

NCC RADIO TEST REPORT

Equipment : RADWIN 2000 Portfolio Built for Backhaul
(Boardband wireless system)

Brand Name : RADWIN

Model Name : RADWIN 2000

Applicant : 晉立科技有限公司
桃園市龍潭區高原里渴望路 185 號之 2

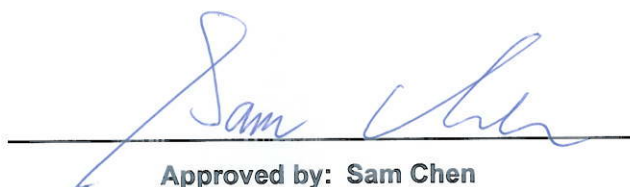
Manufacturer : RADWIN Ltd.
Habarzel 27 Tel-Aviv 6971039 ISRAEL

Standard : LP0002 Section 4.7 (2018-01-10)

The product was received on May 08, 2019, and testing was started from Jun. 03, 2019 and completed on Jun. 10, 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 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: Sam Chen

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



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TEL : 886-3-656-9065
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Report Template No.: CB Ver1.0



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	4.7.8	Antenna Requirement	PASS	-
3.1	2.3	AC Power-line Conducted Emissions	PASS	-
3.2	4.7.3	Emission Bandwidth	PASS	-
3.3	4.7.3	Maximum Conducted Output Power	PASS	-
3.4	4.7.3	Peak Power Spectral Density	PASS	-
3.5	4.7.4	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: Cindy Peng

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	ac (VHT20)	5180-5240	36-48 [4]
5150-5250	ac (VHT40)	5190-5230	38-46 [2]
5150-5250	ac (VHT80)	5210	42 [1]

Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11ac VHT20	20	2TX
5.15-5.25GHz	802.11ac VHT40	40	2TX
5.15-5.25GHz	802.11ac VHT80	80	2TX

Note:

- ♦ 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 Antenna Information

Ant.	Port	Brand	Model Name	Type	Connector	Antenna Gain (dBi)	Loss of Cable (dB)	True Gain (dBi)	Remark
1	1	MARS	MA-WA56-DP25N	Panel	N Type	25.0	0.9	24.1	Vertical Port
	2	MARS	MA-WA56-DP25N	Panel	N Type	24.0	0.9	23.1	Horizontal Port

Note 1: The above information was declared by manufacturer.

Note 2: The antenna has two ports (one is Horizontal and the others are Vertical).

Port 1 and Port 2 could transmit/receive simultaneously.

**1.1.3 Mode Test Duty Cycle**

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11ac VHT20	0.974	0.11	28.08m	100
802.11ac VHT40	0.971	0.13	13.545m	100
802.11ac VHT80	0.96	0.18	6.25m	300

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	☐	Indoor P2M
	☒	Fixed P2P	☐	Client
Test Software Version	RADWIN Radio Test v1.0			

Note: The above information was declared by manufacturer.



1.2 Applicable Standards

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

- ♦ LP0002 Section 4.7 (2018-01-10)
- ♦ 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
RF Conducted	TH01-CB	Eddie Weng	22~24°C / 50~60%	Jun. 03, 2019
Radiated	03CH04-CB	Welson Chen	22~24°C / 55~60%	Jun. 03, 2019
AC Conduction	CO01-CB	Wei Li	24.5~24.8°C / 55~59%	Jun. 10, 2019

Test site Designation No. TW0006 with FCC

Test site registered number IC 4086B 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
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.8 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.7 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Output Power Measurement	1.3 dB	Confidence levels of 95%
Power Density Measurement	1.3 dB	Confidence levels of 95%
Bandwidth Measurement	9.74 x10 ⁻⁸	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	PowerSetting
802.11ac VHT20_Nss1,(MCS0)_2TX	-
5180MHz	0.5
5200MHz	7.5
5240MHz	0.5
802.11ac VHT40_Nss1,(MCS0)_2TX	-
5190MHz	0.5
5230MHz	0.5
802.11ac VHT80_Nss1,(MCS0)_2TX	-
5210MHz	-4.5

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	
1	Unintentional – CRX
2	Intentional – CTX

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

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	
1	Unintentional – CRX
2	Intentional – CTX
Operating Mode > 1GHz	
1	Unintentional – CRX
2	Intentional – CTX

Note: The PoE are for measurement only, would not be marketed.

Equipment	Brand Name	Model Name	FCC ID
PoE	CINCON	TR60A-POE-L	N/A
PoE	MITS	POE-GHI-5056NN4	N/A

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting/receive mode.



2.4 Accessories

N/A

2.5 Support Equipment

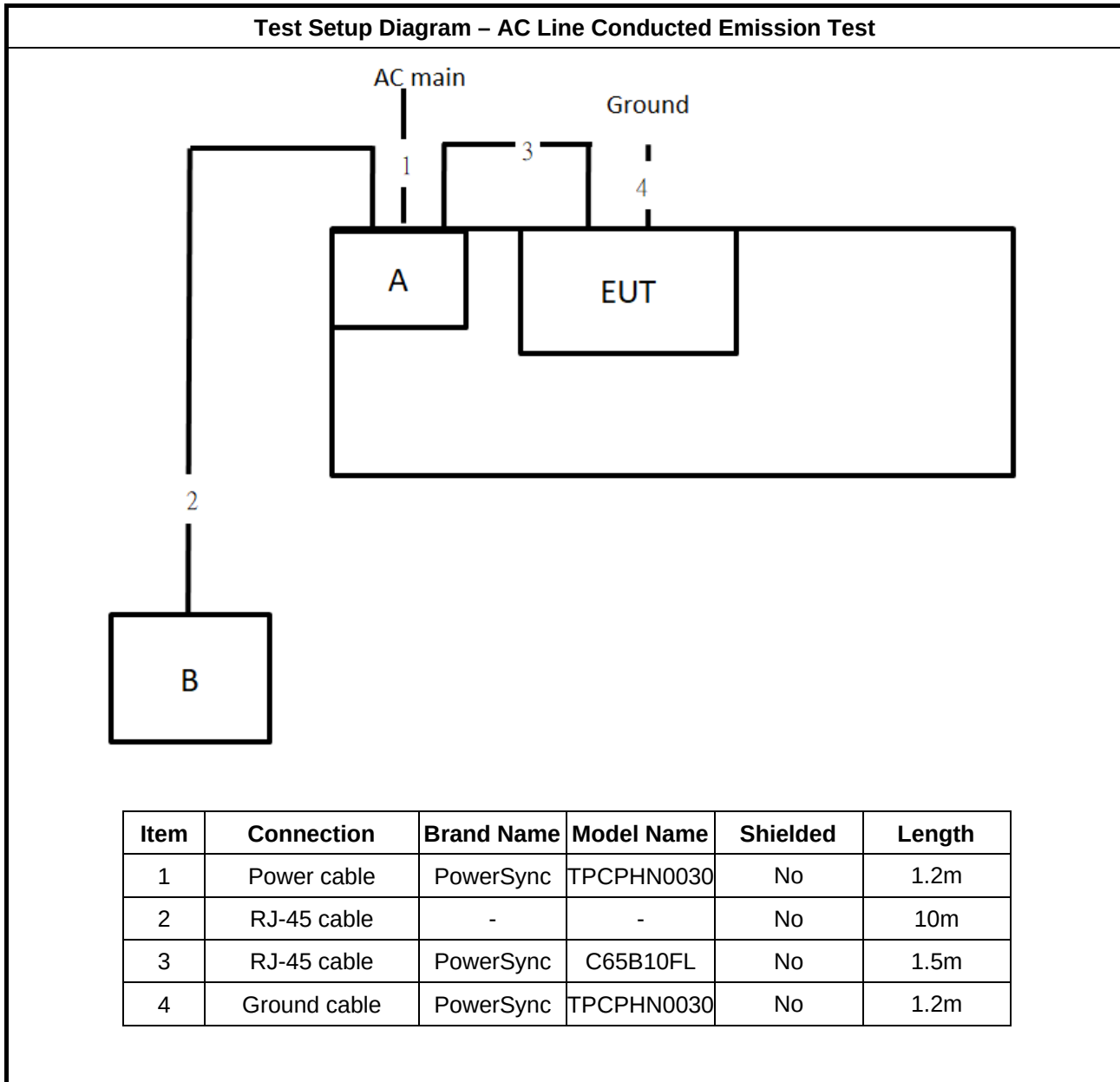
For AC Conduction:

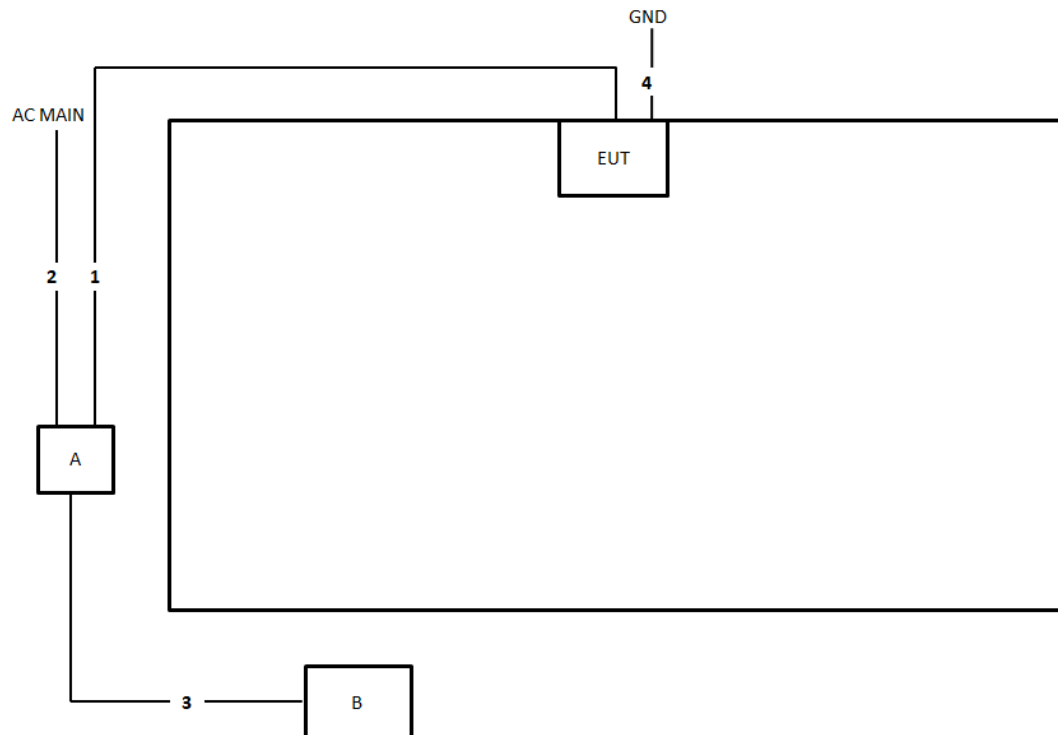
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	PoE	CINCON	TR60A-POE-L	N/A
B	Notebook	DELL	E6430	N/A

For Radiated and RF Conducted:

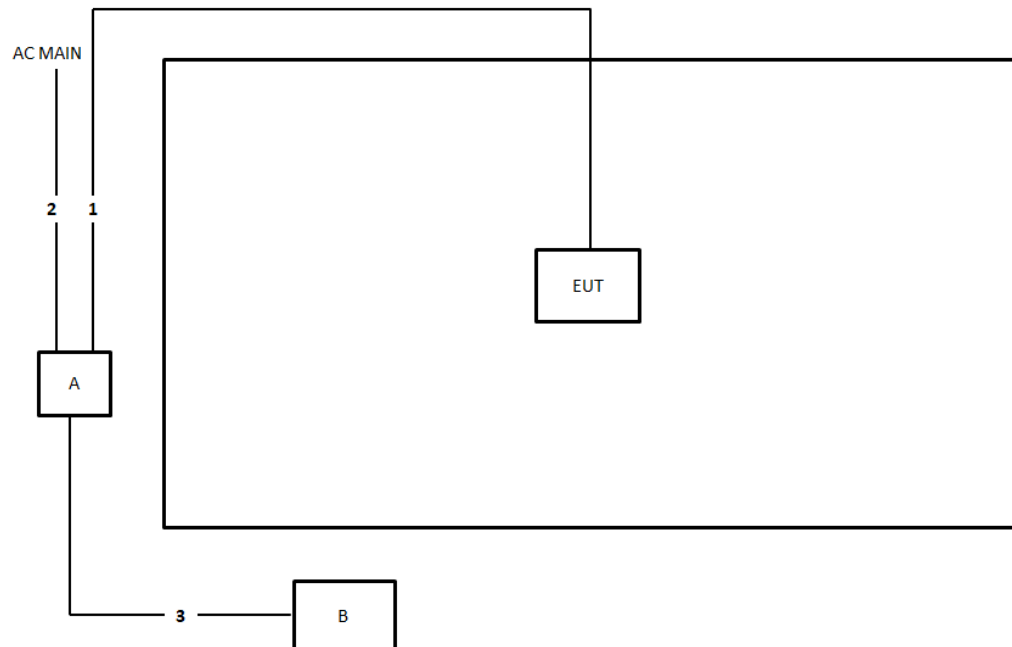
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A
B	PoE	MITC	POE-GHI-5056NN4	N/A

2.6 Test Setup Diagram



**Test Setup Diagram - Radiated Test (below 1GHz) / Unintentional – CRX and Intentional – CTX,
(above 1GHz) / Unintentional – CRX**


Item	Connection	Brand Name	Model Name	Shielded	Length
1	RJ-45 cable	PowerSync	C65B10FL	No	10m
2	Power cable	-	-	No	1.2m
3	RJ-45 cable	-	-	No	1m
4	Ground cable	PowerSync	TPCPHN0030	No	1.2m

Test Setup Diagram - Radiated Test (above 1GHz) / Intentional – CTX


Item	Connection	Brand Name	Model Name	Shielded	Length
1	RJ-45 cable	PowerSync	C65B10FL	No	10m
2	Power cable	-	-	No	1.2m
3	RJ-45 cable	-	-	No	1m

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

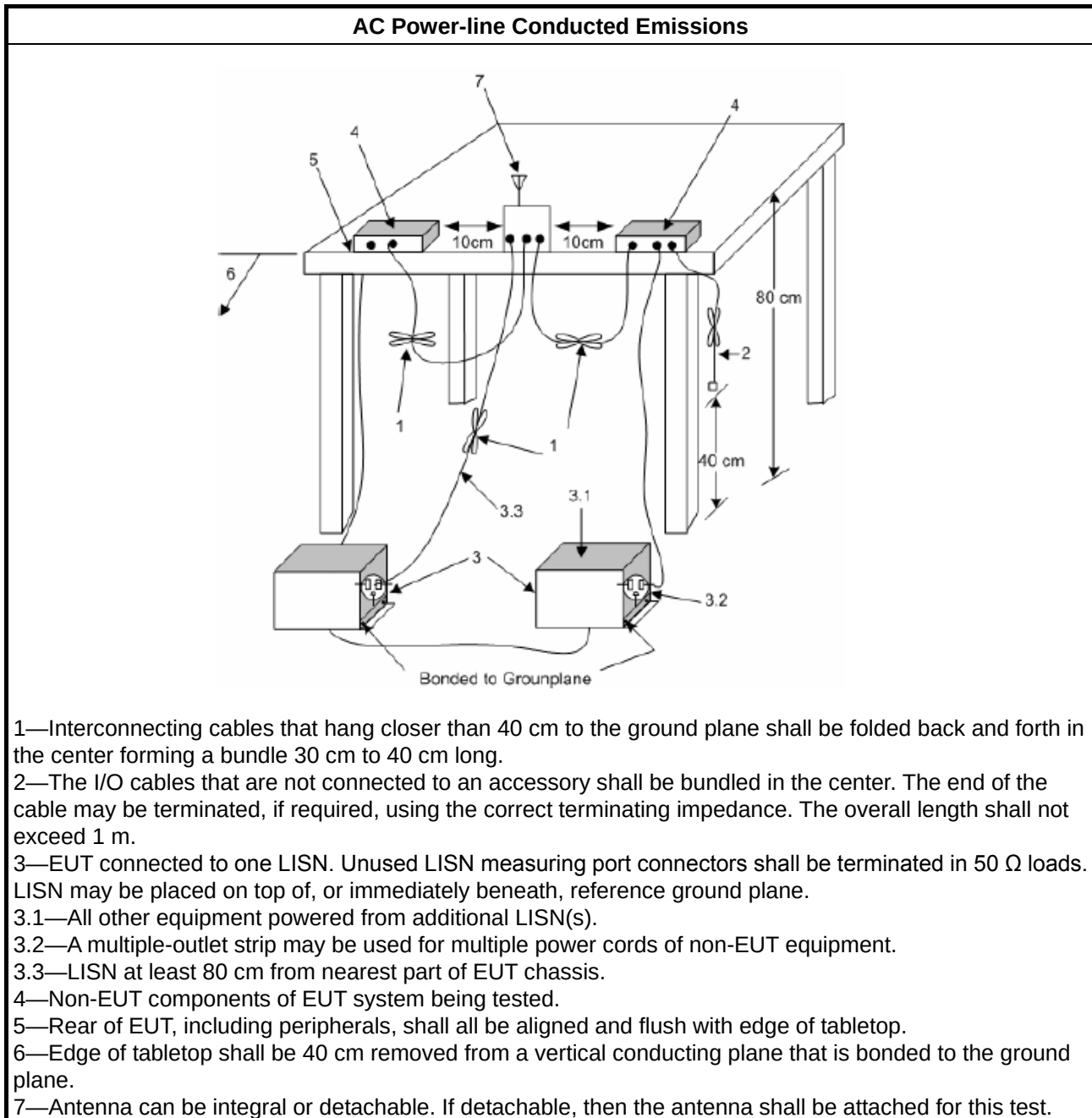
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 Emission Bandwidth

3.2.1 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 $11 \text{ dBm} + 10 \log B$, 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 $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in MHz.
☐	For the 5.725-5.85 GHz band, 6 dB emission bandwidth $\geq 500\text{kHz}$.
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 $\geq 500\text{kHz}$.

