                   | DELL                | OptiPlex 7050     | FTJZ9P2           | N/A               |
| Test Software                                | Rohde & Schwarz     | WMS32 (V10.40.10) | N/A               | N/A               |
| Power Meter                                  | Rohde & Schwarz     | NRP2              | 107105            | 2021-12-20        |
| Wideband Power Sensor                        | Rohde & Schwarz     | NRP-Z81           | 105350            | 2021-12-20        |
| <b>Unwanted Emission Testing</b>             |                     |                   |                   |                   |
| <b>Equipment</b>                             | <b>Manufacturer</b> | <b>Model No.</b>  | <b>Serial No.</b> | <b>Cal. Until</b> |
| Signal Generator                             | Rohde & Schwarz     | SMB100A           | 180840            | 2021-08-30        |
| Wideband Radio Communication Tester          | Rohde & Schwarz     | CMW500            | 165339            | 2021-08-30        |
| Signal Analyzer                              | Rohde & Schwarz     | FSV 40            | 101440            | 2021-08-30        |
| System Controller Interface                  | Rohde & Schwarz     | SCI-100           | S10010036         | N/A               |
| Filterbank                                   | Rohde & Schwarz     | CDMA              | 100751            | 2021-08-30        |
| Filterbank                                   | Rohde & Schwarz     | GSM               | 100811            | 2021-08-30        |
| OSP                                          | Rohde & Schwarz     | OSP 120           | 102041            | N/A               |
| OSP                                          | Rohde & Schwarz     | OSP 150           | 101385            | N/A               |
| Pre-amplifier                                | Rohde & Schwarz     | SCU08F1           | 08320030          | 2021-08-30        |
| Amplifier                                    | Rohde & Schwarz     | SCU-18F           | 180079            | 2021-08-30        |
| Amplifier                                    | Rohde & Schwarz     | SCU40A            | 100450            | 2021-09-03        |
| Trilog Broadband Antenna (30 MHz - 1 GHz)    | Schwarzbeck         | VULB9162          | 192               | 2021-09-02        |
| Double-Ridged Antenna (1 -18 GHz)            | ETS-LINDGREN        | 3117              | 00218719          | 2021-09-02        |
| Wideband Ridged Horn Antenna (12- 18 GHz)    | Steatite            | QMS-00208         | 18312             | 2021-09-02        |
| Wideband Ridged Horn Antenna (18- 40 GHz)    | Steatite            | QMS-00880         | 19066             | 2021-09-02        |
| Biconical Broadband Antenna (30 MHz - 1 GHz) | Schwarzbeck         | VUBA 9117         | 357               | 2021-09-02        |

## 2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

## 2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

## 2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

| Item                              |                               | Extended Uncertainty |
|-----------------------------------|-------------------------------|----------------------|
| Conducted Emission                |                               | $\pm 2.74$ dB        |
| Radiated Emission (30-1000MHz)    | Field strength (dB $\mu$ V/m) | 4.27dB               |
| Radiated Emission (above 1000MHz) | Field strength (dB $\mu$ V/m) | 4.46dB               |
| Radio Spectrum                    |                               | $\pm 1.5$ dB         |

## 2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

## 2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at East of F/1, F/2 - F/4, Building 1, Cybio Technology Building, No. 6 Langshan No. 2 Road, North Hi-tech Industry Park, Nanshan District, Shenzhen, P.R. China, P. R. China. is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

## 3 General Product Information

### 3.1 Product Function and Intended Use

The EUT is an In-Wall Smart Switch, it supports Bluetooth Low Energy wireless technology.

Both models are identical except model number for different regions.

Model HIWMAS1BLE40AWH is for United States market and the model HIWMAS1BLE40AWH-C is for Canada market.

For details refer to the User Manual, Technical Description and Circuit Diagram.

### 3.2 Ratings and System Details

Table 2: Technical Specification of EUT

| General Information of EUT                             | Value                              |
|--------------------------------------------------------|------------------------------------|
| Kind of Equipment                                      | In-Wall Smart Switch               |
| Type Designation                                       | HIWMAS1BLE40AWH, HIWMAS1BLE40AWH-C |
| FCC ID                                                 | 2AKCY-HIWMAS1BLE40A                |
| IC                                                     | 4706A-HIWMASBLE40                  |
| HVIN                                                   | HIWMAS1BLE40A                      |
| Operating Voltage                                      | AC 120V, 60Hz                      |
| Testing Voltage                                        | AC 120V, 60Hz                      |
| <b>Technical Specification of Bluetooth Low Energy</b> |                                    |
| Operating Frequency                                    | 2402 – 2480 MHz                    |
| Bluetooth Core Version                                 | Bluetooth 4.0, single mode         |
| Data rate                                              | 1Mbps                              |
| Channel Number                                         | 40 channels                        |
| Channel separation                                     | 2MHz                               |
| Modulation                                             | GFSK                               |
| Antenna Type                                           | IFA Antenna                        |
| Smart Antenna Systems:                                 | Not Applicable                     |
| Number of Antenna                                      | 1                                  |
| Antenna Gain                                           | 1.85 dBi                           |

**Table 3: RF Channel and Frequency of Bluetooth Low Energy**

| RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) |
|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| <b>00</b>  | <b>2402.00</b>  | 10         | 2422.00         | 20         | 2442.00         | 30         | 2462.00         |
| 01         | 2404.00         | 11         | 2424.00         | 21         | 2444.00         | 31         | 2464.00         |
| 02         | 2406.00         | 12         | 2426.00         | 22         | 2446.00         | 32         | 2466.00         |
| 03         | 2408.00         | 13         | 2428.00         | 23         | 2448.00         | 33         | 2468.00         |
| 04         | 2410.00         | 14         | 2430.00         | 24         | 2450.00         | 34         | 2470.00         |
| 05         | 2412.00         | 15         | 2432.00         | 25         | 2452.00         | 35         | 2472.00         |
| 06         | 2414.00         | 16         | 2434.00         | 26         | 2454.00         | 36         | 2474.00         |
| 07         | 2416.00         | 17         | 2436.00         | 27         | 2456.00         | 37         | 2476.00         |
| 08         | 2418.00         | 18         | 2438.00         | 28         | 2458.00         | 38         | 2478.00         |
| 09         | 2420.00         | <b>19</b>  | <b>2440.00</b>  | 29         | 2460.00         | <b>39</b>  | <b>2480.00</b>  |

### 3.3 Independent Operation Modes

The basic operation modes are:

- A. On, transmitting mode
  - 1. Low channel
  - 2. Middle channel
  - 3. High channel
- B. On, Operating
- C. Off

### 3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

### 3.5 Submitted Documents

- Application Form
- Block Diagram
- FCC/IC Label and Location Info
- Operation Description
- Photo Document
- Schematics
- User Manual

## 4 Test Set-up and Operation Modes

### 4.1 Principle of Configuration Selection

**Radio Spectrum:** The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

### 4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all test items were applied on model HIWMAS1BLE40AWH.

### 4.3 Special Accessories and Auxiliary Equipment

Table 4: List of Accessories and Auxiliary Equipment

| Description | Manufacturer | Model         | S/N |
|-------------|--------------|---------------|-----|
| Notebook    | Lenovo       | ThinkPad X260 | N/A |

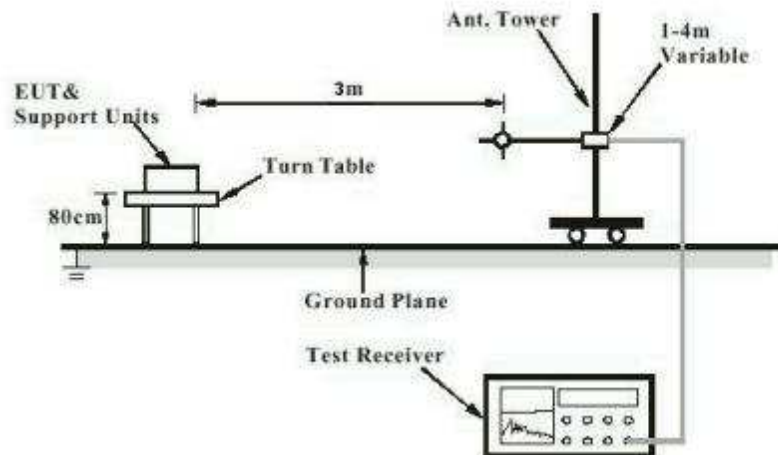
### 4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

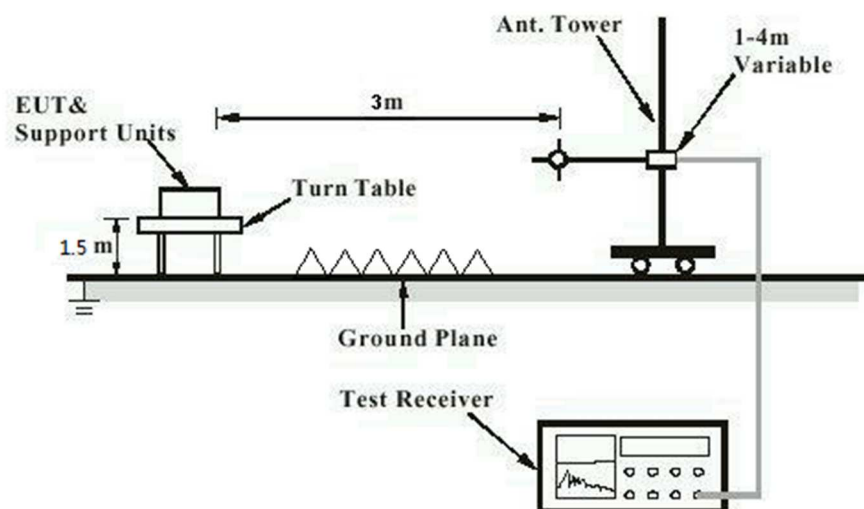
No additional measures were employed to achieve compliance.

## 4.5 Test Setup Diagram

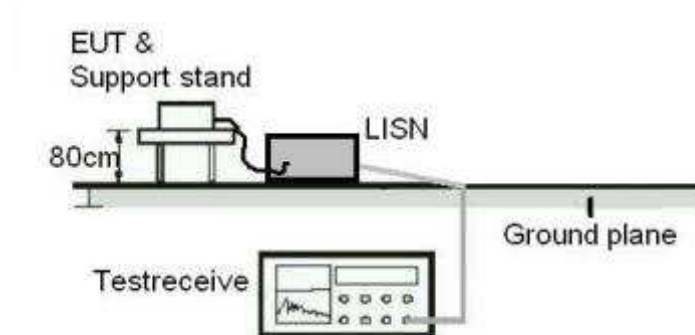
**Diagram of Measurement Configuration for Radiation Test (Below 1GHz)**



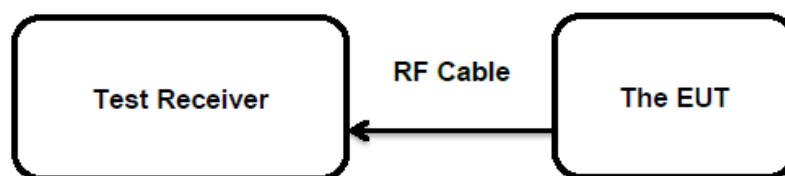
**Diagram of Measurement Configuration for Radiation Test (Above 1GHz)**



### Diagram of Measurement Configuration for Mains Conduction Measurement



### Diagram of Measurement Configuration for Conducted Transmitter Measurement



## 5 Test Results

### 5.1 Transmitter Requirement & Test Suites

#### 5.1.1 Antenna Requirement

RESULT:

Pass

**Test Specification**

|               |   |                                                                     |
|---------------|---|---------------------------------------------------------------------|
| Test standard | : | FCC Part 15.247(b)(4) and Part 15.203                               |
|               | : | RSS-Gen Clause 6.7                                                  |
| Limit         | : | the use of antennas with directional gains that do not exceed 6 dBi |

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 1.85 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

### 5.1.2 Maximum Peak Conducted Output Power

**RESULT:****Pass****Test Specification**

|                   |                                           |
|-------------------|-------------------------------------------|
| Test standard     | : FCC Part 15.247(b)(3)                   |
|                   | : RSS-247 Clause 5.4(d)                   |
| Basic standard    | : ANSI C63.10: 2013                       |
| Limits            | : < 1 Watt (Maximum Conducted Peak Power) |
|                   | : e.i.r.p. <4W                            |
| Kind of test site | : Shielded Room                           |

**Test Setup**

|                      |                       |
|----------------------|-----------------------|
| Date of testing      | : 2021-01-04          |
| Input voltage        | : AC 120V, 60Hz       |
| Operation mode       | : A                   |
| Test channel         | : Low / Middle / High |
| Ambient temperature  | : 24.3 °C             |
| Relative humidity    | : 52 %                |
| Atmospheric pressure | : 101 kPa             |

For details refer to following test result.

**Table 5: Test Result of Maximum Peak Conducted Output Power,**

| Channel        | Channel Frequency (MHz) | Peak Output Power |         | Limit |
|----------------|-------------------------|-------------------|---------|-------|
|                |                         | (dBm)             | (W)     | (W)   |
| Low Channel    | 2402                    | 6.0               | 0.00398 | 1     |
| Middle Channel | 2440                    | 6.8               | 0.00479 | 1     |
| High Channel   | 2480                    | 7.1               | 0.00513 | 1     |

Note: The cable loss is taken into account in results and the e.i.r.p. is 8.95 dBm less than 4W (36 dBm).

### 5.1.3 Conducted Power Spectral Density

**RESULT:****Pass****Test Specification**

|                   |                         |
|-------------------|-------------------------|
| Test standard     | : FCC Part 15.247(e)    |
|                   | : RSS-247 Clause 5.2(b) |
| Basic standard    | : ANSI C63.10: 2013     |
| Limits            | : 8 dBm / 3kHz          |
| Kind of test site | : Shielded Room         |

**Test Setup**

|                      |                       |
|----------------------|-----------------------|
| Date of testing      | : 2021-01-04          |
| Input voltage        | : AC 120V, 60Hz       |
| Operation mode       | : A                   |
| Test channel         | : Low / Middle / High |
| Ambient temperature  | : 25 °C               |
| Relative humidity    | : 56 %                |
| Atmospheric pressure | : 101 kPa             |

For details refer to following test result.

