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# FCC REPORT

**Application No:** SZEM1412006924CR (SGS GZ No.: GZEM1412006583CR)

**Applicant:** WOOX Innovations Ltd. **Manufacturer:** WOOX Innovations Ltd. **Factory:** Arts Electronics Co., Ltd.

**Product Name:** Spotify Connect Multiroom Box

Model No.(EUT): SW100M/37

**Add Model No.:** SW100X/zz, Where X=A-Z or Nil (different cabinet colour),

zz=00-99 (different plug portion and exported countries.)

Trade Mark: PHILIPS

FCC ID: 2AANUSW100M

**Standards:** 47 CFR Part 15, Subpart C (2013)

 Date of Receipt:
 2014-12-16

 Date of Test:
 2014-12-17

 Date of Issue:
 2014-12-31

Test Result: PASS \*

. \* In the configuration tested, the EUT complied with the standards specified above.

### Authorized Signature:



Jack Zhang EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.



Report No.: SZEM141200692401

Page: 2 of 89

## 2 Version

| Revision Record |         |            |          |          |  |  |
|-----------------|---------|------------|----------|----------|--|--|
| Version         | Chapter | Date       | Modifier | Remark   |  |  |
| 00              |         | 2014-12-31 |          | Original |  |  |
|                 |         |            |          |          |  |  |
|                 |         |            |          |          |  |  |

| Authorized for issue by: |                             |            |
|--------------------------|-----------------------------|------------|
| Tested By                | Eric Fu                     | 2014-12-17 |
|                          | (Eric Fu) /Project Engineer | Date       |
| Prepared By              | Hedy Wen                    | 2014-12-31 |
|                          | (Hedy Wen) /Clerk           | Date       |
| Checked By               | Sermen                      | 2015-01-19 |
|                          | (Kevin Feng) /Reviewer      | Date       |



Report No.: SZEM141200692401

Page: 3 of 89

## 3 Test Summary

| Test Item  | Test Requirement                                       | Test method             | Result |
|--|--|-------------------------|--------|
| Antenna Requirement  | 47 CFR Part 15, Subpart C Section<br>15.203/15.247 (c) | ANSI C63.10 2009        | PASS   |
| AC Power Line<br>Conducted<br>Emission                                     | nducted 47 CFR Part 15, Subpart C Section ANSI C63.1   |                         | PASS   |
| Conducted Peak Output<br>Power   | 47 CFR Part 15, Subpart C Section<br>15.247 (b)(3)     | KDB558074 D01<br>v03r02 | PASS   |
| 6dB Occupied Bandwidth   | 47 CFR Part 15, Subpart C Section<br>15.247 (a)(2)     | KDB558074 D01<br>v03r02 | PASS   |
| Power Spectral Density   | 47 CFR Part 15, Subpart C Section 15.247 (e)           | KDB558074 D01<br>v03r02 | PASS   |
| Band-edge for RF Conducted Emissions                                       | 47 CFR Part 15, Subpart C Section 15.247(d)            | KDB558074 D01<br>v03r02 | PASS   |
| RF Conducted Spurious<br>Emissions   | 47 CFR Part 15, Subpart C Section 15.247(d)            | KDB558074 D01<br>v03r02 | PASS   |
| Radiated Spurious Emissions  | 47 CFR Part 15, Subpart C Section<br>15.205/15.209     | ANSI C63.10 2009        | PASS   |
| Restricted bands<br>around fundamental<br>frequency (Radiated<br>Emission) | 47 CFR Part 15, Subpart C Section<br>15.205/15.209     | ANSI C63.10 2009        | PASS   |

Remark:

Model No.: SW100X/zz, Where X=A-Z or Nil (different cabinet colour), zz=00-99 (different plug portion and exported countries.)

Only the Model SW100M/37 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for all above models. Only different on plug portion, exported countries and and model number.



Report No.: SZEM141200692401

Page: 4 of 89

### 4 Contents

|   |      |   | Page  |
|---|------|---|-------|
| 1 | cov  | /ER PAGE  | 1     |
| 2 | VER  | SION  | 2     |
| 3 | TES  | T SUMMARY   | 3     |
| 4 | CON  | ITENTS  | 4     |
| 5 | GEN  | COVER PAGE         1           VERSION         2           TEST SUMMARY         3           CONTENTS         4           GENERAL INFORMATION         5           5.1         CLIENT INFORMATION         5           5.2         GENERAL DESCRIPTION OF EUT         5           5.4         DESCRIPTION OF SUPPORT UNITS         7           5.4         DESCRIPTION OF SUPPORT UNITS         7           5.5         TEST LOCATION         7           5.6         TEST FACILITY         8           5.7         DEVIATION FROM STANDARDS         8           5.8         ABNORMALITIES FROM STANDARD CONDITIONS         8           5.9         OTHER INFORMATION REQUESTED BY THE CUSTOMER         8           5.10         EQUIPMENT LIST         9           TEST RESULTS AND MEASUREMENT DATA         12           6.1         ANTENNA REQUIREMENT         12           6.2         CONDUCTED EMISSIONS         13           6.3         CONDUCTED EMISSIONS         13           6.4         6DB OCCUPY BANDWIDTH         25           6.6         BAND-EDGE FOR RF CONDUCTED EMISSIONS         39           6.7         RF CONDUCTED SPURIOUS EMISSIONS         43 |       |
|   | 5.1  |   |       |
|   | 5.2  | GENERAL DESCRIPTION OF EUT  | 5     |
|   | 5.3  |   |       |
|   | 5.4  |   |       |
|   | 5.5  |   |       |
|   | 5.6  |   |       |
|   | 5.7  |   |       |
|   | 5.8  |   | _     |
|   |      |   |       |
|   | 5.10 | EQUIPMENT LIST  | 9     |
| 6 | TES  | T RESULTS AND MEASUREMENT DATA  | 12    |
|   | 6.1  | ANTENNA REQUIREMENT   | 12    |
|   | 6.2  | CONDUCTED EMISSIONS   | 13    |
|   | 6.3  |   |       |
|   | 6.4  |   |       |
|   | 6.5  |   |       |
|   | 6.6  |   |       |
|   | 6.7  |   |       |
|   |      |   |       |
|   | 6.8  |   |       |
|   |      |   |       |
|   | 0.0  |   |       |
|   | 6.9  | RESTRICTED BANDS AROUND FUNDAMENTAL FREQUENCY   | 76-89 |



Report No.: SZEM141200692401

Page: 5 of 89

## 5 General Information

### 5.1 Client Information

| Applicant:               | WOOX Innovations Ltd.  |
|--------------------------|--|
| Address of Applicant:    | 5/F., Philips Electronics Building, 5 Science Park East Avenue, Hong Kong Science Park, Shatin, New Territories, Hong Kong |
| Manufacturer:            | WOOX Innovations Ltd.  |
| Address of Manufacturer: | 5/F., Philips Electronics Building, 5 Science Park East Avenue, Hong Kong Science Park, Shatin, New Territories, Hong Kong |
| Factory:                 | Arts Electronics Co., Ltd.   |
| Address of Factory:      | NO.1, SHANGXING LU, SHANGJIAO COMMUNITY, CHANGAN TOWN, DONGGUAN CITY, GUANGDONG PROVINCE, CHINA                            |

## 5.2 General Description of EUT

| <b>-</b>              |   |
|-----------------------|---|
| Product Name:         | Spotify Connect Multiroom Box   |
| Model No.:            | SW100M/37   |
| Trade Mark:           | PHILIPS   |
| Operation Frequency:  | IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz                                  |
| Channel Numbers:      | IEEE 802.11b/g, IEEE 802.11n(HT20): 11 Channels                             |
| Channel Separation:   | 5MHz  |
| Type of Modulation:   | IEEE for 802.11b: DSSS (CCK,DQPSK,DBPSK)                                    |
|                       | IEEE for 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)                           |
|                       | IEEE for 802.11n(HT20): OFDM (64QAM, 16QAM, QPSK, BPSK)                     |
| Sample Type:          | Fixed production  |
| Test Power Grade:     | IEEE 802.11b: 15; IEEE 802.11g: 11; IEEE 802.11n: 10 (manufacture declare ) |
| Test Software of EUT: | Art.exe (manufacturer declare )   |
| Antenna Type:         | Integral  |
| Antenna Gain:         | 0dBi  |
| Power Supply:         | Adapter Model: S018KU0500200  |
|                       | Input:100-240V~50/60Hz 500mA  |
|                       | Output:5.0V == 2000mA   |
| Test Voltage:         | AC 120V 60Hz  |
| DC Cable:             | 150cm (Unshielded)  |



Report No.: SZEM141200692401

Page: 6 of 89

| Operation Frequency each of channel(802.11b/g/n HT20) |           |         |           |         |           |         |           |
|---|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel   | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 1   | 2412MHz   | 4       | 2427MHz   | 7       | 2442MHz   | 10      | 2457MHz   |
| 2   | 2417MHz   | 5       | 2432MHz   | 8       | 2447MHz   | 11      | 2462MHz   |
| 3   | 2422MHz   | 6       | 2437MHz   | 9       | 2452MHz   |         |           |

#### Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

#### For 802.11b/g/n (HT20):

| Channel             | Frequency |  |  |
|---------------------|-----------|--|--|
| The Lowest channel  | 2412MHz   |  |  |
| The Middle channel  | 2437MHz   |  |  |
| The Highest channel | 2462MHz   |  |  |



Report No.: SZEM141200692401

Page: 7 of 89

#### 5.3 Test Environment and Mode

| Operating Environment: |   |
|------------------------|---|
| Temperature:           | 20.0 °C   |
| Humidity:              | 45 % RH   |
| Atmospheric Pressure:  | 1015 mbar   |
| Test mode:             |   |
| Transmitting mode:     | Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate |

## 5.4 Description of Support Units

The EUT has been tested independently.

### 5.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab,

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.



Report No.: SZEM141200692401

Page: 8 of 89

## 5.6 Test Facility

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

#### CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

#### VCCI

The 10m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

#### FCC – Registration No.: 556682

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

#### Industry Canada (IC)

Two 3m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1 & 4620C-2.

#### 5.7 Deviation from Standards

None.

#### 5.8 Abnormalities from Standard Conditions

None.

### 5.9 Other Information Requested by the Customer

None.



Report No.: SZEM141200692401

Page: 9 of 89

## 5.10Equipment List

|      | Conducted Emission                    |  |                     |                  |                           |  |  |
|------|---------------------------------------|--|---------------------|------------------|---------------------------|--|--|
| Item | Test Equipment                        | Manufacturer                             | Model No.           | Inventory<br>No. | Cal.Due date (yyyy-mm-dd) |  |  |
| 1    | Shielding Room                        | ZhongYu Electron                         | GB-88               | SEL0042          | 2015-06-10                |  |  |
| 2    | LISN                                  | Rohde & Schwarz                          | ENV216              | SEL0152          | 2015-10-24                |  |  |
| 3    | LISN                                  | ETS-LINDGREN                             | 3816/2              | SEL0021          | 2015-05-16                |  |  |
| 4    | 8 Line ISN                            | Fischer Custom<br>Communications<br>Inc. | FCC-TLISN-<br>T8-02 | SEL0162          | 2015-08-30                |  |  |
| 5    | 4 Line ISN                            | Fischer Custom Communications Inc.       | FCC-TLISN-<br>T4-02 | SEL0163          | 2015-08-30                |  |  |
| 6    | 2 Line ISN                            | Fischer Custom<br>Communications<br>Inc. | FCC-TLISN-<br>T2-02 | SEL0164          | 2015-08-30                |  |  |
| 7    | EMI Test Receiver                     | Rohde & Schwarz                          | ESCI                | SEL0022          | 2015-05-16                |  |  |
| 8    | Coaxial Cable                         | SGS                                      | N/A                 | SEL0025          | 2015-05-29                |  |  |
| 9    | DC Power Supply                       | Zhao Xin                                 | RXN-305D            | SEL0117          | 2015-10-24                |  |  |
| 10   | Humidity/<br>Temperature<br>Indicator | Shanhai Qixiang                          | ZJ1-2B              | SEL0103          | 2015-10-24                |  |  |
| 11   | Barometer                             | Chang Chun                               | DYM3                | SEL0088          | 2015-05-16                |  |  |



Report No.: SZEM141200692401

Page: 10 of 89

|      | RE in Chamber                      |                                    |           |                  |                           |  |  |
|------|------------------------------------|------------------------------------|-----------|------------------|---------------------------|--|--|
| Item | Test Equipment                     | Manufacturer                       | Model No. | Inventory<br>No. | Cal.Due date (yyyy-mm-dd) |  |  |
| 1    | 3m Semi-Anechoic<br>Chamber        | ETS-LINDGREN                       | N/A       | SEL0017          | 2015-06-10                |  |  |
| 2    | EMI Test Receiver                  | Agilent<br>Technologies            | N9038A    | SEL0312          | 2015-09-16                |  |  |
| 3    | EMI Test software                  | AUDIX                              | E3        | SEL0050          | N/A                       |  |  |
| 4    | BiConiLog Antenna<br>(26-3000MHz)  | ETS-LINDGREN                       | 3142C     | SEL0015          | 2015-10-24                |  |  |
| 5    | Double-ridged horn<br>(1-18GHz)    | ETS-LINDGREN                       | 3117      | SEL0006          | 2015-10-24                |  |  |
| 6    | Horn Antenna<br>(18-26GHz)         | ETS-LINDGREN                       | 3160      | SEL0076          | 2015-10-24                |  |  |
| 7    | Pre-amplifier<br>(0.1-1300MHz)     | Agilent<br>Technologies            | 8447D     | SEL0053          | 2015-05-16                |  |  |
| 8    | Pre-Amplifier<br>(0.1-26.5GHz)     | Compliance Directions Systems Inc. | PAP-0126  | SEL0168          | 2015-10-24                |  |  |
| 9    | Coaxial cable                      | SGS                                | N/A       | SEL0027          | 2015-05-29                |  |  |
| 10   | Coaxial cable                      | SGS                                | N/A       | SEL0189          | 2015-05-29                |  |  |
| 11   | Coaxial cable                      | SGS                                | N/A       | SEL0121          | 2015-05-29                |  |  |
| 12   | Coaxial cable                      | SGS                                | N/A       | SEL0178          | 2015-05-29                |  |  |
| 13   | Band filter                        | Amindeon                           | 82346     | SEL0094          | 2015-05-16                |  |  |
| 14   | Barometer                          | Chang Chun                         | DYM3      | SEL0088          | 2015-05-16                |  |  |
| 15   | DC Power Supply                    | Zhao Xin                           | RXN-305D  | SEL0117          | 2015-10-24                |  |  |
| 16   | Humidity/<br>Temperature Indicator | Shanhai Qixiang                    | ZJ1-2B    | SEL0103          | 2015-10-24                |  |  |
| 17   | Signal Generator<br>(10M-27GHz)    | Rohde & Schwarz                    | SMR27     | SEL0067          | 2015-05-16                |  |  |
| 18   | Signal Generator                   | Rohde & Schwarz                    | SMY01     | SEL0155          | 2015-10-24                |  |  |
| 19   | Loop Antenna                       | Beijing Daze                       | ZN30401   | SEL0203          | 2015-06-04                |  |  |



Report No.: SZEM141200692401

Page: 11 of 89

|      | RF connected test                     |                         |           |                  |                           |
|------|---------------------------------------|-------------------------|-----------|------------------|---------------------------|
| Item | Test Equipment                        | Manufacturer            | Model No. | Inventory<br>No. | Cal.Due date (yyyy-mm-dd) |
| 1    | DC Power Supply                       | Zhao Xin                | RXN-305D  | SEL0117          | 2015-10-24                |
| 2    | Humidity/<br>Temperature<br>Indicator | HYGRO                   | ZJ1-2B    | SEL0033          | 2015-10-24                |
| 3    | Spectrum Analyzer                     | Rohde & Schwarz         | FSP       | SEL0154          | 2015-10-24                |
| 4    | Coaxial cable                         | SGS                     | N/A       | SEL0178          | 2015-05-29                |
| 5    | Coaxial cable                         | SGS                     | N/A       | SEL0179          | 2015-05-29                |
| 6    | Barometer                             | ChangChun               | DYM3      | SEL0088          | 2015-05-16                |
| 7    | Signal Generator                      | Rohde & Schwarz         | SML03     | SEL0068          | 2015-05-16                |
| 8    | Band filter                           | amideon                 | 82346     | SEL0094          | 2015-05-16                |
| 9    | POWER METER                           | R&S                     | NRVS      | SEL0144          | 2015-10-24                |
| 10   | Attenuator                            | Beijin feihang taida    | TST-2-6dB | SEL0205          | 2015-05-16                |
| 11   | Power<br>Divider(splitter)            | Agilent<br>Technologies | 11636B    | SEL0130          | 2015-10-24                |

Note: The calibration interval is one year, all the instruments are valid.



