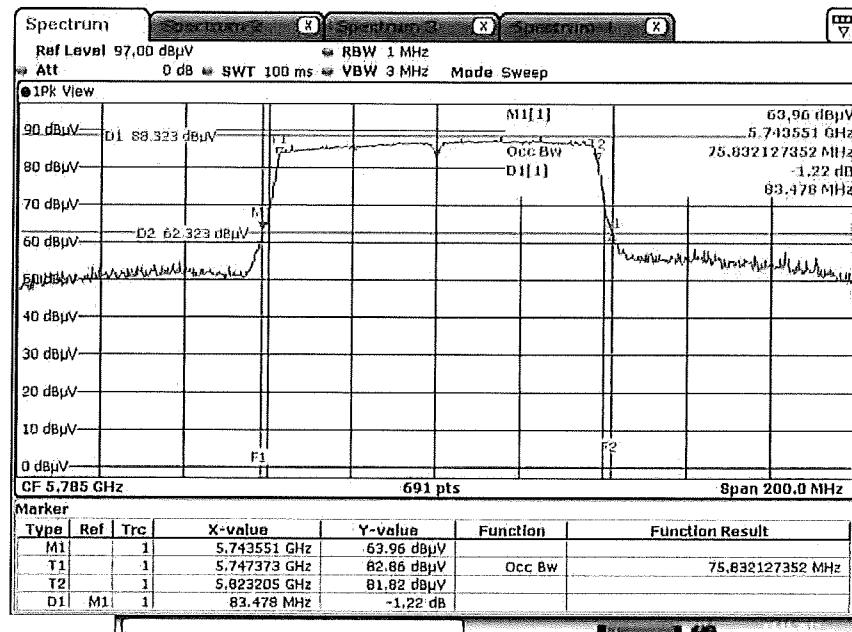
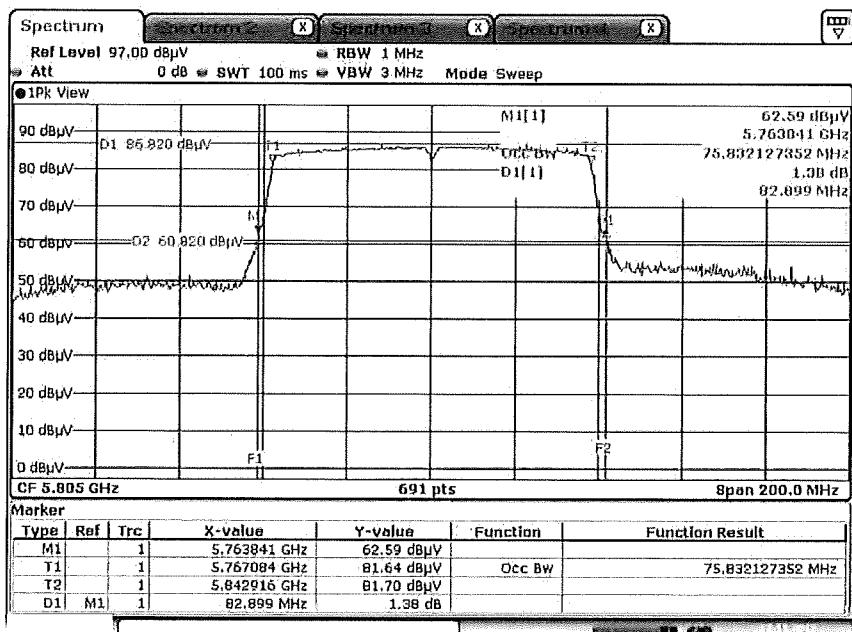


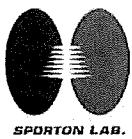


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5785MHz



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





SPARTON LAB.

Report No.: FR7D0728

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

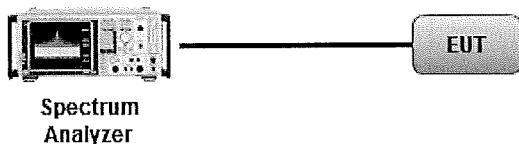
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

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

4.3.3. Test Procedures

Test Method
▪ For the emission bandwidth shall be measured using one of the options below:
<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

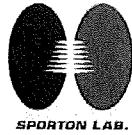


4.3.5. Test Deviation

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:

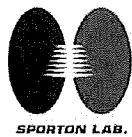
Mode	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Port 1	Port 2		
20M	5745 MHz	17.57	17.57	500	Complies
	5785 MHz	17.57	17.57	500	Complies
	5825 MHz	17.57	17.57	500	Complies
80M	5765 MHz	75.94	75.94	500	Complies
	5785 MHz	75.94	74.49	500	Complies
	5805 MHz	75.94	75.36	500	Complies

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

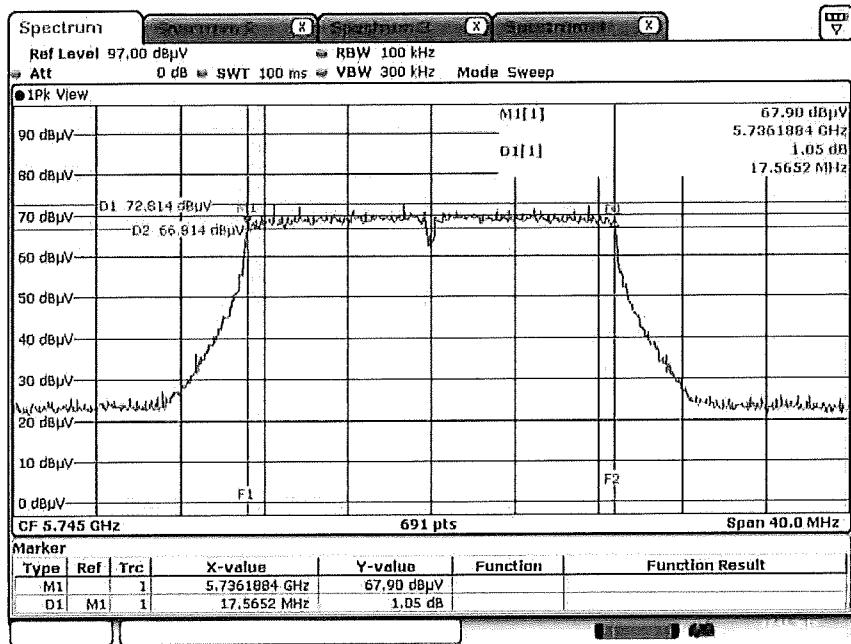
Note: All the test values were listed in the report.

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

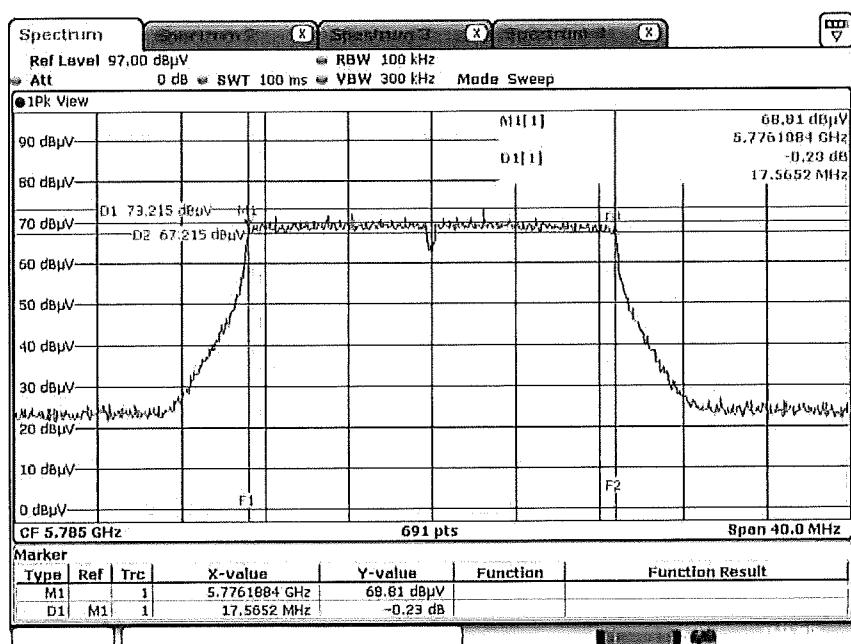


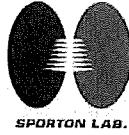
For Antenna 2:

