

FCC/IC TEST REPORT

for

Audio Components International, Inc.

Powered Subwoofer

Model Number: Pulse SUB

FCC ID: 2AGTU-PULSESUB

IC: 20907-PULSESUB

Prepared for : Audio Components International, Inc.
Address : 27520 Hawthorne Blvd., Suite 169, Rolling Hills Estates,
CA 90274, USA

Prepared by : Keyway Testing Technology Co., Ltd.
Address : Baishun Industrial Zone, Zhangmutou Town,
Dongguan, Guangdong, China

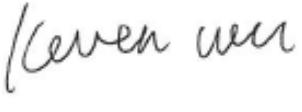
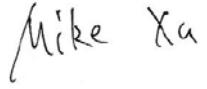
Tel: 86-769-8718 2258
Fax: 86-769-8718 1058

Report No. : 16KWE114625F
Date of Test : Oct.19~Nov.03,2016
Date of Report : Nov.04, 2016

TABLE OF CONTENTS

| | Page |
|--|-----------|
| Test Report Declaration | |
| 1. TEST SUMMARY..... | 4 |
| 2. GENERAL PRODUCT INFORMATION..... | 5 |
| 2.1 Product Function | 5 |
| 2.2 Description of Device (EUT)..... | 5 |
| 2.3 Channel List..... | 5 |
| 2.4 Independent Operation Modes | 6 |
| 2.5 Test Supporting System..... | 6 |
| 2.6 Product Version | 6 |
| 2.7 TEST SITES | 6 |
| 2.8 List of Test and Measurement Instruments..... | 7 |
| 3. TEST SET-UP AND OPERATION MODES..... | 8 |
| 3.1 Principle of Configuration Selection | 8 |
| 3.2 Block Diagram of Test Set-up | 8 |
| 3.3 Special Accessories and Auxiliary Equipment..... | 8 |
| 3.4 Countermeasures to Achieve EMC Compliance..... | 8 |
| 4. EMISSION TEST RESULTS..... | 9 |
| 4.1 Conducted Emission at the Mains Terminals Test | 9 |
| 4.2 Radiated Emission Test | 12 |
| 5. BAND EDGE COMPLIANCE TEST..... | 30 |
| 5.1 Limits..... | 30 |
| 5.2 Test setup..... | 30 |
| 5.3Test Data | 30 |
| 6. 26DB AND 6DB BANDWIDTH TEST..... | 34 |
| 6.1 Applicable Standard..... | 34 |
| 6.2Test Procedure | 34 |
| 6.3 Test setup..... | 34 |
| 7. OUTPUT POWER TEST | 45 |
| 7.1 Limits..... | 45 |
| 7.2 Test setup..... | 45 |
| 7.3Test result | 46 |
| 8. PEAK POWER SPECTRAL DENSITY TEST..... | 50 |
| 8.1 Limits..... | 50 |
| 8.2 Test setup..... | 50 |
| 8.3 Test data..... | 50 |
| 9. FREQUENCY STABILITY TEST | 58 |
| 9.1.limit | 58 |
| 9.2Test Configuration..... | 58 |
| 9.3 test procedure..... | 58 |
| 10. ANTENNA REQUIREMENTS..... | 60 |
| 10.1 Limits..... | 60 |
| 10.2 Result..... | 60 |
| 11. PHOTOGRAPHS OF TEST SET-UP | 61 |
| 12. PHOTOGRAPHS OF THE EUT | 63 |

Keyway Testing Technology Co., Ltd.

| | | | |
|---|--|---|--------------------|
| Applicant: | Audio Components International, Inc. 27520 Hawthorne Blvd., Suite 169, Rolling Hills Estates, CA 90274, USA | | |
| Manufacturer: | Audio Components International, Inc. 27520 Hawthorne Blvd., Suite 169, Rolling Hills Estates, CA 90274, USA | | |
| E.U.T: | Powered Subwoofer | | |
| Model Number: | Pulse SUB | | |
| Trade Name: | N/A | Serial No.: | ----- |
| Date of Receipt: | Oct.18 , 2016 | Date of Test: | Oct.19~Nov.03,2015 |
| Test Specification: | FCC Part 15, Subpart 15.407: 2015 ANSI C63.10:2013 KDB789033 D02 v01r03 RSS-247 Issue 1 May 2015 RSS-Gen Issue 4 November 2014 | | |
| Test Result: | The equipment under test was found to be compliance with the requirements of the standards applied. | | |
| Issue Date: Nov.04, 2016 | | | |
| Tested by: | Reviewed by: | Approved by: | |
|  |  |  | |
| Keven Wu / Engineer | Mike Xu / Supervisor | Andy Gao / Supervisor | |
| Other Aspects: | None. | | |
| Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested | | | |
| <i>This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Keyway Testing Technology Co., Ltd.</i> | | | |

1. TEST SUMMARY

| Test Items | Test Requirement | Result |
|------------------------------------|--------------------------------------|--------|
| Conducted Emissions | 15.207 RSS-Gen§8.8 | PASS |
| Radiated Emissions | 15.407(b), 15.209 & RSS-Gen §6.13 | PASS |
| 26dB bandwidth and 99%dB Bandwidth | 15.407 (a) & RSS-Gen§6.6 | PASS |
| 6dB bandwidth | 15.407(e) & RSS-247 §6.2 | PASS |
| Power density | 15.407 (a) & RSS-247 §6.2 | PASS |
| Maximum Peak Output Power | 15.407 (a) & RSS-247 §6.2 | PASS |
| Emissions from out of band | 15.407 (b) & RSS-247 §6.2 | PASS |
| Frequency Stability | 15.407 (g) & RSS-Gen§8.11 | PASS |
| Antenna Requirement | 15.203&RSS-Gen§8.3 | PASS |

2. GENERAL PRODUCT INFORMATION

2.1 Product Function

Refer to Technical Construction Form and User Manual.

2.2 Description of Device (EUT)

| | |
|------------------------|--|
| Product Name: | Powered Subwoofer |
| Model No.: | Pulse SUB |
| Model Difference | N/A |
| Operation Frequency: | 5.18GHz ~ 5.24GHz, 5.736GHz~5.814GHz |
| Channel numbers: | 3 Channel for 5.2G, 3 Channel for 5.8G |
| Modulation technology: | QPSK (DSSS) |
| Antenna Type: | PCB ANT |
| Antenna gain: | ANT A:2.408dBi ANT B:2.408dBi |
| Power supply: | AC 120V/60Hz |

2.3 Channel List

| Channel | Frequency (MHz) |
|---------|-----------------|
| 01 | 5180 |
| 02 | 5210 |
| 03 | 5240 |
| 04 | 5736 |
| 05 | 5762 |
| 06 | 5814 |

2.4 Independent Operation Modes

The basic operation modes are:

EUT work TX mode, and frequency as below:

5.2G

| Channel | Frequency |
|---------|-----------|
| Low | 5180 |
| Middle | 5210 |
| High | 5240 |

5.8G

| Channel | Frequency |
|---------|-----------|
| Low | 5736 |
| Middle | 5762 |
| High | 5814 |

2.5 Test Supporting System

Antenna A/ B are transmitting, two antennas simultaneously transmit. And the worst data is recorded for radiated emission and band edge.

For MIMO mode , Directional gain=GANT +10log(N)dbi =5.42dbi

The EUT has MIMO mode.

2.6 Product Version

| | |
|-----------------------------|-------------------------------|
| Product SW version | 101CP-D2 |
| Product HW version | 101CP-D2 |
| Radio SW version | DWAM83 TB |
| Radio HW version | DWAM83 TB |
| Test SW Version | V1.0 |
| RF power setting in TEST SW | 4dBm for 5.2G, -3dBm for 5.8G |

2.7 TEST SITES

Test Facilities

Lab Qualifications : Certificated by Industry Canada
Registration No.: 9868A
Date of registration: December 8, 2011

Certificated by FCC, USA
Registration No.: 370994
Date of registration: February 21, 2012

Certificated by CNAS China
Registration No.: CNAS L5783
Date of registration: August 8, 2012

2.8 List of Test and Measurement Instruments

For conducted emission at the mains terminals test

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|--------------------------------|---------------|-----------|------------|------------|------------|
| EMI Test Receiver | Rohde&Schwarz | ESCI | 101156 | Apr. 27,16 | Apr. 27,17 |
| Artificial Mains Network | Rohde&Schwarz | ENV216 | 101315 | Apr. 27,16 | Apr. 27,17 |
| Artificial Mains Network (AUX) | Rohde&Schwarz | ENV216 | 101314 | Apr. 27,16 | Apr. 27,17 |
| RF Cable | FUJIKURA | 3D-2W | 944 Cable | Apr. 27,16 | Apr. 27,17 |

For radiated emission test

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---------------------------------------|---------------|--------------------|----------------------|------------|------------|
| EMI Test Receiver | Rohde&Schwarz | ESCI | 101156 | Apr. 27,16 | Apr. 27,17 |
| System Simulator | Agilent | E5515C | GB43130245 | Apr. 27,16 | Apr. 27,17 |
| Power Splitter | Weinschel | 1506A | NW425 | Apr. 27,16 | Apr. 27,17 |
| Bilog Antenna | ETS-LINDGREEN | 3142D | 135452 | Apr. 27,16 | Apr. 27,17 |
| Spectrum Analyzer | Agilent | E4407B | MY4511304 | Apr. 27,16 | Apr. 27,17 |
| Spectrum Analyzer | R&S | FSV40 | 132.1.3008K39-100967 | Apr. 27,16 | Apr. 27,17 |
| 3m Semi-anechoic Chamber | ETS-LINDGREEN | 966 | KW01 | Apr. 27,16 | Apr. 27,17 |
| Signal Amplifier | SONOMA | 310 | 187016 | Apr. 27,16 | Apr. 27,17 |
| Signal Amplifier | Agilent | 8449B | 3008A00251 | Apr. 27,16 | Apr. 27,17 |
| RF Cable | IMRO | IMRO-400 | 966 Cable 1# | N/A | N/A |
| MULTI-DEVICE Controller | ETS-LINDGREEN | 2090 | 126913 | N/A | N/A |
| Horn Antenna | DAZE | ZN30701 | 11003 | Apr. 27,16 | Apr. 27,17 |
| Horn Antenna | SCHWARZBECK | BBHA9170 | 9170-068 | Apr. 27,16 | Apr. 27,17 |
| Spectrum Analyzer | Agilent | 8593E | 3911A04271 | Apr. 27,16 | Apr. 27,17 |
| Spectrum Analyzer | Agilent | E4408B | MY44211125 | Apr. 27,16 | Apr. 27,17 |
| Signal Amplifier | DAZE | ZN3380C | 11001 | Apr. 27,16 | Apr. 27,17 |
| High Pass filter | Micro | HPM50111 | 324216 | Apr. 27,16 | Apr. 27,17 |
| Filter | COM-MW | ZBSF-C836.5-25-X | KW032 | Apr. 27,16 | Apr. 27,17 |
| Filter | COM-MW | ZBSF-C1747.5-75-X2 | KW035 | Apr. 27,16 | Apr. 27,17 |
| Filter | COM-MW | ZBSF-C1880-60-X2 | KW037 | Apr. 27,16 | Apr. 27,17 |
| Constant temperature and humidity box | GF | GTH-800-40-1P | MAA9906-005 | Apr. 27,16 | Apr. 27,17 |
| Splitter | Agilent | 11636B | 0025164 | Apr. 27,16 | Apr. 27,17 |
| Power Meter | Anritsu | ML2495A | 1204003 | Apr. 24,16 | Apr. 24,17 |
| Power Sensor | Anritsu | MA2411B | 1126150 | Apr. 24,16 | Apr. 24,17 |

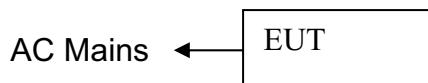
3. TEST SET-UP AND OPERATION MODES

3.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2 Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



(*EUT: Powered Subwoofer*)

3.3 Special Accessories and Auxiliary Equipment

None.

3.4 Countermeasures to Achieve EMC Compliance

None.

4. EMISSION TEST RESULTS

4.1 Conducted Emission at the Mains Terminals Test

Limit 15.207 limits

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dB μ V) | |
|-----------------------------|------------------------------|----------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

Test Setup

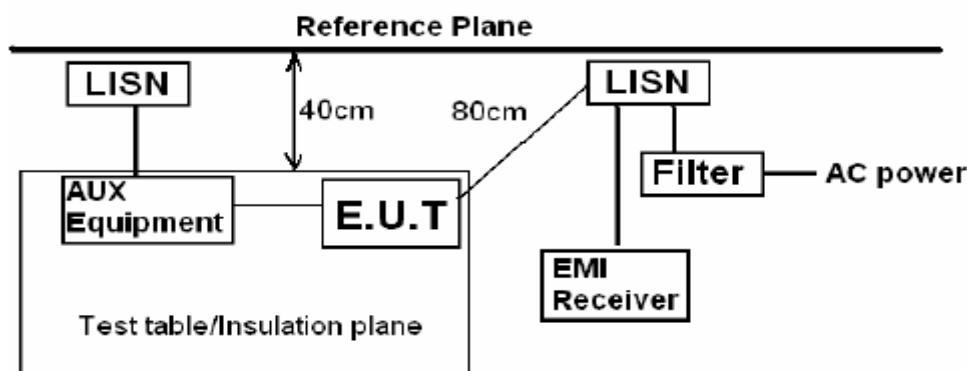
The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 0.8 m, the excess was folded back and forth parallel to the cable at the centre so as to form a bundle no longer than 0.4 m.

The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.

The frequency range from 150 kHz to 30 MHz was investigated.

The bandwidth of the test receiver was set at 9 kHz.

Pretest for all mode, The test data of the worst case condition(s) was reported on the following page.



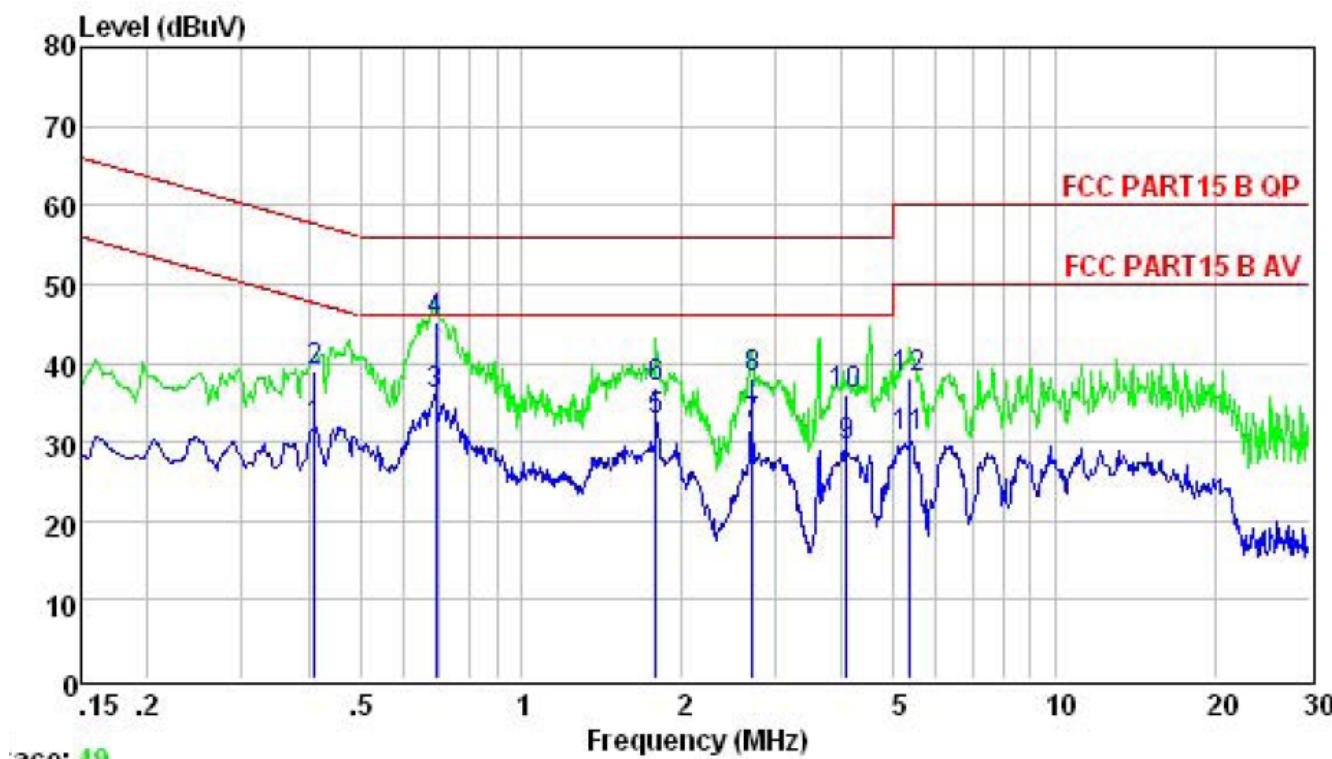
Remark:

E.U.T: Equipment Under Test

LISN: Line Impedance Stabilization Network

Test table height=0.8m

| | | | |
|----------------|-------------------|---------------------|-----------|
| EUT : | Powered Subwoofer | Model Name : | PULSE SUB |
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 1010hPa | Phase : | L |
| Test Voltage : | AC 120V/60Hz | Test Mode : | Link Mode |

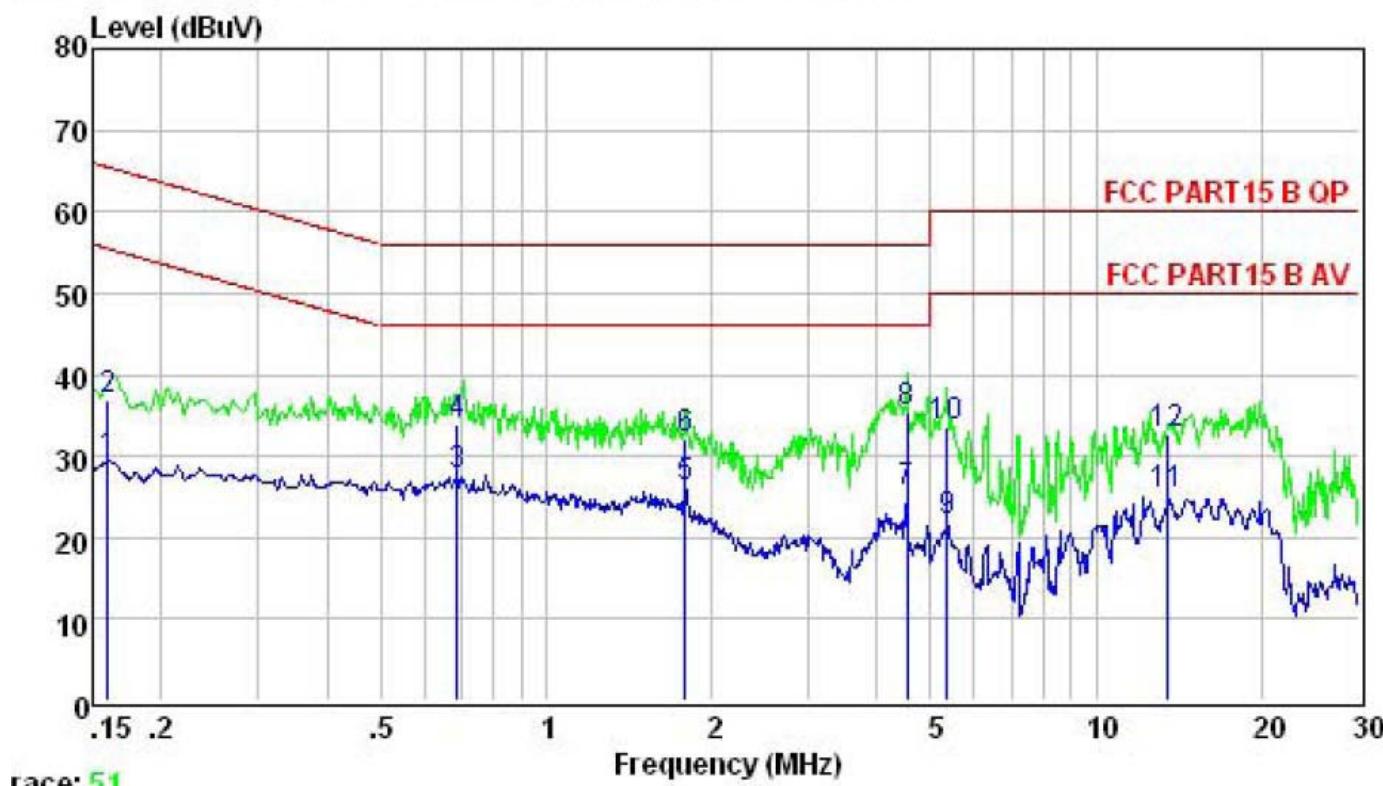


| | | Limit | Over | |
|------|-------|-------|-------|--------|
| Freq | Level | Line | Limit | Remark |

| | MHz | dBuV | dBuV | dB | |
|----|-------|-------|-------|--------|---------|
| 1 | 0.410 | 31.73 | 47.64 | -15.91 | Average |
| 2 | 0.410 | 38.96 | 57.64 | -18.68 | QP |
| 3 | 0.694 | 35.97 | 46.00 | -10.03 | Average |
| 4 | 0.694 | 45.12 | 56.00 | -10.88 | QP |
| 5 | 1.790 | 32.80 | 46.00 | -13.20 | Average |
| 6 | 1.790 | 36.89 | 56.00 | -19.11 | QP |
| 7 | 2.707 | 32.19 | 46.00 | -13.81 | Average |
| 8 | 2.707 | 38.12 | 56.00 | -17.88 | QP |
| 9 | 4.070 | 29.38 | 46.00 | -16.62 | Average |
| 10 | 4.070 | 35.96 | 56.00 | -20.04 | QP |
| 11 | 5.362 | 30.75 | 50.00 | -19.25 | Average |
| 12 | 5.362 | 38.12 | 60.00 | -21.88 | QP |

| | | | |
|----------------|-------------------|---------------------|-----------|
| EUT : | Powered Subwoofer | Model Name : | PULSE SUB |
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 1010hPa | Phase : | N |
| Test Voltage : | AC 120V/60Hz | Test Mode : | Link Mode |

Neutral



| Freq | Level | Limit | Over | Remark |
|------|--------|-------|-------|----------------|
| | | Line | Limit | |
| MHz | dBuV | dBuV | dB | |
| 1 | 0.160 | 29.37 | 55.47 | -26.10 Average |
| 2 | 0.160 | 36.89 | 65.47 | -28.58 QP |
| 3 | 0.690 | 27.80 | 46.00 | -18.20 Average |
| 4 | 0.690 | 33.96 | 56.00 | -22.04 QP |
| 5 | 1.790 | 26.21 | 46.00 | -19.79 Average |
| 6 | 1.790 | 32.12 | 56.00 | -23.88 QP |
| 7 | 4.525 | 25.48 | 46.00 | -20.52 Average |
| 8 | 4.525 | 35.25 | 56.00 | -20.75 QP |
| 9 | 5.362 | 21.94 | 50.00 | -28.06 Average |
| 10 | 5.362 | 33.69 | 60.00 | -26.31 QP |
| 11 | 13.479 | 25.18 | 50.00 | -24.82 Average |
| 12 | 13.479 | 32.59 | 60.00 | -27.41 QP |

4.2 Radiated Emission Test

Limit 15.209 limits

| FREQUENCY MHz | DISTANCE Meters | FIELD STRENGTHS LIMIT | |
|------------------|--------------------|---|----------|
| | | μV/m | dB(μV)/m |
| 30 ~ 88 | 3 | 100 | 40.0 |
| 88 ~ 216 | 3 | 150 | 43.5 |
| 216 ~ 960 | 3 | 200 | 46.0 |
| 960 ~ 1000 | 3 | 500 | 54.0 |
| Above 1000 | 3 | 74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average) | |

Restricted bands of operation

| MHz | MHz | MHz | GHz |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | (²) |

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

Test setup

The EUT was placed on a turn table which was 0.8 m(above 1GHz, the high was 1.5m) above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

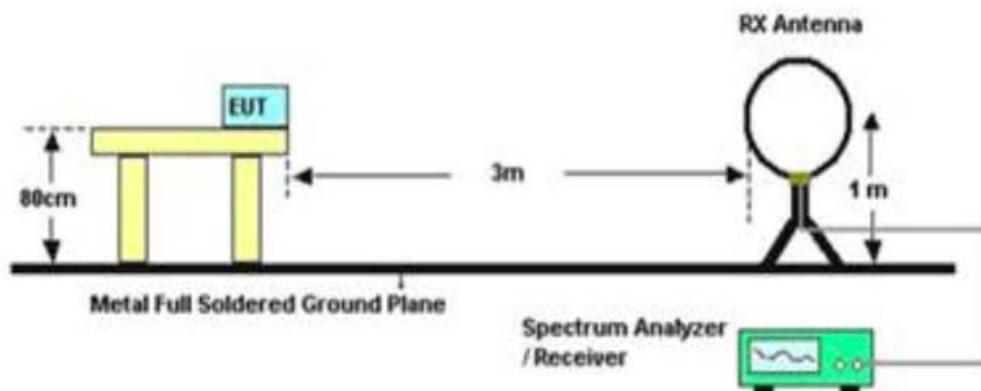
The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz, Both PK and AV measure, PK detector is used.