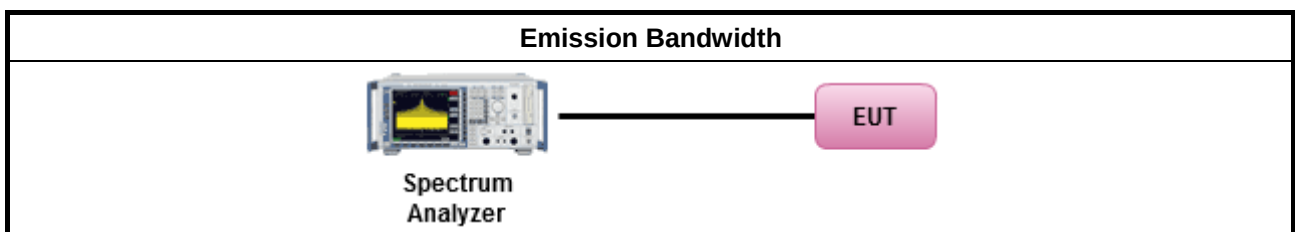
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> 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.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
☐	<ul style="list-style-type: none"> 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:	
☐	<ul style="list-style-type: none"> 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:	
☐	<ul style="list-style-type: none"> 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.	

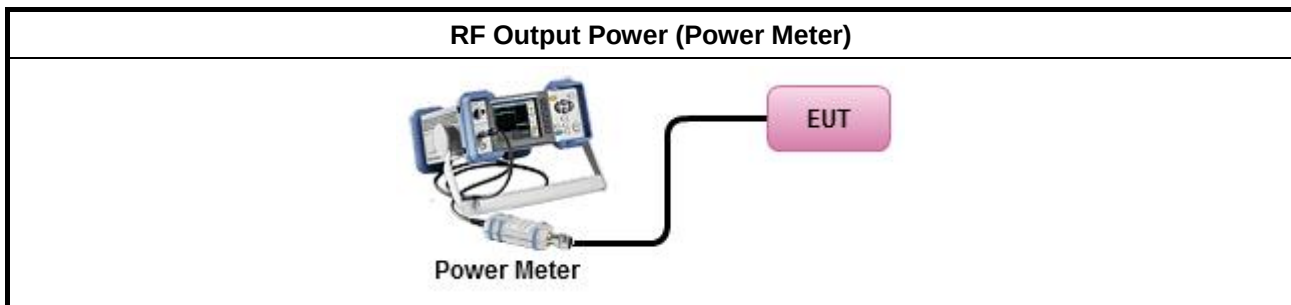
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> 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).
<ul style="list-style-type: none"> For conducted measurement. 	
<ul style="list-style-type: none"> 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. 	
<ul style="list-style-type: none"> 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]) $EIRP_{total} = P_{total} + DG$ 	

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

Peak Power Spectral Density Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
	<ul style="list-style-type: none"> 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:	
	<ul style="list-style-type: none"> 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.	
	<ul style="list-style-type: none"> 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.	
☐ For the 5.725-5.85 GHz band:	
	<ul style="list-style-type: none"> 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 the 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.	

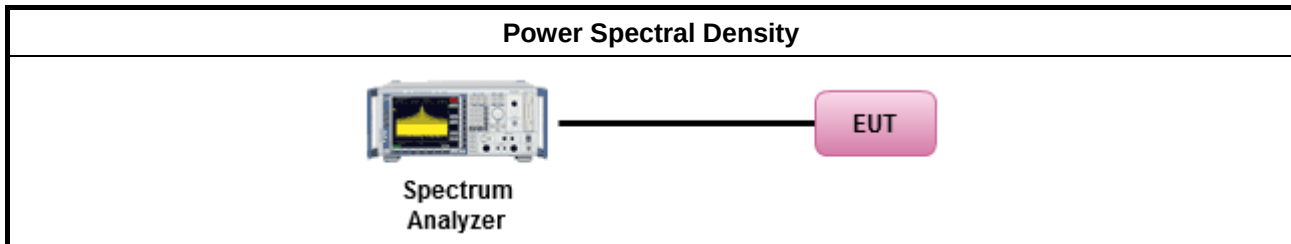
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> 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)
<ul style="list-style-type: none"> For conducted measurement. 	
<ul style="list-style-type: none"> 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.
☐	<ul style="list-style-type: none"> 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]) $EIRP_{total} = PPSD_{total} + DG$

3.4.4 Test Setup



3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D

3.5 Unwanted Emissions

3.5.1 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).

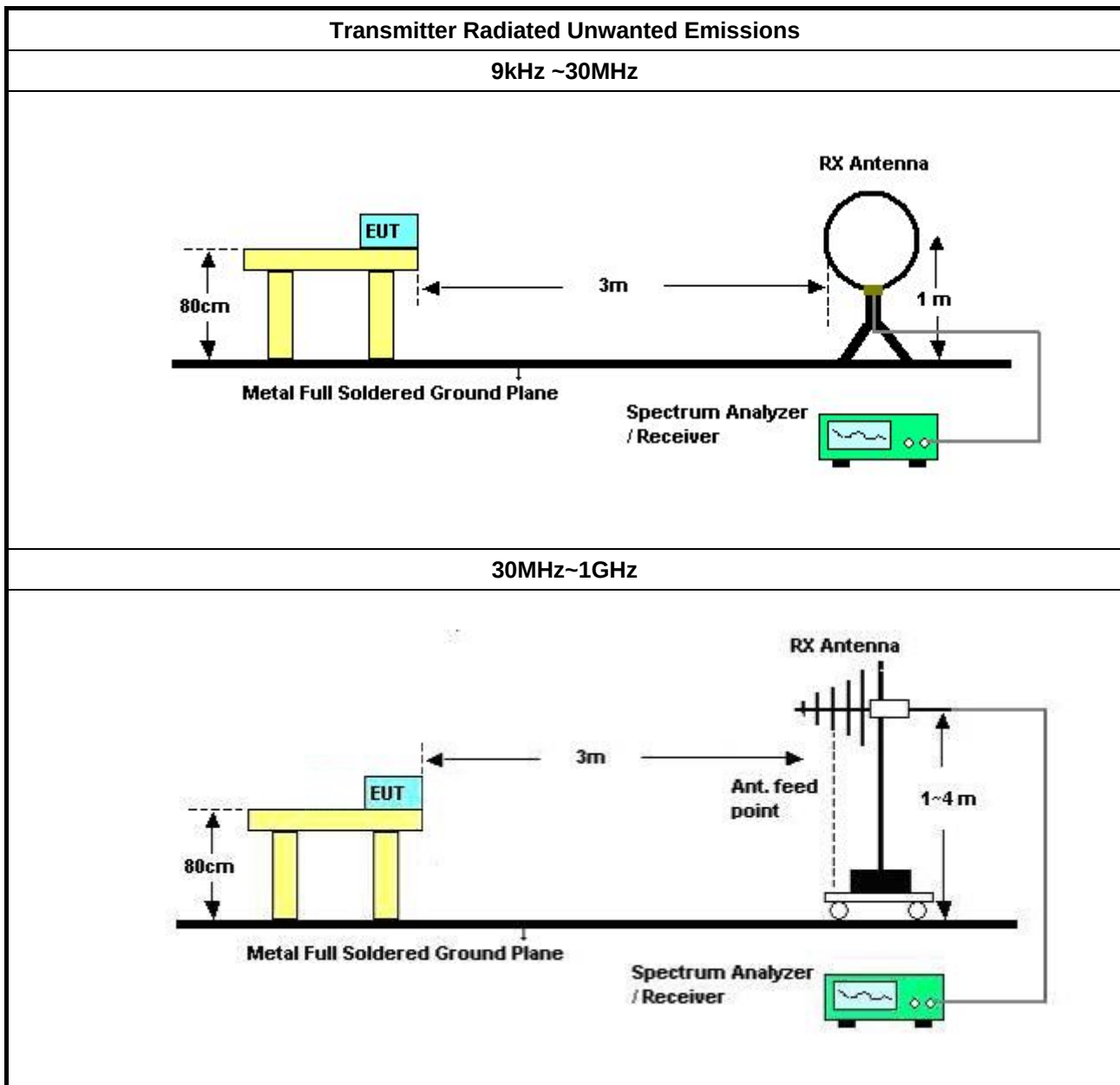
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

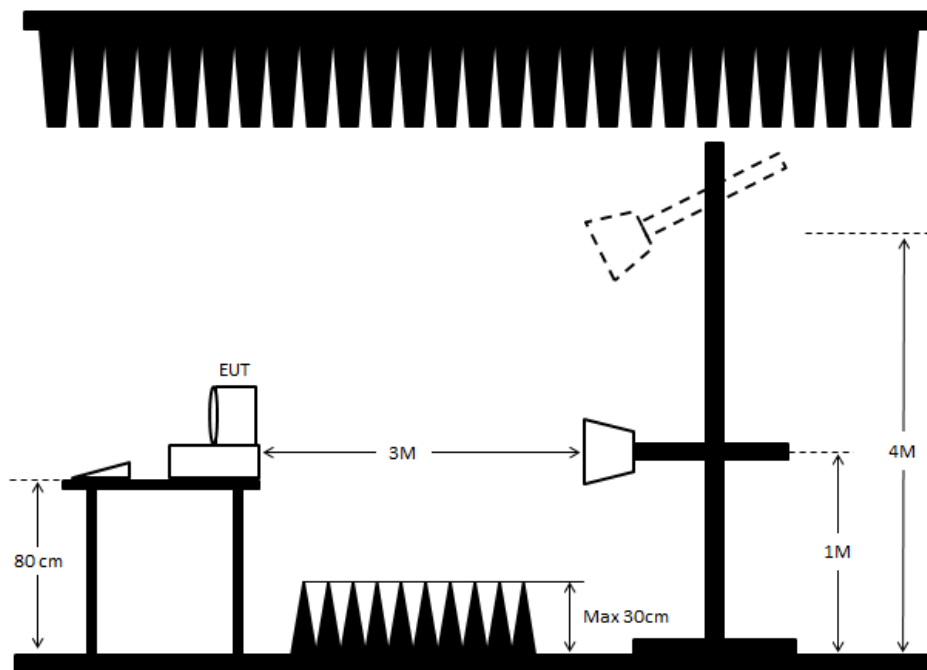
Test Method	
<ul style="list-style-type: none">Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater 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).	
<ul style="list-style-type: none">The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
<ul style="list-style-type: none">For the transmitter unwanted emissions shall be measured using following options below:	
	<ul style="list-style-type: none">Refer as FCC KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.
	<ul style="list-style-type: none">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 $\geq$ 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.	
<ul style="list-style-type: none">For radiated measurement.	
	<ul style="list-style-type: none">Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
	<ul style="list-style-type: none">Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
	<ul style="list-style-type: none">Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
<ul style="list-style-type: none">The any unwanted emissions level shall not exceed the fundamental emission level.	
<ul style="list-style-type: none">All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.	