Report No.: SZEM141200692401

Page: 12 of 89

### 6 Test results and Measurement Data

## 6.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203 /247(c)

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **EUT Antenna:**



The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.





Report No.: SZEM141200692401

Page: 13 of 89

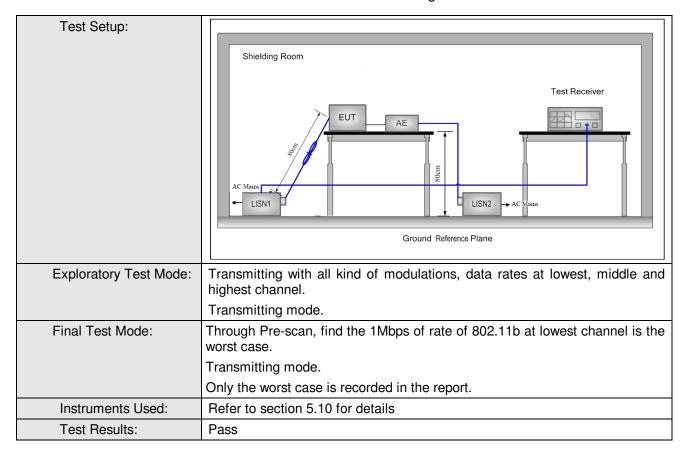
### 6.2 Conducted Emissions

| Test Requirement:     | 47 CFR Part 15C Section 15.207   |                        |                     |      |
|-----------------------|--|------------------------|---------------------|------|
| Test Method:          | ANSI C63.10: 2009  |                        |                     |      |
| Test Frequency Range: | 150kHz to 30MHz  |                        |                     |      |
| Limit:                | Limit (dBuV)   |                        |                     |      |
|                       | Frequency range (MHz)  | 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 logarithr   | n of the frequency.    |                     |      |
| Test Procedure:       | The mains terminal disturb room.   | ance voltage test was  | conducted in a shie | lded |
|                       | 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu H + 5\Omega$ 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.  |                        |                     |      |
|                       | The tabletop EUT was pla<br>ground reference plane.<br>was placed on the horizon   | And for floor-standing | g arrangement, the  |      |
|                       | 4) The test was performed with a vertical ground reference plane. The rea of the EUT shall be 0.4 m from the vertical ground reference plane. Th vertical ground reference plane was bonded to the horizontal groun reference plane. The LISN 1 was placed 0.8 m from the boundary of th unit under test and bonded to a ground reference plane for LISN 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 equipment and all of the interface cables must be changed according ANSI C63.10: 2009 on conducted measurement.   |                        |                     |      |



Report No.: SZEM141200692401

Page: 14 of 89





Report No.: SZEM141200692401

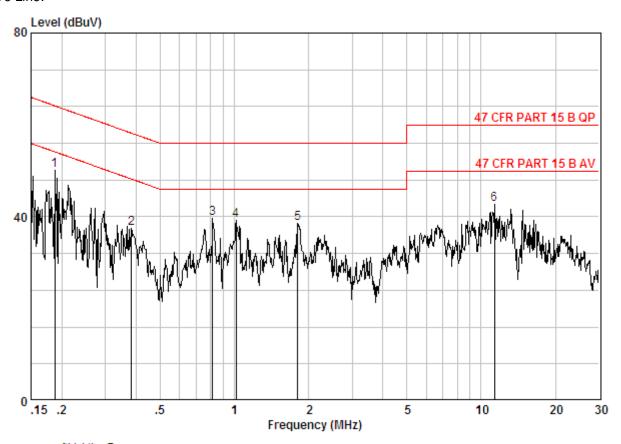
Page: 15 of 89

#### **Measurement Data**

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live Line:



Site : Shielding Room

Condition : 47 CFR PART 15 B AV CE LINE

Job.No : 6924CR

|        | Freq               |      | LISN<br>Factor |       |       |       |       | Remark |
|--------|--------------------|------|----------------|-------|-------|-------|-------|--------|
|        | MHz                | dB   | dB             | dBuV  | dBuV  | dBuV  | dB    |        |
| 1 @    | 0.18738<br>0.38315 |      | 9.70<br>9.78   |       |       |       |       |        |
| 3      | 0.81737            |      |                |       |       |       |       |        |
| 4<br>5 | 1.016<br>1.810     | 0.02 | 9.80<br>9.80   |       |       |       |       |        |
| 6      | 11.317             | 0.01 | 9.96           | 32.84 | 42.81 | 50.00 | -7.19 | Peak   |

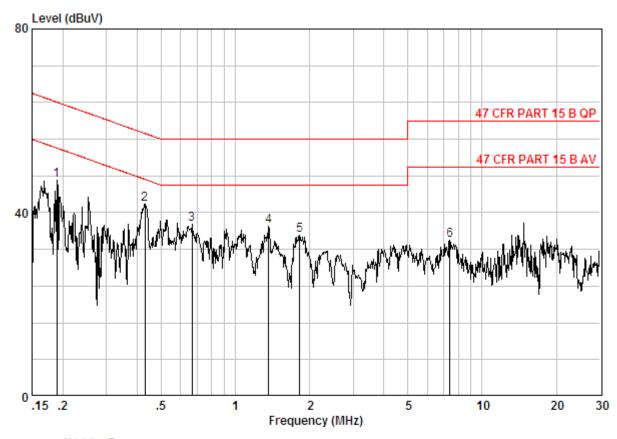




Report No.: SZEM141200692401

Page: 16 of 89

#### Neutral Line:



Site : Shielding Room

Condition : 47 CFR PART 15 B AV CE NEUTRAL

Job.No : 6924CR

|     | Freq    |      | LISN<br>Factor |       |       |       |        | Remark |
|-----|---------|------|----------------|-------|-------|-------|--------|--------|
|     | MHz     | dB   | dB             | dBuV  | dBuV  | dBuV  | dB     |        |
| 1   | 0.18938 | 0.02 | 9.70           | 37.40 | 47.12 | 54.06 | -6.94  | Peak   |
| 2 @ | 0.43052 | 0.01 | 9.80           | 32.07 | 41.88 | 47.24 | -5.36  | Peak   |
| 3   | 0.66832 | 0.02 | 9.80           | 27.69 | 37.51 | 46.00 | -8.49  | Peak   |
| 4   | 1.367   | 0.02 | 9.80           | 27.33 | 37.15 | 46.00 | -8.85  | Peak   |
| 5   | 1.819   | 0.02 | 9.80           | 25.17 | 34.99 | 46.00 | -11.01 | Peak   |
| 6   | 7.407   | 0.01 | 10.00          | 23.97 | 33.98 | 50.00 | -16.02 | Peak   |

#### Notes:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.



Report No.: SZEM141200692401

Page: 17 of 89

## 6.3 Conducted Peak Output Power

| Test Requirement:      | 47 CFR Part 15C Section 15.247 (b)(3)   |  |  |
|------------------------|---|--|--|
| Test Method:           | KDB558074 D01 v03r02  |  |  |
| Test Setup:            | Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane                           |  |  |
|                        | Remark:   |  |  |
|                        | Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.                            |  |  |
| Test Instruments:      | Refer to section 5.10 for details   |  |  |
| Exploratory Test Mode: | Transmitting with all kind of modulations, data rates.  |  |  |
| Final Test Mode:       | Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b;                          |  |  |
|                        | 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20). |  |  |
| Limit:                 | 30dBm   |  |  |
| Test Results:          | Pass  |  |  |



Report No.: SZEM141200692401

Page: 18 of 89

| Pre-scan under all rate at lowest channel 1 |              |        |          |         |        |        |          |        |
|---|--------------|--------|----------|---------|--------|--------|----------|--------|
| Mode  | 802.11b      |        |          |         |        |        |          |        |
| Data Rate                                   | 1Mbps        | 2Mbps  | 5.5Mbps  | 11Mbps  |        |        |          |        |
| Power (dBm)                                 | 17.98        | 17.86  | 17.52    | 17.03   |        |        |          |        |
| Mode 802.11g                                |              |        |          |         |        |        |          |        |
| Data Rate                                   | 6Mbps        | 9Mbps  | 12Mbps   | 18Mbps  | 24Mbps | 36Mbps | 48Mbps   | 54Mbps |
| Power (dBm)                                 | 18.45        | 18.21  | 18.02    | 17.77   | 17.45  | 17.40  | 17.12    | 16.68  |
| Mode  | 802.11n(HT20 |        |          | n(HT20) |        |        |          |        |
| Data Rate                                   | 6.5Mbps      | 13Mbps | 19.5Mbps | 26Mbps  | 39Mbps | 52Mbps | 58.5Mbps | 65Mbps |
| Power (dBm)                                 | 17.30        | 17.11  | 17.01    | 16.79   | 16.56  | 16.55  | 16.32    | 15.98  |

Through Pre-scan, 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20).



Report No.: SZEM141200692401

Page: 19 of 89

#### **Measurement Data**

| ieasurement Data |                         |             |        |
|------------------|-------------------------|-------------|--------|
|                  | 802.11b mo              | de          |        |
| Test channel     | Peak Output Power (dBm) | Limit (dBm) | Result |
| Lowest           | 17.98                   | 30.00       | Pass   |
| Middle           | 18.45                   | 30.00       | Pass   |
| Highest          | 18.88                   | 30.00       | Pass   |
|                  | 802.11g mo              | de          |        |
| Test channel     | Peak Output Power (dBm) | Limit (dBm) | Result |
| Lowest           | 18.45                   | 30.00       | Pass   |
| Middle           | 18.90                   | 30.00       | Pass   |
| Highest          | 19.55                   | 30.00       | Pass   |
|                  | 802.11n(HT20)           | mode        |        |
| Test channel     | Peak Output Power (dBm) | Limit (dBm) | Result |
| Lowest           | 17.30                   | 30.00       | Pass   |
| Middle           | 17.66                   | 30.00       | Pass   |
| Highest          | 18.40                   | 30.00       | Pass   |

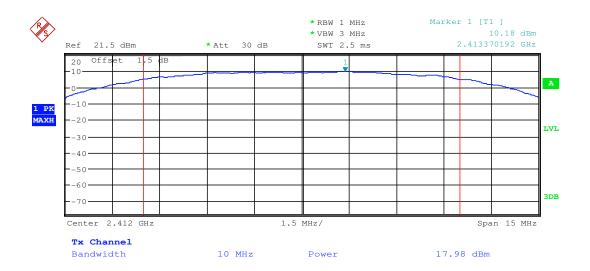


Report No.: SZEM141200692401

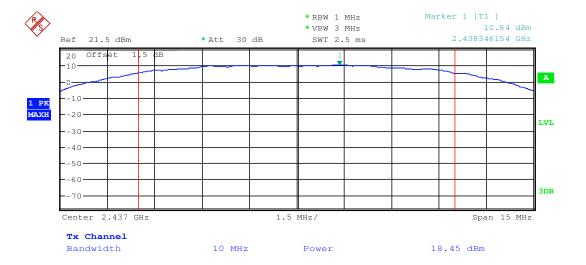
Page: 20 of 89

### Test plot as follows:

Test mode: 802.11b Test channel: Lowest





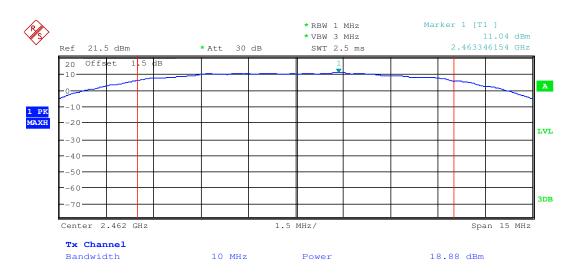




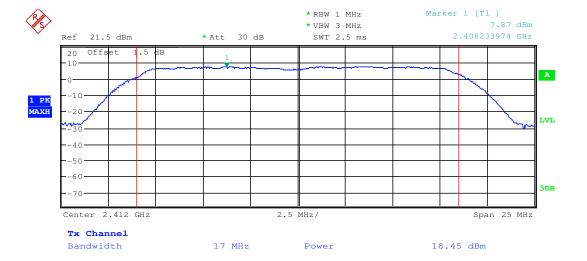
Report No.: SZEM141200692401

Page: 21 of 89

Test mode: 802.11b Test channel: Highest



| Test mode:   | 802.11g | Test channel:    | Lowest |
|--------------|---------|------------------|--------|
| Tool Illoud. | 002.119 | 1 Cot orialinoi. | LOWCOL |





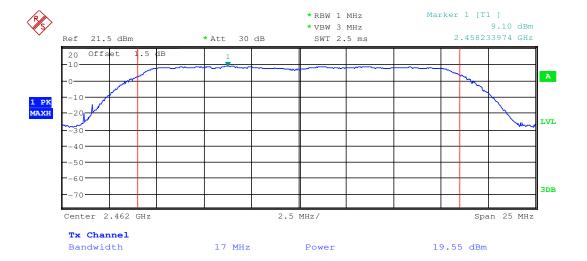
Report No.: SZEM141200692401

Page: 22 of 89

Test mode: 802.11g Test channel: Middle



| Test mode: | 802.11g | Test channel: | Highest |
|------------|---------|---------------|---------|
|            |         |               | 5       |







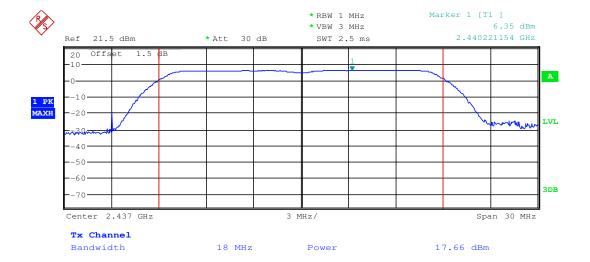
Report No.: SZEM141200692401

Page: 23 of 89

Test mode: 802.11n(HT20) Test channel: Lowest



| Test mode:  | 802.11n(HT20)   | Test channel:   | Middle |
|-------------|-----------------|-----------------|--------|
| TOST HIDUC. | 002.1111(11120) | rost orialinos. | Middle |





Report No.: SZEM141200692401

Page: 24 of 89

Test mode: 802.11n(HT20) Test channel: Highest

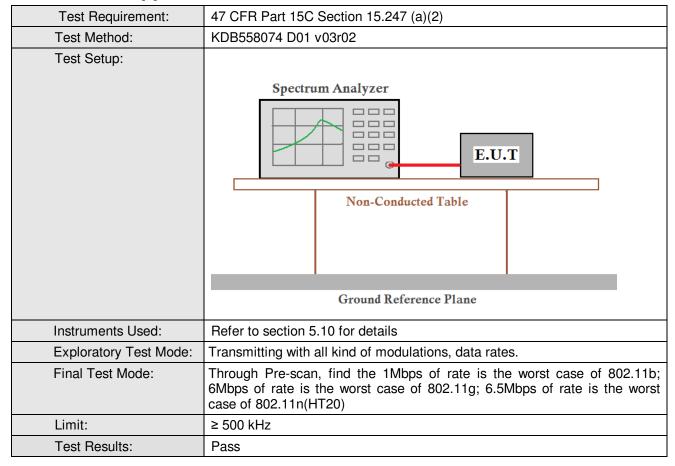




Report No.: SZEM141200692401

Page: 25 of 89

## 6.4 6dB Occupy Bandwidth





Report No.: SZEM141200692401

Page: 26 of 89

#### **Measurement Data**

| Measurement Data |                            |             |        |  |  |  |  |
|------------------|----------------------------|-------------|--------|--|--|--|--|
|                  | 802.11b mode               |             |        |  |  |  |  |
| Test channel     | 6dB Occupy Bandwidth (MHz) | Limit (kHz) | Result |  |  |  |  |
| Lowest           | 9.712                      | ≥500        | Pass   |  |  |  |  |
| Middle           | 9.712                      | ≥500        | Pass   |  |  |  |  |
| Highest          | 9.712                      | ≥500        | Pass   |  |  |  |  |
|                  | 802.11g mode               |             |        |  |  |  |  |
| Test channel     | 6dB Occupy Bandwidth (MHz) | Limit (kHz) | Result |  |  |  |  |
| Lowest           | 16.635                     | ≥500        | Pass   |  |  |  |  |
| Middle           | 16.635                     | ≥500        | Pass   |  |  |  |  |
| Highest          | 16.635                     | ≥500        | Pass   |  |  |  |  |
|                  | 802.11n(HT20) mode         |             |        |  |  |  |  |
| Test channel     | 6dB Occupy Bandwidth (MHz) | Limit (kHz) | Result |  |  |  |  |
| Lowest           | 17.933                     | ≥500        | Pass   |  |  |  |  |
| Middle           | 17.933                     | ≥500        | Pass   |  |  |  |  |
| Highest          | 17.933                     | ≥500        | Pass   |  |  |  |  |

