# FCC CERTIFICATION TEST REPORT

## FOR

| | | |
|---|---|---|
| **Applicant** | : | Guangzhou FiiO Electronics Technology Co., Ltd. |
| **Address** | : | 2/F, F Building, Hougang Industrial Zone, Shigang Village, Huangshi West Road, Baiyun District, Guangzhou City, China. |
| **Equipment under Test** | : | Portable High Resolution Music Player |
| **Model No.** | : | M11 Pro, M15 Pro, M11K, M15K, M11 Plus, M15 Plus, M9 Plus, M7 Plus, M5 Plus, M3 Plus |
| **Trade Mark** | : | FiiO |
| **FCC ID** | : | R56-FCIDAN |
| **Manufacturer** | : | Guangzhou FiiO Electronics Technology Co., Ltd. |
| **Address** | : | 2/F, F Building, Hougang Industrial Zone, Shigang Village, Huangshi West Road, Baiyun District, Guangzhou City, China. |

**Issued By: Dongguan Dongdian Testing Service Co., Ltd.**

**Add:** No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

**Tel:** +86-0769-38826678, **E-mail:** ddt@dgddt.com, http://www.dgddt.com

REPORT

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# TEST REPORT DECLARE

| | | |
|---|---|---|
| **Applicant** | : | Guangzhou FiiO Electronics Technology Co., Ltd. |
| **Address** | : | 2/F, F Building, Hougang Industrial Zone, Shigang Village, Huangshi West Road, Baiyun District, Guangzhou City, China. |
| **Equipment under Test** | : | Portable High Resolution Music Player |
| **Model No** | : | M11 Pro, M15 Pro, M11K, M15K, M11 Plus, M15 Plus, M9 Plus, M7 Plus, M5 Plus, M3 Plus |
| **Trade Mark** | : | FiiO |
| **Manufacturer** | : | Guangzhou FiiO Electronics Technology Co., Ltd. |
| **Address** | : | 2/F, F Building, Hougang Industrial Zone, Shigang Village, Huangshi West Road, Baiyun District, Guangzhou City, China. |

**Test Standard Used:** FCC Rules and Regulations Part 15 Subpart C.

**Test procedure used:** ANSI C63.10:2013, 789033 D02 General U-NII Test Procedures New Rules v02r01.

**We Declare:**

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

**After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.**

| | | | |
|---|---|---|---|
| **Report No:** | DDT-R19081209-1E11 | | |
| **Date of Receipt:** | Aug. 16, 2019 | **Date of Test:** | Aug. 16, 2019 ~ Nov. 20, 2019 |

***Prepared By:*** ***Approved By:***

Sam Li

***Sam Li/Engineer*** ***Damon Hu/EMC Manager***

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

# Revision history

| Rev. | Revisions | Issue Date | Revised By |
|---|---|---|---|
| --- | Initial issue | Nov. 20, 2019 | |
| | | | |

# 1. Summary of test results

| The EUT have been tested according to the applicable standards as referenced below. | | |
|---|---|---|
| **Description of Test Item** | **Standard** | **Results** |
| 6/26db Bandwidth | FCC 15.407 (e) | PASS |
| Maximum Conducted Output Power | FCC 15.407 (a) | PASS |
| Power Spectral Density | FCC 15.407 (a) | PASS |
| Frequency Stability Measurement | FCC 15.407 (g) | PASS |
| Emissions in restricted frequency bands | FCC 15.407 (a)<br>FCC 15.209<br>FCC 15.205 | PASS |
| Band Edge Compliance | FCC 15.407 (a)<br>FCC 15.209<br>FCC 15.205 | PASS |
| Power Line Conducted Emission | FCC 15.207 | PASS |
| Antenna requirement | FCC 15.203 | PASS |
| Dynamic Frequency Selection | FCC 15.407 (h) | PASS |

# 2. General test information

## 2.1. Description of EUT

| | | |
|---|---|---|
| EUT* Name | : | Portable High Resolution Music Player |
| Model Number | : | M11 Pro, M15 Pro, M11K, M15K, M11 Plus, M15 Plus, M9 Plus, M7 Plus, M5 Plus, M3 Plus |
| Difference of model number | : | All models are identical except the appearance and model number, therefore the test performed on the model M11 Pro. |
| EUT function description | : | Please reference user manual of this device |
| Power supply | : | DC 5V from external AC Adapter<br>DC 3.8V built-in battery |
| Radio Technology | : | IEEE 802.11a/n |
| FCC Operation frequency | : | IEEE 802.11a: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz<br>IEEE 802.11n HT20: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz<br>IEEE 802.11n HT40: 5190MHz-5230MHz, 5270MHz-5310MHz, 5510MHz-5670MHz, 5755MHz-5755MHz |
| Modulation | : | IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) |
| Transmitter rate | : | IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>IEEE 802.11n HT20: 14.4, 28.9, 43.3, 57.8, 86.7, 115.6, 130.0, 144.4 Mbps<br>IEEE 802.11n HT40: 30, 60, 90, 120, 180, 240, 270, 300 Mbps |
| Antenna Type | : | Dedicated FPC antenna, maximum PK gain: 2.67 dBi |
| Sample Type | : | Series production |

Note: EUT is the ab. of equipment under test.

## 2.2. Accessories of EUT

| Description of Accessories | Manufacturer | Model number | Description | Remark |
|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A |

## 2.3. Assistant equipment used for test

| Assistant equipment | Manufacturer | Model number | EMC Compliance | SN |
|---|---|---|---|---|
| Notebook | DELL | Latitude D610 | FCC DOC | 00045-534-136-300 |
| AC Adapter | N/A | N/A | N/A | Input: AC 100-240V 50-60Hz 0.5A<br>Output: DC 5V 2.3A |

## 2.4. Block diagram of EUT configuration for test

AC Mains — AC Adapter — EUT

Test software: SamsungRFTestTool.EXE
The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode and data rate as below table.

| Tested mode, channel, and data rate information | | | | |
|---|---|---|---|---|
| Mode | Setting Tx Power | data rate (Mbps) (see Note) | Channel | Frequency (MHz) |
| IEEE 802.11a | / | 54 | Low: CH36 | 5180 |
| | / | 54 | Middle: CH40 | 5200 |
| | / | 54 | High: CH48 | 5240 |
| | / | 54 | Low: CH52 | 5260 |
| | / | 54 | Middle: CH56 | 5280 |
| | / | 54 | High: CH64 | 5320 |
| | / | 54 | Low: CH100 | 5500 |
| | / | 54 | Middle: CH116 | 5580 |
| | / | 54 | High: CH140 | 5700 |
| | / | 54 | Low: CH149 | 5745 |
| | / | 54 | Middle: CH157 | 5785 |
| | / | 54 | High: CH165 | 5825 |
| IEEE 802.11n HT20 | / | MCS 7 | Low: CH36 | 5180 |
| | / | MCS 7 | Middle: CH40 | 5200 |
| | / | MCS 7 | High: CH48 | 5240 |
| | / | MCS 7 | Low: CH52 | 5260 |
| | / | MCS 7 | Middle: CH56 | 5280 |
| | / | MCS 7 | High: CH64 | 5320 |
| | / | MCS 7 | Low: CH100 | 5500 |
| | / | MCS 7 | Middle: CH116 | 5580 |
| | / | MCS 7 | High: CH140 | 5700 |
| | / | MCS 7 | Low: CH149 | 5745 |
| | / | MCS 7 | Middle: CH157 | 5785 |
| | / | MCS 7 | High: CH165 | 5825 |
| IEEE 802.11n HT40 | / | MCS 7 | Low: CH38 | 5190 |
| | / | MCS 7 | Middle: CH46 | 5230 |
| | / | MCS 7 | High: CH54 | 5270 |
| | / | MCS 7 | Low: CH62 | 5310 |
| | / | MCS 7 | Middle: CH102 | 5510 |
| | / | MCS 7 | High: CH110 | 5550 |
| | / | MCS 7 | Low: CH134 | 5670 |
| | / | MCS 7 | Middle: CH151 | 5755 |
| | / | MCS 7 | High: CH159 | 5795 |
| Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test. | | | | |

## 2.5. Deviations of test standard

No Deviation.

## 2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|---|---|
| Temperature range: | 21-25℃ |
| Humidity range: | 40-75% |
| Pressure range: | 86-106 kPa |

## 2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

Tel: +86-0769-38826678, http://www.dgddt.com, Email: ddt@dgddt.com

CNAS Accreditation No. L6451; A2LA Accreditation No. 3870.01

Designation Number: CN1182; Test Firm Registration Number: 540522

Industry Canada site registration number: 10288A-1

## 2.8. Measurement uncertainty

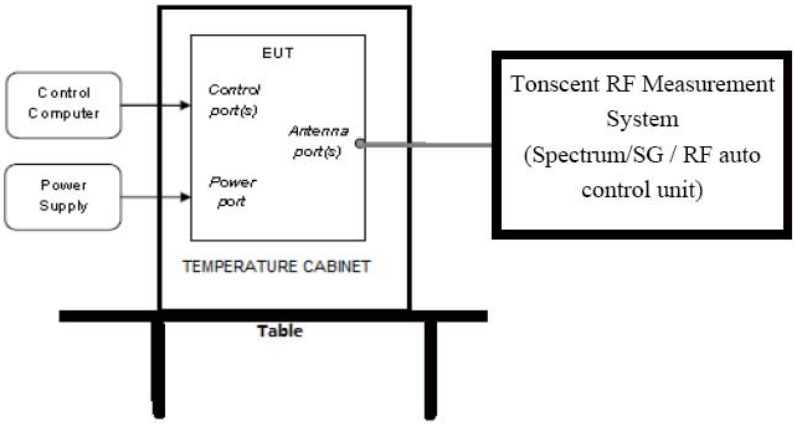
| Test Item | Uncertainty |
|---|---|
| Bandwidth | 1.1% |
| Peak Output Power (Conducted) (Spectrum analyzer) | 0.86 dB (10 MHz ≤ f < 3.6 GHz); |
| | 1.38 dB (3.6 GHz ≤ f < 8 GHz) |
| Peak Output Power (Conducted) (Power Sensor) | 0.74 dB |
| Power Spectral Density | 0.74 dB (10 MHz ≤ f < 3.6 GHz); |
| | 1.38 dB (3.6 GHz ≤ f < 8 GHz) |
| Frequencies Stability | 6.7 x $10^{-8}$ (Antenna couple method) |
| | 5.5 x $10^{-8}$ (Conducted method) |
| Conducted spurious emissions | 0.86 dB (10 MHz ≤ f < 3.6GHz); |
| | 1.40 dB (3.6 GHz ≤ f < 8 GHz) |
| | 1.66 dB (8 GHz≤ f < 22 GHz) |
| Uncertainty for radio frequency (RBW<20kHz) | 3×$10^{-8}$ |
| Temperature | 0.4℃ |
| Humidity | 2% |
| Uncertainty for Radiation Emission test (30MHz-1GHz) | 4.70 dB (Antenna Polarize: V) |
| | 4.84 dB (Antenna Polarize: H) |
| Uncertainty for Radiation Emission test (1GHz-40GHz) | 4.10 dB (1-6 GHz) |
| | 4.40 dB (6 GHz-18 GHz) |
| | 3.54 dB (18 GHz-26 GHz) |
| | 4.30 dB (26 GHz-40 GHz) |
| Uncertainty for Power line conduction emission test | 3.32 dB (150 kHz-30 MHz) |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. | |

## 3. Equipment used during test

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| **RF Connected Test (Tonscend RF Measurement System)** | | | | | |
| Spectrum analyzer | R&S | FSU26 | 200071 | Sep. 29, 2019 | 1 Year |
| Spectrum analyzer | R&S | FSU26 | 201124 | Sep. 29, 2019 | 1 Year |
| Wideband Radio Communication tester | R&S | CMW500 | 117491 | Jun. 25, 2019 | 1 Year |
| Vector Signal Generator | Agilent | E8267D | US49060192 | Sep. 29, 2019 | 1 Year |
| Vector Signal Generator | Agilent | N5182A | MY48180737 | Jun. 25, 2019 | 1 Year |
| Power Sensor | Agilent | U2021XA | MY55150010 | Jun. 28, 2019 | 1 Year |
| Power Sensor | Agilent | U2021XA | MY55150011 | Jun. 28, 2019 | 1 Year |
| Temp & Humi Programmable | ZHIXIANG | ZXGDJS-150L | ZX170110-A | Sep. 29, 2019 | 1 Year |
| Test Software | JS Tonscent | JS1120-3 | Ver.2.7 | N/A | N/A |
| USB Data acquisition | Agilent | U2531A | TW55043503 | N/A | N/A |
| **Radiation 1#chamber** | | | | | |
| EMI Test Receiver | R&S | ESU8 | 100316 | Sep. 29, 2019 | 1 Year |
| Spectrum analyzer | Agilent | E4447A | MY50180031 | Jun. 25, 2019 | 1 Year |
| Trilog Broadband Antenna | Schwarzbeck | VULB9163 | 9163-462 | Nov. 15, 2019 | 1 Year |
| Active Loop antenna | Schwarzbeck | FMZB-1519 | 1519-038 | Sep. 29, 2019 | 1 Year |
| Double Ridged Horn Antenna | R&S | HF907 | 100276 | Nov. 15, 2019 | 1 Year |
| Broad Band Horn Antenna | Schwarzbeck | BBHA 9170 | 790 | Sep. 29, 2019 | 1 Year |
| Pre-amplifier | TERA-MW | TRLA-0040 G35 | 101303 | Sep. 29, 2019 | 1 Year |
| RF Cable | HUBSER | CP-X2+ CP-X1 | W11.03+ W12.02 | Sep. 29, 2019 | 1 Year |
| RF Cable | N/A | SMAJ-SMAJ -1M+11M | 17070133+17 070131 | Sep. 29, 2019 | 1 Year |
| Test software | Audix | E3 | V 6.11111b | N/A | N/A |
| **Power Line Conducted Emissions Test** | | | | | |
| EMI Test Receiver | R&S | ESU8 | 100316 | Sep. 29, 2019 | 1 Year |
| LISN 1 | R&S | ENV216 | 101109 | Sep. 29, 2019 | 1 Year |
| LISN 2 | R&S | ESH2-Z5 | 100309 | Sep. 29, 2019 | 1 Year |
| Pulse Limiter | R&S | ESH3-Z2 | 101242 | Sep. 29, 2019 | 1 Year |
| CE Cable 1 | HUBSER | N/A | W10.01 | Sep. 29, 2019 | 1 Year |
| Test software | Audix | E3 | V 6.11111b | N/A | N/A |

# 4. 26/6dB Bandwidth

## 4.1. Block diagram of test setup




## 4.2. Limits

| FCC Part15, Subpart E | | |
|---|---|---|
| Test Item | Limit | Frequency Range (MHz) |
| Bandwidth | 26 dB Bandwidth | 5150-5250 |
| | 26 dB Bandwidth | 5250-5350 |
| | 26 dB Bandwidth | 5470-5725 |
| | Minimum 500kHz 6dB Bandwidth | 5725-5850 |

## 4.3. Test Procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

| | |
|---|---|
| Center Frequency | The centre frequency of the channel under test |
| Detector | Peak |
| RBW | For 6 dB Bandwidth: RBW=100 kHz<br>For 26 dB Bandwidth: approximately 1% of the emission bandwidth. |
| VBW | For 6 dB Bandwidth: VBW=300 kHz<br>For 26 dB Bandwidth: >3 RBW |
| Trace | Max hold |
| Sweep | Auto couple |

(2) Allow the trace to stabilize, 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 26 dB and 6 dB relative to the maximum level measured in the fundamental emission.

## 4.4. Test Result

26dB Bandwidth:

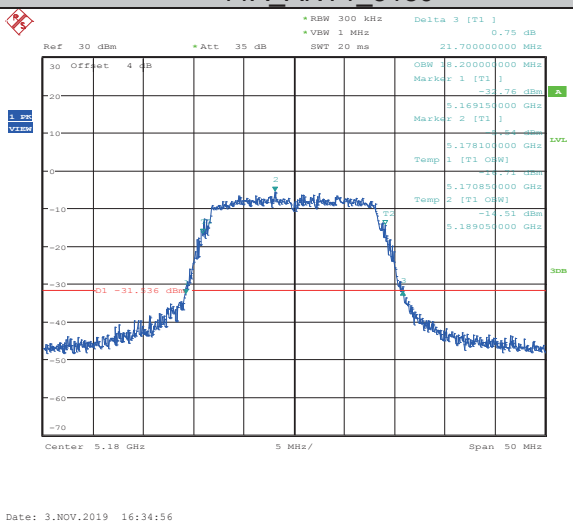
| Test Mode | Antenna | Channel | EBW | Limit | Verdict |
|---|---|---|---|---|---|
| 11A | ANT1 | 5180 | 21.700 | --- | PASS |
| 11A | ANT1 | 5200 | 22.700 | --- | PASS |
| 11A | ANT1 | 5240 | 22.800 | --- | PASS |
| 11A | ANT1 | 5260 | 22.300 | --- | PASS |
| 11A | ANT1 | 5300 | 21.800 | --- | PASS |
| 11A | ANT1 | 5320 | 21.650 | --- | PASS |
| 11A | ANT1 | 5500 | 21.500 | --- | PASS |
| 11A | ANT1 | 5580 | 21.700 | --- | PASS |
| 11A | ANT1 | 5700 | 21.300 | --- | PASS |
| 11N20SISO | ANT1 | 5180 | 22.700 | --- | PASS |
| 11N20SISO | ANT1 | 5200 | 22.800 | --- | PASS |
| 11N20SISO | ANT1 | 5240 | 22.550 | --- | PASS |
| 11N20SISO | ANT1 | 5260 | 22.700 | --- | PASS |
| 11N20SISO | ANT1 | 5300 | 22.400 | --- | PASS |
| 11N20SISO | ANT1 | 5320 | 22.450 | --- | PASS |
| 11N20SISO | ANT1 | 5500 | 22.500 | --- | PASS |
| 11N20SISO | ANT1 | 5580 | 22.400 | --- | PASS |
| 11N20SISO | ANT1 | 5700 | 23.250 | --- | PASS |
| 11N40SISO | ANT1 | 5190 | 46.600 | --- | PASS |
| 11N40SISO | ANT1 | 5230 | 46.700 | --- | PASS |
| 11N40SISO | ANT1 | 5270 | 46.300 | --- | PASS |
| 11N40SISO | ANT1 | 5310 | 45.000 | --- | PASS |
| 11N40SISO | ANT1 | 5510 | 45.900 | --- | PASS |
| 11N40SISO | ANT1 | 5550 | 45.700 | --- | PASS |
| 11N40SISO | ANT1 | 5670 | 44.400 | --- | PASS |

6dB Bandwidth:

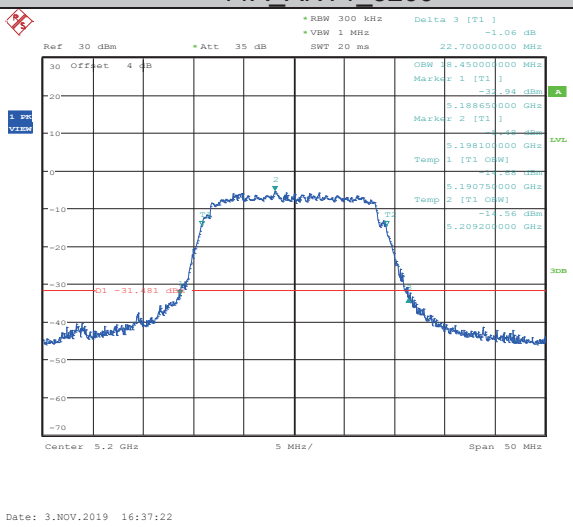
| Test Mode | Antenna | Channel | EBW | Limit | Verdict |
|---|---|---|---|---|---|
| 11A | ANT1 | 5745 | 16.500 | 0.5 | PASS |
| 11A | ANT1 | 5785 | 16.500 | 0.5 | PASS |
| 11A | ANT1 | 5825 | 16.500 | 0.5 | PASS |
| 11N20SISO | ANT1 | 5745 | 17.400 | 0.5 | PASS |
| 11N20SISO | ANT1 | 5785 | 17.300 | 0.5 | PASS |
| 11N20SISO | ANT1 | 5825 | 17.650 | 0.5 | PASS |
| 11N40SISO | ANT1 | 5755 | 35.900 | 0.5 | PASS |
| 11N40SISO | ANT1 | 5795 | 36.400 | 0.5 | PASS |

## 4.5. Original test data

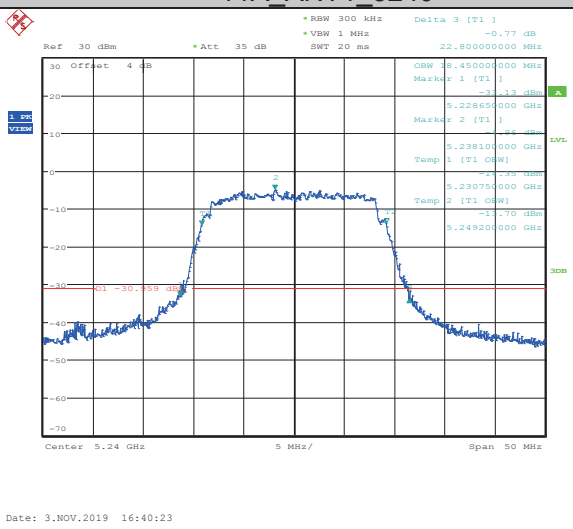
11A_ANT1_5180




11A_ANT1_5200




11A_ANT1_5240

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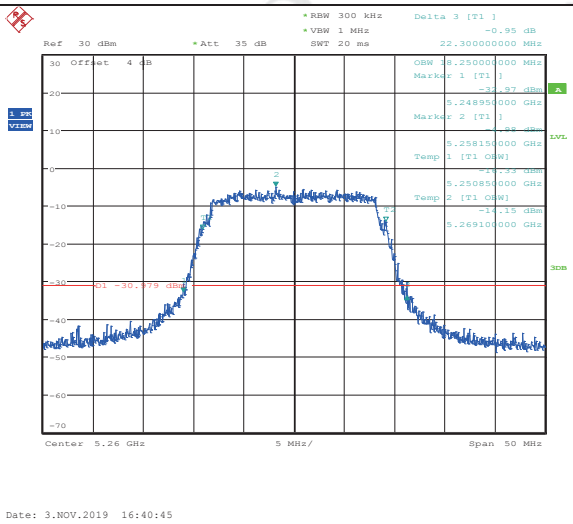
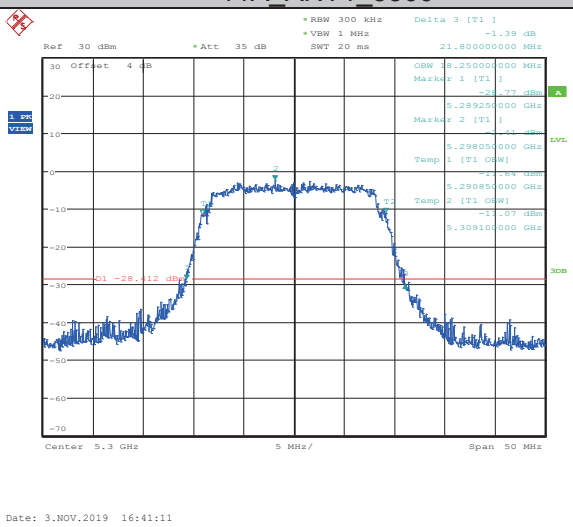
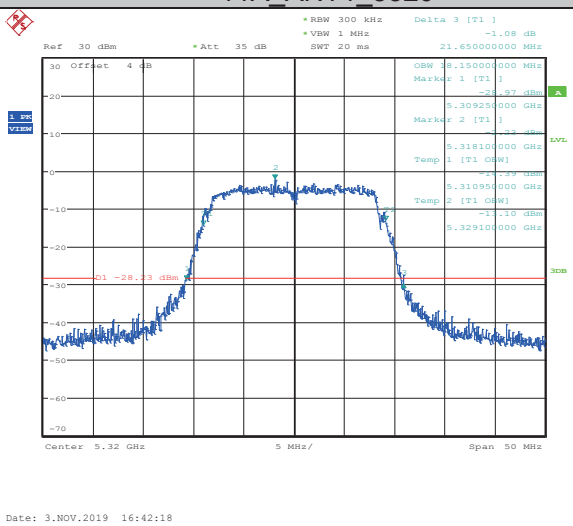


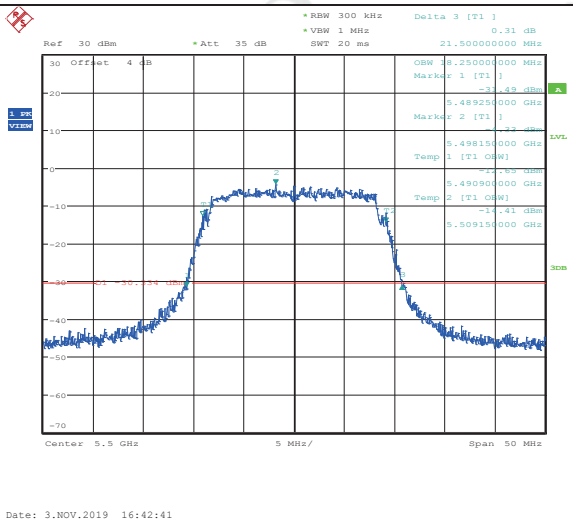

11A_ANT1_5300



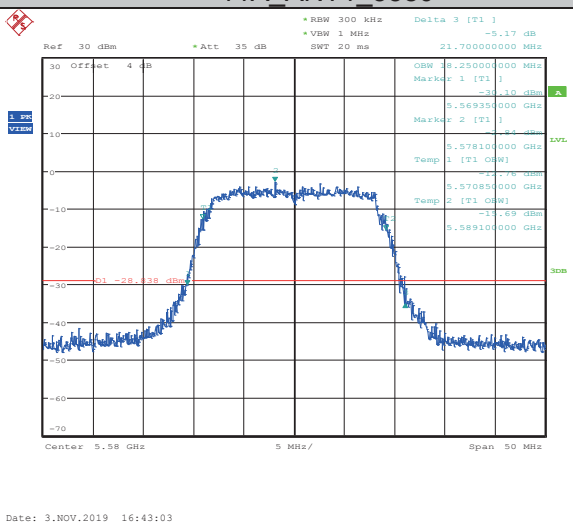

11A_ANT1_5320



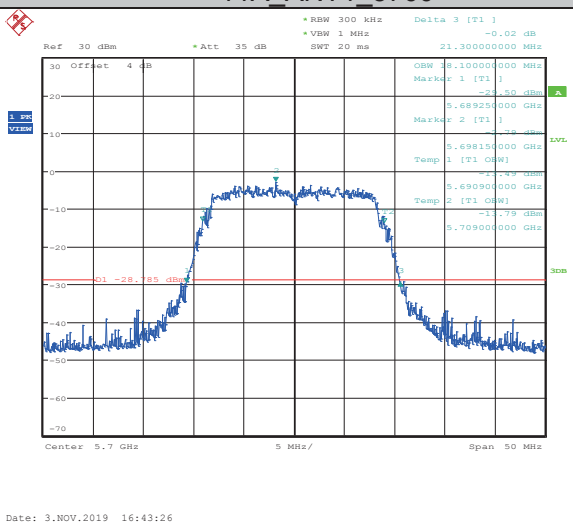

11A_ANT1_5500



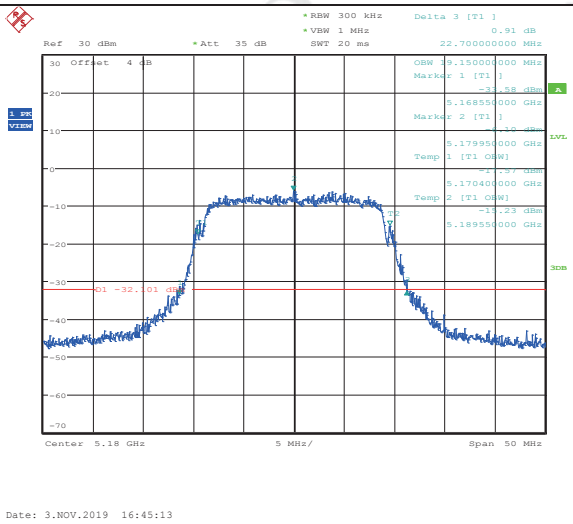

11A_ANT1_5580




11A_ANT1_5700




11N20SISO_ANT1_5180

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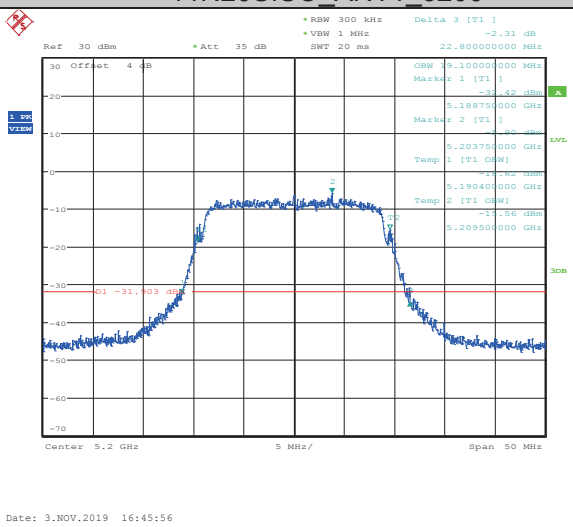


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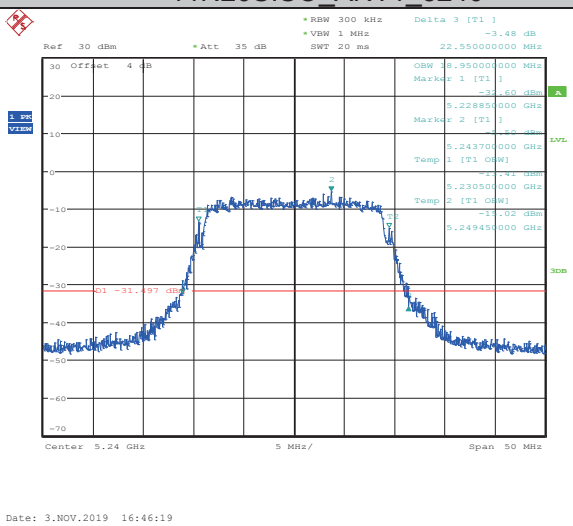


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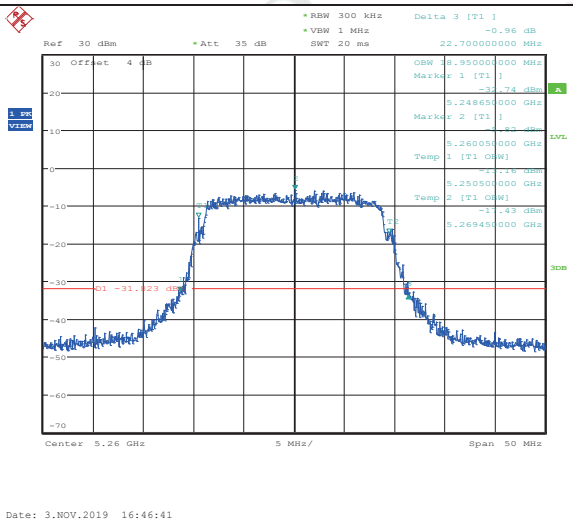


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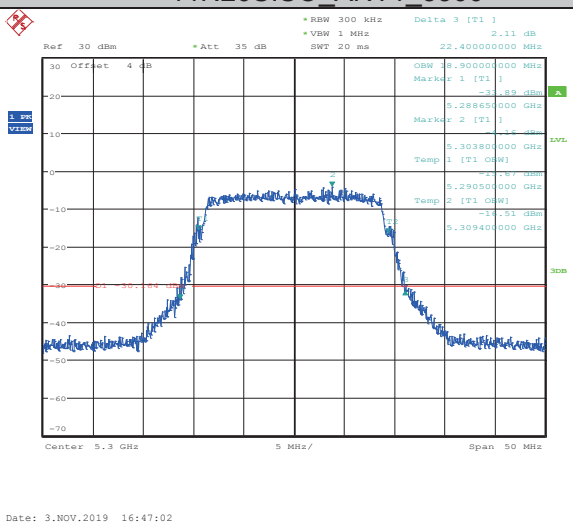


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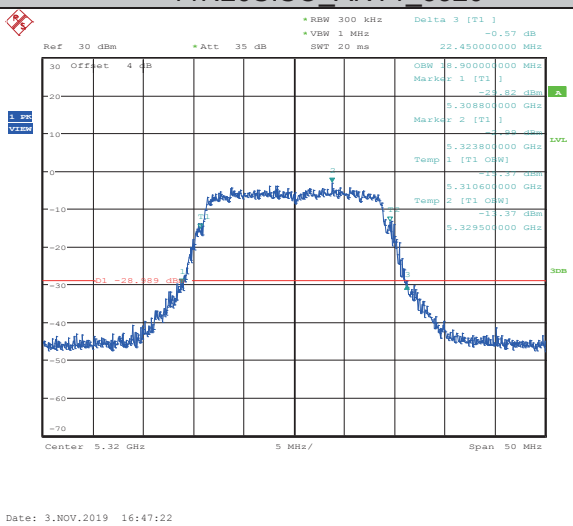


