



Report No.: HKEM220500047602

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## TEST REPORT

**Application No.:** HKEM2205000476AT  
**Applicant:** VTech Telecommunications Ltd.  
**Address of Applicant:** 23/F., Tai Ping Industrial Centre, Block 1, 57 Ting Kok Road, Tai Po, Hong Kong  
**Equipment Under Test (EUT):**  
**EUT Name:** Video baby monitor  
**Model No.:** RM5754HD PU, RM5754-2HD PU, RM5754-aHD PU, RM5854HD PU, RM5854-aHD PU, VM813HD PU, VM813-1bHD PU, VM813-abHD PU, RM5764HD PU, RM5764-2HD PU, RM5764-aHD PU, RM5864HD PU, RM5864-aHD PU, VM906HD PU, VM906-1bHD PU, VM906-abHD PU  
**Additional Model:** Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.  
**FCC ID:** EW780-1930-01  
**IC:** 1135B-80193001  
**HVIN:** 35-400412PU  
**Standard(s) :** CFR 47 FCC Part 15, Subpart C, 2021  
RSS-247 Issue 2: Feb 2017  
RSS-Gen Issue 5: Amdt 2021  
**Date of Receipt:** 2022-05-16  
**Date of Test:** 2022-05-17 to 2022-05-26  
**Date of Issue:** 2022-05-27

|                     |                                                                    |
|---------------------|--------------------------------------------------------------------|
| <b>Test Result:</b> | The submitted sample was found to comply with the test requirement |
|---------------------|--------------------------------------------------------------------|

**Law Man Kit**  
EMC Manager

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 01              |         | 2022-05-27 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                          |  |                                                                                     |  |
|--------------------------|--|-------------------------------------------------------------------------------------|--|
| Authorized for issue by: |  |                                                                                     |  |
|                          |  |    |  |
|                          |  | <b>Panny Leung</b><br>/Project Engineer                                             |  |
|                          |  |  |  |
|                          |  | <b>Law Man Kit</b><br>/Reviewer                                                     |  |

## 2 Test Summary

| Radio Spectrum Technical Requirement |                                  |        |                                                 |        |
|--------------------------------------|----------------------------------|--------|-------------------------------------------------|--------|
| Item                                 | Standard                         | Method | Requirement                                     | Result |
| Antenna Requirement                  | 47 CFR Part 15, Subpart C 15.247 | N/A    | 47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4) | Pass   |

| Radio Spectrum Matter Part                            |                                  |                                        |                                              |        |
|-------------------------------------------------------|----------------------------------|----------------------------------------|----------------------------------------------|--------|
| Item                                                  | Standard                         | Method                                 | Requirement                                  | Result |
| Conducted Disturbance at AC Power Line(150kHz-30MHz)  | 47 CFR Part 15, Subpart C 15.207 | ANSI C63.10: 2013 Section 6.2          | 47 CFR FCC Part 15, Subpart C 15.207         | Pass   |
| Minimum 6dB Bandwidth                                 | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 11.8.1      | 47 CFR Part 15, Subpart C 15.247a(2)         | Pass   |
| Conducted Peak Output Power                           | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 11.9.2.3    | 47 CFR Part 15, Subpart C 15.247(b)(3)       | Pass   |
| Power Spectrum Density                                | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 11.10.2     | 47 CFR Part 15, Subpart C 15.247(e)          | Pass   |
| Conducted Band Edges Measurement                      | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 11.13.3.2   | 47 CFR Part 15, Subpart C 15.247(d)          | Pass   |
| Conducted Spurious Emissions                          | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 11.11       | 47 CFR Part 15, Subpart C 15.247(d)          | Pass   |
| Radiated Emissions which fall in the restricted bands | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 6.10.5      | 47 CFR Part 15, Subpart C 15.209 & 15.247(d) | Pass   |
| Radiated Spurious Emissions                           | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 6.4,6.5,6.6 | 47 CFR Part 15, Subpart C 15.209 & 15.247(d) | Pass   |

| Radio Spectrum Technical Requirement |                            |        |                     |        |
|--------------------------------------|----------------------------|--------|---------------------|--------|
| Item                                 | Standard                   | Method | Requirement         | Result |
| Antenna Requirement                  | RSS-Gen Issue 5, Amdt 2021 | N/A    | RSS-Gen Section 6.8 | Pass   |

| Radio Spectrum Matter Part                          |                                |                                    |                        |        |
|-----------------------------------------------------|--------------------------------|------------------------------------|------------------------|--------|
| Item                                                | Standard                       | Method                             | Requirement            | Result |
| Conducted Emissions at AC Power Line (150kHz-30MHz) | RSS-Gen Issue 5: Amdt 2021     | ANSI C63.10 (2013) Section 6.2     | RSS-Gen Section 8.8    | Pass   |
| 99% Bandwidth                                       | RSS-Gen Issue 5: Amdt 2021     | ANSI C63.10 Section 6.9.3          | RSS-Gen Section 6.7    | Pass   |
| Minimum 6dB Bandwidth                               | RSS-247 Issue 2, February 2017 | ANSI C63.10 (2013) Section 11.8.1  | RSS-247 Section 5.2(a) | Pass   |
| Conducted Peak Output Power                         | RSS-247 Issue 2, February 2017 | ANSI C63.10 (2013) Section 11.9.1  | RSS-247 Section 5.4(d) | Pass   |
| Power Spectrum Density                              | RSS-247 Issue 2, February 2017 | ANSI C63.10 (2013) Section 11.10.2 | RSS-247 Clause 5.2(b)  | Pass   |

| Radio Spectrum Matter Part                            |                                |                                        |                                                    |        |
|-------------------------------------------------------|--------------------------------|----------------------------------------|----------------------------------------------------|--------|
| Item                                                  | Standard                       | Method                                 | Requirement                                        | Result |
| Conducted Band Edges Measurement                      | RSS-247 Issue 2, February 2017 | ANSI C63.10 (2013) Section 11.12       | RSS-247 Section 5.5                                | Pass   |
| Spurious Emissions                                    | RSS-247 Issue 2, February 2017 | ANSI C63.10 (2013) Section 11.11       | RSS-247 Section 5.5                                | Pass   |
| Radiated Emissions which fall in the restricted bands | RSS-Gen Issue 5: Amdt 2021     | ANSI C63.10 (2013) Section 6.4&6.5&6.6 | RSS-247 Section Section 3.3 & RSS-Gen Section 8.10 | Pass   |
| Frequency stability                                   | RSS-247 Issue 2, February 2017 | RSS-Gen Section 6.11                   | RSS-Gen Section 8.11                               | Pass   |

Note: Frequency stability requested in RSS GEN Section 8.1.1 has been complied since the result of band edge can demonstrate.

#### Declaration of EUT Family Grouping:

Item no.: RM5754HD PU, RM5754-2HD PU, RM5754-aHD PU, RM5854HD PU, RM5854-aHD PU, VM813HD PU, VM813-1bHD PU, VM813-abHD PU, RM5764HD PU, RM5764-2HD PU, RM5764-aHD PU, RM5864HD PU, RM5864-aHD PU, VM906HD PU, VM906-1bHD PU, VM906-abHD PU

a=any alphanumeric character or blank is presenting number of parent unit.

b= any alphanumeric character or blank is presenting color option.

According to the confirmation from the applicant, the above models are identical in Electronics/electrical designs including software & firmware, construction design/Physical design/Enclosure and PCB layout. The only differences are the model/item No, color and decorations.

Therefore, only the model RM5754HD PU was tested in this report.

#### Abbreviation:

Tx: In this whole report Tx (or tx) means Transmitter.  
Rx: In this whole report Rx (or rx) means Receiver.  
RF: In this whole report RF means Radiated Frequency.  
CH: In this whole report CH means channel.  
Volt: In this whole report Volt means Voltage.  
Temp: In this whole report Temp means Temperature.  
Humid: In this whole report Humid means humidity.  
Press: In this whole report Press means Pressure.  
N/A: In this whole report not application.



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## 4 General Information

### 4.1 Details of E.U.T.

|                      |                                                                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply:        | Model: VT07EUS05200<br>Input: AC 100-240V, 50/60Hz, Max 0. 5A<br>Output: DC 5.0V, 2.0A, 10.0W<br><br>or<br><br>Battery Model: GSP806090-5Ah-3.7V-1S1P<br>Rated capacity: 5000mAh, 18.5Wh<br>Voltage: 3.7VDC |
| Test voltage:        | AC 120 V                                                                                                                                                                                                    |
| Cable:               | Power Cable: 185cm unshielded 2 wires DC cable                                                                                                                                                              |
| Antenna Gain:        | 2 dBi                                                                                                                                                                                                       |
| Antenna Type:        | Integral Antenna                                                                                                                                                                                            |
| Channel Spacing:     | 5MHz                                                                                                                                                                                                        |
| Modulation Type:     | 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)                                                                                                                             |
| Data rate:           | 802.11b: 1Mbps, 2Mbps, 5.5Mbps, 11 Mbps<br>802.11g: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54<br>802.11n: 6.5Mbps, 13Mbps, 19.5Mbps, 26Mbps, 39Mbps, 52Mbps, 58.5Mbps, 65Mbps                |
| Number of Channels:  | 802.11b/g/n(HT20):11                                                                                                                                                                                        |
| Operation Frequency: | 802.11b/g/n(HT20): 2412MHz to 2462MHz                                                                                                                                                                       |
| Tested Channels:     | 2412MHz, 2442MHz, 2462MHz                                                                                                                                                                                   |
| Version code:        | T31N                                                                                                                                                                                                        |
| Series number:       | A1                                                                                                                                                                                                          |
| Hardware Version:    | V002                                                                                                                                                                                                        |
| Software Version:    | V0.2.0.1                                                                                                                                                                                                    |
|                      | Remark: Power level setting was not adjustable and fixed default through SW Version.                                                                                                                        |

#### Frequency List

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

Remark: 1. Testing Channels are highlighted in **bold**.

## 4.2 Description of Support Units

The EUT has been tested with corresponding accessories as below:

Supplied by client

| Description   | Manufacturer      | Model No.         | SN/Certificate NO |
|---------------|-------------------|-------------------|-------------------|
| Test Software | MicroRidge System | Version 3.0.0.108 | N/A               |

Supplied by SGS:

| Description     | Manufacturer | Model No. | SN/Certificate NO |
|-----------------|--------------|-----------|-------------------|
| NoteBook (EMC4) | Dell         | P75F      | N/A               |

## 4.3 Measurement Uncertainty

RF

| No. | Item                                                   | Measurement Uncertainty   |
|-----|--------------------------------------------------------|---------------------------|
| 1   | Conducted disturbance                                  | 2.6dB (150kHz to 30MHz)   |
| 2   | Radio Frequency                                        | $\pm 7.25 \times 10^{-8}$ |
| 3   | Duty cycle                                             | $\pm 0.37\%$              |
| 4   | Occupied Bandwidth                                     | $\pm 3\%$                 |
| 5   | RF conducted power (30MHz-40GHz)                       | 1.5dB                     |
| 6   | RF power density                                       | 1.5dB                     |
| 7   | Conducted Spurious emissions                           | 1.5dB                     |
| 8   | RF Radiated power &<br>Radiated Spurious emission test | 4.5dB (30MHz-1GHz)        |
|     |                                                        | 4.7dB (1GHz-6GHz)         |
|     |                                                        | 4.7dB (6GHz-18GHz)        |
|     |                                                        | 5.7dB (18GHz-40GHz)       |
| 9   | Temperature test                                       | $\pm 1^\circ\text{C}$     |
| 10  | Humidity test                                          | $\pm 3\%$                 |
| 11  | Supply voltages                                        | $\pm 1.5\%$               |
| 12  | Time                                                   | $\pm 3\%$                 |

Remark:

The  $U_{\text{lab}}$  (lab Uncertainty) is less than  $U_{\text{CISPR}}$  (CISPR Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

According to decision rule based on Clause 4.2 of CISPR 16-4-2, the EUT complied with the standards specified above.

#### 4.4 Test Location

All tests were performed at:

SGS Hong Kong Limited

Unit 2 and 3, G/F, Block A, Po Lung Centre,

11 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong

Tel: +852 2305 2570 Fax: +852 2756 4480

No tests were sub-contracted.

#### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **IAS Accreditation (Lab Code: TL-187)**

SGS HONG KONG Limited has met the requirements of AC89, IAS Accreditation Criteria for Testing Laboratories, and has demonstrated compliance with ISO/IEC Standard 17025:2017, General requirements for the competence of testing and calibration laboratories. This organization is accredited to provide the services specified in the scope of accreditation maintained on the IAS website ([www.iasonline.org](http://www.iasonline.org)).

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

- **FCC Recognized Accredited Test Firm (CAB Registration No.: 514599)**

SGS HONG KONG Limited has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: HK0015, Test Firm Registration Number: 514599.

- **Industry Canada (Site Registration No.: 26103; CAB Identifier No.: HK0015)**

SGS HONG KONG Limited has been recognized by Department of Innovation, Science and Economic Development (ISED) Canada as a wireless testing laboratory. The acceptance letter from the ISED is maintained in our files. CAB Identifier No: HK0015, Site Registration Number: 26103.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None

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## 5 Equipment List

### Minimum 6dB Bandwidth, Conducted Peak Output Power, Power Spectrum Density, Conducted Band Edges Measurement, Conducted Spurious Emissions

| Equipment                        | Manufacturer    | Model No        | Inventory No | Cal Date   | Cal Due Date |
|----------------------------------|-----------------|-----------------|--------------|------------|--------------|
| SMBV100A VECTOR SIGNAL GENERATOR | Rohde & Schwarz | SMBV100A        | E234         | 2021/08/17 | 2022/08/16   |
| FSV40 SIGNAL ANALYZER 40GHz      | Rohde & Schwarz | FSV40           | E235         | 2021/08/17 | 2022/08/16   |
| Wireless Conn. Tester (CMW)      | Rohde & Schwarz | CMW270          | E240         | 2021/08/20 | 2022/08/19   |
| OSP                              | Rohde & Schwarz | OSP-B157W8      | E242         | 2022/04/20 | 2023/04/19   |
| Cable                            | Rohde & Schwarz | J12J103539-00-2 | E239         | 2021/09/17 | 2022/09/16   |
| WMS32 Test Software              | R&S             | Version 10      | N/A          | --         | --           |

### Conducted Emissions at Mains Terminals (150kHz-30MHz)

| Equipment                        | Manufacturer    | Model No             | Inventory No | Cal Date   | Cal Due Date |
|----------------------------------|-----------------|----------------------|--------------|------------|--------------|
| EMI Test Receiver 9kHz to 3.6GHz | Rohde & Schwarz | ESR3 / 102326        | E231         | 2021/08/17 | 2022/08/16   |
| Artificial Mains Network (LISN)  | Schwarzbeck     | NSLK 8127 / 8127312  | E005         | 2022/04/13 | 2023/04/12   |
| Impulse Limiter                  | Rohde & Schwarz | ESH-3-Z2 / 357881052 | E028         | 2021/07/15 | 2022/07/14   |
| EMC32 Test Software              | R&S             | Version 10           | N/A          | --         | --           |

### Radiated Spurious Emissions (30MHz-1GHz)

| Equipment                                           | Manufacturer    | Model No      | Inventory No | Cal Date   | Cal Due Date |
|-----------------------------------------------------|-----------------|---------------|--------------|------------|--------------|
| 3m Semi-Anechoic Chamber                            | ChamPro         | N/A           | E229         | 2021/08/09 | 2022/08/08   |
| Coaxial Cable                                       | SGS             | N/A           | E167         | 2021/07/15 | 2022/07/14   |
| EMI Test Receiver 9kHz to 7GHz                      | Rohde & Schwarz | ESR7 / 102298 | E314         | 2022/04/26 | 2023/04/25   |
| TRILOG Super Broadb. Test Antenna, (25) 30-1000 MHz | Schwarzbeck     | 9168-1110     | E264         | 2021/10/18 | 2023/10/17   |
| EMC32 Test software                                 | Rohde & Schwarz | Version 10    | N/A          | N/A        | N/A          |
| Boresight Mast Controller                           | ChamPro         | AM-BS-4500-E  | E237         | N/A        | N/A          |
| Turntable with Controller                           | ChamPro         | EM1000        | E238         | N/A        | N/A          |

| <b>Radiated Spurious Emissions (above 1GHz)</b>           |                     |                              |                     |                 |                     |
|-----------------------------------------------------------|---------------------|------------------------------|---------------------|-----------------|---------------------|
| <b>Equipment</b>                                          | <b>Manufacturer</b> | <b>Model No</b>              | <b>Inventory No</b> | <b>Cal Date</b> | <b>Cal Due Date</b> |
| 3m Semi-Anechoic Chamber                                  | ChamPro             | N/A                          | E229                | 2021/08/09      | 2022/08/08          |
| Coaxial Cable                                             | SGS                 | N/A                          | E167                | 2021/07/15      | 2022/07/14          |
| EMI Test Receiver<br>9kHz to 7GHz                         | Rohde & Schwarz     | ESR7 / 102298                | E314                | 2022/04/26      | 2023/04/25          |
| TRILOG Super Broadb.<br>Test Antenna,<br>(25) 30-1000 MHz | Schwarzbeck         | 9168-1110                    | E264                | 2021/10/18      | 2023/10/17          |
| Signal and Spectrum<br>Analyzer<br>2Hz - 26.5GHz          | Rohde & Schwarz     | FSW26                        | E296                | 2021/09/17      | 2022/09/16          |
| Horn Antenna 1 - 18GHz                                    | Schwarzbeck         | BBHA9120D                    | E211                | 2022/03/03      | 2024/03/02          |
| Horn Antenna<br>15 - 40GHz                                | Schwarzbeck         | BBHA9170                     | E212                | 2022/03/16      | 2024/03/15          |
| Preamplifier 33dB,<br>1 - 18GHz                           | Schwarzbeck         | BBV9718                      | E214                | 2022/01/20      | 2023/01/19          |
| Preamplifier 33dB,<br>18 - 26.5GHz                        | Schwarzbeck         | BBV9719                      | E215                | 2020/09/21      | 2022/09/20          |
| Broadband Coaxial<br>Preamplifier typ. 30 dB,<br>18-40GHz | Schwarzbeck         | BBV 9721                     | E266                | 2021/09/17      | 2022/09/16          |
| Band Reject Filter<br>2.4 -2.5GHz                         | MICRO-TRONICS       | BRM50702                     | E324                | 2021/09/17      | 2022/09/16          |
| RF cable SMA to SMA<br>10000mm                            | HUBER+SUHNER        | SF104-<br>26.5/2*11SMA<br>45 | E207-1              | 2021/09/17      | 2022/09/16          |
| Boresight Mast<br>Controller                              | ChamPro             | AM-BS-4500-E                 | E237                | N/A             | N/A                 |
| Turntable with Controller                                 | ChamPro             | EM1000                       | E238                | N/A             | N/A                 |

| <b>General used equipment</b>                        |                                  |                 |                     |                 |                     |
|------------------------------------------------------|----------------------------------|-----------------|---------------------|-----------------|---------------------|
| <b>Equipment</b>                                     | <b>Manufacturer</b>              | <b>Model No</b> | <b>Inventory No</b> | <b>Cal Date</b> | <b>Cal Due Date</b> |
| Digital temperature &<br>humidity data logger        | SATO                             | SK-L200TH II    | E232                | 2021/08/16      | 2022/08/15          |
| Electronic Digital<br>Thermometer with<br>Hygrometer | nil                              | 2074/2075       | E159                | 2021/08/16      | 2022/08/15          |
| Barometer with digital<br>thermometer                | SATO                             | 7612-00         | E218                | 2022/03/29      | 2023/03/28          |
| Conditional Chamber                                  | Zhong Zhi Testing<br>Instruments | CZ-E-608D       | E216                | 2021/08/17      | 2022/08/16          |

## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

FCC Part 15 Subpart C Section 15.247 & 15.203

RSS-Gen Section 8.3

#### 6.1.2 Conclusion

Standard Requirement:

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2 dBi.

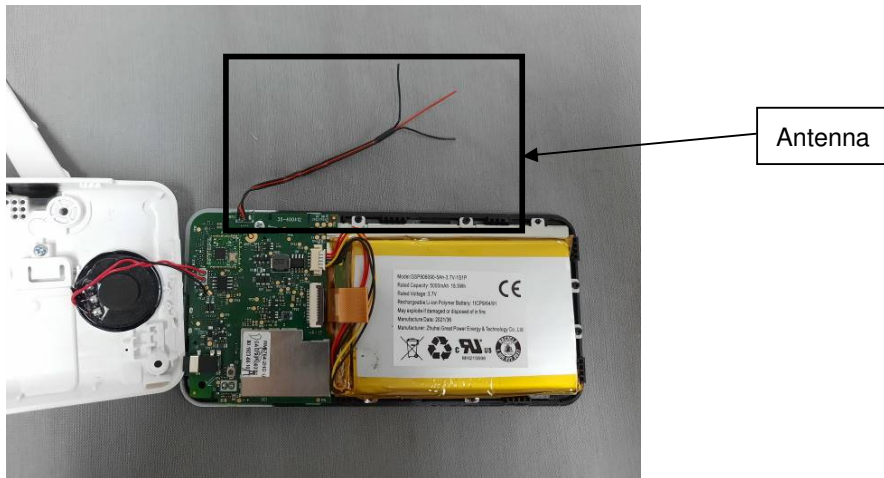


Photo of antenna refer to Appendix – Internal photo.



