

# TEST REPORT

**Application No.:** SHEM2108009806CR  
**FCC ID:** 2AV6B-IP4MCB1PRO  
**IC:** 26035-IP4MCB1PRO  
**Applicant:** Empowerment Technologies Inc  
**Address of Applicant:** 590 York Rd.,Unit2, Niagara-on-the-Lake, L0S 1J0 , Canada  
**Manufacturer:** Empowerment Technologies Inc  
**Address of Manufacturer:** 590 York Rd.,Unit2, Niagara-on-the-Lake, L0S 1J0 , Canada  
**Equipment Under Test (EUT):**  
**EUT Name:** Wi-Fi Camera  
**Model No.:** IP4MCB1PRO;IP4MCB2PRO;IP4MCB3PRO;IP4MCB4PRO  
 Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.247  
 RSS-247 Issue 2, February 2017  
 RSS-Gen Issue 5 Amendment 2 (February 2021)  
**Date of Receipt:** 2021-08-24  
**Date of Test:** 2021-08-26 to 2021-09-23  
**Date of Issue:** 2021-09-30

|                     |              |
|---------------------|--------------|
| <b>Test Result:</b> | <b>Pass*</b> |
|---------------------|--------------|

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

*Parlam Zhan*

Parlam Zhan  
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.



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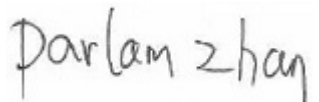
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| Revision Record |             |            |        |
|-----------------|-------------|------------|--------|
| Version         | Description | Date       | Remark |
| 00              | Original    | 2021-09-30 | /      |
|                 |             |            |        |
|                 |             |            |        |

|                          |  |                                                                                    |  |  |
|--------------------------|--|------------------------------------------------------------------------------------|--|--|
| Authorized for issue by: |  |                                                                                    |  |  |
|                          |  |   |  |  |
|                          |  | Micheal Niu / Project Engineer                                                     |  |  |
|                          |  |  |  |  |
|                          |  | Parlam Zhan / Reviewer                                                             |  |  |

## 2 Test Summary

| Radio Spectrum Technical Requirement |                                              |                    |        |                      |
|--------------------------------------|----------------------------------------------|--------------------|--------|----------------------|
| Item                                 | FCC Requirement                              | IC Requirement     | Method | Result               |
| Antenna Requirement                  | 47 CFR Part 15, Subpart C 15.203 & 15.247(c) | RSS-Gen Clause 6.8 | N/A    | Customer Declaration |

N/A: Not applicable

| Radio Spectrum Matter Part                            |                                              |                                           |                                        |        |
|-------------------------------------------------------|----------------------------------------------|-------------------------------------------|----------------------------------------|--------|
| Item                                                  | FCC Requirement                              | IC Requirement                            | Method                                 | Result |
| Conducted Emissions at AC Power Line (150kHz-30MHz)   | 47 CFR Part 15, Subpart C 15.207             | RSS-Gen Clause 8.8                        | ANSI C63.10 (2013) Section 6.2         | Pass   |
| Minimum 6dB Bandwidth                                 | 47 CFR Part 15, Subpart C 15.247a(2)         | RSS-247 Clause 5.2(a)                     | ANSI C63.10 (2013) Section 11.8.1      | Pass   |
| Conducted Average Output Power                        | 47 CFR Part 15, Subpart C 15.247(b)(3)       | RSS-247 Clause 5.4(d)                     | ANSI C63.10 (2013) Section 11.9.2      | Pass   |
| Power Spectrum Density                                | 47 CFR Part 15, Subpart C 15.247(e)          | RSS-247 Clause 5.2(b)                     | ANSI C63.10 (2013) Section 11.10.2     | Pass   |
| Conducted Band Edges Measurement                      | 47 CFR Part 15, Subpart C 15.247(d)          | RSS-247 Clause 5.5                        | ANSI C63.10 (2013) Section 11.13.3.2   | Pass   |
| Conducted Spurious Emissions                          | 47 CFR Part 15, Subpart C 15.247(d)          | RSS-247 Clause 5.5                        | ANSI C63.10 (2013) Section 11.11       | Pass   |
| Radiated Emissions which fall in the restricted bands | 47 CFR Part 15, Subpart C 15.209 & 15.247(d) | RSS-247 Section 3.3 & RSS-Gen Section 8.9 | ANSI C63.10 (2013) Section 6.10.5      | Pass   |
| Radiated Spurious Emissions                           | 47 CFR Part 15, Subpart C 15.209 & 15.247(d) | RSS-247 Section 3.3 & RSS-Gen Section 8.9 | ANSI C63.10 (2013) Section 6.4,6.5,6.6 | Pass   |
| 99% Bandwidth                                         | -                                            | RSS-Gen Section 6.7                       | ANSI C63.10 Section 6.9.3              | Pass   |

### Declaration of EUT Family Grouping:

Note: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model IP4MCB1PRO was tested since their differences were the model number and appearance.



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## 4 General Information

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

Power supply: DC 12V by adapter  
Test voltage: AC 120V/60Hz  
Antenna Gain: Ant1: 1.79dBi (Provided by manufacturer)  
Ant2: 1.79dBi (Provided by manufacturer)  
Directional Gain: 4.8dBi  
Antenna Type: Monopole antenna  
Channel Spacing: 5MHz  
Data Rate: 802.11b: 1/2/5.5/11Mbps,  
802.11g: 6/9/12/18/24/36/48/54Mbps  
802.11n: MCS 0 to 7 for HT20MHz; MCS 0 to 7 for HT40MHz  
Modulation Type: 802.11b: DSSS (CCK, DQPSK, DBPSK)  
802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)  
Number of Channels: 802.11b/g/n(HT20):11  
802.11n(HT40):7  
Operation Frequency: 802.11b/g/n(HT20): 2412MHz to 2462MHz  
802.11n(HT40): 2422MHz to 2452MHz  
Firmware Version: V1.0  
Serial Number: 7G069A2RAZDCD05

### 4.2 Power level setting using in test:

| Channel | 802.11b       |       | 802.11g |       | 802.11n(HT20) |       |
|---------|---------------|-------|---------|-------|---------------|-------|
|         | Ant 1         | Ant 2 | Ant 1   | Ant 2 | Ant 1         | Ant 2 |
| 1       | 29            | 31    | 38      | 39    | 31            | 32    |
| 6       | 29            | 31    | 38      | 39    | 31            | 32    |
| 11      | 29            | 31    | 38      | 39    | 31            | 32    |
| Channel | 802.11n(HT40) |       |         |       |               |       |
|         | Ant 1         | Ant 2 |         |       |               |       |
| 3       | 31            | 33    |         |       |               |       |
| 6       | 31            | 33    |         |       |               |       |
| 9       | 31            | 33    |         |       |               |       |

### 4.3 Description of Support Units

| Description               | Manufacturer | Model No.      | Serial No. |
|---------------------------|--------------|----------------|------------|
| Laptop                    | Lenovo       | ThinkPad X100e | /          |
| SecureCRT                 | VanDyke      | V 6.2.0        | /          |
| Serial port adapter plate | /            | Test Plate 3   | /          |



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|         |        |                          |   |
|---------|--------|--------------------------|---|
| Adapter | HOIOTO | ADS-12AM-12<br>12012EPCU | / |
|---------|--------|--------------------------|---|



#### 4.4 Measurement Uncertainty

| No. | Item                            | Measurement Uncertainty |
|-----|---------------------------------|-------------------------|
| 1   | Radio Frequency                 | $8.4 \times 10^{-8}$    |
| 2   | Timeout                         | 2s                      |
| 3   | Duty Cycle                      | 0.37%                   |
| 4   | Occupied Bandwidth              | 3%                      |
| 5   | RF Conducted Power              | 0.6dB                   |
| 6   | RF Power Density                | 2.9dB                   |
| 7   | Conducted Spurious Emissions    | 0.75dB                  |
| 8   | RF Radiated Power               | 5.2dB (Below 1GHz)      |
|     |                                 | 5.9dB (Above 1GHz)      |
| 9   | Radiated Spurious Emission Test | 4.2dB (Below 30MHz)     |
|     |                                 | 4.5dB (30MHz-1GHz)      |
|     |                                 | 5.1dB (1GHz-18GHz)      |
|     |                                 | 5.4dB (Above 18GHz)     |
| 10  | Temperature Test                | 1°C                     |
| 11  | Humidity Test                   | 3%                      |
| 12  | Supply Voltages                 | 1.5%                    |
| 13  | Time                            | 3%                      |

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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## 4.5 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888

Fax: +86 512 5737 0818

No tests were sub-contracted.

## 4.6 Test Facility

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

- **CNAS (No. CNAS L4354)**

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 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.

- **A2LA (Certificate No. 2541.01)**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC (Designation Number: CN1172)**

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory.

Designation Number: CN1172.

- **ISED (CAB identifier: CN0072)**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E

- **VCCI (Member No.: 1938)**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

## 4.7 Deviation from Standards

None

## 4.8 Abnormalities from Standard Conditions

None



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## 5 Equipment List

| Item                                                        | Equipment                            | Manufacturer  | Model       | Serial Number | Cal Date   | Cal. Due Date |
|-------------------------------------------------------------|--------------------------------------|---------------|-------------|---------------|------------|---------------|
| <b>Conducted Emission at Mains Terminals (150kHz-30MHz)</b> |                                      |               |             |               |            |               |
| 1                                                           | EMI Test Receive                     | R&S           | ESCI        | 100781        | 02/01/2021 | 01/31/2022    |
| 2                                                           | LISN                                 | R&S           | ENV216      | 101604        | 10/19/2020 | 10/18/2021    |
| 3                                                           | LISN                                 | Schwarzbeck   | NNLK 8129   | 8129-143      | 10/19/2020 | 10/18/2021    |
| 4                                                           | Pulse Limiter                        | R&S           | ESH3-Z2     | 100609        | 02/01/2021 | 01/31/2022    |
| 5                                                           | CE test Cable                        | Thermax       | /           | 14            | 10/17/2020 | 10/16/2021    |
| 6                                                           | Test Software                        | Farad         | EZ-EMC      | CCS-03A1      | N.C.R      | N.C.R         |
| <b>RF Conducted Test</b>                                    |                                      |               |             |               |            |               |
| 1                                                           | Spectrum Analyzer                    | Agilent       | E4446A      | MY44020154    | 04/16/2021 | 04/15/2022    |
| 2                                                           | Spectrum Analyzer                    | Keysight      | N9020A      | MY55370209    | 12/02/2020 | 12/01/2021    |
| 3                                                           | Spectrum Analyzer                    | Keysight      | N9010A      | MY56480443    | 02/01/2021 | 01/31/2022    |
| 4                                                           | Signal Generator                     | Agilent       | N5182A      | MY50142015    | 09/25/2020 | 09/24/2021    |
| 5                                                           | Radio Communication Test Station     | Anritsu       | MT8000A     | 6262012849    | N/A        | N/A           |
| 6                                                           | Radio Communication Analyzer         | Anritsu       | MT8821C     | 6201692222    | N/A        | N/A           |
| 7                                                           | Universal Radio Communication Tester | R&S           | CMW500      | 159275        | 10/19/2020 | 10/18/2021    |
| 8                                                           | Universal Radio Communication Tester | R&S           | CMW500      | 167239        | 04/16/2021 | 04/15/2022    |
| 9                                                           | Power Meter                          | Anritsu       | ML2495A     | 1445010       | 04/15/2021 | 04/14/2022    |
| 10                                                          | Switcher                             | CCSRF         | FY562       | KUS2001M001-3 | 10/19/2020 | 10/18/2021    |
| 11                                                          | AC Power Source                      | EXTECH        | 6605        | 1570106       | N.C.R      | N.C.R         |
| 12                                                          | DC Power Supply                      | Aglient       | E3632A      | MY50340053    | N.C.R      | N.C.R         |
| 13                                                          | 6dB Attenuator                       | Mini-Circuits | NAT-6-2W    | 15542-1       | N.C.R      | N.C.R         |
| 14                                                          | Power Divider                        | AI SI         | IOWOPE2068  | PE2068        | N.C.R      | N.C.R         |
| 15                                                          | Filter                               | MICRO-TRONICS | BRM50701    | 5             | N.C.R      | N.C.R         |
| 16                                                          | Conducted test cable                 | /             | RF01-RF04   | /             | 04/15/2021 | 04/14/2022    |
| 17                                                          | Software                             | BST           | TST-PASS    | N/A           | N/A        | N/A           |
| 18                                                          | Temp. / Humidity Chamber             | TERCHY        | MHK-120AK   | X30109        | 04/15/2021 | 04/14/2022    |
| 19                                                          | Thermometer                          | Anymetre      | TH603       | CCS007        | 10/16/2020 | 10/15/2021    |
| <b>RF Radiated Test</b>                                     |                                      |               |             |               |            |               |
| 1                                                           | Spectrum Analyzer                    | R&S           | FSV40       | 101493        | 10/19/2020 | 10/18/2021    |
| 2                                                           | Signal Generator                     | Agilent       | E8257C      | MY43321570    | 10/19/2020 | 10/18/2021    |
| 3                                                           | Loop Antenna                         | Schwarzbeck   | HXYZ9170    | 9170-108      | 02/22/2021 | 02/21/2022    |
| 4                                                           | Bilog Antenna                        | TESEQ         | CBL 6112D   | 35403         | 06/21/2021 | 06/20/2023    |
| 5                                                           | Bilog Antenna                        | SCHWARZBECK   | VULB9160    | 9160-3342     | 04/13/2021 | 04/12/2023    |
| 6                                                           | Horn-antenna(1-18GHz)                | Schwarzbeck   | BBHA9120D   | 267           | 10/26/2020 | 10/25/2022    |
| 7                                                           | Horn-antenna(1-18GHz)                | ETS-LINDGREN  | 3117        | 00143290      | 02/22/2021 | 02/21/2023    |
| 8                                                           | Horn Antenna(18-40GHz)               | Schwarzbeck   | BBHA9170    | BBHA9170171   | 02/22/2021 | 02/21/2022    |
| 9                                                           | Pre-Amplifier(30MHz~18GHz)           | LNA           | /           | /             | 04/15/2021 | 04/14/2022    |
| 10                                                          | Amplifier(18~40GHz)                  | COM-POWER     | PAM-840A    | 461332        | 10/23/2020 | 10/22/2021    |
| 11                                                          | Low Pass Filter                      | MICRO-TRONICS | VLFX-950    | RV142900829   | N.C.R      | N.C.R         |
| 12                                                          | High Pass Filter                     | Mini-Circuits | VHF-1200    | 15542         | N.C.R      | N.C.R         |
| 13                                                          | Filter (5450MHz~5770 MHz)            | MICRO-TRONICS | BRC50704-01 | 2             | N.C.R      | N.C.R         |
| 14                                                          | Filter (5690 MHz~5930 MHz)           | MICRO-TRONICS | BRC50705-01 | 4             | N.C.R      | N.C.R         |
| 15                                                          | Filter (5150 MHz~5350 MHz)           | MICRO-TRONICS | BRC50703-01 | 2             | N.C.R      | N.C.R         |



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|    |                            |               |              |     |            |            |
|----|----------------------------|---------------|--------------|-----|------------|------------|
| 16 | Filter (885 MHz~915 MHz)   | MICRO-TRONICS | BRM14698     | 1   | N.C.R      | N.C.R      |
| 17 | Filter (815 MHz~860 MHz)   | MICRO-TRONICS | BRM14697     | 1   | N.C.R      | N.C.R      |
| 18 | Filter (1745 MHz~1910 MHz) | MICRO-TRONICS | BRM14700     | 1   | N.C.R      | N.C.R      |
| 19 | Filter (1922 MHz~1977 MHz) | MICRO-TRONICS | BRM50715     | 1   | N.C.R      | N.C.R      |
| 20 | Filter (2550 MHz)          | MICRO-TRONICS | HPM13362     | 5   | N.C.R      | N.C.R      |
| 21 | Filter (1532 MHz~1845 MHz) | MICRO-TRONICS | BRM50713     | 1   | N.C.R      | N.C.R      |
| 22 | Filter (2.4GHz)            | MICRO-TRONICS | BRM50701     | 5   | N.C.R      | N.C.R      |
| 23 | RE test cable              | /             | RE01-RE04    | /   | 04/15/2021 | 04/14/2022 |
| 24 | Software                   | Faratronic    | EZ_EMG-v 3A1 | N/A | N/A        | N/A        |



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## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

#### 6.1.2 Conclusion

Standard 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 1 and antenna 2 is Monopole antenna, and all no consideration of replacement. The best case gain of the antenna 1 and antenna 2 is 1.79dBi.

Antenna location: Refer to Appendix (External Photos).



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## 7 Radio Spectrum Matter Test Results

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

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

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

\*Decreases with the logarithm of the frequency.



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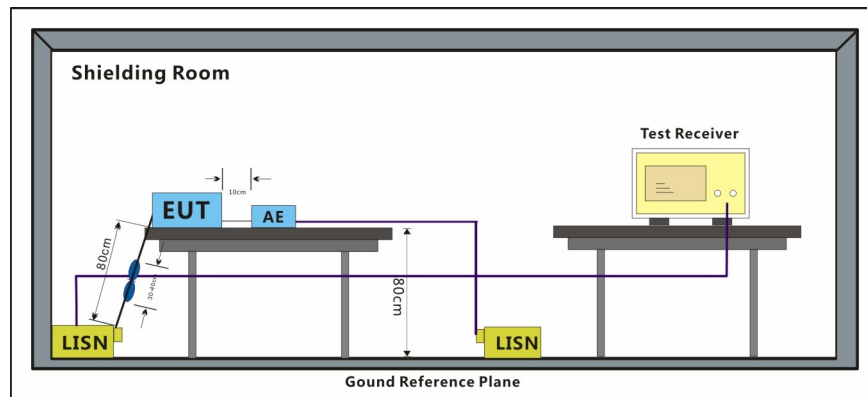
### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.1.2 Test Setup Diagram



### 7.1.3 Measurement Procedure and Data

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

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



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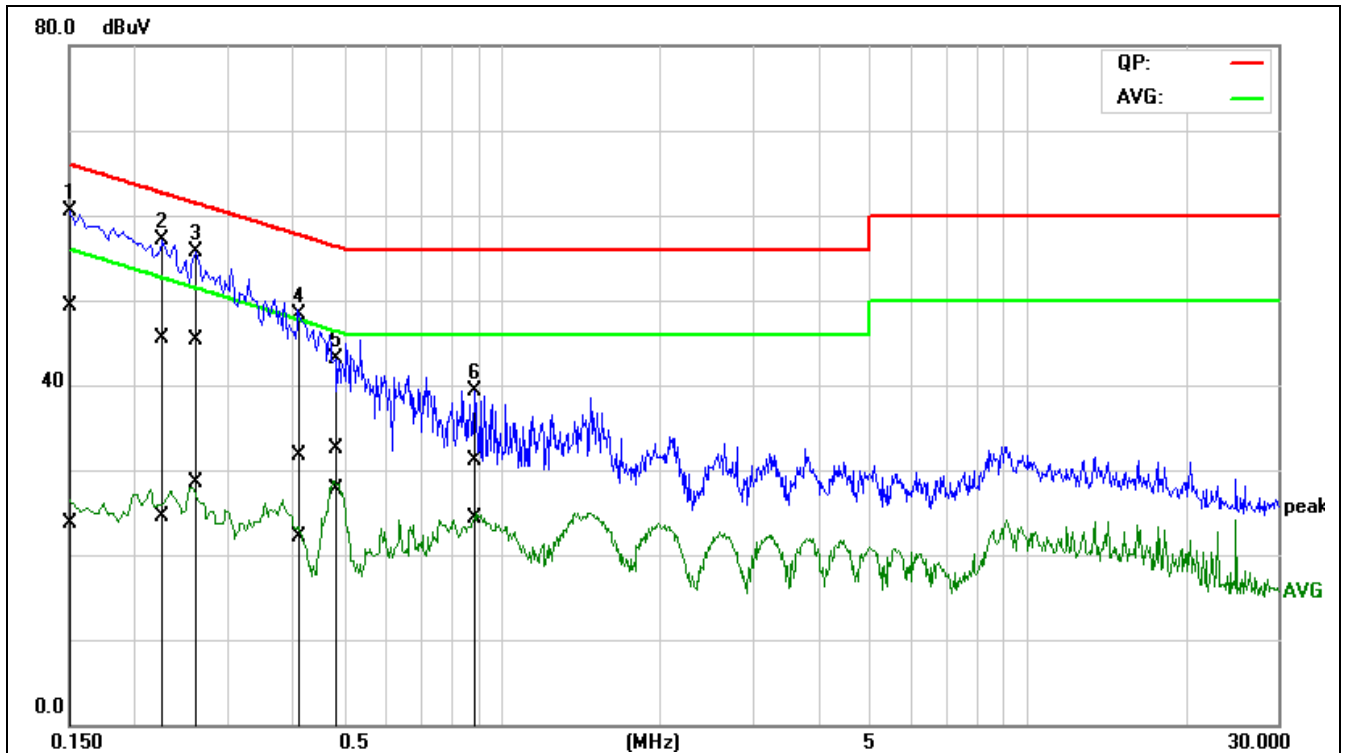
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Mode:a; Line:Live Line



| No. | Frequency<br>(MHz) | QuasiPeak<br>reading<br>(dBuV) | Average<br>reading<br>(dBuV) | Correction<br>factor<br>(dB) | QuasiPeak<br>result<br>(dBuV) | Average<br>result<br>(dBuV) | QuasiPeak<br>limit<br>(dBuV) | Average<br>limit<br>(dBuV) | QuasiPeak<br>margin<br>(dB) | Average<br>margin<br>(dB) | Remark |
|-----|--------------------|--------------------------------|------------------------------|------------------------------|-------------------------------|-----------------------------|------------------------------|----------------------------|-----------------------------|---------------------------|--------|
| 1   | 0.1516             | 29.93                          | 4.24                         | 19.46                        | 49.39                         | 23.70                       | 65.91                        | 55.91                      | -16.52                      | -32.21                    | Pass   |
| 2   | 0.2274             | 26.11                          | 5.13                         | 19.47                        | 45.58                         | 24.60                       | 62.54                        | 52.54                      | -16.96                      | -27.94                    | Pass   |
| 3*  | 0.2602             | 25.76                          | 9.03                         | 19.47                        | 45.23                         | 28.50                       | 61.42                        | 51.43                      | -16.19                      | -22.93                    | Pass   |
| 4   | 0.4143             | 12.14                          | 2.70                         | 19.50                        | 31.64                         | 22.20                       | 57.56                        | 47.56                      | -25.92                      | -25.36                    | Pass   |
| 5   | 0.4784             | 12.91                          | 8.24                         | 19.52                        | 32.43                         | 27.76                       | 56.37                        | 46.37                      | -23.94                      | -18.61                    | Pass   |
| 6   | 0.8830             | 11.56                          | 4.76                         | 19.54                        | 31.10                         | 24.30                       | 56.00                        | 46.00                      | -24.90                      | -21.70                    | Pass   |



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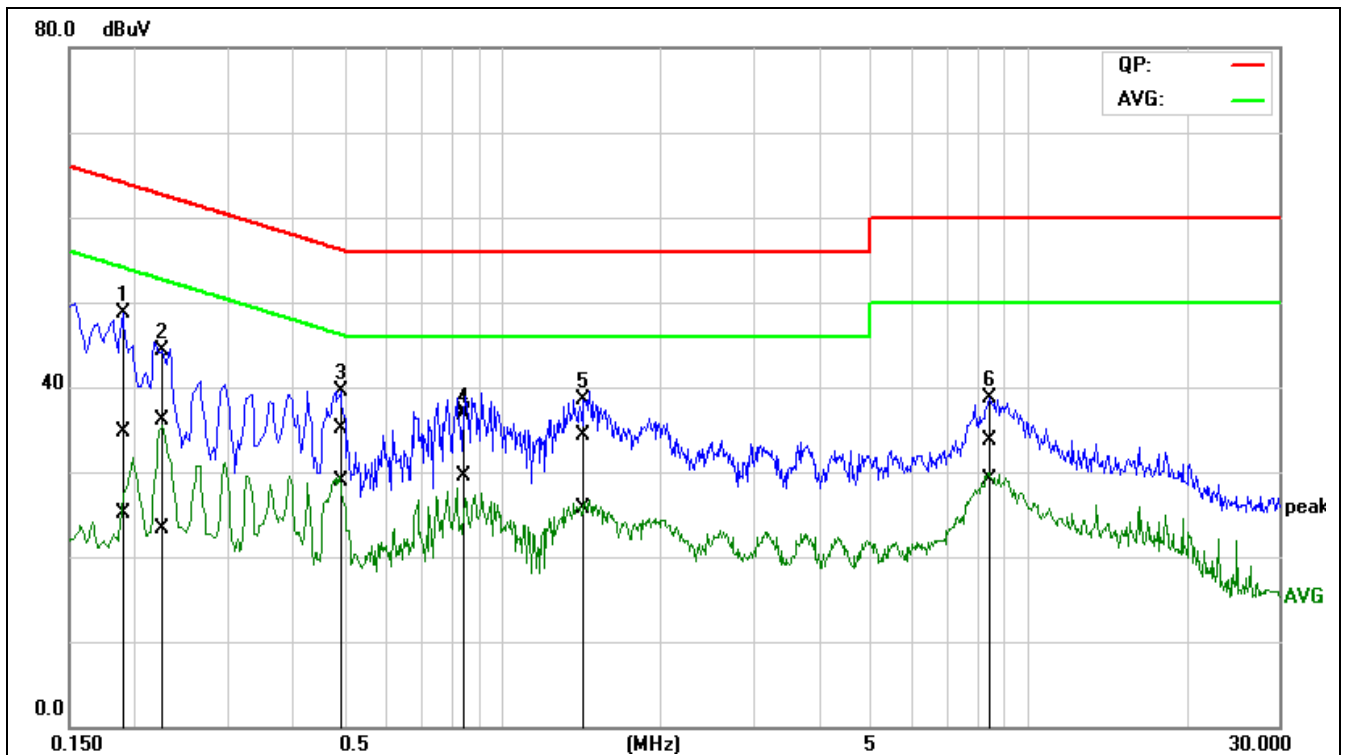
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Mode:a; Line:Neutral Line



| No. | Frequency<br>(MHz) | QuasiPeak<br>reading<br>(dBuV) | Average<br>reading<br>(dBuV) | Correction<br>factor<br>(dB) | QuasiPeak<br>result<br>(dBuV) | Average<br>result<br>(dBuV) | QuasiPeak<br>limit<br>(dBuV) | Average<br>limit<br>(dBuV) | QuasiPeak<br>margin<br>(dB) | Average<br>margin<br>(dB) | Remark |
|-----|--------------------|--------------------------------|------------------------------|------------------------------|-------------------------------|-----------------------------|------------------------------|----------------------------|-----------------------------|---------------------------|--------|
| 1   | 0.1910             | 15.27                          | 5.60                         | 19.43                        | 34.70                         | 25.03                       | 63.99                        | 53.99                      | -29.29                      | -28.96                    | Pass   |
| 2   | 0.2254             | 16.69                          | 3.96                         | 19.44                        | 36.13                         | 23.40                       | 62.62                        | 52.62                      | -26.49                      | -29.22                    | Pass   |
| 3   | 0.4883             | 15.63                          | 9.36                         | 19.51                        | 35.14                         | 28.87                       | 56.20                        | 46.20                      | -21.06                      | -17.33                    | Pass   |
| 4*  | 0.8320             | 17.51                          | 9.95                         | 19.52                        | 37.03                         | 29.47                       | 56.00                        | 46.00                      | -18.97                      | -16.53                    | Pass   |
| 5   | 1.4396             | 14.83                          | 6.21                         | 19.55                        | 34.38                         | 25.76                       | 56.00                        | 46.00                      | -21.62                      | -20.24                    | Pass   |
| 6   | 8.3793             | 13.76                          | 9.24                         | 19.90                        | 33.66                         | 29.14                       | 60.00                        | 50.00                      | -26.34                      | -20.86                    | Pass   |



