Testing Laboratory 1190

FCC RADIO TEST REPORT

FCC ID	:	TOR-C130
Equipment	:	802.11a/b/g/n/ac AP
Brand Name	:	MOJO , ARISTA
Model Name	:	C-130E
Applicant	:	Mojo Networks, Inc. 5453 Great America Parkway Santa Clara, CA 95054 United States
Manufacturer	:	Mojo Networks, Inc. 5453 Great America Parkway Santa Clara, CA 95054 United States
Standard	:	47 CFR FCC Part 15.247

The product was received on Jun. 04, 2019, and testing was started from Jun. 04, 2019 and completed on Jul. 01, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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

Approved by: Cliff Chang

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

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Photographs of EUT v01

History of this test report

Report No.	Version	Description	Issued Date
FR641226-23AA	01	Initial issue of report	Jul. 19, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.247(a)	DTS Bandwidth	PASS	-
3.2	15.247(b)	Maximum Conducted Output Power	PASS	-
3.3	15.247(e)	Power Spectral Density	PASS	-
3.4	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.5	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-

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

Reviewed by: Cliff Chang
Report Producer: Vicky Huang

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
2400-2483.5	b, g, n (HT20), VHT20	2412-2462	1-11 [11]
2400-2483.5	n (HT40), VHT40	2422-2452	3-9 [7]

For Radio 1

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	4TX
2.4-2.4835GHz	802.11g	20	4TX
2.4-2.4835GHz	802.11n HT20	20	4TX
2.4-2.4835GHz	802.11n HT20-BF	20	4TX
2.4-2.4835GHz	VHT20	20	4TX
2.4-2.4835GHz	VHT20-BF	20	4TX
2.4-2.4835GHz	802.11n HT40	40	4TX
2.4-2.4835GHz	802.11n HT40-BF	40	4TX
2.4-2.4835GHz	VHT40	40	4TX
2.4-2.4835GHz	VHT40-BF	40	4TX

For Radio 3

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	2TX
2.4-2.4835GHz	802.11g	20	2TX
2.4-2.4835GHz	802.11n HT20	20	2TX
2.4-2.4835GHz	VHT20	20	2TX
2.4-2.4835GHz	802.11n HT40	40	2TX
2.4-2.4835GHz	VHT40	40	2TX

Note:
- 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- 11g, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Ant.	Port	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	1	WNC	XKAJ-N04	Dipole antenna	Reversed-SMA	Note 1
2	2	WNC	XKAJ-N04	Dipole antenna	Reversed-SMA	
3	3	WNC	XKAJ-N04	Dipole antenna	Reversed-SMA	
4	4	WNC	XKAJ-N04	Dipole antenna	Reversed-SMA	
5	1	WNC	XKAJ-N04	Dipole antenna	Reversed-SMA	
6	2	WNC	XKAJ-N04	Dipole antenna	Reversed-SMA	

Note 1:

Ant.	Port	Antenna Gain (dBi)				Cable Loss (dB)				True Gain (dBi)			
		Radio 1 (2.4G)	Radio 2 (5G)	Radio 3 (2.4G)	Radio 3 (5G)	Radio 1 (2.4G)	Radio 2 (5G)	Radio 3 (2.4G)	Radio 3 (5G)	Radio 1 (2.4G)	Radio 2 (5G)	Radio 3 (2.4G)	Radio 3 (5G)
1	1	4.32	5.04	-	-	1.5	3.5	-	-	2.82	1.54	-	-
2	2	4.32	5.04	-	-	1.5	3.5	-	-	2.82	1.54	-	-
3	3	4.32	5.04	-	-	1.5	3.5	-	-	2.82	1.54	-	-
4	4	4.32	5.04	-	-	1.5	3.5	-	-	2.82	1.54	-	-
5	1	-	-	4.32	5.04	-	-	1.0	1.8	-	-	3.32	3.24
6	2	-	-	4.32	5.04	-	-	1.0	1.8	-	-	3.32	3.24

Note 2: The above information was declared by manufacturer.

Note 3:

For radio 1 and radio 2 (4TX/4RX)

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

For radio 3 (Scan radio) (2TX/2RX)

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

Port 1 and Port 2 can could transmit/receive simultaneously.

1.1.3 Mode Test Duty Cycle

For Radio 1

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
VHT20-BF	0.987	0.06	n/a (DC>=0.98)	n/a (DC>=0.98)
VHT40-BF	0.974	0.11	2.44m	1k

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

1.1.4 EUT Operational Condition

EUT Power Type	From Power Adapter or PoE			
Beamforming Function	☒	With beamforming	☐	Without beamforming
	The product has beamforming function for 802.11HT/VHT in 2.4GHz and 5GHz for Radio 1 and Radio 2.			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	QCARCT Ver3.0.211.0			

Note: The above information was declared by manufacturer.

1.1.5 Table for Multiple Listing

The brand names in the following table are all refer to the identical product.

Model Name	Brand Name	Description
C-130E	MOJO	The EUT has two brand names, the difference brand name served as marketing strategy.
	ARISTA	

1.1.6 Table for Radio Information

Radio	Function
Radio 1	2.4GHz
Radio 2	5GHz
Radio 3	2.4GHz / 5GHz (Scan Radio)

1.1.7 Table for Class II Change

This product is an extension of original one reported under Sporton project number: 641226-21AA

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

Modifications	Performance Checking
1. Adding 5GHz band 2 and band 3 (5250~5350 MHz, 5470~5725 MHz) for this device. 2. Adding the 80+80 mode for Radio 2. 3. Adding the beam-forming function for Radio 2.	No test case need redo for this test report.
4. Adding the beam-forming function for Radio 1.	1. DTS Bandwidth 2. Maximum Conducted Output Power 3. Power Spectral Density 4. Emissions in Non-restricted Frequency Bands 5. Emissions in Restricted Frequency Bands >1GHz

1.2 Applicable Standards

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

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 558074 D01 v05r02
- FCC KDB 662911 D01 v02r01

1.3 Testing Location Information

Testing Location							
☐	HWA YA	ADD	:	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)			
		TEL	:	886-3-327-3456	FAX	:	886-3-327-0973
☒	JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.			
		TEL	:	886-3-656-9065	FAX	:	886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-CB	Lance Wu	22~24°C / 53~55%	Jun. 10, 2019~Jun. 19, 2019
Radiated	03CH01-CB	Stim Sung	22~24°C / 50~60%	Jun. 04, 2019~Jul. 01, 2019

Test site Designation No. TW0006 with FCC.
Test site registered number IC 4086B with Industry Canada.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	Uncertainty	Remark
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%
Output Power Measurement	1.5 dB	Confidence levels of 95%
Power Density Measurement	2.4 dB	Confidence levels of 95%
Bandwidth Measurement	2%	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

For Radio 1

Mode	Power Setting
VHT20-BF_Nss1,(MCS0)_4TX	-
2412MHz	10.5
2417MHz	15
2437MHz	15
2462MHz	12.5
VHT40-BF_Nss1,(MCS0)_4TX	-
2422MHz	8.5
2437MHz	10.5
2452MHz	11.5

Note:
- VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than VHT20 and VHT40.

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains
1	Radio 1

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emissions in Restricted Frequency Bands
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
For Radio 1 The EUT was performed at Y axis and Z axis position and the worst case was found at Z axis for harmonic and the worst case was found at Y axis for bandedge. So the measurement will follow this same test configuration.	
1	Radio 1 (2.4GHz) - EUT in Z axis for harmonic and EUT in Y axis for bandedge

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	Radio1 (2.4G) + Radio2 (5G) + Radio3 (2.4G)
2	Radio1 (2.4G) + Radio2 (5G) + Radio3 (5G)
Refer to Sporton Test Report No.: FA641226-23 for Co-location RF Exposure Evaluation.	

2.3 EUT Operation during Test

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

The measured result was added array gain 10*log(4)=6.02dBi as worse case in beamforming mode.

For Radiated Mode:

The EUT was programmed to be in continuously transmitting mode.

The measured result was added array gain 10*log(4)=6.02dBi as worse case in beamforming mode.

2.4 Accessories

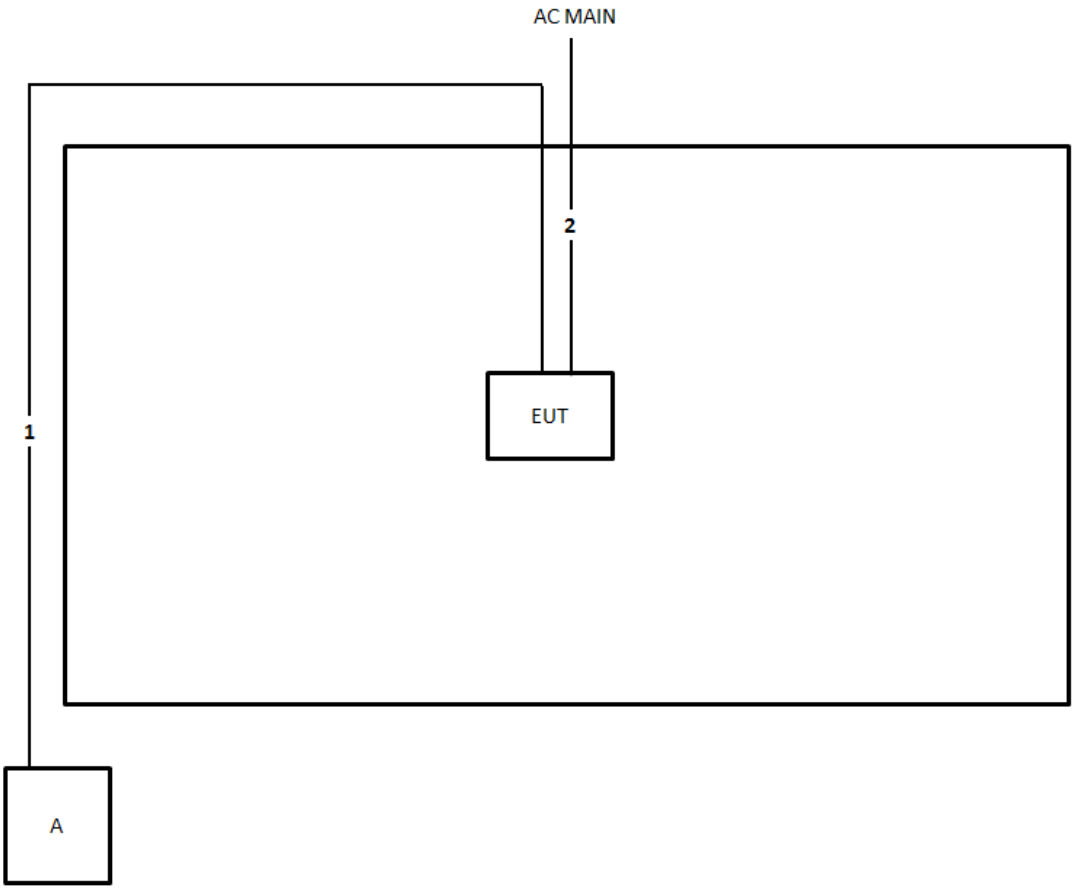
Accessories			
Equipment Name	**Brand Name**	**Model Name**	**Rating**
Adapter	APD	WA-24Q12R	INPUT: 100-240V~,50-60Hz, 0.7A Max OUTPUT: 12V, 2A
Other			
US Plug*1			

2.5 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A

2.6 Test Setup Diagram

Test Setup Diagram - Radiated Test > 1GHz



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

3 Transmitter Test Result

3.1 DTS Bandwidth

3.1.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
▪ 6 dB bandwidth ≥ 500 kHz.

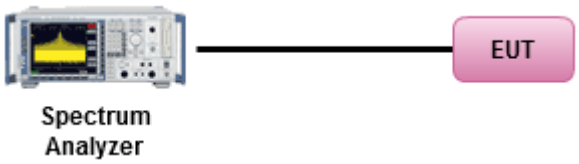
3.1.2 Measuring Instruments

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 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
	☐ Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
	☐ Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

3.1.4 Test Setup

Emission Bandwidth


3.1.5 Test Result of Emission Bandwidth

Refer as Appendix A

3.2 Maximum Conducted Output Power

3.2.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit		
	▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)	
	▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)$ dBm	
	▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm	
	▪ Smart antenna system (SAS):	
		- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3 + 8$dB dBm
P_{Out} = maximum peak conducted output power or 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 Peak Conducted Output Power	
	☒ Refer as FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).
	☐ Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
▪ Maximum Conducted Output Power	
	[duty cycle ≥ 98% or external video / power trigger]
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)
	duty cycle < 98% and average over on/off periods with duty factor
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)
	Measurement using a power meter (PM)
	☒ Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).
	☐ Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.2.4 Test Setup

Maximum Conducted Output Power (Power Meter)

3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

3.3 Power Spectral Density

3.3.1 Power Spectral Density Limit

Power Spectral Density Limit
▪ Power Spectral Density (PSD) ≤ 8 dBm/3kHz

3.3.2 Measuring Instruments

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

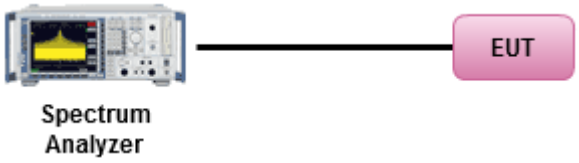
3.3.3 Test Procedures

Test Method			
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).			
	☒ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.2 Method PKPSD.		
	[duty cycle ≥ 98% or external video / power trigger]		
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.3 Method AVGPSD-1.		
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.5 Method AVGPSD-2.		
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.7 Method AVGPSD-3.		
	duty cycle < 98% and average over on/off periods with duty factor		
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.4 Method AVGPSD-1A. (alternative).		
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.6 Method AVGPSD-2A. (alternative)		
	☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.8 Method AVGPSD-3A. (alternative)		
▪ 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.

3.3.4 Test Setup

Power Spectral Density



3.3.5 Test Result of Power Spectral Density

Refer as Appendix C

3.4 Emissions in Non-restricted Frequency Bands

3.4.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dBc)**
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

3.4.2 Measuring Instruments

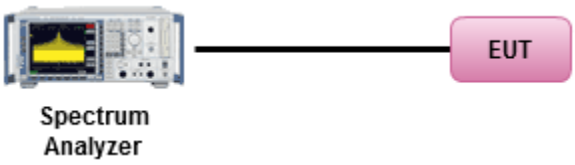
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method
▪ Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted bands.

