Testing Laboratory 1190

FCC RADIO TEST REPORT

FCC ID	:	Z8H89FT0047
Equipment	:	ePMP 5GHz Force 300 CSM RADIO/ePMP 3000L 5GHz Access Point Radio
Brand Name	:	Cambium Networks
Model Name	:	ePMP 5GHz Force 300 CSM RADIO/ePMP 3000L 5GHz Access Point Radio
Applicant	:	Cambium Networks Inc. 3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA
Manufacturer	:	Cambium Networks Inc. 3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA
Standard	:	47 CFR FCC Part 15.407

The product was received on Jan. 15, 2019, and testing was started from Jan. 21, 2019 and completed on Jan. 23, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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

Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR880825-04	01	Initial issue of report	Oct. 09, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.407(a)	Emission Bandwidth	PASS	-
3.2	15.407(a)	Maximum Conducted Output Power	PASS	-
3.3	15.407(a)	Peak Power Spectral Density	PASS	-
3.4	15.407(b)	Unwanted Emissions	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Vicky Huang

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]
5150-5250	ac (VHT80)	5210	42 [1]

Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	2TX
5.15-5.25GHz	802.11n HT20	20	2TX
5.15-5.25GHz	802.11ac VHT20	20	2TX
5.15-5.25GHz	802.11ac VHT80	80	2TX

Note:
- 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 Antenna Information

Set	Ant.	Port	Brand	P/N	Type	Connector	Gain (dBi)
1	1	1	Cambium	C050900D007B	Dish	Reversed-SMA	25
		2	Cambium	C050900D007B	Dish	Reversed-SMA	25
Set	**Ant.**	**Port**	**Brand**	**P/N**	**Type**	**Connector**	**Gain (dBi)**
2	2	1	ANATEL	C050900D021	Array	Reversed-SMA	17
		2	ANATEL	C050900D021	Array	Reversed-SMA	17
Set	**Ant.**	**Port**	**Brand**	**Model Name**	**Type**	**Connector**	**Gain (dBi)**
3	3	1	ABRACON	APAMS-121	Dipole	Reversed-SMA	2
	4	2	ABRACON	APAMS-121	Dipole	Reversed-SMA	2

Note 1:

Set	Support Function				
	2.4GHz	5GHz Band 1	5GHz Band 2	5GHz Band 3	5GHz Band 4
1	V	V	V	V	V
2	V	X	V	V	V
3	V	X	V	V	V

Note 2: The above information was declared by manufacturer.

Note 3: The EUT has three sets of antenna.

Note 4: Set 1 antenna has one antenna, and it has two connectors.

Note 5: Set 2 antenna has one antenna, and it has two connectors.

Note 6: Set 3 antenna contains two antennas, and the array gain is 0dBi.

For IEEE 802.11a/n/ac mode (2TX/2RX)

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) ≥ 1/T
802.11a	0.974	0.114	20.029m	100
802.11ac VHT20	0.988	0.052	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11ac VHT80	0.942	0.259	10.014m	100

Note:
- DC is Duty Cycle.
- DCF is Duty Cycle Factor.

1.1.4 EUT Operational Condition

EUT Power Type	From PoE			
Beamforming Function	☐	With beamforming	☒	Without beamforming
Function	☒	Outdoor P2M for Set 2 antenna and Set 3 antenna	☐	Indoor P2M
	☒	Fixed P2P for Set 1 antenna and Set 3 antenna	☐	Client
Communication Mode	☐	IP Based (Load Based)	☒	Frame Based
Test Software Version	QRCT V3.0.187.0			

Note1: The above information was declared by manufacturer.

Note2: While frame-based mechanism is implemented, the test procedure is the same with regular IEEE 802.11a/n/ac devices.

1.1.5 Table for Multiple Listing

The equipment names/model names in the following table are all refer to the identical product.

EUT	Equipment Name / Model Name	GPS Function	WIFI Filter Function
1	ePMP 5GHz Force 300 CSM RADIO	No	Yes
2	ePMP 3000L 5GHz Access Point Radio	Yes	Yes

From the above models, EUT 1 was selected as representative model for the test and its data was recorded in this report.

1.1.6 Table for Class III Change

This product is an extension of original one reported under Sporton project number: FR880825-02
Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Adding U-NII-1 (5150~5250 MHz) for this device and equiping with antenna gain 25dBi only.	1. Emission Bandwidth. 2. Maximum Conducted Output Power. 3. Peak Power Spectral Density. 4. Unwanted Emissions Above 1GHz.

1.2 Applicable 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 v02r01
- FCC KDB 662911 D01 v02r01
- FCC KDB 412172 D01 v01r01

1.3 Testing Location Information

Testing Location			
☐	HWA YA	ADD :	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)
		TEL :	886-3-327-3456 FAX : 886-3-327-0973
☒	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
Radiated	03CH01-CB	Paul Chen	22.2~26.1°C / 54~60%	Jan. 21, 2019~Jan. 23, 2019
RF Conducted	TH01-CB	Owen Hsu	23.9~26.1°C / 57~60%	Jan. 23, 2019

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)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%
Output Power Measurement	1.5 dB	Confidence levels of 95%
Power Density Measurement	2.4 dB	Confidence levels of 95%
Bandwidth Measurement	2%	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	9
5200MHz	8.5
5240MHz	8
802.11ac VHT20_Nss1,(MCS0)_2TX	-
5180MHz	8.5
5200MHz	8.5
5240MHz	8.5
802.11ac VHT80_Nss1,(MCS0)_2TX	-
5210MHz	9

Note:
- VHT20 cover HT20, due to same modulation. The power setting for 802.11n HT20 is the same or lower than 802.11ac VHT20.

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emission Bandwidth Maximum Conducted Output Power Peak Power Spectral Density
Test Condition	Conducted measurement at transmit chains
Operating Mode	
1	EUT 1 + Set 1 antenna

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
The EUT was performed at X axis, Y axis and Z axis position for Unwanted Emissions test, and the worst case was found at Y axis. So the measurement will follow this same test configuration.	
1	EUT 1 Y axis + Set 1 antenna

Note: The EUT was powered by PoE, and the PoE was for measurement only, would not be marked.

Equipment	Brand Name	Model Name	FCC ID
PoE	Cambium	NTE-P15-30IN	N/A

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

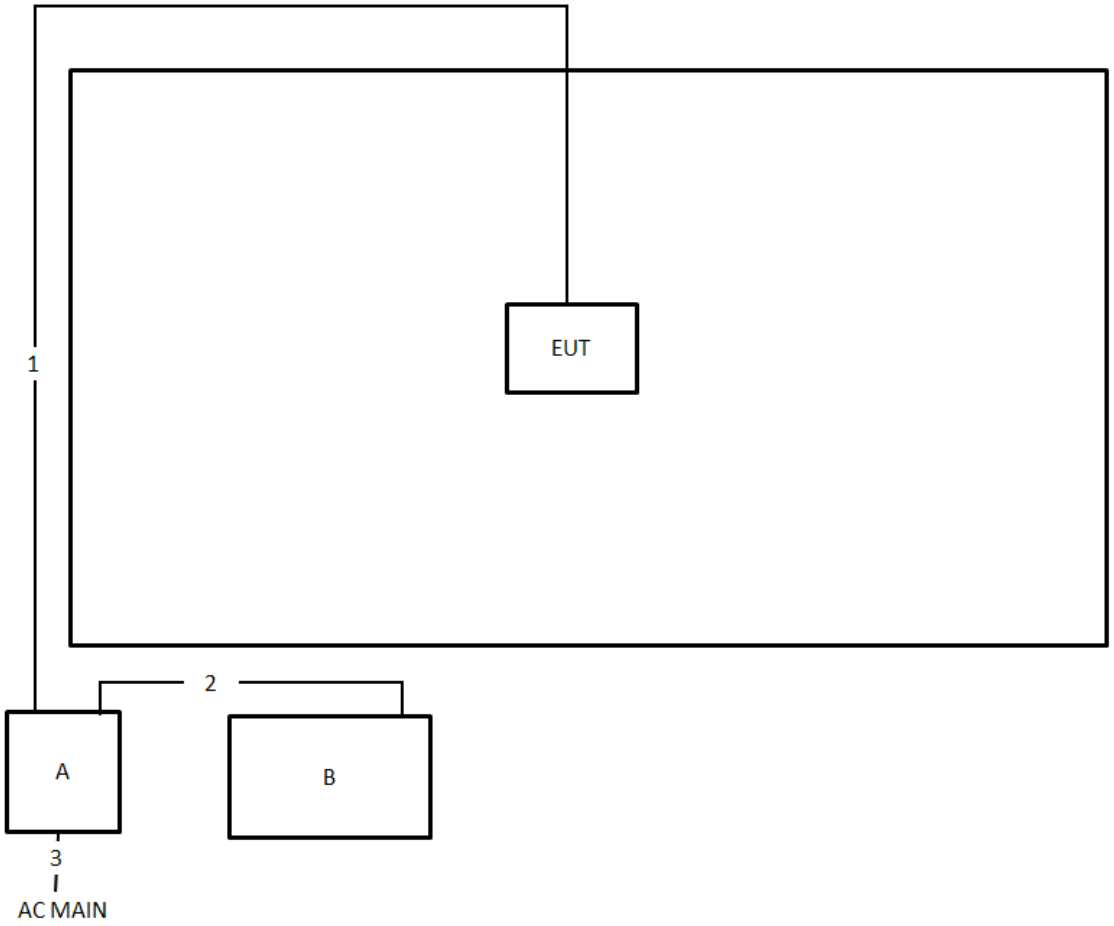
N/A

2.5 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	PoE	Cambium	NTE-P15-30IN	N/A
B	NB	DELL	E4300	N/A

2.6 Test Setup Diagram

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1.5m
3	Power cable	No	0.7m

3 Transmitter Test Result

3.1 Emission Bandwidth

3.1.1 Emission Bandwidth Limit

Emission Bandwidth Limit
UNII Devices
☒ For the 5.15-5.25 GHz band, N/A
☐ For the 5.25-5.35 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
☐ For the 5.47-5.725 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
☐ For the 5.725-5.85 GHz band, 6 dB emission bandwidth ≥ 500kHz.
LE-LAN Devices
☐ For the band 5.15-5.25 GHz, 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, 6 dB emission bandwidth ≥ 500kHz.

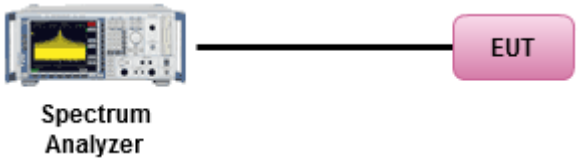
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method	
▪	For the emission bandwidth shall be measured using one of the options below:
☒	Refer as FCC KDB 789033, clause C for EBW and clause D for OBW measurement.
☐	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
☐	Refer as IC RSS-Gen, clause 4.6 for bandwidth testing.

3.1.4 Test Setup

Emission Bandwidth


3.1.5 Test Result of Emission Bandwidth

Refer as Appendix A

3.2 Maximum Conducted Output Power

3.2.1 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.	

3.2.2 Measuring Instruments

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

3.2.3 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: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.2.4 Test Setup

RF Output Power (Power Meter)


3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

3.3 Peak Power Spectral Density

3.3.1 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 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.
	▪ 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° ≤ θ < 8° ; -13 − 0.716 (θ-8) dBW/MHz for 8° ≤ θ < 40° -35.9 − 1.22 (θ-40) dBW/MHz for 40° ≤ θ ≤ 45° ; -42 dBW/MHz for θ > 45°
☐	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 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.	

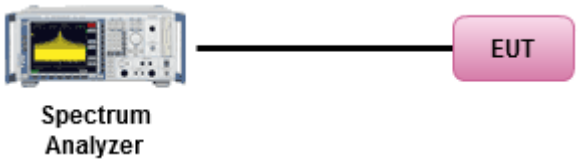
3.3.2 Measuring Instruments

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

3.3.3 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, F)5) 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: $PPSD_{total} = PPSD_1 + PPSD_2 + \ldots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$

3.3.4 Test Setup

Power Spectral Density


3.3.5 Test Result of Peak Power Spectral Density

Refer as Appendix C

3.4 Unwanted Emissions

3.4.1 Transmitter 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.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

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).