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## 7.2 Minimum 6dB Bandwidth

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

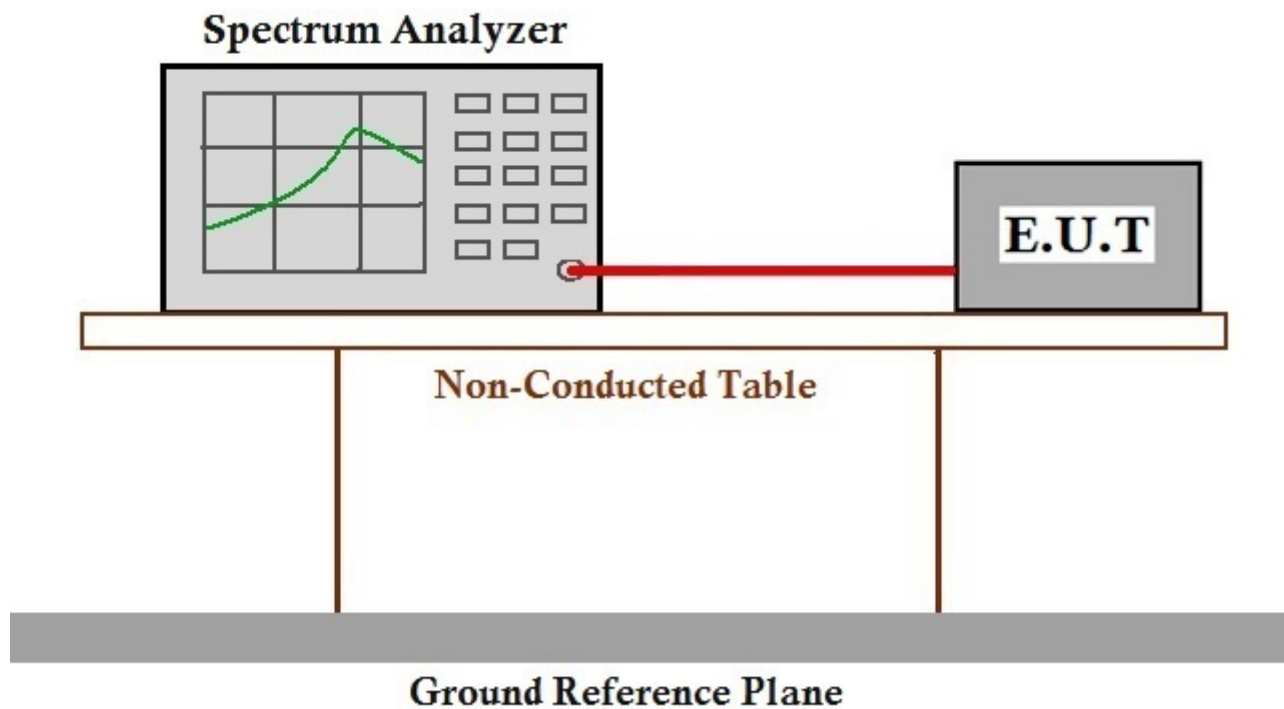
### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.2.2 Test Setup Diagram



### 7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix A for SHEM210800980601



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### 7.3 Conducted Average Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)

Test Method: ANSI C63.10 (2013) Section 11.9.2

Limit:

| Frequency range(MHz) | Output power of the intentional radiator(watt)         |
|----------------------|--------------------------------------------------------|
| 902-928              | 1 for $\geq 50$ hopping channels                       |
|                      | 0.25 for $25 \leq$ hopping channels $< 50$             |
|                      | 1 for digital modulation                               |
| 2400-2483.5          | 1 for $\geq 75$ non-overlapping hopping channels       |
|                      | 0.125 for all other frequency hopping systems          |
|                      | 1 for digital modulation                               |
| 5725-5850            | 1 for frequency hopping systems and digital modulation |



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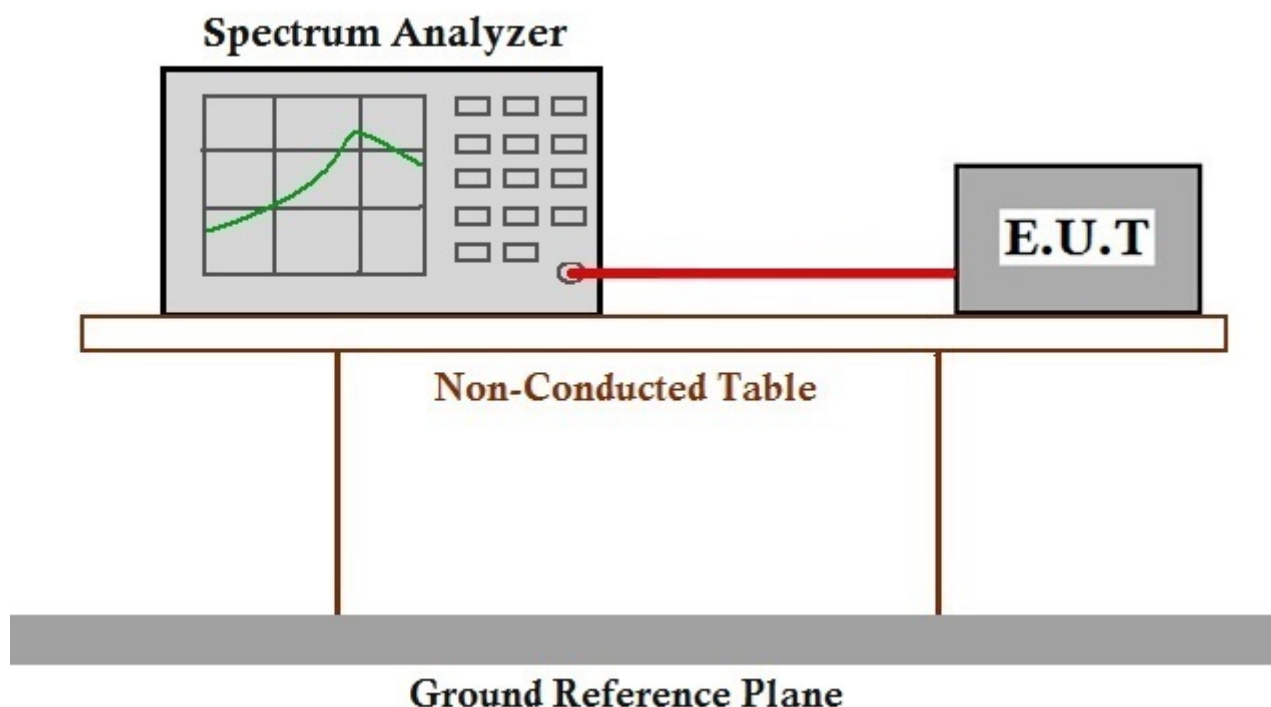
### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.3.2 Test Setup Diagram



### 7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix A for SHEM210800980601



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## 7.4 Power Spectrum Density

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

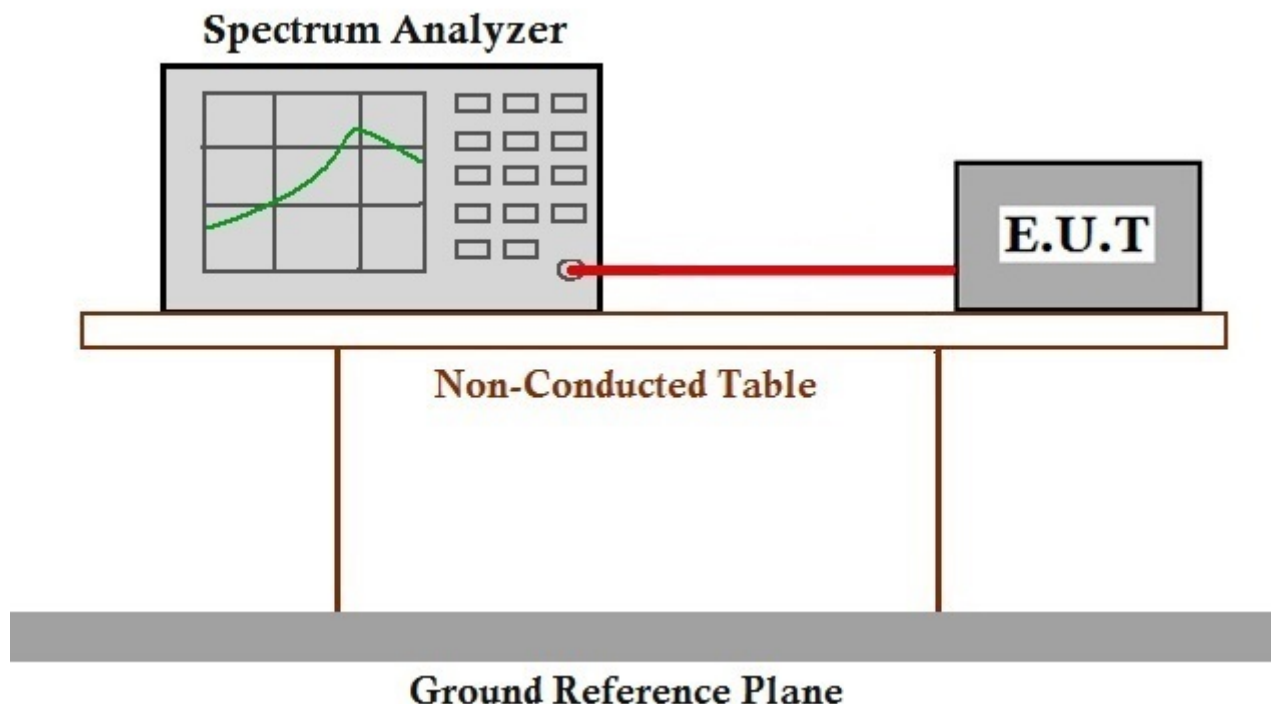
### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.4.2 Test Setup Diagram



### 7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix A for SHEM210800980601



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## 7.5 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.13.3.2

Limit: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))



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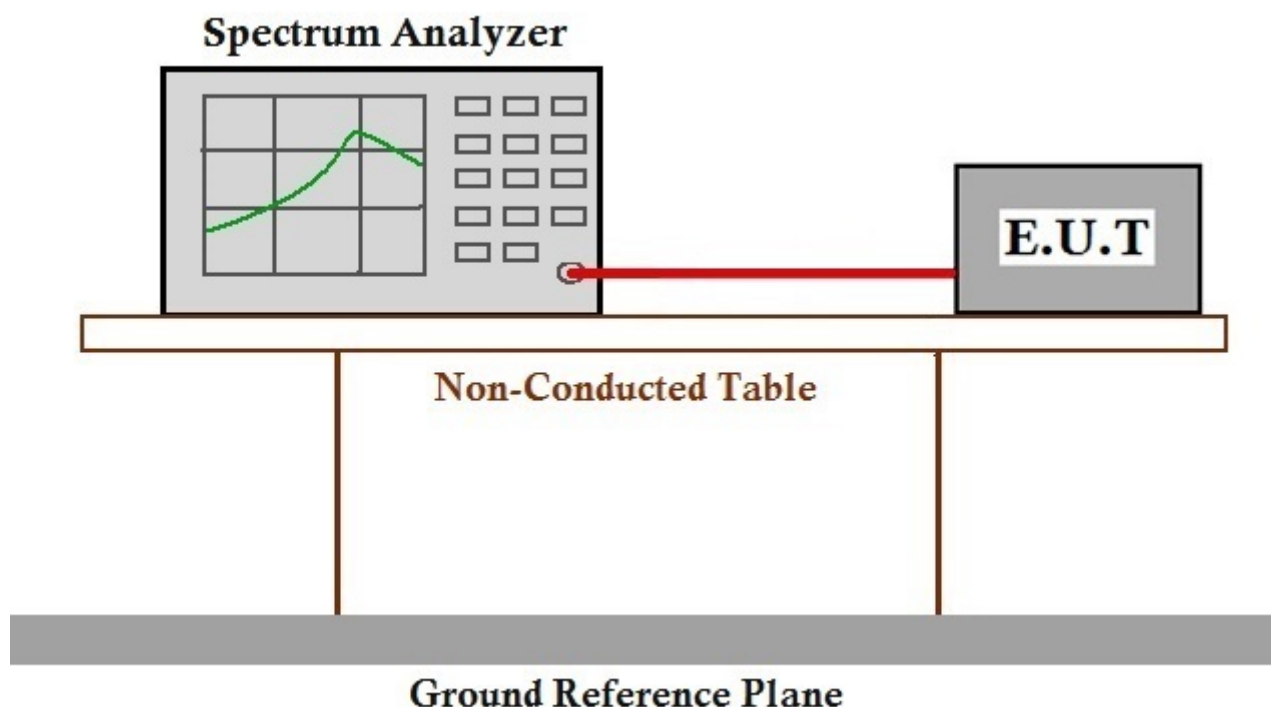
### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.5.2 Test Setup Diagram



### 7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix A for SHEM210800980601



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## 7.6 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.11

Limit: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))



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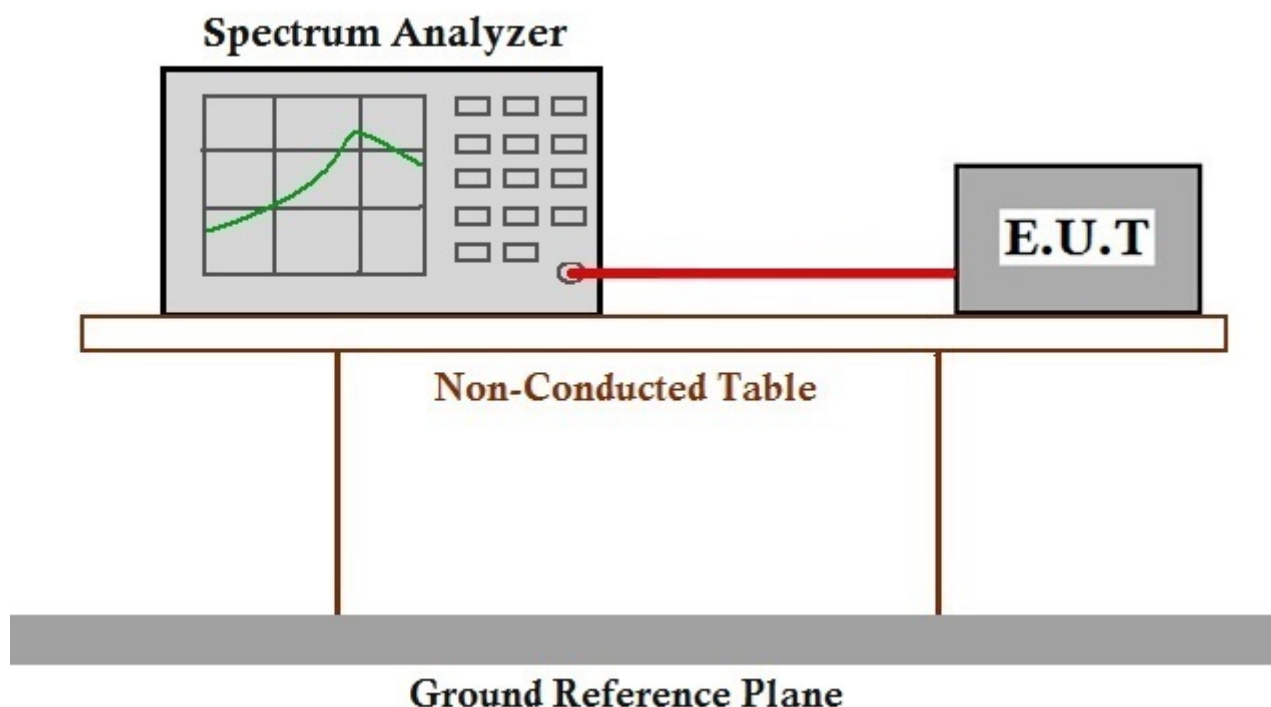
### 7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.6.2 Test Setup Diagram



### 7.6.3 Measurement Procedure and Data

The detailed test data see: Appendix A for SHEM210800980601



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## 7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.209 &amp; 15.247(d)

Test Method: ANSI C63.10 (2013) Section 6.10.5

Limit:

| Frequency(MHz) | Field strength(microvolts/meter) | Measurement distance(meters) |
|----------------|----------------------------------|------------------------------|
| 0.009-0.490    | 2400/F(kHz)                      | 300                          |
| 0.490-1.705    | 24000/F(kHz)                     | 30                           |
| 1.705-30.0     | 30                               | 30                           |
| 30-88          | 100                              | 3                            |
| 88-216         | 150                              | 3                            |
| 216-960        | 200                              | 3                            |
| Above 960      | 500                              | 3                            |

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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.



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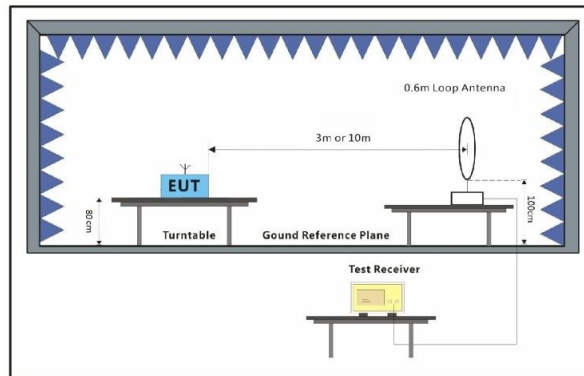
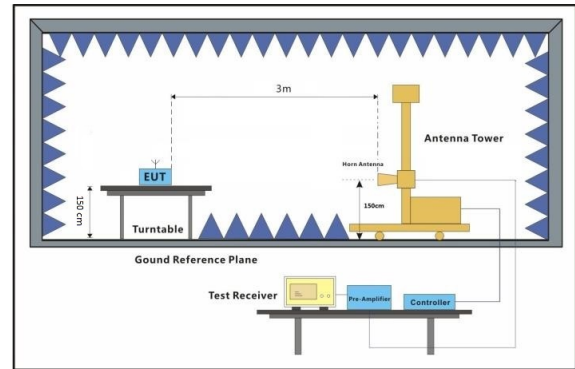
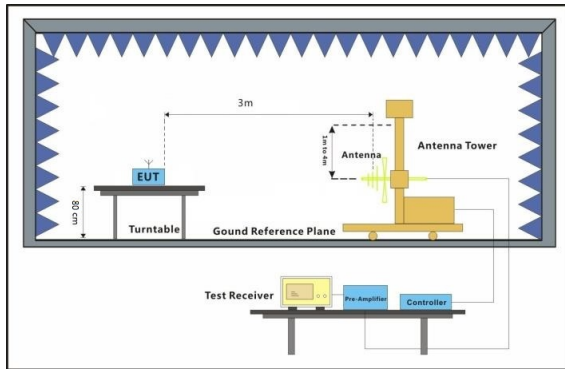
### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.7.2 Test Setup Diagram



### 7.7.3 Measurement Procedure and Data

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

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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

Remark 3: This test item was investigated while operating in SISO and MIMO mode, however, it was determined that SISO antenna 1 operation for b/g modulation and MIMO antenna operation for n modulation produced the worst emissions. So the emissions produced from other operation are not recorded in report.



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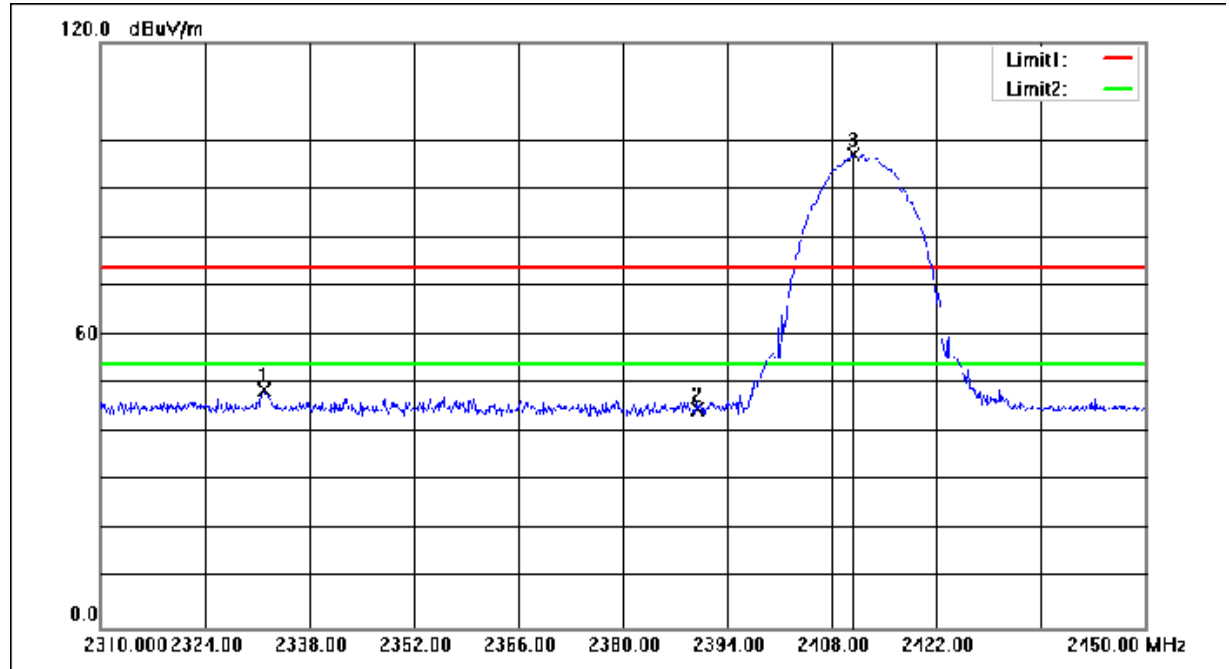
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Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2331.980        | 62.92          | -14.19                  | 48.73           | 74.00          | -25.27      | peak   |
| 2   | 2390.000        | 58.91          | -14.01                  | 44.90           | 74.00          | -29.10      | peak   |
| 3   | 2410.800        | 111.08         | -13.94                  | 97.14           | 74.00          | 23.14       | peak   |



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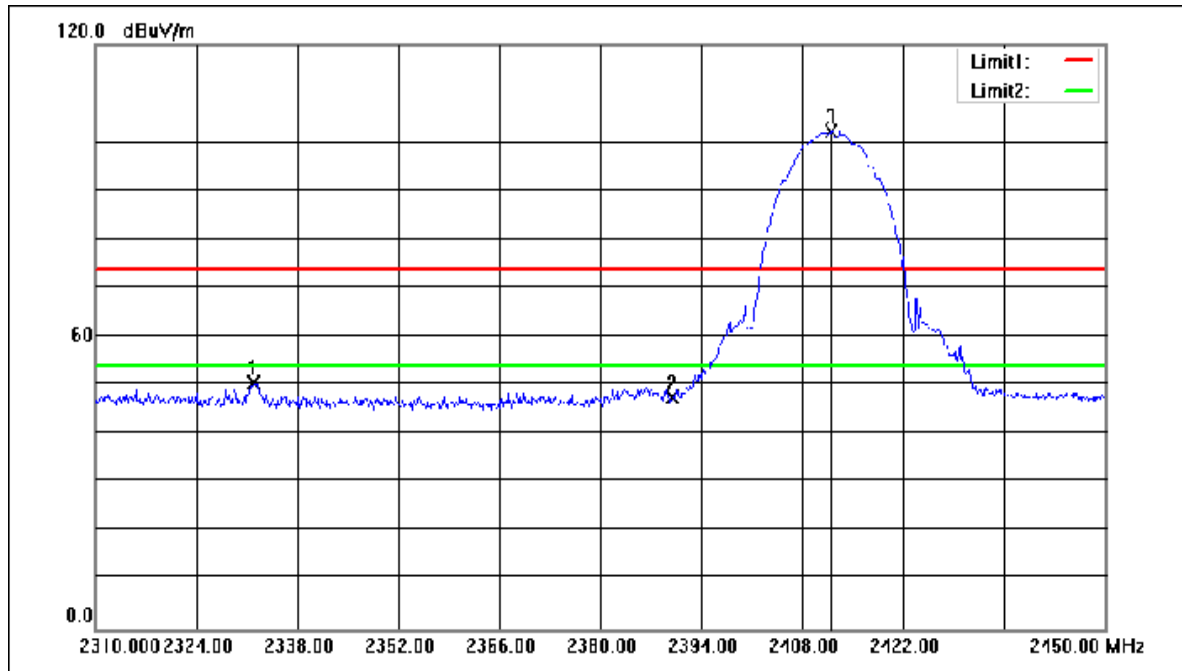
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t(86-21) 61915666 f(86-21) 61915678 e.sgs.china@sgs.com

Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2331.980        | 64.82          | -14.19                  | 50.63           | 74.00          | -23.37      | peak   |
| 2   | 2390.000        | 61.55          | -14.01                  | 47.54           | 74.00          | -26.46      | peak   |
| 3   | 2412.060        | 116.10         | -13.94                  | 102.16          | 74.00          | 28.16       | peak   |



