



FCC Test Report

Equipment : Digital Satellite Receiver(Headless DVR Server)
Brand Name : AT&T DIRECTV
Model No. : HS17-500
FCC ID : O6ZHS17
Standard : 47 CFR FCC Part 15.407
Operating Band : 5150 MHz – 5250 MHz
5250 MHz – 5350 MHz
5470 MHz – 5725 MHz
5725 MHz – 5850 MHz
Applicant : Humax Co., Ltd.
HUMAX BLDG., 2, Yeongmunro, Cheoin-gu, Yongin-si,
Gyeonggi-do, South Korea, 17040
Manufacturer : Humax Co., Ltd.
HUMAX BLDG., 2, Yeongmunro, Cheoin-gu, Yongin-si,
Gyeonggi-do, South Korea, 17040.
Function : ☐ Outdoor; ☒ Indoor; ☐ Fixed P2P
☐ Client

The product sample received on Oct. 28, 2016 and completely tested on Jan. 15, 2018. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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


Cliff Chang
SPORTON INTERNATIONAL INC.





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Summary of Test Result

Conformance Test Specifications			
Report Clause	Ref. Std. Clause	Description	Result
1.1.2	15.203	Antenna Requirement	Complied
3.1	15.407(a)	Emission Bandwidth	Complied
3.2	15.407(a)	Maximum Conducted Output Power	Complied
3.3	15.407(a)	Peak Power Spectral Density	Complied
3.4	15.407(b)	Unwanted Emissions	Complied
3.5	15.407(g)	Frequency Stability	Complied



Revision History

Report No.	Version	Description	Issued Date
FR6O2615-02AC	Rev. 01	Initial issue of report	Jan. 08, 2018
FR6O2615-02AC	Rev. 02	Adding the test data for 11ac VHT20 5745MHz, 11ac VHT20 5785MHz, 11ac VHT20 5825 MHz, 11ac VHT40 5755 MHz, 11ac VHT40 5795 MHz, 11ac VHT80 5775 MHz in Unwanted Emission test above 1GHz, Emission Bandwidth, Maximum Conducted Output Power, Peak Power Spectral Density and Frequency Stability test.	Jan. 22, 2018
FR6O2615-02AC	Rev. 03	Revising the Applicant Address and Manufacturer Address.	Jan. 23, 2018

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	n (HT20), ac (VHT20)	5180-5240	36-48 [4]
5250-5350		5260-5320	52-64 [4]
5470-5725		5500-5720	100-144 [12]
5725-5850		5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40)	5190-5230	38-46 [2]
5250-5350		5260-5320	54-62 [2]
5470-5725		5500-5720	102-142 [6]
5725-5850		5755-5795	151-159 [2]
5150-5250	ac (VHT80)	5210	42 [1]
5250-5350		5260-5320	58 [1]
5470-5725		5500-5720	106-138 [3]
5725-5850		5775	155 [1]



Band	Mode	BWch (MHz)	Nant
5.2G	HT20	20	4
5.3G	HT20	20	4
5.6G	HT20	20	4
5.8G	HT20	20	4
5.2G	HT20,BF	20	4
5.3G	HT20,BF	20	4
5.6G	HT20,BF	20	4
5.8G	HT20,BF	20	4
5.2G	VHT20	20	4
5.3G	VHT20	20	4
5.6G	VHT20	20	4
5.8G	VHT20	20	4
5.2G	VHT20,BF	20	4
5.3G	VHT20,BF	20	4
5.6G	VHT20,BF	20	4
5.8G	VHT20,BF	20	4
5.2G	HT40	40	4
5.3G	HT40	40	4
5.6G	HT40	40	4
5.8G	HT40	40	4
5.2G	HT40,BF	40	4
5.3G	HT40,BF	40	4
5.6G	HT40,BF	40	4
5.8G	HT40,BF	40	4
5.2G	VHT40	40	4
5.3G	VHT40	40	4
5.6G	VHT40	40	4
5.8G	VHT40	40	4
5.2G	VHT40,BF	40	4
5.3G	VHT40,BF	40	4
5.6G	VHT40,BF	40	4
5.8G	VHT40,BF	40	4
5.2G	VHT80	80	4
5.3G	VHT80	80	4
5.6G	VHT80	80	4

Band	Mode	BWch (MHz)	Nant
5.8G	VHT80	80	4
5.2G	VHT80,BF	80	4
5.3G	VHT80	80	4
5.6G	VHT80	80	4
5.8G	VHT80,BF	80	4

Note:

- ♦ 5.2G/5.2G-I(IC) is the 5.2GHz Band (5.15-5.25GHz).
- ♦ 5.3G/5.3G-I(IC) is the 5.3GHz Band (5.25-5.35GHz).
- ♦ 5.6G is the 5.6GHz Band (5.47-5.725GHz) or w/o TDWR (5.47-5.6GHz and 5.65-5.725GHz).
- ♦ 5.6G-I(IC) is the 5.6GHz IC Band w/o TDWR (5.47-5.6GHz and 5.65-5.725GHz).
- ♦ 5.8G/5.8G-I(IC) is the 5.8GHz Band (5.725-5.850GHz).
- ♦ 5.3G-T(Taiwan) is the 5.3GHz TW Band (5.25-5.35GHz).
- ♦ 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ♦ VHT20, VHT40, 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
<2.4GHz and Zigbee Antenna Gain>

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	Zigbee
1	Airgain	N24X2H2YN-W98U	PIFA	U.FL	4.6	-
2	Airgain	N24X2H2YW-B95U	PIFA	U.FL	4.6	-
3	-	-	PCB printed IFA	N/A	-	4
4	-	-	PCB printed IFA	N/A	-	4

<5GHz Antenna Gain>

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)			
					5GHz Band 1	5GHz Band 2	5GHz Band 3	5GHz Band 4
5	Airgain	N5X35B2YN-E57U	PIFA	U.FL	2.89	2.43	3.69	4.34
6	Airgain	N5X35B2YN-R137U	PIFA	U.FL	4.38	4.25	4.71	4.53
7	Airgain	N5X35B2YW-G80U	PIFA	U.FL	3.65	3.82	3.05	3.49
8	Airgain	N5X35BYN-A100U	PIFA	U.FL	5.40	5.27	4.31	4.62

<5GHz Directional Gain>

Stream	Directional Gain (dBi)			
	5GHz Band 1	5GHz Band 2	5GHz Band 3	5GHz Band 4
4T1S	7.02	6.41	6.41	7.06
4T2S	4.14	3.52	3.40	4.11

Note: The EUT has eight antennas.

<For 2.4GHz Band>**For IEEE 802.11b/g Mode (1TX/1RX)**

The EUT supports the antenna with TX and RX diversity functions.

Both Ant. 1 and Ant. 2 support transmit and receive functions, but only one of them will be used at one time.

The Ant. 2 generated the worst case, so it was selected to test and record in the report.

For IEEE 802.11n Mode (2TX/2RX)

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

Ant. 1 and Ant. 2 could transmit/receive simultaneously.

<For Zigbee Band> (1TX/1RX)

The EUT supports the antenna with TX and RX diversity functions.

Both Ant. 3 and Ant. 4 support transmit and receive functions, but only one of them will be used at one time.

The Ant. 4 generated the worst case, so it was selected to test and record in the report.

<For 5GHz Band >**For IEEE 802.11a/n/ac mode (4TX/4RX):**

Ant. 5 (Port 1), Ant. 6 (Port 2), Ant. 7 (Port 3) and Ant. 8 (Port 4) can be used as transmitting/receiving antenna.

Ant. 5 (Port 1), Ant. 6 (Port 2), Ant. 7 (Port 3) and Ant. 8 (Port 4) could transmit/receive simultaneously.

1.1.3 Mode Test Duty Cycle

For 11ac VHT40 5230 MHz 4T1S, 11ac VHT40 5310MHz 4T1S, 11ac VHT 40 5710MHz 4T1S and 11ac VHT20-BF 5745MHz 4T2S:

<For Non-Beamforming Mode> and <For Beamforming Mode 4T1S>

Mode	DC	T(s)	VBW(Hz) $\geq 1/T$
VHT20	0.989	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
VHT20,BF	0.924	3.453m	300
VHT40	0.975	2.423m	1k
VHT40,BF	0.955	1.698m	1k
VHT80	0.958	1.143m	1k
VHT80,BF	0.965	4.22m	300

<For Beamforming Mode 4T2S>

Mode	DC	T(s)	VBW(Hz) $\geq 1/T$
VHT20,BF	0.949	4.322m	300
VHT40,BF	0.955	2.147m	1k
VHT80,BF	0.958	6.282m	300

For 11ac VHT20 5745MHz, 11ac VHT20 5785MHz, 11ac VHT20 5825 MHz, 11ac VHT40 5755 MHz, 11ac VHT40 5795 MHz, 11ac VHT80 5775 MHz:

<For Non-Beamforming Mode>

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11ac VHT20	0.992	0.035	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
802.11ac VHT40	0.994	0.026	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
802.11ac VHT80	0.978	0.097	20.032m	100

1.1.4 EUT Operational Condition

EUT Power Type	From Power Adapter			
Beamforming Function	☒	With beamforming	☐	Without beamforming
Weather Band	☒	With 5600~5650MHz	☐	Without 5600~5650MHz

Note: The product has beamforming function for 802.11n/ac in 5GHz.

1.1.5 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR6O2615AC / FR6O2615-01.

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

Modifications	Performance Checking
1. Adding the shielded can on BBIC. 2. Removing the eSTAT connector port of the EUT. 3. Removing USB shielded can on USB port. 4. Changing the USB port to 2.0 from 3.0. 5. Changing Front End (turner) chip to 45308 from 45208 6. Changing 4GB DDR die to 20nm from 25nm. 7. FLASH memory pin to pin in modifications.	1. Unwanted Emission test below 1GHz. 2. Unwanted Emission test above 1GHz. (After evaluating, the worst case is found at 11ac VHT40 5230 MHz 4T1S, 11ac VHT40 5310MHz 4T1S, 11ac VHT 40 5710MHz 4T1S and 11ac VHT20-BF 5745MHz 4T2S , and retest these channels.)
8. Changing the heat sink of the EUT.	1. Unwanted Emission test below 1GHz. 2. Unwanted Emission test above 1GHz. (After evaluating, the worst case is found at 11ac VHT20 5745MHz, 11ac VHT20 5785MHz, 11ac VHT20 5825 MHz, 11ac VHT20-BF 5745MHz 4T2S, 11ac VHT40 5755 MHz, 11ac VHT40 5795 MHz, 11ac VHT40 5230 MHz 4T1S, 11ac VHT40 5310MHz 4T1S, 11ac VHT 40 5710MHz 4T1S and 11ac VHT80 5775 MHz, and retest these channels for above 2 test items) 3. Emission Bandwidth 4. Maximum Conducted Output Power 5. Peak Power Spectral Density 6. Frequency Stability (After evaluating, the worst case is found at 11ac VHT20 5745MHz, 11ac VHT20 5785MHz, 11ac VHT20 5825 MHz, 11ac VHT40 5755 MHz, 11ac VHT40 5795 MHz, 11ac VHT80 5775 MHz and retest these channels for above 3-6 test items.)



Note:

1. The channel for 11ac VHT40 5230 MHz 4T1S, 11ac VHT40 5310MHz 4T1S, 11ac VHT 40 5710MHz 4T1S and 11ac VHT20-BF 5745MHz 4T2S will be based on original output power to re-test.
2. Since some electrical components and metallic shielding changes, the verification test is performed with the channel which has the highest output power. Both radiated emission above and below 1GHz are checked, and the degradation of RF specification is not found. Considering the modifications above does not affect the RF specification, and the main RF trace has not modified, further verification or normally certification testing is not required.

1.2 Testing Applied Standards

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

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2013
- ♦ FCC KDB 789033 D02 v02r01
- ♦ FCC KDB 662911 D01 v02r01

1.3 Testing Location Information

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

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
Radiated	03CH01-CB	Justin Lin / Jay Chen Brian Sun / DK Chang	22°C / 54%	Sep. 01, 2017~Jan. 15, 2017
RF Conducted	TH01-CB	Stim Sun	22°C / 54%	Sep. 05, 2017~Jan. 15, 2018

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 (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Output Power Measurement	1.33 dB	Confidence levels of 95%
Power Density Measurement	1.27 dB	Confidence levels of 95%
Bandwidth Measurement	9.74×10^{-8}	Confidence levels of 95%
Frequency Stability	6.06×10^{-8}	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

For 11ac VHT40 5230 MHz 4T1S, 11ac VHT40 5310MHz 4T1S, 11ac VHT 40 5710MHz 4T1S and 11ac VHT20-BF 5745MHz 4T2S:

<For Non-Beamforming Mode> and <For Beamforming Mode 4T1S>

Band	Mode	BWch (MHz)	Nss-Min	Nant	Ch. (MHz)	Range	Power Setting
5.2G	VHT40	40	1,(M0)	4	5230	H	23
5.3G	VHT40	40	1,(M0)	4	5310	H	16
5.6G	VHT40	40	1,(M0)	4	5710	C	17

<For Beamforming Mode 4T2S>

Band	Mode	BWch (MHz)	Nss-Min	Nant	Ch. (MHz)	Range	Power Setting
5.8G	VHT20,BF	20	2,(M0)	4	5745	L	25

For 11ac VHT20 5745MHz, 11ac VHT20 5785MHz, 11ac VHT20 5825 MHz, 11ac VHT40 5755 MHz, 11ac VHT40 5795 MHz, 11ac VHT80 5775 MHz:

<For Non-Beamforming Mode>

Mode	Power Setting
802.11ac VHT20_Nss1,(MCS0)_4TX	-
5745MHz	23
5785MHz	23
5825MHz	23
802.11ac VHT40_Nss1,(MCS0)_4TX	-
5755MHz	24
5795MHz	24
802.11ac VHT80_Nss1,(MCS0)_4TX	-
5775MHz	24

Note:

- Test range channel consist of L (Low Ch.), M (Middle Ch.), H (High Ch.), S (Single Ch.) and C (Straddle Band Ch.).
- VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.
- There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802.11n/ac in 5GHz, Beamforming mode and non-beamforming mode has been test and record in this test report.
- Customer requests additional beamfomring mode 4T2S.

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 Frequency Stability
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests	
Tests Item	Unwanted Emissions
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	CTX
1	WiFi 5GHz Function
Operating Mode > 1GHz	CTX

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

2.3 EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

During the test, the following programs under WIN 7 were executed.

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under Telnet.
3. Executed "Lantest.exe " to link with the remote workstation to receive and transmit packet by WLAN module and transmit duty cycle no less 98%.

2.4 Accessories

Accessories					
No.	Equipment Name	Brand Name	Model Name	Rating	Remark
1	AC Adapter	DIRECTV	EPS17R0-36	INPUT: 120V ~ 1.8A 60Hz OUTPUT: 25.2V, 2.86A 72W	AC power cable: Non-Shielded, 1.9m DC power cable: Non-Shielded, 1.3m
Other					
No.	Equipment Name	Brand Name	Model Name	Rating	
1	Hard Drive	WD	WD20EURX-25T0FY0	5VDC, 0.60A 12VDC, 0.45A	

2.5 Support Equipment

For Test Site No: 03CH01-CB (Below 1GHz)

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

<For Non-Beamforming Mode> (Above 1GHz)

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

<For Beamforming Mode> (Above 1GHz)

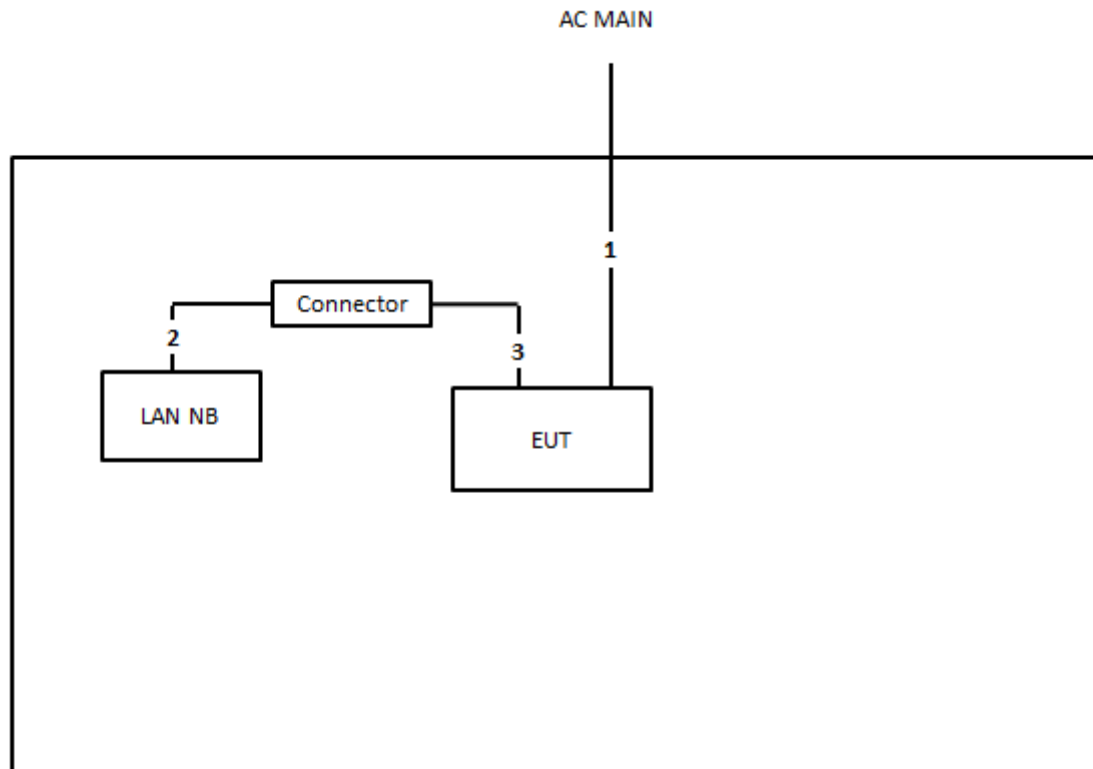
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E4300	DoC
2	Notebook	DELL	E4300	DoC
3	WLAN module	Quantenna	N/A	N/A