3.5.4 Test Setup

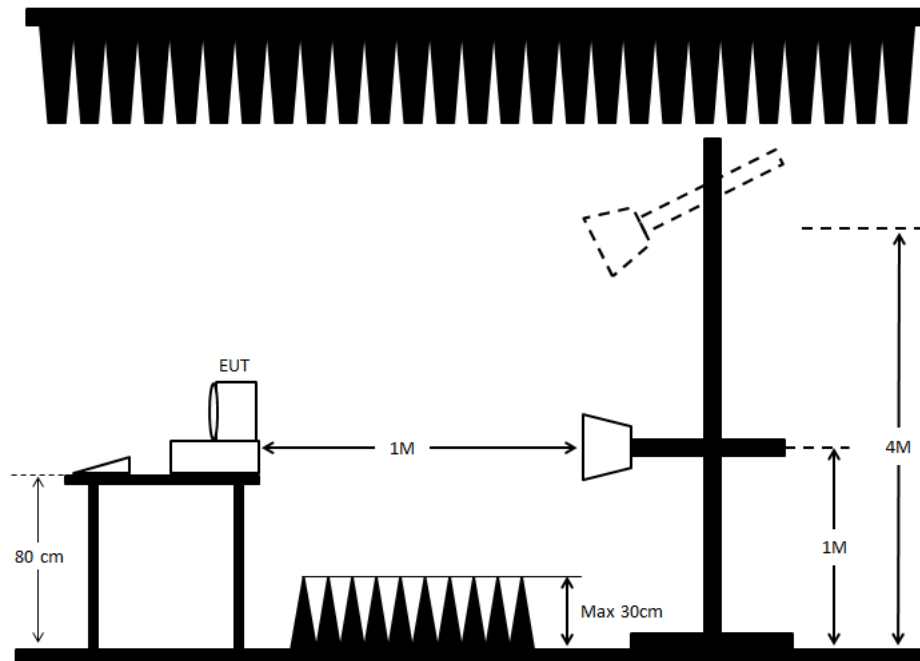


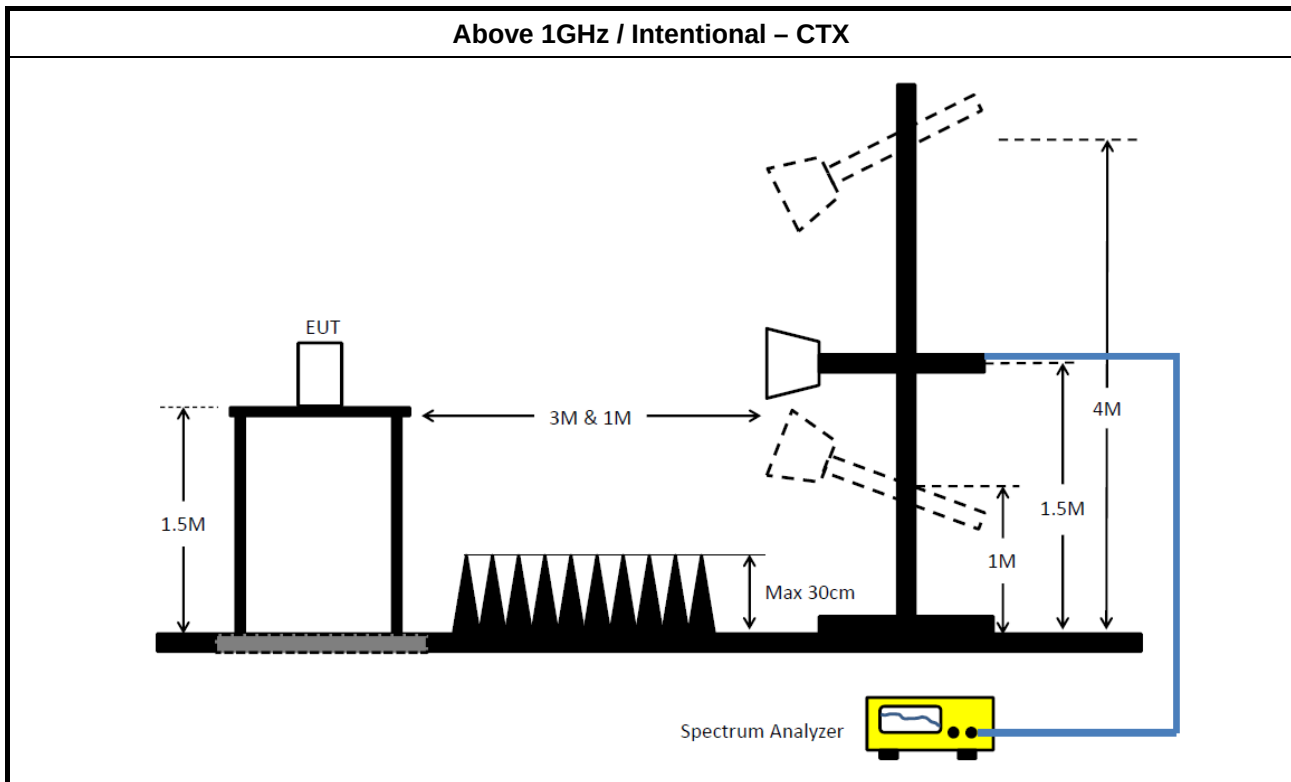
Above 1GHz / Unintentional – CRX

1,000~18,000 MHz



18,000~30,000 MHz





3.5.5 Transmitter Unwanted Emissions (Below 30MHz)

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

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

3.5.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix E



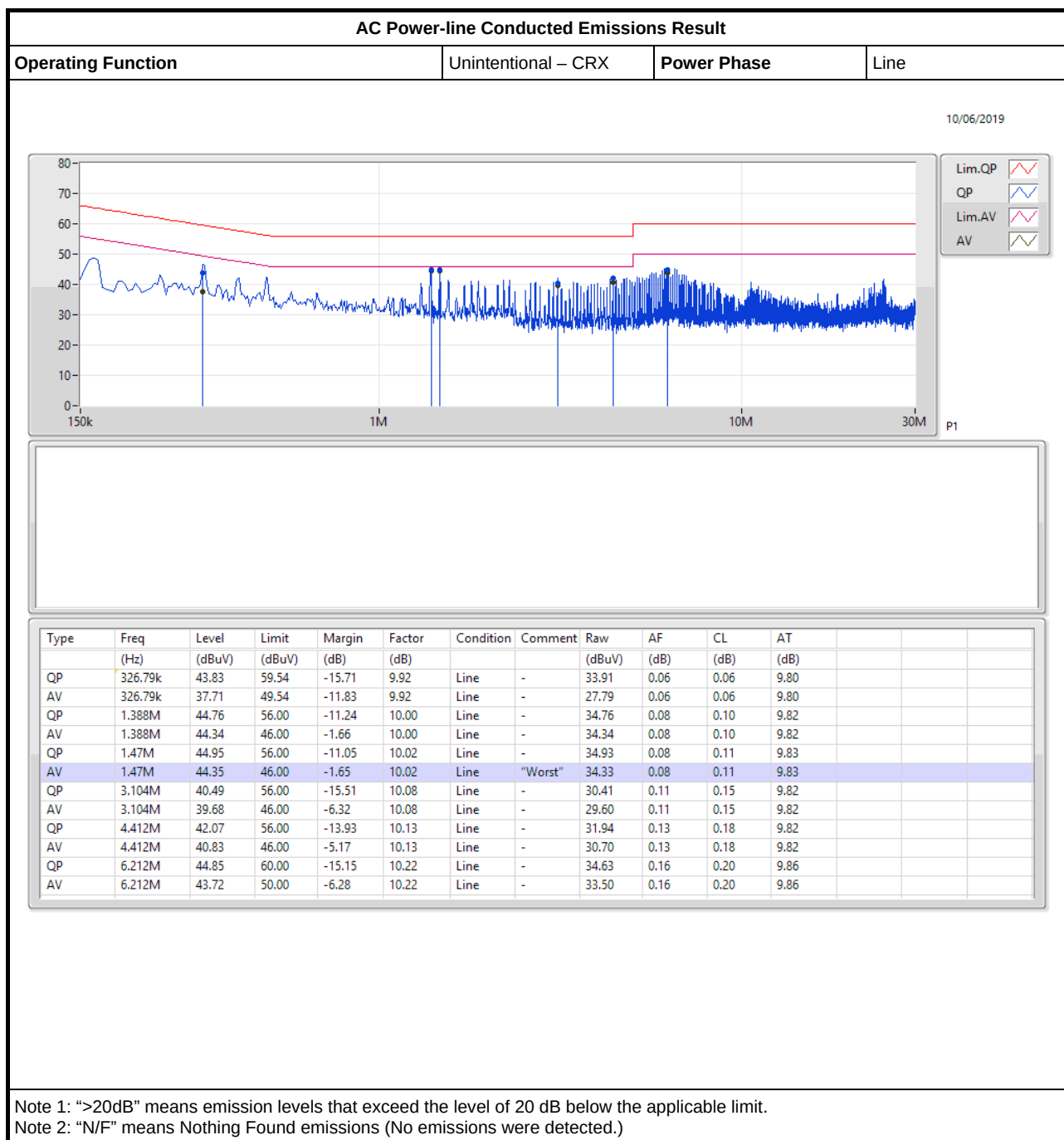
4 Test Equipment and Calibration Data

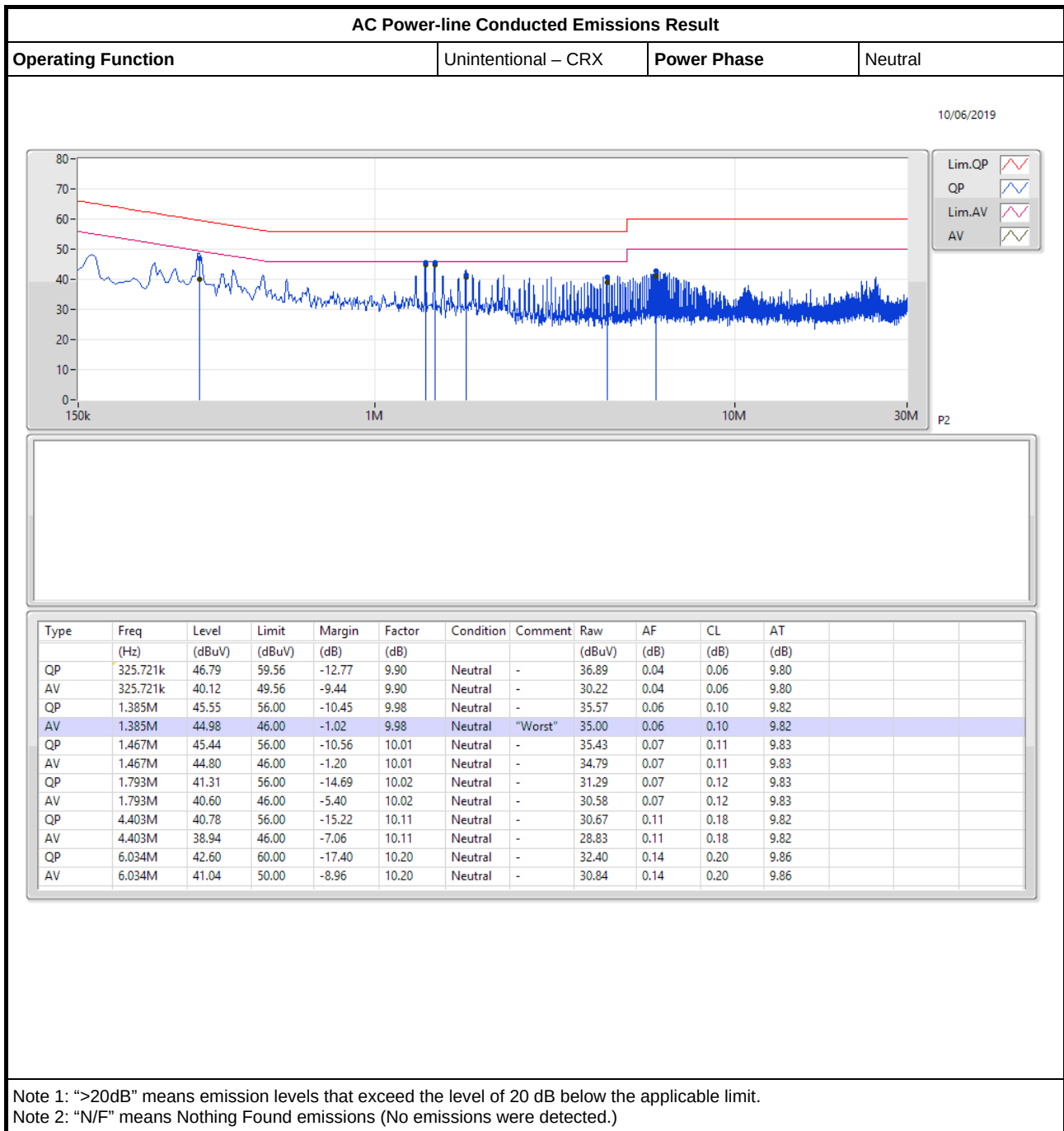
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 28, 2019	Jan. 29, 2020	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 24, 2018	Dec. 23, 2019	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Jan. 11, 2019	Jan. 10, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH04-CB)
BILOG ANTENNA with 6 dB attenuator	Schaffner & Woken	CBL6112B & N-6-06	22021&AT-N06 07	30MHz ~ 1GHz	Oct. 12, 2018	Oct. 11, 2019	Radiation (03CH04-CB)
Horn Antenna	ETS•Lindgren	3115	00143147	750MHz~18GHz	Oct. 26, 2018	Oct. 25, 2019	Radiation (03CH04-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 07, 2018	Jun. 06, 2019	Radiation (03CH04-CB)
Pre-Amplifier	Agilent	310N	187291	0.1MHz ~ 1GHz	Mar. 19, 2019	Mar. 18, 2020	Radiation (03CH04-CB)
Pre-Amplifier	Agilent	83017A	MY53270063	0.5GHz ~ 26.5GHz	Mar. 19, 2019	Mar. 18, 2020	Radiation (03CH04-CB)
Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Dec. 26, 2018	Dec. 25, 2019	Radiation (03CH04-CB)
EMI Test Receiver	R&S	ESCS	100359	9kHz ~ 2.75GHz	Jul. 03, 2018	Jul. 02, 2019	Radiation (03CH04-CB)
RF Cable-low	Woken	RG402	Low Cable-03+22	30MHz ~ 1GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21	1GHz - 18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21+22	1GHz - 18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH04-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Feb. 25, 2019	Feb. 24, 2020	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)

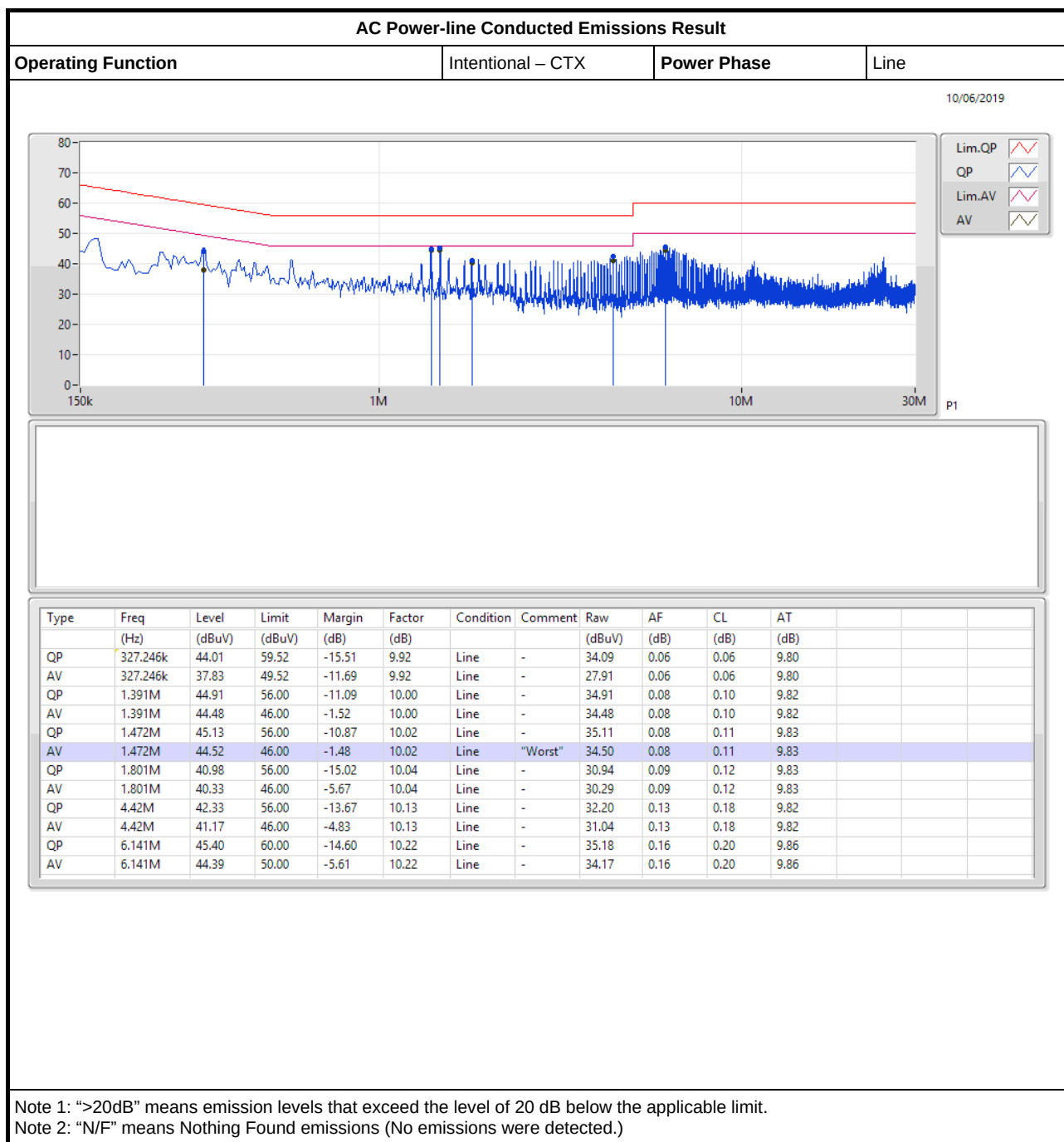


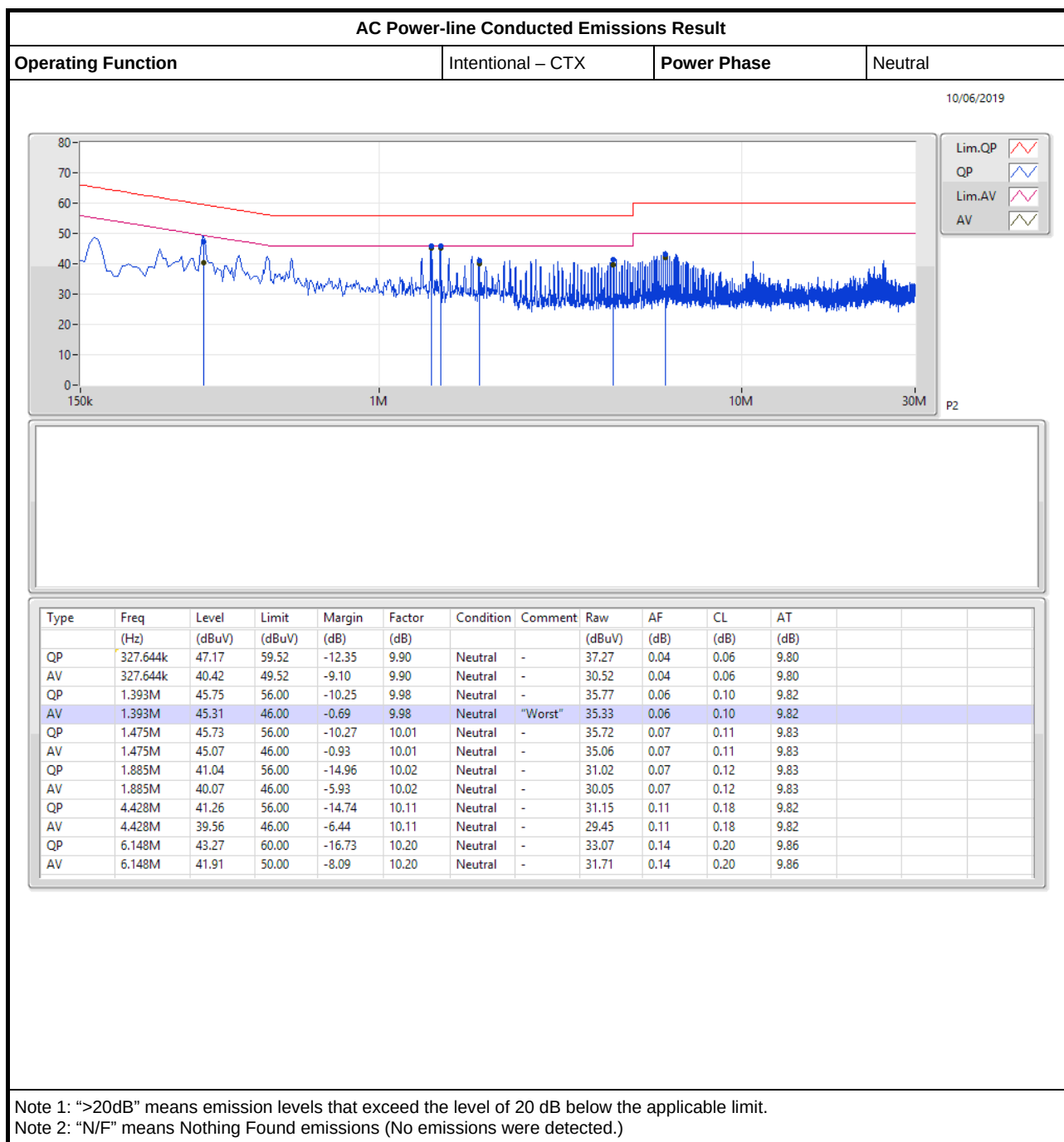
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-08	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (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	E9327A	US40442088	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)
Power Meter	Agilent	E4416A	GB41291199	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	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	-	-	-	-	-
802.11ac VHT20_Nss1,(MCS0)_2TX	23.625M	17.791M	17M8D1D	22.875M	17.666M
802.11ac VHT40_Nss1,(MCS0)_2TX	45.5M	36.282M	36M3D1D	45.35M	36.232M
802.11ac VHT80_Nss1,(MCS0)_2TX	95.8M	76.062M	76M1D1D	89.8M	76.062M

