



FCC Test Report

Equipment : Metrolinq2.5 Outdoor 60GHz PTMP + 5GHz
Brand Name : IgniteNet
Model No. : ML2.5-60-BF-18
FCC ID : HEDML2560
Standard : 47 CFR FCC Part 15.407
Operating Band : 5150 MHz – 5250 MHz
5725 MHz – 5850 MHz
Applicant : Accton Technology Corporation
No. 1, Creation Rd. III, Science-based Industrial Park
Hsin Chu 30077, Taiwan R.O.C.
Manufacturer(1) : Joy Technology (Shen Zhen) Co. Ltd
HengKeng Ind., Shangpai, Shangwu, Aiqun Rd., Shiyan
Town, Shenzhen 518108 China
Manufacturer(2) : Accton Technology Corporation
No. 1, Creation Rd. III, Science-based Industrial Park
Hsin Chu 30077, Taiwan R.O.C.
Function : ☒ Outdoor; ☐ Indoor; ☒ Fixed P2P
☐ Client

The product sample received on Aug. 16, 2017 and completely tested on Oct. 14, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.


Cliff Chang
SPORTON INTERNATIONAL INC.



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Summary of Test Result

Conformance Test Specifications			
Report Clause	Ref. Std. Clause	Description	Result
1.1.2	15.203	Antenna Requirement	Complied
3.2	15.407(a)	Maximum Conducted Output Power	Complied
3.2	15.407(a)	Peak Power Spectral Density	Complied



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FCC ID: HEDML2560

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5150-5250	a, n (HT20), ac (VHT20)	5180-5240	36-48 [4]
5725-5850		5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40)	5190-5230	38-46 [2]
5725-5850		5755-5795	151-159 [2]
5150-5250	ac (VHT80)	5210	42 [1]
5725-5850		5775	155 [1]

Note 1:

- 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40 and VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

Note 2: This device contains transmitter 60GHz module FCC ID: HEDML60PRS4601

Note 3: WLAN and 60G work at the same time.

1.1.2 Antenna Information

Ant.	Brand	Part Number	Antenna Type	Connector	Gain (dBi)	
					Band 1	Band 4
1	Accton	120G00000176X	Dish Antenna	N/A	10.1	12.1

Note: Port 1 and Port 2 connect to Ant. 1

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11a	0.968	0.141	2.068m	1k
802.11ac VHT20	0.987	0.057	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
802.11ac VHT40	0.968	0.141	2.433m	1k
802.11ac VHT80	0.941	0.264	1.153m	1k

1.1.4 EUT Operational Condition

EUT Power Type	From PoE / DC 48V			
Beamforming Function	☐	With beamforming	☒	Without beamforming

1.1.5 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR781526

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Adding a new set of the equipment, the detail information for this new set as below: - Adding a new equipment name: Metrolinq2.5 Outdoor 60GHz PTMP + 5GHz - Adding a new model name: ML2.5-60-BF-18 - Containing a new 60G module (FCC ID: HEDML60PRS4601). - Adding a new antenna which with the same type and lower gain (Brand: Accton, P/N: 120G00000176X). - Adding the point to multipoint function.	Re-evaluated Maximum Conducted Output Power and Peak Power Spectral Density limit.

Based on original output power to test above items.

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2013
- ◆ FCC KDB 789033 D02 v01r04
- ◆ FCC KDB 644545 D03 v01
- ◆ FCC KDB 662911 D01 v02r01
- ◆

1.3 Testing Location Information

Testing Location		
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-CB	Ron Huang	22.6°C / 62%	Oct. 14, 2017

Test site Designation No. TW0006 with FCC

Test site registered number IC 4086D with Industry Canada.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Output Power Measurement	1.33 dB	Confidence levels of 95%
Power Density Measurement	1.27 dB	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	10.5
5200MHz	11
5240MHz	11
5745MHz	12.5
5785MHz	12.5
5825MHz	13
802.11ac VHT20_Nss1,(MCS0)_2TX	-
5180MHz	11
5200MHz	11.5
5240MHz	11.5
5745MHz	13
5785MHz	12.5
5825MHz	13
802.11ac VHT40_Nss1,(MCS0)_2TX	-
5190MHz	12.5
5230MHz	13
5755MHz	11.5
5795MHz	11.5
802.11ac VHT80_Nss1,(MCS0)_2TX	-
5210MHz	12
5775MHz	12.5

Note: VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	Maximum Conducted Output Power Peak Power Spectral Density
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 5GHz + 60GHz
Refer to Sporton Test Report No.: FA791405-02 for Co-location RF Exposure Evaluation.	

Note: 1. The EUT can only be used in Y axis.

2. The defines from manufacturer, "USB port" without any function, and it was performed test at the load.

3. The test configuration and test modes written in this test report are designated by the applicant.

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

Accessories				
No.	Equipment Name	Brand Name	Model Name	Rating
1	PoE	GME	GME241DA-480050G	Input: 100-240Vac, 50-60Hz, 0.55A Output: 48Vdc, 0.5A
Other				
Power cable*1, Non-Shielded, 0.9m				

2.5 Support Equipment

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	NB	DELL	E4300	DoC

3 Transmitter Test Result

3.1 Maximum Conducted Output Power

3.1.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
☐	- Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. e.i.r.p. at any elevation angle above 30 degrees ≤ 125mW [21dBm] - Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ - Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$. - Mobile or Portable Client: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☐	For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☐	For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☒ For the 5.725-5.85 GHz band:	
☐	- Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
LE-LAN Devices	
☐	For the 5.15-5.25 GHz band, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
☐	For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
☐	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
☐ For the 5.725-5.85 GHz band:	
☐	- Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

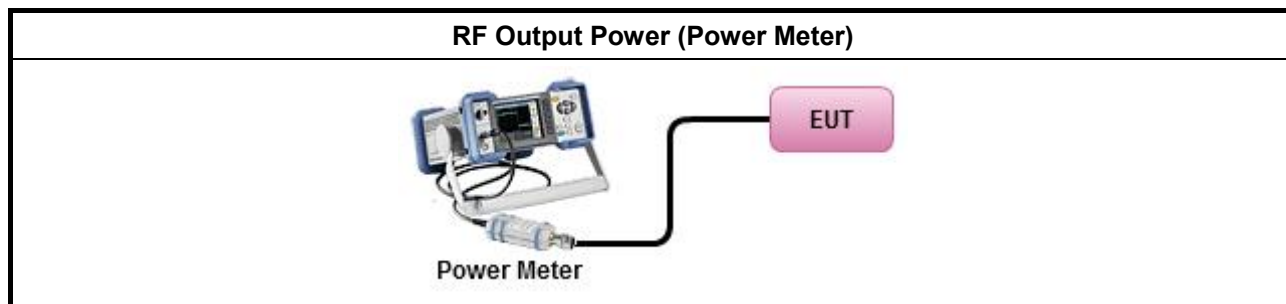
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method	
Maximum Conducted Output Power	
Average over on/off periods with duty factor	
☐	Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).
☐	Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
Wideband RF power meter and average over on/off periods with duty factor	
☒	Refer as FCC KDB 789033, clause E Method PM-G (using an RF average power meter).
For conducted measurement.	
If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.	
If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

3.1.4 Test Setup



3.1.5 Test Result of Maximum Conducted Output Power

Refer as Appendix A

3.2 Peak Power Spectral Density

3.2.1 Peak Power Spectral Density Limit

Peak Power Spectral Density Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
	- Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$. - Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$. - Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 23$ dBi, then $P_{Out} = 17 - (G_{TX} - 23)$. - Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.
☐ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
☐ For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
☒ For the 5.725-5.85 GHz band:	
	- Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
LE-LAN Devices	
☐ For the 5.15-5.25 GHz band, the peak power spectral density (PPSD) ≤ 4 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) ≤ 10 dBm/MHz.	
☐ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) ≤ 17 dBm/MHz.	
	e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below: -13 dBW/MHz for $0^\circ \leq \theta < 8^\circ$; $-13 - 0.716 (\theta - 8)$ dBW/MHz for $8^\circ \leq \theta < 40^\circ$; $-35.9 - 1.22 (\theta - 40)$ dBW/MHz for $40^\circ \leq \theta \leq 45^\circ$; -42 dBW/MHz for $\theta > 45^\circ$
☐ For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) ≤ 17 dBm/MHz.	
☐ For the 5.725-5.85 GHz band:	
	- Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
PPSD = peak power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz G_{TX} = the maximum transmitting antenna directional gain in dBi.	

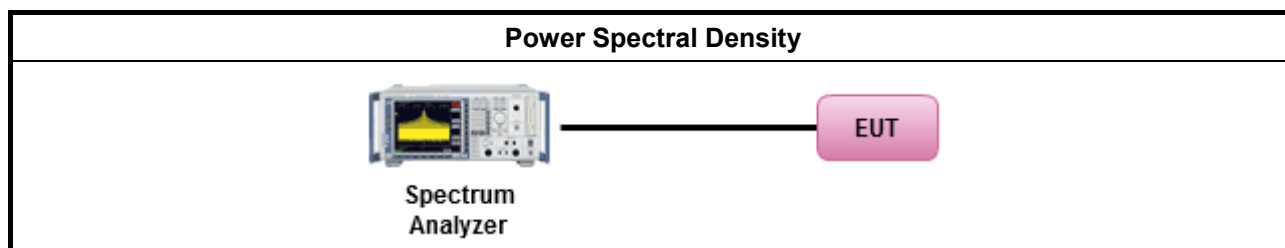
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options:	
☐ Refer as FCC KDB 789033, F5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth	
[duty cycle ≥ 98% or external video / power trigger]	
☒ Refer as FCC KDB 789033, clause E Method SA-1 (spectral trace averaging).	
☐ Refer as FCC KDB 789033, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)	
duty cycle < 98% and average over on/off periods with duty factor	
☒ Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).	
☐ Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)	
For conducted measurement.	
If the EUT supports multiple transmit chains using options given below:	
☒ Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.	
☐ Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,	
☐ Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.	
If multiple transmit chains, EIRP PPSD calculation could be following as methods: $PPSD_{total} = PPSD_1 + PPSD_2 + \dots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$	

3.2.4 Test Setup





3.2.5 Test Result of Peak Power Spectral Density

Refer as Appendix B

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 26, 2016	Dec. 25, 2017	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2017	Jun. 01, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 22, 2016	Nov. 21, 2017	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

