Testing Laboratory 1190

FCC RADIO TEST REPORT

FCC ID	:	MSQ-RTAXI600
Equipment	:	Wireless-AX5700 Dual-band Gigabit Router
Brand Name	:	ASUS
Model Name	:	RT-AX86U/RT-AX5700
Applicant	:	ASUSTeK COMPUTER INC. 4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan
Manufacturer (1)	:	Compal Networking(KunShan) CO., LTD. No.520,Nan Bang RD., Economic & Technical Development Zone, KunShan,JiangSu,China
Manufacturer (2)	:	ARCADYAN TECHNOLOGY (VIETNAM) CO., LTD. Ba Thien Industrial Park, Ba Hien commune, Binh Xuyen district, Vinh Phuc Province
Standard	:	47 CFR FCC Part 15.247

The product was received on Dec. 05, 2019, and testing was started from Dec. 05, 2019 and completed on Jan. 31, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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

Approved by: Sam Chen

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

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Photographs of EUT v01

History of this test report

Report No.	Version	Description	Issued Date
FR9D0510AA	01	Initial issue of report	Feb. 06, 2020

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	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(a)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	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:

1. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.
2. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen
Report Producer: Cindy Peng

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
2400-2483.5	b, g, n (HT20), VHT20, ax (HEW20)	2412-2462	1-11 [11]
2400-2483.5	n (HT40), VHT40, ax (HEW40)	2422-2452	3-9 [7]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	3TX
2.4-2.4835GHz	802.11g	20	3TX
2.4-2.4835GHz	802.11n HT20	20	3TX
2.4-2.4835GHz	802.11n HT20-BF	20	3TX
2.4-2.4835GHz	VHT20	20	3TX
2.4-2.4835GHz	VHT20-BF	20	3TX
2.4-2.4835GHz	802.11ax HEW20	20	3TX
2.4-2.4835GHz	802.11ax HEW20-BF	20	3TX
2.4-2.4835GHz	802.11n HT40	40	3TX
2.4-2.4835GHz	802.11n HT40-BF	40	3TX
2.4-2.4835GHz	VHT40	40	3TX
2.4-2.4835GHz	VHT40-BF	40	3TX
2.4-2.4835GHz	802.11ax HEW40	40	3TX
2.4-2.4835GHz	802.11ax HEW40-BF	40	3TX

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, 1024QAM modulation.
- HEW20, HEW40 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Set	Ant.	Port 2.4 GHz	Port 5 GHz	Brand	P/N	Type	Connector	Antenna Gain (dBi) 2.4GHz	5GHz Band 1	5GHz Band 2	5GHz Band 3	5GHz Band 4
1	1	1	1	WHA YU	C660-510490-A	Dipole	Reversed-SMA	1.66	1.86	1.86	1.90	1.84
	2	2	3									
	3	3	4									
	4	-	2	WHA YU	C660-510390-A	PCB	I-PEX	-	2.90	2.90	3.00	2.52
2	1	-	-	WHA YU	C660-510492-A	Dipole	Reversed-SMA	1.52	1.41	1.45	1.72	1.74
	2	-	-									
	3	-	-									
	4	-	-	WHA YU	C660-510390-A	PCB	I-PEX	-	2.90	2.90	3.00	2.52
3	1	-	-	WHLSIN	RFDPA141500 SBLB802	Dipole	Reversed-SMA	1.52	1.66	1.76	1.82	1.65
	2	-	-									
	3	-	-									
	4	-	-	WHLSIN	RFPCA302603I M5B301	PCB	I-PEX	-	2.17	2.30	2.20	2.49

Set	Directional Gain (dBi) 2.4GHz	5GHz Band 1	5GHz Band 2	5GHz Band 3	5GHz Band 4	
	Nss1	Nss1	Nss1	Nss1	Nss1	Nss2
1	6.43	6.63	6.63	6.67	6.61	4.85

Note1: The above information was declared by manufacturer.
Note2: The EUT has three sets of antenna, and each set contains four antennas.
For 2.4GHz function (3TX/3RX):
Only the higher gain antenna “Set 1” was tested.
Port 1, Port 2 and Port 3 could transmit/receive simultaneously.
For 5GHz function (4TX/4RX):
Only the higher gain antenna “Set 1” was tested.
Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.
Note3: 5GHz Band with four antennas and device designed the three dipole antennas are used in the vertical position, the other one PCB antenna is used in the horizontal position.
So array gain only calculation 10log(3).

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11b	0.952	0.21	12.425m	100
802.11g	0.948	0.23	2.068m	1k
802.11ax HEW20-BF	0.91	0.41	2.928m	1k
802.11ax HEW40-BF	0.923	0.35	4.365m	300

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

1.1.4 EUT Operational Condition

EUT Power Type	From power adapter			
Beamforming Function	☒	With beamforming	☐	Without beamforming
	The product has beamforming function for n/VHT/ax in 2.4GHz and n/ac/ax in 5GHz.			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	Mtool V3.2.0.0			

Note: The above information was declared by manufacturer.

1.1.5 Table for EUT Supports Functions

Function	Support Type
AP Router	Master
Bridge	Client without radar detection
Repeater	Master
Mesh	Master

After evaluating, the most complex modes for “AP Router” and “Mesh” were performed for AC power-line conducted emissions test and recorded in this report.

1.1.6 Table for Multiple Listing

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

Model Name	Description
RT-AX86U	There is nothing different of two model names, just for different marketing use.
RT-AX5700	

From the above models, model: RT-AX86U was selected as representative model for the test and its data was recorded in this report.

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
- FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

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

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-CB	Owen Hsu	20.9~22°C / 64~68%	Dec. 23, 2019~Jan. 20, 2020
Radiated	03CH01-CB	Eason Chen	23~24.5°C / 53~59%	Dec. 05, 2019~Jan. 31, 2020
AC Conduction	CO01-CB	Rick Yeh	21~22°C / 50~51%	Jan. 02, 2020~Jan. 03, 2020

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

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%
Output Power Measurement	1.5 dB	Confidence levels of 95%
Power Density Measurement	2.4 dB	Confidence levels of 95%
Bandwidth Measurement	2%	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
802.11b_Nss1,(1Mbps)_3TX	-
2412MHz	95
2437MHz	100
2462MHz	100
802.11g_Nss1,(6Mbps)_3TX	-
2412MHz	76
2417MHz	83
2437MHz	100
2457MHz	84
2462MHz	78
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	-
2412MHz	71
2417MHz	83
2437MHz	100
2457MHz	83
2462MHz	71
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	-
2422MHz	67
2427MHz	72
2437MHz	83
2447MHz	76
2452MHz	71

Note:
- There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for n/VHT/ax in 2.4GHz and n/ac/ax in 5GHz. Only beamforming mode has been tested and recorded in this test report.

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	Normal Link
1	AP Router - EUT + Adapter 1
2	AP Router - EUT + Adapter 2
3	AP Router - EUT + Adapter 3
Mode 1 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4~5 will follow this same test mode.	
4	Mesh + WLAN 2.4GHz - EUT + Adapter 1
5	Mesh + WLAN 5GHz - EUT + Adapter 1
For operating mode 1 is the worst case and it was record in this test report.	

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

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
1	WLAN 2.4GHz - EUT + Adapter 1
2	WLAN 2.4GHz - EUT + Adapter 2
3	WLAN 2.4GHz - EUT + Adapter 3
Mode 3 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4 will follow this same test mode.	
4	WLAN 5GHz - EUT + Adapter 3
For operating mode 3 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Radiated Emission Co-location
Test Condition	Radiated measurement
Operating Mode	Normal Link
1	WLAN 2.4GHz + WLAN 5GHz
Refer to Appendix G for Radiated Emission Co-location.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz + WLAN 5GHz
Refer to Sporton Test Report No.: FA9D0510 for Co-location RF Exposure Evaluation.	

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

2.3 EUT Operation during Test

For CTX Mode:

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

During the test, the following programs under WIN 7 were executed.
The program was executed as follows:
1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under Telnet.
3. Executed "Lantest.exe" to link with the remote workstation to transmit and receive packet by RX Device and transmit duty cycle no less than 98%.

For Normal Link:

During the test, the EUT operation to normal function.

2.4 Accessories

Accessories					
No.	**Equipment Name**	**Brand Name**	**Model Name**	**Rating**	**Remark**
1	Adapter 1	DELTA	APD-45ZE B	INPUT: 100-240V ~ 50-60Hz, 1.2A OUTPUT: 19V, 2.37A	With the DC cable: Non-shielded, 1.8m
2	Adapter 2	DELTA	APD-45FE F	INPUT: 100-240V ~1.2A, 50-60Hz OUTPUT: 19V, 2.37A	With the DC cable: Non-shielded, 1.5m
3	Adapter 3	AcBel	ADH011	INPUT: 100-240V ~1.4A, 50-60Hz OUTPUT: 19.5V, 2.31A, 45W MAX	With the DC cable: Non-shielded, 1.5m
No.	**Others**				
4	Power cable*1: Non-shielded, 0.9m				
5	RJ-45 cable*1: Non-shielded, 1.5m				

2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	LAN1 NB	DELL	E6430	N/A
B	2.4G NB	DELL	E6430	N/A
C	5G NB	DELL	E6430	N/A
D	LAN4 NB	DELL	E6430	N/A
E	HDD3.0	Transcend	TS1TSJ25A3K	N/A
F	HDD3.0	Transcend	TS1TSJ25A3K	N/A
G	WAN NB	DELL	E6430	N/A
H	2.5G LAN PC	DELL	T3400	N/A

For RF Conducted and Radiated (below 1GHz):

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

For Radiated (above 1GHz):

For non-beamforming mode:

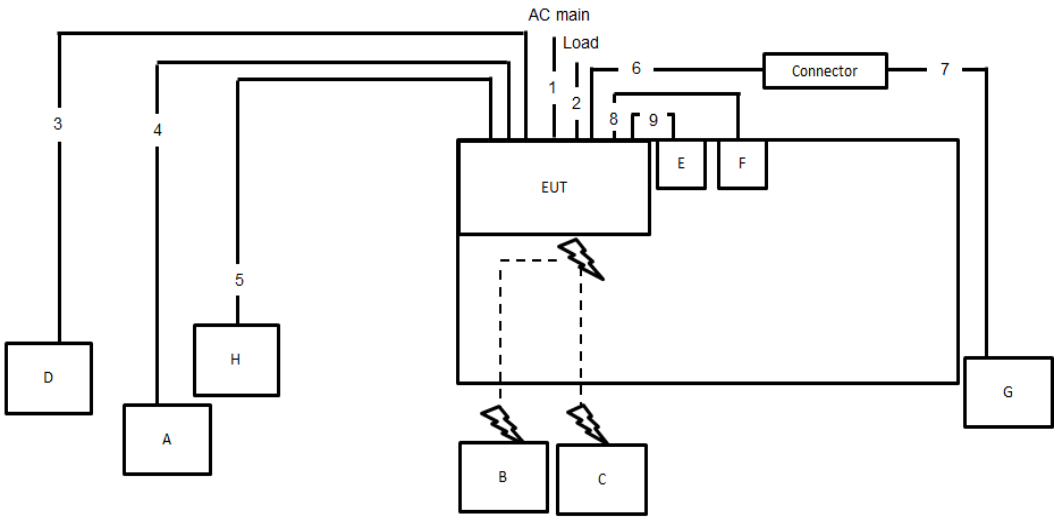
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A

For beamforming mode:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A
B	NB	DELL	E4300	N/A
C	RX Device	ASUS	RT-AX86U	MSQ-RTAXI600

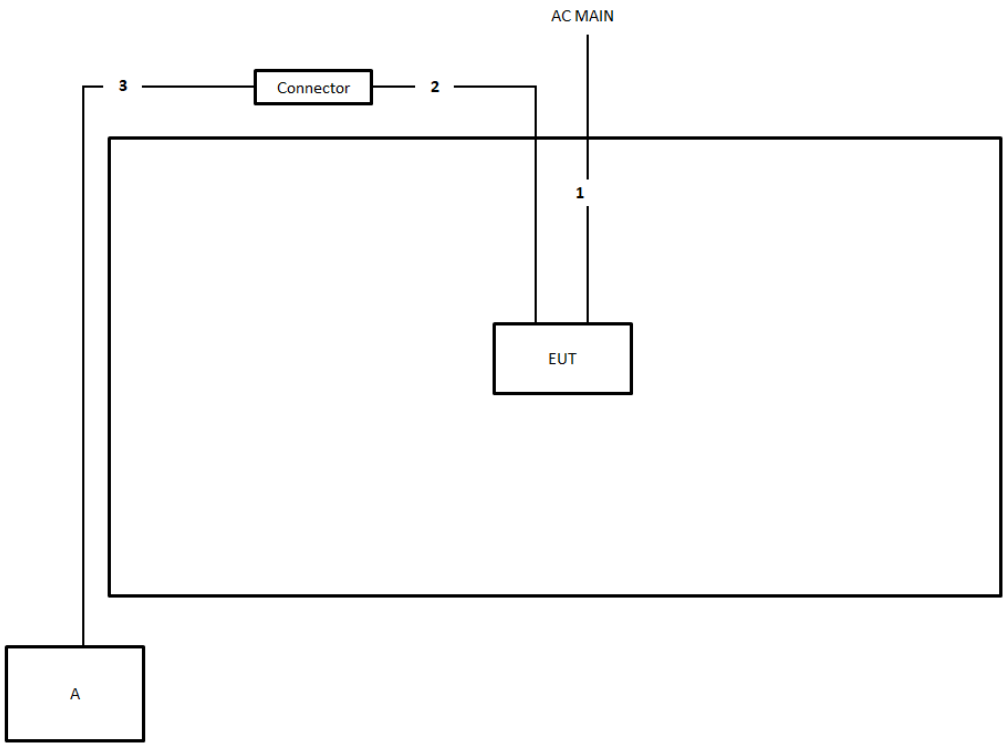
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length
1	Power cable	No	2.7m
2	RJ-45 cable*2	No	1.5m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m
5	RJ-45 cable	No	10m
6	RJ-45 cable	No	1.5m
7	RJ-45 cable	No	10m
8	USB cable	Yes	0.4m
9	USB cable	Yes	0.4m

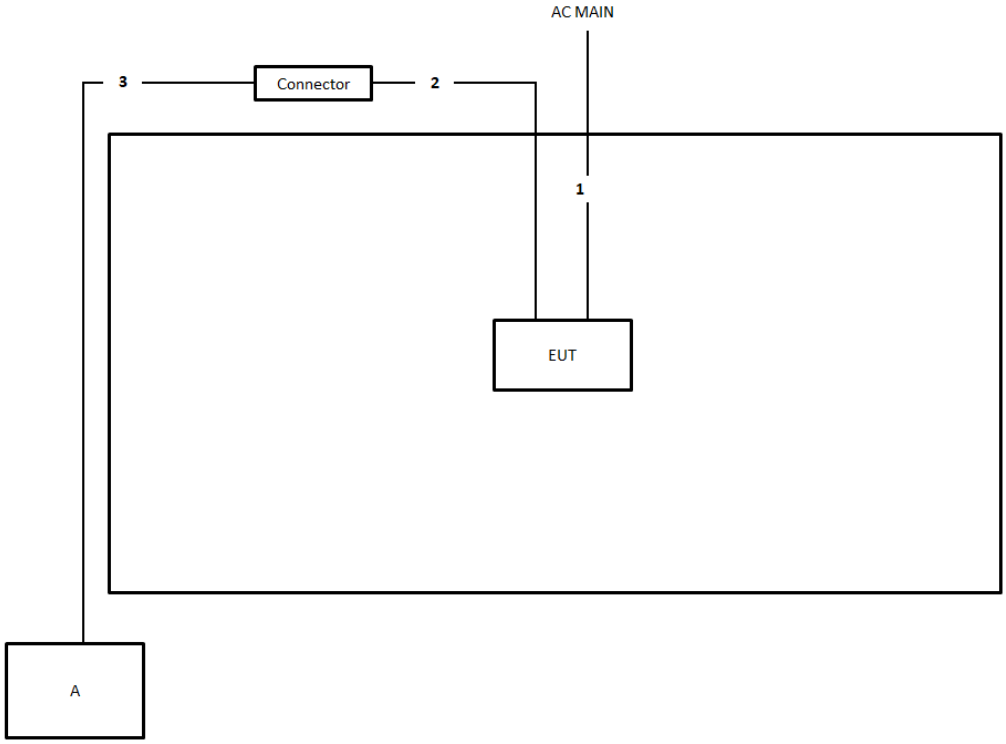
Test Setup Diagram - Radiated Test < 1GHz



Item	Connection	Shielded	Length
1	Power cable	No	2.4m
2	RJ-45 cable	No	1.5m
3	RJ-45 cable	No	10m

Test Setup Diagram - Radiated Test > 1GHz

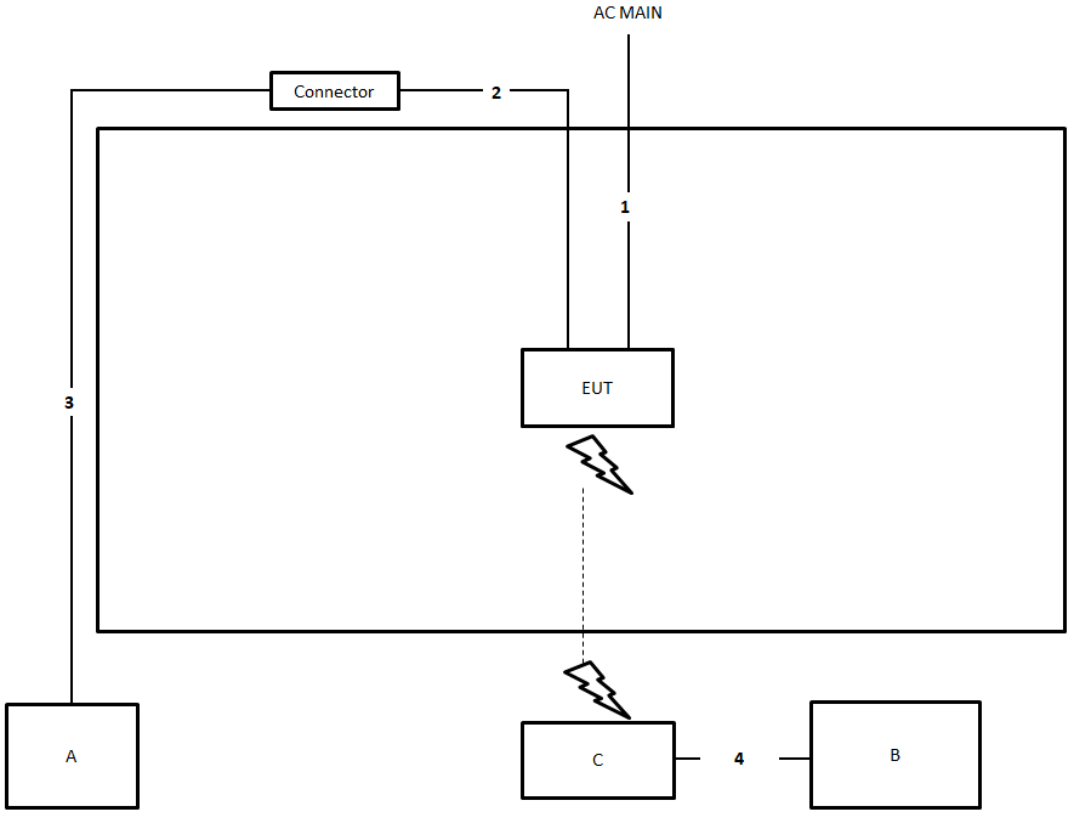
For non-beamforming mode:



Item	Connection	Shielded	Length
1	Power cable	No	2.4m
2	RJ-45 cable	No	1.5m
3	RJ-45 cable	No	10m

Test Setup Diagram - Radiated Test > 1GHz

For beamforming mode:



Item	Connection	Shielded	Length
1	Power cable	No	2.4m
2	RJ-45 cable	No	1.5m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

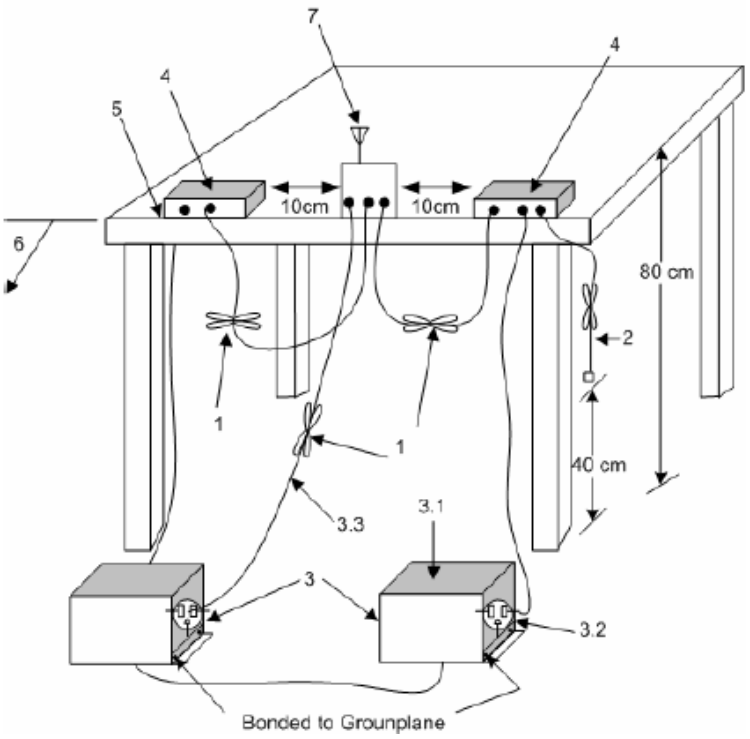
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

AC Power-line Conducted Emissions



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

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

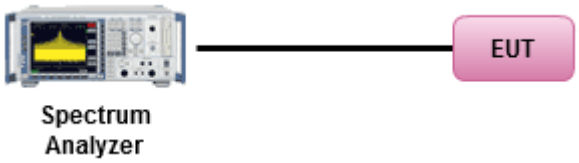
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
▪ 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.

3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit		
	▪ 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.		

3.3.2 Measuring Instruments

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

3.3.3 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]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)

3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

3.4.2 Measuring Instruments

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

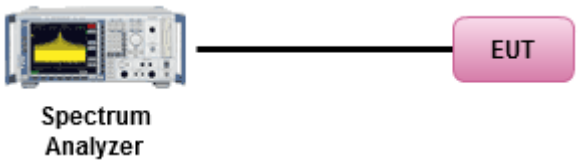
3.4.3 Test Procedures

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.

3.4.4 Test Setup

Power Spectral Density



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 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.

3.5.2 Measuring Instruments

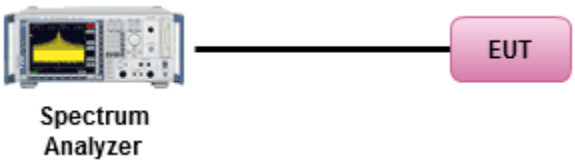
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

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

3.5.4 Test Setup

Emissions in Non-restricted Frequency Bands



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 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.

3.6.2 Measuring Instruments

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

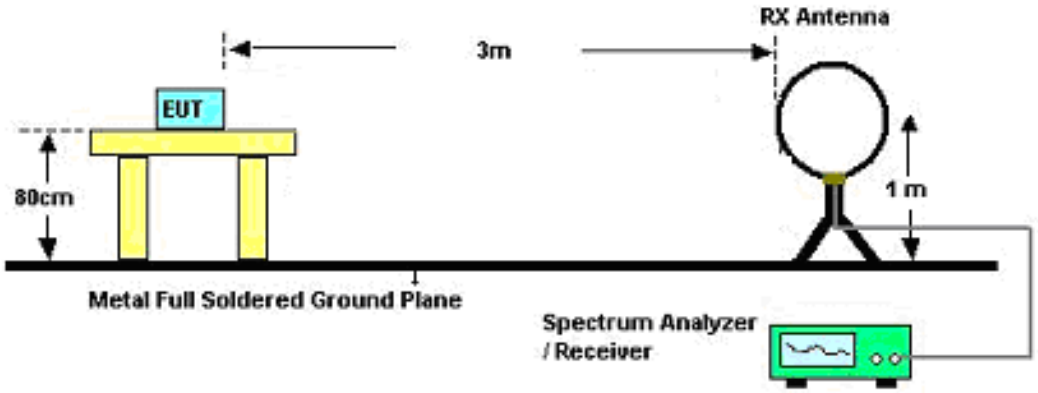
3.6.3 Test Procedures

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.		