3.4.2 Measuring Instruments

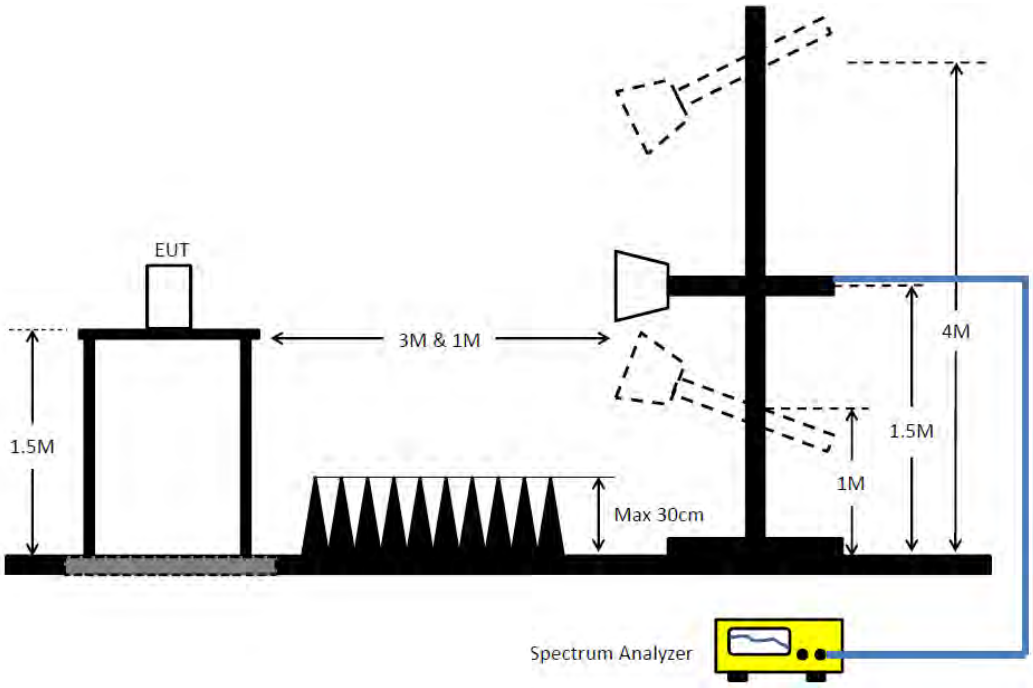
Refer a test equipment and calibration data table in this test report.

3.4.3 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 ≥ 98 or duty factor].			
▪ For the transmitter unwanted emissions shall be measured using following options below:			
	▪ Refer as FCC KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.		
	▪ Refer as FCC KDB 789033, clause G)1) for unwanted emissions into restricted bands.		
		☐ Refer as FCC KDB 789033, G)6) Method AD (Trace Averaging).	
		☒ Refer as FCC KDB 789033, G)6) Method VB (Reduced VBW).	
		☐ Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.	
		☐ Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.	
		☒ Refer as FCC KDB 789033, clause G)5) measurement procedure peak limit.	
		☐ Refer as ANSI C63.10, clause 4.1.4.2.2 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.			

3.4.4 Test Setup

Transmitter Radiated Unwanted Emissions



3.4.5 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.4.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix D

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 13, 2018	Nov. 12, 2019	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 28, 2018	Jun. 27, 2019	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 08, 2019	Jan. 07, 2020	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 03, 2018	Oct. 02, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Jun. 22, 2018	Jun. 21, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz–26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz–26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz–26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz–26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz–26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-28	1 GHz–26.5 GHz	Nov. 19, 2018	Nov. 18, 2019	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 05, 2018	Nov. 04, 2019	Conducted (TH01-CB)

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

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
5.15-5.25GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	19M	16.417M	16M4D1D	18.825M	16.367M
802.11ac VHT20_Nss1,(MCS0)_2TX	20.275M	17.616M	17M6D1D	19.8M	17.566M
802.11ac VHT80_Nss1,(MCS0)_2TX	83.4M	75.862M	75M9D1D	83.1M	75.462M

Max-N dB = Maximum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;
Max-OBW = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;
Min-OBW = Minimum 99% occupied bandwidth;

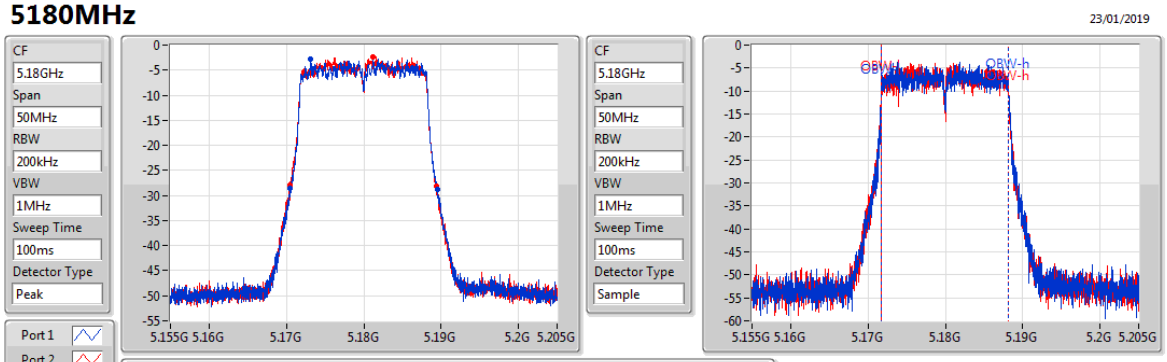
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	19M	16.392M	18.95M	16.392M
5200MHz	Pass	Inf	18.825M	16.392M	18.975M	16.367M
5240MHz	Pass	Inf	19M	16.417M	18.95M	16.392M
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	20.275M	17.616M	19.85M	17.566M
5200MHz	Pass	Inf	20.275M	17.591M	19.8M	17.591M
5240MHz	Pass	Inf	19.925M	17.616M	19.95M	17.616M
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	Inf	83.1M	75.462M	83.4M	75.862M

Port X-N dB = Port **X** 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band
Port X-OBW = Port **X** 99% occupied bandwidth;

802.11a_Nss1,(6Mbps)_2TX **EBW**

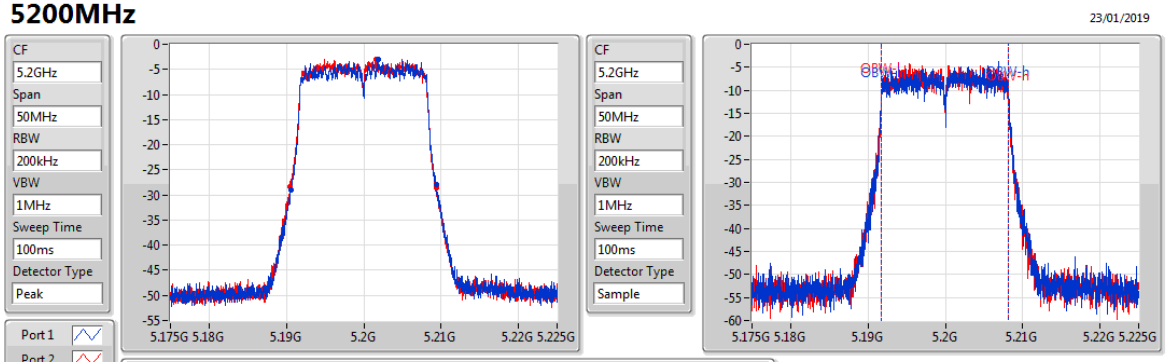
5180MHz



26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
19M	5.1705G	5.1895G	16.392M	5.171779G	5.188171G	Inf	1
18.95M	5.170425G	5.189375G	16.392M	5.171779G	5.188171G	Inf	2

802.11a_Nss1,(6Mbps)_2TX **EBW**

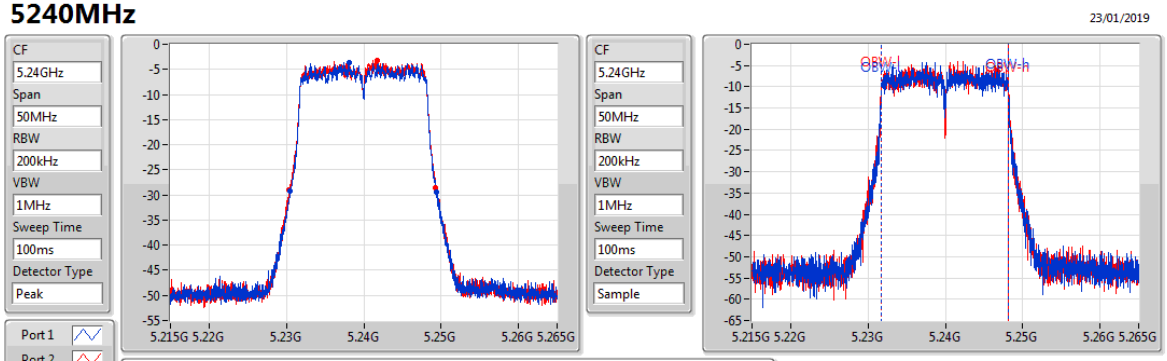
5200MHz



26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
18.825M	5.19055G	5.209375G	16.392M	5.191779G	5.208171G	Inf	1
18.975M	5.1904G	5.209375G	16.367M	5.191779G	5.208146G	Inf	2

802.11a_Nss1,(6Mbps)_2TX **EBW**

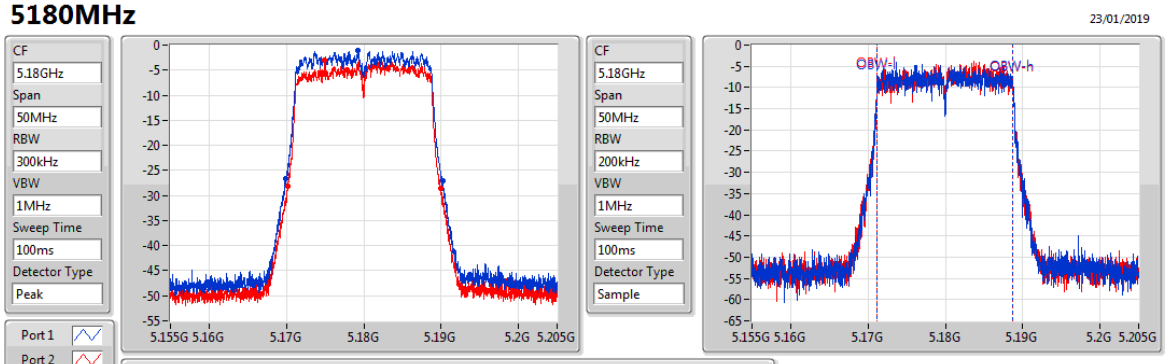
5240MHz



26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
19M	5.23045G	5.24945G	16.417M	5.231754G	5.248171G	Inf	1
18.95M	5.230375G	5.249325G	16.392M	5.231779G	5.248171G	Inf	2

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

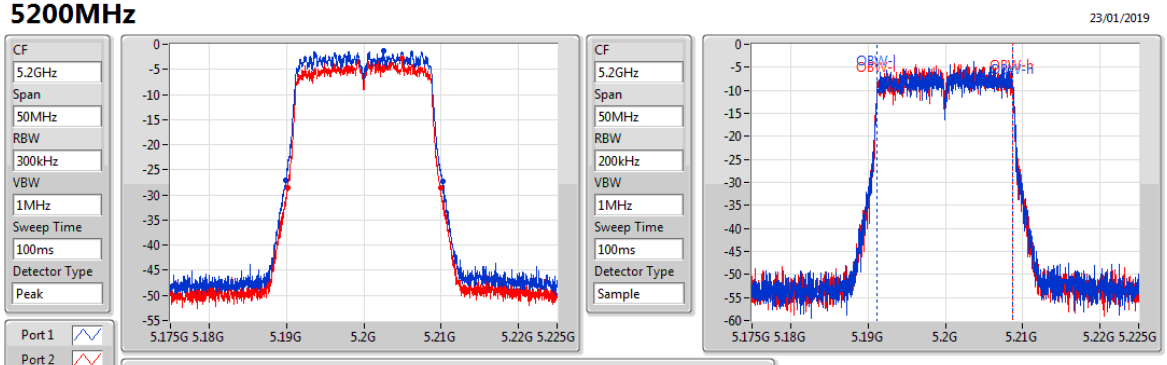
5180MHz



26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
20.275M	5.16995G	5.190225G	17.616M	5.171154G	5.188771G	Inf	1
19.85M	5.170125G	5.189975G	17.566M	5.171204G	5.188771G	Inf	2

