

FCC Test Report

Equipment : DBDC ROUTER
Brand Name : Charter
Model No. : RAC2V1K
FCC ID : H8NRAC2V1K
Standard : 47 CFR FCC Part 15.407
Operating Band : 5150 MHz – 5250 MHz
5725 MHz – 5850 MHz
Applicant : Askey Computer Corp.
10F, NO.119, JIANKANG RD., ZHONGHE DIST., NEW
TAIPEI CITY 23585, TAIWAN
Manufacturer : Askey Computer Corp.
10F, NO.119, JIANKANG RD., ZHONGHE DIST., NEW
TAIPEI CITY 23585, TAIWAN
Function : ☐ Outdoor; ☒ Indoor; ☐ Fixed P2P
☐ Client

The product sample received on Feb. 15, 2017 and completely tested on May 11, 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.

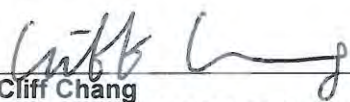

Cliff Chang
SPORTON INTERNATIONAL INC.





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Summary of Test Result

Conformance Test Specifications			
Report Clause	Ref. Std. Clause	Description	Result
1.1.3	15.203	Antenna Requirement	Complied
3.1	15.407(a)	Maximum Conducted Output Power	Complied
3.2	15.407(a)	Peak Power Spectral Density	Complied
3.3	15.407(b)	Unwanted Emissions	Complied



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FCC ID: H8NRAC2V1K

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]

For non-beamforming mode

Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	4TX
5.15-5.25GHz	802.11n HT20	20	4TX
5.15-5.25GHz	802.11ac VHT20	20	4TX
5.15-5.25GHz	802.11n HT40	40	4TX
5.15-5.25GHz	802.11ac VHT40	40	4TX
5.15-5.25GHz	802.11ac VHT80	80	4TX
5.15-5.25GHz	802.11ac VHT80+80	80	4TX(Port 1/2)
5.725-5.85GHz	802.11a	20	4TX
5.725-5.85GHz	802.11n HT20	20	4TX
5.725-5.85GHz	802.11ac VHT20	20	4TX
5.725-5.85GHz	802.11n HT40	40	4TX
5.725-5.85GHz	802.11ac VHT40	40	4TX
5.725-5.85GHz	802.11ac VHT80	80	4TX
5.725-5.85GHz	802.11ac VHT80+80	80	4TX(Port 3/4)

For beamforming mode

Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	4TX
5.15-5.25GHz	802.11n HT20	20	4TX
5.15-5.25GHz	802.11n HT20,TXBF	20	4TX
5.15-5.25GHz	802.11ac VHT20	20	4TX
5.15-5.25GHz	802.11ac VHT20,TXBF	20	4TX
5.15-5.25GHz	802.11n HT40	40	4TX
5.15-5.25GHz	802.11n HT40,TXBF	40	4TX
5.15-5.25GHz	802.11ac VHT40	40	4TX
5.15-5.25GHz	802.11ac VHT40,TXBF	40	4TX
5.15-5.25GHz	802.11ac VHT80	80	4TX
5.15-5.25GHz	802.11ac VHT80,TXBF	40	4TX
5.15-5.25GHz	802.11ac VHT80+80	80	4TX(Port 1/2)
5.15-5.25GHz	802.11ac VHT80+80-BF	80	4TX(Port 1/2)
5.725-5.85GHz	802.11a	20	4TX
5.725-5.85GHz	802.11n HT20	20	4TX
5.725-5.85GHz	802.11n HT20,TXBF	20	4TX
5.725-5.85GHz	802.11ac VHT20	20	4TX
5.725-5.85GHz	802.11ac VHT20,TXBF	20	4TX
5.725-5.85GHz	802.11n HT40	40	4TX
5.725-5.85GHz	802.11n HT40,TXBF	40	4TX
5.725-5.85GHz	802.11ac VHT40	40	4TX
5.725-5.85GHz	802.11ac VHT40,TXBF	40	4TX
5.725-5.85GHz	802.11ac VHT80	80	4TX
5.725-5.85GHz	802.11ac VHT80,TXBF	40	4TX
5.725-5.85GHz	802.11ac VHT80+80	80	4TX(Port 3/4)
5.725-5.85GHz	802.11ac VHT80+80-BF	80	4TX(Port 3/4)

Note:

- 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.

1.1.2 Table for 80+80 MHz Mode

Type	Channel No.	Frequency
1	42+155	5210+5775 MHz

1.1.3 Antenna Information

Ant.	Brand	Part Number	Antenna Type	Connector	Gain (dBi)			Remark
					2.4G	5G B1	5G B4	
1	Airgain	N2420GS	PCB Antenna	I-PEX	1	-	-	2.4GHz TX/RX
2	Airgain	N2420GS	PCB Antenna	I-PEX	1	-	-	2.4GHz TX/RX
3	Airgain	N2420GS	PCB Antenna	I-PEX	1	-	-	2.4GHz TX/RX
4	Airgain	N2420GS	PCB Antenna	I-PEX	1	-	-	2.4GHz TX/RX
5	Airgain	M5x05C (Longer)	PCB Antenna	I-PEX	-	1.2	1.2	5GHz TX/RX
6	Airgain	M5x05C	PCB Antenna	I-PEX	-	1.2	1.2	5GHz TX/RX
7	Airgain	M5x05C	PCB Antenna	I-PEX	-	1.2	1.2	5GHz TX/RX
8	Airgain	M5x05C (Longer)	PCB Antenna	I-PEX	-	1.2	1.2	5GHz TX/RX

Note: The EUT has eight antennas.

For 2.4GHz function (4TX/4RX):

Ant. 1 (P1), Ant. 2 (P2), Ant. 3 (P3) and Ant. 4 (P4) could transmit/receive simultaneously.

For 5GHz function (4TX/4RX):

Ant. 5 (P1), Ant. 6 (P2), Ant. 7 (P3) and Ant. 8 (P4) could transmit/receive simultaneously.

1.1.4 Mode Test Duty Cycle
For non-beamforming mode

Mode	DC	DCF(dB)
802.11a	0.969	0.137
802.11ac VHT20	0.988	0.052
802.11ac VHT40	0.976	0.106
802.11ac VHT80	0.934	0.297
802.11ac VHT80+80	0.975	0.11

For beamforming mode

Mode	DC	DCF(dB)
802.11ac VHT20,TXBF	0.931	0.311
802.11ac VHT40,TXBF	0.924	0.343
802.11ac VHT80,TXBF	0.94	0.269
802.11ac VHT80+80-BF	0.945	0.246

**1.1.5 EUT Operational Condition**

EUT Power Type	From power adapter			
Beamforming Function	☒	With beamforming	☐	Without beamforming
	The product has beamforming function for 802.11n/ac.			

1.1.6 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR711935-01AB and FR711935-01AD.

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

Modifications	Performance Checking
1. Revising the Ant. Gain of 2.4GHz to 1dBi. 2. Revising the Ant. Gain of 5GHz band 1/band 4 to 1.2dBi. 3. Removing Capacitor*3:(1000 pF: C1170 (bottom), C1173, C1176 (Top).	1. Maximum Conducted Output Power 2. Power Spectral Density 3. Emissions in Restricted Frequency Bands (Above 1GHz) All items changing channel as below: For Non-beamforming mode 11a/ac VHT20: CH36 / 5180MHz 11ac VHT40: CH38 / 5190MHz 11ac VHT80: CH42 / 5210MHz & CH155 / 5775MHz For beamforming mode 11ac VHT20: CH36 / 5180MHz 11ac VHT40: CH38 / 5190MHz 11ac VHT80: CH42 / 5210MHz & CH155 / 5775MHz

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	Serway Li	22°C / 55%	May 02, 2017 ~ May 11, 2017
Radiated	03CH01-CB	Joy Luo	22°C / 54%	May 11, 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
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%
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

For non-beamforming mode

Mode	Power Index
802.11a_(6Mbps)_4TX	-
5180MHz	19.5
802.11ac VHT20_Nss1,(MCS0)_4TX	-
5180MHz	21
802.11ac VHT40_Nss1,(MCS0)_4TX	-
5190MHz	19
802.11ac VHT80_Nss1,(MCS0)_4TX	-
5210MHz	18
5775MHz	21.5

For beamforming mode

Mode	Power Index
802.11ac VHT20_Nss1,(MCS0)_4TX	-
5180MHz	25.5
802.11ac VHT40_Nss1,(MCS0)_4TX	-
5190MHz	24
802.11ac VHT80_Nss1,(MCS0)_4TX	-
5210MHz	24.5
5775MHz	25

Note:

- ♦ VHT20/VHT40 covers HT20/HT40, due to same modulation. The power index 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	Unwanted Emissions
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode > 1GHz	CTX

Note: The EUT can only be used at Y axis position.

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 No.	Rating
1	Adapter 1	Sunny	SYS1564-3012-W2	INPUT: 100-240Vac, 50-60Hz, 1.0A MAX. OUTPUT: 12Vdc, 2.5A
2	Adapter 2	Ktec	KSA-36W-120250HU	INPUT: 100-240Vac, 50/60Hz, 1.0A OUTPUT: 12Vdc, 2.5A

Note: The power adapter does not affect the test result of RF tests, so only adapter 1 was tested and recorded in this report.

2.5 Support Equipment

For non-beamforming mode

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

For beamforming mode

For Test Site No: 03CH01-CB

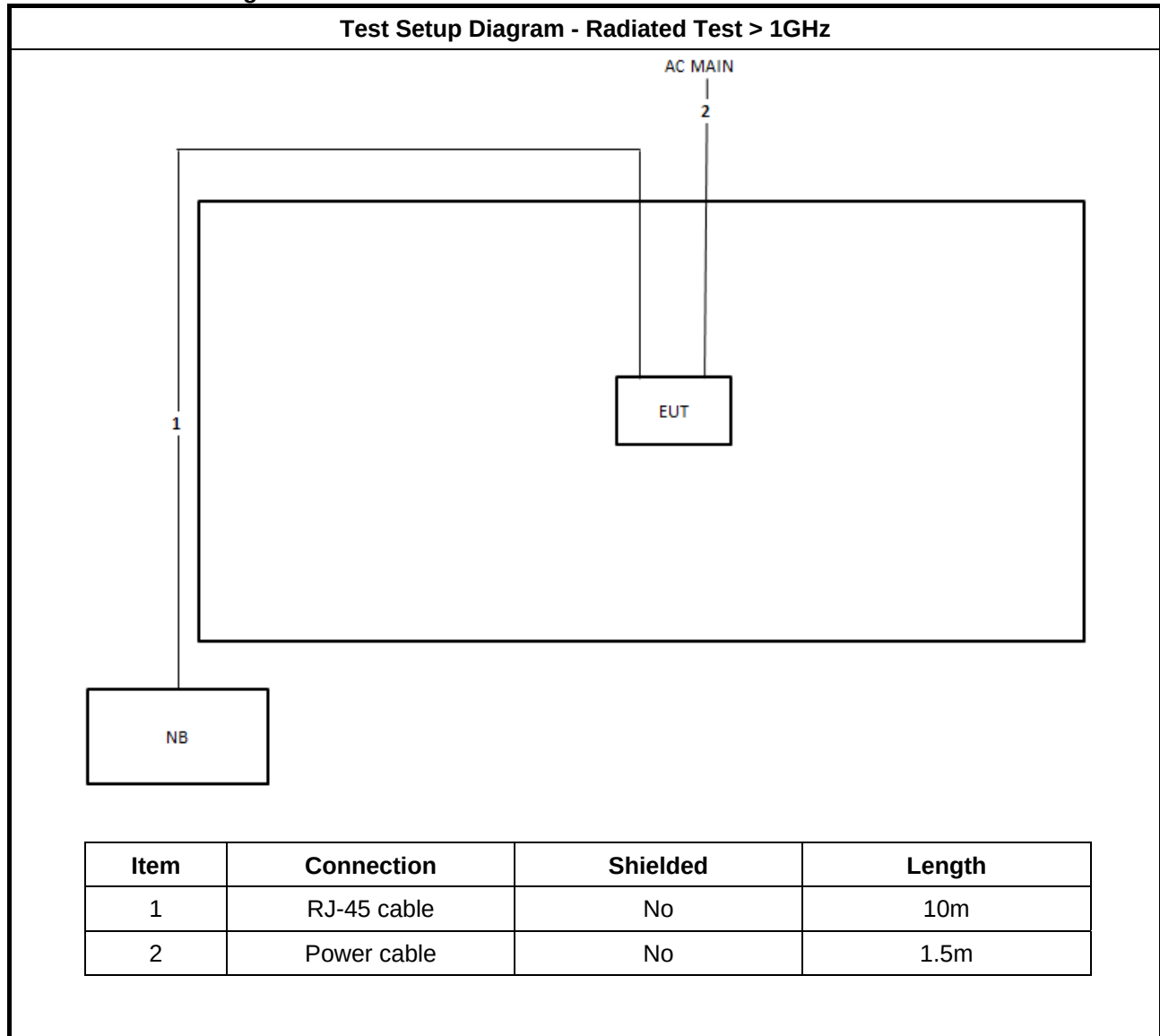
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	NB*2	DELL	E4300	DoC
2	RX Device (DBDC ROUTER)	Charter	RAC2V1K	H8NRAC2V1K

For Test Site No: TH01-CB

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

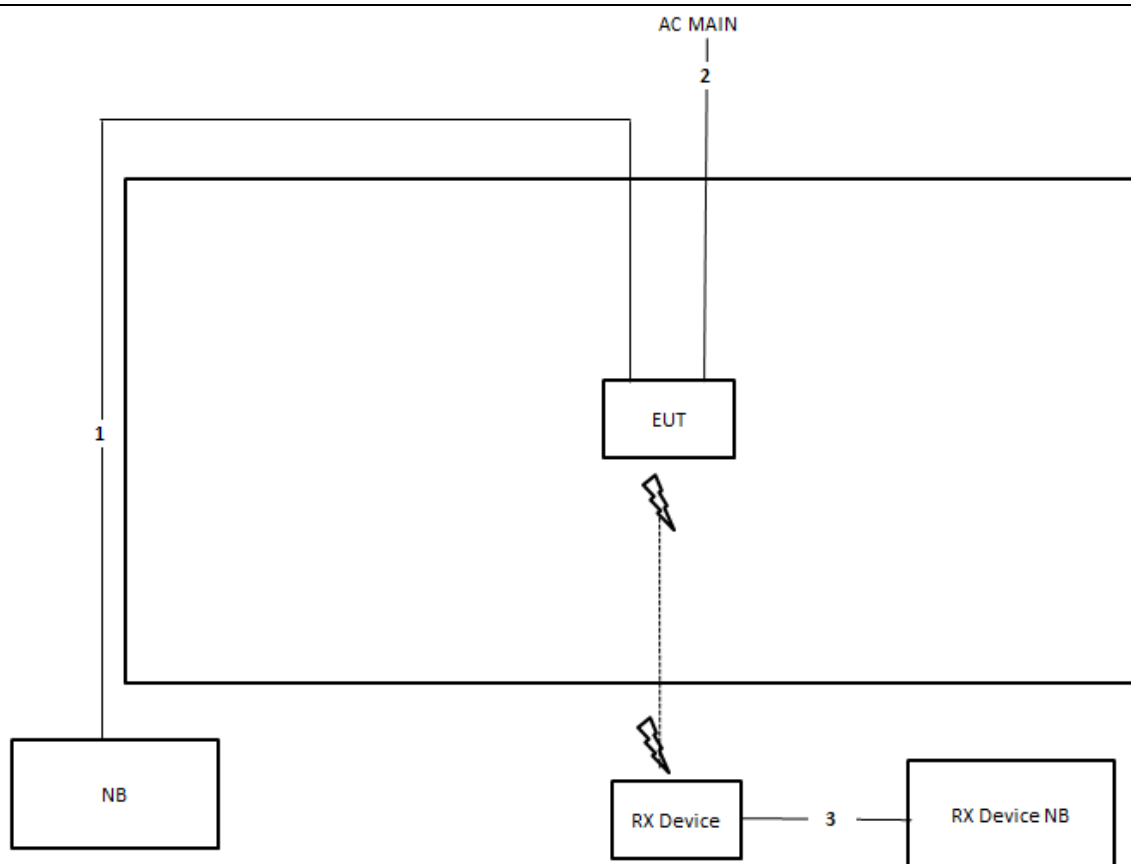
2.6 Test Setup Diagram

For non-beamforming mode



For beamforming mode

Test Setup Diagram - Radiated Test > 1GHz



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	1.5m
3	RJ-45 cable	No	10m

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.	