**Table 6: Test Result of Power Spectral Density**

| Channel        | Channel Frequency (MHz) | Power Spectral Density (dBm/3kHz) | Limit (dBm/3kHz) |
|----------------|-------------------------|-----------------------------------|------------------|
| Low Channel    | 2402                    | 4.36                              | 8                |
| Middle Channel | 2440                    | 5.16                              | 8                |
| High Channel   | 2480                    | 5.42                              | 8                |

Note: The cable loss is taken into account in results.

For the measurement records, refer to the appendix B.

### 5.1.4 99%dB Bandwidth

**RESULT:****Pass****Test Specification**

Test standard : RSS-Gen clause 6.7  
Basic standard : ANSI C63.10: 2013  
Kind of test site : Shielded Room

**Test Setup**

Date of testing : 2021-01-04  
Input voltage : AC 120V, 60Hz  
Operation mode : A  
Test channel : Low / Middle / High  
Ambient temperature : 25 °C  
Relative humidity : 56 %  
Atmospheric pressure : 101 kPa

**Table 7: Test Result of 99% Bandwidth**

| Channel      | Channel Frequency (MHz) | 99% Bandwidth (kHz) | Limit (MHz) | Result |
|--------------|-------------------------|---------------------|-------------|--------|
| Low Channel  | 2402                    | 1030                | /           | Pass   |
| Mid Channel  | 2440                    | 1030                | /           | Pass   |
| High Channel | 2480                    | 1035                | /           | Pass   |

For the measurement records, refer to the appendix B.

### 5.1.5 6dB Bandwidth

**RESULT:****Pass****Test Specification**

Test standard : FCC Part 15.247(a)(2)  
RSS-247 Clause 5.2(a)  
Basic standard : ANSI C63.10: 2013  
Kind of test site : Shielded Room

**Test Setup**

Date of testing : 2021-01-04  
Input voltage : AC 120V, 60Hz  
Operation mode : A  
Test channel : Low / Middle / High  
Ambient temperature : 25 °C  
Relative humidity : 56 %  
Atmospheric pressure : 101 kPa

**Table 8: Test Result of 6dB Bandwidth**

| Channel      | Channel Frequency (MHz) | -6dB Bandwidth (kHz) | Limit (kHz) | Result |
|--------------|-------------------------|----------------------|-------------|--------|
| Low Channel  | 2402                    | 693.070              | 500         | Pass   |
| Mid Channel  | 2440                    | 693.070              | 500         | Pass   |
| High Channel | 2480                    | 712.872              | 500         | Pass   |

For the measurement records, refer to the appendix B.

### 5.1.6 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

**RESULT:****Pass****Test Specification**

|                   |                                                                                                                                                                                                                                                                    |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test standard     | : FCC Part 15.247(d)<br>RSS-247 Clause 5.5                                                                                                                                                                                                                         |
| Basic standard    | : ANSI C63.10: 2013                                                                                                                                                                                                                                                |
| Limits            | : 20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power);<br>In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a) |
| Kind of test site | : Shielded Room                                                                                                                                                                                                                                                    |

**Test Setup**

|                      |                       |
|----------------------|-----------------------|
| Date of testing      | : 2021-01-04          |
| Input voltage        | : AC 120V, 60Hz       |
| Operation mode       | : A                   |
| Test channel         | : Low / Middle / High |
| Ambient temperature  | : 25 °C               |
| Relative humidity    | : 56 %                |
| Atmospheric pressure | : 101 kPa             |

Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to test plots, and compliance is achieved as well.

For the measurement records, refer to the appendix B.

### 5.1.7 Radiated Spurious Emission

**RESULT:****Pass****Test Specification**

|                   |                                                                         |
|-------------------|-------------------------------------------------------------------------|
| Test standard     | : FCC Part 15.247(d) & FCC Part 15.205<br>RSS-247 Clause 3.3 & 5.5      |
| Basic standard    | : ANSI C63.10: 2013                                                     |
| Limits            | : Refer to 15.209(a) of FCC part 15.247(d)<br>RSS-Gen Table 4 & Table 5 |
| Kind of test site | : 3m Semi-anechoic Chamber                                              |

**Test Setup**

|                      |                           |
|----------------------|---------------------------|
| Date of testing      | : 2021-01-07 – 2021-01-12 |
| Input voltage        | : AC 120V, 60Hz           |
| Operation mode       | : A                       |
| Test channel         | : Low / Middle / High     |
| Ambient temperature  | : 22°C                    |
| Relative humidity    | : 50 %                    |
| Atmospheric pressure | : 101 kPa                 |

**Remark:**

Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix B.

### 5.1.8 Conducted Emission on AC Mains

**RESULT:****Pass****Test Specification**

|                   |                                            |
|-------------------|--------------------------------------------|
| Test standard     | : FCC Part 15.207(a)<br>RSS-Gen Clause 8.8 |
| Basic standard    | : ANSI C63.10: 2013                        |
| Frequency range   | : 0.15 – 30MHz                             |
| Limits            | : FCC Part 15.207(a)<br>RSS-Gen Table 4    |
| Kind of test site | : Shielded Room                            |

**Test Setup**

|                      |                 |
|----------------------|-----------------|
| Date of testing      | : 2021-01-15    |
| Input voltage        | : AC 120V/60Hz  |
| Operation mode       | : B             |
| Earthing             | : Not connected |
| Ambient temperature  | : 24.3 °C       |
| Relative humidity    | : 52 %          |
| Atmospheric pressure | : 101 kPa       |

For the measurement records, refer to the appendix B.

## 6 Safety Human Exposure

### 6.1 Radio Frequency Exposure Compliance

#### 6.1.1 Electromagnetic Fields

**RESULT:****Pass****Test Specification**

Test standard : CFR47 FCC Part 2.1091  
RSS-102 Issue 5 March 2015  
FCC KDB Publication 447498 v06

Limit : CFR47 FCC Part 1.1310

**FCC requirement:** Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

**MPE Calculation Method according to OET Bulletin 65**

Power Density:  $S_{(\text{mW}/\text{cm}^2)} = PG/4\pi R^2$  or  $\text{EIRP}/4\pi R^2$

Where:

S = power density ( $\text{mW}/\text{cm}^2$ )

P = power input to the antenna (mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (cm)

**The nominal maximum conducted output power specified:**

BLE: 7.10 dBm

From the peak RF output power, the minimum mobile separation distance,  $d=20$  cm, as well as the antenna gain (1.85 dBi), the RF power density can be calculated as below:

For BLE:  $S_{(\text{mW}/\text{cm}^2)} = PG/4\pi R^2 = 0.002 \text{ mW}/\text{cm}^2$

**Limits for Maximum Permissible Exposure (MPE) according to FCC Part 1.1310:** 1.0  $\text{mW}/\text{cm}^2$

➤ **IC requirements:** The EUT shall comply with the requirement of RSS-102 section 2.5.2.

**Exemption from Routine Evaluation Limits – RF Exposure Evaluation**

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;

- RF exposure evaluation exempted power for 2.4G DTS: 2.676 W

**The nominal maximum conducted output power specified:**

BLE: 7.10 dBm

Antenna Gain: 1.85 dBi

The Max. e.i.r.p. for BLE: 8.95dBm = 0.008 W

The e.i.r.p. of BLE is less than the RF exposure evaluation exempted power. So RF exposure evaluation is not required.

**“RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.”**

## 7 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

## 8 List of Tables

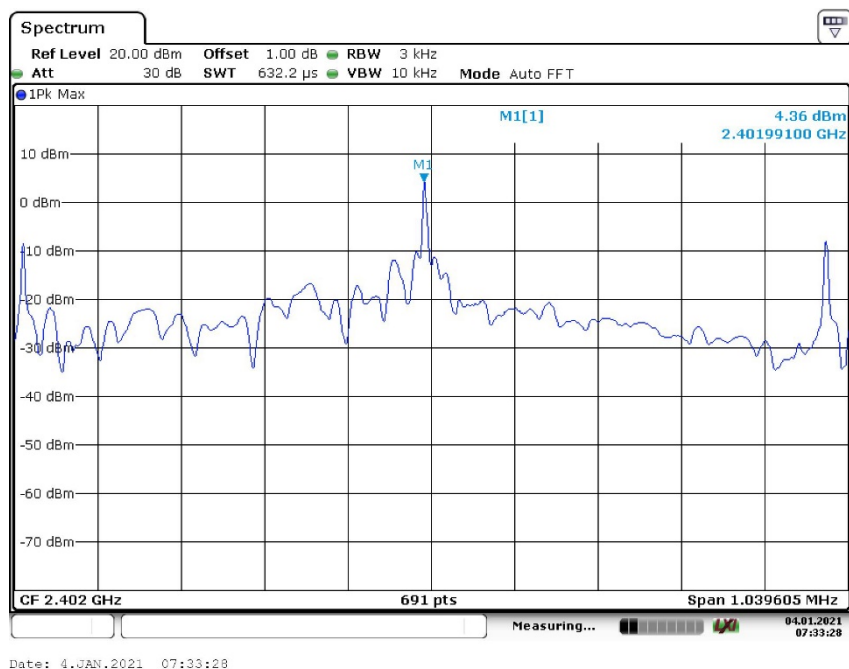
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## Appendix B: Test Results

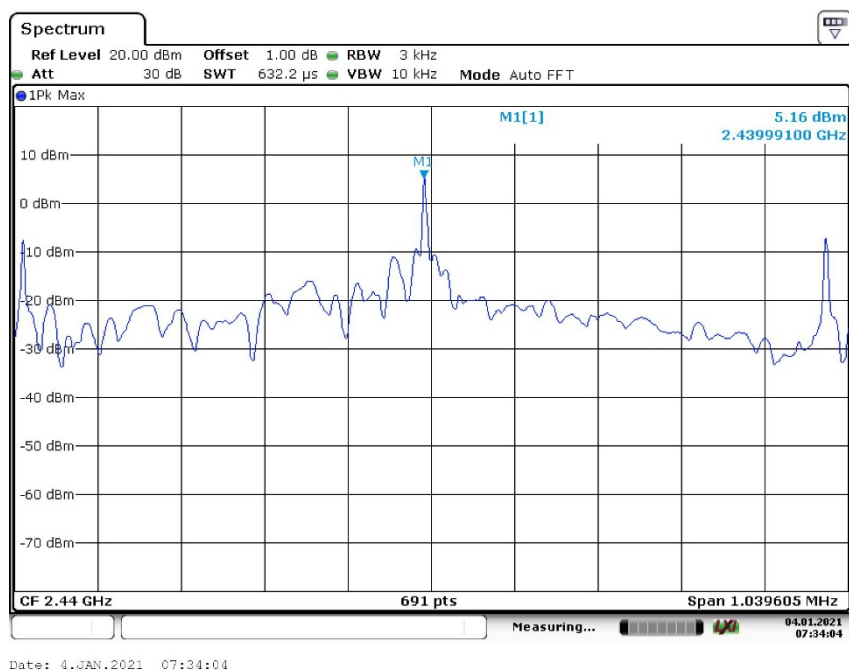
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## Appendix B.1: Conducted Power Spectral Density

