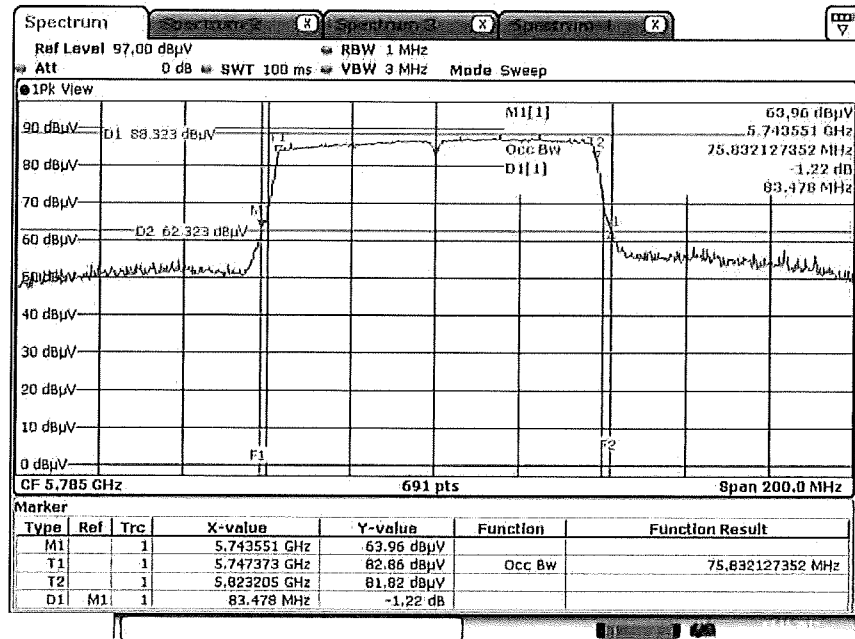
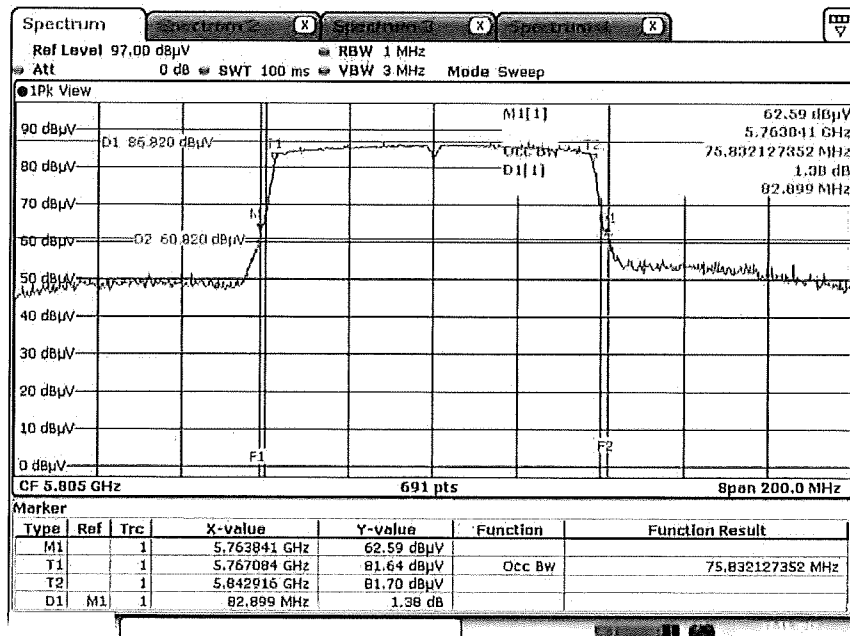


### 26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5785MHz



Date: 22 NOV. 2017 17:10:56

### 26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5805MHz



Date: 22 NOV. 2017 17:10:07

### 4.3. 6dB Spectrum Bandwidth Measurement

#### 4.3.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

#### 4.3.2. Measuring Instruments and Setting

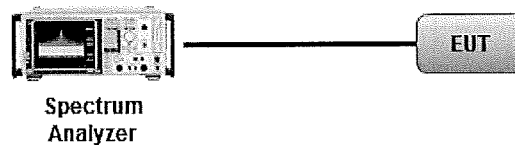
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

| 6dB Spectrum Bandwidth |                            |
|------------------------|----------------------------|
| Spectrum Parameters    | Setting                    |
| Attenuation            | Auto                       |
| Span Frequency         | > 6dB Bandwidth            |
| RBW                    | 100kHz                     |
| VBW                    | $\geq 3 \times \text{RBW}$ |
| Detector               | Peak                       |
| Trace                  | Max Hold                   |
| Sweep Time             | Auto                       |

#### 4.3.3. Test Procedures

| Test Method                                                                           |                                                                             |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <p>▪ For the emission bandwidth shall be measured using one of the options below:</p> |                                                                             |
| <input checked="" type="checkbox"/>                                                   | Refer as FCC KDB 789033, clause C for EBW and clause D for OBW measurement. |
| <input type="checkbox"/>                                                              | Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.          |
| <input checked="" type="checkbox"/>                                                   | Refer as IC RSS-Gen, clause 4.6 for bandwidth testing.                      |

#### 4.3.4. Test Setup Layout



#### 4.3.5. Test Deviation

There is no deviation with the original standard.

#### 4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

#### 4.3.7. Test Result of 6dB Spectrum Bandwidth

|               |                                                 |          |     |
|---------------|-------------------------------------------------|----------|-----|
| Temperature   | 22°C                                            | Humidity | 54% |
| Test Engineer | Ron Huang / Lucke Hsieh / Brian Sun / Serway Li |          |     |

For Antenna 2:

| Mode | Frequency | 6dB Bandwidth (MHz) |        | Min. Limit (kHz) | Test Result |
|------|-----------|---------------------|--------|------------------|-------------|
|      |           | Port 1              | Port 2 |                  |             |
| 20M  | 5745 MHz  | 17.57               | 17.57  | 500              | Complies    |
|      | 5785 MHz  | 17.57               | 17.57  | 500              | Complies    |
|      | 5825 MHz  | 17.57               | 17.57  | 500              | Complies    |
| 80M  | 5765 MHz  | 75.94               | 75.94  | 500              | Complies    |
|      | 5785 MHz  | 75.94               | 74.49  | 500              | Complies    |
|      | 5805 MHz  | 75.94               | 75.36  | 500              | Complies    |

For Antenna 3:

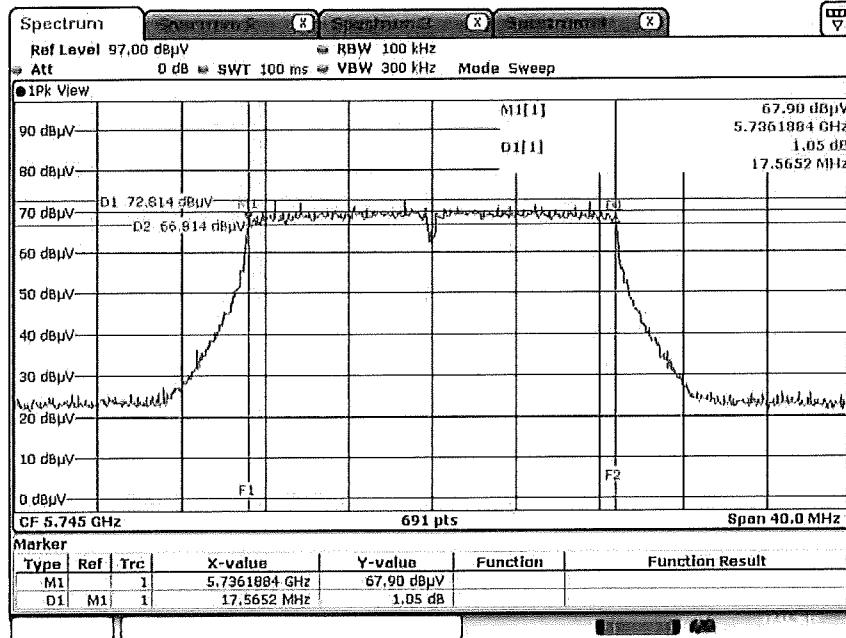
| Mode | Frequency | 6dB Bandwidth (MHz) |        | Min. Limit (kHz) | Test Result |
|------|-----------|---------------------|--------|------------------|-------------|
|      |           | Port 1              | Port 2 |                  |             |
| 20M  | 5745 MHz  | 17.57               | 17.57  | 500              | Complies    |
|      | 5785 MHz  | 17.28               | 17.57  | 500              | Complies    |
|      | 5825 MHz  | 17.57               | 17.57  | 500              | Complies    |
| 80M  | 5765 MHz  | 75.36               | 75.94  | 500              | Complies    |
|      | 5785 MHz  | 76.52               | 73.33  | 500              | Complies    |
|      | 5805 MHz  | 76.52               | 74.20  | 500              | Complies    |

Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

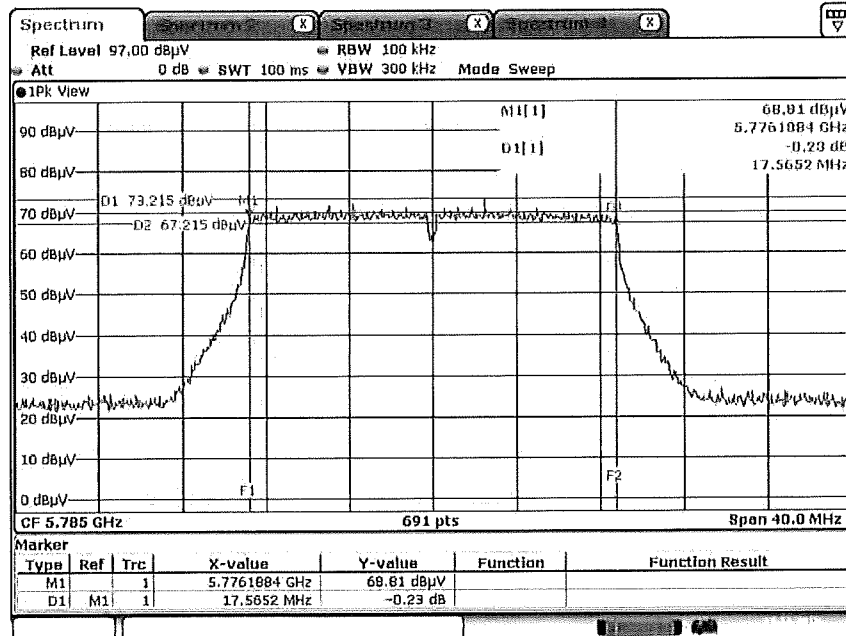
For Antenna 2:

