

FCC Test Report

FCC ID : IPH-04780
Equipment : IVI Unit
Model No. : TGWW
Brand Name : GARMIN
Applicant : Garmin International, Inc.
Address : 1200 E. 151st Street Olathe, KS 66062 United States
Standard : 47 CFR FCC Part 15.407
Received Date : Dec. 15, 2023
Tested Date : Dec. 18 ~ Dec. 29, 2023

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

Approved by:



Along Chen / Assistant Manager



Gary Chang / Manager

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Appendix A. Emission Bandwidth

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Release Record

Report No.	Version	Description	Issued Date
FR3D1301AN	Rev. 01	Initial issue	Jan. 25, 2024

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emissions	Note ¹	N/A
15.407(b) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 40.11MHz 32.58 (Margin -7.42dB) - PK	Pass
15.407(a)	Emission Bandwidth	Meet the requirement of limit	Pass
15.407(e)	6dB bandwidth	Meet the requirement of limit	Pass
15.407(a)	Conducted Output Power	Max Power [dBm]: 5725~5850MHz: 5.75	Pass
15.407(a)	Power Spectral Density	Meet the requirement of limit	Pass
15.407(g)	Frequency Stability	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

N/A means Not Applicable.

Note¹: The EUT consumes DC power from battery, so the test is not required.

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.

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
5725-5850	a	5745-5825	149-165 [5]	2	6-54 Mbps
5725-5850	n (HT20)	5745-5825	149-165 [5]	2	MCS 0-15
5725-5850	ac (VHT20)	5745-5825	149-165 [5]	2	MCS 0-9

Note: OFDM BPSK, QPSK, 16QAM, 64QAM and 256QAM modulation.

1.1.2 Antenna Details

Ant. No.	Brand	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)	
					2400~2483.5	5725~5850
1	HARADA	39215	RHCP	R-SMA	0.3	-0.3
2	HARADA	39216	RHCP	R-SMA	1.2	0.8

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc
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1.1.4 Accessories

N/A

1.1.5 Channel List

Channel	Frequency(MHz)
149	5745
153	5765
157	5785
161	5805
165	5825

1.1.6 Test Tool and Duty Cycle

Test Tool	adb tool		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11a	95.83%	0.18
	HT20	93.73%	0.28
	VHT20	86.95%	0.61

1.1.7 Power Index of Test Tool

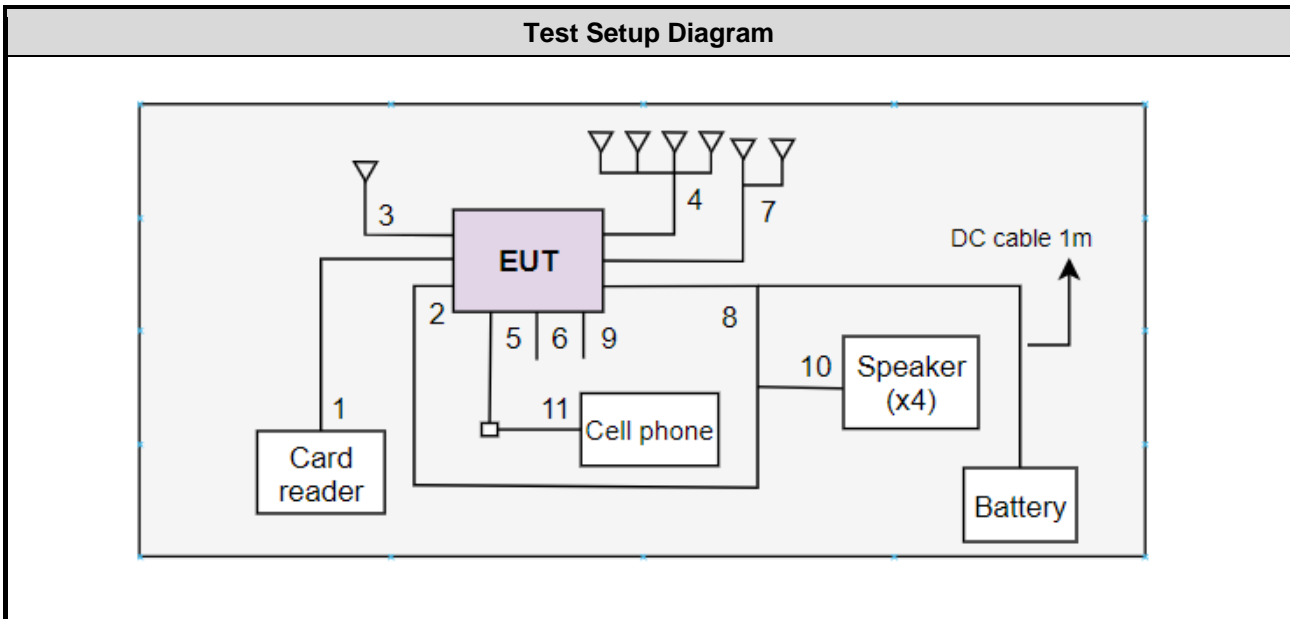
Modulation Mode	Test Frequency (MHz)	Power Index
11a	5745	9
11a	5785	9
11a	5825	9
HT20	5745	9
HT20	5785	9
HT20	5825	9
VHT20	5745	9
VHT20	5785	9
VHT20	5825	9

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Card reader	TCSTAR	TYC-MF007	---	---
2	12V DC Battery	Hotai Motor Co, Ltd.	S55B24LS	---	---
3	Cell phone	SAMSUNG	A8	---	---
4	Speaker	GARMIN	TG SPK	---	Provided by applicant.
5	Fixture Board	GARMIN	TG_FB	---	Provided by applicant.
6	Laptop	DELL	Latitude E5470	DoC	---

Note: The fixture board and laptop are disconnected from EUT and removed from test table when EUT is set to transmit continuously.

1.3 Test Setup Chart



No.	Signal cable / Length (m)
1	USB, 1m shielded. (Brand: GARMIN / Model: TG_USB2)
2	IVI cable, 0.81m shielded. (Brand: GARMIN / Model: TG_IVI)
3	Antenna cable, 0.34m shielded. (Brand: GARMIN / Model: TG_BT2)
4	Antenna cable, 2.76m shielded. (Brand: GARMIN / Model: TG_1to4)
5	USB, 0.36m shielded. (Brand: GARMIN / Model: TG_USB1)
6	LVDS cable, 0.56m shielded. (Brand: GARMIN / Model: TG_LVDS)
7	Antenna cable, 2.85m shielded. (Brand: GARMIN / Model: TG_1to2)
8	EAU cable, 0.81m shielded. (Brand: GARMIN / Model: TG_EAU)
9	SXM cable, 0.3m shielded. (Brand: GARMIN / Model: TG_SXM)
10	Audio cable, 0.42m shielded. (Brand: GARMIN / Model: TG_SPK)
11	USB, 0.55m shielded. (Brand: GARMIN / Model: 320-01643-0A)

1.4 The Equipment List

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Dec. 18 ~ Dec. 25, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 03, 2023	Mar. 02, 2024
Spectrum Analyzer	R&S	FSV40	101498	Nov. 23, 2023	Nov. 22, 2024
Loop Antenna	R&S	HFH2-Z2	100330	Oct. 31, 2023	Oct. 30, 2024
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 31, 2023	Jul. 30, 2024
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Nov. 27, 2023	Nov. 26, 2024
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 30, 2023	Oct. 29, 2024
Preamplifier	EMC	EMC02325	980225	Jun. 28, 2023	Jun. 27, 2024
Preamplifier	EMC	EMC118A45SE	980898	Jul. 14, 2023	Jul. 13, 2024
Preamplifier	EMC	EMC184045SE	980903	Jul. 17, 2023	Jul. 16, 2024
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 03, 2023	Oct. 02, 2024
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 03, 2023	Oct. 02, 2024
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 03, 2023	Oct. 02, 2024
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 03, 2023	Oct. 02, 2024
RF Cable	EMC	EMC104-35M-35M- 8000	210920	Oct. 03, 2023	Oct. 02, 2024
RF Cable	EMC	EMC104-35M-35M- 3000	210922	Oct. 03, 2023	Oct. 02, 2024
Attenuator	Pasternack	PE7005-10	10-1	Oct. 05, 2023	Oct. 04, 2024
HIGHPASS FILTER 7.5-18G	STI	STI15-9722	STI-HP7.5G-A	Oct. 05, 2023	Oct. 04, 2024
Measurement Software	Sporton	SENSE-15407_NII	V5.11	NA	NA
Measurement Software	Sporton	SENSE-EMI	V5.10.8	NA	NA

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

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Dec. 29, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101910	Apr. 14, 2023	Apr. 13, 2024
Power Meter	Anritsu	ML2495A	1241002	Nov. 21, 2023	Nov. 20, 2024
Power Sensor	Anritsu	MA2411B	1207366	Nov. 21, 2023	Nov. 20, 2024
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Jun. 21, 2023	Jun. 20, 2024
AC POWER SOURCE	APC	AFC-500W	F312060012	Dec. 16, 2023	Dec. 15, 2024
Attenuator	Pasternack	PE7005-10	10-2	Oct. 05, 2023	Oct. 04, 2024
Measurement Software	Sporton	SENSE-15407_NII	V5.11	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.407
ANSI C63.10-2013

1.6 Reference Guidance

FCC KDB 412172 D01 Determining ERP and EIRP v01r01
FCC KDB 662911 D01 Multiple Transmitter Output v02r01
FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01

1.7 Deviation from Test Standard and Measurement Procedure

None

1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±34.130 Hz
Conducted power	±0.808 dB
Frequency error	±1×10 ⁻⁹
Power density	±0.583 dB
Conducted emission	±2.715 dB
AC conducted emission	±2.92 dB
Unwanted Emission ≤ 1GHz	±3.41 dB
Unwanted Emission > 1GHz	±4.59 dB
Time	±0.1%
Temperature	±0.4 °C

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	03CH01-WS, TH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Unwanted Emissions ≤1GHz	11a	5825	6 Mbps	---
Unwanted Emissions >1GHz	11a	5745 / 5785 / 5825	6 Mbps	---
Conducted Output Power	HT20	5745 / 5785 / 5825	MCS 0	
Emission Bandwidth	VHT20	5755 / 5795	MCS 0	
Power Spectral Density				
Frequency Stability	Un-modulation	5785	---	---

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.

3 Transmitter Test Results

3.1 Emission Bandwidth

3.1.1 Limit of Emission Bandwidth

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

3.1.2 Test Procedures

26dB Bandwidth

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW, Detector = Peak.
3. Trace mode = max hold.
4. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.

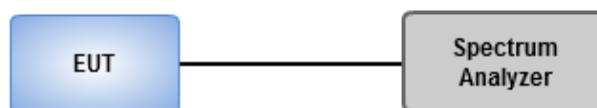
Occupied Bandwidth

1. Set RBW = 1 % to 5 % of the OBW.
2. Set VBW \geq 3 RBW.
3. Sample detection and single sweep mode shall be used.
4. Use the 99 % power bandwidth function of the instrument.

6dB Bandwidth

1. Set RBW = 100kHz, VBW = 300kHz.
2. Detector = Peak, Trace mode = max hold.
3. Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.1.3 Test Setup



3.1.4 Test Results

Ambient Condition	22°C / 63%	Tested By	Roger Lu
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Refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Limit of Conducted Output Power

Frequency Band (MHz)	Limit
<input checked="" type="checkbox"/> 5725 ~ 5850	Conducted Power: 1 W
Note: "B" is the 26dB emission bandwidth in MHz.	

3.2.2 Test Procedures

Method PM-G (Measurement using a gated RF average power meter)

Measurements is performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.2.3 Test Setup



3.2.4 Test Results

Ambient Condition	22°C / 63%	Tested By	Roger Lu
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Refer to Appendix B.

3.3 Power Spectral Density

3.3.1 Limit of Power Spectral Density

Frequency Band (MHz)	Limit
<input checked="" type="checkbox"/> 5725 ~ 5850	30 dBm /500 kHz

3.3.2 Test Procedures

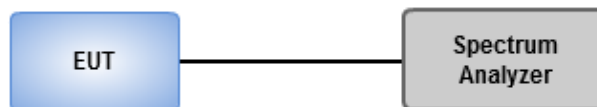
Duty cycle \geq 98 %

1. Set RBW = 500 kHz, VBW = 3 MHz, Sweep time = auto, Detector = RMS.
2. Trace average 100 traces.
3. Use the peak marker function to determine the maximum amplitude level.

Duty cycle < 98 %

1. Set RBW = 500 kHz, VBW = 3 MHz, Detector = RMS.
2. Set sweep time \geq 10 * (number of points in sweep) * (total on/off period of the transmitted signal).
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add $10 \log(1/x)$, where x is the duty cycle.

3.3.3 Test Setup



3.3.4 Test Results

Ambient Condition	22°C / 63%	Tested By	Roger Lu
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Refer to Appendix C.