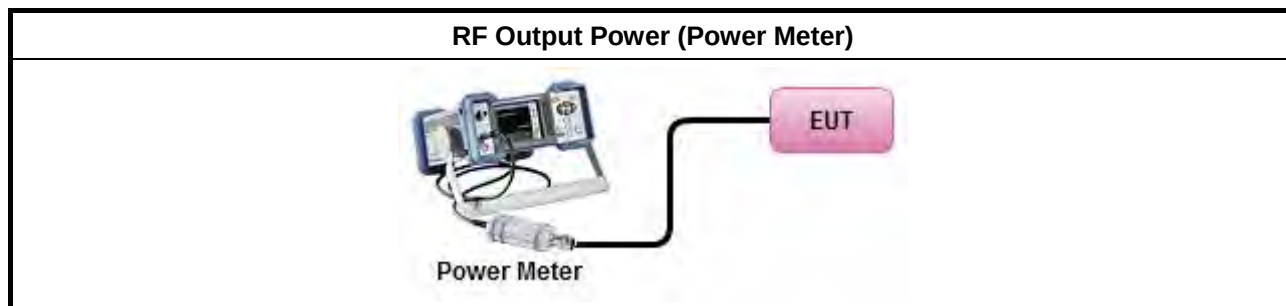
3.1.2 Measuring Instruments

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	
☒	For straddle channel and VHT80+80: 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	
☒	For other channel: 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 (θ-8) dBW/MHz for $8^\circ \leq \theta < 40^\circ$ -35.9 - 1.22 (θ-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.	

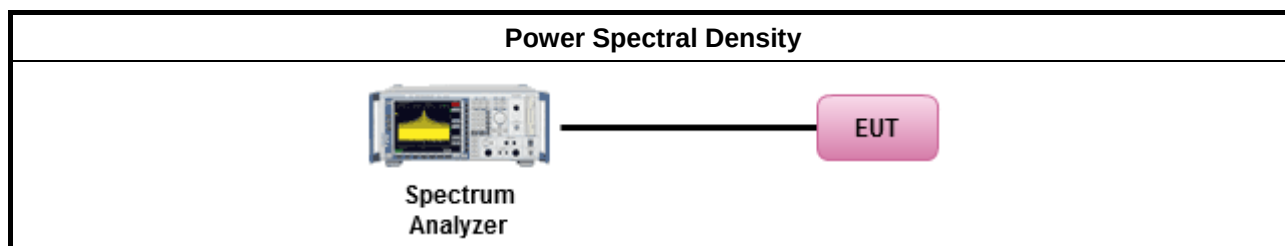
3.2.2 Measuring Instruments

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

3.3 Unwanted Emissions

3.3.1 Transmitter Radiated Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted band emissions above 1GHz Limit	
Operating Band	Limit
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.85 GHz	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.

Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

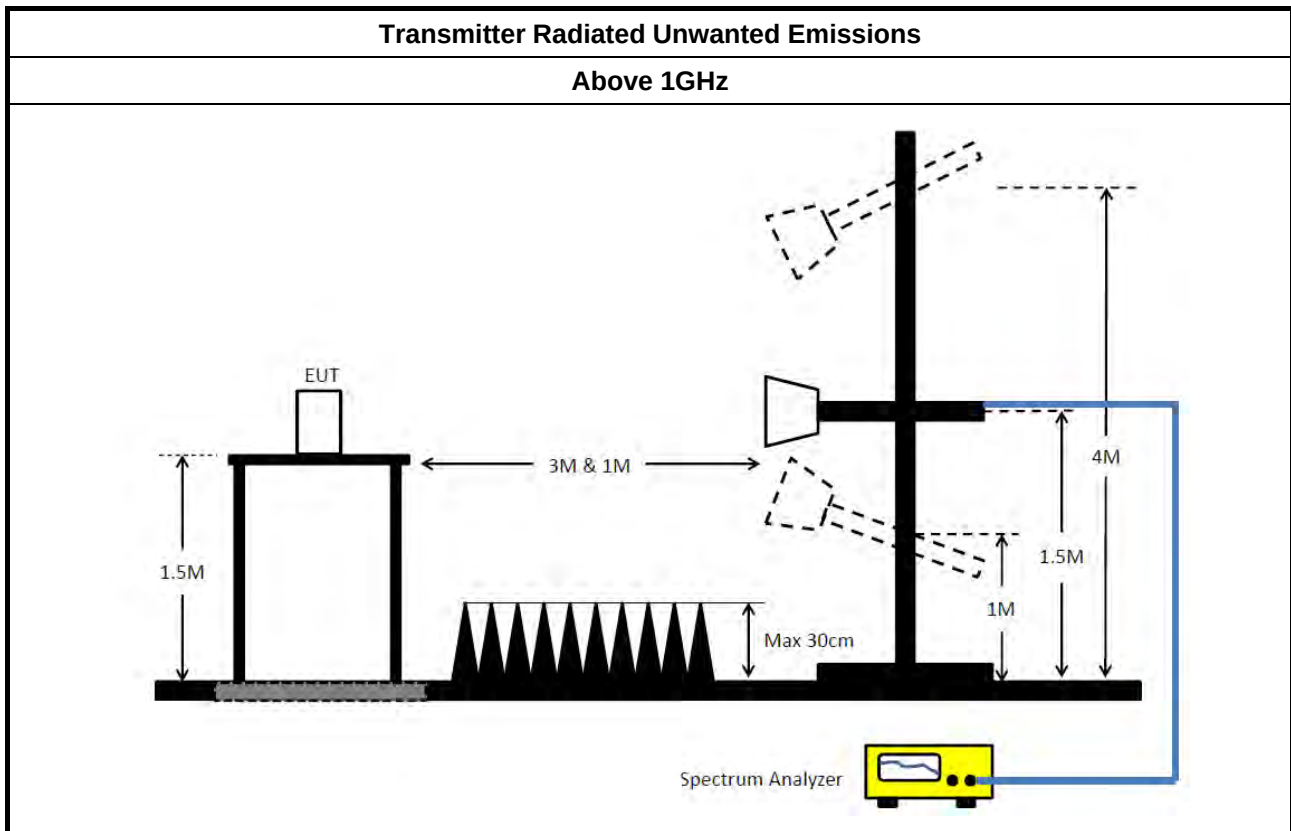
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
For the transmitter unwanted emissions shall be measured using following options below:	
	Refer as FCC KDB 789033, clause H)2) for unwanted emissions into non-restricted bands.
	Refer as FCC KDB 789033, clause H)1) for unwanted emissions into restricted bands.
	☐ Refer as FCC KDB 789033, H)6) Method AD (Trace Averaging).
	☒ Refer as FCC KDB 789033, H)6) Method VB (Reduced VBW).
	☐ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW $\geq$ 1/T, where T is pulse time.
	☐ Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
	☒ Refer as FCC KDB 789033, clause H)5) measurement procedure peak limit.
	☐ Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
	For radiated measurement.
	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
	The any unwanted emissions level shall not exceed the fundamental emission level.
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.	

3.3.4 Test Setup



3.3.5 Test Result of Transmitter Unwanted Emissions

Refer as Appendix C



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 25, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jun. 28, 2016	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 22, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-I0-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 26, 2016	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 22, 2016	Conducted (TH01-CB)

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

**Summary
For non-beamforming**

Mode	Total Power (dBm)	Total Power (W)	EIRP (dBm)	EIRP (W)
802.11a_(6Mbps)_4TX	-	-	-	-
5.15-5.25GHz	26.09	0.40644	27.29	0.53580
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	27.53	0.56624	28.73	0.74645
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	25.78	0.37844	26.98	0.49888
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	24.20	0.26303	25.40	0.34674
5.725-5.85GHz	27.57	0.57148	28.77	0.75336

**Result**

Mode	Result	DG	Port 1	Port 2	Port 3	Port 4	Total Power	Power Limit	EIRP	EIRP Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	1.20	20.18	19.92	20.64	19.43	26.09	30.00	27.29	36.00
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	1.20	21.60	21.34	22.10	20.92	27.53	30.00	28.73	36.00
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	1.20	19.58	19.72	19.85	19.90	25.78	30.00	26.98	36.00
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	1.20	18.41	17.83	18.71	17.70	24.20	30.00	25.40	36.00
5775MHz	Pass	1.20	21.36	21.36	21.35	22.07	27.57	30.00	28.77	36.00

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

**Summary
For beamforming**

Mode	Total Power (dBm)	Total Power (W)	EIRP (dBm)	EIRP (W)
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	25.73	0.37411	32.95	1.97697
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	24.29	0.26853	31.51	1.41579
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	24.02	0.25235	31.24	1.33045
5.725-5.85GHz	24.52	0.28314	31.74	1.49279

**Result**

Mode	Result	DG	Port 1	Port 2	Port 3	Port 4	Total Power	Power Limit	EIRP	EIRP Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	7.22	20.29	20.06	18.95	19.43	25.73	28.78	32.95	36.00
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	7.22	18.65	18.9	17.42	17.94	24.29	28.78	31.51	36.00
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	7.22	17.96	18.02	17.59	18.39	24.02	28.78	31.24	36.00
5775MHz	Pass	7.22	18.46	18.73	18.38	18.41	24.52	28.78	31.74	36.00

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

**Summary
For non-beamforming**

Mode	PD (dBm/RBW)	EIRP PD (dBm/RBW)
802.11a_(6Mbps)_4TX	-	-
5.15-5.25GHz	12.84	20.06
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-
5.15-5.25GHz	13.89	21.11
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-
5.15-5.25GHz	8.99	16.21
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-
5.15-5.25GHz	4.60	11.82
5.725-5.85GHz	6.37	13.59

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)	Port 3 (dBm/RBW)	Port 4 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)	EIRP PD (dBm/RBW)	EIRP PD Limit (dBm/RBW)
802.11a_(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	7.22	7.02	6.89	7.41	6.35	12.84	15.78	20.06	Inf
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	7.22	7.93	7.92	8.52	7.36	13.89	15.78	21.11	Inf
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	7.22	3.35	2.78	3.65	2.39	8.99	15.78	16.21	Inf
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	7.22	-1.04	-1.66	-0.76	-1.67	4.60	15.78	11.82	Inf
5775MHz	Pass	7.22	0.28	0.24	0.24	1.25	6.37	28.78	13.59	Inf

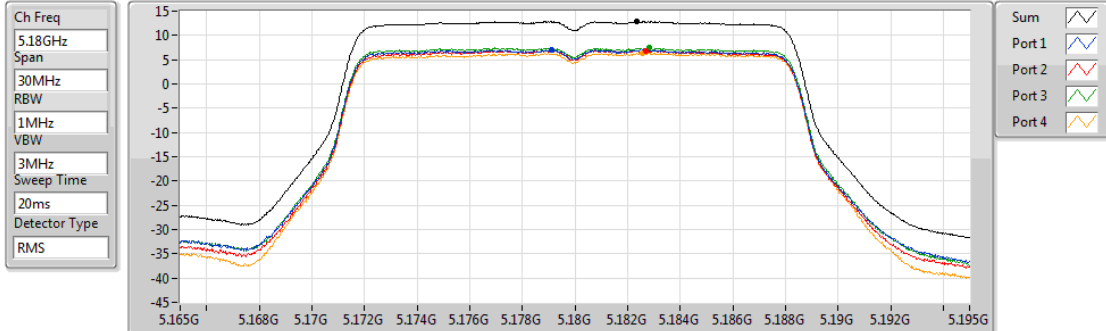
DG = Directional Gain; **RBW** = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

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

802.11a_(6Mbps)_4TX

PSD

5180MHz

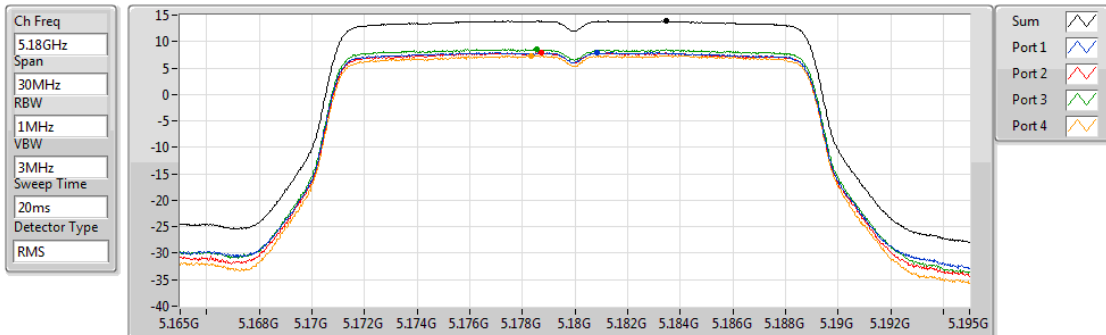


Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
12.84	12.84	7.02	6.89	7.41	6.35