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

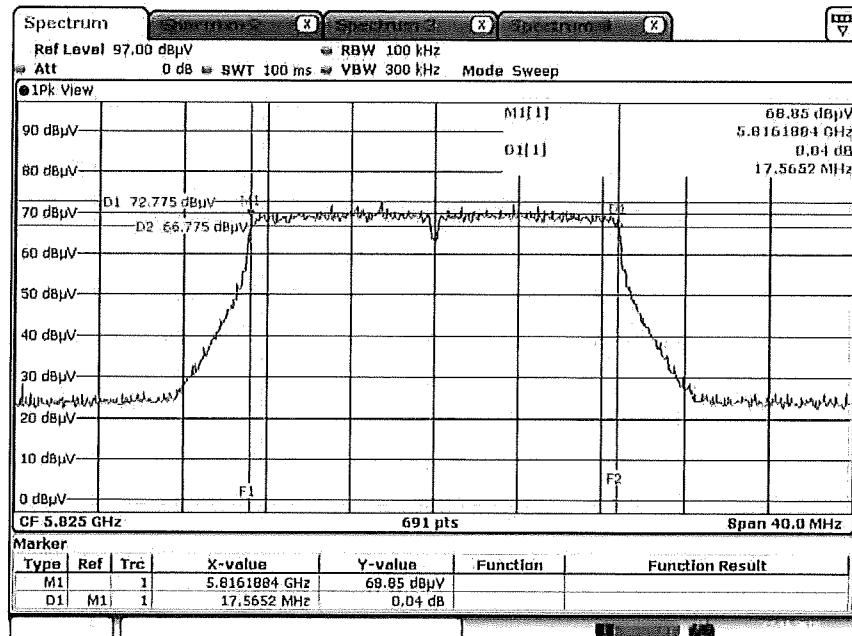


6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 1 / 5785 MHz

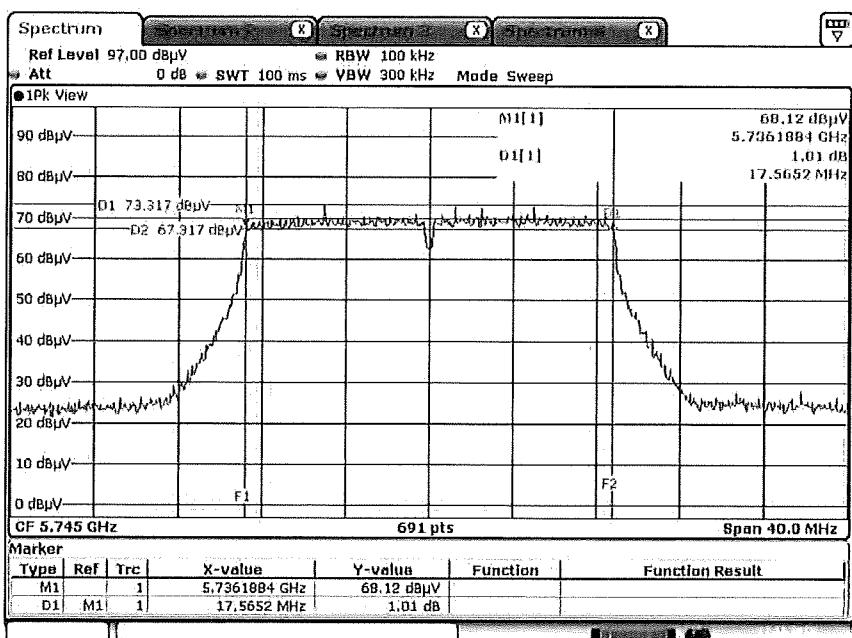




6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 1 / 5825MHz

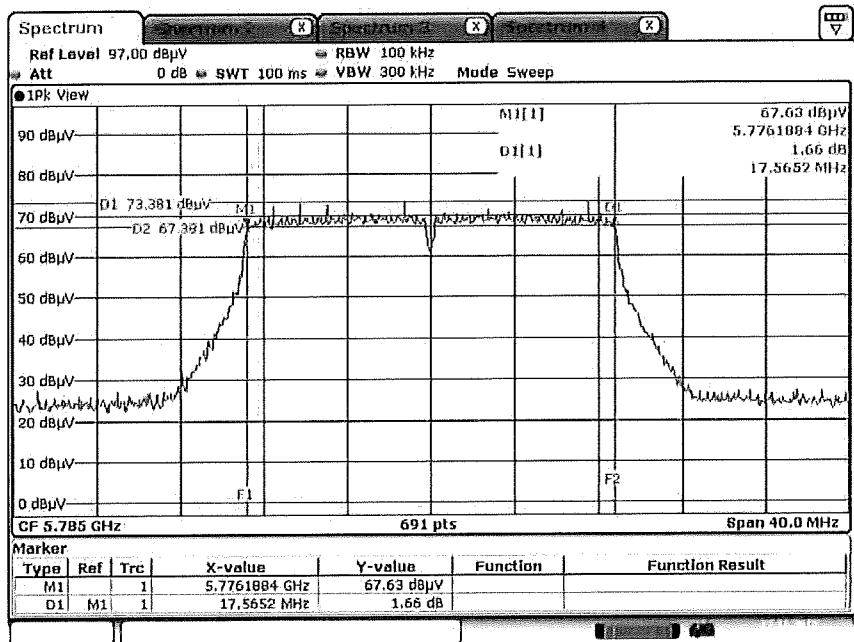


6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5745MHz



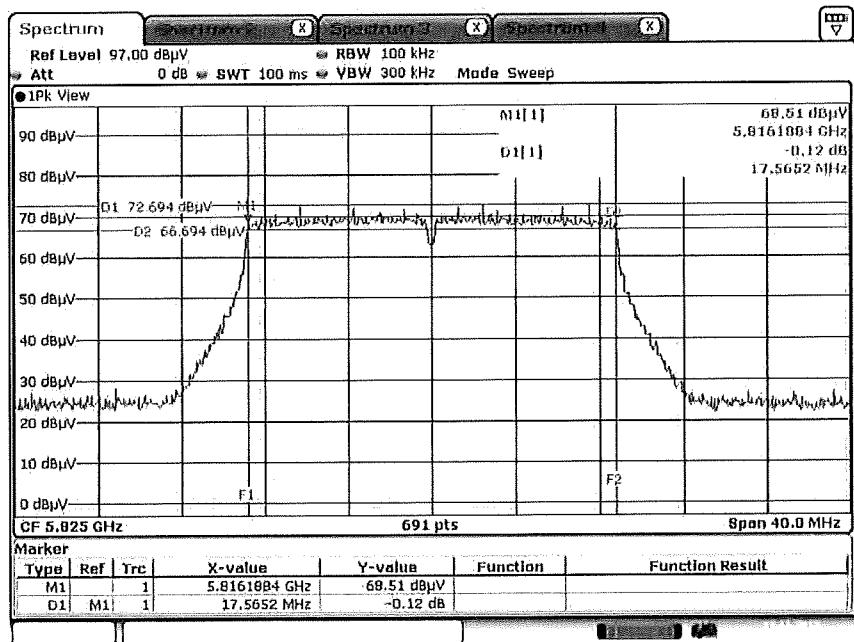


6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5785MHz

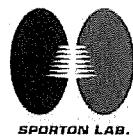


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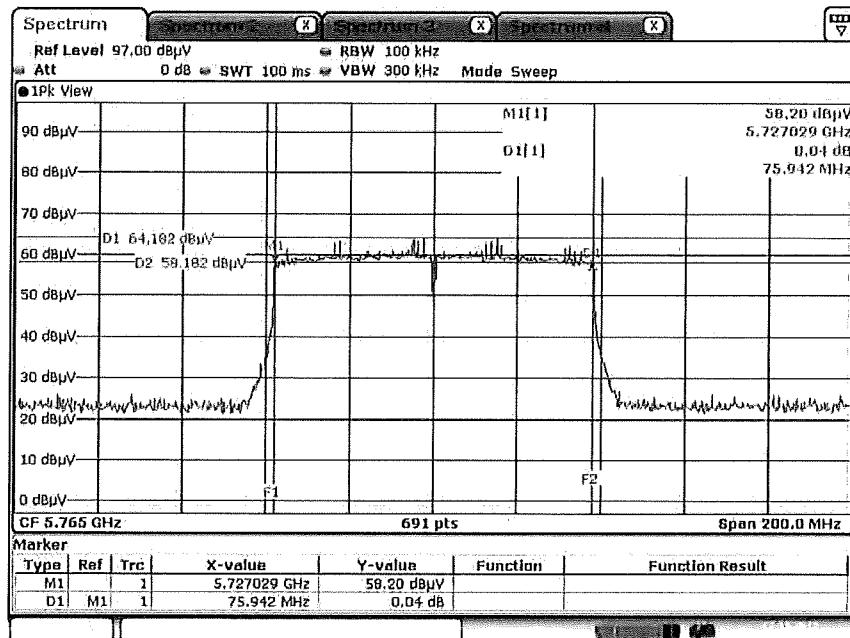
6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5825MHz



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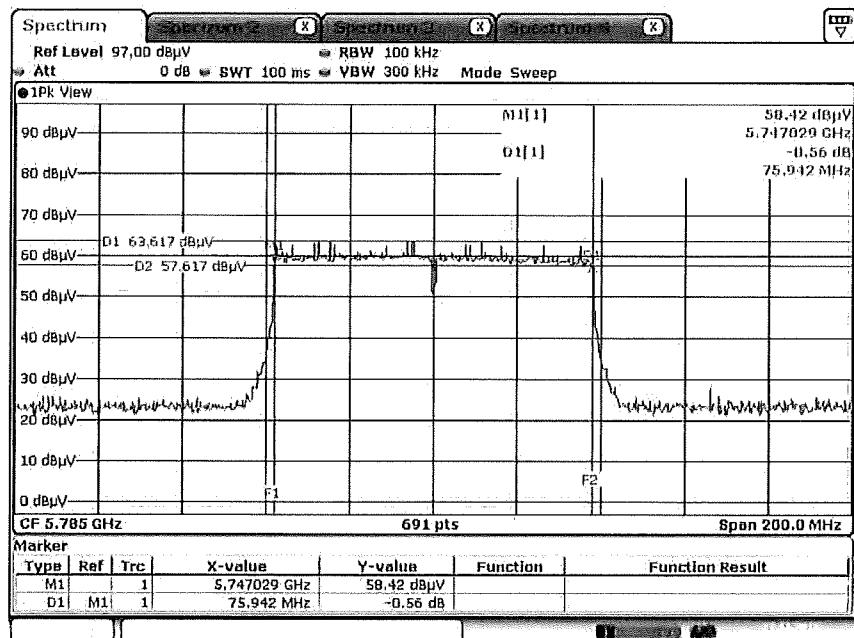


6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5765 MHz

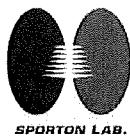


Date: 22.NOV.2017 18:05:08

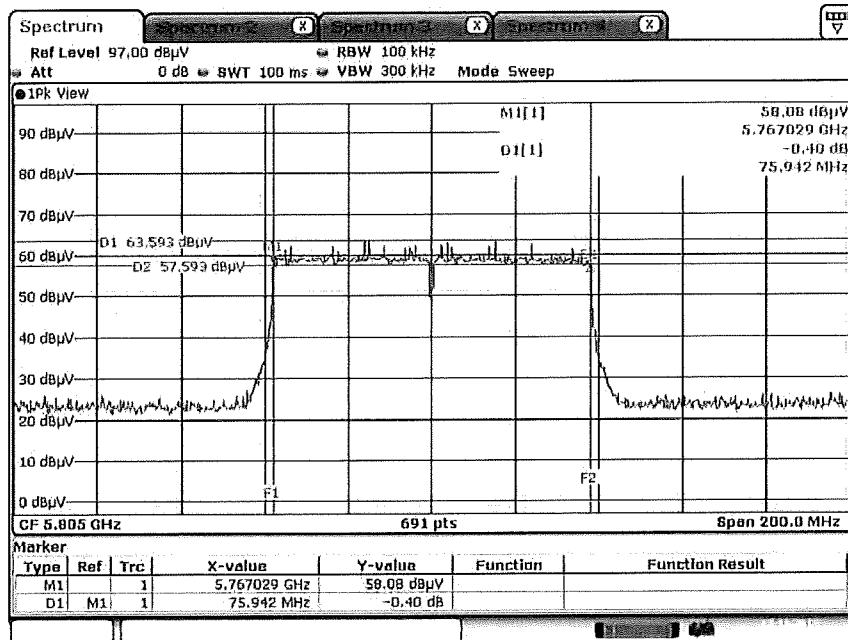
6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5785 MHz



Date: 22.NOV.2017 18:05:37

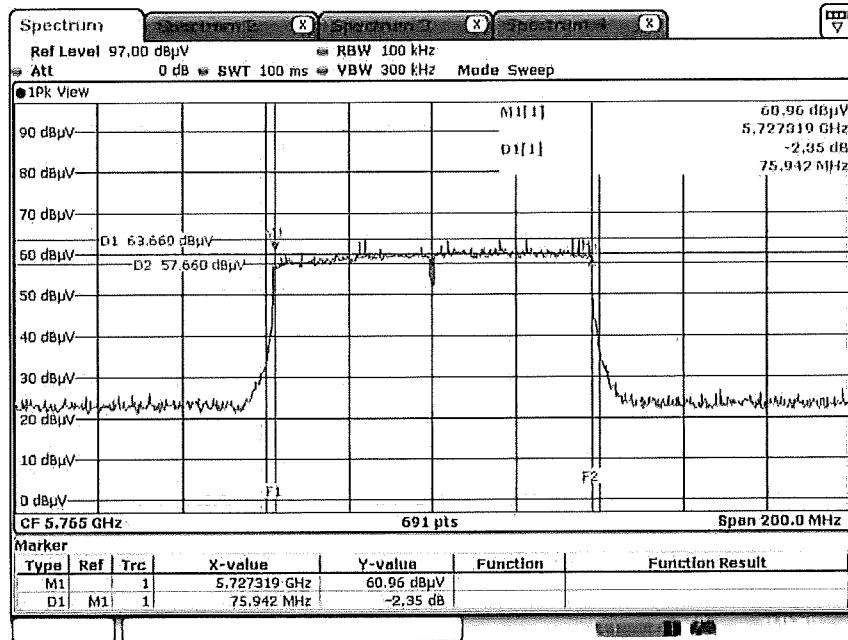


6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5805 MHz



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

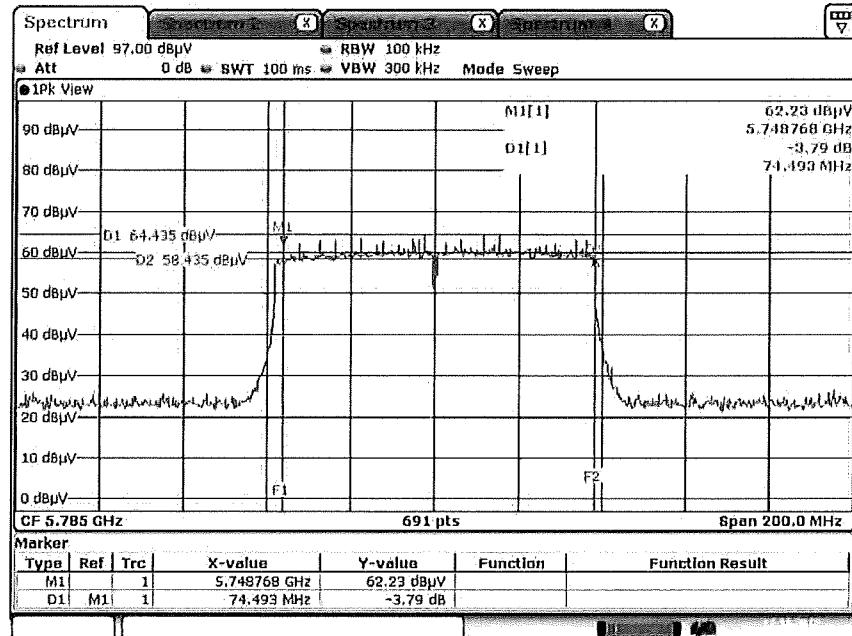
6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5765MHz