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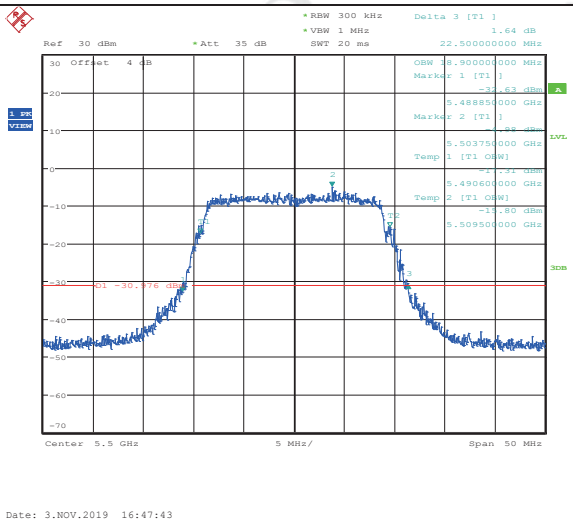


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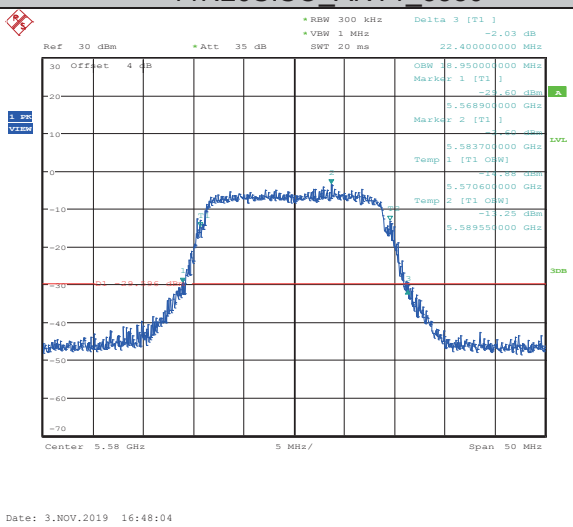


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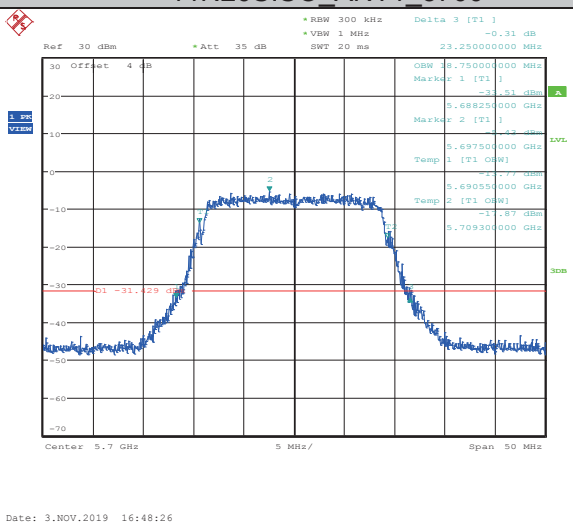


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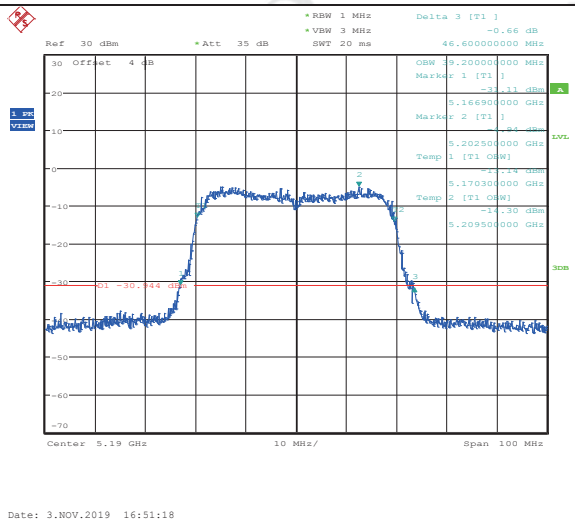


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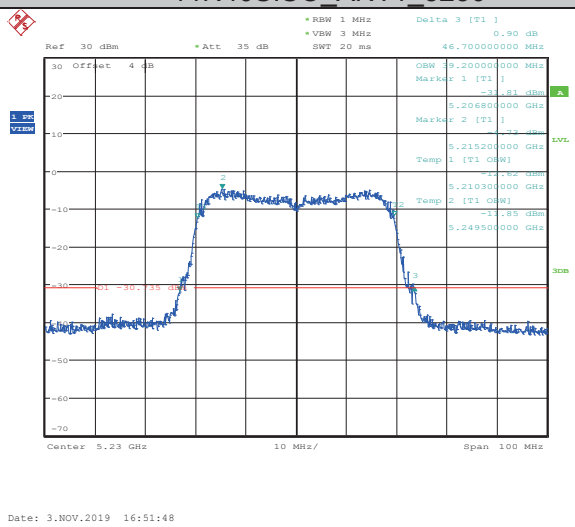


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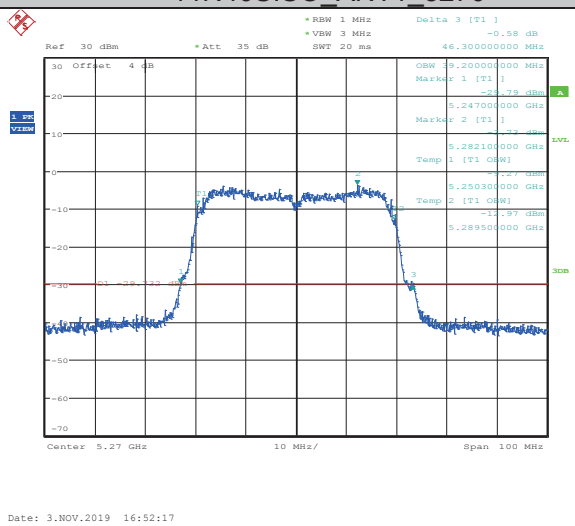


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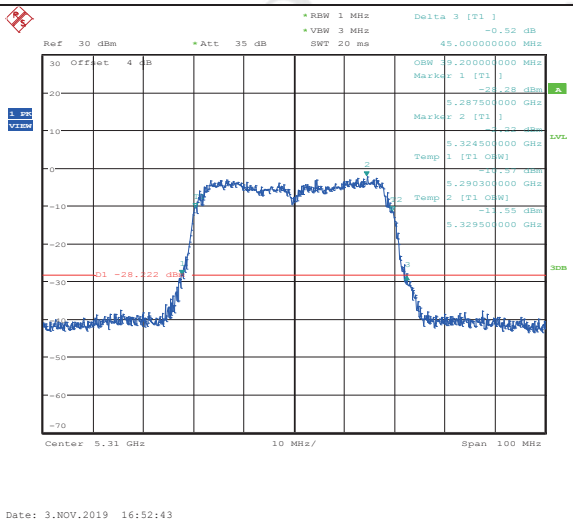


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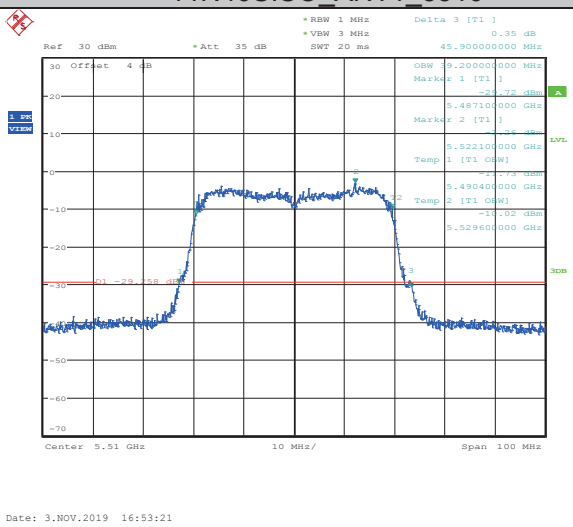


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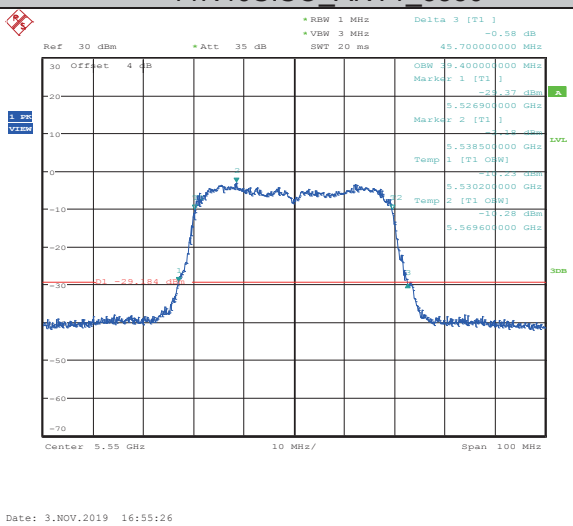


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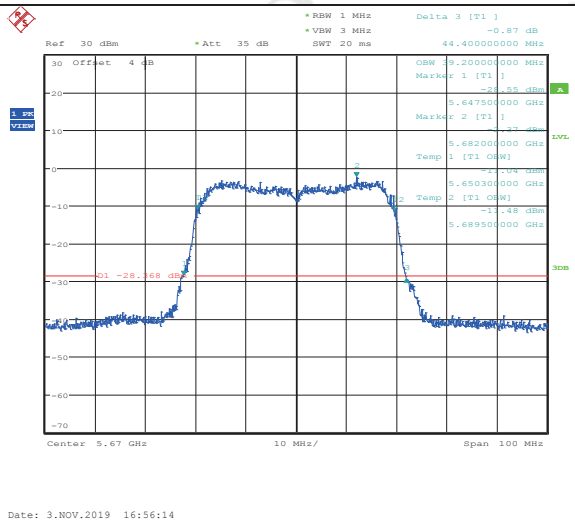


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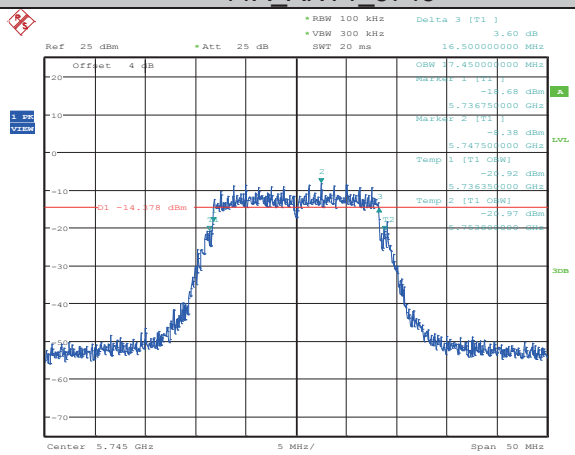


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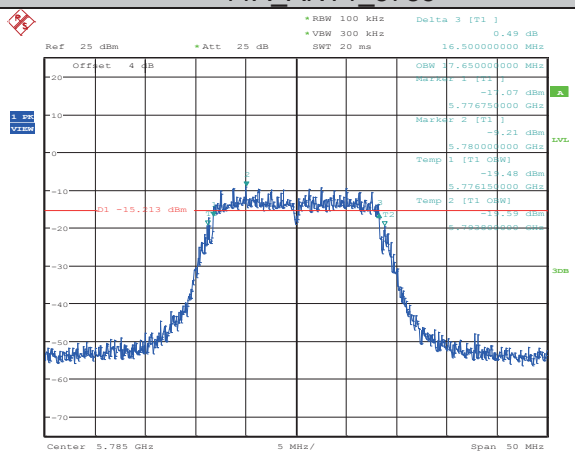


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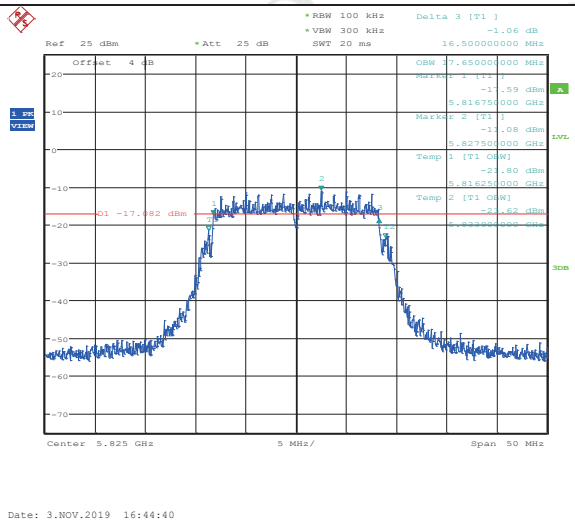


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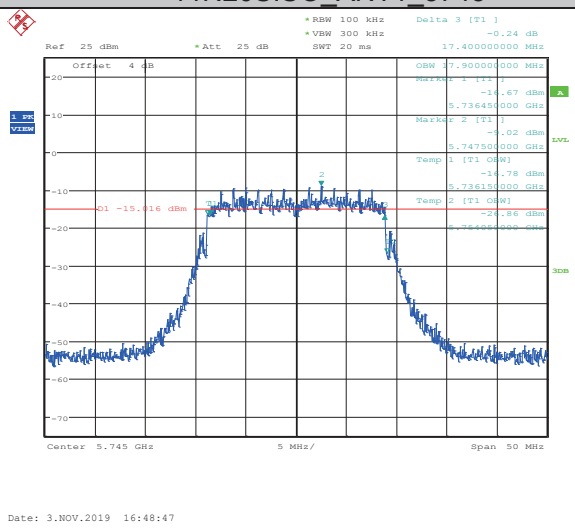


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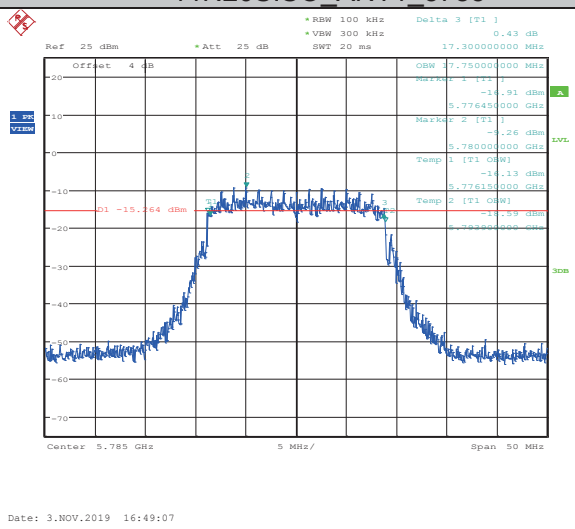


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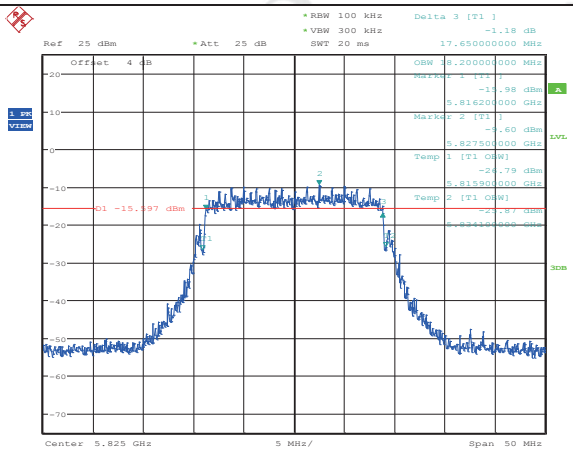


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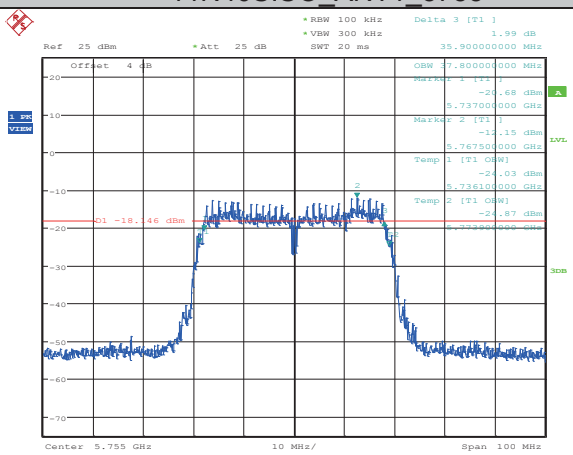


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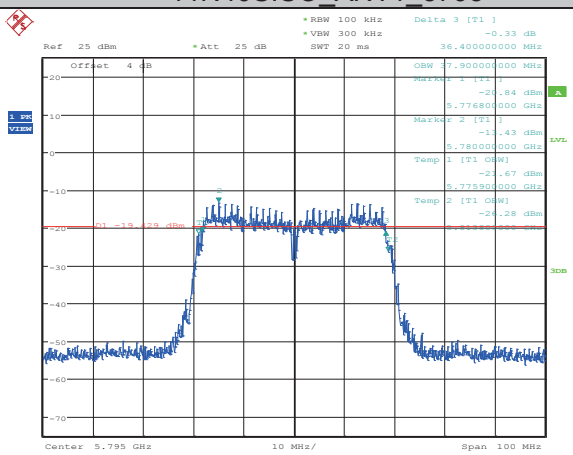


# 5. Maximum Output Power

## 5.1. Block diagram of test setup

Same as section 4.1

## 5.2. Limits

| FCC Part15, Subpart E | | |
|---|---|---|
| Test Item | Limit | Frequency Range (MHz) |
| Conducted Output Power | For client devices: 250 mW (24 dBm) | 5150-5250 |
| | 250mW (24 dBm) or 11 + 10 log10 B | 5250-5350 |
| | 250 mW (24 dBm) or 11 + 10 log10 B | 5470-5725 |
| | 1 Watt (30 dBm) | 5725-5850 |
| Note: B=26 bandwidth | | |

## 5.3. Test Procedure

(1) Connect each EUT's antenna output to Spectrum Analyzer by RF cable and attenuator

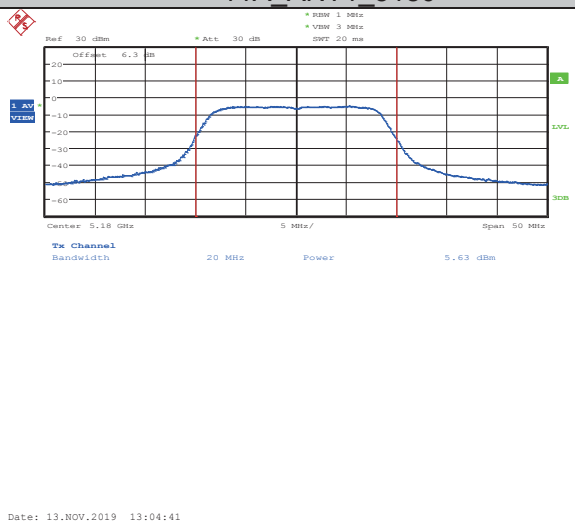
(2) Add each antenna port's results to get the total output power of EUT.

## 5.4. Test Result

| Test Mode | Antenna | Channel | Result | Limit | Verdict |
|---|---|---|---|---|---|
| 11A | ANT1 | 5180 | 5.63 | 24 | PASS |
| 11A | ANT1 | 5200 | 5.35 | 24 | PASS |
| 11A | ANT1 | 5240 | 5.60 | 24 | PASS |
| 11A | ANT1 | 5260 | 5.50 | 24 | PASS |
| 11A | ANT1 | 5300 | 5.44 | 24 | PASS |
| 11A | ANT1 | 5320 | 5.10 | 24 | PASS |
| 11A | ANT1 | 5500 | 5.88 | 24 | PASS |
| 11A | ANT1 | 5580 | 7.40 | 24 | PASS |
| 11A | ANT1 | 5700 | 6.84 | 24 | PASS |
| 11A | ANT1 | 5745 | 7.47 | 30 | PASS |
| 11A | ANT1 | 5785 | 5.25 | 30 | PASS |
| 11A | ANT1 | 5825 | 4.15 | 30 | PASS |
| 11N20SISO | ANT1 | 5180 | 5.10 | 24 | PASS |
| 11N20SISO | ANT1 | 5200 | 5.05 | 24 | PASS |
| 11N20SISO | ANT1 | 5240 | 5.04 | 24 | PASS |
| 11N20SISO | ANT1 | 5260 | 5.09 | 24 | PASS |
| 11N20SISO | ANT1 | 5300 | 4.85 | 24 | PASS |

| | | | | | |
|---|---|---|---|---|---|
| 11N20SISO | ANT1 | 5320 | 4.55 | 24 | PASS |
| 11N20SISO | ANT1 | 5500 | 5.00 | 24 | PASS |
| 11N20SISO | ANT1 | 5580 | 7.06 | 24 | PASS |
| 11N20SISO | ANT1 | 5700 | 6.45 | 24 | PASS |
| 11N20SISO | ANT1 | 5745 | 6.93 | 30 | PASS |
| 11N20SISO | ANT1 | 5785 | 3.35 | 30 | PASS |
| 11N20SISO | ANT1 | 5825 | 3.10 | 30 | PASS |
| 11N40SISO | ANT1 | 5190 | 4.88 | 24 | PASS |
| 11N40SISO | ANT1 | 5230 | 4.58 | 24 | PASS |
| 11N40SISO | ANT1 | 5270 | 4.63 | 24 | PASS |
| 11N40SISO | ANT1 | 5310 | 4.84 | 24 | PASS |
| 11N40SISO | ANT1 | 5510 | 5.28 | 24 | PASS |
| 11N40SISO | ANT1 | 5550 | 4.37 | 24 | PASS |
| 11N40SISO | ANT1 | 5670 | 6.24 | 24 | PASS |
| 11N40SISO | ANT1 | 5755 | 6.00 | 30 | PASS |
| 11N40SISO | ANT1 | 5795 | 3.39 | 30 | PASS |

11A_ANT1_5180

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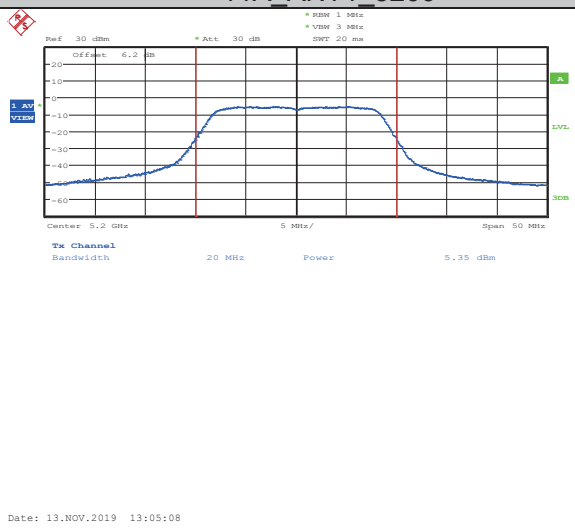


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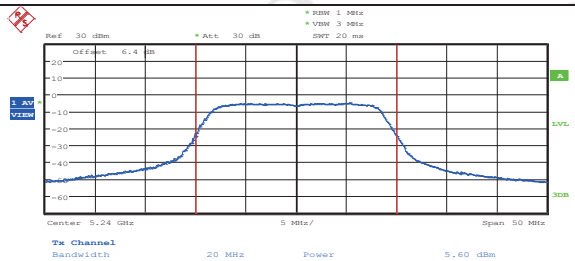


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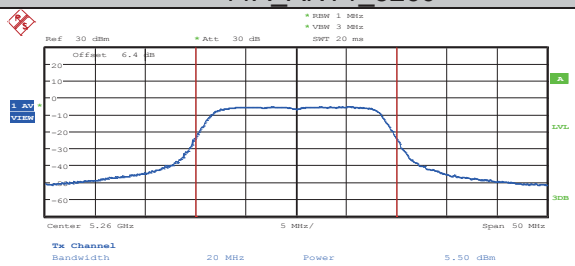


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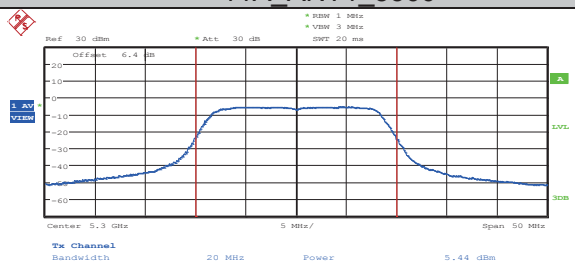


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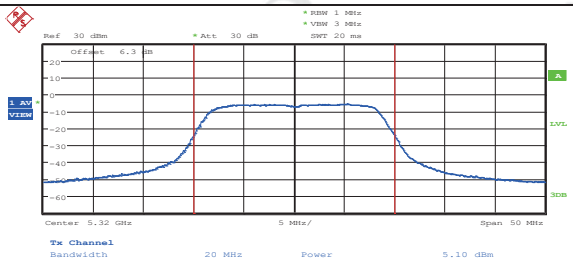


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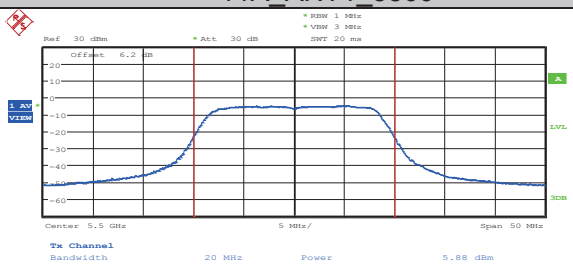


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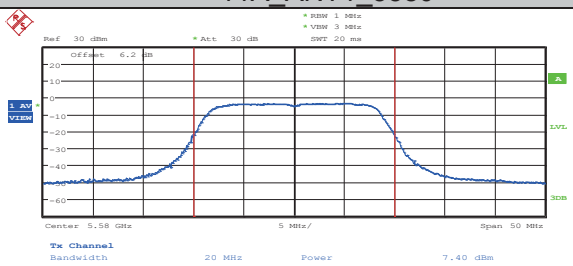


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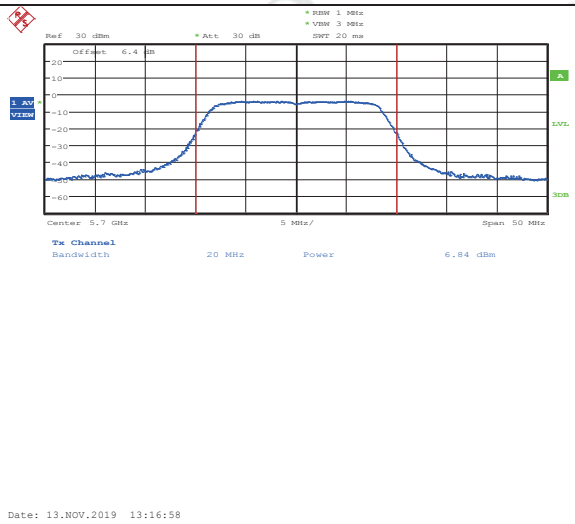


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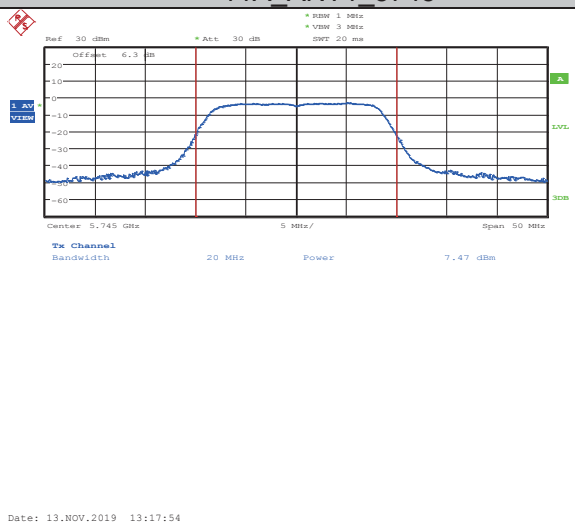


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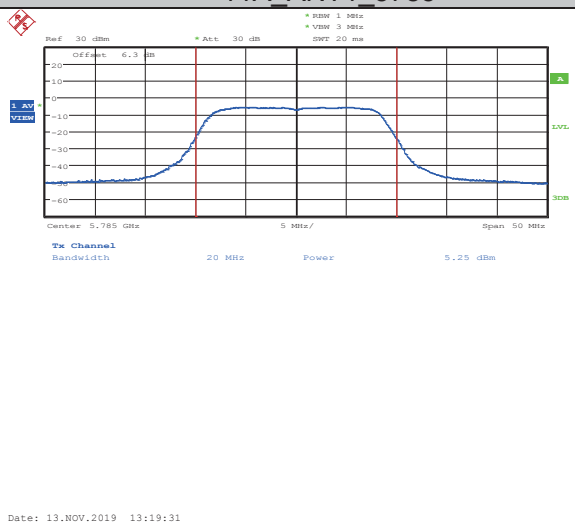


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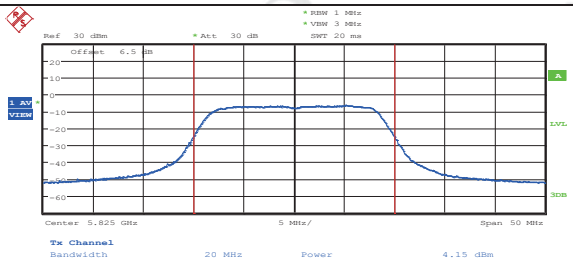


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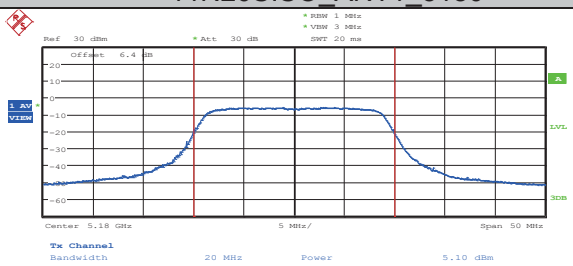


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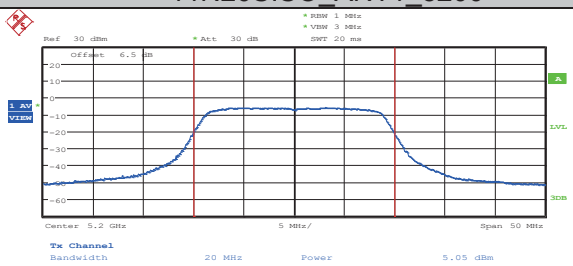


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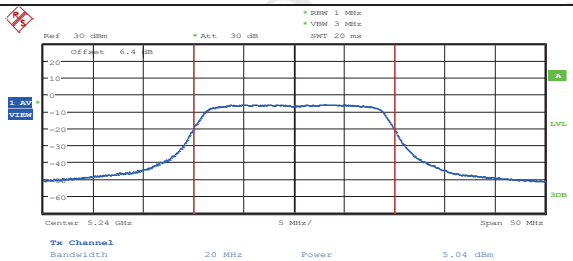


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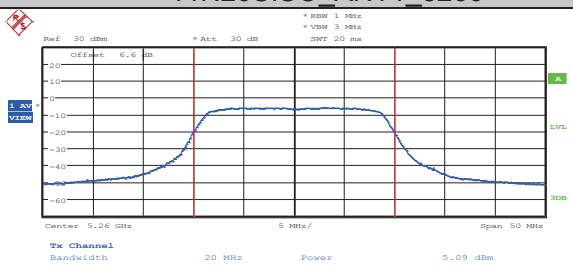


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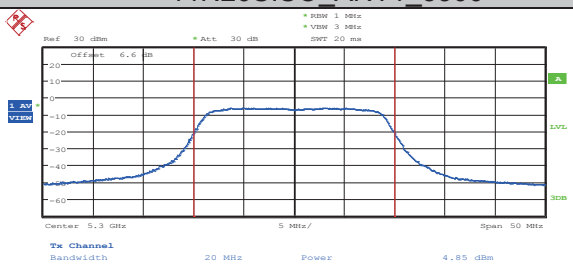


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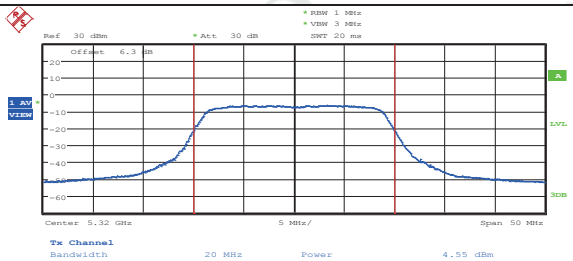


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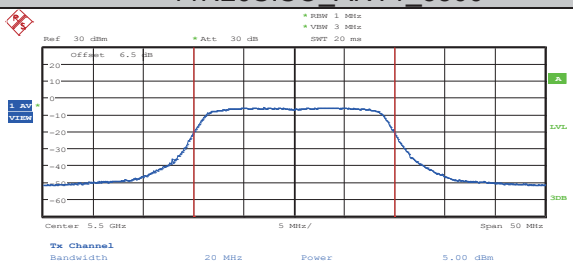


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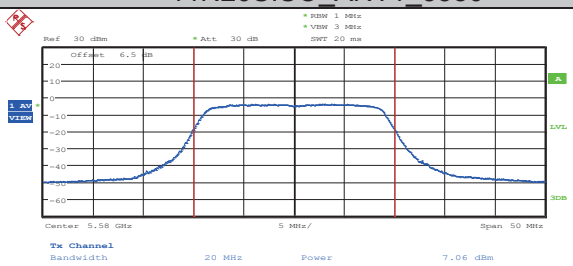