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

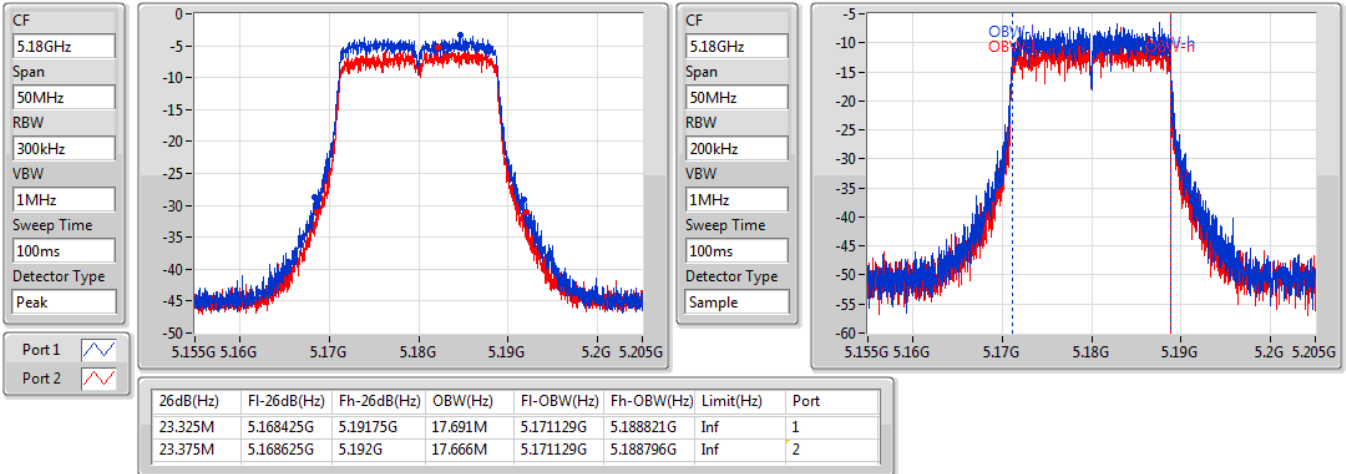
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	23.325M	17.691M	23.375M	17.666M
5200MHz	Pass	Inf	23.625M	17.666M	23.575M	17.791M
5240MHz	Pass	Inf	23.075M	17.716M	22.875M	17.691M
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	Inf	45.4M	36.282M	45.45M	36.232M
5230MHz	Pass	Inf	45.35M	36.282M	45.5M	36.232M
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	Inf	95.8M	76.062M	89.8M	76.062M

Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band

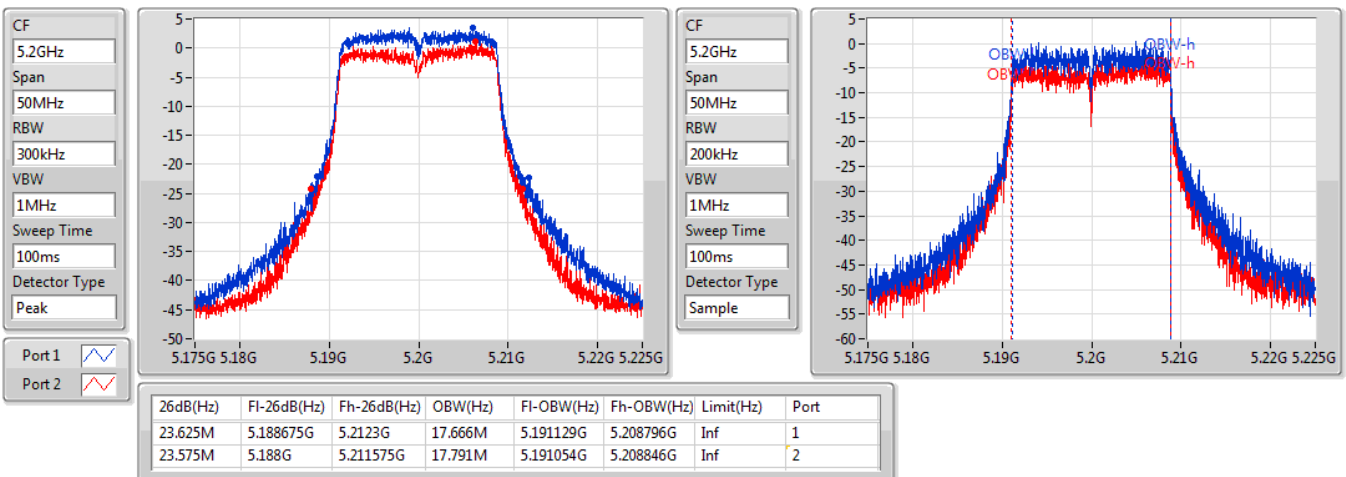
Port X-OBW = Port X 99% occupied bandwidth;

802.11ac VHT20_Nss1,(MCS0)_2TX
EBW
5180MHz

03/06/2019

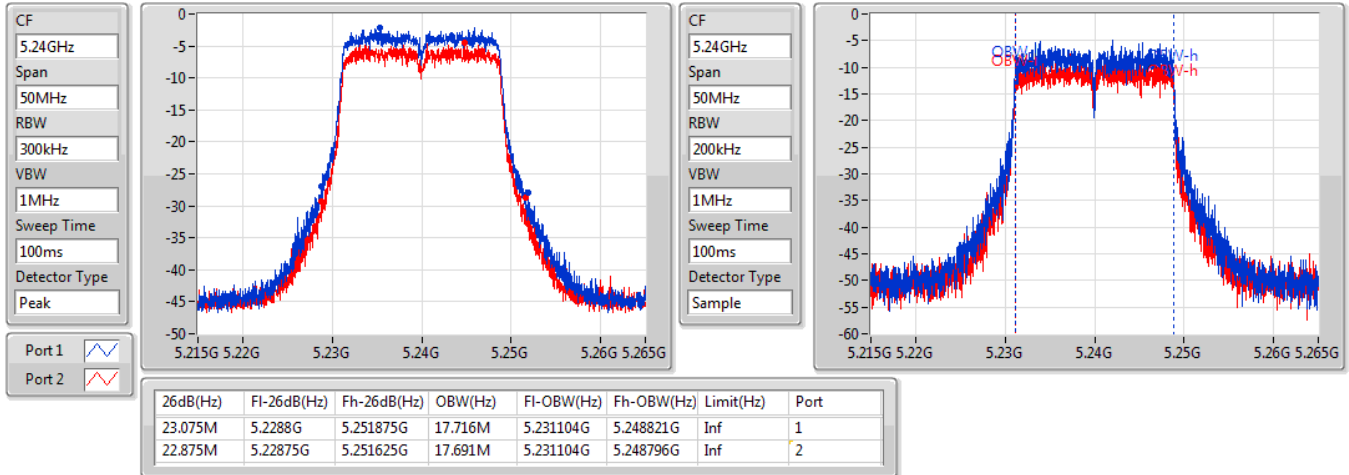

802.11ac VHT20_Nss1,(MCS0)_2TX
EBW
5200MHz

03/06/2019

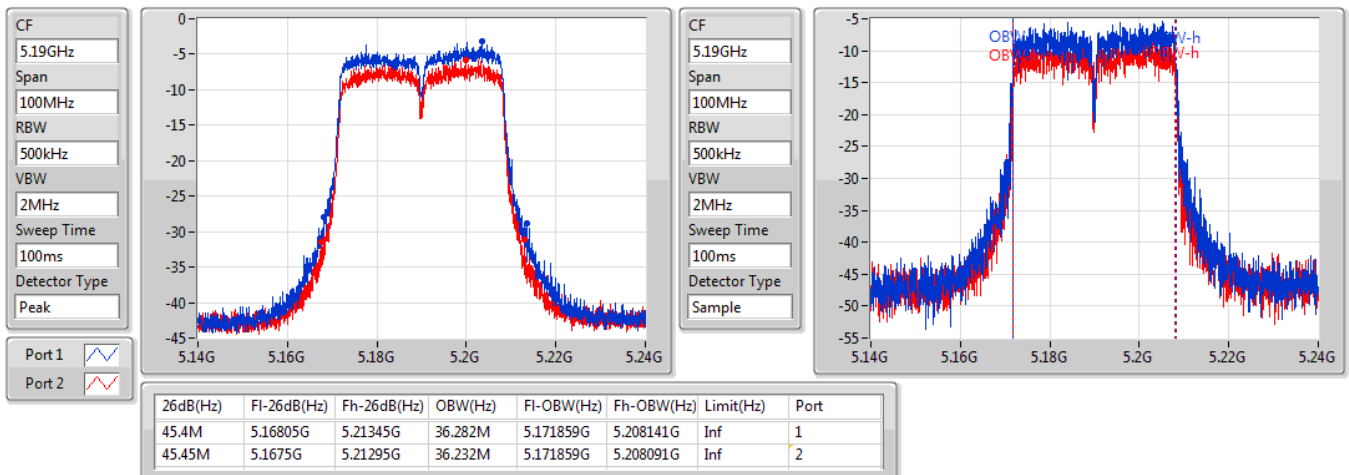


802.11ac VHT20_Nss1,(MCS0)_2TX
EBW
5240MHz

03/06/2019

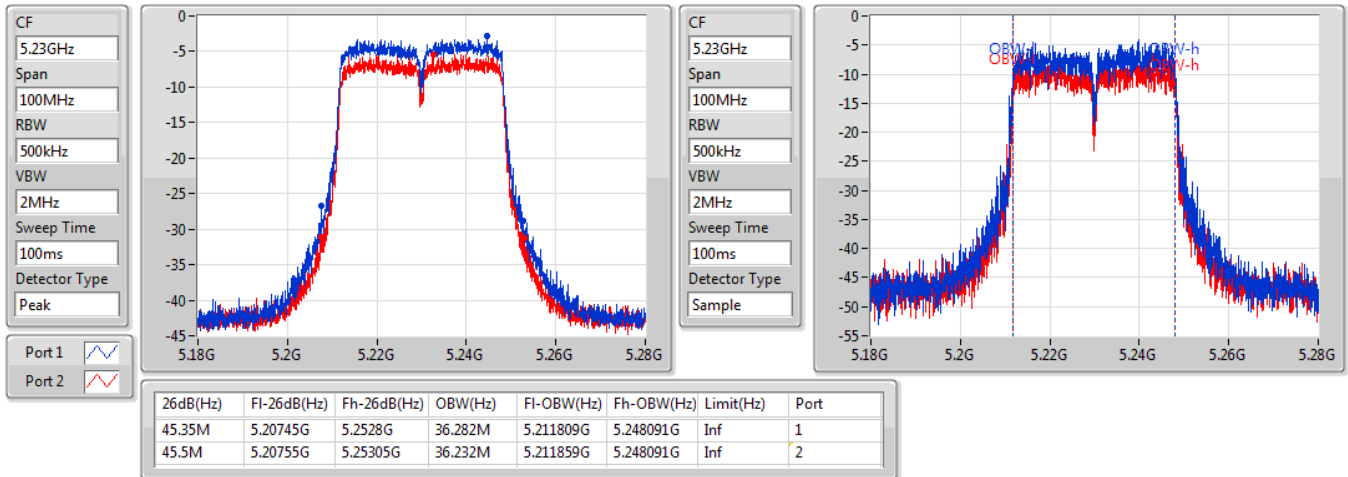

802.11ac VHT40_Nss1,(MCS0)_2TX
EBW
5190MHz

03/06/2019

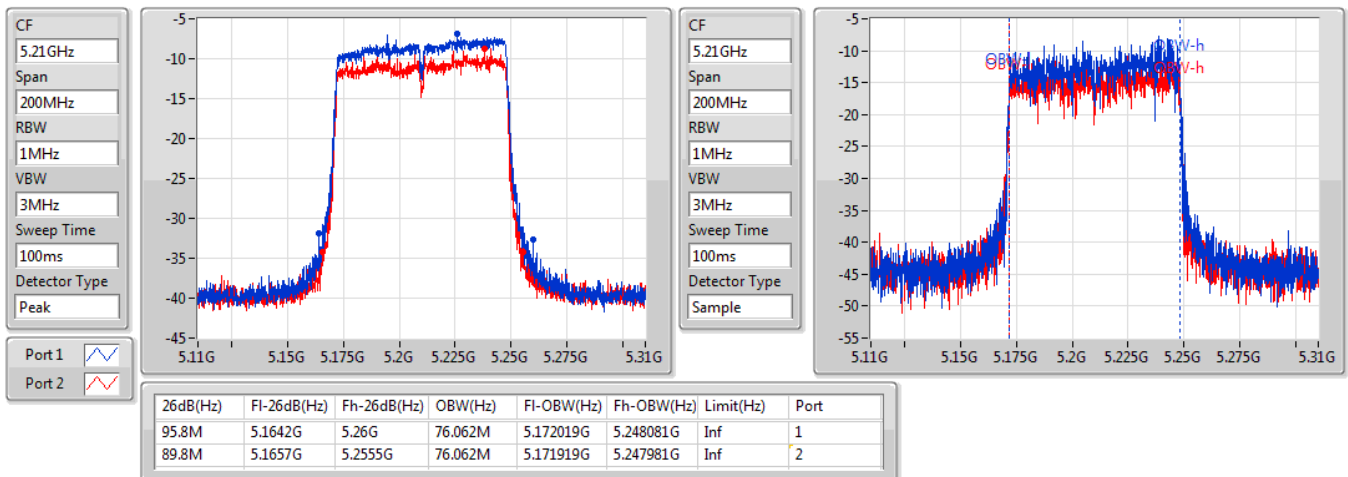


802.11ac VHT40_Nss1,(MCS0)_2TX
EBW
5230MHz

03/06/2019


802.11ac VHT80_Nss1,(MCS0)_2TX
EBW
5210MHz

03/06/2019





Average Power Result

Appendix C

Summary

Mode	Total Power (dBm)	Total Power (W)
5.15-5.25GHz	-	-
802.11ac VHT20_Nss1,(MCS0)_2TX	13.67	0.02328
802.11ac VHT40_Nss1,(MCS0)_2TX	7.87	0.00612
802.11ac VHT80_Nss1,(MCS0)_2TX	3.09	0.00204



Average Power Result

Appendix C

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	24.1	5.10	3.09	7.22	28.90
5200MHz	Pass	24.1	11.79	9.13	13.67	28.90
5240MHz	Pass	24.1	6.33	4.19	8.40	28.90
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	24.1	4.91	2.60	6.92	28.90
5230MHz	Pass	24.1	5.98	3.35	7.87	28.90
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	24.1	1.11	-1.27	3.09	28.90

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



Summary

Mode	PD (dBm/RBW)
5.15-5.25GHz	-
802.11ac VHT20_Nss1,(MCS0)_2TX	0.92
802.11ac VHT40_Nss1,(MCS0)_2TX	-7.75
802.11ac VHT80_Nss1,(MCS0)_2TX	-15.47

RBW = 500 kHz 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)
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	24.10	-7.79	-9.62	-5.68	15.90
5200MHz	Pass	24.10	-1.10	-3.14	0.92	15.90
5240MHz	Pass	24.10	-6.52	-8.69	-4.49	15.90
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	24.10	-10.51	-12.60	-8.45	15.90
5230MHz	Pass	24.10	-9.62	-12.23	-7.75	15.90
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	24.10	-17.37	-19.82	-15.47	15.90

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

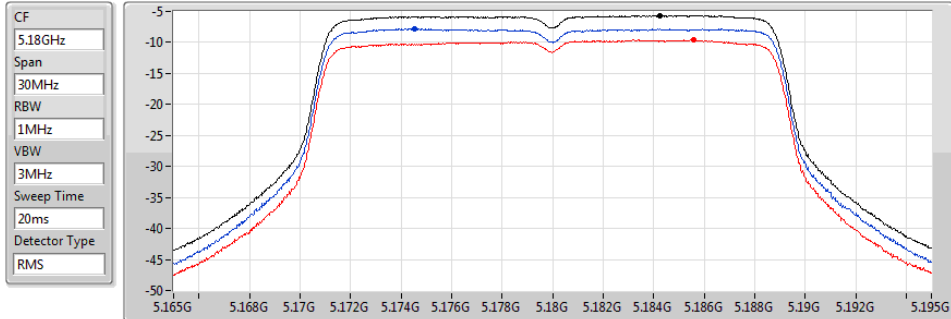
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

5180MHz

03/06/2019



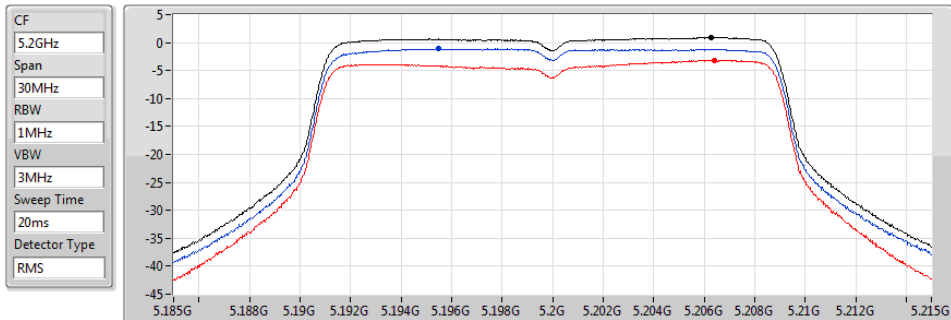
Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-5.68	-5.68	-7.79	-9.62

802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

5200MHz

03/06/2019



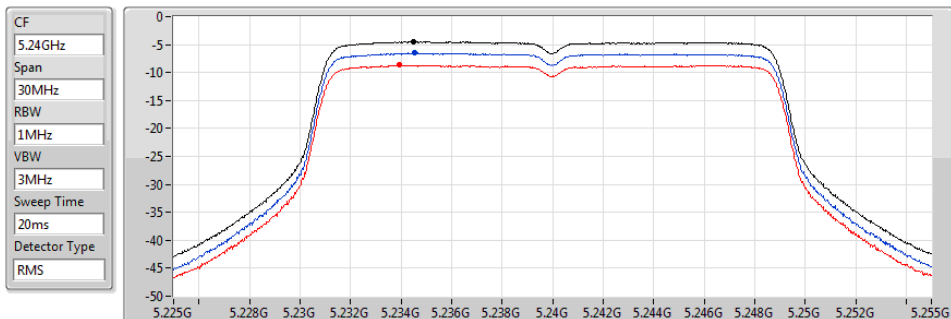
Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
0.92	0.92	-1.10	-3.14