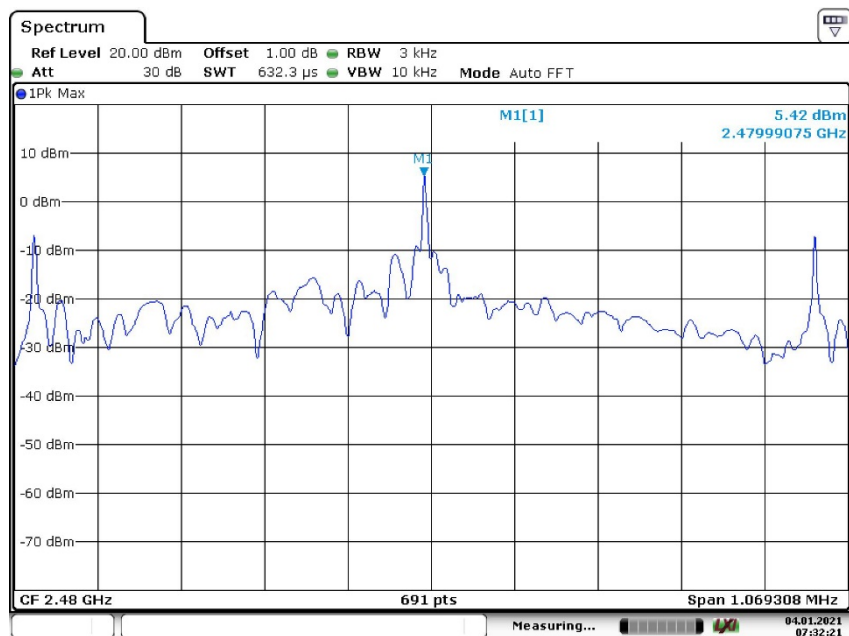
### Low Channel



### Middle Channel



## High Channel

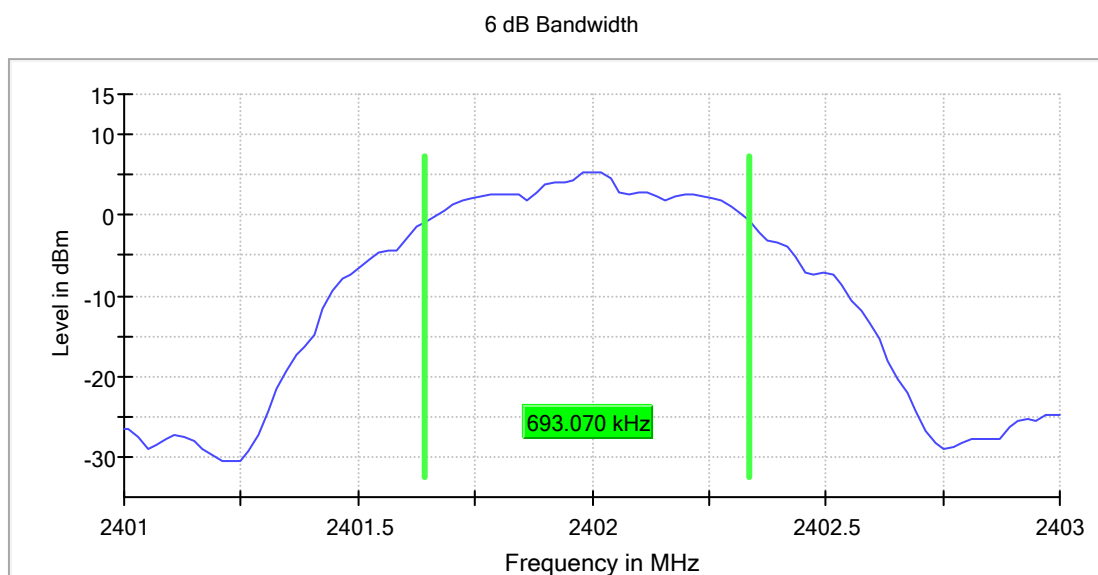


Date: 4.JAN.2021 07:32:21

## Appendix B.2: 6dB Bandwidth

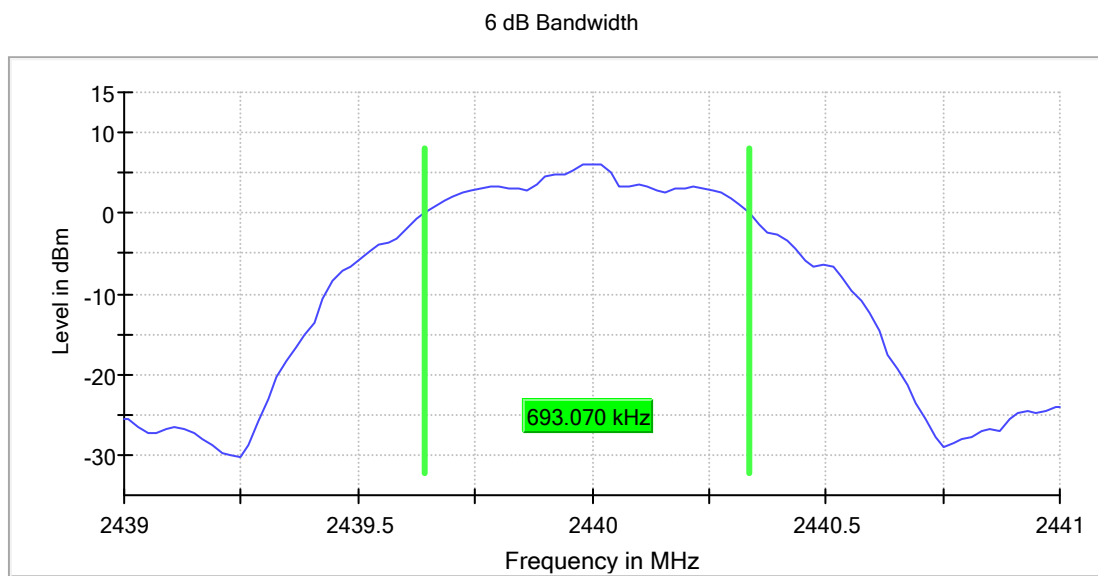
### Low Channel

RBW=100KHz, VBW=300KHz



### Middle Channel

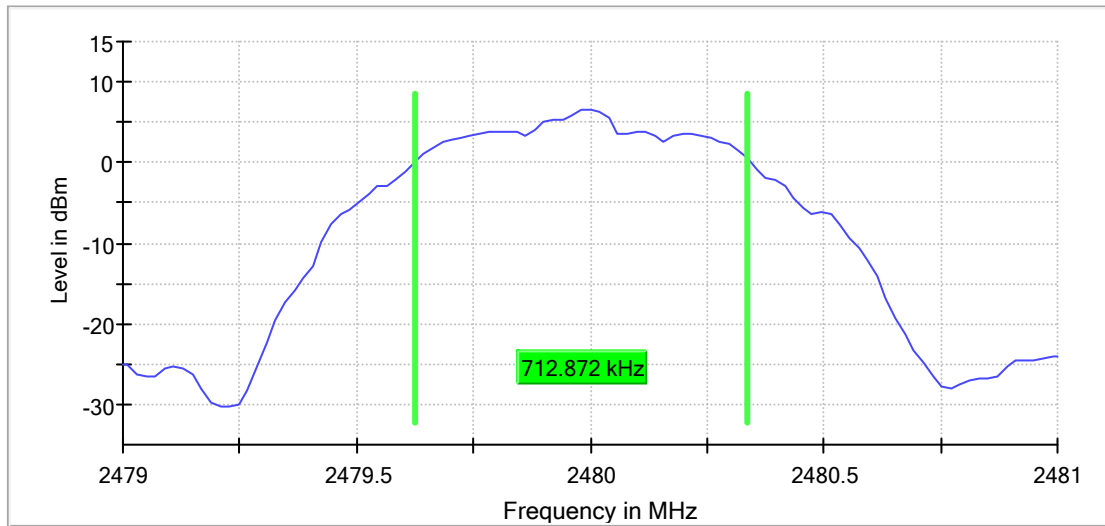
RBW=100KHz, VBW=300KHz



**High Channel**

RBW=100KHz, VBW=300KHz

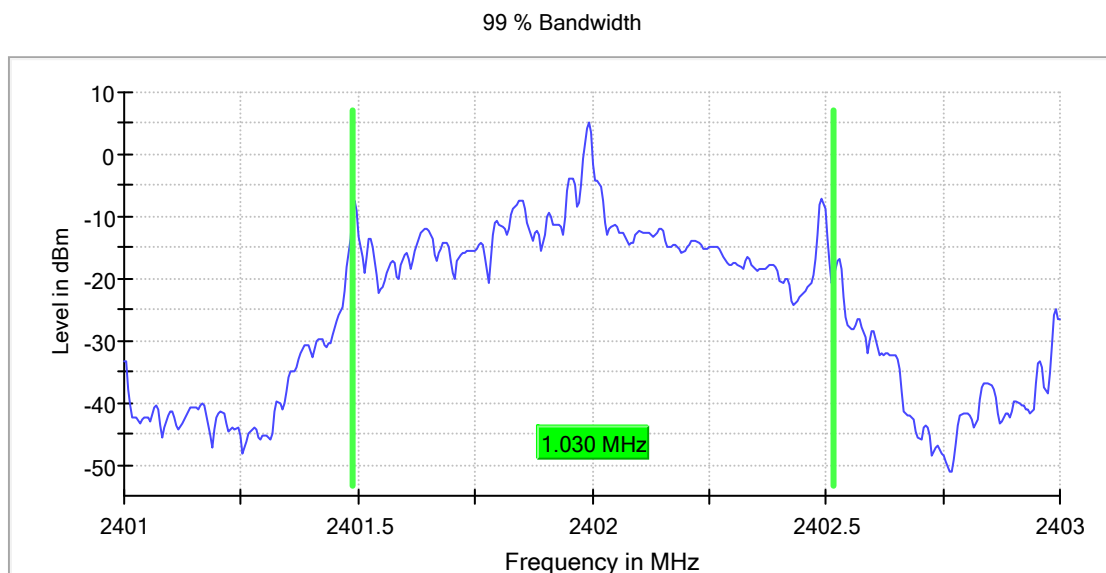
6 dB Bandwidth



## Appendix B.3: 99% Bandwidth

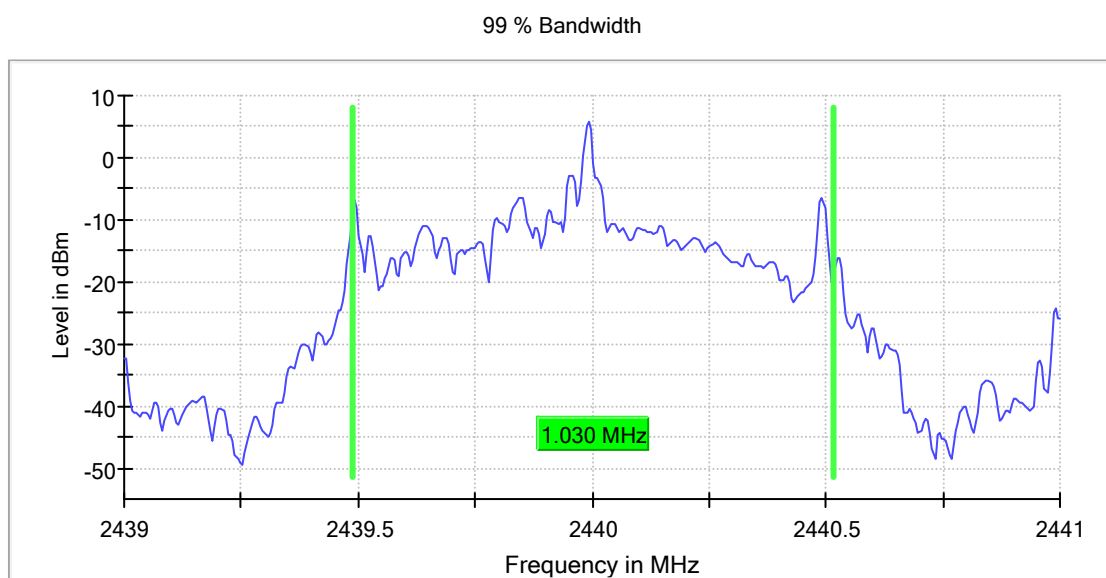
### Low Channel

RBW=50KHz, VBW=200KHz



### Middle Channel

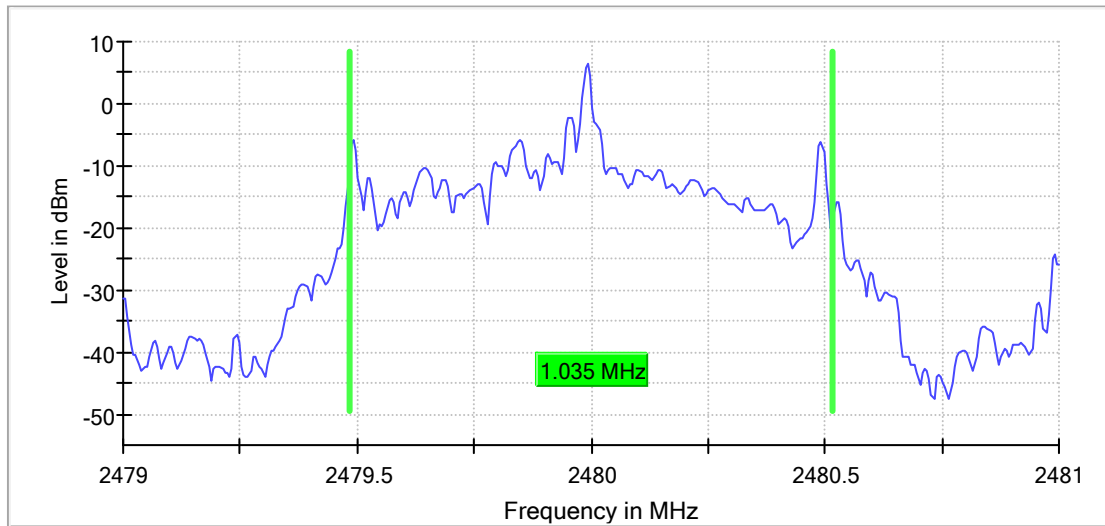
RBW=50KHz, VBW=200KHz



**High Channel**

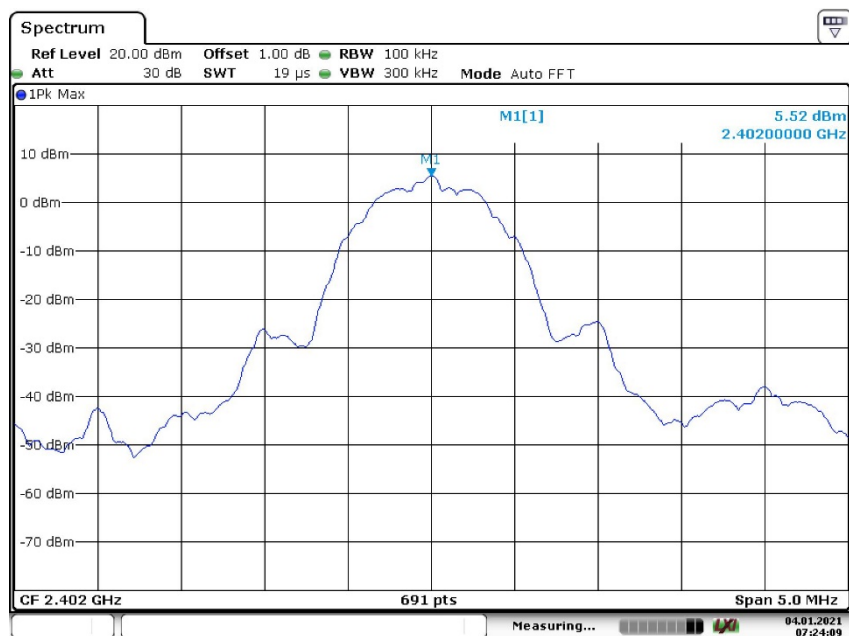
RBW=50KHz, VBW=200KHz

99 % Bandwidth

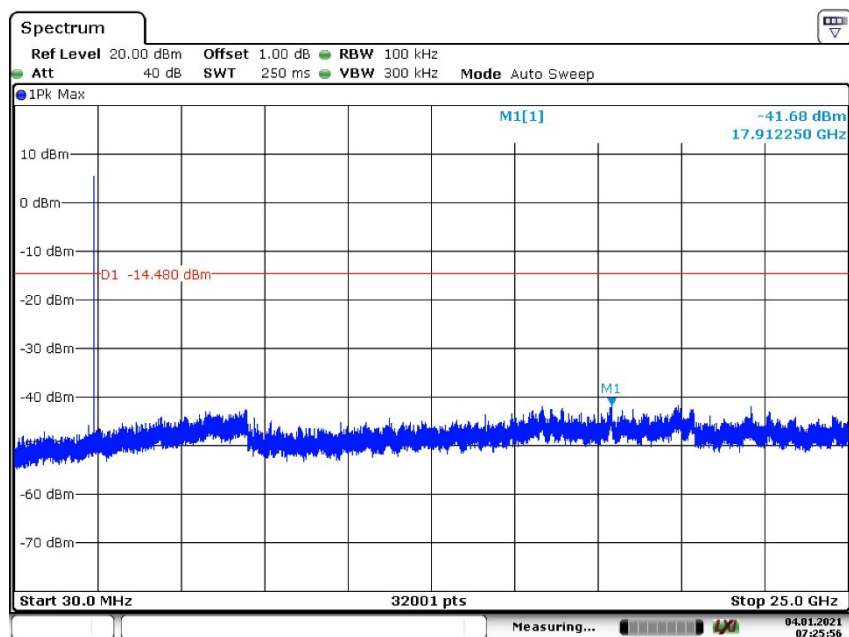


