



FCC RADIO TEST REPORT

FCC ID : S9GT670
Equipment : T670 Access Point
Brand Name : RUCKUS
Model Name : T670
Applicant : Ruckus Wireless LLC
350 W. Java Dr., Sunnyvale CA 94089 USA
Manufacturer : Ruckus Wireless LLC
350 W. Java Dr., Sunnyvale CA 94089 USA
Standard : FCC Part 15 Subpart C §15.247

The product was received on Dec. 07, 2023 and testing was performed from Dec. 12, 2023 to Feb. 28, 2024. We, Sporton International (USA) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval from Sporton International (USA) Inc., the test report shall not be reproduced except in full.

Approved by: Neil Kao

Sporton International (USA) Inc.
1175 Montague Expressway, Milpitas, CA 95035



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History of this test report

Report No.	Version	Description	Issue Date
FR231214001A	01	Initial issue of report	Mar. 12, 2024
FR231214001A	02	Revise Section 1.1 and Appendix A This report is an updated version, replacing the report issued on Mar. 12, 2024.	Mar. 25, 2024
FR231214001A	03	Add remark of Section 1.1 This report is an updated version, replacing the report issued on Mar. 25, 2024.	Mar. 28, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)	Power Output Measurement	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges	Pass	-
		Conducted Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	0.26 dB under the limit at 2483.52 MHz
3.6	15.207	AC Conducted Emission	Pass	3.16 dB under the limit at 0.39 MHz
3.7	15.203	Antenna Requirement	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/manufacture 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 section "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.

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature			
General Specs Wi-Fi 2.4GHz 802.11b/g/n/ac/ax/be and Wi-Fi 5GHz 802.11a/n/ac/ax/be			
Antenna Type WLAN: <Ant. 1>: Omni-Directional Antenna <Ant. 2>: Omni-Directional Antenna <Ant. 3>: Omni-Directional Antenna <Ant. 4>: Omni-Directional Antenna			
Antenna information			
2412 MHz ~ 2462 MHz	Peak Gain (dBi)	Horizontal	<Ant. 3>: 2.0
		Vertical	<Ant. 1>: 2.1

Remark:

1. The device is a special case of MIMO system with two outputs driving a cross-polarized pair of linearly polarized antennas which are vertically/horizontally mounted on the main board as indicated in equipment photo exhibits.
2. The WLAN operation in 6 GHz band are disabled via software.
3. For 2x2 MIMO mode, only ANT1+ANT3 is supported.
4. The above EUT's information was declared by manufacturer. Please refer to Disclaimer in report summary.

1.1.1 Antenna Directional Gain

<For CDD Mode>

Follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01 F2)c)i)

Cross-polarized antennas. For a system in which the antennas have fixed orientations relative to one another that ensure that the antennas are cross-polarized regardless of any user actions, the directional gain is computed as follows.

- (i) Cross-polarized antennas with $N_{ANT} = 2$. In the case of a transmitter with only two outputs driving a pair of antennas that are cross-polarized (e.g., vertical and horizontal or left-circular and right-circular), directional gain is the gain of an individual antenna. If the two antennas have different gains, the larger gain applies.

The directional gain "DG" is calculated as following table.

	Vertical	Horizontal	DG for	DG for	Power Limit	PSD Limit
	Ant 1	Ant 3	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
2.4GHz	2.10	2.00	2.10	2.10	0.00	0.00

Calculation example:

If a device has two cross-polarized antenna, $G_{ANT1} = 2.10\text{dBi}$; $G_{ANT2} = 2.00\text{dBi}$

Directional gain of power measurement = $\max(2.10, 2.00) = 2.10\text{ dBi}$

Directional gain of PSD measurement = $\max(2.10, 2.00) = 2.10\text{ dBi}$

Power and PSD limit reduction = Directional gain – 6dBi, (min = 0)



1.2 Modification of EUT

No modifications made to the EUT during the testing.

1.3 Testing Location

Test Site	Sporton International (USA) Inc.
Test Site Location	1175 Montague Expressway, Milpitas, CA 95035 TEL : 408 9043300
Test Site No.	Sporton Site No.
	03CH02-CA, CO01-CA, TH01-CA

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: US1250

1.4 Applicable Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 15.247 Meas Guidance v05r02
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.



2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and only the worst case emissions were reported in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

2.2 Test Mode

The final test modes include the worst data rates for each modulation shown in the table below.

MIMO Antenna

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20 (Covered by EHT20)	MCS0
802.11n HT40 (Covered by EHT40)	MCS0
802.11ac VHT20 (Covered by EHT20)	MCS0
802.11ac VHT40 (Covered by EHT40)	MCS0
802.11ax HE20 (Covered by EHT20)	MCS0
802.11ax HE40 (Covered by EHT40)	MCS0
802.11be EHT20	MCS0
802.11be EHT 40	MCS0

Remark:

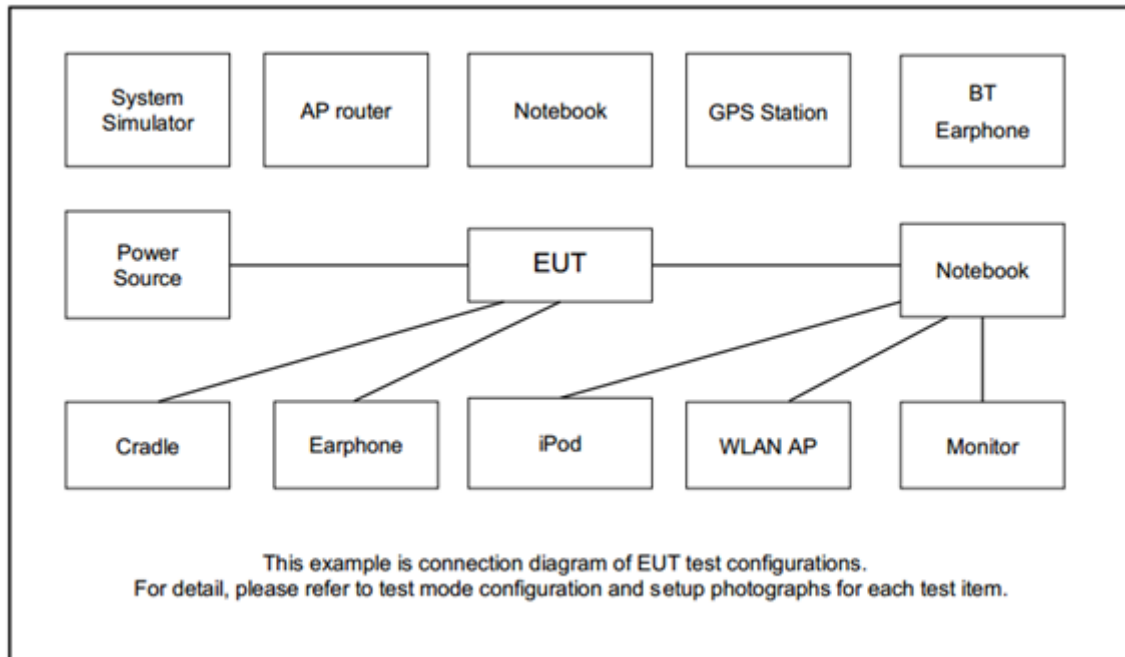
- Based on the manufacturer's declaration, 802.11be covers the 802.11n, 11ac and 11ax due to the same modulation family scheme. For 802.11be, only full resource unit assignment mode is tested since the EUT does not support partial resource unit assignment mode.
- Based on the manufacturer's declaration, RF power on each chain in MIMO mode is parameterized to be greater than the power in SISO mode, giving the condition that the SISO Mode is covered by MIMO Mode which is deemed the worst case selected for testing.
- The EUT information mentioned or listed above is declared by the manufacturer.

Test Cases	
AC Conducted Emission	Mode 1 : WLAN (2.4GHz) Normal Link + Lan1 + Lan2 + AC Adapter

Ch. #	2400-2483.5 MHz			
	802.11b	802.11g	802.11be EHT20	802.11be EHT40
Low	01	01	01	03
Middle	06	06	06	06
High	11	11	11	09

Remark: For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Laptop	DELL	Latitude 5440	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
2.	Laptop	Acer	N18Q13	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Laptop	DELL	Latitude E7470	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Adapter	Ruckus	740-64277-001	N/A	N/A	AC I/P : Unshielded, 1.5m DC O/P : Shielded, 1.1m
5.	PoE Adapter	RUCKUS	740-64310-001	N/A	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “QSPR Version 5.14-00227.1” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10 dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

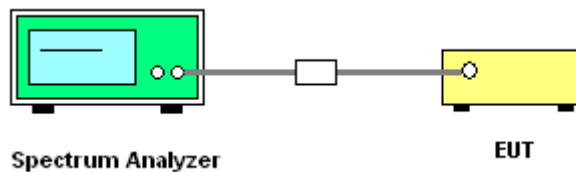
3.1.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.1.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) $\geq 3 * RBW$.
6. Measure and record the results in the test report.

3.1.4 Test Setup

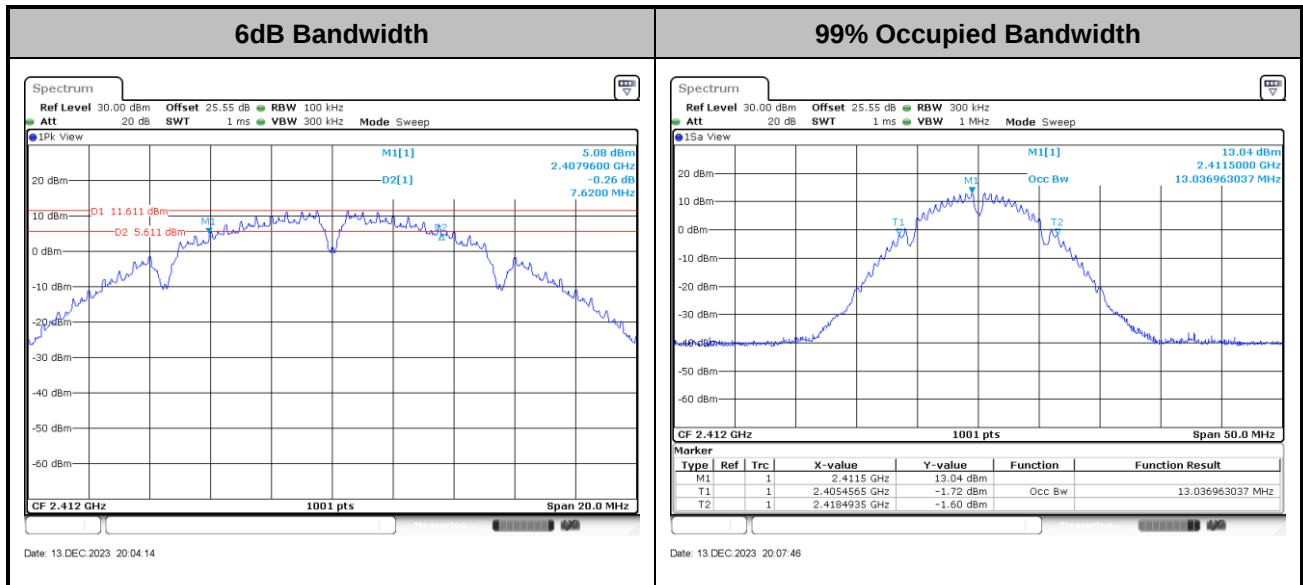


Please refer to Appendix A.



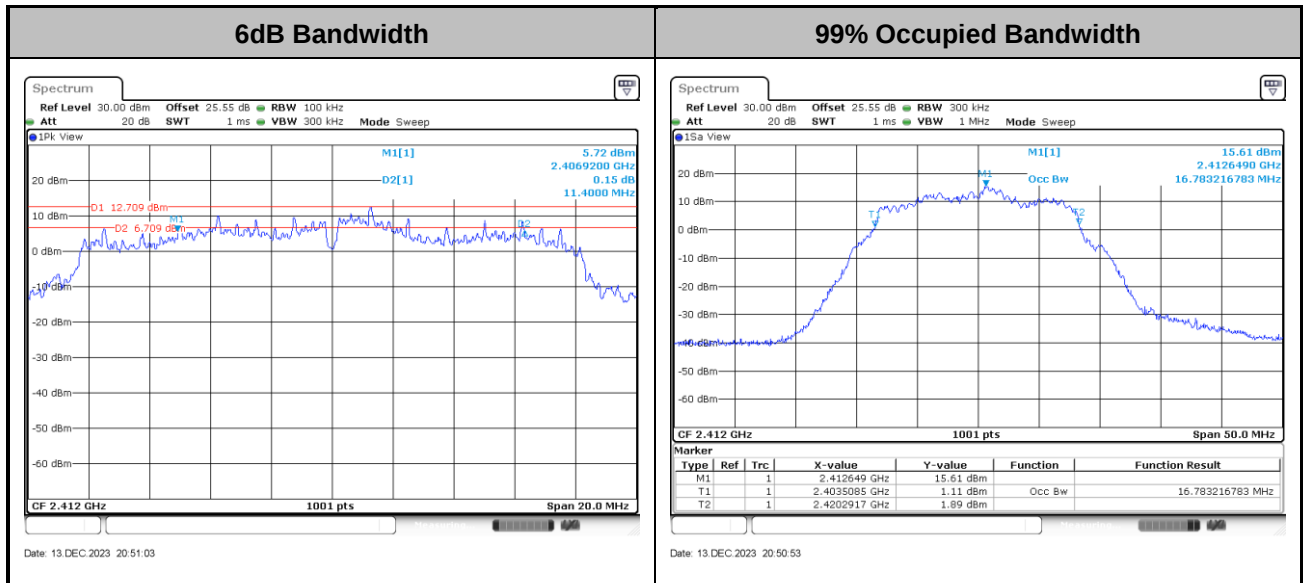
MIMO <Ant. 1+3>

<802.11b>



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

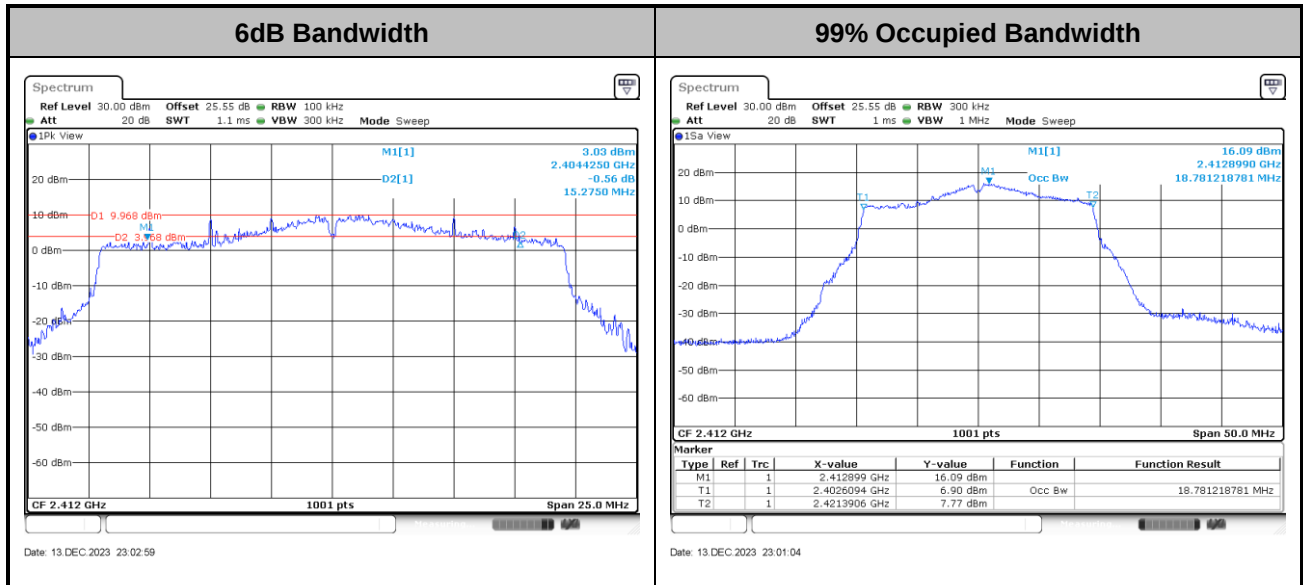
<802.11g>



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

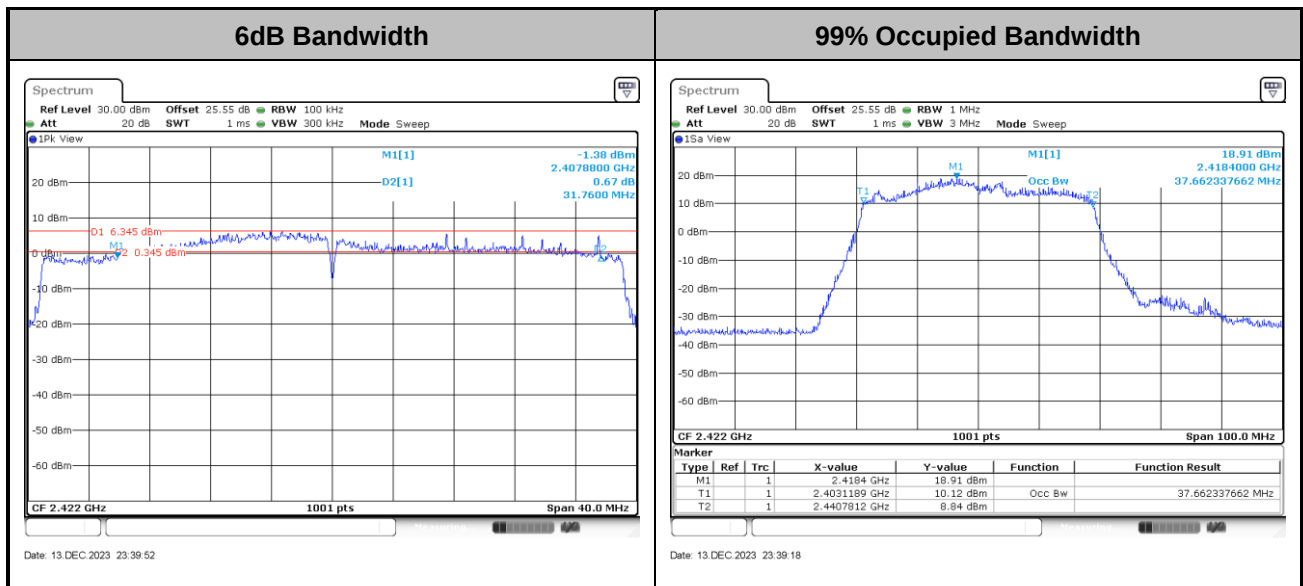


<802.11be EHT20>



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<802.11be EHT40>



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5 MHz, the limit for output power is 30 dBm. If transmitting antenna with directional gain greater than 6 dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

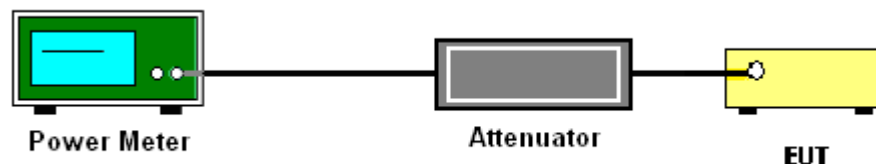
3.2.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.2.3 Test Procedures

1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT is connected to the power meter by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

3.2.4 Test Setup



3.2.5 Test Result of Average Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band at any time interval of continuous transmission.

3.3.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

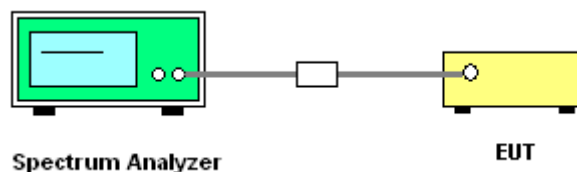
3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (c): Measure and add $10 \log(N_{ANT})$ dB.

With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity $10 \log(N_{ANT})$ dB is added to each spectrum value before comparing to the emission limit. The addition of $10 \log(N_{ANT})$ dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}^{th}$ of the PSD limit .