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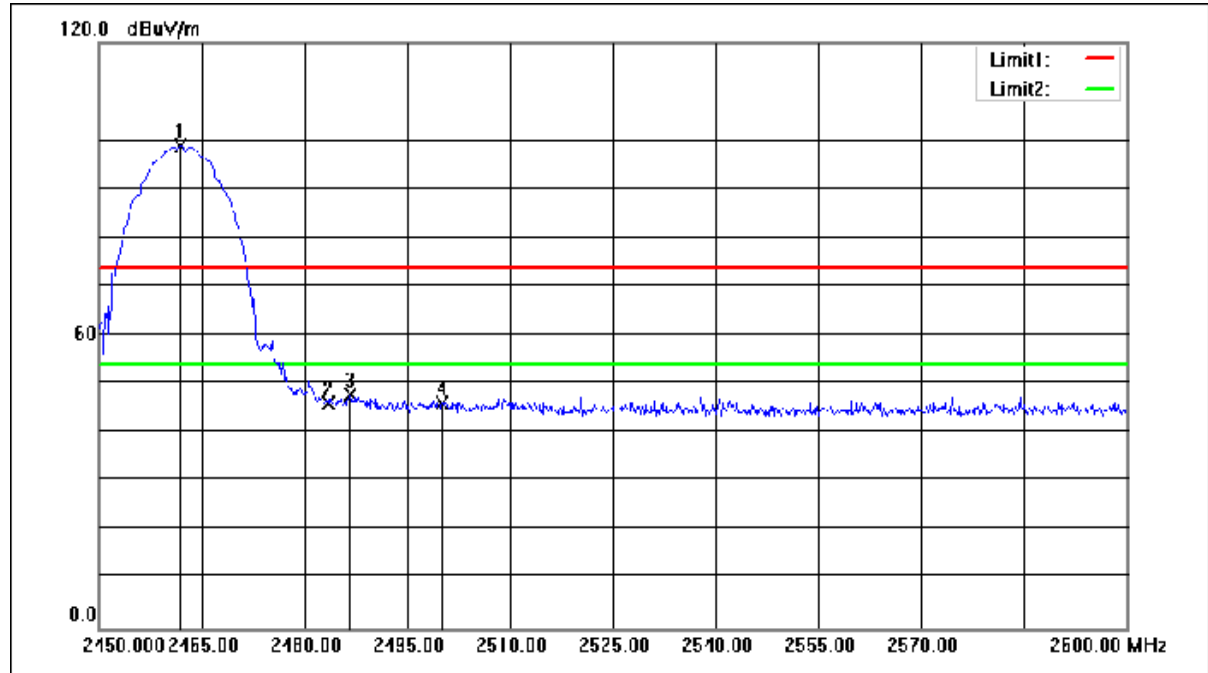
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Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2461.850        | 112.76         | -13.78                  | 98.98           | 74.00          | 24.98       | peak   |
| 2   | 2483.500        | 59.81          | -13.71                  | 46.10           | 74.00          | -27.90      | peak   |
| 3   | 2486.750        | 61.51          | -13.70                  | 47.81           | 74.00          | -26.19      | peak   |
| 4   | 2500.000        | 59.56          | -13.64                  | 45.92           | 74.00          | -28.08      | peak   |



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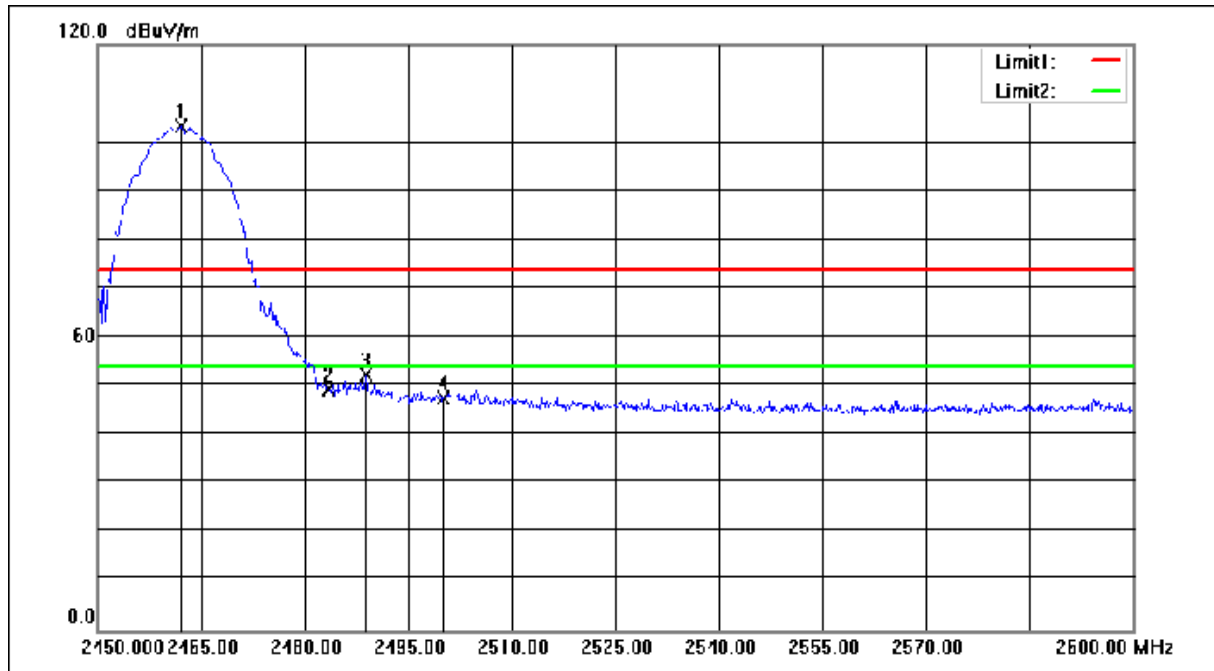
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Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2462.000        | 117.04         | -13.78                  | 103.26          | 74.00          | 29.26       | peak   |
| 2   | 2483.500        | 62.93          | -13.71                  | 49.22           | 74.00          | -24.78      | peak   |
| 3   | 2488.850        | 66.10          | -13.68                  | 52.42           | 74.00          | -21.58      | peak   |
| 4   | 2500.000        | 61.22          | -13.64                  | 47.58           | 74.00          | -26.42      | peak   |



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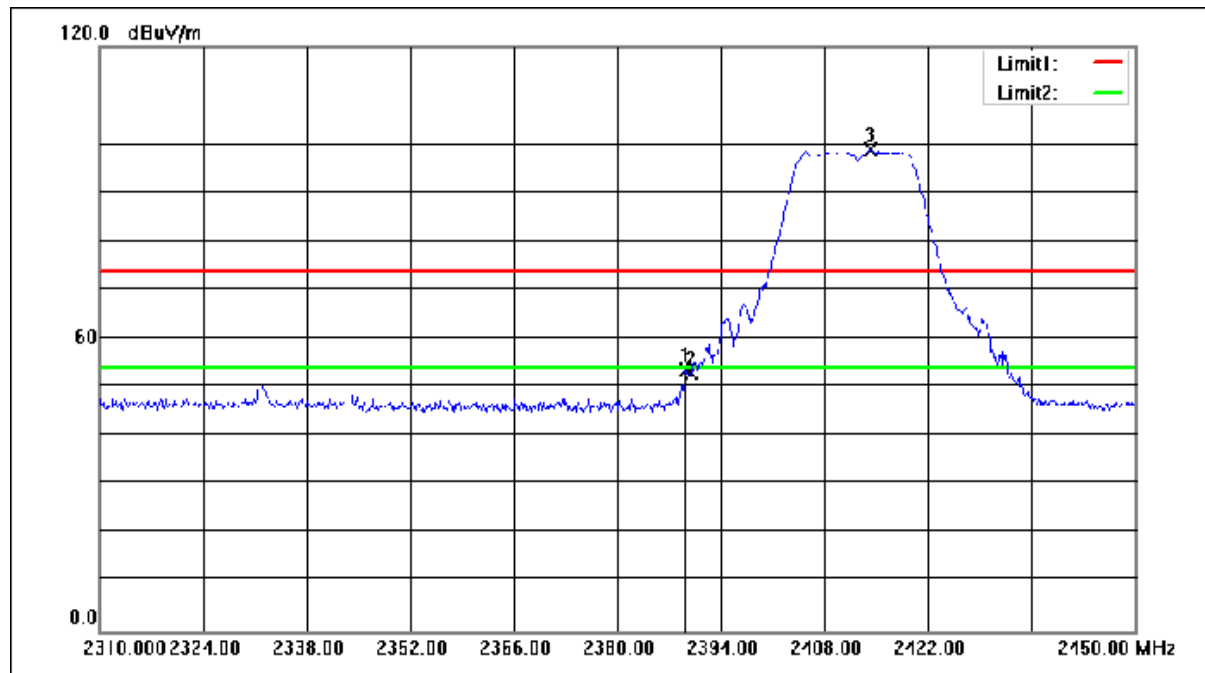
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| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2389.240        | 67.70          | -14.01                  | 53.69           | 74.00          | -20.31      | peak   |
| 2   | 2390.000        | 67.05          | -14.01                  | 53.04           | 74.00          | -20.96      | peak   |
| 3   | 2414.160        | 112.77         | -13.94                  | 98.83           | 74.00          | 24.83       | peak   |



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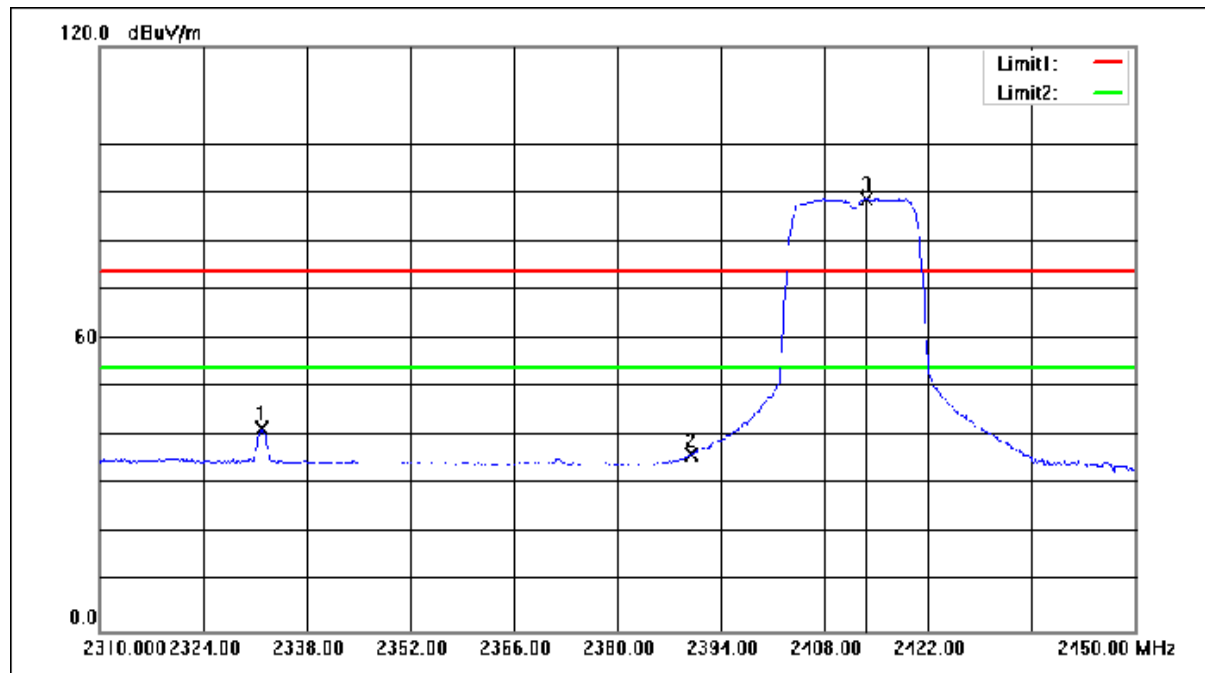
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| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2331.980        | 55.81          | -14.19                  | 41.62           | 54.00          | -12.38      | AVG    |
| 2   | 2390.000        | 50.31          | -14.01                  | 36.30           | 54.00          | -17.70      | AVG    |
| 3   | 2413.740        | 102.61         | -13.94                  | 88.67           | 54.00          | 34.67       | AVG    |



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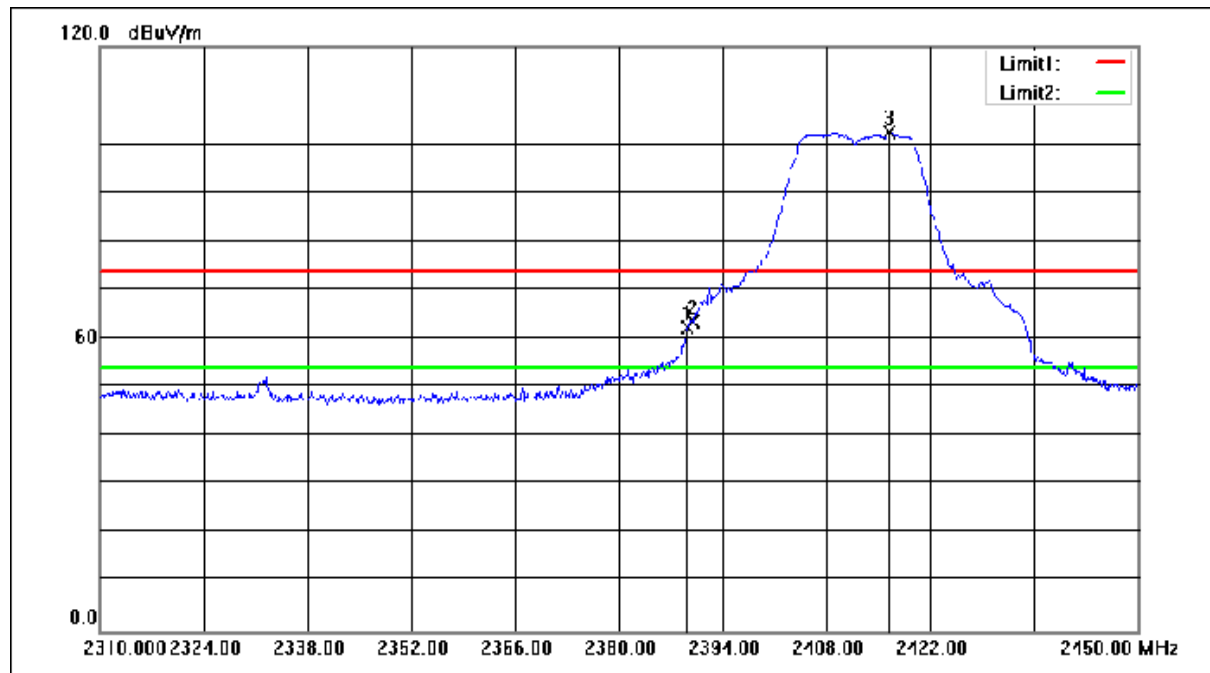
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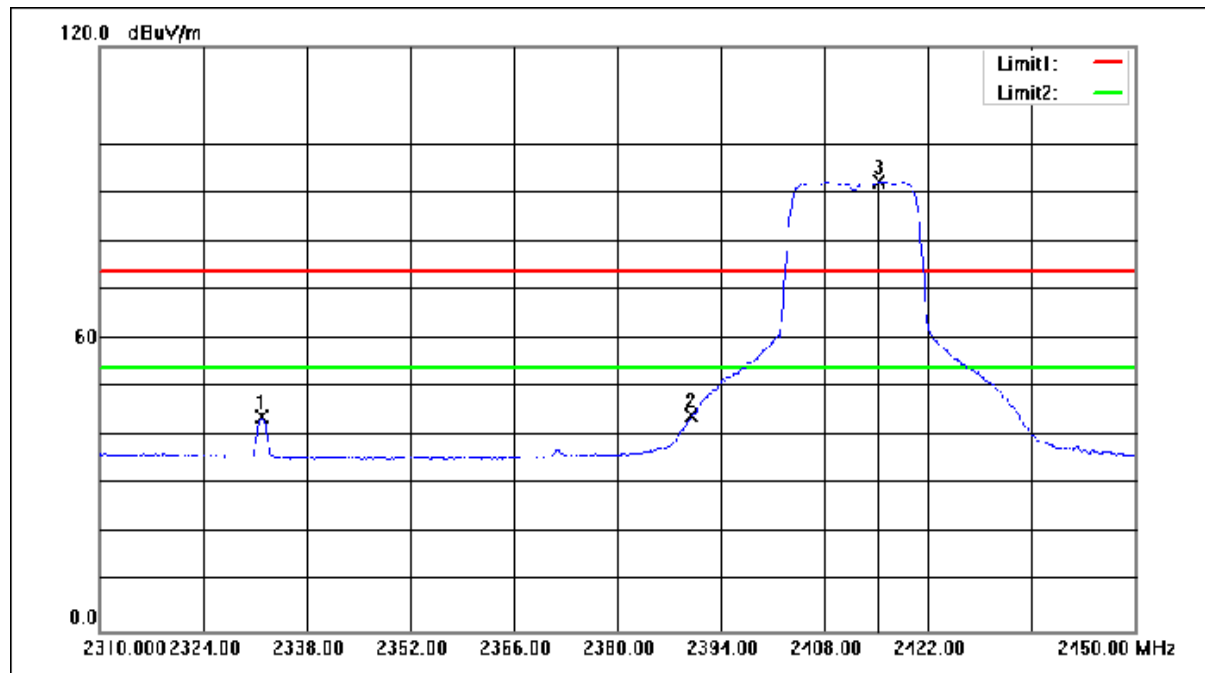
Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2389.240        | 76.40          | -14.01                  | 62.39           | 74.00          | -11.61      | peak   |
| 2   | 2390.000        | 77.51          | -14.01                  | 63.50           | 74.00          | -10.50      | peak   |
| 3   | 2416.540        | 116.45         | -13.93                  | 102.52          | 74.00          | 28.52       | peak   |



Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2331.840        | 58.11          | -14.19                  | 43.92           | 54.00          | -10.08      | AVG    |
| 2   | 2390.000        | 58.28          | -14.01                  | 44.27           | 54.00          | -9.73       | AVG    |
| 3   | 2415.420        | 106.26         | -13.93                  | 92.33           | 54.00          | 38.33       | AVG    |



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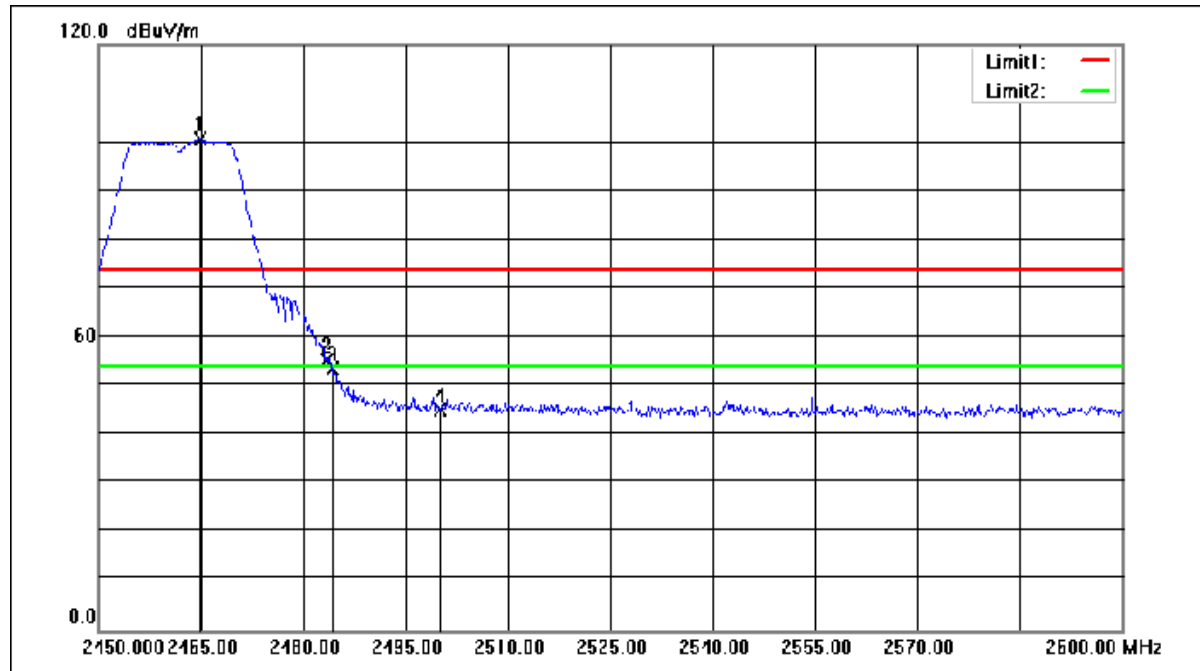
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| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2464.850        | 114.50         | -13.76                  | 100.74          | 74.00          | 26.74       | peak   |
| 2   | 2483.500        | 68.96          | -13.71                  | 55.25           | 74.00          | -18.75      | peak   |
| 3   | 2484.350        | 67.27          | -13.70                  | 53.57           | 74.00          | -20.43      | peak   |
| 4   | 2500.000        | 58.77          | -13.64                  | 45.13           | 74.00          | -28.87      | peak   |



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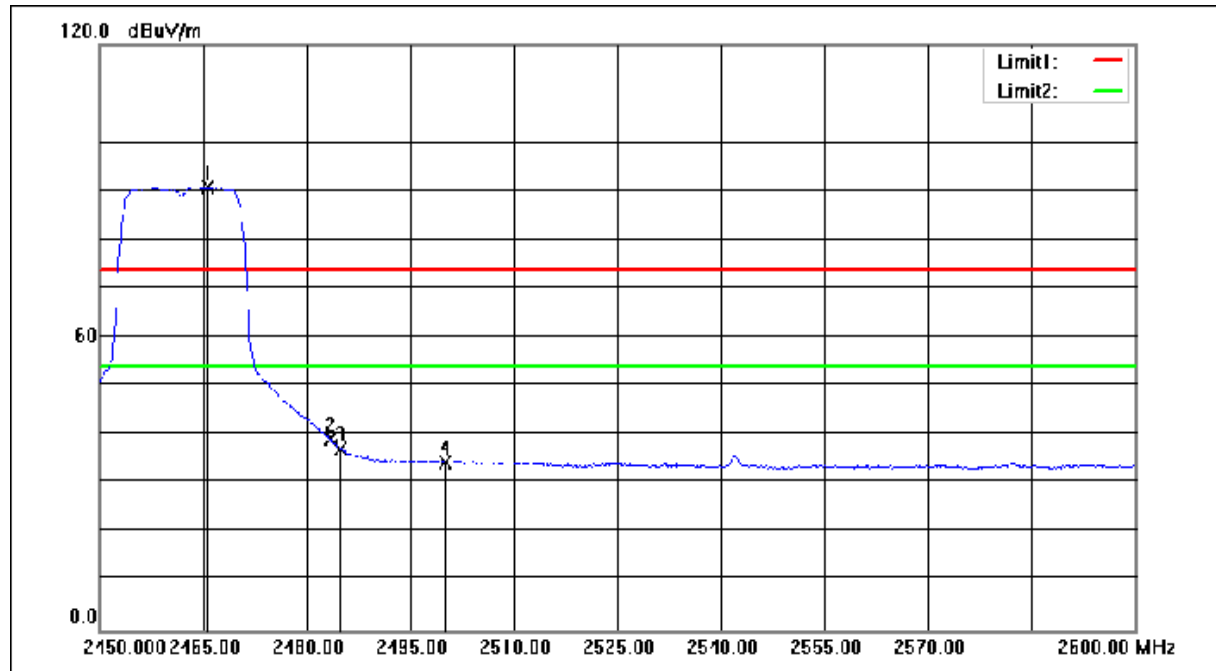
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| No. | Frequency (MHz) | Reading (dBUV) | Correction factor(dB/m) | Result (dBUV/m) | Limit (dBUV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2465.600        | 104.58         | -13.76                  | 90.82           | 54.00          | 36.82       | AVG    |
| 2   | 2483.500        | 52.78          | -13.71                  | 39.07           | 54.00          | -14.93      | AVG    |
| 3   | 2484.950        | 50.86          | -13.70                  | 37.16           | 54.00          | -16.84      | AVG    |
| 4   | 2500.000        | 48.08          | -13.64                  | 34.44           | 54.00          | -19.56      | AVG    |



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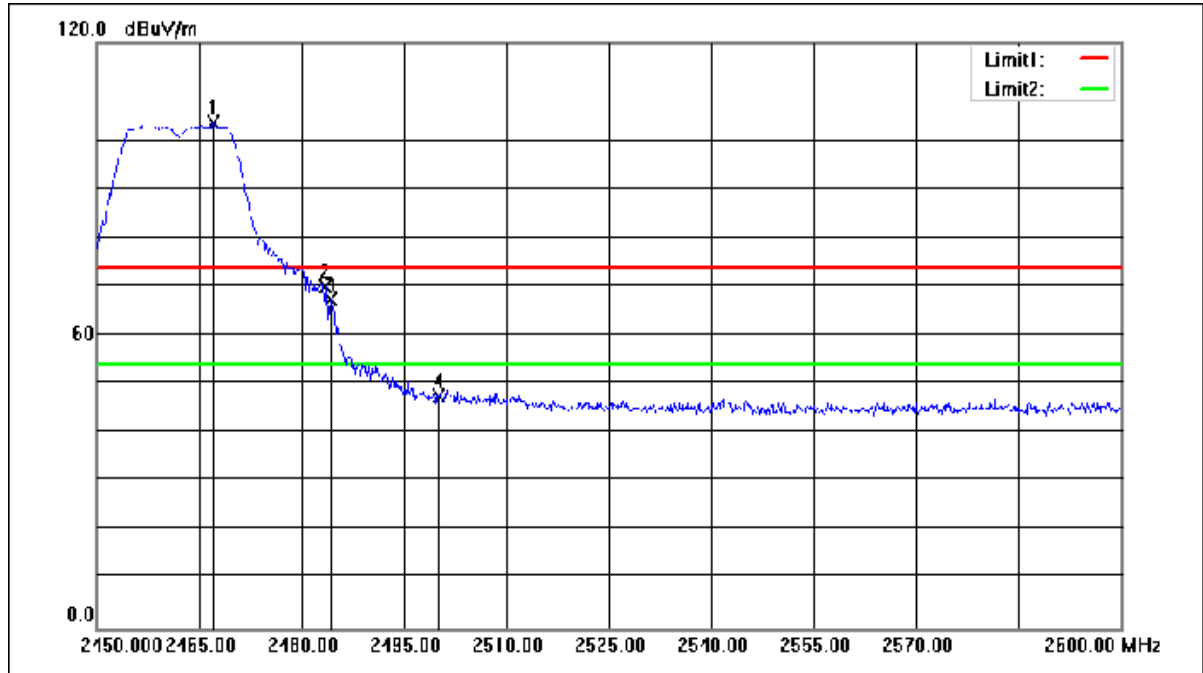
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| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2467.100        | 117.35         | -13.76                  | 103.59          | 74.00          | 29.59       | peak   |
| 2   | 2483.500        | 83.86          | -13.71                  | 70.15           | 74.00          | -3.85       | peak   |
| 3   | 2484.350        | 81.01          | -13.70                  | 67.31           | 74.00          | -6.69       | peak   |
| 4   | 2500.000        | 61.21          | -13.64                  | 47.57           | 74.00          | -26.43      | peak   |