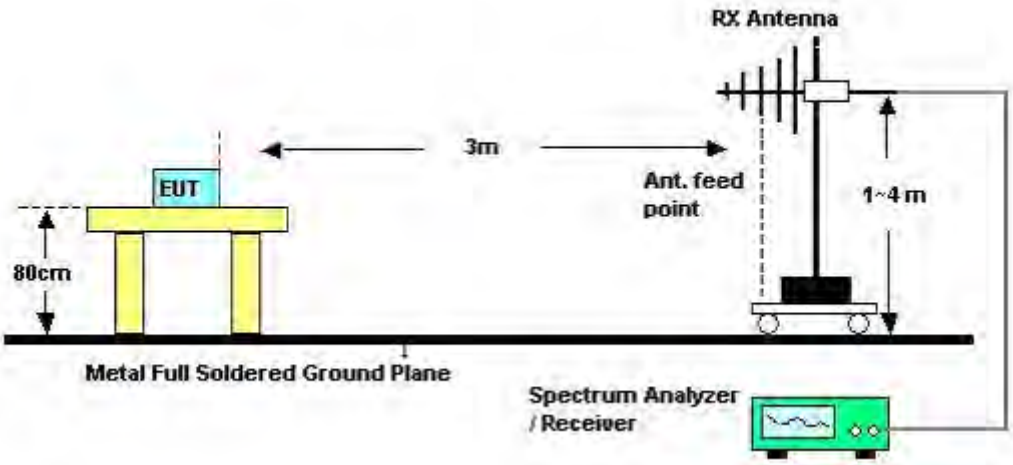
3.6.4 Test Setup

Radiated - Emissions in Restricted Frequency Bands

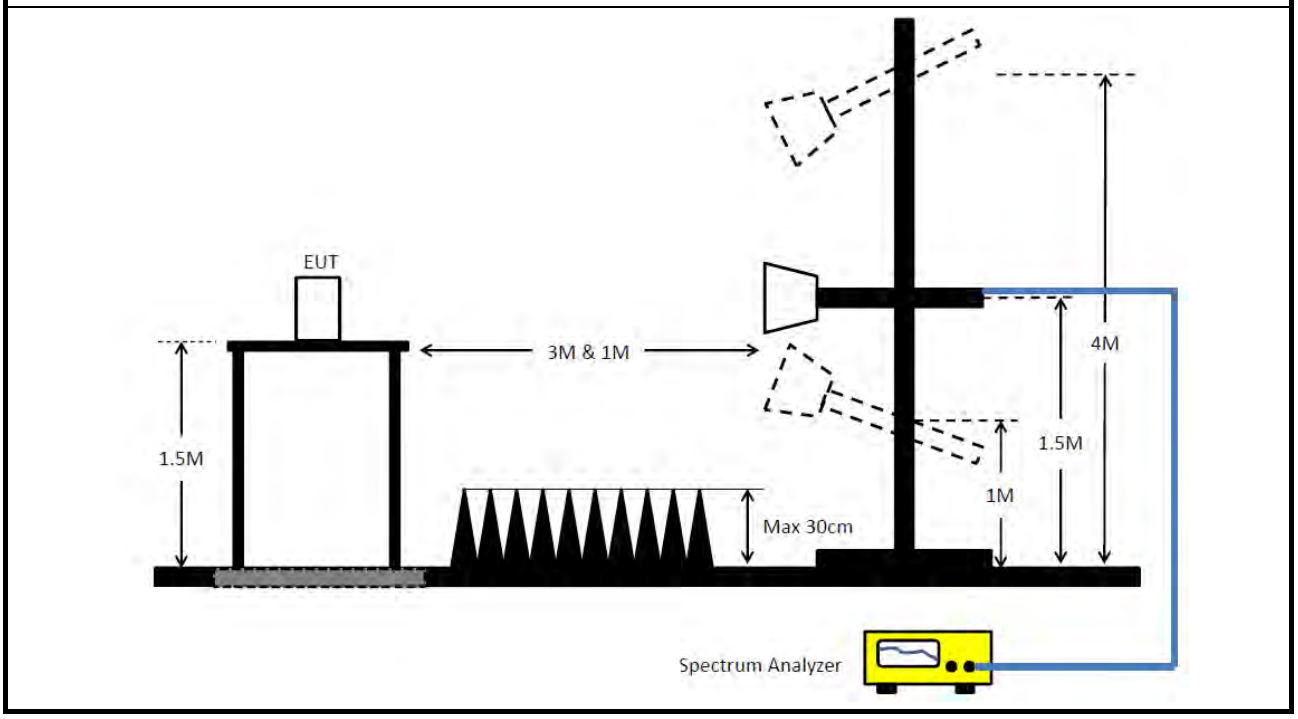
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.6.5 Measurement Results Calculation

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

3.6.6 Emissions in Restricted Frequency Bands (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.
The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

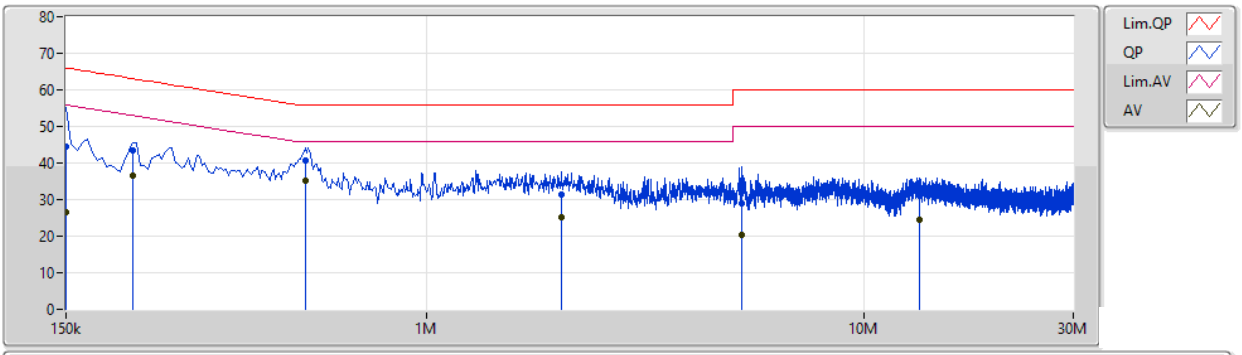
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 28, 2019	Jan. 29, 2020	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 25, 2019	Dec. 24, 2020	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Jan. 11, 2019	Jan. 10, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH01-CB)
Bilog Antenna with 6dB Attenuator	Schaffner & EMCI	CBL6112 & N-6-06	2888 & AT-N0611	30MHz ~ 1GHz	Oct. 12, 2019	Oct. 11, 2020	Radiation (03CH01-CB)
Horn Antenna	ETS-LINDGREN	3115	00075790	750MHz ~ 18GHz	Nov. 04, 2019	Nov. 03, 2020	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 27, 2019	Jun. 26, 2020	Radiation (03CH01-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	83017A	MY39501305	1GHz ~ 26.5GHz	Aug. 21, 2019	Jan. 07, 2020	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSU	100015	9kHz~26GHz	Apr. 23, 2019	Apr. 22, 2020	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH01-CB)
RF Cable-low	Woken	RG402	Low Cable-16+17	30 MHz ~ 1 GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1 GHz ~ 18 GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16+17	1 GHz ~ 18 GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	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. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-08	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-28	1 GHz –26.5 GHz	Nov. 18, 2019	Nov. 17, 2020	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.
N.C.R. means Non-Calibration required.

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	Normal Link		

02/01/2020

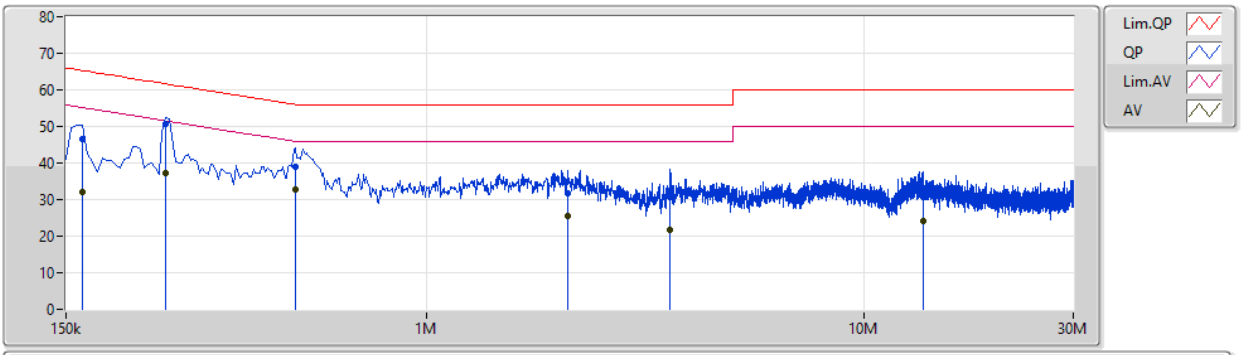


Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	AF	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	150k	44.44	66.00	-21.56	9.90	Line	-	34.54	0.05	0.06	9.79
AV	150k	26.50	56.00	-29.50	9.90	Line	-	16.60	0.05	0.06	9.79
QP	213k	43.51	63.09	-19.58	9.91	Line	-	33.60	0.06	0.06	9.79
AV	213k	36.51	53.09	-16.58	9.91	Line	-	26.60	0.06	0.06	9.79
QP	528k	40.65	56.00	-15.35	9.94	Line	-	30.71	0.06	0.07	9.81
AV	528k	35.15	46.00	-10.85	9.94	Line	"Worst"	25.21	0.06	0.07	9.81
QP	2.031M	31.47	56.00	-24.53	10.04	Line	-	21.43	0.09	0.12	9.83
AV	2.031M	25.20	46.00	-20.80	10.04	Line	-	15.16	0.09	0.12	9.83
QP	5.235M	29.04	60.00	-30.96	10.18	Line	-	18.86	0.15	0.19	9.84
AV	5.235M	20.23	50.00	-29.77	10.18	Line	-	10.05	0.15	0.19	9.84
QP	13.349M	31.03	60.00	-28.97	10.38	Line	-	20.65	0.24	0.22	9.92
AV	13.349M	24.57	50.00	-25.43	10.38	Line	-	14.19	0.24	0.22	9.92

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

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	Normal Link		

02/01/2020



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	AF	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	163.5k	46.72	65.27	-18.55	9.89	Neutral	-	36.83	0.04	0.06	9.79
AV	163.5k	32.22	55.27	-23.05	9.89	Neutral	-	22.33	0.04	0.06	9.79
QP	253.5k	50.64	61.64	-11.00	9.90	Neutral	"Worst"	40.74	0.04	0.06	9.80
AV	253.5k	37.29	51.64	-14.35	9.90	Neutral	-	27.39	0.04	0.06	9.80
QP	500k	39.01	56.00	-16.99	9.92	Neutral	-	29.09	0.04	0.07	9.81
AV	500k	32.86	46.00	-13.14	9.92	Neutral	-	22.94	0.04	0.07	9.81
QP	2.099M	31.74	56.00	-24.26	10.02	Neutral	-	21.72	0.07	0.12	9.83
AV	2.099M	25.38	46.00	-20.62	10.02	Neutral	-	15.36	0.07	0.12	9.83
QP	3.602M	30.86	56.00	-25.14	10.07	Neutral	-	20.79	0.10	0.16	9.81
AV	3.602M	21.89	46.00	-24.11	10.07	Neutral	-	11.82	0.10	0.16	9.81
QP	13.583M	30.71	60.00	-29.29	10.36	Neutral	-	20.35	0.22	0.22	9.92
AV	13.583M	24.30	50.00	-25.70	10.36	Neutral	-	13.94	0.22	0.22	9.92

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

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11b_Nss1,(1Mbps)_3TX	8.05M	10.595M	10M6G1D	6.525M	10.145M
802.11g_Nss1,(6Mbps)_3TX	16.35M	17.141M	17M1D1D	15.675M	16.692M
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	19M	19.19M	19M2D1D	18.15M	18.991M
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	36.7M	37.581M	37M6D1D	32.55M	36.982M

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

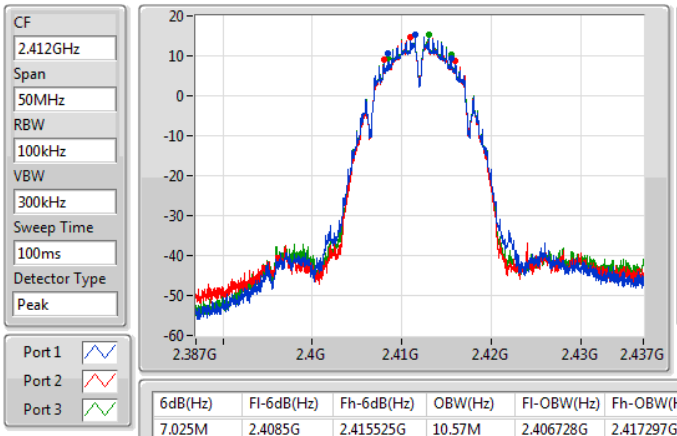
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)
802.11b_Nss1,(1Mbps)_3TX	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	7.025M	10.57M	8.05M	10.37M	7.075M	10.445M
2437MHz	Pass	500k	7.05M	10.445M	6.55M	10.145M	6.55M	10.27M
2462MHz	Pass	500k	7.025M	10.595M	7.025M	10.445M	6.525M	10.37M
802.11g_Nss1,(6Mbps)_3TX	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	16.35M	16.817M	16.35M	16.817M	16.35M	16.717M
2437MHz	Pass	500k	16.05M	17.141M	16.275M	16.692M	15.675M	16.717M
2462MHz	Pass	500k	16.325M	16.817M	16.35M	16.942M	16.35M	16.717M
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	19M	19.04M	18.95M	19.065M	18.95M	19.14M
2437MHz	Pass	500k	18.6M	19.19M	18.4M	18.991M	18.15M	19.065M
2462MHz	Pass	500k	18.975M	19.065M	18.975M	19.14M	18.95M	19.14M
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	36.4M	37.581M	36.3M	37.531M	36.3M	37.481M
2437MHz	Pass	500k	35.4M	37.181M	35M	37.031M	32.55M	36.982M
2452MHz	Pass	500k	36.7M	37.481M	36.35M	37.581M	36.35M	37.381M

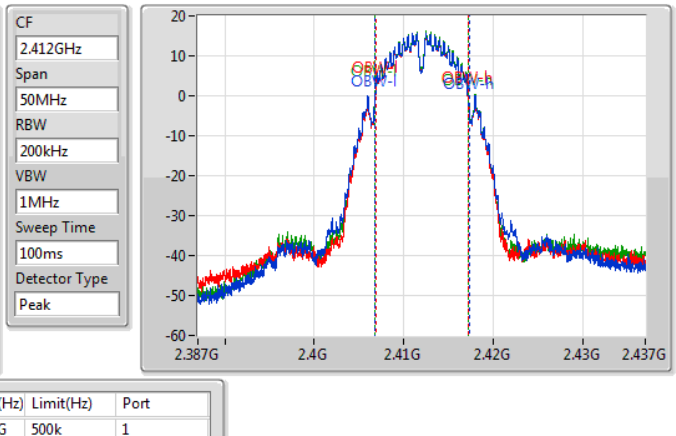
Port X-N dB = Port **X** 6dB down bandwidth; **Port X-OBW** = Port **X** 99% occupied bandwidth;

802.11b_Nss1,(1Mbps)_3TX EBW

2412MHz

27/12/2019



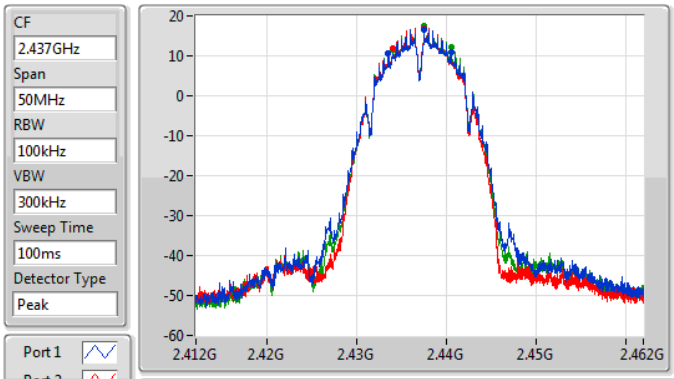


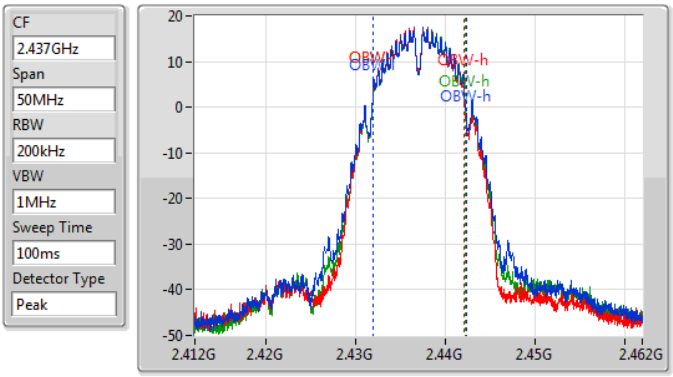
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
7.025M	2.4085G	2.415525G	10.57M	2.406728G	2.417297G	500k	1
8.05M	2.407975G	2.416025G	10.37M	2.406853G	2.417222G	500k	2
7.075M	2.40845G	2.415525G	10.445M	2.406828G	2.417272G	500k	3

802.11b_Nss1,(1Mbps)_3TX EBW

2437MHz

27/12/2019



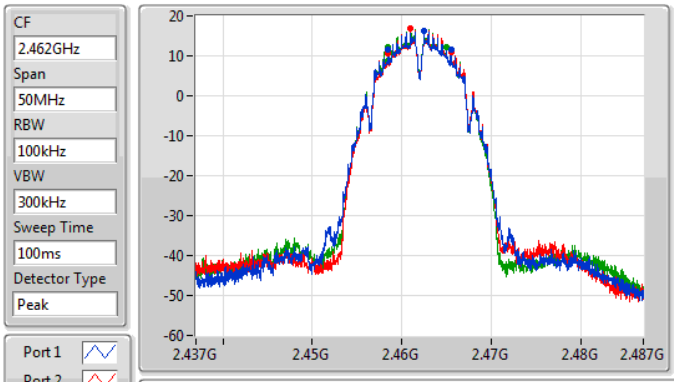


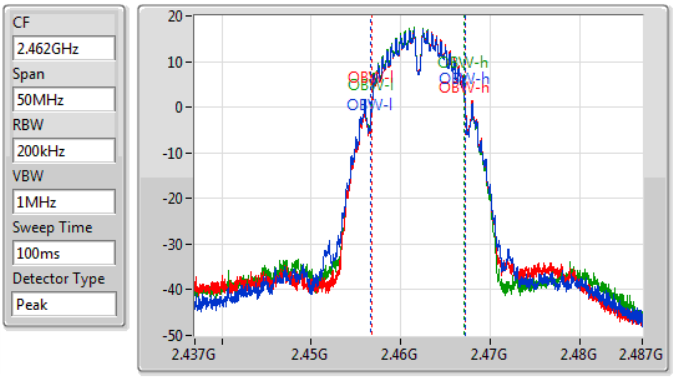
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
7.05M	2.433475G	2.440525G	10.445M	2.431903G	2.442347G	500k	1
6.55M	2.433975G	2.440525G	10.145M	2.431928G	2.442072G	500k	2
6.55M	2.433975G	2.440525G	10.27M	2.431953G	2.442222G	500k	3

802.11b_Nss1,(1Mbps)_3TX EBW

2462MHz

27/12/2019



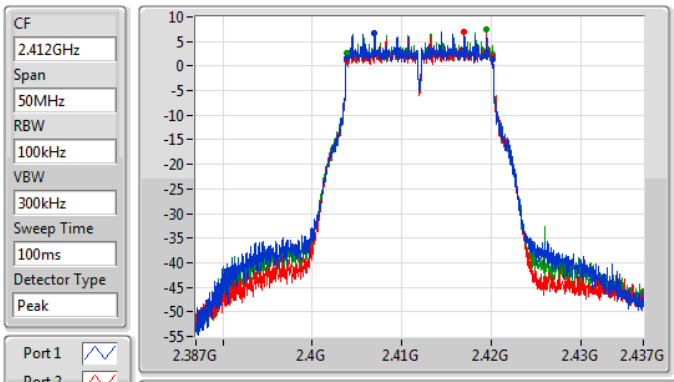


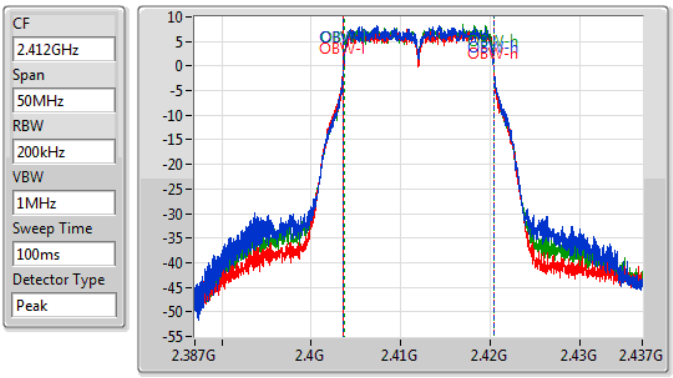
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
7.025M	2.458475G	2.4655G	10.595M	2.456578G	2.467172G	500k	1
7.025M	2.4585G	2.465525G	10.445M	2.456828G	2.467272G	500k	2
6.525M	2.4585G	2.465025G	10.37M	2.456728G	2.467097G	500k	3

802.11g_Nss1,(6Mbps)_3TX EBW

2412MHz

27/12/2019



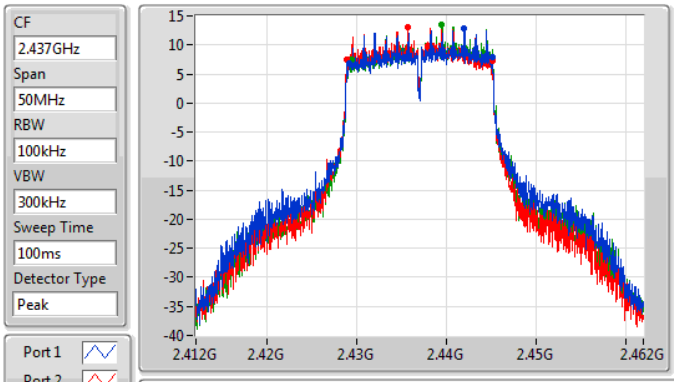


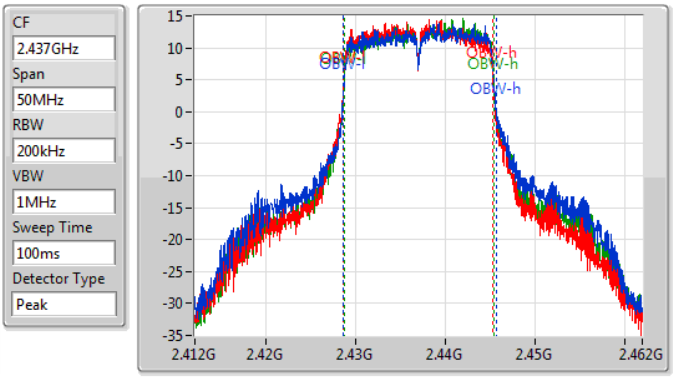
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.35M	2.403825G	2.420175G	16.817M	2.403629G	2.420446G	500k	1
16.35M	2.403825G	2.420175G	16.817M	2.403604G	2.420421G	500k	2
16.35M	2.403825G	2.420175G	16.717M	2.403654G	2.420371G	500k	3

802.11g_Nss1,(6Mbps)_3TX EBW

2437MHz

27/12/2019



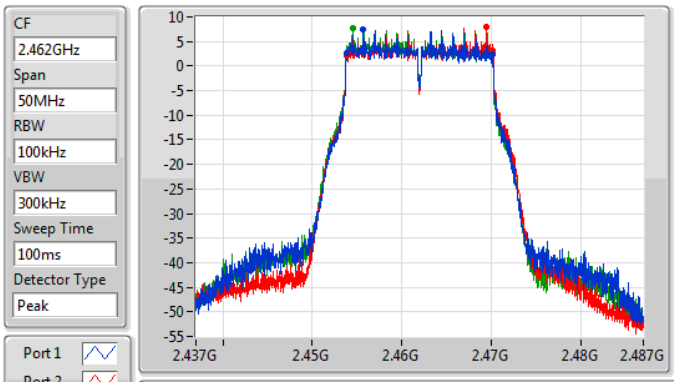


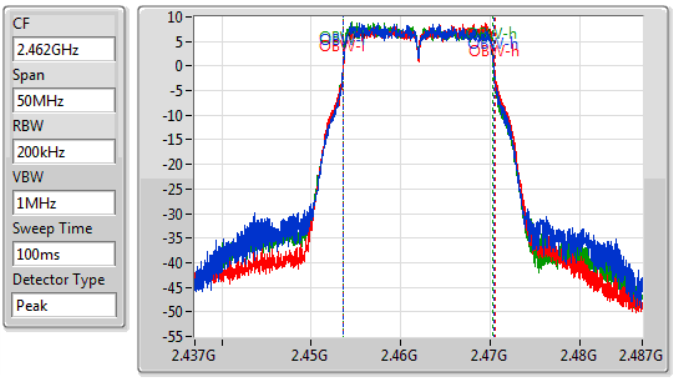
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.05M	2.4291G	2.44515G	17.141M	2.428604G	2.445746G	500k	1
16.275M	2.42885G	2.445125G	16.692M	2.428629G	2.445321G	500k	2
15.675M	2.429475G	2.44515G	16.717M	2.428729G	2.445446G	500k	3

802.11g_Nss1,(6Mbps)_3TX EBW

2462MHz

27/12/2019



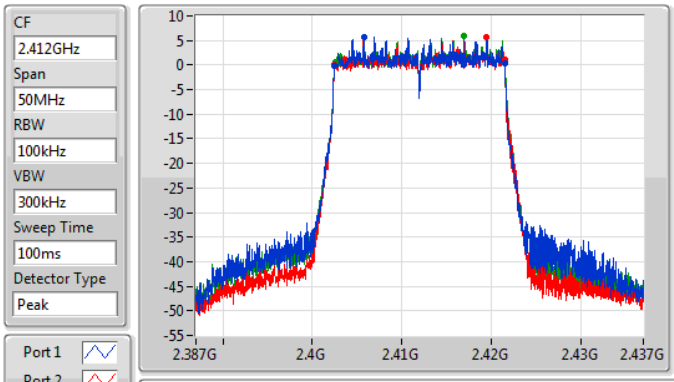


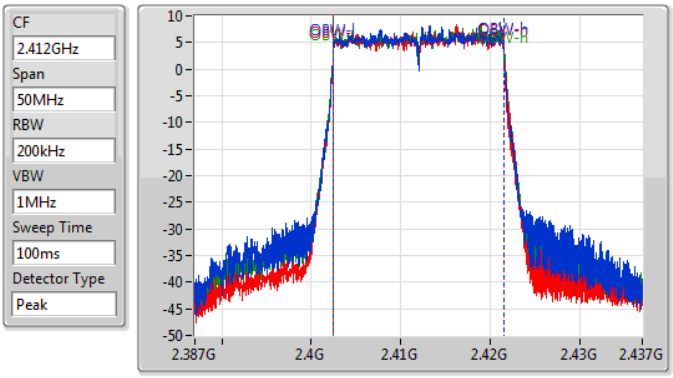
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.325M	2.453825G	2.47015G	16.817M	2.453579G	2.470396G	500k	1
16.35M	2.453825G	2.470175G	16.942M	2.453579G	2.470521G	500k	2
16.35M	2.4538G	2.47015G	16.717M	2.453579G	2.470296G	500k	3