3.4.4 Test Setup

Emissions in Non-restricted Frequency Bands



3.4.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix D

3.5 Emissions in Restricted Frequency Bands

3.5.1 Emissions in Restricted Frequency Bands Limit

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

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

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

3.5.2 Measuring Instruments

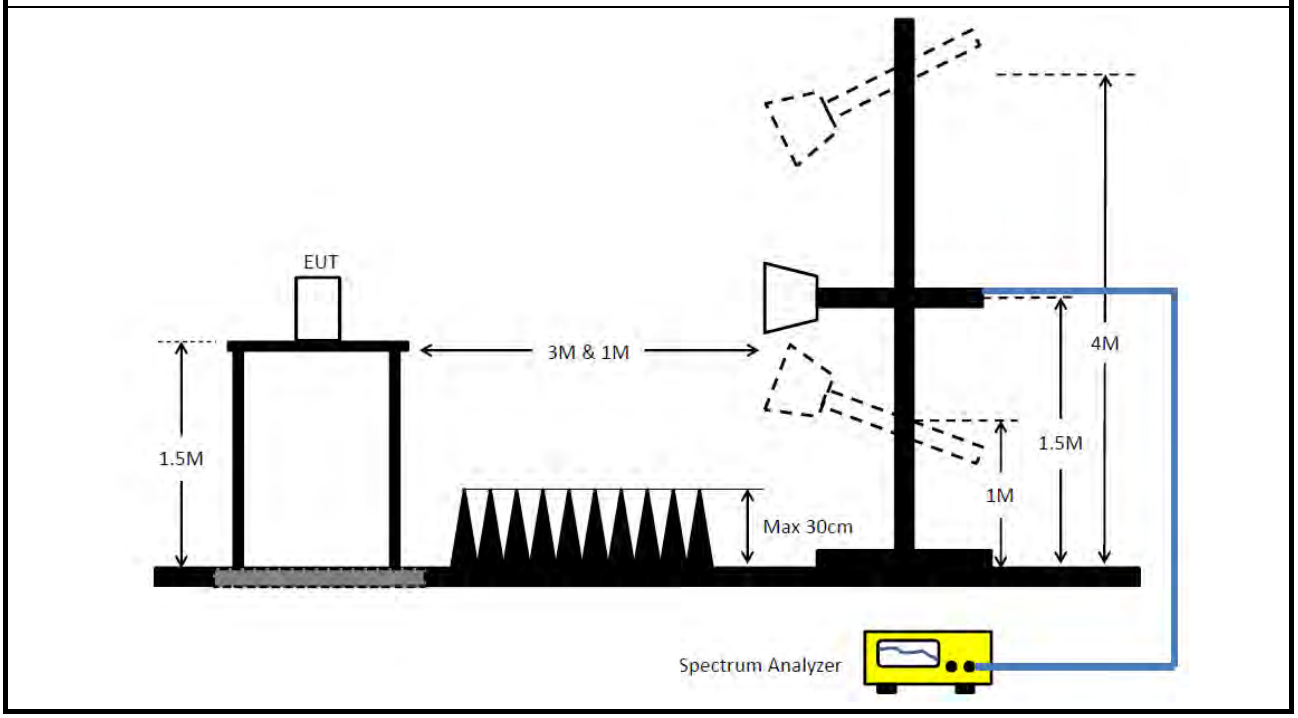
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method			
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].			
▪ Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.			
▪ For the transmitter unwanted emissions shall be measured using following options below:			
	▪ Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.		
		☐	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle ≥98%).
		☐	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
		☒	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW≥1/T).
		☐	Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐	Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
		☒	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
▪ For the transmitter band-edge emissions shall be measured using following options below:			
	▪ Refer as FCC KDB 558074 clause 8.7 & C63.10 clause 11.13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.		
	▪ Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.		
	▪ Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).		
	▪ For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB		
	▪ For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.		

3.5.4 Test Setup

Radiated - Emissions in Restricted Frequency Bands



3.5.5 Measurement Results Calculation

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

3.5.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix E

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 13, 2018	Nov. 12, 2019	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 28, 2018	Jun. 27, 2019	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 27, 2019	Jun. 26, 2020	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 08, 2019	Jan. 07, 2020	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16+17	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Feb. 25, 2019	Feb. 24, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-28	1 GHz –26.5 GHz	Nov. 19, 2018	Nov. 18, 2019	Conducted (TH01-CB)

Power Sensor	Agilent	E9327A	US40442088	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)
Power Meter	Agilent	E4416A	GB41291199	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)

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

For Beamforming mode
Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
VHT20-BF_Nss1,(MCS0)_4TX	17.525M	17.616M	17M6D1D	16.3M	17.541M
VHT40-BF_Nss1,(MCS0)_4TX	35.25M	35.982M	36M0D1D	31.2M	35.782M

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

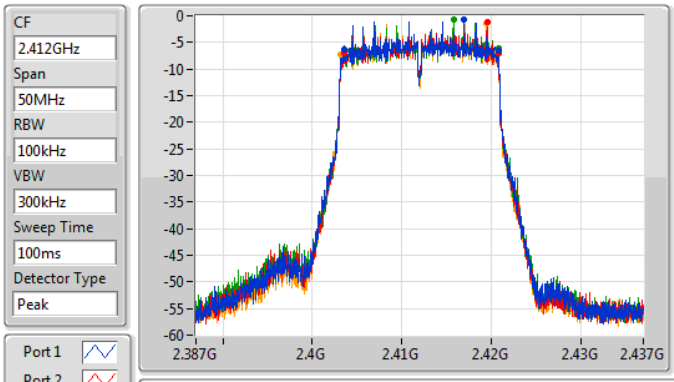
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	17.175M	17.616M	17.175M	17.541M	17.125M	17.616M	17.525M	17.566M
2437MHz	Pass	500k	17.125M	17.616M	17.525M	17.566M	17.525M	17.591M	16.75M	17.591M
2462MHz	Pass	500k	17.15M	17.591M	16.3M	17.541M	16.525M	17.541M	16.525M	17.541M
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	32.45M	35.932M	35M	35.932M	35M	35.832M	33.8M	35.932M
2437MHz	Pass	500k	31.2M	35.782M	35.1M	35.982M	35.05M	35.832M	35.05M	35.982M
2452MHz	Pass	500k	34.05M	35.832M	35.25M	35.982M	34.95M	35.932M	34.95M	35.932M

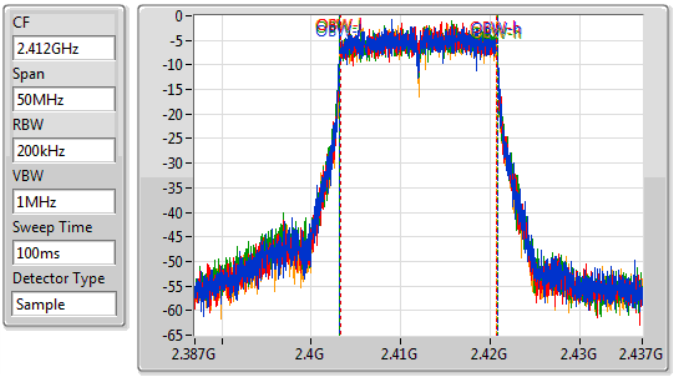
Port X-N dB = Port **X** 6dB down bandwidth; **Port X-OBW** = Port **X** 99% occupied bandwidth;

VHT20-BF_Nss1,(MCS0)_4TX EBW

2412MHz

05/06/2019



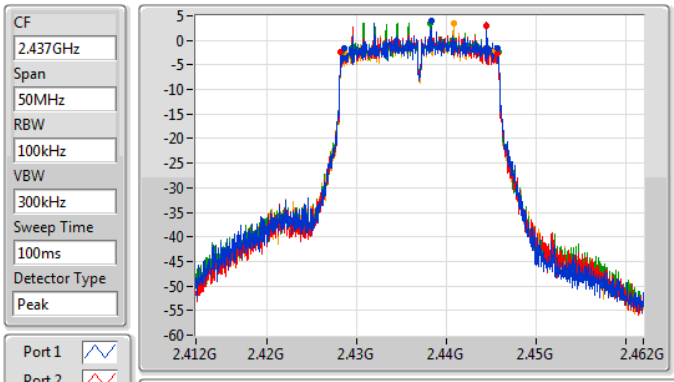


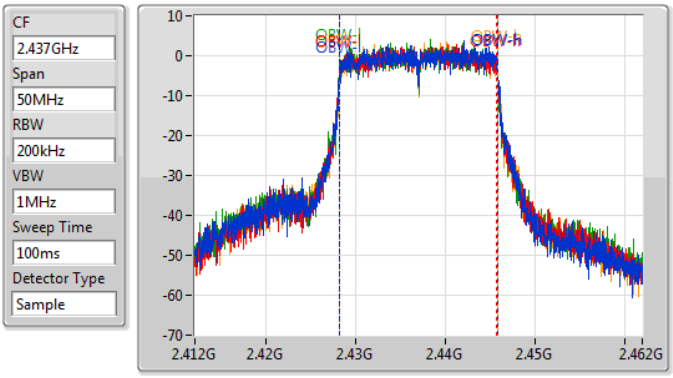
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
17.175M	2.4036G	2.420775G	17.616M	2.403179G	2.420796G	500k	1
17.175M	2.4036G	2.420775G	17.541M	2.403229G	2.420771G	500k	2
17.125M	2.40365G	2.420775G	17.616M	2.403204G	2.420821G	500k	3
17.525M	2.403225G	2.42075G	17.566M	2.403204G	2.420771G	500k	4

VHT20-BF_Nss1,(MCS0)_4TX EBW

2437MHz

05/06/2019



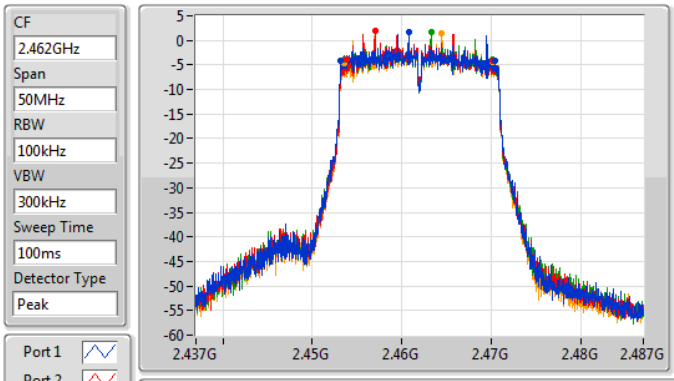


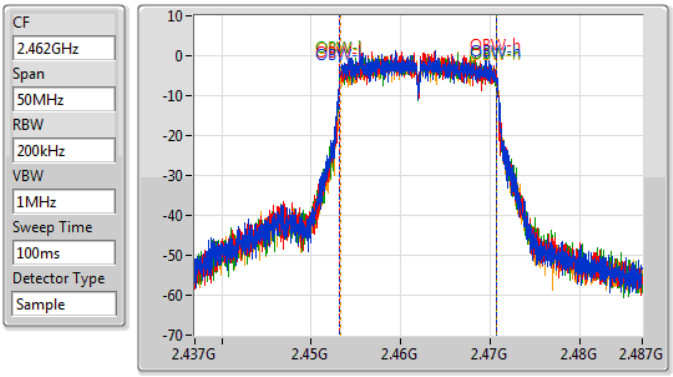
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
17.125M	2.428625G	2.44575G	17.616M	2.428204G	2.445821G	500k	1
17.525M	2.428225G	2.44575G	17.566M	2.428204G	2.445771G	500k	2
17.525M	2.42825G	2.445775G	17.591M	2.428204G	2.445796G	500k	3
16.75M	2.428625G	2.445375G	17.591M	2.428204G	2.445796G	500k	4

VHT20-BF_Nss1,(MCS0)_4TX EBW

2462MHz

05/06/2019



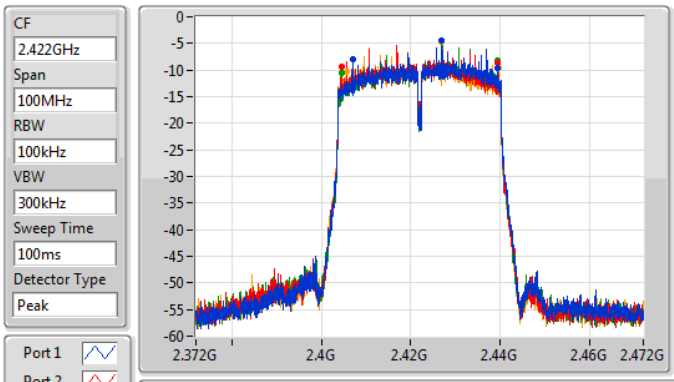


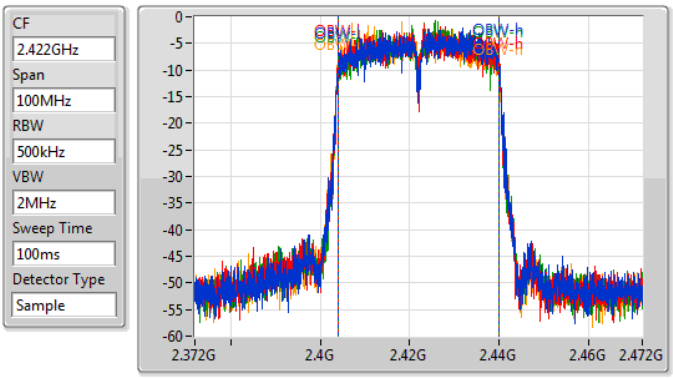
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
17.15M	2.453225G	2.470375G	17.591M	2.453179G	2.470771G	500k	1
16.3M	2.45385G	2.47015G	17.541M	2.453204G	2.470746G	500k	2
16.525M	2.453625G	2.47015G	17.541M	2.453204G	2.470746G	500k	3
16.525M	2.453625G	2.47015G	17.541M	2.453229G	2.470771G	500k	4

VHT40-BF_Nss1,(MCS0)_4TX EBW

2422MHz

05/06/2019



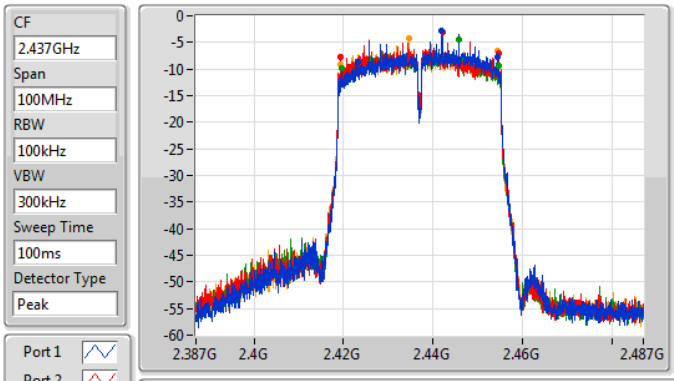


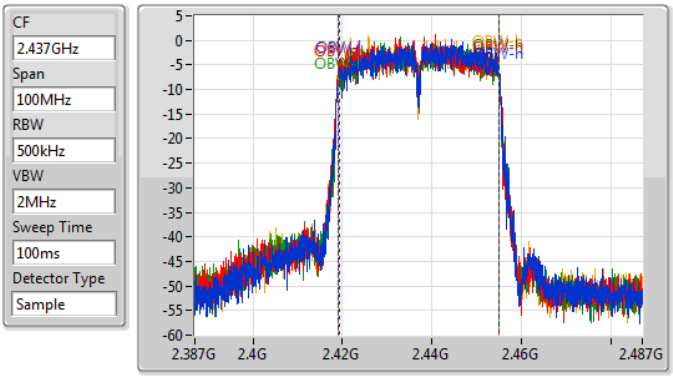
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
32.45M	2.407G	2.43945G	35.932M	2.404059G	2.439991G	500k	1
35M	2.4045G	2.4395G	35.932M	2.404059G	2.439991G	500k	2
35M	2.4045G	2.4395G	35.832M	2.404109G	2.439941G	500k	3
33.8M	2.40575G	2.43955G	35.932M	2.404009G	2.439941G	500k	4

