

TCL entertainment solutions limited

# TEST REPORT

**SCOPE OF WORK**

FCC TESTING–TS9030, RAYDANZ

**REPORT NUMBER**

191126031SZN-005

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# RF TEST REPORT

**Report No.:** 191126031SZN-005  
**Product:** 3.1 Atmos Sound Bar with Wireless Subwoofer, Wireless Subwoofer  
**Model No.:** TS9030, RAYDANZ  
**FCC ID:** 2ARUDTS9030

**Applicant:** TCL entertainment solutions limited

**Test Method/  
Standard:** FCC Part 15 Subpart E;  
KDB 789033 D02 v02r01;  
KDB 662911 D01 v02r01;  
KDB 905462 D02 v02;  
ANSI C63.10-2013

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Date: 16 January 2020

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**Summary of Tests**

| FCC Parts                   | Test                                   | Section | Results |
|-----------------------------|--|---------|---------|
| 15.203                      | Antenna Requirement                    | 1.3     | Pass    |
| 15.407 a (1)/(3)            | Maximum output power test              | 3       | Pass    |
| 15.407 a (1)/(3)            | Power Spectrum Density test            | 4       | Pass    |
| 15.407 e                    | 6dB Bandwidth                          | 5       | Pass    |
| 15.407 b,<br>15.205, 15.209 | Radiated spurious emission test        | 6       | Pass    |
| 15.207                      | AC line conducted emission test        | 7       | Pass    |
| 15.407 g                    | Frequency Stability                    | 8       | Pass    |
| 15.407 h                    | DFS: Channel Closing Transmission Time | 9.3     | Pass    |
| 15.407 h                    | DFS: Channel Move Time                 | 9.3     | Pass    |

## 1. General information

### 1.1 Identification of the EUT

|                            |  |
|----------------------------|--|
| Product:                   | 3.1 Atmos Sound Bar with Wireless Subwoofer, Wireless Subwoofer  |
| Model No.:                 | TS9030, RAYDANZ  |
| Type of Device:            | Client device  |
| Nominal Channel Bandwidth: | 802.11a/n-HT20 (20 MHz), 802.11n-HT40 (40MHz), 802.11ac (20/40/80MHz)  |
| Operating Frequency:       | 5150MHz~5250 MHz, 5250MHz~5350MHz, 5470MHz-5725MHz, 5725MHz~5850MHz  |
| Channel Number:            | 4 channels for 5180 MHz ~ 5240 MHz (802.11a/n/ac-HT20);<br>2 channels for 5190 MHz ~ 5230 MHz (802.11n/ac-HT40);<br>1 channels for 5210 MHz (802.11ac-HT80);<br>4 channels for 5260 MHz ~ 5320 MHz (802.11a/n/ac-HT20);<br>2 channels for 5270 MHz ~ 5310 MHz (802.11n/ac-HT40);<br>1 channels for 5290 MHz (802.11ac-HT80);<br>11 channels for 5500 MHz ~ 5700 MHz (802.11a/n/ac-HT20);<br>5 channels for 5510 MHz ~ 5670 MHz (802.11n/ac-HT40);<br>2 channels for 5530 MHz ~ 5610 MHz (802.11ac-HT80);<br>5 channels for 5745 MHz ~ 5825 MHz (802.11a/n/ac-HT20);<br>2 channels for 5755 MHz ~ 5795 MHz (802.11n/ac-HT40);<br>1 channels for 5775 MHz (802.11ac-HT80);   |
| Modulation:                | 802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)  |
| Rated Power:               | AC120V, 60Hz   |
| Test Date(s):              | 26 November 2019 to 07 January 2020  |
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| Note 2:                    | When determining the test conclusion, the Measurement Uncertainty of test has been considered.   |

## 1.2 Additional information about the EUT

The EUT is a 3.1 Atmos Sound Bar with Wireless Subwoofer, Wireless Subwoofer with 5G WIFI technology. The EUT is powered by AC 100-240V~ 50/60Hz.

For more detail features, please refer to User's description as file name "descri.pdf".

The Model: RAYDANZ are the same as the Model: TS9030 in hardware aspect (circuitry and electrical, mechanical and physical construction), the only differences is the model number and trade mark for trading purpose.

### Related Submittal(s) Grants

This is an application for certification of U–NII device (5GHz Wi-Fi transmitter portion).

For the BT transmitter function was tested and demonstrated in report 191126031SZN-002.

For the 2.4GHz WIFI function was tested and demonstrated in report 191126031SZN-003.

For the Normal 2.4G TX function was tested and demonstrated in report 191126031SZN-004.

For other functions were reported in the SDOC report: 191126031SZN-001.

## 1.3 Antenna description (15.203)

The EUT uses Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

Antenna Gain: 4.25 dBi Max for 5G WIFI.

### 1.4 Peripherals equipment

Refer List:

| Description                                       | Manufacturer          | Model No.                |
|---|-----------------------|--------------------------|
| iPod<br>(Provided by Intertek)                    | Apple                 | A1367                    |
| Test TV<br>(Provided by Intertek)                 | SONY                  | KDL-24EX520              |
| USB Memory<br>(Provided by Intertek)              | SanDisk               | SDCZ36-002G-P36          |
| Audio Cable<br>(Provided by Intertek)             | N/A                   | Unshielded, Length 120cm |
| HDMI In Cable<br>(Provided by Intertek)           | UGREEN                | Unshielded, Length 175cm |
| HDMI In Cable<br>(Provided by applicant)          | Richsound             | Shielded, Length 180cm   |
| Detached AC power cord<br>(Provided by applicant) | Richsound             | Unshielded, Length 150cm |
| Optical Cable<br>(Provided by applicant)          | Richsound             | Unshielded, Length 120cm |
| Dummy Load<br>(Provided by Intertek)              | N/A                   | 75 Ω                     |
| Remote control<br>(Provided by applicant)         | Provided by applicant | N/A                      |

## 2. Test specifications

### 2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 E, Section 15.203, 15.207, 15.209, 15.407 and ANSI C63.10/2013, method of measurement: KDB 789033.

The test of radiated measurements according to FCC Part 15 Section 15.33(a) had been conducted and the field strength of this frequency band was all meet limit requirement, thus we evaluate the EUT pass the specified test.

The AC power conducted emissions was investigated over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz (15.207 paragraph).

Radiated emissions were investigated cover the frequency range from 9KHz to 30MHz using a receiver RBW of 9kHz, from 30 MHz to 1000 MHz using a receiver RBW of 120 kHz record QP reading, and the frequency over 1 GHz using a spectrum analyzer RBW of 1 MHz, VBW of 3MHz, Detector=Peak record for Peak reading, RBW of 1 MHz, VBW of 3MHz, Detector=RMS record for Average reading recorded on the report.

The EUT setup configurations please refer to the photo of radiated setup photos.pdf & conducted setup photos.pdf.

### 2.2 Operation mode

The EUT was supplied by and it was run in TX mode that was controlled by client provided RF testing program.

The EUT was transmitted continuously during the test. The worst case test result was showed in the report.

With individual verifying, the maximum output power was found at 6 Mbps data rate for 802.11a mode, 6.5 Mbps data rate for 802.11n-HT20 mode, 13.5 Mbps data rate for 802.11n-HT40 mode, 29.3Mbps data rate for 802.11ac. The final tests were executed under these conditions and recorded in this report individually.

#### **Table for Parameters of Test Software Setting**

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

Test Software: fw\_bcm43456c5\_ag\_mfg V1.0



### 3. Maximum Output Power test (FCC 15.407)

#### 3.1 Operating environment

Temperature: 25 °C  
Relative Humidity: 55 %  
Atmospheric Pressure: 1011 hPa

#### 3.2 Test setup & procedure

The power output per FCC §15.407(a) was measured on the EUT using a 50 ohm SMA cable connected to Power Meter and the measurement method refer to 789033 D02. Power was read directly and cable loss correction (1.0dB) was added to the reading to obtain power at the EUT antenna terminals.

#### 3.3 Limit

| Operating Frequency (MHz) | Max Conducted TX Power          | Max EIRP                     |
|---------------------------|---------------------------------|------------------------------|
| 5150~5250                 | 30dBm (1W) for master device    | 4W (36dBm) with 6dBi antenna |
|                           | 24dBm (250mW) for client device |                              |
| 5250~5350                 | 24dBm (250mW) or 11dBm+ 10logB* | 1W (30dBm) with 6dBi antenna |
| 5470~5725                 | 24dBm (250mW) or 11dBm+ 10logB* |                              |
| 5725~5850                 | 30dBm (1W)                      | 4W (36dBm) with 6dBi antenna |

Remark: 1) \*Where B is the 26dB emission Bandwidth in MHz.

- 2) The device was declared as client device.
- 3) Tx Power Reduction (dBm-by-dBi) required when antenna exceeds 6dBi.
- 4) Max antenna gain= 4.25 dBi < 6 dBi.

### 3.4 Measured data of Maximum Output Power test results

5150 MHz ~ 5250 MHz, 5250MHz~5350MHz, 5470MHz-5725MHZ, 5725 MHz ~ 5850 MHz

#### Max Conducted TX Power

| Test Mode | Channel | Result | Limit | Verdict |
|-----------|---------|--------|-------|---------|
| 11A       | 5180    | 16.00  | 24    | PASS    |
|           | 5200    | 16.18  | 24    | PASS    |
|           | 5240    | 16.48  | 24    | PASS    |
|           | 5260    | 18.46  | 24    | PASS    |
|           | 5280    | 18.26  | 24    | PASS    |
|           | 5320    | 17.87  | 24    | PASS    |
|           | 5500    | 15.74  | 24    | PASS    |
|           | 5580    | 16.77  | 24    | PASS    |
|           | 5700    | 16.89  | 24    | PASS    |
|           | 5745    | 16.93  | 30    | PASS    |
|           | 5785    | 16.79  | 30    | PASS    |
|           | 5825    | 16.69  | 30    | PASS    |
| 11N20     | 5180    | 16.68  | 24    | PASS    |
|           | 5200    | 17.08  | 24    | PASS    |
|           | 5240    | 16.39  | 24    | PASS    |
|           | 5260    | 18.62  | 24    | PASS    |
|           | 5280    | 18.65  | 24    | PASS    |
|           | 5320    | 17.91  | 24    | PASS    |
|           | 5500    | 16.21  | 24    | PASS    |
|           | 5580    | 17.13  | 24    | PASS    |
|           | 5700    | 16.56  | 24    | PASS    |
|           | 5745    | 16.60  | 30    | PASS    |
|           | 5785    | 16.23  | 30    | PASS    |
|           | 5825    | 16.51  | 30    | PASS    |
| 11N40     | 5190    | 16.79  | 24    | PASS    |
|           | 5230    | 16.98  | 24    | PASS    |
|           | 5270    | 17.27  | 24    | PASS    |
|           | 5310    | 17.02  | 24    | PASS    |
|           | 5510    | 14.96  | 24    | PASS    |
|           | 5550    | 15.50  | 24    | PASS    |
|           | 5670    | 15.92  | 24    | PASS    |
|           | 5755    | 15.44  | 30    | PASS    |
|           | 5795    | 15.87  | 30    | PASS    |
| 11AC20    | 5180    | 15.59  | 24    | PASS    |
|           | 5200    | 15.79  | 24    | PASS    |
|           | 5240    | 16.19  | 24    | PASS    |
|           | 5260    | 18.10  | 24    | PASS    |
|           | 5280    | 18.23  | 24    | PASS    |
|           | 5320    | 17.56  | 24    | PASS    |
|           | 5500    | 15.60  | 24    | PASS    |
|           | 5580    | 16.77  | 24    | PASS    |
|           | 5700    | 16.32  | 24    | PASS    |
|           | 5745    | 16.36  | 30    | PASS    |

|        |      |       |    |      |
|--------|------|-------|----|------|
|        | 5785 | 16.21 | 30 | PASS |
|        | 5825 | 16.51 | 30 | PASS |
| 11AC40 | 5190 | 16.66 | 24 | PASS |
|        | 5230 | 17.11 | 24 | PASS |
|        | 5270 | 17.20 | 24 | PASS |
|        | 5310 | 17.04 | 24 | PASS |
|        | 5510 | 15.11 | 24 | PASS |
|        | 5550 | 15.61 | 24 | PASS |
|        | 5670 | 15.96 | 24 | PASS |
|        | 5755 | 15.52 | 30 | PASS |
|        | 5795 | 15.51 | 30 | PASS |
| 11AC80 | 5210 | 15.43 | 24 | PASS |
|        | 5290 | 15.71 | 24 | PASS |
|        | 5530 | 15.57 | 24 | PASS |
|        | 5610 | 14.83 | 24 | PASS |
|        | 5775 | 13.71 | 30 | PASS |

**MAX EIRP**

| Test Mode | Channel | Output Power (dBm) | ANT. Gain (dBi) | E.I.R.P (dBm) | Limit | Verdict |
|-----------|---------|--------------------|-----------------|---------------|-------|---------|
| 11A       | 5180    | 16.00              | 4.25            | 20.25         | 36    | PASS    |
|           | 5200    | 16.18              | 4.25            | 20.43         | 36    | PASS    |
|           | 5240    | 16.48              | 4.25            | 20.73         | 36    | PASS    |
|           | 5260    | 18.46              | 4.25            | 22.71         | 30    | PASS    |
|           | 5280    | 18.26              | 4.25            | 22.51         | 30    | PASS    |
|           | 5320    | 17.87              | 4.25            | 22.12         | 30    | PASS    |
|           | 5500    | 15.74              | 4.25            | 19.99         | 30    | PASS    |
|           | 5580    | 16.77              | 4.25            | 21.02         | 30    | PASS    |
|           | 5700    | 16.89              | 4.25            | 21.14         | 30    | PASS    |
|           | 5745    | 16.93              | 4.25            | 21.18         | 36    | PASS    |
|           | 5785    | 16.79              | 4.25            | 21.04         | 36    | PASS    |
|           | 5825    | 16.69              | 4.25            | 20.94         | 36    | PASS    |
| 11N20     | 5180    | 16.68              | 4.25            | 20.93         | 36    | PASS    |
|           | 5200    | 17.08              | 4.25            | 21.33         | 36    | PASS    |
|           | 5240    | 16.39              | 4.25            | 20.64         | 36    | PASS    |
|           | 5260    | 18.62              | 4.25            | 22.87         | 30    | PASS    |
|           | 5280    | 18.65              | 4.25            | 22.90         | 30    | PASS    |
|           | 5320    | 17.91              | 4.25            | 22.16         | 30    | PASS    |
|           | 5500    | 16.21              | 4.25            | 20.46         | 30    | PASS    |
|           | 5580    | 17.13              | 4.25            | 21.38         | 30    | PASS    |
|           | 5700    | 16.56              | 4.25            | 20.81         | 30    | PASS    |
|           | 5745    | 16.60              | 4.25            | 20.85         | 36    | PASS    |
|           | 5785    | 16.23              | 4.25            | 20.48         | 36    | PASS    |
|           | 5825    | 16.51              | 4.25            | 20.76         | 36    | PASS    |
| 11N40     | 5190    | 16.79              | 4.25            | 21.04         | 36    | PASS    |
|           | 5230    | 16.98              | 4.25            | 21.23         | 36    | PASS    |
|           | 5270    | 17.27              | 4.25            | 21.52         | 30    | PASS    |
|           | 5310    | 17.02              | 4.25            | 21.27         | 30    | PASS    |
|           | 5510    | 14.96              | 4.25            | 19.21         | 30    | PASS    |
|           | 5550    | 15.50              | 4.25            | 19.75         | 30    | PASS    |
|           | 5670    | 15.92              | 4.25            | 20.17         | 30    | PASS    |
|           | 5755    | 15.44              | 4.25            | 19.69         | 36    | PASS    |
| 5795      | 15.87   | 4.25               | 20.12           | 36            | PASS  |         |
| 11AC20    | 5180    | 15.59              | 4.25            | 19.84         | 36    | PASS    |
|           | 5200    | 15.79              | 4.25            | 20.04         | 36    | PASS    |
|           | 5240    | 16.19              | 4.25            | 20.44         | 36    | PASS    |
|           | 5260    | 18.10              | 4.25            | 22.35         | 30    | PASS    |
|           | 5280    | 18.23              | 4.25            | 22.48         | 30    | PASS    |
|           | 5320    | 17.56              | 4.25            | 21.81         | 30    | PASS    |
|           | 5500    | 15.60              | 4.25            | 19.85         | 30    | PASS    |
|           | 5580    | 16.77              | 4.25            | 21.02         | 30    | PASS    |
|           | 5700    | 16.32              | 4.25            | 20.57         | 30    | PASS    |
|           | 5745    | 16.36              | 4.25            | 20.61         | 36    | PASS    |
|           | 5785    | 16.21              | 4.25            | 20.46         | 36    | PASS    |
|           | 5825    | 16.51              | 4.25            | 20.76         | 36    | PASS    |

|        |      |       |      |       |    |      |
|--------|------|-------|------|-------|----|------|
| 11AC40 | 5190 | 16.66 | 4.25 | 20.91 | 36 | PASS |
|        | 5230 | 17.11 | 4.25 | 21.36 | 36 | PASS |
|        | 5270 | 17.20 | 4.25 | 21.45 | 30 | PASS |
|        | 5310 | 17.04 | 4.25 | 21.29 | 30 | PASS |
|        | 5510 | 15.11 | 4.25 | 19.36 | 30 | PASS |
|        | 5550 | 15.61 | 4.25 | 19.86 | 30 | PASS |
|        | 5670 | 15.96 | 4.25 | 20.21 | 30 | PASS |
|        | 5755 | 15.52 | 4.25 | 19.77 | 36 | PASS |
|        | 5795 | 15.51 | 4.25 | 19.76 | 36 | PASS |
| 11AC80 | 5210 | 15.43 | 4.25 | 19.68 | 36 | PASS |
|        | 5290 | 15.71 | 4.25 | 19.96 | 30 | PASS |
|        | 5530 | 15.57 | 4.25 | 19.82 | 30 | PASS |
|        | 5610 | 14.83 | 4.25 | 19.08 | 30 | PASS |
|        | 5775 | 13.71 | 4.25 | 17.96 | 36 | PASS |

#### 4. Power Spectrum Density test (FCC 15.407)

##### 4.1 Operating environment

Temperature: 25 °C  
Relative Humidity: 50 %  
Atmospheric Pressure: 1011 hPa

##### 4.2 Test setup & procedure

###### Method of Measurement:

The power spectrum density per FCC §15.407(a) was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 1MHz/500KHz, the video bandwidth set at 3 MHz/2MHz (measurement method refer to KDB 789033 D02). Power spectrum density was read directly and cable loss (1.0 dB) reading to obtain power at the EUT antenna terminals.

##### 4.3 Limit

| Operating Frequency (MHz) | Max Conducted Power Spectral Density        |
|---------------------------|---|
| 5150~5250                 | *17dBm/MHz for master device                |
|                           | 11dBm/MHz for mobile/portable client device |
| 5250~5350                 | 11dBm/MHz                                   |
| 5470~5725                 | 11dBm/MHz                                   |
| 5725~5850                 | 30dBm/500KHz                                |

Remark: 1) \*The device was declared as Slave device.

2) Tx Power Reduction (dBm-by-dBi) required when antenna exceeds 6dBi.

3) Ant gain = 4.25 dBi < 6 dBi.

#### 4.4 Measured data of Power Spectrum Density test results

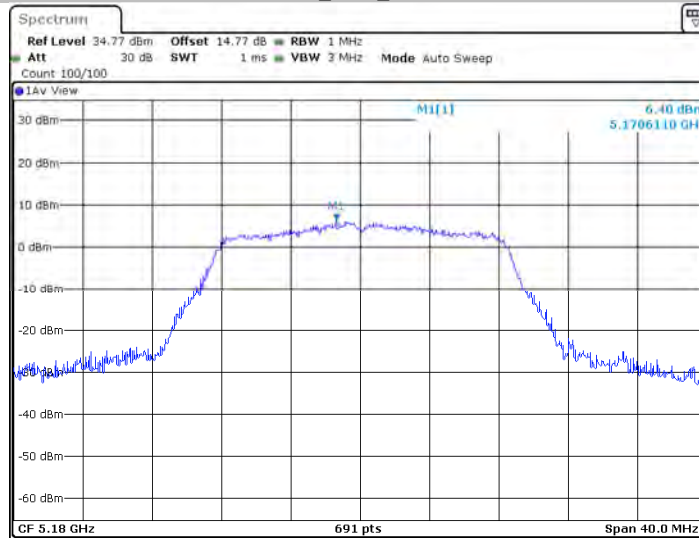
5150 MHz ~ 5250 MHz, 5250MHz~5350MHz, 5470MHz-5725MHZ, 5725 MHz ~ 5850 MHz

| Test Mode | Channel | Result | Limit | Verdict |
|-----------|---------|--------|-------|---------|
| 11A       | 5180    | 6.40   | 11    | PASS    |
|           | 5200    | 6.64   | 11    | PASS    |
|           | 5240    | 6.86   | 11    | PASS    |
|           | 5260    | 9.25   | 11    | PASS    |
|           | 5280    | 8.73   | 11    | PASS    |
|           | 5320    | 7.87   | 11    | PASS    |
|           | 5500    | 6.12   | 11    | PASS    |
|           | 5580    | 7.12   | 11    | PASS    |
|           | 5700    | 7.32   | 11    | PASS    |
|           | 5745    | 6.59   | 30    | PASS    |
|           | 5785    | 6.15   | 30    | PASS    |
|           | 5825    | 6.01   | 30    | PASS    |
| 11N20     | 5180    | 6.85   | 11    | PASS    |
|           | 5200    | 7.05   | 11    | PASS    |
|           | 5240    | 6.27   | 11    | PASS    |
|           | 5260    | 8.17   | 11    | PASS    |
|           | 5280    | 8.49   | 11    | PASS    |
|           | 5320    | 7.93   | 11    | PASS    |
|           | 5500    | 6.26   | 11    | PASS    |
|           | 5580    | 7.07   | 11    | PASS    |
|           | 5700    | 6.02   | 11    | PASS    |
|           | 5745    | 5.10   | 30    | PASS    |
|           | 5785    | 5.09   | 30    | PASS    |
|           | 5825    | 5.41   | 30    | PASS    |
| 11N40     | 5190    | 3.36   | 11    | PASS    |
|           | 5230    | 3.76   | 11    | PASS    |
|           | 5270    | 4.20   | 11    | PASS    |
|           | 5310    | 3.76   | 11    | PASS    |
|           | 5510    | 1.70   | 11    | PASS    |
|           | 5550    | 2.25   | 11    | PASS    |
|           | 5670    | 2.76   | 11    | PASS    |
|           | 5755    | 1.24   | 30    | PASS    |
|           | 5795    | 1.70   | 30    | PASS    |
| 11AC20    | 5180    | 5.67   | 11    | PASS    |
|           | 5200    | 5.80   | 11    | PASS    |
|           | 5240    | 6.00   | 11    | PASS    |
|           | 5260    | 7.82   | 11    | PASS    |

|        |        |        |      |      |
|--------|--------|--------|------|------|
|        | 5280   | 7.98   | 11   | PASS |
|        | 5320   | 7.11   | 11   | PASS |
|        | 5500   | 5.69   | 11   | PASS |
|        | 5580   | 6.48   | 11   | PASS |
|        | 5700   | 6.13   | 11   | PASS |
|        | 5745   | 4.70   | 30   | PASS |
|        | 5785   | 4.68   | 30   | PASS |
|        | 5825   | 5.44   | 30   | PASS |
| 11AC40 | 5190   | 3.61   | 11   | PASS |
|        | 5230   | 4.39   | 11   | PASS |
|        | 5270   | 4.16   | 11   | PASS |
|        | 5310   | 3.63   | 11   | PASS |
|        | 5510   | 1.97   | 11   | PASS |
|        | 5550   | 2.32   | 11   | PASS |
|        | 5670   | 2.50   | 11   | PASS |
|        | 5755   | 1.22   | 30   | PASS |
| 5795   | -13.19 | 30     | PASS |      |
| 11AC80 | 5210   | -14.64 | 11   | PASS |
|        | 5290   | -14.53 | 11   | PASS |
|        | 5530   | -16.59 | 11   | PASS |
|        | 5610   | -1.00  | 11   | PASS |
|        | 5775   | -2.75  | 30   | PASS |

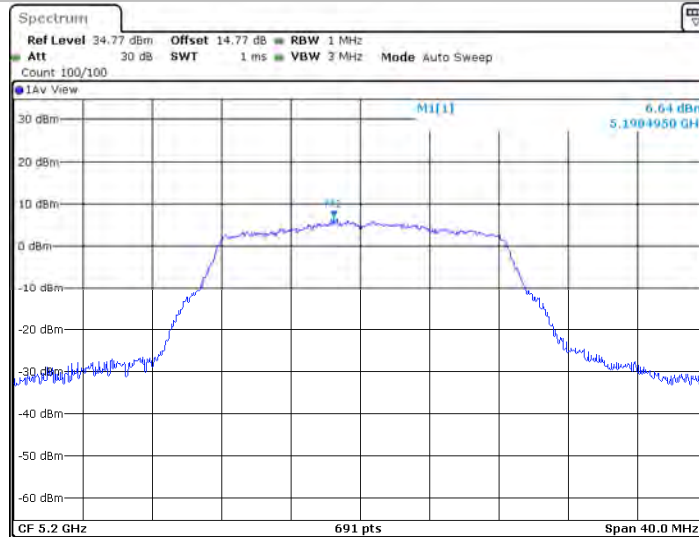


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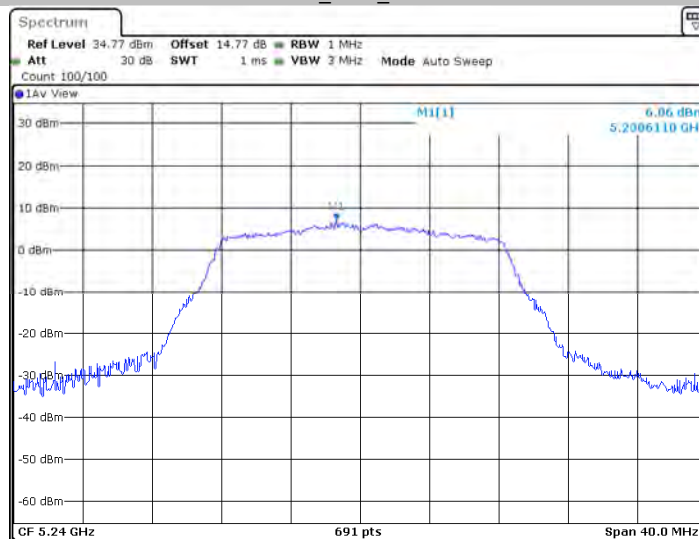
Date: 9 DEC 2019 13:43:42

## 11A\_Ant1\_5200



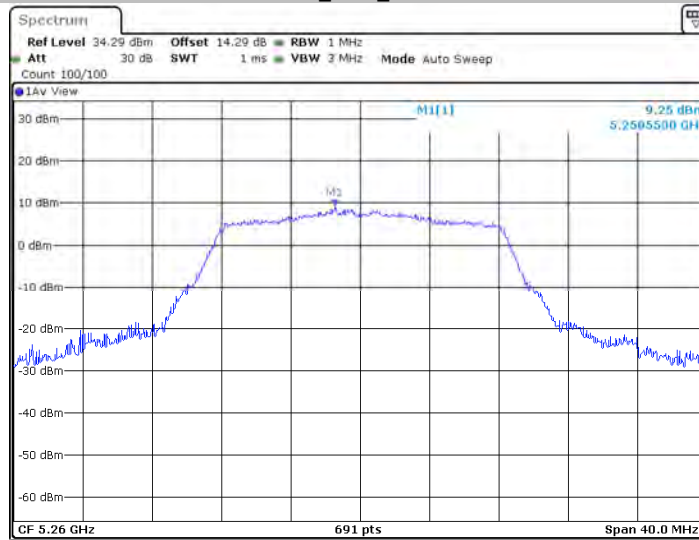
Date: 9 DEC 2019 13:44:33

## 11A\_Ant1\_5240



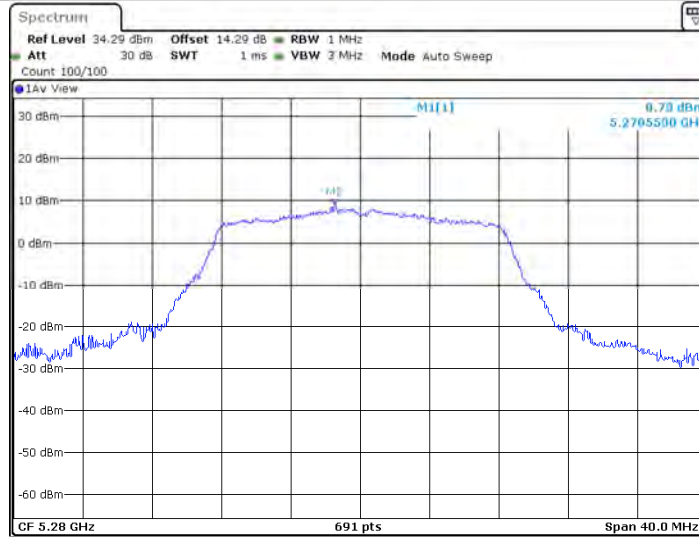
Date: 9 DEC 2019 13:48:25

## 11A\_Ant1\_5260



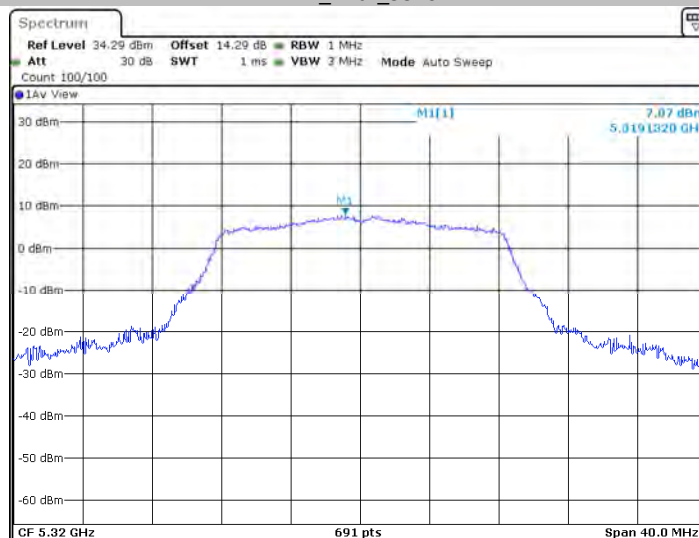
Date: 6 DEC 2019 11:34:02

## 11A\_Ant1\_5280



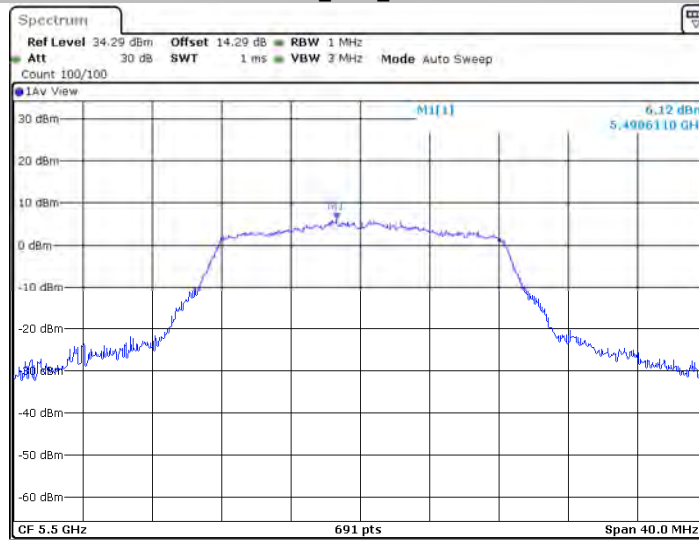
Date: 6 DEC 2019 11:39:24

## 11A\_Ant1\_5320



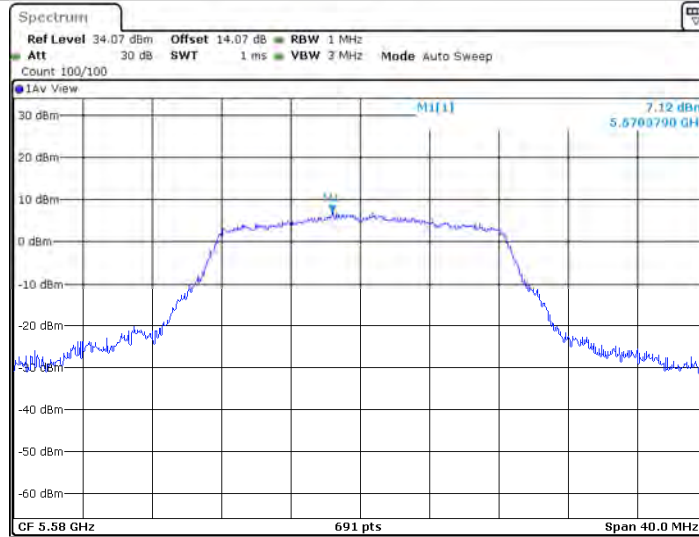
Date: 6 DEC 2019 11:44:12

## 11A\_Ant1\_5500



Date: 6 DEC.2019 11:53:30

## 11A\_Ant1\_5580



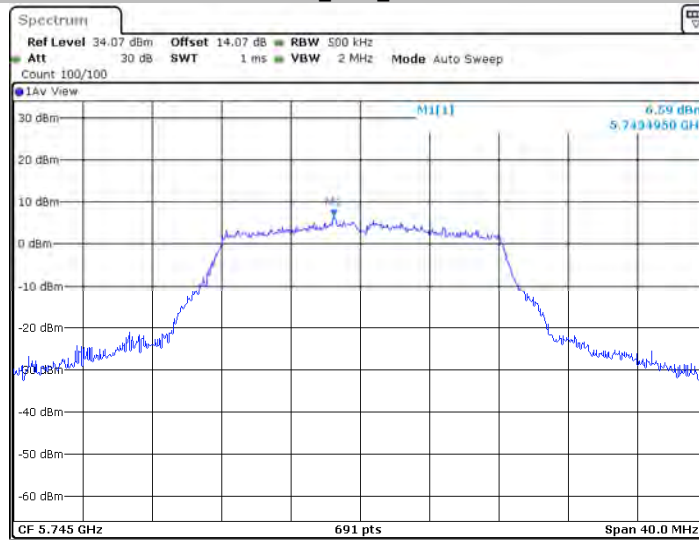
Date: 6 DEC.2019 11:58:07

## 11A\_Ant1\_5700



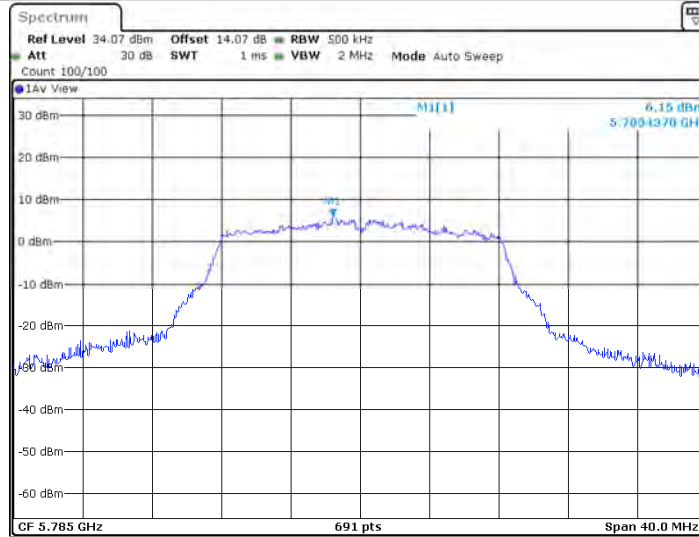
Date: 6 DEC.2019 13:20:14

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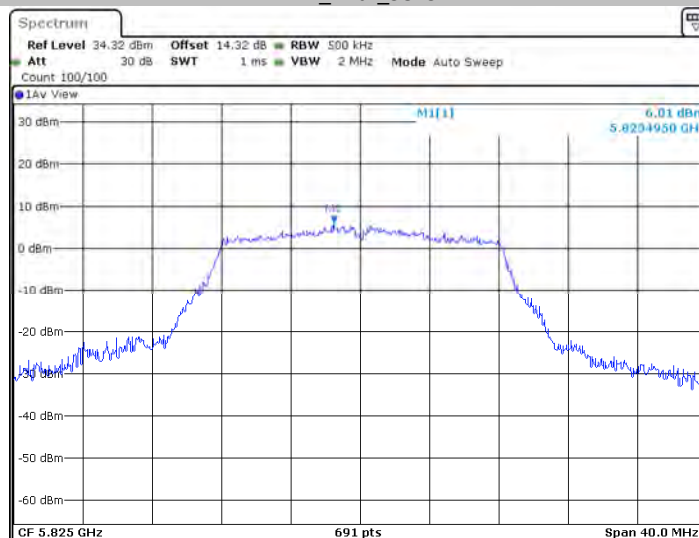
Date: 6 DEC.2019 13:31:12