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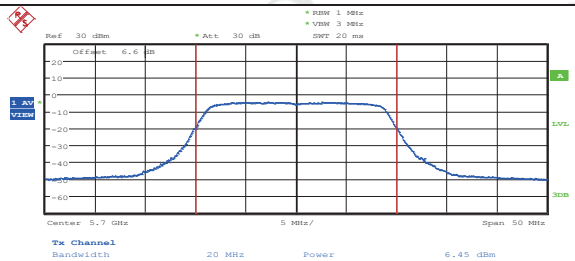
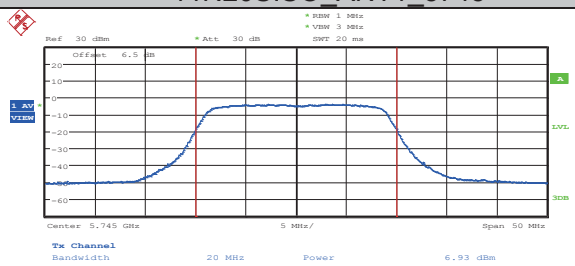



Date: 13.NOV.2019 13:33:47

11N20SISO_ANT1_5745




Date: 13.NOV.2019 13:34:51

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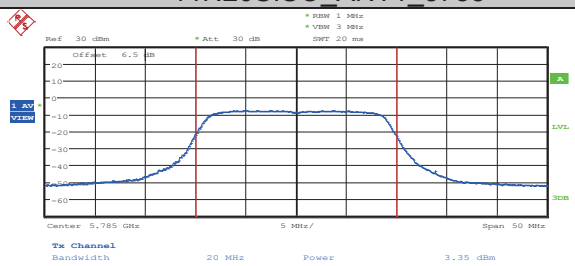


Date: 13.NOV.2019 13:39:23

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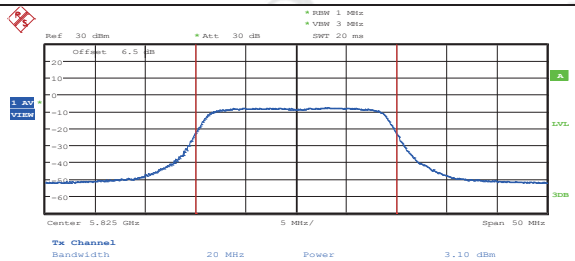


Date: 13.NOV.2019 13:40:28

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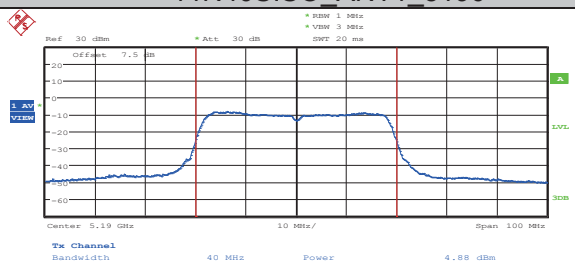


Date: 13.NOV.2019 13:41:42

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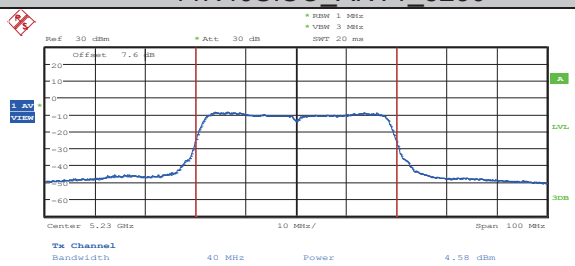


Date: 13.NOV.2019 13:42:45

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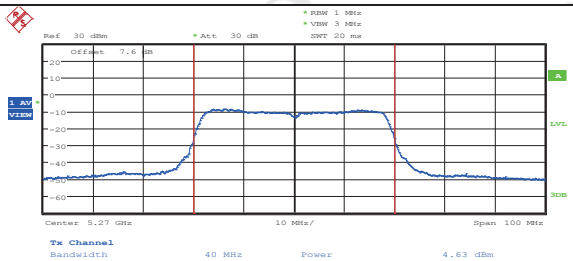
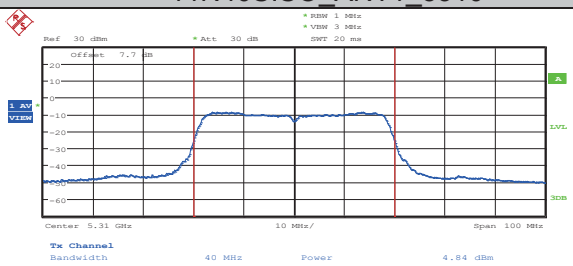



Date: 13.NOV.2019 13:43:57

11N40SISO_ANT1_5310

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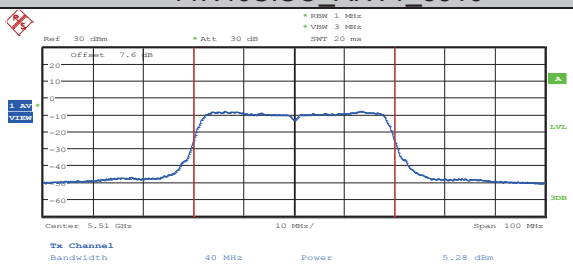
11N40SISO_ANT1_5510

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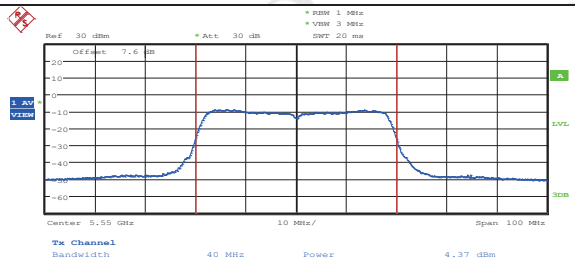


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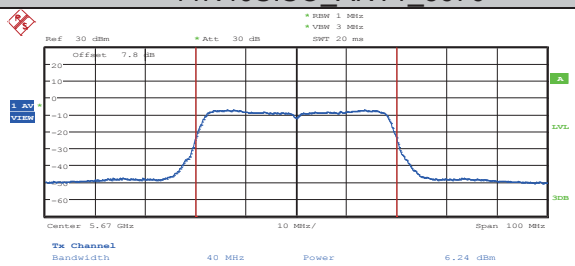


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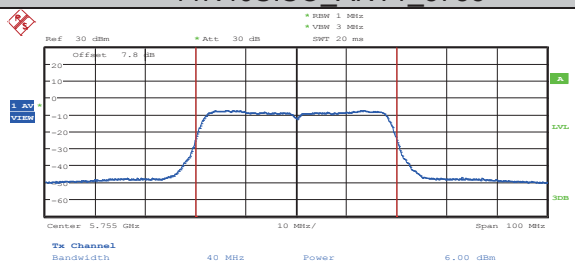


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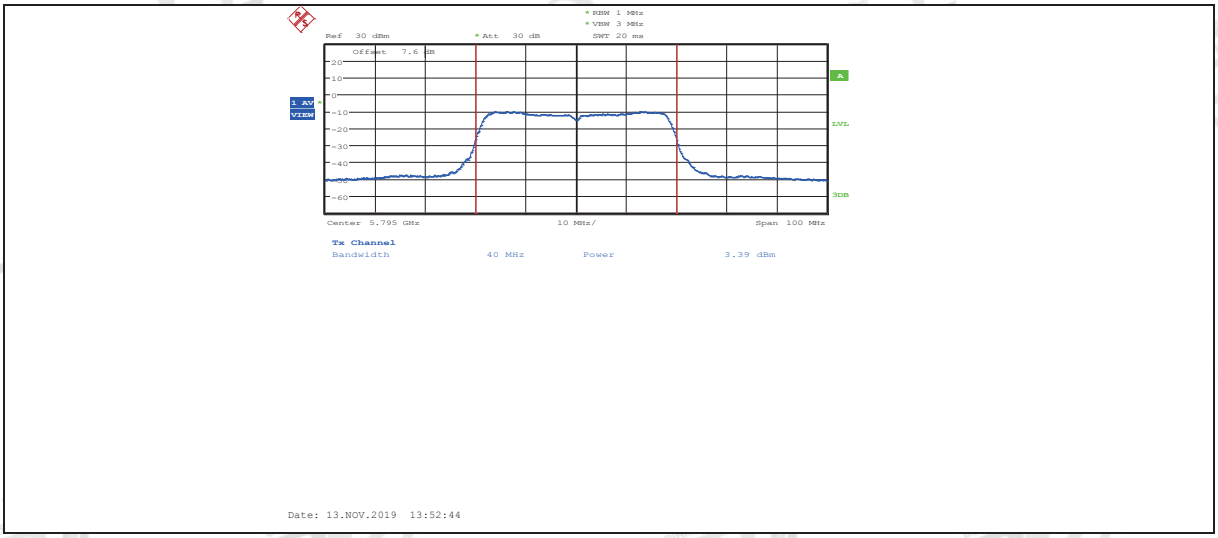
RBW 1 MHz
VBW 3 MHz
Ref 30 dBm
Att 30 dB
SWT 20 ms
Offset 7.6 dB
1 AV
VIEW
A
LVL
3DB
Center 5.795 GHz
10 MHz/
Span 100 MHz
Tx Channel
Bandwidth 40 MHz
Power 3.39 dBm
Date: 13.NOV.2019 13:52:44

# 6. Power Spectral Density

## 6.1. Block diagram of test setup

Same with 4.1

## 6.2. Limits

| FCC Part15, Subpart E | | |
|---|---|---|
| Test Item | Limit | Frequency Range (MHz) |
| Power Spectral Density | Other than Mobile and portable:17 dBm/MHz<br>Mobile and portable:11 dBm/MHz | 5150-5250 |
| | 11 dBm/MHz | 5250-5350 |
| | 11 dBm/MHz | 5470-5725 |
| | 30 dBm/500 kHz | 5725-5850 |

## 6.3. Test Procedure

The transmitter output was connected to a spectrum analyzer. Power density was measured by spectrum analyzer with 1MHz RBW and 3MHz VBW.
Connect the UUT to the spectrum analyser and use the following settings:

5150 MHz~5250 MHz, 5250 MHz~5350 MHz, 5470 MHz~5725 MHz

| | |
|---|---|
| Center Frequency | The centre frequency of the channel under test |
| Detector | RMS |
| RBW | 1MHz |
| VBW | ≥3 × RBW |
| Span | Encompass the entire emissions bandwidth (EBW) of the signal |
| Trace | Max hold |
| Sweep time | Auto |

5725 MHz-5850 MHz

| | |
|---|---|
| Center Frequency | The centre frequency of the channel under test |
| Detector | RMS |
| RBW | 500 kHz |
| VBW | ≥3 × RBW |
| Span | Encompass the entire emissions bandwidth (EBW) of the signal |
| Trace | Max hold |
| Sweep time | Auto |

Note:
1. For UNII-3, according to KDB publication 789033 D02 General U-NII Test Procedures New Rules v02r01, section II.F.5., it is acceptable to set RBW at 1 MHz and VBW at 3 MHz if the spectrum analyzer does not have 500 kHz RBW.
2. The value measured with RBW=1MHz is to be added with 10log(500kHz/1MHz) which is - 3dB. For example, if the measured value is +10 dBm using RBW=1 MHz (that is +10 dBm/MHz), then the converted value will be +7 dBm/500 kHz.
Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

## 6.4. Test Result

**(5150-5250)**

| Test Mode | Ant | Test Channel | PSD [dBm/MHz] | Limit [dBm/MHz] |
|---|---|---|---|---|
| 11A | ANT1 | 5180 | -4.92 | 11 |
| 11A | ANT1 | 5200 | -5.12 | 11 |
| 11A | ANT1 | 5240 | -5.17 | 11 |
| 11N20 | ANT1 | 5180 | -5.77 | 11 |
| 11N20 | ANT1 | 5200 | -5.84 | 11 |
| 11N20 | ANT1 | 5240 | -5.96 | 11 |
| 11N40 | ANT1 | 5190 | -10.43 | 11 |
| 11N40 | ANT1 | 5230 | -8.79 | 11 |

**(5250-5350, 5470-5725)**

| Test Mode | Ant | Test Channel | PSD [dBm/MHz] | Limit [dBm/MHz] | Verdict |
|---|---|---|---|---|---|
| 11A | ANT1 | 5260 | -5.22 | 11 | PASS |
| 11A | ANT1 | 5280 | -5.34 | 11 | PASS |
| 11A | ANT1 | 5320 | -5.67 | 11 | PASS |
| 11A | ANT1 | 5500 | -4.74 | 11 | PASS |
| 11A | ANT1 | 5580 | -2.85 | 11 | PASS |
| 11A | ANT1 | 5700 | -3.93 | 11 | PASS |
| 11N20 | ANT1 | 5260 | -5.93 | 11 | PASS |
| 11N20 | ANT1 | 5300 | -6.42 | 11 | PASS |
| 11N20 | ANT1 | 5320 | -6.23 | 11 | PASS |
| 11N20 | ANT1 | 5500 | -5.85 | 11 | PASS |
| 11N20 | ANT1 | 5580 | -3.88 | 11 | PASS |
| 11N20 | ANT1 | 5700 | -4.57 | 11 | PASS |
| 11N40 | ANT1 | 5270 | -10.49 | 11 | PASS |
| 11N40 | ANT1 | 5310 | -8.95 | 11 | PASS |
| 11N40 | ANT1 | 5510 | -8.03 | 11 | PASS |

| | | | | | |
|---|---|---|---|---|---|
| 11N40 | ANT1 | 5550 | -11.02 | 11 | PASS |
| 11N40 | ANT1 | 5670 | -7.40 | 11 | PASS |

**(5725-5850)**

| Test Mode | Test Channel | Ant | PSD [dBm/500kHz] | Limit [dBm/500kHz] | Verdict |
|---|---|---|---|---|---|
| 11A | ANT1 | 5745 | -5.73 | 30 | PASS |
| 11A | ANT1 | 5785 | -7.90 | 30 | PASS |
| 11A | ANT1 | 5825 | -9.49 | 30 | PASS |
| 11N20 | ANT1 | 5745 | -5.99 | 30 | PASS |
| 11N20 | ANT1 | 5785 | -9.87 | 30 | PASS |
| 11N20 | ANT1 | 5825 | -9.92 | 30 | PASS |
| 11N40 | ANT1 | 5755 | -9.93 | 30 | PASS |
| 11N40 | ANT1 | 5795 | -12.64 | 30 | PASS |

## 6.5. Original test data

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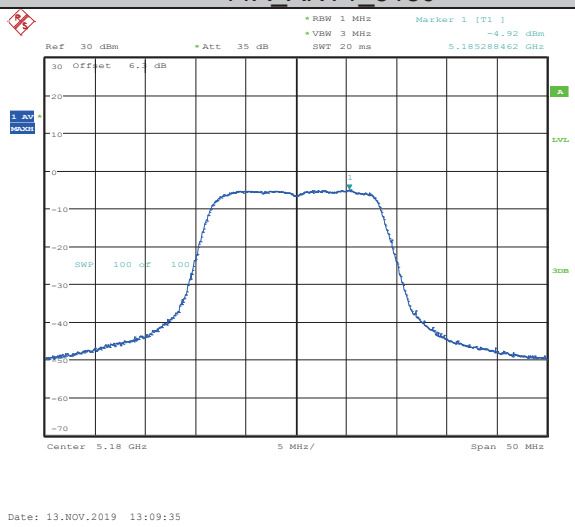


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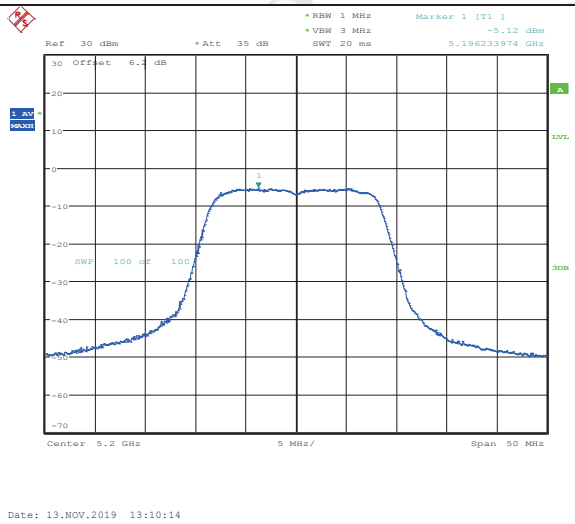
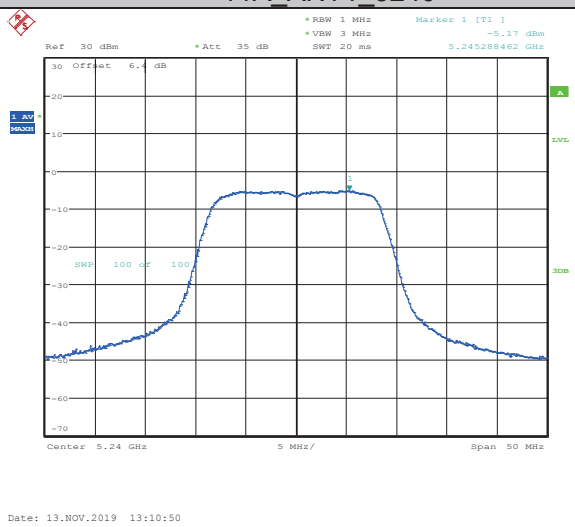



11A_ANT1_5240

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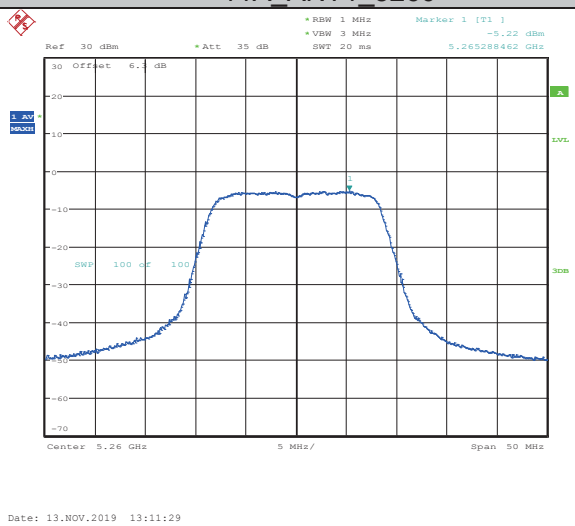


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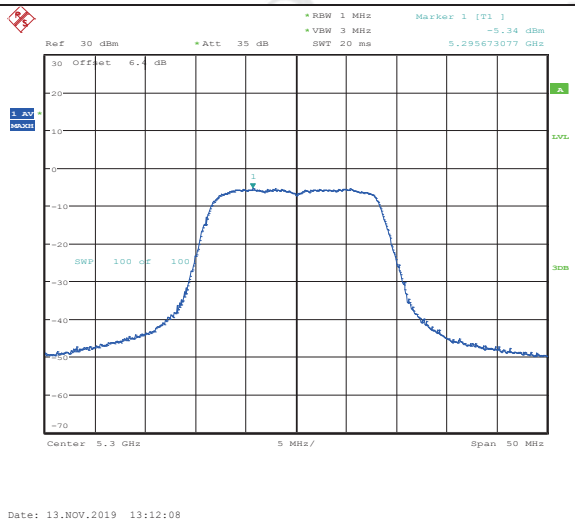


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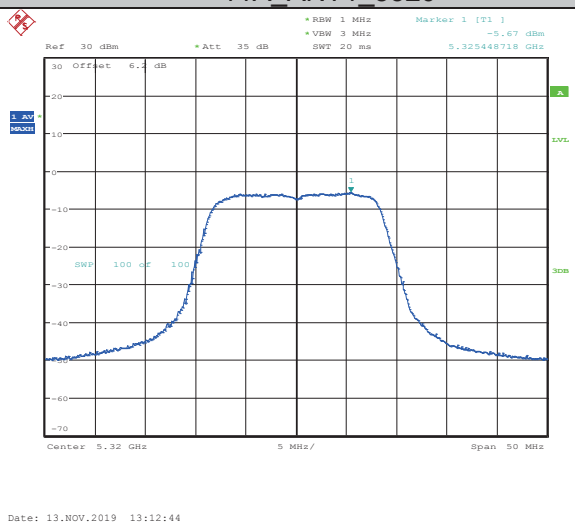


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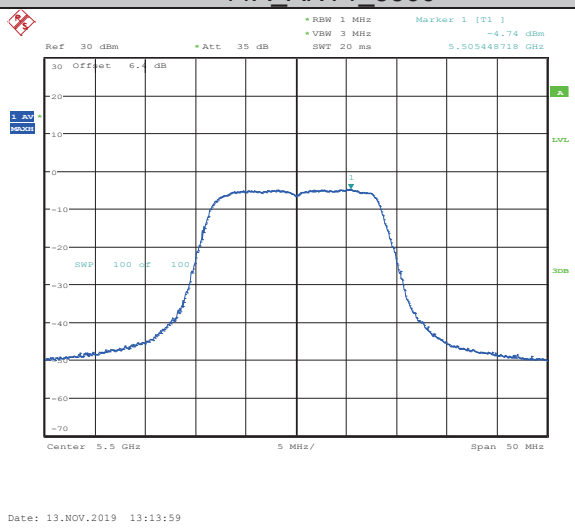


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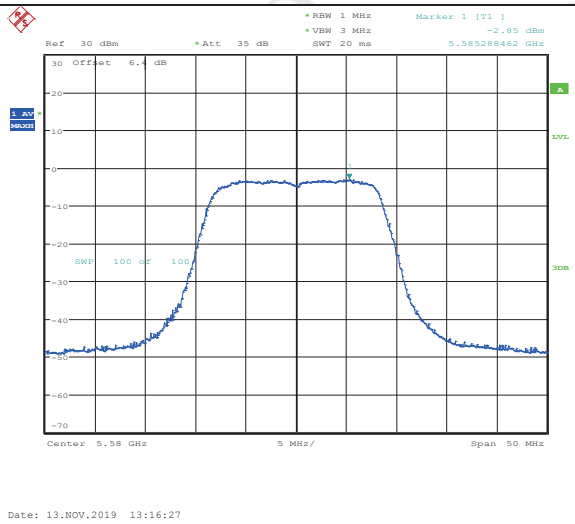


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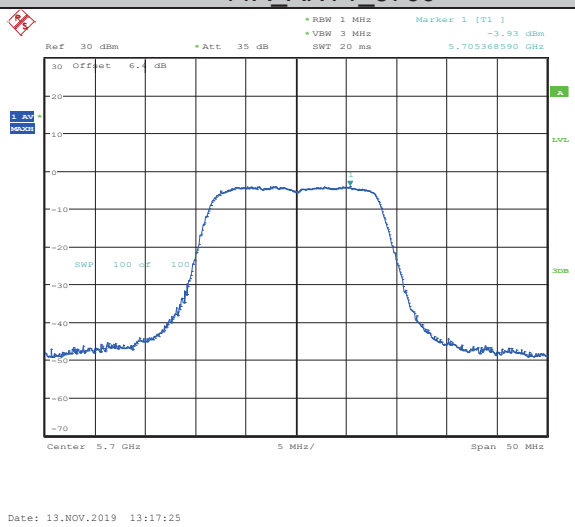


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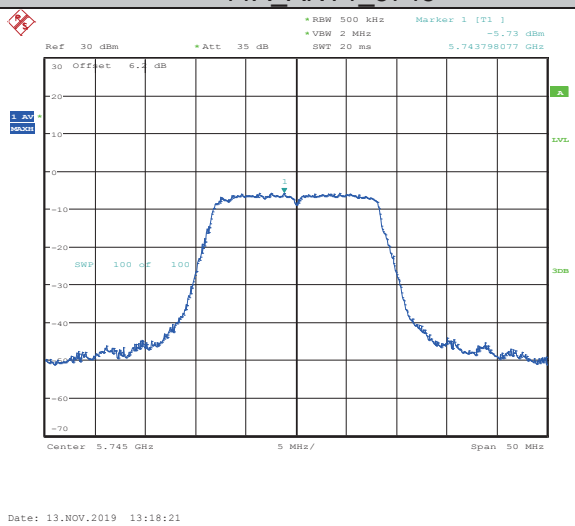


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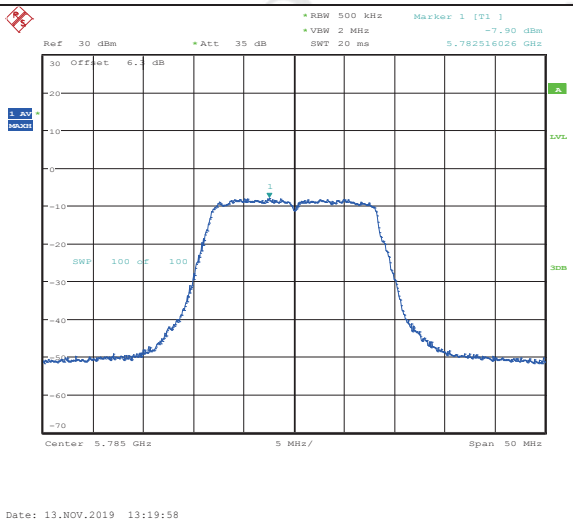


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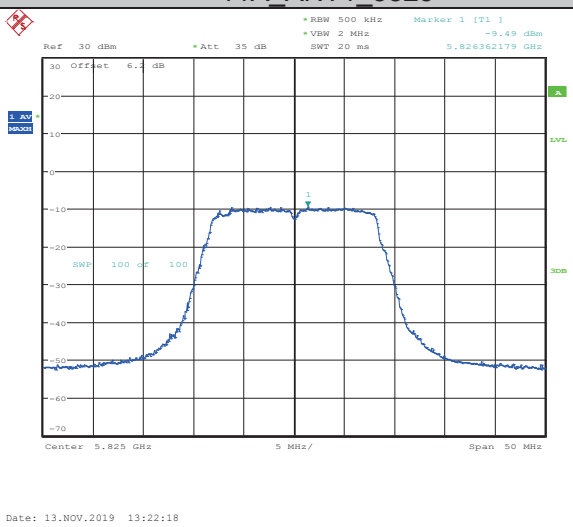


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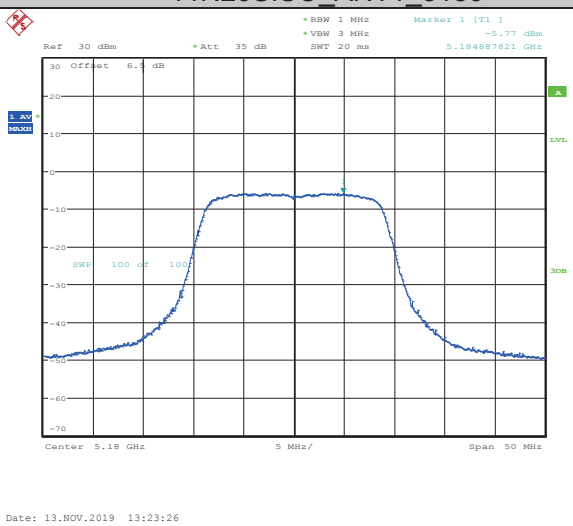


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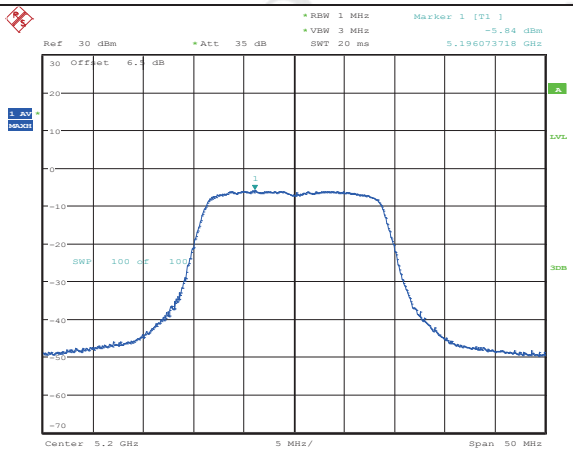


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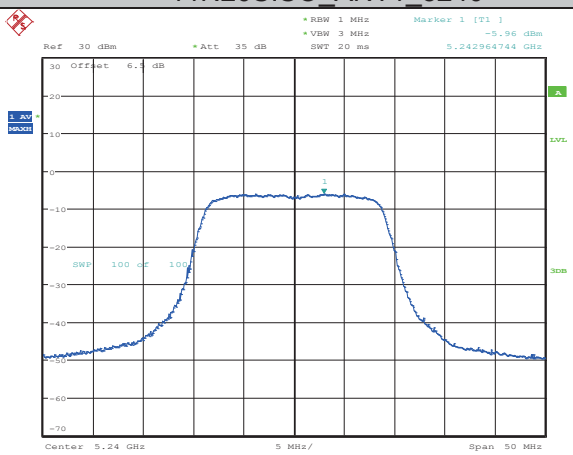


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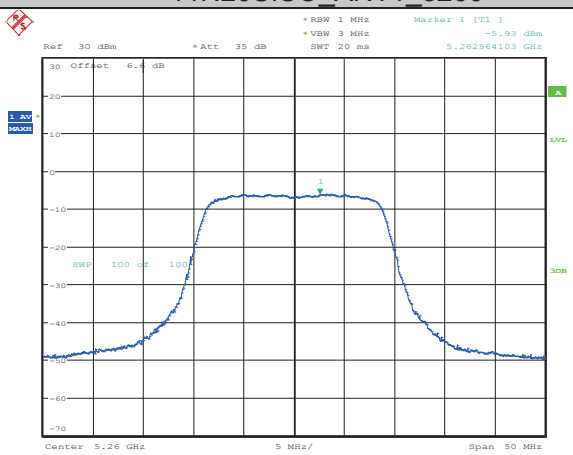


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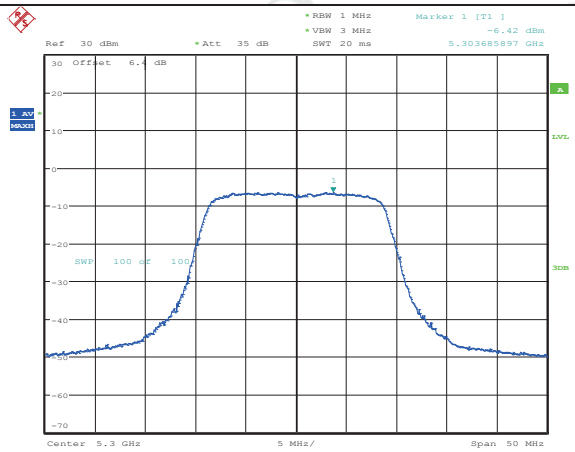


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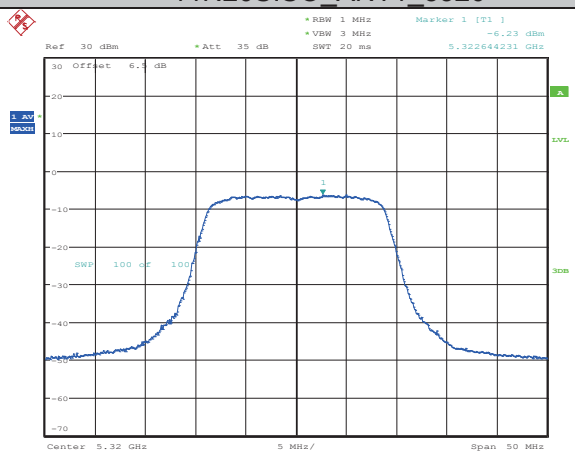


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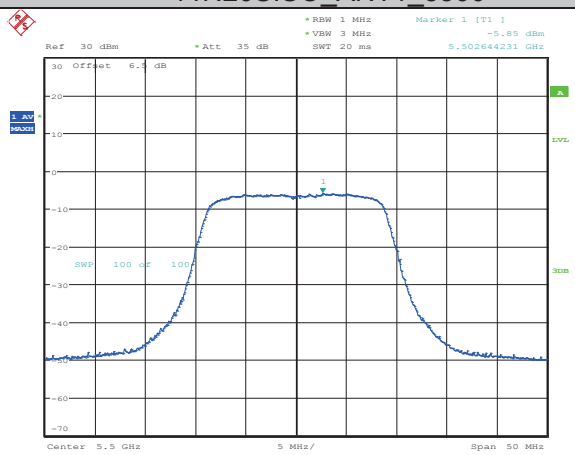


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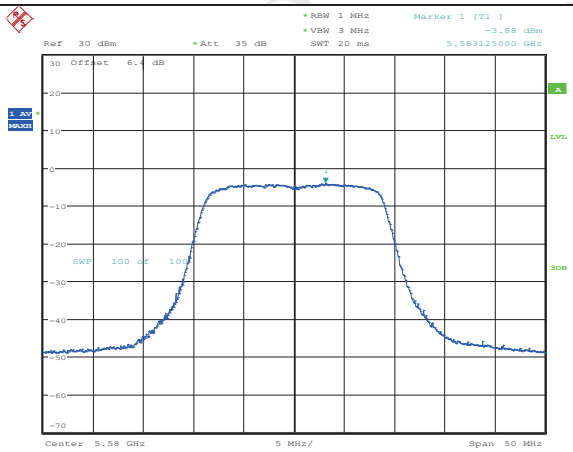


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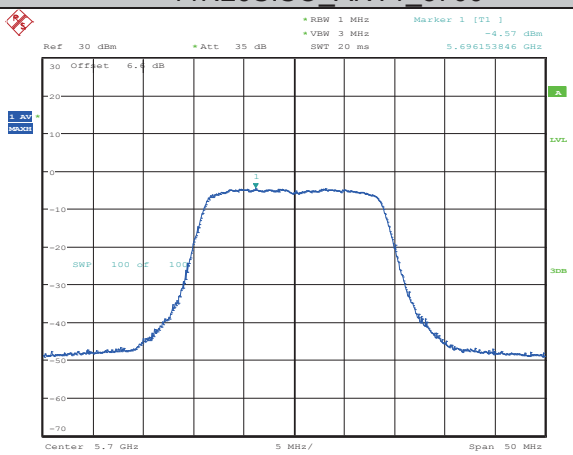