For Test Site No: TH01-CB

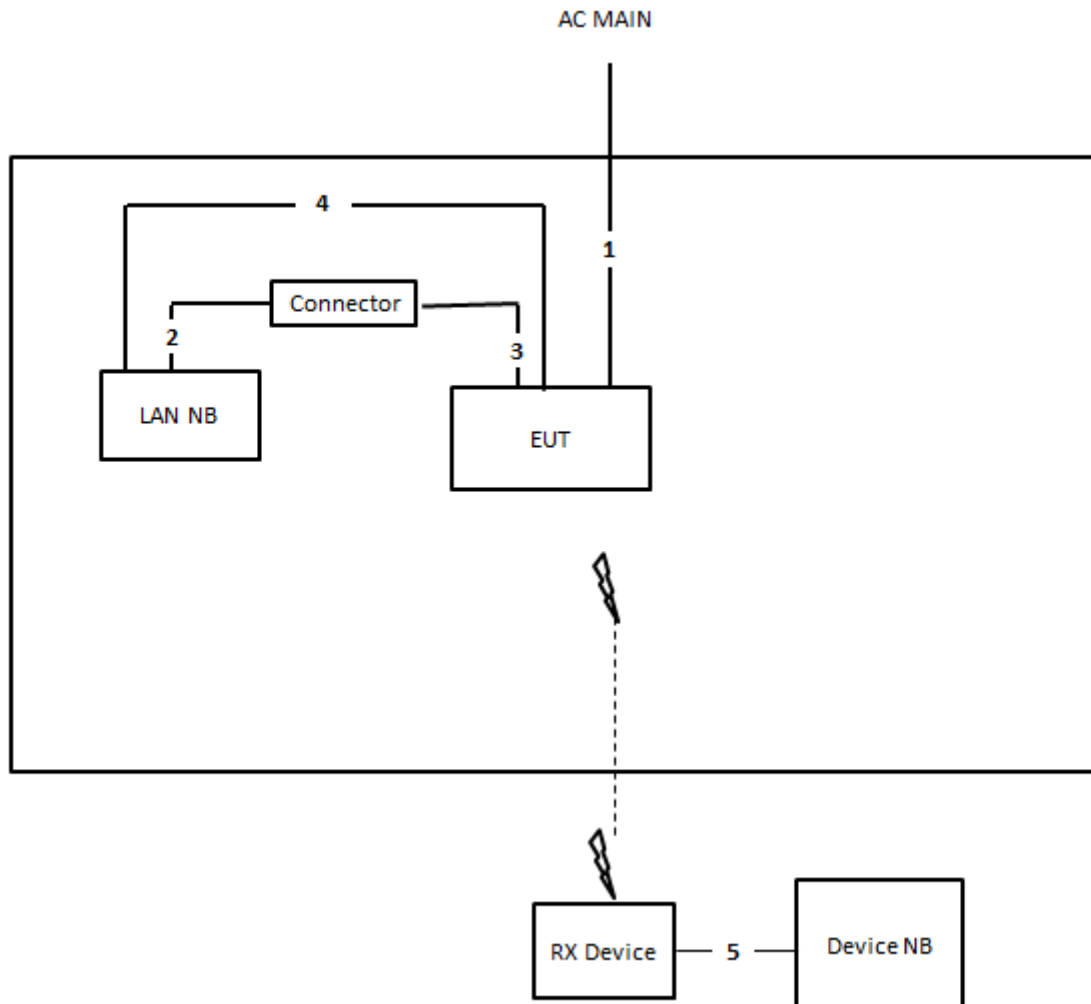
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E4300	DoC

2.6 Test Setup Diagram

**Test Setup Diagram –
Radiated Test < 1GHz and Radiated Test > 1GHz (For Non-Beamforming Mode)**



Item	Connection	Shielded	Length
1	Power cable	No	3.2m
2	RS-232 cable	No	0.4m
3	Console cable	No	1m

Test Setup Diagram - Radiated Test > 1GHz (For Beamforming Mode)


Item	Connection	Shielded	Length
1	Power cable	No	3.2m
2	RS-232 cable	No	0.4m
3	Console cable	No	1m
4	RJ-45 cable	No	1.5m
5	RJ-45 cable	No	1.5m

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 $\geq$ 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 $\geq$ 500kHz.

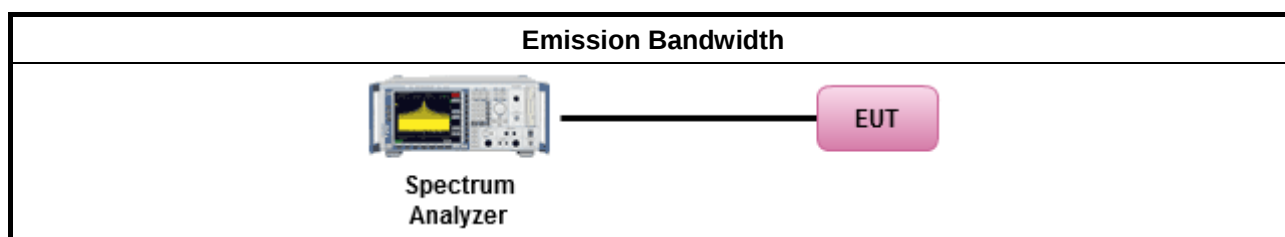
3.1.2 Measuring Instruments

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



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.	

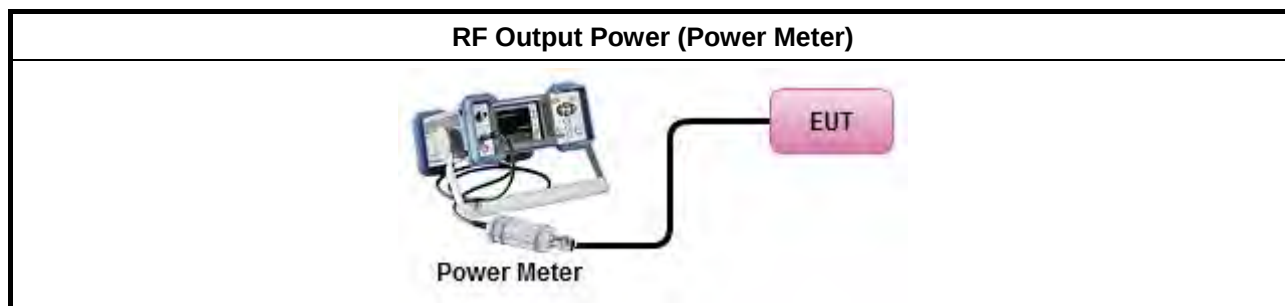
3.2.2 Measuring Instruments

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

3.2.4 Test Setup



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 peak power spectral density (PPSD) ≤ 4 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) ≤ 10 dBm/MHz.	
☐ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) ≤ 17 dBm/MHz.	
	e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below: -13 dBW/MHz for $0^\circ \leq \theta < 8^\circ$; -13 - 0.716 (θ-8) dBW/MHz for $8^\circ \leq \theta < 40^\circ$ -35.9 - 1.22 (θ-40) dBW/MHz for $40^\circ \leq \theta \leq 45^\circ$; -42 dBW/MHz for $\theta > 45^\circ$
☐ For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) ≤ 17 dBm/MHz.	
☐ For the 5.725-5.85 GHz band:	
	- Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
PPSD = peak power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz G_{TX} = the maximum transmitting antenna directional gain in dBi.	

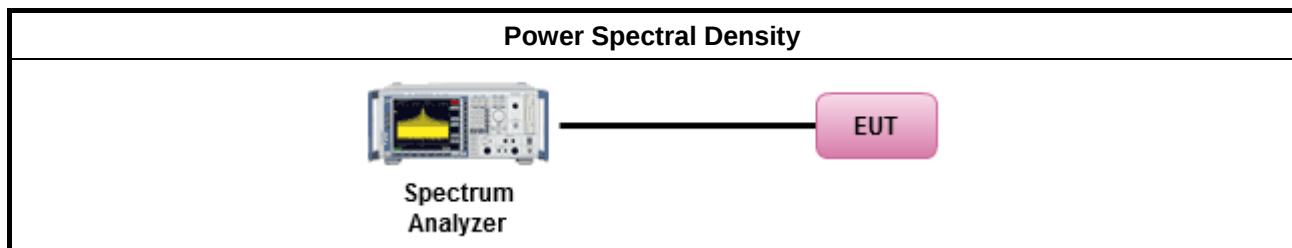
3.3.2 Measuring Instruments

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

3.3.4 Test Setup





3.3.5 Test Result of Peak Power Spectral Density

Refer as Appendix C

3.4 Unwanted Emissions

3.4.1 Transmitter Radiated Unwanted Emissions Limit

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

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

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

Un-restricted band emissions above 1GHz Limit	
Operating Band	Limit
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.85 GHz	all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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

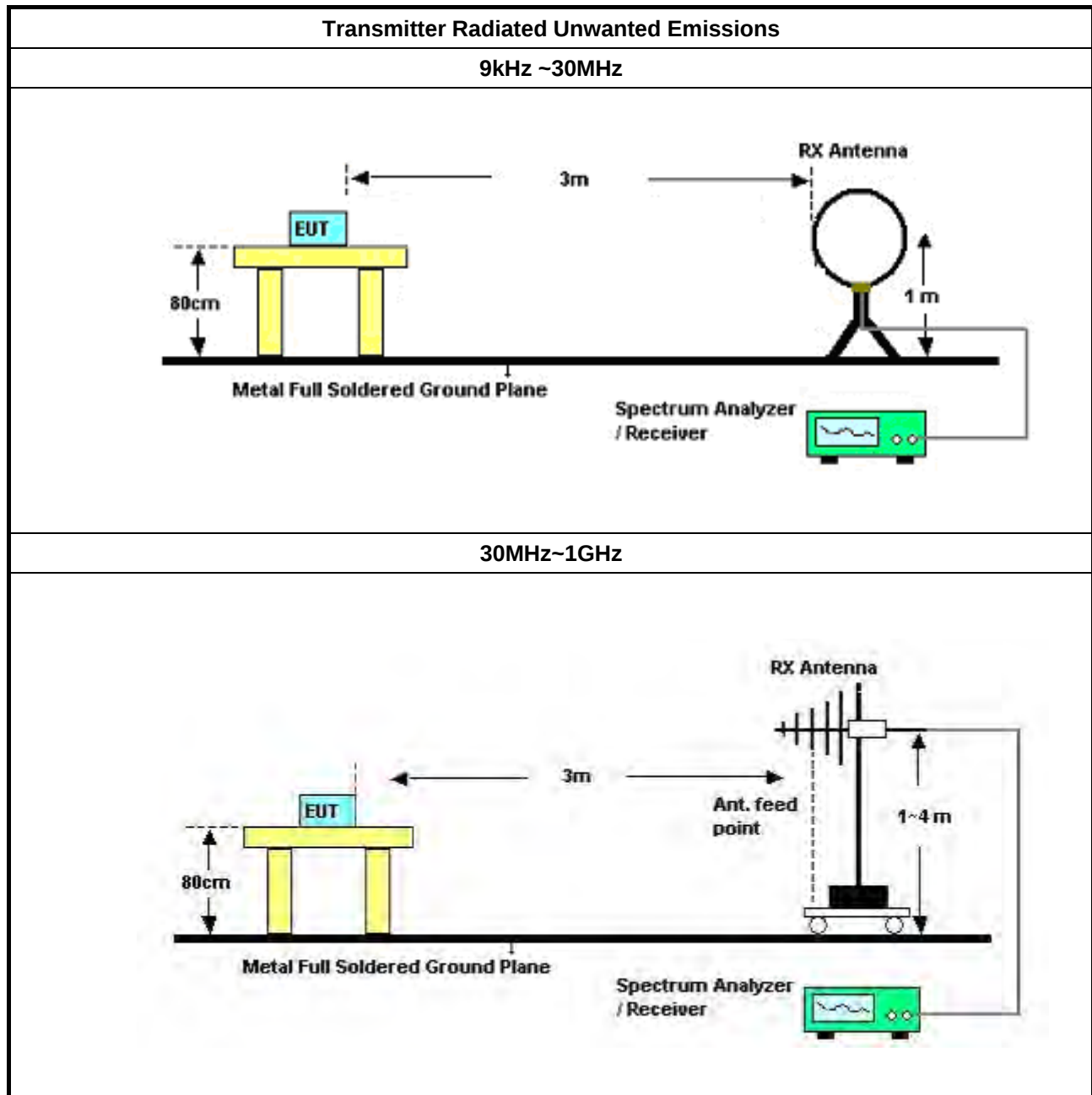
3.4.2 Measuring Instruments

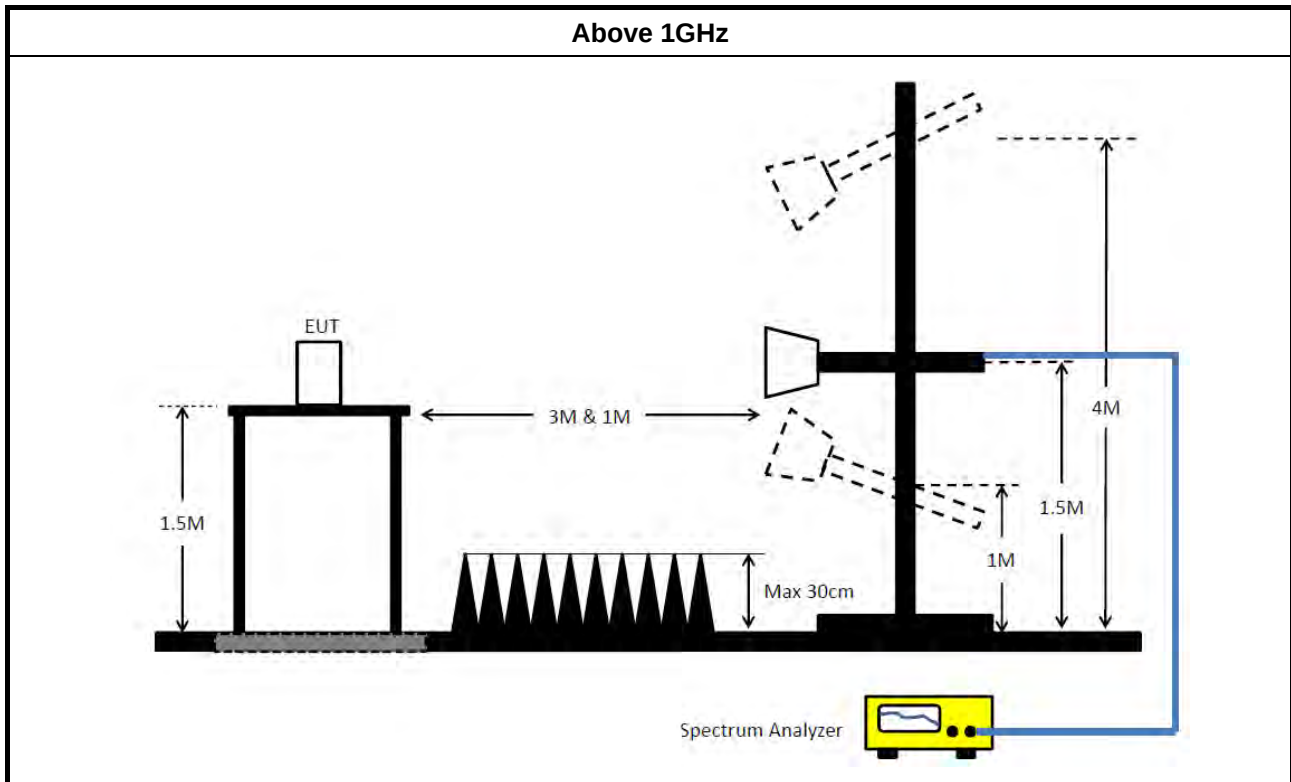
Refer a test equipment and calibration data table in this test report.

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 $\geq$ 98 or duty factor].	
For the transmitter unwanted emissions shall be measured using following options below:	
	Refer as FCC KDB 789033, clause H)2) for unwanted emissions into non-restricted bands.
	Refer as FCC KDB 789033, clause H)1) for unwanted emissions into restricted bands.
	☐ Refer as FCC KDB 789033, H)6) Method AD (Trace Averaging).
	☒ Refer as FCC KDB 789033, H)6) Method VB (Reduced VBW).
	☐ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW $\geq$ 1/T, where T is pulse time.
	☐ Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
	☒ Refer as FCC KDB 789033, clause H)5) measurement procedure peak limit.
	☐ Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
	For radiated measurement.
	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
	The any unwanted emissions level shall not exceed the fundamental emission level.
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.	

3.4.4 Test Setup





3.4.5 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.

3.4.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix D

3.5 Frequency Stability

3.5.1 Frequency Stability Limit

Frequency Stability Limit	
UNII Devices	
In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.	
LE-LAN Devices	
N/A	
IEEE Std. 802.11	
The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band and ± 25 ppm maximum for the 2.4 GHz band.	

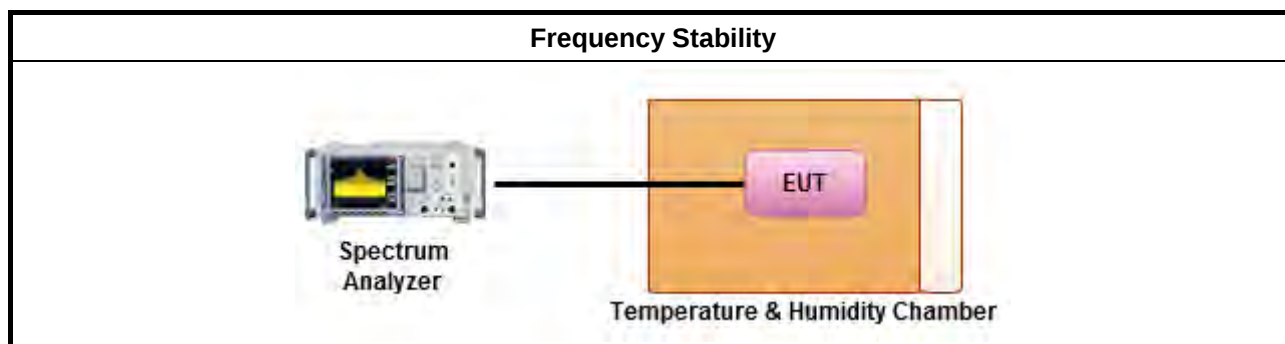
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method	
Refer as ANSI C63.10, clause 6.8 for frequency stability tests	
	Frequency stability with respect to ambient temperature
	Frequency stability when varying supply voltage
	Extreme temperature is 0°C~50°C.

3.5.4 Test Setup



3.5.5 Test Result of Frequency Stability

Refer as Appendix E



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Mar. 15, 2018*	Radiation (03CH01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 30, 2017	Aug. 29, 2018	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Nov. 09, 2017	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 20, 2017	Nov. 19, 2018	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA91702 52	15GHz ~ 40GHz	Jul. 05, 2017	Jul. 04, 2018	Radiation (03CH01-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 02, 2017	May 01, 2018	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Jan. 15, 2018	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 22, 2016	Nov. 21, 2017	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 23, 2017	Nov. 22, 2018	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	May 06, 2017	May 05, 2018	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-I0-7	N/A	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 21, 2017	Dec. 20, 2018	Conducted (TH01-CB)



FCC Test Report

Report No. : FR6O2615-02AC

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2017	Jun. 01, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 20, 2017	Nov. 19, 2018	Conducted (TH01-CB)

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

“*” Calibration Interval of instruments listed above is two years.