3.4 Unwanted Emissions

3.4.1 Limit of Unwanted Emissions

Restricted Band Emissions 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:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

Un-restricted band emissions above 1GHz Limit	
Operating Band	Limit
5.725 - 5.850 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 Test Procedures

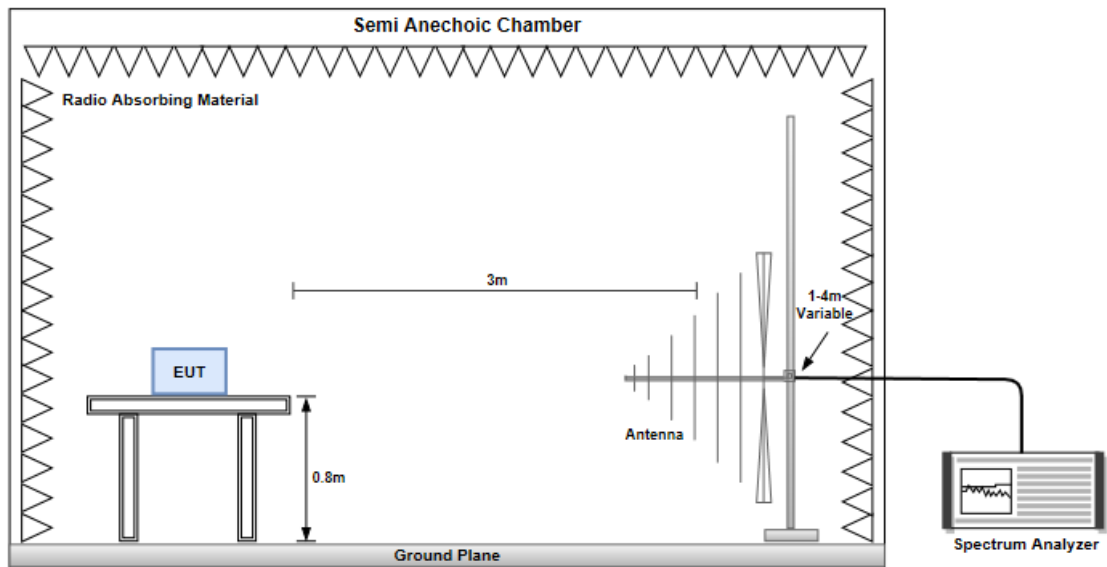
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

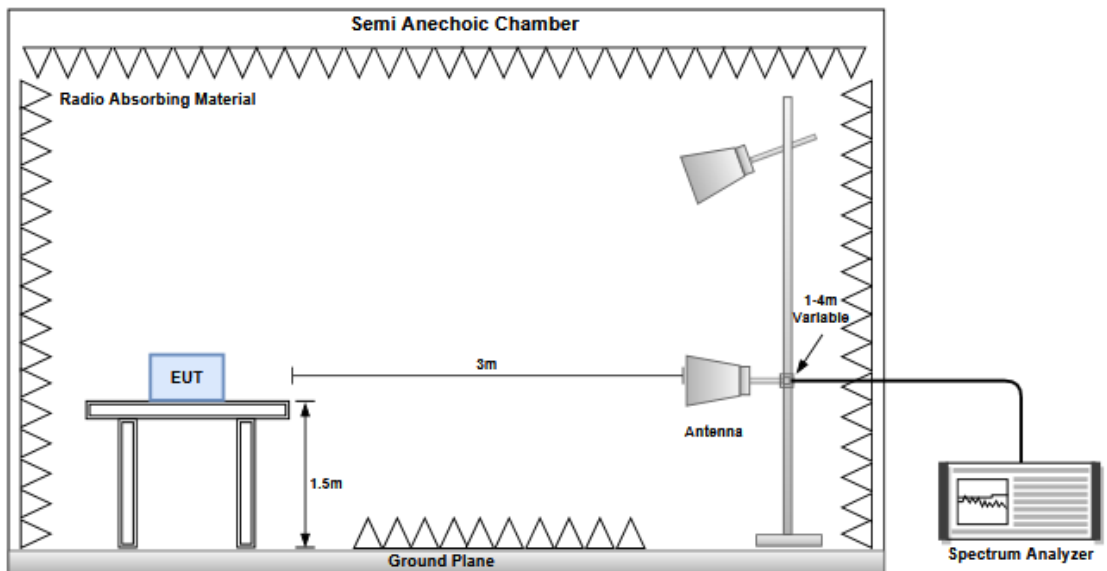
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.4.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.4.4 Test Results

Refer to Appendix D.

3.5 Frequency Stability

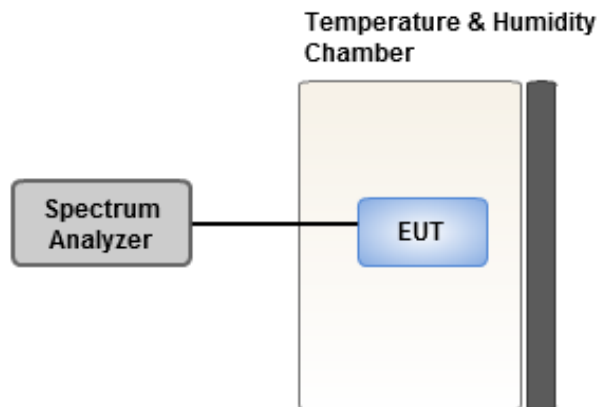
3.5.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

3.5.2 Test Procedures

1. The EUT is installed in an environment test chamber with external power source.
2. Set the chamber to operate at 20 centigrade and external power source to output at nominal voltage of EUT.
3. A sufficient stabilization period at each temperature is used prior to each frequency measurement.
4. When temperature is stabled, measure the frequency stability.
5. The test shall be performed under normal and extreme condition for temperature and voltage.

3.5.3 Test Setup



3.5.4 Test Results

Ambient Condition	22°C / 63%	Tested By	Roger Lu
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Refer to Appendix E.

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou
District, New Taipei City, Taiwan
(R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)
No.2-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666

Fax: 886-3-318-0345

Email: ICC_Service@icertifi.com.tw

==END==



Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	15.642M	16.255M	16M3D1D	14.982M	16.228M
802.11n HT20_Nss1,(MCS0)_2TX	15.114M	17.382M	17M4D1D	14.652M	17.371M
802.11ac VHT20_Nss1,(MCS0)_2TX	15.708M	17.412M	17M4D1D	15.048M	17.359M

Max-N dB = Maximum 6dB down bandwidth
 Max-OBW = Maximum 99% occupied bandwidth;
 Min-N dB = Minimum 6dB down bandwidth
 Min-OBW = Minimum 99% occupied bandwidth

Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5745MHz	Pass	500k	15.114M	16.234M	14.982M	16.255M
5785MHz	Pass	500k	15.246M	16.228M	14.982M	16.252M
5825MHz	Pass	500k	15.642M	16.231M	14.982M	16.253M
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5745MHz	Pass	500k	14.652M	17.371M	15.114M	17.373M
5785MHz	Pass	500k	14.916M	17.382M	14.982M	17.379M
5825MHz	Pass	500k	14.982M	17.382M	15.048M	17.38M
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5745MHz	Pass	500k	15.048M	17.361M	15.642M	17.406M
5785MHz	Pass	500k	15.048M	17.363M	15.114M	17.412M
5825MHz	Pass	500k	15.048M	17.359M	15.708M	17.411M

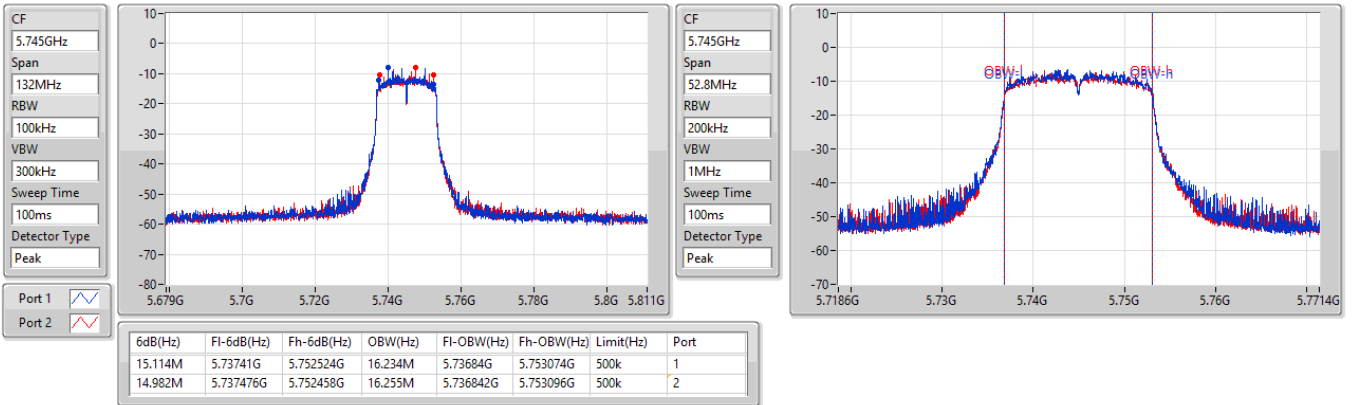
Port X-N dB = Port X 6dB down bandwidth
 Port X-OBW = Port X 99% occupied bandwidth