6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 1 / 5745 MHz



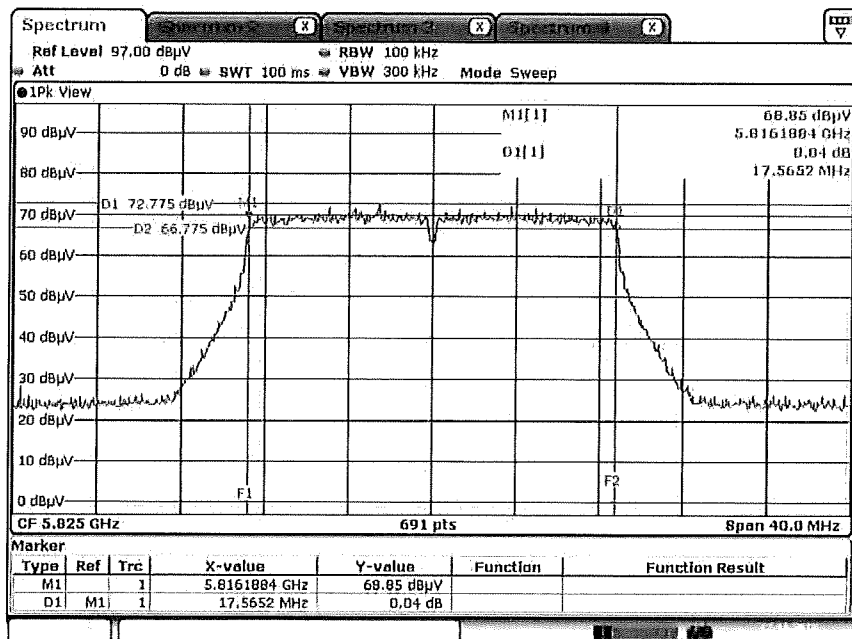
Date: 22 NOV. 2017 17:51:49

6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 1 / 5785 MHz



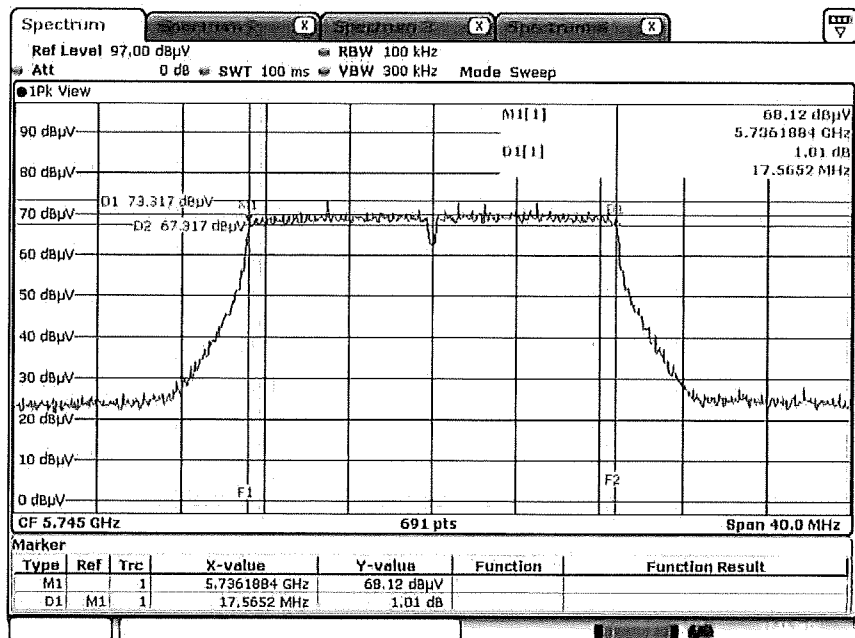
Date: 22 NOV. 2017 17:51:07

### 6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 1 / 5825MHz



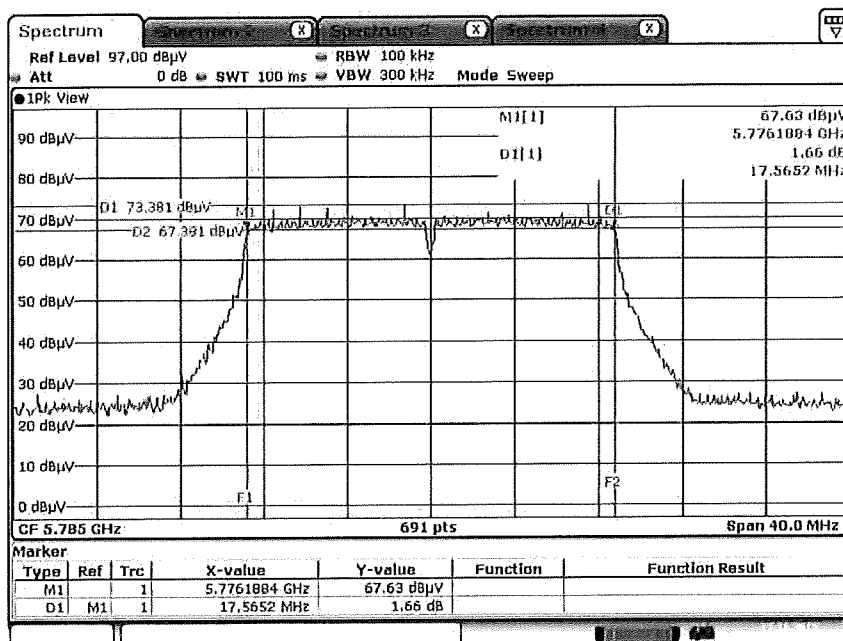
Date: 22.NOV.2017 17:50:23

### 6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5745MHz



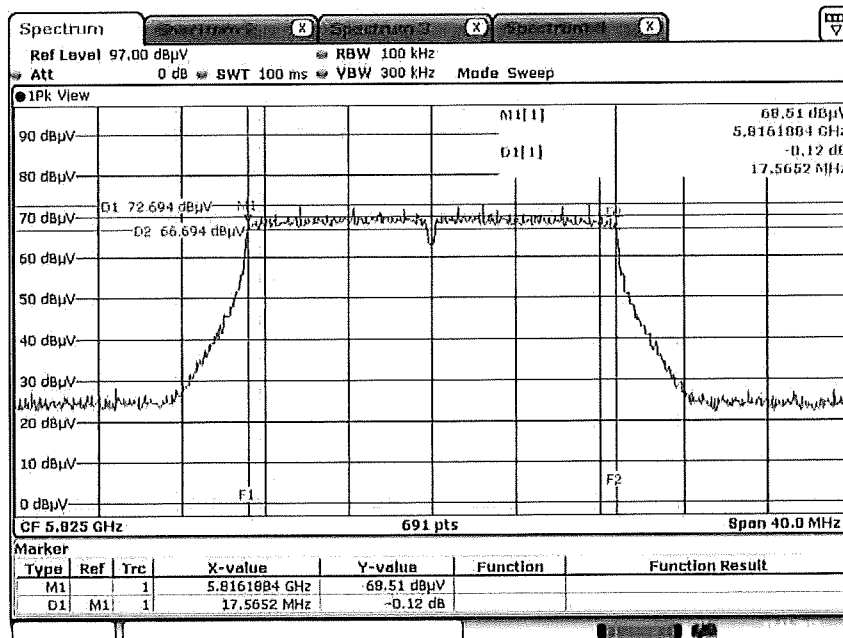
Date: 22.NOV.2017 17:53:11

### 6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5785MHz



Date: 22 NOV.2017 17:53:40

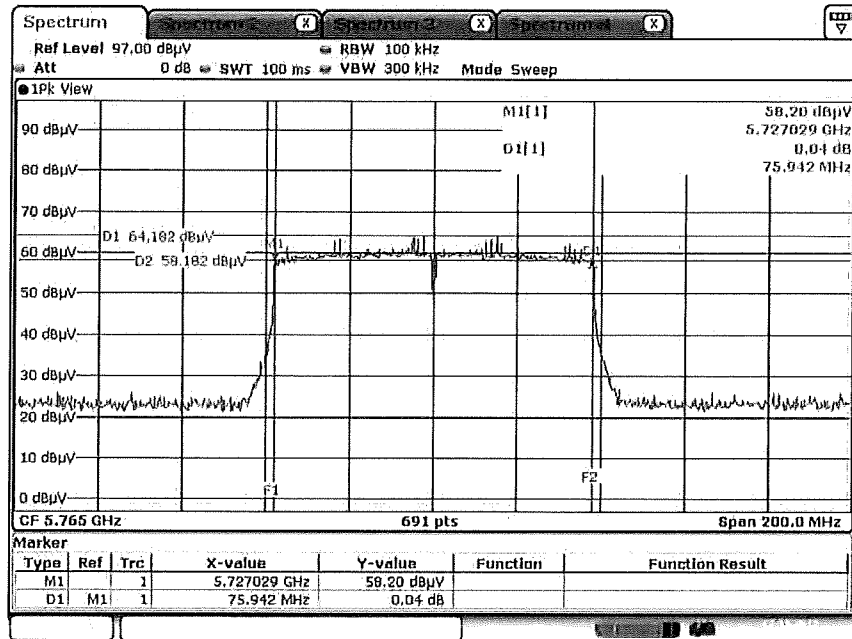
### 6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5825MHz



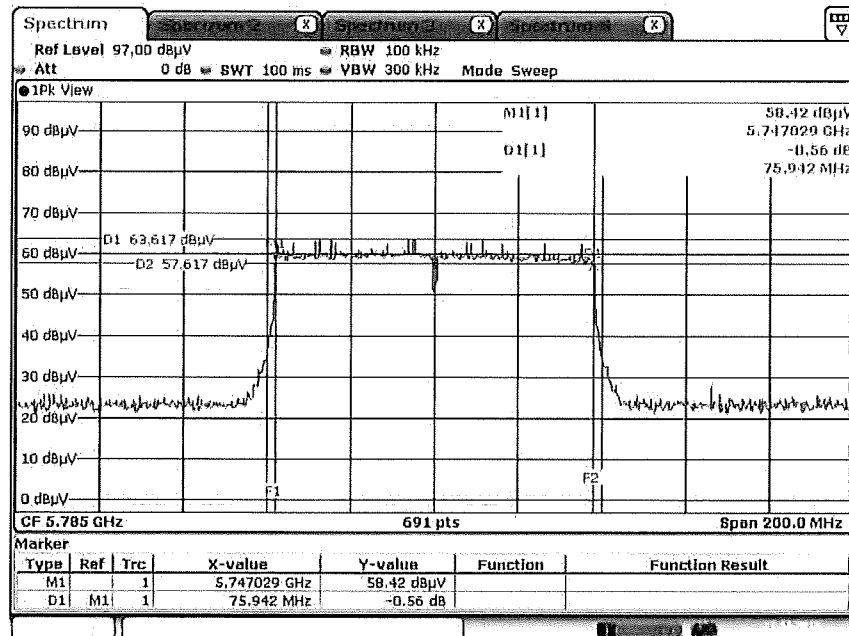
Date: 22 NOV.2017 17:54:12



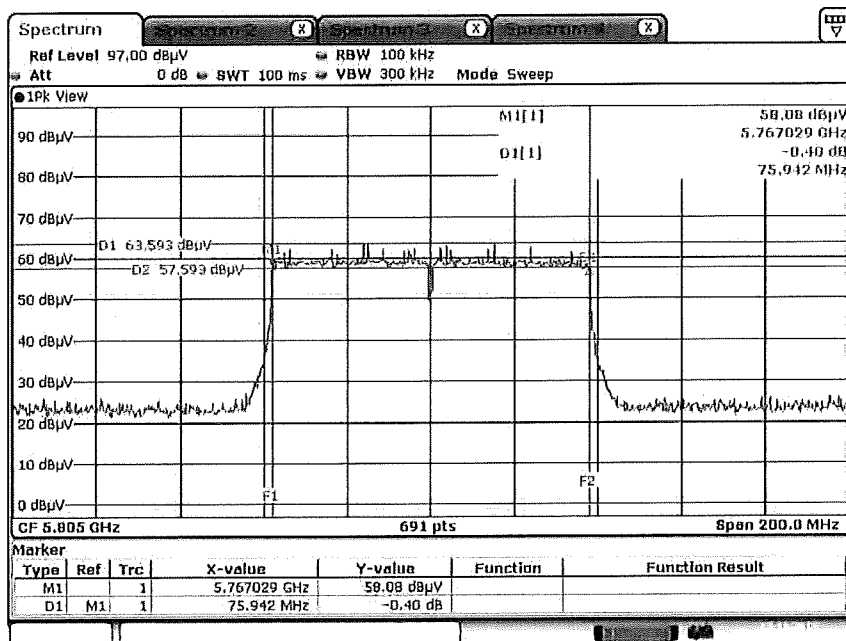
## 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5765 MHz