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
5.725-5.85GHz	-	-	-	-	-
802.11ac VHT20_Nss1,(MCS0)_4TX	17.625M	17.841M	17M8D1D	17.25M	17.716M
802.11ac VHT40_Nss1,(MCS0)_4TX	36.35M	36.432M	36M4D1D	36.3M	36.182M
802.11ac VHT80_Nss1,(MCS0)_4TX	75.1M	75.462M	75M5D1D	74.6M	75.362M

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

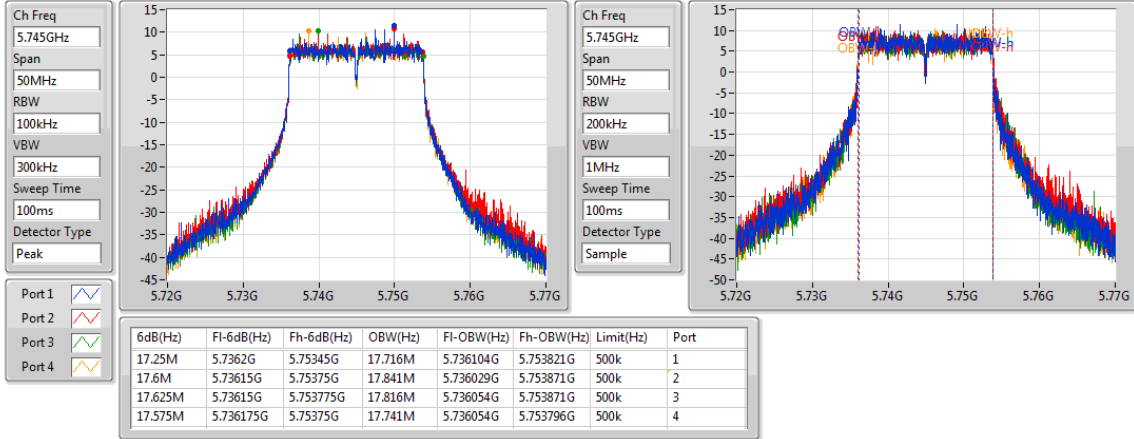
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5745MHz	Pass	500k	17.25M	17.716M	17.6M	17.841M	17.625M	17.816M	17.575M	17.741M
5785MHz	Pass	500k	17.625M	17.741M	17.6M	17.816M	17.6M	17.791M	17.575M	17.841M
5825MHz	Pass	500k	17.55M	17.791M	17.6M	17.816M	17.6M	17.841M	17.575M	17.791M
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5755MHz	Pass	500k	36.35M	36.432M	36.3M	36.282M	36.3M	36.182M	36.35M	36.382M
5795MHz	Pass	500k	36.35M	36.282M	36.3M	36.332M	36.35M	36.332M	36.3M	36.282M
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5775MHz	Pass	500k	74.6M	75.362M	74.8M	75.462M	75.1M	75.362M	75.1M	75.462M

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

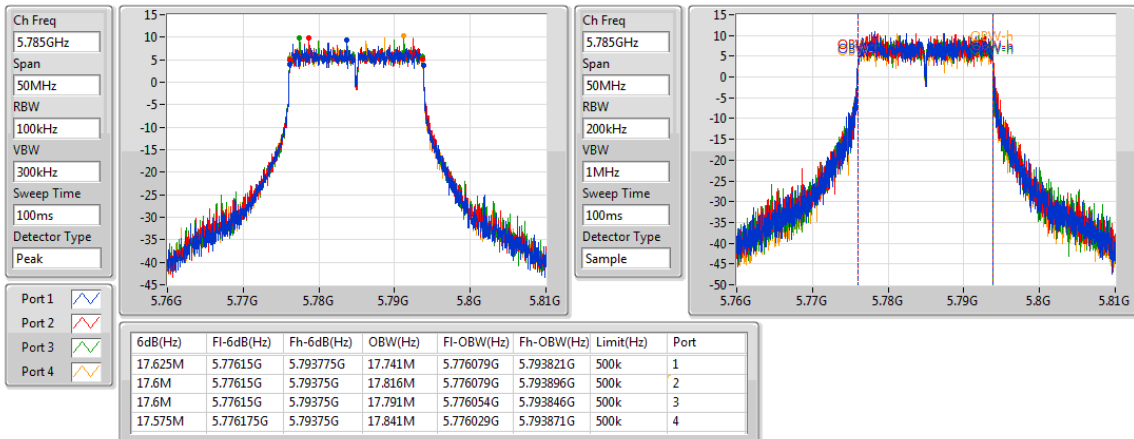
Port X-OBW = Port X 99% occupied bandwidth;

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5745MHz

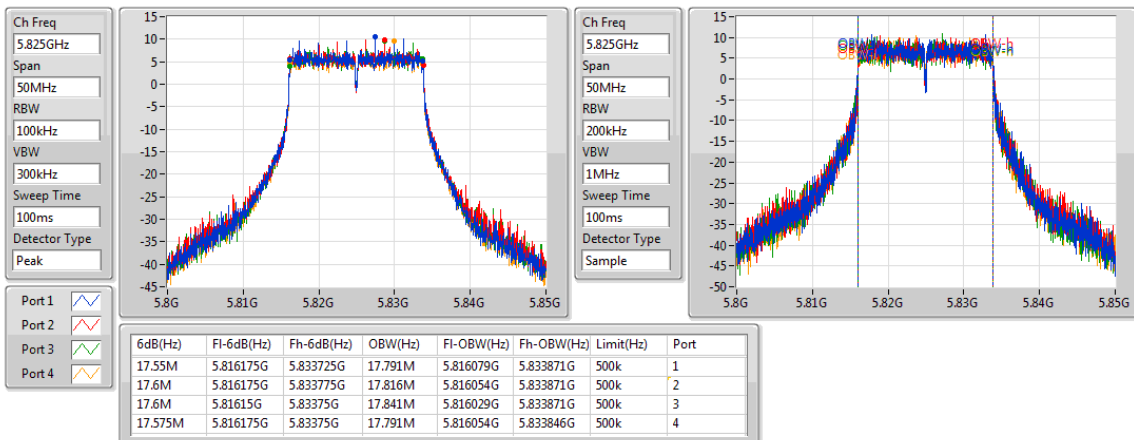
15/01/2018


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5785MHz

15/01/2018

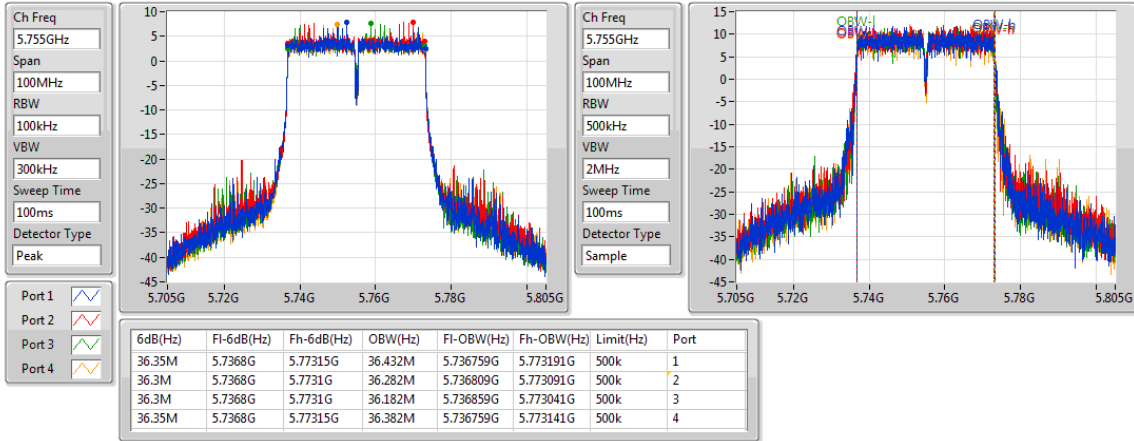

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5825MHz

15/01/2018

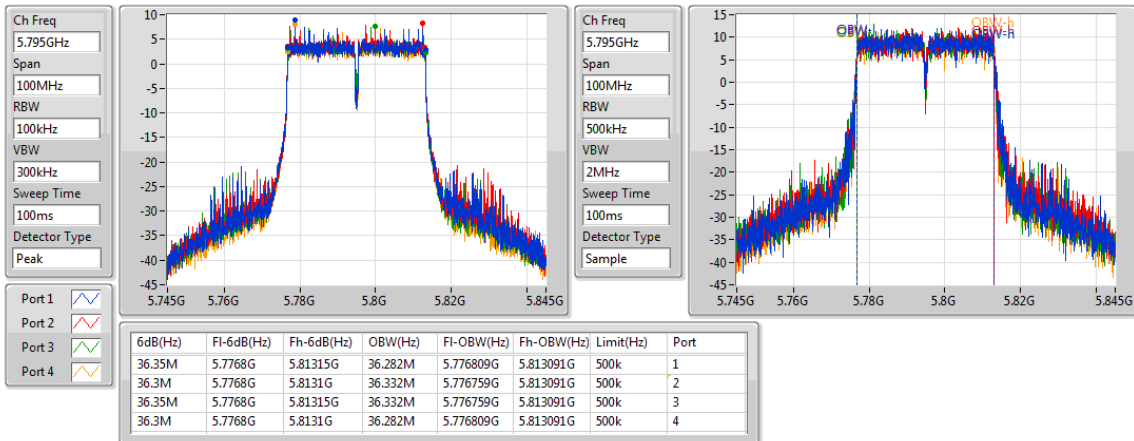


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5755MHz

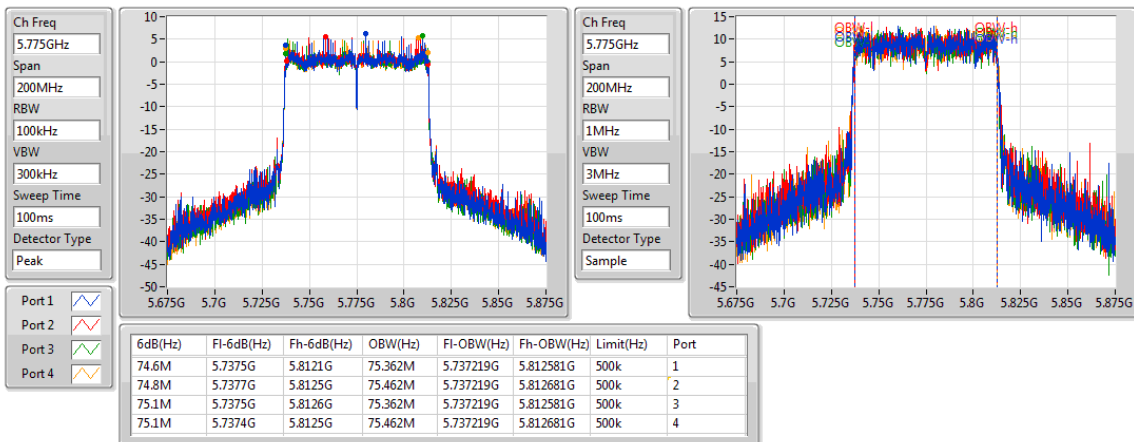
15/01/2018


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5795MHz

15/01/2018


802.11ac VHT80_Nss1,(MCS0)_4TX
EBW
5775MHz

15/01/2018





Summary

Mode	Total Power (dBm)	Total Power (W)
5.725-5.85GHz	-	-
802.11ac VHT20_Nss1,(MCS0)_4TX	29.58	0.90782
802.11ac VHT40_Nss1,(MCS0)_4TX	29.92	0.98175
802.11ac VHT80_Nss1,(MCS0)_4TX	29.93	0.98401

**Result**

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5745MHz	Pass	4.62	23.51	23.57	23.52	23.63	29.58	30.00
5785MHz	Pass	4.62	23.41	23.72	23.26	23.59	29.52	30.00
5825MHz	Pass	4.62	23.09	23.53	23.52	23.59	29.46	30.00
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5755MHz	Pass	4.62	23.58	23.61	24.07	24.24	29.91	30.00
5795MHz	Pass	4.62	23.73	23.63	24.03	24.19	29.92	30.00
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5775MHz	Pass	4.62	23.73	23.71	24.18	24.01	29.93	30.00

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



Summary

Mode	PD (dBm/RBW)
5.725-5.85GHz	-
802.11ac VHT20_Nss1,(MCS0)_4TX	13.86
802.11ac VHT40_Nss1,(MCS0)_4TX	10.93
802.11ac VHT80_Nss1,(MCS0)_4TX	8.49

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

Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	Port 3 (dBm/RBW)	Port 4 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5745MHz	Pass	7.06	8.07	7.99	7.96	7.69	13.86	28.94
5785MHz	Pass	7.06	7.83	7.74	7.76	7.63	13.71	28.94
5825MHz	Pass	7.06	7.78	7.65	7.64	7.24	13.48	28.94
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5755MHz	Pass	7.06	5.13	5.23	5.13	4.71	10.93	28.94
5795MHz	Pass	7.06	5.12	5.29	5.08	4.55	10.91	28.94
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5775MHz	Pass	7.06	2.82	3.17	1.98	2.65	8.49	28.94

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

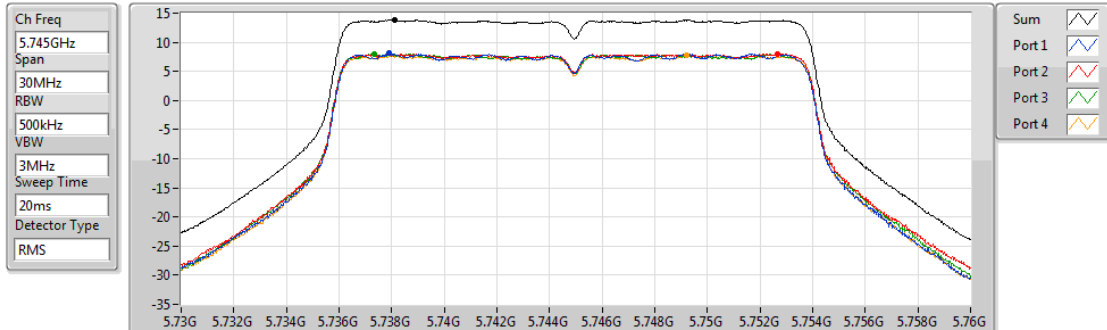
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port Xpower density;

802.11ac VHT20_Nss1,(MCS0)_4TX

5745MHz

PSD

15/01/2018



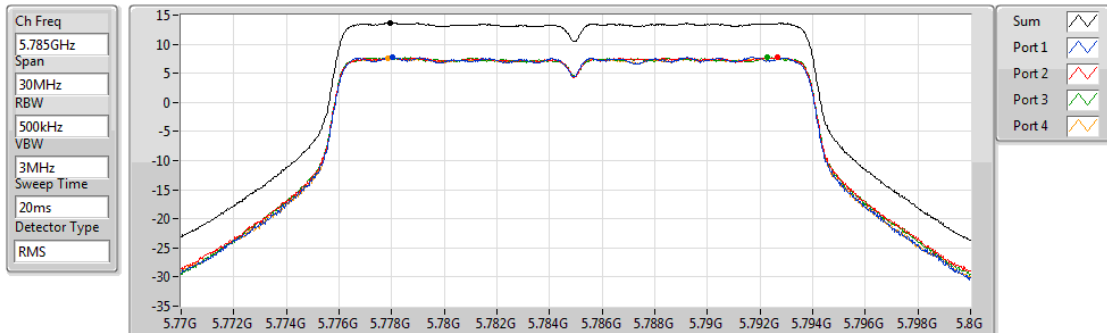
Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
13.86	13.86	8.07	7.99	7.96	7.69

802.11ac VHT20_Nss1,(MCS0)_4TX

5785MHz

PSD

15/01/2018



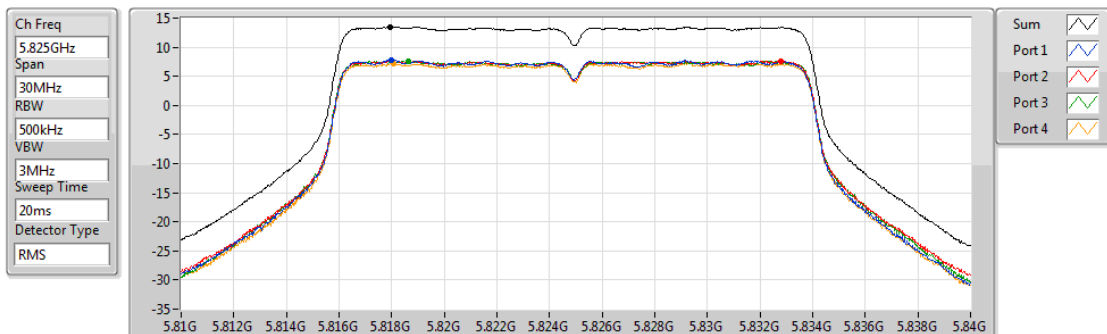
Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
13.71	13.71	7.83	7.74	7.76	7.63

802.11ac VHT20_Nss1,(MCS0)_4TX

5825MHz

PSD

15/01/2018



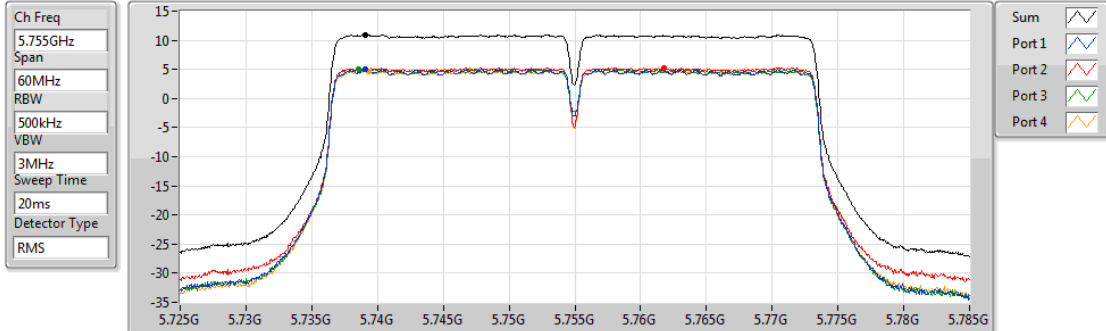
Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
13.48	13.48	7.78	7.65	7.64	7.24

802.11ac VHT40_Nss1,(MCS0)_4TX

PSD

5755MHz

15/01/2018



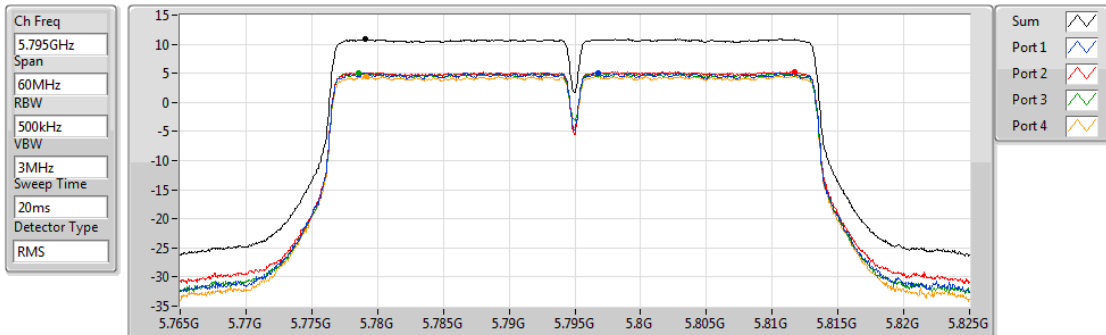
Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
10.93	10.93	5.13	5.23	5.13	4.71