802.11ac VHT20_Nss1,(MCS0)_4TX

PSD

5180MHz

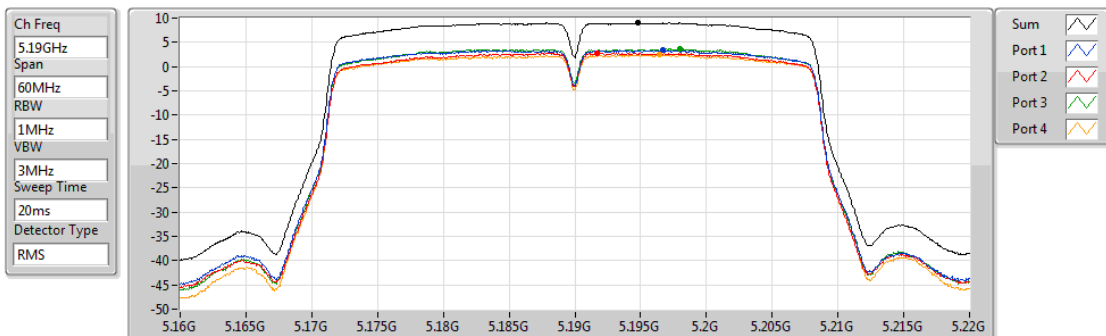


Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
13.89	13.89	7.93	7.92	8.52	7.36

802.11ac VHT40_Nss1,(MCS0)_4TX

PSD

5190MHz

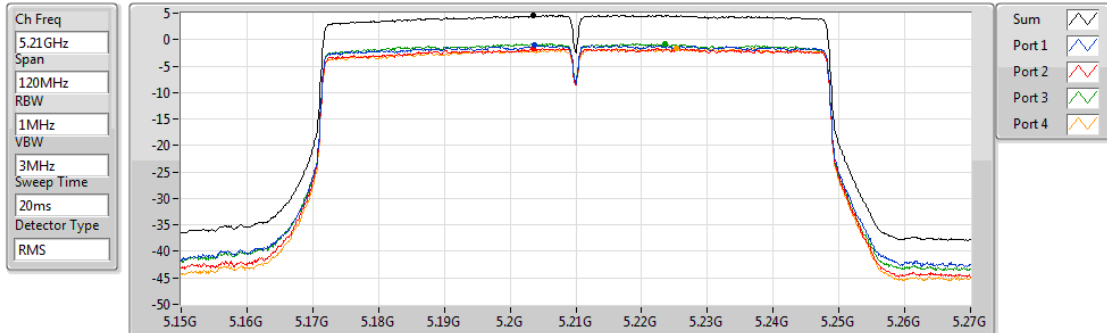


Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
8.99	8.99	3.35	2.78	3.65	2.39

802.11ac VHT80_Nss1,(MCS0)_4TX

PSD

5210MHz

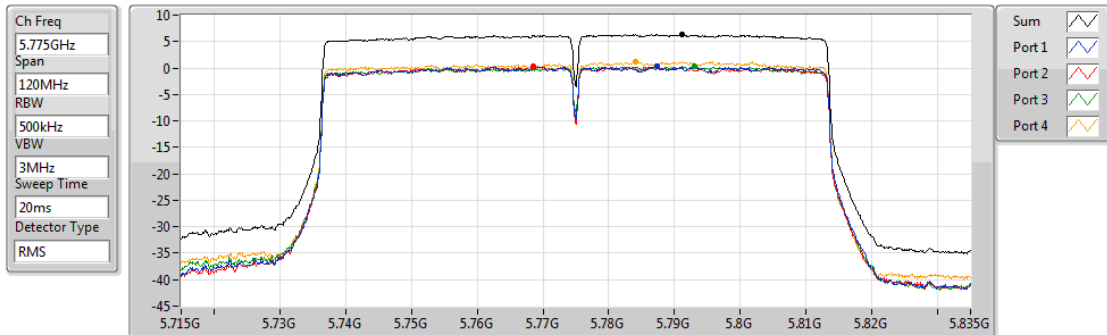


Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
4.60	4.60	-1.04	-1.66	-0.76	-1.67

802.11ac VHT80_Nss1,(MCS0)_4TX

PSD

5775MHz



Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
6.37	6.37	0.28	0.24	0.24	1.25

**Summary
For beamforming**

Mode	PD (dBm/RBW)	EIRP PD (dBm/RBW)
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-
5.15-5.25GHz	12.44	19.66
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-
5.15-5.25GHz	9.35	16.57
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-
5.15-5.25GHz	4.74	11.96
5.725-5.85GHz	3.16	10.38

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)	Port 3 (dBm/RBW)	Port 4 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)	EIRP PD (dBm/RBW)	EIRP PD Limit (dBm/RBW)
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	7.22	6.88	6.67	6.46	6.98	12.44	15.78	19.66	Inf
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	7.22	3.37	4.55	3.1	3.12	9.35	15.78	16.57	Inf
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	7.22	-0.82	-1	-1.49	-0.88	4.74	15.78	11.96	Inf
5775MHz	Pass	7.22	-2.85	-2.51	-2.47	-2	3.16	28.78	10.38	Inf

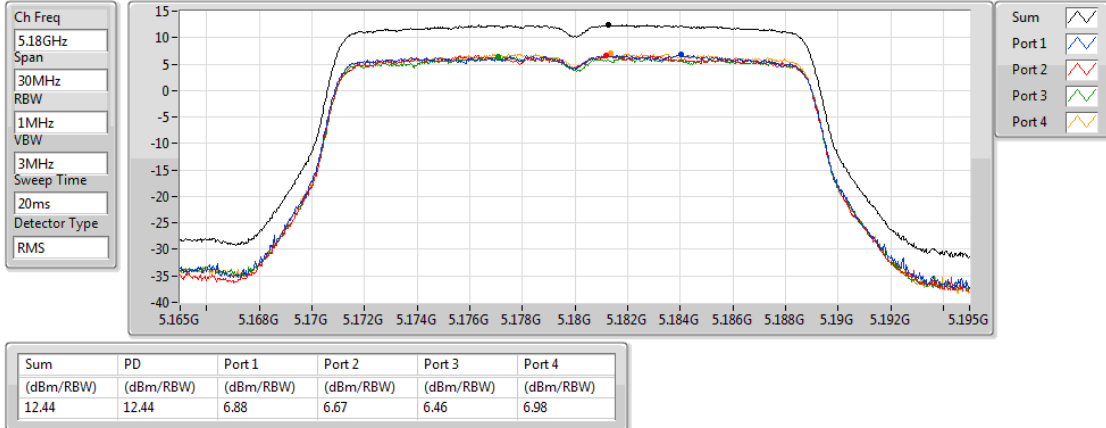
DG = Directional Gain; **RBW** = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

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

802.11ac VHT20_Nss1,(MCS0)_4TX

PSD

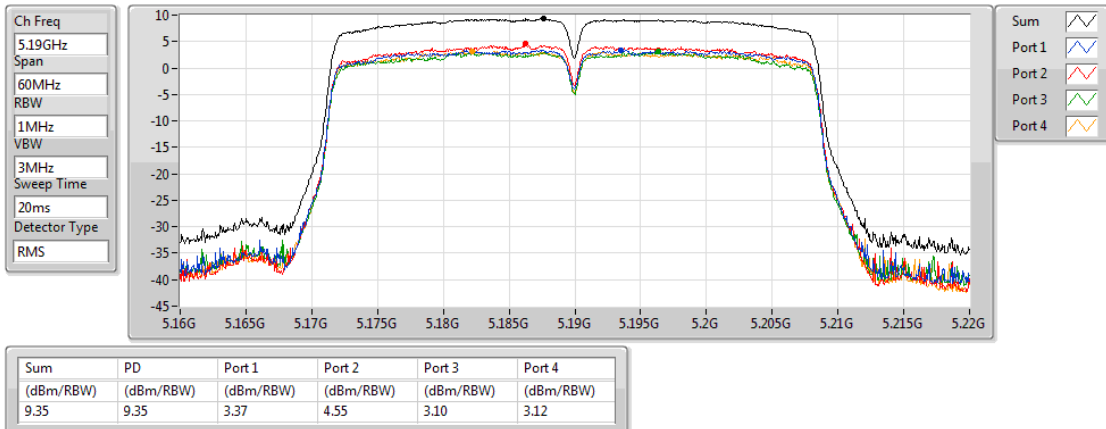
5180MHz



802.11ac VHT40_Nss1,(MCS0)_4TX

PSD

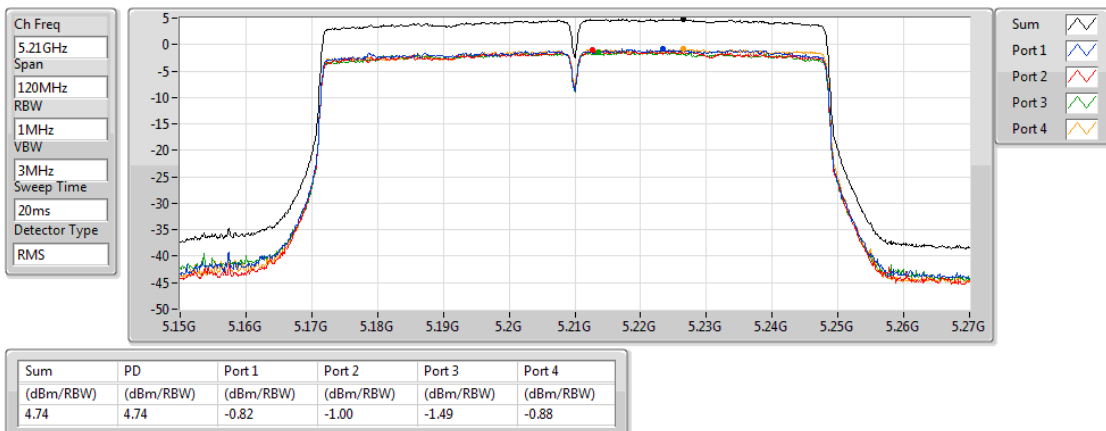
5190MHz



802.11ac VHT80_Nss1,(MCS0)_4TX

PSD

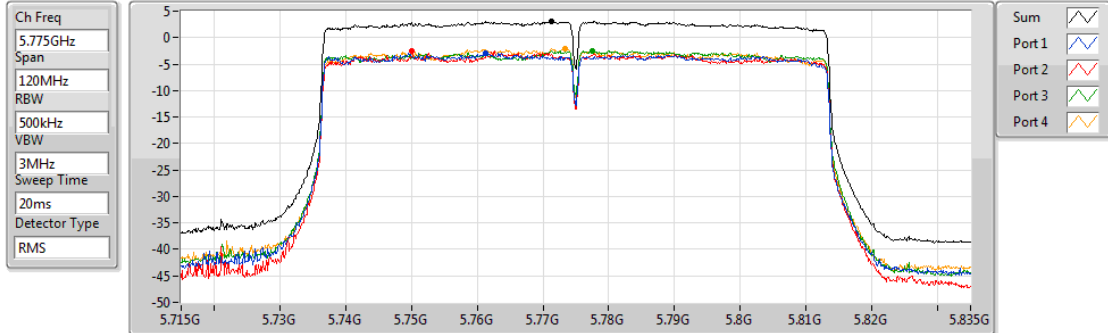
5210MHz



802.11ac VHT80_Nss1,(MCS0)_4TX

PSD

5775MHz



Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
3.16	3.16	-2.85	-2.51	-2.47	-2.00

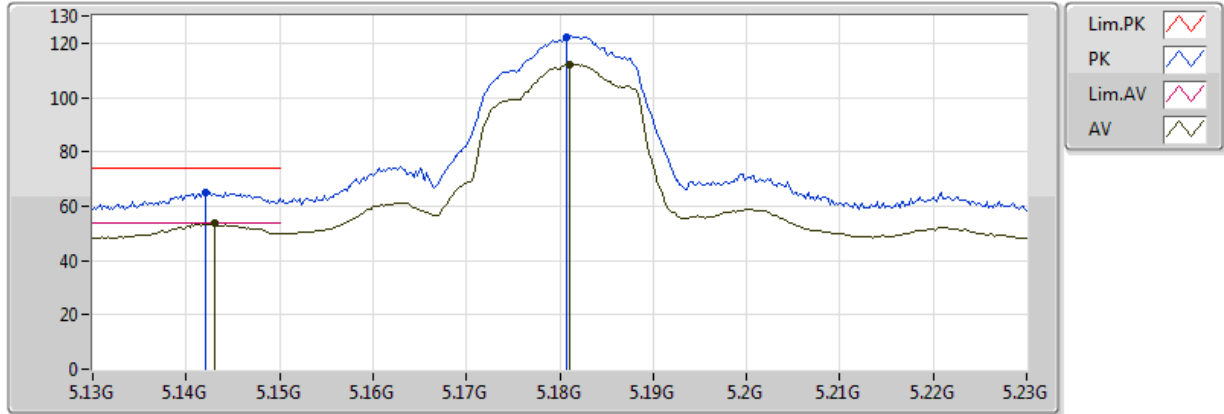


**Summary
For non-beamforming**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-
5.15-5-5.25GHz	Pass	AV	5.143G	53.99	54.00	-0.01	8.91	3	V	215	1.92	-

802.11a_(6Mbps)_4TX

5180MHz_TX

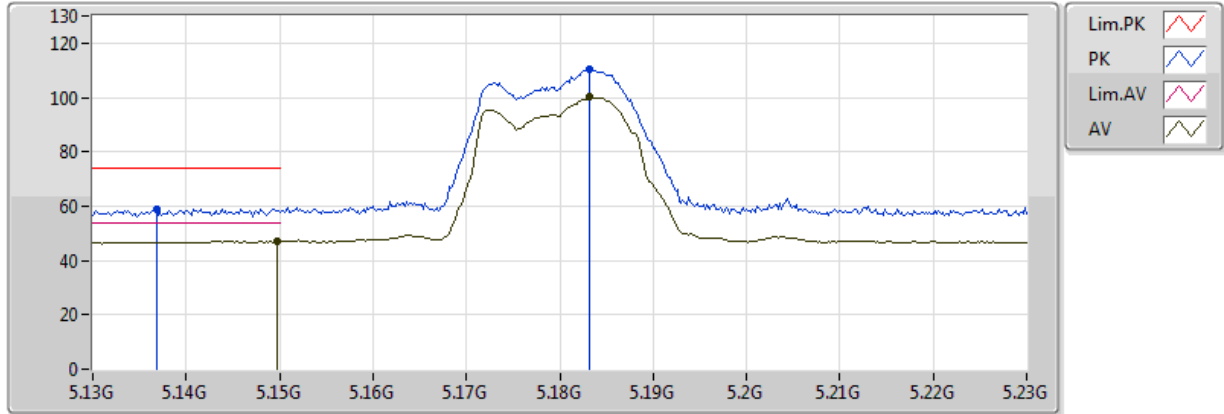


20170508
EUT Y 4TX
Setting 19.5
02-Z-1-10
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.143G	53.78	54.00	-0.22	8.91	3	V	203	2.60	-
AV	5.181G	111.79	Inf	-Inf	9.01	3	V	203	2.60	-
PK	5.142G	64.77	74.00	-9.23	8.91	3	V	203	2.60	-
PK	5.1808G	121.89	Inf	-Inf	9.01	3	V	203	2.60	-

