# FCC Radio Test Report

## FCC ID: 2AHKA-CAPRI125P

**This report concerns (check one):** ☒**Original Grant** ☐**Class I Change** ☐**Class II Change**

| | | |
|---|---|---|
| **Project No.** | : | 1708C076 |
| **Equipment** | : | BT Speaker, Internet Radio |
| **Test Model** | : | KAPSCH-H |
| **Series Model** | : | KAPSCH CAPRI 125 PLUS |
| **Applicant** | : | Guangzhou Rayer Acoustic Technology Co.,Ltd |
| **Address** | : | 520.192 Kezhu Road,Guangzhou science park, Guangdong province |

| | | |
|---|---|---|
| **Date of Receipt** | : | Aug. 04, 2017 |
| **Date of Test** | : | Aug. 04, 2017 ~ Sep. 22, 2017 |
| **Issued Date** | : | Sep. 25, 2017 |
| **Tested by** | : | BTL Inc. |

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For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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## REPORT ISSUED HISTORY

| Issued No. | Description | Issued Date |
|---|---|---|
| BTL-FCCP-3-1708C076 | Original Issue. | Sep. 25, 2017 |

## 1. CERTIFICATION

| | | |
|---|---|---|
| Equipment | : | BT Speaker, Internet Radio |
| Brand Name | : | KAPSCH |
| Test Model | : | KAPSCH-H |
| Series Model | : | KAPSCH CAPRI 125 PLUS |
| Applicant | : | Guangzhou Rayer Acoustic Technology Co.,Ltd |
| Manufacturer | : | Guangzhou Rayer Acoustic Technology Co.,Ltd |
| Address | : | 520.192 Kezhu Road,Guangzhou science park,Guangdong province |
| Factory | : | 1# Guangzhou Singulargold Electronics Co.Ltd<br>2# Dah Dyi Audio Equipment Co., Ltd.<br>3# DongGuanHuaZhuang Electronics Co.,LTD |
| Address | : | 1# NO.6 LianhuayanRoad,Sciencepark,guangZhou,China<br>2# Jin San Jiao Ind. Zone, Shi Bu Village,Liao Bu Town, Dong Guan City, Guang Dong Province, China<br>3# NO.3 Sanjiang Industrial Zone.HengliTown,DongguanCity,Guangdong Province, China |
| Date of Test | : | Aug. 04, 2017 ~ Sep. 22, 2017 |
| Test Sample | : | Engineering Sample |
| Standard(s) | : | FCC Part15, Subpart E(15.407) / ANSI C63.10-2013 |

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-3-1708C076) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP according to the ISO-17025 quality assessment standard and technical standard(s).

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

| FCC Part15, Subpart E(15.407) | | | |
|---|---|---|---|
| Standard(s) Section | Test Item | Judgment | Remark |
| 15.207 | AC Power Line Conducted Emissions | PASS | |
| 15.407(a) | 26dB Spectrum Bandwidth | PASS | |
| 15.407(a) | Maximum Conducted Output Power | PASS | |
| 15.407(a) | Power Spectral Density | PASS | |
| 15.407(a) | Radiated Emissions | PASS | |
| 15.407(b) | Band Edge Emissions | PASS | |
| 15.407(g) | Frequency Stability | PASS | |
| 15.203 | Antenna Requirements | PASS | |

NOTE:

(1)" N/A" denotes test is not applicable in this test report.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3,Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.
BTL's test firm number for FCC: 854385
Designation number for FCC: CN5020

## 2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 $U_{cispr}$ requirement.

The reported uncertainty of measurement y ± U, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

A. Conducted Measurement:

| Test Site | Method | Measurement Frequency Range | U, (dB) |
|---|---|---|---|
| DG-C02 | CISPR | 150 KHz ~ 30MHz | 1.94 |

B. Radiated Measurement:

| Test Site | Method | Measurement Frequency Range | Ant. H / V | U, (dB) |
|---|---|---|---|---|
| DG-CB03 | CISPR | 9kHz~30MHz | V | 3.79 |
| | | 9kHz~30MHz | H | 3.57 |
| | | 30MHz ~ 200MHz | V | 3.82 |
| | | 30MHz ~ 200MHz | H | 3.60 |
| | | 200MHz ~ 1,000MHz | V | 3.86 |
| | | 200MHz ~ 1,000MHz | H | 3.94 |
| | | 1GHz~18GHz | V | 3.12 |
| | | 1GHz~18GHz | H | 3.68 |
| | | 18GHz~40GHz | V | 4.15 |
| | | 18GHz~40GHz | H | 4.14 |

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

# 3. GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | | |
|---|---|---|
| Equipment | BT Speaker, Internet Radio | |
| Brand Name | KAPSCH | |
| Test Model | KAPSCH-H | |
| Series Model | KAPSCH CAPRI 125 PLUS | |
| Model Difference | Only differ in the model name and color. | |
| Product Description | Operation Frequency | UNII-1: 5150-5250MHz |
| | Modulation Type | OFDM |
| | Bit Rate of Transmitter | 150 Mbps |
| Power Source | DC Voltage supplied from AC/DC adapter.<br>Brand / Model: FLYPOWER / PS30D180K1000UD | |
| Power Rating | I/P: 100-240V~ 50/60Hz 800mA O/P: 18.0V⎓1000mA | |
| Output Power | Output Power (Max.)for UNII-1 (1TX) | 802.11a: 5.20dBm<br>802.11n (20M): 4.24dBm |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Channel List:

| UNII-1 | |
|---|---|
| Channel | Frequency (MHz) |
| 36 | 5180 |
| 40 | 5200 |
| 44 | 5220 |
| 48 | 5240 |

3. Antenna Specification:

| Ant. | Manufacturer | Model Name | Antenna Type | Connector | Gain (dBi) | Note |
|---|---|---|---|---|---|---|
| 1 | KAPSCH | N/A | PCB | N/A | 5.5 | N/A |

## 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description |
|---|---|
| Mode 1 | TX A Mode / CH36, CH40, CH48 (UNII-1) |
| Mode 2 | TX N20 Mode / CH36, CH40, CH48 (UNII-1) |
| Mode 3 | TX Mode |

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

| For Conducted Test | |
|---|---|
| Final Test Mode | Description |
| Mode 3 | TX Mode |

| For Radiated Test | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | TX A Mode / CH36, CH40, CH48 (UNII-1) |
| Mode 2 | TX N20 Mode / CH36, CH40, CH48 (UNII-1) |

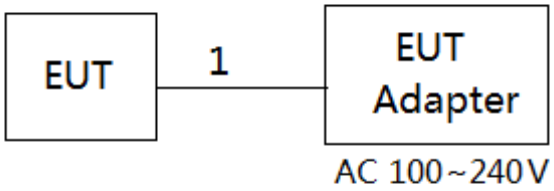
Note:
(1) For radiated below 1GHz test, the 802.11a mode is found to be the worst case and recorded.

### 3.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product

| UNII-1 - 1TX | | | |
|---|---|---|---|
| Test Software Version | N/A | | |
| Frequency (MHz) | 5180 | 5200 | 5240 |
| A Mode | N/A | N/A | N/A |
| Frequency (MHz) | 5180 | 5200 | 5240 |
| N20 Mode | N/A | N/A | N/A |

### 3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED




### 3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Series No. |
|---|---|---|---|---|---|
| - | - | - | - | - | - |

| Item | Shielded Type | Ferrite Core | Length | Note |
|---|---|---|---|---|
| 1 | No | YES | 1.0M | DC CABLE |

# 4. EMC EMISSION TEST

## 4.1 CONDUCTED EMISSION MEASUREMENT

### 4.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150kHz-30MHz)

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | |
|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00 | 50.00 |

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

### 4.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

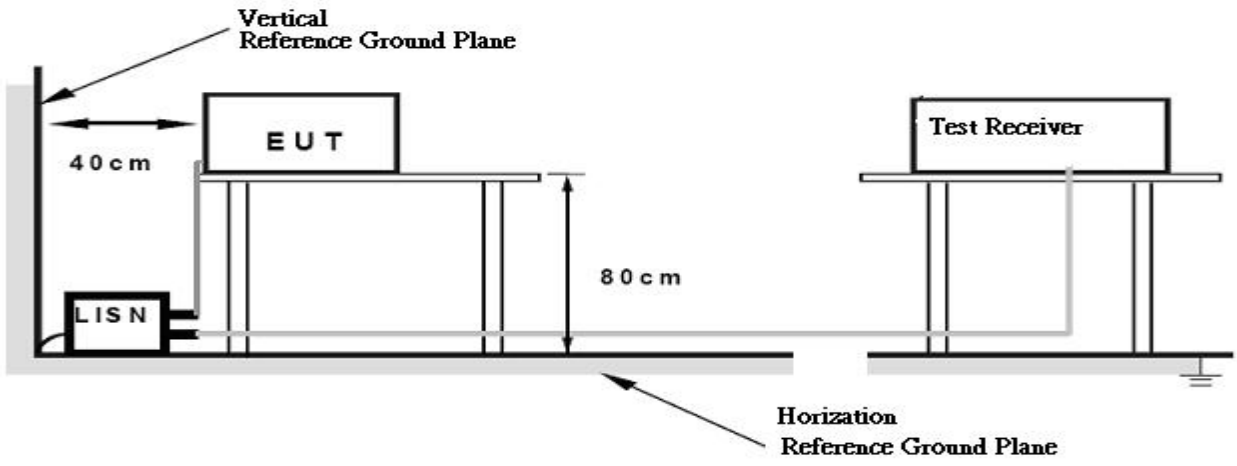
d. LISN at least 80 cm from nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 4.1.4 TEST SETUP




### 4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.
The EUT was programmed to be in continuously transmitting/TX Mode mode.

### 4.1.6 EUT TEST CONDITIONS

Temperature: 25°C  Relative Humidity: 53%  Test Voltage: AC 120V/60Hz

### 4.1.7 TEST RESULTS

Please refer to the Appendix A.

Remark:

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(2) Measuring frequency range from 150kHz to 30MHz。

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequencies (MHz) | Field Strength (micorvolts/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 |

| Frequencies (MHz) | EIRP Limit (dBm) | Equivalent Field Strength at 3m (dBμV/m) |
|---|---|---|
| 5150-5250 | -27 | 68.3 |
| 5250-5350 | -27 | 68.3 |
| 5470-5725 | -27 | 68.3 |
| 5725-5850 | -27(Note 2) | 68.3 |
| | 10(Note 2) | 105.3 |
| | 15.6(Note 2) | 110.9 |
| | 27(Note 2) | 122.3 |

Note:

1. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength: $E = \frac{1000000\sqrt{30P}}{3}$ μV/m, where P is the eirp (Watts)

2. According to FCC 16-24,All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below theband edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above orbelow the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

### 4.2.2 TEST PROCEDURE

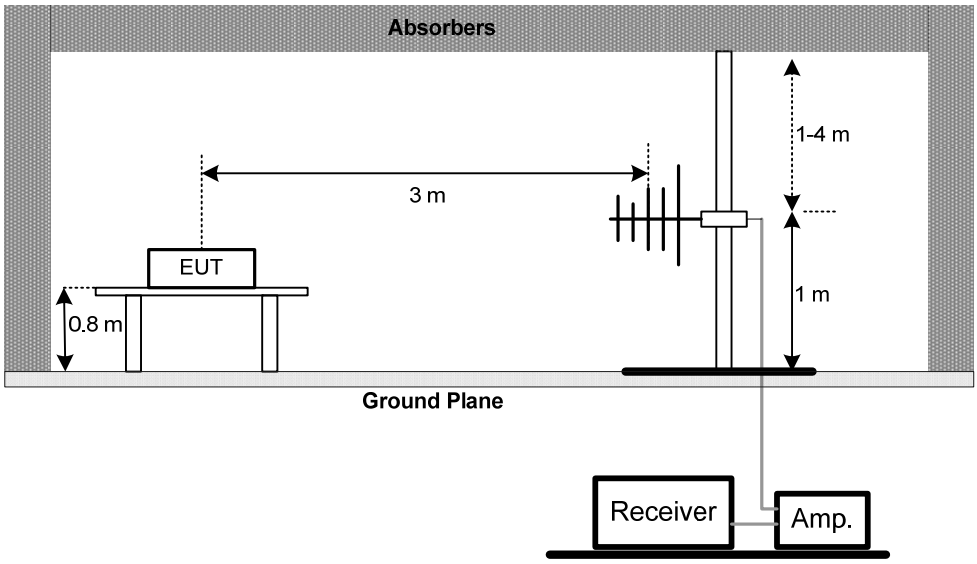
a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1GHz)
h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform. (above 1GHz)
i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 4.2.3 DEVIATION FROM TEST STANDARD

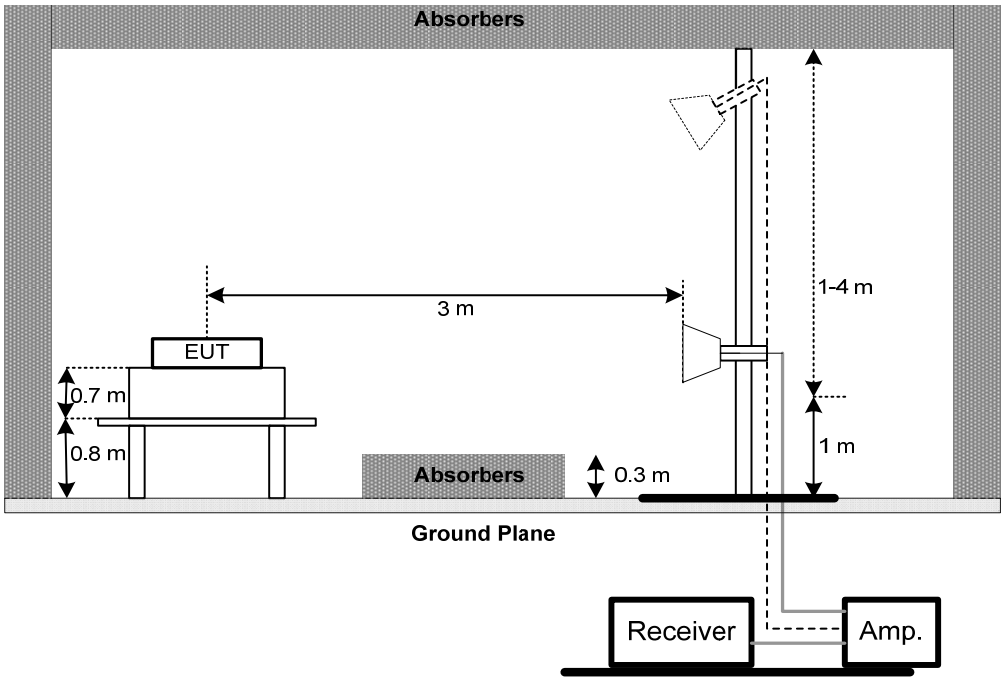
No deviation

### 4.2.4 TEST SETUP

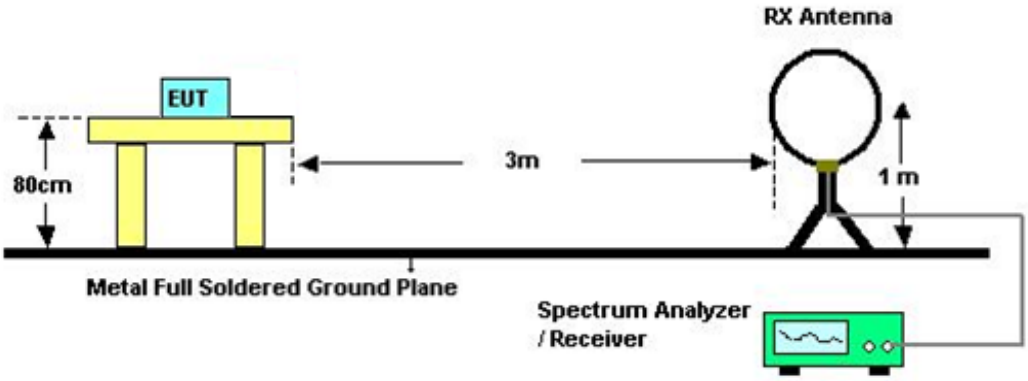
(A)Radiated Emission Test Set-Up Frequency Below 1GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz




(C) Radiated emissions below 30MHz




### 4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

### 4.2.6 EUT TEST CONDITIONS

Temperature: 25°C  Relative Humidity: 60%  Test Voltage: AC 120V/60Hz

### 4.2.7 TEST RESULTS (9K TO 30MHz)

Please refer to the Appendix B

Remark:

(1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
(2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
(3) Limit line = specific limits (dBuV) + distance extrapolation factor.

### 4.2.8 TEST RESULTS (BETWEEN 30 TO 1000 MHz)

Please refer to the Appendix C.

### 4.2.9 TEST RESULTS (ABOVE 1000 MHz)

Please refer to the Appendix D.

Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

# 5. 26dB SPECTRUM BANDWIDTH

## 5.1 APPLIED PROCEDURES / LIMIT

| FCC Part15, Subpart E | | | |
|---|---|---|---|
| Test Item | Limit | Frequency Range (MHz) | Result |
| Bandwidth | 26 dB Bandwidth | 5150-5250 | PASS |

### 5.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

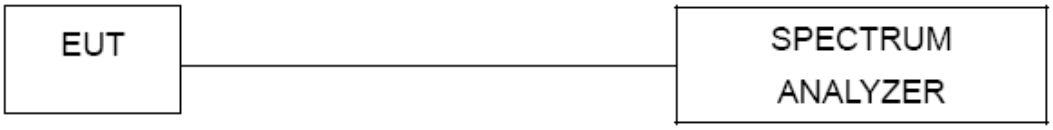
| Spectrum Parameters | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | > 26dB Bandwidth |
| RBW | 300 kHz(Bandwidth 20MHz)<br>1MHz(Bandwidth 40MHz and 80MHz) |
| VBW | 1MHz(Bandwidth 20MHz)<br>3MHz(Bandwidth 40MHz and 80MHz) |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

c. Measured the spectrum width with power higher than 26dB below carrier

### 5.1.2 DEVIATION FROM STANDARD

No deviation.

### 5.1.3 TEST SETUP




### 5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

### 5.1.5 EUT TEST CONDITIONS

Temperature: 25°C  Relative Humidity: 60%  Test Voltage: AC 120V/60Hz

### 5.1.6 TEST RESULTS

Please refer to the Appendix E.

# 6. MAXIMUM CONDUCTED OUTPUT POWER

## 6.1 APPLIED PROCEDURES / LIMIT

| FCC Part15, Subpart E | | | |
|---|---|---|---|
| Test Item | Limit | Frequency Range (MHz) | Result |
| Conducted Output Power | Fixed:1 Watt (30dBm)<br>Mobile and portable: 250mW (24dBm) | 5150-5250 | PASS |
| Note: The maximum e.i.r.p at anyelevation angle above 30 degrees as measured from the horizon must not exceed 125mW(21dBm) | | | |

### 6.1.1 TEST PROCEDURE

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,

b.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | Encompass the entire emissions bandwidth (EBW) of the signal |
| RBW | = 1MHz. |
| VBW | ≥ 3MHz. |
| Detector | RMS |
| Trace | Max Hold |
| Sweep Time | auto |

c. Test was performed in accordance with method of KDB 789033 D02.

### 6.1.2 DEVIATION FROM STANDARD

No deviation.

### 6.1.3 TEST SETUP

### 6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

### 6.1.5 EUT TEST CONDITIONS

Temperature: 25°C  Relative Humidity: 60%  Test Voltage: AC 120V/60Hz

### 6.1.6 TEST RESULTS

Please refer to the Appendix F.

# 7. POWER SPECTRAL DENSITY TEST

## 7.1 APPLIED PROCEDURES / LIMIT

| FCC Part15, Subpart E | | | |
|---|---|---|---|
| Test Item | Limit | Frequency Range (MHz) | Result |
| Power Spectral Density | Other then Mobile and portable:17dBm/MHz<br>Mobile and portable:11dBm/MHz | 5150-5250 | PASS |

### 8.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | Encompass the entire emissions bandwidth (EBW) of the signal |
| RBW | = 1MHz. |
| VBW | ≥ 3MHz. |
| Detector | RMS |
| Trace average | 100 trace |
| Sweep Time | Auto |

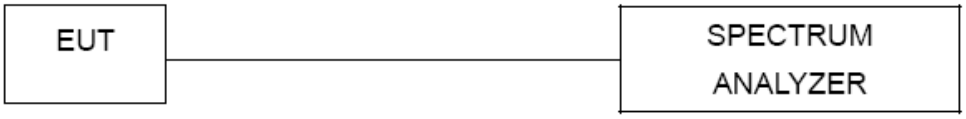
Note:

1. For UNII-3, according to KDB publication 789033 D02 General UNII Test Procedures New Rules v01r02, section II.F.5., it is acceptable to set RBW at 1MHz and VBW at 3MHz if the spectrum analyzer does not have 500kHz RBW.
2. The value measured with RBW=1MHz is to be added with 10log(500kHz/1MHz) which is -3dB. For example, if the measured value is +10dBm using RBW=1MHz (that is

### 7.1.1 DEVIATION FROM STANDARD

No deviation.

### 7.1.2 TEST SETUP




### 7.1.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

### 7.1.4 EUT TEST CONDITIONS

Temperature: 25°C  Relative Humidity: 60%  Test Voltage: AC 120V/60Hz

### 7.1.5 TEST RESULTS

**Please refer to the Appendix H.**

# 8. FREQUENCY STABILITY MEASUREMENT

## 8.1 APPLIED PROCEDURES / LIMIT

| FCC Part15, Subpart E | | | |
|---|---|---|---|
| Test Item | Limit | Frequency Range (MHz) | Result |
| Frequency Stability | Specified in the user's manual | 5150-5250 | PASS |

### 8.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | Entire absence of modulation emissions bandwidth |
| RBW | 10 kHz |
| VBW | 10 kHz |
| Sweep Time | Auto |

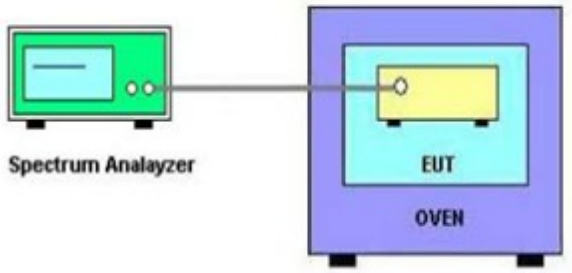
c. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

d. User manual temperature is 0°C~45°C.

### 8.1.2 DEVIATION FROM STANDARD

No deviation.