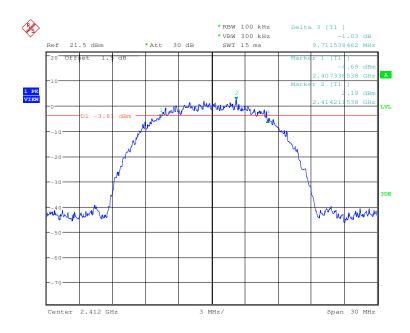


Report No.: SZEM141200692401

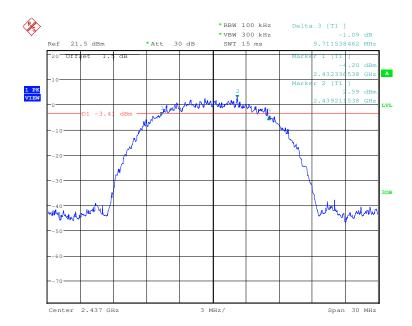
Page: 27 of 89

#### Test plot as follows:

Test mode: 802.11b Test channel: Lowest



Test mode: 802.11b Test channel: Middle

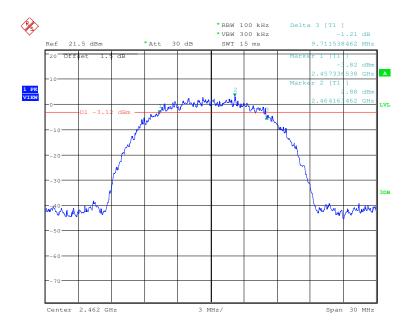




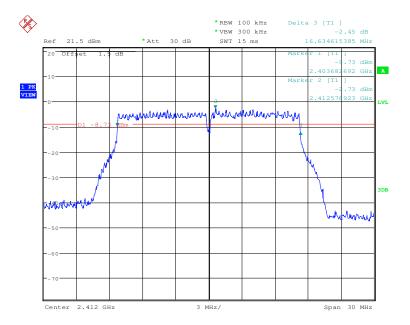
Report No.: SZEM141200692401

Page: 28 of 89

Test mode: 802.11b Test channel: Highest





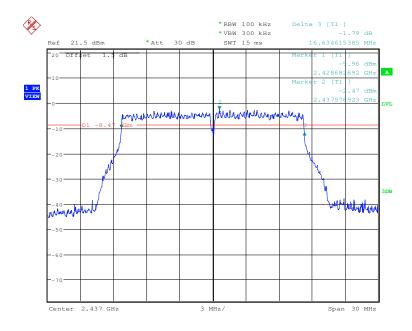




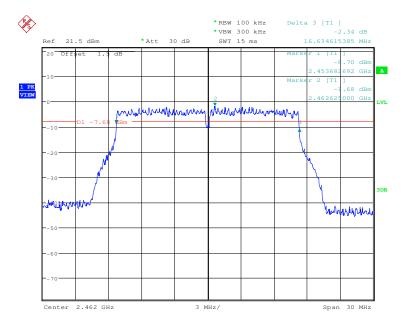
Report No.: SZEM141200692401

Page: 29 of 89

Test mode: 802.11g Test channel: Middle





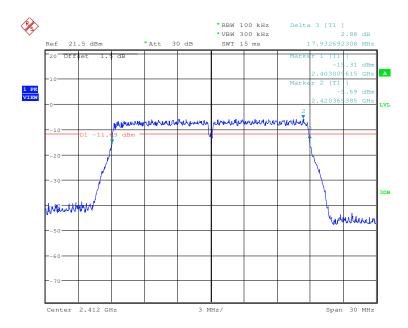




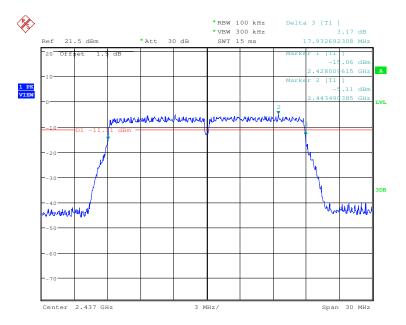
Report No.: SZEM141200692401

Page: 30 of 89

Test mode: 802.11n(HT20) Test channel: Lowest





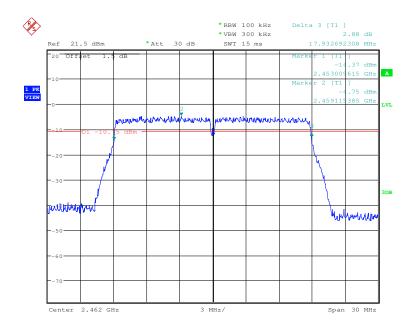




Report No.: SZEM141200692401

Page: 31 of 89

Test mode: 802.11n(HT20) Test channel: Highest





Report No.: SZEM141200692401

Page: 32 of 89

## 6.5 Power Spectral Density

| Test Requirement:      | 47 CFR Part 15C Section 15.247 (e)   |  |  |
|------------------------|--|--|--|
| Test Method:           | KDB558074 D01 v03r02   |  |  |
| Test Setup:            | Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane  Remark:  Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.                   |  |  |
| Test Instruments:      | Refer to section 5.10 for details.   |  |  |
| Exploratory Test Mode: |  |  |  |
| Final Test Mode:       | Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20). |  |  |
| Limit:                 | ≤8.00dBm   |  |  |
| Test Results:          | Pass   |  |  |





Report No.: SZEM141200692401

Page: 33 of 89

#### **Measurement Data**

| Measurement Data |                              |             |        |  |  |  |  |
|------------------|------------------------------|-------------|--------|--|--|--|--|
|                  | 802.11b mode                 |             |        |  |  |  |  |
| Test channel     | Power Spectral Density (dBm) | Limit (dBm) | Result |  |  |  |  |
| Lowest           | -12.72                       | ≤8.00       | Pass   |  |  |  |  |
| Middle           | -12.42                       | ≤8.00       | Pass   |  |  |  |  |
| Highest          | -11.83                       | ≤8.00       | Pass   |  |  |  |  |
|                  | 802.11g mode                 |             |        |  |  |  |  |
| Test channel     | Power Spectral Density (dBm) | Limit (dBm) | Result |  |  |  |  |
| Lowest           | -16.03                       | ≤8.00       | Pass   |  |  |  |  |
| Middle           | -15.14                       | ≤8.00       | Pass   |  |  |  |  |
| Highest          | -14.92                       | ≤8.00       | Pass   |  |  |  |  |
|                  | 802.11n (HT20) mode          |             |        |  |  |  |  |
| Test channel     | Power Spectral Density (dBm) | Limit (dBm) | Result |  |  |  |  |
| Lowest           | -16.41                       | ≤8.00       | Pass   |  |  |  |  |
| Middle           | -15.68                       | ≤8.00       | Pass   |  |  |  |  |
| Highest          | -14.54                       | ≤8.00       | Pass   |  |  |  |  |

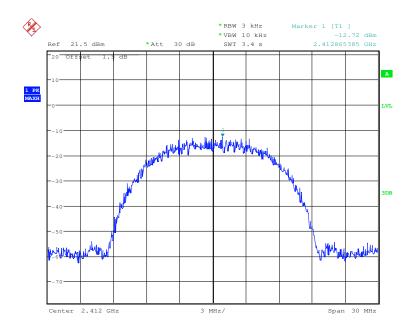


Report No.: SZEM141200692401

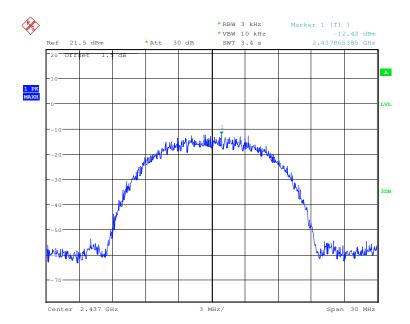
Page: 34 of 89

## Test plot as follows:

Test mode: 802.11b Test channel: Lowest



Test mode: 802.11b Test channel: Middle

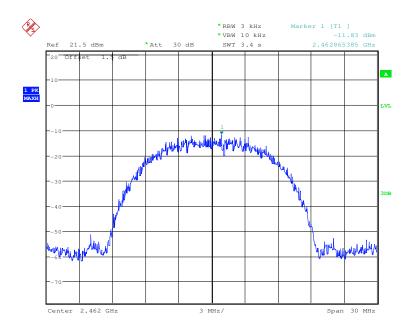




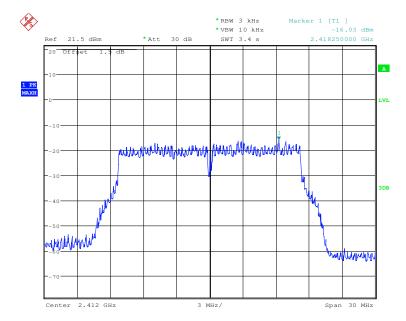
Report No.: SZEM141200692401

Page: 35 of 89

Test mode: 802.11b Test channel: Highest





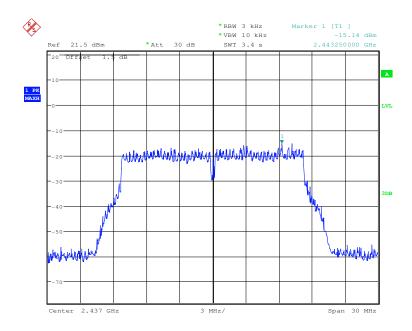




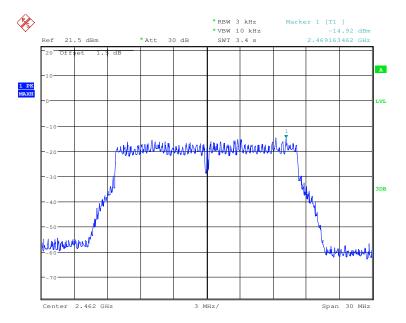
Report No.: SZEM141200692401

Page: 36 of 89

Test mode: 802.11g Test channel: Middle





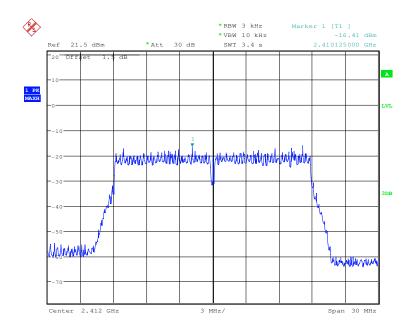




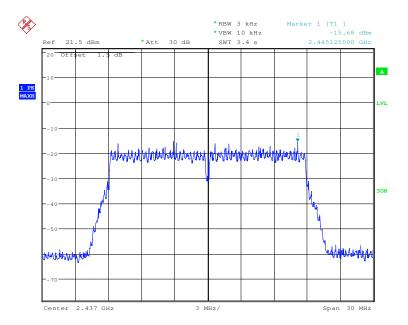
Report No.: SZEM141200692401

Page: 37 of 89

Test mode: 802.11n (HT20) Test channel: Lowest





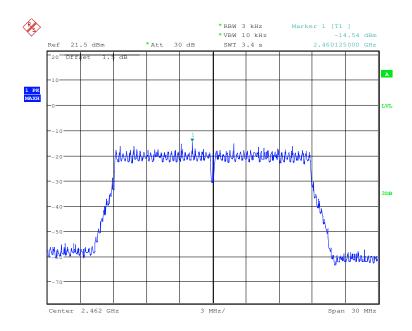




Report No.: SZEM141200692401

Page: 38 of 89

Test mode: 802.11n (HT20) Test channel: Highest





Report No.: SZEM141200692401

Page: 39 of 89

# 6.6 Band-edge for RF Conducted Emissions

| Test Requirement:      | 47 CFR Part 15C Section 15.247 (d)  |  |  |  |  |  |
|------------------------|---|--|--|--|--|--|
| Test Method:           | KDB558074 D01 v03r02  |  |  |  |  |  |
| Test Setup:            | Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane  Remark:  |  |  |  |  |  |
|                        | Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.  |  |  |  |  |  |
| Exploratory Test Mode: | Transmitting with all kind of modulations, data rates.  |  |  |  |  |  |
| Final Test Mode:       | Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20).  |  |  |  |  |  |
| Limit:                 | In any 100 kHz bandwidth outside the frequency band in which the spread   |  |  |  |  |  |
|                        | spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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. |  |  |  |  |  |
| Instruments Used:      | Refer to section 5.10 for details   |  |  |  |  |  |
| Test Results:          | Pass  |  |  |  |  |  |

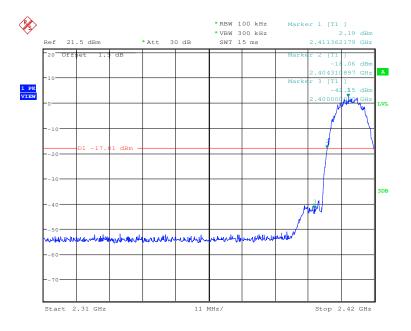


Report No.: SZEM141200692401

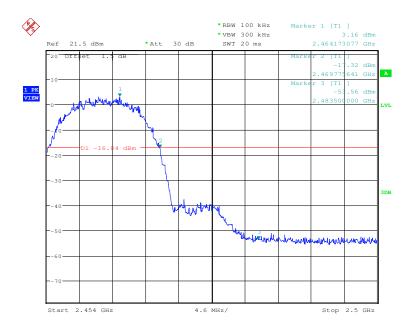
Page: 40 of 89

### Test plot as follows:

Test mode: 802.11b Test channel: Lowest



Test mode: 802.11b Test channel: Highest

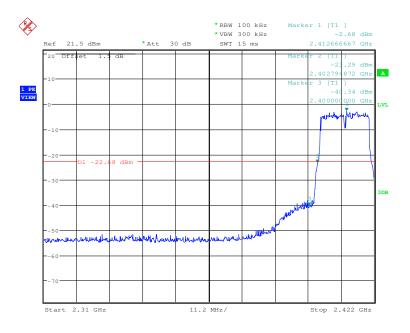




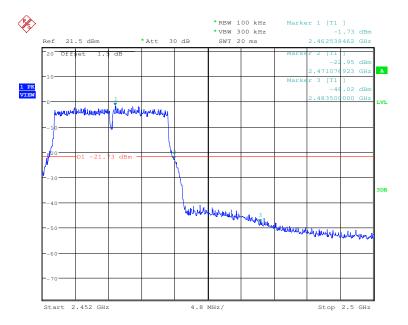
Report No.: SZEM141200692401

Page: 41 of 89

Test mode: 802.11g Test channel: Lowest





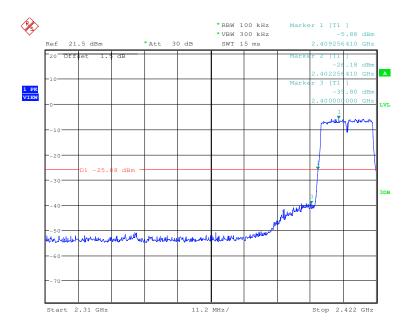




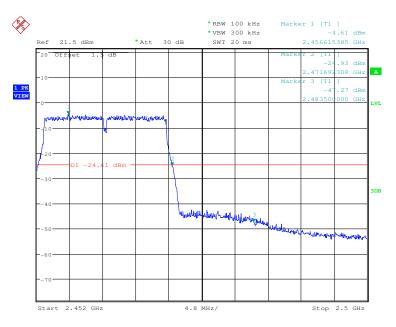
Report No.: SZEM141200692401

Page: 42 of 89

Test mode: 802.11n (HT20) Test channel: Lowest



Test mode: 802.11n (HT20) Test channel: Highest







Report No.: SZEM141200692401

Page: 43 of 89

# 6.7 RF Conducted Spurious Emissions

| Test Requirement:      | 47 CFR Part 15C Section 15.247 (d)   |
|------------------------|--|
| Test Method:           | KDB558074 D01 v03r02   |
| Test Setup:            | Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane  |
|                        | Remark:  |
|                        | Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.   |
| Exploratory Test Mode: | Transmitting with all kind of modulations, data rates.   |
| Final Test Mode:       | Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20). |
| Limit:                 | In any 100 kHz bandwidth outside the frequency band in which the spread  |
|                        | spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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.   |
| Instruments Used:      | Refer to section 5.10 for details  |
| Test Results:          | Pass   |