802.11a_(6Mbps)_4TX

5180MHz_TX

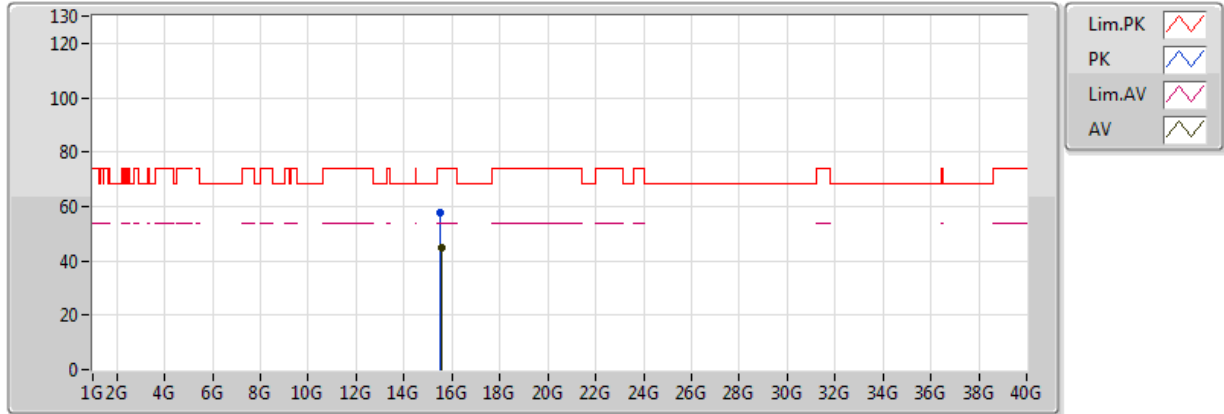


20170508
EUT Y 4TX
Setting 19.5
02-Z-1-10
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.1498G	47.32	54.00	-6.68	8.93	3	H	356	1.50	-
AV	5.1832G	100.08	Inf	-Inf	9.02	3	H	356	1.50	-
PK	5.1368G	58.86	74.00	-15.14	8.90	3	H	356	1.50	-
PK	5.1832G	110.25	Inf	-Inf	9.02	3	H	356	1.50	-

802.11a_(6Mbps)_4TX

5180MHz_TX

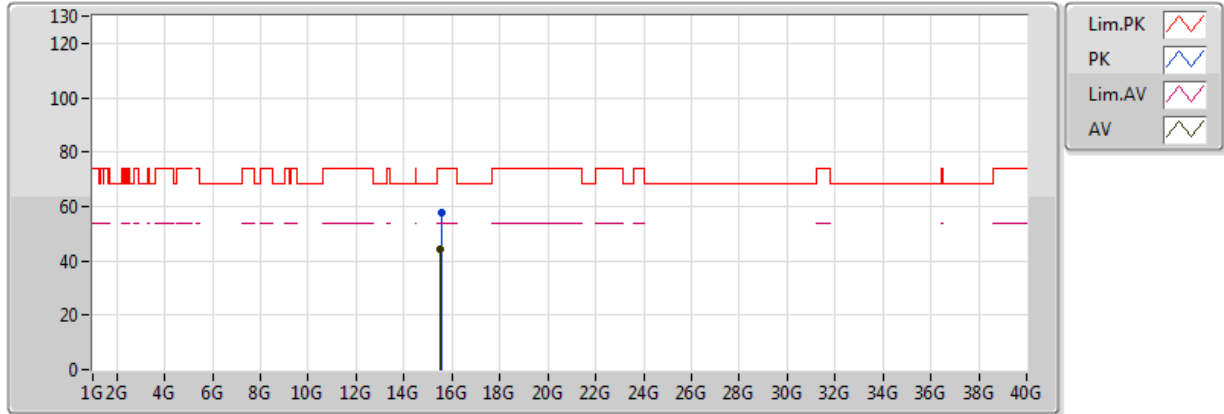


20170508
EUT Y 4TX
Setting 19.5
02-Z-1
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.54448G	44.58	54.00	-9.42	18.10	3	V	24	2.10	-
PK	15.53648G	57.61	74.00	-16.39	18.12	3	V	24	2.10	-

802.11a_(6Mbps)_4TX

5180MHz_TX

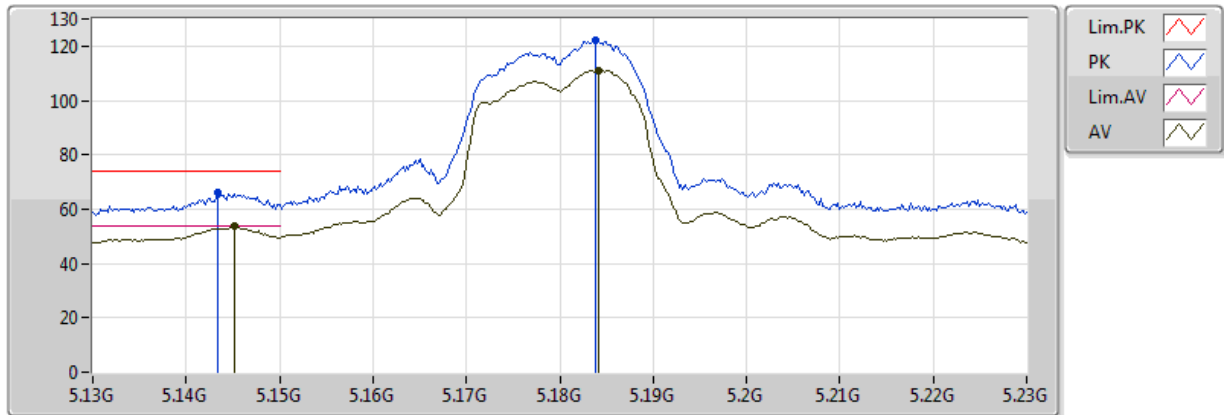


20170508
EUT Y 4TX
Setting 19.5
02-Z-1
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.5244G	44.51	54.00	-9.49	18.15	3	H	128	2.36	-
PK	15.5572G	57.51	74.00	-16.49	18.07	3	H	128	2.36	-

802.11ac VHT20_Nss1,(MCS0)_4TX

5180MHz_TX

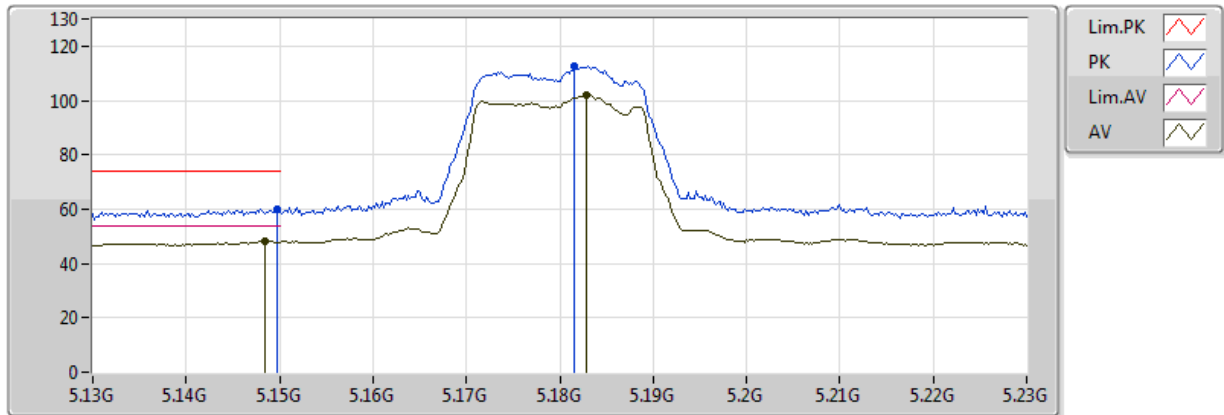


20170508
EUT Y 4TX
Setting 21
02-Z-1-10
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.1452G	53.88	54.00	-0.12	8.92	3	V	236	2.82	-
AV	5.1842G	110.97	Inf	-Inf	9.02	3	V	236	2.82	-
PK	5.1434G	66.21	74.00	-7.79	8.91	3	V	236	2.82	-
PK	5.1838G	121.95	Inf	-Inf	9.02	3	V	236	2.82	-

802.11ac VHT20_Nss1,(MCS0)_4TX

5180MHz_TX

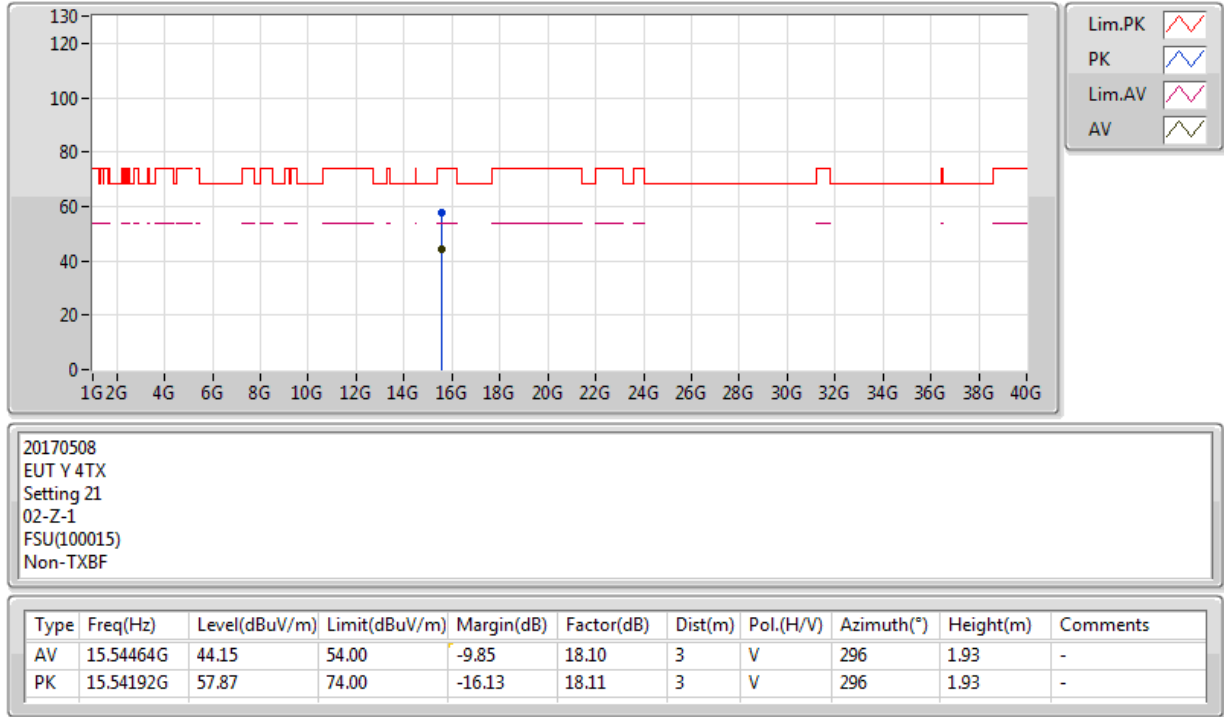


20170508
EUT Y 4TX
Setting 21
02-Z-1-10
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.1484G	48.24	54.00	-5.76	8.93	3	H	335	1.87	-
AV	5.1828G	102.20	Inf	-Inf	9.02	3	H	335	1.87	-
PK	5.1498G	59.91	74.00	-14.09	8.93	3	H	335	1.87	-
PK	5.1816G	112.58	Inf	-Inf	9.01	3	H	335	1.87	-

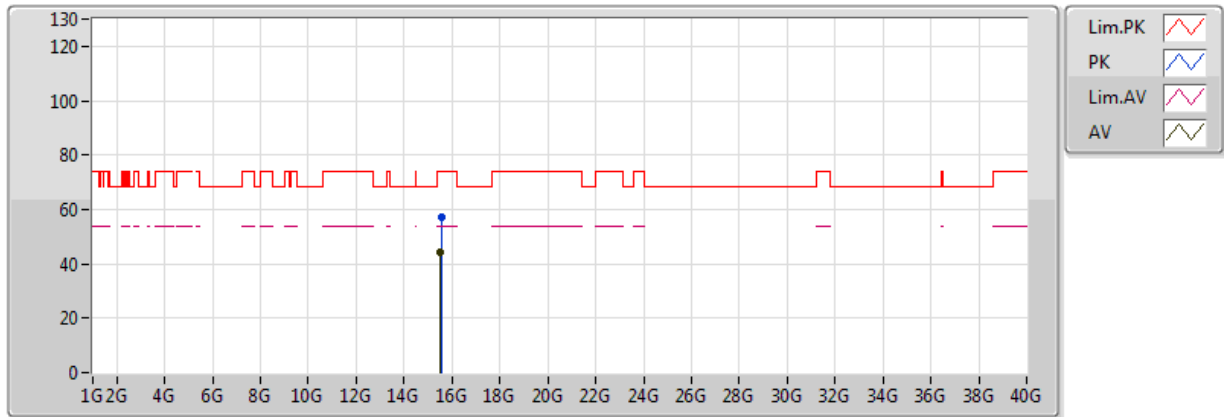
802.11ac VHT20_Nss1,(MCS0)_4TX

5180MHz_TX



802.11ac VHT20_Nss1,(MCS0)_4TX

5180MHz_TX

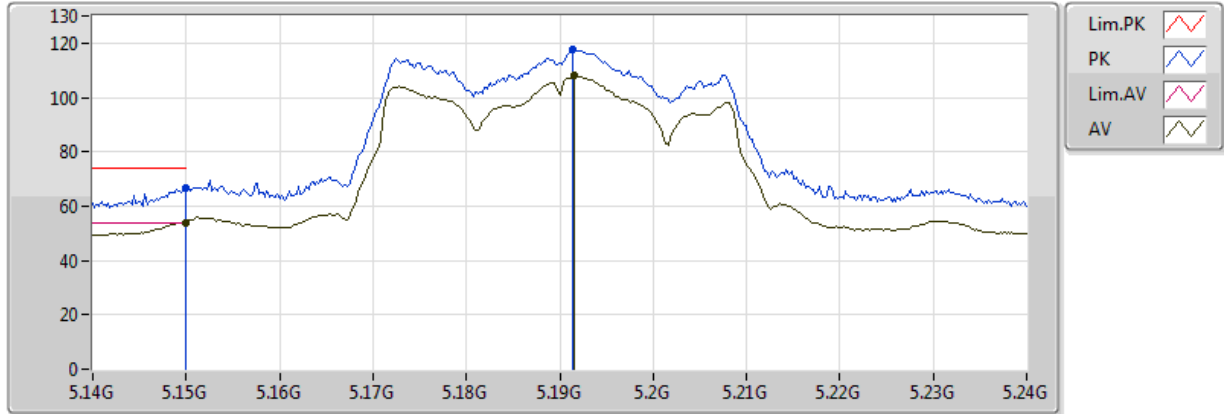


20170508
EUT Y 4TX
Setting 21
02-Z-1
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.53056G	44.16	54.00	-9.84	18.14	3	H	63	1.55	-
PK	15.54332G	57.23	74.00	-16.77	18.10	3	H	63	1.55	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5190MHz_TX