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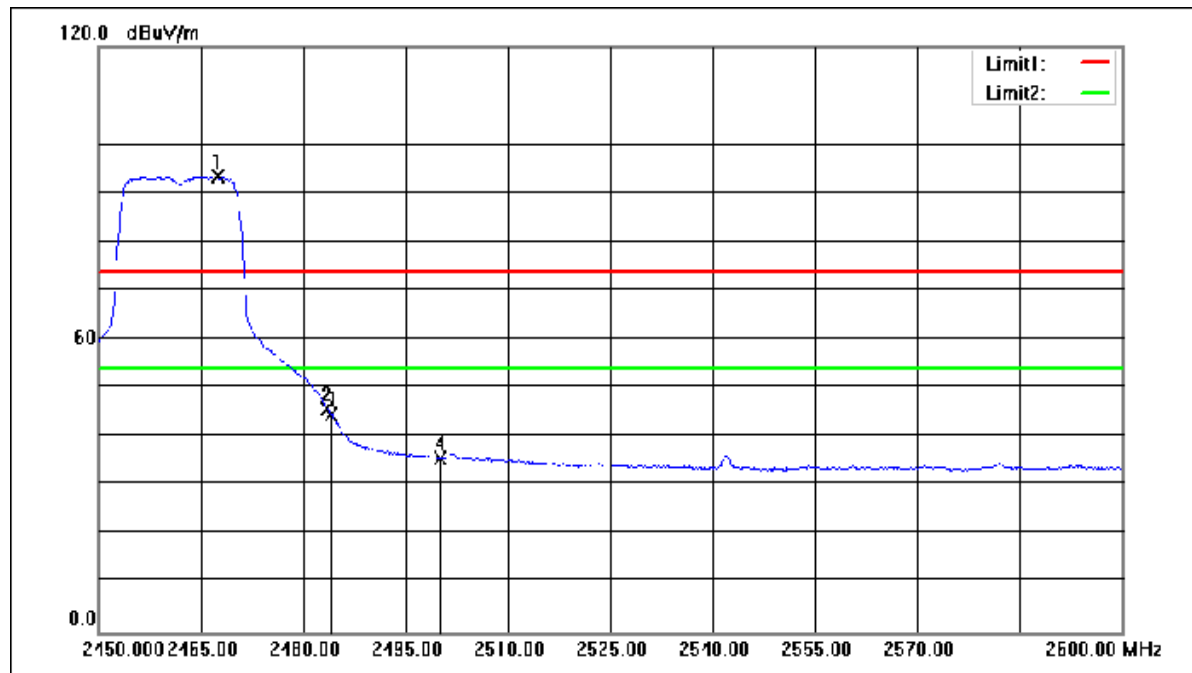
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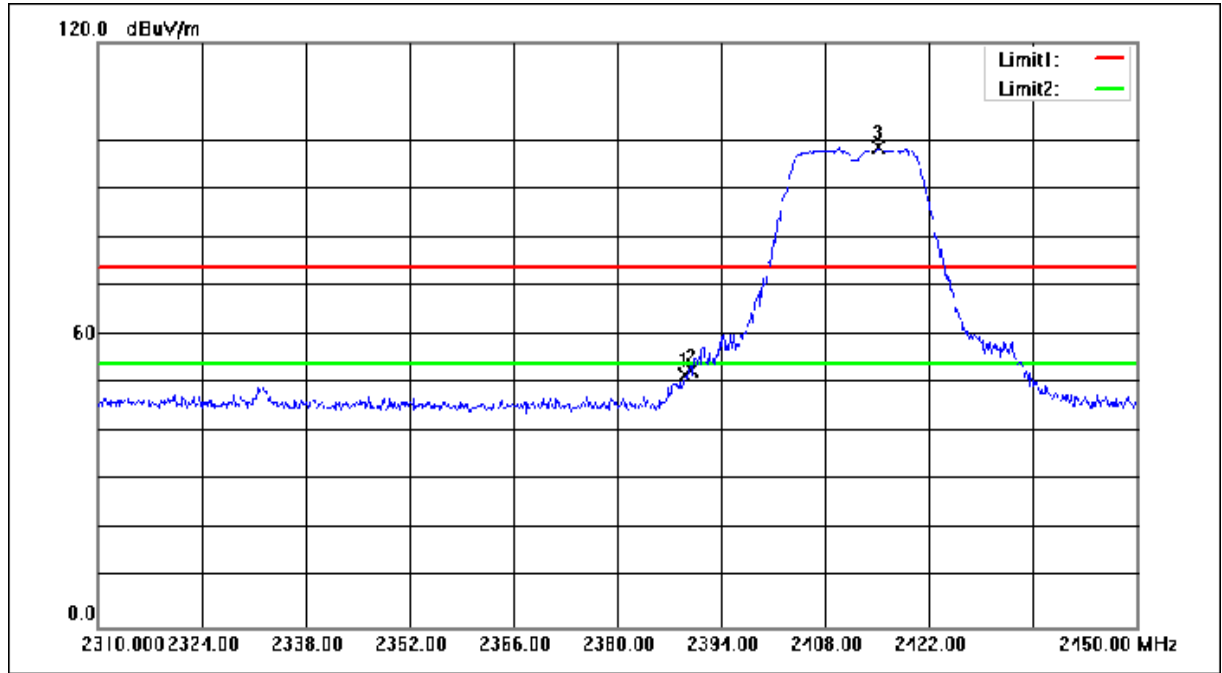
Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2467.400        | 107.28         | -13.75                  | 93.53           | 54.00          | 39.53       | AVG    |
| 2   | 2483.500        | 59.39          | -13.71                  | 45.68           | 54.00          | -8.32       | AVG    |
| 3   | 2484.050        | 58.30          | -13.70                  | 44.60           | 54.00          | -9.40       | AVG    |
| 4   | 2500.000        | 49.23          | -13.64                  | 35.59           | 54.00          | -18.41      | AVG    |



Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2389.100        | 65.67          | -14.01                  | 51.66           | 74.00          | -22.34      | peak   |
| 2   | 2390.000        | 66.53          | -14.01                  | 52.52           | 74.00          | -21.48      | peak   |
| 3   | 2415.140        | 112.46         | -13.93                  | 98.53           | 74.00          | 24.53       | peak   |



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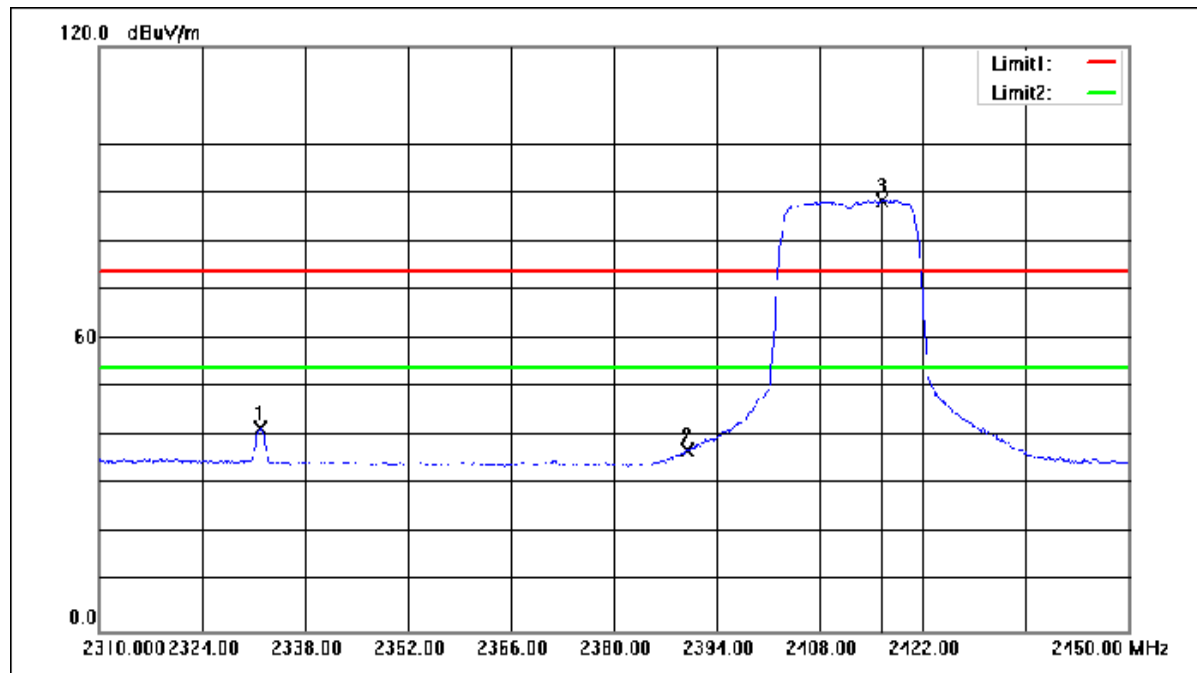
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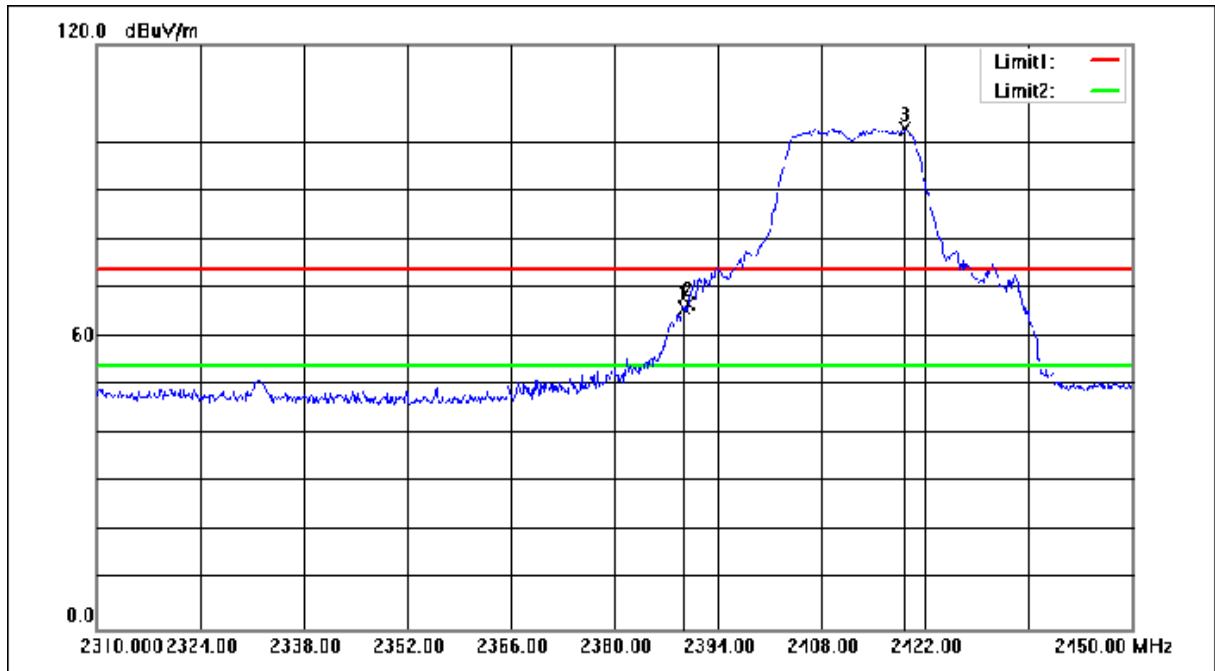
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2331.840        | 55.82          | -14.19                  | 41.63           | 54.00          | -12.37      | AVG    |
| 2   | 2390.000        | 50.99          | -14.01                  | 36.98           | 54.00          | -17.02      | AVG    |
| 3   | 2416.540        | 102.34         | -13.93                  | 88.41           | 54.00          | 34.41       | AVG    |

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2389.380        | 79.90          | -14.01                  | 65.89           | 74.00          | -8.11       | peak   |
| 2   | 2390.000        | 80.69          | -14.01                  | 66.68           | 74.00          | -7.32       | peak   |
| 3   | 2419.340        | 116.77         | -13.91                  | 102.86          | 74.00          | 28.86       | peak   |



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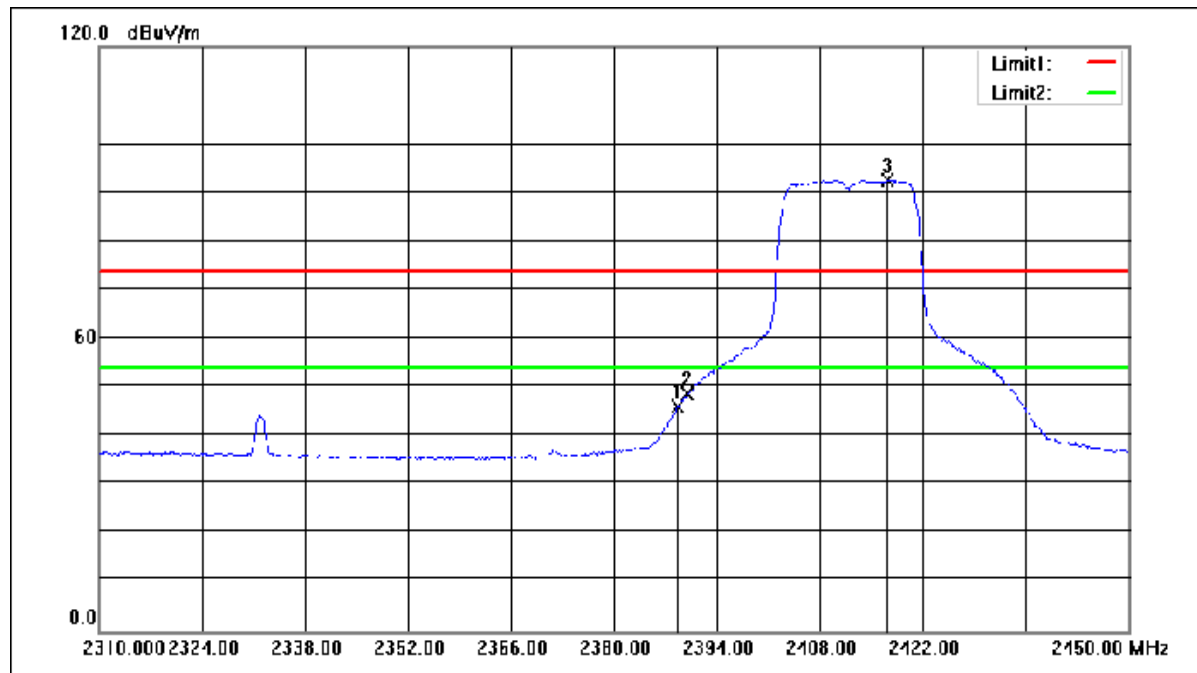
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Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2388.680        | 60.01          | -14.01                  | 46.00           | 54.00          | -8.00       | AVG    |
| 2   | 2390.000        | 62.77          | -14.01                  | 48.76           | 54.00          | -5.24       | AVG    |
| 3   | 2417.240        | 106.55         | -13.93                  | 92.62           | 54.00          | 38.62       | AVG    |



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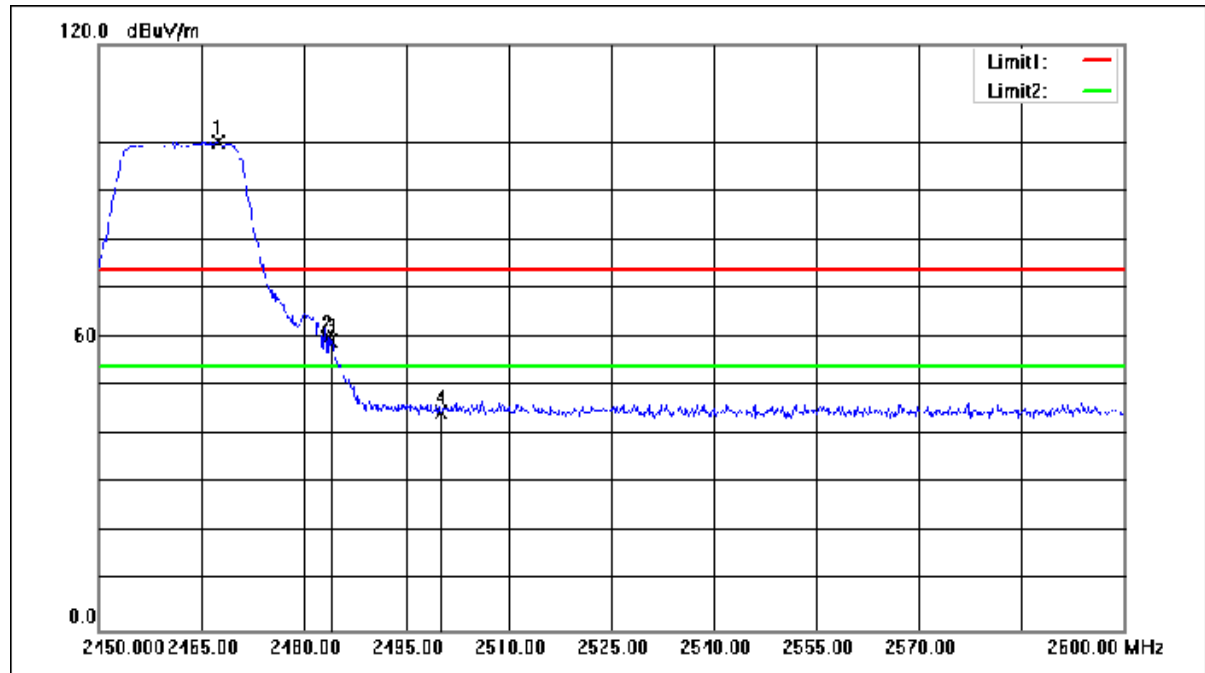
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2467.400        | 113.83         | -13.75                  | 100.08          | 74.00          | 26.08       | peak   |
| 2   | 2483.500        | 73.43          | -13.71                  | 59.72           | 74.00          | -14.28      | peak   |
| 3   | 2484.050        | 73.01          | -13.70                  | 59.31           | 74.00          | -14.69      | peak   |
| 4   | 2500.000        | 58.06          | -13.64                  | 44.42           | 74.00          | -29.58      | peak   |



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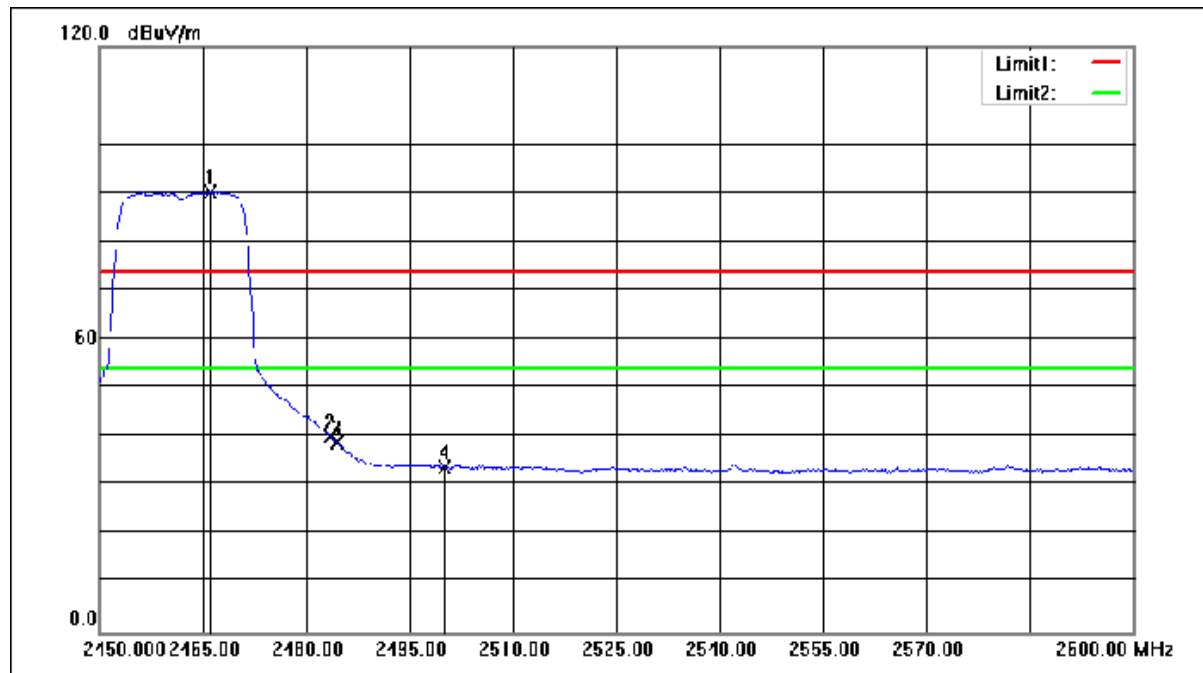
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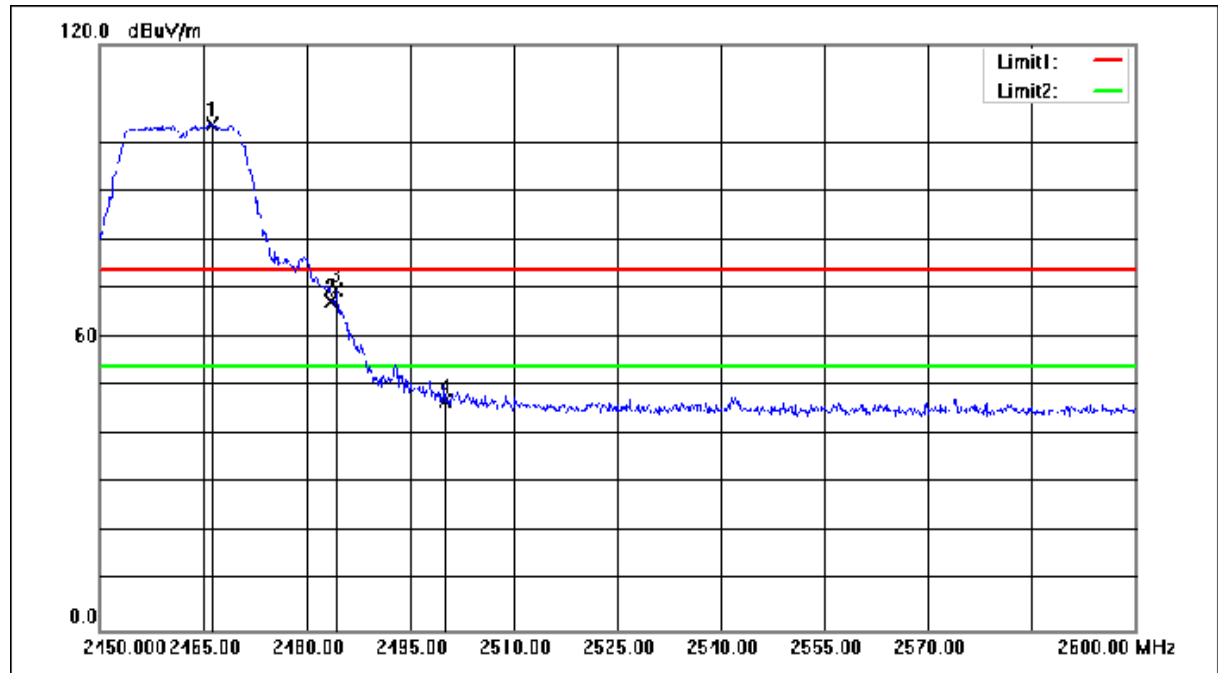


Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2466.050        | 103.93         | -13.76                  | 90.17           | 54.00          | 36.17       | AVG    |
| 2   | 2483.500        | 53.68          | -13.71                  | 39.97           | 54.00          | -14.03      | AVG    |
| 3   | 2484.500        | 52.45          | -13.70                  | 38.75           | 54.00          | -15.25      | AVG    |
| 4   | 2500.000        | 47.47          | -13.64                  | 33.83           | 54.00          | -20.17      | AVG    |

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2466.200        | 117.55         | -13.76                  | 103.79          | 74.00          | 29.79       | peak   |
| 2   | 2483.500        | 81.13          | -13.71                  | 67.42           | 74.00          | -6.58       | peak   |
| 3   | 2484.350        | 83.32          | -13.70                  | 69.62           | 74.00          | -4.38       | peak   |
| 4   | 2500.000        | 60.57          | -13.64                  | 46.93           | 74.00          | -27.07      | peak   |



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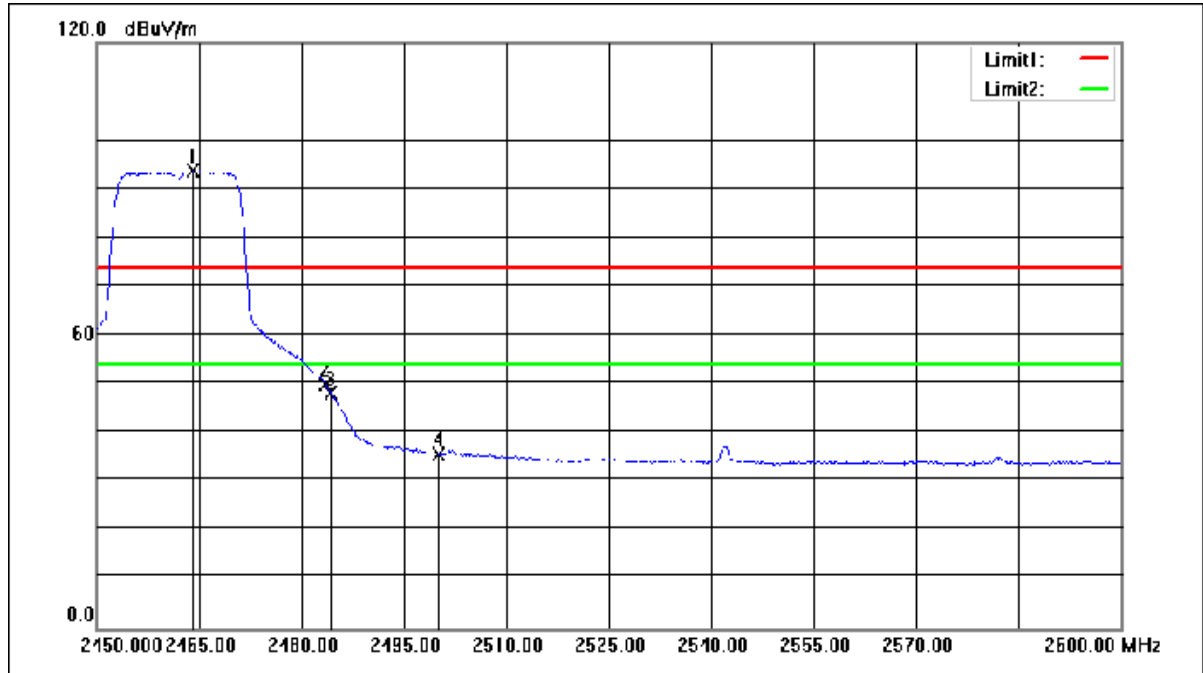
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Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2464.100        | 107.40         | -13.77                  | 93.63           | 54.00          | 39.63       | AVG    |
| 2   | 2483.500        | 63.56          | -13.71                  | 49.85           | 54.00          | -4.15       | AVG    |
| 3   | 2484.350        | 61.81          | -13.70                  | 48.11           | 54.00          | -5.89       | AVG    |
| 4   | 2500.000        | 49.29          | -13.64                  | 35.65           | 54.00          | -18.35      | AVG    |