### 8.1.3 TEST SETUP




### 8.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

### 8.1.5 EUT TEST CONDITIONS

Temperature: 25°C  Relative Humidity: 55%  Test Voltage: AC 120V/60Hz

### 8.1.6 TEST RESULTS

**Please refer to the Appendix I.**

## 9. MEASUREMENT INSTRUMENTS LIST

| Conducted Emission Measurement | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | LISN | EMCO | 3816/2 | 0052765 | Mar. 26, 2018 |
| 2 | LISN | R&S | ENV216 | 101447 | Mar. 26, 2018 |
| 3 | Test Cable | emci | RG223(9KHz-30 MHz) | C_17 | Sep. 03, 2018 |
| 4 | EMI Test Receiver | R&S | ESCI | 100382 | Sep. 03, 2018 |
| 5 | 50Ω Terminator | SHX | TF2-3G-A | 08122901 | Mar. 09, 2018 |
| 6 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |

| Radiated Emission Measurement | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Antenna | Schwarbeck | VULB9160 | 9160-3232 | Mar. 26, 2018 |
| 2 | Amplifier | HP | 8447D | 2944A09673 | Oct. 20, 2017 |
| 3 | Receiver | Agilent | N9038A | MY52130039 | Sep. 03, 2018 |
| 4 | Cable | emci | LMR-400(30MHz-1GHz)(8m+5m) | N/A | Jun. 26, 2018 |
| 5 | Controller | CT | SC100 | N/A | N/A |
| 6 | Controller | MF | MF-7802 | MF780208416 | N/A |
| 7 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |
| 8 | Amplifier | Agilent | 8449B | 3008A02274 | Mar. 09, 2018 |
| 9 | Receiver | Agilent | N9038A | MY52130039 | Sep. 03, 2018 |
| 10 | Antenna | EM | EM-6876-1 | 230 | Jul. 07, 2018 |
| 11 | Controller | CT | SC100 | N/A | N/A |
| 12 | Controller | MF | MF-7802 | MF780208416 | N/A |
| 13 | Cable | emci | EMC104-SM-SM-12000(12m) | N/A | Jul. 05, 2018 |
| 14 | Broad-Band Horn Antenna | Schwarzbeck | BBHA 9170 | 9170319 | Apr. 24, 2018 |
| 15 | Spectrum Analyzer | R&S | FSP40 | 100185 | Sep. 03, 2018 |
| 16 | Microwave Preamplifier With Adaptor | EMC INSTRUMENT | EMC2654045 | 980039 & HA01 | Mar. 26, 2018 |
| 17 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |

| Spectrum Bandwidth Measurement | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100185 | Sep. 03, 2018 |

| Maximum Conducted Output Power Measurement | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Power Meter | ANRITSU | ML2495A | 1128009 | Mar. 26, 2018 |
| 2 | Pulse Power Sensor | ANRITSU | MA 2411B | 1027500 | Mar. 26, 2018 |

| Power Spectral Density Measurement | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100185 | Sep. 03, 2018 |

| Frequency Stability Measurement | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP 40 | 100185 | Sep. 03, 2018 |
| 2 | Precision Oven Tester | HOLINK | H-T-1F-D | BA03101701 | May 21, 2018 |

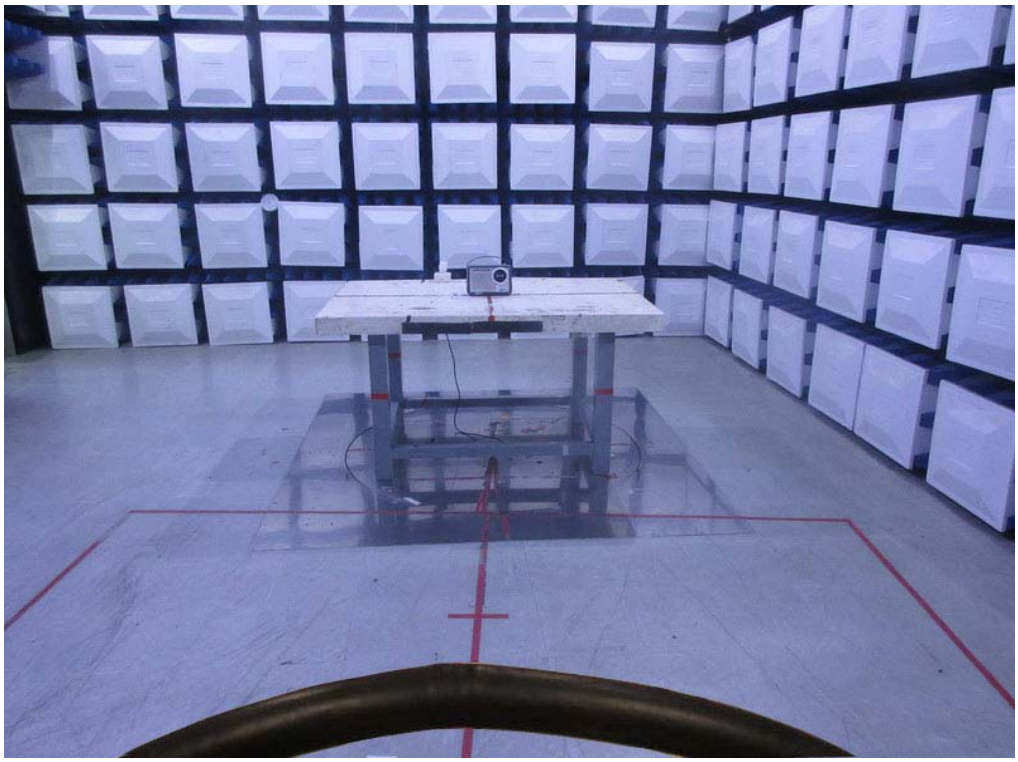
Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

## 10. EUT TEST PHOTOS

**Conducted Measurement Photos**

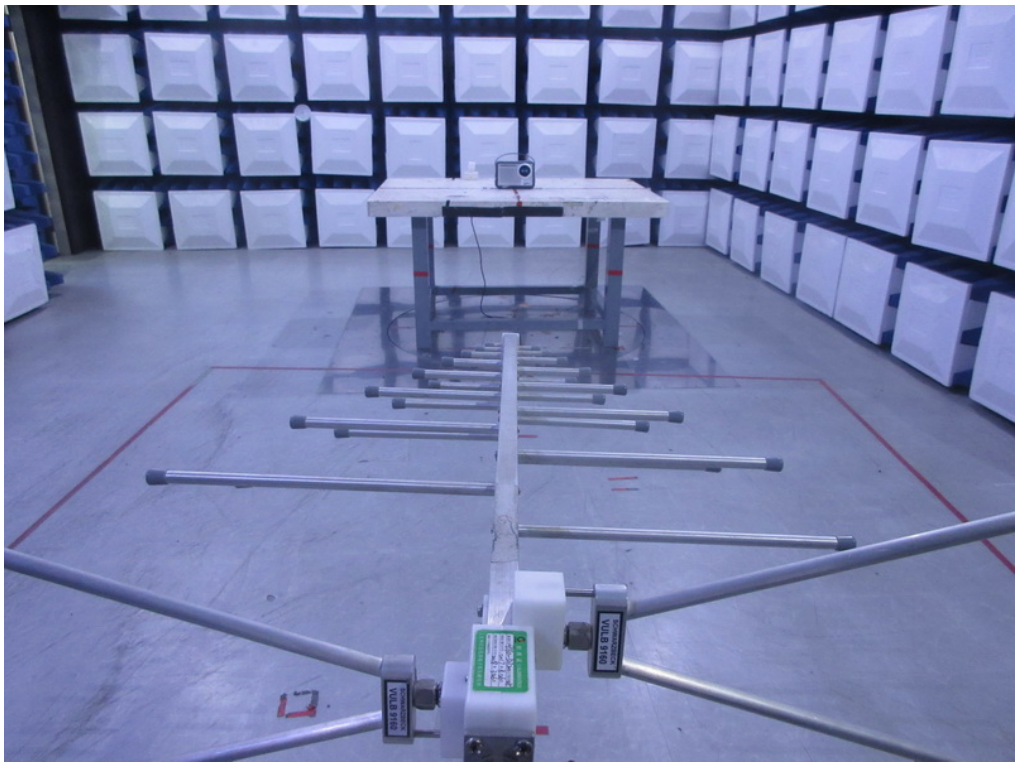
## Radiated Measurement Photos

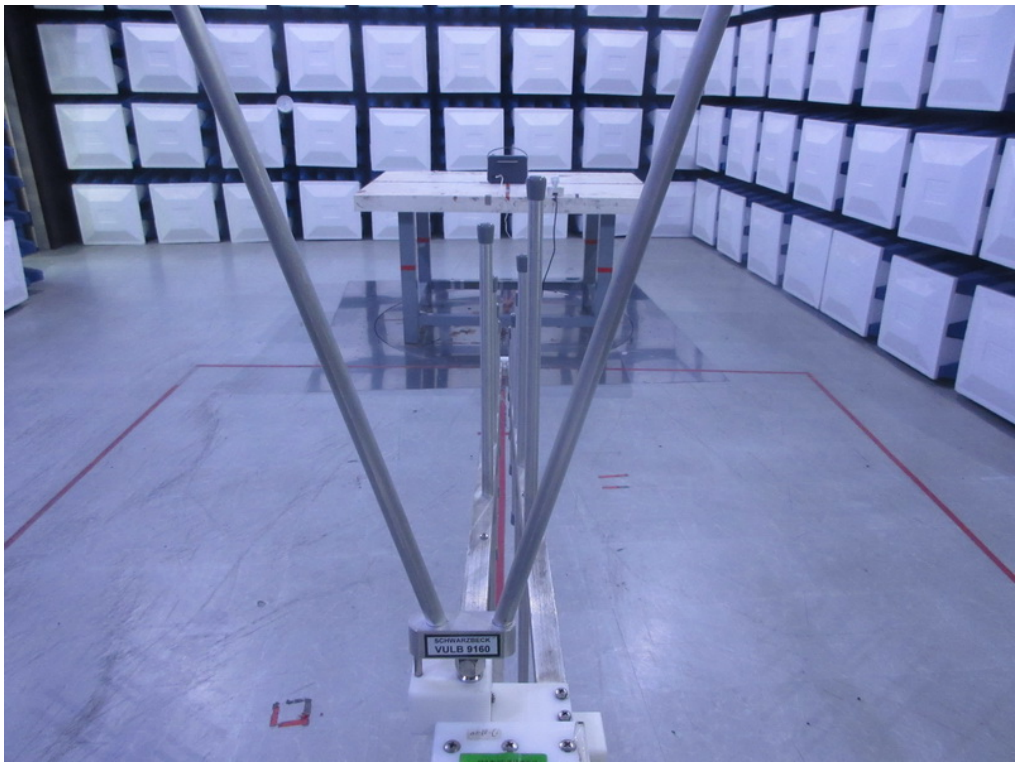
### 9kHz to 30MHz



## Radiated Measurement Photos

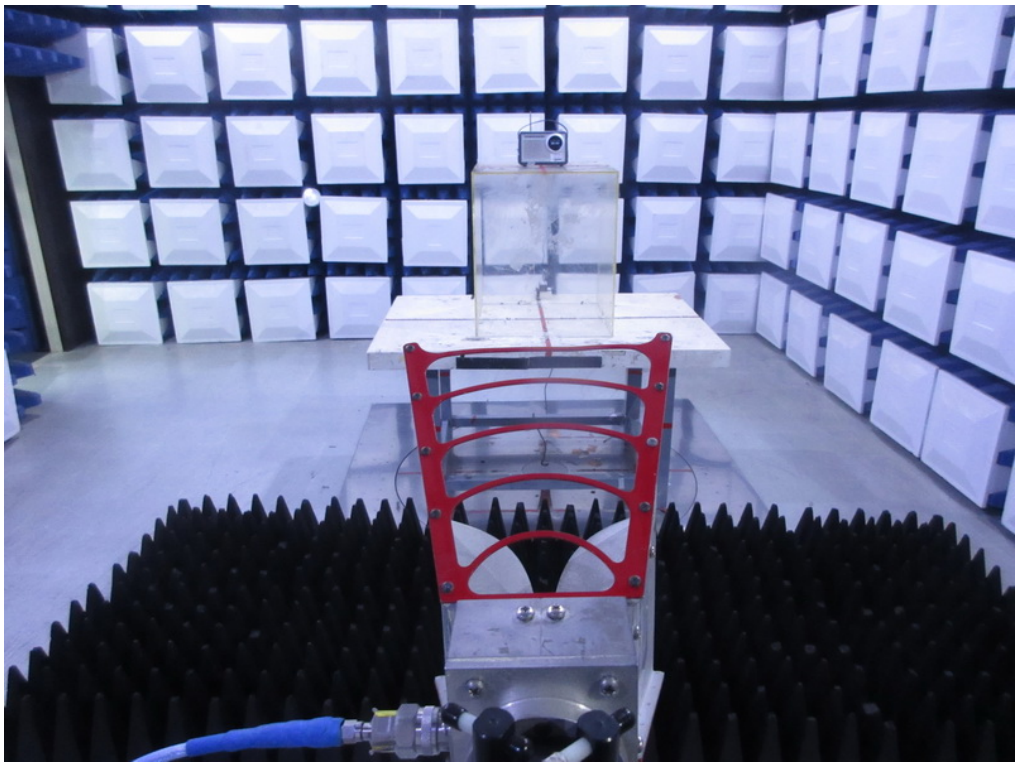
### 30MHz to 1000MHz

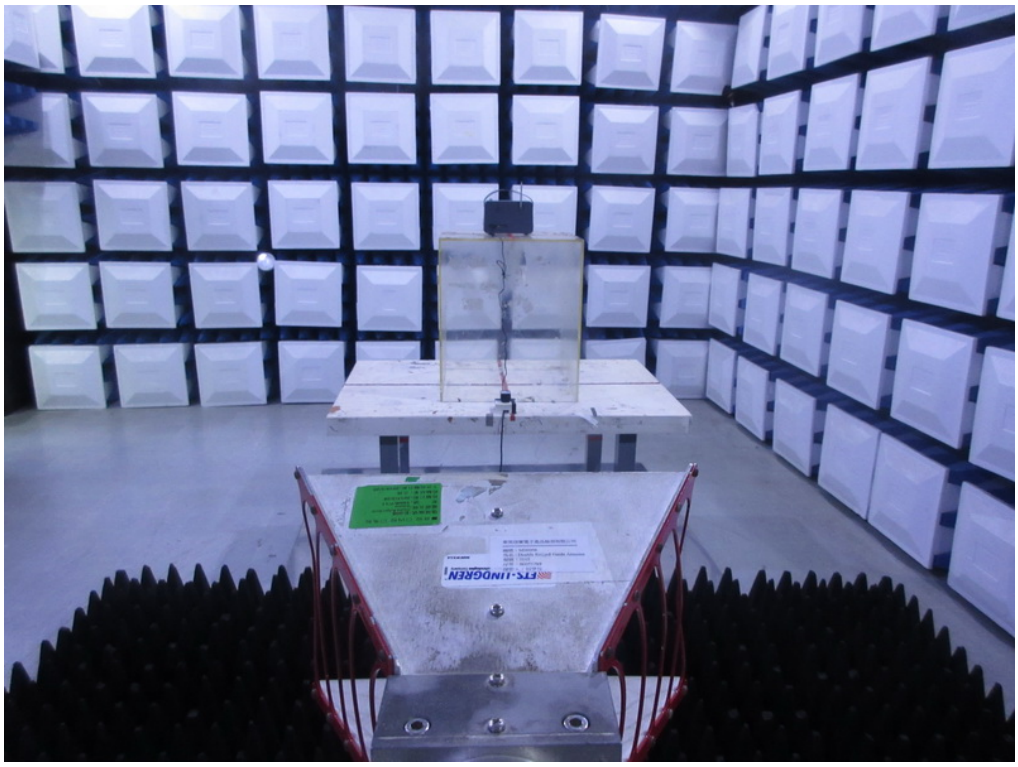


## Radiated Measurement Photos

### Above 1000MHz

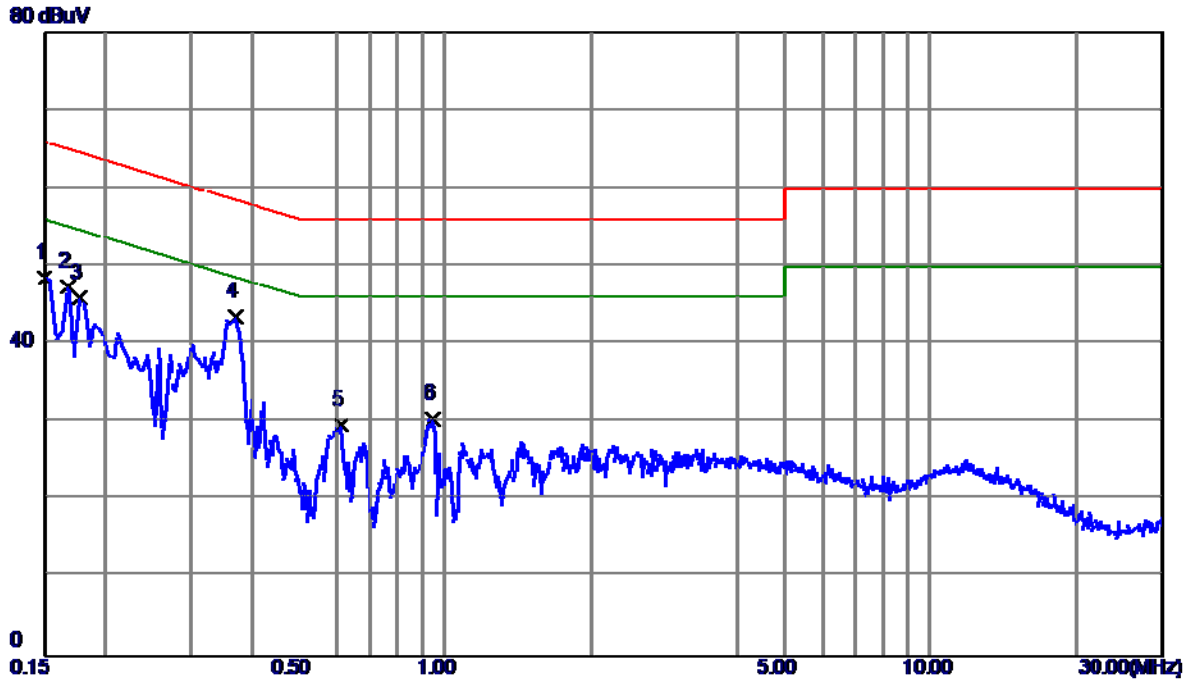




# APPENDIX A - CONDUCTED EMISSION

| Test Mode: | TX MODE (Adapter 1) |
|---|---|

**Line**

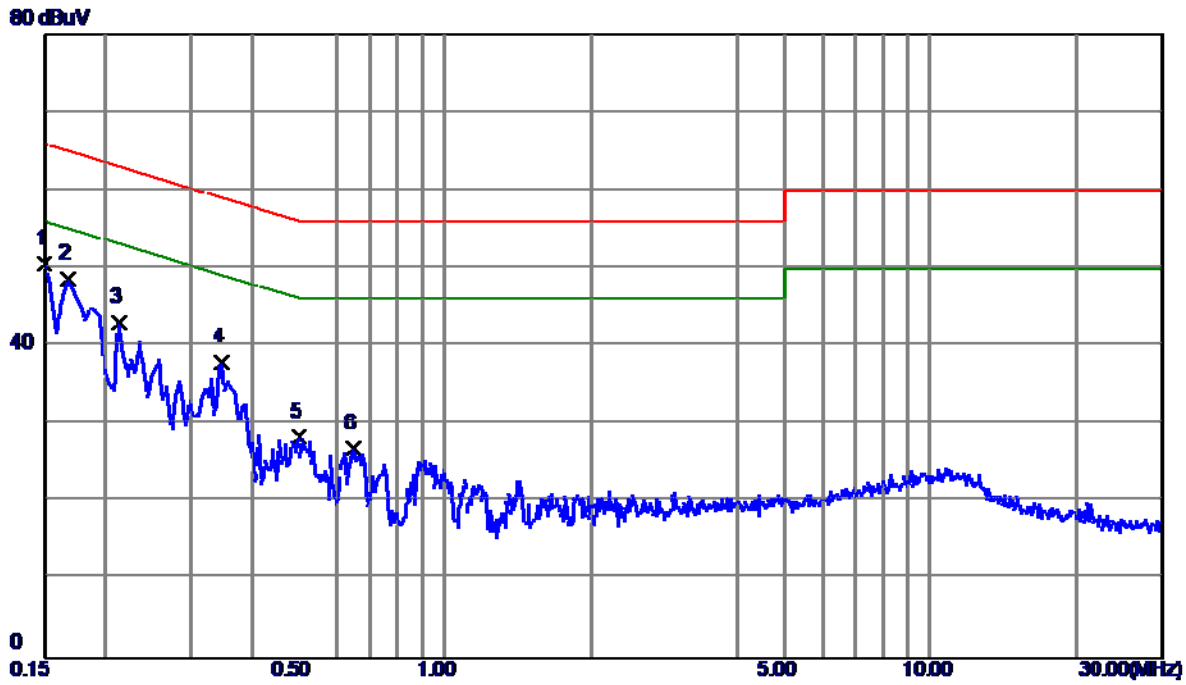



| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | 0.1500 | 38.70 | 9.79 | 48.49 | 66.00 | -17.51 | Peak | |
| 2 | 0.1680 | 37.52 | 9.78 | 47.30 | 65.06 | -17.76 | Peak | |
| 3 | 0.1770 | 36.08 | 9.78 | 45.86 | 64.63 | -18.77 | Peak | |
| 4 * | 0.3704 | 33.67 | 9.79 | 43.46 | 58.49 | -15.03 | Peak | |
| 5 | 0.6134 | 19.82 | 9.81 | 29.63 | 56.00 | -26.37 | Peak | |
| 6 | 0.9465 | 20.61 | 9.85 | 30.46 | 56.00 | -25.54 | Peak | |

Note：The test result has included the cable loss.

| Test Mode: | TX MODE (Adapter 1) |
|---|---|

**Neutral**



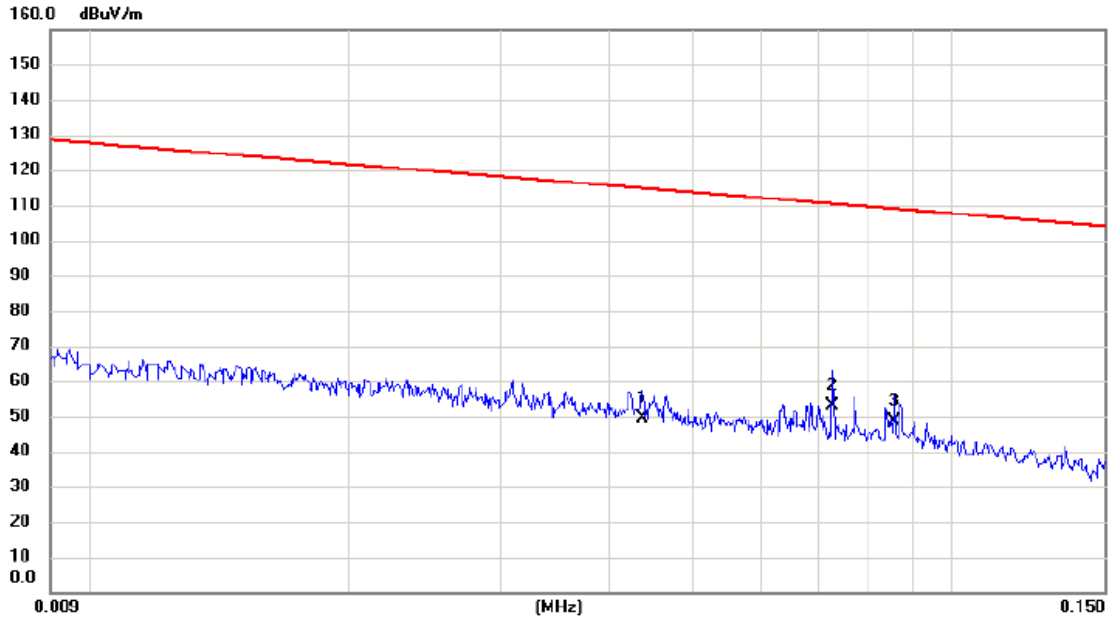

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 * | 0.1500 | 40.90 | 9.68 | 50.58 | 66.00 | -15.42 | Peak | |
| 2 | 0.1680 | 38.91 | 9.68 | 48.59 | 65.06 | -16.47 | Peak | |
| 3 | 0.2130 | 33.38 | 9.69 | 43.07 | 63.09 | -20.02 | Peak | |
| 4 | 0.3480 | 28.22 | 9.70 | 37.92 | 59.01 | -21.09 | Peak | |
| 5 | 0.5010 | 18.59 | 9.70 | 28.29 | 56.00 | -27.71 | Peak | |
| 6 | 0.6495 | 17.11 | 9.71 | 26.82 | 56.00 | -29.18 | Peak | |

Note：The test result has included the cable loss.