802.11ac VHT40_Nss1,(MCS0)_4TX

PSD

5795MHz

15/01/2018



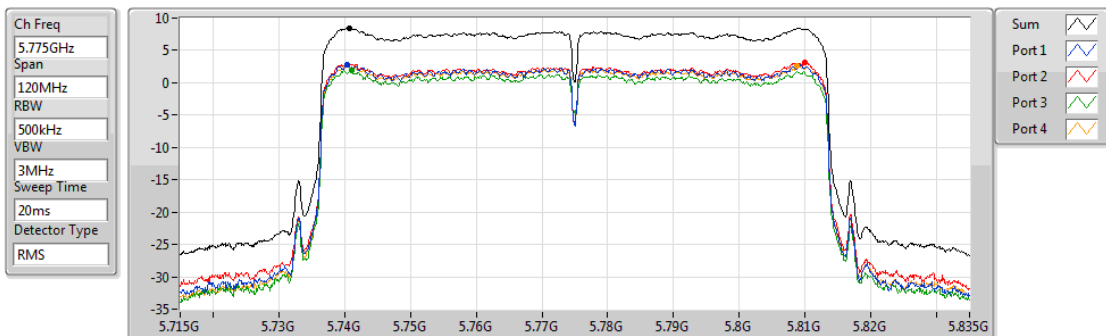
Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
10.91	10.91	5.12	5.29	5.08	4.55

802.11ac VHT80_Nss1,(MCS0)_4TX

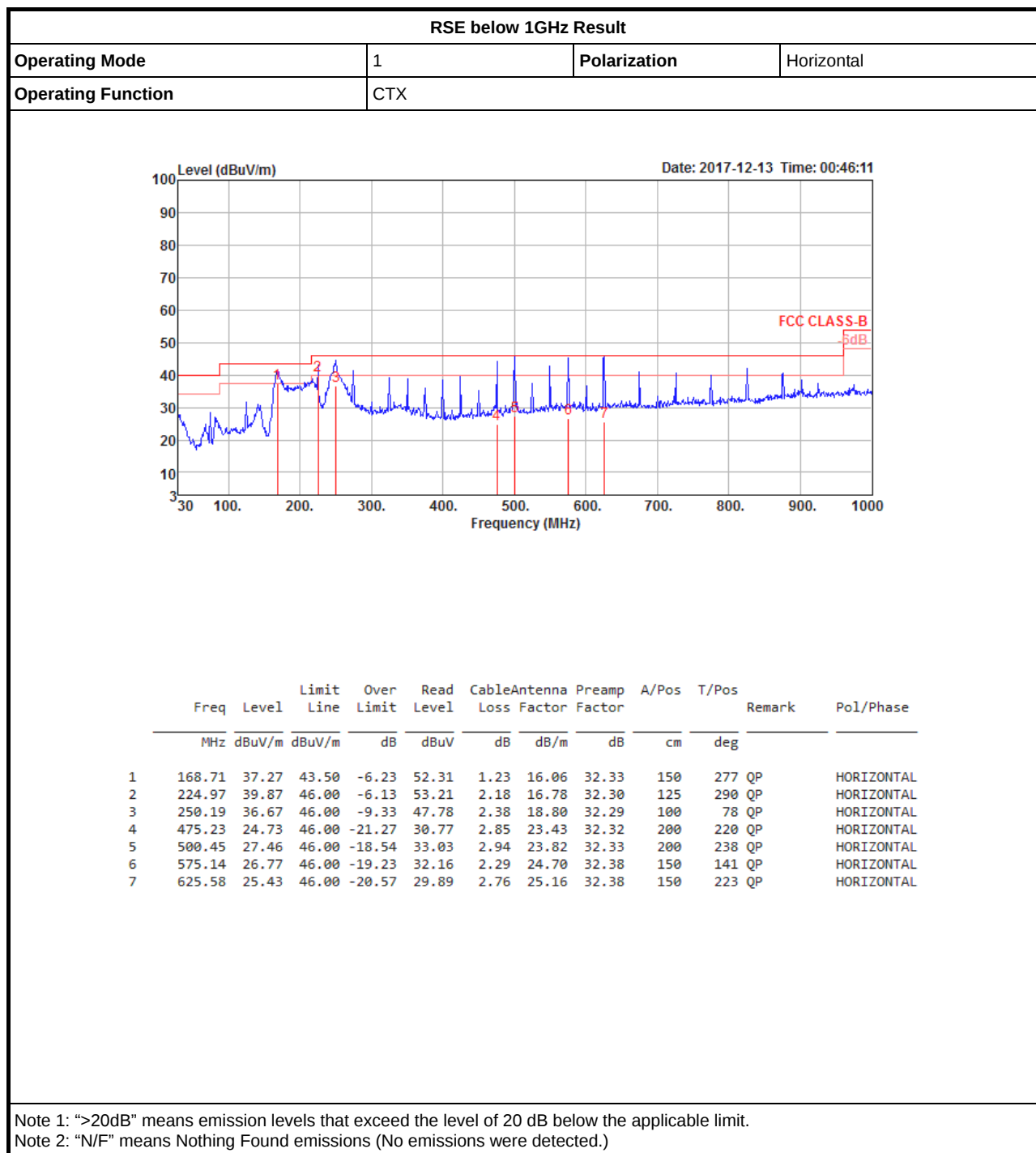
PSD

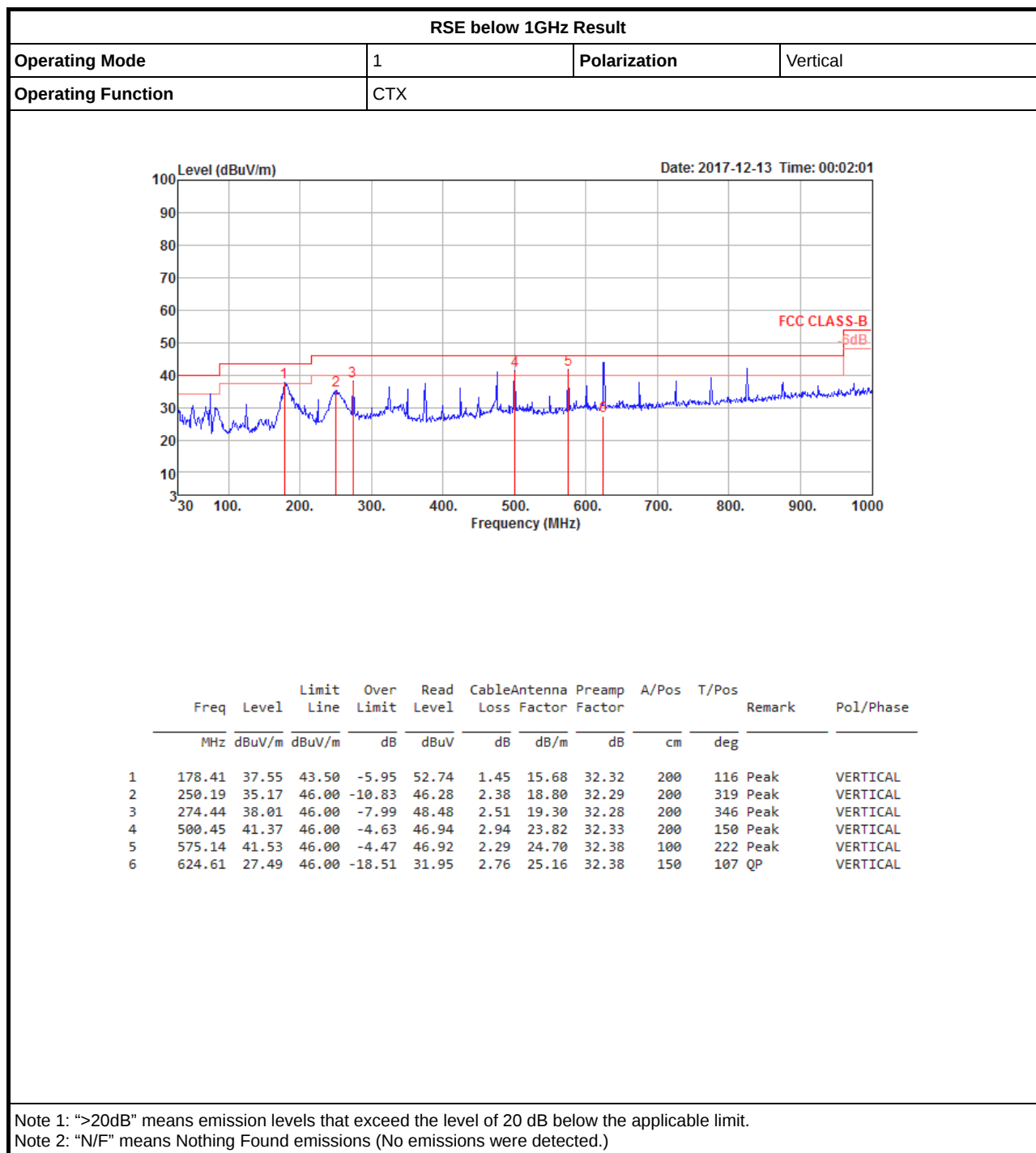
5775MHz

15/01/2018



Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
8.49	8.49	2.82	3.17	1.98	2.65







RSE TX above 1GHz Result

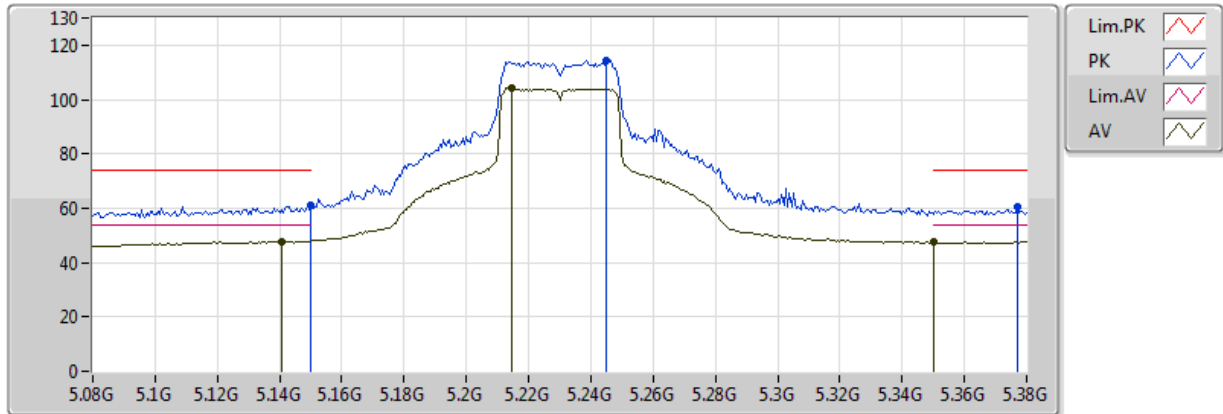
Appendix D.2

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
802.11ac VHT20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-
5.725-5.85GHz	Pass	AV	11.49018G	52.53	54.00	-1.47	16.12	3	H	189	2.60	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5230MHz_TX

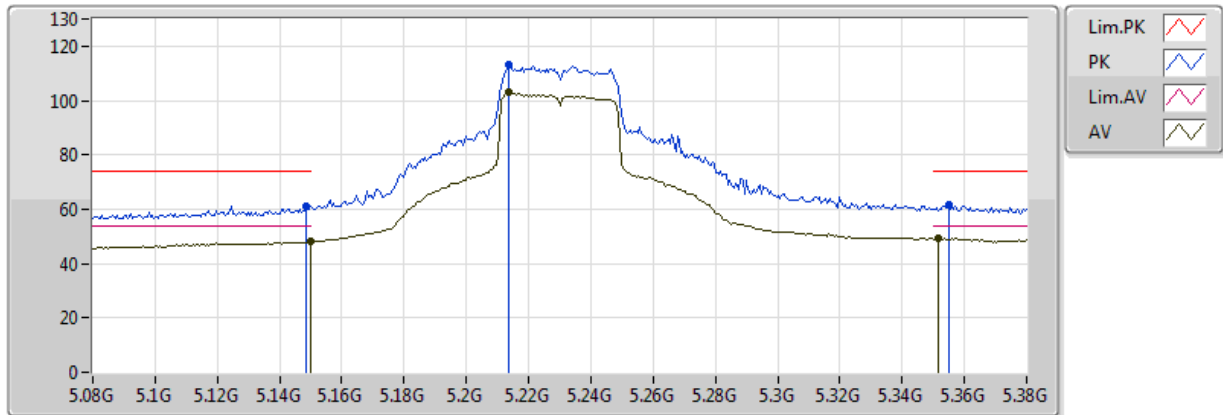


20170901
EUT_Y_4TX
Setting 23
04-J-4-10
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.1406G	47.90	54.00	-6.10	5.28	3	V	51	1.50	-
AV	5.2144G	104.30	Inf	-Inf	5.51	3	V	51	1.50	-
AV	5.350005G	47.80	54.00	-6.20	5.65	3	V	51	1.50	-
PK	5.149995G	61.00	74.00	-13.00	5.31	3	V	51	1.50	-
PK	5.245G	114.41	Inf	-Inf	5.54	3	V	51	1.50	-
PK	5.377G	60.53	74.00	-13.47	5.68	3	V	51	1.50	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5230MHz_TX

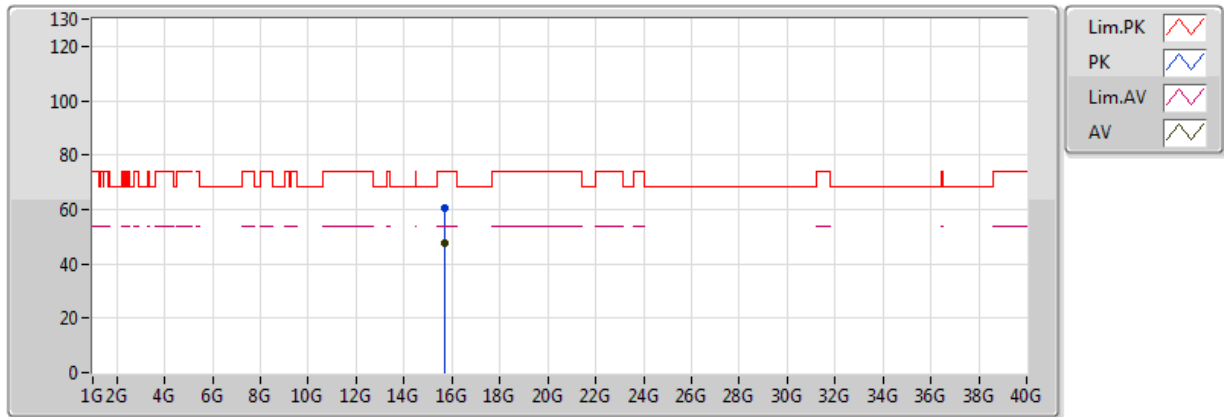


20170901
EUT_Y_4TX
Setting 23
04-J-4-10
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.149995G	48.33	54.00	-5.67	5.31	3	H	42	1.50	-
AV	5.2138G	102.83	Inf	-Inf	5.51	3	H	42	1.50	-
AV	5.3518G	49.22	54.00	-4.78	5.65	3	H	42	1.50	-
PK	5.1484G	60.94	74.00	-13.06	5.31	3	H	42	1.50	-
PK	5.2138G	112.91	Inf	-Inf	5.51	3	H	42	1.50	-
PK	5.3548G	61.82	74.00	-12.18	5.65	3	H	42	1.50	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5230MHz_TX

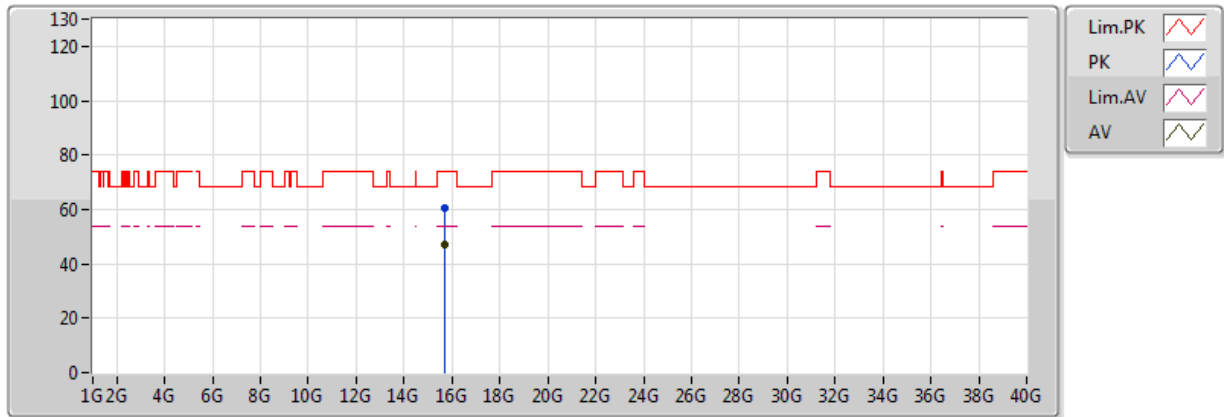


20170901
EUT_Y_4TX
Setting 23
04-J-4
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.69258G	47.36	54.00	-6.64	17.92	3	V	86	1.48	-
PK	15.68738G	60.46	74.00	-13.54	17.92	3	V	86	1.48	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5230MHz_TX

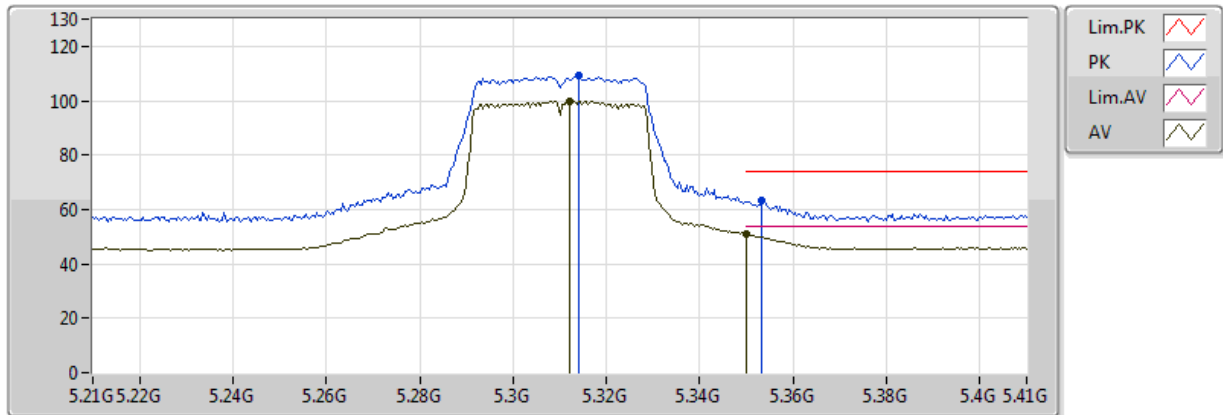


20170901
EUT_Y_4TX
Setting 23
04-J-4
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.665G	47.26	54.00	-6.74	17.90	3	H	227	1.50	-
PK	15.6703G	60.48	74.00	-13.52	17.90	3	H	227	1.50	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5310MHz_TX