VHT40-BF_Nss1,(MCS0)_4TX EBW

2437MHz

05/06/2019



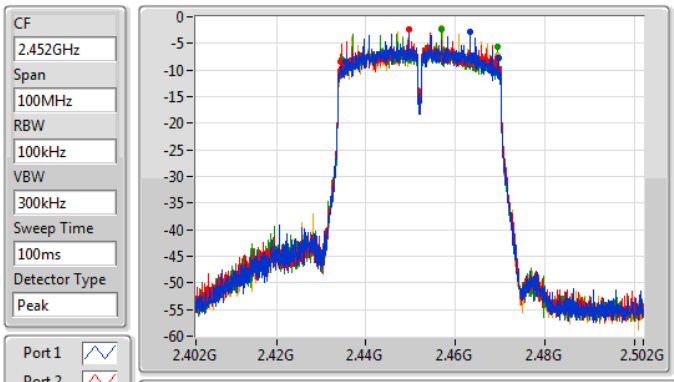


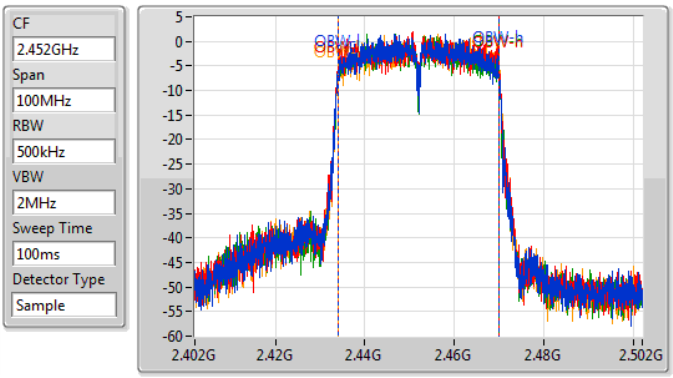
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
31.2M	2.4233G	2.4545G	35.782M	2.419209G	2.454991G	500k	1
35.1M	2.41945G	2.45455G	35.982M	2.419009G	2.454991G	500k	2
35.05M	2.4195G	2.45455G	35.832M	2.419109G	2.454941G	500k	3
35.05M	2.41945G	2.4545G	35.982M	2.419059G	2.455041G	500k	4

VHT40-BF_Nss1,(MCS0)_4TX EBW

2452MHz

05/06/2019





6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
34.05M	2.4355G	2.46955G	35.832M	2.434009G	2.469841G	500k	1
35.25M	2.43425G	2.4695G	35.982M	2.433959G	2.469941G	500k	2
34.95M	2.43455G	2.4695G	35.932M	2.434009G	2.469941G	500k	3
34.95M	2.4345G	2.46945G	35.932M	2.434059G	2.469991G	500k	4

For Beamforming mode
Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
VHT20-BF_Nss1,(MCS0)_4TX	21.51	0.14158
VHT40-BF_Nss1,(MCS0)_4TX	18.21	0.06622

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	8.84	10.97	11.08	11.09	10.88	17.03	27.16
2417MHz	Pass	8.84	15.51	15.58	15.47	15.39	21.51	27.16
2437MHz	Pass	8.84	15.54	15.45	15.57	15.24	21.47	27.16
2462MHz	Pass	8.84	13.14	13.34	13.20	12.86	19.16	27.16
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	8.84	9.32	9.22	9.07	9.07	15.19	27.16
2437MHz	Pass	8.84	11.13	11.23	11.00	10.97	17.10	27.16
2452MHz	Pass	8.84	12.33	12.35	11.96	12.11	18.21	27.16

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

For Beamforming mode
Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
VHT20-BF_Nss1,(MCS0)_4TX	-7.32
VHT40-BF_Nss1,(MCS0)_4TX	-12.59

RBW=3 kHz.

Result

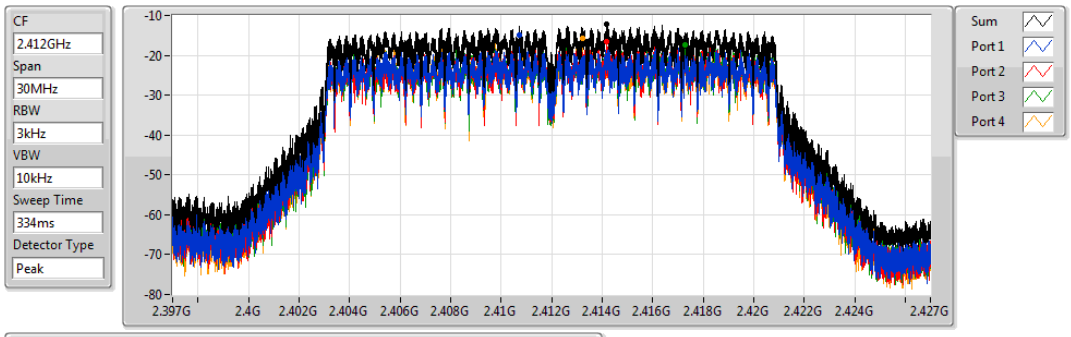
Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	Port 3 (dBm/RBW)	Port 4 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	8.84	-14.90	-16.58	-17.34	-15.71	-12.19	5.16
2437MHz	Pass	8.84	-12.79	-12.48	-12.72	-12.49	-7.32	5.16
2462MHz	Pass	8.84	-15.12	-14.89	-15.40	-15.09	-9.33	5.16
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	8.84	-20.78	-21.12	-20.70	-21.24	-16.25	5.16
2437MHz	Pass	8.84	-18.77	-17.91	-19.10	-19.63	-14.21	5.16
2452MHz	Pass	8.84	-17.55	-17.71	-17.57	-17.80	-12.59	5.16

DG = Directional Gain; RBW=3 kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

VHT20-BF_Nss1,(MCS0)_4TX PSD

2412MHz

05/06/2019

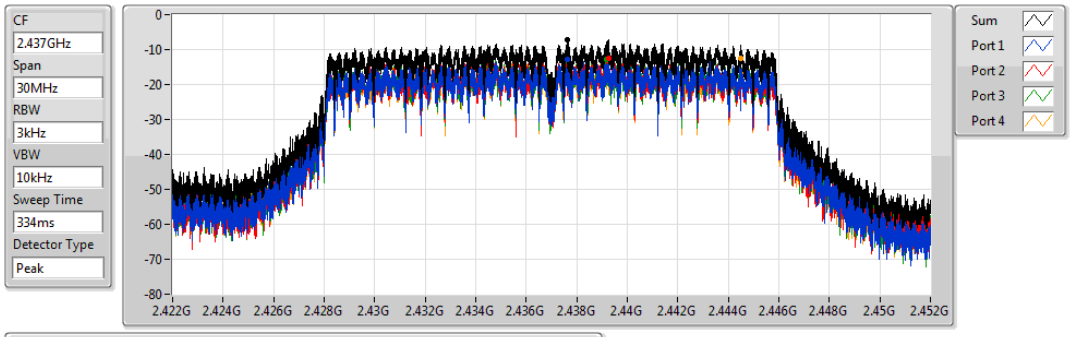


Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-12.19	-12.19	-14.90	-16.58	-17.34	-15.71

VHT20-BF_Nss1,(MCS0)_4TX PSD

2437MHz

05/06/2019

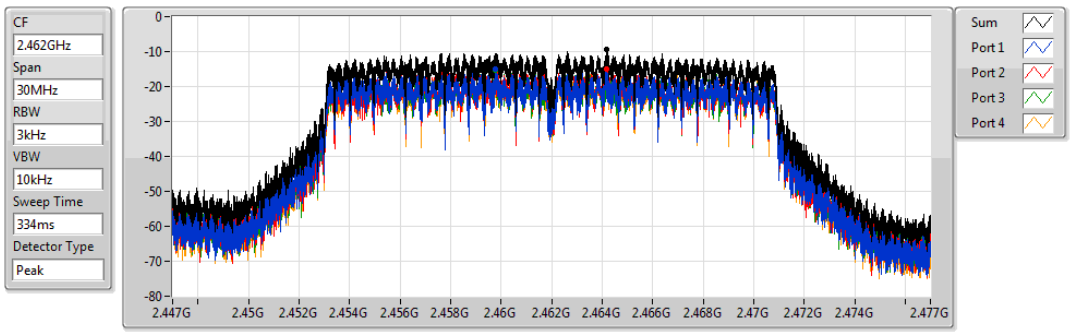


Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.32	-7.32	-12.79	-12.48	-12.72	-12.49

VHT20-BF_Nss1,(MCS0)_4TX PSD

2462MHz

05/06/2019

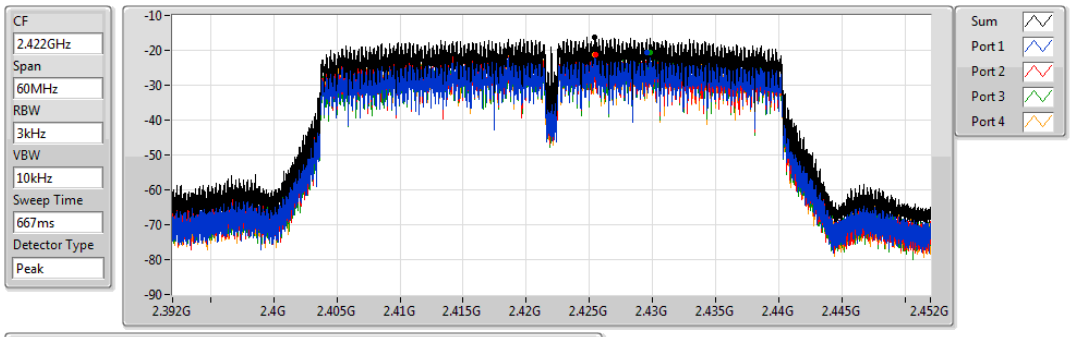


Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.33	-9.33	-15.12	-14.89	-15.40	-15.09

VHT40-BF_Nss1,(MCS0)_4TX PSD

2422MHz

05/06/2019

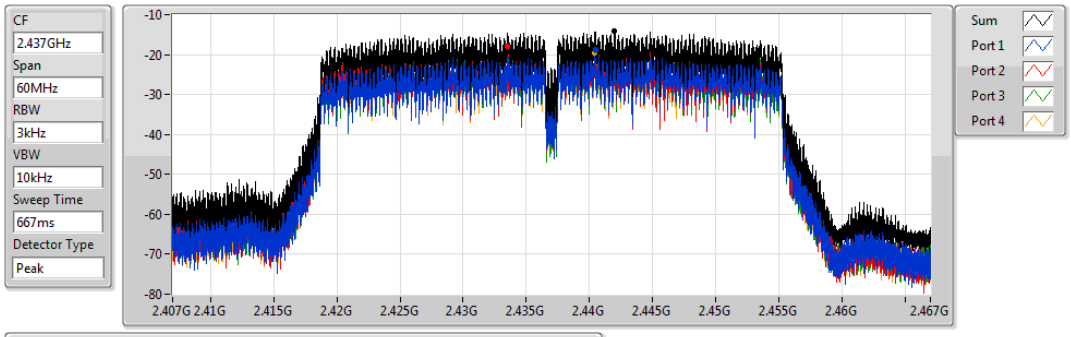


Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-16.25	-16.25	-20.78	-21.12	-20.70	-21.24

VHT40-BF_Nss1,(MCS0)_4TX PSD

2437MHz

05/06/2019

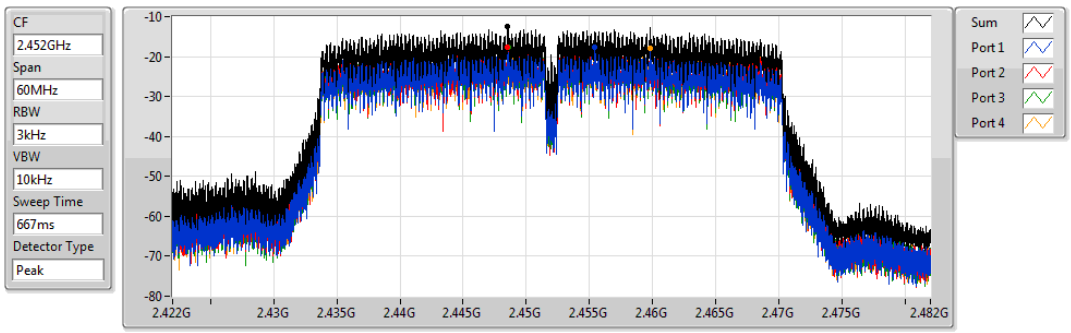


Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.21	-14.21	-18.77	-17.91	-19.10	-19.63

VHT40-BF_Nss1,(MCS0)_4TX PSD

2452MHz

05/06/2019



Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-12.59	-12.59	-17.55	-17.71	-17.57	-17.80

For Beamforming mode
Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
VHT20-BF_Nss1,(MCS0)_4TX	Pass	2.43574G	4.25	-25.75	2.0603G	-53.94	2.39702G	-41.76	2.52228G	-52.01	15.27891G	-43.84	3
VHT40-BF_Nss1,(MCS0)_4TX	Pass	2.442G	-2.44	-32.44	597.35M	-54.02	2.39888G	-52.95	2.54186G	-52.03	15.2261G	-44.19	3