802.11ax HEW20-BF_Nss1,(MCS0)_3TX EBW

2412MHz

27/12/2019



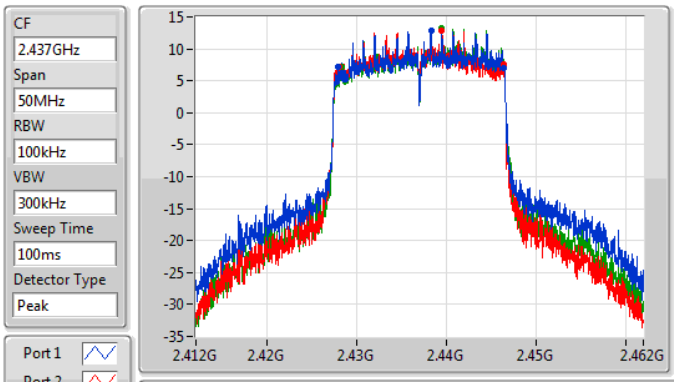


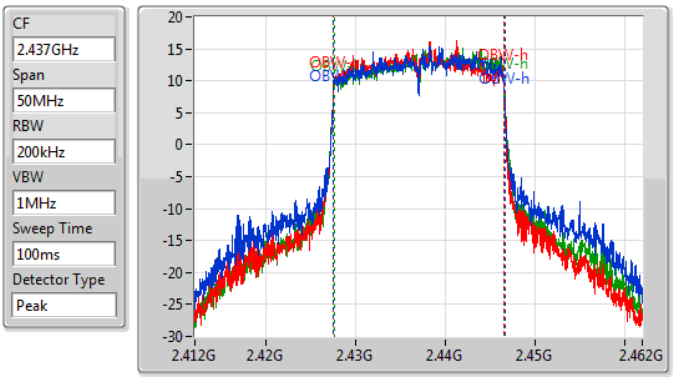
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
19M	2.402475G	2.421475G	19.04M	2.40248G	2.42152G	500k	1
18.95M	2.402525G	2.421475G	19.065M	2.40248G	2.421545G	500k	2
18.95M	2.40255G	2.4215G	19.14M	2.402455G	2.421595G	500k	3

802.11ax HEW20-BF_Nss1,(MCS0)_3TX EBW

2437MHz

27/12/2019



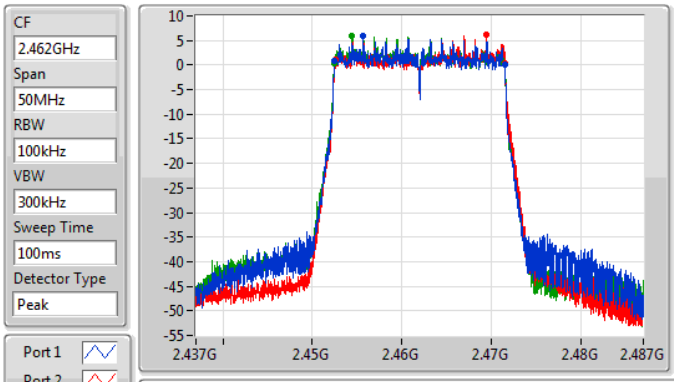


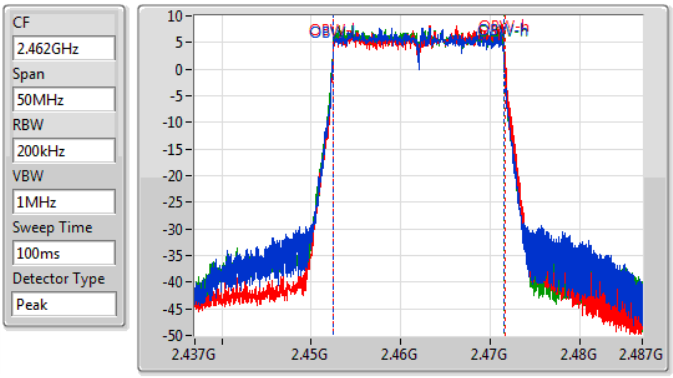
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
18.6M	2.42785G	2.44645G	19.19M	2.42743G	2.44662G	500k	1
18.4M	2.427975G	2.446375G	18.991M	2.427505G	2.446495G	500k	2
18.15M	2.42825G	2.4464G	19.065M	2.42753G	2.446595G	500k	3

802.11ax HEW20-BF_Nss1,(MCS0)_3TX EBW

2462MHz

27/12/2019



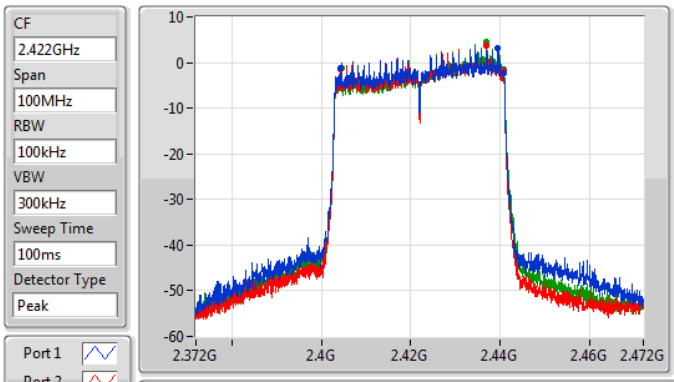


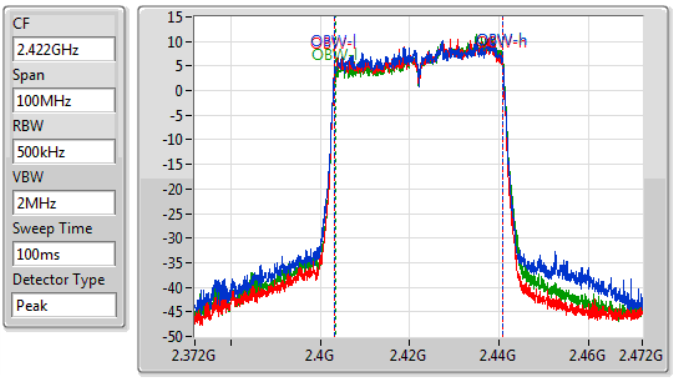
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
18.975M	2.4525G	2.471475G	19.065M	2.45243G	2.471495G	500k	1
18.975M	2.45255G	2.471525G	19.14M	2.45248G	2.47162G	500k	2
18.95M	2.4525G	2.47145G	19.14M	2.452405G	2.471545G	500k	3

802.11ax HEW40-BF_Nss1,(MCS0)_3TX EBW

2422MHz

27/12/2019



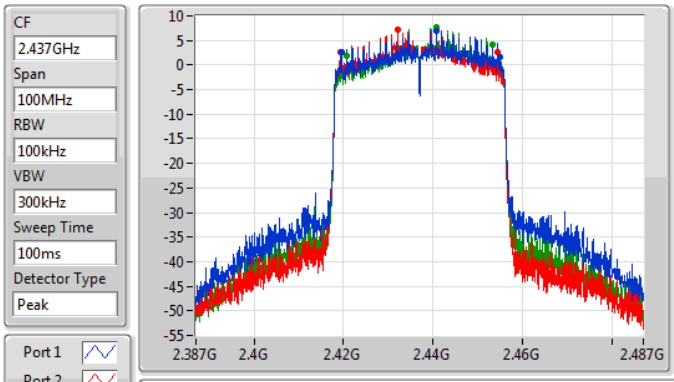


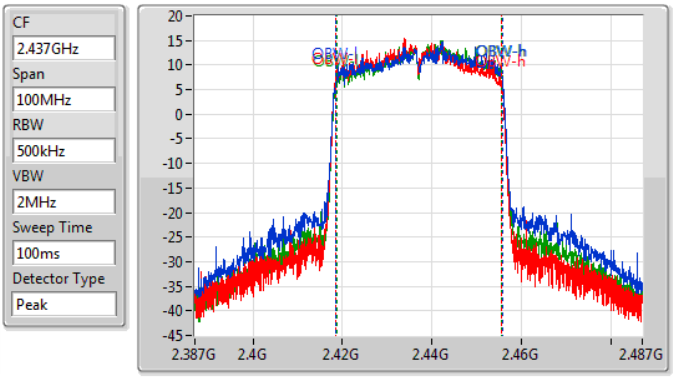
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
36.4M	2.40445G	2.44085G	37.581M	2.403309G	2.440891G	500k	1
36.3M	2.40445G	2.44075G	37.531M	2.403309G	2.440841G	500k	2
36.3M	2.4045G	2.4408G	37.481M	2.403459G	2.440941G	500k	3

802.11ax HEW40-BF_Nss1,(MCS0)_3TX EBW

2437MHz

27/12/2019



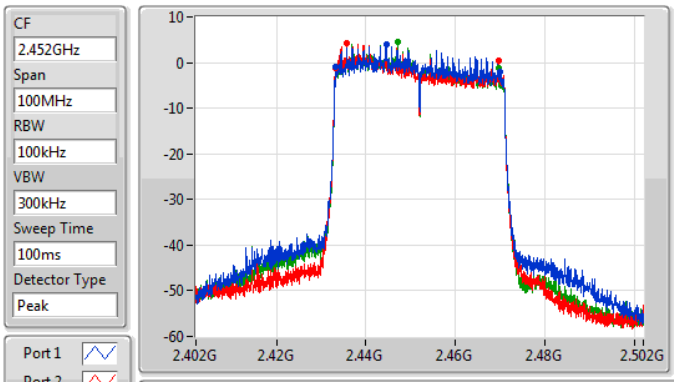


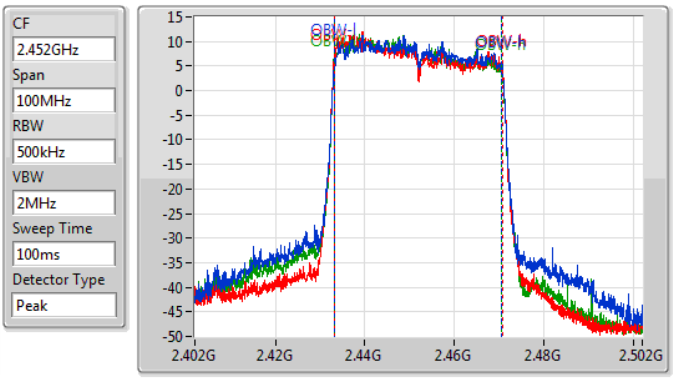
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
35.4M	2.4195G	2.4549G	37.181M	2.418509G	2.455691G	500k	1
35M	2.41945G	2.45445G	37.031M	2.418409G	2.455441G	500k	2
32.55M	2.4207G	2.45325G	36.982M	2.418659G	2.455641G	500k	3

802.11ax HEW40-BF_Nss1,(MCS0)_3TX EBW

2452MHz

27/12/2019





6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
36.7M	2.4332G	2.4699G	37.481M	2.433159G	2.470641G	500k	1
36.35M	2.4332G	2.46955G	37.581M	2.433109G	2.470691G	500k	2
36.35M	2.4332G	2.46955G	37.381M	2.433159G	2.470541G	500k	3

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_3TX	29.66	0.92470
802.11g_Nss1,(6Mbps)_3TX	29.37	0.86497
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	29.45	0.88105
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	25.86	0.38548

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Total Power (dBm)	Power Limit (dBm)
802.11b_Nss1,(1Mbps)_3TX	-	-	-	-	-	-	-
2412MHz	Pass	1.66	23.36	23.25	23.69	28.21	30.00
2437MHz	Pass	1.66	24.51	25.06	25.06	29.66	30.00
2462MHz	Pass	1.66	24.63	24.79	25.08	29.61	30.00
802.11g_Nss1,(6Mbps)_3TX	-	-	-	-	-	-	-
2412MHz	Pass	1.66	19.00	18.62	19.10	23.68	30.00
2417MHz	Pass	1.66	20.66	20.45	20.55	25.33	30.00
2437MHz	Pass	1.66	24.27	24.76	24.76	29.37	30.00
2457MHz	Pass	1.66	20.80	20.83	21.51	25.83	30.00
2462MHz	Pass	1.66	18.94	19.63	19.83	24.25	30.00
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-
2412MHz	Pass	6.43	17.86	17.80	18.18	22.72	29.57
2417MHz	Pass	6.43	21.10	20.84	21.10	25.79	29.57
2437MHz	Pass	6.43	24.49	24.81	24.72	29.45	29.57
2457MHz	Pass	6.43	20.96	21.14	21.55	25.99	29.57
2462MHz	Pass	6.43	18.00	18.06	18.39	22.92	29.57
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-
2422MHz	Pass	6.43	17.22	17.17	17.25	21.98	29.57
2427MHz	Pass	6.43	18.26	18.45	18.43	23.15	29.57
2437MHz	Pass	6.43	20.85	21.10	21.30	25.86	29.57
2447MHz	Pass	6.43	19.27	19.24	19.57	24.13	29.57
2452MHz	Pass	6.43	18.18	18.02	18.27	22.93	29.57

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_3TX	5.53
802.11g_Nss1,(6Mbps)_3TX	4.49
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	2.74
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	-2.64

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

Result

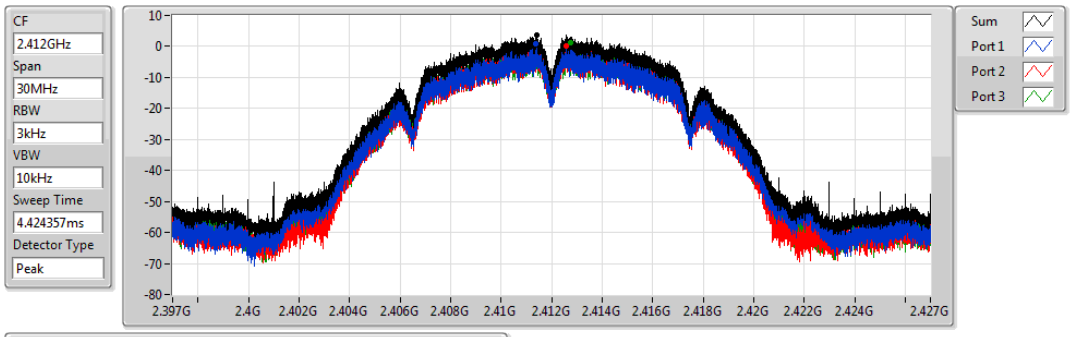
Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	Port 3 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11b_Nss1,(1Mbps)_3TX	-	-	-	-	-	-	-
2412MHz	Pass	6.43	0.71	0.28	1.04	3.82	7.57
2437MHz	Pass	6.43	2.13	3.33	3.45	5.53	7.57
2462MHz	Pass	6.43	1.59	1.36	1.63	4.52	7.57
802.11g_Nss1,(6Mbps)_3TX	-	-	-	-	-	-	-
2412MHz	Pass	6.43	-7.30	-7.26	-7.77	-2.92	7.57
2437MHz	Pass	6.43	-1.10	0.17	-0.03	4.49	7.57
2462MHz	Pass	6.43	-6.82	-7.34	-6.01	-2.62	7.57
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-
2412MHz	Pass	6.43	-8.46	-8.41	-7.34	-3.27	7.57
2437MHz	Pass	6.43	-2.42	-0.93	-1.64	2.74	7.57
2462MHz	Pass	6.43	-6.95	-7.17	-6.06	-1.93	7.57
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-
2422MHz	Pass	6.43	-12.47	-10.95	-11.19	-6.96	7.57
2437MHz	Pass	6.43	-7.50	-7.45	-7.10	-2.64	7.57
2452MHz	Pass	6.43	-10.20	-10.12	-9.32	-5.32	7.57

DG = Directional Gain; **RBW** = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

802.11b_Nss1,(1Mbps)_3TX PSD

2412MHz

27/12/2019

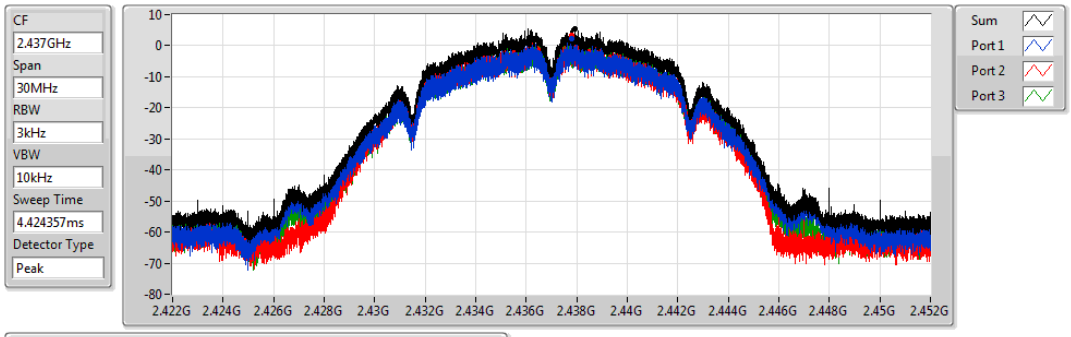


Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
3.82	3.82	0.71	0.28	1.04

802.11b_Nss1,(1Mbps)_3TX PSD

2437MHz

27/12/2019

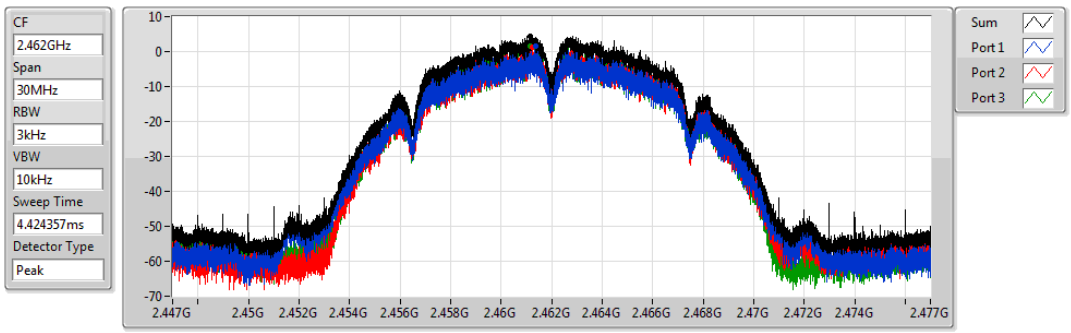


Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
5.53	5.53	2.13	3.33	3.45

802.11b_Nss1,(1Mbps)_3TX PSD

2462MHz

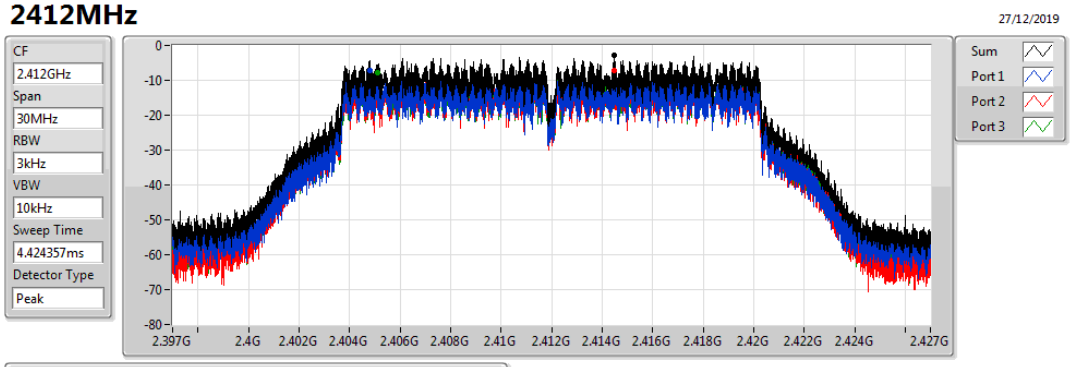
27/12/2019



Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
4.52	4.52	1.59	1.36	1.63

802.11g_Nss1,(6Mbps)_3TX PSD

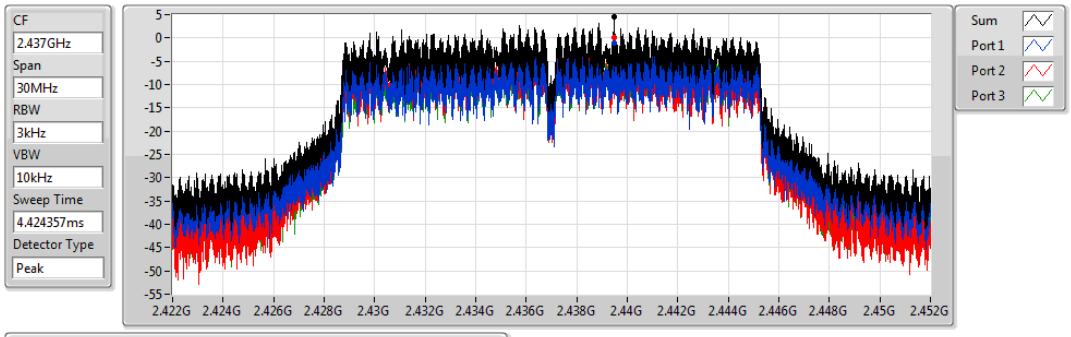
2412MHz



Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.92	-2.92	-7.30	-7.26	-7.77

802.11g_Nss1,(6Mbps)_3TX PSD

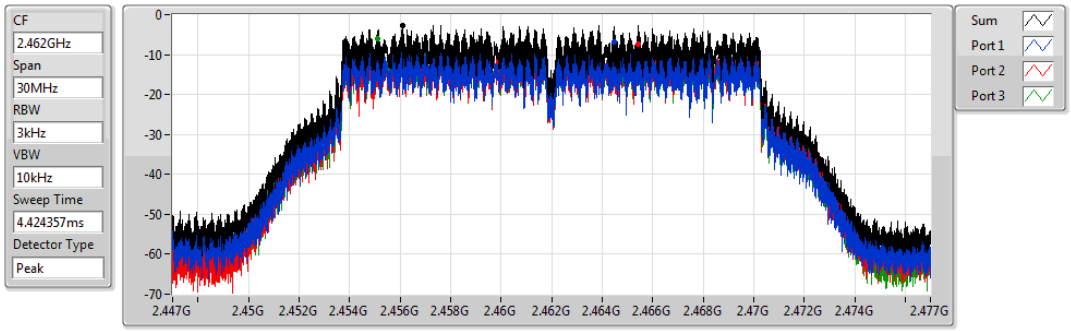
2437MHz



Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
4.49	4.49	-1.10	0.17	-0.03

802.11g_Nss1,(6Mbps)_3TX PSD

2462MHz

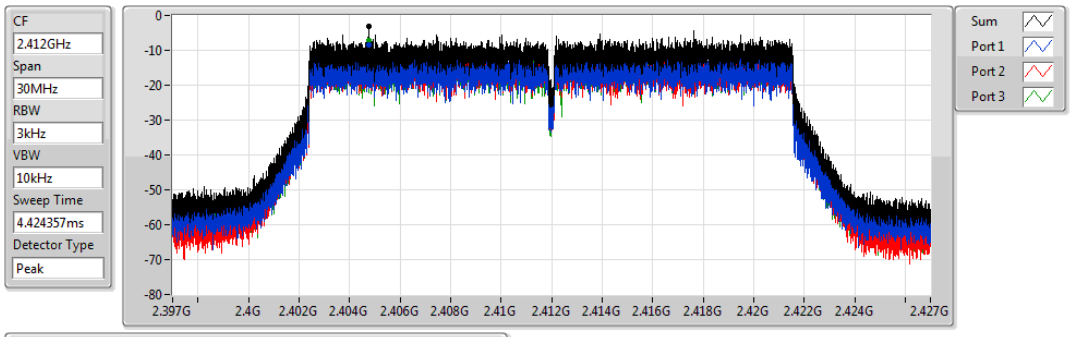


Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.62	-2.62	-6.82	-7.34	-6.01

802.11ax HEW20-BF_Nss1,(MCS0)_3TX PSD

2412MHz

27/12/2019

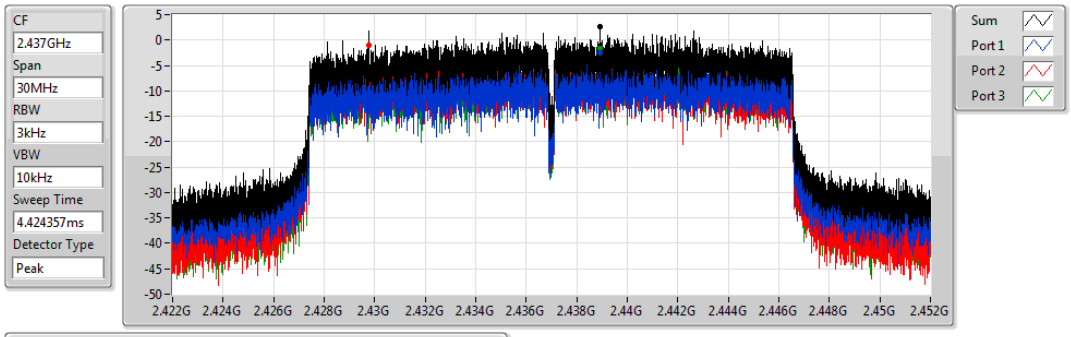


Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-3.27	-3.27	-8.46	-8.41	-7.34

802.11ax HEW20-BF_Nss1,(MCS0)_3TX PSD

2437MHz

27/12/2019

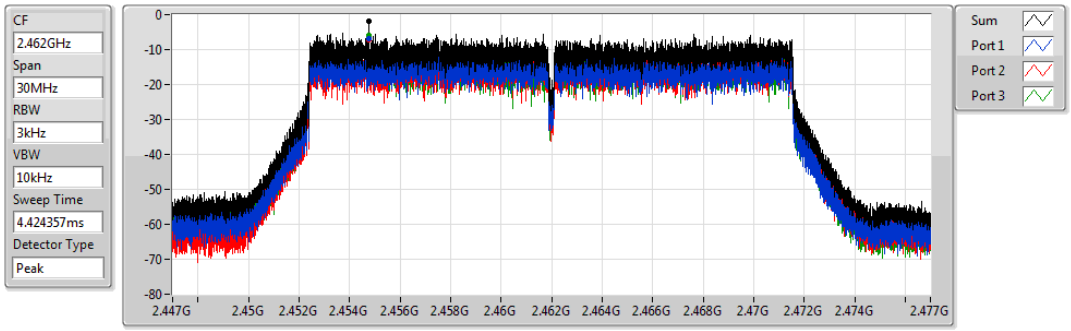


Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
2.74	2.74	-2.42	-0.93	-1.64

802.11ax HEW20-BF_Nss1,(MCS0)_3TX PSD

2462MHz

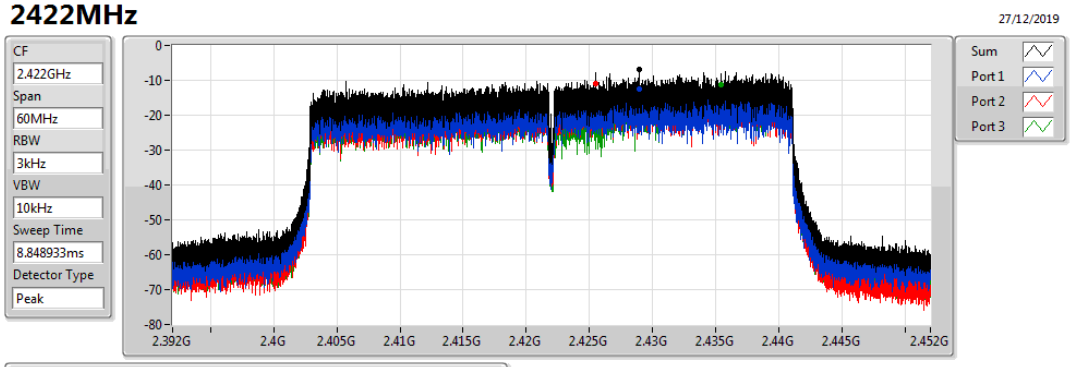
27/12/2019



Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-1.93	-1.93	-6.95	-7.17	-6.06