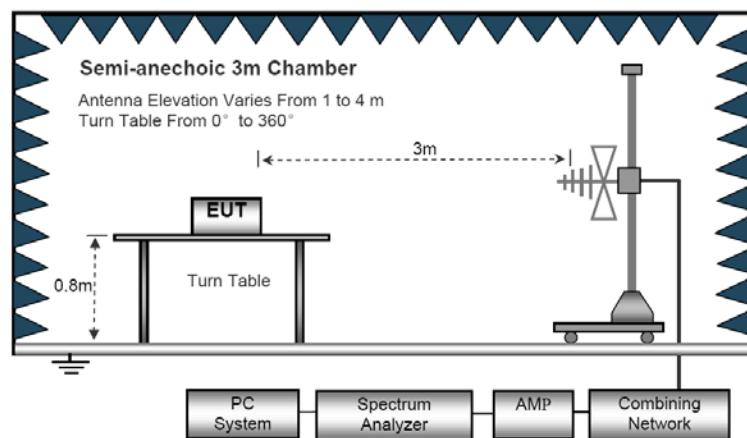
The frequency range from 30MHz to 10th harmonic are checked. and no any emissions were found from 18GHz to 40 GHz, So the radiated emissions from 18GHz to 40GHz were not record.

- Notes:
1. Emission Level = Antenna Factor + Cable Loss + Meter Reading-Preamp Factor.
 2. Measurement Uncertainty: ± 3.2 dB at a level of confidence of 95%.
 3. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.
 4. For emissions below 1GHz, pretest for all mode, The test data of the worst case condition(s) was reported on the following pages.
 5. For Both PK and AV value above 1GHz, PK detector is used.

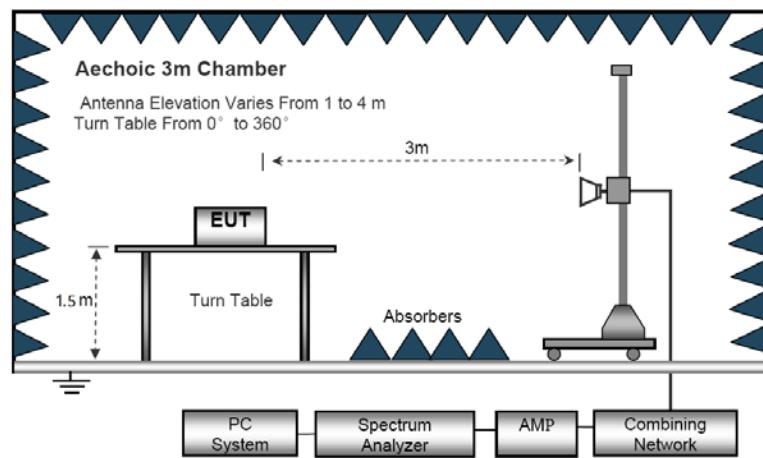
Radiated Emission Test-Up Frequency Below 30MHz



Below 1GHz



Above 1GHz



| | | | |
|----------------|-------------------|---------------------|-----------|
| EUT : | Powered Subwoofer | Model Name : | PULSE SUB |
| Temperature : | 20 °C | Relative Humidity : | 48% |
| Pressure : | 1010hPa | Test Mode : | TX |
| Test Voltage : | AC 120V/60Hz | | |

Below 30MHz

| Freq. (MHz) | Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) | State P/F |
|----------------|---------------------|-------------------|----------------|--------------|
| -- | -- | -- | -- | P |
| -- | -- | -- | -- | P |

Note:

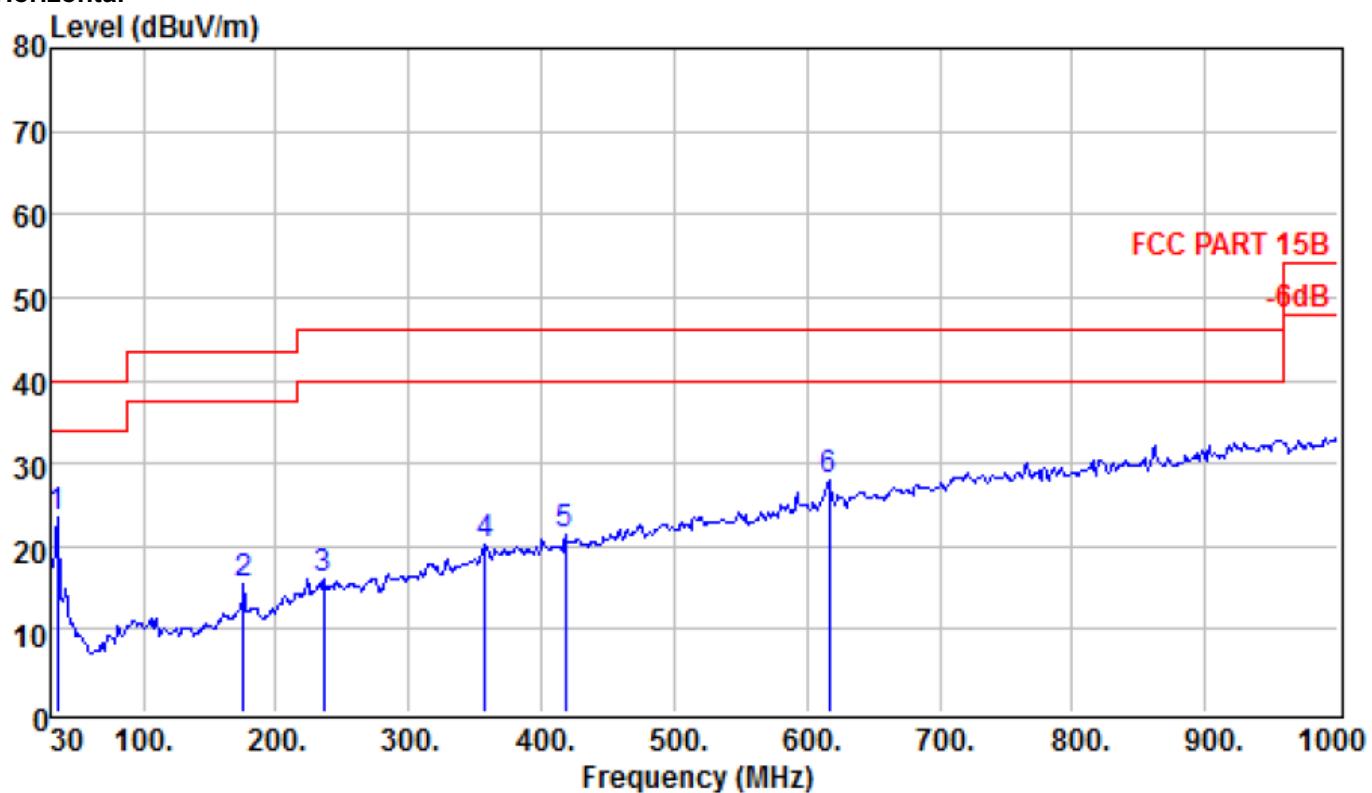
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);
Limit line = specific limits(dBuV) + distance extrapolation factor.

Below 1GHz

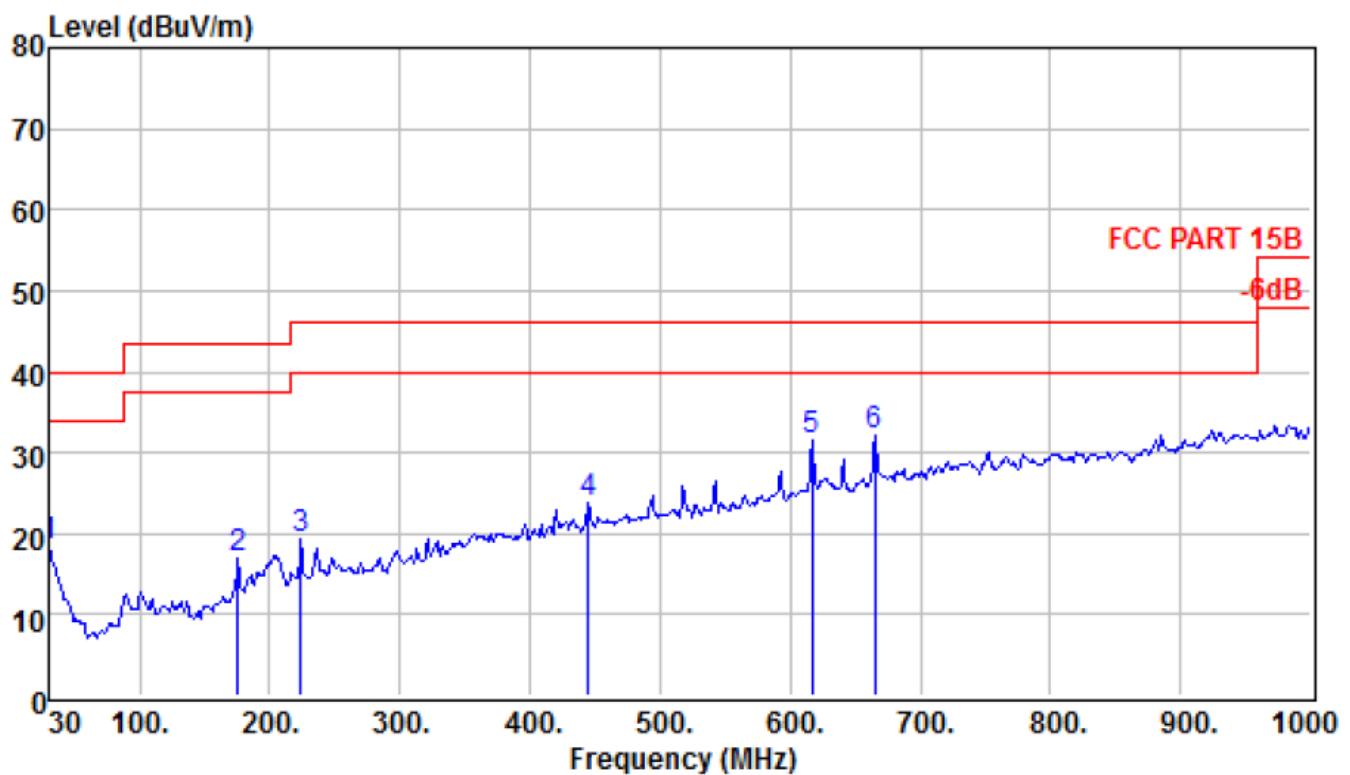
| | | | |
|----------------|-------------------|---------------------|-----------|
| EUT : | Powered Subwoofer | Model Name : | PULSE SUB |
| Temperature : | 20 °C | Relative Humidity : | 48% |
| Pressure : | 1010hPa | Test Mode : | TX |
| Test Voltage : | AC 120V/60Hz | | |

Horizontal



| Freq | Read | Preamp | Cable | Antenna | Limit | Over | Remark | |
|------|---------|--------|--------|---------|-------|--------|--------|-----------|
| | Freq | Level | Factor | Loss | | | | |
| | MHz | dBuV | dB | dB | dB/m | dBuV/m | dBuV/m | dB |
| 1 | 34.850 | 38.38 | 31.38 | 0.56 | 15.94 | 23.50 | 40.00 | -16.50 QP |
| 2 | 175.500 | 34.90 | 31.17 | 1.39 | 10.27 | 15.39 | 43.50 | -28.11 QP |
| 3 | 235.640 | 32.92 | 30.94 | 1.61 | 12.50 | 16.09 | 46.00 | -29.91 QP |
| 4 | 357.860 | 32.62 | 30.63 | 2.18 | 16.10 | 20.27 | 46.00 | -25.73 QP |
| 5 | 418.000 | 32.70 | 30.63 | 2.48 | 16.88 | 21.43 | 46.00 | -24.57 QP |
| 6 | 616.850 | 34.16 | 30.64 | 3.38 | 21.07 | 27.97 | 46.00 | -18.03 QP |

Vertical



| Freq | Read | Preamp | Cable | Antenna | Limit | Over | Line | Limit | Remark |
|------|---------|--------|--------|---------|-------|-------|-------|--------|--------|
| | MHz | dBuV | Factor | Loss | | | | | |
| 1 | 30.000 | 30.64 | 31.41 | 0.56 | 18.80 | 18.59 | 40.00 | -21.41 | QP |
| 2 | 175.500 | 36.43 | 31.17 | 1.39 | 10.27 | 16.92 | 43.50 | -26.58 | QP |
| 3 | 224.000 | 36.48 | 30.95 | 1.53 | 12.15 | 19.21 | 46.00 | -26.79 | QP |
| 4 | 445.160 | 34.15 | 30.61 | 2.62 | 17.50 | 23.66 | 46.00 | -22.34 | QP |
| 5 | 616.850 | 37.67 | 30.64 | 3.38 | 21.07 | 31.48 | 46.00 | -14.52 | QP |
| 6 | 665.350 | 37.45 | 30.80 | 3.69 | 21.77 | 32.11 | 46.00 | -13.89 | QP |

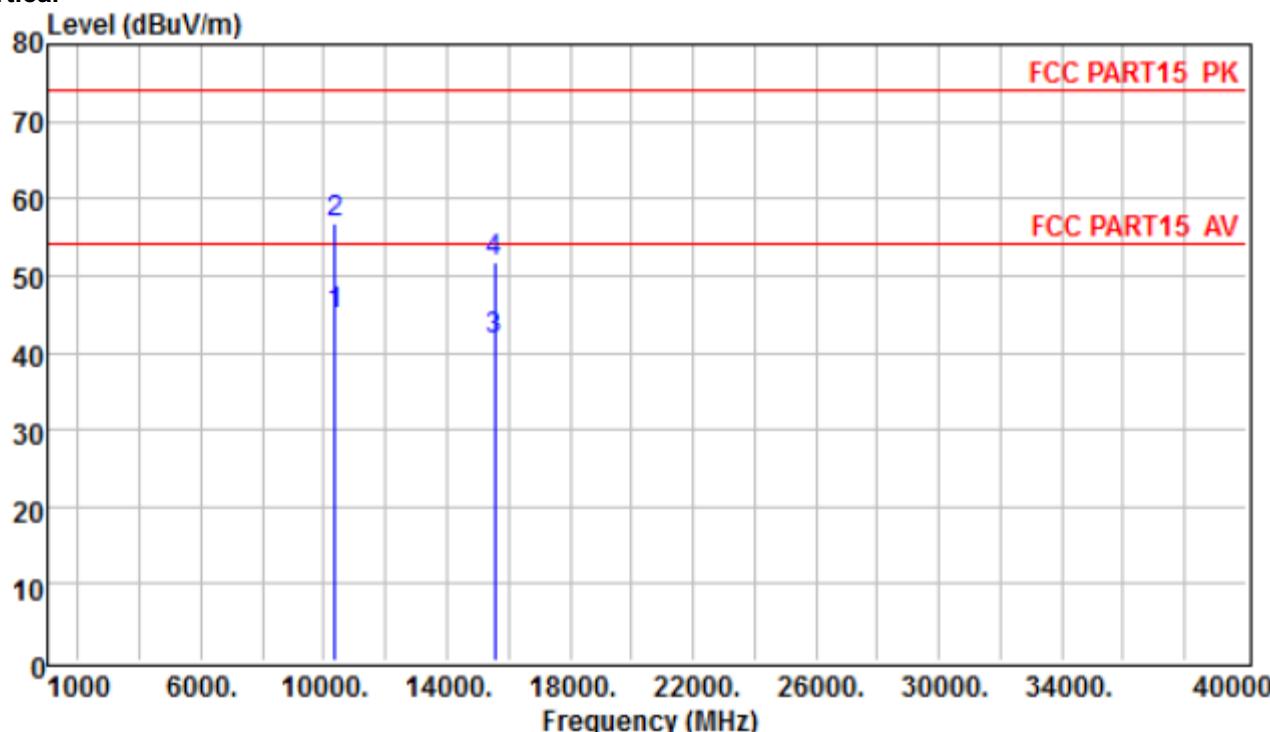
NOTE:

Absolute Level= ReadingLevel+antenna Factor+cable loss-preamp factor,
Over Limit= Absolute Level – Limit

Above 1GHz

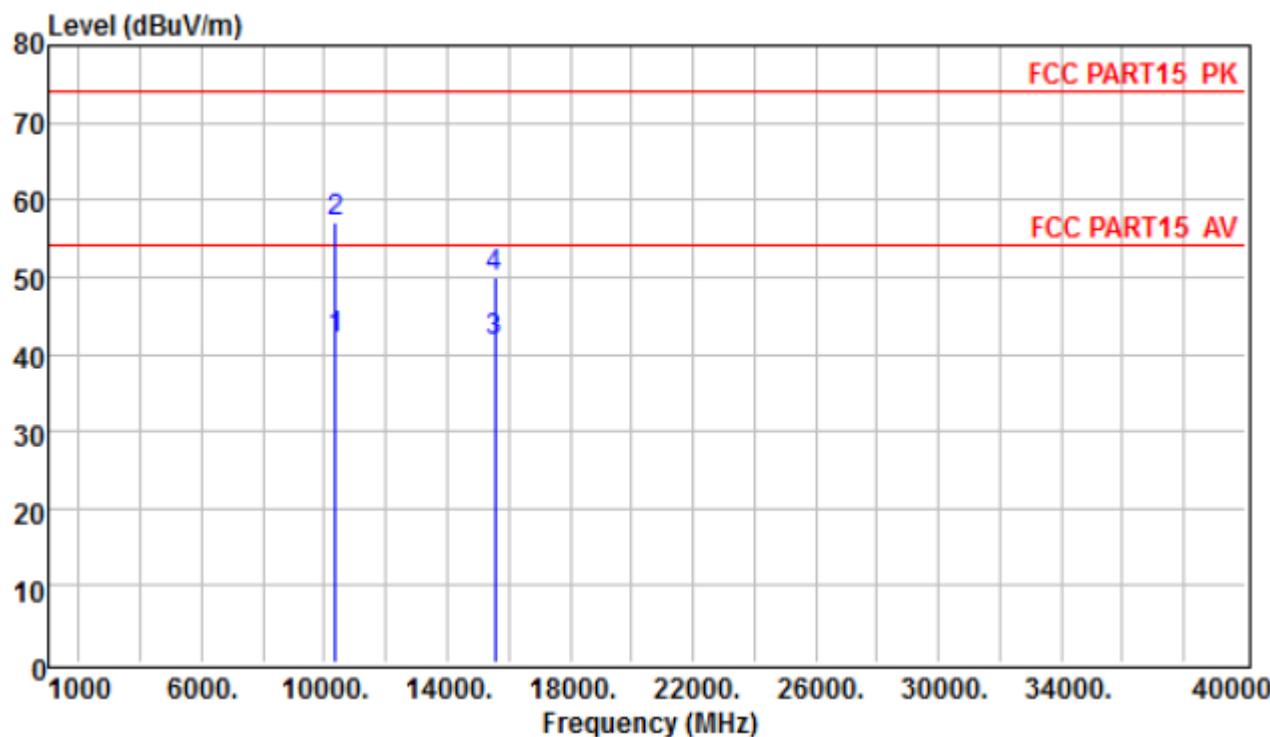
| | | | |
|----------------|-------------------|---------------------|-----------|
| EUT : | Powered Subwoofer | Model Name : | PULSE SUB |
| Temperature : | 20 °C | Relative Humidity : | 48% |
| Pressure : | 1010hPa | Test Mode : | TX-5180 |
| Test Voltage : | AC 120V/60Hz | | |