Report No.: SZEM141200692401

Page: 44 of 89

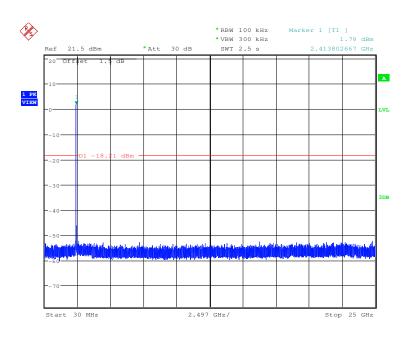
Test plot as follows:

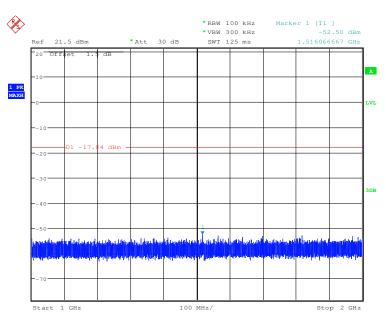
Test mode:

802.11b

Test channel:

Lowest

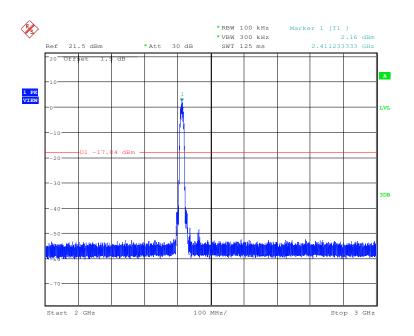


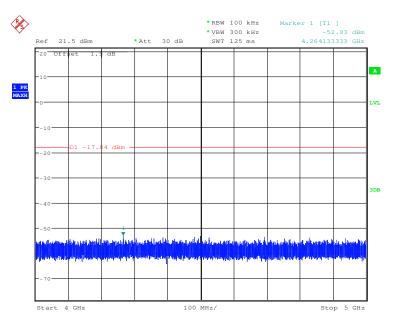




Report No.: SZEM141200692401

Page: 45 of 89



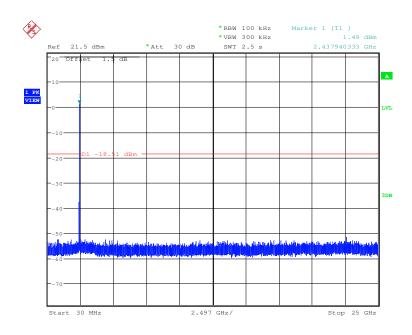


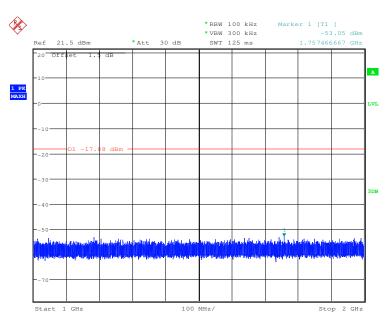


Report No.: SZEM141200692401

Page: 46 of 89

Test mode: 802.11b Test channel: Middle

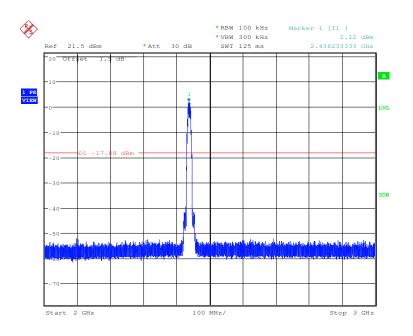


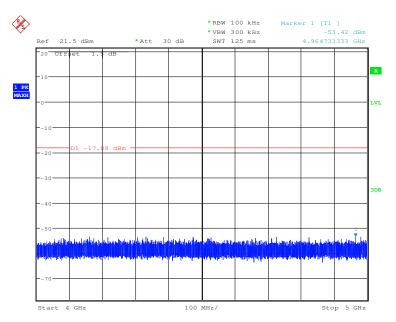




Report No.: SZEM141200692401

Page: 47 of 89



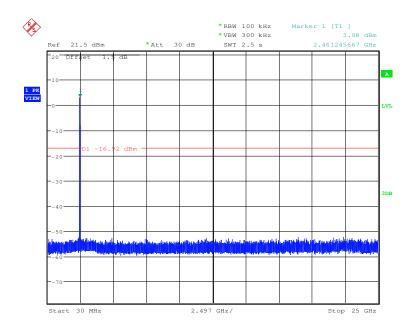


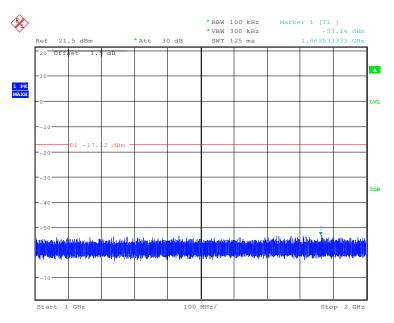


Report No.: SZEM141200692401

Page: 48 of 89

Test mode: 802.11b Test channel: Highest

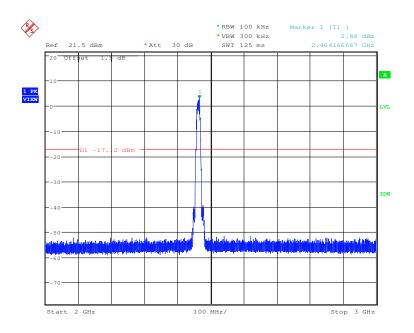


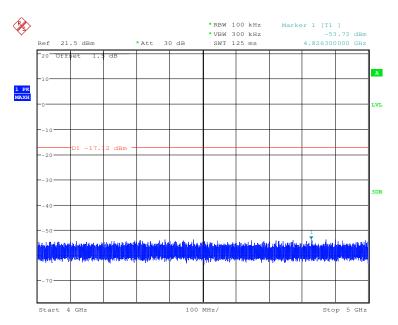




Report No.: SZEM141200692401

Page: 49 of 89



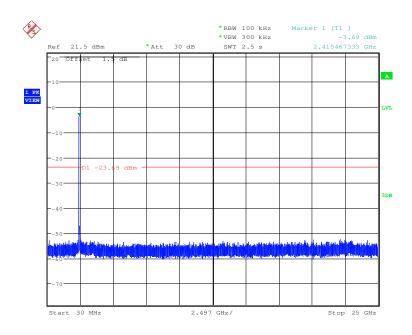


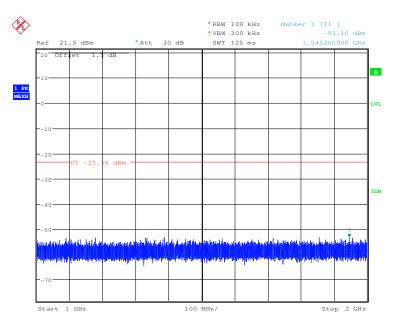


Report No.: SZEM141200692401

Page: 50 of 89

Test mode: 802.11g Test channel: Lowest

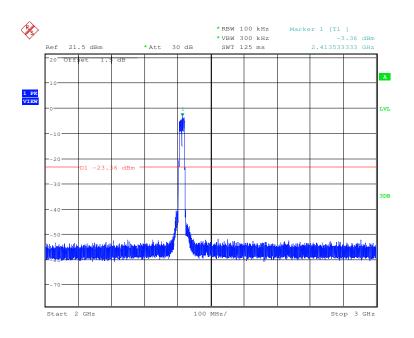


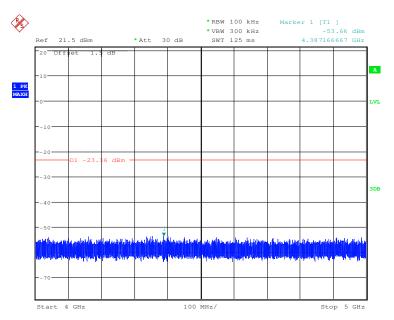




Report No.: SZEM141200692401

Page: 51 of 89



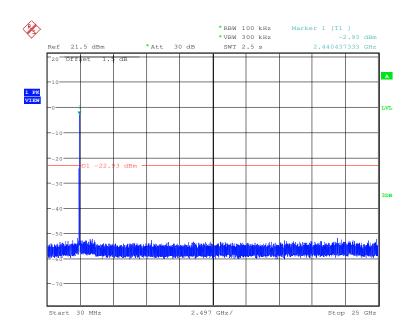


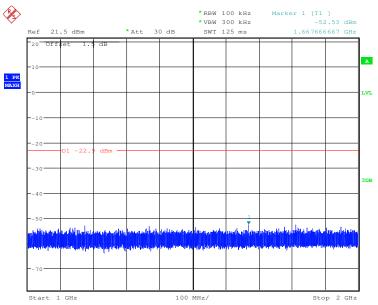


Report No.: SZEM141200692401

Page: 52 of 89

Test mode: 802.11g Test channel: Middle



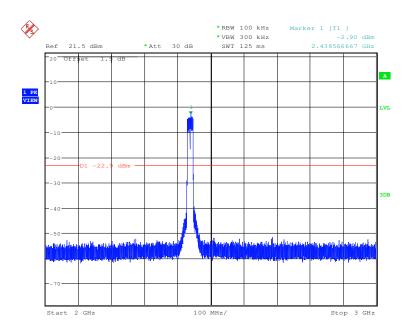


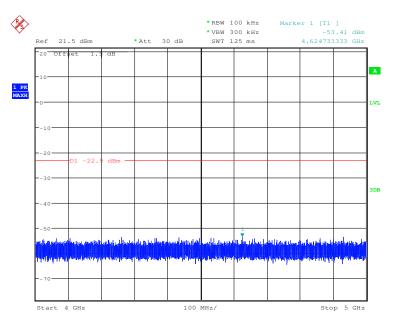




Report No.: SZEM141200692401

Page: 53 of 89



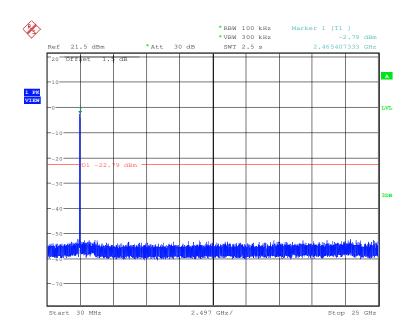


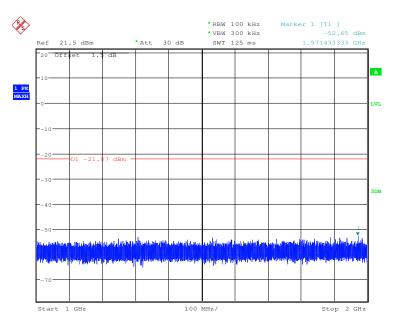


Report No.: SZEM141200692401

Page: 54 of 89

Test mode: 802.11g Test channel: Highest

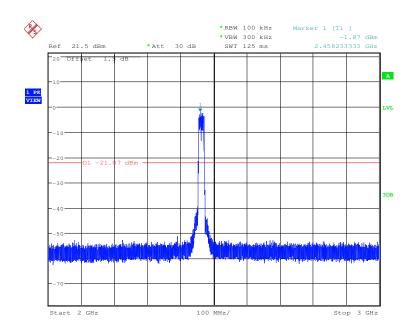


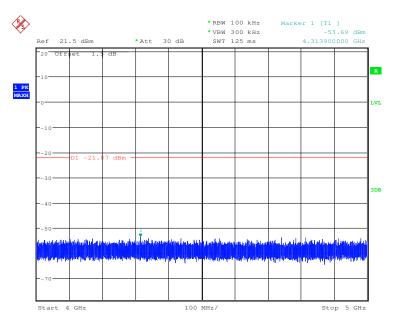




Report No.: SZEM141200692401

Page: 55 of 89



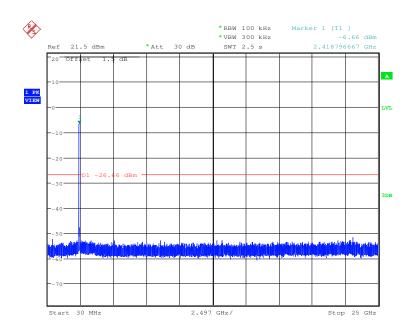


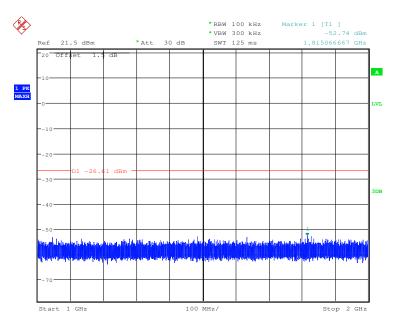


Report No.: SZEM141200692401

Page: 56 of 89

Test mode: 802.11n (HT20) Test channel: Lowest

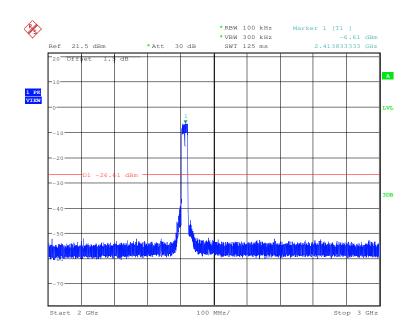


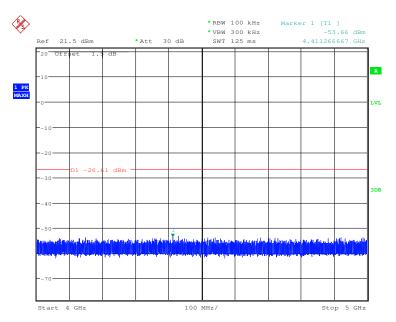




Report No.: SZEM141200692401

Page: 57 of 89



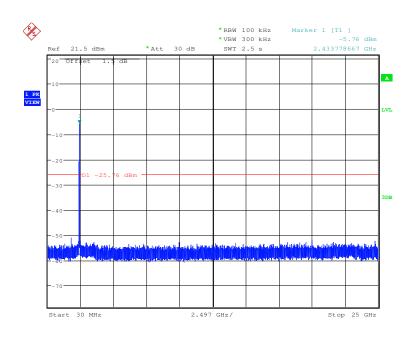


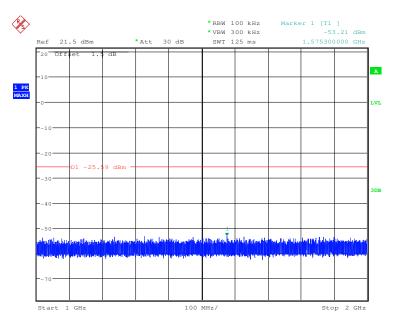


Report No.: SZEM141200692401

Page: 58 of 89

Test mode: 802.11n (HT20) Test channel: Middle

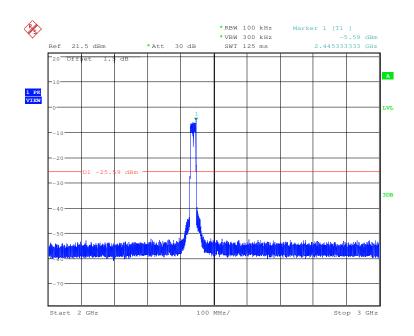


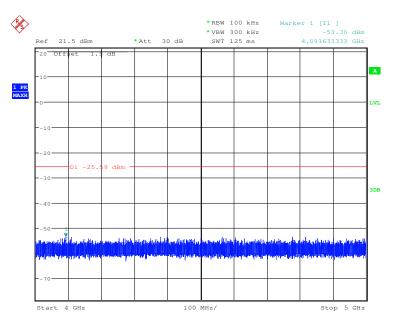




Report No.: SZEM141200692401

Page: 59 of 89



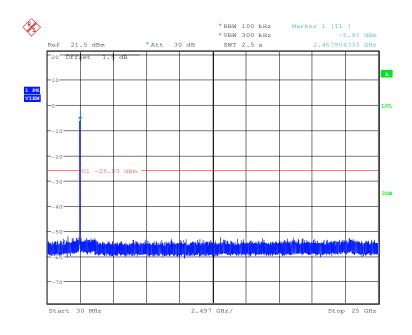


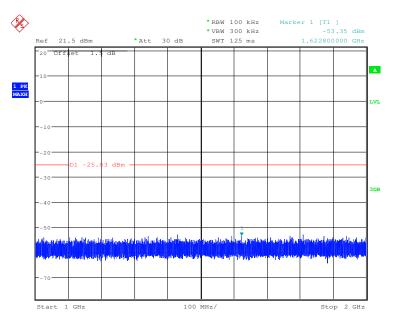


Report No.: SZEM141200692401

Page: 60 of 89

Test mode: 802.11n (HT20) Test channel: Highest

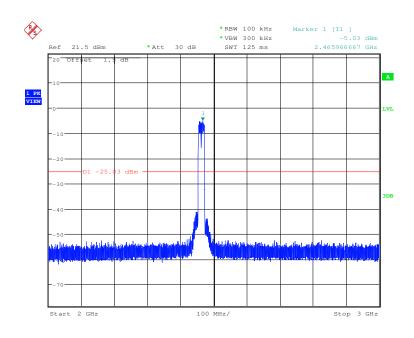


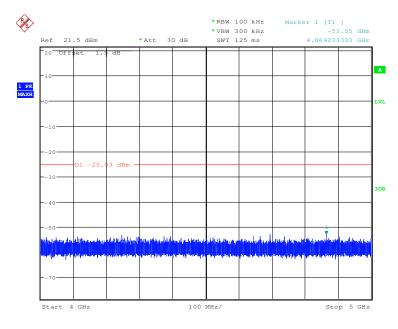




Report No.: SZEM141200692401

Page: 61 of 89





#### Remark:

Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.



Report No.: SZEM141200692401

Page: 62 of 89

# 6.8 Radiated Spurious Emissions

| Test Requirement: | 47 CFR Part 15C Section 15.209 and 15.205   |                                  |                   |            |                          |  |  |  |
|-------------------|---|----------------------------------|-------------------|------------|--------------------------|--|--|--|
| Test Method:      | ANSI C63.10 2009  |                                  |                   |            |                          |  |  |  |
| Test Site:        | Measurement Distance:   | 3m (Semi-Anecho                  | ic Chamber)       |            |                          |  |  |  |
| Receiver Setup:   | Frequency   | Detector                         | RBW               | VBW        | Remark                   |  |  |  |
|                   | 0.009MHz-0.090MHz   | Peak                             | 10kHz             | 30kHz      | Peak                     |  |  |  |
|                   | 0.009MHz-0.090MHz   | Average                          | 10kHz             | 30kHz      | Average                  |  |  |  |
|                   | 0.090MHz-0.110MHz   | Quasi-peak                       | 10kHz             | 30kHz      | Quasi-peak               |  |  |  |
|                   | 0.110MHz-0.490MHz   | Peak                             | 10kHz             | 30kHz      | Peak                     |  |  |  |
|                   | 0.110MHz-0.490MHz   | Average                          | 10kHz             | 30kHz      | Average                  |  |  |  |
|                   | 0.490MHz -30MHz   | Quasi-peak                       | 10kHz             | 30kHz      | Quasi-peak               |  |  |  |
|                   | 30MHz-1GHz  | Quasi-peak                       | 100 kHz           | 300kHz     | Quasi-peak               |  |  |  |
|                   | Above 1GHz  | Peak                             | 1MHz              | 3MHz       | Peak                     |  |  |  |
|                   | Above IGHZ  | Peak                             | 1MHz              | 10Hz       | Average                  |  |  |  |
| Limit:            | Frequency   | Field strength (microvolt/meter) | Limit<br>(dBuV/m) | Remark     | Measurement distance (m) |  |  |  |
|                   | 0.009MHz-0.490MHz   | 2400/F(kHz)                      | -                 | -          | 300                      |  |  |  |
|                   | 0.490MHz-1.705MHz   | 24000/F(kHz)                     | -                 | -          | 30                       |  |  |  |
|                   | 1.705MHz-30MHz  | 30                               | -                 | -          | 30                       |  |  |  |
|                   | 30MHz-88MHz   | 100                              | 40.0              | Quasi-peak | 3                        |  |  |  |
|                   | 88MHz-216MHz  | 150                              | 43.5              | Quasi-peak | 3                        |  |  |  |
|                   | 216MHz-960MHz   | 200                              | 46.0              | Quasi-peak | 3                        |  |  |  |
|                   | 960MHz-1GHz   | 500                              | 54.0              | Quasi-peak | 3                        |  |  |  |
|                   | Above 1GHz  | 500                              | 54.0              | Average    | 3                        |  |  |  |