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43574G	4.25	-25.75	2.05623G	-53.19	2.39986G	-43.34	2.51678G	-52.79	14.93334G	-44.80	1
2412MHz	Pass	2.43574G	4.25	-25.75	681.82M	-53.63	2.39794G	-43.64	2.49276G	-52.66	15.25082G	-44.17	2
2412MHz	Pass	2.43574G	4.25	-25.75	2.0603G	-53.94	2.39702G	-41.76	2.52228G	-52.01	15.27891G	-43.84	3
2412MHz	Pass	2.43574G	4.25	-25.75	933.75M	-53.77	2.39698G	-44.03	2.49838G	-52.46	24.87076G	-44.95	4
2437MHz	Pass	2.43574G	4.25	-25.75	1.64731G	-53.39	2.39136G	-51.59	2.4888G	-51.20	16.41679G	-45.34	1
2437MHz	Pass	2.43574G	4.25	-25.75	942.78M	-53.52	2.39464G	-50.95	2.48694G	-51.75	16.4196G	-44.68	2
2437MHz	Pass	2.43574G	4.25	-25.75	1.87711G	-53.62	2.39574G	-49.99	2.48366G	-50.47	15.27329G	-44.67	3
2437MHz	Pass	2.43574G	4.25	-25.75	869.67M	-53.46	2.39892G	-50.38	2.48484G	-50.89	15.24801G	-45.39	4
2462MHz	Pass	2.43574G	4.25	-25.75	1.99536G	-52.99	2.39618G	-53.63	2.48358G	-50.66	17.60804G	-44.83	1
2462MHz	Pass	2.43574G	4.25	-25.75	286.59M	-54.09	2.3922G	-52.22	2.48414G	-51.53	15.23115G	-45.21	2
2462MHz	Pass	2.43574G	4.25	-25.75	2.12001G	-53.97	2.3993G	-53.99	2.50324G	-50.76	15.20867G	-45.10	3
2462MHz	Pass	2.43574G	4.25	-25.75	2.13719G	-52.62	2.39342G	-53.00	2.50348G	-50.71	24.83143G	-45.49	4
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.442G	-2.44	-32.44	1.7455G	-53.91	2.39888G	-46.62	2.51258G	-52.55	15.22049G	-45.30	1
2422MHz	Pass	2.442G	-2.44	-32.44	870.72M	-52.91	2.39828G	-45.18	2.52838G	-52.26	15.22049G	-45.33	2
2422MHz	Pass	2.442G	-2.44	-32.44	2.13022G	-54.01	2.397G	-45.51	2.5179G	-53.67	15.21769G	-44.84	3
2422MHz	Pass	2.442G	-2.44	-32.44	1.93328G	-53.14	2.39636G	-46.21	2.56262G	-53.14	15.20086G	-44.59	4
2437MHz	Pass	2.442G	-2.44	-32.44	1.87889G	-53.71	2.39828G	-48.15	2.53418G	-52.91	15.23451G	-45.25	1
2437MHz	Pass	2.442G	-2.44	-32.44	922.81M	-53.54	2.39832G	-46.60	2.50598G	-52.96	17.63802G	-45.16	2
2437MHz	Pass	2.442G	-2.44	-32.44	955.73M	-54.17	2.39948G	-45.72	2.49198G	-52.79	24.77283G	-45.03	3
2437MHz	Pass	2.442G	-2.44	-32.44	921.38M	-53.49	2.3992G	-46.73	2.49282G	-52.77	15.20647G	-45.36	4
2452MHz	Pass	2.442G	-2.44	-32.44	70.65M	-53.44	2.39612G	-53.07	2.50134G	-49.58	16.41523G	-44.85	1
2452MHz	Pass	2.442G	-2.44	-32.44	1.80733G	-53.33	2.3988G	-52.93	2.4851G	-50.96	24.91025G	-44.84	2
2452MHz	Pass	2.442G	-2.44	-32.44	597.35M	-54.02	2.39888G	-52.95	2.54186G	-52.03	15.2261G	-44.19	3
2452MHz	Pass	2.442G	-2.44	-32.44	2.30025G	-53.69	2.39916G	-52.68	2.4841G	-51.39	15.21769G	-45.50	4

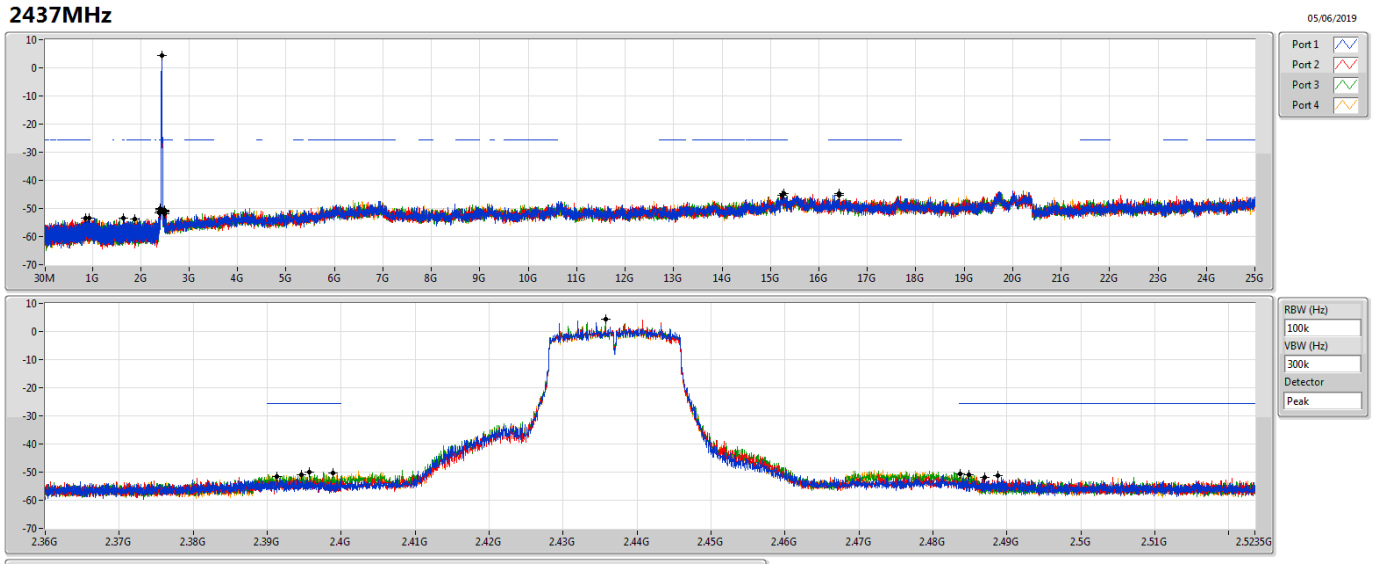
VHT20-BF_Nss1,(MCS0)_4TX **CSE NdB**

2412MHz

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43574G	4.25	-25.75	2.05623G	-53.19	2.39986G	-43.34	2.51678G	-52.79	14.93334G	-44.80	1
2.43574G	4.25	-25.75	681.82M	-53.63	2.39794G	-43.64	2.49276G	-52.66	15.25082G	-44.17	2
2.43574G	4.25	-25.75	2.0603G	-53.94	2.39702G	-41.76	2.52228G	-52.01	15.27891G	-43.84	3
2.43574G	4.25	-25.75	933.75M	-53.77	2.39698G	-44.03	2.49838G	-52.46	24.87076G	-44.95	4

VHT20-BF_Nss1,(MCS0)_4TX **CSE NdB**

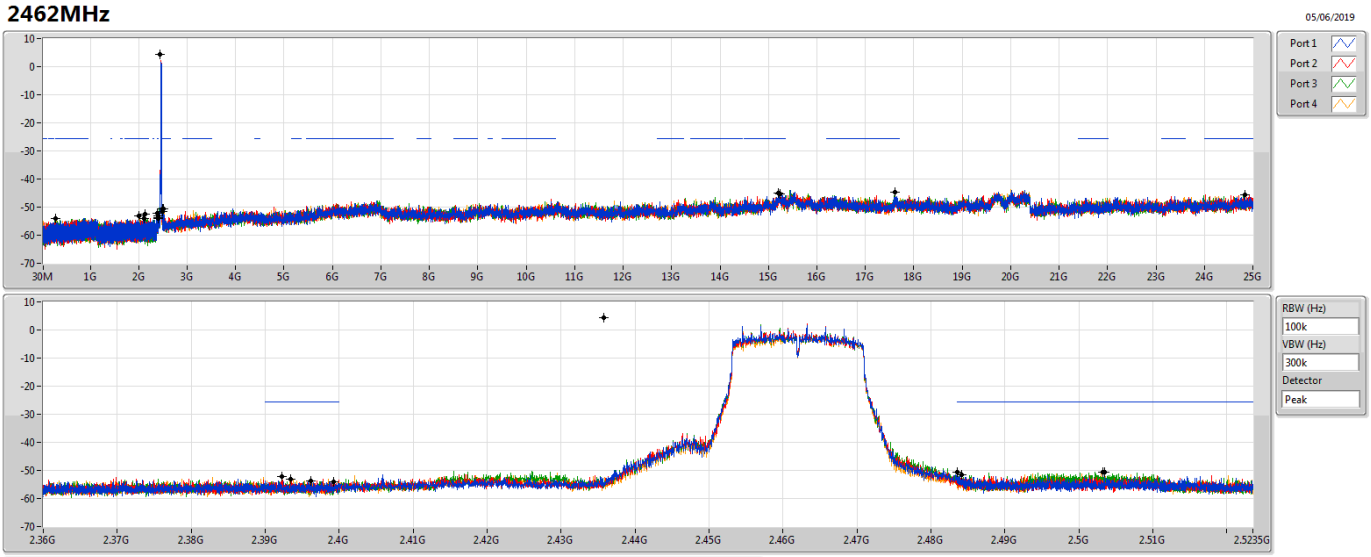
2437MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43574G	4.25	-25.75	1.64731G	-53.39	2.39136G	-51.59	2.4888G	-51.20	16.41679G	-45.34	1
2.43574G	4.25	-25.75	942.78M	-53.52	2.39464G	-50.95	2.48694G	-51.75	16.4196G	-44.68	2
2.43574G	4.25	-25.75	1.87711G	-53.62	2.39574G	-49.99	2.48366G	-50.47	15.27329G	-44.67	3
2.43574G	4.25	-25.75	869.67M	-53.46	2.39892G	-50.38	2.48484G	-50.89	15.24801G	-45.39	4

VHT20-BF_Nss1,(MCS0)_4TX **CSE NdB**

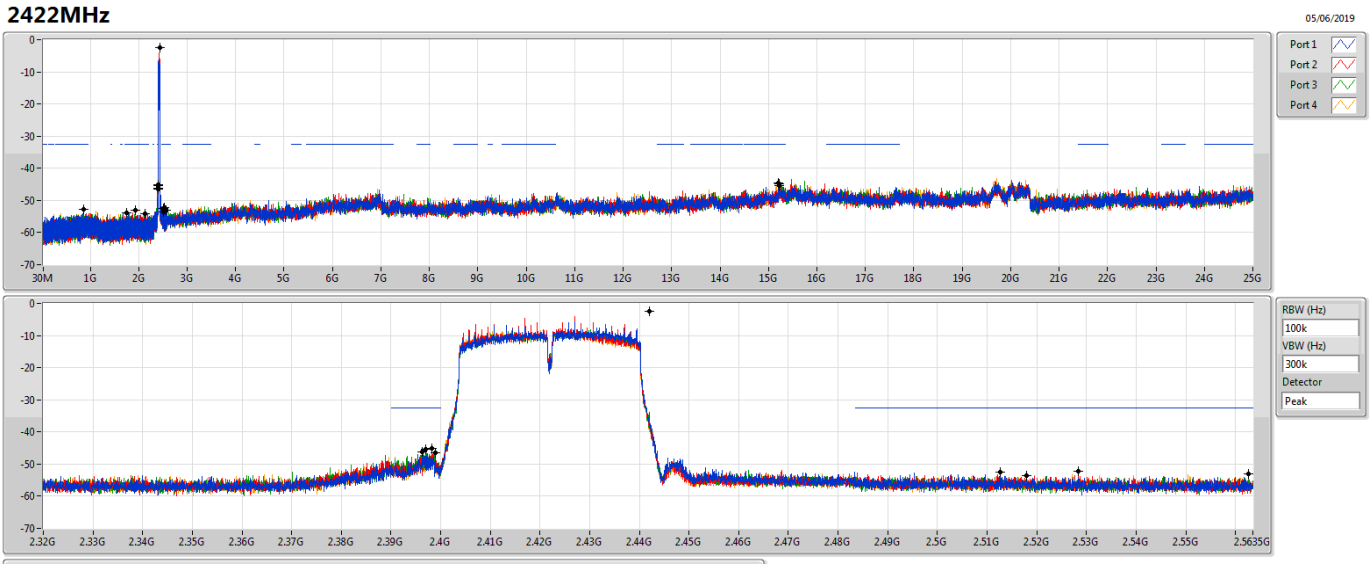
2462MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43574G	4.25	-25.75	1.99536G	-52.99	2.39618G	-53.63	2.48358G	-50.66	17.60804G	-44.83	1
2.43574G	4.25	-25.75	286.59M	-54.09	2.3922G	-52.22	2.48414G	-51.53	15.23115G	-45.21	2
2.43574G	4.25	-25.75	2.12001G	-53.97	2.3993G	-53.99	2.50324G	-50.76	15.20867G	-45.10	3
2.43574G	4.25	-25.75	2.13719G	-52.62	2.39342G	-53.00	2.50348G	-50.71	24.83143G	-45.49	4

VHT40-BF_Nss1,(MCS0)_4TX **CSE NdB**

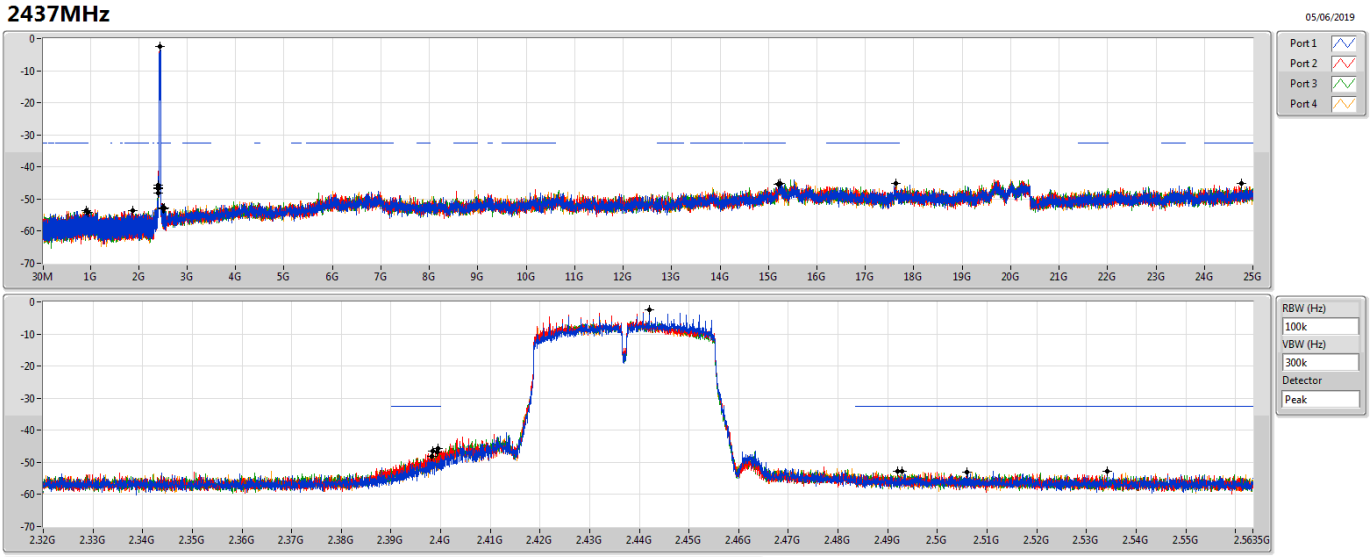
2422MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.442G	-2.44	-32.44	1.7455G	-53.91	2.39888G	-46.62	2.51258G	-52.55	15.22049G	-45.30	1
2.442G	-2.44	-32.44	870.72M	-52.91	2.39828G	-45.18	2.52838G	-52.26	15.22049G	-45.33	2
2.442G	-2.44	-32.44	2.13022G	-54.01	2.397G	-45.51	2.5179G	-53.67	15.21769G	-44.84	3
2.442G	-2.44	-32.44	1.93328G	-53.14	2.39636G	-46.21	2.56262G	-53.14	15.20086G	-44.59	4

