Testing Laboratory 3787

RADIO TEST REPORT

FCC ID	:	MSQ-RTAXE4P00
Equipment	:	AXE11000 Tri Band WiFi Router
Brand Name	:	ASUS
Model Name	:	ET12, ZenWiFi ET12, ASUS ZenWiFi ET12
Applicant	:	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou, Taipei 112, Taiwan
Standard	:	47 CFR FCC Part 15.247

The product was received on Sep. 02, 2023, and testing was started from Sep. 02, 2023 and completed on Apr. 08, 2024. We, Sporton International Inc. Hsinchu 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 test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory
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History of this test report

Report No.	Version	Description	Issued Date
FR0D2518-10AA	01	Initial issue of report	May 07, 2024

Summary of Test Result

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

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sam Chen
Report Producer: Vicky Huang

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
2400-2483.5	b, g, n (HT20), VHT20, 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	4TX
2.4-2.4835GHz	802.11g	20	4TX
2.4-2.4835GHz	802.11n HT20	20	4TX
2.4-2.4835GHz	802.11n HT20-BF	20	4TX
2.4-2.4835GHz	VHT20	20	4TX
2.4-2.4835GHz	VHT20-BF	20	4TX
2.4-2.4835GHz	802.11ax HEW20	20	4TX
2.4-2.4835GHz	802.11ax HEW20-BF	20	4TX
2.4-2.4835GHz	802.11n HT40	40	4TX
2.4-2.4835GHz	802.11n HT40-BF	40	4TX
2.4-2.4835GHz	VHT40	40	4TX
2.4-2.4835GHz	VHT40-BF	40	4TX
2.4-2.4835GHz	802.11ax HEW40	40	4TX
2.4-2.4835GHz	802.11ax HEW40-BF	40	4TX

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.

1.1.2 Antenna Information

Ant.	Port				Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	Bluetooth					
1	-	-	3	-	WHA YU	C660-510565-A	PIFA	I-PEX	Note1
2	-	-	2	-	WHA YU	C660-510565-A	PIFA	I-PEX	
3	-	-	1	-	WHA YU	C660-510565-A	PIFA	I-PEX	
4	-	-	4	-	WHA YU	C660-510565-A	PIFA	I-PEX	
5	3	2	-	-	WHA YU	C660-510565-A	PIFA	I-PEX	
6	4	1	-	-	WHA YU	C660-510565-A	PIFA	I-PEX	
7	1	4	-	-	WHA YU	C660-510565-A	PIFA	I-PEX	
8	2	3	-	-	WHA YU	C660-510565-A	PIFA	I-PEX	
9	-	-	-	1	YAGEO	ANT3216A063R2400A	Chip	N/A	

Note1:

Ant.	Port				Antenna Gain (dBi)									
	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	Bluetooth	WLAN 2.4GHz	WLAN 5GHz				WLAN 6GHz				Bluetooth
						UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 5	UNII 6	UNII 7	UNII 8	
1	-	-	3	-	-	-	-	-	-	0.97	0.81	1.07	1.14	-
2	-	-	2	-	-	-	-	-	-					-
3	-	-	1	-	-	-	-	-	-					-
4	-	-	4	-	-	-	-	-	-					-
5	3	2	-	-	3.03	3.63	3.43	3.18	4.44	-	-	-	-	-
6	4	1	-	-	2.13	4.04	3.59	2.73	3.14	-	-	-	-	-
7	1	4	-	-	2.34	2.76	3.12	3.17	3.46	-	-	-	-	-
8	2	3	-	-	3.67	4.17	4.44	4.41	4.94	-	-	-	-	-
9	-	-	-	1	-	-	-	-	-	-	-	-	-	1.69

Directional Gain (dBi)									
WLAN 2.4GHz		WLAN 5GHz UNII 1		WLAN 5GHz UNII 2A		WLAN 5GHz UNII 2C		WLAN 5GHz UNII 3	
4T1S	4T2S	4T1S	4T2S	4T1S	4T2S	4T1S	4T2S	4T1S	4T2S
6.66	3.67	4.32	4.17	5.3	4.44	4.83	4.41	5.09	4.94

Note2: The above information was declared by manufacturer.
WLAN 6GHz: The directional gain is calculated which follows the procedure of KDB 662911 D01.
WLAN 2.4GHz/5GHz: The directional gain is measured which follows the procedure of KDB 662911 D03.
For 2.4GHz function:
For IEEE 802.11b/g/n/VHT/ax (4TX/4RX):
Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

For 5GHz function:
For IEEE 802.11a/n/ac/ax (4TX/4RX):
Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.
For 6GHz function:
For IEEE 802.11ax (4TX/4RX):
Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.
For Bluetooth Function:
For Bluetooth mode (1TX/1RX)
Only Port 1 can be use as transmit and receive antenna.

1.1.3 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, n/ac/ax in 5GHz and ax in 6GHz.			
Function	☒	Point-to-multipoint	☐	Point-to-point
Support RU	☒	Full RU	☐	Partial RU
Test Software Version	accessMTool(ver 3.2.1.3)			

Note: The above information was declared by manufacturer.

1.1.4 Table for Multiple Listing

Brand Name	Model Name	Description
ASUS	ET12	All the models are identical, the different model names served as a marketing strategy.
	ZenWiFi ET12	
	ASUS ZenWiFi ET12	

Note1: From the above model: ET12 was selected as representative model for the test and its data was recorded in this report.
Note2: The above information was declared by manufacturer.

1.1.5 Table for Components Source Information

Items	Main Source	Second Source
Transceiver (2.5G LAN)	Brand: MAXLINEAR Model: GPY211	Brand: Broadcom Model: BCM50991
MLCC on the path of the CPU (Location: CA15,CA16,CA17,CA18,CB15,CB16, CB17,CB18,CE15,CE16,CE17,CE18)	Brand: MURATA Model: GRM0335C1E100JA01D	Brand: WALSIN Model: RF03N100J250CT
MLCC on the path of the CPU (Location: CA281,CA282,CB121,CB221,CB281, CB282,CB321,CB421,CC117,CC119, CC121,CC217,CC219,CC221,CC317, CC319,CC321,CC417,CC419,CC421, CE281,CE282)	Brand: WALSIN Model: RF03N1R0B250CT	Brand: MURATA Model: GRM0335C1E1R0BA01D

Note: The above information was declared by manufacturer.

1.1.6 Table for EUT Information

EUT	Transceiver (2.5G LAN)	MLCC on the path of the CPU (Location: CA15,CA16,CA17,CA18,CB15, CB16,CB17,CB18,CE15,CE16, CE17,CE18)	MLCC on the path of the CPU (Location: CA281,CA282,CB121,CB221,CB281, CB282,CB321,CB421,CC117,CC119, CC121,CC217,CC219,CC221,CC317,CC319, CC321,CC417,CC419,CC421,CE281, CE282)
EUT 1	Main Source	Main Source	Main Source
EUT 2	Second Source	Main Source	Main Source
EUT 3	Main Source	Second Source	Second Source

Note1: From the above, EUT 3 has been selected as representative mode for the test and its data was recorded in this report.
Note2: The above information was declared by manufacturer.

1.1.7 Table for EUT Supports Function

Function	Support Type	Remark
AP Router	Master	Support 2.4GHz/5GHz/6GHz
Bridge	Slave without radar detection	Support 2.4GHz/5GHz
Repeater	Master	Support 2.4GHz/5GHz
Mesh	Master	Support 2.4GHz/5GHz/6GHz

Note1: From the above, AP Router (Master) has been selected to test Emissions in Restricted Frequency Bands below 1GHz.

Note2: The above information was declared by manufacturer.

1.1.8 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR0D2518AA

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

Modifications	Performance Checking
1. Add the second source for MLCC on the path of the CPU (Location:CA15,CA16,CA17,CA18,CB15,CB16,CB17, CB18,CE15,CE16,CE17,CE18,CA281,CA282,CB121, CB221,CB281,CB282,CB321,CB421,CC117,CC119, CC121,CC217,CC219,CC221,CC317,CC319,CC321, CC417,CC419,CC421,CE281,CE282)	1. Emissions in Restricted Frequency Bands below 1GHz test 2. DTS Bandwidth 3. Maximum Conducted Output Power 4. Power Spectral Density 5. Emissions in Non-restricted Frequency Bands 6. Emissions in Restricted Frequency Bands above 1GHz test (For above item 2~6: Evaluating the affected frequencies only.)
2. Removing Manufacturer name and address.	After evaluating, it does not affect the test.

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 15.247
- ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF.

- FCC KDB 558074 D01 v05r02
- FCC KDB 662911 D03 v01
- FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location Information	
Test Lab.：Sporton International Inc. Hsinchu Laboratory	
Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.) TEL: 886-3-656-9065 FAX: 886-3-656-9085 Test site Designation No. TW3787 with FCC. Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted	TH01-CB	Richard Pai	23~24.1 / 62~66	Jan. 25, 2024~ Mar. 08, 2024
Radiated<1GHz	03CH05-CB	Roy Mai	21.9-22.4 / 55-58	Apr. 08, 2024
Radiated>1GHz	03CH04-CB	Stim Sung	22.7-23.8 / 56-59	Sep. 02, 2023
	03CH06-CB	Stim Sung	21.4-22.5 / 55-58	Sep. 02, 2023

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Radiated Emission (9kHz ~ 30MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.1 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.1 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.2 dB	Confidence levels of 95%
Conducted Emission	3.1 dB	Confidence levels of 95%
Output Power Measurement	0.8 dB	Confidence levels of 95%
Power Density Measurement	3.1 dB	Confidence levels of 95%
Bandwidth Measurement	2.2%	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

For 4T1S:

Mode
802.11ax HEW20-BF_Nss1,(MCS0)_4TX
2412MHz
2462MHz
802.11ax HEW40-BF_Nss1,(MCS0)_4TX
2422MHz
2452MHz

- Note1: There are two modes of EUT for n/VHT/ax in 2.4GHz and n/ac/ax in 5GHz. One is beamforming mode, and the other is non-beamforming mode, after evaluating, beamforming mode has been evaluated to be the worst case, so it was selected to test and record in this test report.
- Note2: Evaluated HEW20/HEW40 mode only, due to similar modulation. The power setting of HT20/HT40/VHT20/VHT40 mode are the same or lower than HEW20/HEW40.

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains
1	EUT 3

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	Normal Link
	1. The EUT was performed at X axis, Y axis and Z axis position for Emissions in Restricted Frequency Bands above 1GHz test, and the worst case was found at Y axis. So the measurement will follow this same test configuration. 2. There are two Adapters, after evaluating, Adapter 1 has been evaluated to be the worst case, thus measurement will follow this same test configuration.
1	EUT 3 in Y axis + Adapter 1
Operating Mode > 1GHz	The EUT was performed at X axis, Y axis and Z axis position, and the worst case was found at Y axis. So the measurement will follow this same test configuration.
	CTX - EUT 3 in Y axis

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	EUT 3-WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz + Bluetooth
Refer to Sporton Test Report No.: FA0D2518-10 for Co-location RF Exposure Evaluation.	

2.3 EUT Operation during Test

For CTX 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 DOS(ver 6.1.7601).
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 Mode:

During the test, the EUT operation to normal function.