3.3.4 Test Setup

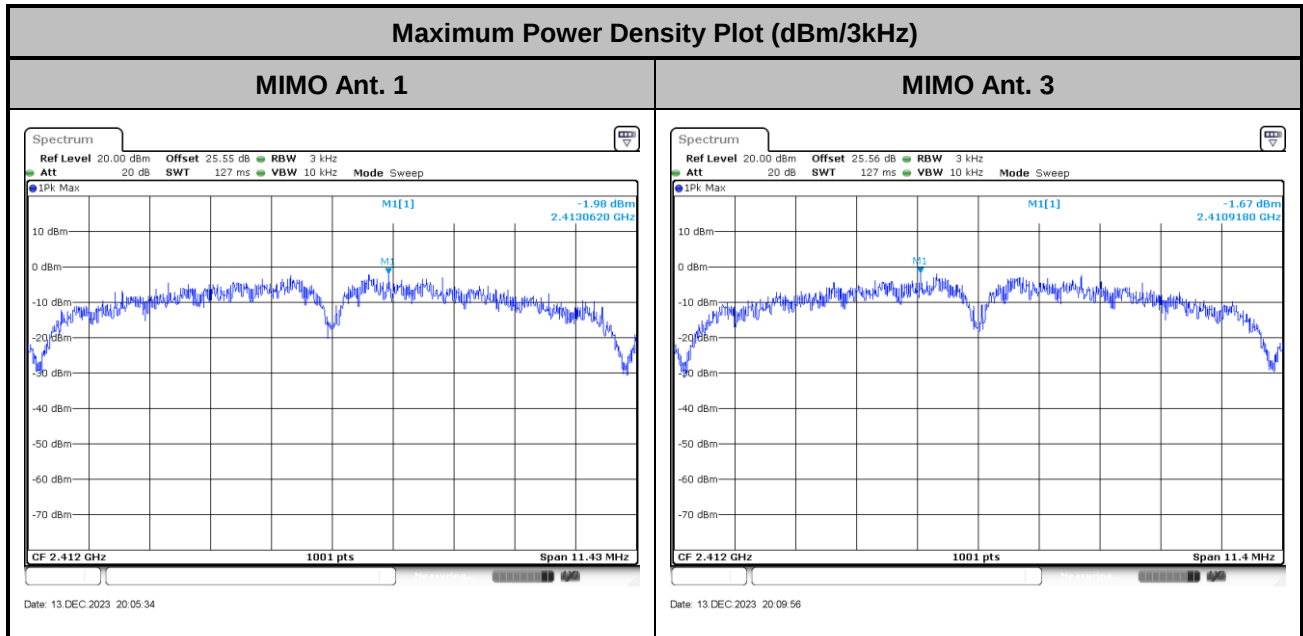


3.3.5 Test Result of Power Spectral Density

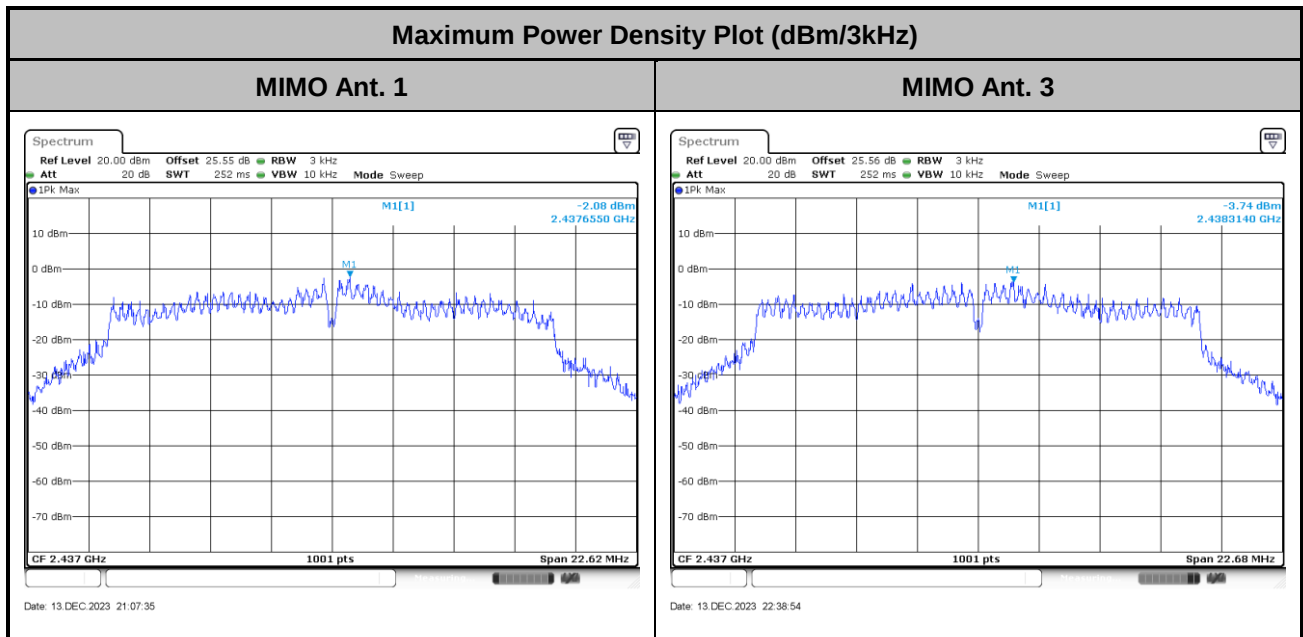
Please refer to Appendix A.



<802.11b>



<802.11g>

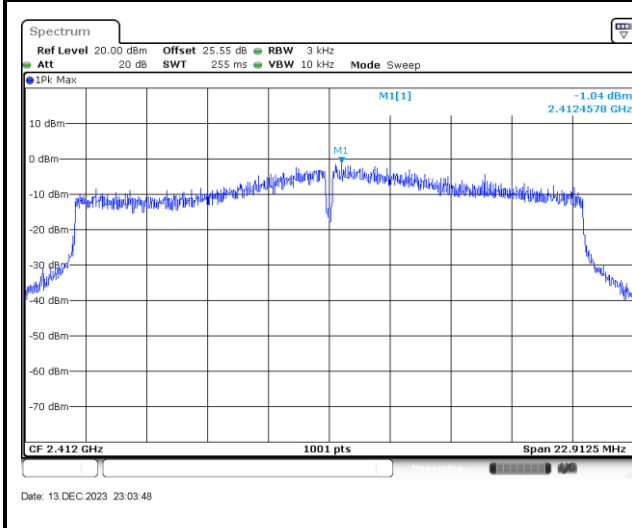




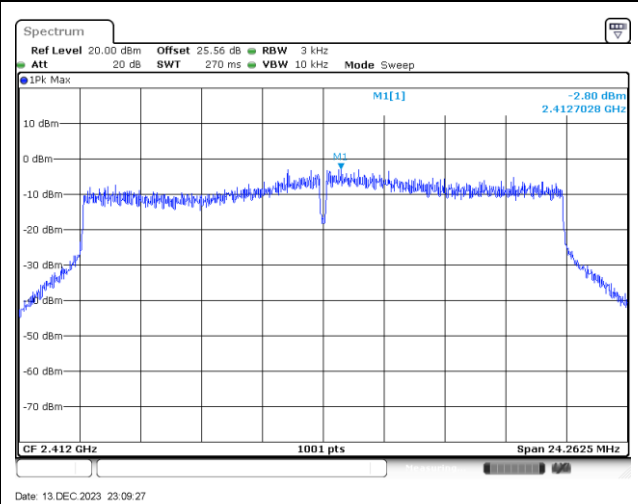
<802.11be EHT20>

Maximum Power Density Plot (dBm/3kHz)

MIMO Ant. 1



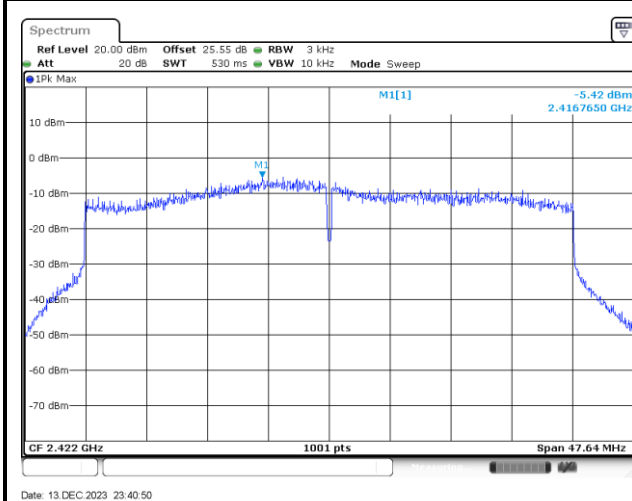
MIMO Ant. 3



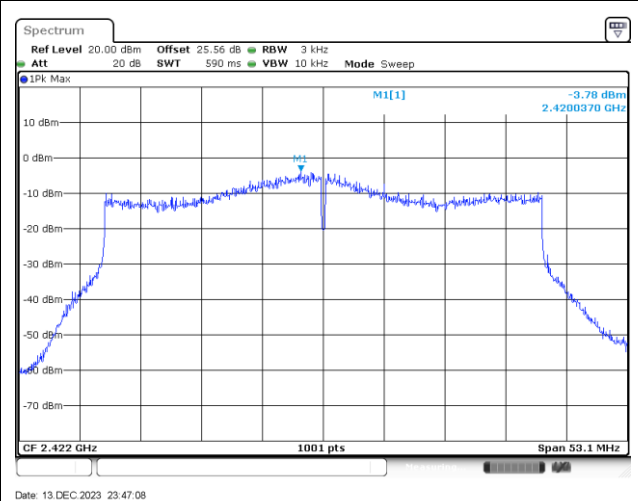
<802.11be EHT40>

Maximum Power Density Plot (dBm/3kHz)

MIMO Ant. 1



MIMO Ant. 3



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

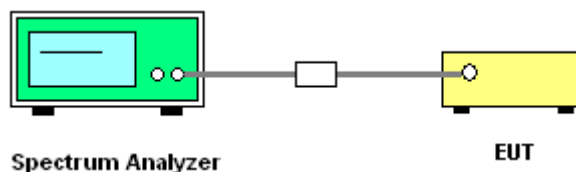
3.4.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.4.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement.
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



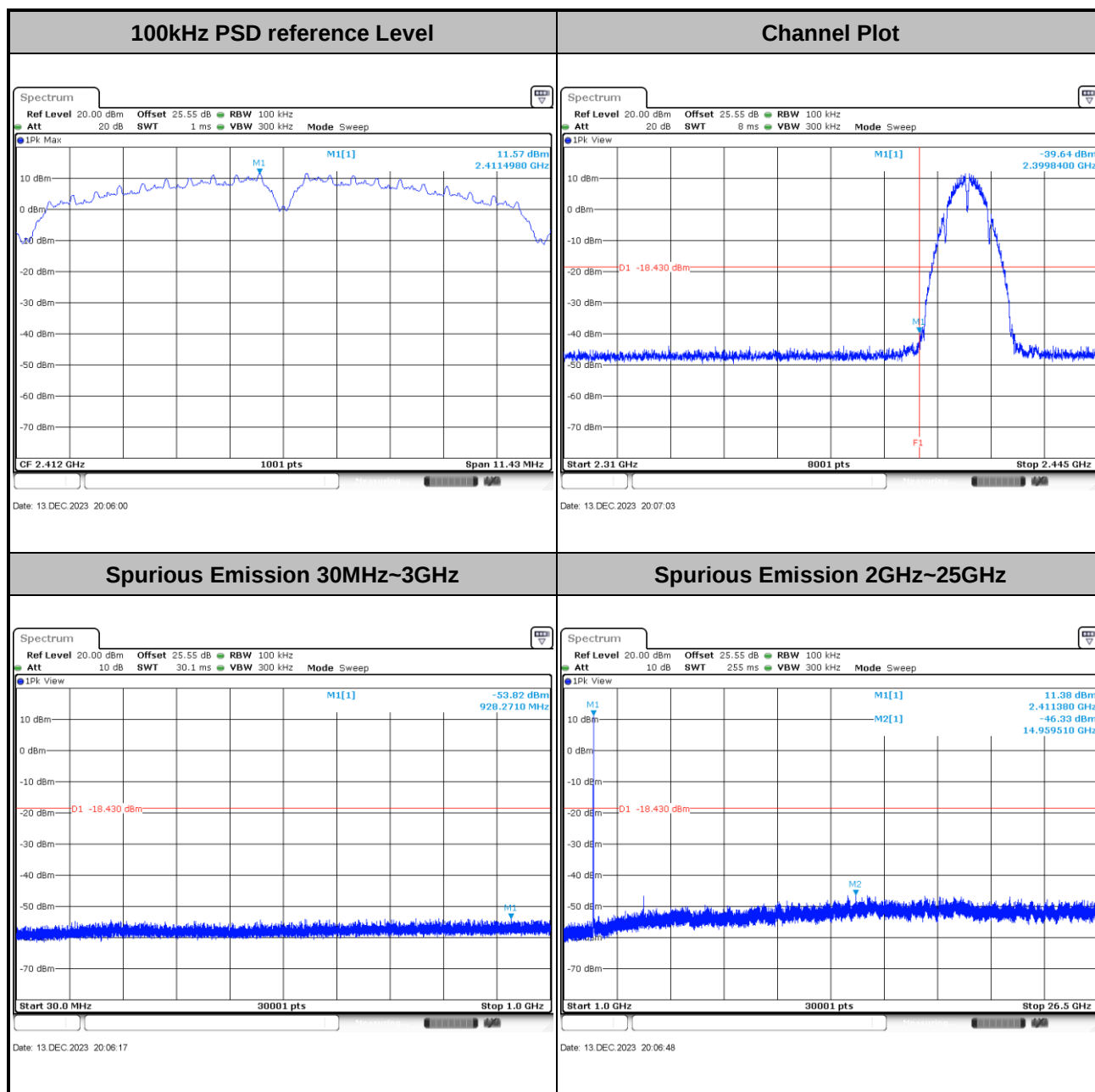
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Please refer to Appendix A.



Number of TX = 2, Ant. 1 (Measured)

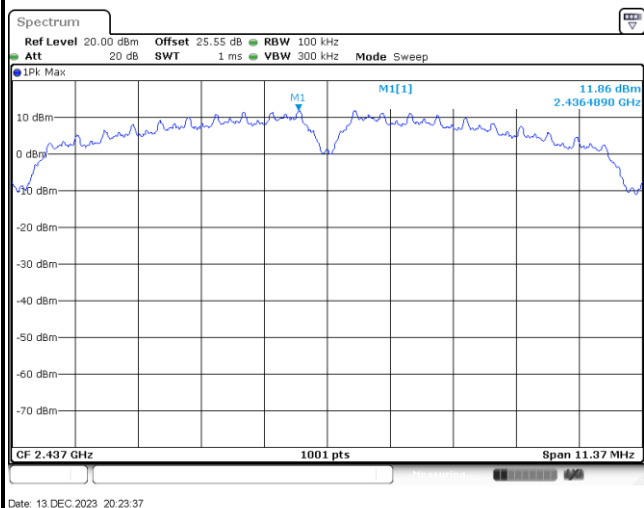
Test Mode :	802.11b	Test Channel :	01
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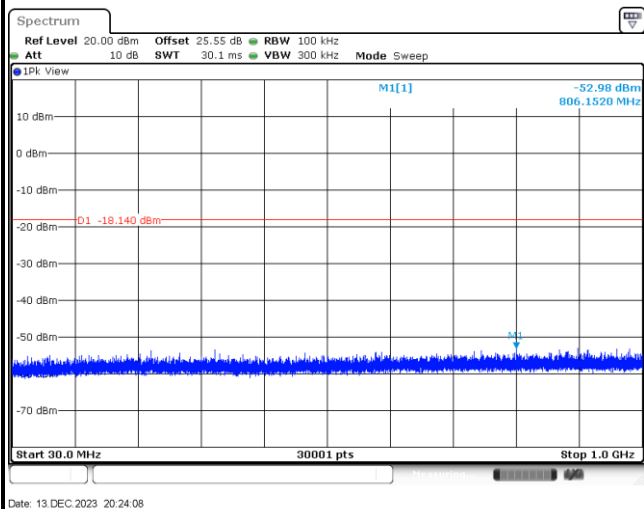
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100kHz PSD reference Level