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

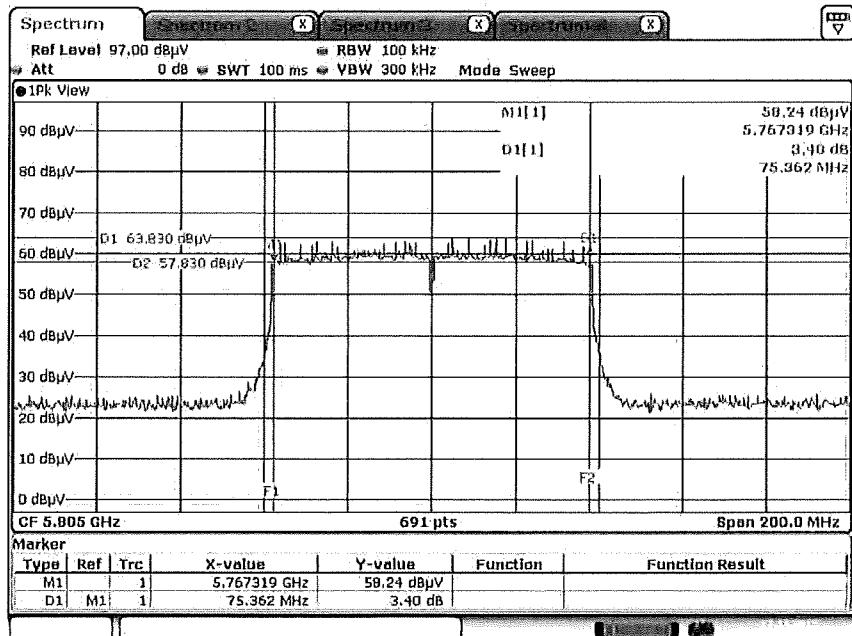


6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5785MHz



Date: 22 NOV, 2017 18:04:05

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

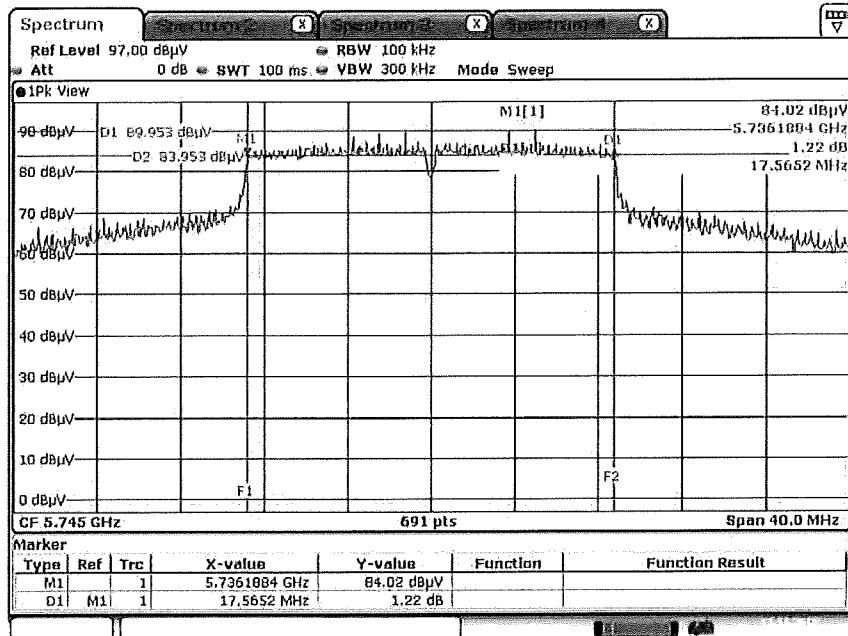


Date: 22 NOV, 2017 18:03:35



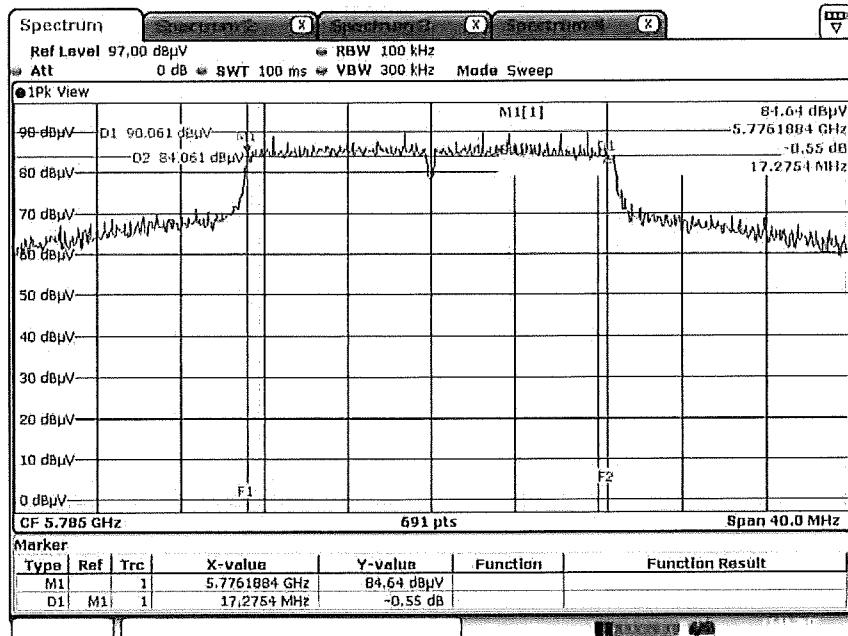
For Antenna 3:

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

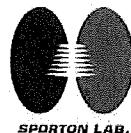


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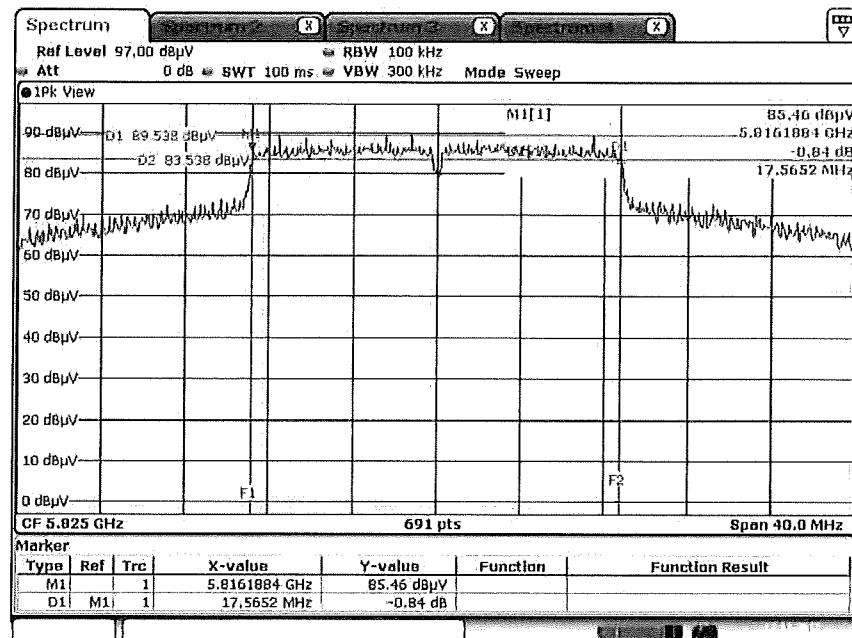
6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 1 / 5785 MHz



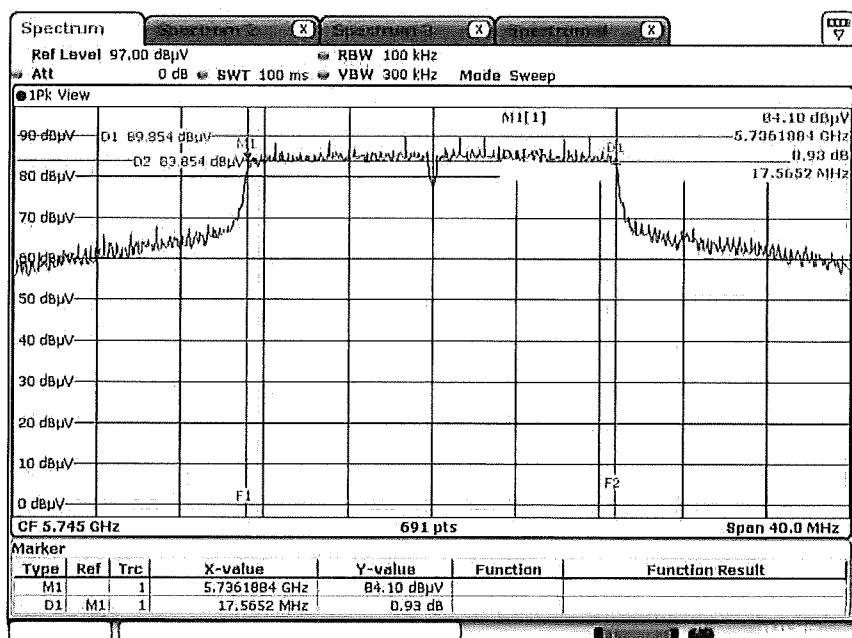
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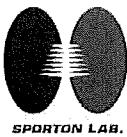


