



RADIO TEST REPORT

FCC ID : MSQ-RTBE6G00
Equipment : BE19000 Tri-band WiFi Router
Brand Name : ASUS
Model Name : RT-BE96U
Applicant : ASUSTeK COMPUTER INC.
1F., No. 15, Lide Rd., Beitou, Taipei City 112, Taiwan
Standard : 47 CFR FCC Part 15.247

The product was received on Dec. 26, 2022, and testing was started from Jan. 18, 2023 and completed on May 31, 2023. 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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Photographs of EUT v01



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	-

Note: Reference to Sporton Project No.:262427-02.

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: Sandy Chuang



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), be (EHT20)	2412-2462	1-11 [11]
2400-2483.5	n (HT40), VHT40, ax (HEW40), be (EHT40)	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	802.11be EHT20	20	4TX
2.4-2.4835GHz	802.11be EHT20-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
2.4-2.4835GHz	802.11be EHT40	40	4TX
2.4-2.4835GHz	802.11be EHT40-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.
- ◆ EHT20, EHT40 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM modulation.
- ◆ BWch is the nominal channel bandwidth.



1.1.2 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 6GHz	WLAN 2.4GHz	WLAN 5GHz					
1	1	-	-	WHA Yu	C660-510587-A	Dipole Antenna	I-PEX	Note 1
2	2	-	-	WHA Yu	C660-510588-A	Dipole Antenna	I-PEX	
3	3	-	-	WHA Yu	C660-510589-A	Dipole Antenna	I-PEX	
4	4	-	-	WHA Yu	C660-510590-A	Dipole Antenna	I-PEX	
5	-	1	1	WHA Yu	C660-510591-A	Dipole Antenna	I-PEX	
6	-	4	4	WHA Yu	C660-510592-A	Dipole Antenna	I-PEX	
7	-	3	3	WHA Yu	C660-510593-A	Dipole Antenna	I-PEX	
8	-	2	2	WHA Yu	C660-510594-A	Dipole Antenna	I-PEX	

Note 1

Ant.	Antenna Gain (dBi)					
	WLAN 2.4GHz	WLAN 5GHz UNII 1	WLAN 5GHz UNII 2A	WLAN 5GHz UNII 2C	WLAN 5GHz UNII 3	WLAN 6GHz
1	-	-	-	-	-	2.44
2	-	-	-	-	-	2.39
3	-	-	-	-	-	2.44
4	-	-	-	-	-	2.43
5	2.09	1.52	1.17	1.98	1.08	-
6	1.84	2.29	2.9	3.09	2.51	-
7	2.91	2.7	3.04	2.48	3.39	-
8	2.14	1.21	1.19	3.23	1.87	-

Item	Directional gain (dBi)				
	WLAN 2.4GHz	WLAN 5GHz			
		WLAN 5GHz UNII 1	WLAN 5GHz UNII 2A	WLAN 5GHz UNII 2C	WLAN 5GHz UNII 3
4T1S	5.99	4.72	5.97	5.72	5.64
4T2S	2.99	2.7	3.04	3.23	3.39
4T4S	2.91	2.7	3.04	3.23	3.39

Note 2: The above information (except antenna 5~8 gain and directional gain) was declared by manufacturer.

Note 3: For 2.4GHz/5GHz, the antenna gain and directional gain are measured which follow the procedure of KDB 662911 D03.

Note 4: **For 2.4GHz function:**

For IEEE 802.11 b/g/n/VHT/ax/be (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/be (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/be mode (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.



1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11b	0.991	0.04	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11g	0.988	0.05	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11be EHT20-BF	0.981	0.08	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11be EHT40-BF	0.967	0.15	4.623m	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	<input checked="" type="checkbox"/> With beamforming	<input type="checkbox"/> Without beamforming		
	The product has beamforming function for n/VHT/ax/be in 2.4GHz, n/ac/ax/be in 5GHz and ax/be in 6GHz.			
Function	<input checked="" type="checkbox"/> Point-to-multipoint	<input type="checkbox"/> Point-to-point		
Support RU	<input checked="" type="checkbox"/> Full RU	<input type="checkbox"/> Partial RU		
Test Software Version	accessMtool 3.3.0.4			

Note: The above information was declared by manufacturer.

1.1.5 Table for EUT supports functions

Function	Support Type
AP Router	Master
Bridge	Slave without radar detection
Extender	Master
Mesh	Master

Note: The above information was declared by manufacturer.

1.1.6 Table for Radio function

Radio 1	Radio 2	Radio 3
WLAN 2.4GHz	WLAN 5GHz UNII 1~3	WLAN 6GHz UNII 5~8

Note: The above information was declared by manufacturer.



1.1.7 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR262427-01AA.

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

Modifications	Performance Checking
1. Adding the second source for capacitance and resistance on path of CPU.	1. DTS Bandwidth 2. Maximum Conducted Output Power 3. Power Spectral Density 4. Emissions in Non-restricted Frequency Bands
2. Changing the EUT hardware version to "R1.20" from "R1.00". The difference with R1.00 is listed below: (1) Revising enclosure design for device and antennas. (2) Revising the heatsink of the bottom of EUT. (3) Revising the shape of the PCB board to fit the new enclosure.	Emissions in Restricted Frequency Bands below 1GHz.
3. Adding accessory: RJ-45 cable 2*1 (Shielded, 1.5m).	
4. Removing manufacturers' company names and addresses in the report.	After evaluation, it does not need to re-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	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	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	TH02-CB	Mason Chan	23.6-24.1 / 63-67	Jan. 18, 2023~ May 31, 2023
Radiated < 1GHz	03CH06-CB	Alex Kuo	21.7~22.9 / 58~62	Apr. 24, 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)	3.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.6 dB	Confidence levels of 95%
Conducted Emission	3.2 dB	Confidence levels of 95%
Output Power Measurement	0.8 dB	Confidence levels of 95%
Power Density Measurement	3.2 dB	Confidence levels of 95%
Bandwidth Measurement	2.0 %	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
802.11b_Nss1,(1Mbps)_4TX	-
2412MHz	90
2437MHz	93
2462MHz	90
802.11g_Nss1,(6Mbps)_4TX	-
2412MHz	85
2417MHz	92
2437MHz	94
2457MHz	86
2462MHz	83
802.11be EHT20-BF_Nss1,(MCS0)_4TX	-
2412MHz	75
2417MHz	85
2437MHz	91
2457MHz	85
2462MHz	75
802.11be EHT40-BF_Nss1,(MCS0)_4TX	-
2422MHz	72
2437MHz	70
2452MHz	72
802.11be EHT20-BF_Nss2,(MCS0)_4TX	-
2412MHz	80
2417MHz	88
2437MHz	95
2457MHz	86
2462MHz	80
802.11be EHT40-BF_Nss2,(MCS0)_4TX	-
2422MHz	75
2437MHz	73
2452MHz	74

Note:

- ♦ EHT20 / EHT40 covers HT20 / HT40 / VHT20 / VHT40 / HEW20 / HEW40 due to similar modulation. The power setting for HT20 / HT40 / VHT20 / VHT40 / HEW20 / HEW40 is the same or lower than EHT20 / EHT40.
- ♦ The EUT supports non-beamforming and beamforming modes, after evaluating, the beamforming mode has been selected to test.



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

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
	<ol style="list-style-type: none"> The EUT performed the testing with Adapter 1 and Adapter 3. "Adapter 3" generated the worst case. Consequently, measurement will follow this same test mode. After evaluating, the worst case was found at Z axis, thus the measurement will follow this same test configuration.
1	EUT in Z axis_WLAN 2.4GHz + Adapter 3 + RJ-45 cable 1
2	EUT in Z axis_WLAN 5GHz + Adapter 3 + RJ-45 cable 1
3	EUT in Z axis_WLAN 6GHz + Adapter 3 + RJ-45 cable 1
Mode 2 has been evaluated to be the worst case among Mode 1~3, so measurement for Mode 4 will follow this same test mode.	
4	EUT in Z axis_WLAN 5GHz + Adapter 3 + RJ-45 cable 2
For operating, Mode 4 is the worst case and it was record in this test report.	

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 + WLAN 6GHz
Refer to Sporton Test Report No.: FA262427-05 for Co-location RF Exposure Evaluation.	

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.



2.4 Accessories

Power	Brand	Model	Rating	Remark
Adapter 1	DELTA	ADP-65DE B	INPUT: 100-240V~1.5A, 50-60Hz OUTPUT: 19.0V, 3.42A, 65.0W	With the DC cable: Non-shielded, 1.5m
Adapter 2	DELTA	ADP-65DE B	INPUT: 100-240V~1.5A, 50-60Hz OUTPUT: 19.0V, 3.42A, 65.0W	With the DC cable: Non-shielded, 1.5m
Adapter 3	AcBel	ADD011	INPUT: 100-240V~ 1.7A, 50-60Hz OUTPUT: +19.5V, 3.33A, 65.0W MAX.	With the DC cable: Non-shielded, 1.5m
Adapter 4	AcBel	ADD011	INPUT: 100-240V~ 1.7A, 50-60Hz OUTPUT: +19.5V, 3.33A, 65.0W MAX.	With the DC cable: Non-shielded, 1.5m
Others				
RJ-45 cable 1*1: Shielded, 1.5m				
RJ-45 cable 2*1: Shielded, 1.5m				
Power cord*1: Non-shielded, 0.9m				

Note1: Adapter 1 & Adapter 2 and Adapter 3 & Adapter 4 are identical.

Note2: Refer to photographs of EUT for the detail information of difference between Adapter 1 & Adapter 2 and Adapter 3 & Adapter 4.

2.5 Support Equipment

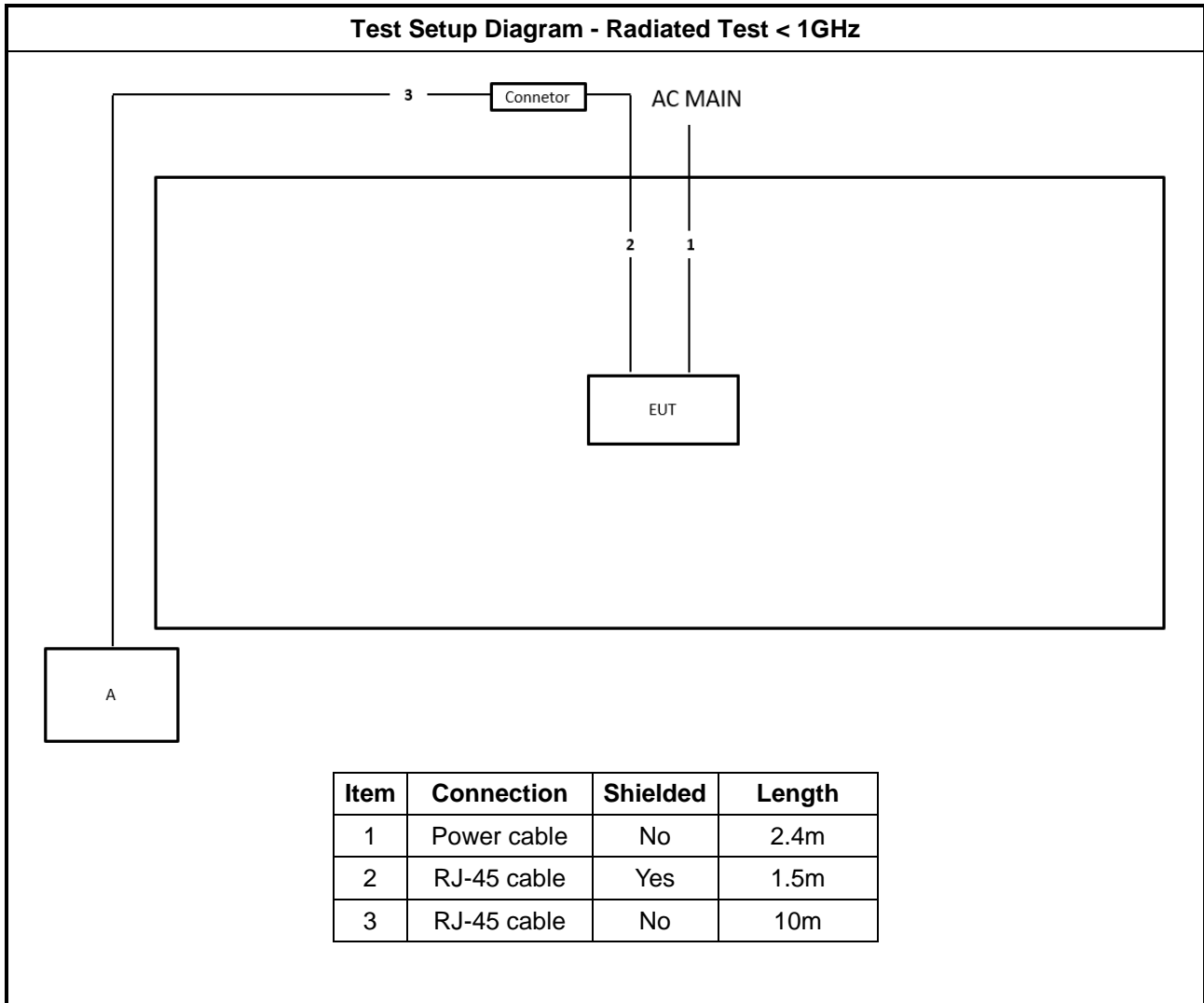
For Radiated (below 1GHz):

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

For RF Conducted:

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

2.6 Test Setup Diagram



3 Transmitter Test Result

3.1 DTS Bandwidth

3.1.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
<ul style="list-style-type: none"> ▪ 6 dB bandwidth \geq 500 kHz.

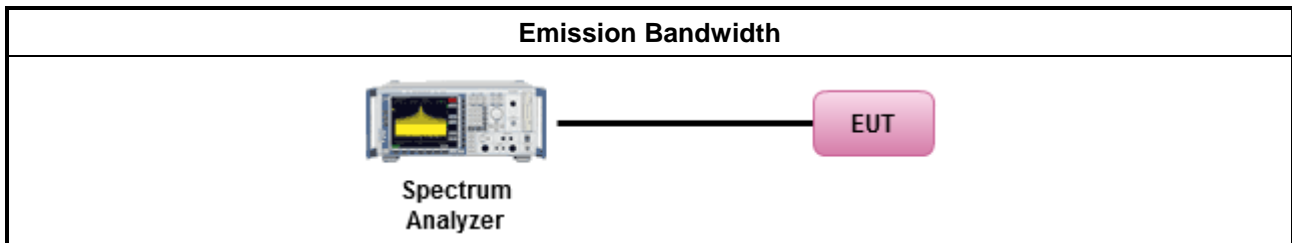
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method
<ul style="list-style-type: none"> ▪ For the emission bandwidth shall be measured using one of the options below:
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
<input type="checkbox"/> Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

3.1.4 Test Setup



3.1.5 Test Result of Emission Bandwidth

Refer as Appendix A



3.2 Maximum Conducted Output Power

3.2.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
	<ul style="list-style-type: none"> ▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
	<ul style="list-style-type: none"> ▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
	<ul style="list-style-type: none"> ▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<ul style="list-style-type: none"> ▪ Smart antenna system (SAS):
	<ul style="list-style-type: none"> - Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<ul style="list-style-type: none"> - Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<ul style="list-style-type: none"> - 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

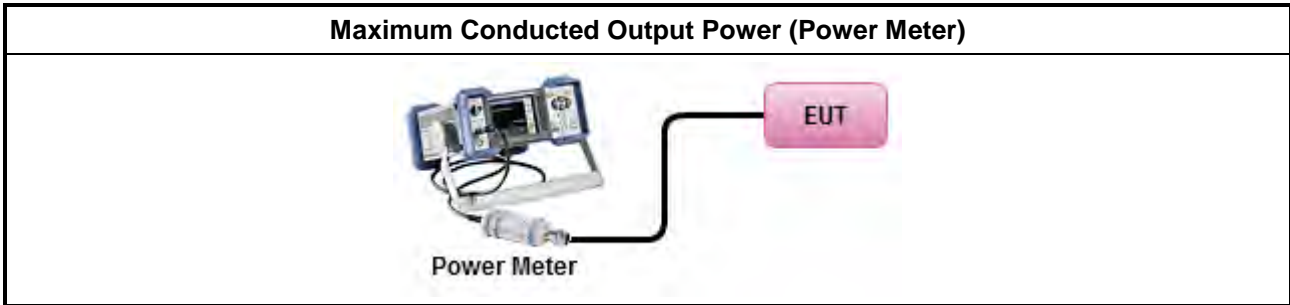
Refer a test equipment and calibration data table in this test report.



3.2.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> ▪ Maximum Peak Conducted Output Power 	
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
<ul style="list-style-type: none"> ▪ Maximum Conducted Output Power 	
[duty cycle ≥ 98% or external video / power trigger]	
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
	<input type="checkbox"/> 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	
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
	<input type="checkbox"/> 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)	
	<input type="checkbox"/> 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).
	<input checked="" type="checkbox"/> 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).
<ul style="list-style-type: none"> ▪ For conducted measurement. 	
	<ul style="list-style-type: none"> ▪ 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.
	<ul style="list-style-type: none"> ▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B



3.3 Power Spectral Density

3.3.1 Power Spectral Density Limit

Power Spectral Density Limit
<ul style="list-style-type: none"> Power Spectral Density (PSD) \leq 8 dBm/3kHz

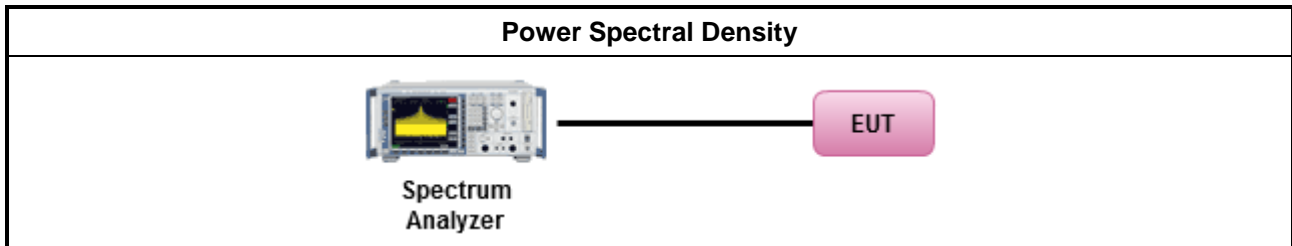
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method			
<ul style="list-style-type: none"> 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). 			
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD.			
<ul style="list-style-type: none"> For conducted measurement. <ul style="list-style-type: none"> If The EUT supports multiple transmit chains using options given below: <table border="1"> <tbody> <tr> <td> <input checked="" type="checkbox"/> 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. </td> </tr> <tr> <td> <input type="checkbox"/> 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, </td> </tr> <tr> <td> <input type="checkbox"/> 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. </td> </tr> </tbody> </table> 	<input checked="" type="checkbox"/> 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.	<input type="checkbox"/> 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,	<input type="checkbox"/> 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.
<input checked="" type="checkbox"/> 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.			
<input type="checkbox"/> 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,			
<input type="checkbox"/> 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



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.

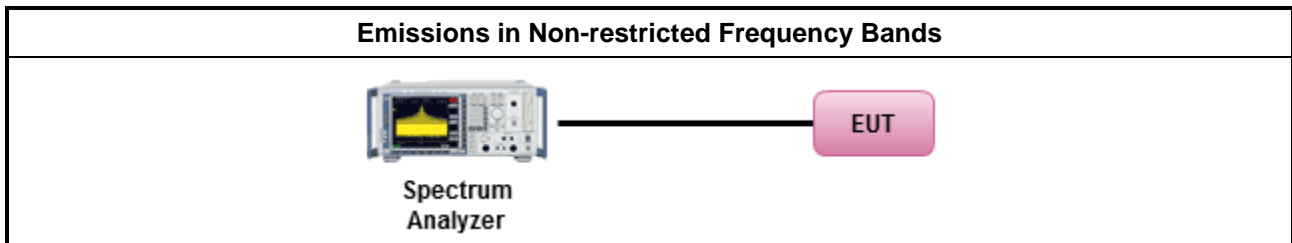
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method
<ul style="list-style-type: none"> Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted bands.

3.4.4 Test Setup



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

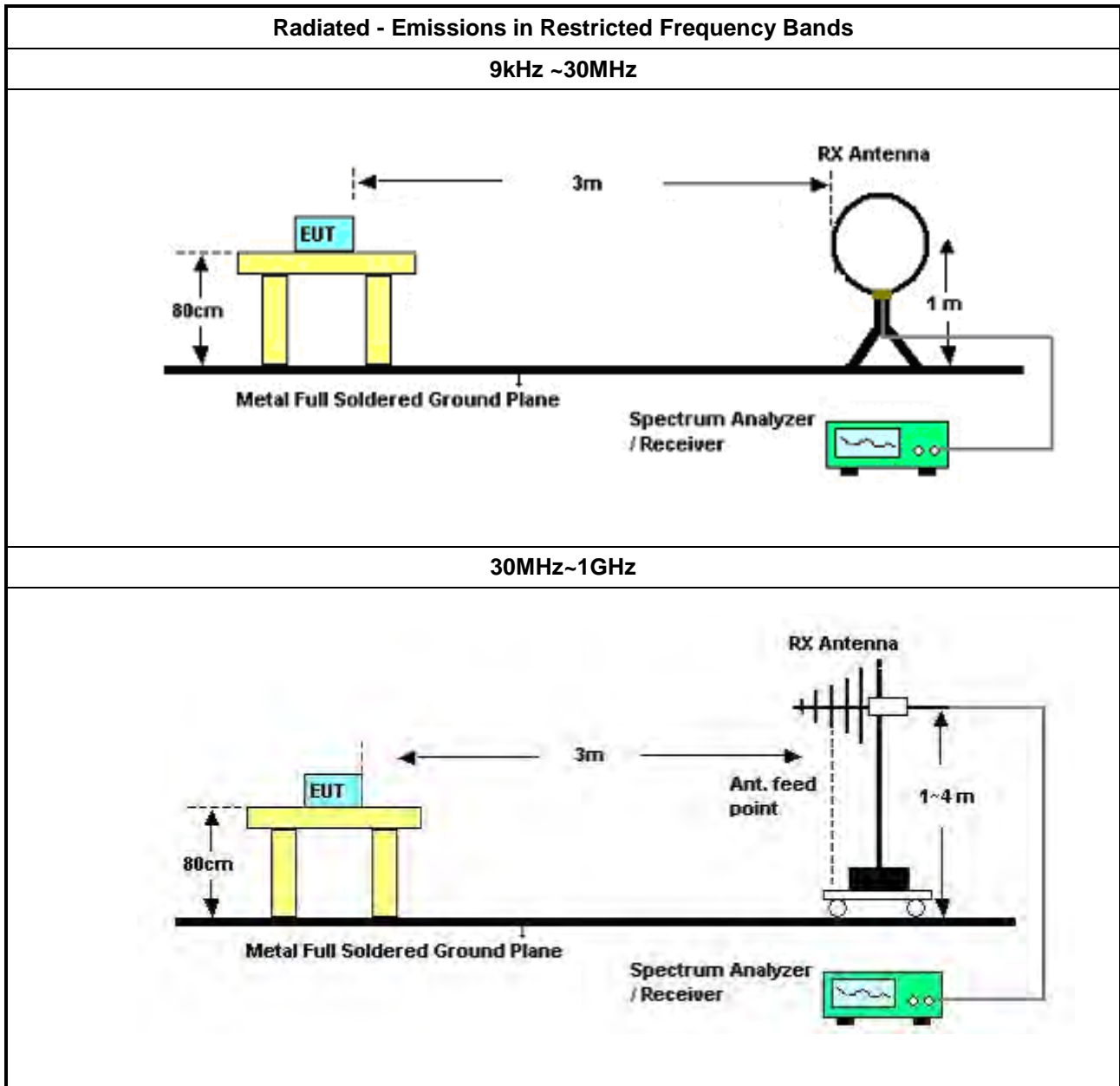
Refer a test equipment and calibration data table in this test report.