## Appendix B.4: Conducted Spurious Emissions Measured in 100 kHz Bandwidth

### Low Channel

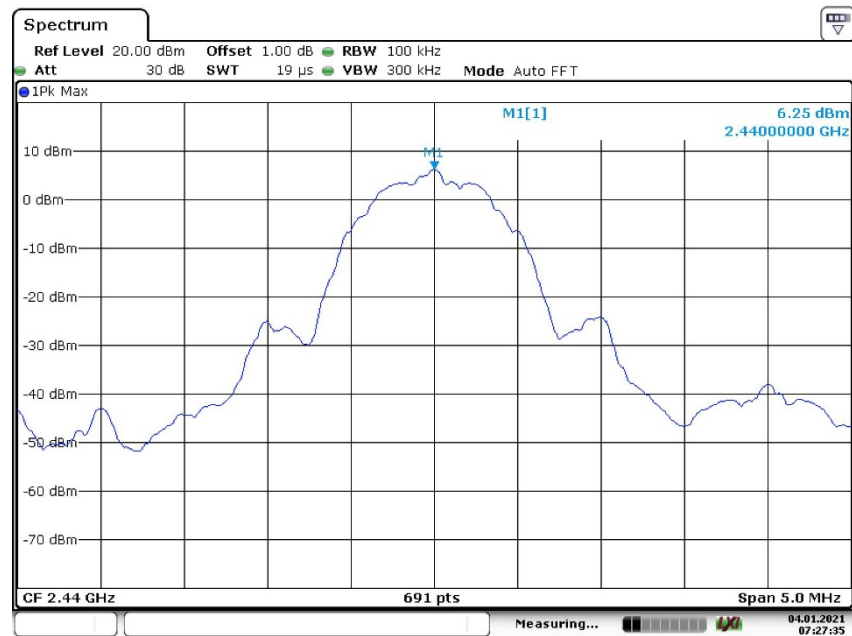


Date: 4.JAN.2021 07:24:09

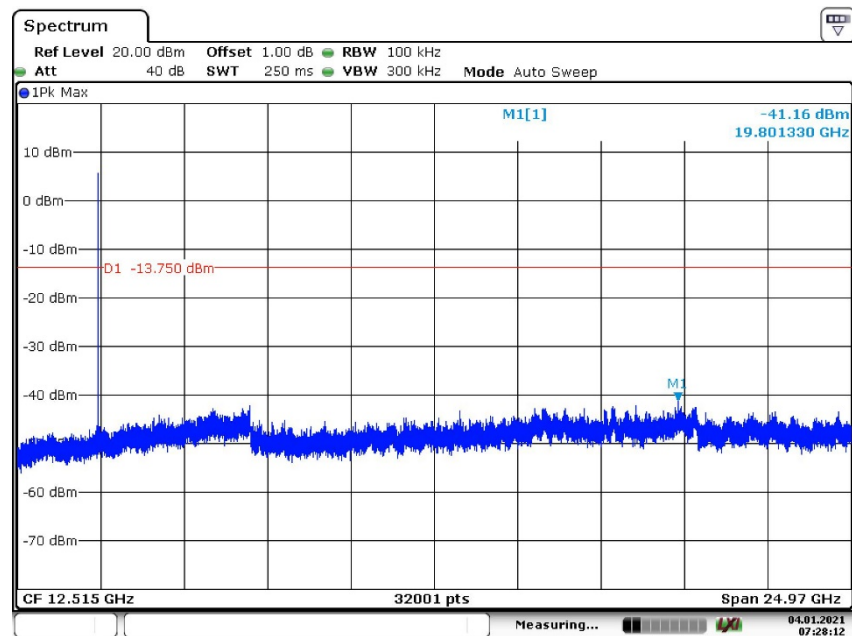


Date: 4.JAN.2021 07:25:56

## Middle Channel

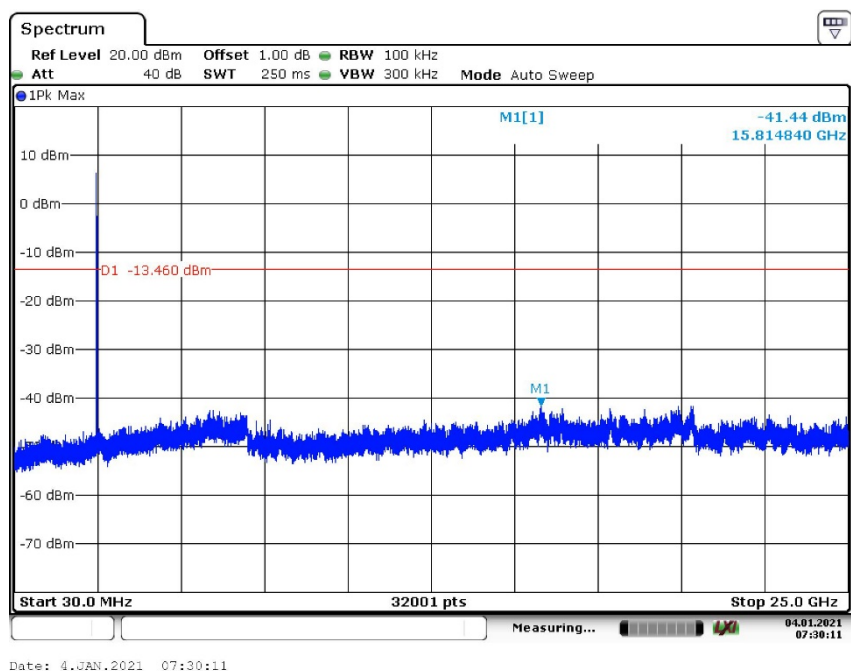
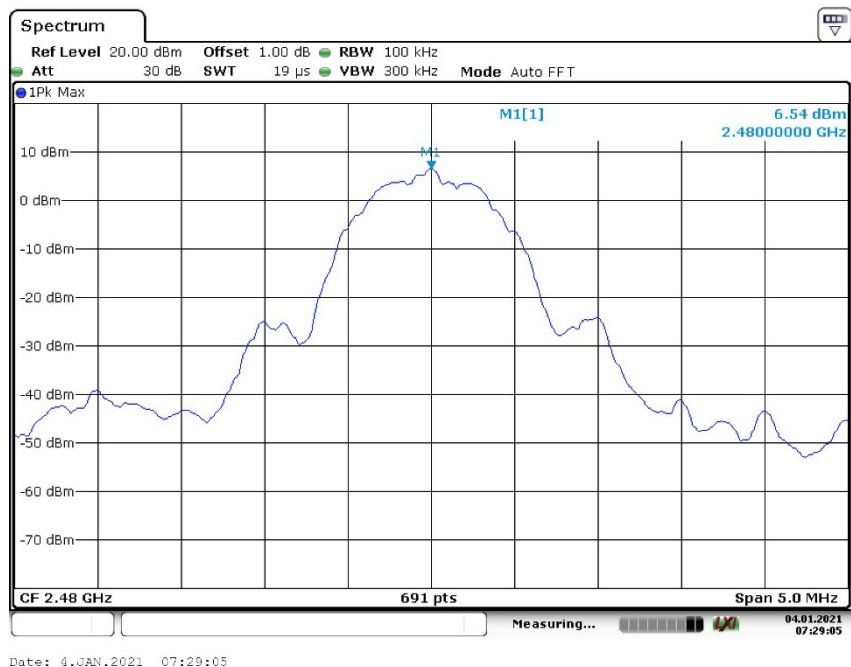


Date: 4.JAN.2021 07:27:35

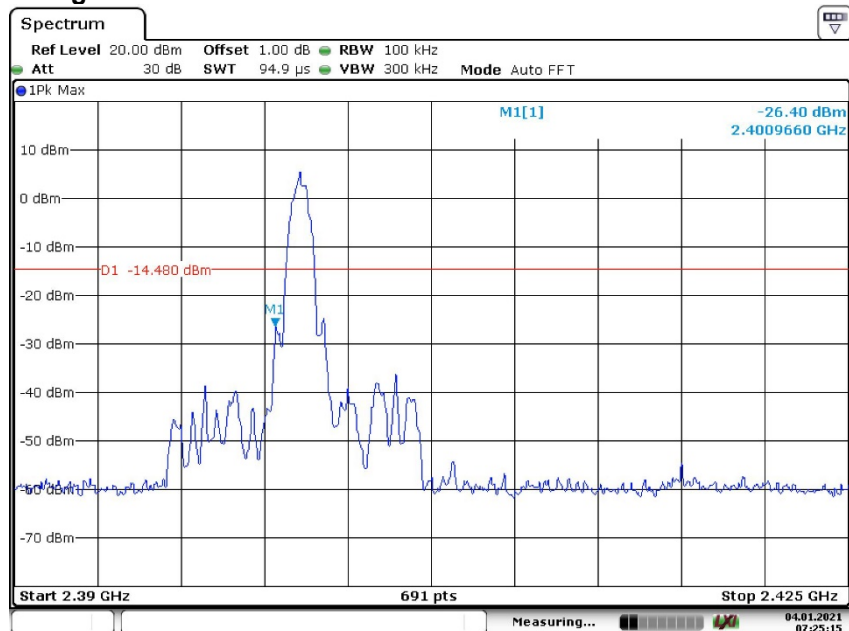


Date: 4.JAN.2021 07:28:12

## High Channel

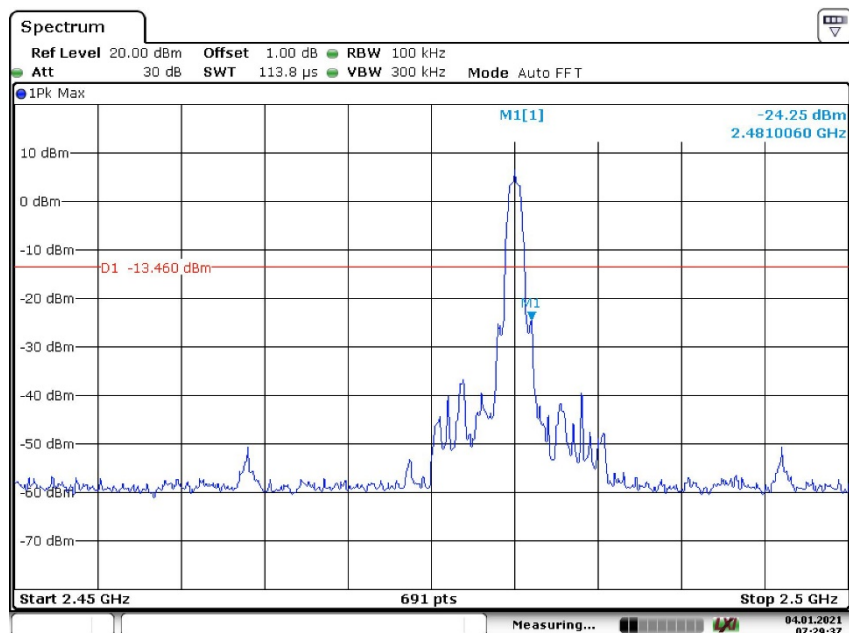


## Low Channel\_Band Edge



Date: 4.JAN.2021 07:25:15

## High Channel\_Band Edge



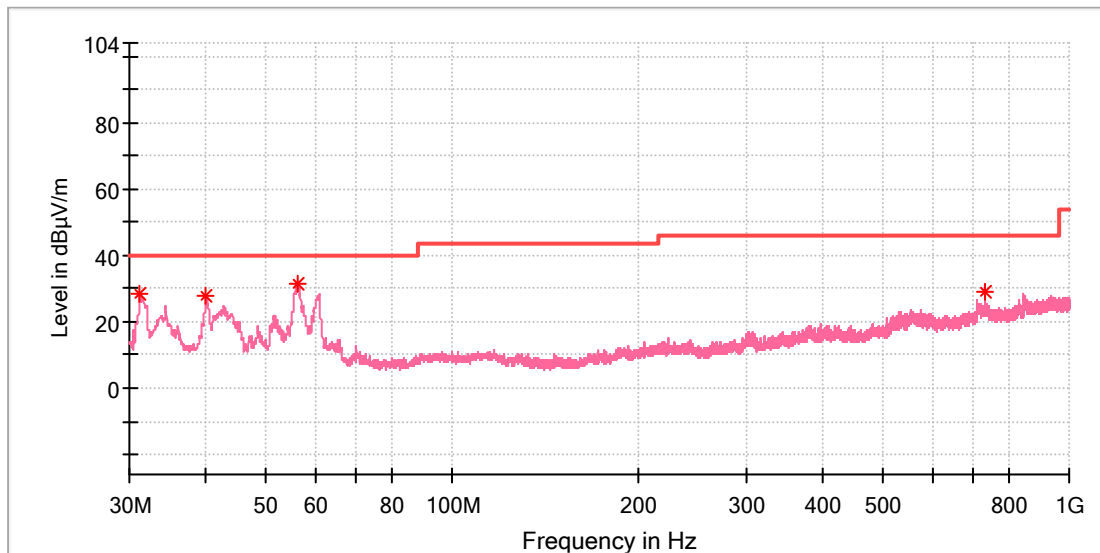
Date: 4.JAN.2021 07:29:37

## Appendix B.5: Test Results of Radiated Spurious Emissions

Note 1: Testing was carried out within frequency range 9 kHz to the tenth harmonics. The measurement results below 30MHz and above 18GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

### EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_Low CH        |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 24 Humi:47%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

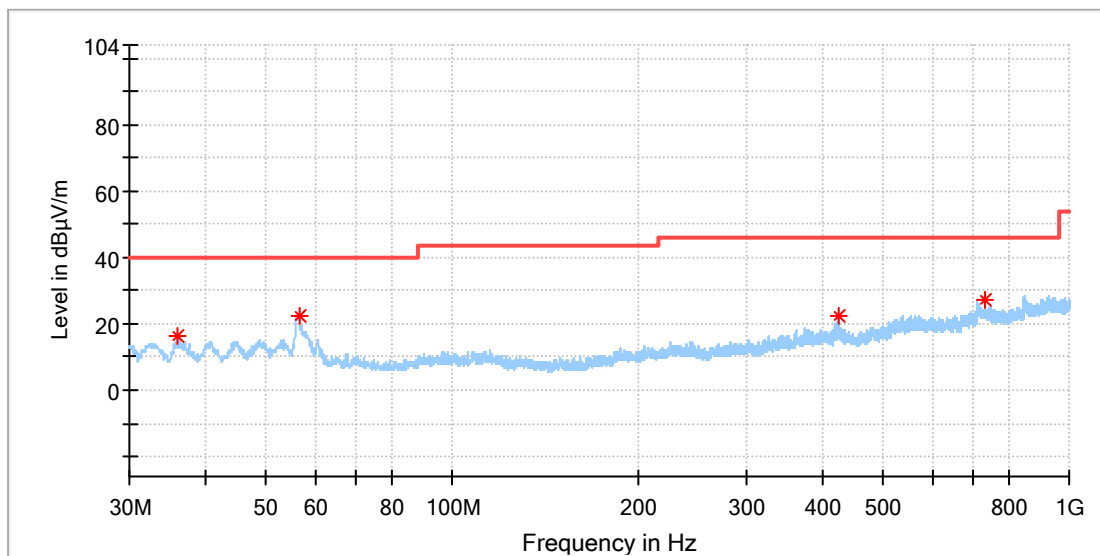


### Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 31.212500       | 28.19            | ---              | 40.00          | 11.81       | 100.0       | V   | 276.0         | -23.1        |
| 39.942500       | 27.82            | ---              | 40.00          | 12.18       | 100.0       | V   | 120.0         | -20.4        |
| 56.190000       | 31.66            | ---              | 40.00          | 8.34        | 100.0       | V   | 178.0         | -18.9        |
| 729.467000      | 28.82            | ---              | 46.00          | 17.18       | 100.0       | V   | 3.0           | -7.9         |

## EUT Information

EUT Name: In-Wall Smart Switch  
 Model: HIWMAS1BLE40AWH  
 Test Mode: TX\_BLE\_Low CH  
 Test Voltage:: AC 120V, 60Hz  
 Remark: Temp 24 Humi:47%  
 Test Standard: FCC 15.247  
 Tested By: Alano Qu  
 Reviewed By: Terry Yin

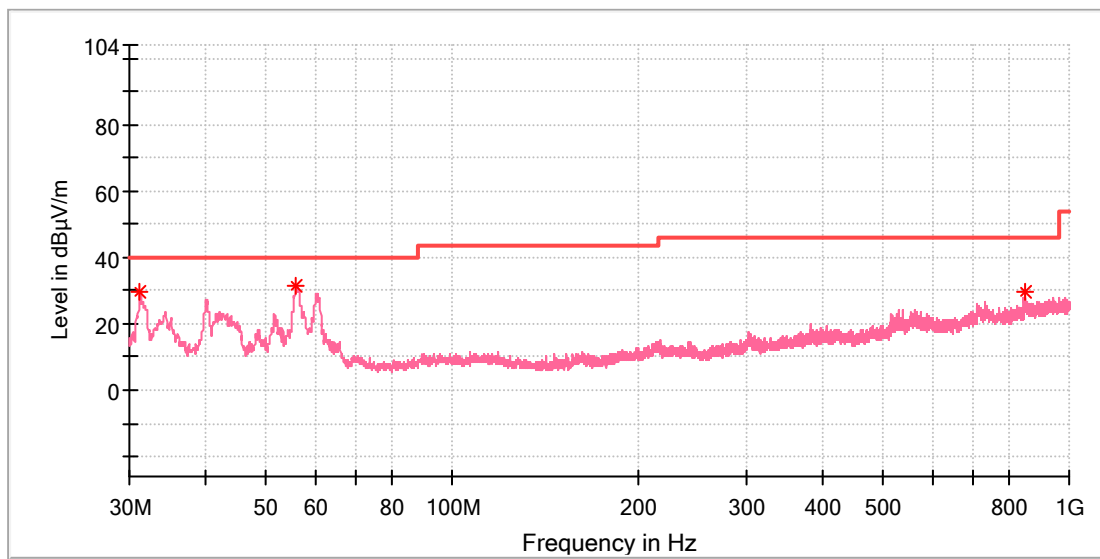


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 35.965500       | 16.09            | ---              | 40.00          | 23.91       | 100.0       | H   | 235.0         | -21.9        |
| 56.481000       | 22.65            | ---              | 40.00          | 17.35       | 100.0       | H   | 0.0           | -18.9        |
| 424.014000      | 22.47            | ---              | 46.00          | 23.53       | 100.0       | H   | 93.0          | -13.7        |
| 730.000500      | 27.34            | ---              | 46.00          | 18.66       | 100.0       | H   | 115.0         | -7.9         |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_High CH       |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 24 Humi:47%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

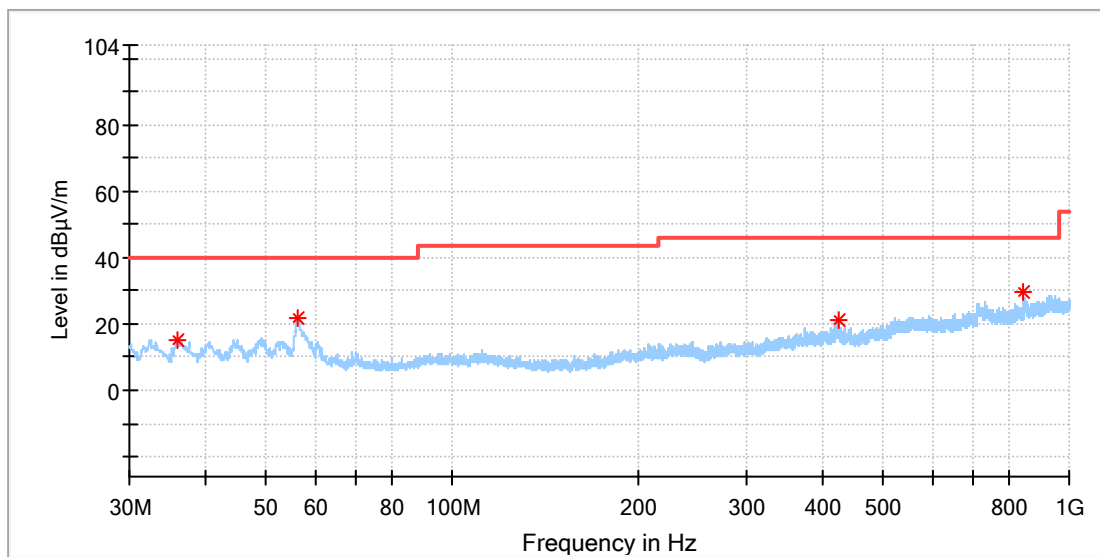


## Critical Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 31.212500       | 29.48            | ---              | 40.00          | 10.52       | 100.0       | V   | 213.0         | -23.1        |
| 55.899000       | 31.40            | ---              | 40.00          | 8.60        | 100.0       | V   | 13.0          | -18.8        |
| 845.236500      | 29.65            | ---              | 46.00          | 16.35       | 100.0       | V   | 279.0         | -6.0         |

## EUT Information

EUT Name: In-Wall Smart Switch  
 Model: HIWMAS1BLE40AWH  
 Test Mode: TX\_BLE\_High CH  
 Test Voltage:: AC 120V, 60Hz  
 Remark: Temp 24 Humi:47%  
 Test Standard: FCC 15.247  
 Tested By: Alano Qu  
 Reviewed By: Terry Yin

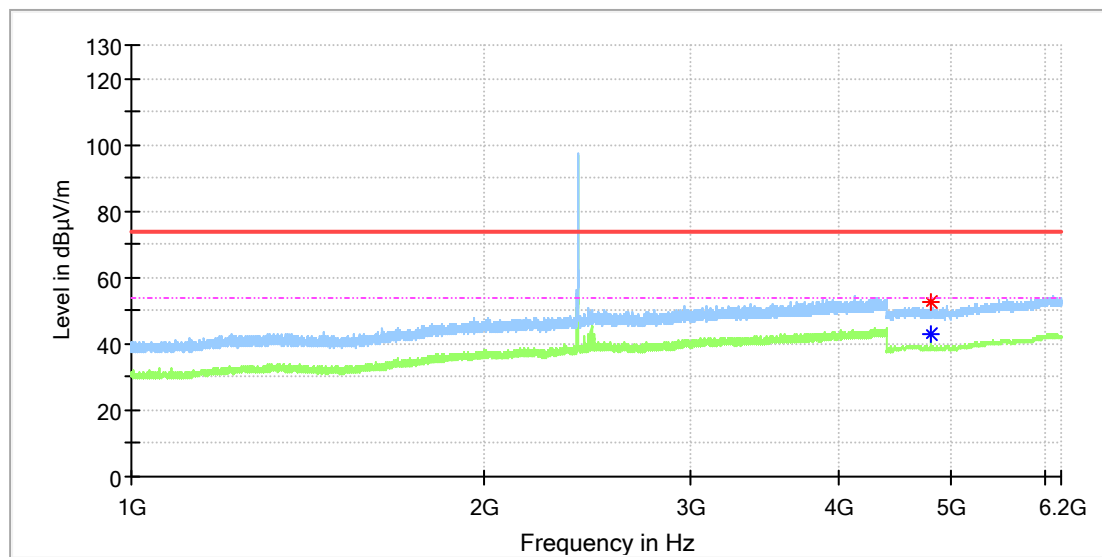


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 35.917000       | 15.32            | ---              | 40.00          | 24.68       | 100.0       | H   | 19.0          | -21.9        |
| 56.141500       | 21.93            | ---              | 40.00          | 18.07       | 100.0       | H   | 149.0         | -18.9        |
| 423.965500      | 21.02            | ---              | 46.00          | 24.98       | 100.0       | H   | 324.0         | -13.7        |
| 844.848500      | 29.93            | ---              | 46.00          | 16.07       | 100.0       | H   | 0.0           | -6.0         |

## EUT Information

EUT Name: In-Wall Smart Switch  
 Model: HIWMAS1BLE40AWH  
 Test Mode: TX\_BLE\_Low CH  
 Test Voltage:: AC 120V, 60Hz  
 Remark: Temp 22 Humi:50%  
 Test Standard: FCC 15.247  
 Tested By: Alano Qu  
 Reviewed By: Terry Yin

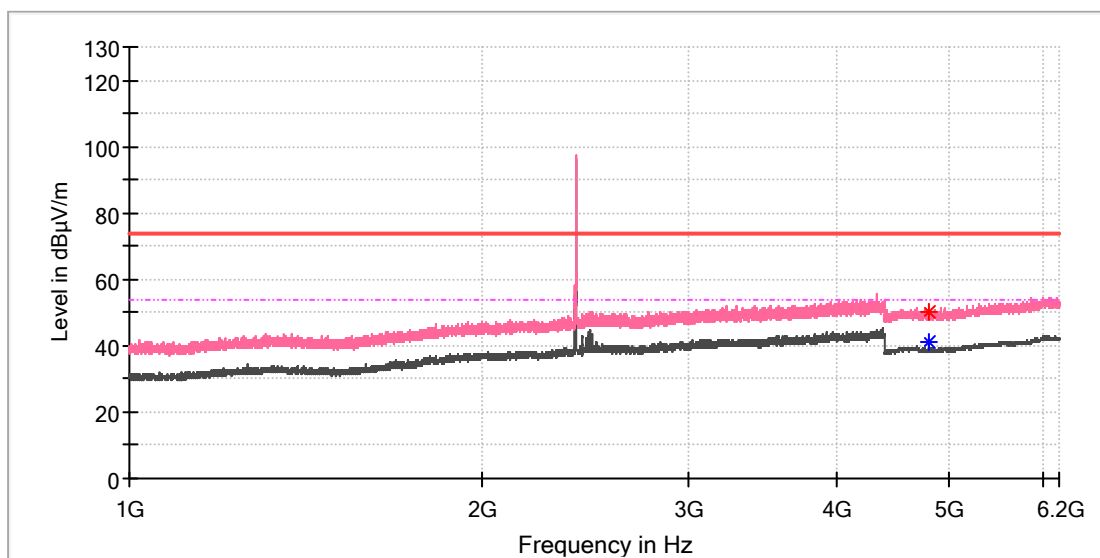


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 4803.500000     | ---              | 42.93            | 54.00          | 11.07       | 100.0       | H   | 1.0           | 11.8         |
| 4804.000000     | 52.61            | ---              | 74.00          | 21.39       | 100.0       | H   | 340.0         | 11.8         |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_Low CH        |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 22 Humi:50%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