2.4 Accessories

Accessories				
Equipment Name	**Brand Name**	**Model Name**	**Rating**	**Remark**
Adapter 1	DELTA	ADP-45FE	INPUT: 100-240V~1.2A, 50-60Hz OUTPUT: 19.0V, 2.37A, 45.0W	With the DC Power cable: Non-shielded, 1.5m
Adapter 2	AcBel	ADH011	INPUT: 100-240V~1.4A, 50-60Hz OUTPUT: 19.5V, 2.31A, 45.0W	With the DC Power cable: Non-shielded, 1.5m
Others				
Power cable*1: Non-shielded, 0.9m RJ-45 cable*1: Non-shielded, 1.5m				

2.5 Support Equipment

For Radiated (below 1GHz):

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A
B	2.4G NB	DELL	E4300	N/A
C	5G NB	DELL	E4300	N/A
D	WLAN module	Intel	AX210NGW	PD9AX210NG
E	6G NB	DELL	E4300	N/A
F	2.5G LAN PC	DELL	E4300	N/A
G	2.5G WAN PC	DELL	E4300	N/A

For Radiated (above 1GHz):

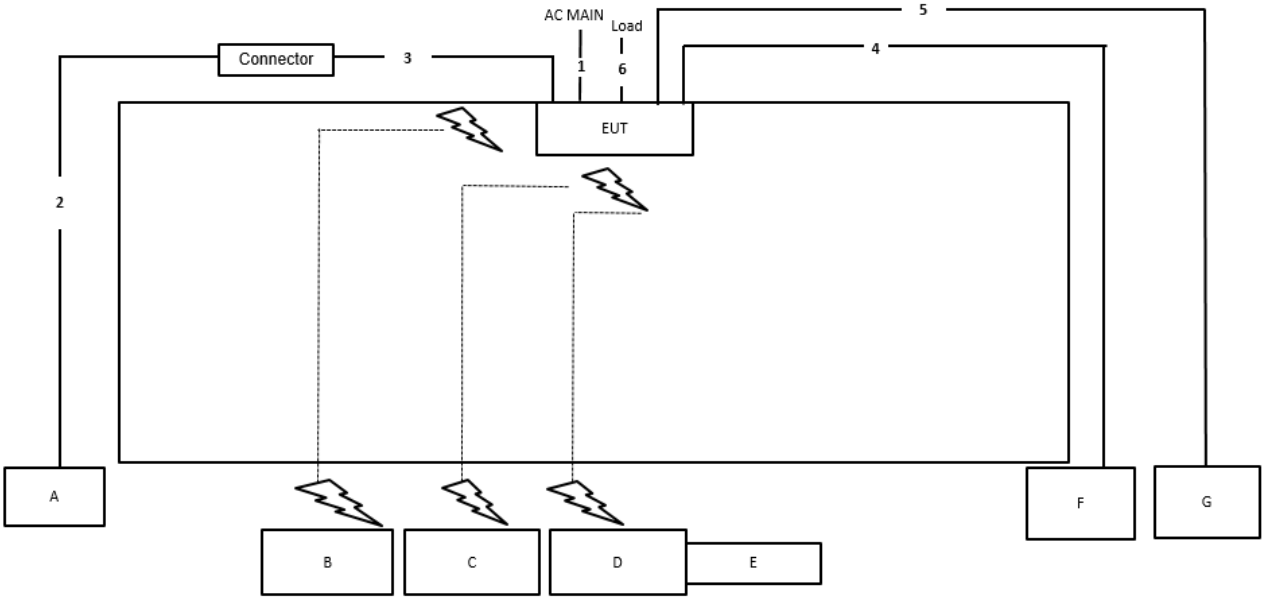
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A
B	RX Device	ASUS	ET12	MSQ-RTAXE4P00
C	NB	DELL	E4300	N/A

For RF Conducted:

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

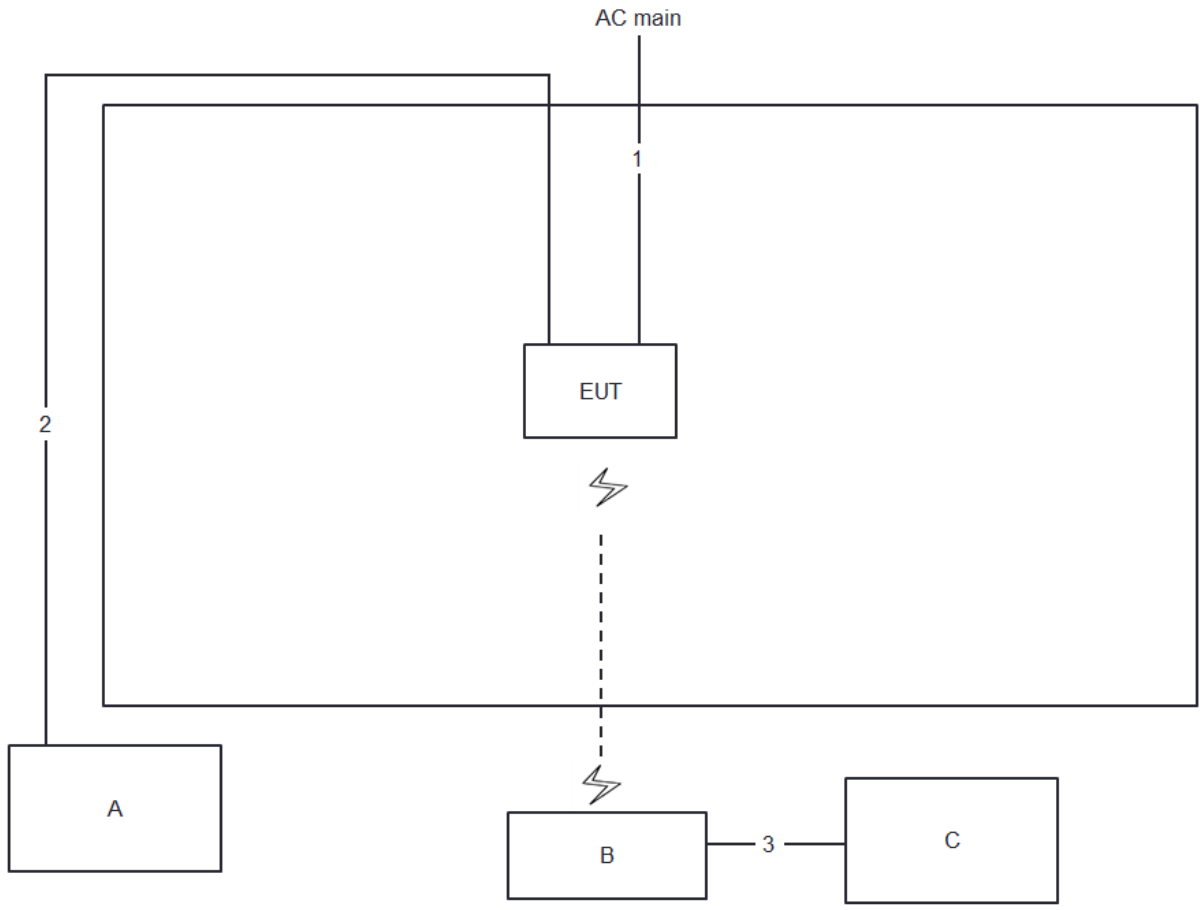
2.6 Test Setup Diagram

Test Setup Diagram - Radiated Test < 1GHz



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

Test Setup Diagram - Radiated Test > 1GHz



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

3 Transmitter Test Result

3.1 DTS Bandwidth

3.1.1 6dB Bandwidth Limit

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

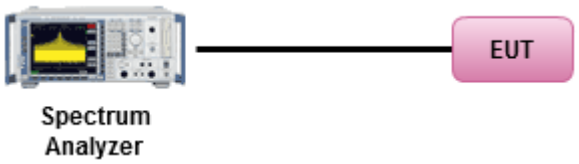
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
	☒ Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
	☐ Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
	☐ Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

3.1.4 Test Setup

Emission Bandwidth


3.1.5 Test Result of Emission Bandwidth

Refer as Appendix A

3.2 Maximum Conducted Output Power

3.2.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit		
	▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)	
	▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)$ dBm	
	▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm	
	▪ Smart antenna system (SAS):	
		- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3 + 8$dB dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, **G_{TX}** = the maximum transmitting antenna directional gain in dBi.		

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

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

3.2.4 Test Setup

Maximum Conducted Output Power (Power Meter)


3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

3.3 Power Spectral Density

3.3.1 Power Spectral Density Limit

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

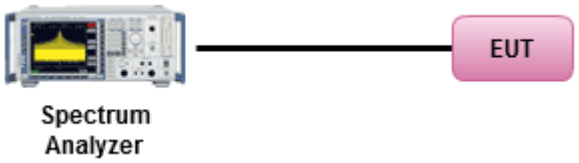
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method		
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).		
	☒ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD.	
▪ For conducted measurement.		
	▪ If The EUT supports multiple transmit chains using options given below:	
		☒ Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
		☐ Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,
		☐ Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.

3.3.4 Test Setup

Power Spectral Density


3.3.5 Test Result of Power Spectral Density

Refer as Appendix C

3.4 Emissions in Non-restricted Frequency Bands

3.4.1 Emissions in Non-restricted Frequency Bands Limit

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

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

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

3.4.2 Measuring Instruments

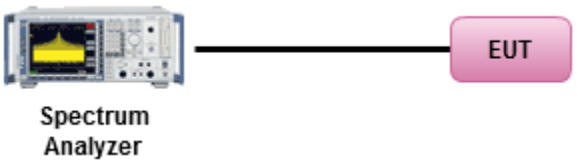
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

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

3.4.4 Test Setup

Emissions in Non-restricted Frequency Bands



3.4.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix D

3.5 Emissions in Restricted Frequency Bands

3.5.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

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

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

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

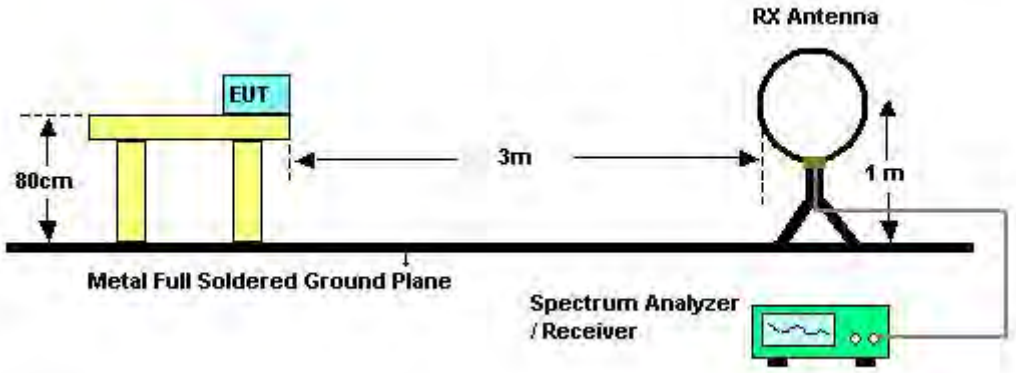
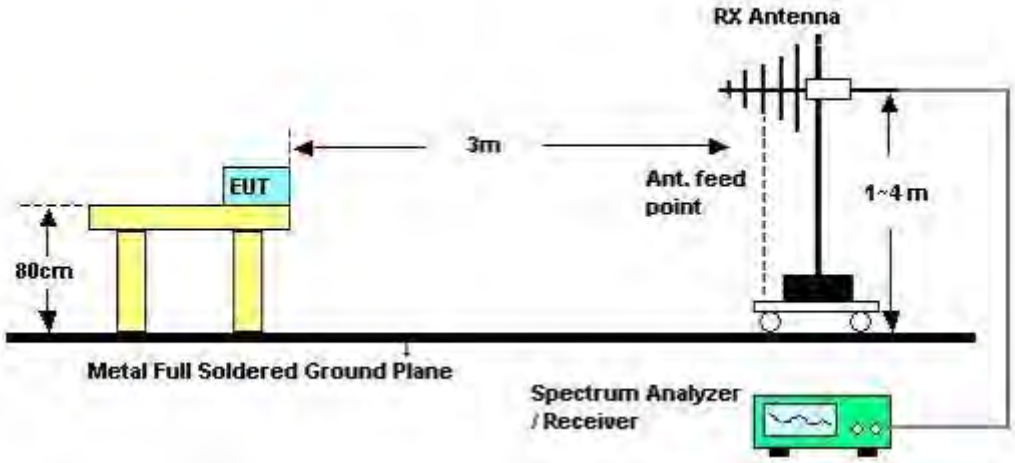
3.5.2 Measuring Instruments