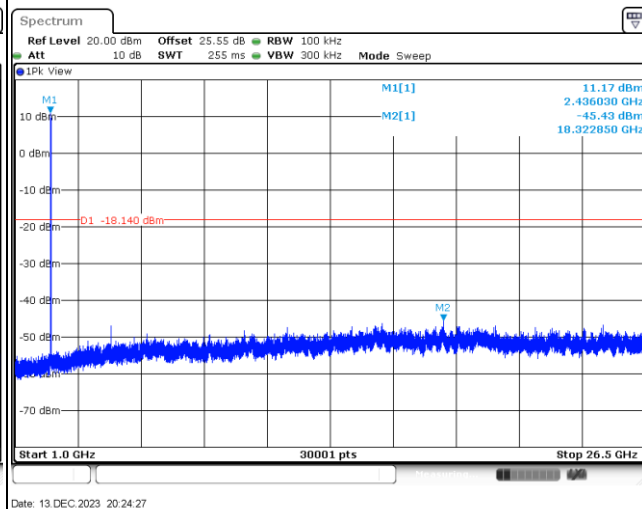


Channel Plot

Spurious Emission 30MHz~3GHz

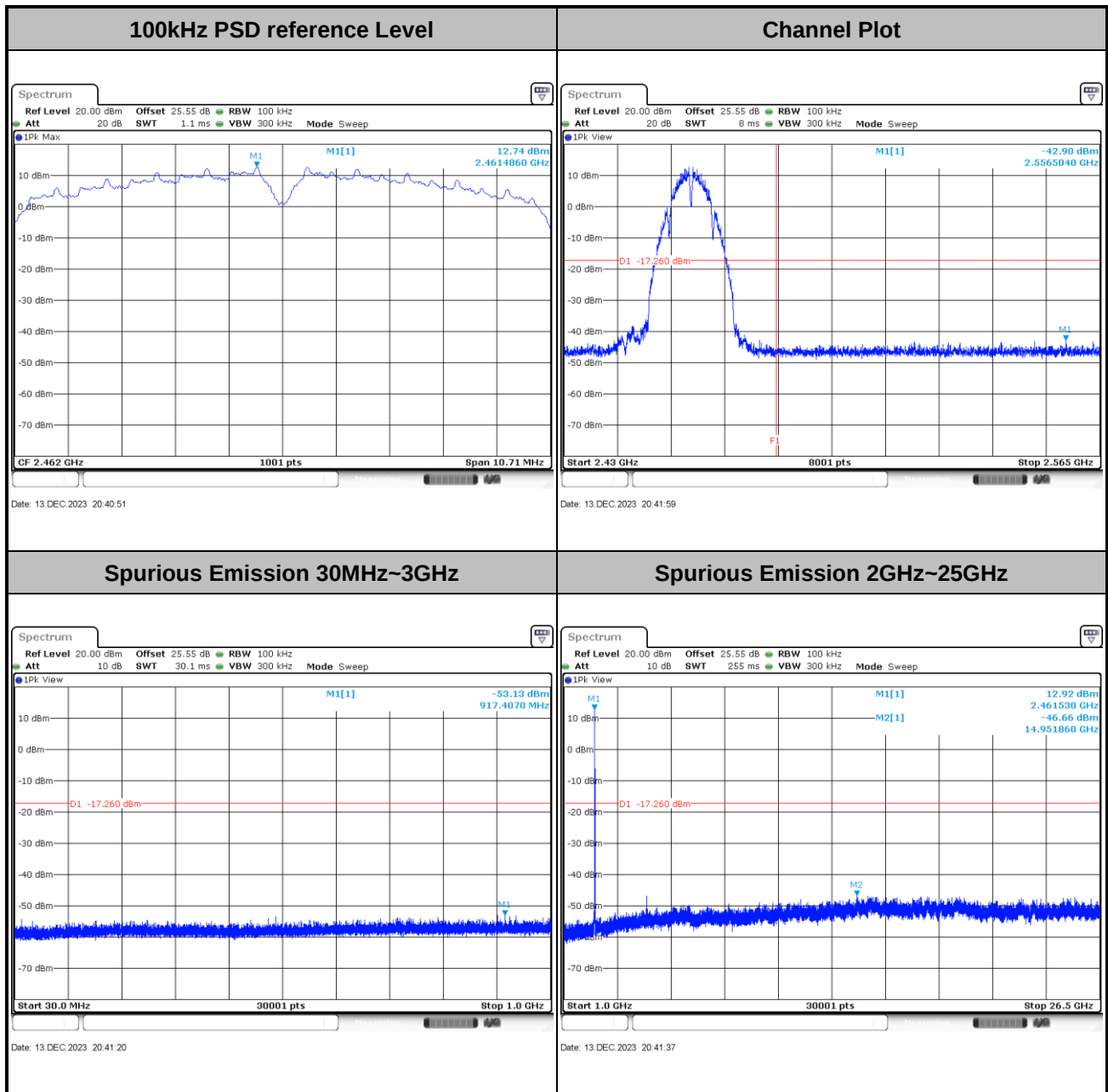


Spurious Emission 2GHz~25GHz



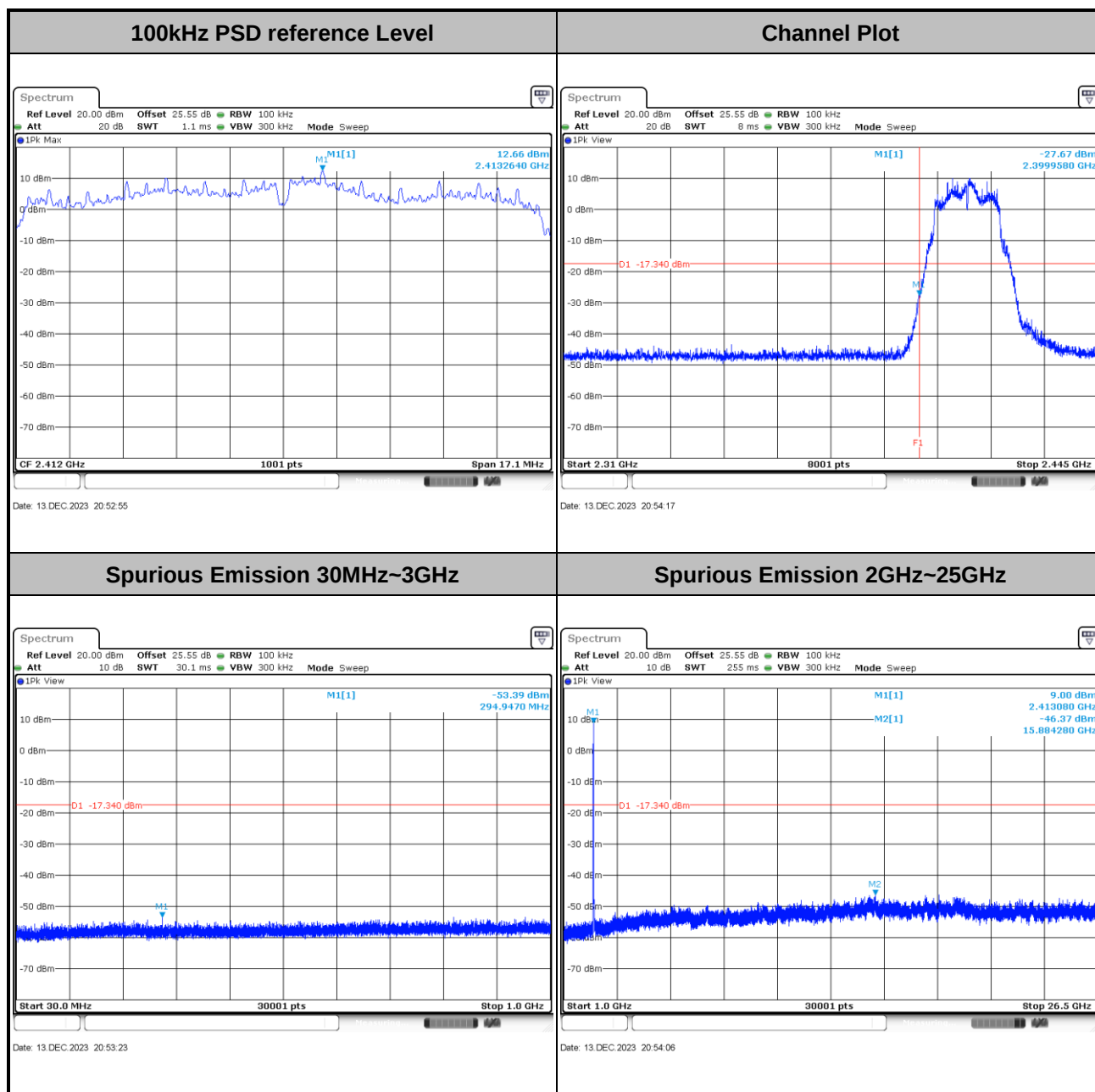


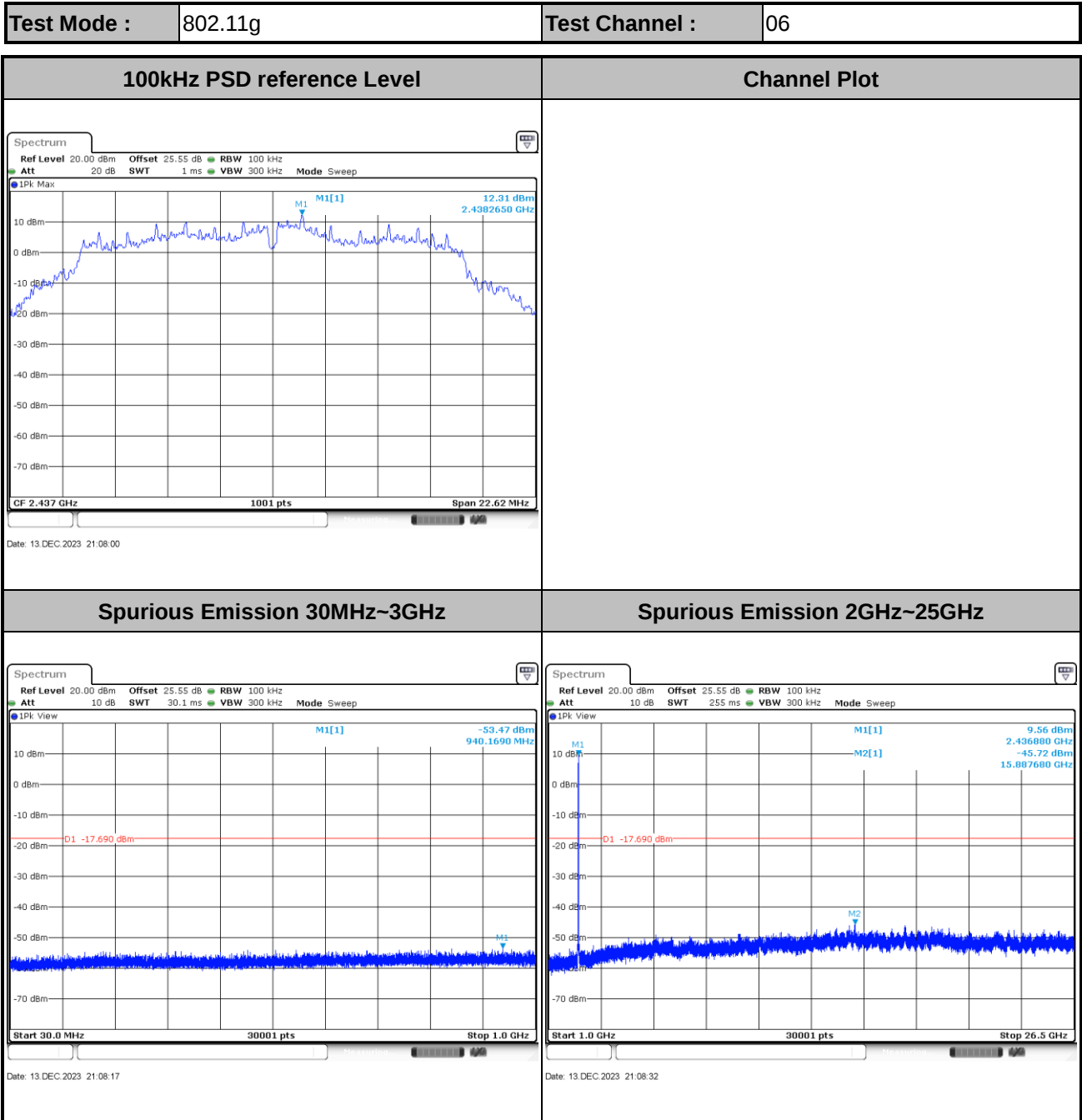
Test Mode :	802.11b	Test Channel :	11
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Test Mode :	802.11g	Test Channel :	01
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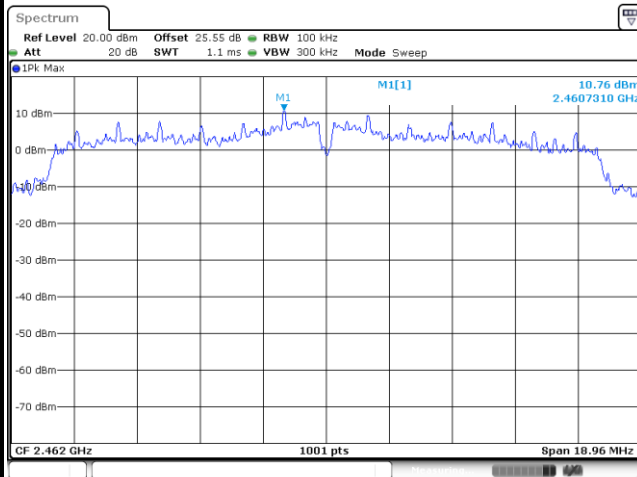






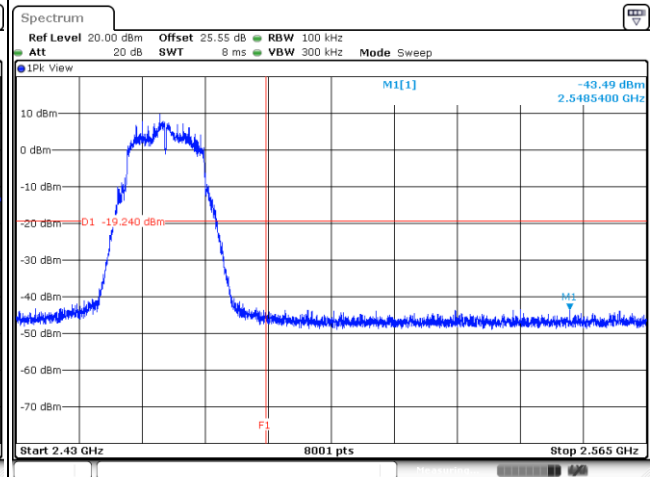
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100kHz PSD reference Level



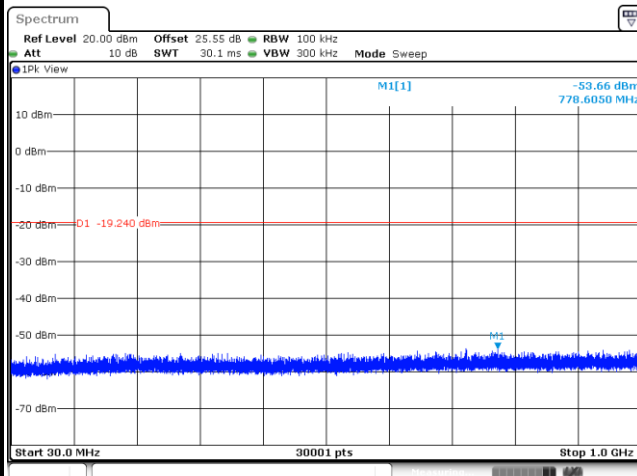
Date: 28 FEB 2024 23:37:21

Channel Plot



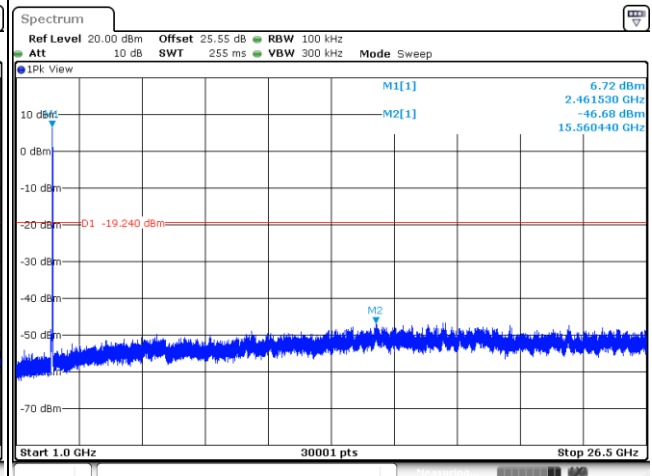
Date: 28 FEB 2024 23:37:44

Spurious Emission 30MHz~3GHz



Date: 28 FEB 2024 23:38:04

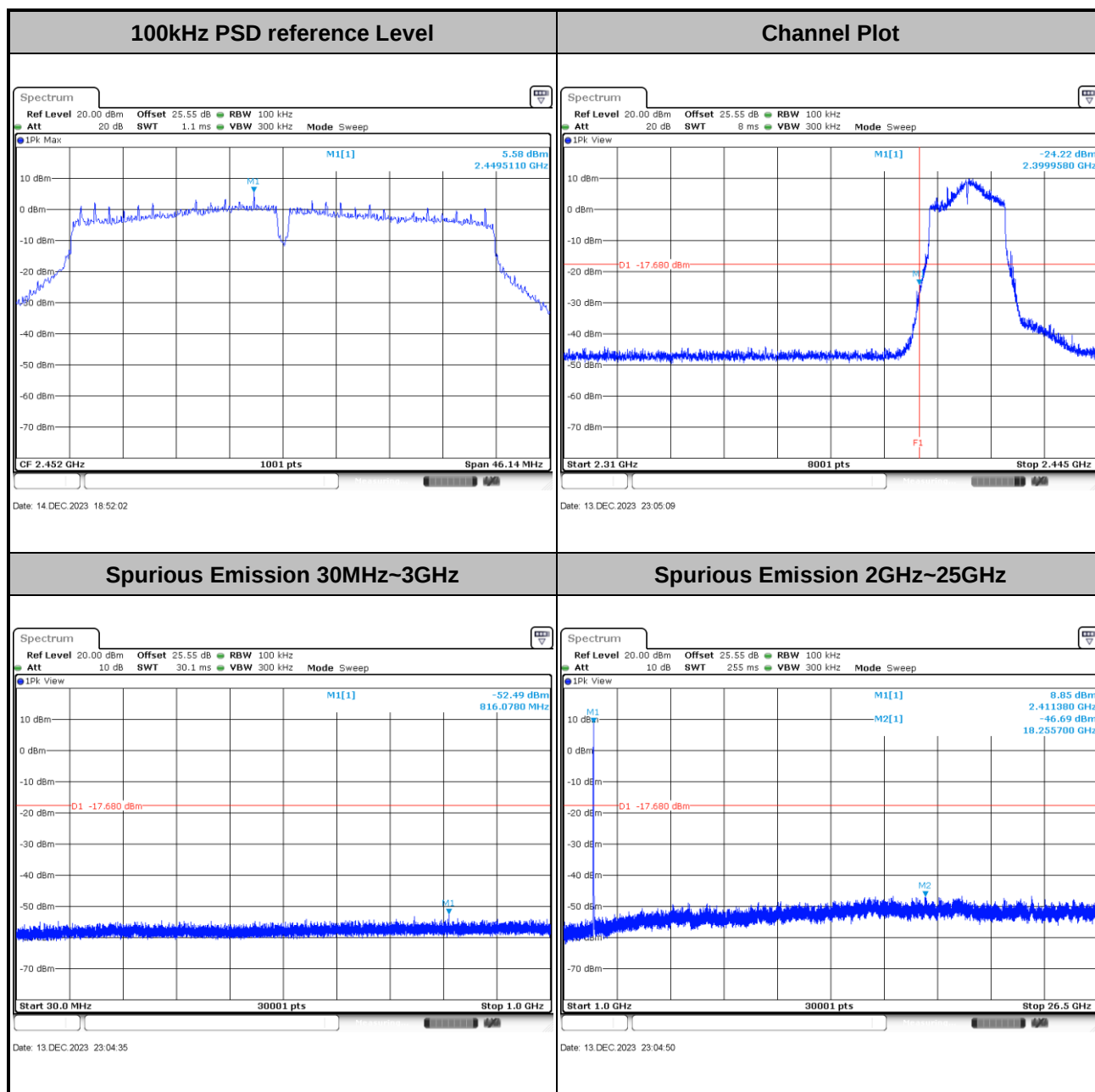
Spurious Emission 2GHz~25GHz



Date: 28 FEB 2024 23:38:21

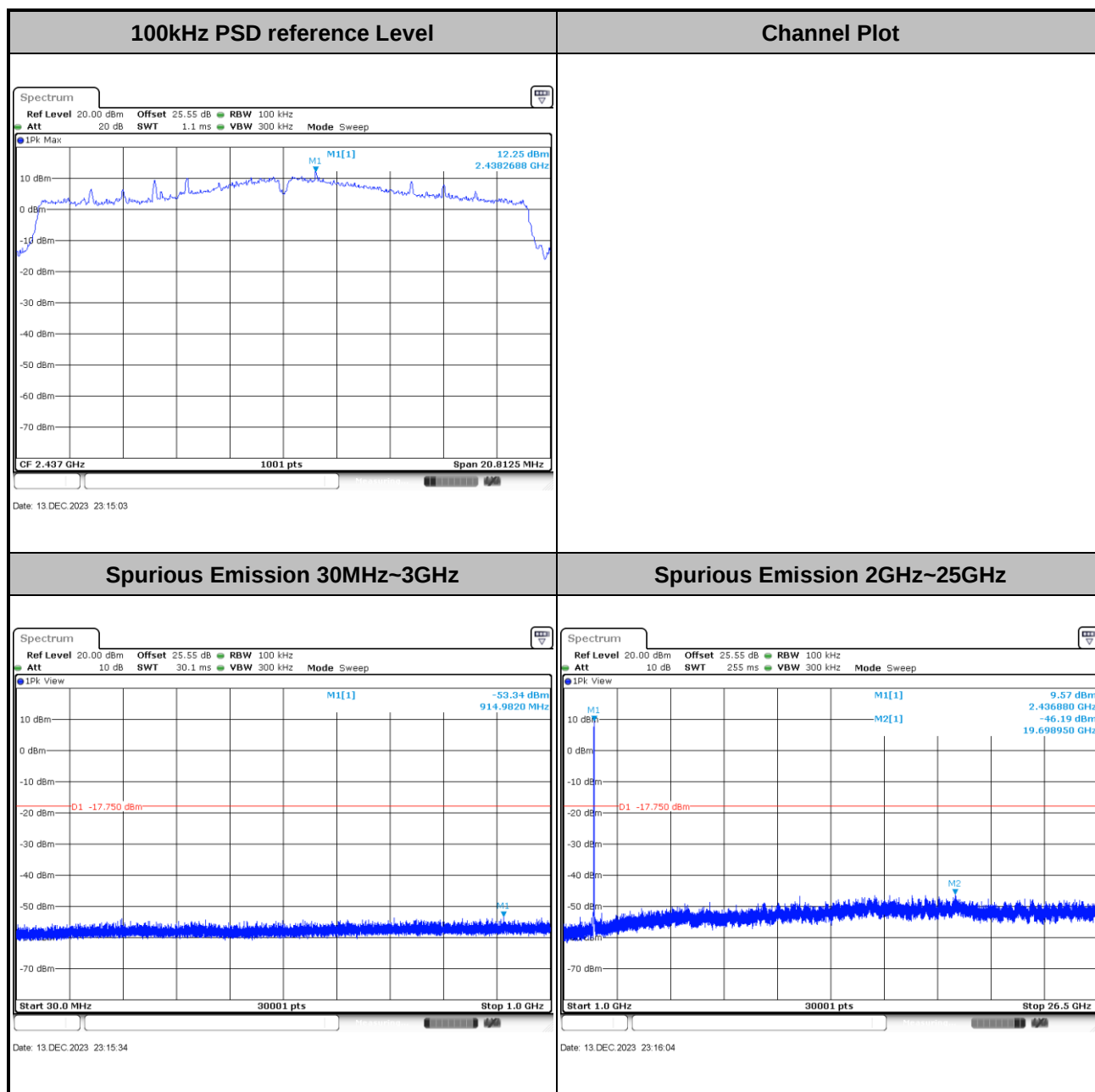


Test Mode :	802.11be EHT20	Test Channel :	01
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Test Mode :	802.11be EHT20	Test Channel :	06
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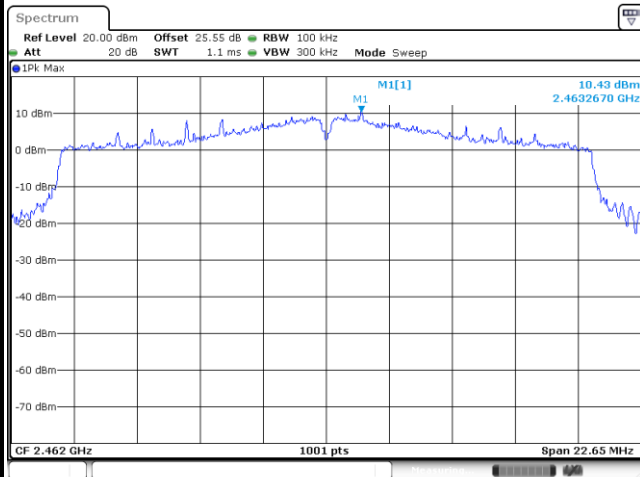