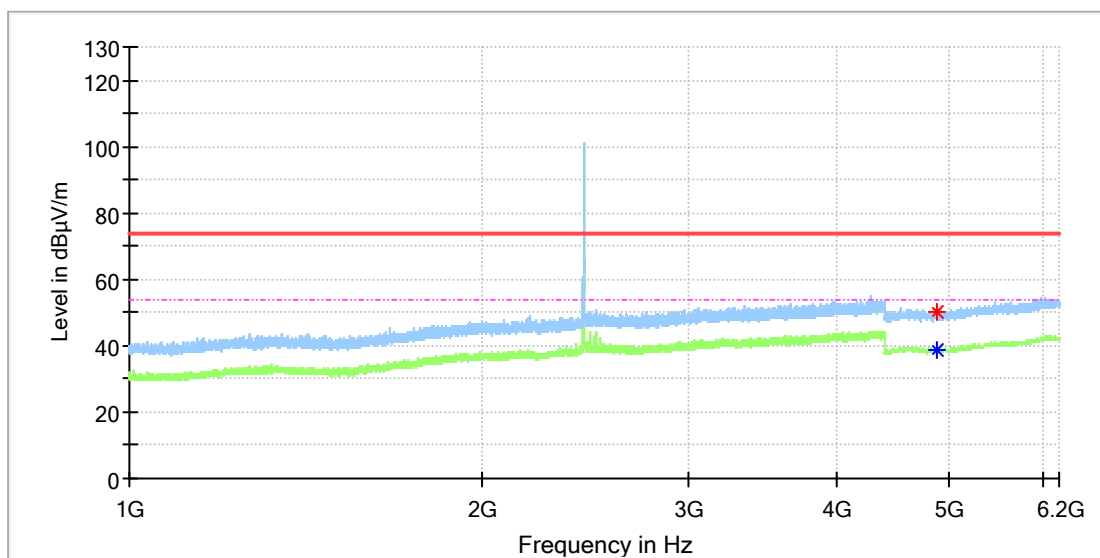


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 4804.000000     | ---              | 40.85            | 54.00          | 13.15       | 100.0       | V   | 310.0         | 11.8         |
| 4804.500000     | 50.10            | ---              | 74.00          | 23.90       | 100.0       | V   | 294.0         | 11.8         |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_Mid CH        |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 22 Humi:50%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

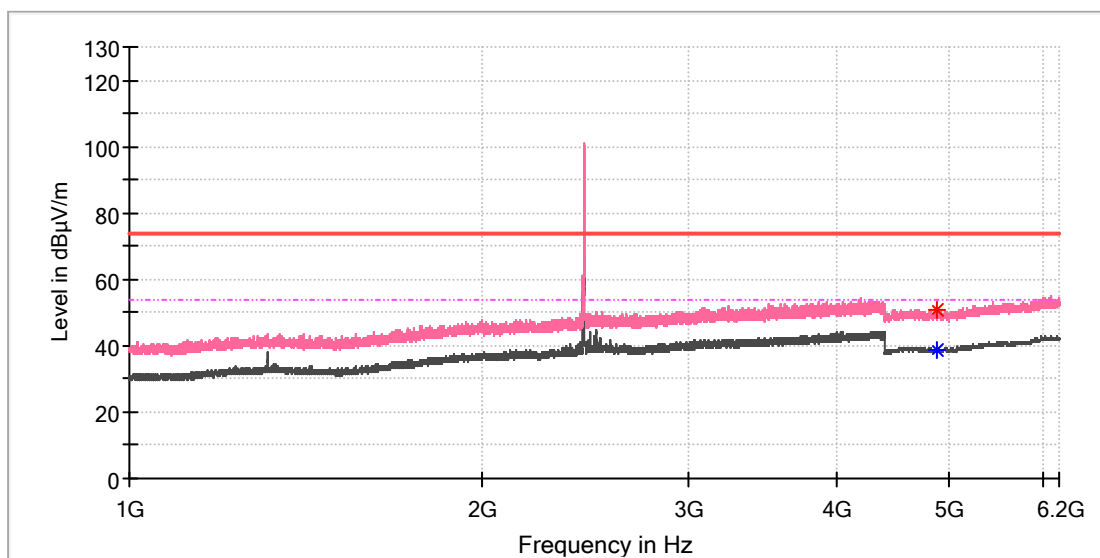


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 4880.000000     | ---              | 38.73            | 54.00          | 15.27       | 100.0       | H   | 233.0         | 11.8         |
| 4881.000000     | 49.99            | ---              | 74.00          | 24.01       | 100.0       | H   | 152.0         | 11.8         |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_Mid CH        |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 22 Humi:50%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

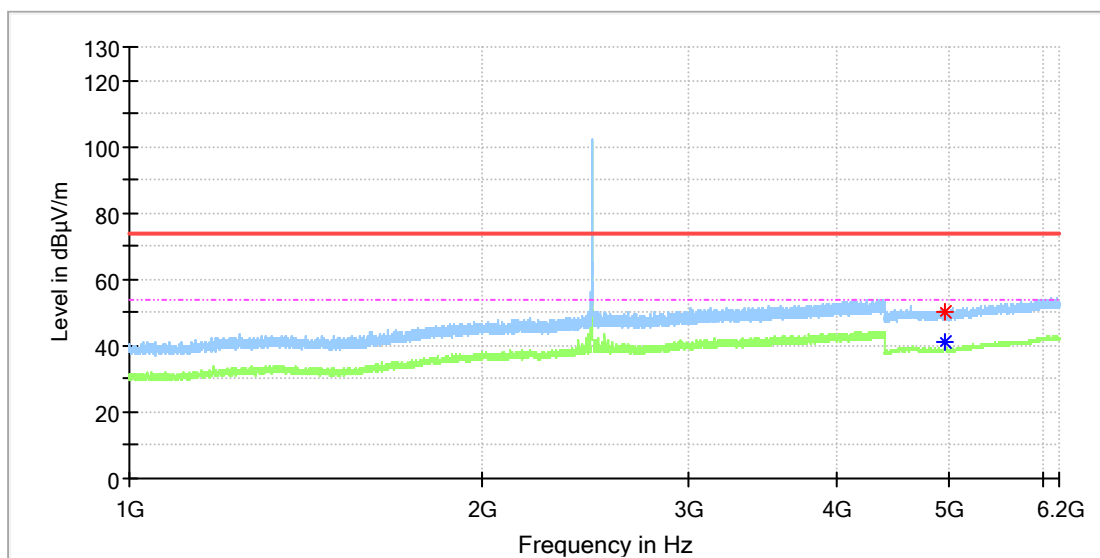


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 4878.000000     | 50.68            | ---              | 74.00          | 23.32       | 100.0       | V   | 73.0          | 11.8         |
| 4880.500000     | ---              | 38.73            | 54.00          | 15.27       | 100.0       | V   | 89.0          | 11.8         |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_High CH       |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 22 Humi:50%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

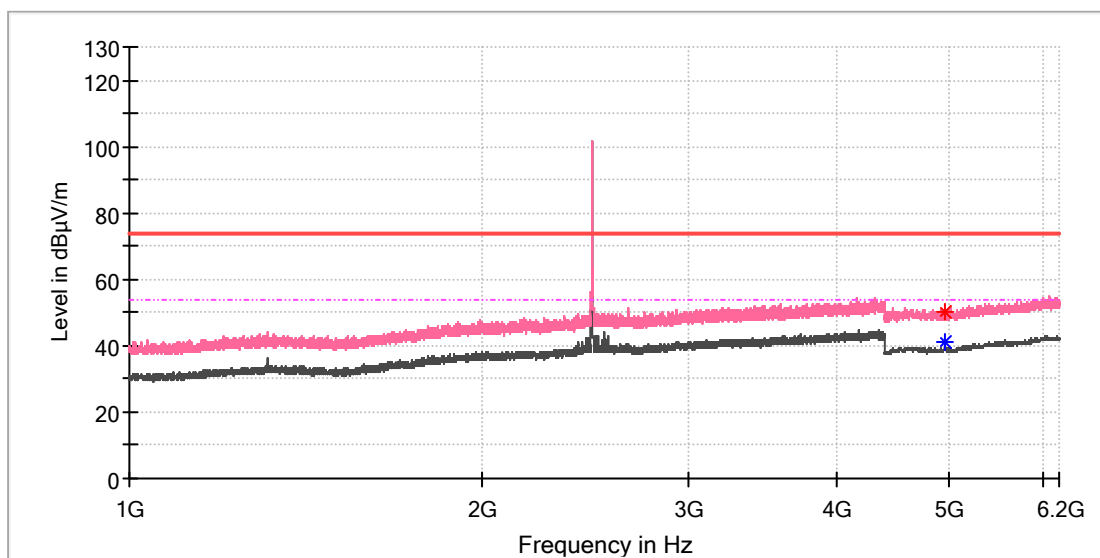


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 4956.500000     | 50.29            | ---              | 74.00          | 23.71       | 100.0       | H   | 76.0          | 11.8         |
| 4960.500000     | ---              | 41.12            | 54.00          | 12.88       | 100.0       | H   | 190.0         | 11.8         |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_High CH       |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 22 Humi:50%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

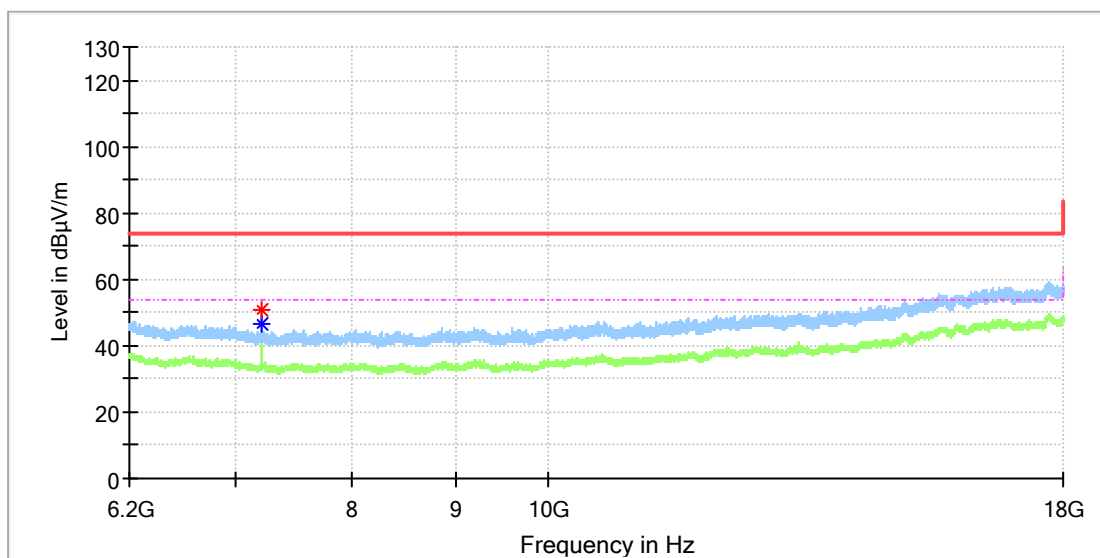


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 4960.000000     | 50.04            | ---              | 74.00          | 23.96       | 100.0       | V   | 315.0         | 11.8         |
| 4960.000000     | ---              | 40.84            | 54.00          | 13.16       | 100.0       | V   | 315.0         | 11.8         |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_Low CH        |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 24 Humi:47%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

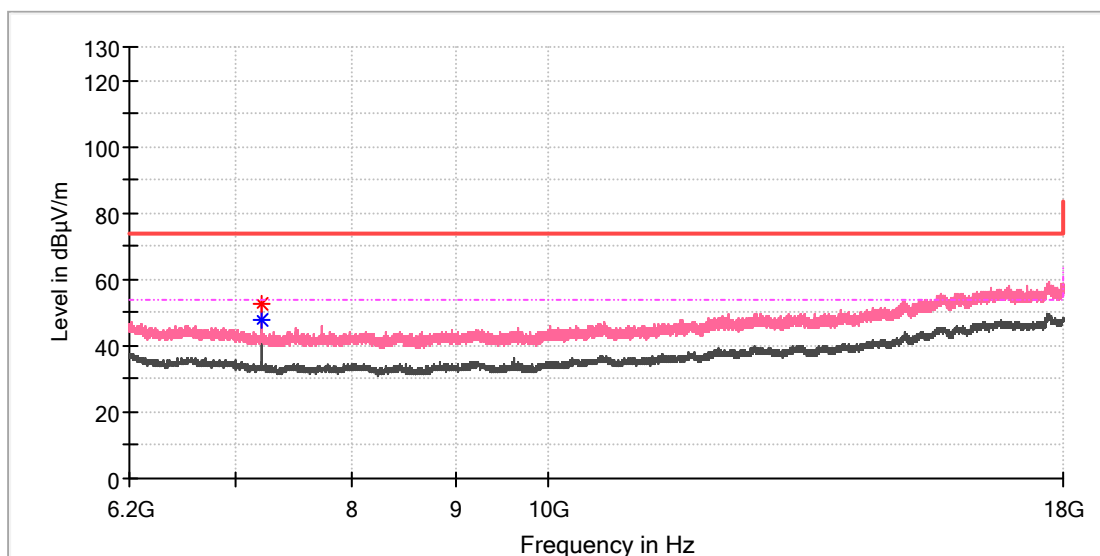


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 7205.458333     | ---              | 46.39            | 54.00          | 7.61        | 100.0       | H   | 354.0         | 8.8          |
| 7206.933333     | 50.96            | ---              | 74.00          | 23.04       | 100.0       | H   | 315.0         | 8.8          |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_Low CH        |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 24 Humi:47%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