6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 1 / 5825MHz

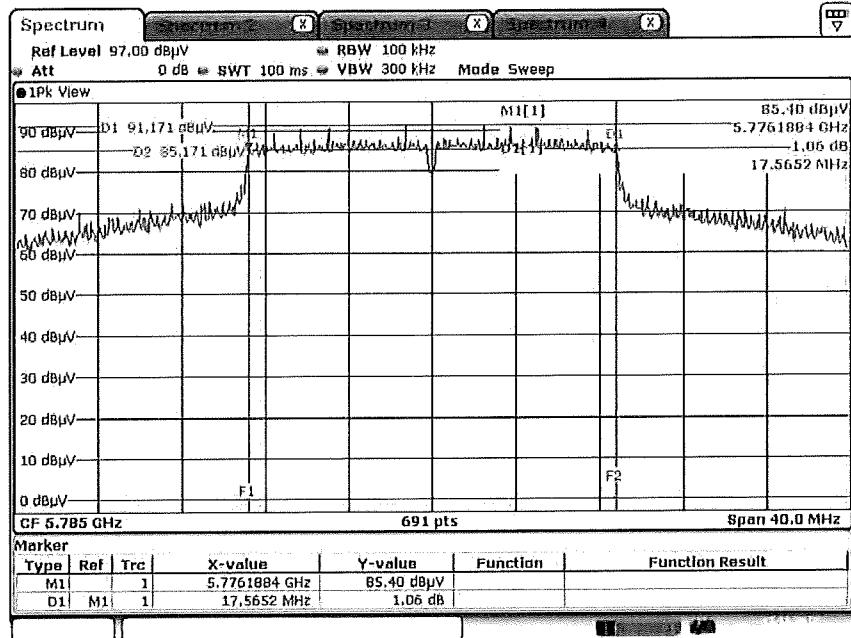


6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5745MHz



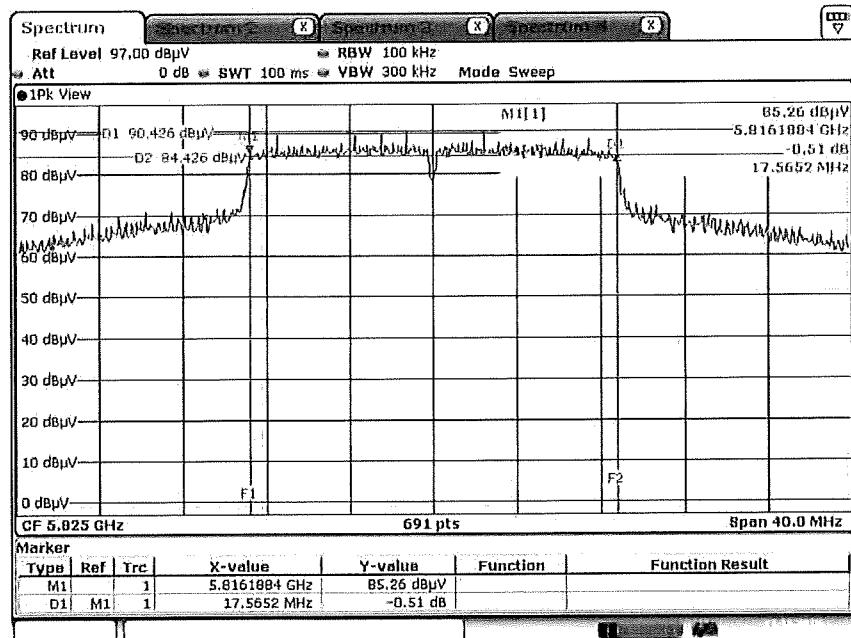


6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5785MHz

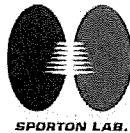


Date: 22.NOV.2017 16:11:58

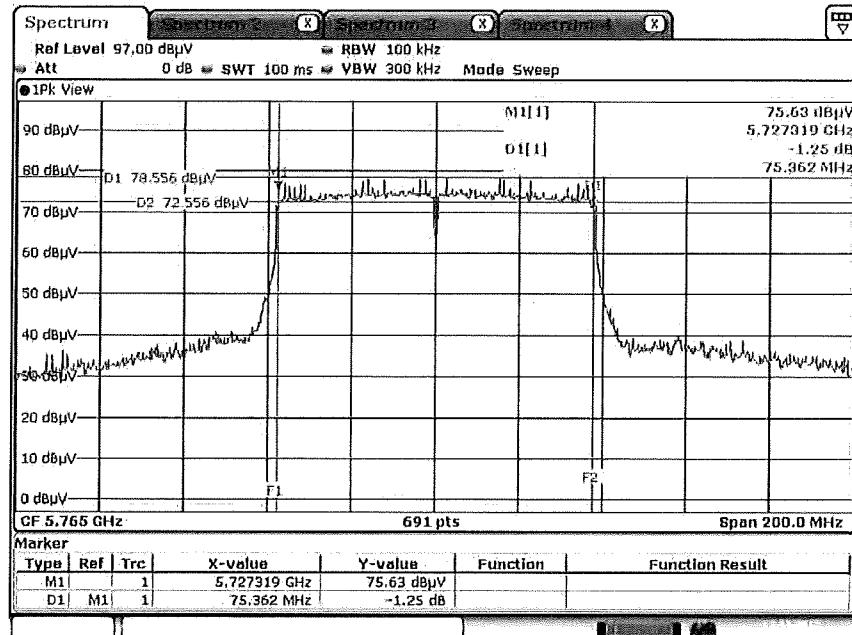
6 dB Bandwidth Plot on Configuration QPSK, 20M / Port 2 / 5825MHz



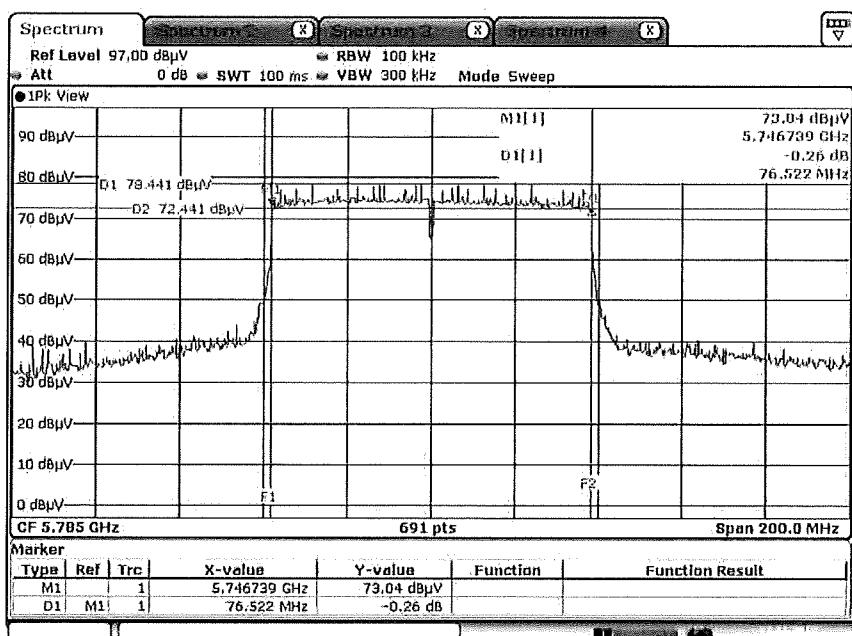
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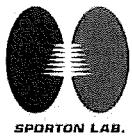