802.11ac VHT20_Nss1,(MCS0)_2TX

PSD

5240MHz

03/06/2019



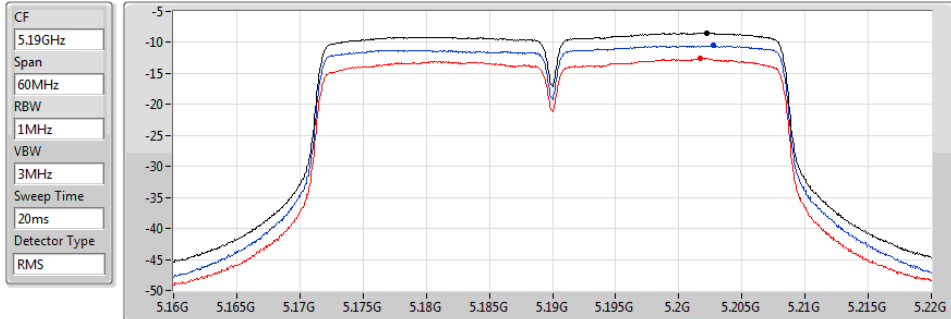
Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-4.49	-4.49	-6.52	-8.69

802.11ac VHT40_Nss1,(MCS0)_2TX

PSD

5190MHz

03/06/2019



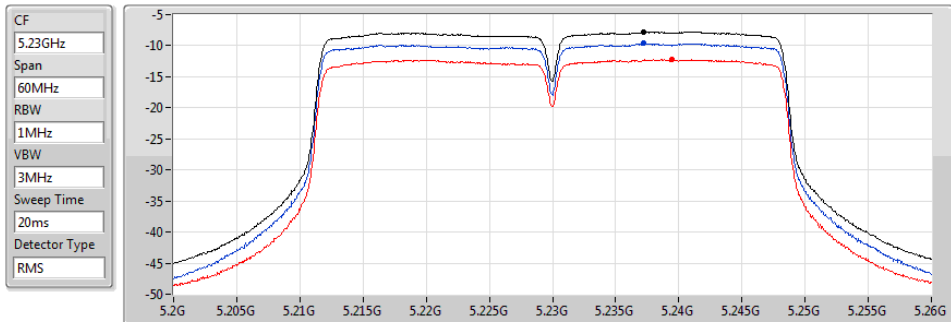
Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-8.45	-8.45	-10.51	-12.60

802.11ac VHT40_Nss1,(MCS0)_2TX

PSD

5230MHz

03/06/2019



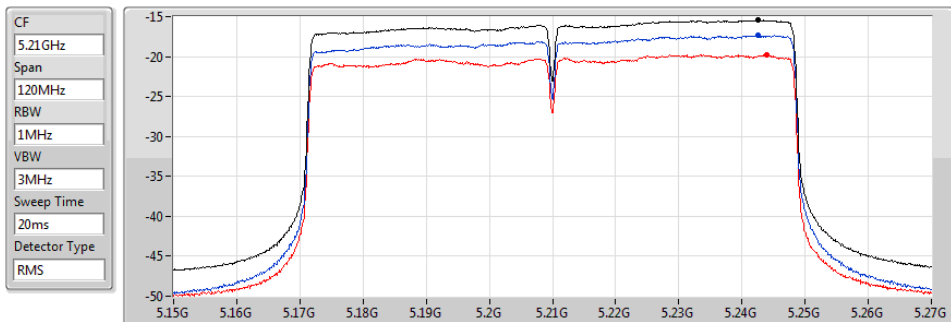
Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-7.75	-7.75	-9.62	-12.23

802.11ac VHT80_Nss1,(MCS0)_2TX

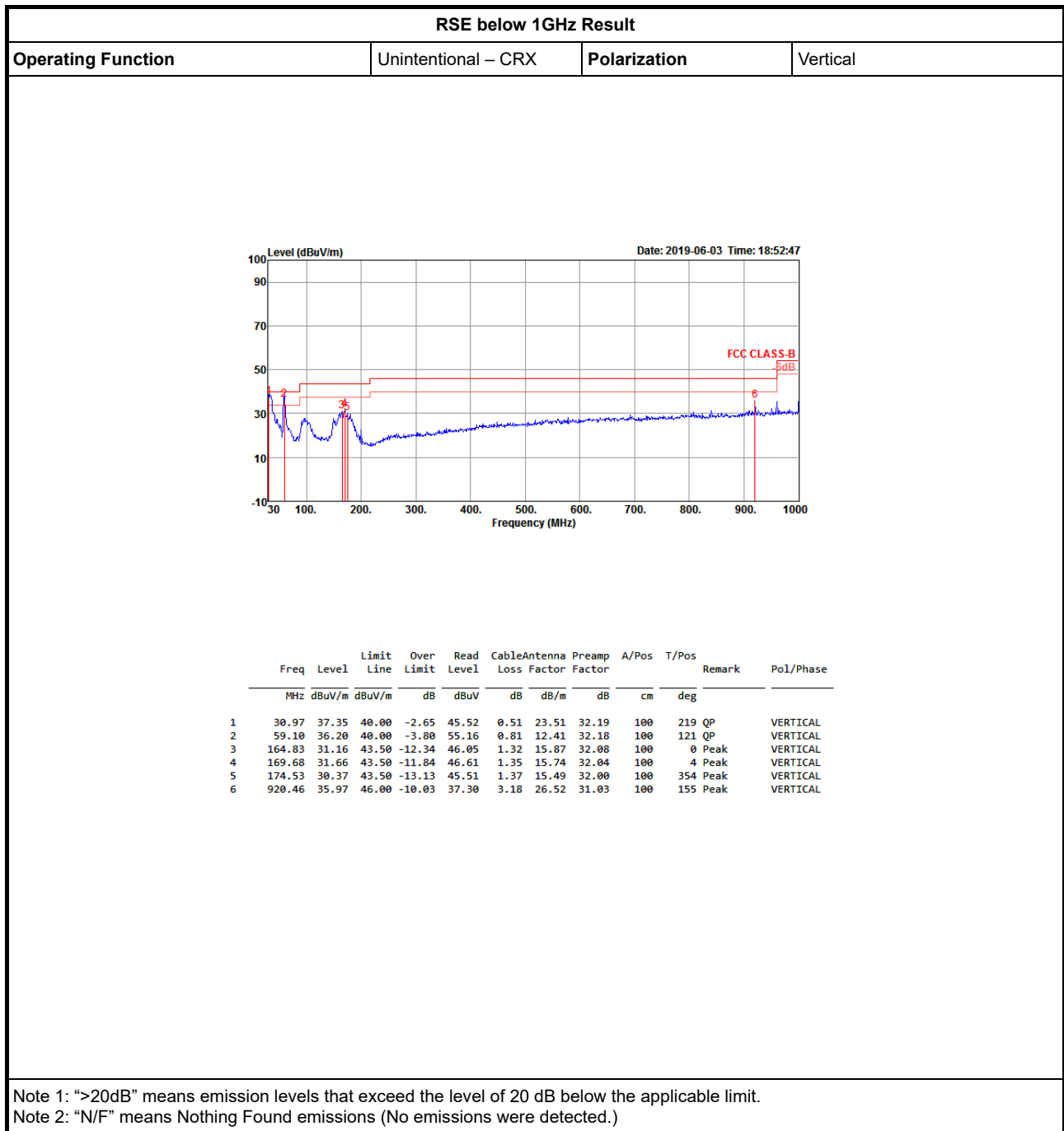
PSD

5210MHz

03/06/2019



Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-15.47	-15.47	-17.37	-19.82



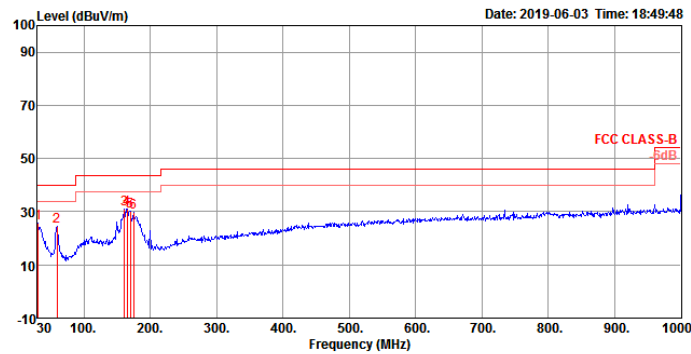
RSE below 1GHz Result

Operating Function

Unintentional – CRX

Polarization

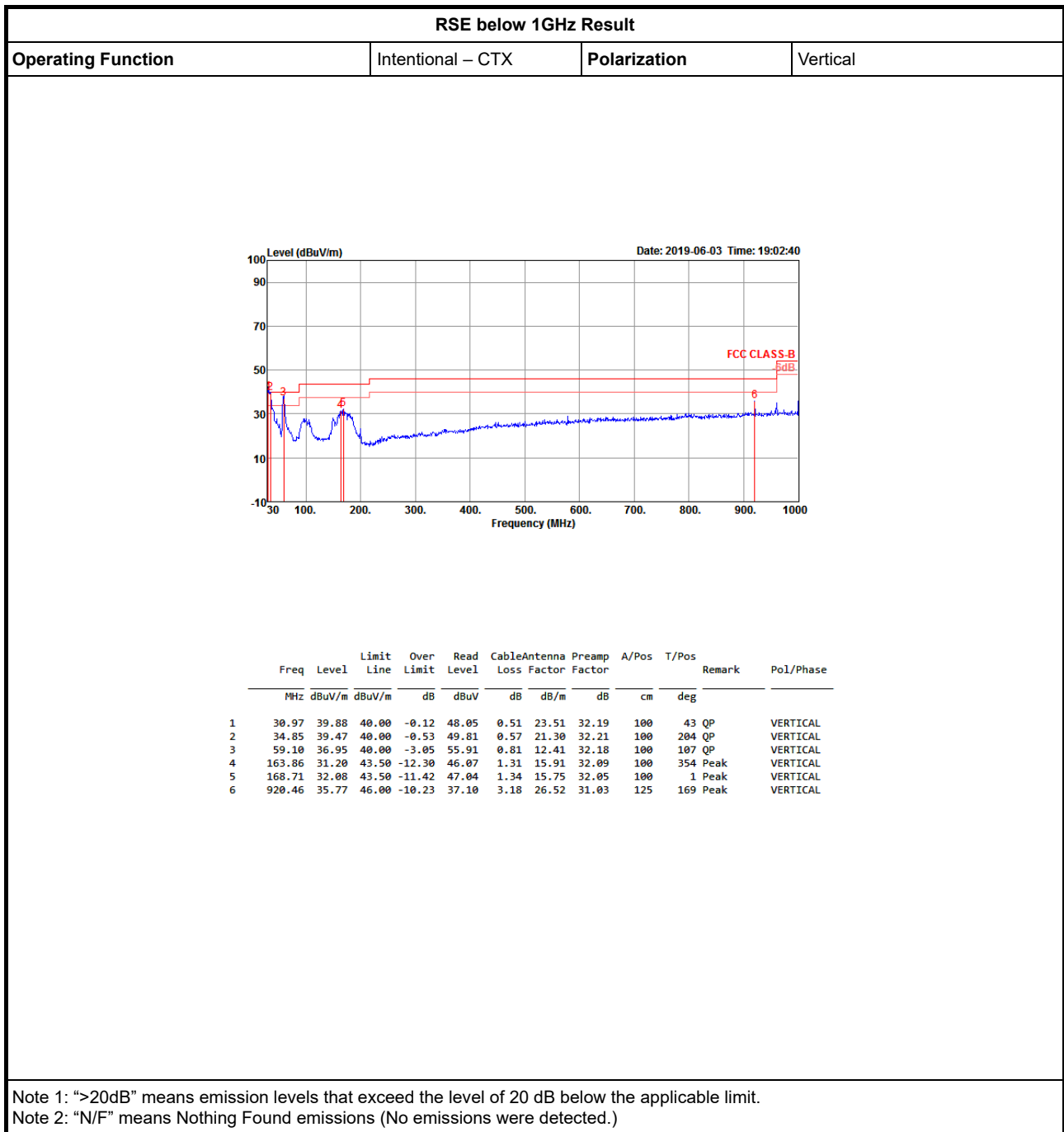
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preampl	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	30.97	25.57	40.00	-14.43	33.74	0.51	23.51	32.19	100	119 Peak	HORIZONTAL
2	59.10	24.59	40.00	-15.41	43.55	0.81	12.41	32.18	200	214 Peak	HORIZONTAL
3	160.95	30.88	43.50	-12.62	45.69	1.30	16.01	32.12	150	238 Peak	HORIZONTAL
4	164.83	30.93	43.50	-12.57	45.82	1.32	15.87	32.08	200	247 Peak	HORIZONTAL
5	169.68	30.30	43.50	-13.20	45.25	1.35	15.74	32.04	200	231 Peak	HORIZONTAL
6	174.53	29.76	43.50	-13.74	44.90	1.37	15.49	32.00	150	221 Peak	HORIZONTAL

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)



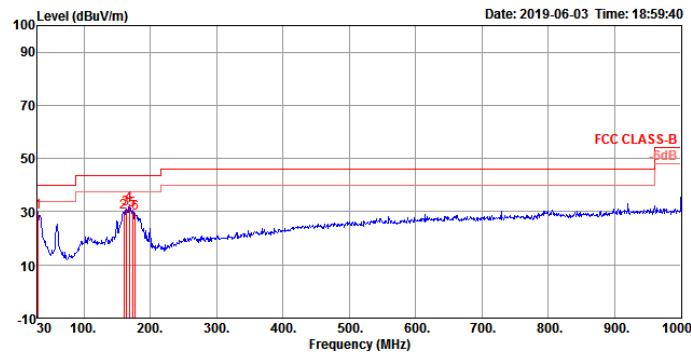
RSE below 1GHz Result

Operating Function

Intentional – CTX

Polarization

Horizontal



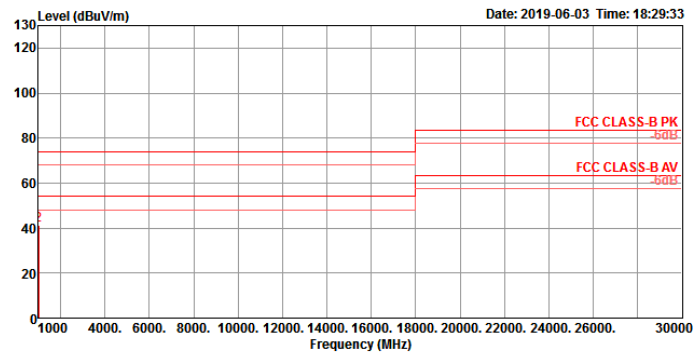
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	30.97	29.62	40.00	-10.38	37.79	0.51	23.51	32.19	100	275 Peak	HORIZONTAL
2	159.98	29.84	43.50	-13.66	44.63	1.29	16.05	32.13	150	230 Peak	HORIZONTAL
3	163.86	30.97	43.50	-12.53	45.84	1.31	15.91	32.09	200	74 Peak	HORIZONTAL
4	168.71	32.47	43.50	-11.03	47.43	1.34	15.75	32.05	150	222 Peak	HORIZONTAL
5	173.56	30.63	43.50	-12.87	45.74	1.37	15.52	32.00	150	182 Peak	HORIZONTAL
6	177.44	29.49	43.50	-14.01	44.67	1.39	15.40	31.97	125	210 Peak	HORIZONTAL

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

RSE RX above 1GHz Result

Operating Function	Unintentional – CRX	Polarization	Vertical
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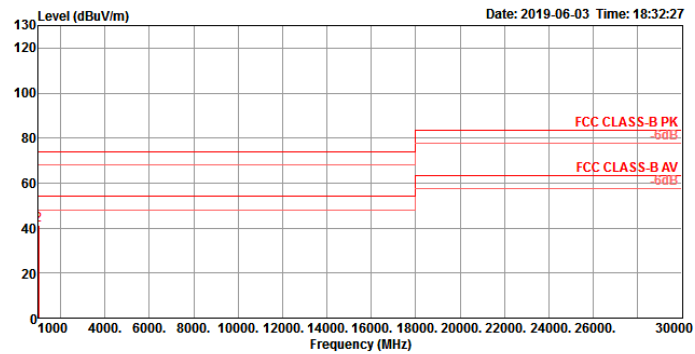


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1000.04	31.19	54.00	-22.81	42.84	2.88	23.30	37.83	100	87 Average	VERTICAL
2	1000.06	41.47	74.00	-32.53	53.12	2.88	23.30	37.83	100	87 Peak	VERTICAL

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

RSE RX above 1GHz Result

Operating Function	Unintentional – CRX	Polarization	Horizontal
--------------------	---------------------	--------------	------------



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1000.07	33.65	54.00	-20.35	45.30	2.88	23.30	37.83	134	226 Average	HORIZONTAL
2	1000.10	41.34	74.00	-32.66	52.99	2.88	23.30	37.83	134	226 Peak	HORIZONTAL

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)