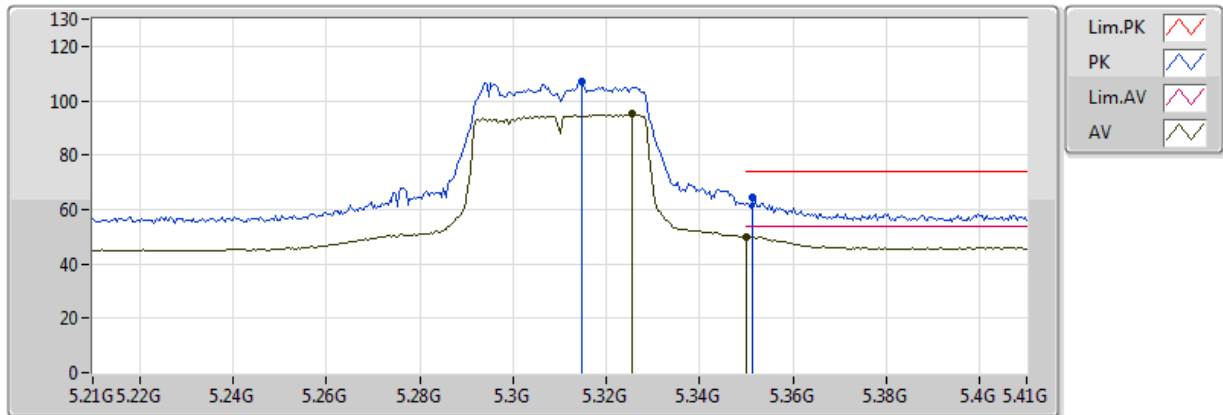


20170901
EUT_Y_4TX
Setting 16
04-J-4-10
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.312G	99.91	Inf	-Inf	5.61	3	V	232	2.43	-
AV	5.350005G	50.80	54.00	-3.20	5.65	3	V	232	2.43	-
PK	5.314G	109.23	Inf	-Inf	5.61	3	V	232	2.43	-
PK	5.3532G	63.10	74.00	-10.90	5.65	3	V	232	2.43	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5310MHz_TX

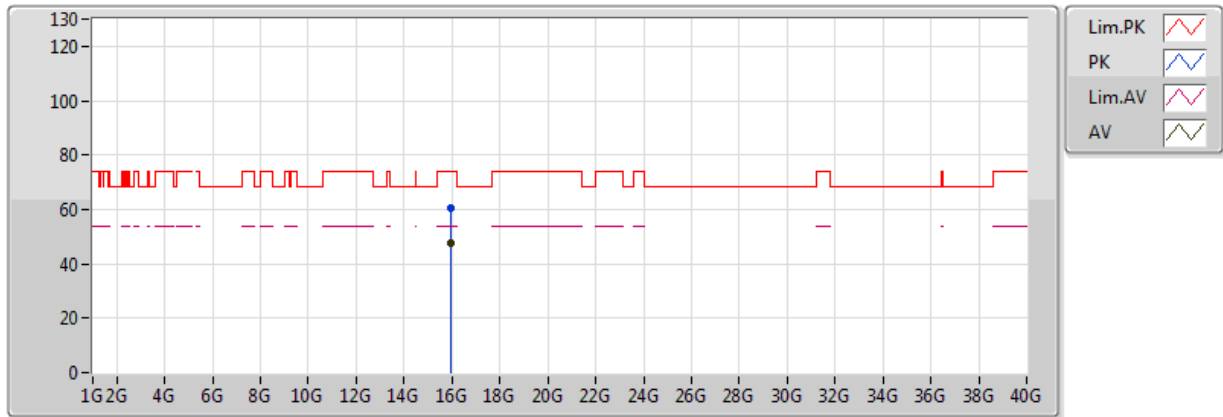


20170901
EUT_Y_4TX
Setting 16
04-J-4-10
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.3256G	94.99	Inf	-Inf	5.63	3	H	43	1.50	-
AV	5.350005G	49.93	54.00	-4.07	5.65	3	H	43	1.50	-
PK	5.3148G	107.20	Inf	-Inf	5.61	3	H	43	1.50	-
PK	5.3512G	64.48	74.00	-9.52	5.65	3	H	43	1.50	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5310MHz_TX

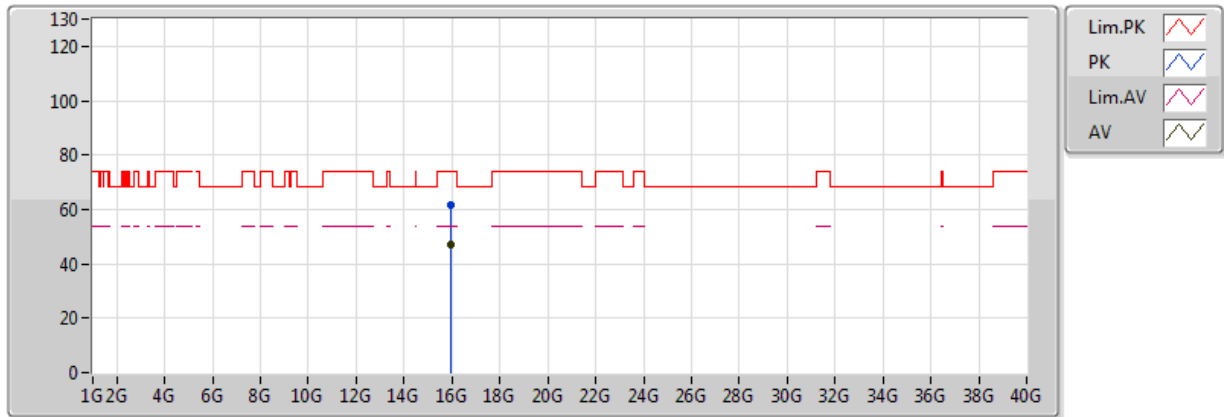


20170901
EUT_Y_4TX
Setting 16
04-J-4
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.929688G	47.69	54.00	-6.31	18.11	3	V	270	1.50	-
PK	15.92972G	60.70	74.00	-13.30	18.11	3	V	270	1.50	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5310MHz_TX

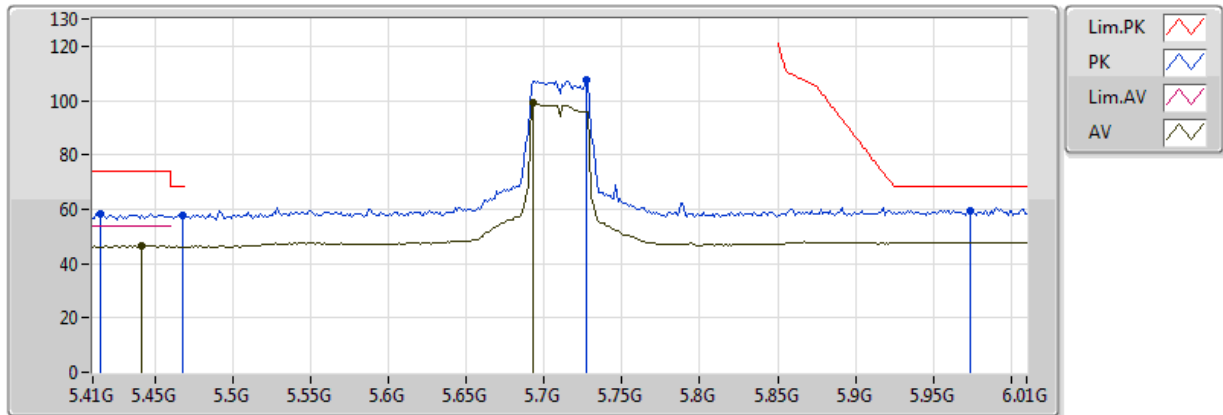


20170901
EUT_Y_4TX
Setting 16
04-J-4
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	15.93034G	47.21	54.00	-6.79	18.11	3	H	61	1.50	-
PK	15.93044G	61.51	74.00	-12.49	18.11	3	H	61	1.50	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5710MHz Straddle 5.47-5.725GHz_TX

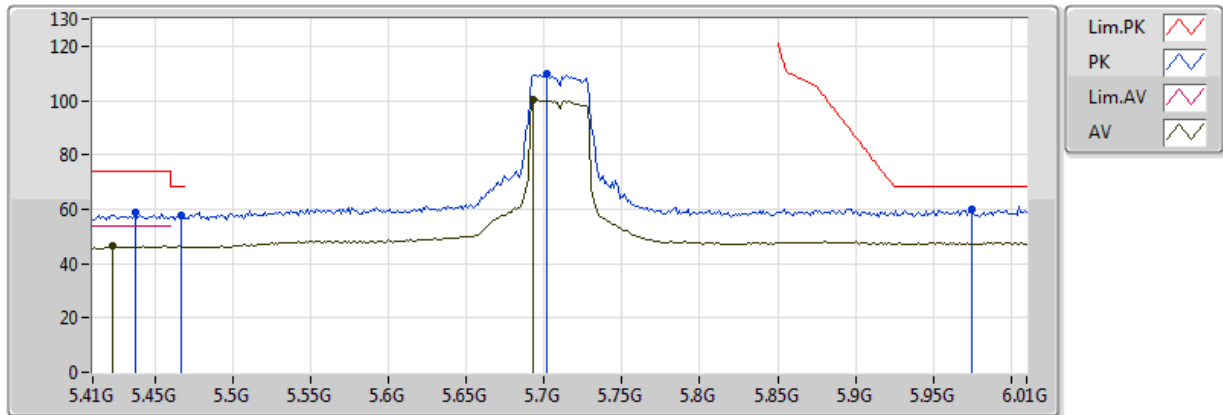


20170901
EUT_Y_4TX
Setting 17
04-J-4-10
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.4412G	46.61	54.00	-7.39	5.89	3	V	54	1.87	-
AV	5.6932G	99.00	Inf	-Inf	6.96	3	V	54	1.87	-
PK	5.4148G	58.22	74.00	-15.78	5.77	3	V	54	1.87	-
PK	5.4676G	57.83	68.20	-10.37	6.01	3	V	54	1.87	-
PK	5.7268G	107.31	Inf	-Inf	7.03	3	V	54	1.87	-
PK	5.974G	59.62	68.20	-8.58	8.31	3	V	54	1.87	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5710MHz Straddle 5.47-5.725GHz_TX

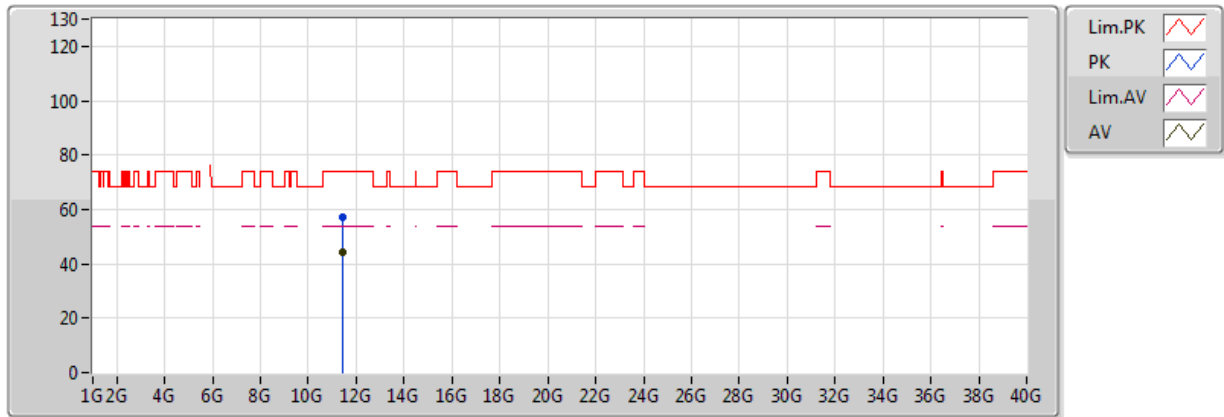


20170901
EUT_Y_4TX
Setting 17
04-J-4-10
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.4232G	46.39	54.00	-7.61	5.81	3	H	55	1.50	-
AV	5.6932G	100.46	Inf	-Inf	6.96	3	H	55	1.50	-
PK	5.4376G	58.70	74.00	-15.30	5.87	3	H	55	1.50	-
PK	5.4664G	57.71	68.20	-10.49	6.01	3	H	55	1.50	-
PK	5.7016G	110.04	Inf	-Inf	6.97	3	H	55	1.50	-
PK	5.9752G	59.87	68.20	-8.33	8.32	3	H	55	1.50	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5710MHz Straddle 5.47-5.725GHz_TX

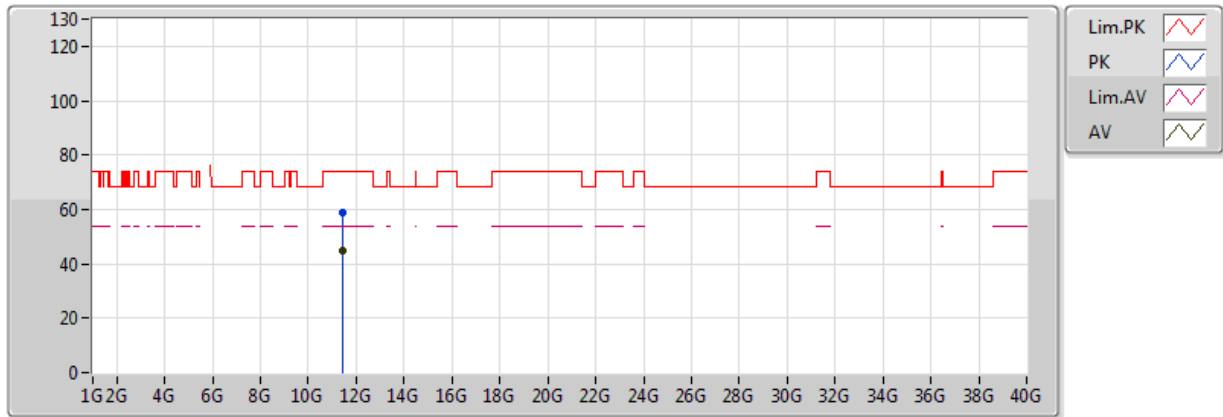


20170901
EUT_Y_4TX
Setting 17
04-J-4
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	11.41934G	44.00	54.00	-10.00	16.08	3	V	263	1.69	-
PK	11.41919G	57.12	74.00	-16.88	16.08	3	V	263	1.69	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5710MHz Straddle 5.47-5.725GHz_TX

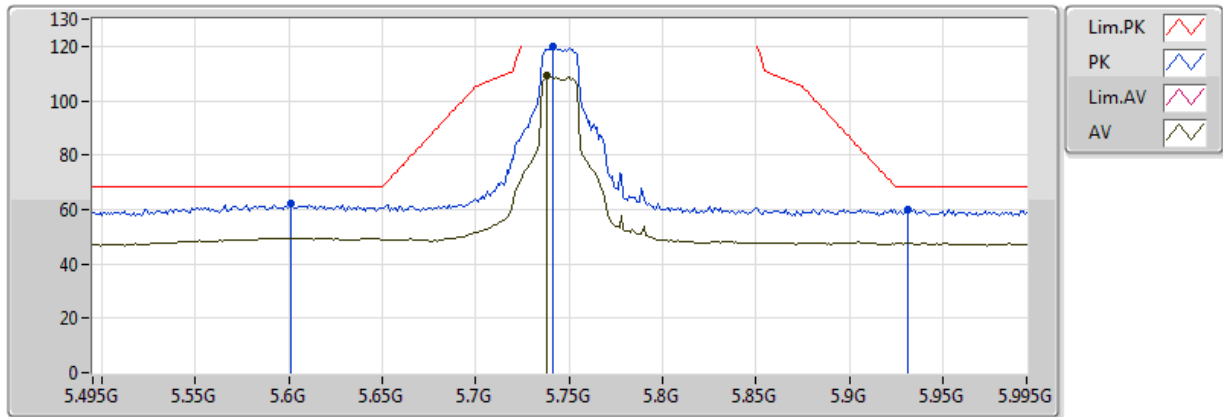


20170901
EUT_Y_4TX
Setting 17
04-J-4
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	11.420272G	45.01	54.00	-8.99	16.08	3	H	214	1.10	-
PK	11.420832G	58.77	74.00	-15.23	16.08	3	H	214	1.10	-

802.11ac VHT20-BF_Nss2,(MCS0)_4TX

5745MHz_TX

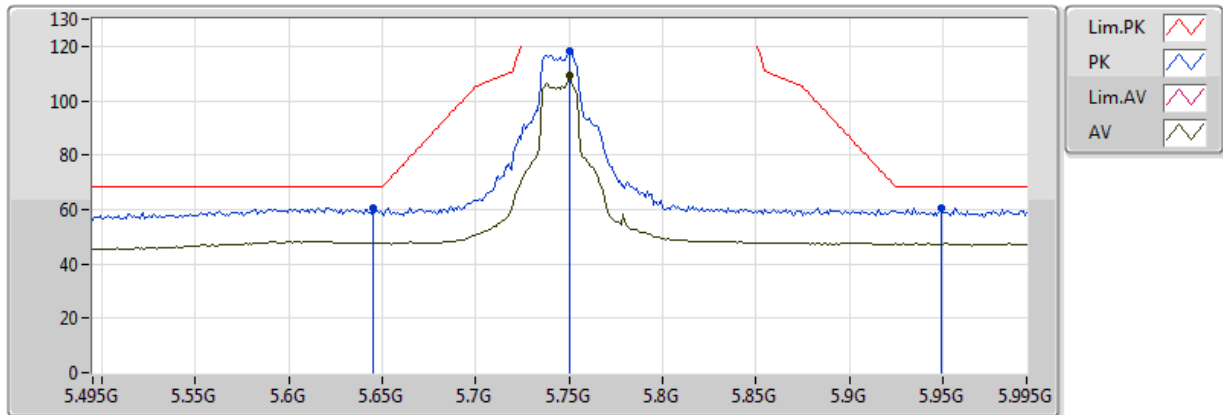


20170904
EUT_Y_4TX
Setting 25
04-J-5-10
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.738G	109.29	Inf	-Inf	7.05	3	V	44	1.49	-
PK	5.601G	62.00	68.20	-6.20	6.78	3	V	44	1.49	-
PK	5.741G	119.93	Inf	-Inf	7.06	3	V	44	1.49	-
PK	5.931G	59.74	68.20	-8.46	8.03	3	V	44	1.49	-