3.5.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> ▪ The average emission levels shall be measured in [duty cycle \geq 98 or duty factor]. 	
<ul style="list-style-type: none"> ▪ 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. 	
<ul style="list-style-type: none"> ▪ For the transmitter unwanted emissions shall be measured using following options below: 	
	<ul style="list-style-type: none"> ▪ Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle \geq 98%).
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
	<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW \geq 1/T).
	<input type="checkbox"/> Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW \geq 1/T, where T is pulse time.
	<input type="checkbox"/> Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
	<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
<ul style="list-style-type: none"> ▪ For the transmitter band-edge emissions shall be measured using following options below: 	
	<ul style="list-style-type: none"> ▪ 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.
	<ul style="list-style-type: none"> ▪ Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
	<ul style="list-style-type: none"> ▪ 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).
	<ul style="list-style-type: none"> ▪ 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
	<ul style="list-style-type: none"> ▪ 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





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
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	May 14, 2022	May 13, 2023	Radiation (03CH06-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH06-CB	30 MHz ~ 1 GHz	Aug. 04, 2022	Aug. 03, 2023	Radiation (03CH06-CB)
Bilog Antenna with 6 dB attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37878 & AT-N0606	20MHz ~ 2GHz	Jul. 31, 2022	Jul. 30, 2023	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	310N	187290	0.1MHz ~ 1GHz	Nov. 04, 2022	Nov. 03, 2023	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Dec. 21, 2022	Dec. 20, 2023	Radiation (03CH06-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 17, 2022	Jun. 16, 2023	Radiation (03CH06-CB)
RF Cable-low	Woken	RG402	Low Cable-24+68	30MHz~1GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH06-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Aug. 15, 2022	Aug. 14, 2023	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Oct. 17, 2022	Oct. 16, 2023	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Oct. 17, 2022	Oct. 16, 2023	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-01	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-02	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-03	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-04	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-05	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH02-CB)
Switch	SPTCB	SP-SWI	SWI-02	1 GHz – 26.5 GHz	Oct. 04, 2022	Oct. 03, 2023	Conducted (TH02-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conducted (TH02-CB)

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

NCR 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	-	-	-	-	-
802.11b_Nss1,(1Mbps)_4TX	7.55M	10.327M	10M3G1D	6.525M	10.188M
802.11g_Nss1,(6Mbps)_4TX	16.325M	16.872M	16M9D1D	16.3M	16.767M
802.11be EHT20-BF_Nss1,(MCS0)_4TX	18.95M	19.059M	19M1D1D	18.75M	19M
802.11be EHT20-BF_Nss2,(MCS0)_4TX	18.975M	19.092M	19M1D1D	18.75M	19.015M
802.11be EHT40-BF_Nss1,(MCS0)_4TX	37.85M	37.781M	37M8D1D	37.3M	37.695M
802.11be EHT40-BF_Nss2,(MCS0)_4TX	37.85M	37.784M	37M8D1D	37.4M	37.652M

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

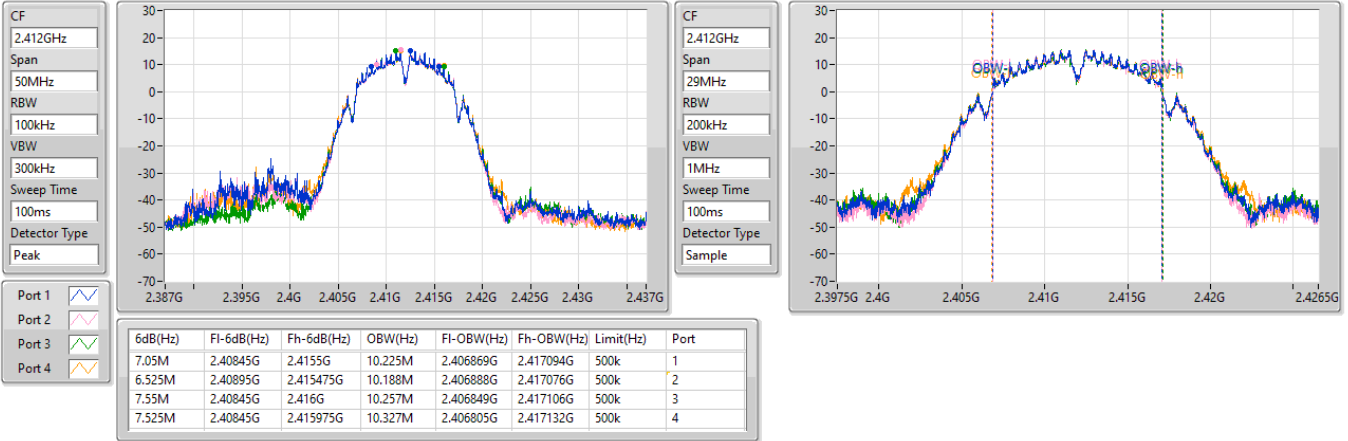
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11b_Nss1,(1Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	7.05M	10.225M	6.525M	10.188M	7.55M	10.257M	7.525M	10.327M
2437MHz	Pass	500k	6.525M	10.268M	7M	10.209M	7.075M	10.25M	7.05M	10.293M
2462MHz	Pass	500k	7.075M	10.273M	7.025M	10.229M	7.05M	10.267M	6.55M	10.3M
802.11g_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	16.325M	16.782M	16.325M	16.824M	16.325M	16.836M	16.325M	16.768M
2437MHz	Pass	500k	16.325M	16.767M	16.325M	16.773M	16.325M	16.768M	16.3M	16.789M
2462MHz	Pass	500k	16.325M	16.78M	16.325M	16.8M	16.325M	16.844M	16.325M	16.872M
802.11be EHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	18.925M	19.014M	18.9M	19.041M	18.85M	19.036M	18.8M	19.027M
2437MHz	Pass	500k	18.75M	19.039M	18.85M	19.017M	18.9M	19M	18.9M	19.019M
2462MHz	Pass	500k	18.95M	19.039M	18.85M	19.059M	18.875M	19.015M	18.85M	19.036M
802.11be EHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	37.5M	37.76M	37.55M	37.781M	37.75M	37.72M	37.35M	37.744M
2437MHz	Pass	500k	37.85M	37.712M	37.8M	37.695M	37.8M	37.707M	37.7M	37.765M
2452MHz	Pass	500k	37.6M	37.751M	37.3M	37.768M	37.8M	37.751M	37.3M	37.76M
802.11be EHT20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	18.925M	19.015M	18.8M	19.026M	18.85M	19.092M	18.825M	19.054M
2437MHz	Pass	500k	18.975M	19.049M	18.8M	19.053M	18.85M	19.043M	18.85M	19.078M
2462MHz	Pass	500k	18.75M	19.023M	18.825M	19.021M	18.85M	19.034M	18.825M	19.074M
802.11be EHT40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	37.65M	37.758M	37.4M	37.707M	37.55M	37.784M	37.45M	37.738M
2437MHz	Pass	500k	37.65M	37.778M	37.65M	37.714M	37.85M	37.698M	37.8M	37.652M
2452MHz	Pass	500k	37.65M	37.767M	37.55M	37.754M	37.75M	37.761M	37.6M	37.714M

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

2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX
2412MHz

EBW

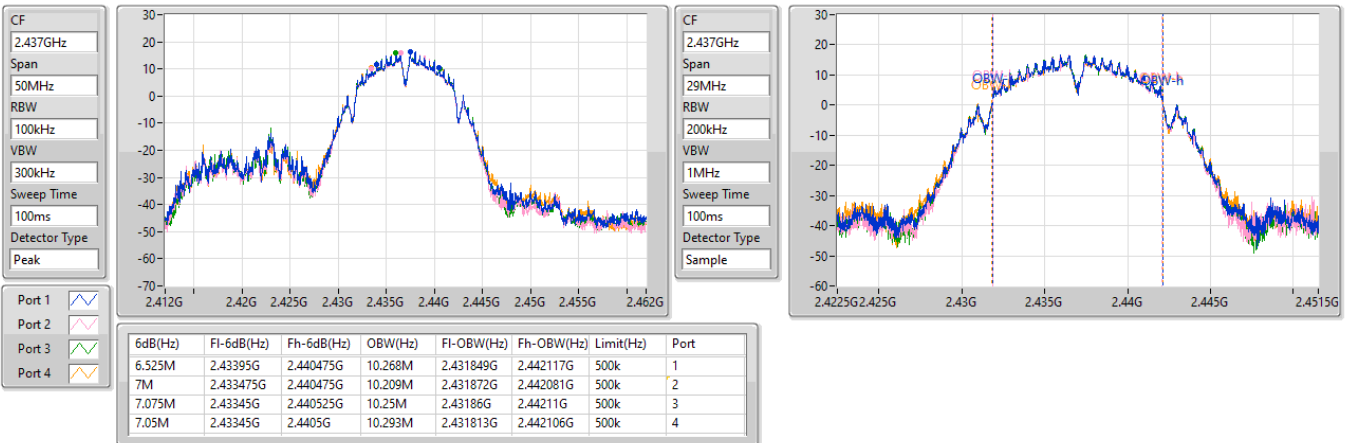
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2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX
2437MHz

EBW

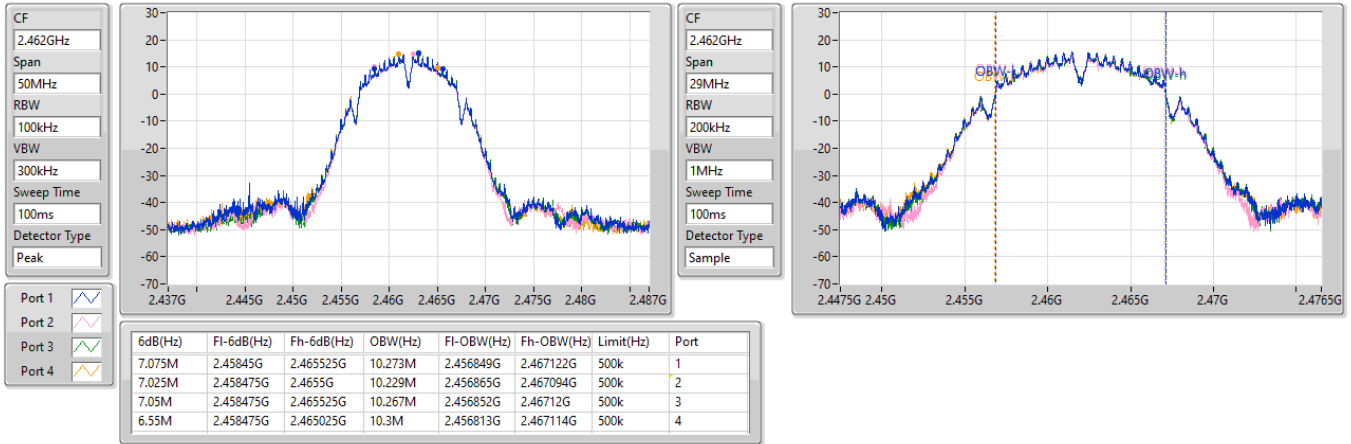
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2462MHz

EBW

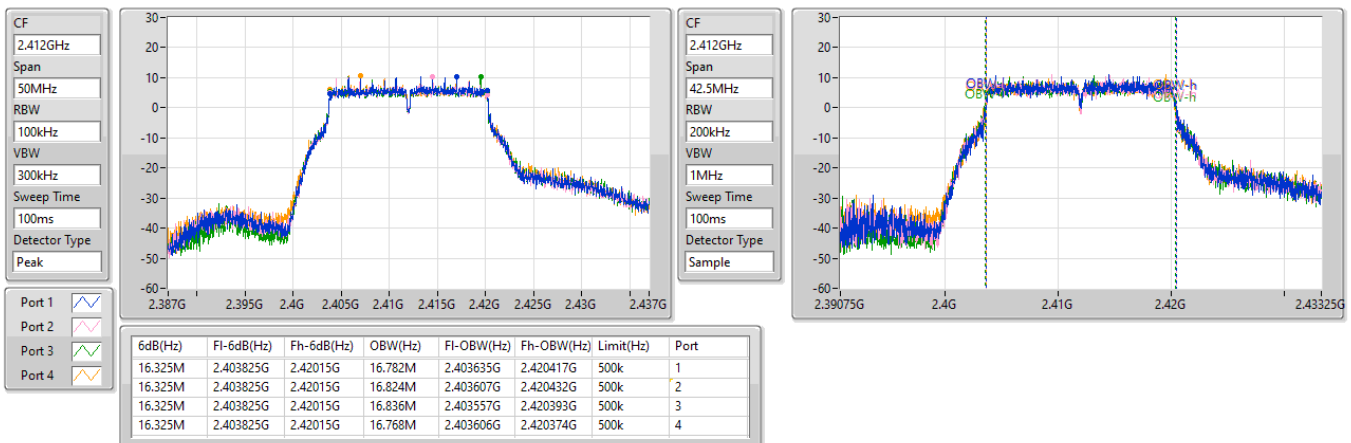
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2412MHz

EBW

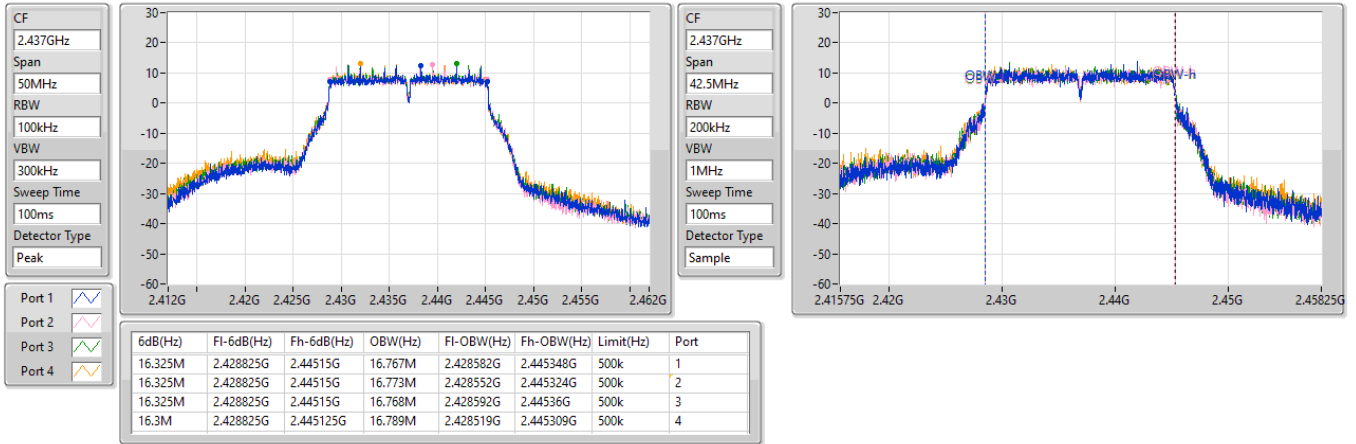
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2437MHz

EBW

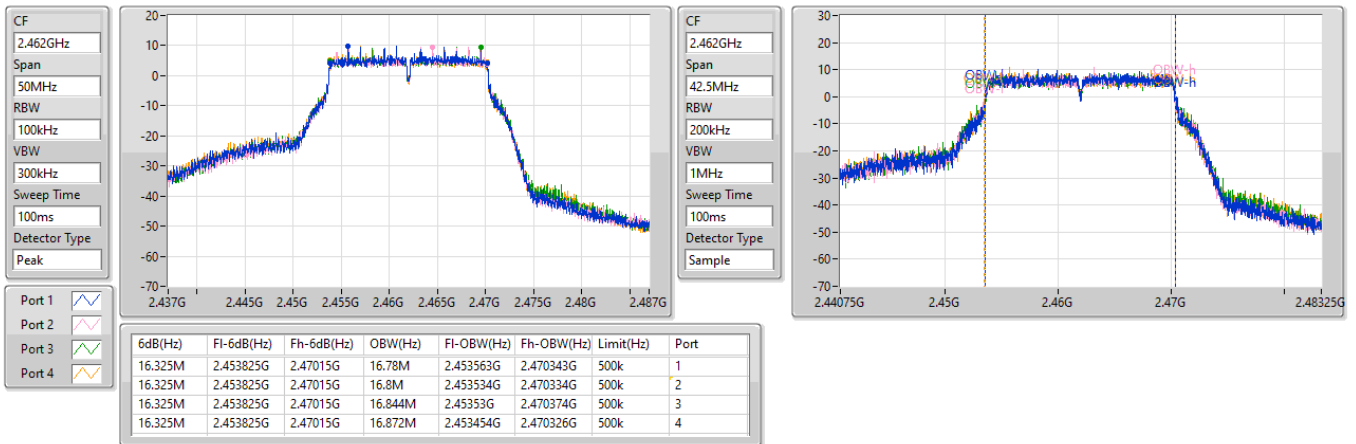
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2462MHz

EBW

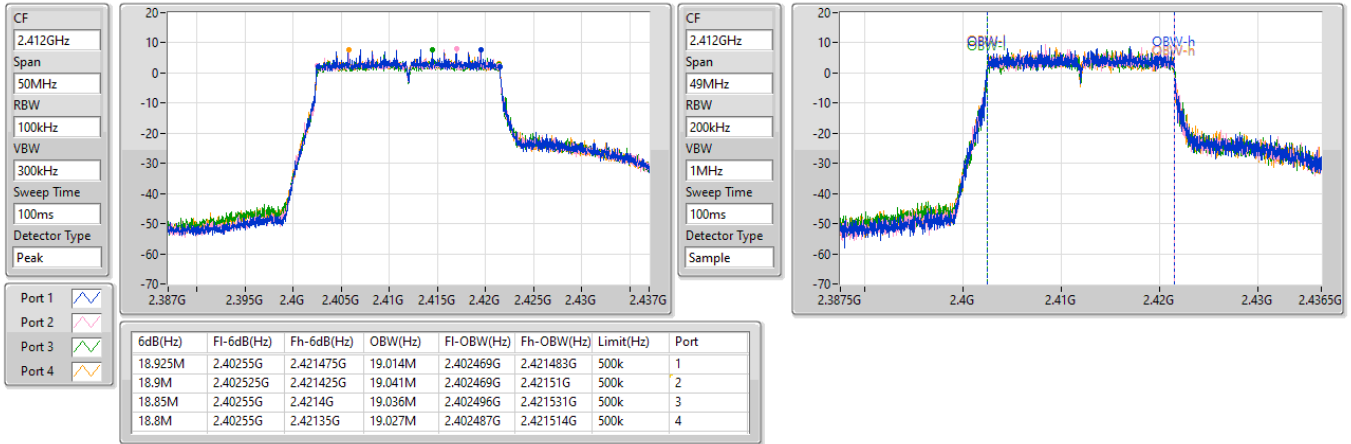
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2412MHz

EBW

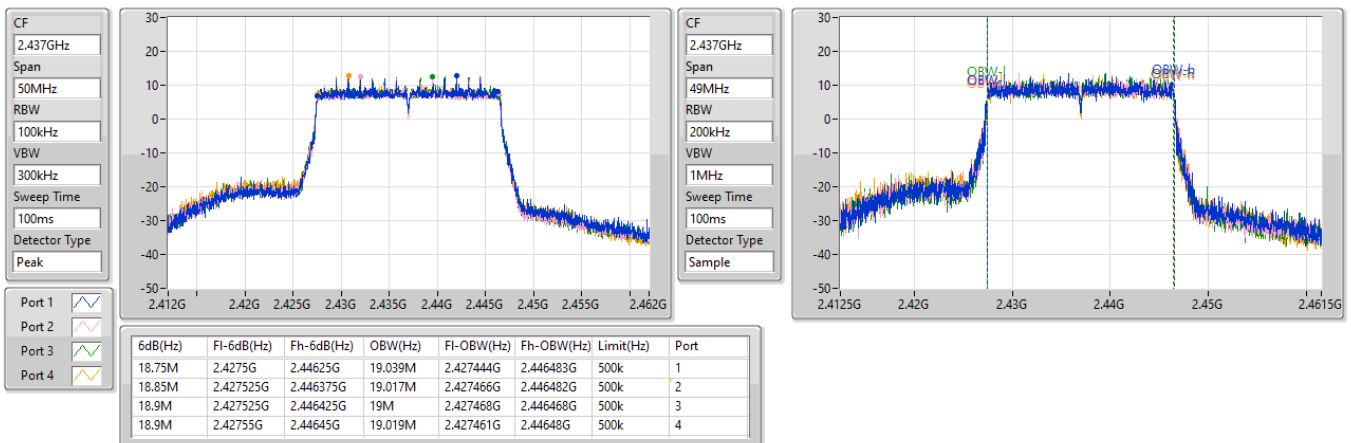
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2437MHz

EBW

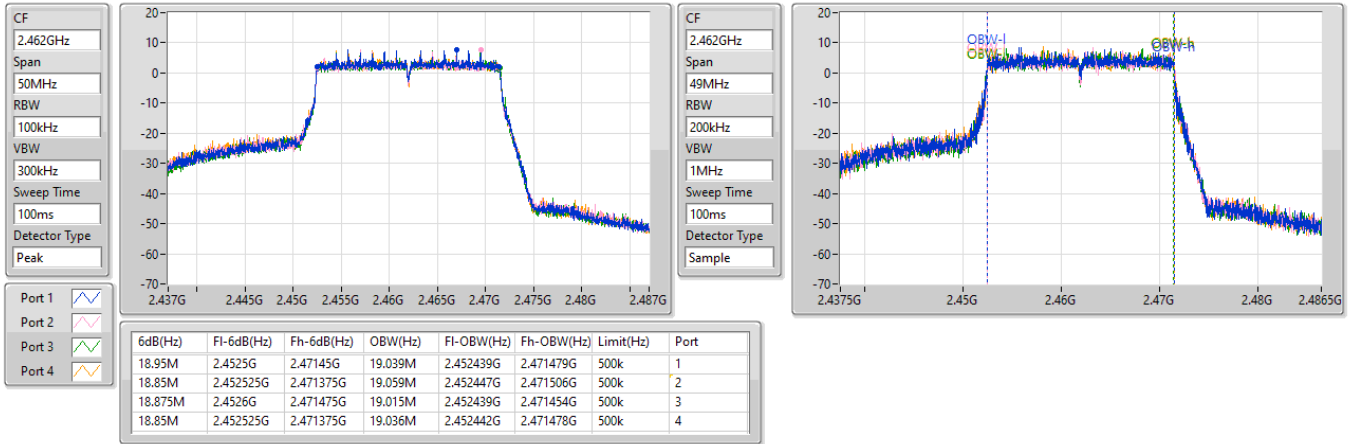
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2462MHz

EBW

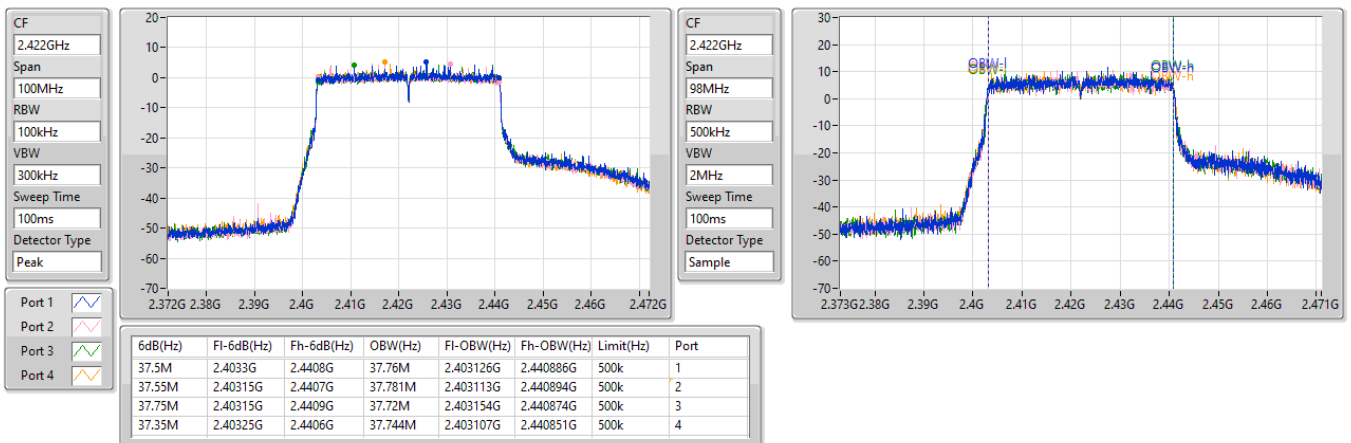
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2422MHz

EBW

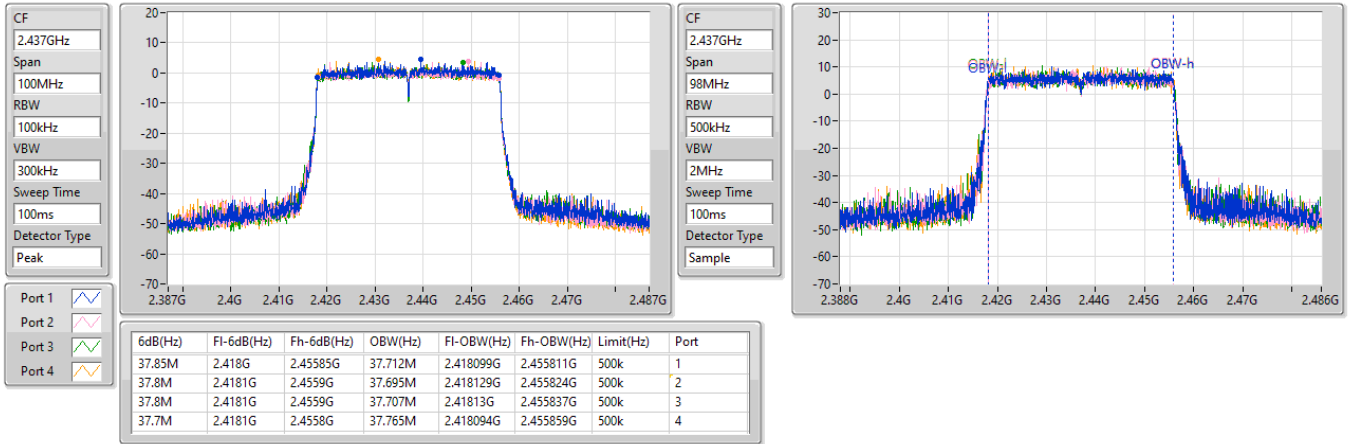
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2437MHz