6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5765 MHz

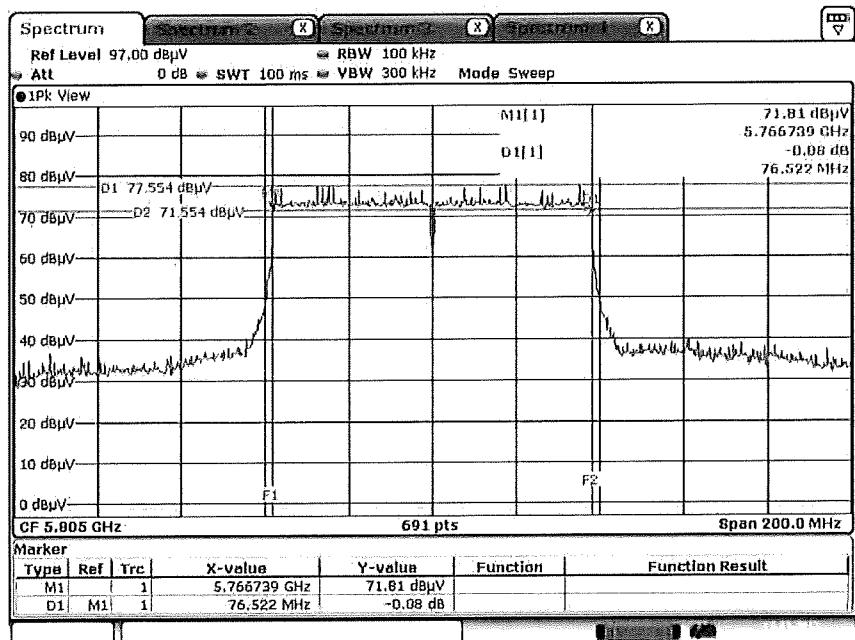


6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5785 MHz

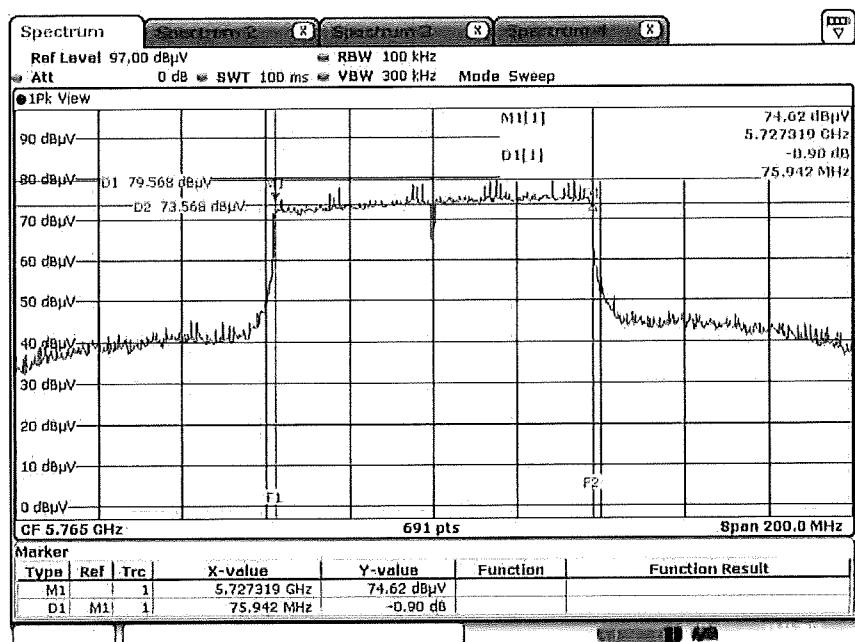




6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 1 / 5805 MHz

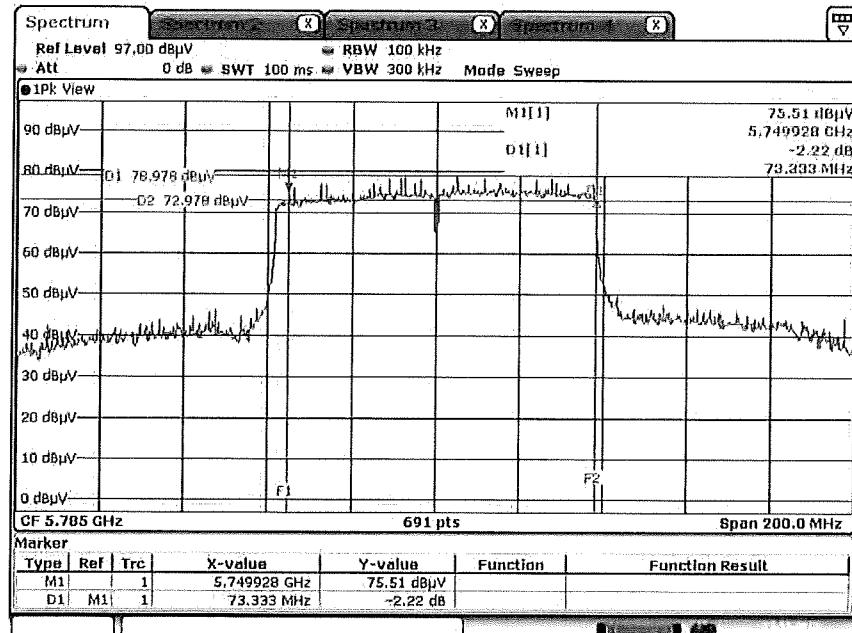


6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5765MHz

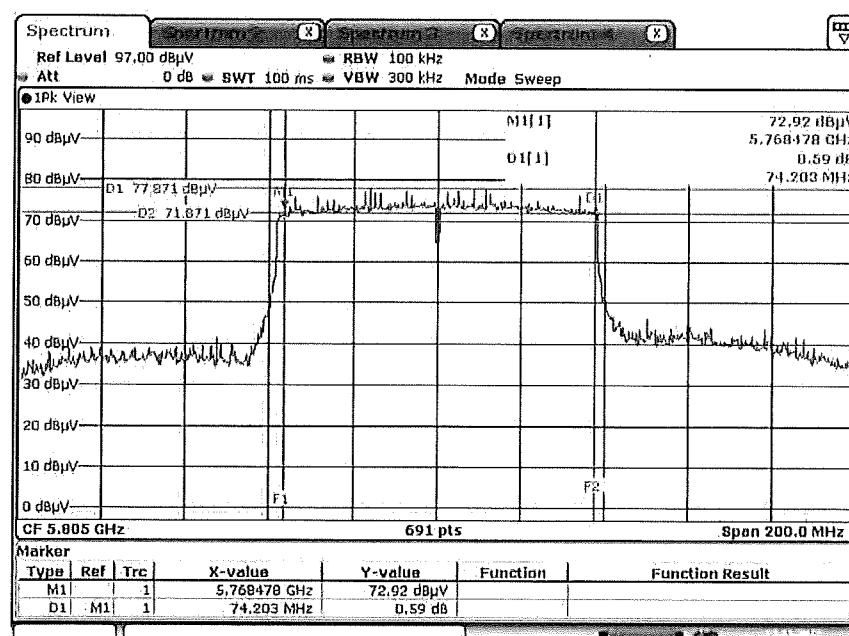


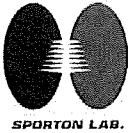


6 dB Bandwidth Plot on Configuration QPSK, 80M / Port 2 / 5785MHz



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





4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

Frequency Band	Limit
<input checked="" type="checkbox"/> 5.15~5.25 GHz	
<input type="checkbox"/> 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.
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4.4.2. Measuring Instruments and Setting

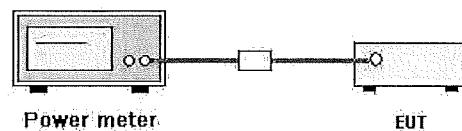
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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

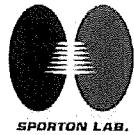
Temperature	22°C	Humidity	54%
Test Engineer	Ron Huang / Lucke Hsieh / Brian Sun / Serway Li	Test Date	Nov. 16, 2017~Nov. 30, 2017

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

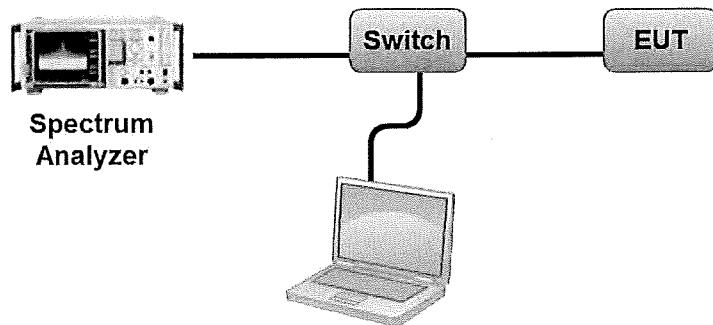
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 $10\log(500\text{kHz}/\text{RBW})$ and the final result should $\leq 30 \text{ dBm}$.

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

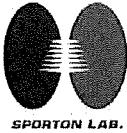
Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
1	5180 MHz	-21.85	15.00	Complies
5	5200 MHz	-16.74	15.00	Complies
13	5240 MHz	-16.43	15.00	Complies

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**

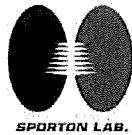
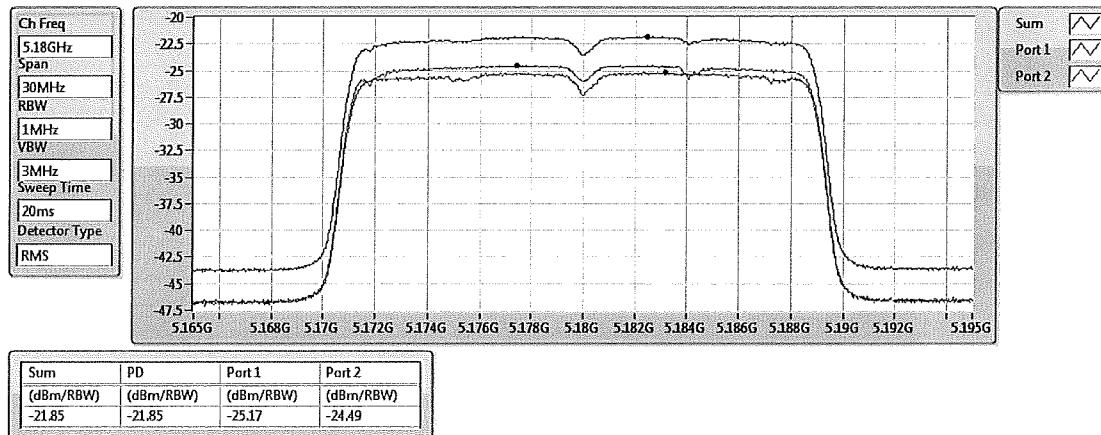
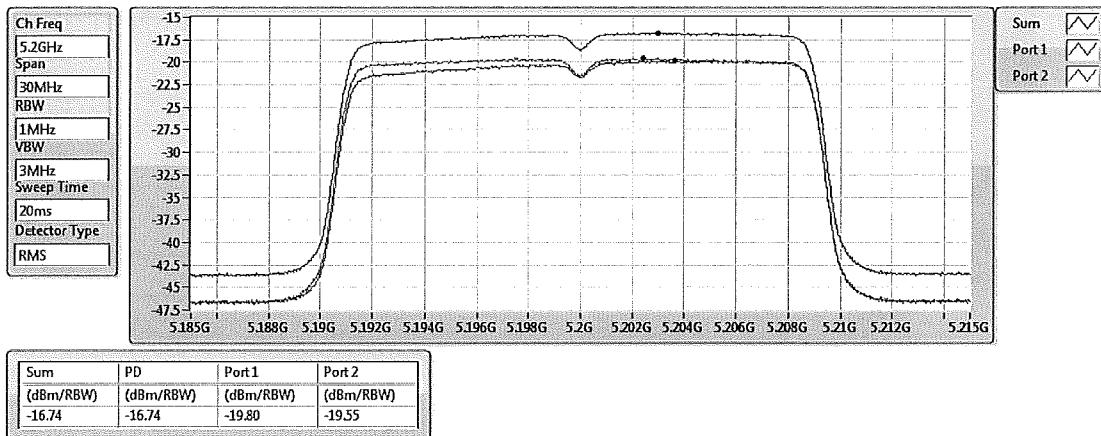
Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
1	5180 MHz	8.83	17.00	Complies
5	5200 MHz	15.01	17.00	Complies
13	5240 MHz	16.48	17.00	Complies

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

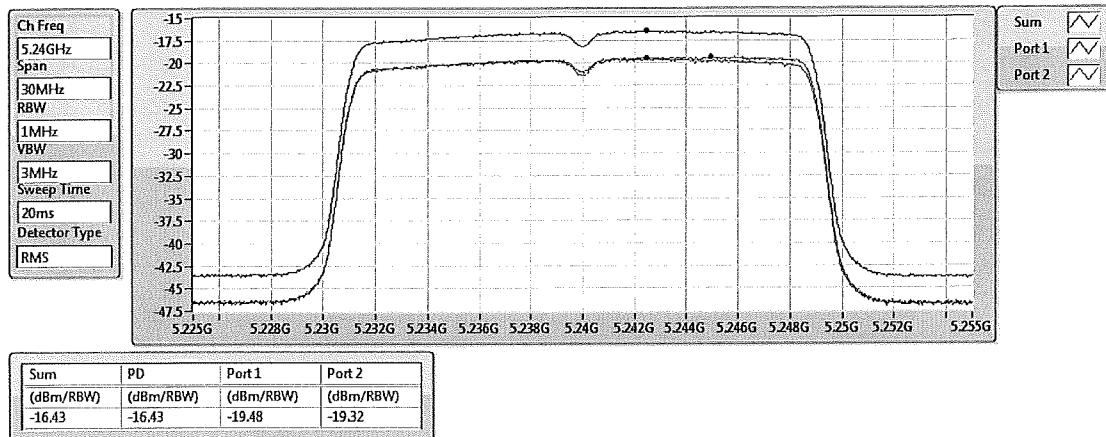
Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
1	5200 MHz	-2.82	17.00	Complies
3	5210 MHz	-2.75	17.00	Complies

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**

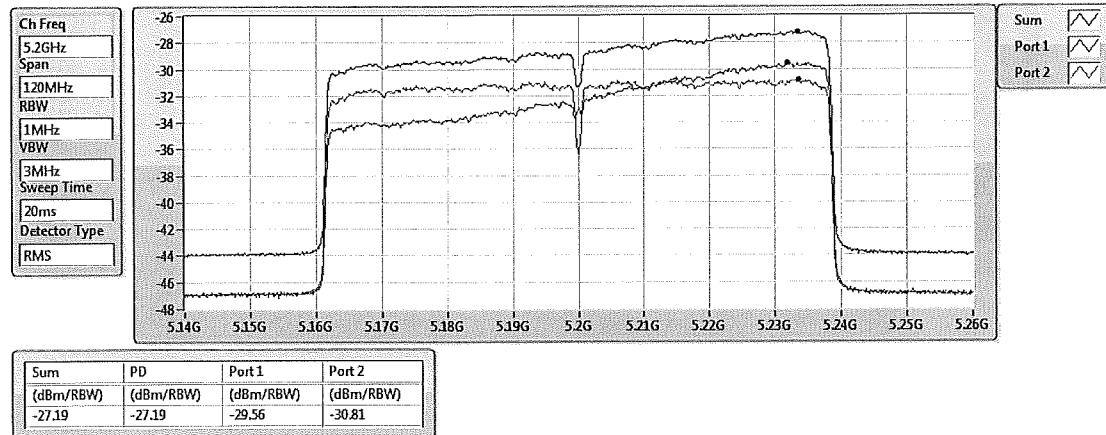
Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5240 MHz