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

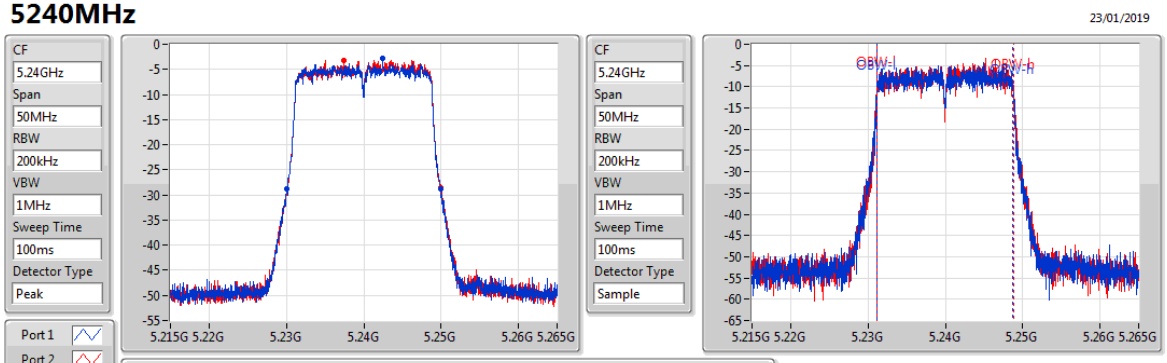
5200MHz



26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
20.275M	5.1899G	5.210175G	17.591M	5.191179G	5.208771G	Inf	1
19.8M	5.190125G	5.209925G	17.591M	5.191179G	5.208771G	Inf	2

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

5240MHz

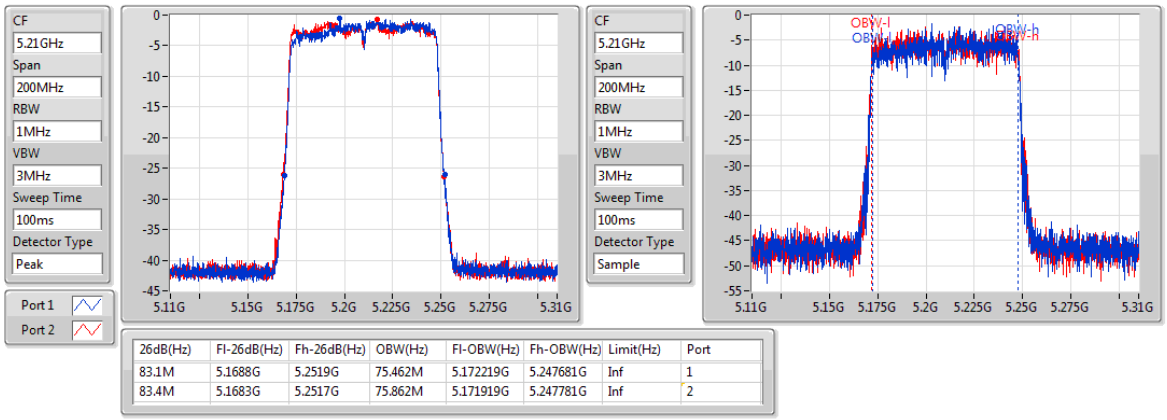


26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
19.925M	5.230025G	5.24995G	17.616M	5.231154G	5.248771G	Inf	1
19.95M	5.230075G	5.250025G	17.616M	5.231179G	5.248796G	Inf	2

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

5210MHz

23/01/2019



26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
83.1M	5.1688G	5.2519G	75.462M	5.172219G	5.247681G	Inf	1
83.4M	5.1683G	5.2517G	75.862M	5.171919G	5.247781G	Inf	2

Summary

Mode	Total Power (dBm)	Total Power (W)
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	11.40	0.01380
802.11ac VHT20_Nss1,(MCS0)_2TX	11.20	0.01318
802.11ac VHT80_Nss1,(MCS0)_2TX	11.52	0.01419

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	25.00	8.20	8.58	11.40	28.00
5200MHz	Pass	25.00	7.73	8.09	10.92	28.00
5240MHz	Pass	25.00	7.55	7.69	10.63	28.00
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	25.00	8.05	8.30	11.19	28.00
5200MHz	Pass	25.00	7.85	8.39	11.14	28.00
5240MHz	Pass	25.00	7.99	8.38	11.20	28.00
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	25.00	8.46	8.55	11.52	28.00

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

Summary

Mode	PD (dBm/RBW)
5.15-5.25GHz	-
802.11a_Nss1,(6Mbps)_2TX	-1.64
802.11ac VHT20_Nss1,(MCS0)_2TX	-2.18
802.11ac VHT80_Nss1,(MCS0)_2TX	-7.82

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

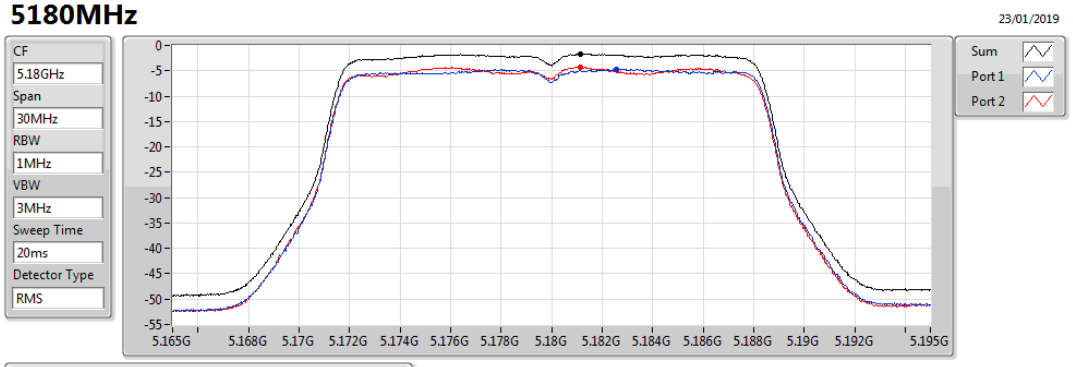
Result

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	25.00	-4.66	-4.31	-1.64	15.00
5200MHz	Pass	25.00	-5.19	-4.82	-2.13	15.00
5240MHz	Pass	25.00	-5.65	-5.15	-2.50	15.00
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	25.00	-5.66	-4.90	-2.31	15.00
5200MHz	Pass	25.00	-5.59	-4.84	-2.28	15.00
5240MHz	Pass	25.00	-5.45	-4.81	-2.18	15.00
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	25.00	-10.88	-10.72	-7.82	15.00

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 Xpower density;

802.11a_Nss1,(6Mbps)_2TX **PSD**

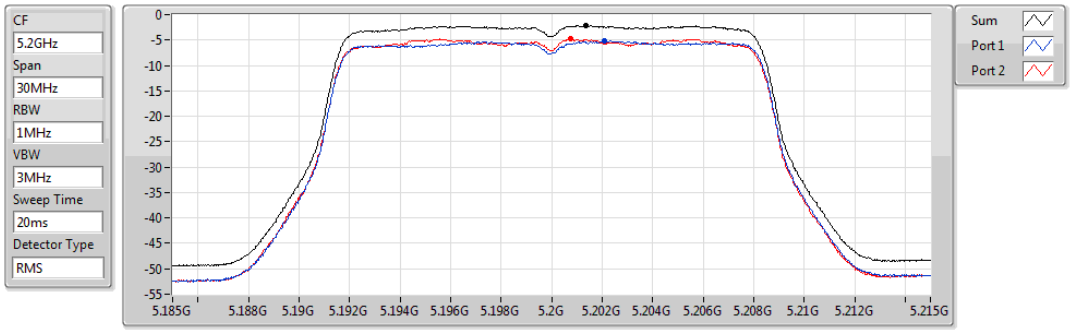
5180MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-1.64	-1.64	-4.66	-4.31

802.11a_Nss1,(6Mbps)_2TX **PSD**

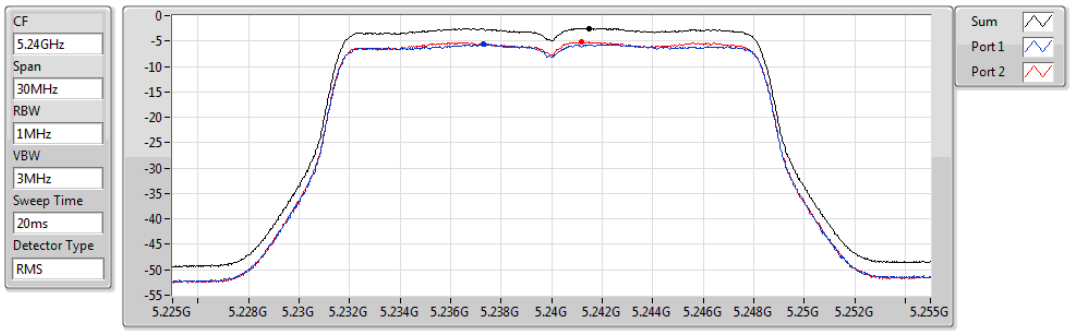
5200MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.13	-2.13	-5.19	-4.82

802.11a_Nss1,(6Mbps)_2TX **PSD**

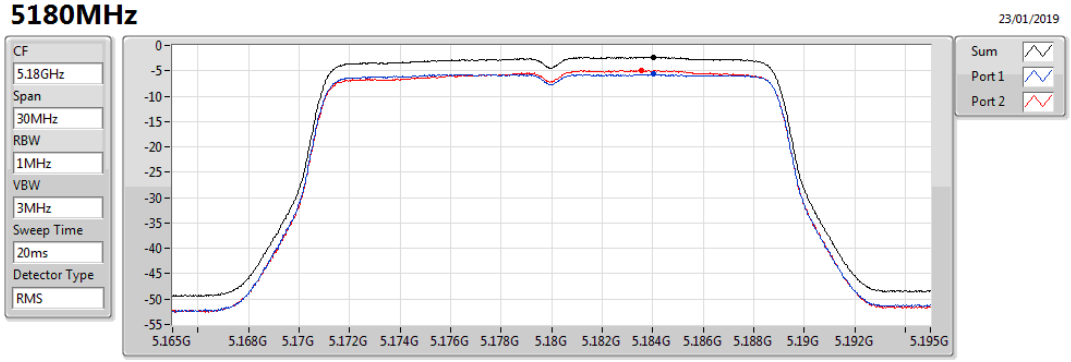
5240MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.50	-2.50	-5.65	-5.15

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

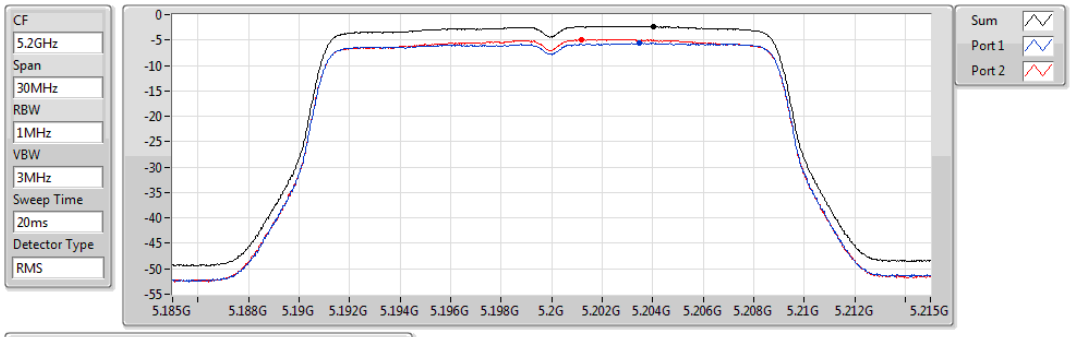
5180MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.31	-2.31	-5.66	-4.90