802.11ax HEW40-BF_Nss1,(MCS0)_3TX PSD

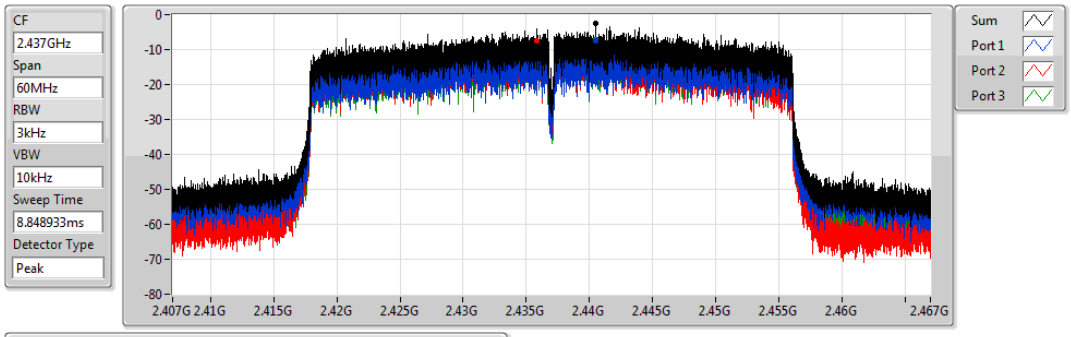
2422MHz



Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.96	-6.96	-12.47	-10.95	-11.19

802.11ax HEW40-BF_Nss1,(MCS0)_3TX PSD

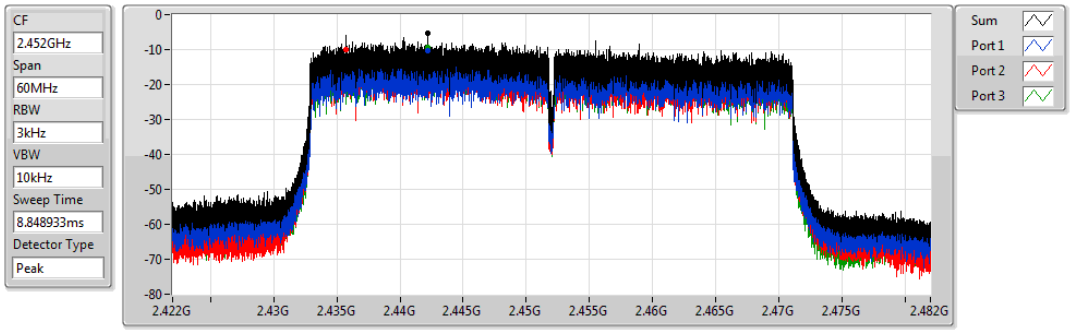
2437MHz



Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.64	-2.64	-7.50	-7.45	-7.10

802.11ax HEW40-BF_Nss1,(MCS0)_3TX PSD

2452MHz



Sum	PD	Port 1	Port 2	Port 3
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-5.32	-5.32	-10.20	-10.12	-9.32

Summary

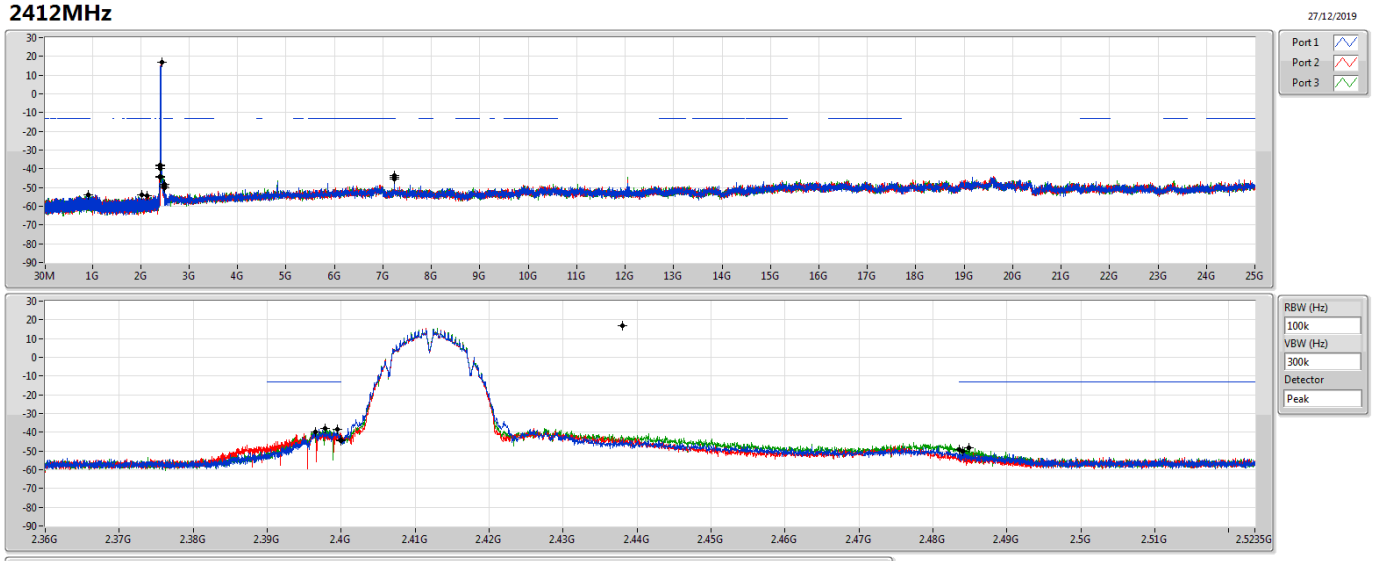
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
802.11b_Nss1,(1Mbps)_3TX	Pass	2.43799G	16.75	-13.25	2.02477G	-53.83	2.39782G	-38.04	2.4G	-44.36	2.48482G	-48.18	7.23795G	-45.27	3
802.11g_Nss1,(6Mbps)_3TX	Pass	2.442G	13.54	-16.46	898.51M	-54.20	2.39976G	-32.86	2.4G	-33.82	2.4845G	-51.45	16.52355G	-46.05	1
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	Pass	2.442G	13.70	-16.30	1.99099G	-54.69	2.39946G	-33.70	2.4G	-34.64	2.48616G	-51.67	16.49826G	-46.64	1
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	Pass	2.44196G	7.93	-22.07	1.95618G	-54.48	2.39952G	-32.57	2.4G	-37.20	2.4841G	-42.03	21.40175G	-45.48	1

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)	Freq (Hz)	Level (dBm)	Port
802.11b_Nss1,(1Mbps)_3TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43799G	16.75	-13.25	2.12729G	-54.42	2.3995G	-38.43	2.4G	-44.43	2.48402G	-49.93	7.23795G	-44.38	1
2412MHz	Pass	2.43799G	16.75	-13.25	916.57M	-53.73	2.39652G	-39.88	2.4G	-43.91	2.4835G	-49.26	7.23795G	-43.48	2
2412MHz	Pass	2.43799G	16.75	-13.25	2.02477G	-53.83	2.39782G	-38.04	2.4G	-44.36	2.48482G	-48.18	7.23795G	-45.27	3
2437MHz	Pass	2.43799G	16.75	-13.25	901.71M	-54.55	2.39986G	-49.55	2.4G	-51.35	2.48432G	-49.05	17.49285G	-46.66	1
2437MHz	Pass	2.43799G	16.75	-13.25	735.99M	-53.58	2.39764G	-47.17	2.4G	-51.15	2.48484G	-51.36	16.59941G	-45.44	2
2437MHz	Pass	2.43799G	16.75	-13.25	955.59M	-54.74	2.39744G	-50.21	2.4835G	-49.25	2.48366G	-49.31	16.5376G	-45.91	3
2462MHz	Pass	2.43799G	16.75	-13.25	731.91M	-54.73	2.39852G	-49.20	2.4835G	-46.74	2.48362G	-44.63	24.16837G	-45.65	1
2462MHz	Pass	2.43799G	16.75	-13.25	2.16253G	-54.18	2.39682G	-46.30	2.4835G	-47.77	2.48388G	-45.51	16.52636G	-46.56	2
2462MHz	Pass	2.43799G	16.75	-13.25	2.18409G	-53.98	2.39896G	-48.24	2.4835G	-43.99	2.48356G	-44.02	16.50107G	-45.94	3
802.11g_Nss1,(6Mbps)_3TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.442G	13.54	-16.46	898.51M	-54.20	2.39976G	-32.86	2.4G	-33.82	2.4845G	-51.45	16.52355G	-46.05	1
2412MHz	Pass	2.442G	13.54	-16.46	804.73M	-54.79	2.3998G	-37.09	2.4G	-37.56	2.484G	-52.37	24.83143G	-45.65	2
2412MHz	Pass	2.442G	13.54	-16.46	671.62M	-54.92	2.39984G	-34.04	2.4G	-36.99	2.48762G	-51.22	16.94779G	-45.41	3
2437MHz	Pass	2.442G	13.54	-16.46	200.67M	-54.44	2.39986G	-39.39	2.4G	-42.72	2.48424G	-44.74	17.57433G	-45.91	1
2437MHz	Pass	2.442G	13.54	-16.46	1.84536G	-54.32	2.4G	-40.32	2.4G	-41.00	2.48948G	-48.33	16.55165G	-46.69	2
2437MHz	Pass	2.442G	13.54	-16.46	736.86M	-54.84	2.39886G	-41.18	2.4G	-41.20	2.48634G	-46.73	24.86233G	-46.49	3
2462MHz	Pass	2.442G	13.54	-16.46	709.2M	-54.77	2.39784G	-50.99	2.4835G	-43.43	2.48446G	-41.96	24.93819G	-46.06	1
2462MHz	Pass	2.442G	13.54	-16.46	1.9208G	-54.86	2.39756G	-50.25	2.4835G	-49.96	2.4836G	-47.79	16.25945G	-46.48	2
2462MHz	Pass	2.442G	13.54	-16.46	729.58M	-53.89	2.39872G	-51.60	2.4835G	-45.37	2.48356G	-43.97	24.93538G	-46.65	3
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.442G	13.70	-16.30	1.99099G	-54.69	2.39946G	-33.70	2.4G	-34.64	2.48616G	-51.67	16.49826G	-46.64	1
2412MHz	Pass	2.442G	13.70	-16.30	1.96536G	-54.61	2.39966G	-37.96	2.4G	-40.52	2.48406G	-53.31	24.97752G	-45.89	2
2412MHz	Pass	2.442G	13.70	-16.30	652.4M	-54.35	2.3997G	-34.75	2.4G	-37.43	2.48352G	-50.99	16.55726G	-46.57	3
2437MHz	Pass	2.442G	13.70	-16.30	937.83M	-54.70	2.39916G	-38.61	2.4G	-40.15	2.48386G	-40.34	15.29296G	-45.90	1
2437MHz	Pass	2.442G	13.70	-16.30	2.07603G	-53.74	2.4G	-40.06	2.4G	-43.04	2.48444G	-46.51	16.37183G	-46.54	2
2437MHz	Pass	2.442G	13.70	-16.30	685.9M	-54.15	2.39958G	-41.22	2.4G	-41.29	2.48376G	-45.42	16.55446G	-45.95	3
2462MHz	Pass	2.442G	13.70	-16.30	815.5M	-54.46	2.39988G	-52.00	2.4835G	-43.06	2.48502G	-41.71	16.31564G	-46.21	1
2462MHz	Pass	2.442G	13.70	-16.30	696.09M	-53.81	2.39694G	-50.27	2.4835G	-49.21	2.48372G	-46.05	16.62188G	-45.60	2
2462MHz	Pass	2.442G	13.70	-16.30	2.12147G	-54.78	2.3985G	-51.96	2.4835G	-48.38	2.4849G	-43.15	17.4788G	-46.33	3
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.44196G	7.93	-22.07	2.0306G	-54.58	2.39852G	-40.82	2.4G	-42.40	2.51966G	-52.37	24.78685G	-46.25	1
2422MHz	Pass	2.44196G	7.93	-22.07	2.10531G	-54.00	2.3984G	-43.17	2.4G	-46.65	2.48358G	-53.57	16.5162G	-45.79	2
2422MHz	Pass	2.44196G	7.93	-22.07	812.32M	-54.19	2.39856G	-41.58	2.4G	-44.30	2.48402G	-51.83	24.86819G	-45.83	3
2437MHz	Pass	2.44196G	7.93	-22.07	1.95618G	-54.48	2.39952G	-32.57	2.4G	-37.20	2.4841G	-42.03	21.40175G	-45.48	1
2437MHz	Pass	2.44196G	7.93	-22.07	864.99M	-54.53	2.39948G	-36.83	2.4G	-44.70	2.4849G	-45.66	15.2261G	-46.41	2
2437MHz	Pass	2.44196G	7.93	-22.07	2.30741G	-53.15	2.39952G	-35.27	2.4G	-40.71	2.48382G	-43.79	16.62277G	-46.45	3
2452MHz	Pass	2.44196G	7.93	-22.07	889.61M	-54.16	2.39836G	-50.92	2.4835G	-45.13	2.4845G	-43.16	17.02382G	-45.83	1
2452MHz	Pass	2.44196G	7.93	-22.07	723.58M	-54.05	2.39356G	-49.51	2.4G	-50.87	2.48546G	-51.00	15.31585G	-44.90	2
2452MHz	Pass	2.44196G	7.93	-22.07	2.16543G	-54.32	2.39916G	-50.69	2.4835G	-50.52	2.48354G	-48.81	16.9481G	-46.51	3

802.11b_Nss1,(1Mbps)_3TX **CSE NdB**

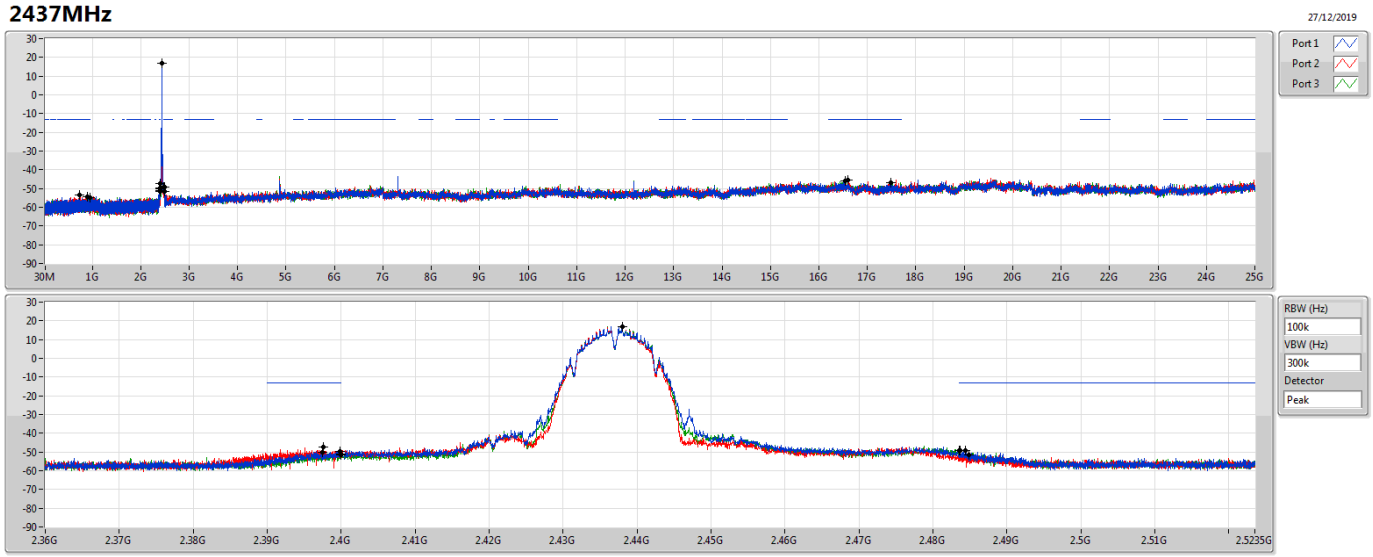
2412MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43799G	16.75	-13.25	2.12729G	-54.42	2.3995G	-38.43	2.4G	-44.43	2.48402G	-49.93	7.23795G	-44.38	1
2.43799G	16.75	-13.25	916.57M	-53.73	2.39652G	-39.88	2.4G	-43.91	2.4835G	-49.26	7.23795G	-43.48	2
2.43799G	16.75	-13.25	2.02477G	-53.83	2.39782G	-38.04	2.4G	-44.36	2.48482G	-48.18	7.23795G	-45.27	3

802.11b_Nss1,(1Mbps)_3TX **CSE NdB**

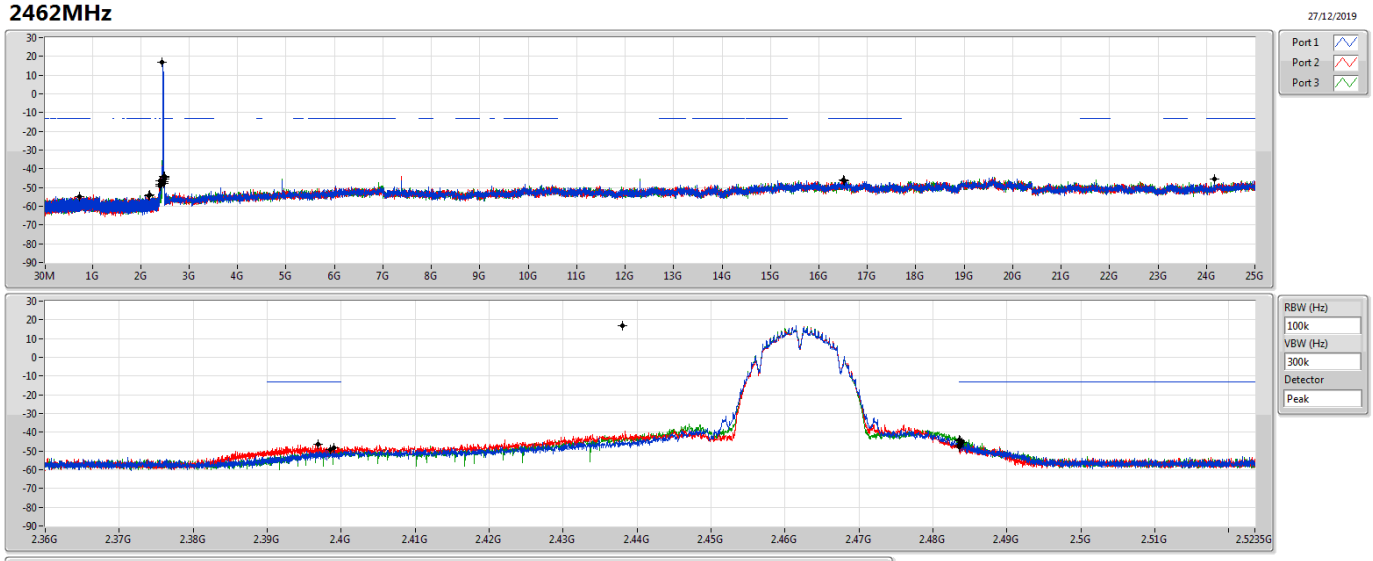
2437MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43799G	16.75	-13.25	901.71M	-54.55	2.39986G	-49.55	2.4G	-51.35	2.48432G	-49.05	17.49285G	-46.66	1
2.43799G	16.75	-13.25	735.99M	-53.58	2.39764G	-47.17	2.4G	-51.15	2.48484G	-51.36	16.59941G	-45.44	2
2.43799G	16.75	-13.25	955.59M	-54.74	2.39744G	-50.21	2.4835G	-49.25	2.48366G	-49.31	16.5376G	-45.91	3

802.11b_Nss1,(1Mbps)_3TX **CSE NdB**

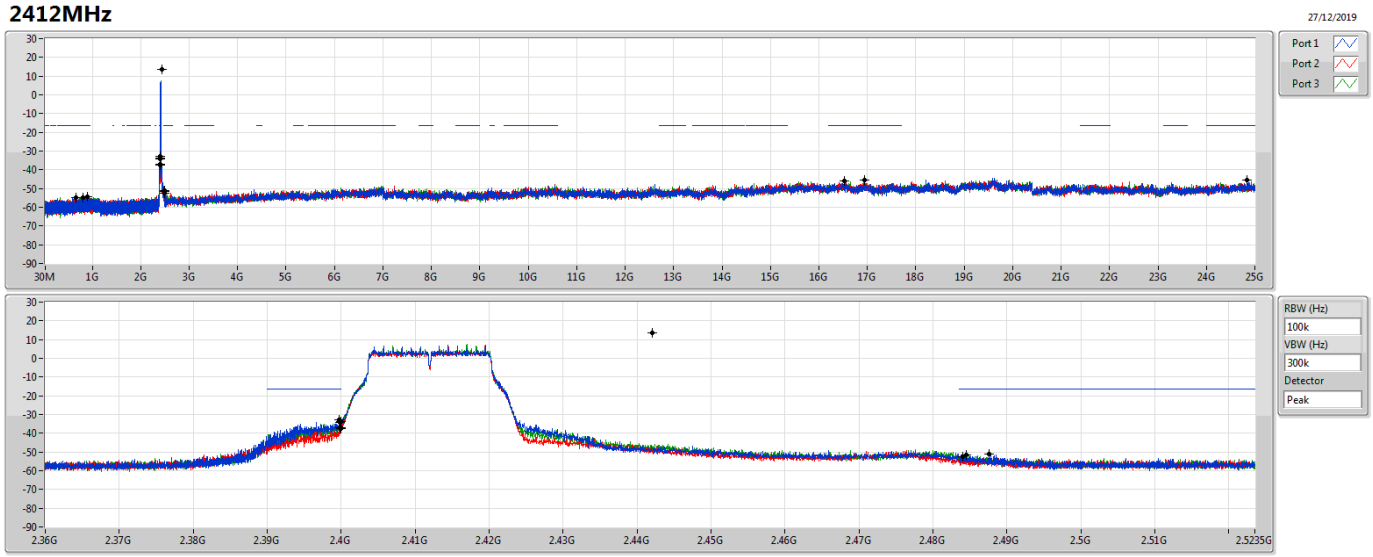
2462MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43799G	16.75	-13.25	731.91M	-54.73	2.39852G	-49.20	2.4835G	-46.74	2.48362G	-44.63	24.16837G	-45.65	1
2.43799G	16.75	-13.25	2.16253G	-54.18	2.39682G	-46.30	2.4835G	-47.77	2.48388G	-45.51	16.52636G	-46.56	2
2.43799G	16.75	-13.25	2.18409G	-53.98	2.39896G	-48.24	2.4835G	-43.99	2.48356G	-44.02	16.50107G	-45.94	3

802.11g_Nss1,(6Mbps)_3TX **CSE NdB**

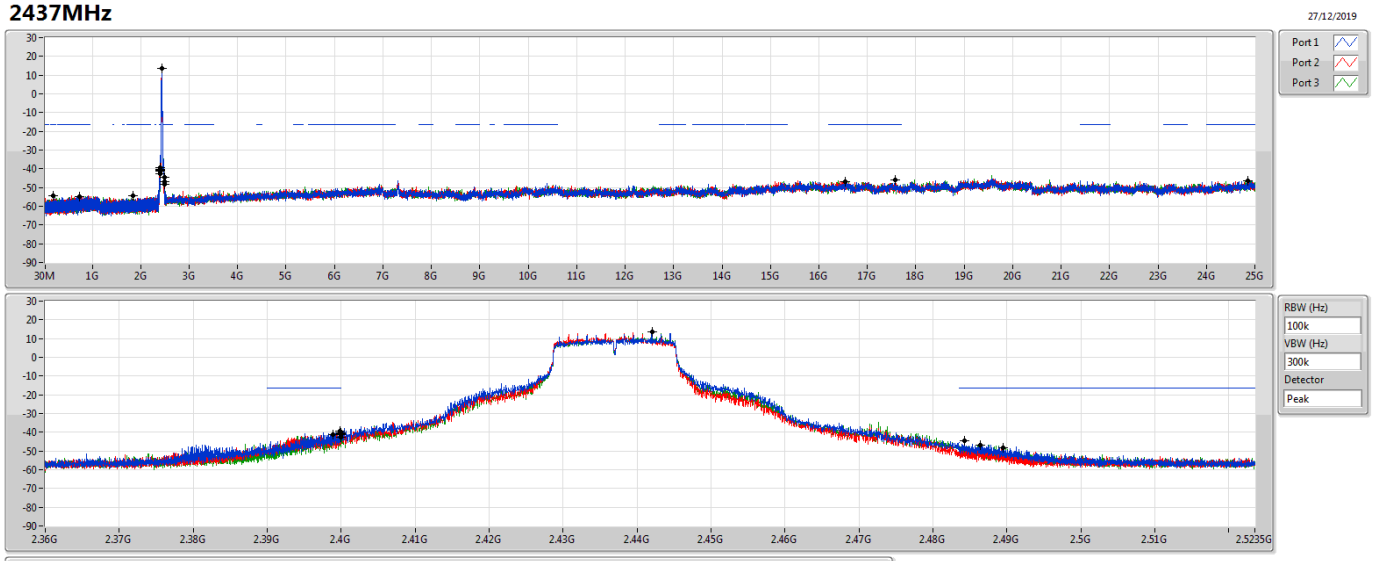
2412MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.442G	13.54	-16.46	898.51M	-54.20	2.39976G	-32.86	2.4G	-33.82	2.4845G	-51.45	16.52355G	-46.05	1
2.442G	13.54	-16.46	804.73M	-54.79	2.3998G	-37.09	2.4G	-37.56	2.484G	-52.37	24.83143G	-45.65	2
2.442G	13.54	-16.46	671.62M	-54.92	2.39984G	-34.04	2.4G	-36.99	2.48762G	-51.22	16.94779G	-45.41	3

