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Report No.: SHEM130300045305
Page 1 of 49

FCC Part 15E TEST REPORT

| | |
|---|--|
| Application No. : | SHEM1303000453RF |
| Applicant: | Lenbrook Industries Limited |
| FCC ID: | SVC-USBDAC2TX |
| IC: | 152A-USBDAC2TX |
| Equipment Under Test (EUT): NOTE: The following sample(s) submitted was/were identified on behalf of the client as | |
| Product Name: | Wireless USB DAC2 |
| Brand Name: | NAD |
| Model: | Wireless USB DAC 2 Transmitter |
| Fundamental Frequency : | 2.4GHz Band: 2412MHz to 2464MHz 5.2GHz Band: 5180MHz to 5240MHz 5.8GHz Band: 5736MHz to 5814MHz |
| Test Frequency: | 5.2GHz Band: 5180MHz to 5240MHz |
| Standards: | FCC PART 15 SUBPART E, Section 15.407:2012 RSS-210 Issue 8 (December 2010) RSS-Gen Issue 3 (December 2010) |
| Date of Receipt: | March 26, 2013 |
| Date of Test: | April 07, 2013 to April 10, 2013 |
| Date of Issue: | May 21, 2013 |
| Test Result : | PASS * |

* In the configuration tested, the EUT (Equipment under test) complied with the standards specified above.



Tony Wu

E&E Section Manager

SGS-CSTC (Shanghai) Co., Ltd.

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.



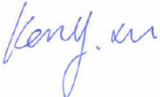
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

| Revision Record | | | | |
|-----------------|---------|--------------|----------|----------|
| Version | Chapter | Date | Modifier | Remark |
| 00 | / | May 21, 2013 | / | Original |
| | | | | |
| | | | | |
| | | | | |

| | | | | |
|--------------------------|--|-------------------------------------|--|--|
| Authorized for issue by: | | | | |
| Engineer | | Zenger Zhang _____ Print Name | |  _____ |
| Clerk | | Susie Liu _____ Print Name | |  _____ |
| Reviewer | | Keny Xu _____ Print Name | |  _____ |



3 Test Summary

| TEST ITEM | FCC REFERENCE | IC REFERENCE | Test Procedure | RESULT |
|---|--|---------------------------------|----------------------------------|--------|
| Power line conducted emission | 15.407(b)(6) 15.207 | RSS-Gen Issue 8 Clause 7.2.4 | ANSI C63.4,2009 Clause 6.2 | Pass |
| Peak Transmit Power | 15.407(a)(1) | RSS-210 Issue 8 Annex 9 | ANSI C63.4,2009 Clause 6.10.2 | Pass |
| Peak Power Spectral Density | 15.407(a)(1) | RSS-210 Issue 8 Annex 9 | KDB 789033 D01 | Pass |
| Peak Power Excursion | 15.407(a)(6) | RSS-210 Issue 8 Annex 9 | KDB 789033 D01 | Pass |
| Electric Field Strength Spurious Emissions | 15.407(b)(1)(6)(7) 15.205 15.209 | RSS-210 Issue 8 Annex 9 | KDB 789033 D01 | Pass |
| Radiated Emission BandEdge | 15.407(b)(5)(7) 15.205 | --- | KDB 789033 D01 | Pass |
| Frequency stability | FCC Part15 407 (g) | --- | KDB 789033 D01 | Pass |
| Occupied bandwidth | --- | RSS-Gen Issue 3 Clause 4.6.1 | RSS-Gen Issue 3 Clause 4.6.1 | Tested |



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| 5 General Information | | | | |
|----------------------------------|---|----------------|------------|-----------------|
| 5.1 Client Information | | | | |
| Applicant : | Lenbrook Industries Limited | | | |
| Applicant Address: | 633 Granite Court, Pickering Ontario, Toronto L1W 3K1, Canada | | | |
| Manufacturer: | Lenbrook Industries Limited | | | |
| Manufacturer Address: | 633 Granite Court, Pickering Ontario, Toronto L1W 3K1, Canada | | | |
| Factory: | Hansong (Nanjing) Technology Ltd. | | | |
| 5.2 Details of E.U.T. | | | | |
| EUT Name: | Wireless USB DAC2 | | | |
| Brand Name: | NAD | | | |
| Model No: | Wireless USB DAC 2 Transmitter | | | |
| Power Supply: | DC 5V (USB Cable) | | | |
| Test Band and Channels : | 5.2GHz Band Channel Description: | | | |
| | Channel of Tranmitter | Frequency(MHz) | | |
| | Low | 5180 | | |
| | Mid | 5210 | | |
| | High | 5240 | | |
| Modulation Type: | QPSK | | | |
| Antenna Type: | Integral antenna(Antenna Gain 2.0dBi) | | | |
| USB Cable: | 18cm | | | |
| 5.3 Description of Support Units | | | | |
| Description | Manufacturer | Model No. | Serial No. | Supplied By |
| Leptop | Lenovo | L420 | N/A | Supplied by SGS |



5.4 Details of Test Mode

| Test Mode | Description of Test Mode |
|-------------------|---|
| Transmitting mode | Keep the EUT on continue transmitting mode. |
| Remark:N/A | |

5.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China.201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

5.6 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.



6 Equipments Used during Test

Conducted Emission

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Cal.Due date |
|------|--------------------------------------|-----------------|-----------|------------|--------------|
| 1 | EMI test receiver | Rohde & Schwarz | ESCS30 | 100086 | 2014-02-22 |
| 2 | Line impedance stabilization network | SCHWARZBECK | NSLK8127 | 8127-490 | 2014-02-22 |
| 3 | Line impedance stabilization network | ETS | 3816/2 | 00034161 | 2014-02-22 |

☒ RF Test

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Due date |
|------|---------------------------|--------------------------------------|-----------|-------------|---------------|
| 1 | EMI test receiver | Rohde & Schwarz | ESU40 | 100109 | 2014-02-22 |
| 2 | Horn Antenna | SCHWARZBECK | BBHA9120D | 9120D-679 | 2014-03-06 |
| 3 | Horn Antenna | Rohde & Schwarz | HF906 | 100284 | 2014-06-01 |
| 4 | ANTENNA | SCHWARZBECK | VULB9168 | 9168-313 | 2014-03-06 |
| 5 | Horn Antenna | SCHWARZBECK | BBHA9170 | BBHA9170373 | 2014-03-06 |
| 6 | Ultra broadband antenna | Rohde & Schwarz | HL562 | 100227 | 2013-10-08 |
| 7 | Atmosphere pressure meter | Shanghai ZhongXuan Electronic Co;Ltd | BY 2009P | -- | 2013-10-08 |
| 8 | CLAMP METER | FLUKE | 316 | 86080010 | 2014-06-01 |
| 9 | Thermo-Hygrometer | ZHICHEN | ZC1-2 | 01050033 | 2013-10-08 |

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| | | | | | |
|----|--------------------------------------|-----------------------------|---|----------|------------|
| 11 | High-low temperature cabinet | Shanghai YuanZhen | GW2050 | -- | 2014-06-01 |
| 12 | Tunable Notch Filter | Wainwright instruments Gmbh | WRCT180 0.0/ 2000.0- 0.2/40- 5SSK | 11 | 2014-06-01 |
| 13 | Tunable Notch Filter | Wainwright instruments Gmbh | WRCT800. 0/880.0- 0.2/40- 5SSK | 9 | 2014-06-01 |
| 14 | High pass Filter | FSCW | HP 12/2800- 5AA2 | 19A45-02 | 2014-06-01 |
| 15 | Low noise amplifier | TESEQ | LNA6900 | 70133 | 2014-02-22 |
| 16 | EMI test receiver | Rohde & Schwarz | ESCS30 | 100086 | 2014-02-22 |
| 17 | Line impedance stabilization network | SCHWARZBECK | NSLK8127 | 8127-490 | 2014-02-22 |

7 Test Results

7.1 E.U.T. Operation

Input voltage: 5V DC(Supply by USB cable)

Operating Environment:

Temperature: 25.0 °C

Humidity: 45 % RH

Atmospheric Pressure: 1013 mbar

EUT Operation: The EUT has been tested under operating condition.
Test program was used to control the EUT for staying in continuous transmitting mode is programmed.

7.2 Conducted Emissions on Mains Terminals

Test Requirement: FCC Part 15E.407(b)(6) and 15.207
RSS-Gen Issue 8 Clause 7.2.4

Test Method: ANSI C63.4:2009 Section 6.2

Test Result: Pass

Test Voltage: AC 120V 60Hz

Frequency Range: 150 KHz to 30 MHz

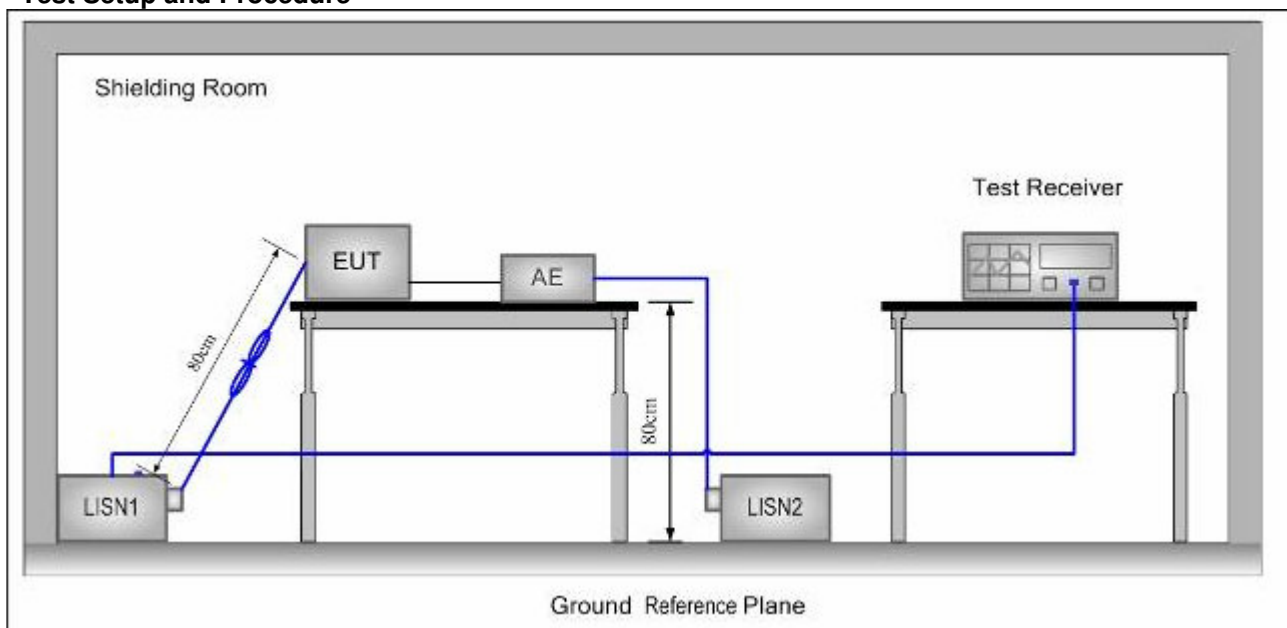
Class/Severity: Class B

Test mode: Transmitting mode

Limit:

| Frequency range MHz | Class B Limits dB (μV) | |
|---|---------------------------|----------|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56 | 56 to 46 |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |
| Note1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz. | | |
| Note2: The lower limit is applicable at the transition frequency. | | |

Test Setup and Procedure



1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT was connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN 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, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
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 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance was between the closest points of the LISN and the EUT. The mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m. All other units of the EUT and associated equipment was at least 0,8 m from the LISN.



Measurement Result

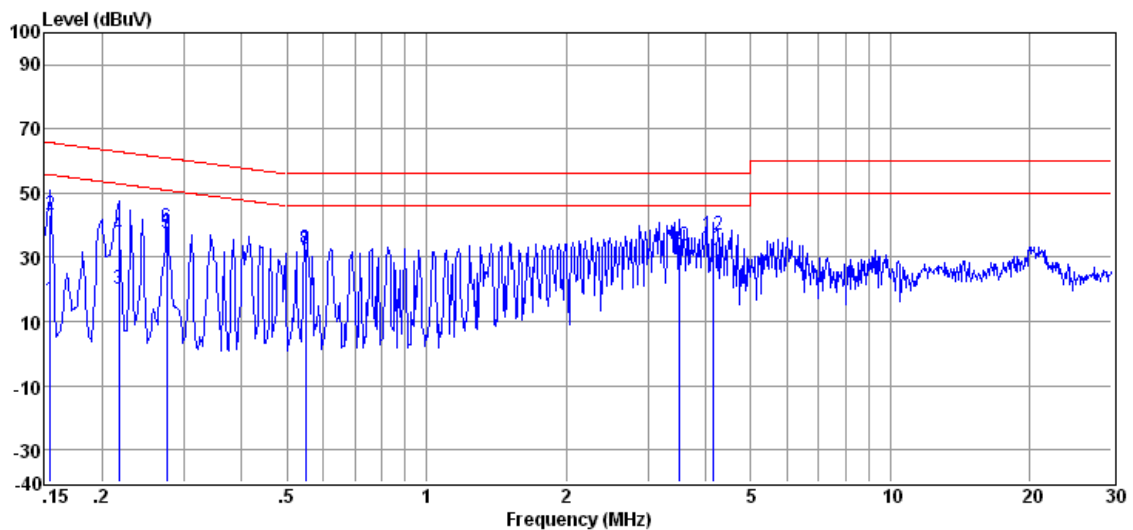
Operation mode: Transmitter conducted to Receiver by wireless.

Pre-scan was performed with peak detected on all ports, Quasi-peak & average measurements were performed at the frequencies at which maximum peak emission level were detected.
Please see the attached Quasi-peak and Average test results.

Level = Read Level + LISN/ISN Factor + Cable Loss.

Test Mode: Transmitting mode

Test Port: AC Live Line

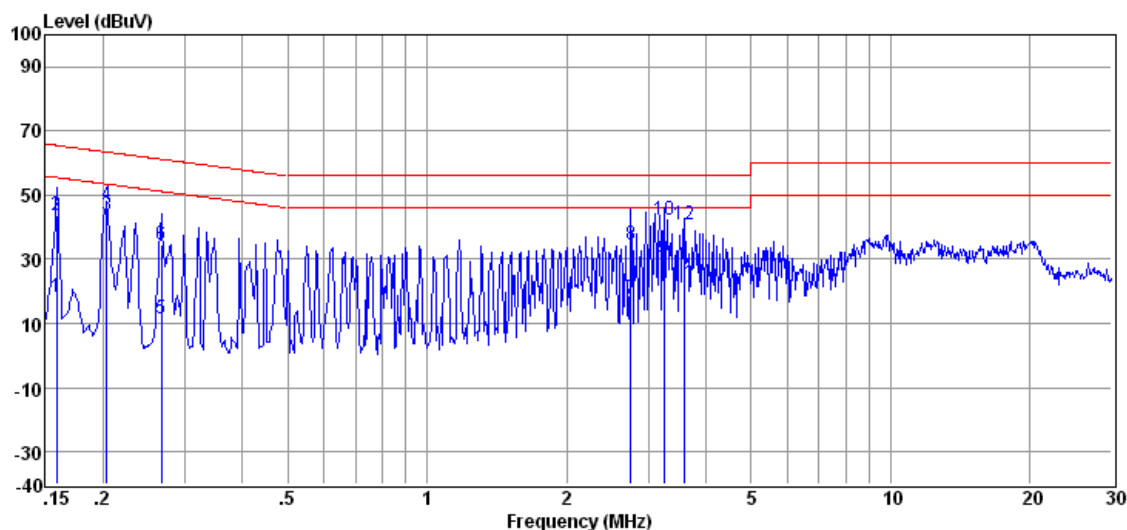


| Freq (MHz) | Read Level (dBμV) | LISN Factor (dB) | Cable Loss (dB) | Level (dBμV) | Limit Line (dBμV) | Over Limit (dB) | Detector | Phase |
|---------------|-------------------------|------------------------|-----------------------|-----------------|-------------------------|-----------------------|----------|-------|
| 0.155 | 16.29 | 0.19 | 0.10 | 16.58 | 55.74 | -39.16 | Average | Live |
| 0.155 | 42.98 | 0.19 | 0.10 | 43.27 | 65.74 | -22.47 | QP | Live |
| 0.217 | 19.93 | 0.11 | 0.10 | 20.14 | 52.92 | -32.78 | Average | Live |
| 0.217 | 37.00 | 0.11 | 0.10 | 37.21 | 62.92 | -25.71 | QP | Live |
| 0.276 | 37.35 | 0.13 | 0.10 | 37.58 | 50.94 | -13.36 | Average | Live |
| 0.276 | 39.38 | 0.13 | 0.10 | 39.61 | 60.94 | -21.33 | QP | Live |
| 0.549 | 31.65 | 0.20 | 0.10 | 31.95 | 46.00 | -14.05 | Average | Live |
| 0.549 | 32.41 | 0.20 | 0.10 | 32.71 | 56.00 | -23.29 | QP | Live |
| 3.509 | 29.68 | 0.30 | 0.15 | 30.13 | 46.00 | -15.87 | Average | Live |
| 3.509 | 33.38 | 0.30 | 0.15 | 33.83 | 56.00 | -22.17 | QP | Live |
| 4.136 | 32.56 | 0.30 | 0.17 | 33.03 | 46.00 | -12.97 | Average | Live |
| 4.136 | 36.43 | 0.30 | 0.17 | 36.90 | 56.00 | -19.10 | QP | Live |