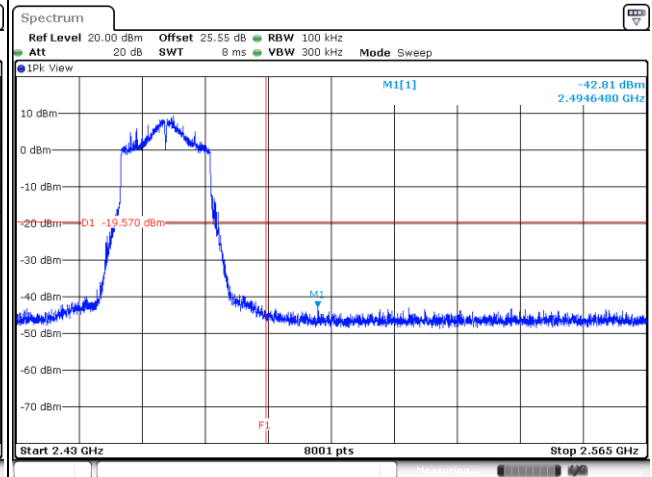
Test Mode : 802.11be EHT20

Test Channel : 11

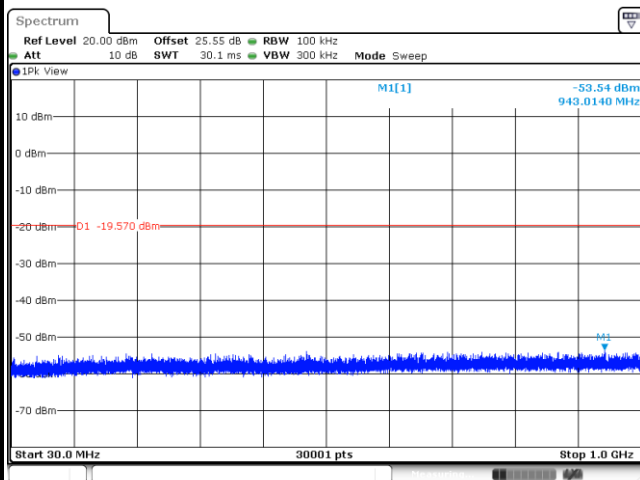
100kHz PSD reference Level



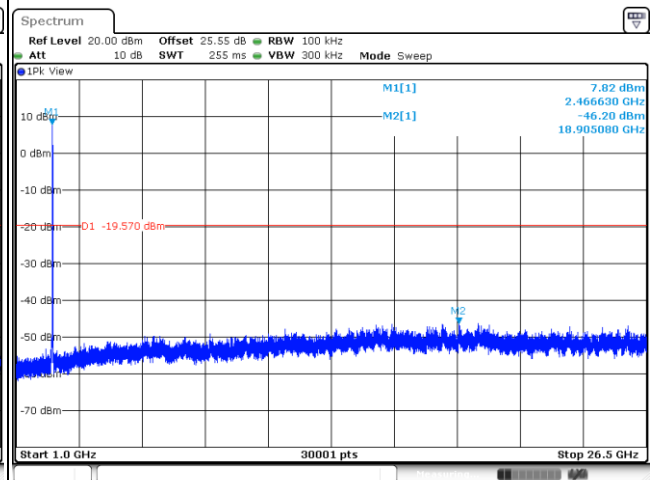
Channel Plot



Spurious Emission 30MHz~3GHz

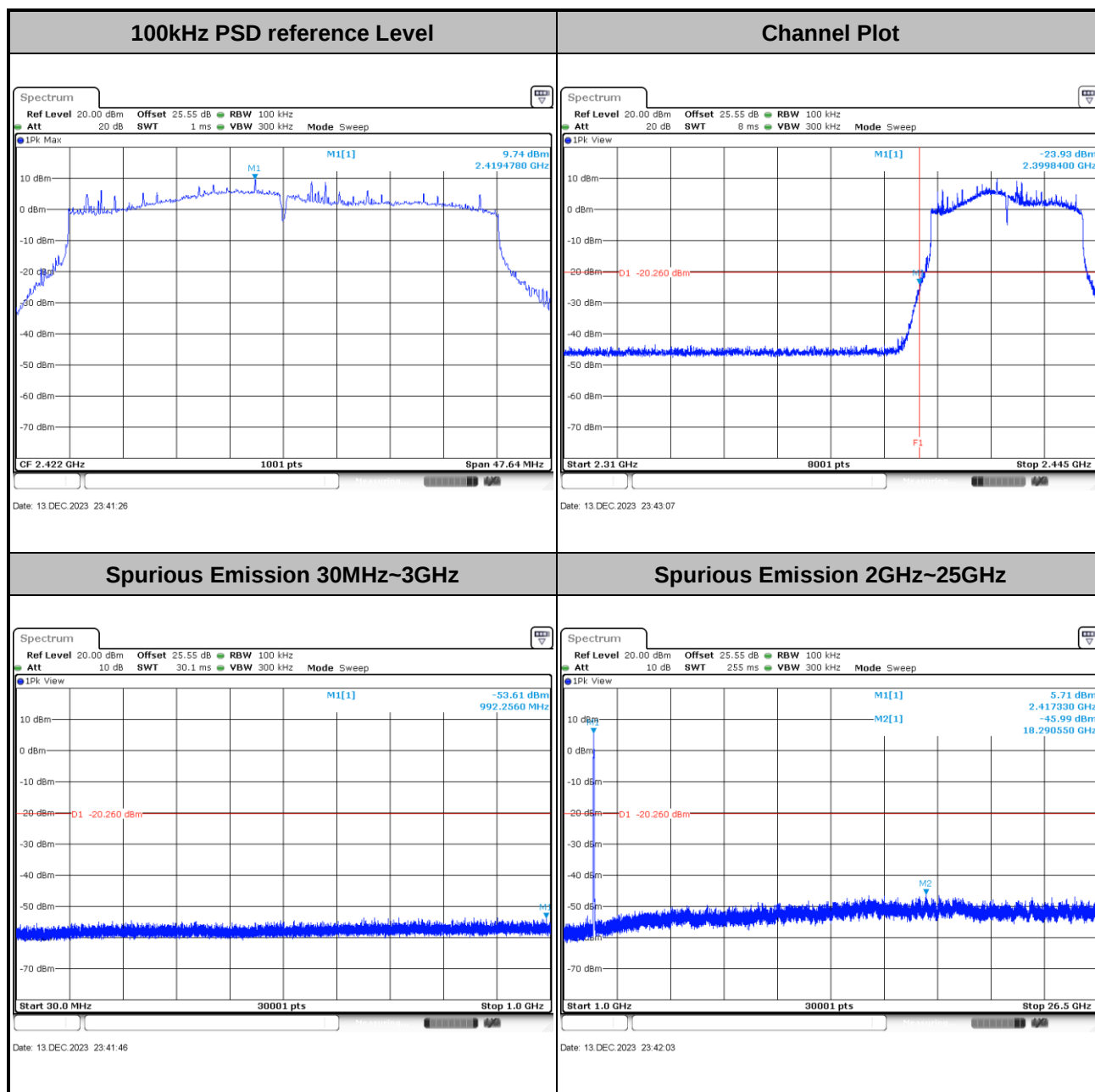


Spurious Emission 2GHz~25GHz



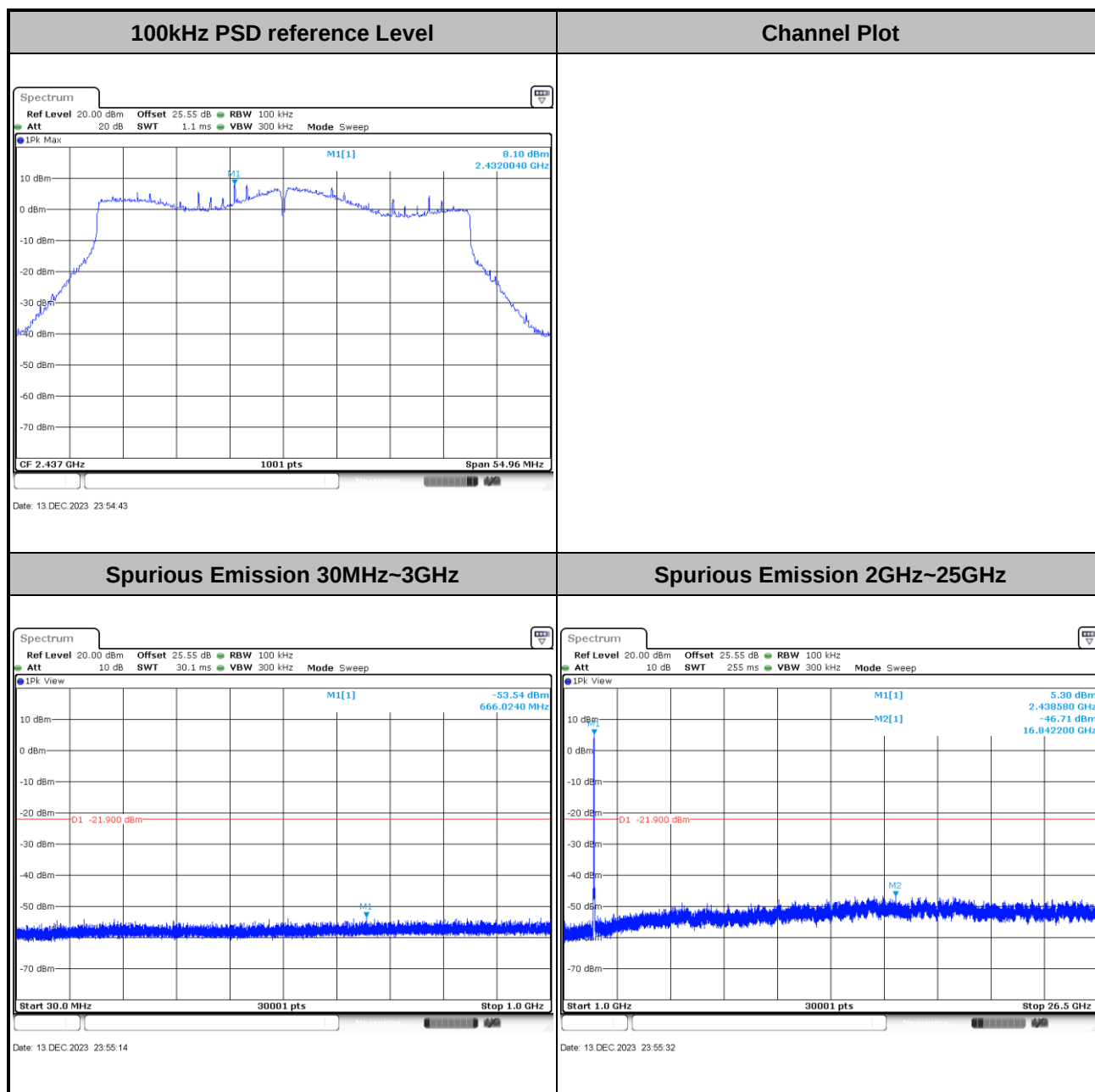


Test Mode :	802.11be EHT40	Test Channel :	03
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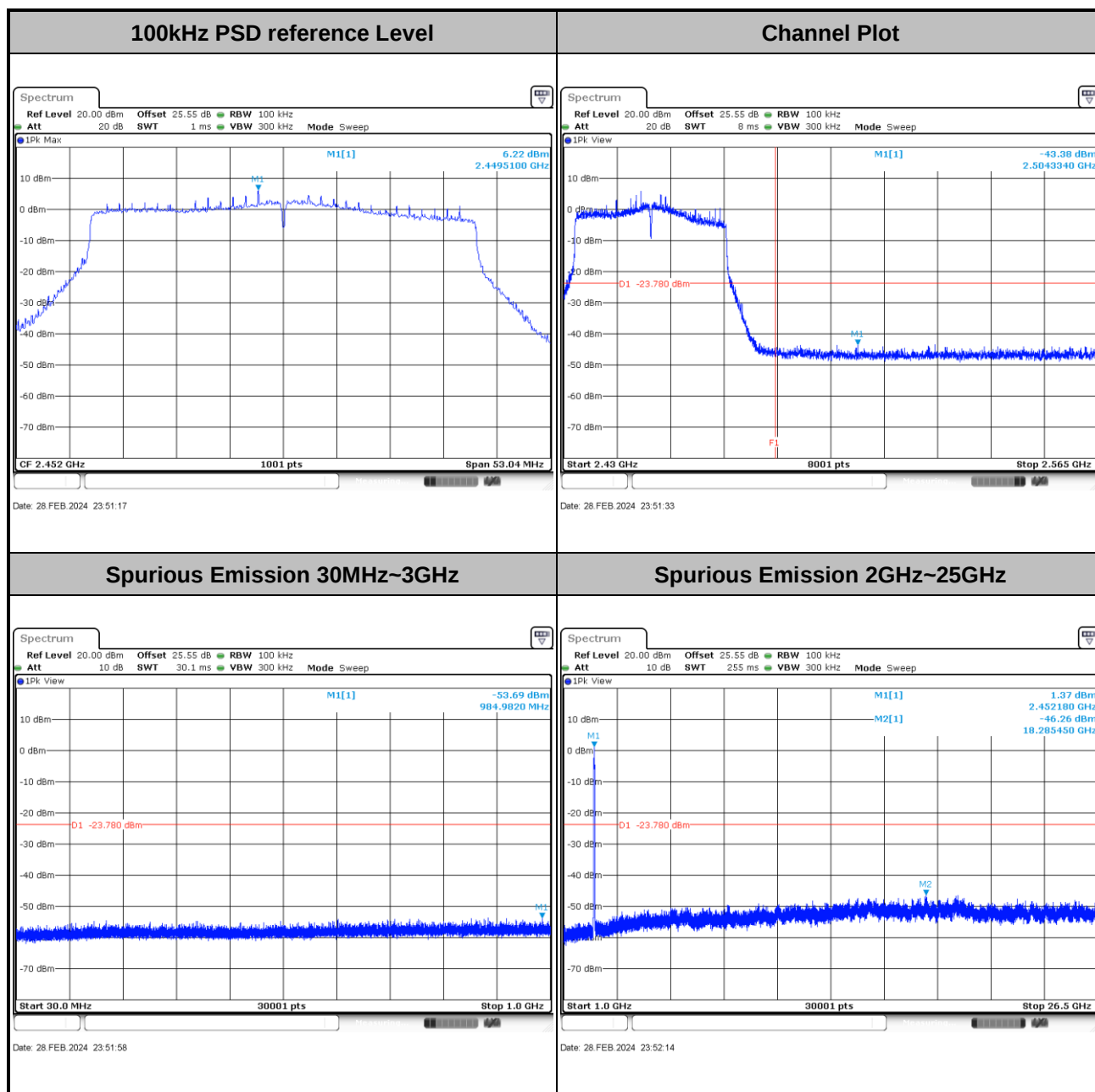


Test Mode :	802.11be EHT40	Test Channel :	06
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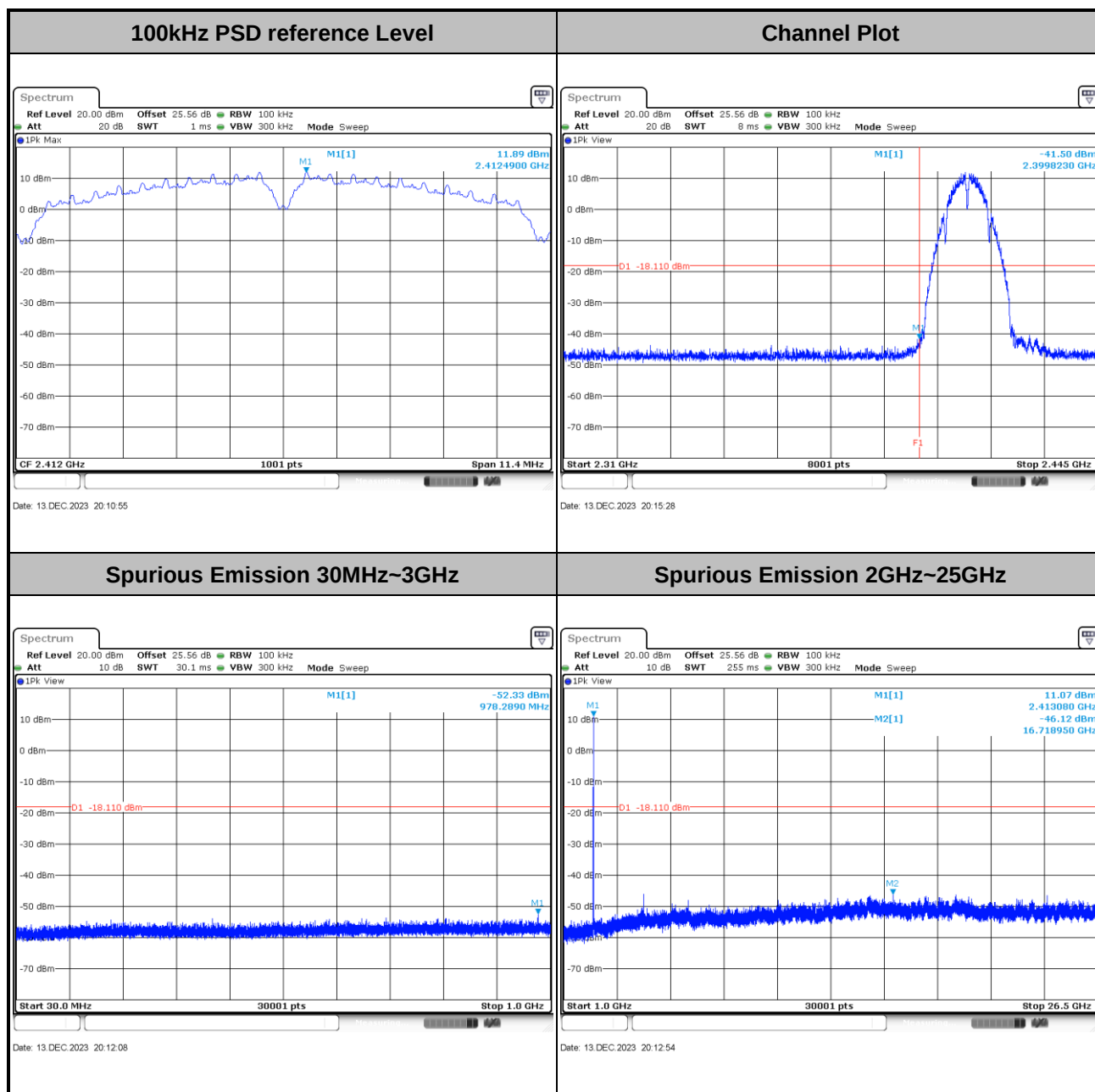
Test Mode :	802.11be EHT40	Test Channel :	09
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Number of TX = 2, Ant. 3 (Measured)

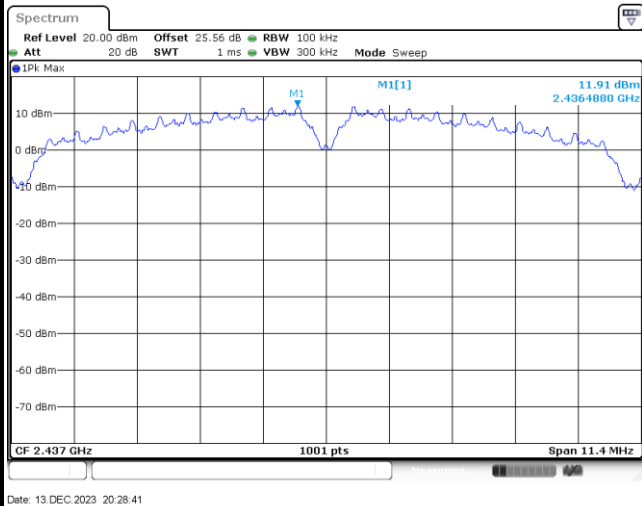
Test Mode :	802.11b	Test Channel :	01
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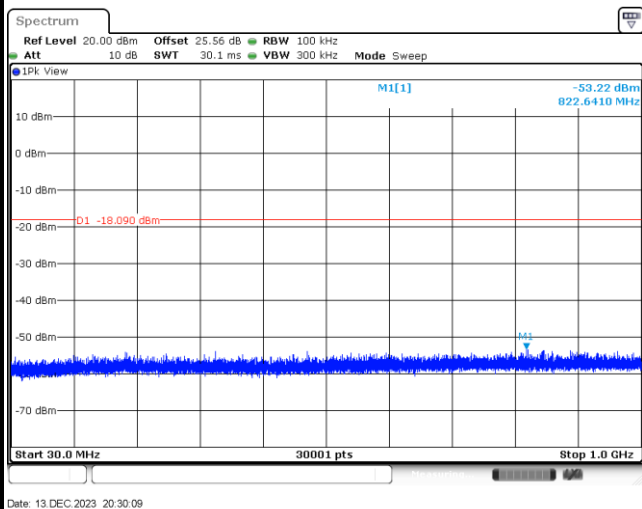
Test Mode :	802.11b	Test Channel :	06
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100kHz PSD reference Level