802.11g_Nss1,(6Mbps)_3TX **CSE NdB**

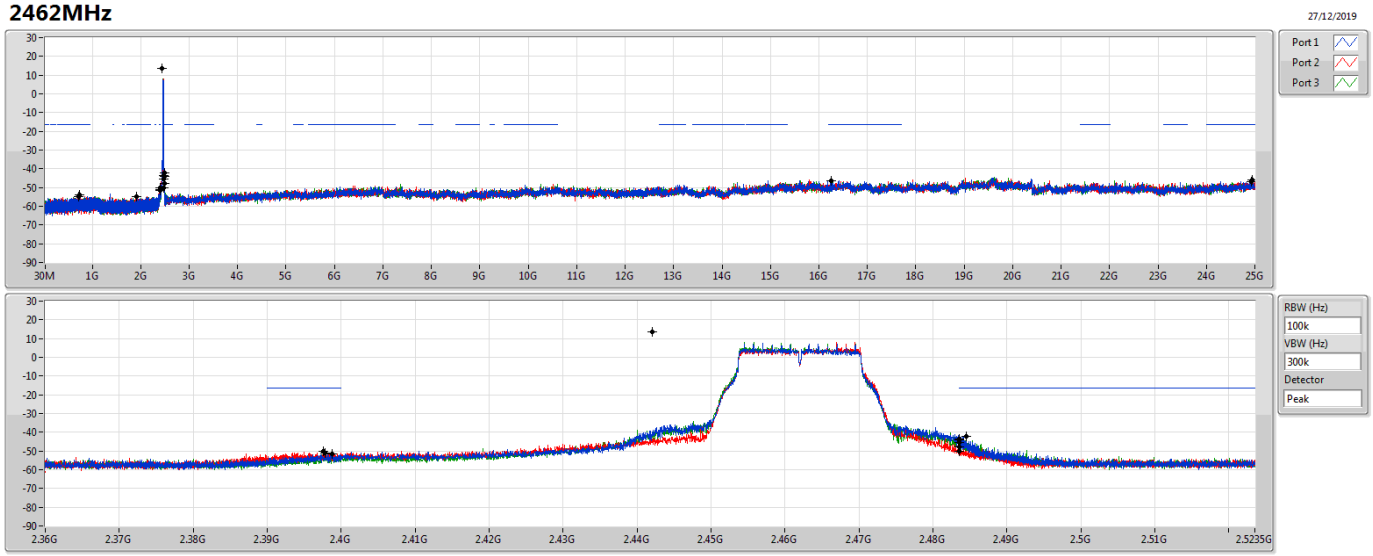
2437MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.442G	13.54	-16.46	200.67M	-54.44	2.39986G	-39.39	2.4G	-42.72	2.48424G	-44.74	17.57433G	-45.91	1
2.442G	13.54	-16.46	1.84536G	-54.32	2.4G	-40.32	2.4G	-41.00	2.48948G	-48.33	16.55165G	-46.69	2
2.442G	13.54	-16.46	736.86M	-54.84	2.39886G	-41.18	2.4G	-41.20	2.48634G	-46.73	24.86233G	-46.49	3

802.11g_Nss1,(6Mbps)_3TX **CSE NdB**

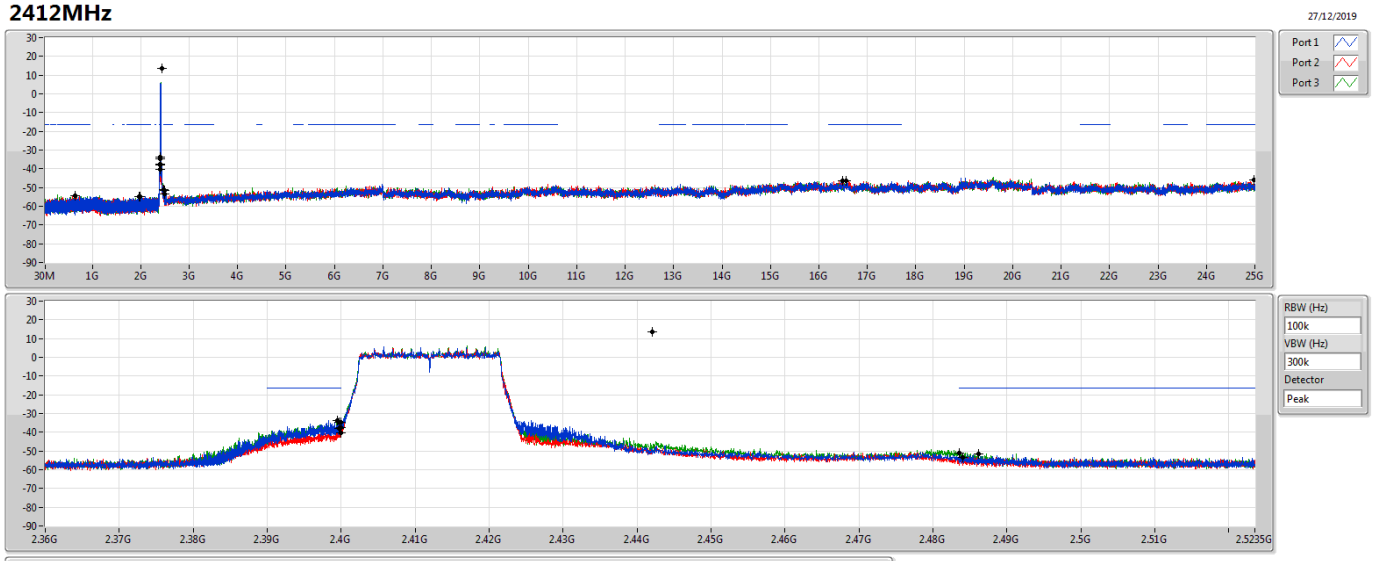
2462MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.442G	13.54	-16.46	709.2M	-54.77	2.39784G	-50.99	2.4835G	-43.43	2.48446G	-41.96	24.93819G	-46.06	1
2.442G	13.54	-16.46	1.9208G	-54.86	2.39756G	-50.25	2.4835G	-49.96	2.4836G	-47.79	16.25945G	-46.48	2
2.442G	13.54	-16.46	729.58M	-53.89	2.39872G	-51.60	2.4835G	-45.37	2.48356G	-43.97	24.93538G	-46.65	3

802.11ax HEW20-BF_Nss1,(MCS0)_3TX **CSE NdB**

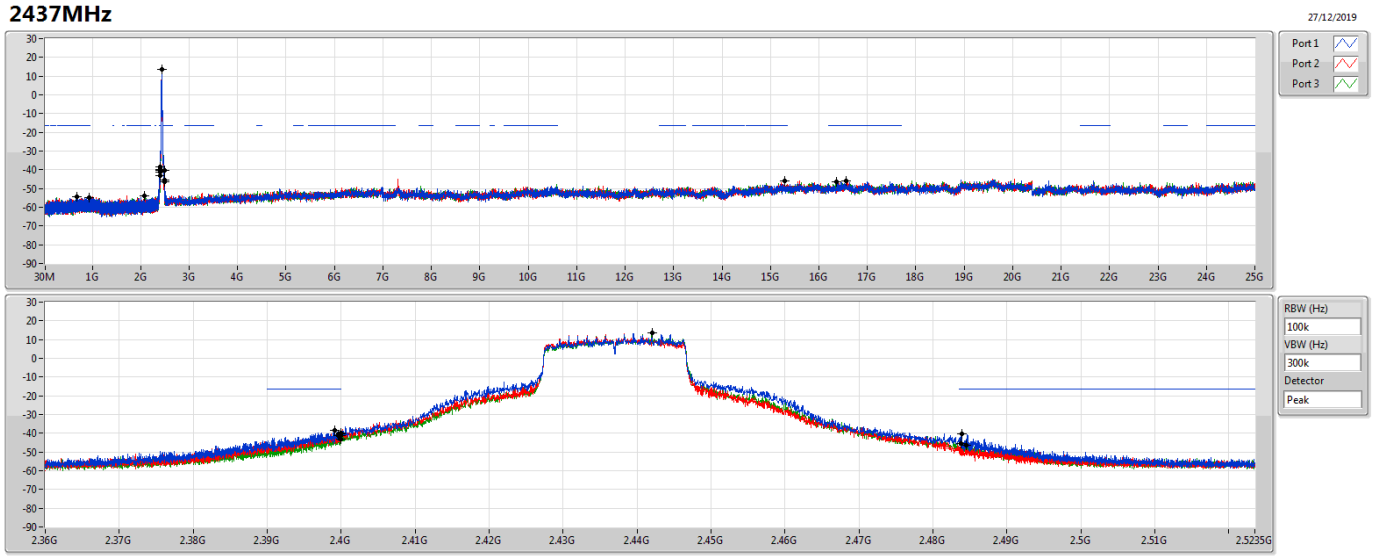
2412MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.442G	13.70	-16.30	1.99099G	-54.69	2.39946G	-33.70	2.4G	-34.64	2.48616G	-51.67	16.49826G	-46.64	1
2.442G	13.70	-16.30	1.96536G	-54.61	2.39966G	-37.96	2.4G	-40.52	2.48406G	-53.31	24.97752G	-45.89	2
2.442G	13.70	-16.30	652.4M	-54.35	2.3997G	-34.75	2.4G	-37.43	2.48352G	-50.99	16.55726G	-46.57	3

802.11ax HEW20-BF_Nss1,(MCS0)_3TX **CSE NdB**

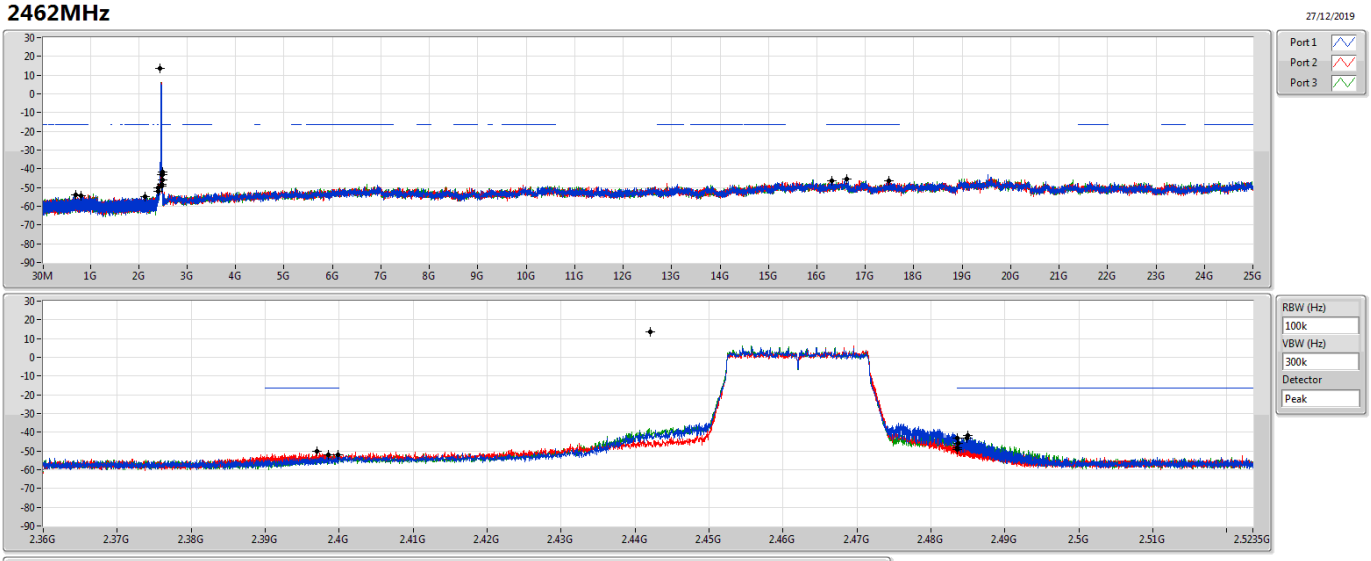
2437MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.442G	13.70	-16.30	937.83M	-54.70	2.39916G	-38.61	2.4G	-40.15	2.48386G	-40.34	15.29296G	-45.90	1
2.442G	13.70	-16.30	2.07603G	-53.74	2.4G	-40.06	2.4G	-43.04	2.48444G	-46.51	16.37183G	-46.54	2
2.442G	13.70	-16.30	685.9M	-54.15	2.39958G	-41.22	2.4G	-41.29	2.48376G	-45.42	16.55446G	-45.95	3

802.11ax HEW20-BF_Nss1,(MCS0)_3TX **CSE NdB**

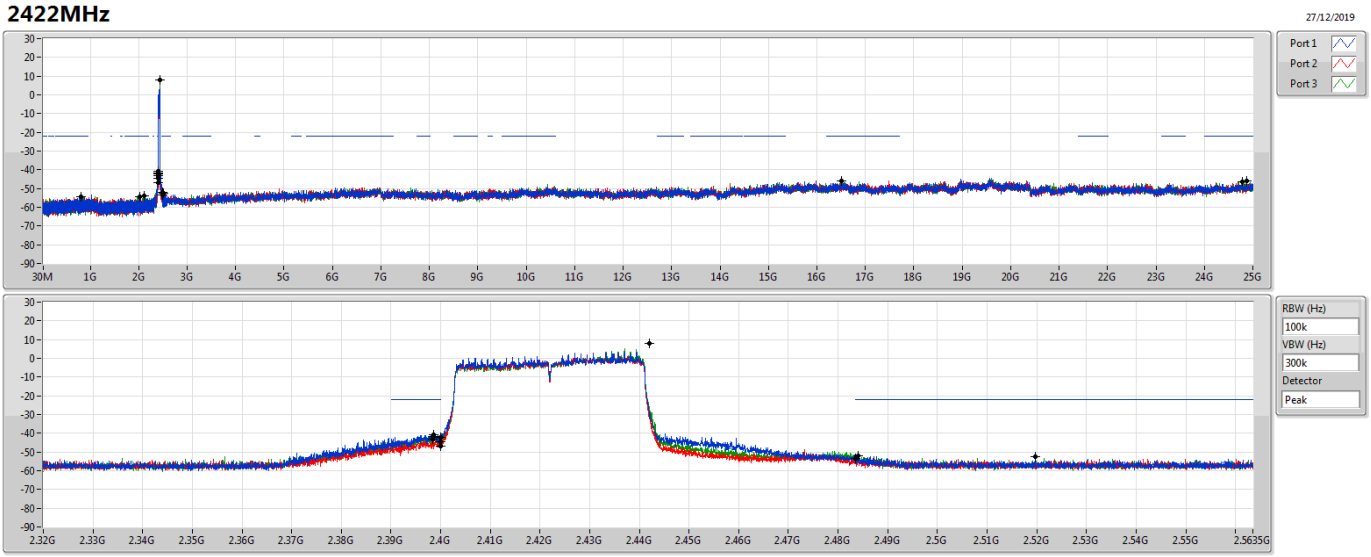
2462MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.442G	13.70	-16.30	815.5M	-54.46	2.39988G	-52.00	2.4835G	-43.06	2.48502G	-41.71	16.31564G	-46.21	1
2.442G	13.70	-16.30	696.09M	-53.81	2.39694G	-50.27	2.4835G	-49.21	2.48372G	-46.05	16.62188G	-45.60	2
2.442G	13.70	-16.30	2.12147G	-54.78	2.3985G	-51.96	2.4835G	-48.38	2.4849G	-43.15	17.4788G	-46.33	3

802.11ax HEW40-BF_Nss1,(MCS0)_3TX **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)	Freq(Hz)	Level(dBm)	Port
2.44196G	7.93	-22.07	2.0306G	-54.58	2.39852G	-40.82	2.4G	-42.40	2.51966G	-52.37	24.78685G	-46.25	1
2.44196G	7.93	-22.07	2.10531G	-54.00	2.3984G	-43.17	2.4G	-46.65	2.48358G	-53.57	16.5162G	-45.79	2
2.44196G	7.93	-22.07	812.32M	-54.19	2.39856G	-41.58	2.4G	-44.30	2.48402G	-51.83	24.86819G	-45.83	3

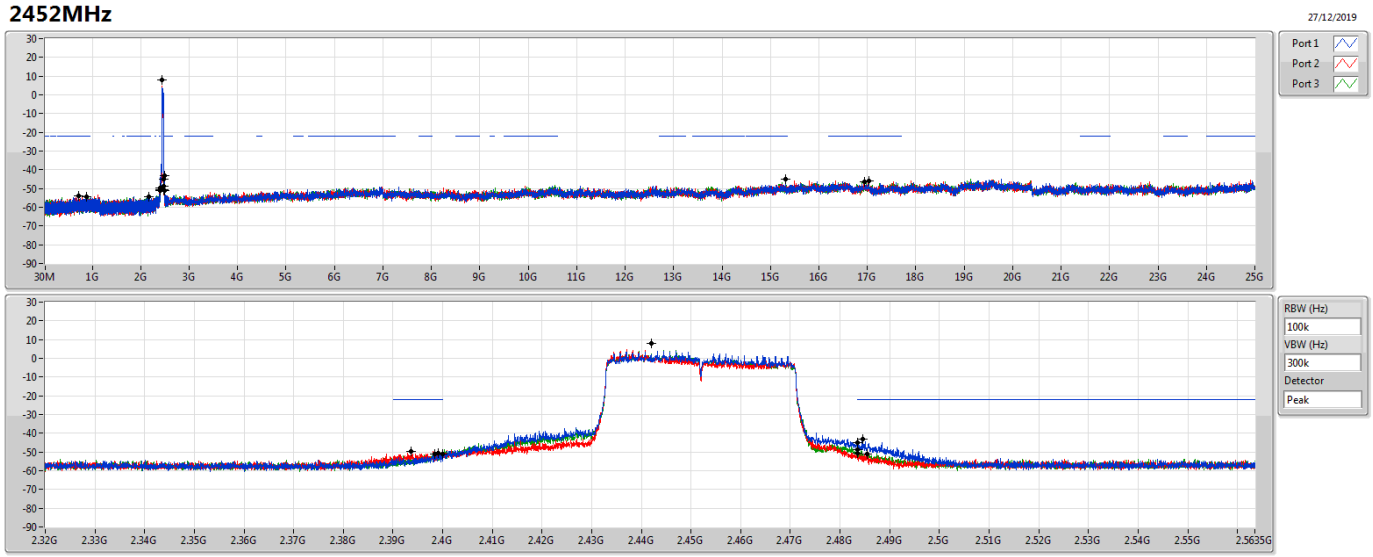
802.11ax HEW40-BF_Nss1,(MCS0)_3TX **CSE NdB**

2437MHz

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44196G	7.93	-22.07	1.95618G	-54.48	2.39952G	-32.57	2.4G	-37.20	2.4841G	-42.03	21.40175G	-45.48	1
2.44196G	7.93	-22.07	864.99M	-54.53	2.39948G	-36.83	2.4G	-44.70	2.4849G	-45.66	15.2261G	-46.41	2
2.44196G	7.93	-22.07	2.30741G	-53.15	2.39952G	-35.27	2.4G	-40.71	2.48382G	-43.79	16.62277G	-46.45	3

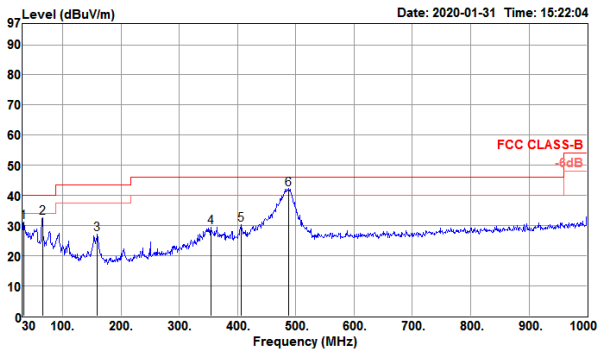
802.11ax HEW40-BF_Nss1,(MCS0)_3TX **CSE NdB**

2452MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44196G	7.93	-22.07	889.61M	-54.16	2.39836G	-50.92	2.4835G	-45.13	2.4845G	-43.16	17.02382G	-45.83	1
2.44196G	7.93	-22.07	723.58M	-54.05	2.39356G	-49.51	2.4G	-50.87	2.48546G	-51.00	15.31585G	-44.90	2
2.44196G	7.93	-22.07	2.16543G	-54.32	2.39916G	-50.69	2.4835G	-50.52	2.48354G	-48.81	16.9481G	-46.51	3

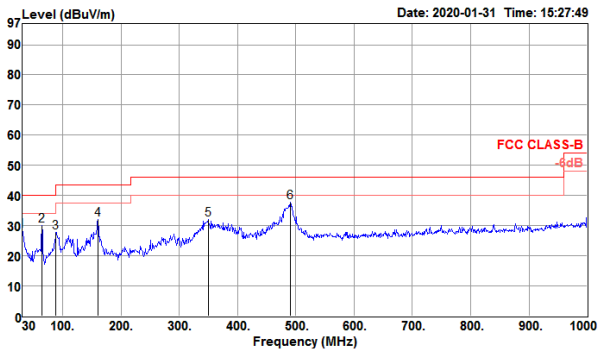
RSE below 1GHz Result			
Operating Mode	3	**Polarization**	Vertical
Operating Function	CTX		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	32.91	31.13	40.00	-8.87	38.91	0.76	22.89	31.43	300	360	Peak	VERTICAL
2	64.92	32.57	40.00	-7.43	51.00	1.00	12.35	31.78	300	360	Peak	VERTICAL
3	159.01	27.30	43.50	-16.20	41.22	1.50	16.30	31.72	300	360	Peak	VERTICAL
4	353.98	29.58	46.00	-16.42	39.04	2.11	20.42	31.99	300	360	Peak	VERTICAL
5	405.39	30.45	46.00	-15.55	38.20	2.22	22.11	32.08	300	360	Peak	VERTICAL
6	487.84	41.96	46.00	-4.04	48.39	2.48	23.38	32.29	300	360	QP	VERTICAL

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

RSE below 1GHz Result			
Operating Mode	3	**Polarization**	Horizontal
Operating Function	CTX		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	30.00	28.41	40.00	-11.59	34.86	0.70	24.35	31.50	100	0	Peak	HORIZONTAL
2	63.95	29.95	40.00	-10.05	48.38	1.00	12.34	31.77	100	0	Peak	HORIZONTAL
3	88.20	27.82	43.50	-15.68	43.73	1.20	14.68	31.79	100	0	Peak	HORIZONTAL
4	159.98	31.92	43.50	-11.58	45.82	1.50	16.31	31.71	100	0	Peak	HORIZONTAL
5	349.13	32.00	46.00	-14.00	41.64	2.10	20.24	31.98	100	0	Peak	HORIZONTAL
6	489.78	37.85	46.00	-8.15	44.28	2.48	23.38	32.29	100	0	Peak	HORIZONTAL

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

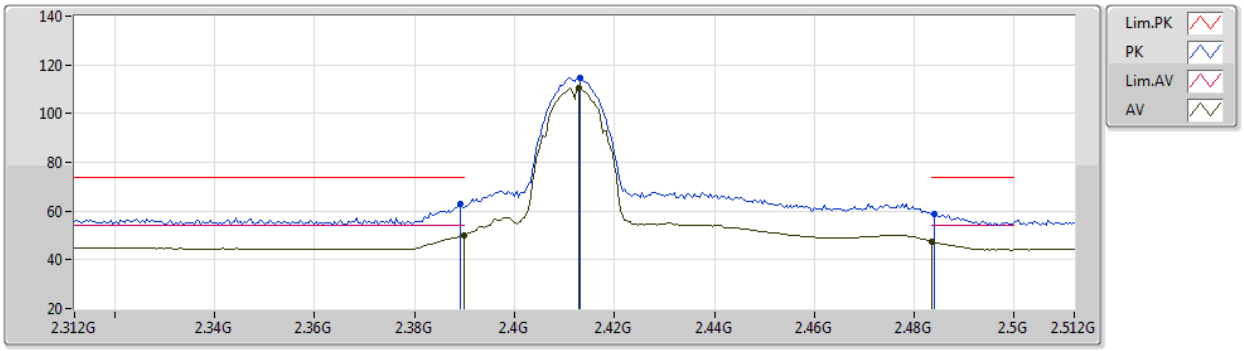
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
802.11b_Nss1,(1Mbps)_3TX	Pass	AV	4.82397G	53.98	54.00	-0.02	3	Vertical	352	2.25	-

802.11b_Nss1,(1Mbps)_3TX

2412MHz_TX

05/12/2019



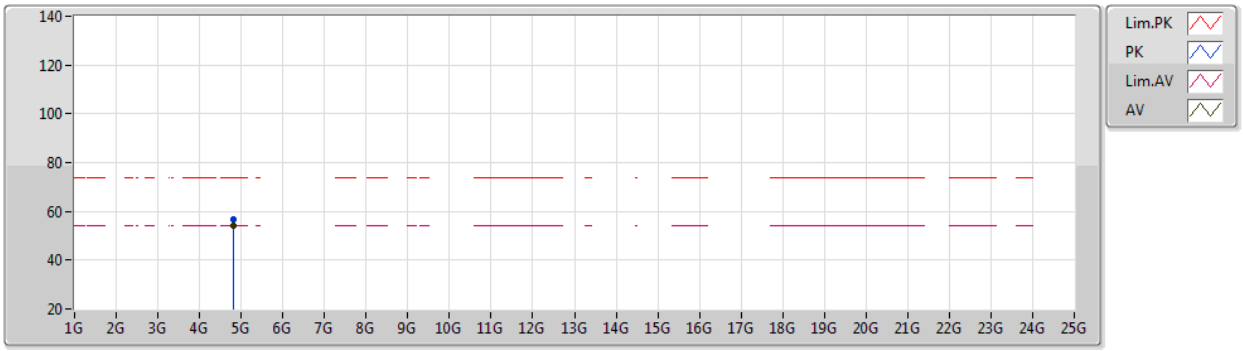
EUT Y_3TX
Setting 95
06-E-S-5
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3892G	62.74	74.00	-11.26	31.12	3	Vertical	0	1.41	-	27.63	3.99	-
AV	2.39G	50.16	54.00	-3.84	18.53	3	Vertical	0	1.41	-	27.63	4.00	-
PK	2.4132G	114.73	Inf	-Inf	83.16	3	Vertical	0	1.41	-	27.56	4.01	-
AV	2.4128G	110.48	Inf	-Inf	78.91	3	Vertical	0	1.41	-	27.56	4.01	-
PK	2.484G	58.73	74.00	-15.27	27.34	3	Vertical	0	1.41	-	27.35	4.04	-
AV	2.4835G	47.26	54.00	-6.74	15.87	3	Vertical	0	1.41	-	27.35	4.04	-