# APPENDIX B - RADIATED EMISSION (9KHZ TO 30MHZ)

| Test Mode: | TX MODE (Adapter 1) |
|---|---|

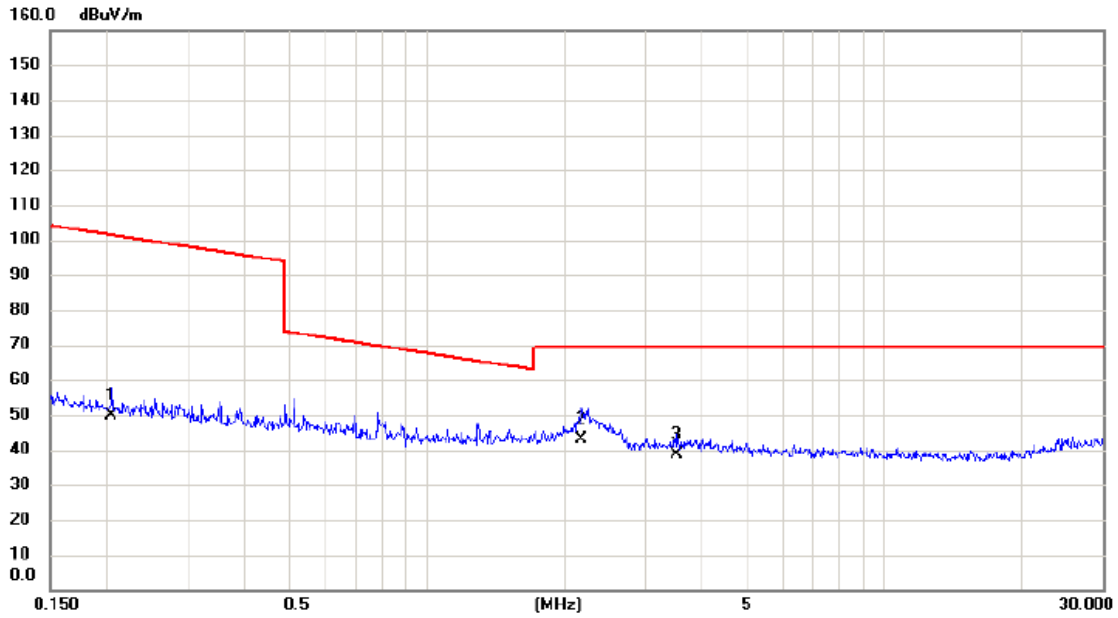
**Ant 0°**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.0437 | 30.47 | 18.91 | 49.38 | 114.80 | -65.42 | AVG | |
| 2 | * | 0.0726 | 34.86 | 18.28 | 53.14 | 110.39 | -57.25 | AVG | |
| 3 | | 0.0857 | 30.69 | 17.97 | 48.66 | 108.95 | -60.29 | AVG | |

| Test Mode: | TX MODE (Adapter 1) |
|---|---|

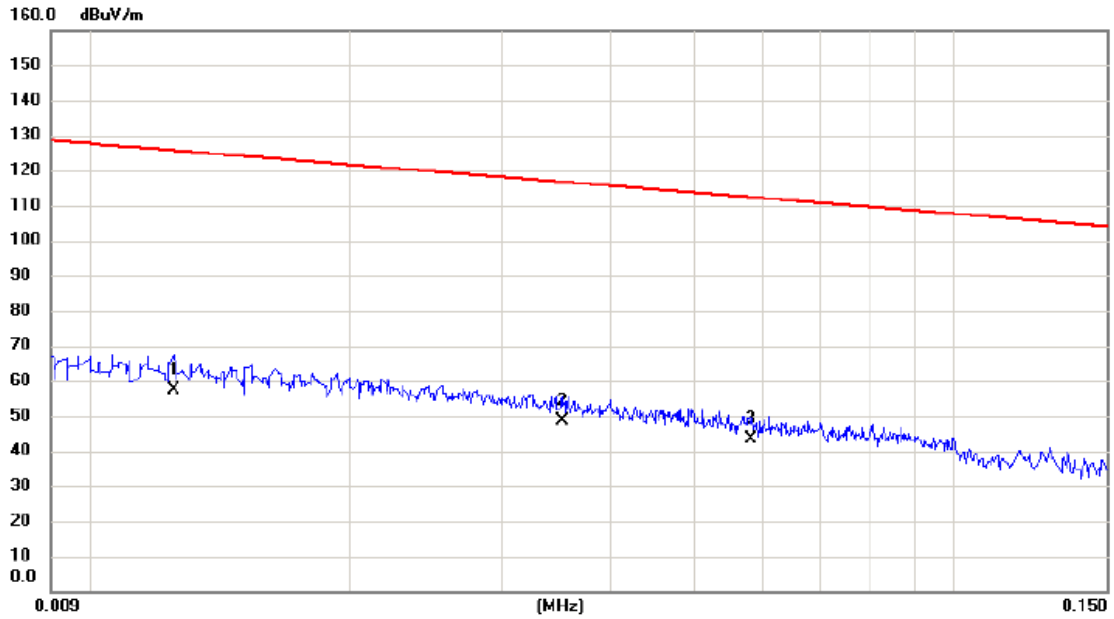
**Ant 0°**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.2040 | 32.85 | 16.79 | 49.64 | 101.41 | -51.77 | AVG | |
| 2 | * | 2.1783 | 27.45 | 15.46 | 42.91 | 69.54 | -26.63 | QP | |
| 3 | | 3.5278 | 23.69 | 15.08 | 38.77 | 69.54 | -30.77 | QP | |

| Test Mode: | TX MODE (Adapter 1) |
|---|---|

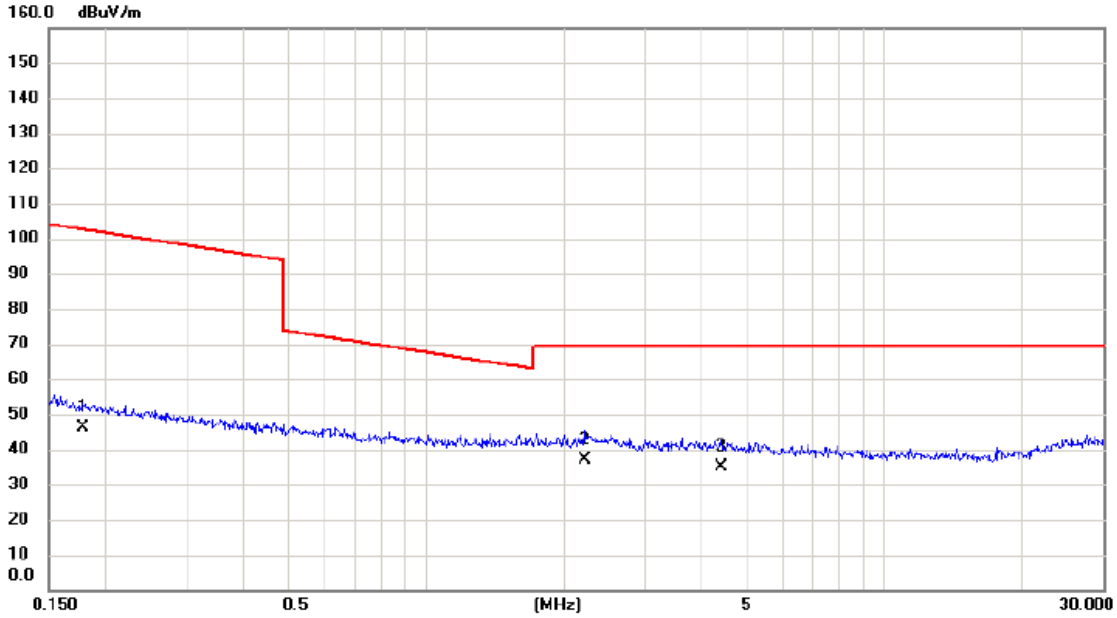
**Ant 90°**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.0125 | 36.89 | 20.59 | 57.48 | 125.67 | -68.19 | AVG | |
| 2 | * | 0.0352 | 29.35 | 19.16 | 48.51 | 116.67 | -68.16 | AVG | |
| 3 | | 0.0581 | 24.69 | 18.57 | 43.26 | 112.32 | -69.06 | AVG | |

| Test Mode: | TX MODE (Adapter 1) |
|---|---|

**Ant 90°**

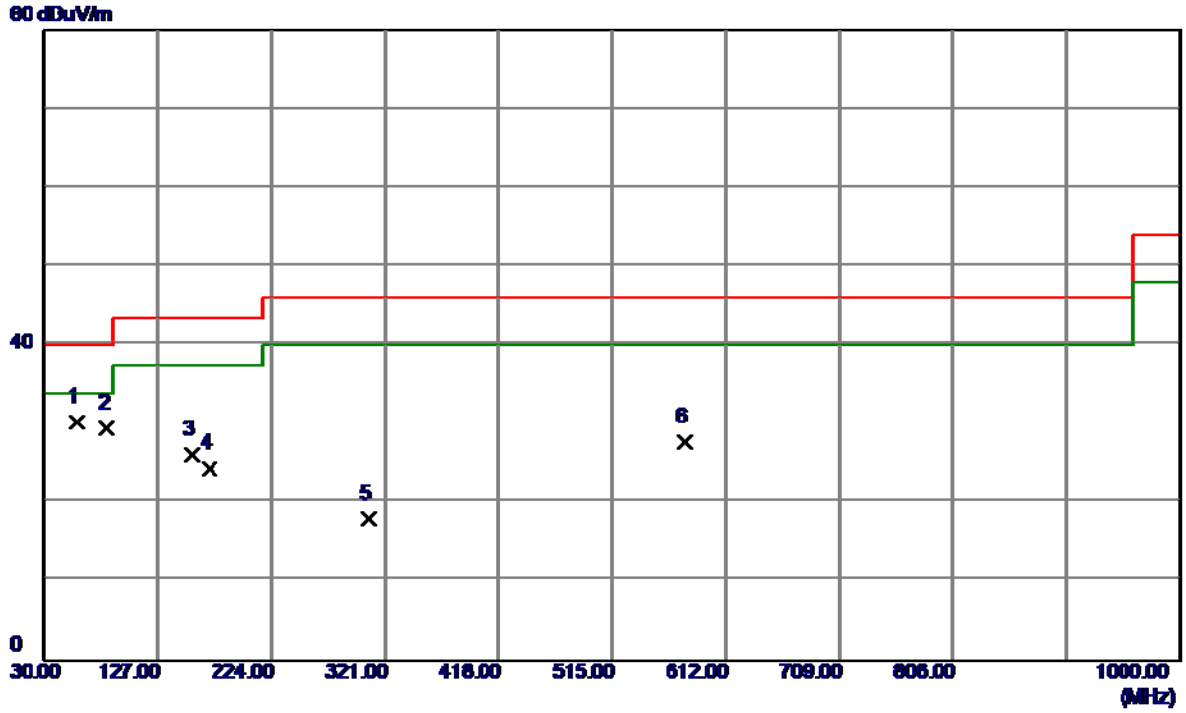



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.1787 | 29.45 | 16.86 | 46.31 | 102.56 | -56.25 | AVG | |
| 2 | * | 2.2250 | 21.56 | 15.44 | 37.00 | 69.54 | -32.54 | QP | |
| 3 | | 4.4071 | 20.34 | 14.72 | 35.06 | 69.54 | -34.48 | QP | |

# APPENDIX C - RADIATED EMISSION (30MHZ TO 1000MHZ)

| Test Mode: | UNII-1/TX A Mode 5180MHz (Adapter 1) |
|---|---|

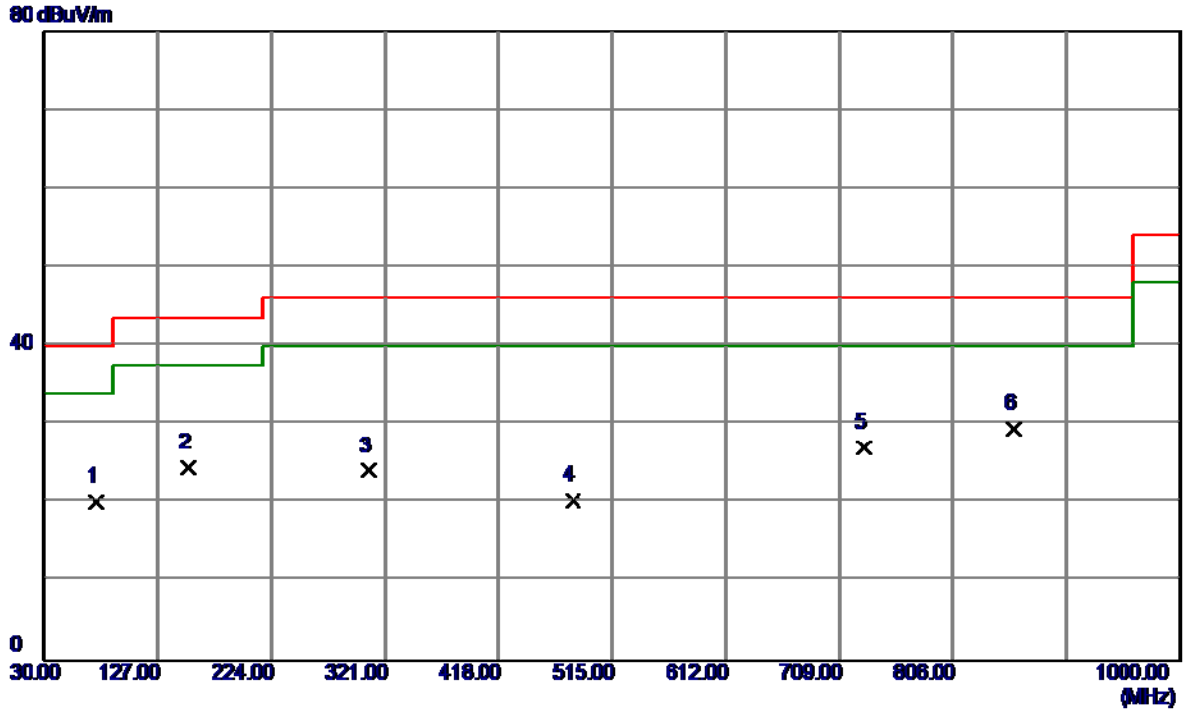
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 58.1300 | 44.41 | -14.13 | 30.28 | 40.00 | -9.72 | Peak | |
| 2 | 83.3500 | 47.84 | -18.34 | 29.50 | 40.00 | -10.50 | Peak | |
| 3 | 156.1000 | 39.26 | -13.16 | 26.10 | 43.50 | -17.40 | Peak | |
| 4 | 171.6200 | 36.67 | -12.29 | 24.38 | 43.50 | -19.12 | Peak | |
| 5 | 307.4200 | 30.65 | -12.70 | 17.95 | 46.00 | -28.05 | Peak | |
| 6 | 577.0800 | 34.64 | -7.01 | 27.63 | 46.00 | -18.37 | Peak | |

| Test Mode: | UNII-1/TX A Mode 5180MHz (Adapter 1) |
|---|---|

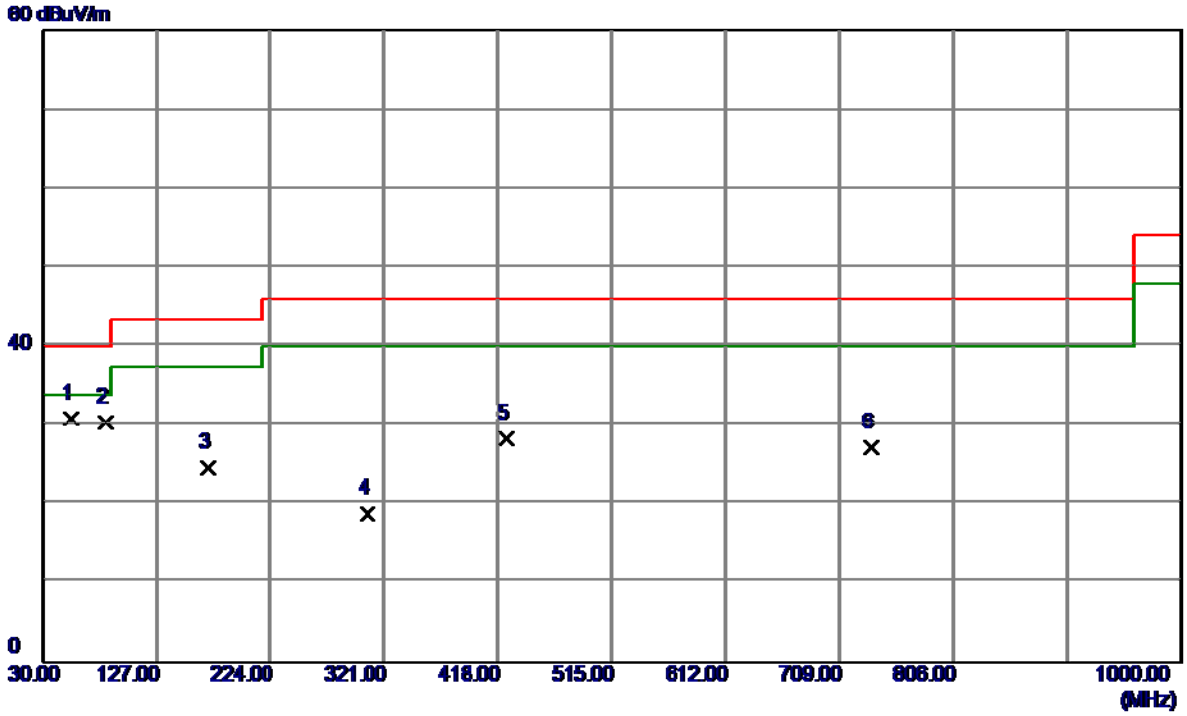
**Horizontal**




| No. | Freq. MHz | Reading Level dBuV/m | Correct Factor dB | Measurement dBuV/m | Limit dBuV/m | Margin dB | Detector | Comment |
|---|---|---|---|---|---|---|---|---|
| 1 | 74.6200 | 37.21 | -17.04 | 20.17 | 40.00 | -19.83 | Peak | |
| 2 | 153.1900 | 37.77 | -13.34 | 24.43 | 43.50 | -19.07 | Peak | |
| 3 | 307.4200 | 36.78 | -12.70 | 24.08 | 46.00 | -21.92 | Peak | |
| 4 | 481.0500 | 29.52 | -9.18 | 20.34 | 46.00 | -25.66 | Peak | |
| 5 | 730.3400 | 30.06 | -3.03 | 27.03 | 46.00 | -18.97 | Peak | |
| 6 * | 857.4100 | 29.29 | 0.15 | 29.44 | 46.00 | -16.56 | Peak | |

| Test Mode: | UNII-1/TX A Mode 5200MHz (Adapter 1) |
|---|---|

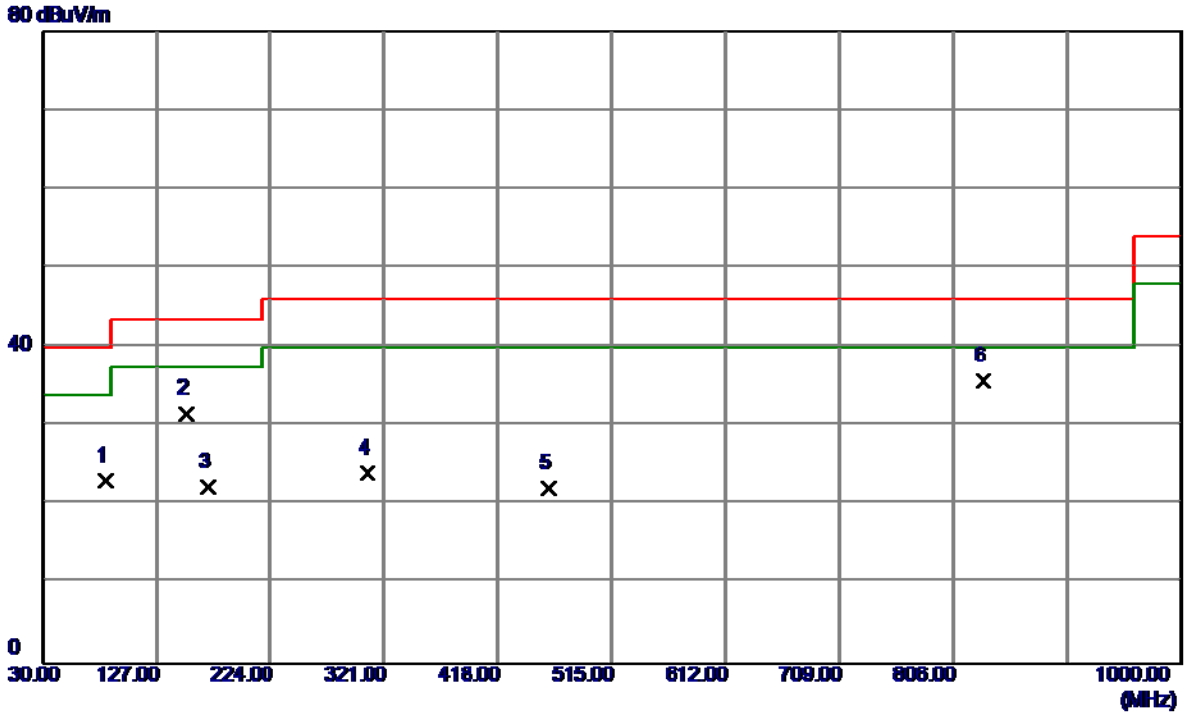
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 55.2200 | 44.81 | -13.94 | 30.87 | 40.00 | -9.13 | Peak | |
| 2 | 84.3200 | 48.78 | -18.37 | 30.41 | 40.00 | -9.59 | Peak | |
| 3 | 171.6200 | 36.96 | -12.29 | 24.67 | 43.50 | -18.83 | Peak | |
| 4 | 307.4200 | 31.60 | -12.70 | 18.90 | 46.00 | -27.10 | Peak | |
| 5 | 425.7600 | 38.99 | -10.63 | 28.36 | 46.00 | -17.64 | Peak | |
| 6 | 736.1599 | 29.99 | -2.86 | 27.13 | 46.00 | -18.87 | Peak | |