EBW

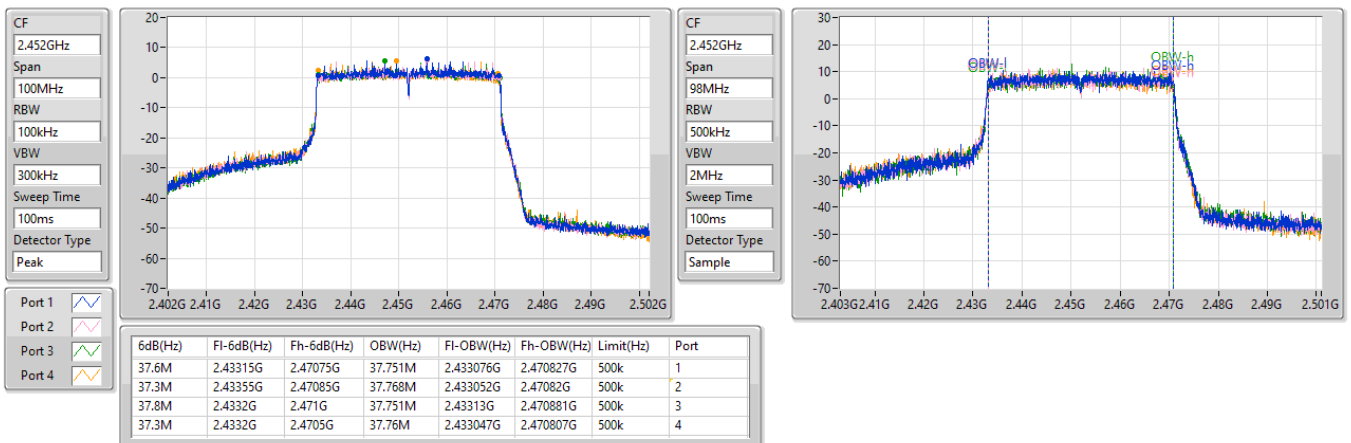
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2452MHz

EBW

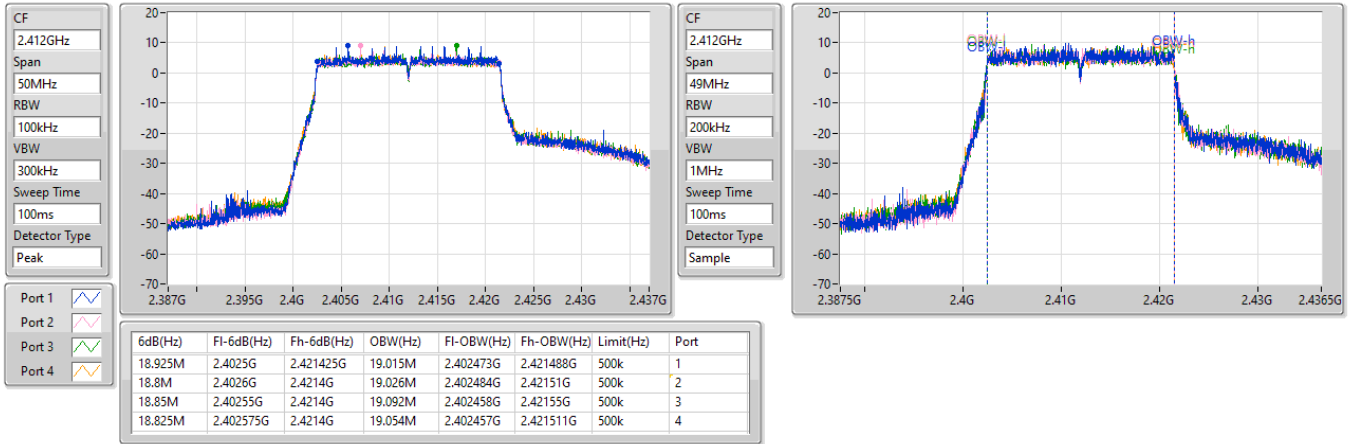
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2.4-2.4835GHz_802.11be EHT20-BF_Nss2,(MCS0)_4TX
2412MHz

EBW

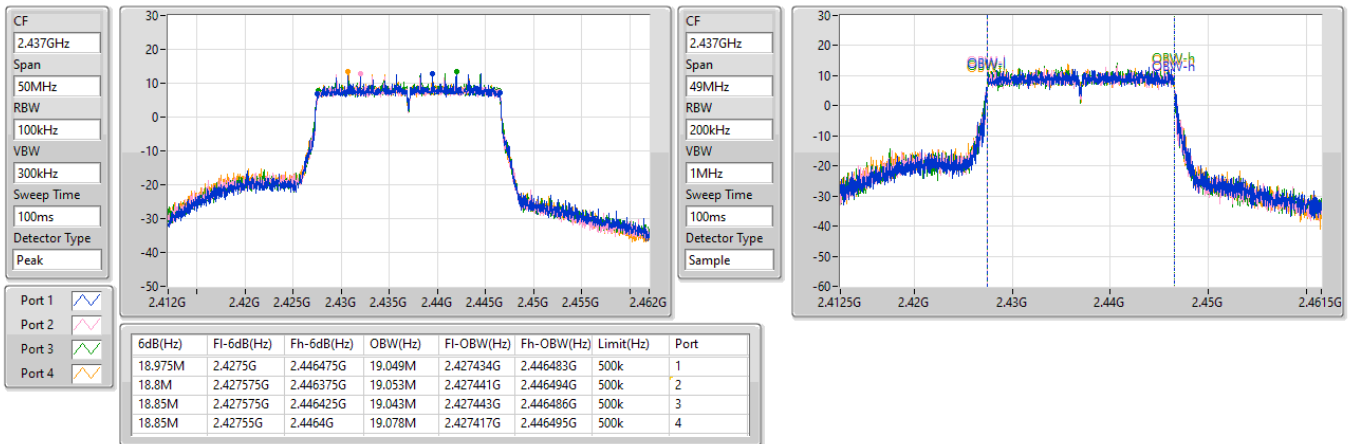
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2.4-2.4835GHz_802.11be EHT20-BF_Nss2,(MCS0)_4TX
2437MHz

EBW

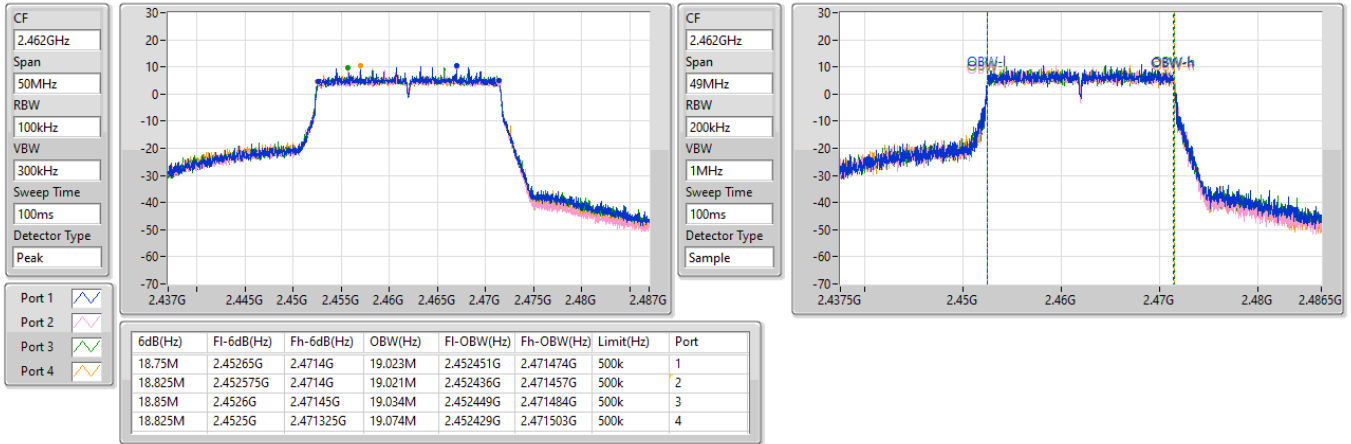
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2462MHz

EBW

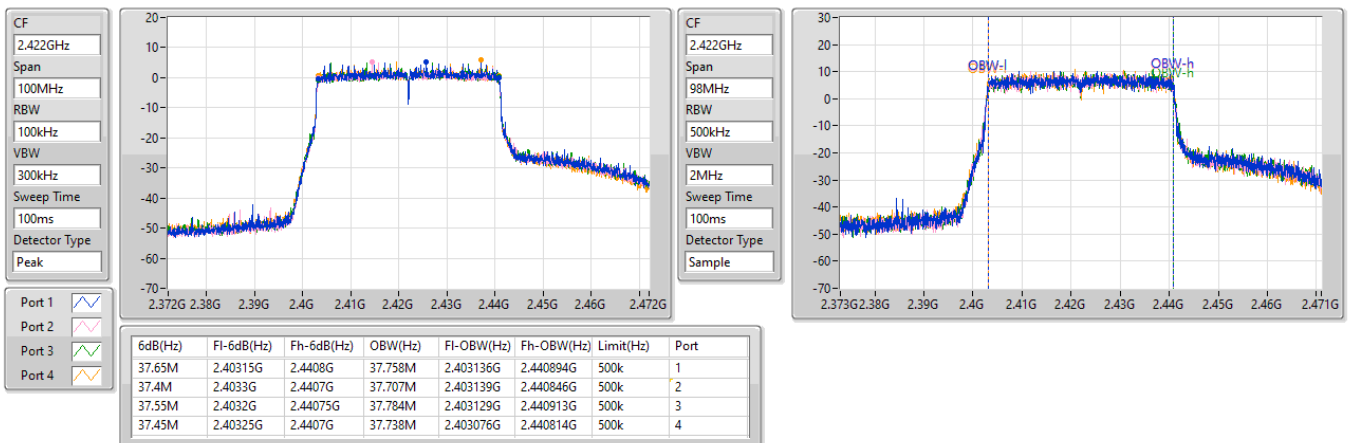
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2.4-2.4835GHz_802.11be EHT40-BF_Nss2,(MCS0)_4TX
2422MHz

EBW

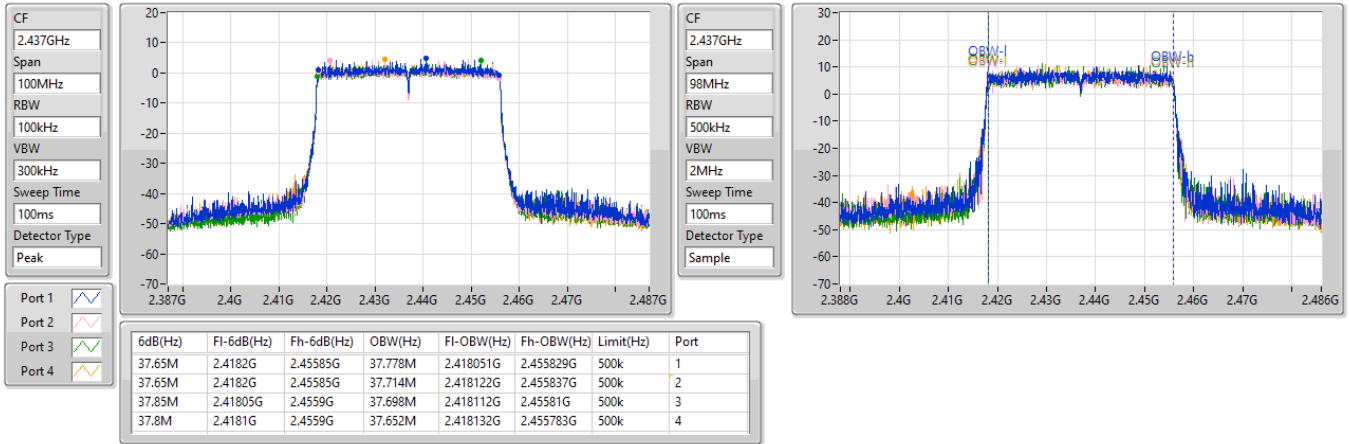
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2.4-2.4835GHz_802.11be EHT40-BF_Nss2,(MCS0)_4TX
2437MHz

EBW

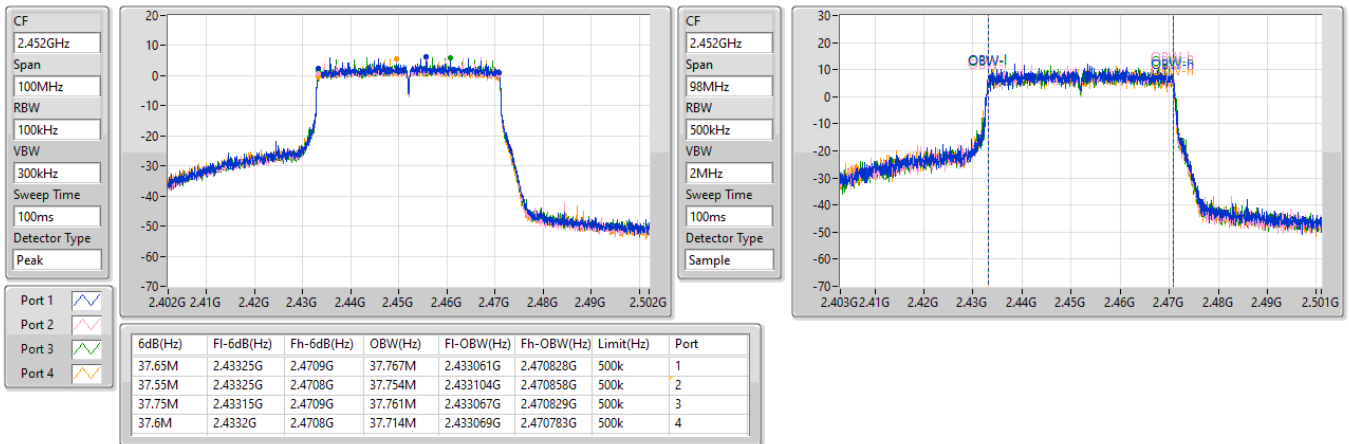
13/01/2023



2.4-2.4835GHz_802.11be EHT40-BF_Nss2,(MCS0)_4TX
2452MHz

EBW

13/01/2023





Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_4TX	29.94	0.98628
802.11g_Nss1,(6Mbps)_4TX	29.62	0.91622
802.11be EHT20-BF_Nss1,(MCS0)_4TX	28.72	0.74473
802.11be EHT20-BF_Nss2,(MCS0)_4TX	29.66	0.92470
802.11be EHT40-BF_Nss1,(MCS0)_4TX	24.72	0.29648
802.11be EHT40-BF_Nss2,(MCS0)_4TX	25.17	0.32885



Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)
802.11b_Nss1,(1Mbps)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.91	22.79	22.97	22.86	23.21	28.98	30.00
2437MHz	Pass	2.91	24.17	23.61	24.07	23.82	29.94	30.00
2462MHz	Pass	2.91	22.72	22.54	22.80	22.88	28.76	30.00
802.11g_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.91	21.17	21.14	21.05	21.02	27.12	30.00
2417MHz	Pass	2.91	23.01	22.81	23.20	22.91	29.01	30.00
2437MHz	Pass	2.91	23.77	23.62	23.42	23.57	29.62	30.00
2457MHz	Pass	2.91	21.47	21.30	21.59	21.58	27.51	30.00
2462MHz	Pass	2.91	20.81	20.40	20.58	20.49	26.59	30.00
802.11be EHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	5.99	18.64	18.81	18.44	18.66	24.66	30.00
2417MHz	Pass	5.99	21.16	21.16	21.08	21.11	27.15	30.00
2437MHz	Pass	5.99	22.56	22.33	22.97	22.90	28.72	30.00
2457MHz	Pass	5.99	20.97	20.80	21.18	21.35	27.10	30.00
2462MHz	Pass	5.99	18.74	18.18	18.42	18.62	24.52	30.00
802.11be EHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	5.99	18.81	18.57	18.49	18.92	24.72	30.00
2437MHz	Pass	5.99	18.38	18.55	18.53	18.61	24.54	30.00
2452MHz	Pass	5.99	18.36	18.30	18.55	18.49	24.45	30.00
802.11be EHT20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.99	20.10	20.03	19.86	19.93	26.00	30.00
2417MHz	Pass	2.99	22.02	21.77	22.00	21.84	27.93	30.00
2437MHz	Pass	2.99	23.48	23.57	23.71	23.81	29.66	30.00
2457MHz	Pass	2.99	21.47	21.06	21.41	21.48	27.38	30.00
2462MHz	Pass	2.99	19.87	19.78	20.08	19.99	25.95	30.00
802.11be EHT40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	2.99	19.17	19.47	18.72	18.79	25.07	30.00
2437MHz	Pass	2.99	19.51	19.03	18.83	19.19	25.17	30.00
2452MHz	Pass	2.99	19.37	18.99	19.17	18.85	25.12	30.00

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



Summary

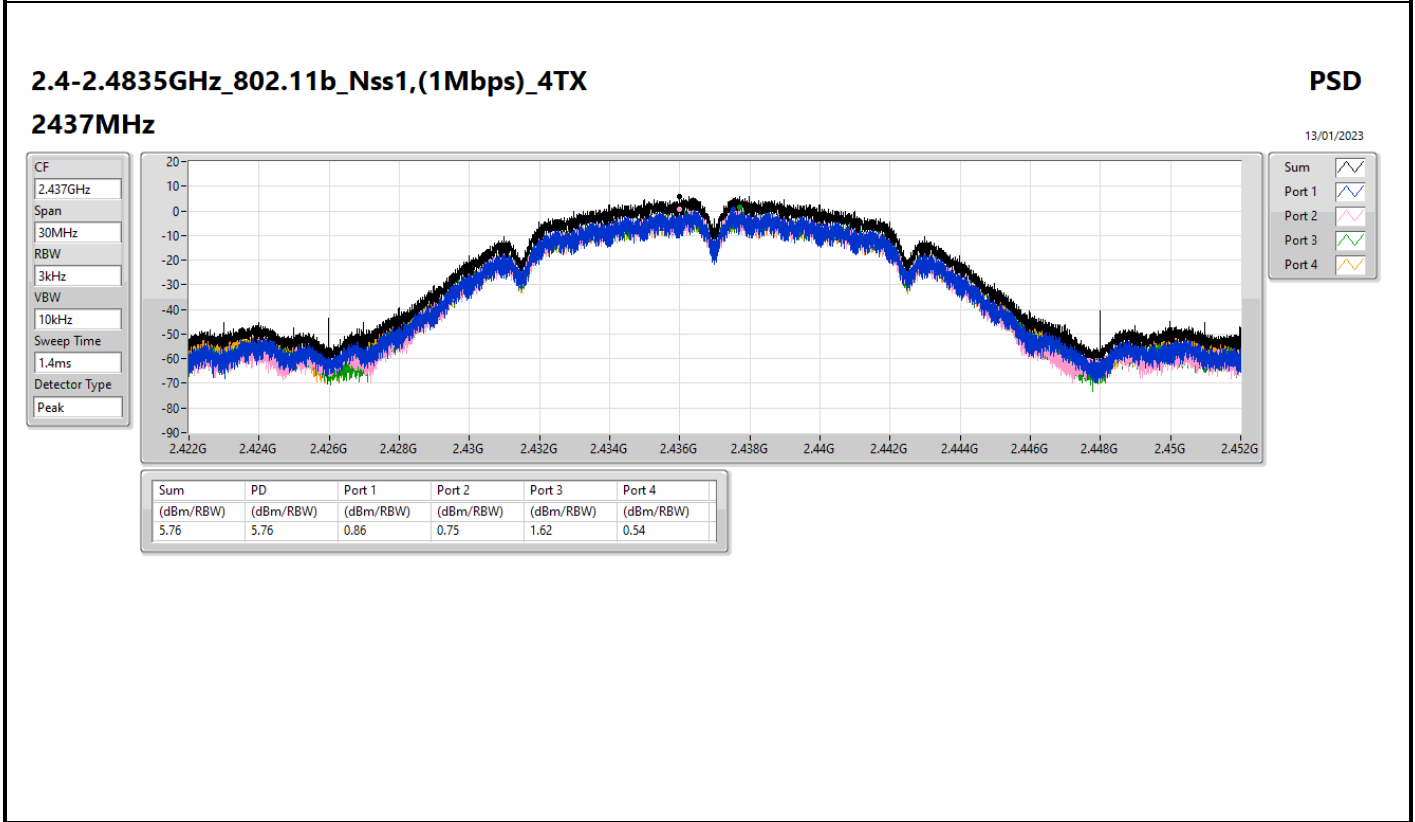
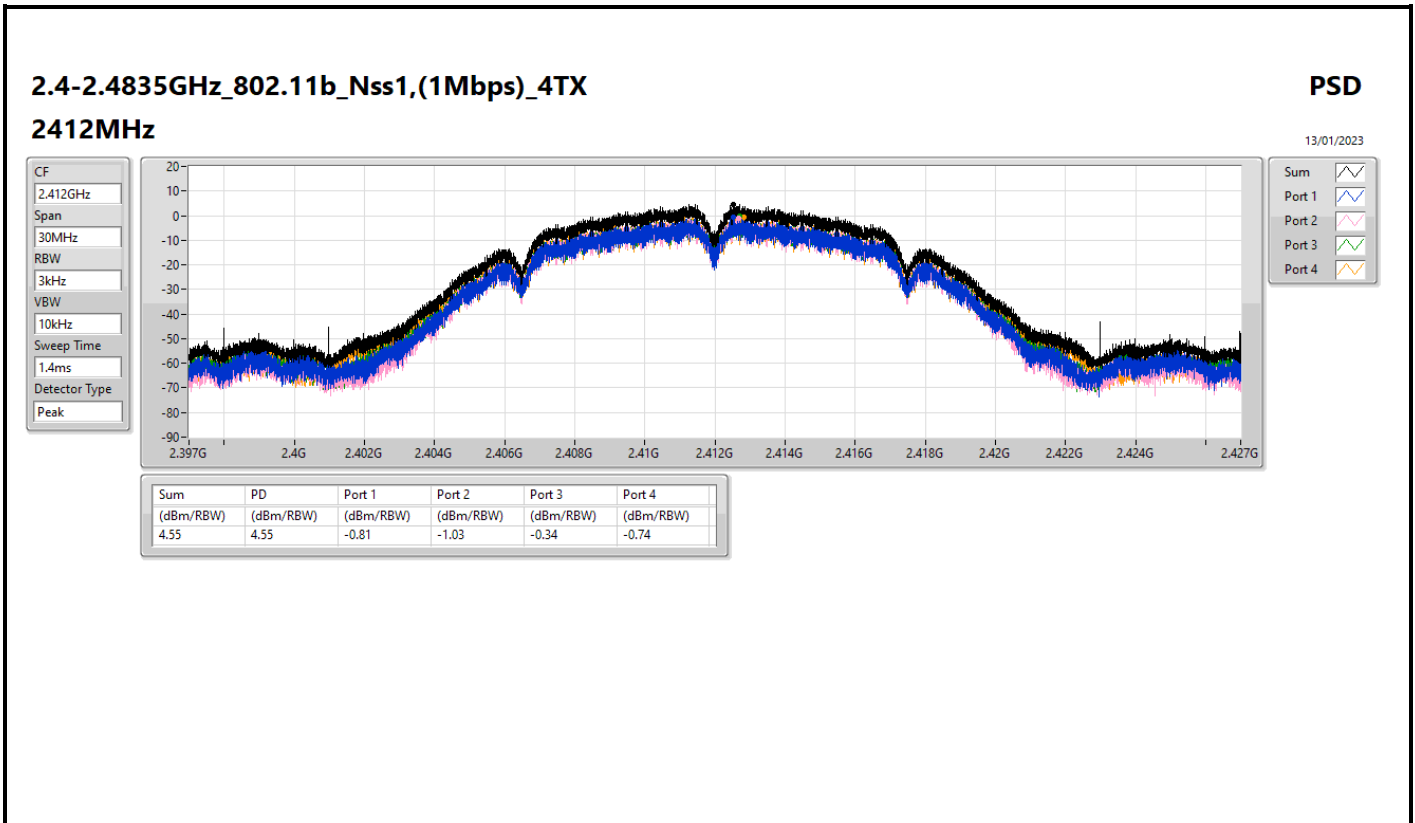
Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_4TX	5.76
802.11g_Nss1,(6Mbps)_4TX	1.22
802.11be EHT20-BF_Nss1,(MCS0)_4TX	-0.90
802.11be EHT20-BF_Nss2,(MCS0)_4TX	0.42
802.11be EHT40-BF_Nss1,(MCS0)_4TX	-7.09
802.11be EHT40-BF_Nss2,(MCS0)_4TX	-6.84