Summary

Mode	Total Power (dBm)	Total Power (W)	EIRP/ EIRP- Elevation 30° (dBm)	EIRP/ EIRP- Elevation 30° (W)
5.15-5.25GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	15.77	0.03776	25.87/9.26	0.38637/0.00843
802.11ac VHT20_Nss1,(MCS0)_2TX	16.01	0.03990	26.11/9.50	0.40832/0.00891
802.11ac VHT40_Nss1,(MCS0)_2TX	18.55	0.07161	28.65/12.04	0.73282/0.01599
802.11ac VHT80_Nss1,(MCS0)_2TX	16.89	0.04887	26.99/10.38	0.50003/0.01091
5.725-5.85GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	15.88	0.03873	27.98	0.62806
802.11ac VHT20_Nss1,(MCS0)_2TX	15.93	0.03917	28.03	0.63533
802.11ac VHT40_Nss1,(MCS0)_2TX	15.46	0.03516	27.56	0.57016
802.11ac VHT80_Nss1,(MCS0)_2TX	15.90	0.03890	28.00	0.63096

Result

Mode	Result	Directional Gain (Output Power) / Gain- Elevation 30°	Port 1	Port 2	Total Power	Power Limit	EIRP / EIRP- Elevation 30°	EIRP Limit / EIRP Limit- Elevation 30°
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-
5180MHz	Pass	10.10/-6.51	13.38	11.00	15.36	25.90	25.46/8.85	36.00/21.00
5200MHz	Pass	10.10/-6.51	13.82	11.36	15.77	25.90	25.87/9.26	36.00/21.00
5240MHz	Pass	10.10/-6.51	13.29	11.00	15.30	25.90	25.40/8.79	36.00/21.00
5745MHz	Pass	12.10	13.82	10.70	15.54	23.90	27.64	36.00
5785MHz	Pass	12.10	14.14	11.08	15.88	23.90	27.98	36.00
5825MHz	Pass	12.10	13.97	11.21	15.82	23.90	27.92	36.00
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
5180MHz	Pass	10.10/-6.51	13.38	11.38	15.50	25.90	25.60/8.99	36.00/21.00
5200MHz	Pass	10.10/-6.51	14.00	11.69	16.01	25.90	26.11/9.50	36.00/21.00
5240MHz	Pass	10.10/-6.51	13.83	11.23	15.73	25.90	25.83/9.22	36.00/21.00
5745MHz	Pass	12.10	14.20	11.11	15.93	23.90	28.03	36.00
5785MHz	Pass	12.10	13.95	10.92	15.70	23.90	27.80	36.00
5825MHz	Pass	12.10	13.90	11.24	15.78	23.90	27.88	36.00
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
5190MHz	Pass	10.10/-6.51	16.32	14.08	18.35	25.90	28.45/11.84	36.00/21.00
5230MHz	Pass	10.10/-6.51	16.66	14.04	18.55	25.90	28.65/12.04	36.00/21.00
5755MHz	Pass	12.10	13.71	10.67	15.46	23.90	27.56	36.00
5795MHz	Pass	12.10	14.00	9.96	15.44	23.90	27.54	36.00
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
5210MHz	Pass	10.10/-6.51	14.82	12.68	16.89	25.90	26.99/10.38	36.00/21.00
5775MHz	Pass	12.10	14.09	11.22	15.90	23.90	28.00	36.00

DG = Directional Gain; **Port X** = Port X output power

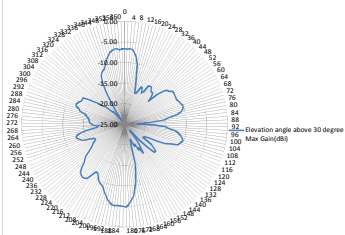


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Elevation angle above 30 degree Max Gain(dBi)		-6.51
Freq. (MHz)	S180	Elevation Angle Define
H-Plan angle(Degree)	Gain(dBm)	
0	-6.65	Above 30°
2	-6.71	
4	-6.59	
6	-6.75	
8	-7.42	
10	-6.56	
12	-10.11	
14	-13.13	
16	-14.99	
18	-17.00	
20	-16.98	
22	-16.22	
24	-15.12	
26	-15.21	
28	-16.38	
30	-15.86	
32	-14.00	
34	-13.67	
36	-13.85	
38	-14.65	
40	-14.79	
42	-14.75	
44	-15.56	
46	-16.88	
48	-14.09	
50	-12.42	
52	-11.68	
54	-11.57	
56	-10.90	
58	-10.82	
60	-10.94	
62	-10.96	
64	-11.05	
66	-10.95	
68	-10.66	
70	-10.46	
72	-10.15	
74	-10.18	
76	-10.50	
78	-11.00	
80	-11.94	
82	-14.27	
84	-15.30	
86	-19.04	
88	-21.99	
90	-21.75	
92	-17.83	
94	-15.09	
96	-14.17	
98	-12.50	
100	-11.67	
102	-11.11	
104	-10.58	
106	-10.32	
108	-10.56	
110	-10.89	
112	-11.23	
114	-12.89	
116	-14.08	
118	-16.14	
120	-18.26	
122	-19.27	
124	-19.40	
126	-19.54	
128	-16.92	
130	-15.66	
132	-15.00	
134	-15.03	
136	-17.52	
138	-20.32	
140	-23.07	
142	-22.93	
144	-19.99	
146	-18.31	
148	-16.74	
150	-16.33	0° ~ 30°
152	-17.89	
154	-19.55	
156	-18.17	
158	-20.00	
160	-21.12	
162	-20.57	
164	-19.10	
166	-14.83	
168	-12.74	
170	-10.66	
172	-8.94	
174	-7.38	
176	-6.50	
178	-5.51	
180	-4.91	0° reference angle
182	-5.04	
184	-6.11	
186	-5.24	
188	-5.09	
190	-5.19	
192	-5.65	
194	-6.31	
196	-7.26	
198	-7.80	
200	-6.76	0° ~ 30°
202	-5.26	
204	-6.95	
206	-6.97	
208	-10.80	
210	-11.39	
212	-11.51	
214	-10.36	
216	-8.94	
218	-8.64	
220	-8.54	
222	-8.79	
224	-9.21	
226	-10.14	Above 30°
228	-11.57	
230	-12.16	
232	-12.82	
234	-13.99	
236	-14.98	
238	-15.62	
240	-15.96	
242	-16.89	
244	-17.04	
246	-16.97	
248	-16.11	
250	-14.24	
252	-13.64	
254	-13.23	
256	-12.75	
258	-13.03	
260	-13.79	
262	-15.60	
264	-17.40	
266	-18.39	
268	-18.55	
270	-17.22	
272	-16.95	
274	-16.46	
276	-16.43	
278	-16.24	
280	-16.26	
282	-15.76	
284	-15.52	
286	-14.90	
288	-13.71	
290	-13.34	
292	-12.44	
294	-12.20	
296	-12.40	
298	-12.61	
300	-13.02	
302	-13.08	
304	-13.04	
306	-14.34	
308	-15.69	
310	-16.80	
312	-18.35	
314	-18.60	
316	-20.25	
318	-20.92	
320	-20.83	
322	-23.00	
324	-23.86	
326	-23.86	
328	-21.48	
330	-19.09	
332	-15.69	
334	-13.45	
336	-11.96	
338	-11.27	
340	-10.88	
342	-10.60	
344	-9.67	
346	-8.72	
348	-8.00	
350	-7.26	
352	-6.88	
354	-6.57	
356	-6.51	
358	-6.89	
360	-6.65	

Elevation angle above 30 degree Max Gain(dBi)



Summary

Mode	Total Power (dBm)	Total Power (W)
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	15.77	0.03776
802.11ac VHT20_Nss1,(MCS0)_2TX	16.01	0.03990
802.11ac VHT40_Nss1,(MCS0)_2TX	18.55	0.07161
802.11ac VHT80_Nss1,(MCS0)_2TX	16.89	0.04887
5.725-5.85GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	15.88	0.03873
802.11ac VHT20_Nss1,(MCS0)_2TX	15.93	0.03917
802.11ac VHT40_Nss1,(MCS0)_2TX	15.46	0.03516
802.11ac VHT80_Nss1,(MCS0)_2TX	15.90	0.03890

Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	10.10	13.38	11.00	15.36	30.00
5200MHz	Pass	10.10	13.82	11.36	15.77	30.00
5240MHz	Pass	10.10	13.29	11.00	15.30	30.00
5745MHz	Pass	12.10	13.82	10.70	15.54	30.00
5785MHz	Pass	12.10	14.14	11.08	15.88	30.00
5825MHz	Pass	12.10	13.97	11.21	15.82	30.00
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	10.10	13.38	11.38	15.50	30.00
5200MHz	Pass	10.10	14.00	11.69	16.01	30.00
5240MHz	Pass	10.10	13.83	11.23	15.73	30.00
5745MHz	Pass	12.10	14.20	11.11	15.93	30.00
5785MHz	Pass	12.10	13.95	10.92	15.70	30.00
5825MHz	Pass	12.10	13.90	11.24	15.78	30.00
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	10.10	16.32	14.08	18.35	30.00
5230MHz	Pass	10.10	16.66	14.04	18.55	30.00
5755MHz	Pass	12.10	13.71	10.67	15.46	30.00
5795MHz	Pass	12.10	14.00	9.96	15.44	30.00
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	10.10	14.82	12.68	16.89	30.00
5775MHz	Pass	12.10	14.09	11.22	15.90	30.00

DG = Directional Gain; **Port X** = Port X output power

Summary

Mode	PD (dBm/RBW)
5.15-5.25GHz	-
802.11a_Nss1,(6Mbps)_2TX	2.63
802.11ac VHT20_Nss1,(MCS0)_2TX	2.51
802.11ac VHT40_Nss1,(MCS0)_2TX	2.44
802.11ac VHT80_Nss1,(MCS0)_2TX	-2.13
5.725-5.85GHz	-
802.11a_Nss1,(6Mbps)_2TX	1.36
802.11ac VHT20_Nss1,(MCS0)_2TX	0.98
802.11ac VHT40_Nss1,(MCS0)_2TX	-2.08
802.11ac VHT80_Nss1,(MCS0)_2TX	-4.62