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

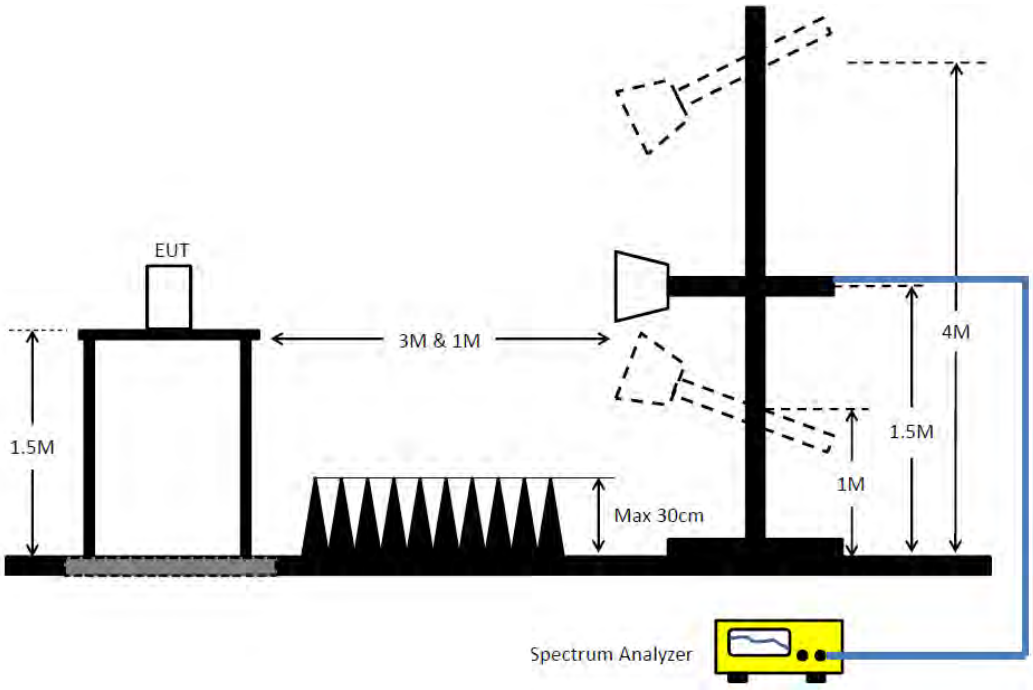
3.5.3 Test Procedures

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

3.5.4 Test Setup

Radiated - Emissions in Restricted Frequency Bands
9kHz ~30MHz

30MHz~1GHz


Above 1GHz



3.5.5 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

3.5.6 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 10th harmonic or 40 GHz, whichever is appropriate.

3.5.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix E

4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30 MHz ~ 1 GHz	Aug. 02, 2023	Aug. 01, 2024	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 23, 2024	Mar. 22, 2025	Radiation (03CH05-CB)
Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 03, 2023	May 02, 2024	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Apr. 18, 2023	Apr. 17, 2024	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 13, 2023	Jun. 12, 2024	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	Low Cable-04+23	30MHz~1GHz	Dec. 06, 2023	Dec. 05, 2024	Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6121	65417	9kHz - 30 MHz	Oct. 13, 2023	Oct. 12, 2024	Radiation (03CH05-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH05-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH04-CB	1GHz ~18GHz 3m	Feb. 23, 2023	Feb. 22, 2024	Radiation (03CH04-CB)
Horn Antenna	ETS·Lindgren	3115	00143147	750MHz~18GHz	Oct. 12, 2022	Oct. 11, 2023	Radiation (03CH04-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 28, 2023	Jun. 27, 2024	Radiation (03CH04-CB)
Pre-Amplifier	Agilent	83017A	MY53270063	0.5GHz ~ 26.5GHz	Jun. 30, 2023	Jun. 29, 2024	Radiation (03CH04-CB)
Pre-Amplifier	Agilent	8449B	3008A02121	1GHz ~ 26.5GHz	May 18, 2023	May 17, 2024	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Mar. 21, 2023	Mar. 20, 2024	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21	1GHz - 18GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21+67	1GHz - 18GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH04-CB)
High Cable	Woken	WCA0929M	40G#5+6	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH04-CB)
High Cable	Woken	WCA0929M	40G#5	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH04-CB)
High Cable	Woken	WCA0929M	40G#6	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH04-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH04-CB)

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH06-CB	1GHz ~18GHz 3m	Sep. 30, 2022	Sep. 29, 2023	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1292	1GHz~18GHz	Jul. 31, 2023	Jul. 30, 2024	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 28, 2023	Jun. 27, 2024	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	Aug. 01, 2023	Jul. 31, 2024	Radiation (03CH06-CB)
Pre-Amplifier	SGH	SGH184	20221107-3	18GHz ~ 40GHz	Nov. 16, 2022	Nov. 15, 2023	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Dec. 21, 2022	Dec. 20, 2023	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-05+68	1GHz~18GHz	Aug. 15, 2023	Aug. 14, 2024	Radiation (03CH06-CB)
High Cable	Woken	WCA0929M	40G#5+6	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH06-CB)
High Cable	Woken	WCA0929M	40G#5	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH06-CB)
High Cable	Woken	WCA0929M	40G#6	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH06-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	May 29, 2023	May 28, 2024	Conducted (TH01-CB)
Switch	SPTCB	SP-SWI	SWI-01	1~26.5 GHz	Oct. 03, 2023	Oct. 02, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-30	1 GHz – 18 GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
Power Sensor	Agilent	E9327A	US40442088	50MHz~18GHz	Mar. 01, 2024	Feb. 28, 2025	Conducted (TH01-CB)
Power Meter	Agilent	E4416A	GB41291199	50MHz~18GHz	Mar. 04, 2024	Mar. 03, 2025	Conducted (TH01-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conducted (TH01-CB)

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

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	18.875M	19.115M	19M1D1D	18.725M	19.065M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	37.65M	38.081M	38M1D1D	37.4M	37.981M

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

Result

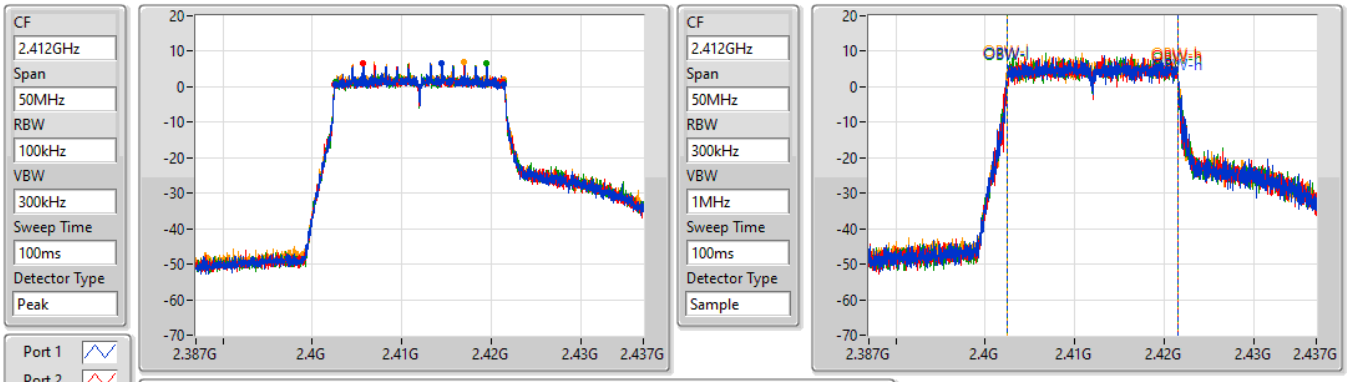
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	18.875M	19.115M	18.8M	19.09M	18.825M	19.065M	18.775M	19.115M
2462MHz	Pass	500k	18.85M	19.065M	18.725M	19.09M	18.85M	19.09M	18.775M	19.065M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	37.6M	38.031M	37.4M	38.031M	37.65M	37.981M	37.6M	38.081M
2452MHz	Pass	500k	37.65M	38.031M	37.55M	38.031M	37.6M	38.031M	37.65M	38.081M

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

802.11ax HEW20-BF_Nss1,(MCS0)_4TX EBW

2412MHz

08/03/2024

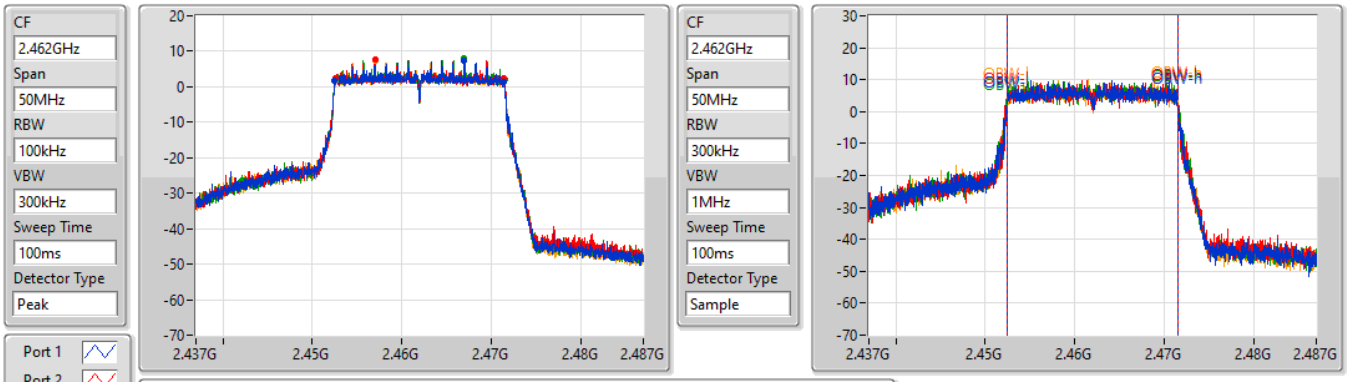


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
18.875M	2.40255G	2.421425G	19.115M	2.40243G	2.421545G	500k	1
18.8M	2.4025G	2.4213G	19.09M	2.40243G	2.42152G	500k	2
18.825M	2.40255G	2.421375G	19.065M	2.402455G	2.42152G	500k	3
18.775M	2.402575G	2.42135G	19.115M	2.40243G	2.421545G	500k	4