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

EBW

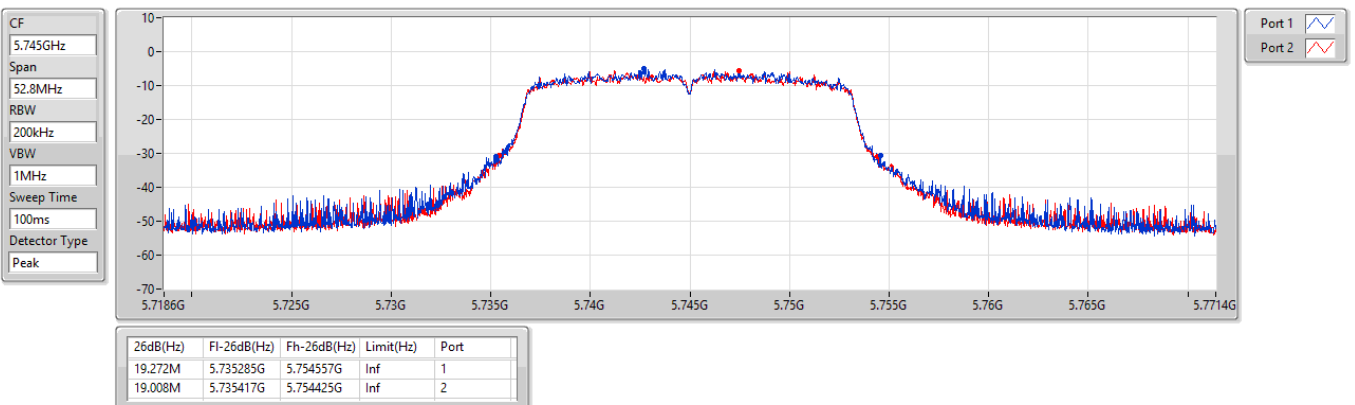
5745MHz



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

EBW

5745MHz

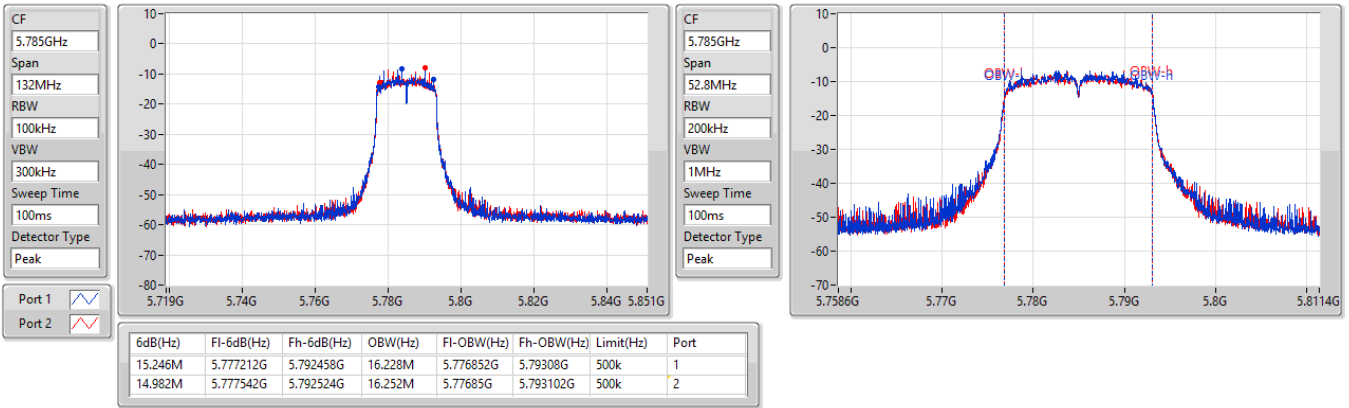




5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

EBW

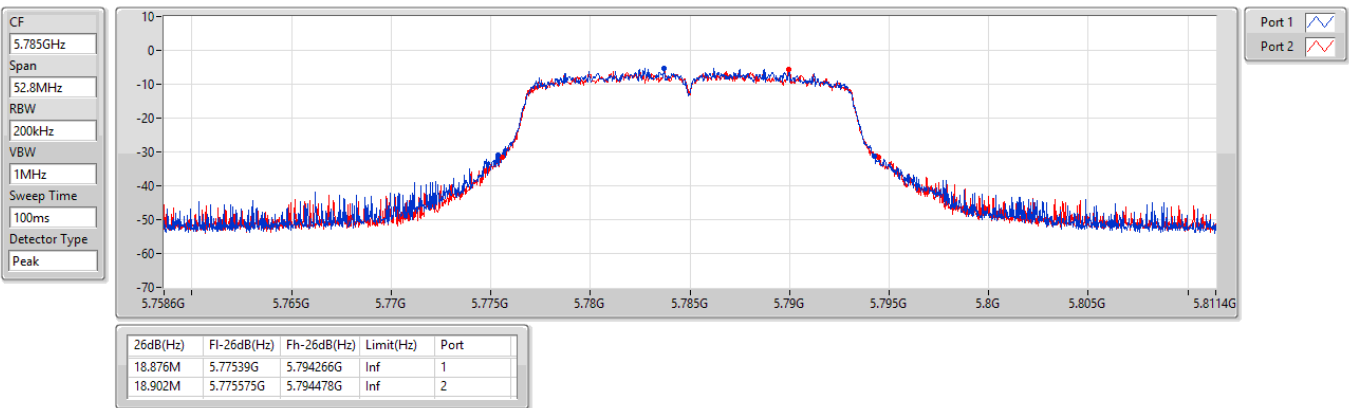
5785MHz



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

EBW

5785MHz

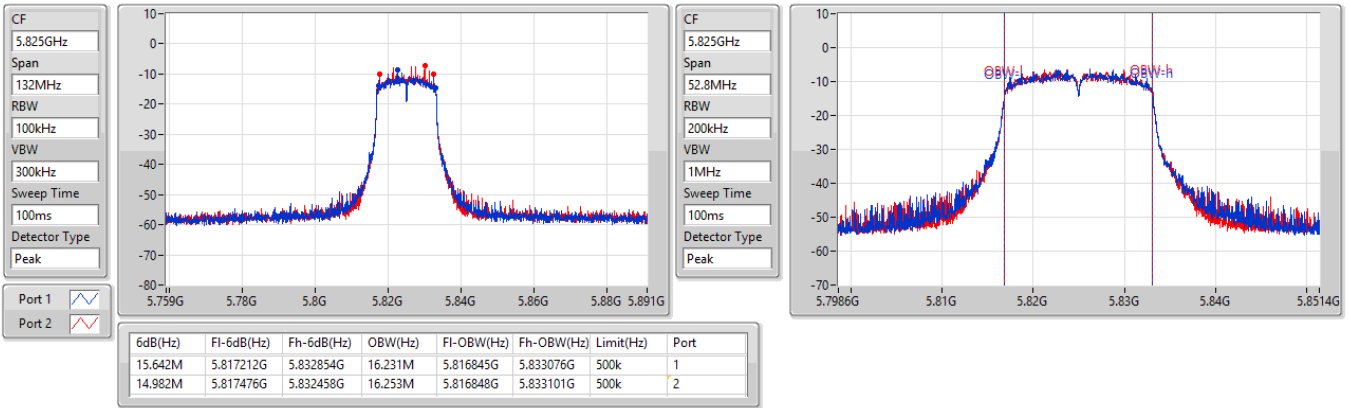




5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

EBW

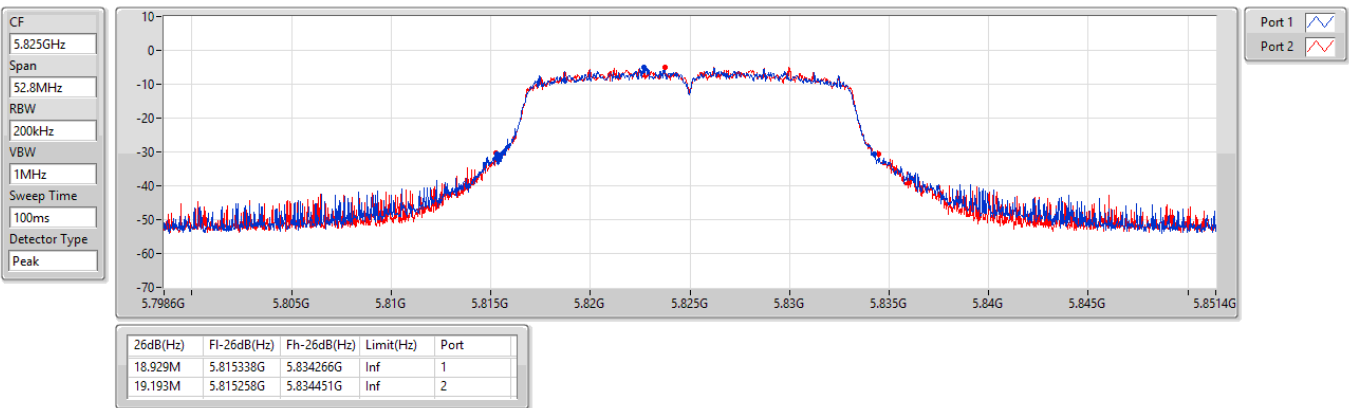
5825MHz



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

EBW

5825MHz

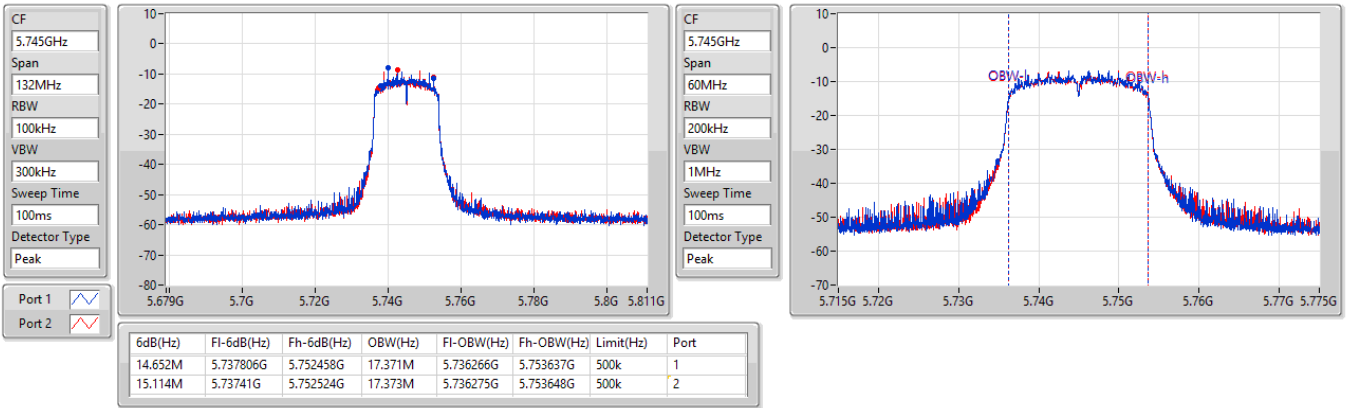




5.725-5.85GHz_802.11n HT20_Nss1,(MCS0)_2TX

EBW

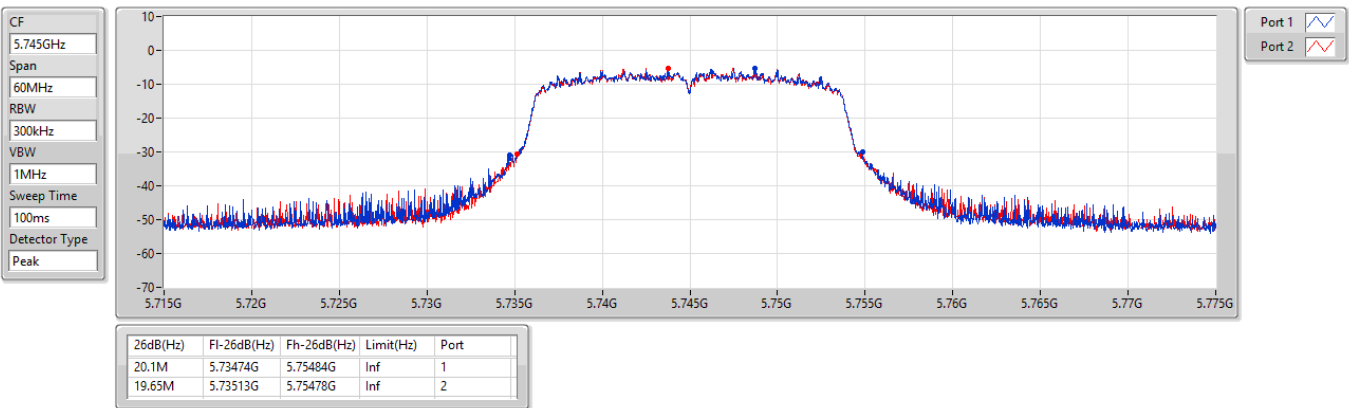
5745MHz



5.725-5.85GHz_802.11n HT20_Nss1,(MCS0)_2TX

EBW

5745MHz

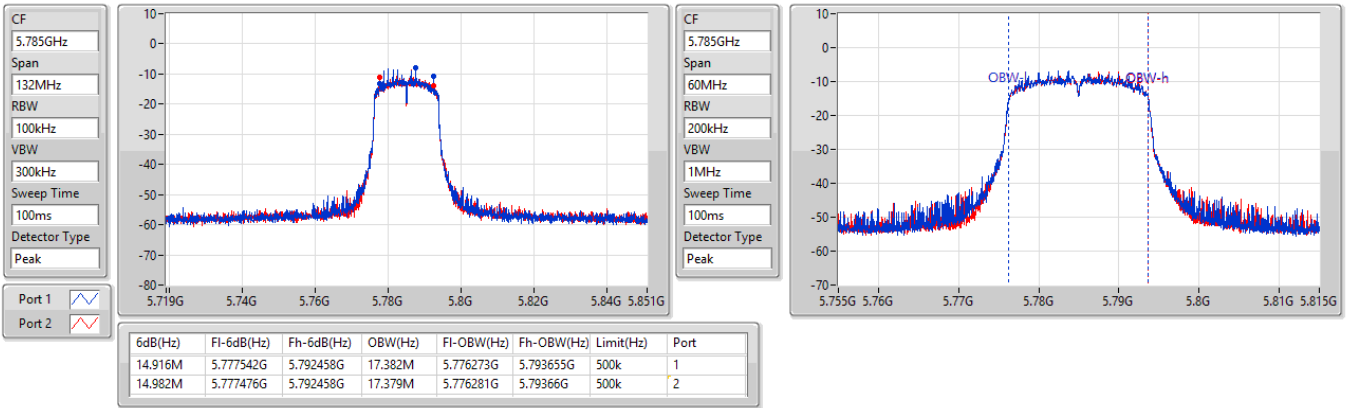




5.725-5.85GHz_802.11n HT20_Nss1,(MCS0)_2TX

EBW

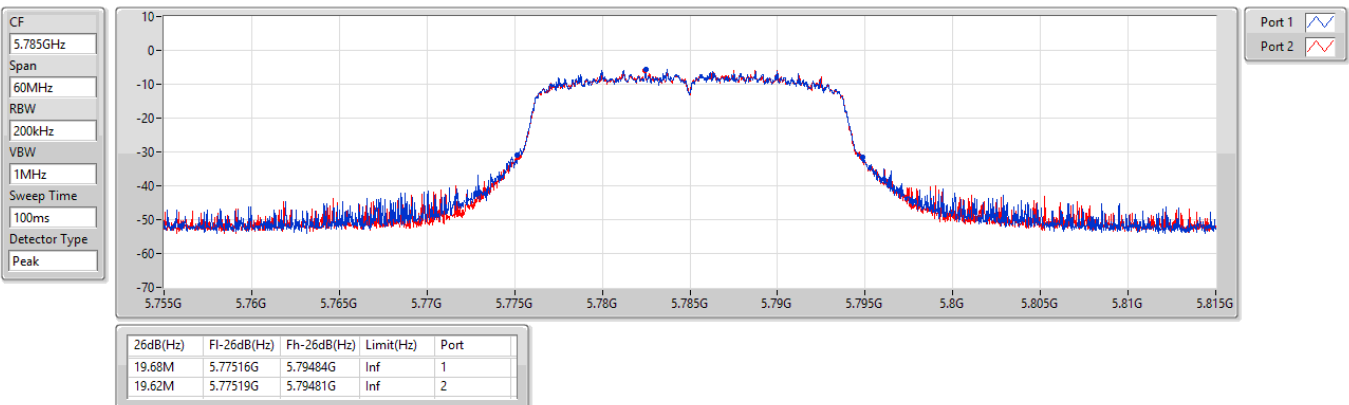
5785MHz



5.725-5.85GHz_802.11n HT20_Nss1,(MCS0)_2TX

EBW

5785MHz



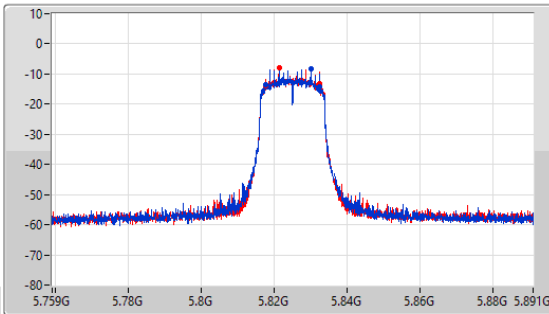


5.725-5.85GHz_802.11n HT20_Nss1,(MCS0)_2TX

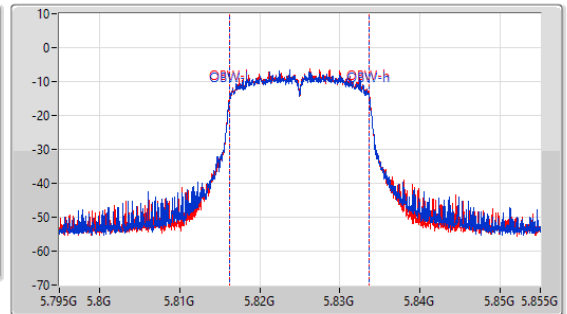
EBW

5825MHz

CF
5.825GHz
Span
132MHz
RBW
100kHz
VBW
300kHz
Sweep Time
100ms
Detector Type
Peak



CF
5.825GHz
Span
60MHz
RBW
200kHz
VBW
1MHz
Sweep Time
100ms
Detector Type
Peak



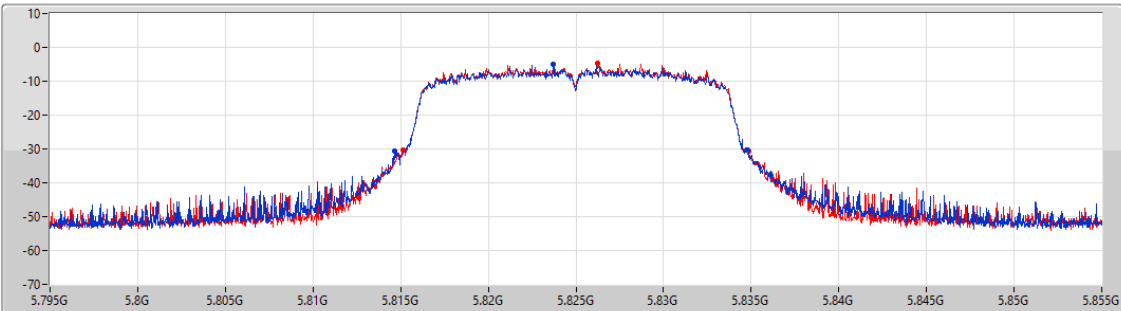
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
14.982M	5.817542G	5.832524G	17.382M	5.816272G	5.833654G	500k	1
15.048M	5.817476G	5.832524G	17.38M	5.81628G	5.83366G	500k	2

5.725-5.85GHz_802.11n HT20_Nss1,(MCS0)_2TX

EBW

5825MHz

CF
5.825GHz
Span
60MHz
RBW
300kHz
VBW
1MHz
Sweep Time
100ms
Detector Type
Peak



Port 1
Port 2

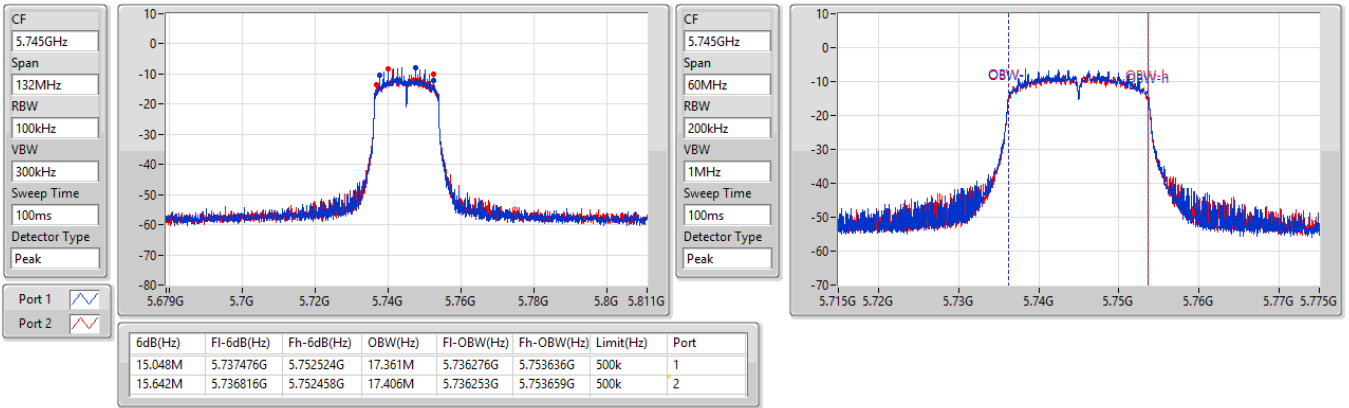
26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	Limit(Hz)	Port
20.13M	5.81468G	5.83481G	Inf	1
19.74M	5.81513G	5.83487G	Inf	2