RBW = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	13.11	0.50	-1.73	2.52	9.89
5200MHz	Pass	13.11	0.68	-1.55	2.63	9.89
5240MHz	Pass	13.11	0.45	-2.07	2.34	9.89
5745MHz	Pass	15.11	-0.73	-3.54	0.88	20.89
5785MHz	Pass	15.11	-0.34	-3.22	1.36	20.89
5825MHz	Pass	15.11	-0.57	-3.20	1.20	20.89
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	13.11	0.48	-1.77	2.44	9.89
5200MHz	Pass	13.11	0.62	-1.79	2.51	9.89
5240MHz	Pass	13.11	0.32	-2.29	2.21	9.89
5745MHz	Pass	15.11	-0.65	-3.73	0.98	20.89
5785MHz	Pass	15.11	-1.07	-3.83	0.67	20.89
5825MHz	Pass	15.11	-1.21	-3.62	0.68	20.89
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	13.11	0.30	-1.74	2.30	9.89
5230MHz	Pass	13.11	0.65	-2.04	2.44	9.89
5755MHz	Pass	15.11	-3.69	-6.91	-2.08	20.89
5795MHz	Pass	15.11	-3.73	-6.69	-2.09	20.89
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	13.11	-4.16	-6.35	-2.13	9.89
5775MHz	Pass	15.11	-6.17	-9.59	-4.62	20.89

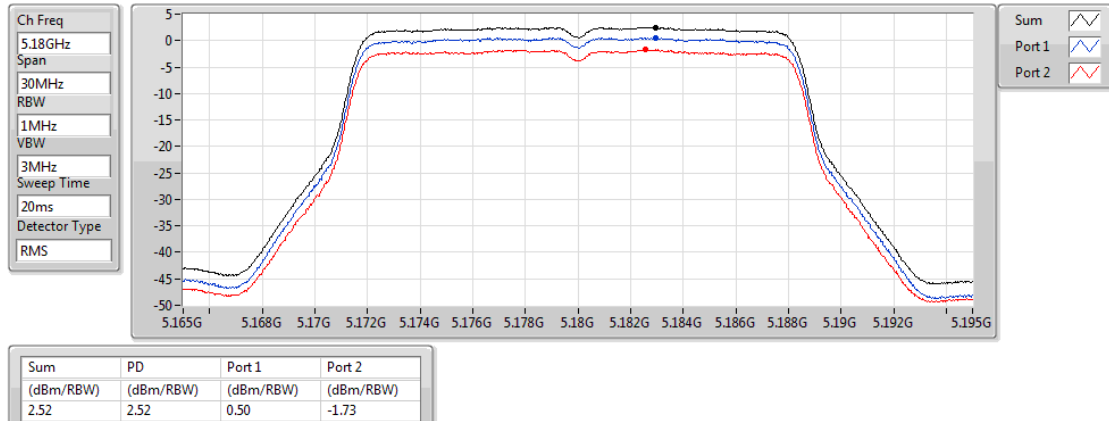
DG = Directional Gain; **RBW** = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