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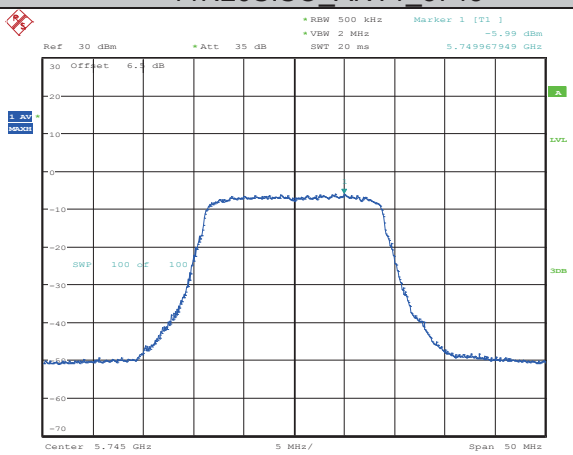


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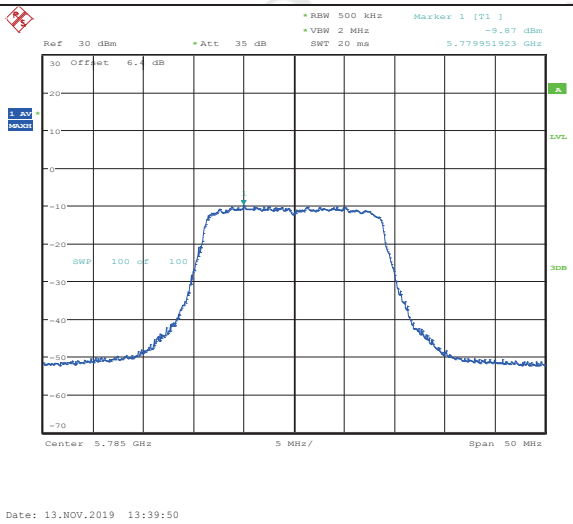


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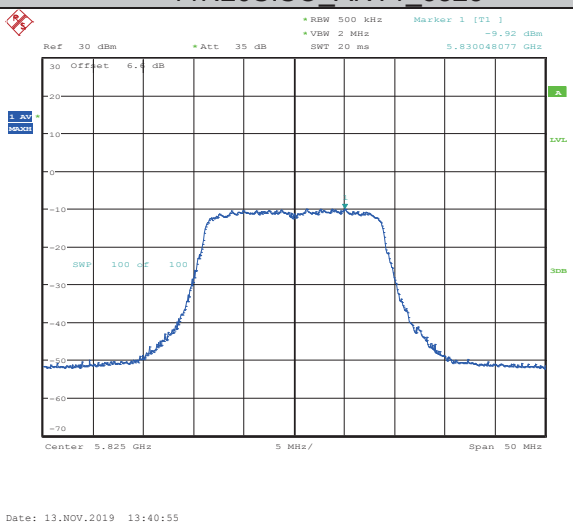


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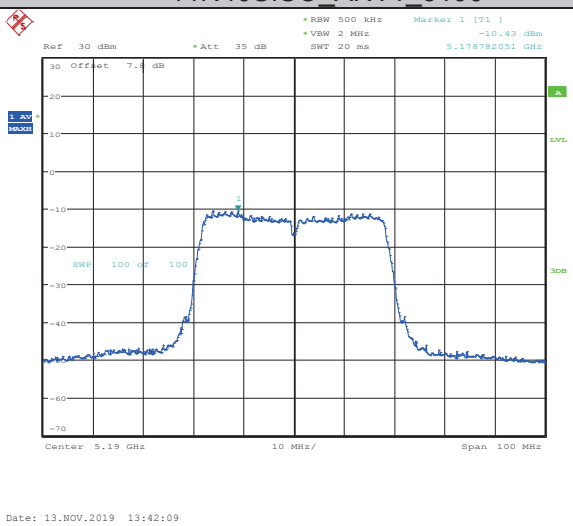


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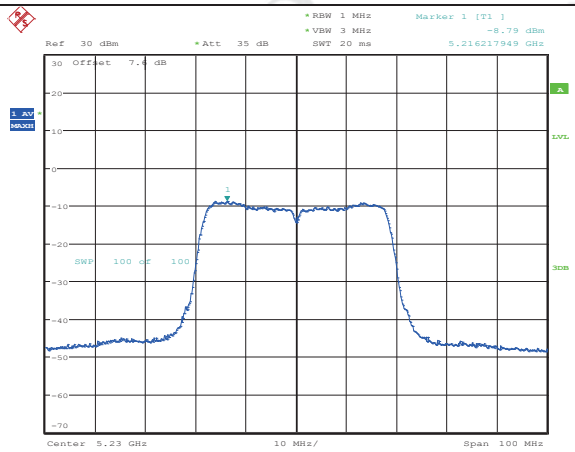


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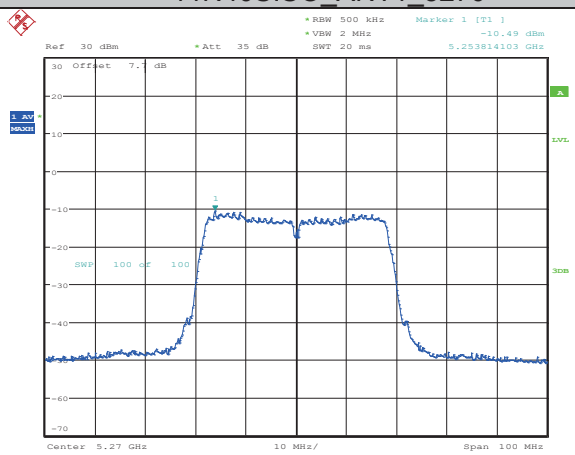


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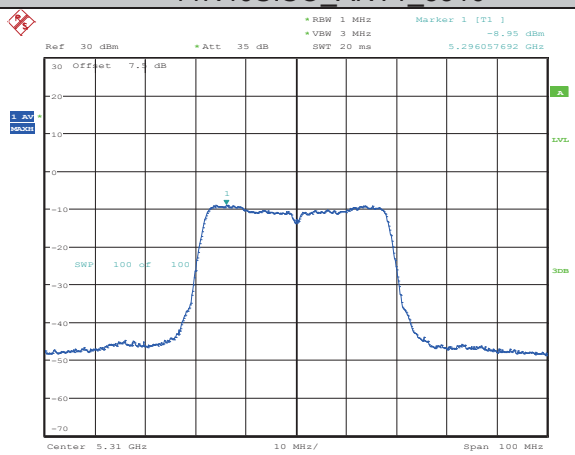
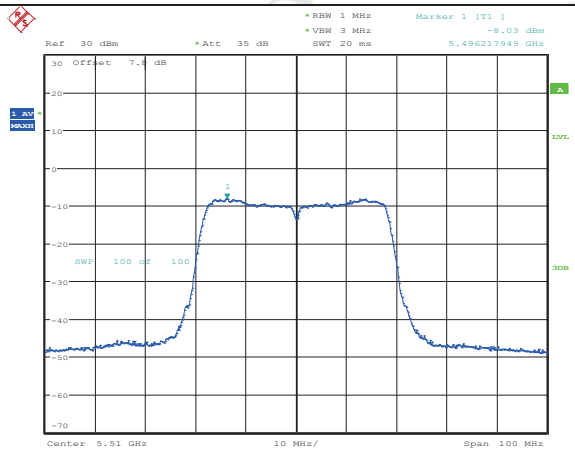
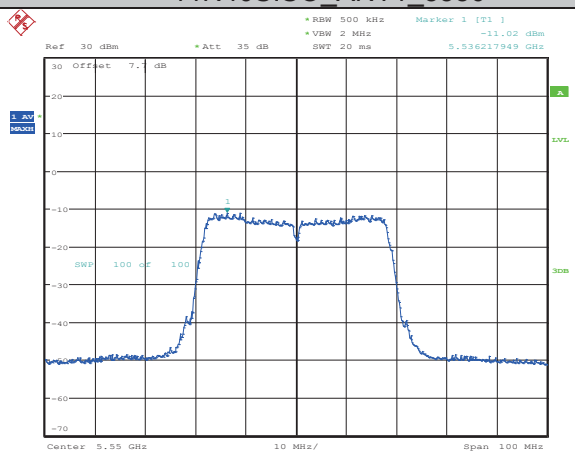



Date: 13.NOV.2019 13:45:32

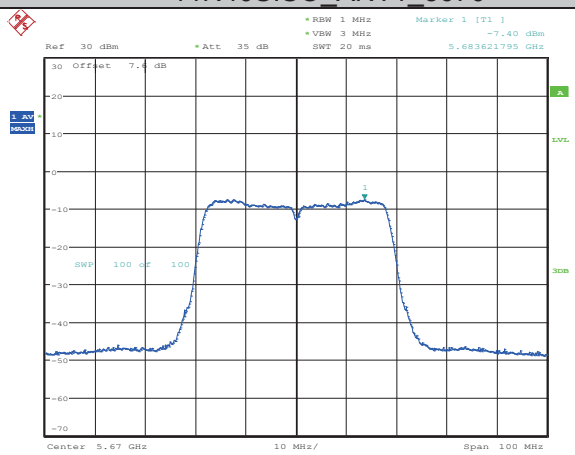
11N40SISO_ANT1_5510



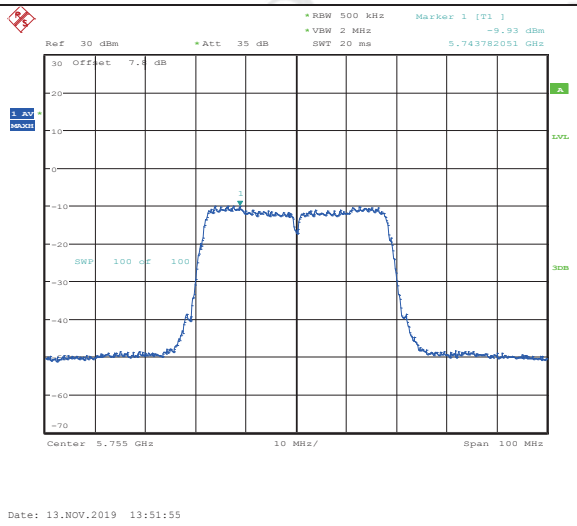

11N40SISO_ANT1_5550



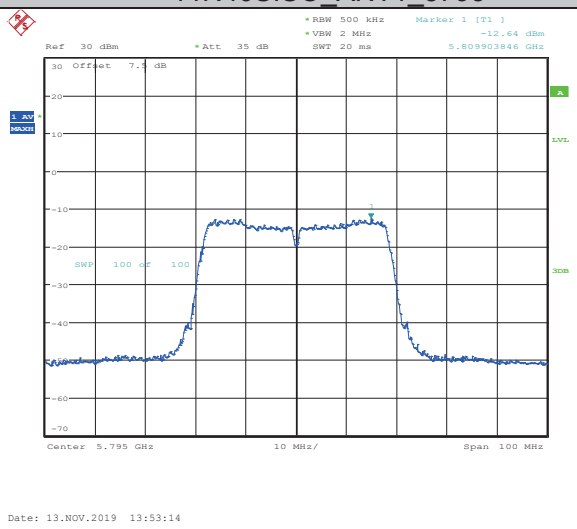

11N40SISO_ANT1_5670




11N40SISO_ANT1_5755




11N40SISO_ANT1_5795



# 7. Frequency Stability Measurement

## 7.1. Limit of Frequency Stability

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.

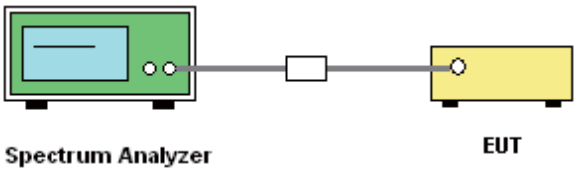
## 7.2. Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

## 7.3. Test Procedures

(1) To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
(2) The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10 dB lower than the measured peak value.
(3) The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

## 7.4. Test Setup




## 7.5. Test Result

| Voltage | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Test Mode | Antenna | Channel | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| 11A | ANT1 | 5180 | NV | NT | 200 | 0.03861 | 20 | PASS |
| 11A | ANT1 | 5180 | LV | NT | 200 | 0.03861 | 20 | PASS |
| 11A | ANT1 | 5180 | HV | NT | 200 | 0.03861 | 20 | PASS |
| 11A | ANT1 | 5190 | NV | NT | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5190 | LV | NT | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5190 | HV | NT | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5200 | NV | NT | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5200 | LV | NT | 400 | 0.076923 | 20 | PASS |
| 11A | ANT1 | 5200 | HV | NT | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5230 | NV | NT | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5230 | LV | NT | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5230 | HV | NT | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5240 | NV | NT | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5240 | LV | NT | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5240 | HV | NT | 200 | 0.038168 | 20 | PASS |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11A | ANT1 | 5260 | NV | NT | 200 | 0.038023 | 20 | PASS |
| 11A | ANT1 | 5260 | LV | NT | 0 | 0 | 20 | PASS |
| 11A | ANT1 | 5260 | HV | NT | 200 | 0.038023 | 20 | PASS |
| 11A | ANT1 | 5270 | NV | NT | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5270 | LV | NT | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5270 | HV | NT | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5300 | NV | NT | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5300 | LV | NT | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5300 | HV | NT | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5310 | NV | NT | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5310 | LV | NT | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5310 | HV | NT | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5320 | NV | NT | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5320 | LV | NT | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5320 | HV | NT | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5500 | NV | NT | 200 | 0.036364 | 20 | PASS |
| 11A | ANT1 | 5500 | LV | NT | 200 | 0.036364 | 20 | PASS |
| 11A | ANT1 | 5500 | HV | NT | 200 | 0.036364 | 20 | PASS |
| 11A | ANT1 | 5510 | NV | NT | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5510 | LV | NT | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5510 | HV | NT | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5550 | NV | NT | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5550 | LV | NT | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5550 | HV | NT | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5580 | NV | NT | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5580 | LV | NT | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5580 | HV | NT | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5670 | NV | NT | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5670 | LV | NT | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5670 | HV | NT | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5700 | NV | NT | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5700 | LV | NT | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5700 | HV | NT | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5745 | NV | NT | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5745 | LV | NT | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5745 | HV | NT | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5755 | NV | NT | 0 | 0 | 20 | PASS |
| 11A | ANT1 | 5755 | LV | NT | 200 | 0.034752 | 20 | PASS |
| 11A | ANT1 | 5755 | HV | NT | 200 | 0.034752 | 20 | PASS |
| 11A | ANT1 | 5785 | NV | NT | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5785 | LV | NT | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5785 | HV | NT | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5795 | NV | NT | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5795 | LV | NT | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5795 | HV | NT | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5825 | NV | NT | 200 | 0.034335 | 20 | PASS |
| 11A | ANT1 | 5825 | LV | NT | 200 | 0.034335 | 20 | PASS |
| 11A | ANT1 | 5825 | HV | NT | 200 | 0.034335 | 20 | PASS |

| Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Test Mode | Antenna | Channel | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| 11A | ANT1 | 5180 | NV | -30 | 0 | 0 | 20 | PASS |
| 11A | ANT1 | 5180 | NV | -20 | 200 | 0.03861 | 20 | PASS |
| 11A | ANT1 | 5180 | NV | -10 | 200 | 0.03861 | 20 | PASS |
| 11A | ANT1 | 5180 | NV | 0 | 0 | 0 | 20 | PASS |
| 11A | ANT1 | 5180 | NV | 10 | 200 | 0.03861 | 20 | PASS |
| 11A | ANT1 | 5180 | NV | 20 | 200 | 0.03861 | 20 | PASS |
| 11A | ANT1 | 5180 | NV | 30 | 200 | 0.03861 | 20 | PASS |
| 11A | ANT1 | 5180 | NV | 40 | 0 | 0 | 20 | PASS |
| 11A | ANT1 | 5180 | NV | 50 | 400 | 0.07722 | 20 | PASS |
| 11A | ANT1 | 5190 | NV | -30 | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5190 | NV | -20 | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5190 | NV | -10 | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5190 | NV | 0 | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5190 | NV | 10 | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5190 | NV | 20 | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5190 | NV | 30 | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5190 | NV | 40 | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5190 | NV | 50 | 200 | 0.038536 | 20 | PASS |
| 11A | ANT1 | 5200 | NV | -30 | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5200 | NV | -20 | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5200 | NV | -10 | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5200 | NV | 0 | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5200 | NV | 10 | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5200 | NV | 20 | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5200 | NV | 30 | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5200 | NV | 40 | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5200 | NV | 50 | 200 | 0.038462 | 20 | PASS |
| 11A | ANT1 | 5230 | NV | -30 | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5230 | NV | -20 | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5230 | NV | -10 | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5230 | NV | 0 | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5230 | NV | 10 | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5230 | NV | 20 | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5230 | NV | 30 | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5230 | NV | 40 | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5230 | NV | 50 | 200 | 0.038241 | 20 | PASS |
| 11A | ANT1 | 5240 | NV | -30 | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5240 | NV | -20 | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5240 | NV | -10 | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5240 | NV | 0 | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5240 | NV | 10 | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5240 | NV | 20 | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5240 | NV | 30 | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5240 | NV | 40 | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5240 | NV | 50 | 200 | 0.038168 | 20 | PASS |
| 11A | ANT1 | 5260 | NV | -30 | 400 | 0.076046 | 20 | PASS |
| 11A | ANT1 | 5260 | NV | -20 | 0 | 0 | 20 | PASS |
| 11A | ANT1 | 5260 | NV | -10 | 200 | 0.038023 | 20 | PASS |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11A | ANT1 | 5260 | NV | 0 | 200 | 0.038023 | 20 | PASS |
| 11A | ANT1 | 5260 | NV | 10 | 200 | 0.038023 | 20 | PASS |
| 11A | ANT1 | 5260 | NV | 20 | 200 | 0.038023 | 20 | PASS |
| 11A | ANT1 | 5260 | NV | 30 | 400 | 0.076046 | 20 | PASS |
| 11A | ANT1 | 5260 | NV | 40 | 400 | 0.076046 | 20 | PASS |
| 11A | ANT1 | 5260 | NV | 50 | 400 | 0.076046 | 20 | PASS |
| 11A | ANT1 | 5270 | NV | -30 | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5270 | NV | -20 | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5270 | NV | -10 | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5270 | NV | 0 | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5270 | NV | 10 | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5270 | NV | 20 | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5270 | NV | 30 | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5270 | NV | 40 | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5270 | NV | 50 | 200 | 0.037951 | 20 | PASS |
| 11A | ANT1 | 5300 | NV | -30 | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5300 | NV | -20 | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5300 | NV | -10 | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5300 | NV | 0 | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5300 | NV | 10 | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5300 | NV | 20 | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5300 | NV | 30 | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5300 | NV | 40 | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5300 | NV | 50 | 200 | 0.037736 | 20 | PASS |
| 11A | ANT1 | 5310 | NV | -30 | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5310 | NV | -20 | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5310 | NV | -10 | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5310 | NV | 0 | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5310 | NV | 10 | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5310 | NV | 20 | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5310 | NV | 30 | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5310 | NV | 40 | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5310 | NV | 50 | 200 | 0.037665 | 20 | PASS |
| 11A | ANT1 | 5320 | NV | -30 | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5320 | NV | -20 | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5320 | NV | -10 | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5320 | NV | 0 | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5320 | NV | 10 | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5320 | NV | 20 | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5320 | NV | 30 | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5320 | NV | 40 | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5320 | NV | 50 | 200 | 0.037594 | 20 | PASS |
| 11A | ANT1 | 5500 | NV | -30 | 200 | 0.036364 | 20 | PASS |
| 11A | ANT1 | 5500 | NV | -20 | 200 | 0.036364 | 20 | PASS |
| 11A | ANT1 | 5500 | NV | -10 | 200 | 0.036364 | 20 | PASS |
| 11A | ANT1 | 5500 | NV | 0 | 200 | 0.036364 | 20 | PASS |
| 11A | ANT1 | 5500 | NV | 10 | 0 | 0 | 20 | PASS |
| 11A | ANT1 | 5500 | NV | 20 | 200 | 0.036364 | 20 | PASS |
| 11A | ANT1 | 5500 | NV | 30 | 200 | 0.036364 | 20 | PASS |
| 11A | ANT1 | 5500 | NV | 40 | 200 | 0.036364 | 20 | PASS |
| 11A | ANT1 | 5500 | NV | 50 | 200 | 0.036364 | 20 | PASS |

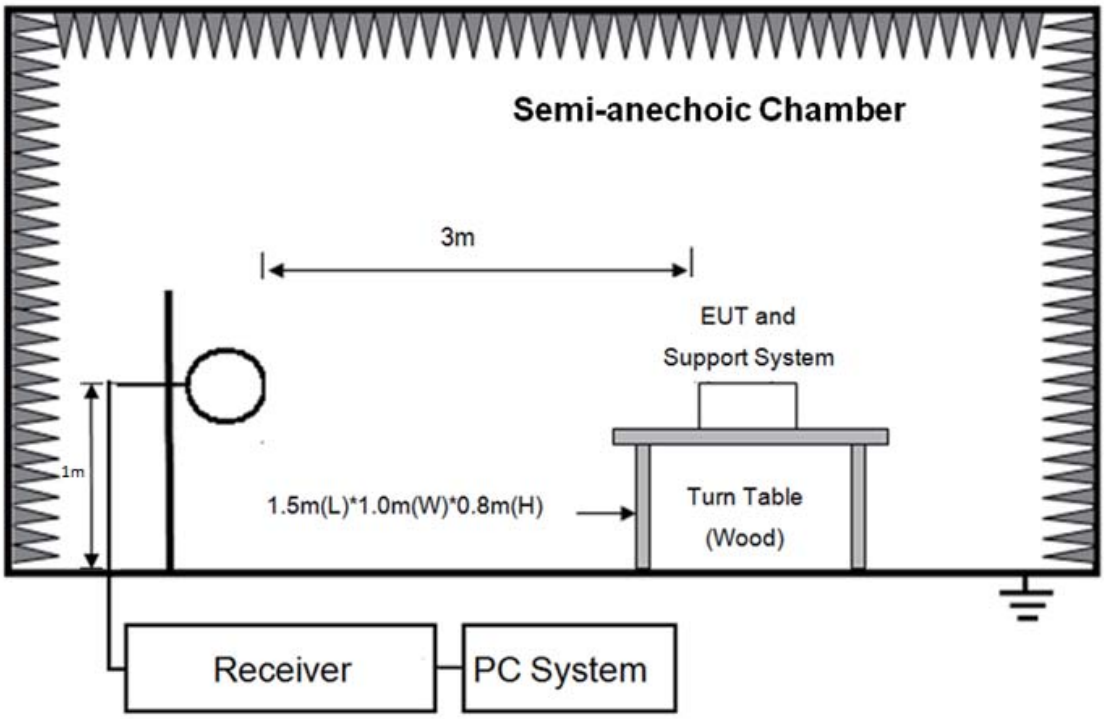
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11A | ANT1 | 5510 | NV | -30 | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5510 | NV | -20 | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5510 | NV | -10 | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5510 | NV | 0 | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5510 | NV | 10 | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5510 | NV | 20 | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5510 | NV | 30 | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5510 | NV | 40 | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5510 | NV | 50 | 200 | 0.036298 | 20 | PASS |
| 11A | ANT1 | 5550 | NV | -30 | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5550 | NV | -20 | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5550 | NV | -10 | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5550 | NV | 0 | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5550 | NV | 10 | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5550 | NV | 20 | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5550 | NV | 30 | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5550 | NV | 40 | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5550 | NV | 50 | 200 | 0.036036 | 20 | PASS |
| 11A | ANT1 | 5580 | NV | -30 | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5580 | NV | -20 | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5580 | NV | -10 | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5580 | NV | 0 | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5580 | NV | 10 | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5580 | NV | 20 | 400 | 0.071685 | 20 | PASS |
| 11A | ANT1 | 5580 | NV | 30 | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5580 | NV | 40 | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5580 | NV | 50 | 200 | 0.035842 | 20 | PASS |
| 11A | ANT1 | 5670 | NV | -30 | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5670 | NV | -20 | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5670 | NV | -10 | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5670 | NV | 0 | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5670 | NV | 10 | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5670 | NV | 20 | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5670 | NV | 30 | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5670 | NV | 40 | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5670 | NV | 50 | 200 | 0.035273 | 20 | PASS |
| 11A | ANT1 | 5700 | NV | -30 | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5700 | NV | -20 | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5700 | NV | -10 | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5700 | NV | 0 | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5700 | NV | 10 | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5700 | NV | 20 | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5700 | NV | 30 | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5700 | NV | 40 | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5700 | NV | 50 | 200 | 0.035088 | 20 | PASS |
| 11A | ANT1 | 5745 | NV | -30 | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5745 | NV | -20 | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5745 | NV | -10 | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5745 | NV | 0 | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5745 | NV | 10 | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5745 | NV | 20 | 200 | 0.034813 | 20 | PASS |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11A | ANT1 | 5745 | NV | 30 | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5745 | NV | 40 | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5745 | NV | 50 | 200 | 0.034813 | 20 | PASS |
| 11A | ANT1 | 5755 | NV | -30 | 200 | 0.034752 | 20 | PASS |
| 11A | ANT1 | 5755 | NV | -20 | 200 | 0.034752 | 20 | PASS |
| 11A | ANT1 | 5755 | NV | -10 | 200 | 0.034752 | 20 | PASS |
| 11A | ANT1 | 5755 | NV | 0 | 200 | 0.034752 | 20 | PASS |
| 11A | ANT1 | 5755 | NV | 10 | 0 | 0 | 20 | PASS |
| 11A | ANT1 | 5755 | NV | 20 | 200 | 0.034752 | 20 | PASS |
| 11A | ANT1 | 5755 | NV | 30 | 0 | 0 | 20 | PASS |
| 11A | ANT1 | 5755 | NV | 40 | 200 | 0.034752 | 20 | PASS |
| 11A | ANT1 | 5755 | NV | 50 | 200 | 0.034752 | 20 | PASS |
| 11A | ANT1 | 5785 | NV | -30 | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5785 | NV | -20 | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5785 | NV | -10 | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5785 | NV | 0 | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5785 | NV | 10 | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5785 | NV | 20 | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5785 | NV | 30 | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5785 | NV | 40 | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5785 | NV | 50 | 200 | 0.034572 | 20 | PASS |
| 11A | ANT1 | 5795 | NV | -30 | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5795 | NV | -20 | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5795 | NV | -10 | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5795 | NV | 0 | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5795 | NV | 10 | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5795 | NV | 20 | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5795 | NV | 30 | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5795 | NV | 40 | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5795 | NV | 50 | 200 | 0.034513 | 20 | PASS |
| 11A | ANT1 | 5825 | NV | -30 | 200 | 0.034335 | 20 | PASS |
| 11A | ANT1 | 5825 | NV | -20 | 200 | 0.034335 | 20 | PASS |
| 11A | ANT1 | 5825 | NV | -10 | 200 | 0.034335 | 20 | PASS |
| 11A | ANT1 | 5825 | NV | 0 | 200 | 0.034335 | 20 | PASS |
| 11A | ANT1 | 5825 | NV | 10 | 200 | 0.034335 | 20 | PASS |
| 11A | ANT1 | 5825 | NV | 20 | 200 | 0.034335 | 20 | PASS |
| 11A | ANT1 | 5825 | NV | 30 | 200 | 0.034335 | 20 | PASS |
| 11A | ANT1 | 5825 | NV | 40 | 200 | 0.034335 | 20 | PASS |
| 11A | ANT1 | 5825 | NV | 50 | 200 | 0.034335 | 20 | PASS |

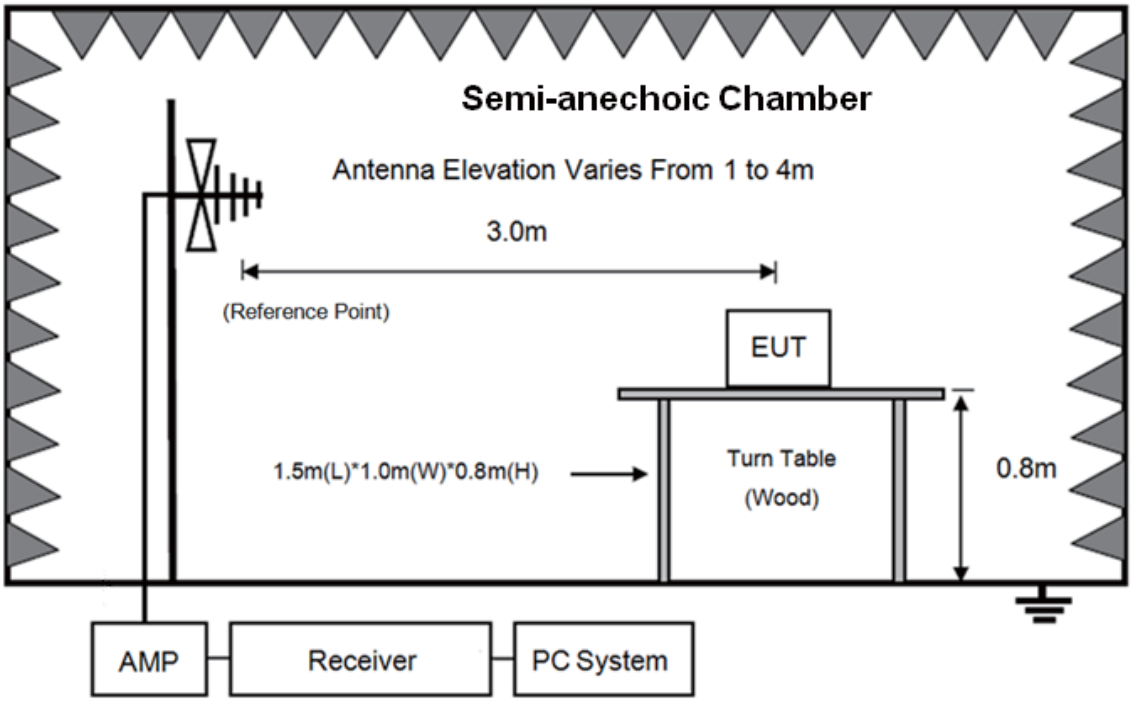
# 8. Emissions in restricted frequency bands

## 8.1. Block diagram of test setup

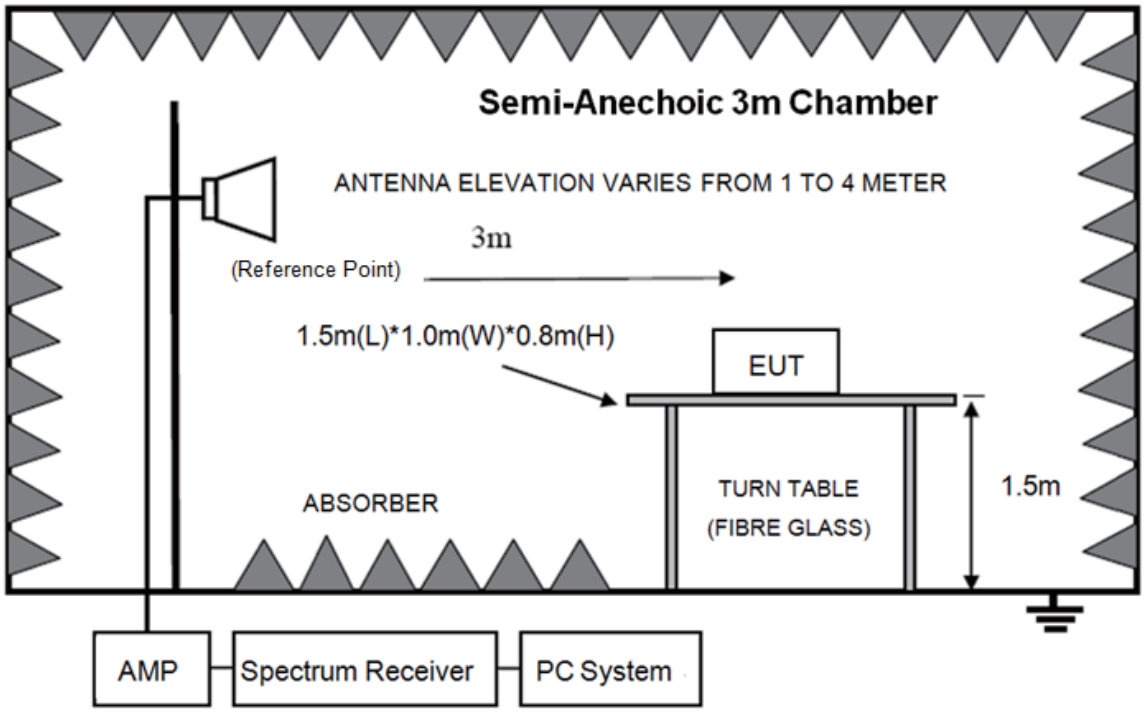
In 3m Anechoic Chamber Test Setup Diagram for 9kHz-30MHz




In 3m Anechoic Chamber Test Setup Diagram for 30MHz-1GHz



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz




Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

## 8.2. Limit

8.3.1 FCC 15.205 Restricted frequency band

| 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 |
| 4.1772&4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.2072&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]) |
| 13.36-13.41 | | | |

8.3.2 FCC 15.209 Limit.

| FREQUENCY MHz | DISTANCE Meters | FIELD STRENGTHS LIMIT | |
|---|---|---|---|
| | | μV/m | dB(μV)/m |
| 0.009 ~ 0.490 | 300 | 2400/F(kHz) | 67.6-20log(F) |
| 0.490 ~ 1.705 | 30 | 24000/F(kHz) | 87.6-20log(F) |
| 1.705 ~ 30.0 | 30 | 30 | 29.54 |
| 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)<br>54.0 dB(μV)/m (Average) | |

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000MHz.Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$Limit_{3m}(dBuV/m) = Limit_{30m}(dBuV/m) + 40Log(30m/3m)$$

8.3.3 Limit for this EUT

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.