802.11ax HEW20-BF_Nss1,(MCS0)_4TX EBW

2462MHz

08/03/2024

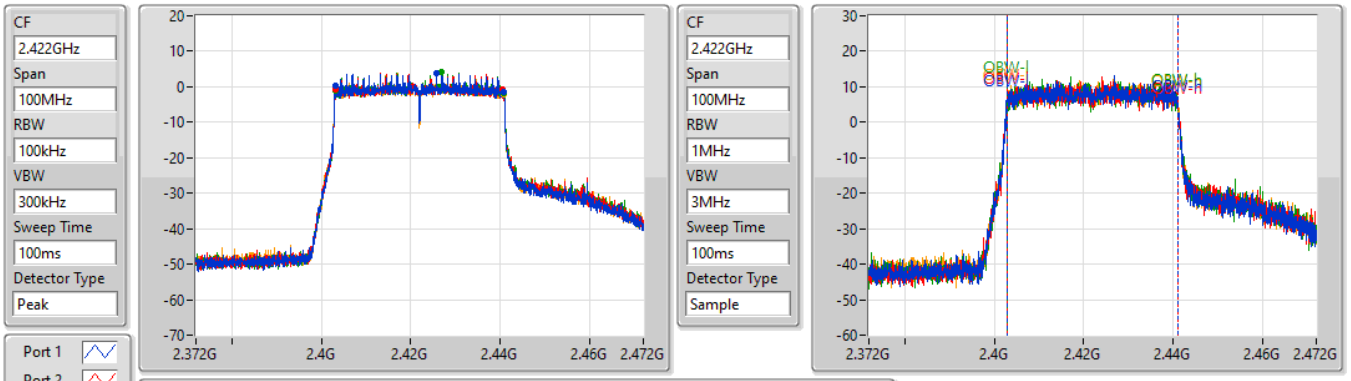


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
18.85M	2.452525G	2.471375G	19.065M	2.45243G	2.471495G	500k	1
18.725M	2.452625G	2.47135G	19.09M	2.45243G	2.47152G	500k	2
18.85M	2.452625G	2.471475G	19.09M	2.452405G	2.471495G	500k	3
18.775M	2.45265G	2.471425G	19.065M	2.45243G	2.471495G	500k	4

802.11ax HEW40-BF_Nss1,(MCS0)_4TX EBW

2422MHz

08/03/2024

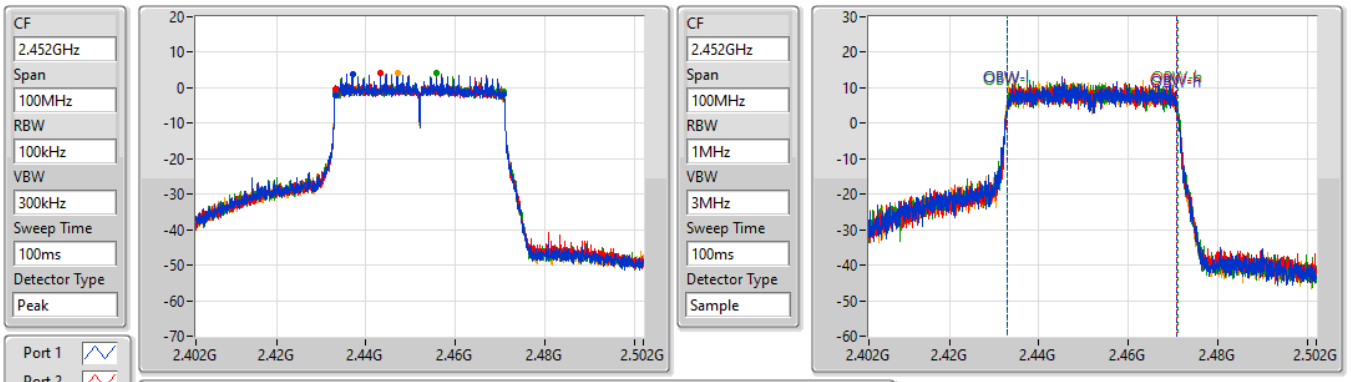


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
37.6M	2.4031G	2.4407G	38.031M	2.40296G	2.440991G	500k	1
37.4M	2.4032G	2.4406G	38.031M	2.40296G	2.440991G	500k	2
37.65M	2.4032G	2.44085G	37.981M	2.403009G	2.440991G	500k	3
37.6M	2.4032G	2.4408G	38.081M	2.403009G	2.44109G	500k	4

802.11ax HEW40-BF_Nss1,(MCS0)_4TX EBW

2452MHz

08/03/2024



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
37.65M	2.43315G	2.4708G	38.031M	2.43286G	2.470891G	500k	1
37.55M	2.4332G	2.47075G	38.031M	2.43291G	2.470941G	500k	2
37.6M	2.43315G	2.47075G	38.031M	2.43296G	2.470991G	500k	3
37.65M	2.4331G	2.47075G	38.081M	2.43286G	2.470941G	500k	4

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	24.50	0.28184
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	24.17	0.26122

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	6.66	17.50	17.52	17.60	18.00	23.68	29.34
2462MHz	Pass	6.66	18.32	18.56	18.71	18.32	24.50	29.34
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	6.66	18.04	18.11	18.08	17.99	24.08	29.34
2452MHz	Pass	6.66	18.00	18.12	18.27	18.20	24.17	29.34

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-3.17
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-6.26

RBW = 3kHz;

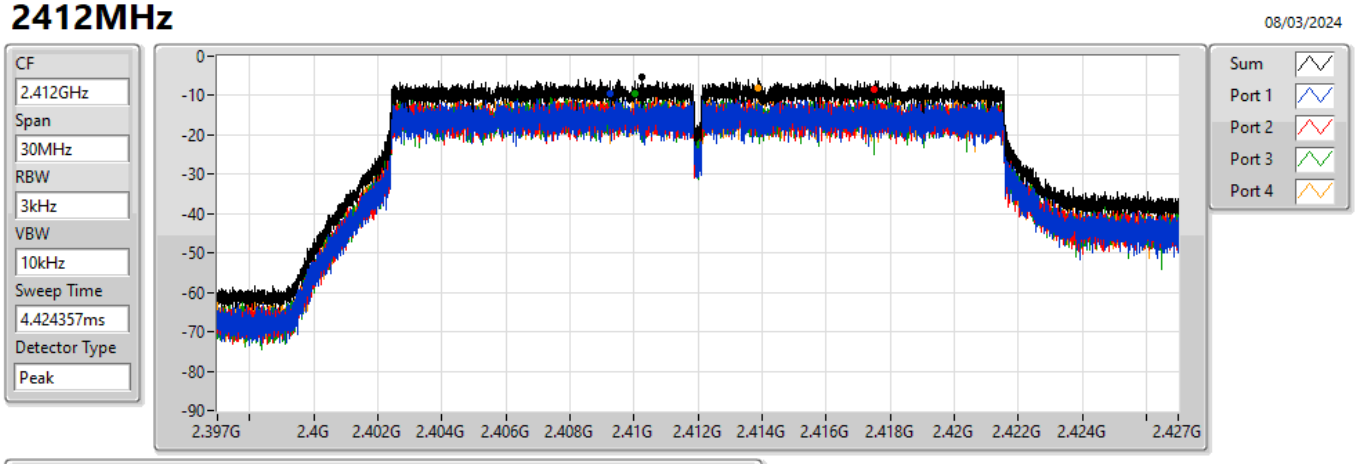
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	Port 3 (dBm/RBW)	Port 4 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	6.66	-9.62	-8.51	-9.45	-7.98	-5.29	7.34
2462MHz	Pass	6.66	-6.87	-6.91	-7.28	-8.40	-3.17	7.34
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	6.66	-10.17	-11.11	-11.00	-11.22	-6.26	7.34
2452MHz	Pass	6.66	-10.39	-12.02	-10.32	-10.46	-6.96	7.34

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

802.11ax HEW20-BF_Nss1,(MCS0)_4TX PSD

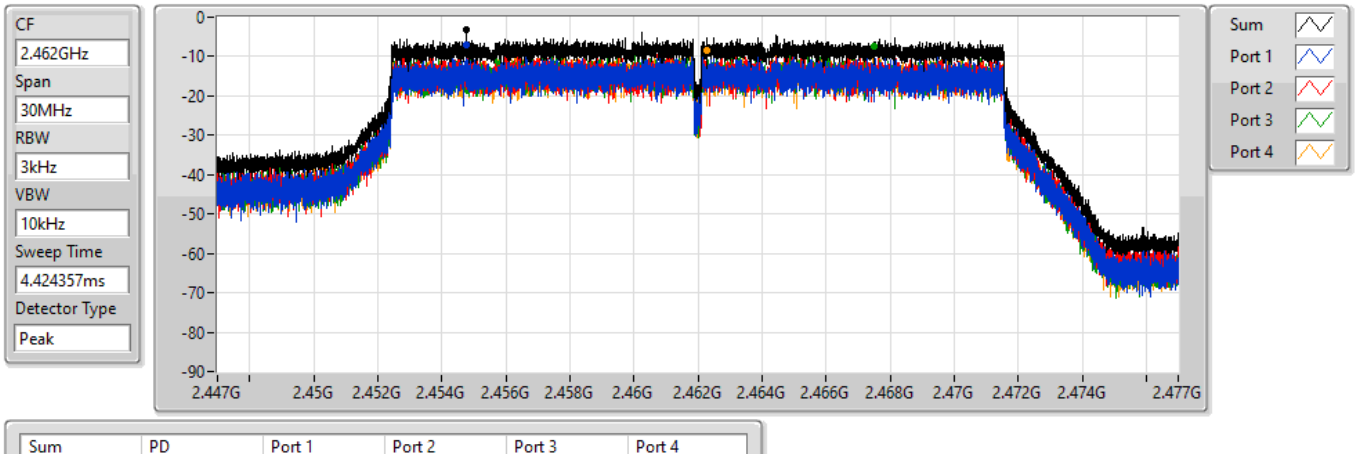
2412MHz



Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-5.29	-5.29	-9.62	-8.51	-9.45	-7.98