VHT40-BF_Nss1,(MCS0)_4TX **CSE NdB**

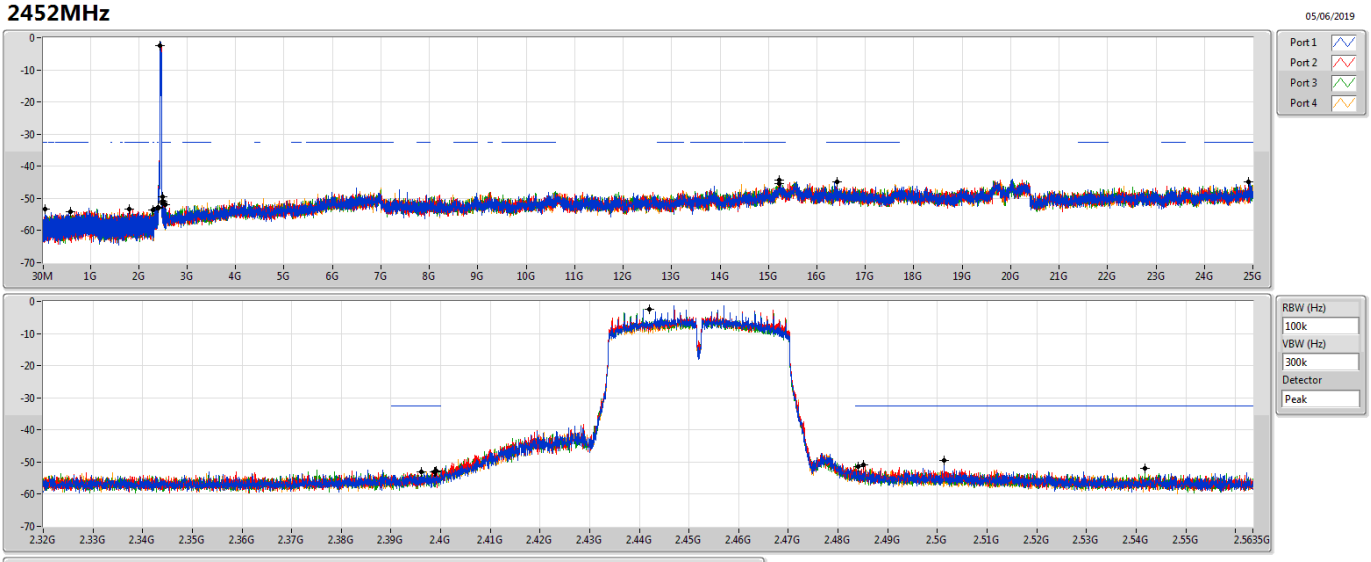
2437MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.442G	-2.44	-32.44	1.87889G	-53.71	2.39828G	-48.15	2.53418G	-52.91	15.23451G	-45.25	1
2.442G	-2.44	-32.44	922.81M	-53.54	2.39832G	-46.60	2.50598G	-52.96	17.63802G	-45.16	2
2.442G	-2.44	-32.44	955.73M	-54.17	2.39948G	-45.72	2.49198G	-52.79	24.77283G	-45.03	3
2.442G	-2.44	-32.44	921.38M	-53.49	2.3992G	-46.73	2.49282G	-52.77	15.20647G	-45.36	4

VHT40-BF_Nss1,(MCS0)_4TX **CSE NdB**

2452MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.442G	-2.44	-32.44	70.65M	-53.44	2.39612G	-53.07	2.50134G	-49.58	16.41523G	-44.85	1
2.442G	-2.44	-32.44	1.80733G	-53.33	2.3988G	-52.93	2.4851G	-50.96	24.91025G	-44.84	2
2.442G	-2.44	-32.44	597.35M	-54.02	2.39888G	-52.95	2.54186G	-52.03	15.2261G	-44.19	3
2.442G	-2.44	-32.44	2.30025G	-53.69	2.39916G	-52.68	2.4841G	-51.39	15.21769G	-45.50	4

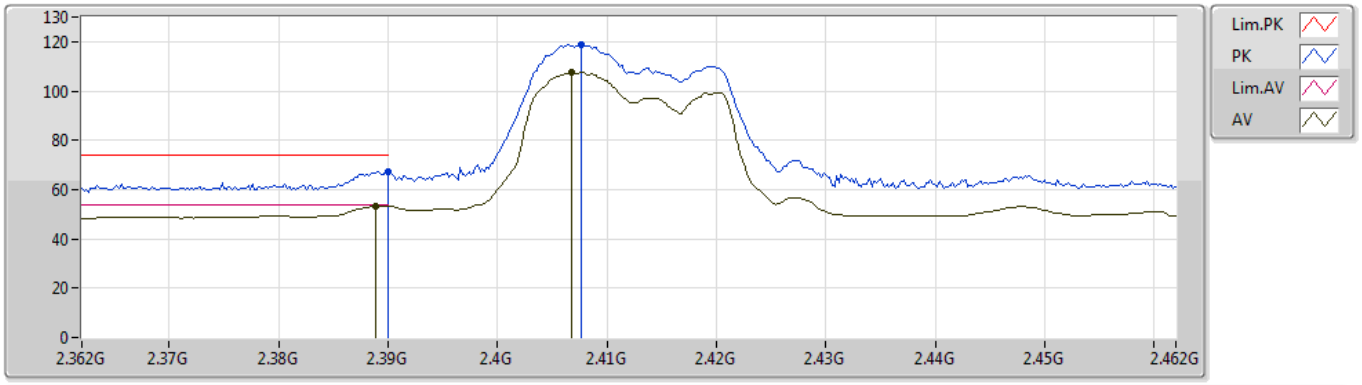
For Beamforming mode
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
VHT20-BF_Nss1,(MCS0)_4TX	Pass	AV	2.39G	53.83	54.00	-0.17	32.06	3	Vertical	3	1.71	-

VHT20-BF_Nss1,(MCS0)_4TX

2412MHz_TX

04/06/2019



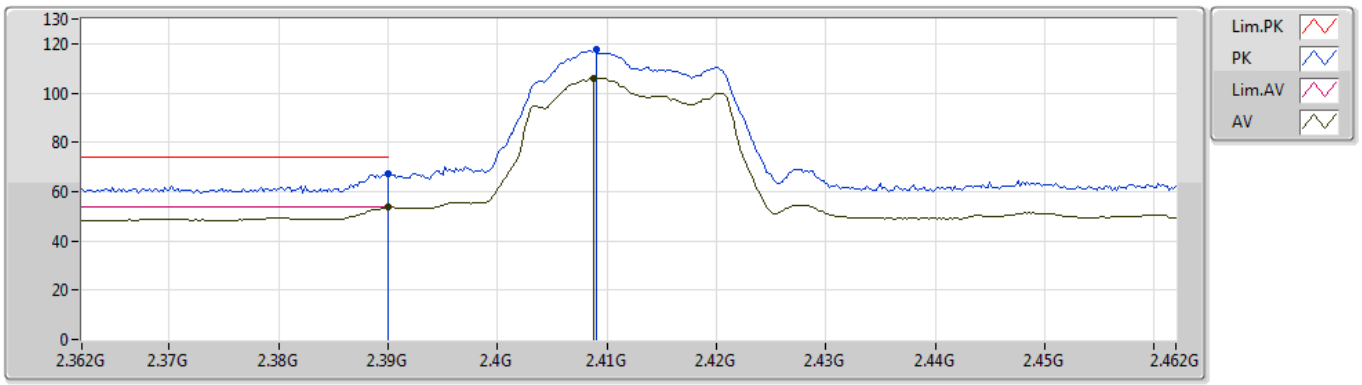
EUT Y_4TX
Setting 10.5
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.39G	67.17	74.00	-6.83	32.06	3	Vertical	2	1.69	-
AV	2.3888G	53.23	54.00	-0.77	32.06	3	Vertical	2	1.69	-
PK	2.4076G	118.96	Inf	-Inf	32.12	3	Vertical	2	1.69	-
AV	2.4068G	107.64	Inf	-Inf	32.12	3	Vertical	2	1.69	-

VHT20-BF_Nss1,(MCS0)_4TX

2412MHz_TX

04/06/2019



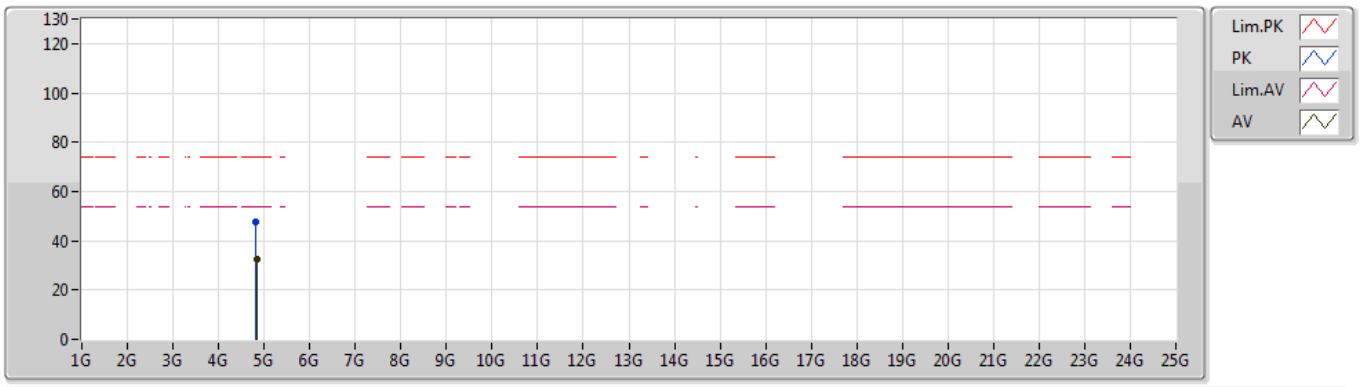
EUT Y_4TX
Setting 10.5
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.39G	67.15	74.00	-6.85	32.06	3	Horizontal	10	2.03	-
AV	2.39G	53.59	54.00	-0.41	32.06	3	Horizontal	10	2.03	-
PK	2.409G	117.70	Inf	-Inf	32.13	3	Horizontal	10	2.03	-
AV	2.4088G	106.06	Inf	-Inf	32.13	3	Horizontal	10	2.03	-

VHT20-BF_Nss1,(MCS0)_4TX

2412MHz_TX

04/06/2019



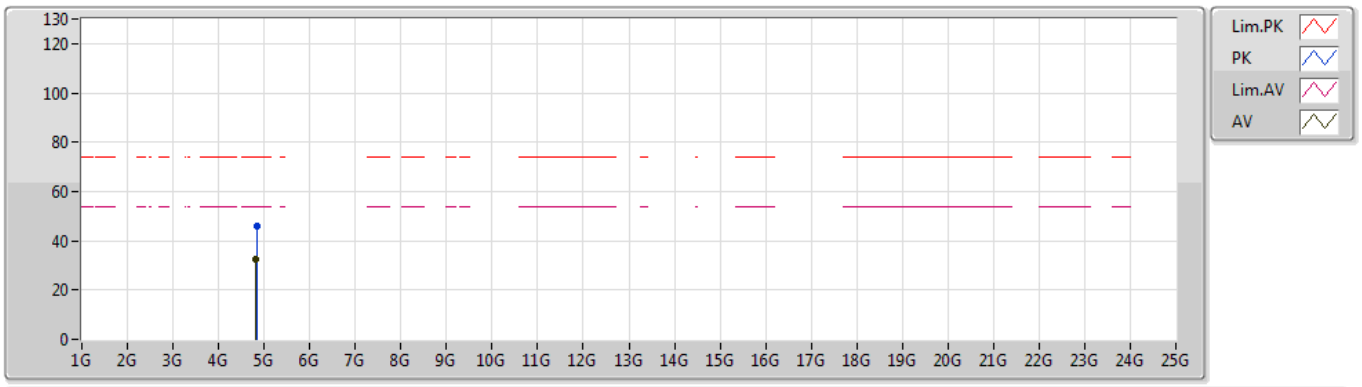
EUT Z_4TX
Setting 10.5
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.82768G	47.50	74.00	-26.50	5.12	3	Vertical	85	1.26	-
AV	4.82864G	32.74	54.00	-21.26	5.12	3	Vertical	85	1.26	-

VHT20-BF_Nss1,(MCS0)_4TX

2412MHz_TX

04/06/2019



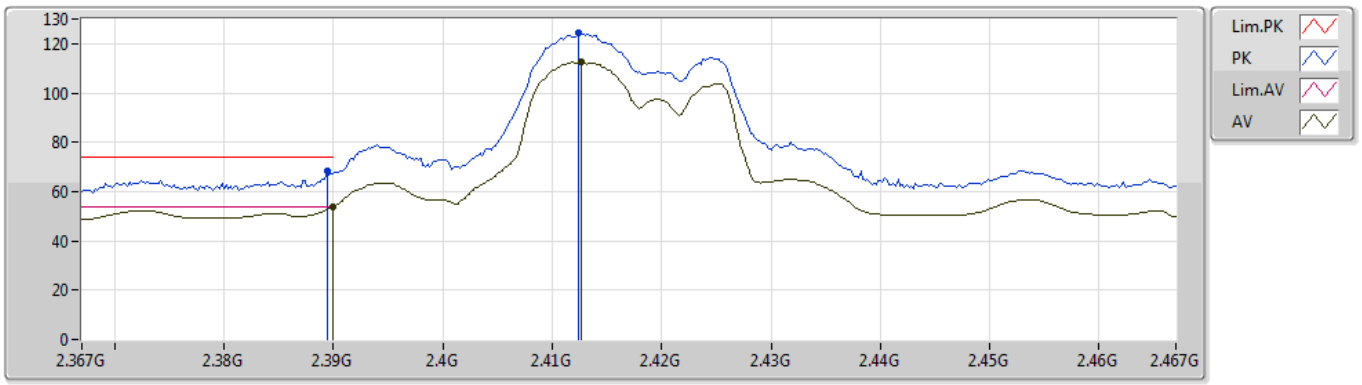
EUT Z_4TX
Setting 10.5
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.83384G	46.13	74.00	-27.87	5.14	3	Horizontal	37	1.42	-
AV	4.8284G	32.58	54.00	-21.42	5.12	3	Horizontal	37	1.42	-

VHT20-BF_Nss1,(MCS0)_4TX

2417MHz_TX

04/06/2019



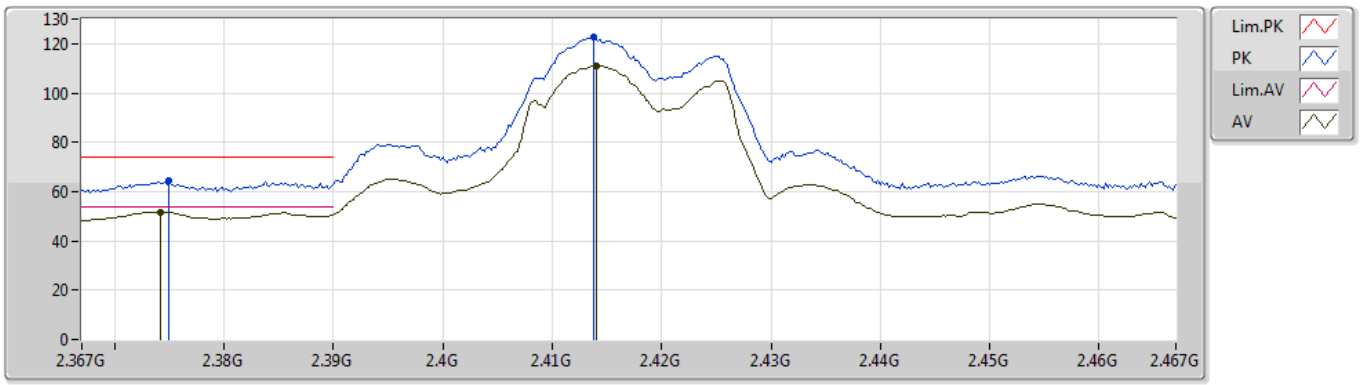
EUT Y_4TX
Setting 15
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3894G	68.38	74.00	-5.62	32.06	3	Vertical	3	1.71	-
AV	2.39G	53.83	54.00	-0.17	32.06	3	Vertical	3	1.71	-
PK	2.4124G	124.20	Inf	-Inf	32.14	3	Vertical	3	1.71	-
AV	2.4126G	112.61	Inf	-Inf	32.14	3	Vertical	3	1.71	-