## 8.3. Test Procedure

(1) EUT height should be 0.8 m for below 1 GHz at a semi‐anechoic chamber while EUT height should be 1.5 m for above 1GHz at full chamber or semi‐anechoic chamber ground with absorbers

(2) Setup EUT and assistant system according clause 2.3 and 8.2

(3) Test antenna was located 3m from the EUT on an adjustable mast, and the antenna used as below table.

| Test frequency range | Test antenna used | Test distance |
|---|---|---|
| 9 kHz-30 MHz | Active Loop antenna | 3 m |
| 30 MHz-1 GHz | Trilog Broadband Antenna | 3 m |
| 1 GHz-18 GHz | Double Ridged Horn Antenna(1GHz-18GHz) | 3 m |
| 18 GHz-40 GHz | Horn Antenna(18GHz-40GHz) | 1 m |

According ANSI C63.10:2013 clause 6.4.4.2 and 6,5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical

axis for maximum response at each azimuth position around the EUT. And the loop antenna also be positioned with its plane horizontal at the specified distance from the EUT. The center of the loop is 1 m above the ground. for measurement above 30 MHz, the Trilog Broadband Antenna or Horn Antenna was located 3m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(4) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 40 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Change power supply range from 85% to 115% of the rated supply voltage

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 40 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 9 kHz to 30 MHz and 18 GHz to 40 GHz, so below final test was performed with frequency range from 30 MHz to 18 GHz.

(5) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on Radiated Emission test.

(6) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz, for emissions from 9kHz-90kHz,110kHz-490kHz and above 1GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.

(7) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW

| Frequency band | RBW |
|---|---|
| 9 kHz-150 kHz | 200 Hz |
| 150 kHz-30 MHz | 9 kHz |
| 30 MHz-1 GHz | 120 kHz |

(8) For emissions above 1 GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3MHz for Peak measure, the RBW is set at 1 MHz, VBW is set at 10 Hz for AV value.

## 8.4. Test result

**PASS. (See below detailed test result)**

All the emissions except fundamental emission from 9kHz to 40GHz were comply with 15.209 limit.

Note1: According exploratory test no any obvious emission was detected from 9 kHz to 30 MHz and 18 GHz to 40 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

Note2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in 11a mode.

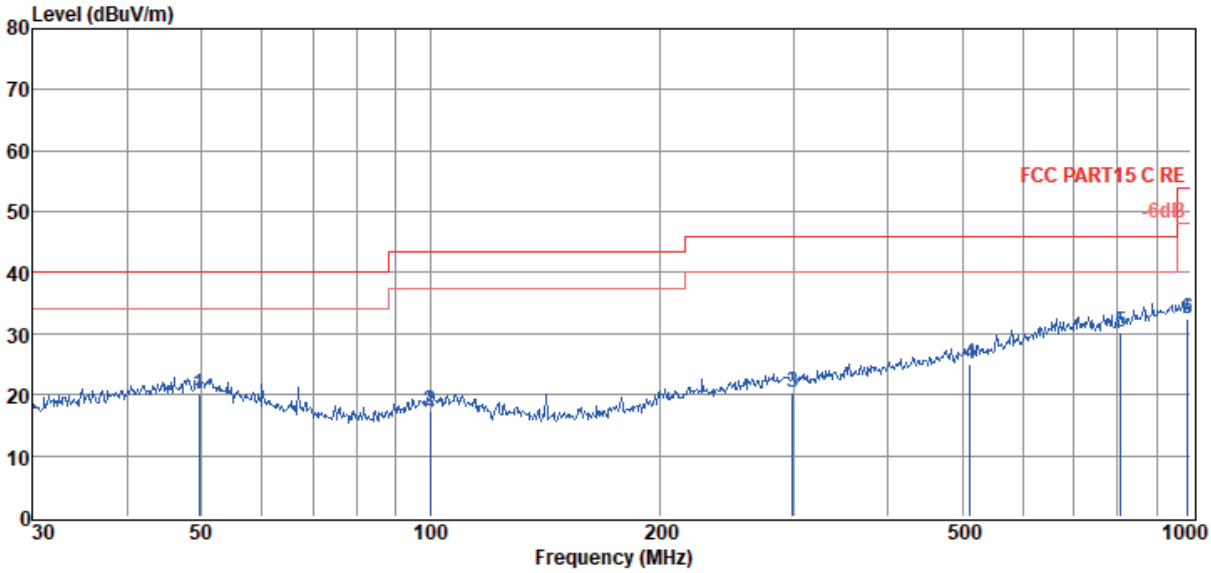
Note3: For below test data, when the limit tabular marked "/" means this frequency point is the fundamental emission and no need comply with this limit.

## Radiated Emission test (below 1GHz)

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC BELOW1G.EM6 | |
| **Test Date** | : 2019-11-11 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:101.4kPa | **Antenna/Distance** | : 2018 VULB 9163 1#/3m/VERTICAL |
| **Memo** | : | | |

Data: 7



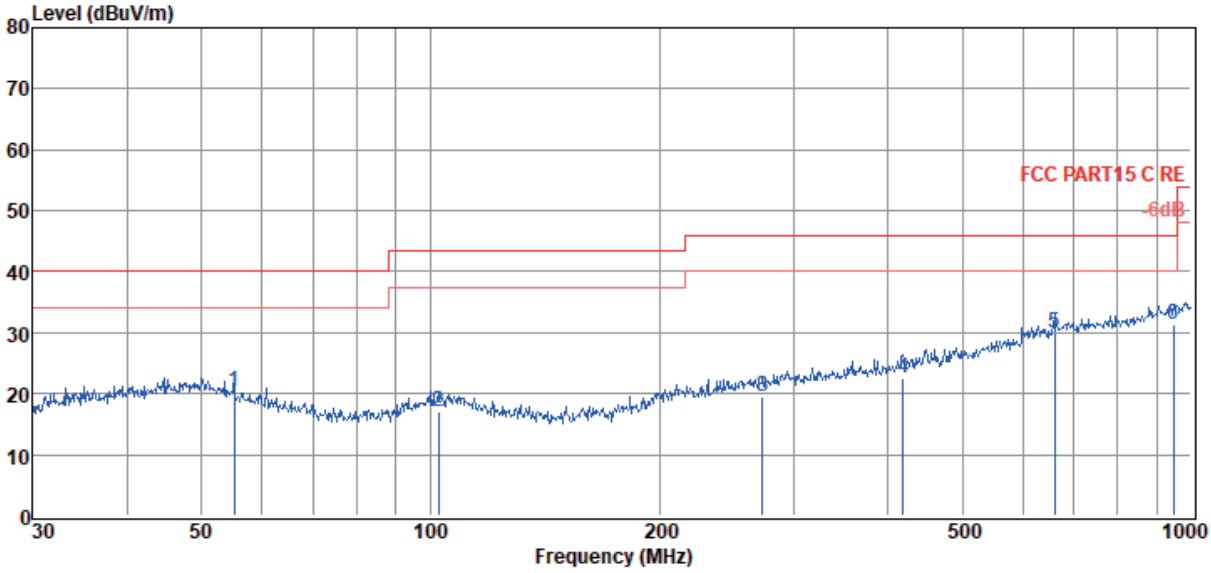

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 49.71 | 1.54 | 14.57 | 3.87 | 19.98 | 40.00 | -20.02 | QP | VERTICAL |
| 2 | 99.88 | 1.34 | 11.68 | 4.20 | 17.22 | 43.50 | -26.28 | QP | VERTICAL |
| 3 | 299.32 | 1.17 | 13.99 | 5.18 | 20.34 | 46.00 | -25.66 | QP | VERTICAL |
| 4 | 511.84 | 1.81 | 17.28 | 5.86 | 24.95 | 46.00 | -21.05 | QP | VERTICAL |
| 5 | 807.43 | 2.95 | 20.78 | 6.62 | 30.35 | 46.00 | -15.65 | QP | VERTICAL |
| 6 | 989.54 | 2.74 | 22.69 | 7.06 | 32.49 | 54.00 | -21.51 | QP | VERTICAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC BELOW1G.EM6 | |
| **Test Date** | : 2019-11-11 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:101.4kPa | **Antenna/Distance** | : 2018 VULB 9163 1#/3m/HORIZONTAL |
| **Memo** | : | | |

Data: 8




| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 55.22 | 3.60 | 12.86 | 3.91 | 20.37 | 40.00 | -19.63 | QP | HORIZONTAL |
| 2 | 102.36 | 1.05 | 11.72 | 4.22 | 16.99 | 43.50 | -26.51 | QP | HORIZONTAL |
| 3 | 273.23 | 1.11 | 13.40 | 5.09 | 19.60 | 46.00 | -26.40 | QP | HORIZONTAL |
| 4 | 417.64 | 0.96 | 15.89 | 5.57 | 22.42 | 46.00 | -23.58 | QP | HORIZONTAL |
| 5 | 661.15 | 4.25 | 19.51 | 6.27 | 30.03 | 46.00 | -15.97 | QP | HORIZONTAL |
| 6 | 948.76 | 2.00 | 22.25 | 7.06 | 31.31 | 46.00 | -14.69 | QP | HORIZONTAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

## Radiated Emission test (above 1GHz)

| Freq (MHz) | Read level (dBμV) | Antenna Factor (dB/m) | PRM Factor(dB) | Cable Loss (dB) | Result Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector type | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| **11a CH36** | | | | | | | | | |
| 5760.00 | 44.78 | 34.51 | 43.12 | 6.36 | 42.53 | 74.00 | -31.47 | Peak | HORIZONTAL |
| 7936.00 | 45.00 | 36.25 | 43.18 | 7.26 | 45.33 | 74.00 | -28.67 | Peak | HORIZONTAL |
| 9755.00 | 45.46 | 37.26 | 43.14 | 8.54 | 48.12 | 74.00 | -25.88 | Peak | HORIZONTAL |
| 10979.00 | 44.81 | 37.51 | 41.41 | 8.99 | 49.90 | 74.00 | -24.10 | Peak | HORIZONTAL |
| 12866.00 | 44.64 | 38.25 | 42.87 | 10.49 | 50.51 | 74.00 | -23.49 | Peak | HORIZONTAL |
| 14515.00 | 43.65 | 40.31 | 41.73 | 11.16 | 53.39 | 74.00 | -20.61 | Peak | HORIZONTAL |
| 5981.00 | 43.99 | 34.69 | 43.16 | 6.59 | 42.11 | 74.00 | -31.89 | Peak | VERTICAL |
| 8769.00 | 43.31 | 36.80 | 42.18 | 7.79 | 45.72 | 74.00 | -28.28 | Peak | VERTICAL |
| 11234.00 | 44.34 | 38.02 | 41.91 | 9.02 | 49.47 | 74.00 | -24.53 | Peak | VERTICAL |
| 13070.00 | 45.61 | 38.40 | 42.75 | 10.74 | 52.00 | 74.00 | -22.00 | Peak | VERTICAL |
| 13971.00 | 44.26 | 40.13 | 41.79 | 11.09 | 53.69 | 74.00 | -20.31 | Peak | VERTICAL |
| 16470.00 | 42.54 | 41.95 | 42.39 | 10.48 | 52.58 | 74.00 | -21.42 | Peak | VERTICAL |
| **11a CH40** | | | | | | | | | |
| 5726.00 | 43.97 | 34.49 | 43.13 | 6.33 | 41.66 | 74.00 | -32.34 | Peak | HORIZONTAL |
| 8599.00 | 43.96 | 36.80 | 42.17 | 7.69 | 46.28 | 74.00 | -27.72 | Peak | HORIZONTAL |
| 11319.00 | 44.11 | 38.21 | 42.11 | 9.03 | 49.24 | 74.00 | -24.76 | Peak | HORIZONTAL |
| 12951.00 | 44.89 | 38.28 | 42.84 | 10.63 | 50.96 | 74.00 | -23.04 | Peak | HORIZONTAL |
| 14974.00 | 43.55 | 40.68 | 41.70 | 11.22 | 53.75 | 74.00 | -20.25 | Peak | HORIZONTAL |
| 16555.00 | 42.86 | 42.12 | 42.33 | 10.53 | 53.18 | 74.00 | -20.82 | Peak | HORIZONTAL |
| 5420.00 | 44.44 | 34.24 | 43.28 | 6.01 | 41.41 | 74.00 | -32.59 | Peak | VERTICAL |
| 8616.00 | 43.45 | 36.80 | 42.17 | 7.70 | 45.78 | 74.00 | -28.22 | Peak | VERTICAL |
| 10775.00 | 44.57 | 37.59 | 41.90 | 8.94 | 49.20 | 74.00 | -24.80 | Peak | VERTICAL |
| 12050.00 | 46.10 | 38.01 | 42.70 | 9.18 | 50.59 | 74.00 | -23.41 | Peak | VERTICAL |
| 14260.00 | 43.27 | 40.25 | 41.74 | 11.13 | 52.91 | 74.00 | -21.09 | Peak | VERTICAL |
| 16555.00 | 43.41 | 42.12 | 42.33 | 10.53 | 53.73 | 74.00 | -20.27 | Peak | VERTICAL |
| **11a CH48** | | | | | | | | | |
| 5556.00 | 44.64 | 34.35 | 43.19 | 6.15 | 41.95 | 74.00 | -32.05 | Peak | HORIZONTAL |
| 9840.00 | 45.14 | 37.31 | 43.18 | 8.61 | 47.88 | 74.00 | -26.12 | Peak | HORIZONTAL |
| 12050.00 | 46.50 | 38.01 | 42.70 | 9.18 | 50.99 | 74.00 | -23.01 | Peak | HORIZONTAL |
| 14141.00 | 43.11 | 40.23 | 41.75 | 11.12 | 52.71 | 74.00 | -21.29 | Peak | HORIZONTAL |
| 15076.00 | 43.70 | 40.67 | 41.75 | 11.14 | 53.76 | 74.00 | -20.24 | Peak | HORIZONTAL |
| 16436.00 | 43.20 | 41.90 | 42.40 | 10.46 | 53.16 | 74.00 | -20.84 | Peak | HORIZONTAL |
| 6474.00 | 44.61 | 35.27 | 43.04 | 6.40 | 43.24 | 74.00 | -30.76 | Peak | VERTICAL |
| 8820.00 | 42.89 | 36.80 | 42.18 | 7.82 | 45.33 | 74.00 | -28.67 | Peak | VERTICAL |
| 9789.00 | 45.59 | 37.28 | 43.15 | 8.57 | 48.29 | 74.00 | -25.71 | Peak | VERTICAL |
| 11625.00 | 45.32 | 38.45 | 42.56 | 9.06 | 50.27 | 74.00 | -23.73 | Peak | VERTICAL |
| 14379.00 | 44.10 | 40.28 | 41.74 | 11.15 | 53.79 | 74.00 | -20.21 | Peak | VERTICAL |
| 16334.00 | 43.54 | 41.74 | 42.44 | 10.41 | 53.25 | 74.00 | -20.75 | Peak | VERTICAL |

Conclusion: Pass

Note: -27 dBm/MHz Limit=95.2+EIRP[dBm]=95.2-27=68.2 dBμV/m
For transmitters operating in the 5150MHz-5250MHz, 5250MHz-5350MHz, 5470MHz-5725MHz, 5725MHz-5850MHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

Note:1. 30MHz~40GHz: (11a, 11n20, n40 mode all have been tested, only 11a mode is the worst case and reported.)

2. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

| Freq (MHz) | Read level (dBμV) | Antenna Factor (dB/m) | PRM Factor(dB) | Cable Loss (dB) | Result Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector type | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| **11a CH52** | | | | | | | | | |
| 6151.00 | 44.42 | 34.89 | 43.12 | 6.54 | 42.73 | 74.00 | -31.27 | Peak | HORIZONTAL |
| 7936.00 | 45.04 | 36.25 | 43.18 | 7.26 | 45.37 | 74.00 | -28.63 | Peak | HORIZONTAL |
| 10860.00 | 44.42 | 37.56 | 41.69 | 8.96 | 49.25 | 74.00 | -24.75 | Peak | HORIZONTAL |
| 13070.00 | 44.67 | 38.40 | 42.75 | 10.74 | 51.06 | 74.00 | -22.94 | Peak | HORIZONTAL |
| 14651.00 | 43.18 | 40.42 | 41.72 | 11.18 | 53.06 | 74.00 | -20.94 | Peak | HORIZONTAL |
| 16385.00 | 43.25 | 41.82 | 42.42 | 10.44 | 53.09 | 74.00 | -20.91 | Peak | HORIZONTAL |
| 5556.00 | 44.16 | 34.35 | 43.19 | 6.15 | 41.47 | 74.00 | -32.53 | Peak | VERTICAL |
| 7851.00 | 45.19 | 36.18 | 43.22 | 7.16 | 45.31 | 74.00 | -28.69 | Peak | VERTICAL |
| 10401.00 | 44.62 | 37.64 | 42.69 | 8.84 | 48.41 | 74.00 | -25.59 | Peak | VERTICAL |
| 12050.00 | 46.38 | 38.01 | 42.70 | 9.18 | 50.87 | 74.00 | -23.13 | Peak | VERTICAL |
| 13920.00 | 44.06 | 40.01 | 41.84 | 11.07 | 53.30 | 74.00 | -20.70 | Peak | VERTICAL |
| 14719.00 | 43.36 | 40.48 | 41.72 | 11.19 | 53.31 | 74.00 | -20.69 | Peak | VERTICAL |
| **11a CH56** | | | | | | | | | |
| 9160.00 | 43.82 | 36.90 | 42.46 | 8.05 | 46.31 | 74.00 | -27.69 | Peak | HORIZONTAL |
| 11336.00 | 44.58 | 38.24 | 42.15 | 9.03 | 49.70 | 74.00 | -24.30 | Peak | HORIZONTAL |
| 12475.00 | 45.21 | 38.10 | 42.96 | 9.86 | 50.21 | 74.00 | -23.79 | Peak | HORIZONTAL |
| 13920.00 | 43.87 | 40.01 | 41.84 | 11.07 | 53.11 | 74.00 | -20.89 | Peak | HORIZONTAL |
| 16385.00 | 43.66 | 41.82 | 42.42 | 10.44 | 53.50 | 74.00 | -20.50 | Peak | HORIZONTAL |
| 6950.00 | 45.27 | 35.57 | 43.13 | 6.18 | 43.89 | 74.00 | -30.11 | Peak | VERTICAL |
| 9636.00 | 45.74 | 37.19 | 43.08 | 8.44 | 48.29 | 74.00 | -25.71 | Peak | VERTICAL |
| 12611.00 | 45.94 | 38.15 | 42.94 | 10.08 | 51.23 | 74.00 | -22.77 | Peak | VERTICAL |
| 14141.00 | 43.61 | 40.23 | 41.75 | 11.12 | 53.21 | 74.00 | -20.79 | Peak | VERTICAL |
| 16436.00 | 43.33 | 41.90 | 42.40 | 10.46 | 53.29 | 74.00 | -20.71 | Peak | VERTICAL |
| **11a CH64** | | | | | | | | | |
| 6729.00 | 45.57 | 35.44 | 43.08 | 6.28 | 44.21 | 74.00 | -29.79 | Peak | HORIZONTAL |
| 10911.00 | 44.27 | 37.53 | 41.57 | 8.98 | 49.21 | 74.00 | -24.79 | Peak | HORIZONTAL |
| 12050.00 | 45.67 | 38.01 | 42.70 | 9.18 | 50.16 | 74.00 | -23.84 | Peak | HORIZONTAL |
| 13920.00 | 42.82 | 40.01 | 41.84 | 11.07 | 52.06 | 74.00 | -21.94 | Peak | HORIZONTAL |
| 16130.00 | 43.43 | 41.41 | 42.51 | 10.29 | 52.62 | 74.00 | -21.38 | Peak | HORIZONTAL |
| 6049.00 | 43.87 | 34.76 | 43.15 | 6.59 | 42.07 | 74.00 | -31.93 | Peak | VERTICAL |
| 7834.00 | 44.69 | 36.17 | 43.22 | 7.14 | 44.78 | 74.00 | -29.22 | Peak | VERTICAL |
| 9551.00 | 44.83 | 37.14 | 43.04 | 8.37 | 47.30 | 74.00 | -26.70 | Peak | VERTICAL |
| 11251.00 | 44.54 | 38.06 | 41.95 | 9.03 | 49.68 | 74.00 | -24.32 | Peak | VERTICAL |
| 12050.00 | 45.48 | 38.01 | 42.70 | 9.18 | 49.97 | 74.00 | -24.03 | Peak | VERTICAL |
| 12849.00 | 44.69 | 38.24 | 42.87 | 10.47 | 50.53 | 74.00 | -23.47 | Peak | VERTICAL |
| Conclusion: Pass | | | | | | | | | |
| Note: -27 dBm/MHz Limit=95.2+EIRP[dBm]=95.2-27=68.2 dBμV/m<br>For transmitters operating in the 5150MHz-5250MHz, 5250MHz-5350MHz, 5470MHz-5725MHz, 5725MHz-5850MHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. | | | | | | | | | |

Note:1. 30MHz~40GHz: (11a, 11n20, n40 mode all have been tested, only 11a mode is the worst case and reported.)

2. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

| Freq (MHz) | Read level (dBμV) | Antenna Factor (dB/m) | PRM Factor(dB) | Cable Loss (dB) | Result Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector type | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| **11a CH110** | | | | | | | | | |
| 8259.00 | 44.33 | 36.56 | 42.64 | 7.49 | 45.74 | 74.00 | -28.26 | Peak | HORIZONTAL |
| 10214.00 | 46.04 | 37.53 | 42.95 | 8.80 | 49.42 | 74.00 | -24.58 | Peak | HORIZONTAL |
| 12050.00 | 46.29 | 38.01 | 42.70 | 9.18 | 50.78 | 74.00 | -23.22 | Peak | HORIZONTAL |
| 14396.00 | 43.95 | 40.28 | 41.74 | 11.15 | 53.64 | 74.00 | -20.36 | Peak | HORIZONTAL |
| 16334.00 | 43.44 | 41.74 | 42.44 | 10.41 | 53.15 | 74.00 | -20.85 | Peak | HORIZONTAL |
| 6304.00 | 44.82 | 35.07 | 43.08 | 6.47 | 43.28 | 74.00 | -30.72 | Peak | VERTICAL |
| 8089.00 | 45.62 | 36.39 | 42.98 | 7.39 | 46.42 | 74.00 | -27.58 | Peak | VERTICAL |
| 11251.00 | 45.99 | 38.06 | 41.95 | 9.03 | 51.13 | 74.00 | -22.87 | Peak | VERTICAL |
| 13971.00 | 43.14 | 40.13 | 41.79 | 11.09 | 52.57 | 74.00 | -21.43 | Peak | VERTICAL |
| 15314.00 | 43.54 | 40.57 | 41.93 | 10.91 | 53.09 | 74.00 | -20.91 | Peak | VERTICAL |
| 16725.00 | 42.08 | 42.50 | 42.19 | 10.63 | 53.02 | 74.00 | -20.98 | Peak | VERTICAL |
| **11a CH116** | | | | | | | | | |
| 8514.00 | 43.79 | 36.80 | 42.16 | 7.64 | 46.07 | 74.00 | -27.93 | Peak | HORIZONTAL |
| 10911.00 | 44.49 | 37.53 | 41.57 | 8.98 | 49.43 | 74.00 | -24.57 | Peak | HORIZONTAL |
| 12050.00 | 47.72 | 38.01 | 42.70 | 9.18 | 52.21 | 74.00 | -21.79 | Peak | HORIZONTAL |
| 14039.00 | 44.28 | 40.21 | 41.76 | 11.10 | 53.83 | 74.00 | -20.17 | Peak | HORIZONTAL |
| 16385.00 | 43.79 | 41.82 | 42.42 | 10.44 | 53.63 | 74.00 | -20.37 | Peak | HORIZONTAL |
| 7596.00 | 44.57 | 35.98 | 43.31 | 6.86 | 44.10 | 74.00 | -29.90 | Peak | VERTICAL |
| 10690.00 | 45.56 | 37.62 | 42.10 | 8.92 | 50.00 | 74.00 | -24.00 | Peak | VERTICAL |
| 13019.00 | 45.92 | 38.33 | 42.81 | 10.72 | 52.16 | 74.00 | -21.84 | Peak | VERTICAL |
| 14260.00 | 43.14 | 40.25 | 41.74 | 11.13 | 52.78 | 74.00 | -21.22 | Peak | VERTICAL |
| 16385.00 | 43.74 | 41.82 | 42.42 | 10.44 | 53.58 | 74.00 | -20.42 | Peak | VERTICAL |
| **11a CH140** | | | | | | | | | |
| 7800.00 | 44.92 | 36.14 | 43.24 | 7.10 | 44.92 | 74.00 | -29.08 | Peak | HORIZONTAL |
| 11744.00 | 45.08 | 38.30 | 42.60 | 9.07 | 49.85 | 74.00 | -24.15 | Peak | HORIZONTAL |
| 13376.00 | 44.62 | 38.83 | 42.42 | 10.86 | 51.89 | 74.00 | -22.11 | Peak | HORIZONTAL |
| 14141.00 | 43.51 | 40.23 | 41.75 | 11.12 | 53.11 | 74.00 | -20.89 | Peak | HORIZONTAL |
| 16351.00 | 43.93 | 41.76 | 42.43 | 10.42 | 53.68 | 74.00 | -20.32 | Peak | HORIZONTAL |
| 6066.00 | 43.12 | 34.78 | 43.14 | 6.58 | 41.34 | 74.00 | -32.66 | Peak | VERTICAL |
| 8259.00 | 44.21 | 36.56 | 42.64 | 7.49 | 45.62 | 74.00 | -28.38 | Peak | VERTICAL |
| 10979.00 | 44.67 | 37.51 | 41.41 | 8.99 | 49.76 | 74.00 | -24.24 | Peak | VERTICAL |
| 13495.00 | 44.91 | 38.99 | 42.30 | 10.90 | 52.50 | 74.00 | -21.50 | Peak | VERTICAL |
| 14549.00 | 43.37 | 40.34 | 41.73 | 11.17 | 53.15 | 74.00 | -20.85 | Peak | VERTICAL |
| 16266.00 | 43.67 | 41.63 | 42.46 | 10.37 | 53.21 | 74.00 | -20.79 | Peak | VERTICAL |
| Conclusion: Pass | | | | | | | | | |
| Note: -27 dBm/MHz Limit=95.2+EIRP[dBm]=95.2-27=68.2 dBμV/m<br>For transmitters operating in the 5150MHz-5250MHz, 5250MHz-5350MHz, 5470MHz-5725MHz, 5725MHz-5850MHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. | | | | | | | | | |

Note:1. 30MHz~40GHz: (11a, 11n20, n40 mode all have been tested, only 11a mode is the worst case and

reported.)

2. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

| Freq (MHz) | Read level (dBμV) | Antenna Factor (dB/m) | PRM Factor(dB) | Cable Loss (dB) | Result Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector type | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| **11a CH149** | | | | | | | | | |
| 6695.00 | 44.93 | 35.42 | 43.07 | 6.30 | 43.58 | 74.00 | -30.42 | Peak | HORIZONTAL |
| 9279.00 | 43.08 | 36.97 | 42.65 | 8.15 | 45.55 | 74.00 | -28.45 | Peak | HORIZONTAL |
| 11251.00 | 44.27 | 38.06 | 41.95 | 9.03 | 49.41 | 74.00 | -24.59 | Peak | HORIZONTAL |
| 13444.00 | 44.88 | 38.92 | 42.35 | 10.88 | 52.33 | 74.00 | -21.67 | Peak | HORIZONTAL |
| 14634.00 | 42.97 | 40.41 | 41.72 | 11.18 | 52.84 | 74.00 | -21.16 | Peak | HORIZONTAL |
| 16555.00 | 42.95 | 42.12 | 42.33 | 10.53 | 53.27 | 74.00 | -20.73 | Peak | HORIZONTAL |
| 6151.00 | 43.46 | 34.89 | 43.12 | 6.54 | 41.77 | 74.00 | -32.23 | Peak | VERTICAL |
| 8565.00 | 43.62 | 36.80 | 42.16 | 7.67 | 45.93 | 74.00 | -28.07 | Peak | VERTICAL |
| 10979.00 | 44.67 | 37.51 | 41.41 | 8.99 | 49.76 | 74.00 | -24.24 | Peak | VERTICAL |
| 12050.00 | 45.65 | 38.01 | 42.70 | 9.18 | 50.14 | 74.00 | -23.86 | Peak | VERTICAL |
| 14090.00 | 43.31 | 40.22 | 41.75 | 11.11 | 52.89 | 74.00 | -21.11 | Peak | VERTICAL |
| 16266.00 | 43.67 | 41.63 | 42.46 | 10.37 | 53.21 | 74.00 | -20.79 | Peak | VERTICAL |
| **11a CH157** | | | | | | | | | |
| 6185.00 | 43.83 | 34.93 | 43.11 | 6.53 | 42.18 | 74.00 | -31.82 | Peak | HORIZONTAL |
| 8565.00 | 43.32 | 36.80 | 42.16 | 7.67 | 45.63 | 74.00 | -28.37 | Peak | HORIZONTAL |
| 10894.00 | 44.43 | 37.54 | 41.61 | 8.97 | 49.33 | 74.00 | -24.67 | Peak | HORIZONTAL |
| 12050.00 | 45.39 | 38.01 | 42.70 | 9.18 | 49.88 | 74.00 | -24.12 | Peak | HORIZONTAL |
| 14549.00 | 43.49 | 40.34 | 41.73 | 11.17 | 53.27 | 74.00 | -20.73 | Peak | HORIZONTAL |
| 16504.00 | 43.02 | 42.01 | 42.38 | 10.50 | 53.15 | 74.00 | -20.85 | Peak | HORIZONTAL |
| 6304.00 | 44.55 | 35.07 | 43.08 | 6.47 | 43.01 | 74.00 | -30.99 | Peak | VERTICAL |
| 9211.00 | 42.74 | 36.93 | 42.54 | 8.09 | 45.22 | 74.00 | -28.78 | Peak | VERTICAL |
| 11064.00 | 44.39 | 37.64 | 41.51 | 9.01 | 49.53 | 74.00 | -24.47 | Peak | VERTICAL |
| 13920.00 | 43.38 | 40.01 | 41.84 | 11.07 | 52.62 | 74.00 | -21.38 | Peak | VERTICAL |
| 15076.00 | 43.58 | 40.67 | 41.75 | 11.14 | 53.64 | 74.00 | -20.36 | Peak | VERTICAL |
| 16334.00 | 43.28 | 41.74 | 42.44 | 10.41 | 52.99 | 74.00 | -21.01 | Peak | VERTICAL |
| **11a CH165** | | | | | | | | | |
| 7715.00 | 44.81 | 36.08 | 43.27 | 7.00 | 44.62 | 74.00 | -29.38 | Peak | HORIZONTAL |
| 10299.00 | 44.31 | 37.58 | 42.83 | 8.82 | 47.88 | 74.00 | -26.12 | Peak | HORIZONTAL |
| 11744.00 | 45.48 | 38.30 | 42.60 | 9.07 | 50.25 | 74.00 | -23.75 | Peak | HORIZONTAL |
| 14396.00 | 43.95 | 40.28 | 41.74 | 11.15 | 53.64 | 74.00 | -20.36 | Peak | HORIZONTAL |
| 16249.00 | 44.22 | 41.60 | 42.47 | 10.36 | 53.71 | 74.00 | -20.29 | Peak | HORIZONTAL |
| 9041.00 | 43.30 | 36.83 | 42.26 | 7.95 | 45.82 | 74.00 | -28.18 | Peak | VERTICAL |
| 10945.00 | 44.65 | 37.52 | 41.49 | 8.99 | 49.67 | 74.00 | -24.33 | Peak | VERTICAL |
| 13325.00 | 44.16 | 38.76 | 42.48 | 10.84 | 51.28 | 74.00 | -22.72 | Peak | VERTICAL |
| 13920.00 | 44.28 | 40.01 | 41.84 | 11.07 | 53.52 | 74.00 | -20.48 | Peak | VERTICAL |
| 16674.00 | 42.51 | 42.39 | 42.23 | 10.60 | 53.27 | 74.00 | -20.73 | Peak | VERTICAL |

Conclusion: Pass

Note: -27 dBm/MHz Limit=95.2+EIRP[dBm]=95.2-27=68.2 dBμV/m
For transmitters operating in the 5150MHz-5250MHz, 5250MHz-5350MHz, 5470MHz-5725MHz, 5725MHz-5850MHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

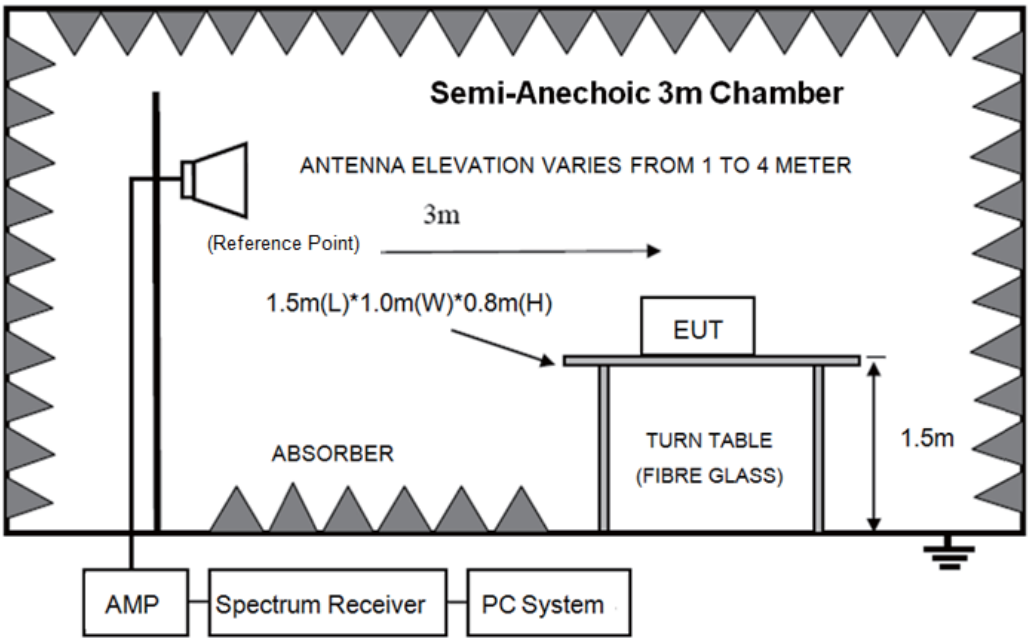
Note: 1. 30MHz~40GHz: (11a, 11n20, n40 mode all have been tested, only 11a mode is the worst case and reported.)

2. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# 9. Band Edge Compliance

## 9.1. Block diagram of test setup




## 9.2. Limit

For transmitters operating in the 5.15-5.25 GHz and 5.725-5.85 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

-27 dBm/MHz Limit=95.2+EIRP[dBm]=95.2-27=68.2 dBμV/m

## 9.3. Test Procedure

Same with clause 8.3 except change investigated frequency range from 5.15-5.25 GHz, 5250-5350 GHz, 5470-5725 GHz, 5.725-5.85 GHz.

Remark: All restriction band have been tested, and only the worst case is shown in report.

## 9.4. Test result

**PASS. (See below detailed test result)**

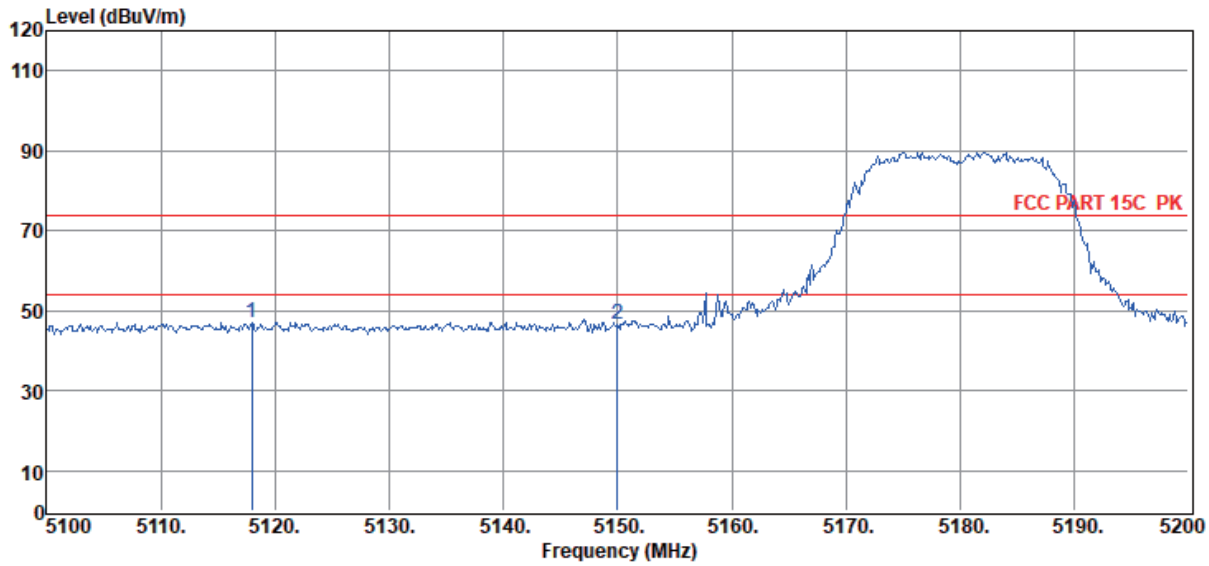
Note1: As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit

Note2: 11a, 11n20, n40 mode all have been tested, only 11a mode is the worst case and reported.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-06 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/VERTICAL |
| **Memo** | : 11A 5180 | | |

Data: 45



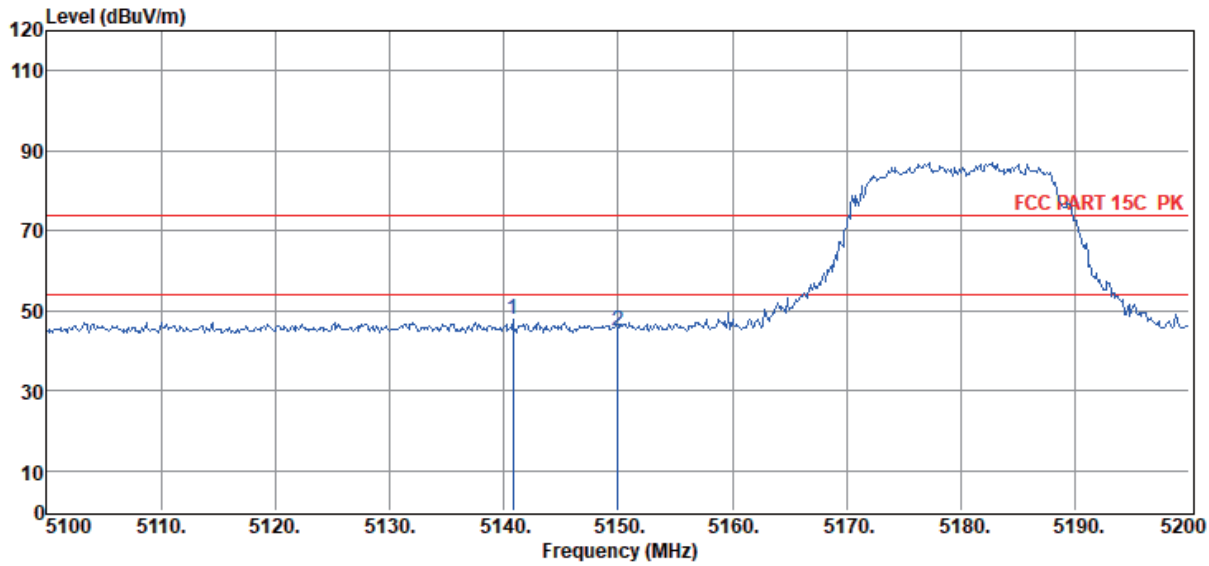

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5118.00 | 53.29 | 31.69 | 43.56 | 5.70 | 47.12 | 74.00 | -26.88 | Peak | VERTICAL |
| 2 | 5150.00 | 52.61 | 31.72 | 43.53 | 5.73 | 46.53 | 74.00 | -27.47 | Peak | VERTICAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-06 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/HORIZONTAL |
| **Memo** | : 11A 5180 | | |

Data: 46



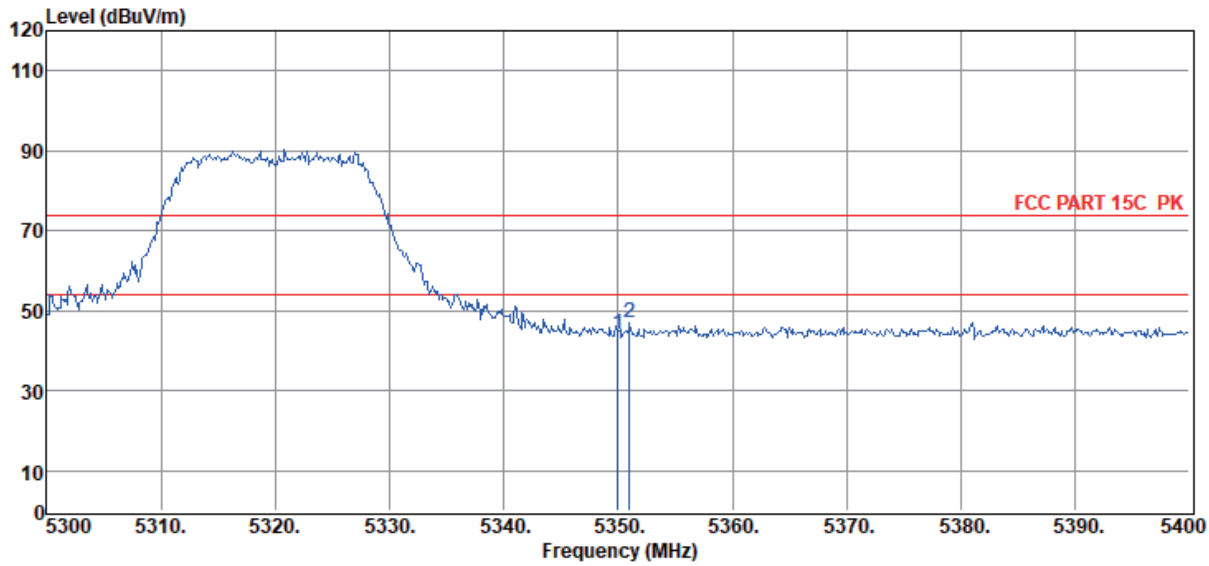

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5140.80 | 53.80 | 31.71 | 43.54 | 5.73 | 47.70 | 74.00 | -26.30 | Peak | HORIZONTAL |
| 2 | 5150.00 | 51.13 | 31.72 | 43.53 | 5.73 | 45.05 | 74.00 | -28.95 | Peak | HORIZONTAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/VERTICAL |
| **Memo** | : 11A 5320 | | |

Data: 47



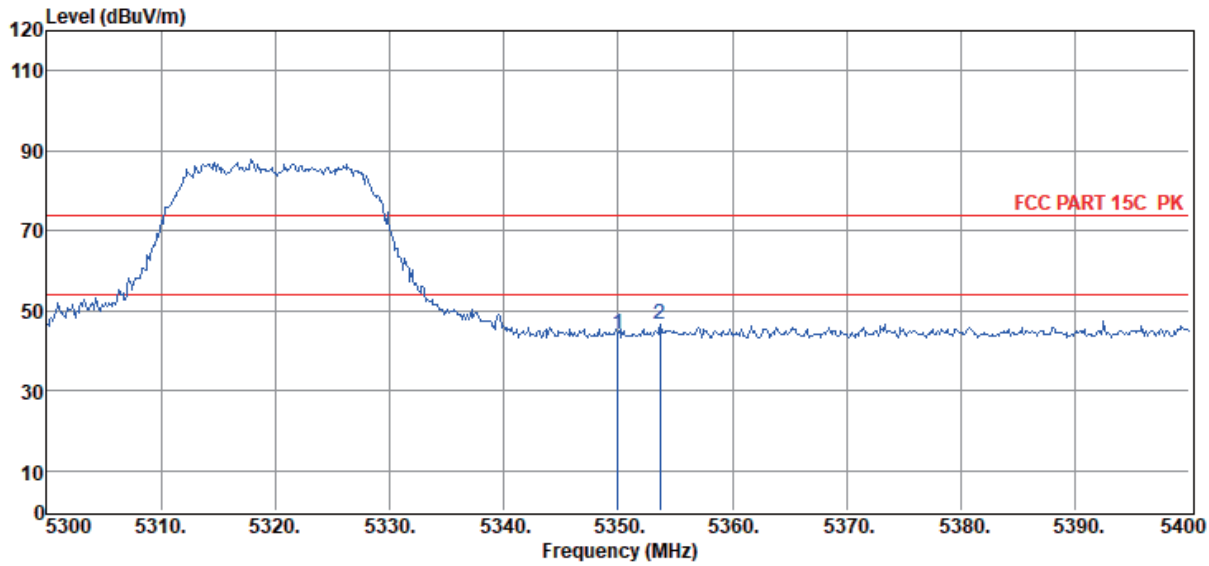

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5350.00 | 49.67 | 31.88 | 43.34 | 5.94 | 44.15 | 74.00 | -29.85 | Peak | VERTICAL |
| 2 | 5351.00 | 52.65 | 31.88 | 43.34 | 5.94 | 47.13 | 74.00 | -26.87 | Peak | VERTICAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/HORIZONTAL |
| **Memo** | : 11A 5320 | | |

Data: 48



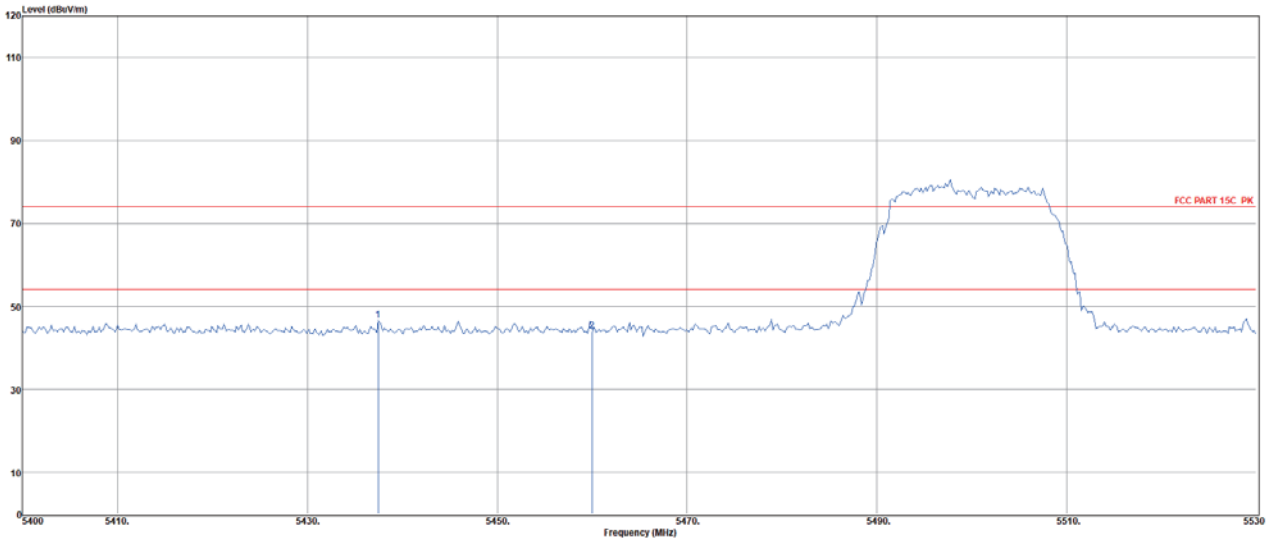

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5350.00 | 49.53 | 31.88 | 43.34 | 5.94 | 44.01 | 74.00 | -29.99 | Peak | HORIZONTAL |
| 2 | 5353.70 | 52.28 | 31.88 | 43.34 | 5.94 | 46.76 | 74.00 | -27.24 | Peak | HORIZONTAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/HORIZONTAL |
| **Memo** | : 11A 5500 | | |

Data: 49



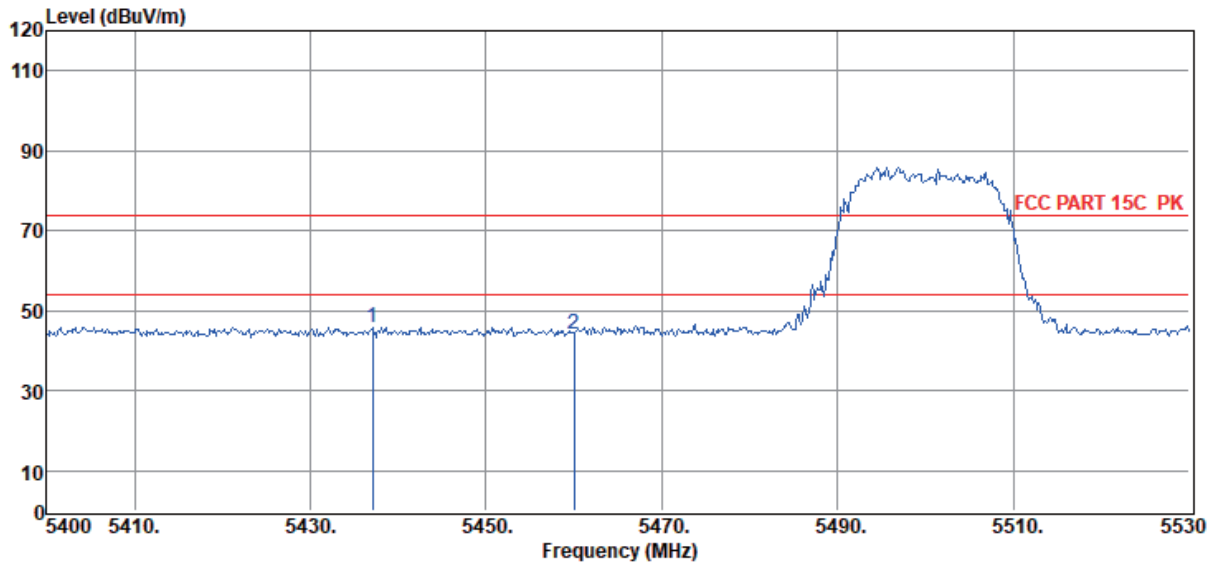

| Item (Mark) | Freq. (MHz) | Read Level (dBµV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBµV/m) | Limit Line (dBµV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5437.44 | 51.93 | 31.95 | 43.27 | 6.03 | 46.64 | 74.00 | -27.36 | Peak | HORIZONTAL |
| 2 | 5460.00 | 49.38 | 31.97 | 43.25 | 6.05 | 44.15 | 74.00 | -29.85 | Peak | HORIZONTAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/VERTICAL |
| **Memo** | : 11A 5500 | | |

Data: 50



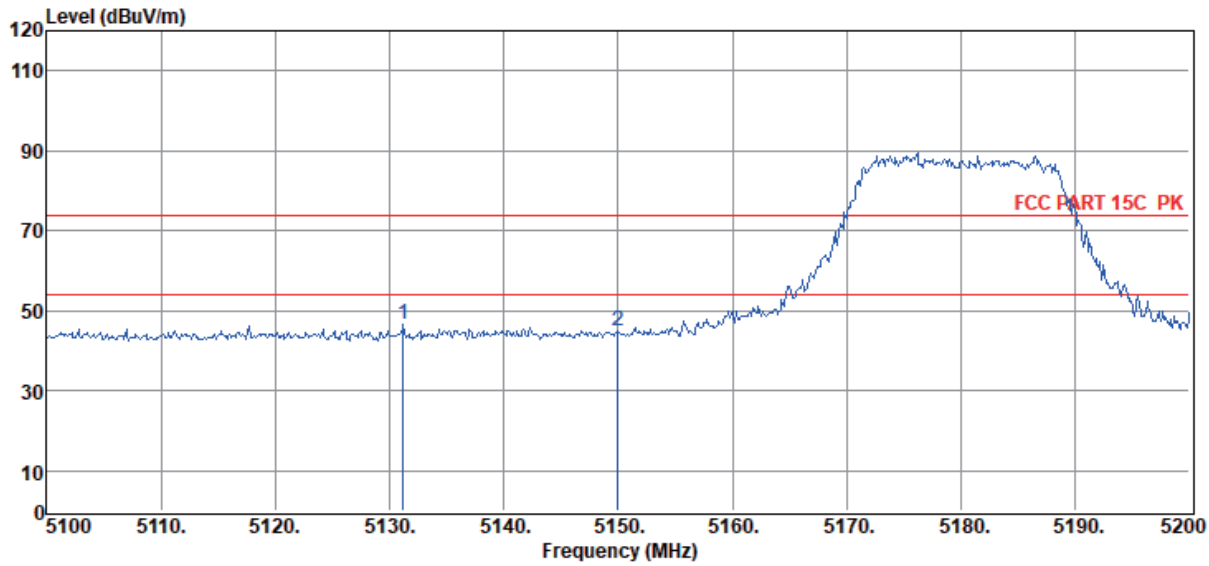

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5437.05 | 51.08 | 31.95 | 43.27 | 6.03 | 45.79 | 74.00 | -28.21 | Peak | VERTICAL |
| 2 | 5460.00 | 49.27 | 31.97 | 43.25 | 6.05 | 44.04 | 74.00 | -29.96 | Peak | VERTICAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/VERTICAL |
| **Memo** | : 11N20 5180 | | |

Data: 51



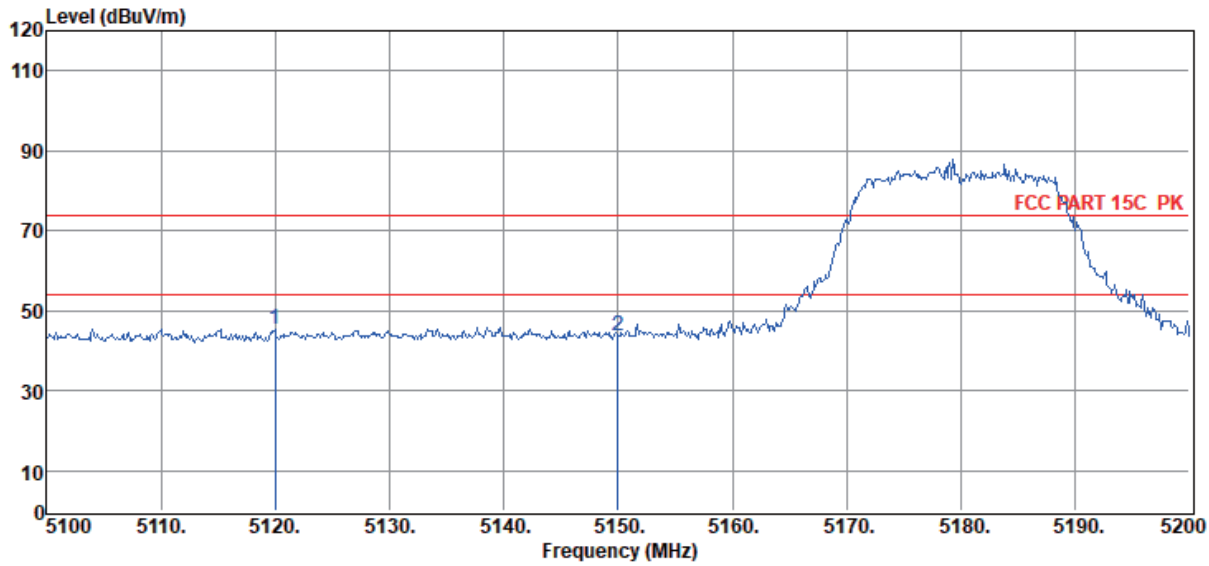

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5131.20 | 52.60 | 31.70 | 43.55 | 5.72 | 46.47 | 74.00 | -27.53 | Peak | VERTICAL |
| 2 | 5150.00 | 51.14 | 31.72 | 43.53 | 5.73 | 45.06 | 74.00 | -28.94 | Peak | VERTICAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/HORIZONTAL |
| **Memo** | : 11N20 5180 | | |

Data: 52



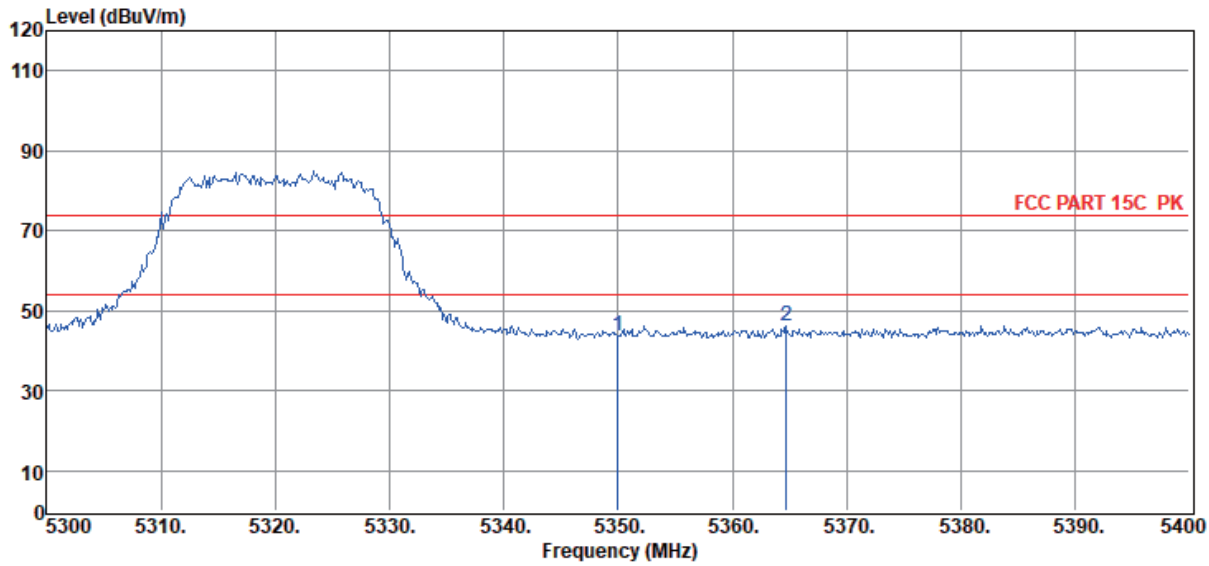

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5120.00 | 51.56 | 31.70 | 43.56 | 5.70 | 45.40 | 74.00 | -28.60 | Peak | HORIZONTAL |
| 2 | 5150.00 | 49.65 | 31.72 | 43.53 | 5.73 | 43.57 | 74.00 | -30.43 | Peak | HORIZONTAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/HORIZONTAL |
| **Memo** | : 11N20 5320 | | |

Data: 53



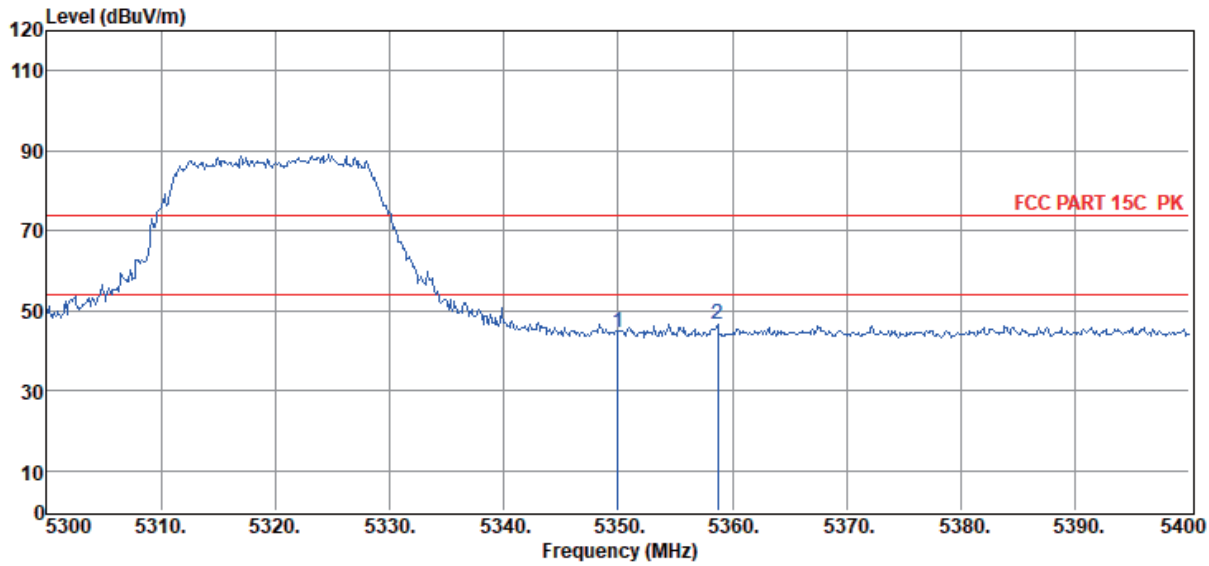

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5350.00 | 49.16 | 31.88 | 43.34 | 5.94 | 43.64 | 74.00 | -30.36 | Peak | HORIZONTAL |
| 2 | 5364.70 | 51.56 | 31.89 | 43.33 | 5.96 | 46.08 | 74.00 | -27.92 | Peak | HORIZONTAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/VERTICAL |
| **Memo** | : 11N20 5320 | | |

Data: 54



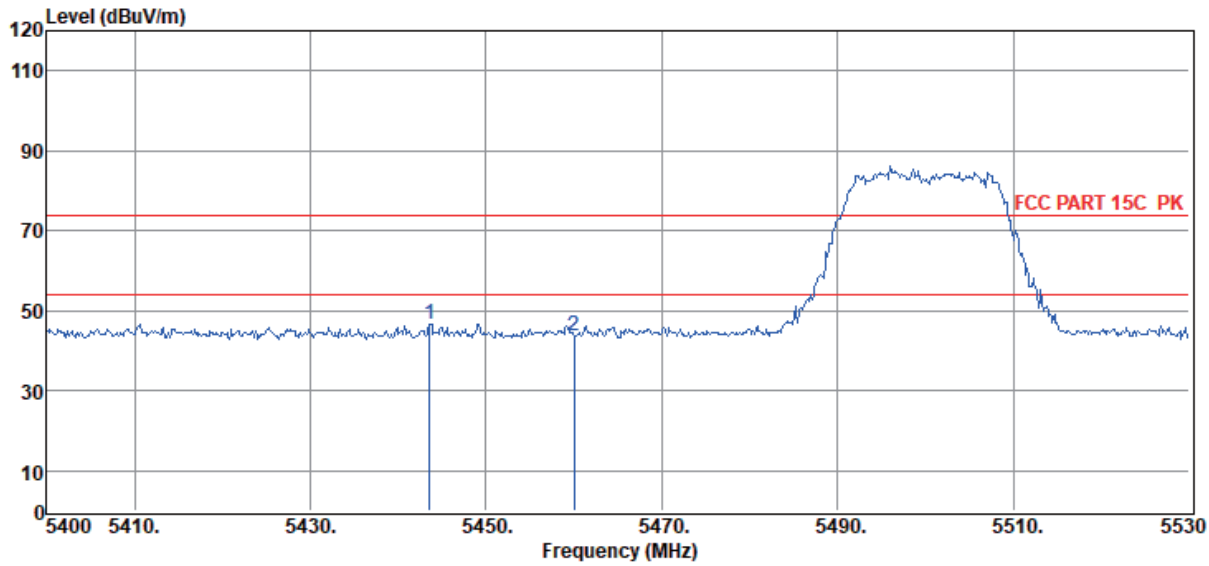

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5350.00 | 50.20 | 31.88 | 43.34 | 5.94 | 44.68 | 74.00 | -29.32 | Peak | VERTICAL |
| 2 | 5358.70 | 51.93 | 31.89 | 43.33 | 5.95 | 46.44 | 74.00 | -27.56 | Peak | VERTICAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/VERTICAL |
| **Memo** | : 11N20 5500 | | |

Data: 55



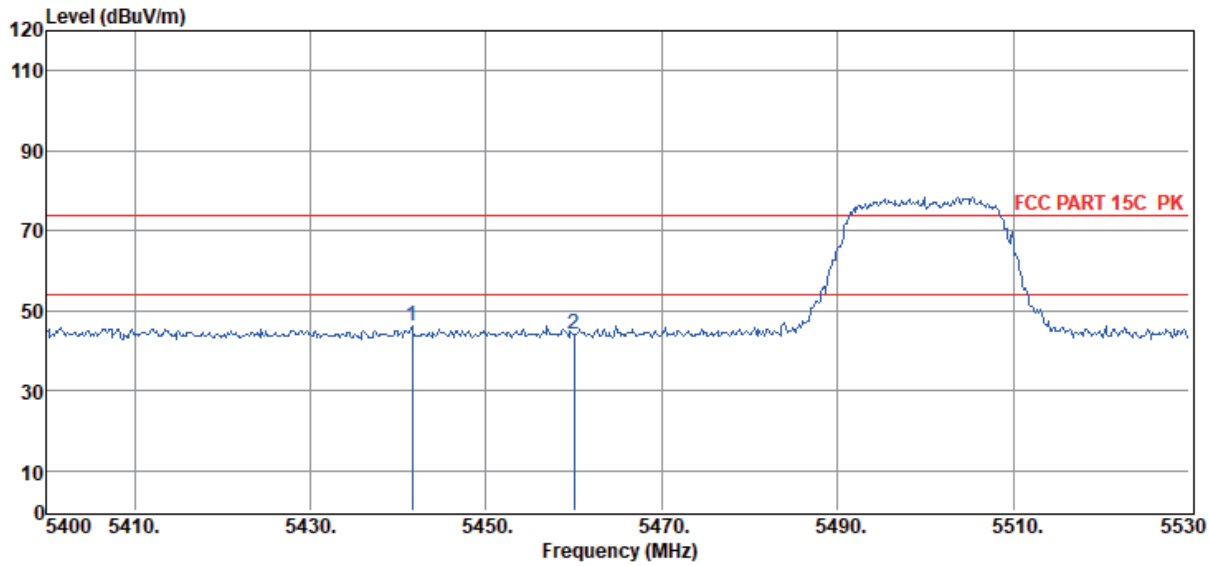

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5443.55 | 52.06 | 31.95 | 43.26 | 6.04 | 46.79 | 74.00 | -27.21 | Peak | VERTICAL |
| 2 | 5460.00 | 48.99 | 31.97 | 43.25 | 6.05 | 43.76 | 74.00 | -30.24 | Peak | VERTICAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/HORIZONTAL |
| **Memo** | : 11N20 5500 | | |