## 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207, RSS-Gen Section 8.8  
Test Method: ANSI C63.10 (2013) Section 6.2  
Limit:

| Frequency of emission(MHz)                      | Conducted limit(dBμV) |           |
|-------------------------------------------------|-----------------------|-----------|
|                                                 | Quasi-peak            | Average   |
| 0.15-0.5                                        | 66 to 56*             | 56 to 46* |
| 0.5-5                                           | 56                    | 46        |
| 5-30                                            | 60                    | 50        |
| *Decreases with the logarithm of the frequency. |                       |           |

## 7.1.1 E.U.T. Operation

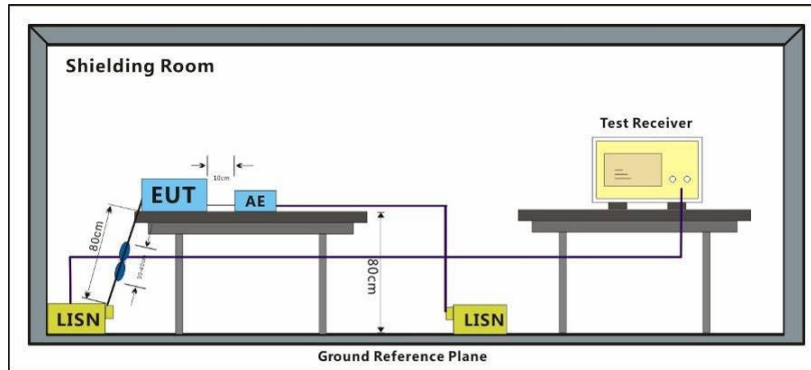
Operating Environment:

Temperature: 22.5 °C Humidity: 51.2 % RH :

Test mode a :TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20)..11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20).

Only the data of worst case is recorded in the report.

## 7.1.2 Test Setup Diagram



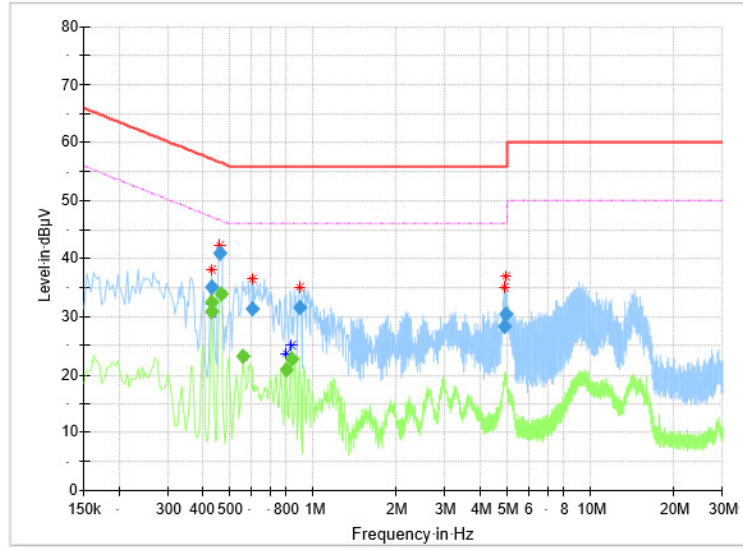
## 7.1.3 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor

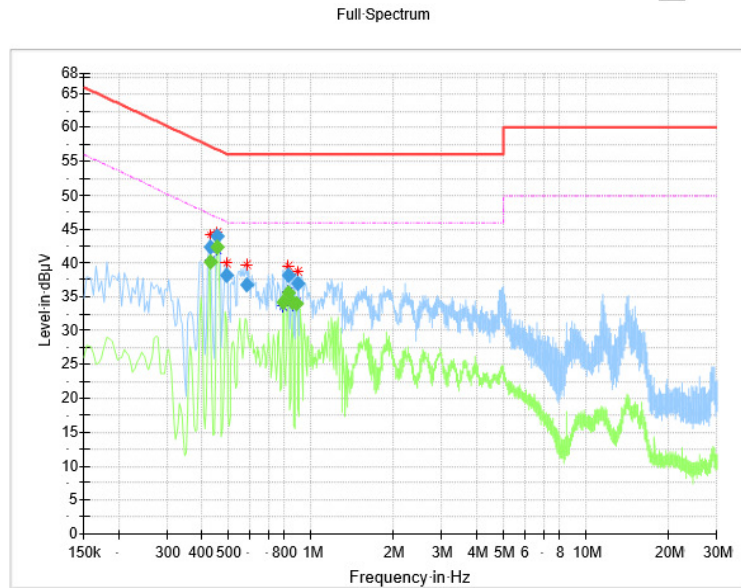
Mode:a (802.11b);  
Line: Live Line

Full-Spectrum



| Frequency<br>(MHz) | QuasiPeak<br>(dBµV) | Average<br>(dBµV) | Limit<br>(dBµV) | Margin<br>(dB) | Corr.<br>(dB) | Result |
|--------------------|---------------------|-------------------|-----------------|----------------|---------------|--------|
| 0.430000           | ---                 | 32.56             | 47.25           | 14.69          | 10.8          | Pass   |
| 0.434000           | ---                 | 30.90             | 47.18           | 16.28          | 10.8          | Pass   |
| 0.434000           | 35.02               | ---               | 57.18           | 22.16          | 10.8          | Pass   |
| 0.462000           | 40.95               | ---               | 56.66           | 15.71          | 10.8          | Pass   |
| 0.466000           | ---                 | 33.86             | 46.59           | 12.73          | 10.8          | Pass   |
| 0.562000           | ---                 | 23.08             | 46.00           | 22.92          | 10.7          | Pass   |
| 0.602000           | 31.46               | ---               | 56.00           | 24.54          | 10.7          | Pass   |
| 0.802000           | ---                 | 20.79             | 46.00           | 25.21          | 10.5          | Pass   |
| 0.834000           | ---                 | 22.70             | 46.00           | 23.30          | 10.5          | Pass   |
| 0.902000           | 31.64               | ---               | 56.00           | 24.36          | 10.4          | Pass   |
| 4.878000           | 28.37               | ---               | 56.00           | 27.63          | 10.2          | Pass   |
| 4.954000           | 30.51               | ---               | 56.00           | 25.49          | 10.2          | Pass   |

Mode: a(802.11b);  
Line: Neutral Line



| Frequency<br>(MHz) | QuasiPeak<br>(dBµV) | Average<br>(dBµV) | Limit<br>(dBµV) | Margin<br>(dB) | Corr.<br>(dB) | Result |
|--------------------|---------------------|-------------------|-----------------|----------------|---------------|--------|
| 0.430000           | ---                 | 40.19             | 47.25           | 7.06           | 10.8          | Pass   |
| 0.430000           | 42.41               | ---               | 57.25           | 14.84          | 10.8          | Pass   |
| 0.458000           | ---                 | 42.39             | 46.73           | 4.34           | 10.8          | Pass   |
| 0.458000           | 43.94               | ---               | 56.73           | 12.79          | 10.8          | Pass   |
| 0.494000           | 38.24               | ---               | 56.10           | 17.86          | 10.8          | Pass   |
| 0.582000           | 36.78               | ---               | 56.00           | 19.22          | 10.7          | Pass   |
| 0.794000           | ---                 | 34.10             | 46.00           | 11.90          | 10.5          | Pass   |
| 0.826000           | ---                 | 35.56             | 46.00           | 10.44          | 10.5          | Pass   |
| 0.826000           | 38.12               | ---               | 56.00           | 17.88          | 10.5          | Pass   |
| 0.858000           | ---                 | 34.15             | 46.00           | 11.85          | 10.4          | Pass   |
| 0.890000           | ---                 | 33.98             | 46.00           | 12.02          | 10.4          | Pass   |
| 0.894000           | 37.07               | ---               | 56.00           | 18.93          | 10.4          | Pass   |

## 7.2 99% Bandwidth

Test Requirement RSS-Gen Section 6.6  
Test Method: ANSI C63.10 Section 6.9.3

### 7.2.1 E.U.T. Operation

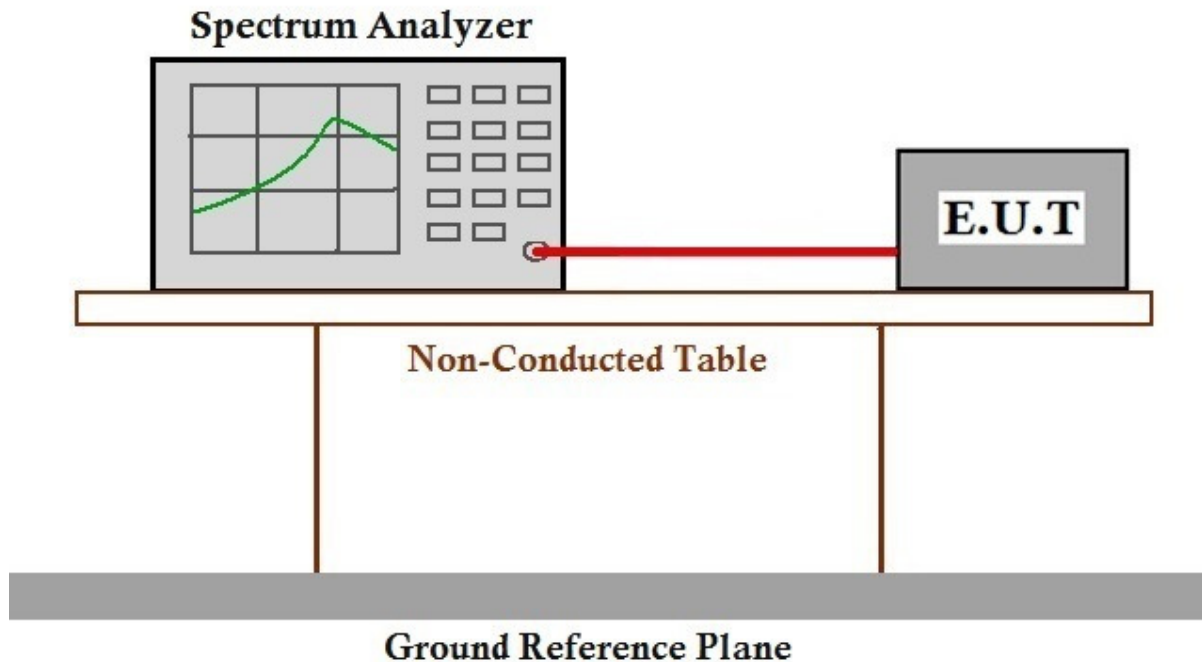
Operating Environment:

Temperature: 22.5 °C Humidity: 51.2 % RH :

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20).

Only the data of worst case is recorded in the report.

### 7.2.2 Test Setup Diagram



### 7.2.3 Measurement Procedure and Data

The detailed test data see section 9: Appendix

## 7.3 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)  
 Test Method: ANSI C63.10 (2013) Section 11.8.1  
 Limit:  $\geq 500$  kHz

### 7.3.1 E.U.T. Operation

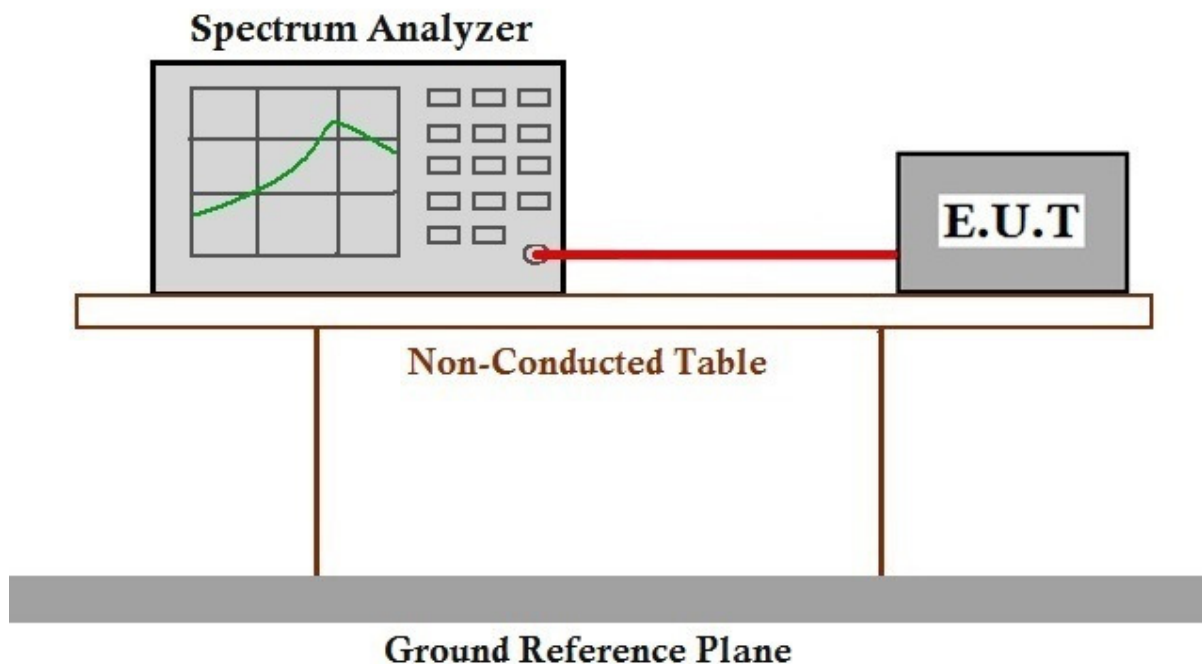
Operating Environment:

Temperature: 22.5 °C Humidity: 49.1 % RH :

Test mode b:TX mode\_ Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20)..11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20).

Only the data of worst case is recorded in the report.

### 7.3.2 Test Setup Diagram



### 7.3.3 Measurement Procedure and Data

The detailed test data see section 9: Appendix

## 7.4 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247 (b)(1) & 15.247(b)(3), RSS-247 Section 5.4(b)

Test Method: ANSI C63.10 (2013) Section 7.8.5

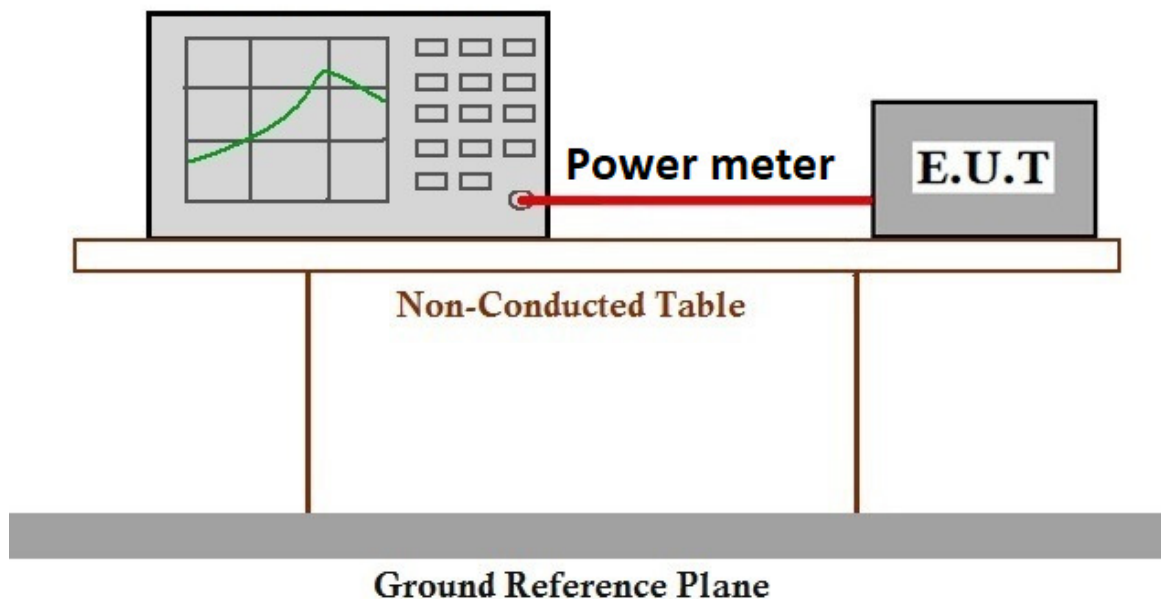
### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 51.2 % RH :

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20).

### 7.4.2 Test Setup Diagram



### 7.4.3 Measurement Procedure and Data

The detailed test data see section 9: Appendix

## 7.5 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e), RSS-247 Clause 5.2(b)  
Test Method: ANSI C63.10 (2013) Section 11.10.2  
Limit:  $\leq 8\text{dBm}$  in any 3 kHz band during any time interval of continuous transmission

### 7.5.1 E.U.T. Operation

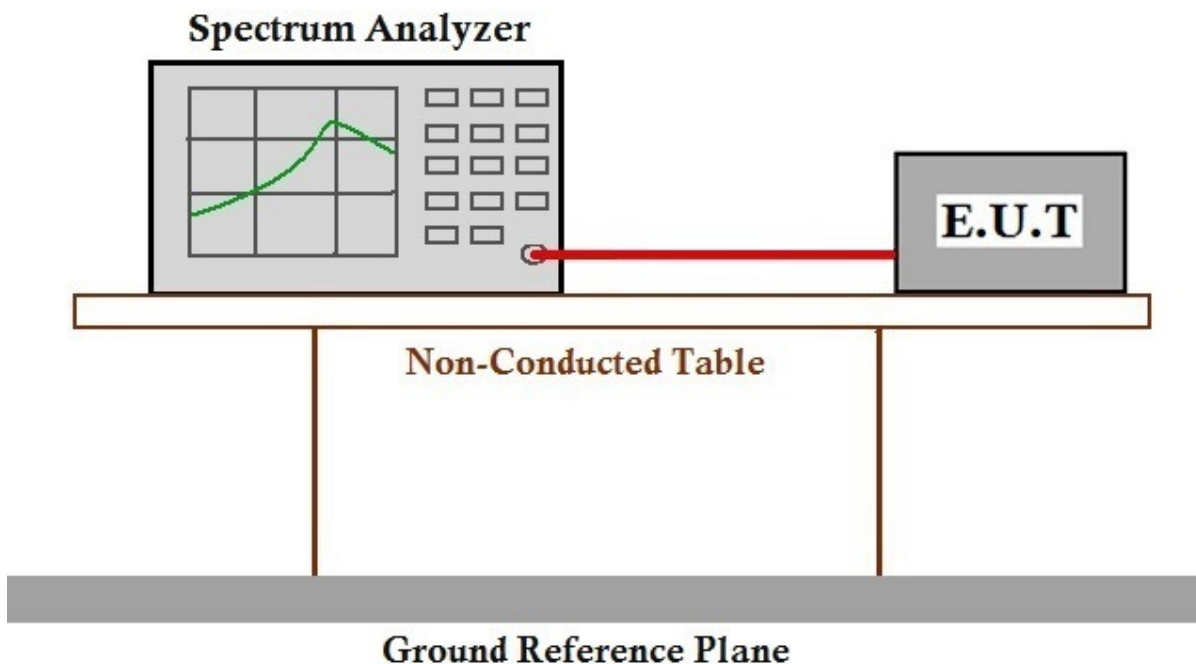
Operating Environment:

Temperature: 22.5 °C Humidity: 49.1 % RH :

Test mode b:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20).

Only the data of worst case is recorded in the report.

### 7.5.2 Test Setup Diagram



### 7.5.3 Measurement Procedure and Data

The detailed test data see section 9: Appendix

## 7.6 Conducted Band Edges Measurement

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement | 47 CFR Part 15, Subpart C 15.247 (d), RSS-247 Section 5.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Test Method:     | ANSI C63.10 (2013) Section 7.8.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Limit:           | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)) |

FCC Part 15 C Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                        | MHz                   | MHz             | GHz           |
|----------------------------|-----------------------|-----------------|---------------|
| 0.090 - 0.110              | 16.42 - 16.423        | 399.9 - 410     | 4.5 - 5.15    |
| <sup>1</sup> 0.495 - 0.505 | 16.69475 - 16.69525   | 608 - 614       | 5.35 - 5.46   |
| 2.1735 - 2.1905            | 16.80425 - 16.80475   | 960 - 1240      | 7.25 - 7.75   |
| 4.125 - 4.128              | 25.5 - 25.67          | 1300 - 1427     | 8.025 - 8.5   |
| 4.17725 - 4.17775          | 37.5 - 38.25          | 1435 - 1626.5   | 9.0 - 9.2     |
| 4.20725 - 4.20775          | 73 - 74.6             | 1645.5 - 1646.5 | 9.3 - 9.5     |
| 6.215 - 6.218              | 74.8 - 75.2           | 1660 - 1710     | 10.6 - 12.7   |
| 6.26775 - 6.26825          | 108 - 121.94          | 1718.8 - 1722.2 | 13.25 - 13.4  |
| 6.31175 - 6.31225          | 123 - 138             | 2200 - 2300     | 14.47 - 14.5  |
| 8.291 - 8.294              | 149.9 - 150.05        | 2310 - 2390     | 15.35 - 16.2  |
| 8.362 - 8.366              | 156.52475 - 156.52525 | 2483.5 - 2500   | 17.7 - 21.4   |
| 8.37625 - 8.38675          | 156.7 - 156.9         | 2655 - 2900     | 22.01 - 23.12 |
| 8.41425 - 8.41475          | 162.0125 - 167.17     | 3260 - 3267     | 23.6 - 24.0   |
| 12.29 - 12.293             | 167.72 - 173.2        | 3332 - 3339     | 31.2 - 31.8   |
| 12.51975 - 12.52025        | 240 - 285             | 3345.8 - 3358   | 36.43 - 36.5  |
| 12.57675 - 12.57725        | 322 - 335.4           | 3600 - 4400     |               |
| 13.36 - 13.41              |                       |                 |               |

RSS-Gen Section 8.10 Restricted bands of operation.