802.11b_Nss1,(1Mbps)_3TX

2412MHz_TX

05/12/2019



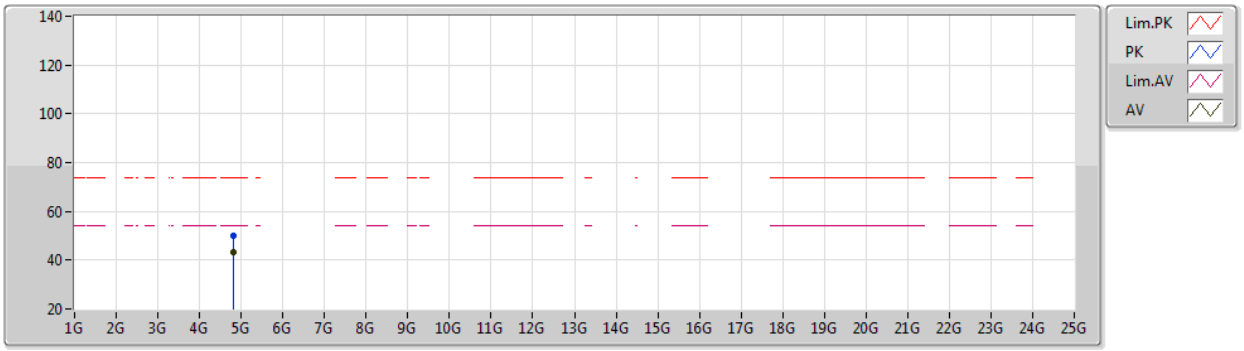
EUT Y_3TX
Setting 95
06-E-S-5
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.8239G	56.81	74.00	-17.19	52.13	3	Vertical	352	2.25	-	31.02	5.33	31.67
AV	4.82397G	53.98	54.00	-0.02	49.30	3	Vertical	352	2.25	-	31.02	5.33	31.67

802.11b_Nss1,(1Mbps)_3TX

2412MHz_TX

05/12/2019



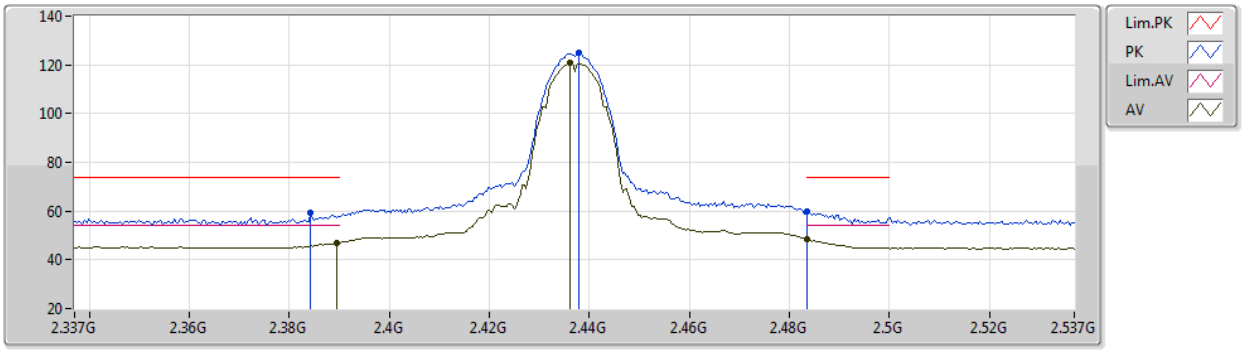
EUT Y_3TX
Setting 95
06-E-S-5
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.82392G	49.77	74.00	-24.23	45.09	3	Horizontal	44	1.80	-	31.02	5.33	31.67
AV	4.82393G	43.38	54.00	-10.62	38.70	3	Horizontal	44	1.80	-	31.02	5.33	31.67

802.11b_Nss1,(1Mbps)_3TX

2437MHz_TX

05/12/2019



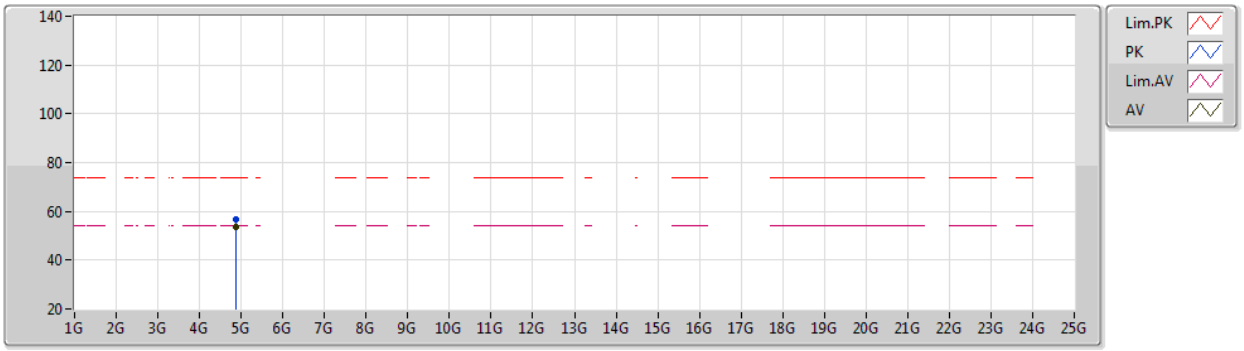
EUT Y_3TX
Setting 100
06-E-S-5
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3842G	59.43	74.00	-14.57	27.79	3	Vertical	338	1.61	-	27.65	3.99	-
AV	2.3894G	46.91	54.00	-7.09	15.29	3	Vertical	338	1.61	-	27.63	3.99	-
PK	2.4378G	124.80	Inf	-Inf	93.29	3	Vertical	338	1.61	-	27.49	4.02	-
AV	2.4362G	121.05	Inf	-Inf	89.54	3	Vertical	338	1.61	-	27.49	4.02	-
PK	2.4835G	59.84	74.00	-14.16	28.45	3	Vertical	338	1.61	-	27.35	4.04	-
AV	2.4835G	48.49	54.00	-5.51	17.10	3	Vertical	338	1.61	-	27.35	4.04	-

802.11b_Nss1,(1Mbps)_3TX

2437MHz_TX

05/12/2019



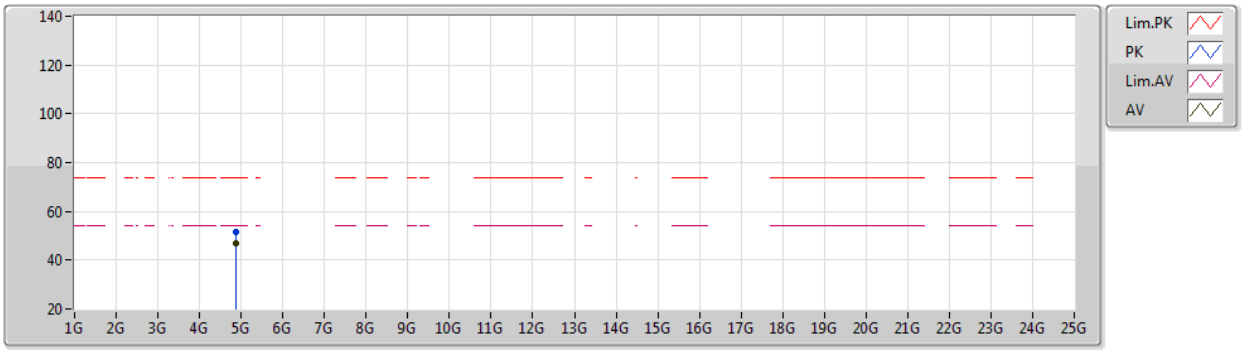
EUT Y_3TX
Setting 100
06-E-S-5
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.87398G	56.75	74.00	-17.25	51.92	3	Vertical	354	2.20	-	31.07	5.40	31.64
AV	4.87396G	53.77	54.00	-0.23	48.94	3	Vertical	354	2.20	-	31.07	5.40	31.64

802.11b_Nss1,(1Mbps)_3TX

2437MHz_TX

05/12/2019



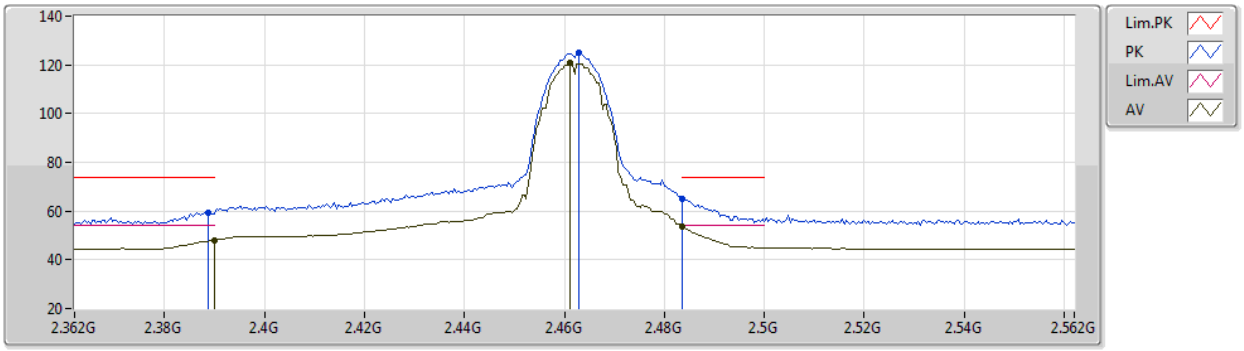
EUT Y_3TX
Setting 100
06-E-S-5
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.87394G	51.46	74.00	-22.54	46.63	3	Horizontal	50	1.75	-	31.07	5.40	31.64
AV	4.87396G	46.98	54.00	-7.02	42.15	3	Horizontal	50	1.75	-	31.07	5.40	31.64

802.11b_Nss1,(1Mbps)_3TX

2462MHz_TX

05/12/2019



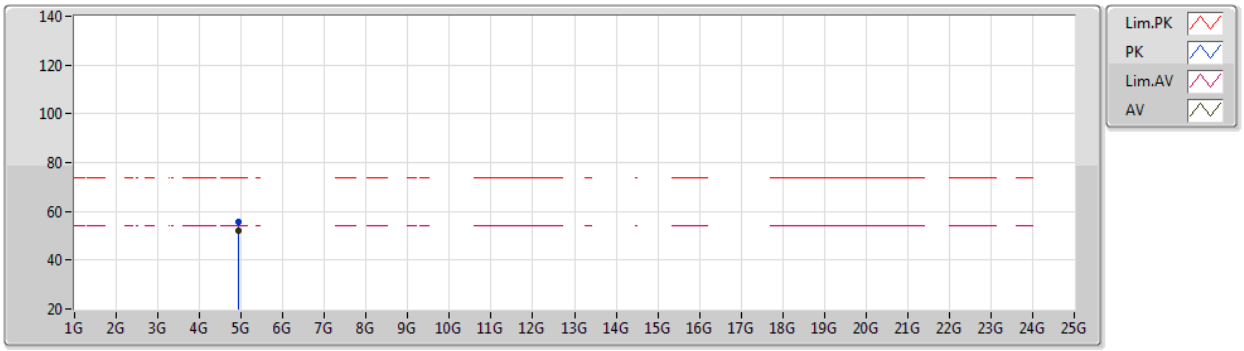
EUT Y_3TX
Setting 100
06-E-S-5
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3888G	59.32	74.00	-14.68	27.70	3	Vertical	93	1.58	-	27.63	3.99	-
AV	2.39G	48.13	54.00	-5.87	16.50	3	Vertical	93	1.58	-	27.63	4.00	-
PK	2.4628G	124.84	Inf	-Inf	93.40	3	Vertical	93	1.58	-	27.41	4.03	-
AV	2.4612G	120.81	Inf	-Inf	89.36	3	Vertical	93	1.58	-	27.42	4.03	-
PK	2.4835G	64.92	74.00	-9.08	33.53	3	Vertical	93	1.58	-	27.35	4.04	-
AV	2.4835G	53.44	54.00	-0.56	22.05	3	Vertical	93	1.58	-	27.35	4.04	-

802.11b_Nss1,(1Mbps)_3TX

2462MHz_TX

05/12/2019



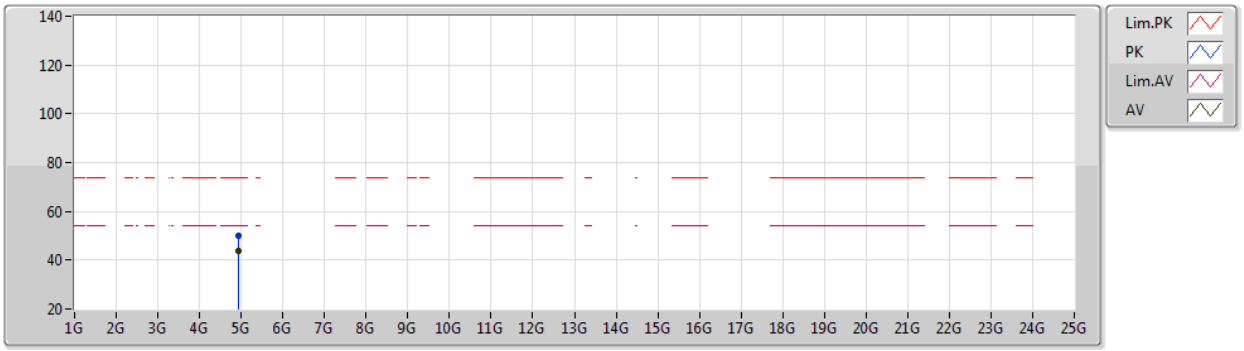
EUT Y_3TX
Setting 100
06-E-S-5
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.924G	55.57	74.00	-18.43	50.50	3	Vertical	0	1.91	-	31.20	5.48	31.61
AV	4.92394G	51.96	54.00	-2.04	46.89	3	Vertical	0	1.91	-	31.20	5.48	31.61

802.11b_Nss1,(1Mbps)_3TX

2462MHz_TX

05/12/2019



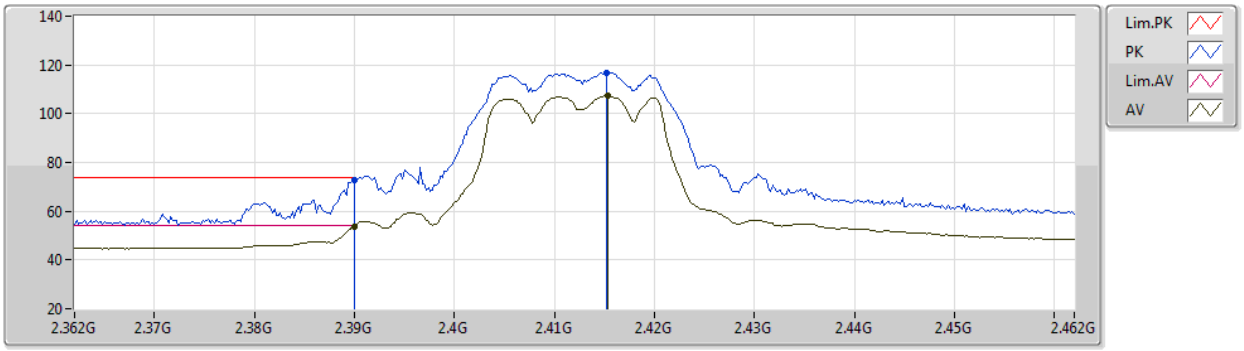
EUT Y_3TX
Setting 100
06-E-S-5
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.92398G	49.93	74.00	-24.07	44.86	3	Horizontal	155	2.00	-	31.20	5.48	31.61
AV	4.92395G	43.90	54.00	-10.10	38.83	3	Horizontal	155	2.00	-	31.20	5.48	31.61

802.11g_Nss1,(6Mbps)_3TX

2412MHz_TX

05/12/2019



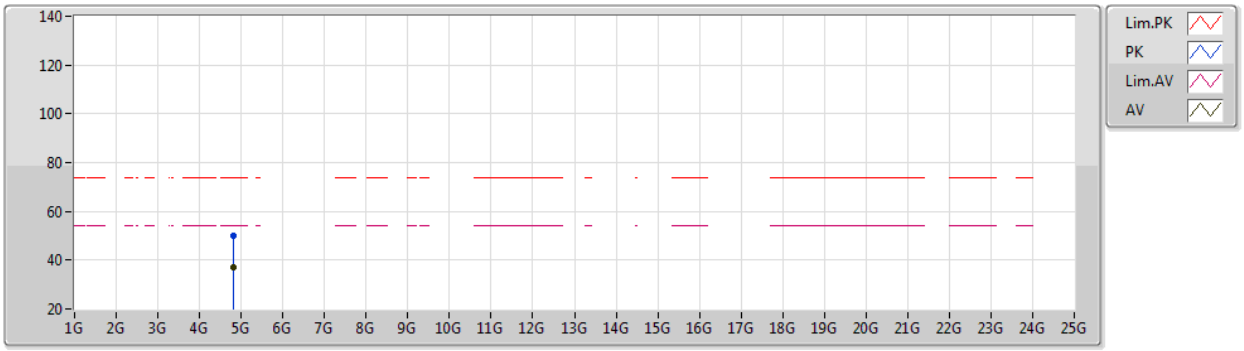
EUT Y_3TX
Setting 76
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.39G	72.71	74.00	-1.29	41.08	3	Vertical	334	1.62	-	27.63	4.00	-
AV	2.39G	53.83	54.00	-0.17	22.20	3	Vertical	334	1.62	-	27.63	4.00	-
PK	2.4152G	116.71	Inf	-Inf	85.15	3	Vertical	334	1.62	-	27.55	4.01	-
AV	2.4154G	107.18	Inf	-Inf	75.62	3	Vertical	334	1.62	-	27.55	4.01	-

802.11g_Nss1,(6Mbps)_3TX

2412MHz_TX

05/12/2019



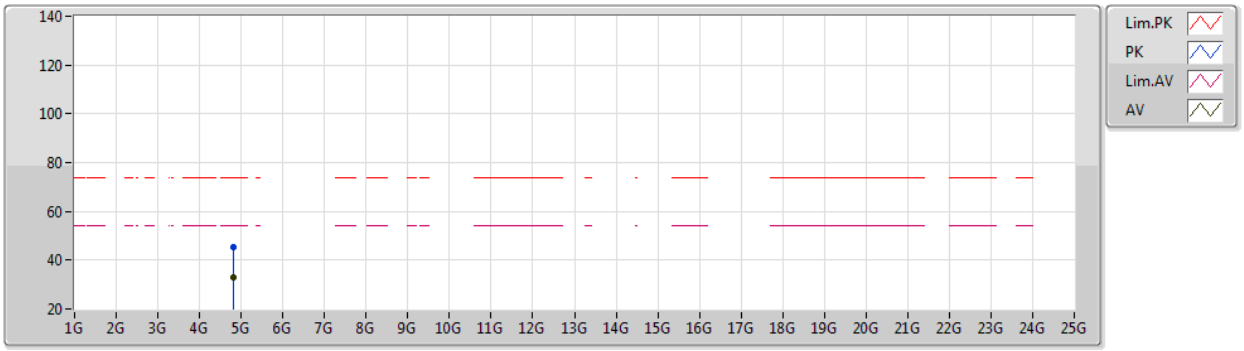
EUT Y_3TX
Setting 76
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.81908G	49.94	74.00	-24.06	45.26	3	Vertical	347	2.26	-	31.02	5.33	31.67
AV	4.8201G	36.83	54.00	-17.17	32.15	3	Vertical	347	2.26	-	31.02	5.33	31.67

802.11g_Nss1,(6Mbps)_3TX

2412MHz_TX

05/12/2019



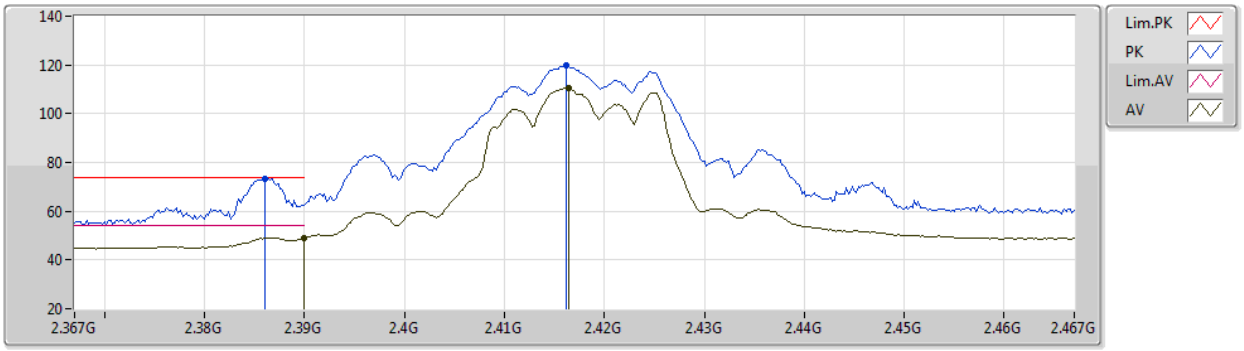
EUT Y_3TX
Setting 76
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.8168G	45.50	74.00	-28.50	40.83	3	Horizontal	337	2.53	-	31.02	5.32	31.67
AV	4.8237G	33.05	54.00	-20.95	28.37	3	Horizontal	337	2.53	-	31.02	5.33	31.67

802.11g_Nss1,(6Mbps)_3TX

2417MHz_TX

05/12/2019



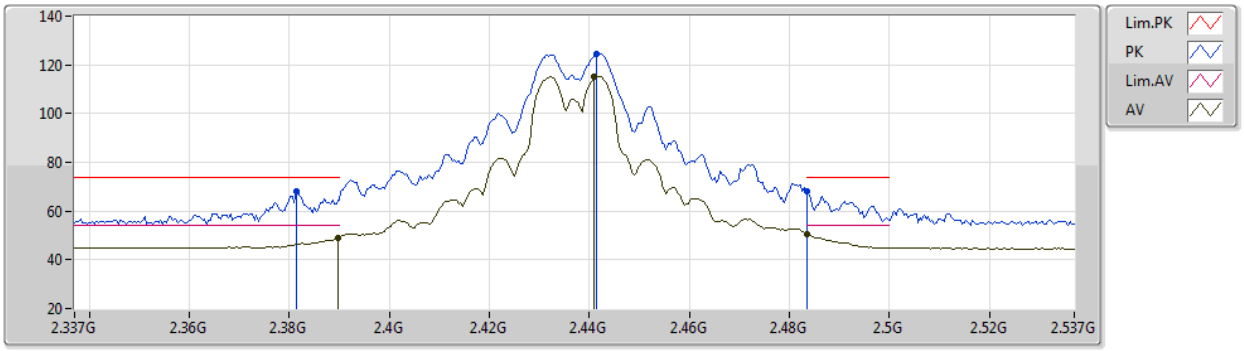
EUT Y_3TX
Setting 83
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.386G	73.36	74.00	-0.64	41.73	3	Vertical	314	1.68	-	27.64	3.99	-
AV	2.39G	49.01	54.00	-4.99	17.38	3	Vertical	314	1.68	-	27.63	4.00	-
PK	2.4162G	119.66	Inf	-Inf	88.10	3	Vertical	314	1.68	-	27.55	4.01	-
AV	2.4164G	110.45	Inf	-Inf	78.89	3	Vertical	314	1.68	-	27.55	4.01	-

802.11g_Nss1,(6Mbps)_3TX

2437MHz_TX

05/12/2019



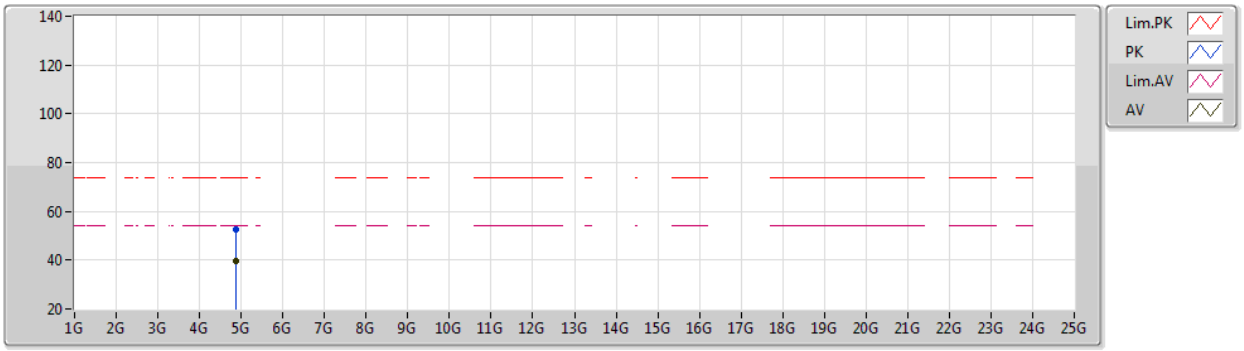
EUT Y_3TX
Setting 100
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3814G	67.96	74.00	-6.04	36.31	3	Vertical	41	2.00	-	27.66	3.99	-
AV	2.3898G	49.06	54.00	-4.94	17.44	3	Vertical	41	2.00	-	27.63	3.99	-
PK	2.4414G	124.74	Inf	-Inf	93.24	3	Vertical	41	2.00	-	27.48	4.02	-
AV	2.441G	115.11	Inf	-Inf	83.61	3	Vertical	41	2.00	-	27.48	4.02	-
PK	2.4835G	68.21	74.00	-5.79	36.82	3	Vertical	41	2.00	-	27.35	4.04	-
AV	2.4835G	50.62	54.00	-3.38	19.23	3	Vertical	41	2.00	-	27.35	4.04	-

802.11g_Nss1,(6Mbps)_3TX

2437MHz_TX

05/12/2019



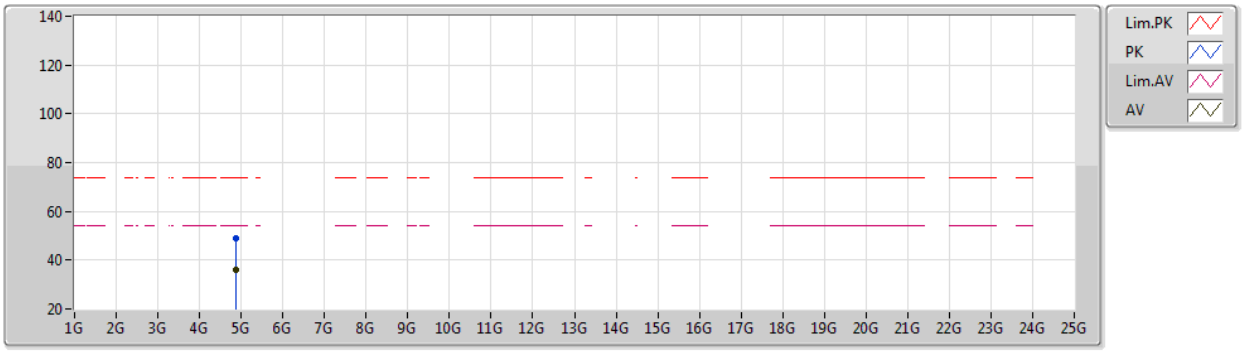
EUT Y_3TX
Setting 100
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.87892G	52.76	74.00	-21.24	47.90	3	Vertical	353	2.07	-	31.08	5.41	31.63
AV	4.87436G	39.89	54.00	-14.11	35.06	3	Vertical	353	2.07	-	31.07	5.40	31.64