| Test Mode: | UNII-1/TX A Mode 5200MHz (Adapter 1) |
|---|---|

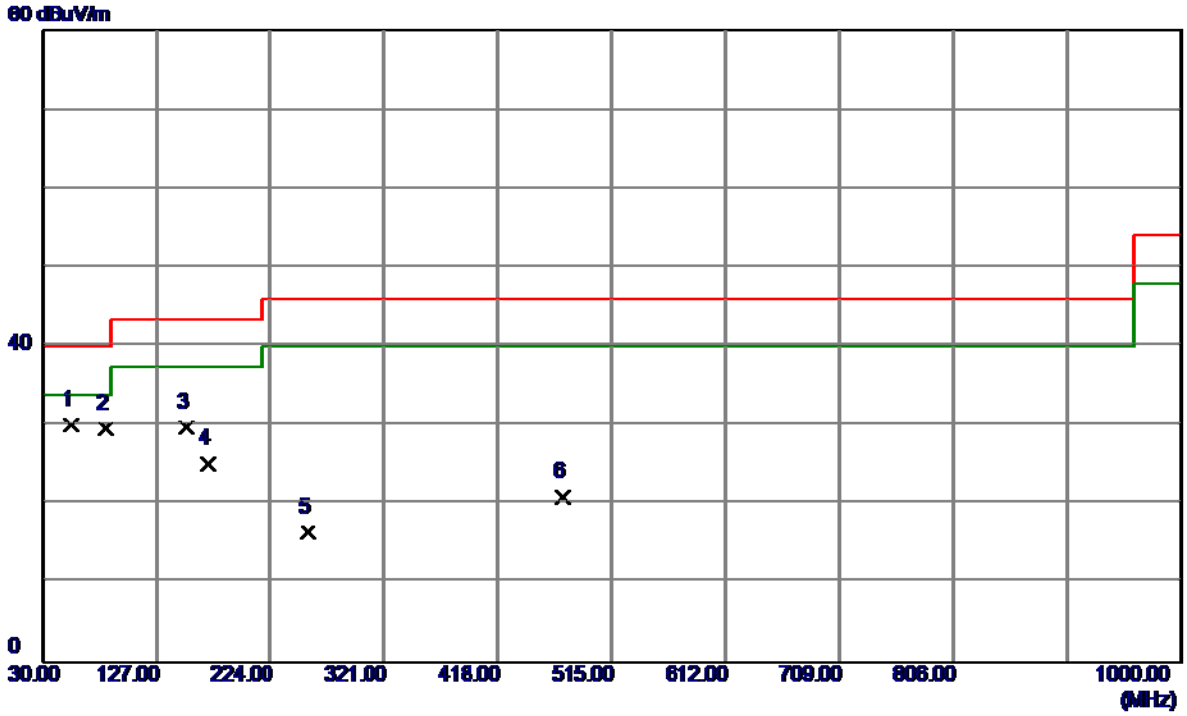
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 84.3200 | 41.43 | -18.37 | 23.06 | 40.00 | -16.94 | Peak | |
| 2 | 153.1900 | 44.79 | -13.34 | 31.45 | 43.50 | -12.05 | Peak | |
| 3 | 171.6200 | 34.60 | -12.29 | 22.31 | 43.50 | -21.19 | Peak | |
| 4 | 307.4200 | 36.69 | -12.70 | 23.99 | 46.00 | -22.01 | Peak | |
| 5 | 460.6800 | 31.70 | -9.68 | 22.02 | 46.00 | -23.98 | Peak | |
| 6 * | 832.1900 | 36.11 | -0.48 | 35.63 | 46.00 | -10.37 | Peak | |

| Test Mode: | UNII-1/TX A Mode 5240MHz (Adapter 1) |
|---|---|

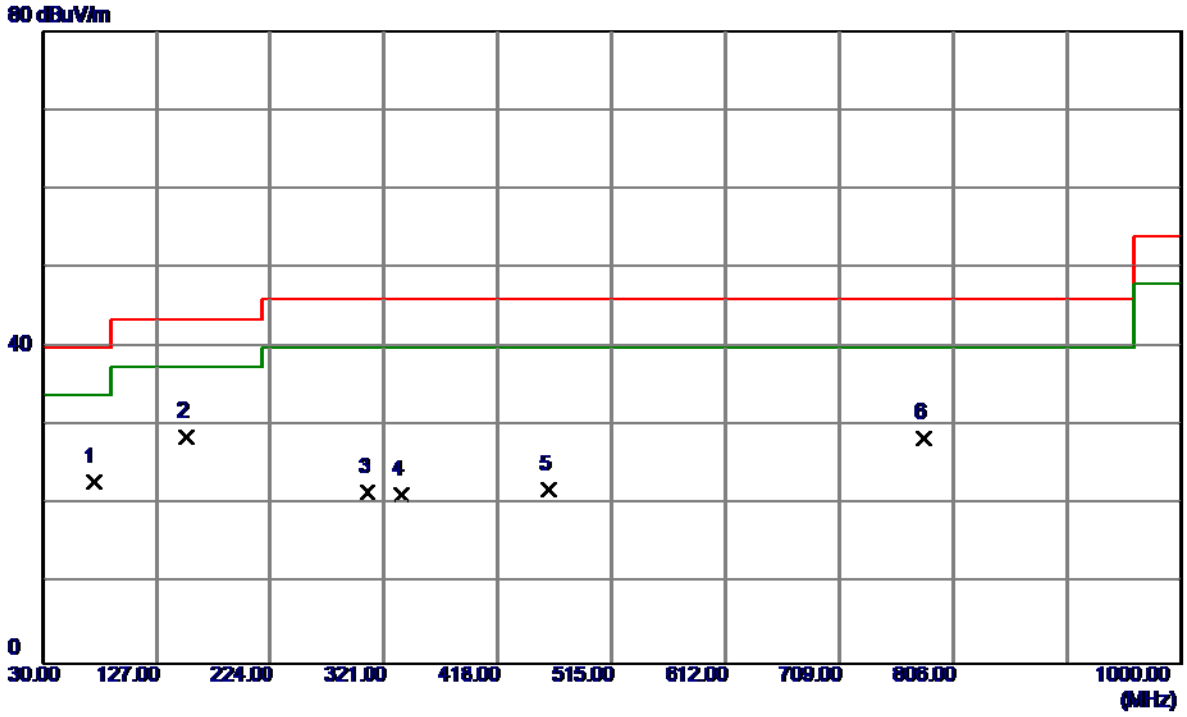
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 55.2200 | 43.97 | -13.94 | 30.03 | 40.00 | -9.97 | Peak | |
| 2 | 84.3200 | 47.90 | -18.37 | 29.53 | 40.00 | -10.47 | Peak | |
| 3 | 153.1900 | 43.11 | -13.34 | 29.77 | 43.50 | -13.73 | Peak | |
| 4 | 171.6200 | 37.37 | -12.29 | 25.08 | 43.50 | -18.42 | Peak | |
| 5 | 256.0100 | 31.90 | -15.38 | 16.52 | 46.00 | -29.48 | Peak | |
| 6 | 473.2900 | 30.38 | -9.37 | 21.01 | 46.00 | -24.99 | Peak | |

| Test Mode: | UNII-1/TX A Mode 5240MHz (Adapter 1) |
|---|---|

**Horizontal**

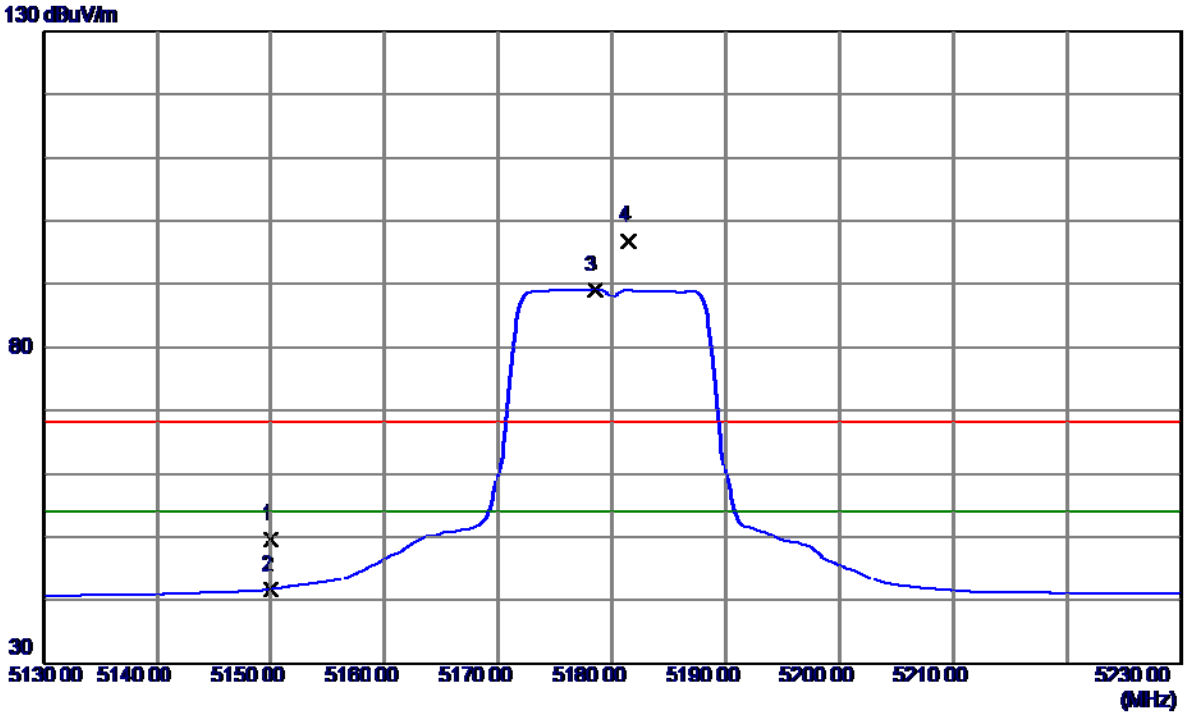



| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 73.6500 | 39.84 | -16.93 | 22.91 | 40.00 | -17.09 | Peak | |
| 2 * | 153.1900 | 41.93 | -13.34 | 28.59 | 43.50 | -14.91 | Peak | |
| 3 | 307.4200 | 34.26 | -12.70 | 21.56 | 46.00 | -24.44 | Peak | |
| 4 | 336.5200 | 33.49 | -12.19 | 21.30 | 46.00 | -24.70 | Peak | |
| 5 | 460.6800 | 31.67 | -9.68 | 21.99 | 46.00 | -24.01 | Peak | |
| 6 | 780.7800 | 30.22 | -1.78 | 28.44 | 46.00 | -17.56 | Peak | |

# APPENDIX D - RADIATED EMISSION (ABOVE 1000MHZ)

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5180MHz |

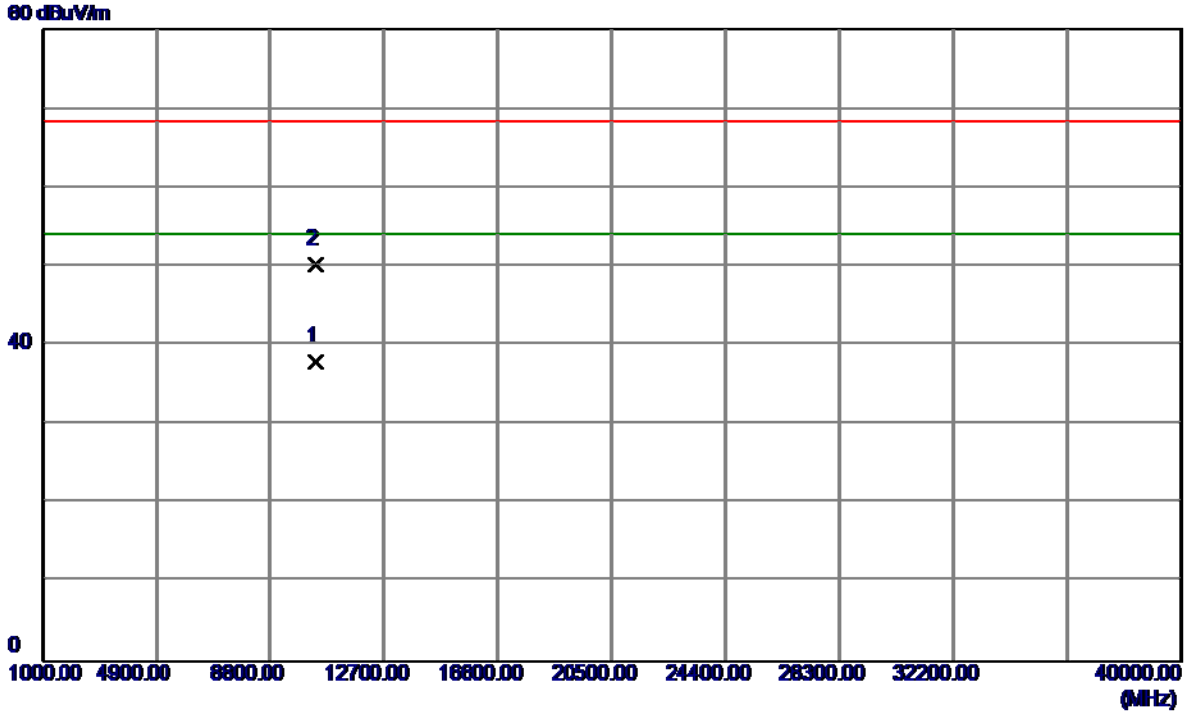
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 5150.0000 | 8.52 | 41.10 | 49.62 | 68.30 | -18.68 | Peak | |
| 2 | 5150.0000 | 0.57 | 41.10 | 41.67 | 54.00 | -12.33 | AVG | |
| 3 * | 5178.5000 | 47.84 | 41.25 | 89.09 | 54.00 | 35.09 | AVG | No Limit |
| 4 | 5181.4000 | 55.45 | 41.26 | 96.71 | 68.30 | 28.41 | Peak | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5180MHz |

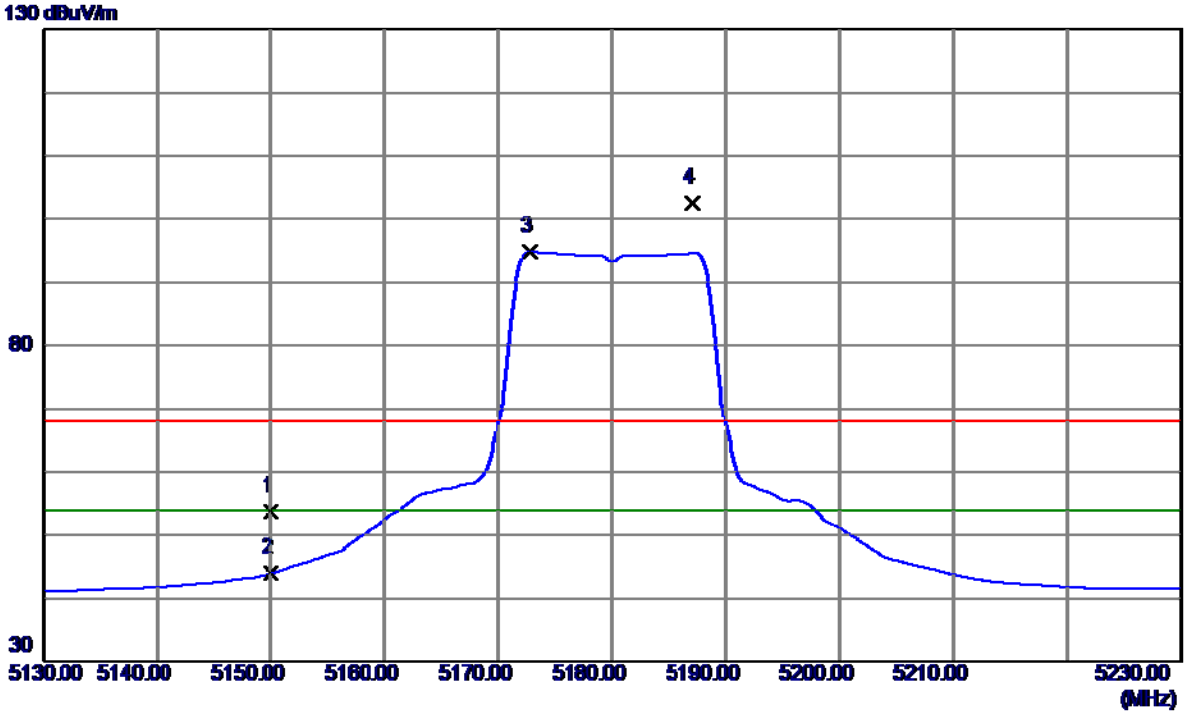
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 10359.8099 | 20.82 | 17.10 | 37.92 | 54.00 | -16.08 | AVG | |
| 2 | 10362.4100 | 33.16 | 17.11 | 50.27 | 68.30 | -18.03 | Peak | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5180MHz |

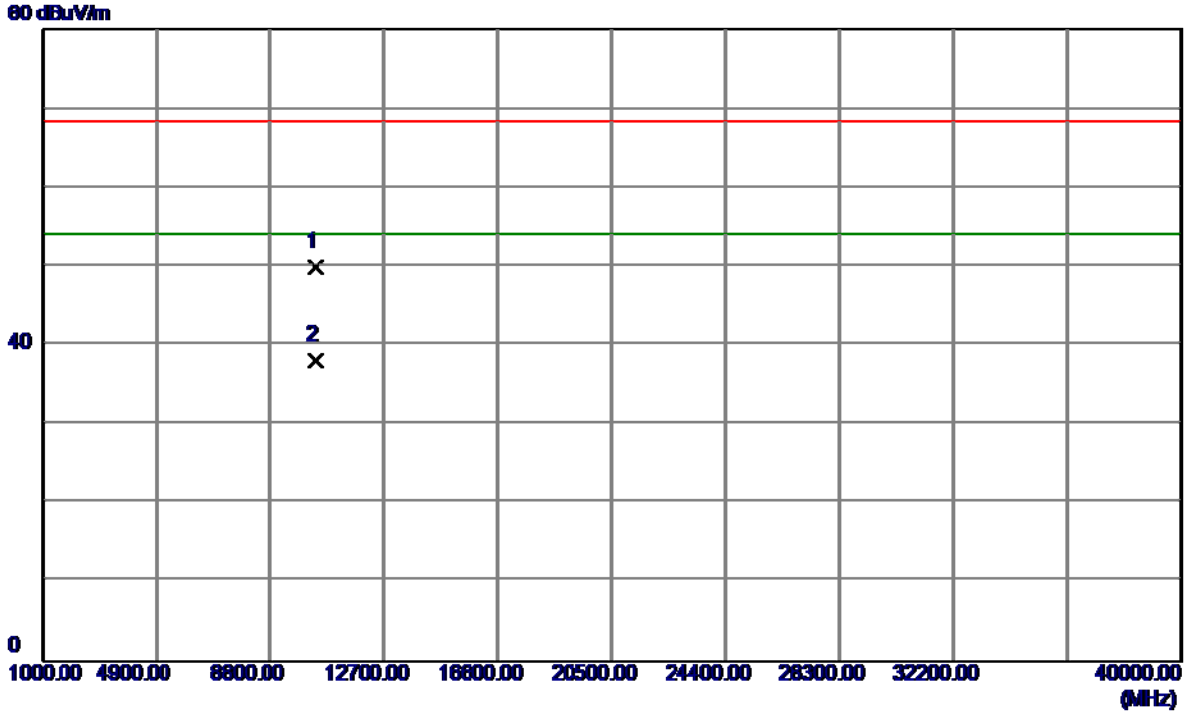
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 5150.0000 | 12.69 | 41.10 | 53.79 | 68.30 | -14.51 | Peak | |
| 2 | 5150.0000 | 2.84 | 41.10 | 43.94 | 54.00 | -10.06 | AVG | |
| 3 * | 5172.8000 | 53.59 | 41.22 | 94.81 | 54.00 | 40.81 | AVG | No Limit |
| 4 | 5187.1000 | 61.24 | 41.29 | 102.53 | 68.30 | 34.23 | Peak | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5180MHz |