Test Mode: Transmitting mode

Test Port: AC Neutral Line



| Freq (MHz) | Read Level (dBμV) | LISN Factor (dB) | Cable Loss (dB) | Level (dBμV) | Limit Line (dBμV) | Over Limit (dB) | Detector | Phase |
|---------------|-------------------------|------------------------|-----------------------|-----------------|-------------------------|-----------------------|----------|---------|
| 0.159 | 18.01 | 0.18 | 0.10 | 18.29 | 55.52 | -37.23 | Average | Neutral |
| 0.159 | 43.40 | 0.18 | 0.10 | 43.68 | 65.52 | -21.84 | QP | Neutral |
| 0.204 | 43.63 | 0.10 | 0.10 | 43.83 | 53.45 | -9.62 | Average | Neutral |
| 0.204 | 46.67 | 0.10 | 0.10 | 46.87 | 63.45 | -16.58 | QP | Neutral |
| 0.267 | 11.19 | 0.10 | 0.10 | 11.39 | 51.20 | -39.81 | Average | Neutral |
| 0.267 | 34.20 | 0.10 | 0.10 | 34.40 | 61.20 | -26.80 | QP | Neutral |
| 2.750 | 17.51 | 0.27 | 0.13 | 17.91 | 46.00 | -28.09 | Average | Neutral |
| 2.750 | 34.01 | 0.27 | 0.13 | 34.41 | 56.00 | -21.59 | QP | Neutral |
| 3.241 | 30.03 | 0.25 | 0.14 | 30.42 | 46.00 | -15.58 | Average | Neutral |
| 3.241 | 41.72 | 0.25 | 0.14 | 42.11 | 56.00 | -13.89 | QP | Neutral |
| 3.584 | 22.34 | 0.24 | 0.15 | 22.73 | 46.00 | -23.27 | Average | Neutral |
| 3.584 | 40.23 | 0.24 | 0.15 | 40.62 | 56.00 | -15.38 | QP | Neutral |

7.3 Peak Transmit Power

| | |
|-------------------------------|---|
| Test Requirement: | FCC Part 15 407 (a) (1) RSS-210 Issue 8 Annex 9 |
| Standard Applicable: | According to section 15.407(a) (1) For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the 26- dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. |
| Measurement Procedure: | <ol style="list-style-type: none"> 1. Place the EUT on the table and set it in transmitting mode. 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum. 3. Set the occur band to the entire emission bandwidth of the signal. 4. Record the max.channel power reading <p>Repeat above procedures until all the frequency measured were complete.</p> |
| Limit: | $\leq 16\text{dBm}$ Note: For 5.15-5.25GHz band the Minimum 26BW is 16.70MHz. So the minimum limit is $4\text{dBm} + 10\log B = 16\text{dBm} < 17\text{dBm}$. |

Measurement Result:

For Antenna A 5180-5240MHz Band:

| CH | Frequency (MHz) | Reading RMS Power (dBm) | Cable Loss (dB) | Output RMS Power (dBm) | PEAK POWER LIMIT (dBm) | Result |
|------|-----------------|-------------------------|-----------------|------------------------|------------------------|--------|
| LOW | 5180 | 12.26 | 1.9 | 14.16 | 16 | PASS |
| MID | 5210 | 12.52 | 1.9 | 14.42 | 16 | PASS |
| HIGH | 5240 | 12.18 | 1.9 | 14.08 | 16 | PASS |

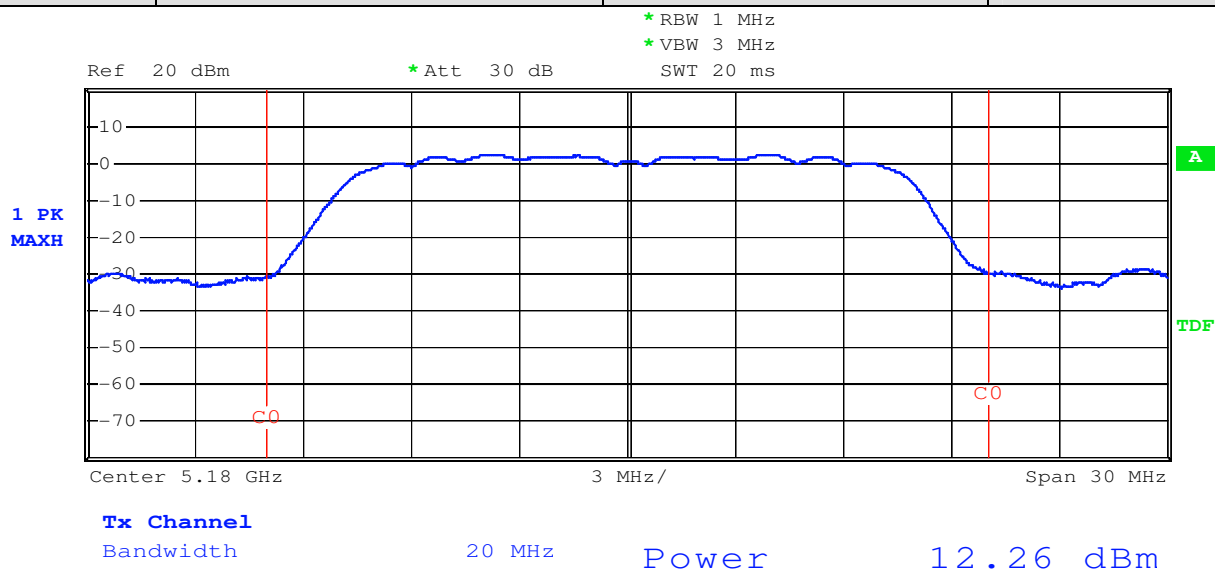
For Antenna B 5180-5240MHz Band:

| CH | Frequency (MHz) | Reading RMS Power (dBm) | Cable Loss (dB) | Output RMS Power (dBm) | PEAK POWER LIMIT (dBm) | Result |
|------|-----------------|-------------------------|-----------------|------------------------|------------------------|--------|
| LOW | 5180 | 12.28 | 1.9 | 14.18 | 16 | PASS |
| MID | 5210 | 11.66 | 1.9 | 13.56 | 16 | PASS |
| HIGH | 5240 | 11.71 | 1.9 | 13.61 | 16 | PASS |

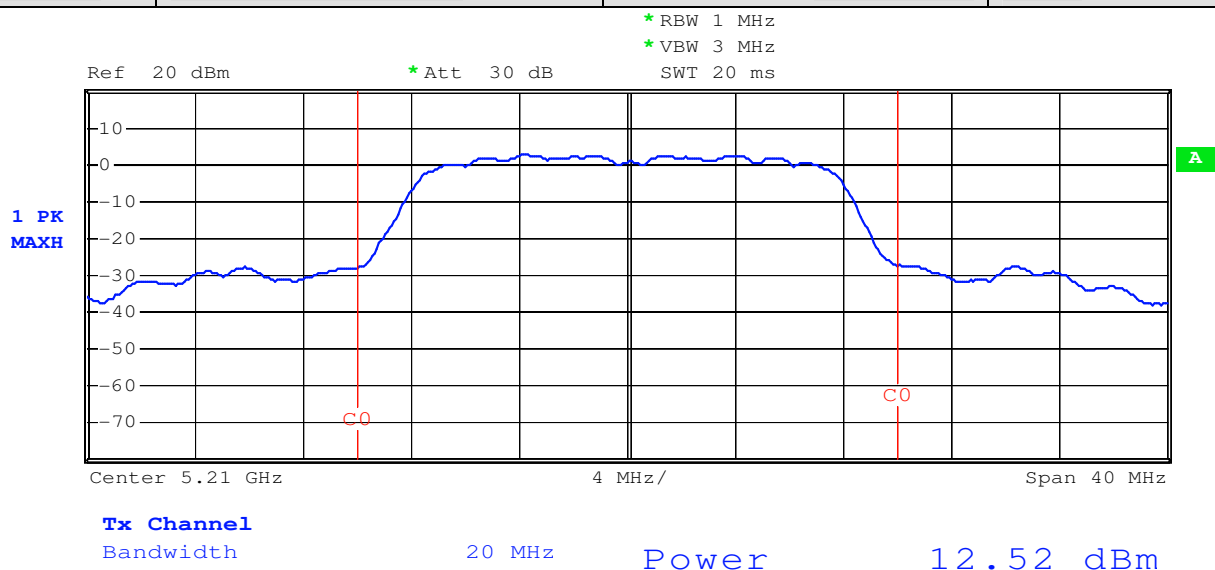


Test plot as follows:

| | | | |
|------------|-----------------------|---------------|-----|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | Low |
|------------|-----------------------|---------------|-----|

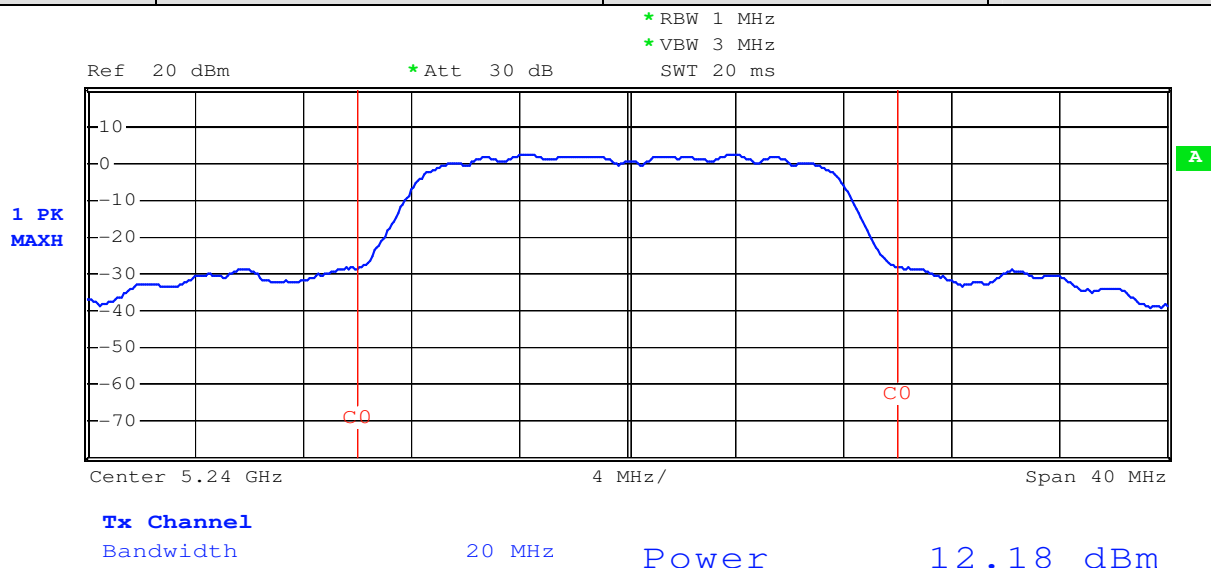


| | | | |
|------------|-----------------------|---------------|--------|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | Middle |
|------------|-----------------------|---------------|--------|

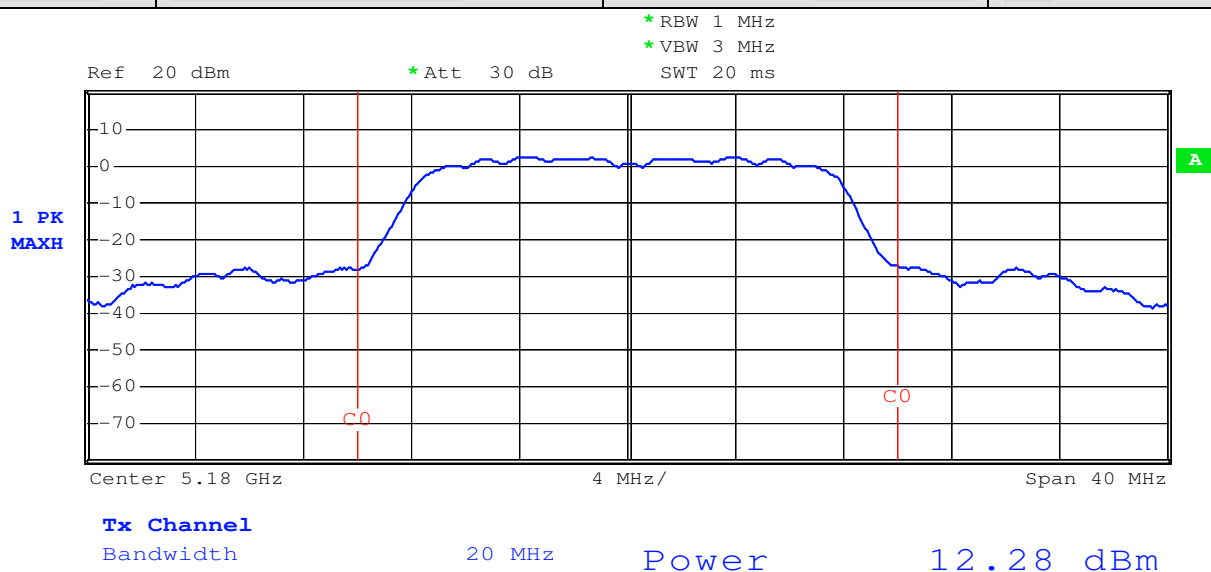




| | | | |
|------------|-----------------------|---------------|------|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | High |
|------------|-----------------------|---------------|------|

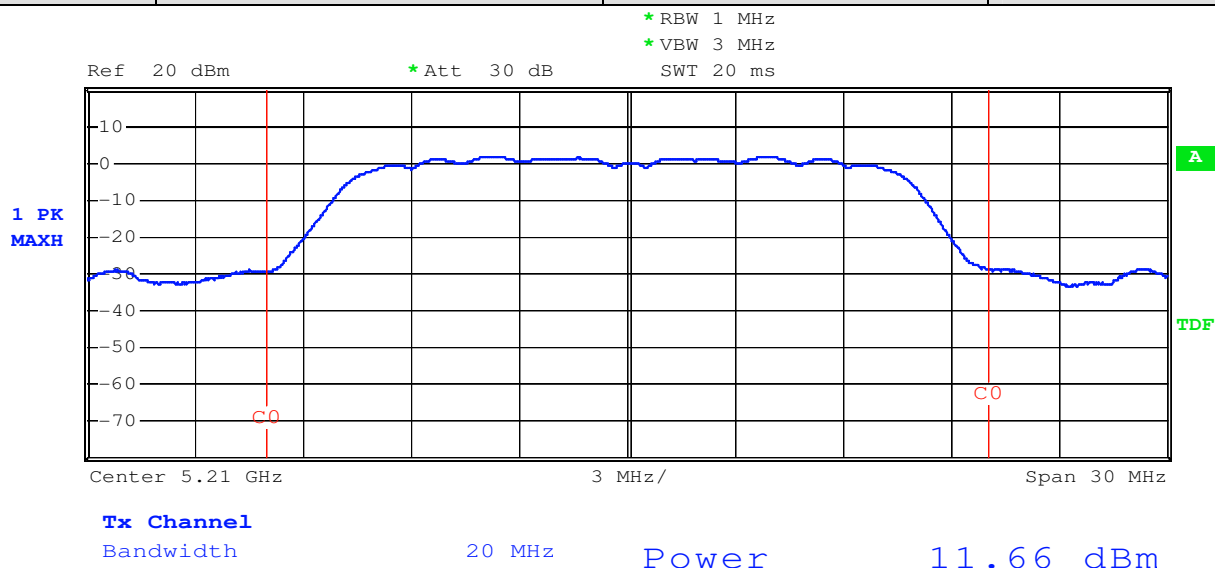


| | | | |
|------------|-----------------------|---------------|-----|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | Low |
|------------|-----------------------|---------------|-----|