Data: 56



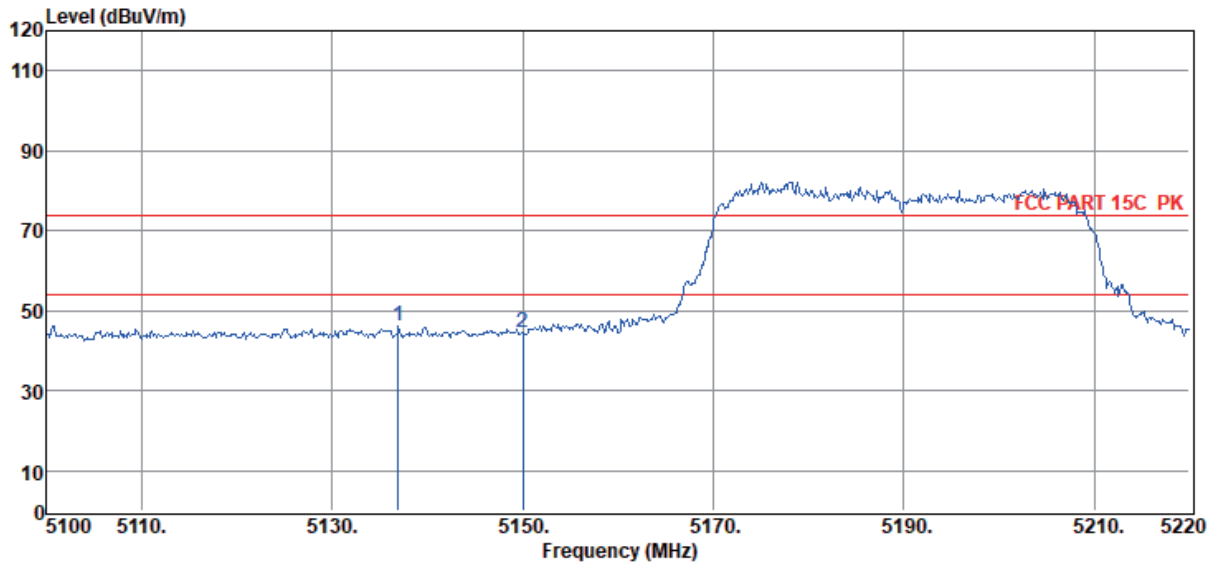

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5441.60 | 51.27 | 31.95 | 43.26 | 6.03 | 45.99 | 74.00 | -28.01 | Peak | HORIZONTAL |
| 2 | 5460.00 | 49.35 | 31.97 | 43.25 | 6.05 | 44.12 | 74.00 | -29.88 | Peak | HORIZONTAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/HORIZONTAL |
| **Memo** | : 11N40 5190 | | |

Data: 57



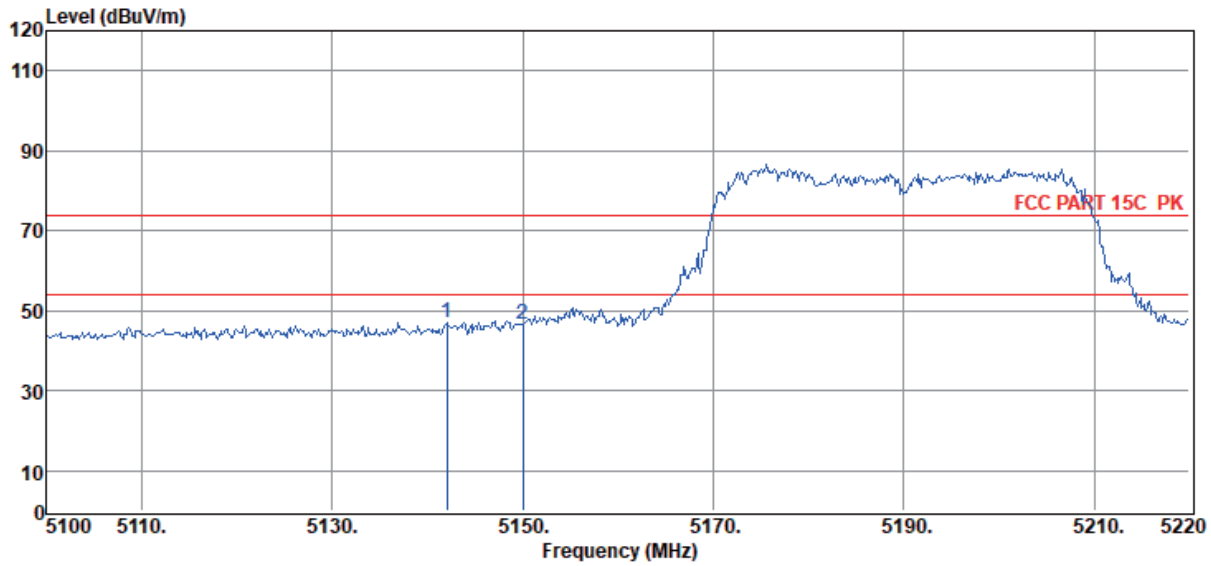

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5136.96 | 52.13 | 31.71 | 43.54 | 5.72 | 46.02 | 74.00 | -27.98 | Peak | HORIZONTAL |
| 2 | 5150.00 | 50.49 | 31.72 | 43.53 | 5.73 | 44.41 | 74.00 | -29.59 | Peak | HORIZONTAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/VERTICAL |
| **Memo** | : 11N40 5190 | | |

Data: 58



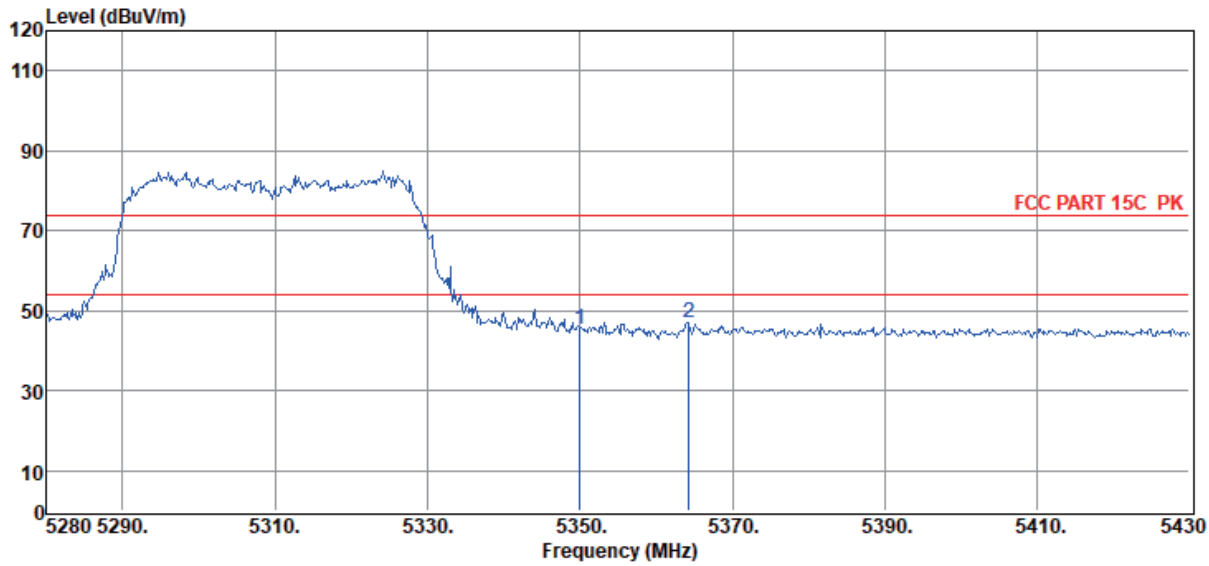

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5142.00 | 53.20 | 31.71 | 43.54 | 5.73 | 47.10 | 74.00 | -26.90 | Peak | VERTICAL |
| 2 | 5150.00 | 52.55 | 31.72 | 43.53 | 5.73 | 46.47 | 74.00 | -27.53 | Peak | VERTICAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/VERTICAL |
| **Memo** | : 11N40 5310 | | |

Data: 59



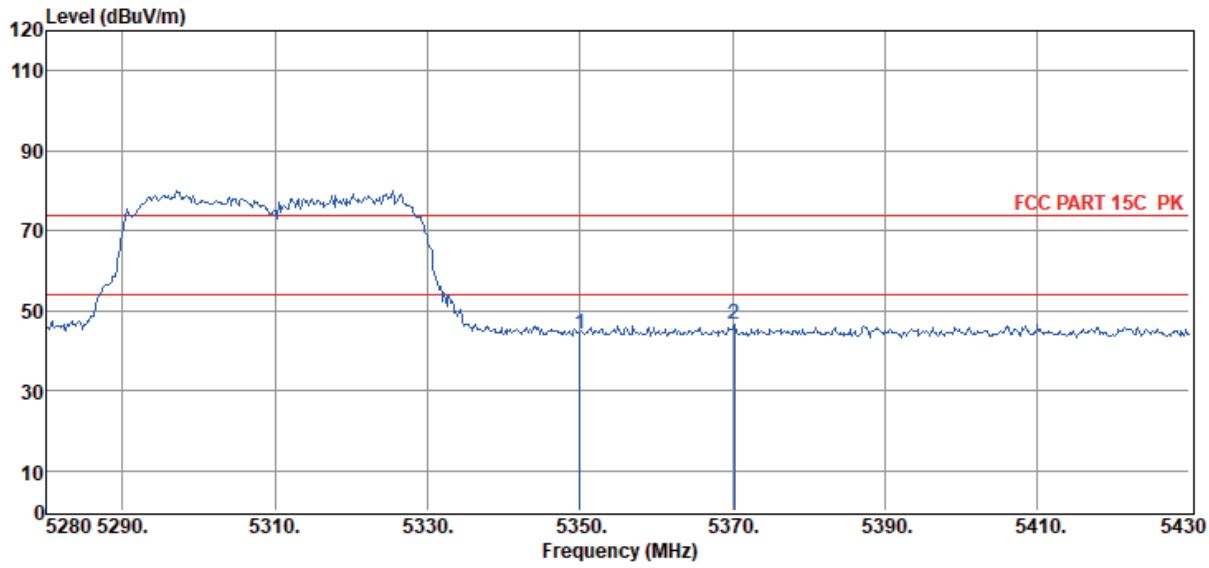

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5350.00 | 50.74 | 31.88 | 43.34 | 5.94 | 45.22 | 74.00 | -28.78 | Peak | VERTICAL |
| 2 | 5364.30 | 52.63 | 31.89 | 43.33 | 5.96 | 47.15 | 74.00 | -26.85 | Peak | VERTICAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/HORIZONTAL |
| **Memo** | : 11N40 5310 | | |

Data: 60



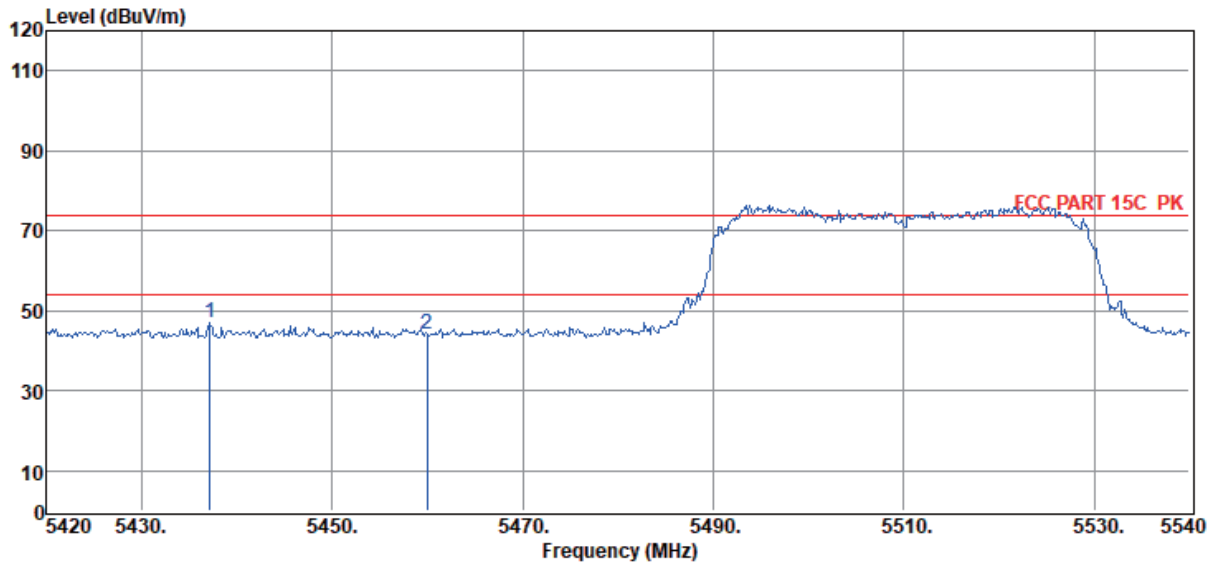

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5350.00 | 49.74 | 31.88 | 43.34 | 5.94 | 44.22 | 74.00 | -29.78 | Peak | HORIZONTAL |
| 2 | 5370.30 | 52.05 | 31.90 | 43.32 | 5.96 | 46.59 | 74.00 | -27.41 | Peak | HORIZONTAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/HORIZONTAL |
| **Memo** | : 11N40 5310 | | |

Data: 61



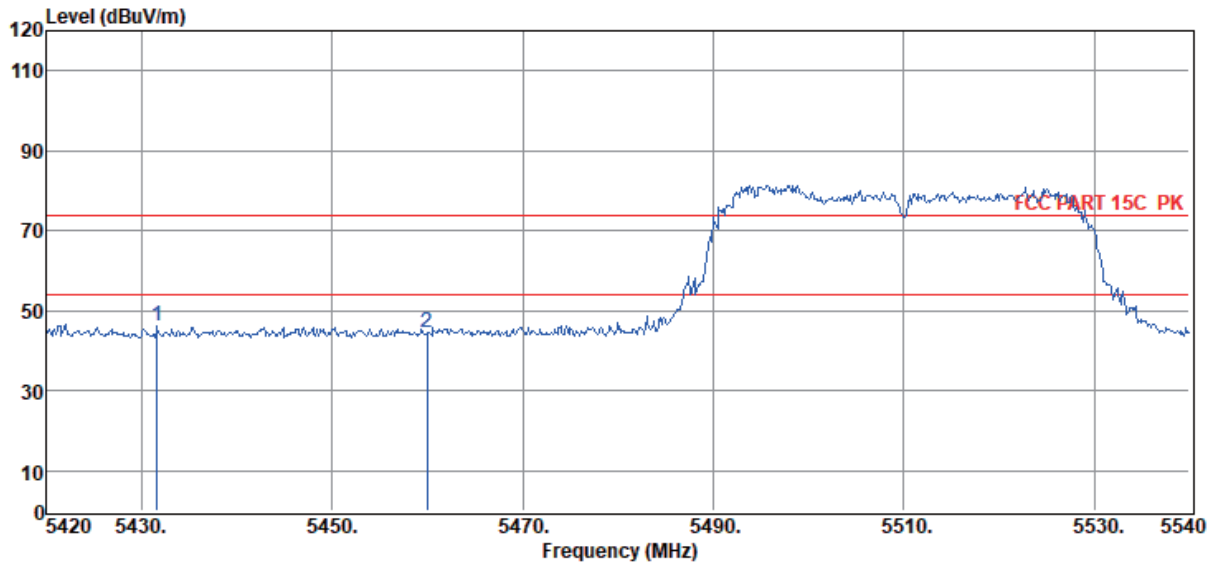

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5437.16 | 52.34 | 31.95 | 43.27 | 6.03 | 47.05 | 74.00 | -26.95 | Peak | HORIZONTAL |
| 2 | 5460.00 | 49.33 | 31.97 | 43.25 | 6.05 | 44.10 | 74.00 | -29.90 | Peak | HORIZONTAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 3m Chamber 1# | D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6 | |
| **Test Date** | : 2019-11-18 | **Tested By** | : Jacky |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : Battery | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:55%, Press:100.1kPa | **Antenna/Distance** | : 2019 BBHA 9120 D/3m/VERTICAL |
| **Memo** | : 11N40 5310 | | |

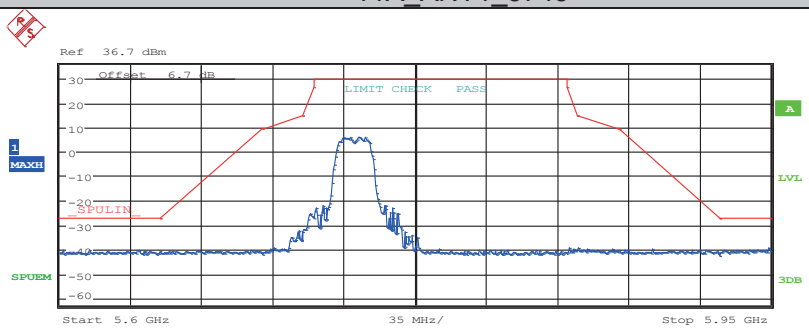
Data: 62




| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor dB | Cable Loss dB | Result Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5431.64 | 51.38 | 31.95 | 43.27 | 6.02 | 46.08 | 74.00 | -27.92 | Peak | VERTICAL |
| 2 | 5460.00 | 49.66 | 31.97 | 43.25 | 6.05 | 44.43 | 74.00 | -29.57 | Peak | VERTICAL |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## 11A_ANT1_5745




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | Δ Limit [dB] |
|---|---|---|---|---|---|
| 5.600 G | 5.650 G | 1.00 M | 5.639188 G | -40.63 | -13.63 |
| 5.650 G | 5.700 G | 1.00 M | 5.650000 G | -41.77 | -14.77 |
| 5.700 G | 5.720 G | 1.00 M | 5.717500 G | -32.78 | -47.68 |
| 5.720 G | 5.725 G | 1.00 M | 5.720103 G | -32.20 | -48.04 |
| 5.725 G | 5.850 G | 1.00 M | 5.743125 G | 5.97 | -24.03 |
| 5.850 G | 5.855 G | 1.00 M | 5.854984 G | -40.32 | -55.95 |
| 5.855 G | 5.875 G | 1.00 M | 5.874975 G | -40.99 | -50.99 |
| 5.875 G | 5.925 G | 1.00 M | 5.924844 G | -41.53 | -14.65 |
| 5.925 G | 5.950 G | 1.00 M | 5.948656 G | -39.77 | -12.77 |

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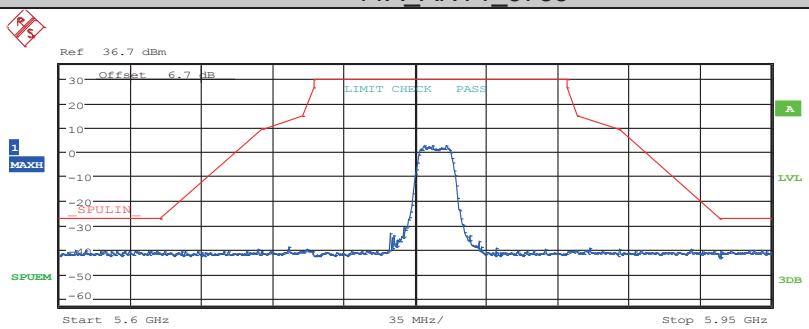
## 11A_ANT1_5785




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | Δ Limit [dB] |
|---|---|---|---|---|---|
| 5.600 G | 5.650 G | 1.00 M | 5.607875 G | -40.36 | -13.36 |
| 5.650 G | 5.700 G | 1.00 M | 5.650000 G | -42.19 | -15.19 |
| 5.700 G | 5.720 G | 1.00 M | 5.700088 G | -41.81 | -51.83 |
| 5.720 G | 5.725 G | 1.00 M | 5.720038 G | -41.41 | -57.10 |
| 5.725 G | 5.850 G | 1.00 M | 5.790078 G | 2.52 | -27.48 |
| 5.850 G | 5.855 G | 1.00 M | 5.854841 G | -41.12 | -57.08 |
| 5.855 G | 5.875 G | 1.00 M | 5.872875 G | -40.43 | -51.03 |
| 5.875 G | 5.925 G | 1.00 M | 5.924812 G | -41.83 | -14.97 |
| 5.925 G | 5.950 G | 1.00 M | 5.941438 G | -40.56 | -13.56 |

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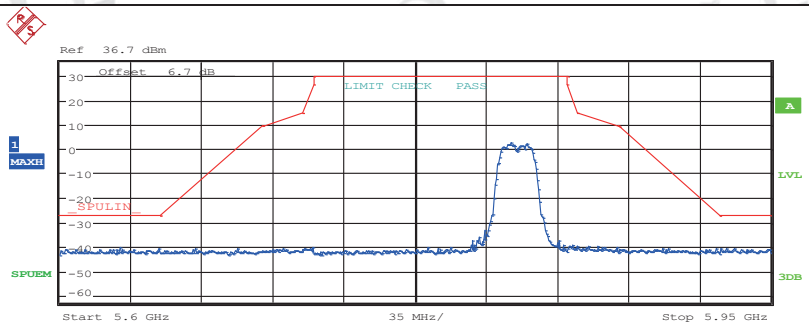
## 11A_ANT1_5825




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | Δ Limit [dB] |
|---|---|---|---|---|---|
| 5.600 G | 5.650 G | 1.00 M | 5.629812 G | -40.46 | -13.46 |
| 5.650 G | 5.700 G | 1.00 M | 5.650062 G | -42.88 | -15.93 |
| 5.700 G | 5.720 G | 1.00 M | 5.700000 G | -41.90 | -51.90 |
| 5.720 G | 5.725 G | 1.00 M | 5.720059 G | -41.54 | -57.28 |
| 5.725 G | 5.850 G | 1.00 M | 5.821797 G | 2.50 | -27.50 |
| 5.850 G | 5.855 G | 1.00 M | 5.854872 G | -40.09 | -55.98 |
| 5.855 G | 5.875 G | 1.00 M | 5.874025 G | -40.71 | -50.98 |
| 5.875 G | 5.925 G | 1.00 M | 5.924594 G | -42.31 | -15.61 |
| 5.925 G | 5.950 G | 1.00 M | 5.925125 G | -40.87 | -13.87 |

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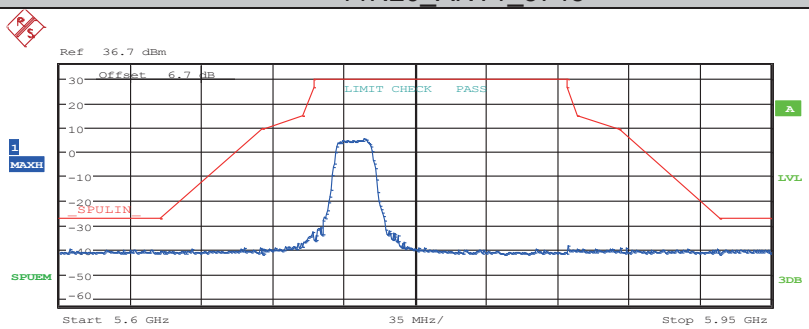
11N20_ANT1_5745




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | Δ Limit [dB] |
|---|---|---|---|---|---|
| 5.600 G | 5.650 G | 1.00 M | 5.605062 G | -40.24 | -13.24 |
| 5.650 G | 5.700 G | 1.00 M | 5.650156 G | -41.18 | -14.29 |
| 5.700 G | 5.720 G | 1.00 M | 5.700550 G | -40.27 | -50.42 |
| 5.720 G | 5.725 G | 1.00 M | 5.720022 G | -37.30 | -52.95 |
| 5.725 G | 5.850 G | 1.00 M | 5.749609 G | 5.49 | -24.51 |
| 5.850 G | 5.855 G | 1.00 M | 5.854819 G | -39.98 | -55.99 |
| 5.855 G | 5.875 G | 1.00 M | 5.872225 G | -39.91 | -50.69 |
| 5.875 G | 5.925 G | 1.00 M | 5.923875 G | -40.27 | -14.10 |
| 5.925 G | 5.950 G | 1.00 M | 5.945656 G | -40.31 | -13.31 |

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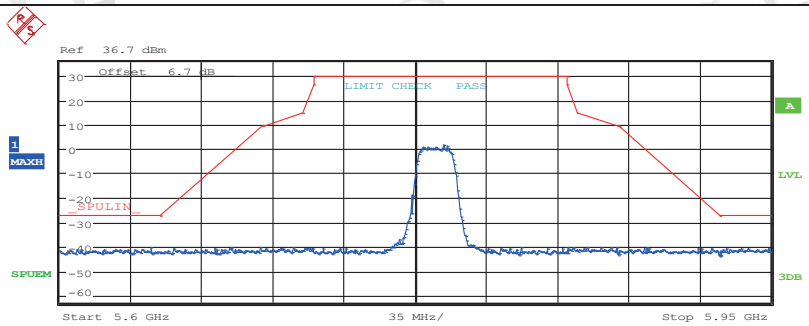
11N20_ANT1_5785




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | Δ Limit [dB] |
|---|---|---|---|---|---|
| 5.600 G | 5.650 G | 1.00 M | 5.644906 G | -40.40 | -13.40 |
| 5.650 G | 5.700 G | 1.00 M | 5.650156 G | -42.62 | -15.73 |
| 5.700 G | 5.720 G | 1.00 M | 5.701738 G | -40.85 | -51.34 |
| 5.720 G | 5.725 G | 1.00 M | 5.720022 G | -42.06 | -57.71 |
| 5.725 G | 5.850 G | 1.00 M | 5.788906 G | 1.67 | -28.33 |
| 5.850 G | 5.855 G | 1.00 M | 5.854978 G | -41.88 | -57.53 |
| 5.855 G | 5.875 G | 1.00 M | 5.875000 G | -40.55 | -50.55 |
| 5.875 G | 5.925 G | 1.00 M | 5.924812 G | -42.47 | -15.61 |
| 5.925 G | 5.950 G | 1.00 M | 5.948641 G | -41.09 | -14.09 |

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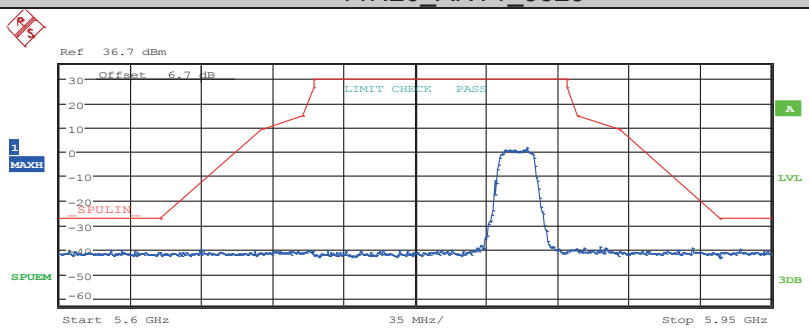
11N20_ANT1_5825




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | Δ Limit [dB] |
|---|---|---|---|---|---|
| 5.600 G | 5.650 G | 1.00 M | 5.604594 G | -40.38 | -13.38 |
| 5.650 G | 5.700 G | 1.00 M | 5.650469 G | -42.20 | -15.54 |
| 5.700 G | 5.720 G | 1.00 M | 5.700275 G | -41.83 | -51.90 |
| 5.720 G | 5.725 G | 1.00 M | 5.720003 G | -41.77 | -57.38 |
| 5.725 G | 5.850 G | 1.00 M | 5.829688 G | 1.60 | -28.40 |
| 5.850 G | 5.855 G | 1.00 M | 5.854909 G | -40.03 | -55.83 |
| 5.855 G | 5.875 G | 1.00 M | 5.868837 G | -39.57 | -51.29 |
| 5.875 G | 5.925 G | 1.00 M | 5.924812 G | -41.76 | -14.90 |
| 5.925 G | 5.950 G | 1.00 M | 5.934797 G | -39.96 | -12.96 |

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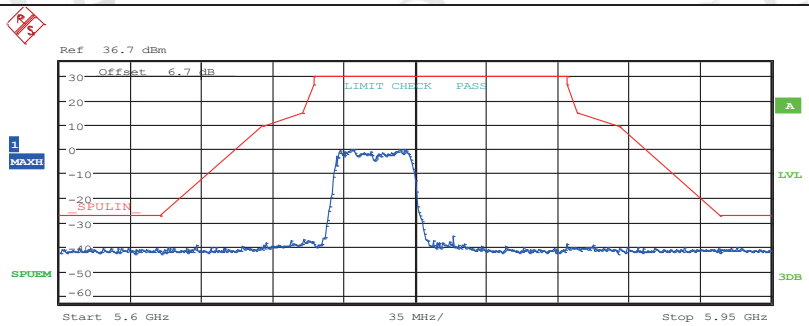
11N40_ANT1_5755




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | Δ Limit [dB] |
|---|---|---|---|---|---|
| 5.600 G | 5.650 G | 1.00 M | 5.647594 G | -40.82 | -13.82 |
| 5.650 G | 5.700 G | 1.00 M | 5.650406 G | -42.33 | -15.63 |
| 5.700 G | 5.720 G | 1.00 M | 5.701638 G | -38.84 | -49.30 |
| 5.720 G | 5.725 G | 1.00 M | 5.720166 G | -37.12 | -53.10 |
| 5.725 G | 5.850 G | 1.00 M | 5.743437 G | -0.10 | -30.10 |
| 5.850 G | 5.855 G | 1.00 M | 5.854875 G | -41.20 | -57.08 |
| 5.855 G | 5.875 G | 1.00 M | 5.874350 G | -41.74 | -51.92 |
| 5.875 G | 5.925 G | 1.00 M | 5.924688 G | -40.84 | -14.07 |
| 5.925 G | 5.950 G | 1.00 M | 5.933328 G | -40.63 | -13.63 |

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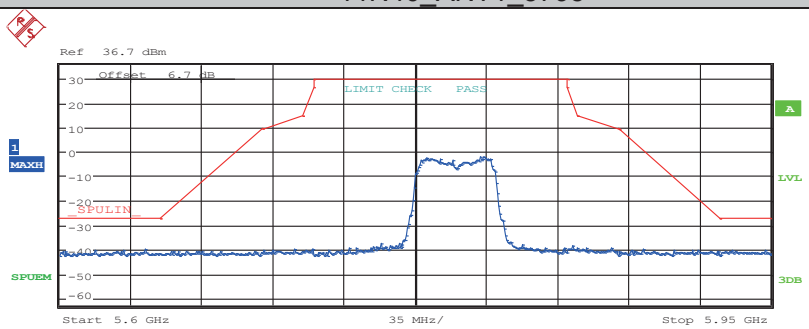
## 11N40_ANT1_5795




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | Δ Limit [dB] |
|---|---|---|---|---|---|
| 5.600 G | 5.650 G | 1.00 M | 5.641781 G | -40.23 | -13.23 |
| 5.650 G | 5.700 G | 1.00 M | 5.650156 G | -42.47 | -15.58 |
| 5.700 G | 5.720 G | 1.00 M | 5.700225 G | -40.55 | -50.61 |
| 5.720 G | 5.725 G | 1.00 M | 5.720072 G | -41.51 | -57.27 |
| 5.725 G | 5.850 G | 1.00 M | 5.806953 G | -1.84 | -31.84 |
| 5.850 G | 5.855 G | 1.00 M | 5.854981 G | -39.96 | -55.60 |
| 5.855 G | 5.875 G | 1.00 M | 5.871487 G | -39.73 | -50.71 |
| 5.875 G | 5.925 G | 1.00 M | 5.924531 G | -40.96 | -14.31 |
| 5.925 G | 5.950 G | 1.00 M | 5.947234 G | -40.45 | -13.45 |

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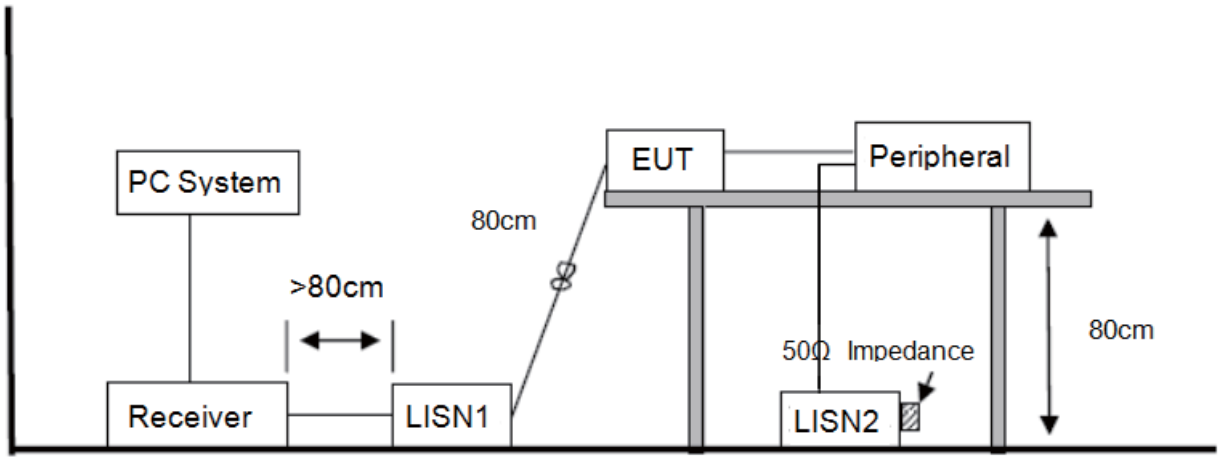
# 10. Power Line Conducted Emission

## 10.1. Block diagram of test setup




## 10.2. Power Line Conducted Emission Limits (Class B)

| Frequency | Quasi-Peak Level dB(μV) | Average Level dB(μV) |
|---|---|---|
| 150 kHz ~ 500 kHz | 66 ~ 56* | 56 ~ 46* |
| 500 kHz ~ 5 MHz | 56 | 46 |
| 5 MHz ~ 30 MHz | 60 | 50 |

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

## 10.3. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.3 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.3 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.
EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

## 10.4. Test Result

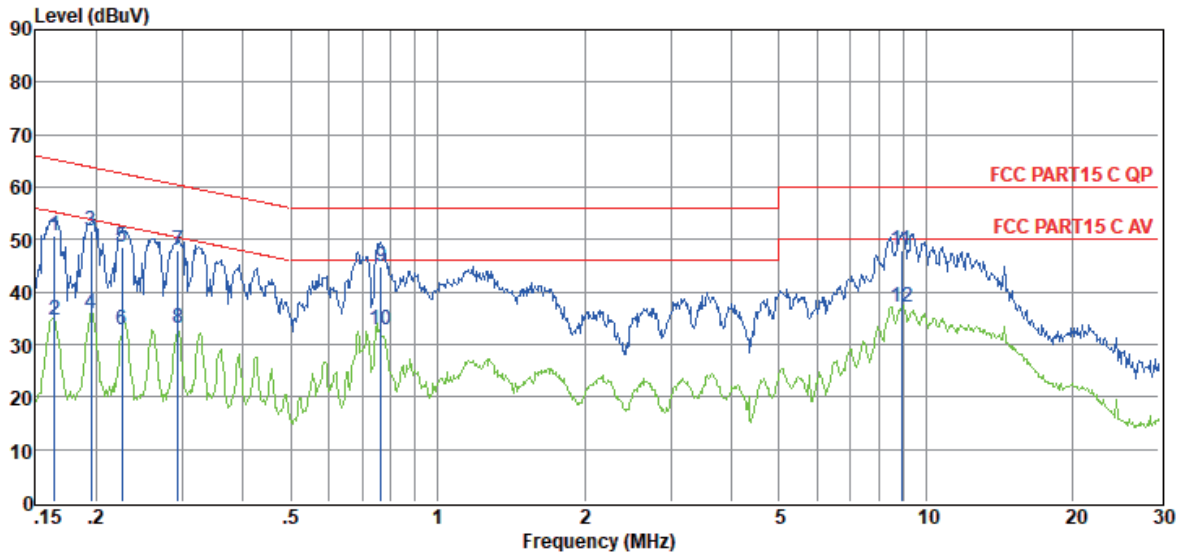
## PASS. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.
Note2: "-----" means peak detection; "-----" means average detection
Note3: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/60Hz, recorded worse case (AC 120V/60Hz).