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

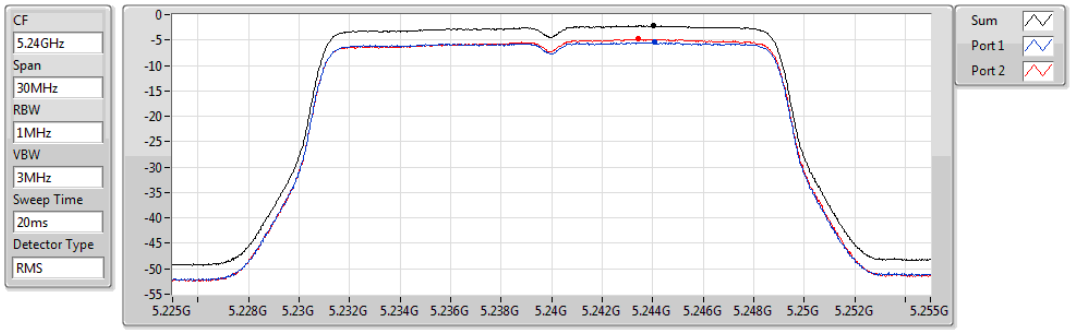
5200MHz



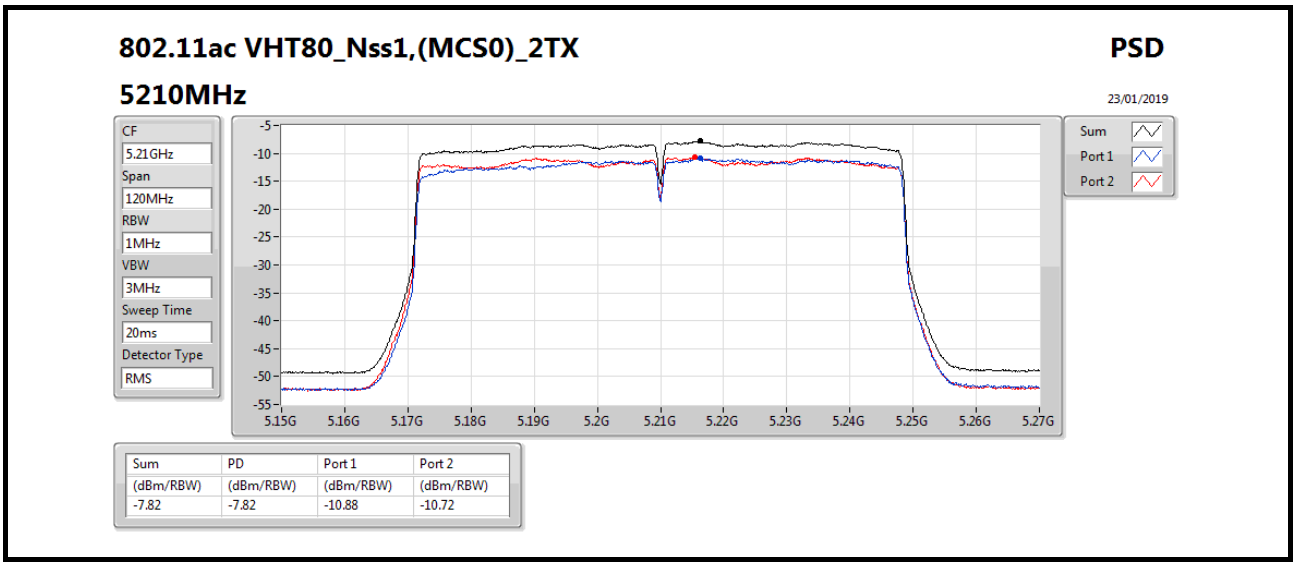
Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.28	-2.28	-5.59	-4.84

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

5240MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.18	-2.18	-5.45	-4.81


802.11ac VHT80_Nss1,(MCS0)_2TX
PSD
5210MHz
23/01/2019
CF
5.21GHz
Span
120MHz
RBW
1MHz
VBW
3MHz
Sweep Time
20ms
Detector Type
RMS
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
5.15G
5.16G
5.17G
5.18G
5.19G
5.2G
5.21G
5.22G
5.23G
5.24G
5.25G
5.26G
5.27G
Sum
Port 1
Port 2
Sum PD Port 1 Port 2
(dBm/RBW) (dBm/RBW) (dBm/RBW) (dBm/RBW)
-7.82 -7.82 -10.88 -10.72

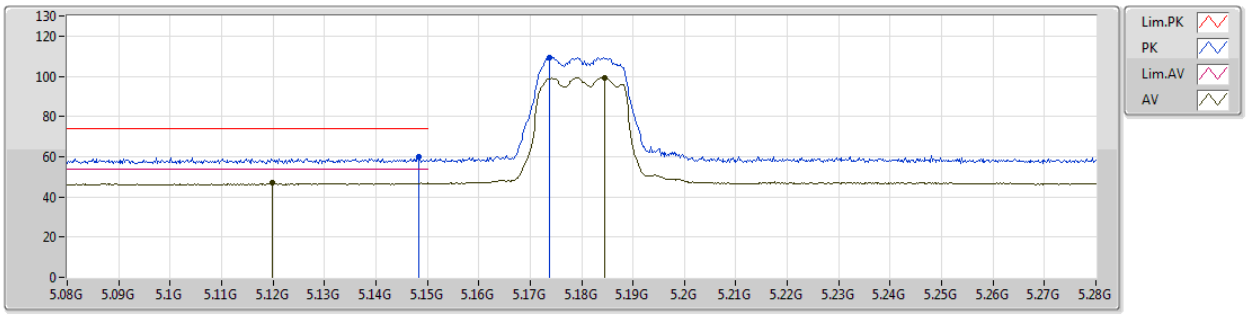
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
5.15-5.25GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11ac VHT80_Nss1,(MCS0)_2TX	Pass	AV	5.145	51.58	54.00	-2.42	6.24	3	Horizontal	359	1.84	-

802.11a_Nss1,(6Mbps)_2TX

5180MHz_TX

23/01/2019



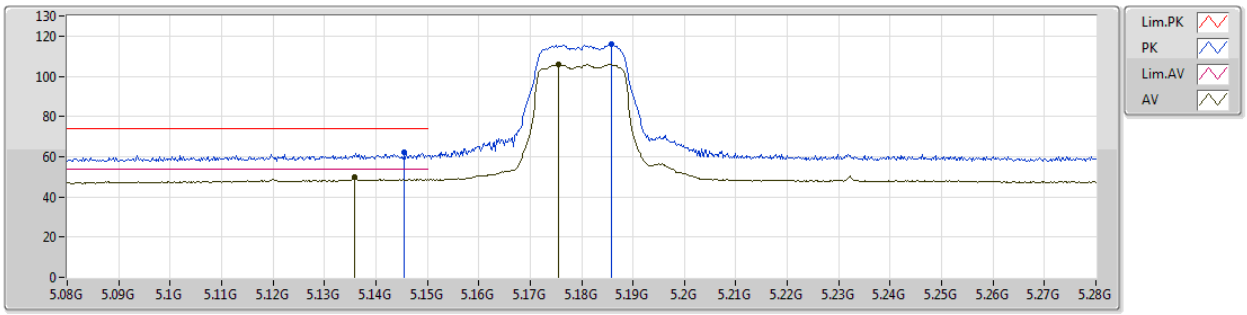
EUT Y_2TX
Setting 9
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.1484G	59.90	74.00	-14.10	6.24	3	Vertical	350	2.29	-
AV	5.1198G	47.27	54.00	-6.73	6.21	3	Vertical	350	2.29	-
PK	5.1738G	109.47	Inf	-Inf	6.26	3	Vertical	350	2.29	-
AV	5.1844G	99.26	Inf	-Inf	6.27	3	Vertical	350	2.29	-

802.11a_Nss1,(6Mbps)_2TX

5180MHz_TX

23/01/2019



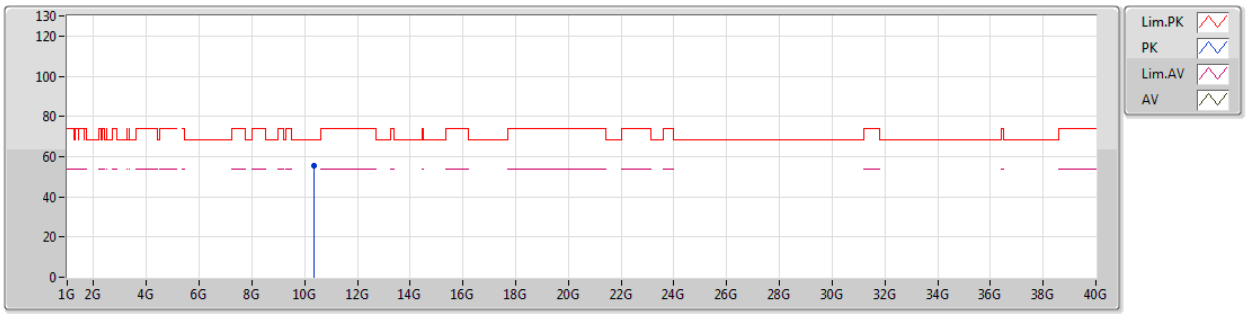
EUT Y_2TX
Setting 9
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.1456G	62.36	74.00	-11.64	6.24	3	Horizontal	359	1.89	-
AV	5.1358G	49.94	54.00	-4.06	6.22	3	Horizontal	359	1.89	-
PK	5.1858G	116.08	Inf	-Inf	6.27	3	Horizontal	359	1.89	-
AV	5.1754G	105.87	Inf	-Inf	6.26	3	Horizontal	359	1.89	-

802.11a_Nss1,(6Mbps)_2TX

5180MHz_TX

23/01/2019



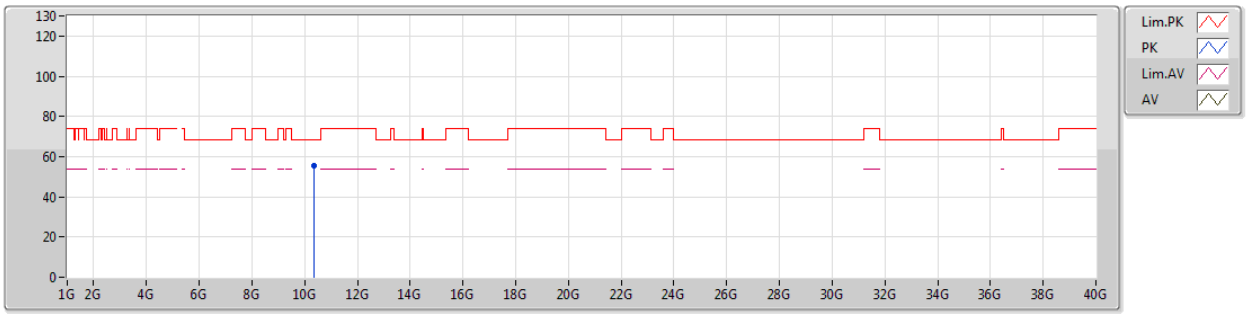
EUT Y_2TX
Setting 9
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.35503G	55.40	68.20	-12.80	14.27	3	Vertical	265	1.38	-