802.11g_Nss1,(6Mbps)_3TX

2437MHz_TX

05/12/2019



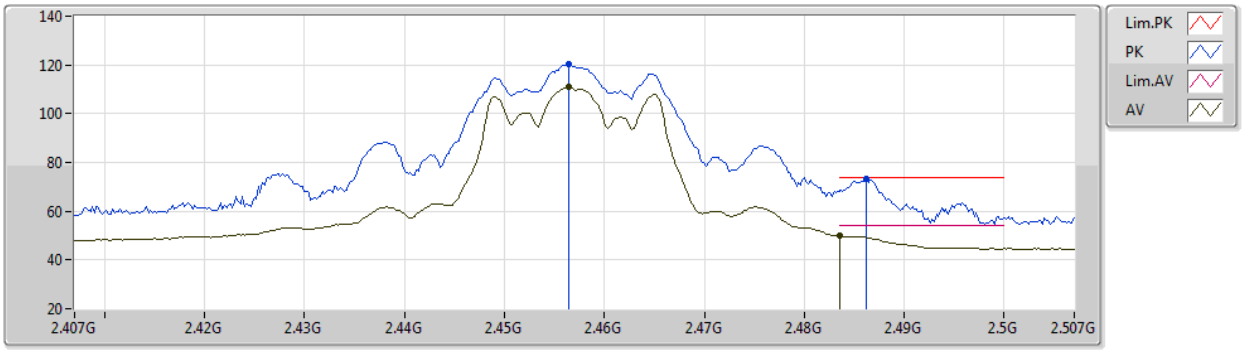
EUT Y_3TX
Setting 100
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.87382G	49.13	74.00	-24.87	44.30	3	Horizontal	60	2.16	-	31.07	5.40	31.64
AV	4.87382G	35.94	54.00	-18.06	31.11	3	Horizontal	60	2.16	-	31.07	5.40	31.64

802.11g_Nss1,(6Mbps)_3TX

2457MHz_TX

05/12/2019



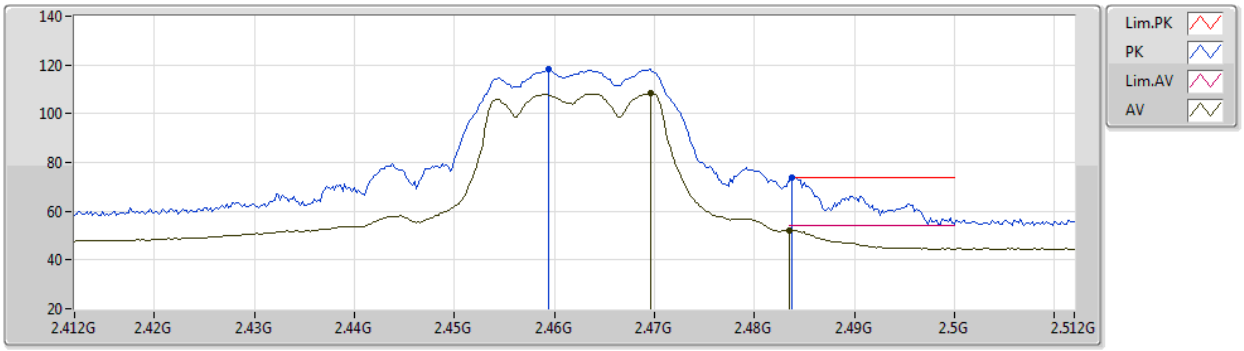
EUT Y_3TX
Setting 84
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4564G	120.41	Inf	-Inf	88.95	3	Vertical	39	1.80	-	27.43	4.03	-
AV	2.4564G	110.96	Inf	-Inf	79.50	3	Vertical	39	1.80	-	27.43	4.03	-
PK	2.4862G	73.27	74.00	-0.73	41.89	3	Vertical	39	1.80	-	27.34	4.04	-
AV	2.4835G	49.87	54.00	-4.13	18.48	3	Vertical	39	1.80	-	27.35	4.04	-

802.11g_Nss1,(6Mbps)_3TX

2462MHz_TX

05/12/2019



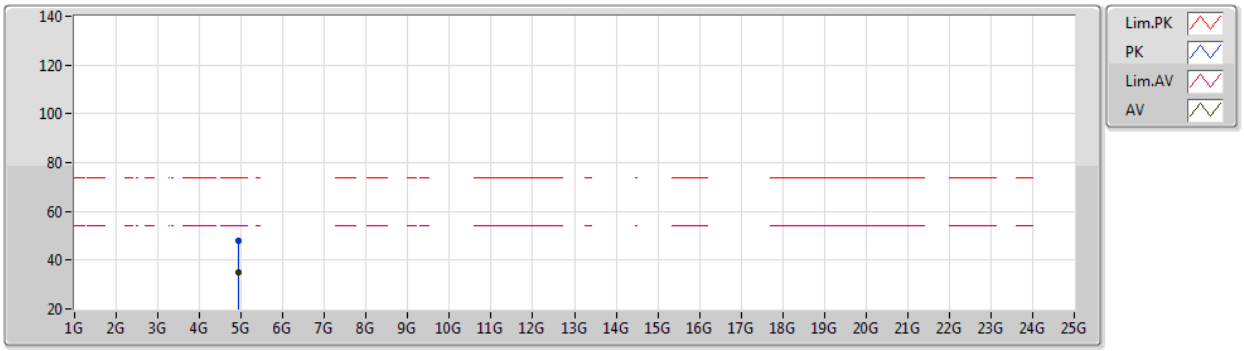
EUT Y_3TX
Setting 78
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4594G	118.21	Inf	-Inf	86.76	3	Vertical	317	1.80	-	27.42	4.03	-
AV	2.4696G	108.45	Inf	-Inf	77.03	3	Vertical	317	1.80	-	27.39	4.03	-
PK	2.4838G	73.96	74.00	-0.04	42.57	3	Vertical	317	1.80	-	27.35	4.04	-
AV	2.4835G	52.15	54.00	-1.85	20.76	3	Vertical	317	1.80	-	27.35	4.04	-

802.11g_Nss1,(6Mbps)_3TX

2462MHz_TX

05/12/2019



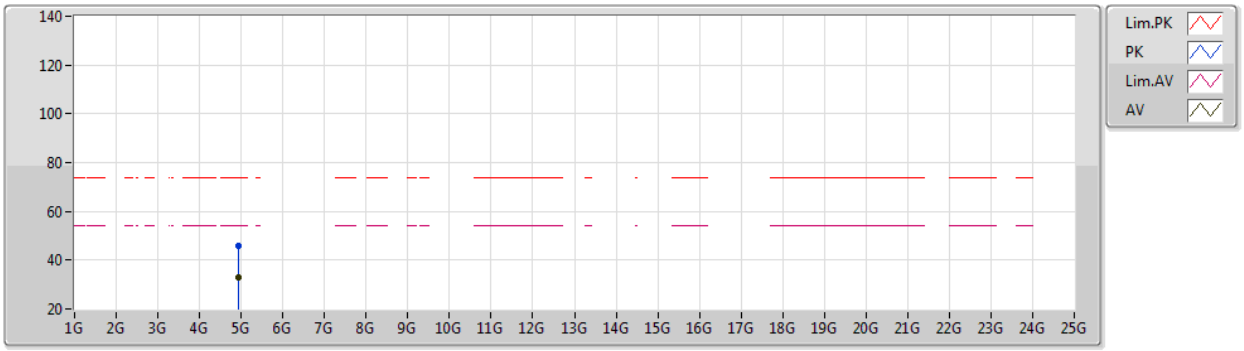
EUT Y_3TX
Setting 78
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.92514G	48.06	74.00	-25.94	42.98	3	Vertical	359	2.30	-	31.20	5.48	31.60
AV	4.92544G	35.12	54.00	-18.88	30.04	3	Vertical	359	2.30	-	31.20	5.48	31.60

802.11g_Nss1,(6Mbps)_3TX

2462MHz_TX

05/12/2019



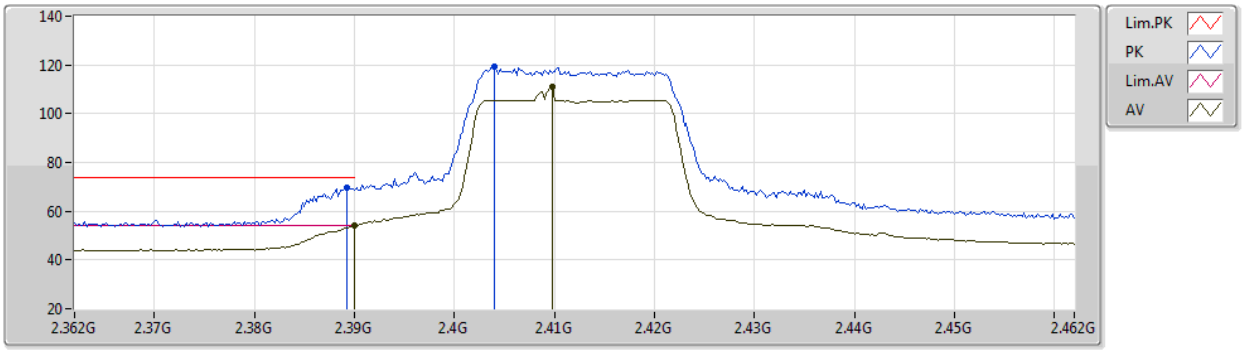
EUT Y_3TX
Setting 78
06-E-A-3
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.92388G	46.02	74.00	-27.98	40.95	3	Horizontal	29	1.43	-	31.20	5.48	31.61
AV	4.91986G	32.97	54.00	-21.03	27.93	3	Horizontal	29	1.43	-	31.18	5.47	31.61

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2412MHz_TX

05/12/2019



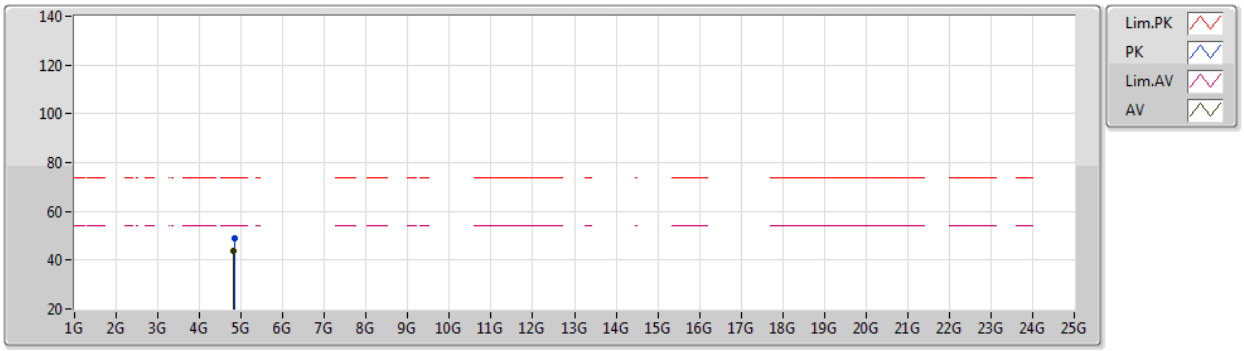
EUT Y_3TX
Setting 71
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3892G	69.54	74.00	-4.46	37.92	3	Vertical	34	1.77	-	27.63	3.99	-
AV	2.39G	53.88	54.00	-0.12	22.25	3	Vertical	34	1.77	-	27.63	4.00	-
PK	2.404G	119.52	Inf	-Inf	87.93	3	Vertical	34	1.77	-	27.59	4.00	-
AV	2.4098G	110.85	Inf	-Inf	79.28	3	Vertical	34	1.77	-	27.57	4.00	-

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2412MHz_TX

05/12/2019



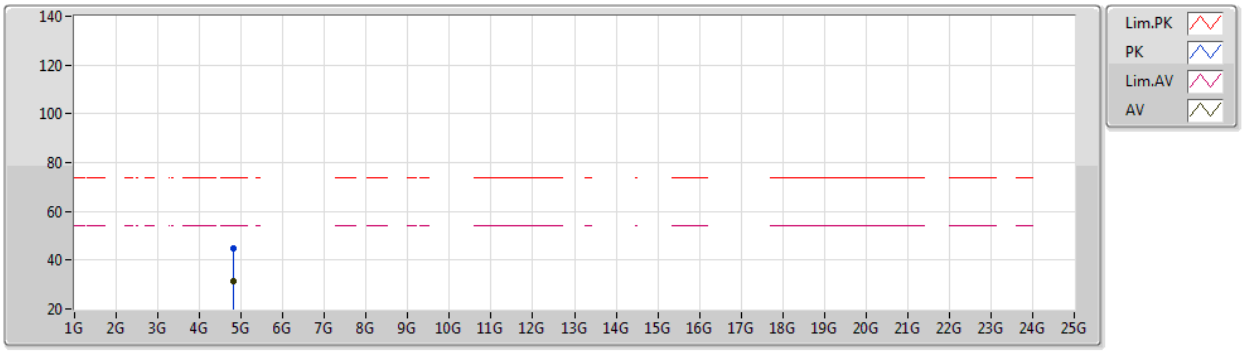
EUT Y_3TX
Setting 71
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.8288G	49.04	74.00	-24.96	44.33	3	Vertical	343	1.80	-	31.03	5.34	31.66
AV	4.82404G	43.60	54.00	-10.40	38.92	3	Vertical	343	1.80	-	31.02	5.33	31.67

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2412MHz_TX

05/12/2019



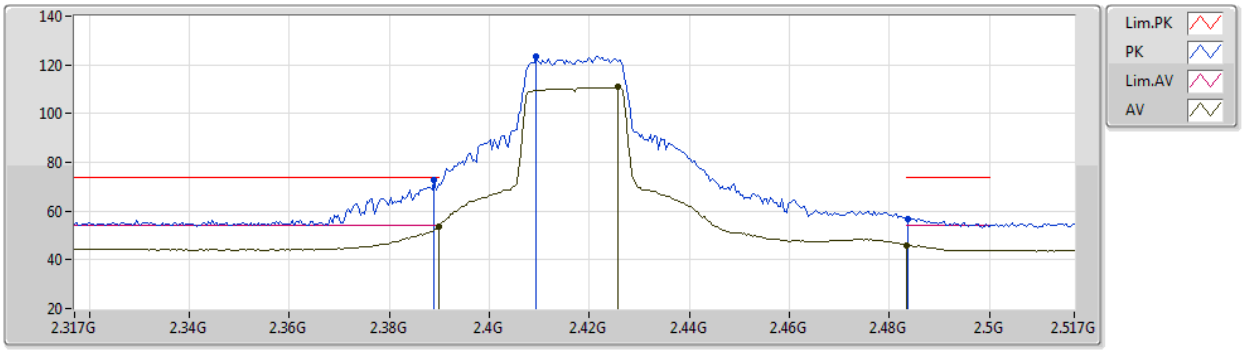
EUT Y_3TX
Setting 71
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.81652G	44.95	74.00	-29.05	40.28	3	Horizontal	263	2.65	-	31.02	5.32	31.67
AV	4.82672G	31.57	54.00	-22.43	26.86	3	Horizontal	263	2.65	-	31.03	5.34	31.66

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2417MHz_TX

05/12/2019



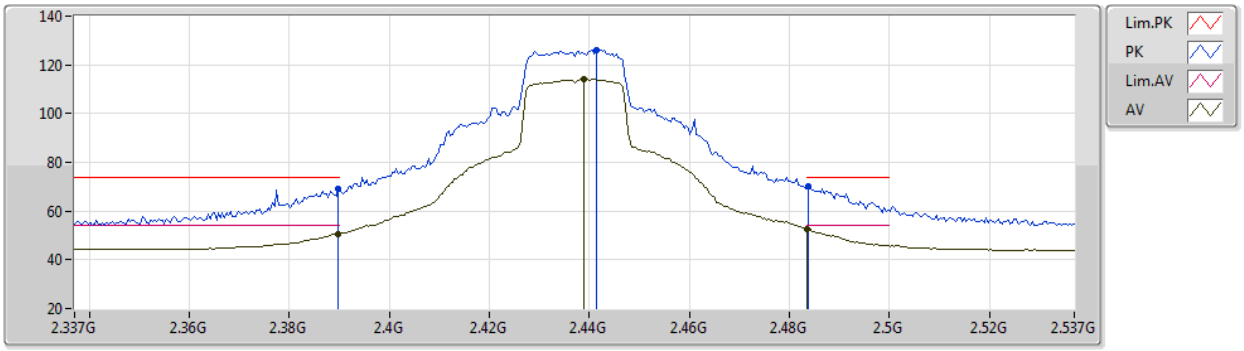
EUT Y_3TX
Setting 83
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.389G	72.64	74.00	-1.36	41.02	3	Vertical	269	1.68	-	27.63	3.99	-
AV	2.3898G	53.43	54.00	-0.57	21.81	3	Vertical	269	1.68	-	27.63	3.99	-
PK	2.4094G	123.48	Inf	-Inf	91.91	3	Vertical	269	1.68	-	27.57	4.00	-
AV	2.4258G	110.87	Inf	-Inf	79.34	3	Vertical	269	1.68	-	27.52	4.01	-
PK	2.4838G	56.65	74.00	-17.35	25.26	3	Vertical	269	1.68	-	27.35	4.04	-
AV	2.4835G	45.96	54.00	-8.04	14.57	3	Vertical	269	1.68	-	27.35	4.04	-

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2437MHz_TX

05/12/2019



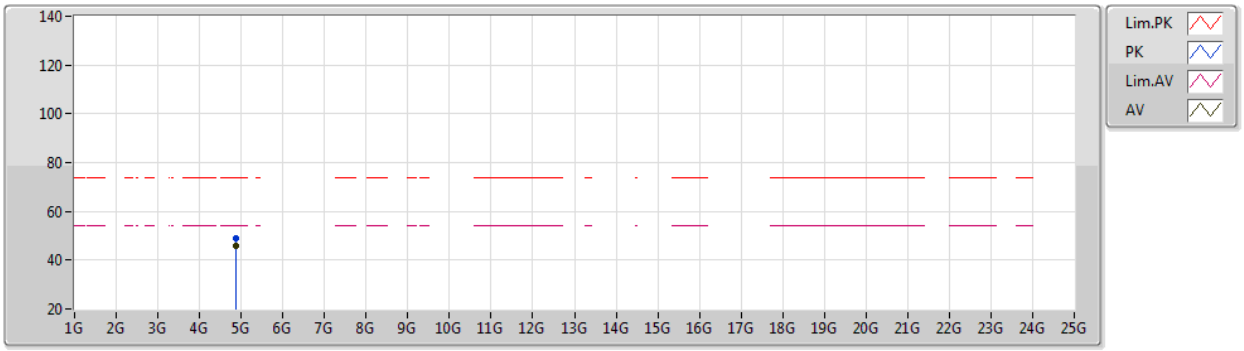
EUT Y_3TX
Setting 100
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3898G	68.91	74.00	-5.09	37.29	3	Vertical	313	1.82	-	27.63	3.99	-
AV	2.3898G	50.73	54.00	-3.27	19.11	3	Vertical	313	1.82	-	27.63	3.99	-
PK	2.4414G	126.18	Inf	-Inf	94.68	3	Vertical	313	1.82	-	27.48	4.02	-
AV	2.439G	114.13	Inf	-Inf	82.63	3	Vertical	313	1.82	-	27.48	4.02	-
PK	2.4838G	70.40	74.00	-3.60	39.01	3	Vertical	313	1.82	-	27.35	4.04	-
AV	2.4835G	52.77	54.00	-1.23	21.38	3	Vertical	313	1.82	-	27.35	4.04	-

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2437MHz_TX

05/12/2019



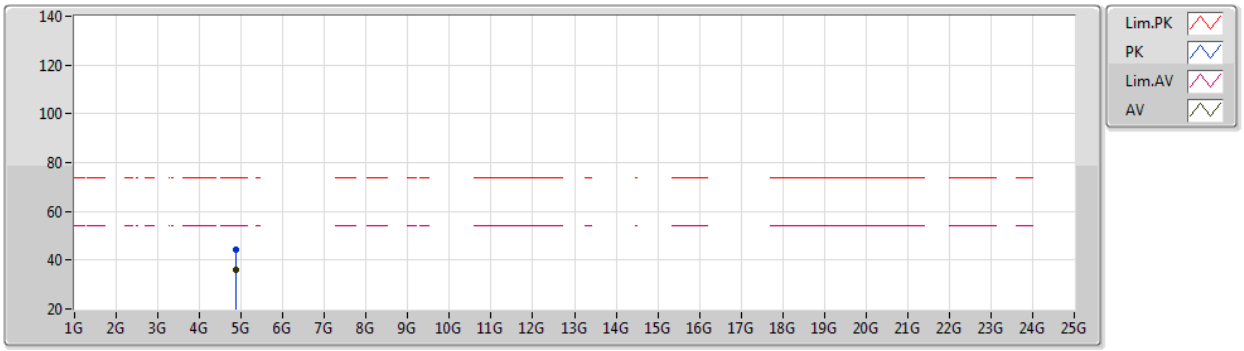
EUT Y_3TX
Setting 100
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.87284G	48.87	74.00	-25.13	44.04	3	Vertical	350	1.80	-	31.07	5.40	31.64
AV	4.87408G	45.85	54.00	-8.15	41.02	3	Vertical	350	1.80	-	31.07	5.40	31.64

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2437MHz_TX

05/12/2019



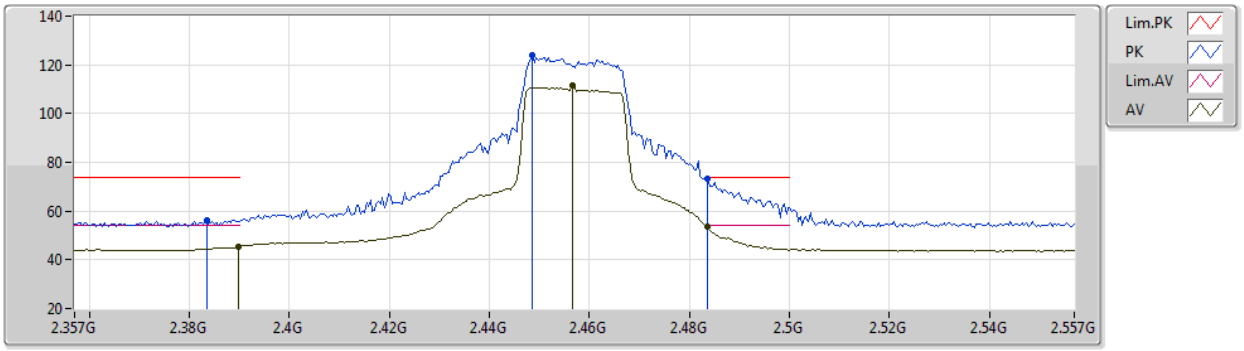
EUT Y_3TX
Setting 100
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.88332G	44.40	74.00	-29.60	39.53	3	Horizontal	155	1.08	-	31.08	5.42	31.63
AV	4.87412G	36.01	54.00	-17.99	31.18	3	Horizontal	155	1.08	-	31.07	5.40	31.64

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2457MHz_TX

05/12/2019



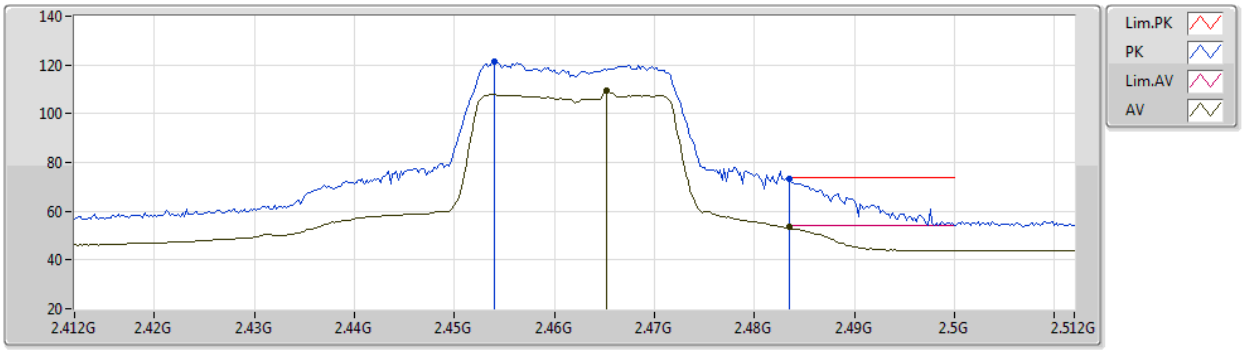
EUT Y_3TX
Setting 83
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3834G	56.40	74.00	-17.60	24.76	3	Vertical	64	1.78	-	27.65	3.99	-
AV	2.3898G	45.35	54.00	-8.65	13.73	3	Vertical	64	1.78	-	27.63	3.99	-
PK	2.4486G	123.82	Inf	-Inf	92.35	3	Vertical	64	1.78	-	27.45	4.02	-
AV	2.4566G	111.52	Inf	-Inf	80.06	3	Vertical	64	1.78	-	27.43	4.03	-
PK	2.4835G	73.33	74.00	-0.67	41.94	3	Vertical	64	1.78	-	27.35	4.04	-
AV	2.4835G	53.84	54.00	-0.16	22.45	3	Vertical	64	1.78	-	27.35	4.04	-

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2462MHz_TX

05/12/2019



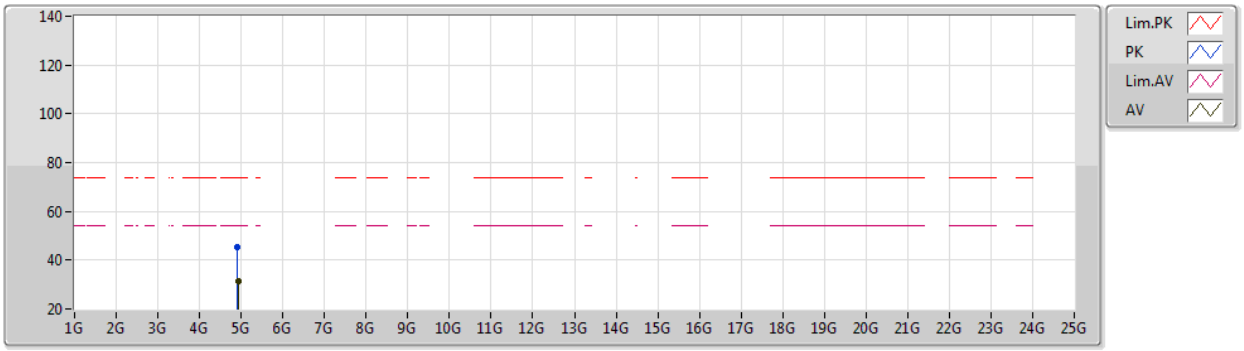
EUT Y_3TX
Setting 71
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.454G	121.44	Inf	-Inf	89.97	3	Vertical	284	1.57	-	27.44	4.03	-
AV	2.4652G	109.46	Inf	-Inf	78.03	3	Vertical	284	1.57	-	27.40	4.03	-
PK	2.4835G	73.10	74.00	-0.90	41.71	3	Vertical	284	1.57	-	27.35	4.04	-
AV	2.4835G	53.77	54.00	-0.23	22.38	3	Vertical	284	1.57	-	27.35	4.04	-