## 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5785 MHz

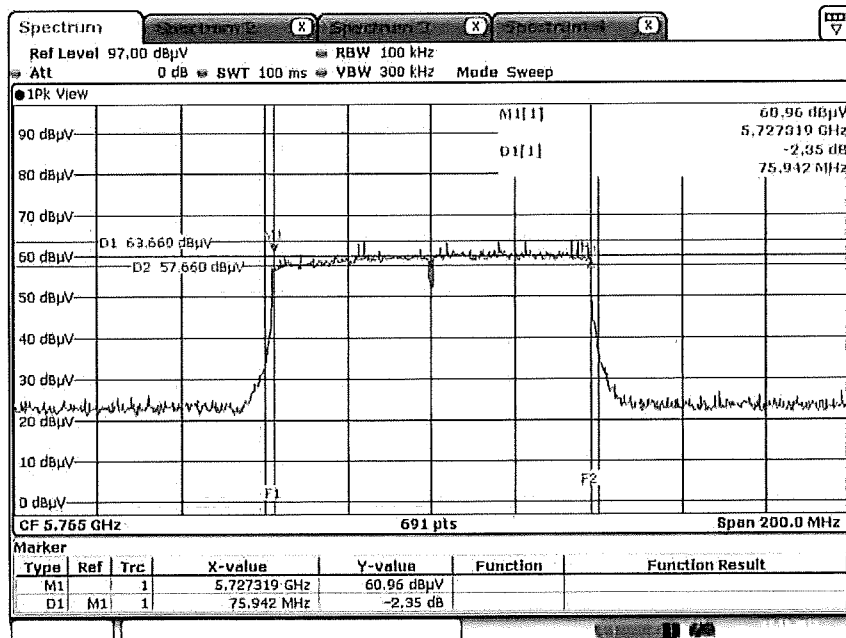


### 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5805 MHz



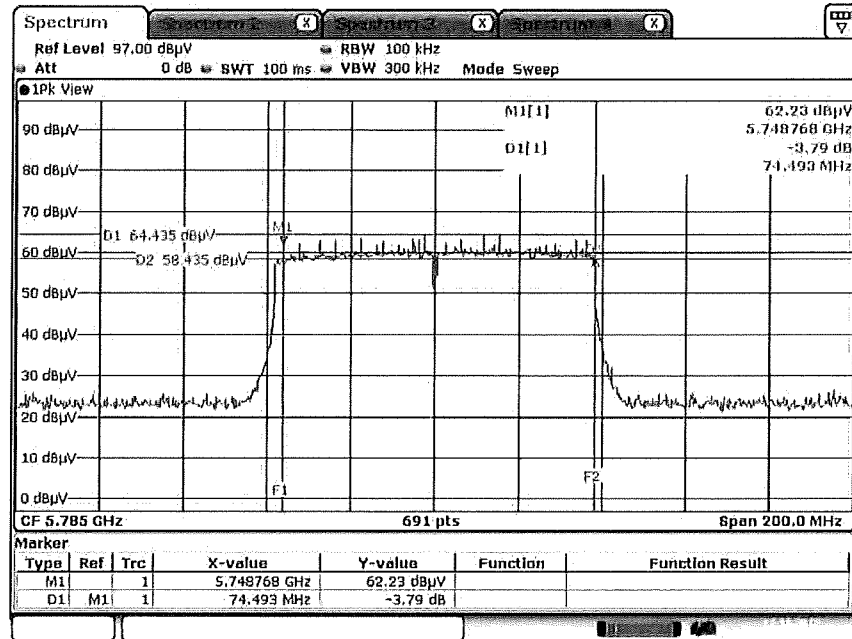
Date: 22.NOV.2017 18:05:53

### 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5765MHz



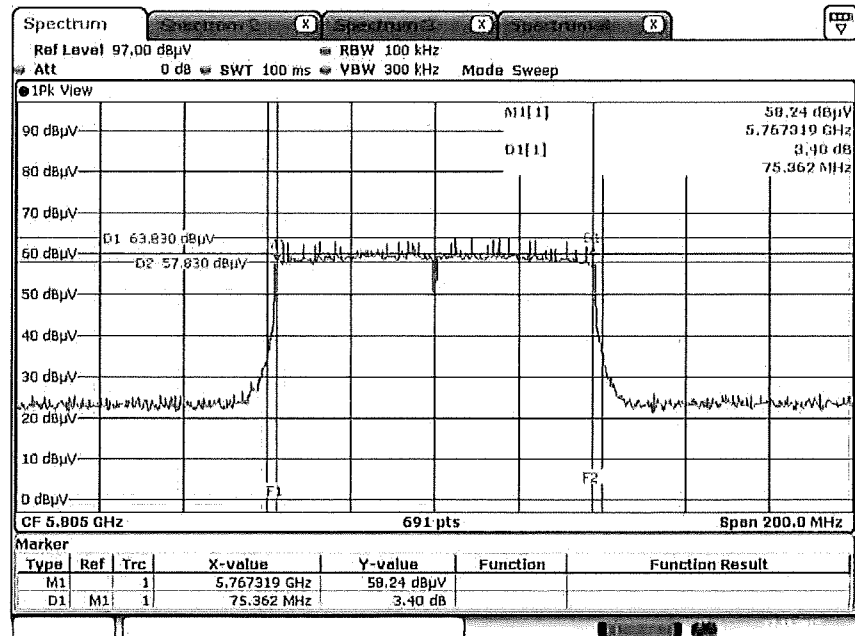
Date: 22.NOV.2017 18:04:22

### 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5785MHz



Date: 22 NOV, 2017 18:04:05

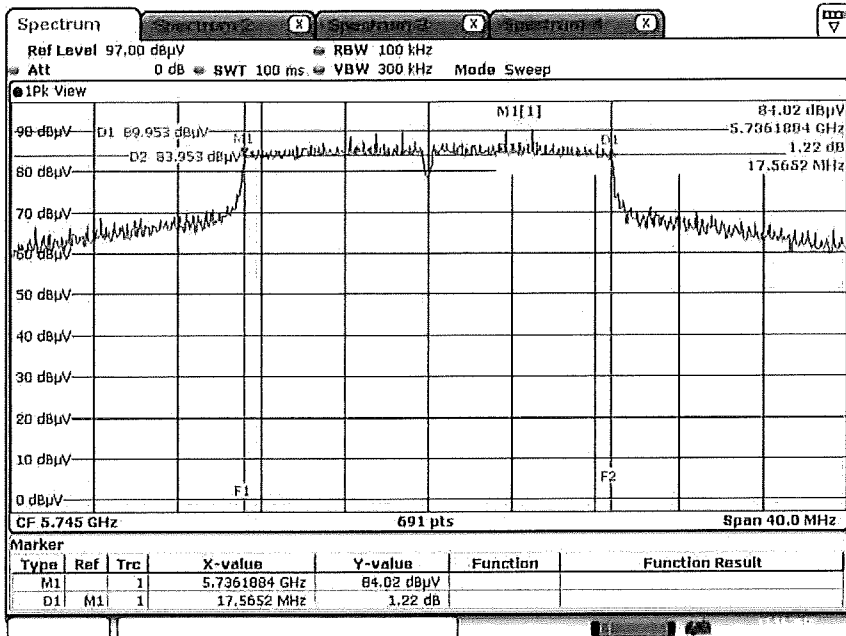
### 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5805MHz



Date: 22 NOV, 2017 18:03:35

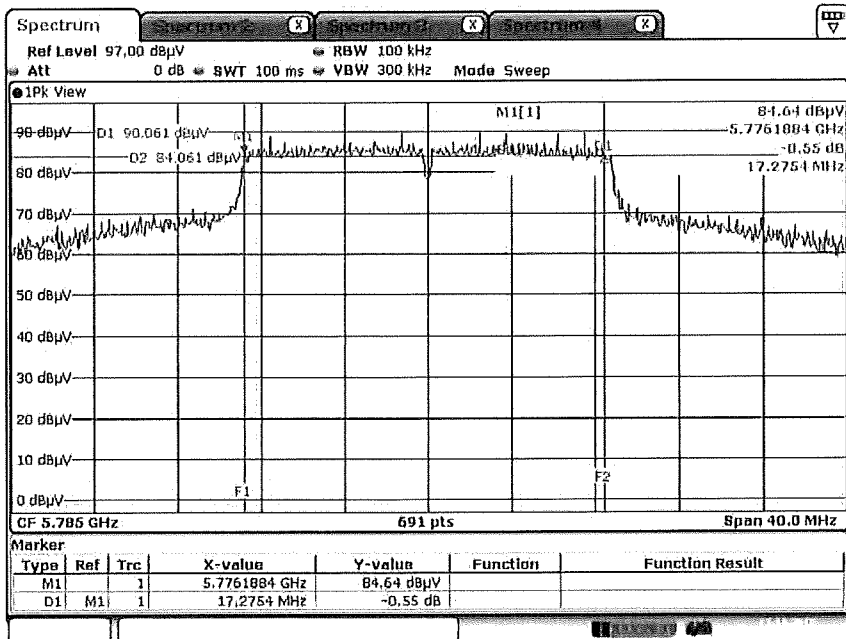
For Antenna 3:

6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 1 / 5745 MHz



Date: 22 NOV. 2017 16:14:38

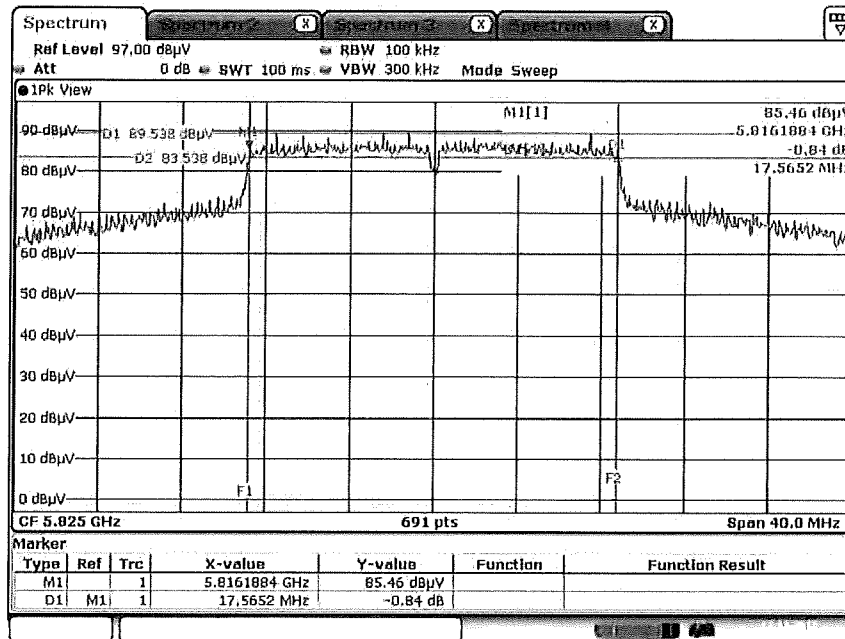
6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 1 / 5785 MHz