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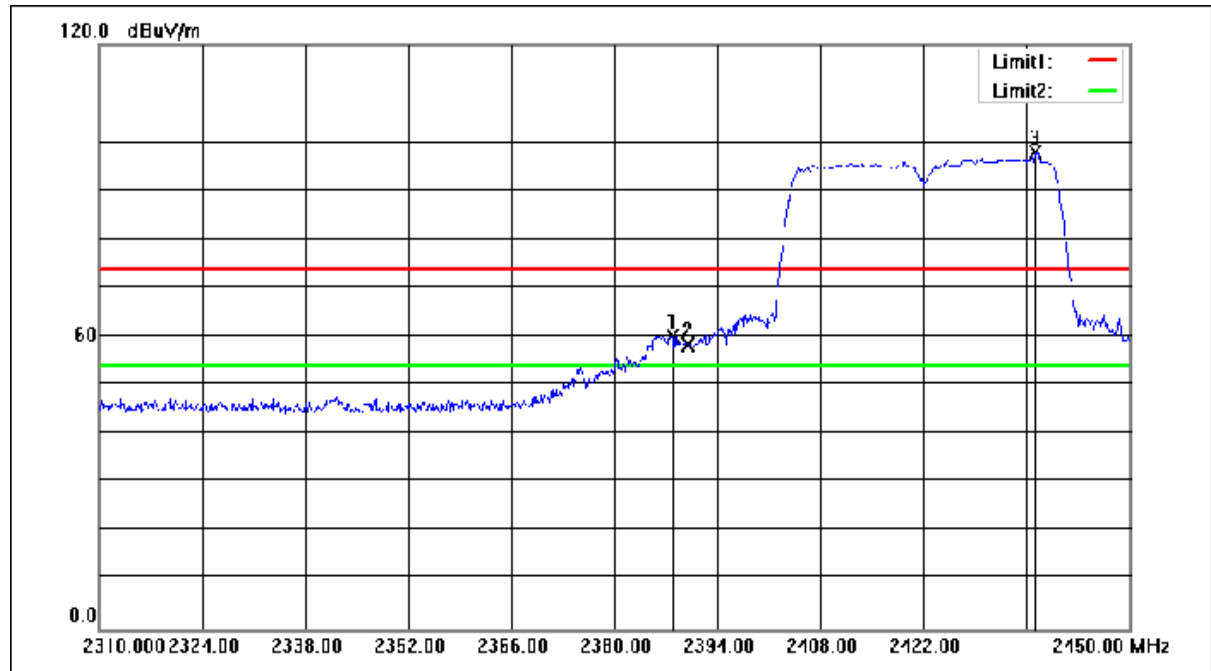
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2387.840        | 74.03          | -14.02                  | 60.01           | 74.00          | -13.99      | peak   |
| 2   | 2390.000        | 72.38          | -14.01                  | 58.37           | 74.00          | -15.63      | peak   |
| 3   | 2437.120        | 111.71         | -13.86                  | 97.85           | 74.00          | 23.85       | peak   |



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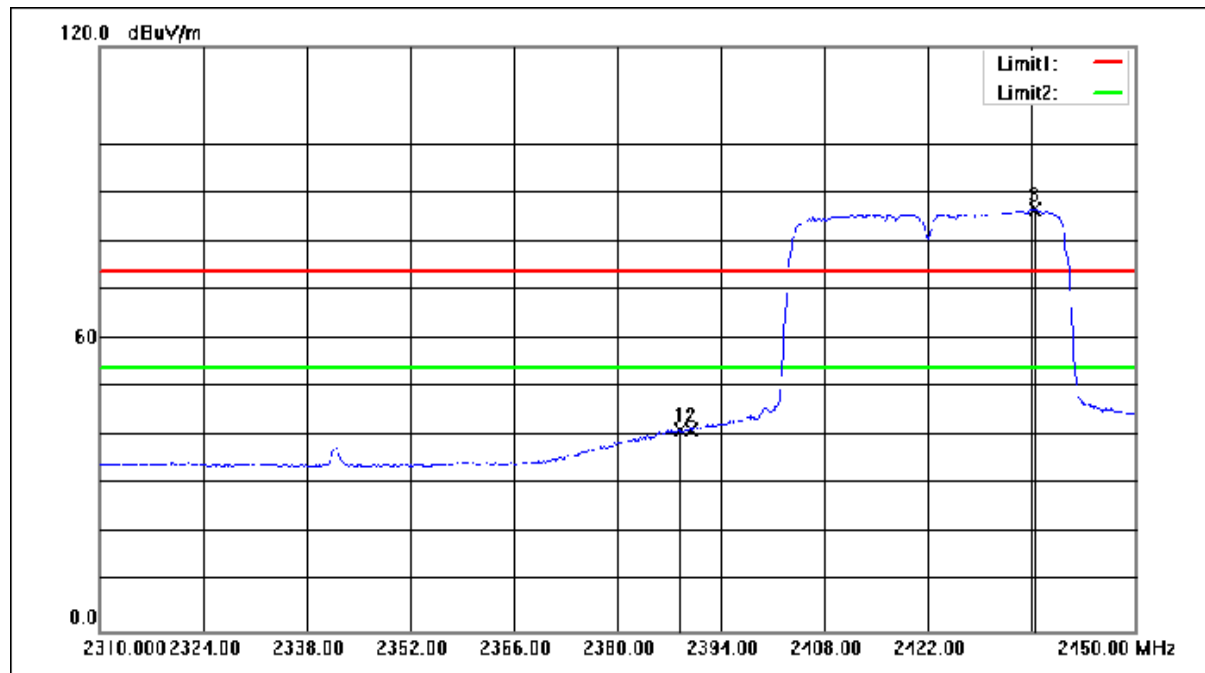
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2388.400        | 55.30          | -14.01                  | 41.29           | 54.00          | -12.71      | AVG    |
| 2   | 2390.000        | 55.37          | -14.01                  | 41.36           | 54.00          | -12.64      | AVG    |
| 3   | 2436.420        | 100.45         | -13.86                  | 86.59           | 54.00          | 32.59       | AVG    |



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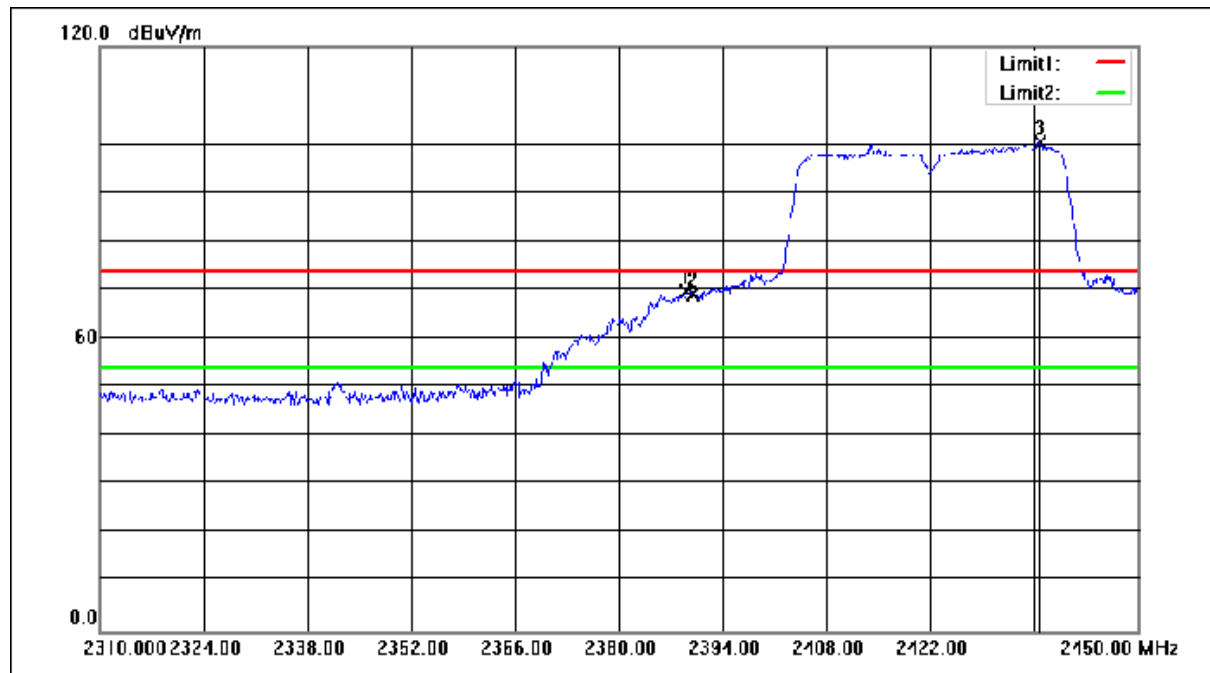
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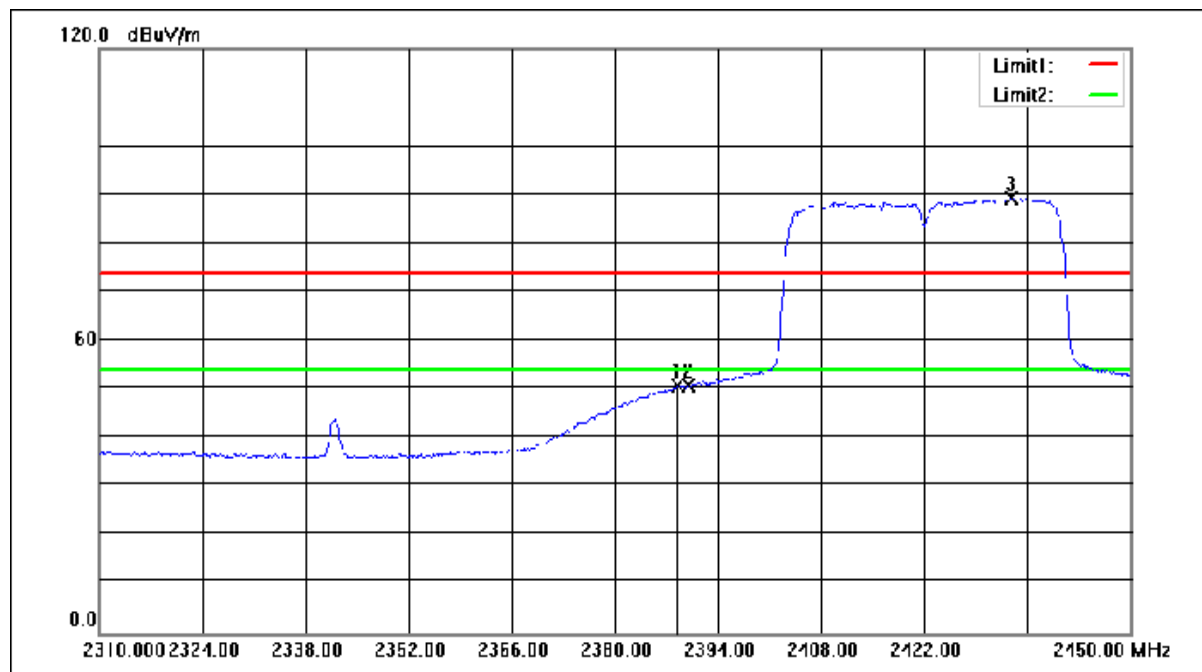


Mode:a; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2389.100        | 83.73          | -14.01                  | 69.72           | 74.00          | -4.28       | peak   |
| 2   | 2390.000        | 83.12          | -14.01                  | 69.11           | 74.00          | -4.89       | peak   |
| 3   | 2436.840        | 114.16         | -13.86                  | 100.30          | 74.00          | 26.30       | peak   |

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2388.540        | 64.78          | -14.01                  | 50.77           | 54.00          | -3.23       | AVG    |
| 2   | 2390.000        | 64.88          | -14.01                  | 50.87           | 54.00          | -3.13       | AVG    |
| 3   | 2433.760        | 103.06         | -13.87                  | 89.19           | 54.00          | 35.19       | AVG    |



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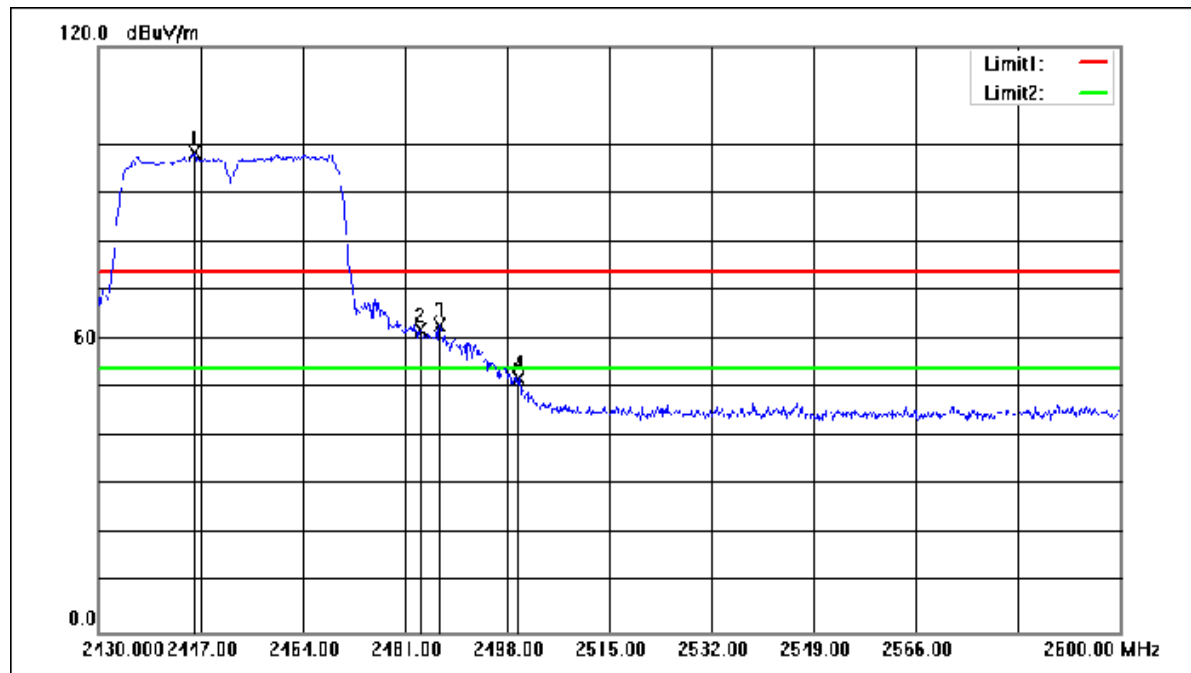
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2445.980        | 111.96         | -13.83                  | 98.13           | 74.00          | 24.13       | peak   |
| 2   | 2483.500        | 75.77          | -13.71                  | 62.06           | 74.00          | -11.94      | peak   |
| 3   | 2486.780        | 76.49          | -13.70                  | 62.79           | 74.00          | -11.21      | peak   |
| 4   | 2500.000        | 65.63          | -13.64                  | 51.99           | 74.00          | -22.01      | peak   |



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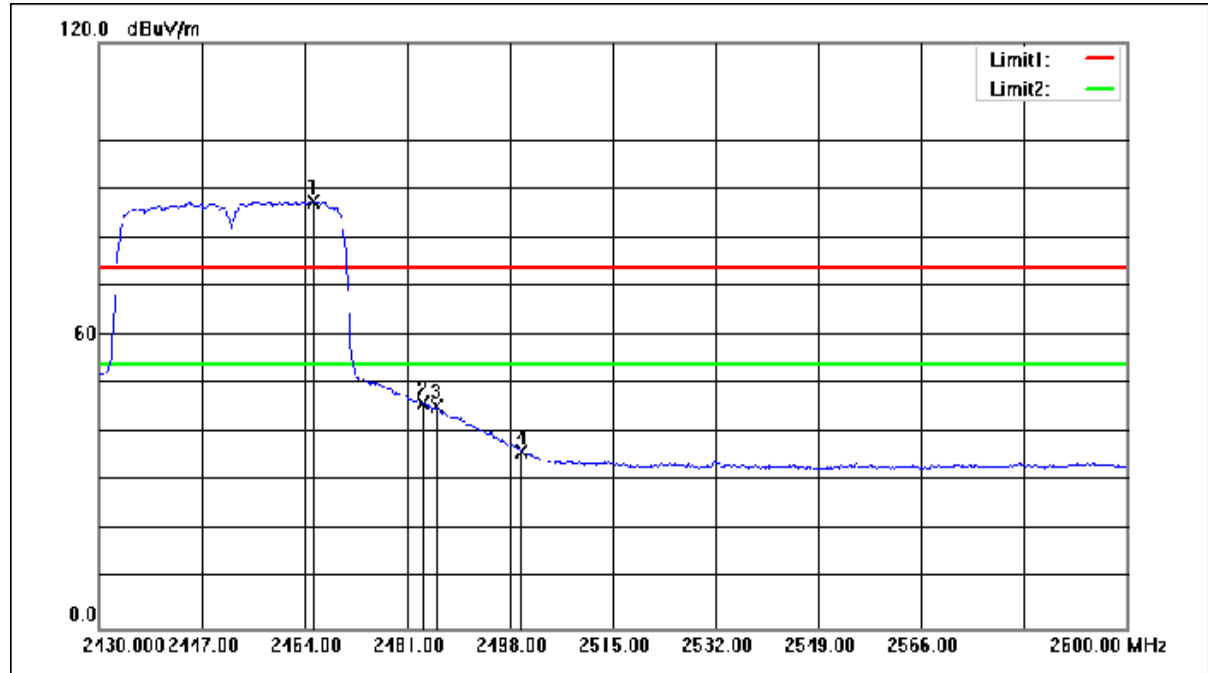
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| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2465.360        | 101.36         | -13.76                  | 87.60           | 54.00          | 33.60       | AVG    |
| 2   | 2483.500        | 59.84          | -13.71                  | 46.13           | 54.00          | -7.87       | AVG    |
| 3   | 2485.760        | 59.10          | -13.70                  | 45.40           | 54.00          | -8.60       | AVG    |
| 4   | 2500.000        | 49.91          | -13.64                  | 36.27           | 54.00          | -17.73      | AVG    |



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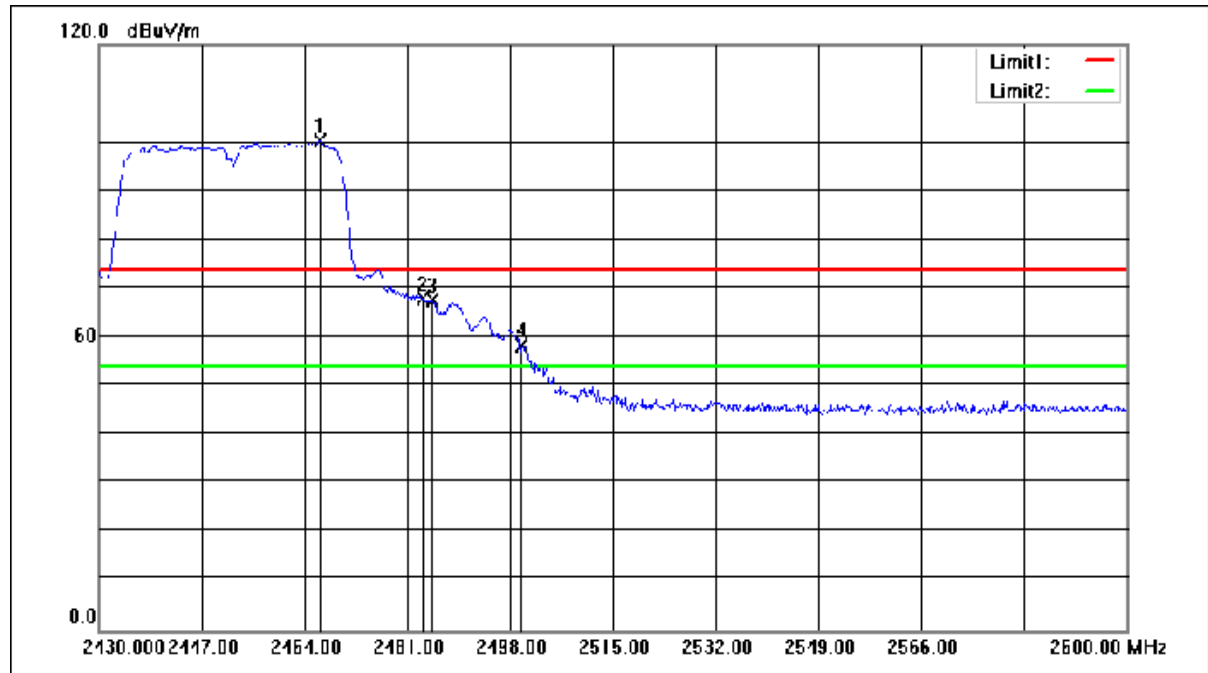
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Mode:a; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2466.550        | 114.08         | -13.76                  | 100.32          | 74.00          | 26.32       | peak   |
| 2   | 2483.500        | 81.80          | -13.71                  | 68.09           | 74.00          | -5.91       | peak   |
| 3   | 2485.080        | 81.45          | -13.70                  | 67.75           | 74.00          | -6.25       | peak   |
| 4   | 2500.000        | 71.88          | -13.64                  | 58.24           | 74.00          | -15.76      | peak   |



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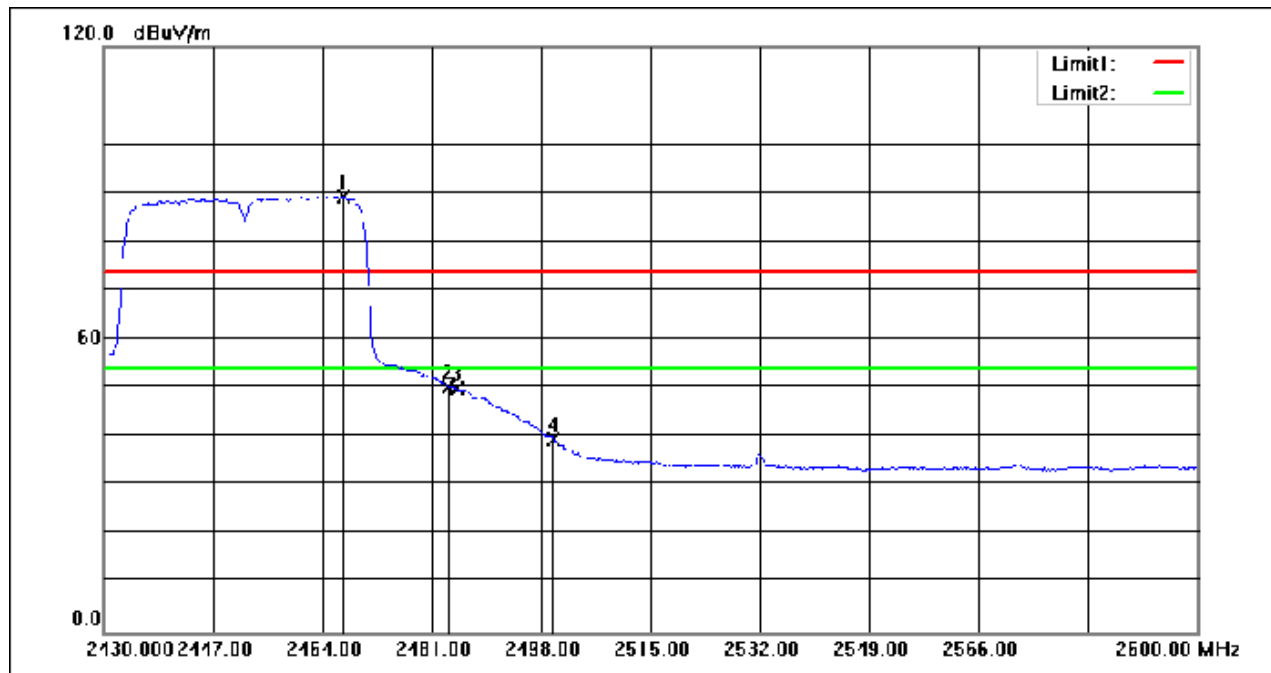
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Mode:a; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 2467.230        | 102.96         | -13.76                  | 89.20           | 54.00          | 35.20       | AVG    |
| 2   | 2483.500        | 64.11          | -13.71                  | 50.40           | 54.00          | -3.60       | AVG    |
| 3   | 2484.910        | 63.61          | -13.70                  | 49.91           | 54.00          | -4.09       | AVG    |
| 4   | 2500.000        | 53.05          | -13.64                  | 39.41           | 54.00          | -14.59      | AVG    |



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## 7.8 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 &amp; 15.247(d)

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

Limit:

| Frequency(MHz) | Field strength(microvolts/meter) | Measurement distance(meters) |
|----------------|----------------------------------|------------------------------|
| 0.009-0.490    | 2400/F(kHz)                      | 300                          |
| 0.490-1.705    | 24000/F(kHz)                     | 30                           |
| 1.705-30.0     | 30                               | 30                           |
| 30-88          | 100                              | 3                            |
| 88-216         | 150                              | 3                            |
| 216-960        | 200                              | 3                            |
| Above 960      | 500                              | 3                            |

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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.



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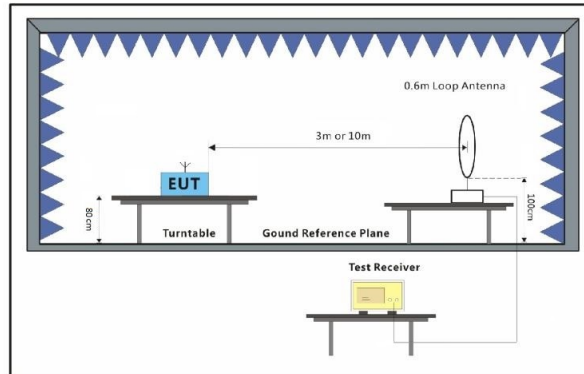
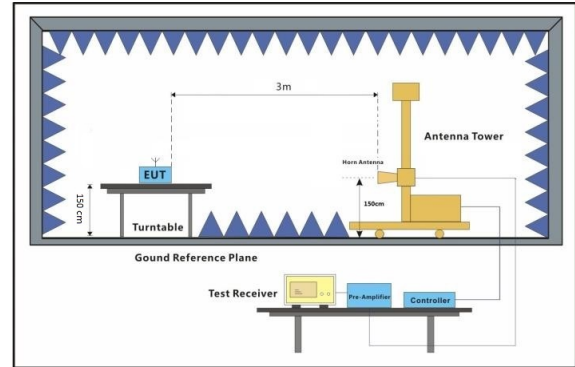
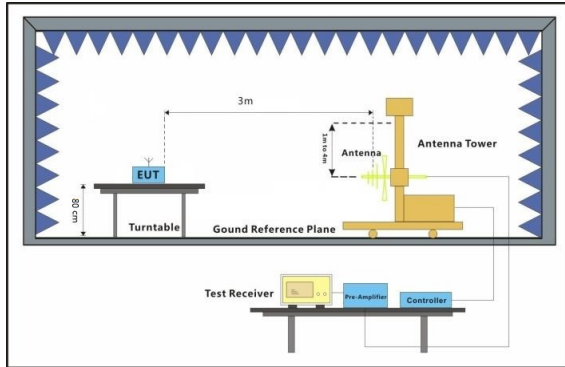
### 7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.8.2 Test Setup Diagram



### 7.8.3 Measurement Procedure and Data

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

#### Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.
- 5) This test item was investigated while operating in SISO and MIMO mode, however, it was determined that SISO antenna 1 operation for b/g modulation and MIMO antenna operation for n modulation produced the worst emissions. So the emissions produced from other operation are not recorded in report.