VHT20-BF_Nss1,(MCS0)_4TX

2417MHz_TX

04/06/2019



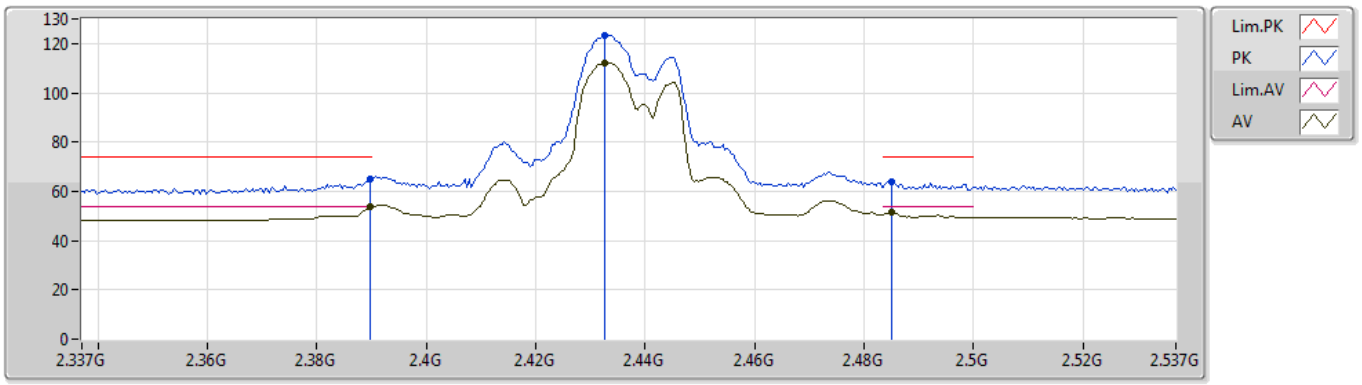
EUT Y_4TX
Setting 15
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.375G	64.32	74.00	-9.68	32.02	3	Horizontal	12	2.01	-
AV	2.3742G	51.79	54.00	-2.21	32.02	3	Horizontal	12	2.01	-
PK	2.4138G	122.55	Inf	-Inf	32.14	3	Horizontal	12	2.01	-
AV	2.414G	111.02	Inf	-Inf	32.14	3	Horizontal	12	2.01	-

VHT20-BF_Nss1,(MCS0)_4TX

2437MHz_TX

04/06/2019



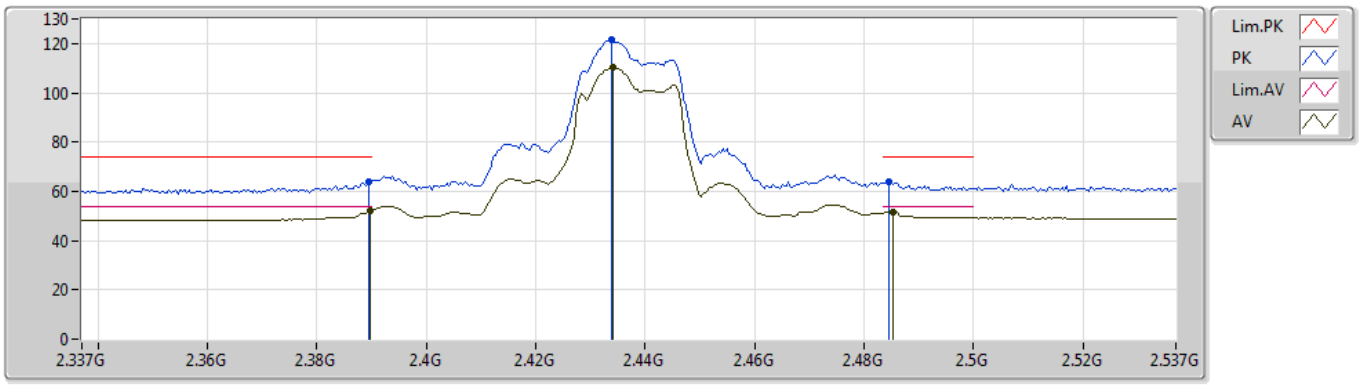
EUT Y_4TX
Setting 15
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3898G	64.80	74.00	-9.20	32.06	3	Vertical	4	1.67	-
AV	2.3898G	53.67	54.00	-0.33	32.06	3	Vertical	4	1.67	-
PK	2.4326G	123.54	Inf	-Inf	32.22	3	Vertical	4	1.67	-
AV	2.4326G	112.21	Inf	-Inf	32.22	3	Vertical	4	1.67	-
PK	2.485G	63.66	74.00	-10.34	32.42	3	Vertical	4	1.67	-
AV	2.485G	51.47	54.00	-2.53	32.42	3	Vertical	4	1.67	-

VHT20-BF_Nss1,(MCS0)_4TX

2437MHz_TX

04/06/2019



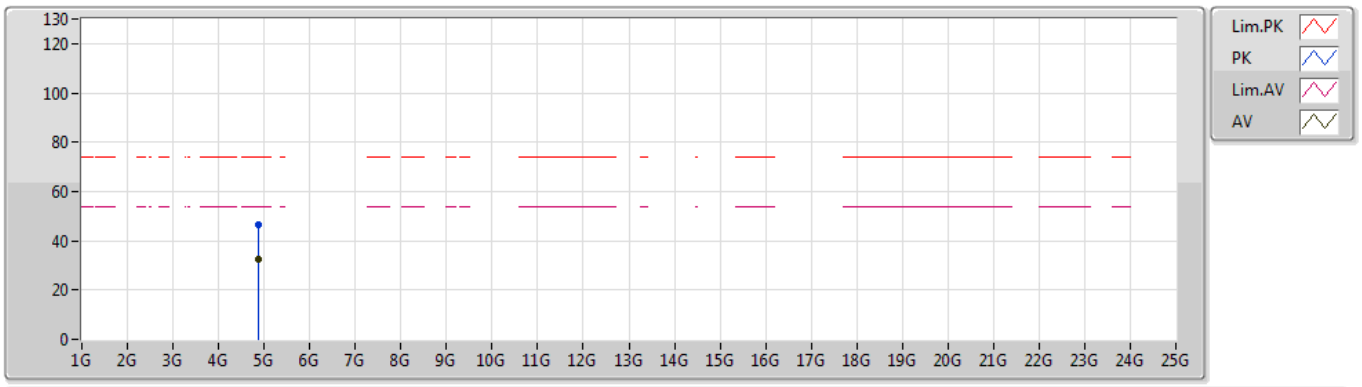
EUT Y_4TX
Setting 15
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3894G	63.99	74.00	-10.01	32.06	3	Horizontal	11	2.01	-
AV	2.3898G	51.93	54.00	-2.07	32.06	3	Horizontal	11	2.01	-
PK	2.4338G	121.53	Inf	-Inf	32.22	3	Horizontal	11	2.01	-
AV	2.4342G	110.31	Inf	-Inf	32.22	3	Horizontal	11	2.01	-
PK	2.4846G	63.91	74.00	-10.09	32.41	3	Horizontal	11	2.01	-
AV	2.4854G	51.73	54.00	-2.27	32.42	3	Horizontal	11	2.01	-

VHT20-BF_Nss1,(MCS0)_4TX

2437MHz_TX

04/06/2019



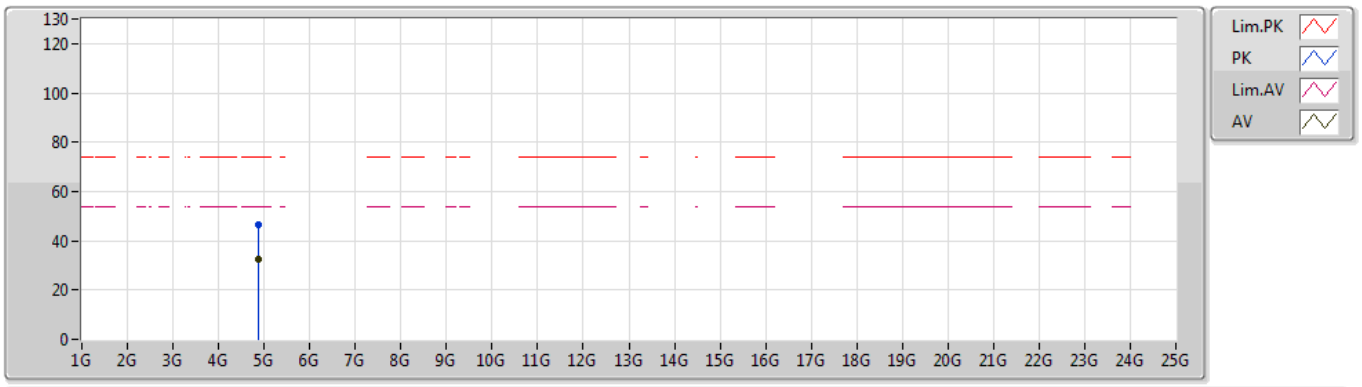
EUT Z_4TX
Setting 15
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.87172G	46.57	74.00	-27.43	5.23	3	Vertical	22	2.36	-
AV	4.88372G	32.62	54.00	-21.38	5.26	3	Vertical	22	2.36	-

VHT20-BF_Nss1,(MCS0)_4TX

2437MHz_TX

04/06/2019



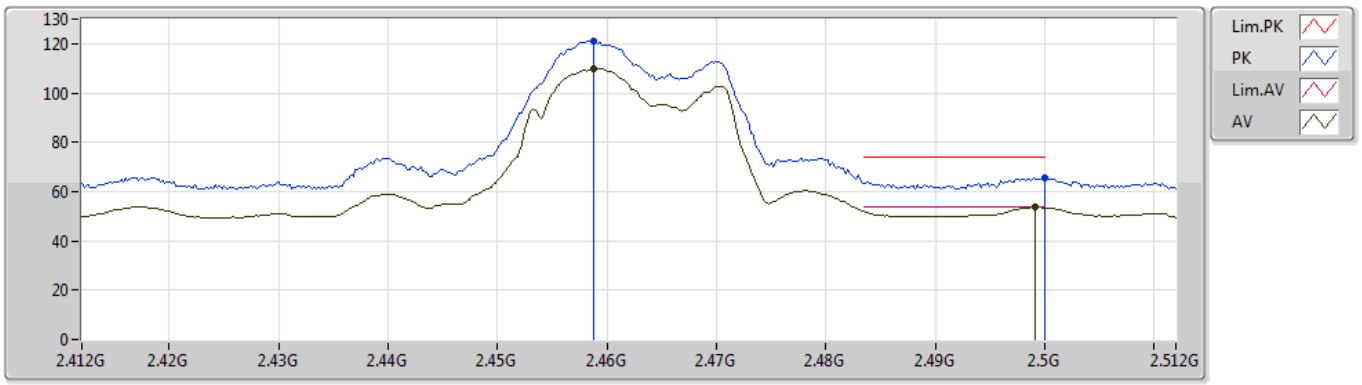
EUT Z_4TX
Setting 15
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.88308G	46.47	74.00	-27.53	5.26	3	Horizontal	6	1.30	-
AV	4.88336G	32.64	54.00	-21.36	5.26	3	Horizontal	6	1.30	-

VHT20-BF_Nss1,(MCS0)_4TX

2462MHz_TX

04/06/2019



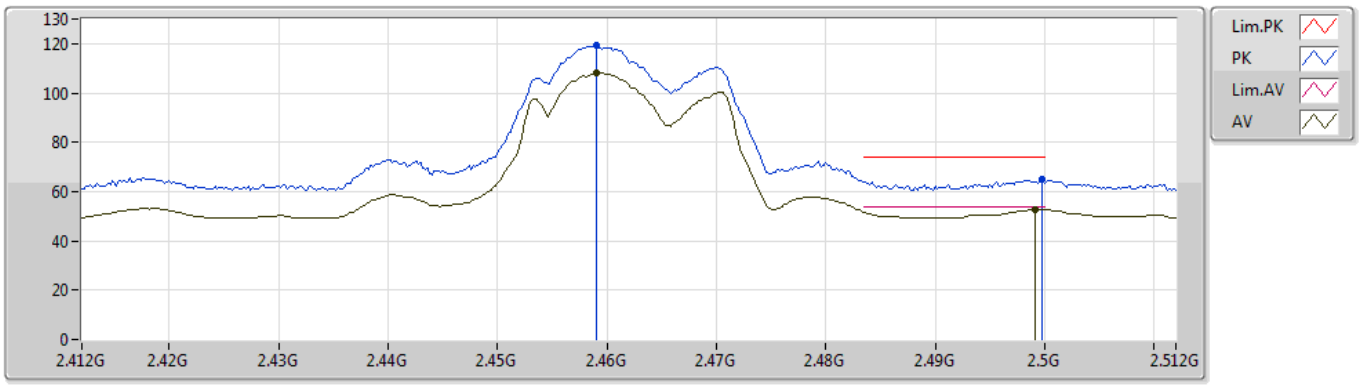
EUT Y_4TX
Setting 12.5
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.4588G	120.99	Inf	-Inf	32.32	3	Vertical	2	1.91	-
AV	2.4588G	109.85	Inf	-Inf	32.32	3	Vertical	2	1.91	-
PK	2.5G	65.77	74.00	-8.23	32.47	3	Vertical	2	1.91	-
AV	2.4992G	53.63	54.00	-0.37	32.47	3	Vertical	2	1.91	-