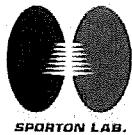
802.11ac VHT20_Nss1,(MCS0)_2TX **PSD**

5240MHz

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

802.11ac VHT80_Nss1,(MCS0)_2TX **PSD**

5200MHz

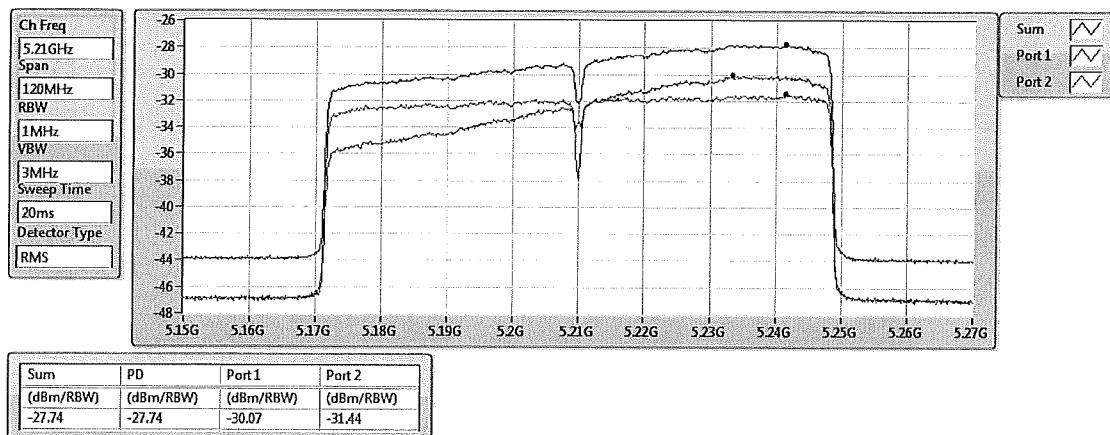


Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5210 MHz

802.11ac VHT80_Nss1,(MCS0)_2TX

PSD

5210MHz

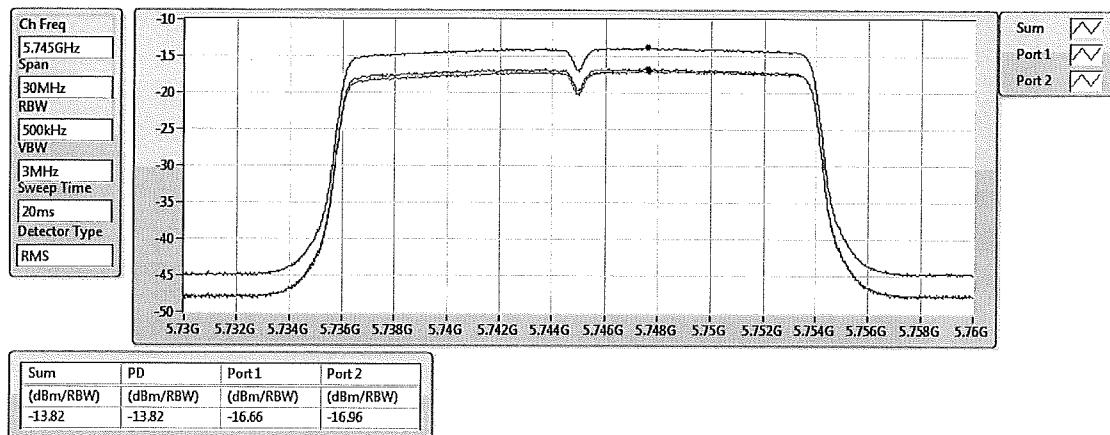


Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5745 MHz

802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

5745MHz

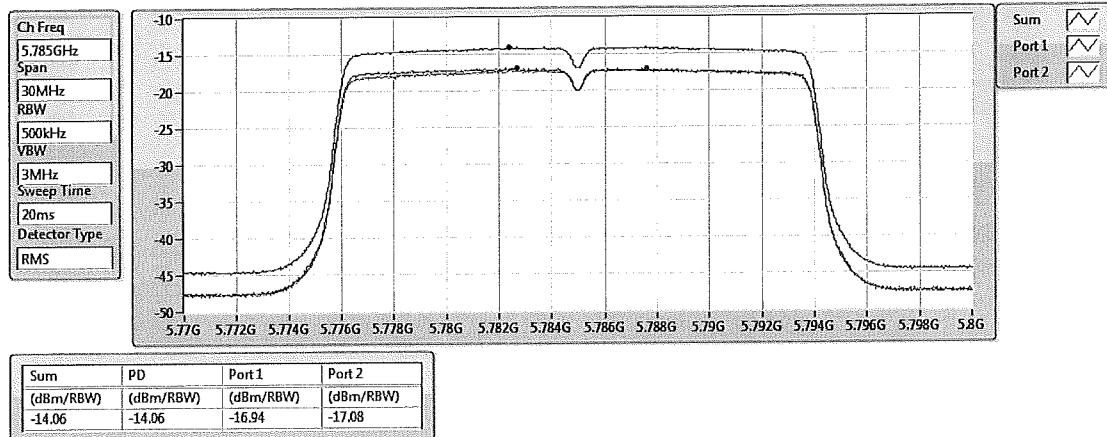




Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5785 MHz

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

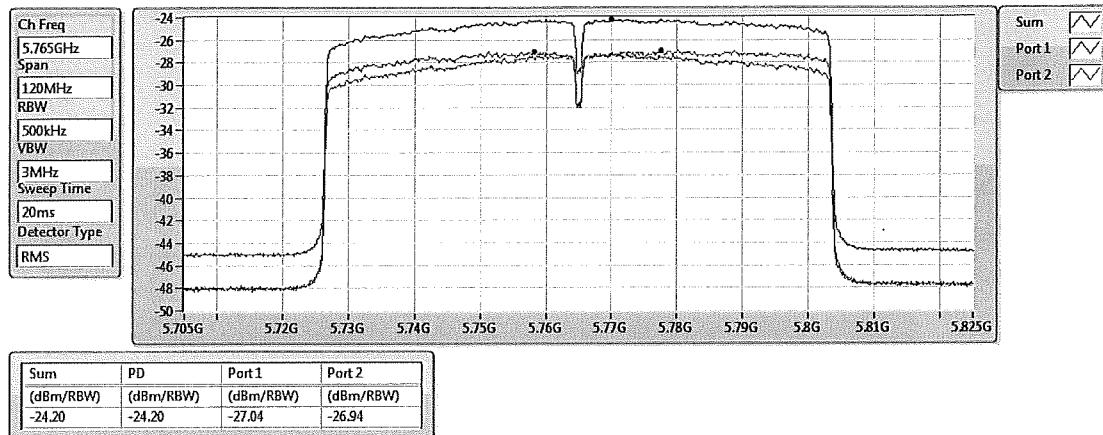




Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5765 MHz

802.11ac VHT80_Nss1,(MCS0)_2TX PSD

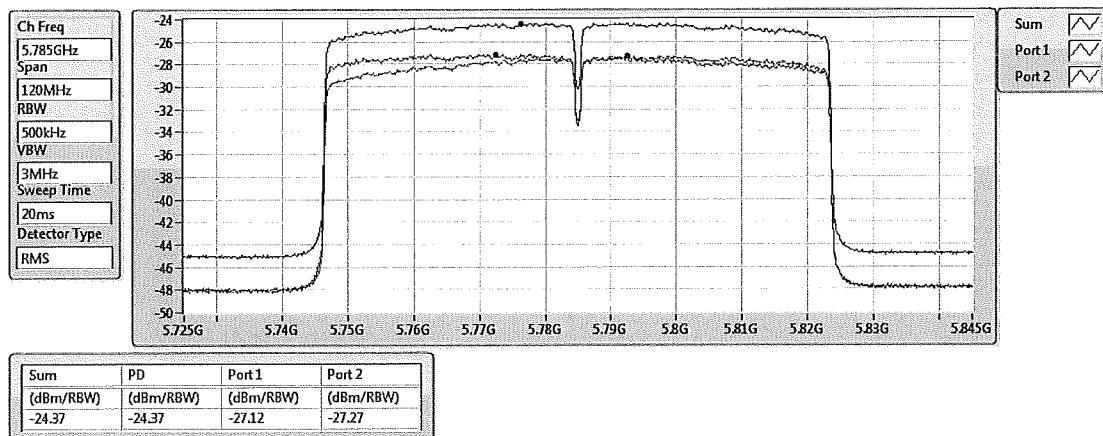
5765MHz



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

802.11ac VHT80_Nss1,(MCS0)_2TX PSD

5785MHz





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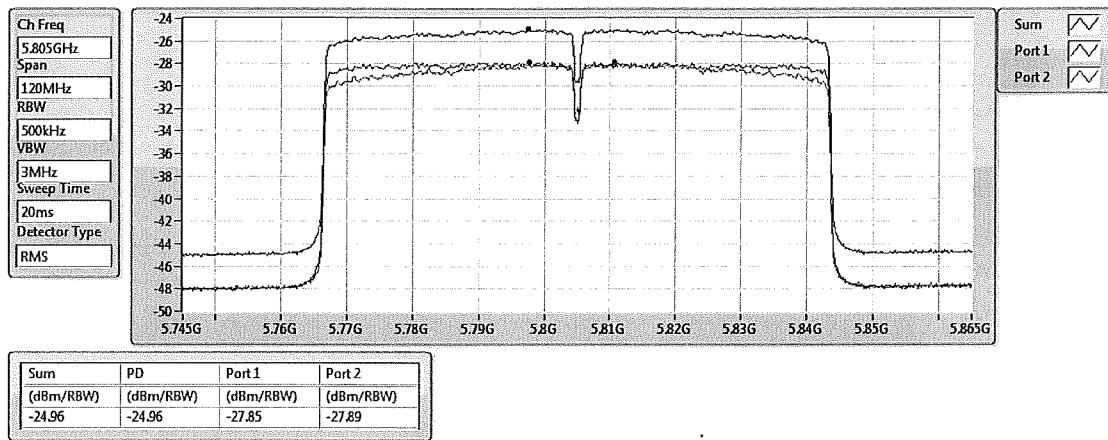
Report No.: FR7D0728

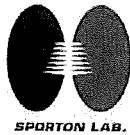
Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5805 MHz

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

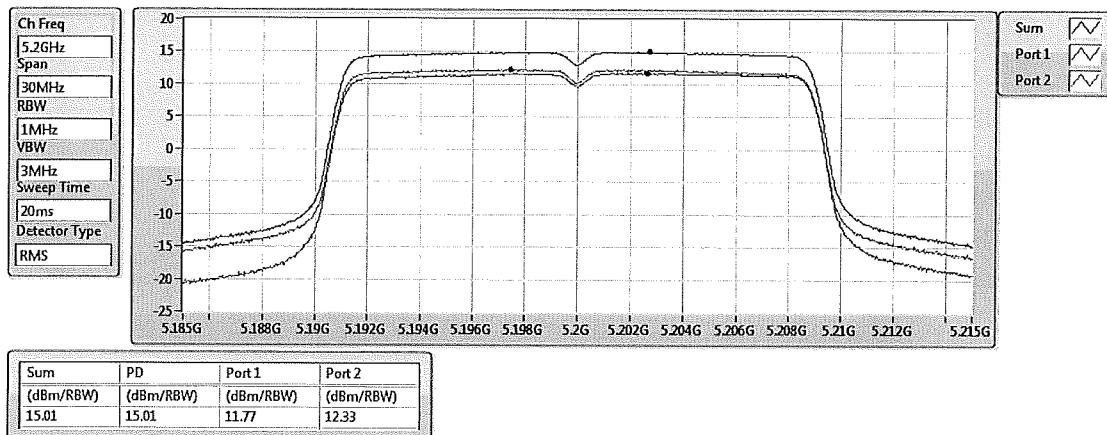
5180MHz



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

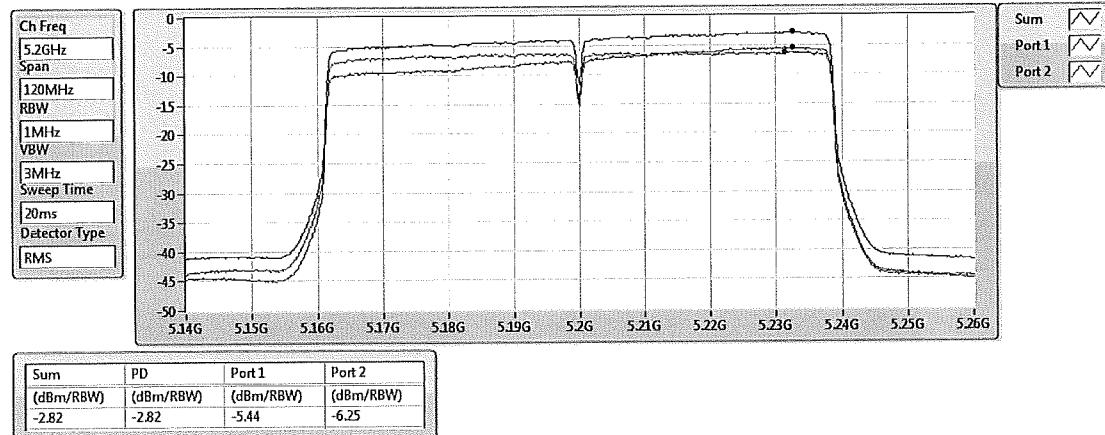


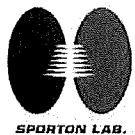
Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5200 MHz