802.11a_Nss1,(6Mbps)_2TX

PSD

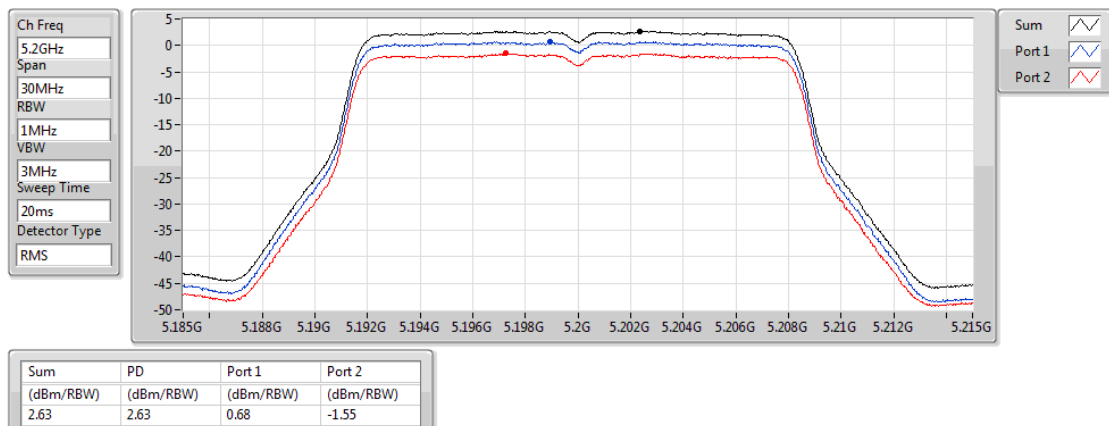
5180MHz



802.11a_Nss1,(6Mbps)_2TX

PSD

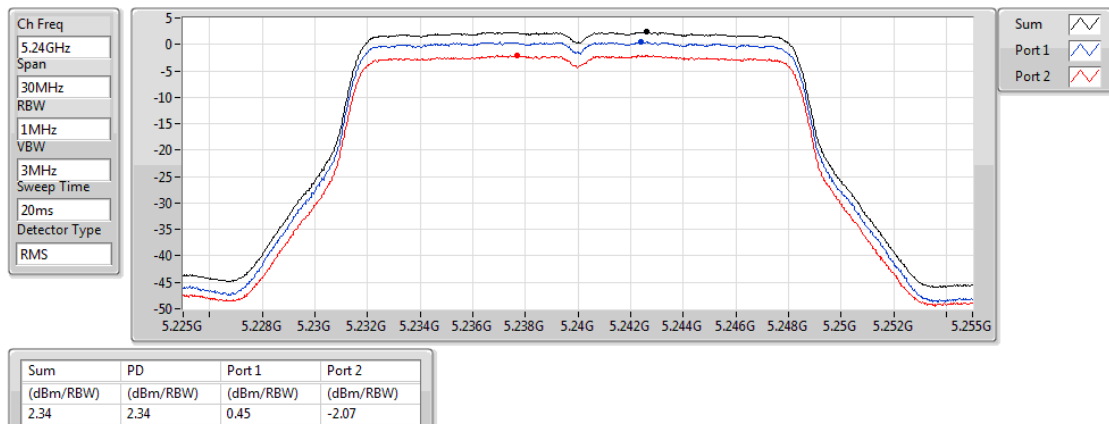
5200MHz



802.11a_Nss1,(6Mbps)_2TX

PSD

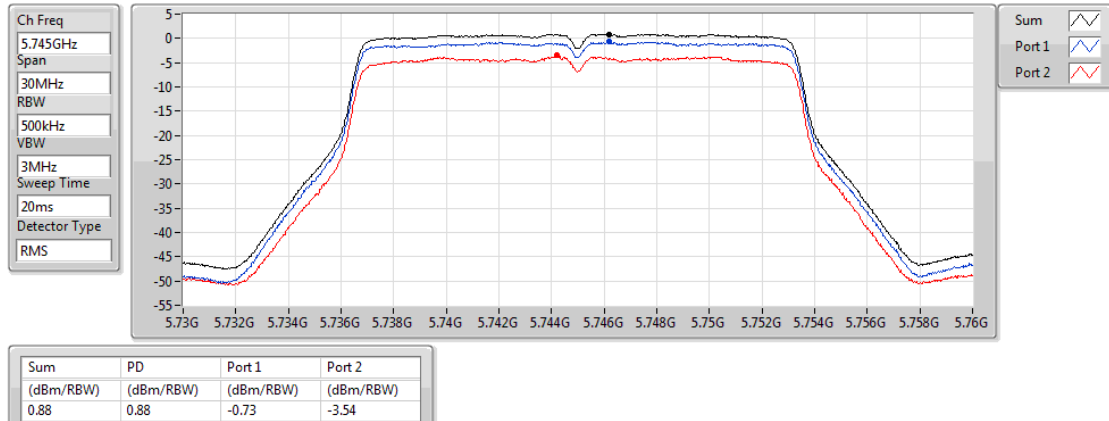
5240MHz



802.11a_Nss1,(6Mbps)_2TX

PSD

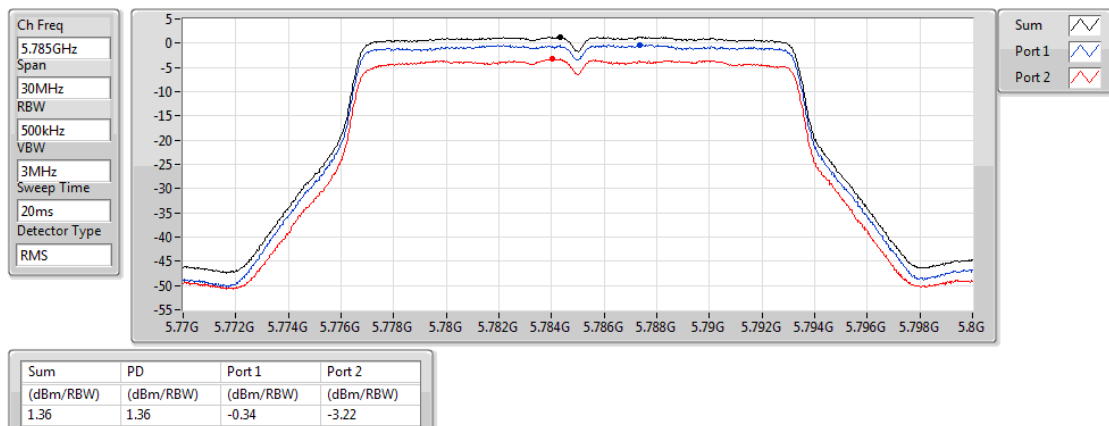
5745MHz



802.11a_Nss1,(6Mbps)_2TX

PSD

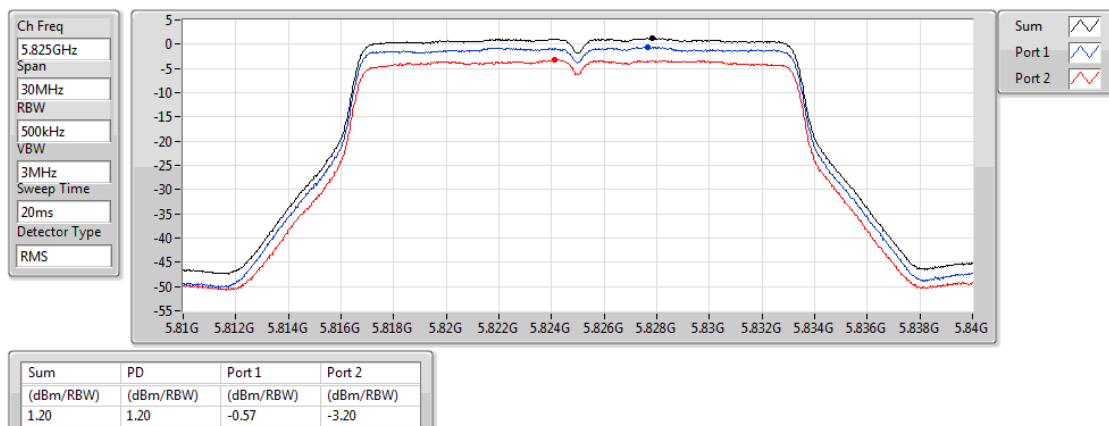
5785MHz



802.11a_Nss1,(6Mbps)_2TX

PSD

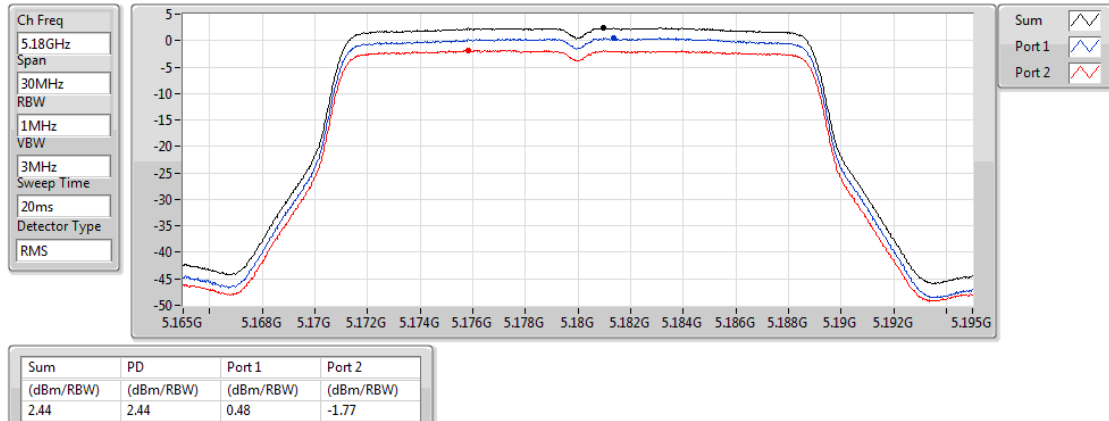
5825MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

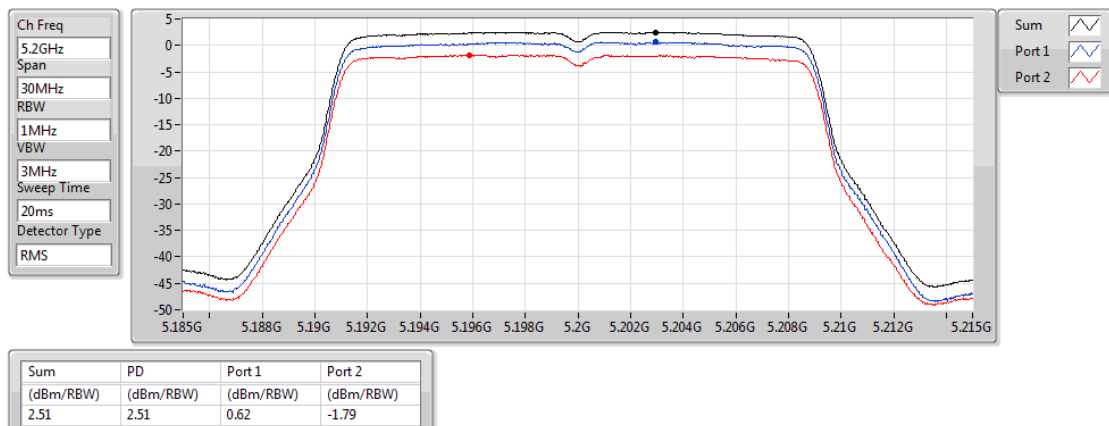
5180MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

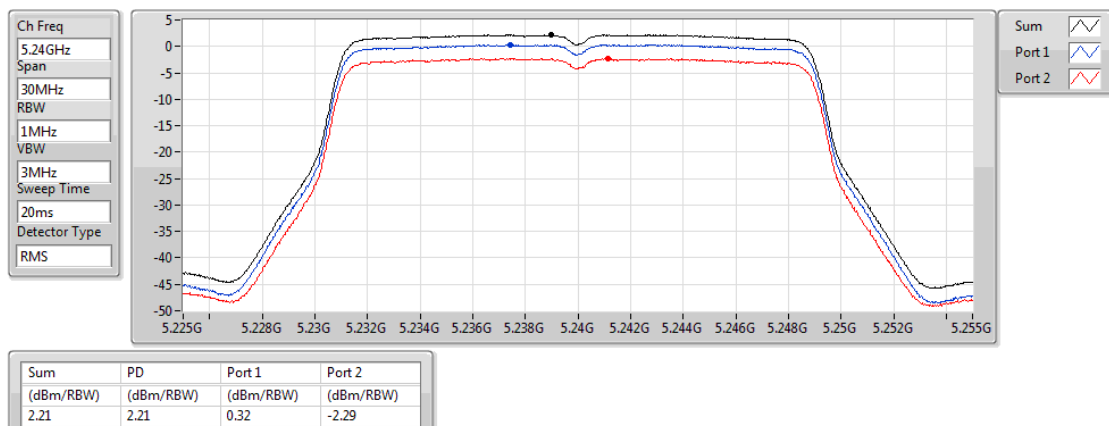
5200MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

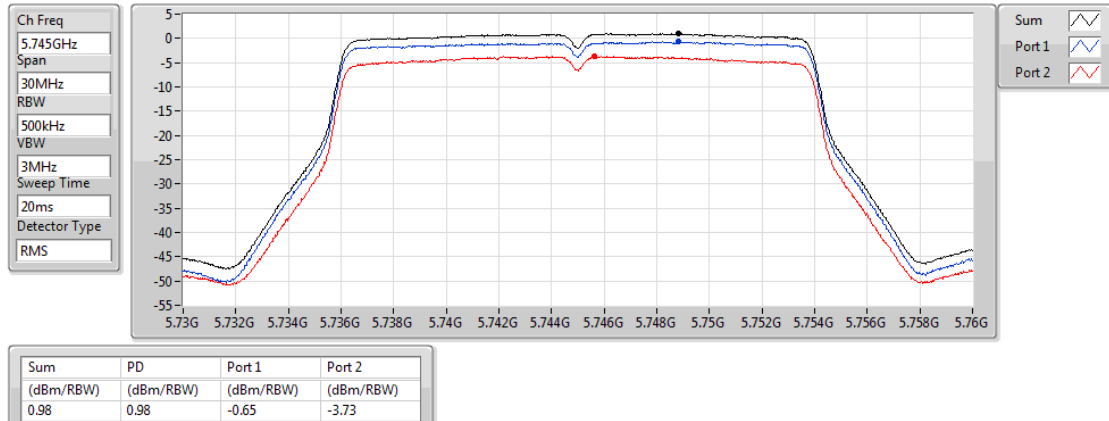
5240MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

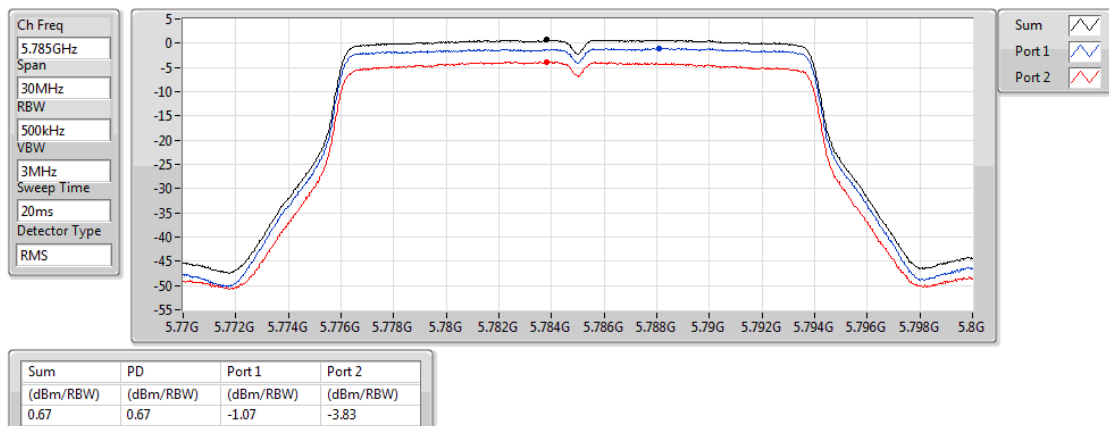
5745MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

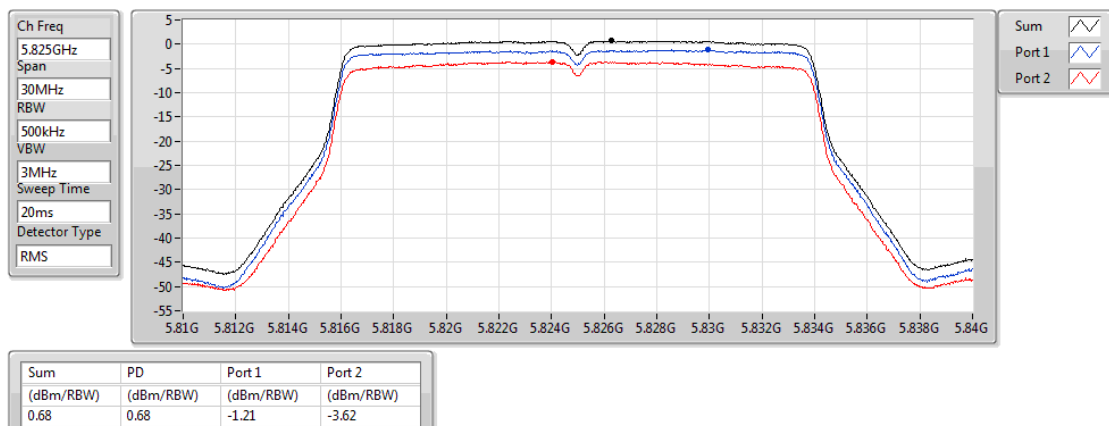
5785MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