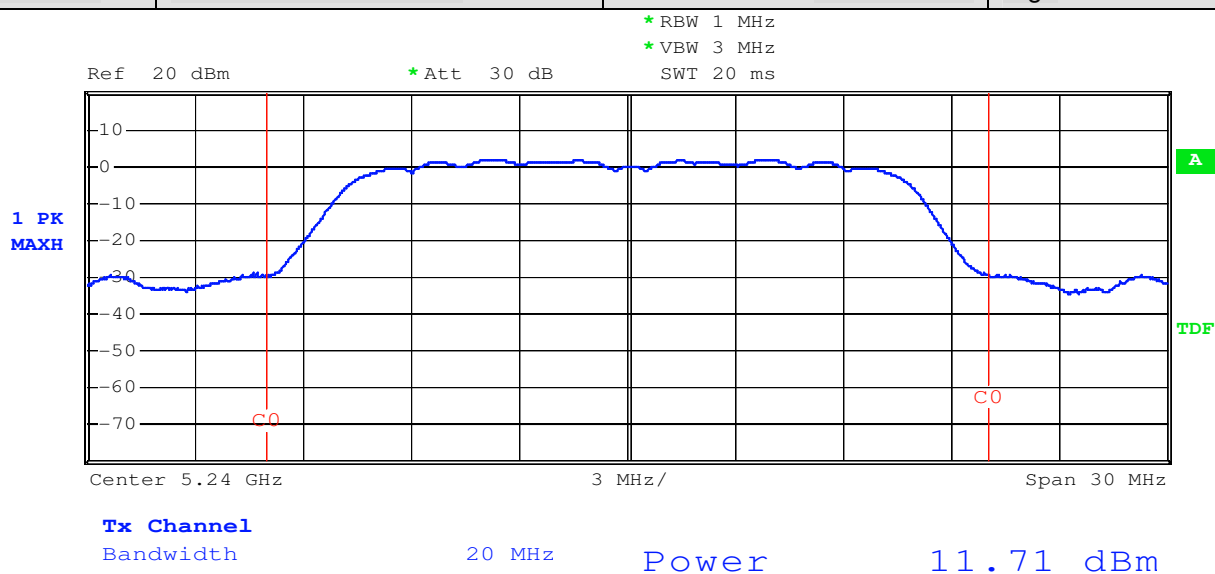




| | | | |
|------------|-----------------------|---------------|--------|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | Middle |
|------------|-----------------------|---------------|--------|



| | | | |
|------------|-----------------------|---------------|------|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | High |
|------------|-----------------------|---------------|------|



7.4 Peak Power Spectral Density

Test Requirement: FCC Part15 407(a)(1)
RSS-210 Issue 8 Annex 9

Standard Applicable: According to section 15.407(a),
(1) For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the 26- dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Measurement Procedure: The EUT was tested according to UNII test procedure of KDB 789033 for compliance to FCC 47CFR 15.407 requirements.
Set RBW=1MHz, Set VBW=3MHz, Span=50MHz, Sweep time=Auto, Set detector=Peak detector.

Measurement Result:

For Antenna A 5180-5240MHz Band:

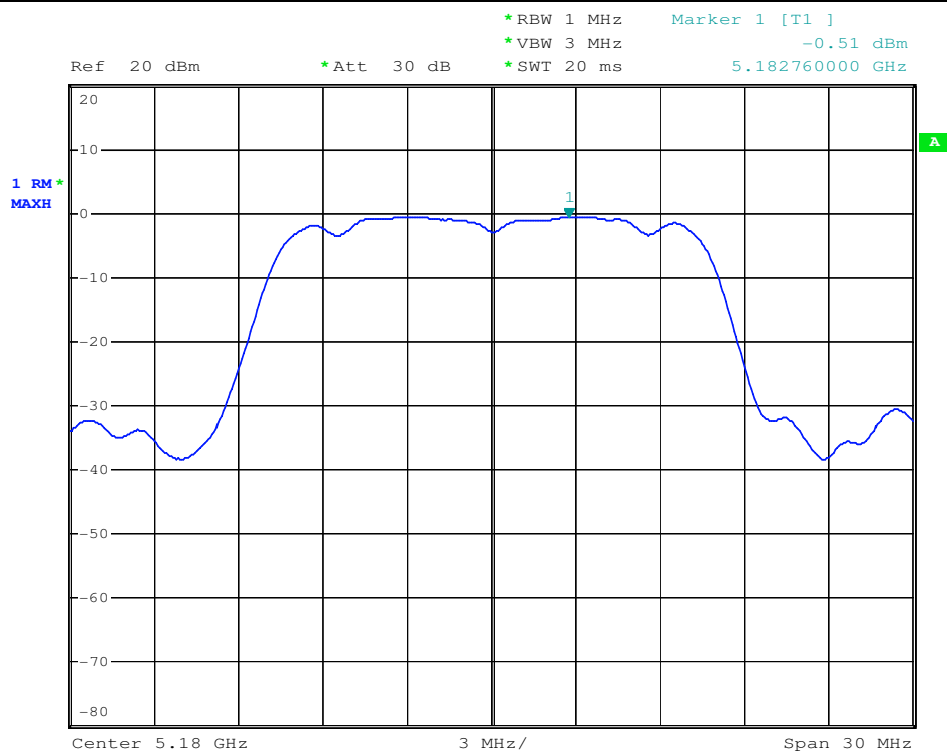
| CH | Frequency (MHz) | Reading (dBm) | Cable Loss (dB) | RF Power Density (dBm) | Limit (dBm) | Result |
|------|-----------------|---------------|-----------------|------------------------|-------------|--------|
| LOW | 5180 | -0.51 | 1.9 | 1.39 | 4 | PASS |
| MID | 5210 | -1.50 | 1.9 | 0.40 | 4 | PASS |
| HIGH | 5240 | -1.86 | 1.9 | 0.04 | 4 | PASS |

For Antenna B 5180-5240MHz Band:

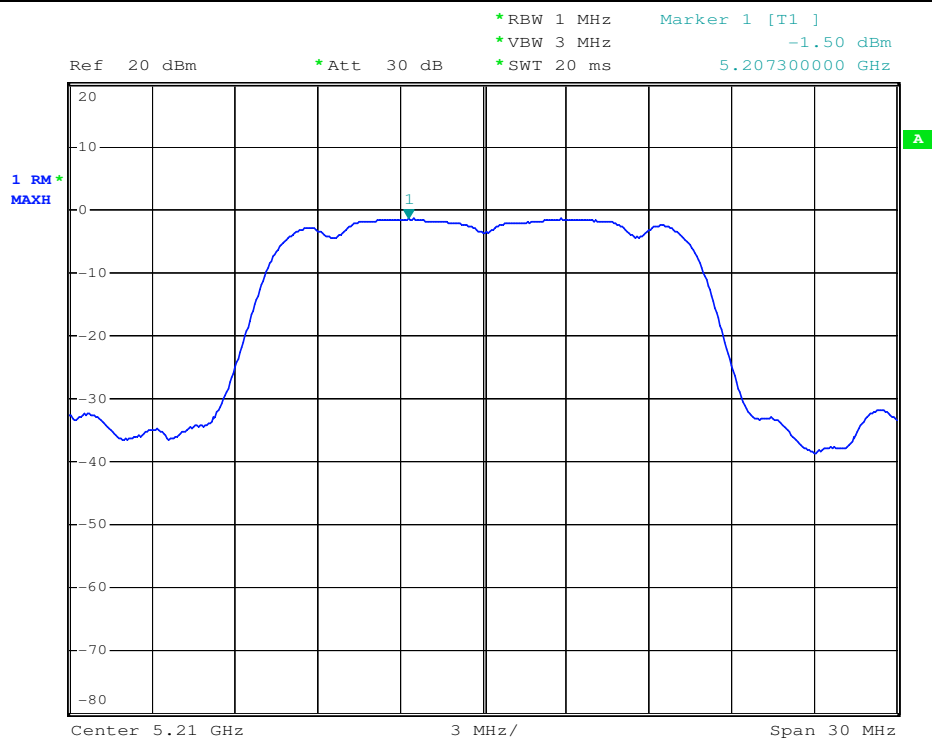
| CH | Frequency (MHz) | Reading (dBm) | Cable Loss (dB) | RF Power Density (dBm) | Limit (dBm) | Result |
|------|-----------------|---------------|-----------------|------------------------|-------------|--------|
| LOW | 5180 | -1.61 | 1.9 | 0.29 | 4 | PASS |
| MID | 5210 | -2.65 | 1.9 | -0.75 | 4 | PASS |
| HIGH | 5240 | -3.55 | 1.9 | -1.65 | 4 | PASS |



| | | | |
|------------|-----------------------|---------------|-----|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | Low |
|------------|-----------------------|---------------|-----|



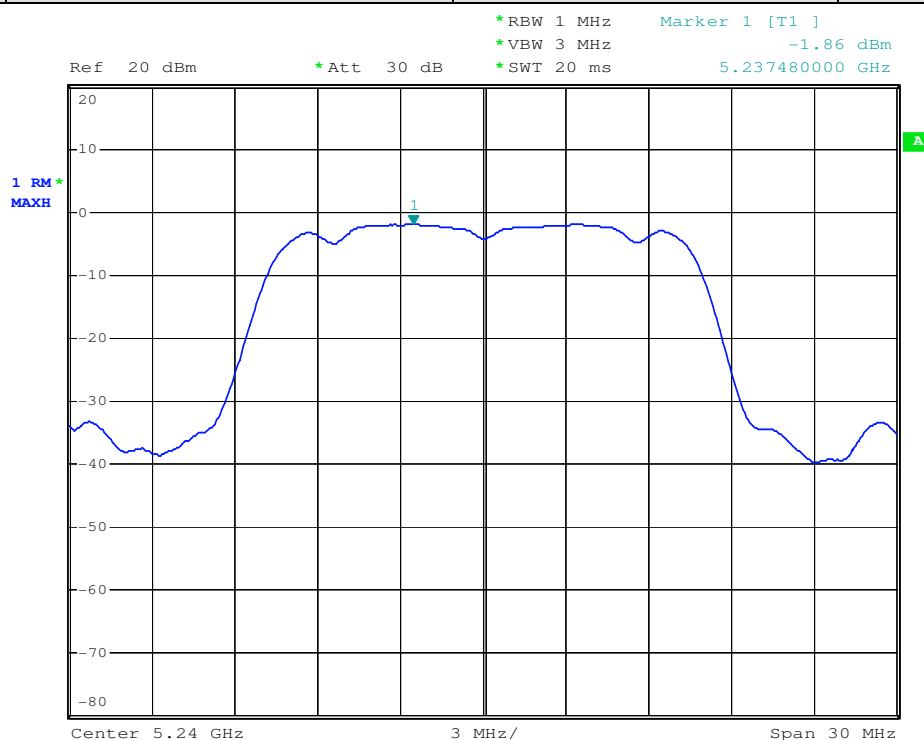
| | | | |
|------------|-----------------------|---------------|--------|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | Middle |
|------------|-----------------------|---------------|--------|



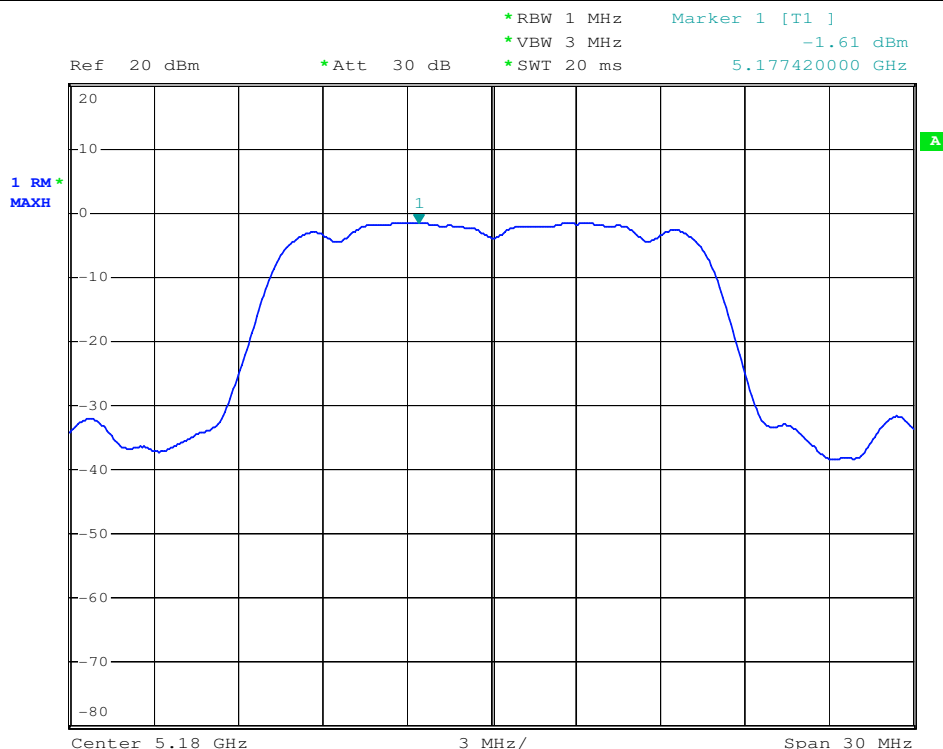
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| | | | |
|------------|-----------------------|---------------|------|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | High |
|------------|-----------------------|---------------|------|

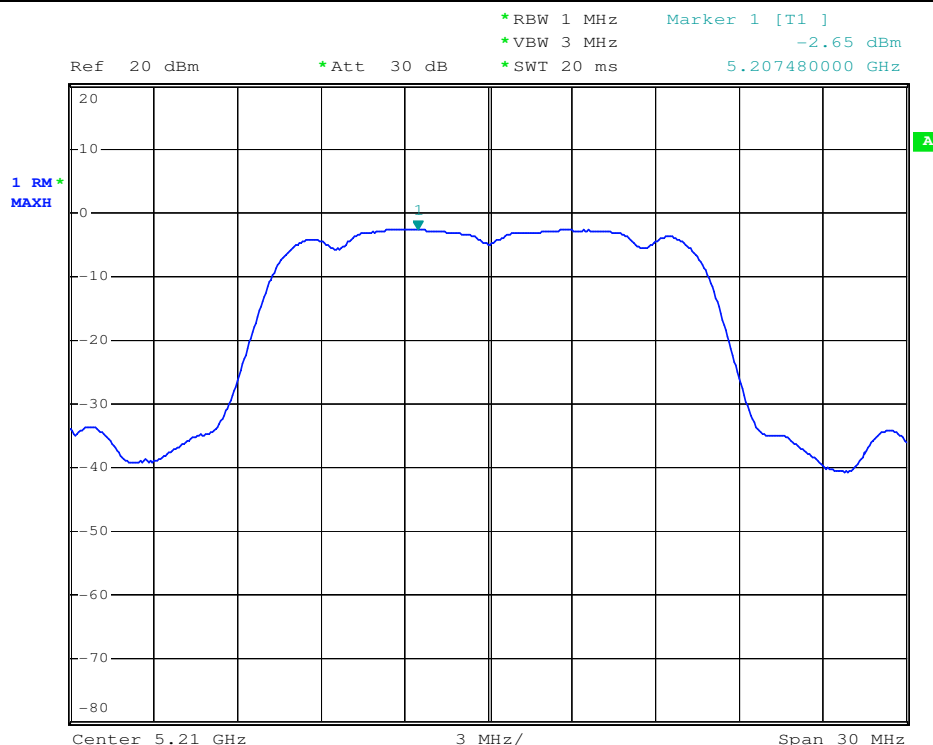


| | | | |
|------------|-----------------------|---------------|-----|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | Low |
|------------|-----------------------|---------------|-----|