802.11ac VHT80_Nss1,(MCS0)_2TX

PSD

5200MHz



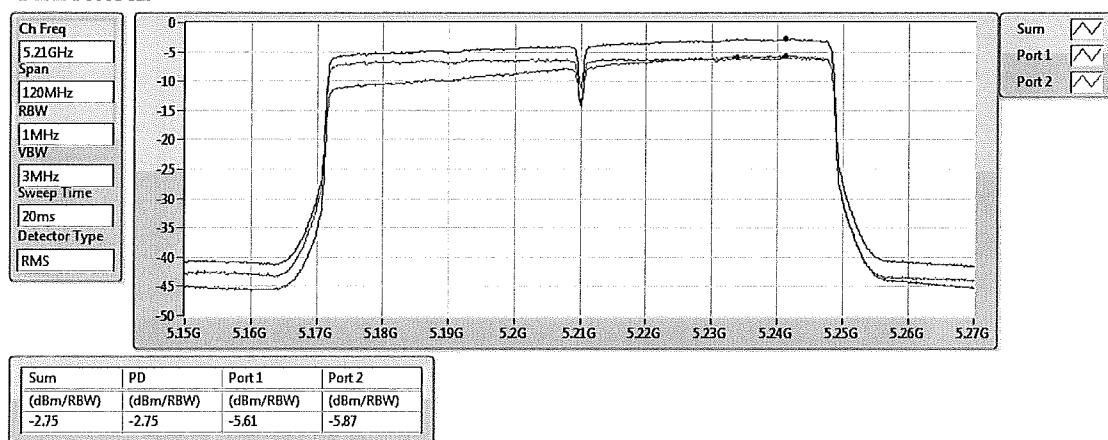


Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5210 MHz

802.11ac VHT80_Nss1,(MCS0)_2TX

PSD

5210MHz

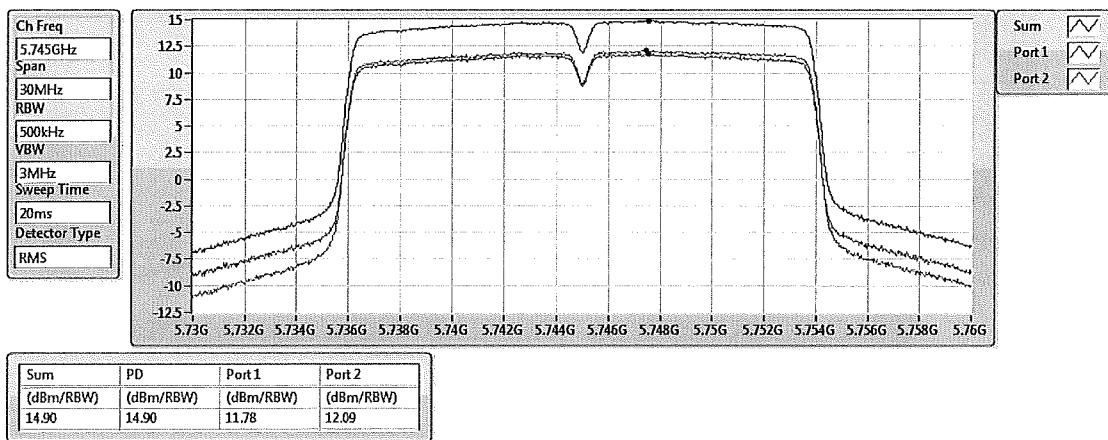


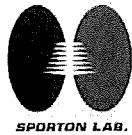
Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5745 MHz