802.11ax HEW20-BF_Nss1,(MCS0)_4TX PSD

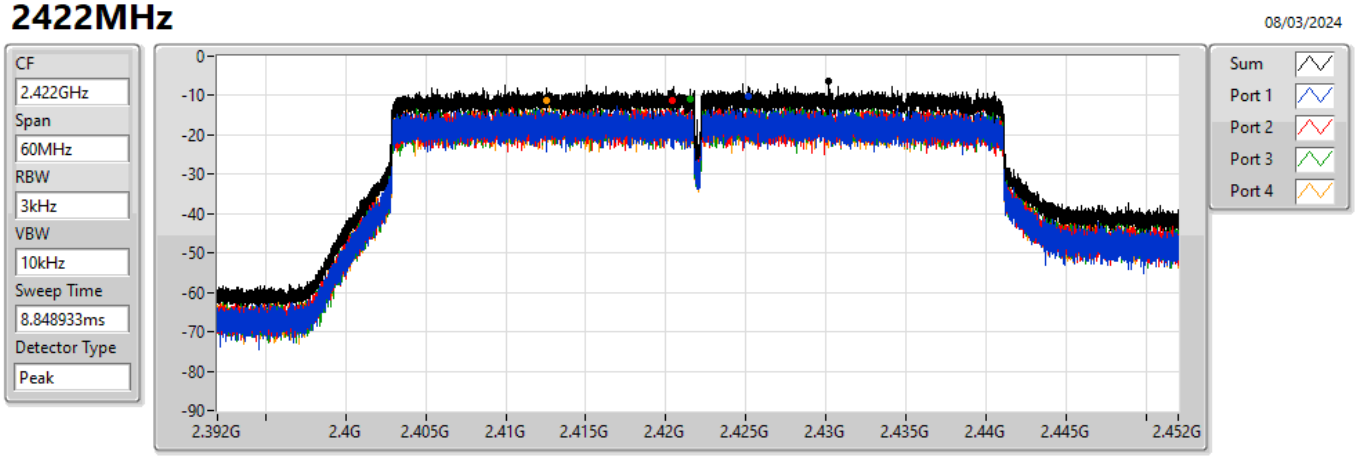
2462MHz



Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-3.17	-3.17	-6.87	-6.91	-7.28	-8.40

802.11ax HEW40-BF_Nss1,(MCS0)_4TX PSD

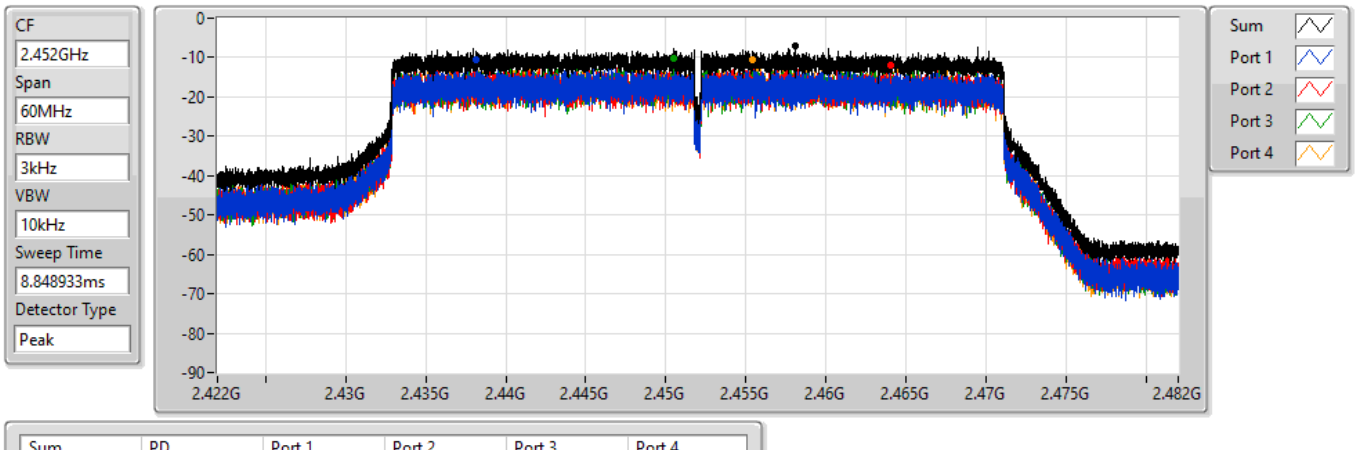
2422MHz



Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.26	-6.26	-10.17	-11.11	-11.00	-11.22

802.11ax HEW40-BF_Nss1,(MCS0)_4TX PSD

2452MHz



Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.96	-6.96	-10.39	-12.02	-10.32	-10.46

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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	Pass	2.442G	11.28	-18.72	2.30379G	-50.96	2.4G	-31.18	2.4G	-32.38	2.48504G	-48.33	17.16132G	-44.65	1
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	Pass	2.422G	6.52	-23.48	2.30626G	-48.53	2.4G	-27.36	2.4G	-29.01	2.48514G	-46.79	24.88782G	-44.40	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
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.442G	11.28	-18.72	2.30379G	-50.96	2.4G	-31.18	2.4G	-32.38	2.48504G	-48.33	17.16132G	-44.65	1
2412MHz	Pass	2.442G	11.28	-18.72	2.30175G	-50.91	2.39984G	-32.97	2.4G	-33.88	2.51508G	-49.90	24.89043G	-44.05	2
2412MHz	Pass	2.442G	11.28	-18.72	2.30961G	-51.09	2.39996G	-34.37	2.4G	-31.97	2.50062G	-49.03	24.1487G	-43.58	3
2412MHz	Pass	2.442G	11.28	-18.72	2.30787G	-51.39	2.3999G	-34.57	2.4G	-35.22	2.48774G	-48.71	17.0096G	-44.26	4
2462MHz	Pass	2.442G	11.28	-18.72	2.30321G	-51.47	2.39466G	-48.00	2.4835G	-45.04	2.48418G	-43.41	23.40979G	-44.44	1
2462MHz	Pass	2.442G	11.28	-18.72	2.30758G	-50.92	2.39674G	-47.46	2.4835G	-46.36	2.48382G	-43.76	24.80614G	-45.03	2
2462MHz	Pass	2.442G	11.28	-18.72	2.30379G	-51.22	2.3911G	-48.32	2.4835G	-45.21	2.48394G	-43.33	15.05134G	-44.87	3
2462MHz	Pass	2.442G	11.28	-18.72	2.17739G	-51.66	2.39992G	-48.12	2.4835G	-46.66	2.48424G	-45.62	24.48585G	-45.43	4
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.422G	6.52	-23.48	2.30626G	-48.53	2.4G	-27.36	2.4G	-29.01	2.48514G	-46.79	24.88782G	-44.40	1
2422MHz	Pass	2.422G	6.52	-23.48	2.30741G	-48.61	2.39996G	-28.73	2.4G	-29.75	2.48918G	-47.55	24.2624G	-44.28	2
2422MHz	Pass	2.422G	6.52	-23.48	2.30168G	-49.24	2.39972G	-29.69	2.4G	-29.71	2.4917G	-46.07	15.05502G	-44.39	3
2422MHz	Pass	2.422G	6.52	-23.48	2.30626G	-49.96	2.39992G	-30.14	2.4G	-29.82	2.48598G	-47.17	16.26659G	-44.20	4
2452MHz	Pass	2.422G	6.52	-23.48	2.3054G	-50.34	2.397G	-34.07	2.4G	-35.99	2.4839G	-41.95	24.83173G	-43.96	1
2452MHz	Pass	2.422G	6.52	-23.48	2.30741G	-50.27	2.39984G	-36.09	2.4G	-36.90	2.4855G	-43.80	17.67448G	-44.66	2
2452MHz	Pass	2.422G	6.52	-23.48	2.30712G	-49.18	2.39948G	-33.20	2.4G	-37.59	2.48822G	-41.89	17.69411G	-44.30	3
2452MHz	Pass	2.422G	6.52	-23.48	2.30826G	-50.47	2.39704G	-35.88	2.4G	-37.70	2.4873G	-43.59	15.03258G	-43.17	4

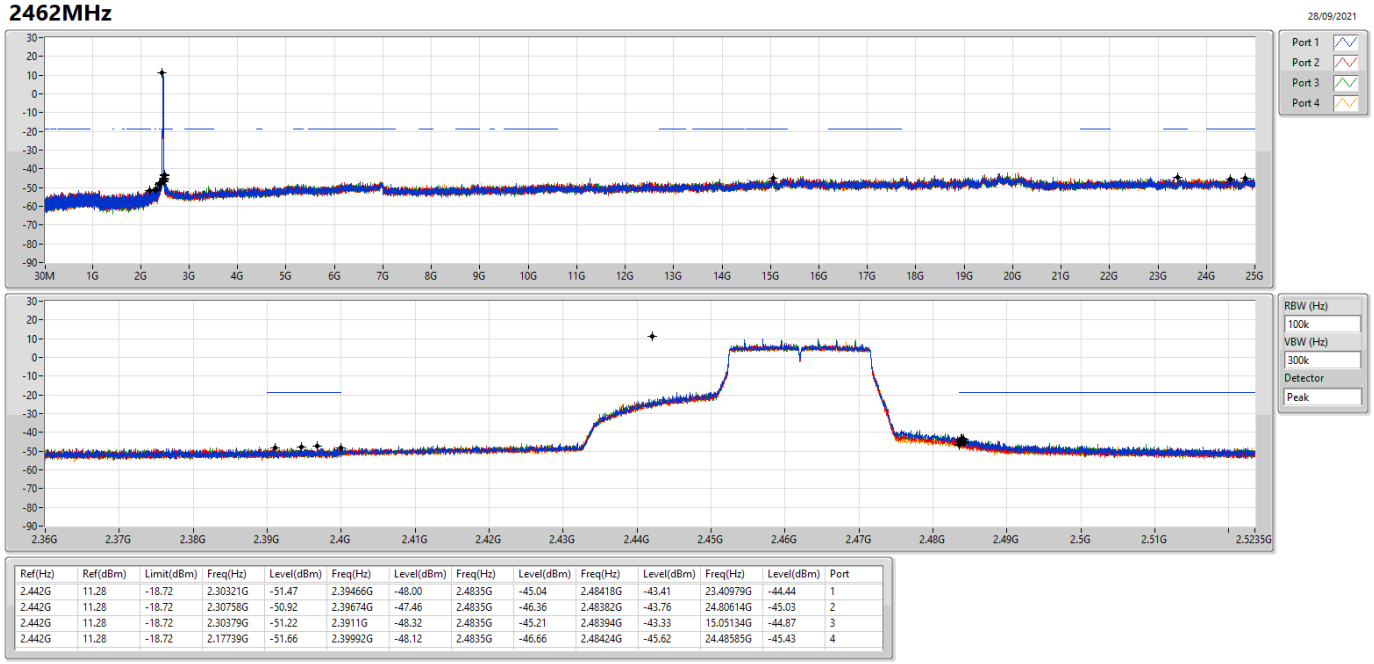
802.11ax HEW20-BF_Nss1,(MCS0)_4TX **CSENdB**

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	11.28	-18.72	2.30379G	-50.96	2.4G	-31.18	2.4G	-32.38	2.48504G	-48.33	17.16132G	-44.65	1
2.442G	11.28	-18.72	2.30175G	-50.91	2.39984G	-32.97	2.4G	-33.88	2.51508G	-49.90	24.89043G	-44.05	2
2.442G	11.28	-18.72	2.30961G	-51.09	2.39996G	-34.37	2.4G	-31.97	2.50062G	-49.03	24.1487G	-43.58	3
2.442G	11.28	-18.72	2.30787G	-51.39	2.3999G	-34.57	2.4G	-35.22	2.48774G	-48.71	17.0096G	-44.26	4