Restricted frequency bands, identified in table 7, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

(a) The transmit frequency, including fundamental components of modulation, of licence-exempt radio

apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, *Emergency Position Indicating Radio Beacons (EPIRB)*, *Emergency Locator Transmitters (ELT)*, *Personal Locator Beacons (PLB)*, and *Maritime Survivor Locator Devices (MSLD)*.

(b) Unwanted emissions that fall into restricted frequency bands listed in table 7 shall comply with the limits specified in table 5 and table 6.

(c) Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

| Table 7 – Restricted frequency bands* MHz | MHz                   | GHz                                                                                                                                                                                                                                             |
|-------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0.090 - 0.110                             | 149.9 - 150.05        | 9.0 - 9.2                                                                                                                                                                                                                                       |
| 0.495 - 0.505                             | 156.52475 - 156.52525 | 9.3 - 9.5                                                                                                                                                                                                                                       |
| 2.1735 - 2.1905                           | 156.7 - 156.9         | 10.6 - 12.7                                                                                                                                                                                                                                     |
| 3.020 - 3.026                             | 162.0125 - 167.17     | 13.25 - 13.4                                                                                                                                                                                                                                    |
| 4.125 - 4.128                             | 167.72 - 173.2        | 14.47 - 14.5                                                                                                                                                                                                                                    |
| 4.17725 - 4.17775                         | 240 - 285             | 15.35 - 16.2                                                                                                                                                                                                                                    |
| 4.20725 - 4.20775                         | 322 - 335.4           | 17.7 - 21.4                                                                                                                                                                                                                                     |
| 5.677 - 5.683                             | 399.9 - 410           | 22.01 - 23.12                                                                                                                                                                                                                                   |
| 6.215 - 6.218                             | 608 - 614             | 23.6 - 24.0                                                                                                                                                                                                                                     |
| 6.26775 - 6.26825                         | 960 - 1427            | 31.2 - 31.8                                                                                                                                                                                                                                     |
| 6.31175 - 6.31225                         | 1435 - 1626.5         | 36.43 - 36.5                                                                                                                                                                                                                                    |
| 8.291 - 8.294                             | 1645.5 - 1646.5       | Above 38.6                                                                                                                                                                                                                                      |
| 8.362 - 8.366                             | 1660 - 1710           | * Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs. |
| 8.37625 - 8.38675                         | 1718.8 - 1722.2       |                                                                                                                                                                                                                                                 |
| 8.41425 - 8.41475                         | 2200 - 2300           |                                                                                                                                                                                                                                                 |
| 12.29 - 12.293                            | 2310 - 2390           |                                                                                                                                                                                                                                                 |
| 12.51975 - 12.52025                       | 2483.5 - 2500         |                                                                                                                                                                                                                                                 |
| 12.57675 - 12.57725                       | 2655 - 2900           |                                                                                                                                                                                                                                                 |
| 13.36 - 13.41                             | 3260 - 3267           |                                                                                                                                                                                                                                                 |
| 16.42 - 16.423                            | 3332 - 3339           |                                                                                                                                                                                                                                                 |
| 16.69475 - 16.69525                       | 3345.8 - 3358         |                                                                                                                                                                                                                                                 |
| 16.80425 - 16.80475                       | 3500 - 4400           |                                                                                                                                                                                                                                                 |
| 25.5 - 25.67                              | 4500 - 5150           |                                                                                                                                                                                                                                                 |
| 37.5 - 38.25                              | 5350 - 5460           |                                                                                                                                                                                                                                                 |
| 73 - 74.6                                 | 7250 - 7750           |                                                                                                                                                                                                                                                 |
| 74.8 - 75.2                               | 8025 - 8500           |                                                                                                                                                                                                                                                 |
| 108 - 138                                 | --                    |                                                                                                                                                                                                                                                 |

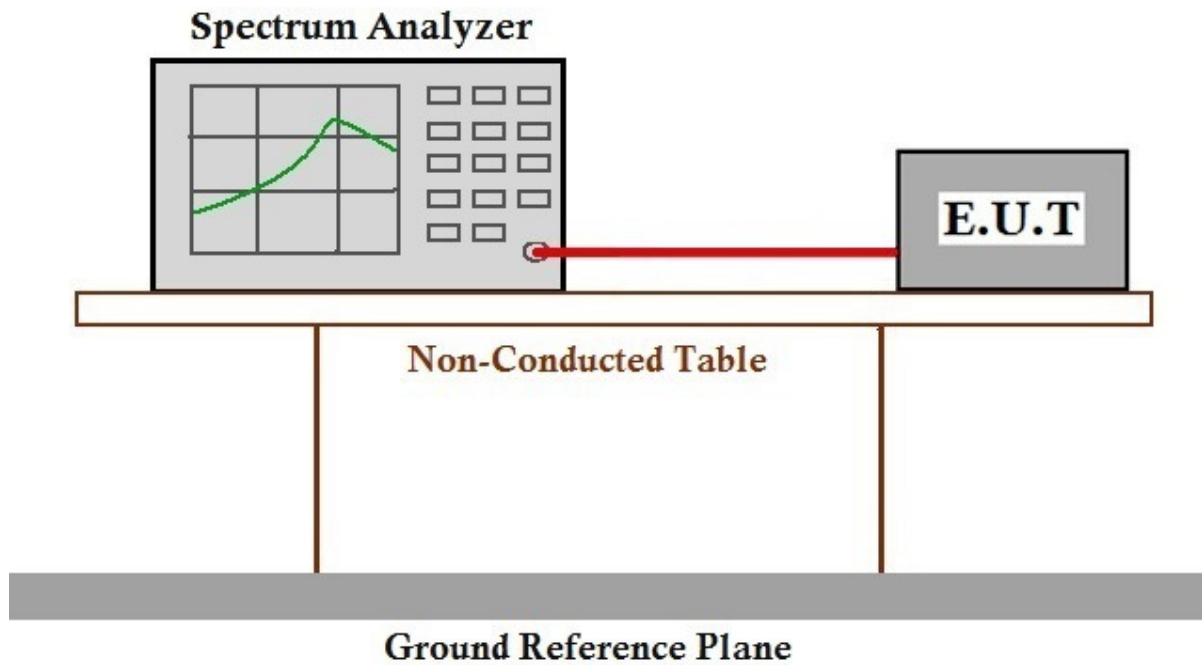
## 7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 51.1 % RH :

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20).

## 7.6.2 Test Setup Diagram



## 7.6.3 Measurement Procedure and Data

The detailed test data see section 9: Appendix

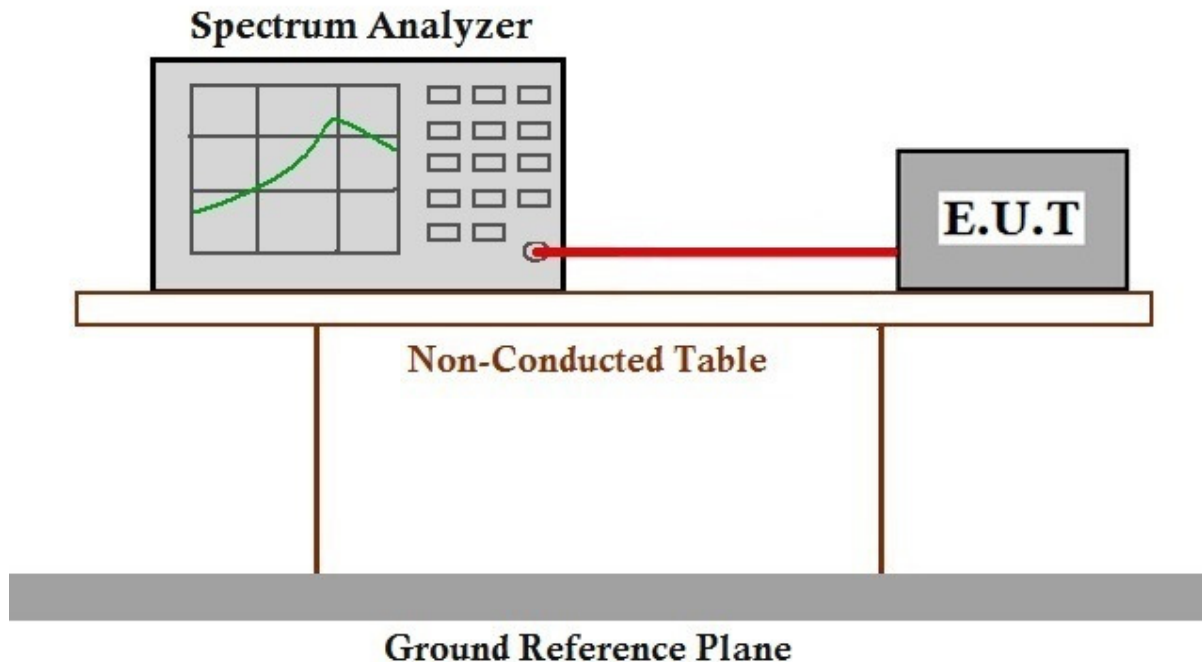
## 7.7 Conducted Spurious Emissions

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement | 47 CFR Part 15, Subpart C 15.247 (d), RSS-247 Section 5.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Test Method:     | ANSI C63.10 (2013) Section 7.8.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Limit:           | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required. |

### 7.7.1 E.U.T. Operation

|                        |                                                                                                                                                                                                                                                                                                                                   |           |             |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
| Operating Environment: |                                                                                                                                                                                                                                                                                                                                   |           |             |
| Temperature:           | 22.5 °C                                                                                                                                                                                                                                                                                                                           | Humidity: | 51.2 % RH : |
| Test mode              | a:TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). |           |             |

### 7.7.2 Test Setup Diagram



### 7.7.3 Measurement Procedure and Data

The detailed test data see section 9: Appendix

## 7.8 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d), Section 3.3 & RSS-Gen Section 8.9  
Test Method: ANSI C63.10 (2013) Section 6.10.5  
Limit:

**Table 5 – General field strength limits at frequencies above 30 MHz**

| Frequency<br>(MHz) | Field strength<br>( $\mu\text{V/m}$ at 3 m) |
|--------------------|---------------------------------------------|
| 30 – 88            | 100                                         |
| 88 – 216           | 150                                         |
| 216 – 960          | 200                                         |
| Above 960          | 500                                         |

**Table 6 – General field strength limits at frequencies below 30 MHz**

| Frequency      | Magnetic field strength (H-Field)<br>( $\mu\text{A/m}$ ) | Measurement distance<br>(m) |
|----------------|----------------------------------------------------------|-----------------------------|
| 9 - 490 kHz 1  | 6.37/F (F in kHz)                                        | 300                         |
| 490 - 1705 kHz | 63.7/F (F in kHz)                                        | 30                          |
| 1.705 - 30 MHz | 0.08                                                     | 30                          |

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

### 7.8.1 E.U.T. Operation

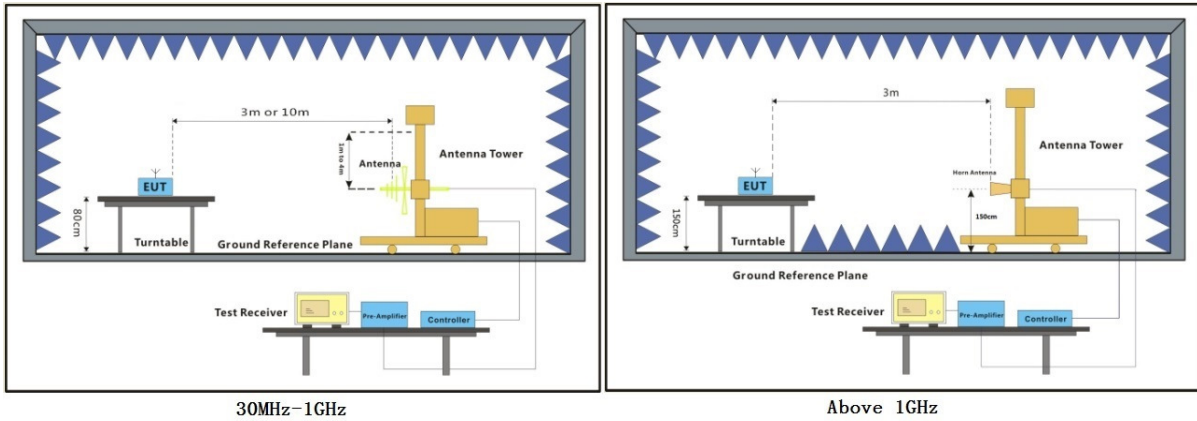
Operating Environment:

Temperature: 23.1 °C Humidity: 51.4 % RH :

Test mode a:TX mode\_ Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20).

Only the data of worst case is recorded in the report.

### 7.8.2 Test Setup Diagram



### 7.8.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1:  $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



Worse test result as shown below:

Mode: 802.11b

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dBμV/m) |         | Limit (dBμV/m) |         | Remark |
|--------------------|-------------------------|-------------------------|---------|----------------|---------|--------|
|                    |                         | Peak                    | Average | Peak           | Average |        |
| 2390.000           | V                       | 59.8                    | 48.0    | 74.0           | 54.0    | Pass   |
| 2483.500           | V                       | 53.5                    | 40.3    | 74.0           | 54.0    | Pass   |

Mode: 802.11g

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dBμV/m) |         | Limit (dBμV/m) |         | Remark |
|--------------------|-------------------------|-------------------------|---------|----------------|---------|--------|
|                    |                         | Peak                    | Average | Peak           | Average |        |
| 2390.000           | V                       | 61.7                    | 51.2    | 74.0           | 54.0    | Pass   |
| 2483.500           | V                       | 59.7                    | 47.2    | 74.0           | 54.0    | Pass   |

Mode: 802.11n20

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dBμV/m) |         | Limit (dBμV/m) |         | Remark |
|--------------------|-------------------------|-------------------------|---------|----------------|---------|--------|
|                    |                         | Peak                    | Average | Peak           | Average |        |
| 2390.000           | V                       | 65.2                    | 49.1    | 74.0           | 54.0    | Pass   |
| 2483.500           | V                       | 59.8                    | 44.8    | 74.0           | 54.0    | Pass   |

## 7.9 Radiated Spurious Emissions

Test Requirement Section 3.3 & RSS-Gen Section 8.9

Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Limit:

**Table 5 – General field strength limits at frequencies above 30 MHz**

| Frequency<br>(MHz) | Field strength<br>( $\mu\text{V/m}$ at 3 m) |
|--------------------|---------------------------------------------|
| 30 – 88            | 100                                         |
| 88 – 216           | 150                                         |
| 216 – 960          | 200                                         |
| Above 960          | 500                                         |

**Table 6 – General field strength limits at frequencies below 30 MHz**

| Frequency      | Magnetic field strength (H-Field)<br>( $\mu\text{A/m}$ ) | Measurement distance<br>(m) |
|----------------|----------------------------------------------------------|-----------------------------|
| 9 - 490 kHz 1  | $6.37/F$ (F in kHz)                                      | 300                         |
| 490 - 1705 kHz | $63.7/F$ (F in kHz)                                      | 30                          |
| 1.705 - 30 MHz | 0.08                                                     | 30                          |

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

### 7.9.1 E.U.T. Operation

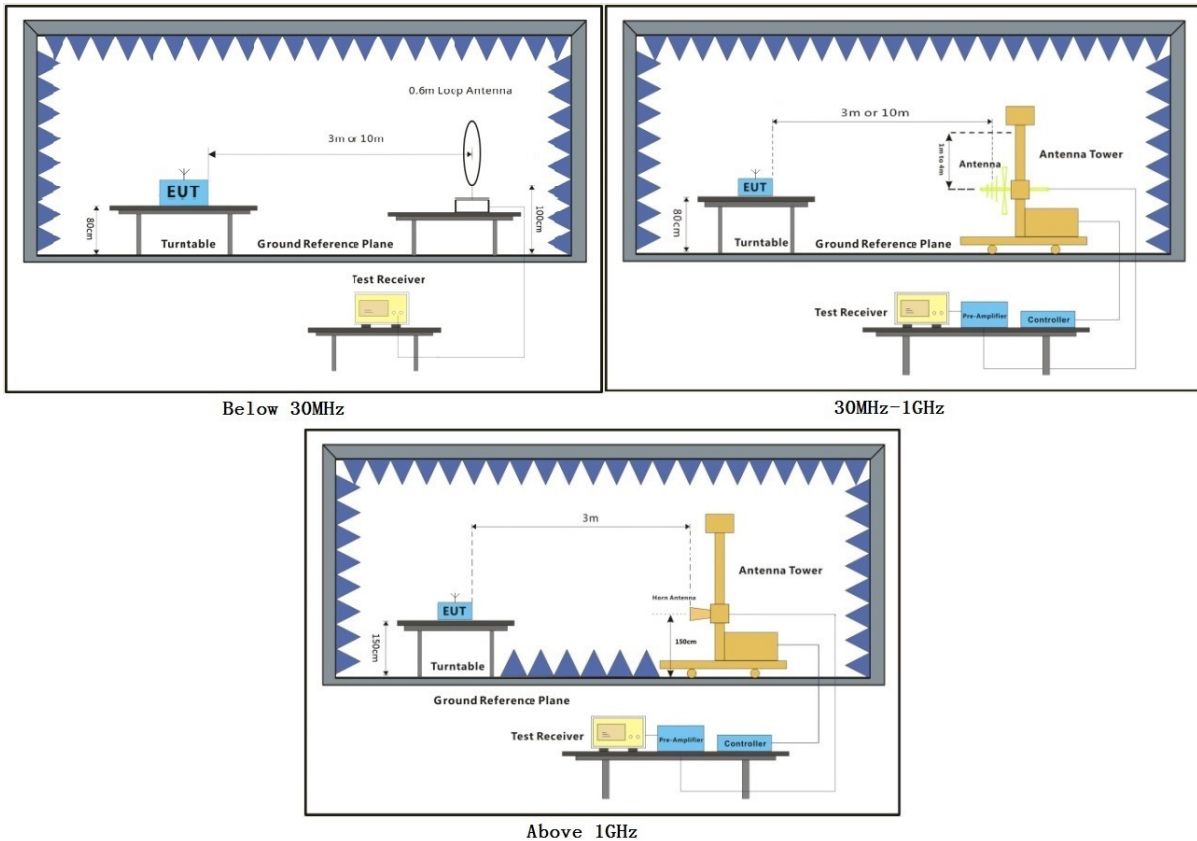
Operating Environment:

Temperature: 22.3 °C Humidity: 52.3 % RH :

Test mode a:TX mode. Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20).

Only the data of worst case is recorded in the report.