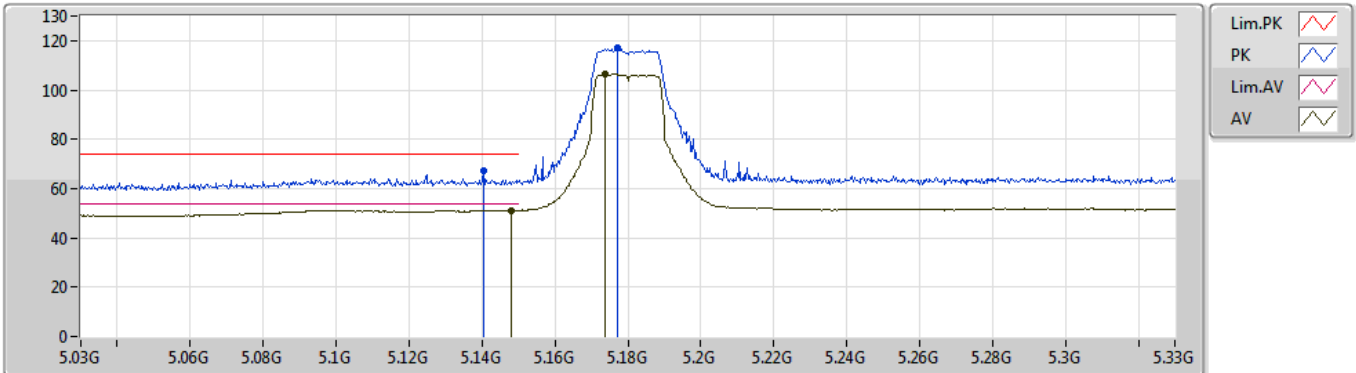
Summary

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	5.1499G	53.98	54.00	-0.02	7.31	3	Vertical	356	1.72	-

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5180MHz_TX



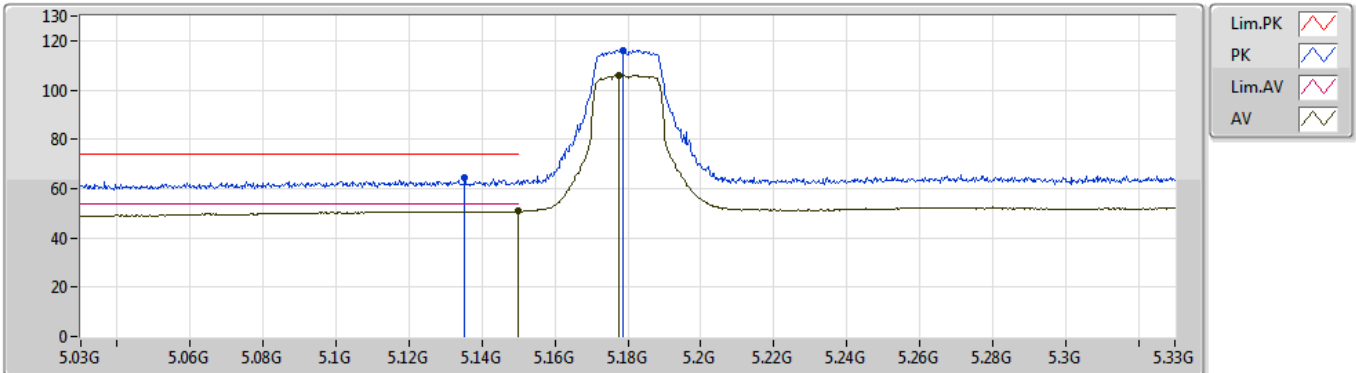
EUT Y_2TX
Setting 0.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	5.1404G	67.33	74.00	-6.67	7.30	3	Vertical	355	1.65	-			
AV	5.1482G	51.10	54.00	-2.90	7.31	3	Vertical	355	1.65	-			
PK	5.177G	116.99	Inf	-Inf	7.35	3	Vertical	355	1.65	-			
AV	5.1737G	106.42	Inf	-Inf	7.34	3	Vertical	355	1.65	-			

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5180MHz_TX



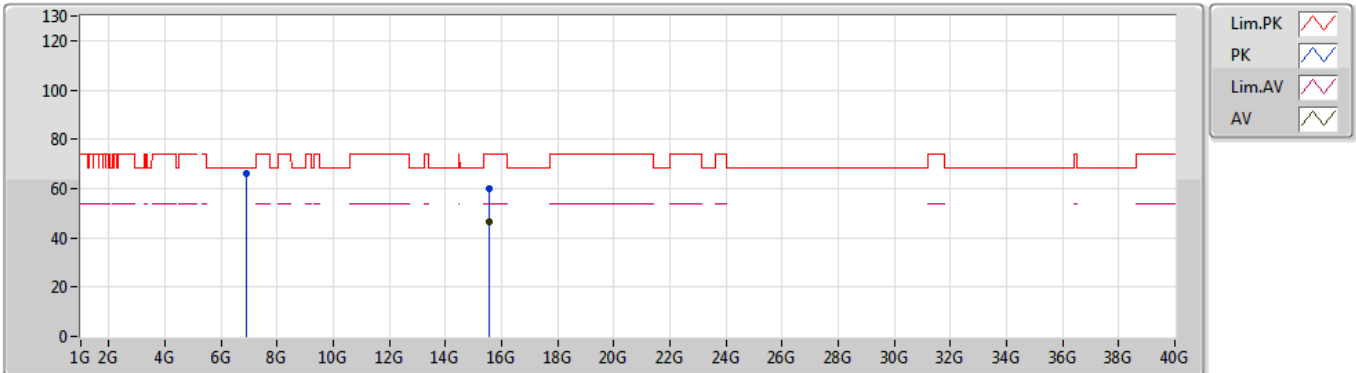
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Setting 0.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	5.1353G	64.30	74.00	-9.70	7.30	3	Horizontal	355	1.67	-			
AV	5.15G	50.77	54.00	-3.23	7.31	3	Horizontal	355	1.67	-			
PK	5.1788G	115.98	Inf	-Inf	7.35	3	Horizontal	355	1.67	-			
AV	5.1776G	105.81	Inf	-Inf	7.35	3	Horizontal	355	1.67	-			

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5180MHz_TX



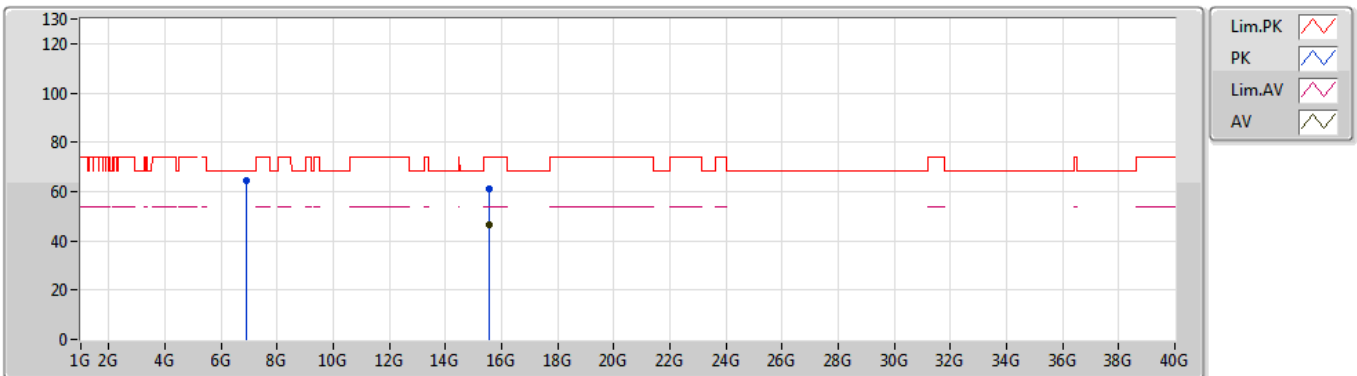
EUT Y_2TX
Setting 0.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	6.90664G	66.11	68.20	-2.09	11.53	3	Vertical	355	1.50	-			
PK	15.54996G	60.17	74.00	-13.83	15.49	3	Vertical	239	1.41	-			
AV	15.54774G	46.54	54.00	-7.46	15.49	3	Vertical	239	1.41	-			

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5180MHz_TX



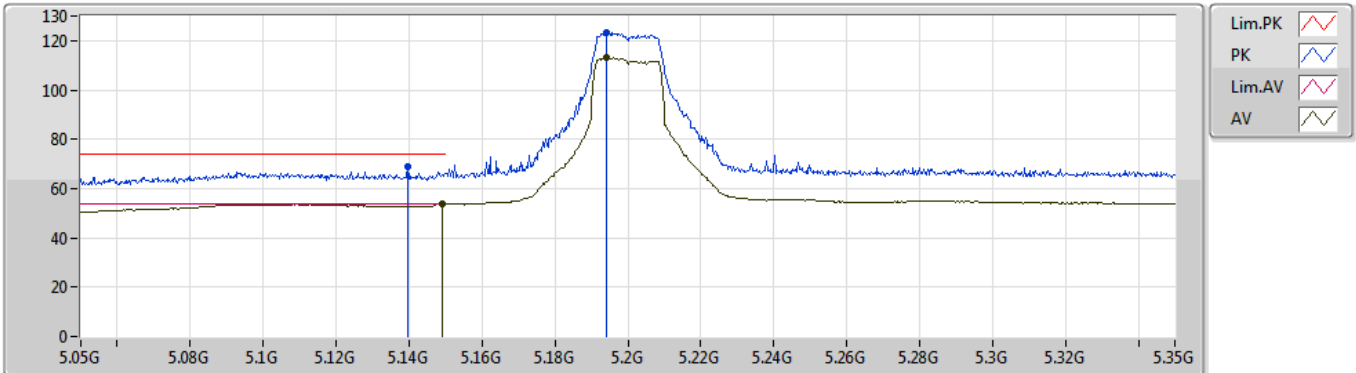
EUT Y_2TX
Setting 0.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	6.90669G	64.42	68.20	-3.78	11.53	3	Horizontal	355	1.66	-			
PK	15.54028G	61.06	74.00	-12.94	15.50	3	Horizontal	185	1.39	-			
AV	15.5452G	46.65	54.00	-7.35	15.49	3	Horizontal	185	1.39	-			

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5200MHz_TX



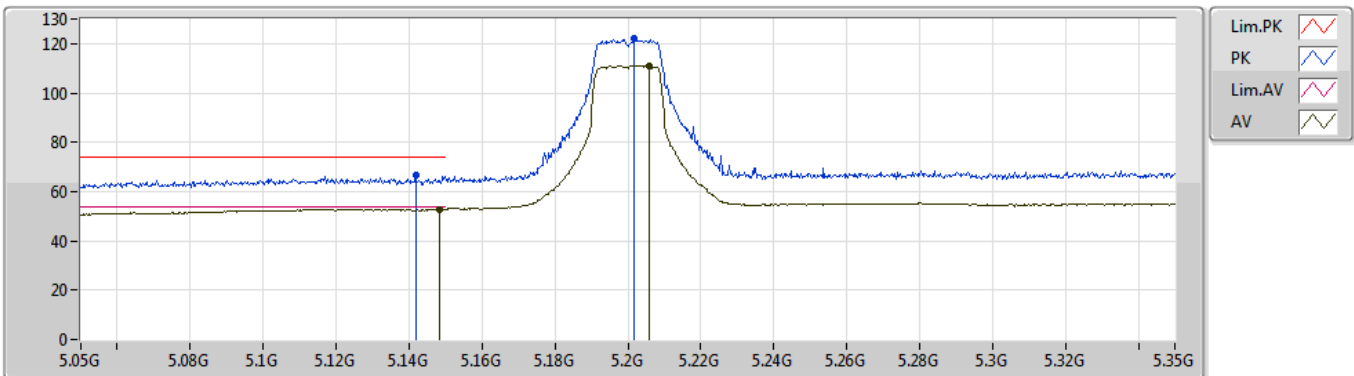
EUT Y_2TX
Setting 7.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	5.1397G	68.68	74.00	-5.32	7.30	3	Vertical	356	1.72	-			
AV	5.1493G	53.84	54.00	-0.16	7.31	3	Vertical	356	1.72	-			
PK	5.194G	123.51	Inf	-Inf	7.36	3	Vertical	356	1.72	-			
AV	5.1943G	113.04	Inf	-Inf	7.36	3	Vertical	356	1.72	-			

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5200MHz_TX



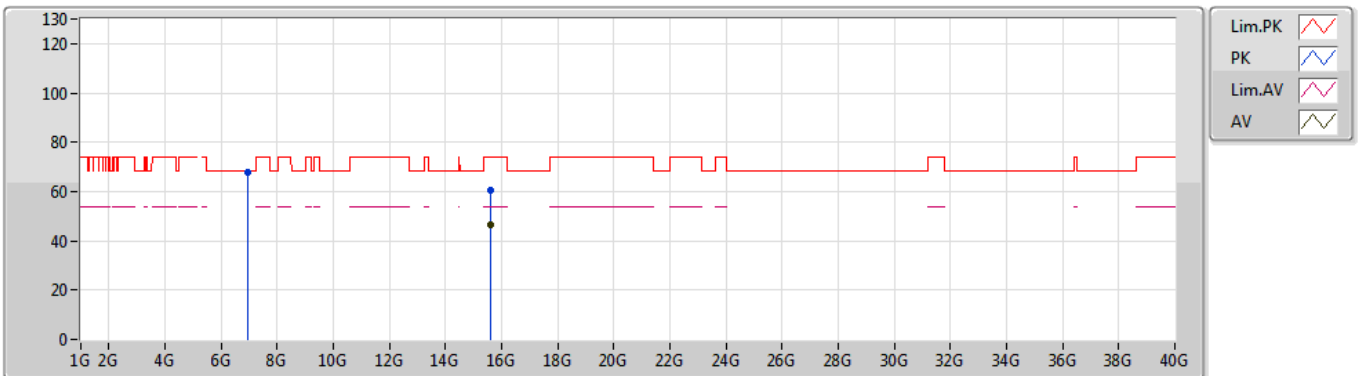
EUT Y_2TX
Setting 7.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	5.1418G	66.54	74.00	-7.46	7.30	3	Horizontal	356	1.70	-			
AV	5.1484G	52.90	54.00	-1.10	7.31	3	Horizontal	356	1.70	-			
PK	5.2018G	121.95	Inf	-Inf	7.37	3	Horizontal	356	1.70	-			
AV	5.2057G	110.97	Inf	-Inf	7.39	3	Horizontal	356	1.70	-			

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5200MHz_TX



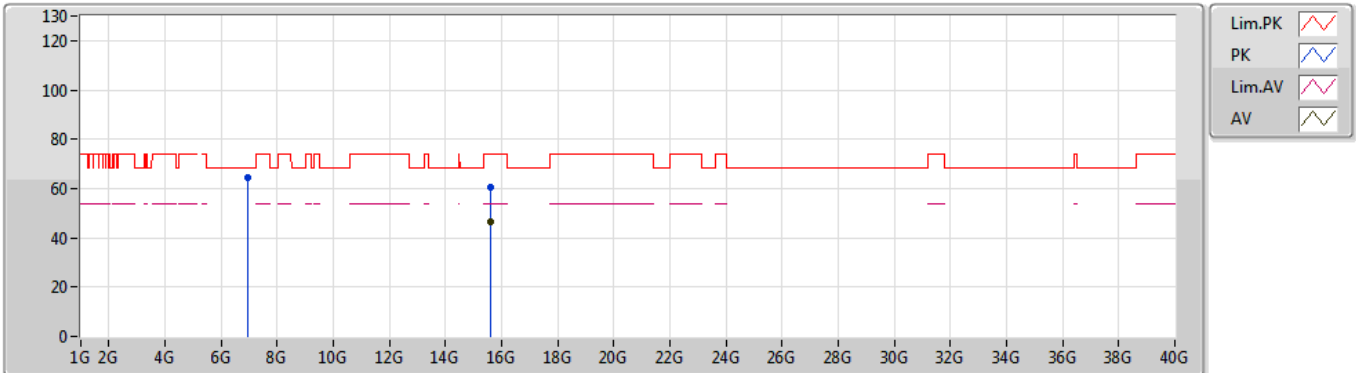
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Setting 7.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	6.93325G	67.65	68.20	-0.55	11.53	3	Vertical	356	1.50	-			
PK	15.60918G	60.70	74.00	-13.30	15.45	3	Vertical	254	1.21	-			
AV	15.59832G	46.45	54.00	-7.55	15.45	3	Vertical	254	1.21	-			

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5200MHz_TX



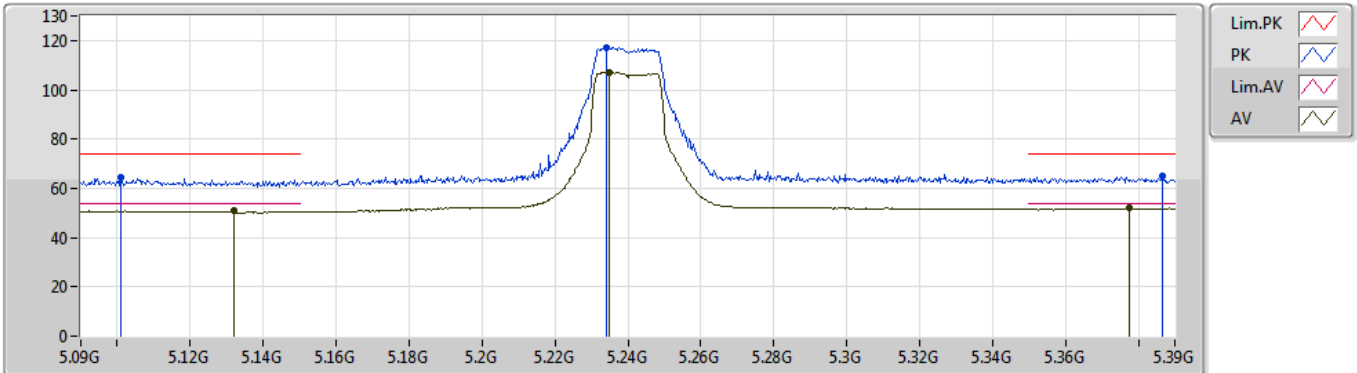
EUT Y_2TX
Setting 7.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	6.93327G	64.21	68.20	-3.99	11.53	3	Horizontal	355	1.50	-			
PK	15.60164G	60.52	74.00	-13.48	15.45	3	Horizontal	358	1.79	-			
AV	15.60562G	46.42	54.00	-7.58	15.46	3	Horizontal	358	1.79	-			