|                   | Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device. |                                  |                   |            |                          |  |  |  |

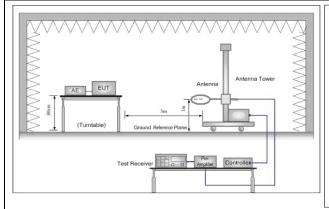




Report No.: SZEM141200692401

Page: 63 of 89

#### Test Setup:



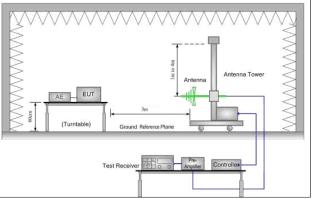


Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz

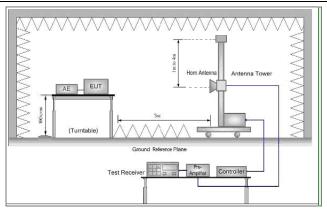


Figure 3. Above 1 GHz

#### Test Procedure:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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



Report No.: SZEM141200692401

Page: 64 of 89

|                   | method as specified and then reported in a data sheet.   |  |  |  |  |
|-------------------|--|--|--|--|--|
|                   | g. Test the EUT in the lowest channel ,the middle channel ,the Highest channel   |  |  |  |  |
|                   | h. Repeat above procedures until all frequencies measured was complete.  |  |  |  |  |
| Exploratory       | Transmitting with all kind of modulations, data rates.   |  |  |  |  |
| Test Mode:        | ransmitting mode.  |  |  |  |  |
| Final Test Mode:  | Fransmitting mode.   |  |  |  |  |
|                   | Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20). |  |  |  |  |
|                   | Only the worst case is recorded in the report.   |  |  |  |  |
| Instruments Used: | Refer to section 5.10 for details  |  |  |  |  |
| Test Results:     | Pass   |  |  |  |  |

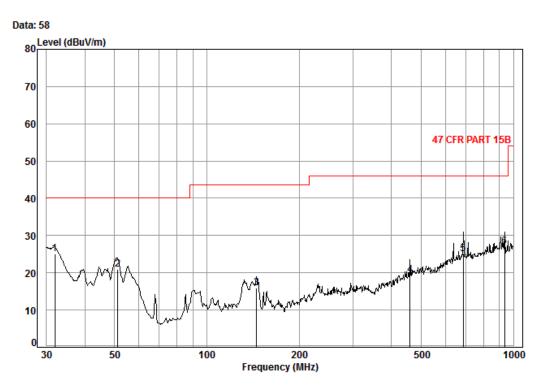


Report No.: SZEM141200692401

Page: 65 of 89

#### 6.8.1 Radiated emission below 1GHz

| 30MHz~1GHz | 30MHz~1GHz (QP)   |               |        |               |          |  |  |  |  |
|------------|-------------------|---------------|--------|---------------|----------|--|--|--|--|
| Test mode: | Transmitting mode | Test Channel: | Lowest | Polarization: | Vertical |  |  |  |  |



Condition: 47 CFR PART 15B 3m Vertical

Job No. : 6924CR Test mode: TX mode

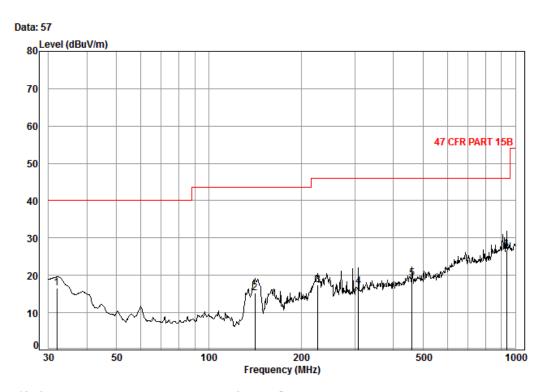
|   | Freq   |      |       | Preamp<br>Factor |       |        |        | Over<br>Limit |
|---|--------|------|-------|------------------|-------|--------|--------|---------------|
|   | MHz    | dB   | dB/m  | ——dB             | dBuV  | dBuV/m | dBuV/m | ——dB          |
| 1 | 31.95  | 0.60 | 17.61 | 27.35            | 34.27 | 25.13  | 40.00  | -14.87        |
| 2 | 51.30  | 0.80 | 8.50  | 27.29            | 38.98 | 20.99  | 40.00  | -19.01        |
| 3 | 145.35 | 1.31 | 8.58  | 26.93            | 33.05 | 16.01  | 43.50  | -27.49        |
| 4 | 460.73 | 2.45 | 17.29 | 27.50            | 27.21 | 19.45  | 46.00  | -26.55        |
| 5 | 687.15 | 2.88 | 21.50 | 27.43            | 28.05 | 25.00  | 46.00  | -21.00        |
| 6 | 935.55 | 3.64 | 23.30 | 26.61            | 26.67 | 27.00  | 46.00  | -19.00        |



Report No.: SZEM141200692401

Page: 66 of 89

Test mode: Transmitting mode Test Channel: Lowest Polarization: Horizontal



Condition: 47 CFR PART 15B 3m Horizontal

Job No. : 6924CR Test mode: TX mode

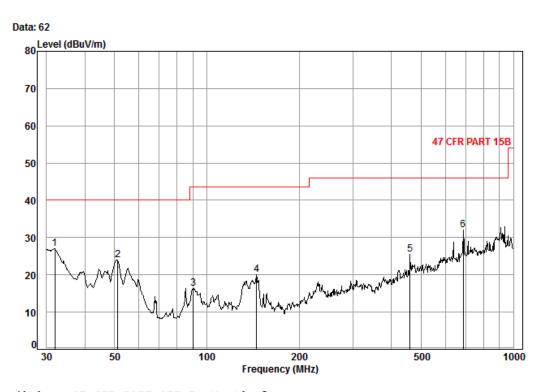
|   |        | Cable | Ant    | Preamp | Read  |        | Limit  | 0ver   |
|---|--------|-------|--------|--------|-------|--------|--------|--------|
|   | Freq   | Loss  | Factor | Factor | Level | Level  | Line   | Limit  |
|   |        |       |        |        |       |        |        |        |
|   | MHz    | dB    | dB/m   | dB     | dBuV  | dBuV/m | dBuV/m | dB     |
|   |        |       |        |        |       |        |        |        |
| 1 | 31.95  | 0.60  | 17.61  | 27.35  | 25.70 | 16.56  | 40.00  | -23.44 |
| 2 | 141.33 | 1.30  | 8.22   | 26.95  | 32.71 | 15.28  | 43.50  | -28.22 |
| 3 | 226.89 | 1.56  | 11.56  | 26.61  | 30.93 | 17.44  | 46.00  | -28.56 |
| 4 | 307.83 | 1.93  | 14.18  | 26.46  | 27.38 | 17.03  | 46.00  | -28.97 |
| 5 | 460.73 | 2.45  | 17.29  | 27.50  | 26.97 | 19.21  | 46.00  | -26.79 |
| 6 | 935.55 | 3.64  | 23.30  | 26.61  | 26.52 | 26.85  | 46.00  | -19.15 |



Report No.: SZEM141200692401

Page: 67 of 89

Test mode: Transmitting mode Test Channel: Middle Polarization: Vertical



Condition: 47 CFR PART 15B 3m Vertical

Job No. : 6924CR Test mode: TX mode

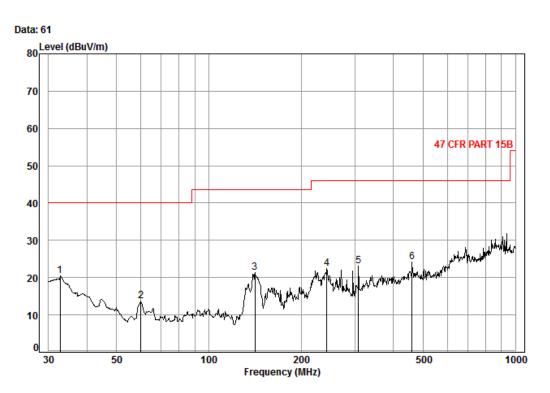
|   |        | Cable | Ant    | Preamp | Read  |        | Limit  | 0ver   |
|---|--------|-------|--------|--------|-------|--------|--------|--------|
|   | Freq   | Loss  | Factor | Factor | Level | Level  | Line   | Limit  |
|   |        |       |        |        |       |        |        |        |
|   | MHz    | dB    | dB/m   | dB     | dBuV  | dBuV/m | dBuV/m | dB     |
|   |        |       |        |        |       |        |        |        |
| 1 | 31.95  | 0.60  | 17.61  | 27.35  | 36.27 | 27.13  | 40.00  | -12.87 |
| 2 | 51.30  | 0.80  | 8.50   | 27.29  | 41.98 | 23.99  | 40.00  | -16.01 |
| 3 | 90.22  | 1.10  | 8.71   | 27.21  | 33.70 | 16.30  | 43.50  | -27.20 |
| 4 | 145.35 | 1.31  | 8.58   | 26.93  | 37.05 | 20.01  | 43.50  | -23.49 |
| 5 | 460.73 | 2.45  | 17.29  | 27.50  | 33.21 | 25.45  | 46.00  | -20.55 |
| 6 | 687.15 | 2.88  | 21.50  | 27.43  | 35.05 | 32.00  | 46.00  | -14.00 |



Report No.: SZEM141200692401

Page: 68 of 89

Test mode: Transmitting mode Test Channel: Middle Polarization: Horizontal



Condition: 47 CFR PART 15B 3m Horizontal

Job No. : 6924CR Test mode: TX mode

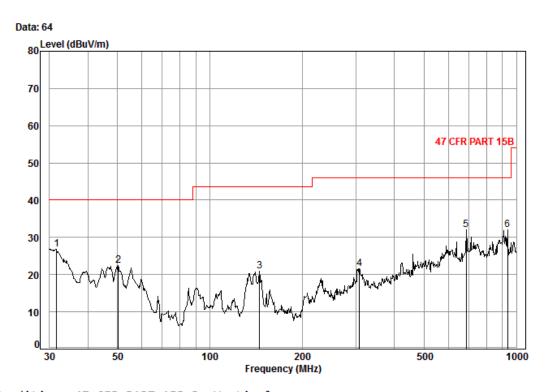
|   |        | Cable | Ant    | Preamp | Read  |        | Limit  | 0ver   |
|---|--------|-------|--------|--------|-------|--------|--------|--------|
|   | Freq   | Loss  | Factor | Factor | Level | Level  | Line   | Limit  |
|   | MHz    | dB    | dB/m   | dB     | dBuV  | dBuV/m | dBuV/m | dB     |
| 1 | 32.75  | 0.60  | 17.16  | 27.35  | 30.07 | 20.48  | 40.00  | -19.52 |
| 2 | 60.07  | 0.80  | 7.20   | 27.27  | 33.10 | 13.83  | 40.00  | -26.17 |
| 3 | 141.33 | 1.30  | 8.22   | 26.95  | 38.71 | 21.28  | 43.50  | -22.22 |
| 4 | 242.53 | 1.64  | 12.06  | 26.56  | 35.29 | 22.43  | 46.00  | -23.57 |
| 5 | 307.83 | 1.93  | 14.18  | 26.46  | 33.38 | 23.03  | 46.00  | -22.97 |
| 6 | 460.73 | 2.45  | 17.29  | 27.50  | 31.97 | 24.21  | 46.00  | -21.79 |