802.11ax HEW20-BF_Nss1,(MCS0)_4TX **CSENdB**

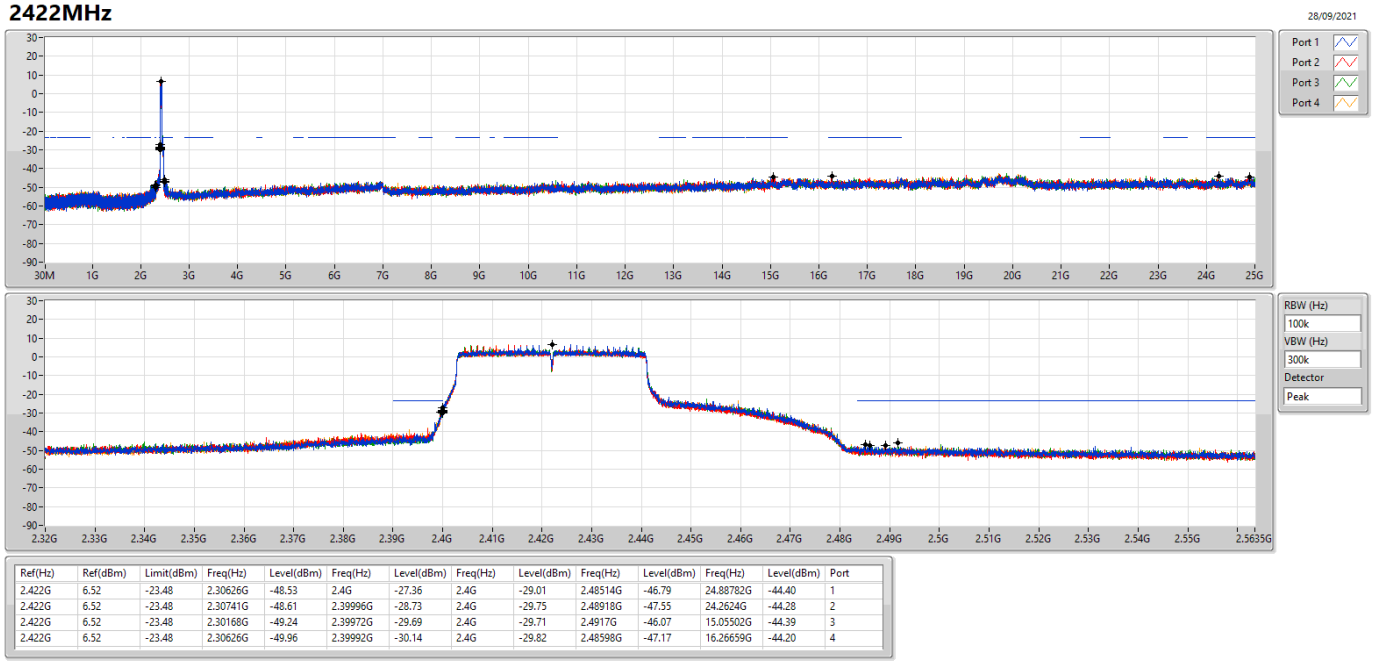
2462MHz



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	11.28	-18.72	2.30321G	-51.47	2.39466G	-48.00	2.4835G	-45.04	2.48418G	-43.41	23.40979G	-44.44	1
2.442G	11.28	-18.72	2.30758G	-50.92	2.39674G	-47.46	2.4835G	-46.36	2.48382G	-43.76	24.80614G	-45.03	2
2.442G	11.28	-18.72	2.30379G	-51.22	2.3911G	-48.32	2.4835G	-45.21	2.48394G	-43.33	15.05134G	-44.87	3
2.442G	11.28	-18.72	2.17739G	-51.66	2.39992G	-48.12	2.4835G	-46.66	2.48424G	-45.62	24.48585G	-45.43	4

802.11ax HEW40-BF_Nss1,(MCS0)_4TX **CSENdB**

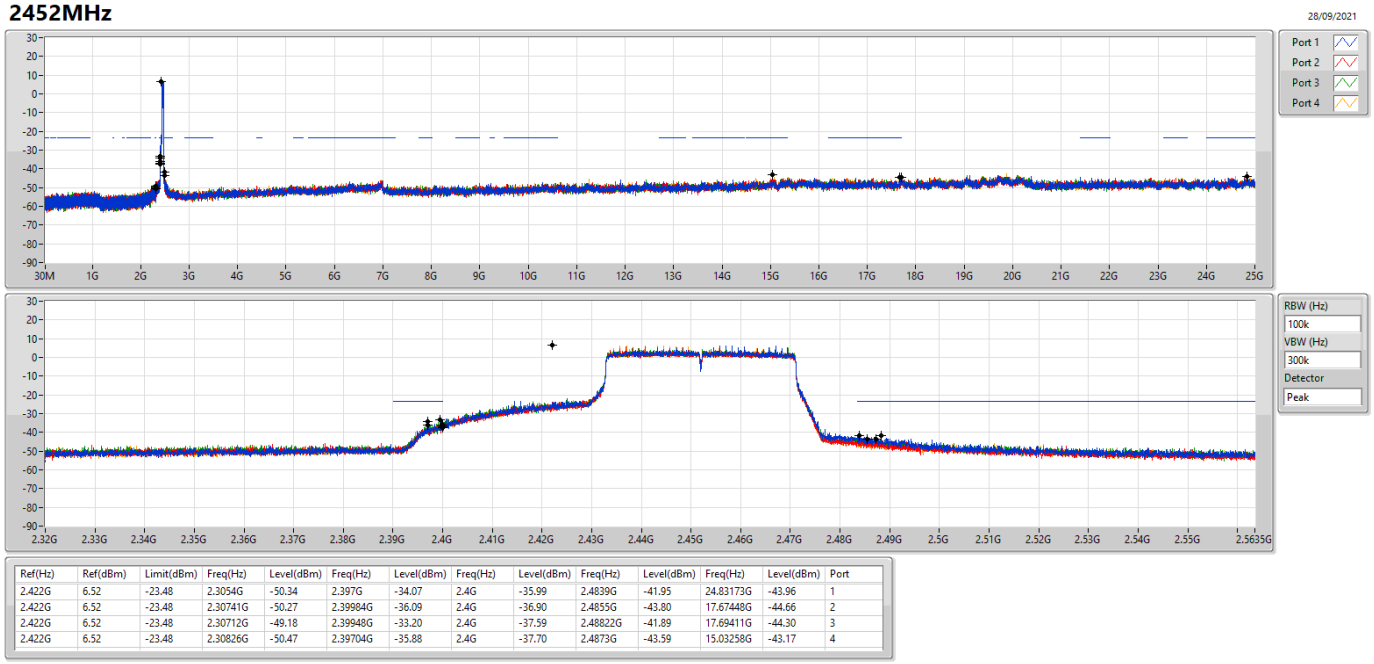
2422MHz



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
2.422G	6.52	-23.48	2.30626G	-48.53	2.4G	-27.36	2.4G	-29.01	2.48514G	-46.79	24.88782G	-44.40	1
2.422G	6.52	-23.48	2.30741G	-48.61	2.39996G	-28.73	2.4G	-29.75	2.48918G	-47.55	24.2624G	-44.28	2
2.422G	6.52	-23.48	2.30168G	-49.24	2.39972G	-29.69	2.4G	-29.71	2.4917G	-46.07	15.05502G	-44.39	3
2.422G	6.52	-23.48	2.30626G	-49.96	2.39992G	-30.14	2.4G	-29.82	2.48598G	-47.17	16.26659G	-44.20	4

802.11ax HEW40-BF_Nss1,(MCS0)_4TX **CSENdB**

2452MHz

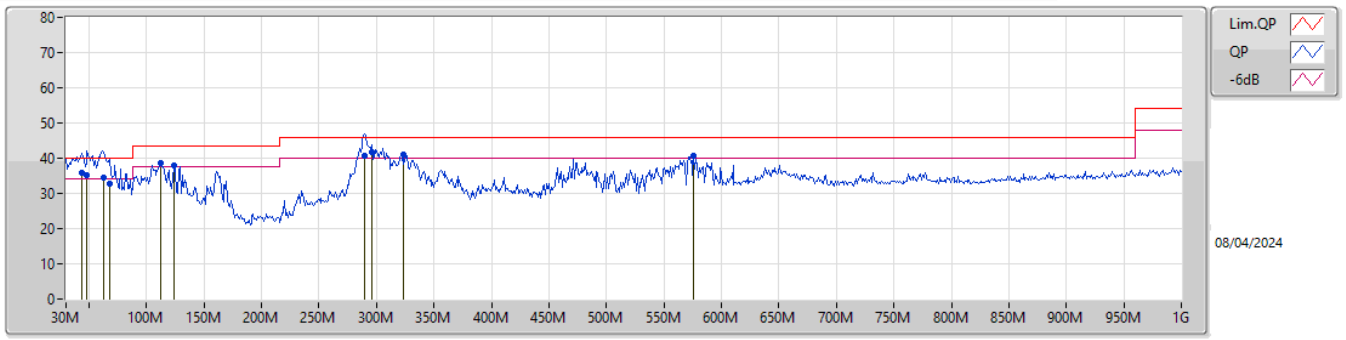


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.422G	6.52	-23.48	2.3054G	-50.34	2.397G	-34.07	2.4G	-35.99	2.4839G	-41.95	24.83173G	-43.96	1
2.422G	6.52	-23.48	2.30741G	-50.27	2.39984G	-36.09	2.4G	-36.90	2.4855G	-43.80	17.67448G	-44.66	2
2.422G	6.52	-23.48	2.30712G	-49.18	2.39948G	-33.20	2.4G	-37.59	2.48822G	-41.89	17.69411G	-44.30	3
2.422G	6.52	-23.48	2.30826G	-50.47	2.39704G	-35.88	2.4G	-37.70	2.4873G	-43.59	15.03258G	-43.17	4

Summary

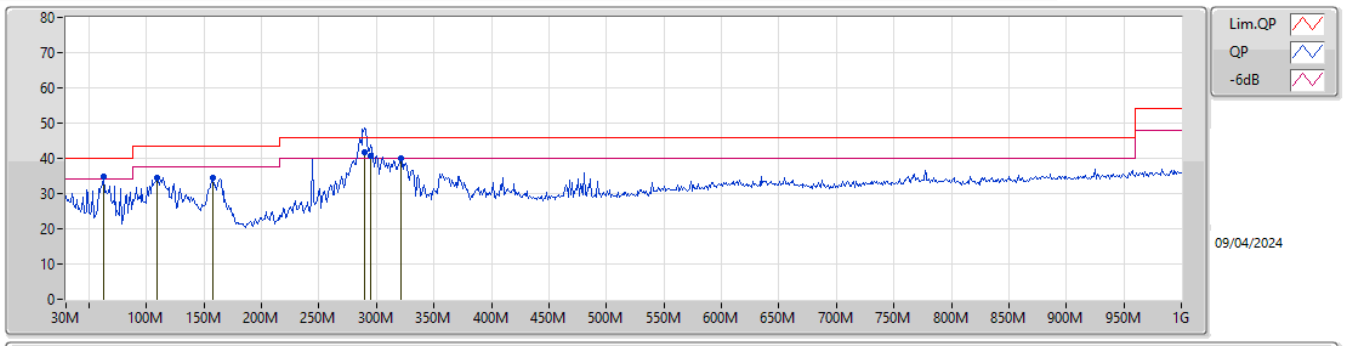
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	QP	43.58M	35.99	40.00	-4.01	Vertical