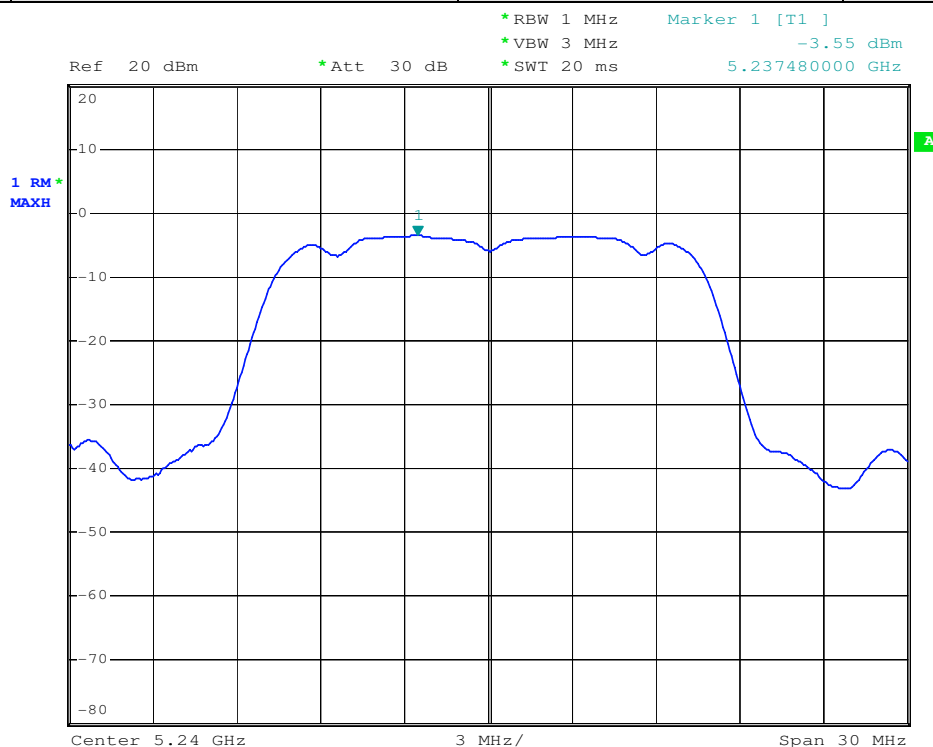




| | | | |
|------------|-----------------------|---------------|--------|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | Middle |
|------------|-----------------------|---------------|--------|



| | | | |
|------------|-----------------------|---------------|------|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | High |
|------------|-----------------------|---------------|------|



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7.5 Peak Power Excursion

Test Requirement: FCC Part15 407(a)(6)
RSS-210 Issue 8 Annex 9

Standard Applicable: According to section 15.407(a) and KDB 789033
(6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Measurement Procedure:

1. The transmitter output was connected to the spectrum analyzer.
2. Set the spectrum analyzer span to view the entire emission bandwidth.
3. Find the maximum of the peak-max-hold spectrum.
set RBW=1MHz,VBW \geq 3MHz, Detector=peak, Trace mode=max-hold
4. allowt the sweeps to continue until the trace stabilizes.
5. Use the peak search function to find the peak of the spectrum.
6. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD

Note: PPSD reference section 6.3

Limit:

| Frequency Band | Limit |
|-----------------|-------|
| 5.15 – 5.25 GHz | 13dB |

Measurement Result:

For Antenna A 5180-5240MHz Band:

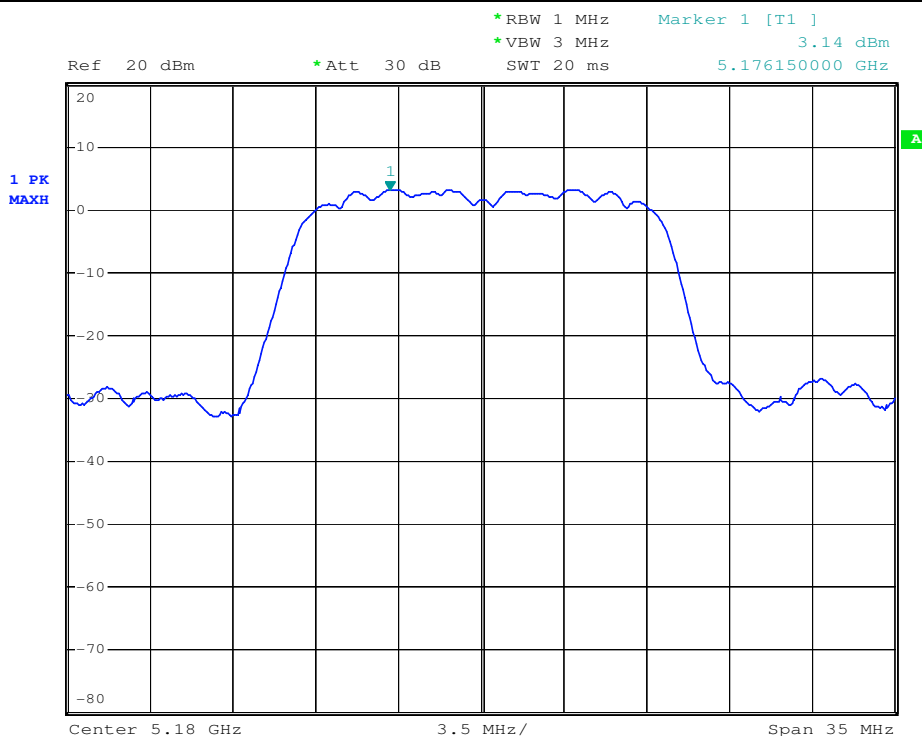
| CH | Frequency (MHz) | Measure Value (dBm) | PPSD (dBm) | Peak power excursion (dB) | Limit (dBm) | Result |
|------|-----------------|---------------------|------------|---------------------------|-------------|--------|
| LOW | 5180 | 3.14 | -0.51 | 3.65 | 13 | PASS |
| MID | 5210 | 2.03 | -1.50 | 3.53 | 13 | PASS |
| HIGH | 5240 | 1.55 | -1.86 | 3.41 | 13 | PASS |

For Antenna B 5180-5240MHz Band:

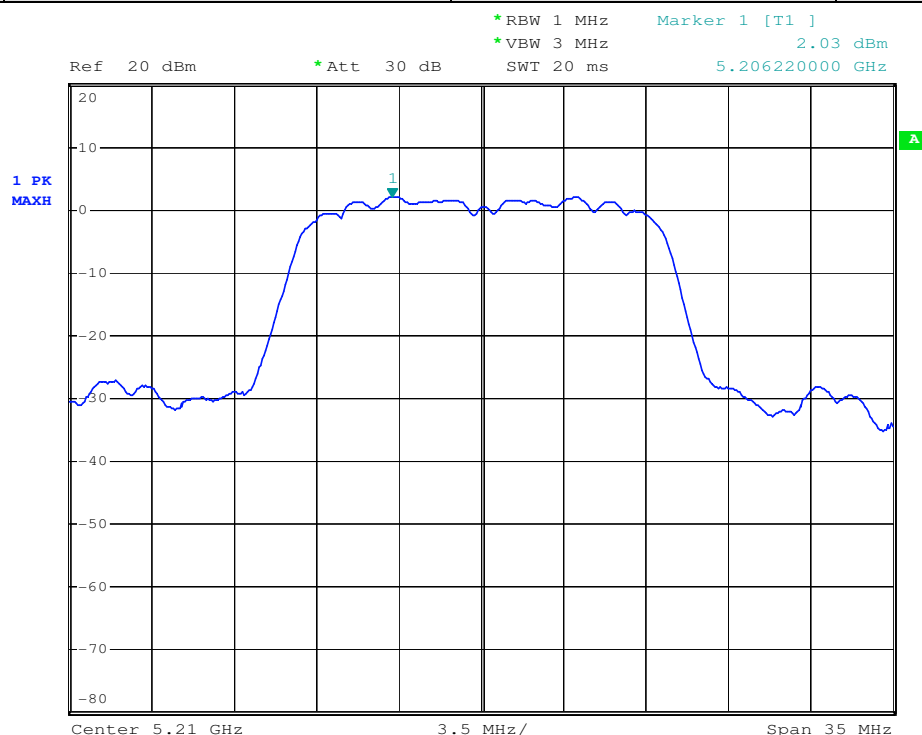
| CH | Frequency (MHz) | Measure Value (dBm) | PPSD (dBm) | Peak power excursion (dB) | Limit (dBm) | Result |
|------|-----------------|---------------------|------------|---------------------------|-------------|--------|
| LOW | 5180 | 1.8 | -1.61 | 3.41 | 13 | PASS |
| MID | 5210 | 1.03 | -2.65 | 3.68 | 13 | PASS |
| HIGH | 5240 | 0.02 | -3.55 | 3.57 | 13 | PASS |



| | | | |
|------------|-----------------------|---------------|-----|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | Low |
|------------|-----------------------|---------------|-----|



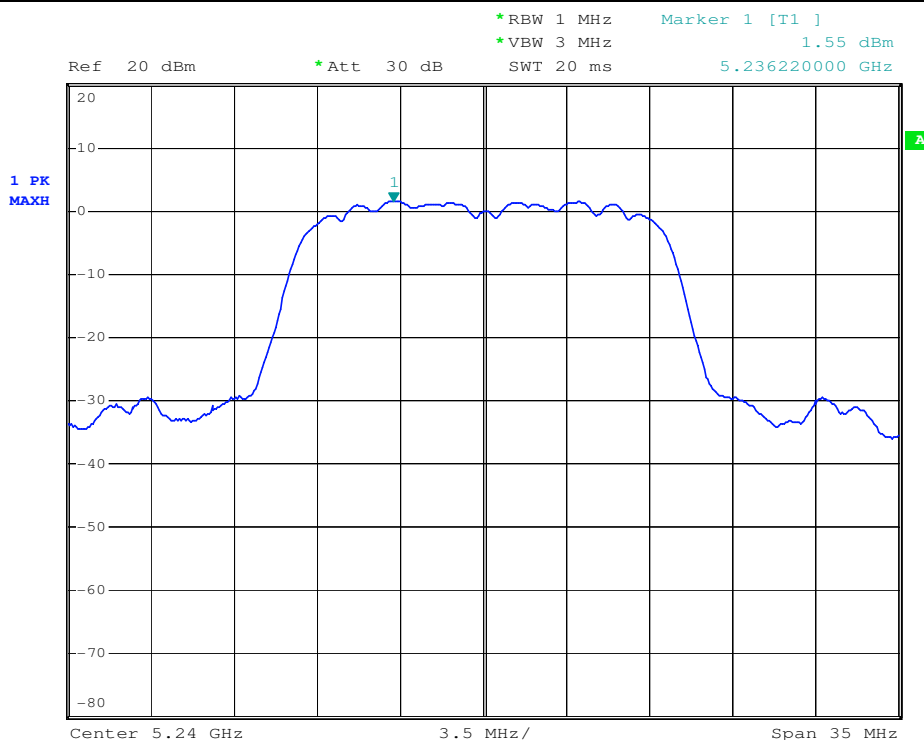
| | | | |
|------------|-----------------------|---------------|--------|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | Middle |
|------------|-----------------------|---------------|--------|



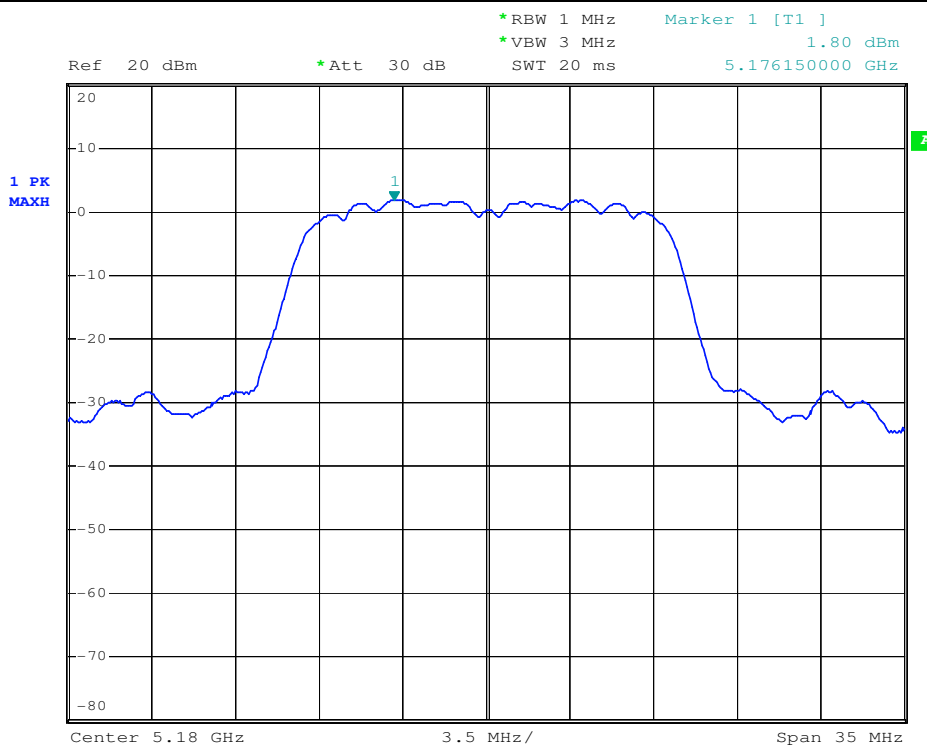
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| | | | |
|------------|-----------------------|---------------|------|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | High |
|------------|-----------------------|---------------|------|



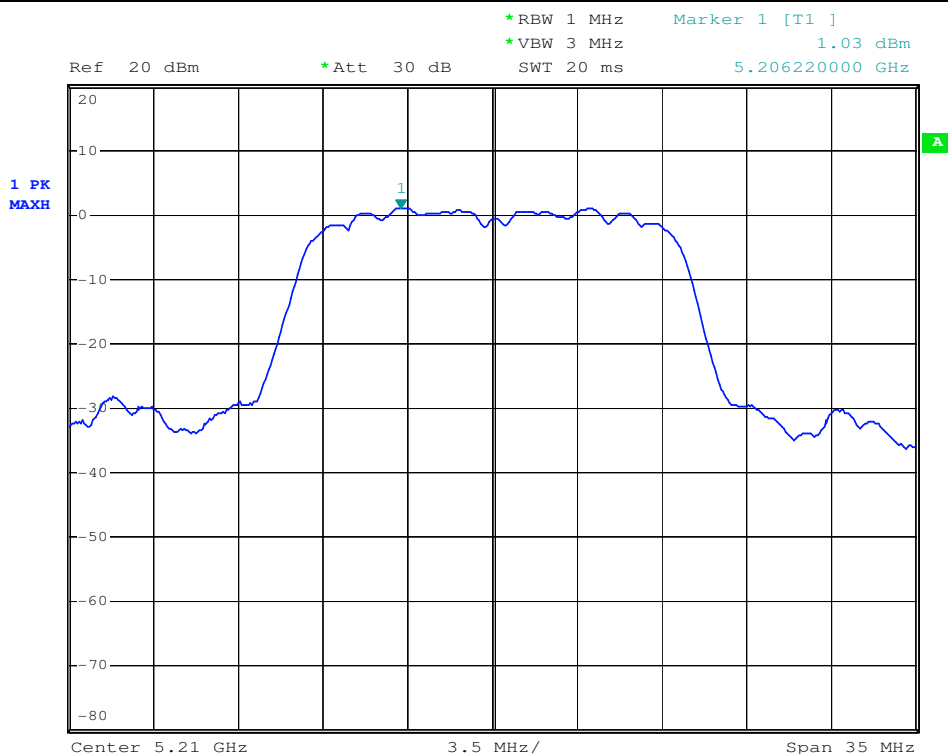
| | | | |
|------------|-----------------------|---------------|-----|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | Low |
|------------|-----------------------|---------------|-----|



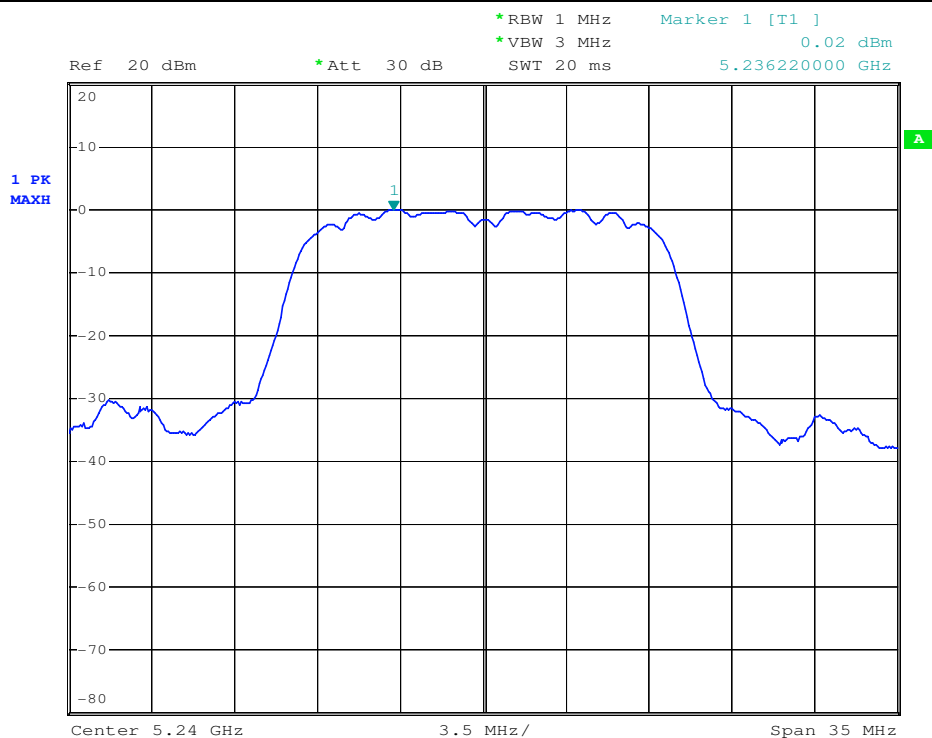
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| | | | |
|------------|-----------------------|---------------|--------|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | Middle |
|------------|-----------------------|---------------|--------|



| | | | |
|------------|-----------------------|---------------|------|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | High |
|------------|-----------------------|---------------|------|



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7.6 Electric Field Strength Spurious Emissions

Test Requirement: FCC Part15 407(b)(1)(6)(7) and FCC Part 15.209
RSS-210 Issue 8 Annex 9

Standard Applicable: According to section 15.407(b)
(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.