Report No.: SZEM141200692401

Page: 69 of 89

Test mode: Transmitting mode Test Channel: Highest Polarization: Vertical



Condition: 47 CFR PART 15B 3m Vertical

Job No. : 6924CR Test mode: TX mode

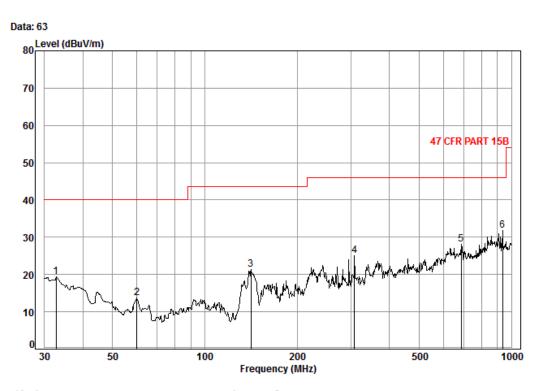
|   |        | Cable | Ant    | Preamp | Read  |        | Limit  | 0ver   |
|---|--------|-------|--------|--------|-------|--------|--------|--------|
|   | Freq   | Loss  | Factor | Factor | Level | Level  | Line   | Limit  |
|   |        |       |        |        |       |        |        |        |
|   | MHz    | dB    | dB/m   | dB     | dBuV  | dBuV/m | dBuV/m | dB     |
|   |        |       |        |        |       |        |        |        |
| 1 | 31.62  | 0.60  | 17.79  | 27.35  | 35.86 | 26.90  | 40.00  | -13.10 |
| 2 | 50.23  | 0.80  | 8.67   | 27.29  | 40.25 | 22.43  | 40.00  | -17.57 |
| 3 | 145.35 | 1.31  | 8.58   | 26.93  | 38.05 | 21.01  | 43.50  | -22.49 |
| 4 | 307.83 | 1.93  | 14.18  | 26.46  | 31.87 | 21.52  | 46.00  | -24.48 |
| 5 | 687.15 | 2.88  | 21.50  | 27.43  | 35.05 | 32.00  | 46.00  | -14.00 |
| 6 | 935.55 | 3.64  | 23.30  | 26.61  | 31.67 | 32.00  | 46.00  | -14.00 |



Report No.: SZEM141200692401

Page: 70 of 89

Test mode: Transmitting mode Test Channel: Highest Polarization: Horizontal



Condition: 47 CFR PART 15B 3m Horizontal

Job No. : 6924CR Test mode: TX mode

|   | Freq   |      |       | Preamp<br>Factor |       |        |        |        |
|---|--------|------|-------|------------------|-------|--------|--------|--------|
|   | MHz    | dB   | dB/m  | dB               | dBuV  | dBuV/m | dBuV/m | dB     |
| 1 | 32.75  | 0.60 | 17.16 | 27.35            | 29.07 | 19.48  | 40.00  | -20.52 |
| 2 | 60.07  | 0.80 | 7.20  | 27.27            | 33.10 | 13.83  | 40.00  | -26.17 |
| 3 | 141.33 | 1.30 | 8.22  | 26.95            | 38.71 | 21.28  | 43.50  | -22.22 |
| 4 | 307.83 | 1.93 | 14.18 | 26.46            | 35.38 | 25.03  | 46.00  | -20.97 |
| 5 | 687.15 | 2.88 | 21.50 | 27.43            | 31.25 | 28.20  | 46.00  | -17.80 |
| 6 | 935.55 | 3.64 | 23.30 | 26.61            | 31.52 | 31.85  | 46.00  | -14.15 |



Report No.: SZEM141200692401

Page: 71 of 89

#### 6.8.2 Transmitter emission above 1GHz

| Test mode:         | 802.                  | 11b                         | Test cha                 | ınnel:                  | Lowest            | Remark:                |                       | Peak         |
|--------------------|-----------------------|-----------------------------|--------------------------|-------------------------|-------------------|------------------------|-----------------------|--------------|
| Frequency<br>(MHz) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Read<br>Level<br>(dBuV) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) |              |
| 3641.878           | 6.89                  | 33.03                       | 38.80                    | 47.90                   | 49.02             | 74                     | -24.9                 | 8 Vertical   |
| 4824.000           | 6.46                  | 34.72                       | 39.24                    | 49.06                   | 51.00             | 74                     | -23.0                 | 0 Vertical   |
| 5921.940           | 7.96                  | 36.15                       | 39.19                    | 47.71                   | 52.63             | 74                     | -21.3                 | 7 Vertical   |
| 7236.000           | 8.96                  | 35.60                       | 39.06                    | 47.98                   | 53.48             | 74                     | -20.5                 | 2 Vertical   |
| 9648.000           | 9.97                  | 37.45                       | 37.91                    | 42.23                   | 51.74             | 74                     | -22.2                 | 6 Vertical   |
| 11128.630          | 10.31                 | 38.11                       | 38.29                    | 42.83                   | 52.96             | 74                     | -21.0                 | 4 Vertical   |
| 3368.157           | 7.22                  | 32.70                       | 38.68                    | 47.13                   | 48.37             | 74                     | -25.6                 | 3 Horizontal |
| 4824.000           | 6.46                  | 34.72                       | 39.24                    | 48.46                   | 50.40             | 74                     | -23.6                 | O Horizontal |
| 6034.386           | 8.07                  | 36.26                       | 39.18                    | 47.20                   | 52.35             | 74                     | -21.6                 | 5 Horizontal |
| 7236.000           | 8.96                  | 35.60                       | 39.06                    | 47.86                   | 53.36             | 74                     | -20.6                 | 4 Horizontal |
| 9648.000           | 9.97                  | 37.45                       | 37.91                    | 41.92                   | 51.43             | 74                     | -22.5                 | 7 Horizontal |
| 11128.630          | 10.31                 | 38.11                       | 38.29                    | 42.49                   | 52.62             | 74                     | -21.3                 | 8 Horizontal |

| Test mode: 802.1   |                       | .11b                        | Test channel:            |                         | Middle            | Remark                 | :                     | Peak             |
|--------------------|-----------------------|-----------------------------|--------------------------|-------------------------|-------------------|------------------------|-----------------------|------------------|
| Frequency<br>(MHz) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Read<br>Level<br>(dBuV) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) | Polarizatio<br>n |
| 3705.664           | 6.85                  | 33.08                       | 38.83                    | 48.73                   | 49.83             | 74                     | -24.17                | Vertical         |
| 4874.000           | 6.57                  | 34.77                       | 39.26                    | 49.36                   | 51.44             | 74                     | -22.56                | Vertical         |
| 5930.516           | 7.97                  | 36.17                       | 39.19                    | 48.47                   | 53.42             | 74                     | -20.58                | Vertical         |
| 7311.000           | 9.06                  | 35.52                       | 39.06                    | 47.39                   | 52.91             | 74                     | -21.09                | Vertical         |
| 9748.000           | 9.91                  | 37.76                       | 37.85                    | 42.82                   | 52.64             | 74                     | -21.36                | Vertical         |
| 11422.280          | 10.37                 | 38.17                       | 38.43                    | 43.15                   | 53.26             | 74                     | -20.74                | Vertical         |
| 3652.432           | 6.88                  | 33.04                       | 38.81                    | 48.59                   | 49.70             | 74                     | -24.30                | Horizontal       |
| 4874.000           | 6.57                  | 34.77                       | 39.26                    | 48.51                   | 50.59             | 74                     | -23.41                | Horizontal       |
| 5896.291           | 7.92                  | 36.10                       | 39.19                    | 48.50                   | 53.33             | 74                     | -20.67                | Horizontal       |
| 7311.000           | 9.06                  | 35.52                       | 39.06                    | 47.91                   | 53.43             | 74                     | -20.57                | Horizontal       |
| 9748.000           | 9.91                  | 37.76                       | 37.85                    | 42.09                   | 51.91             | 74                     | -22.09                | Horizontal       |
| 11323.540          | 10.35                 | 38.14                       | 38.38                    | 43.28                   | 53.39             | 74                     | -20.61                | Horizontal       |



Report No.: SZEM141200692401

Page: 72 of 89

| Test mode: 802.    |                       | 11b                         | Test channel:            |                         | Highest           | Remark:                |                       | Peak         |  |
|--------------------|-----------------------|-----------------------------|--------------------------|-------------------------|-------------------|------------------------|-----------------------|--------------|--|
| Frequency<br>(MHz) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Read<br>Level<br>(dBuV) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) |              |  |
| 3291.078           | 7.37                  | 32.50                       | 38.65                    | 48.32                   | 49.54             | 74                     | -24.46                | 6 Vertical   |  |
| 4924.000           | 6.68                  | 34.82                       | 39.28                    | 47.81                   | 50.03             | 74                     | -23.97                | 7 Vertical   |  |
| 6104.642           | 8.06                  | 36.18                       | 39.17                    | 47.44                   | 52.51             | 74                     | -21.49                | 9 Vertical   |  |
| 7386.000           | 9.16                  | 35.44                       | 39.05                    | 46.87                   | 52.42             | 74                     | -21.58                | 3 Vertical   |  |
| 9848.000           | 9.85                  | 38.06                       | 37.79                    | 42.52                   | 52.64             | 74                     | -21.36                | 6 Vertical   |  |
| 11860.170          | 10.55                 | 38.56                       | 38.64                    | 43.26                   | 53.73             | 74                     | -20.27                | 7 Vertical   |  |
| 3397.525           | 7.16                  | 32.77                       | 38.69                    | 48.25                   | 49.49             | 74                     | -24.51                | I Horizontal |  |
| 4924.000           | 6.68                  | 34.82                       | 39.28                    | 48.41                   | 50.63             | 74                     | -23.37                | 7 Horizontal |  |
| 6034.386           | 8.07                  | 36.26                       | 39.18                    | 48.30                   | 53.45             | 74                     | -20.55                | 5 Horizontal |  |
| 7386.000           | 9.16                  | 35.44                       | 39.05                    | 43.45                   | 49.00             | 74                     | -25.00                | ) Horizontal |  |
| 9848.000           | 9.85                  | 38.06                       | 37.79                    | 41.88                   | 52.00             | 74                     | -22.00                | ) Horizontal |  |
| 11757.650          | 10.50                 | 38.46                       | 38.59                    | 42.48                   | 52.85             | 74                     | -21.15                | 5 Horizontal |  |

| Test mode: 802.    |                   | 11g | Test channel:               |                          | Lowest                  |   | Remark:           |                        | Peak                  |              |
|--------------------|-------------------|-----|-----------------------------|--------------------------|-------------------------|---|-------------------|------------------------|-----------------------|--------------|
| Frequency<br>(MHz) | Cat<br>Los<br>(dE | SS  | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Read<br>Level<br>(dBuV) | ) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) |              |
| 3814.113           | 4.9               | 95  | 33.18                       | 38.88                    | 48.06                   |   | 47.31             | 74                     | -26.69                | 9 Vertical   |
| 4824.000           | 5.6               | 63  | 34.72                       | 39.24                    | 52.18                   |   | 53.29             | 74                     | -20.7                 | 1 Vertical   |
| 6088.229           | 6.5               | 55  | 36.20                       | 39.17                    | 48.86                   |   | 52.44             | 74                     | -21.56                | 6 Vertical   |
| 7236.000           | 6.7               | 78  | 35.60                       | 39.06                    | 48.91                   |   | 52.23             | 74                     | -21.77                | 7 Vertical   |
| 9648.000           | 8.9               | 91  | 37.45                       | 37.91                    | 44.48                   |   | 52.93             | 74                     | -21.07                | 7 Vertical   |
| 12489.060          | 8.7               | 79  | 39.22                       | 39.11                    | 44.76                   |   | 53.66             | 74                     | -20.34                | 4 Vertical   |
| 3719.627           | 5.0               | )1  | 33.09                       | 38.84                    | 48.11                   |   | 47.37             | 74                     | -26.63                | 3 Horizontal |
| 4824.000           | 5.6               | 63  | 34.72                       | 39.24                    | 50.91                   |   | 52.02             | 74                     | -21.98                | B Horizontal |
| 5980.114           | 6.5               | 59  | 36.26                       | 39.19                    | 48.58                   |   | 52.24             | 74                     | -21.76                | 6 Horizontal |
| 7236.000           | 6.7               | 78  | 35.60                       | 39.06                    | 48.79                   |   | 52.11             | 74                     | -21.89                | 9 Horizontal |
| 9648.000           | 8.9               | 91  | 37.45                       | 37.91                    | 43.37                   |   | 51.82             | 74                     | -22.18                | B Horizontal |
| 12179.670          | 9.0               | )1  | 38.93                       | 38.85                    | 44.49                   |   | 53.58             | 74                     | -20.42                | 2 Horizontal |





Report No.: SZEM141200692401

Page: 73 of 89

| Test mode:         | 802                   | 2.11g                       | Test cha                 | ınnel:                  | Middle            | Remark:                |                       | Peak                    |
|--------------------|-----------------------|-----------------------------|--------------------------|-------------------------|-------------------|------------------------|-----------------------|-------------------------|
| Frequency<br>(MHz) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Read<br>Level<br>(dBuV) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) |                         |
| 3548.251           | 6.94                  | 32.94                       | 38.76                    | 48.07                   | 49.19             | 74                     | -24.81                | Vertical                |
| 4874.000           | 6.57                  | 34.77                       | 39.26                    | 48.64                   | 50.72             | 74                     | -23.28                | 3 Vertical              |
| 5982.226           | 8.05                  | 36.27                       | 39.19                    | 47.16                   | 52.29             | 74                     | -21.71                | Vertical                |
| 7311.000           | 9.06                  | 35.52                       | 39.06                    | 43.26                   | 48.78             | 74                     | -25.22                | 2 Vertical              |
| 9748.000           | 9.91                  | 37.76                       | 37.85                    | 41.32                   | 51.14             | 74                     | -22.86                | 6 Vertical              |
| 11723.670          | 10.49                 | 38.43                       | 38.57                    | 41.89                   | 52.24             | 74                     | -21.76                | S Vertical              |
| 3803.444           | 6.80                  | 33.16                       | 38.87                    | 48.15                   | 49.24             | 74                     | -24.76                | 6 Horizontal            |
| 4874.000           | 6.57                  | 34.77                       | 39.26                    | 49.29                   | 51.37             | 74                     | -22.63                | B Horizontal            |
| 5904.828           | 7.93                  | 36.12                       | 39.19                    | 48.47                   | 53.33             | 74                     | -20.67                | 7 Horizontal            |
| 7311.000           | 9.06                  | 35.52                       | 39.06                    | 47.10                   | 52.62             | 74                     | -21.38                | B Horizontal            |
| 9748.000           | 9.91                  | 37.76                       | 37.85                    | 41.67                   | 51.49             | 74                     | -22.51                | Horizontal              |
| 11488.580          | 10.39                 | 38.22                       | 38.46                    | 43.08                   | 53.23             | 74                     | -20.77                | <sup>7</sup> Horizontal |

| Test mode:         | 80                    | 2.11g                       | Test cha                 | nnel:                   | Highest           | Remark:                |                       | Peak                  |
|--------------------|-----------------------|-----------------------------|--------------------------|-------------------------|-------------------|------------------------|-----------------------|-----------------------|
| Frequency<br>(MHz) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Read<br>Level<br>(dBuV) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) |                       |
| 3652.432           | 6.88                  | 33.04                       | 38.81                    | 47.55                   | 48.66             | 74                     | -25.34                | 1 Vertical            |
| 4924.000           | 6.68                  | 34.82                       | 39.28                    | 48.50                   | 50.72             | 74                     | -23.28                | 3 Vertical            |
| 5913.378           | 7.95                  | 36.13                       | 39.19                    | 47.95                   | 52.84             | 74                     | -21.16                | S Vertical            |
| 7386.000           | 9.16                  | 35.44                       | 39.05                    | 43.80                   | 49.35             | 74                     | -24.65                | 5 Vertical            |
| 9848.000           | 9.85                  | 38.06                       | 37.79                    | 41.81                   | 51.93             | 74                     | -22.07                | <sup>7</sup> Vertical |
| 11505.210          | 10.39                 | 38.23                       | 38.47                    | 42.25                   | 52.40             | 74                     | -21.60                | ) Vertical            |
| 3631.354           | 6.89                  | 33.02                       | 38.80                    | 46.94                   | 48.05             | 74                     | -25.95                | 5 Horizontal          |
| 4924.000           | 6.68                  | 34.82                       | 39.28                    | 47.90                   | 50.12             | 74                     | -23.88                | B Horizontal          |
| 5982.226           | 8.05                  | 36.27                       | 39.19                    | 48.16                   | 53.29             | 74                     | -20.71                | Horizontal            |
| 7386.000           | 9.16                  | 35.44                       | 39.05                    | 42.81                   | 48.36             | 74                     | -25.64                | Horizontal            |
| 9848.000           | 9.85                  | 38.06                       | 37.79                    | 41.58                   | 51.70             | 74                     | -22.30                | ) Horizontal          |
| 11538.550          | 10.41                 | 38.25                       | 38.48                    | 41.88                   | 52.06             | 74                     | -21.94                | Horizontal            |