### 7.9.2 Test Setup Diagram



### 7.9.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

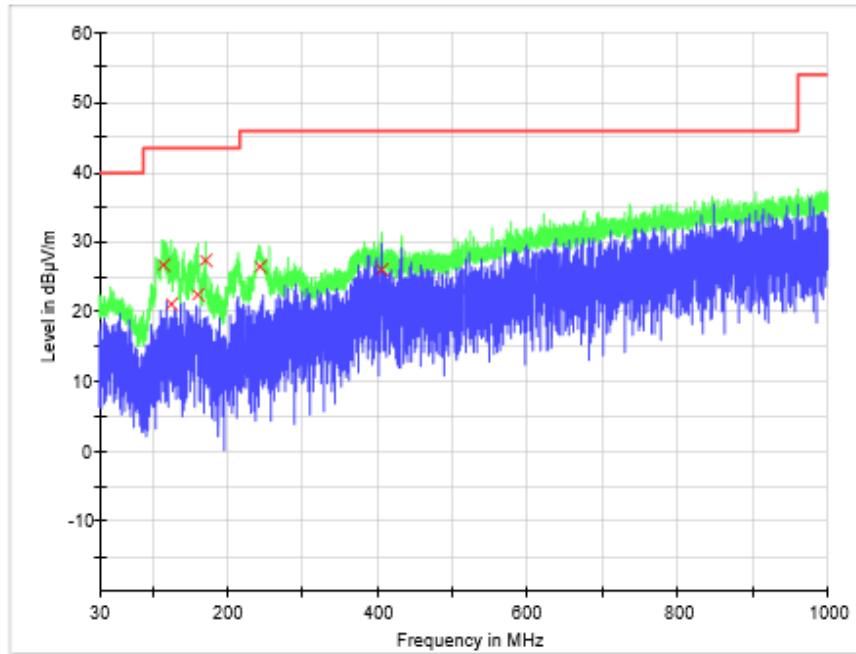
#### Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 3) Scan from 9kHz to 40GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

802.11b

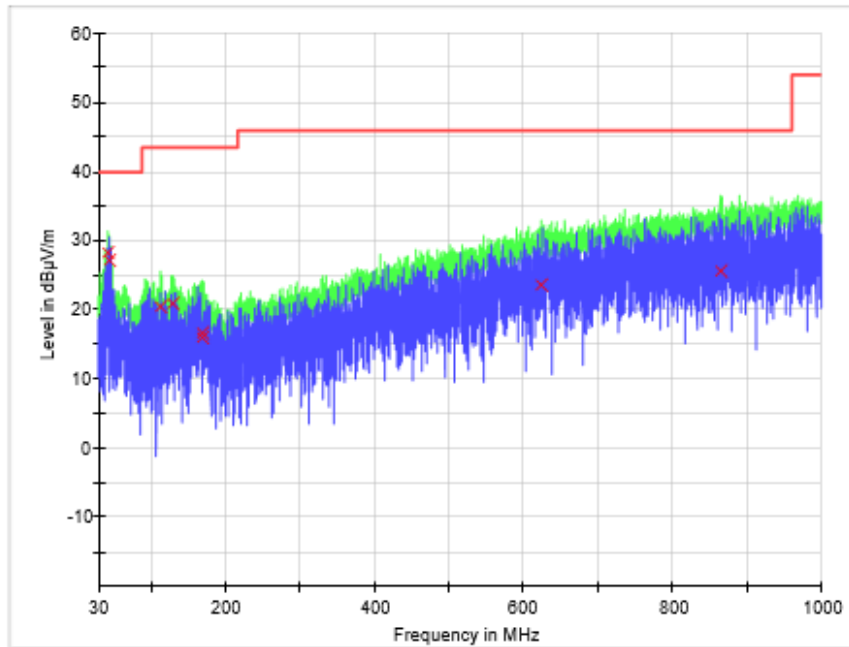
### Radiated emission below 1GHz

Horizontal (the worst plot is shown below)



| Frequency (MHz) | QuasiPeak (dBμV/m) | Pol. | Corr. (dB/m) | Margin (dB) | Limit (dBμV/m) | Result |
|-----------------|--------------------|------|--------------|-------------|----------------|--------|
| 115.967500      | 26.7               | H    | 11.9         | 16.8        | 43.5           | Pass   |
| 126.010000      | 21.2               | H    | 12.7         | 22.3        | 43.5           | Pass   |
| 160.037500      | 22.6               | H    | 14.6         | 20.9        | 43.5           | Pass   |
| 170.372500      | 27.4               | H    | 14.1         | 16.1        | 43.5           | Pass   |
| 243.302500      | 26.4               | H    | 12.7         | 19.6        | 46.0           | Pass   |
| 404.957500      | 25.9               | H    | 17.5         | 20.1        | 46.0           | Pass   |

Vertical (the worst plot is shown below)



| Frequency<br>(MHz) | QuasiPeak<br>(dBµV/m) | Pol. | Corr.<br>(dB/m) | Margin<br>(dB) | Limit<br>(dBµV/m) | Result |
|--------------------|-----------------------|------|-----------------|----------------|-------------------|--------|
| 43.135000          | 28.3                  | V    | 14.0            | 11.7           | 40.0              | Pass   |
| 45.475000          | 27.3                  | V    | 14.2            | 12.7           | 40.0              | Pass   |
| 112.457500         | 20.4                  | V    | 11.4            | 23.1           | 43.5              | Pass   |
| 130.690000         | 20.9                  | V    | 13.0            | 22.6           | 43.5              | Pass   |
| 623.260000         | 23.5                  | V    | 22.5            | 22.5           | 46.0              | Pass   |
| 863.987500         | 25.6                  | V    | 25.4            | 20.4           | 46.0              | Pass   |

### Above 1GHz

Channel:Low

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dB $\mu$ V/m) |         | Limit (dB $\mu$ V/m) |         | Remark |
|--------------------|-------------------------|-------------------------------|---------|----------------------|---------|--------|
|                    |                         | Peak                          | Average | Peak                 | Average |        |
| 1662.393           | V                       | 49.2                          | /       | 74.0                 | 54.0    | Pass   |
| 2998.714           | H                       | 44.8                          | /       | 74.0                 | 54.0    | Pass   |
| 4823.179           | V                       | 53.0                          | /       | 74.0                 | 54.0    | Pass   |
| 6470.964           | H                       | 50.4                          | /       | 74.0                 | 54.0    | Pass   |
| 7235.357           | V                       | 57.5                          | 49.2    | 74.0                 | 54.0    | Pass   |
| 10821.750          | H                       | 58.0                          | 44.5    | 74.0                 | 54.0    | Pass   |

Channel:Middle

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dB $\mu$ V/m) |         | Limit (dB $\mu$ V/m) |         | Remark |
|--------------------|-------------------------|-------------------------------|---------|----------------------|---------|--------|
|                    |                         | Peak                          | Average | Peak                 | Average |        |
| 1997.5357          | H                       | 42.7                          | /       | 74.0                 | 54.0    | Pass   |
| 4823.1786          | H                       | 48.2                          | /       | 74.0                 | 54.0    | Pass   |
| 4823.7857          | V                       | 51.2                          | /       | 74.0                 | 54.0    | Pass   |
| 7186.7857          | V                       | 53.0                          | /       | 74.0                 | 54.0    | Pass   |
| 7934.1786          | H                       | 54.6                          | 41.1    | 74.0                 | 54.0    | Pass   |
| 12131.357          | H                       | 57.8                          | 44.4    | 74.0                 | 54.0    | Pass   |

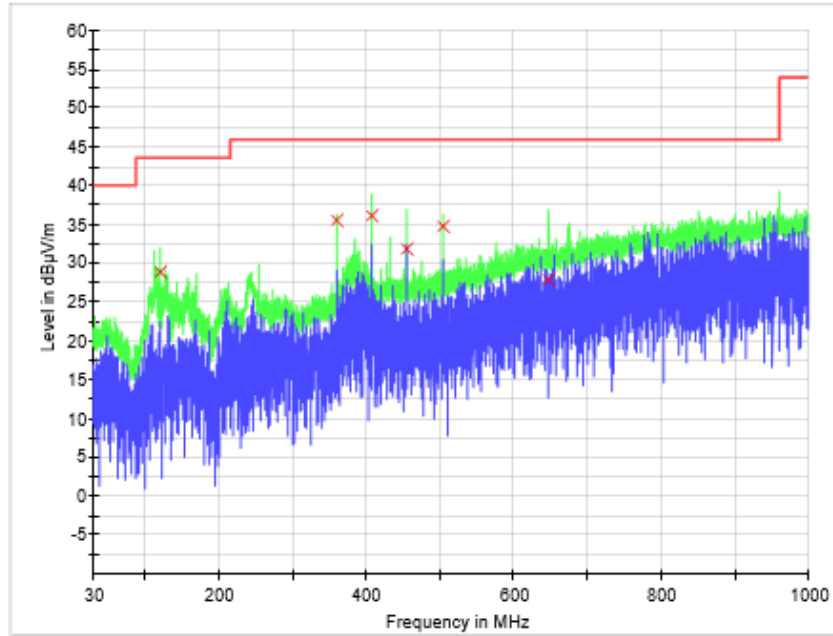
Channel: High

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dB $\mu$ V/m) |         | Limit (dB $\mu$ V/m) |         | Remark |
|--------------------|-------------------------|-------------------------------|---------|----------------------|---------|--------|
|                    |                         | Peak                          | Average | Peak                 | Average |        |
| 4823.786           | H                       | 47.8                          | /       | 74.0                 | 54.0    | Pass   |
| 4823.786           | V                       | 51.4                          | /       | 74.0                 | 54.0    | Pass   |
| 7268.750           | H                       | 52.2                          | /       | 74.0                 | 54.0    | Pass   |
| 7981.536           | V                       | 55.6                          | 41.8    | 74.0                 | 54.0    | Pass   |
| 7986.393           | V                       | 55.6                          | 41.7    | 74.0                 | 54.0    | Pass   |
| 10952.286          | H                       | 58.8                          | 45.2    | 74.0                 | 54.0    | Pass   |

802.11g

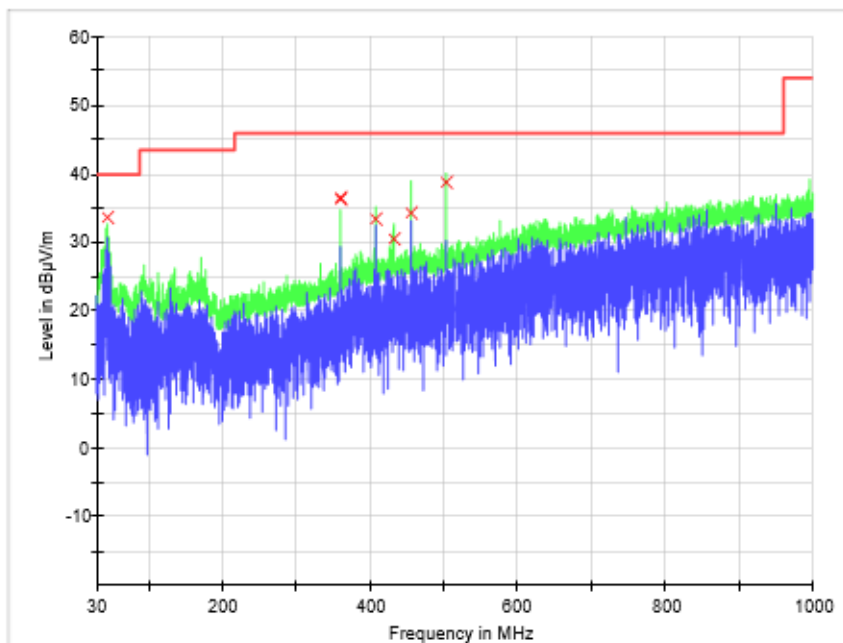
**Radiated emission below 1GHz**

Horizontal (the worst plot is shown below)



| Frequency<br>(MHz) | QuasiPeak<br>(dBμV/m) | Pol. | Corr.<br>(dB/m) | Margin<br>(dB) | Limit<br>(dBμV/m) | Result |
|--------------------|-----------------------|------|-----------------|----------------|-------------------|--------|
| 119.965000         | 28.8                  | H    | 12.2            | 14.7           | 43.5              | Pass   |
| 360.010000         | 35.5                  | H    | 16.3            | 10.5           | 46.0              | Pass   |
| 407.980000         | 36.2                  | H    | 17.5            | 9.8            | 46.0              | Pass   |
| 455.950000         | 31.8                  | H    | 18.8            | 14.2           | 46.0              | Pass   |
| 504.017500         | 34.8                  | H    | 19.6            | 11.2           | 46.0              | Pass   |
| 648.025000         | 27.9                  | H    | 22.5            | 18.1           | 46.0              | Pass   |

Vertical (the worst plot is shown below)



| Frequency<br>(MHz) | QuasiPeak<br>(dBµV/m) | Pol. | Corr.<br>(dB/m) | Margin<br>(dB) | Limit<br>(dBµV/m) | Result |
|--------------------|-----------------------|------|-----------------|----------------|-------------------|--------|
| 43.720000          | 33.7                  | V    | 14.1            | 6.3            | 40.0              | Pass   |
| 360.010000         | 36.3                  | V    | 16.3            | 9.7            | 46.0              | Pass   |
| 407.980000         | 33.4                  | V    | 17.5            | 12.6           | 46.0              | Pass   |
| 431.965000         | 30.4                  | V    | 18.2            | 15.6           | 46.0              | Pass   |
| 455.950000         | 34.3                  | V    | 18.8            | 11.7           | 46.0              | Pass   |
| 504.017500         | 38.8                  | V    | 19.6            | 7.2            | 46.0              | Pass   |

**Above 1GHz**

Channel:Low

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dB $\mu$ V/m) |         | Limit (dB $\mu$ V/m) |         | Remark |
|--------------------|-------------------------|-------------------------------|---------|----------------------|---------|--------|
|                    |                         | Peak                          | Average | Peak                 | Average |        |
| 1331.875           | H                       | 38.1                          | /       | 74.0                 | 54.0    | Pass   |
| 1991.125           | V                       | 43.4                          | /       | 74.0                 | 54.0    | Pass   |
| 3096.625           | H                       | 44.8                          | /       | 74.0                 | 54.0    | Pass   |
| 5142.500           | H                       | 53.4                          | /       | 74.0                 | 54.0    | Pass   |
| 7529.500           | V                       | 56.7                          | 44.1    | 74.0                 | 54.0    | Pass   |
| 10453.500          | H                       | 61.0                          | 47.9    | 74.0                 | 54.0    | Pass   |

Channel:Middle

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dB $\mu$ V/m) |         | Limit (dB $\mu$ V/m) |         | Remark |
|--------------------|-------------------------|-------------------------------|---------|----------------------|---------|--------|
|                    |                         | Peak                          | Average | Peak                 | Average |        |
| 4824.393           | H                       | 49.1                          | /       | 74.0                 | 54.0    | Pass   |
| 4826.216           | V                       | 52.8                          | /       | 74.0                 | 54.0    | Pass   |
| 7109.072           | V                       | 53.4                          | /       | 74.0                 | 54.0    | Pass   |
| 7971.214           | H                       | 55.5                          | 41.7    | 74.0                 | 54.0    | Pass   |
| 10394.928          | V                       | 57.7                          | 44.0    | 74.0                 | 54.0    | Pass   |
| 12359.036          | V                       | 57.5                          | 44.3    | 74.0                 | 54.0    | Pass   |

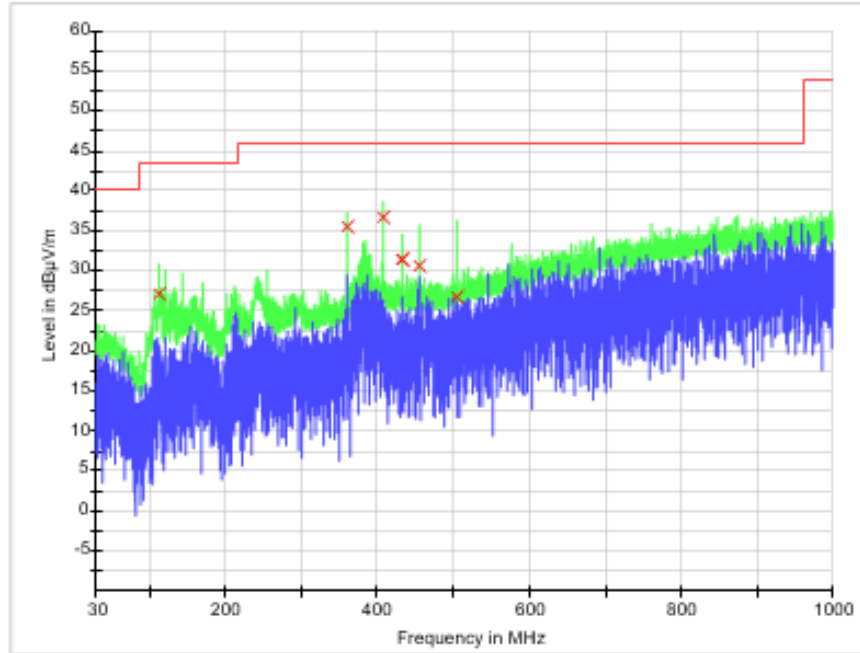
Channel: High

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dB $\mu$ V/m) |         | Limit (dB $\mu$ V/m) |         | Remark |
|--------------------|-------------------------|-------------------------------|---------|----------------------|---------|--------|
|                    |                         | Peak                          | Average | Peak                 | Average |        |
| 4816.500           | H                       | 47.7                          | /       | 74.0                 | 54.0    | Pass   |
| 4824.393           | V                       | 48.8                          | /       | 74.0                 | 54.0    | Pass   |
| 7966.964           | H                       | 54.8                          | 41.7    | 74.0                 | 54.0    | Pass   |
| 10506.643          | H                       | 57.3                          | 44.1    | 74.0                 | 54.0    | Pass   |
| 10566.143          | V                       | 57.3                          | 44.2    | 74.0                 | 54.0    | Pass   |
| 12288.607          | V                       | 57.5                          | 44.2    | 74.0                 | 54.0    | Pass   |

802.11n20

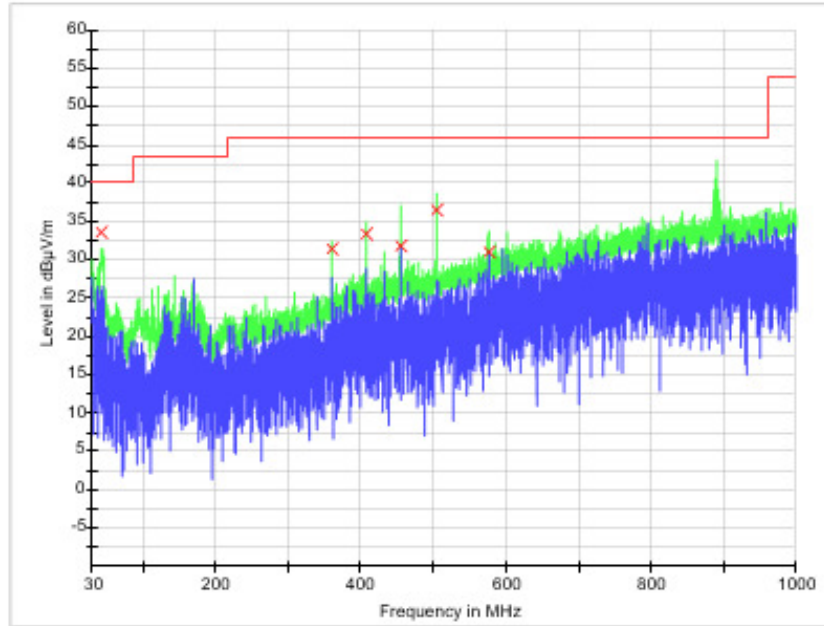
### Radiated emission below 1GHz

Horizontal (the worst plot is shown below)



| Frequency (MHz) | QuasiPeak (dBμV/m) | Pol. | Corr. (dB/m) | Margin (dB) | Limit (dBμV/m) | Result |
|-----------------|--------------------|------|--------------|-------------|----------------|--------|
| 112.555000      | 27.1               | H    | 11.4         | 16.4        | 43.5           | Pass   |
| 360.010000      | 35.5               | H    | 16.3         | 10.5        | 46.0           | Pass   |
| 407.980000      | 36.8               | H    | 17.5         | 9.2         | 46.0           | Pass   |
| 431.965000      | 31.5               | H    | 18.2         | 14.5        | 46.0           | Pass   |
| 455.950000      | 30.7               | H    | 18.8         | 15.3        | 46.0           | Pass   |
| 504.017500      | 26.8               | H    | 19.6         | 19.2        | 46.0           | Pass   |

Vertical (the worst plot is shown below)



| Frequency<br>(MHz) | QuasiPeak<br>(dBµV/m) | Pol. | Corr.<br>(dB/m) | Margin<br>(dB) | Limit<br>(dBµV/m) | Result |
|--------------------|-----------------------|------|-----------------|----------------|-------------------|--------|
| 42.940000          | 33.5                  | V    | 14.0            | 6.5            | 40.0              | Pass   |
| 360.010000         | 31.5                  | V    | 16.3            | 14.5           | 46.0              | Pass   |
| 407.980000         | 33.4                  | V    | 17.5            | 12.6           | 46.0              | Pass   |
| 455.950000         | 31.8                  | V    | 18.8            | 14.2           | 46.0              | Pass   |
| 504.017500         | 36.6                  | V    | 19.6            | 9.4            | 46.0              | Pass   |
| 575.972500         | 31.0                  | V    | 21.1            | 15.0           | 46.0              | Pass   |

### Above 1GHz

Channel:Low

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dB $\mu$ V/m) |         | Limit (dB $\mu$ V/m) |         | Remark |
|--------------------|-------------------------|-------------------------------|---------|----------------------|---------|--------|
|                    |                         | Peak                          | Average | Peak                 | Average |        |
| 1995.714           | H                       | 45.9                          | /       | 74.0                 | 54.0    | Pass   |
| 1996.929           | V                       | 53.3                          | /       | 74.0                 | 54.0    | Pass   |
| 6499.500           | V                       | 50.9                          | /       | 74.0                 | 54.0    | Pass   |
| 7021.643           | H                       | 53.4                          | /       | 74.0                 | 54.0    | Pass   |
| 7993.679           | V                       | 55.7                          | 41.8    | 74.0                 | 54.0    | Pass   |
| 10615.929          | H                       | 58.0                          | 44.5    | 74.0                 | 54.0    | Pass   |

Channel:Middle

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dB $\mu$ V/m) |         | Limit (dB $\mu$ V/m) |         | Remark |
|--------------------|-------------------------|-------------------------------|---------|----------------------|---------|--------|
|                    |                         | Peak                          | Average | Peak                 | Average |        |
| 2227.643           | V                       | 49.4                          | /       | 74.0                 | 54.0    | Pass   |
| 4953.714           | V                       | 46.6                          | /       | 74.0                 | 54.0    | Pass   |
| 5000.464           | H                       | 46.7                          | /       | 74.0                 | 54.0    | Pass   |
| 7022.857           | H                       | 52.7                          | /       | 74.0                 | 54.0    | Pass   |
| 7156.429           | V                       | 53.1                          | /       | 74.0                 | 54.0    | Pass   |
| 7991.250           | H                       | 55.1                          | 41.7    | 74.0                 | 54.0    | Pass   |

Channel: High

| Frequency<br>(MHz) | Antenna<br>Polarization | Emission Level (dB $\mu$ V/m) |         | Limit (dB $\mu$ V/m) |         | Remark |
|--------------------|-------------------------|-------------------------------|---------|----------------------|---------|--------|
|                    |                         | Peak                          | Average | Peak                 | Average |        |
| 5129.786           | V                       | 47.7                          | /       | 74.0                 | 54.0    | Pass   |
| 5157.107           | H                       | 46.9                          | /       | 74.0                 | 54.0    | Pass   |
| 6990.679           | H                       | 52.9                          | /       | 74.0                 | 54.0    | Pass   |
| 7077.500           | V                       | 53.5                          | /       | 74.0                 | 54.0    | Pass   |
| 7959.679           | V                       | 55.1                          | 41.5    | 74.0                 | 54.0    | Pass   |
| 7977.286           | H                       | 54.6                          | 41.8    | 74.0                 | 54.0    | Pass   |



Report No.: HKEM220500047602  
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## 8 Photographs