Vertical



| Freq | ReadAntenna | | Cable Preamp | | Limit | Over Line | Over Limit | Remark |
|-------------|-------------|--------|--------------|--------|--------|-----------|------------|---------|
| | Level | Factor | Loss | Factor | | | | |
| MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 10360.000 | 32.76 | 23.99 | 17.04 | 28.84 | 44.95 | 54.00 | -9.05 | Average |
| 2 10360.000 | 44.54 | 23.99 | 17.04 | 28.84 | 56.73 | 74.00 | -17.27 | Peak |
| 3 15540.000 | 27.54 | 23.53 | 20.34 | 29.63 | 41.78 | 54.00 | -12.22 | Average |
| 4 15540.000 | 37.47 | 23.53 | 20.34 | 29.63 | 51.71 | 74.00 | -22.29 | Peak |

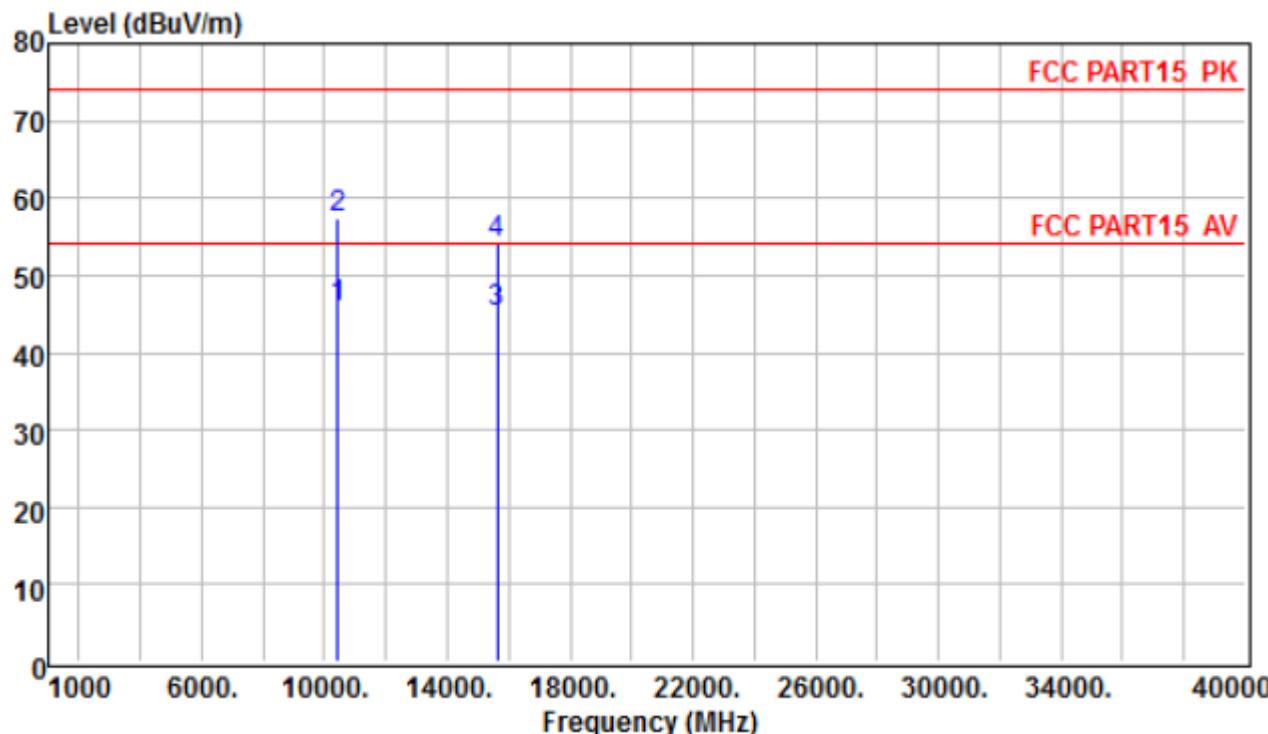
Horizontal



| | | ReadAntenna | Cable | Preamp | | Limit | Over | |
|------|-----------|-------------|-------|--------|-------|--------|--------|----------------|
| Freq | Level | Factor | Loss | Factor | Level | Line | Line | Remark |
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB |
| 1 | 10360.000 | 29.76 | 23.99 | 17.04 | 28.84 | 41.95 | 54.00 | -12.05 Average |
| 2 | 10360.000 | 44.97 | 23.99 | 17.04 | 28.84 | 57.16 | 74.00 | -16.84 Peak |
| 3 | 15540.000 | 27.54 | 23.53 | 20.34 | 29.63 | 41.78 | 54.00 | -12.22 Average |
| 4 | 15540.000 | 35.76 | 23.53 | 20.34 | 29.63 | 50.00 | 74.00 | -24.00 Peak |

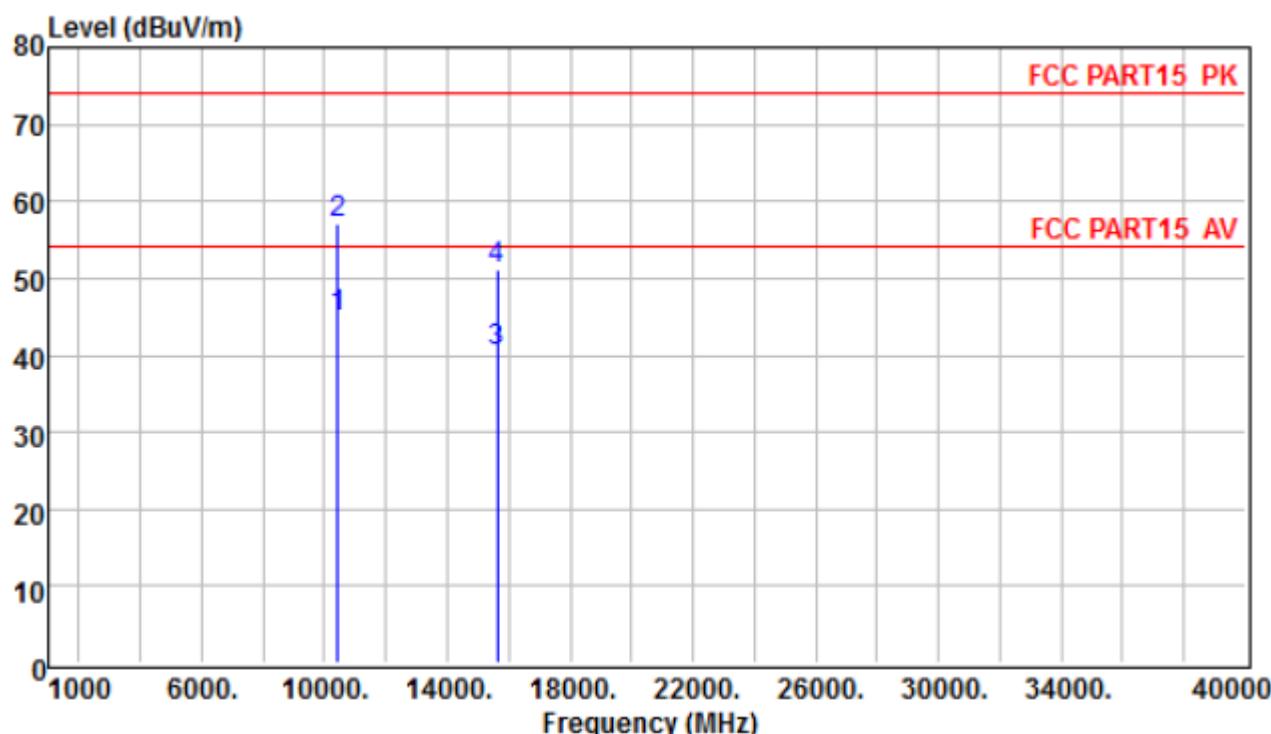
| | | | |
|----------------|-------------------|---------------------|-----------|
| EUT : | Powered Subwoofer | Model Name : | PULSE SUB |
| Temperature : | 20 °C | Relative Humidity : | 48% |
| Pressure : | 1010hPa | Test Mode : | TX-5210 |
| Test Voltage : | AC 120V/60Hz | | |

Vertical



| Freq | ReadAntenna | | Cable Preamp | | Limit Level | Line Limit | Over Remark |
|-------------|-------------|--------|--------------|--------|-------------|------------|---------------|
| | Level | Factor | Loss | Factor | | | |
| MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB |
| 1 10420.000 | 33.50 | 24.07 | 17.05 | 28.84 | 45.78 | 54.00 | -8.22 Average |
| 2 10420.000 | 45.19 | 24.07 | 17.05 | 28.84 | 57.47 | 74.00 | -16.53 Peak |
| 3 15630.000 | 30.52 | 23.92 | 20.40 | 29.65 | 45.19 | 54.00 | -8.81 Average |
| 4 15630.000 | 39.42 | 23.92 | 20.40 | 29.65 | 54.09 | 74.00 | -19.91 Peak |

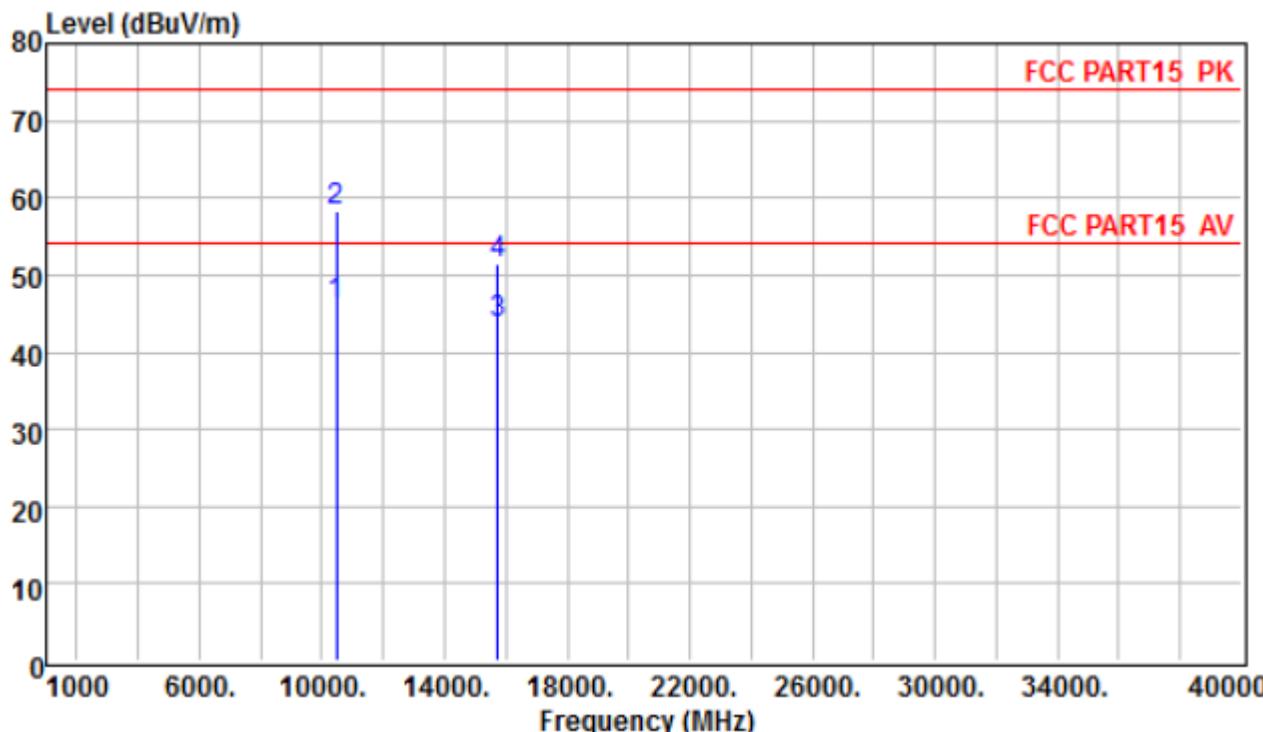
Horizontal



| Freq | Read | Antenna | Cable | Preamp | Limit | Over | Line | Over | Remark |
|------|-----------|---------|-------|--------|-------|--------|--------|--------|---------|
| | Level | Factor | Loss | Factor | | | | | |
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 10420.000 | 32.61 | 24.07 | 17.05 | 28.84 | 44.89 | 54.00 | -9.11 | Average |
| 2 | 10420.000 | 44.72 | 24.07 | 17.05 | 28.84 | 57.00 | 74.00 | -17.00 | Peak |
| 3 | 15630.000 | 25.86 | 23.92 | 20.40 | 29.65 | 40.53 | 54.00 | -13.47 | Average |
| 4 | 15630.000 | 36.52 | 23.92 | 20.40 | 29.65 | 51.19 | 74.00 | -22.81 | Peak |

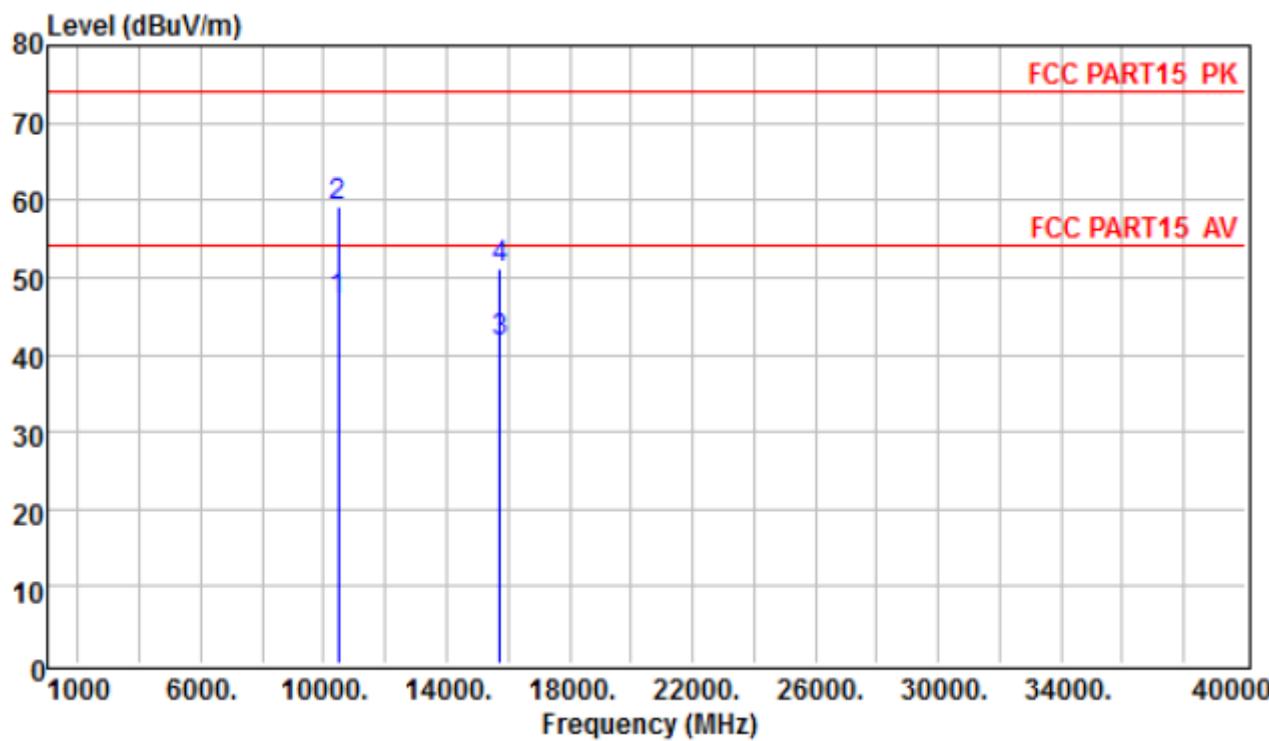
| | | | |
|----------------|-------------------|---------------------|-----------|
| EUT : | Powered Subwoofer | Model Name : | PULSE SUB |
| Temperature : | 20 °C | Relative Humidity : | 48% |
| Pressure : | 1010hPa | Test Mode : | TX-5240 |
| Test Voltage : | AC 120V/60Hz | | |

Vertical



| Freq | ReadAntenna | | Cable Preamp | | Limit Level | Over Line | Over Limit | Remark |
|------|-------------|--------------|--------------|---------------|-------------|-----------|------------|----------------|
| | Freq | Level Factor | Cable Loss | Preamp Factor | | | | |
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB |
| 1 | 10480.000 | 32.77 | 25.17 | 17.06 | 28.85 | 46.15 | 54.00 | -7.85 Average |
| 2 | 10480.000 | 44.99 | 25.17 | 17.06 | 28.85 | 58.37 | 74.00 | -15.63 Peak |
| 3 | 15720.000 | 28.55 | 24.25 | 20.45 | 29.66 | 43.59 | 54.00 | -10.41 Average |
| 4 | 15720.000 | 36.55 | 24.25 | 20.45 | 29.66 | 51.59 | 74.00 | -22.41 Peak |

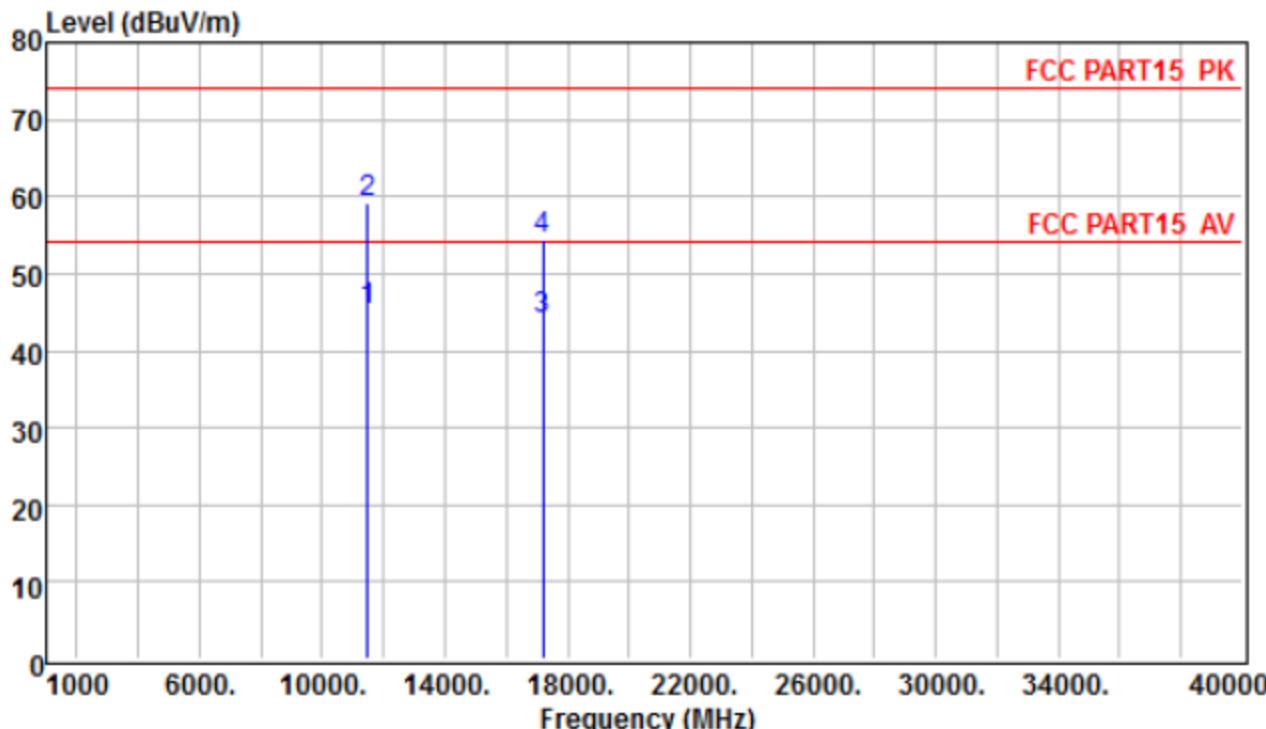
Horizontal



| Freq | ReadAntenna | | Cable | | Preamp | | Limit | Over | Remark |
|------|-------------|--------|-------|--------|--------|--------|--------|--------|---------|
| | Level | Factor | Loss | Factor | Level | Line | | | |
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 10480.000 | 33.66 | 25.17 | 17.06 | 28.85 | 47.04 | 54.00 | -6.96 | Average |
| 2 | 10480.000 | 45.88 | 25.17 | 17.06 | 28.85 | 59.26 | 74.00 | -14.74 | Peak |
| 3 | 15720.000 | 26.66 | 24.25 | 20.45 | 29.66 | 41.70 | 54.00 | -12.30 | Average |
| 4 | 15720.000 | 36.05 | 24.25 | 20.45 | 29.66 | 51.09 | 74.00 | -22.91 | Peak |

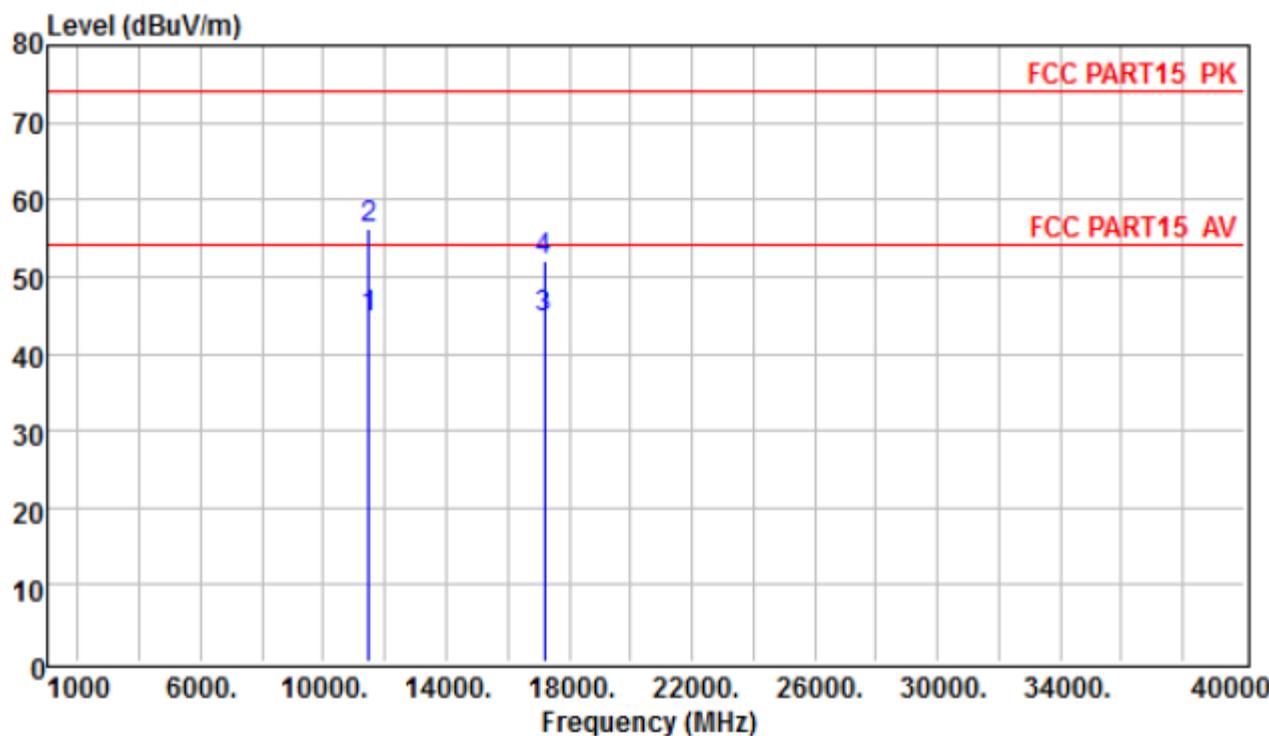
| | | | |
|----------------|-------------------|---------------------|-----------|
| EUT : | Powered Subwoofer | Model Name : | PULSE SUB |
| Temperature : | 20 °C | Relative Humidity : | 48% |
| Pressure : | 1010hPa | Test Mode : | TX-5736 |
| Test Voltage : | AC 120V/60Hz | | |