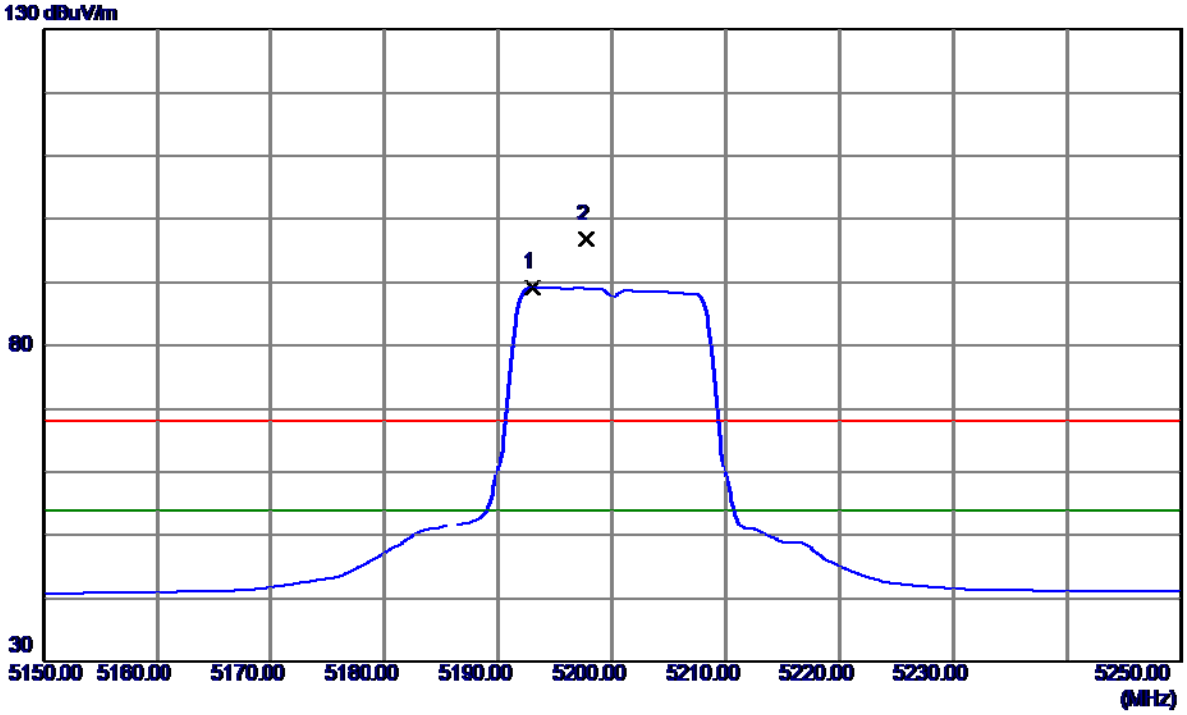
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 10360.9150 | 32.77 | 17.11 | 49.88 | 68.30 | -18.42 | Peak | |
| 2 * | 10361.6350 | 21.03 | 17.11 | 38.14 | 54.00 | -15.86 | AVG | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5200MHz |

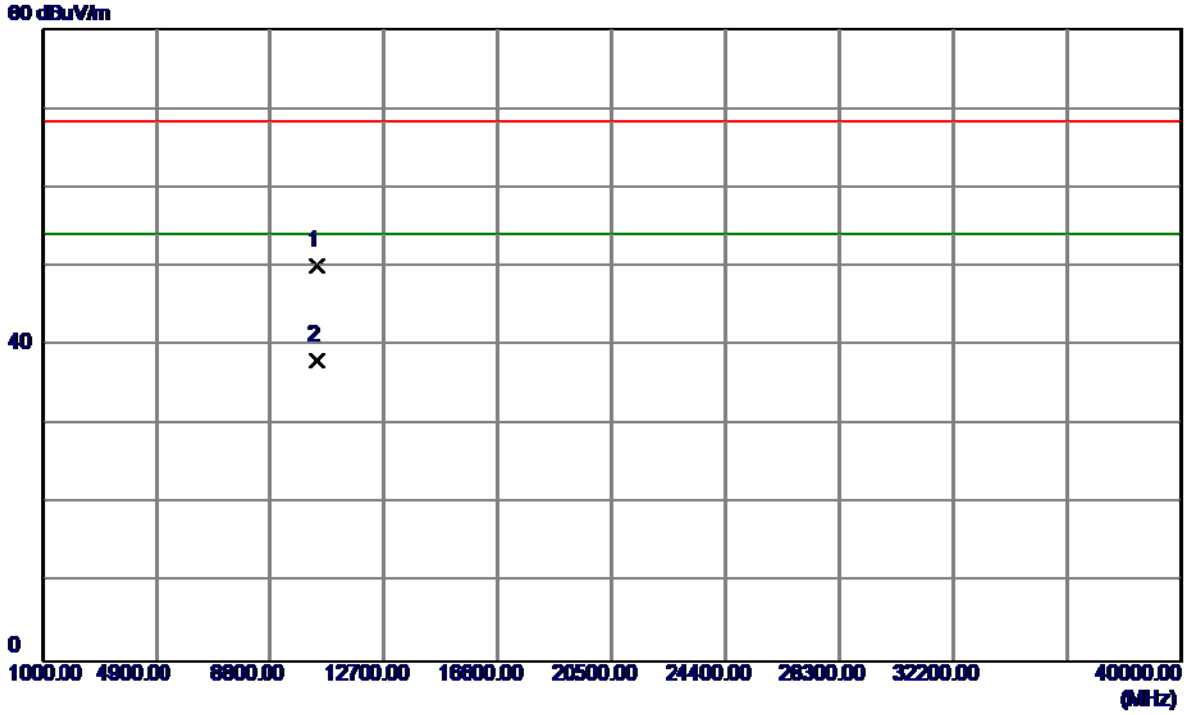
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 5193.0000 | 47.90 | 41.32 | 89.22 | 54.00 | 35.22 | AVG | No Limit |
| 2 | 5197.8000 | 55.50 | 41.34 | 96.84 | 68.30 | 28.54 | Peak | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5200MHz |

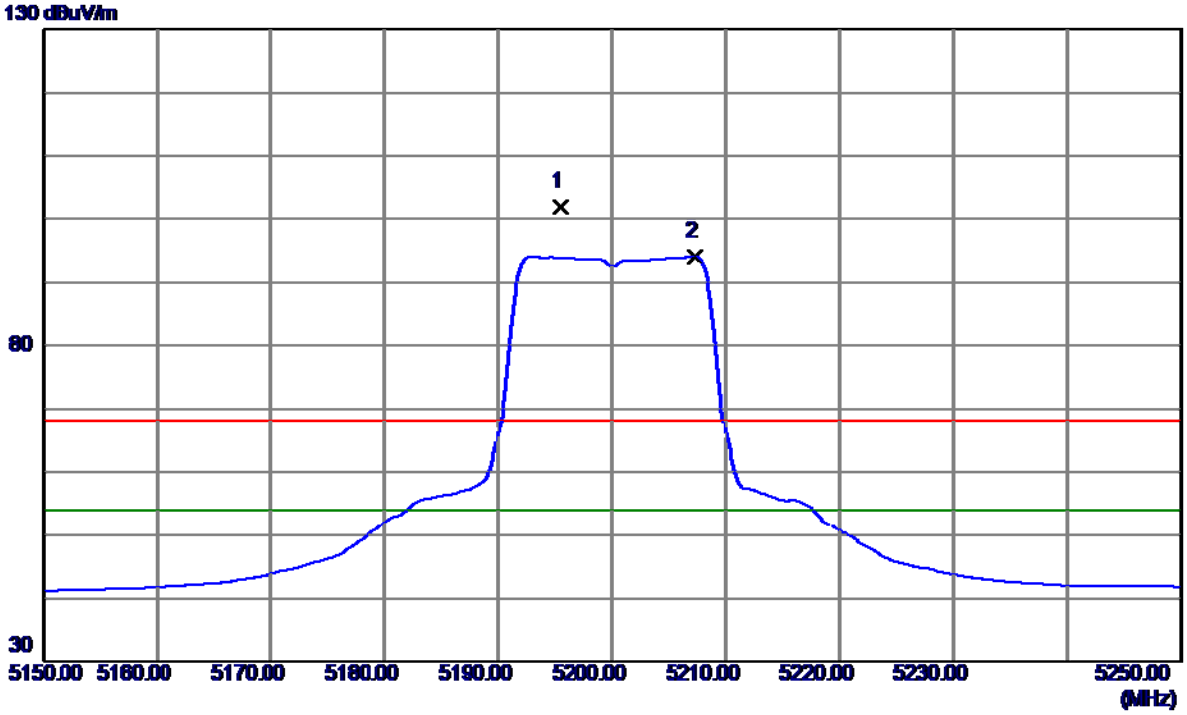
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 10399.0199 | 32.87 | 17.22 | 50.09 | 68.30 | -18.21 | Peak | |
| 2 * | 10399.8900 | 20.84 | 17.22 | 38.06 | 54.00 | -15.94 | AVG | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5200MHz |

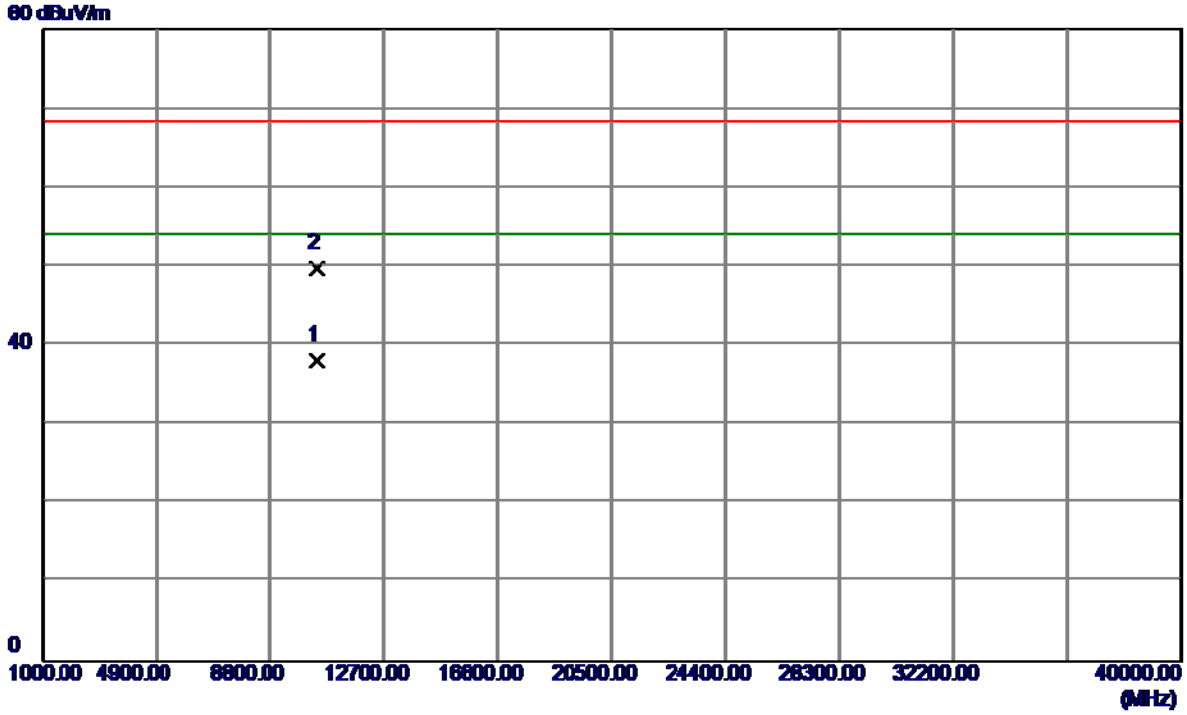
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 5195.4000 | 60.69 | 41.33 | 102.02 | 68.30 | 33.72 | Peak | No Limit |
| 2 * | 5207.3000 | 52.68 | 41.39 | 94.07 | 54.00 | 40.07 | AVG | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5200MHz |

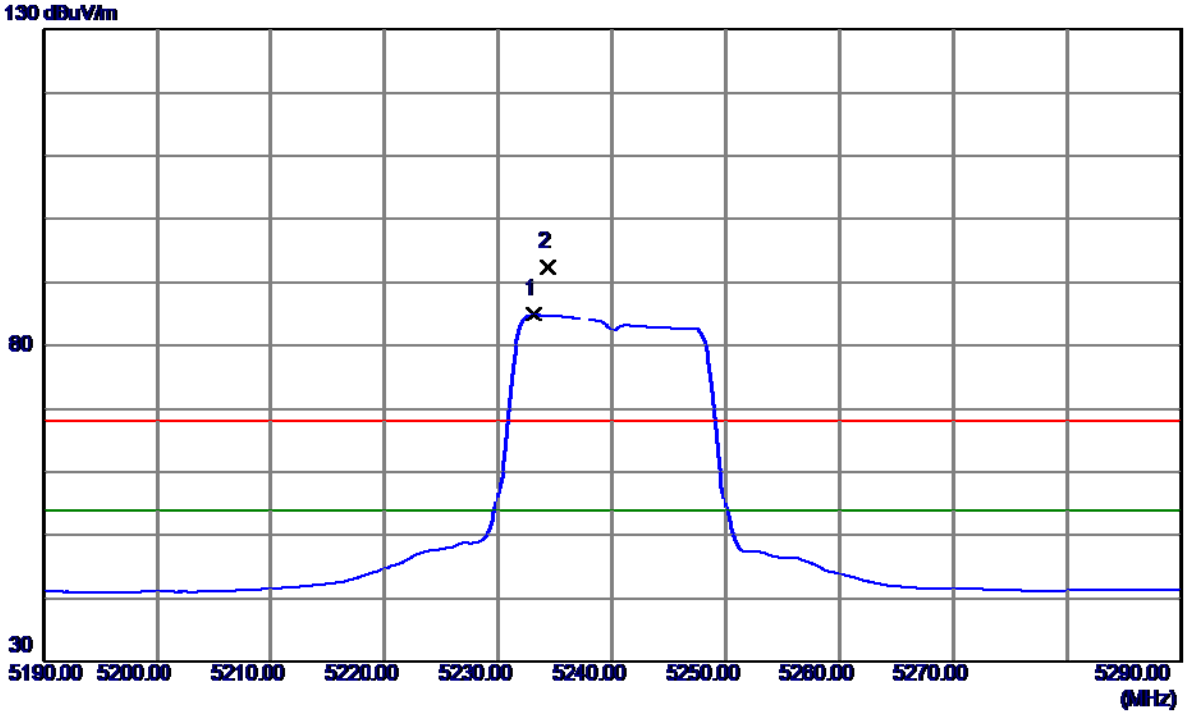
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 10400.2699 | 20.79 | 17.22 | 38.01 | 68.30 | -30.29 | Peak | |
| 2 * | 10400.2950 | 32.54 | 17.22 | 49.76 | 68.30 | -18.54 | Peak | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5240MHz |

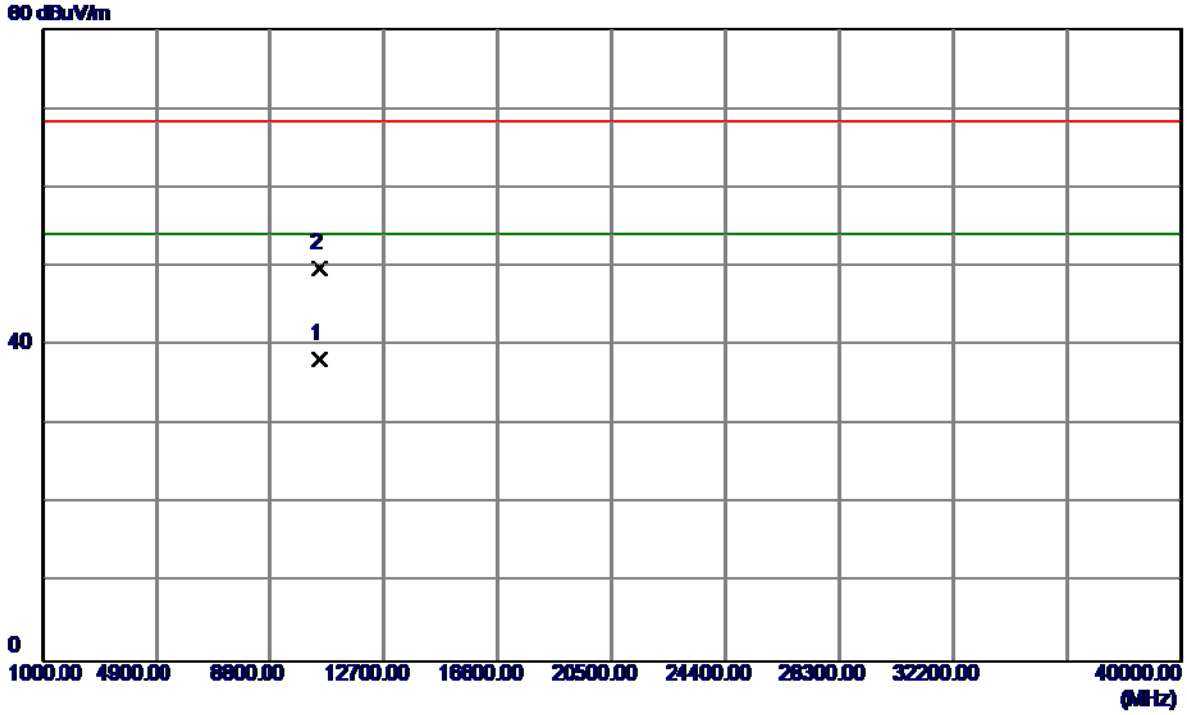
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 5233.1000 | 43.41 | 41.52 | 84.93 | 54.00 | 30.93 | AVG | No Limit |
| 2 | 5234.3000 | 50.91 | 41.53 | 92.44 | 68.30 | 24.14 | Peak | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5240MHz |

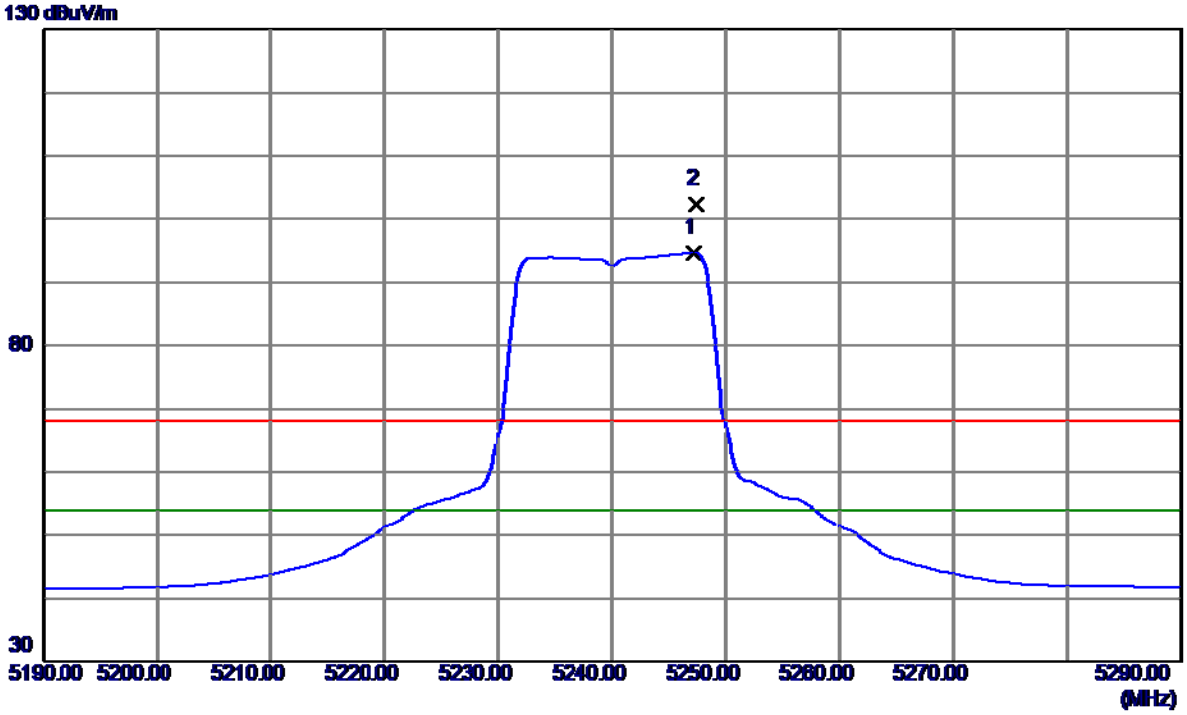
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 10479.6449 | 20.82 | 17.44 | 38.26 | 54.00 | -15.74 | AVG | |
| 2 | 10480.6650 | 32.32 | 17.45 | 49.77 | 68.30 | -18.53 | Peak | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5240MHz |

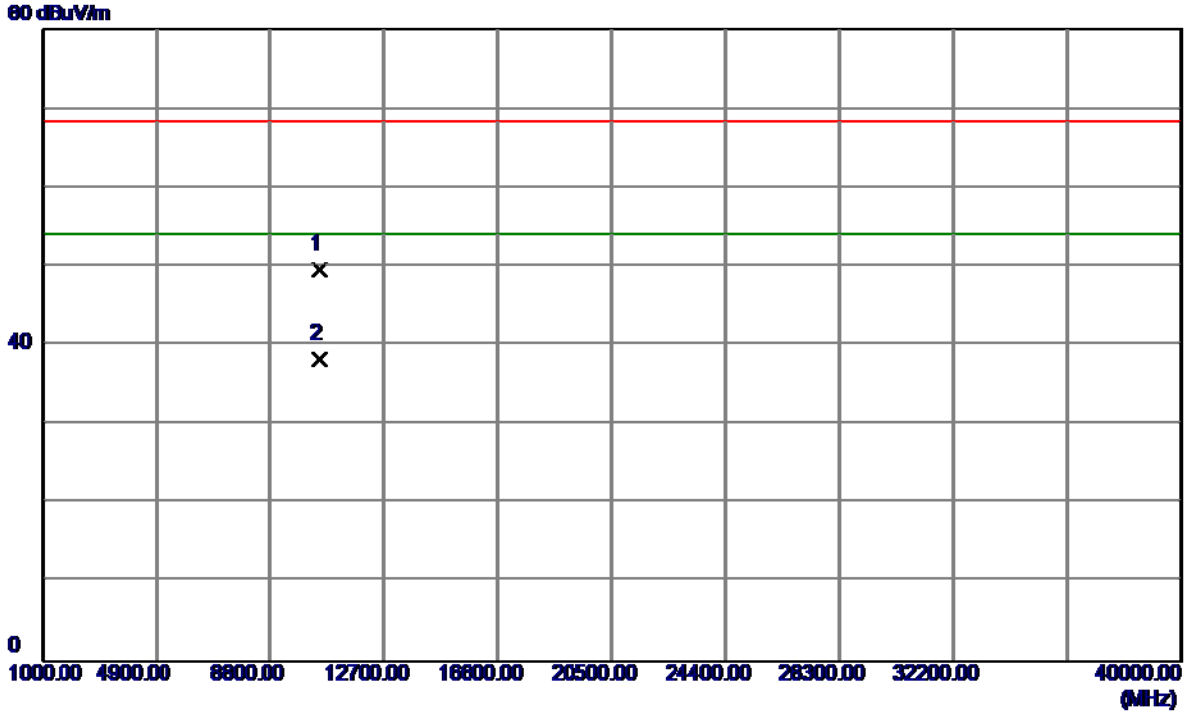
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 5247.2000 | 53.00 | 41.60 | 94.60 | 54.00 | 40.60 | AVG | No Limit |
| 2 | 5247.4000 | 60.82 | 41.60 | 102.42 | 68.30 | 34.12 | Peak | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX A Mode 5240MHz |