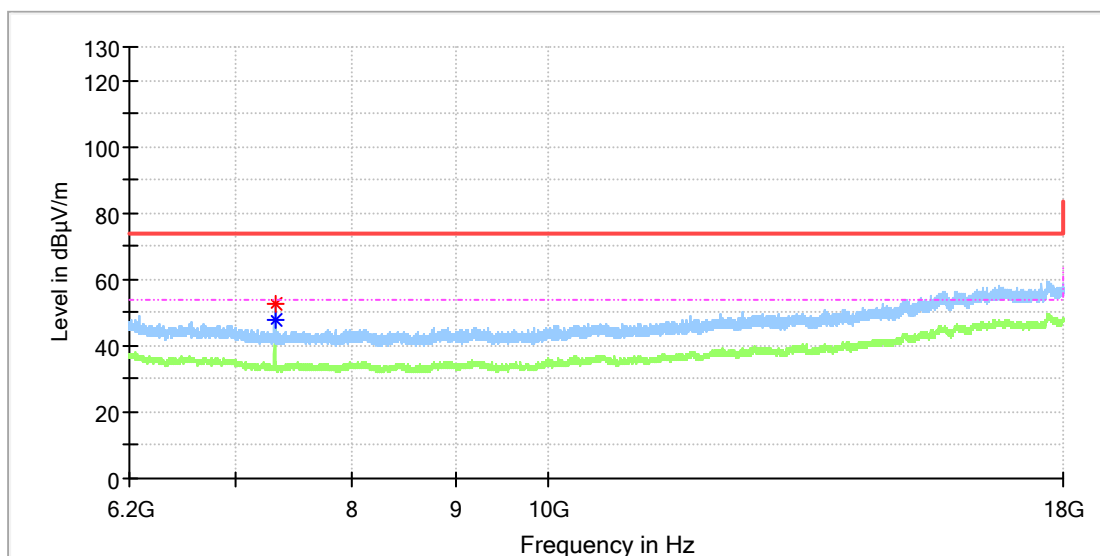


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 7205.458333     | ---              | 47.86            | 54.00          | 6.14        | 100.0       | V   | 113.0         | 8.8          |
| 7206.933333     | 52.83            | ---              | 74.00          | 21.17       | 100.0       | V   | 198.0         | 8.8          |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_Mid CH        |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 22 Humi:50%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

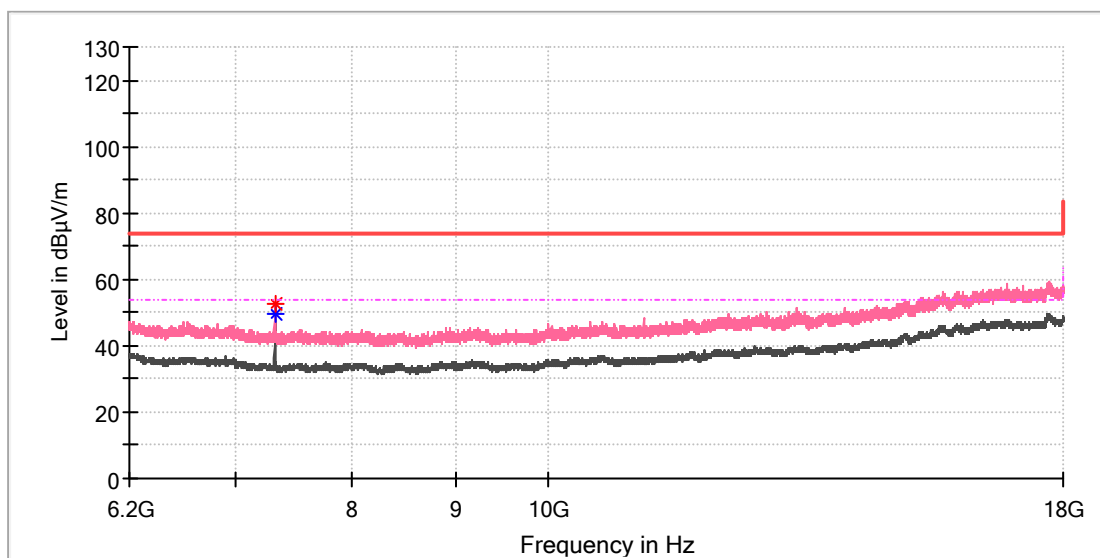


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 7320.508333     | 52.61            | ---              | 74.00          | 21.39       | 100.0       | H   | 250.0         | 8.2          |
| 7320.508333     | ---              | 47.76            | 54.00          | 6.24        | 100.0       | H   | 250.0         | 8.2          |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_Mid CH        |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 22 Humi:50%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

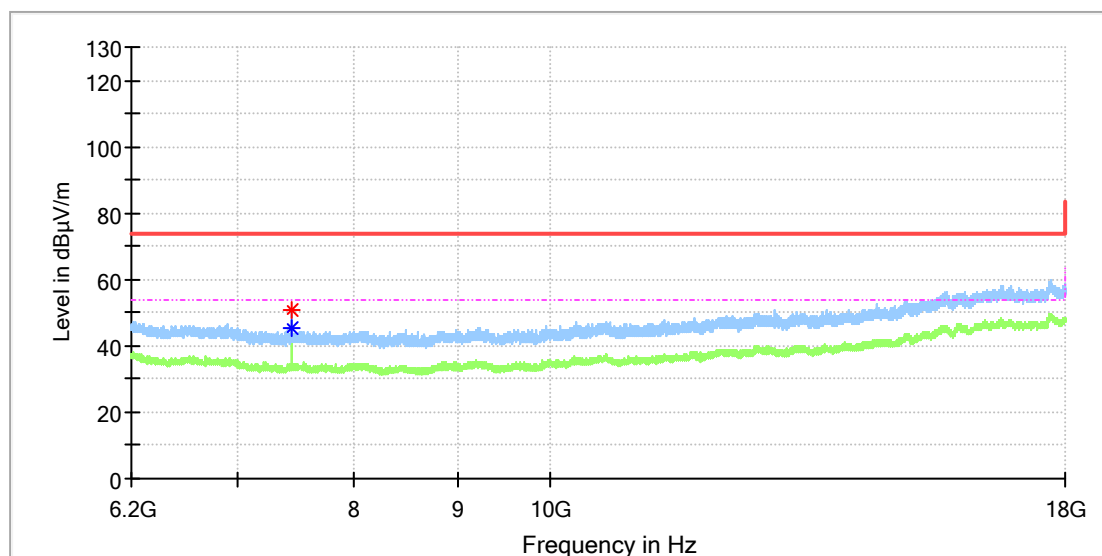


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 7320.016667     | 52.41            | ---              | 74.00          | 21.59       | 100.0       | V   | 81.0          | 8.2          |
| 7320.016667     | ---              | 49.59            | 54.00          | 4.41        | 100.0       | V   | 81.0          | 8.2          |

## EUT Information

EUT Name: In-Wall Smart Switch  
 Model: HIWMAS1BLE40AWH  
 Test Mode: TX\_BLE\_High CH  
 Test Voltage:: AC 120V, 60Hz  
 Remark: Temp 22 Humi:50%  
 Test Standard: FCC 15.247  
 Tested By: Alano Qu  
 Reviewed By: Terry Yin

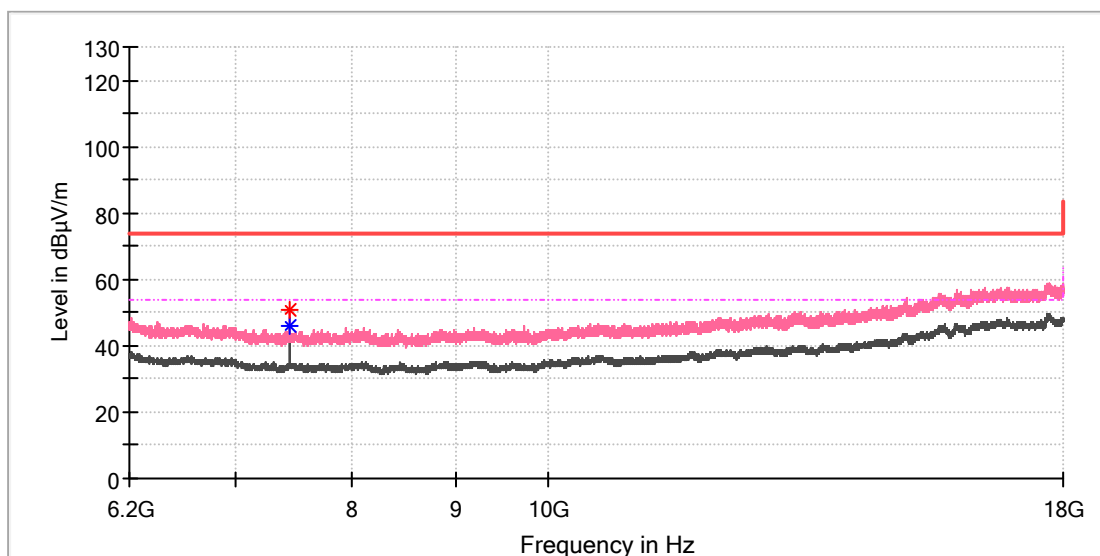


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 7439.000000     | 50.77            | ---              | 74.00          | 23.23       | 100.0       | H   | 206.0         | 8.4          |
| 7439.983333     | ---              | 45.23            | 54.00          | 8.77        | 100.0       | H   | 206.0         | 8.4          |

## EUT Information

EUT Name: In-Wall Smart Switch  
 Model: HIWMAS1BLE40AWH  
 Test Mode: TX\_BLE\_High CH  
 Test Voltage:: AC 120V, 60Hz  
 Remark: Temp 22 Humi:50%  
 Test Standard: FCC 15.247  
 Tested By: Alano Qu  
 Reviewed By: Terry Yin



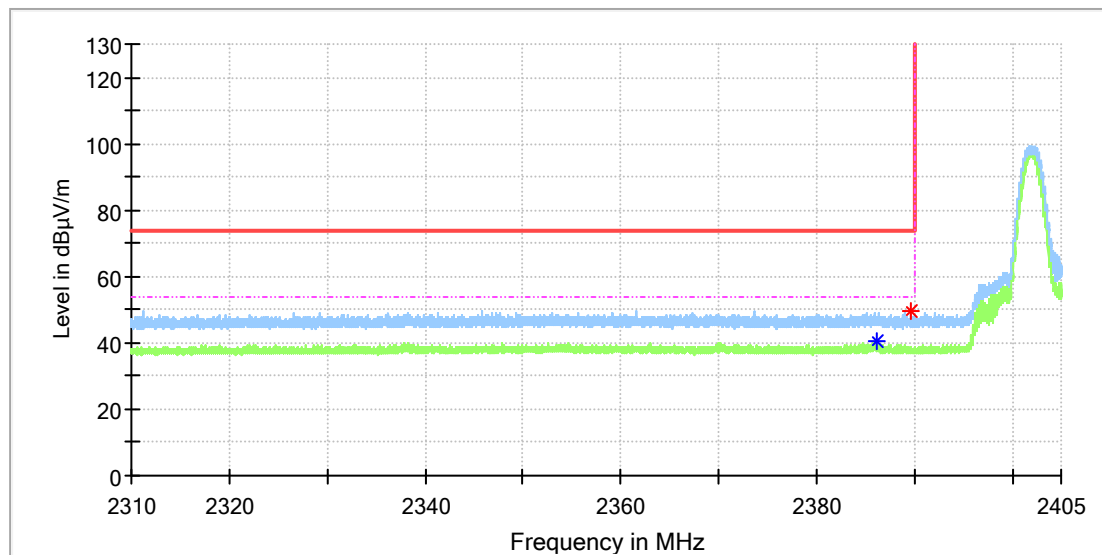
## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 7439.491667     | 50.62            | ---              | 74.00          | 23.38       | 100.0       | V   | 230.0         | 8.4          |
| 7439.491667     | ---              | 45.89            | 54.00          | 8.11        | 100.0       | V   | 230.0         | 8.4          |

## Appendix B.6: Test Results of Radiated Emissions in Restricted Bands

### EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_Low CH        |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 24 Humi:47%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

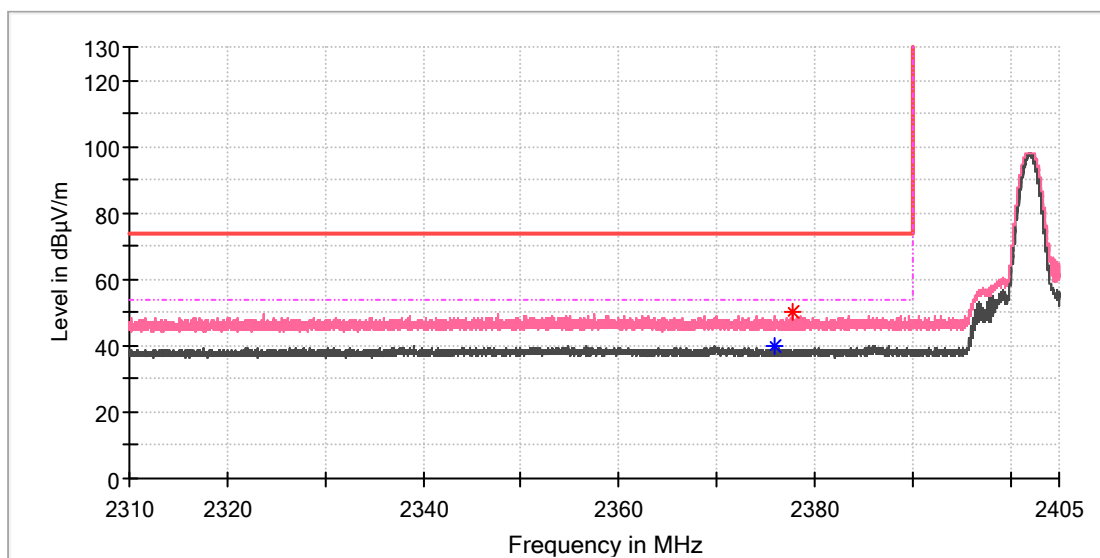


### Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 2386.177500     | ---              | 40.30            | 54.00          | 13.70       | 100.0       | H   | 257.0         | 7.0          |
| 2389.684500     | 49.34            | ---              | 74.00          | 24.67       | 100.0       | H   | 19.0          | 7.0          |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_Low CH        |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 24 Humi:47%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