Vertical



| Freq | ReadAntenna | | Cable Preamp | | Limit Level | Over Line | Over Limit | Remark |
|------|-------------|-------|--------------|-------|-------------|-----------|------------|----------------|
| | MHz | dBuV | dB/m | dB | | | | |
| 1 | 11472.000 | 33.09 | 23.87 | 17.26 | 28.95 | 45.27 | 54.00 | -8.73 Average |
| 2 | 11472.000 | 46.89 | 23.87 | 17.26 | 28.95 | 59.07 | 74.00 | -14.93 Peak |
| 3 | 17208.000 | 27.72 | 24.92 | 21.52 | 30.18 | 43.98 | 54.00 | -10.02 Average |
| 4 | 17208.000 | 38.04 | 24.92 | 21.52 | 30.18 | 54.30 | 74.00 | -19.70 Peak |

Horizontal

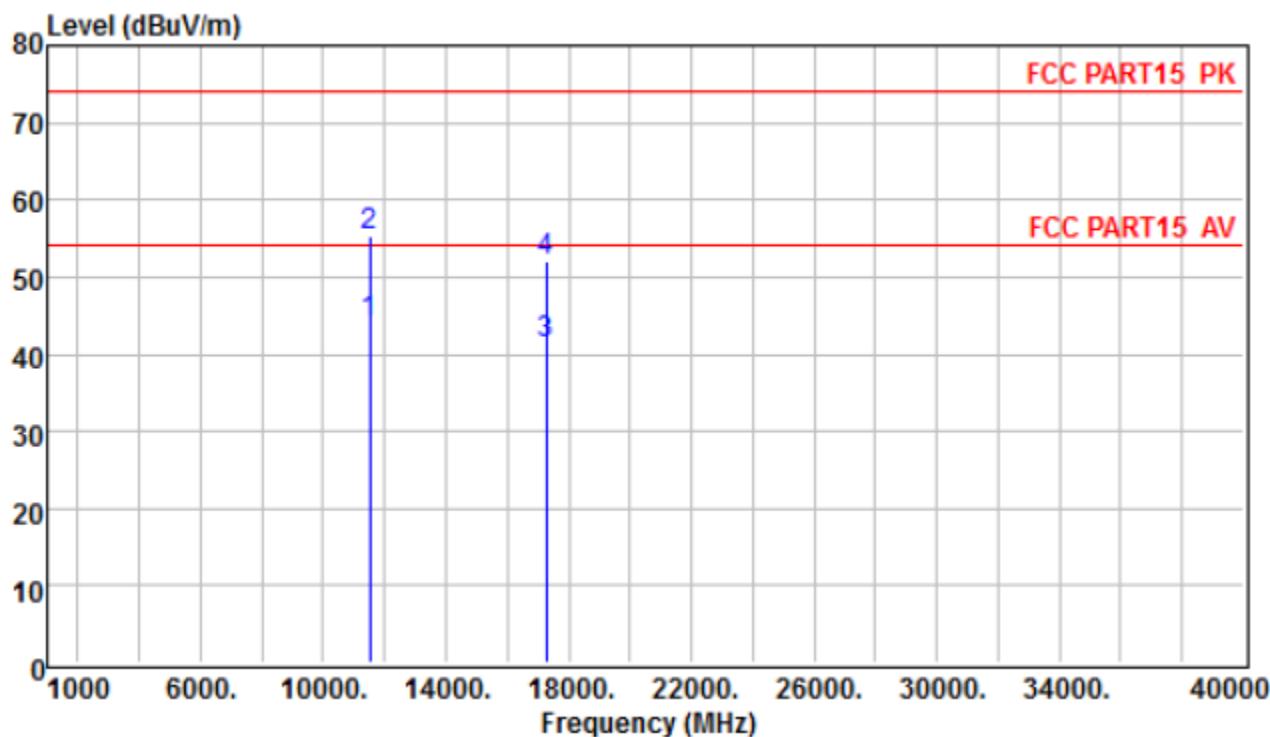


| | ReadAntenna | Cable | Preamp | Limit | Over | | |
|------|-------------|--------|--------|-------|------|-------|--------|
| Freq | Level | Factor | Loss | Level | Line | Limit | Remark |

| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
|---|-----------|-------|-------|-------|-------|--------|--------|--------|---------|
| 1 | 11472.000 | 32.45 | 23.87 | 17.26 | 28.95 | 44.63 | 54.00 | -9.37 | Average |
| 2 | 11472.000 | 43.89 | 23.87 | 17.26 | 28.95 | 56.07 | 74.00 | -17.93 | Peak |
| 3 | 17208.000 | 28.21 | 24.92 | 21.52 | 30.18 | 44.47 | 54.00 | -9.53 | Average |
| 4 | 17208.000 | 35.76 | 24.92 | 21.52 | 30.18 | 52.02 | 74.00 | -21.98 | Peak |

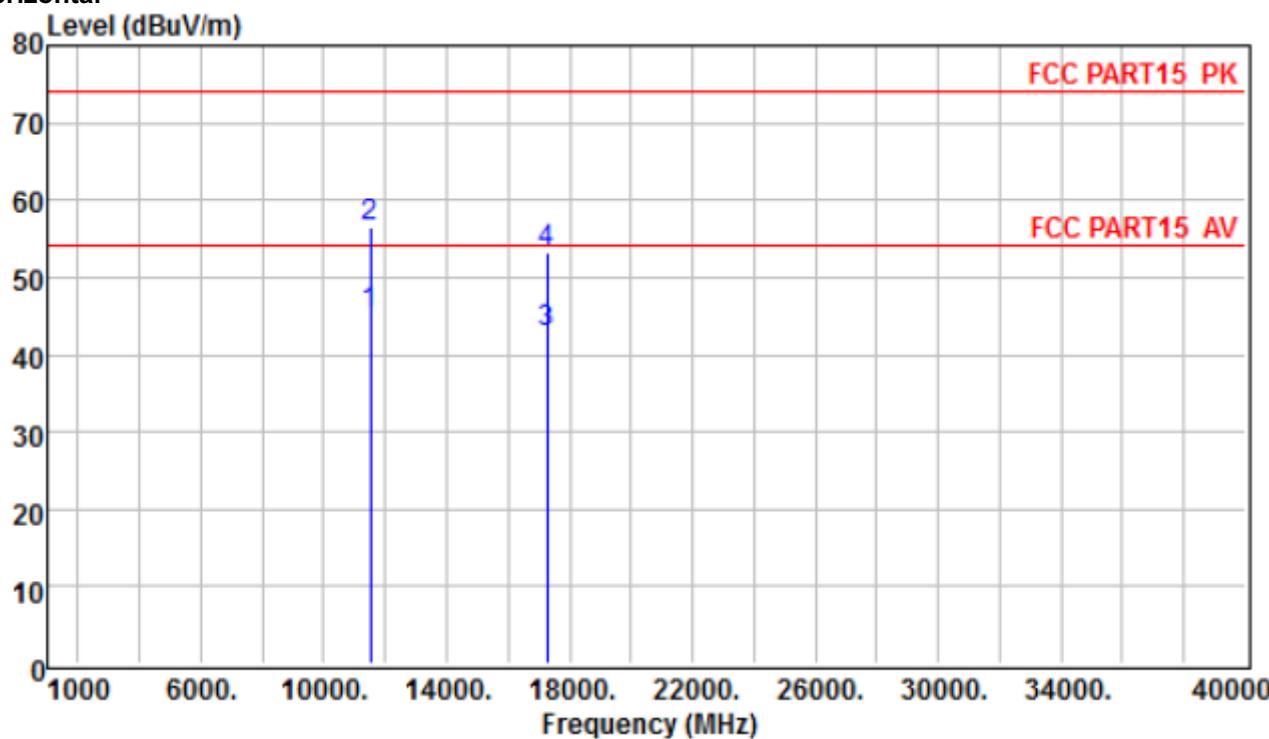
| | | | |
|----------------|-------------------|---------------------|-----------|
| EUT : | Powered Subwoofer | Model Name : | PULSE SUB |
| Temperature : | 20 °C | Relative Humidity : | 48% |
| Pressure : | 1010hPa | Test Mode : | TX-5762 |
| Test Voltage : | AC 120V/60Hz | | |

Vertical



| Freq | ReadAntenna | | Cable Preamp | | Limit Level | Line Limit | Over Remark | |
|------|-------------|-------|--------------|-------|-------------|------------|-------------|----------------|
| | Freq | Level | Factor | Loss | | | | |
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB |
| 1 | 11524.000 | 31.76 | 23.88 | 17.27 | 28.95 | 43.96 | 54.00 | -10.04 Average |
| 2 | 11524.000 | 43.23 | 23.88 | 17.27 | 28.95 | 55.43 | 74.00 | -18.57 Peak |
| 3 | 17286.000 | 24.99 | 25.05 | 21.59 | 30.22 | 41.41 | 54.00 | -12.59 Average |
| 4 | 17286.000 | 35.55 | 25.05 | 21.59 | 30.22 | 51.97 | 74.00 | -22.03 Peak |

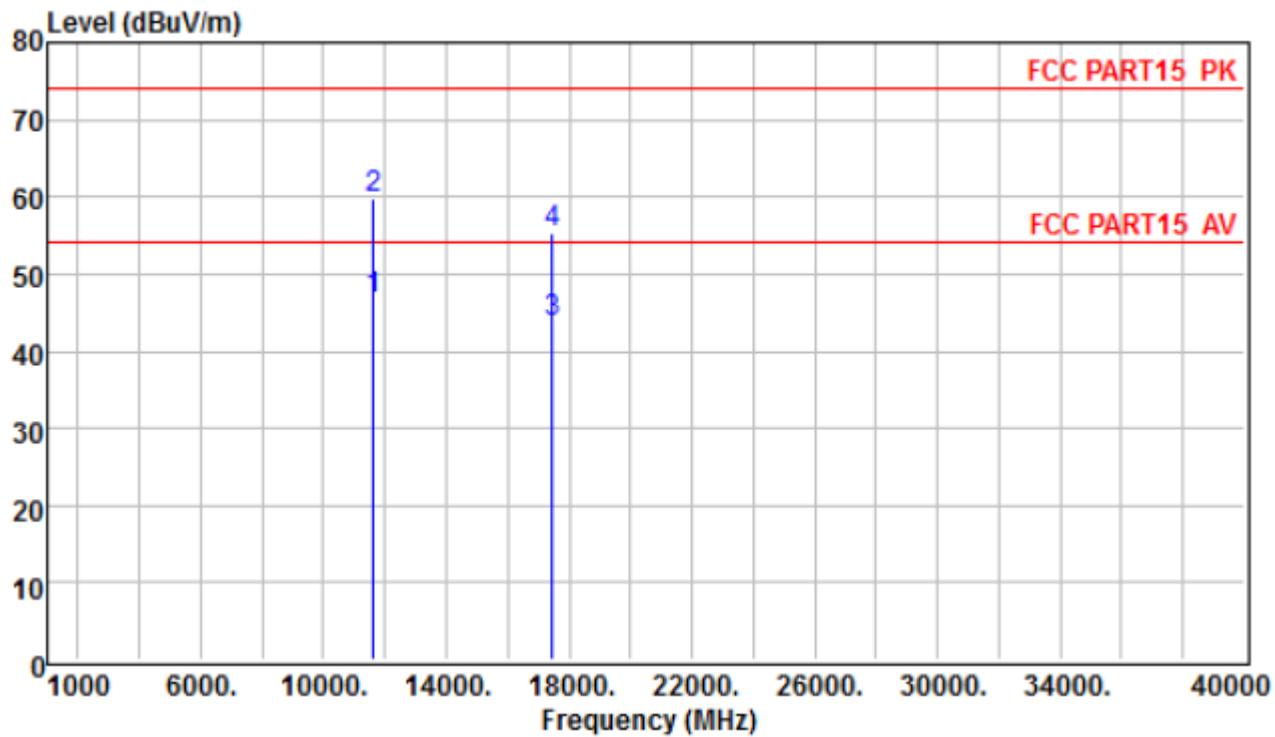
Horizontal



| Freq | ReadAntenna | | Cable Preamp | | Limit Level | Over Line Limit | Over Remark | |
|------|-------------|--------|--------------|--------|-------------|-----------------|-------------|----------------|
| | Level | Factor | Loss | Factor | | | | |
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB |
| 1 | 11524.000 | 32.88 | 23.88 | 17.27 | 28.95 | 45.08 | 54.00 | -8.92 Average |
| 2 | 11524.000 | 44.21 | 23.88 | 17.27 | 28.95 | 56.41 | 74.00 | -17.59 Peak |
| 3 | 17286.000 | 26.44 | 25.05 | 21.59 | 30.22 | 42.86 | 54.00 | -11.14 Average |
| 4 | 17286.000 | 36.91 | 25.05 | 21.59 | 30.22 | 53.33 | 74.00 | -20.67 Peak |

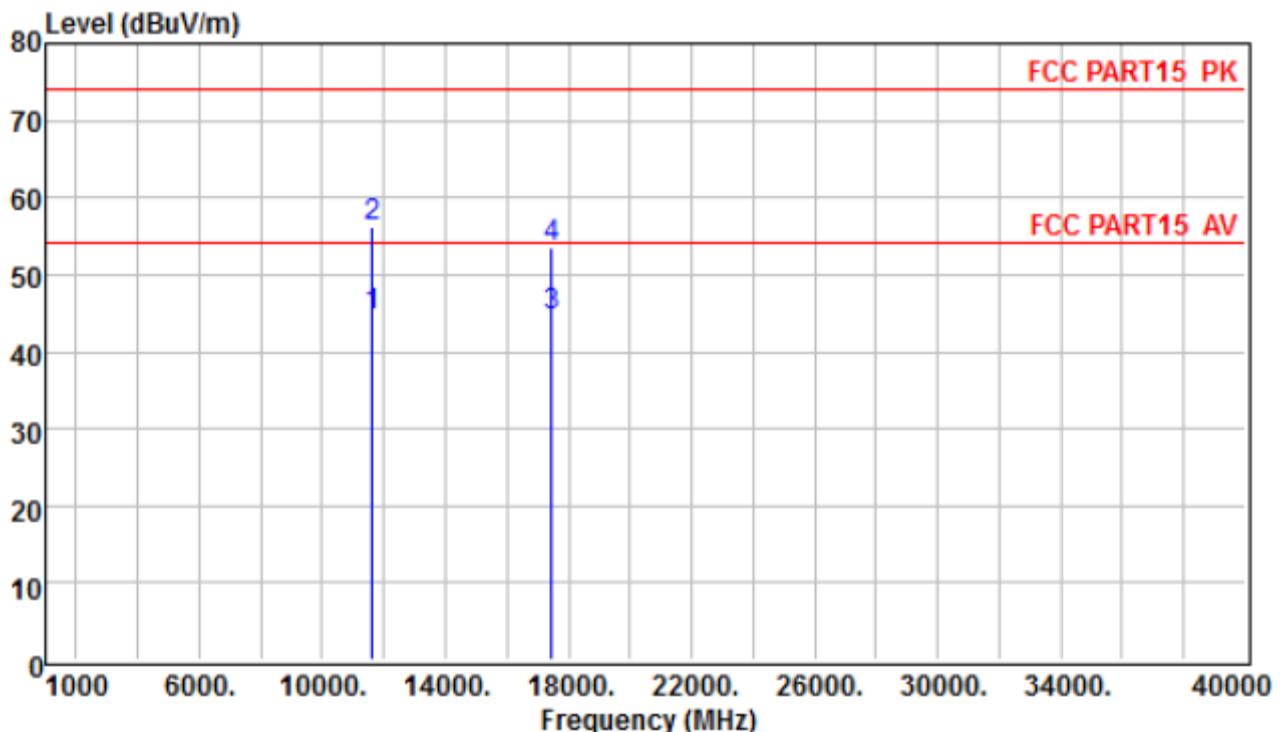
| | | | |
|----------------|-------------------|---------------------|-----------|
| EUT : | Powered Subwoofer | Model Name : | PULSE SUB |
| Temperature : | 20 °C | Relative Humidity : | 48% |
| Pressure : | 1010hPa | Test Mode : | TX-5814 |
| Test Voltage : | AC 120V/60Hz | | |

Vertical



| Freq | ReadAntenna | | Cable Preamp | | Limit Level | Over Line | Over Limit | Remark |
|------|-------------|-------|----------------|------------|-------------|-----------|------------|----------------|
| | Freq | Level | Antenna Factor | Cable Loss | | | | |
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB |
| 1 | 11628.000 | 32.65 | 25.78 | 17.29 | 28.96 | 46.76 | 54.00 | -7.24 Average |
| 2 | 11628.000 | 45.65 | 25.78 | 17.29 | 28.96 | 59.76 | 74.00 | -14.24 Peak |
| 3 | 17442.000 | 25.09 | 27.29 | 21.74 | 30.28 | 43.84 | 54.00 | -10.16 Average |
| 4 | 17442.000 | 36.61 | 27.29 | 21.74 | 30.28 | 55.36 | 74.00 | -18.64 Peak |

Horizontal



| Freq | ReadAntenna | | Cable Preamp | | Limit Line | Over Limit | Remark | |
|------|-------------|--------------|--------------|--------|------------|------------|--------|---------------|
| | MHz | Level Factor | Loss | Factor | | | | |
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB |
| 1 | 11628.000 | 30.43 | 25.78 | 17.29 | 28.96 | 44.54 | 54.00 | -9.46 Average |
| 2 | 11628.000 | 42.09 | 25.78 | 17.29 | 28.96 | 56.20 | 74.00 | -17.80 Peak |
| 3 | 17442.000 | 25.87 | 27.29 | 21.74 | 30.28 | 44.62 | 54.00 | -9.38 Average |
| 4 | 17442.000 | 34.66 | 27.29 | 21.74 | 30.28 | 53.41 | 74.00 | -20.59 Peak |

Note:

Absolute Level= ReadingLevel+antenna Factor+cable loss-preamp factor,

Over Limit= Absolute Level – Limit

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has not to be reported.

5. BAND EDGE COMPLIANCE TEST

5.1 Limits

Band 5.15-5.25GHz:

FCC: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

IC: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

FCC: For the band 5725-5850 MHz , All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

IC: For the band 5725-5825 MHz, emissions within the frequency range from the band edges to 10 MHz above or below the band edges shall not exceed -17 dBm/MHz e.i.r.p. For frequencies more than 10 MHz above or below the band edges, emissions shall not exceed -27 dBm/MHz.

5.2 Test setup

Test method: FCC KDB 789033 G)& Parts 15.407(b)(4) & 15.209(a)

Same as Clause 4.2.