5.725-5.85GHz_802.11ac VHT20_Nss1,(MCS0)_2TX

EBW

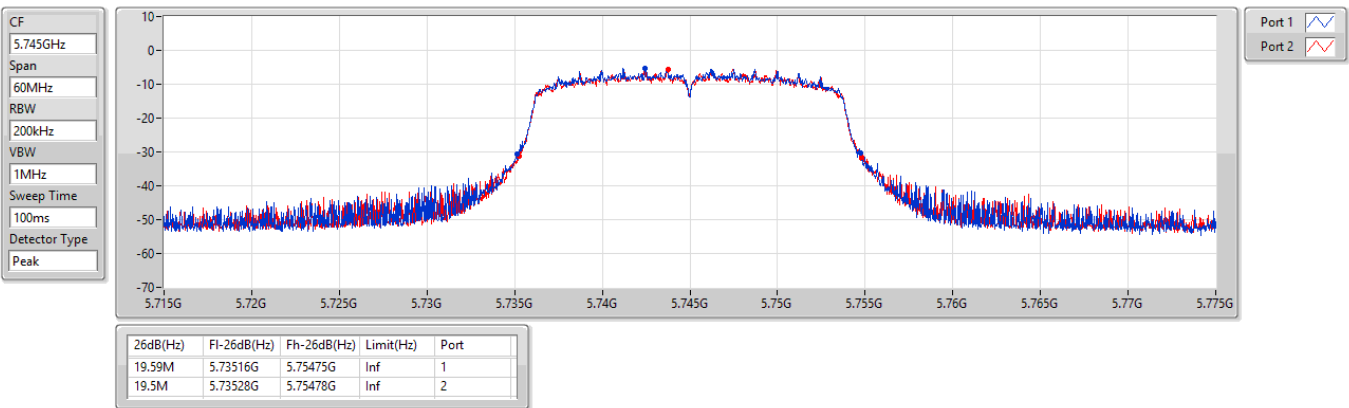
5745MHz



5.725-5.85GHz_802.11ac VHT20_Nss1,(MCS0)_2TX

EBW

5745MHz

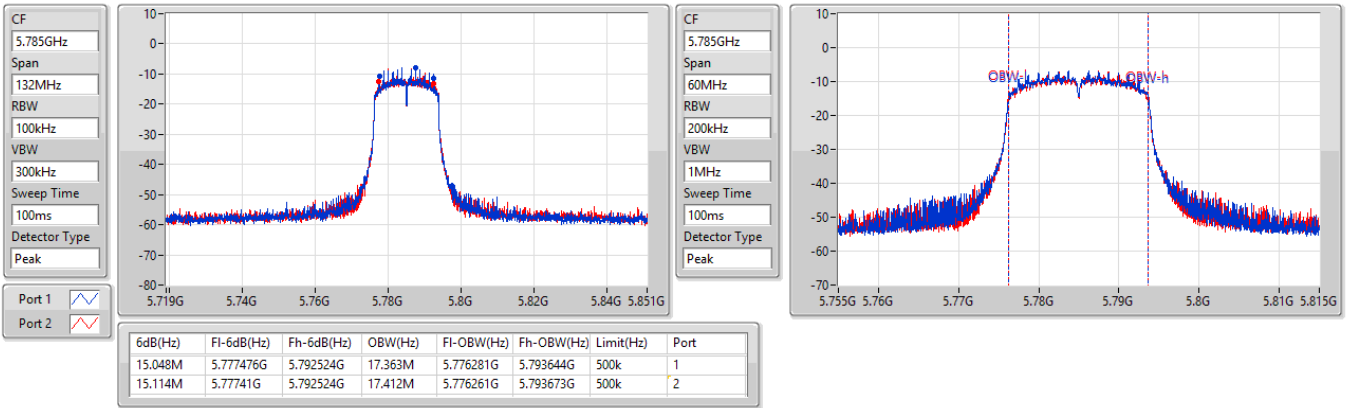




5.725-5.85GHz_802.11ac VHT20_Nss1,(MCS0)_2TX

EBW

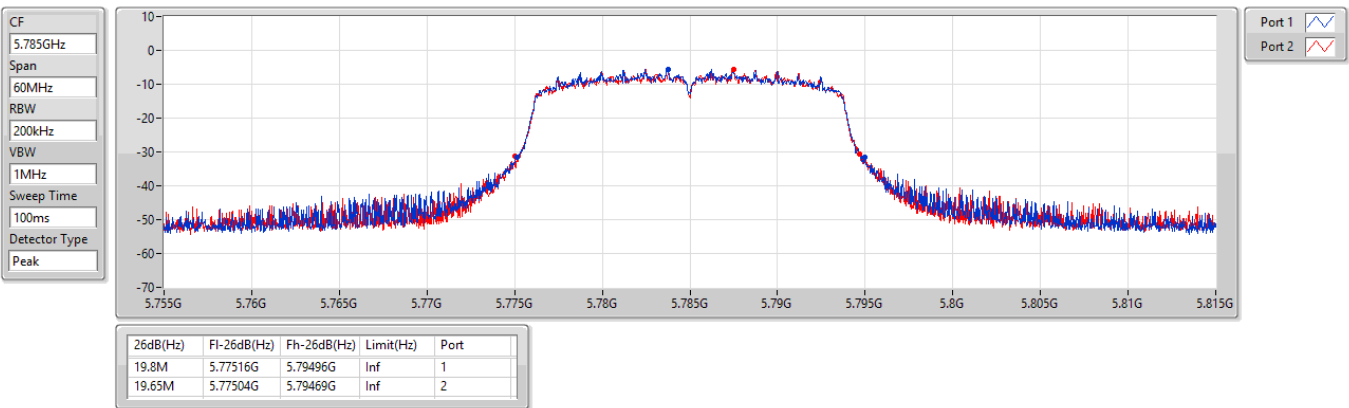
5785MHz



5.725-5.85GHz_802.11ac VHT20_Nss1,(MCS0)_2TX

EBW

5785MHz

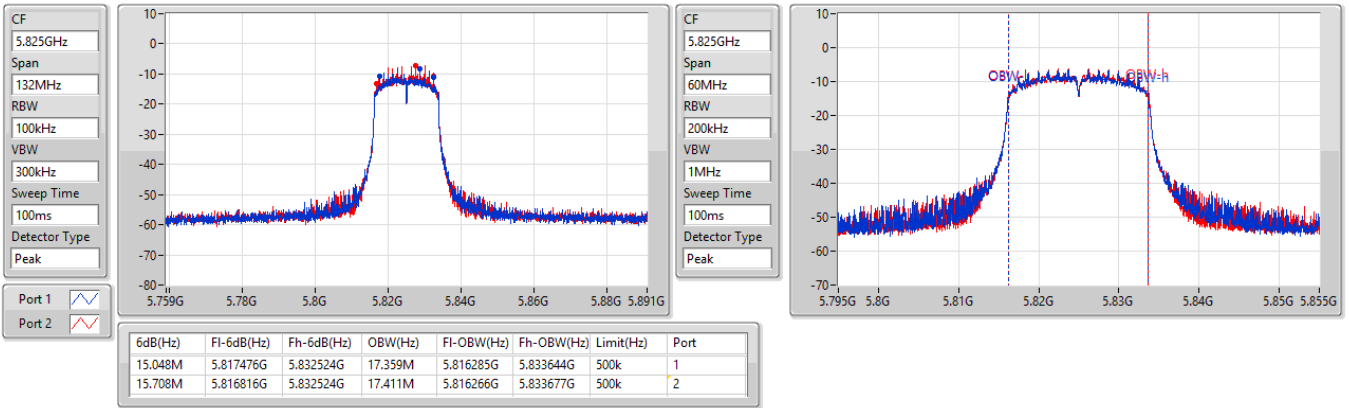




5.725-5.85GHz_802.11ac VHT20_Nss1,(MCS0)_2TX

EBW

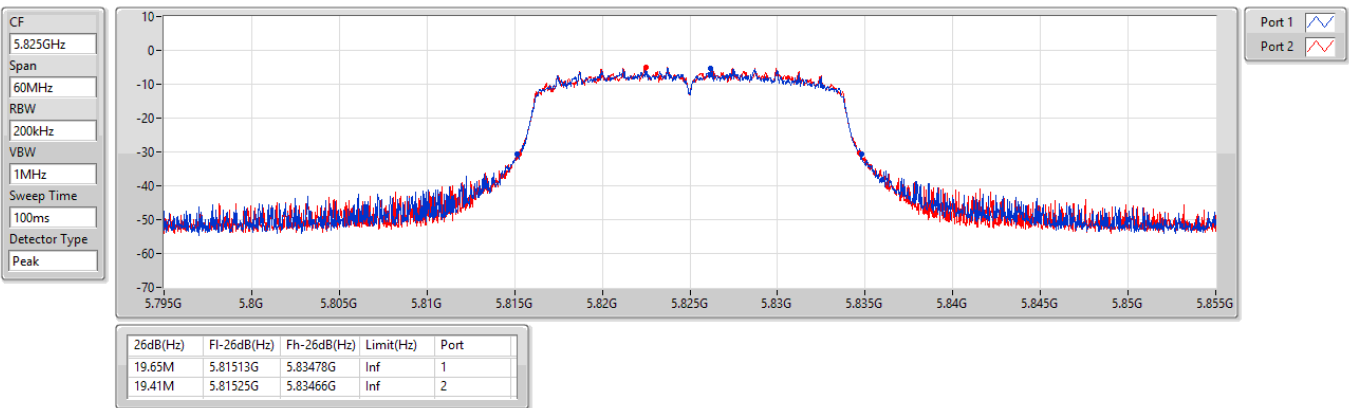
5825MHz



5.725-5.85GHz_802.11ac VHT20_Nss1,(MCS0)_2TX

EBW

5825MHz





Conducted Output Power(Average)

Appendix B

Summary

Mode	Total Power (dBm)	Total Power (W)	EIRP (dBm)	EIRP (W)
5.725-5.85GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	5.75	0.00376	6.55	0.00452
802.11n HT20_Nss1,(MCS0)_2TX	5.61	0.00364	6.41	0.00438
802.11ac VHT20_Nss1,(MCS0)_2TX	5.70	0.00372	6.50	0.00447

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-
5745MHz	Pass	0.80	2.54	2.16	5.36	30.00	6.16	36.00
5785MHz	Pass	0.80	2.45	2.32	5.40	30.00	6.20	36.00
5825MHz	Pass	0.80	2.62	2.85	5.75	30.00	6.55	36.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
5745MHz	Pass	0.80	2.45	2.11	5.29	30.00	6.09	36.00
5785MHz	Pass	0.80	2.32	2.04	5.19	30.00	5.99	36.00
5825MHz	Pass	0.80	2.46	2.73	5.61	30.00	6.41	36.00
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
5745MHz	Pass	0.80	2.42	2.03	5.24	30.00	6.04	36.00
5785MHz	Pass	0.80	2.22	2.16	5.20	30.00	6.00	36.00
5825MHz	Pass	0.80	2.57	2.81	5.70	30.00	6.50	36.00

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



Summary

Mode	PD (dBm/RBW)	EIRP PD (dBm/RBW)
5.725-5.85GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	-7.84	-4.56
802.11n HT20_Nss1,(MCS0)_2TX	-7.76	-4.48
802.11ac VHT20_Nss1,(MCS0)_2TX	-8.27	-4.99