802.11a_Nss1,(6Mbps)_2TX

5180MHz_TX

23/01/2019



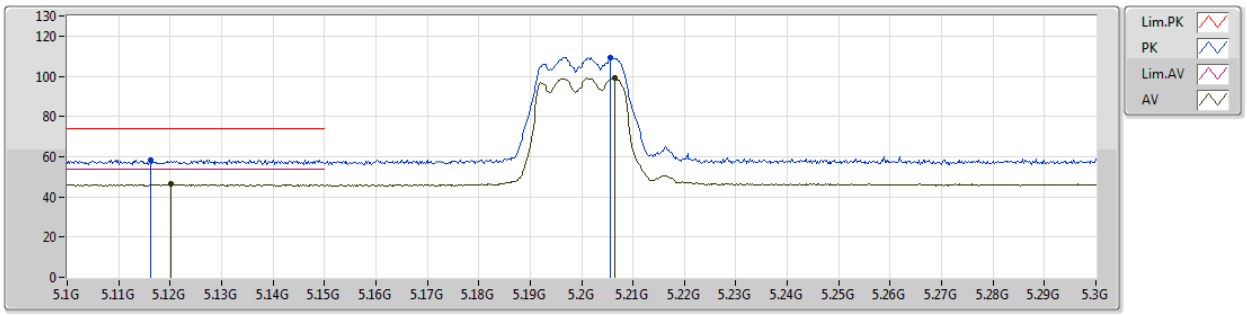
EUT Y_2TX
Setting 9
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.35605G	55.23	68.20	-12.97	14.27	3	Horizontal	65	2.59	-

802.11a_Nss1,(6Mbps)_2TX

5200MHz_TX

23/01/2019



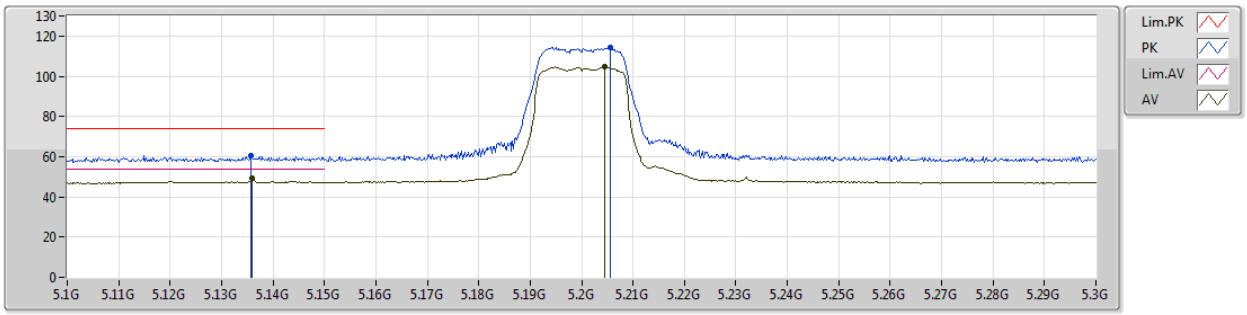
EUT Y_2TX
Setting 8.5
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.1162G	58.54	74.00	-15.46	6.20	3	Vertical	359	2.24	-
AV	5.1202G	46.27	54.00	-7.73	6.21	3	Vertical	359	2.24	-
PK	5.2056G	109.48	Inf	-Inf	6.30	3	Vertical	359	2.24	-
AV	5.2064G	98.99	Inf	-Inf	6.30	3	Vertical	359	2.24	-

802.11a_Nss1,(6Mbps)_2TX

5200MHz_TX

23/01/2019



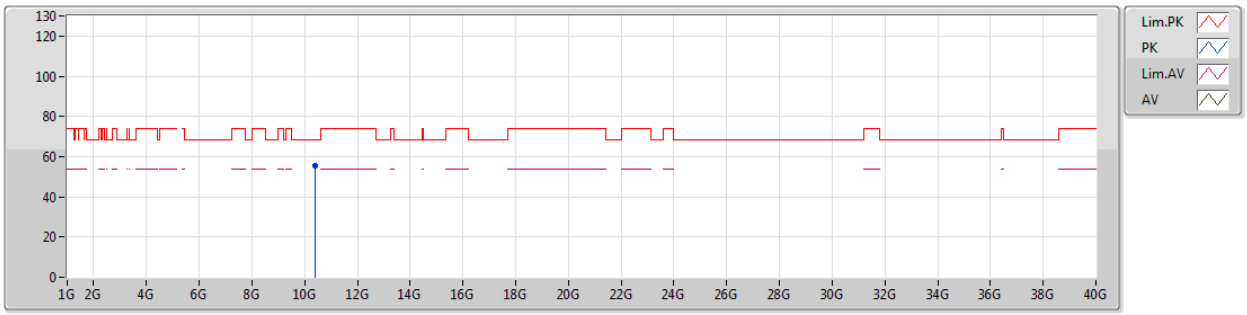
EUT Y_2TX
Setting 8.5
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.1358G	60.64	74.00	-13.36	6.22	3	Horizontal	359	1.89	-
AV	5.136G	49.06	54.00	-4.94	6.22	3	Horizontal	359	1.89	-
PK	5.2056G	114.32	Inf	-Inf	6.30	3	Horizontal	359	1.89	-
AV	5.2046G	104.64	Inf	-Inf	6.30	3	Horizontal	359	1.89	-

802.11a_Nss1,(6Mbps)_2TX

5200MHz_TX

23/01/2019



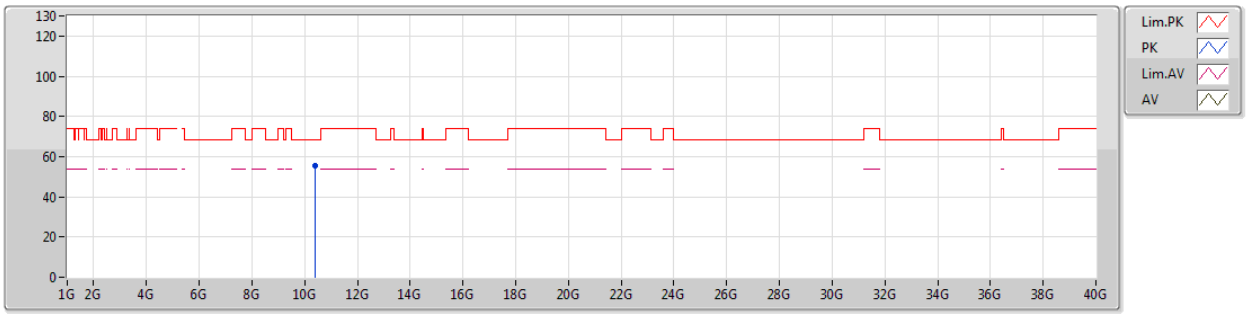
EUT Y_2TX
Setting 8.5
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.4022G	55.34	68.20	-12.86	14.39	3	Vertical	124	1.22	-

802.11a_Nss1,(6Mbps)_2TX

5200MHz_TX

23/01/2019



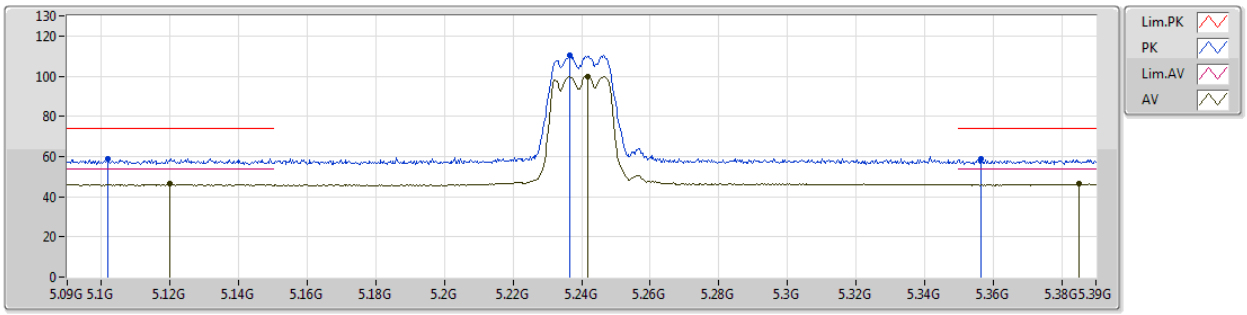
EUT Y_2TX
Setting 8.5
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.39592G	55.22	68.20	-12.98	14.38	3	Horizontal	179	1.50	-

802.11a_Nss1,(6Mbps)_2TX

5240MHz_TX

23/01/2019



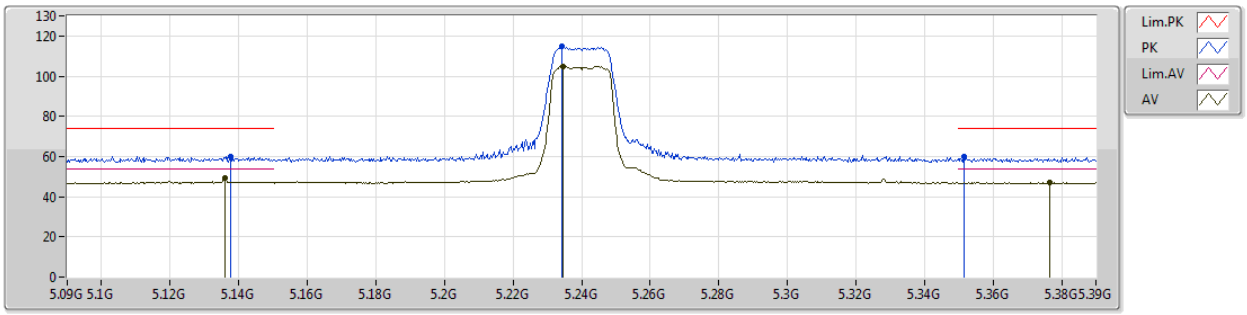
EUT Y_2TX
Setting 8
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.1017G	59.11	74.00	-14.89	6.18	3	Vertical	359	2.23	-
AV	5.12G	46.58	54.00	-7.42	6.21	3	Vertical	359	2.23	-
PK	5.2367G	110.30	Inf	-Inf	6.34	3	Vertical	359	2.23	-
AV	5.2418G	99.97	Inf	-Inf	6.36	3	Vertical	359	2.23	-
PK	5.3564G	58.88	74.00	-15.12	6.50	3	Vertical	359	2.23	-
AV	5.3852G	46.40	54.00	-7.60	6.54	3	Vertical	359	2.23	-

802.11a_Nss1,(6Mbps)_2TX

5240MHz_TX

23/01/2019



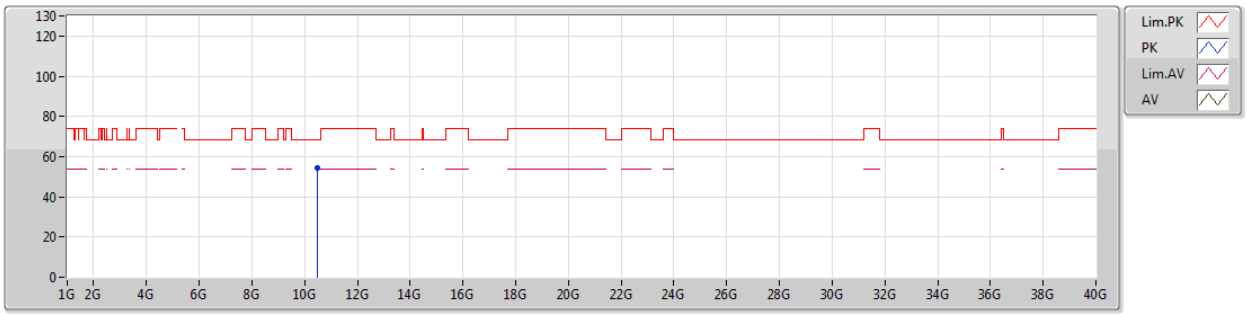
EUT Y_2TX
Setting 8
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.1377G	59.94	74.00	-14.06	6.23	3	Horizontal	359	1.93	-
AV	5.1359G	49.07	54.00	-4.93	6.22	3	Horizontal	359	1.93	-
PK	5.2343G	114.69	Inf	-Inf	6.34	3	Horizontal	359	1.93	-
AV	5.2346G	104.71	Inf	-Inf	6.34	3	Horizontal	359	1.93	-
PK	5.3516G	59.98	74.00	-14.02	6.50	3	Horizontal	359	1.93	-
AV	5.3765G	46.98	54.00	-7.02	6.53	3	Horizontal	359	1.93	-