802.11ac VHT20-BF_Nss2,(MCS0)_4TX

5745MHz_TX

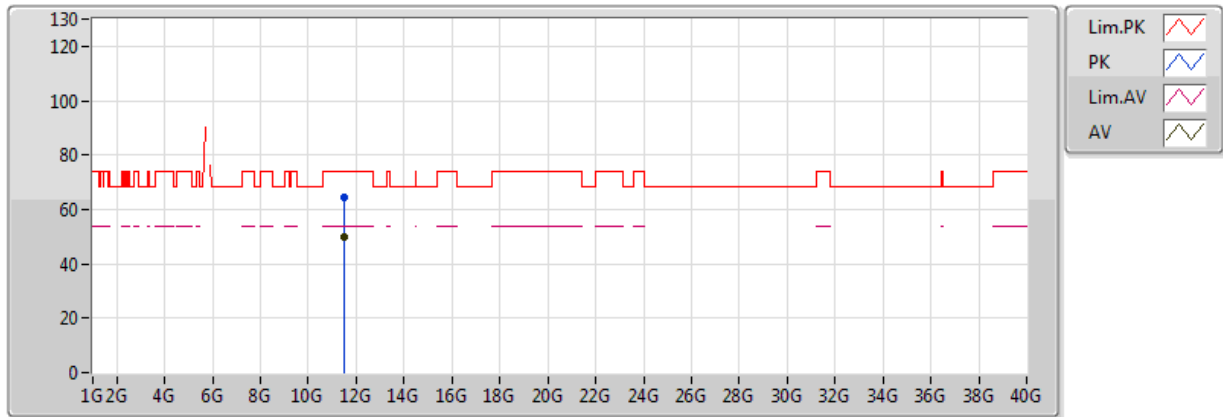


20170904
EUT_Y_4TX
Setting 25
04-J-5-10
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	5.75G	109.15	Inf	-Inf	7.08	3	H	51	1.50	-
PK	5.645G	60.35	68.20	-7.85	6.87	3	H	51	1.50	-
PK	5.75G	118.05	Inf	-Inf	7.08	3	H	51	1.50	-
PK	5.949G	60.42	68.20	-7.78	8.15	3	H	51	1.50	-

802.11ac VHT20-BF_Nss2,(MCS0)_4TX

5745MHz_TX

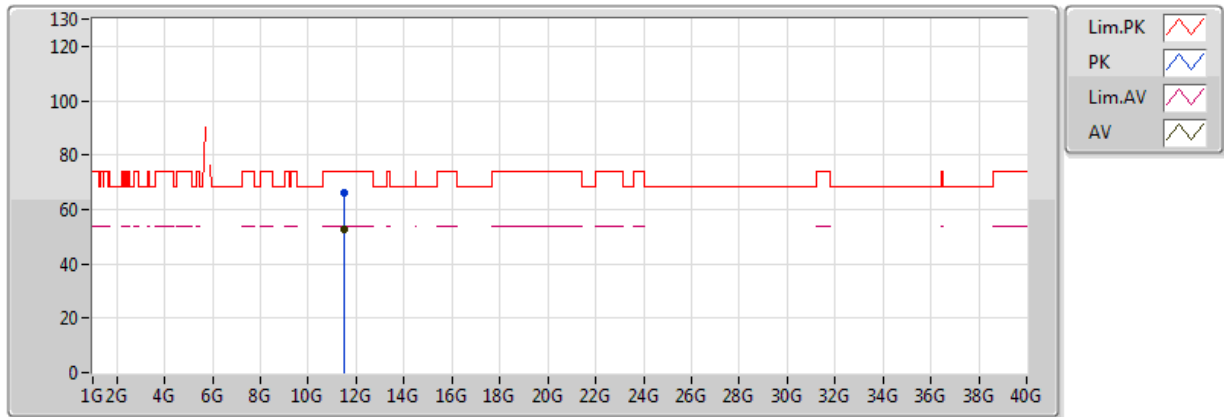


20170904
EUT_Y_4TX
Setting 25
04-J-5
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	11.49G	50.07	54.00	-3.93	16.12	3	V	284	1.49	-
PK	11.48994G	64.55	74.00	-9.45	16.12	3	V	284	1.49	-

802.11ac VHT20-BF_Nss2,(MCS0)_4TX

5745MHz_TX



20170904
EUT_Y_4TX
Setting 25
04-J-5
FSP(100142)

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	11.49018G	52.53	54.00	-1.47	16.12	3	H	189	2.60	-
PK	11.48952G	66.08	74.00	-7.92	16.12	3	H	189	2.60	-



RSE TX above 1GHz Result

Appendix D.2

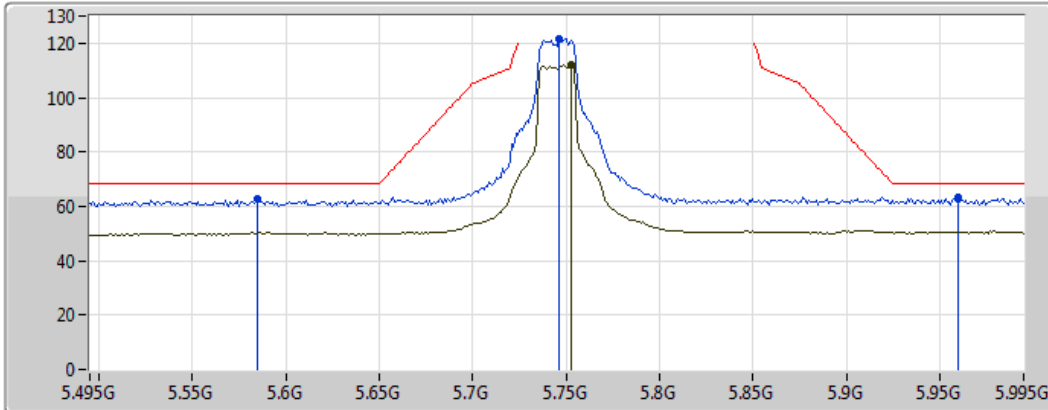
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
5.725-5.85GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11ac VHT80_Nss1,(MCS0)_4TX	Pass	PK	5.639G	68.11	68.20	-0.09	10.54	3	Vertical	203	2.04	-

802.11ac VHT20_Nss1,(MCS0)_4TX

5745MHz_TX

12/01/2018



Lim.PK
PK
Lim.AV
AV

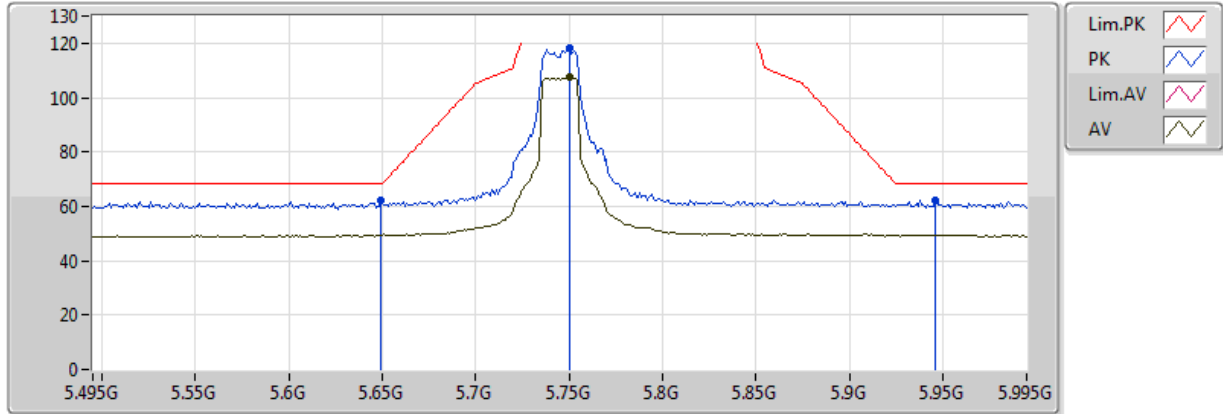
20180112
EUT_Y_4TX
Setting 25
02-J-5-10
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	5.753G	112.05	Inf	-Inf	10.67	3	Vertical	207	1.74	-				
PK	5.585G	62.79	68.20	-5.41	10.57	3	Vertical	207	1.74	-				
PK	5.746G	121.48	Inf	-Inf	10.66	3	Vertical	207	1.74	-				
PK	5.96G	63.51	68.20	-4.69	11.17	3	Vertical	207	1.74	-				

802.11ac VHT20_Nss1,(MCS0)_4TX

5745MHz_TX

12/01/2018



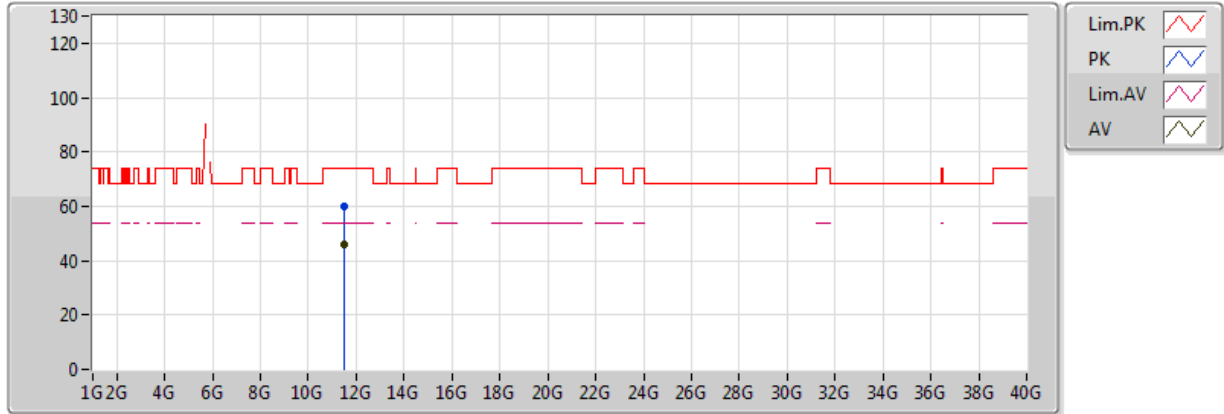
20180112
EUT_Y_4TX
Setting 25
02-J-5-10
FSU

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments				
AV	5.75G	107.31	Inf	-Inf	10.67	3	Horizontal	36	1.42	-				
PK	5.649G	61.98	68.20	-6.22	10.55	3	Horizontal	36	1.42	-				
PK	5.75G	118.04	Inf	-Inf	10.67	3	Horizontal	36	1.42	-				
PK	5.946G	62.14	68.20	-6.06	11.13	3	Horizontal	36	1.42	-				

802.11ac VHT20_Nss1,(MCS0)_4TX

5745MHz_TX

12/01/2018



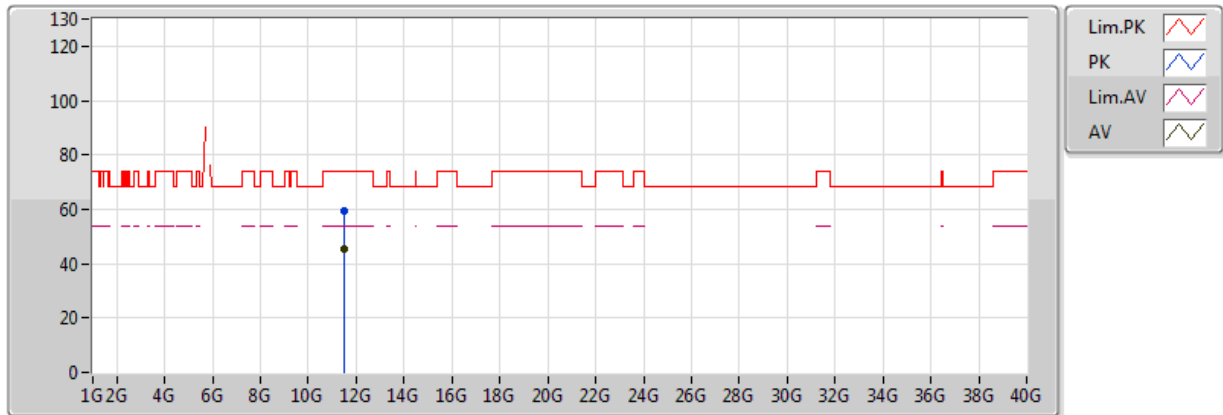
20180112
EUT_Y_4TX
Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.4906G	46.01	54.00	-7.99	15.44	3	Vertical	72	2.77	-				
PK	11.49108G	59.76	74.00	-14.24	15.44	3	Vertical	72	2.77	-				

802.11ac VHT20_Nss1,(MCS0)_4TX

5745MHz_TX

12/01/2018



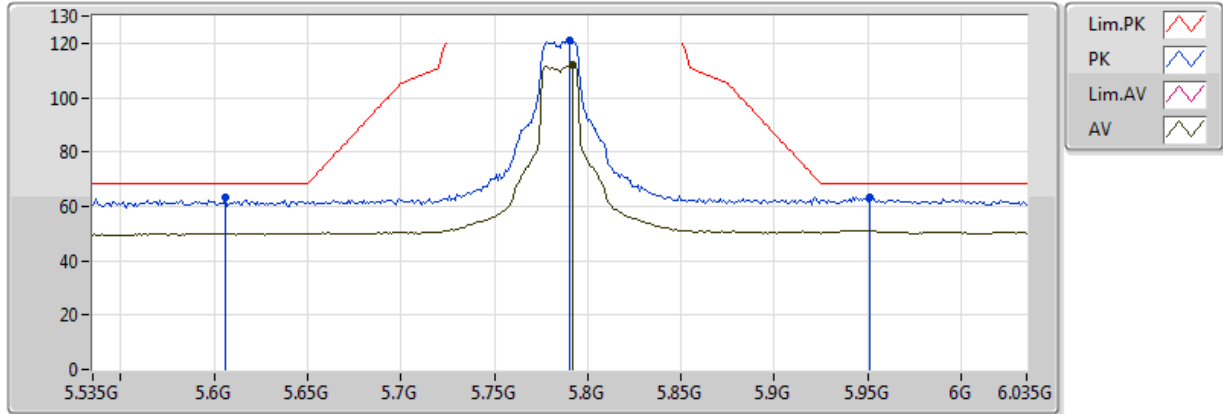
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EUT_Y_4TX
Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.4903G	45.49	54.00	-8.51	15.44	3	Horizontal	202	1.52	-				
PK	11.4909G	59.30	74.00	-14.70	15.44	3	Horizontal	202	1.52	-				

802.11ac VHT20_Nss1,(MCS0)_4TX

5785MHz_TX

12/01/2018



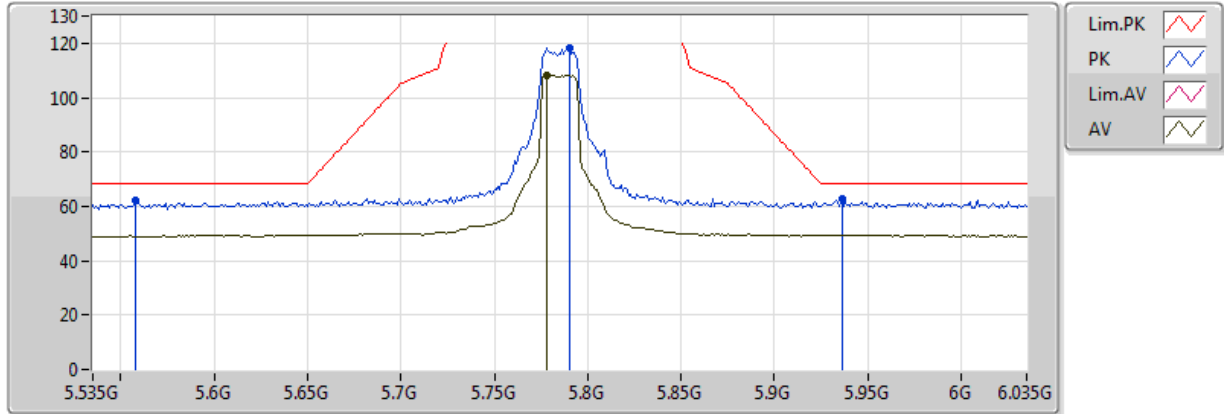
20180112
EUT_Y_4TX
Setting 25
02-J-5-10
FSU

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments				
AV	5.792G	111.84	Inf	-Inf	10.73	3	Vertical	202	1.50	-				
PK	5.606G	63.25	68.20	-4.95	10.51	3	Vertical	202	1.50	-				
PK	5.79G	121.30	Inf	-Inf	10.73	3	Vertical	202	1.50	-				
PK	5.951G	63.19	68.20	-5.01	11.14	3	Vertical	202	1.50	-				

802.11ac VHT20_Nss1,(MCS0)_4TX

5785MHz_TX

12/01/2018



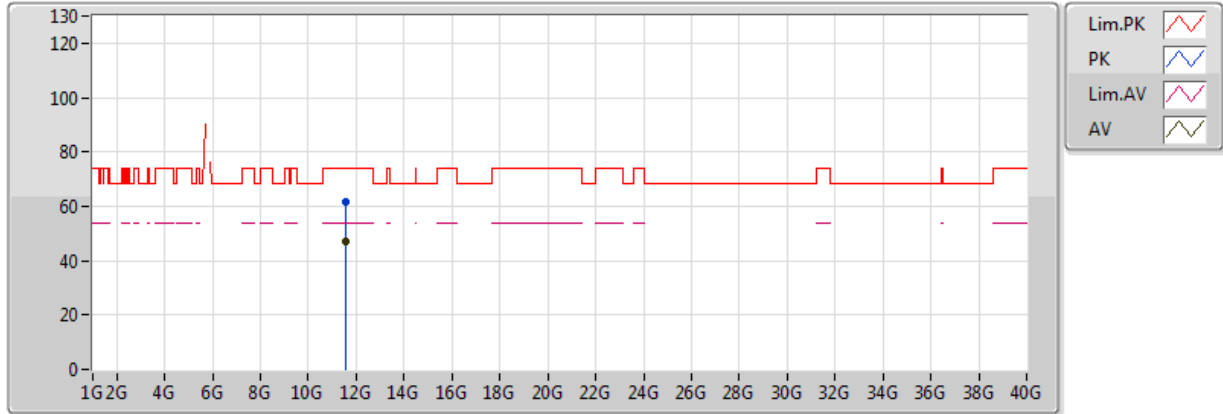
20180112
EUT_Y_4TX
Setting 25
02-J-5-10
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	5.778G	108.16	Inf	-Inf	10.71	3	Horizontal	22	1.90	-				
PK	5.558G	61.93	68.20	-6.27	10.69	3	Horizontal	22	1.90	-				
PK	5.79G	118.25	Inf	-Inf	10.73	3	Horizontal	22	1.90	-				
PK	5.936G	62.51	68.20	-5.69	11.10	3	Horizontal	22	1.90	-				