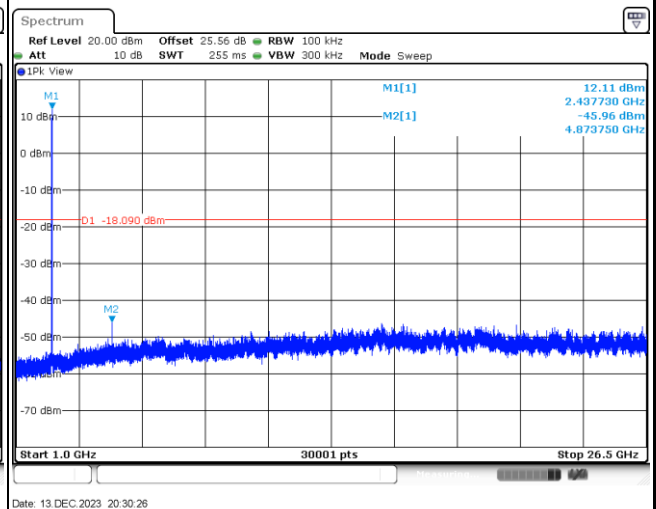


Channel Plot

Spurious Emission 30MHz~3GHz



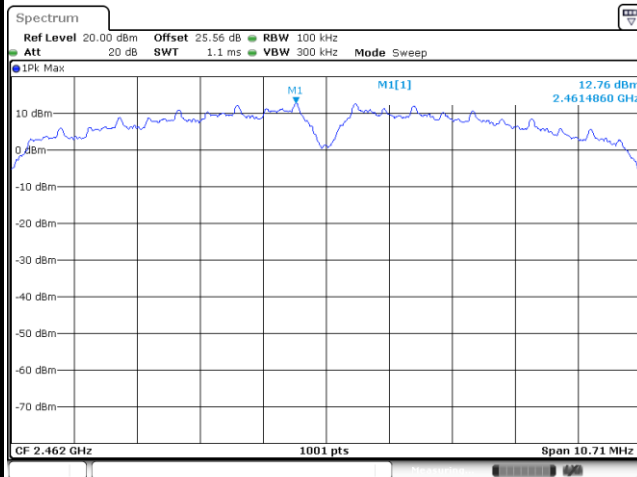
Spurious Emission 2GHz~25GHz





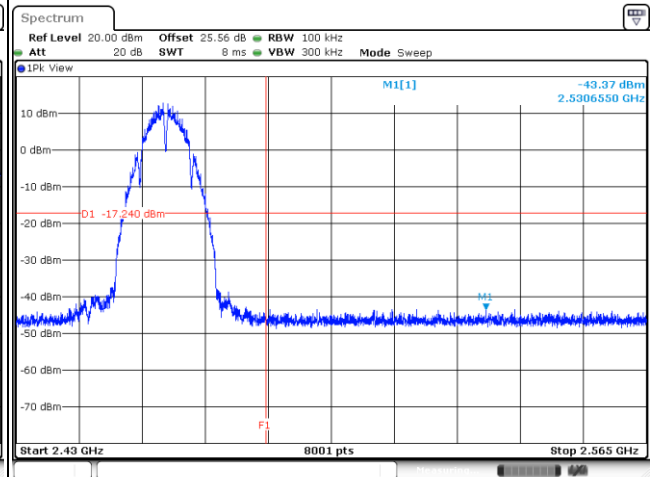
Test Mode :	802.11b	Test Channel :	11
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100kHz PSD reference Level



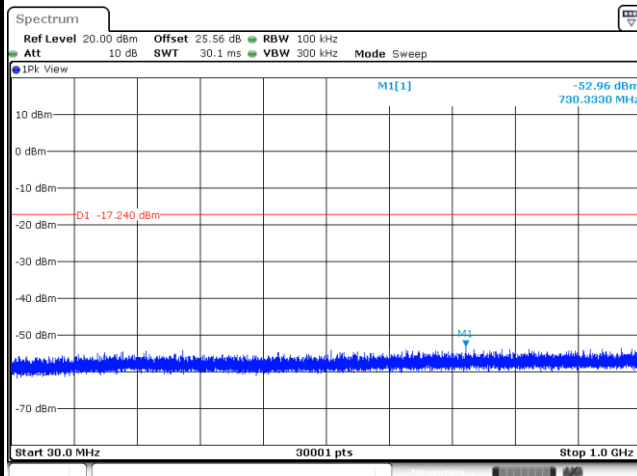
Date: 13 DEC 2023 20:45:14

Channel Plot



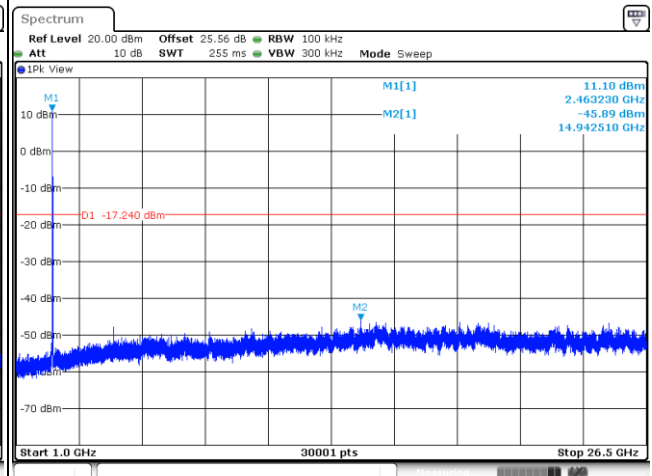
Date: 13 DEC 2023 20:45:59

Spurious Emission 30MHz~3GHz



Date: 13 DEC 2023 20:45:31

Spurious Emission 2GHz~25GHz

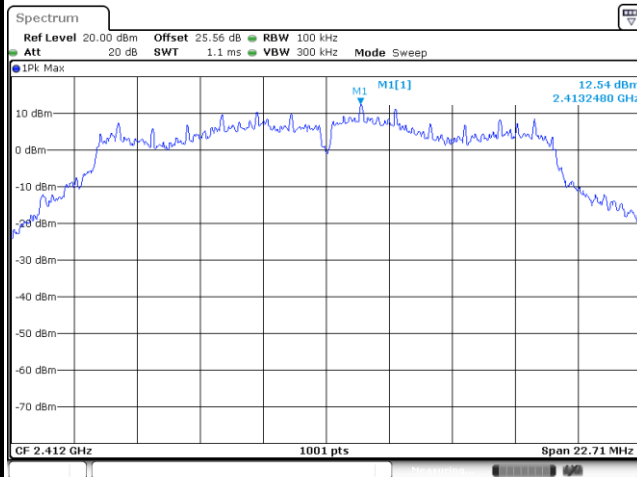


Date: 13 DEC 2023 20:45:47

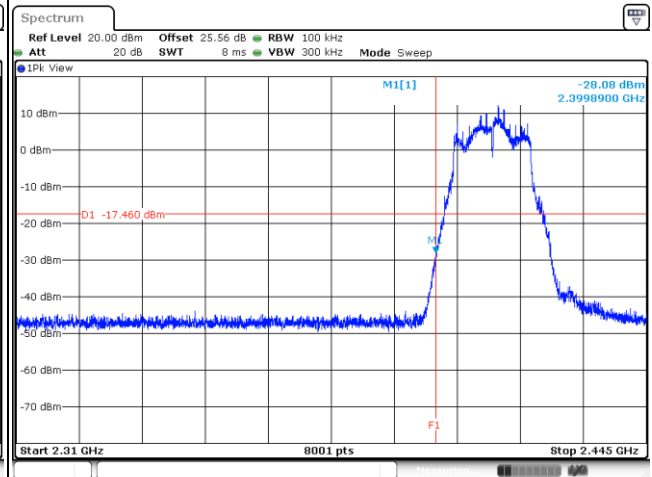


Test Mode :	802.11g	Test Channel :	01
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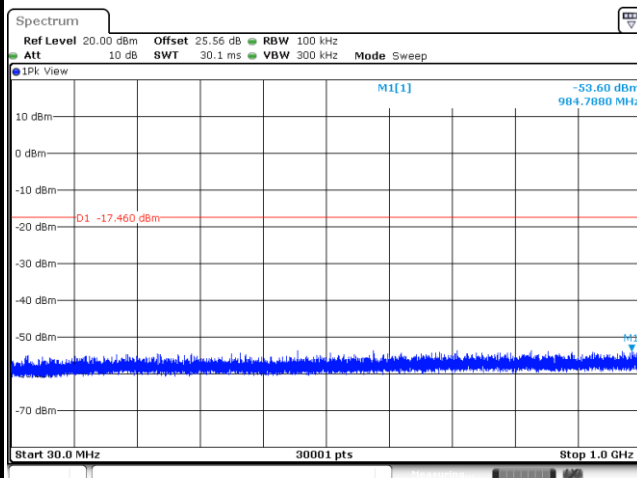
100kHz PSD reference Level



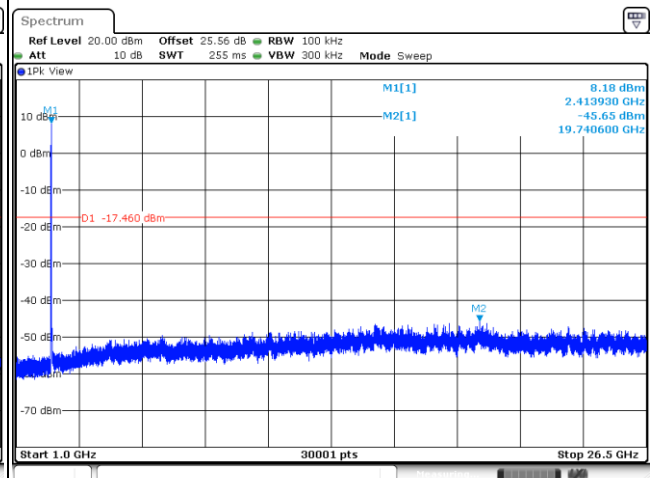
Channel Plot

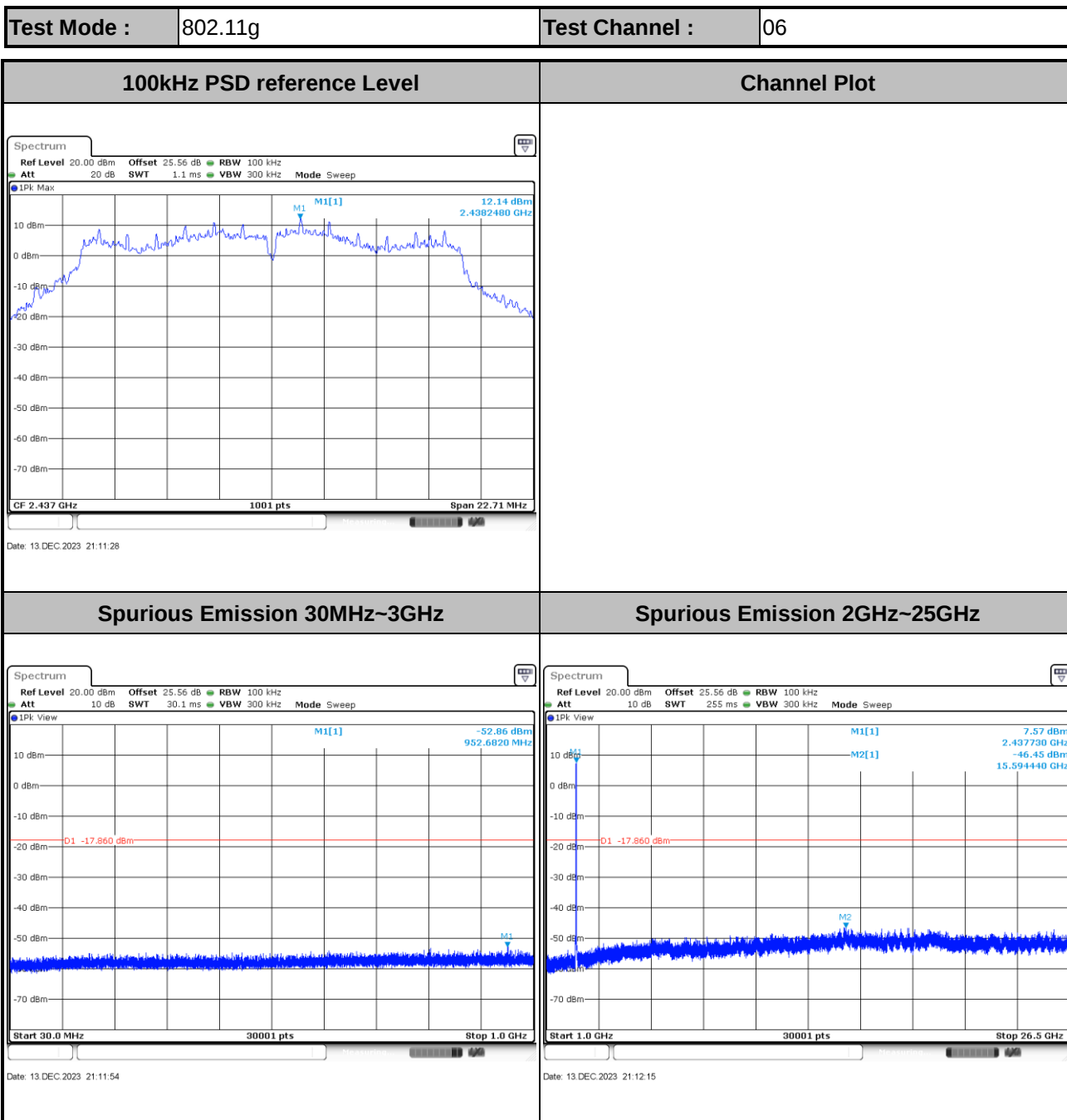


Spurious Emission 30MHz~3GHz



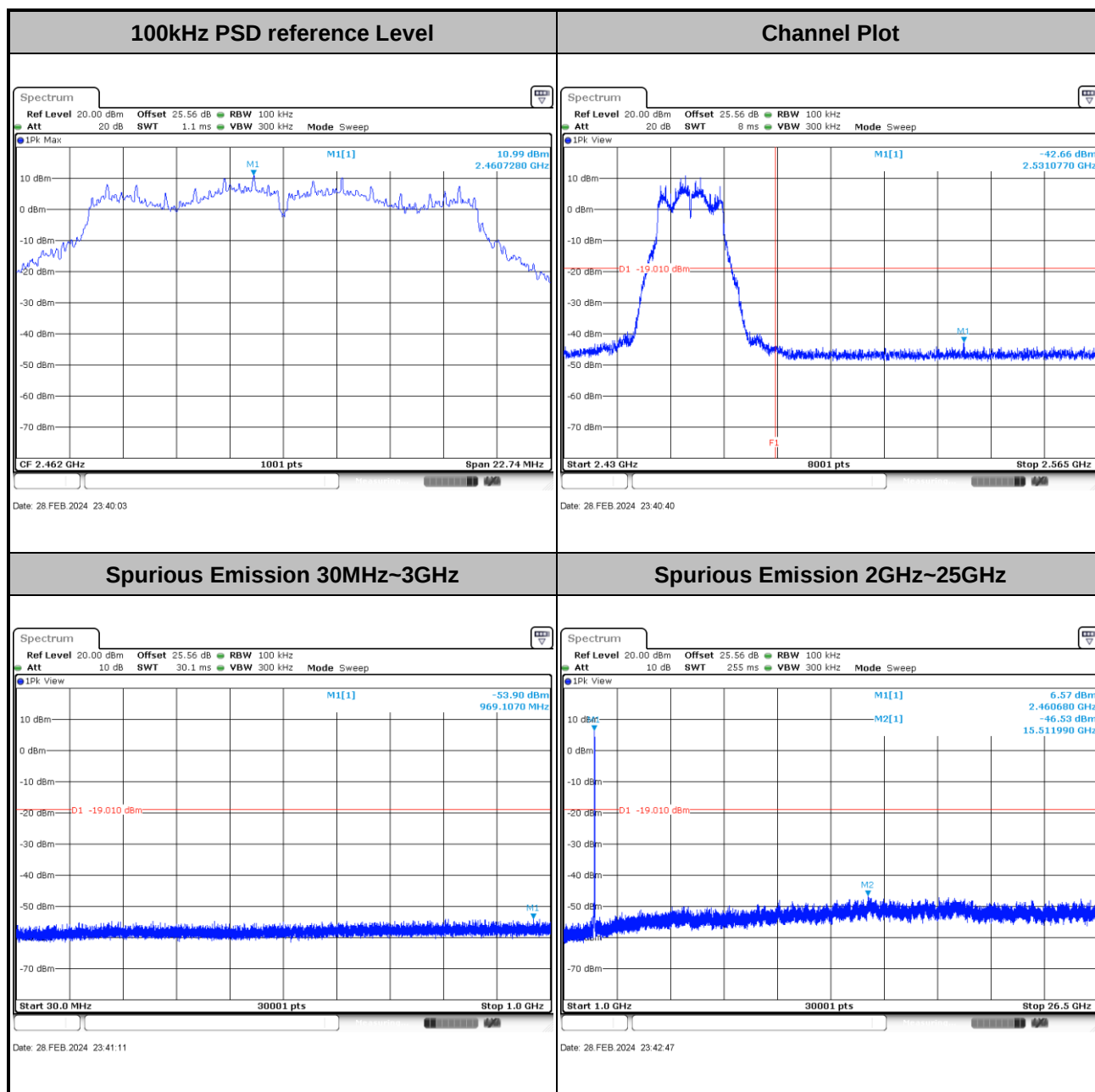
Spurious Emission 2GHz~25GHz







Test Mode :	802.11g	Test Channel :	11
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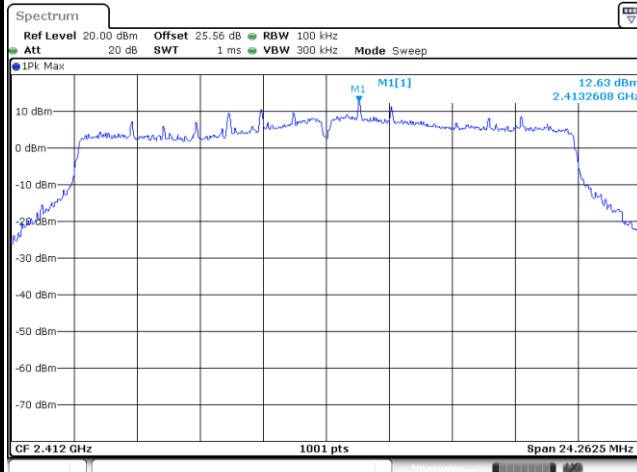