Measurement Procedure:

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Pre-test with the Horizontal, Vertical and other status towards to the test antenna. To find the worst status.
3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.

Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). 1MHz resolution bandwidth and Peak detector apply (1000 MHz – 25GHz)
Above 1GHz
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO.

5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until all frequency measured were complete.

Limit:

According to the general radiated limits in 15.209 as following

| Frequency (MHz) | Field strength (microvolts/meter) | Field strength (dBuV/m) | Measurement distance (meters) |
|-----------------|-----------------------------------|-------------------------|-------------------------------|
| 30-88 | 100 | 40.0 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46.0 | 3 |
| Above 960 | 500 | 54.0 | 3 |

Limits of unwanted emission out of the restricted bands in 15.407

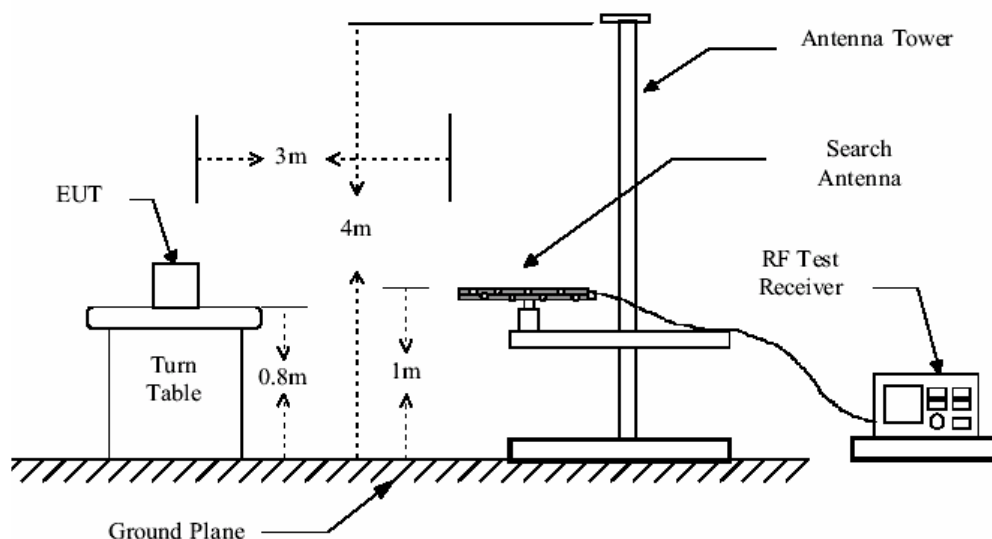
| Operation Frequency (MHz) | EIRP Limit (dBm/MHz) | Equivalent Field Strength at 3m (dBμV/m) * |
|---------------------------|----------------------|--|
| 5150-5250 | -27 | 68.3 |

Note: 1. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength

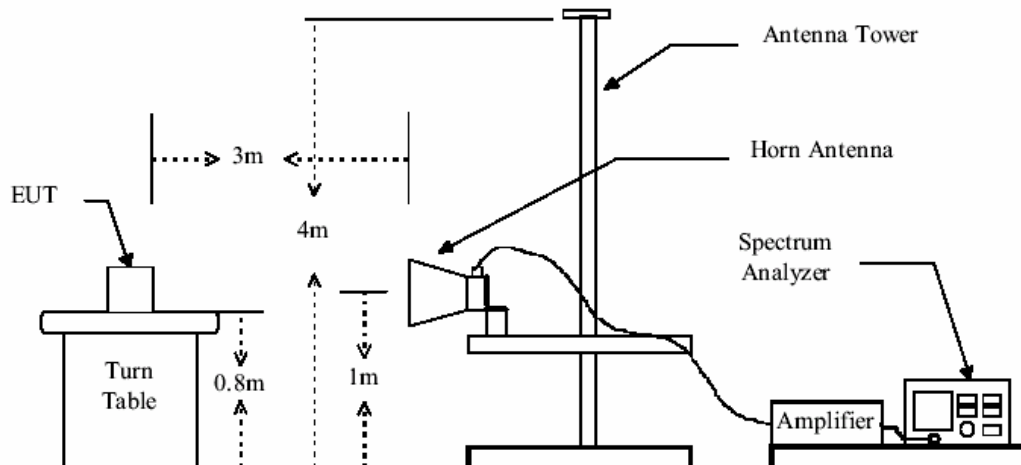
$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$

Radiated Test Set-up:

Radiated Emission Test Set-up, Frequency Below 1000MHz



Radiated Emission Test Set-up Frequency Over 1GHz



Low noise amplifier was used below 1GHz, High pass Filter was used above 1GHz.

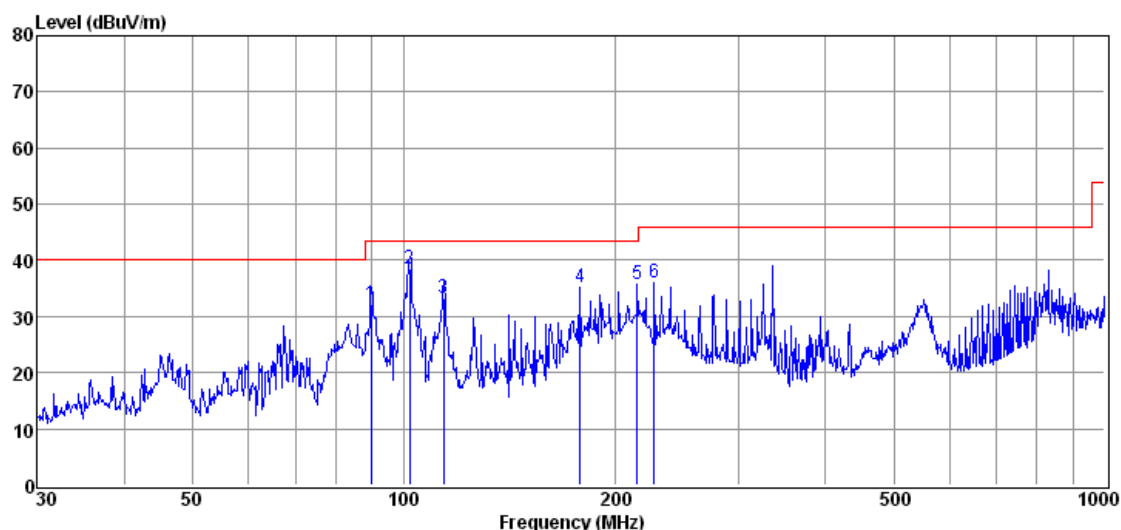
Tests results:

From the pre-test the worst status is the EUT Horizontal towards to the antenna. Below is the worst test results.

30MHz~1GHz Spurious Emissions

Quasi-Peak Measurement

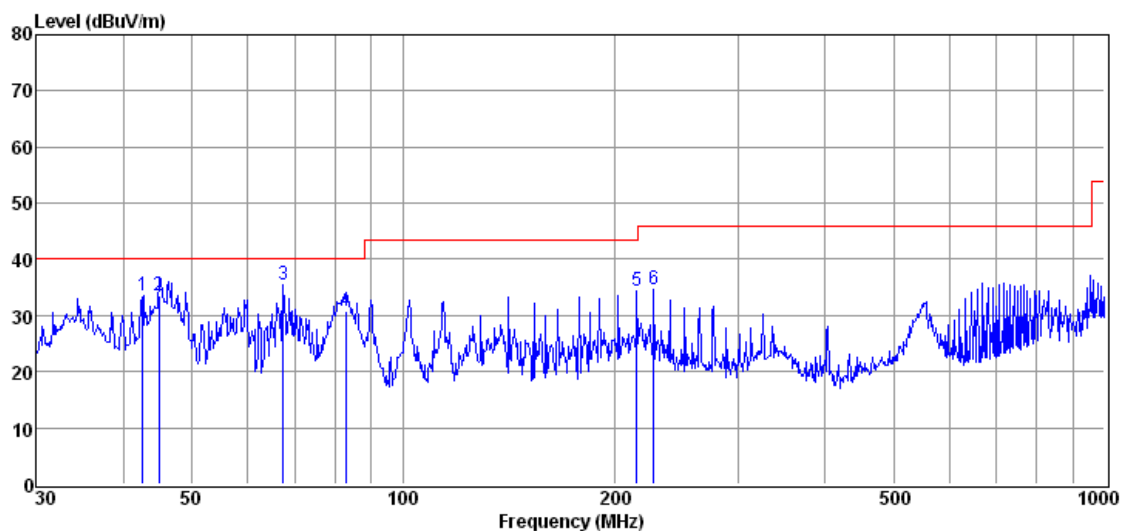
Antenna:Horizontal



| Item | Freq. | Read Level | Antenna Factor | Preamplifier Factor | Cable Loss | Result Level | Limit Line | Over Limit |
|--------|--------|------------|----------------|---------------------|------------|--------------|------------|------------|
| (Mark) | (MHz) | (dBμV) | (dB/m) | (dB) | (dB) | (dBμV/m) | (dBuV/m) | (dB) |
| 1 | 89.92 | 47.49 | 8.50 | 24.70 | 0.95 | 32.24 | 43.50 | -11.26 |
| 2 | 101.99 | 52.81 | 9.38 | 24.70 | 1.05 | 38.54 | 43.50 | -4.96 |
| 3 | 114.06 | 46.42 | 10.55 | 24.70 | 1.11 | 33.38 | 43.50 | -10.12 |
| 4 | 178.43 | 47.13 | 11.29 | 24.60 | 1.40 | 35.22 | 43.50 | -8.28 |
| 5 | 215.50 | 49.65 | 9.14 | 24.60 | 1.58 | 35.77 | 43.50 | -7.73 |
| 6 | 227.90 | 49.72 | 9.26 | 24.60 | 1.63 | 36.01 | 46.00 | -9.99 |

Quasi-Peak Measurement

Antenna:Vertical



| Item | Freq. | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Result Level | Limit Line | Over Limit |
|--------|--------|------------|----------------|---------------|------------|--------------|------------|------------|
| (Mark) | (MHz) | (dBμV) | (dB/m) | (dB) | (dB) | (dBμV/m) | (dBuV/m) | (dB) |
| 1 | 42.58 | 44.38 | 13.20 | 24.70 | 0.58 | 33.46 | 40.00 | -6.54 |
| 2 | 44.85 | 44.66 | 13.11 | 24.70 | 0.60 | 33.67 | 40.00 | -6.33 |
| 3 | 67.50 | 48.32 | 11.15 | 24.70 | 0.78 | 35.55 | 40.00 | -4.45 |
| 4 | 82.81 | 45.91 | 8.72 | 24.70 | 0.89 | 30.82 | 40.00 | -9.18 |
| 5 | 215.45 | 48.36 | 9.15 | 24.60 | 1.58 | 34.49 | 43.50 | -9.01 |
| 6 | 227.73 | 48.45 | 9.25 | 24.60 | 1.63 | 34.73 | 46.00 | -11.27 |



Above 1GHz Peak and Average Spurious Emissions Measurement

EUT mode: Antenna A

Test Antenna: Horizontal

Test Channel: Low

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|
| 1 | 3232 | 39.74 | 6.17 | 45.91 | 54 | -8.09 | peak |
| 2 | 10336 | 34.07 | 11.24 | 45.31 | 54 | -8.69 | peak |
| 3 | 15736 | 40.42 | 10.79 | 51.21 | 54 | -2.79 | peak |
| 4 | 20896 | 39.27 | 11.55 | 50.82 | 54 | -3.18 | peak |

Test Antenna: Vertical

Test Channel: Low

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|
| 1 | 2824 | 39.09 | 5.70 | 44.79 | 54 | -9.21 | peak |
| 2 | 12112 | 36.18 | 11.44 | 47.62 | 54 | -6.38 | peak |
| 3 | 17104 | 40.53 | 11.29 | 51.82 | 54 | -2.18 | peak |
| 4 | 21136 | 41.08 | 11.57 | 52.65 | 54 | -1.35 | peak |

Test Antenna: Horizontal

Test Channel: Middle

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|
| 1 | 2320 | 37.34 | 5.42 | 42.76 | 54 | -11.24 | peak |
| 2 | 10432 | 33.82 | 11.17 | 44.99 | 54 | -9.01 | peak |
| 3 | 15640 | 41.94 | 10.71 | 52.65 | 54 | -1.35 | peak |
| 4 | 20128 | 38.21 | 11.49 | 49.70 | 54 | -4.30 | peak |

Test Antenna: Vertical

Test Channel: Middle

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|
| 1 | 2776 | 36.94 | 5.68 | 42.62 | 54 | -11.38 | peak |
| 2 | 10480 | 33.90 | 11.14 | 45.04 | 54 | -8.96 | peak |
| 3 | 16048 | 41.16 | 11.02 | 52.18 | 54 | -1.82 | peak |
| 4 | 20824 | 40.07 | 11.54 | 51.61 | 54 | -2.39 | peak |



Test Antenna: Horizontal

Test Channel: High

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|
| 1 | 2344 | 40.71 | 5.44 | 46.15 | 54 | -7.85 | peak |
| 2 | 10456 | 36.38 | 11.16 | 47.54 | 54 | -6.46 | peak |
| 3 | 15760 | 40.95 | 10.81 | 51.76 | 54 | -2.24 | peak |
| 4 | 20800 | 40.47 | 11.54 | 52.01 | 54 | -1.99 | peak |

Test Antenna: Vertical

Test Channel: High

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|
| 1 | 2416 | 39.38 | 5.47 | 44.85 | 54 | -9.15 | peak |
| 2 | 10384 | 34.91 | 11.21 | 46.12 | 54 | -7.88 | peak |
| 3 | 15544 | 41.39 | 10.63 | 52.02 | 54 | -1.98 | peak |
| 4 | 20848 | 39.83 | 11.55 | 51.38 | 54 | -2.62 | peak |

EUT mode: Antenna B

Test Antenna: Horizontal

Test Channel: Low

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|
| 1 | 3136 | 39.50 | 6.02 | 45.52 | 54 | -8.48 | peak |
| 2 | 10360 | 37.19 | 11.22 | 48.41 | 54 | -5.59 | peak |
| 3 | 15472 | 40.96 | 10.57 | 51.53 | 54 | -2.47 | peak |
| 4 | 20368 | 40.07 | 11.51 | 51.58 | 54 | -2.42 | peak |

Test Antenna: Vertical

Test Channel: Low

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|
| 1 | 3184 | 39.97 | 6.10 | 46.07 | 54 | -7.93 | peak |
| 2 | 10144 | 35.69 | 11.37 | 47.06 | 54 | -6.94 | peak |
| 3 | 15256 | 42.99 | 10.39 | 53.38 | 54 | -0.62 | peak |
| 4 | 20368 | 41.94 | 11.51 | 53.45 | 54 | -0.55 | peak |



Test Antenna: Horizontal

Test Channel: Middle

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|
| 1 | 3040 | 38.45 | 5.87 | 44.32 | 74 | -29.68 | peak |
| 2 | 10456 | 34.77 | 11.16 | 45.93 | 74 | -28.07 | peak |
| 3 | 15640 | 40.71 | 10.71 | 51.42 | 74 | -22.58 | peak |
| 4 | 20800 | 40.12 | 11.54 | 51.66 | 74 | -22.34 | peak |

Test Antenna: Vertical

Test Channel: Middle

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|
| 1 | 2848 | 36.90 | 5.72 | 42.62 | 54 | -9.68 | peak |
| 2 | 10384 | 34.41 | 11.21 | 45.62 | 54 | -8.07 | peak |
| 3 | 15544 | 41.12 | 10.63 | 51.75 | 54 | -2.58 | peak |
| 4 | 20728 | 41.14 | 11.54 | 52.68 | 54 | -2.34 | peak |

Test Antenna: Horizontal

Test Channel: High

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|----------------|----------|
| 1 | 2368 | 36.39 | 5.45 | 41.84 | 54 | -12.16 | peak |
| 2 | 10480 | 34.88 | 11.14 | 46.02 | 54 | -7.98 | peak |
| 3 | 15640 | 40.47 | 10.71 | 51.18 | 54 | -2.82 | peak |
| 4 | 20824 | 39.02 | 11.54 | 50.56 | 54 | -3.44 | peak |

Test Antenna: Vertical

Test Channel: High

| Mark | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|------|--------------------|-------------------|----------------|----------------------|-------------------|----------------|----------|
| 1 | 2560 | 36.71 | 5.55 | 42.26 | 54 | -11.74 | peak |
| 2 | 10384 | 33.92 | 11.21 | 45.13 | 54 | -8.87 | peak |
| 3 | 15544 | 41.8 | 10.63 | 52.43 | 54 | -1.57 | peak |
| 4 | 20728 | 40.06 | 11.54 | 51.60 | 54 | -2.40 | peak |

Remark: No other radiation has been found

Test Level = Receiver Reading + Antenna Factor + Cable Loss – Preamplifier Factor.