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

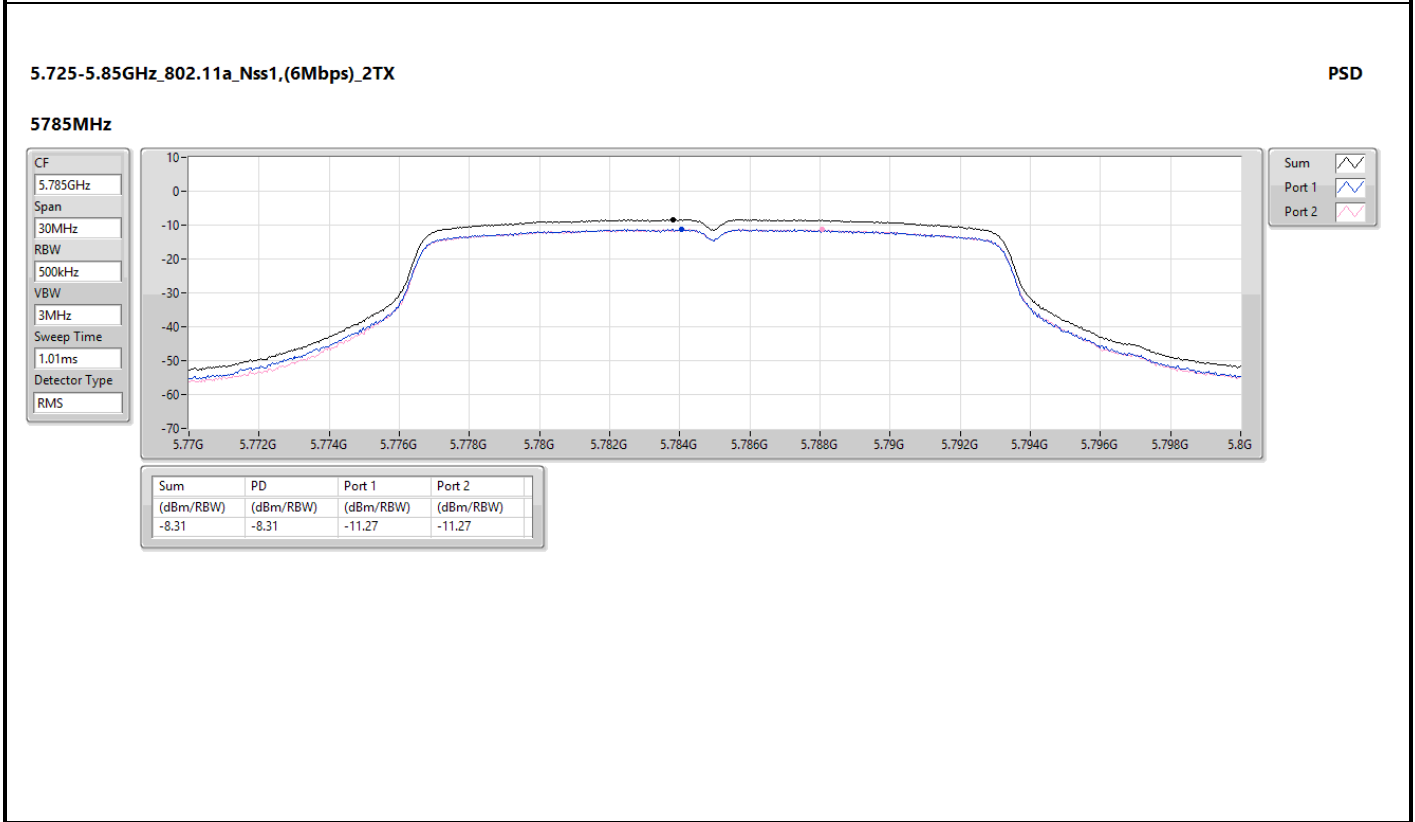
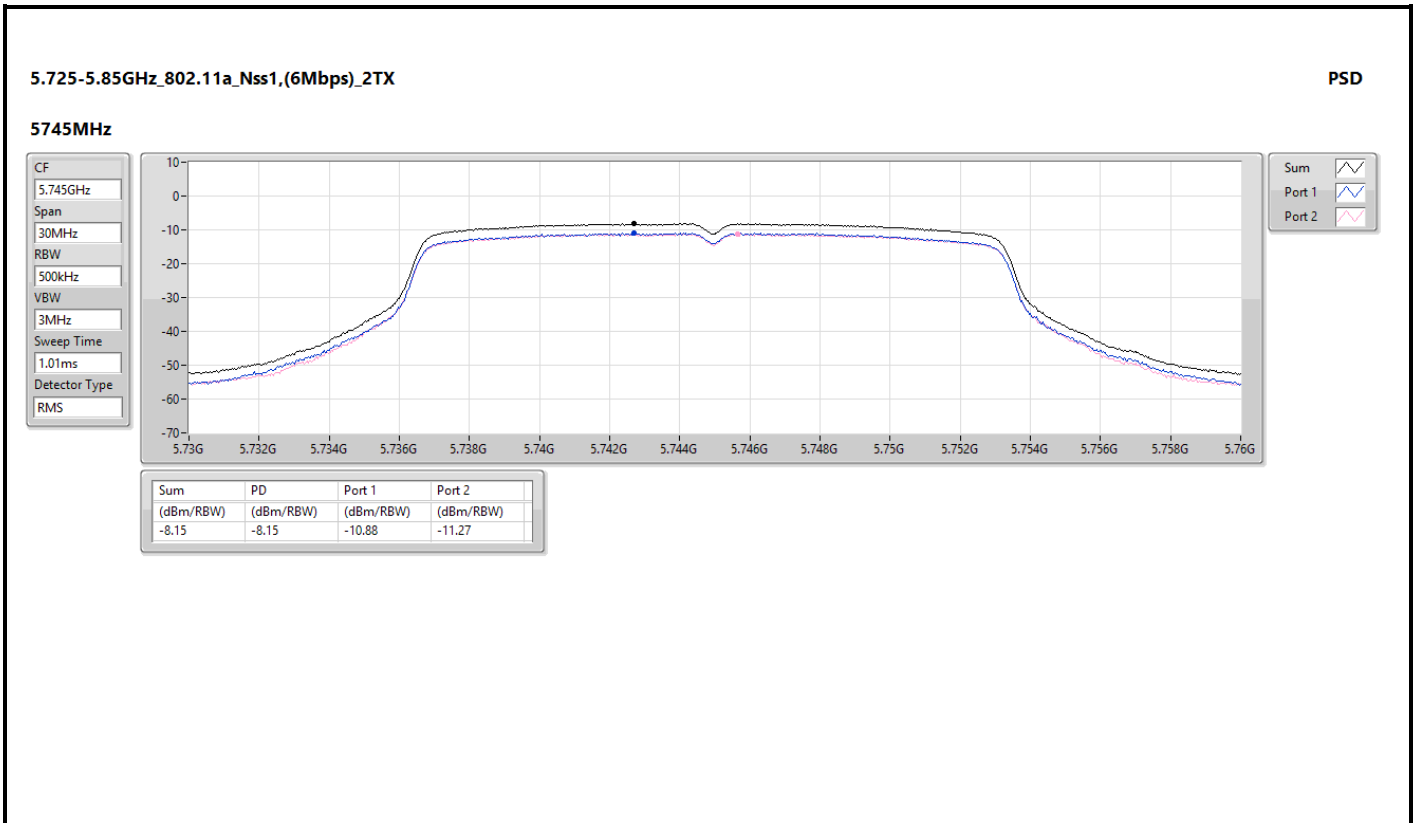
Result

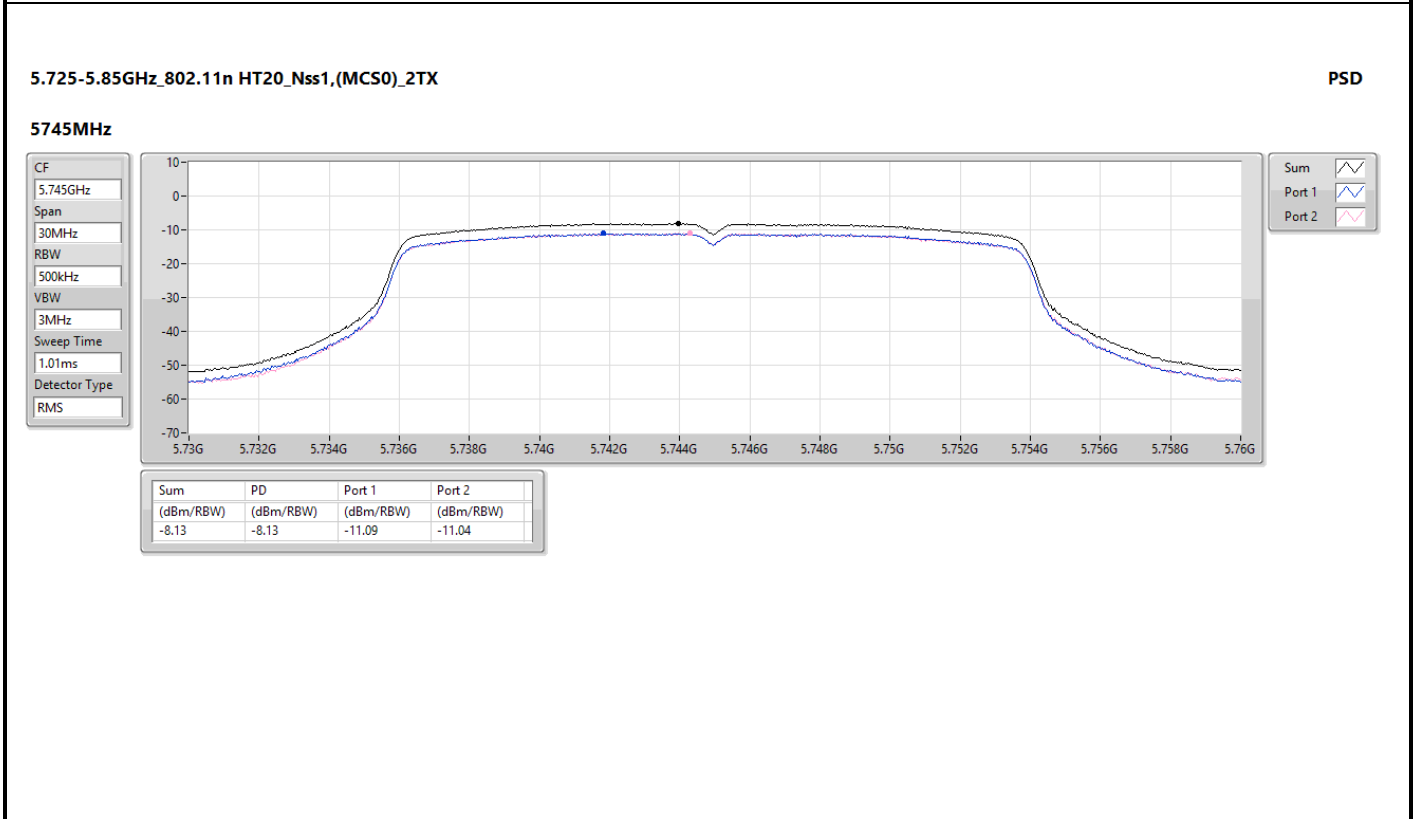
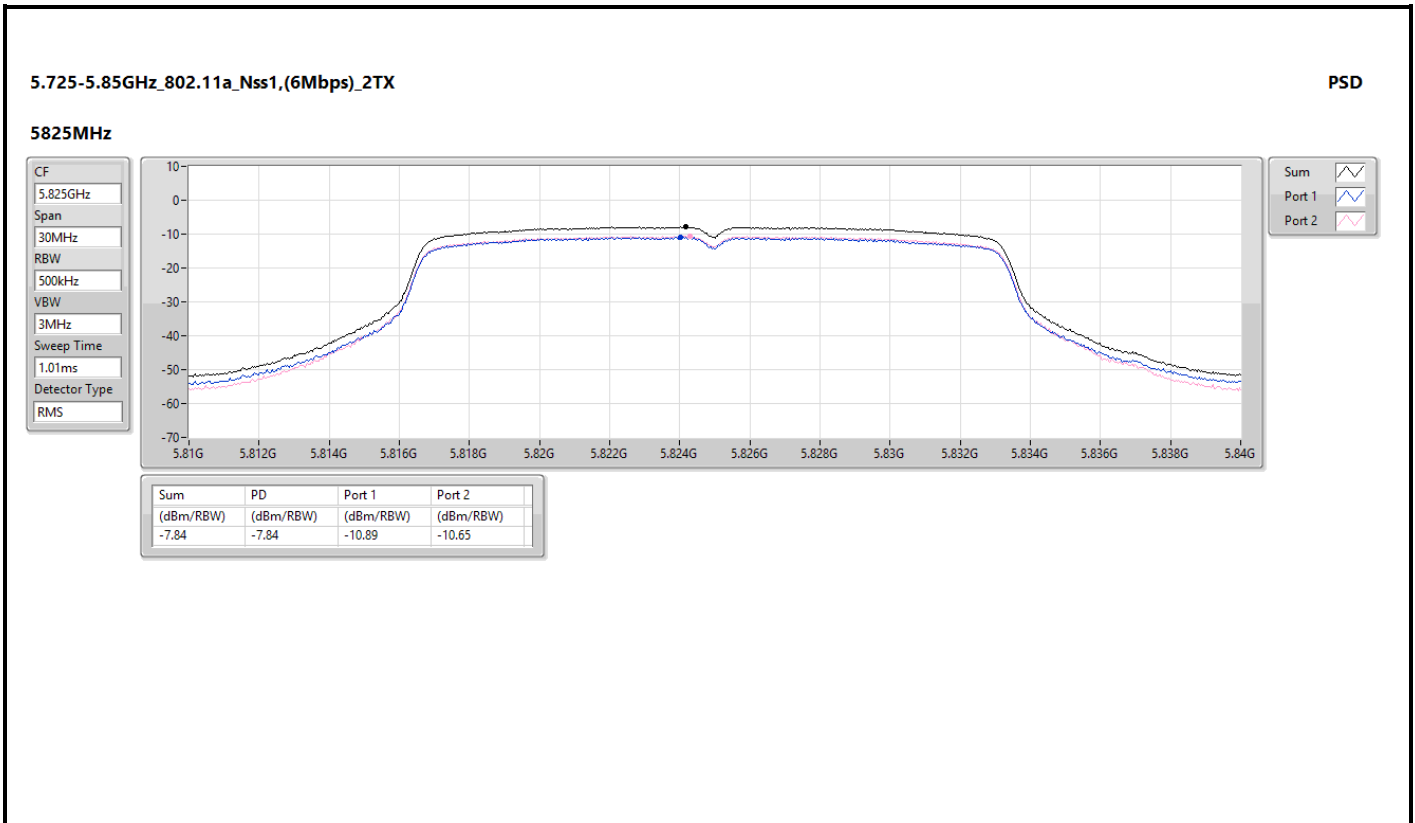
Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)	EIRP PD (dBm/RBW)	EIRP PD Limit (dBm/RBW)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-
5745MHz	Pass	3.28	-10.88	-11.27	-8.15	30.00	-4.87	36.00
5785MHz	Pass	3.28	-11.27	-11.27	-8.31	30.00	-5.03	36.00
5825MHz	Pass	3.28	-10.89	-10.65	-7.84	30.00	-4.56	36.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
5745MHz	Pass	3.28	-11.09	-11.04	-8.13	30.00	-4.85	36.00
5785MHz	Pass	3.28	-11.22	-11.25	-8.33	30.00	-5.05	36.00
5825MHz	Pass	3.28	-10.96	-10.47	-7.76	30.00	-4.48	36.00
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
5745MHz	Pass	3.28	-11.26	-11.44	-8.63	30.00	-5.35	36.00
5785MHz	Pass	3.28	-11.82	-11.79	-8.90	30.00	-5.62	36.00
5825MHz	Pass	3.28	-11.29	-11.04	-8.27	30.00	-4.99	36.00