5.3 Test Data

Please see data as below:

Note: we pretest horizontal and vertical, the worst was vertical and show in the report.

| Frequency (MHz) | Meter Reading (dB μ V) | antenna Factor (dB) | cable loss (dB) | preamp factor (dB) | Emission Level (dB μ V/m) | EIRP [dBm] | Limit [dBm] | Result |
|--------------------|----------------------------------|---------------------------|-----------------------|--------------------------|----------------------------------|---------------|----------------|--------|
| 5.2G | | | | | | | | |
| 5150 | 34.65 | 28.66 | 12.93 | 27.62 | 48.62 | -46.58 | -27.00 | Pass |
| 5350 | 34.13 | 28.73 | 13.09 | 27.62 | 48.33 | -46.87 | -27.00 | Pass |
| 5.8G | | | | | | | | |
| 5650 | 32.54 | 28.44 | 14.64 | 27.67 | 47.95 | -47.25 | -27.00 | Pass |
| 5700 | 33.76 | 28.52 | 14.95 | 27.67 | 49.56 | -45.64 | 10.00 | Pass |
| 5720 | 33.56 | 27.59 | 15.05 | 27.67 | 48.53 | -46.67 | 15.60 | Pass |
| 5725 | 37.87 | 27.63 | 15.16 | 27.67 | 52.99 | -42.21 | 27.00 | Pass |
| 5736 | 80.80 | 27.63 | 15.16 | 27.67 | 95.92 | 0.72 | 27.00 | Pass |
| 5850 | 38.06 | 27.86 | 15.75 | 27.68 | 53.99 | -41.21 | 27.00 | Pass |
| 5855 | 34.55 | 26.9 | 15.84 | 27.69 | 49.60 | -45.60 | 15.60 | Pass |
| 5875 | 32.09 | 26.93 | 15.93 | 27.69 | 47.26 | -47.94 | 10.00 | Pass |
| 5925 | 31.77 | 27.05 | 16.15 | 27.69 | 47.28 | -47.92 | -27.00 | Pass |
| 5814 | 79.14 | 27.78 | 15.56 | 27.68 | 94.80 | -0.40 | 27.00 | Pass |

Remark: 1. According to KDB 789033 D02 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dB μ V/m] - 95.2

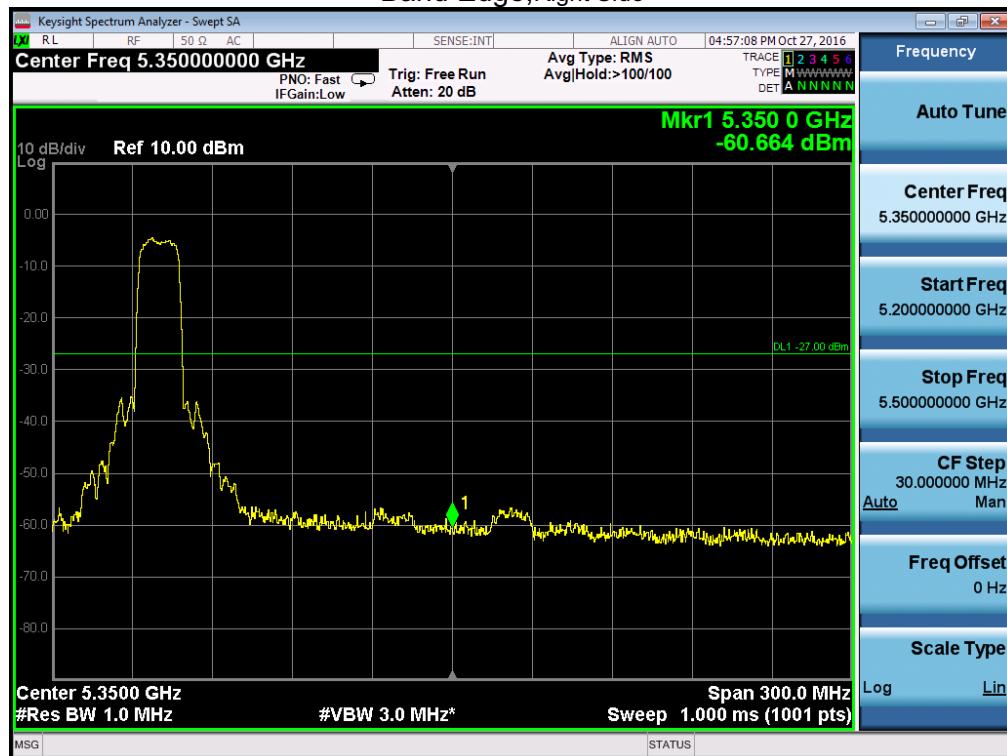
For conducted test:

5.2G

Band Edge, Left Side



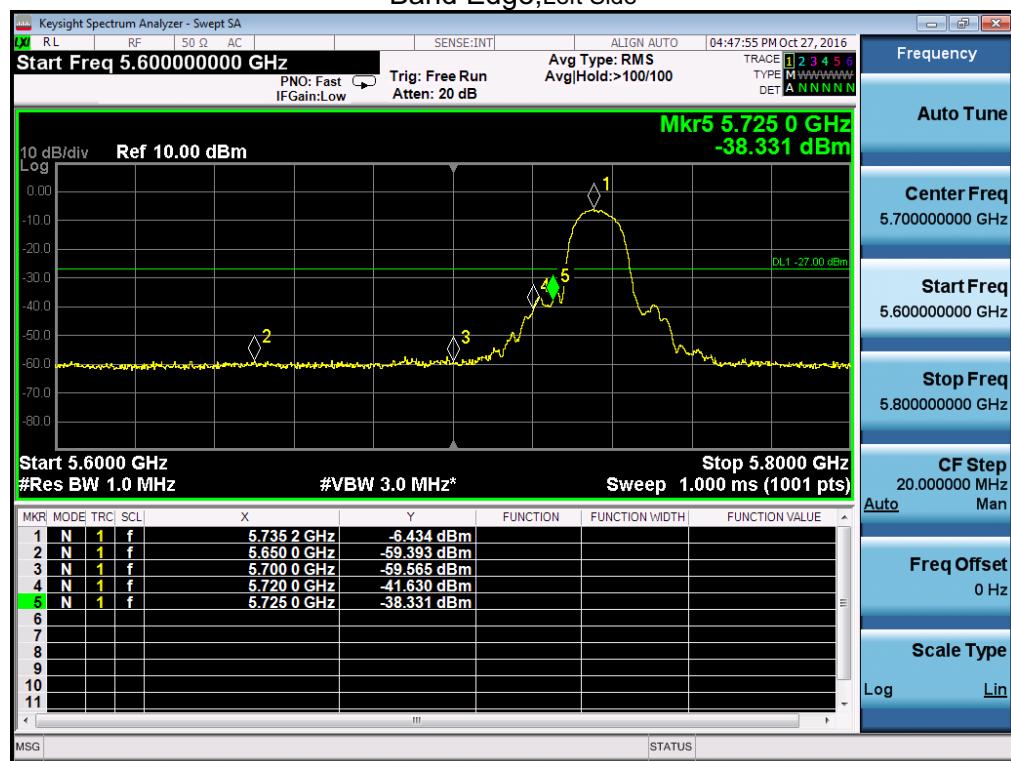
Band Edge, Right Side



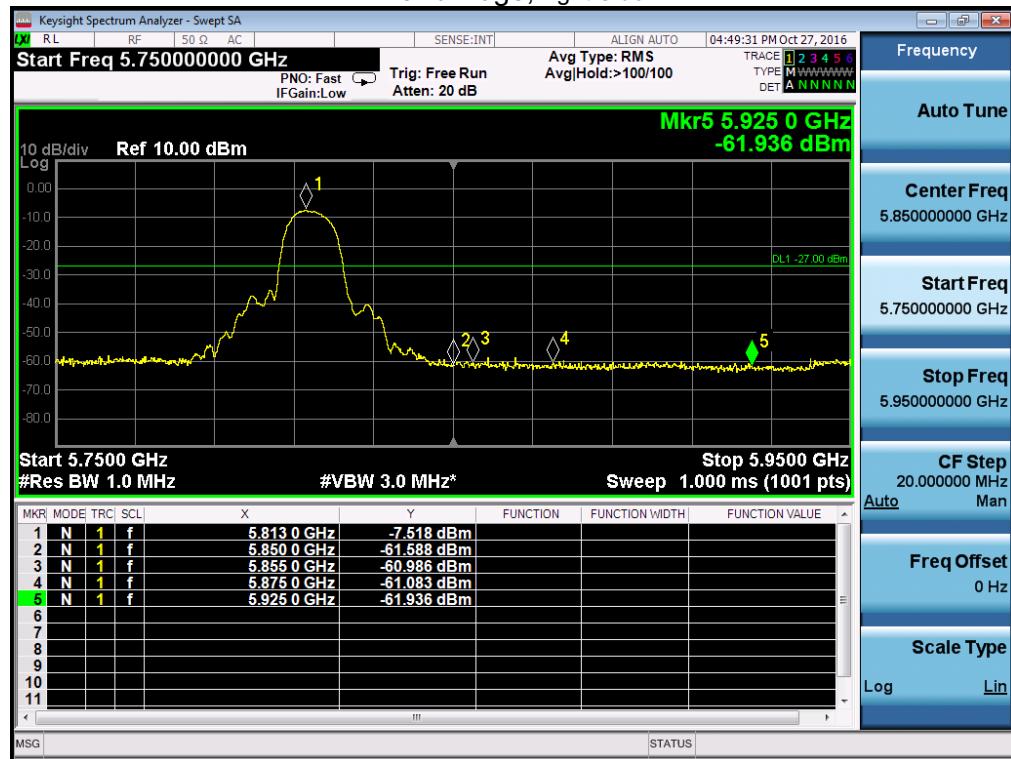
Note: EIRP BAND EDGE=Reading Level+antenna gain

5.8G

Band Edge,Left Side



Band Edge,Right Side



Note: EIRP BAND EDGE=Reading Level+antenna gain

6. 26DB AND 6DB BANDWIDTH TEST

6.1 Applicable Standard

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033, at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth. The 26 dB bandwidth is used to determine the conducted power limits. The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

6.2 Test Procedure

1. Emission Bandwidth (EBW)

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3 Test setup

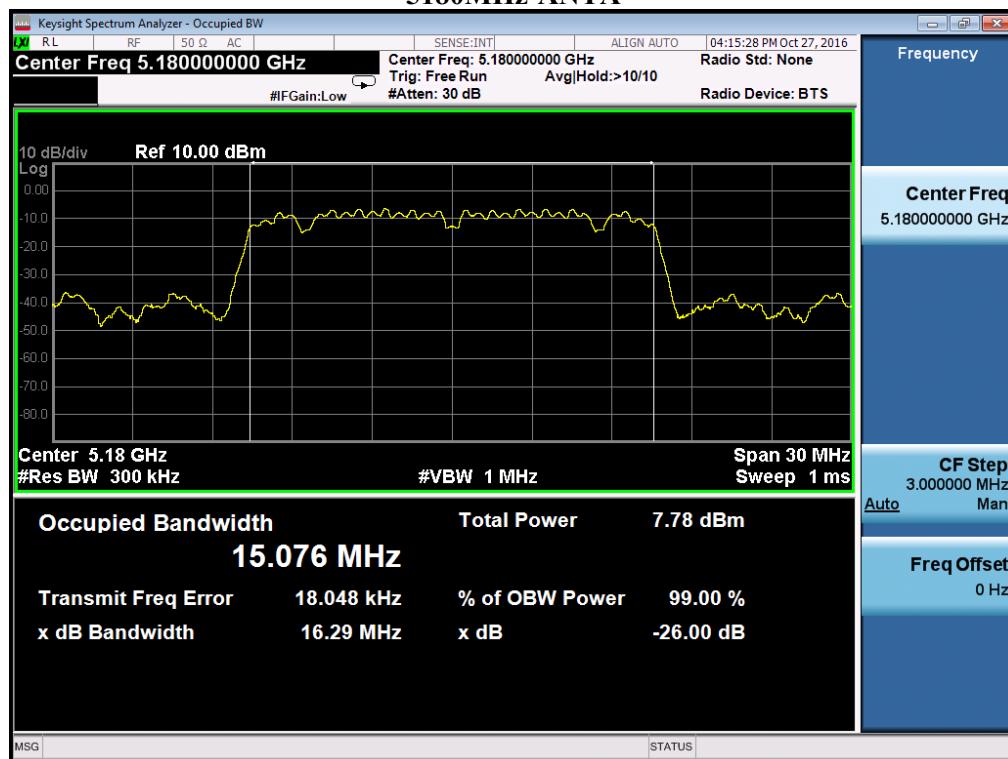


| Frequency (MHz) | 26dB Bandwidth (MHz) ANT A | 99% Bandwidth (MHz) ANT A | 26dB Bandwidth (MHz) ANT B | 99% Bandwidth (MHz) ANT B |
|--------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|
| 5180 | 16.29 | 15.076 | 16.30 | 15.068 |
| 5200 | 16.28 | 15.070 | 16.29 | 15.060 |
| 5240 | 16.30 | 15.070 | 16.30 | 15.052 |

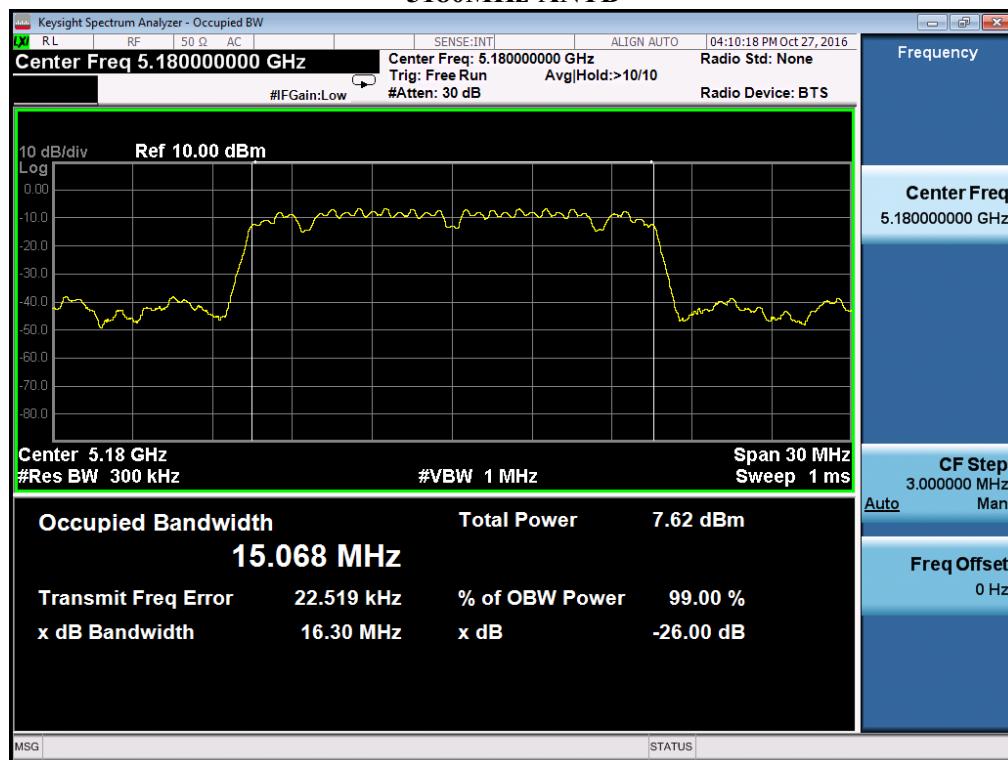
| Frequency (MHz) | 6dB Bandwidth (MHz) ANT A | 6dB Bandwidth (MHz) ANT B | Limit (MHz) | 99% Bandwidth (MHz) ANT A | 99% Bandwidth (MHz) ANT B |
|--------------------|------------------------------------|------------------------------------|----------------|------------------------------------|------------------------------------|
| 5736 | 9.840 | 9.840 | 0.5 | 13.781 | 13.813 |
| 5762 | 9.839 | 9.840 | 0.5 | 13.807 | 13.791 |
| 5814 | 9.840 | 9.837 | 0.5 | 13.825 | 13.817 |

5150-5250 MHz:

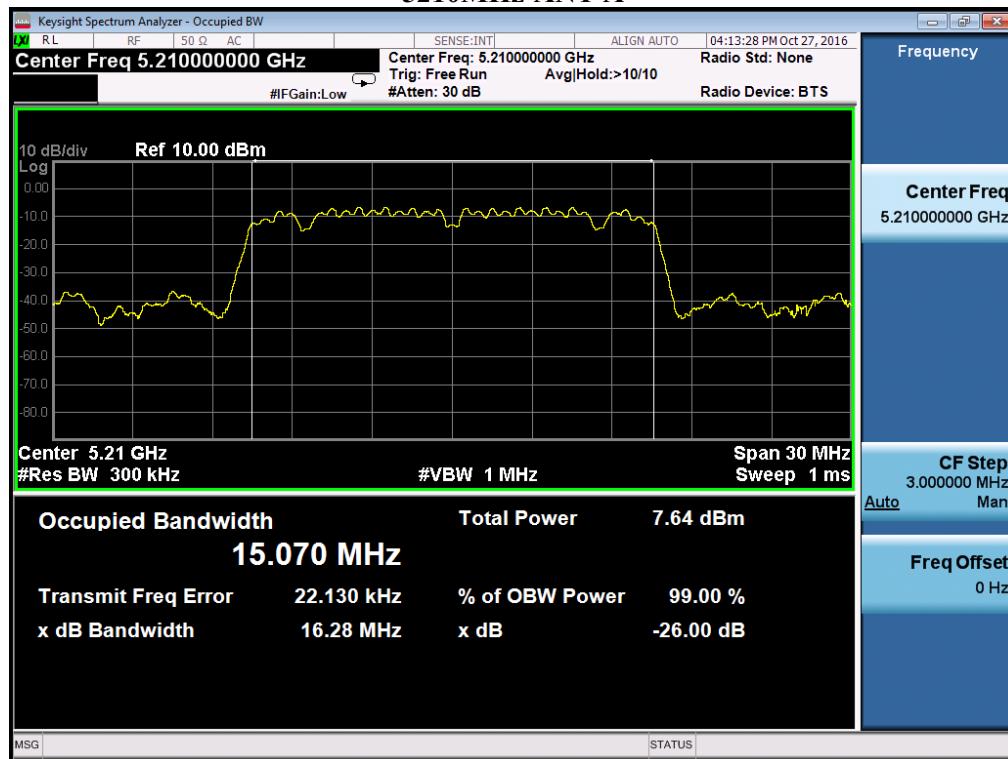
5180MHz-ANTA



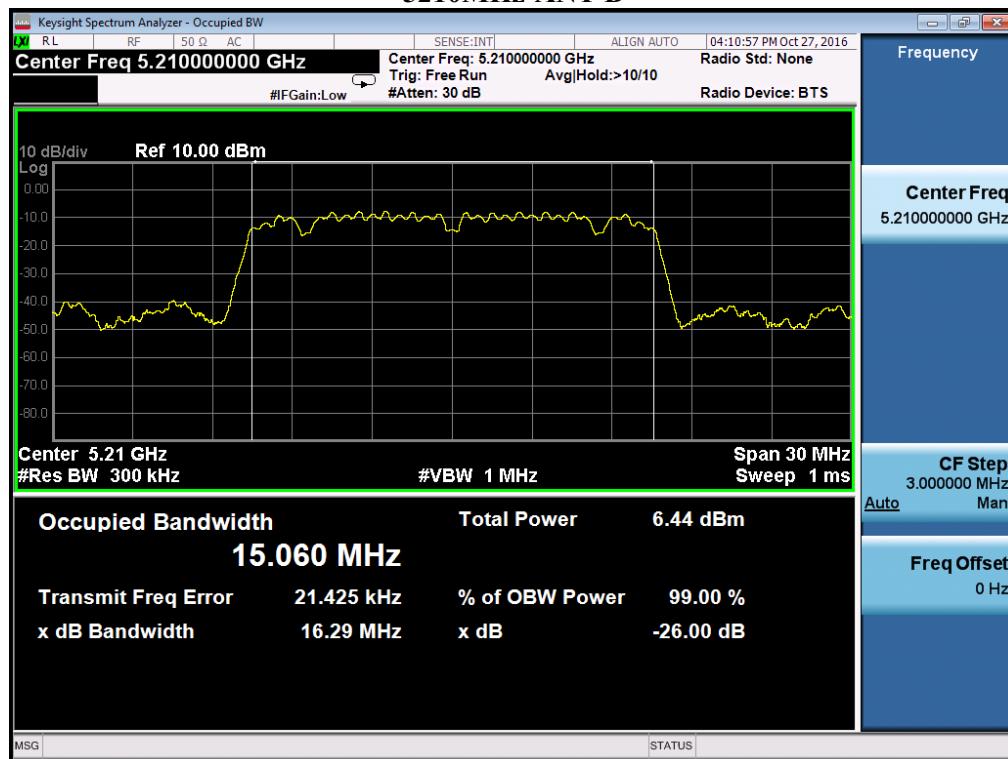
5180MHz-ANTB



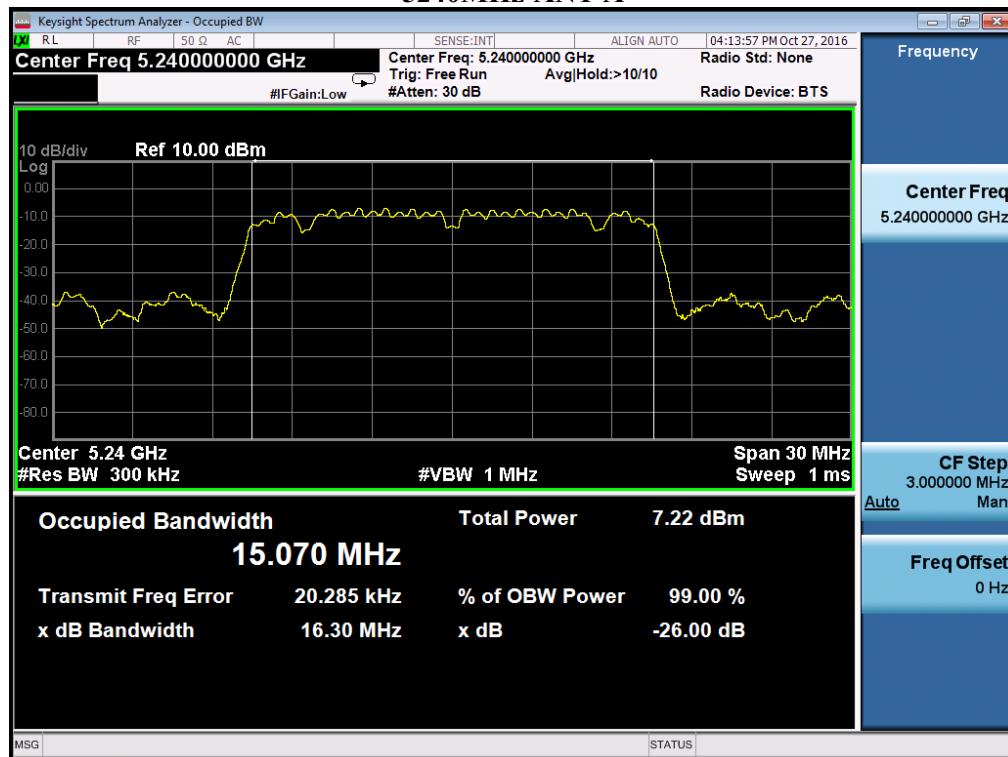
5210MHz-ANT A



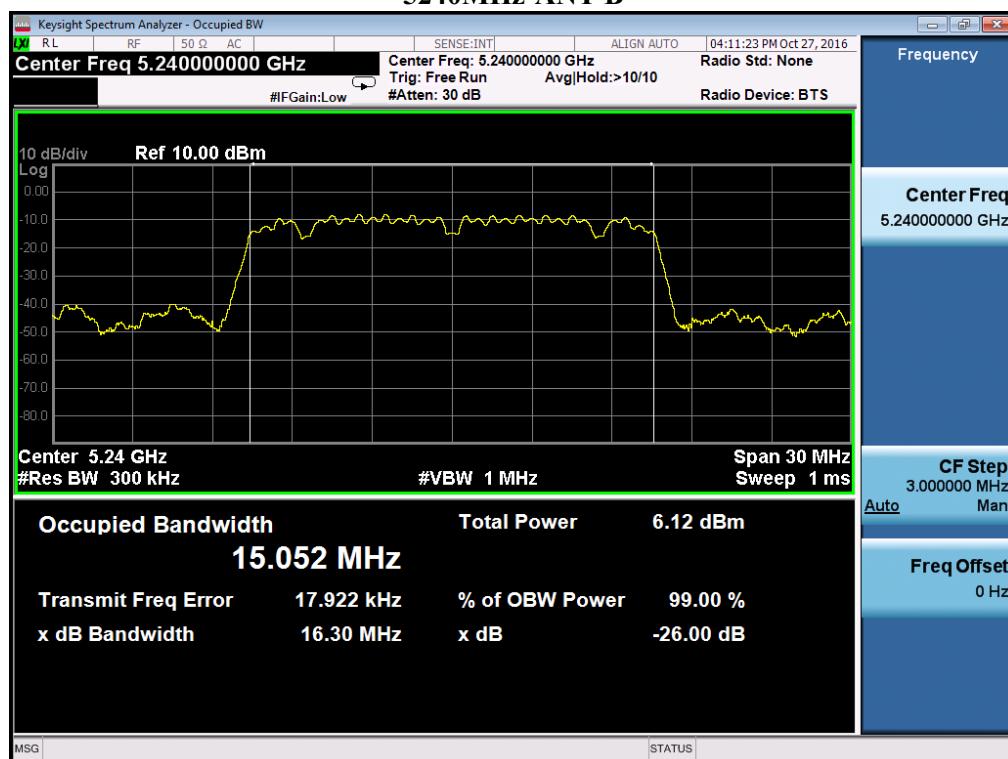
5210MHz-ANT B



5240MHz-ANT A



5240MHz-ANT B

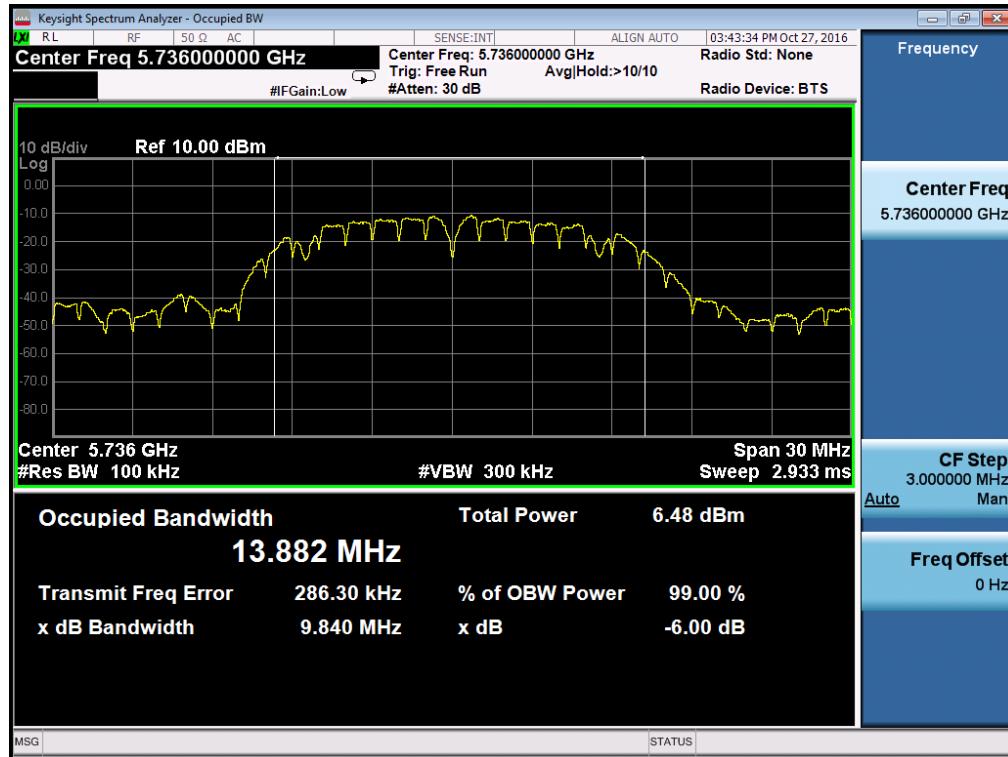


5725-5850MHz:
-6dB Bandwidth

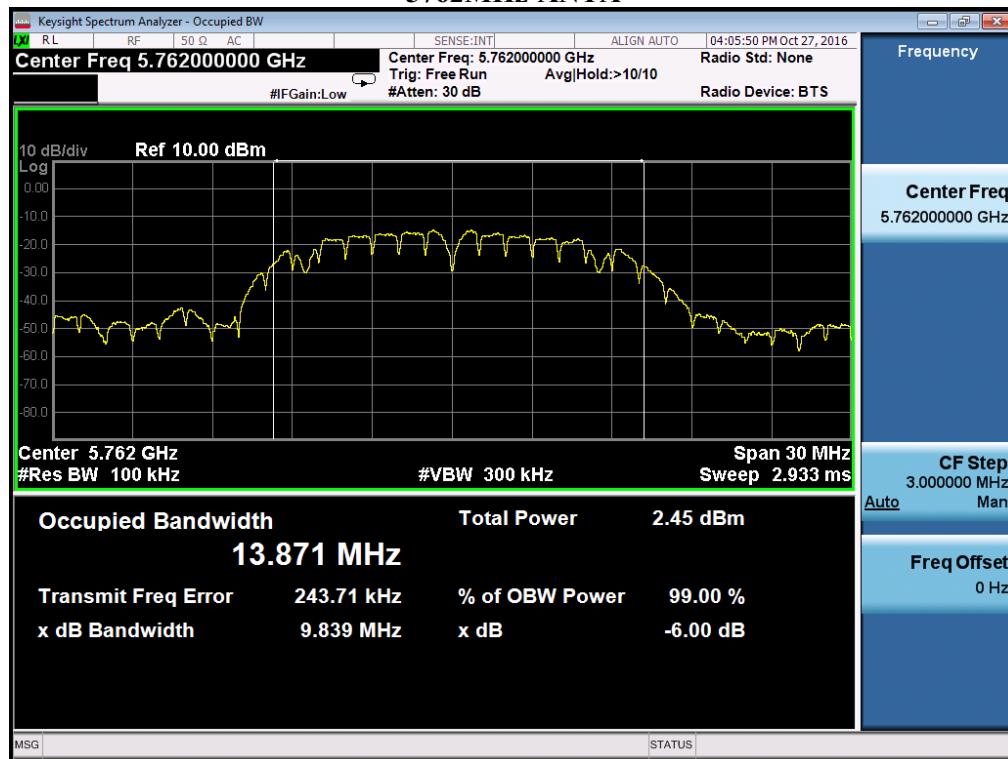
5736MHz-ANTA



5736MHz-ANTB



5762MHz-ANTA



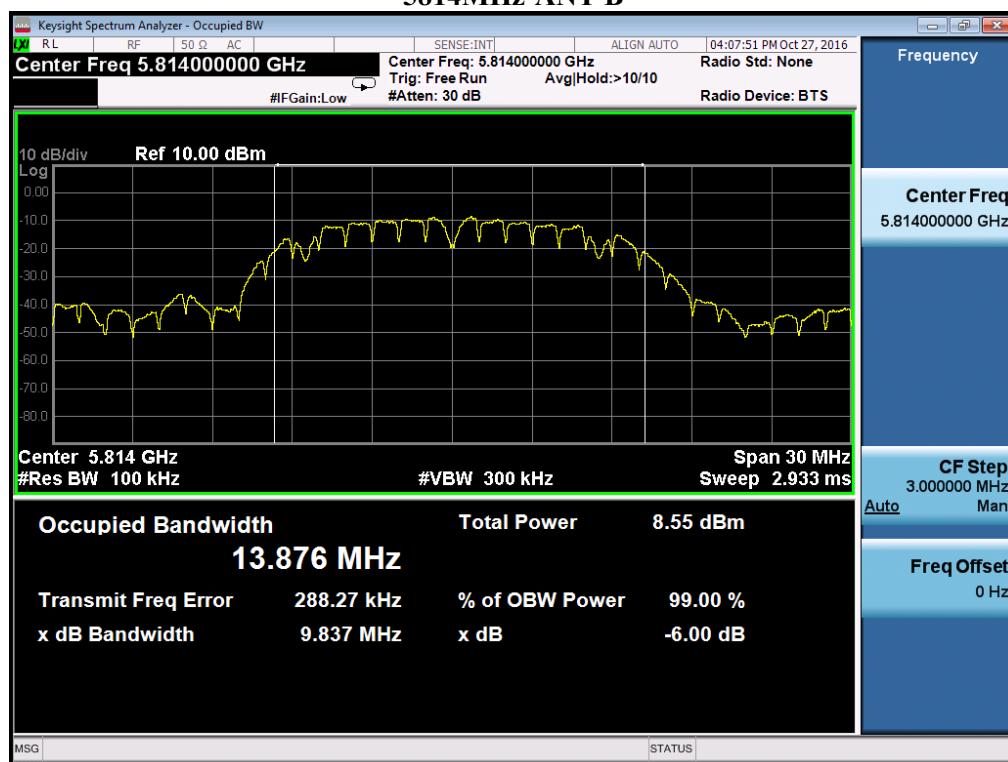
5762MHz-ANT B



5814MHz-ANTA



5814MHz-ANT B



99% Bandwidth

5736MHz-ANTA



5736MHz-ANT B



5762MHz-ANTA



5762MHz-ANT B



5814MHz-ANTA



5814MHz-ANT B



7. OUTPUT POWER TEST

7.1 Limits

Band 5.15-5.25GHz:

FCC: For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

IC: The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10\log B$ dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Band 5.725-5.825GHz:

FCC: For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

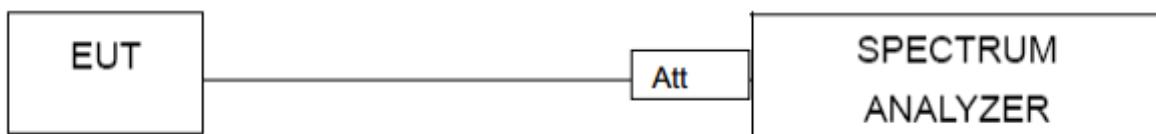
IC: The maximum conducted output power shall not exceed 1 W.

7.2 Test setup

1. The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):
 2. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
 - a. The Transmitter output (antenna port) was connected to the power meter.
 - b. Turn on the EUT and power meter and then record the power value.
 - c. Repeat above procedures on all channels needed to be tested.



Duty cycle



7.3 Test result

| Frequency (MHz) | Average Output Power (dBm) ANT A | Average Output Power (dBm) ANT B | Total power (dBm) | IC Limit (dBm) | FCC Limit (dBm) | Result |
|-----------------|-------------------------------------|-------------------------------------|-------------------|----------------|-----------------|--------|
| 5180 | 4.378 | 3.575 | 7.01 | - | 24 | Pass |
| 5210 | 4.467 | 3.754 | 7.14 | - | 24 | Pass |
| 5240 | 4.765 | 3.679 | 7.27 | - | 24 | Pass |
| 5736 | -2.124 | -3.253 | 0.36 | 30 | 30 | Pass |
| 5762 | -1.768 | -3.254 | 0.56 | 30 | 30 | Pass |
| 5814 | -1.834 | -3.353 | 0.48 | 30 | 30 | Pass |

For 5.15~5.25GHz, the limit=200 mW or $10 + 10\log B$ dBm, whichever power is less

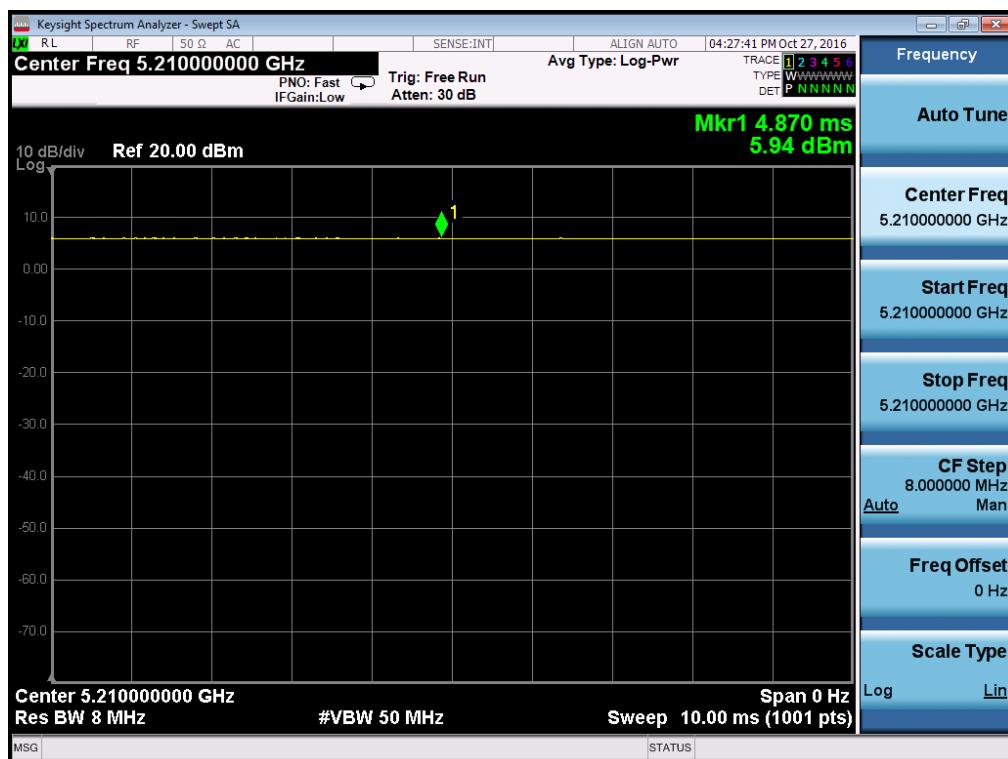
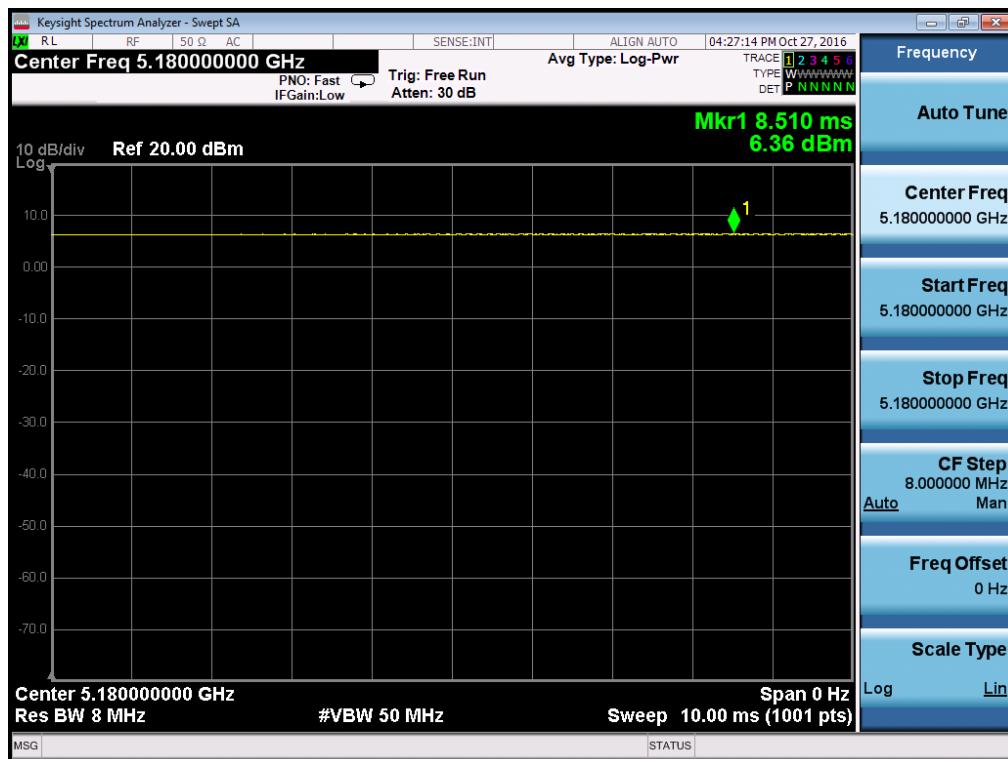
For 5.725-5.825GHz, the limit=1 W

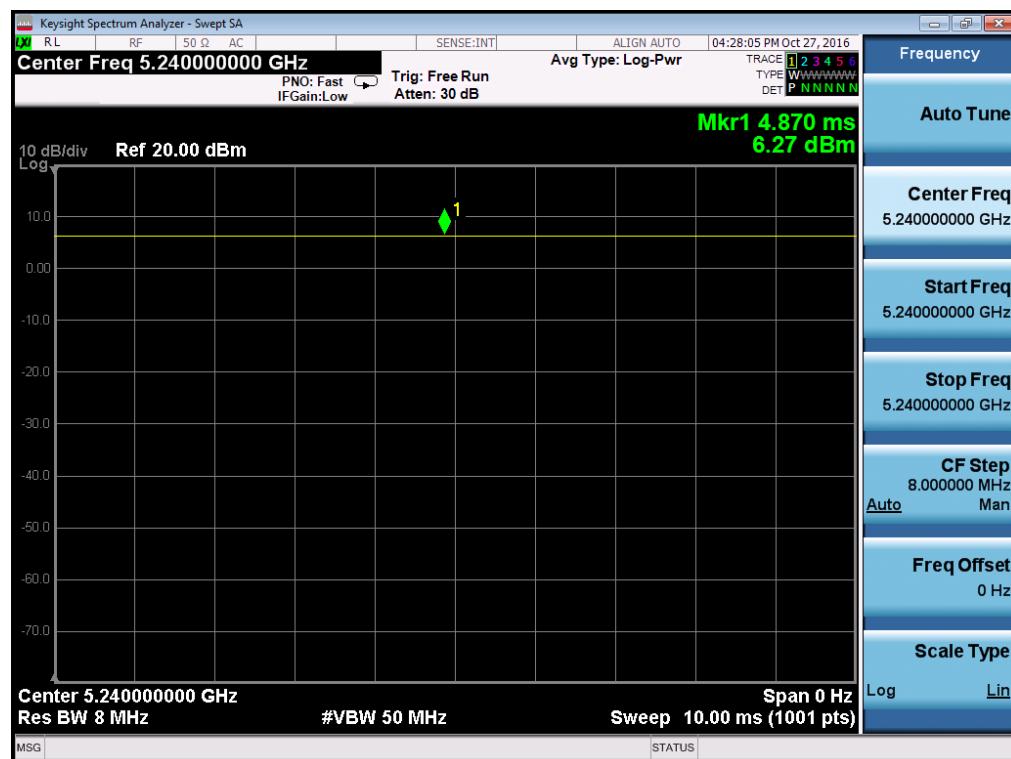
EIRP=output power+antenna gain

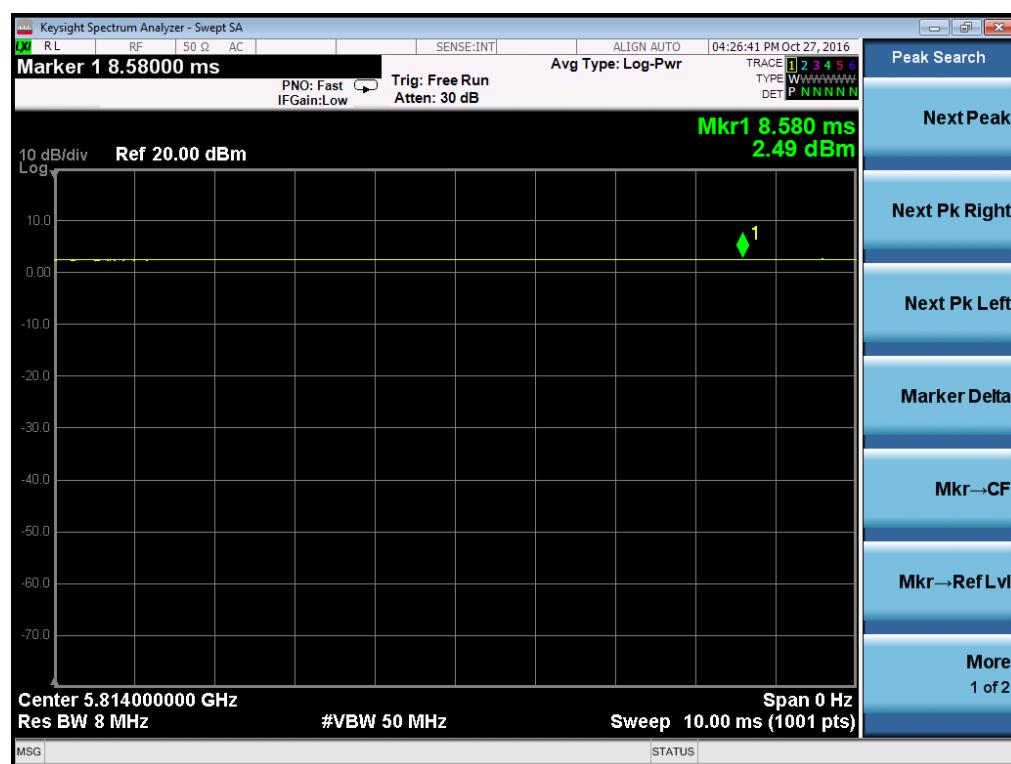
| Frequency (MHz) | Average Output Power (dBm) | Antenna Gain (dBi) | EIRP(dBm) | IC Limit (dBm) |
|-----------------|----------------------------|--------------------|-----------|----------------|
| 5180 | 7.01 | 5.42 | 12.43 | 21.8 |
| 5210 | 7.14 | 5.42 | 12.56 | 21.8 |
| 5240 | 7.27 | 5.42 | 12.69 | 21.8 |

NOTE: During the test the EUT is in 100% duty cycle transmitting.

Test plot of Duty Cycle







8. PEAK POWER SPECTRAL DENSITY TEST

8.1 Limits

Band 5.15-5.25GHz:

FCC: In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

IC: The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band..

Band 5.725-5.825GHz:

FCC: In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

IC: The power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used.