Report No.: SZEM141200692401

Page: 74 of 89

| Test mode:         | 802.                  | 11n(HT20)                   | Test cha                 | ınnel:                  | Lowest            | Remark:                |                       | Peak         |
|--------------------|-----------------------|-----------------------------|--------------------------|-------------------------|-------------------|------------------------|-----------------------|--------------|
| Frequency<br>(MHz) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Read<br>Level<br>(dBuV) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) |              |
| 3616.451           | 6.90                  | 33.01                       | 38.79                    | 42.98                   | 44.10             | 74                     | -29.90                | ) Vertical   |
| 4824.000           | 6.46                  | 34.72                       | 39.24                    | 41.85                   | 43.79             | 74                     | -30.2                 | l Vertical   |
| 6063.190           | 8.07                  | 36.23                       | 39.18                    | 42.58                   | 47.70             | 74                     | -26.30                | ) Vertical   |
| 7236.000           | 8.96                  | 35.60                       | 39.06                    | 41.41                   | 46.91             | 74                     | -27.09                | 9 Vertical   |
| 9648.000           | 9.97                  | 37.45                       | 37.91                    | 38.89                   | 48.40             | 74                     | -25.60                | ) Vertical   |
| 11457.210          | 10.38                 | 38.19                       | 38.45                    | 40.52                   | 50.64             | 74                     | -23.36                | 6 Vertical   |
| 3472.118           | 3.89                  | 32.86                       | 38.73                    | 46.95                   | 44.97             | 74                     | -29.03                | B Horizontal |
| 4824.000           | 4.31                  | 34.72                       | 39.24                    | 44.95                   | 44.74             | 74                     | -29.26                | 6 Horizontal |
| 6078.644           | 5.19                  | 36.21                       | 39.18                    | 46.78                   | 49.00             | 74                     | -25.00                | ) Horizontal |
| 7236.000           | 5.28                  | 35.60                       | 39.06                    | 45.01                   | 46.83             | 74                     | -27.17                | 7 Horizontal |
| 9648.000           | 6.51                  | 37.45                       | 37.91                    | 42.71                   | 48.76             | 74                     | -25.24                | 4 Horizontal |
| 11283.550          | 7.60                  | 38.13                       | 38.36                    | 43.52                   | 50.89             | 74                     | -23.11                | I Horizontal |

| Test mode:         | 802                   | .11n(HT20)                  | Test cha                 | ınnel:                  | Middle            | Remark:                | Р                     | eak          |
|--------------------|-----------------------|-----------------------------|--------------------------|-------------------------|-------------------|------------------------|-----------------------|--------------|
| Frequency<br>(MHz) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Read<br>Level<br>(dBuV) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) | Polarization |
| 3561.636           | 4.09                  | 32.96                       | 38.77                    | 46.66                   | 44.94             | 74                     | -29.06                | Vertical     |
| 4874.000           | 4.36                  | 34.77                       | 39.26                    | 46.71                   | 46.58             | 74                     | -27.42                | Vertical     |
| 5940.967           | 5.08                  | 36.19                       | 39.19                    | 47.88                   | 49.96             | 74                     | -24.04                | Vertical     |
| 7311.000           | 5.22                  | 35.52                       | 39.06                    | 46.14                   | 47.82             | 74                     | -26.18                | Vertical     |
| 9748.000           | 6.49                  | 37.76                       | 37.85                    | 42.27                   | 48.67             | 74                     | -25.33                | Vertical     |
| 11515.680          | 7.62                  | 38.24                       | 38.47                    | 44.74                   | 52.13             | 74                     | -21.87                | Vertical     |
| 3598.087           | 4.17                  | 33.00                       | 38.78                    | 46.41                   | 44.80             | 74                     | -29.20                | Horizontal   |
| 4874.000           | 4.36                  | 34.77                       | 39.26                    | 44.99                   | 44.86             | 74                     | -29.14                | Horizontal   |
| 5940.967           | 5.08                  | 36.19                       | 39.19                    | 47.88                   | 49.96             | 74                     | -24.04                | Horizontal   |
| 7311.000           | 5.22                  | 35.52                       | 39.06                    | 43.08                   | 44.76             | 74                     | -29.24                | Horizontal   |
| 9748.000           | 6.49                  | 37.76                       | 37.85                    | 42.71                   | 49.11             | 74                     | -24.89                | Horizontal   |
| 11903.140          | 7.27                  | 38.60                       | 38.66                    | 43.88                   | 51.09             | 74                     | -22.91                | Horizontal   |



Report No.: SZEM141200692401

Page: 75 of 89

| Test mode:         | 802                   | .11n(HT20)                  | Test cha                 | ınnel:                  | Highest           | Remark:                |                       | Peak         |
|--------------------|-----------------------|-----------------------------|--------------------------|-------------------------|-------------------|------------------------|-----------------------|--------------|
| Frequency<br>(MHz) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Read<br>Level<br>(dBuV) | Level<br>(dBuV/m) | Limit Line<br>(dBuV/m) | Over<br>Limit<br>(dB) | Polarization |
| 3672.110           | 4.10                  | 33.06                       | 38.82                    | 45.88                   | 44.22             | 74                     | -29.78                | Vertical     |
| 4924.000           | 4.40                  | 34.82                       | 39.28                    | 44.72                   | 44.66             | 74                     | -29.34                | Vertical     |
| 6001.768           | 5.39                  | 36.30                       | 39.18                    | 46.18                   | 48.69             | 74                     | -25.31                | Vertical     |
| 7386.000           | 5.15                  | 35.44                       | 39.05                    | 45.14                   | 46.68             | 74                     | -27.32                | Vertical     |
| 9848.000           | 6.62                  | 38.06                       | 37.79                    | 41.38                   | 48.27             | 74                     | -25.73                | Vertical     |
| 11428.080          | 7.80                  | 38.17                       | 38.43                    | 43.01                   | 50.55             | 74                     | -23.45                | Vertical     |
| 3672.110           | 4.10                  | 33.06                       | 38.82                    | 45.88                   | 44.22             | 74                     | -29.78                | Horizontal   |
| 4924.000           | 4.40                  | 34.82                       | 39.28                    | 46.03                   | 45.97             | 74                     | -28.03                | Horizontal   |
| 6063.190           | 5.23                  | 36.23                       | 39.18                    | 46.65                   | 48.93             | 74                     | -25.07                | Horizontal   |
| 7386.000           | 5.15                  | 35.44                       | 39.05                    | 45.14                   | 46.68             | 74                     | -27.32                | Horizontal   |
| 9848.000           | 6.62                  | 38.06                       | 37.79                    | 41.21                   | 48.10             | 74                     | -25.90                | Horizontal   |
| 11283.550          | 7.60                  | 38.13                       | 38.36                    | 42.84                   | 50.21             | 74                     | -23.79                | Horizontal   |

#### Remark:

- 1) 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
- 2) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 3) As shown in this section, 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. So, only the peak measurements were shown in the report.

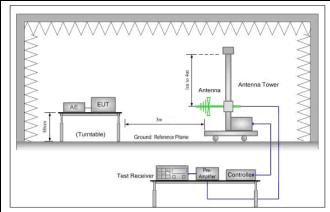


Report No.: SZEM141200692401

Page: 76 of 89

# 6.9 Restricted bands around fundamental frequency

| Test Requirement: | 47 CFR Part 15C Section 1 | 5.209 and 15.205                                 |                  |  |  |  |  |  |  |  |
|-------------------|---------------------------|--|------------------|--|--|--|--|--|--|--|
| Test Method:      | ANSI C63.10 2009          | NSI C63.10 2009                                  |                  |  |  |  |  |  |  |  |
| Test Site:        | Measurement Distance: 3m  | Measurement Distance: 3m (Semi-Anechoic Chamber) |                  |  |  |  |  |  |  |  |
| Limit:            | Frequency                 | Limit (dBuV/m @3m)                               | Remark           |  |  |  |  |  |  |  |
|                   | 30MHz-88MHz               | 40.0   | Quasi-peak Value |  |  |  |  |  |  |  |
|                   | 88MHz-216MHz              | 43.5   | Quasi-peak Value |  |  |  |  |  |  |  |
|                   | 216MHz-960MHz             | 46.0   | Quasi-peak Value |  |  |  |  |  |  |  |
|                   | 960MHz-1GHz               | 54.0   | Quasi-peak Value |  |  |  |  |  |  |  |
|                   | Above 1CUz                | 54.0   | Average Value    |  |  |  |  |  |  |  |
|                   | Above 1GHz                | 74.0   | Peak Value       |  |  |  |  |  |  |  |
| Test Setup:       |                           |  |                  |  |  |  |  |  |  |  |



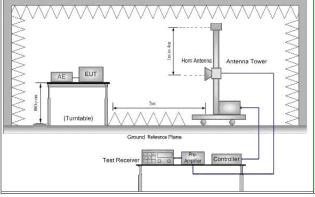


Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz



Report No.: SZEM141200692401

Page: 77 of 89

| Test Procedure:            | a. The EUT was placed on the top of a rotating table 0.8 meters above  |
|----------------------------|--|
|                            | the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.  |
| l l                        | b. The EUT was set 3 meters away from the interference-receiving<br>antenna, which was mounted on the top of a variable-height antenna<br>tower.   |
|                            | c. 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.                                    |
|                            | d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.                            |
|                            | e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.  |
| 1                          | f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel |
|                            | g. Test the EUT in the lowest channel, the Highest channel   |
| I                          | h. Repeat above procedures until all frequencies measured was complete.  |
| Exploratory Test Mode:   T | Fransmitting with all kind of modulations, data rates.   |
| 1                          | Fransmitting mode.   |
| Final Test Mode:           | Fransmitting mode.   |
| 6                          | Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20).  |
|                            | Only the worst case is recorded in the report.   |
| Instruments Used:          | Refer to section 5.10 for details  |
| Test Results:              | Pass   |

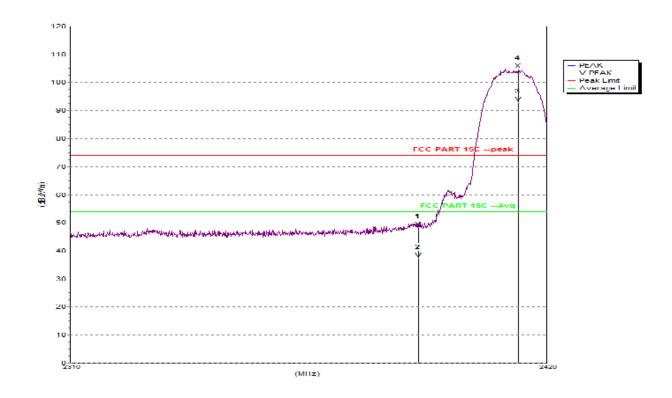


Report No.: SZEM141200692401

Page: 78 of 89

# Test plot as follows:

| Test mode: | 802.11b | Test channel: | Lowest | Remark: | Vertical |
|------------|---------|---------------|--------|---------|----------|
|------------|---------|---------------|--------|---------|----------|



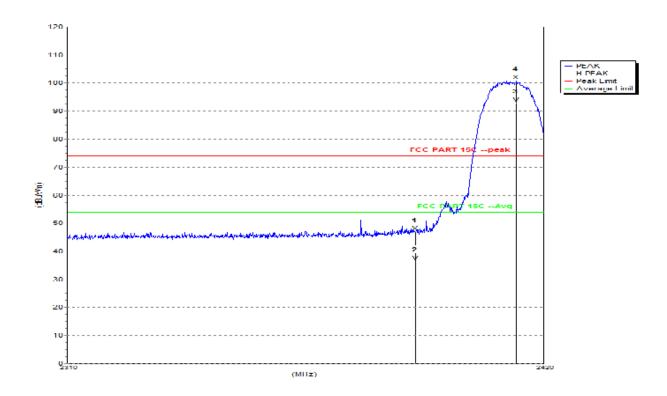
| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | POI. |
| Peak: |          |          |          |        |        |        |        |      |
| 1     | 2390     | 48.4     | 74.0     | 25.6   | 28.7   | 35.3   | 5.0    | ٧    |
| 2 F   | 2413.400 | 104.8    | 74.0     | -30.8  | 28.9   | 35.3   | 5.1    | ٧    |
| Avg   |          |          |          |        |        |        |        |      |
| 1     | 2390     | 37.2     | 54.0     | 16.8   | 28.7   | 35.3   | 5.0    | ٧    |
| 2 F   | 2413.400 | 93.0     | 54.0     | -39.0  | 28.9   | 35.3   | 5.1    | ٧    |



Report No.: SZEM141200692401

Page: 79 of 89

Test mode: 802.11b Test channel: Lowest Remark: Horizontal



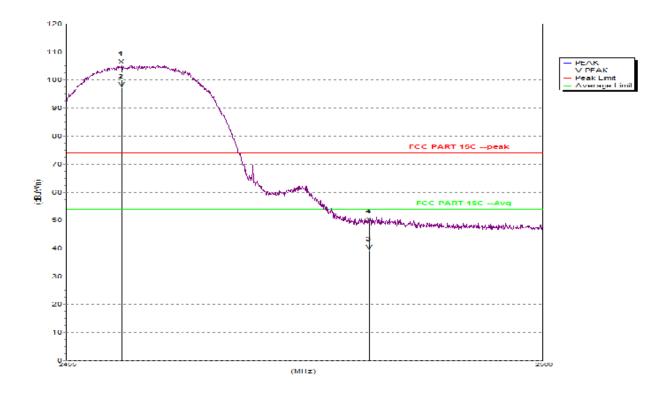
| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | FOI. |
| Peak: |          |          |          |        |        |        |        |      |
| 1     | 2390     | 47.0     | 74.0     | 27.0   | 28.7   | 35.3   | 5.0    | Н    |
| 2 F   | 2413.620 | 100.9    | 74.0     | -26.9  | 28.9   | 35.3   | 5.1    | Н    |
| Avg   |          |          |          |        |        |        |        |      |
| 1     | 2390     | 36.6     | 54.0     | 17.4   | 28.7   | 35.3   | 5.0    | Н    |
| 2 F   | 2413.620 | 92.9     | 54.0     | -38.9  | 28.9   | 35.3   | 5.1    | Н    |