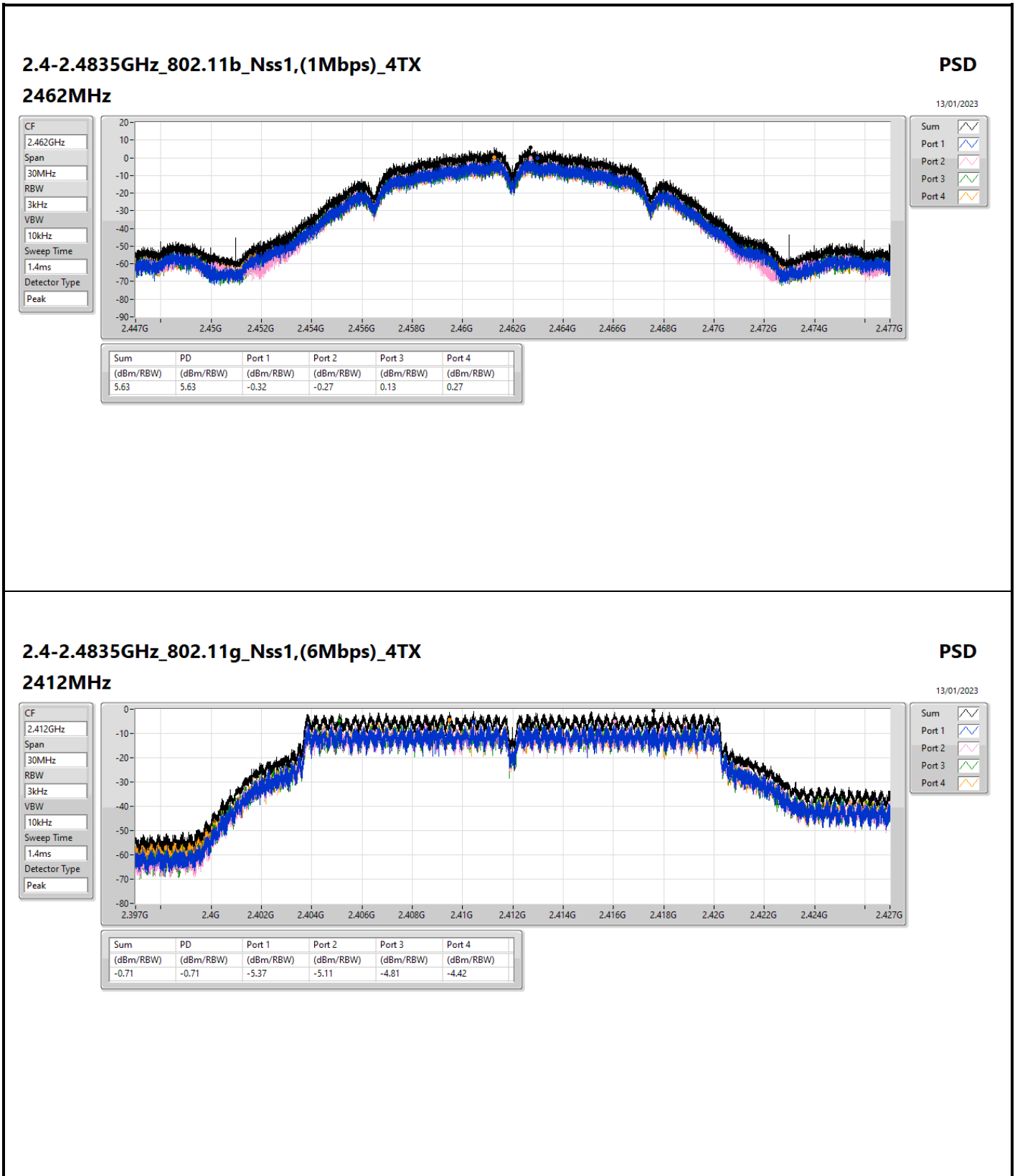
RBW = 3kHz;

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)
802.11b_Nss1,(1Mbps)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	5.99	-0.81	-1.03	-0.34	-0.74	4.55	8.00
2437MHz	Pass	5.99	0.86	0.75	1.62	0.54	5.76	8.00
2462MHz	Pass	5.99	-0.32	-0.27	0.13	0.27	5.63	8.00
802.11g_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	5.99	-5.37	-5.11	-4.81	-4.42	-0.71	8.00
2437MHz	Pass	5.99	-3.61	-2.92	-1.78	-3.13	1.22	8.00
2462MHz	Pass	5.99	-4.96	-5.01	-5.71	-5.06	-0.97	8.00
802.11be EHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	5.99	-8.97	-8.53	-7.78	-8.98	-4.39	8.00
2437MHz	Pass	5.99	-6.00	-4.41	-5.75	-5.77	-0.90	8.00
2462MHz	Pass	5.99	-9.07	-7.74	-9.20	-9.15	-4.25	8.00
802.11be EHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	5.99	-11.61	-12.82	-11.47	-12.62	-7.53	8.00
2437MHz	Pass	5.99	-11.49	-12.87	-12.29	-12.64	-7.84	8.00
2452MHz	Pass	5.99	-11.87	-12.10	-11.39	-11.35	-7.09	8.00
802.11be EHT20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.99	-7.13	-8.30	-8.34	-7.57	-4.15	8.00
2437MHz	Pass	2.99	-4.11	-4.38	-2.98	-4.28	0.42	8.00
2462MHz	Pass	2.99	-7.17	-7.83	-8.38	-7.37	-3.34	8.00
802.11be EHT40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	2.99	-12.83	-11.80	-11.89	-11.25	-6.98	8.00
2437MHz	Pass	2.99	-12.01	-11.48	-11.96	-11.45	-6.92	8.00
2452MHz	Pass	2.99	-11.22	-11.31	-11.50	-10.80	-6.84	8.00

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;



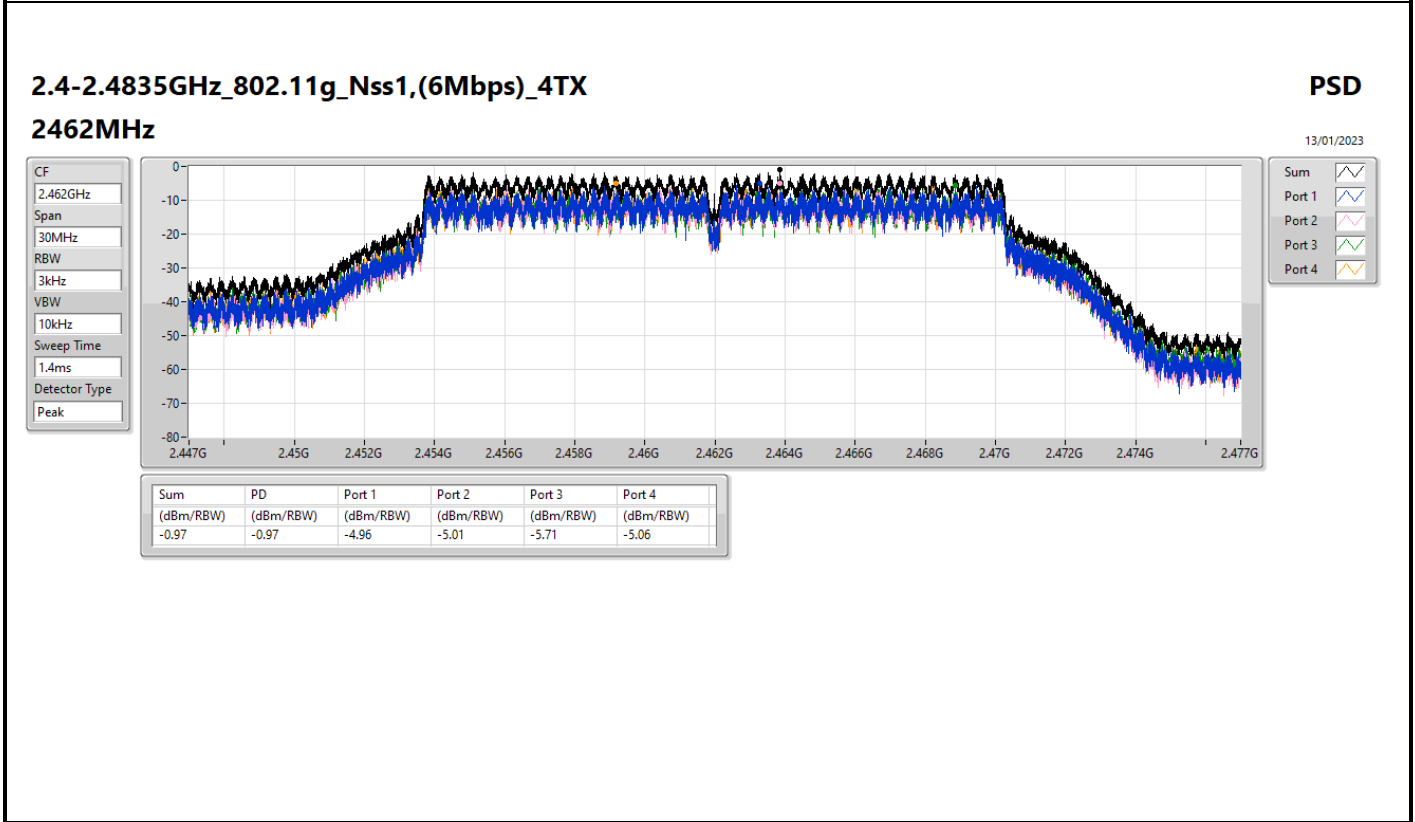
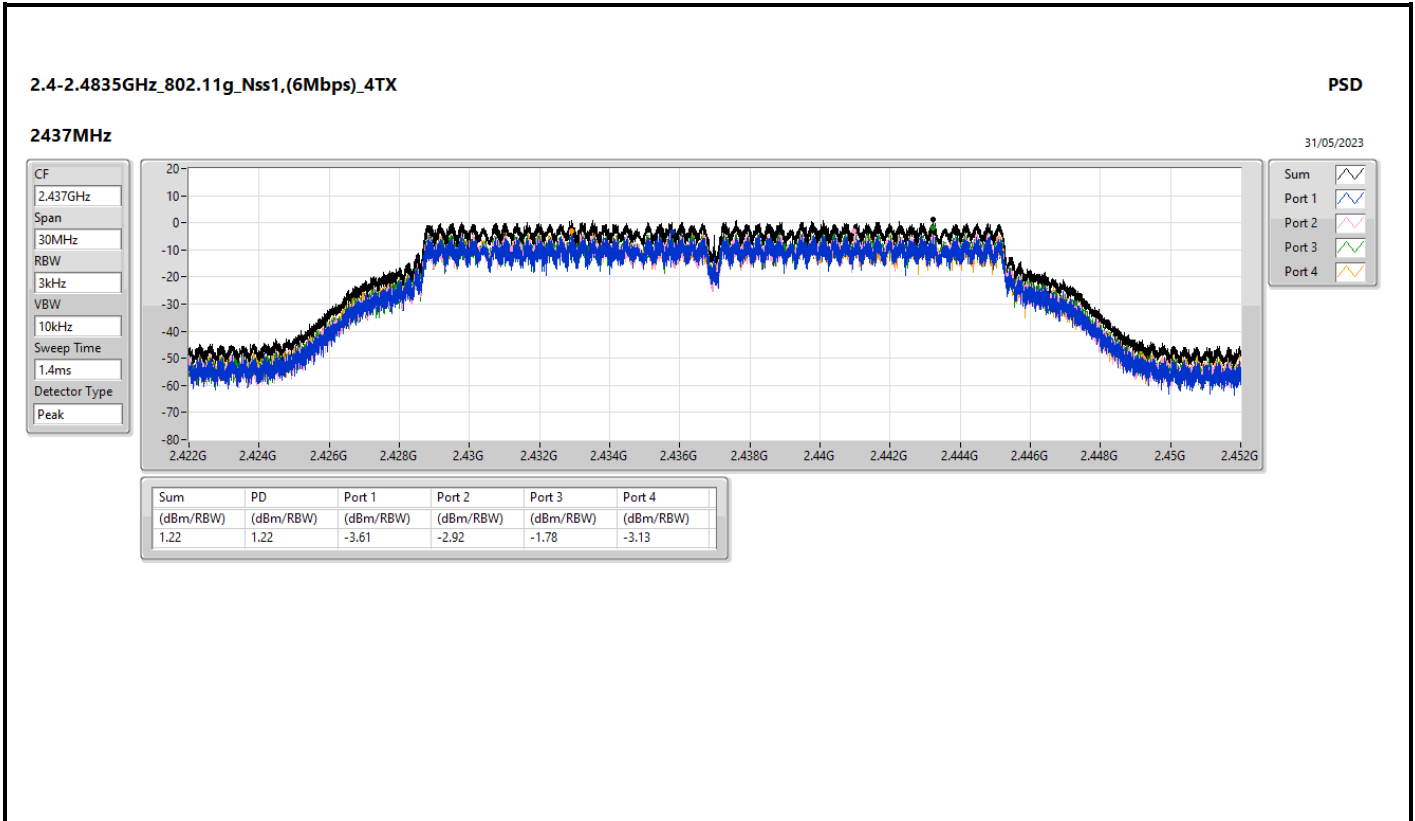


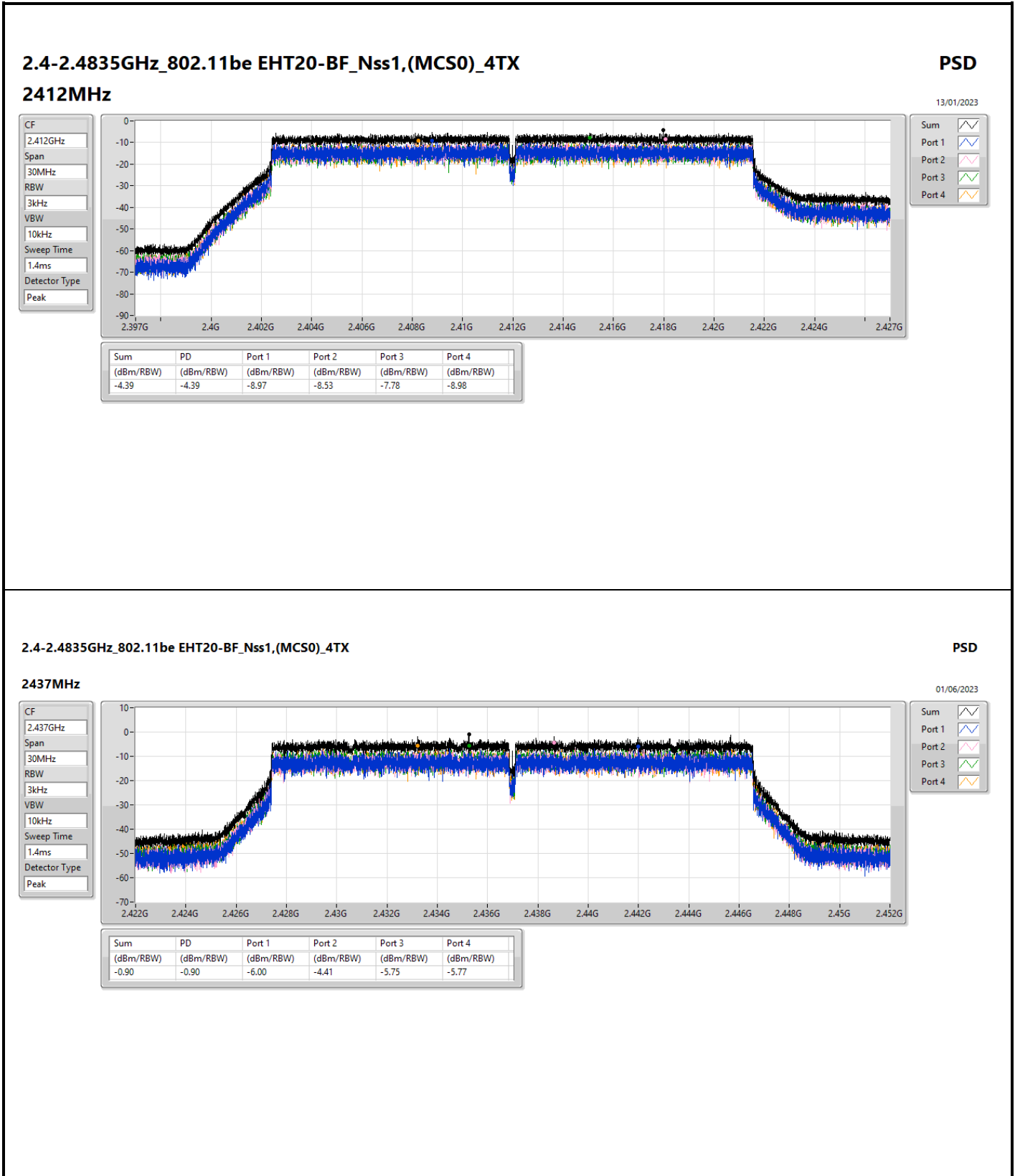
2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_4TX

2412MHz

PSD

13/01/2023



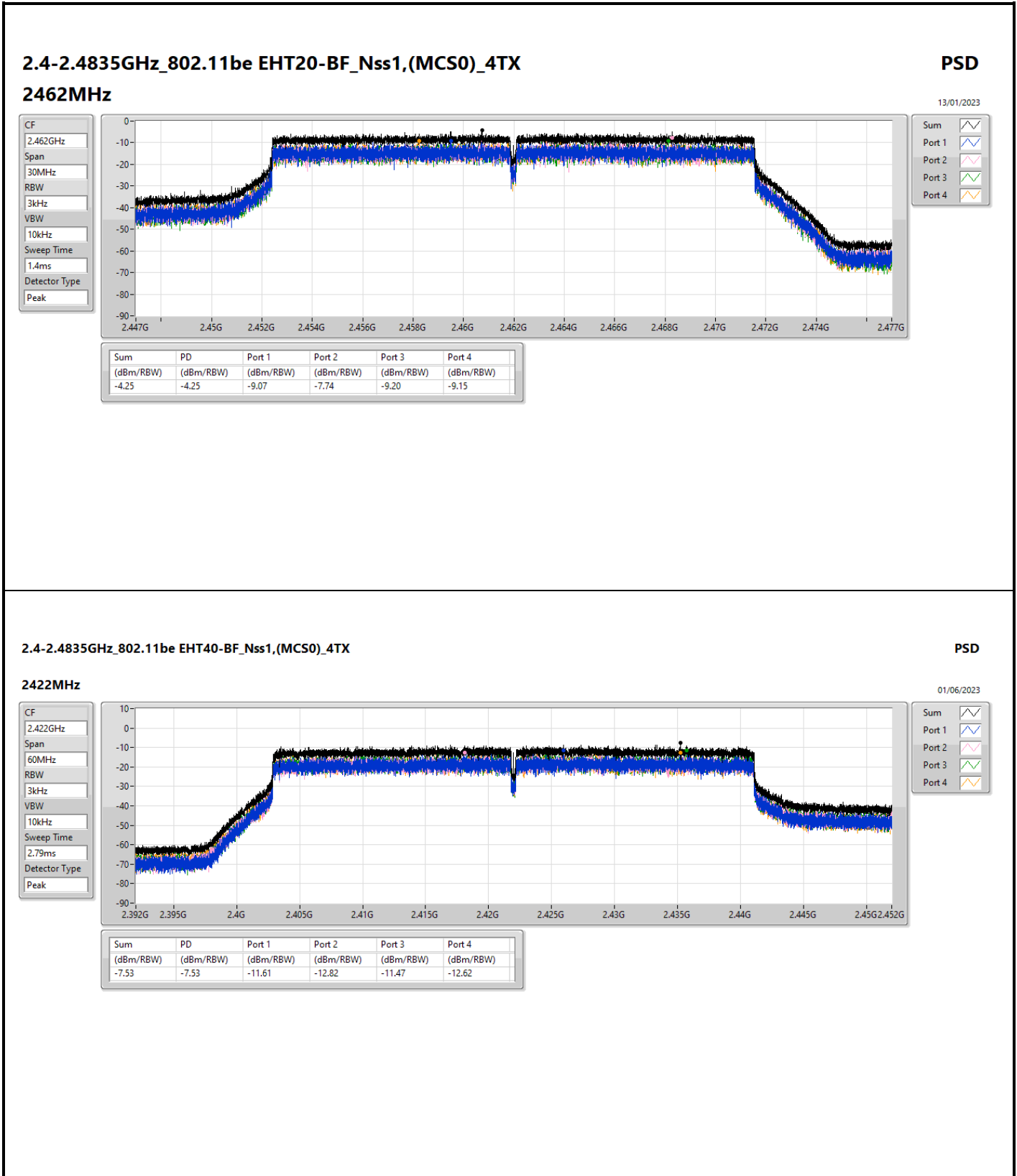


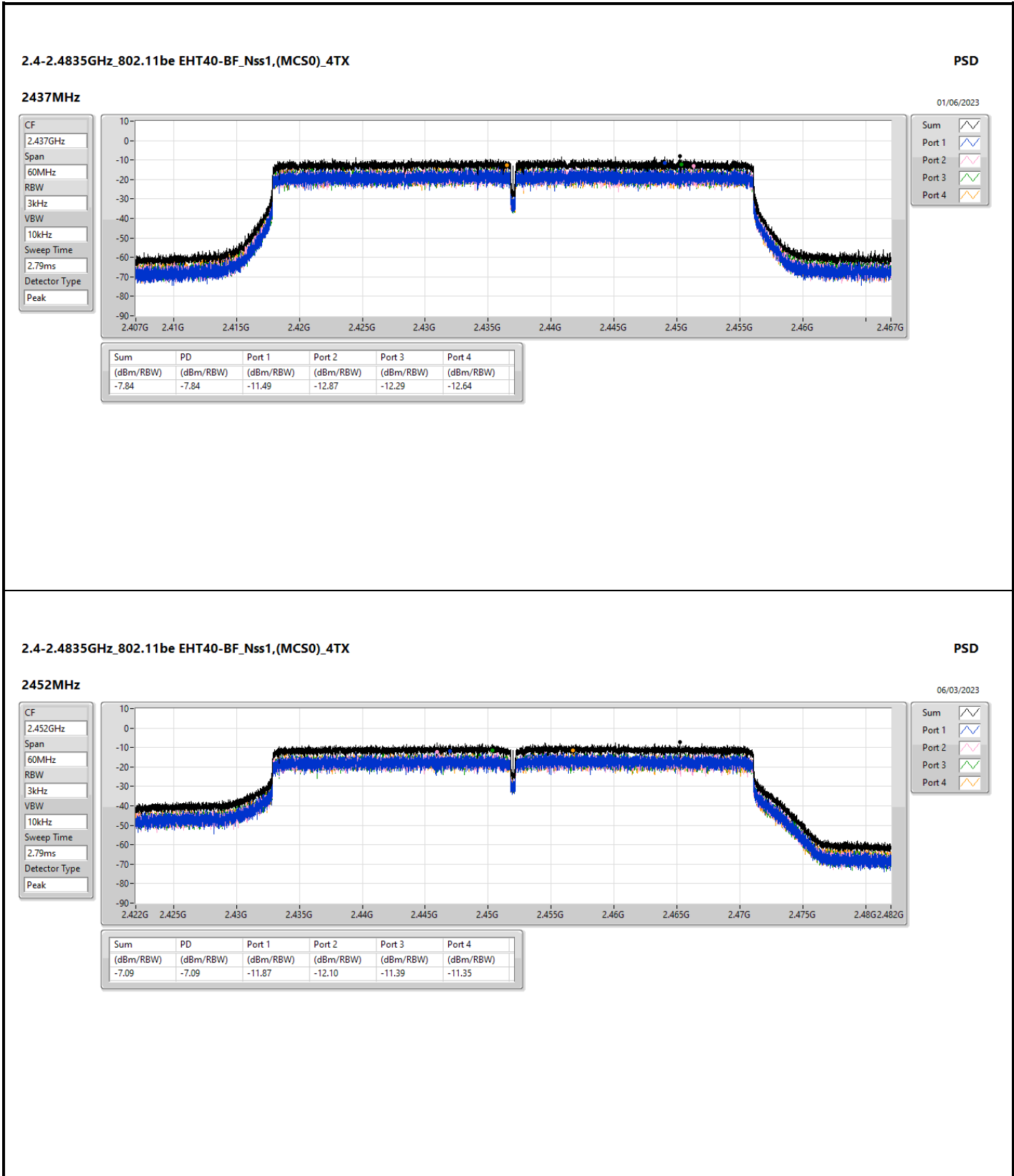
2.4-2.4835GHz_802.11be EHT20-BF_Nss1,(MCS0)_4TX