## 11A\_Ant1\_5785



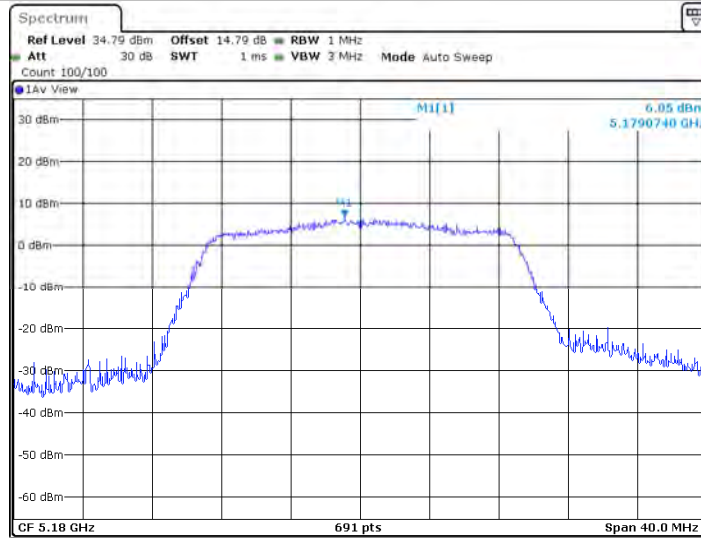
Date: 6 DEC.2019 13:36:34

## 11A\_Ant1\_5825



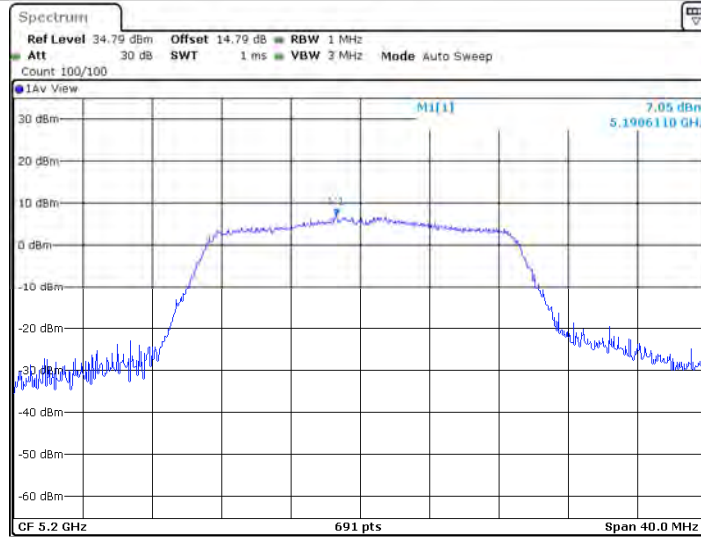
Date: 6 DEC.2019 13:41:57

### 11N20SISO\_Ant1\_5180



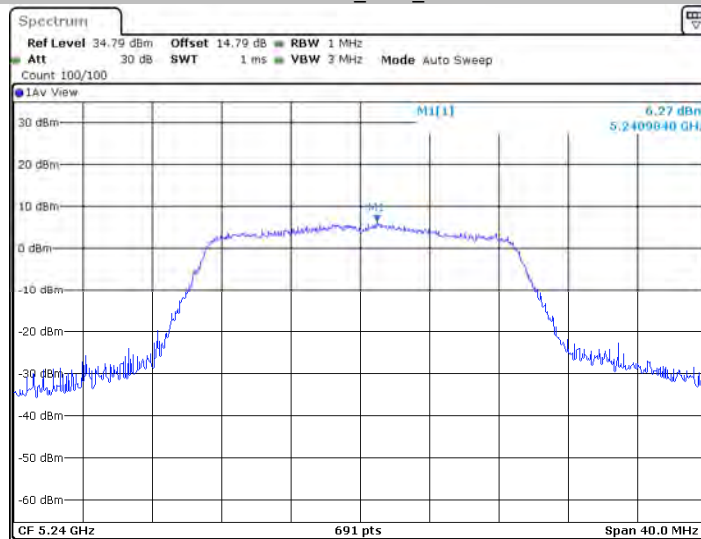
Date: 9 DEC 2019 13:50:29

### 11N20SISO\_Ant1\_5200



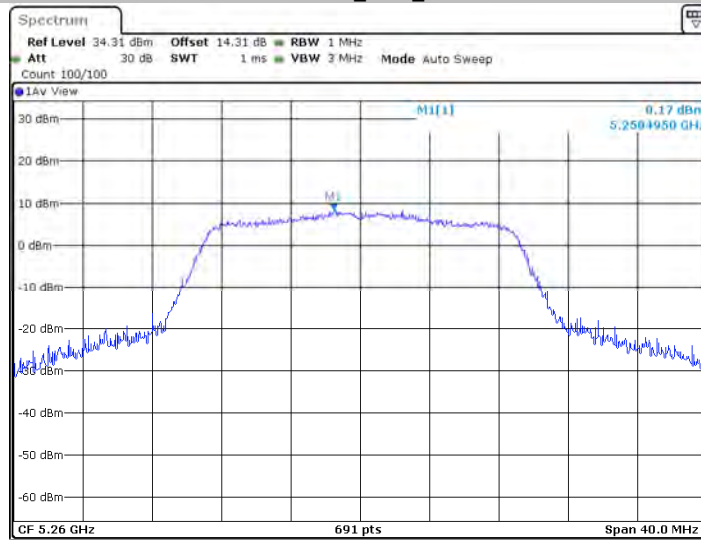
Date: 9 DEC 2019 13:51:05

### 11N20SISO\_Ant1\_5240



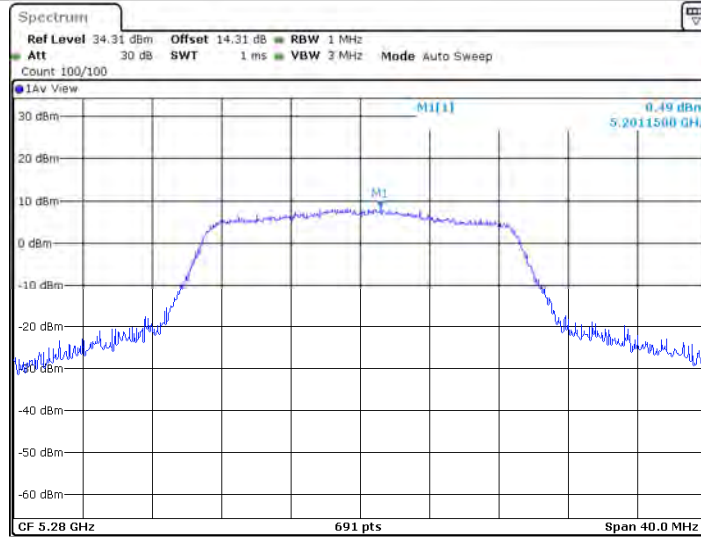
Date: 9 DEC 2019 13:54:05

### 11N20SISO\_Ant1\_5260



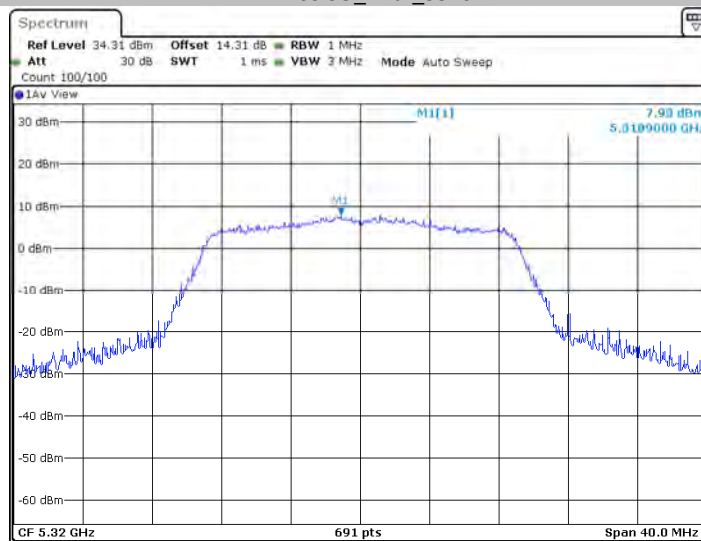
Date: 6 DEC.2019 14:02:40

### 11N20SISO\_Ant1\_5280



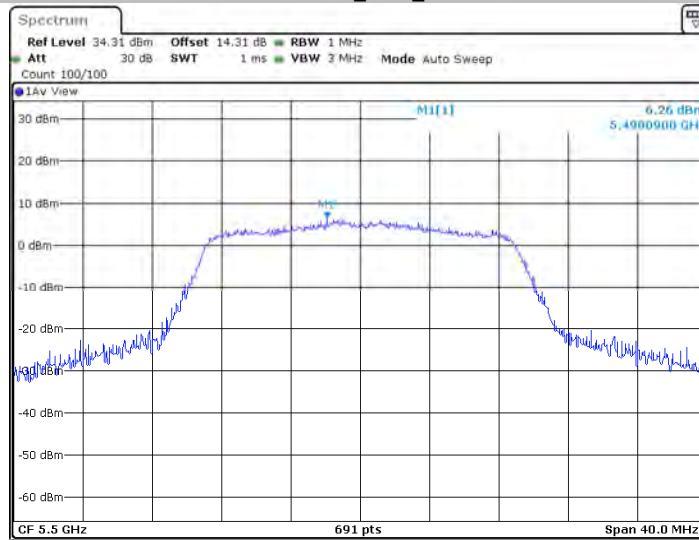
Date: 6 DEC.2019 14:07:20

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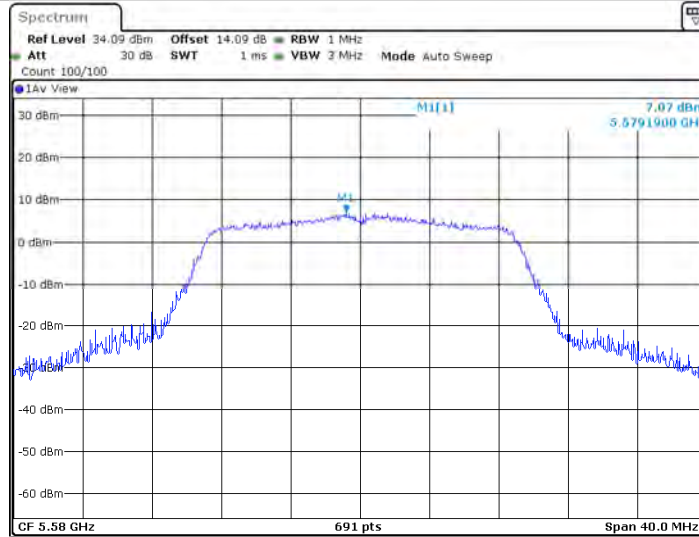
Date: 6 DEC.2019 14:13:42

### 11N20SISO\_Ant1\_5500



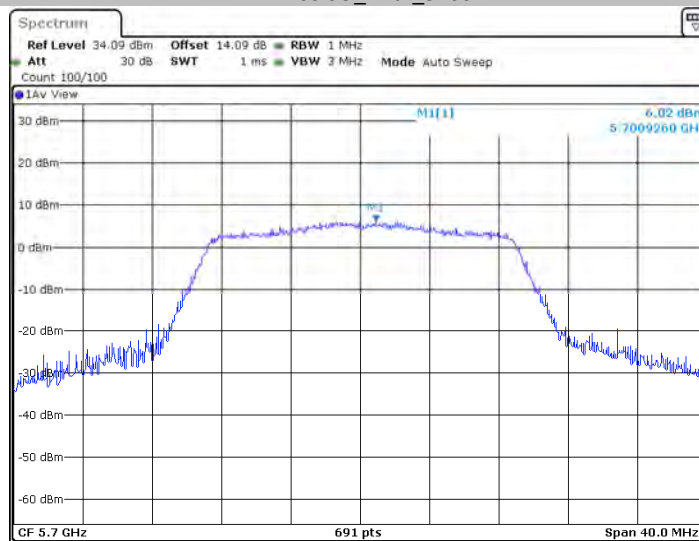
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### 11N20SISO\_Ant1\_5580



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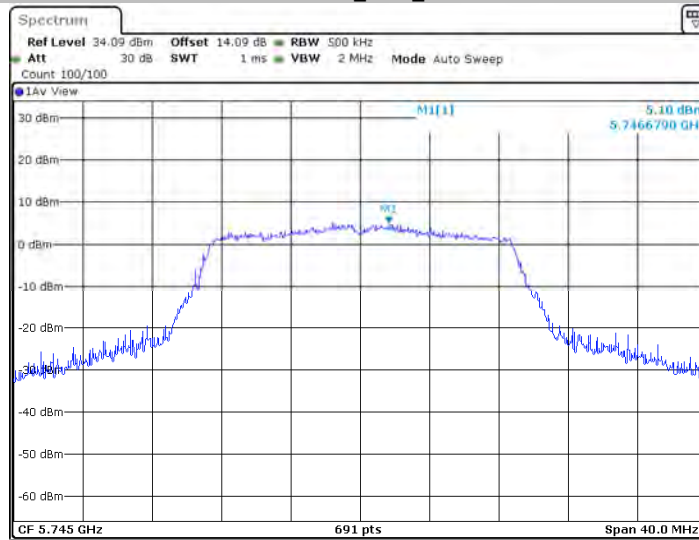
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Date: 6 DEC.2019 14:35:16

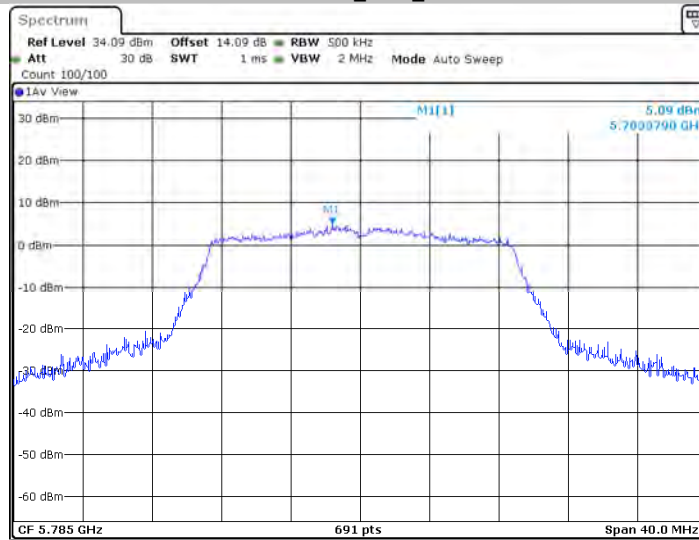


### 11N20SISO\_Ant1\_5745



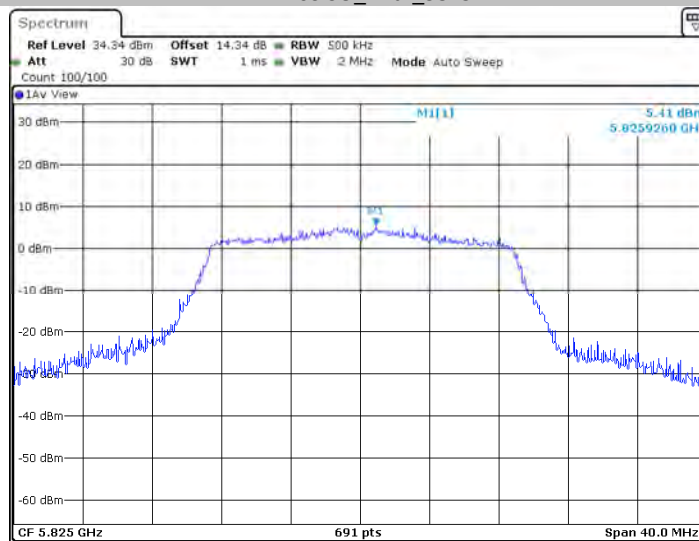
Date: 6 DEC 2019 14:45:22

### 11N20SISO\_Ant1\_5785



Date: 6 DEC 2019 14:50:24

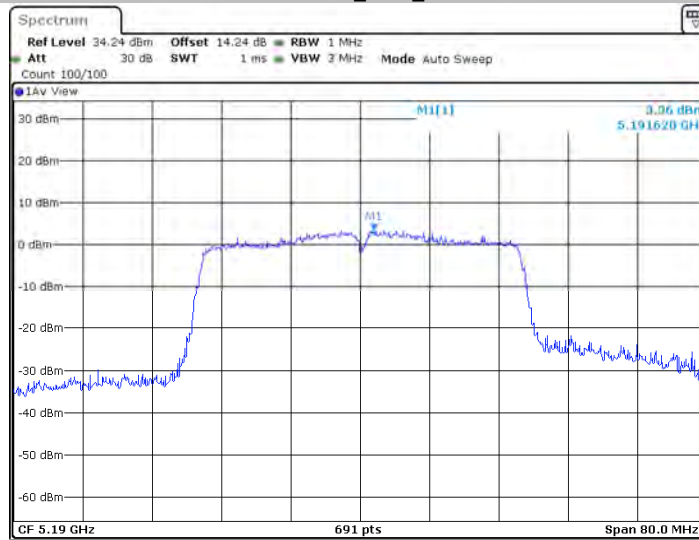
### 11N20SISO\_Ant1\_5825



Date: 6 DEC 2019 14:57:31

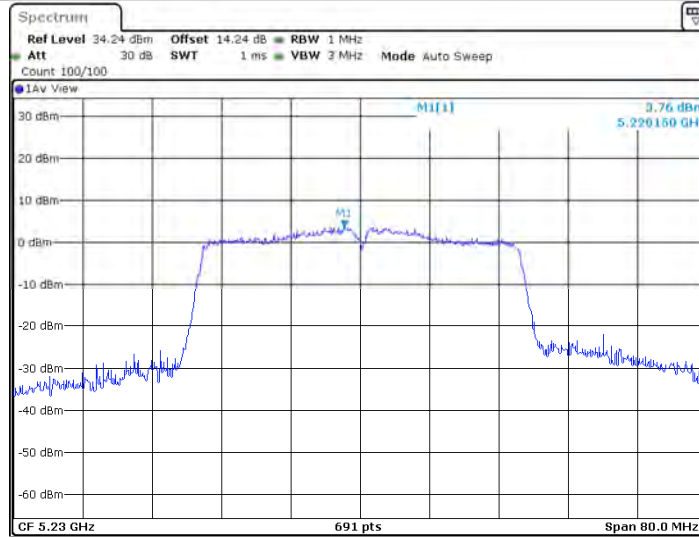


### 11N40SISO\_Ant1\_5190



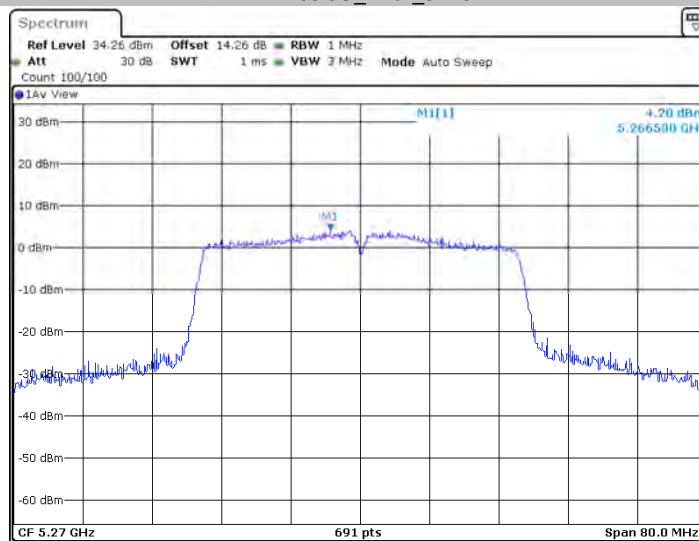
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### 11N40SISO\_Ant1\_5230



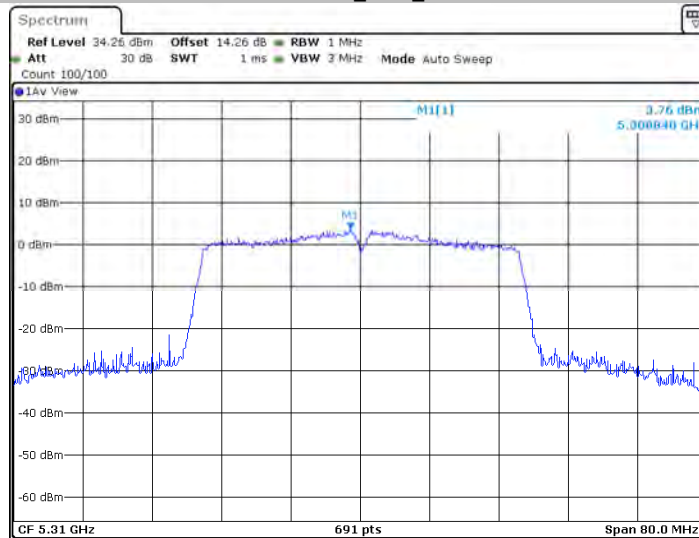
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### 11N40SISO\_Ant1\_5270



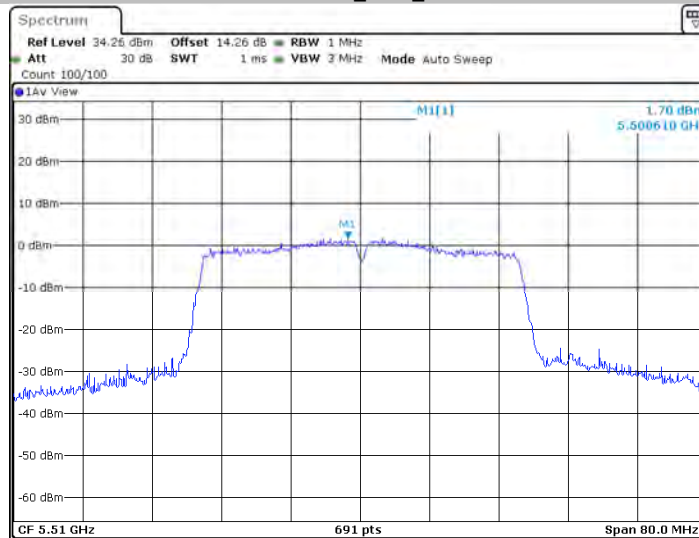
Date: 6 DEC.2019 15:35:00

### 11N40SISO\_Ant1\_5310



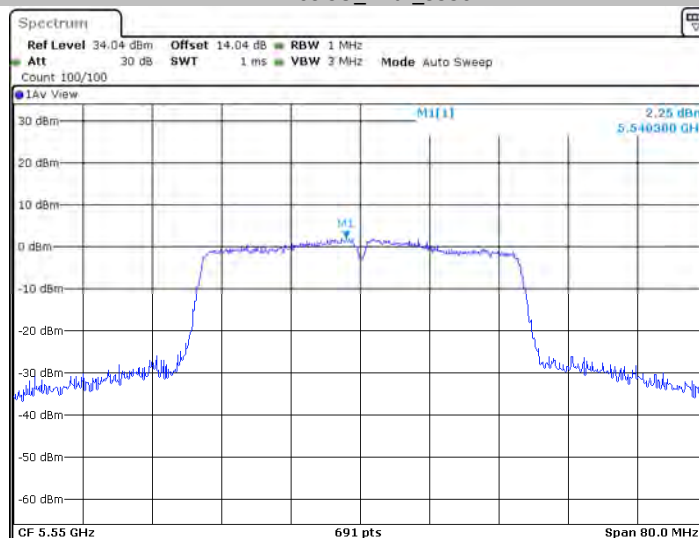
Date: 6 DEC 2019 15:40:12

### 11N40SISO\_Ant1\_5510



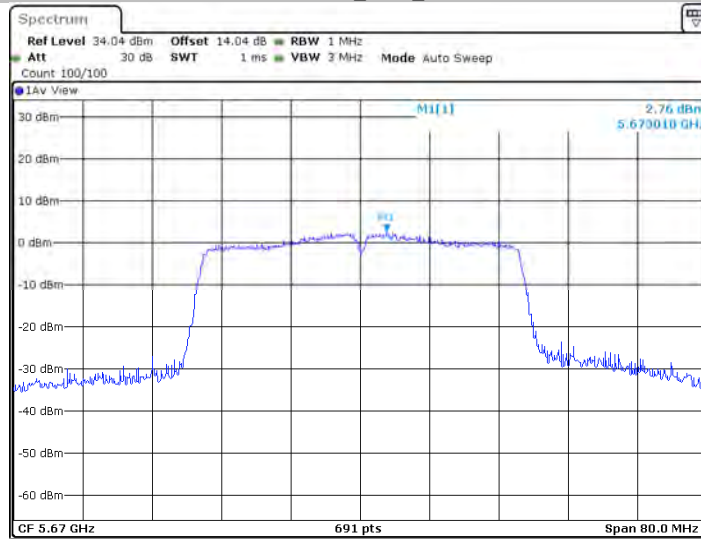
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### 11N40SISO\_Ant1\_5550



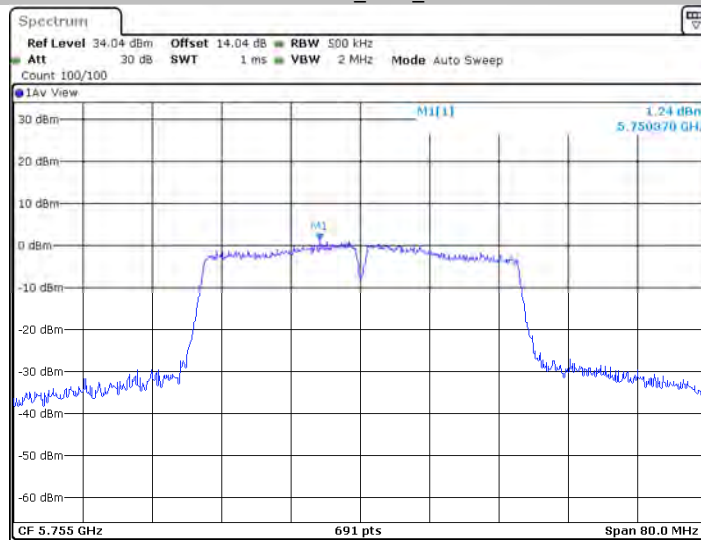
Date: 6 DEC 2019 15:50:00

### 11N40SISO\_Ant1\_5670



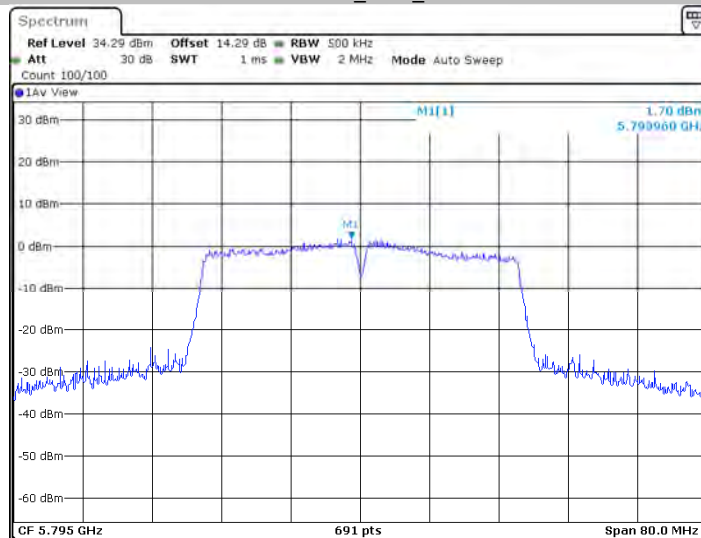
Date: 6 DEC.2019 15:54:54

### 11N40SISO\_Ant1\_5755



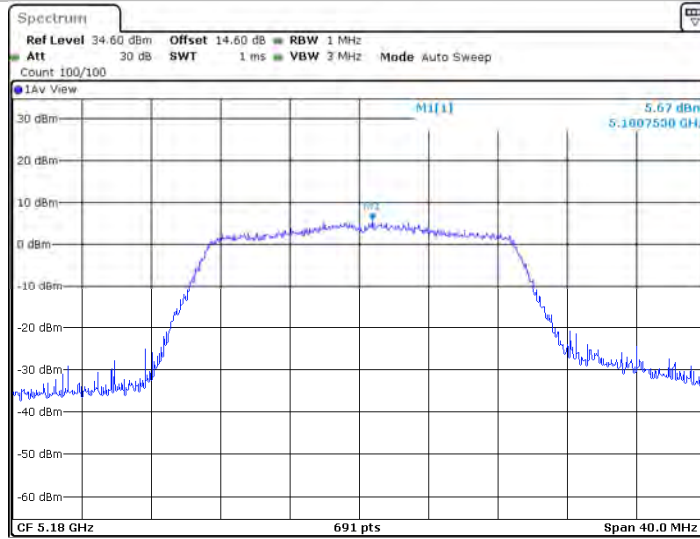
Date: 6 DEC.2019 16:28:53

### 11N40SISO\_Ant1\_5795



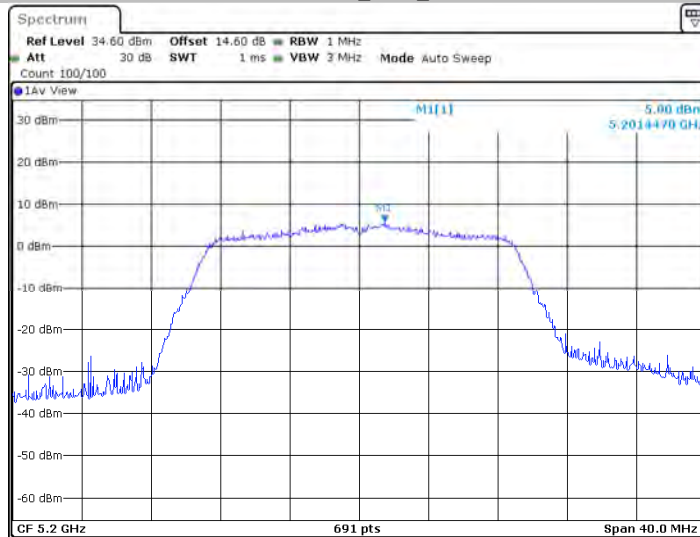
Date: 6 DEC.2019 16:34:29

### 11AC20SISO\_Ant1\_5180



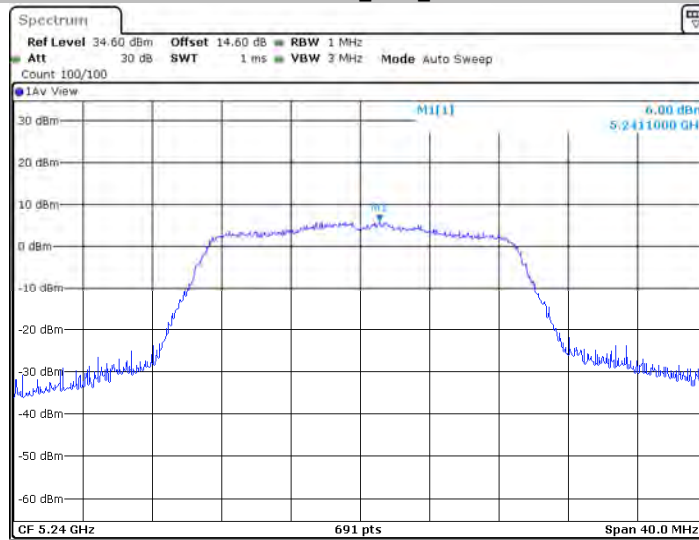
Date: 9.DEC.2019 13:59:40

### 11AC20SISO\_Ant1\_5200



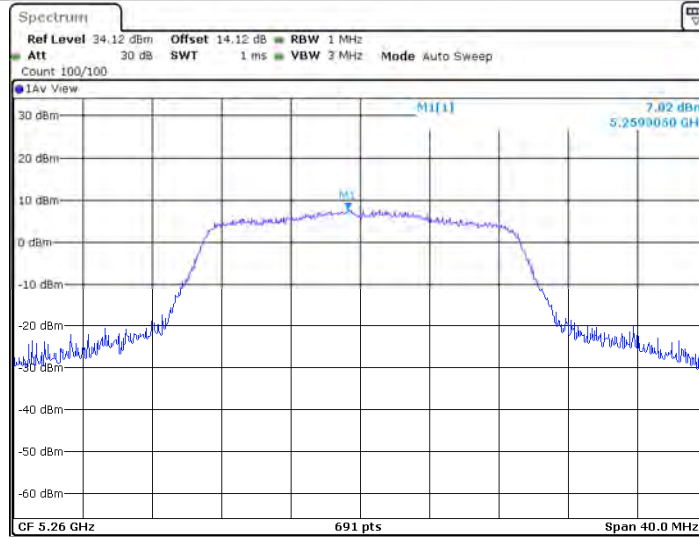
Date: 9.DEC.2019 14:00:28

### 11AC20SISO\_Ant1\_5240



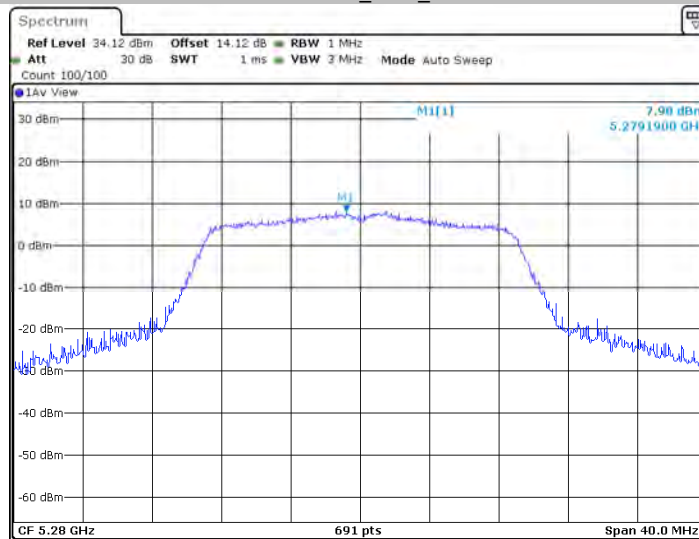
Date: 9 DEC 2019 14:01:06

### 11AC20SISO\_Ant1\_5260



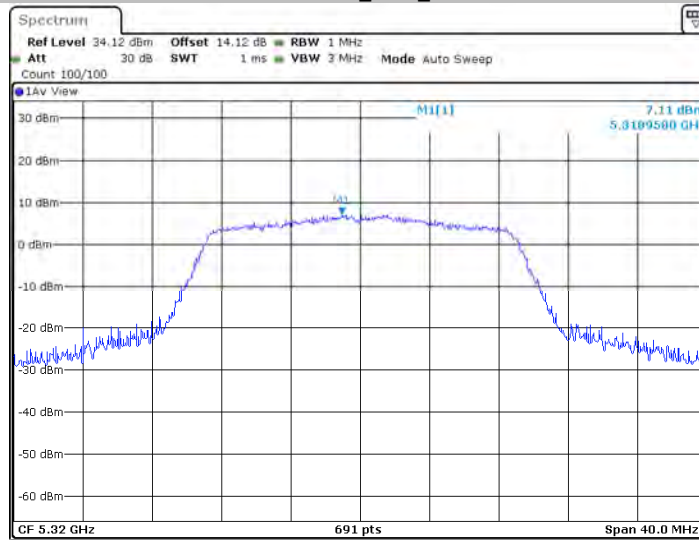
Date: 6 DEC 2019 16:55:02

### 11AC20SISO\_Ant1\_5280



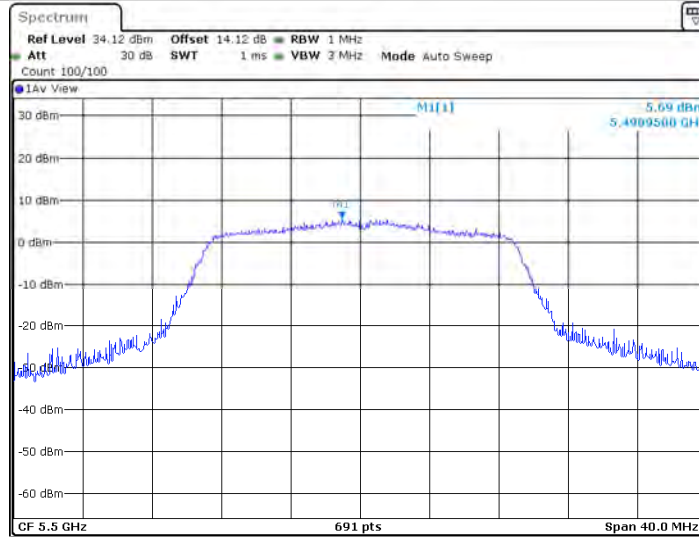
Date: 6 DEC 2019 16:59:35

### 11AC20SISO\_Ant1\_5320



Date: 6 DEC.2019 17:04:08

### 11AC20SISO\_Ant1\_5500



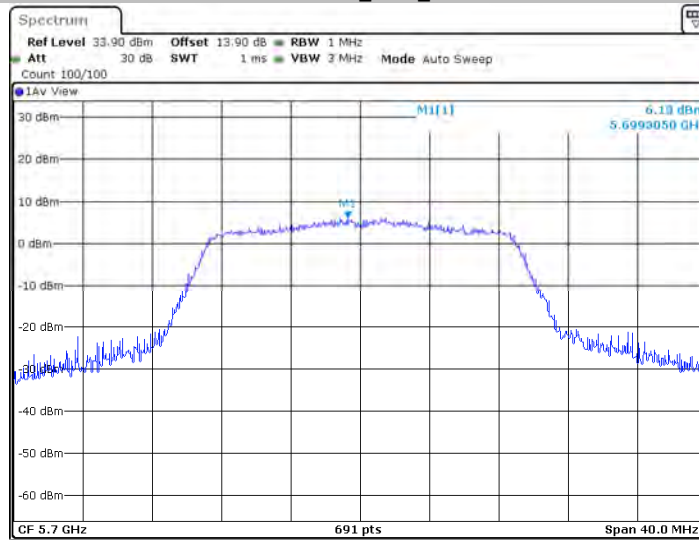
Date: 6 DEC.2019 17:08:43

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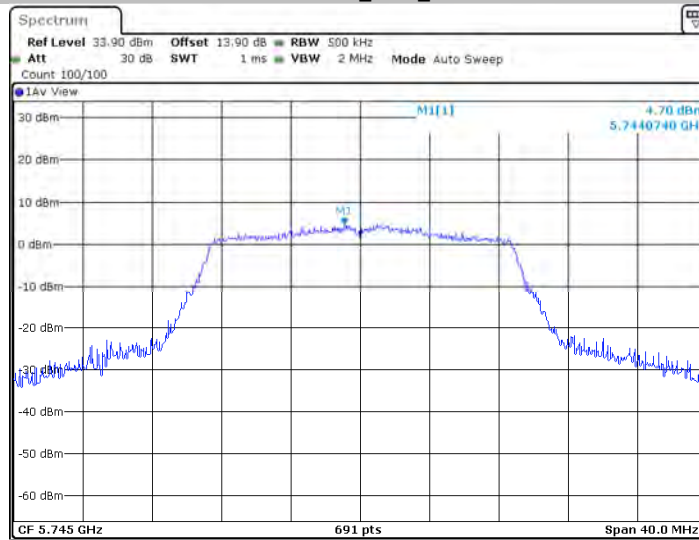
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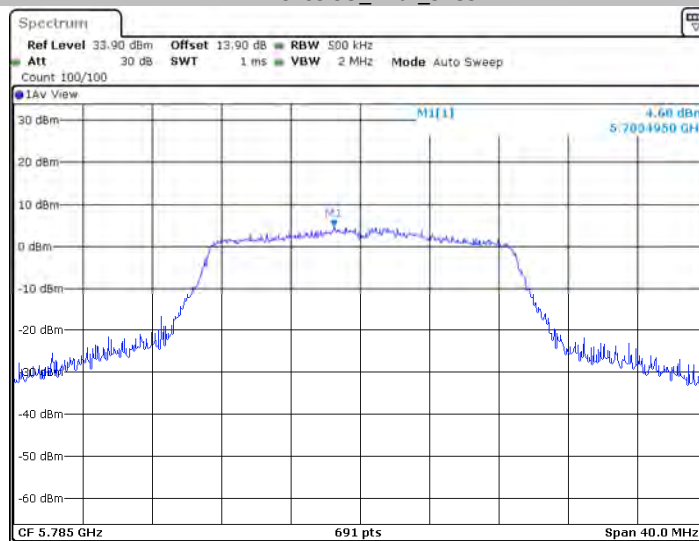
Date: 6 DEC 2019 17:18:50

### 11AC20SISO\_Ant1\_5745



Date: 6 DEC 2019 17:23:48

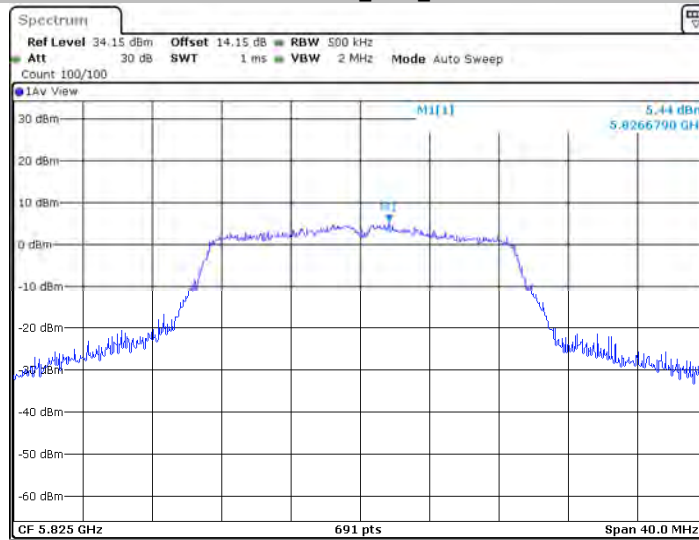
### 11AC20SISO\_Ant1\_5785



Date: 6 DEC 2019 17:29:22

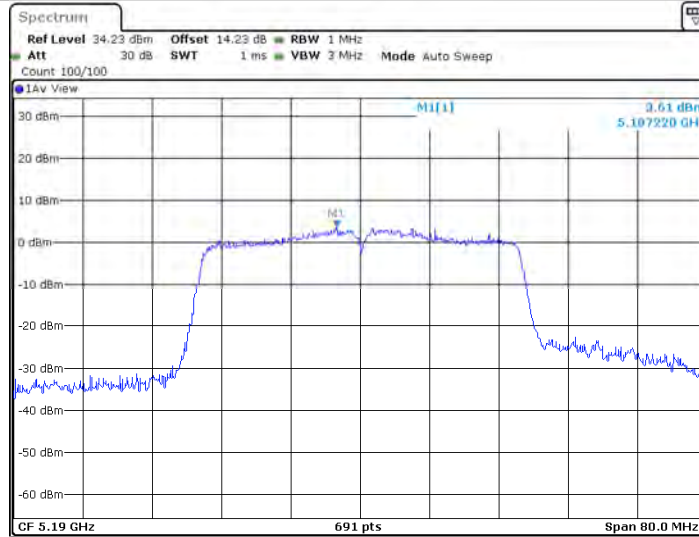


### 11AC20SISO\_Ant1\_5825



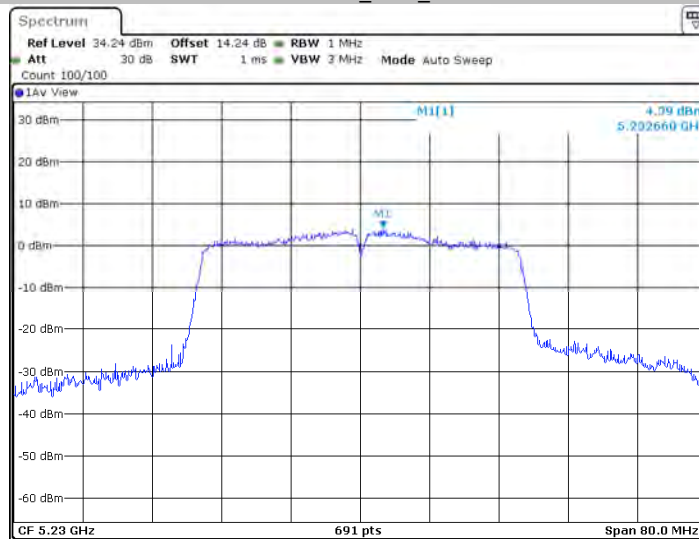
Date: 6 DEC.2019 17:34:49

### 11AC40SISO\_Ant1\_5190



Date: 6 DEC.2019 17:40:31

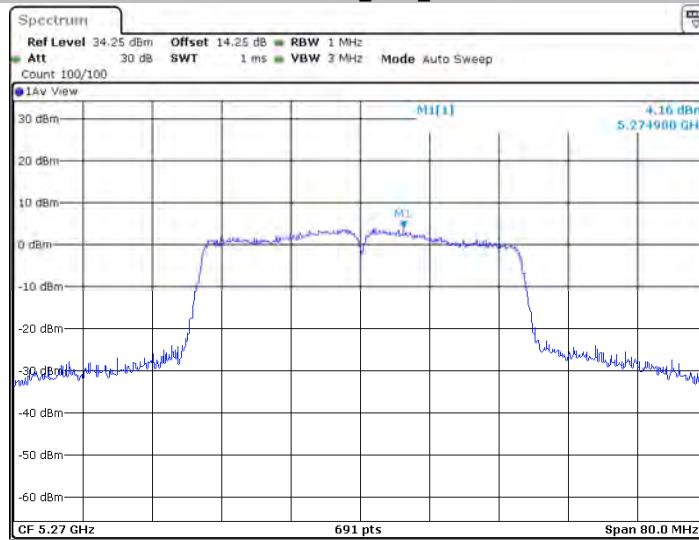
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Date: 6 DEC.2019 17:46:02