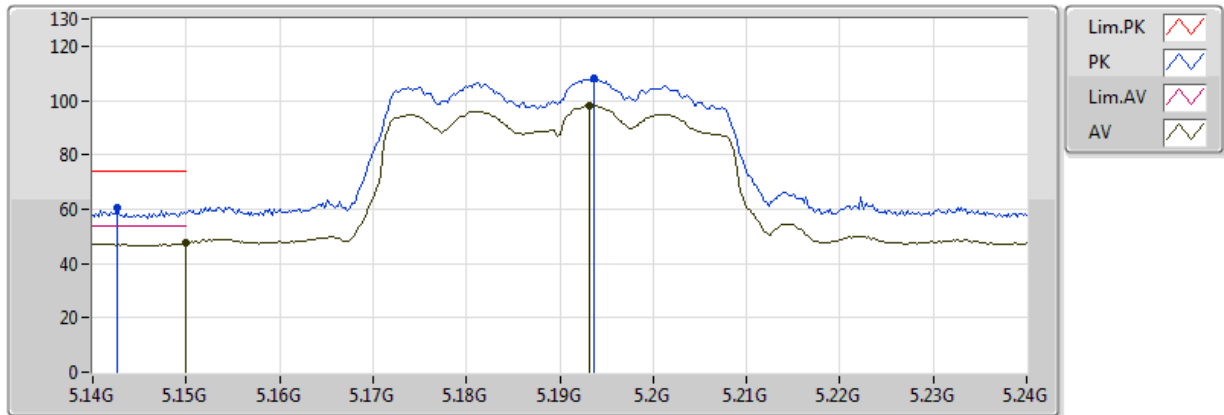


20170508
EUT Y 4TX
Setting 19
02-Z-1-10
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.149995G	53.98	54.00	-0.02	8.93	3	V	203	2.58	-
AV	5.1916G	107.94	Inf	-Inf	9.04	3	V	203	2.58	-
PK	5.149995G	66.50	74.00	-7.50	8.93	3	V	203	2.58	-
PK	5.1914G	117.79	Inf	-Inf	9.04	3	V	203	2.58	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5190MHz_TX

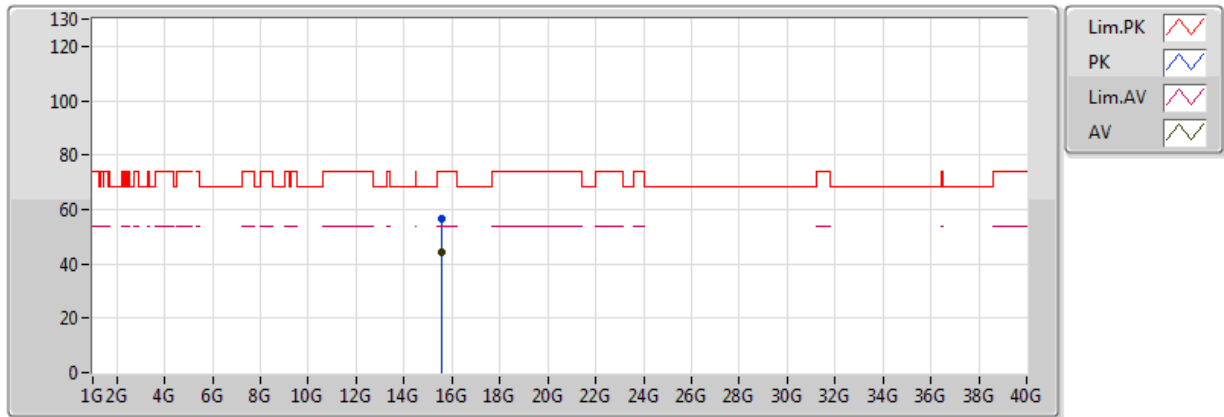


20170508
EUT Y 4TX
Setting 19
02-Z-1-10
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.149995G	47.55	54.00	-6.45	8.93	3	H	342	1.64	-
AV	5.1932G	98.08	Inf	-Inf	9.04	3	H	342	1.64	-
PK	5.1426G	60.36	74.00	-13.64	8.91	3	H	342	1.64	-
PK	5.1936G	108.03	Inf	-Inf	9.04	3	H	342	1.64	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5190MHz_TX

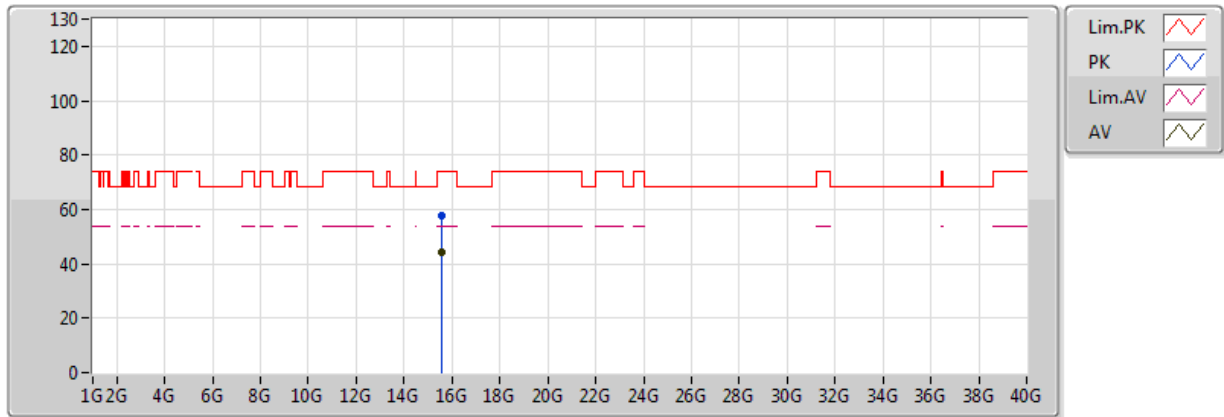


20170508
EUT Y 4TX
Setting 19
02-Z-1
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.56168G	44.16	54.00	-9.84	18.06	3	V	50	2.49	-
PK	15.57736G	56.86	74.00	-17.14	18.02	3	V	50	2.49	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5190MHz_TX

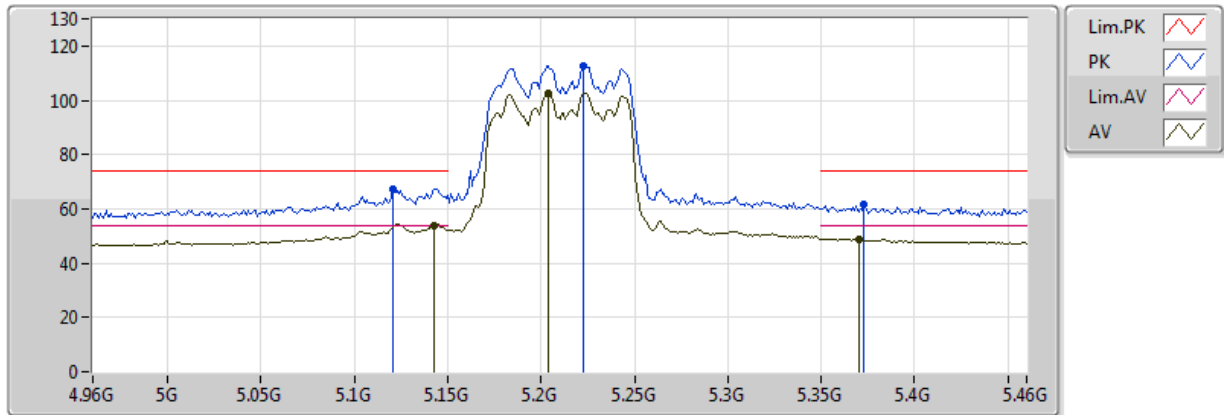


20170508
EUT Y 4TX
Setting 19
02-Z-1
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.55072G	44.25	54.00	-9.75	18.08	3	H	158	2.42	-
PK	15.55904G	57.52	74.00	-16.48	18.06	3	H	158	2.42	-

802.11ac VHT80_Nss1,(MCS0)_4TX

5210MHz_TX

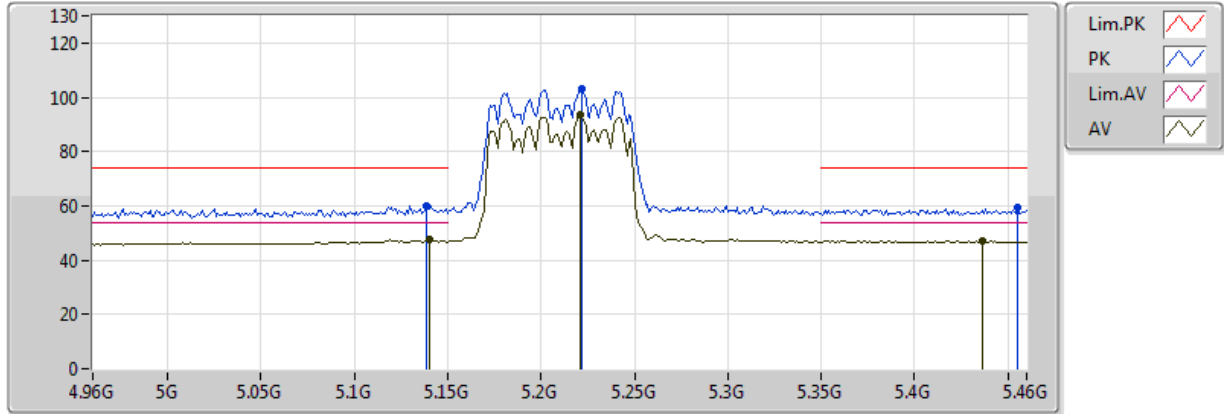


20170508
EUT Y 4TX
Setting 18
02-Z-1-10
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.143G	53.99	54.00	-0.01	8.91	3	V	215	1.92	-
AV	5.204G	102.79	Inf	-Inf	9.07	3	V	215	1.92	-
AV	5.37G	48.86	54.00	-5.14	9.38	3	V	215	1.92	-
PK	5.121G	67.16	74.00	-6.84	8.85	3	V	215	1.92	-
PK	5.223G	112.64	Inf	-Inf	9.10	3	V	215	1.92	-
PK	5.373G	61.36	74.00	-12.64	9.38	3	V	215	1.92	-

802.11ac VHT80_Nss1,(MCS0)_4TX

5210MHz_TX

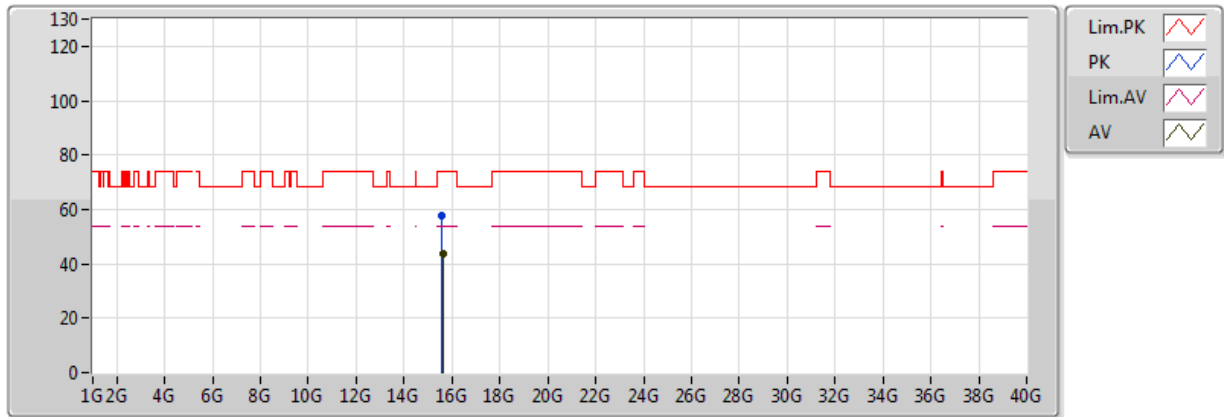


20170508
EUT Y 4TX
Setting 18
02-Z-1-10
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.14G	47.87	54.00	-6.13	8.90	3	H	220	1.07	-
AV	5.221G	93.47	Inf	-Inf	9.10	3	H	220	1.07	-
AV	5.436G	47.10	54.00	-6.90	9.52	3	H	220	1.07	-
PK	5.139G	59.86	74.00	-14.14	8.90	3	H	220	1.07	-
PK	5.222G	102.86	Inf	-Inf	9.10	3	H	220	1.07	-
PK	5.455G	59.46	74.00	-14.54	9.57	3	H	220	1.07	-

802.11ac VHT80_Nss1,(MCS0)_4TX

5210MHz_TX

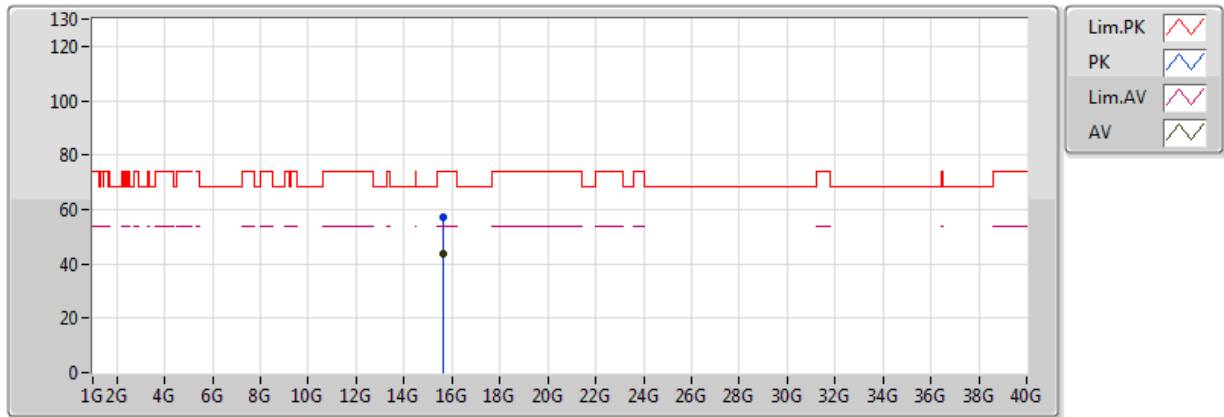


20170508
EUT Y 4TX
Setting 18
02-Z-1
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.65304G	43.91	54.00	-10.09	17.82	3	V	246	1.60	-
PK	15.59144G	57.58	74.00	-16.42	17.98	3	V	246	1.60	-