802.11ac VHT20_Nss1,(MCS0)_4TX

5785MHz_TX

12/01/2018



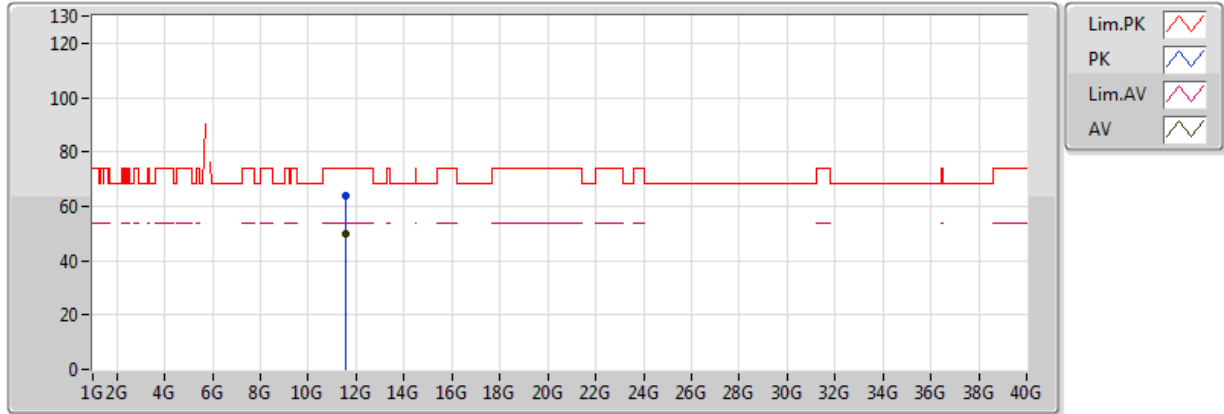
20180112
EUT_Y_4TX
Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.57012G	47.16	54.00	-6.84	15.55	3	Vertical	281	1.38	-				
PK	11.57078G	61.46	74.00	-12.54	15.55	3	Vertical	281	1.38	-				

802.11ac VHT20_Nss1,(MCS0)_4TX

5785MHz_TX

12/01/2018



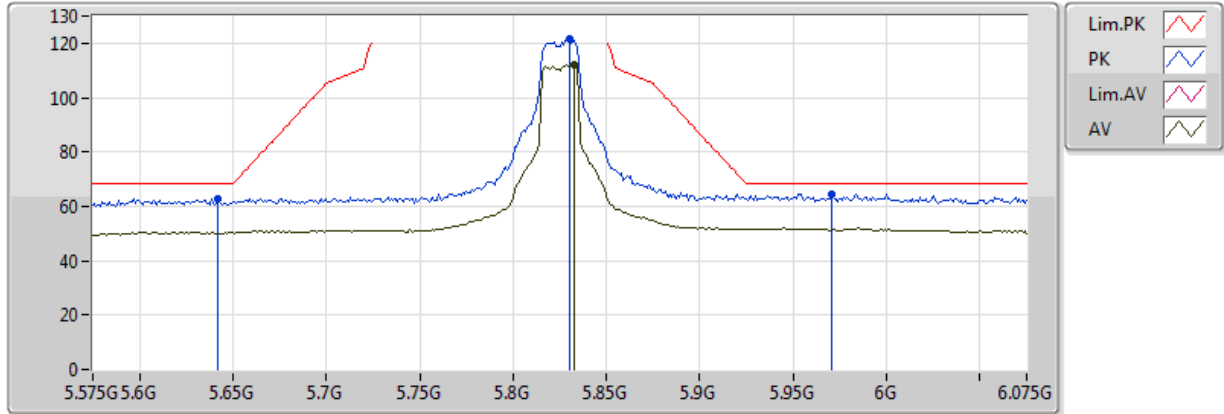
20180112
EUT_Y_4TX
Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.57018G	49.80	54.00	-4.20	15.55	3	Horizontal	207	1.44	-				
PK	11.5706G	63.94	74.00	-10.06	15.55	3	Horizontal	207	1.44	-				

802.11ac VHT20_Nss1,(MCS0)_4TX

5825MHz_TX

12/01/2018



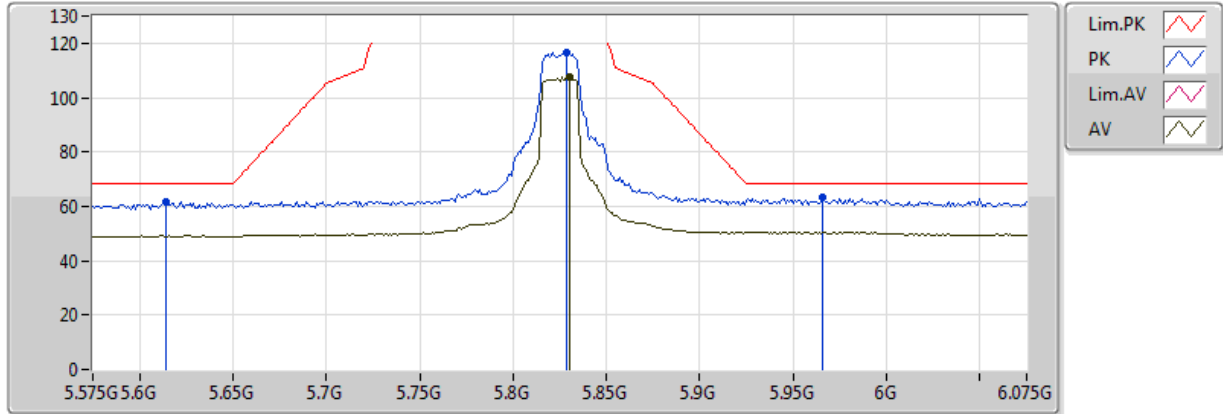
20180112
EUT_Y_4TX
Setting 25
02-J-5-10
FSU

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments				
AV	5.833G	112.34	Inf	-Inf	10.83	3	Vertical	213	1.94	-				
PK	5.642G	62.81	68.20	-5.39	10.54	3	Vertical	213	1.94	-				
PK	5.83G	121.65	Inf	-Inf	10.82	3	Vertical	213	1.94	-				
PK	5.971G	64.37	68.20	-3.83	11.19	3	Vertical	213	1.94	-				

802.11ac VHT20_Nss1,(MCS0)_4TX

5825MHz_TX

12/01/2018



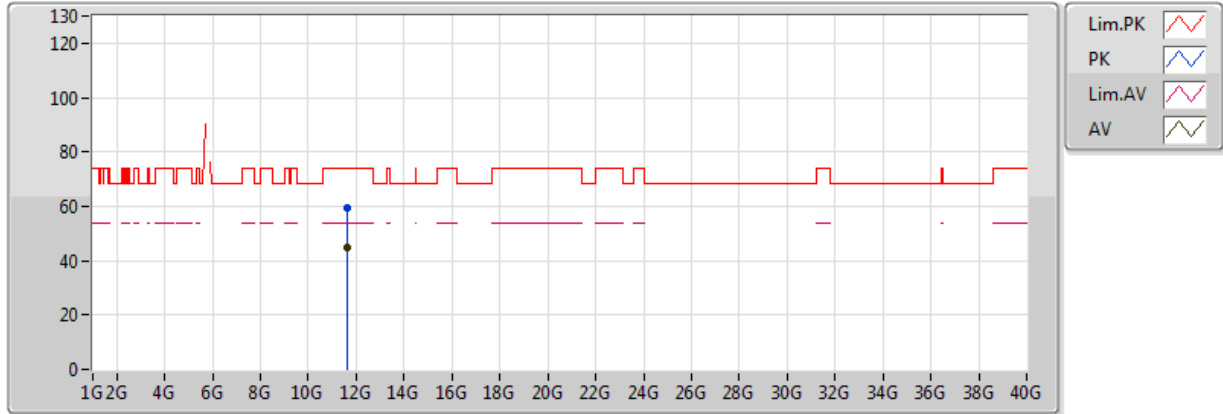
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Setting 25
02-J-5-10
FSU

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	5.83G	107.62	Inf	-Inf	10.82	3	Horizontal	155	1.35	-
PK	5.614G	61.53	68.20	-6.67	10.51	3	Horizontal	155	1.35	-
PK	5.829G	116.61	Inf	-Inf	10.82	3	Horizontal	155	1.35	-
PK	5.966G	63.48	68.20	-4.72	11.18	3	Horizontal	155	1.35	-

802.11ac VHT20_Nss1,(MCS0)_4TX

5825MHz_TX

12/01/2018



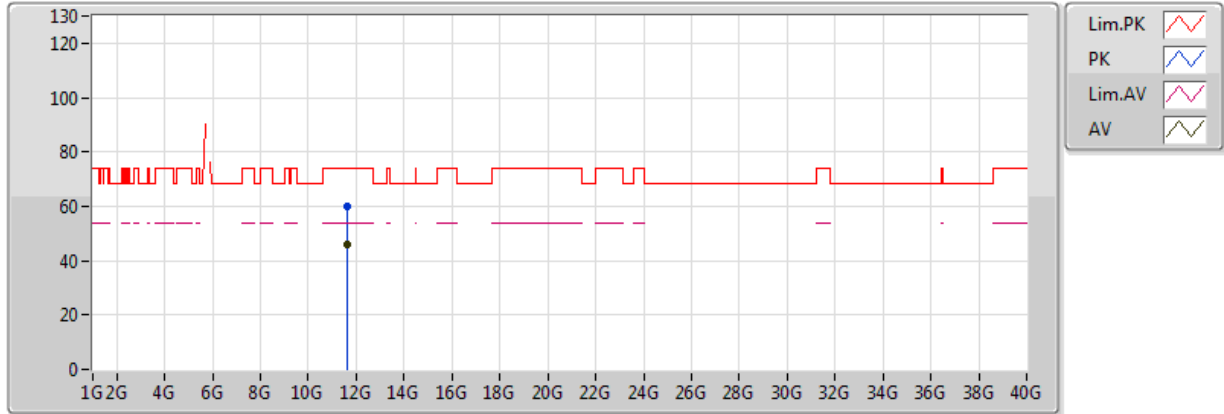
20180112
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Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.64994G	45.03	54.00	-8.97	15.66	3	Vertical	280	1.52	-				
PK	11.65102G	59.42	74.00	-14.58	15.66	3	Vertical	280	1.52	-				

802.11ac VHT20_Nss1,(MCS0)_4TX

5825MHz_TX

12/01/2018



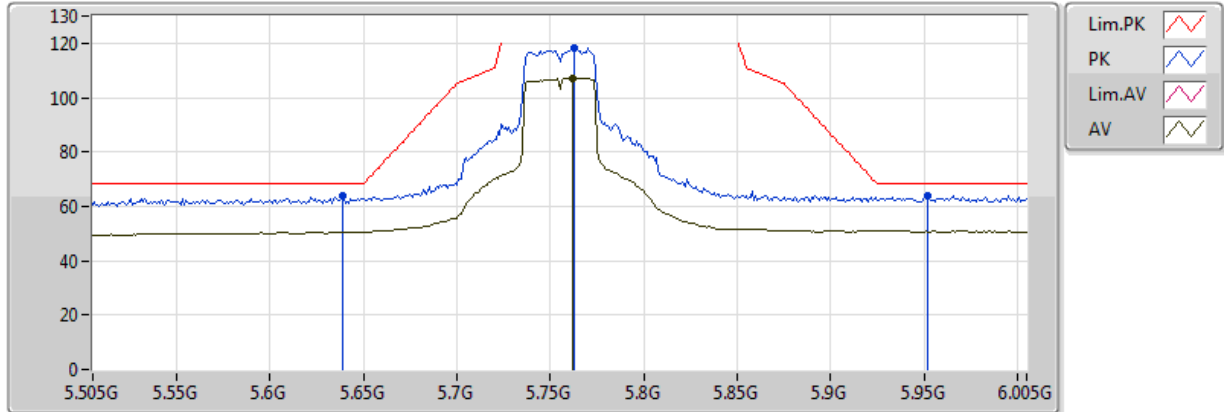
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Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.65G	46.11	54.00	-7.89	15.66	3	Horizontal	195	1.51	-				
PK	11.65102G	60.08	74.00	-13.92	15.66	3	Horizontal	195	1.51	-				

802.11ac VHT40_Nss1,(MCS0)_4TX

5755MHz_TX

13/01/2018



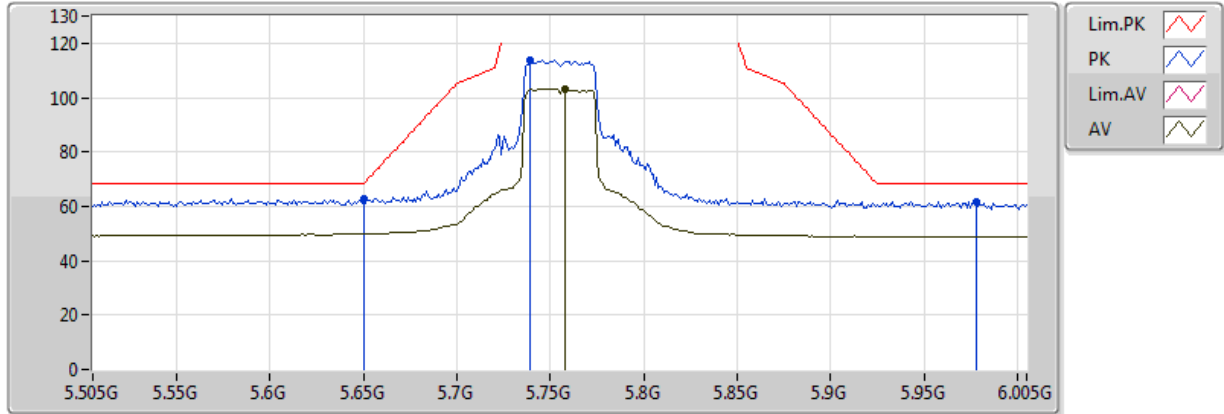
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Setting 25
02-J-5-10
FSU

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	5.762G	107.23	Inf	-Inf	10.69	3	Vertical	205	2.05	-
PK	5.639G	63.65	68.20	-4.55	10.54	3	Vertical	205	2.05	-
PK	5.763G	118.27	Inf	-Inf	10.69	3	Vertical	205	2.05	-
PK	5.952G	64.02	68.20	-4.18	11.15	3	Vertical	205	2.05	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5755MHz_TX

13/01/2018



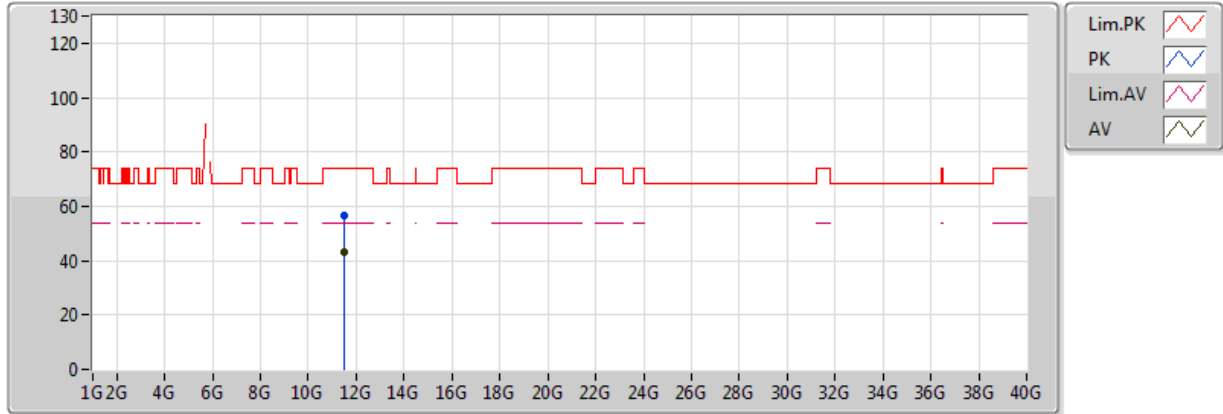
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Setting 25
02-J-5-10
FSU

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	5.758G	103.11	Inf	-Inf	10.68	3	Horizontal	29	1.99	-
PK	5.65G	63.02	68.20	-5.18	10.55	3	Horizontal	29	1.99	-
PK	5.739G	113.48	Inf	-Inf	10.65	3	Horizontal	29	1.99	-
PK	5.978G	61.62	68.20	-6.58	11.21	3	Horizontal	29	1.99	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5755MHz_TX

13/01/2018



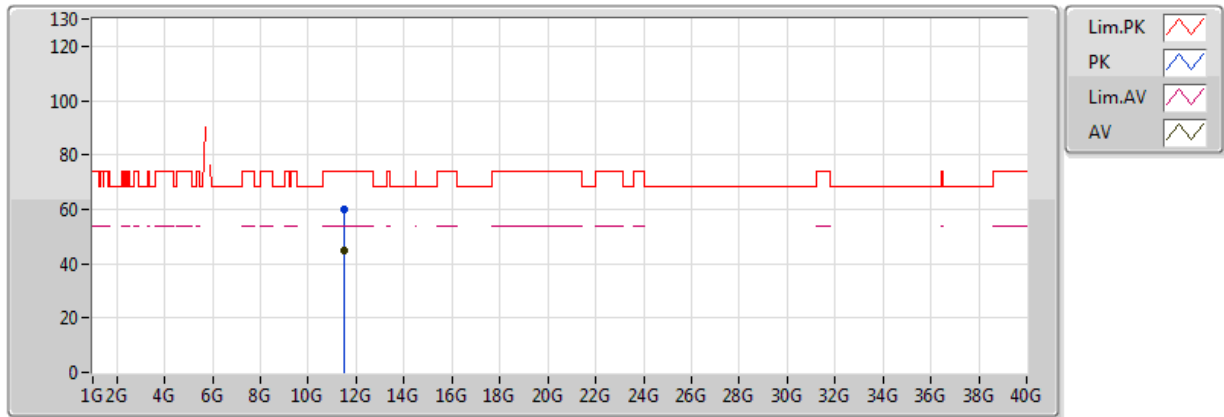
20180112
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Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.50928G	42.89	54.00	-11.11	15.47	3	Vertical	298	1.50	-				
PK	11.51174G	56.77	74.00	-17.23	15.47	3	Vertical	298	1.50	-				