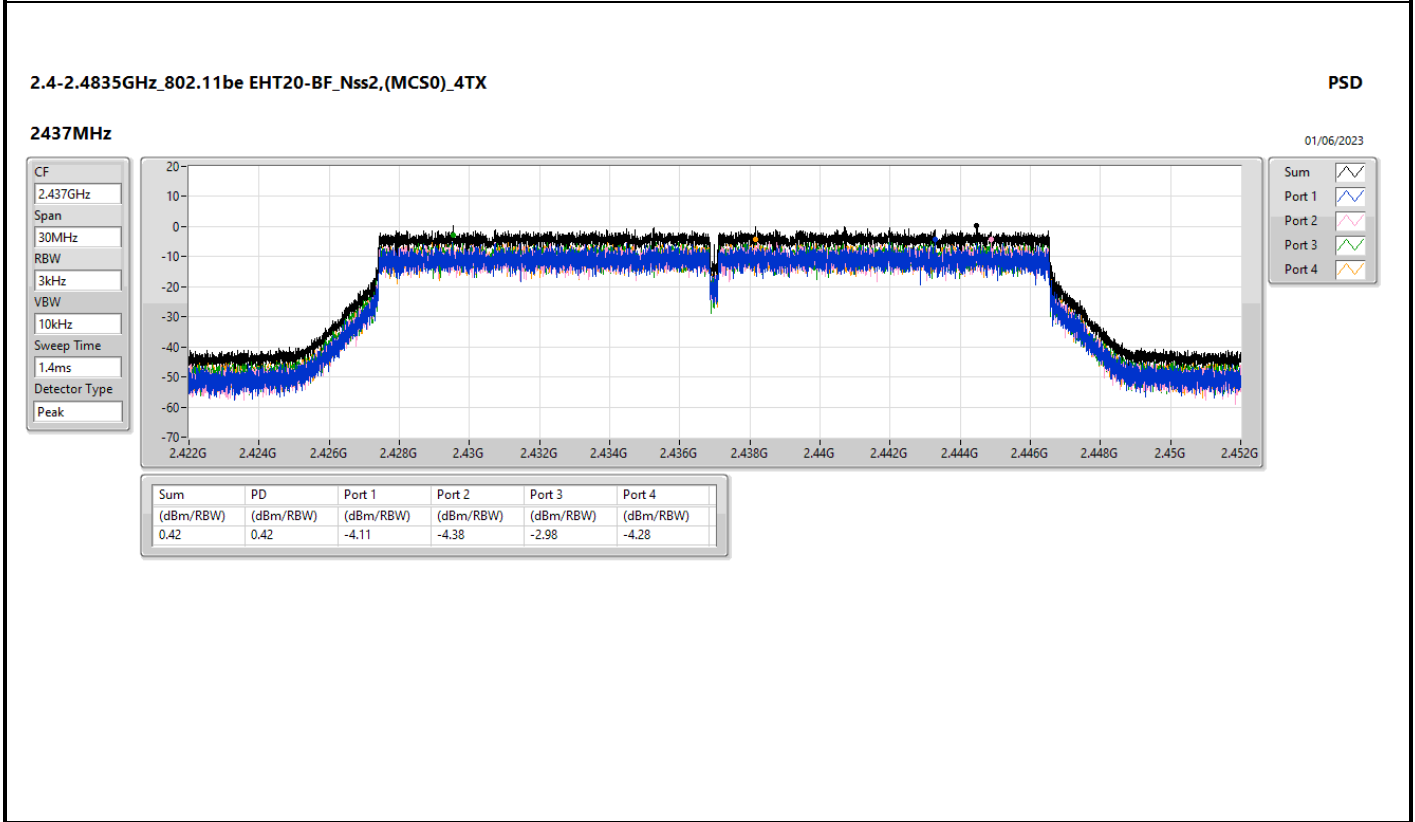
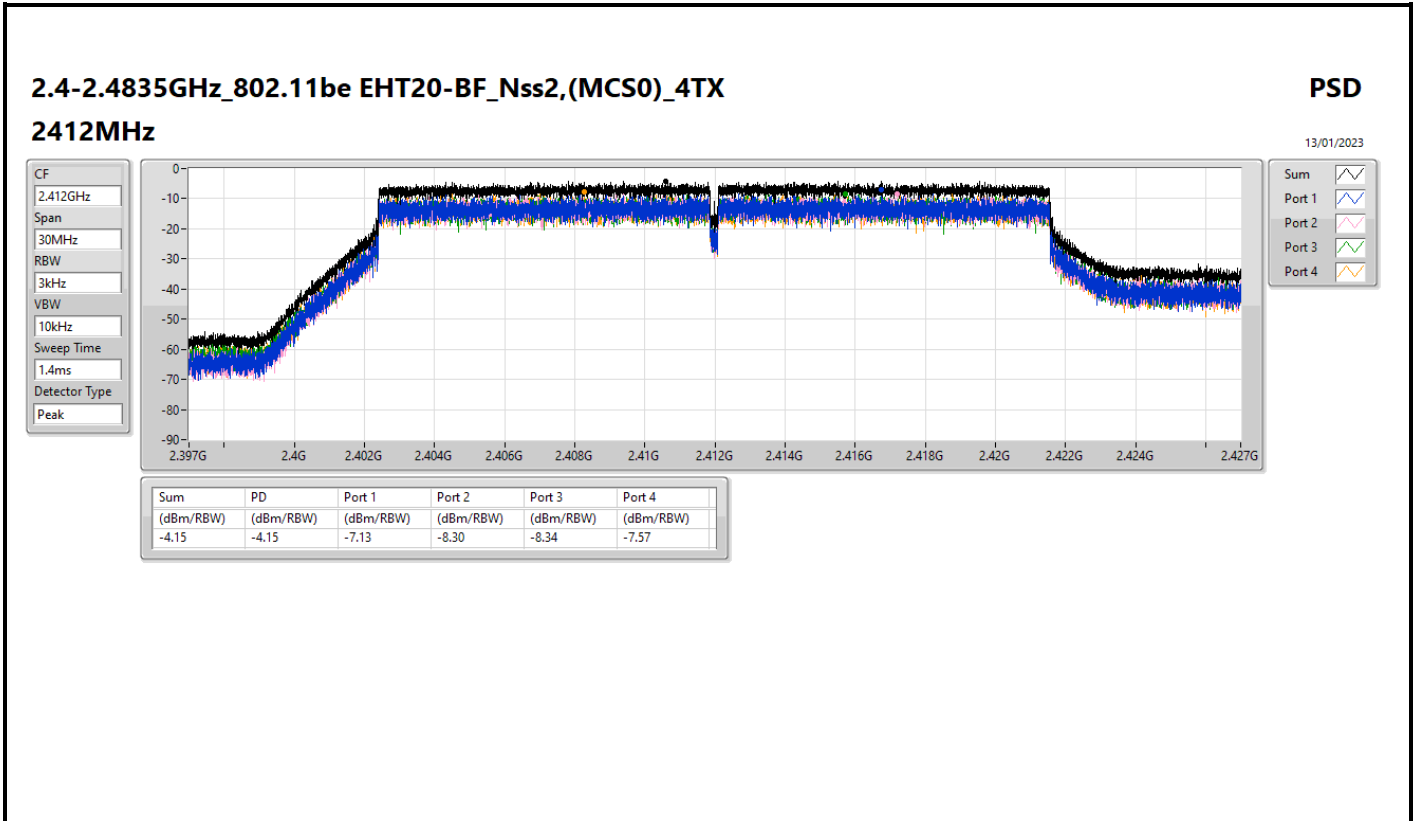
2437MHz

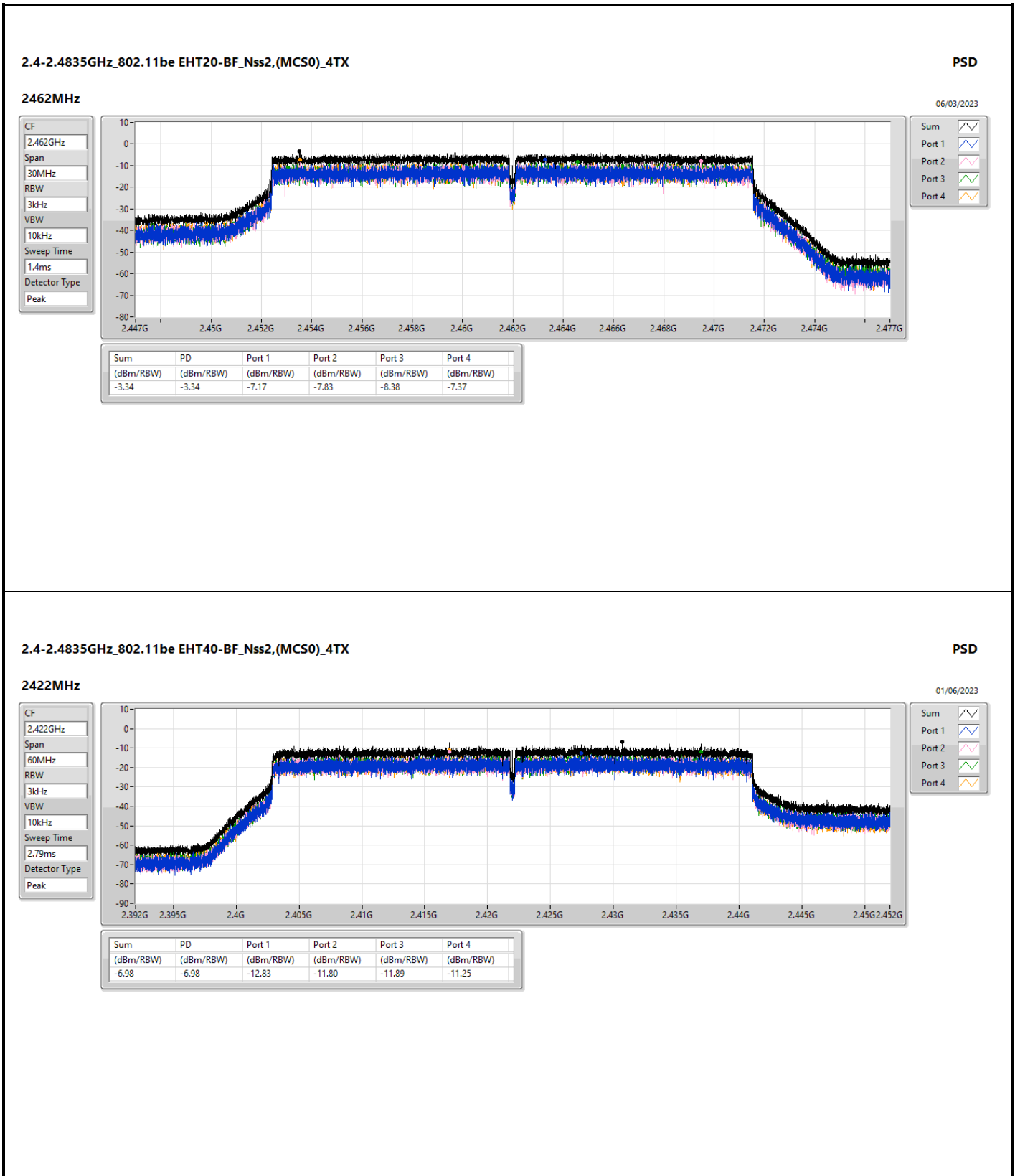
PSD

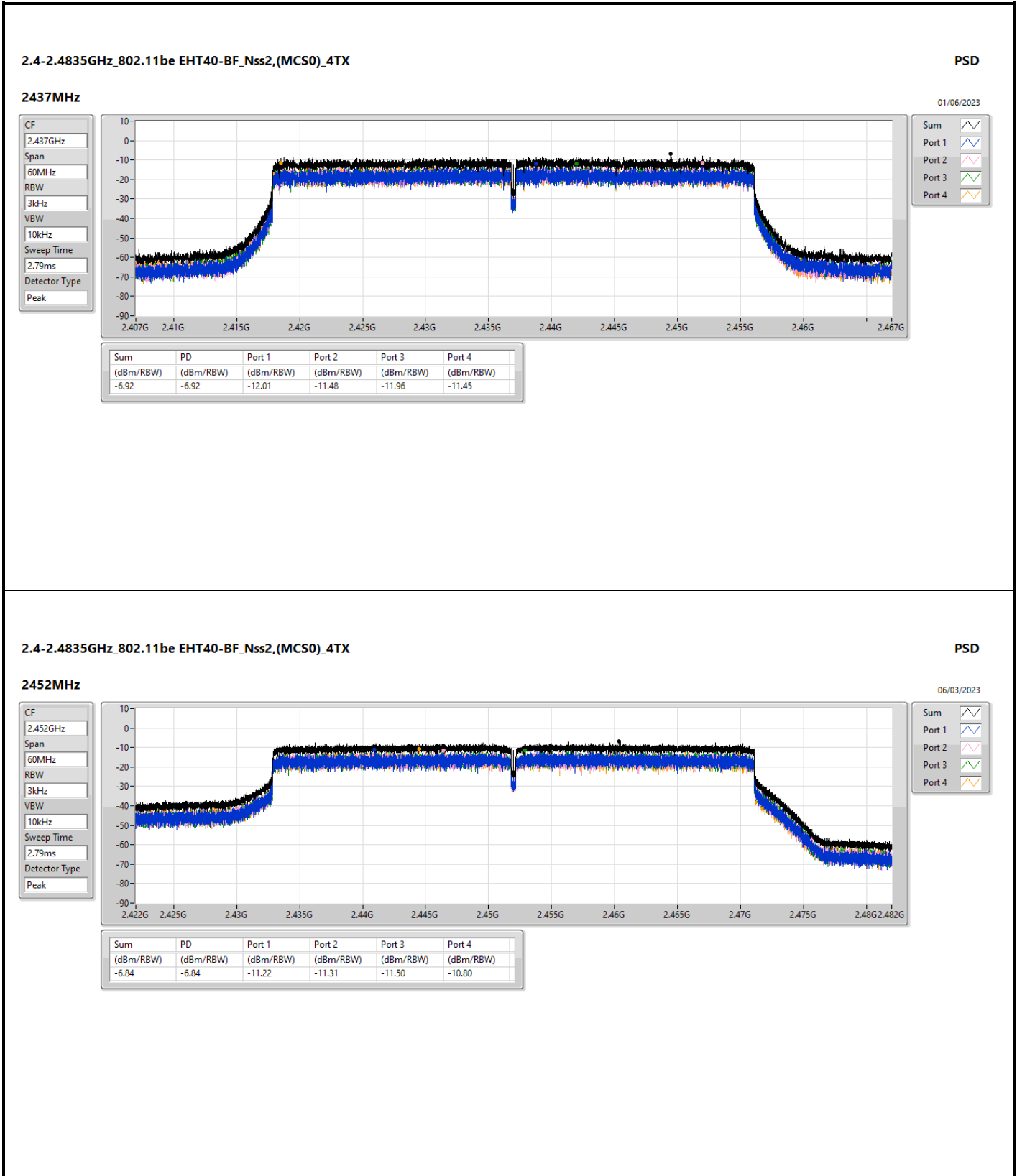
01/06/2023













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)_4TX	Pass	2.43591G	16.33	-13.67	2.30641G	-52.81	2.39904G	-35.55	2.4G	-43.50	2.51766G	-49.00	7.23795G	-31.57	4
802.11g_Nss1,(6Mbps)_4TX	Pass	2.43073G	13.68	-16.32	2.30292G	-51.18	2.4G	-30.95	2.4G	-27.90	2.52214G	-49.02	7.24076G	-38.97	4
802.11be EHT20-BF_Nss1,(MCS0)_4TX	Pass	2.44192G	13.42	-16.58	2.30175G	-53.25	2.4G	-33.96	2.4G	-31.65	2.5159G	-49.27	7.24357G	-40.76	4
802.11be EHT20-BF_Nss2,(MCS0)_4TX	Pass	2.43073G	13.87	-16.13	2.30292G	-53.36	2.4G	-33.22	2.4G	-30.43	2.50046G	-49.03	7.23795G	-40.32	2
802.11be EHT40-BF_Nss1,(MCS0)_4TX	Pass	2.44943G	6.16	-23.84	2.30168G	-52.77	2.4G	-31.71	2.4G	-29.41	2.5227G	-49.81	7.24712G	-45.48	2
802.11be EHT40-BF_Nss2,(MCS0)_4TX	Pass	2.45578G	6.88	-23.12	2.30626G	-51.21	2.39984G	-28.45	2.4G	-28.39	2.50894G	-50.72	7.24992G	-46.04	4



Result

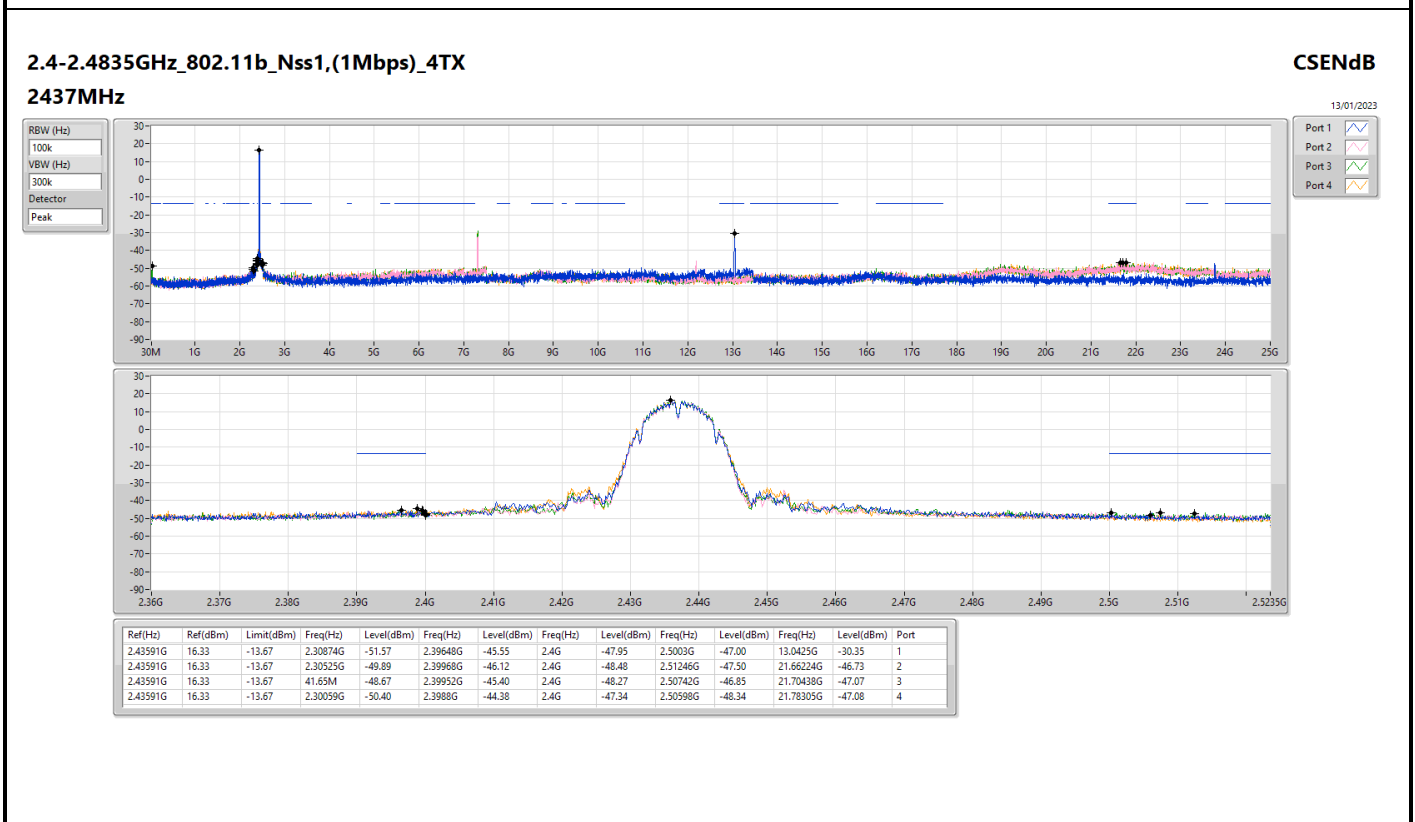
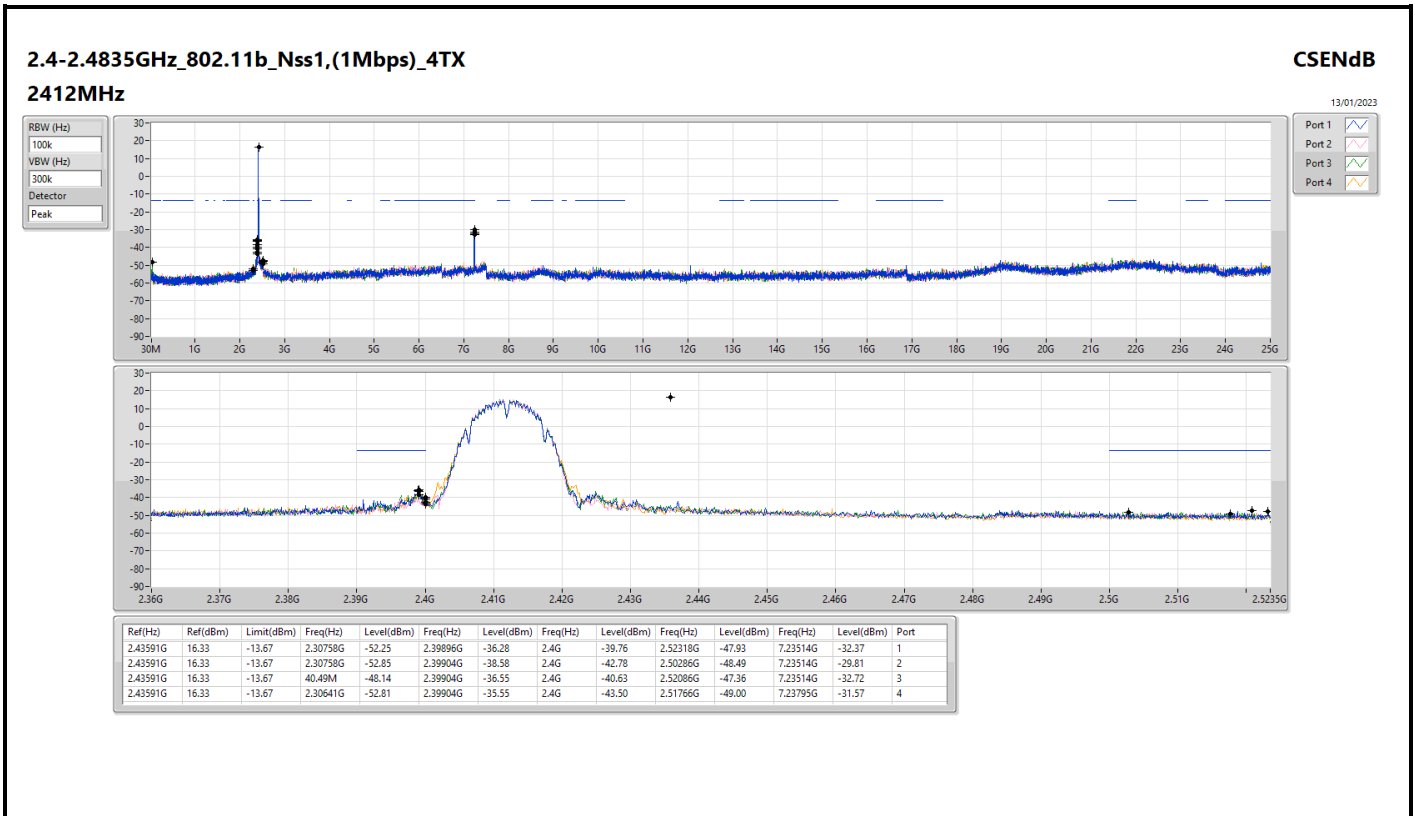
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
802.11b_Nss1,(1Mbps)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43591G	16.33	-13.67	2.30758G	-52.25	2.39896G	-36.28	2.4G	-39.76	2.52318G	-47.93	7.23514G	-32.37	1
2412MHz	Pass	2.43591G	16.33	-13.67	2.30758G	-52.85	2.39904G	-38.58	2.4G	-42.78	2.50286G	-48.49	7.23514G	-29.81	2
2412MHz	Pass	2.43591G	16.33	-13.67	40.49M	-48.14	2.39904G	-36.55	2.4G	-40.63	2.52086G	-47.36	7.23514G	-32.72	3
2412MHz	Pass	2.43591G	16.33	-13.67	2.30641G	-52.81	2.39904G	-35.55	2.4G	-43.50	2.51766G	-49.00	7.23795G	-31.57	4
2437MHz	Pass	2.43591G	16.33	-13.67	2.30874G	-51.57	2.39648G	-45.55	2.4G	-47.95	2.5003G	-47.00	13.0425G	-30.35	1
2437MHz	Pass	2.43591G	16.33	-13.67	2.30525G	-49.89	2.39968G	-46.12	2.4G	-48.48	2.51246G	-47.50	21.66224G	-46.73	2
2437MHz	Pass	2.43591G	16.33	-13.67	41.65M	-48.67	2.39952G	-45.40	2.4G	-48.27	2.50742G	-46.85	21.70438G	-47.07	3
2437MHz	Pass	2.43591G	16.33	-13.67	2.30059G	-50.40	2.3988G	-44.38	2.4G	-47.34	2.50598G	-48.34	21.78305G	-47.08	4
2462MHz	Pass	2.43591G	16.33	-13.67	2.30991G	-52.59	2.39456G	-48.72	2.4G	-51.69	2.5003G	-46.29	21.94039G	-46.35	1
2462MHz	Pass	2.43591G	16.33	-13.67	2.30059G	-52.40	2.398G	-48.19	2.4G	-51.72	2.50502G	-46.63	21.74372G	-47.12	2
2462MHz	Pass	2.43591G	16.33	-13.67	41.65M	-49.25	2.39984G	-48.00	2.4G	-51.43	2.50302G	-45.24	21.77462G	-47.29	3
2462MHz	Pass	2.43591G	16.33	-13.67	2.30874G	-51.07	2.39856G	-47.15	2.4G	-49.59	2.50526G	-46.87	21.64819G	-46.66	4
802.11g_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43073G	13.68	-16.32	2.30408G	-53.11	2.4G	-34.63	2.4G	-31.71	2.5163G	-48.31	7.23233G	-38.24	1
2412MHz	Pass	2.43073G	13.68	-16.32	2.30991G	-52.89	2.39984G	-36.77	2.4G	-32.64	2.51038G	-48.77	7.21547G	-38.39	2
2412MHz	Pass	2.43073G	13.68	-16.32	40.49M	-49.15	2.4G	-34.69	2.4G	-31.96	2.50462G	-48.00	7.23233G	-38.98	3
2412MHz	Pass	2.43073G	13.68	-16.32	2.30292G	-51.18	2.4G	-30.95	2.4G	-27.90	2.52214G	-49.02	7.24076G	-38.97	4
2437MHz	Pass	2.43073G	13.68	-16.32	2.30059G	-50.95	2.39944G	-41.59	2.4G	-43.42	2.50166G	-46.97	21.74934G	-46.10	1
2437MHz	Pass	2.43073G	13.68	-16.32	2.30991G	-52.16	2.3996G	-42.86	2.4G	-42.14	2.50014G	-46.11	21.90105G	-46.97	2
2437MHz	Pass	2.43073G	13.68	-16.32	31.17M	-50.51	2.39888G	-41.55	2.4G	-42.87	2.50422G	-46.42	21.90948G	-46.72	3
2437MHz	Pass	2.43073G	13.68	-16.32	2.30408G	-49.97	2.39912G	-42.38	2.4G	-42.93	2.50702G	-47.30	21.8561G	-47.92	4
2462MHz	Pass	2.43073G	13.68	-16.32	2.30641G	-52.21	2.39424G	-48.18	2.4G	-52.53	2.50486G	-46.84	21.63414G	-47.66	1
2462MHz	Pass	2.43073G	13.68	-16.32	2.30525G	-53.53	2.39224G	-48.21	2.4G	-51.86	2.50542G	-47.67	21.86734G	-47.39	2
2462MHz	Pass	2.43073G	13.68	-16.32	40.49M	-49.55	2.39112G	-49.55	2.4G	-52.34	2.50694G	-46.80	21.96567G	-47.48	3
2462MHz	Pass	2.43073G	13.68	-16.32	2.30408G	-52.67	2.39712G	-48.01	2.4G	-51.41	2.50182G	-47.85	21.74934G	-47.44	4
802.11be EHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.44192G	13.42	-16.58	2.30758G	-53.93	2.4G	-34.40	2.4G	-32.26	2.50942G	-49.89	7.24076G	-41.75	1
2412MHz	Pass	2.44192G	13.42	-16.58	2.30641G	-52.65	2.4G	-33.95	2.4G	-32.20	2.50446G	-49.61	7.23514G	-40.87	2
2412MHz	Pass	2.44192G	13.42	-16.58	31.17M	-52.06	2.4G	-34.25	2.4G	-32.72	2.51862G	-49.41	7.23795G	-43.94	3
2412MHz	Pass	2.44192G	13.42	-16.58	2.30175G	-53.25	2.4G	-33.96	2.4G	-31.65	2.5159G	-49.27	7.24357G	-40.76	4
2437MHz	Pass	2.44192G	13.42	-16.58	2.11768G	-53.77	2.3996G	-39.78	2.4G	-40.68	2.5019G	-47.32	21.87858G	-47.11	1
2437MHz	Pass	2.44192G	13.42	-16.58	2.30991G	-52.22	2.39928G	-39.83	2.4G	-40.57	2.51462G	-47.18	21.92634G	-47.14	2
2437MHz	Pass	2.44192G	13.42	-16.58	41.65M	-49.14	2.39912G	-39.57	2.4G	-41.35	2.51182G	-46.60	21.77181G	-47.37	3
2437MHz	Pass	2.44192G	13.42	-16.58	2.30991G	-51.84	2.39928G	-39.56	2.4G	-39.64	2.50014G	-48.04	21.91791G	-45.64	4
2462MHz	Pass	2.44192G	13.42	-16.58	2.19923G	-54.01	2.39592G	-49.20	2.4G	-53.01	2.5003G	-48.27	21.75496G	-47.40	1
2462MHz	Pass	2.44192G	13.42	-16.58	2.16079G	-53.00	2.39984G	-49.76	2.4G	-53.20	2.50038G	-47.86	21.66224G	-47.07	2
2462MHz	Pass	2.44192G	13.42	-16.58	40.49M	-50.58	2.39744G	-50.38	2.4G	-53.64	2.50702G	-48.73	21.53862G	-47.79	3
2462MHz	Pass	2.44192G	13.42	-16.58	2.30292G	-53.99	2.3912G	-48.03	2.4G	-52.41	2.5007G	-47.03	21.63414G	-46.97	4
802.11be EHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.44943G	6.16	-23.84	2.1826G	-53.37	2.4G	-29.98	2.4G	-30.47	2.50558G	-49.71	7.24992G	-44.95	1
2422MHz	Pass	2.44943G	6.16	-23.84	2.30168G	-52.77	2.4G	-31.71	2.4G	-29.41	2.5227G	-49.81	7.24712G	-45.48	2
2422MHz	Pass	2.44943G	6.16	-23.84	40.31M	-50.05	2.4G	-30.98	2.4G	-30.85	2.51294G	-49.67	7.24992G	-46.00	3
2422MHz	Pass	2.44943G	6.16	-23.84	2.1036G	-52.80	2.39984G	-30.68	2.4G	-29.48	2.51246G	-50.31	7.24992G	-43.60	4
2437MHz	Pass	2.44943G	6.16	-23.84	2.19634G	-52.89	2.3984G	-42.95	2.4G	-43.14	2.50862G	-48.59	21.69062G	-46.29	1
2437MHz	Pass	2.44943G	6.16	-23.84	2.01658G	-52.53	2.3984G	-40.71	2.4G	-45.12	2.5019G	-47.77	21.97949G	-46.96	2
2437MHz	Pass	2.44943G	6.16	-23.84	41.45M	-50.42	2.39856G	-41.16	2.4G	-44.47	2.50142G	-48.88	21.7439G	-46.62	3
2437MHz	Pass	2.44943G	6.16	-23.84	2.11963G	-53.68	2.39648G	-41.88	2.4G	-43.85	2.5075G	-50.24	21.70744G	-47.73	4
2452MHz	Pass	2.44943G	6.16	-23.84	1.75552G	-53.81	2.39984G	-36.65	2.4G	-37.14	2.50334G	-47.51	21.71025G	-46.96	1
2452MHz	Pass	2.44943G	6.16	-23.84	1.96047G	-52.81	2.39904G	-35.54	2.4G	-37.58	2.50878G	-48.05	21.57002G	-47.46	2
2452MHz	Pass	2.44943G	6.16	-23.84	41.45M	-49.94	2.39984G	-36.12	2.4G	-37.18	2.51134G	-47.68	21.71586G	-46.85	3
2452MHz	Pass	2.44943G	6.16	-23.84	2.30855G	-53.28	2.39952G	-34.48	2.4G	-36.10	2.50062G	-48.81	21.88974G	-46.19	4
802.11be EHT20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43073G	13.87	-16.13	2.15263G	-53.86	2.4G	-33.54	2.4G	-31.36	2.50598G	-49.02	7.23514G	-39.49	1
2412MHz	Pass	2.43073G	13.87	-16.13	2.30292G	-53.36	2.4G	-33.22	2.4G	-30.43	2.50046G	-49.03	7.23795G	-40.32	2
2412MHz	Pass	2.43073G	13.87	-16.13	41.65M	-50.87	2.39992G	-33.50	2.4G	-31.26	2.50558G	-48.74	7.24076G	-42.18	3
2412MHz	Pass	2.43073G	13.87	-16.13	2.30525G	-52.21	2.39992G	-31.77	2.4G	-30.82	2.50454G	-49.61	7.24357G	-39.70	4
2437MHz	Pass	2.43073G	13.87	-16.13	2.30408G	-51.57	2.39776G	-40.93	2.4G	-40.98	2.50318G	-46.63	21.96005G	-46.73	1
2437MHz	Pass	2.43073G	13.87	-16.13	2.30059G	-50.91	2.39936G	-39.91	2.4G	-42.19	2.50582G	-46.57	21.8842G	-47.13	2
2437MHz	Pass	2.43073G	13.87	-16.13	41.65M	-49.72	2.39984G	-40.13	2.4G	-40.80	2.50734G	-46.66	21.74653G	-47.40	3
2437MHz	Pass	2.43073G	13.87	-16.13	2.30292G	-51.04	2.39904G	-40.03	2.4G	-40.88	2.50822G	-46.92	21.73248G	-46.65	4