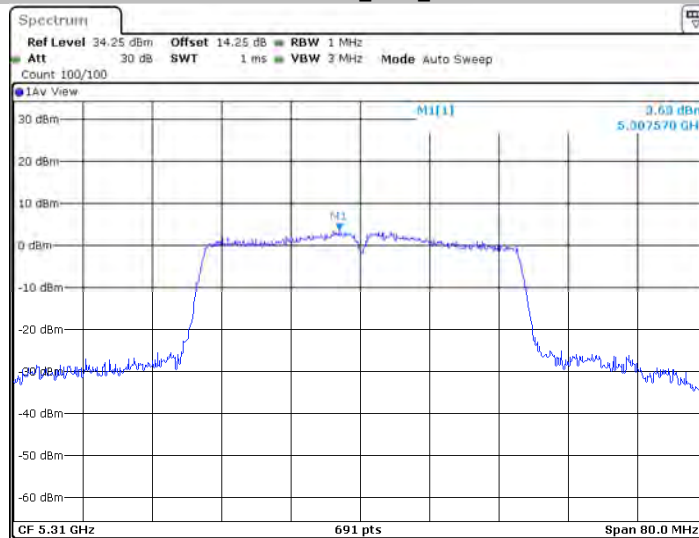


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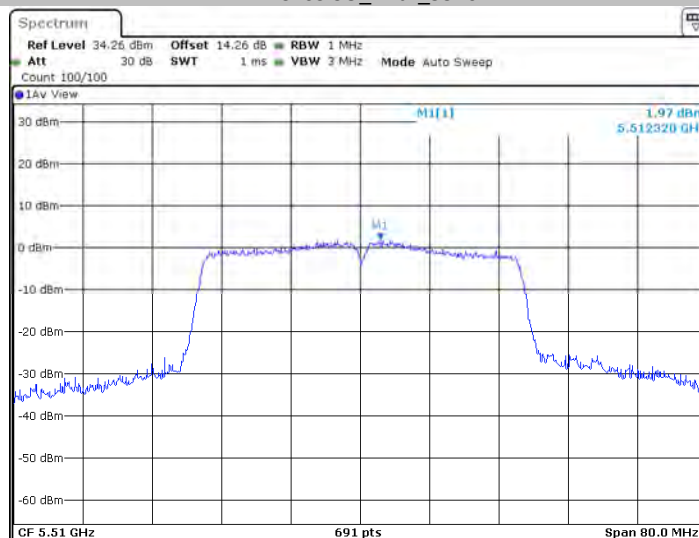
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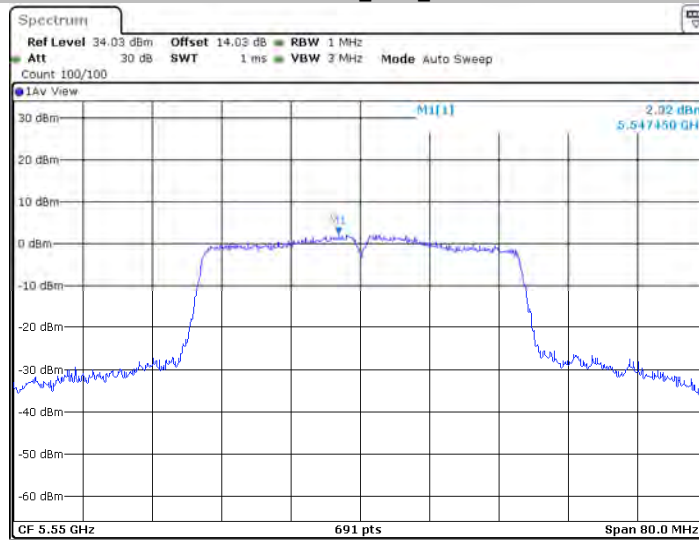
Date: 6 DEC.2019 17:56:12

### 11AC40SISO\_Ant1\_5510



Date: 6 DEC.2019 18:01:00

### 11AC40SISO\_Ant1\_5550



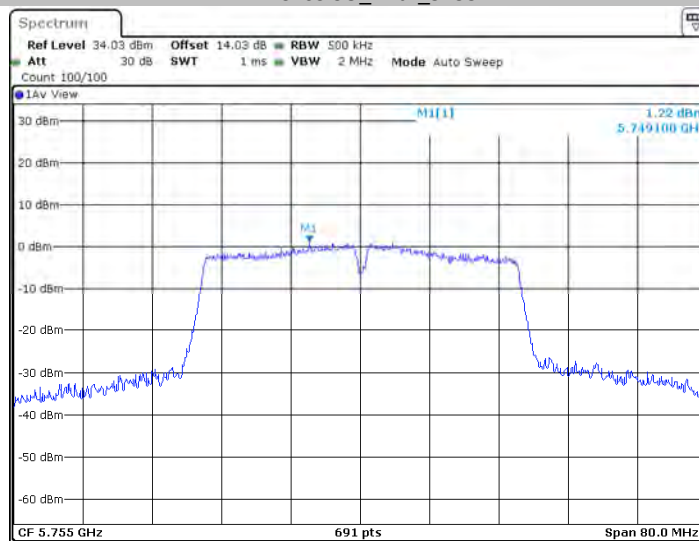
Date: 6 DEC.2019 18:05:53

### 11AC40SISO\_Ant1\_5670



Date: 6 DEC.2019 18:12:39

### 11AC40SISO\_Ant1\_5755



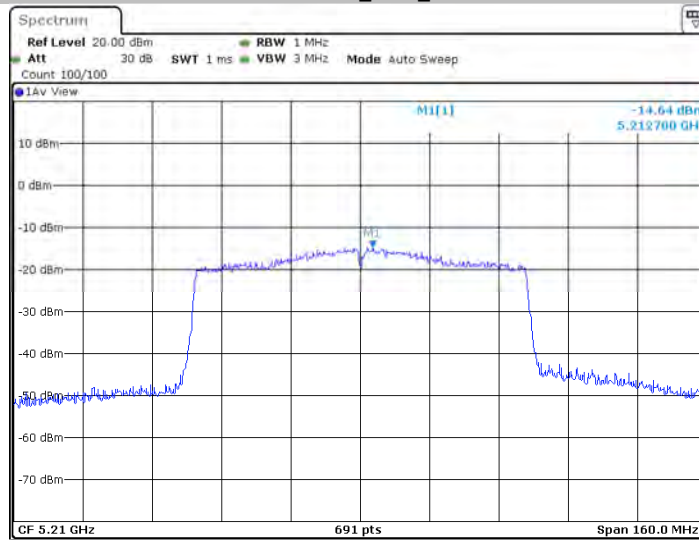
Date: 6 DEC.2019 18:18:00

### 11AC40SISO\_Ant1\_5795



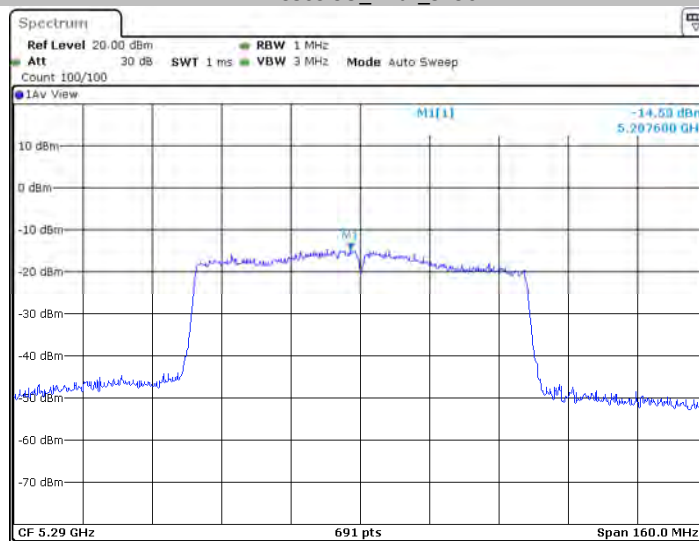
Date: 6 DEC 2019 18:23:11

### 11AC80SISO\_Ant1\_5210



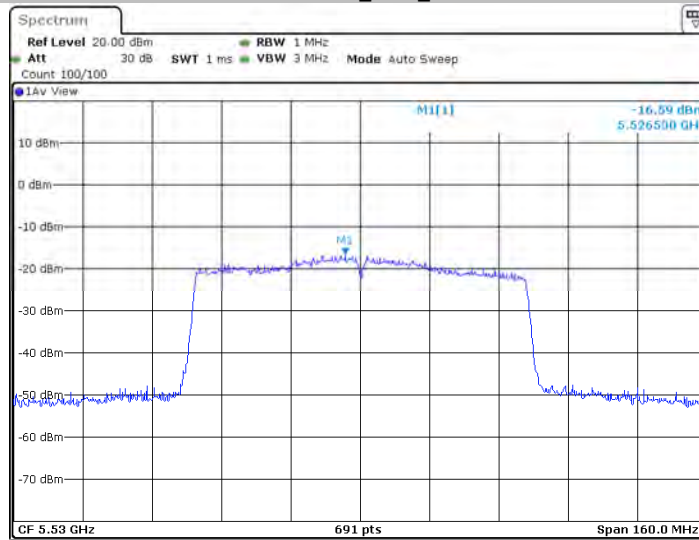
Date: 6 DEC 2019 18:30:35

### 11AC80SISO\_Ant1\_5290



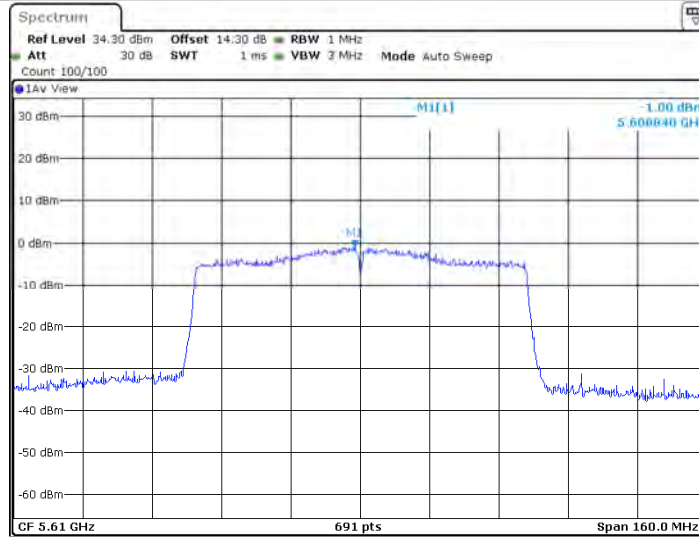
Date: 6 DEC 2019 19:00:04

### 11AC80SISO\_Ant1\_5530



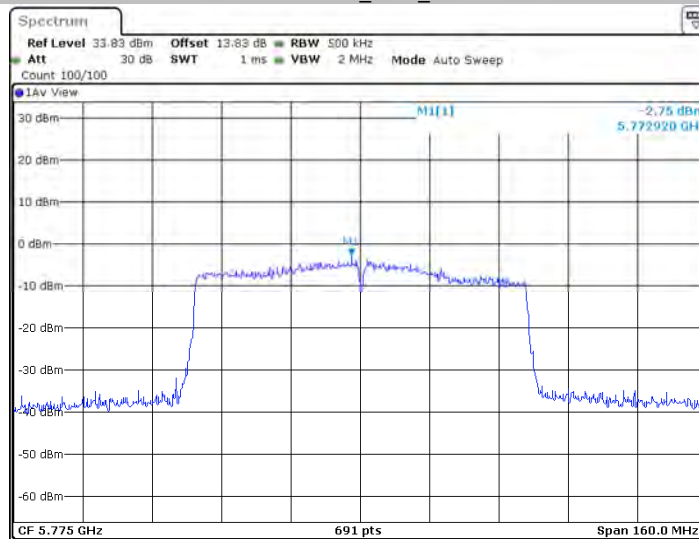
Date: 6 DEC 2019 19:05:06

### 11AC80SISO\_Ant1\_5610



Date: 6 DEC 2019 19:18:04

### 11AC80SISO\_Ant1\_5775



Date: 6 DEC 2019 19:42:16

## 5. Minimum 6 dB RF Bandwidth (FCC 15.407)

### 5.1 Operating environment

Temperature: 25 °C  
 Relative Humidity: 50 %  
 Atmospheric Pressure: 1011 hPa

### 5.2 Test setup & procedure

The Minimum 6 dB RF Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100KHz, and set the video bandwidth (VBW)  $\geq 3 \times$  RBW. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

#### For 26dB down Emission Bandwidth

The 26dB down Emission Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set RBW = approximately 1% of the emission bandwidth. Set the VBW > RBW, Detector = Peak, Trace mode = max hold (Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%).

#### For 99% Occupied Bandwidth

The 99% Occupied Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set center frequency to the nominal EUT channel center frequency, set span = 1.5 times to 5.0 times the OBW, set RBW = 1 % to 5 % of the OBW, set VBW  $\geq 3 \times$  RBW, The 99% occupied bandwidth was determined from where the channel output spectrum intersected the display line.

### 5.3 Limit

| Operating Frequency (MHz) | Minimum 6 dB RF Bandwidth Limit |
|---------------------------|---------------------------------|
| 5150~5250                 | N/A                             |
| 5250~5350                 | N/A                             |
| 5470~5725                 | N/A                             |
| 5725~ 5850                | $\geq 500\text{KHz}$            |

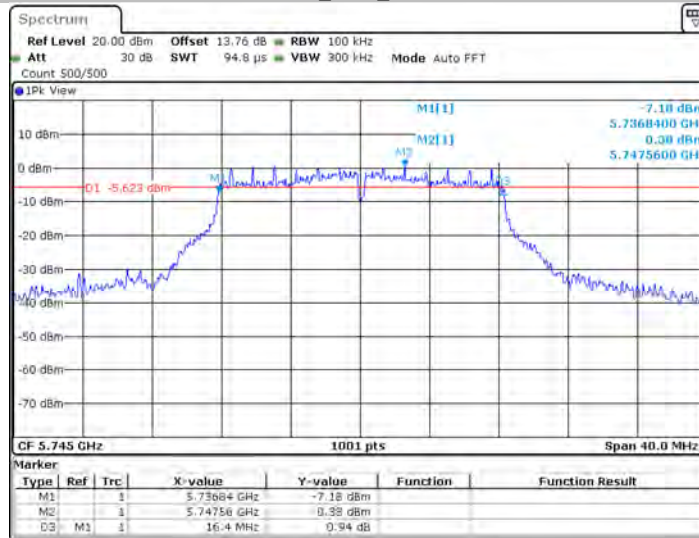
**Note: 99% Occupied Bandwidth within the U-NII-1 band and 26dB Emission Bandwidth for reference. The plots are attached as below: "26dB OBW" and "99% OBW"**

**5.4 Measured data of 6dB down Emission Bandwidth test results**

| Test Mode | Channel | 6dB EBW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|-----------|---------|---------------|----------|----------|------------|---------|
| 11A       | 5745    | 16.400        | 5736.840 | 5753.240 | 0.5        | PASS    |
|           | 5785    | 16.400        | 5776.840 | 5793.240 | 0.5        | PASS    |
|           | 5825    | 16.360        | 5816.880 | 5833.240 | 0.5        | PASS    |
| 11N20     | 5745    | 17.360        | 5736.280 | 5753.640 | 0.5        | PASS    |
|           | 5785    | 17.360        | 5776.280 | 5793.640 | 0.5        | PASS    |
|           | 5825    | 17.640        | 5816.280 | 5833.920 | 0.5        | PASS    |
| 11N40     | 5755    | 36.240        | 5736.840 | 5773.080 | 0.5        | PASS    |
|           | 5795    | 36.240        | 5776.840 | 5813.080 | 0.5        | PASS    |
| 11AC20    | 5745    | 17.640        | 5736.240 | 5753.880 | 0.5        | PASS    |
|           | 5785    | 17.400        | 5776.240 | 5793.640 | 0.5        | PASS    |
|           | 5825    | 16.960        | 5816.280 | 5833.240 | 0.5        | PASS    |
| 11AC40    | 5755    | 35.920        | 5736.840 | 5772.760 | 0.5        | PASS    |
|           | 5795    | 36.080        | 5776.840 | 5812.920 | 0.5        | PASS    |
| 11AC80    | 5775    | 75.520        | 5737.240 | 5812.760 | 0.5        | PASS    |

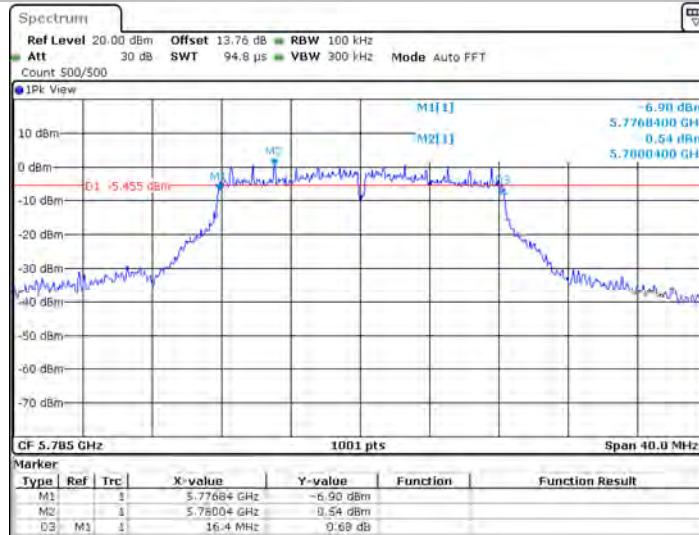
The test plots are attached as below.

## 11A\_Ant1\_5745



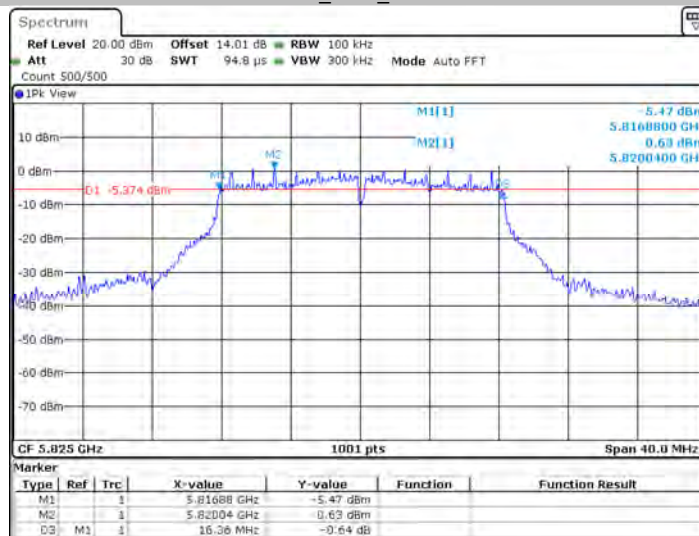
Date: 6 DEC 2019 13:30:30

## 11A\_Ant1\_5785



Date: 6 DEC 2019 13:36:52

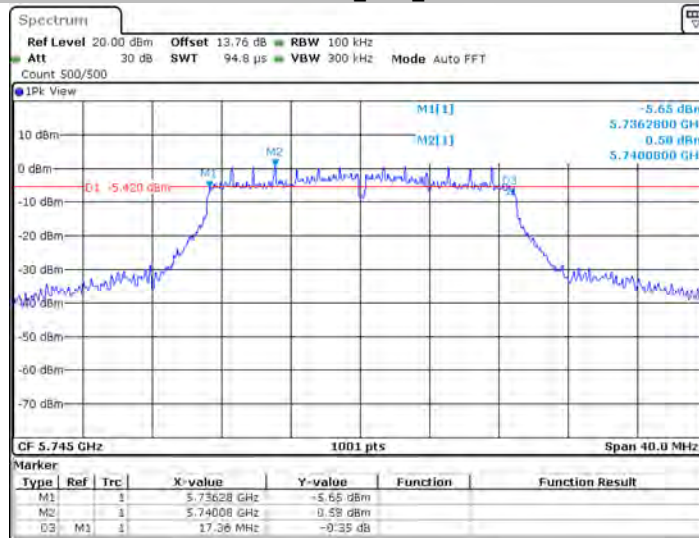
## 11A\_Ant1\_5825



Date: 6 DEC 2019 13:41:15

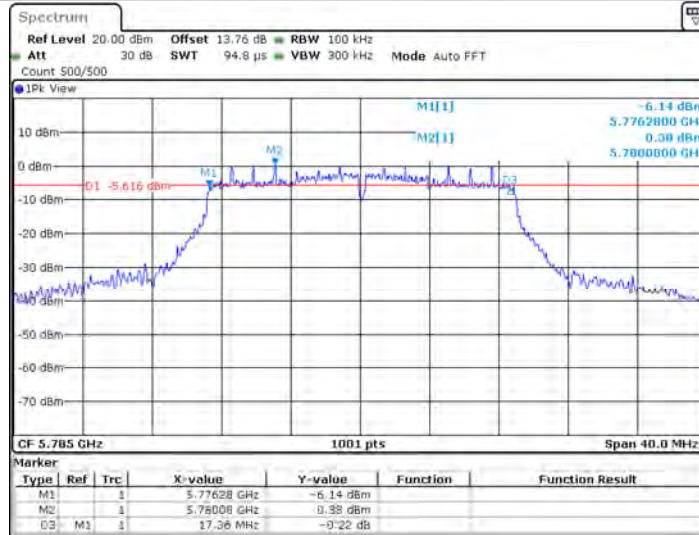


## 11N20SISO\_Ant1\_5745



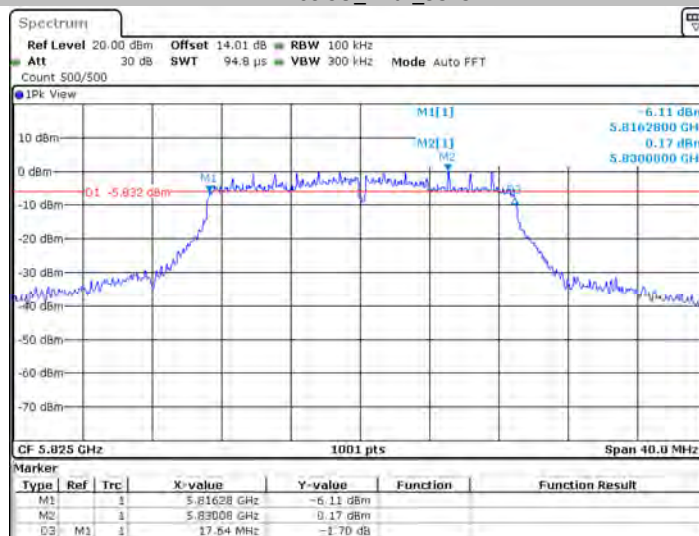
Date: 6 DEC 2019 14:44:39

## 11N20SISO\_Ant1\_5785



Date: 6 DEC 2019 14:49:42

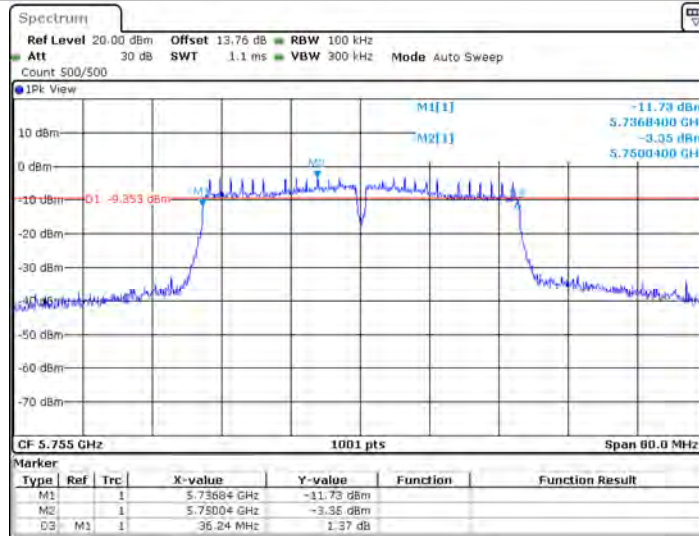
## 11N20SISO\_Ant1\_5825



Date: 6 DEC 2019 14:56:49

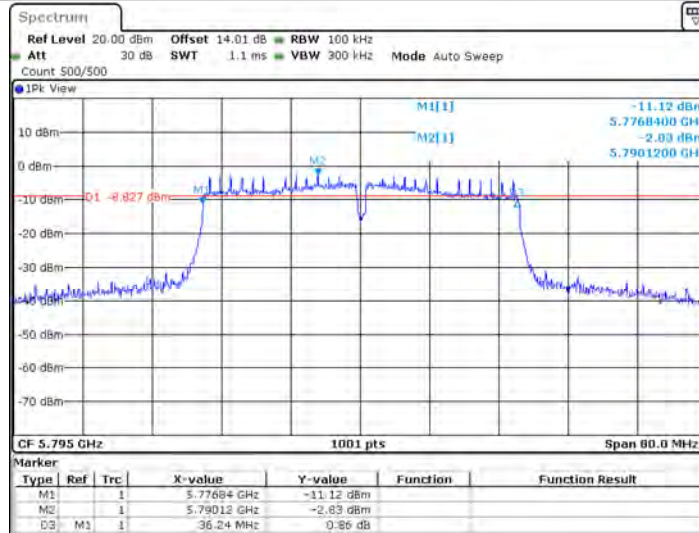


## 11N40SISO\_Ant1\_5755



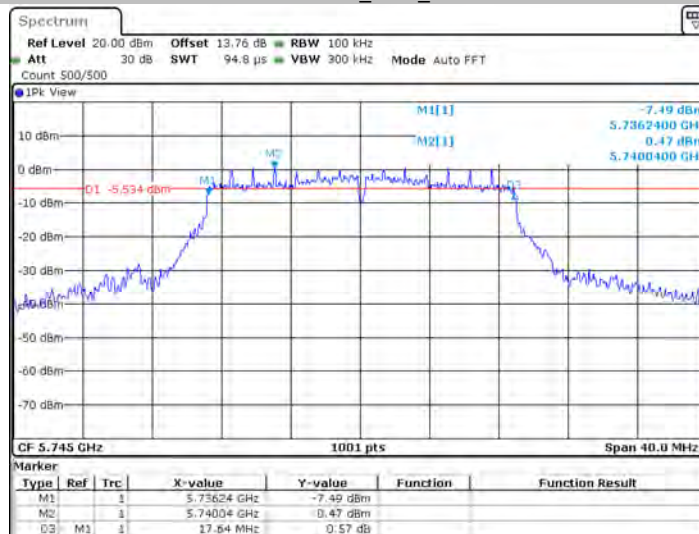
Date: 6 DEC 2019 16:26:11

## 11N40SISO\_Ant1\_5795



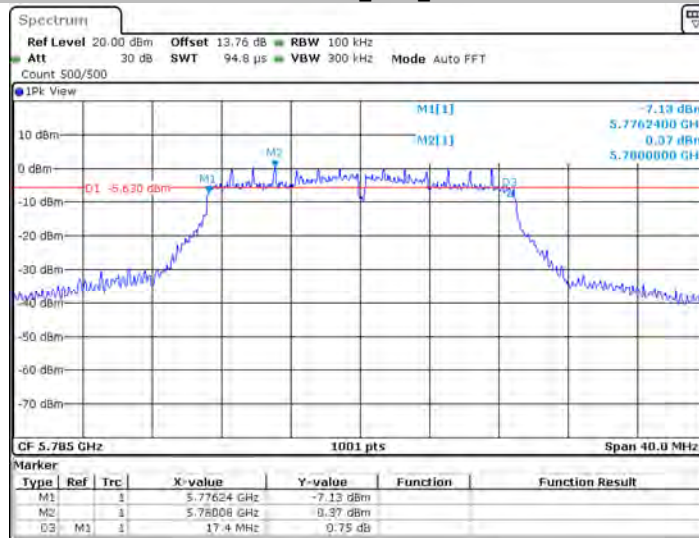
Date: 6 DEC 2019 16:33:47

## 11AC20SISO\_Ant1\_5745



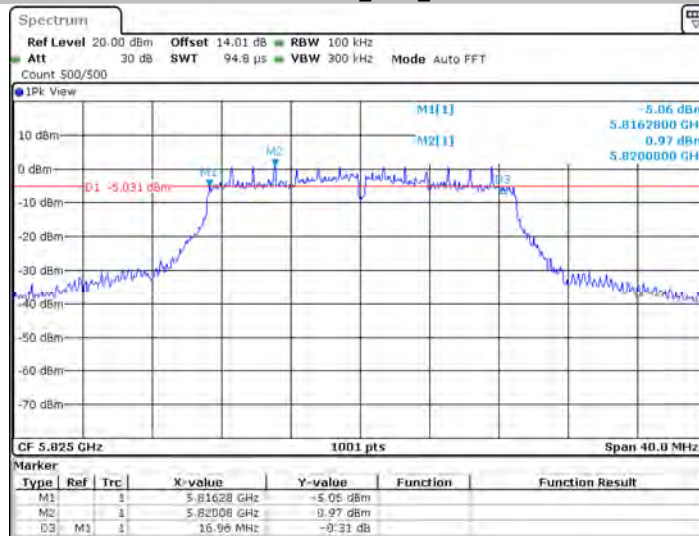
Date: 6 DEC 2019 17:23:09

11AC20SISO\_Ant1\_5785



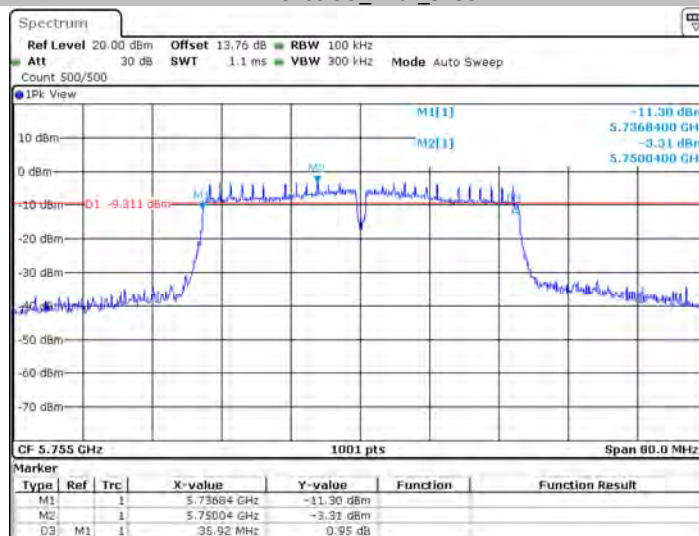
Date: 6 DEC 2019 17:28:40

11AC20SISO\_Ant1\_5825



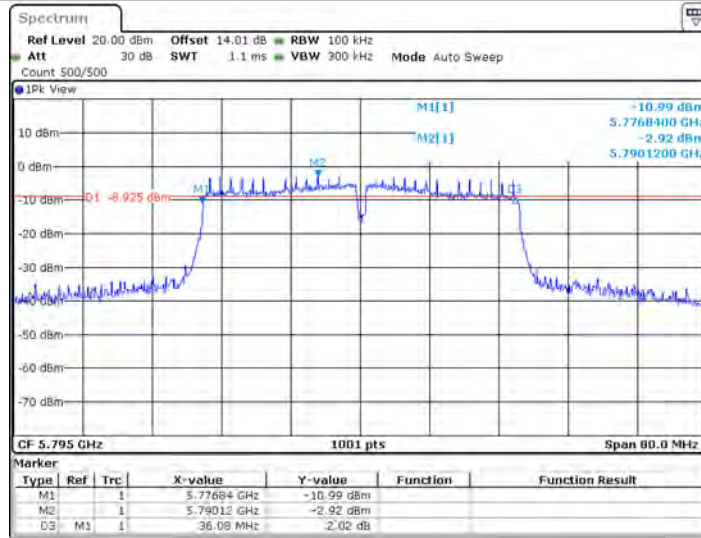
Date: 6 DEC 2019 17:34:07

11AC40SISO\_Ant1\_5755



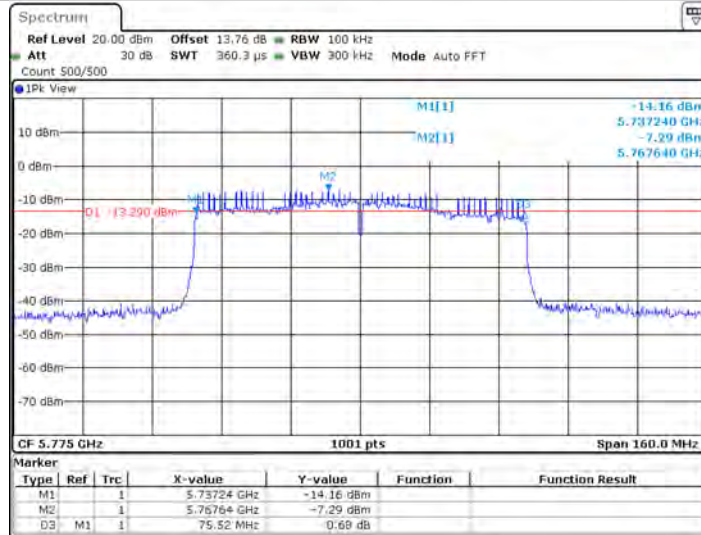
Date: 6 DEC 2019 18:17:10

11AC40SISO\_Ant1\_5795



Date: 6 DEC 2019 18:22:29

11AC80SISO\_Ant1\_5775

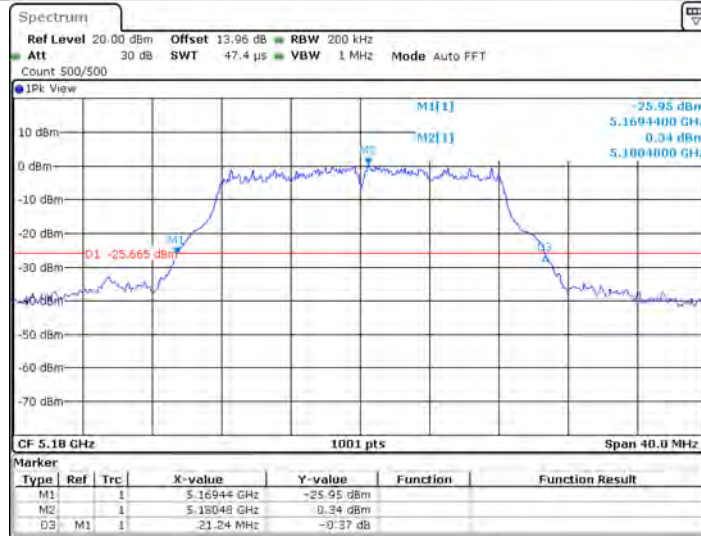


Date: 6 DEC 2019 19:41:33

26dB OBW

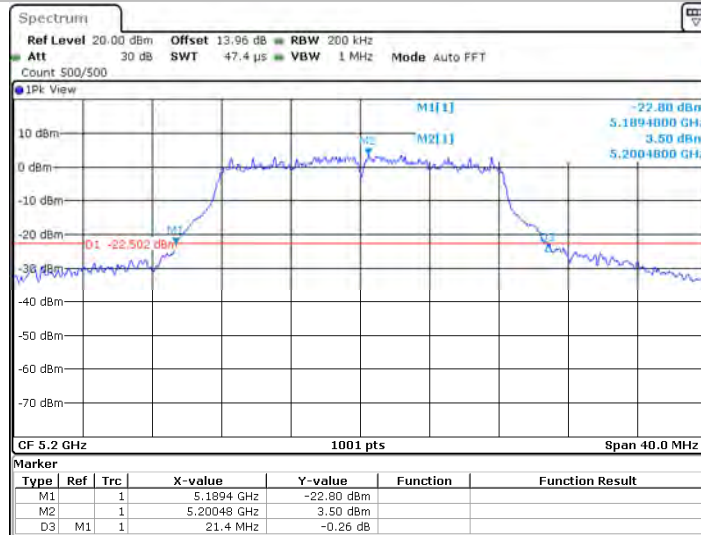
| Test Mode | Channel | 26dB EBW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|-----------|---------|----------------|----------|----------|------------|---------|
| 11A       | 5180    | 21.240         | 5169.440 | 5190.680 | ---        | PASS    |
|           | 5200    | 21.400         | 5189.400 | 5210.800 | ---        | PASS    |
|           | 5240    | 21.440         | 5229.360 | 5250.800 | ---        | PASS    |
|           | 5260    | 21.240         | 5249.360 | 5270.600 | ---        | PASS    |
|           | 5280    | 21.160         | 5269.400 | 5290.560 | ---        | PASS    |
|           | 5320    | 21.280         | 5309.360 | 5330.640 | ---        | PASS    |
|           | 5500    | 21.160         | 5489.400 | 5510.560 | ---        | PASS    |
|           | 5580    | 21.200         | 5569.400 | 5590.600 | ---        | PASS    |
|           | 5700    | 21.360         | 5689.360 | 5710.720 | ---        | PASS    |
|           | 5745    | 21.160         | 5734.400 | 5755.560 | ---        | PASS    |
| 5785      | 21.160  | 5774.320       | 5795.480 | ---      | PASS       |         |
| 5825      | 21.240  | 5814.320       | 5835.560 | ---      | PASS       |         |
| 11N20     | 5180    | 23.000         | 5169.400 | 5192.400 | ---        | PASS    |
|           | 5200    | 21.520         | 5189.320 | 5210.840 | ---        | PASS    |
|           | 5240    | 21.880         | 5229.280 | 5251.160 | ---        | PASS    |
|           | 5260    | 21.920         | 5249.280 | 5271.200 | ---        | PASS    |
|           | 5280    | 21.440         | 5269.320 | 5290.760 | ---        | PASS    |
|           | 5320    | 21.480         | 5309.400 | 5330.880 | ---        | PASS    |
|           | 5500    | 21.440         | 5489.360 | 5510.800 | ---        | PASS    |
|           | 5580    | 21.520         | 5569.360 | 5590.880 | ---        | PASS    |
|           | 5700    | 21.680         | 5689.400 | 5711.080 | ---        | PASS    |
|           | 5745    | 21.680         | 5734.360 | 5756.040 | ---        | PASS    |
| 5785      | 21.600  | 5774.320       | 5795.920 | ---      | PASS       |         |
| 5825      | 21.920  | 5813.920       | 5835.840 | ---      | PASS       |         |
| 11N40     | 5190    | 47.440         | 5170.000 | 5217.440 | ---        | PASS    |
|           | 5230    | 45.520         | 5210.000 | 5255.520 | ---        | PASS    |
|           | 5270    | 48.800         | 5248.960 | 5297.760 | ---        | PASS    |
|           | 5310    | 41.840         | 5289.680 | 5331.520 | ---        | PASS    |
|           | 5510    | 41.760         | 5489.680 | 5531.440 | ---        | PASS    |
|           | 5550    | 42.560         | 5527.920 | 5570.480 | ---        | PASS    |
|           | 5670    | 41.680         | 5649.920 | 5691.600 | ---        | PASS    |
|           | 5755    | 49.360         | 5732.840 | 5782.200 | ---        | PASS    |
| 5795      | 44.720  | 5770.520       | 5815.240 | ---      | PASS       |         |
| 11AC20    | 5180    | 21.600         | 5169.400 | 5191.000 | ---        | PASS    |
|           | 5200    | 21.480         | 5189.320 | 5210.800 | ---        | PASS    |
|           | 5240    | 21.720         | 5229.280 | 5251.000 | ---        | PASS    |
|           | 5260    | 21.600         | 5249.200 | 5270.800 | ---        | PASS    |
|           | 5280    | 21.600         | 5269.240 | 5290.840 | ---        | PASS    |
|           | 5320    | 21.960         | 5308.840 | 5330.800 | ---        | PASS    |
|           | 5500    | 21.600         | 5489.280 | 5510.880 | ---        | PASS    |
|           | 5580    | 21.720         | 5569.080 | 5590.800 | ---        | PASS    |
|           | 5700    | 21.480         | 5689.320 | 5710.800 | ---        | PASS    |
|           | 5745    | 21.800         | 5734.200 | 5756.000 | ---        | PASS    |
| 5785      | 23.080  | 5773.280       | 5796.360 | ---      | PASS       |         |
| 5825      | 22.320  | 5813.720       | 5836.040 | ---      | PASS       |         |
| 11AC40    | 5190    | 48.880         | 5169.920 | 5218.800 | ---        | PASS    |
|           | 5230    | 41.920         | 5210.000 | 5251.920 | ---        | PASS    |
|           | 5270    | 41.200         | 5249.840 | 5291.040 | ---        | PASS    |
|           | 5310    | 41.280         | 5289.760 | 5331.040 | ---        | PASS    |
|           | 5510    | 42.720         | 5490.000 | 5532.720 | ---        | PASS    |
|           | 5550    | 41.120         | 5529.920 | 5571.040 | ---        | PASS    |
|           | 5670    | 41.840         | 5649.920 | 5691.760 | ---        | PASS    |
|           | 5755    | 42.160         | 5734.760 | 5776.920 | ---        | PASS    |
| 5795      | 40.640  | 5774.680       | 5815.320 | ---      | PASS       |         |
| 11AC80    | 5210    | 84.160         | 5169.200 | 5253.360 | ---        | PASS    |
|           | 5290    | 82.080         | 5249.040 | 5331.120 | ---        | PASS    |
|           | 5530    | 81.760         | 5489.200 | 5570.960 | ---        | PASS    |
|           | 5610    | 83.360         | 5568.880 | 5652.240 | ---        | PASS    |
|           | 5775    | 88.000         | 5733.560 | 5821.560 | ---        | PASS    |