802.11a_Nss1,(6Mbps)_2TX

5240MHz_TX

23/01/2019



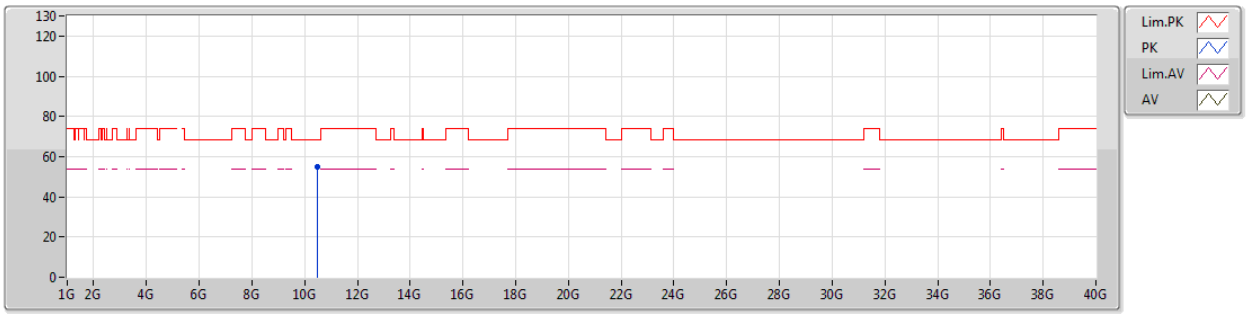
EUT Y_2TX
Setting 8
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.47843G	54.53	68.20	-13.67	14.61	3	Vertical	27	2.48	-

802.11a_Nss1,(6Mbps)_2TX

5240MHz_TX

23/01/2019



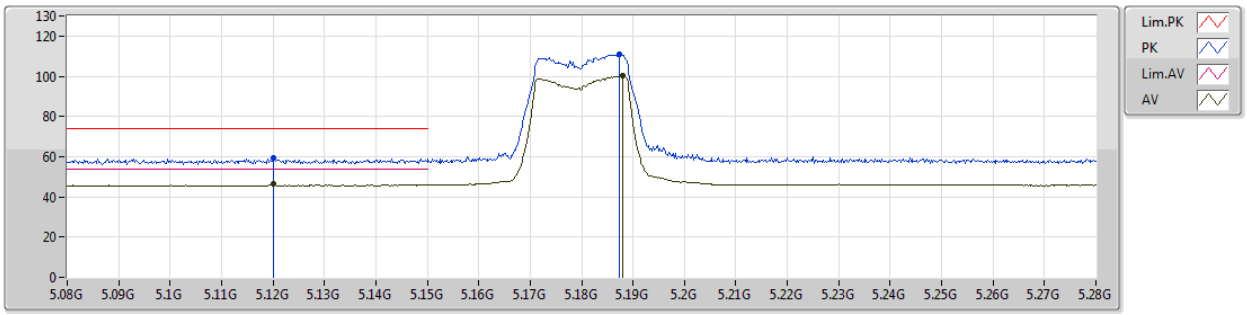
EUT Y_2TX
Setting 8
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.48307G	54.67	68.20	-13.53	14.62	3	Horizontal	33	1.01	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5180MHz_TX

23/01/2019



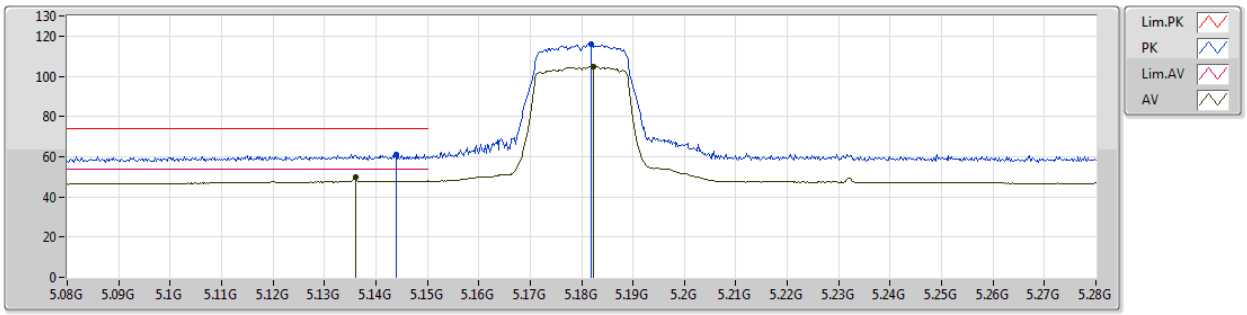
EUT Y_2TX
Setting 8.5
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.12G	59.26	74.00	-14.74	6.21	3	Vertical	358	2.19	-
AV	5.12G	46.66	54.00	-7.34	6.21	3	Vertical	358	2.19	-
PK	5.1874G	111.20	Inf	-Inf	6.27	3	Vertical	358	2.19	-
AV	5.188G	100.22	Inf	-Inf	6.28	3	Vertical	358	2.19	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5180MHz_TX

23/01/2019



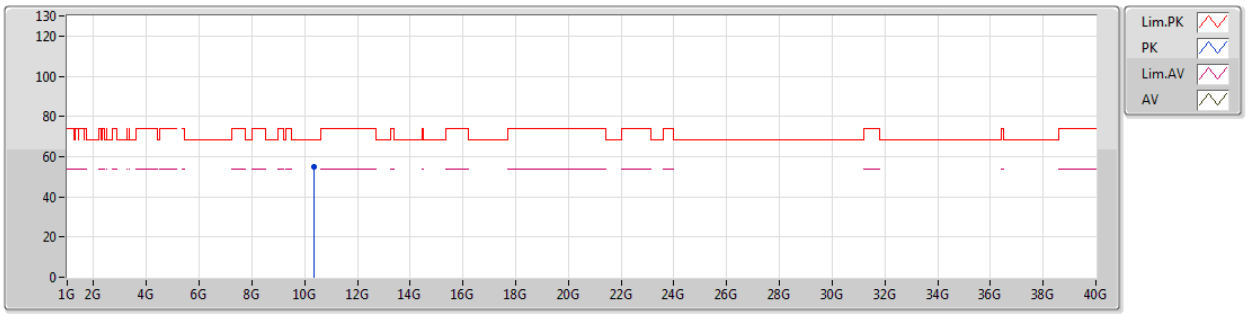
EUT Y_2TX
Setting 8.5
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.144G	61.03	74.00	-12.97	6.24	3	Horizontal	359	1.88	-
AV	5.136G	49.60	54.00	-4.40	6.22	3	Horizontal	359	1.88	-
PK	5.1818G	116.12	Inf	-Inf	6.27	3	Horizontal	359	1.88	-
AV	5.1822G	104.82	Inf	-Inf	6.27	3	Horizontal	359	1.88	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5180MHz_TX

23/01/2019



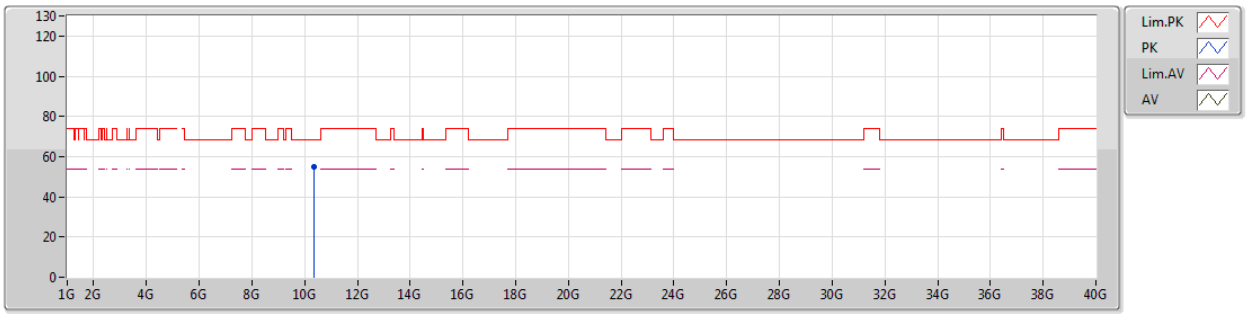
EUT Y_2TX
Setting 8.5
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.36046G	54.83	68.20	-13.37	14.29	3	Vertical	232	1.34	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5180MHz_TX

23/01/2019



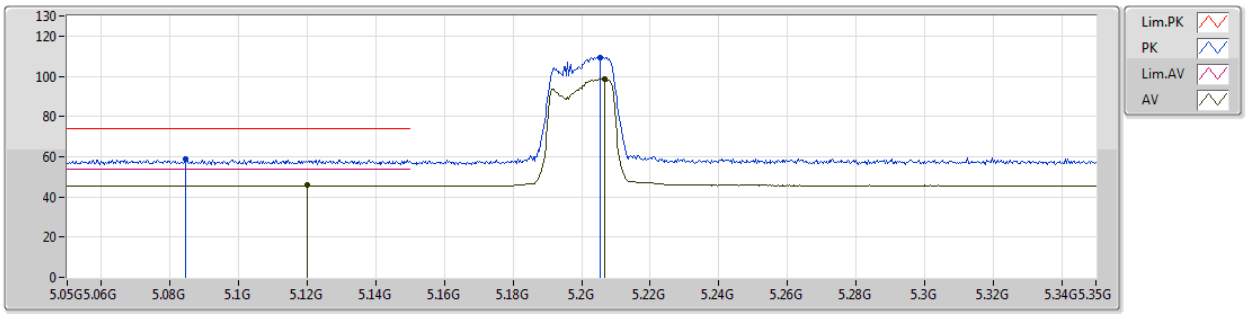
EUT Y_2TX
Setting 8.5
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.36397G	55.16	68.20	-13.04	14.29	3	Horizontal	216	1.85	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5200MHz_TX

23/01/2019



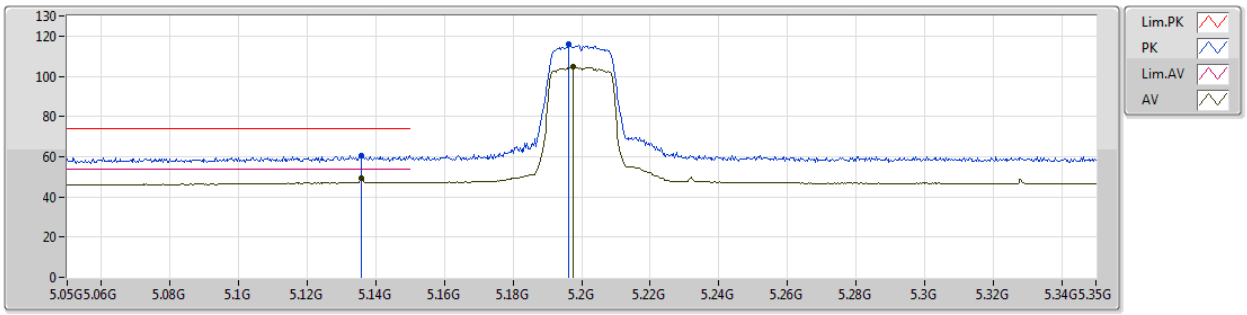
EUT Y_2TX
Setting 8.5
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.0845G	58.57	74.00	-15.43	6.15	3	Vertical	0	2.42	-
AV	5.1199G	45.95	54.00	-8.05	6.21	3	Vertical	0	2.42	-
PK	5.2054G	109.49	Inf	-Inf	6.30	3	Vertical	0	2.42	-
AV	5.2066G	98.59	Inf	-Inf	6.30	3	Vertical	0	2.42	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5200MHz_TX