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2462MHz_TX

05/12/2019



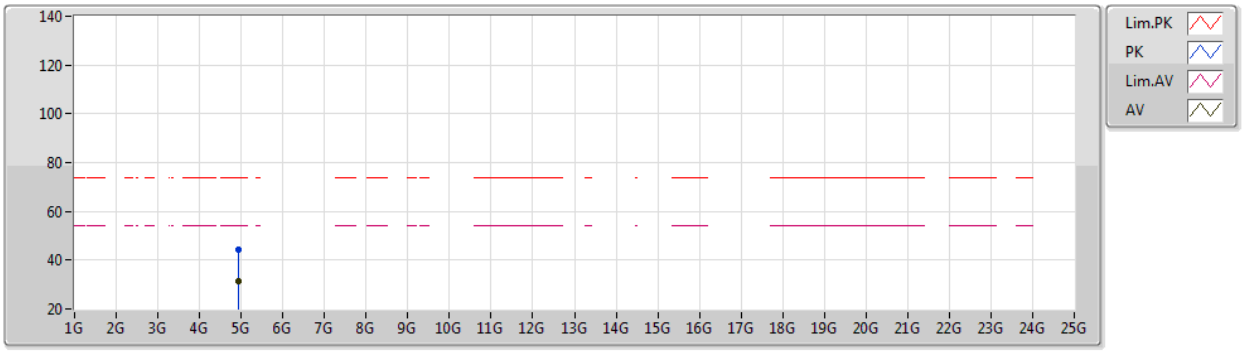
EUT Y_3TX
Setting 71
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.91748G	45.11	74.00	-28.89	40.08	3	Vertical	122	2.03	-	31.17	5.47	31.61
AV	4.92732G	31.52	54.00	-22.48	26.43	3	Vertical	122	2.03	-	31.21	5.48	31.60

802.11ax HEW20-BF_Nss1,(MCS0)_3TX

2462MHz_TX

05/12/2019



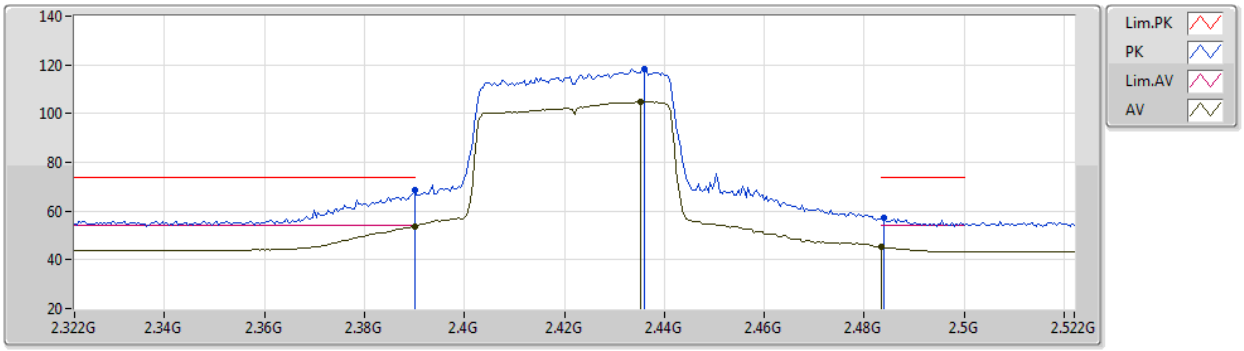
EUT Y_3TX
Setting 71
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.92732G	44.49	74.00	-29.51	39.40	3	Horizontal	298	1.60	-	31.21	5.48	31.60
AV	4.91992G	31.40	54.00	-22.60	26.36	3	Horizontal	298	1.60	-	31.18	5.47	31.61

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2422MHz_TX

05/12/2019



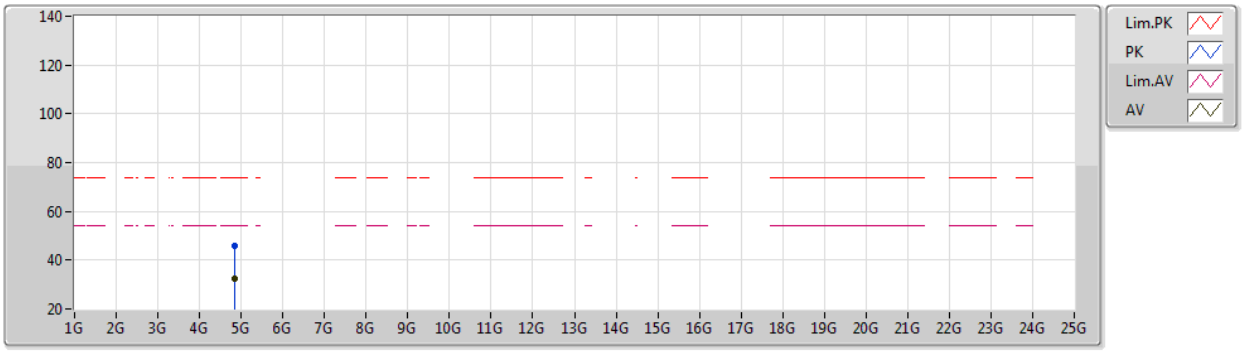
EUT Y_3TX
Setting 67
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.39G	68.68	74.00	-5.32	37.05	3	Vertical	74	1.80	-	27.63	4.00	-
AV	2.39G	53.81	54.00	-0.19	22.18	3	Vertical	74	1.80	-	27.63	4.00	-
PK	2.436G	118.11	Inf	-Inf	86.60	3	Vertical	74	1.80	-	27.49	4.02	-
AV	2.4352G	104.94	Inf	-Inf	73.43	3	Vertical	74	1.80	-	27.49	4.02	-
PK	2.484G	57.00	74.00	-17.00	25.61	3	Vertical	74	1.80	-	27.35	4.04	-
AV	2.4835G	45.37	54.00	-8.63	13.98	3	Vertical	74	1.80	-	27.35	4.04	-

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2422MHz_TX

05/12/2019



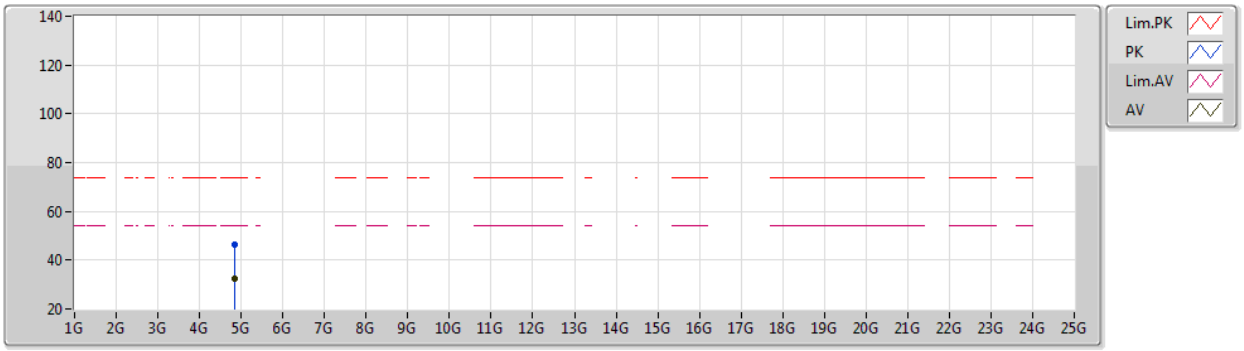
EUT Y_3TX
Setting 67
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.843G	45.77	74.00	-28.23	41.02	3	Vertical	350	2.94	-	31.04	5.36	31.65
AV	4.844G	32.58	54.00	-21.42	27.83	3	Vertical	350	2.94	-	31.04	5.36	31.65

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2422MHz_TX

05/12/2019



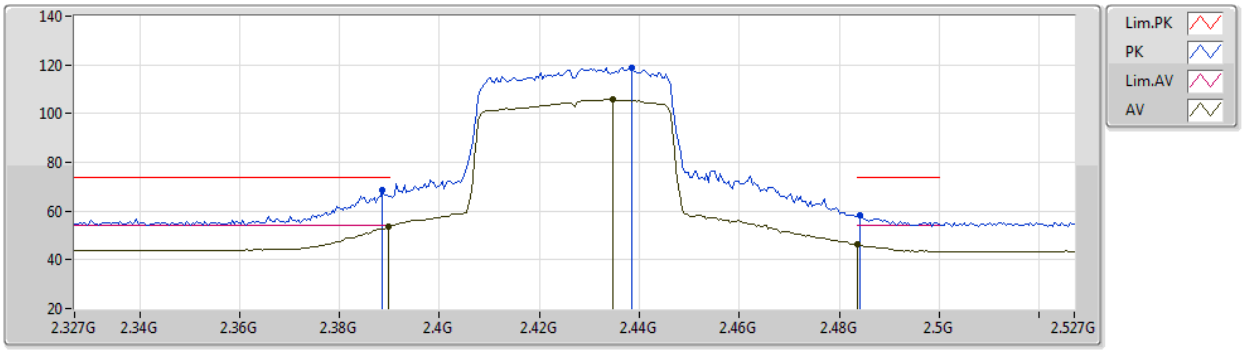
EUT Y_3TX
Setting 67
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.845G	46.21	74.00	-27.79	41.45	3	Horizontal	305	2.38	-	31.05	5.36	31.65
AV	4.844G	32.45	54.00	-21.55	27.70	3	Horizontal	305	2.38	-	31.04	5.36	31.65

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2427MHz_TX

05/12/2019



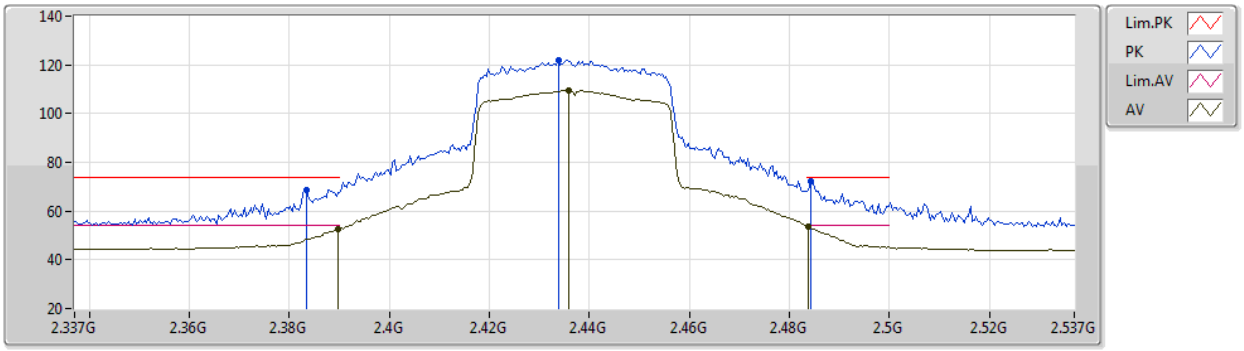
EUT Y_3TX
Setting 72
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3886G	68.66	74.00	-5.34	37.04	3	Vertical	81	1.74	-	27.63	3.99	-
AV	2.3898G	53.87	54.00	-0.13	22.25	3	Vertical	81	1.74	-	27.63	3.99	-
PK	2.4386G	118.79	Inf	-Inf	87.29	3	Vertical	81	1.74	-	27.48	4.02	-
AV	2.4346G	105.84	Inf	-Inf	74.32	3	Vertical	81	1.74	-	27.50	4.02	-
PK	2.4842G	58.50	74.00	-15.50	27.11	3	Vertical	81	1.74	-	27.35	4.04	-
AV	2.4835G	46.19	54.00	-7.81	14.80	3	Vertical	81	1.74	-	27.35	4.04	-

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2437MHz_TX

05/12/2019



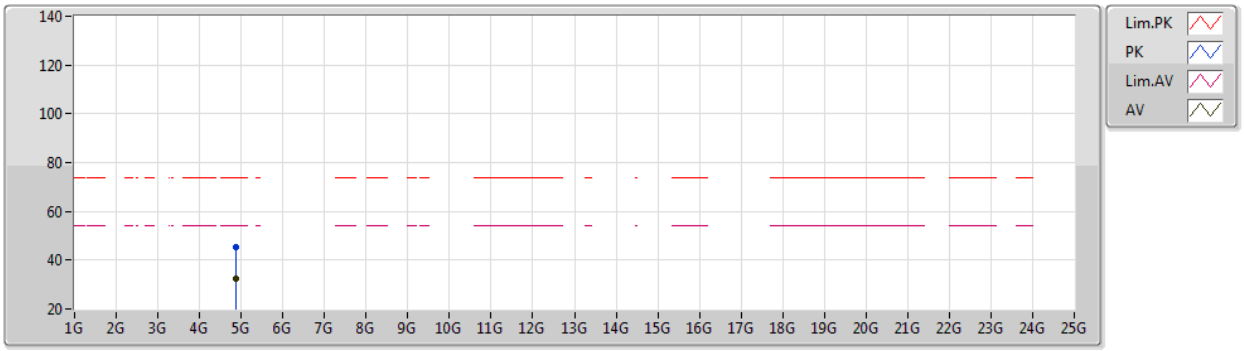
EUT Y_3TX
Setting 83
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3834G	68.73	74.00	-5.27	37.09	3	Vertical	73	1.61	-	27.65	3.99	-
AV	2.3898G	52.72	54.00	-1.28	21.10	3	Vertical	73	1.61	-	27.63	3.99	-
PK	2.4338G	121.93	Inf	-Inf	90.41	3	Vertical	73	1.61	-	27.50	4.02	-
AV	2.4358G	109.63	Inf	-Inf	78.12	3	Vertical	73	1.61	-	27.49	4.02	-
PK	2.4842G	72.25	74.00	-1.75	40.86	3	Vertical	73	1.61	-	27.35	4.04	-
AV	2.4838G	53.82	54.00	-0.18	22.43	3	Vertical	73	1.61	-	27.35	4.04	-

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2437MHz_TX

05/12/2019



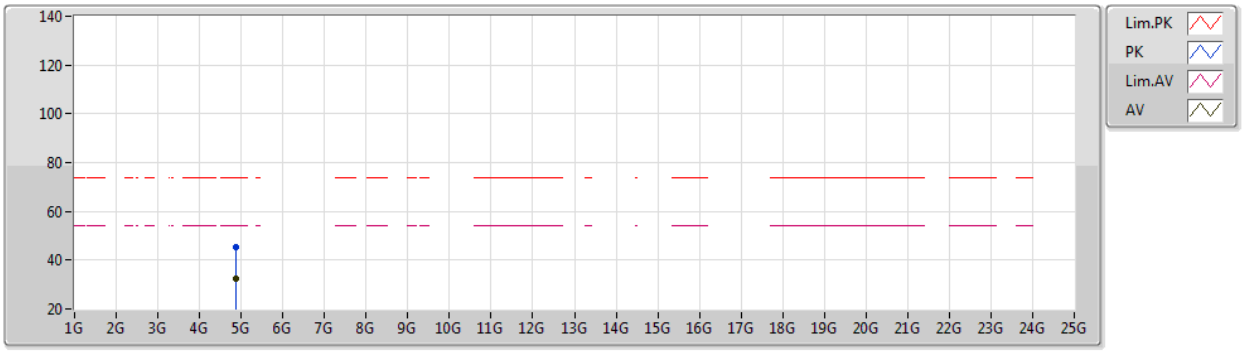
EUT Y_3TX
Setting 83
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.8753G	45.42	74.00	-28.58	40.56	3	Vertical	1	1.34	-	31.08	5.41	31.63
AV	4.8751G	32.66	54.00	-21.34	27.80	3	Vertical	1	1.34	-	31.08	5.41	31.63

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2437MHz_TX

05/12/2019



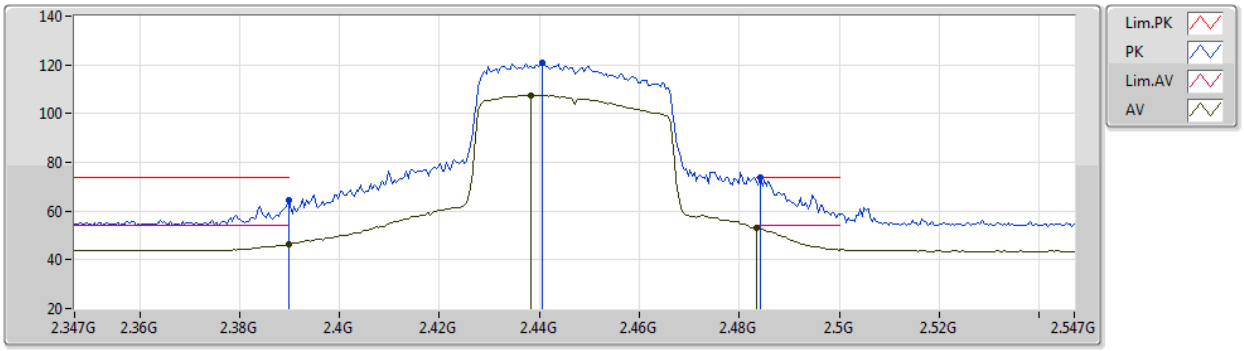
EUT Y_3TX
Setting 83
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.8741G	45.55	74.00	-28.45	40.72	3	Horizontal	254	2.91	-	31.07	5.40	31.64
AV	4.8752G	32.36	54.00	-21.64	27.50	3	Horizontal	254	2.91	-	31.08	5.41	31.63

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2447MHz_TX

05/12/2019



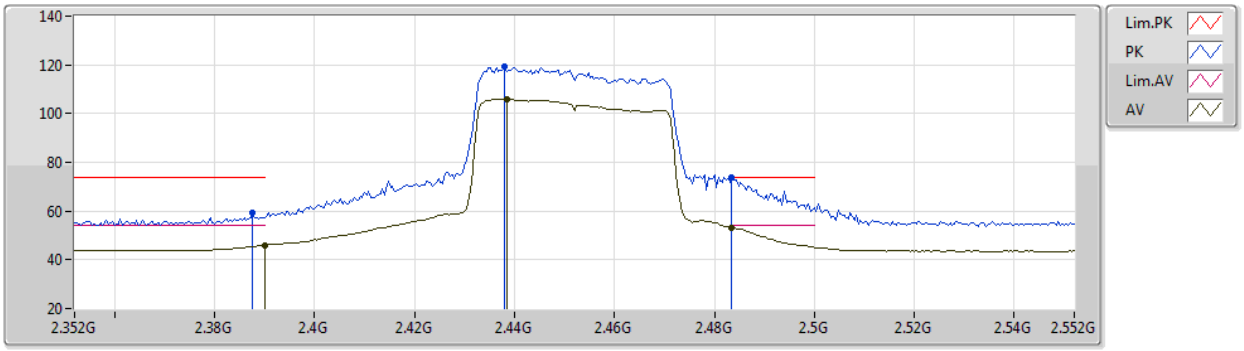
EUT Y_3TX
Setting 76
06-E-S-5
MTOOL 3.2.0.0

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3898G	64.65	74.00	-9.35	33.03	3	Vertical	262	1.78	-	27.63	3.99	-
AV	2.3898G	46.37	54.00	-7.63	14.75	3	Vertical	262	1.78	-	27.63	3.99	-
PK	2.4406G	121.06	Inf	-Inf	89.56	3	Vertical	262	1.78	-	27.48	4.02	-
AV	2.4382G	107.66	Inf	-Inf	76.15	3	Vertical	262	1.78	-	27.49	4.02	-
PK	2.4842G	73.77	74.00	-0.23	42.38	3	Vertical	262	1.78	-	27.35	4.04	-
AV	2.4835G	53.21	54.00	-0.79	21.82	3	Vertical	262	1.78	-	27.35	4.04	-

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2452MHz_TX

05/12/2019



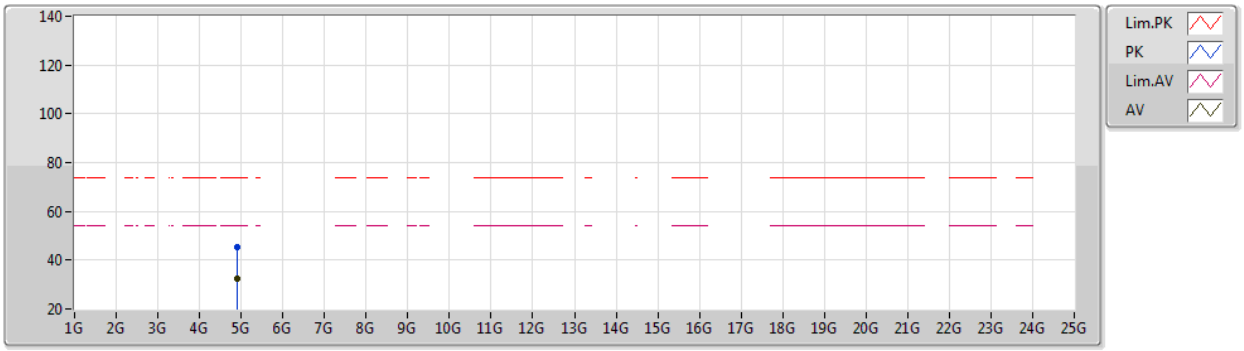
EUT Y_3TX
Setting 71
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3876G	59.09	74.00	-14.91	27.46	3	Vertical	271	1.78	-	27.64	3.99	-
AV	2.39G	46.03	54.00	-7.97	14.40	3	Vertical	271	1.78	-	27.63	4.00	-
PK	2.438G	119.28	Inf	-Inf	87.77	3	Vertical	271	1.78	-	27.49	4.02	-
AV	2.4384G	106.04	Inf	-Inf	74.54	3	Vertical	271	1.78	-	27.48	4.02	-
PK	2.4835G	73.80	74.00	-0.20	42.41	3	Vertical	271	1.78	-	27.35	4.04	-
AV	2.4835G	53.21	54.00	-0.79	21.82	3	Vertical	271	1.78	-	27.35	4.04	-

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2452MHz_TX

05/12/2019



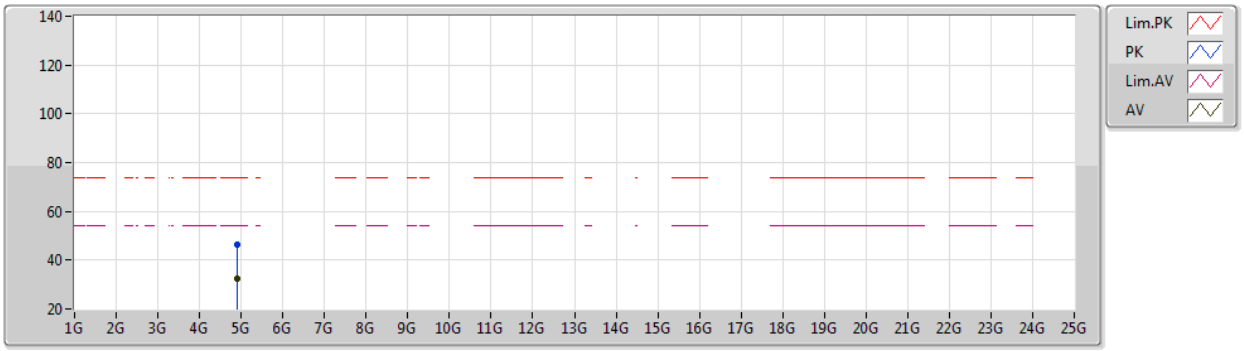
EUT Y_3TX
Setting 71
06-E-S-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.906G	45.32	74.00	-28.68	40.37	3	Vertical	149	2.53	-	31.12	5.45	31.62
AV	4.9064G	32.55	54.00	-21.45	27.59	3	Vertical	149	2.53	-	31.13	5.45	31.62

802.11ax HEW40-BF_Nss1,(MCS0)_3TX

2452MHz_TX

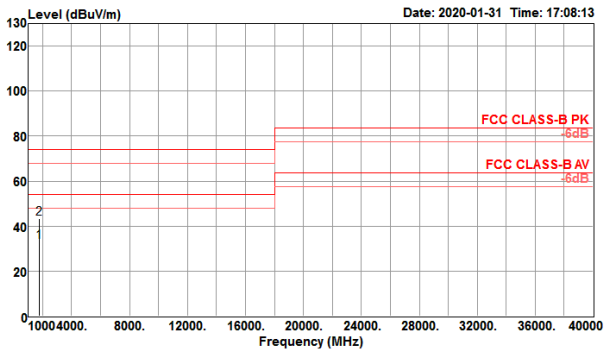
05/12/2019



EUT Y_3TX
Setting 71
06-E-S-5

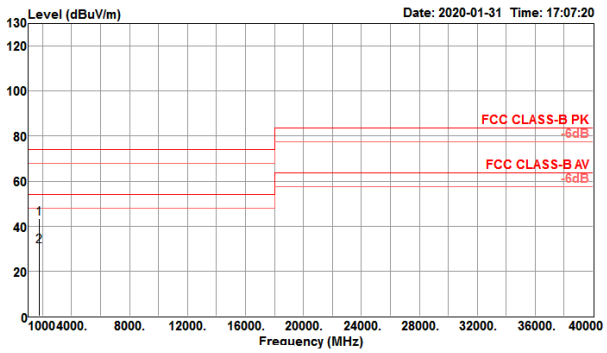
Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.9032G	46.29	74.00	-27.71	41.35	3	Horizontal	327	2.19	-	31.11	5.45	31.62
AV	4.9025G	32.62	54.00	-21.38	27.69	3	Horizontal	327	2.19	-	31.11	5.44	31.62

RSE Co-location Result			
Operating Mode	1	**Polarization**	Horizontal
Operating Function	Normal Link		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	1757.05	32.91	54.00	-21.09	38.64	3.56	25.42	34.71	109	66	Average	HORIZONTAL
2	1759.87	43.33	74.00	-30.67	49.03	3.57	25.44	34.71	109	66	Peak	HORIZONTAL

RSE Co-location Result			
Operating Mode	1	**Polarization**	Vertical
Operating Function	Normal Link		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	1759.81	43.21	74.00	-30.79	48.91	3.57	25.44	34.71	106	15	Peak	VERTICAL
2	1762.82	30.90	54.00	-23.10	36.60	3.57	25.44	34.71	106	15	Average	VERTICAL