Remark: Photos refer to Appendix: External Photo, Internal Phot, and Setup Photo

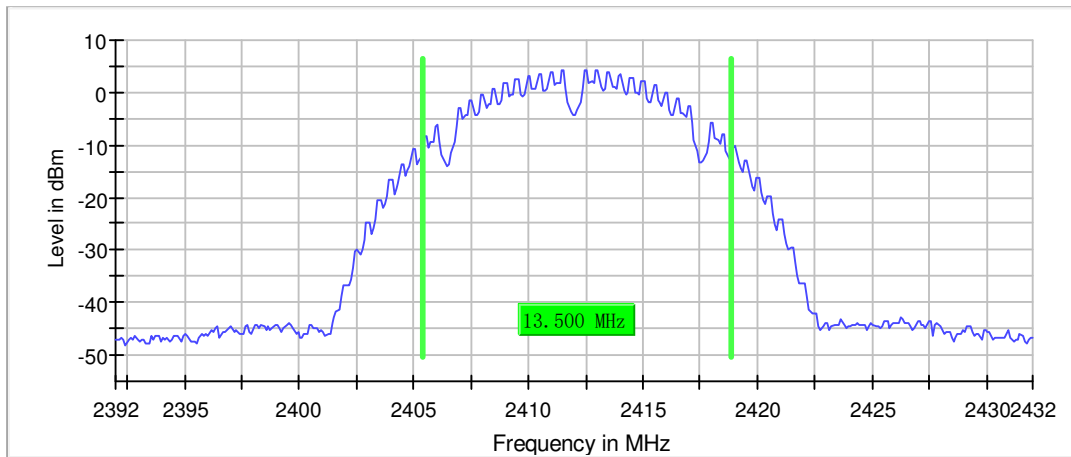
## 9 Appendix

### 9.1 99% Bandwidth

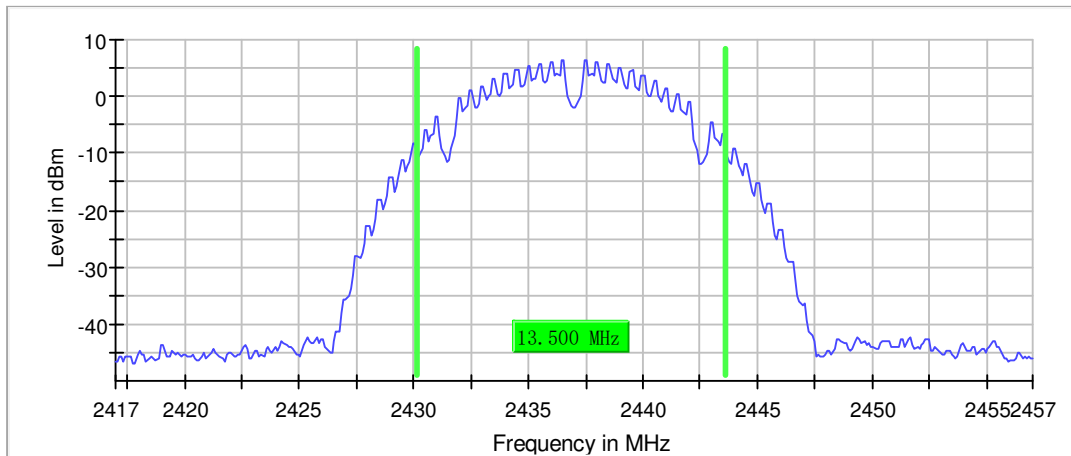
802.11b:

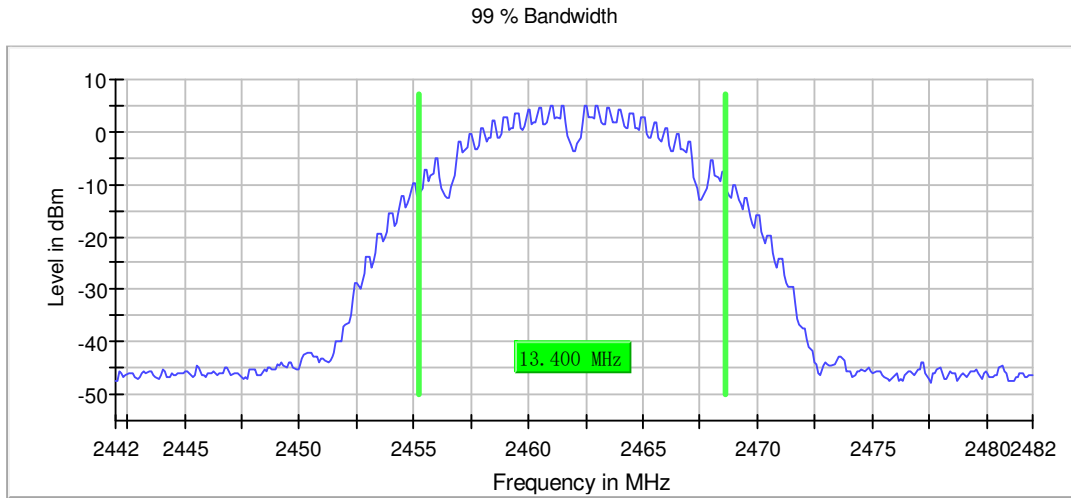
| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2412.000000         | 13.500000       | ---             | ---             | 2405.150000          | 2418.850000           |
| 2437.000000         | 13.500000       | ---             | ---             | 2435.150000          | 2448.650000           |
| 2462.000000         | 13.400000       | ---             | ---             | 2455.050000          | 2468.650000           |

99 % Bandwidth



99 % Bandwidth





## Measurement

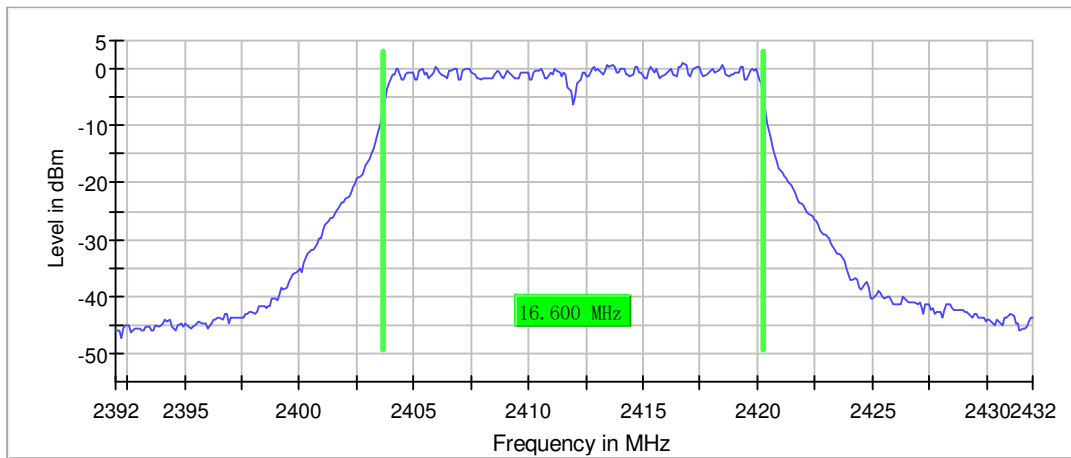
| Setting               | Instrument Value | Target Value       |
|-----------------------|------------------|--------------------|
| Span                  | 40.000 MHz       | 40.000 MHz         |
| RBW                   | 200.000 kHz      | $\geq 200.000$ kHz |
| VBW                   | 1.000 MHz        | $\geq 600.000$ kHz |
| SweepPoints           | 400              | ~ 400              |
| Sweptime              | 47.266 $\mu$ s   | AUTO               |
| Reference Level       | 0.000 dBm        | 0.000 dBm          |
| Attenuation           | 20.000 dB        | AUTO               |
| Detector              | MaxPeak          | MaxPeak            |
| SweepCount            | 100              | 100                |
| Filter                | 3 dB             | 3 dB               |
| Trace Mode            | Max Hold         | Max Hold           |
| SweepType             | FFT              | AUTO               |
| Preamplifier          | off              | off                |
| Stablemode            | Trace            | Trace              |
| Stablevalue           | 0.30 dB          | 0.30 dB            |
| Run                   | 8 / max. 150     | max. 150           |
| Stable                | 3 / 3            | 3                  |
| Max Stable Difference | 0.06 dB          | 0.30 dB            |

Remark: Cable loss 0.8dB was considered and set in system configuration.

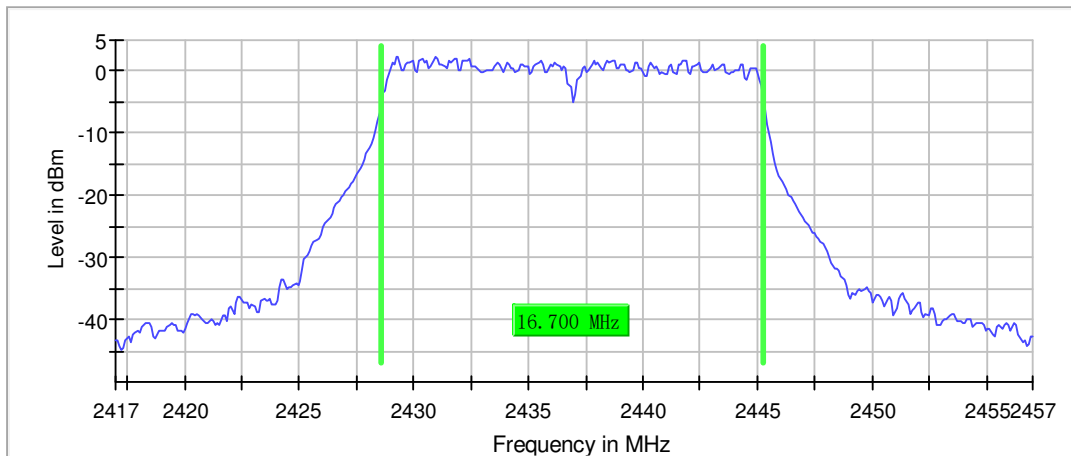
802.11g:

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2412.000000         | 16.600000       | ---             | ---             | 2403.650000          | 2420.250000           |
| 2437.000000         | 16.700000       | ---             | ---             | 2428.550000          | 2445.250000           |
| 2462.000000         | 16.700000       | ---             | ---             | 2453.550000          | 2470.250000           |

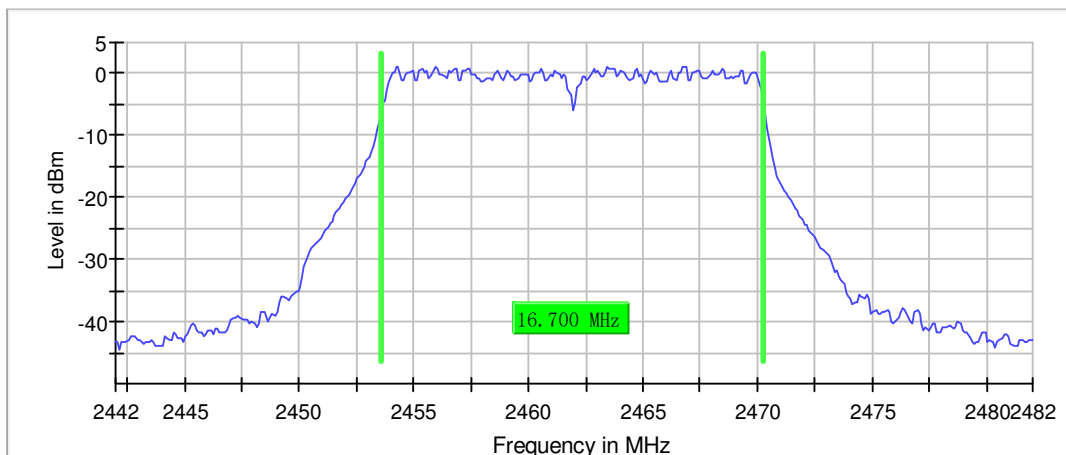
99 % Bandwidth



99 % Bandwidth



99 % Bandwidth



## Measurement

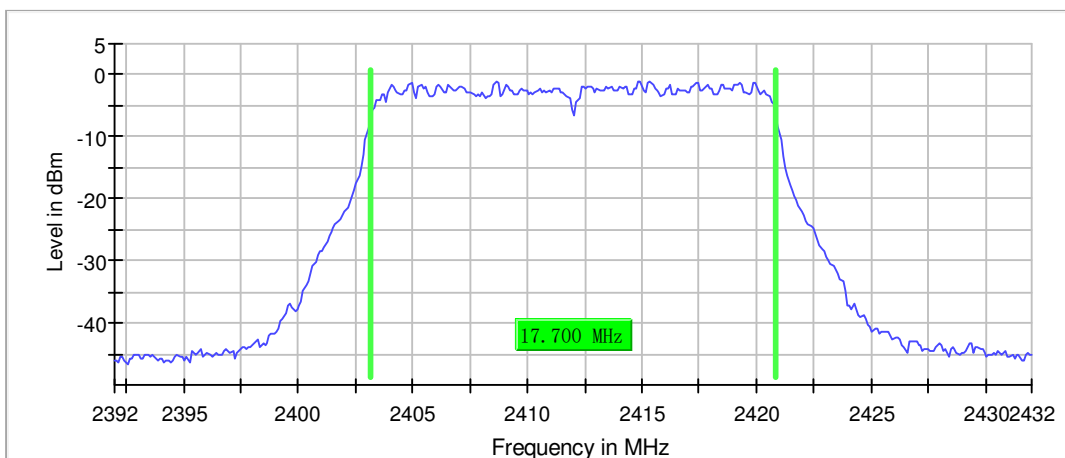
| Setting               | Instrument Value | Target Value       |
|-----------------------|------------------|--------------------|
| Span                  | 40.000 MHz       | 40.000 MHz         |
| RBW                   | 200.000 kHz      | $\geq 200.000$ kHz |
| VBW                   | 1.000 MHz        | $\geq 600.000$ kHz |
| SweepPoints           | 400              | ~ 400              |
| SweepTime             | 47.266 $\mu$ s   | AUTO               |
| Reference Level       | 0.000 dBm        | 0.000 dBm          |
| Attenuation           | 20.000 dB        | AUTO               |
| Detector              | MaxPeak          | MaxPeak            |
| SweepCount            | 100              | 100                |
| Filter                | 3 dB             | 3 dB               |
| Trace Mode            | Max Hold         | Max Hold           |
| SweepType             | FFT              | AUTO               |
| Preamplifier          | off              | off                |
| Stablemode            | Trace            | Trace              |
| Stablevalue           | 0.30 dB          | 0.30 dB            |
| Run                   | 24 / max. 150    | max. 150           |
| Stable                | 3 / 3            | 3                  |
| Max Stable Difference | 0.10 dB          | 0.30 dB            |

Remark: Cable loss 0.8dB was considered and set in system configuration.

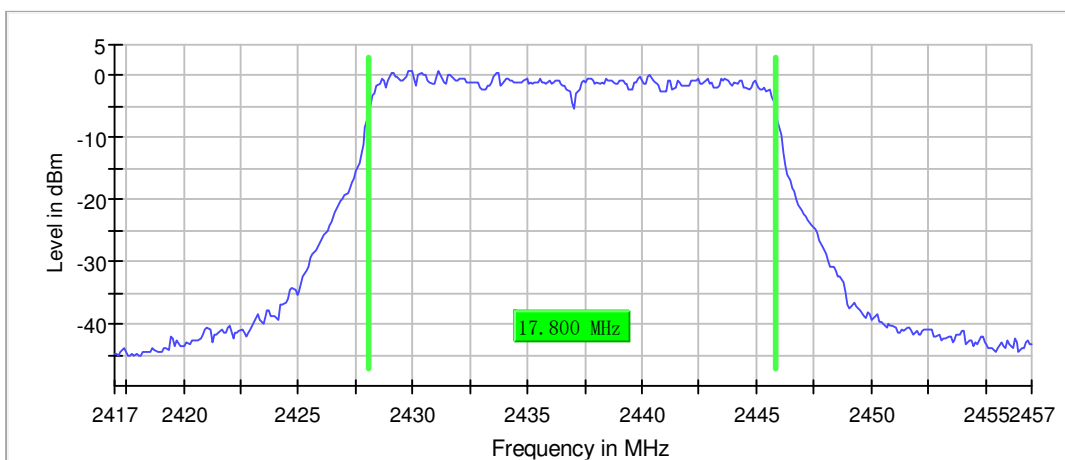
802.11n20:

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2412.000000         | 17.700000       | ---             | ---             | 2403.150000          | 2420.850000           |
| 2437.000000         | 17.800000       | ---             | ---             | 2428.050000          | 2445.850000           |
| 2462.000000         | 17.800000       | ---             | ---             | 2453.050000          | 2470.850000           |

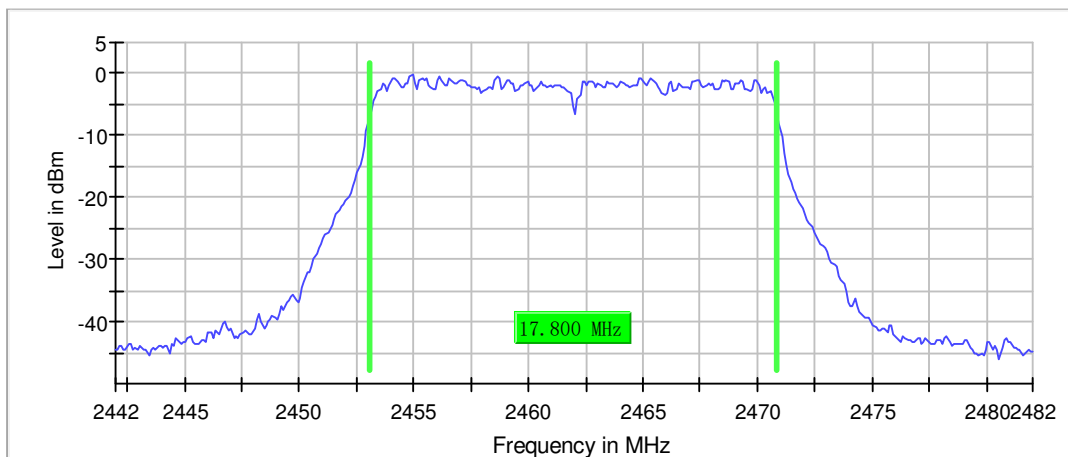
99 % Bandwidth



99 % Bandwidth



99 % Bandwidth



## Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Span                  | 40.000 MHz       | 40.000 MHz     |
| RBW                   | 200.000 kHz      | >= 200.000 kHz |
| VBW                   | 1.000 MHz        | >= 600.000 kHz |
| SweepPoints           | 400              | ~ 400          |
| SweepTime             | 47.266 us        | AUTO           |
| Reference Level       | 0.000 dBm        | 0.000 dBm      |
| Attenuation           | 20.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 100              | 100            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | FFT              | AUTO           |
| Preamplifier          | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.30 dB          | 0.30 dB        |
| Run                   | 19 / max. 150    | max. 150       |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.19 dB          | 0.30 dB        |

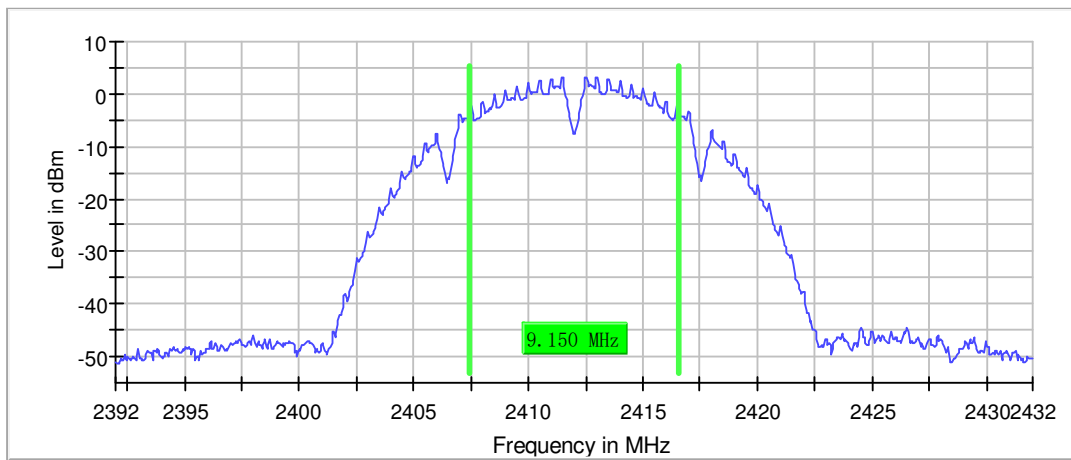
Remark: Cable loss 0.8dB was considered and set in system configuration.