Date: 22 NOV. 2017 16:13:58

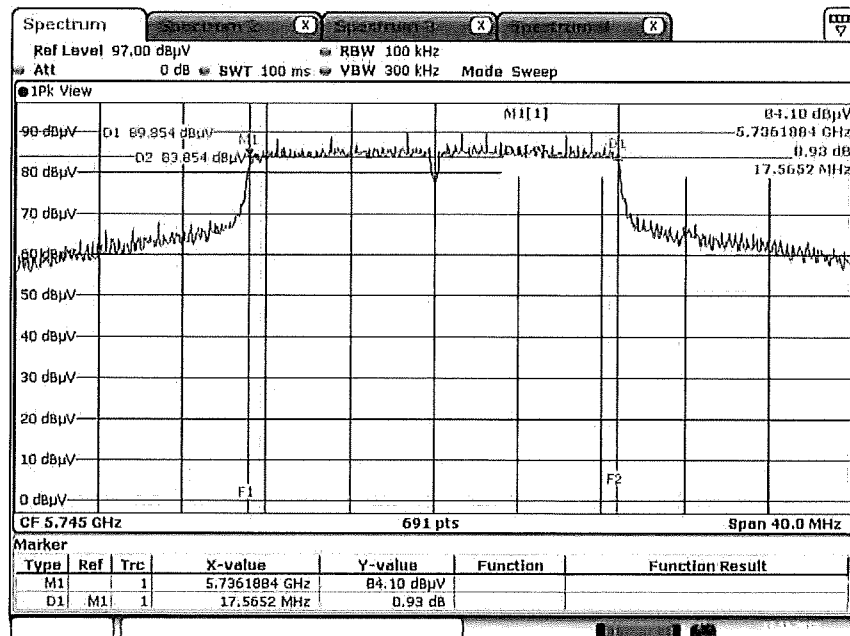


## 6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 1 / 5825MHz



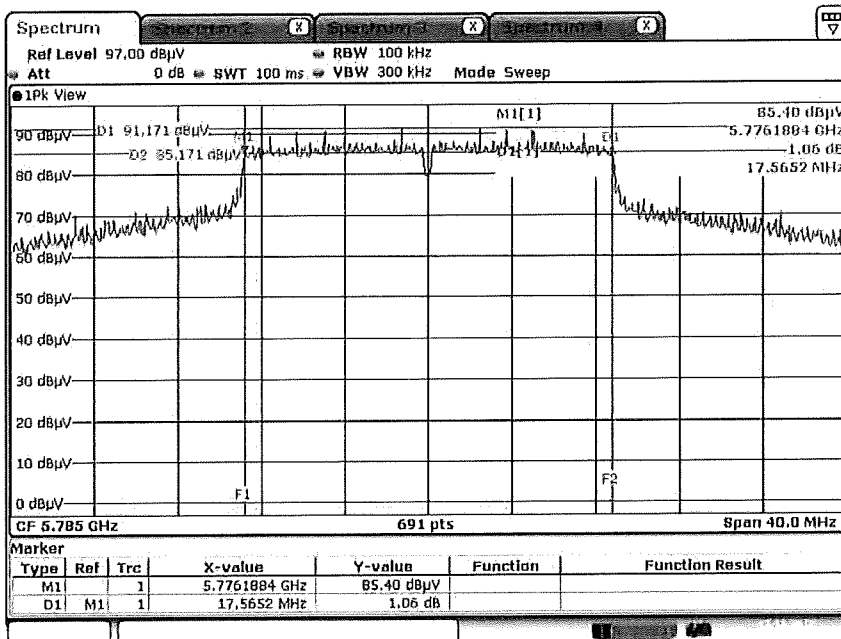
Date: 22 NOV.2017 16:13:39

## 6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5745MHz



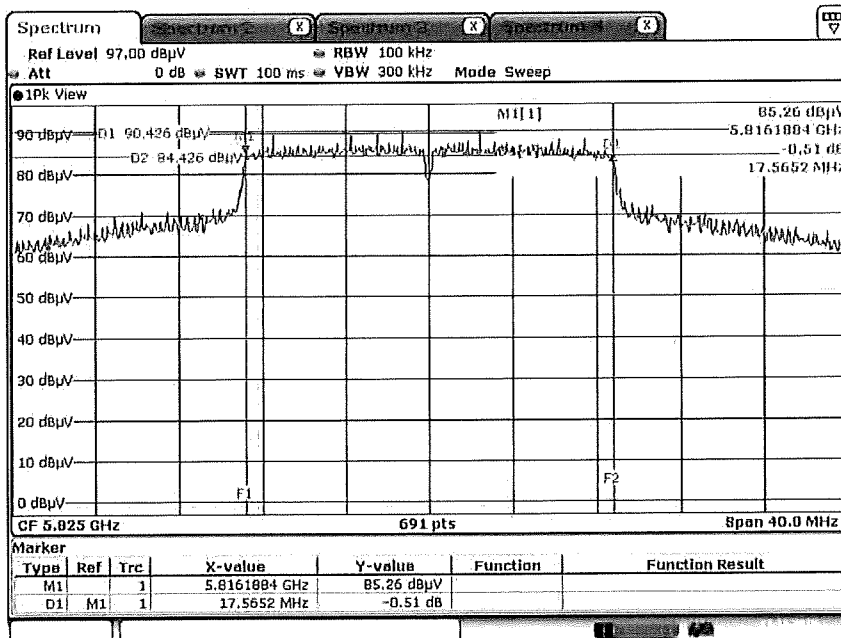
Date: 22 NOV.2017 16:11:32

### 6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5785MHz



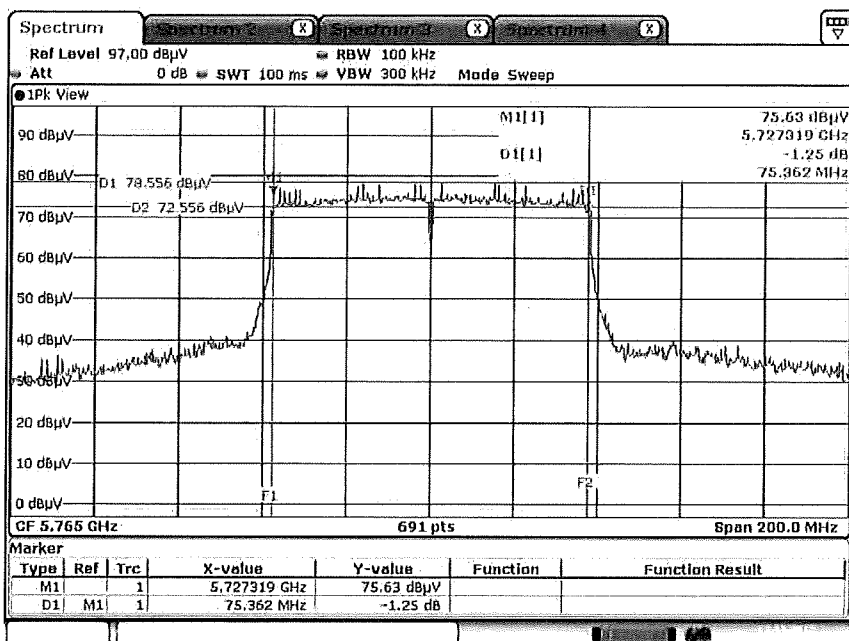
Date: 22 NOV. 2017 16:11:58

### 6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5825MHz

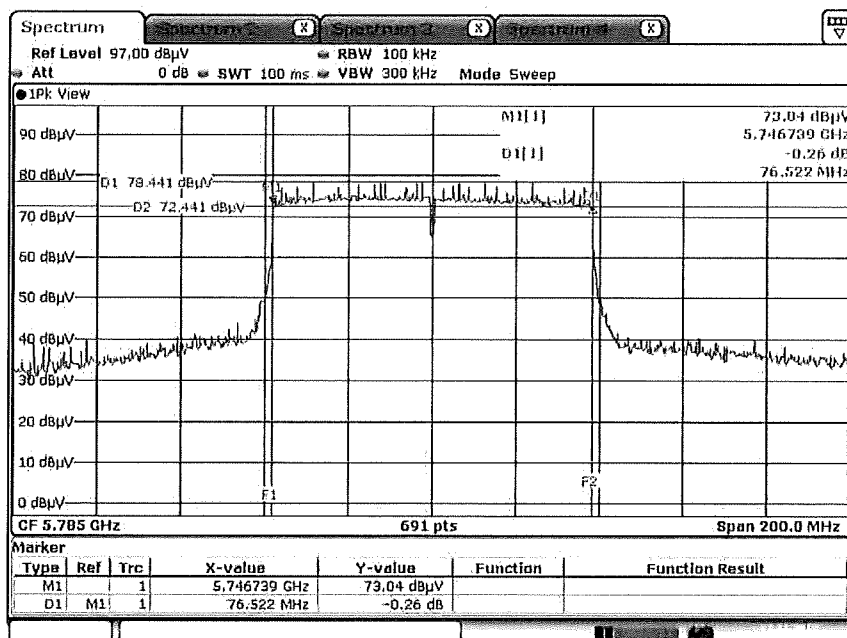


Date: 22 NOV. 2017 16:12:19

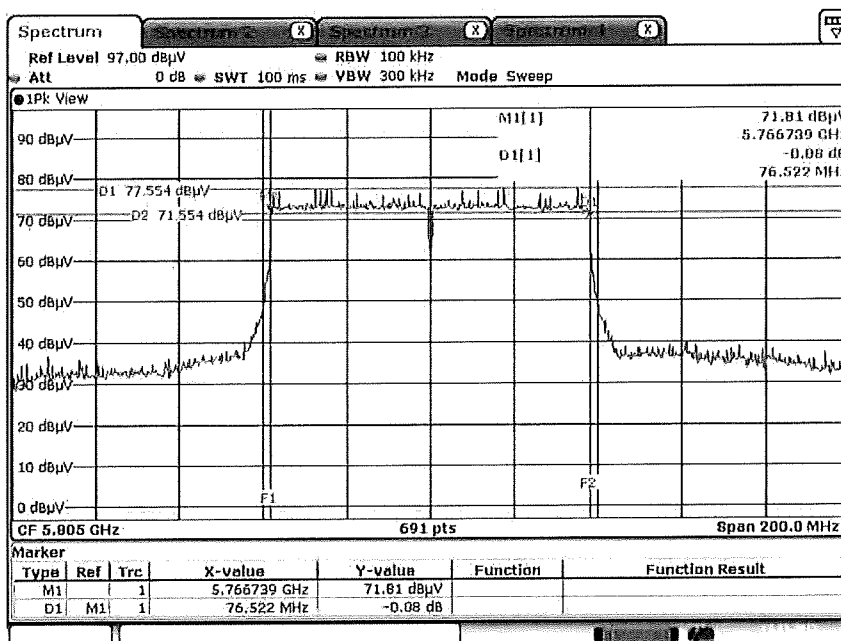
### 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5765 MHz



### 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5785 MHz

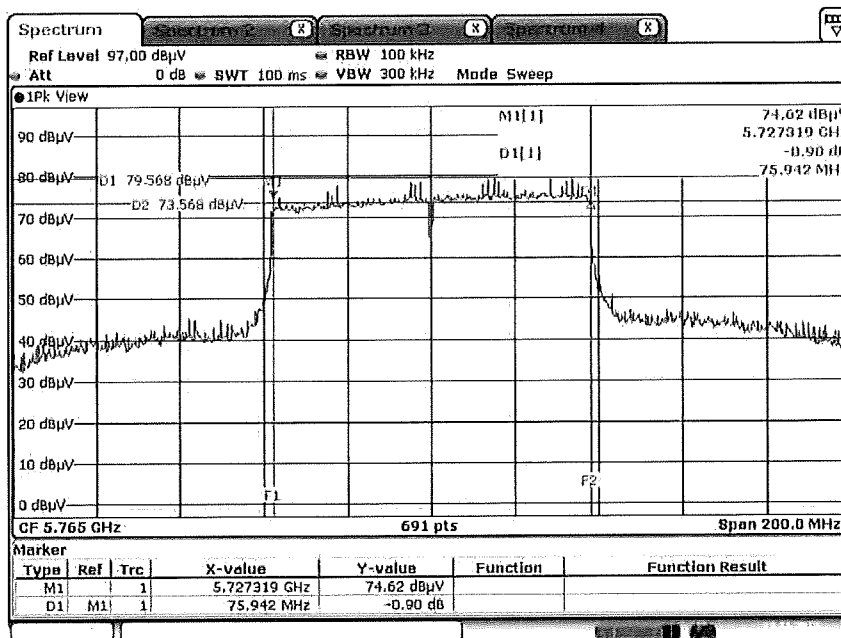


### 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5805 MHz



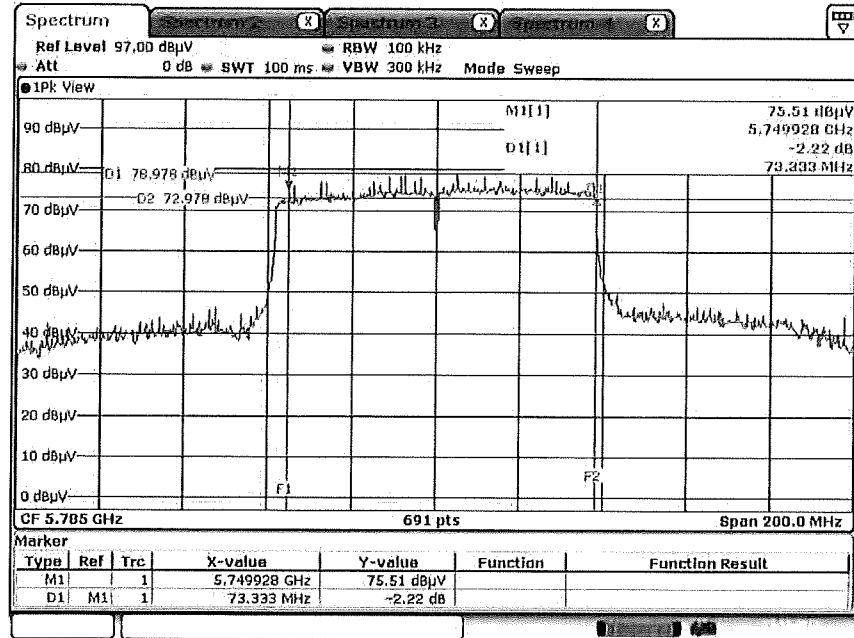
Date: 22 NOV 2017 17:32:02

### 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5765MHz



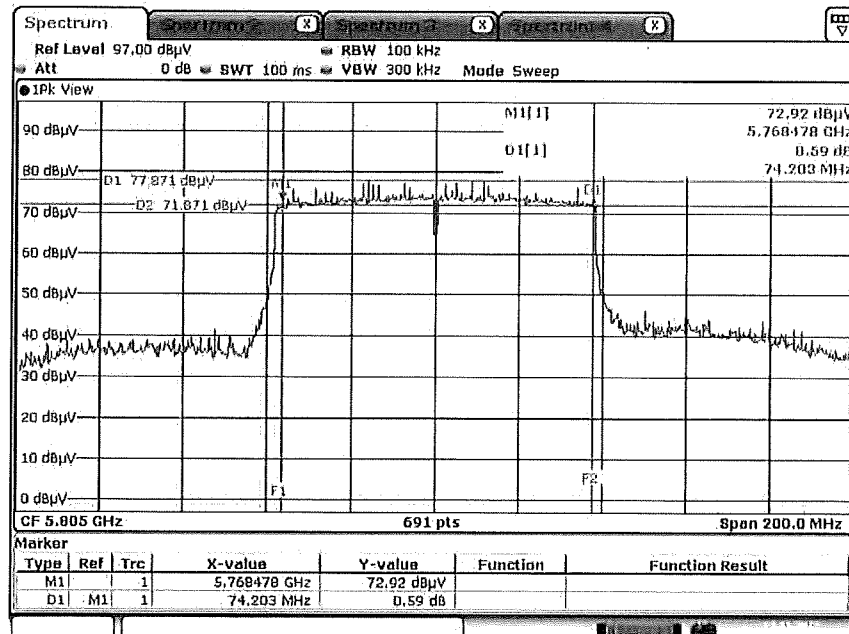
Date: 22 NOV 2017 17:26:52

### 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5785MHz



Date: 22 NOV 2017 17:28:04

### 6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5805MHz



Date: 22 NOV 2017 17:29:23

#### 4.4. Maximum Conducted Output Power Measurement

##### 4.4.1. Limit

| Frequency Band                      |                                                                        | Limit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | 5.15~5.25 GHz                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                     | Operating Mode                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                     | <input type="checkbox"/> Outdoor access point                          | The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).                      |
|                                     | <input type="checkbox"/> Indoor access point                           | The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.                                                                                                                                                 |
|                                     | <input checked="" type="checkbox"/> Fixed point-to-point access points | The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. |
|                                     | <input type="checkbox"/> Client devices                                | The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.                                                                                                                                              |

|                                     |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | 5.725~5.85 GHz | The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. |
|-------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 4.4.2. Measuring Instruments and Setting

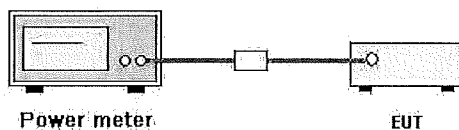
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

| Power Meter Parameter | Setting |
|-----------------------|---------|
| Detector              | AVERAGE |

#### 4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

#### 4.4.4. Test Setup Layout



#### 4.4.5. Test Deviation

There is no deviation with the original standard.

#### 4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

#### 4.4.7. Test Result of Maximum Conducted Output Power

|               |                                                 |           |                             |
|---------------|-------------------------------------------------|-----------|-----------------------------|
| Temperature   | 22°C                                            | Humidity  | 54%                         |
| Test Engineer | Ron Huang / Lucke Hsieh / Brian Sun / Serway Li | Test Date | Nov. 16, 2017~Nov. 30, 2017 |

##### For Antenna 2:

| Mode | Frequency | Conducted Power (dBm) |        |       | Max. Limit (dBm) | Result   |
|------|-----------|-----------------------|--------|-------|------------------|----------|
|      |           | Port 1                | Port 2 | Total |                  |          |
| 20M  | 5180 MHz  | -12.50                | -11.63 | -9.03 | 28.00            | Complies |
|      | 5200 MHz  | -7.79                 | -6.69  | -4.19 | 28.00            | Complies |
|      | 5240 MHz  | -7.52                 | -6.73  | -4.10 | 28.00            | Complies |
|      | 5745 MHz  | -1.09                 | -0.54  | 2.20  | 30.00            | Complies |
|      | 5785 MHz  | -1.11                 | -1.17  | 1.87  | 30.00            | Complies |
|      | 5825 MHz  | -0.54                 | -1.27  | 2.12  | 30.00            | Complies |
| 80M  | 5200 MHz  | -11.92                | -11.37 | -8.63 | 28.00            | Complies |
|      | 5210 MHz  | -11.61                | -11.44 | -8.51 | 28.00            | Complies |
|      | 5765 MHz  | -4.80                 | -4.37  | -1.57 | 30.00            | Complies |
|      | 5785 MHz  | -4.52                 | -4.36  | -1.43 | 30.00            | Complies |
|      | 5705 MHz  | -4.97                 | -4.95  | -1.95 | 30.00            | Complies |

##### For Antenna 3:

| Mode | Frequency | Conducted Power (dBm) |        |       | Max. Limit (dBm) | Result   |
|------|-----------|-----------------------|--------|-------|------------------|----------|
|      |           | Port 1                | Port 2 | Total |                  |          |
| 20M  | 5180 MHz  | 19.48                 | 20.23  | 22.88 | 30.00            | Complies |
|      | 5200 MHz  | 25.77                 | 26.55  | 29.19 | 30.00            | Complies |
|      | 5240 MHz  | 26.45                 | 27.13  | 29.81 | 30.00            | Complies |
|      | 5745 MHz  | 26.79                 | 26.93  | 29.87 | 30.00            | Complies |
|      | 5785 MHz  | 26.73                 | 27.22  | 29.99 | 30.00            | Complies |
|      | 5825 MHz  | 26.82                 | 27.12  | 29.98 | 30.00            | Complies |
| 80M  | 5200 MHz  | 13.73                 | 14.49  | 17.14 | 30.00            | Complies |
|      | 5210 MHz  | 14.30                 | 15.01  | 17.68 | 30.00            | Complies |
|      | 5765 MHz  | 21.25                 | 21.41  | 24.34 | 30.00            | Complies |
|      | 5785 MHz  | 21.42                 | 21.38  | 24.41 | 30.00            | Complies |
|      | 5705 MHz  | 20.53                 | 20.32  | 23.44 | 30.00            | Complies |

## 4.5. Power Spectral Density Measurement

### 4.5.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.4.1.

| Frequency Band                      |                                    | Limit         |
|-------------------------------------|------------------------------------|---------------|
| <input checked="" type="checkbox"/> | 5.15~5.25 GHz                      |               |
|                                     | Operating Mode                     |               |
| <input type="checkbox"/>            | Outdoor access point               | 17 dBm/MHz    |
| <input type="checkbox"/>            | Indoor access point                | 17 dBm/MHz    |
| <input checked="" type="checkbox"/> | Fixed point-to-point access points | 17 dBm/MHz    |
| <input type="checkbox"/>            | Client devices                     | 11 dBm/MHz    |
| <input checked="" type="checkbox"/> | 5.725~5.85 GHz                     | 30 dBm/500kHz |

### 4.5.2. Measuring Instruments and Setting

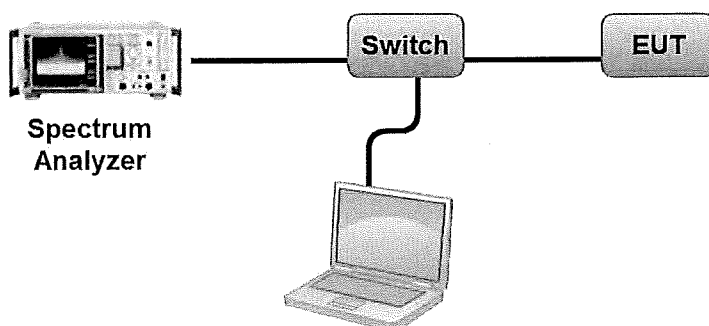
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

| Spectrum Parameter                                                                                                                                                                                                                                 | Setting                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Attenuation                                                                                                                                                                                                                                        | Auto                                                         |
| Span Frequency                                                                                                                                                                                                                                     | Encompass the entire emissions bandwidth (EBW) of the signal |
| RBW                                                                                                                                                                                                                                                | 1000 kHz                                                     |
| VBW                                                                                                                                                                                                                                                | 3000 kHz                                                     |
| Detector                                                                                                                                                                                                                                           | RMS                                                          |
| Trace                                                                                                                                                                                                                                              | AVERAGE                                                      |
| Sweep Time                                                                                                                                                                                                                                         | Auto                                                         |
| Trace Average                                                                                                                                                                                                                                      | 100 times                                                    |
| Note: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/\text{RBW})$ to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement. |                                                              |

#### 4.5.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 In-Band Power Spectral Density (PSD) Measurements and sum the spectra across the outputs.
4. For 5.725~5.85 GHz, the measured result of PSD level must add  $10\log(500\text{kHz/RBW})$  and the final result should  $\leq 30$  dBm.