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5240MHz_TX



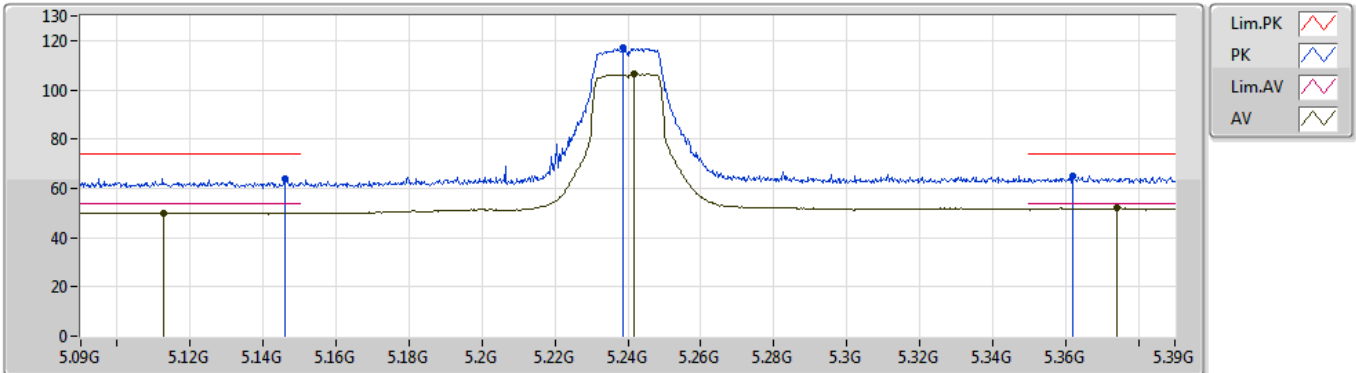
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Setting 0.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	5.1008G	64.26	74.00	-9.74	7.26	3	Vertical	356	1.70	-
AV	5.1321G	50.73	54.00	-3.27	7.29	3	Vertical	356	1.70	-
PK	5.2343G	117.21	Inf	-Inf	7.50	3	Vertical	356	1.70	-
AV	5.2349G	107.03	Inf	-Inf	7.50	3	Vertical	356	1.70	-
PK	5.3867G	65.24	74.00	-8.76	8.11	3	Vertical	356	1.70	-
AV	5.3777G	51.86	54.00	-2.14	8.07	3	Vertical	356	1.70	-

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5240MHz_TX



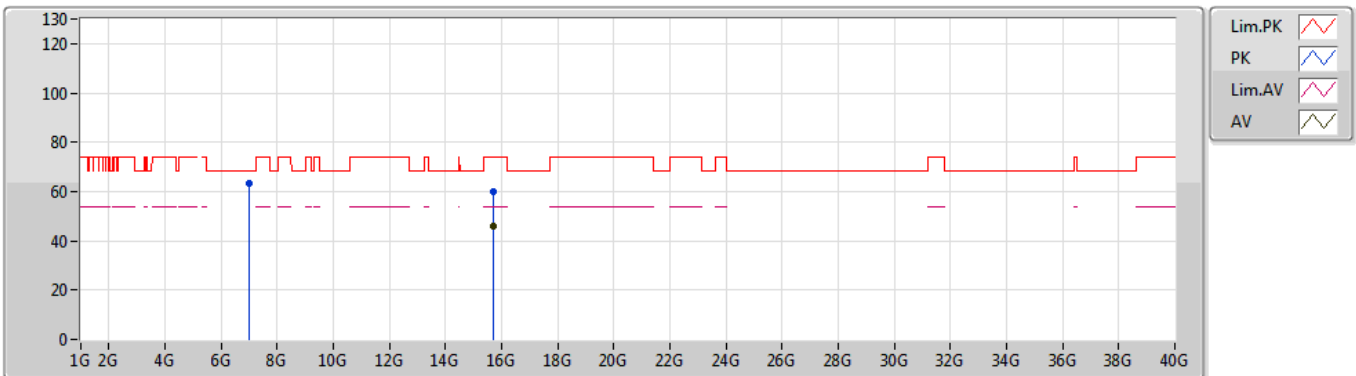
EUT Y_2TX
Setting 0.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	5.1461G	63.80	74.00	-10.20	7.31	3	Horizontal	356	1.62	-
AV	5.1128G	50.04	54.00	-3.96	7.27	3	Horizontal	356	1.62	-
PK	5.2388G	117.38	Inf	-Inf	7.52	3	Horizontal	356	1.62	-
AV	5.2418G	106.38	Inf	-Inf	7.52	3	Horizontal	356	1.62	-
PK	5.3621G	65.07	74.00	-8.93	8.01	3	Horizontal	356	1.62	-
AV	5.3741G	51.92	54.00	-2.08	8.05	3	Horizontal	356	1.62	-

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5240MHz_TX



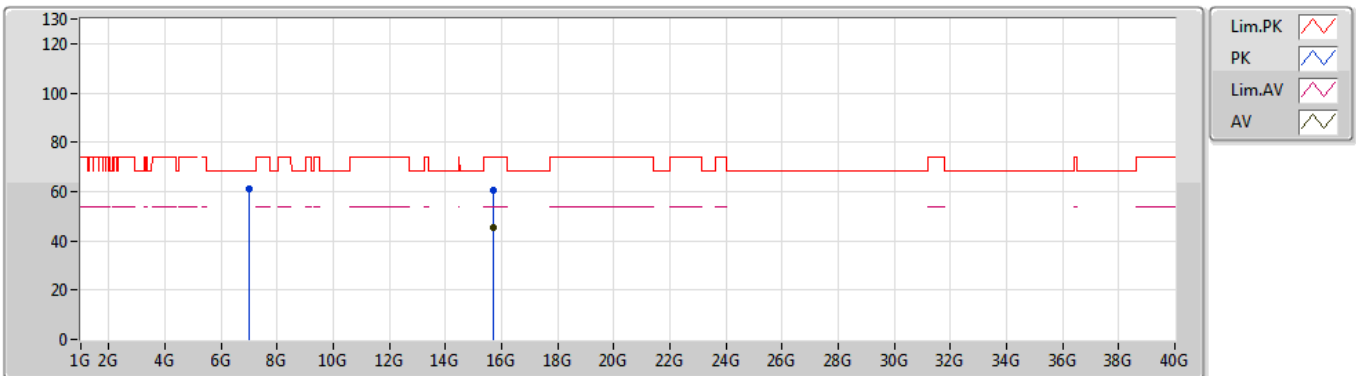
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Setting 0.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	6.9867G	63.34	68.20	-4.86	11.55	3	Vertical	355	1.50	-			
PK	15.71798G	60.07	74.00	-13.93	15.39	3	Vertical	310	1.90	-			
AV	15.71688G	45.67	54.00	-8.33	15.39	3	Vertical	310	1.90	-			

802.11ac VHT20_Nss1,(MCS0)_2TX

03/06/2019

5240MHz_TX



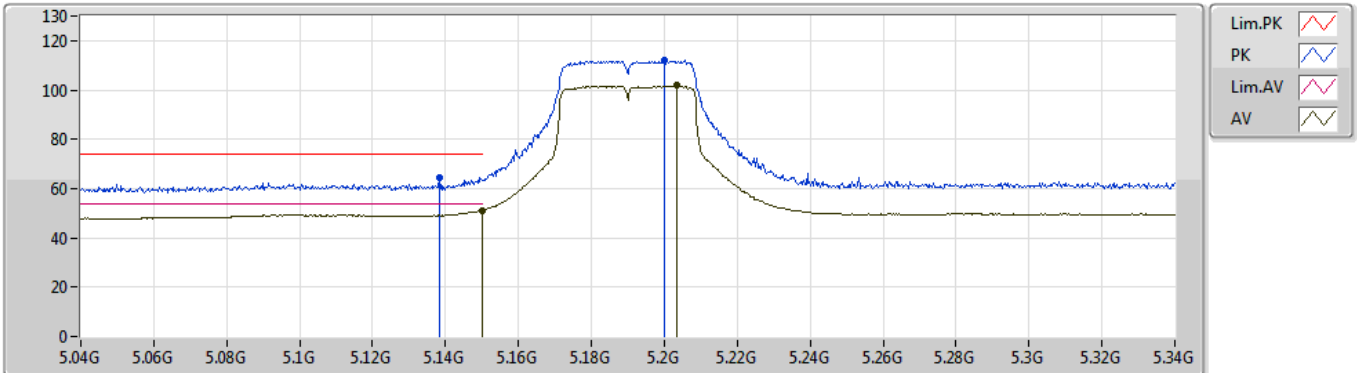
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Setting 0.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	6.9866G	61.09	68.20	-7.11	11.55	3	Horizontal	354	1.67	-			
PK	15.71715G	60.66	74.00	-13.34	15.39	3	Horizontal	84	1.99	-			
AV	15.7157G	45.59	54.00	-8.41	15.38	3	Horizontal	84	1.99	-			

802.11ac VHT40_Nss1,(MCS0)_2TX

03/06/2019

5190MHz_TX



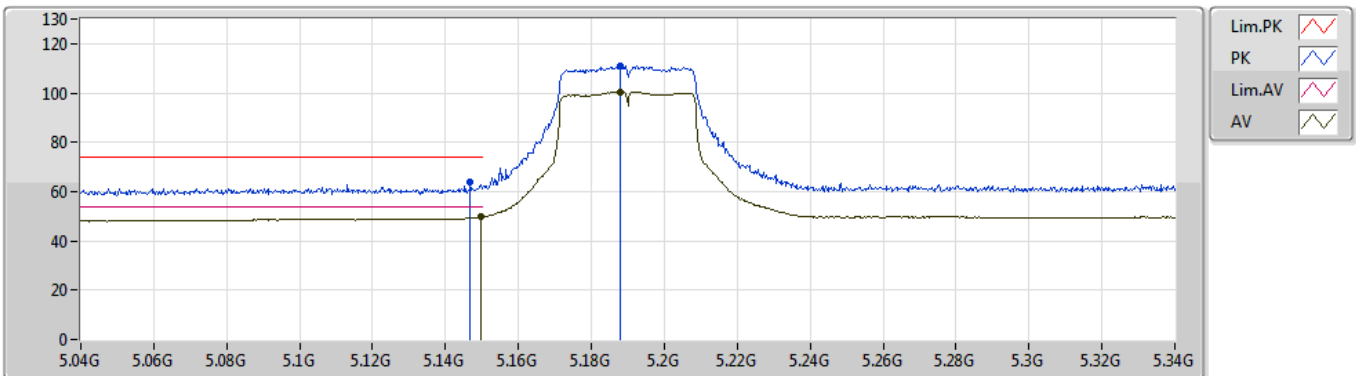
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Setting 0.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	5.1384G	64.61	74.00	-9.39	7.30	3	Vertical	353	1.50	-			
AV	5.15G	51.24	54.00	-2.76	7.31	3	Vertical	353	1.50	-			
PK	5.2002G	112.19	Inf	-Inf	7.37	3	Vertical	353	1.50	-			
AV	5.2035G	101.73	Inf	-Inf	7.39	3	Vertical	353	1.50	-			

802.11ac VHT40_Nss1,(MCS0)_2TX

03/06/2019

5190MHz_TX



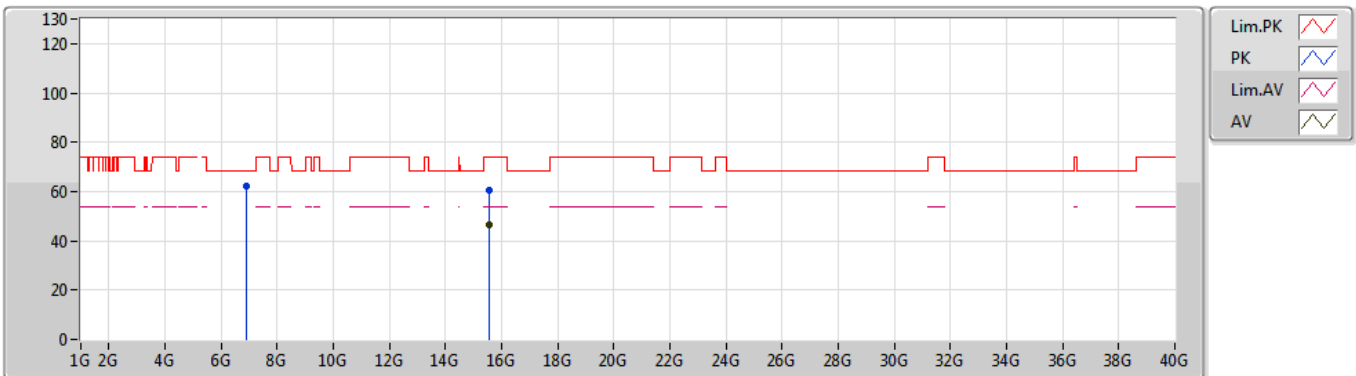
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Setting 0.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	5.1468G	63.68	74.00	-10.32	7.31	3	Horizontal	354	1.50	-			
AV	5.1498G	49.74	54.00	-4.26	7.31	3	Horizontal	354	1.50	-			
PK	5.1879G	111.13	Inf	-Inf	7.36	3	Horizontal	354	1.50	-			
AV	5.1879G	100.55	Inf	-Inf	7.36	3	Horizontal	354	1.50	-			

802.11ac VHT40_Nss1,(MCS0)_2TX

03/06/2019

5190MHz_TX



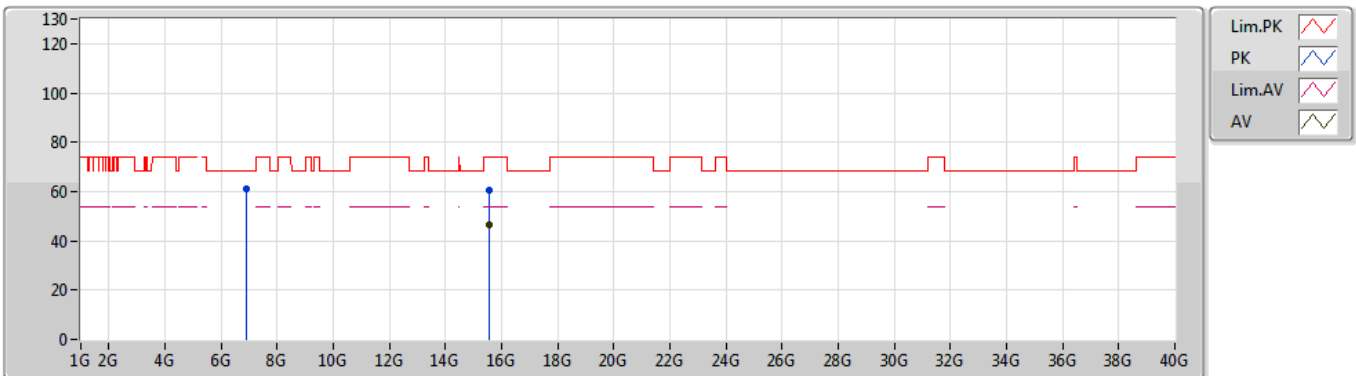
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Setting 0.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	6.91992G	62.32	68.20	-5.88	11.53	3	Vertical	356	1.50	-				
PK	15.56967G	60.58	74.00	-13.42	15.47	3	Vertical	96	1.07	-				
AV	15.56853G	46.55	54.00	-7.45	15.48	3	Vertical	96	1.07	-				

802.11ac VHT40_Nss1,(MCS0)_2TX

03/06/2019

5190MHz_TX



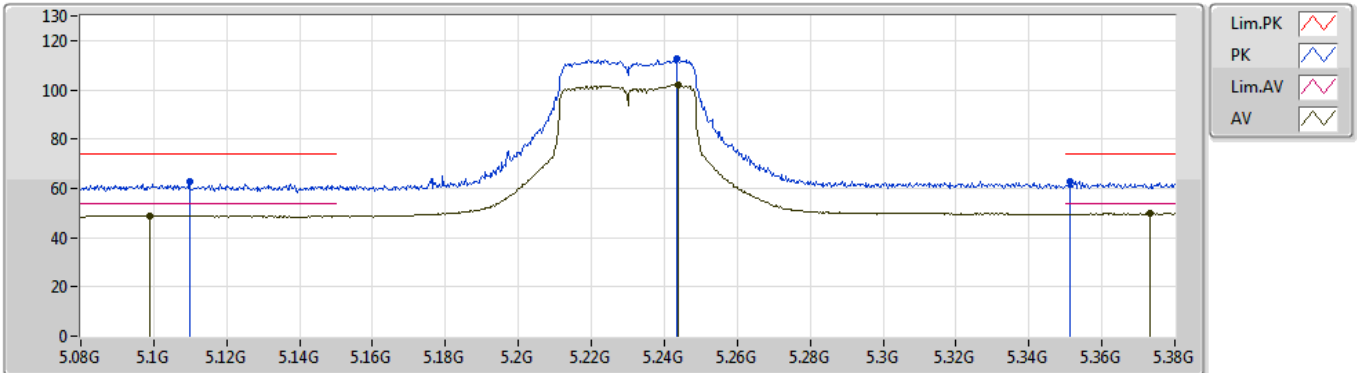
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Setting 0.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	6.91997G	60.87	68.20	-7.33	11.53	3	Horizontal	355	1.69	-			
PK	15.57028G	60.47	74.00	-13.53	15.47	3	Horizontal	315	1.26	-			
AV	15.56942G	46.59	54.00	-7.41	15.47	3	Horizontal	315	1.56	-			