VHT20-BF_Nss1,(MCS0)_4TX

2462MHz_TX

04/06/2019



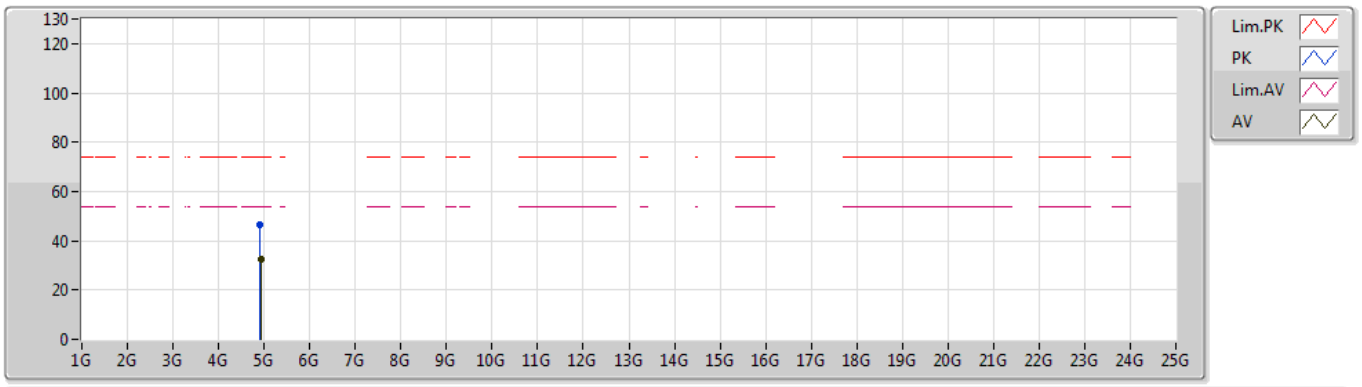
EUT Y_4TX
Setting 12.5
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.459G	119.37	Inf	-Inf	32.32	3	Horizontal	11	1.97	-
AV	2.459G	108.04	Inf	-Inf	32.32	3	Horizontal	11	1.97	-
PK	2.4998G	65.12	74.00	-8.88	32.47	3	Horizontal	11	1.97	-
AV	2.4992G	52.75	54.00	-1.25	32.47	3	Horizontal	11	1.97	-

VHT20-BF_Nss1,(MCS0)_4TX

2462MHz_TX

04/06/2019



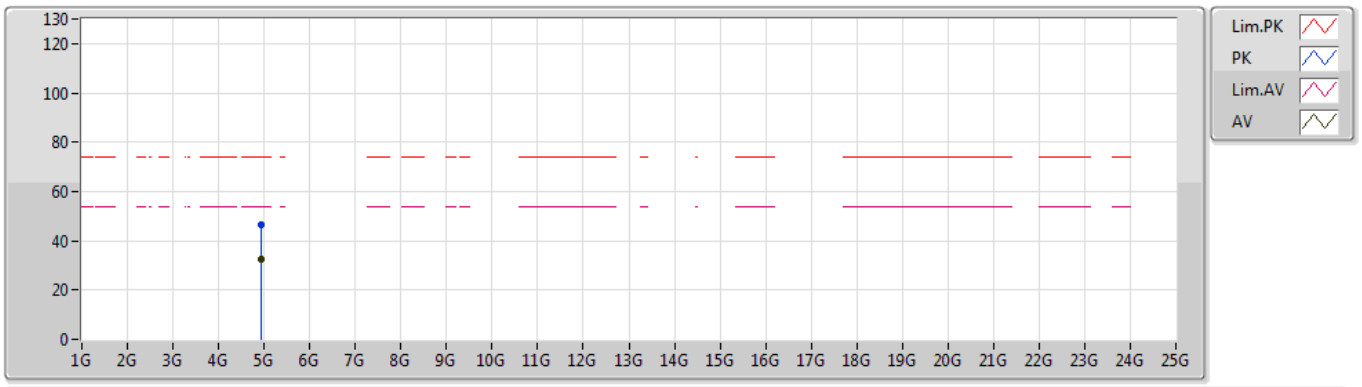
EUT Z_4TX
Setting 12.5
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.91484G	46.78	74.00	-27.22	5.34	3	Vertical	188	2.37	-
AV	4.93392G	32.39	54.00	-21.61	5.38	3	Vertical	188	2.37	-

VHT20-BF_Nss1,(MCS0)_4TX

2462MHz_TX

04/06/2019



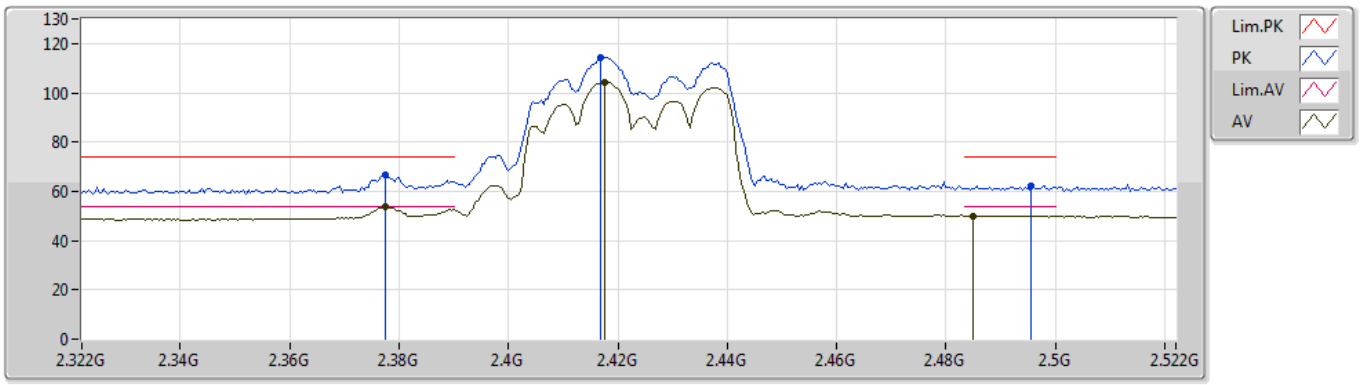
EUT Z_4TX
Setting 12.5
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.93352G	46.45	74.00	-27.55	5.38	3	Horizontal	45	1.57	-
AV	4.9286G	32.41	54.00	-21.59	5.37	3	Horizontal	45	1.57	-

VHT40-BF_Nss1,(MCS0)_4TX

2422MHz_TX

04/06/2019



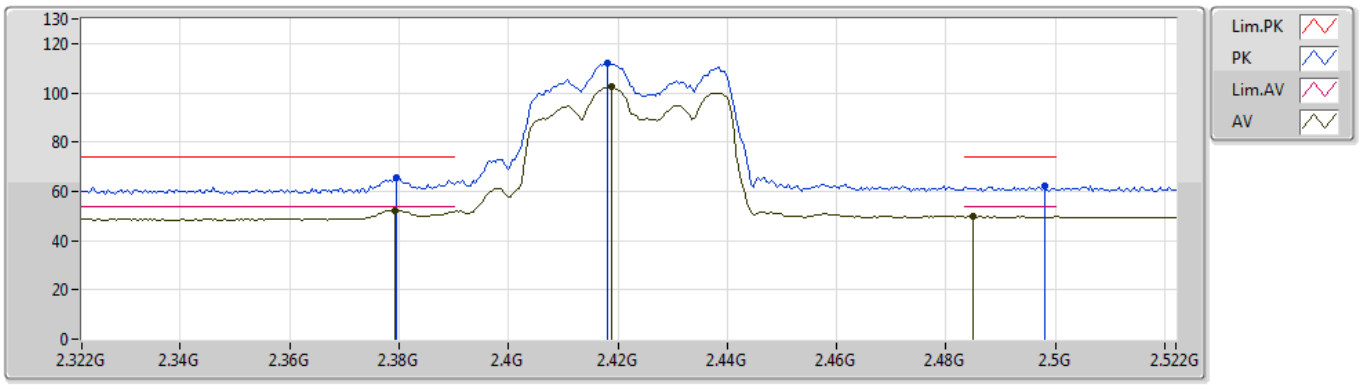
EUT Y_4TX
Setting 8.5
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3776G	66.43	74.00	-7.57	32.03	3	Vertical	3	1.73	-
AV	2.3776G	53.65	54.00	-0.35	32.03	3	Vertical	3	1.73	-
PK	2.4168G	114.34	Inf	-Inf	32.15	3	Vertical	3	1.73	-
AV	2.4176G	104.45	Inf	-Inf	32.15	3	Vertical	3	1.73	-
PK	2.4956G	62.33	74.00	-11.67	32.46	3	Vertical	3	1.73	-
AV	2.4848G	50.09	54.00	-3.91	32.41	3	Vertical	3	1.73	-

VHT40-BF_Nss1,(MCS0)_4TX

2422MHz_TX

04/06/2019



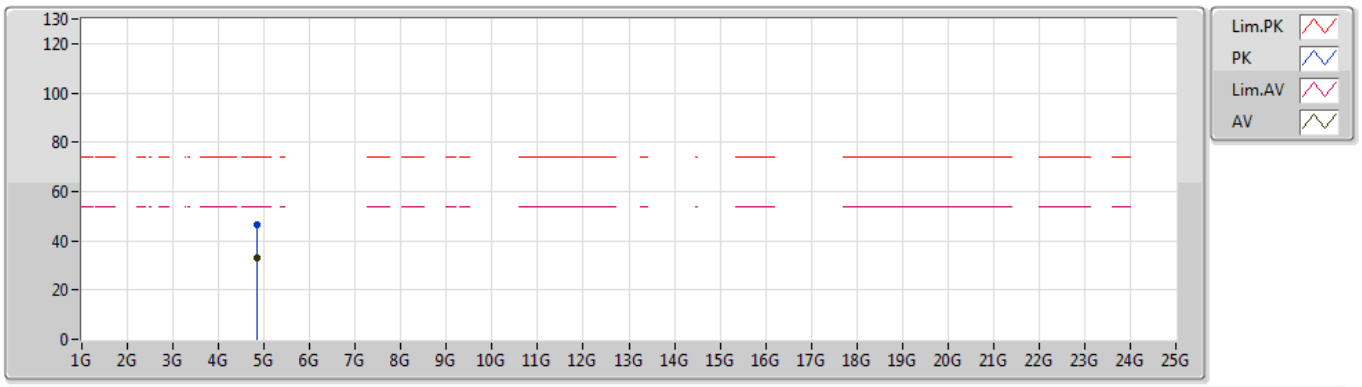
EUT Y_4TX
Setting 8.5
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3796G	65.81	74.00	-8.19	32.03	3	Horizontal	11	1.78	-
AV	2.3792G	52.34	54.00	-1.66	32.03	3	Horizontal	11	1.78	-
PK	2.418G	112.24	Inf	-Inf	32.15	3	Horizontal	11	1.78	-
AV	2.4188G	102.44	Inf	-Inf	32.17	3	Horizontal	11	1.78	-
PK	2.498G	62.03	74.00	-11.97	32.46	3	Horizontal	11	1.78	-
AV	2.4848G	49.84	54.00	-4.16	32.41	3	Horizontal	11	1.78	-

VHT40-BF_Nss1,(MCS0)_4TX

2422MHz_TX

04/06/2019



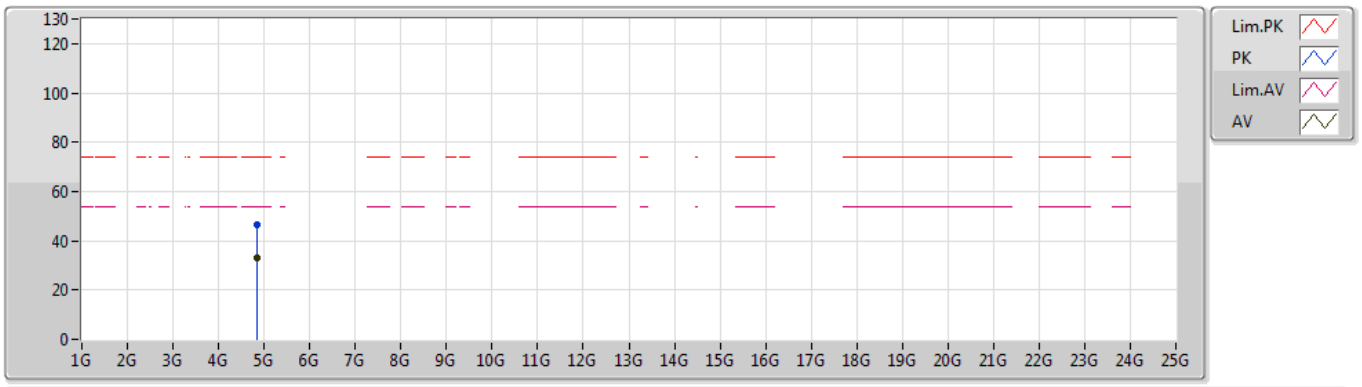
EUT Z_4TX
Setting 8.5
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.85316G	46.71	74.00	-27.29	5.19	3	Vertical	102	1.01	-
AV	4.83864G	33.21	54.00	-20.79	5.15	3	Vertical	102	1.01	-

VHT40-BF_Nss1,(MCS0)_4TX

2422MHz_TX

04/06/2019



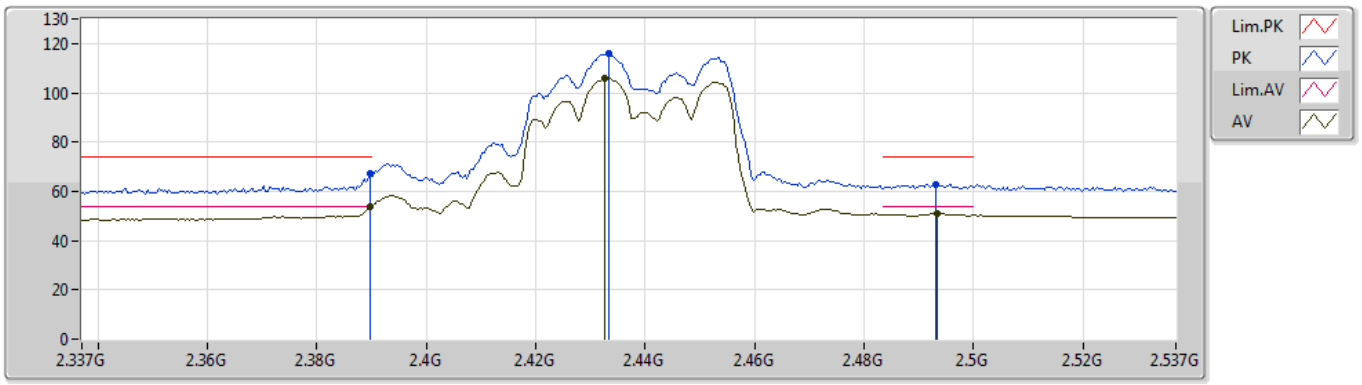
EUT Z_4TX
Setting 8.5
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.83764G	46.54	74.00	-27.46	5.15	3	Horizontal	153	1.50	-
AV	4.83888G	33.18	54.00	-20.82	5.15	3	Horizontal	153	1.50	-