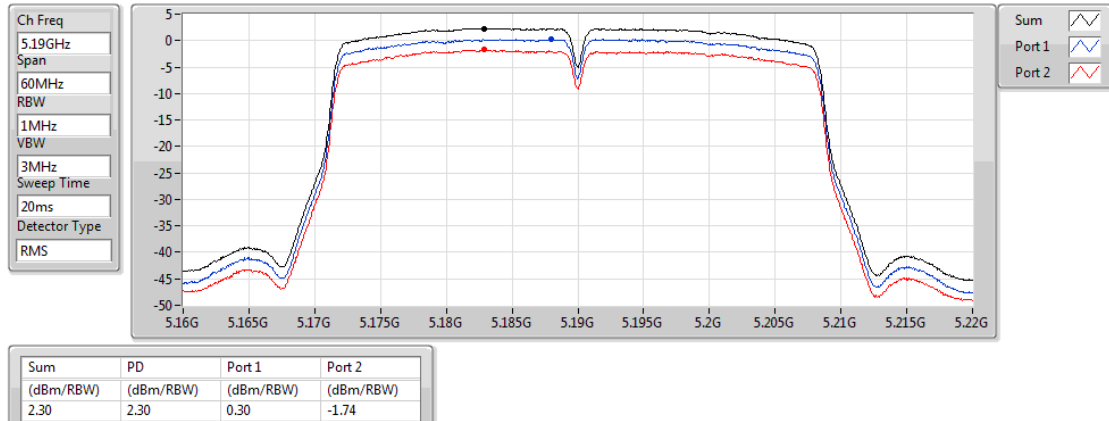
5825MHz



802.11ac VHT40_Nss1,(MCS0)_2TX

PSD

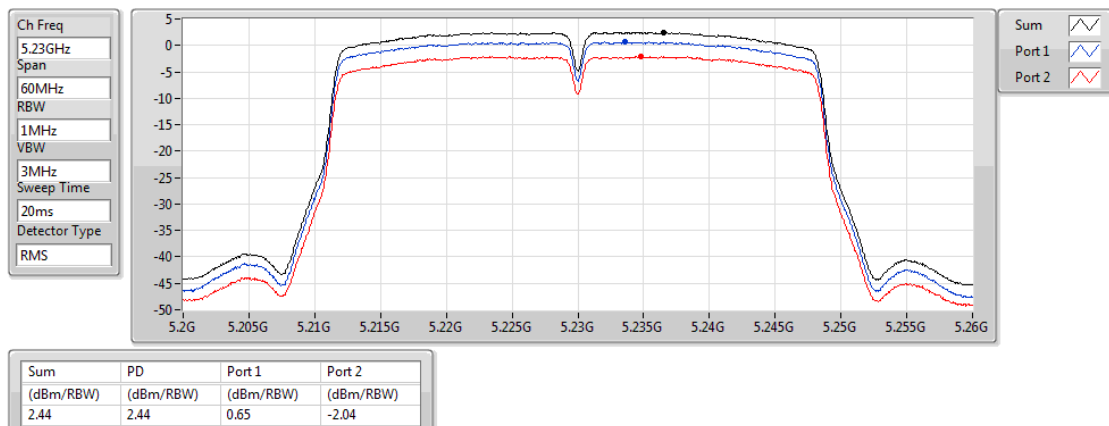
5190MHz



802.11ac VHT40_Nss1,(MCS0)_2TX

PSD

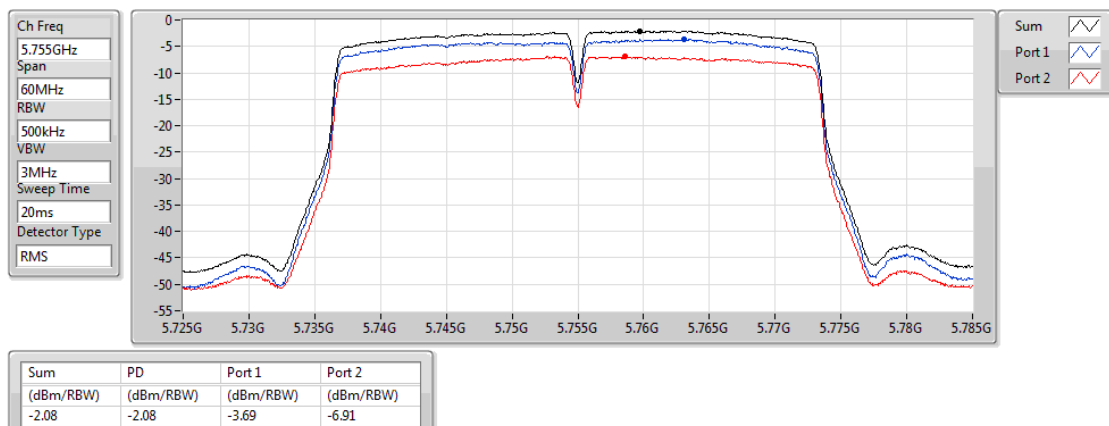
5230MHz



802.11ac VHT40_Nss1,(MCS0)_2TX

PSD

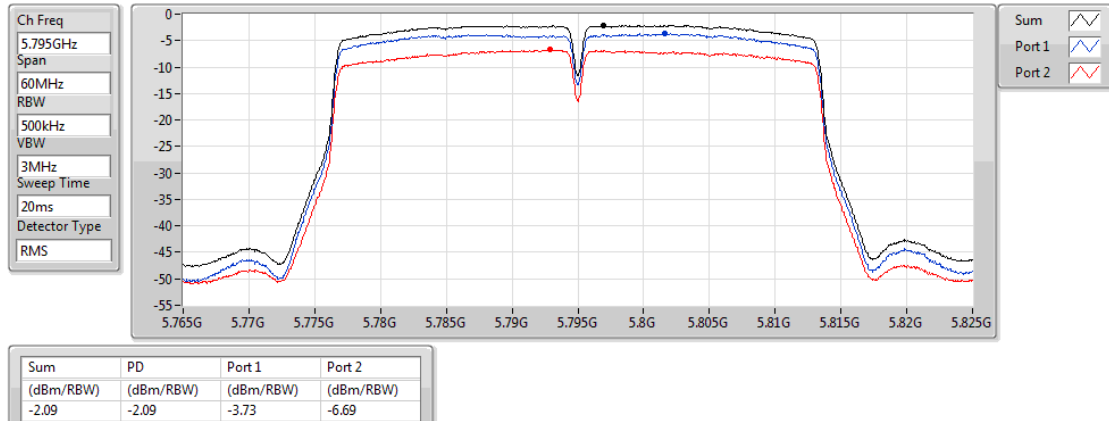
5755MHz



802.11ac VHT40_Nss1,(MCS0)_2TX

PSD

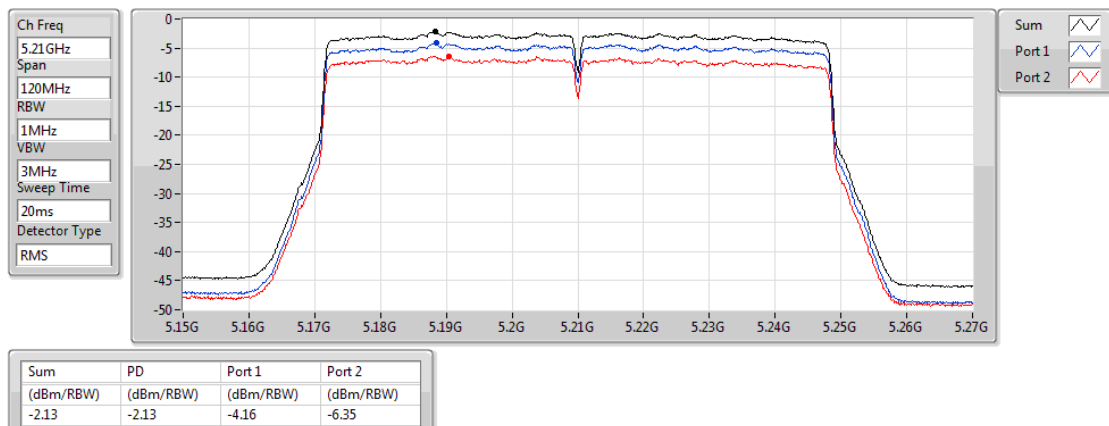
5795MHz



802.11ac VHT80_Nss1,(MCS0)_2TX

PSD

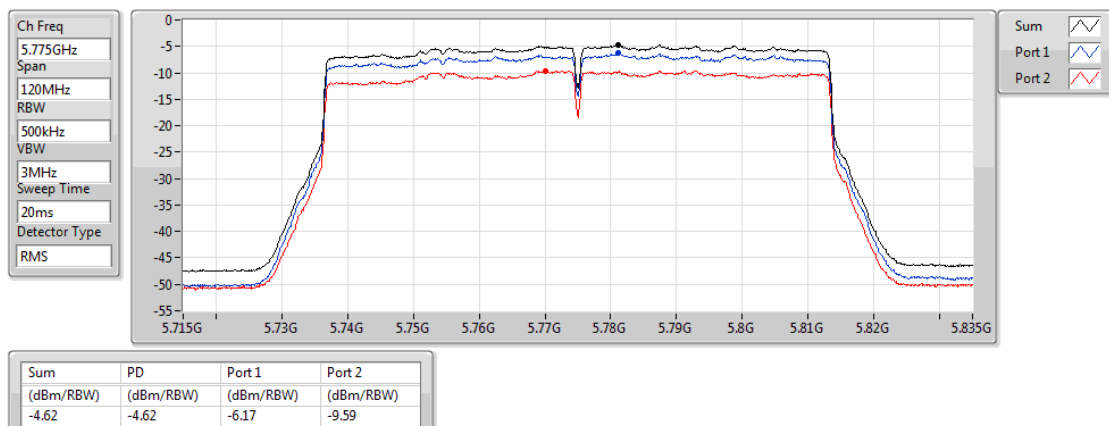
5210MHz



802.11ac VHT80_Nss1,(MCS0)_2TX

PSD

5775MHz



Summary

Mode	PD (dBm/RBW)
5.15-5.25GHz	-
802.11a_Nss1,(6Mbps)_2TX	2.63
802.11ac VHT20_Nss1,(MCS0)_2TX	2.51
802.11ac VHT40_Nss1,(MCS0)_2TX	2.44
802.11ac VHT80_Nss1,(MCS0)_2TX	-2.13
5.725-5.85GHz	-
802.11a_Nss1,(6Mbps)_2TX	1.36
802.11ac VHT20_Nss1,(MCS0)_2TX	0.98
802.11ac VHT40_Nss1,(MCS0)_2TX	-2.08
802.11ac VHT80_Nss1,(MCS0)_2TX	-4.62