## 11A\_Ant1\_5180



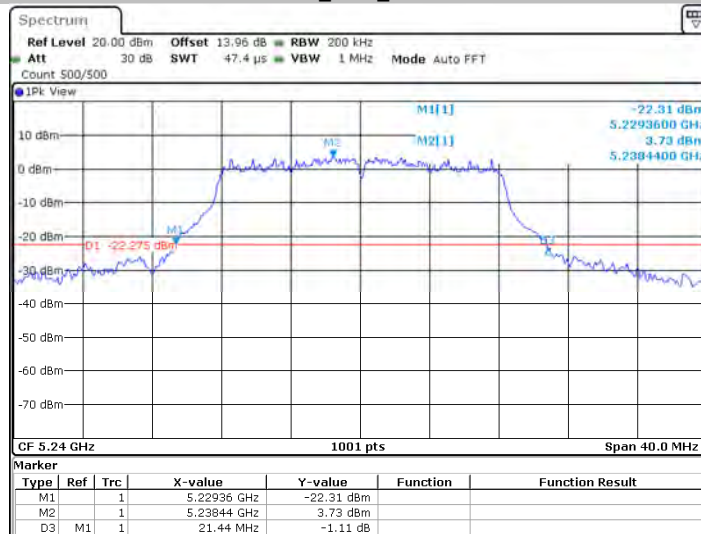
Date: 6 DEC 2019 11:16:03

## 11A\_Ant1\_5200



Date: 6 DEC 2019 11:23:09

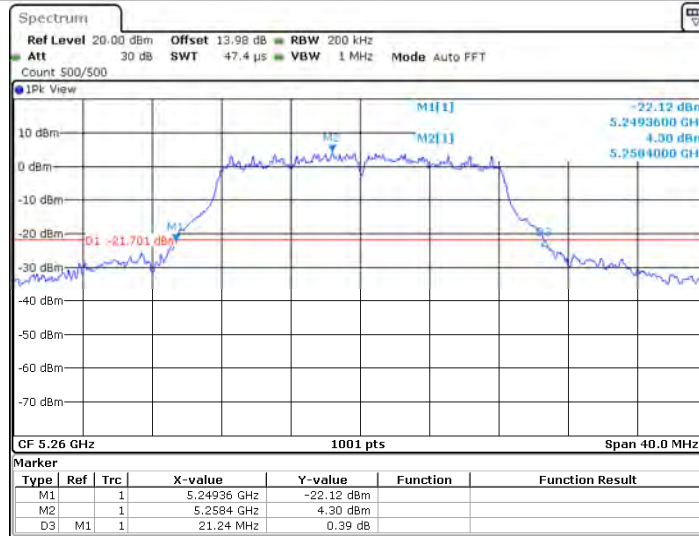
## 11A\_Ant1\_5240



Date: 6 DEC 2019 11:28:03

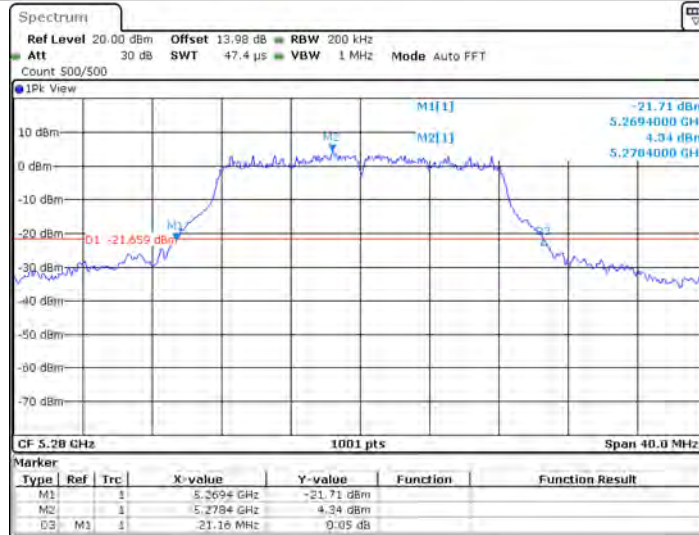


## 11A\_Ant1\_5260



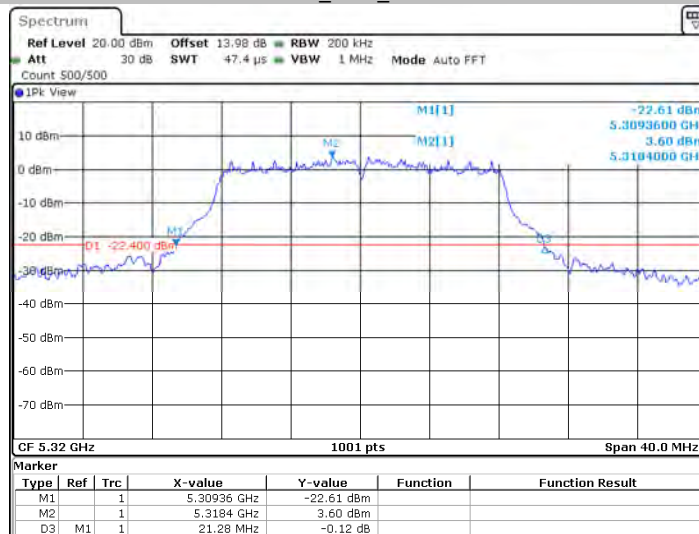
Date: 6 DEC 2019 11:33:19

## 11A\_Ant1\_5280



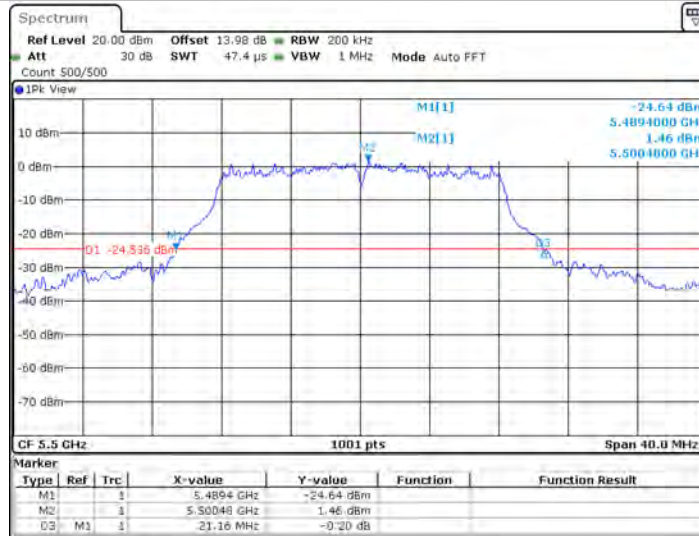
Date: 6 DEC 2019 11:38:43

## 11A\_Ant1\_5320



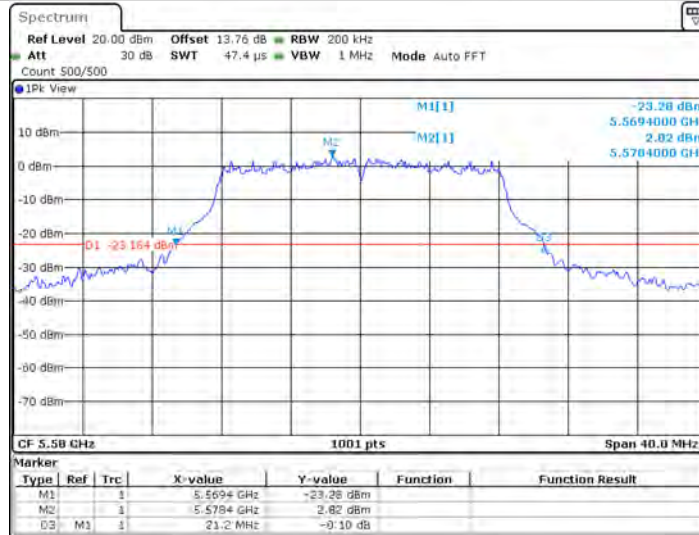
Date: 6 DEC 2019 11:43:32

## 11A\_Ant1\_5500



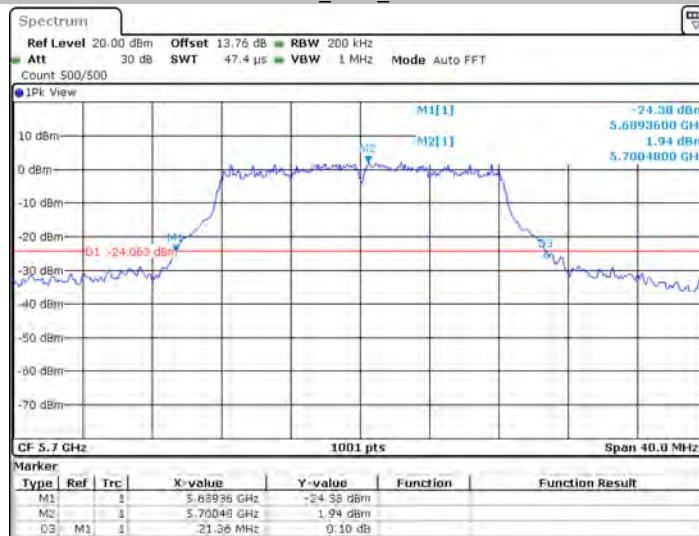
Date: 6 DEC 2019 11:52:48

## 11A\_Ant1\_5580



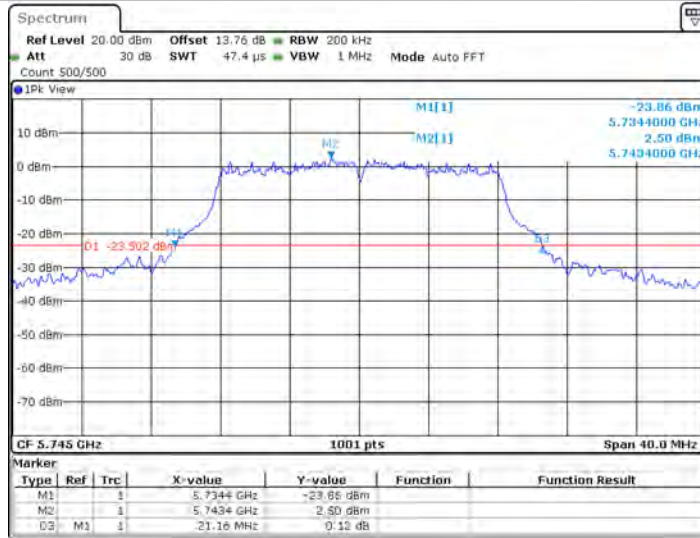
Date: 6 DEC 2019 11:57:24

## 11A\_Ant1\_5700



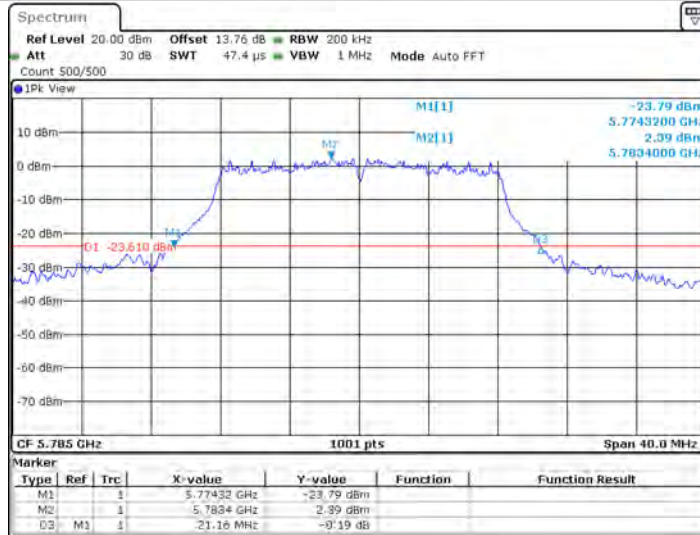
Date: 6 DEC 2019 13:19:30

11A\_Ant1\_5745



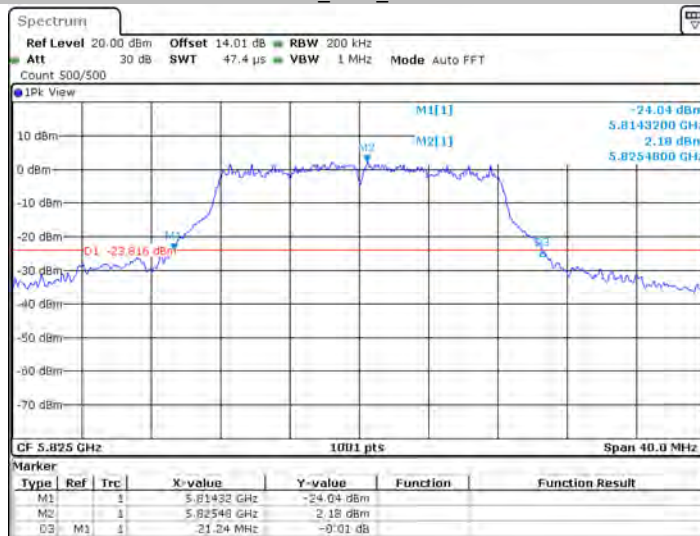
Date: 6 DEC 2019 13:30:12

11A\_Ant1\_5785



Date: 6 DEC 2019 13:35:34

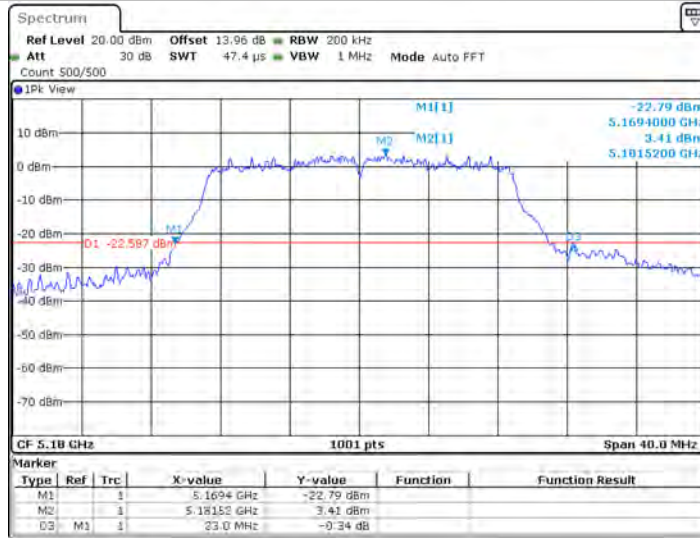
11A\_Ant1\_5825



Date: 6 DEC 2019 13:40:57

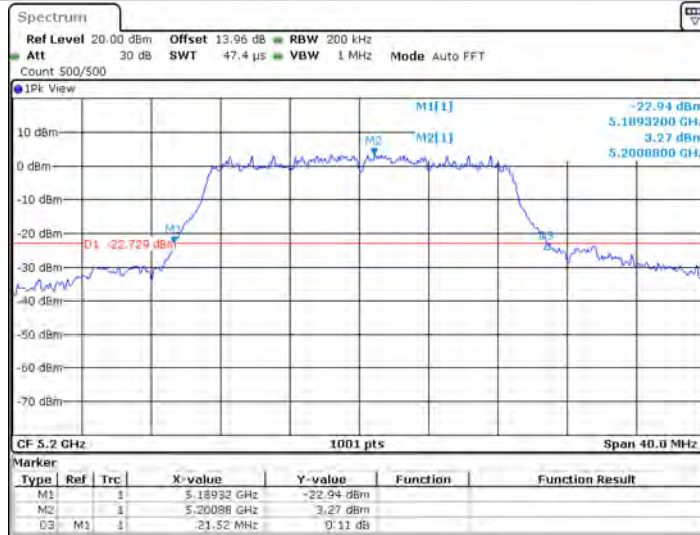


11N20SISO\_Ant1\_5180



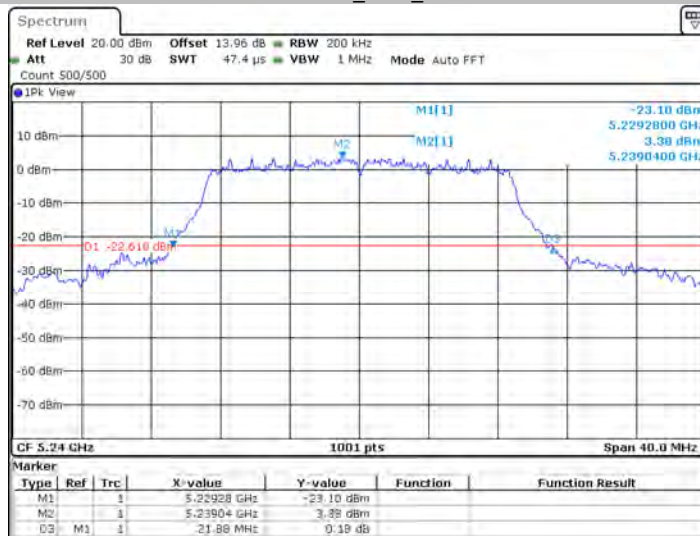
Date: 6 DEC 2019 13:47:56

11N20SISO\_Ant1\_5200



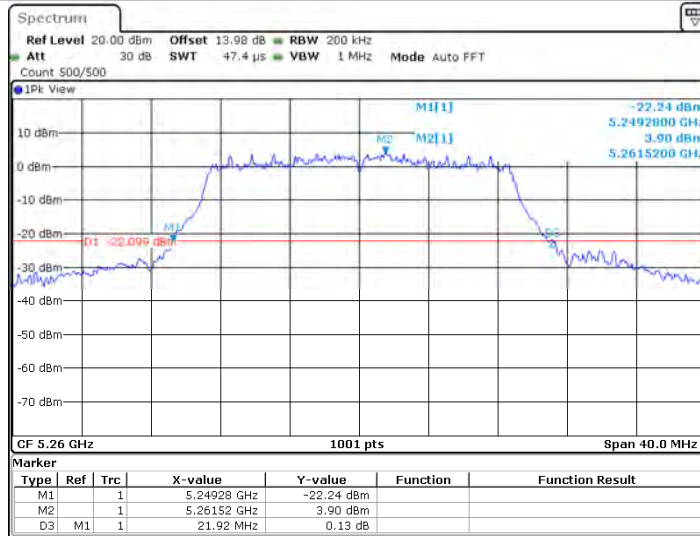
Date: 6 DEC 2019 13:52:29

11N20SISO\_Ant1\_5240



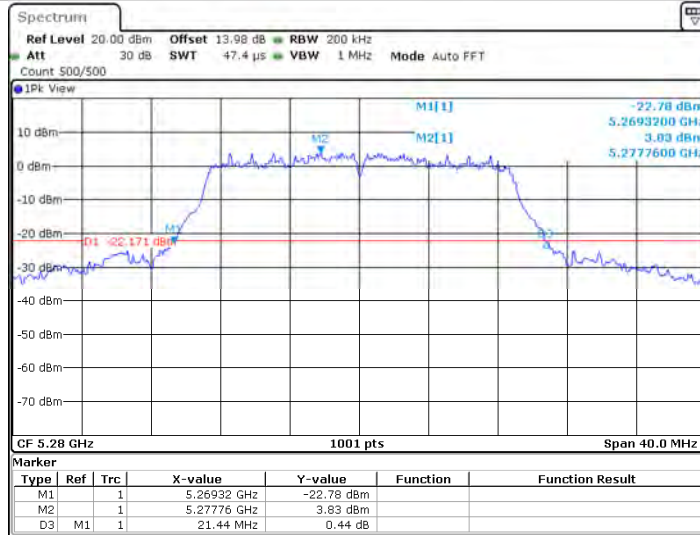
Date: 6 DEC 2019 13:57:22

11N20SISO\_Ant1\_5260



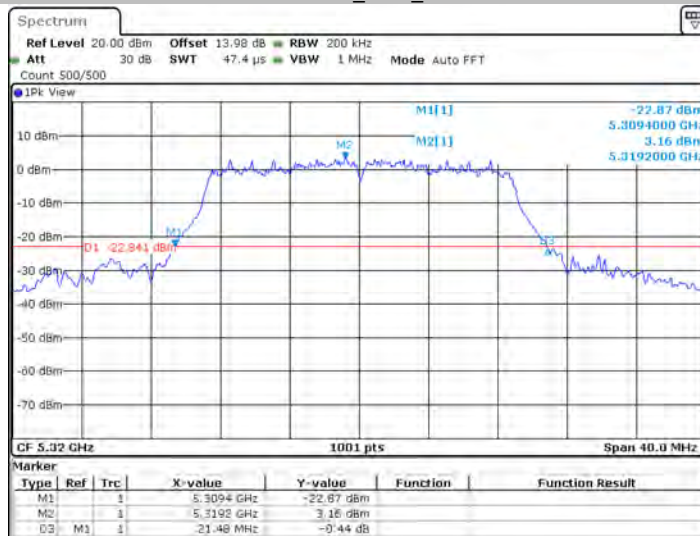
Date: 6 DEC 2019 14:01:58

11N20SISO\_Ant1\_5280



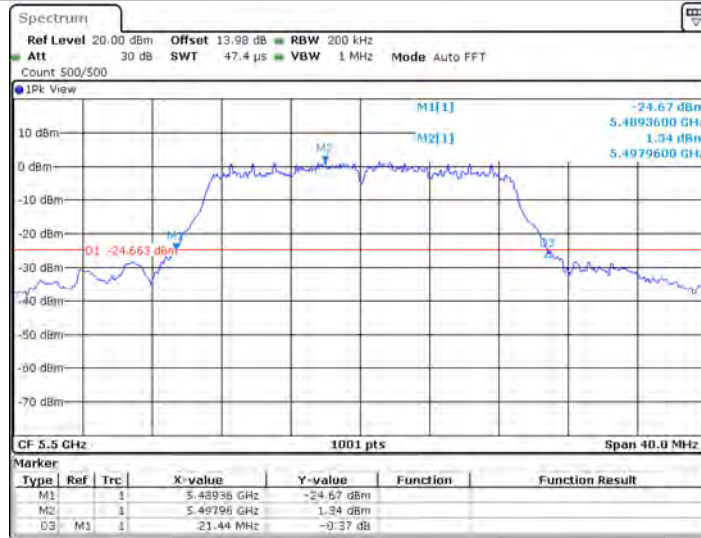
Date: 6 DEC 2019 14:06:37

11N20SISO\_Ant1\_5320



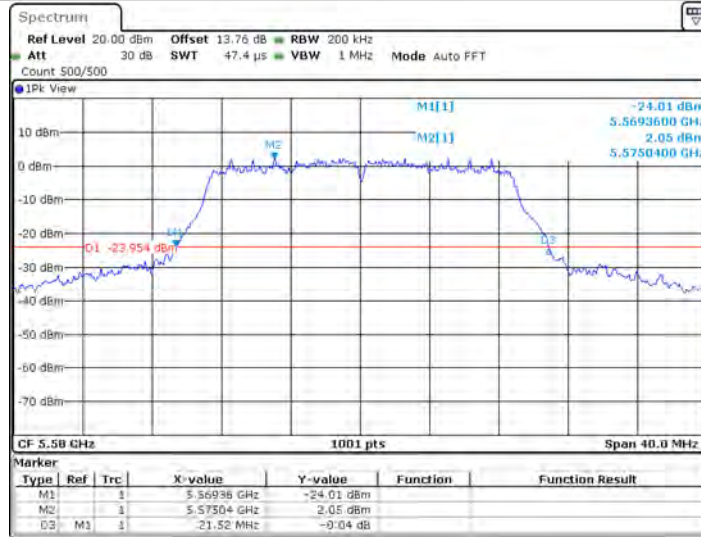
Date: 6 DEC 2019 14:13:00

11N20SISO\_Ant1\_5500



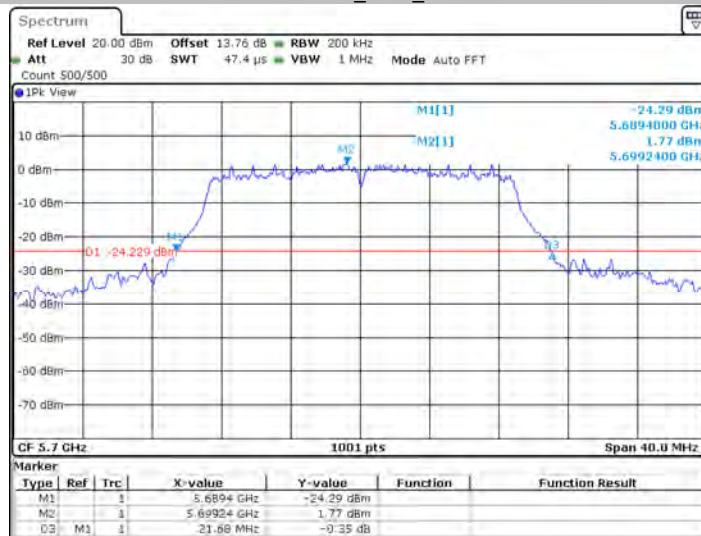
Date: 6 DEC 2019 14:24:29

11N20SISO\_Ant1\_5580



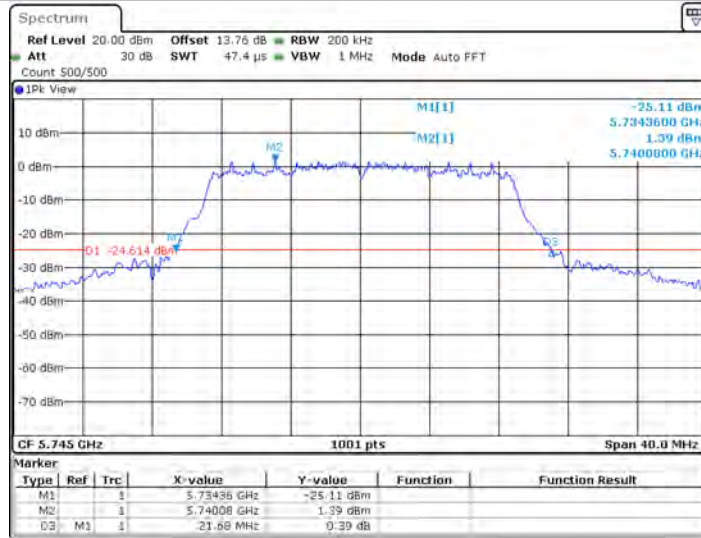
Date: 6 DEC 2019 14:29:27

11N20SISO\_Ant1\_5700



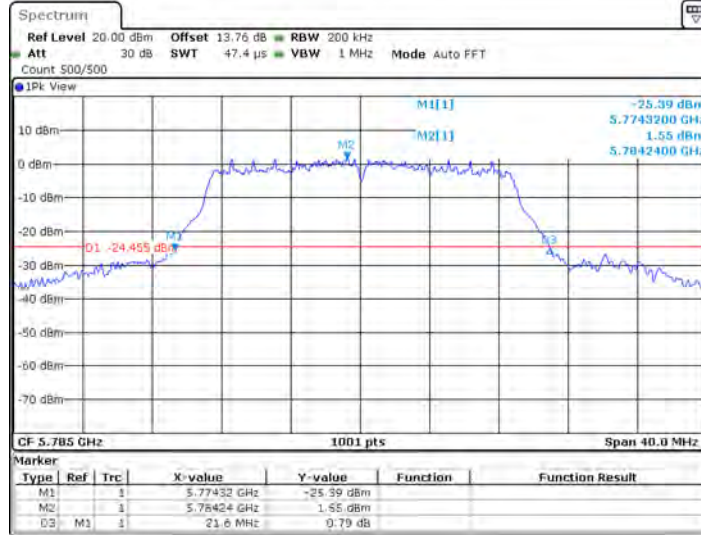
Date: 6 DEC 2019 14:34:34

11N20SISO\_Ant1\_5745



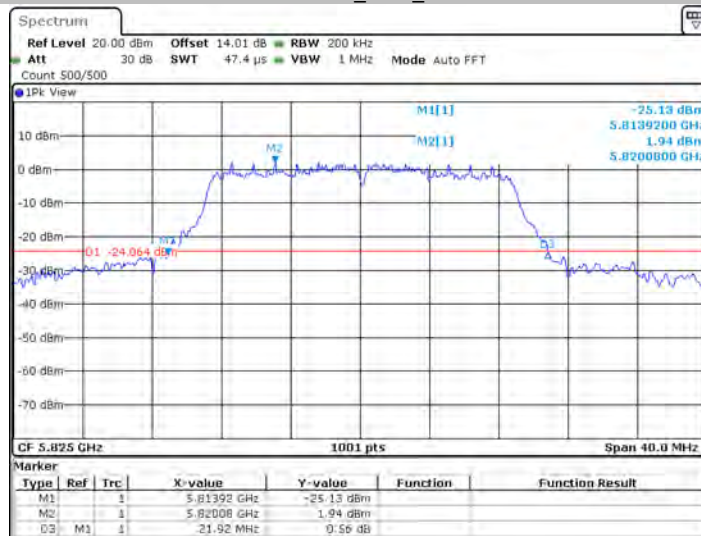
Date: 6 DEC 2019 14:44:21

11N20SISO\_Ant1\_5785



Date: 6 DEC 2019 14:49:24

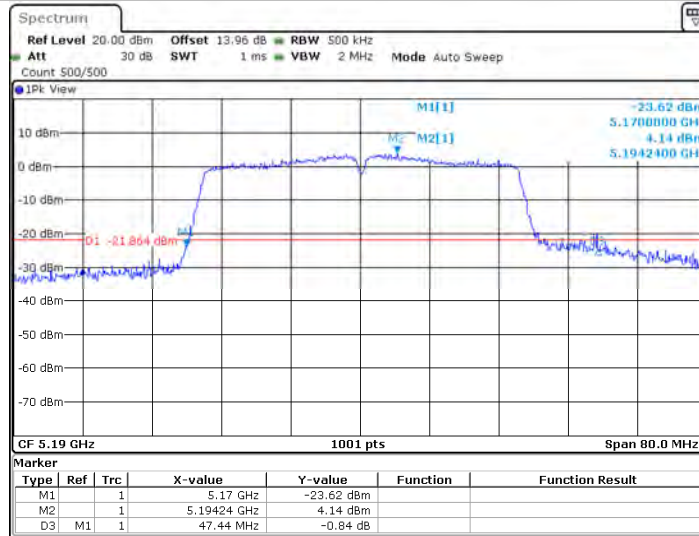
11N20SISO\_Ant1\_5825



Date: 6 DEC 2019 14:56:31

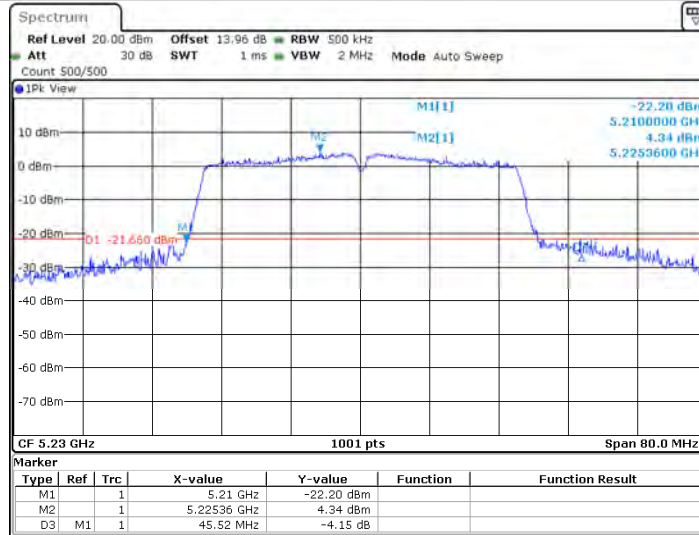


## 11N40SISO\_Ant1\_5190



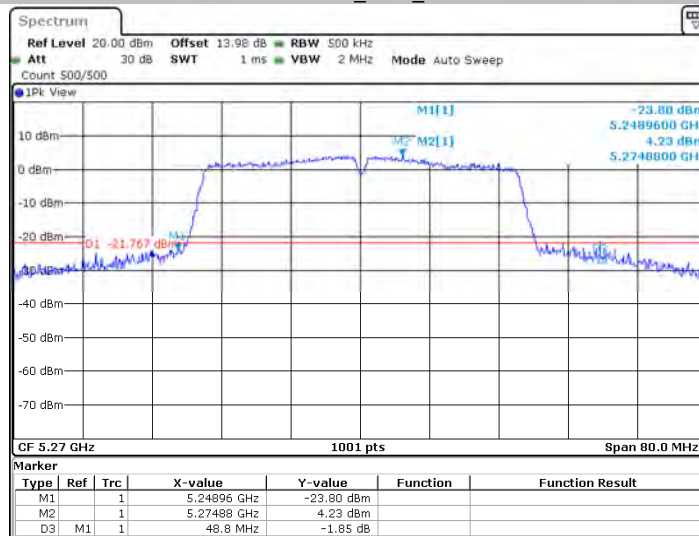
Date: 6 DEC 2019 15:16:33

## 11N40SISO\_Ant1\_5230



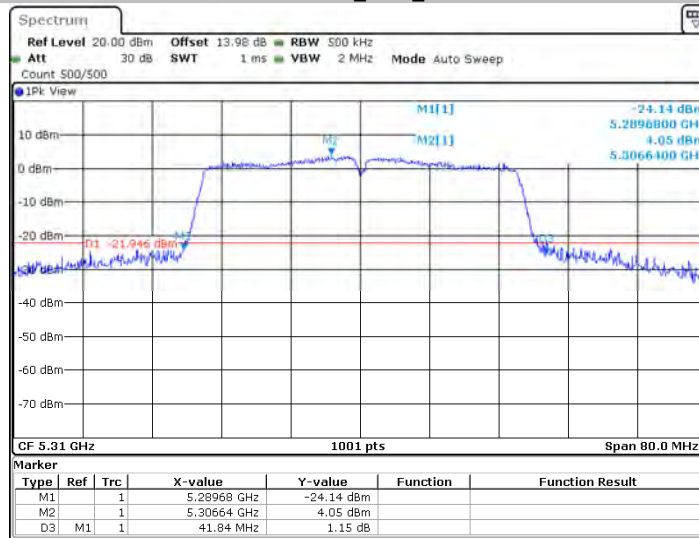
Date: 6 DEC 2019 15:25:49

## 11N40SISO\_Ant1\_5270



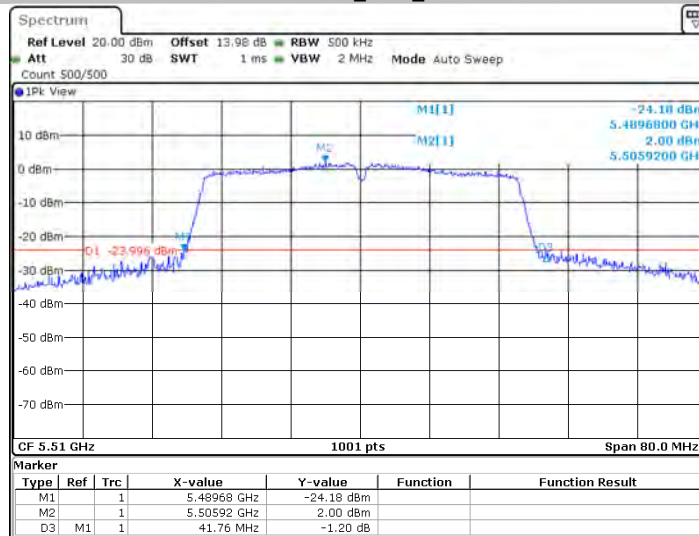
Date: 6 DEC 2019 15:34:18

## 11N40SISO\_Ant1\_5310



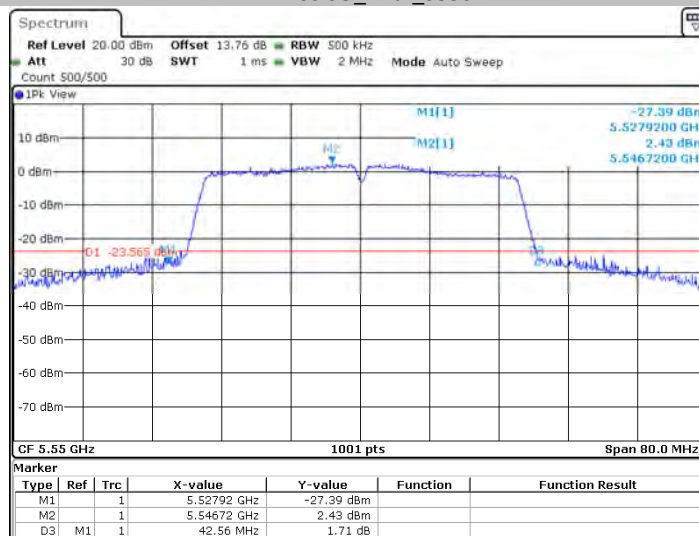
Date: 6 DEC 2019 15:39:30

## 11N40SISO\_Ant1\_5510



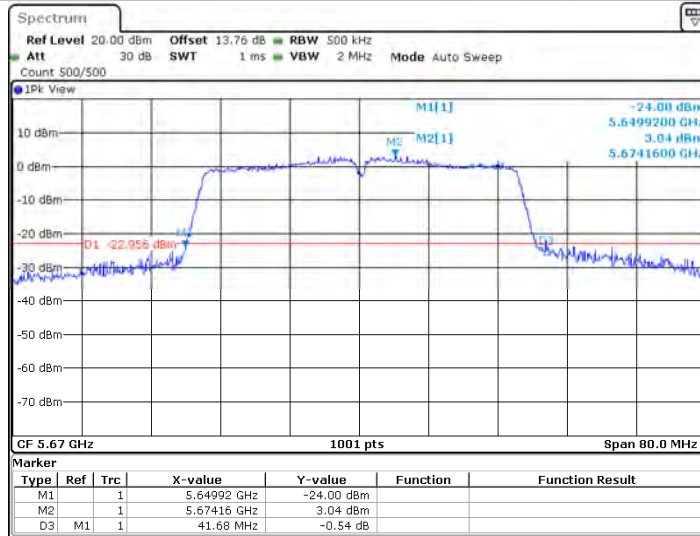
Date: 6 DEC 2019 15:44:24

## 11N40SISO\_Ant1\_5550



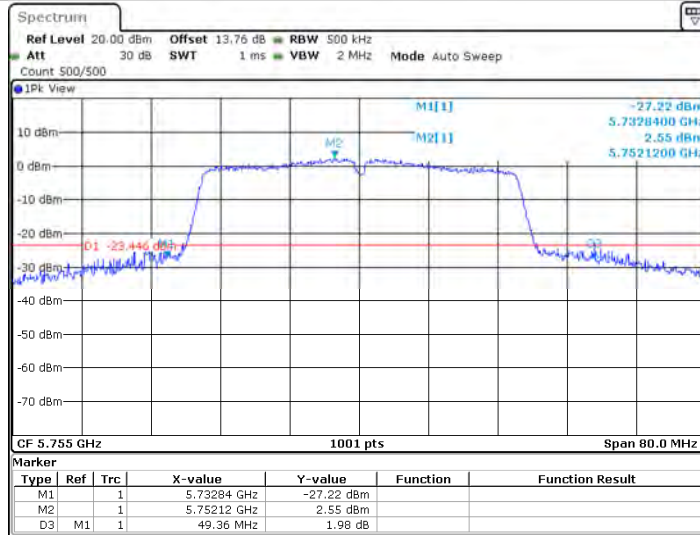
Date: 6 DEC 2019 15:49:18

11N40SISO\_Ant1\_5670



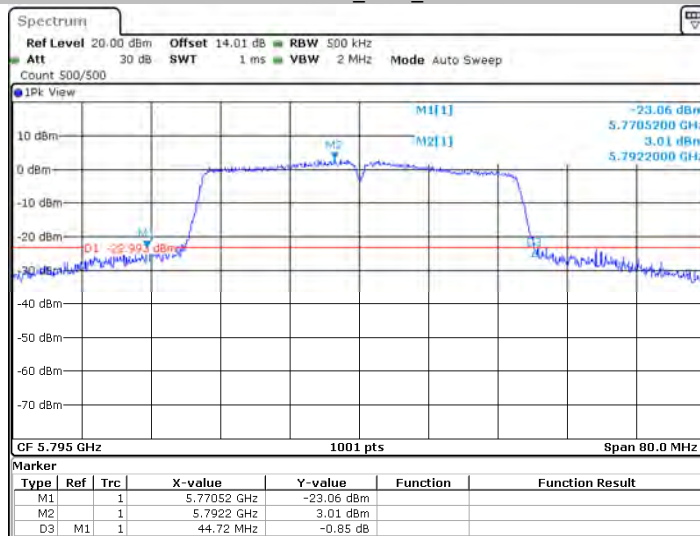
Date: 6 DEC 2019 15:54:12

11N40SISO\_Ant1\_5755



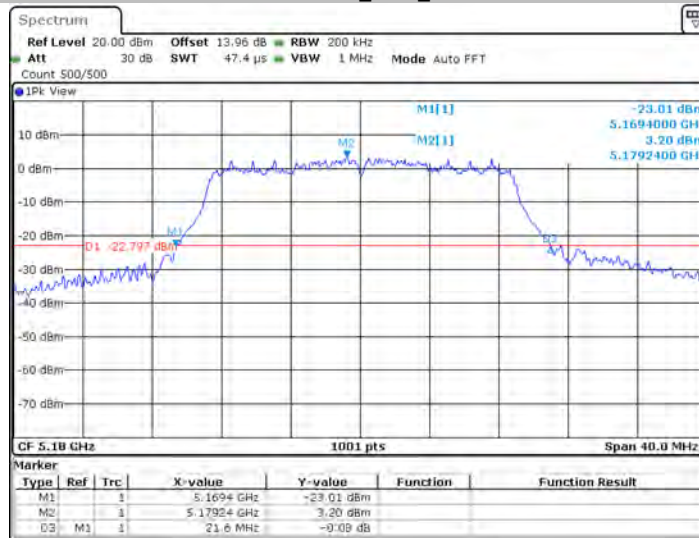
Date: 6 DEC 2019 16:27:51

11N40SISO\_Ant1\_5795



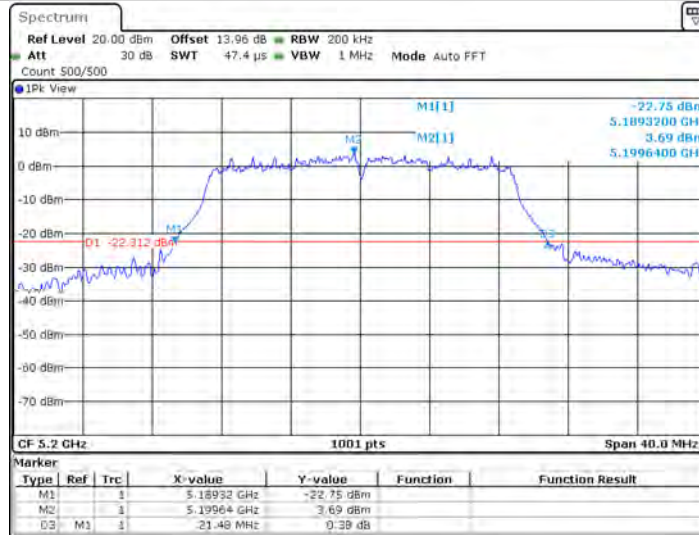
Date: 6 DEC 2019 16:33:27

## 11AC20SISO\_Ant1\_5180



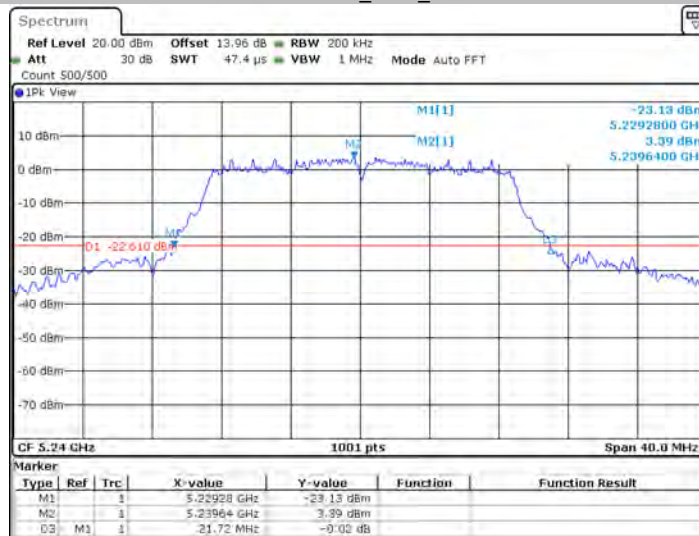
Date: 6 DEC 2019 16:38:21

## 11AC20SISO\_Ant1\_5200



Date: 6 DEC 2019 16:44:17

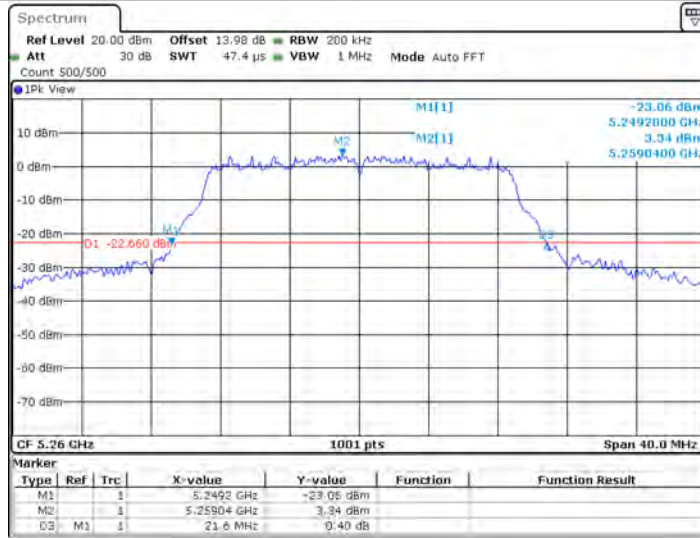
## 11AC20SISO\_Ant1\_5240



Date: 6 DEC 2019 16:48:57

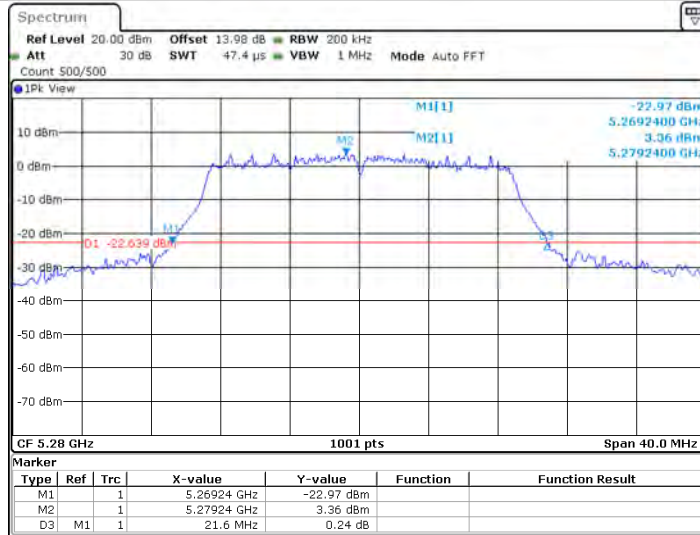


11AC20SISO\_Ant1\_5260



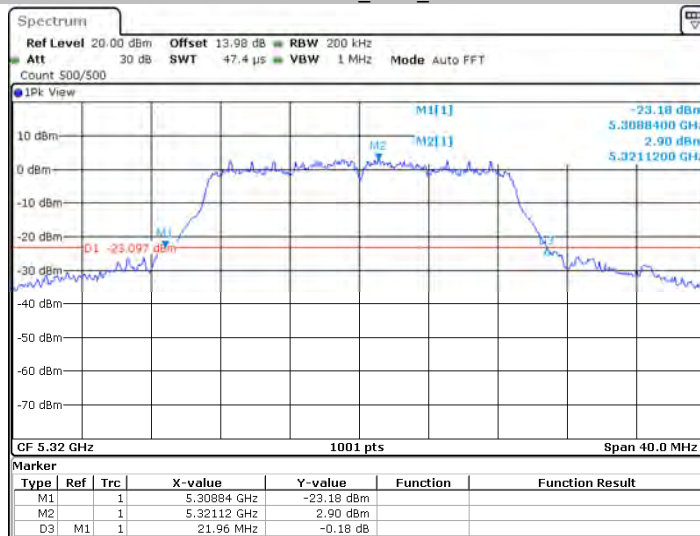
Date: 6 DEC 2019 16:54:20

11AC20SISO\_Ant1\_5280



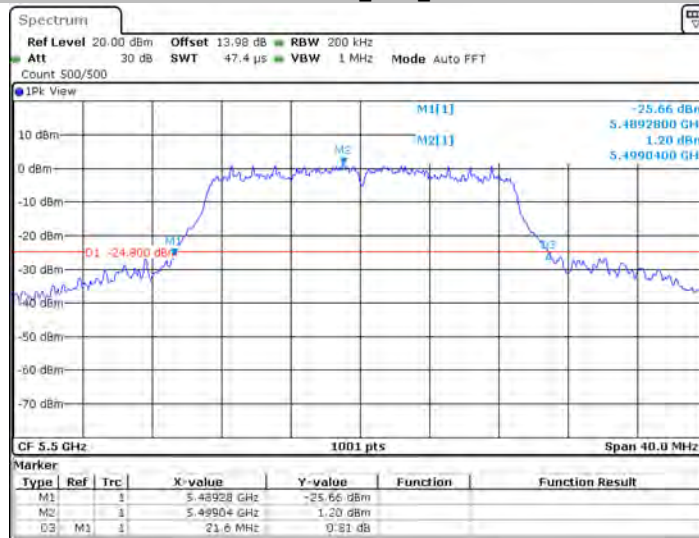
Date: 6 DEC 2019 16:58:53

11AC20SISO\_Ant1\_5320



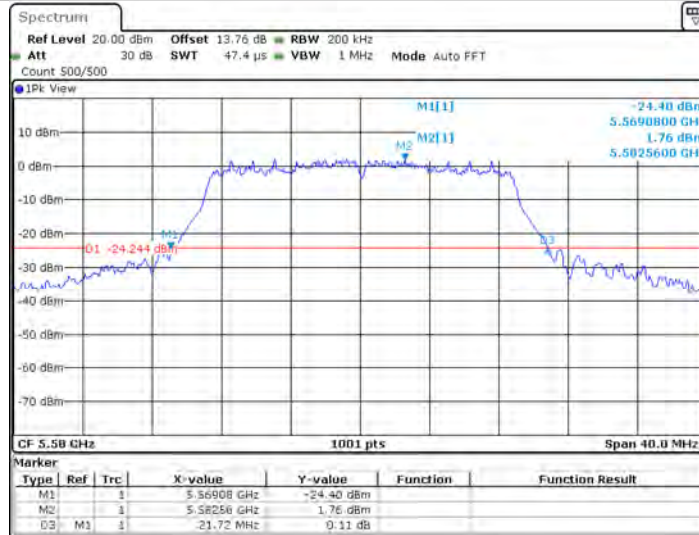
Date: 6 DEC 2019 17:03:26

11AC20SISO\_Ant1\_5500



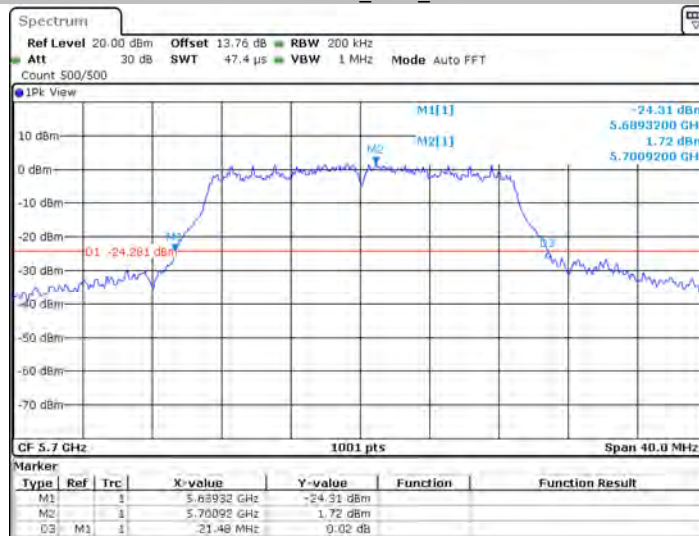
Date: 6 DEC 2019 17:08:00

11AC20SISO\_Ant1\_5580



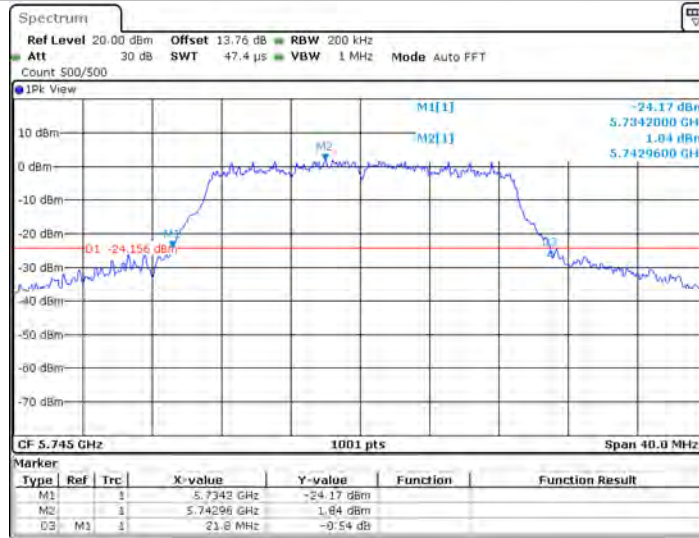
Date: 6 DEC 2019 17:13:31

11AC20SISO\_Ant1\_5700



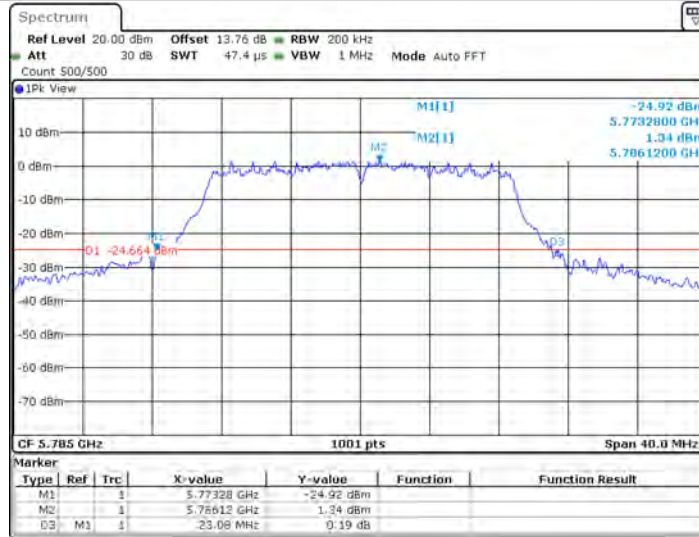
Date: 6 DEC 2019 17:16:00

11AC20SISO\_Ant1\_5745



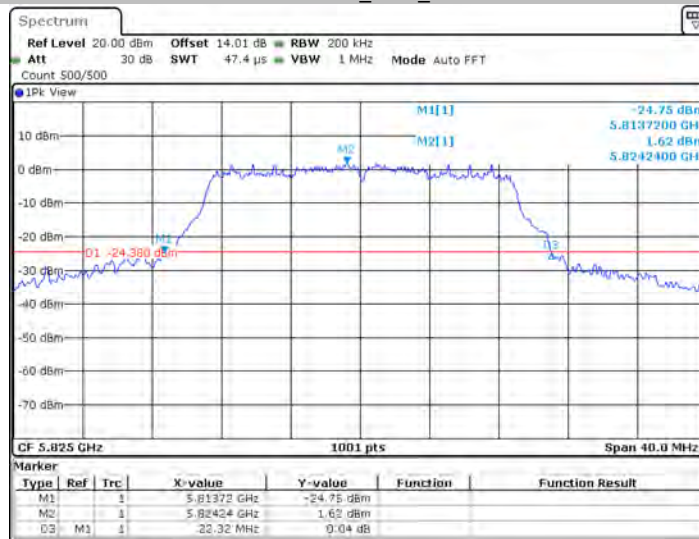
Date: 6 DEC 2019 17:22:47

11AC20SISO\_Ant1\_5785



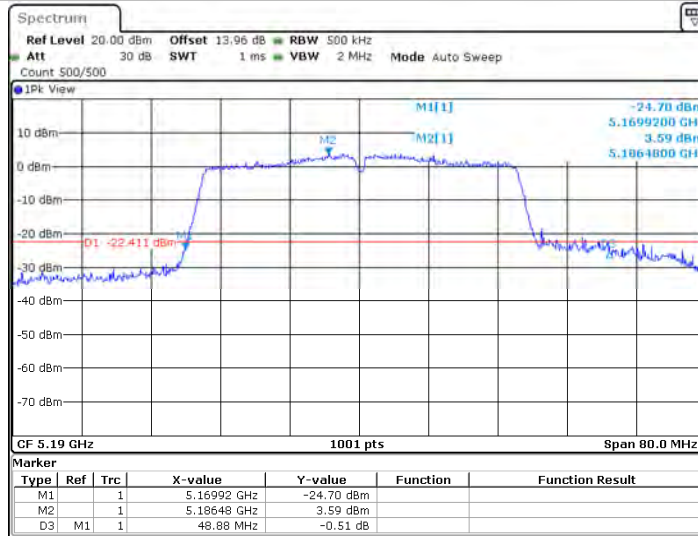
Date: 6 DEC 2019 17:20:22

11AC20SISO\_Ant1\_5825



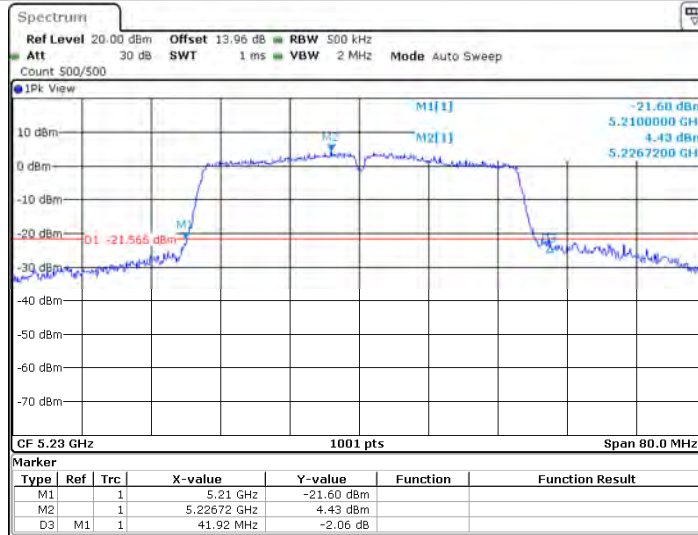
Date: 6 DEC 2019 17:33:49

## 11AC40SISO\_Ant1\_5190



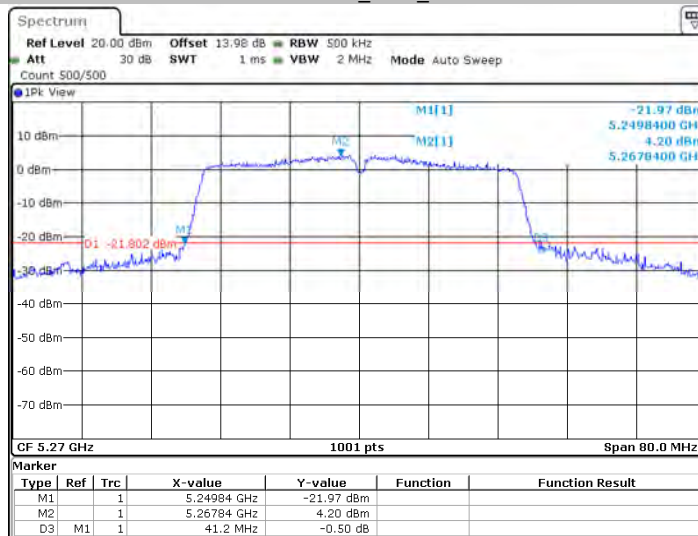
Date: 6 DEC.2019 17:39:48

## 11AC40SISO\_Ant1\_5230



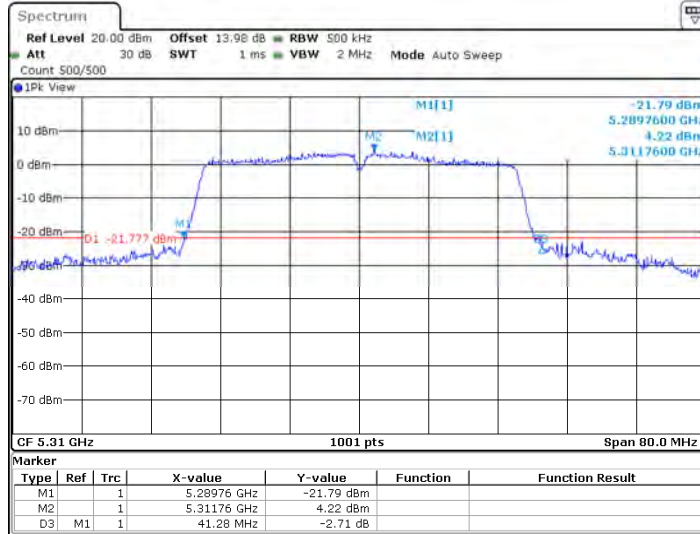
Date: 6 DEC.2019 17:45:19

## 11AC40SISO\_Ant1\_5270



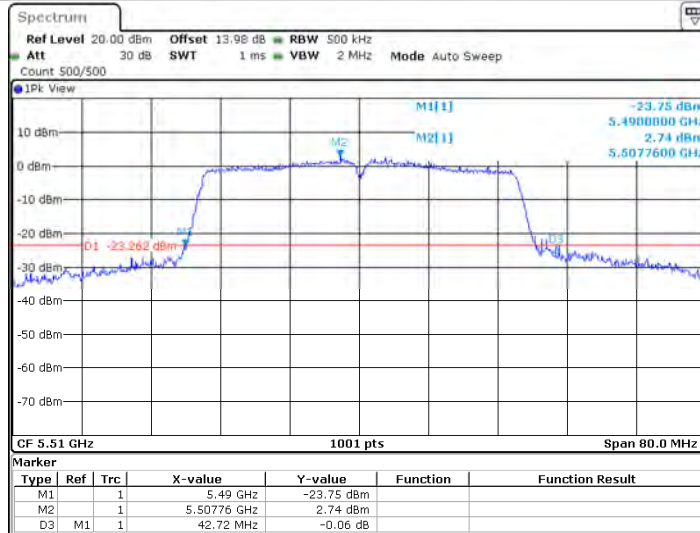
Date: 6 DEC.2019 17:50:53

11AC40SISO\_Ant1\_5310



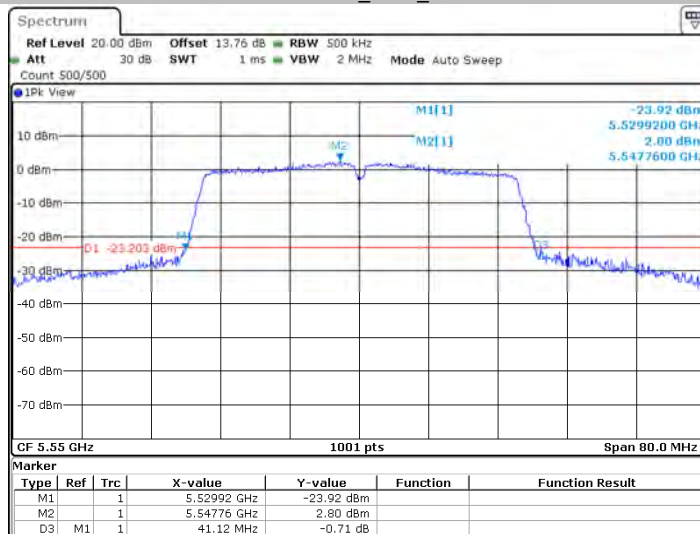
Date: 6 DEC 2019 17:55:30

11AC40SISO\_Ant1\_5510



Date: 6 DEC 2019 18:00:17

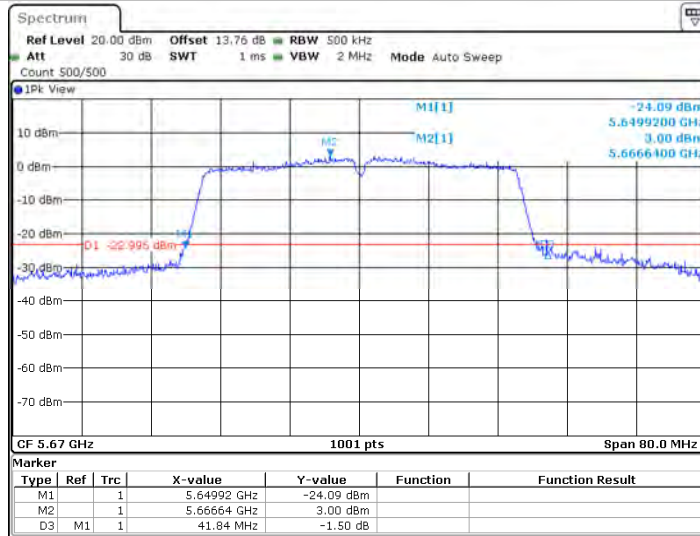
11AC40SISO\_Ant1\_5550



Date: 6 DEC 2019 18:05:11

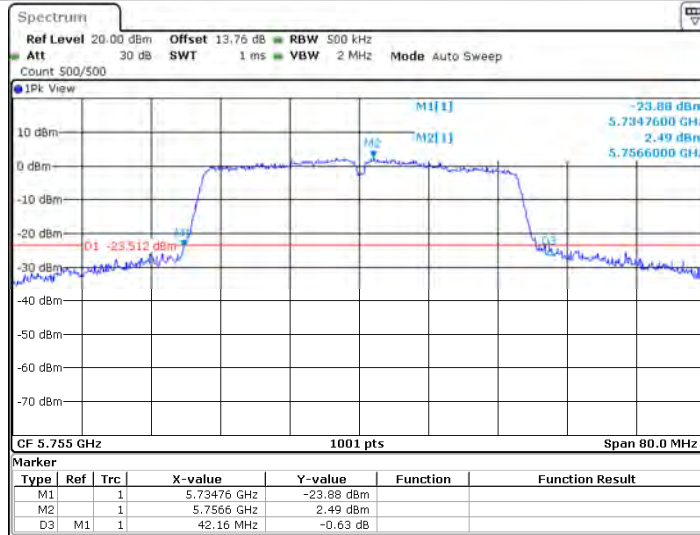


11AC40SISO\_Ant1\_5670



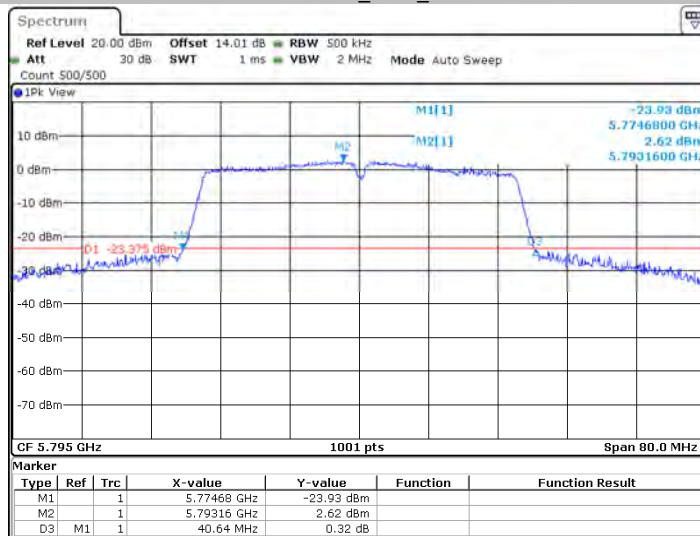
Date: 6 DEC 2019 18:11:56

11AC40SISO\_Ant1\_5755



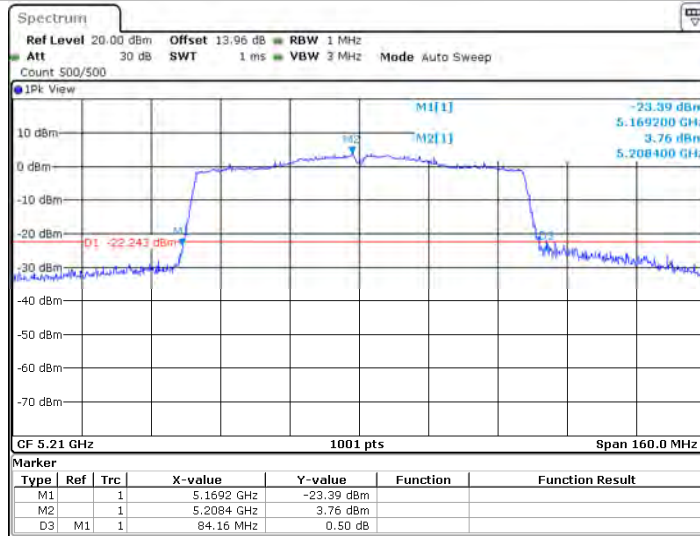
Date: 6 DEC 2019 18:16:58

11AC40SISO\_Ant1\_5795



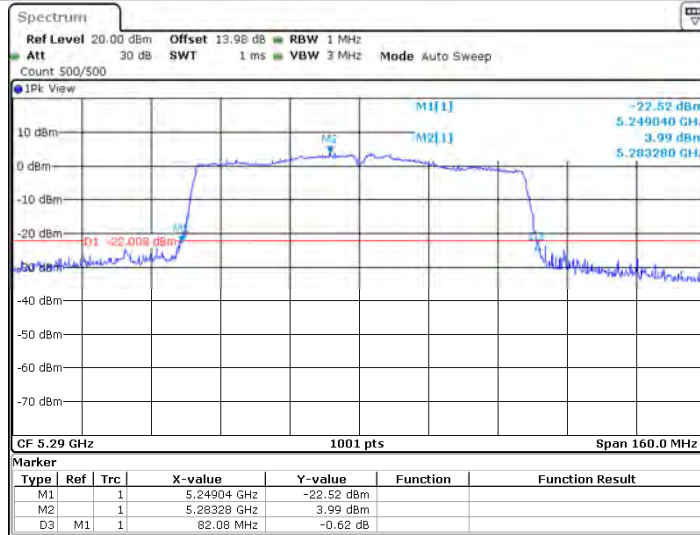
Date: 6 DEC 2019 18:22:09

11AC80SISO\_Ant1\_5210



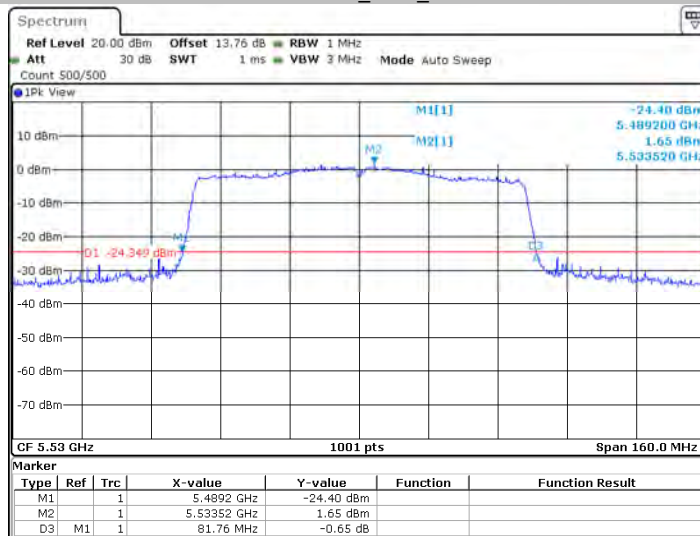
Date: 6 DEC.2019 18:29:52

11AC80SISO\_Ant1\_5290



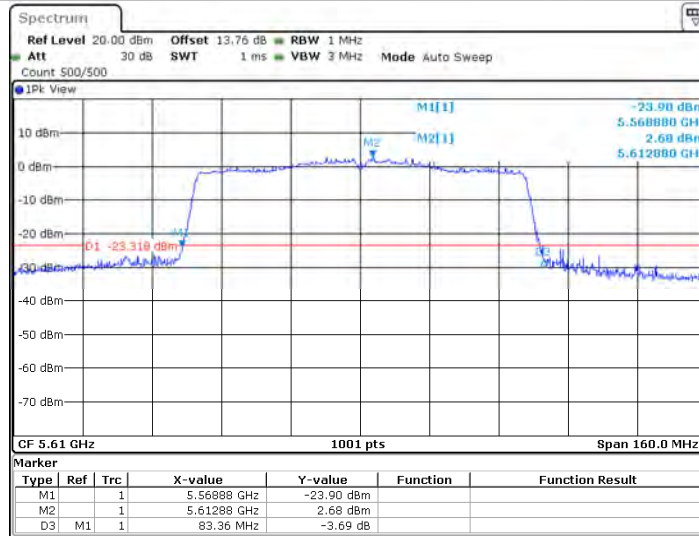