#### 4.5.4. Test Setup Layout



#### 4.5.5. Test Deviation

There is no deviation with the original standard.

#### 4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

#### 4.5.7. Test Result of Power Spectral Density

|               |                                                 |          |     |
|---------------|-------------------------------------------------|----------|-----|
| Temperature   | 22°C                                            | Humidity | 54% |
| Test Engineer | Ron Huang / Lucke Hsieh / Brian Sun / Serway Li |          |     |

For Antenna 2:

Configuration QPSK, 20M / Port 1 + Port 2

| Channel | Frequency | Power Density (dBm/MHz) | Max. Limit (dBm/MHz) | Result   |
|---------|-----------|-------------------------|----------------------|----------|
| 1       | 5180 MHz  | -21.85                  | 15.00                | Complies |
| 5       | 5200 MHz  | -16.74                  | 15.00                | Complies |
| 13      | 5240 MHz  | -16.43                  | 15.00                | Complies |

| Channel | Frequency | Power Density (dBm/MHz) | 10log(500kHz/RBW) Factor (dB) | Power Density (dBm/500kHz) | Power Density Limit (dBm/500kHz) | Result   |
|---------|-----------|-------------------------|-------------------------------|----------------------------|----------------------------------|----------|
| 1       | 5745 MHz  | -13.82                  | -3.01                         | -16.83                     | 30.00                            | Complies |
| 9       | 5785 MHz  | -14.06                  | -3.01                         | -17.07                     | 30.00                            | Complies |
| 17      | 5825 MHz  | -13.79                  | -3.01                         | -16.80                     | 30.00                            | Complies |

Configuration QPSK, 80M / Port 1 + Port 2

| Channel | Frequency | Power Density (dBm/MHz) | Max. Limit (dBm/MHz) | Result   |
|---------|-----------|-------------------------|----------------------|----------|
| 1       | 5200 MHz  | -27.19                  | 15.00                | Complies |
| 3       | 5210 MHz  | -27.74                  | 15.00                | Complies |

| Channel | Frequency | Power Density (dBm/MHz) | 10log(500kHz/RBW) Factor (dB) | Power Density (dBm/500kHz) | Power Density Limit (dBm/500kHz) | Result   |
|---------|-----------|-------------------------|-------------------------------|----------------------------|----------------------------------|----------|
| 1       | 5765 MHz  | -24.20                  | -3.01                         | -27.21                     | 30.00                            | Complies |
| 5       | 5785 MHz  | -24.37                  | -3.01                         | -27.38                     | 30.00                            | Complies |
| 9       | 5805 MHz  | -24.96                  | -3.01                         | -27.97                     | 30.00                            | Complies |

For Antenna 3:

Configuration QPSK, 20M / Port 1 + Port 2

| Channel | Frequency | Power Density (dBm/MHz) | Max. Limit (dBm/MHz) | Result   |
|---------|-----------|-------------------------|----------------------|----------|
| 1       | 5180 MHz  | 8.83                    | 17.00                | Complies |
| 5       | 5200 MHz  | 15.01                   | 17.00                | Complies |
| 13      | 5240 MHz  | 16.48                   | 17.00                | Complies |

| Channel | Frequency | Power Density (dBm/MHz) | 10log(500kHz/RBW) Factor (dB) | Power Density (dBm/500kHz) | Power Density Limit (dBm/500kHz) | Result   |
|---------|-----------|-------------------------|-------------------------------|----------------------------|----------------------------------|----------|
| 1       | 5745 MHz  | 14.90                   | -3.01                         | 11.89                      | 30.00                            | Complies |
| 9       | 5785 MHz  | 14.55                   | -3.01                         | 11.54                      | 30.00                            | Complies |
| 17      | 5825 MHz  | 14.79                   | -3.01                         | 11.78                      | 30.00                            | Complies |

Configuration QPSK, 80M / Port 1 + Port 2

| Channel | Frequency | Power Density (dBm/MHz) | Max. Limit (dBm/MHz) | Result   |
|---------|-----------|-------------------------|----------------------|----------|
| 1       | 5200 MHz  | -2.82                   | 17.00                | Complies |
| 3       | 5210 MHz  | -2.75                   | 17.00                | Complies |

| Channel | Frequency | Power Density (dBm/MHz) | 10log(500kHz/RBW) Factor (dB) | Power Density (dBm/500kHz) | Power Density Limit (dBm/500kHz) | Result   |
|---------|-----------|-------------------------|-------------------------------|----------------------------|----------------------------------|----------|
| 1       | 5765 MHz  | 2.94                    | -3.01                         | -0.07                      | 30.00                            | Complies |
| 5       | 5785 MHz  | 2.60                    | -3.01                         | -0.41                      | 30.00                            | Complies |
| 9       | 5805 MHz  | 2.07                    | -3.01                         | -0.94                      | 30.00                            | Complies |

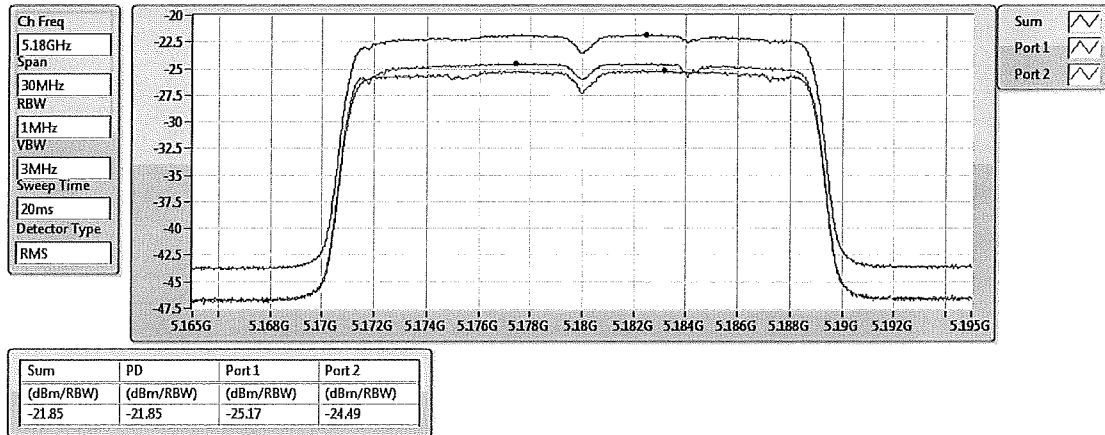
For Antenna 2:

Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5180 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5180MHz

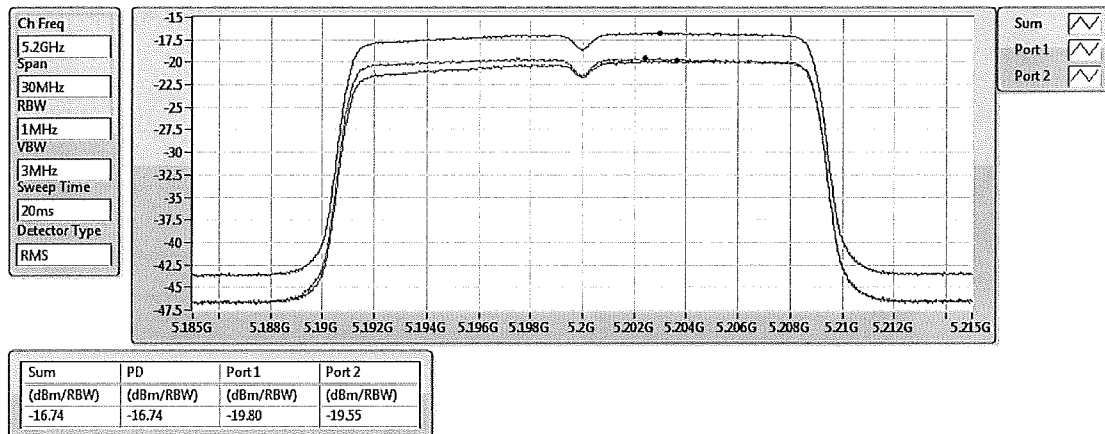


Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5200 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5200MHz

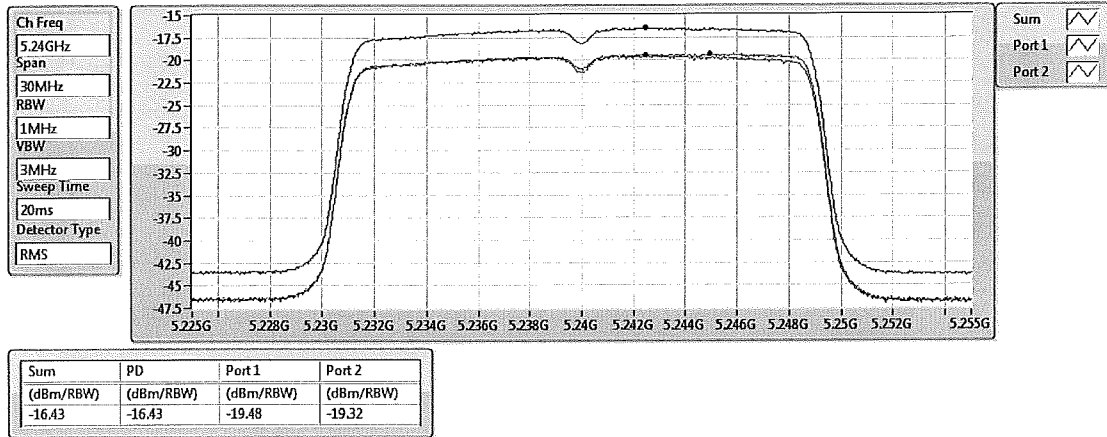


Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5240 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5240MHz