802.11ac VHT40_Nss1,(MCS0)_4TX

5755MHz_TX

13/01/2018



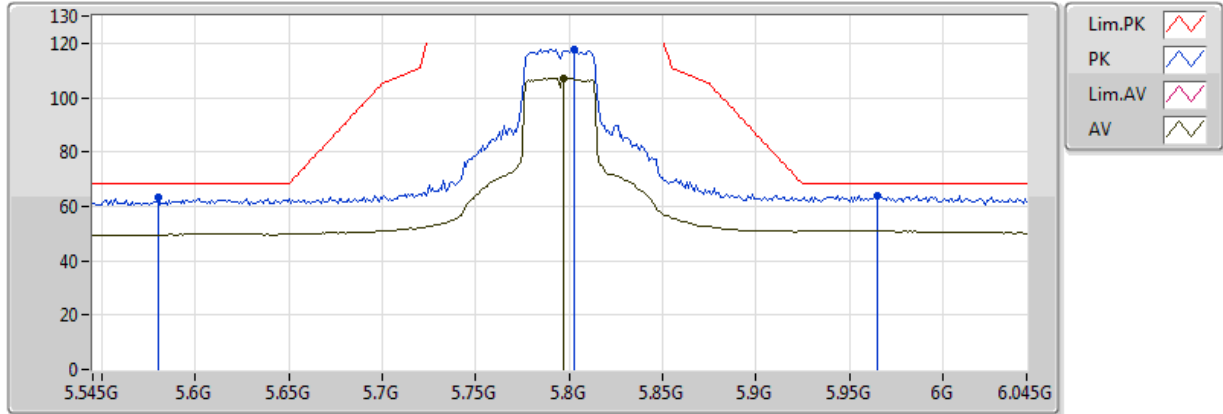
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Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.51G	45.07	54.00	-8.93	15.47	3	Horizontal	208	1.04	-				
PK	11.50796G	60.20	74.00	-13.80	15.47	3	Horizontal	208	1.04	-				

802.11ac VHT40_Nss1,(MCS0)_4TX

5795MHz_TX

13/01/2018



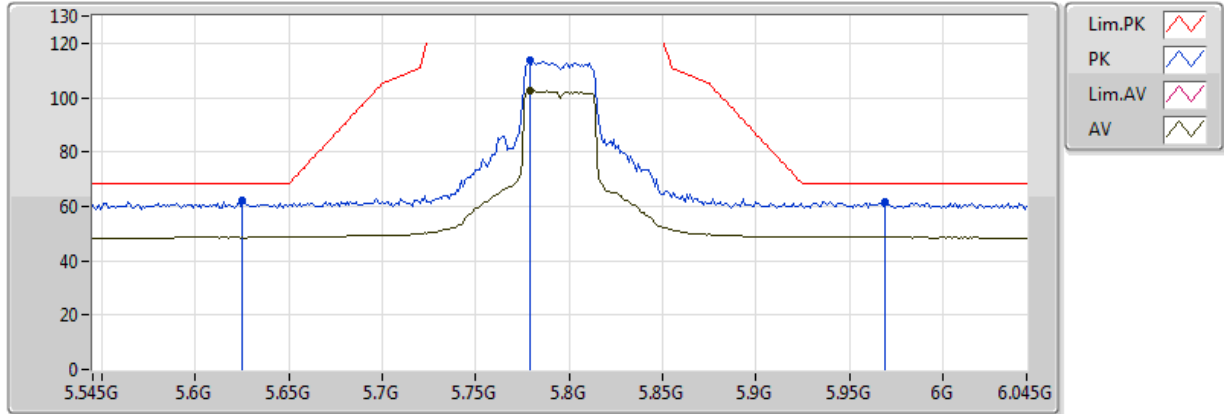
20180112
EUT_Y_4TX
Setting 25
02-J-5-10
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	5.797G	107.24	Inf	-Inf	10.74	3	Vertical	207	1.97	-				
PK	5.58G	63.27	68.20	-4.93	10.59	3	Vertical	207	1.97	-				
PK	5.803G	117.80	Inf	-Inf	10.75	3	Vertical	207	1.97	-				
PK	5.965G	63.99	68.20	-4.21	11.18	3	Vertical	207	1.97	-				

802.11ac VHT40_Nss1,(MCS0)_4TX

5795MHz_TX

13/01/2018



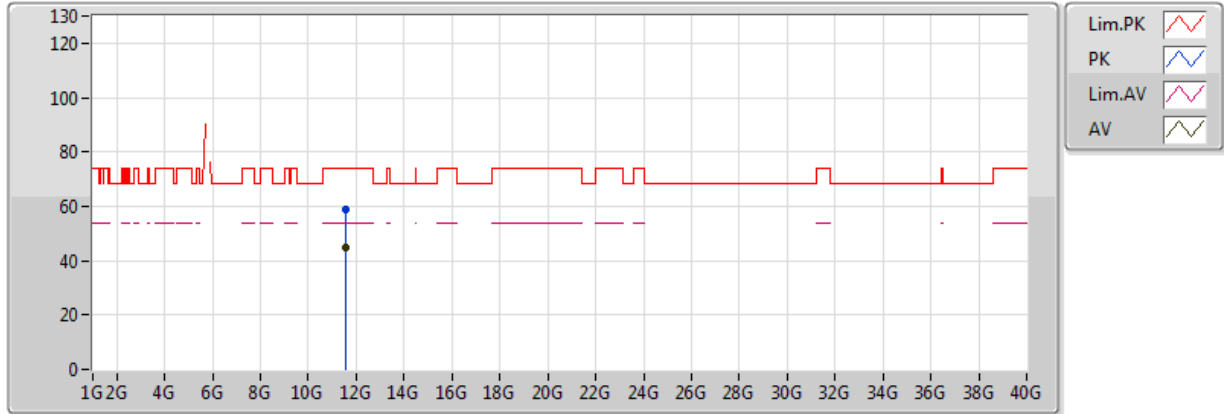
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Setting 25
02-J-5-10
FSU

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	5.779G	102.77	Inf	-Inf	10.71	3	Horizontal	28	1.89	-
PK	5.625G	62.01	68.20	-6.19	10.52	3	Horizontal	28	1.89	-
PK	5.779G	113.88	Inf	-Inf	10.71	3	Horizontal	28	1.89	-
PK	5.969G	61.80	68.20	-6.40	11.19	3	Horizontal	28	1.89	-

802.11ac VHT40_Nss1,(MCS0)_4TX

5795MHz_TX

13/01/2018



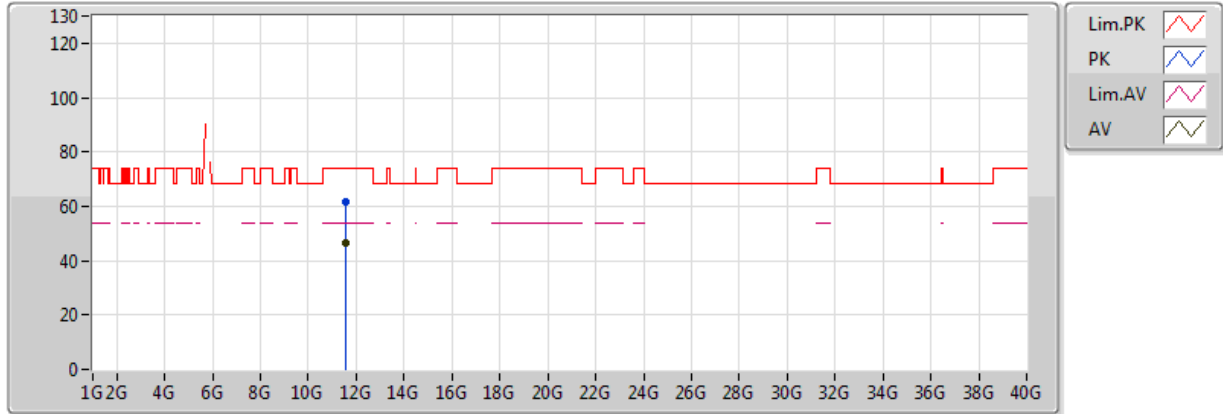
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Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.58988G	44.62	54.00	-9.38	15.58	3	Vertical	276	1.50	-				
PK	11.58874G	58.71	74.00	-15.29	15.58	3	Vertical	276	1.50	-				

802.11ac VHT40_Nss1,(MCS0)_4TX

5795MHz_TX

13/01/2018



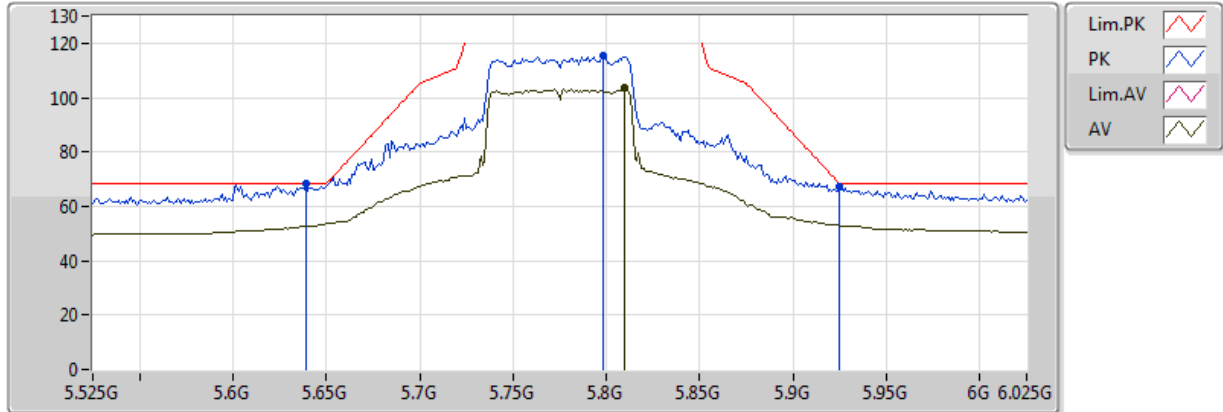
20180112
EUT_Y_4TX
Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.58982G	46.77	54.00	-7.23	15.58	3	Horizontal	209	2.03	-				
PK	11.59174G	61.90	74.00	-12.10	15.58	3	Horizontal	209	2.03	-				

802.11ac VHT80_Nss1,(MCS0)_4TX

5775MHz_TX

13/01/2018



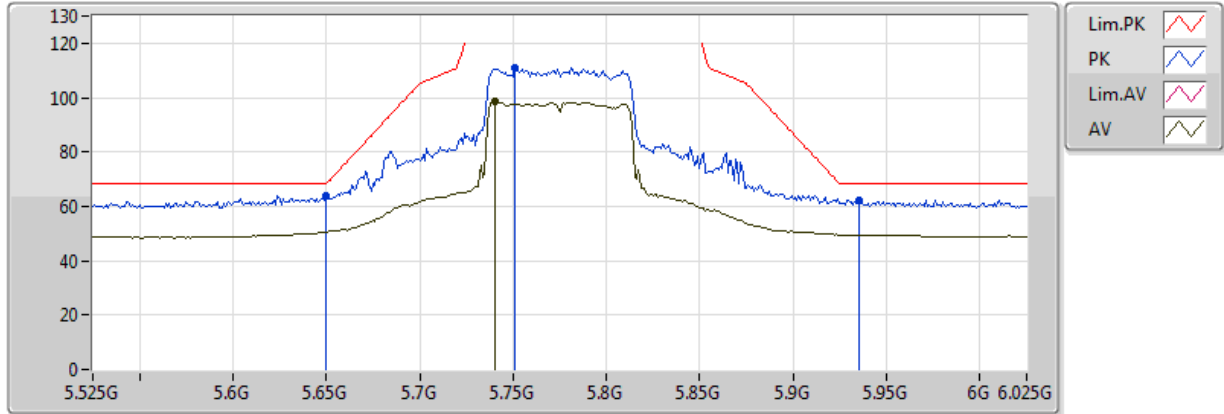
20180112
EUT_Y_4TX
Setting 25
02-J-5-10
FSU

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	5.81G	103.59	Inf	-Inf	10.77	3	Vertical	203	2.04	-
PK	5.639G	68.11	68.20	-0.09	10.54	3	Vertical	203	2.04	-
PK	5.798G	115.41	Inf	-Inf	10.74	3	Vertical	203	2.04	-
PK	5.925G	67.08	68.20	-1.12	11.07	3	Vertical	203	2.04	-

802.11ac VHT80_Nss1,(MCS0)_4TX

5775MHz_TX

13/01/2018



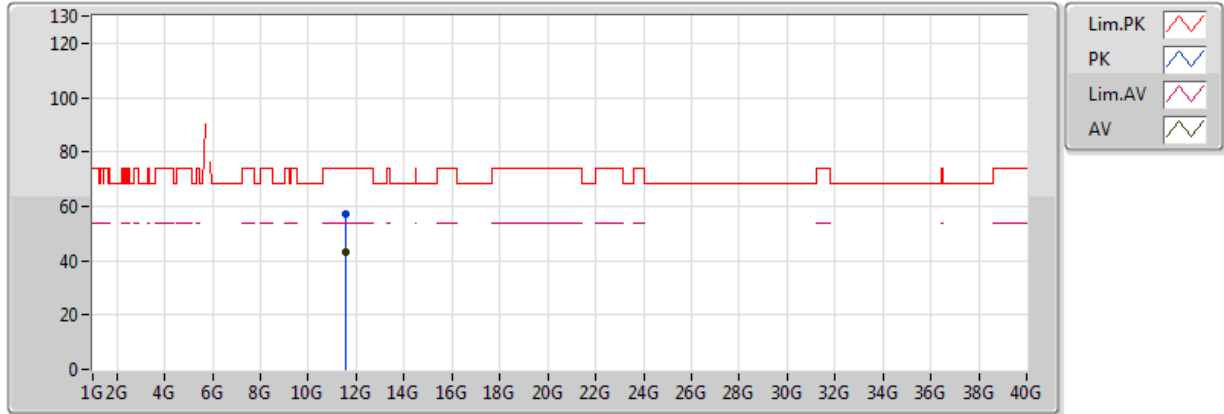
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Setting 25
02-J-5-10
FSU

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	5.74G	98.70	Inf	-Inf	10.66	3	Horizontal	25	1.50	-
PK	5.65G	63.73	68.20	-4.47	10.55	3	Horizontal	25	1.50	-
PK	5.751G	110.97	Inf	-Inf	10.67	3	Horizontal	25	1.50	-
PK	5.935G	62.30	68.20	-5.90	11.10	3	Horizontal	25	1.50	-

802.11ac VHT80_Nss1,(MCS0)_4TX

5775MHz_TX

13/01/2018



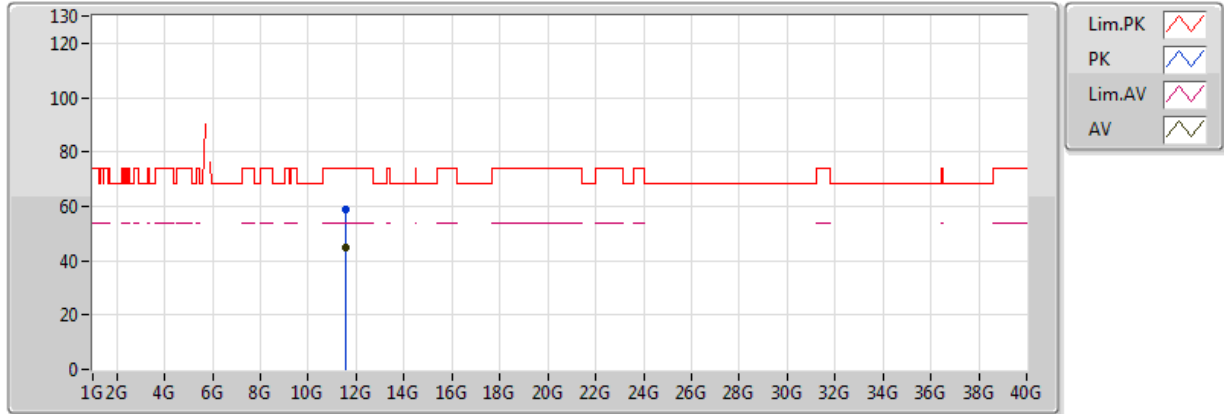
20180112
EUT_Y_4TX
Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.55006G	43.30	54.00	-10.70	15.52	3	Vertical	292	1.22	-				
PK	11.55306G	57.41	74.00	-16.59	15.53	3	Vertical	292	1.22	-				

802.11ac VHT80_Nss1,(MCS0)_4TX

5775MHz_TX

13/01/2018



20180112
EUT_Y_4TX
Setting 25
02-J-5
FSU

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments				
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)					
AV	11.55006G	44.72	54.00	-9.28	15.52	3	Horizontal	195	1.49	-				
PK	11.54622G	58.67	74.00	-15.33	15.52	3	Horizontal	195	1.49	-				

Mode: 20 MHz / Ant. 6

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9636	5784.9631	5784.9622	5784.9619
110.00	5784.9635	5784.9625	5784.9621	5784.9619
93.50	5784.9630	5784.9628	5784.9625	5784.9616
Max. Deviation (MHz)	0.0370	0.0375	0.0379	0.0384
Max. Deviation (ppm)	6.40	6.48	6.55	6.64
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9612	5784.9608	5784.9606	5784.9597
10	5784.9622	5784.9619	5784.9618	5784.9610
20	5784.9635	5784.9626	5784.9619	5784.9613
30	5784.9958	5784.9955	5784.9952	5784.9944
40	5784.9977	5784.9972	5784.9963	5784.9962
50	5784.9975	5784.9974	5784.9970	5784.9969
Max. Deviation (MHz)	0.0420	0.0426	0.0429	0.0433
Max. Deviation (ppm)	7.26	7.36	7.42	7.48
Result	Pass			

Mode: 40 MHz / Ant. 6

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9636	5754.9629	5754.9628	5754.9627
110.00	5754.9635	5754.9634	5754.9624	5754.9618
93.50	5754.9632	5754.9624	5754.9622	5754.9616
Max. Deviation (MHz)	0.0368	0.0376	0.0378	0.0384
Max. Deviation (ppm)	6.39	6.53	6.57	6.67
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5754.9597	5754.9589	5754.9579	5754.9572
10	5754.9617	5754.9607	5754.9599	5754.9594
20	5754.9635	5754.9627	5754.9621	5754.9616
30	5754.9958	5754.9955	5754.9949	5754.9946
40	5754.9976	5754.9967	5754.9963	5754.9954
50	5754.9645	5754.9642	5754.9639	5754.9634
Max. Deviation (MHz)	0.0426	0.0433	0.0442	0.0450
Max. Deviation (ppm)	7.40	7.52	7.68	7.82
Result	Pass			

Mode: 80 MHz / Ant. 6

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9637	5774.9636	5774.9634	5774.9630
110.00	5774.9635	5774.9630	5774.9625	5774.9623
93.50	5774.9629	5774.9621	5774.9614	5774.9605
Max. Deviation (MHz)	0.0371	0.0379	0.0386	0.0395
Max. Deviation (ppm)	6.42	6.56	6.68	6.84
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5774.9614	5774.9613	5774.9608	5774.9601
10	5774.9625	5774.9621	5774.9612	5774.9610
20	5774.9635	5774.9626	5774.9618	5774.9609
30	5774.9958	5774.9952	5774.9947	5774.9939
40	5774.9969	5774.9960	5774.9958	5774.9957
50	5774.9655	5774.9649	5774.9645	5774.9639
Max. Deviation (MHz)	0.0421	0.0429	0.0435	0.0442
Max. Deviation (ppm)	7.29	7.43	7.53	7.65
Result	Pass			