Date: 6 DEC.2019 18:59:21

11AC80SISO\_Ant1\_5530



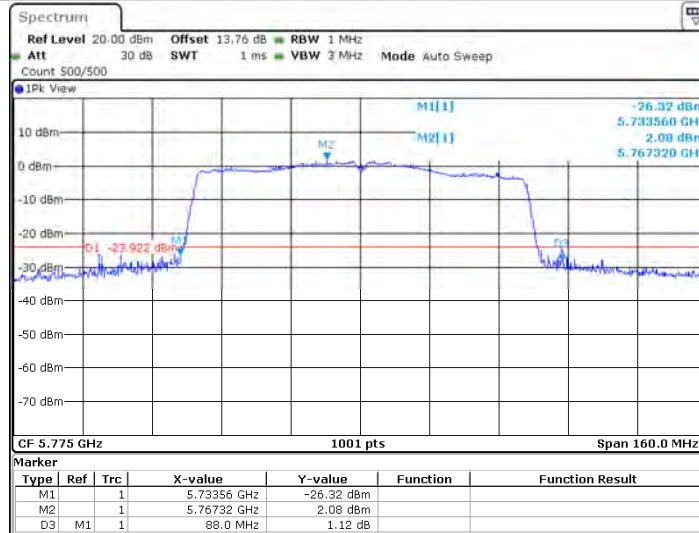
Date: 6 DEC.2019 19:04:24

11AC80SISO\_Ant1\_5610



Date: 6.DEC.2019 19:17:21

11AC80SISO\_Ant1\_5775



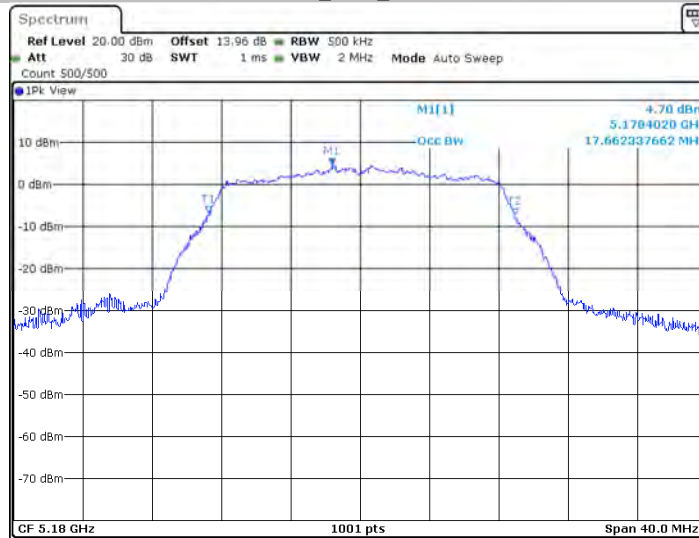
Date: 6.DEC.2019 19:41:15



**99% OBW**

| Test Mode | Channel | OCB [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|-----------|---------|-----------|----------|----------|------------|---------|
| 11A       | 5180    | 17.662    | 5171.249 | 5188.911 | ---        | PASS    |
|           | 5200    | 17.982    | 5191.049 | 5209.031 | ---        | PASS    |
|           | 5240    | 17.942    | 5230.969 | 5248.911 | ---        | PASS    |
|           | 5260    | 17.902    | 5251.009 | 5268.911 | ---        | PASS    |
|           | 5280    | 17.862    | 5271.009 | 5288.871 | ---        | PASS    |
|           | 5320    | 18.022    | 5310.969 | 5328.991 | ---        | PASS    |
|           | 5500    | 17.902    | 5491.009 | 5508.911 | ---        | PASS    |
|           | 5580    | 17.942    | 5571.009 | 5588.951 | ---        | PASS    |
|           | 5700    | 17.942    | 5691.089 | 5709.031 | ---        | PASS    |
|           | 5745    | 17.942    | 5735.969 | 5753.911 | ---        | PASS    |
| 5785      | 18.022  | 5775.889  | 5793.911 | ---      | PASS       |         |
| 5825      | 17.982  | 5815.889  | 5833.871 | ---      | PASS       |         |
| 11N20     | 5180    | 18.741    | 5170.769 | 5189.510 | ---        | PASS    |
|           | 5200    | 18.901    | 5190.689 | 5209.590 | ---        | PASS    |
|           | 5240    | 18.821    | 5230.649 | 5249.471 | ---        | PASS    |
|           | 5260    | 18.941    | 5250.569 | 5269.510 | ---        | PASS    |
|           | 5280    | 18.781    | 5270.649 | 5289.431 | ---        | PASS    |
|           | 5320    | 18.861    | 5310.609 | 5329.471 | ---        | PASS    |
|           | 5500    | 18.861    | 5490.609 | 5509.471 | ---        | PASS    |
|           | 5580    | 18.821    | 5570.649 | 5589.471 | ---        | PASS    |
|           | 5700    | 18.821    | 5690.729 | 5709.550 | ---        | PASS    |
|           | 5745    | 18.941    | 5735.569 | 5754.510 | ---        | PASS    |
| 5785      | 18.861  | 5775.609  | 5794.471 | ---      | PASS       |         |
| 5825      | 18.901  | 5815.569  | 5834.471 | ---      | PASS       |         |
| 11N40     | 5190    | 36.763    | 5171.858 | 5208.621 | ---        | PASS    |
|           | 5230    | 36.843    | 5211.698 | 5248.541 | ---        | PASS    |
|           | 5270    | 36.763    | 5251.698 | 5288.462 | ---        | PASS    |
|           | 5310    | 36.763    | 5291.698 | 5328.462 | ---        | PASS    |
|           | 5510    | 36.923    | 5491.618 | 5528.541 | ---        | PASS    |
|           | 5550    | 36.923    | 5531.618 | 5568.541 | ---        | PASS    |
|           | 5670    | 36.923    | 5651.778 | 5688.701 | ---        | PASS    |
|           | 5755    | 36.923    | 5736.618 | 5773.541 | ---        | PASS    |
| 5795      | 36.923  | 5776.538  | 5813.462 | ---      | PASS       |         |
| 11AC20    | 5180    | 18.781    | 5170.769 | 5189.550 | ---        | PASS    |
|           | 5200    | 18.821    | 5190.729 | 5209.550 | ---        | PASS    |
|           | 5240    | 18.861    | 5230.649 | 5249.510 | ---        | PASS    |
|           | 5260    | 18.821    | 5250.649 | 5269.471 | ---        | PASS    |
|           | 5280    | 18.781    | 5270.649 | 5289.431 | ---        | PASS    |
|           | 5320    | 18.901    | 5310.649 | 5329.550 | ---        | PASS    |
|           | 5500    | 18.821    | 5490.649 | 5509.471 | ---        | PASS    |
|           | 5580    | 18.821    | 5570.649 | 5589.471 | ---        | PASS    |
|           | 5700    | 18.821    | 5690.729 | 5709.550 | ---        | PASS    |
|           | 5745    | 18.901    | 5735.609 | 5754.510 | ---        | PASS    |
| 5785      | 18.901  | 5775.569  | 5794.471 | ---      | PASS       |         |
| 5825      | 19.021  | 5815.490  | 5834.510 | ---      | PASS       |         |
| 11AC40    | 5190    | 36.843    | 5171.858 | 5208.701 | ---        | PASS    |
|           | 5230    | 36.843    | 5211.698 | 5248.541 | ---        | PASS    |
|           | 5270    | 36.763    | 5251.698 | 5288.462 | ---        | PASS    |
|           | 5310    | 36.923    | 5291.618 | 5328.541 | ---        | PASS    |
|           | 5510    | 36.843    | 5491.698 | 5528.541 | ---        | PASS    |
|           | 5550    | 36.923    | 5531.618 | 5568.541 | ---        | PASS    |
|           | 5670    | 36.763    | 5651.858 | 5688.621 | ---        | PASS    |
|           | 5755    | 36.923    | 5736.618 | 5773.541 | ---        | PASS    |
| 5795      | 36.843  | 5776.618  | 5813.462 | ---      | PASS       |         |
| 11AC80    | 5210    | 75.604    | 5172.438 | 5248.042 | ---        | PASS    |
|           | 5290    | 75.924    | 5251.958 | 5327.882 | ---        | PASS    |
|           | 5530    | 75.924    | 5492.118 | 5568.042 | ---        | PASS    |
|           | 5610    | 75.924    | 5572.118 | 5648.042 | ---        | PASS    |
|           | 5775    | 75.924    | 5736.958 | 5812.882 | ---        | PASS    |