8.2 Test setup

Methods refer to FCC KDB 789033

- 1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power..." .
- 2) Use the peak search function on the instrument to find the peak of the spectrum.
- 3) The result is the PPSD.
- 4) The above procedures make use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified in the 15.407(a)(5). That rule section also permits use of resolution bandwidths less than 1 MHz "provided that the measured power is integrated to show the total power over the measurement bandwidth" (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth



8.3 Test data

Test data as below

For FCC:

5.15-5.25GHz

| Frequency (MHz) | Power Density. Antenna A | Power Density. Antenna B | Total power | FCC Limit (dBm/MHz) |
|--------------------|-----------------------------|-----------------------------|----------------|------------------------|
| | (dBm/MHz) | (dBm/MHz) | (dBm/MHz) | |
| 5180 | -5.206 | -5.393 | -2.29 | 11 |
| 5210 | -5.461 | -6.670 | -3.01 | 11 |
| 5240 | -4.069 | -7.316 | -2.39 | 11 |

5.725-5.825GHz

| Frequency (MHz) | Power Density. Antenna A | Power Density. Antenna B | Total power Density | FCC Limit (dBm/500KHz) |
|--------------------|-----------------------------|-----------------------------|------------------------|---------------------------|
| | (dBm/500KHz) | (dBm/500KHz) | (dBm/500KHz) | |
| 5736 | -8.389 | -5.469 | -3.68 | 30 |
| 5762 | -8.506 | -5.327 | -3.62 | 30 |
| 5814 | -9.763 | -3.617 | -2.67 | 30 |

For IC:

5.15-5.25GHz

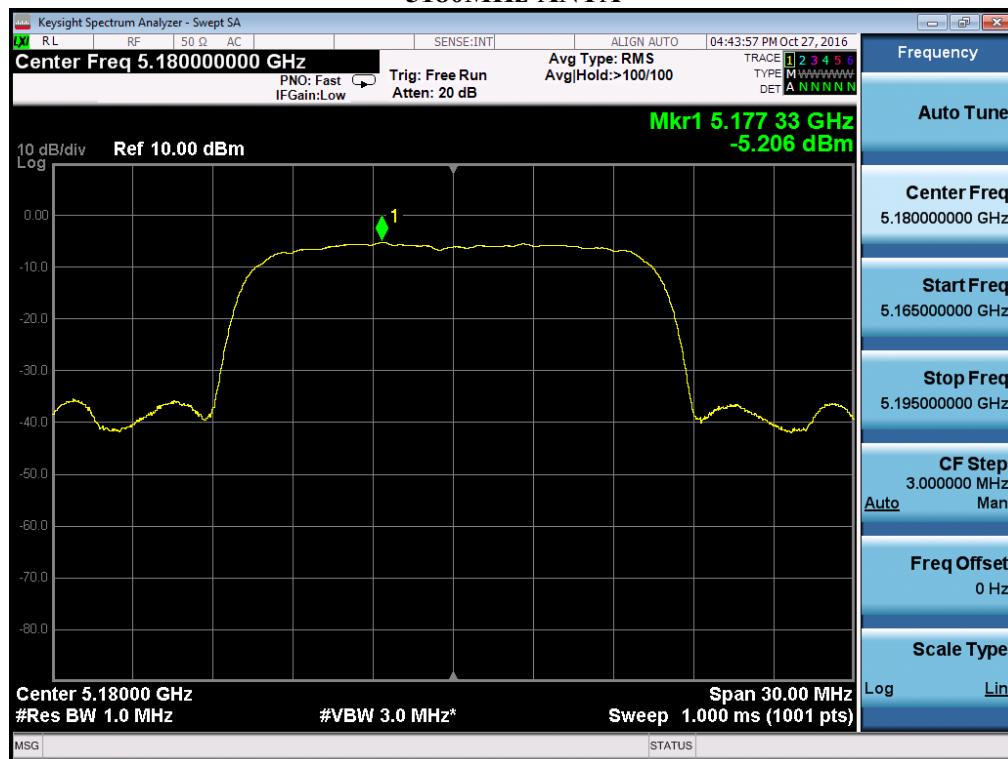
| Frequency (MHz) | Total power | Directional gain | e.i.r.p. spectral density | IC Limit (dBm/MHz) |
|--------------------|----------------|---------------------|---------------------------------|-----------------------|
| | (dBm/MHz) | (dBi) | (dBm/MHz) | |
| 5180 | -2.29 | 5.42 | 3.13 | 10 |
| 5210 | -3.01 | 5.42 | 2.41 | 10 |
| 5240 | -2.39 | 5.42 | 3.03 | 10 |

5.725-5.825GHz

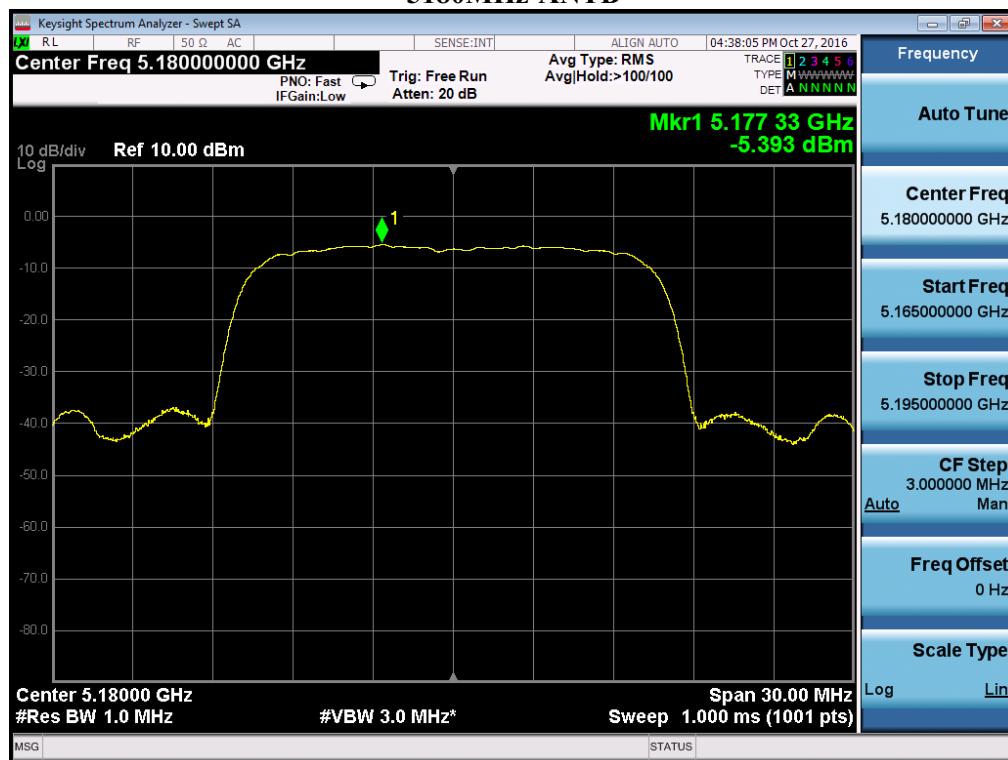
| Frequency (MHz) | Power Density. Antenna A | Power Density. Antenna B | Total power Density | FCC Limit (dBm/500KHz) |
|--------------------|-----------------------------|-----------------------------|------------------------|---------------------------|
| | (dBm/500KHz) | (dBm/500KHz) | (dBm/500KHz) | |
| 5736 | -8.389 | -5.469 | -3.68 | 30 |
| 5762 | -8.506 | -5.327 | -3.62 | 30 |
| 5814 | -9.763 | -3.617 | -2.67 | 30 |

5150-5250 MHz:

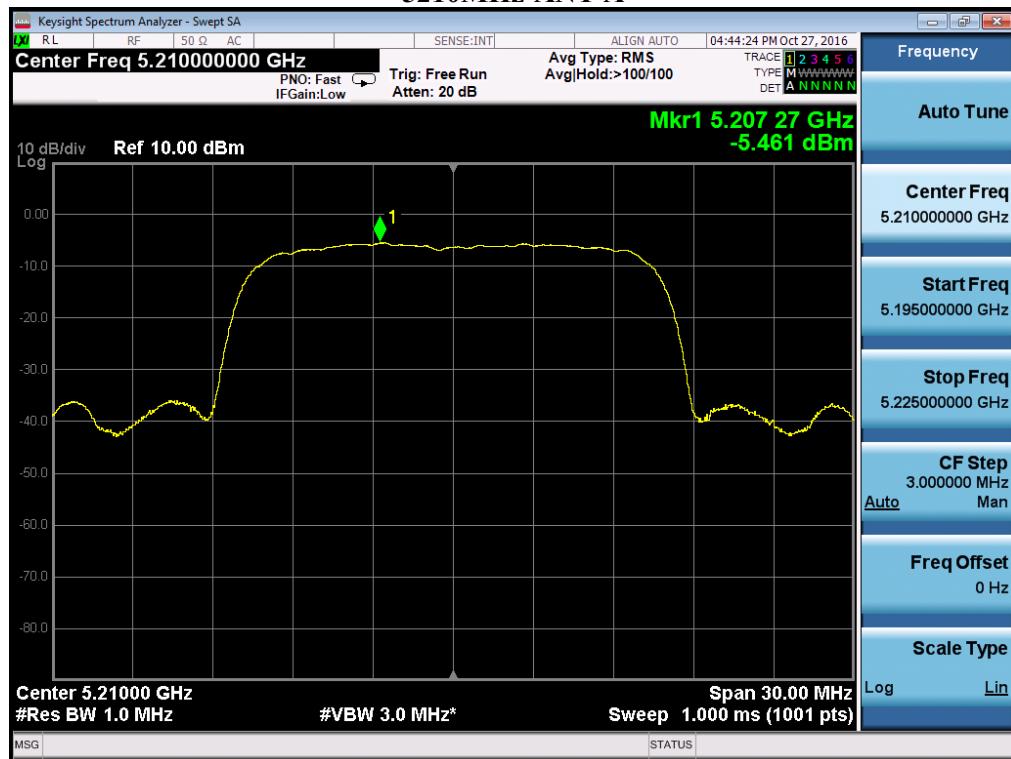
5180MHz-ANTA



5180MHz-ANTB



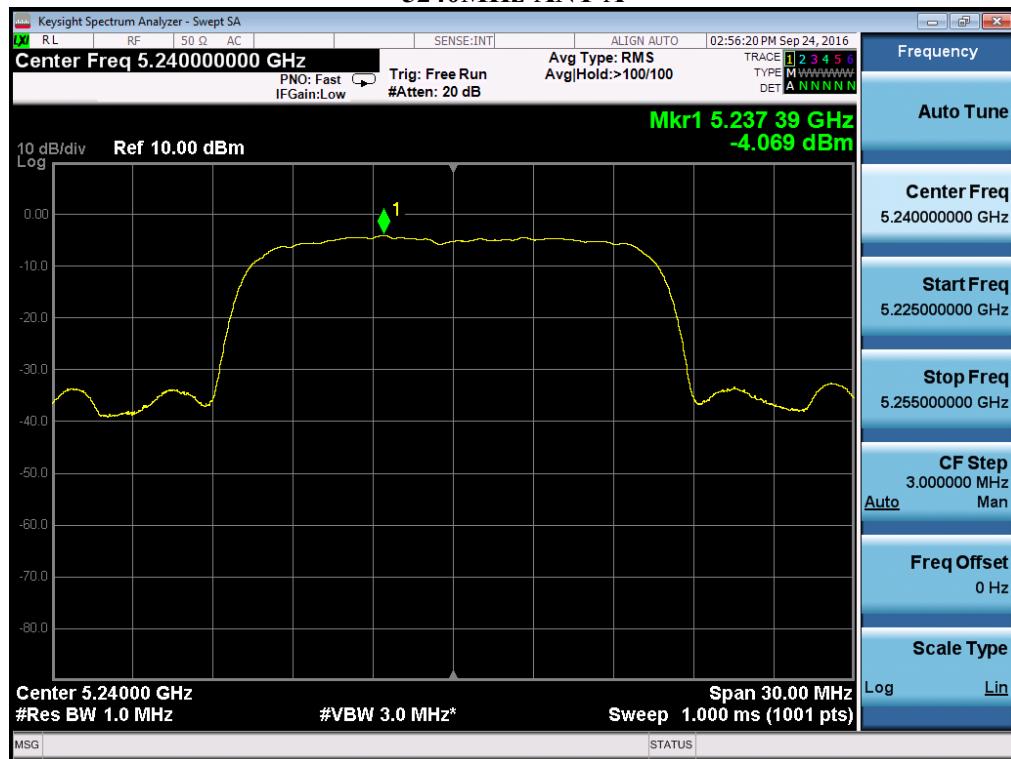
5210MHz-ANT A



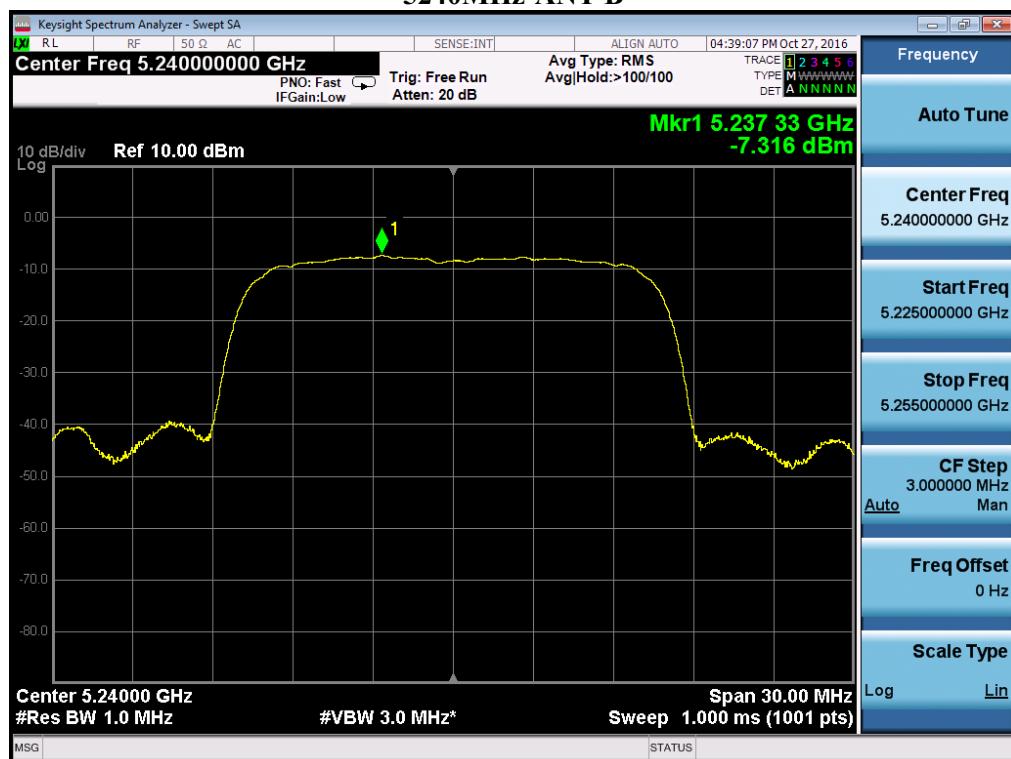
5210MHz-ANT B



5240MHz-ANT A



5240MHz-ANT B



5725-5850MHz:

5736MHz-ANTA



5736MHz-ANTB



5762MHz-ANTA



5762MHz-ANT B



5814MHz-ANTA



5814MHz-ANT B

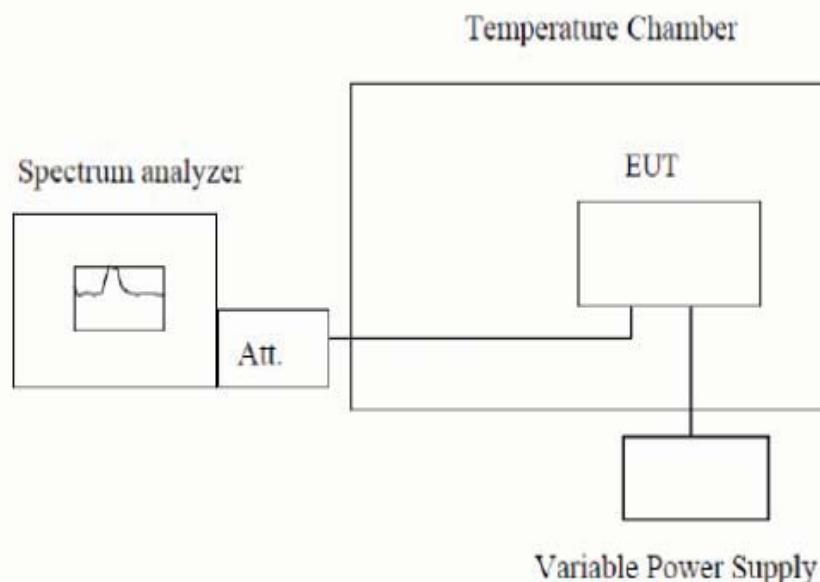


9. FREQUENCY STABILITY TEST

9.1.limit

According to §15.407(g), manufacturers of U-NII 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's manual.

9.2 Test Configuration



9.3 test procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is $(fc-f)/fc \times 10^6$ ppm and the limit is less than ± 20 ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature rule is -30°C~50°C..

Test result

Measurement Data (the worst channel):

Frequency Stability under Temperature

| Operating Frequency: 5180 MHz | | | | |
|-------------------------------|-------------|--------------------------|-------------------|----------------------|
| Environment Temperature (°C) | Voltage (V) | Measured Frequency (MHz) | Test Result (MHz) | Max. Deviation (ppm) |
| 50 | 120 | 5180 | 5180.0135 | 2.336 |
| 40 | 120 | 5180 | 5180.0103 | 2.162 |
| 30 | 120 | 5180 | 5180.0112 | 1.988 |
| 20 | 120 | 5180 | 5180.0117 | 2.104 |
| 10 | 120 | 5180 | 5180.0105 | 2.066 |
| 0 | 120 | 5180 | 5180.0143 | 2.181 |
| -10 | 120 | 5180 | 5180.0112 | 2.259 |
| -20 | 120 | 5180 | 5180.0133 | 2.432 |
| -30 | 120 | 5180 | 5180.0124 | 2.471 |

Frequency Stability under Voltage

| Operating Frequency: 5180 MHz | | | |
|-------------------------------|--------------------------|-------------------|----------------------|
| AC Voltage (V) | Measured Frequency (MHz) | Test Result (MHz) | Max. Deviation (ppm) |
| 102 | 5180 | 5180.0132 | 2.548 |
| 120 | 5180 | 5180.0238 | 4.595 |
| 138 | 5180 | 5180.0134 | 2.587 |

10. ANTENNA REQUIREMENTS

10.1 Limits

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2 Result

The antennas used for this product is PCB antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 2.408dBi.