23/01/2019



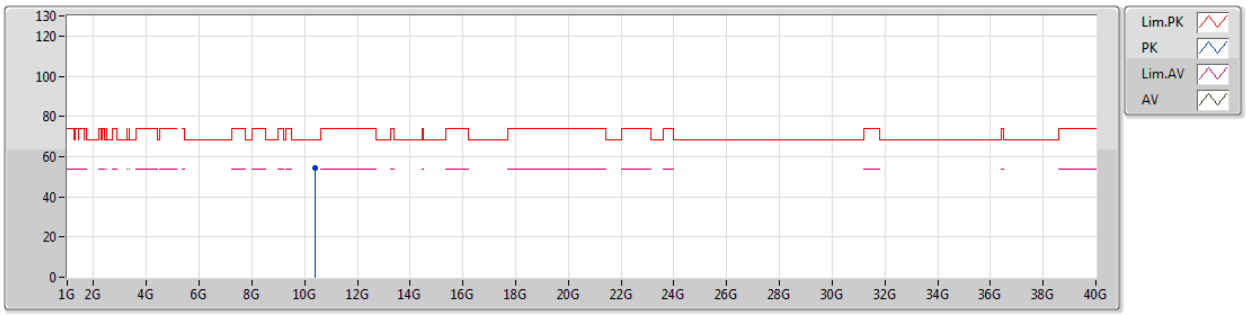
EUT Y_2TX
Setting 8.5
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.1358G	60.53	74.00	-13.47	6.22	3	Horizontal	359	1.87	-
AV	5.1358G	49.16	54.00	-4.84	6.22	3	Horizontal	359	1.87	-
PK	5.1961G	116.06	Inf	-Inf	6.29	3	Horizontal	359	1.87	-
AV	5.1976G	104.54	Inf	-Inf	6.29	3	Horizontal	359	1.87	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5200MHz_TX

23/01/2019



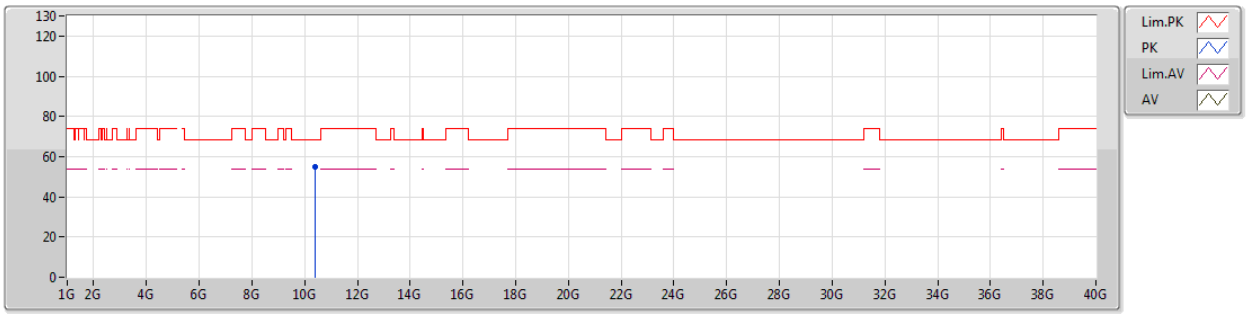
EUT Y_2TX
Setting 8.5
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.4001G	54.42	68.20	-13.78	14.39	3	Vertical	54	1.27	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5200MHz_TX

23/01/2019



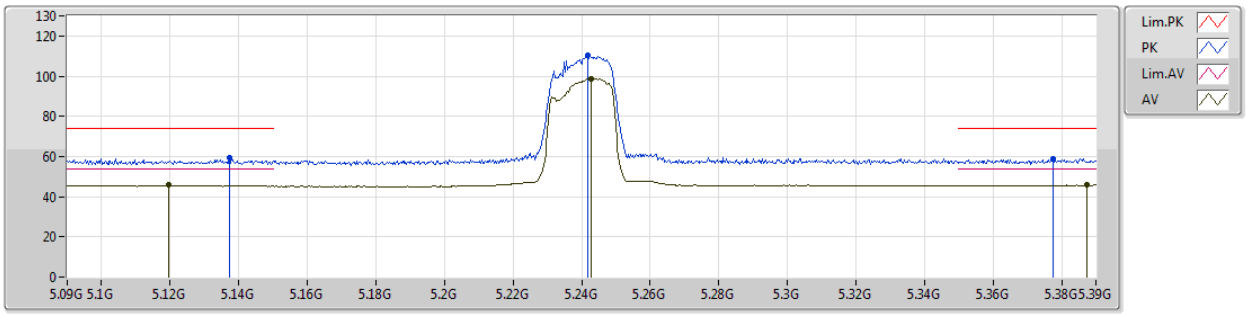
EUT Y_2TX
Setting 8.5
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.402G	54.64	68.20	-13.56	14.39	3	Horizontal	28	1.84	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5240MHz_TX

23/01/2019



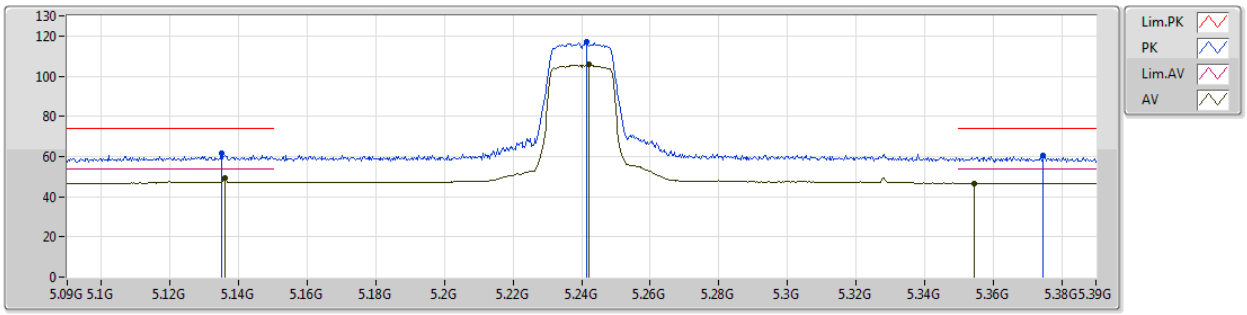
EUT Y_2TX
Setting 8.5
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.1374G	59.33	74.00	-14.67	6.22	3	Vertical	0	2.34	-
AV	5.1197G	45.72	54.00	-8.28	6.21	3	Vertical	0	2.34	-
PK	5.2418G	110.39	Inf	-Inf	6.36	3	Vertical	0	2.34	-
AV	5.2427G	98.86	Inf	-Inf	6.36	3	Vertical	0	2.34	-
PK	5.3774G	58.83	74.00	-15.17	6.53	3	Vertical	0	2.34	-
AV	5.3873G	45.77	54.00	-8.23	6.54	3	Vertical	0	2.34	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5240MHz_TX

23/01/2019



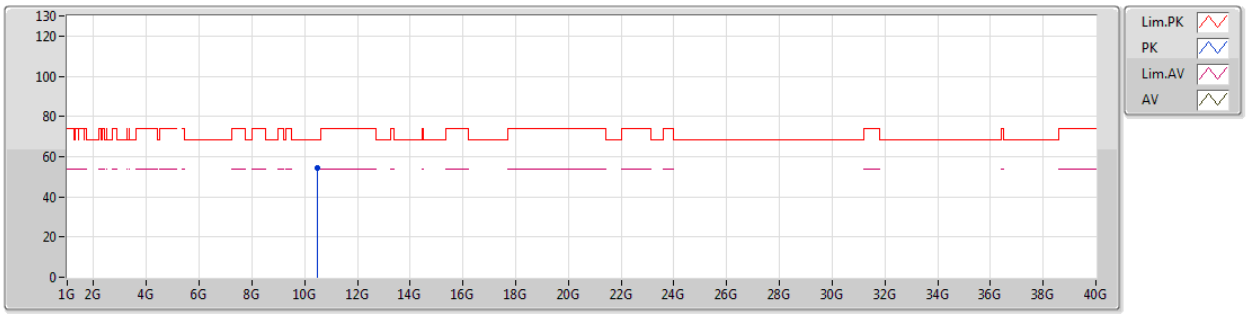
EUT Y_2TX
Setting 8.5
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.135G	61.40	74.00	-12.60	6.22	3	Horizontal	359	1.91	-
AV	5.1359G	49.48	54.00	-4.52	6.22	3	Horizontal	359	1.91	-
PK	5.2415G	116.99	Inf	-Inf	6.36	3	Horizontal	359	1.91	-
AV	5.2421G	105.68	Inf	-Inf	6.36	3	Horizontal	359	1.91	-
PK	5.3747G	60.65	74.00	-13.35	6.53	3	Horizontal	359	1.91	-
AV	5.3546G	46.76	54.00	-7.24	6.50	3	Horizontal	359	1.91	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5240MHz_TX

23/01/2019



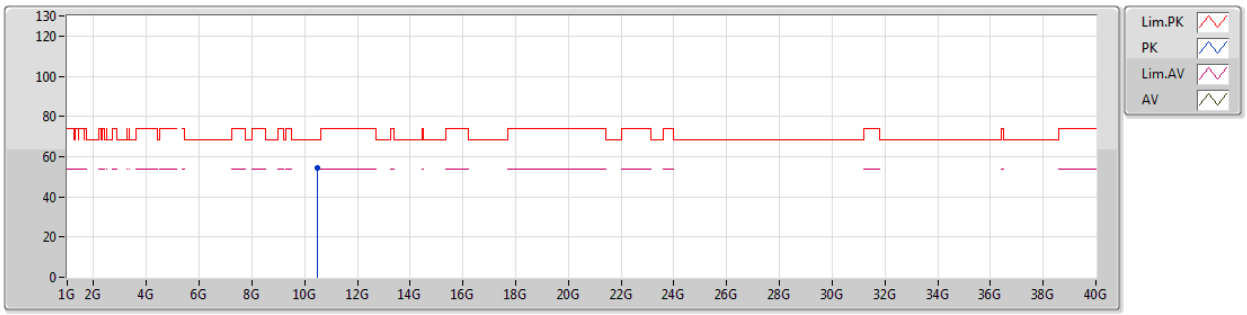
EUT Y_2TX
Setting 8.5
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.47648G	54.24	68.20	-13.96	14.59	3	Vertical	204	1.82	-

802.11ac VHT20_Nss1,(MCS0)_2TX

5240MHz_TX

23/01/2019



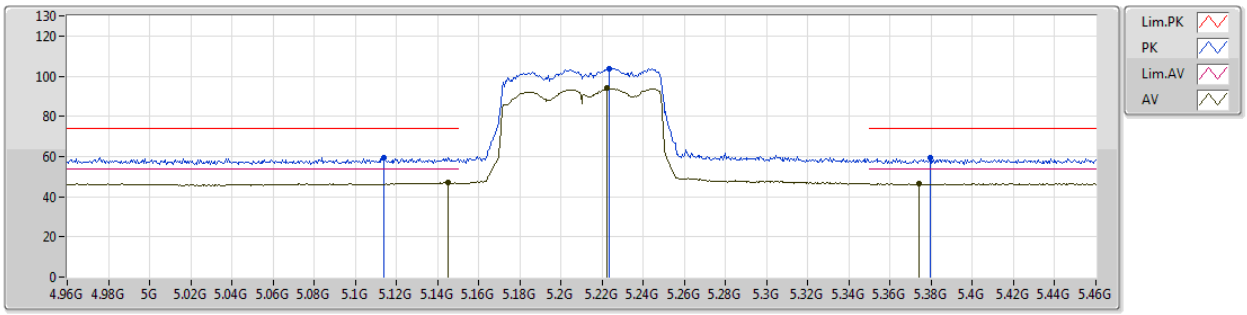
EUT Y_2TX
Setting 8.5
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.48281G	54.54	68.20	-13.66	14.62	3	Horizontal	70	1.41	-