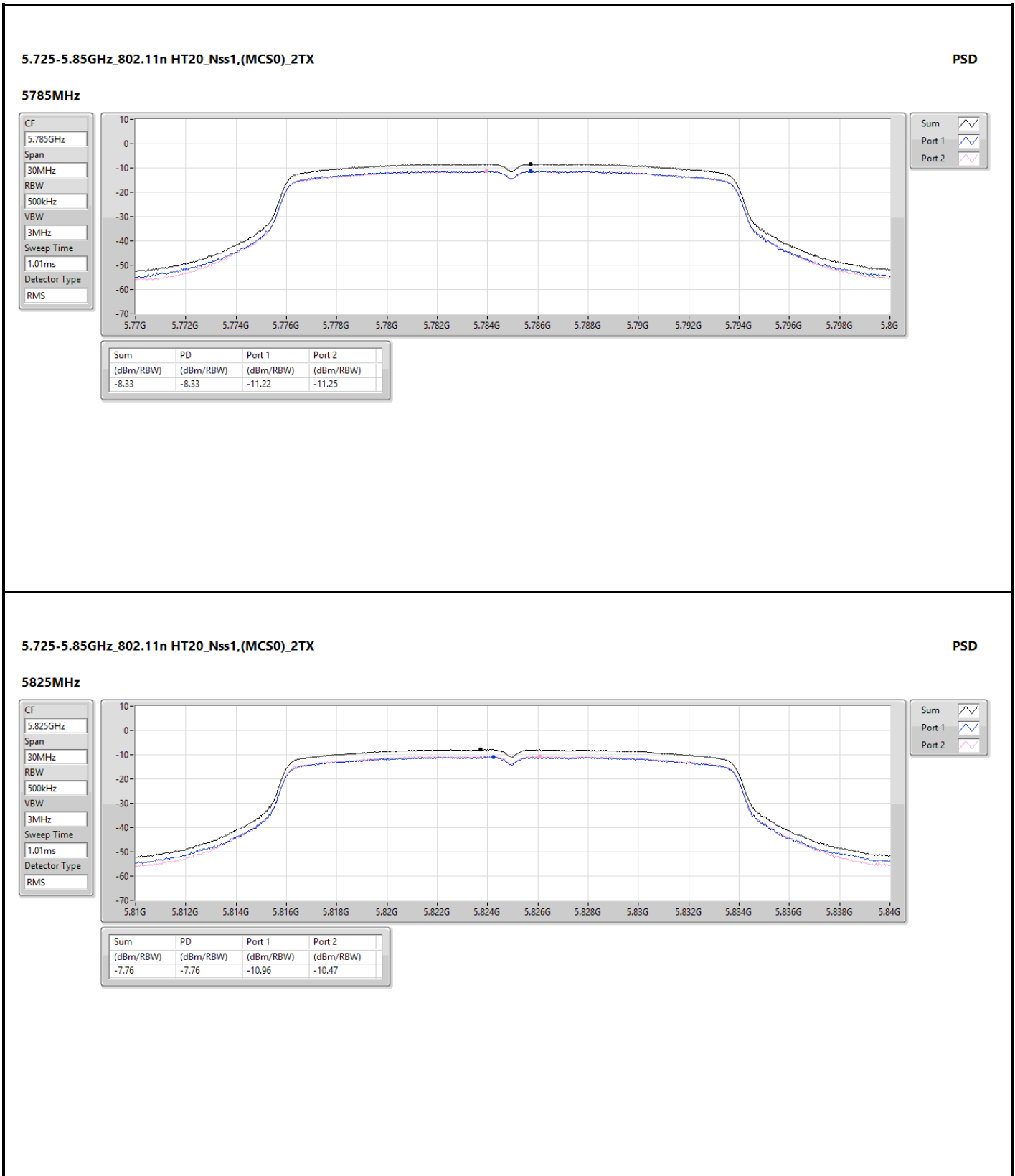
DG = Directional Gain; RBW = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

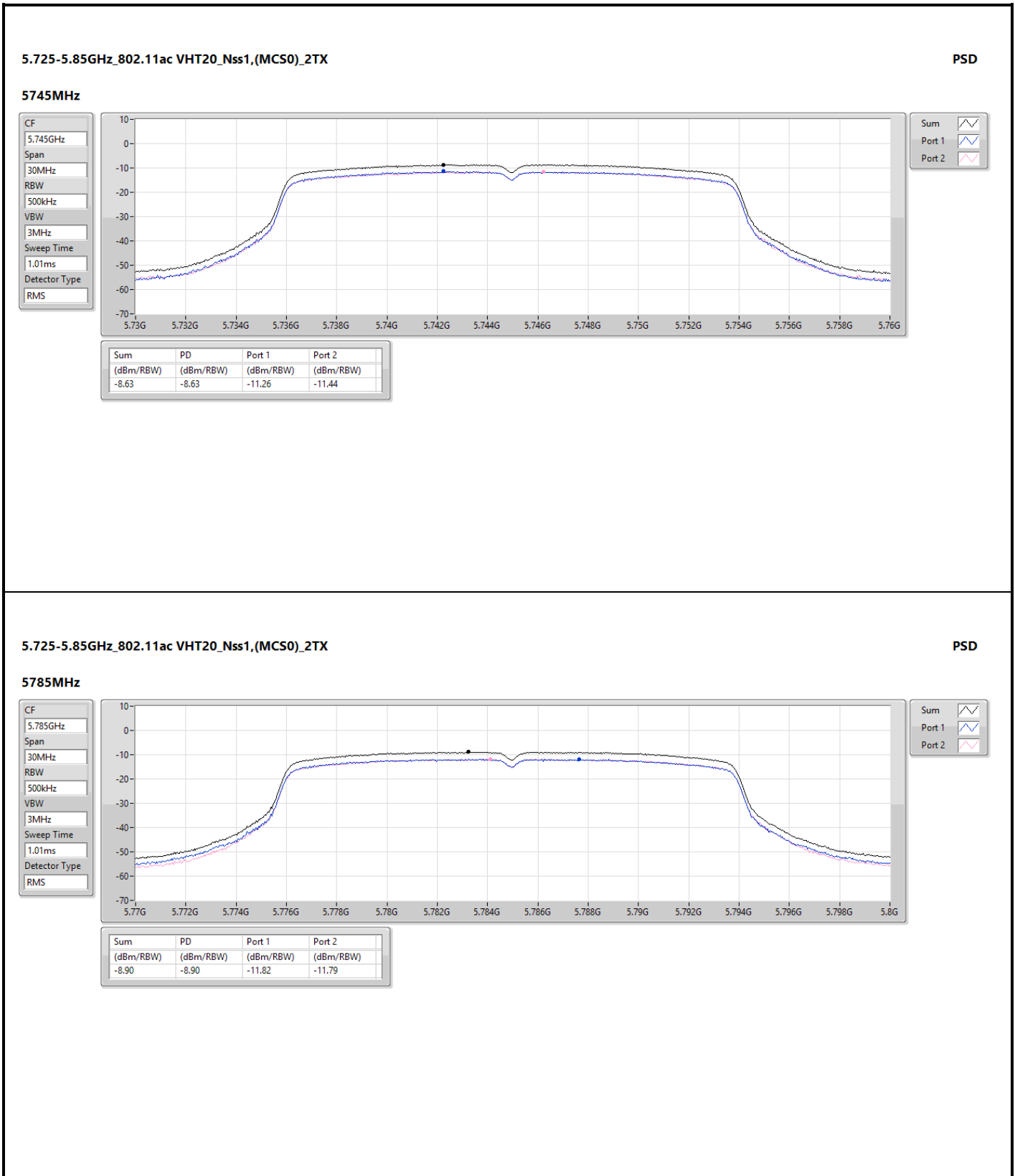
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

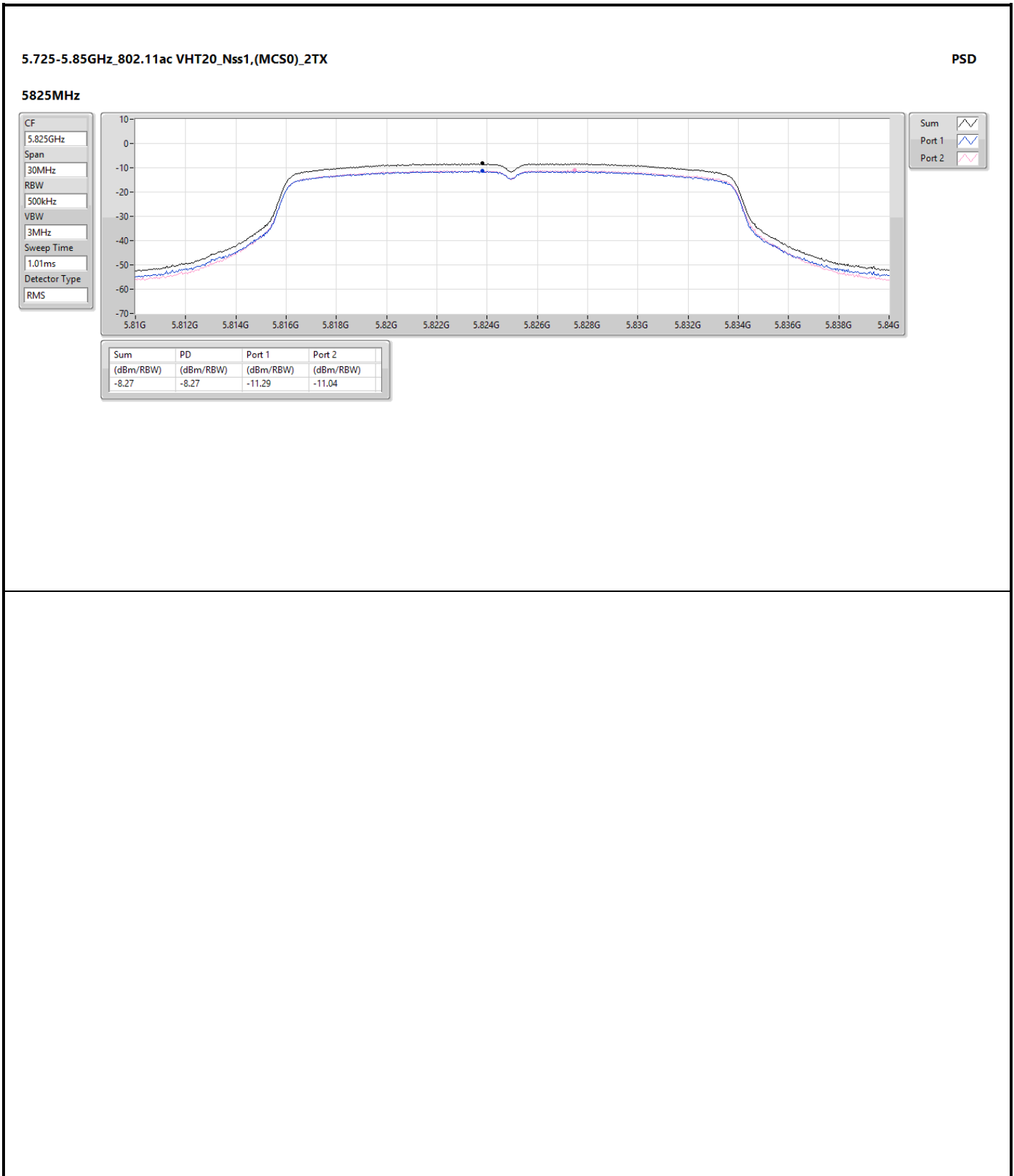
DG = Directional gain = $10 * \log ((10^{-0.3/20} + 10^{0.8/20})^2 / 2) = 3.28$ dBi











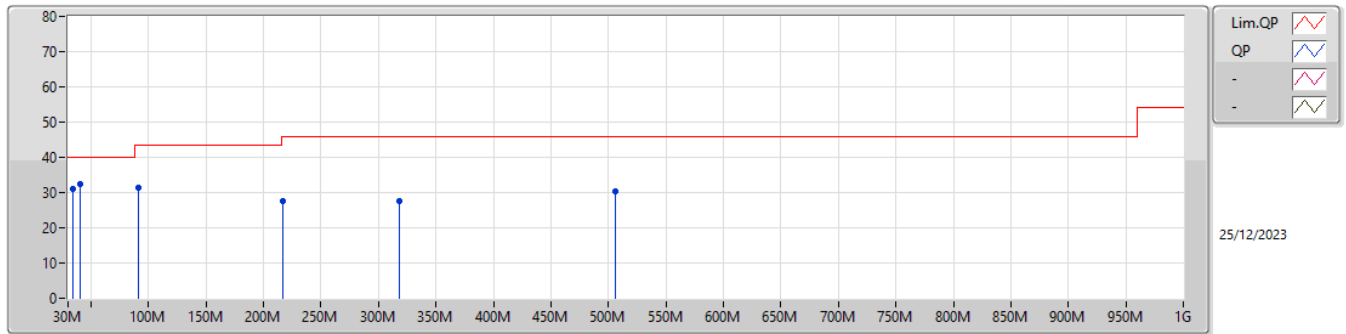


Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	PK	40.11M	32.58	40.00	-7.42	Vertical



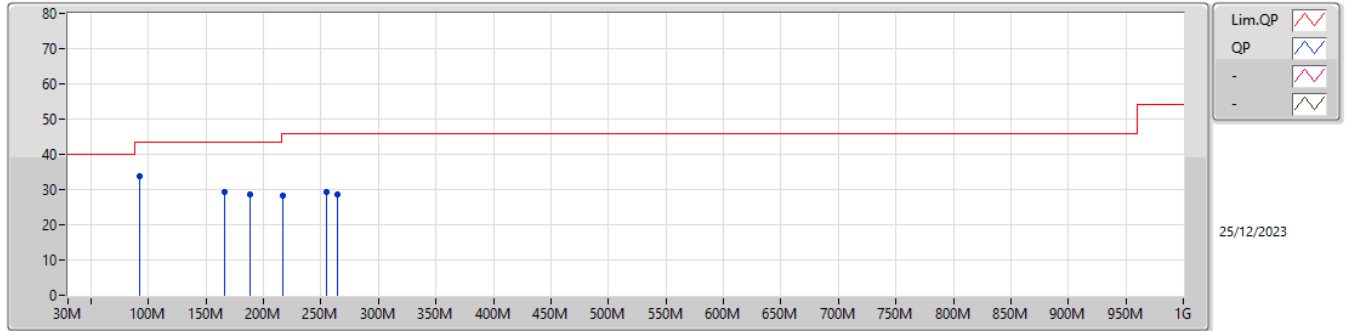
Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	34.17M	31.16	40.00	-8.84	-9.54	3	Vertical	-	-	-	40.70	17.92	0.53	27.99
PK	40.11M	32.58	40.00	-7.42	-8.84	3	Vertical	-	-	-	41.42	18.61	0.58	28.03
PK	91.59M	31.42	43.50	-12.08	-14.37	3	Vertical	-	-	-	45.79	13.06	0.90	28.33
PK	216.78M	27.46	46.00	-18.54	-11.92	3	Vertical	-	-	-	39.38	15.14	1.38	28.44
PK	318.05M	27.74	46.00	-18.26	-7.45	3	Vertical	-	-	-	35.19	19.26	1.69	28.40
PK	505.83M	30.35	46.00	-15.65	-2.83	3	Vertical	-	-	-	33.18	23.22	2.19	28.24



Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	92.27M	33.72	43.50	-9.78	-14.25	3	Horizontal	-	-	-	47.97	13.18	0.90	28.33
PK	165.64M	29.48	43.50	-14.02	-9.01	3	Horizontal	-	-	-	38.49	18.20	1.21	28.42
PK	188.16M	28.63	43.50	-14.87	-11.07	3	Horizontal	-	-	-	39.70	16.07	1.29	28.43
PK	217.14M	28.22	46.00	-17.78	-11.92	3	Horizontal	-	-	-	40.14	15.14	1.38	28.44
PK	255.06M	29.34	46.00	-16.66	-9.83	3	Horizontal	-	-	-	39.17	17.10	1.50	28.43
PK	264.38M	28.74	46.00	-17.26	-9.32	3	Horizontal	-	-	-	38.06	17.58	1.53	28.43