802.11ac VHT40_Nss1,(MCS0)_2TX

03/06/2019

5230MHz_TX



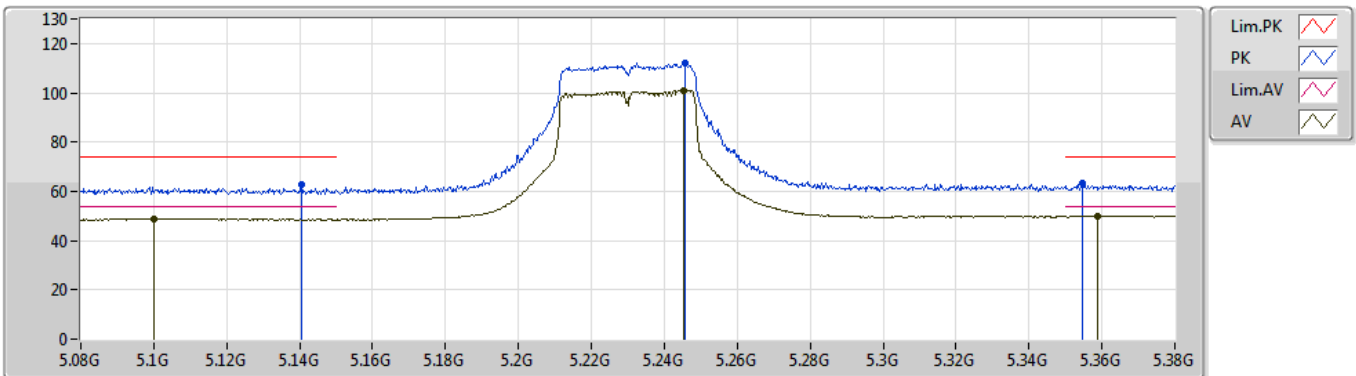
EUT Y_2TX
Setting 0.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	5.1097G	62.64	74.00	-11.36	7.27	3	Vertical	356	1.50	-
AV	5.0989G	48.97	54.00	-5.03	7.26	3	Vertical	356	1.50	-
PK	5.2435G	112.55	Inf	-Inf	7.53	3	Vertical	356	1.50	-
AV	5.2438G	101.82	Inf	-Inf	7.53	3	Vertical	356	1.50	-
PK	5.3512G	62.59	74.00	-11.41	7.95	3	Vertical	356	1.50	-
AV	5.3731G	49.77	54.00	-4.23	8.05	3	Vertical	356	1.50	-

802.11ac VHT40_Nss1,(MCS0)_2TX

03/06/2019

5230MHz_TX



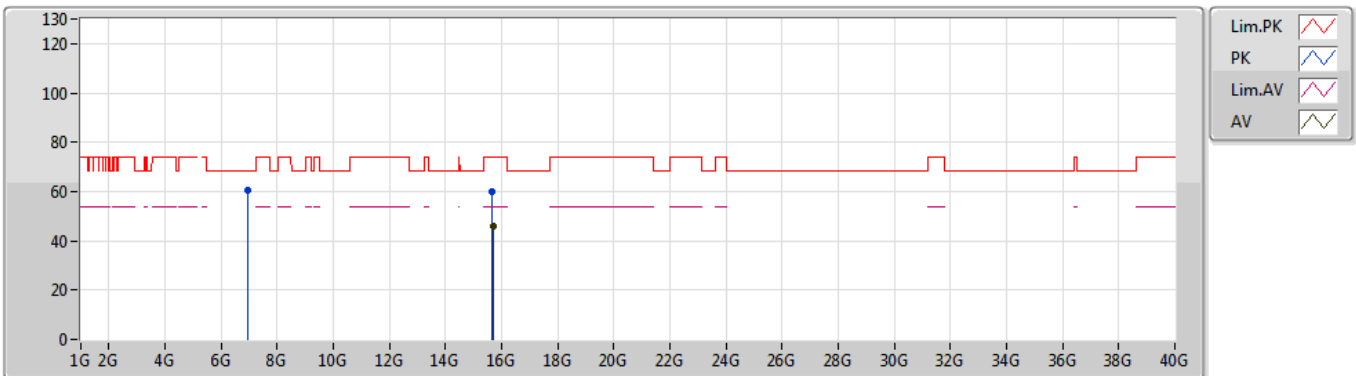
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Setting 0.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	5.1406G	62.55	74.00	-11.45	7.30	3	Horizontal	355	1.50	-
AV	5.1001G	48.71	54.00	-5.29	7.26	3	Horizontal	355	1.50	-
PK	5.2456G	111.95	Inf	-Inf	7.54	3	Horizontal	355	1.50	-
AV	5.2453G	101.08	Inf	-Inf	7.54	3	Horizontal	355	1.50	-
PK	5.3545G	63.26	74.00	-10.74	7.97	3	Horizontal	355	1.50	-
AV	5.359G	50.04	54.00	-3.96	7.99	3	Horizontal	355	1.50	-

802.11ac VHT40_Nss1,(MCS0)_2TX

03/06/2019

5230MHz_TX



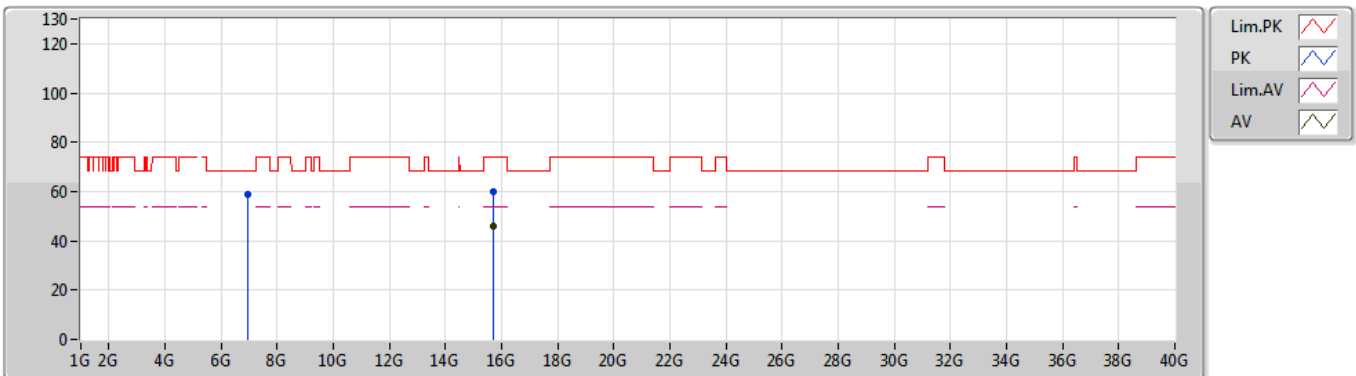
EUT Y_2TX
Setting 0.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	6.97328G	60.30	68.20	-7.90	11.54	3	Vertical	355	1.50	-			
PK	15.67245G	59.82	74.00	-14.18	15.42	3	Vertical	101	1.55	-			
AV	15.69925G	46.05	54.00	-7.95	15.40	3	Vertical	101	1.55	-			

802.11ac VHT40_Nss1,(MCS0)_2TX

03/06/2019

5230MHz_TX



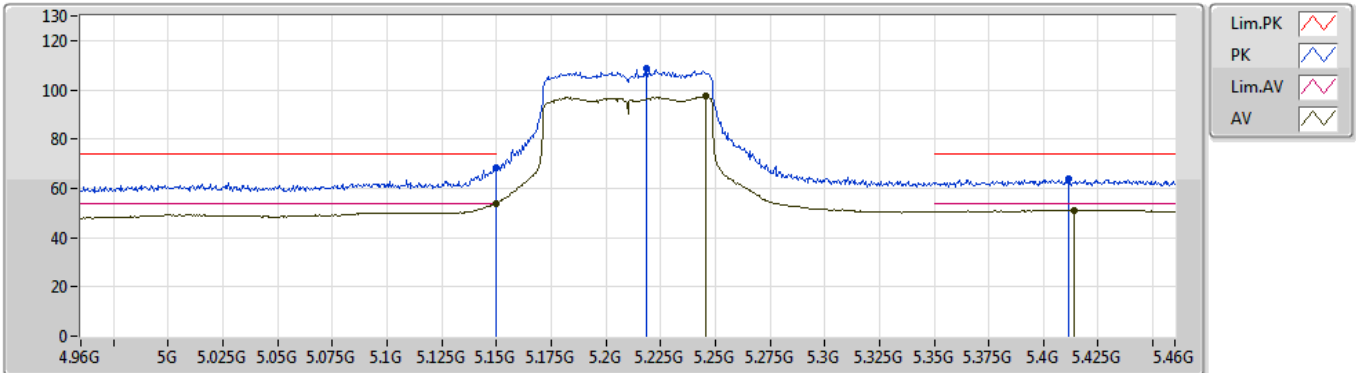
EUT Y_2TX
Setting 0.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	6.97317G	58.74	68.20	-9.46	11.54	3	Horizontal	354	1.64	-			
PK	15.70025G	59.68	74.00	-14.32	15.40	3	Horizontal	121	1.15	-			
AV	15.70505G	46.06	54.00	-7.94	15.40	3	Horizontal	121	1.15	-			

802.11ac VHT80_Nss1,(MCS0)_2TX

03/06/2019

5210MHz_TX



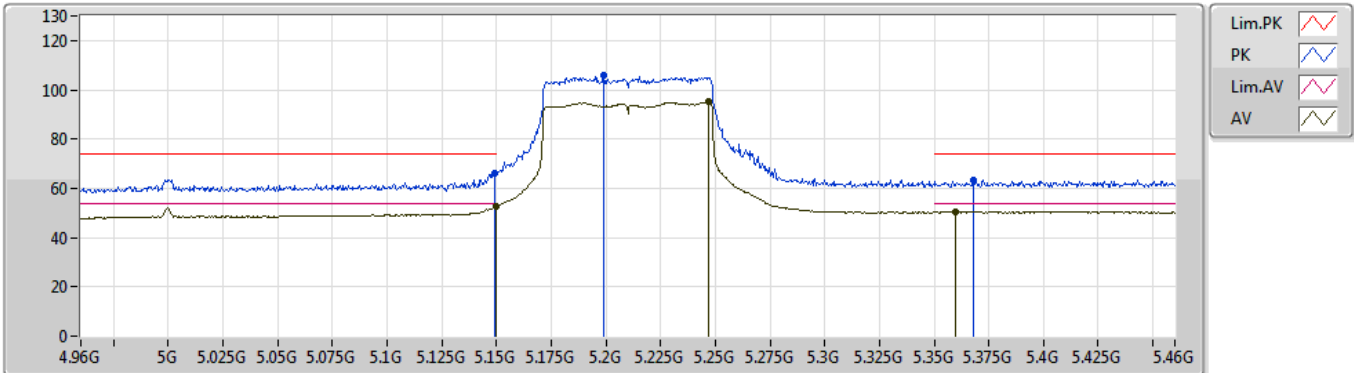
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Setting -4.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	5.1499G	68.23	74.00	-5.77	7.31	3	Vertical	356	1.72	-
AV	5.1499G	53.98	54.00	-0.02	7.31	3	Vertical	356	1.72	-
PK	5.2185G	108.70	Inf	-Inf	7.44	3	Vertical	356	1.72	-
AV	5.2455G	97.24	Inf	-Inf	7.54	3	Vertical	356	1.72	-
PK	5.4115G	63.62	74.00	-10.38	8.21	3	Vertical	356	1.72	-
AV	5.414G	51.21	54.00	-2.79	8.22	3	Vertical	356	1.72	-

802.11ac VHT80_Nss1,(MCS0)_2TX

03/06/2019

5210MHz_TX



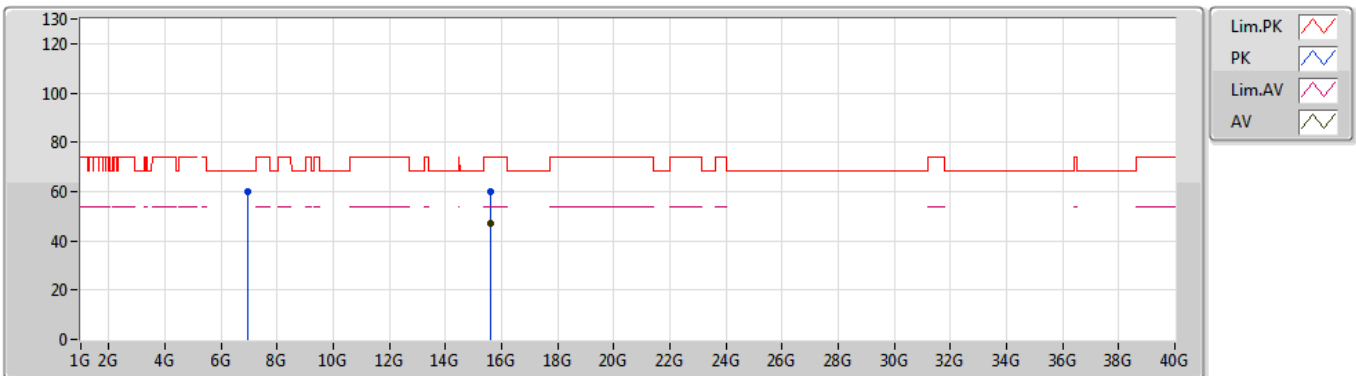
EUT Y_2TX
Setting -4.5
04-W-3-10
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment
PK	5.149G	66.33	74.00	-7.67	7.31	3	Horizontal	356	1.50	-
AV	5.15G	52.91	54.00	-1.09	7.31	3	Horizontal	356	1.50	-
PK	5.199G	105.86	Inf	-Inf	7.37	3	Horizontal	356	1.50	-
AV	5.247G	95.01	Inf	-Inf	7.54	3	Horizontal	356	1.50	-
PK	5.368G	63.51	74.00	-10.49	8.03	3	Horizontal	356	1.50	-
AV	5.3595G	50.58	54.00	-3.42	7.99	3	Horizontal	356	1.50	-

802.11ac VHT80_Nss1,(MCS0)_2TX

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5210MHz_TX



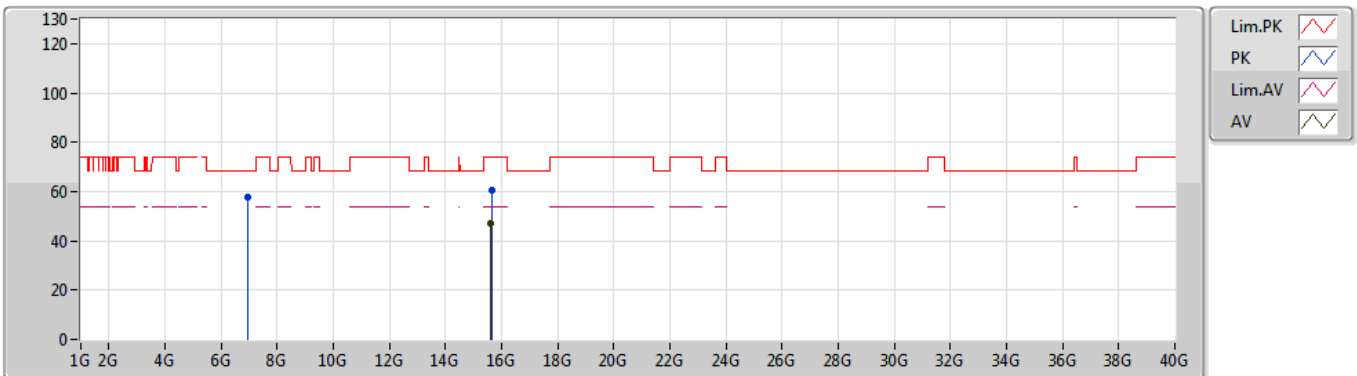
EUT Y_2TX
Setting -4.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	6.94665G	60.19	68.20	-8.01	11.54	3	Vertical	354	1.50	-				
PK	15.6277G	60.03	74.00	-13.97	15.45	3	Vertical	179	1.50	-				
AV	15.6265G	46.82	54.00	-7.18	15.45	3	Vertical	179	1.50	-				

802.11ac VHT80_Nss1,(MCS0)_2TX

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5210MHz_TX



EUT Y_2TX
Setting -4.5
04-W-3
FSP(100142)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment			
PK	6.94654G	57.98	68.20	-10.22	11.54	3	Horizontal	355	1.65	-			
PK	15.6346G	60.41	74.00	-13.59	15.44	3	Horizontal	231	1.50	-			
AV	15.5982G	46.91	54.00	-7.09	15.45	3	Horizontal	231	1.50	-			