802.11ac VHT80_Nss1,(MCS0)_2TX

5210MHz_TX

23/01/2019



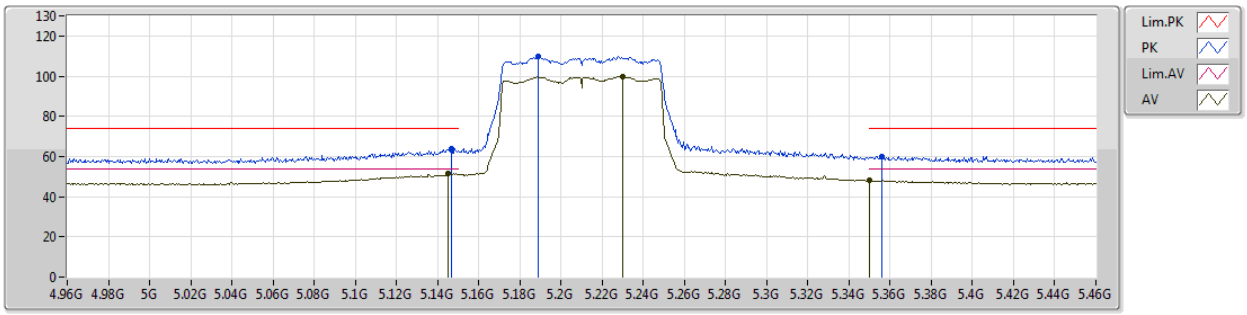
EUT Y_2TX
Setting 9
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.114G	59.34	74.00	-14.66	6.20	3	Vertical	350	2.32	-
AV	5.145G	47.15	54.00	-6.85	6.24	3	Vertical	350	2.32	-
PK	5.2235G	103.77	Inf	-Inf	6.33	3	Vertical	350	2.32	-
AV	5.2225G	93.92	Inf	-Inf	6.32	3	Vertical	350	2.32	-
PK	5.3795G	59.15	74.00	-14.85	6.53	3	Vertical	350	2.32	-
AV	5.374G	46.61	54.00	-7.39	6.53	3	Vertical	350	2.32	-

802.11ac VHT80_Nss1,(MCS0)_2TX

5210MHz_TX

23/01/2019



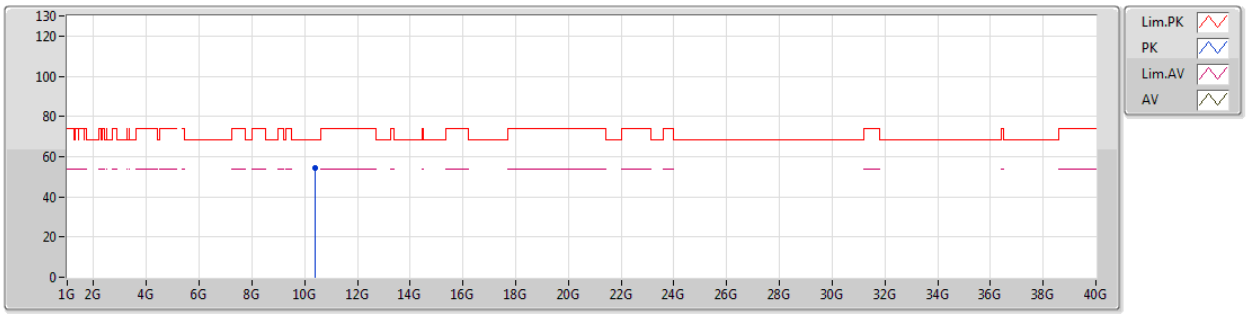
EUT Y_2TX
Setting 9
03-P-2-10
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	5.147G	63.98	74.00	-10.02	6.24	3	Horizontal	359	1.84	-
AV	5.145G	51.58	54.00	-2.42	6.24	3	Horizontal	359	1.84	-
PK	5.189G	110.05	Inf	-Inf	6.28	3	Horizontal	359	1.84	-
AV	5.23G	99.96	Inf	-Inf	6.33	3	Horizontal	359	1.84	-
PK	5.356G	60.11	74.00	-13.89	6.50	3	Horizontal	359	1.84	-
AV	5.35G	48.14	54.00	-5.86	6.50	3	Horizontal	359	1.84	-

802.11ac VHT80_Nss1,(MCS0)_2TX

5210MHz_TX

23/01/2019



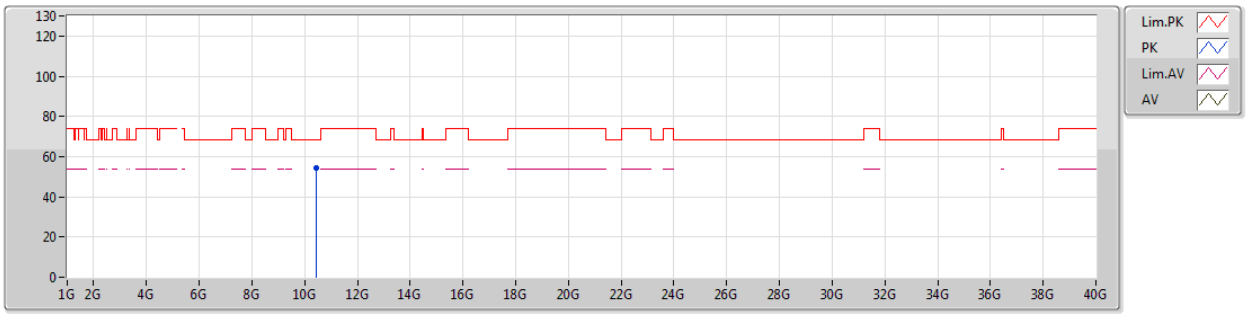
EUT Y_2TX
Setting 9
03-P-2
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.41774G	54.53	68.20	-13.67	14.44	3	Vertical	95	1.71	-

802.11ac VHT80_Nss1,(MCS0)_2TX

5210MHz_TX

23/01/2019

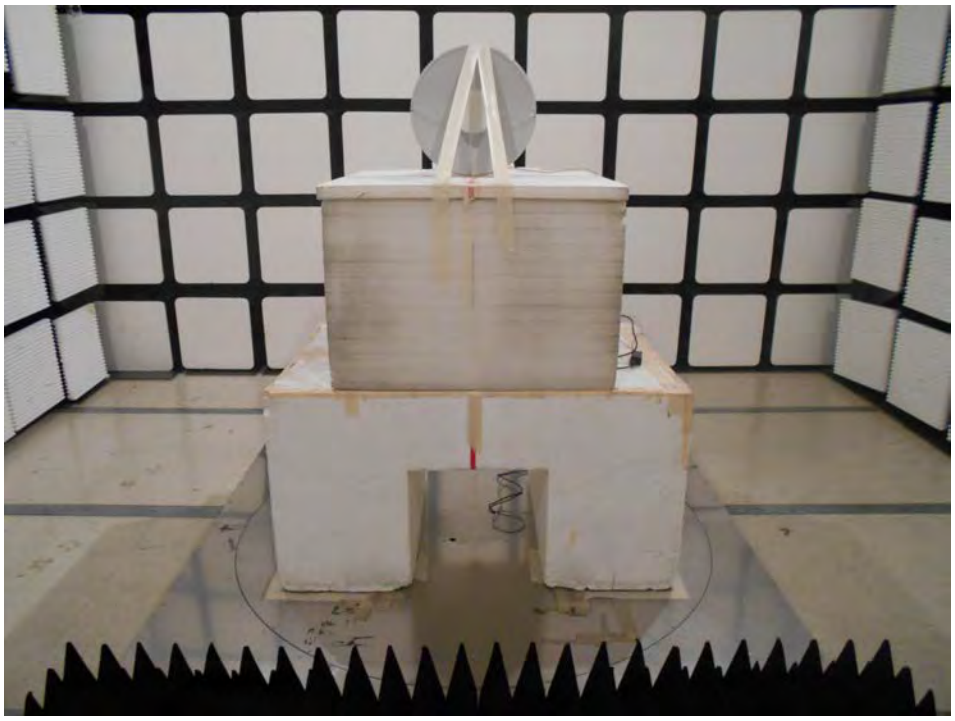


EUT Y_2TX
Setting 9
03-P-2
FSP(100019)

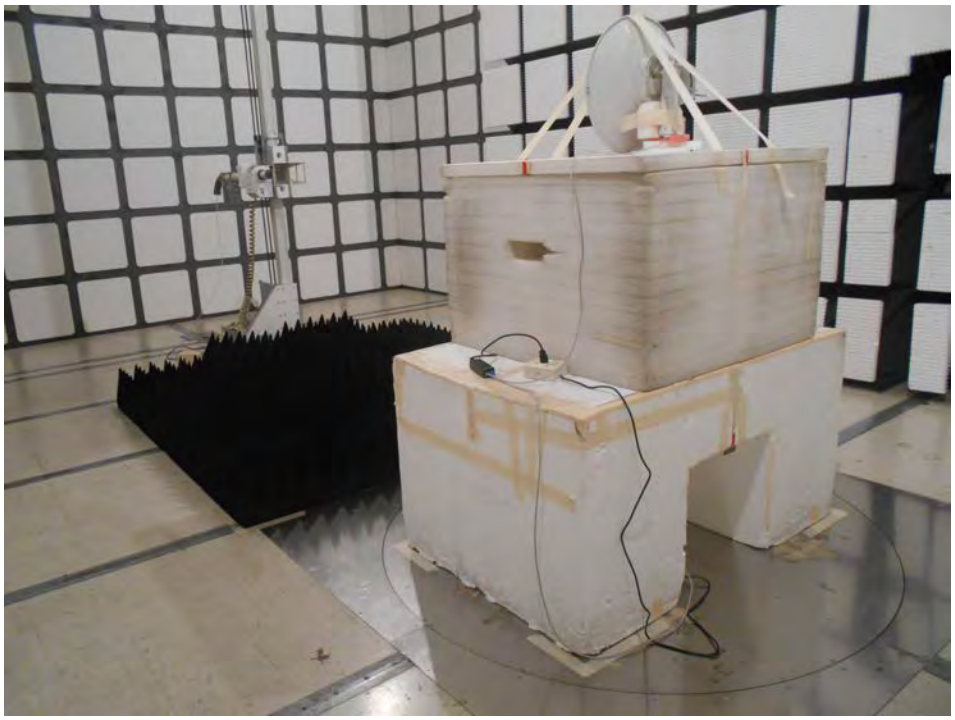
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	10.41998G	54.22	68.20	-13.98	14.45	3	Horizontal	129	1.87	-

1. Photographs of Radiated Emissions Test Configuration

FRONT VIEW

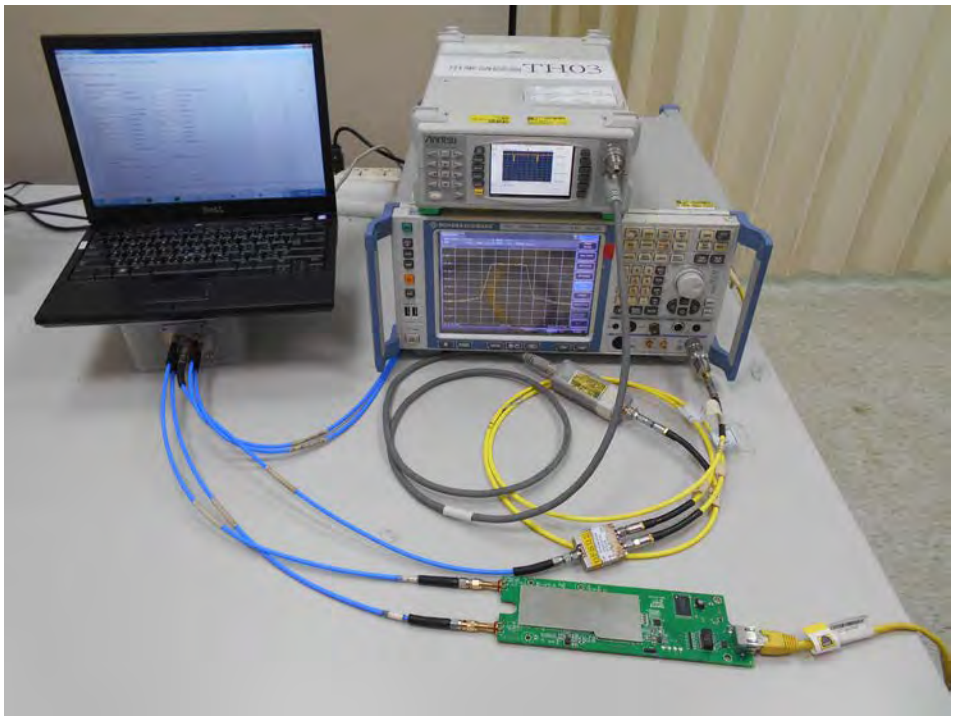


REAR VIEW



2. Photographs of Conducted Emissions Test Configuration

FRONT VIEW



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