Remark: No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be

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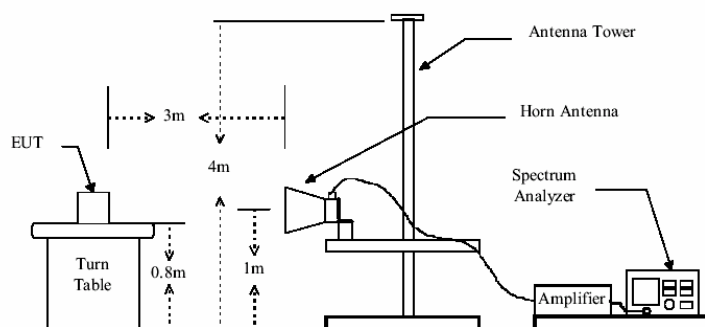


reported unless specifically required elsewhere in this Part. Hence there no other emissions have been reported.

7.7 Radiated Emission Band Edge

| | |
|-------------------------------|---|
| Test Requirement: | FCC Part15 407(b)(5)(7) and FCC Part 15.205 |
| Standard Applicable: | According to section 15.407(b) (5) The above emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz. |
| Measurement Distance: | 3m (Semi-Anechoic Chamber) |
| Limit: | 40.0 dBμV/m between 30MHz & 88MHz; 43.5 dBμV/m between 88MHz & 216MHz; 46.0 dBμV/m between 216MHz & 960MHz; AV 54.0 dBμV/m PK 74.0dBμV/m above 960MHz. |
| Measurement Procedure: | The EUT was setup according to ANSI 63.10,2009 and tested according to DTS test procedure of KDB789033 for compliance to FCC 47 CFR 15.407 requirements.The EUT is placed on a turn table which is 0.8 m above ground.The turn table is rotated 360 degrees to determine to the position of the maximum emission level.The EUT was positioned such that the distance from antenna to the EUT was 3 meters.The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level This is repeated for both horizontal and vertical polarization of the antenna.In order to find the maximum emission,all of the interface cables were manipulated according to ANSIC 63.10:2009 on radiated measurement. Spectrum analyzer parameters setting as shown below: (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO |

Radiated Emission Test Set-up Frequency Over 1GHz



The field strength is calculated by adding the Antenna Factor, Preamplifier Factor & Cable Factor. The basic equation with a sample calculation is as follows:

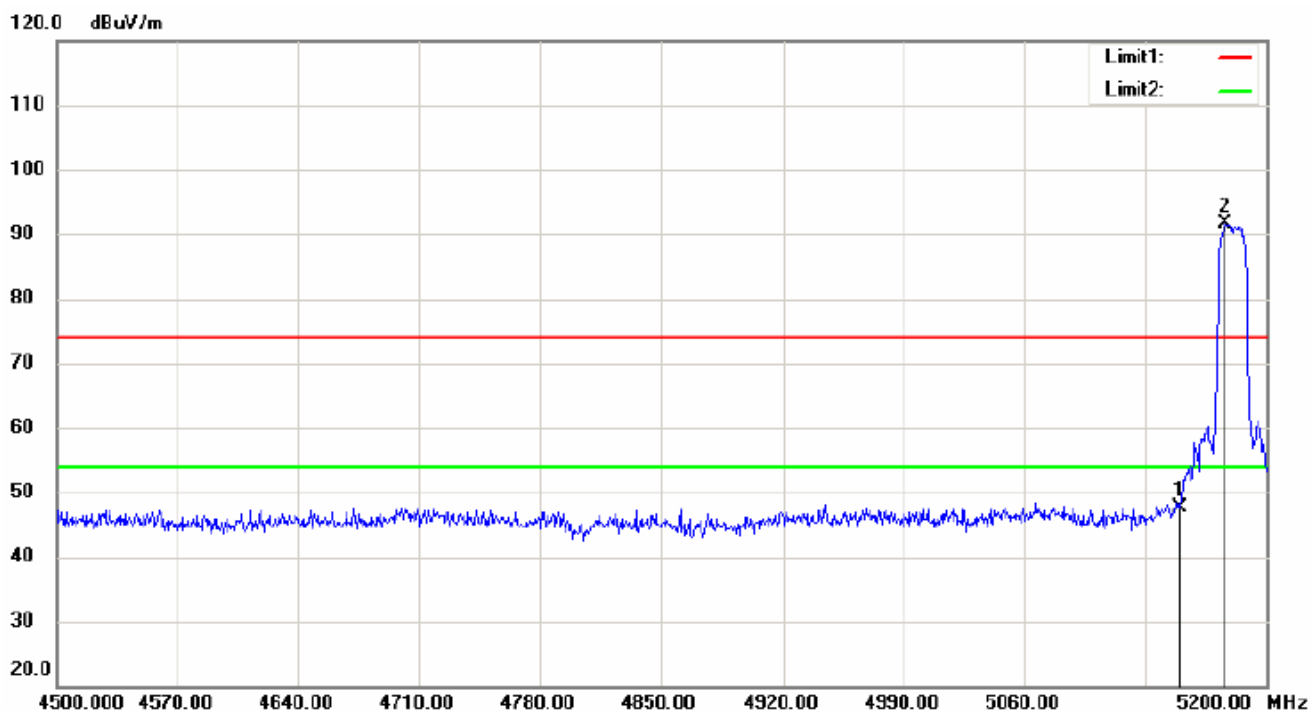
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor



Radiated Bandedge Measurement Result:

| | | | |
|------------|-----------------------|---------------|-----|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | Low |
|------------|-----------------------|---------------|-----|

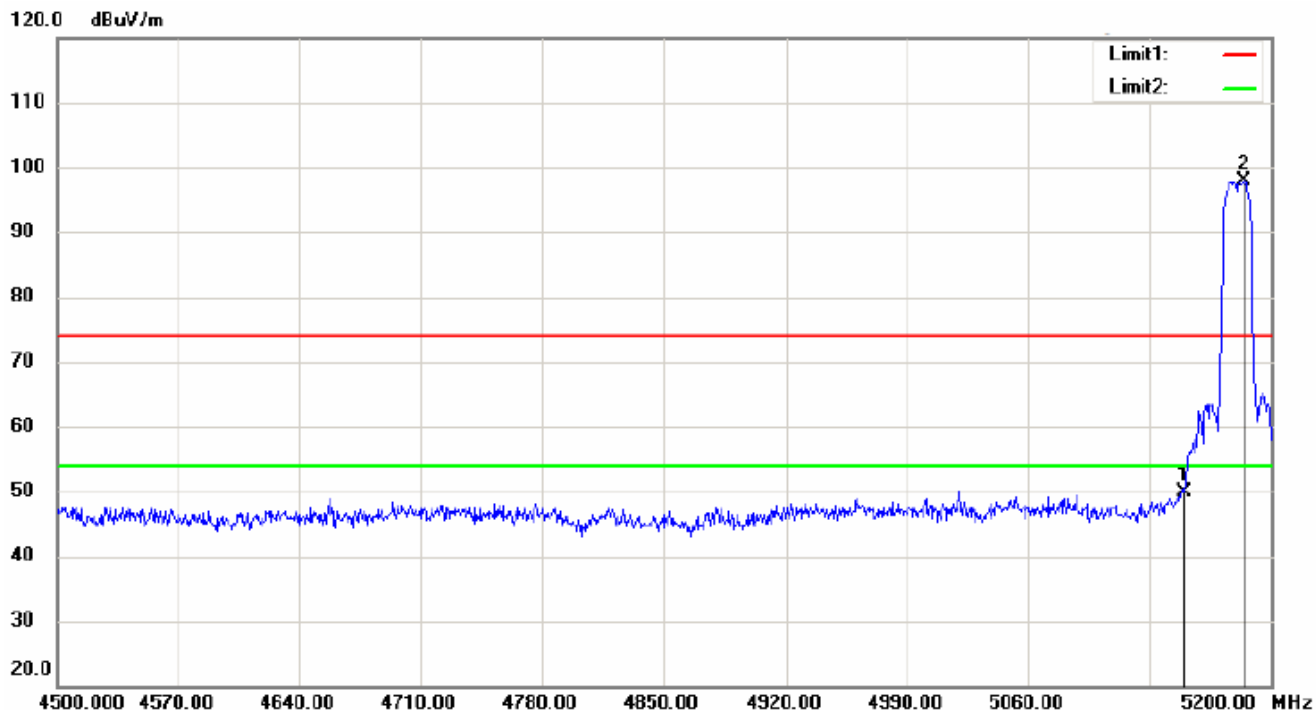
Horizontal, Peak Detector:



| MK. | Frequency | Reading (dBuV/m) | Detector | Corrected factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------|------------------|----------|----------------------|-----------------|----------------|-------------|
| 1 | 5150.300 | 39.03 | peak | 8.61 | 47.64 | 54 | 6.36 |
| 2 | 5176.200 | 82.90 | peak | 8.63 | 91.53 | 54 | -37.53 |



Vertical , Peak Detector:

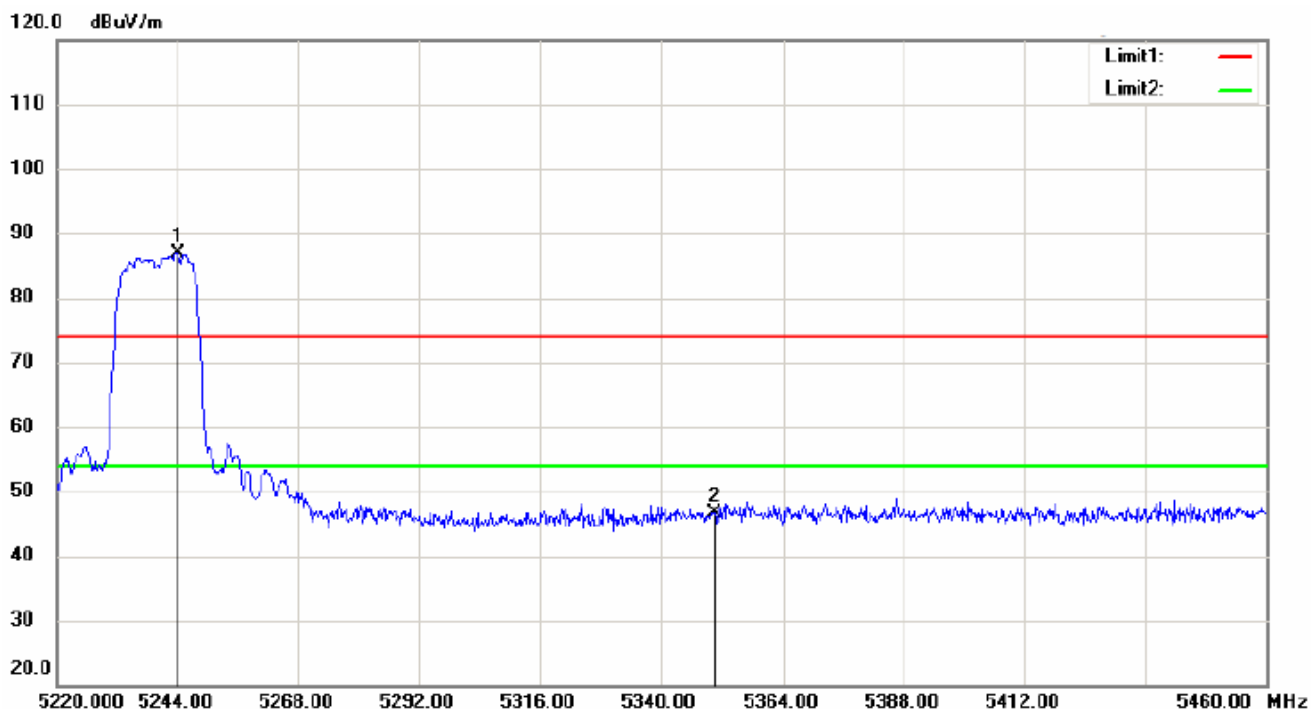


| MK. | Frequency | Reading (dBuV/m) | Detector | Corrected factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------|---------------------|----------|-------------------------|--------------------|-------------------|----------------|
| 1 | 5150.300 | 41.31 | peak | 8.61 | 49.92 | 54 | 4.08 |
| 2 | 5184.600 | 89.23 | peak | 8.64 | 97.87 | 54 | -43.87 |



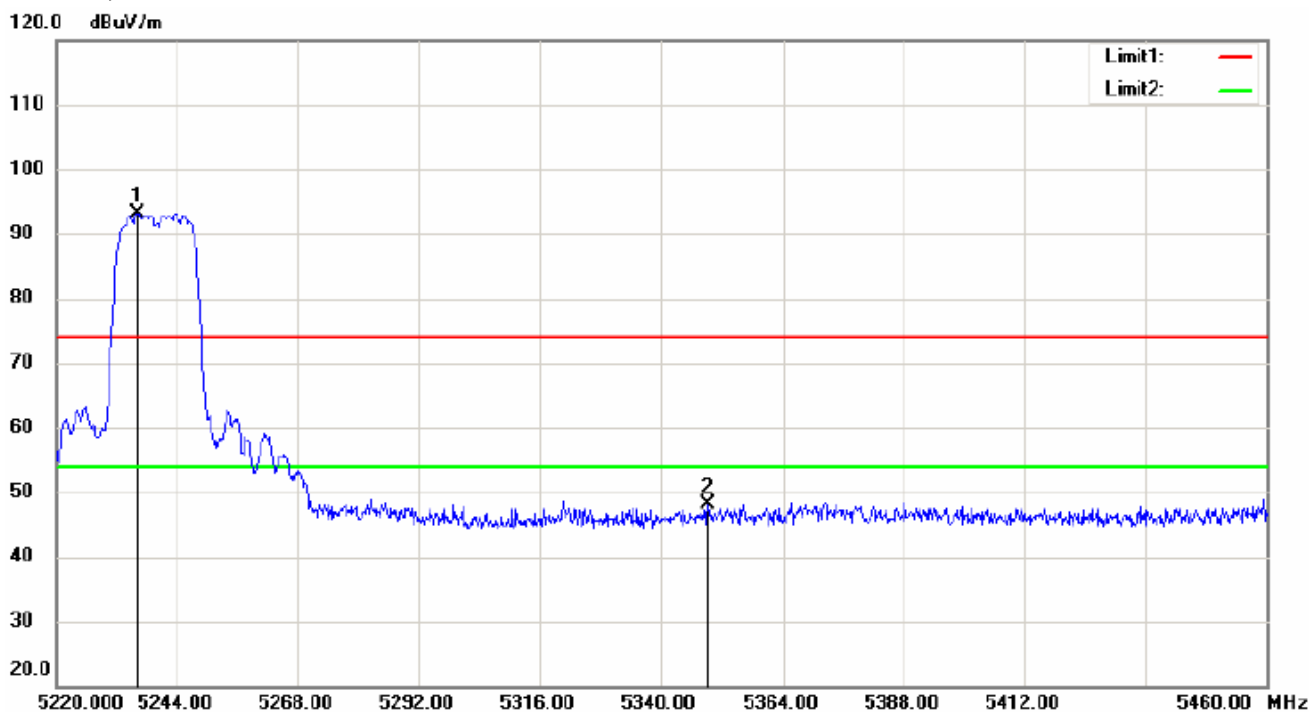
| | | | |
|------------|-----------------------|---------------|------|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | High |
|------------|-----------------------|---------------|------|