RBW = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	13.11	0.50	-1.73	2.52	17.00
5200MHz	Pass	13.11	0.68	-1.55	2.63	17.00
5240MHz	Pass	13.11	0.45	-2.07	2.34	17.00
5745MHz	Pass	15.11	-0.73	-3.54	0.88	30.00
5785MHz	Pass	15.11	-0.34	-3.22	1.36	30.00
5825MHz	Pass	15.11	-0.57	-3.20	1.20	30.00
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	13.11	0.48	-1.77	2.44	17.00
5200MHz	Pass	13.11	0.62	-1.79	2.51	17.00
5240MHz	Pass	13.11	0.32	-2.29	2.21	17.00
5745MHz	Pass	15.11	-0.65	-3.73	0.98	30.00
5785MHz	Pass	15.11	-1.07	-3.83	0.67	30.00
5825MHz	Pass	15.11	-1.21	-3.62	0.68	30.00
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	13.11	0.30	-1.74	2.30	17.00
5230MHz	Pass	13.11	0.65	-2.04	2.44	17.00
5755MHz	Pass	15.11	-3.69	-6.91	-2.08	30.00
5795MHz	Pass	15.11	-3.73	-6.69	-2.09	30.00
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	13.11	-4.16	-6.35	-2.13	17.00
5775MHz	Pass	15.11	-6.17	-9.59	-4.62	30.00

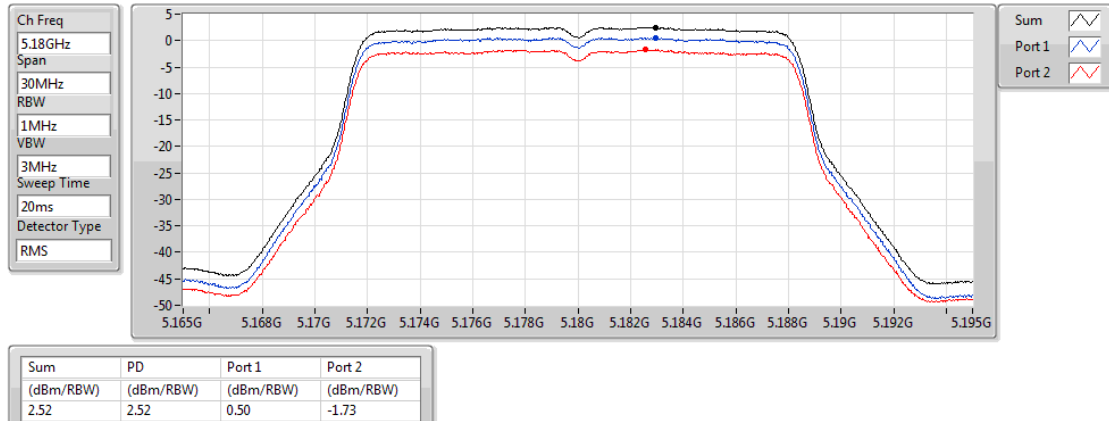
DG = Directional Gain; **RBW** = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