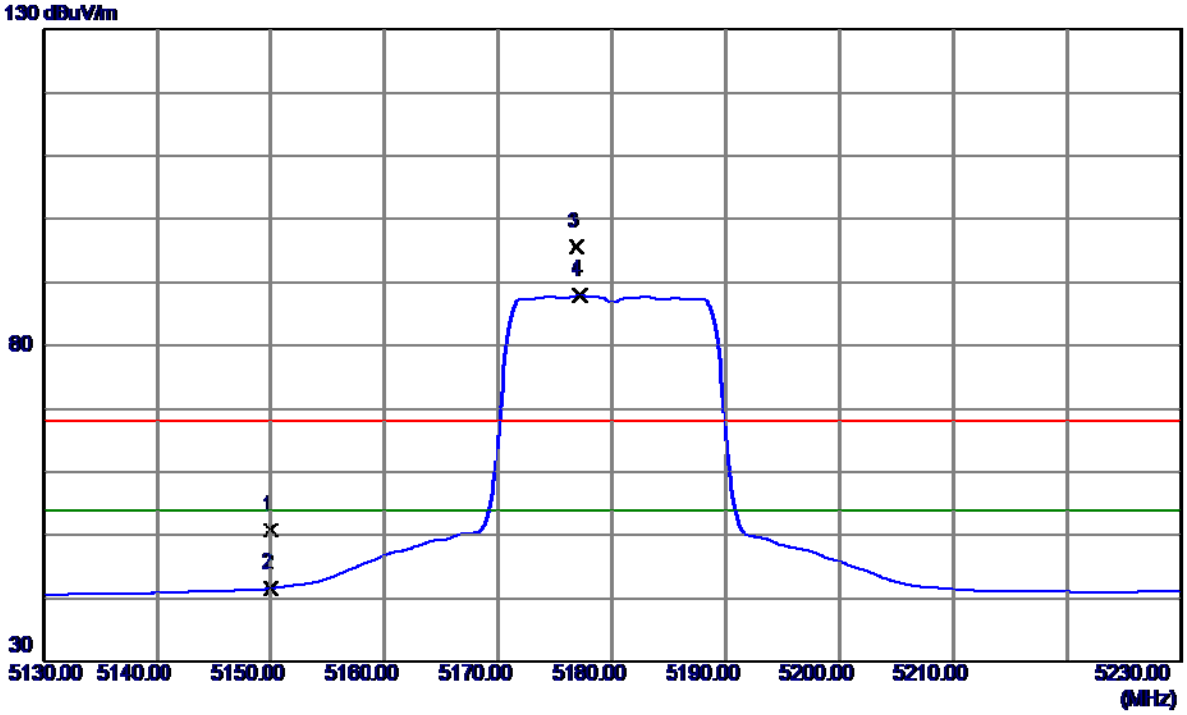
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 10479.6849 | 32.13 | 17.44 | 49.57 | 68.30 | -18.73 | Peak | |
| 2 * | 10482.0350 | 20.82 | 17.45 | 38.27 | 54.00 | -15.73 | AVG | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5180MHz |

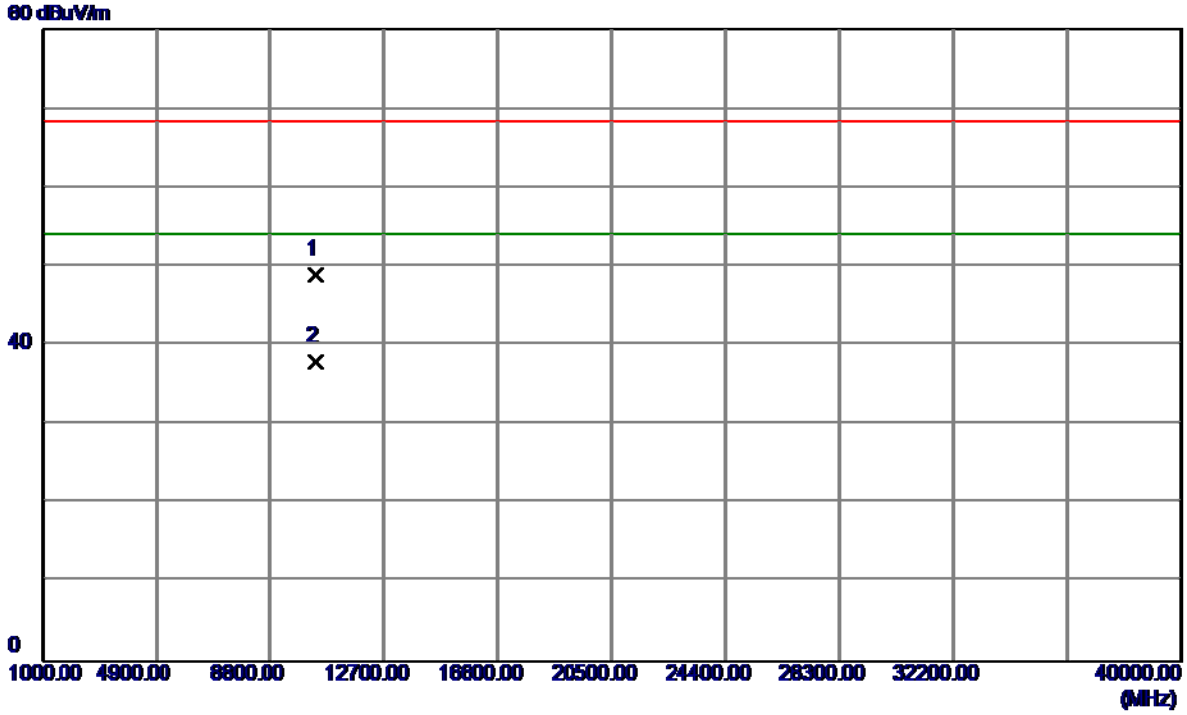
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 5150.0000 | 9.65 | 41.10 | 50.75 | 68.30 | -17.55 | Peak | |
| 2 | 5150.0000 | 0.53 | 41.10 | 41.63 | 54.00 | -12.37 | AVG | |
| 3 | 5176.9000 | 54.31 | 41.24 | 95.55 | 68.30 | 27.25 | Peak | No Limit |
| 4 * | 5177.2000 | 46.71 | 41.24 | 87.95 | 54.00 | 33.95 | AVG | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5180MHz |

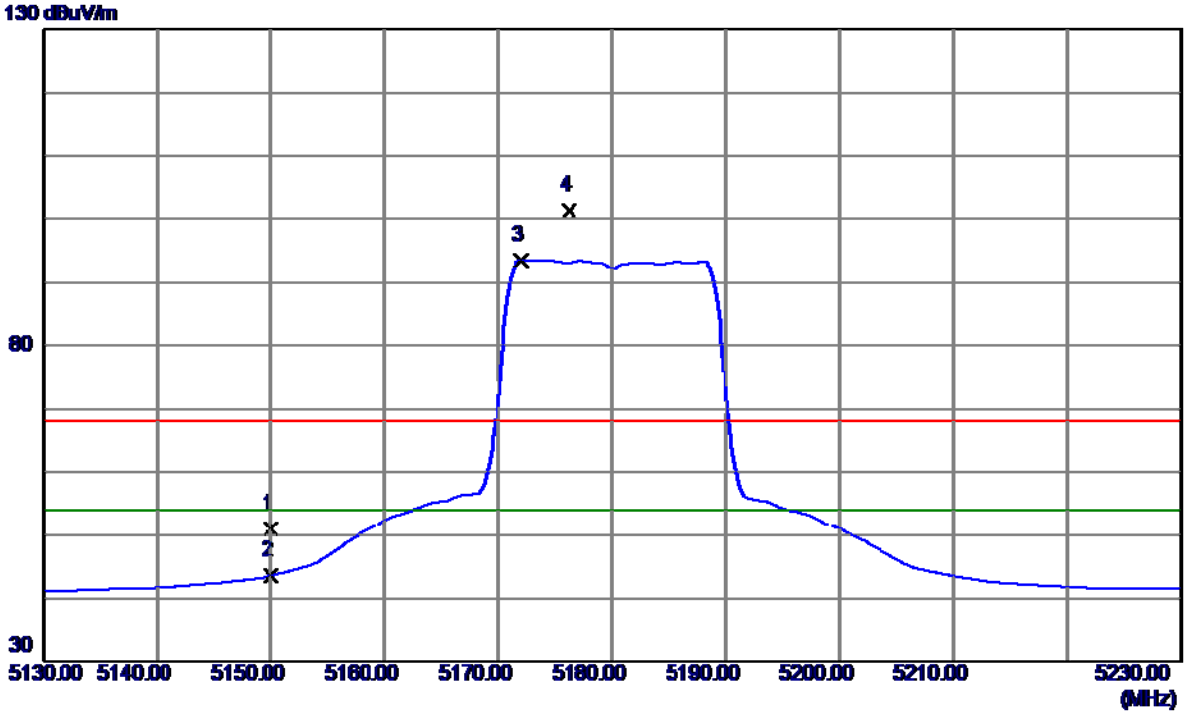
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 10358.7450 | 31.90 | 17.10 | 49.00 | 68.30 | -19.30 | Peak | |
| 2 * | 10361.8800 | 20.74 | 17.11 | 37.85 | 54.00 | -16.15 | AVG | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5180MHz |

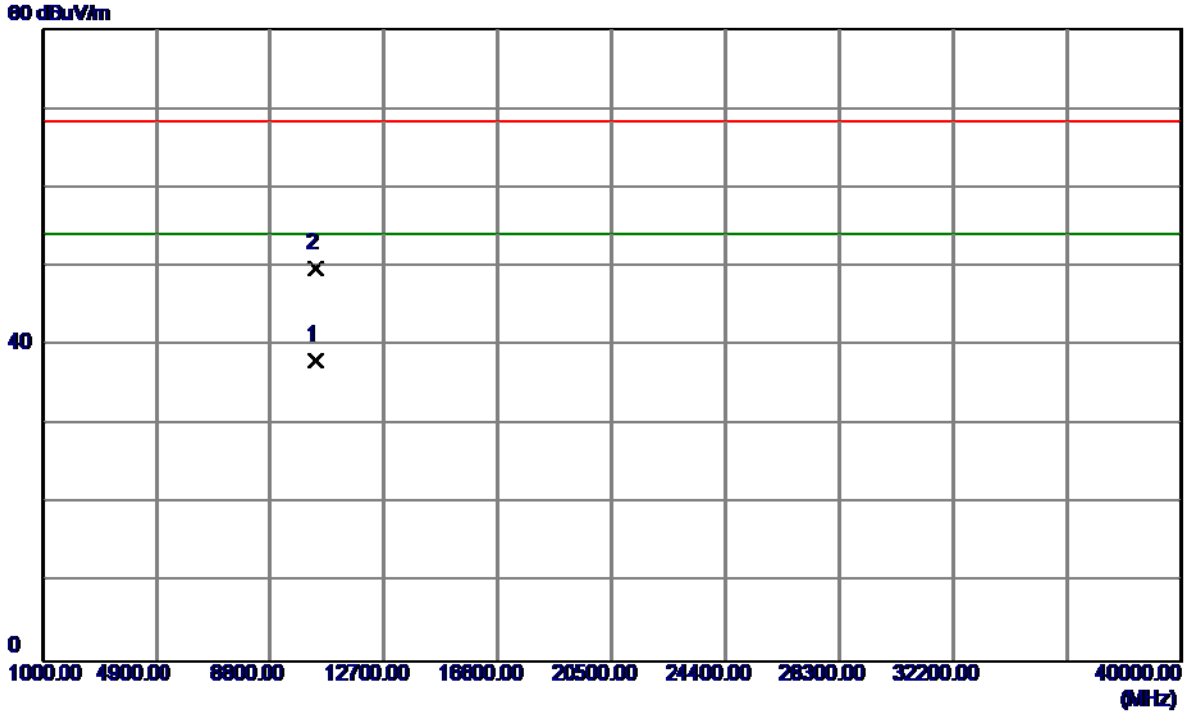
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 5150.0000 | 9.89 | 41.10 | 50.99 | 68.30 | -17.31 | Peak | |
| 2 | 5150.0000 | 2.51 | 41.10 | 43.61 | 54.00 | -10.39 | AVG | |
| 3 * | 5172.0000 | 52.26 | 41.21 | 93.47 | 54.00 | 39.47 | AVG | No Limit |
| 4 | 5176.2000 | 60.22 | 41.23 | 101.45 | 68.30 | 33.15 | Peak | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5180MHz |

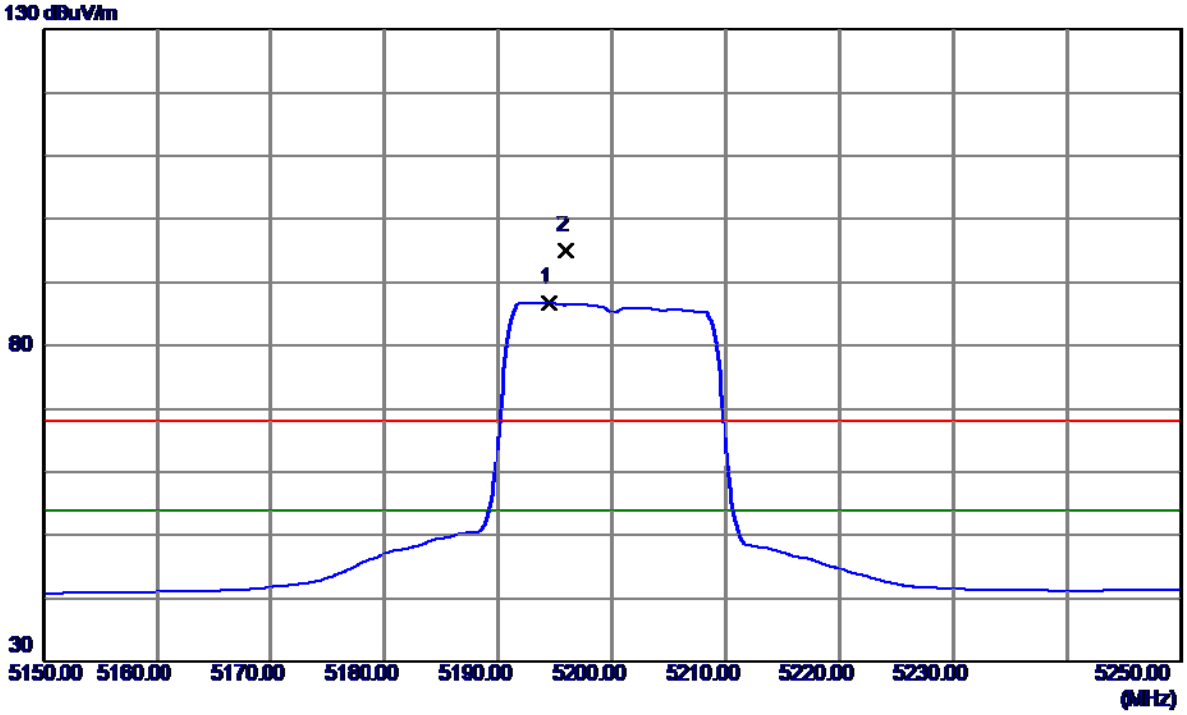
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 10357.9950 | 20.99 | 17.10 | 38.09 | 54.00 | -15.91 | AVG | |
| 2 | 10361.8450 | 32.60 | 17.11 | 49.71 | 68.30 | -18.59 | Peak | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5200MHz |

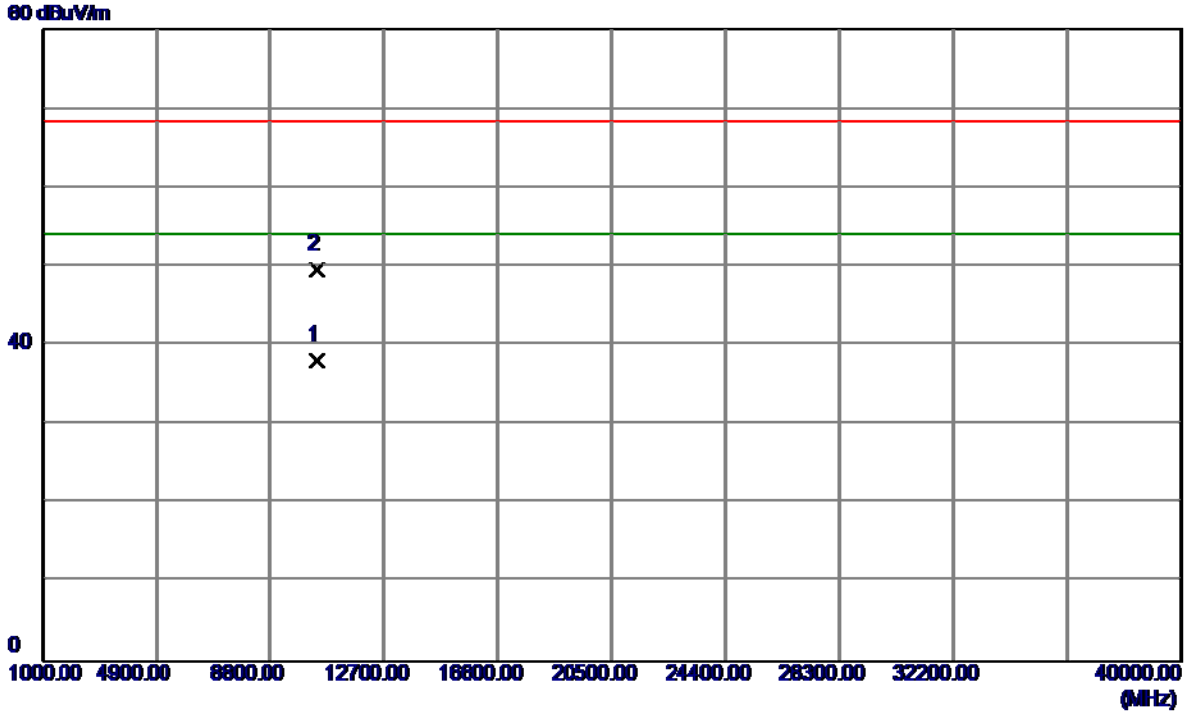
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 5194.4000 | 45.55 | 41.33 | 86.88 | 54.00 | 32.88 | AVG | No Limit |
| 2 | 5195.9000 | 53.67 | 41.34 | 95.01 | 68.30 | 26.71 | Peak | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5200MHz |

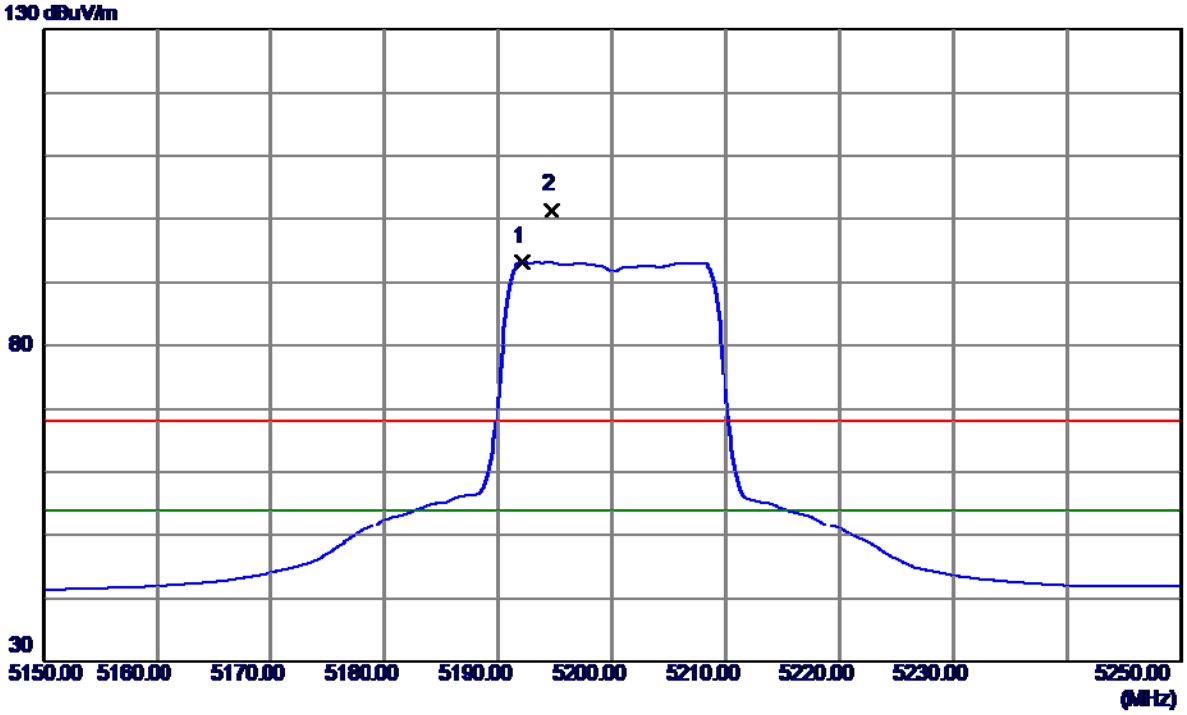
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 10400.1849 | 20.79 | 17.22 | 38.01 | 54.00 | -15.99 | AVG | |
| 2 | 10401.3450 | 32.44 | 17.22 | 49.66 | 68.30 | -18.64 | Peak | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5200MHz |