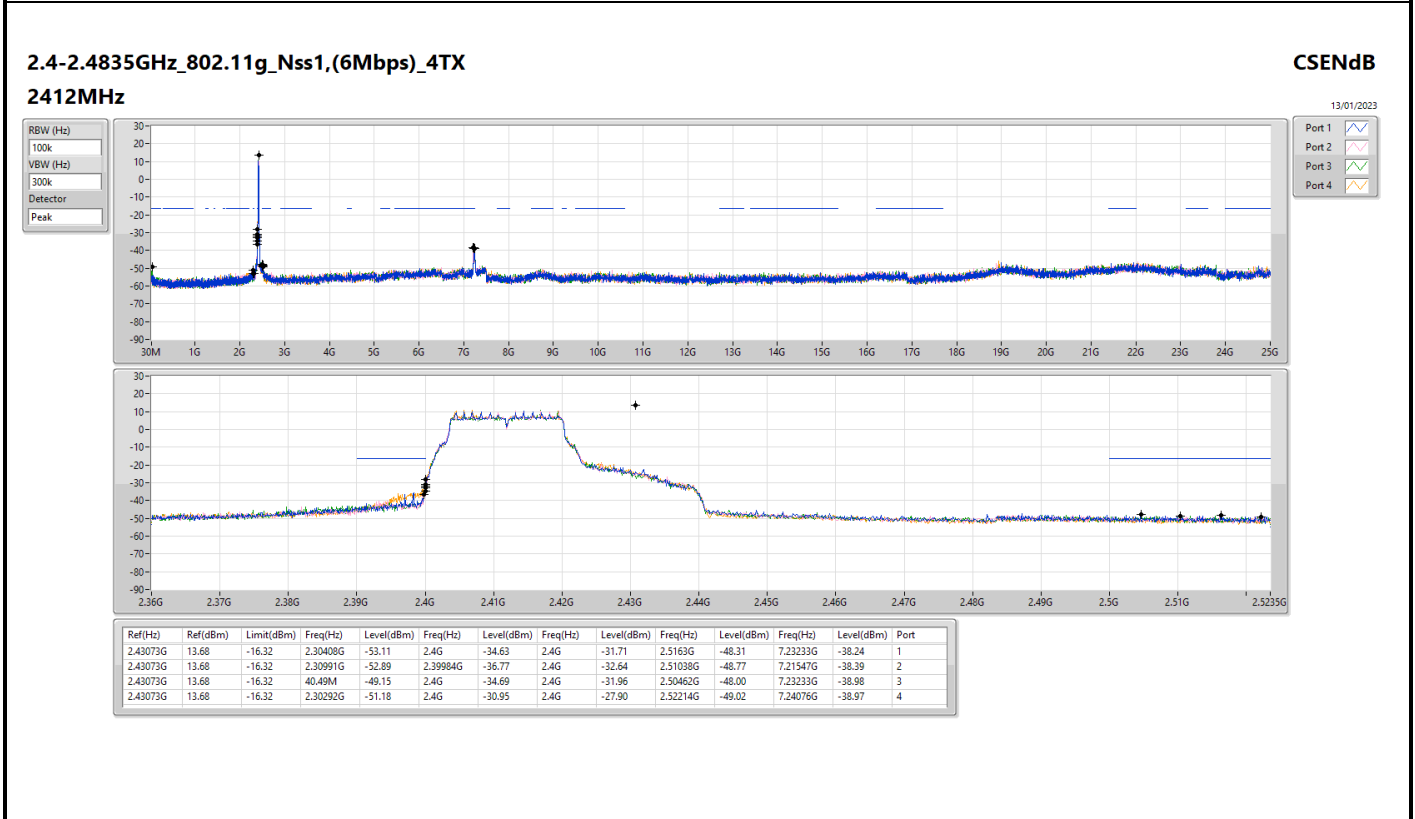
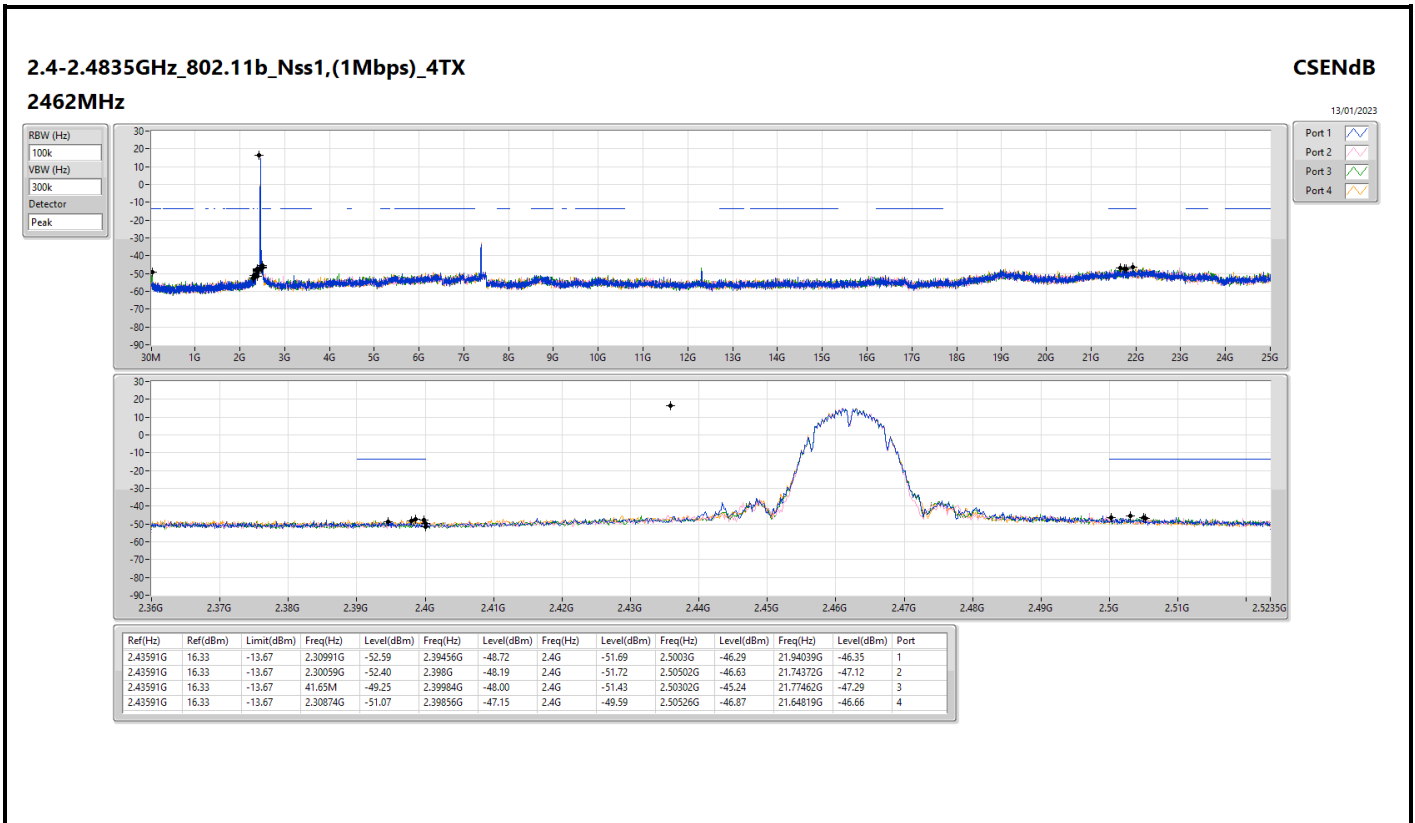


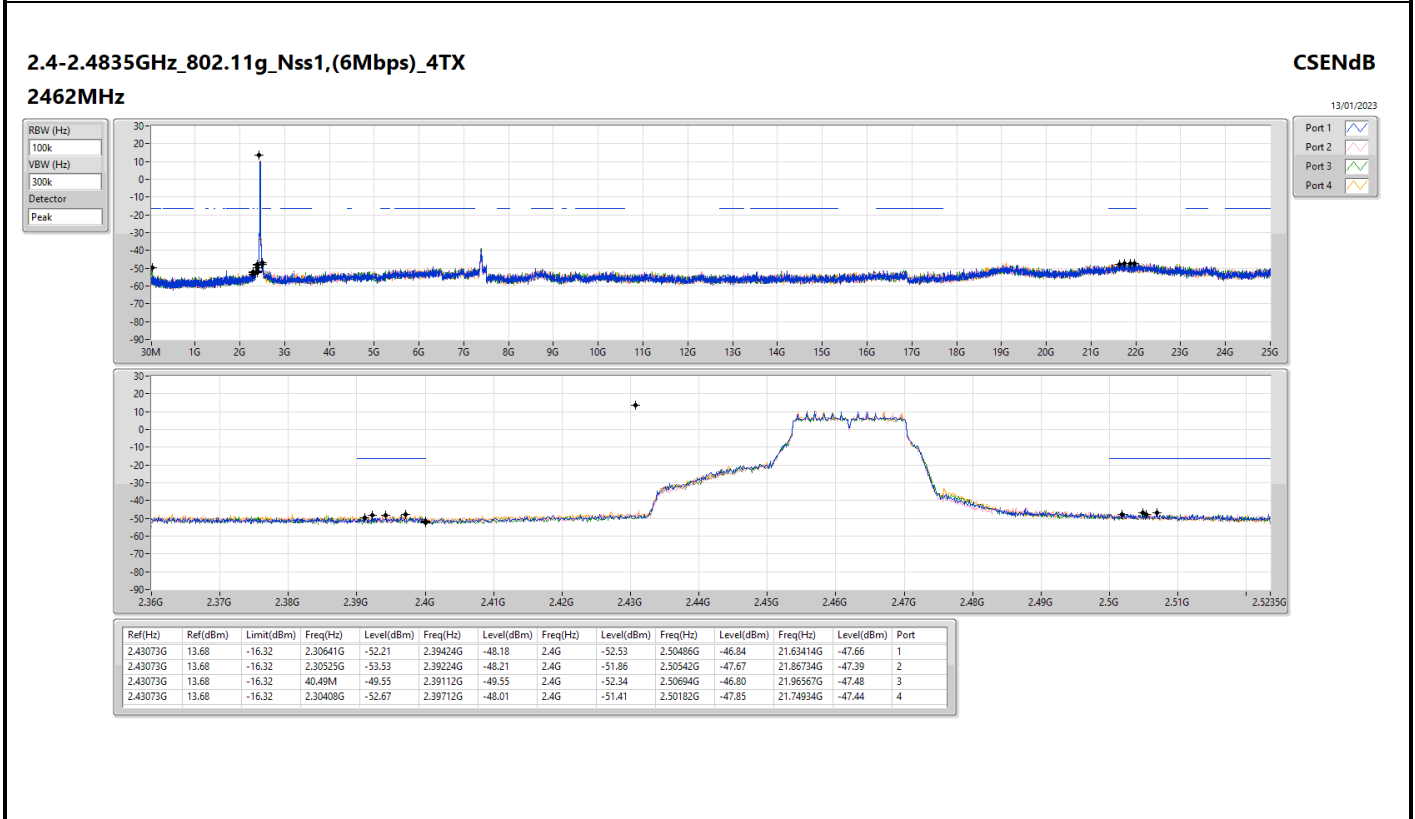
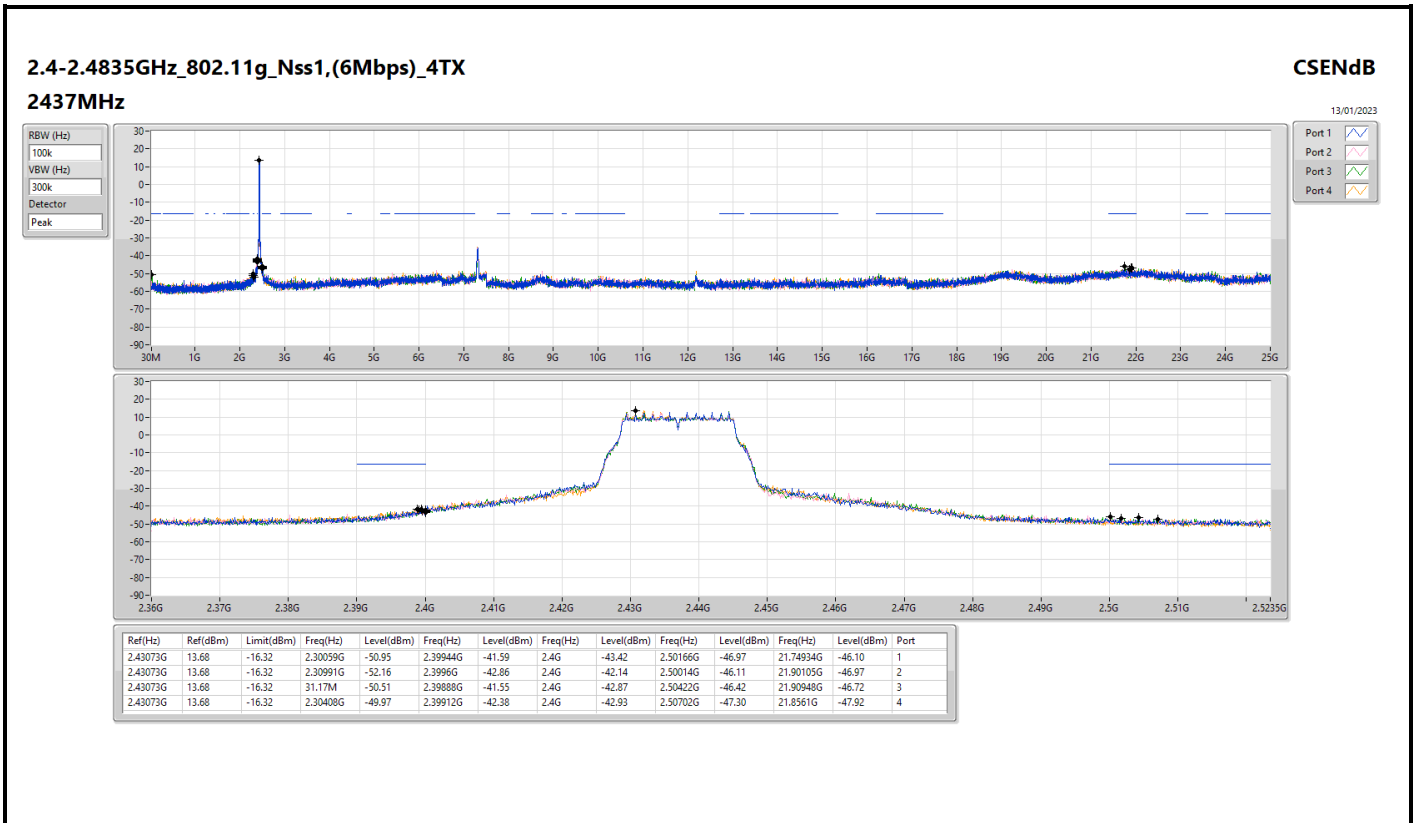
CSE (NdB Down)