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30MHz-1GHz

Horizontal

70.0 dBuV/m



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|--------------------|-------------------|-------------------------|--------------------|-------------------|----------------|----------------|------------------|--------|
| 1   | 30.9700            | 1.14              | 25.38                   | 26.52              | 40.00             | -13.48         | 100            | 115              | QP     |
| 2   | 104.6900           | 12.60             | 18.66                   | 31.26              | 43.50             | -12.24         | 100            | 360              | QP     |
| 3   | 155.1300           | 14.88             | 19.74                   | 34.62              | 43.50             | -8.88          | 100            | 360              | QP     |
| 4   | 178.4100           | 6.76              | 17.93                   | 24.69              | 43.50             | -18.81         | 100            | 15               | QP     |
| 5   | 250.1900           | 9.10              | 19.32                   | 28.42              | 46.00             | -17.58         | 100            | 360              | QP     |
| 6   | 767.2000           | 2.55              | 27.60                   | 30.15              | 46.00             | -15.85         | 100            | 25               | QP     |



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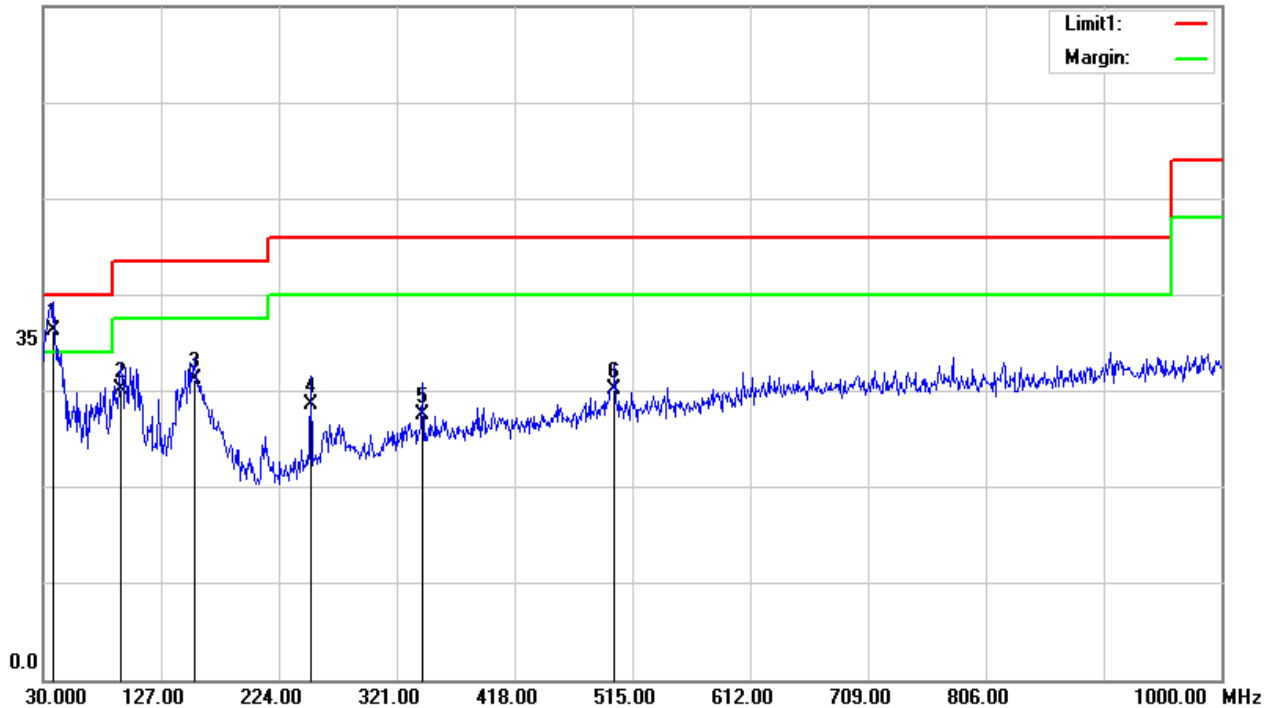
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Vertical

70.0 dBuV/m



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|--------------------|-------------------|-------------------------|--------------------|-------------------|----------------|----------------|------------------|--------|
| 1   | 38.7300            | 15.31             | 20.95                   | 36.26              | 40.00             | -3.74          | 100            | 360              | QP     |
| 2   | 94.0200            | 12.78             | 17.37                   | 30.15              | 43.50             | -13.35         | 100            | 44               | QP     |
| 3   | 155.1300           | 11.51             | 19.74                   | 31.25              | 43.50             | -12.25         | 100            | 109              | QP     |
| 4   | 250.1900           | 9.32              | 19.32                   | 28.64              | 46.00             | -17.36         | 100            | 310              | QP     |
| 5   | 342.3400           | 5.50              | 22.11                   | 27.61              | 46.00             | -18.39         | 100            | 348              | QP     |
| 6   | 500.4500           | 4.90              | 25.25                   | 30.15              | 46.00             | -15.85         | 100            | 348              | QP     |



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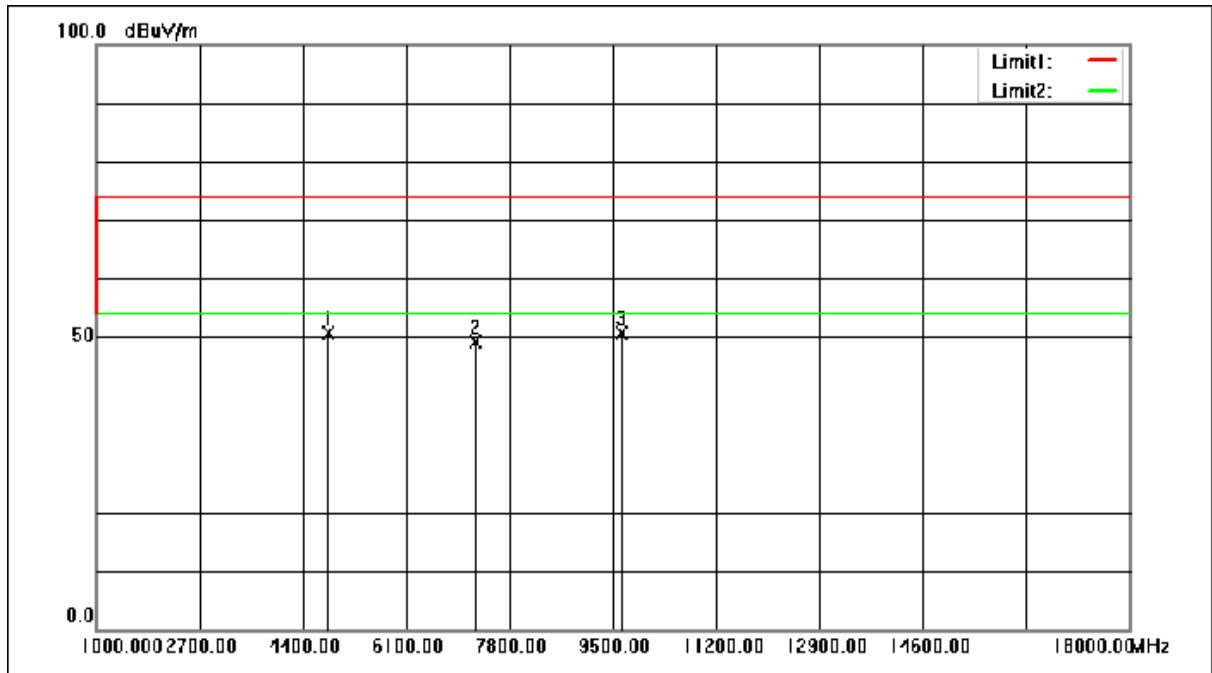
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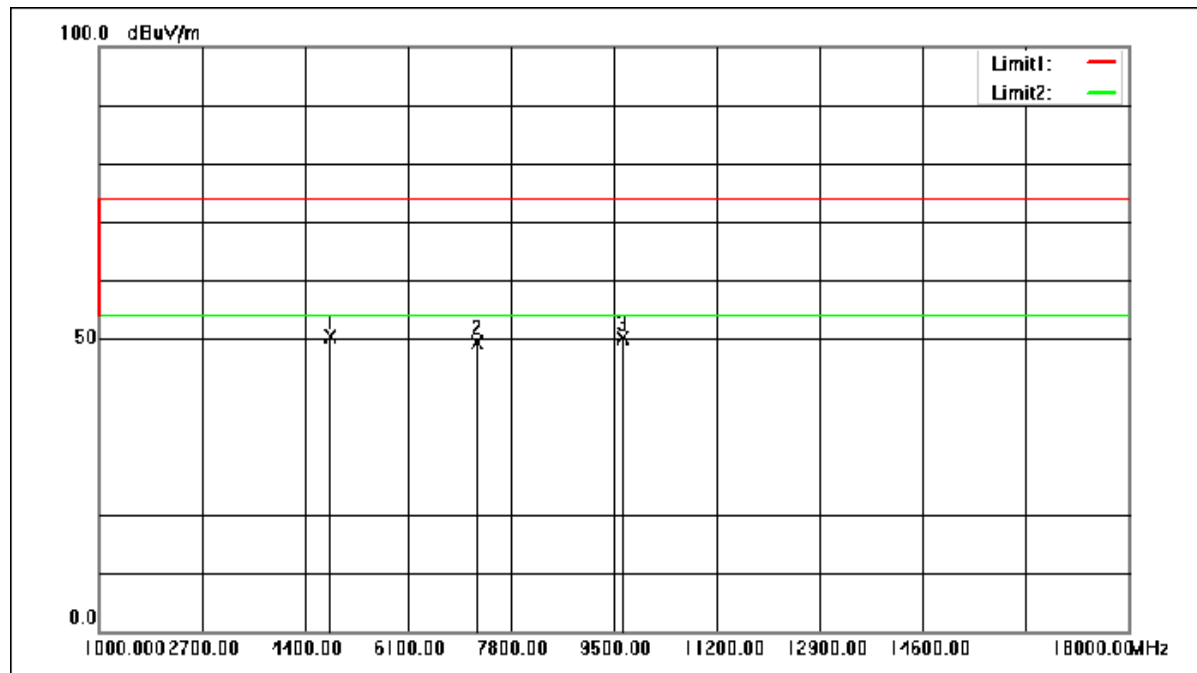
Above 1GHz

Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4824.000        | 59.52          | -8.78                   | 50.74           | 74.00          | -23.26      | peak   |
| 2   | 7236.000        | 54.98          | -5.86                   | 49.12           | 74.00          | -24.88      | peak   |
| 3   | 9648.000        | 51.93          | -1.31                   | 50.62           | 74.00          | -23.38      | peak   |

Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4824.000        | 59.19          | -8.78                   | 50.41           | 74.00          | -23.59      | peak   |
| 2   | 7236.000        | 55.23          | -5.86                   | 49.37           | 74.00          | -24.63      | peak   |
| 3   | 9648.000        | 51.35          | -1.31                   | 50.04           | 74.00          | -23.96      | peak   |



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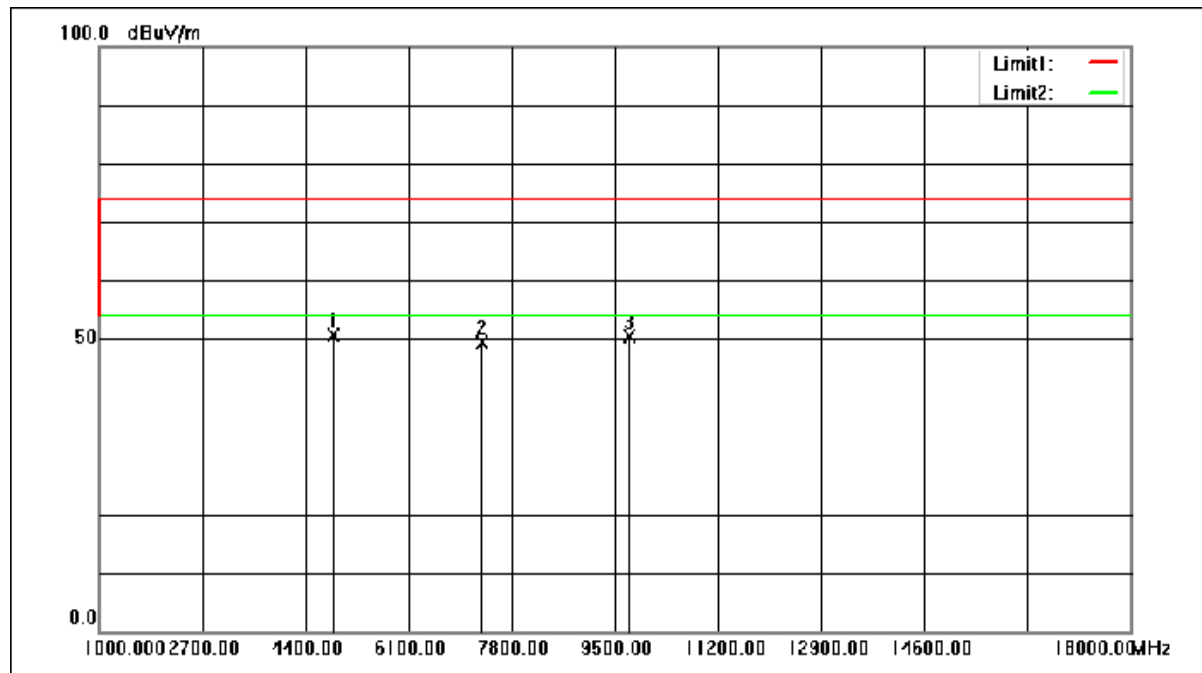
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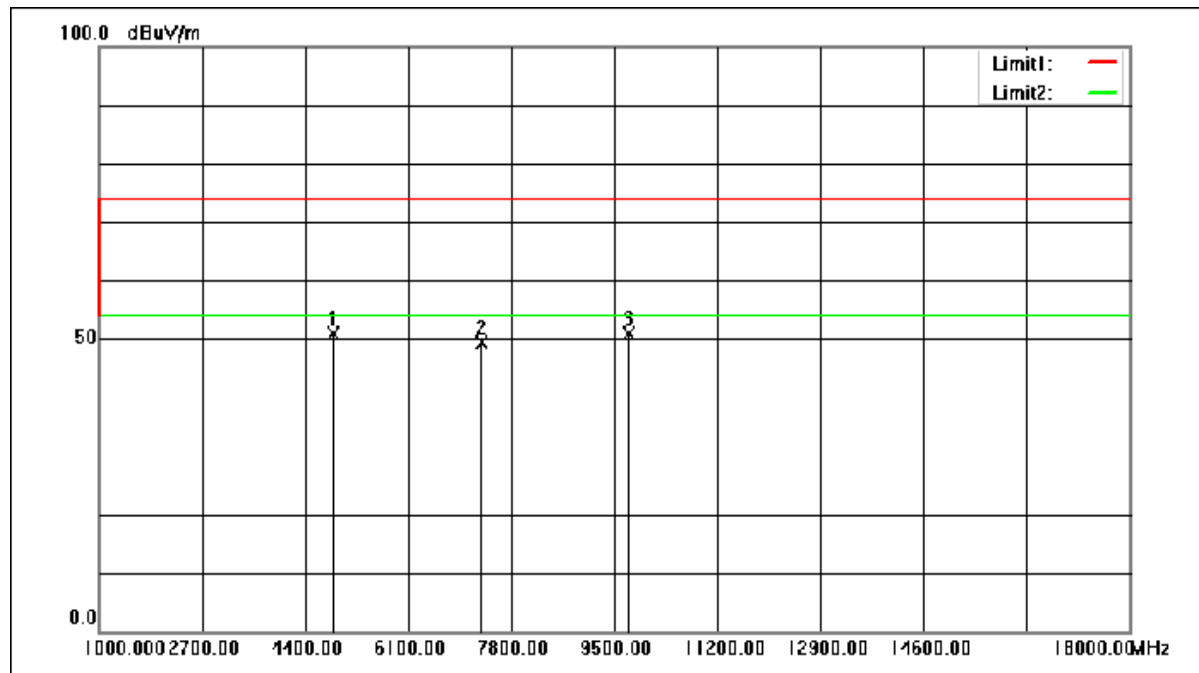
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Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:middle



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4874.000        | 59.17          | -8.61                   | 50.56           | 74.00          | -23.44      | peak   |
| 2   | 7311.000        | 55.14          | -5.78                   | 49.36           | 74.00          | -24.64      | peak   |
| 3   | 9748.000        | 51.87          | -1.43                   | 50.44           | 74.00          | -23.56      | peak   |

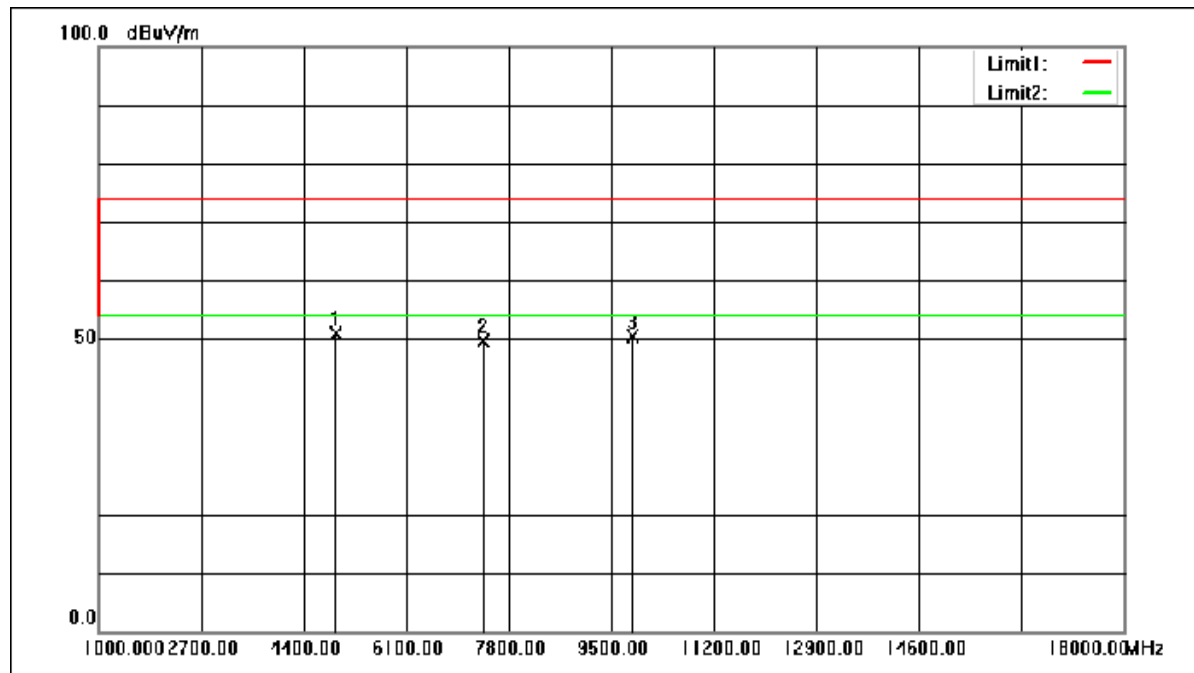
Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:middle



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4874.000        | 59.55          | -8.61                   | 50.94           | 74.00          | -23.06      | peak   |
| 2   | 7311.000        | 55.17          | -5.78                   | 49.39           | 74.00          | -24.61      | peak   |
| 3   | 9748.000        | 52.28          | -1.43                   | 50.85           | 74.00          | -23.15      | peak   |



Mode:a; Polarization:Horizontal; Modulation:b; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4924.000        | 59.37          | -8.44                   | 50.93           | 74.00          | -23.07      | peak   |
| 2   | 7386.000        | 55.28          | -5.69                   | 49.59           | 74.00          | -24.41      | peak   |
| 3   | 9848.000        | 51.68          | -1.27                   | 50.41           | 74.00          | -23.59      | peak   |



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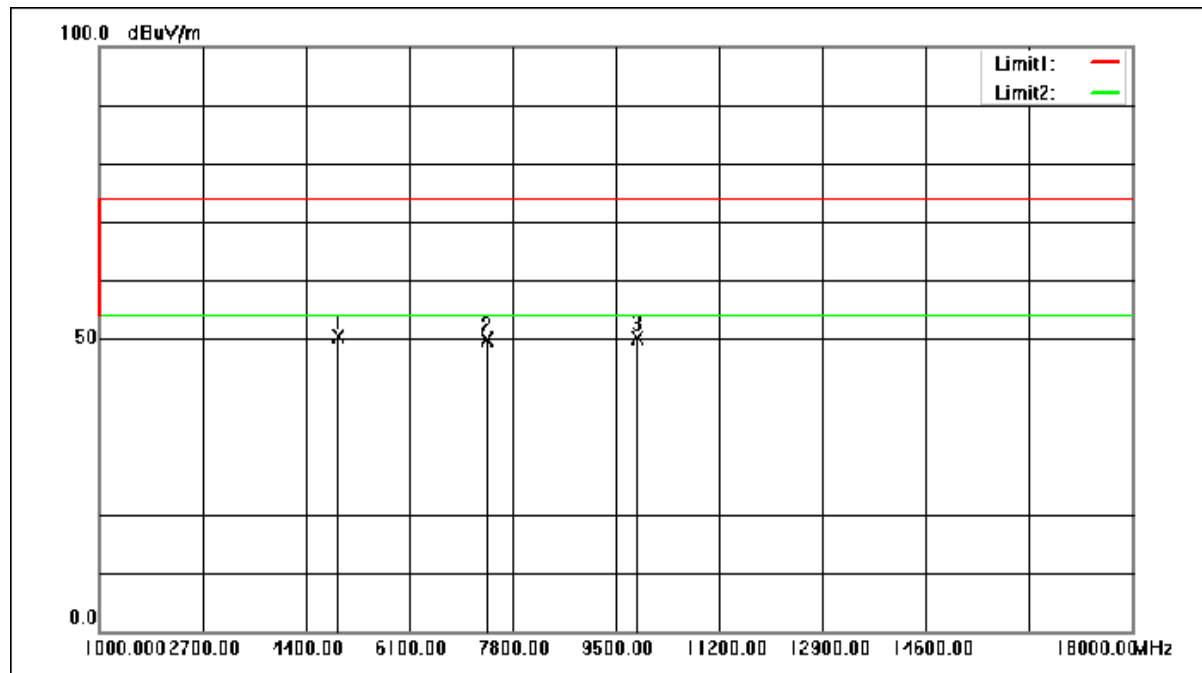
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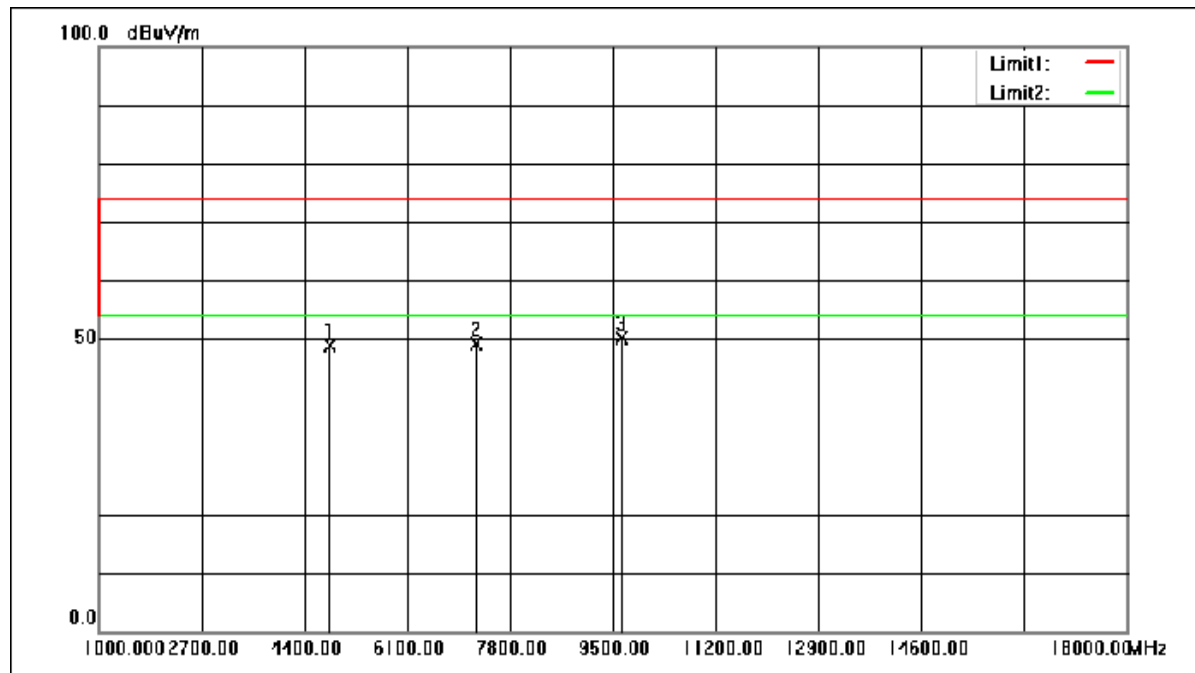
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Mode:a; Polarization:Vertical; Modulation:b; bandwidth:20MHz; Channel:High