11.PHOTOGRAPHS OF TEST SET-UP

Conducted Emission

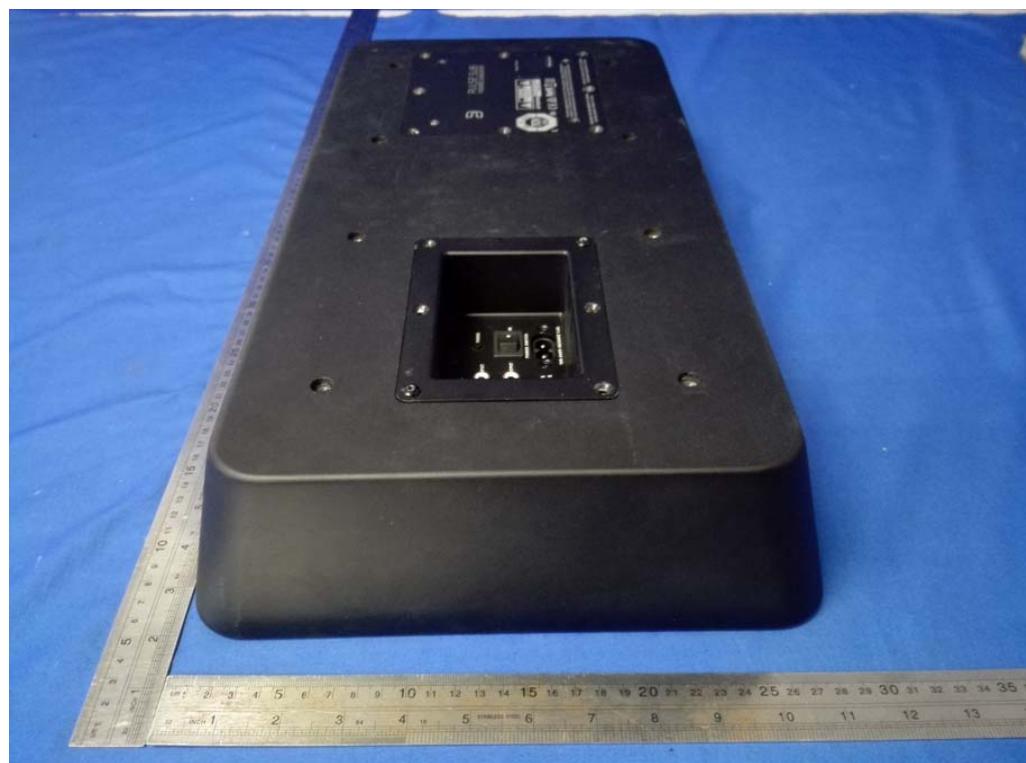


Radiated Emission Test

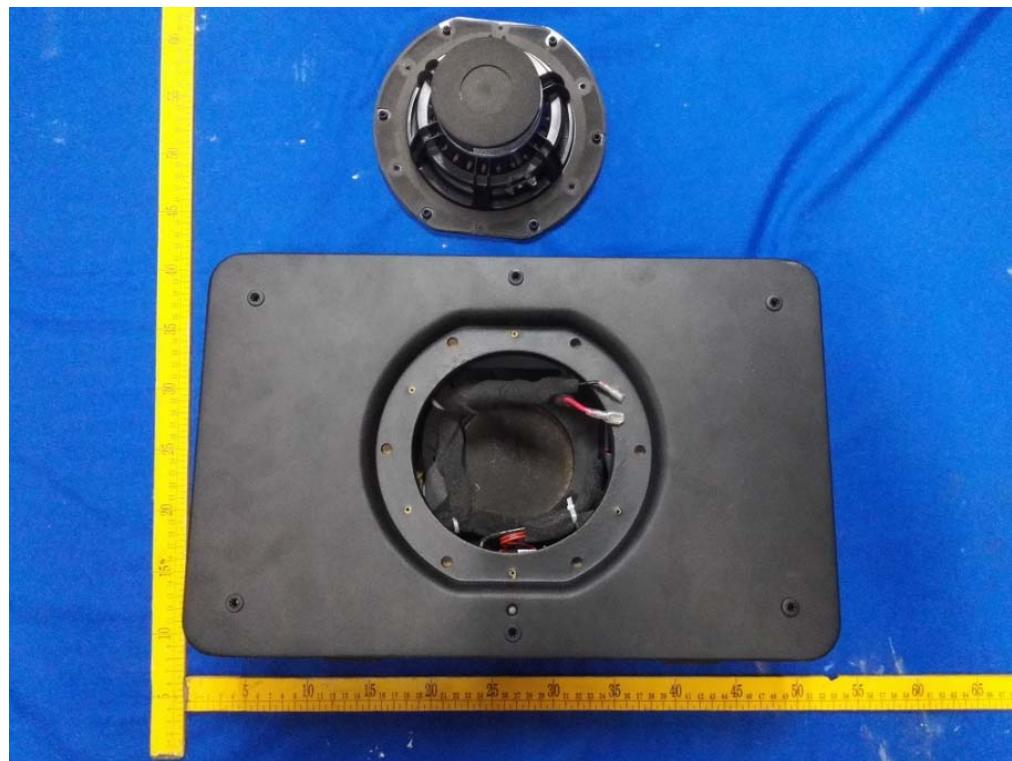


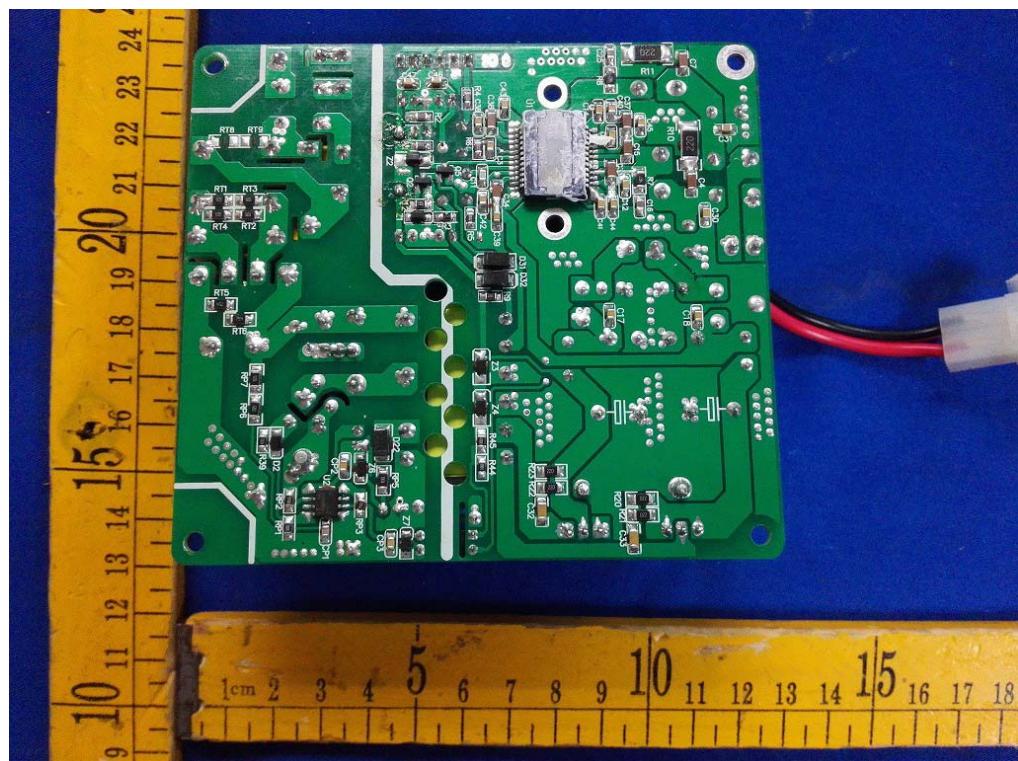
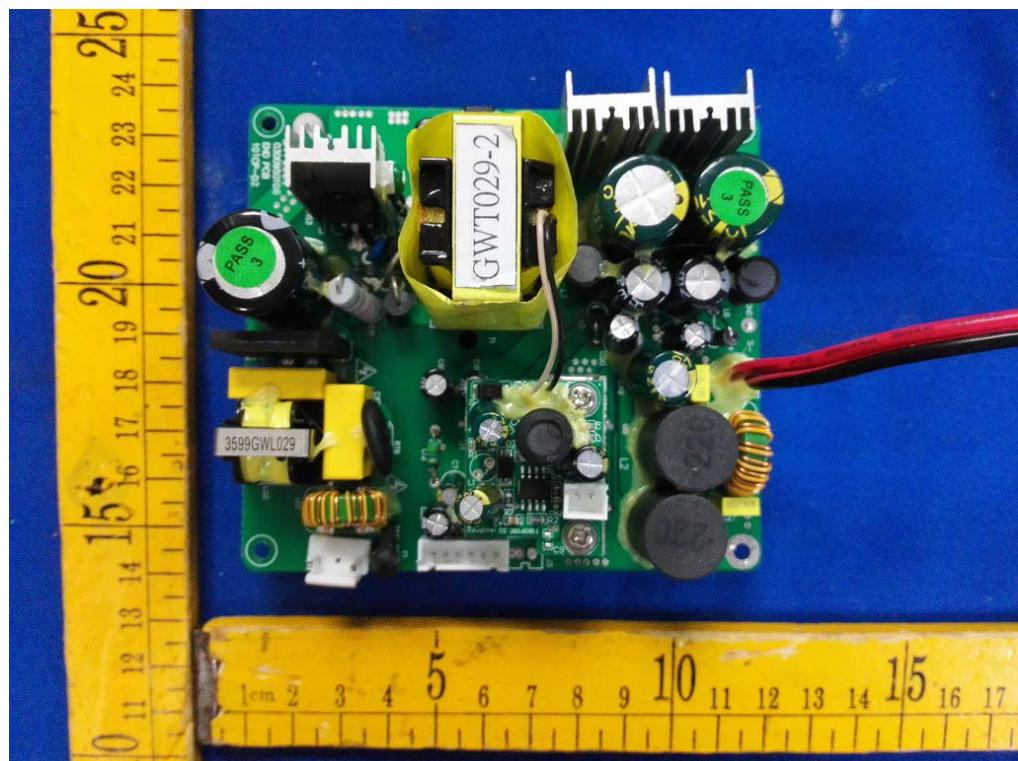
12.PHOTOGRAPHS OF THE EUT

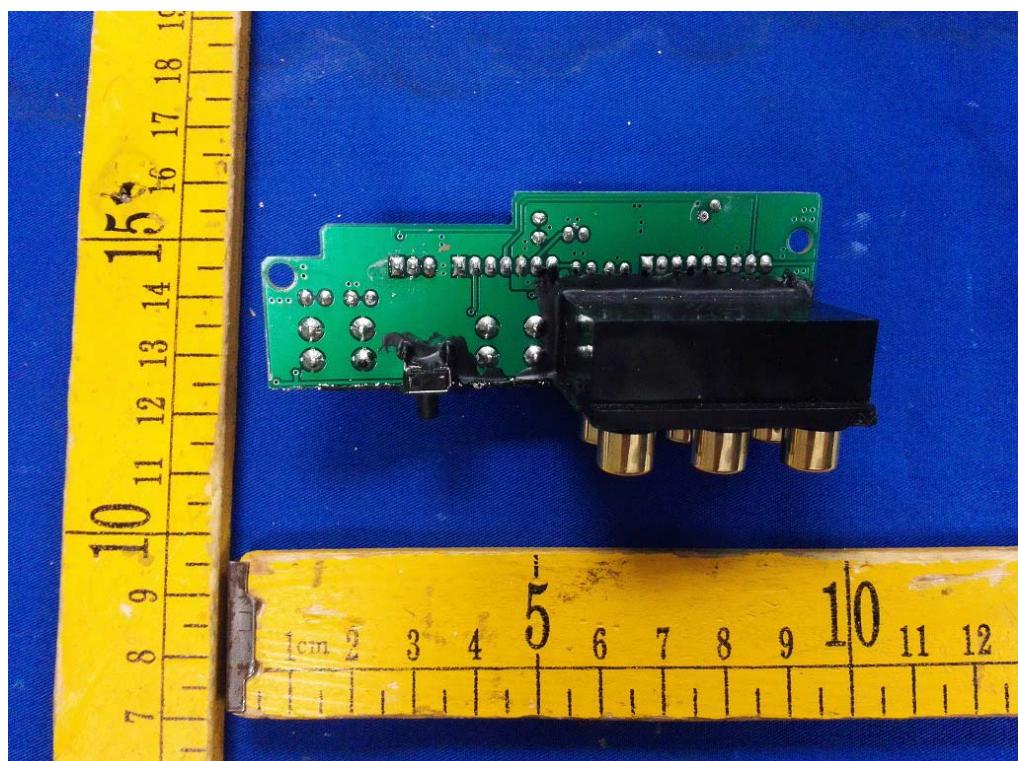
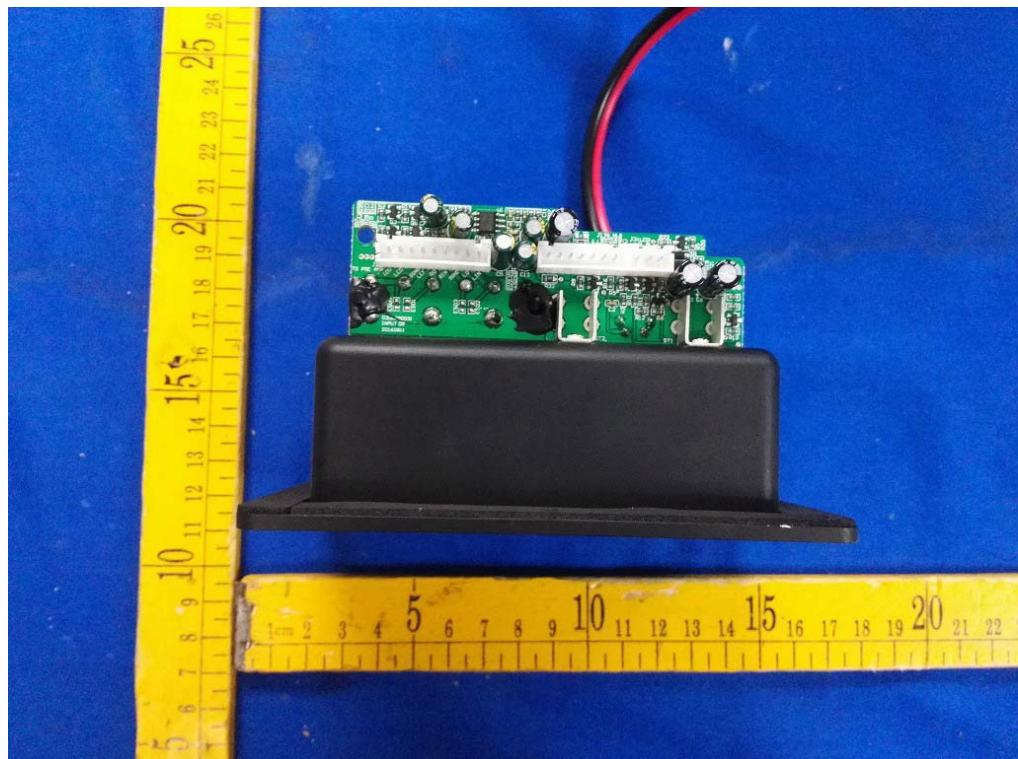


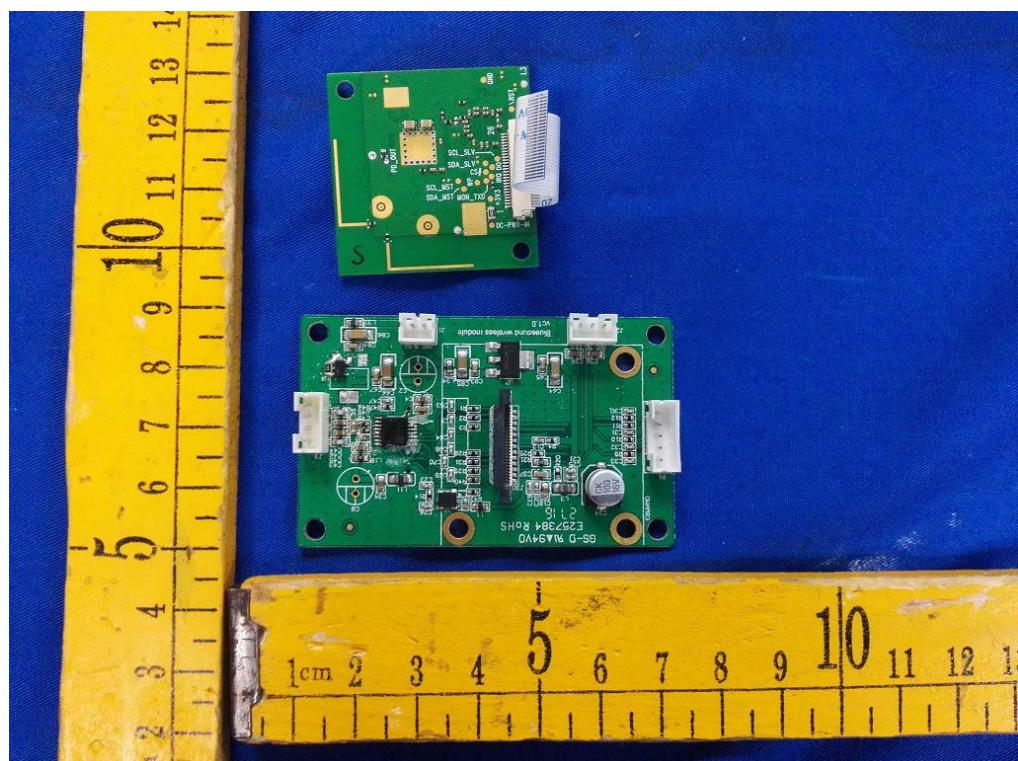
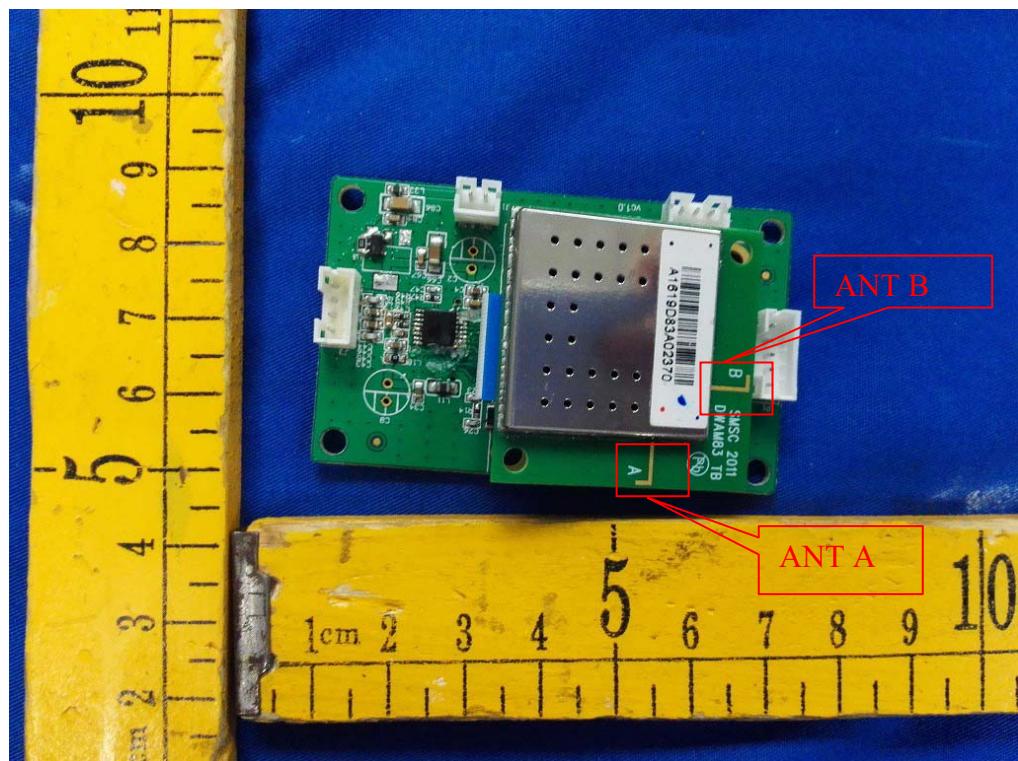


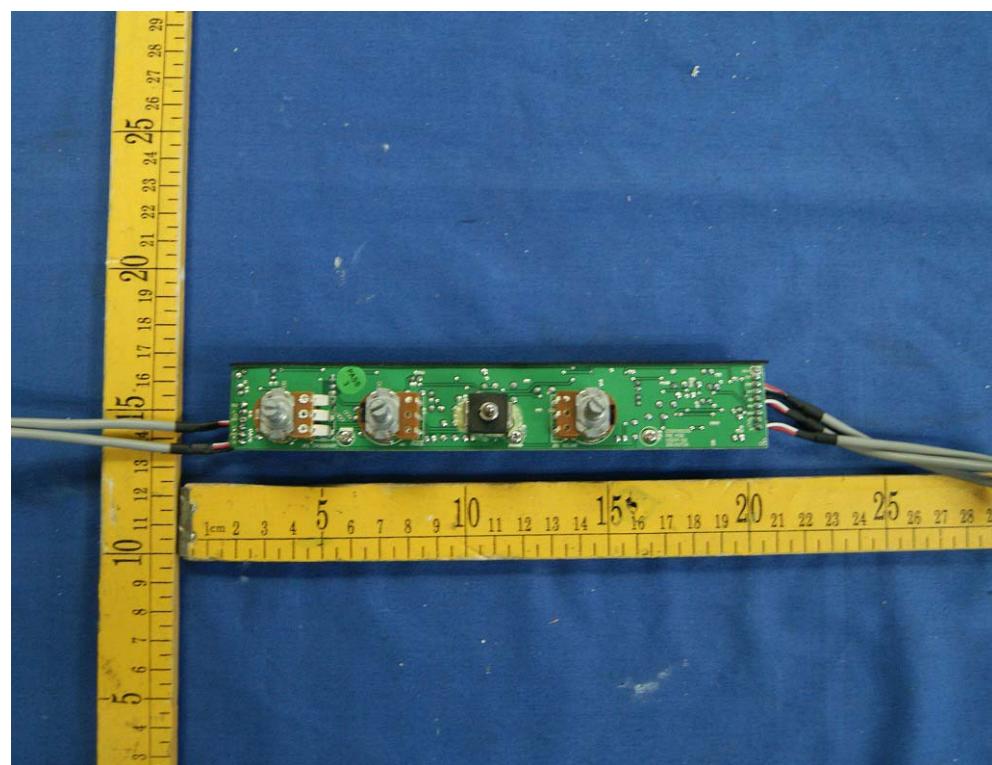
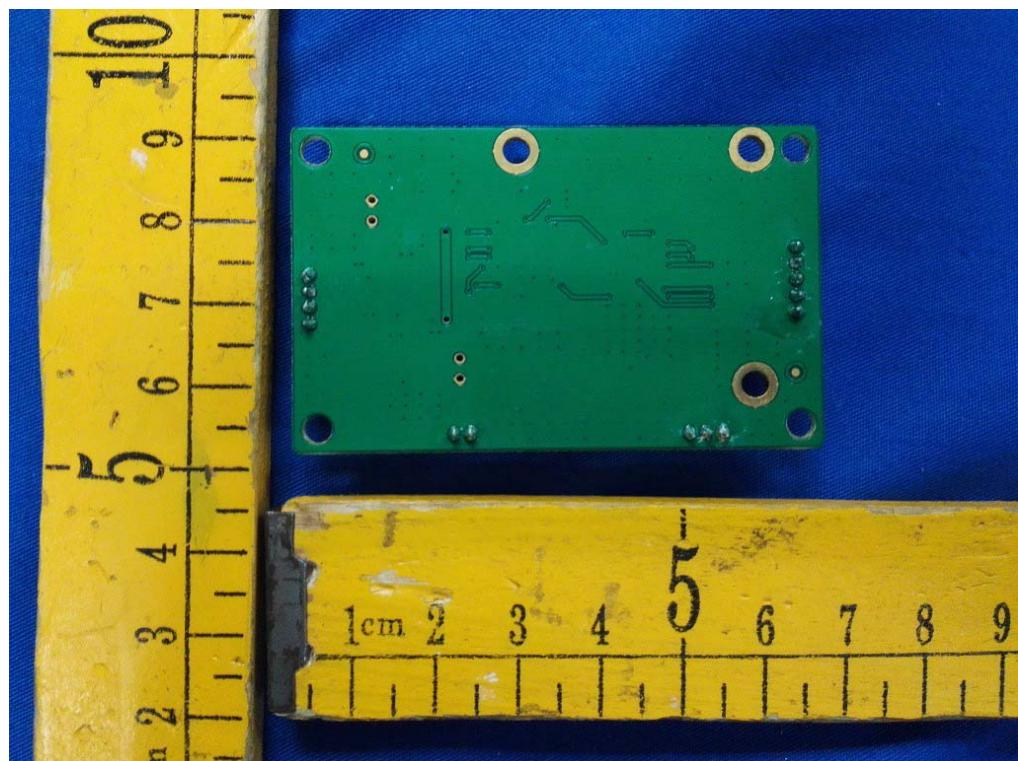


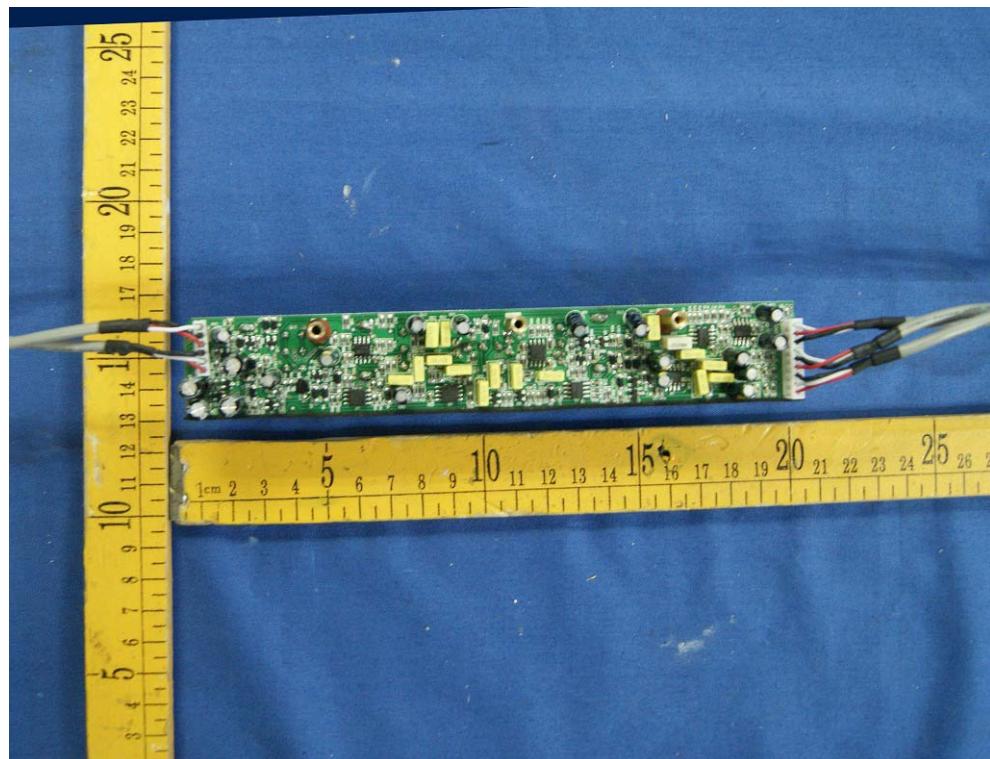












-----END-----