Horizontal, Peak Detector:



| MK. | Frequency | Reading (dBuV/m) | Detector | Corrected factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------|------------------|----------|----------------------|-----------------|----------------|-------------|
| 1 | 5244.000 | 78.20 | peak | 8.68 | 86.88 | 54 | -32.88 |
| 2 | 5350.320 | 37.85 | peak | 8.75 | 46.60 | 54 | 7.40 |

Vertical , Peak Detector:

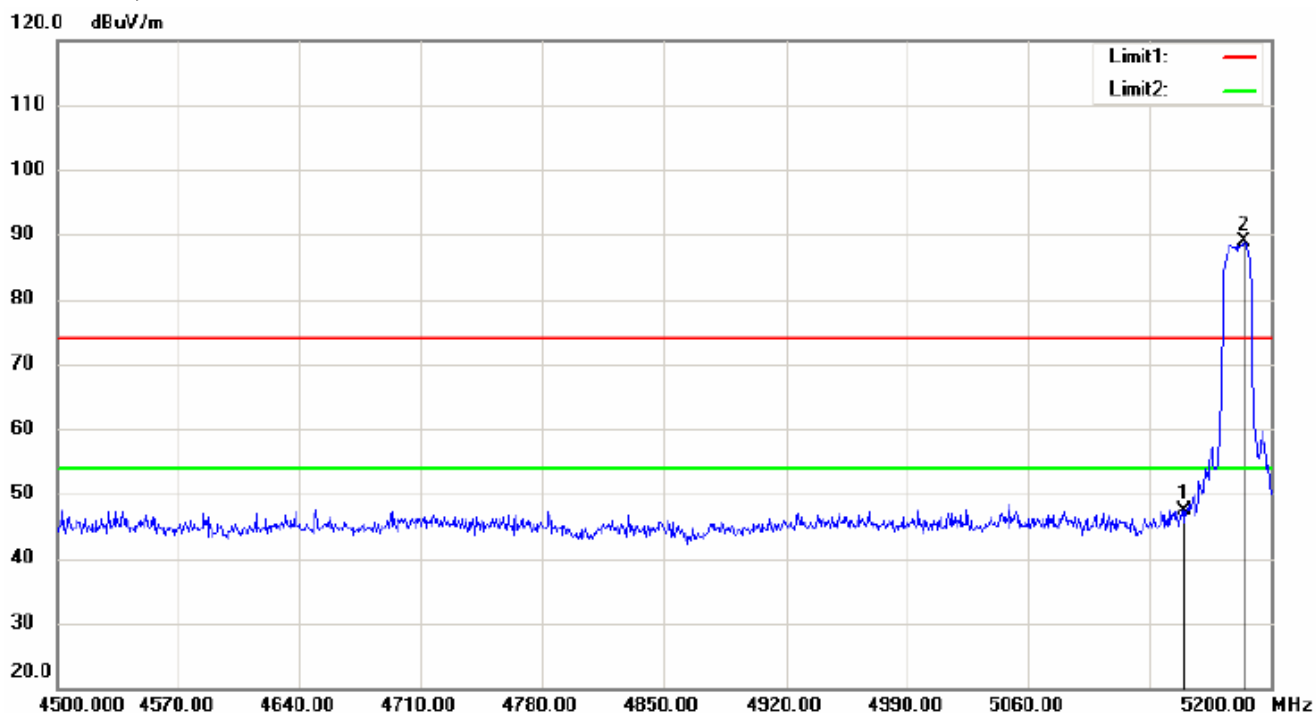


| MK. | Frequency | Reading (dBuV/m) | Detector | Corrected factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------|---------------------|----------|-------------------------|--------------------|-------------------|----------------|
| 1 | 5236.080 | 84.48 | peak | 8.67 | 93.15 | 54 | -39.15 |
| 2 | 5349.120 | 39.34 | peak | 8.75 | 48.09 | 54 | 5.91 |



| | | | |
|------------|-----------------------|---------------|-----|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | Low |
|------------|-----------------------|---------------|-----|

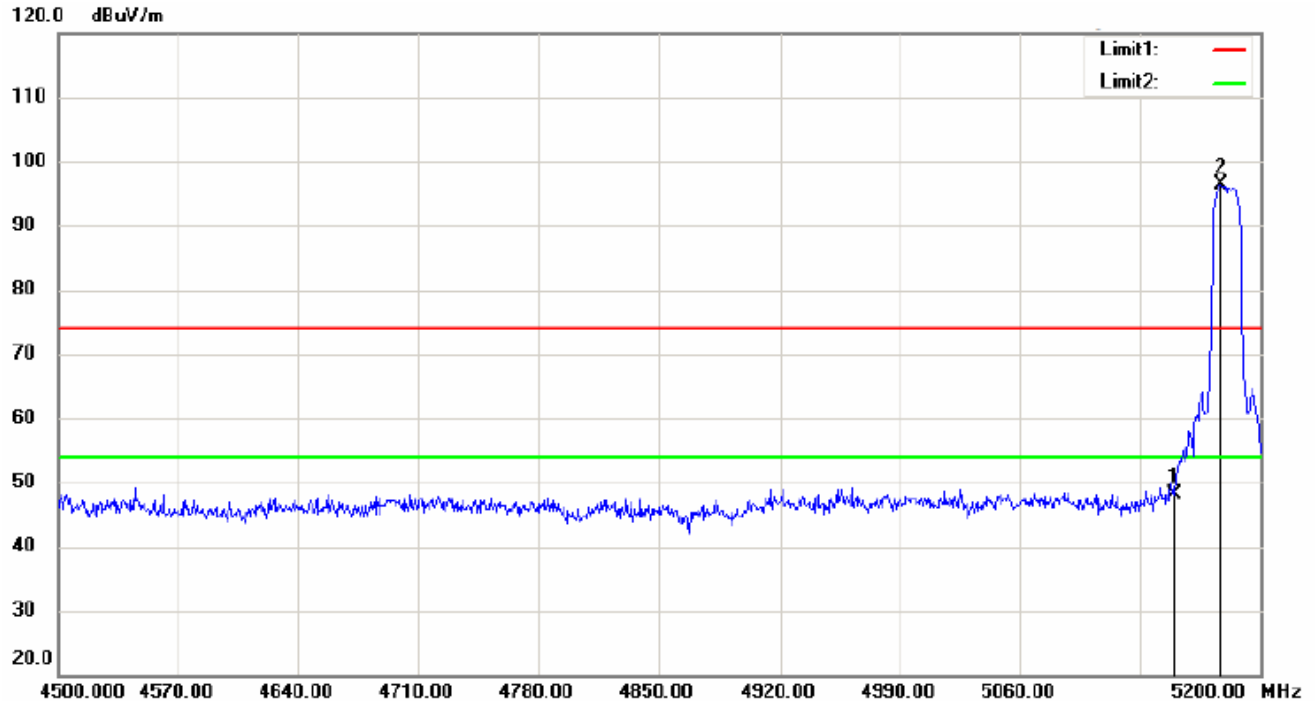
Horizontal, Peak Detector:



| MK. | Frequency | Reading (dBuV/m) | Detector | Corrected factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------|---------------------|----------|-------------------------|--------------------|-------------------|----------------|
| 1 | 5150.300 | 38.85 | peak | 8.61 | 47.46 | 54 | 6.54 |
| 2 | 5184.600 | 80.22 | peak | 8.64 | 88.86 | 54 | -34.86 |



Vertical , Peak Detector:

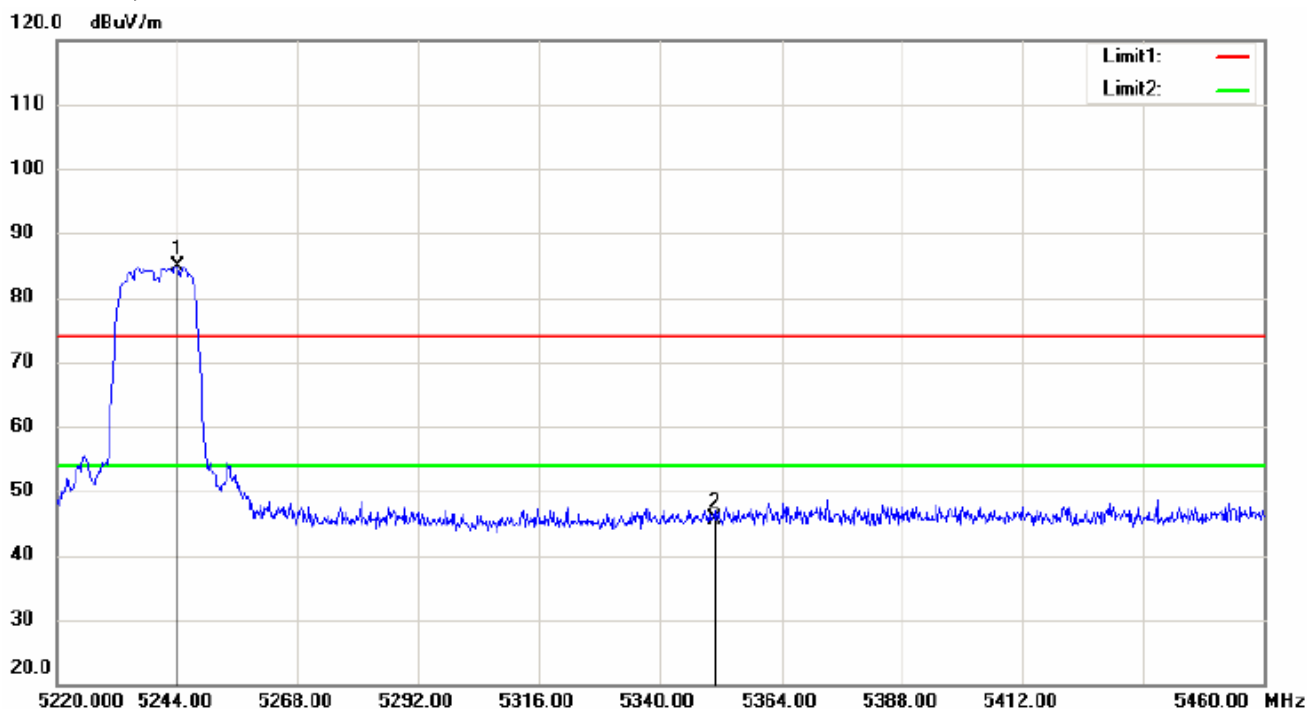


| MK. | Frequency | Reading (dBuV/m) | Detector | Corrected factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------|---------------------|----------|-------------------------|--------------------|-------------------|----------------|
| 1 | 5150.300 | 39.49 | peak | 8.61 | 48.10 | 54 | 5.90 |
| 2 | 5176.900 | 87.71 | peak | 8.63 | 96.34 | 54 | -42.34 |



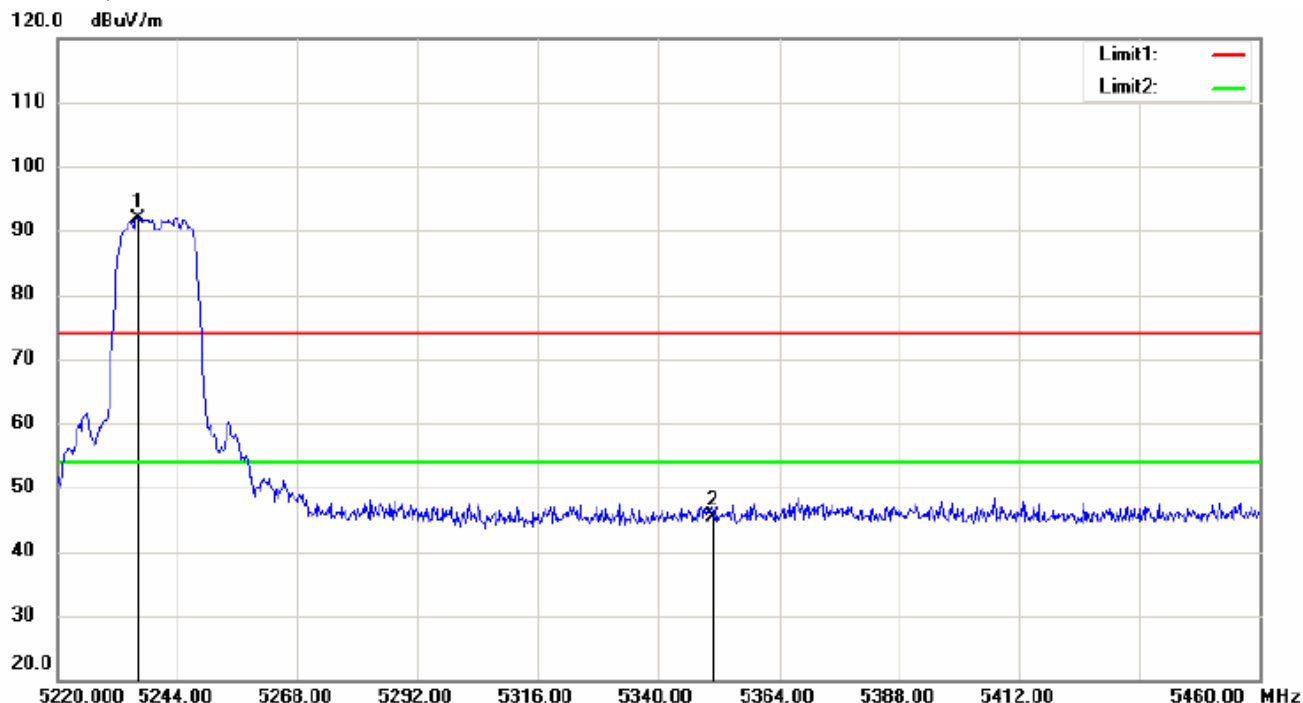
| | | | |
|------------|-----------------------|---------------|------|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | High |
|------------|-----------------------|---------------|------|

Horizontal, Peak Detector:



| MK. | Frequency | Reading (dBuV/m) | Detector | Corrected factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------|---------------------|----------|-------------------------|--------------------|-------------------|----------------|
| 1 | 5244.000 | 76.26 | peak | 8.68 | 84.94 | 54 | -30.94 |
| 2 | 5350.800 | 36.78 | peak | 8.75 | 45.53 | 54 | 8.47 |

Vertical , Peak Detector:



| MK. | Frequency | Reading (dBuV/m) | Detector | Corrected factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------|------------------|----------|----------------------|-----------------|----------------|-------------|
| 1 | 5236.080 | 83.33 | peak | 8.67 | 92.00 | 54 | -38.00 |
| 2 | 5350.800 | 36.64 | peak | 8.75 | 45.39 | 54 | 8.61 |

Remark: No any other emission which fall in restricted bands can be detected and be reported.

Test Level = Receiver Reading + Antenna Factor + Cable Loss- Preamplifier Factor

All frequencies within the “Restricted bands” have been evaluated to compliance. Section 15.205 Restricted bands of operation.

7.8 Frequency stability

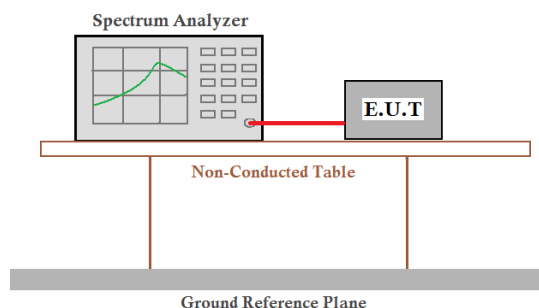
Test requirement: FCC Part15 407 (g)

Standard Applicable: According to section 15.407(g), the manufacturers of UNII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual.