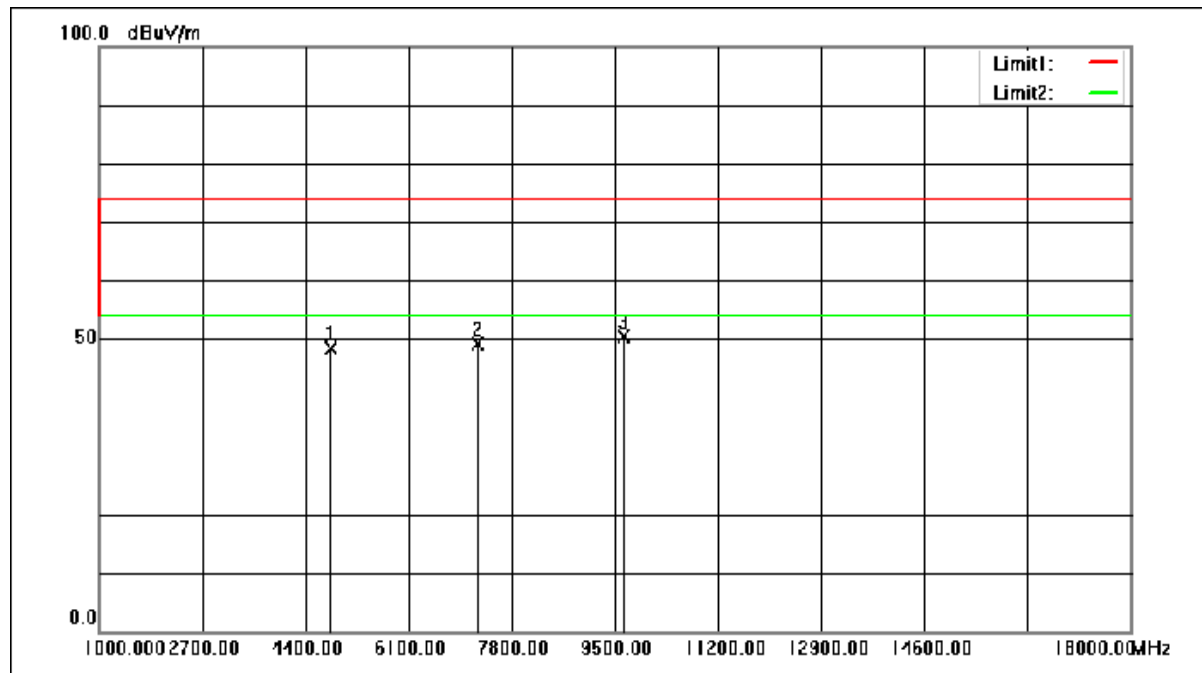
| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4924.000        | 58.73          | -8.44                   | 50.29           | 74.00          | -23.71      | peak   |
| 2   | 7386.000        | 55.47          | -5.69                   | 49.78           | 74.00          | -24.22      | peak   |
| 3   | 9848.000        | 51.49          | -1.27                   | 50.22           | 74.00          | -23.78      | peak   |

Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4824.000        | 57.70          | -8.78                   | 48.92           | 74.00          | -25.08      | peak   |
| 2   | 7236.000        | 55.08          | -5.86                   | 49.22           | 74.00          | -24.78      | peak   |
| 3   | 9648.000        | 51.43          | -1.31                   | 50.12           | 74.00          | -23.88      | peak   |

Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4824.000        | 57.13          | -8.78                   | 48.35           | 74.00          | -25.65      | peak   |
| 2   | 7236.000        | 55.11          | -5.86                   | 49.25           | 74.00          | -24.75      | peak   |
| 3   | 9648.000        | 51.80          | -1.31                   | 50.49           | 74.00          | -23.51      | peak   |



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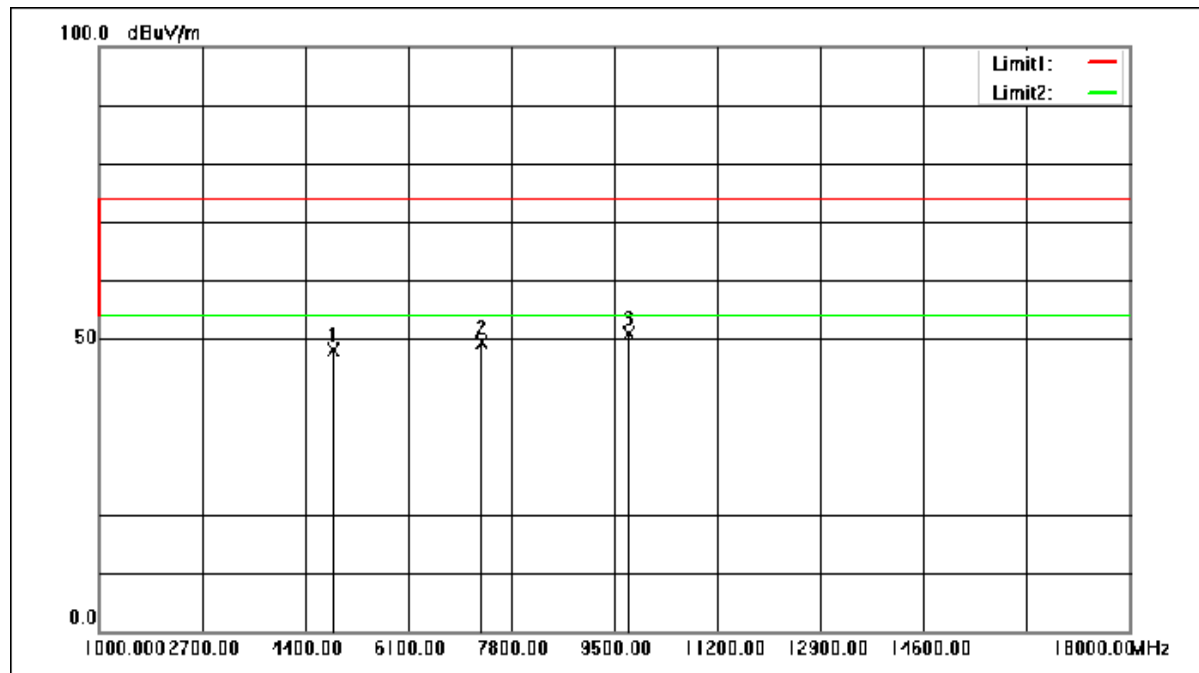
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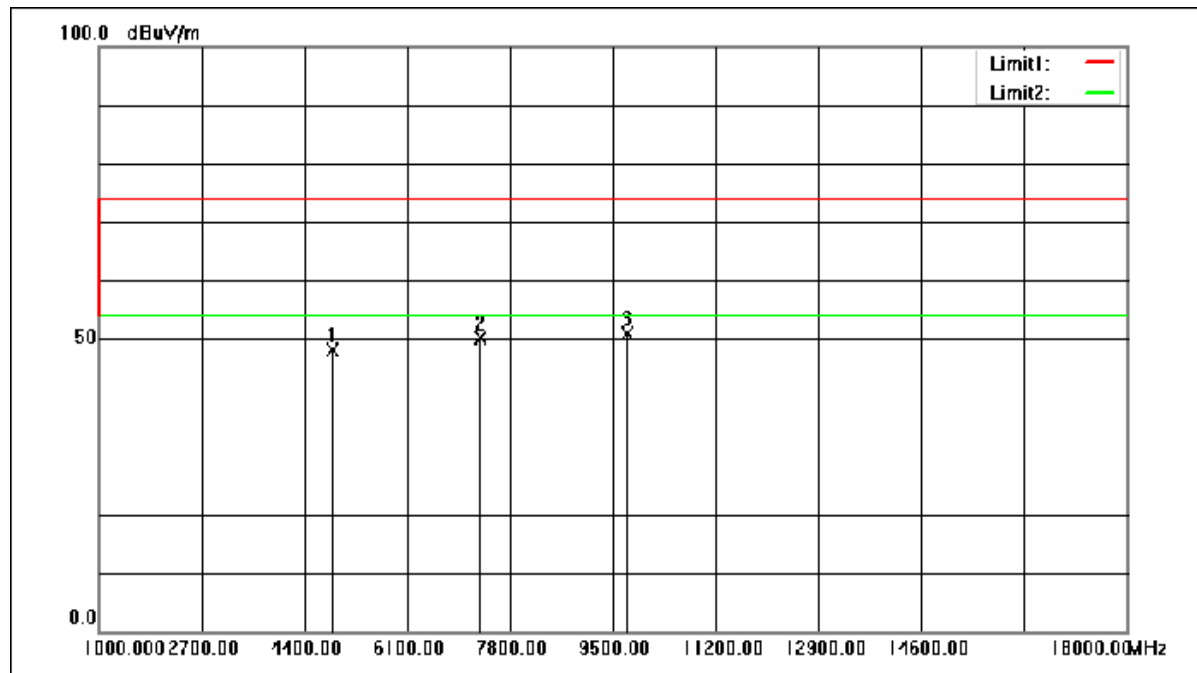
Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:middle



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4874.000        | 56.70          | -8.61                   | 48.09           | 74.00          | -25.91      | peak   |
| 2   | 7311.000        | 55.21          | -5.78                   | 49.43           | 74.00          | -24.57      | peak   |
| 3   | 9748.000        | 52.25          | -1.43                   | 50.82           | 74.00          | -23.18      | peak   |



Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:middle



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4874.000        | 56.75          | -8.61                   | 48.14           | 74.00          | -25.86      | peak   |
| 2   | 7311.000        | 55.81          | -5.78                   | 50.03           | 74.00          | -23.97      | peak   |
| 3   | 9748.000        | 52.39          | -1.43                   | 50.96           | 74.00          | -23.04      | peak   |



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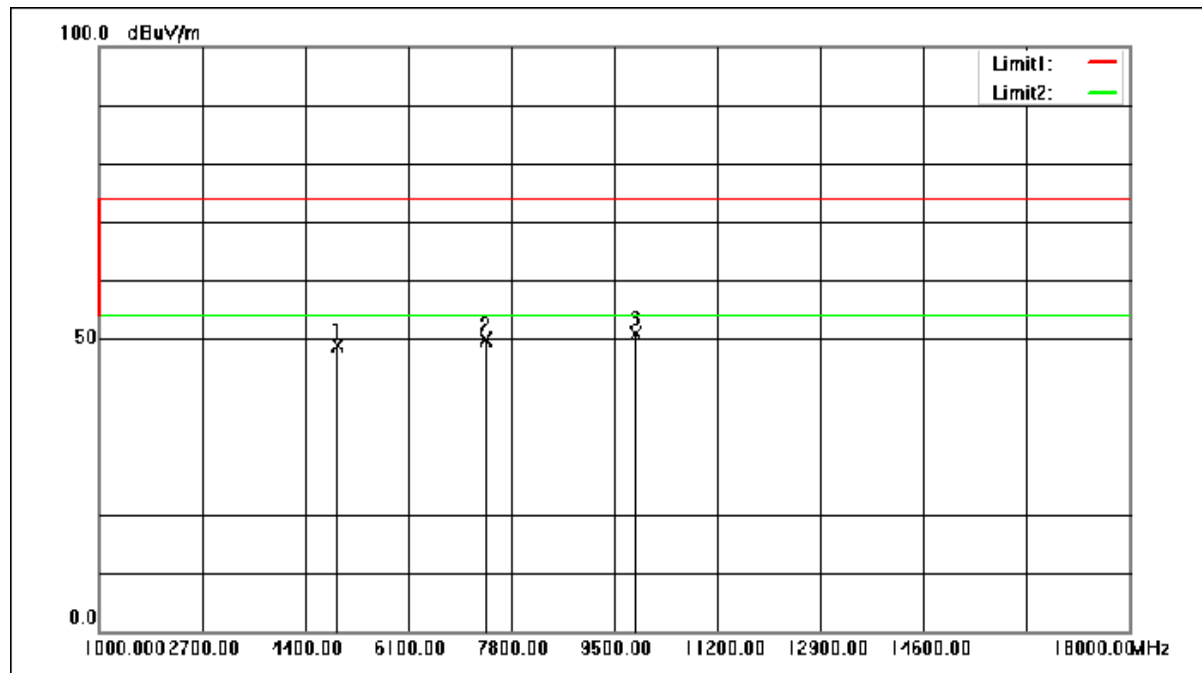
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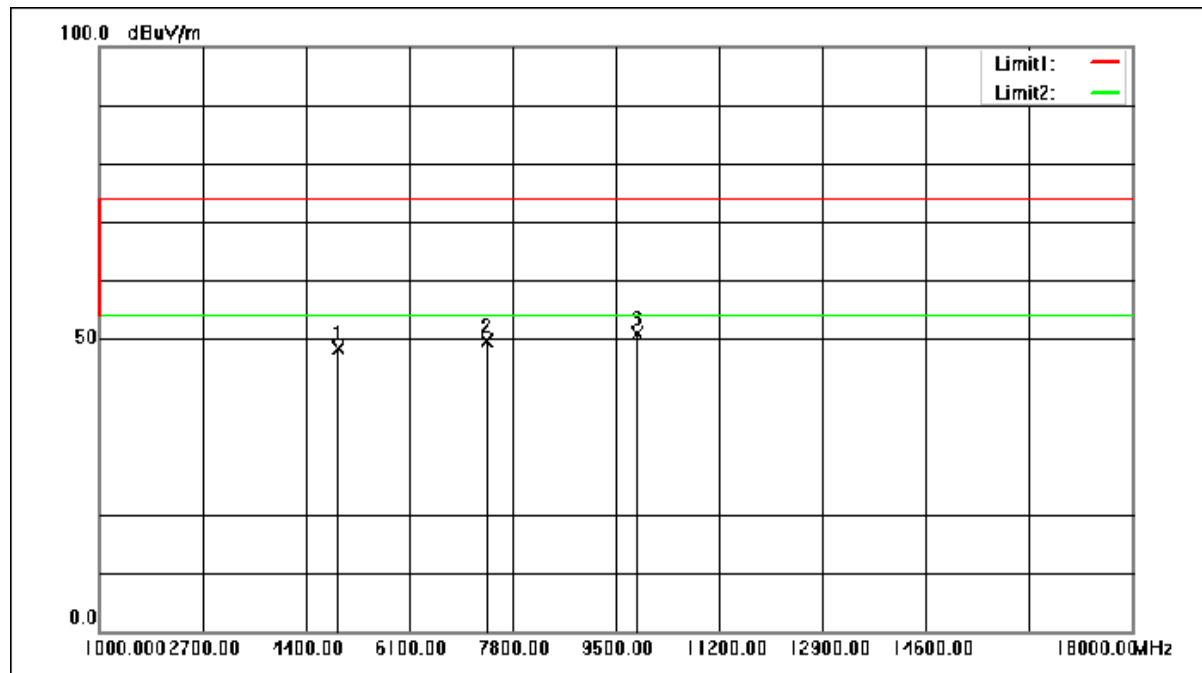
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Mode:a; Polarization:Horizontal; Modulation:g; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4924.000        | 57.31          | -8.44                   | 48.87           | 74.00          | -25.13      | peak   |
| 2   | 7386.000        | 55.49          | -5.69                   | 49.80           | 74.00          | -24.20      | peak   |
| 3   | 9848.000        | 52.12          | -1.27                   | 50.85           | 74.00          | -23.15      | peak   |

Mode:a; Polarization:Vertical; Modulation:g; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4924.000        | 56.70          | -8.44                   | 48.26           | 74.00          | -25.74      | peak   |
| 2   | 7386.000        | 55.42          | -5.69                   | 49.73           | 74.00          | -24.27      | peak   |
| 3   | 9848.000        | 52.17          | -1.27                   | 50.90           | 74.00          | -23.10      | peak   |



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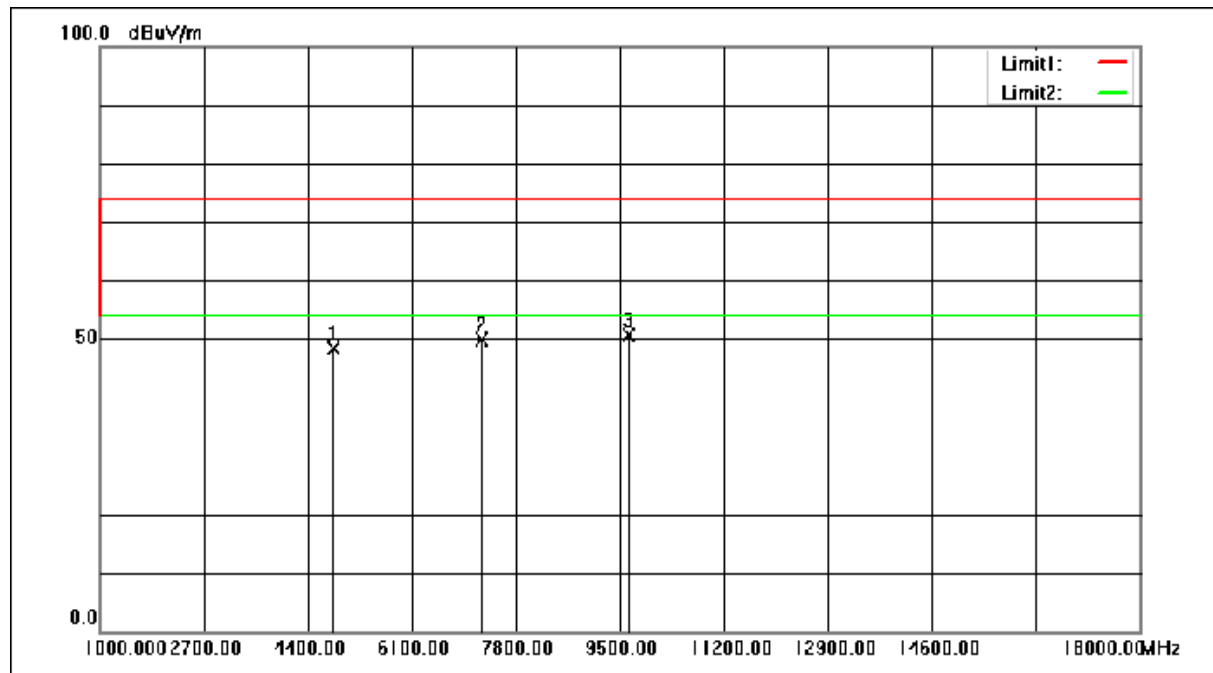
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4824.000        | 57.19          | -8.78                   | 48.41           | 74.00          | -25.59      | peak   |
| 2   | 7236.000        | 55.81          | -5.86                   | 49.95           | 74.00          | -24.05      | peak   |
| 3   | 9648.000        | 51.95          | -1.31                   | 50.64           | 74.00          | -23.36      | peak   |



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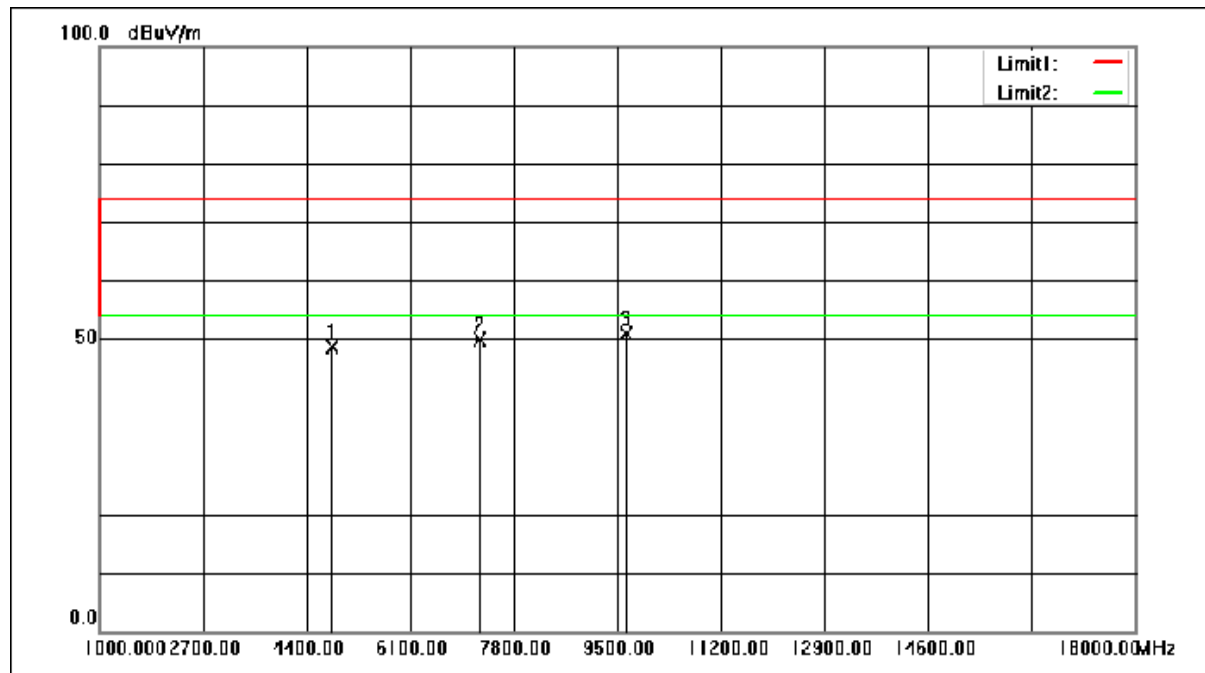
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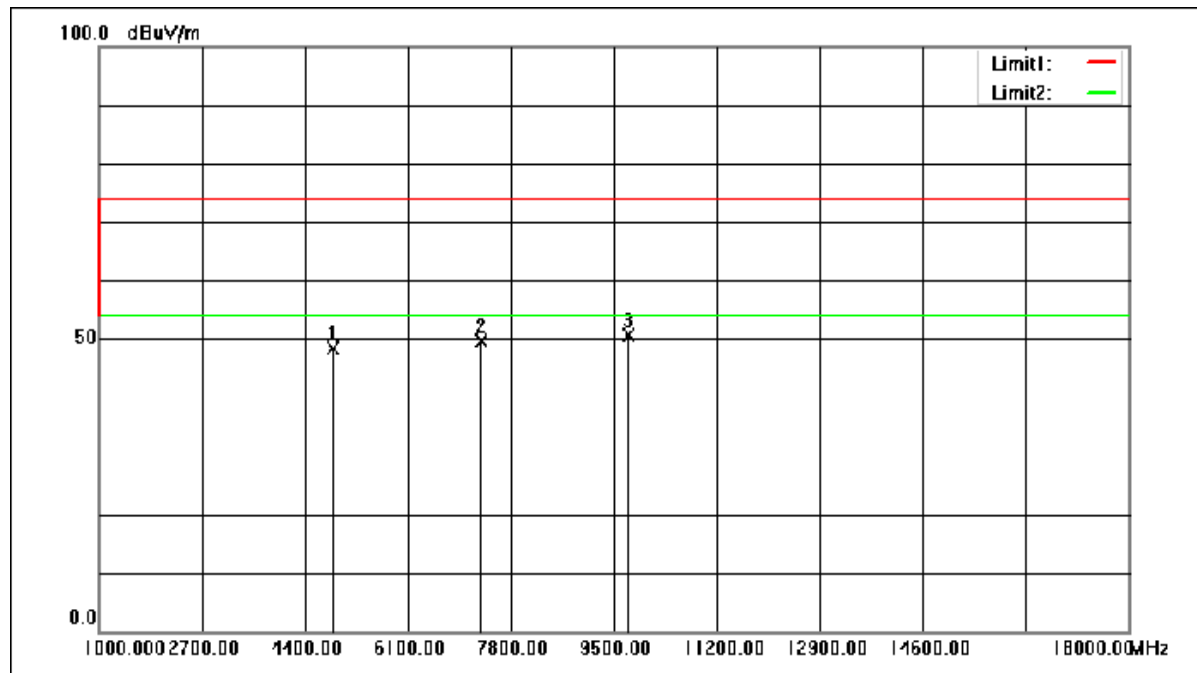
Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4824.000        | 57.43          | -8.78                   | 48.65           | 74.00          | -25.35      | peak   |
| 2   | 7236.000        | 55.64          | -5.86                   | 49.78           | 74.00          | -24.22      | peak   |
| 3   | 9648.000        | 52.10          | -1.31                   | 50.79           | 74.00          | -23.21      | peak   |

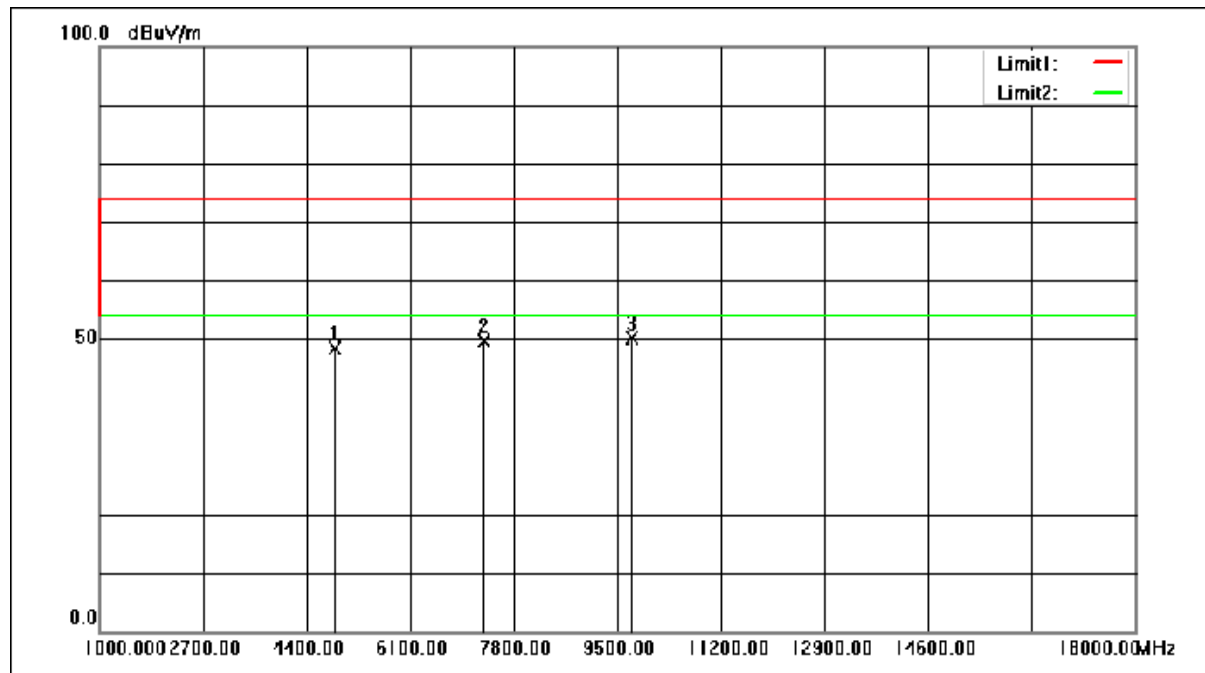


Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:middle



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4874.000        | 56.99          | -8.61                   | 48.38           | 74.00          | -25.62      | peak   |
| 2   | 7311.000        | 55.45          | -5.78                   | 49.67           | 74.00          | -24.33      | peak   |
| 3   | 9748.000        | 52.15          | -1.43                   | 50.72           | 74.00          | -23.28      | peak   |

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:middle



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4874.000        | 57.00          | -8.61                   | 48.39           | 74.00          | -25.61      | peak   |
| 2   | 7311.000        | 55.35          | -5.78                   | 49.57           | 74.00          | -24.43      | peak   |
| 3   | 9748.000        | 51.58          | -1.43                   | 50.15           | 74.00          | -23.85      | peak   |