802.11ac VHT80_Nss1,(MCS0)_4TX

5210MHz_TX

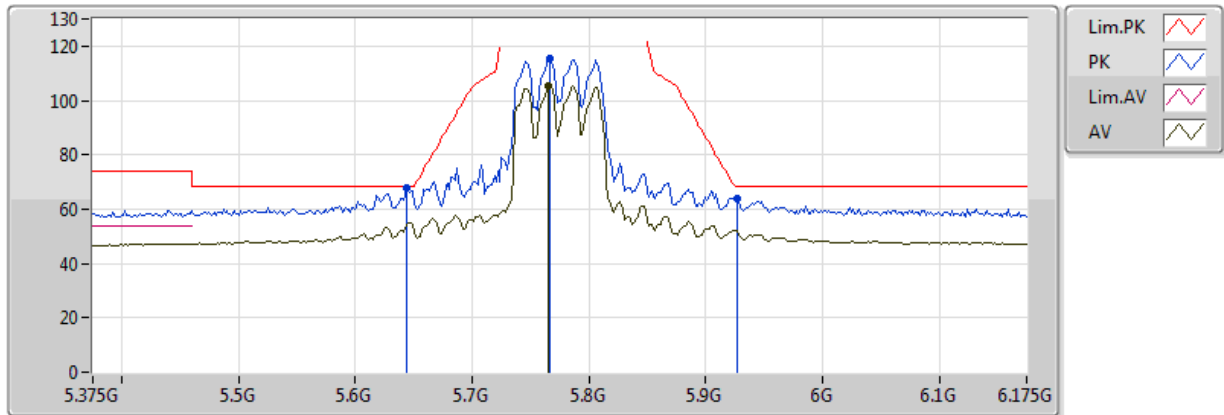


20170508
EUT Y 4TX
Setting 18
02-Z-1
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.64664G	43.86	54.00	-10.14	17.84	3	H	7	2.18	-
PK	15.63848G	57.06	74.00	-16.94	17.86	3	H	7	2.18	-

802.11ac VHT80_Nss1,(MCS0)_4TX

5775MHz_TX

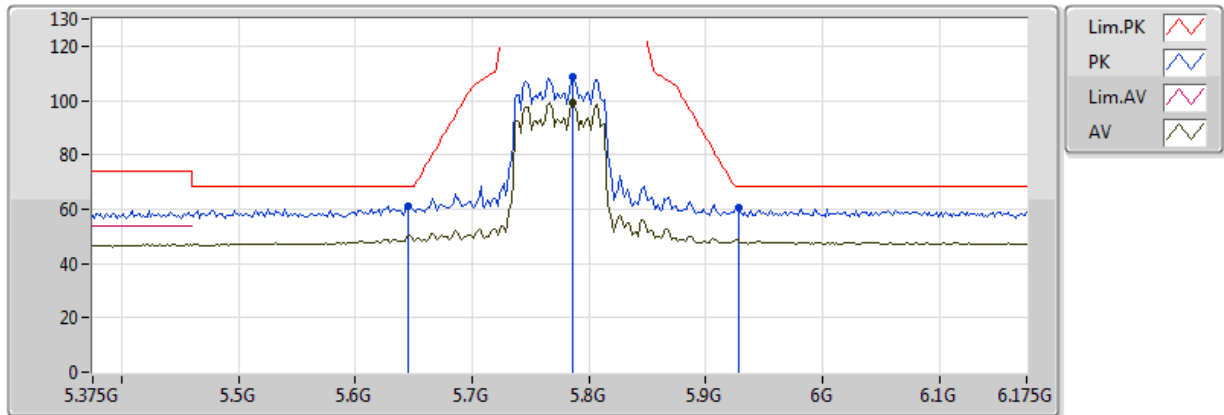


20170508
EUT Y 4TX
Setting 21.5
02-Z-1-10
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.7654G	105.52	Inf	-Inf	9.81	3	V	204	1.57	-
PK	5.6438G	68.04	68.20	-0.16	9.79	3	V	204	1.57	-
PK	5.767G	115.25	Inf	-Inf	9.81	3	V	204	1.57	-
PK	5.927G	64.07	68.20	-4.13	10.00	3	V	204	1.57	-

802.11ac VHT80_Nss1,(MCS0)_4TX

5775MHz_TX

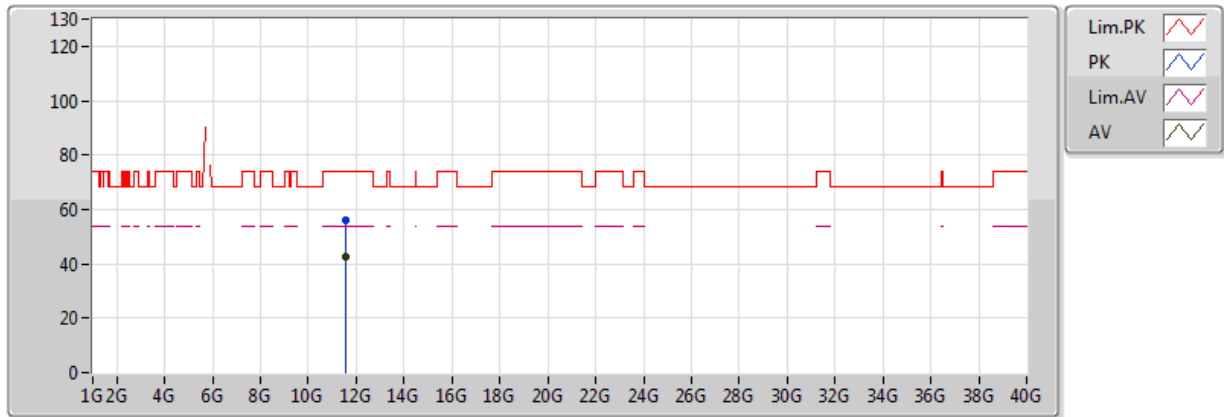


20170508
EUT Y 4TX
Setting 21.5
02-Z-1-10
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.7862G	99.05	Inf	-Inf	9.82	3	H	222	1.83	-
PK	5.6454G	61.31	68.20	-6.89	9.79	3	H	222	1.83	-
PK	5.7862G	108.95	Inf	-Inf	9.82	3	H	222	1.83	-
PK	5.9286G	60.62	68.20	-7.58	10.00	3	H	222	1.83	-

802.11ac VHT80_Nss1,(MCS0)_4TX

5775MHz_TX

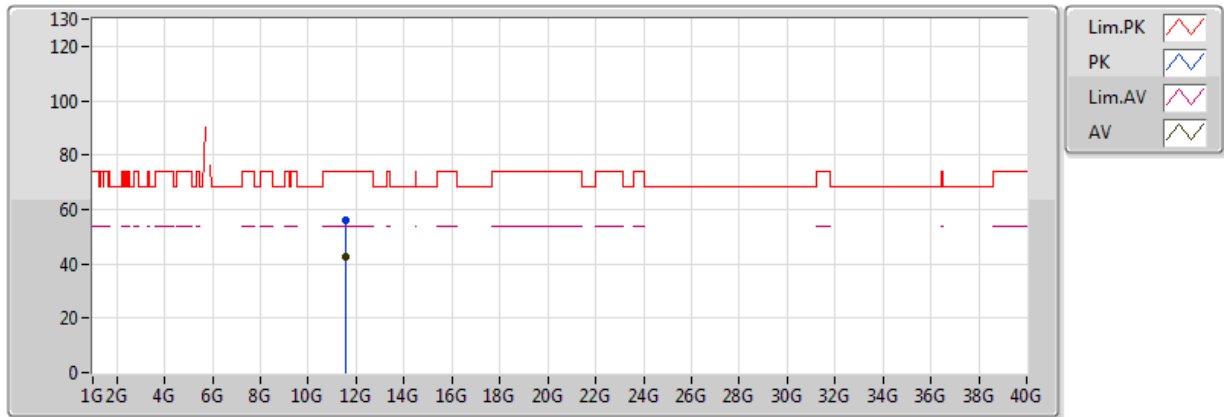


20170508
EUT Y 4TX
Setting 21.5
02-Z-1
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	11.5544G	42.41	54.00	-11.59	16.38	3	V	303	1.31	-
PK	11.556G	55.97	74.00	-18.03	16.38	3	V	303	1.31	-

802.11ac VHT80_Nss1,(MCS0)_4TX

5775MHz_TX



20170508
EUT Y 4TX
Setting 21.5
02-Z-1
FSU(100015)
Non-TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	11.55376G	42.67	54.00	-11.33	16.38	3	H	258	1.83	-
PK	11.56536G	56.06	74.00	-17.94	16.39	3	H	258	1.83	-

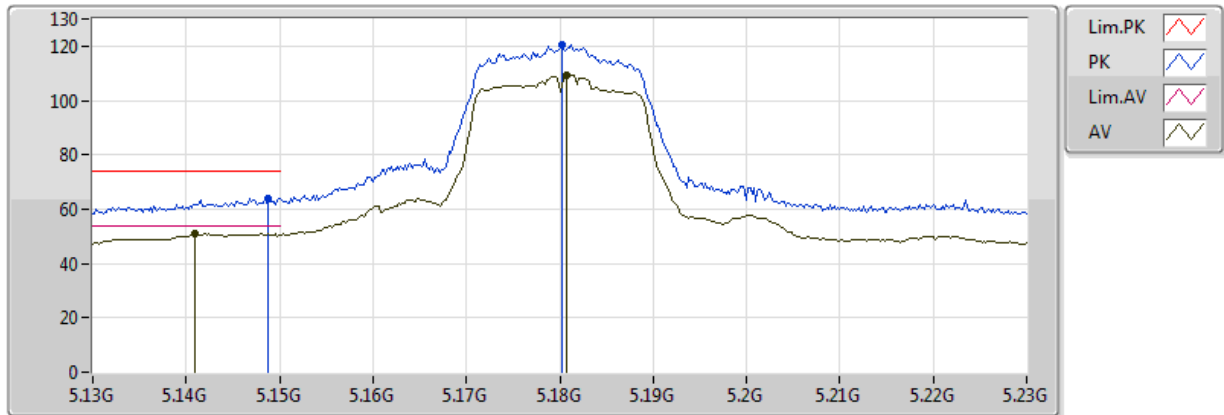


**Summary
For beamforming**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-
5.15-5-5.25GHz	Pass	AV	5.143G	53.94	54.00	-0.06	8.91	3	V	206	1.91	-

802.11ac VHT20-BF_Nss1,(MCS0)_4TX

5180MHz_TX

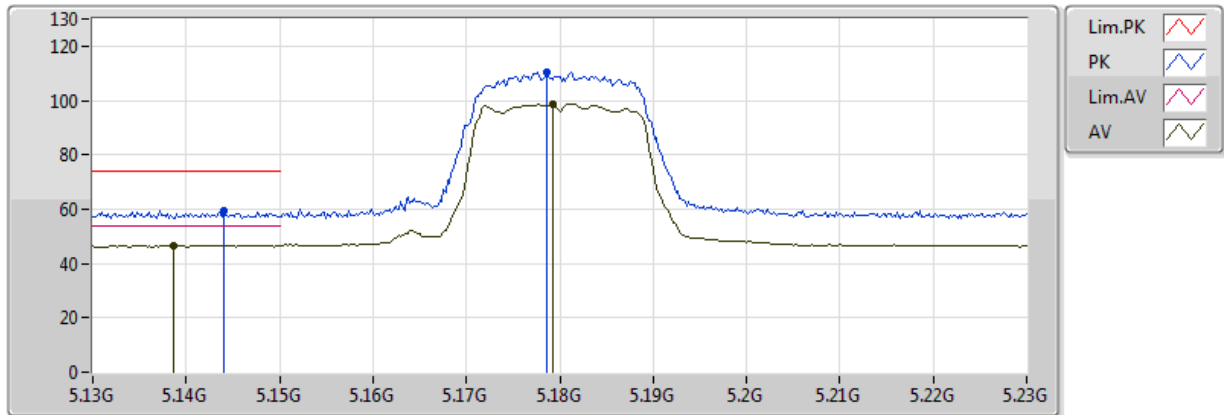


20170509
EUT Y 4TX
Setting 25.5
02-Z-1-10
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.141G	50.96	54.00	-3.04	8.91	3	V	193	2.59	-
AV	5.1808G	109.49	Inf	-Inf	9.01	3	V	193	2.59	-
PK	5.1488G	64.13	74.00	-9.87	8.93	3	V	193	2.59	-
PK	5.1802G	120.32	Inf	-Inf	9.01	3	V	193	2.59	-

802.11ac VHT20-BF_Nss1,(MCS0)_4TX

5180MHz_TX

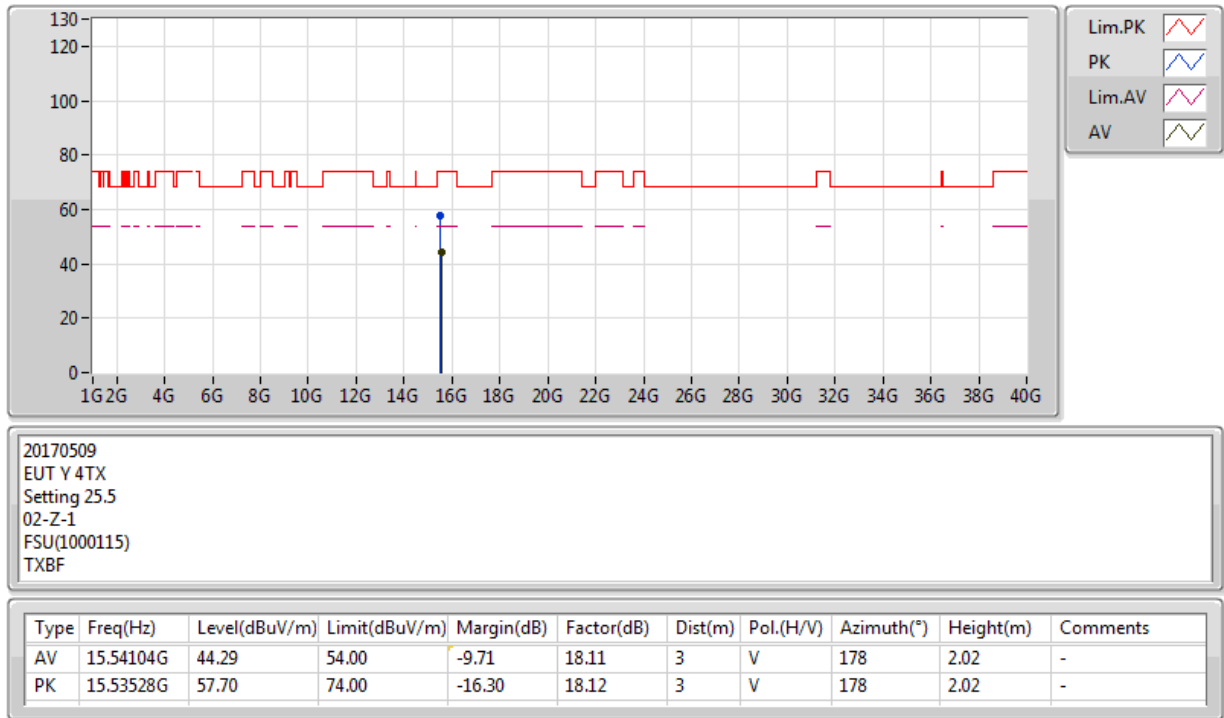


20170509
EUT Y 4TX
Setting 25.5
02-Z-1-10
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.1386G	46.63	54.00	-7.37	8.90	3	H	211	1.48	-
AV	5.1792G	98.63	Inf	-Inf	9.01	3	H	211	1.48	-
PK	5.144G	59.28	74.00	-14.72	8.91	3	H	211	1.48	-
PK	5.1786G	110.66	Inf	-Inf	9.00	3	H	211	1.48	-