## 9.2 Minimum Emission Bandwidth 6 dB

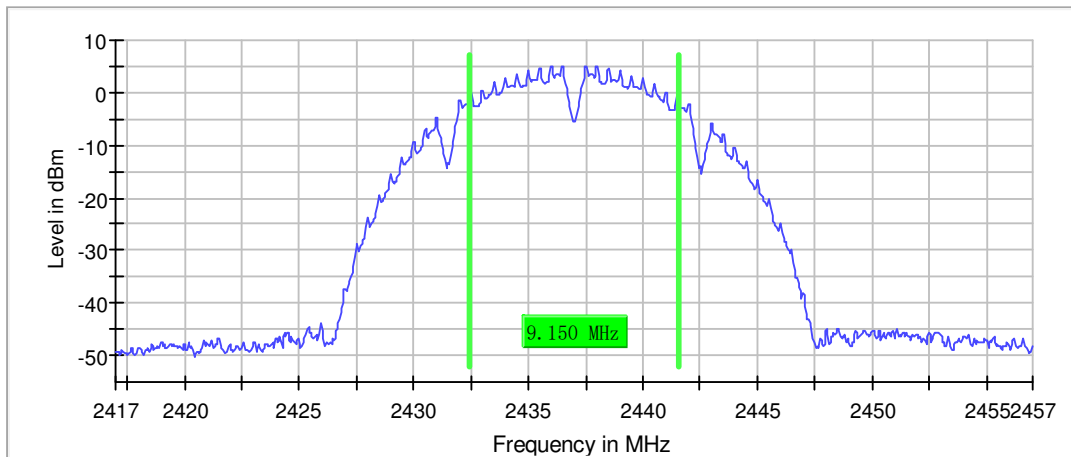
802.11b:

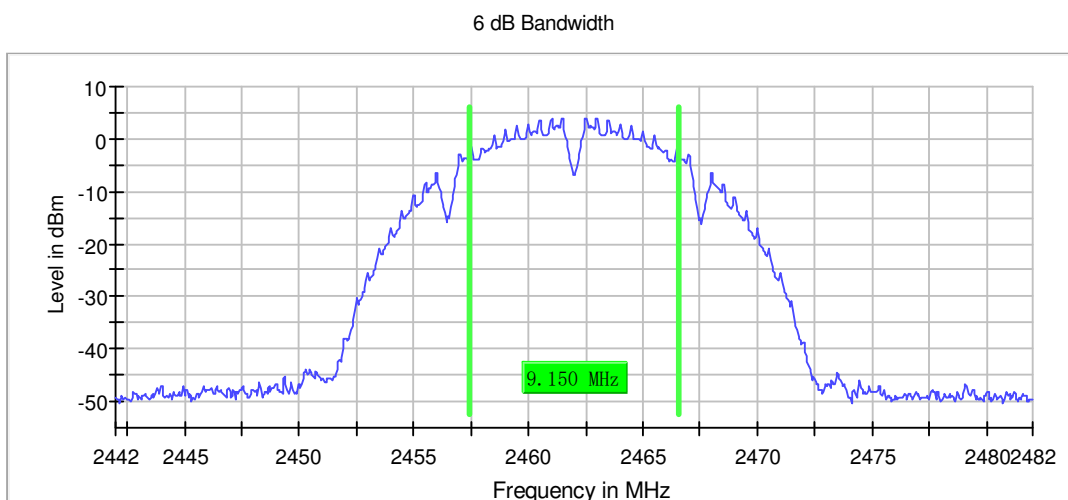
| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2412.000000         | 9.150000        | 0.500000        | ---             | 2407.425000          | 2416.575000           |
| 2437.000000         | 9.150000        | 0.500000        | ---             | 2432.425000          | 2441.575000           |
| 2462.000000         | 9.150000        | 0.500000        | ---             | 2457.425000          | 2466.575000           |

6 dB Bandwidth



6 dB Bandwidth





## Measurement

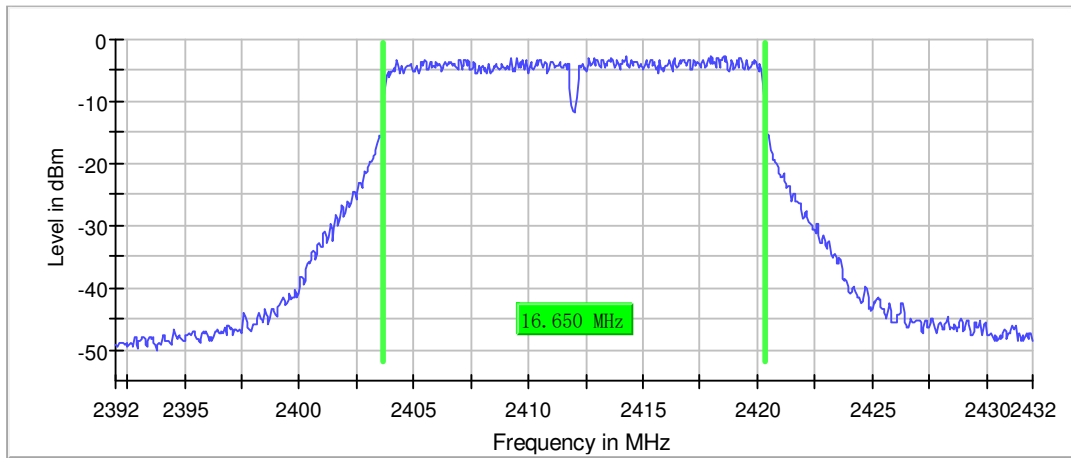
| Setting               | Instrument Value | Target Value |
|-----------------------|------------------|--------------|
| Span                  | 40.000 MHz       | 40.000 MHz   |
| RBW                   | 100.000 kHz      | 100.000 kHz  |
| VBW                   | 300.000 kHz      | 300.000 kHz  |
| SweepPoints           | 800              | ~ 800        |
| SweepTime             | 94.922 $\mu$ s   | AUTO         |
| Reference Level       | 10.000 dBm       | 10.000 dBm   |
| Attenuation           | 30.000 dB        | AUTO         |
| Detector              | MaxPeak          | MaxPeak      |
| SweepCount            | 100              | 100          |
| Filter                | 3 dB             | 3 dB         |
| Trace Mode            | Max Hold         | Max Hold     |
| SweepType             | FFT              | AUTO         |
| Preamplifier          | off              | off          |
| Stablemode            | Trace            | Trace        |
| Stablevalue           | 0.50 dB          | 0.50 dB      |
| Run                   | 10 / max. 150    | max. 150     |
| Stable                | 5 / 5            | 5            |
| Max Stable Difference | 0.11 dB          | 0.50 dB      |

Remark: Cable loss 0.8dB was considered and set in system configuration.

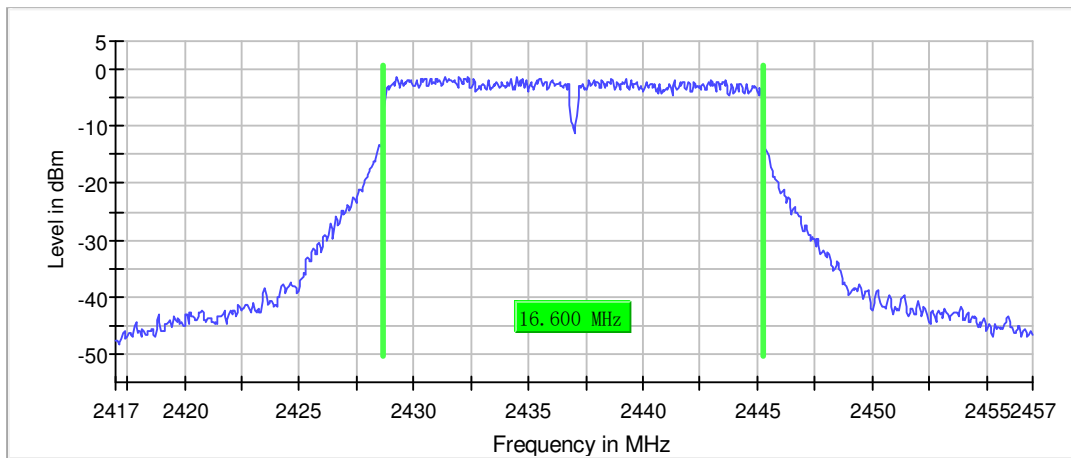
802.11g:

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2412.000000         | 16.650000       | 0.500000        | ---             | 2403.675000          | 2420.325000           |
| 2437.000000         | 16.600000       | 0.500000        | ---             | 2428.675000          | 2445.275000           |
| 2462.000000         | 16.650000       | 0.500000        | ---             | 2453.675000          | 2470.325000           |

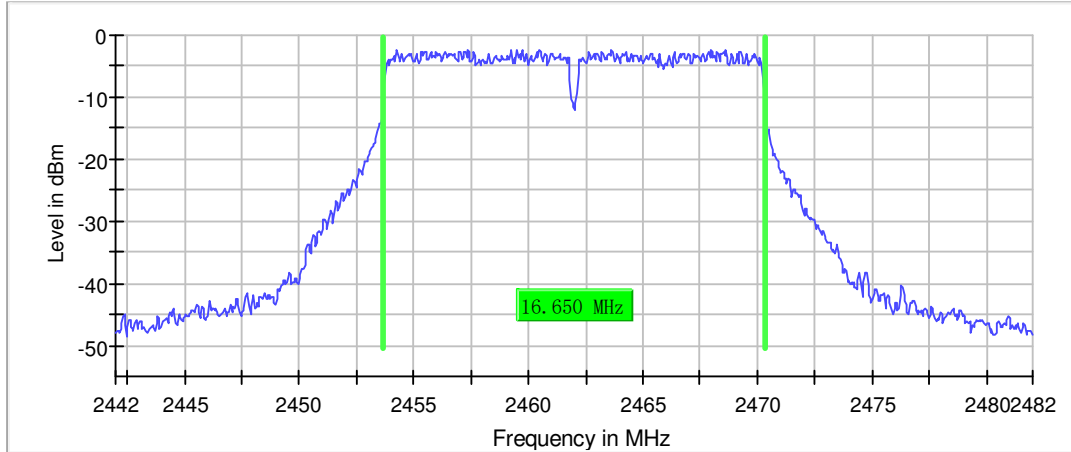
6 dB Bandwidth



6 dB Bandwidth



6 dB Bandwidth



## Measurement

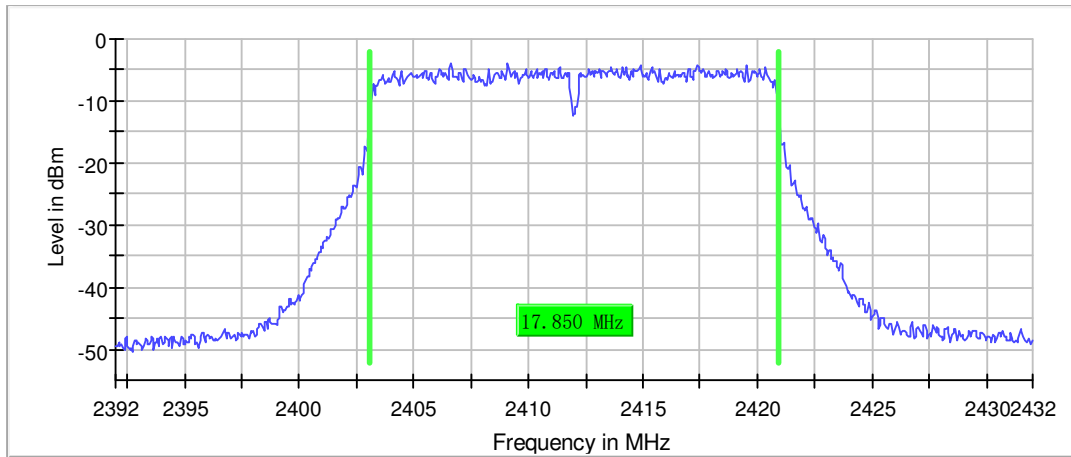
| Setting               | Instrument Value | Target Value  |
|-----------------------|------------------|---------------|
| Span                  | 40.000 MHz       | 40.000 MHz    |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz |
| VBW                   | 300.000 kHz      | ~ 300.000 kHz |
| SweepPoints           | 800              | ~ 800         |
| SweepTime             | 94.922 $\mu$ s   | AUTO          |
| Reference Level       | 0.000 dBm        | 0.000 dBm     |
| Attenuation           | 20.000 dB        | AUTO          |
| Detector              | MaxPeak          | MaxPeak       |
| SweepCount            | 100              | 100           |
| Filter                | 3 dB             | 3 dB          |
| Trace Mode            | Max Hold         | Max Hold      |
| SweepType             | FFT              | AUTO          |
| Preamplifier          | off              | off           |
| Stablemode            | Trace            | Trace         |
| Stablevalue           | 0.50 dB          | 0.50 dB       |
| Run                   | 20 / max. 150    | max. 150      |
| Stable                | 5 / 5            | 5             |
| Max Stable Difference | 0.14 dB          | 0.50 dB       |

Remark: Cable loss 0.8dB was considered and set in system configuration.

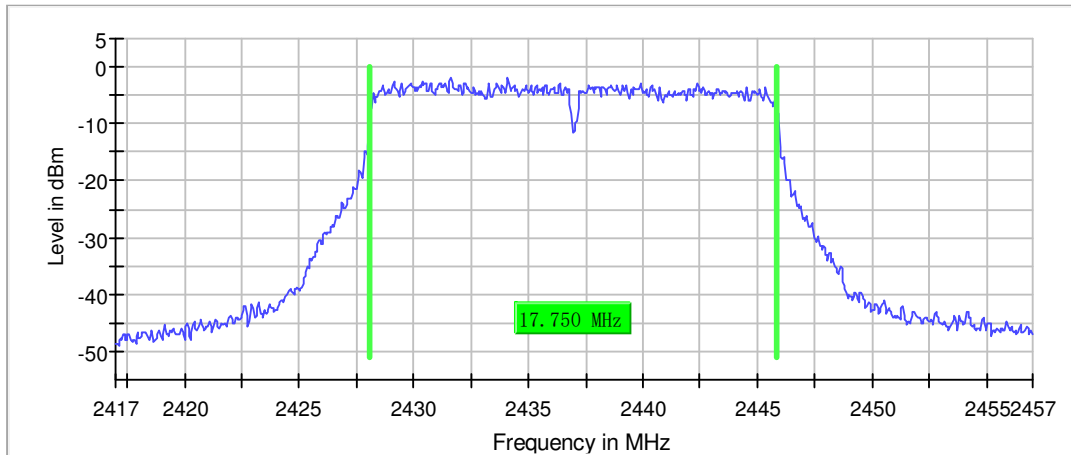
802.11n20:

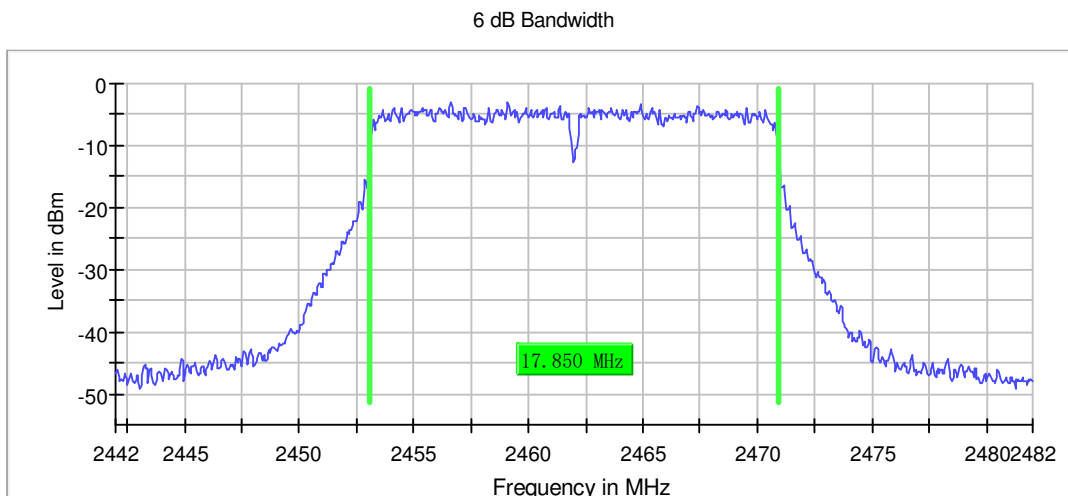
| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2412.000000         | 17.850000       | 0.500000        | ---             | 2403.075000          | 2420.925000           |
| 2437.000000         | 17.750000       | 0.500000        | ---             | 2428.075000          | 2445.825000           |
| 2462.000000         | 17.850000       | 0.500000        | ---             | 2453.075000          | 2470.925000           |

6 dB Bandwidth



6 dB Bandwidth





## Measurement

| Setting               | Instrument Value | Target Value  |
|-----------------------|------------------|---------------|
| Span                  | 40.000 MHz       | 40.000 MHz    |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz |
| VBW                   | 300.000 kHz      | ~ 300.000 kHz |
| SweepPoints           | 800              | ~ 800         |
| SweepTime             | 94.922 $\mu$ s   | AUTO          |
| Reference Level       | 0.000 dBm        | 0.000 dBm     |
| Attenuation           | 20.000 dB        | AUTO          |
| Detector              | MaxPeak          | MaxPeak       |
| SweepCount            | 100              | 100           |
| Filter                | 3 dB             | 3 dB          |
| Trace Mode            | Max Hold         | Max Hold      |
| SweepType             | FFT              | AUTO          |
| Preamplifier          | off              | off           |
| Stablemode            | Trace            | Trace         |
| Stablevalue           | 0.50 dB          | 0.50 dB       |
| Run                   | 14 / max. 150    | max. 150      |
| Stable                | 5 / 5            | 5             |
| Max Stable Difference | 0.43 dB          | 0.50 dB       |

Remark: Cable loss 0.8dB was considered and set in system configuration.

### 9.3 RF output power

| Operation Mode | DUT Frequency (MHz) | Limit Max (dBm) | Gated Level (dBm) | Result |
|----------------|---------------------|-----------------|-------------------|--------|
| 802.11b        | 2412.000000         | 30.0            | 13.0              | PASS   |
| 802.11b        | 2442.000000         | 30.0            | 14.9              | PASS   |
| 802.11b        | 2462.000000         | 30.0            | 13.8              | PASS   |
| 802.11g        | 2412.000000         | 30.0            | 12.2              | PASS   |
| 802.11g        | 2442.000000         | 30.0            | 13.5              | PASS   |
| 802.11g        | 2462.000000         | 30.0            | 12.8              | PASS   |
| 802.11n20      | 2412.000000         | 30.0            | 12.2              | PASS   |
| 802.11n20      | 2442.000000         | 30.0            | 12.0              | PASS   |
| 802.11n20      | 2462.000000         | 30.0            | 12.1              | PASS   |

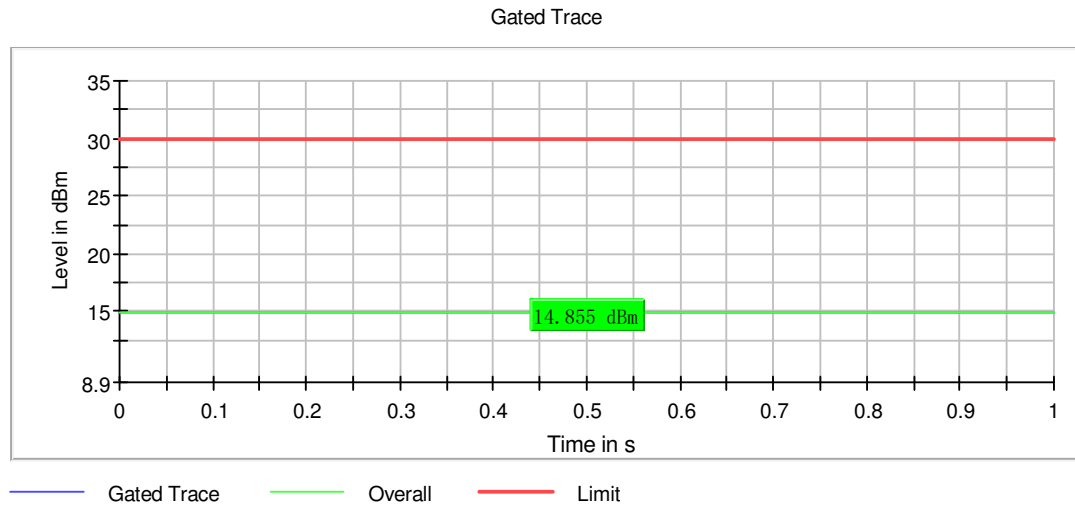
Remark:

Antenna gain: 2 dBi

Cable loss 0.8dB was considered and set in system configuration.