Test Mode : 802.11be EHT20

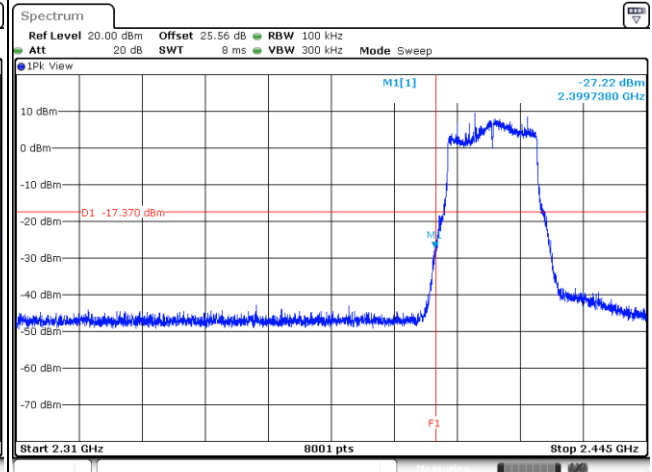
Test Channel : 01

100kHz PSD reference Level



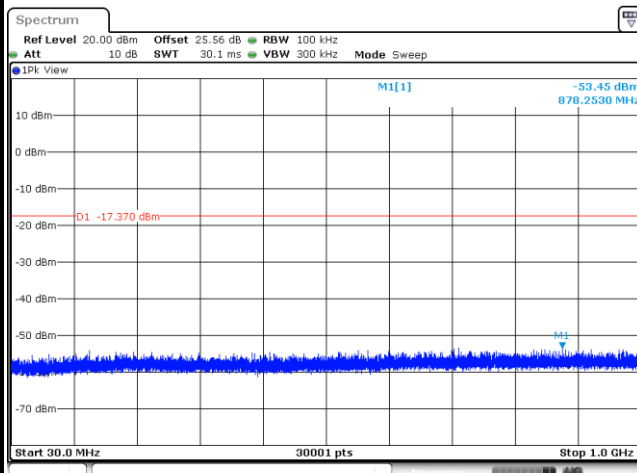
Date: 13 DEC 2023 23:10:21

Channel Plot



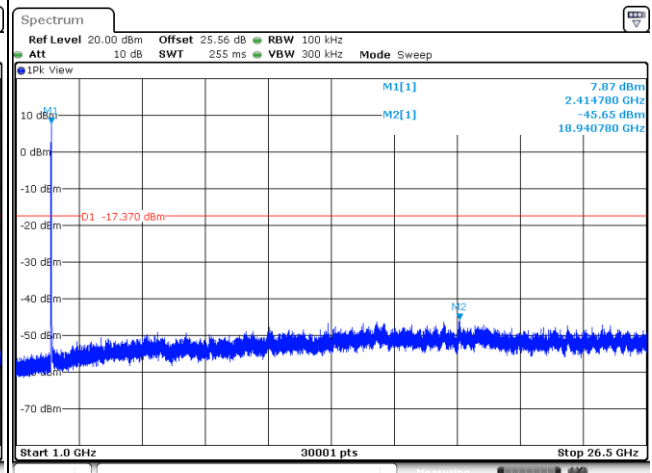
Date: 13 DEC 2023 23:11:15

Spurious Emission 30MHz~3GHz

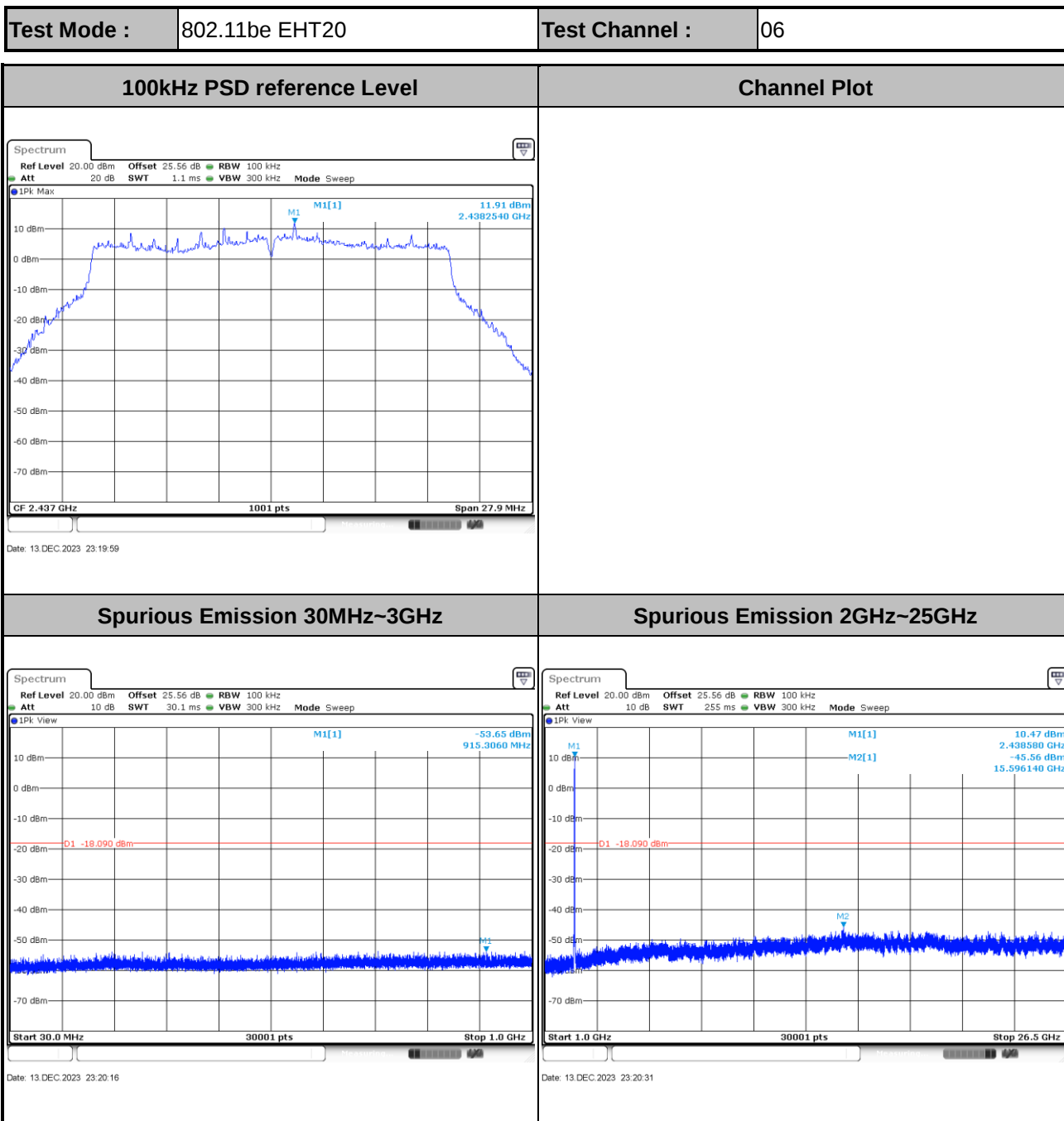


Date: 13 DEC 2023 23:10:42

Spurious Emission 2GHz~25GHz



Date: 13 DEC 2023 23:11:00

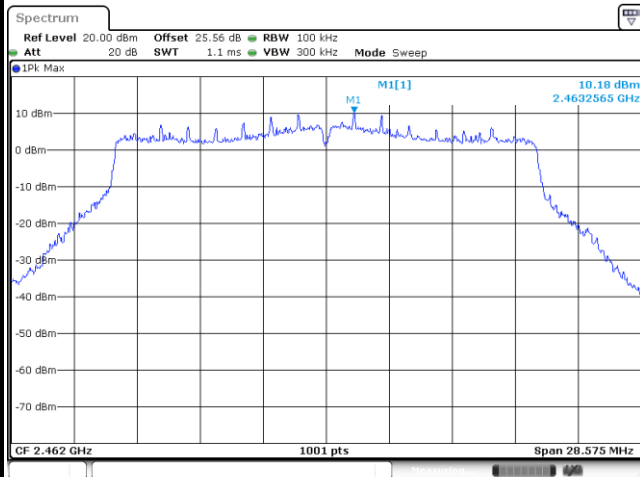




Test Mode : 802.11be EHT20

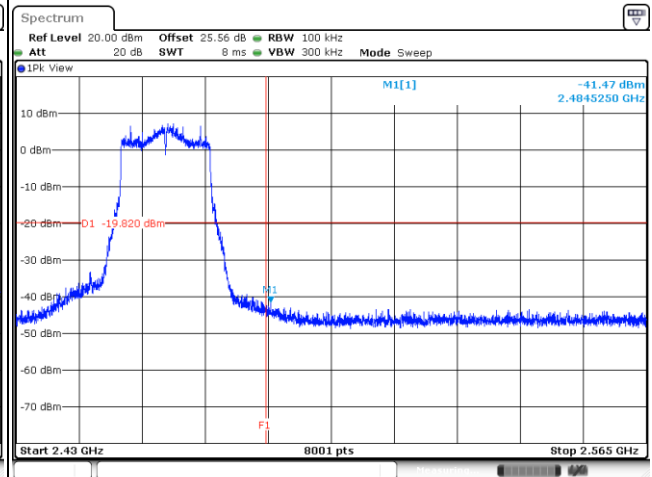
Test Channel : 11

100kHz PSD reference Level



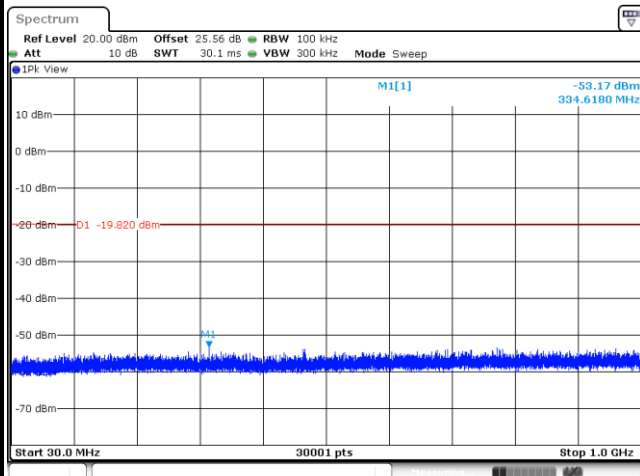
Date: 13 DEC 2023 23:32:12

Channel Plot



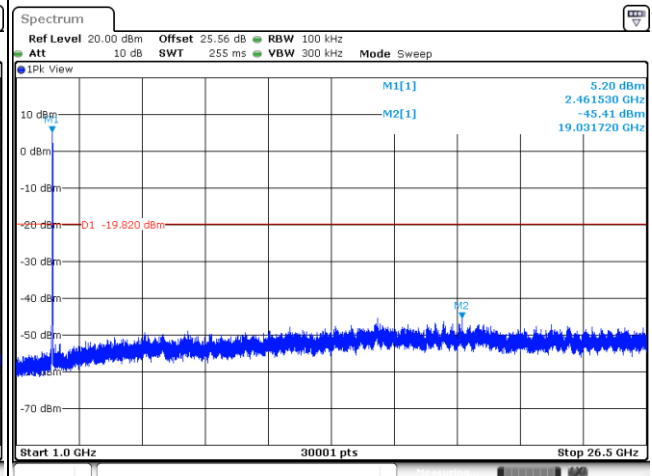
Date: 13 DEC 2023 23:33:25

Spurious Emission 30MHz~3GHz



Date: 13 DEC 2023 23:32:45

Spurious Emission 2GHz~25GHz



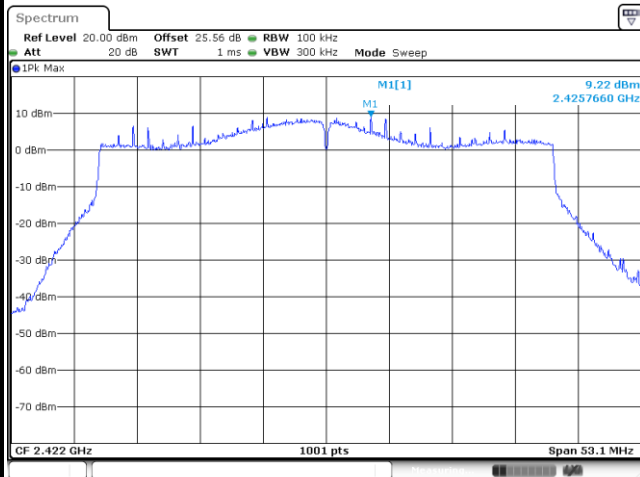
Date: 13 DEC 2023 23:33:02



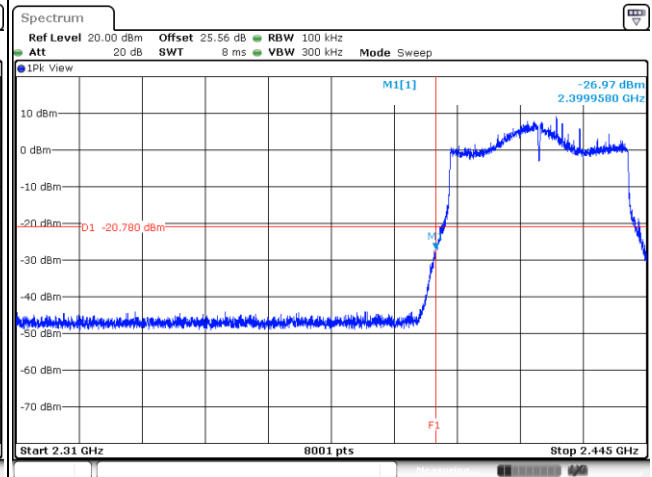
Test Mode : 802.11be EHT40

Test Channel : 03

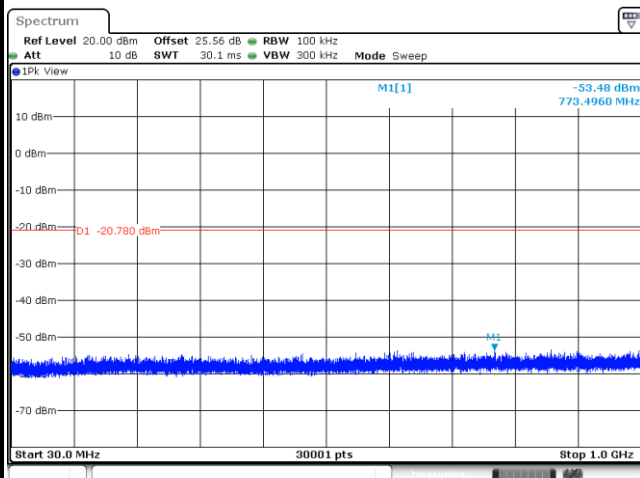
100kHz PSD reference Level



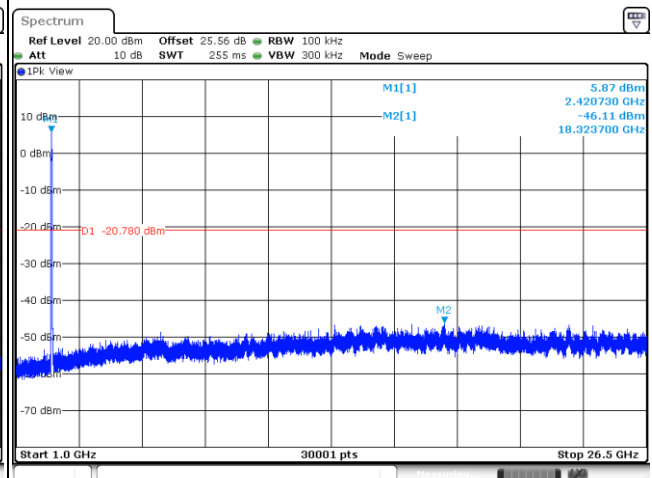
Channel Plot



Spurious Emission 30MHz~3GHz

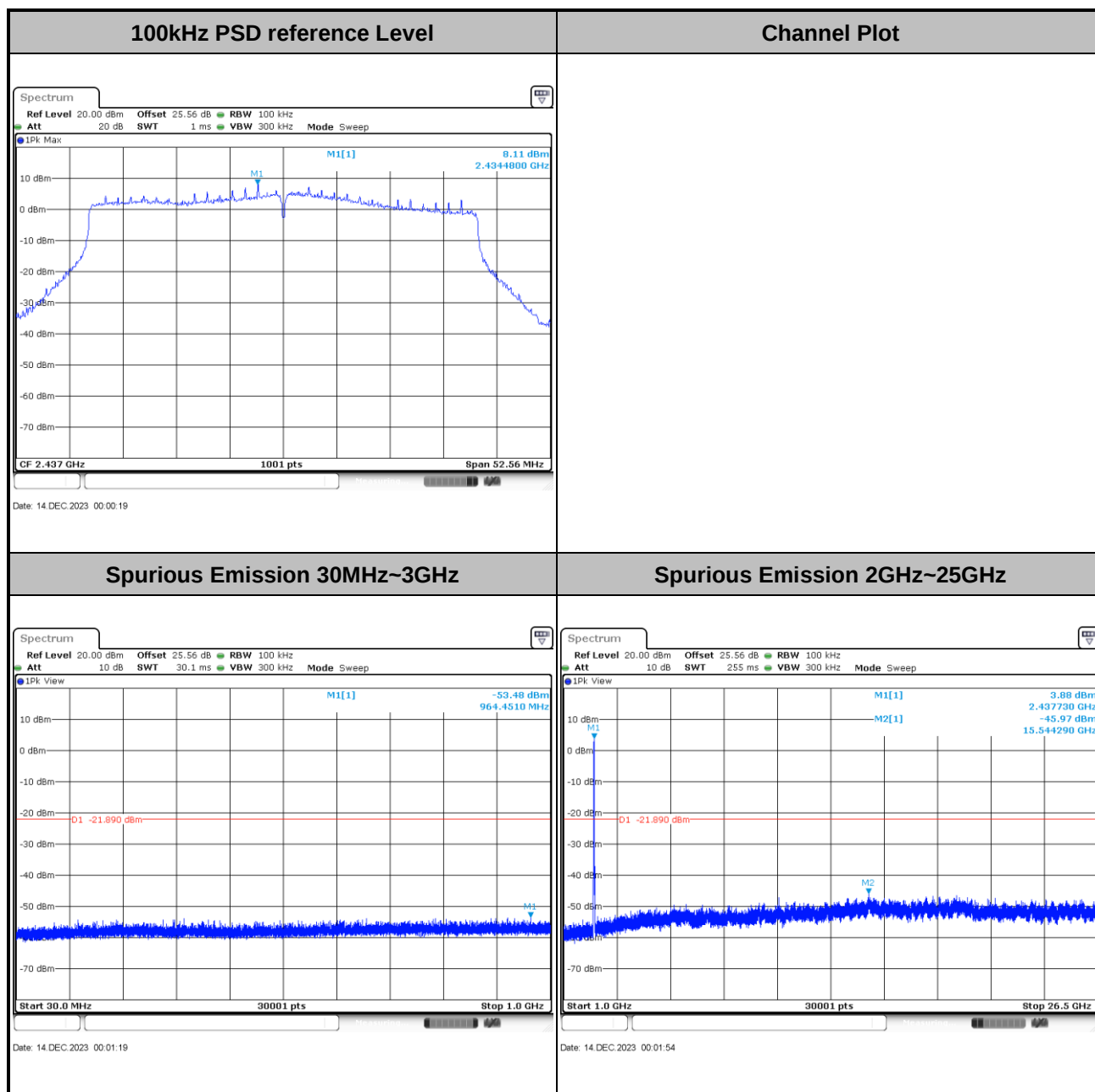


Spurious Emission 2GHz~25GHz





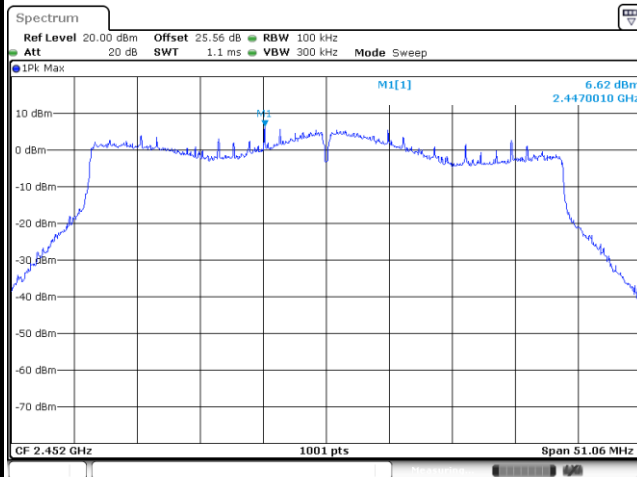
Test Mode :	802.11be EHT40	Test Channel :	06
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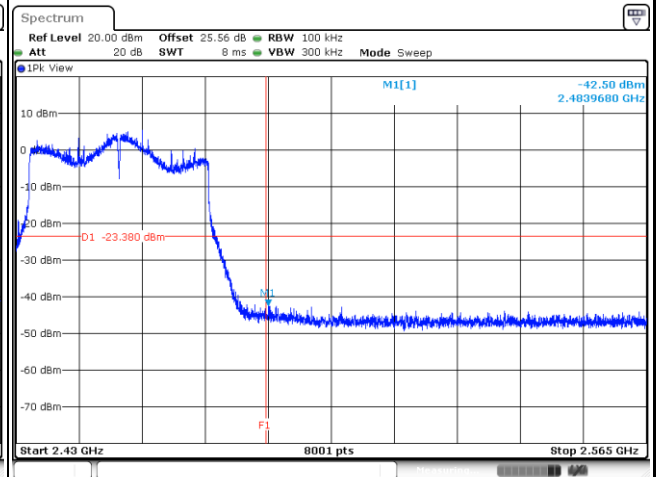


Test Mode :	802.11be EHT40	Test Channel :	09
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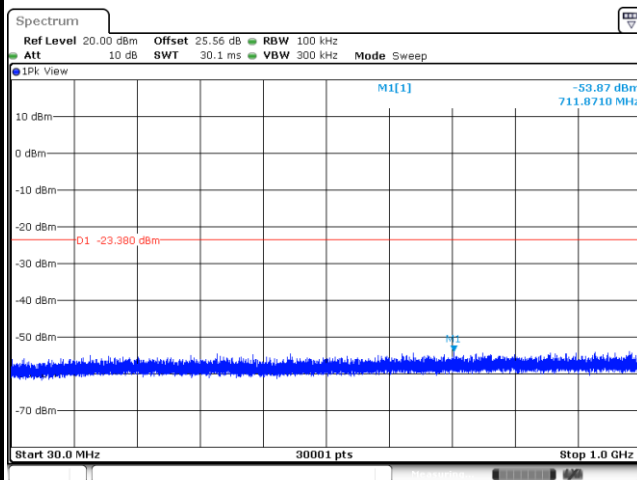
100kHz PSD reference Level



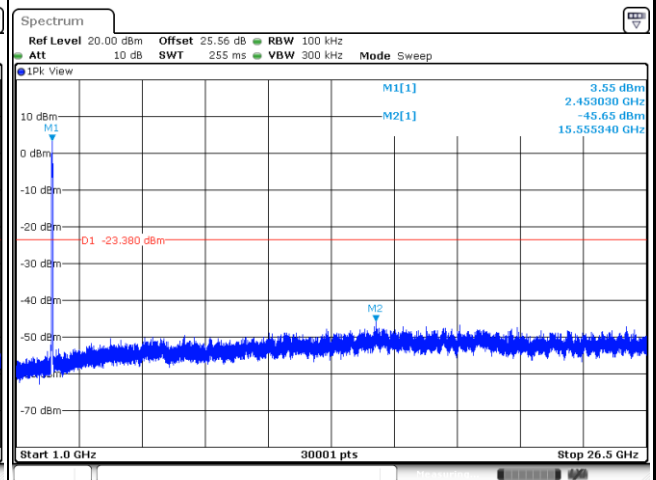
Channel Plot



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz



3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device is measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.5.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT is arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
4. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-”.