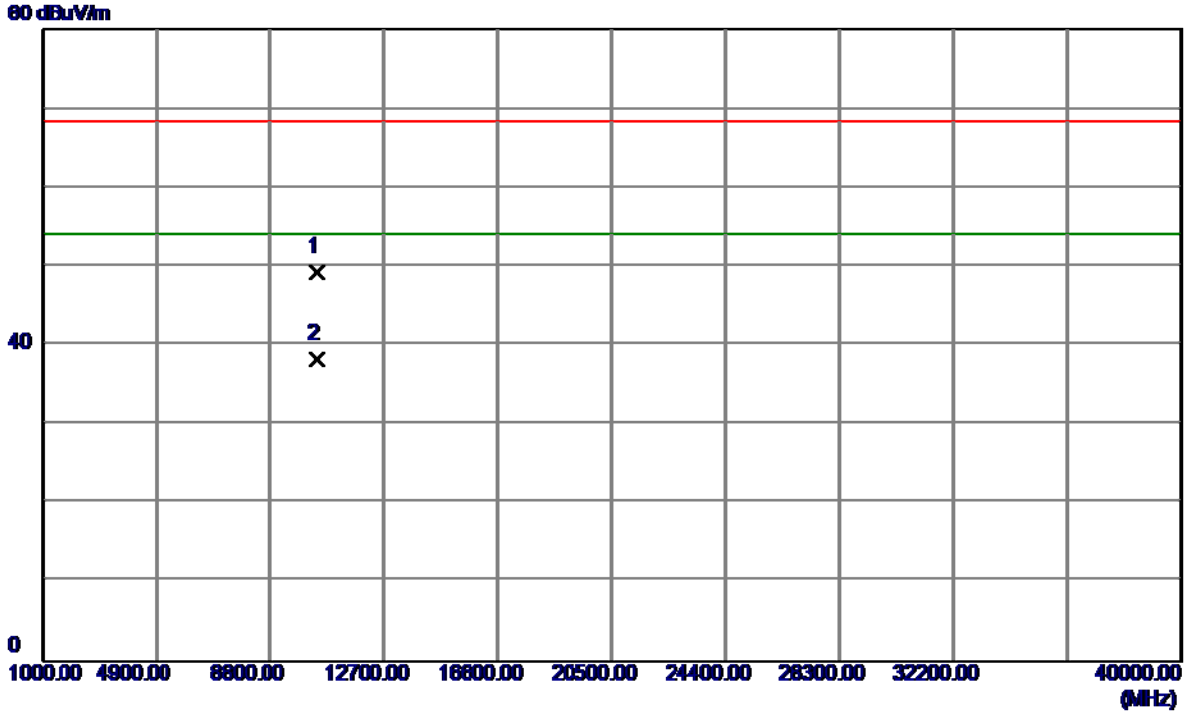
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 5192.1000 | 51.86 | 41.32 | 93.18 | 54.00 | 39.18 | AVG | No Limit |
| 2 | 5194.7000 | 60.17 | 41.33 | 101.50 | 68.30 | 33.20 | Peak | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5200MHz |

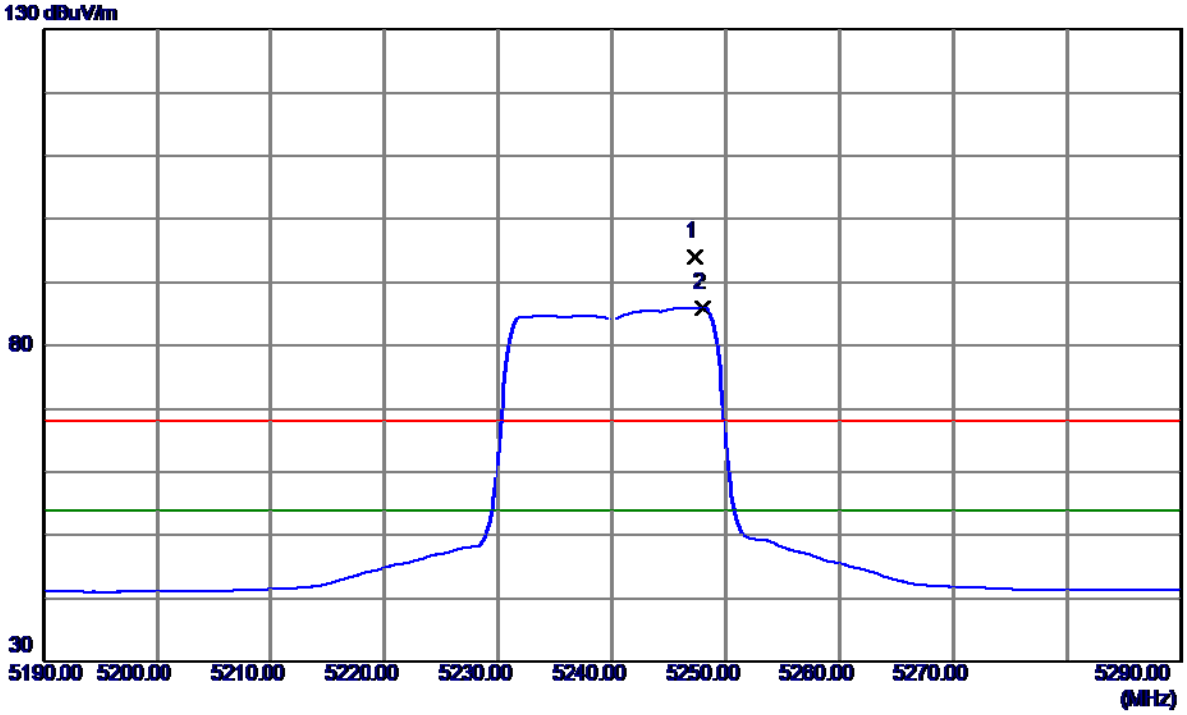
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 10400.5300 | 32.03 | 17.22 | 49.25 | 68.30 | -19.05 | Peak | |
| 2 * | 10401.4650 | 21.09 | 17.22 | 38.31 | 54.00 | -15.69 | AVG | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5240MHz |

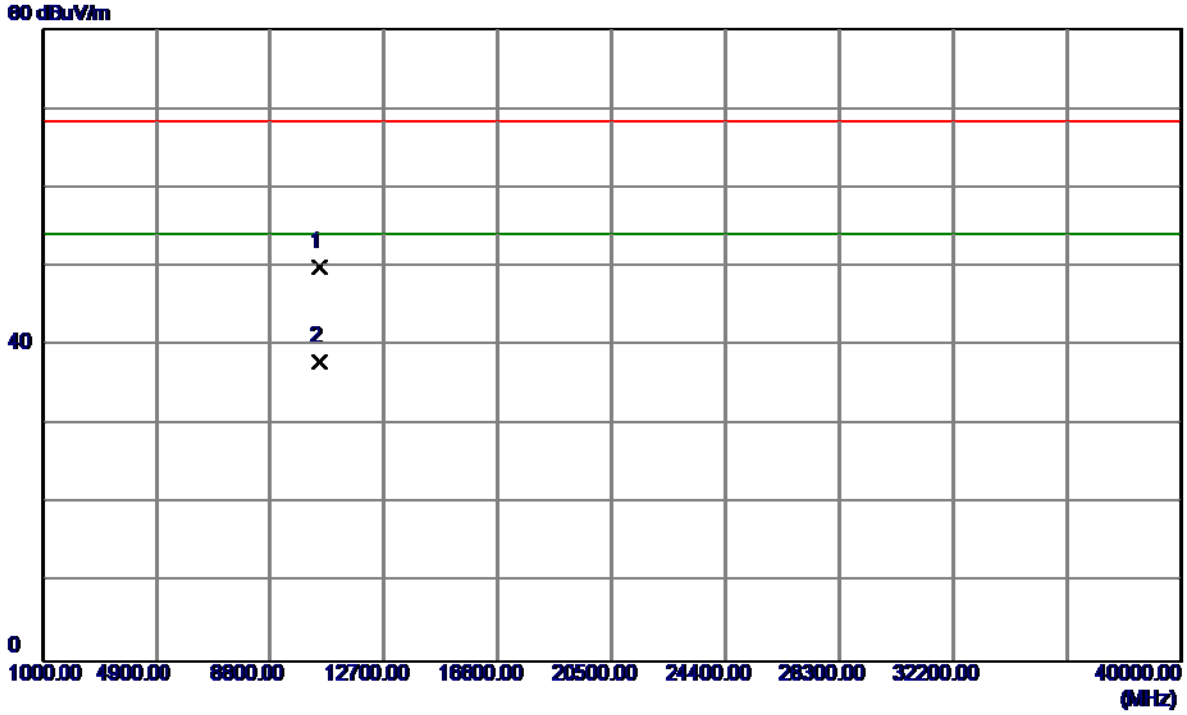
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 5247.3000 | 52.35 | 41.60 | 93.95 | 68.30 | 25.65 | Peak | No Limit |
| 2 * | 5248.0000 | 44.47 | 41.60 | 86.07 | 54.00 | 32.07 | AVG | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5240MHz |

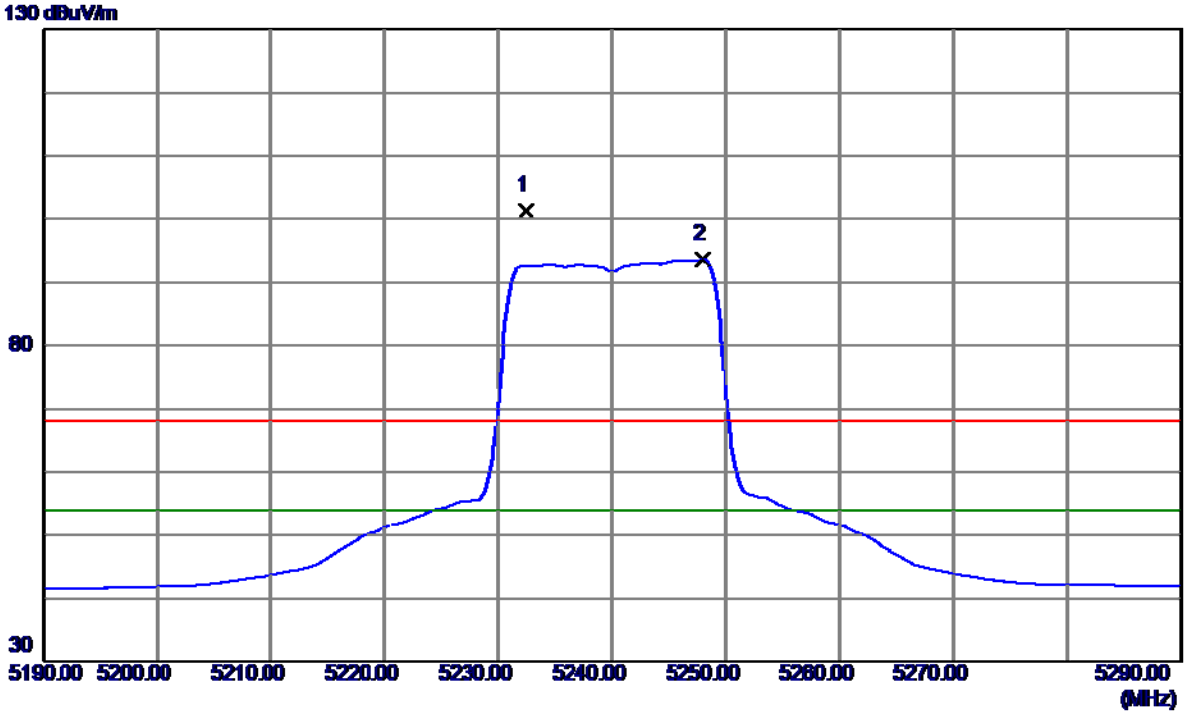
**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 10478.7450 | 32.45 | 17.44 | 49.89 | 68.30 | -18.41 | Peak | |
| 2 * | 10479.7450 | 20.47 | 17.44 | 37.91 | 54.00 | -16.09 | AVG | |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5240MHz |

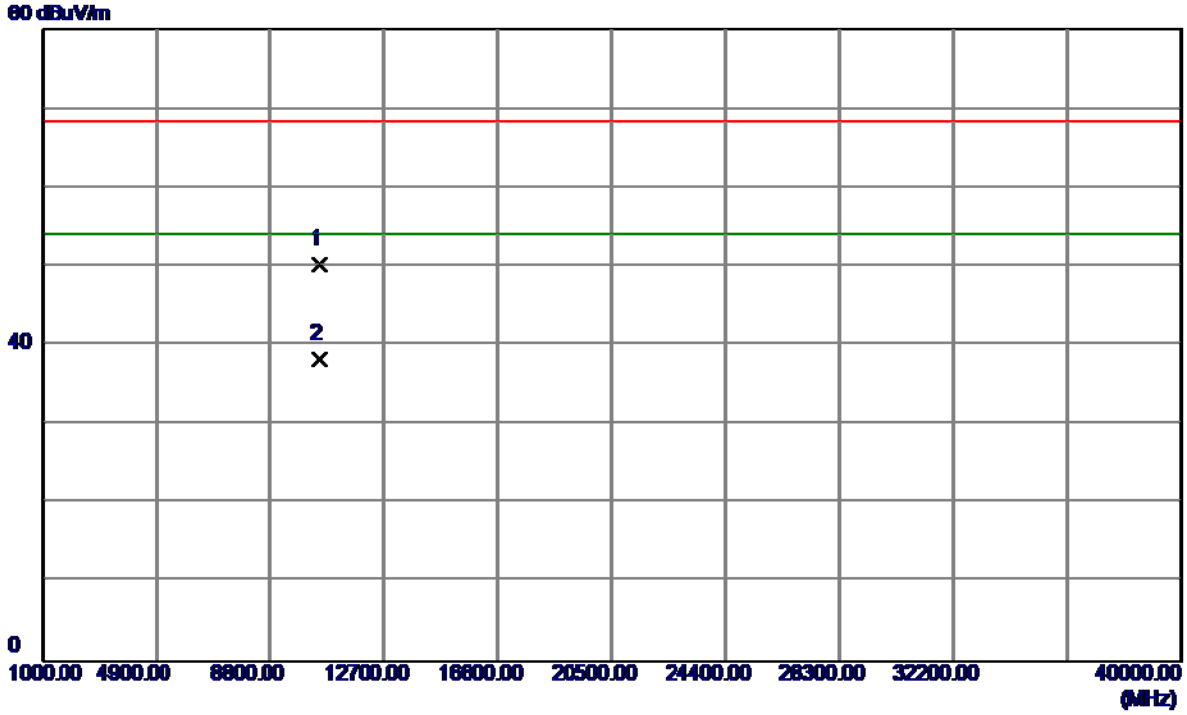
**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 5232.4000 | 59.84 | 41.52 | 101.36 | 68.30 | 33.06 | Peak | No Limit |
| 2 * | 5248.0000 | 51.93 | 41.60 | 93.53 | 54.00 | 39.53 | AVG | No Limit |

| | |
|---|---|
| Orthogonal Axis: | X |
| Test Mode: | UNII-1/ TX N20 Mode 5240MHz |

**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 10480.5050 | 32.82 | 17.44 | 50.26 | 68.30 | -18.04 | Peak | |
| 2 * | 10481.6150 | 20.83 | 17.45 | 38.28 | 54.00 | -15.72 | AVG | |

## TX A Mode_DUTY CYCLE

Duty cycle: TX DUTYMHz

Duty cycle = $T_{ON}$ / $T_{Total}$

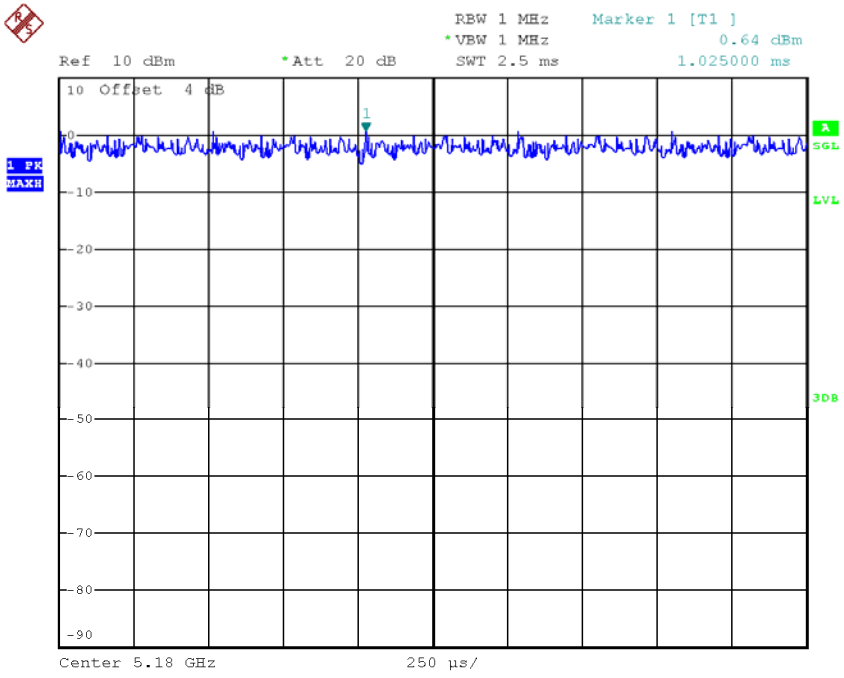
$T_{ON}$: 100000.00 msec

$T_{Total}$: 100000.00 msec

Duty cycle: 100.00%

Duty Factor = 10 log(1/Duty cycle)

Duty Factor = 0.00




Date: 16.SEP.2017 15:55:08

Note: The EUT was programmed to be in countinously transmitting mode and the transmit duty cycle is not less than 98 %, so, the output power and power density should be cacluated as Output Power = Measured power + Ducy factor
Power Spectral Density = Measured density + Duty factor

## TX N20 Mode_DUTY CYCLE

Duty cycle: TX DUTYMHz

Duty cycle = $T_{ON}$ / $T_{Total}$

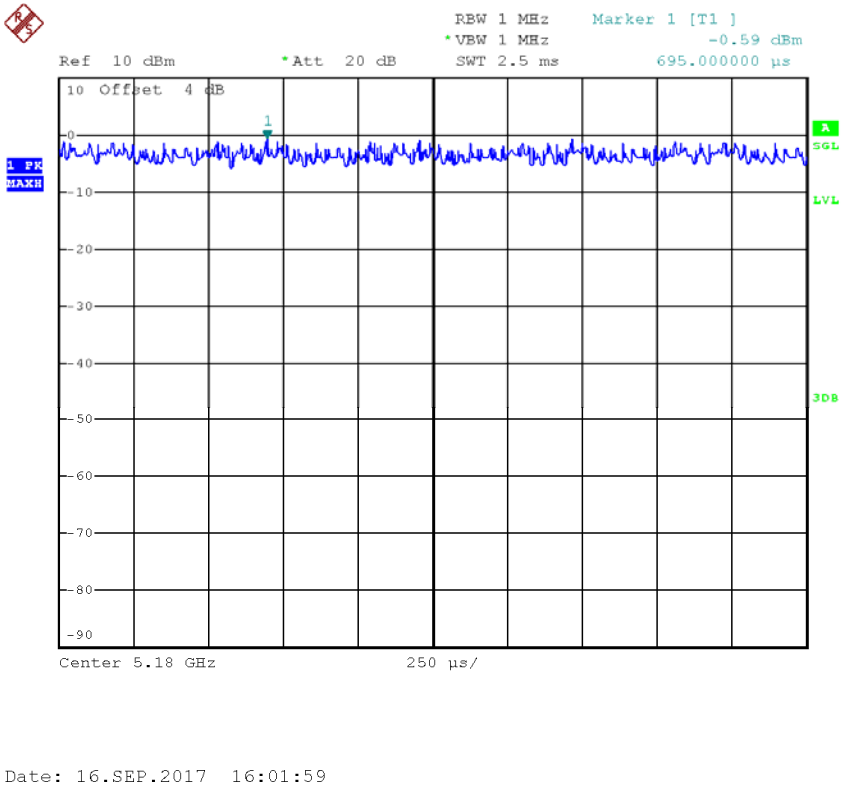
$T_{ON}$: 100000.00 msec

$T_{Total}$: 100000.00 msec

Duty cycle: 100.00%

Duty Factor = 10 log(1/Duty cycle)

Duty Factor = 0.00



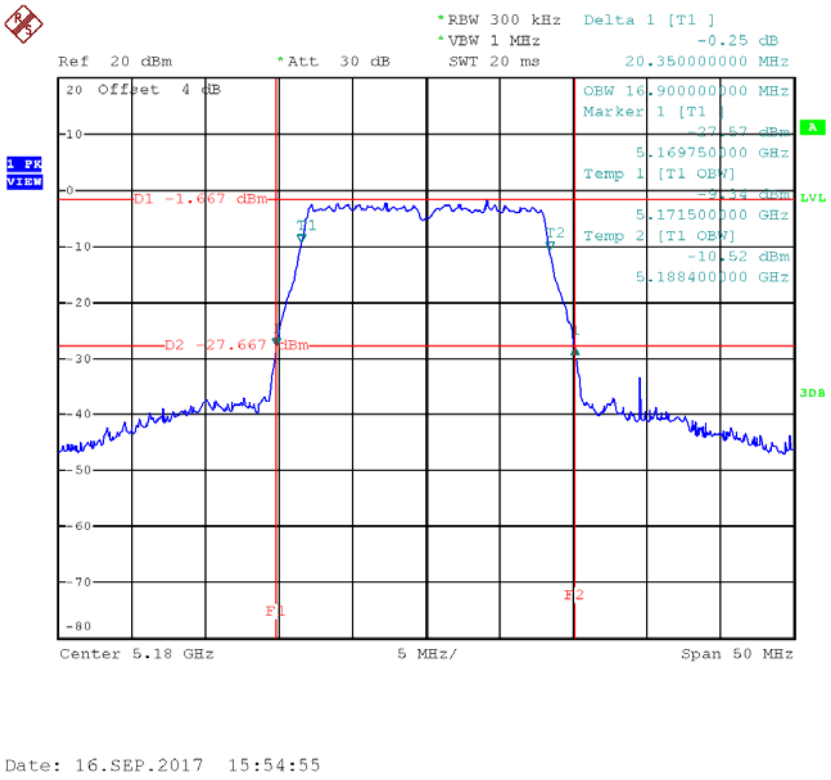

Note: The EUT was programmed to be in countinously transmitting mode and the transmit duty cycle is not less than 98 %, so, the output power and power density should be cacluated as Output Power = Measured power + Ducy factor
Power Spectral Density = Measured density + Duty factor

# APPENDIX E - BANDWIDTH

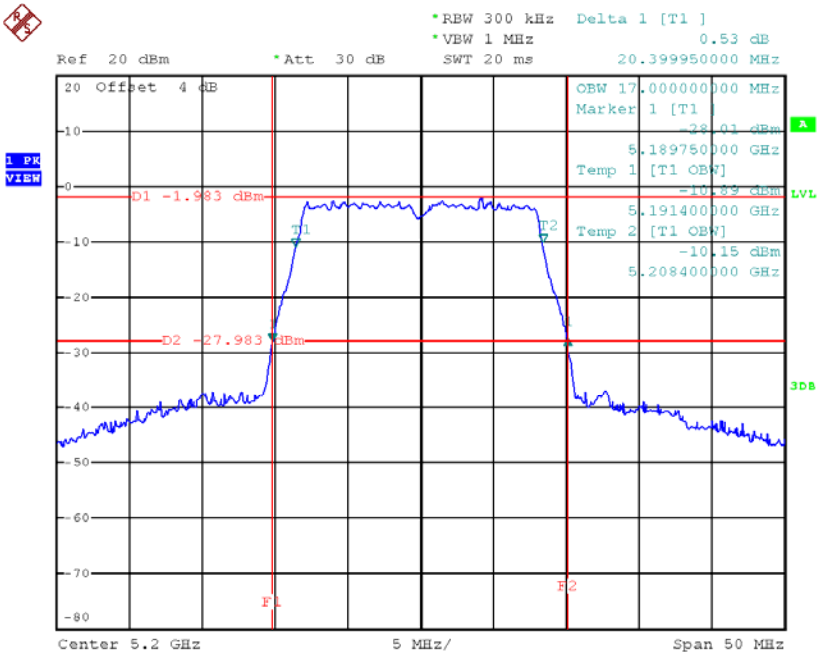
| Test Mode: UNII-1/TX A Mode_CH36/CH40/CH48 |
|---|

| Channel | Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
|---|---|---|---|
| CH36 | 5180 | 20.35 | 16.90 |
| CH40 | 5200 | 20.40 | 17.00 |
| CH48 | 5240 | 20.25 | 16.90 |