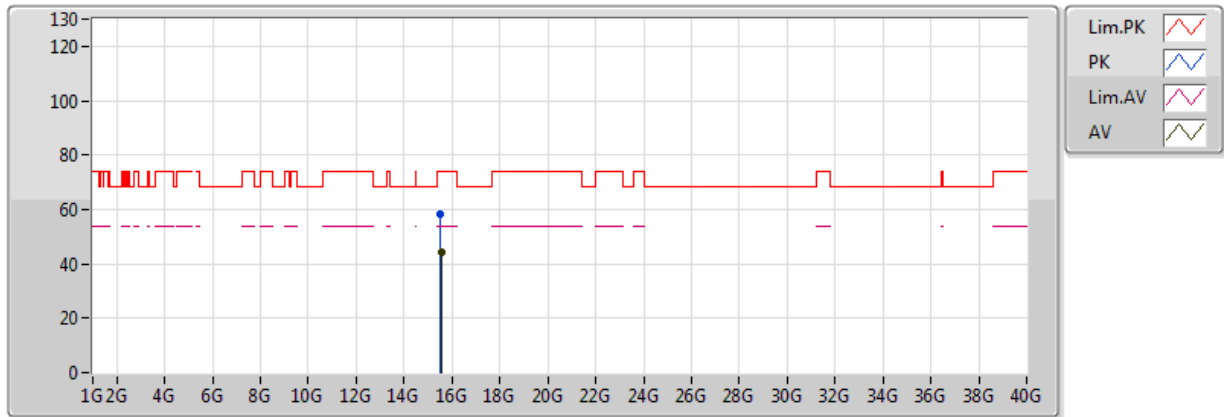
802.11ac VHT20-BF_Nss1,(MCS0)_4TX

5180MHz_TX



802.11ac VHT20-BF_Nss1,(MCS0)_4TX

5180MHz_TX

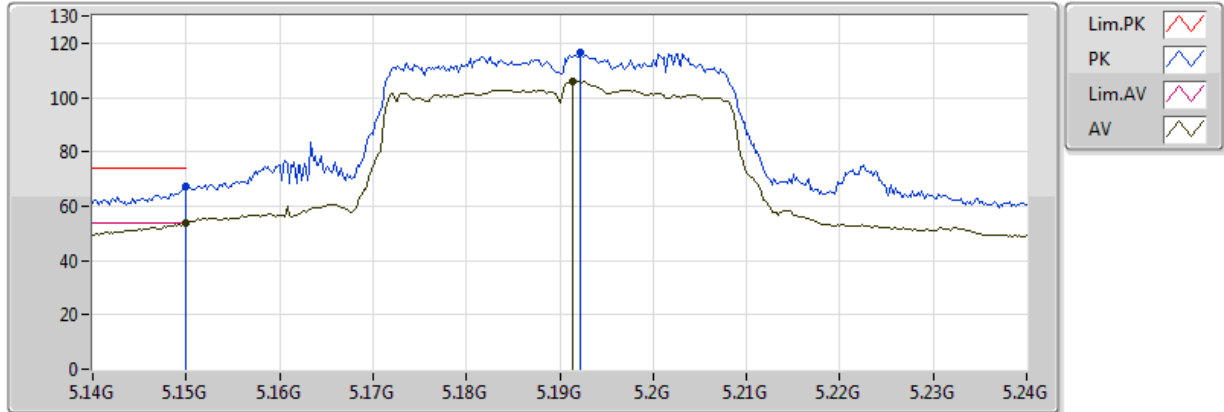


20170509
EUT Y 4TX
Setting 25.5
02-Z-1
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.53888G	44.36	54.00	-9.64	18.12	3	H	339	1.50	-
PK	15.53692G	58.25	74.00	-15.75	18.12	3	H	339	1.50	-

802.11ac VHT40-BF_Nss1,(MCS0)_4TX

5190MHz_TX

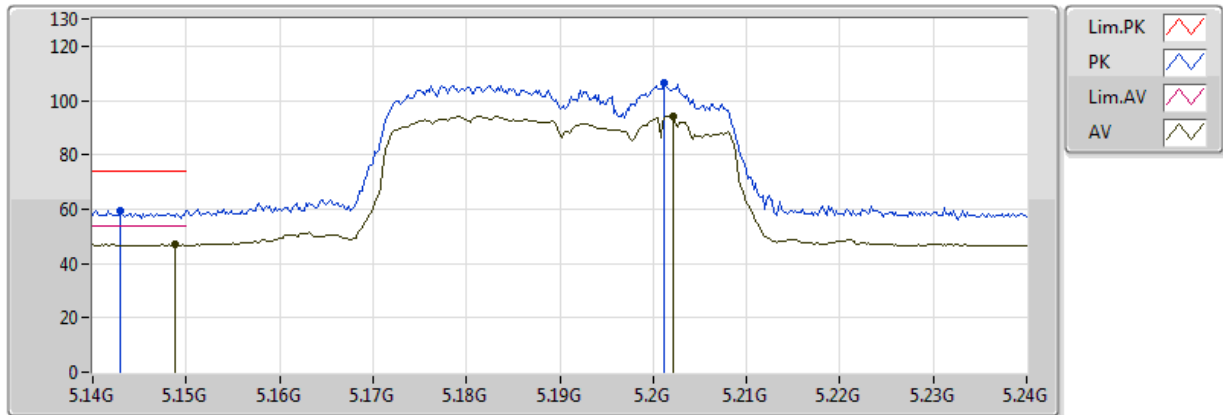


20170509
EUT Y 4TX
Setting 24
02-Z-1-10
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.149995G	53.86	54.00	-0.14	8.93	3	V	205	2.69	-
AV	5.1914G	106.00	Inf	-Inf	9.04	3	V	205	2.69	-
PK	5.149995G	67.24	74.00	-6.76	8.93	3	V	205	2.69	-
PK	5.1922G	116.76	Inf	-Inf	9.04	3	V	205	2.69	-

802.11ac VHT40-BF_Nss1,(MCS0)_4TX

5190MHz_TX

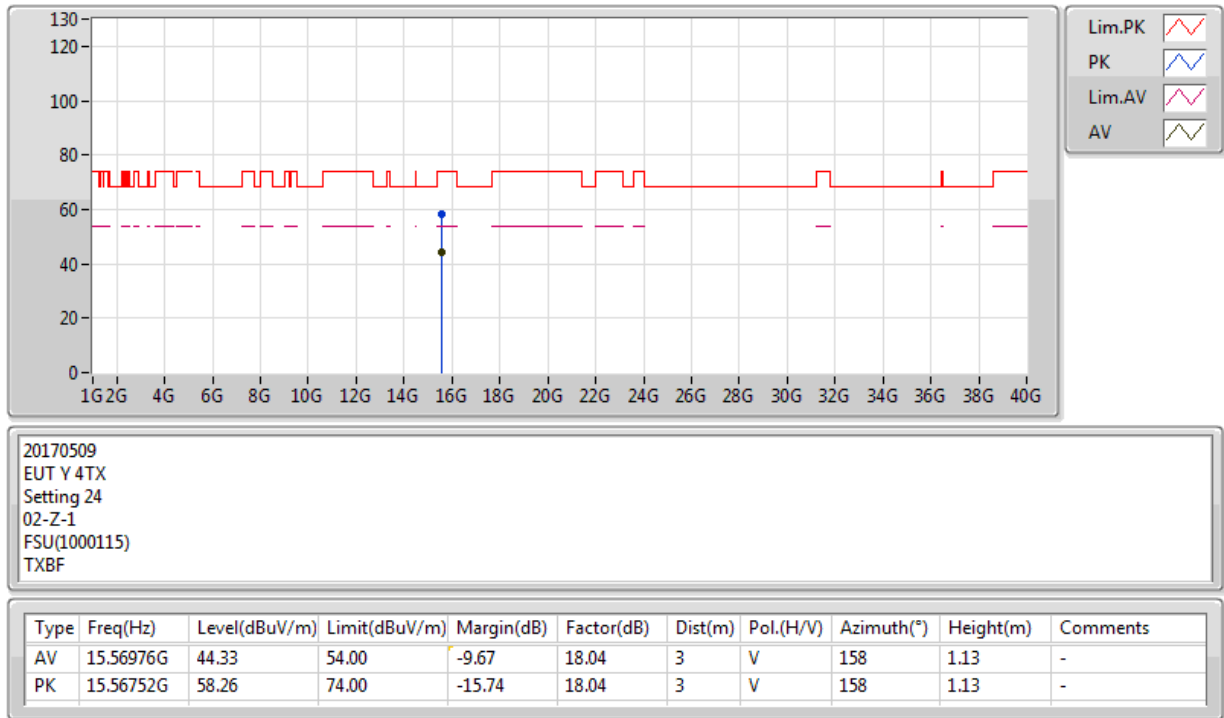


20170509
EUT Y 4TX
Setting 24
02-Z-1-10
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.1488G	47.00	54.00	-7.00	8.93	3	H	209	1.50	-
AV	5.2022G	94.21	Inf	-Inf	9.06	3	H	209	1.50	-
PK	5.143G	59.66	74.00	-14.34	8.91	3	H	209	1.50	-
PK	5.2012G	106.70	Inf	-Inf	9.06	3	H	209	1.50	-

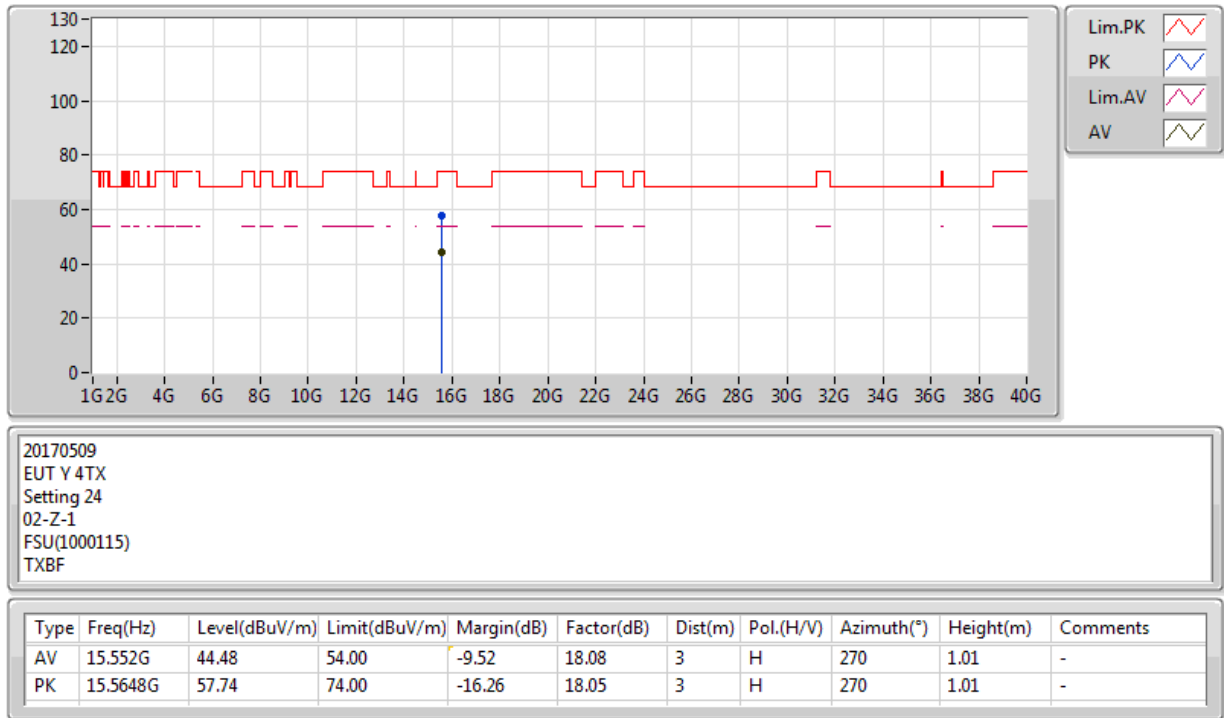
802.11ac VHT40-BF_Nss1,(MCS0)_4TX

5190MHz_TX



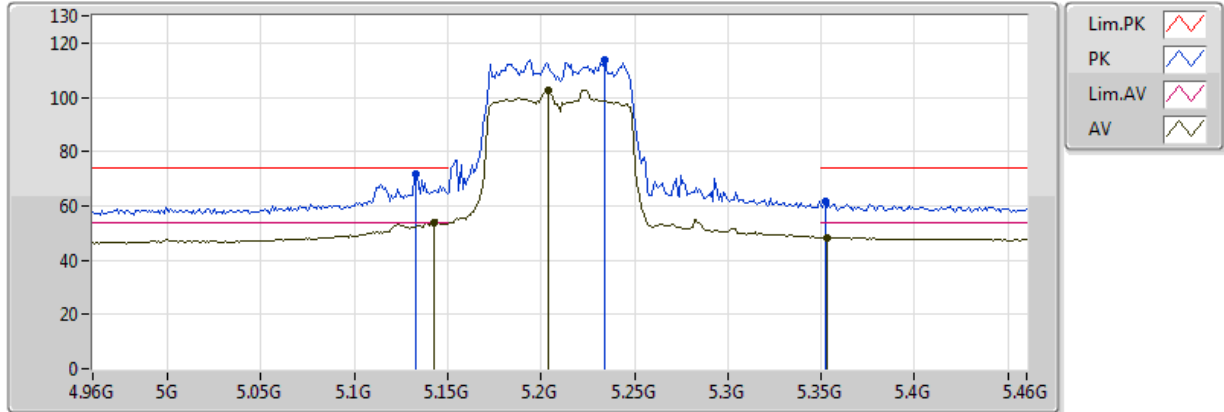
802.11ac VHT40-BF_Nss1,(MCS0)_4TX

5190MHz_TX



802.11ac VHT80-BF_Nss1,(MCS0)_4TX

5210MHz_TX

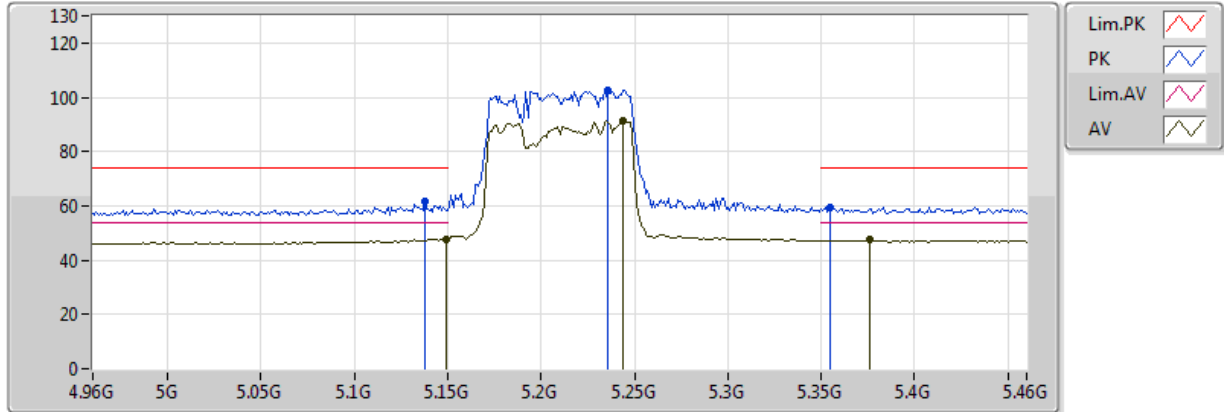


20170509
EUT Y 4TX
Setting 24.5
02-Z-1-10
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.143G	53.94	54.00	-0.06	8.91	3	V	206	1.91	-
AV	5.204G	102.57	Inf	-Inf	9.07	3	V	206	1.91	-
AV	5.353G	48.44	54.00	-5.56	9.35	3	V	206	1.91	-
PK	5.133G	71.71	74.00	-2.29	8.89	3	V	206	1.91	-
PK	5.234G	113.51	Inf	-Inf	9.12	3	V	206	1.91	-
PK	5.352G	61.76	74.00	-12.24	9.34	3	V	206	1.91	-