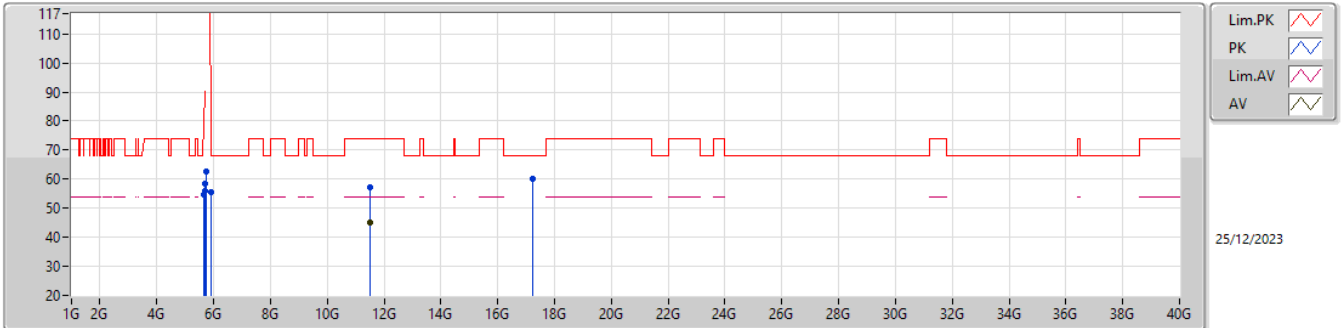
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
5.725-5.85GHz	-	-	-	-	-	-	-	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	Pass	PK	17.475G	60.43	68.20	-7.77	3	Vertical	128	1.00	-
802.11ac VHT20_Nss1,(MCS0)_2TX	Pass	PK	17.475G	60.44	68.20	-7.76	3	Vertical	152	1.00	-



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

5745MHz_TX

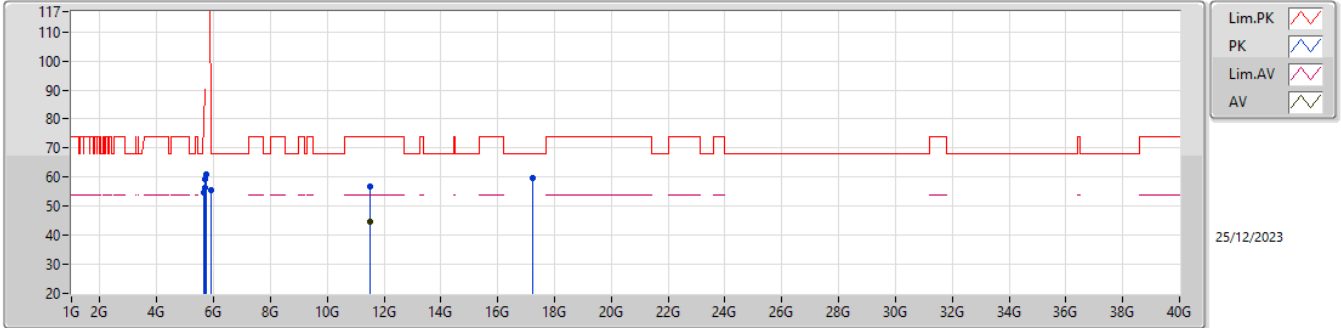


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.57	68.20	-13.63	54.36	3	Vertical	347	1.40	-	31.70	7.36	38.85
PK	5.7G	56.10	105.20	-49.10	55.58	3	Vertical	347	1.40	-	32.00	7.37	38.85
PK	5.72G	58.39	110.80	-52.41	57.82	3	Vertical	347	1.40	-	32.04	7.38	38.85
PK	5.725G	62.83	122.20	-59.37	62.25	3	Vertical	347	1.40	-	32.05	7.38	38.85
PK	5.925G	55.56	68.20	-12.64	54.43	3	Vertical	347	1.40	-	32.55	7.44	38.86
PK	11.49G	57.22	74.00	-16.78	49.90	3	Vertical	160	1.00	-	40.16	9.98	42.82
AV	11.49G	44.95	54.00	-9.05	37.63	3	Vertical	160	1.00	-	40.16	9.98	42.82
PK	17.235G	60.16	68.20	-8.04	53.47	3	Vertical	251	1.00	-	41.31	12.47	47.09



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

5745MHz_TX

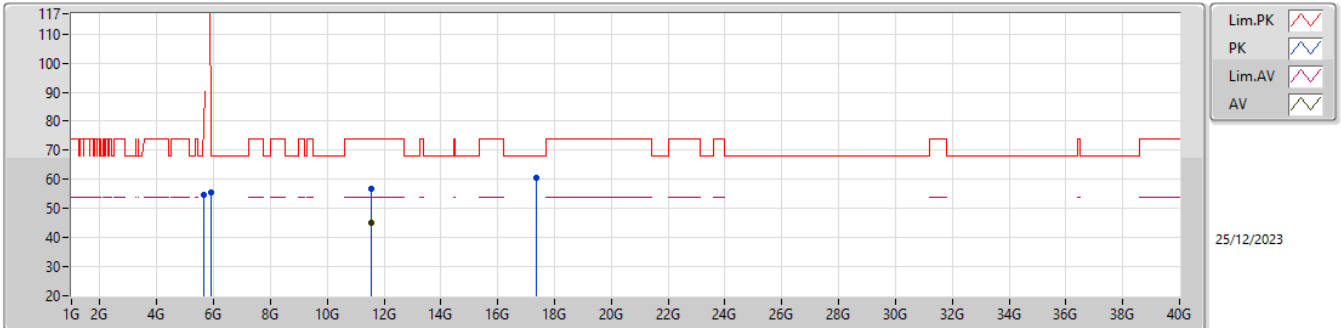


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.74	68.20	-13.46	54.53	3	Horizontal	317	1.10	-	31.70	7.36	38.85
PK	5.7G	56.41	105.20	-48.79	55.89	3	Horizontal	317	1.10	-	32.00	7.37	38.85
PK	5.72G	59.19	110.80	-51.61	58.62	3	Horizontal	317	1.10	-	32.04	7.38	38.85
PK	5.725G	60.96	122.20	-61.24	60.38	3	Horizontal	317	1.10	-	32.05	7.38	38.85
PK	5.925G	55.45	68.20	-12.75	54.32	3	Horizontal	317	1.10	-	32.55	7.44	38.86
PK	11.49G	56.67	74.00	-17.33	49.35	3	Horizontal	128	1.00	-	40.16	9.98	42.82
AV	11.49G	44.46	54.00	-9.54	37.14	3	Horizontal	128	1.00	-	40.16	9.98	42.82
PK	17.235G	59.77	68.20	-8.43	53.08	3	Horizontal	223	1.00	-	41.31	12.47	47.09



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

5785MHz_TX

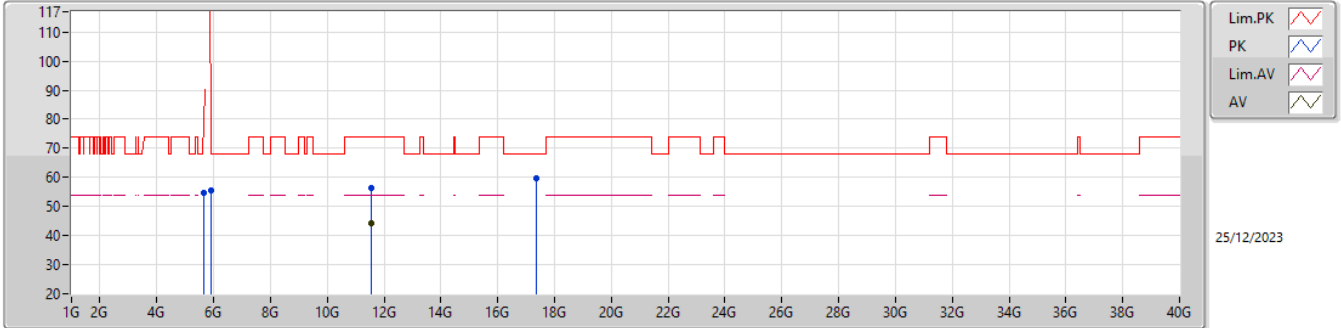


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.63	68.20	-13.57	54.42	3	Vertical	342	1.59	-	31.70	7.36	38.85
PK	5.925G	55.52	68.20	-12.68	54.39	3	Vertical	342	1.59	-	32.55	7.44	38.86
PK	11.57G	56.99	74.00	-17.01	49.77	3	Vertical	158	1.00	-	40.08	9.99	42.85
AV	11.57G	44.89	54.00	-9.11	37.67	3	Vertical	158	1.00	-	40.08	9.99	42.85
PK	17.355G	60.35	68.20	-7.85	53.47	3	Vertical	208	1.00	-	41.63	12.57	47.32



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

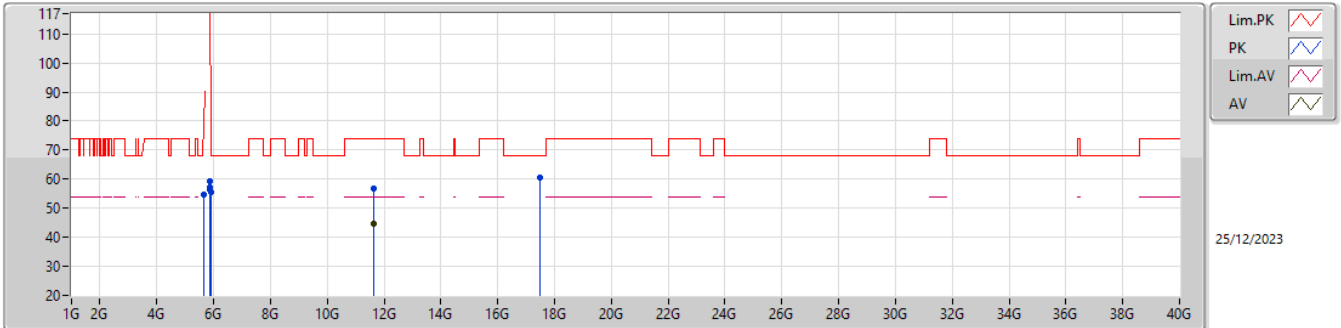
5785MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.69	68.20	-13.51	54.48	3	Horizontal	317	1.29	-	31.70	7.36	38.85
PK	5.925G	55.60	68.20	-12.60	54.47	3	Horizontal	317	1.29	-	32.55	7.44	38.86
PK	11.57G	56.38	74.00	-17.62	49.16	3	Horizontal	126	1.00	-	40.08	9.99	42.85
AV	11.57G	44.29	54.00	-9.71	37.07	3	Horizontal	126	1.00	-	40.08	9.99	42.85
PK	17.355G	59.82	68.20	-8.38	52.94	3	Horizontal	251	1.00	-	41.63	12.57	47.32

5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

5825MHz_TX

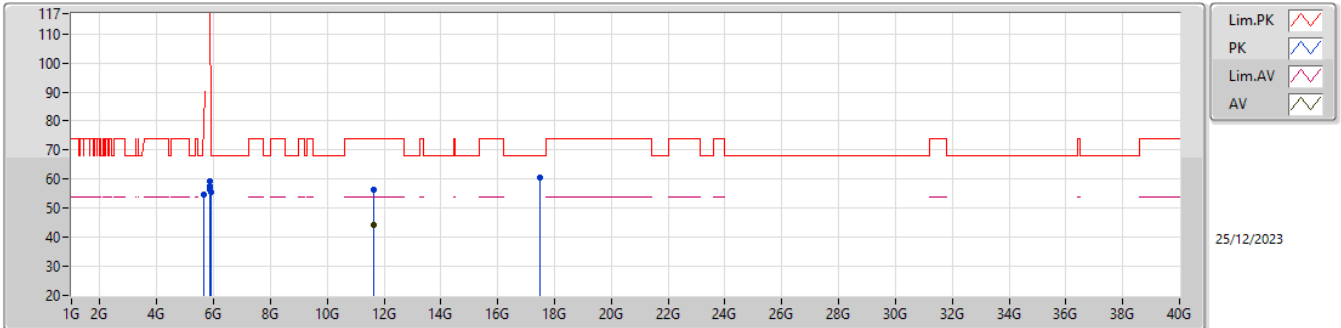


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.68	68.20	-13.52	54.47	3	Vertical	338	1.64	-	31.70	7.36	38.85
PK	5.85G	59.30	122.20	-62.90	58.33	3	Vertical	338	1.64	-	32.40	7.42	38.85
PK	5.855G	57.28	110.80	-53.52	56.30	3	Vertical	338	1.64	-	32.41	7.42	38.85
PK	5.875G	56.50	105.20	-48.70	55.49	3	Vertical	338	1.64	-	32.45	7.42	38.86
PK	5.925G	55.45	68.20	-12.75	54.32	3	Vertical	338	1.64	-	32.55	7.44	38.86
PK	11.65G	56.86	74.00	-17.14	50.23	3	Vertical	159	1.00	-	39.50	9.99	42.86
AV	11.65G	44.56	54.00	-9.44	37.93	3	Vertical	159	1.00	-	39.50	9.99	42.86
PK	17.475G	60.43	68.20	-7.77	53.06	3	Vertical	128	1.00	-	42.25	12.67	47.55



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_2TX

5825MHz_TX

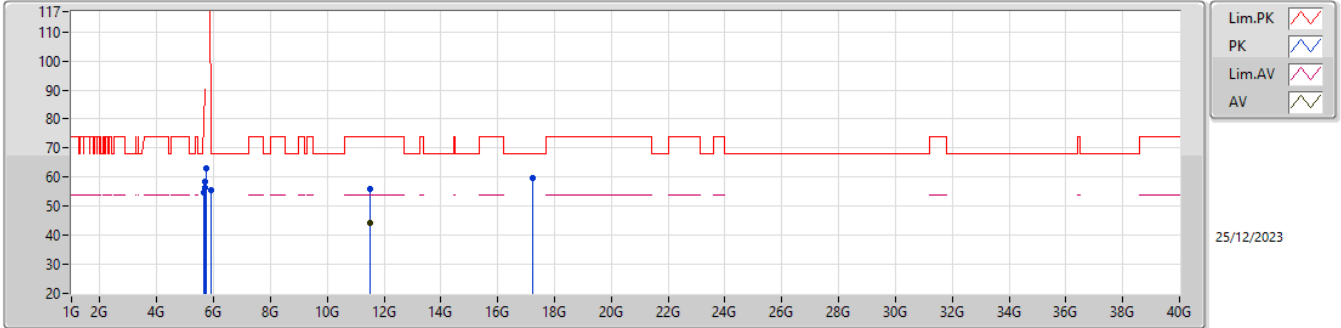


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.68	68.20	-13.52	54.47	3	Horizontal	315	1.10	-	31.70	7.36	38.85
PK	5.85G	59.46	122.20	-62.74	58.49	3	Horizontal	315	1.10	-	32.40	7.42	38.85
PK	5.855G	57.71	110.80	-53.09	56.73	3	Horizontal	315	1.10	-	32.41	7.42	38.85
PK	5.875G	56.32	105.20	-48.88	55.31	3	Horizontal	315	1.10	-	32.45	7.42	38.86
PK	5.925G	55.39	68.20	-12.81	54.26	3	Horizontal	315	1.10	-	32.55	7.44	38.86
PK	11.65G	56.25	74.00	-17.75	49.62	3	Horizontal	126	1.00	-	39.50	9.99	42.86
AV	11.65G	44.09	54.00	-9.91	37.46	3	Horizontal	126	1.00	-	39.50	9.99	42.86
PK	17.475G	60.42	68.20	-7.78	53.05	3	Horizontal	128	1.00	-	42.25	12.67	47.55