**TX CH36**

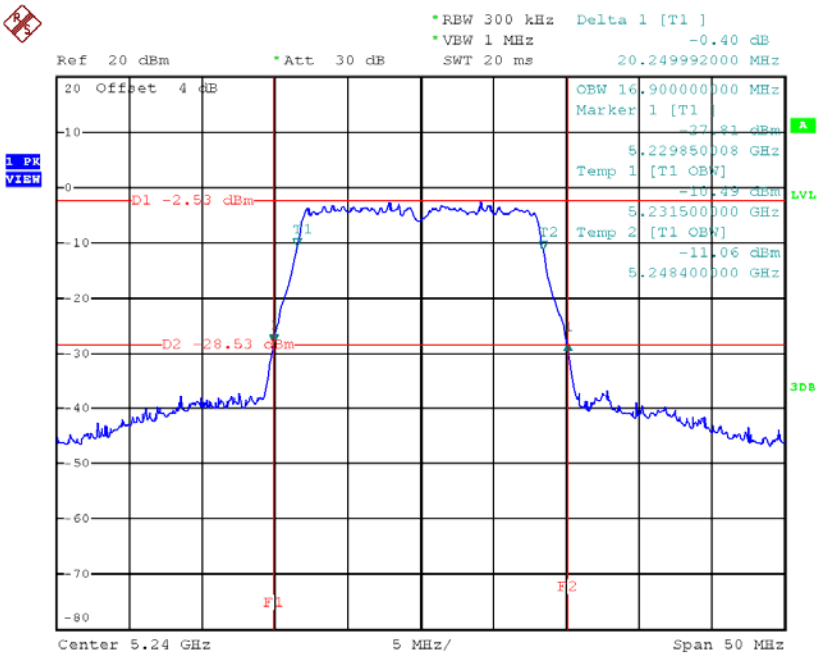


## TX CH40




Date: 16.SEP.2017 15:59:38

## TX CH48

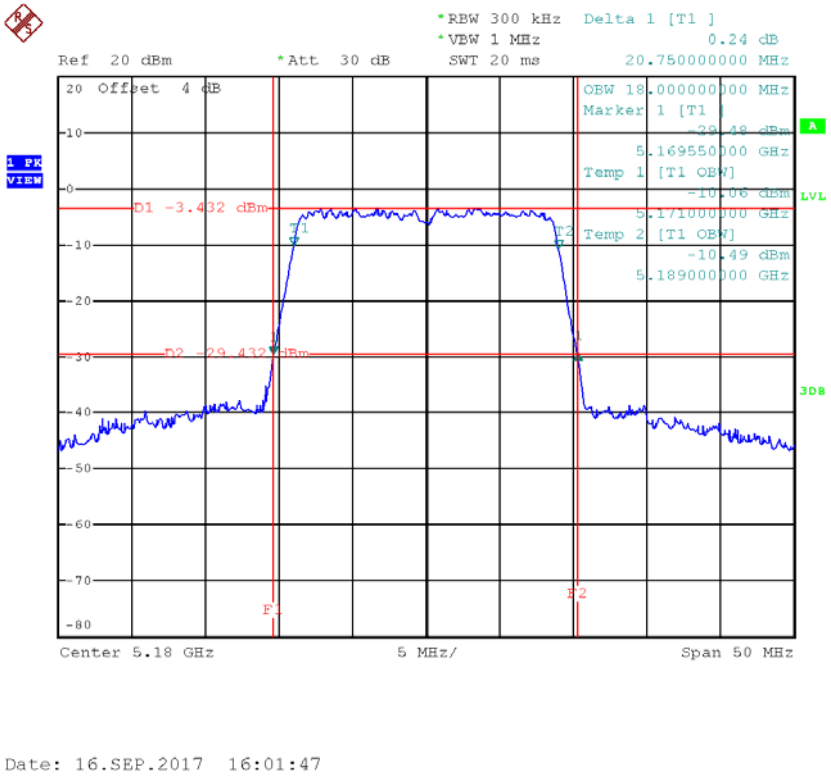



Date: 16.SEP.2017 16:00:46

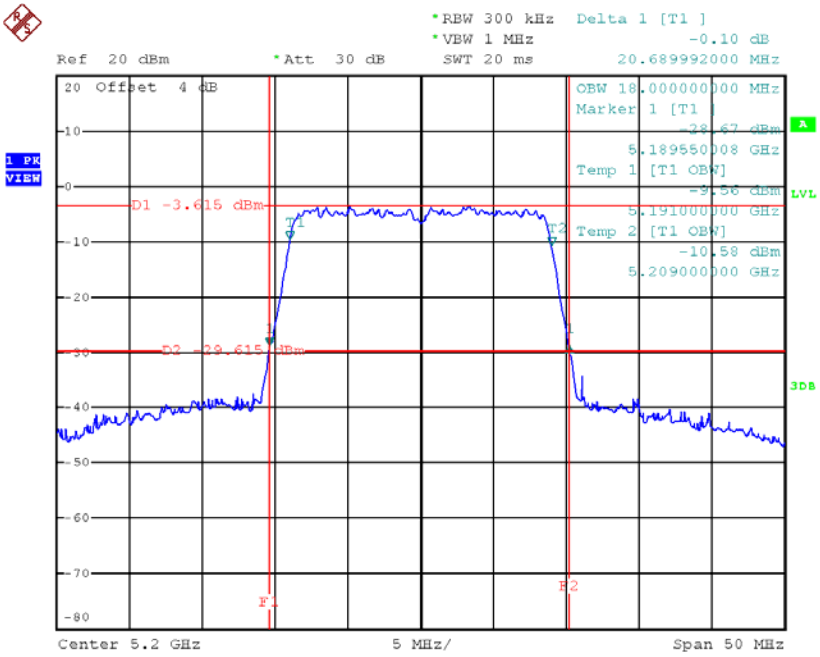
| Test Mode: UNII-1/TX N20 Mode_CH36/CH40/CH48 |
|---|

| Channel | Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
|---|---|---|---|
| CH36 | 5180 | 20.75 | 18.00 |
| CH40 | 5200 | 20.69 | 18.00 |
| CH48 | 5240 | 20.79 | 18.00 |

**TX CH36**

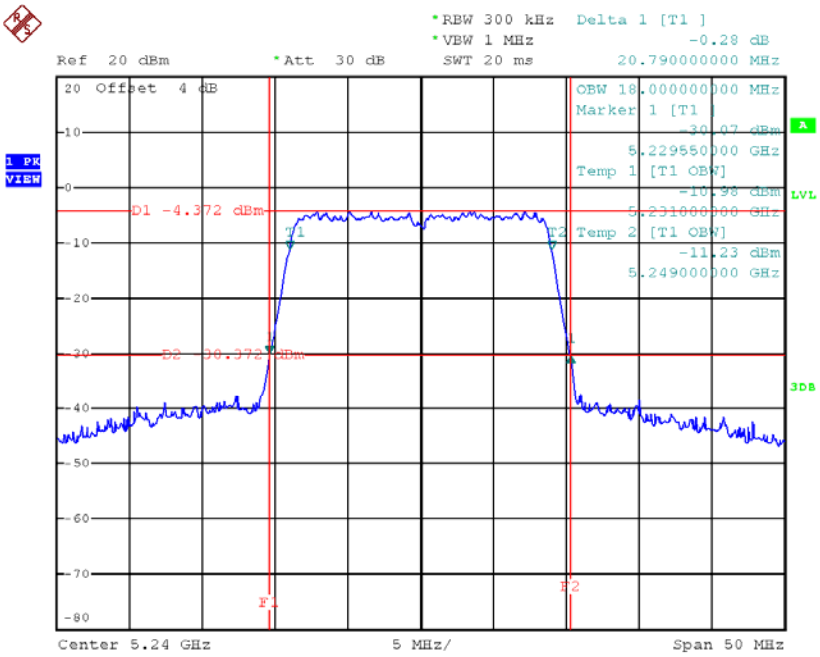


## TX CH40




Date: 16.SEP.2017 16:02:44

## TX CH48




Date: 16.SEP.2017 16:03:58

# APPENDIX F - MAXIMUM OUTPUT POWER

| Test Mode: UNII-1/TX A Mode | | | | | | |
|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Output Power (dBm) | Duty Factor | Output Power + Duty Factor (dBm) | Limit (dBm) | Limit (Watt) |
| CH36 | 5180 | 5.20 | 0.00 | 5.20 | 24 | 0.25 |
| CH40 | 5200 | 5.06 | 0.00 | 5.06 | 24 | 0.25 |
| CH48 | 5240 | 4.92 | 0.00 | 4.92 | 24 | 0.25 |

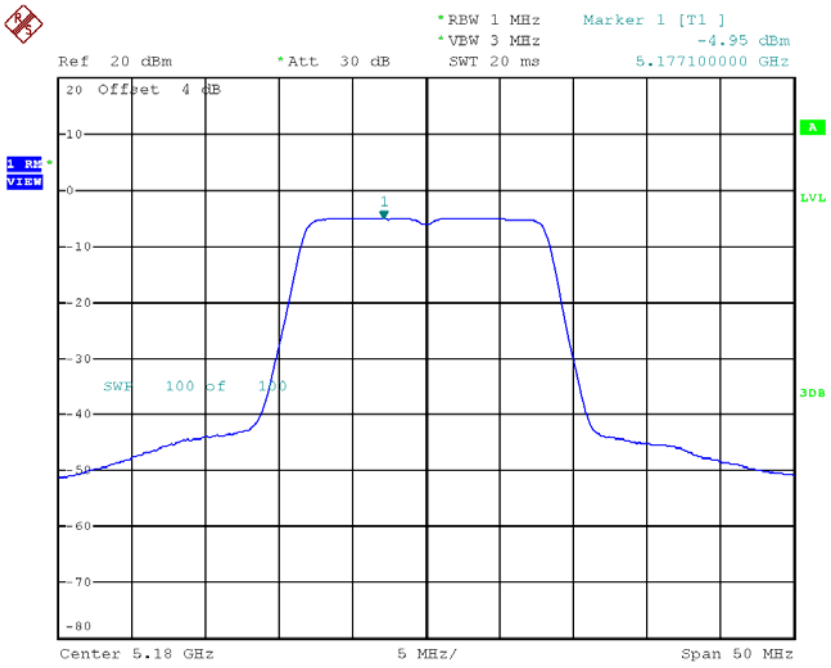
| Test Mode: UNII-1/TX N20 Mode | | | | | | |
|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Output Power (dBm) | Duty Factor | Output Power + Duty Factor (dBm) | Limit (dBm) | Limit (Watt) |
| CH36 | 5180 | 4.24 | 0.00 | 4.24 | 24 | 0.25 |
| CH40 | 5200 | 4.21 | 0.00 | 4.21 | 24 | 0.25 |
| CH48 | 5240 | 4.07 | 0.00 | 4.07 | 24 | 0.25 |

# APPENDIX G - POWER SPECTRAL DENSITY

| Test Mode: UNII-1/ TX A Mode_CH36/CH40/CH48 |
|---|

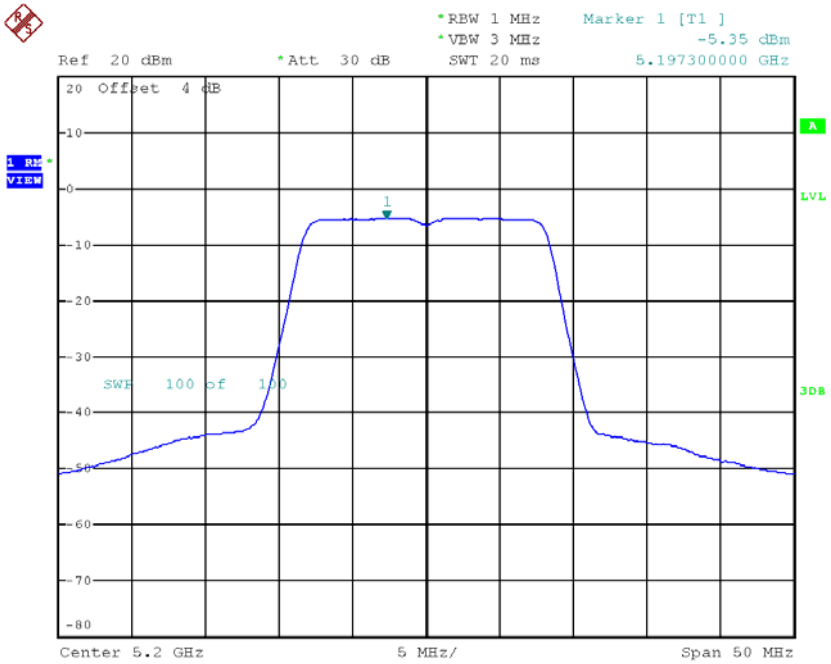
| Channel | Frequency (MHz) | Power Density (dBm/MHz) | Duty Factor | Power Density + Duty Factor (dBm/MHz) | Limit (dBm/MHz) |
|---|---|---|---|---|---|
| CH36 | 5180 | -4.95 | 0.00 | -4.95 | 11.00 |
| CH40 | 5200 | -5.35 | 0.00 | -5.35 | 11.00 |
| CH48 | 5240 | -5.93 | 0.00 | -5.93 | 11.00 |

**CH36**



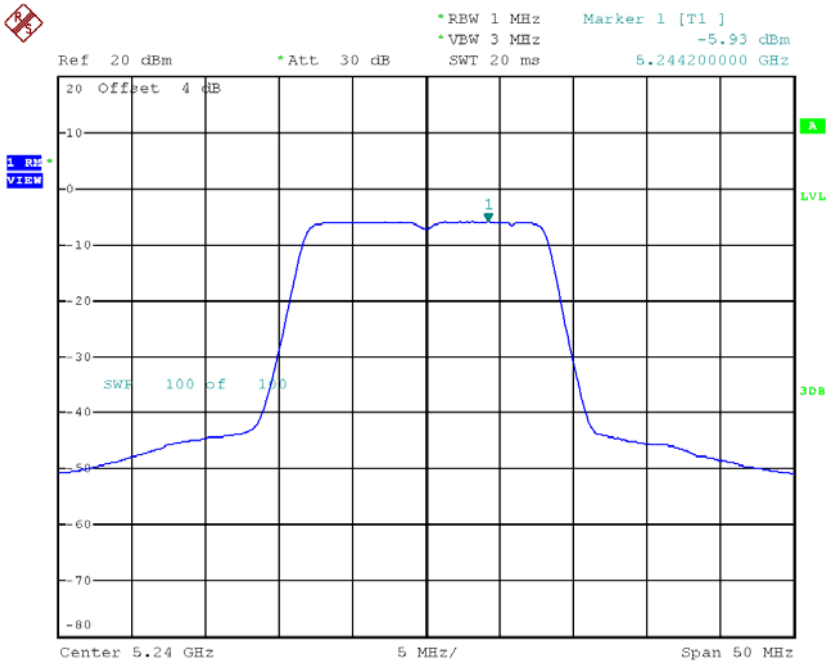

Date: 16.SEP.2017 15:55:04

## CH40




Date: 16.SEP.2017 15:59:47

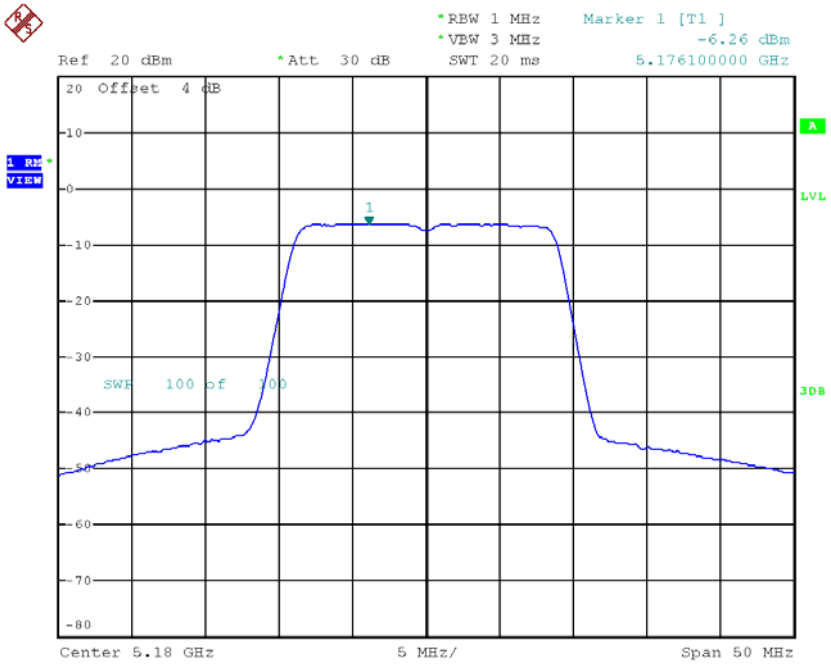
## CH48




Date: 16.SEP.2017 16:00:54

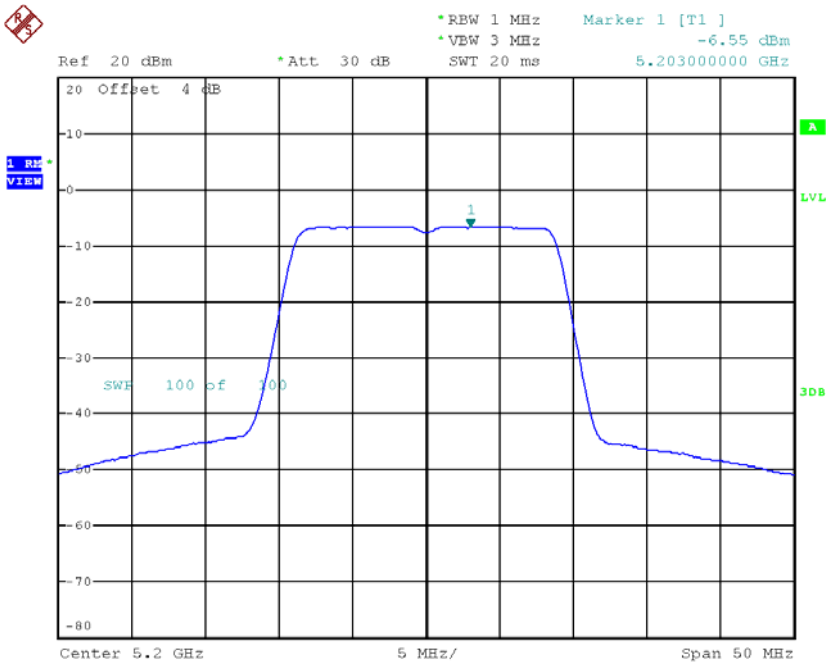
| Test Mode: UNII-1/TX N20 Mode_CH36/CH40/CH48 | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Power Density (dBm/MHz) | Duty Factor | Power Density + Duty Factor (dBm/MHz) | Limit (dBm/MHz) |
| CH36 | 5180 | -6.26 | 0.00 | -6.26 | 11.00 |
| CH40 | 5200 | -6.55 | 0.00 | -6.55 | 11.00 |
| CH48 | 5240 | -7.11 | 0.00 | -7.11 | 11.00 |

**CH36**



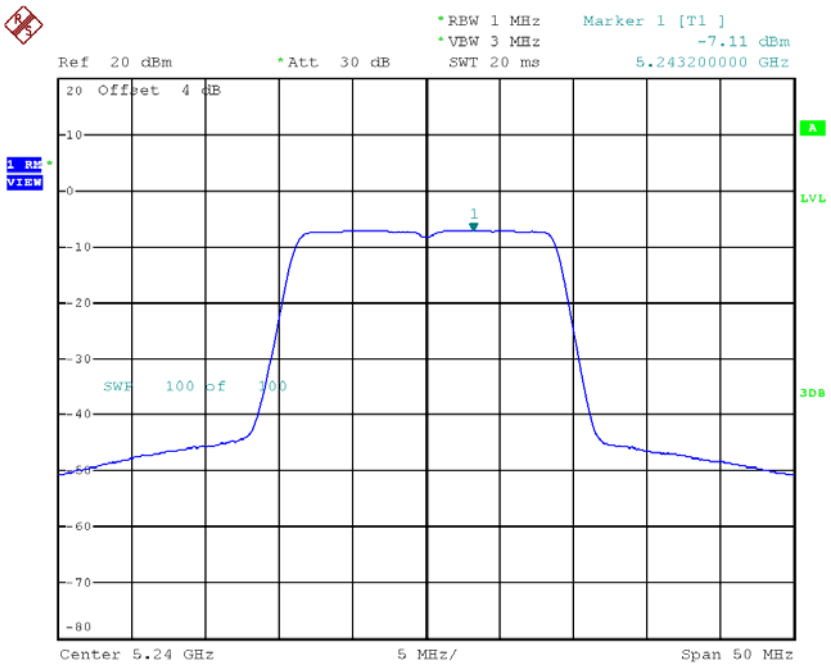

Date: 16.SEP.2017 16:01:55

## CH40




Date: 16.SEP.2017 16:02:52

## CH48




Date: 16.SEP.2017 16:04:07

# APPENDIX H - FREQUENCY STABILITY

| Test Mode: | UNII-1 |
|---|---|

**Voltage vs. Frequency Stability**

| Voltage | Measurement Frequency (MHz) |
|---|---|
| (V) | 5180.0000 |
| 132 | 5179.9550 |
| 120 | 5179.9750 |
| 108 | 5179.9600 |
| Max. Deviation (MHz) | 0.0450 |
| Max. Deviation (ppm) | 8.6873 |

**Temperature vs. Frequency Stability**

| Voltage | Measurement Frequency (MHz) |
|---|---|
| (℃) | 5180.0000 |
| -5 | 5179.9550 |
| 5 | 5179.9550 |
| 15 | 5179.9550 |
| 25 | 5179.9550 |
| 35 | 5179.9550 |
| 45 | 5179.9550 |
| 50 | 5179.9600 |
| Max. Deviation (MHz) | 0.0450 |
| Max. Deviation (ppm) | 8.6873 |