## 11A\_Ant1\_5180



Date: 6 DEC 2019 11:16:15

## 11A\_Ant1\_5200



Date: 6 DEC 2019 11:23:21

## 11A\_Ant1\_5240



Date: 6 DEC 2019 11:28:15



## 11A\_Ant1\_5500



Date: 6.DEC.2019 11:52:59

## 11A\_Ant1\_5580



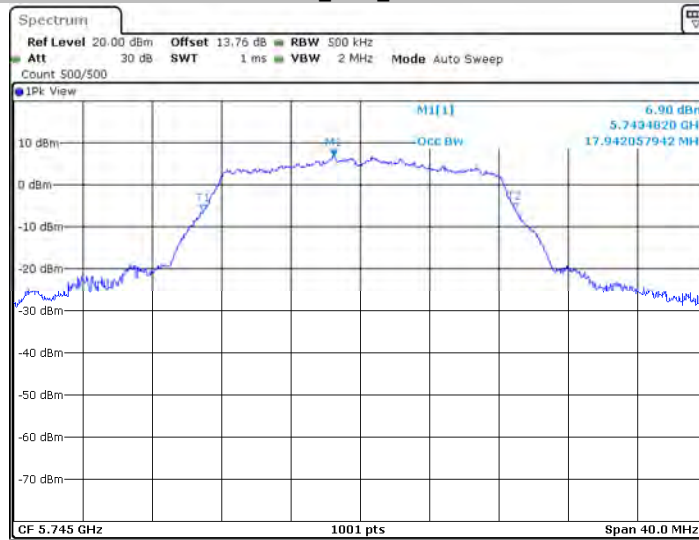
Date: 6.DEC.2019 11:57:36

## 11A\_Ant1\_5700



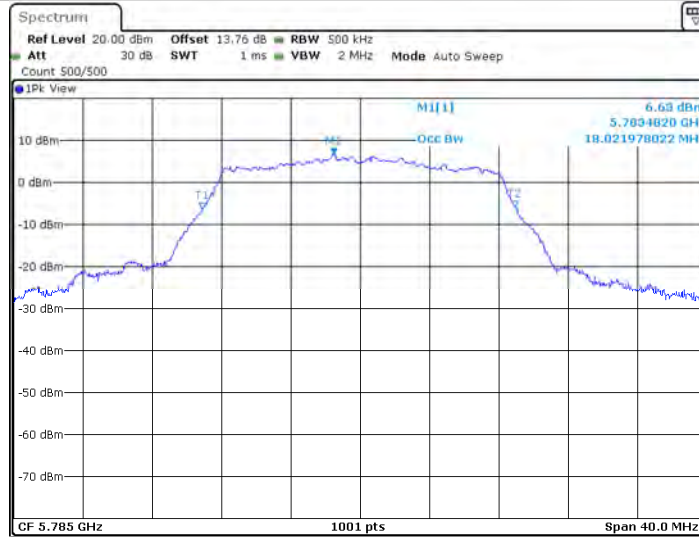
Date: 6.DEC.2019 13:19:46

## 11A\_Ant1\_5745



Date: 6.DEC.2019 13:30:41

## 11A\_Ant1\_5785



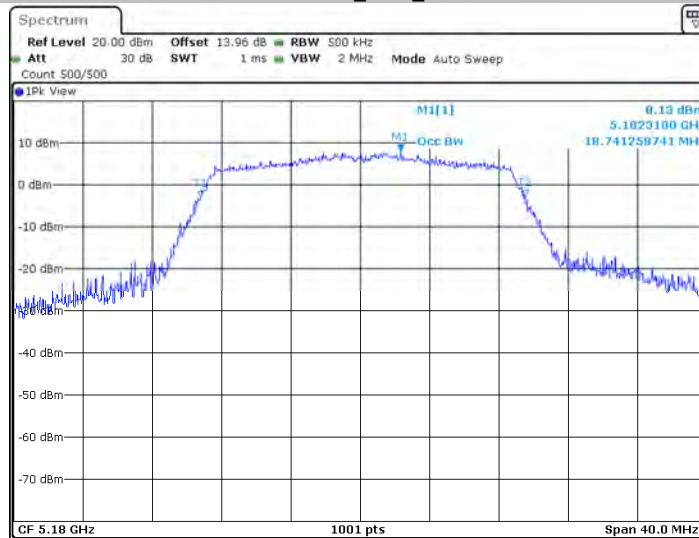
Date: 6.DEC.2019 13:36:03

## 11A\_Ant1\_5825



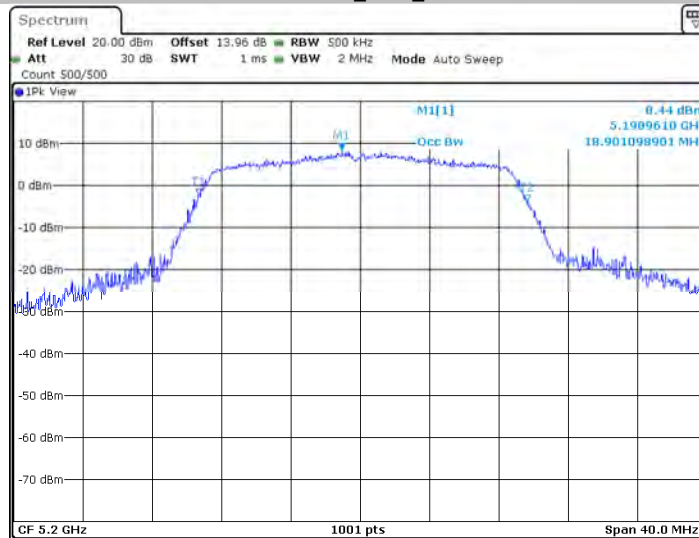
Date: 6.DEC.2019 13:41:27

## 11N20SISO\_Ant1\_5180



Date: 6.DEC.2019 13:48:07

## 11N20SISO\_Ant1\_5200



Date: 6.DEC.2019 13:52:40

## 11N20SISO\_Ant1\_5240



Date: 6.DEC.2019 13:57:35

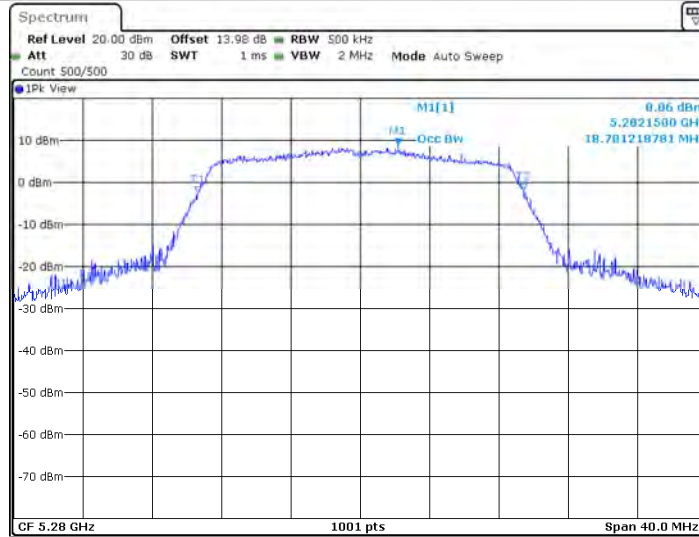


## 11N20SISO\_Ant1\_5260



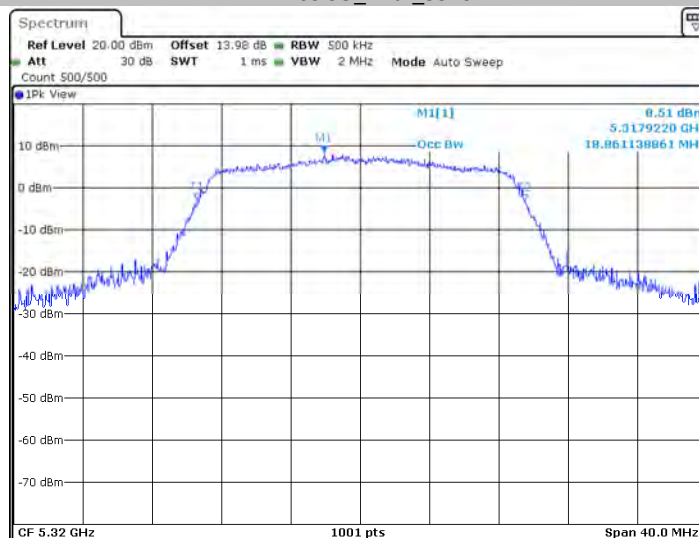
Date: 6 DEC 2019 14:02:09

## 11N20SISO\_Ant1\_5280



Date: 6 DEC 2019 14:06:49

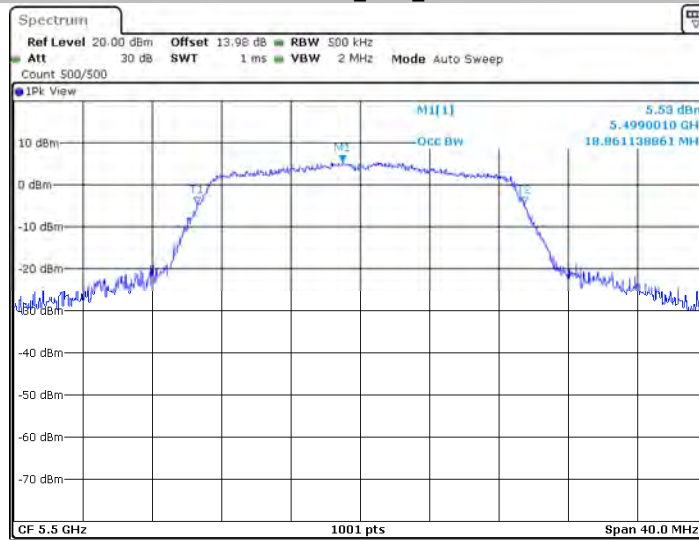
## 11N20SISO\_Ant1\_5320



Date: 6 DEC 2019 14:13:11

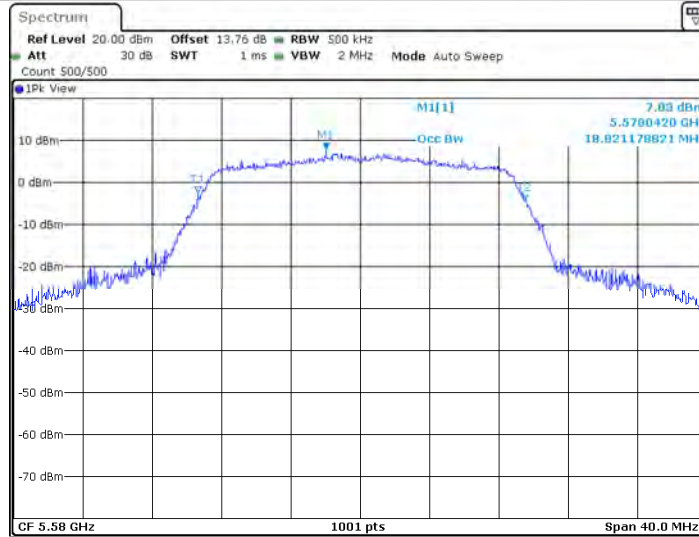


## 11N20SISO\_Ant1\_5500



Date: 6 DEC 2019 14:24:40

## 11N20SISO\_Ant1\_5580



Date: 6 DEC 2019 14:29:39

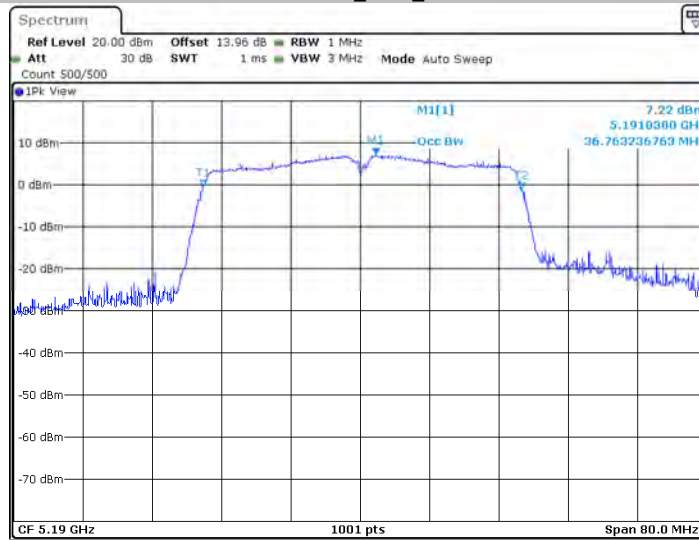
## 11N20SISO\_Ant1\_5700



Date: 6 DEC 2019 14:34:45

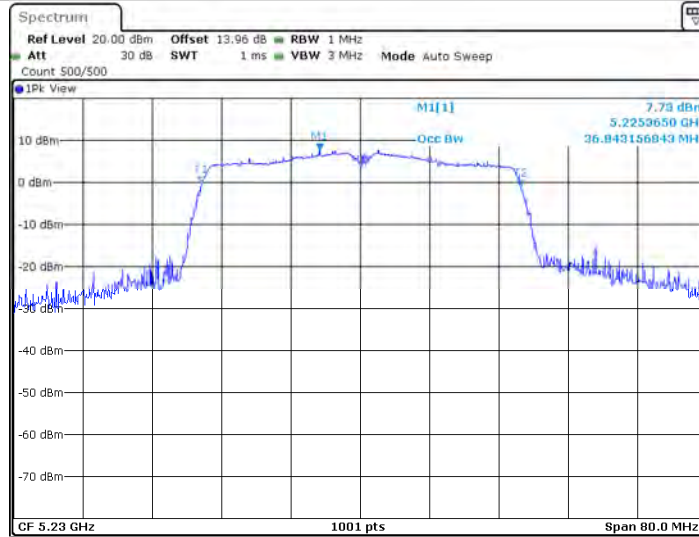


### 11N40SISO\_Ant1\_5190



Date: 6 DEC 2019 15:16:45

### 11N40SISO\_Ant1\_5230



Date: 6 DEC 2019 15:26:00

### 11N40SISO\_Ant1\_5270



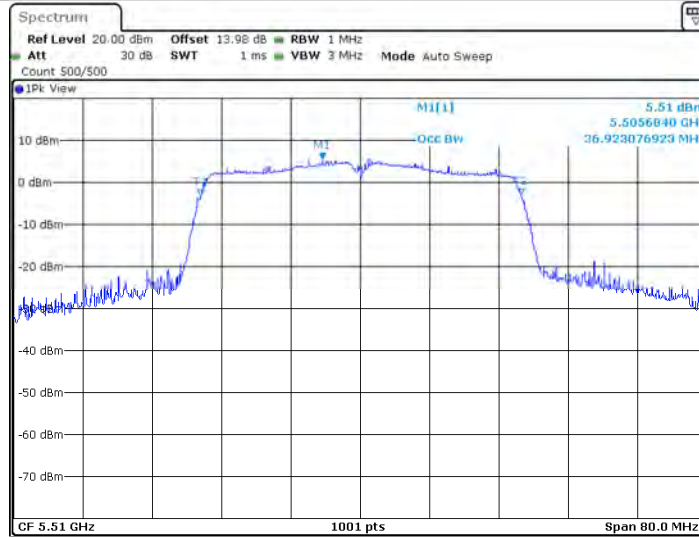
Date: 6 DEC 2019 15:34:29

## 11N40SISO\_Ant1\_5310



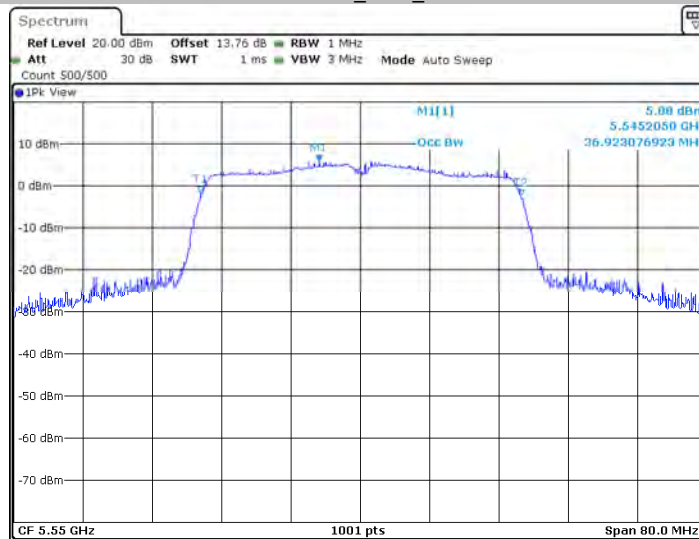
Date: 6 DEC 2019 15:39:41

## 11N40SISO\_Ant1\_5510



Date: 6 DEC 2019 15:44:36

## 11N40SISO\_Ant1\_5550



Date: 6 DEC 2019 15:49:29

### 11N40SISO\_Ant1\_5670



Date: 6 DEC 2019 15:54:23

### 11N40SISO\_Ant1\_5755



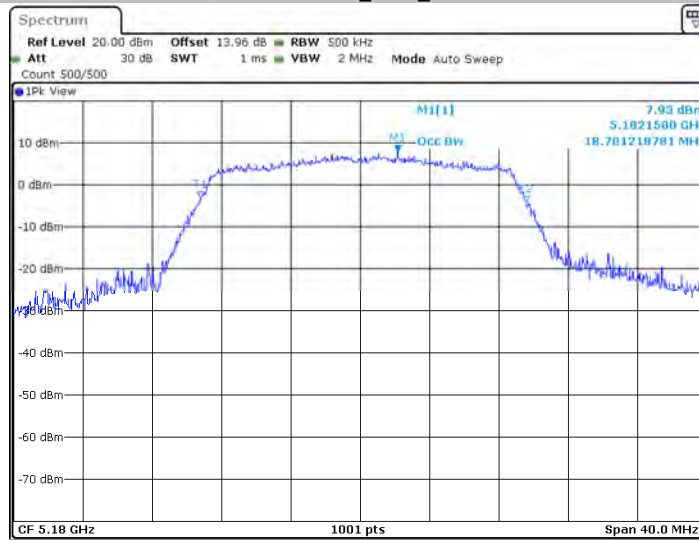
Date: 6 DEC 2019 16:28:22

### 11N40SISO\_Ant1\_5795



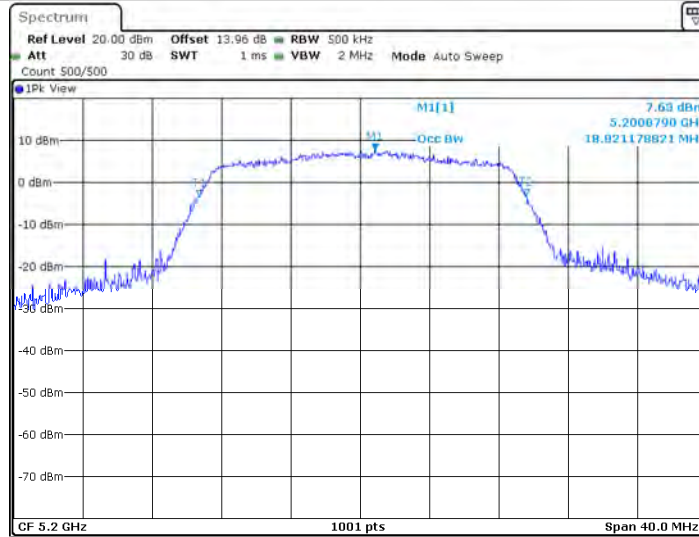
Date: 6 DEC 2019 16:33:58

## 11AC20SISO\_Ant1\_5180



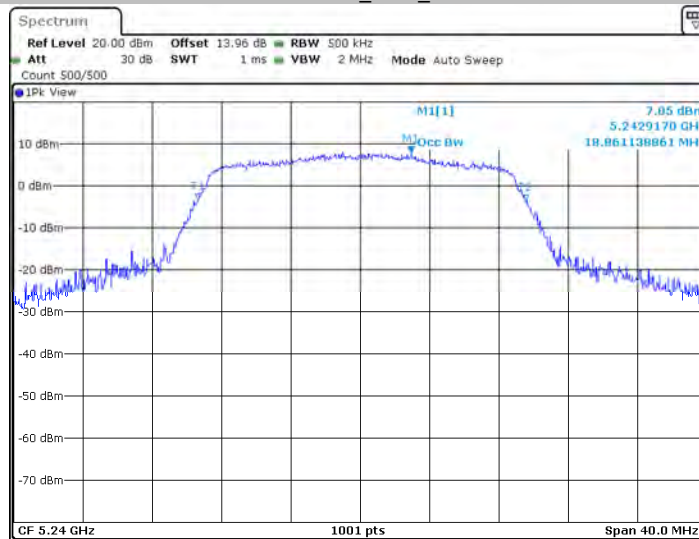
Date: 6 DEC.2019 16:39:32

## 11AC20SISO\_Ant1\_5200



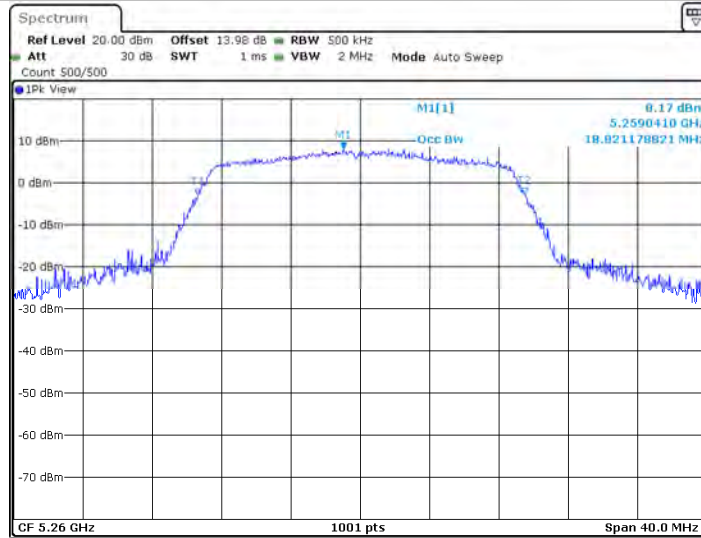
Date: 6 DEC.2019 16:44:29

## 11AC20SISO\_Ant1\_5240



Date: 6 DEC.2019 16:49:08

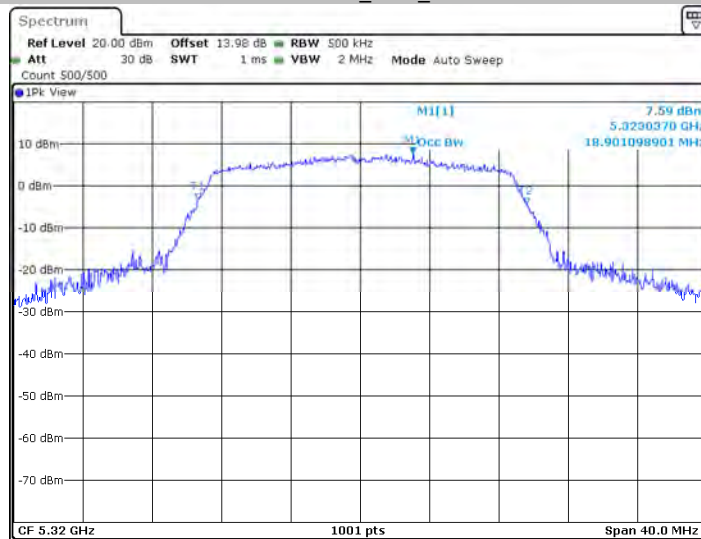
### 11AC20SISO\_Ant1\_5260



Date: 6.DEC.2019 16:54:32

### 11AC20SISO\_Ant1\_5280

### 11AC20SISO\_Ant1\_5320

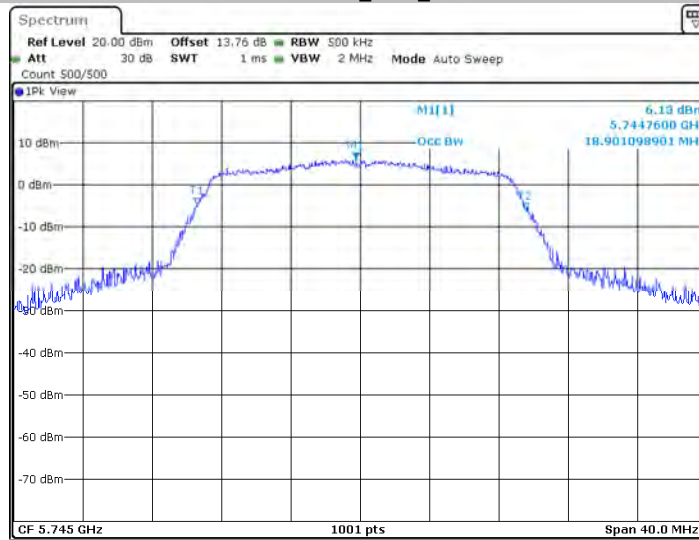


Date: 6.DEC.2019 17:03:37





### 11AC20SISO\_Ant1\_5745



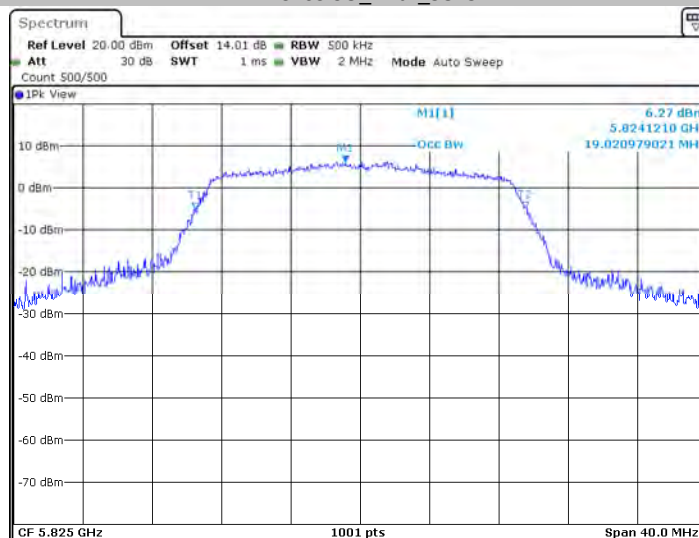
Date: 6.DEC.2019 17:23:17

### 11AC20SISO\_Ant1\_5785



Date: 6.DEC.2019 17:28:51

### 11AC20SISO\_Ant1\_5825



Date: 6.DEC.2019 17:34:19

### 11AC40SISO\_Ant1\_5190



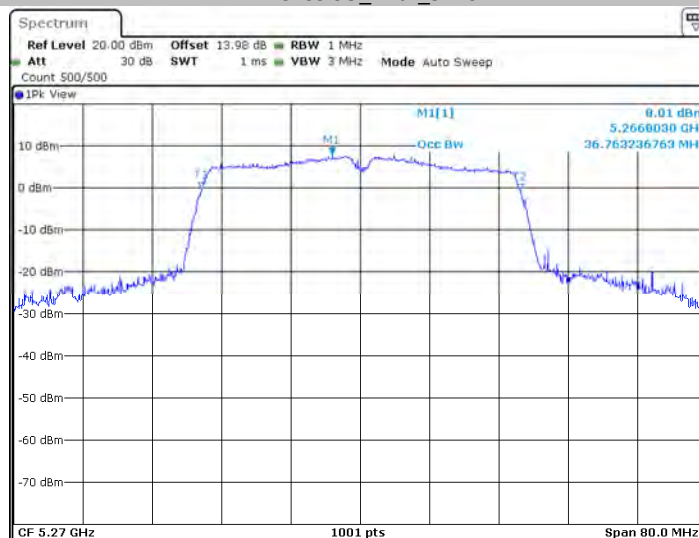
Date: 6 DEC.2019 17:40:00

### 11AC40SISO\_Ant1\_5230



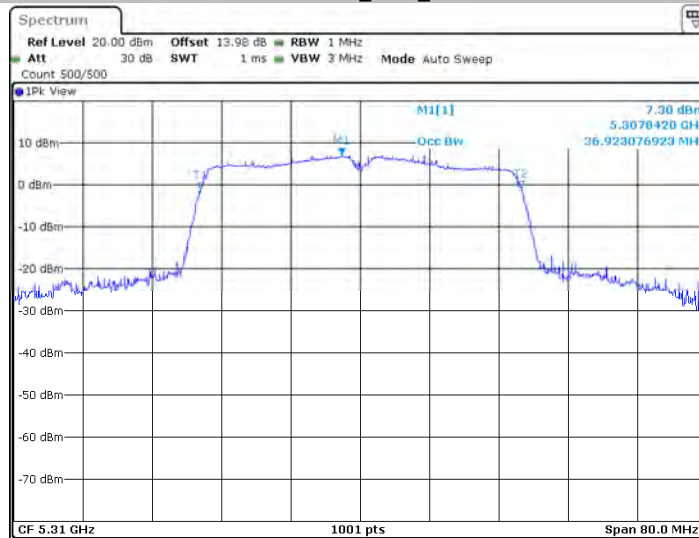
Date: 6 DEC.2019 17:45:31

### 11AC40SISO\_Ant1\_5270



Date: 6 DEC.2019 17:51:05

## 11AC40SISO\_Ant1\_5310



Date: 6 DEC 2019 17:55:41

## 11AC40SISO\_Ant1\_5510



Date: 6 DEC 2019 18:00:29

## 11AC40SISO\_Ant1\_5550



Date: 6 DEC 2019 18:05:22

### 11AC40SISO\_Ant1\_5670



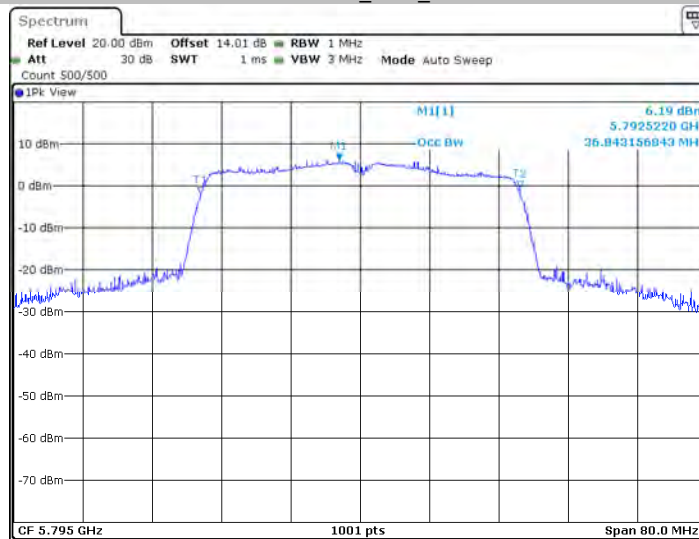
Date: 6 DEC 2019 18:12:08

### 11AC40SISO\_Ant1\_5755



Date: 6 DEC 2019 18:17:29

### 11AC40SISO\_Ant1\_5795



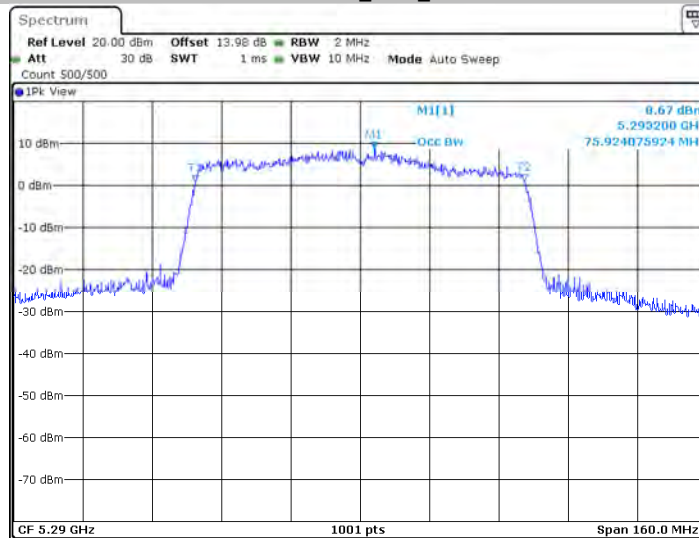
Date: 6 DEC 2019 18:22:40

### 11AC80SISO\_Ant1\_5210



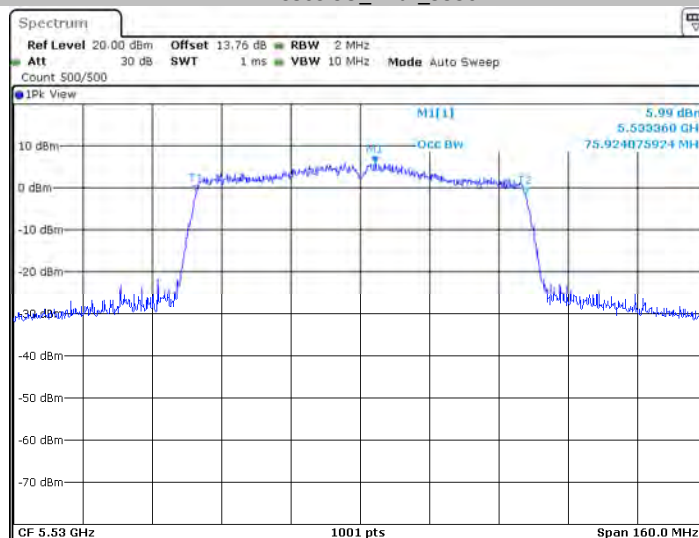
Date: 6 DEC 2019 18:30:04

### 11AC80SISO\_Ant1\_5290



Date: 6 DEC 2019 18:59:33

### 11AC80SISO\_Ant1\_5530



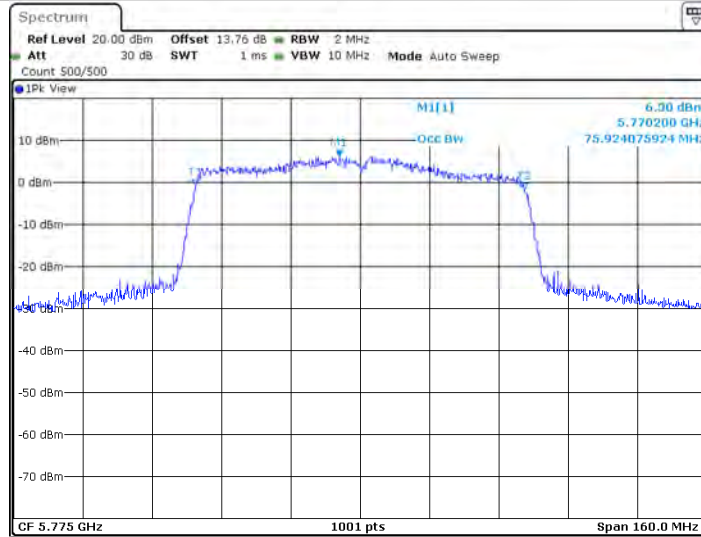
Date: 6 DEC 2019 19:04:35

## 11AC80SISO\_Ant1\_5610



Date: 6 DEC 2019 19:17:33

## 11AC80SISO\_Ant1\_5775



Date: 6 DEC 2019 19:41:45



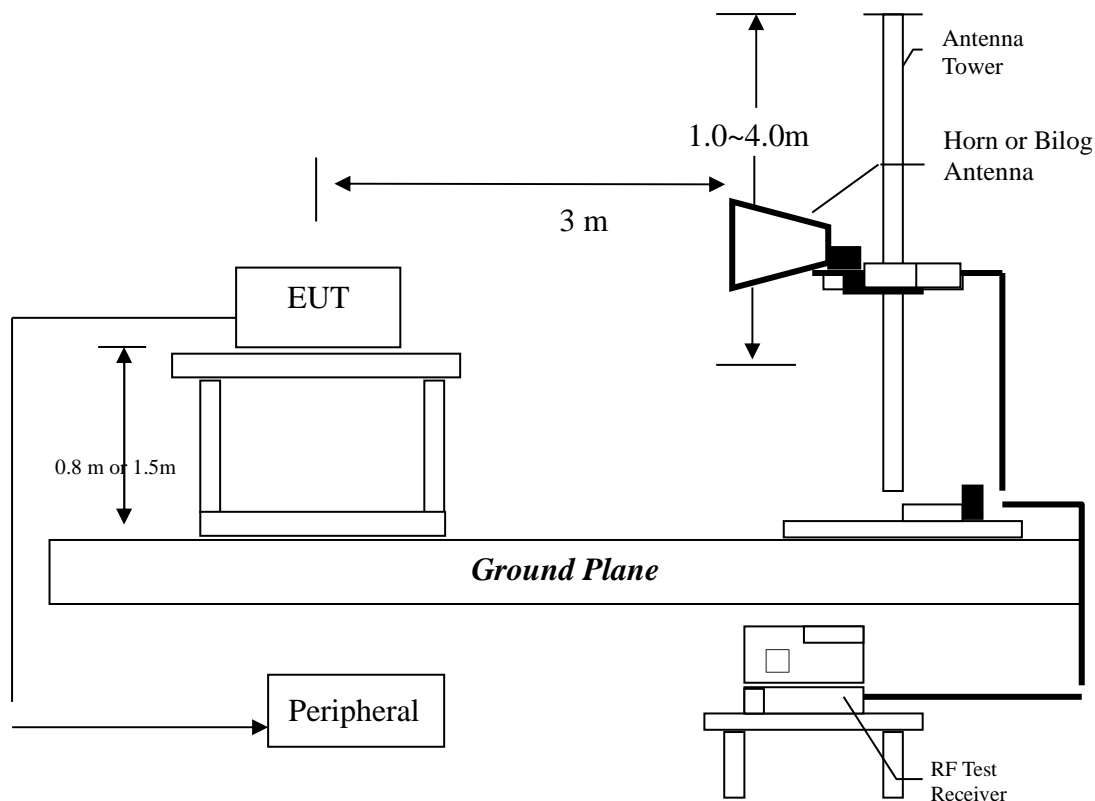
## 6. Radiated Emission test (FCC 15.205 & 15.209 & 15.407)

### 6.1 Operating environment

|                      |      |     |
|----------------------|------|-----|
| Temperature:         | 22   | °C  |
| Relative Humidity:   | 55   | %   |
| Atmospheric Pressure | 1010 | hPa |

### 6.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emission measurements were performed from 9KHz to tenth harmonic or 40GHz. The EUT for testing is arranged on a styrene turntable with the height of 0.8m up to 1GHz and 1.5m above 1GHz. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

Testing settings (refer to KDB 789033 D02)

Peak Measurements below 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=120KHz
- 4, Detector=Quasi-Peak
- 5, Trace was allowed to stabilize

Peak Measurements above 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=1MHz
- 4, VBW=3MHz
- 4, Detector= Peak (Max-hold)
- 5, Trace was allowed to stabilize

Average Measurements above 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=1MHz
- 4, VBW=3MHz
- 4, Detector= RMS (Max-hold)
- 5, Trace was allowed to stabilize

### 6.3 Limit

The spurious Emission shall test through the 10th harmonic or 40GHz (whichever is lower). In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

#### Notes:

- 1, All emission out-side of the 5.15-5.35GHz & 5.47-5.725GHz band shall not exceed an EIRP of -27dBm/MHz (68.2dBuV/m, test distance: 3 meter); for band 5.725-5.85GHz, all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
- 2, The spectrum is measured from 9KHz to the 10<sup>th</sup> harmonic of the fundamental frequency of the transmitter using QP detector below 1GHz, above 1GHz, average & peak measurements were taken using for test. The worst-case emission are reported however emission whose levels were not within 20dB of the respective limited were not reported.
- 3, The test was performed on EUT under 802.11a/n-HT20/40/ac-HT20/40/80 continuously transmitting mode. Simultaneous transmitting was considered during the testing. All mode had been tested, but only the worst-case is recorded in the following graph and table.

## Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD$$

Where FS = Field Strength in dB $\mu$ V/m  
RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V  
CF = Cable Attenuation Factor in dB  
AF = Antenna Factor in dB  
AG = Amplifier Gain in dB  
PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD$$

### Example

Assume a receiver reading of 62.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$\begin{aligned} RA &= 62.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB} \\ CF &= 1.6 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ PD &= 0 \text{ dB} \\ FS &= 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V/m} \end{aligned}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm} [(42 \text{ dB}\mu\text{V/m})/20] = 125.9 \mu\text{V/m}$$

## 6.4 Radiated spurious emission test data

### 6.4.1 Measurement results: frequencies equal to or less than 1 GHz

Applicant: TCL entertainment solutions limited

Date of Test: January 06, 2020

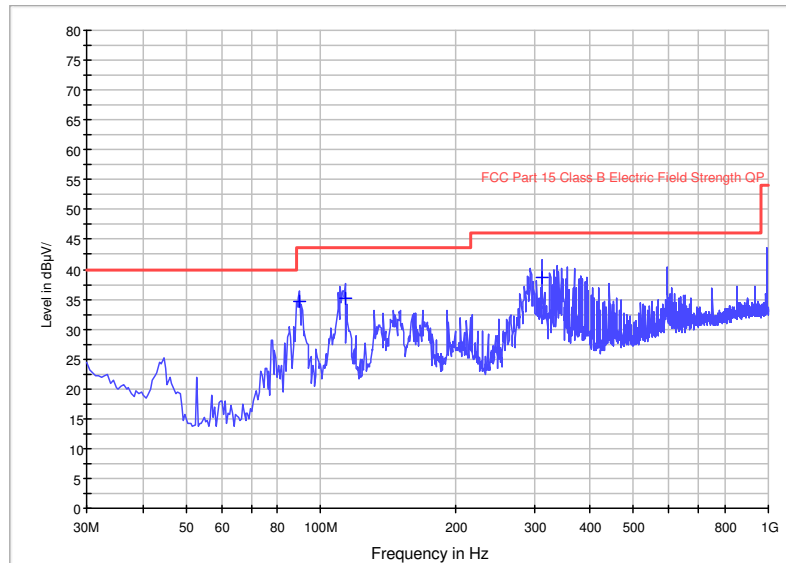
Model: TS9030

Worst Case Operating Mode:

Transmitting (802.11ac-HT40)

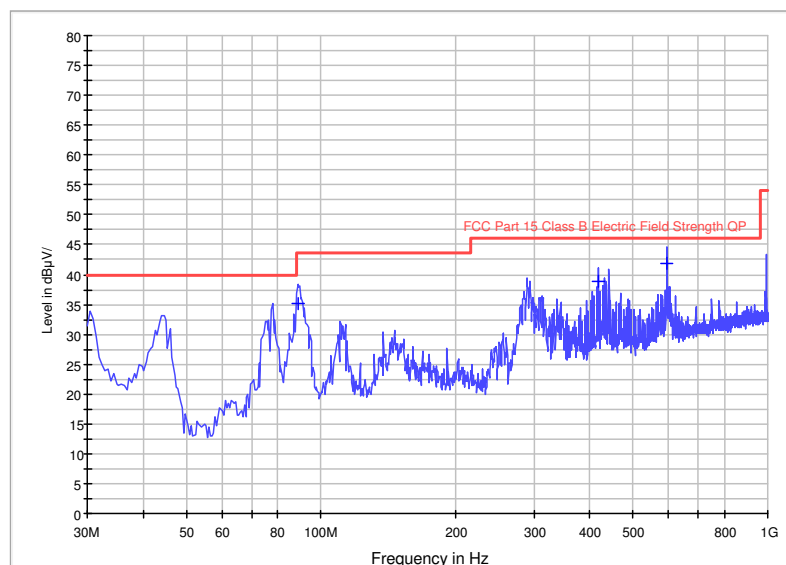
ANT Polarity: Horizontal

FCC Part 15



ANT Polarity: Vertical

FCC Part 15



Applicant: TCL entertainment solutions limited

Date of Test: January 06, 2020

Worst Case Operating Mode:

Model: TS9030

Transmitting (802.11ac-HT40)

### Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dB $\mu$ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB $\mu$ V/m) | Limit at 3m (dB $\mu$ V/m) | Margin (dB) |
|--------------|-----------------|----------------------|-------------------|---------------------|--------------------------|----------------------------|-------------|
| Horizontal   | 89.655000       | 45.0                 | 20.0              | 9.6                 | 34.6                     | 43.5                       | -8.9        |
| Horizontal   | 113.420000      | 45.5                 | 20.0              | 9.6                 | 35.1                     | 43.5                       | -8.4        |
| Horizontal   | 312.270000      | 41.2                 | 20.0              | 17.2                | 38.4                     | 46.0                       | -7.6        |
| Vertical     | 88.685000       | 45.4                 | 20.0              | 9.5                 | 34.9                     | 43.5                       | -8.6        |
| Vertical     | 418.000000      | 38.5                 | 20.0              | 20.3                | 38.8                     | 46.0                       | -7.2        |
| Vertical     | 594.027000      | 37.7                 | 20.0              | 24.2                | 41.9                     | 46.0                       | -4.1        |

- NOTES:
1. Quasi-Peak detector is used for frequency below 1GHz.
  2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. All emissions are below the QP limit.

**6.4.2 Measurement results: frequency above 1GHz**

The worst case occurred at 802.11ac-VHT40

Channel 38/27 Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 10380.000       | 51.1           | 36.3              | 38.9                | 53.7               | 68.2                      | -14.5       |
| Horizontal   | 15570.000       | 51.5           | 34.7              | 41.0                | 57.8               | 68.2                      | -10.4       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 10380.000       | 41.6           | 36.3              | 38.9                | 44.2               | 54.0                         | -9.8        |
| Horizontal   | 15570.000       | 39.4           | 34.7              | 41.0                | 45.7               | 54.0                         | -8.3        |

Channel 46/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 10460.000       | 50.1           | 36.3              | 38.9                | 52.7               | 68.2                      | -15.5       |
| Horizontal   | 15690.000       | 49.3           | 34.7              | 41.0                | 55.6               | 68.2                      | -12.6       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 10460.000       | 41.6           | 36.3              | 38.9                | 44.2               | 54.0                         | -9.8        |
| Horizontal   | 15690.000       | 39.0           | 34.7              | 41.0                | 45.3               | 54.0                         | -8.7        |

Channel 54/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 10540.000       | 49.6           | 36.3              | 38.9                | 52.2               | 68.2                      | -16.0       |
| Horizontal   | 15810.000       | 46.0           | 34.7              | 41.0                | 52.3               | 68.2                      | -15.9       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 10540.000       | 40.6           | 36.3              | 38.9                | 43.2               | 54.0                         | -10.8       |
| Horizontal   | 15810.000       | 37.3           | 34.7              | 41.0                | 43.6               | 54.0                         | -10.4       |



Channel 62/27Mbps

| Polarization | Frequency (MHz) | Reading (dB $\mu$ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB $\mu$ V/m) | Peak Limit at 3m (dB $\mu$ V/m) | Margin (dB) |
|--------------|-----------------|----------------------|-------------------|---------------------|--------------------------|---------------------------------|-------------|
| Horizontal   | 10620.000       | 50.6                 | 36.3              | 38.9                | 53.2                     | 68.2                            | -15.0       |
| Horizontal   | 15930.000       | 50.2                 | 34.7              | 41.0                | 56.5                     | 68.2                            | -11.7       |

| Polarization | Frequency (MHz) | Reading (dB $\mu$ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB $\mu$ V/m) | Average Limit at 3m (dB $\mu$ V/m) | Margin (dB) |
|--------------|-----------------|----------------------|-------------------|---------------------|--------------------------|------------------------------------|-------------|
| Horizontal   | 10620.000       | 40.6                 | 36.3              | 38.9                | 43.2                     | 54.0                               | -10.8       |
| Horizontal   | 15930.000       | 39.1                 | 34.7              | 41.0                | 45.4                     | 54.0                               | -8.6        |

Channel 102/27Mbps

| Polarization | Frequency (MHz) | Reading (dB $\mu$ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB $\mu$ V/m) | Peak Limit at 3m (dB $\mu$ V/m) | Margin (dB) |
|--------------|-----------------|----------------------|-------------------|---------------------|--------------------------|---------------------------------|-------------|
| Horizontal   | 11020.000       | 52.1                 | 36.3              | 38.9                | 54.7                     | 68.2                            | -13.5       |
| Horizontal   | 16530.000       | 48.3                 | 34.7              | 41.0                | 54.6                     | 68.2                            | -13.6       |

| Polarization | Frequency (MHz) | Reading (dB $\mu$ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB $\mu$ V/m) | Average Limit at 3m (dB $\mu$ V/m) | Margin (dB) |
|--------------|-----------------|----------------------|-------------------|---------------------|--------------------------|------------------------------------|-------------|
| Horizontal   | 11020.000       | 41.0                 | 36.3              | 38.9                | 43.6                     | 54.0                               | -10.4       |
| Horizontal   | 16530.000       | 38.6                 | 34.7              | 41.0                | 44.9                     | 54.0                               | -9.1        |

Channel 118/27Mbps

| Polarization | Frequency (MHz) | Reading (dB $\mu$ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB $\mu$ V/m) | Peak Limit at 3m (dB $\mu$ V/m) | Margin (dB) |
|--------------|-----------------|----------------------|-------------------|---------------------|--------------------------|---------------------------------|-------------|
| Horizontal   | 11180.000       | 52.2                 | 36.3              | 39.0                | 54.9                     | 68.2                            | -13.3       |
| Horizontal   | 16770.000       | 48.6                 | 34.7              | 41.2                | 55.1                     | 68.2                            | -13.1       |

| Polarization | Frequency (MHz) | Reading (dB $\mu$ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB $\mu$ V/m) | Average Limit at 3m (dB $\mu$ V/m) | Margin (dB) |
|--------------|-----------------|----------------------|-------------------|---------------------|--------------------------|------------------------------------|-------------|
| Horizontal   | 11180.000       | 40.7                 | 36.3              | 39.0                | 43.4                     | 54.0                               | -10.6       |
| Horizontal   | 16770.000       | 38.6                 | 34.7              | 41.2                | 45.1                     | 54.0                               | -8.9        |

Channel 134/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 11340.000       | 2.3            | 36.3              | 39.0                | 5.0                | 68.2                      | -63.2       |
| Horizontal   | 17010.000       | 47.1           | 34.7              | 41.2                | 53.6               | 68.2                      | -14.6       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 11340.000       | 39.6           | 36.3              | 39.0                | 42.3               | 54.0                         | -11.7       |
| Horizontal   | 17010.000       | 37.1           | 34.7              | 41.2                | 43.6               | 54.0                         | -10.4       |

Channel 151/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 11510.000       | 50.9           | 36.3              | 39.0                | 53.6               | 68.2                      | -14.6       |
| Horizontal   | 17265.000       | 48.3           | 34.7              | 41.2                | 54.8               | 68.2                      | -13.4       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 11510.000       | 38.6           | 36.3              | 39.0                | 41.3               | 54.0                         | -12.7       |
| Horizontal   | 17265.000       | 37.4           | 34.7              | 41.2                | 43.9               | 54.0                         | -10.1       |

Channel 159/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 11590.000       | 51.6           | 36.3              | 39.0                | 54.3               | 68.2                      | -13.9       |
| Horizontal   | 17385.000       | 47.2           | 34.7              | 41.2                | 53.7               | 68.2                      | -14.5       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 11590.000       | 39.6           | 36.3              | 39.0                | 42.3               | 54.0                         | -11.7       |
| Horizontal   | 17385.000       | 37.1           | 34.7              | 41.2                | 43.6               | 54.0                         | -10.4       |

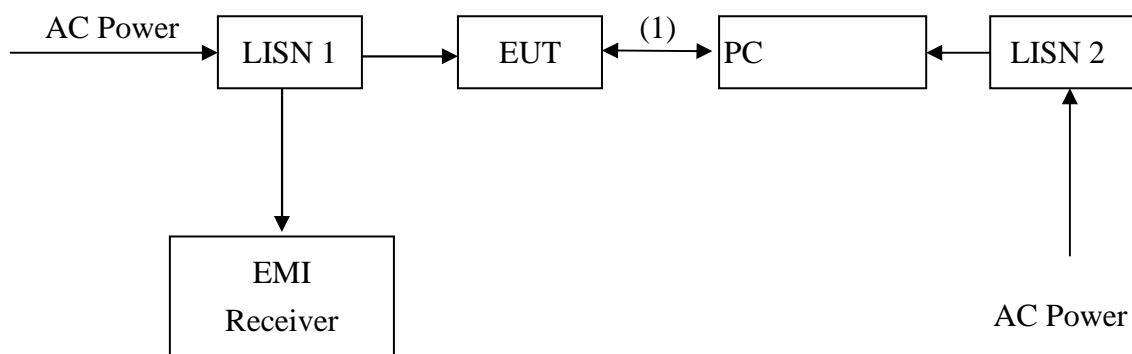
\* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

## 7. Power Line Conducted Emission test

### 7.1 Operating environment

Temperature: 23 °C  
Relative Humidity: 55 %  
Atmospheric Pressure 1011 hPa

### 7.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm/50 uH coupling impedance with 50 ohm termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10/2013 on conducted measurement.

The bandwidth of the field strength meter (R & S Test Receiver ESCI 30) is set at 9 kHz.

### 7.3 Limit

| Freq.<br>(MHz) | Conducted Limit (dBuV) |          |
|----------------|------------------------|----------|
|                | Q.P.                   | Ave.     |
| 0.15~0.50      | 66 – 56*               | 56 – 46* |
| 0.50~5.00      | 56                     | 46       |
| 5.00~30.0      | 60                     | 50       |

\*Decreases with the logarithm of the frequency.

## 7.4 Power Line Conducted Emission test data

Applicant: TCL entertainment solutions limited

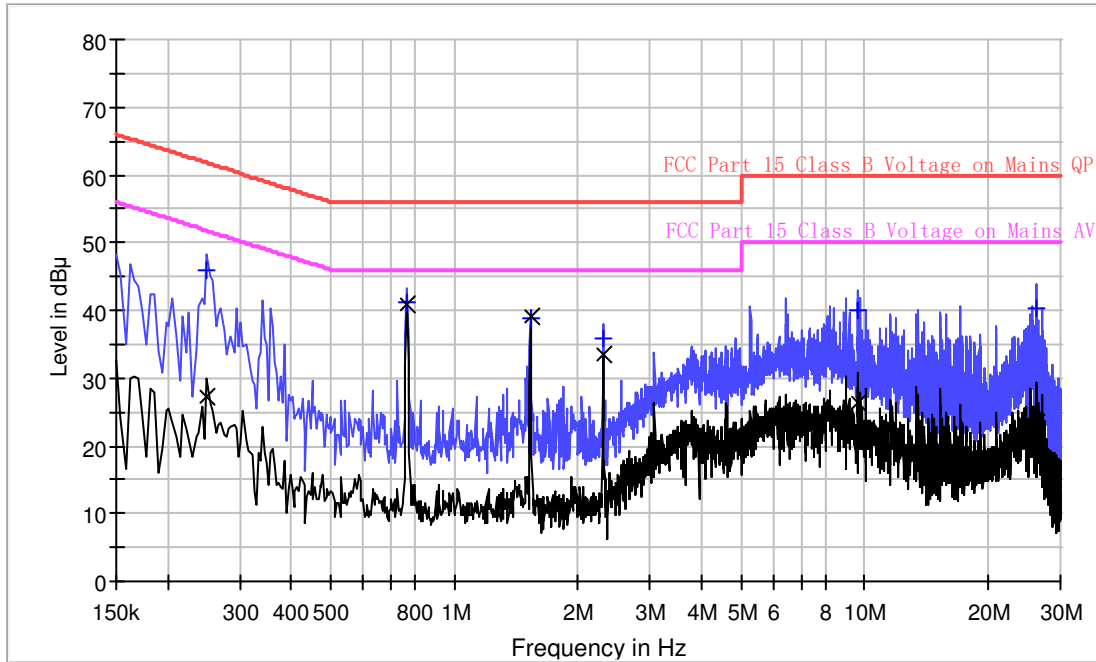
Date of Test: January 06, 2020

Worst Case Operating Mode:

Phase: Live

Model: TS9030

WIFI Link



### Result Table QP

| Frequency (MHz) | QuasiPeak (dBuV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|------------------|-----------------|------|------------|-------------|--------------|
| 0.250000        | 45.8             | 9.000           | L1   | 9.7        | 16.0        | 61.8         |
| 0.770000        | 41.3             | 9.000           | L1   | 9.7        | 14.7        | 56.0         |
| 1.538000        | 38.7             | 9.000           | L1   | 9.7        | 17.3        | 56.0         |
| 2.306000        | 35.8             | 9.000           | L1   | 9.7        | 20.2        | 56.0         |
| 9.638000        | 40.1             | 9.000           | L1   | 9.9        | 19.9        | 60.0         |
| 26.342000       | 40.3             | 9.000           | L1   | 11.0       | 19.7        | 60.0         |

### Result Table AV

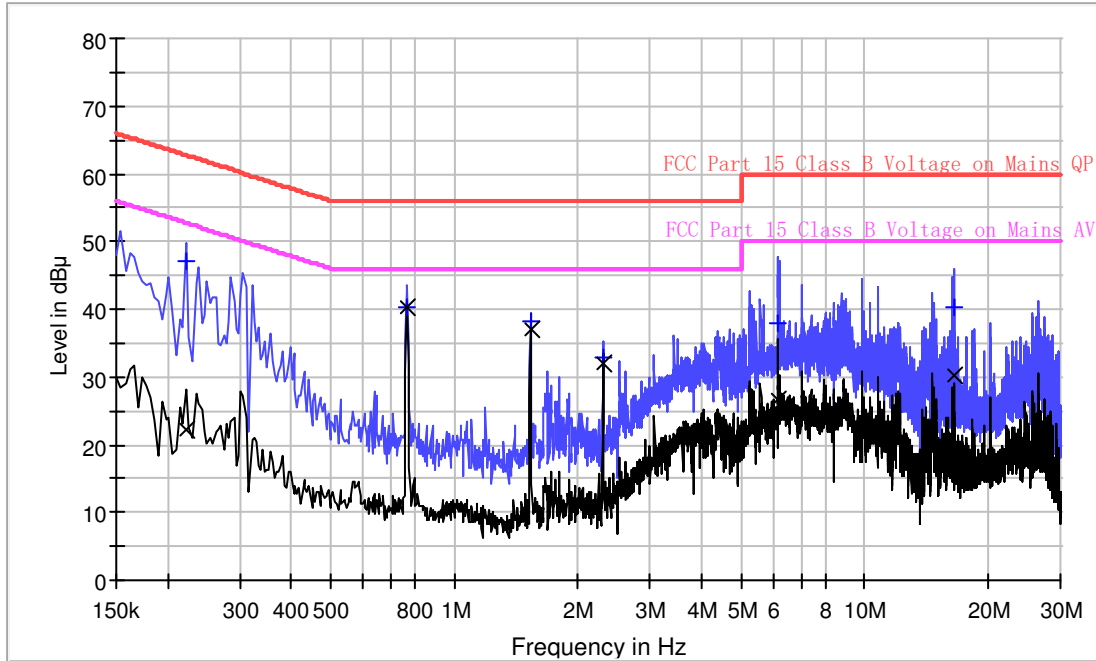
| Frequency (MHz) | Average (dBuV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|
| 0.250000        | 27.2           | 9.000           | L1   | 9.7        | 24.6        | 51.8         |
| 0.770000        | 41.0           | 9.000           | L1   | 9.7        | 5.0         | 46.0         |
| 1.538000        | 39.1           | 9.000           | L1   | 9.7        | 6.9         | 46.0         |
| 2.306000        | 33.6           | 9.000           | L1   | 9.7        | 12.4        | 46.0         |
| 9.638000        | 26.3           | 9.000           | L1   | 9.9        | 23.7        | 50.0         |
| 26.342000       | 23.5           | 9.000           | L1   | 11.0       | 26.5        | 50.0         |

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBuV) – Level (dBuV)

Applicant: TCL entertainment solutions limited  
Date of Test: 06 February 2020  
Worst Case Operating Mode:  
Phase: Neutral

Model: TS9030  
WIFI Link



## Result Table QP

| Frequency (MHz) | QuasiPeak (dBuV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|------------------|-----------------|------|------------|-------------|--------------|
| 0.222000        | 47.1             | 9.000           | N    | 9.7        | 15.6        | 62.7         |
| 0.770000        | 40.2             | 9.000           | N    | 9.7        | 15.8        | 56.0         |
| 1.538000        | 38.3             | 9.000           | N    | 9.7        | 17.7        | 56.0         |
| 2.302000        | 32.9             | 9.000           | N    | 9.8        | 23.1        | 56.0         |
| 6.154000        | 37.9             | 9.000           | N    | 9.9        | 22.1        | 60.0         |
| 16.510000       | 40.2             | 9.000           | N    | 10.3       | 19.8        | 60.0         |

## Result Table AV

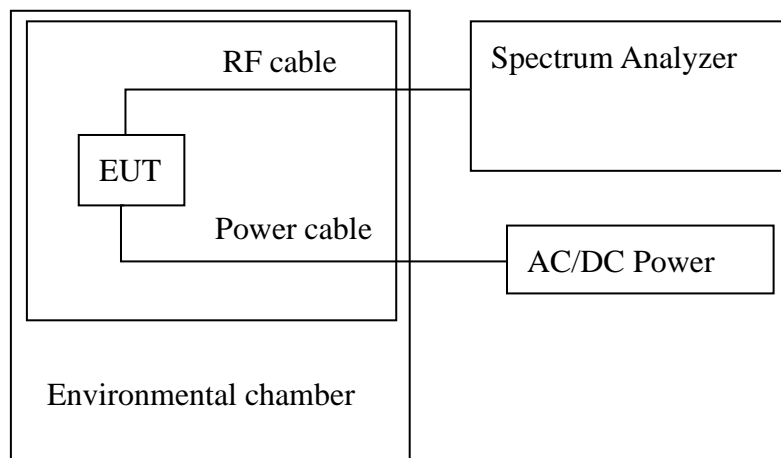
| Frequency (MHz) | Average (dBuV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|
| 0.222000        | 22.3           | 9.000           | N    | 9.7        | 30.4        | 52.7         |
| 0.770000        | 40.2           | 9.000           | N    | 9.7        | 5.8         | 46.0         |
| 1.538000        | 37.1           | 9.000           | N    | 9.7        | 8.9         | 46.0         |
| 2.302000        | 32.1           | 9.000           | N    | 9.8        | 13.9        | 46.0         |
| 6.154000        | 26.8           | 9.000           | N    | 9.9        | 23.2        | 50.0         |
| 16.510000       | 30.1           | 9.000           | N    | 10.3       | 19.9        | 50.0         |

## Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBuV) – Level (dBuV)

## 8. Frequency Stability Test

### 8.1 Test setup & procedure



Note1: The frequency stability is measured with the temperature variation range of 0°C to +45°C (5°C increment), and voltage supply variation range of 85% to 115% of nominal AC supply voltage.

2: To ensure emission at the band-edge is maintained within the authorized band, the frequency 802.11a/n-HT20/40/ac-HT20/40/80 channel 36, 48, 52, 64, 100, 140, 149, 165, 38, 46, 54, 62, 102, 134, 151, 159, 42, 58, 106, 122, 155 are selected to test and the worst case was reported.

### 8.2 Frequency Stability Test Data

20°C is taken as temperature in normal condition.

| Test Mode | Channel   | Voltage [Vdc] | Temperature (°C) | Deviation (Hz) | Deviation (ppm) | Verdict   |      |
|-----------|-----------|---------------|------------------|----------------|-----------------|-----------|------|
| 11A       | 5180      | 120           | 20               | 60000          | 11.583012       | PASS      |      |
|           |           | 102           | 20               | 75000          | 14.478764       | PASS      |      |
|           |           | 138           | 20               | 75000          | 14.478764       | PASS      |      |
|           | 5240      | 120           | 20               | 60000          | 11.450382       | PASS      |      |
|           |           | 102           | 20               | 60000          | 11.450382       | PASS      |      |
|           |           | 138           | 20               | 60000          | 11.450382       | PASS      |      |
|           | 5260      | 120           | 20               | 60000          | 11.406844       | PASS      |      |
|           |           | 102           | 20               | 60000          | 11.406844       | PASS      |      |
|           |           | 138           | 20               | 60000          | 11.406844       | PASS      |      |
|           | 5320      | 120           | 20               | 60000          | 11.278195       | PASS      |      |
|           |           | 102           | 20               | 60000          | 11.278195       | PASS      |      |
|           |           | 138           | 20               | 60000          | 11.278195       | PASS      |      |
|           | 5500      | 120           | 20               | 60000          | 10.909091       | PASS      |      |
|           |           | 102           | 20               | 60000          | 10.909091       | PASS      |      |
|           |           | 138           | 20               | 60000          | 10.909091       | PASS      |      |
|           | 5700      | 120           | 20               | 75000          | 13.157895       | PASS      |      |
|           |           | 102           | 20               | 75000          | 13.157895       | PASS      |      |
|           |           | 138           | 20               | 45000          | 7.894737        | PASS      |      |
|           | 5745      | 120           | 20               | 60000          | 10.443864       | PASS      |      |
|           |           | 102           | 20               | 45000          | 7.832898        | PASS      |      |
|           |           | 138           | 20               | 45000          | 7.832898        | PASS      |      |
|           | 5825      | 120           | 20               | 75000          | 12.875536       | PASS      |      |
|           |           | 102           | 20               | 60000          | 10.300429       | PASS      |      |
|           |           | 138           | 20               | 60000          | 10.300429       | PASS      |      |
|           | 11N20SISO | 5180          | 120              | 20             | 60000           | 11.583012 | PASS |
|           |           |               | 102              | 20             | 30000           | 5.791506  | PASS |
|           |           |               | 138              | 20             | 45000           | 8.687259  | PASS |
| 5240      |           | 120           | 20               | 60000          | 11.450382       | PASS      |      |
|           |           | 102           | 20               | 60000          | 11.450382       | PASS      |      |
|           |           | 138           | 20               | 60000          | 11.450382       | PASS      |      |
| 5260      |           | 120           | 20               | 60000          | 11.406844       | PASS      |      |
|           |           | 102           | 20               | 60000          | 11.406844       | PASS      |      |
|           |           | 138           | 20               | 75000          | 14.258555       | PASS      |      |
| 5320      |           | 120           | 20               | 75000          | 14.097744       | PASS      |      |
|           |           | 102           | 20               | 60000          | 11.278195       | PASS      |      |
|           |           | 138           | 20               | 60000          | 11.278195       | PASS      |      |
| 5500      |           | 120           | 20               | 45000          | 8.181818        | PASS      |      |
|           |           | 102           | 20               | 60000          | 10.909091       | PASS      |      |
|           |           | 138           | 20               | 60000          | 10.909091       | PASS      |      |
| 5700      |           | 120           | 20               | 75000          | 13.157895       | PASS      |      |
|           |           | 102           | 20               | 75000          | 13.157895       | PASS      |      |
|           |           | 138           | 20               | 75000          | 13.157895       | PASS      |      |
| 5745      |           | 120           | 20               | 75000          | 13.05483        | PASS      |      |
|           |           | 102           | 20               | 60000          | 10.443864       | PASS      |      |
|           |           | 138           | 20               | 90000          | 15.665796       | PASS      |      |
| 5825      |           | 120           | 20               | 90000          | 15.450644       | PASS      |      |
|           |           | 102           | 20               | 90000          | 15.450644       | PASS      |      |
|           |           | 138           | 20               | 90000          | 15.450644       | PASS      |      |
| 11N40SISO |           | 5190          | 120              | 20             | 90000           | 17.34104  | PASS |
|           |           |               | 102              | 20             | 60000           | 11.560694 | PASS |
|           |           |               | 138              | 20             | 30000           | 5.780347  | PASS |
|           | 5230      | 120           | 20               | 20000          | 3.824091        | PASS      |      |
|           |           | 102           | 20               | 90000          | 17.208413       | PASS      |      |
|           |           | 138           | 20               | 90000          | 17.208413       | PASS      |      |
|           | 5270      | 120           | 20               | 90000          | 17.077799       | PASS      |      |
|           |           | 102           | 20               | 60000          | 11.385199       | PASS      |      |
|           |           | 138           | 20               | 60000          | 11.385199       | PASS      |      |
|           | 5310      | 120           | 20               | 90000          | 16.949153       | PASS      |      |
|           |           | 102           | 20               | 60000          | 11.299435       | PASS      |      |



|            |      |     |       |          |           |      |
|------------|------|-----|-------|----------|-----------|------|
|            | 5510 | 138 | 20    | 60000    | 11.299435 | PASS |
|            |      | 120 | 20    | 90000    | 16.333938 | PASS |
|            |      | 102 | 20    | 90000    | 16.333938 | PASS |
|            |      | 138 | 20    | 90000    | 16.333938 | PASS |
|            | 5670 | 120 | 20    | 60000    | 10.582011 | PASS |
|            |      | 102 | 20    | 90000    | 15.873016 | PASS |
|            |      | 138 | 20    | 90000    | 15.873016 | PASS |
|            | 5755 | 120 | 20    | 30000    | 5.212858  | PASS |
|            |      | 102 | 20    | 30000    | 5.212858  | PASS |
|            |      | 138 | 20    | 30000    | 5.212858  | PASS |
|            | 5795 | 120 | 20    | 60000    | 10.353753 | PASS |
|            |      | 102 | 20    | 90000    | 15.53063  | PASS |
| 138        |      | 20  | 90000 | 15.53063 | PASS      |      |
| 11AC20SISO | 5180 | 120 | 20    | 75000    | 14.478764 | PASS |
|            |      | 102 | 20    | 60000    | 11.583012 | PASS |
|            |      | 138 | 20    | 75000    | 14.478764 | PASS |
|            | 5240 | 120 | 20    | 75000    | 14.312977 | PASS |
|            |      | 102 | 20    | 45000    | 8.587786  | PASS |
|            |      | 138 | 20    | 60000    | 11.450382 | PASS |
|            | 5260 | 120 | 20    | 60000    | 11.406844 | PASS |
|            |      | 102 | 20    | 60000    | 11.406844 | PASS |
|            |      | 138 | 20    | 60000    | 11.406844 | PASS |
|            | 5320 | 120 | 20    | 75000    | 14.097744 | PASS |
|            |      | 102 | 20    | 75000    | 14.097744 | PASS |
|            |      | 138 | 20    | 75000    | 14.097744 | PASS |
|            | 5500 | 120 | 20    | 60000    | 10.909091 | PASS |
|            |      | 120 | 20    | 90000    | 16.363636 | PASS |
|            |      | 102 | 20    | 60000    | 10.909091 | PASS |
|            | 5700 | 138 | 20    | 75000    | 13.157895 | PASS |
|            |      | 120 | 20    | 75000    | 13.157895 | PASS |
|            |      | 102 | 20    | 60000    | 10.526316 | PASS |
|            | 5745 | 138 | 20    | 75000    | 13.05483  | PASS |
|            |      | 120 | 20    | 60000    | 10.443864 | PASS |
|            |      | 102 | 20    | 60000    | 10.443864 | PASS |
|            | 5825 | 138 | 20    | 75000    | 12.875536 | PASS |
|            |      | 120 | 20    | 75000    | 12.875536 | PASS |
|            |      | 102 | 20    | 75000    | 12.875536 | PASS |
| 11AC40SISO | 5190 | 138 | 20    | 90000    | 17.34104  | PASS |
|            |      | 120 | 20    | 90000    | 17.34104  | PASS |
|            |      | 102 | 20    | 90000    | 17.34104  | PASS |
|            | 5230 | 138 | 20    | 90000    | 17.208413 | PASS |
|            |      | 120 | 20    | 90000    | 17.208413 | PASS |
|            |      | 102 | 20    | 90000    | 17.208413 | PASS |
|            | 5270 | 138 | 20    | 90000    | 17.077799 | PASS |
|            |      | 120 | 20    | 60000    | 11.385199 | PASS |
|            |      | 102 | 20    | 90000    | 17.077799 | PASS |
|            | 5310 | 138 | 20    | 60000    | 11.299435 | PASS |
|            |      | 120 | 20    | 90000    | 16.949153 | PASS |
|            |      | 102 | 20    | 60000    | 11.299435 | PASS |
|            | 5510 | 138 | 20    | 90000    | 16.333938 | PASS |
|            |      | 120 | 20    | 60000    | 10.889292 | PASS |
|            |      | 102 | 20    | 90000    | 16.333938 | PASS |
|            | 5670 | 138 | 20    | 90000    | 15.873016 | PASS |
|            |      | 120 | 20    | 90000    | 15.873016 | PASS |
|            |      | 102 | 20    | 90000    | 15.873016 | PASS |
|            | 5755 | 138 | 20    | 90000    | 15.638575 | PASS |
|            |      | 120 | 20    | 60000    | 10.425717 | PASS |
|            |      | 102 | 20    | 90000    | 15.638575 | PASS |
|            | 5795 | 138 | 20    | 30000    | 5.176877  | PASS |
|            |      | 120 | 20    | 90000    | 15.53063  | PASS |
|            |      | 102 | 20    | 60000    | 10.353753 | PASS |
| 11AC80SISO | 5210 | 138 | 20    | 60000    | 13.03263  | PASS |
|            |      | 120 | 20    | 60000    | 11.516315 | PASS |

|  |      |     |    |       |           |      |
|--|------|-----|----|-------|-----------|------|
|  | 5290 | 102 | 20 | 60000 | 11.516315 | PASS |
|  |      | 138 | 20 | 0     | 0         | PASS |
|  |      | 120 | 20 | 60000 | 11.342155 | PASS |
|  |      | 102 | 20 | 60000 | 11.342155 | PASS |
|  | 5530 | 138 | 20 | 60000 | 10.84991  | PASS |
|  |      | 120 | 20 | 60000 | 10.84991  | PASS |
|  |      | 102 | 20 | 0     | 0         | PASS |
|  | 5610 | 138 | 20 | 60000 | 10.695187 | PASS |
|  |      | 120 | 20 | 60000 | 10.695187 | PASS |
|  |      | 102 | 20 | 60000 | 11.390374 | PASS |
|  | 5775 | 138 | 20 | 60000 | 10.779221 | PASS |
|  |      | 120 | 20 | 60000 | 10.38961  | PASS |
|  |      | 102 | 20 | 60000 | 10.38961  | PASS |

| Test Mode | Channel | Voltage [Vdc] | Temperature (°C) | Deviation (Hz) | Deviation (ppm) | Verdict |
|-----------|---------|---------------|------------------|----------------|-----------------|---------|
| 11A       | 5180    | 120           | 0                | 75000          | 14.478764       | PASS    |
|           |         | 120           | 5                | 75000          | 14.478764       | PASS    |
|           |         | 120           | 15               | 75000          | 14.478764       | PASS    |
|           |         | 120           | 25               | 75000          | 14.478764       | PASS    |
|           |         | 120           | 35               | 60000          | 11.583012       | PASS    |
|           |         | 120           | 45               | 75000          | 14.478764       | PASS    |
|           | 5240    | 120           | 0                | 60000          | 11.450382       | PASS    |
|           |         | 120           | 5                | 75000          | 14.312977       | PASS    |
|           |         | 120           | 15               | 60000          | 11.450382       | PASS    |
|           |         | 120           | 25               | 60000          | 11.450382       | PASS    |
|           |         | 120           | 35               | 60000          | 11.450382       | PASS    |
|           |         | 120           | 45               | 60000          | 11.450382       | PASS    |
|           | 5260    | 120           | 0                | 75000          | 14.258555       | PASS    |
|           |         | 120           | 5                | 75000          | 14.258555       | PASS    |
|           |         | 120           | 15               | 60000          | 11.406844       | PASS    |
|           |         | 120           | 25               | 60000          | 11.406844       | PASS    |
|           |         | 120           | 35               | 60000          | 11.406844       | PASS    |
|           |         | 120           | 45               | 60000          | 11.406844       | PASS    |
|           | 5320    | 120           | 0                | 60000          | 11.363636       | PASS    |
|           |         | 120           | 5                | 60000          | 11.363636       | PASS    |
|           |         | 120           | 15               | 60000          | 11.363636       | PASS    |
|           |         | 120           | 25               | 60000          | 11.363636       | PASS    |
|           |         | 120           | 35               | 60000          | 11.363636       | PASS    |
|           |         | 120           | 45               | 60000          | 11.363636       | PASS    |
|           | 5500    | 120           | 0                | 75000          | 13.636364       | PASS    |
|           |         | 120           | 5                | 60000          | 10.909091       | PASS    |
|           |         | 120           | 15               | 60000          | 10.909091       | PASS    |
|           |         | 120           | 25               | 60000          | 10.909091       | PASS    |
|           |         | 120           | 35               | 60000          | 10.909091       | PASS    |
|           |         | 120           | 45               | 60000          | 10.909091       | PASS    |
|           | 5700    | 120           | 0                | 60000          | 10.526316       | PASS    |
|           |         | 120           | 5                | 60000          | 10.526316       | PASS    |
|           |         | 120           | 15               | 60000          | 10.526316       | PASS    |
|           |         | 120           | 25               | 60000          | 10.526316       | PASS    |
|           |         | 120           | 35               | 75000          | 13.157895       | PASS    |
|           |         | 120           | 45               | 60000          | 10.526316       | PASS    |
|           | 5745    | 120           | 0                | 45000          | 7.832898        | PASS    |
|           |         | 120           | 5                | 45000          | 7.832898        | PASS    |
|           |         | 120           | 15               | 60000          | 10.443864       | PASS    |