Mode 1



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV/m)	(dB/m)	(dB)	(dB)
QP	43.58M	35.99	40.00	-4.01	-13.49	3	Vertical	350	1.00	"Worst"	49.48	17.10	1.21	31.80
QP	48.43M	35.07	40.00	-4.93	-15.68	3	Vertical	261	1.25	-	50.75	14.92	1.26	31.86
QP	62.98M	34.38	40.00	-5.62	-17.95	3	Vertical	143	1.25	-	52.33	12.57	1.41	31.93
QP	67.83M	32.85	40.00	-7.15	-17.94	3	Vertical	60	1.00	-	50.79	12.51	1.46	31.91
PK	112.45M	38.52	43.50	-4.98	-12.18	3	Vertical	324	1.00	-	50.70	17.92	1.86	31.96
PK	124.09M	37.76	43.50	-5.74	-11.82	3	Vertical	258	1.00	-	49.58	18.20	1.96	31.98
QP	289.96M	40.79	46.00	-5.21	-10.10	3	Vertical	193	2.00	-	50.89	18.93	3.07	32.10
QP	295.78M	41.73	46.00	-4.27	-9.94	3	Vertical	174	1.50	-	51.67	19.07	3.10	32.11
PK	323.91M	40.89	46.00	-5.11	-9.24	3	Vertical	201	1.50	-	50.13	19.63	3.27	32.14
PK	576.11M	40.57	46.00	-5.43	-3.63	3	Vertical	47	1.25	-	44.20	24.35	4.51	32.49

Mode 1



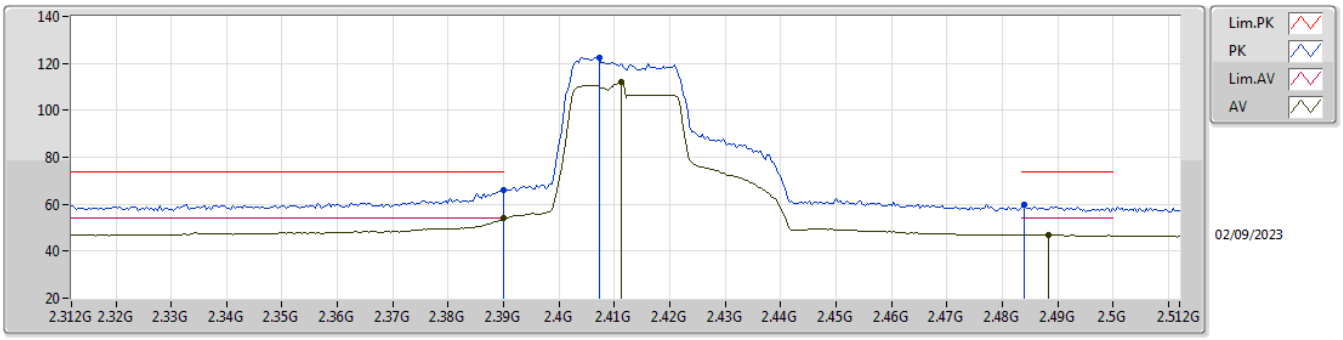
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV/m)	(dB/m)	(dB)	(dB)
PK	62.98M	34.79	40.00	-5.21	-17.95	3	Horizontal	0	1.50	-	52.74	12.57	1.41	31.93
PK	109.54M	34.59	43.50	-8.91	-12.38	3	Horizontal	63	3.00	-	46.97	17.74	1.84	31.96
PK	158.04M	34.48	43.50	-9.02	-13.79	3	Horizontal	355	3.00	-	48.27	16.04	2.21	32.04
QP	289.96M	41.83	46.00	-4.17	-10.10	3	Horizontal	292	1.25	"Worst"	51.93	18.93	3.07	32.10
QP	294.81M	40.84	46.00	-5.16	-9.96	3	Horizontal	241	1.00	-	50.80	19.05	3.10	32.11
PK	321M	40.05	46.00	-5.95	-9.30	3	Horizontal	206	1.25	-	49.35	19.58	3.26	32.14

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	-	-	-	-	-	-	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	Pass	AV	2.4835G	53.92	54.00	-0.08	3	Vertical	345.6	1.83	-

2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

2412MHz_TX

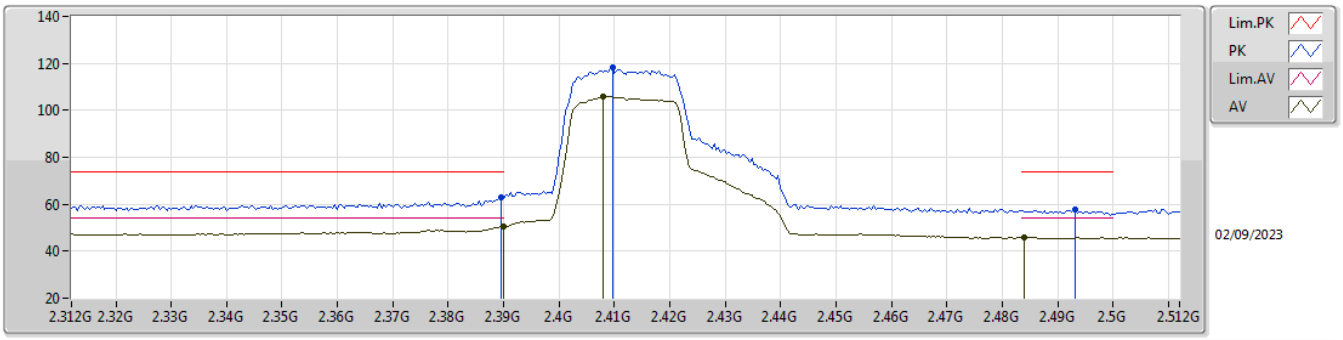


EUT Y_4TX
Setting 81
06-C-S-5

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	66.05	74.00	-7.95	33.48	3	Vertical	39.2	2.34	-	27.70	4.87	-
AV	2.39G	53.89	54.00	-0.11	21.32	3	Vertical	39.2	2.34	-	27.70	4.87	-
PK	2.4072G	122.35	Inf	-Inf	89.82	3	Vertical	39.2	2.34	-	27.63	4.90	-
AV	2.4112G	111.88	Inf	-Inf	79.39	3	Vertical	39.2	2.34	-	27.60	4.89	-
PK	2.484G	59.73	74.00	-14.27	27.47	3	Vertical	39.2	2.34	-	27.40	4.86	-
AV	2.4884G	47.11	54.00	-6.89	14.85	3	Vertical	39.2	2.34	-	27.40	4.86	-

2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

2412MHz_TX

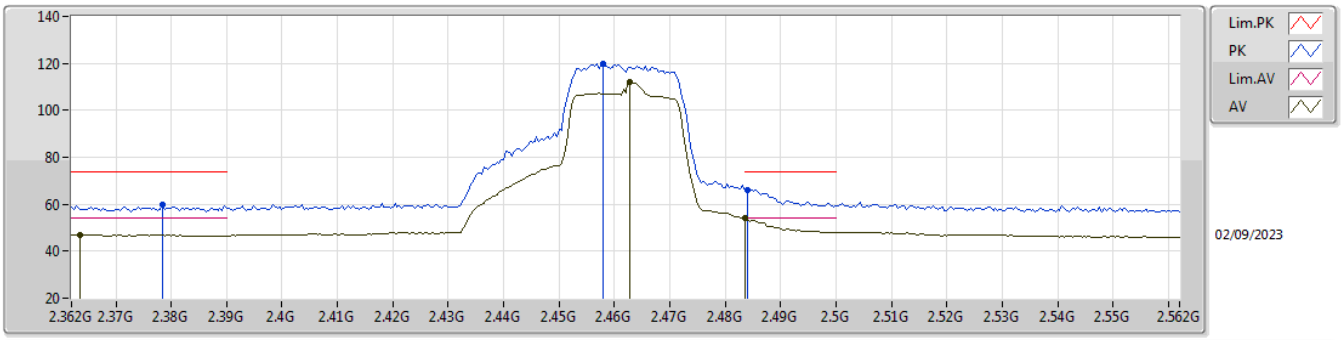


EUT Y_4TX
Setting 81
06-C-S-5

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	2.3896G	62.90	74.00	-11.10	30.33	3	Horizontal	113.7	1.94	-	27.70	4.87	-
AV	2.39G	50.47	54.00	-3.53	17.90	3	Horizontal	113.7	1.94	-	27.70	4.87	-
PK	2.4096G	118.25	Inf	-Inf	85.75	3	Horizontal	113.7	1.94	-	27.60	4.90	-
AV	2.408G	105.80	Inf	-Inf	73.28	3	Horizontal	113.7	1.94	-	27.62	4.90	-
PK	2.4932G	57.71	74.00	-16.29	25.46	3	Horizontal	113.7	1.94	-	27.40	4.85	-
AV	2.484G	45.81	54.00	-8.19	13.55	3	Horizontal	113.7	1.94	-	27.40	4.86	-

2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

2462MHz_TX

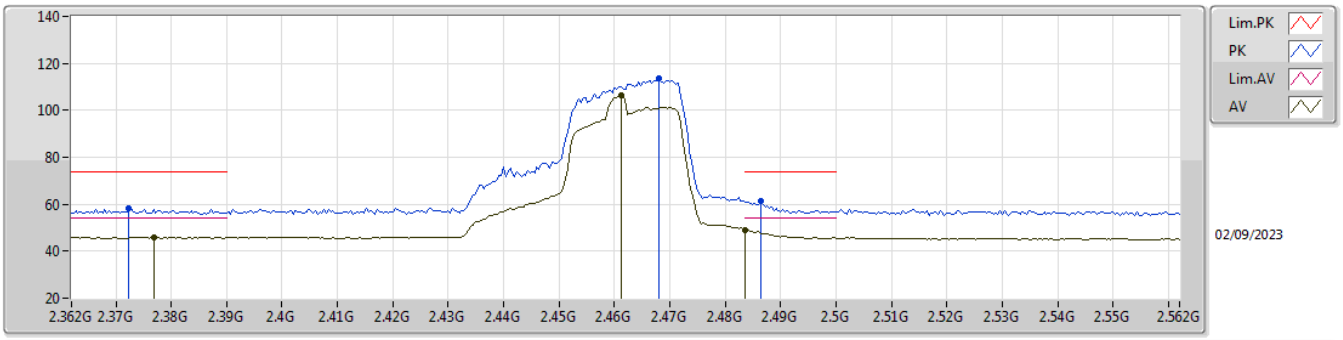


EUT Y_4TX
Setting 71
06-C-S-5

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	2.3784G	59.73	74.00	-14.27	27.16	3	Vertical	345.6	1.83	-	27.72	4.85	-
AV	2.3636G	47.12	54.00	-6.88	14.45	3	Vertical	345.6	1.83	-	27.86	4.81	-
PK	2.458G	119.73	Inf	-Inf	87.44	3	Vertical	345.6	1.83	-	27.42	4.87	-
AV	2.4628G	112.14	Inf	-Inf	79.87	3	Vertical	345.6	1.83	-	27.40	4.87	-
PK	2.484G	66.12	74.00	-7.88	33.86	3	Vertical	345.6	1.83	-	27.40	4.86	-
AV	2.4835G	53.92	54.00	-0.08	21.66	3	Vertical	345.6	1.83	-	27.40	4.86	-