802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

5745MHz

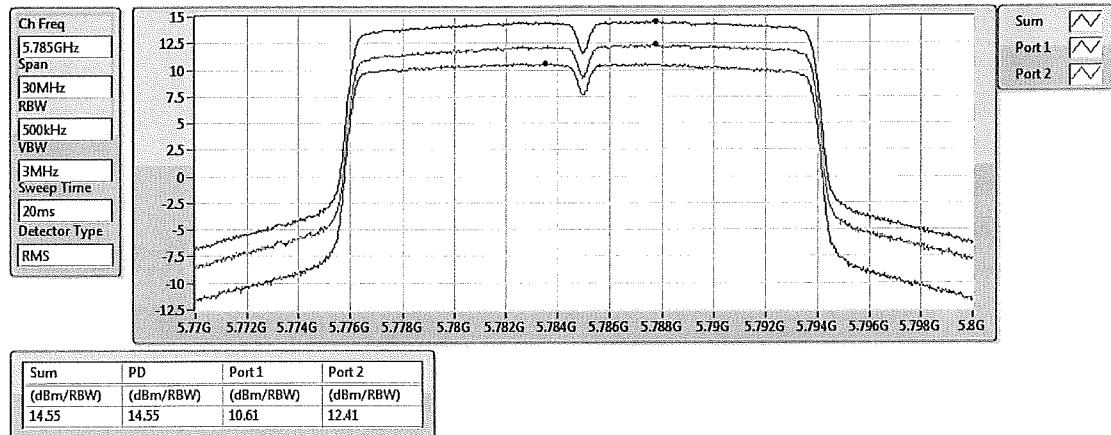




Power Density Plot on Configuration QPSK, 20M / Port 1 + Port 2 / 5785 MHz

802.11ac VHT20_Nss1,(MCS0)_2TX PSD

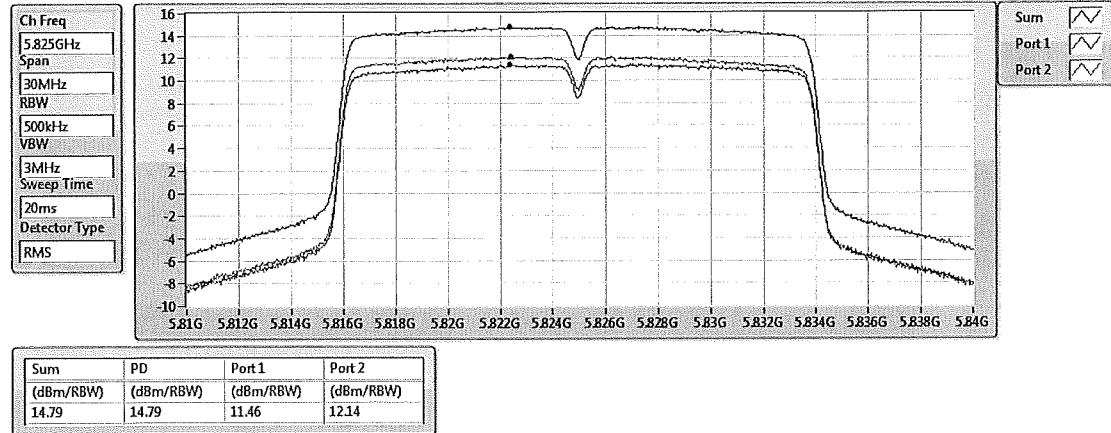
5785MHz



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

802.11ac VHT20_Nss1,(MCS0)_2TX PSD

5825MHz

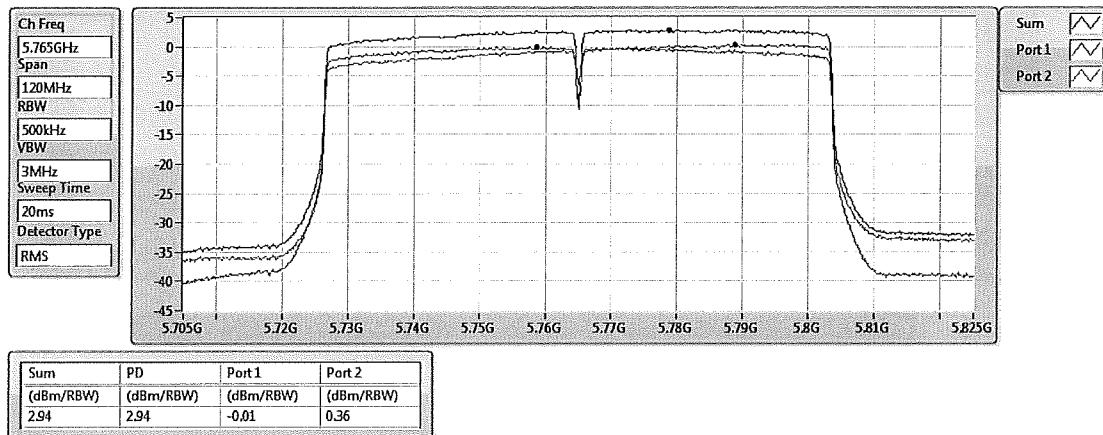




Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5765 MHz

802.11ac VHT80_Nss1,(MCS0)_2TX PSD

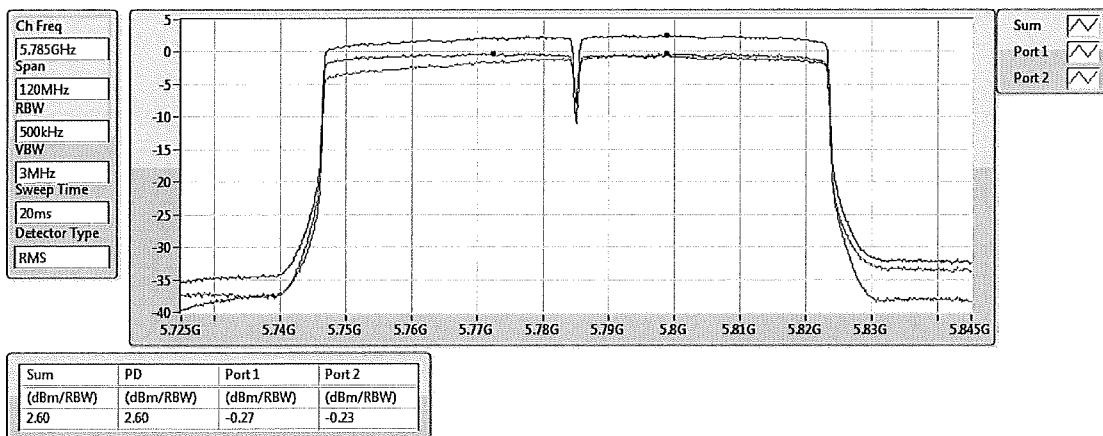
5765MHz

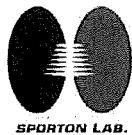


Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5785 MHz

802.11ac VHT80_Nss1,(MCS0)_2TX PSD

5785MHz





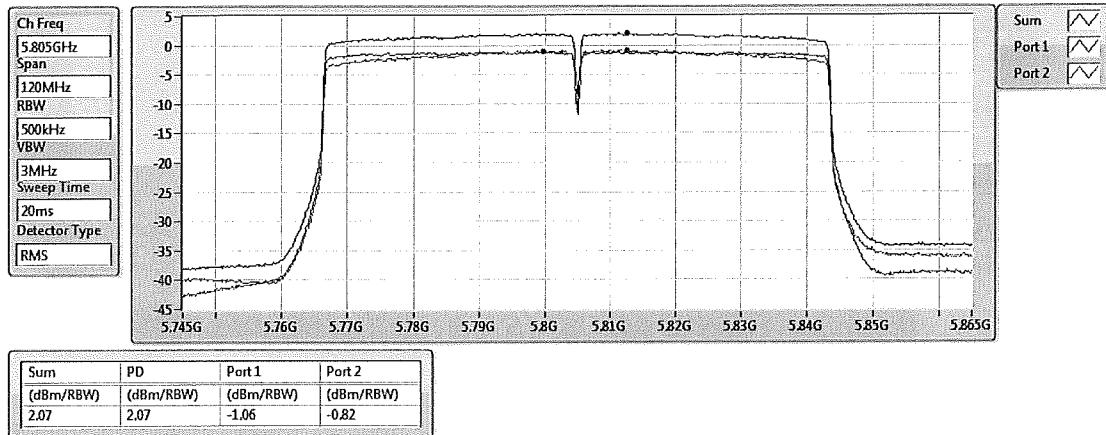
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Power Density Plot on Configuration QPSK, 80M / Port 1 + Port 2 / 5805 MHz

802.11ac VHT80_Nss1,(MCS0)_2TX PSD

5805MHz





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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.

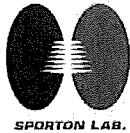
Frequencies (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

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)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 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



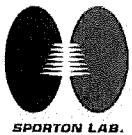
4.6.3. Test Procedures

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.



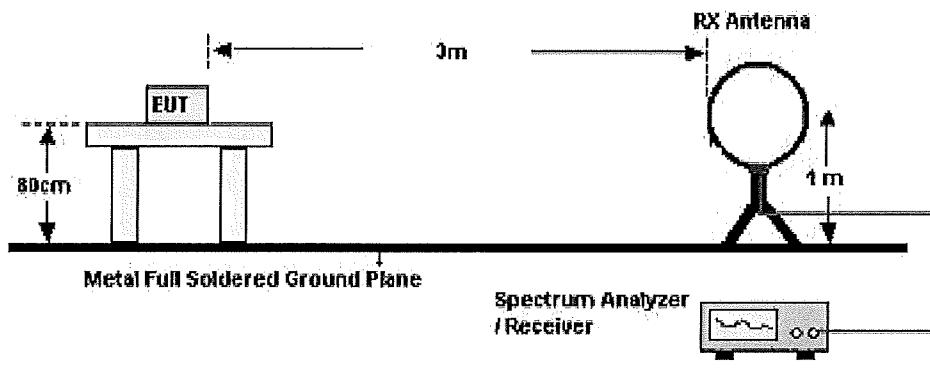
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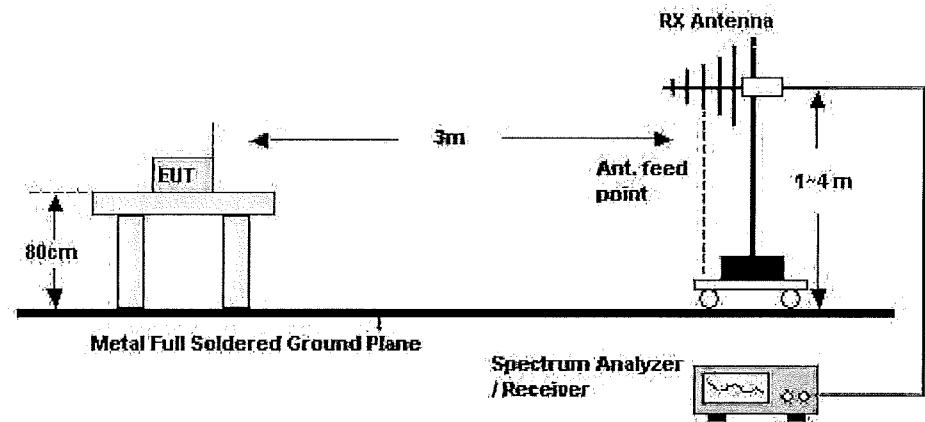
4.6.4. Test Setup Layout

For Radiated test

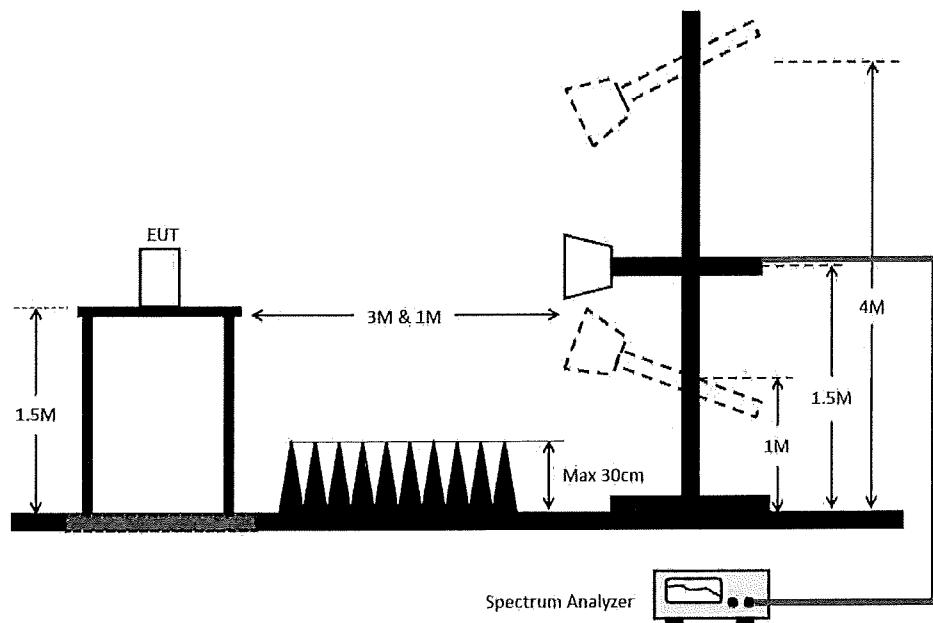
9kHz ~30MHz



30MHz~1GHz

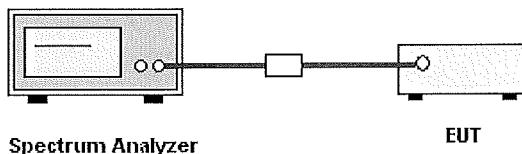


Above 1GHz



For Conducted measurement

For Above 1GHz only:

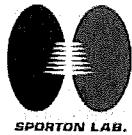


4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.



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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		

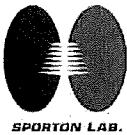
Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

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);

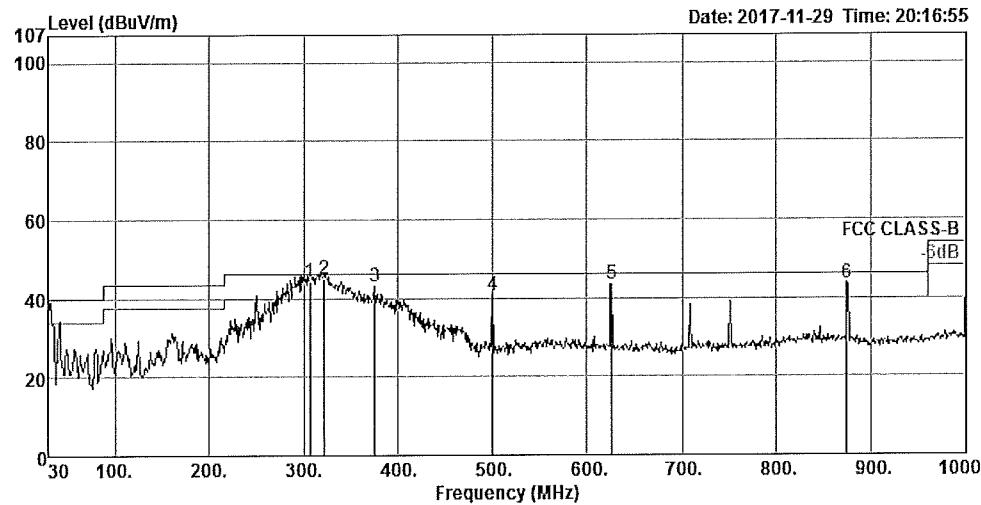
Limit line = specific limits (dBuV) + distance extrapolation factor.



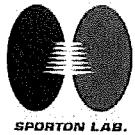
4.6.8. Results of Radiated Emissions (30MHz~1GHz)

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

Horizontal

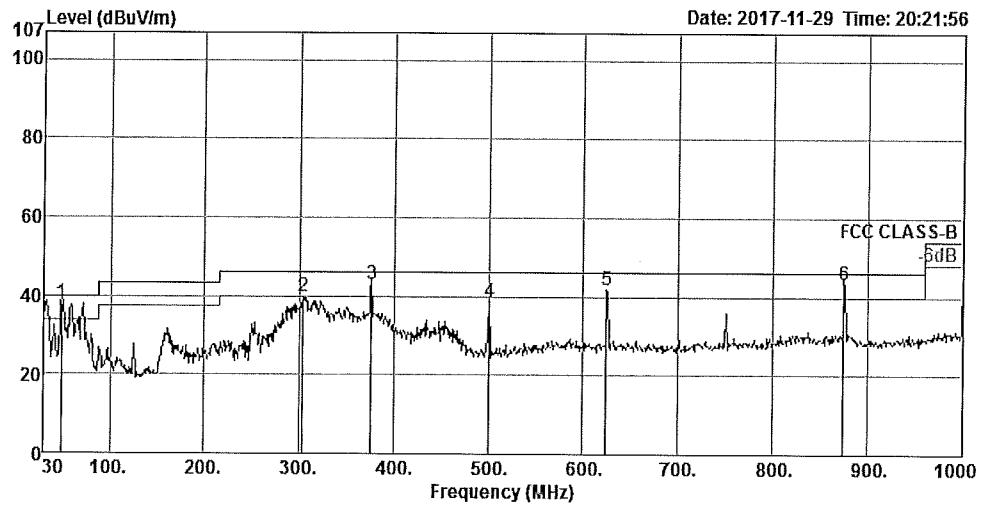


Freq	Level	Limit		Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	306.45	44.20	46.00	-1.80	54.80	2.13	19.19	31.92	100	220	QP	HORIZONTAL
2	321.97	44.86	46.00	-1.14	55.09	2.21	19.50	31.94	100	163	QP	HORIZONTAL
3	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



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Vertical

Freq	Level	Limit	Over	Read	CableAntenna			Preamp	A/Pos	T/Pos	Remark	Pol/Phase
					Line	Limit	Level					
	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) Spurious Level (dBm)	Chain 2 (TX2) Spurious Level (dBm)	Total Spurious Level (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) Spurious Level (dBm)	Chain 2 (TX2) Spurious Level (dBm)	Total Spurious Level (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) Spurious Level (dBm)	Chain 2 (TX2) Spurious Level (dBm)	Total Spurious Level (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