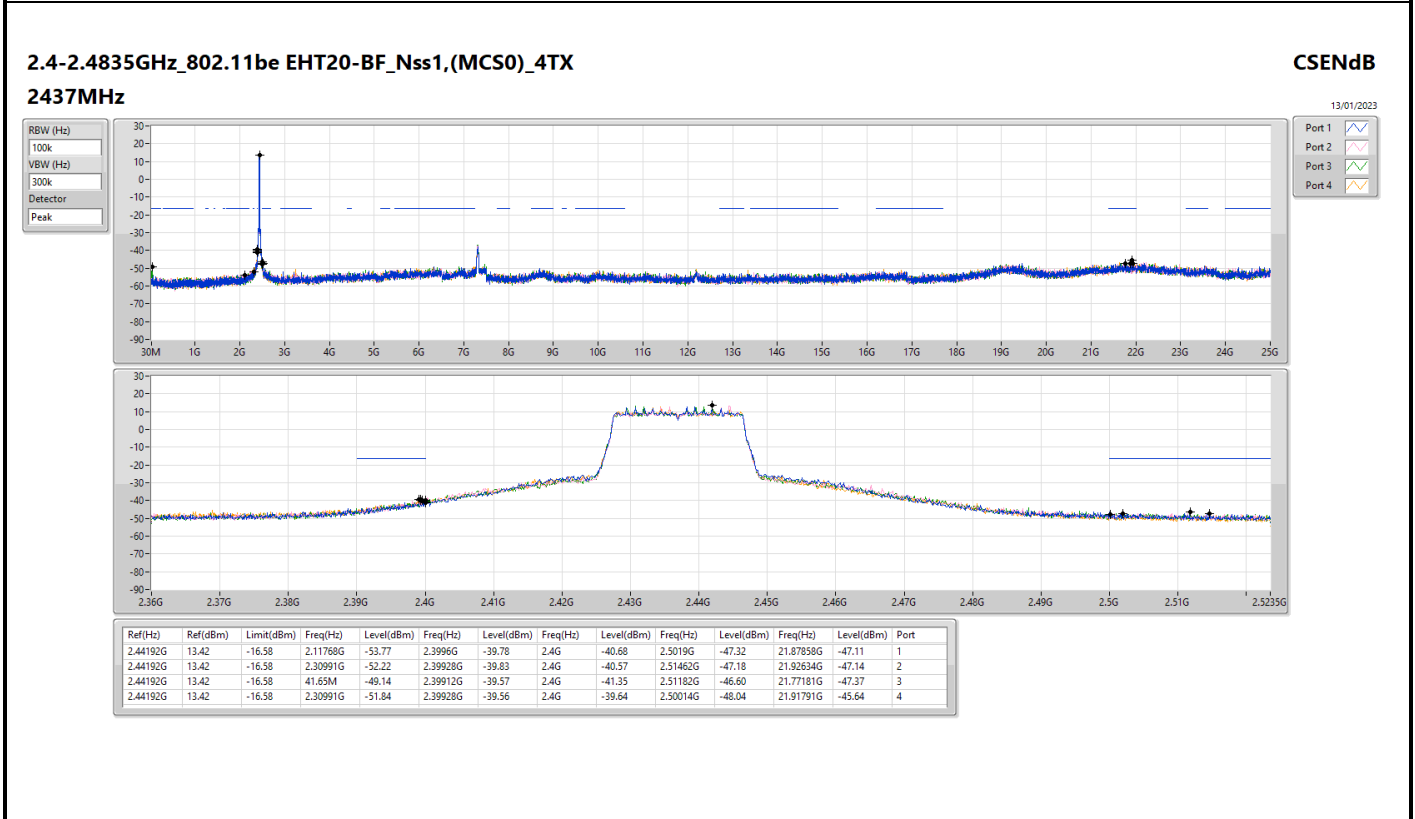
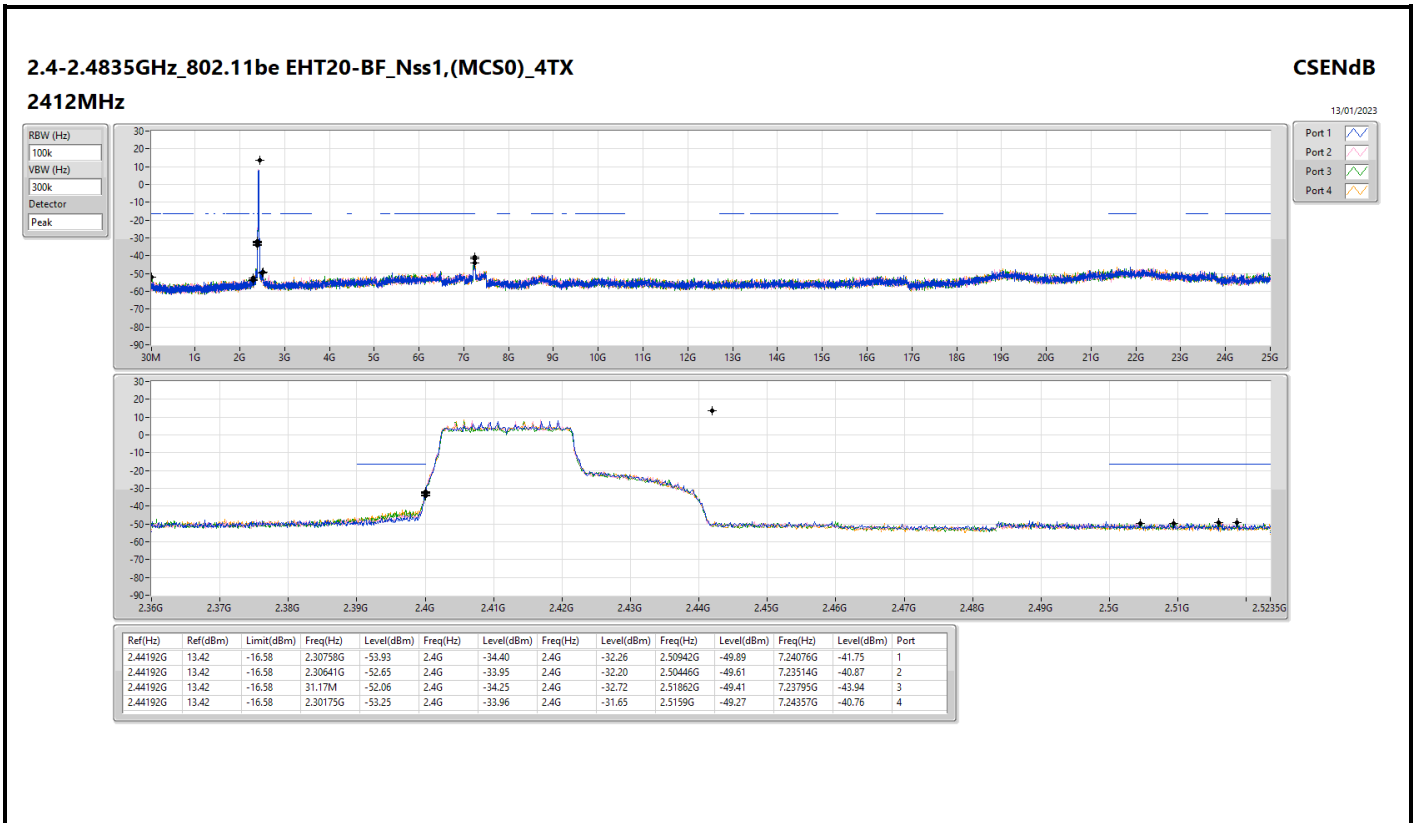
Appendix D

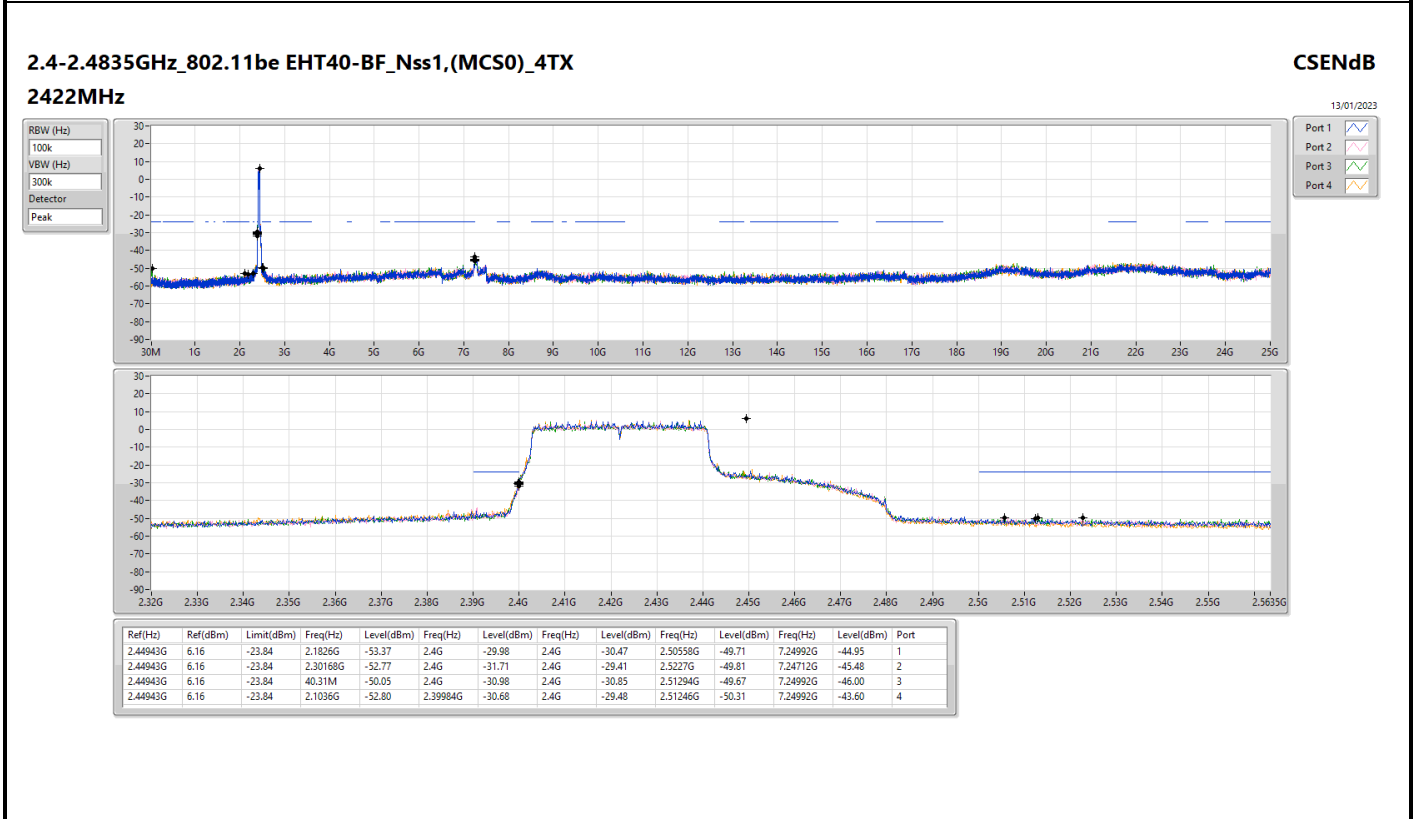
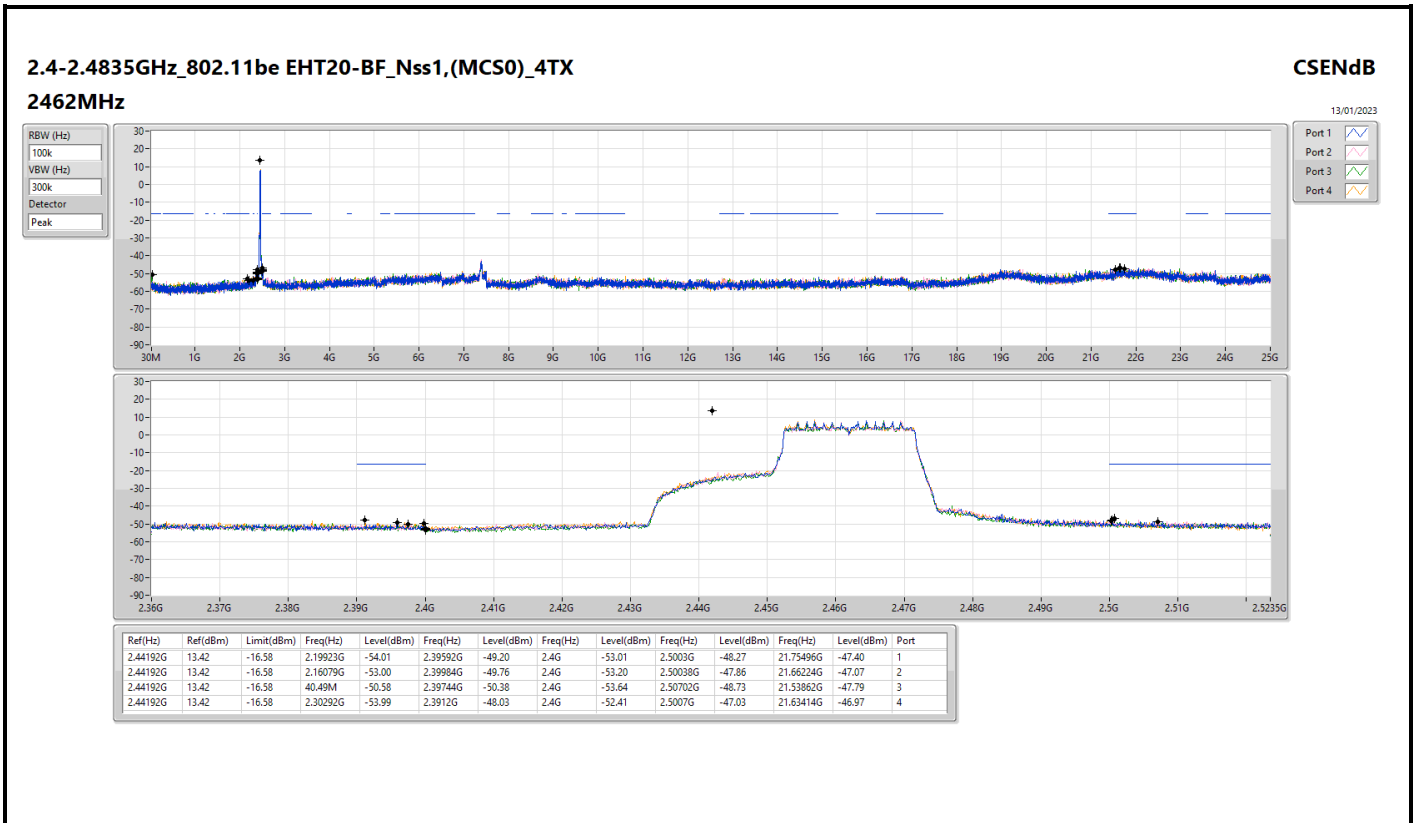
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2462MHz	Pass	2.43073G	13.87	-16.13	45.15M	-52.92	2.39624G	-48.77	2.4G	-52.38	2.50134G	-46.01	21.92915G	-46.89	1
2462MHz	Pass	2.43073G	13.87	-16.13	2.30292G	-53.11	2.3924G	-48.86	2.4G	-52.65	2.50486G	-47.63	21.68191G	-47.81	2
2462MHz	Pass	2.43073G	13.87	-16.13	40.49M	-50.76	2.39224G	-48.14	2.4G	-52.82	2.50878G	-46.01	21.87015G	-47.58	3
2462MHz	Pass	2.43073G	13.87	-16.13	2.10254G	-53.99	2.39368G	-48.26	2.4G	-50.23	2.50246G	-47.49	21.87296G	-47.28	4
802.11be EHT40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.45578G	6.88	-23.12	2.30054G	-52.67	2.4G	-31.13	2.4G	-28.73	2.53646G	-50.09	7.24992G	-44.52	1
2422MHz	Pass	2.45578G	6.88	-23.12	2.30626G	-52.95	2.39968G	-30.07	2.4G	-28.72	2.5123G	-49.67	7.24712G	-45.77	2
2422MHz	Pass	2.45578G	6.88	-23.12	41.45M	-49.29	2.4G	-29.17	2.4G	-29.06	2.51598G	-48.81	7.2359G	-46.61	3
2422MHz	Pass	2.45578G	6.88	-23.12	2.30626G	-51.21	2.39984G	-28.45	2.4G	-28.39	2.50894G	-50.72	7.24992G	-46.04	4
2437MHz	Pass	2.45578G	6.88	-23.12	2.16199G	-53.69	2.39728G	-43.07	2.4G	-40.25	2.50014G	-48.73	21.69623G	-47.33	1
2437MHz	Pass	2.45578G	6.88	-23.12	2.30054G	-52.52	2.39824G	-41.63	2.4G	-41.69	2.50078G	-47.88	21.60928G	-46.92	2
2437MHz	Pass	2.45578G	6.88	-23.12	41.45M	-50.31	2.39648G	-43.16	2.4G	-46.60	2.50286G	-49.39	21.7411G	-47.47	3
2437MHz	Pass	2.45578G	6.88	-23.12	2.30512G	-53.15	2.3952G	-41.68	2.4G	-45.81	2.50622G	-48.77	21.99631G	-47.39	4
2452MHz	Pass	2.45578G	6.88	-23.12	2.30512G	-51.32	2.39952G	-32.76	2.4G	-32.18	2.50846G	-47.36	21.72147G	-47.18	1
2452MHz	Pass	2.45578G	6.88	-23.12	2.30283G	-53.28	2.39952G	-32.78	2.4G	-36.16	2.5027G	-48.43	21.69623G	-47.19	2
2452MHz	Pass	2.45578G	6.88	-23.12	41.45M	-50.20	2.39952G	-35.11	2.4G	-37.14	2.50126G	-47.14	21.57002G	-46.22	3
2452MHz	Pass	2.45578G	6.88	-23.12	2.18604G	-53.58	2.39952G	-35.41	2.4G	-35.61	2.50398G	-48.44	21.65416G	-47.26	4

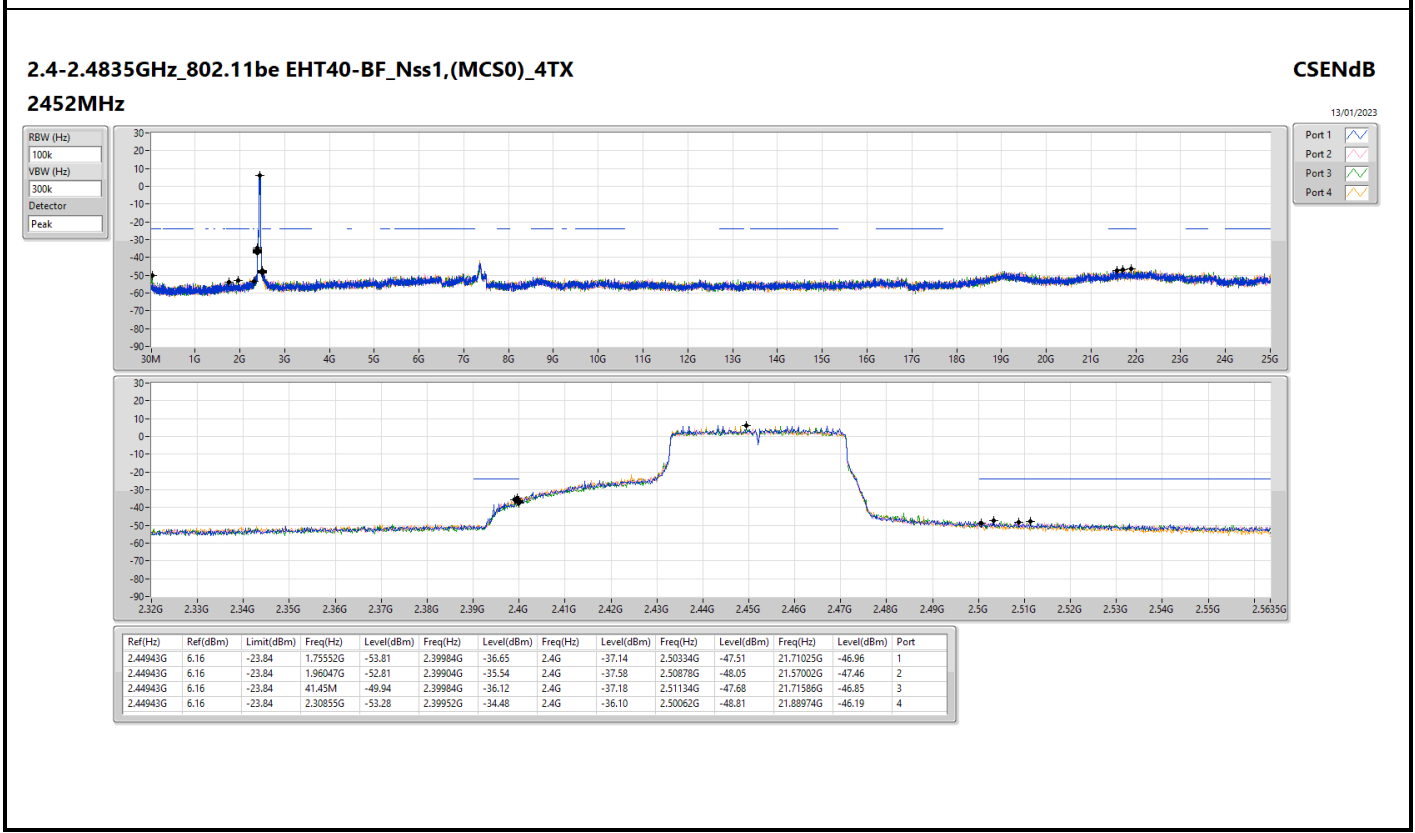
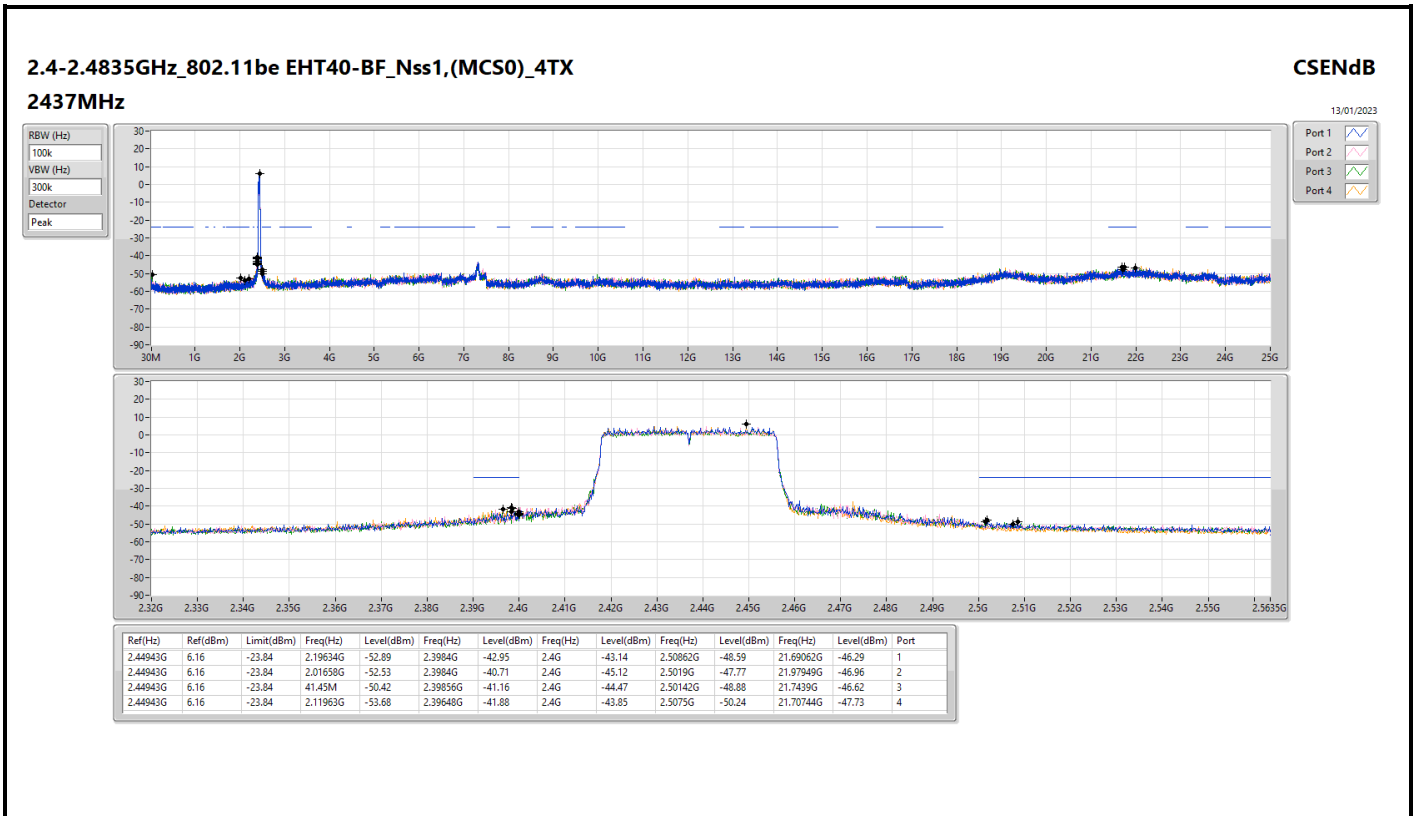