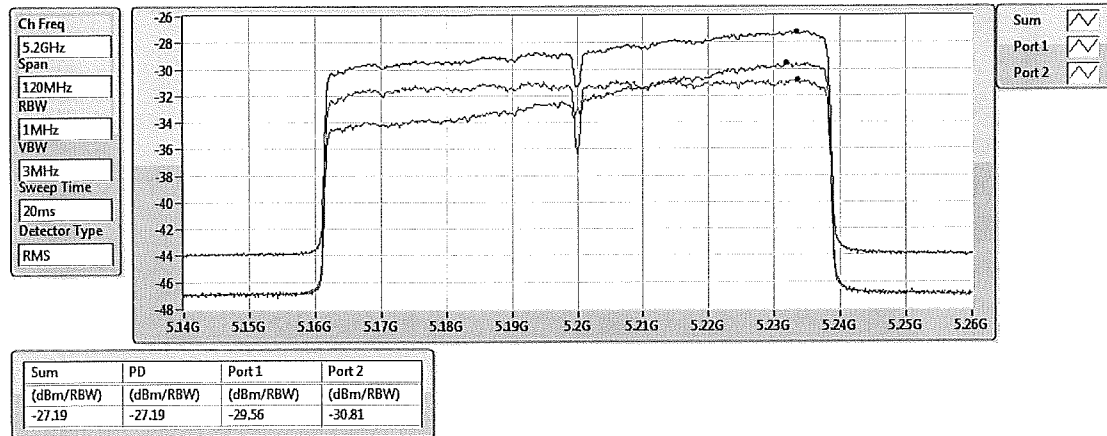


Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5200 MHz

802.11ac VHT80\_Nss1,(MCS0)\_2TX

PSD

5200MHz

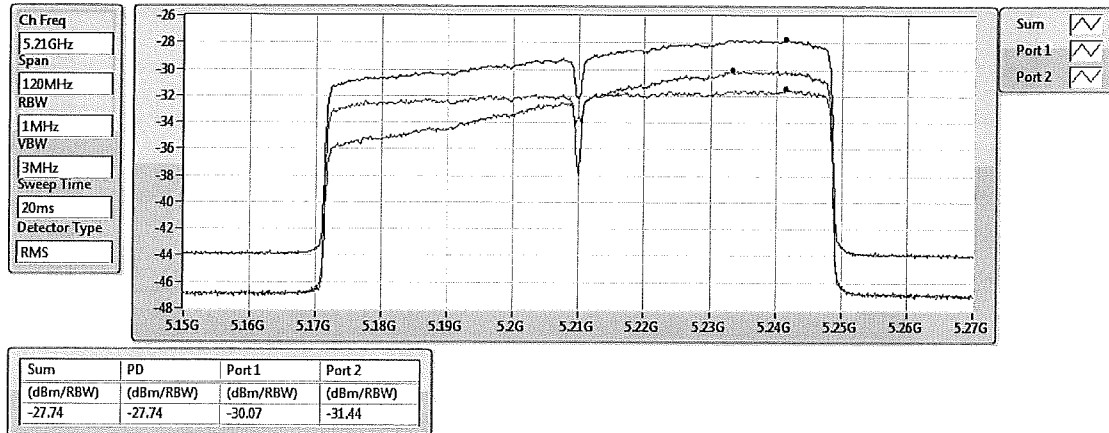


# Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5210 MHz

802.11ac VHT80\_Nss1,(MCS0)\_2TX

PSD

5210MHz

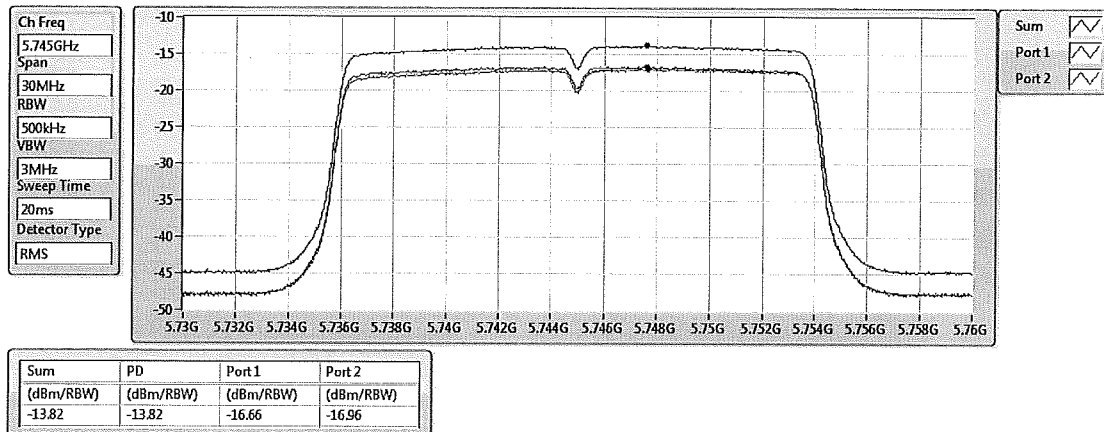


# Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5745 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5745MHz

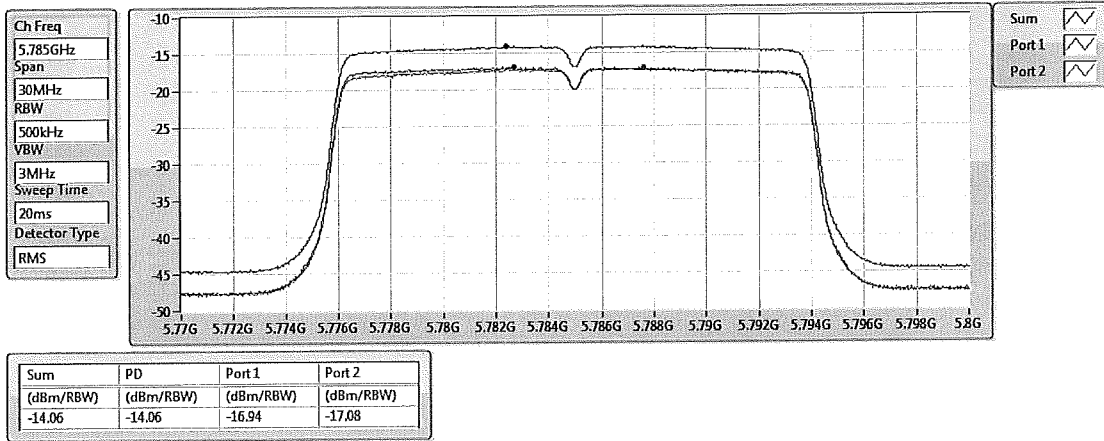


Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5785 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5785MHz

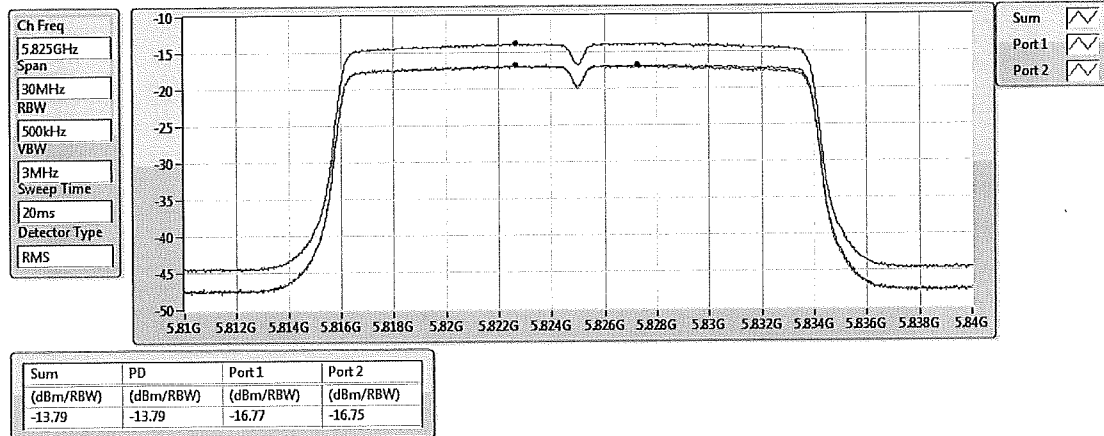


Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5825 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5825MHz

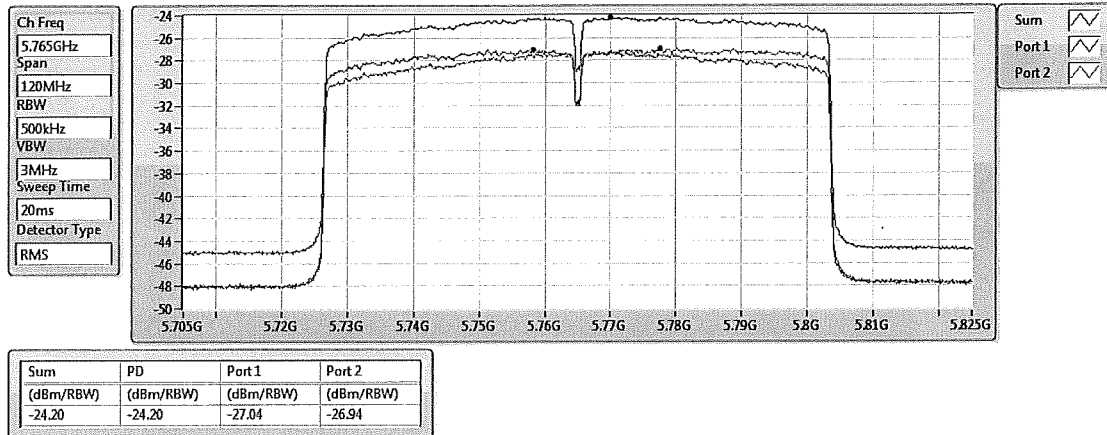


## Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5765 MHz

802.11ac VHT80\_Nss1,(MCS0)\_2TX

PSD

5765MHz

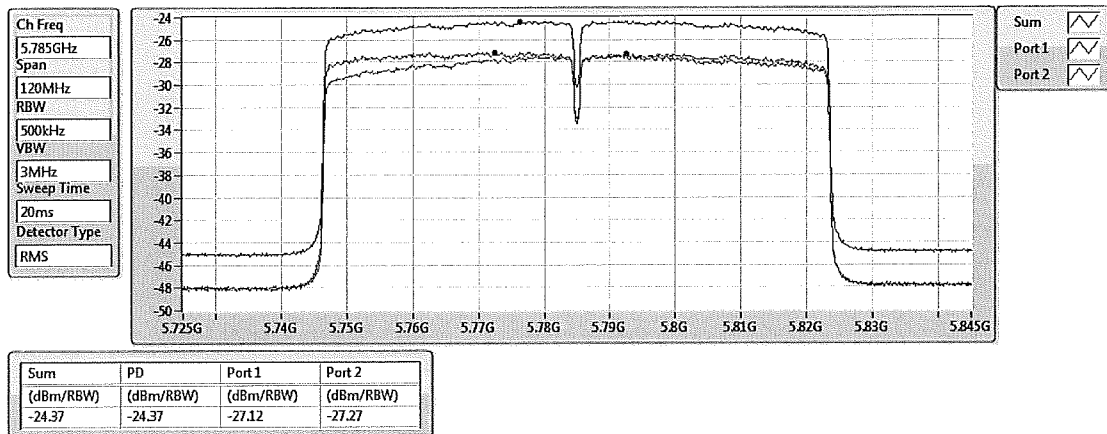


## Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5785 MHz

802.11ac VHT80\_Nss1,(MCS0)\_2TX

PSD

5785MHz

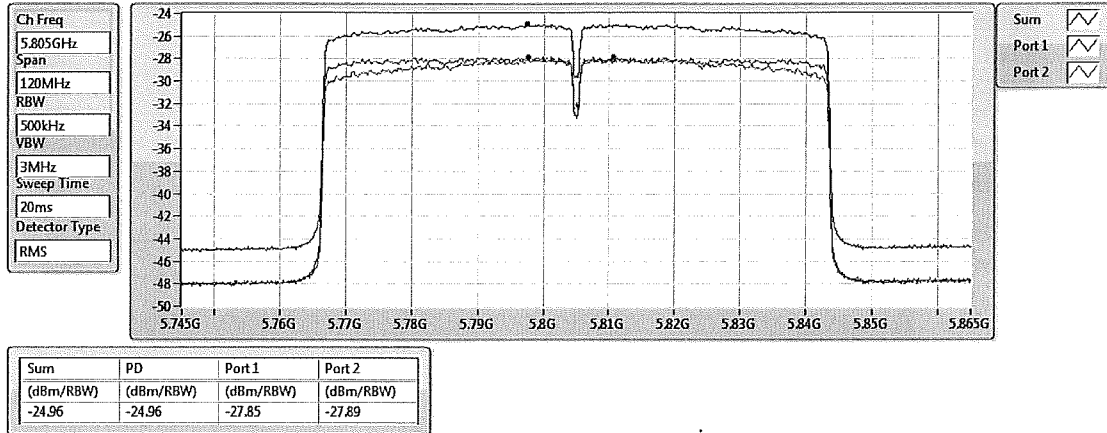


Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5805 MHz

802.11ac VHT80\_Nss1,(MCS0)\_2TX

PSD

5805MHz



For Antenna 3:

Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5180 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5180MHz

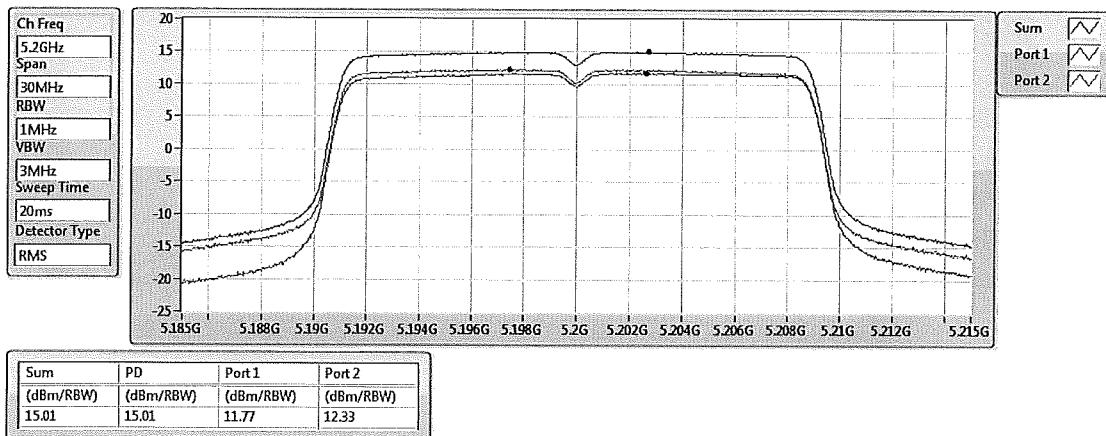


Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5200 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5200MHz

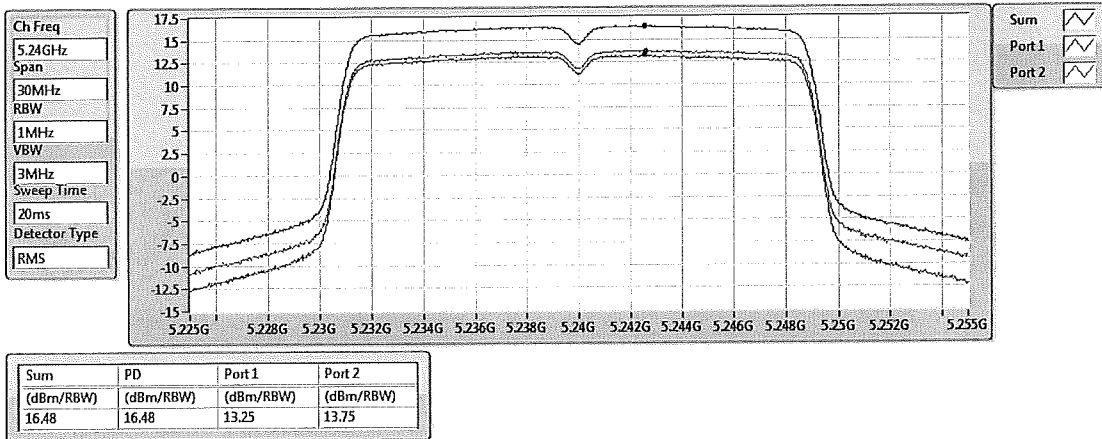


# Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5240 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5240MHz