2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

2462MHz_TX

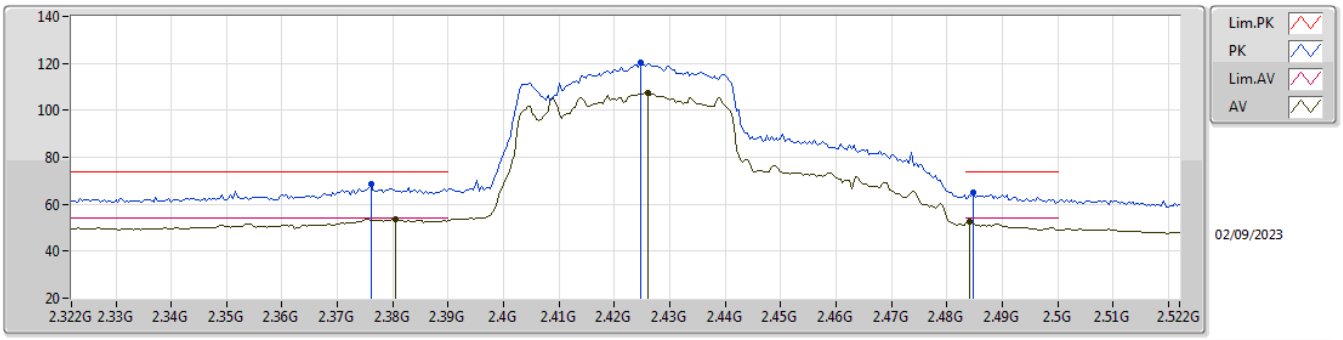


EUT Y_4TX
Setting 71
06-C-S-5

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	2.3724G	58.19	74.00	-15.81	25.58	3	Horizontal	123.1	2.37	-	27.78	4.83	-
AV	2.3768G	45.89	54.00	-8.11	13.32	3	Horizontal	123.1	2.37	-	27.73	4.84	-
PK	2.468G	113.41	Inf	-Inf	81.14	3	Horizontal	123.1	2.37	-	27.40	4.87	-
AV	2.4612G	106.30	Inf	-Inf	74.03	3	Horizontal	123.1	2.37	-	27.40	4.87	-
PK	2.4864G	61.42	74.00	-12.58	29.16	3	Horizontal	123.1	2.37	-	27.40	4.86	-
AV	2.4835G	49.09	54.00	-4.91	16.83	3	Horizontal	123.1	2.37	-	27.40	4.86	-

2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

2422MHz_TX

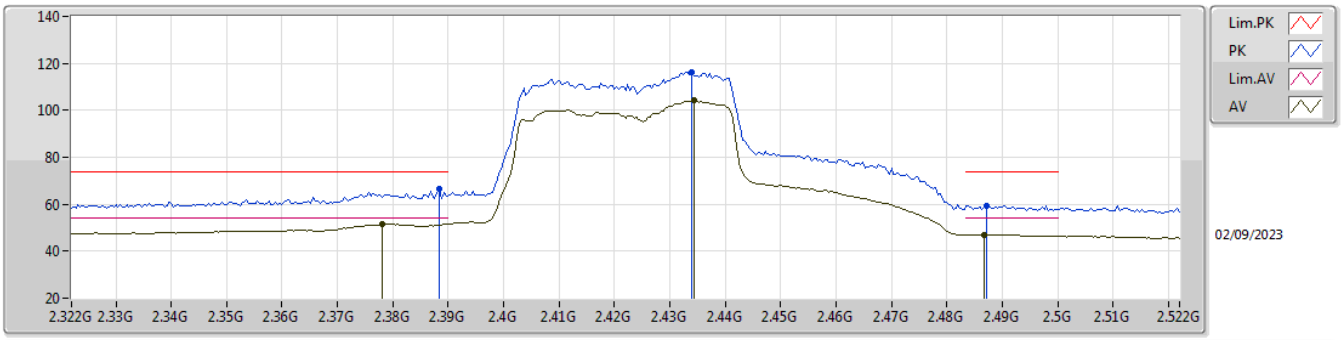


EUT Y_4TX
Setting 82
06-C-S-5

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	2.376G	68.46	74.00	-5.54	35.88	3	Vertical	340.9	2.09	-	27.74	4.84	-
AV	2.3804G	53.81	54.00	-0.19	21.26	3	Vertical	340.9	2.09	-	27.70	4.85	-
PK	2.4248G	120.31	Inf	-Inf	87.87	3	Vertical	340.9	2.09	-	27.55	4.89	-
AV	2.426G	107.67	Inf	-Inf	75.24	3	Vertical	340.9	2.09	-	27.54	4.89	-
PK	2.4848G	65.24	74.00	-8.76	32.98	3	Vertical	340.9	2.09	-	27.40	4.86	-
AV	2.484G	52.53	54.00	-1.47	20.27	3	Vertical	340.9	2.09	-	27.40	4.86	-

2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

2422MHz_TX

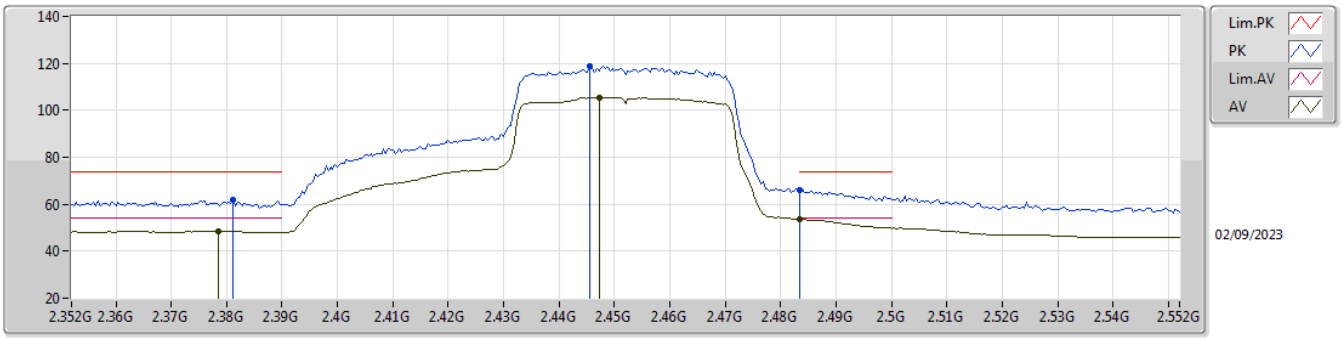


EUT Y_4TX
Setting 82
06-C-S-5

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	2.3884G	66.77	74.00	-7.23	34.20	3	Horizontal	118.4	1.95	-	27.70	4.87	-
AV	2.378G	51.69	54.00	-2.31	19.12	3	Horizontal	118.4	1.95	-	27.72	4.85	-
PK	2.434G	116.39	Inf	-Inf	84.01	3	Horizontal	118.4	1.95	-	27.50	4.88	-
AV	2.4344G	104.12	Inf	-Inf	71.74	3	Horizontal	118.4	1.95	-	27.50	4.88	-
PK	2.4872G	59.54	74.00	-14.46	27.28	3	Horizontal	118.4	1.95	-	27.40	4.86	-
AV	2.4868G	46.96	54.00	-7.04	14.70	3	Horizontal	118.4	1.95	-	27.40	4.86	-

2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

2452MHz_TX

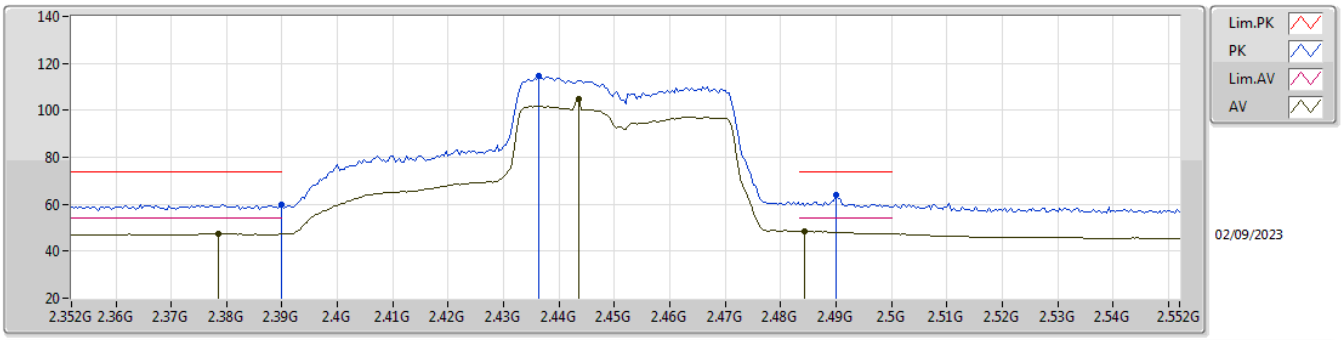


EUT Y_4TX
Setting 73
06-C-S-5

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	2.3812G	61.84	74.00	-12.16	29.29	3	Vertical	196.3	1.97	-	27.70	4.85	-
AV	2.3784G	48.56	54.00	-5.44	15.99	3	Vertical	196.3	1.97	-	27.72	4.85	-
PK	2.4456G	118.74	Inf	-Inf	86.36	3	Vertical	196.3	1.97	-	27.50	4.88	-
AV	2.4472G	105.58	Inf	-Inf	73.20	3	Vertical	196.3	1.97	-	27.50	4.88	-
PK	2.4835G	65.83	74.00	-8.17	33.57	3	Vertical	196.3	1.97	-	27.40	4.86	-
AV	2.4835G	53.76	54.00	-0.24	21.50	3	Vertical	196.3	1.97	-	27.40	4.86	-

2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

2452MHz_TX



EUT Y_4TX
Setting 73
06-C-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	60.05	74.00	-13.95	27.48	3	Horizontal	119	1.76	-	27.70	4.87	-
AV	2.3784G	47.53	54.00	-6.47	14.96	3	Horizontal	119	1.76	-	27.72	4.85	-
PK	2.4364G	114.88	Inf	-Inf	82.50	3	Horizontal	119	1.76	-	27.50	4.88	-
AV	2.4436G	104.93	Inf	-Inf	72.55	3	Horizontal	119	1.76	-	27.50	4.88	-
PK	2.49G	63.89	74.00	-10.11	31.63	3	Horizontal	119	1.76	-	27.40	4.86	-
AV	2.4844G	48.38	54.00	-5.62	16.12	3	Horizontal	119	1.76	-	27.40	4.86	-