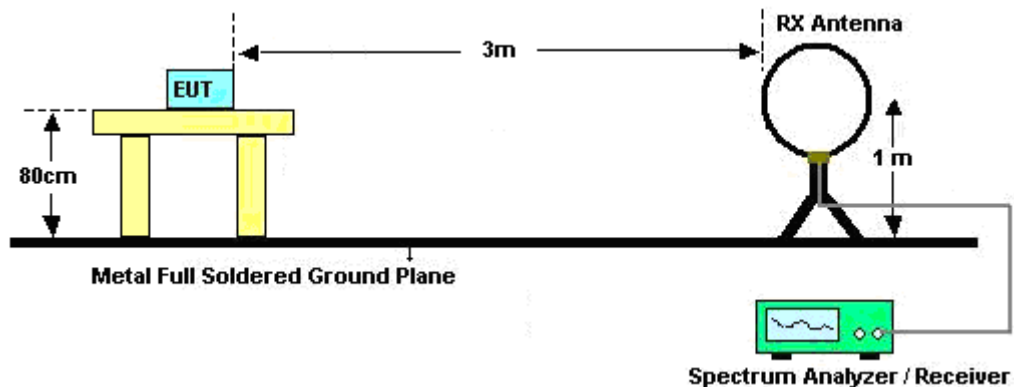
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as “-”.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW = 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW = 3 MHz for $f \geq 1$ GHz for peak measurement.

For average measurement:

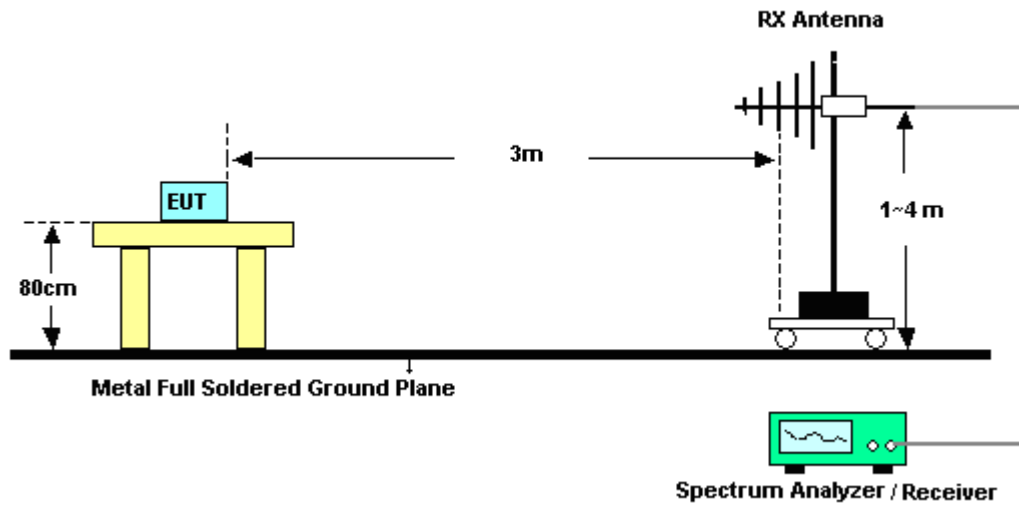
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

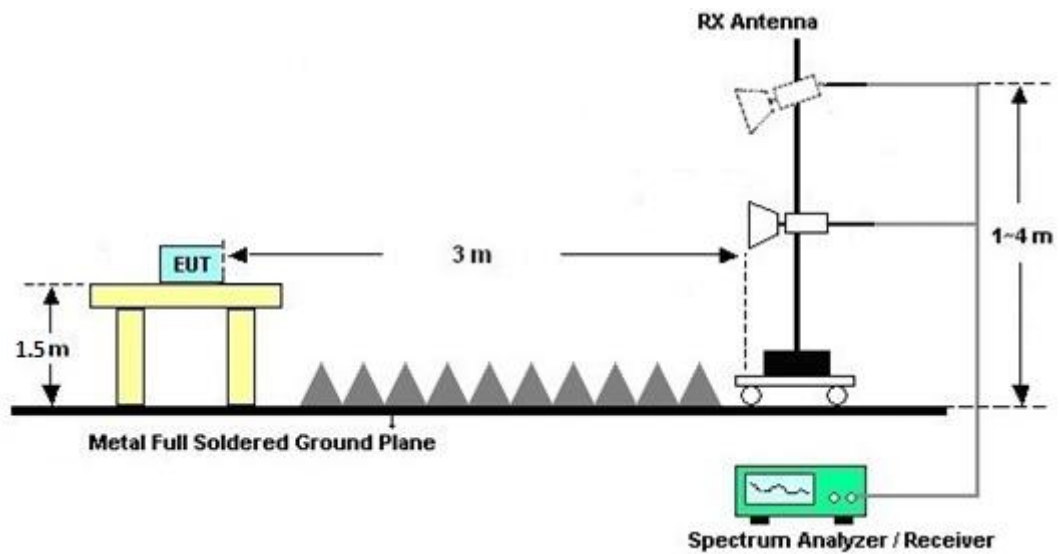
For radiated emissions below 30MHz



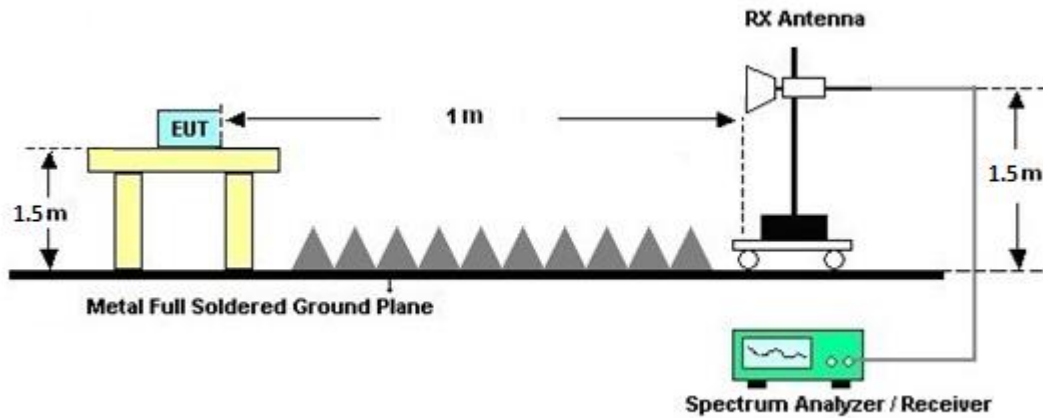
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

The low frequency, which starts from 9 kHz to 30 MHz, is pre-scanned and the result which is 20 dB lower than the limit line is not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result comes out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C and D.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

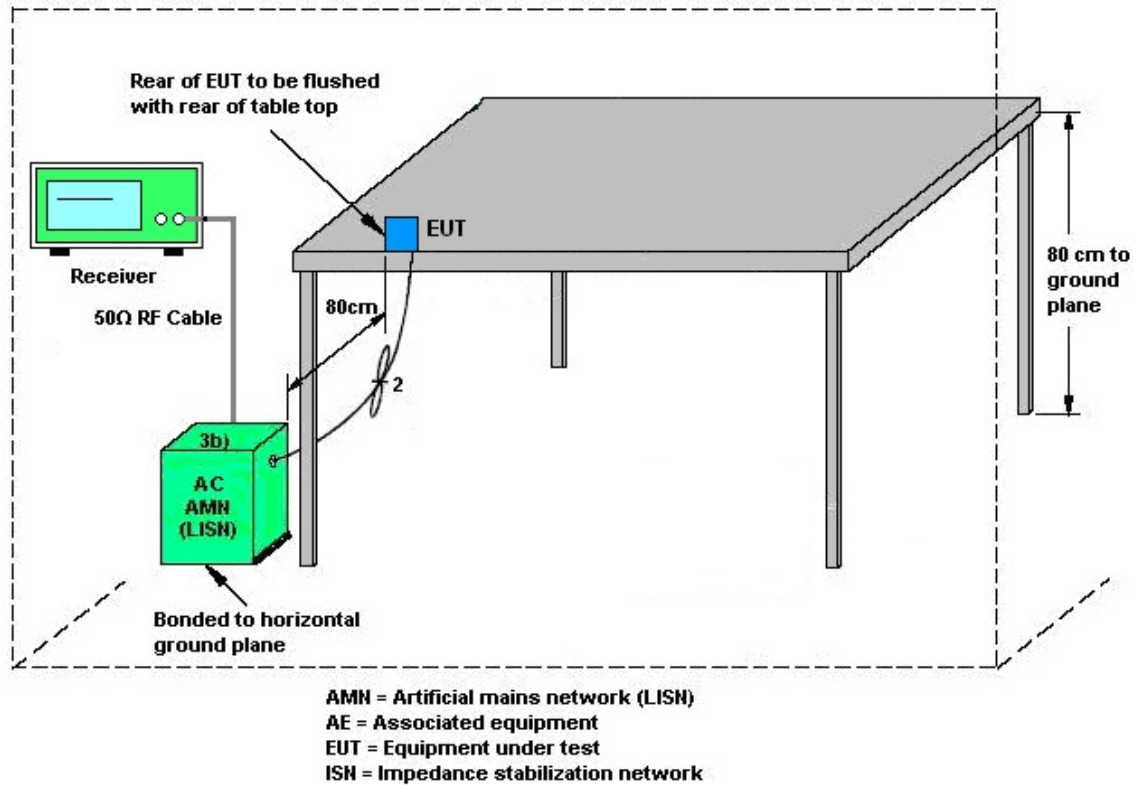
3.6.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.6.3 Test Procedures

1. The EUT is placed 0.4 meter away from the conducting wall of the shielding room, and is kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both Line and Neutral shall be tested in order to find out the maximum conducted emission.
7. The frequency range from 150 kHz to 30 MHz is scanned.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.7 Antenna Requirements

3.7.1 Standard Applicable

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	6111D	54683	30MHz~1GHz	Nov. 13, 2023	Dec. 11, 2023~ Feb. 02, 2024	Nov. 12, 2024	Radiation (03CH01-CA)
Amplifier	SONOMA	310N	372241	N/A	May 03, 2023	Dec. 11, 2023~ Feb. 02, 2024	May 02, 2024	Radiation (03CH01-CA)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	02115	1GHz~18GHz	Aug. 09, 2023	Dec. 11, 2023~ Feb. 02, 2024	Aug. 08, 2024	Radiation (03CH01-CA)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA9170	00842	18GHz~40GHz	Jul. 17, 2023	Dec. 11, 2023~ Feb. 02, 2024	Jul. 16, 2024	Radiation (03CH01-CA)
Preamplifier	Keysight	83017A	MY53270321	1GHz~26.5GHz	May 04, 2023	Dec. 11, 2023~ Feb. 02, 2024	May 03, 2024	Radiation (03CH01-CA)
Preamplifier	E-instrument	ERA-100M-18 G-56-01-A70	EC1900251	1GHz~18GHz	Jun. 27, 2023	Dec. 11, 2023~ Feb. 02, 2024	Jun. 26, 2024	Radiation (03CH01-CA)
Preamplifier	EMEC	EMC18G40G	060725	18GHz-40GHz	May 04, 2023	Dec. 12, 2023~ Jan. 10, 2024	May 03, 2024	Radiation (03CH01-CA)
Spectrum Analyzer	Keysight	N9010B	MY63440343	10Hz - 44GHz	Jan. 15, 2023	Dec. 11, 2023~ Jan. 13, 2024	Jan. 14, 2024	Radiation (03CH01-CA)
Spectrum Analyzer	Keysight	N9010B	MY63440343	10Hz - 44GHz	Jan. 16, 2024	Jan. 16, 2024~ Feb. 02, 2024	Jan. 15, 2025	Radiation (03CH01-CA)
Filter	Wainwright	WLK12-1200-1 272-11000-40 SS	SN1	1.2GHz Low Pass Filter	Jun. 05, 2023	Dec. 11, 2023~ Feb. 02, 2024	Jun. 04, 2024	Radiation (03CH01-CA)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 OST	SN9	3GHz High Pass Filter	Jun. 05, 2023	Dec. 11, 2023~ Feb. 02, 2024	Jun. 04, 2024	Radiation (03CH01-CA)
RF Cable	HUBER+SUH NER	SUCOFLEX 102	8015932/2, 8015762/2, 804938/2	N/A	Mar. 06, 2023	Dec. 11, 2023~ Feb. 02, 2024	Mar. 05, 2024	Radiation (03CH01-CA)
Hygrometer	TESEO	608-H1	45142559	N/A	Aug. 30, 2023	Dec. 11, 2023~ Feb. 02, 2024	Aug. 29, 2024	Radiation (03CH01-CA)
Controller	ChainTek	EM-1000	060881	5.11	N/A	Dec. 11, 2023~ Feb. 02, 2024	N/A	Radiation (03CH01-CA)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Dec. 11, 2023~ Feb. 02, 2024	N/A	Radiation (03CH01-CA)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Dec. 11, 2023~ Feb. 02, 2024	N/A	Radiation (03CH01-CA)
Audix E3	E6.2009-8-24d	PK-002093	Audix E3	E6.2009-8-24d	N/A	Dec. 11, 2023~ Feb. 02, 2024	N/A	Radiation (03CH01-CA)
LISN	TESEQ	NNB51	47415	N/A	Aug. 04, 2023	Jan. 31, 2024	Aug. 03, 2024	Conduction (CO01-CA)
EMI Test Receiver	R&S	ESR7	102177	9kHz~7GHz	May 23, 2023	Jan. 31, 2024	May 22, 2024	Conduction (CO01-CA)
Pulse limiter with 10dB attenuation	R&S	VTSD 9561-F N	9561-F- N00412	N/A	Jun. 05, 2023	Jan. 31, 2024	Jun. 04, 2024	Conduction (CO01-CA)
Test Software	R&S	EMC32 V10.30.0	N/A	N/A	N/A	Jan. 31, 2024	N/A	Conduction (CO01-CA)
Hygrometer	Testo	608-H1	45141354	N/A	Jul. 26, 2023	Dec. 13, 2023~ Feb. 28, 2024	Jul. 25, 2024	Conducted (TH01-CA)
Power Sensor	DARE!!	RPR3006W	RPR6W-2101 003	10MHz-8GHz	May 04, 2023	Dec. 13, 2023~ Feb. 28, 2024	May 03, 2024	Conducted (TH01-CA)
Switch Box	EM Electronics	EMSW18	1070902	N/A	Aug. 25, 2023	Dec. 13, 2023~ Feb. 28, 2024	Aug. 24, 2024	Conducted (TH01-CA)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101089	10Hz-40GHz	May 22, 2023	Dec. 13, 2023~ Feb. 28, 2024	May 21, 2024	Conducted (TH01-CA)

5 Measurement Uncertainty

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.7 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.7 dB
--	--------

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 6000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.6 dB
--	--------

Uncertainty of Radiated Emission Measurement (6000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2 dB
--	--------

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1 dB
--	--------

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Venkata Kondepudi	Temperature:	19.5~21.2°C	°C
Test Date:	2023/12/13~2024/02/28	Relative Humidity:	41.9~46.2%	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band MIMO										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant1	Ant3	Ant1	Ant3		
11b	1Mbps	2	1	2412	13.04	12.99	7.62	7.60	0.50	Pass
11b	1Mbps	2	6	2437	13.14	13.09	7.58	7.60	0.50	Pass
11b	1Mbps	2	11	2462	13.14	13.19	7.14	7.14	0.50	Pass
11g	6Mbps	2	1	2412	16.78	16.78	11.40	15.14	0.50	Pass
11g	6Mbps	2	6	2437	16.98	16.98	15.08	15.12	0.50	Pass
11g	6Mbps	2	11	2462	17.08	16.78	12.64	15.16	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant3	SUM	Ant1	Ant3	Ant1	Ant3	Ant1	Ant3	Ant1	Ant3	
11b	1Mbps	2	1	2412	21.01	21.51	24.28	30.00		2.10		26.38		36.00		Pass
11b	1Mbps	2	6	2437	21.20	21.46	24.34	30.00		2.10		26.44		36.00		Pass
11b	1Mbps	2	11	2462	21.29	21.63	24.47	30.00		2.10		26.57		36.00		Pass
11g	6Mbps	2	1	2412	20.87	21.07	23.98	30.00		2.10		26.08		36.00		Pass
11g	6Mbps	2	6	2437	21.03	21.18	24.12	30.00		2.10		26.22		36.00		Pass
11g	6Mbps	2	11	2462	19.73	20.17	22.97	30.00		2.10		25.07		36.00		Pass
HT20	MCS0	2	1	2412	20.62	20.41	23.53	30.00		2.10		25.63		36.00		Pass
HT20	MCS0	2	6	2437	19.72	20.94	23.38	30.00		2.10		25.48		36.00		Pass
HT20	MCS0	2	11	2462	19.80	19.57	22.70	30.00		2.10		24.80		36.00		Pass
HT40	MCS0	2	3	2422	20.92	20.74	23.84	30.00		2.10		25.94		36.00		Pass
HT40	MCS0	2	6	2437	18.84	19.60	22.25	30.00		2.10		24.35		36.00		Pass
HT40	MCS0	2	9	2452	17.38	17.40	20.40	30.00		2.10		22.50		36.00		Pass
VHT20	MCS0	2	1	2412	20.46	21.54	24.04	30.00		2.10		26.14		36.00		Pass
VHT20	MCS0	2	6	2437	20.71	20.04	23.40	30.00		2.10		25.50		36.00		Pass
VHT20	MCS0	2	11	2462	19.41	20.21	22.84	30.00		2.10		24.94		36.00		Pass
VHT40	MCS0	2	3	2422	20.87	20.81	23.85	30.00		2.10		25.95		36.00		Pass
VHT40	MCS0	2	6	2437	19.44	19.48	22.47	30.00		2.10		24.57		36.00		Pass
VHT40	MCS0	2	9	2452	17.22	17.61	20.43	30.00		2.10		22.53		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant1	Ant3	Worse + 3.01	Ant1	Ant3	Ant1	Ant3	
11b	1Mbps	2	1	2412	-1.98	-1.67	1.34	2.10		8.00		Pass
11b	1Mbps	2	6	2437	-2.79	-2.54	0.47	2.10		8.00		Pass
11b	1Mbps	2	11	2462	-2.58	-2.65	0.43	2.10		8.00		Pass
11g	6Mbps	2	1	2412	-2.62	-2.60	0.41	2.10		8.00		Pass
11g	6Mbps	2	6	2437	-2.08	-3.74	0.93	2.10		8.00		Pass
11g	6Mbps	2	11	2462	-4.62	-5.61	-1.61	2.10		8.00		Pass

Measured power density (dBm) has offset with cable loss.