802.11ac VHT80-BF_Nss1,(MCS0)_4TX

5210MHz_TX

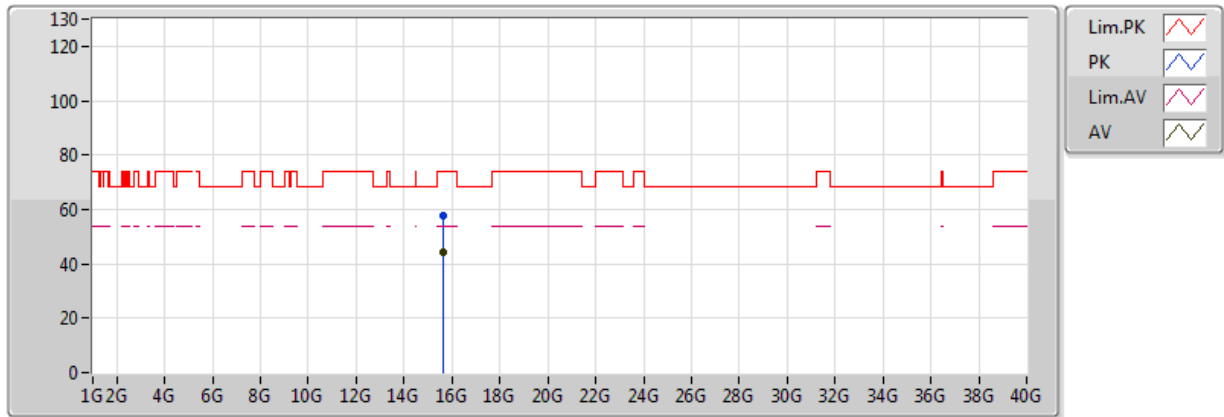


20170509
EUT Y 4TX
Setting 24.5
02-Z-1-10
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.149G	47.86	54.00	-6.14	8.93	3	H	231	1.50	-
AV	5.244G	91.60	Inf	-Inf	9.14	3	H	231	1.50	-
AV	5.376G	47.76	54.00	-6.24	9.39	3	H	231	1.50	-
PK	5.138G	61.43	74.00	-12.57	8.90	3	H	231	1.50	-
PK	5.236G	102.74	Inf	-Inf	9.13	3	H	231	1.50	-
PK	5.355G	59.46	74.00	-14.54	9.35	3	H	231	1.50	-

802.11ac VHT80-BF_Nss1,(MCS0)_4TX

5210MHz_TX

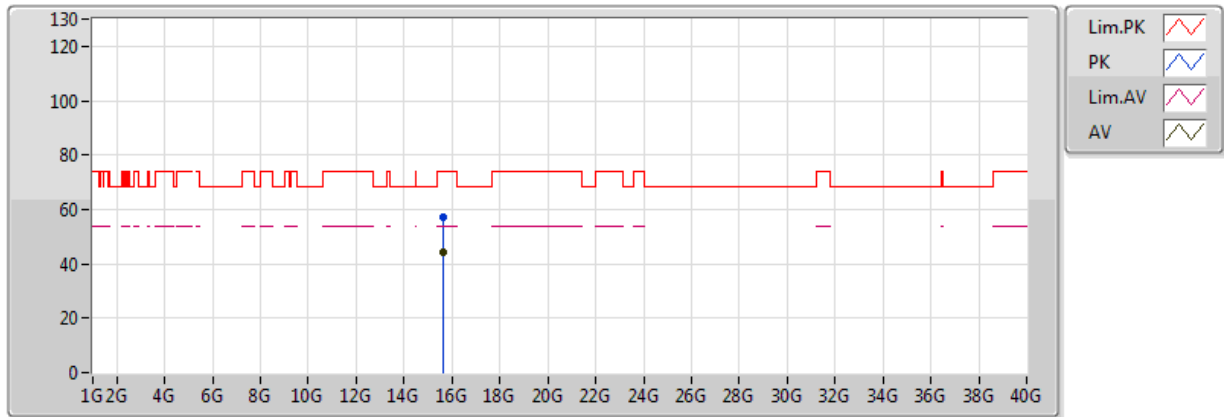


20170509
EUT Y 4TX
Setting 24.5
02-Z-1
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.62328G	44.43	54.00	-9.57	17.90	3	V	303	1.49	-
PK	15.62488G	57.91	74.00	-16.09	17.89	3	V	303	1.49	-

802.11ac VHT80-BF_Nss1,(MCS0)_4TX

5210MHz_TX

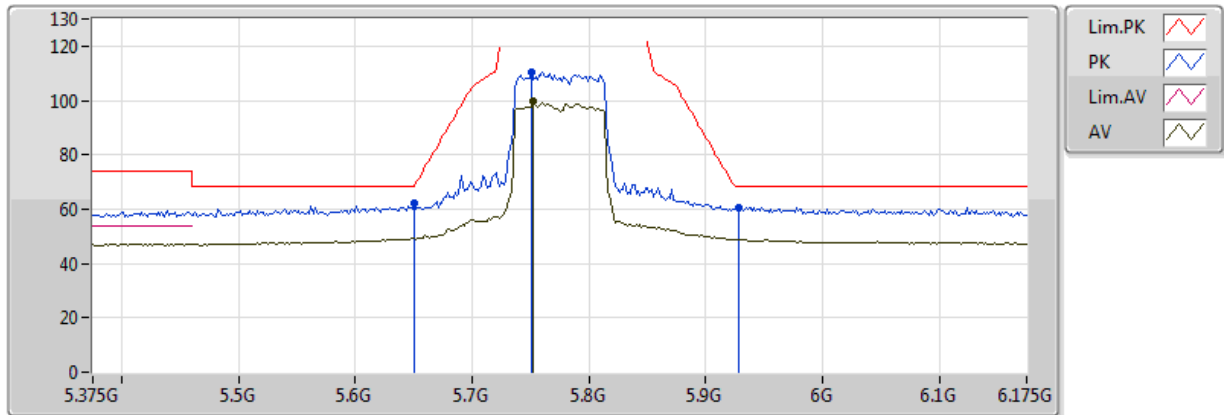


20170509
EUT Y 4TX
Setting 24.5
02-Z-1
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.61432G	44.45	54.00	-9.55	17.92	3	H	69	2.05	-
PK	15.63896G	57.38	74.00	-16.62	17.86	3	H	69	2.05	-

802.11ac VHT80-BF_Nss1,(MCS0)_4TX

5775MHz_TX

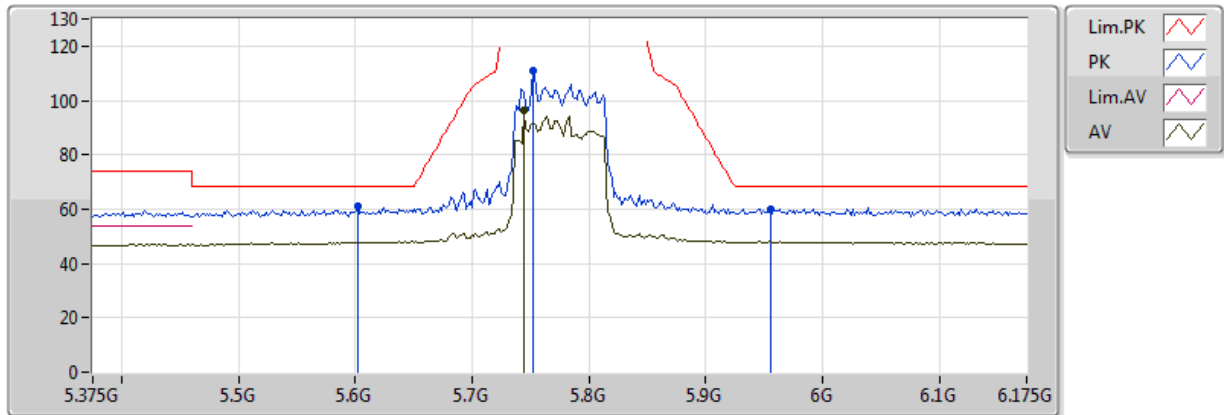


20170509
EUT Y 4TX
Setting 25
02-Z-1-10
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.7526G	99.72	Inf	-Inf	9.81	3	V	259	1.50	-
PK	5.6502G	62.00	68.35	-6.35	9.79	3	V	259	1.50	-
PK	5.751G	110.34	Inf	-Inf	9.81	3	V	259	1.50	-
PK	5.9286G	60.79	68.20	-7.41	10.00	3	V	259	1.50	-

802.11ac VHT80-BF_Nss1,(MCS0)_4TX

5775MHz_TX

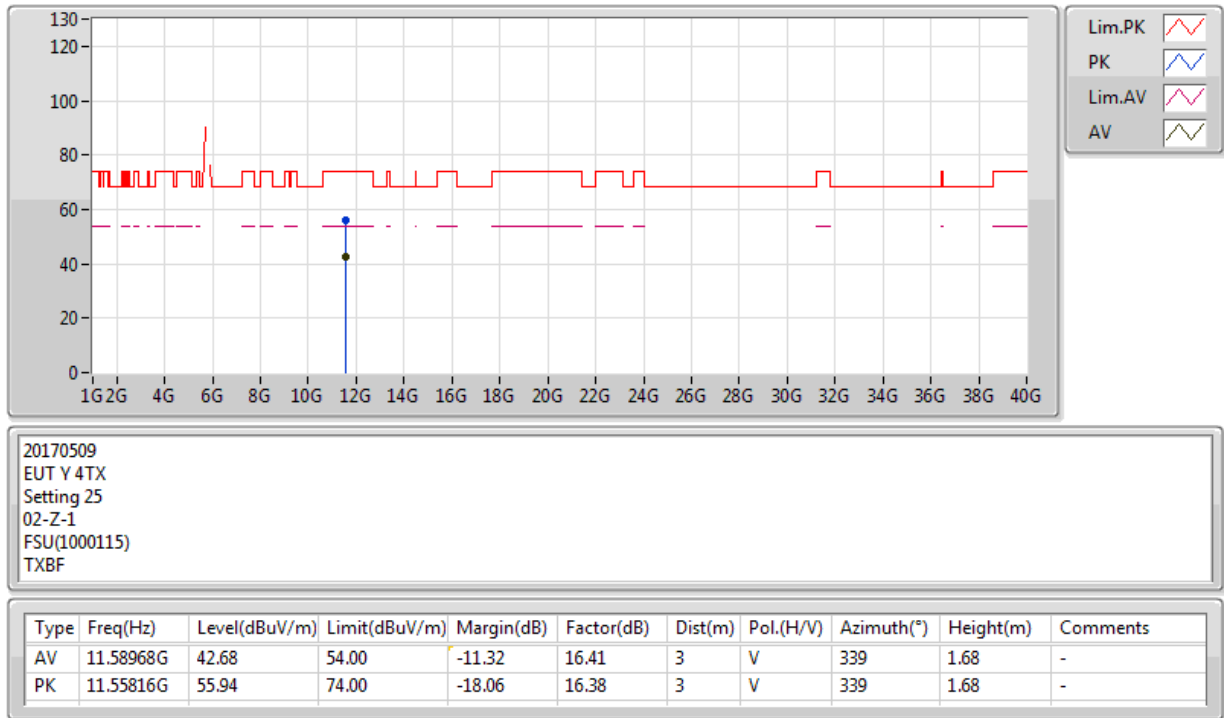


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EUT Y 4TX
Setting 25
02-Z-1-10
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.7446G	96.17	Inf	-Inf	9.81	3	H	199	1.50	-
PK	5.6022G	61.00	68.20	-7.20	9.78	3	H	199	1.50	-
PK	5.7526G	111.05	Inf	-Inf	9.81	3	H	199	1.50	-
PK	5.9558G	60.06	68.20	-8.14	10.04	3	H	199	1.50	-

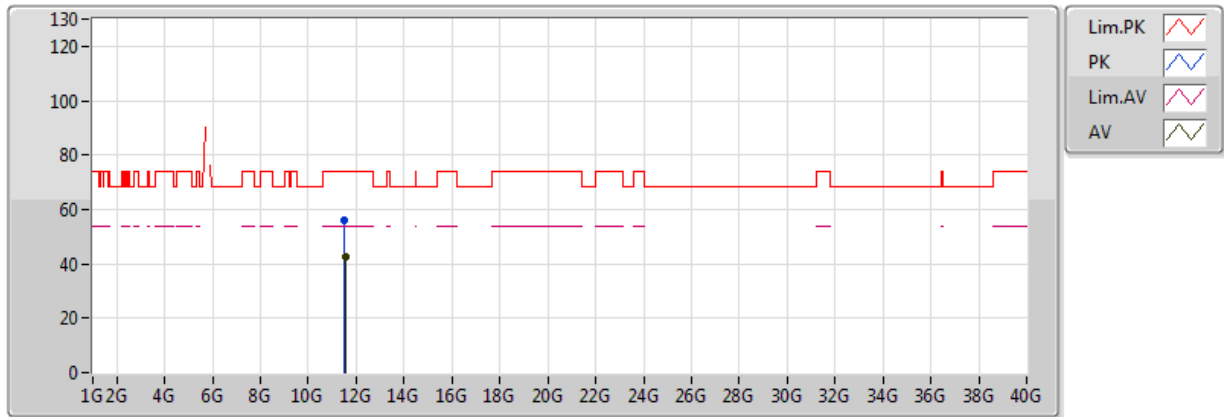
802.11ac VHT80-BF_Nss1,(MCS0)_4TX

5775MHz_TX



802.11ac VHT80-BF_Nss1,(MCS0)_4TX

5775MHz_TX



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EUT Y 4TX
Setting 25
02-Z-1
FSU(1000115)
TXBF

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	11.53352G	42.70	54.00	-11.30	16.36	3	H	286	1.67	-
PK	11.51624G	55.78	74.00	-18.22	16.34	3	H	286	1.67	-