5.725-5.85GHz_802.11ac_VHT20_Nss1,(MCS0)_2TX

5745MHz_TX

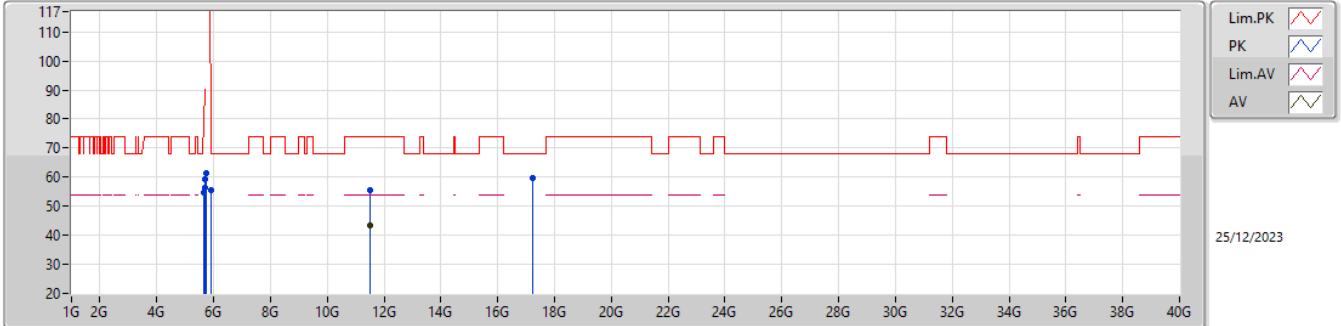


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.64	68.20	-13.56	54.43	3	Vertical	351	1.42	-	31.70	7.36	38.85
PK	5.7G	56.23	105.20	-48.97	55.71	3	Vertical	351	1.42	-	32.00	7.37	38.85
PK	5.72G	58.65	110.80	-52.15	58.08	3	Vertical	351	1.42	-	32.04	7.38	38.85
PK	5.725G	63.06	122.20	-59.14	62.48	3	Vertical	351	1.42	-	32.05	7.38	38.85
PK	5.925G	55.49	68.20	-12.71	54.36	3	Vertical	351	1.42	-	32.55	7.44	38.86
PK	11.49G	56.08	74.00	-17.92	48.76	3	Vertical	158	1.00	-	40.16	9.98	42.82
AV	11.49G	44.18	54.00	-9.82	36.86	3	Vertical	158	1.00	-	40.16	9.98	42.82
PK	17.235G	59.89	68.20	-8.31	53.20	3	Vertical	226	1.00	-	41.31	12.47	47.09



5.725-5.85GHz_802.11ac_VHT20_Nss1,(MCS0)_2TX

5745MHz_TX

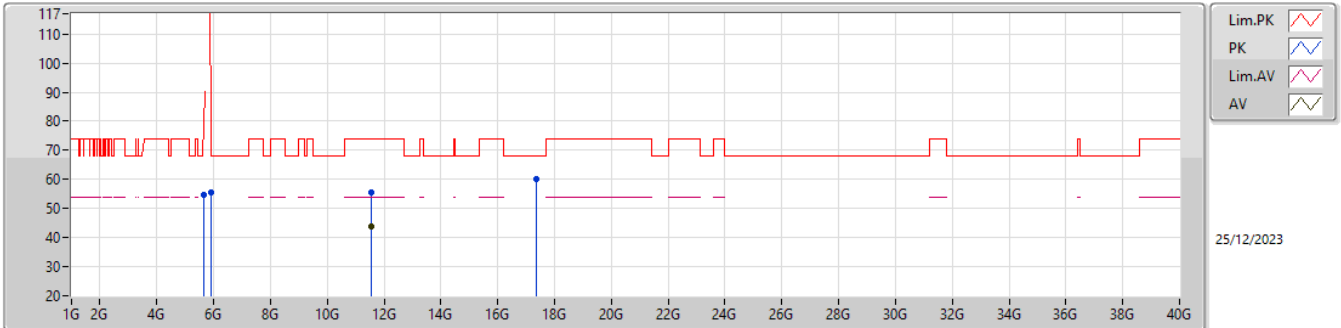


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.69	68.20	-13.51	54.48	3	Horizontal	321	1.12	-	31.70	7.36	38.85
PK	5.7G	56.31	105.20	-48.89	55.79	3	Horizontal	321	1.12	-	32.00	7.37	38.85
PK	5.72G	59.28	110.80	-51.52	58.71	3	Horizontal	321	1.12	-	32.04	7.38	38.85
PK	5.725G	61.20	122.20	-61.00	60.62	3	Horizontal	321	1.12	-	32.05	7.38	38.85
PK	5.925G	55.56	68.20	-12.64	54.43	3	Horizontal	321	1.12	-	32.55	7.44	38.86
PK	11.49G	55.66	74.00	-18.34	48.34	3	Horizontal	126	1.00	-	40.16	9.98	42.82
AV	11.49G	43.62	54.00	-10.38	36.30	3	Horizontal	126	1.00	-	40.16	9.98	42.82
PK	17.235G	59.57	68.20	-8.63	52.88	3	Horizontal	114	1.00	-	41.31	12.47	47.09



5.725-5.85GHz_802.11ac_VHT20_Nss1,(MCS0)_2TX

5785MHz_TX

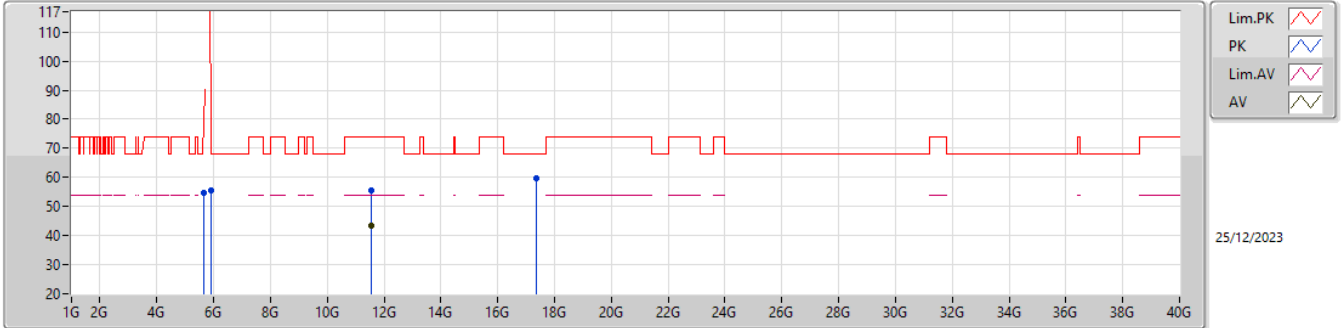


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.64	68.20	-13.56	54.43	3	Vertical	338	1.69	-	31.70	7.36	38.85
PK	5.925G	55.51	68.20	-12.69	54.38	3	Vertical	338	1.69	-	32.55	7.44	38.86
PK	11.57G	55.69	74.00	-18.31	48.47	3	Vertical	154	1.00	-	40.08	9.99	42.85
AV	11.57G	43.81	54.00	-10.19	36.59	3	Vertical	154	1.00	-	40.08	9.99	42.85
PK	17.355G	60.21	68.20	-7.99	53.33	3	Vertical	117	1.00	-	41.63	12.57	47.32



5.725-5.85GHz_802.11ac_VHT20_Nss1,(MCS0)_2TX

5785MHz_TX

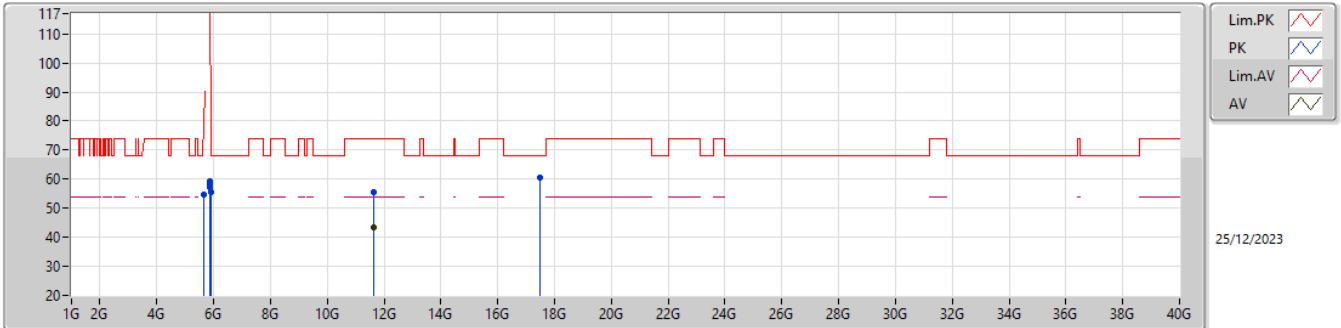


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.79	68.20	-13.41	54.58	3	Horizontal	317	1.26	-	31.70	7.36	38.85
PK	5.925G	55.45	68.20	-12.75	54.32	3	Horizontal	317	1.26	-	32.55	7.44	38.86
PK	11.57G	55.39	74.00	-18.61	48.17	3	Horizontal	127	1.00	-	40.08	9.99	42.85
AV	11.57G	43.25	54.00	-10.75	36.03	3	Horizontal	127	1.00	-	40.08	9.99	42.85
PK	17.355G	59.87	68.20	-8.33	52.99	3	Horizontal	225	1.00	-	41.63	12.57	47.32



5.725-5.85GHz_802.11ac_VHT20_Nss1,(MCS0)_2TX

5825MHz_TX

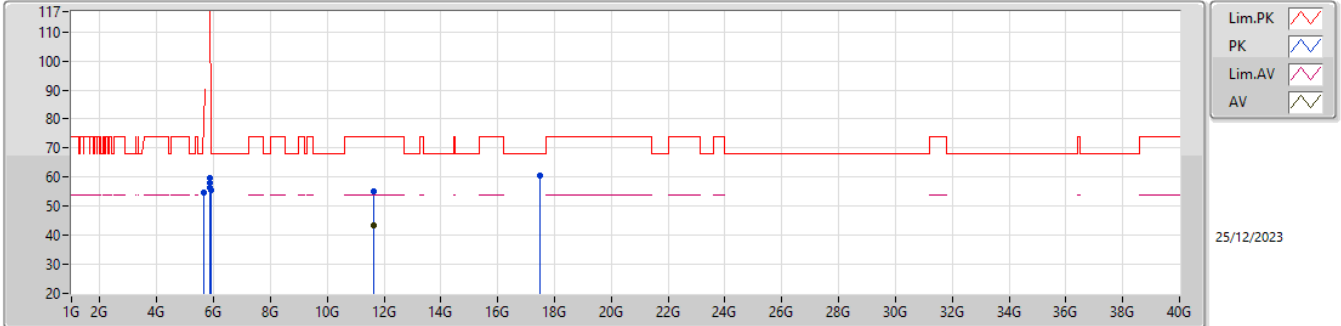


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.68	68.20	-13.52	54.47	3	Vertical	341	1.59	-	31.70	7.36	38.85
PK	5.85G	59.34	122.20	-62.86	58.37	3	Vertical	341	1.59	-	32.40	7.42	38.85
PK	5.855G	57.93	110.80	-52.87	56.95	3	Vertical	341	1.59	-	32.41	7.42	38.85
PK	5.875G	57.19	105.20	-48.01	56.18	3	Vertical	341	1.59	-	32.45	7.42	38.86
PK	5.925G	55.50	68.20	-12.70	54.37	3	Vertical	341	1.59	-	32.55	7.44	38.86
PK	11.65G	55.41	74.00	-18.59	48.78	3	Vertical	158	1.00	-	39.50	9.99	42.86
AV	11.65G	43.43	54.00	-10.57	36.80	3	Vertical	158	1.00	-	39.50	9.99	42.86
PK	17.475G	60.44	68.20	-7.76	53.07	3	Vertical	152	1.00	-	42.25	12.67	47.55



5.725-5.85GHz_802.11ac_VHT20_Nss1,(MCS0)_2TX

5825MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	5.65G	54.67	68.20	-13.53	54.46	3	Horizontal	317	1.08	-	31.70	7.36	38.85
PK	5.85G	59.73	122.20	-62.47	58.76	3	Horizontal	317	1.08	-	32.40	7.42	38.85
PK	5.855G	57.87	110.80	-52.93	56.89	3	Horizontal	317	1.08	-	32.41	7.42	38.85
PK	5.875G	56.53	105.20	-48.67	55.52	3	Horizontal	317	1.08	-	32.45	7.42	38.86
PK	5.925G	55.54	68.20	-12.66	54.41	3	Horizontal	317	1.08	-	32.55	7.44	38.86
PK	11.65G	55.32	74.00	-18.68	48.69	3	Horizontal	128	1.00	-	39.50	9.99	42.86
AV	11.65G	43.26	54.00	-10.74	36.63	3	Horizontal	128	1.00	-	39.50	9.99	42.86
PK	17.475G	60.40	68.20	-7.80	53.03	3	Horizontal	112	1.00	-	42.25	12.67	47.55



Frequency: 5785 MHz	Frequency Drift (ppm)			
	0 minute	2 minutes	5 minutes	10 minutes
T20°CVmax	2.76	2.79	2.64	2.61
T20°CVmin	4.21	4.60	4.42	3.98
T70°CVnom	6.44	6.41	6.99	6.32
T60°CVnom	5.15	5.18	4.01	3.74
T50°CVnom	5.85	5.68	5.64	5.97
T40°CVnom	3.61	3.87	3.59	3.45
T30°CVnom	2.85	2.71	2.73	2.60
T20°CVnom	3.19	3.59	3.09	3.13
T10°CVnom	3.51	3.62	4.09	3.99
T0°CVnom	3.29	3.63	3.94	3.57
T-10°CVnom	2.43	2.53	2.47	3.04
T-20°CVnom	1.94	2.00	2.26	1.76
Vnom [V]: 12	Vmax [V]: 16		Vmin [V]: 10	
Tnom [°C]: 20	Tmax [°C]: 70		Tmin [°C]: -20	