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																	
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant1	Ant3	SUM	Ant1	Ant3	Ant1	Ant3	Ant1	Ant3	Ant1	Ant3	
HE20	MCS0	2	1	2412	Full	20.50	21.54	24.06	30.00		2.10		26.16		36.00		Pass
HE20	MCS0	2	6	2437	Full	19.87	20.95	23.45	30.00		2.10		25.55		36.00		Pass
HE20	MCS0	2	11	2462	Full	20.17	20.53	23.36	30.00		2.10		25.46		36.00		Pass
HE40	MCS0	2	3	2422	Full	21.02	20.67	23.86	30.00		2.10		25.96		36.00		Pass
HE40	MCS0	2	6	2437	Full	19.49	19.54	22.53	30.00		2.10		24.63		36.00		Pass
HE40	MCS0	2	9	2452	Full	17.20	17.67	20.45	30.00		2.10		22.55		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band MIMO											
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	RU Config	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
						Ant1	Ant3	Ant1	Ant3		
EHT20	MCS0	2	1	2412	Full	18.78	18.98	15.28	16.18	0.50	Pass
EHT20	MCS0	2	6	2437	Full	18.83	19.13	13.88	18.60	0.50	Pass
EHT20	MCS0	2	11	2462	Full	18.73	19.13	15.10	19.05	0.50	Pass
EHT40	MCS0	2	3	2422	Full	37.66	37.86	31.76	35.40	0.50	Pass
EHT40	MCS0	2	6	2437	Full	38.36	37.96	36.64	35.04	0.50	Pass
EHT40	MCS0	2	9	2452	Full	38.06	38.26	35.36	34.04	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																	
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant1	Ant3	SUM	Ant1	Ant3	Ant1	Ant3	Ant1	Ant3	Ant1	Ant3	
EHT20	MCS0	2	1	2412	Full	20.80	21.58	24.22	30.00		2.10		26.32		36.00		Pass
EHT20	MCS0	2	6	2437	Full	21.13	20.62	23.89	30.00		2.10		25.99		36.00		Pass
EHT20	MCS0	2	11	2462	Full	20.72	20.86	23.80	30.00		2.10		25.90		36.00		Pass
EHT40	MCS0	2	3	2422	Full	20.68	21.43	24.08	30.00		2.10		26.18		36.00		Pass
EHT40	MCS0	2	6	2437	Full	19.83	19.71	22.78	30.00		2.10		24.88		36.00		Pass
EHT40	MCS0	2	9	2452	Full	17.81	18.72	21.30	30.00		2.10		23.40		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band MIMO													
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	RU Config	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
						Ant1	Ant3	Worse + 3.01	Ant1	Ant3	Ant1	Ant3	
EHT20	MCS0	2	1	2412	Full	-1.04	-2.80	1.97	2.10		8.00		Pass
EHT20	MCS0	2	6	2437	Full	-1.17	-3.91	1.84	2.10		8.00		Pass
EHT20	MCS0	2	11	2462	Full	-2.29	-4.55	0.72	2.10		8.00		Pass
EHT40	MCS0	2	3	2422	Full	-5.42	-3.78	-0.77	2.10		8.00		Pass
EHT40	MCS0	2	6	2437	Full	-5.51	-6.10	-2.50	2.10		8.00		Pass
EHT40	MCS0	2	9	2452	Full	-9.07	-6.53	-3.52	2.10		8.00		Pass

Measured power density (dBm) has offset with cable loss.



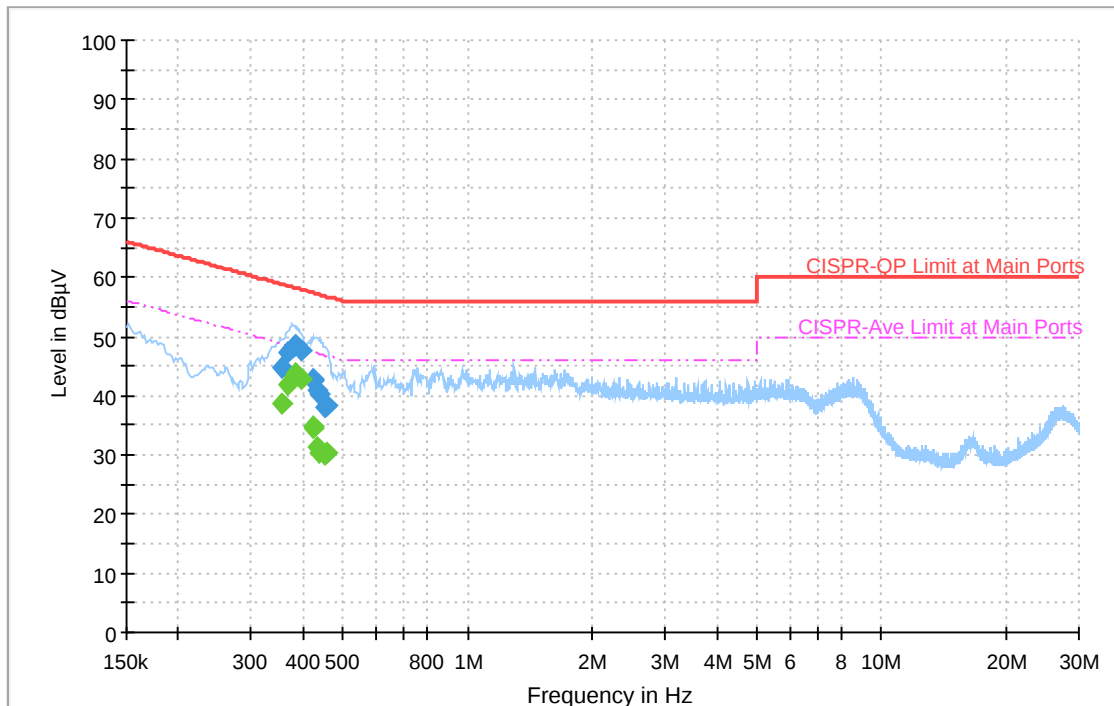
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Yuan Lee	Temperature :	20.6~21.2℃
		Relative Humidity :	43.5~46.3%

EUT Information

Test Site Location : CO01-CA
Project 231214001
Power: 120Vac/60Hz
Mode 1

Full Spectrum



Final Result

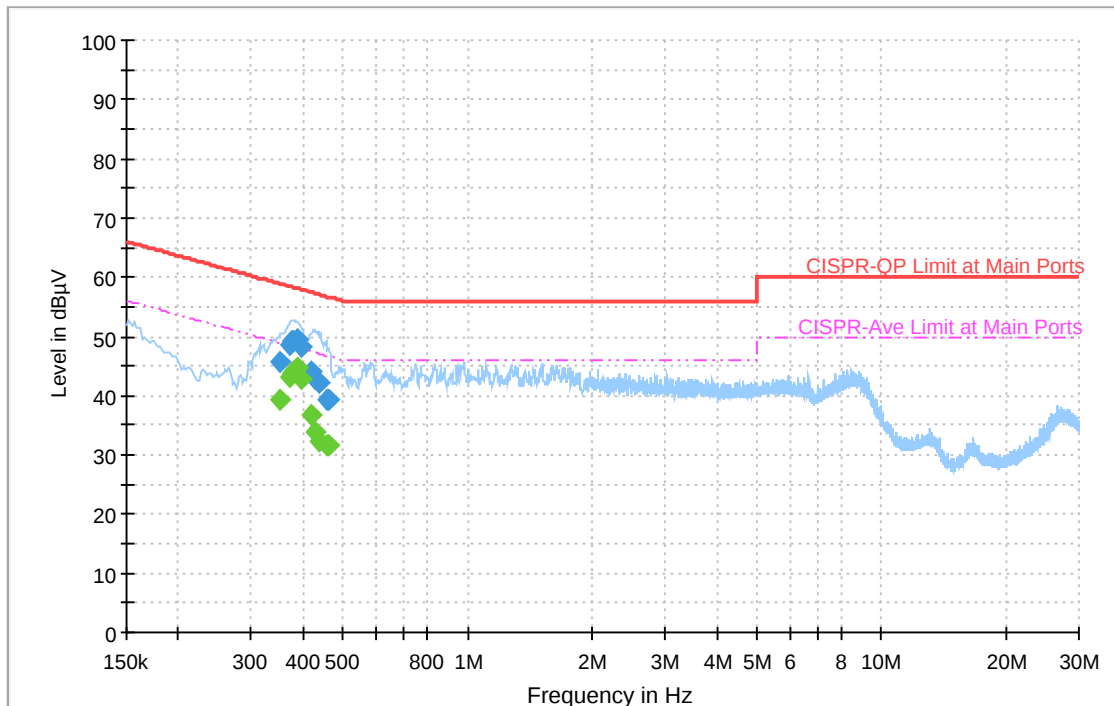
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.353922	---	38.62	48.87	10.25	L1	OFF	20.3
0.353922	44.79	---	58.87	14.08	L1	OFF	20.3
0.367026	---	41.77	48.57	6.80	L1	OFF	20.3
0.367026	47.17	---	58.57	11.40	L1	OFF	20.3
0.378510	---	43.02	48.31	5.29	L1	OFF	20.3
0.378510	48.23	---	58.31	10.08	L1	OFF	20.3
0.385647	---	43.81	48.16	4.35	L1	OFF	20.3
0.385647	48.47	---	58.16	9.69	L1	OFF	20.3
0.395439	---	42.81	47.95	5.14	L1	OFF	20.3
0.395439	47.75	---	57.95	10.20	L1	OFF	20.3
0.421332	---	34.78	47.42	12.64	L1	OFF	20.3
0.421332	42.66	---	57.42	14.76	L1	OFF	20.3
0.423402	---	34.39	47.38	12.99	L1	OFF	20.3
0.423402	42.46	---	57.38	14.92	L1	OFF	20.3
0.434004	---	31.45	47.18	15.73	L1	OFF	20.3
0.434004	41.04	---	57.18	16.14	L1	OFF	20.3
0.439476	---	30.40	47.07	16.67	L1	OFF	20.3
0.439476	40.13	---	57.07	16.94	L1	OFF	20.3
0.452805	---	30.02	46.82	16.80	L1	OFF	20.3
0.452805	38.06	---	56.82	18.76	L1	OFF	20.3
0.456504	---	30.41	46.76	16.35	L1	OFF	20.3

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.456504	38.18	---	56.76	18.58	L1	OFF	20.3

EUT Information

Test Site Location : CO01-CA
Project 231214001
Power: 120Vac/60Hz
Mode 1

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.352059	---	39.18	48.91	9.73	N	OFF	20.3
0.352059	45.82	---	58.91	13.09	N	OFF	20.3
0.370347	---	43.01	48.49	5.48	N	OFF	20.3
0.370347	48.66	---	58.49	9.83	N	OFF	20.3
0.376269	---	43.68	48.36	4.68	N	OFF	20.3
0.376269	49.15	---	58.36	9.21	N	OFF	20.3
0.378978	---	44.04	48.30	4.26	N	OFF	20.3
0.378978	49.28	---	58.30	9.02	N	OFF	20.3
0.389094	---	44.81	48.08	3.27	N	OFF	20.3
0.389094	49.37	---	58.08	8.71	N	OFF	20.3
0.398292	---	42.86	47.89	5.03	N	OFF	20.3
0.398292	48.11	---	57.89	9.78	N	OFF	20.3
0.417858	---	36.72	47.49	10.77	N	OFF	20.3
0.417858	44.01	---	57.49	13.48	N	OFF	20.3
0.428622	---	33.76	47.28	13.52	N	OFF	20.3
0.428622	42.79	---	57.28	14.49	N	OFF	20.3
0.435255	---	32.24	47.15	14.91	N	OFF	20.3
0.435255	42.04	---	57.15	15.11	N	OFF	20.3
0.458070	---	31.52	46.73	15.21	N	OFF	20.3
0.458070	39.23	---	56.73	17.50	N	OFF	20.3
0.460329	---	31.72	46.69	14.97	N	OFF	20.3

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.460329	39.36	---	56.69	17.33	N	OFF	20.3



Appendix C. Radiated Spurious Emission

Test Engineer :	Jesse, Yuan Lee and Leo Liu	Temperature :	17.1~21.4
		Relative Humidity :	41.2~56.3

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+3		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2377.515	55.7	-18.3	74	41.63	27.31	17.57	30.81	300	54	P	H
		2385.495	46.15	-7.85	54	32.01	27.35	17.58	30.79	300	54	A	H
	*	2412	117.62	-	-	103.25	27.52	17.62	30.77	300	54	P	H
	*	2412	114.54	-	-	100.17	27.52	17.62	30.77	300	54	A	H
													H
													H
		2375.205	55.75	-18.25	74	41.8	27.2	17.56	30.81	398	0	P	V
		2366.385	46.02	-7.98	54	32.1	27.18	17.55	30.81	398	0	A	V
	*	2412	112.75	-	-	98.6	27.3	17.62	30.77	398	0	P	V
	*	2412	109.64	-	-	95.49	27.3	17.62	30.77	398	0	A	V
													V
													V
802.11b CH 06 2437MHz		2357.52	55.42	-18.58	74	41.52	27.18	17.54	30.82	199	58	P	H
		2373.84	46.15	-7.85	54	32.11	27.29	17.56	30.81	199	58	A	H
	*	2437	120.59	-	-	106.07	27.61	17.66	30.75	199	58	P	H
	*	2437	117.46	-	-	102.94	27.61	17.66	30.75	199	58	A	H
		2483.92	56.71	-17.29	74	41.81	27.87	17.73	30.7	199	58	P	H
		2485.2	47.23	-6.77	54	32.3	27.88	17.74	30.69	199	58	A	H
		2359.92	55.61	-18.39	74	41.72	27.17	17.54	30.82	303	52	P	V
		2369.2	45.84	-8.16	54	31.9	27.19	17.56	30.81	303	52	A	V
	*	2437	114.32	-	-	99.95	27.46	17.66	30.75	303	52	P	V
	*	2437	111.19	-	-	96.82	27.46	17.66	30.75	303	52	A	V
		2489.68	55.67	-18.33	74	40.92	27.7	17.74	30.69	303	52	P	V
		2486.56	46.53	-7.47	54	31.78	27.7	17.74	30.69	303	52	A	V



WIFI Ant. 1+3	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 11 2462MHz	*	2462	114.31	-	-	99.6	27.73	17.7	30.72	400	324	P	H
	*	2462	111.37	-	-	96.66	27.73	17.7	30.72	400	324	A	H
		2485.04	59.52	-14.48	74	44.59	27.88	17.74	30.69	400	324	P	H
		2483.52	48.67	-5.33	54	33.77	27.87	17.73	30.7	400	324	A	H
													H
													H
	*	2462	112.9	-	-	98.31	27.61	17.7	30.72	400	44	P	V
	*	2462	109.73	-	-	95.14	27.61	17.7	30.72	400	44	A	V
		2494.8	58.89	-15.11	74	44.09	27.74	17.75	30.69	400	44	P	V
		2483.52	48.65	-5.35	54	33.92	27.7	17.73	30.7	400	44	A	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**2.4GHz 2400~2483.5MHz****WIFI 802.11b (Harmonic @ 3m)**

WIFI Ant. 1+3	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	43.53	-30.47	74	65.72	32.54	11.49	66.22	-	-	P	H
													H
													H
													H
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		4824	44.94	-29.06	74	67.1	32.57	11.49	66.22	-	-	P	V
													V
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Report No. : FR231214001A

[illegible]



WIFI Ant. 1+3	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 11 2462MHz		4924	46.92	-27.08	74	68.49	32.9	11.57	66.04	-	-	P	H
		7386	46.79	-27.21	74	62.35	36.64	13.83	66.03	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4924	47.67	-26.33	74	69.43	32.71	11.57	66.04	-	-	P	V
		7386	45.78	-28.22	74	61.3	36.68	13.83	66.03	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												
	3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												



2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1+3	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.38	56.52	-17.48	74	42.35	27.37	17.58	30.78	203	56	P	H
		2389.38	45.43	-8.57	54	31.26	27.37	17.58	30.78	203	56	A	H
	*	2412	123.2	-	-	108.83	27.52	17.62	30.77	203	56	P	H
	*	2412	115.76	-	-	101.39	27.52	17.62	30.77	203	56	A	H
													H
													H
		2331.735	55.63	-18.37	74	41.83	27.15	17.5	30.85	197	107	P	V
		2374.575	43.86	-10.14	54	29.91	27.2	17.56	30.81	197	107	A	V
	*	2412	103.79	-	-	89.64	27.3	17.62	30.77	197	107	P	V
	*	2412	96.13	-	-	81.98	27.3	17.62	30.77	197	107	A	V
													V
													V
802.11g CH 06 2437MHz		2362.8	55.28	-18.72	74	41.34	27.21	17.55	30.82	250	62	P	H
		2389.36	44.17	-9.83	54	30	27.37	17.58	30.78	250	62	A	H
	*	2437	122.35	-	-	107.83	27.61	17.66	30.75	250	62	P	H
	*	2437	115.03	-	-	100.51	27.61	17.66	30.75	250	62	A	H
		2484.16	58.41	-15.59	74	43.51	27.87	17.73	30.7	250	62	P	H
		2483.92	46.29	-7.71	54	31.39	27.87	17.73	30.7	250	62	A	H
		2353.52	55.49	-18.51	74	41.64	27.14	17.53	30.82	400	28	P	V
		2375.6	43.9	-10.1	54	29.94	27.21	17.56	30.81	400	28	A	V
	*	2437	114.36	-	-	99.99	27.46	17.66	30.75	400	28	P	V
	*	2437	107.02	-	-	92.65	27.46	17.66	30.75	400	28	A	V
		2493.68	56.39	-17.61	74	41.6	27.73	17.75	30.69	400	28	P	V
		2483.52	45.23	-8.77	54	30.5	27.7	17.73	30.7	400	28	A	V



WIFI Ant. 1+3	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 11 2462MHz	*	2462	115.98	-	-	101.27	27.73	17.7	30.72	400	349	P	H
	*	2462	108.59	-	-	93.88	27.73	17.7	30.72	400	349	A	H
		2484.8	67.22	-6.78	74	52.3	27.88	17.74	30.7	400	349	P	H
		2483.52	53.74	-0.26	54	38.84	27.87	17.73	30.7	400	349	A	H
													H
													H
	*	2462	115.6	-	-	101.01	27.61	17.7	30.72	400	35	P	V
	*	2462	108.25	-	-	93.66	27.61	17.7	30.72	400	35	A	V
		2483.52	66.71	-7.29	74	51.98	27.7	17.73	30.7	400	35	P	V
		2483.5	53.67	-0.33	54	38.94	27.7	17.73	30.7	400	35	A	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1+3	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	42.83	-31.17	74	65.02	32.54	11.49	66.22	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4824	43.32	-30.68	74	65.48	32.57	11.49	66.22	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

[illegible]

[illegible]



2.4GHz 2400~2483.5MHz

WIFI 802.11be EHT20 Full (Band Edge @ 3m)

WIFI Ant. 1+3	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11be EHT20 Full CH 01 2412MHz		2387.07	56.84	-17.16	74	42.69	27.36	17.58	30.79	210	53	P	H
		2390	45.72	-8.28	54	31.53	27.38	17.59	30.78	210	53	A	H
	*	2412	121.75	-	-	107.38	27.52	17.62	30.77	210	53	P	H
	*	2412	112.56	-	-	98.19	27.52	17.62	30.77	210	53	A	H
													H
													H
		2386.65	55.39	-18.61	74	41.39	27.21	17.58	30.79	300	328	P	V
		2389.905	44.52	-9.48	54	30.5	27.21	17.59	30.78	300	328	A	V
	*	2412	120.93	-	-	106.78	27.3	17.62	30.77	300	328	P	V
	*	2412	111.5	-	-	97.35	27.3	17.62	30.77	300	328	A	V
													V
													V
802.11be EHT20 Full CH 06 2437MHz		2369.84	55.93	-18.07	74	41.92	27.26	17.56	30.81	194	52	P	H
		2389.52	44.25	-9.75	54	30.07	27.38	17.58	30.78	194	52	A	H
	*	2437	123.43	-	-	108.91	27.61	17.66	30.75	194	52	P	H
	*	2437	115.23	-	-	100.71	27.61	17.66	30.75	194	52	A	H
		2490.08	57.36	-16.64	74	42.41	27.9	17.74	30.69	194	52	P	H
		2483.6	46.41	-7.59	54	31.51	27.87	17.73	30.7	194	52	A	H
		2378.96	55.19	-18.81	74	41.21	27.22	17.57	30.81	301	14	P	V
		2379.12	43.97	-10.03	54	29.99	27.22	17.57	30.81	301	14	A	V
	*	2437	118.77	-	-	104.4	27.46	17.66	30.75	301	14	P	V
	*	2437	110.59	-	-	96.22	27.46	17.66	30.75	301	14	A	V
		2490.88	56.88	-17.12	74	42.11	27.71	17.75	30.69	301	14	P	V
		2483.6	45.25	-8.75	54	30.52	27.7	17.73	30.7	301	14	A	V



WIFI Ant. 1+3	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11be EHT20 Full CH 11 2462MHz	*	2462	119.49	-	-	104.78	27.73	17.7	30.72	202	53	P	H
	*	2462	109.56	-	-	94.85	27.73	17.7	30.72	202	53	A	H
		2485.24	68.24	-5.76	74	53.31	27.88	17.74	30.69	202	53	P	H
		2483.64	52.3	-1.7	54	37.4	27.87	17.73	30.7	202	53	A	H
													H
													H
	*	2462	116.15	-	-	101.56	27.61	17.7	30.72	400	37	P	V
	*	2462	107.93	-	-	93.34	27.61	17.7	30.72	400	37	A	V
		2483.6	64.72	-9.28	74	49.99	27.7	17.73	30.7	400	37	P	V
		2483.52	51.99	-2.01	54	37.26	27.7	17.73	30.7	400	37	A	V
Remark													V
													V

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

2.4GHz 2400~2483.5MHz

WIFI 802.11be EHT20 Full (Harmonic @ 3m)

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WIFI Ant. 1+3	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11be EHT20 Full CH 06 2437MHz		4874	43.81	-30.19	74	65.68	32.73	11.53	66.13	-	-	P	H
		7311	45.25	-28.75	74	60.59	36.88	13.77	65.99	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4874	44.42	-29.58	74	66.4	32.62	11.53	66.13	-	-	P	V
		7311	45.99	-28.01	74	61.29	36.92	13.77	65.99	-	-	P	V
													V
													V
													V
													V
													V
													V
													V