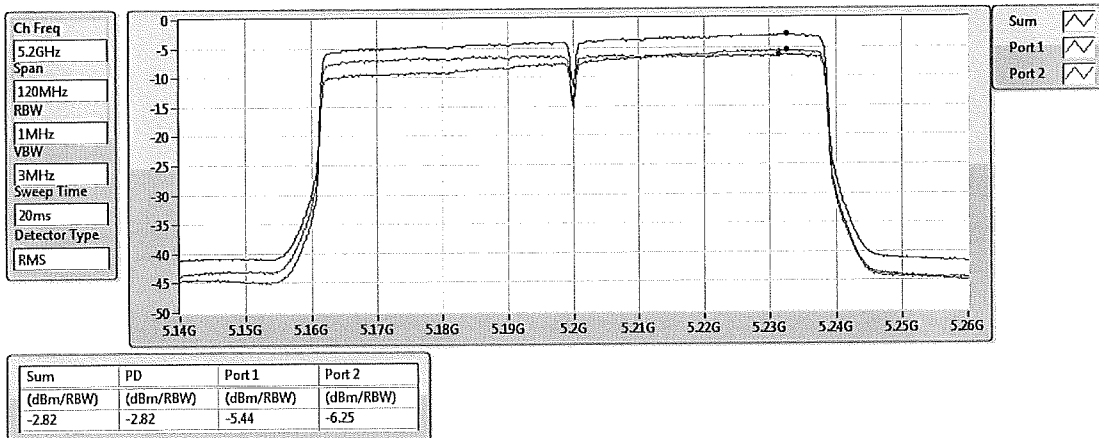


# Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5200 MHz

802.11ac VHT80\_Nss1,(MCS0)\_2TX

PSD

5200MHz

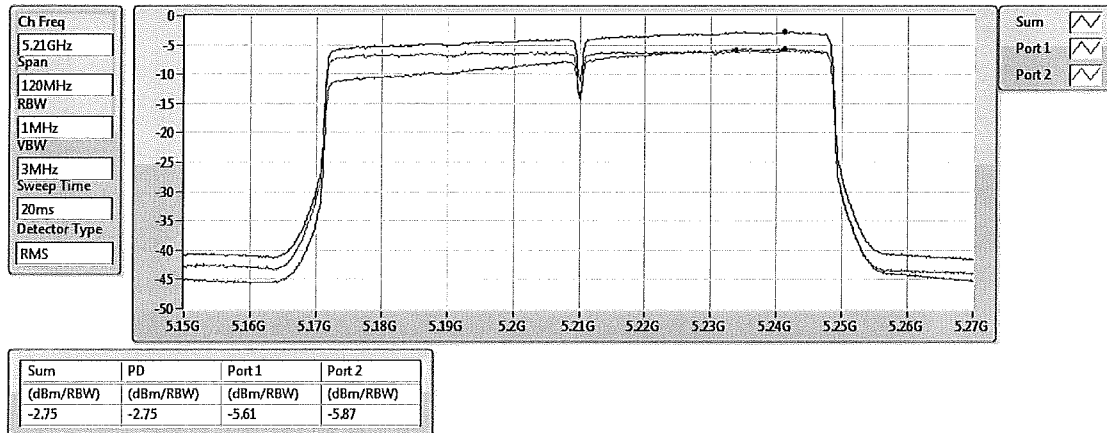


# Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5210 MHz

802.11ac VHT80\_Nss1,(MCS0)\_2TX

PSD

5210MHz

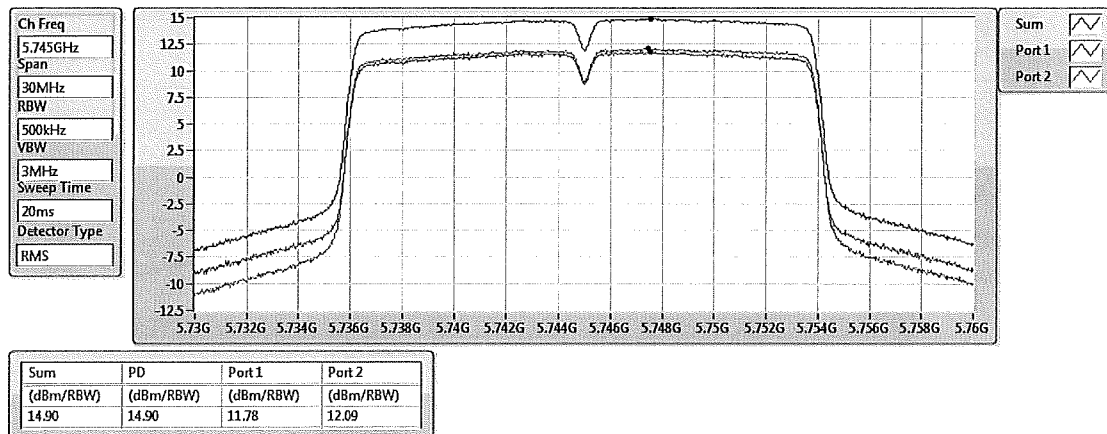


# Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5745 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5745MHz

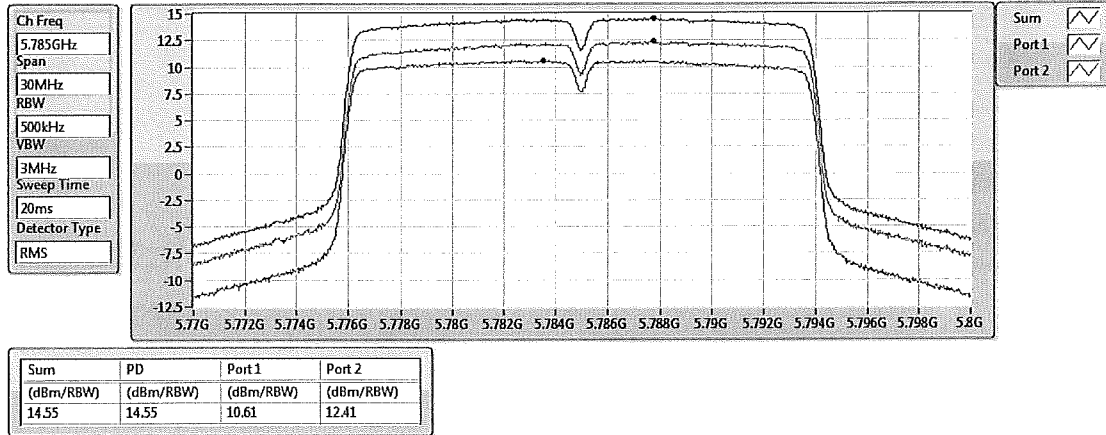


# Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5785 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5785MHz

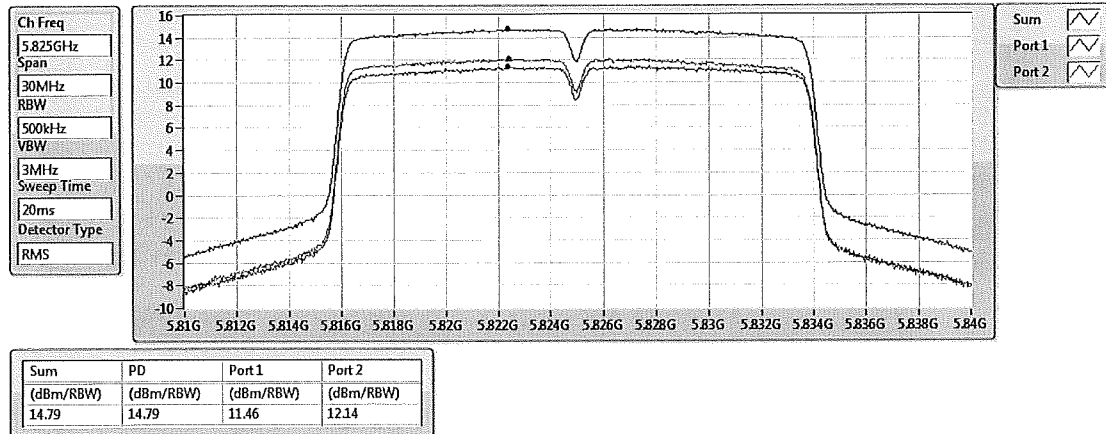


# Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5825 MHz

802.11ac VHT20\_Nss1,(MCS0)\_2TX

PSD

5825MHz

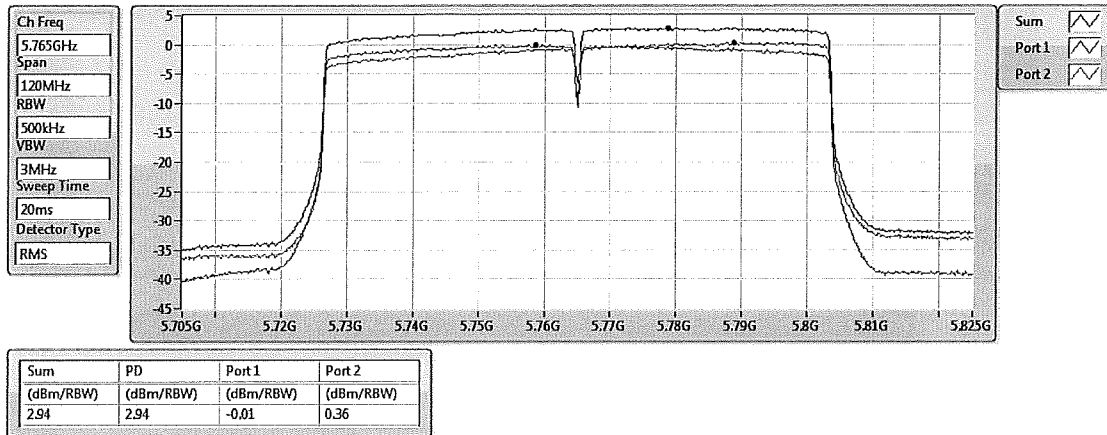


# Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5765 MHz

802.11ac VHT80\_Nss1,(MCS0)\_2TX

PSD

5765MHz

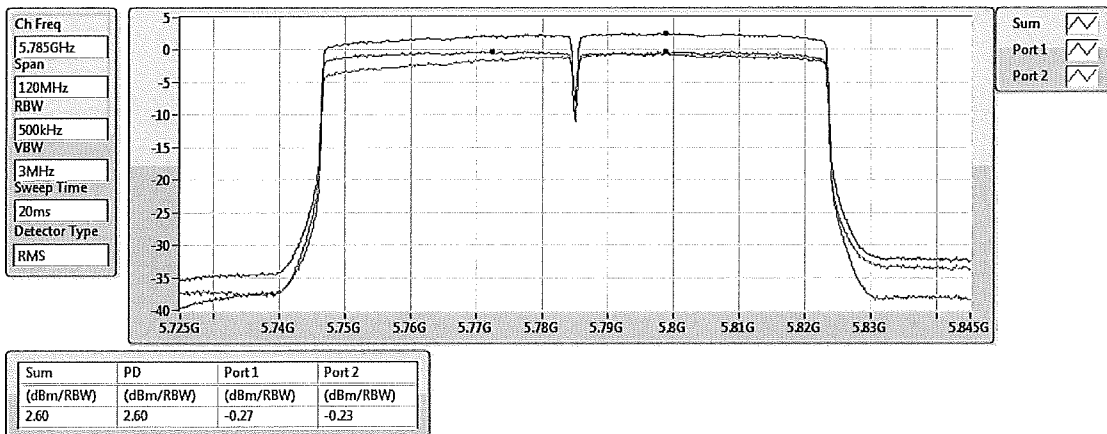


# Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5785 MHz

802.11ac VHT80\_Nss1,(MCS0)\_2TX

PSD

5785MHz

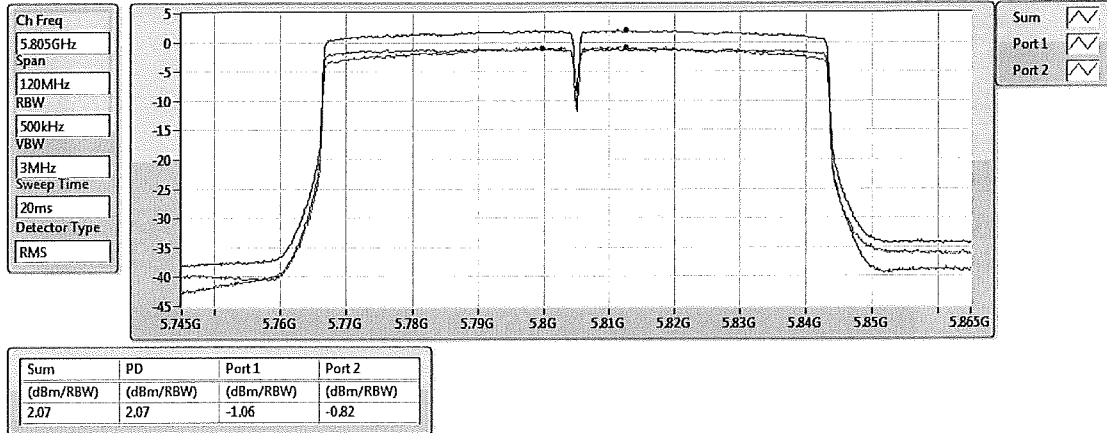


Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5805 MHz

802.11ac VHT80\_Nss1,(MCS0)\_2TX

PSD

5805MHz



## 4.6. Radiated Emissions Measurement

### 4.6.1. Limit

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of  $-27$  dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: 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.