# TR-4-E-010 Conducted Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 1# Shield Room | D:\2019 CE report data\Q19081209-1E\CE.EM6 | |
| **Test Date** | : 2019-08-19 | **Tested By** | : Lori |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : AC 120V/60Hz | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:71.2%, Press:101.4kPa | **LISN** | : 2018 ENV216/LINE |
| **Memo** | : | | |

Data: 11



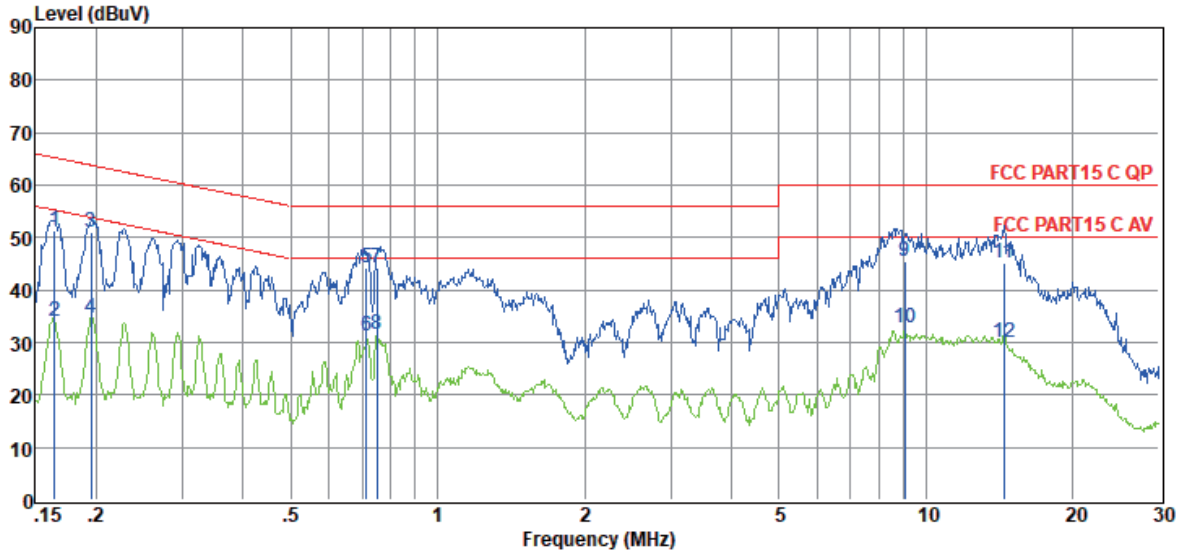

| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | LISN Factor (dB) | Cable Loss (dB) | Pulse Limiter Factor (dB) | Result Level (dBμV) | Limit Line (dBμV) | Over Limit (dB) | Detector | Phase |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.16 | 31.32 | 9.63 | 0.02 | 9.86 | 50.83 | 65.25 | -14.42 | QP | LINE |
| 2 | 0.16 | 15.26 | 9.63 | 0.02 | 9.86 | 34.77 | 55.25 | -20.48 | Average | LINE |
| 3 | 0.20 | 32.22 | 9.63 | 0.02 | 9.86 | 51.73 | 63.80 | -12.07 | QP | LINE |
| 4 | 0.20 | 16.22 | 9.63 | 0.02 | 9.86 | 35.73 | 53.80 | -18.07 | Average | LINE |
| 5 | 0.23 | 28.99 | 9.63 | 0.02 | 9.86 | 48.50 | 62.61 | -14.11 | QP | LINE |
| 6 | 0.23 | 13.23 | 9.63 | 0.02 | 9.86 | 32.74 | 52.61 | -19.87 | Average | LINE |
| 7 | 0.29 | 28.40 | 9.63 | 0.02 | 9.86 | 47.91 | 60.41 | -12.50 | QP | LINE |
| 8 | 0.29 | 13.49 | 9.63 | 0.02 | 9.86 | 33.00 | 50.41 | -17.41 | Average | LINE |
| 9 | 0.77 | 25.21 | 9.64 | 0.04 | 9.86 | 44.75 | 56.00 | -11.25 | QP | LINE |
| 10 | 0.77 | 13.25 | 9.64 | 0.04 | 9.86 | 32.79 | 46.00 | -13.21 | Average | LINE |
| 11 | 8.92 | 28.23 | 9.76 | 0.07 | 9.90 | 47.96 | 60.00 | -12.04 | QP | LINE |
| 12 | 8.92 | 17.46 | 9.76 | 0.07 | 9.90 | 37.19 | 50.00 | -12.81 | Average | LINE |

Note: 1. Result Level = Read Level +LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

# TR-4-E-010 Conducted Emission Test Result

| | | | |
|---|---|---|---|
| **Test Site** | : DDT 1# Shield Room | D:\2019 CE report data\Q19081209-1E\CE.EM6 | |
| **Test Date** | : 2019-08-19 | **Tested By** | : Lori |
| **EUT** | : Portable High Resolution Music Player | **Model Number** | : M11 Pro |
| **Power Supply** | : AC 120V/60Hz | **Test Mode** | : Tx mode |
| **Condition** | : Temp:24.5'C, Humi:71.2%, Press:101.4kPa | **LISN** | : 2018 ENV216/NEUTRAL |
| **Memo** | : | | |

Data: 12




| Item (Mark) | Freq. (MHz) | Read Level (dBμV) | LISN Factor (dB) | Cable Loss (dB) | Pulse Limiter Factor (dB) | Result Level (dBμV) | Limit Line (dBμV) | Over Limit (dB) | Detector | Phase |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.16 | 31.71 | 9.64 | 0.02 | 9.86 | 51.23 | 65.25 | -14.02 | QP | NEUTRAL |
| 2 | 0.16 | 14.43 | 9.64 | 0.02 | 9.86 | 33.95 | 55.25 | -21.30 | Average | NEUTRAL |
| 3 | 0.20 | 31.65 | 9.64 | 0.02 | 9.86 | 51.17 | 63.80 | -12.63 | QP | NEUTRAL |
| 4 | 0.20 | 14.98 | 9.64 | 0.02 | 9.86 | 34.50 | 53.80 | -19.30 | Average | NEUTRAL |
| 5 | 0.72 | 24.81 | 9.64 | 0.04 | 9.86 | 44.35 | 56.00 | -11.65 | QP | NEUTRAL |
| 6 | 0.72 | 11.63 | 9.64 | 0.04 | 9.86 | 31.17 | 46.00 | -14.83 | Average | NEUTRAL |
| 7 | 0.75 | 24.57 | 9.64 | 0.04 | 9.86 | 44.11 | 56.00 | -11.89 | QP | NEUTRAL |
| 8 | 0.75 | 12.13 | 9.64 | 0.04 | 9.86 | 31.67 | 46.00 | -14.33 | Average | NEUTRAL |
| 9 | 9.06 | 25.72 | 9.79 | 0.08 | 9.90 | 45.49 | 60.00 | -14.51 | QP | NEUTRAL |
| 10 | 9.06 | 13.01 | 9.79 | 0.08 | 9.90 | 32.78 | 50.00 | -17.22 | Average | NEUTRAL |
| 11 | 14.44 | 24.88 | 10.27 | 0.05 | 9.93 | 45.13 | 60.00 | -14.87 | QP | NEUTRAL |
| 12 | 14.44 | 9.81 | 10.27 | 0.05 | 9.93 | 30.06 | 50.00 | -19.94 | Average | NEUTRAL |

Note: 1. Result Level = Read Level +LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

# 11. Antenna Requirements

## 11.1. Limit

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.

## 11.2. Result

The antenna used for this product is dedicated FPC antenna and other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 2.67 dBi.

# 12. Dynamic Frequency Selection

## 12.1. Applicability of DFS requirements

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

| Requirement | Operational Mode | | |
|---|---|---|---|
| | ☐Master | ☒Client Without Radar Detection | ☐Client with Radar Detection |
| Non-Occupancy Period | Yes | Not required | Yes |
| DFS Detection Threshold | Yes | Not required | Yes |
| Channel Availability Check Time | Yes | Not required | Not required |
| U-NII Detection Bandwidth | Yes | Not required | Yes |

Table 2: Applicability of DFS requirements during normal operation

| Requirement | Operational Mode | |
|---|---|---|
| | ☐Master Device or Client with Radar Detection | ☒Client Without Radar Detection |
| DFS Detection Threshold | Yes | Not required |
| Channel Closing Transmission Time | Yes | Yes |
| Channel Move Time | Yes | Yes |
| U-NII Detection Bandwidth | Yes | Not required |

| | | |
|---|---|---|
| Additional requirements for devices with multiple bandwidth modes | ☐Master Device or Client with Radar Detection | ☒Client Without Radar Detection |
| U-NII Detection Bandwidth and Statistical Performance Check | All BW modes must be tested | Not required |
| Channel Move Time and Channel Closing Transmission Time | Test using widest BW mode available | Test using the widest BW mode available for the link |
| All other tests | Any single BW mode | Not required |
| Note: Frequencies selected for statistical performance check should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency. | | |

## 12.2. Limit

(1) DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

| Maximum Transmit Power | Value (See Notes 1, 2, and 3) |
|---|---|
| EIRP ≥ 200 milliwatt | -64 dBm |
| EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz | -62 dBm |
| EIRP < 200 milliwatt that do not meet the power spectral density requirement | -64 dBm |
| Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.<br>Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.<br>Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01. | |

(2) DFS Response Requirements

Table 4: DFS Response Requirement Values

| Parameter | Value |
|---|---|
| Non-occupancy period | Minimum 30 minutes |
| Channel Availability Check Time | 60 seconds |
| Channel Move Time | 10 seconds<br>See Note 1. |
| Channel Closing Transmission Time | 200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period.<br>See Notes 1 and 2. |
| U-NII Detection Bandwidth | Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3. |
| Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.<br>Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required facilitating a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.<br>Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic. | |

## 12.3. Parameters of radar test waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test
waveforms.

Table 5 Short Pulse Radar Test Waveforms

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Number of Pulses | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|---|---|---|---|---|---|
| 0 | 1 | 1428 | 18 | See Note 1 | See Note 1 |
| 1 | 1 | Test A | $\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu sec}}\right)\right\}$ | 60% | 30 |
| | | Test B | | | |
| 2 | 1-5 | 150-230 | 23-29 | 60% | 30 |
| 3 | 6-10 | 200-500 | 16-18 | 60% | 30 |
| 4 | 11-20 | 200-500 | 12-16 | 60% | 30 |
| Aggregate (Radar Types 1-4) | | | | 80% | 120 |

Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.
Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a
Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B. Test aggregate is average of the percentage of successful detections of short pulse radar types 1-4

## 12.4. Calibration of radar waveform

Radar Waveform Calibration Procedure:

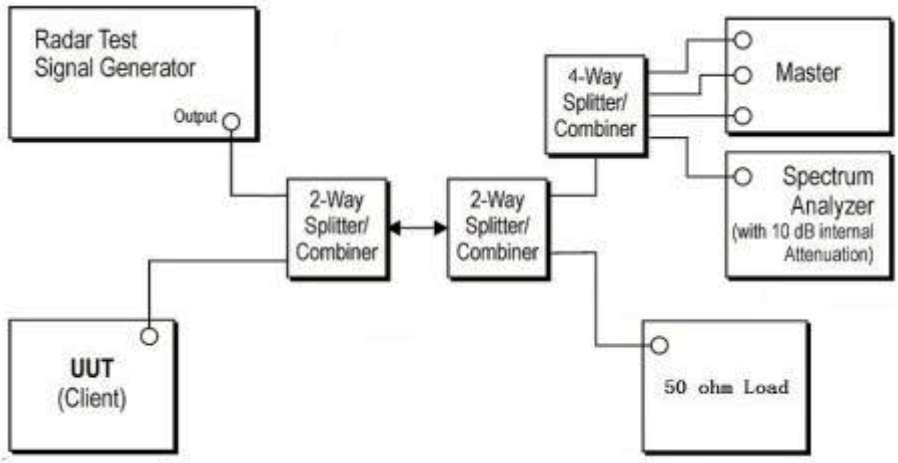
(1) A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master

(2) The interference Radar Detection Threshold Level is -62dBm + 0dBi +1dB = -61dBm that had been taken into account the output power range and antenna gain.

(3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz. The spectrum analyzer had offset -1.0dB to compensate RF cable loss 1.0dB.

(4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was - -62dBm + 0dBi +1dB = -61dBm. Capture the spectrum analyzer plots on short pulse radar waveform.

Conducted Calibration Setup:

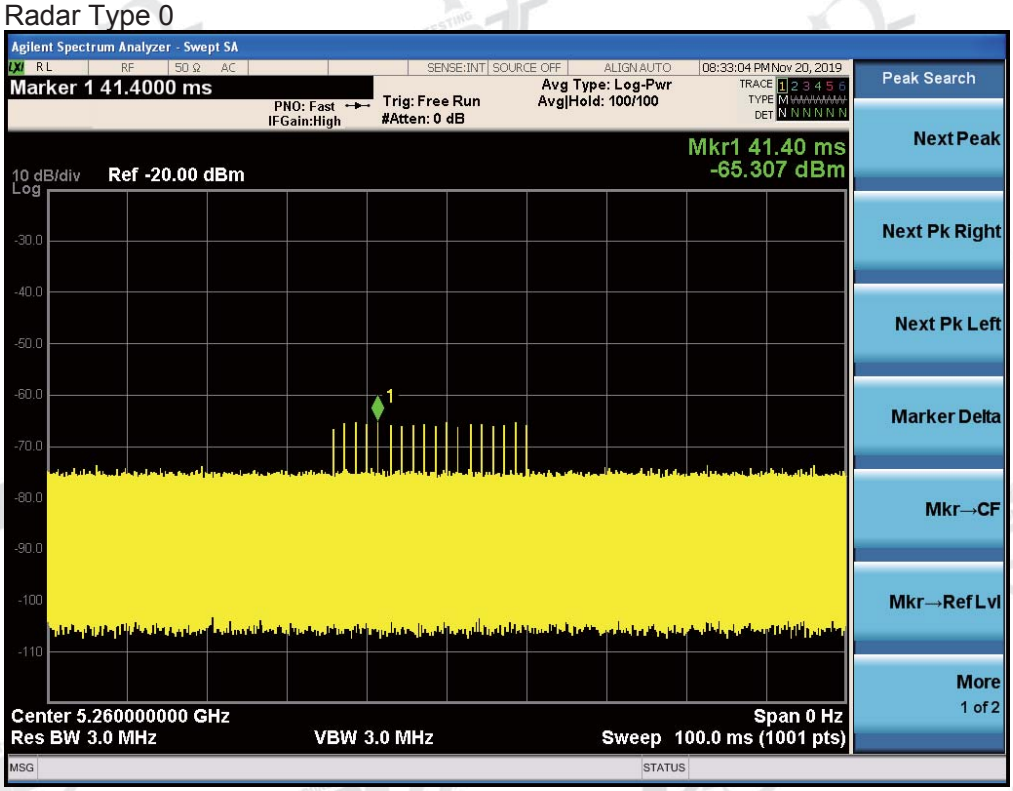


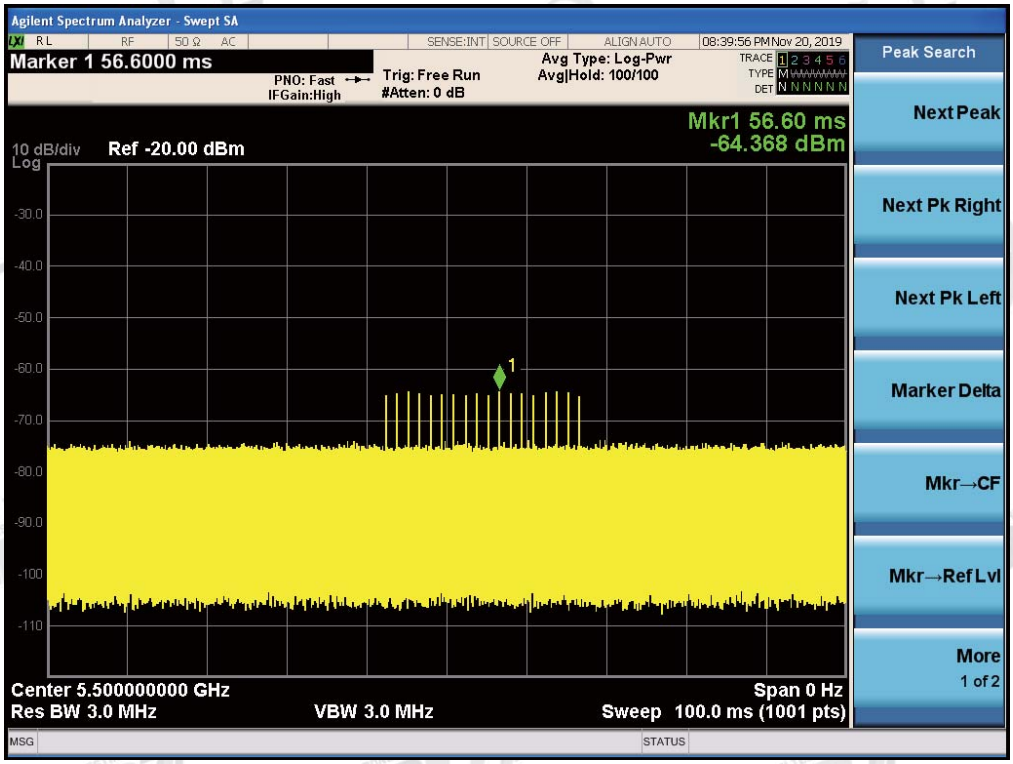

Note: 1. Use the software "Web" to set the frequency channel.

2. EUT is not support TPC and not with Radar detection.

Radar Waveform Calibration Result:

Radar Type 0




Agilent Spectrum Analyzer - Swept SA
Marker 1 56.6000 ms
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold: 100/100
08:39:56 PM Nov 20, 2019
Mkr1 56.60 ms
-64.368 dBm
10 dB/div
Log
Ref -20.00 dBm
Center 5.500000000 GHz
Res BW 3.0 MHz
VBW 3.0 MHz
Span 0 Hz
Sweep 100.0 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

## 12.5. Channel closing transmission time, channel move time and non-occupancy period

Block diagram of test setup Test Procedure:

(1) The radar pulse generator is setup to provide a pulse at frequency that the master and client are operating. A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.

(2) The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -61dBm at the antenna port of the master device.

(3) A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.

(4) EUT will associate with the master at channel. The file “iperf.exe” specified by the FCC is streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using Test Software in order to properly load the network for the entire period of the test.

(5) When radar burst with a level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection Threshold +1dB.

(6) Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). One 15 seconds plot is reported for the Short Pulse Radar Type 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom in 600ms plot of the Short Pulse Radar Type.

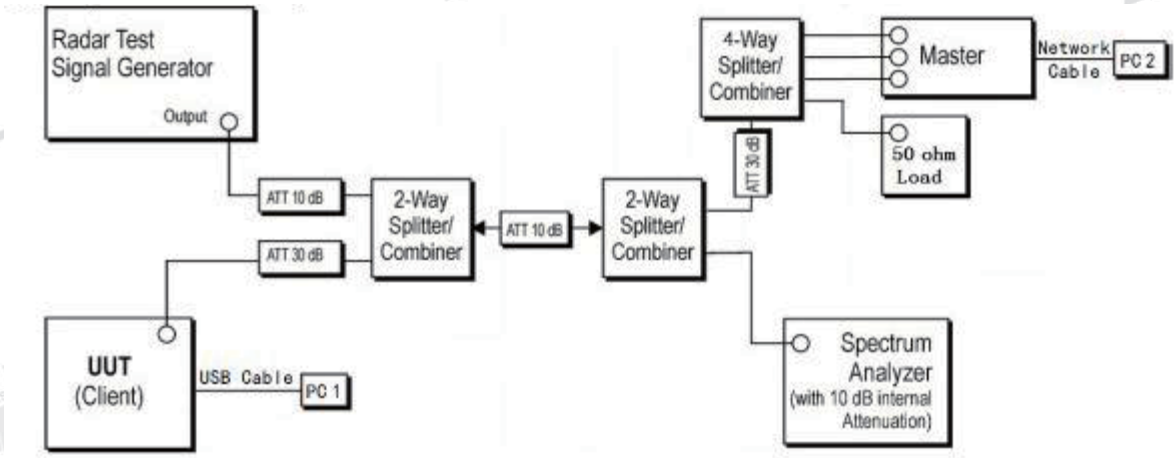
(7) Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the

(8) spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: Dwell (0.3ms) =S (12000ms) / B (4000); where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: C (ms)= N X Dwell (0.3ms); where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.

Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

## 12.6. Test setup

Setup for Client with injection at the Master

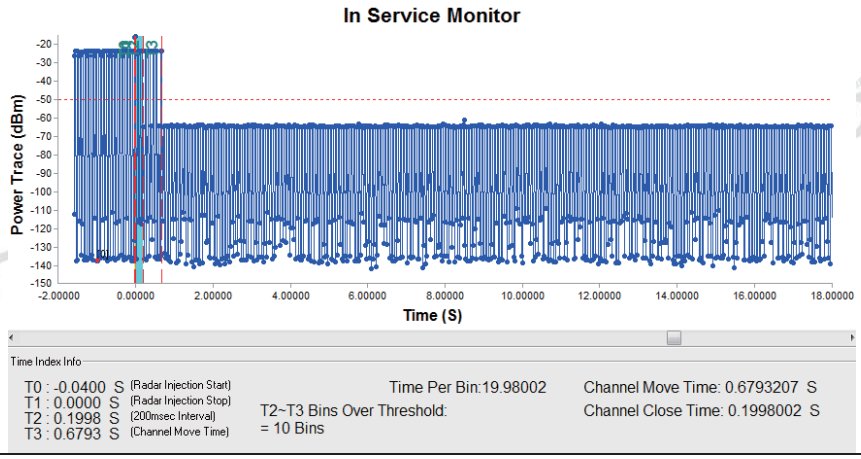


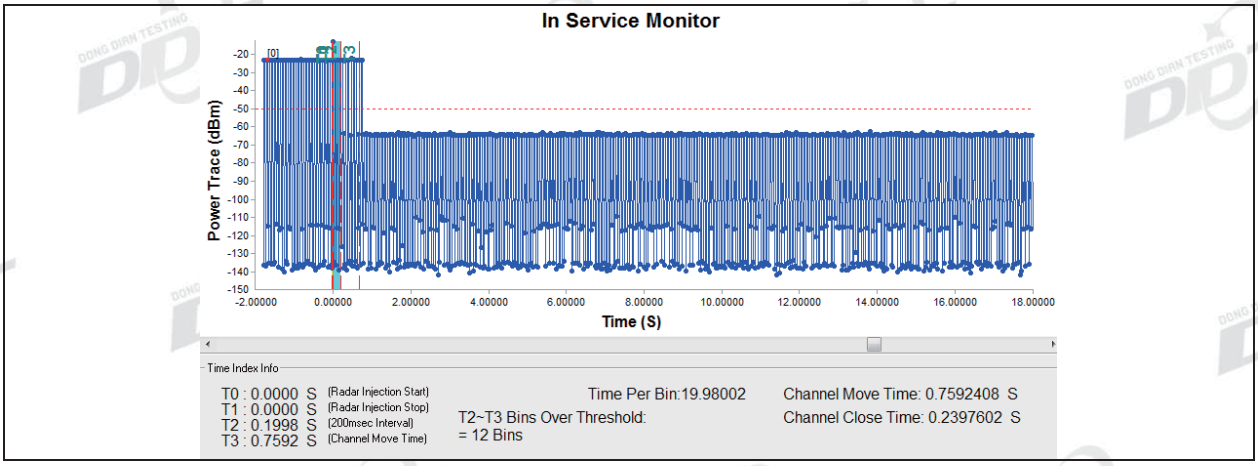

## 12.7. Test result

| BW/Channel | Test Item | Test Result | Limit | Results |
|---|---|---|---|---|
| 40M/5260MHz | Channel Move Time | 0.679s | ＜10s | pass |
| | Channel Closing Transmission Time | 0.200s | ＜0.26s | pass |
| 40M/5500MHz | Channel Move Time | 0.759s | ＜10s | pass |
| | Channel Closing Transmission Time | 0.240s | ＜0.26s | pass |
| 40M/5260MHz | Non-Occupancy Period | >30min | 30min | pass |
| 40M/5500MHz | Non-Occupancy Period | >30min | 30min | pass |

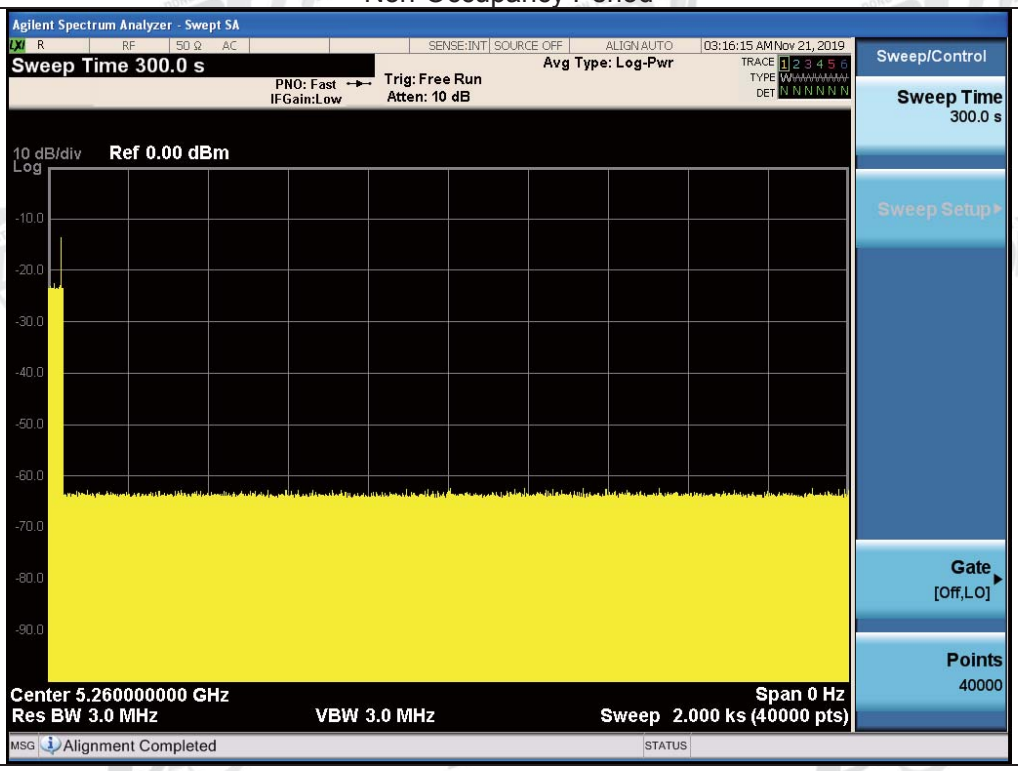
Test plots as follows:

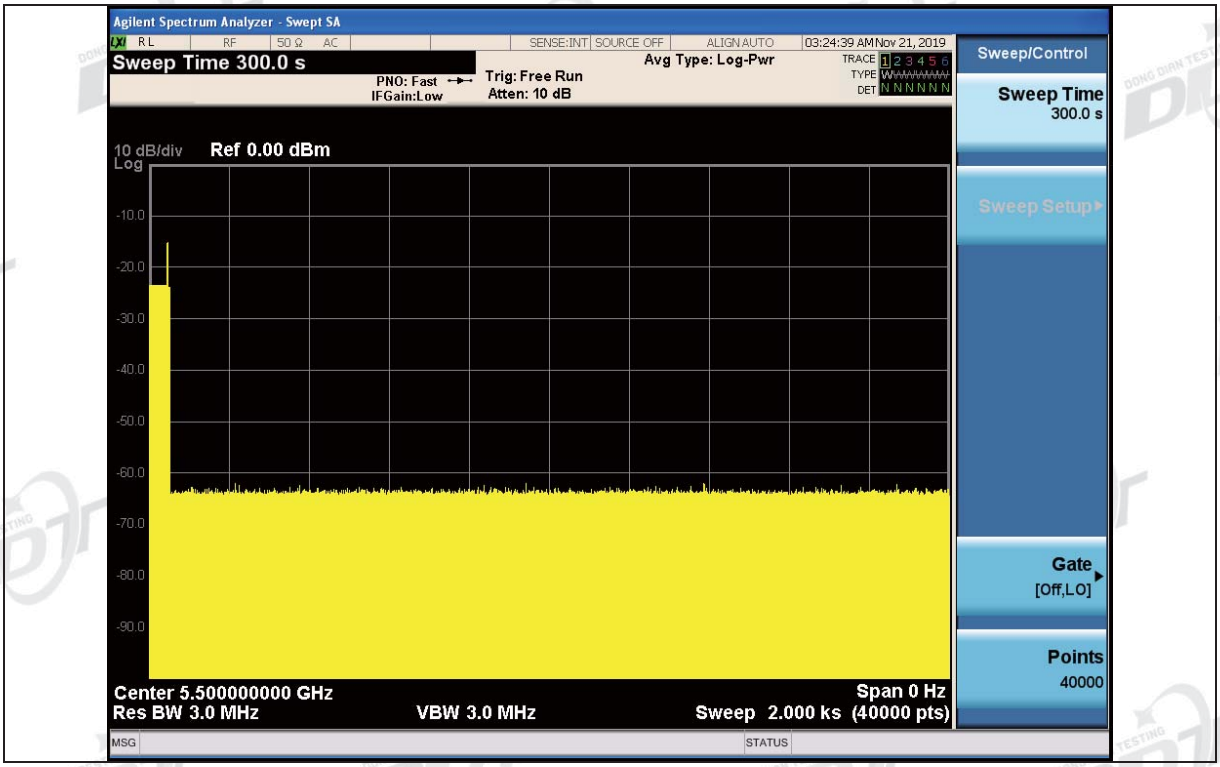
Channel Move Time & Channel Closing Transmission Time






Non-Occupancy Period




Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
SOURCE OFF
ALIGN AUTO
03:24:39 AM Nov 21, 2019
Sweep Time 300.0 s
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET N N N N N N
Sweep/Control
Sweep Time
300.0 s
Sweep Setup
10 dB/div
Log
Ref 0.00 dBm
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
Gate
[Off,LO]
Points
40000
Center 5.500000000 GHz
Res BW 3.0 MHz
VBW 3.0 MHz
Span 0 Hz
Sweep 2.000 ks (40000 pts)
MSG
STATUS