802.11a_Nss1,(6Mbps)_2TX

PSD

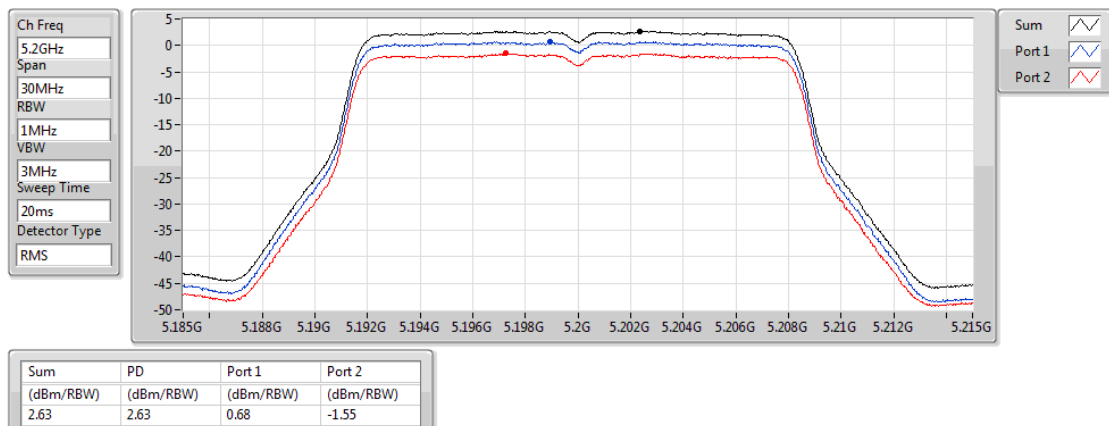
5180MHz



802.11a_Nss1,(6Mbps)_2TX

PSD

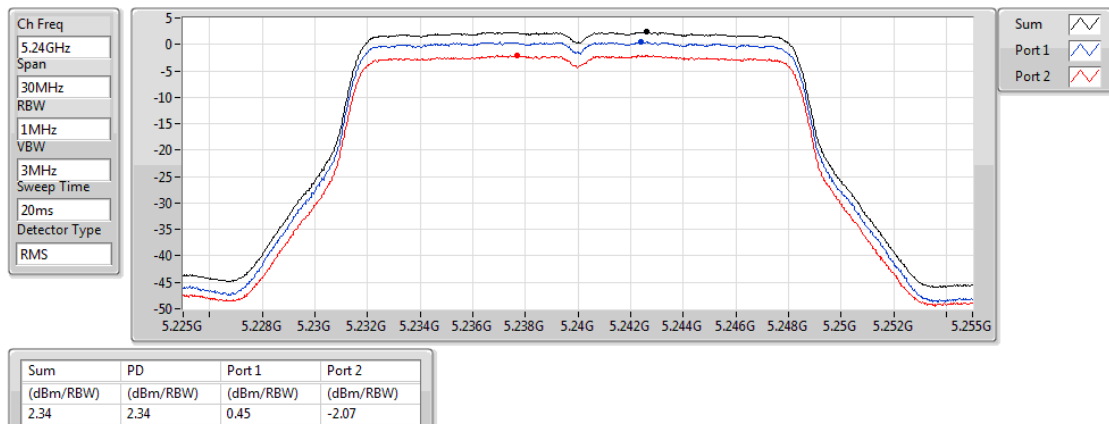
5200MHz



802.11a_Nss1,(6Mbps)_2TX

PSD

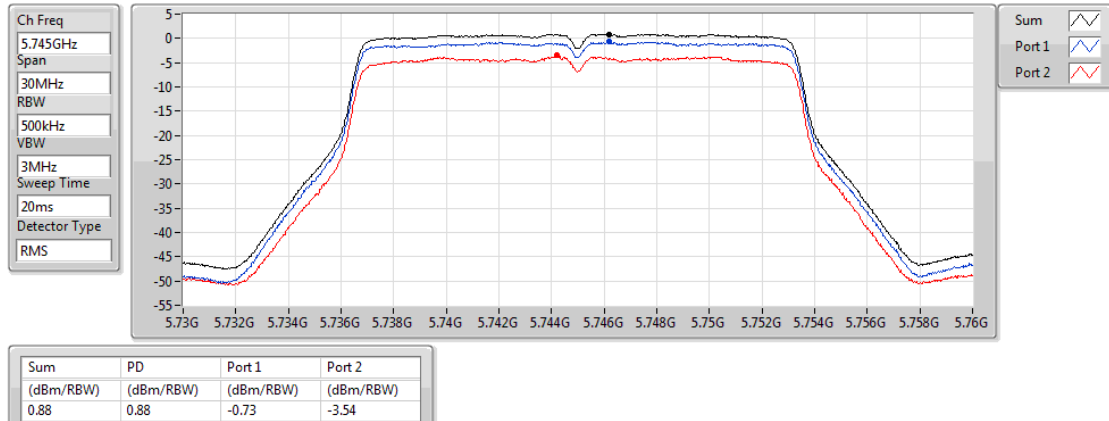
5240MHz



802.11a_Nss1,(6Mbps)_2TX

PSD

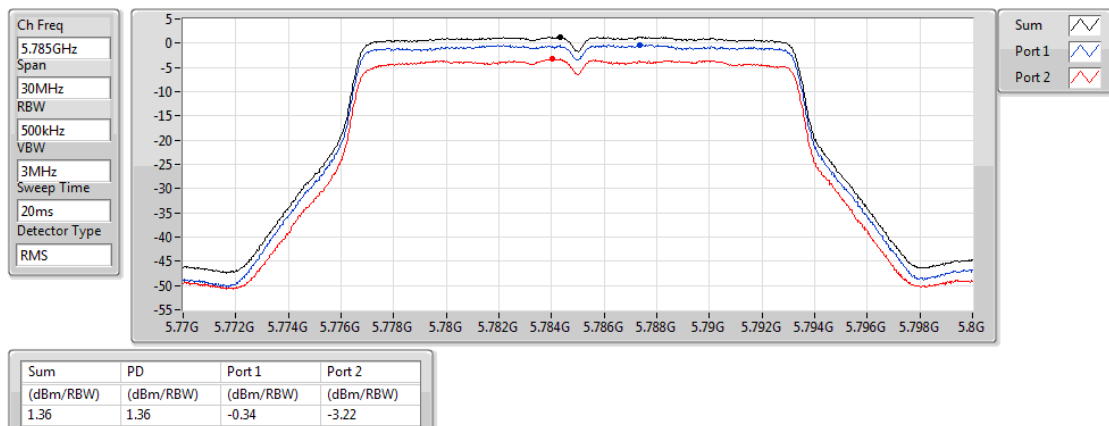
5745MHz



802.11a_Nss1,(6Mbps)_2TX

PSD

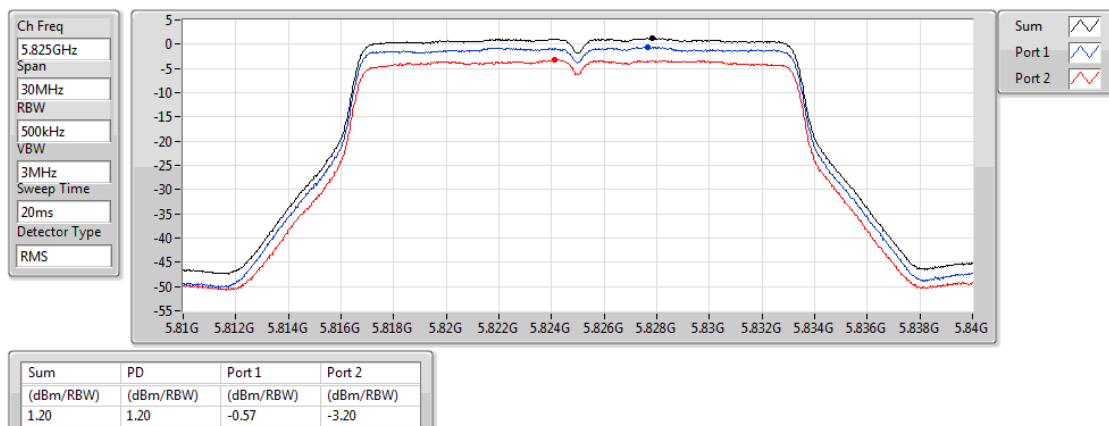
5785MHz



802.11a_Nss1,(6Mbps)_2TX

PSD

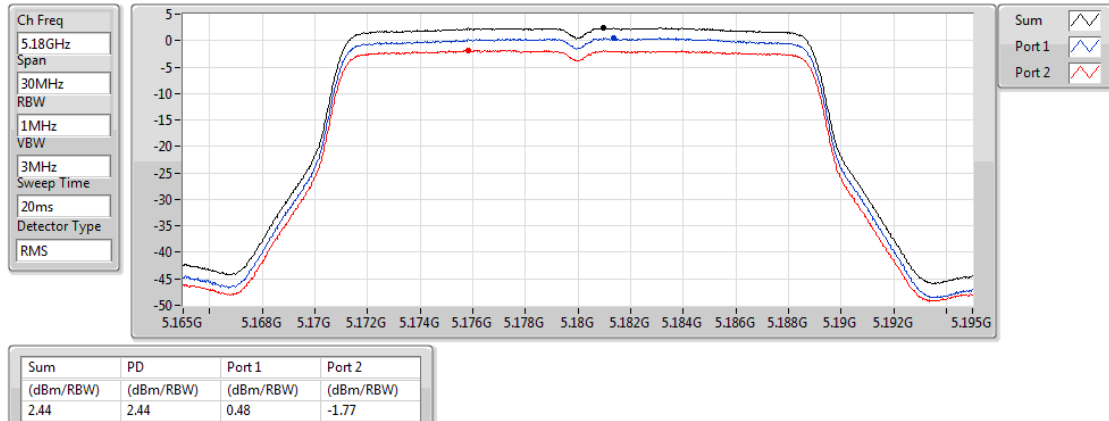
5825MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

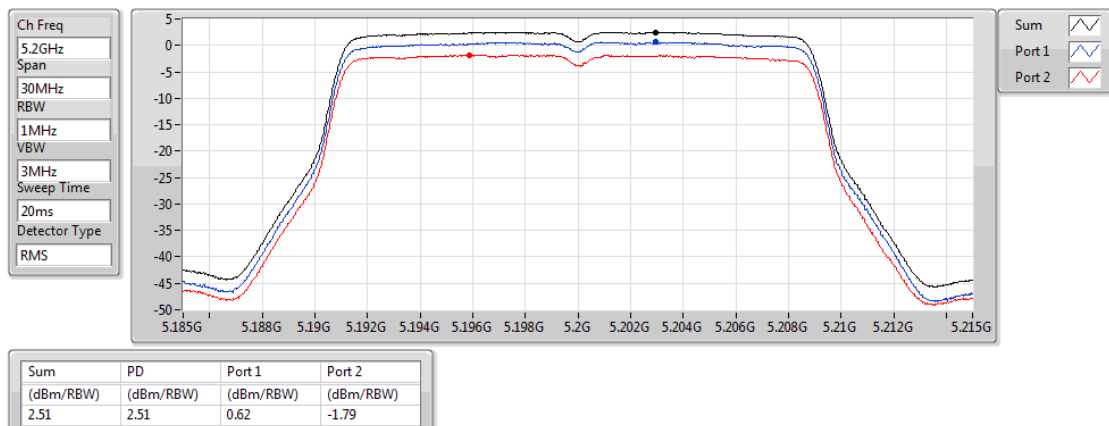
5180MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

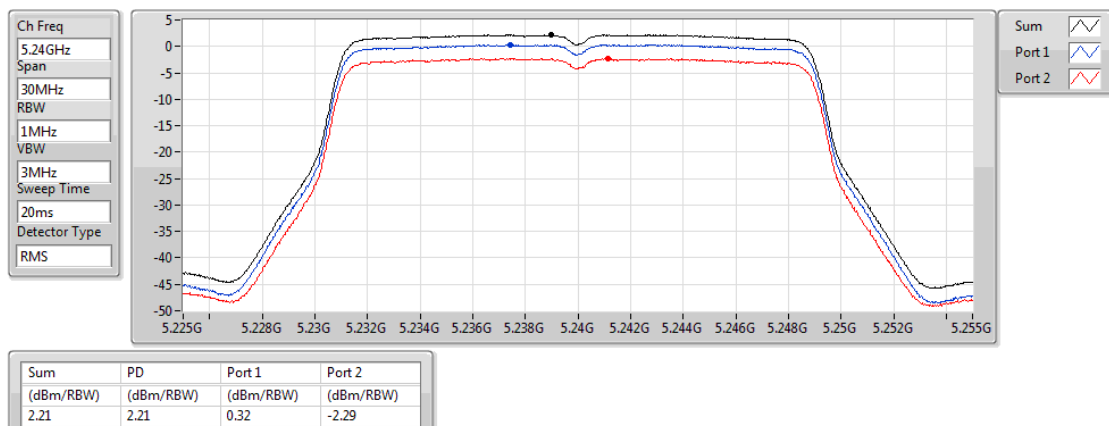
5200MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

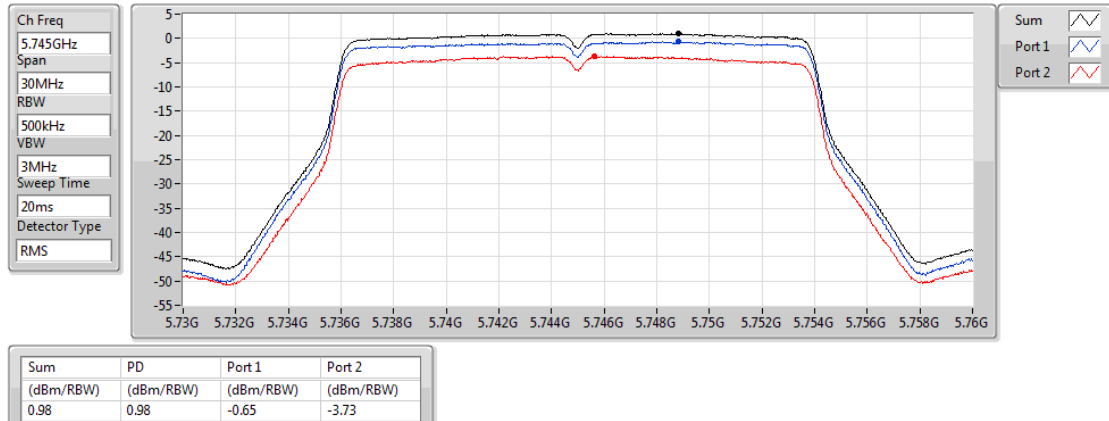
5240MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

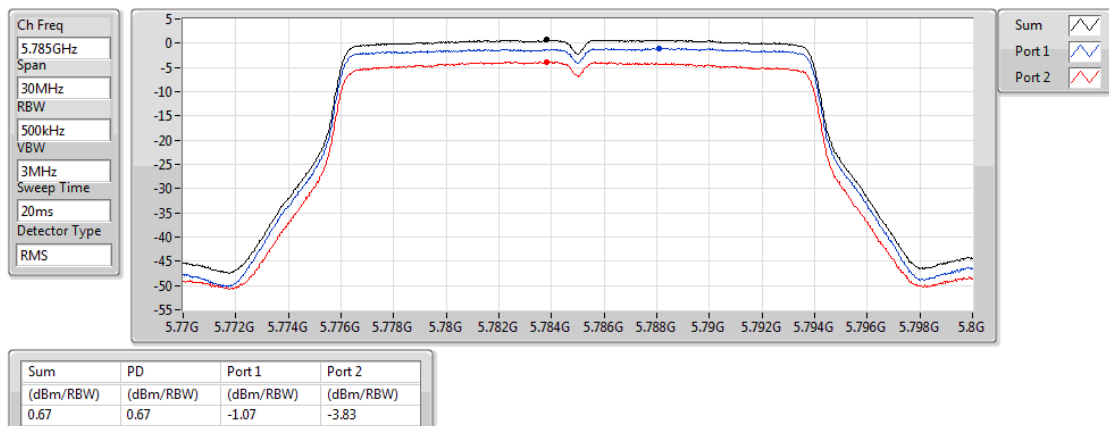
5745MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