VHT40-BF_Nss1,(MCS0)_4TX

2437MHz_TX

04/06/2019



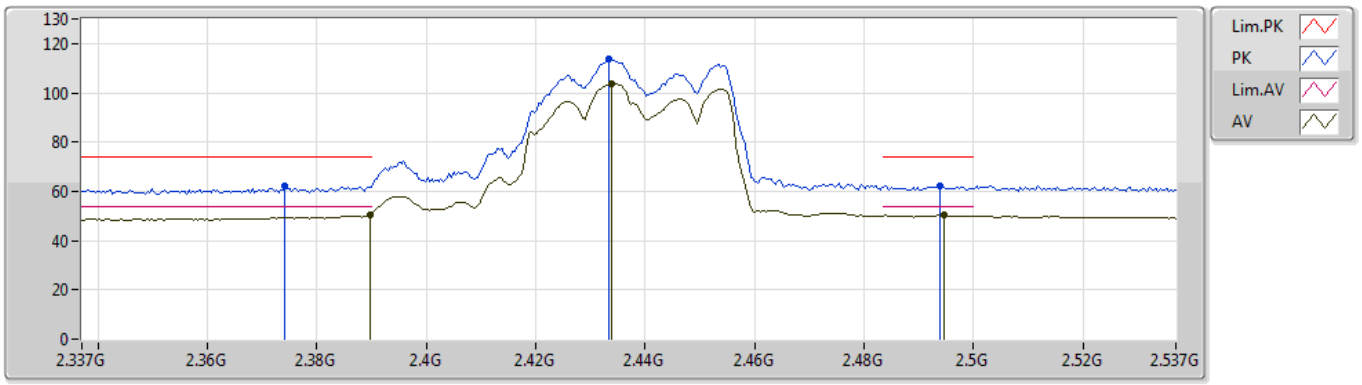
EUT Y_4TX
Setting 10.5
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3898G	67.36	74.00	-6.64	32.06	3	Vertical	3	1.67	-
AV	2.3898G	53.77	54.00	-0.23	32.06	3	Vertical	3	1.67	-
PK	2.4334G	116.01	Inf	-Inf	32.22	3	Vertical	3	1.67	-
AV	2.4326G	105.91	Inf	-Inf	32.22	3	Vertical	3	1.67	-
PK	2.493G	62.94	74.00	-11.06	32.44	3	Vertical	3	1.67	-
AV	2.4934G	51.06	54.00	-2.94	32.44	3	Vertical	3	1.67	-

VHT40-BF_Nss1,(MCS0)_4TX

2437MHz_TX

04/06/2019



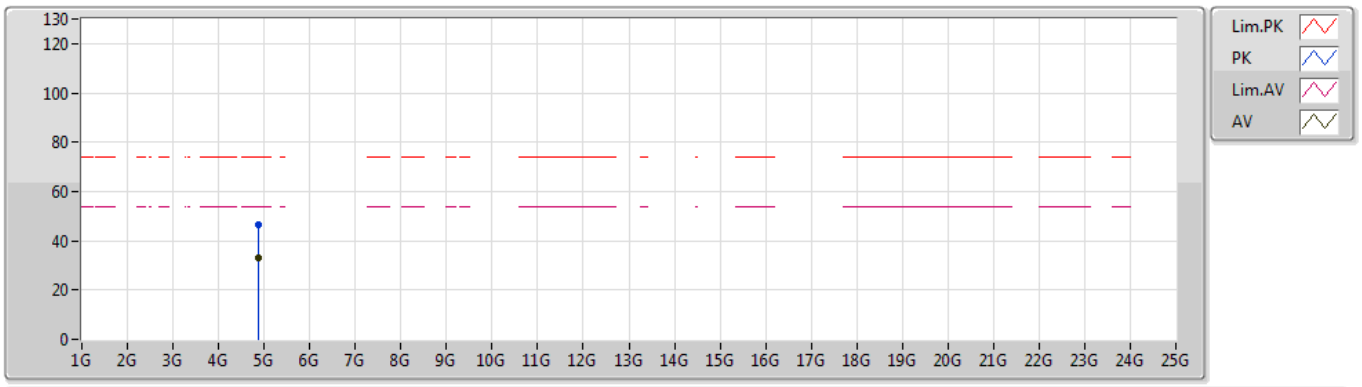
EUT Y_4TX
Setting 10.5
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3742G	62.19	74.00	-11.81	32.02	3	Horizontal	12	1.86	-
AV	2.3898G	50.64	54.00	-3.36	32.06	3	Horizontal	12	1.86	-
PK	2.4334G	113.74	Inf	-Inf	32.22	3	Horizontal	12	1.86	-
AV	2.4338G	103.56	Inf	-Inf	32.22	3	Horizontal	12	1.86	-
PK	2.4938G	62.14	74.00	-11.86	32.45	3	Horizontal	12	1.86	-
AV	2.4946G	50.45	54.00	-3.55	32.45	3	Horizontal	12	1.86	-

VHT40-BF_Nss1,(MCS0)_4TX

2437MHz_TX

04/06/2019



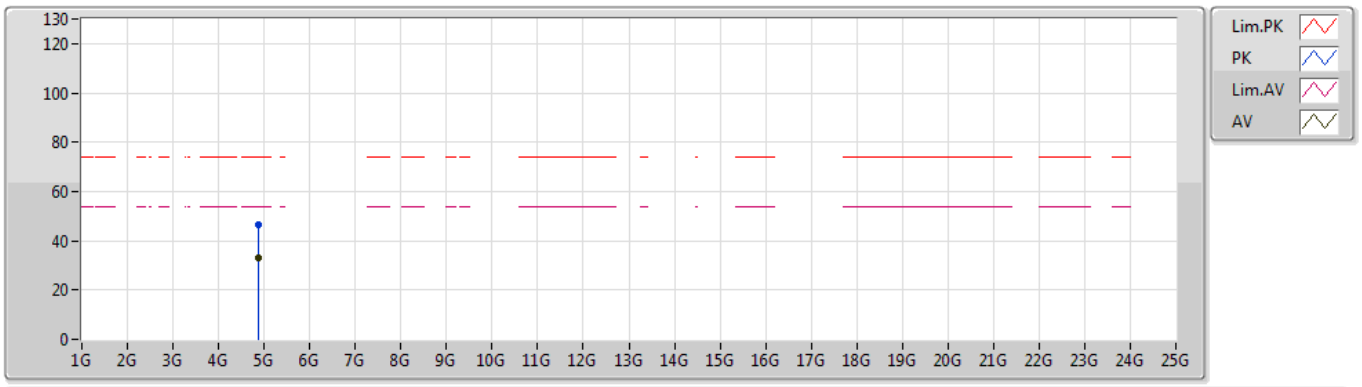
EUT Z_4TX
Setting 10.5
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.87012G	46.25	74.00	-27.75	5.23	3	Vertical	297	1.82	-
AV	4.88216G	33.28	54.00	-20.72	5.25	3	Vertical	297	1.82	-

VHT40-BF_Nss1,(MCS0)_4TX

2437MHz_TX

04/06/2019



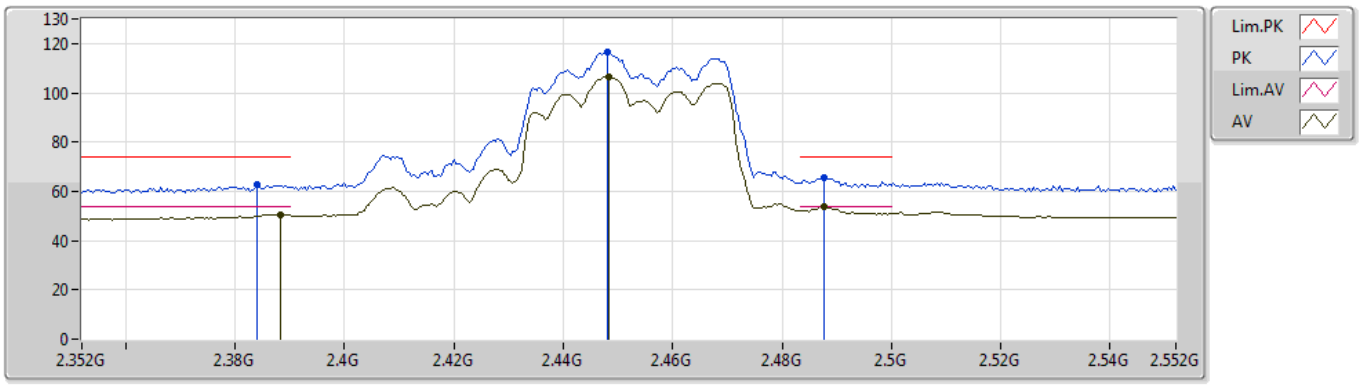
EUT Z_4TX
Setting 10.5
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.87816G	46.25	74.00	-27.75	5.25	3	Horizontal	307	1.52	-
AV	4.88324G	33.16	54.00	-20.84	5.26	3	Horizontal	307	1.52	-

VHT40-BF_Nss1,(MCS0)_4TX

2452MHz_TX

04/06/2019



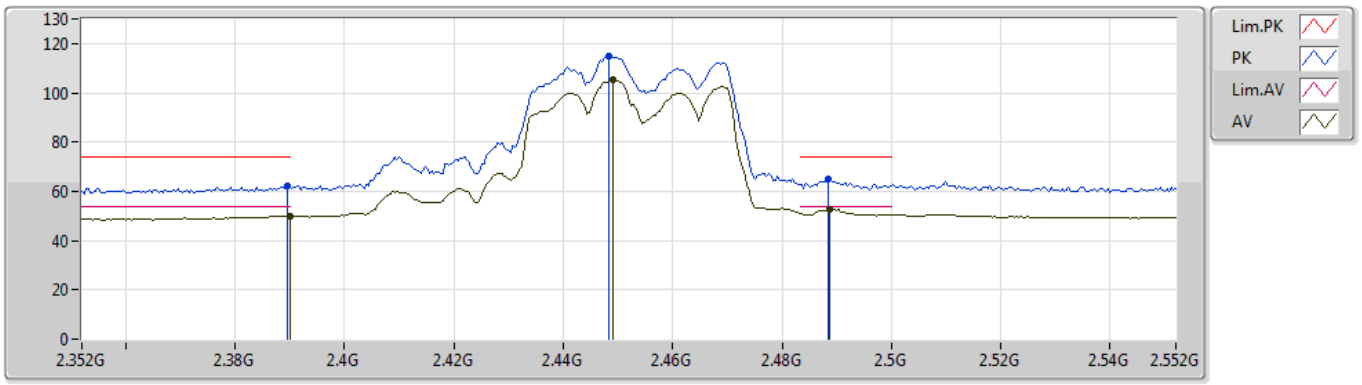
EUT Y_4TX
Setting 11.5
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.384G	62.53	74.00	-11.47	32.05	3	Vertical	5	1.69	-
AV	2.3884G	50.59	54.00	-3.41	32.06	3	Vertical	5	1.69	-
PK	2.448G	116.47	Inf	-Inf	32.27	3	Vertical	5	1.69	-
AV	2.4484G	106.50	Inf	-Inf	32.28	3	Vertical	5	1.69	-
PK	2.4876G	65.59	74.00	-8.41	32.42	3	Vertical	5	1.69	-
AV	2.4876G	53.61	54.00	-0.39	32.42	3	Vertical	5	1.69	-

VHT40-BF_Nss1,(MCS0)_4TX

2452MHz_TX

04/06/2019



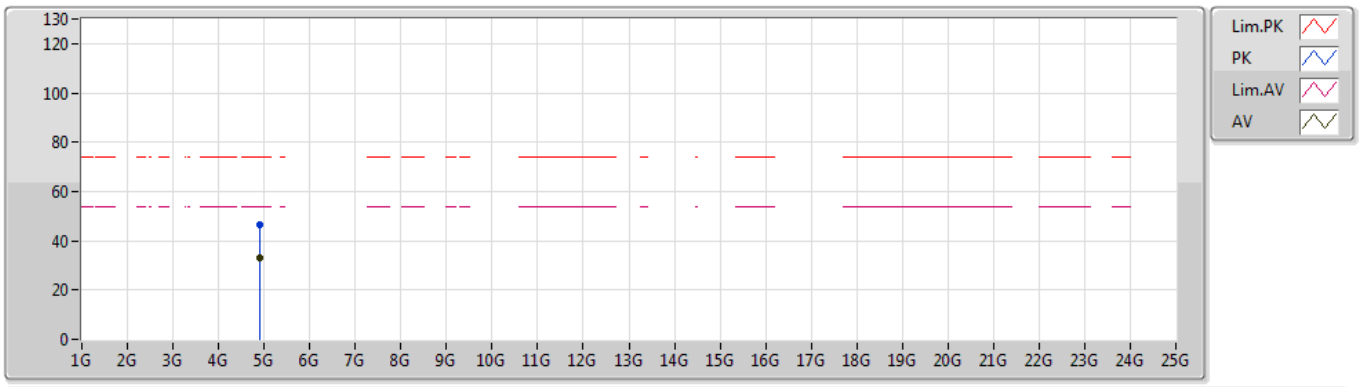
EUT Y_4TX
Setting 11.5
03-S-5-6.02
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	2.3896G	61.98	74.00	-12.02	32.06	3	Horizontal	11	1.95	-
AV	2.39G	50.09	54.00	-3.91	32.06	3	Horizontal	11	1.95	-
PK	2.4484G	114.79	Inf	-Inf	32.28	3	Horizontal	11	1.95	-
AV	2.4492G	105.15	Inf	-Inf	32.28	3	Horizontal	11	1.95	-
PK	2.4884G	64.93	74.00	-9.07	32.43	3	Horizontal	11	1.95	-
AV	2.4888G	52.64	54.00	-1.36	32.43	3	Horizontal	11	1.95	-

VHT40-BF_Nss1,(MCS0)_4TX

2452MHz_TX

04/06/2019



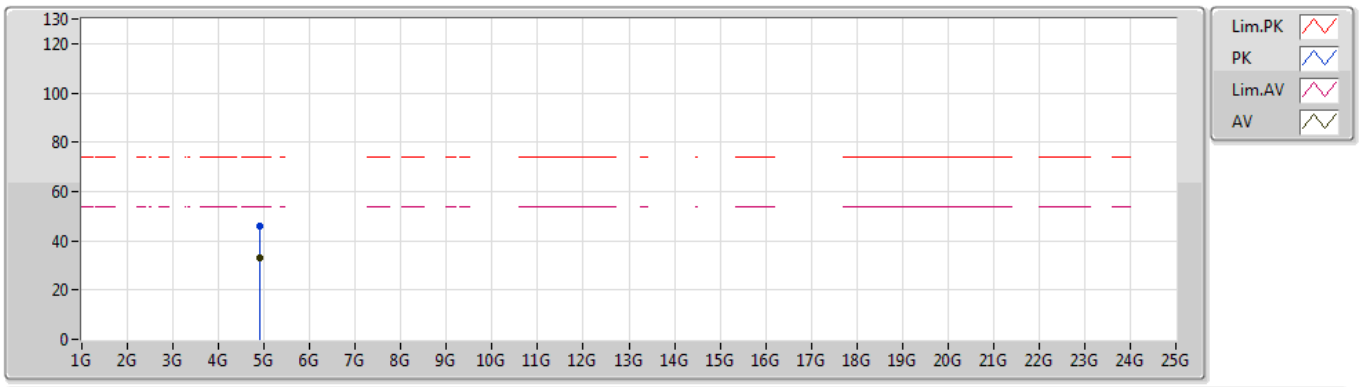
EUT Z_4TX
Setting 11.5
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.91072G	46.56	74.00	-27.44	5.32	3	Vertical	211	1.15	-
AV	4.89492G	33.09	54.00	-20.91	5.29	3	Vertical	211	1.15	-

VHT40-BF_Nss1,(MCS0)_4TX

2452MHz_TX

04/06/2019



EUT Z_4TX
Setting 11.5
03-S-5
Dipole ANT
FSP(100019)

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	4.8994G	45.75	74.00	-28.25	5.30	3	Horizontal	89	1.04	-
AV	4.89492G	33.10	54.00	-20.90	5.29	3	Horizontal	89	1.04	-