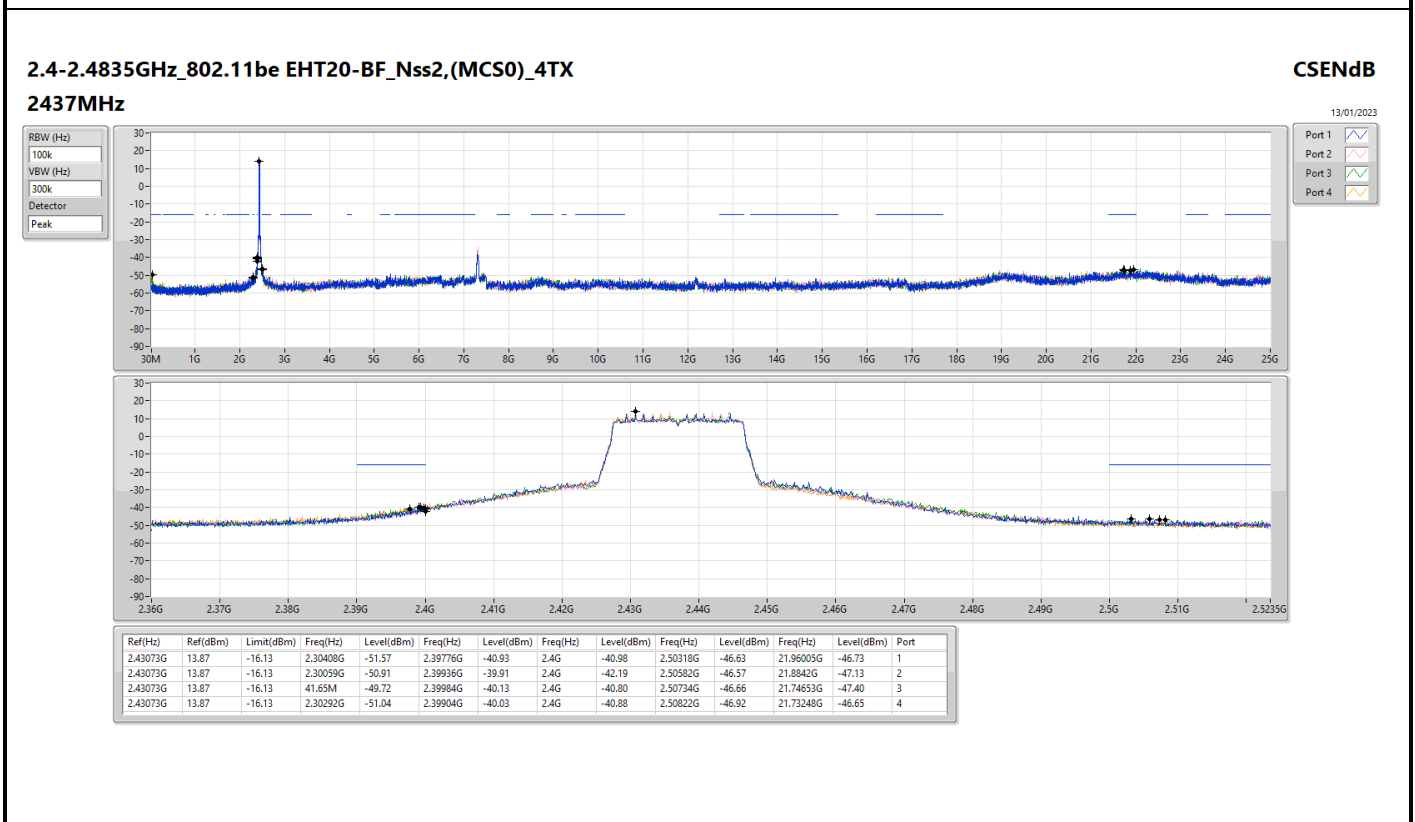
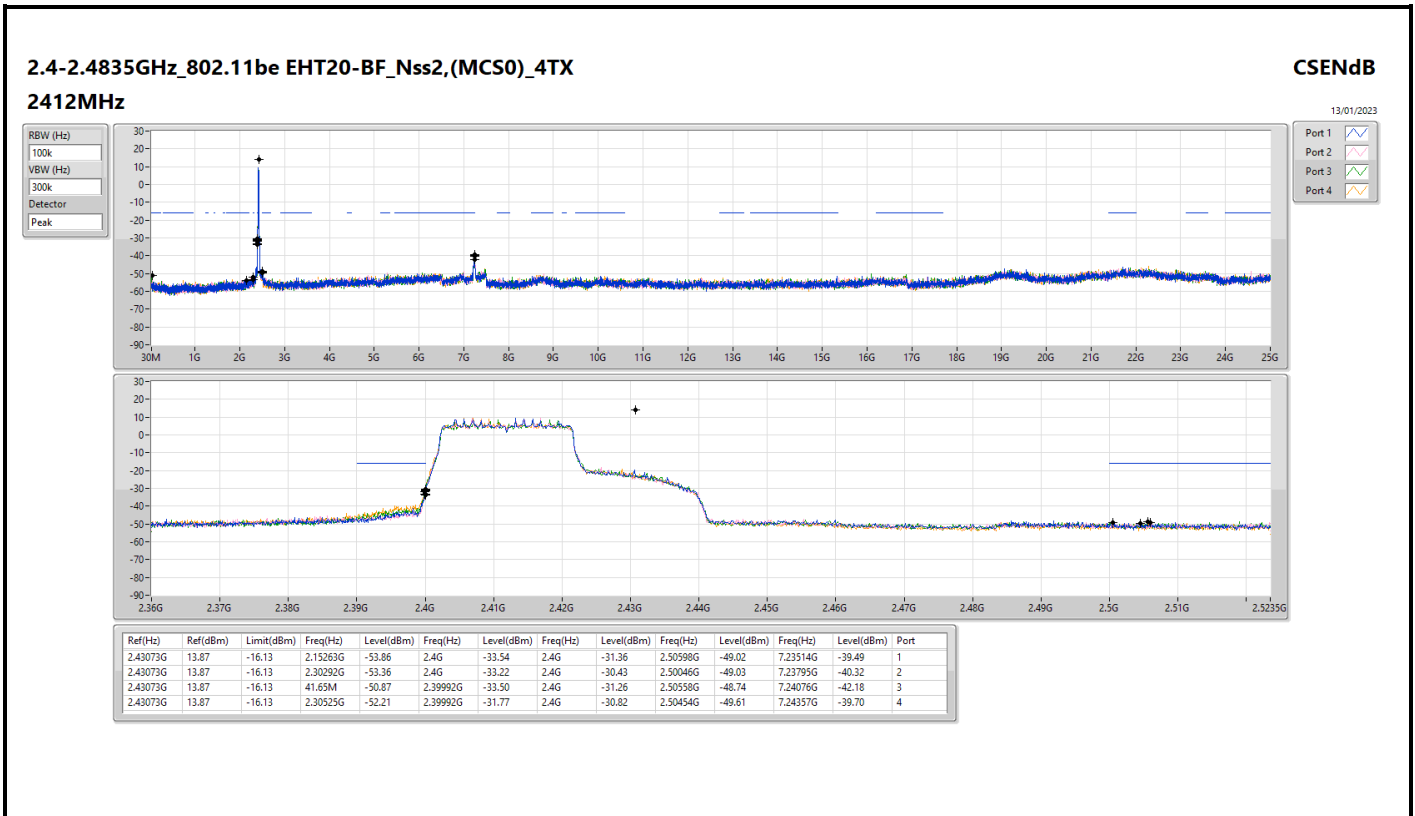


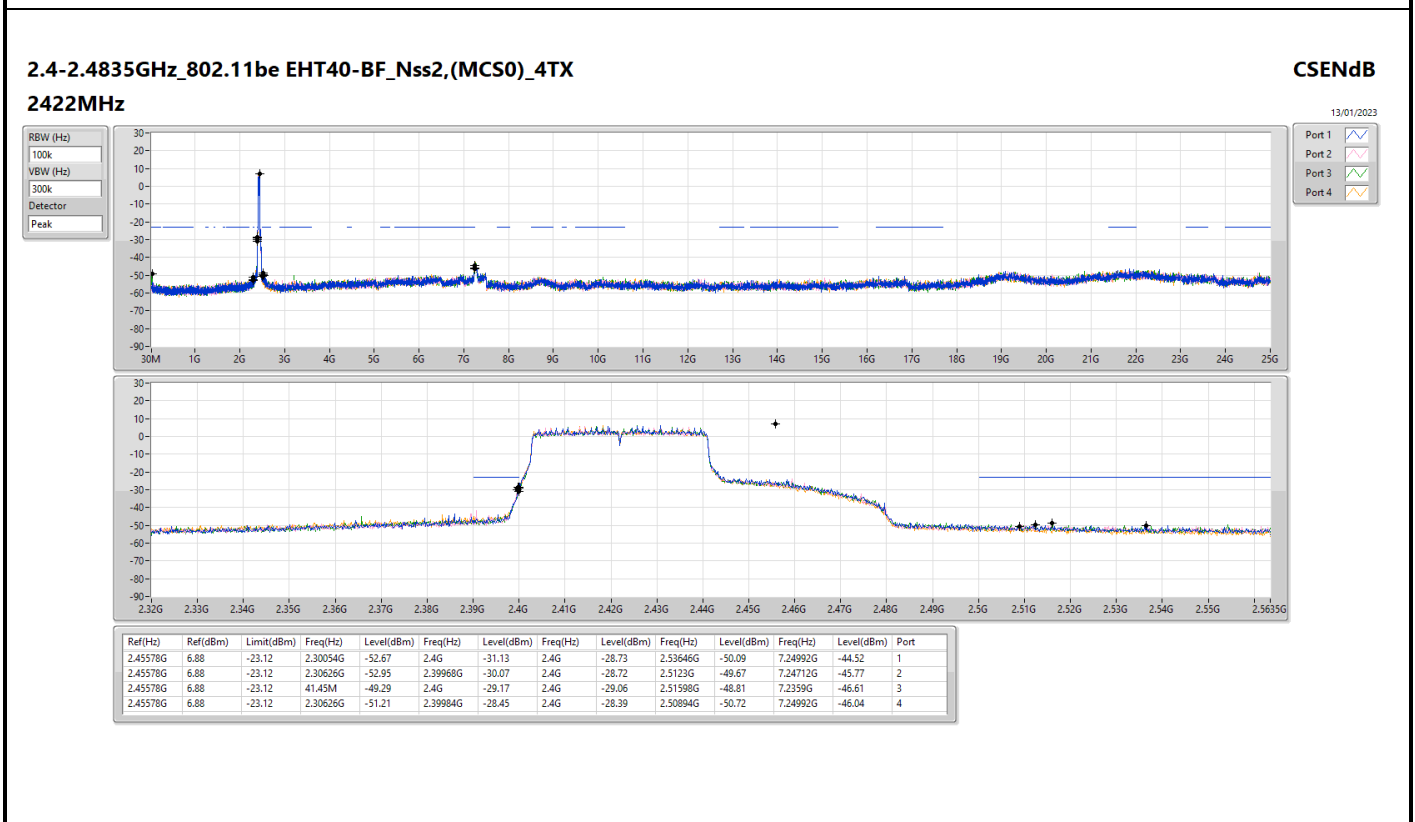
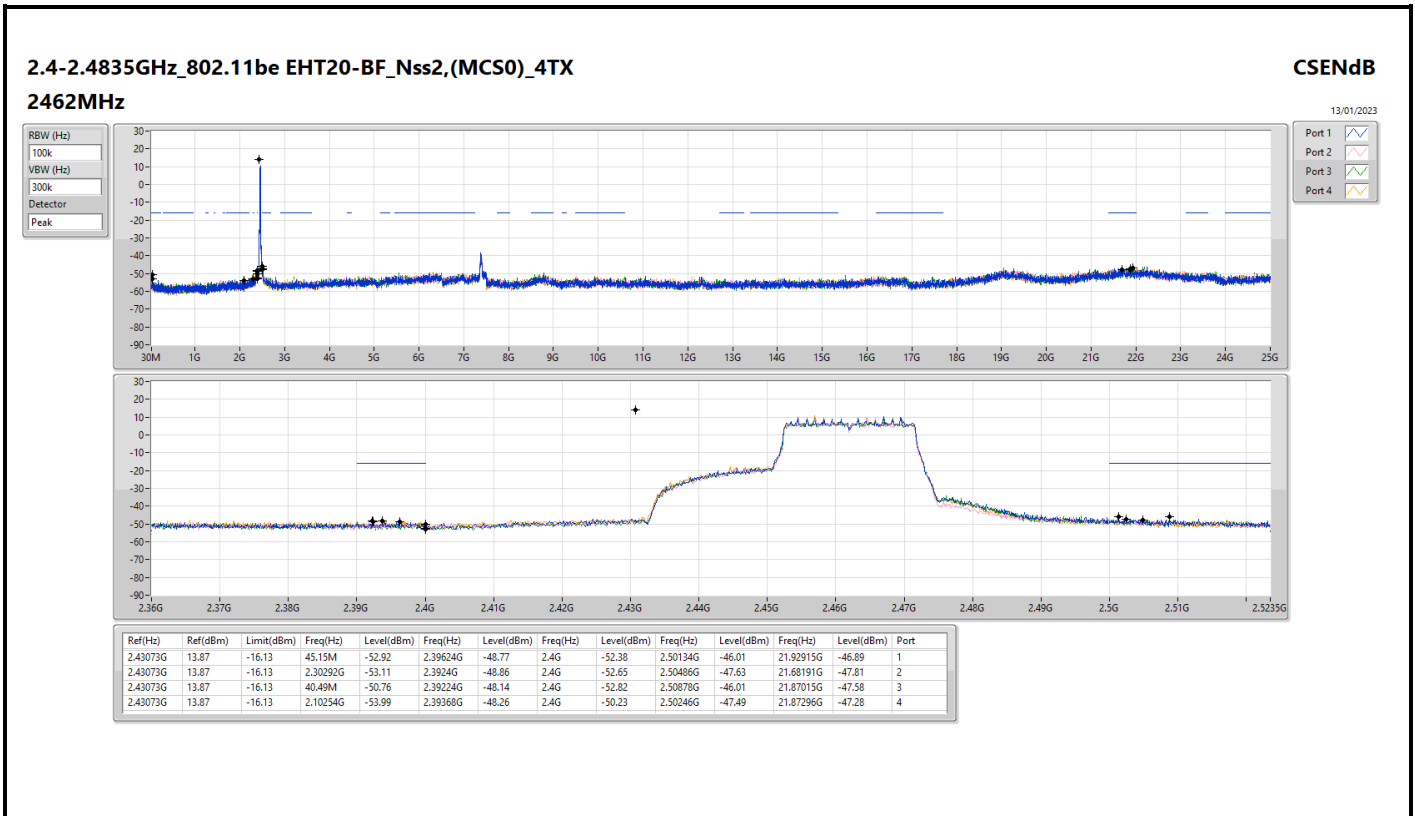


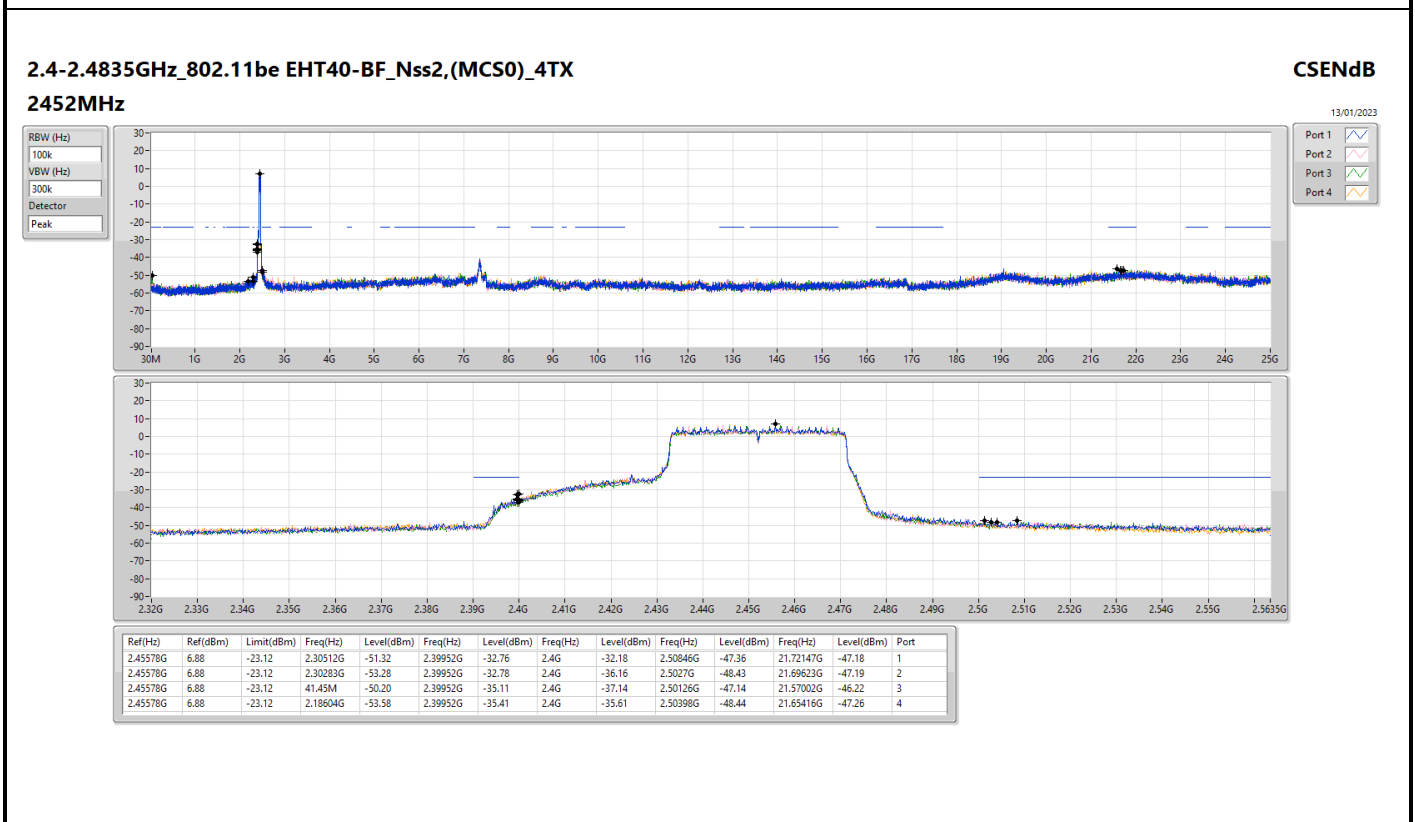
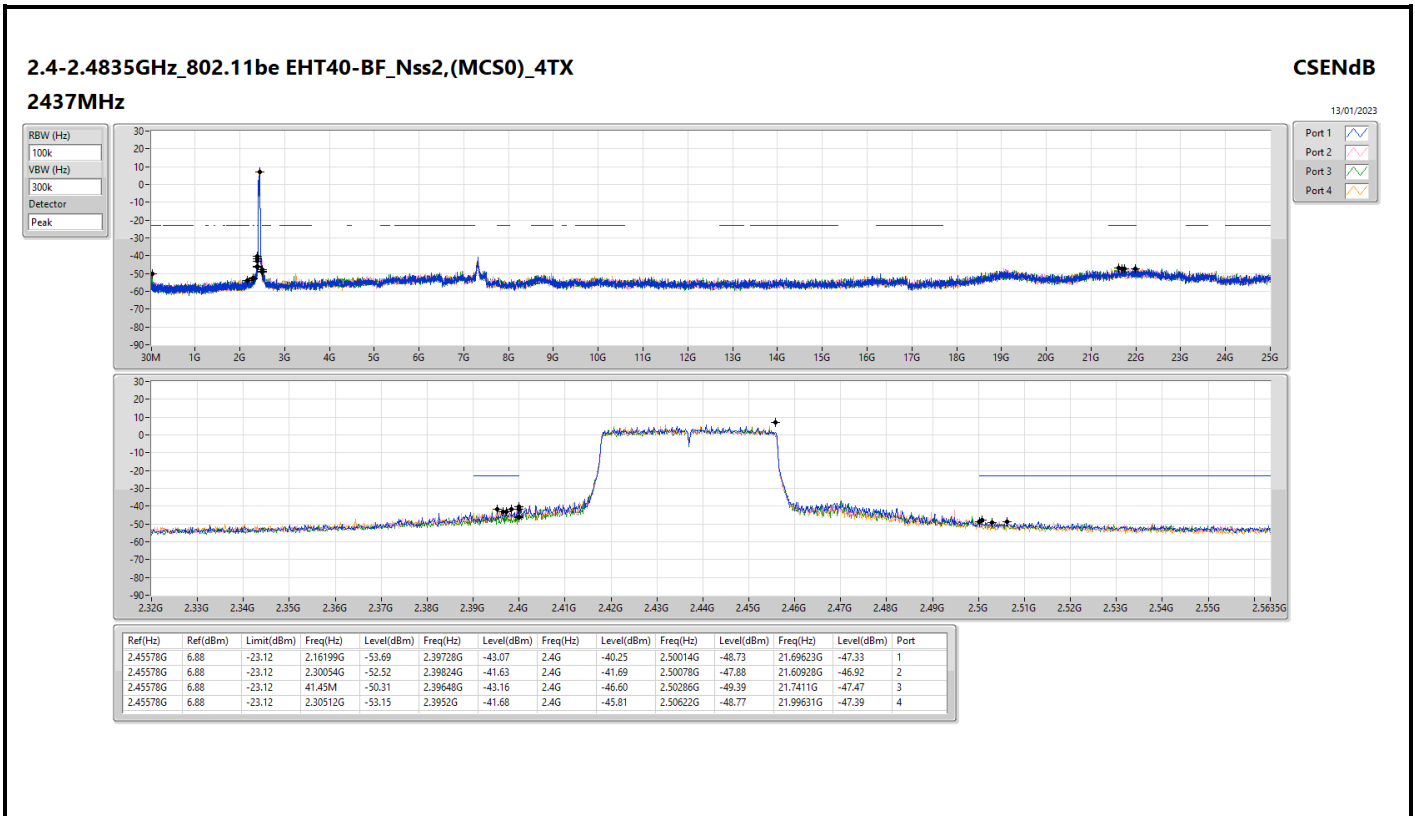










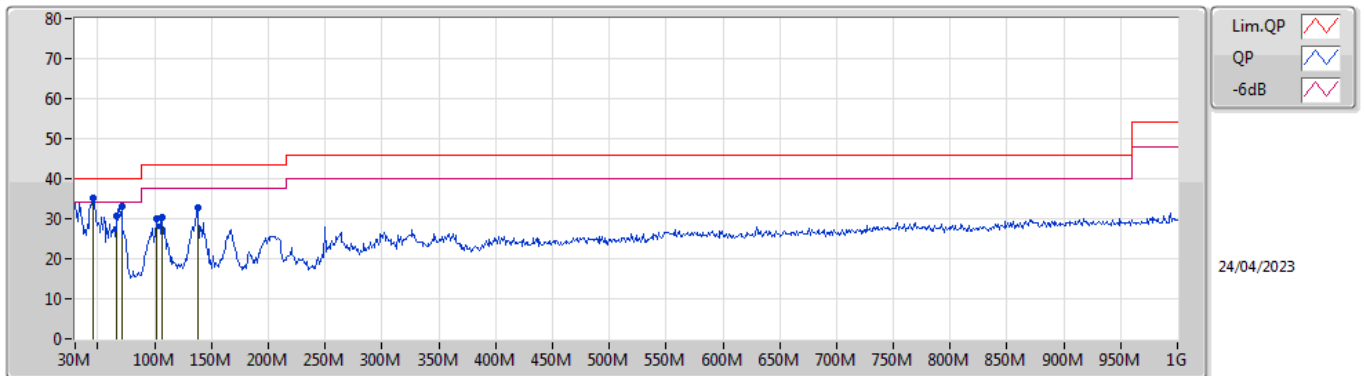




Summary

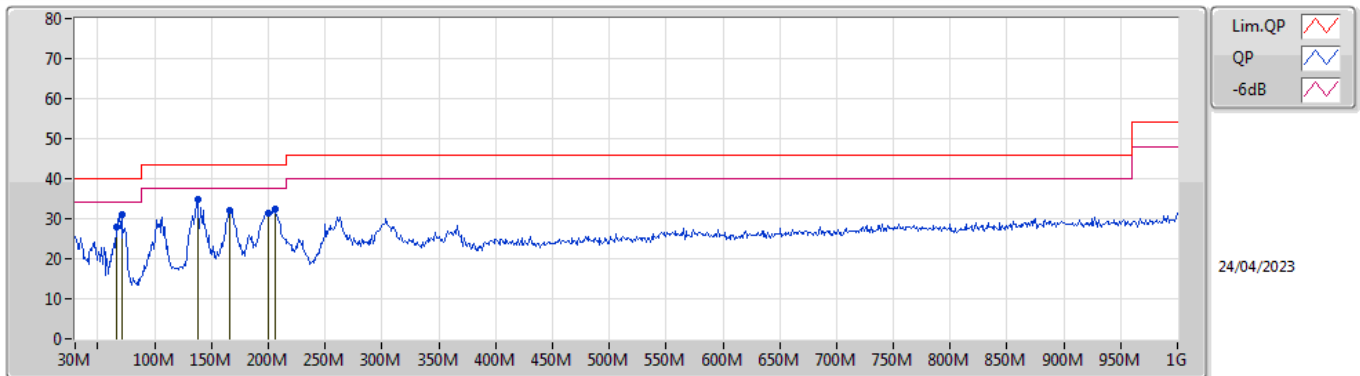
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 4	Pass	PK	45.52M	35.23	40.00	-4.77	Vertical

Mode 4



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
PK	45.52M	35.23	40.00	-4.77	-14.88	3	Vertical	358	1.00	"Worst"	50.11	16.34	0.95	32.17
PK	65.89M	30.54	40.00	-9.46	-18.67	3	Vertical	149	3.00	-	49.21	12.32	1.12	32.11
PK	70.74M	32.98	40.00	-7.02	-18.56	3	Vertical	202	1.50	-	51.54	12.33	1.14	32.03
PK	101.78M	30.07	43.50	-13.43	-13.90	3	Vertical	158	1.25	-	43.97	16.91	1.34	32.15
PK	106.63M	30.21	43.50	-13.29	-13.28	3	Vertical	202	1.25	-	43.49	17.41	1.39	32.08
PK	137.67M	32.68	43.50	-10.82	-13.18	3	Vertical	217	1.00	-	45.86	17.30	1.52	32.00

Mode 4



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
PK	65.89M	27.82	40.00	-12.18	-18.67	3	Horizontal	245	3.00	-	46.49	12.32	1.12	32.11
PK	70.74M	31.07	40.00	-8.93	-18.56	3	Horizontal	97	2.00	-	49.63	12.33	1.14	32.03
PK	137.67M	34.75	43.50	-8.75	-13.18	3	Horizontal	259	2.00	"Worst"	47.93	17.30	1.52	32.00
PK	165.8M	32.10	43.50	-11.40	-14.45	3	Horizontal	272	1.50	-	46.55	15.88	1.70	32.03
PK	199.75M	31.26	43.50	-12.24	-14.94	3	Horizontal	185	1.50	-	46.20	15.22	1.82	31.98
PK	205.57M	32.47	43.50	-11.03	-14.81	3	Horizontal	220	1.50	-	47.28	15.31	1.85	31.97