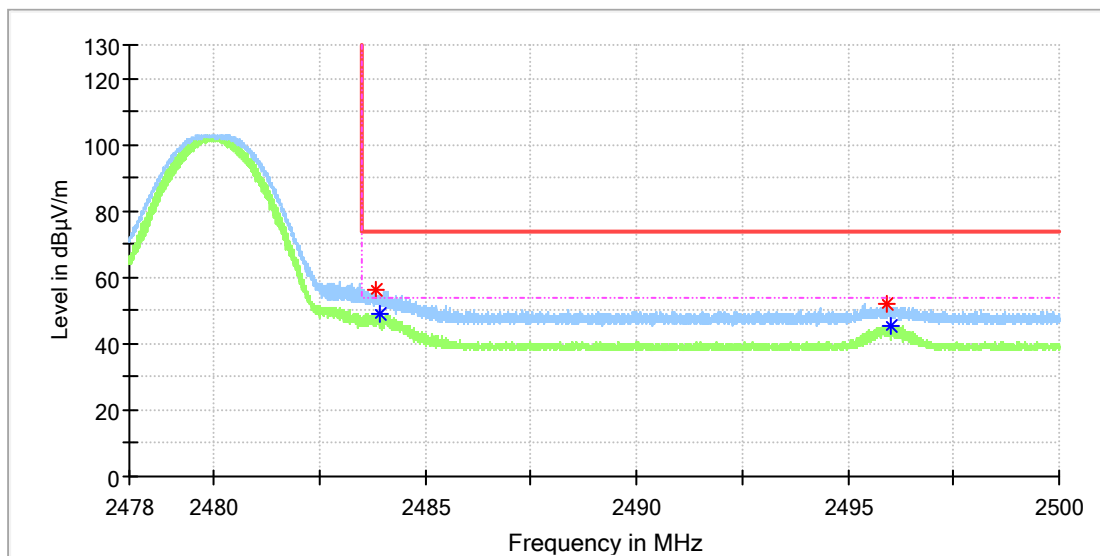


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 2375.934750     | ---              | 39.80            | 54.00          | 14.20       | 100.0       | V   | 191.0         | 6.9          |
| 2377.735500     | 50.16            | ---              | 74.00          | 23.84       | 100.0       | V   | 180.0         | 6.9          |

## EUT Information

|                |                      |
|----------------|----------------------|
| EUT Name:      | In-Wall Smart Switch |
| Model:         | HIWMAS1BLE40AWH      |
| Test Mode:     | TX_BLE_High CH       |
| Test Voltage:: | AC 120V, 60Hz        |
| Remark:        | Temp 22 Humi:50%     |
| Test Standard: | FCC 15.247           |
| Tested By:     | Alano Qu             |
| Reviewed By:   | Terry Yin            |

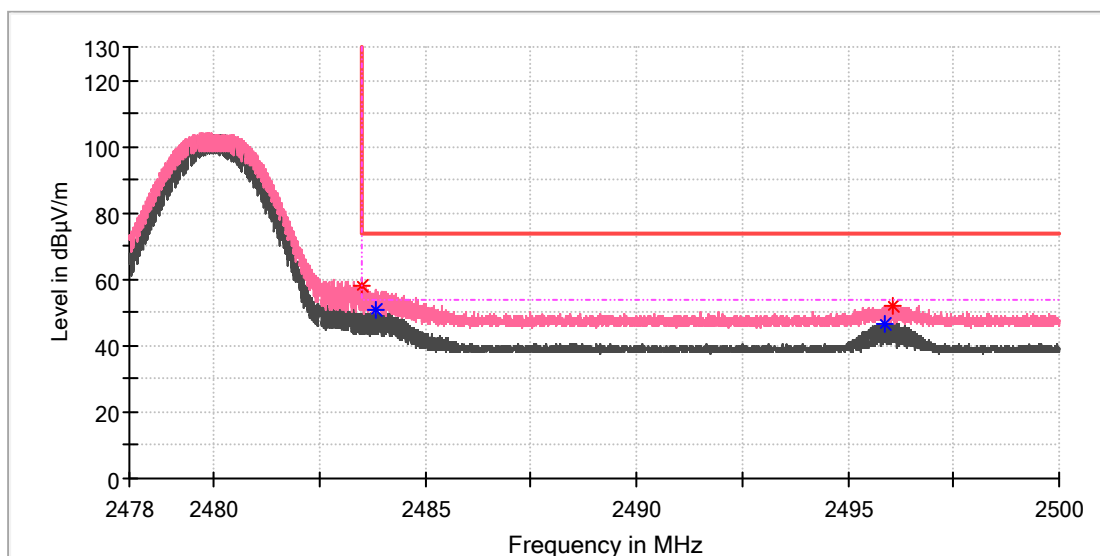


## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 2483.809600     | 56.26            | ---              | 74.00          | 17.74       | 100.0       | H   | 193.0         | 7.4          |
| 2483.931200     | ---              | 49.02            | 54.00          | 4.98        | 100.0       | H   | 193.0         | 7.4          |
| 2495.899200     | 51.87            | ---              | 74.00          | 22.13       | 100.0       | H   | 193.0         | 7.4          |
| 2496.033600     | ---              | 45.51            | 54.00          | 8.49        | 100.0       | H   | 193.0         | 7.4          |

## EUT Information

EUT Name: In-Wall Smart Switch  
 Model: HIWMAS1BLE40AWH  
 Test Mode: TX\_BLE\_High CH  
 Test Voltage:: AC 120V, 60Hz  
 Remark: Temp 22 Humi:50%  
 Test Standard: FCC 15.247  
 Tested By: Alano Qu  
 Reviewed By: Terry Yin



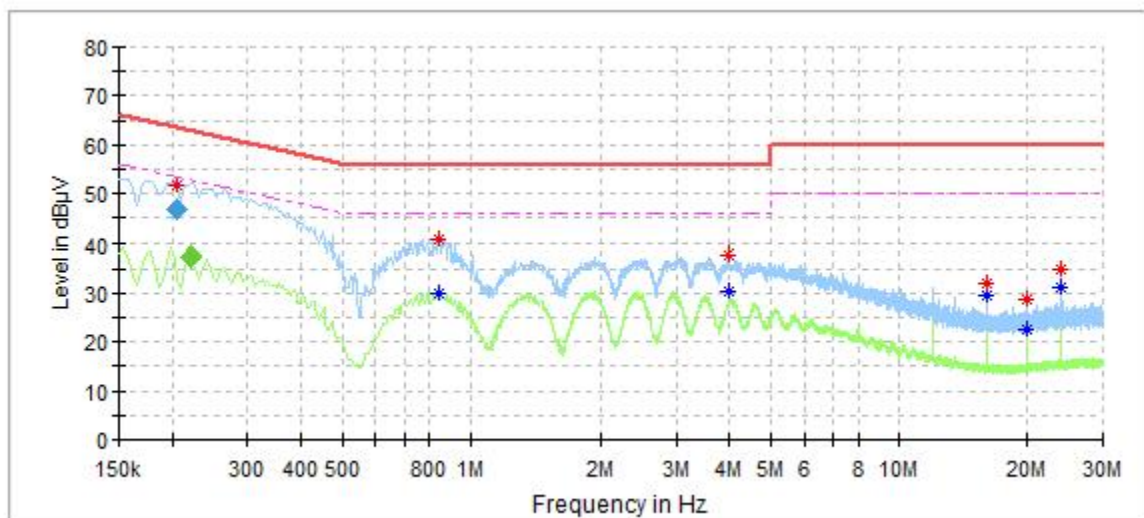
## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|------------------|----------------|-------------|-------------|-----|---------------|--------------|
| 2483.516800     | 57.96            | ---              | 74.00          | 16.04       | 100.0       | V   | 70.0          | 7.4          |
| 2483.843200     | ---              | 50.64            | 54.00          | 3.36        | 100.0       | V   | 70.0          | 7.4          |
| 2495.865600     | ---              | 46.71            | 54.00          | 7.29        | 100.0       | V   | 70.0          | 7.4          |
| 2496.062400     | 51.96            | ---              | 74.00          | 22.04       | 100.0       | V   | 84.0          | 7.4          |

## Appendix B.7: Test Results of Conducted Emissions on AC Mains

### EUT Information

EUT Name: In-Wall Smart Switch  
 Model: HIWMAS1BLE40AWH  
 Test Mode: Full Load  
 Test Voltage: AC 120V/60Hz  
 Test By: Shower.Dai  
 Review By: Gary Chen  
 Remark: Main



### Critical\_Freqs

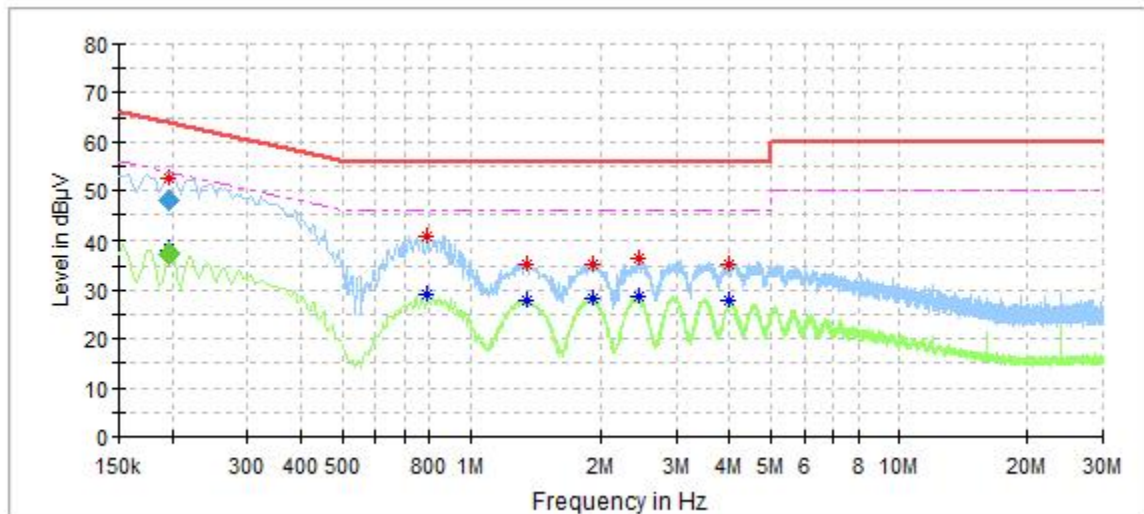
| Frequency (MHz) | MaxPeak (dBμV) | Average (dBμV) | Limit (dBμV) | Margin (dB) | Line | Corr. (dB) |
|-----------------|----------------|----------------|--------------|-------------|------|------------|
| 0.204500        | 51.64          | ---            | 62.90        | 11.25       | L1   | 9.6        |
| 0.220500        | ---            | 37.77          | 52.90        | 15.13       | L1   | 9.6        |
| 0.840000        | ---            | 29.96          | 46.00        | 16.04       | L1   | 9.7        |
| 0.840000        | 40.67          | ---            | 56.00        | 15.33       | L1   | 9.7        |
| 4.000000        | ---            | 30.33          | 46.00        | 15.67       | L1   | 9.8        |
| 4.000000        | 37.63          | ---            | 56.00        | 18.37       | L1   | 9.8        |
| 16.000000       | ---            | 29.35          | 50.00        | 20.65       | L1   | 10.3       |
| 16.000000       | 32.13          | ---            | 60.00        | 27.87       | L1   | 10.3       |
| 20.000000       | ---            | 22.71          | 50.00        | 27.29       | L1   | 10.5       |
| 20.000000       | 28.83          | ---            | 60.00        | 31.17       | L1   | 10.5       |
| 24.000000       | ---            | 31.38          | 50.00        | 18.62       | L1   | 10.5       |
| 24.000000       | 34.71          | ---            | 60.00        | 25.29       | L1   | 10.5       |

### Final\_Result

| Frequency (MHz) | QuasiPeak (dBμV) | Average (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.204500        | 46.71            | ---            | 63.43        | 16.72       | 200.0           | 9.000           | L1   | 9.6        |
| 0.220500        | ---              | 37.25          | 52.80        | 15.55       | 200.0           | 9.000           | L1   | 9.6        |

## EUT Information

EUT Name: In-Wall Smart Switch  
 Model: HIWMAS1BLE40AWH  
 Test Mode: Full Load  
 Test Voltage: AC 120V/60Hz  
 Test By: Shower.Dai  
 Review By: Gary Chen  
 Remark: Main



## Critical\_Freqs

| Frequency (MHz) | MaxPeak (dBµV) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|-----------------|----------------|----------------|--------------|-------------|------|------------|
| 0.196500        | ---            | 38.19          | 53.69        | 15.51       | N    | 9.6        |
| 0.196500        | 52.61          | ---            | 63.69        | 11.09       | N    | 9.6        |
| 0.792000        | 40.54          | ---            | 56.00        | 15.46       | N    | 9.7        |
| 0.792000        | ---            | 29.02          | 46.00        | 16.98       | N    | 9.7        |
| 1.360000        | 35.14          | ---            | 56.00        | 20.86       | N    | 9.7        |
| 1.360000        | ---            | 27.91          | 46.00        | 18.09       | N    | 9.7        |
| 1.908000        | ---            | 28.48          | 46.00        | 17.52       | N    | 9.7        |
| 1.908000        | 35.12          | ---            | 56.00        | 20.88       | N    | 9.7        |
| 2.456000        | ---            | 28.69          | 46.00        | 17.31       | N    | 9.8        |
| 2.460000        | 36.46          | ---            | 56.00        | 19.54       | N    | 9.8        |
| 4.000000        | 35.24          | ---            | 56.00        | 20.76       | N    | 9.8        |
| 4.008000        | ---            | 28.03          | 46.00        | 17.97       | N    | 9.8        |

## Final\_Result

| Frequency (MHz) | QuasiPeak (dBµV) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.196500        | ---              | 37.31          | 53.76        | 16.45       | 200.0           | 9.000           | N    | 9.6        |
| 0.196500        | 47.95            | ---            | 63.76        | 15.81       | 200.0           | 9.000           | N    | 9.6        |