Report No.: SZEM141200692401

Page: 80 of 89

Test mode: 802.11b Test channel: Highest Remark: Vertical



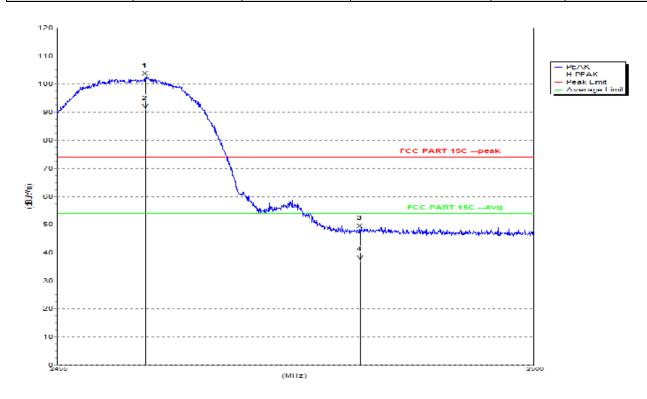
| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | FUI. |
| Peak: |          |          |          |        |        |        |        |      |
| 1 F   | 2460.220 | 105.3    | 74.0     | -31.3  | 29.2   | 35.3   | 5.2    | V    |
| 2     | 2483.5   | 49.0     | 74.0     | 25.0   | 29.3   | 35.3   | 5.2    | V    |
| Avg   |          |          |          |        |        |        |        |      |
| 1 F   | 2460.220 | 97.2     | 54.0     | -43.2  | 29.2   | 35.3   | 5.2    | V    |
| 2     | 2483.5   | 39.2     | 54.0     | 14.8   | 29.3   | 35.3   | 5.2    | V    |



Report No.: SZEM141200692401

Page: 81 of 89

Test mode: 802.11b Test channel: Highest Remark: Horizontal



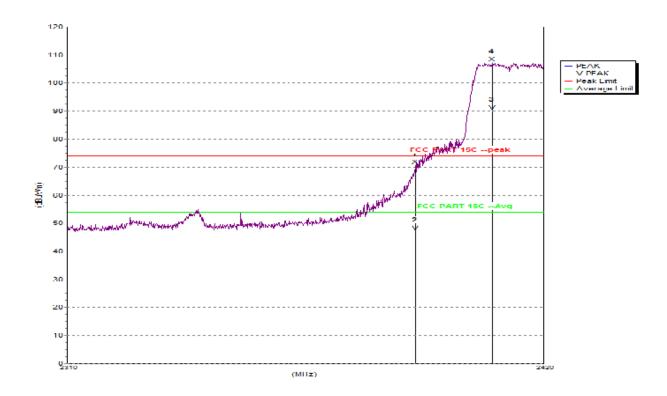
| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | P01. |
| Peak: |          |          |          |        |        |        |        |      |
| 1 F   | 2463.280 | 102.7    | 74.0     | -28.7  | 29.2   | 35.3   | 5.2    | Н    |
| 2     | 2483.5   | 48.4     | 74.0     | 25.6   | 29.3   | 35.3   | 5.2    | Н    |
| Avg   |          |          |          |        |        |        |        |      |
| 1 F   | 2463.280 | 91.0     | 54.0     | -37.0  | 29.2   | 35.3   | 5.2    | Н    |
| 2     | 2483.5   | 37.1     | 54.0     | 16.9   | 29.3   | 35.3   | 5.2    | Н    |



Report No.: SZEM141200692401

Page: 82 of 89

Test mode: 802.11g Test channel: Lowest Remark: Vertical



| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | FOI. |
| Peak: |          |          |          |        |        |        |        |      |
| 1     | 2390     | 70.8     | 74.0     | 3.2    | 28.7   | 35.3   | 5.0    | V    |
| 2 F   | 2407.900 | 107.2    | 74.0     | -33.2  | 28.8   | 35.3   | 5.1    | V    |
| Avg   |          |          |          |        |        |        |        |      |
| 1     | 2390     | 47.2     | 54.0     | 6.8    | 28.7   | 35.3   | 5.0    | V    |
| 2 F   | 2407.900 | 90.1     | 54.0     | -36.1  | 28.8   | 35.3   | 5.1    | V    |

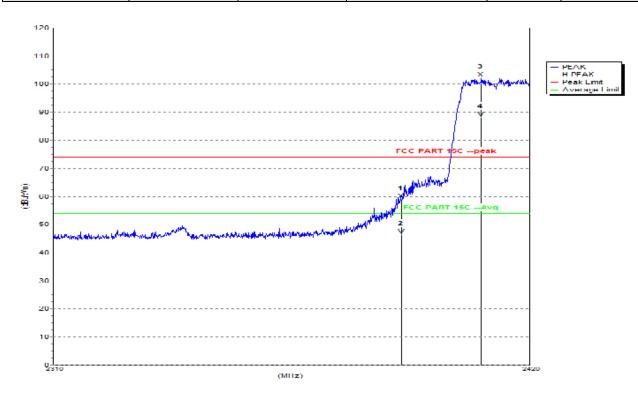




Report No.: SZEM141200692401

Page: 83 of 89

Test mode: 802.11g Test channel: Lowest Remark: Horizontal



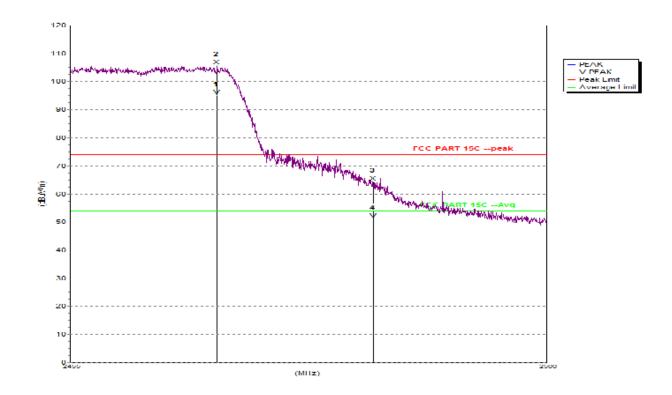
| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | P01. |
| Peak: |          |          |          |        |        |        |        |      |
| 1     | 2390     | 58.9     | 74.0     | 15.1   | 28.7   | 35.3   | 5.0    | Н    |
| 2 F   | 2408.450 | 102.2    | 74.0     | -28.2  | 28.8   | 35.3   | 5.1    | Н    |
| Avg   |          |          |          |        |        |        |        |      |
| 1     | 2390     | 46.3     | 54.0     | 7.7    | 28.7   | 35.3   | 5.0    | Н    |
| 2 F   | 2408.450 | 88.2     | 54.0     | -34.2  | 28.8   | 35.3   | 5.1    | Н    |



Report No.: SZEM141200692401

Page: 84 of 89

Test mode: 802.11g Test channel: Highest Remark: Vertical



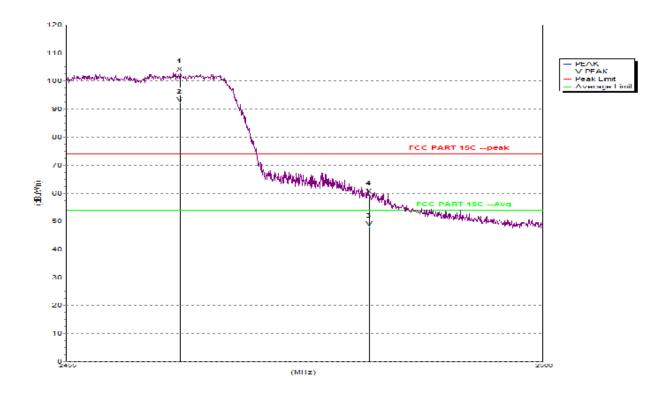
| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | FUI. |
| Peak: |          |          |          |        |        |        |        |      |
| 1 F   | 2468.815 | 105.7    | 74.0     | -31.7  | 29.2   | 35.3   | 5.2    | V    |
| 2     | 2483.5   | 64.4     | 74.0     | 9.6    | 29.3   | 35.3   | 5.2    | V    |
| Avg   |          |          |          |        |        |        |        |      |
| 1 F   | 2468.815 | 95.1     | 54.0     | -41.1  | 29.2   | 35.3   | 5.2    | V    |
| 2     | 2483.5   | 51       | 54.0     | 3.0    | 29.3   | 35.3   | 5.2    | V    |



Report No.: SZEM141200692401

Page: 85 of 89

Test mode: 802.11g Test channel: Highest Remark: Horizontal



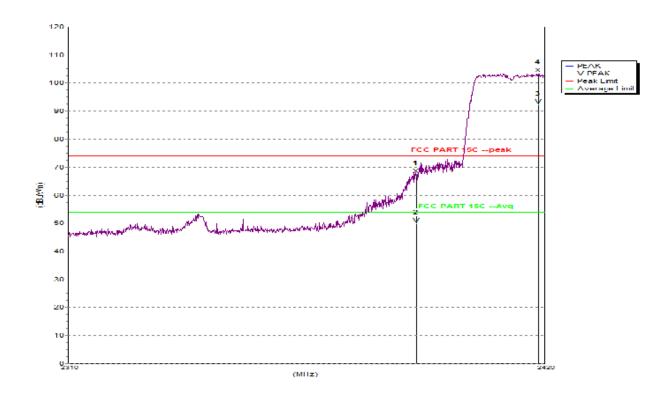
| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIN. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | FOI. |
| Peak: |          |          |          |        |        |        |        |      |
| 1 F   | 2465.710 | 103.0    | 74.0     | -29.0  | 29.2   | 35.3   | 5.2    | V    |
| 2     | 2483.5   | 59.6     | 74.0     | 14.4   | 29.3   | 35.3   | 5.2    | V    |
| Avg   |          |          |          |        |        |        |        |      |
| 1 F   | 2465.710 | 92.2     | 54.0     | -38.2  | 29.2   | 35.3   | 5.2    | V    |
| 2     | 2483.5   | 48.0     | 54.0     | 6.0    | 29.3   | 35.3   | 5.2    | V    |



Report No.: SZEM141200692401

Page: 86 of 89

Test mode: 802.11n(HT20) Test channel: Lowest Remark: Vertical



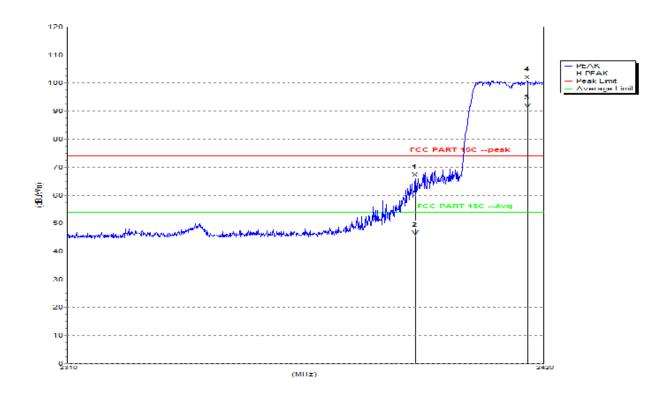
| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | FOI. |
| Peak: |          |          |          |        |        |        |        |      |
| 1     | 2390     | 67.4     | 74.0     | 6.6    | 28.8   | 35.3   | 5.0    | V    |
| 2 F   | 2418.460 | 103.3    | 74.0     | -29.3  | 28.9   | 35.3   | 5.1    | V    |
| Avg   |          |          |          |        |        |        |        |      |
| 1     | 2390     | 49.8     | 54.0     | 4.2    | 28.8   | 35.3   | 5.0    | V    |
| 2 F   | 2418.460 | 92.2     | 54.0     | -38.2  | 28.9   | 35.3   | 5.1    | V    |



Report No.: SZEM141200692401

Page: 87 of 89

Test mode: 802.11n(HT20) Test channel: Lowest Remark: Horizontal



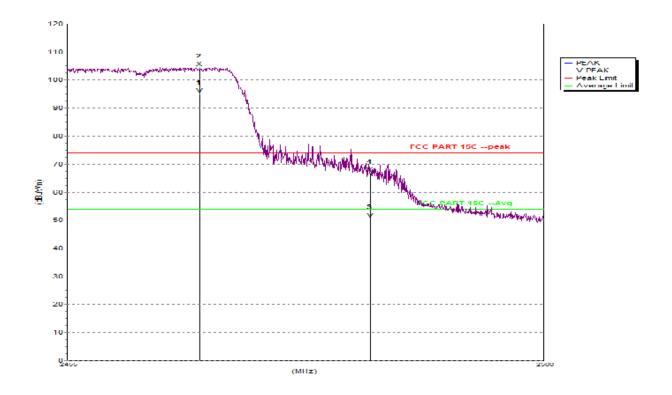
| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | FOI. |
| Peak: |          |          |          |        |        |        |        |      |
| 1     | 2390     | 66.0     | 74.0     | 8.0    | 28.7   | 35.3   | 5.0    | Н    |
| 2 F   | 2416.260 | 100.9    | 74.0     | -26.9  | 28.9   | 35.3   | 5.1    | Н    |
| Avg   |          |          |          |        |        |        |        |      |
| 1     | 2390     | 45.4     | 54.0     | 8.6    | 28.7   | 35.3   | 5.0    | Н    |
| 2 F   | 2416.260 | 90.8     | 54.0     | -36.8  | 28.9   | 35.3   | 5.1    | Н    |



Report No.: SZEM141200692401

Page: 88 of 89

Test mode: 802.11n(HT20) Test channel: Highest Remark: Vertical



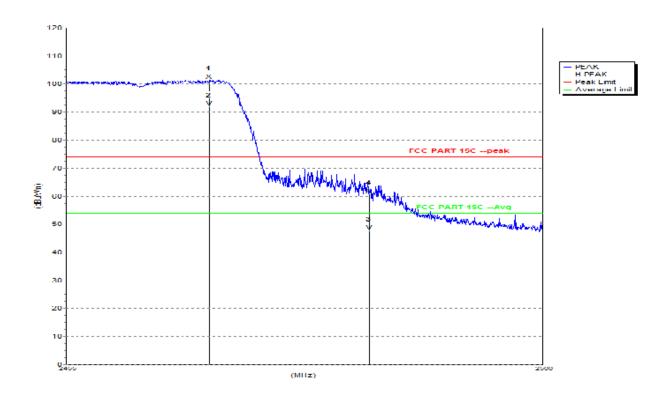
| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | FOI. |
| Peak: |          |          |          |        |        |        |        |      |
| 1 F   | 2467.510 | 104.6    | 74.0     | -30.6  | 29.2   | 35.3   | 5.2    | V    |
| 2     | 2483.5   | 66.9     | 74.0     | 7.1    | 29.3   | 35.3   | 5.2    | V    |
| Avg   |          |          |          |        |        |        |        |      |
| 1 F   | 2467.510 | 95.1     | 54.0     | -41.1  | 29.2   | 35.3   | 5.2    | V    |
| 2     | 2483.5   | 50.7     | 54.0     | 3.3    | 29.3   | 35.3   | 5.2    | V    |



Report No.: SZEM141200692401

Page: 89 of 89

Test mode: 802.11n(HT20) Test channel: Highest Remark: Horizontal



| Mk.   | Freq.    | Level    | Limit    | Margin | Ant.F. | Amp.G. | Cbl.L. | Pol. |
|-------|----------|----------|----------|--------|--------|--------|--------|------|
| IVIK. | (MHz)    | (dBuV/m) | (dBuV/m) | (dB)   | (dB/m) | (dB)   | (dB)   | FUI. |
| Peak: |          |          |          |        |        |        |        |      |
| 1 F   | 2468.500 | 101.5    | 74.0     | -27.5  | 29.2   | 35.3   | 5.2    | Н    |
| 2     | 2483.5   | 60.7     | 74.0     | 13.3   | 29.3   | 35.3   | 5.2    | Н    |
| Avg   |          |          |          |        |        |        |        |      |
| 1 F   | 2468.500 | 91.9     | 54.0     | -37.9  | 29.2   | 35.3   | 5.2    | Н    |
| 2     | 2483.5   | 47.8     | 54.0     | 6.2    | 29.3   | 35.3   | 5.2    | Н    |

#### Note

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