|           |      |     |     |       |           |           |      |
|-----------|------|-----|-----|-------|-----------|-----------|------|
|           |      | 120 | 25  | 45000 | 7.832898  | PASS      |      |
|           |      | 120 | 35  | 45000 | 7.832898  | PASS      |      |
|           |      | 120 | 45  | 60000 | 10.443864 | PASS      |      |
|           | 5825 |     | 120 | 0     | 75000     | 12.875536 | PASS |
|           |      |     | 120 | 5     | 60000     | 10.300429 | PASS |
|           |      |     | 120 | 15    | 60000     | 10.300429 | PASS |
|           |      |     | 120 | 25    | 60000     | 10.300429 | PASS |
|           |      |     | 120 | 35    | 60000     | 10.300429 | PASS |
|           |      |     | 120 | 45    | 60000     | 10.300429 | PASS |
| 120       |      |     | 0   | 45000 | 8.687259  | PASS      |      |
| 120       |      |     | 5   | 75000 | 14.478764 | PASS      |      |
| 11N20SISO | 5180 | 120 | 15  | 60000 | 11.583012 | PASS      |      |
|           |      | 120 | 25  | 45000 | 8.687259  | PASS      |      |
|           |      | 120 | 35  | 45000 | 8.687259  | PASS      |      |
|           |      | 120 | 45  | 75000 | 14.478764 | PASS      |      |
|           |      | 120 | 0   | 60000 | 11.450382 | PASS      |      |
|           |      | 120 | 5   | 60000 | 11.450382 | PASS      |      |
|           | 5240 |     | 120 | 15    | 60000     | 11.450382 | PASS |
|           |      |     | 120 | 25    | 60000     | 11.450382 | PASS |
|           |      |     | 120 | 35    | 45000     | 8.587786  | PASS |
|           |      |     | 120 | 45    | 60000     | 11.450382 | PASS |
|           |      |     | 120 | 0     | 60000     | 11.406844 | PASS |
|           |      |     | 120 | 5     | 60000     | 11.406844 | PASS |
|           | 5260 |     | 120 | 15    | 60000     | 11.406844 | PASS |
|           |      |     | 120 | 25    | 60000     | 11.406844 | PASS |
|           |      |     | 120 | 35    | 60000     | 11.406844 | PASS |
|           |      |     | 120 | 45    | 45000     | 8.555133  | PASS |
|           |      |     | 120 | 0     | 60000     | 11.278195 | PASS |
|           |      |     | 120 | 5     | 60000     | 11.278195 | PASS |
| 5320      |      | 120 | 15  | 60000 | 11.278195 | PASS      |      |
|           |      | 120 | 25  | 60000 | 11.278195 | PASS      |      |
|           |      | 120 | 35  | 60000 | 11.278195 | PASS      |      |
|           |      | 120 | 45  | 60000 | 11.278195 | PASS      |      |
|           |      | 120 | 0   | 45000 | 8.181818  | PASS      |      |
|           |      | 120 | 5   | 45000 | 8.181818  | PASS      |      |
| 5500      |      | 120 | 15  | 60000 | 10.909091 | PASS      |      |
|           |      | 120 | 25  | 45000 | 8.181818  | PASS      |      |
|           |      | 120 | 35  | 75000 | 13.636364 | PASS      |      |
|           |      | 120 | 45  | 45000 | 8.181818  | PASS      |      |
|           |      | 120 | 0   | 75000 | 13.157895 | PASS      |      |
|           |      | 120 | 5   | 90000 | 15.789474 | PASS      |      |
| 5700      |      | 120 | 15  | 90000 | 15.789474 | PASS      |      |
|           |      | 120 | 25  | 60000 | 10.526316 | PASS      |      |
|           |      | 120 | 35  | 75000 | 13.157895 | PASS      |      |
|           |      | 120 | 45  | 75000 | 13.157895 | PASS      |      |
|           |      | 120 | 0   | 60000 | 10.443864 | PASS      |      |
|           |      | 120 | 5   | 75000 | 13.05483  | PASS      |      |
| 5745      |      | 120 | 15  | 90000 | 15.665796 | PASS      |      |
|           |      | 120 | 25  | 75000 | 13.05483  | PASS      |      |
|           |      | 120 | 35  | 75000 | 13.05483  | PASS      |      |
|           |      | 120 | 45  | 75000 | 13.05483  | PASS      |      |
|           |      | 120 | 0   | 75000 | 12.964564 | PASS      |      |
|           |      | 120 | 5   | 75000 | 12.964564 | PASS      |      |
| 5825      |      | 120 | 15  | 90000 | 15.557476 | PASS      |      |
|           |      | 120 | 25  | 90000 | 15.557476 | PASS      |      |
|           |      | 120 | 35  | 90000 | 15.557476 | PASS      |      |
|           |      | 120 | 45  | 90000 | 15.557476 | PASS      |      |
|           |      | 120 | 0   | 90000 | 17.34104  | PASS      |      |
|           |      | 120 | 5   | 90000 | 17.34104  | PASS      |      |
| 11N40SISO | 5190 | 120 | 15  | 90000 | 17.34104  | PASS      |      |
|           |      | 120 | 25  | 90000 | 17.34104  | PASS      |      |
|           |      | 120 | 35  | 90000 | 17.34104  | PASS      |      |
|           |      | 120 | 45  | 60000 | 11.560694 | PASS      |      |

|      |            |      |     |       |           |           |      |
|------|------------|------|-----|-------|-----------|-----------|------|
|      | 5230       | 120  | 0   | 60000 | 11.472275 | PASS      |      |
|      |            | 120  | 5   | 60000 | 11.472275 | PASS      |      |
|      |            | 120  | 15  | 60000 | 11.472275 | PASS      |      |
|      |            | 120  | 25  | 60000 | 11.472275 | PASS      |      |
|      |            | 120  | 35  | 90000 | 17.208413 | PASS      |      |
|      |            | 120  | 45  | 60000 | 11.472275 | PASS      |      |
|      | 5270       | 120  | 0   | 90000 | 17.077799 | PASS      |      |
|      |            | 120  | 5   | 60000 | 11.385199 | PASS      |      |
|      |            | 120  | 15  | 60000 | 11.385199 | PASS      |      |
|      |            | 120  | 25  | 30000 | 5.6926    | PASS      |      |
|      |            | 120  | 35  | 60000 | 11.385199 | PASS      |      |
|      |            | 120  | 45  | 90000 | 17.077799 | PASS      |      |
|      | 5310       | 120  | 0   | 90000 | 16.949153 | PASS      |      |
|      |            | 120  | 5   | 30000 | 5.649718  | PASS      |      |
|      |            | 120  | 15  | 90000 | 16.949153 | PASS      |      |
|      |            | 120  | 25  | 30000 | 5.649718  | PASS      |      |
|      |            | 120  | 35  | 60000 | 11.299435 | PASS      |      |
|      |            | 120  | 45  | 60000 | 11.299435 | PASS      |      |
|      | 5510       | 120  | 0   | 90000 | 16.333938 | PASS      |      |
|      |            | 120  | 5   | 90000 | 16.333938 | PASS      |      |
|      |            | 120  | 15  | 60000 | 10.889292 | PASS      |      |
|      |            | 120  | 25  | 30000 | 5.444646  | PASS      |      |
|      |            | 120  | 35  | 60000 | 10.889292 | PASS      |      |
|      |            | 120  | 45  | 90000 | 16.333938 | PASS      |      |
|      | 5670       | 120  | 0   | 90000 | 15.873016 | PASS      |      |
|      |            | 120  | 5   | 90000 | 15.873016 | PASS      |      |
|      |            | 120  | 15  | 90000 | 15.873016 | PASS      |      |
|      |            | 120  | 25  | 90000 | 15.873016 | PASS      |      |
|      |            | 120  | 35  | 90000 | 15.873016 | PASS      |      |
|      |            | 120  | 45  | 90000 | 15.873016 | PASS      |      |
|      | 5755       | 120  | 0   | 90000 | 15.638575 | PASS      |      |
|      |            | 120  | 5   | 60000 | 10.425717 | PASS      |      |
|      |            | 120  | 15  | 90000 | 15.638575 | PASS      |      |
|      |            | 120  | 25  | 30000 | 5.212858  | PASS      |      |
|      |            | 120  | 35  | 60000 | 10.425717 | PASS      |      |
|      |            | 120  | 45  | 60000 | 10.425717 | PASS      |      |
|      | 5795       | 120  | 0   | 60000 | 10.353753 | PASS      |      |
|      |            | 120  | 5   | 90000 | 15.53063  | PASS      |      |
|      |            | 120  | 15  | 30000 | 5.176877  | PASS      |      |
|      |            | 120  | 25  | 90000 | 15.53063  | PASS      |      |
|      |            | 120  | 35  | 90000 | 15.53063  | PASS      |      |
|      |            | 120  | 45  | 90000 | 15.53063  | PASS      |      |
|      | 11AC20SISO | 5180 | 120 | 0     | 90000     | 17.374517 | PASS |
|      |            |      | 120 | 5     | 60000     | 11.583012 | PASS |
|      |            |      | 120 | 15    | 75000     | 14.478764 | PASS |
|      |            |      | 120 | 25    | 75000     | 14.478764 | PASS |
|      |            |      | 120 | 35    | 60000     | 11.583012 | PASS |
|      |            |      | 120 | 45    | 75000     | 14.478764 | PASS |
|      |            | 5240 | 120 | 0     | 75000     | 14.312977 | PASS |
|      |            |      | 120 | 5     | 45000     | 8.587786  | PASS |
|      |            |      | 120 | 15    | 60000     | 11.450382 | PASS |
|      |            |      | 120 | 25    | 75000     | 14.312977 | PASS |
|      |            |      | 120 | 35    | 60000     | 11.450382 | PASS |
|      |            |      | 120 | 45    | 75000     | 14.312977 | PASS |
|      |            | 5260 | 120 | 0     | 60000     | 11.406844 | PASS |
|      |            |      | 120 | 5     | 75000     | 14.258555 | PASS |
|      |            |      | 120 | 15    | 75000     | 14.258555 | PASS |
|      |            |      | 120 | 25    | 60000     | 11.406844 | PASS |
|      |            |      | 120 | 35    | 75000     | 14.258555 | PASS |
|      |            |      | 120 | 45    | 75000     | 14.258555 | PASS |
| 5320 |            | 120  | 0   | 60000 | 11.278195 | PASS      |      |
|      |            | 120  | 5   | 75000 | 14.097744 | PASS      |      |
|      |            | 120  | 15  | 75000 | 14.097744 | PASS      |      |

|            |      |     |      |       |           |           |       |
|------------|------|-----|------|-------|-----------|-----------|-------|
|            |      | 120 | 25   | 60000 | 11.278195 | PASS      |       |
|            |      | 120 | 35   | 75000 | 14.097744 | PASS      |       |
|            |      | 120 | 45   | 75000 | 14.097744 | PASS      |       |
|            | 5500 |     | 120  | 0     | 75000     | 13.636364 | PASS  |
|            |      |     | 120  | 5     | 75000     | 13.636364 | PASS  |
|            |      |     | 120  | 15    | 60000     | 10.909091 | PASS  |
|            |      |     | 120  | 25    | 60000     | 10.909091 | PASS  |
|            |      |     | 120  | 35    | 75000     | 13.636364 | PASS  |
|            |      |     | 120  | 45    | 60000     | 10.909091 | PASS  |
|            |      |     | 5700 |       | 120       | 0         | 60000 |
|            | 120  | 5   |      |       | 75000     | 13.157895 | PASS  |
|            | 120  | 15  |      |       | 75000     | 13.157895 | PASS  |
|            | 120  | 25  |      |       | 75000     | 13.157895 | PASS  |
|            | 120  | 35  |      |       | 60000     | 10.526316 | PASS  |
|            | 120  | 45  |      |       | 75000     | 13.157895 | PASS  |
|            | 5745 |     | 120  | 0     | 75000     | 13.05483  | PASS  |
|            |      |     | 120  | 5     | 75000     | 13.05483  | PASS  |
|            |      |     | 120  | 15    | 60000     | 10.443864 | PASS  |
|            |      |     | 120  | 25    | 75000     | 13.05483  | PASS  |
|            |      |     | 120  | 35    | 60000     | 10.443864 | PASS  |
|            |      |     | 120  | 45    | 75000     | 13.05483  | PASS  |
|            | 5825 |     | 120  | 0     | 60000     | 10.300429 | PASS  |
|            |      |     | 120  | 5     | 75000     | 12.875536 | PASS  |
|            |      |     | 120  | 15    | 75000     | 12.875536 | PASS  |
|            |      |     | 120  | 25    | 75000     | 12.875536 | PASS  |
|            |      |     | 120  | 35    | 75000     | 12.875536 | PASS  |
|            |      |     | 120  | 45    | 75000     | 12.875536 | PASS  |
| 11AC40SISO | 5190 | 120 | 0    | 90000 | 17.34104  | PASS      |       |
|            |      | 120 | 5    | 90000 | 17.34104  | PASS      |       |
|            |      | 120 | 15   | 90000 | 17.34104  | PASS      |       |
|            |      | 120 | 25   | 90000 | 17.34104  | PASS      |       |
|            |      | 120 | 35   | 90000 | 17.34104  | PASS      |       |
|            |      | 120 | 45   | 90000 | 17.34104  | PASS      |       |
|            | 5230 |     | 120  | 0     | 90000     | 17.208413 | PASS  |
|            |      |     | 120  | 5     | 60000     | 11.472275 | PASS  |
|            |      |     | 120  | 15    | 90000     | 17.208413 | PASS  |
|            |      |     | 120  | 25    | 90000     | 17.208413 | PASS  |
|            |      |     | 120  | 35    | 60000     | 11.472275 | PASS  |
|            |      |     | 120  | 45    | 60000     | 11.472275 | PASS  |
|            | 5270 |     | 120  | 0     | 90000     | 17.077799 | PASS  |
|            |      |     | 120  | 5     | 60000     | 11.385199 | PASS  |
|            |      |     | 120  | 15    | 60000     | 11.385199 | PASS  |
|            |      |     | 120  | 25    | 90000     | 17.077799 | PASS  |
|            |      |     | 120  | 35    | 90000     | 17.077799 | PASS  |
|            |      |     | 120  | 45    | 60000     | 11.385199 | PASS  |
|            | 5310 |     | 120  | 0     | 90000     | 16.949153 | PASS  |
|            |      |     | 120  | 5     | 60000     | 11.299435 | PASS  |
|            |      |     | 120  | 15    | 60000     | 11.299435 | PASS  |
|            |      |     | 120  | 25    | 60000     | 11.299435 | PASS  |
|            |      |     | 120  | 35    | 90000     | 16.949153 | PASS  |
|            |      |     | 120  | 45    | 90000     | 16.949153 | PASS  |
|            | 5510 |     | 120  | 0     | 90000     | 16.333938 | PASS  |
|            |      |     | 120  | 5     | 60000     | 10.889292 | PASS  |
|            |      |     | 120  | 15    | 60000     | 10.889292 | PASS  |
| 120        |      |     | 25   | 60000 | 10.889292 | PASS      |       |
| 120        |      |     | 35   | 90000 | 16.333938 | PASS      |       |
| 120        |      |     | 45   | 90000 | 16.333938 | PASS      |       |
| 5670       |      | 120 | 0    | 90000 | 15.873016 | PASS      |       |
|            |      | 120 | 5    | 90000 | 15.873016 | PASS      |       |
|            |      | 120 | 15   | 90000 | 15.873016 | PASS      |       |
|            |      | 120 | 25   | 90000 | 15.873016 | PASS      |       |
|            |      | 120 | 35   | 90000 | 15.873016 | PASS      |       |
|            |      | 120 | 45   | 90000 | 15.873016 | PASS      |       |

|            |      |     |    |       |           |      |
|------------|------|-----|----|-------|-----------|------|
|            | 5755 | 120 | 0  | 90000 | 15.638575 | PASS |
|            |      | 120 | 5  | 90000 | 15.638575 | PASS |
|            |      | 120 | 15 | 60000 | 10.425717 | PASS |
|            |      | 120 | 25 | 60000 | 10.425717 | PASS |
|            |      | 120 | 35 | 90000 | 15.638575 | PASS |
|            |      | 120 | 45 | 90000 | 15.638575 | PASS |
|            | 5795 | 120 | 0  | 90000 | 15.53063  | PASS |
|            |      | 120 | 5  | 60000 | 10.353753 | PASS |
|            |      | 120 | 15 | 90000 | 15.53063  | PASS |
|            |      | 120 | 25 | 90000 | 15.53063  | PASS |
|            |      | 120 | 35 | 90000 | 15.53063  | PASS |
|            |      | 120 | 45 | 60000 | 10.353753 | PASS |
| 11AC80SISO | 5210 | 120 | 0  | 60000 | 11.516315 | PASS |
|            |      | 120 | 5  | 60000 | 11.516315 | PASS |
|            |      | 120 | 15 | 60000 | 13.03263  | PASS |
|            |      | 120 | 25 | 60000 | 11.516315 | PASS |
|            |      | 120 | 35 | 60000 | 11.516315 | PASS |
|            |      | 120 | 45 | 80000 | 15.355086 | PASS |
|            | 5290 | 120 | 0  | 60000 | 11.342155 | PASS |
|            |      | 120 | 5  | 60000 | 11.342155 | PASS |
|            |      | 120 | 15 | 60000 | 11.342155 | PASS |
|            |      | 120 | 25 | 0     | 0         | PASS |
|            |      | 120 | 35 | 60000 | 11.342155 | PASS |
|            |      | 120 | 45 | 0     | 0         | PASS |
|            | 5530 | 120 | 0  | 60000 | 11.699819 | PASS |
|            |      | 120 | 5  | 60000 | 10.84991  | PASS |
|            |      | 120 | 15 | 60000 | 11.699819 | PASS |
|            |      | 120 | 25 | 60000 | 10.84991  | PASS |
|            |      | 120 | 35 | 60000 | 10.84991  | PASS |
|            |      | 120 | 45 | 60000 | 10.84991  | PASS |
|            | 5610 | 120 | 0  | 60000 | 10.695187 | PASS |
|            |      | 120 | 5  | 60000 | 10.695187 | PASS |
|            |      | 120 | 15 | 60000 | 10.695187 | PASS |
|            |      | 120 | 25 | 60000 | 10.695187 | PASS |
|            |      | 120 | 35 | 90000 | 16.042781 | PASS |
|            |      | 120 | 45 | 60000 | 11.390374 | PASS |
|            | 5775 | 120 | 0  | 60000 | 10.38961  | PASS |
|            |      | 120 | 5  | 60000 | 10.38961  | PASS |
|            |      | 120 | 15 | 60000 | 10.38961  | PASS |
|            |      | 120 | 25 | 60000 | 10.38961  | PASS |
|            |      | 120 | 35 | 60000 | 10.38961  | PASS |
|            |      | 120 | 45 | 60000 | 10.38961  | PASS |

Note: All emissions are maintained within the band of operation under all conditions of normal operation as specified in the user manual. It fulfills the requirement of 15.407(g).

## 9. Dynamic Frequency Selection (DFS) (FCC 15.407)

### 9.1 Requirement

#### Applicability of DFS Requirements Prior to Use of a Channel

| Requirement                     | Operational Mode |                                |              |
|---------------------------------|------------------|--------------------------------|--------------|
|                                 | Master           | Client Without 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          |

#### Applicability of DFS requirements during normal operation

| Requirement                              | Operational Mode                             |                                |
|--|--|--------------------------------|
|  | Master Device or Client with Radar Detection | Client Without Radar Detection |
| <i>DFS Detection Threshold</i>           | Yes  | Not Required                   |
| <i>Channel Closing Transmission Time</i> | Yes  | Yes                            |
| <i>Channel Move Time</i>                 | Yes  | Yes                            |
| <i>U-NII Detection Bandwidth</i>         | 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   |
| <b>Note:</b> 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. |  |  |

Note: EUT is a client without DFS detection capabilities.



9.1.1 DFS Detection Thresholds for Master or Client Devices with DFS Detection

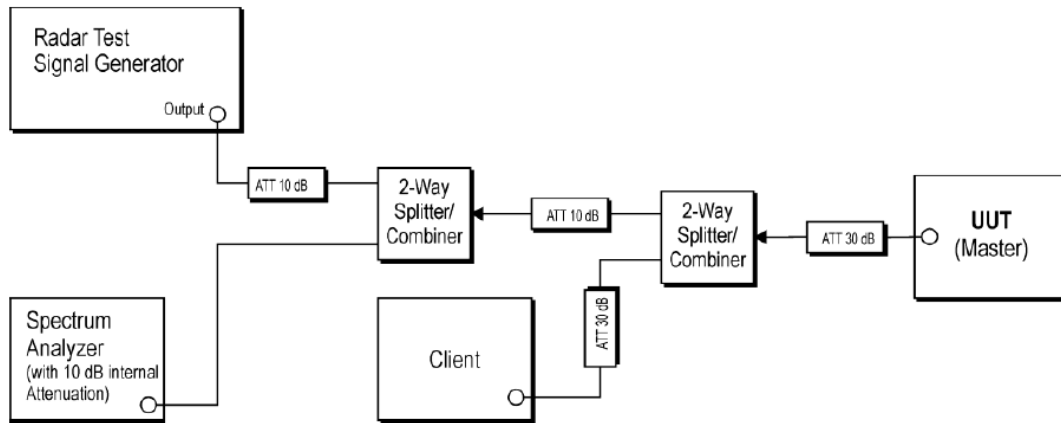
| Maximum Transmit Power   | Values ( See Notes 1, 2, and 3) |
|--|---------------------------------|
| EIRP ≥ 200 milliwatt   | -64 dBm                         |
| EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz   | -62 dBm                         |
| EIRP < 200 milliwatt that do not meet the power spectral density requirement   | -64 dBm                         |
| <p><b>Note 1:</b> This is the level at the input of the receiver assuming a 0 dBi receive antenna.</p> <p><b>Note 2:</b> 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.</p> <p><b>Note3:</b> EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01</p> |                                 |

| Parameter  | Value  |
|--|--|
| Non-Occupancy Period   | Minimum 30 minutes   |
| Channel Availability Check Time  | 60 Seconds   |
| Channel Move Time  | 10 seconds (see note 1)  |
| Channel Closing Transmission Time  | 200 ms + an aggregate of 60 ms over remaining 10 Second period. (see note 1 and 2) |
| U-NII Detection Bandwidth  | Minimum 100% of the U-NII 99% transmission power bandwidth. (see note 3)           |
| <p><b>Note 1:</b> 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.</p> <p><b>Note 2:</b> 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 to facilitate 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.</p> <p><b>Note 3:</b> 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.</p> |  |

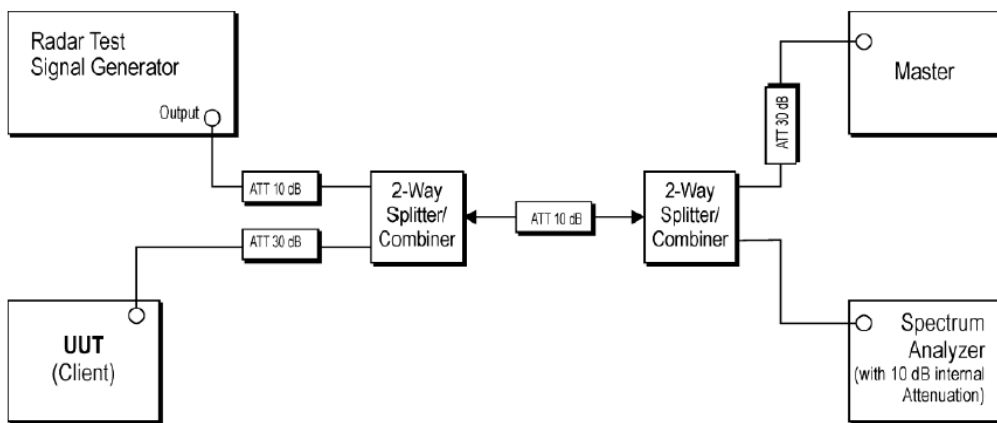
9.1.2 Radar Test Waveforms

Test procedures were made in accordance to KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02, for more radar test waveform details please refer section 6 of KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02.

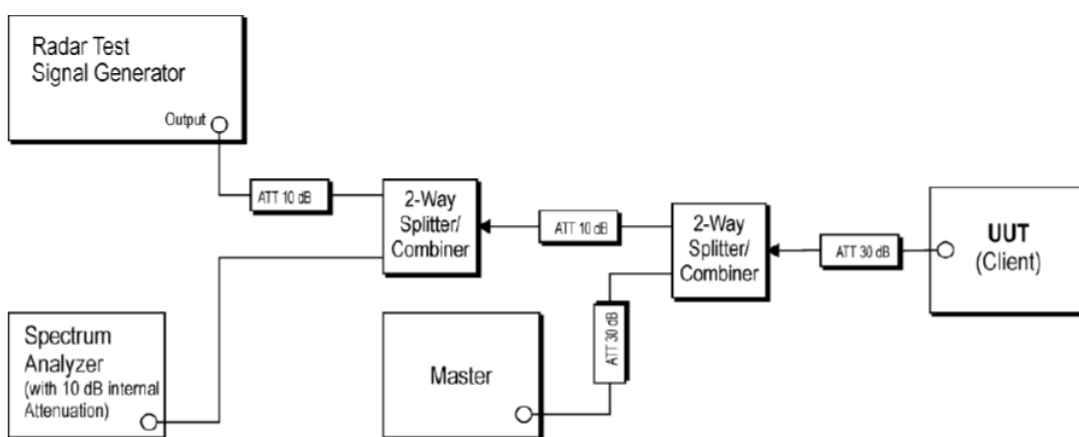
## 9.2 Test setup



**Setup for Master with injection at the Master**



**Setup for Client with injection at the Master**



**Setup for Client with injection at the Client**

Note: EUT is a client without DFS detection capabilities. Test procedures were made in accordance to KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02. DFS testing was setup as a client with injection into the master.

### **9.3 In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period**

#### 9.3.1 Test Procedure

The EUT was configured to communicate with a master device. The test file was streamed from the Master to the Client (EUT) on the selected test channel. Measurements were made while utilizing the widest bandwidth of the EUT.

Channel closing transmission time and channel move time were measured by applying a radar type 0 at threshold + 1dB to the EUT. The EUT transmissions were observed on the EUT center channel. The time between the end of the applied radar waveform and the final transmission on the channel is the channel move time. The channel closing transmission time comprises only those fragments of the channel move time during which the EUT transmits.

The Channel Move time shall be less than 10 seconds

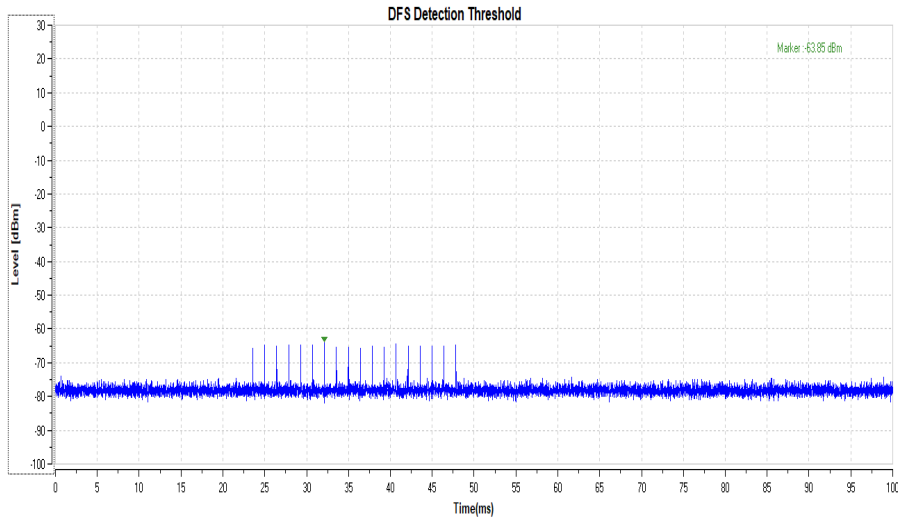
The Channel Close time shall be 200ms +60ms of aggregate time.

The Non-occupancy time shall 30 minutes or greater.

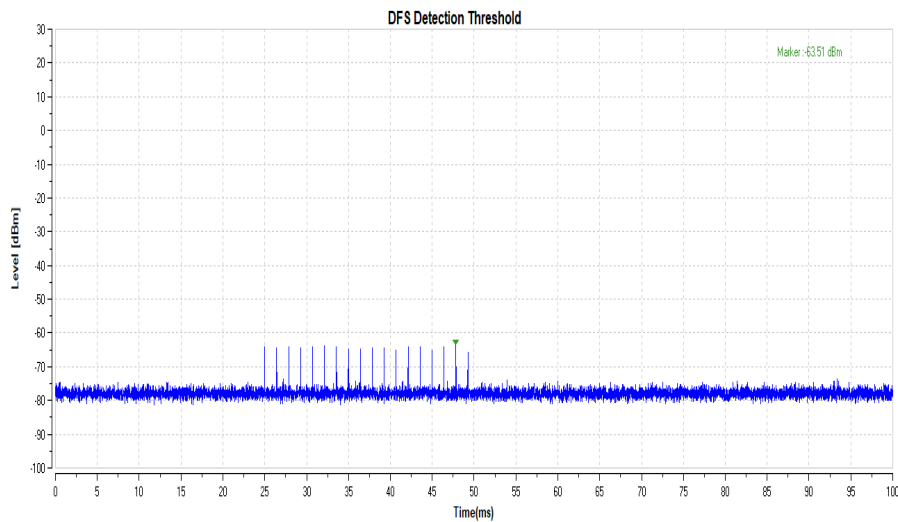
## 9.3.2 Calibration Results

Radar Type 0 Calibration:

| Frequency | Radar Waveform Length: | Detection Threshold level |
|-----------|------------------------|---------------------------|
| 5290 MHz  | 0.025704s              | -63.85 dBm                |



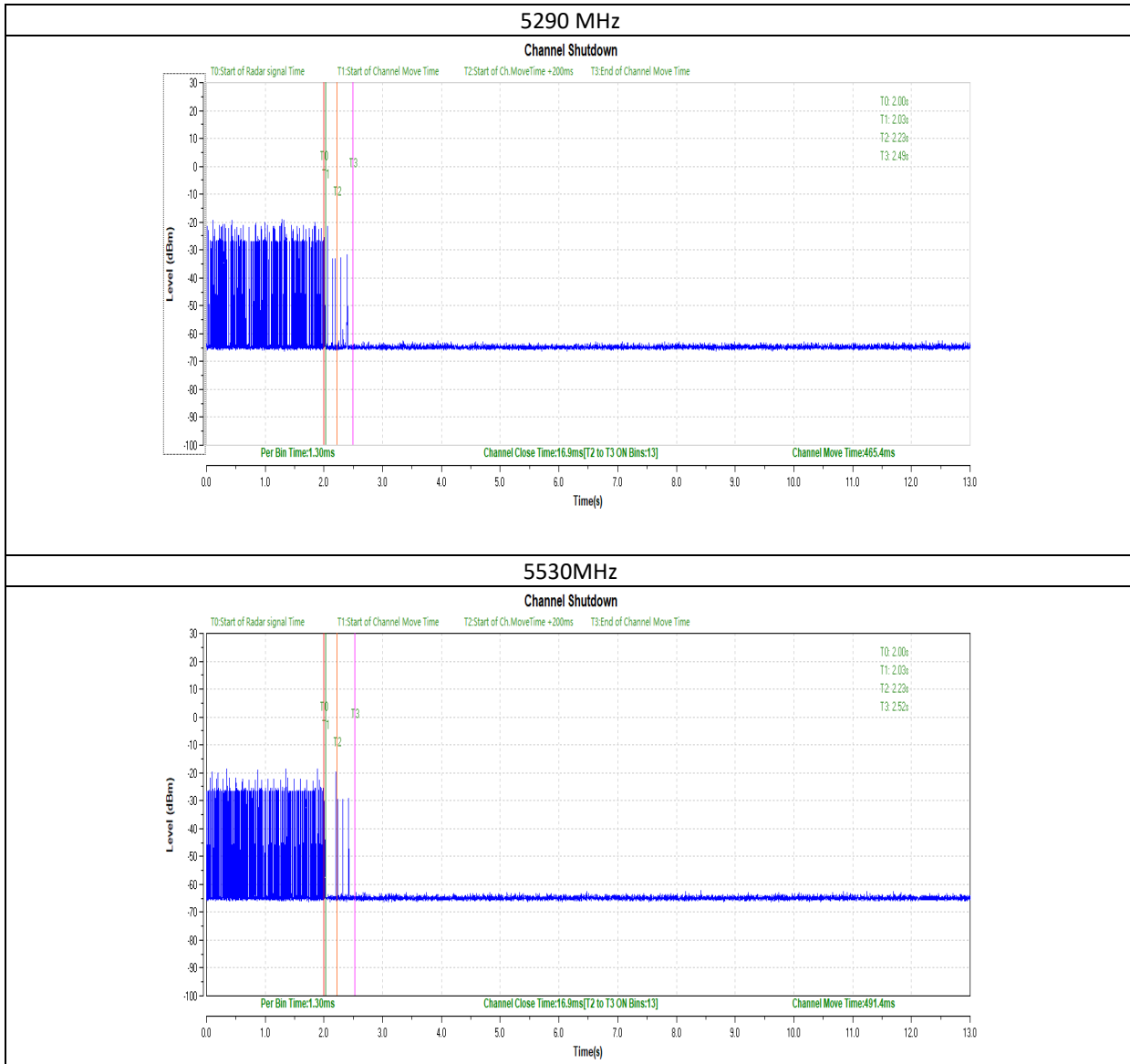
| Frequency | Radar Waveform Length: | Detection Threshold level |
|-----------|------------------------|---------------------------|
| 5530 MHz  | 0.025704s              | -63.51 dBm                |



### 9.3.3 Channel Move time and Channel Closing Transmission Time Test Results

| Frequency | Bandwidth | Channel Move Time [ms] | Limit[ms] | Channel Closing Transmission [ms] | Limit[ms] | Verdict |
|-----------|-----------|------------------------|-----------|-----------------------------------|-----------|---------|
| 5290MHz   | 80 MHz    | 465.4                  | 10000     | 16.9                              | 260       | PASS    |
| 5530 MHz  | 80 MHz    | 491.4                  | 10000     | 16.9                              | 260       | PASS    |

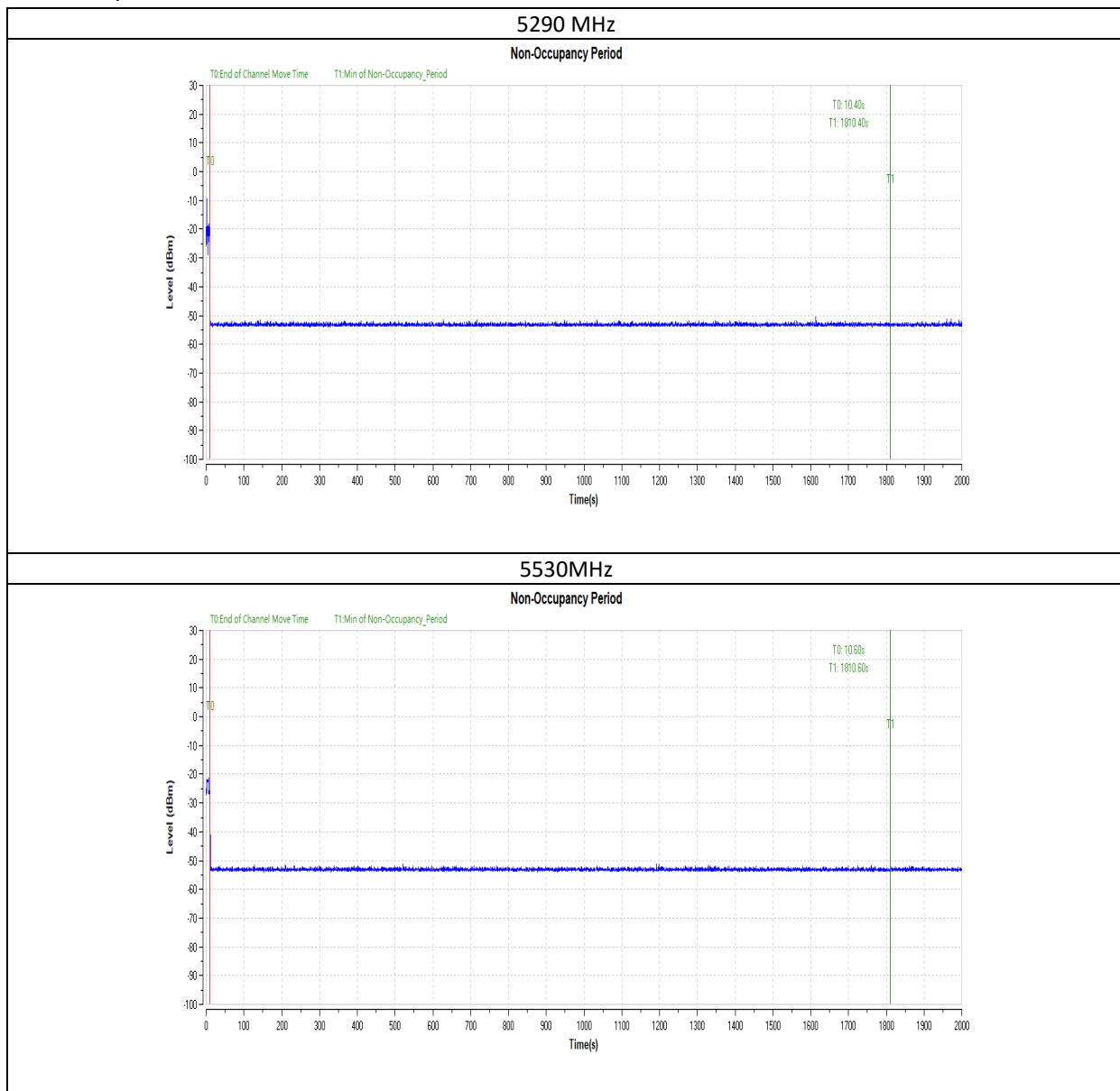
Test Graph:



### 9.3.4 Non-Occupancy Period Test Results

| Frequency | Bandwidth | Measured Value | Limit Requirements | Verdict |
|-----------|-----------|----------------|--------------------|---------|
| 5290MHz   | 80 MHz    | > 30min        | 30min              | Pass    |
| 5530 MHz  | 80 MHz    | > 30min        | 30min              | Pass    |

#### Test Graph:



Appendix A: Test equipment list

| Equipment No. | Equipment  | Manufacturer    | Model No.    | Serial No. | Cal. Date                  | Due Date                   |
|---------------|--|-----------------|--------------|------------|----------------------------|----------------------------|
| SZ182-02      | RF Power Meter   | Anritsu         | ML2496A      | 1302005    | 28-May-2019                | 28-May-2020                |
| SZ182-02-01   | Pulse Power Sensor   | Anritsu         | MA2411B      | 1207429    | 28-May-2019                | 28-May-2020                |
| SZ070-24      | Open Switch and Control Unit with TS8997 option for power measurement test | R&S             | OSP120+B157  | ---        | 30-Oct-2019                | 30-Oct-2020                |
| SZ070-20      | Combiner   | Mini-Circuits   | ZN2PD-63-S+  | ---        | 28-May-2019                | 28-May-2020                |
| SZ070-21      | Combiner   | Mini-Circuits   | ZN2PD-63-S+  | ---        | 28-May-2019                | 28-May-2020                |
| SZ056-05      | Spectrum Analyzer  | Agilent         | E4407B       | US40522113 | 24-Dec-2018<br>24-Dec-2019 | 24-Dec-2019<br>24-Dec-2020 |
| SZ180-13      | MXG Vector Signal Generator  | Keysight        | N5182B       | MY53051328 | 29-Oct-2019                | 29-Oct-2020                |
| SZ061-12      | BiConiLog Antenna  | ETS             | 3142E        | 00166158   | 14-Sep-2018                | 14-Sep-2020                |
| SZ061-06      | Active Loop Antenna  | Electro-Metrics | EM-6876      | 217        | 24-May-2019                | 24-May-2020                |
| SZ061-09      | Horn Antenna   | ETS             | 3115         | 00092346   | 24-Aug-2019                | 24-Aug-2021                |
| SZ061-07      | Pyramidal Horn Antenna   | ETS             | 3160-09      | 00083067   | 13-Aug-2019                | 13-Aug-2021                |
| SZ185-01      | EMI Receiver   | R&S             | ESCI         | 100547     | 24-Dec-2018<br>24-Dec-2019 | 24-Dec-2019<br>24-Dec-2020 |
| SZ056-06      | Signal Analyzer  | R&S             | FSV40        | 101101     | 28-May-2019                | 28-May-2020                |
| SZ181-04      | Preamplifier   | Agilent         | 8449B        | 3008A02474 | 5-Jul-2019                 | 5-Jul-2020                 |
| SZ188-01      | Anechoic Chamber   | ETS             | RFD-F/A-100  | 4102       | 15-Dec-2018                | 15-Dec-2020                |
| SZ062-02      | RF Cable   | RADIALL         | RG 213U      | --         | 10-Jun-2019                | 10-Jun-2020                |
| SZ062-05      | RF Cable   | RADIALL         | 0.04-26.5GHz | --         | 10-Jun-2019                | 10-Jun-2020                |
| SZ062-12      | RF Cable   | RADIALL         | 0.04-26.5GHz | --         | 10-Jun-2019                | 10-Jun-2020                |
| SZ067-25      | Notch Filter   | Micro-Tronics   | BRM50716     | --         | 22-Mar-2019                | 22-Mar-2020                |
| SZ067-04      | Notch Filter   | Micro-Tronics   | BRM50702-02  | --         | 22-Mar-2019                | 22-Mar-2020                |
| SZ185-02      | EMI Test Receiver  | R&S             | ESCI         | 100692     | 29-Oct-2019                | 29-Oct-2020                |
| SZ187-01      | Two-Line V-Network   | R&S             | ENV216       | 100072     | 29-Oct-2019                | 29-Oct-2020                |
| SZ187-02      | Two-Line V-Network   | R&S             | ENV216       | 100073     | 28-May-2019                | 28-May-2020                |
| SZ188-03      | Shielding Room   | ETS             | RFD-100      | 4100       | 16-Jan-2017                | 16-Jan-2020                |
| SZ016-12      | Programmable Temperature & Humidity Chamber                                | Taili           | MHK-120NK    | AB0105     | 17-Jan-2019                | 17-Jan-2020                |
| SZ006-30      | DC Power Supply  | Guwei           | SPS-3610     | GEQ920551  | 15-Jan-2019                | 15-Jan-2020                |

Expanded uncertainty of radiated emission measurement is  $\pm 4.9$  dB.  
Expanded uncertainty of conducted emission measurement is  $\pm 3.6$  dB.

\*\*\*\*\* End of Report\*\*\*\*\*