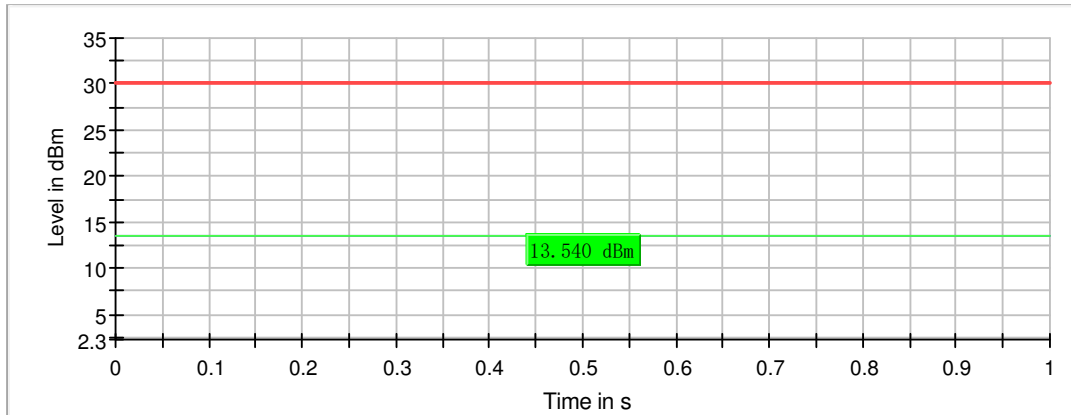
(only the plot of the worst case is shown for each mode)

802.11b:



802.11g:

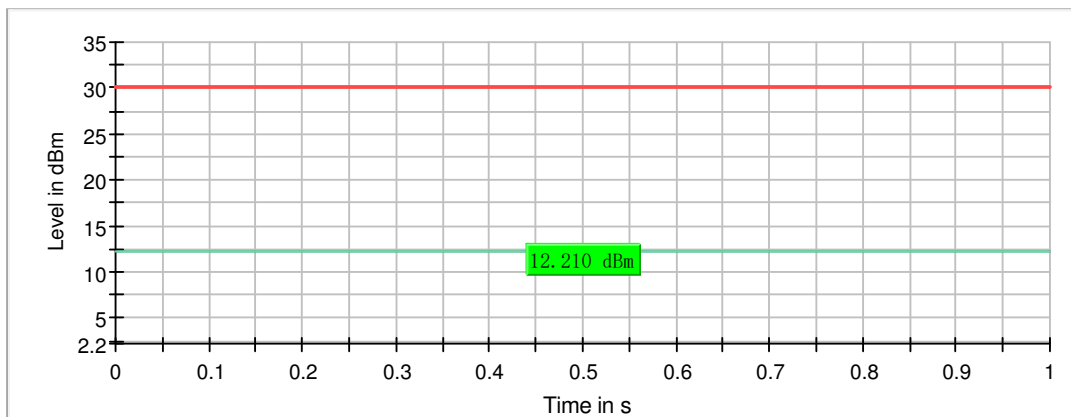
Gated Trace



— Gated Trace — Overall — Limit

802.11n20:

Gated Trace



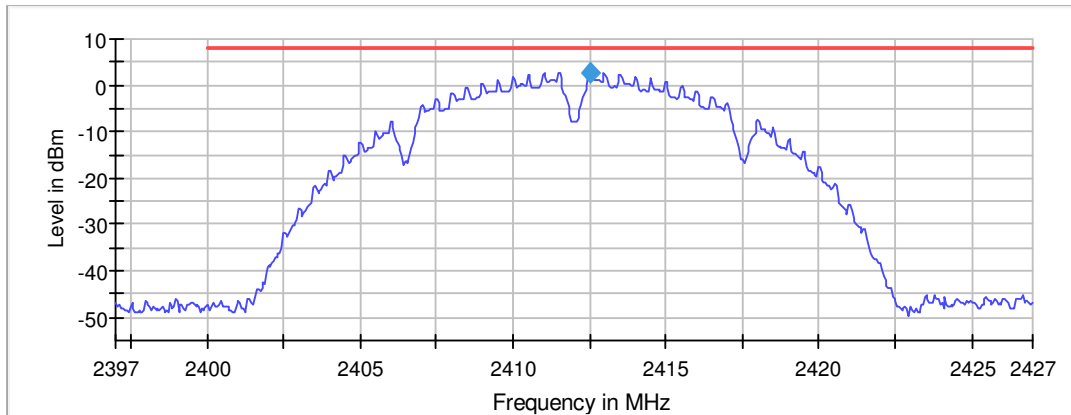
— Gated Trace — Overall — Limit

### Power Spectral Density

802.11b:

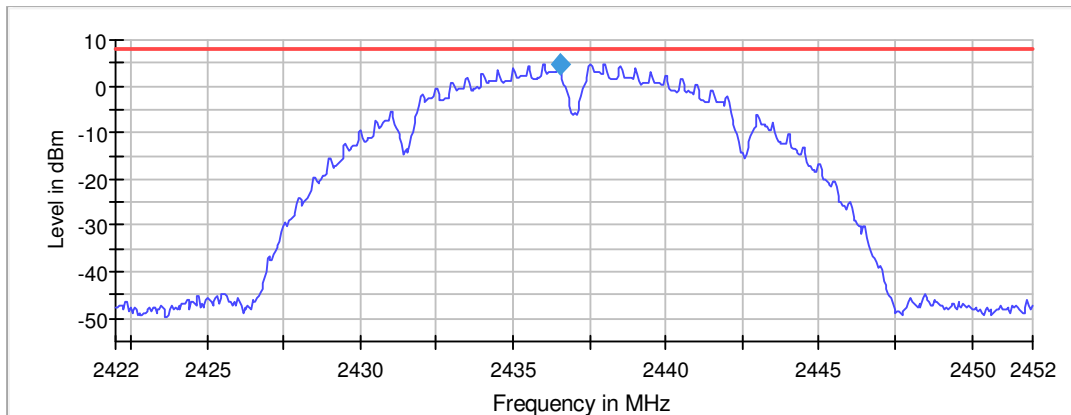
| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2412.000000         | 2412.525000     | 2.822     | 8.0             | PASS   |
| 2437.000000         | 2436.525000     | 4.854     | 8.0             | PASS   |
| 2462.000000         | 2461.525000     | 3.746     | 8.0             | PASS   |

### Peak Power Spectral Density



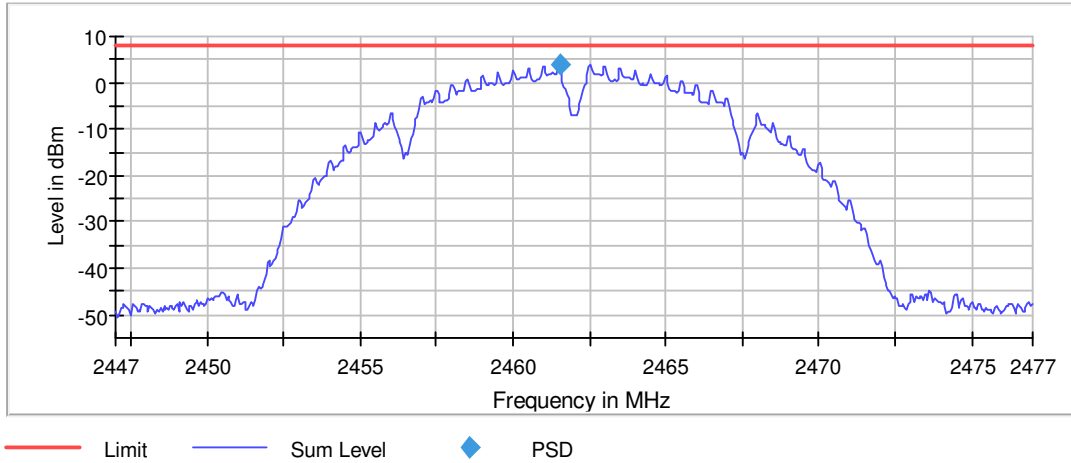
— Limit    — Sum Level    ◆ PSD

### Peak Power Spectral Density



— Limit    — Sum Level    ◆ PSD

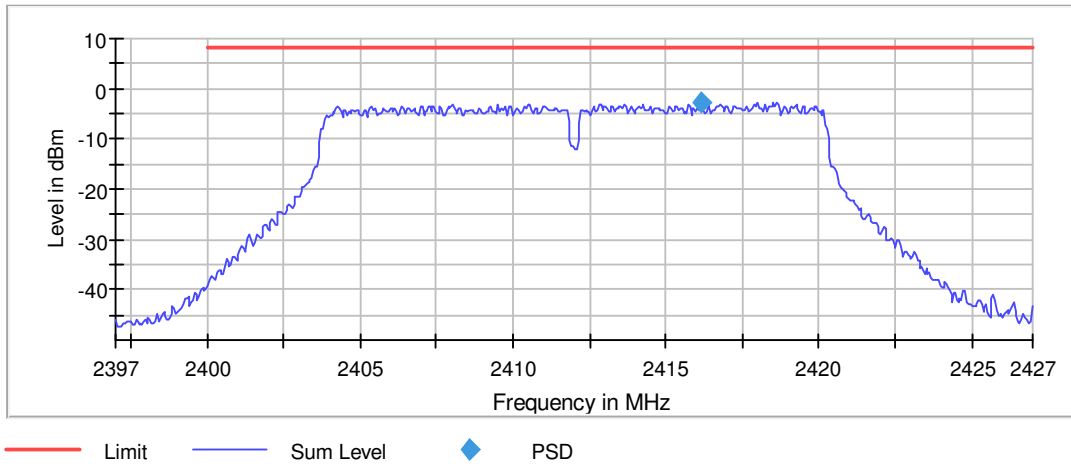
Peak Power Spectral Density



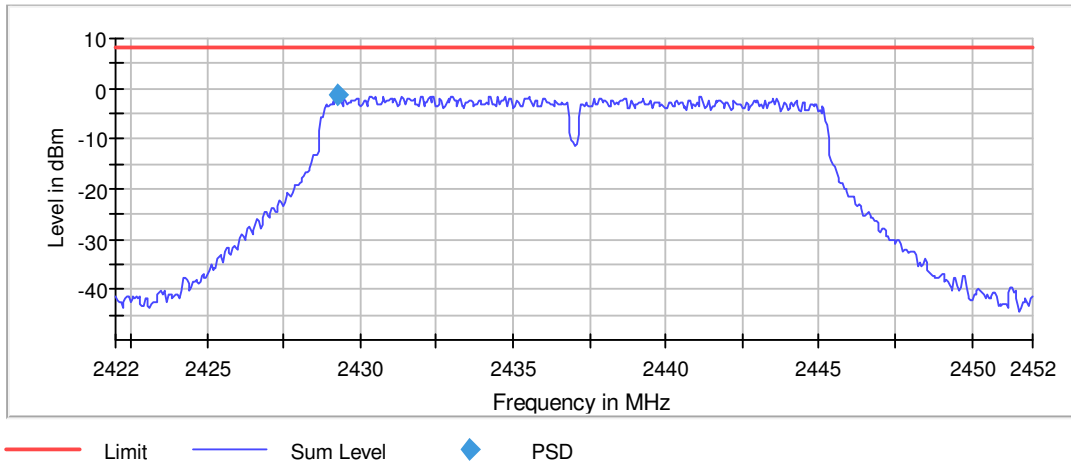
802.11g:

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2412.000000         | 2416.175000     | -2.579    | 8.0             | PASS   |
| 2437.000000         | 2429.275000     | -1.221    | 8.0             | PASS   |
| 2462.000000         | 2454.275000     | -2.218    | 8.0             | PASS   |

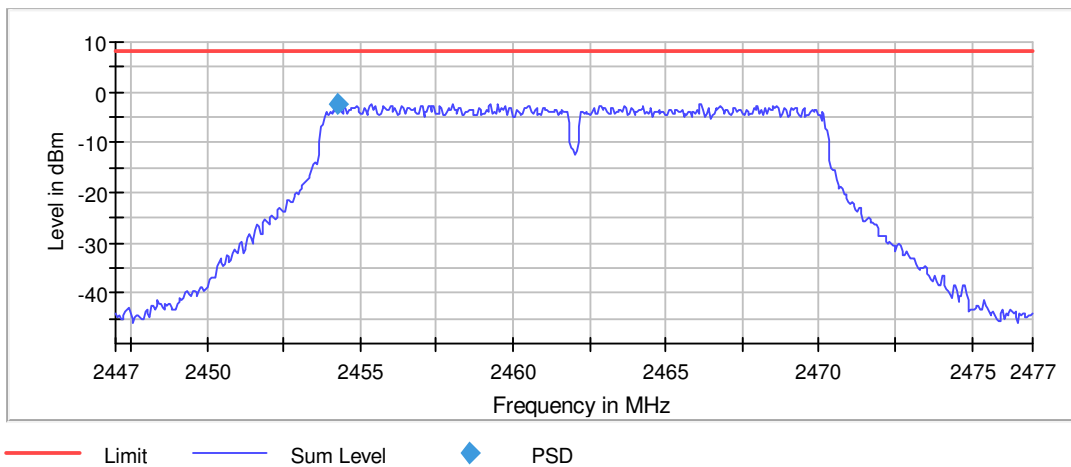
Peak Power Spectral Density



Peak Power Spectral Density



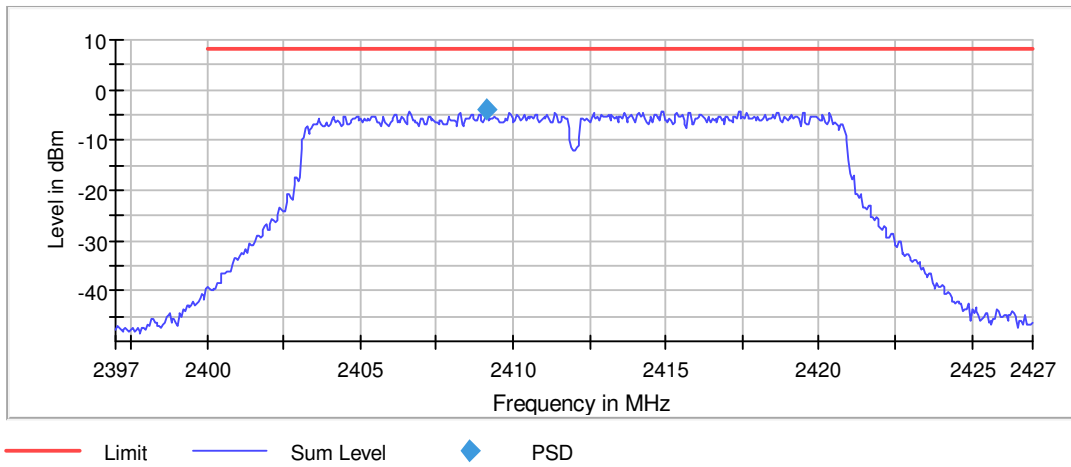
Peak Power Spectral Density



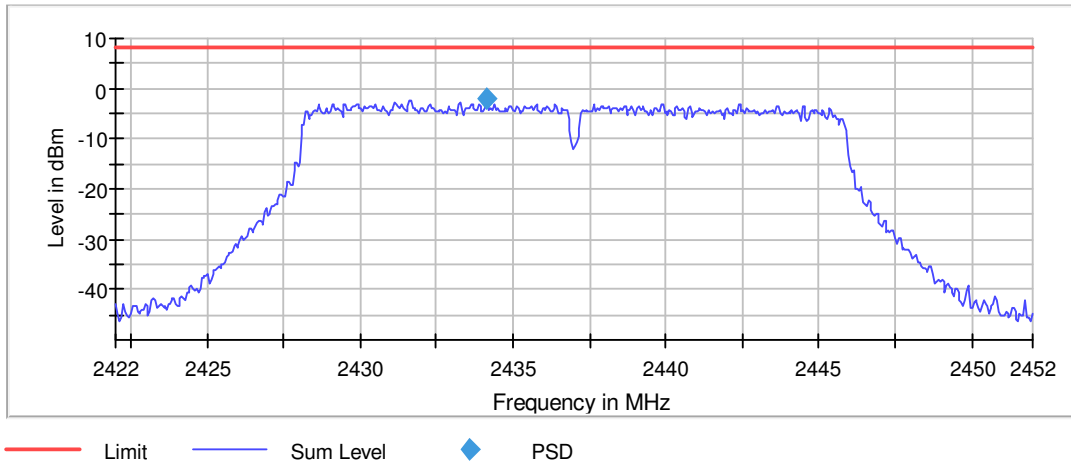
802.11n20:

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2412.000000         | 2409.125000     | -3.967    | 8.0             | PASS   |
| 2437.000000         | 2434.125000     | -2.135    | 8.0             | PASS   |
| 2462.000000         | 2456.625000     | -3.167    | 8.0             | PASS   |

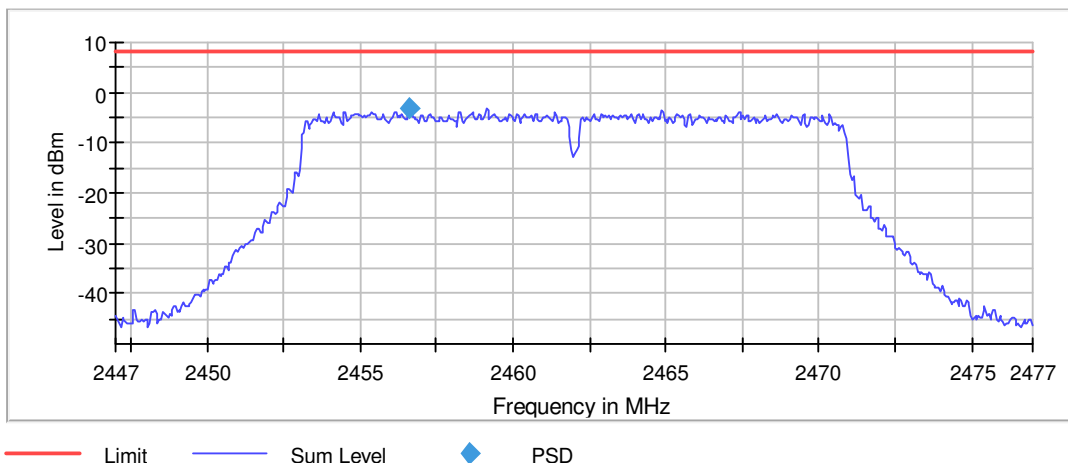
Peak Power Spectral Density



Peak Power Spectral Density



Peak Power Spectral Density



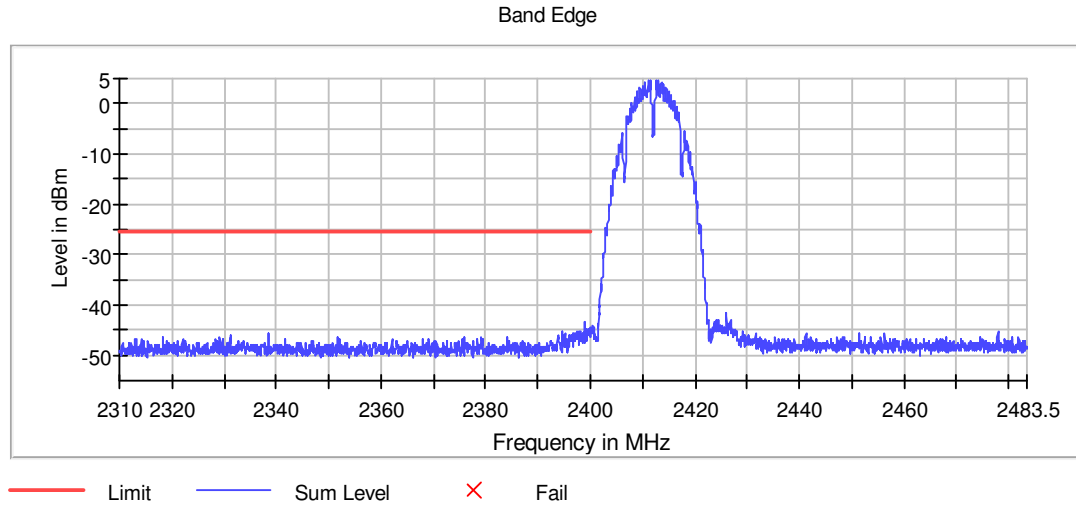
## Measurement

| Setting               | Instrument Value | Target Value       |
|-----------------------|------------------|--------------------|
| Span                  | 30.000 MHz       | 30.000 MHz         |
| RBW                   | 100.000 kHz      | $\leq 100.000$ kHz |
| VBW                   | 300.000 kHz      | $\geq 300.000$ kHz |
| SweepPoints           | 600              | ~ 600              |
| Sweptime              | 12.000 ms        | 12.000 ms          |
| Reference Level       | 0.000 dBm        | 0.000 dBm          |
| Attenuation           | 20.000 dB        | AUTO               |
| Detector              | RMS              | RMS                |
| SweepCount            | 1                | 1                  |
| Filter                | 3 dB             | 3 dB               |
| Trace Mode            | Max Hold         | Max Hold           |
| SweepType             | Sweep            | Sweep              |
| Preamplifier          | off              | off                |
| Stablemode            | Trace            | Trace              |
| Stablevalue           | 0.50 dB          | 0.50 dB            |
| Run                   | 45 / max. 150    | max. 150           |
| Stable                | 3 / 3            | 3                  |
| Max Stable Difference | 0.30 dB          | 0.50 dB            |

Remark: Cable loss 0.8dB was considered and set in system configuration.