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

| Frequencies<br>(MHz) | Field Strength<br>(micovolts/meter) | Measurement Distance<br>(meters) |
|----------------------|-------------------------------------|----------------------------------|
| 0.009~0.490          | 2400/F(kHz)                         | 300                              |
| 0.490~1.705          | 24000/F(kHz)                        | 30                               |
| 1.705~30.0           | 30                                  | 30                               |
| 30~88                | 100                                 | 3                                |
| 88~216               | 150                                 | 3                                |
| 216~960              | 200                                 | 3                                |
| Above 960            | 500                                 | 3                                |

### 4.6.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

| Spectrum Parameter                          | Setting                                           |
|---------------------------------------------|---------------------------------------------------|
| Attenuation                                 | Auto                                              |
| Start Frequency                             | 1000 MHz                                          |
| Stop Frequency                              | 40 GHz                                            |
| RBW / VBW (Emission in restricted band)     | 1 MHz / 3MHz for Peak,<br>1 MHz / 1/T for Average |
| RBW / VBW (Emission in non-restricted band) | 1 MHz / 3MHz for peak                             |

| Receiver Parameter     | Setting                           |
|------------------------|-----------------------------------|
| Attenuation            | Auto                              |
| Start ~ Stop Frequency | 9kHz~150kHz / RBW 200Hz for QP    |
| Start ~ Stop Frequency | 150kHz~30MHz / RBW 9kHz for QP    |
| Start ~ Stop Frequency | 30MHz~1000MHz / RBW 120kHz for QP |

#### 4.6.3. Test Procedures

##### For Radiated measurement:

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

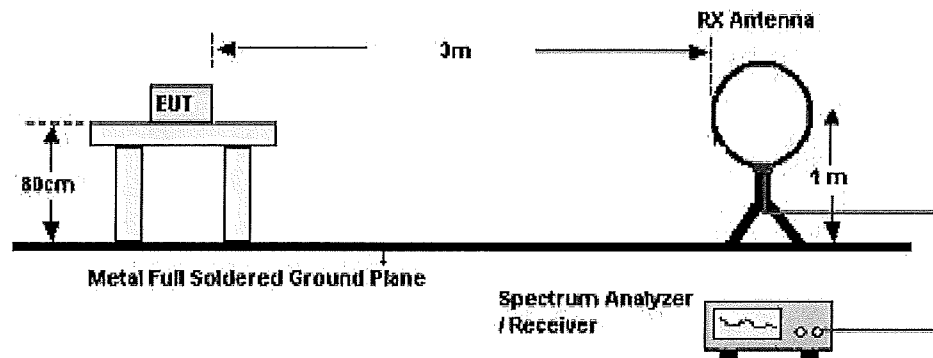
##### For Conducted measurement:

The EUT was perform conducted measurement and measurement level added antenna gain shall be comply to section 4.5.3.

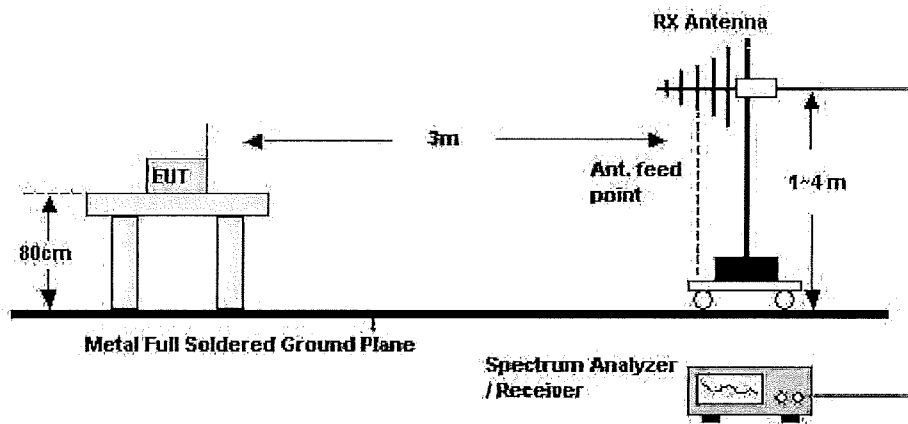
#### 4.6.4. Test Setup Layout

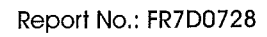
For Radiated test

9kHz ~30MHz

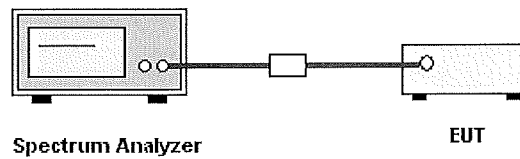


30MHz~1GHz





**For Above 1GHz only:**



There is no deviation with the original standard.

The EUT was programmed to be in continuously transmitting mode.

**4.6.7. Results of Radiated Emissions (9kHz~30MHz)**

|               |               |                |     |
|---------------|---------------|----------------|-----|
| Temperature   | 22°C          | Humidity       | 56% |
| Test Engineer | Serway Li     | Configurations | CTX |
| Test Date     | Nov. 29, 2017 |                |     |

| Freq.<br>(MHz) | Level<br>(dBuV) | Over Limit<br>(dB) | Limit Line<br>(dBuV) | Remark   |
|----------------|-----------------|--------------------|----------------------|----------|
| -              | -               | -                  | -                    | See Note |

Note:

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

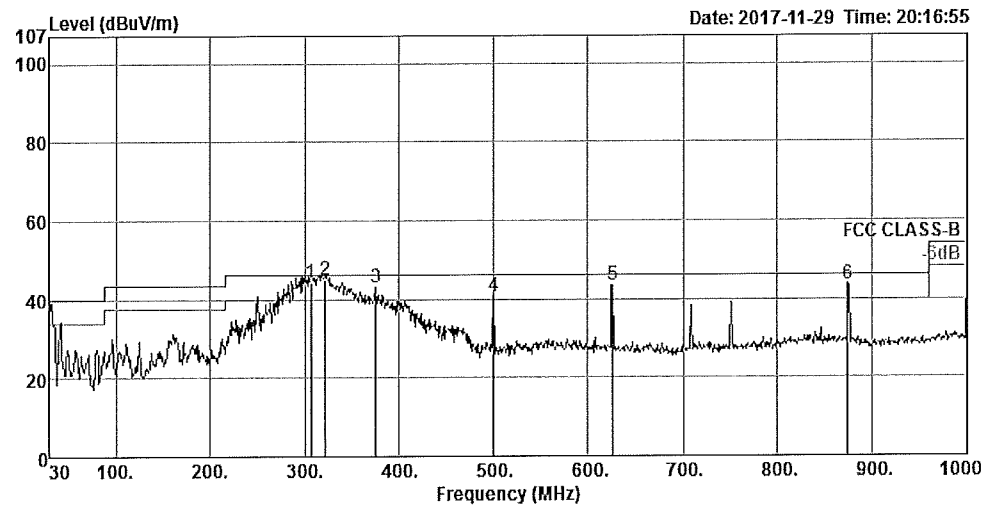
Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

#### 4.6.8. Results of Radiated Emissions (30MHz~1GHz)

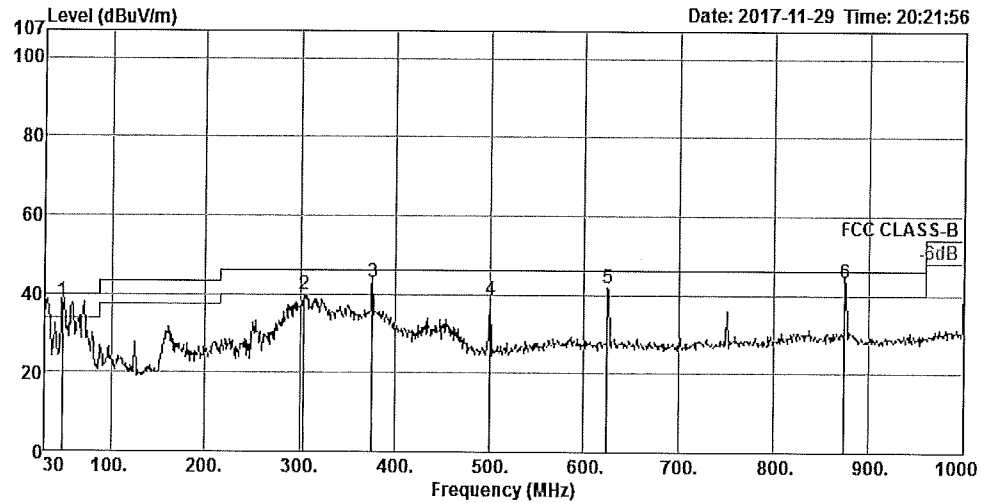
|               |           |                |     |
|---------------|-----------|----------------|-----|
| Temperature   | 22°C      | Humidity       | 56% |
| Test Engineer | Serway Li | Configurations | CTX |

Horizontal



|   | Freq   | Level  | Limit  | Over  | Read  | CableAntenna | Preamp | A/Pos | T/Pos | Remark   | Pol/Phase  |
|---|--------|--------|--------|-------|-------|--------------|--------|-------|-------|----------|------------|
|   | MHz    | dBuV/m | dBuV/m | dB    | dBuV  | dB           | dB/m   | dB    | cm    | deg      |            |
| 1 | 306.45 | 44.20  | 46.00  | -1.80 | 54.80 | 2.13         | 19.19  | 31.92 | 100   | 220 QP   | HORIZONTAL |
| 2 | 321.97 | 44.86  | 46.00  | -1.14 | 55.09 | 2.21         | 19.50  | 31.94 | 100   | 163 QP   | HORIZONTAL |
| 3 | 375.32 | 42.88  | 46.00  | -3.12 | 51.74 | 2.40         | 20.76  | 32.02 | 100   | 56 Peak  | HORIZONTAL |
| 4 | 500.45 | 40.61  | 46.00  | -5.39 | 46.72 | 2.77         | 23.31  | 32.19 | 125   | 132 Peak | HORIZONTAL |
| 5 | 625.58 | 43.48  | 46.00  | -2.52 | 47.72 | 3.08         | 25.03  | 32.35 | 100   | 48 QP    | HORIZONTAL |
| 6 | 874.87 | 43.34  | 46.00  | -2.66 | 45.47 | 3.83         | 26.45  | 32.41 | 200   | 360 QP   | HORIZONTAL |

### Vertical



|   | Freq   | Level  | Limit  | Over  | Read  | CableAntenna | Preamp | A/Pos | T/Pos | Remark   | Pol/Phase |
|---|--------|--------|--------|-------|-------|--------------|--------|-------|-------|----------|-----------|
|   | MHz    | dBuV/m | dBuV/m | dB    | dBuV  | dB           | dB/m   | dB    | cm    | deg      |           |
| 1 | 48.43  | 37.99  | 40.00  | -2.01 | 54.25 | 0.87         | 14.46  | 31.59 | 125   | 73 QP    | VERTICAL  |
| 2 | 304.51 | 39.94  | 46.00  | -6.06 | 50.59 | 2.12         | 19.15  | 31.92 | 125   | 244 Peak | VERTICAL  |
| 3 | 375.32 | 43.06  | 46.00  | -2.94 | 51.92 | 2.40         | 20.76  | 32.02 | 125   | 252 QP   | VERTICAL  |
| 4 | 500.45 | 38.80  | 46.00  | -7.20 | 44.91 | 2.77         | 23.31  | 32.19 | 100   | 150 Peak | VERTICAL  |
| 5 | 624.61 | 41.74  | 46.00  | -4.26 | 45.98 | 3.08         | 25.03  | 32.35 | 125   | 212 Peak | VERTICAL  |
| 6 | 874.87 | 43.56  | 46.00  | -2.44 | 45.69 | 3.83         | 26.45  | 32.41 | 100   | 356 QP   | VERTICAL  |

#### Note:

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

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

#### 4.6.9. Results for Radiated Emissions (1GHz~40GHz)

For Conducted test:

For Antenna 2:

|               |           |                |                                                   |
|---------------|-----------|----------------|---------------------------------------------------|
| Temperature   | 22°C      | Humidity       | 56%                                               |
| Test Engineer | Serway Li | Configurations | QPSK, 20M / Average / Port 1 + Port 2 / 1GHz~3GHz |

| Frequency(MHz) | Chain 1 (TX1)<br>Spurious Level<br>(dBm) | Chain 2 (TX2)<br>Spurious Level<br>(dBm) | Total<br>Spurious Level<br>(dBm) | Limit (dBm) | Margin (dB) |
|----------------|------------------------------------------|------------------------------------------|----------------------------------|-------------|-------------|
| 5180           | -80.06                                   | -84.38                                   | -53.69                           | -41.25      | 12.44       |
| 5200           | -84.47                                   | -84.39                                   | -56.42                           | -41.25      | 15.17       |
| 5240           | -82.26                                   | -82.84                                   | -54.53                           | -41.25      | 13.28       |

|               |           |                |                                                |
|---------------|-----------|----------------|------------------------------------------------|
| Temperature   | 22°C      | Humidity       | 56%                                            |
| Test Engineer | Serway Li | Configurations | QPSK, 20M / Peak / Port 1 + Port 2 / 1GHz~3GHz |

| Frequency(MHz) | Chain 1 (TX1)<br>Spurious Level<br>(dBm) | Chain 2 (TX2)<br>Spurious Level<br>(dBm) | Total<br>Spurious Level<br>(dBm) | Limit (dBm) | Margin (dB) |
|----------------|------------------------------------------|------------------------------------------|----------------------------------|-------------|-------------|
| 5180           | -62.19                                   | -65.09                                   | -35.39                           | -21.25      | 14.14       |
| 5200           | -63.03                                   | -63.57                                   | -35.28                           | -21.25      | 14.03       |
| 5240           | -62.06                                   | -63.07                                   | -34.53                           | -21.25      | 13.28       |

|               |           |                |                                                   |
|---------------|-----------|----------------|---------------------------------------------------|
| Temperature   | 22°C      | Humidity       | 56%                                               |
| Test Engineer | Serway Li | Configurations | QPSK, 80M / Average / Port 1 + Port 2 / 1GHz~3GHz |

| Frequency(MHz) | Chain 1 (TX1)<br>Spurious Level<br>(dBm) | Chain 2 (TX2)<br>Spurious Level<br>(dBm) | Total<br>Spurious Level<br>(dBm) | Limit (dBm) | Margin (dB) |
|----------------|------------------------------------------|------------------------------------------|----------------------------------|-------------|-------------|
| 5200           | -83.50                                   | -84.71                                   | -56.05                           | -41.25      | 14.80       |
| 5210           | -84.55                                   | -80.34                                   | -53.94                           | -41.25      | 12.69       |