Test Procedure:

- 1) Set up the EUT on lowest channel and the highest channel
- 2) Test the EUT in the lowest channel and the Highest channel ,
- 3) Select the lowest operating frequency of the equipment under test.
- 4) Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.
- 5) Adjust the centre frequency of spectrum analyzer on any frequency be measured.
- 6) Measure the frequency range by spectrum analyzer Marker function.
set the Spectrum Analyzer as below:
 - Span: Wide enough to capture the complete power envelope, including all side bands
 - RBW: 100KHz
 - VBW: 100KHz
 - Detector function: RMS average
 - Trace mode: Max Hold
 - Sweep time: 1minute
- 7) Using the marker of the spectrum analyzer, find the the lowest frequency of the spectrum envelope This frequency shall be recorded as FL.
- 8) Select the highest operating frequency of the equipment under test.
- 9) Using the same set as step 6), find the highest frequency of the spectrum envelope. This frequency shall be recorded as FH.
- 10) Pretest the EUT at different transmission rate and worst case data in the report.

Test setup:





**Test Data:
Antenna A**

| Test Conditions | | Nominal Frequency (MHz) | Measured Frequency (MHz) | Limit (MHz) | Result |
|------------------------|------------------------|-------------------------------|--------------------------------|----------------------|--------|
| Temp (°C) | Volt (V DC) | | | | |
| T _{nom} (25) | V _{nom} (5.0) | 5180 | 5169.42 | F _L >5150 | Pass |
| | | 5240 | 5248.35 | F _H <5250 | Pass |
| T _{min} (-20) | V _{min} (5.5) | 5180 | 5171.26 | F _L >5150 | Pass |
| | | 5240 | 5248.43 | F _H <5250 | Pass |
| | V _{max} (4.5) | 5180 | 5172.39 | F _L >5150 | Pass |
| | | 5240 | 5248.41 | F _H <5250 | Pass |
| T _{max} (55) | V _{min} (5.5) | 5180 | 5175.51 | F _L >5150 | Pass |
| | | 5240 | 5248.63 | F _H <5250 | Pass |
| | V _{max} (4.5) | 5180 | 5174.57 | F _L >5150 | Pass |
| | | 5240 | 5248.49 | F _H <5250 | Pass |

Antenna B

| Test Conditions | | Nominal Frequency (MHz) | Measured Frequency (MHz) | Limit (MHz) | Result |
|------------------------|------------------------|-------------------------------|--------------------------------|----------------------|--------|
| Temp (°C) | Volt (V DC) | | | | |
| T _{nom} (25) | V _{nom} (5.0) | 5180 | 5174.27 | F _L >5150 | Pass |
| | | 5240 | 5248.38 | F _H <5250 | Pass |
| T _{min} (-20) | V _{min} (5.5) | 5180 | 5175.33 | F _L >5150 | Pass |
| | | 5240 | 5249.28 | F _H <5250 | Pass |
| | V _{max} (4.5) | 5180 | 5174.31 | F _L >5150 | Pass |
| | | 5240 | 5248.45 | F _H <5250 | Pass |
| T _{max} (55) | V _{min} (5.5) | 5180 | 5174.72 | F _L >5150 | Pass |
| | | 5240 | 5248.43 | F _H <5250 | Pass |
| | V _{max} (4.5) | 5180 | 5174.82 | F _L >5150 | Pass |
| | | 5240 | 5248.63 | F _H <5250 | Pass |

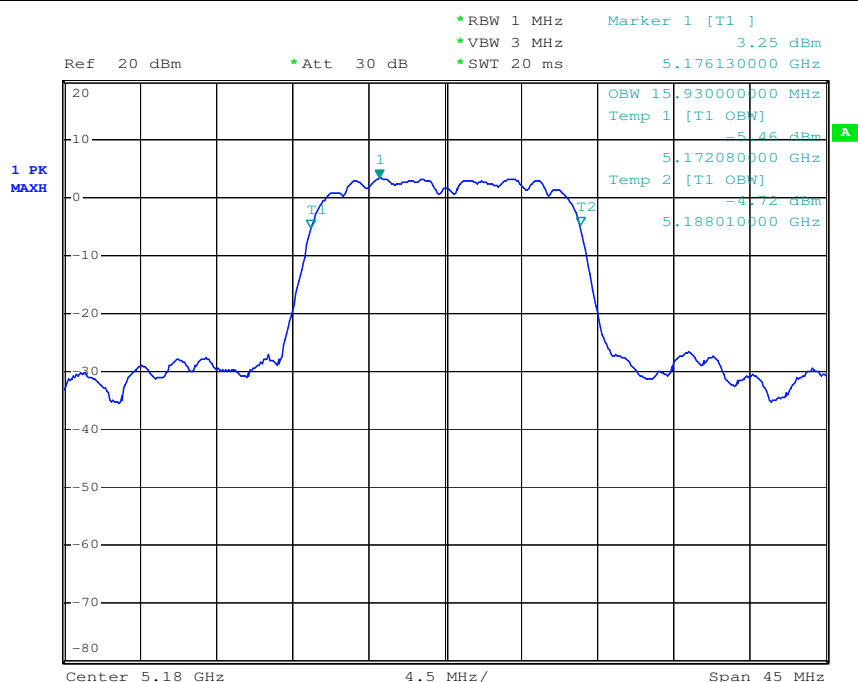
7.9 Occupied Bandwidth Test

| | |
|----------------------------|---|
| Test Requirement: | RSS-Gen Issue 3 Clause 4.6.1 |
| Standard Applicable | According to the section RSS-Gen Issue 3 Clause 4.6.1 |
| EUT Setup | The occupied bandwidth per RSS-Gen Issue 3 Clause 4.6.1 was measured using the Spectrum Analyzer with the resolutions set at 100kHz, the video bandwidth set at 300kHz. |

Measurement Result: For 5180-5240MHz Band

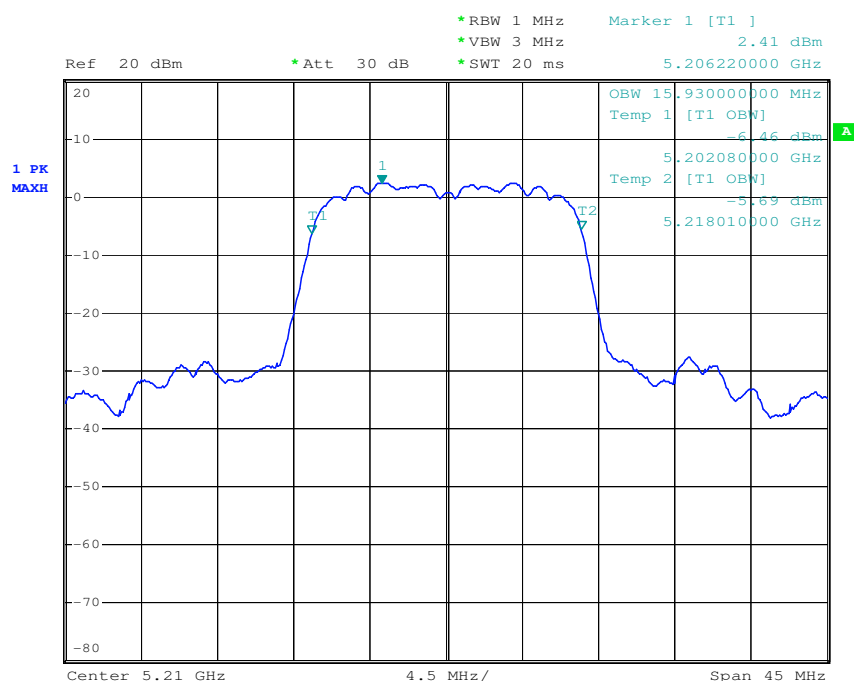
| Test Mode | Channel | Frequency (MHz) | Bandwidth (MHz) |
|-----------|---------|-----------------|-----------------|
| Antenna A | Low | 5180 | 15.93 |
| | Middle | 5210 | 15.93 |
| | High | 5240 | 15.93 |
| Antenna B | Low | 5180 | 15.93 |
| | Middle | 5210 | 15.93 |
| | High | 5240 | 15.84 |

| | | | |
|------------|-----------------------|---------------|-----|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | Low |
|------------|-----------------------|---------------|-----|

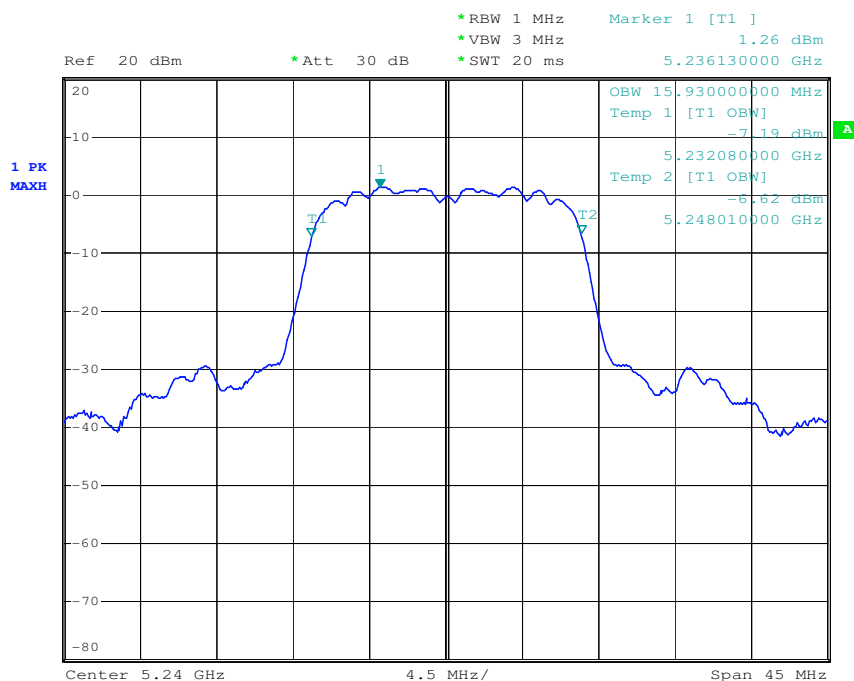




| | | | |
|------------|-----------------------|---------------|--------|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | Middle |
|------------|-----------------------|---------------|--------|

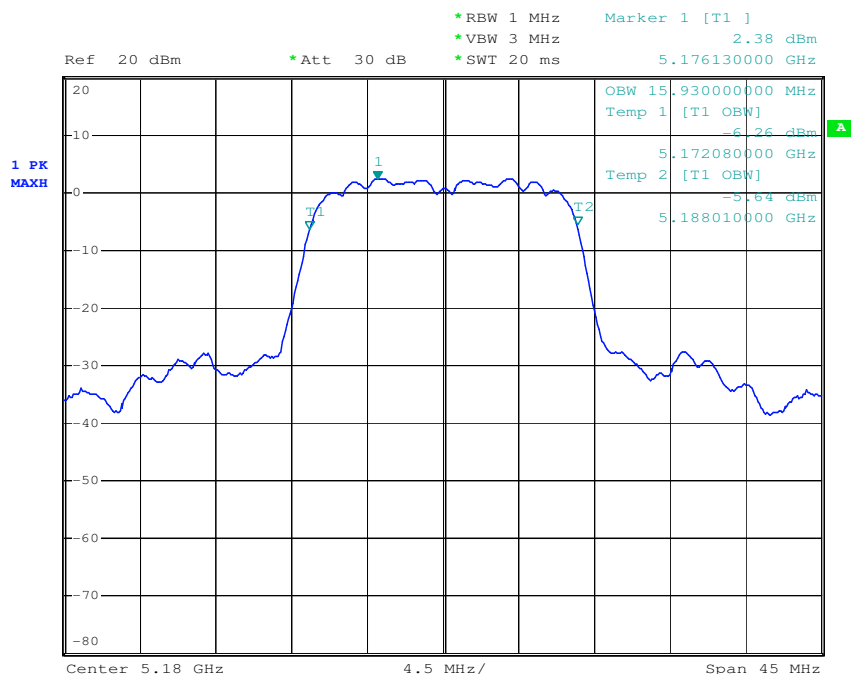


| | | | |
|------------|-----------------------|---------------|------|
| Test mode: | 5.2GHz Band Antenna A | Test channel: | High |
|------------|-----------------------|---------------|------|

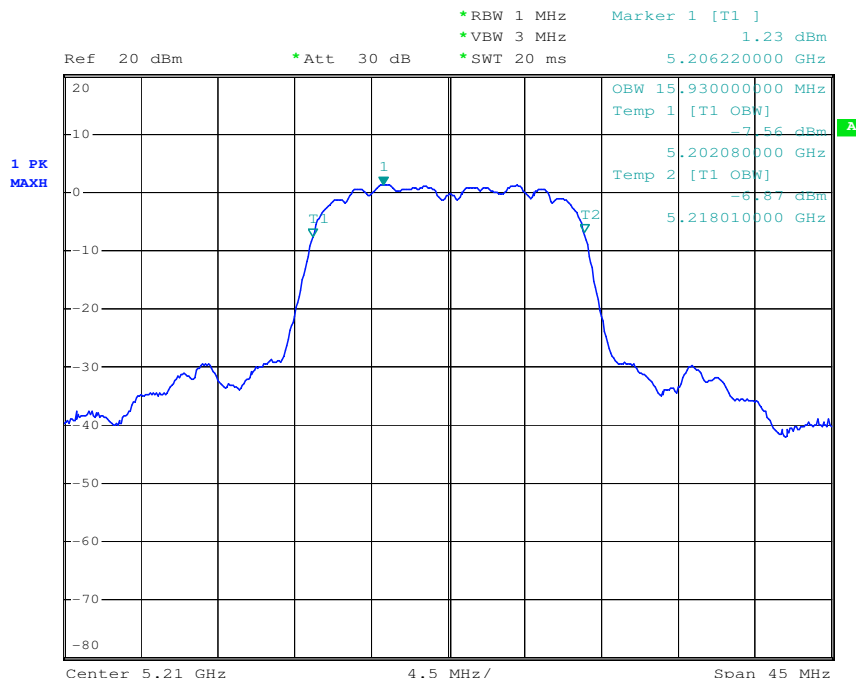




| | | | |
|------------|-----------------------|---------------|-----|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | Low |
|------------|-----------------------|---------------|-----|

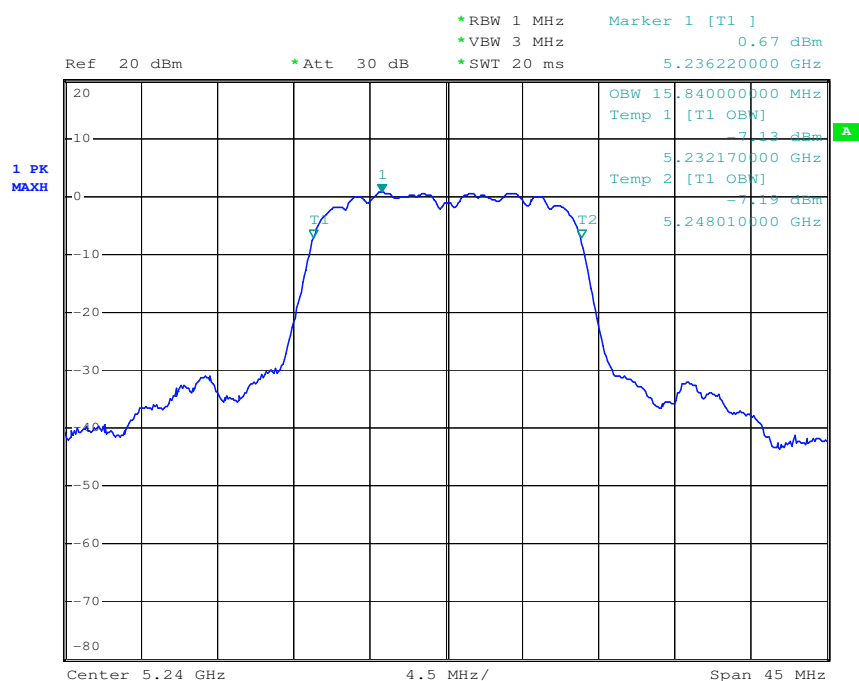


| | | | |
|------------|-----------------------|---------------|--------|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | Middle |
|------------|-----------------------|---------------|--------|





| | | | |
|------------|-----------------------|---------------|------|
| Test mode: | 5.2GHz Band Antenna B | Test channel: | High |
|------------|-----------------------|---------------|------|





8 Test Setup Photographs

Refer to the < DAC2 _Test Setup photos>.

9 EUT Constructional Details

Refer to the < DAC2 _External Photos > & < DAC2 _Internal Photos >.

End of Report