## 9.4 Band Edge

802.11b Band Edge Low

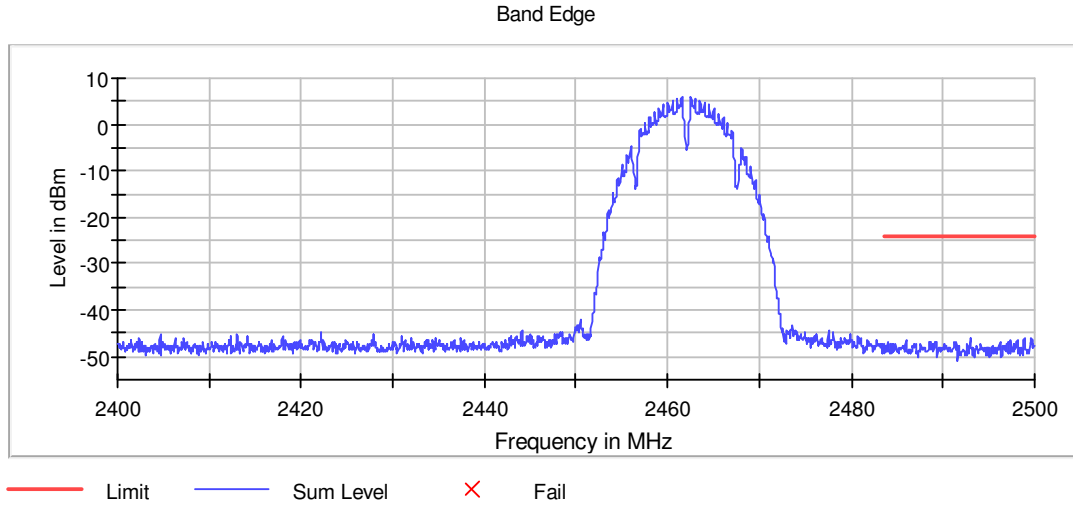


## Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2398.925000     | -43.4       | 18.1        | -25.3       | PASS   |
| 2398.875000     | -43.6       | 18.3        | -25.3       | PASS   |
| 2399.975000     | -44.4       | 19.2        | -25.3       | PASS   |
| 2399.425000     | -44.7       | 19.5        | -25.3       | PASS   |
| 2399.675000     | -44.9       | 19.6        | -25.3       | PASS   |
| 2399.475000     | -44.9       | 19.7        | -25.3       | PASS   |
| 2399.525000     | -45.0       | 19.7        | -25.3       | PASS   |
| 2399.325000     | -45.0       | 19.8        | -25.3       | PASS   |
| 2399.875000     | -45.1       | 19.8        | -25.3       | PASS   |
| 2399.625000     | -45.1       | 19.8        | -25.3       | PASS   |
| 2399.375000     | -45.2       | 19.9        | -25.3       | PASS   |
| 2398.025000     | -45.2       | 19.9        | -25.3       | PASS   |
| 2394.625000     | -45.2       | 19.9        | -25.3       | PASS   |
| 2397.975000     | -45.2       | 20.0        | -25.3       | PASS   |
| 2399.575000     | -45.2       | 20.0        | -25.3       | PASS   |

Remark: Limit = Inband peak - 30dB

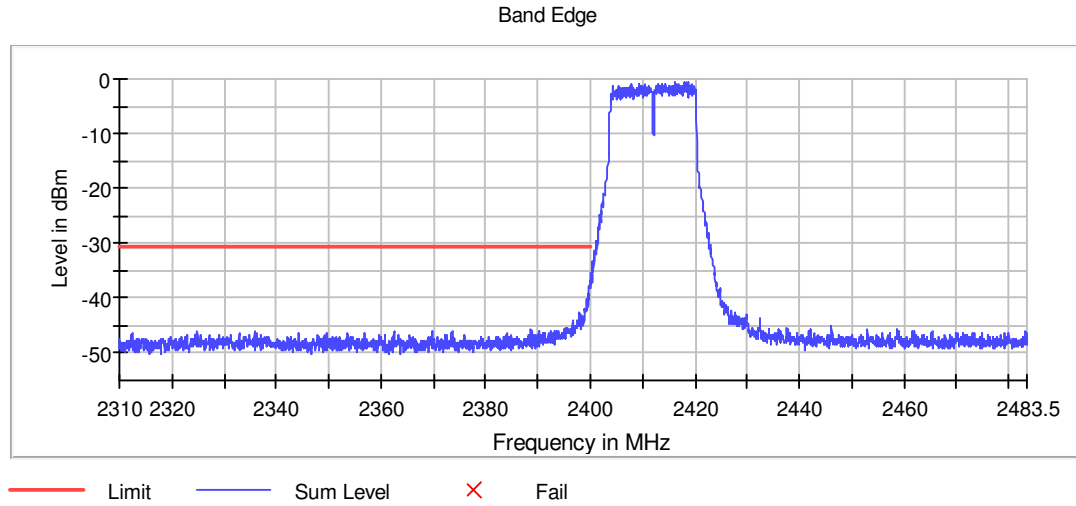
## 802.11b Band Edge High



## Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2499.675000     | -46.2       | 21.9        | -24.2       | PASS   |
| 2498.875000     | -46.2       | 22.0        | -24.2       | PASS   |
| 2492.975000     | -46.2       | 22.0        | -24.2       | PASS   |
| 2492.925000     | -46.4       | 22.1        | -24.2       | PASS   |
| 2497.425000     | -46.4       | 22.2        | -24.2       | PASS   |
| 2497.375000     | -46.5       | 22.3        | -24.2       | PASS   |
| 2498.075000     | -46.5       | 22.3        | -24.2       | PASS   |
| 2485.975000     | -46.6       | 22.3        | -24.2       | PASS   |
| 2499.725000     | -46.6       | 22.4        | -24.2       | PASS   |
| 2498.825000     | -46.6       | 22.4        | -24.2       | PASS   |
| 2486.025000     | -46.6       | 22.4        | -24.2       | PASS   |
| 2498.025000     | -46.7       | 22.5        | -24.2       | PASS   |
| 2497.075000     | -46.7       | 22.5        | -24.2       | PASS   |
| 2491.225000     | -46.8       | 22.6        | -24.2       | PASS   |
| 2488.575000     | -46.9       | 22.6        | -24.2       | PASS   |

## 802.11g Band Edge Low

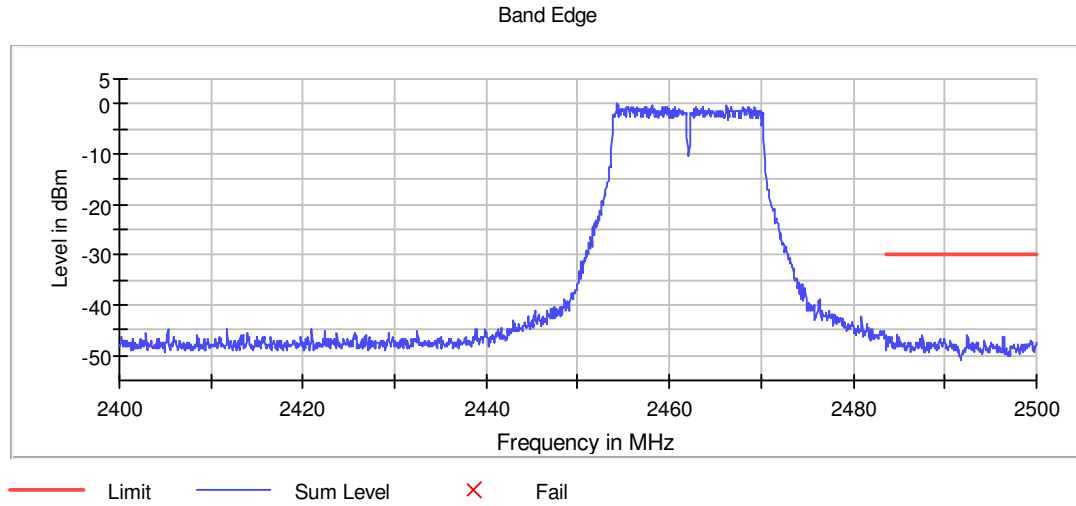


## Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2399.925000     | -36.7       | 6.2         | -30.5       | PASS   |
| 2399.875000     | -36.7       | 6.2         | -30.5       | PASS   |
| 2399.825000     | -37.5       | 7.0         | -30.5       | PASS   |
| 2399.775000     | -37.7       | 7.1         | -30.5       | PASS   |
| 2399.975000     | -38.1       | 7.6         | -30.5       | PASS   |
| 2399.625000     | -39.1       | 8.6         | -30.5       | PASS   |
| 2399.675000     | -39.2       | 8.7         | -30.5       | PASS   |
| 2399.575000     | -39.9       | 9.4         | -30.5       | PASS   |
| 2399.725000     | -40.3       | 9.8         | -30.5       | PASS   |
| 2399.325000     | -40.4       | 9.8         | -30.5       | PASS   |
| 2399.275000     | -40.5       | 9.9         | -30.5       | PASS   |
| 2399.525000     | -41.2       | 10.6        | -30.5       | PASS   |
| 2399.475000     | -41.2       | 10.7        | -30.5       | PASS   |
| 2399.225000     | -41.2       | 10.7        | -30.5       | PASS   |
| 2399.375000     | -41.4       | 10.9        | -30.5       | PASS   |

Remark: Limit = Inband peak - 20dB

## 802.11g Band Edge High

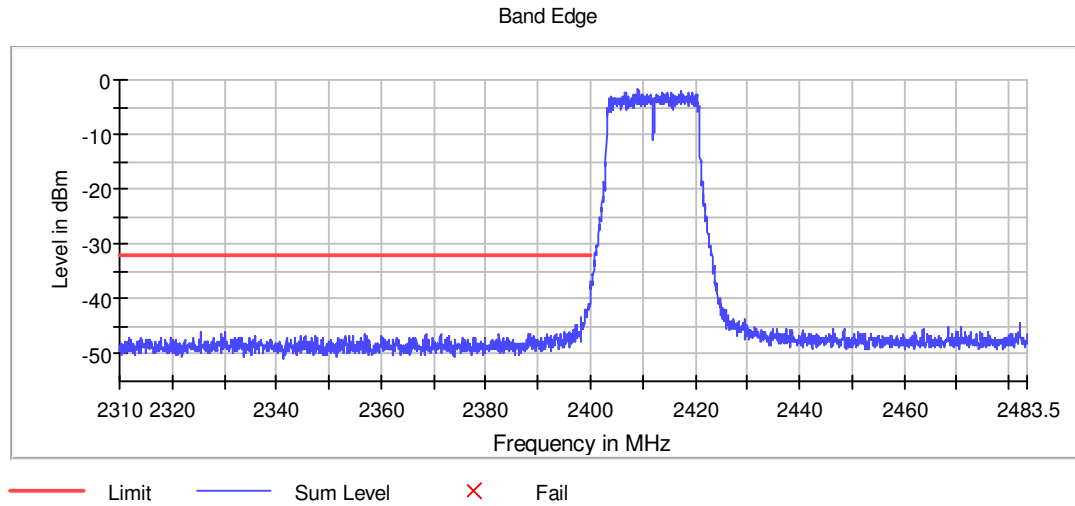


## Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2484.775000     | -45.9       | 15.9        | -30.0       | PASS   |
| 2492.475000     | -46.0       | 16.0        | -30.0       | PASS   |
| 2492.425000     | -46.1       | 16.1        | -30.0       | PASS   |
| 2487.525000     | -46.2       | 16.2        | -30.0       | PASS   |
| 2487.575000     | -46.2       | 16.2        | -30.0       | PASS   |
| 2496.425000     | -46.2       | 16.2        | -30.0       | PASS   |
| 2485.075000     | -46.2       | 16.2        | -30.0       | PASS   |
| 2484.825000     | -46.3       | 16.3        | -30.0       | PASS   |
| 2483.825000     | -46.4       | 16.4        | -30.0       | PASS   |
| 2496.375000     | -46.4       | 16.4        | -30.0       | PASS   |
| 2483.875000     | -46.4       | 16.5        | -30.0       | PASS   |
| 2485.025000     | -46.5       | 16.5        | -30.0       | PASS   |
| 2483.925000     | -46.5       | 16.5        | -30.0       | PASS   |
| 2484.125000     | -46.5       | 16.6        | -30.0       | PASS   |
| 2483.975000     | -46.6       | 16.7        | -30.0       | PASS   |

Remark: Limit = Inband peak - 30dB

## 802.11n20 Band Edge Low

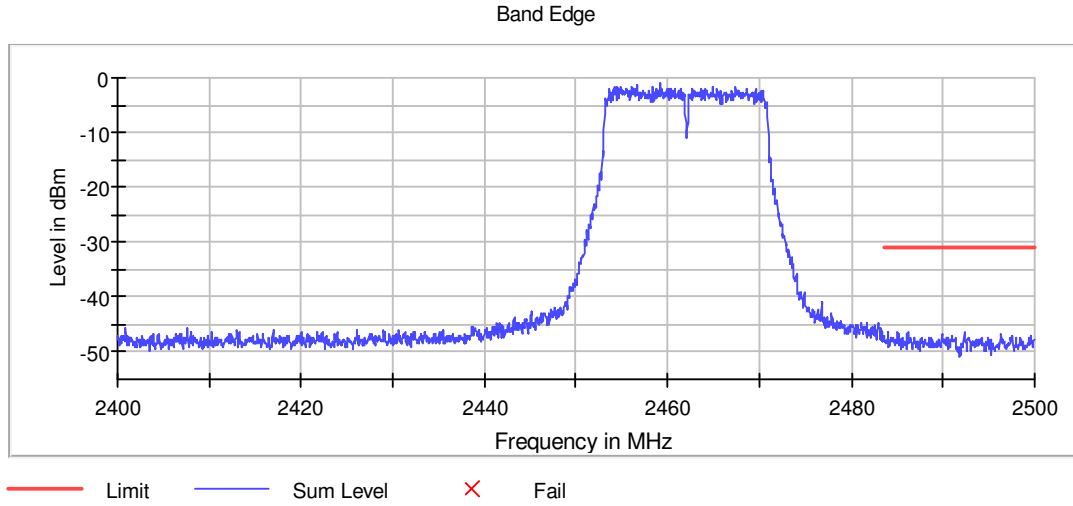


## Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2399.975000     | -37.3       | 5.4         | -31.9       | PASS   |
| 2399.925000     | -39.0       | 7.1         | -31.9       | PASS   |
| 2399.875000     | -40.1       | 8.2         | -31.9       | PASS   |
| 2399.825000     | -40.8       | 8.9         | -31.9       | PASS   |
| 2399.525000     | -41.0       | 9.1         | -31.9       | PASS   |
| 2399.575000     | -41.4       | 9.5         | -31.9       | PASS   |
| 2399.475000     | -41.4       | 9.5         | -31.9       | PASS   |
| 2399.625000     | -41.7       | 9.8         | -31.9       | PASS   |
| 2399.725000     | -41.8       | 10.0        | -31.9       | PASS   |
| 2399.775000     | -41.9       | 10.0        | -31.9       | PASS   |
| 2399.075000     | -41.9       | 10.1        | -31.9       | PASS   |
| 2399.675000     | -42.0       | 10.2        | -31.9       | PASS   |
| 2399.125000     | -42.1       | 10.2        | -31.9       | PASS   |
| 2399.375000     | -42.5       | 10.6        | -31.9       | PASS   |
| 2399.425000     | -42.6       | 10.8        | -31.9       | PASS   |

Remark: Limit = Inband peak - 30dB

## 802.11n20 Band Edge High



## Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2483.975000     | -46.3       | 15.2        | -31.0       | PASS   |
| 2486.175000     | -46.4       | 15.4        | -31.0       | PASS   |
| 2492.325000     | -46.5       | 15.4        | -31.0       | PASS   |
| 2492.375000     | -46.5       | 15.4        | -31.0       | PASS   |
| 2484.025000     | -46.5       | 15.4        | -31.0       | PASS   |
| 2485.075000     | -46.5       | 15.5        | -31.0       | PASS   |
| 2496.325000     | -46.6       | 15.6        | -31.0       | PASS   |
| 2496.375000     | -46.7       | 15.6        | -31.0       | PASS   |
| 2485.125000     | -46.8       | 15.8        | -31.0       | PASS   |
| 2489.875000     | -46.8       | 15.8        | -31.0       | PASS   |
| 2486.125000     | -46.8       | 15.8        | -31.0       | PASS   |
| 2485.025000     | -47.0       | 15.9        | -31.0       | PASS   |
| 2490.925000     | -47.0       | 16.0        | -31.0       | PASS   |
| 2490.975000     | -47.0       | 16.0        | -31.0       | PASS   |
| 2489.925000     | -47.1       | 16.0        | -31.0       | PASS   |

Remark: Limit = Inband peak - 30dB

## Measurement setting

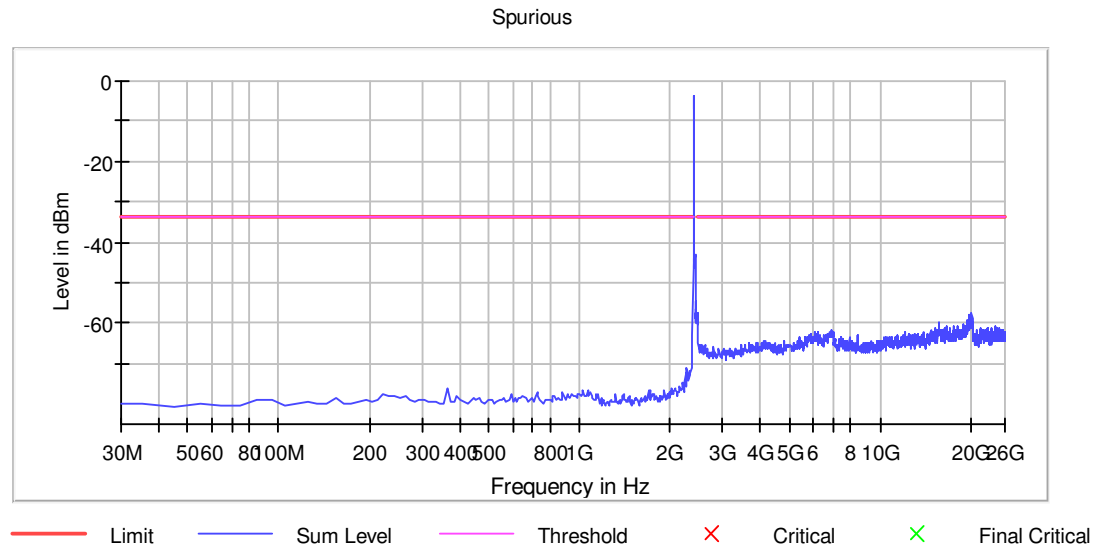
| Setting               | Instrument Value | Target Value       |
|-----------------------|------------------|--------------------|
| RBW                   | 100.000 kHz      | $\leq 100.000$ kHz |
| VBW                   | 300.000 kHz      | $\geq 300.000$ kHz |
| SweepPoints           | 1670             | ~ 1670             |
| SweepTime             | 1.670 ms         | AUTO               |
| Reference Level       | 0.000 dBm        | 0.000 dBm          |
| Attenuation           | 20.000 dB        | AUTO               |
| Detector              | MaxPeak          | MaxPeak            |
| SweepCount            | 100              | 100                |
| Filter                | 3 dB             | 3 dB               |
| Trace Mode            | Max Hold         | Max Hold           |
| SweepType             | Sweep            | AUTO               |
| Preamp                | off              | off                |
| Stablemode            | Trace            | Trace              |
| Stablevalue           | 0.50 dB          | 0.50 dB            |
| Run                   | 9 / max. 150     | max. 150           |
| Stable                | 3 / 3            | 3                  |
| Max Stable Difference | 0.18 dB          | 0.50 dB            |

Remark: Cable loss 0.8dB was considered and set in system configuration.

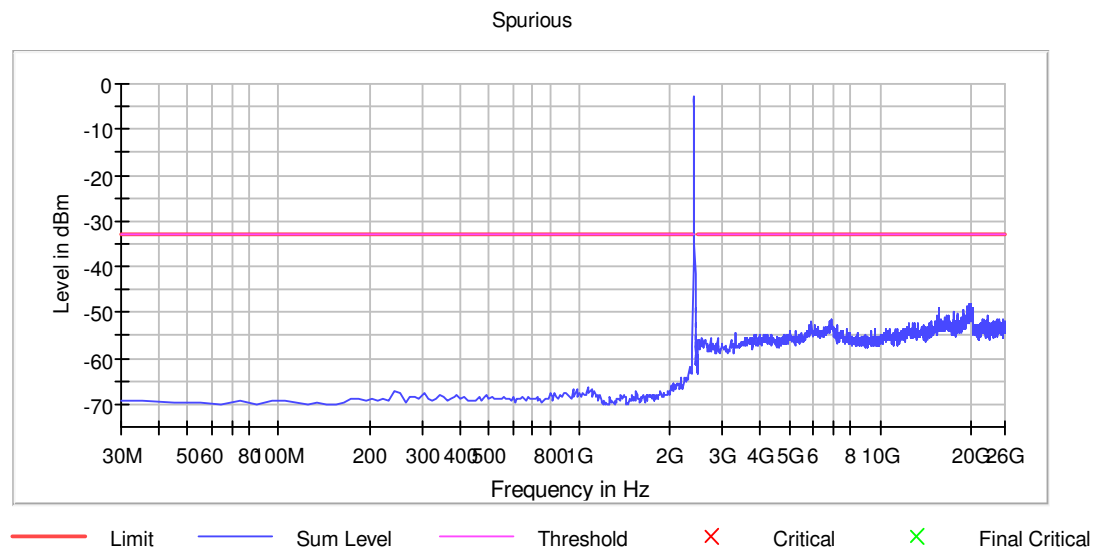
## 9.5 Conducted spurious emission

Only the worst case is shown for each mode

802.11b

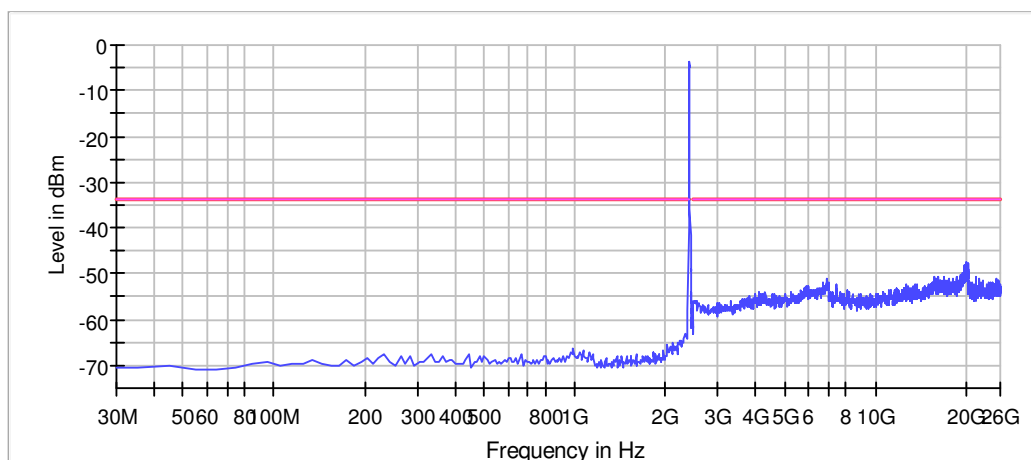


802.11g



802.11n20

Spurious



— Limit — Sum Level — Threshold × Critical × Final Critical

Limit=Inband peak-30dB

## Pre Measurement 1

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 2601             | ~ 2601         |
| SweepTime             | 23.700 ms        | AUTO           |
| Reference Level       | -10.000 dBm      | -30.000 dBm    |
| Attenuation           | 20.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 3                | 3              |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | Sweep            | AUTO           |
| Preamplifier          | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 8 / max. 40      | max. 40        |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

Remark: Cable loss 0.8dB was considered and set in system configuration.

- End of the Report -