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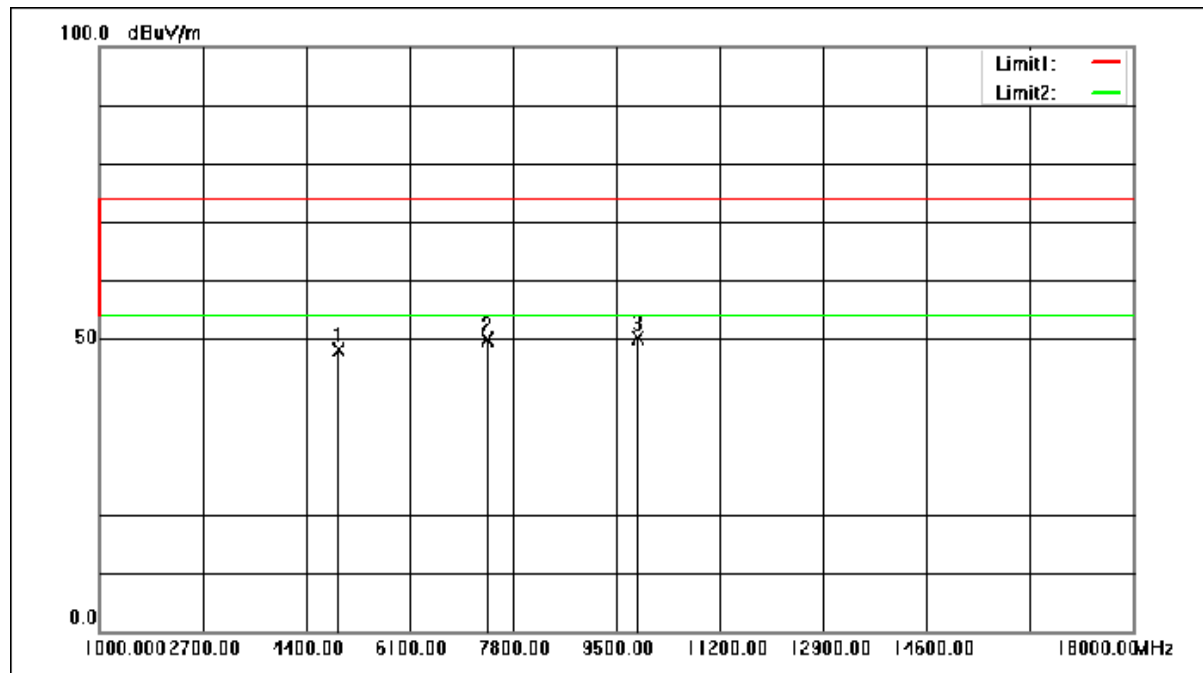
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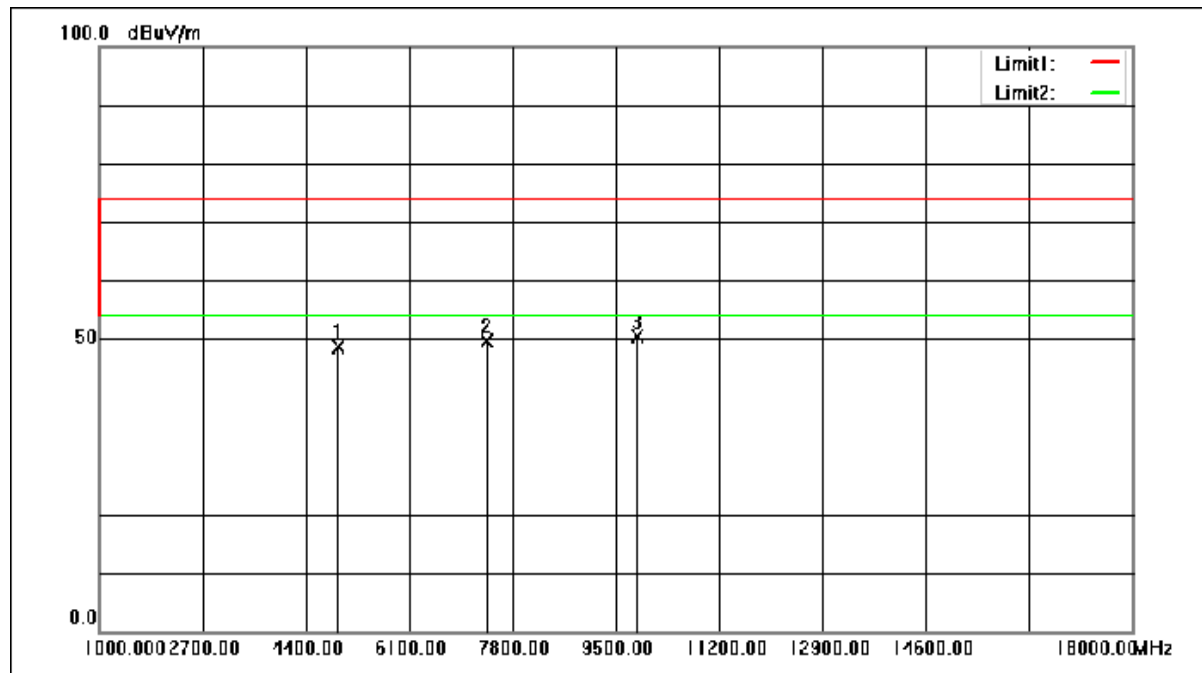
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:20MHz; Channel:High



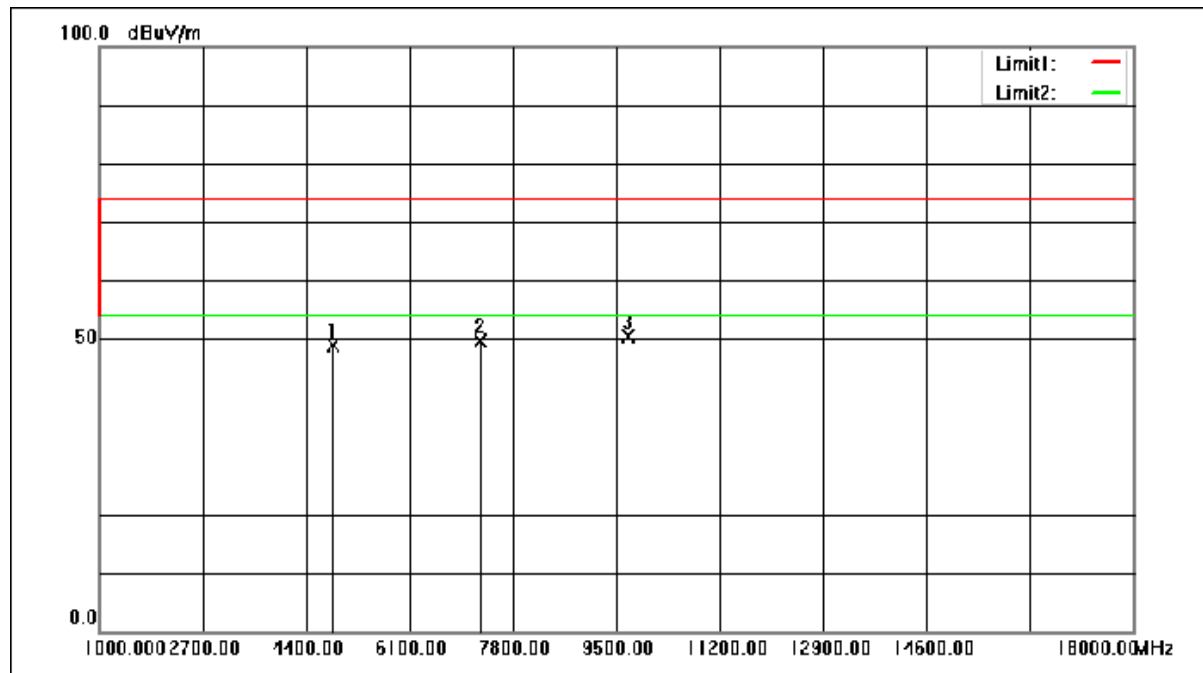
| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4924.000        | 56.59          | -8.44                   | 48.15           | 74.00          | -25.85      | peak   |
| 2   | 7386.000        | 55.46          | -5.69                   | 49.77           | 74.00          | -24.23      | peak   |
| 3   | 9848.000        | 51.34          | -1.27                   | 50.07           | 74.00          | -23.93      | peak   |

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:20MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4924.000        | 56.95          | -8.44                   | 48.51           | 74.00          | -25.49      | peak   |
| 2   | 7386.000        | 55.23          | -5.69                   | 49.54           | 74.00          | -24.46      | peak   |
| 3   | 9848.000        | 51.73          | -1.27                   | 50.46           | 74.00          | -23.54      | peak   |

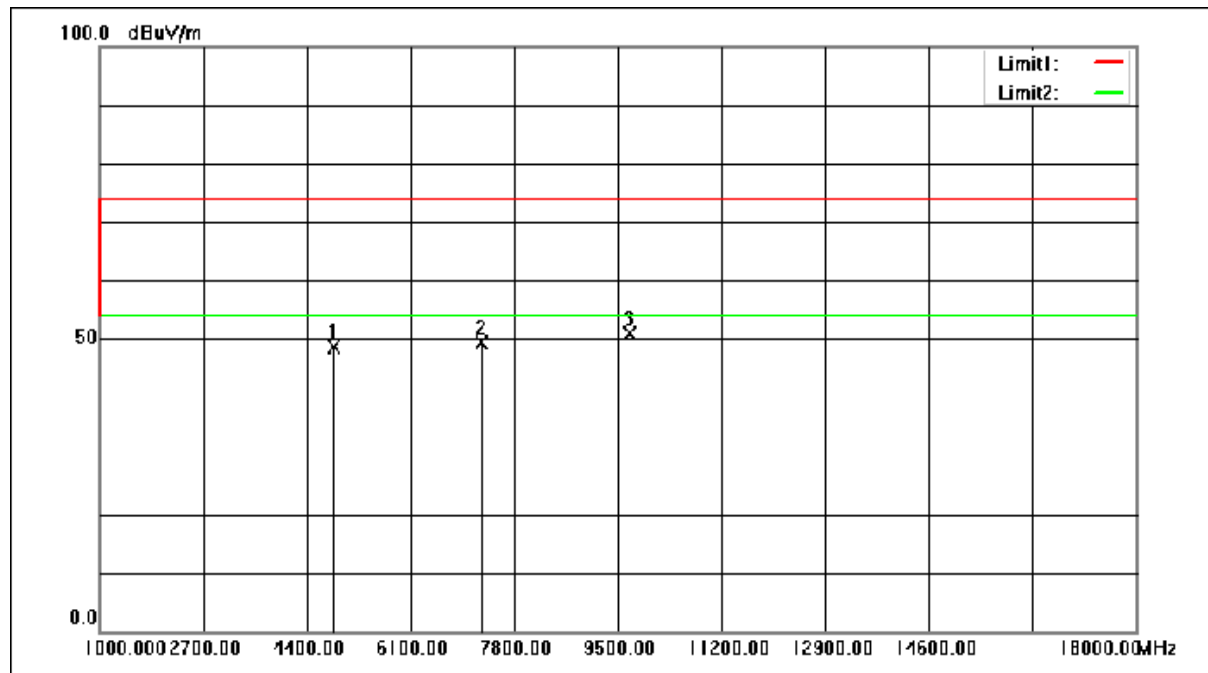
Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4844.000        | 57.52          | -8.71                   | 48.81           | 74.00          | -25.19      | peak   |
| 2   | 7266.000        | 55.50          | -5.83                   | 49.67           | 74.00          | -24.33      | peak   |
| 3   | 9688.000        | 51.62          | -1.36                   | 50.26           | 74.00          | -23.74      | peak   |

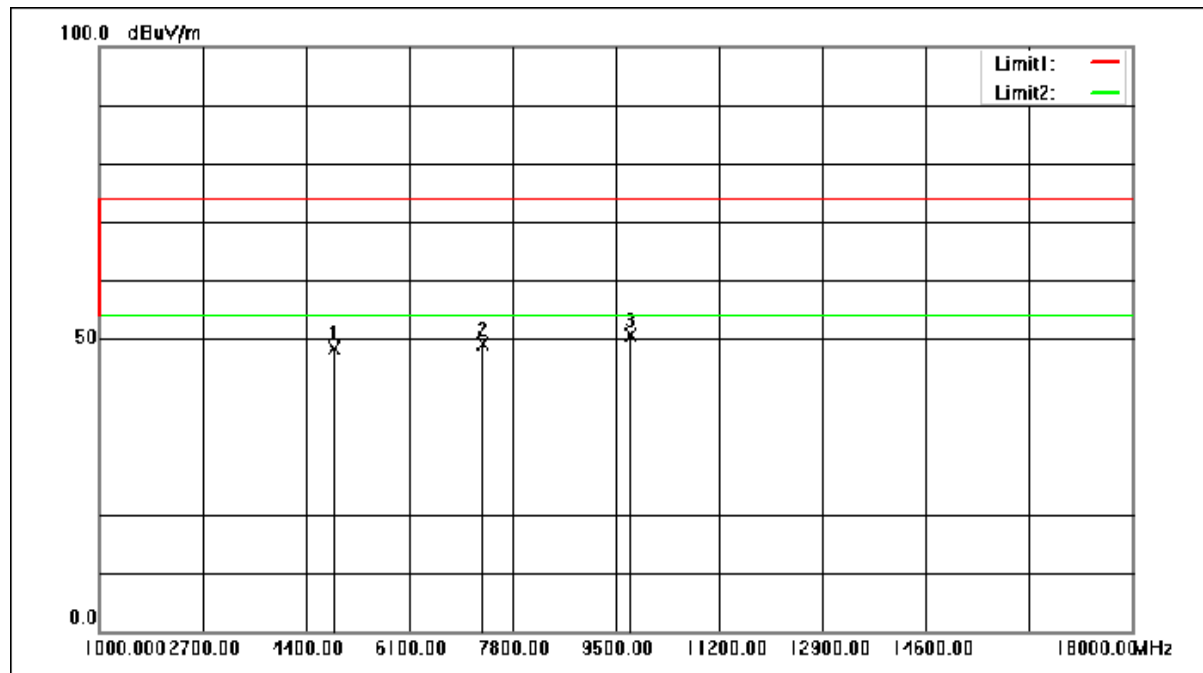


Mode:a; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:Low



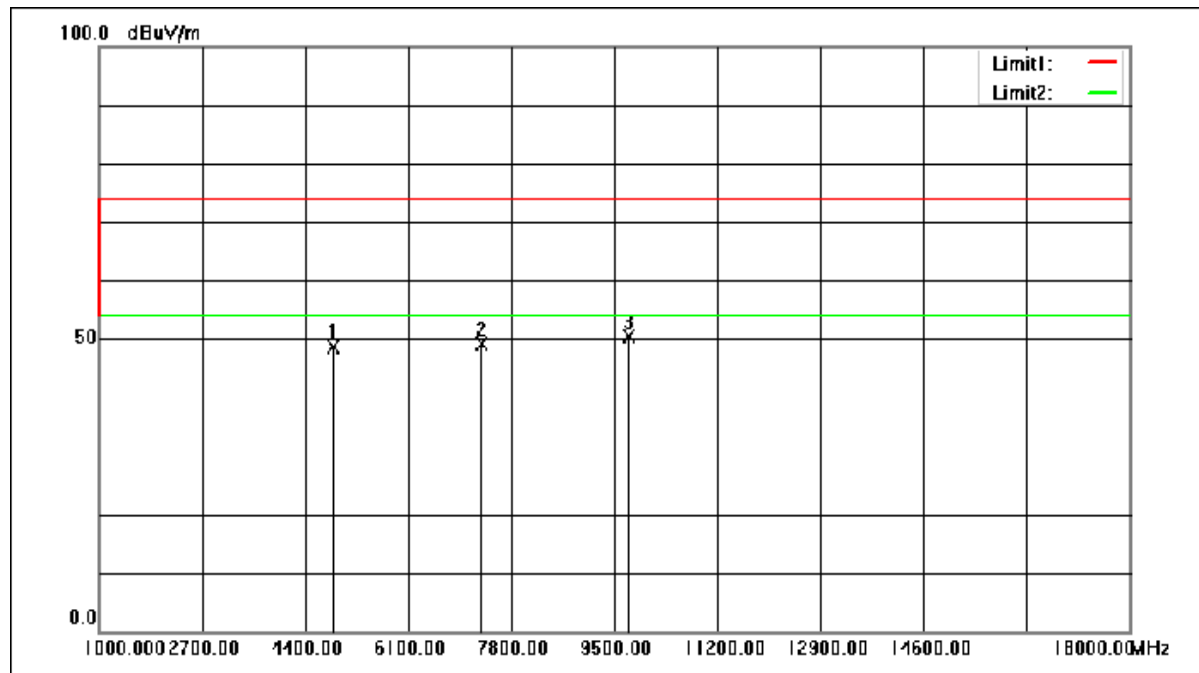
| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4844.000        | 57.43          | -8.71                   | 48.72           | 74.00          | -25.28      | peak   |
| 2   | 7266.000        | 55.17          | -5.83                   | 49.34           | 74.00          | -24.66      | peak   |
| 3   | 9688.000        | 52.24          | -1.36                   | 50.88           | 74.00          | -23.12      | peak   |

Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:middle



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4874.000        | 57.11          | -8.61                   | 48.50           | 74.00          | -25.50      | peak   |
| 2   | 7311.000        | 54.95          | -5.78                   | 49.17           | 74.00          | -24.83      | peak   |
| 3   | 9748.000        | 52.13          | -1.43                   | 50.70           | 74.00          | -23.30      | peak   |

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:middle



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4874.000        | 57.16          | -8.61                   | 48.55           | 74.00          | -25.45      | peak   |
| 2   | 7311.000        | 54.92          | -5.78                   | 49.14           | 74.00          | -24.86      | peak   |
| 3   | 9748.000        | 51.79          | -1.43                   | 50.36           | 74.00          | -23.64      | peak   |



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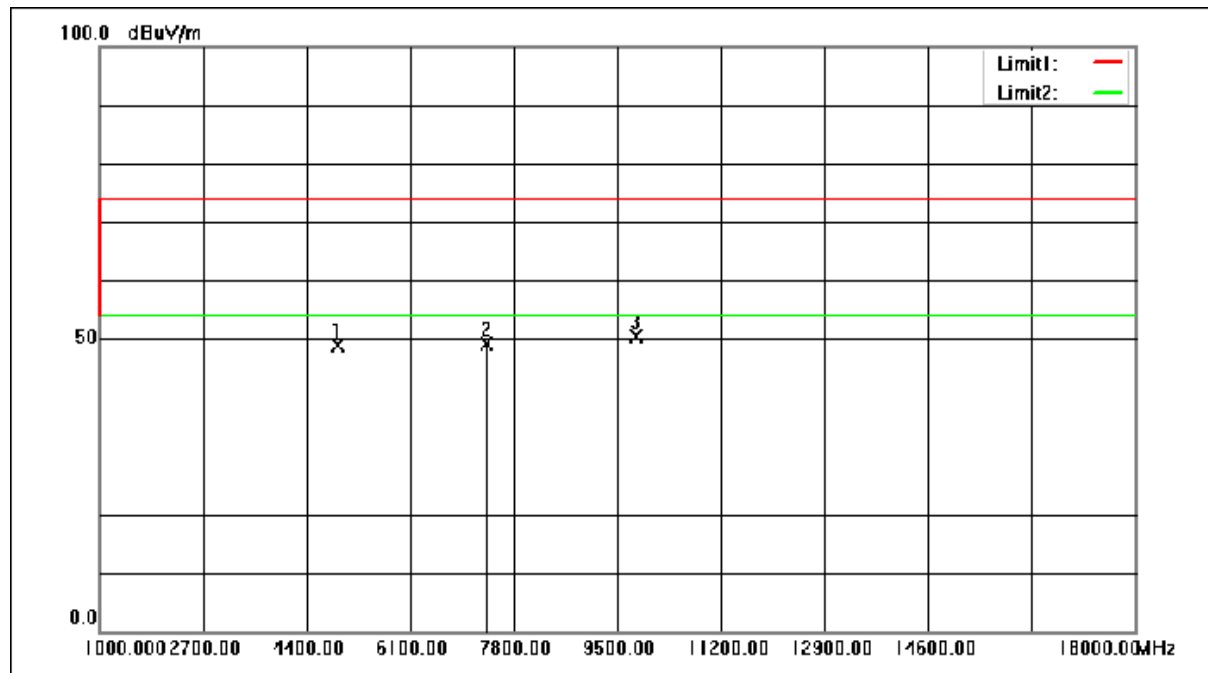
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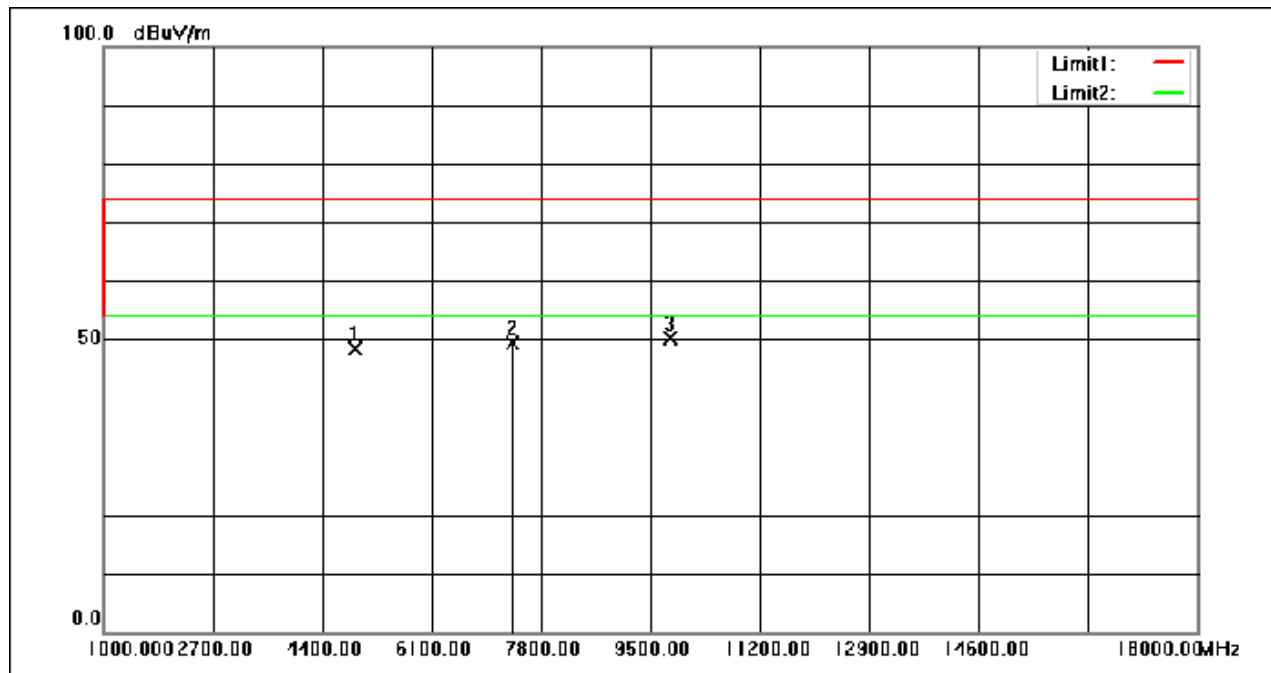
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Mode:a; Polarization:Horizontal; Modulation:n; bandwidth:40MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4904.000        | 57.49          | -8.51                   | 48.98           | 74.00          | -25.02      | peak   |
| 2   | 7356.000        | 54.94          | -5.73                   | 49.21           | 74.00          | -24.79      | peak   |
| 3   | 9808.000        | 51.85          | -1.47                   | 50.38           | 74.00          | -23.62      | peak   |

Mode:a; Polarization:Vertical; Modulation:n; bandwidth:40MHz; Channel:High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 4904.000        | 56.93          | -8.51                   | 48.42           | 74.00          | -25.58      | peak   |
| 2   | 7356.000        | 55.17          | -5.73                   | 49.44           | 74.00          | -24.56      | peak   |
| 3   | 9808.000        | 51.64          | -1.47                   | 50.17           | 74.00          | -23.83      | peak   |



## 7.9 99% Bandwidth

Test Requirement RSS-Gen Section 6.7

Test Method: ANSI C63.10 Section 6.9.3

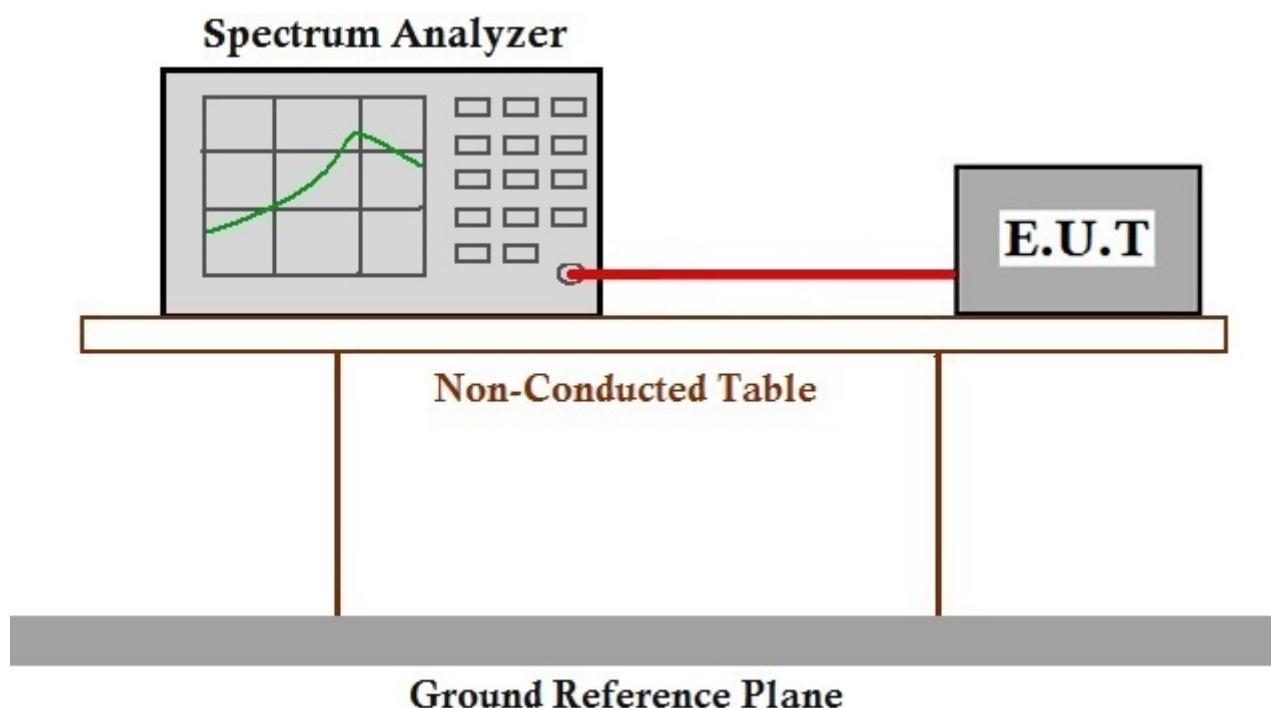
### 7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.9.2 Test Setup Diagram



### 7.9.3 Measurement Procedure and Data

The detailed test data see: Appendix A for SHEM210800980601



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## 8 Test Setup Photographs

Refer to the < Test Setup photos-FCC >.

## 9 EUT Constructional Details

Refer to the < External Photos > & < Internal Photos >.

**- End of the Report -**



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