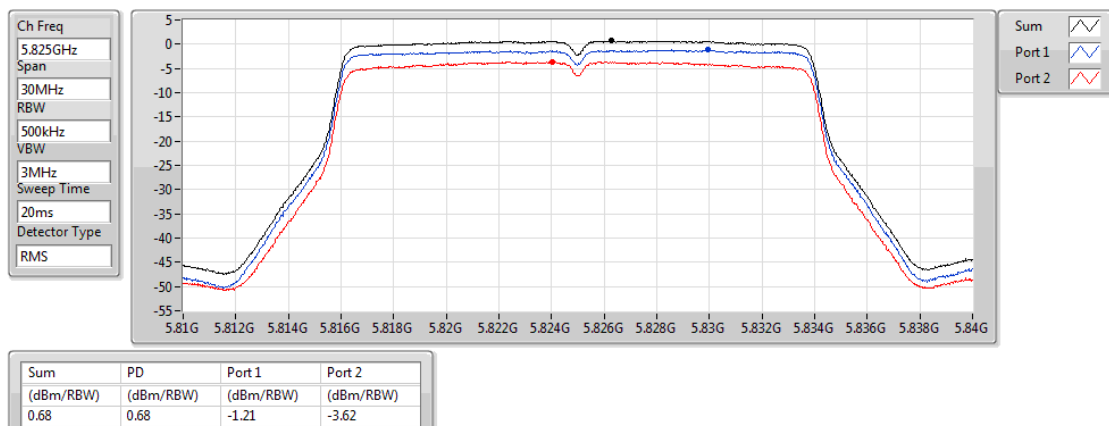
5785MHz



802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

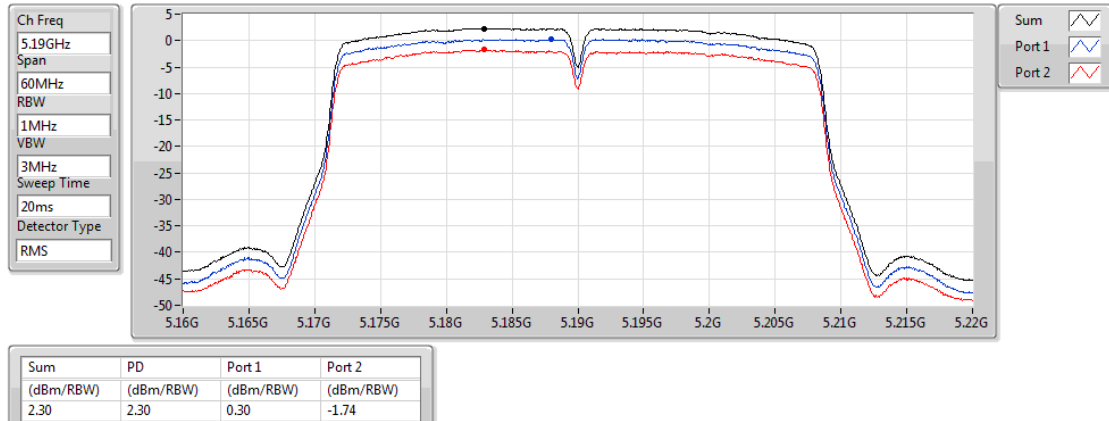
5825MHz



802.11ac VHT40_Nss1,(MCS0)_2TX

PSD

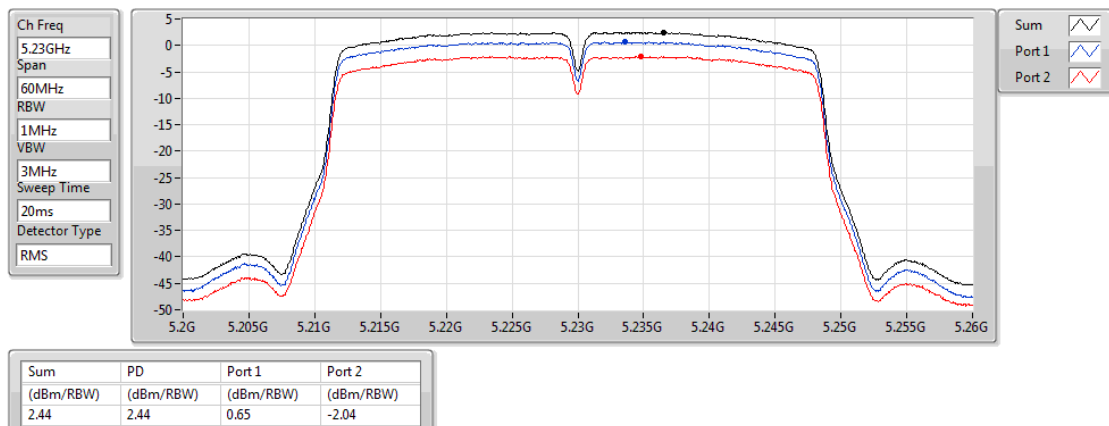
5190MHz



802.11ac VHT40_Nss1,(MCS0)_2TX

PSD

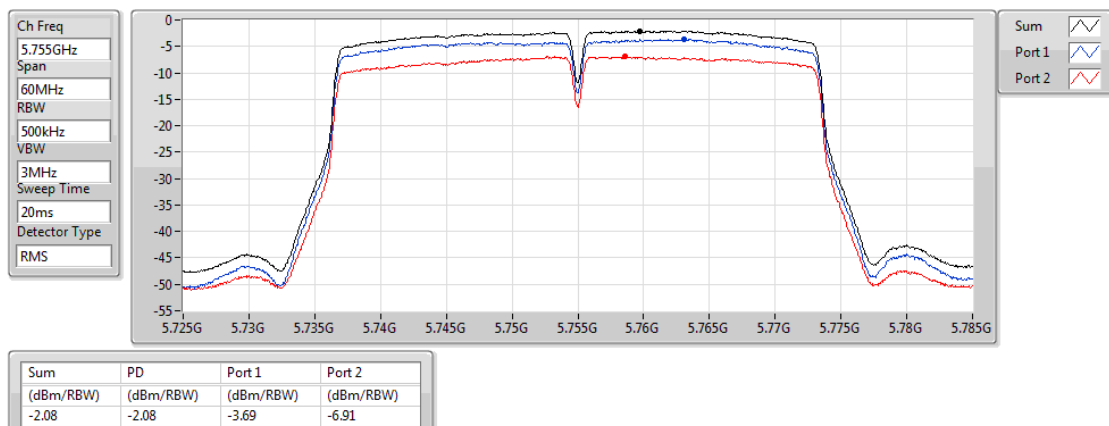
5230MHz



802.11ac VHT40_Nss1,(MCS0)_2TX

PSD

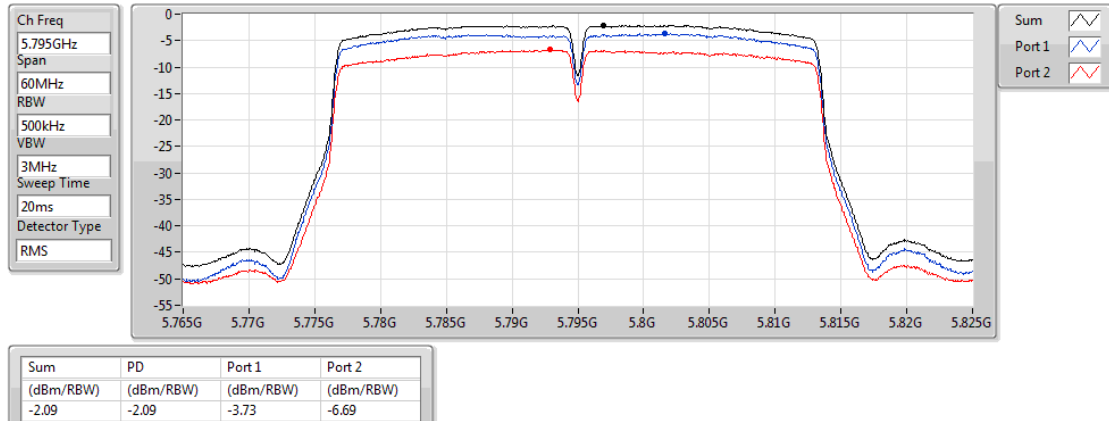
5755MHz



802.11ac VHT40_Nss1,(MCS0)_2TX

PSD

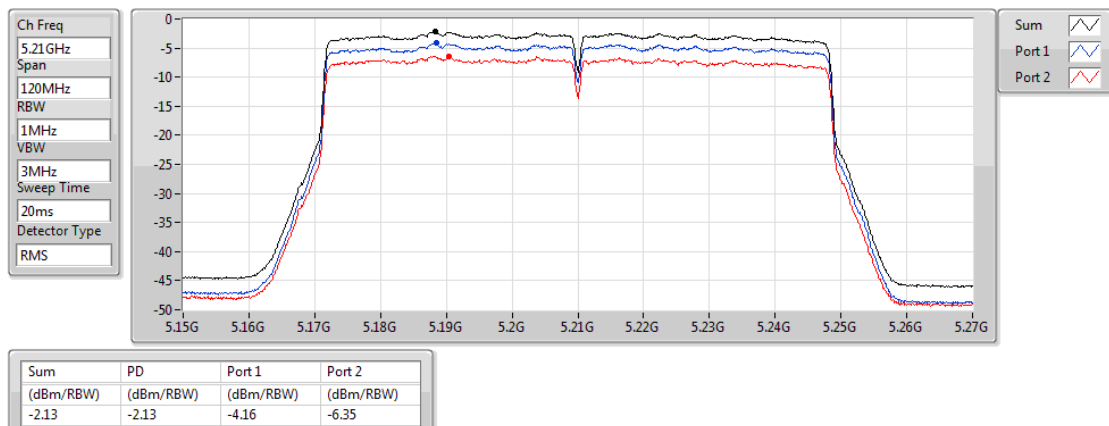
5795MHz



802.11ac VHT80_Nss1,(MCS0)_2TX

PSD

5210MHz



802.11ac VHT80_Nss1,(MCS0)_2TX

PSD

5775MHz

