HCT CO.,LTD.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 **FAX: +82-31-645-6401**

FCC DTS REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
July 13, 2023

Test Site/Location:
74, Seoicheon-ro 578 beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2307-FC019

FCC ID:	**A3LSMX616B**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model:	SM-X616B
Additional Model:	-
EUT Type:	Tablet
Average Output Power:	SISO(Ant.1) : 15.98 dBm MIMO (Ant.1+ Ant.2) : 18.85 dBm
Frequency Range:	2 412 MHz ~ 2 472 MHz
Modulation type:	OFDM, OFDMA
FCC Classification:	Digital Transmission System(DTS)
FCC Rule Part(s):	Part 15.247

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

REVIEWED BY

Report prepared by : Sang Hoon Lee
Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee
Manager of Telecommunication Testing Center

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *.
The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2307-FC019	July 13, 2023	- First Approval Report

Table of Contents

1. EUT DESCRIPTION

Model	SM-X616B		
Additional Model	-		
EUT Type	Tablet		
Power Supply	DC 3.85 V		
Frequency Range	2 412 MHz ~ 2 472 MHz		
Max. RF Output Power	Peak Power	SISO(Ant.1)	25.36 dBm
		MIMO (Ant.1+ Ant.2)	28.14 dBm
	Average Power	SISO(Ant.1)	15.98 dBm
		MIMO (Ant.1+ Ant.2)	18.85 dBm
Modulation Type	OFDM, OFDMA		
Number of Channels	13 Channels		
Date(s) of Tests	May 24, 2023 ~ July 13, 2023		
Serial number	Radiated: R32W500WZGY Conducted : R32W500WZ4A		

ANTENNA CONFIGURATIONS

1. Antenna configuration

Configurations	SISO		MIMO	
	ANT.1	ANT.2	CDD	SDM
802.11ax	O	X	X	O

Note:

(1) O = Support, X = Not Support

(2) SISO = Single Input Single Output

(3) SDM = Spatial Diversity Multiplexing

(4) CDD = Cyclic Delay Diversity

2. Directional Gain Calculation

According to KDB 662911 D01 Multiple Transmitter Output v02r01 F) 2) e) (iii), f) ii)

$$\text{Directional gain(SDM)} = G_{max} + 10 \cdot \log(N_{ANT} / N_{ss}),$$

Ant Gain (dBi)		N_{ANT}/ N_{ss}	Directional Gain (dBi)
			SDM
ANT1	-2.84	2 / 2	-2.78
ANT2	-2.78		

Note

According to Ansi C63.10-2013 section 14.4.3, the directional gain is calculated using the formula, where G_N is the gain of the nth antenna and N_{ANT} is the total number of antennas used.

$$\text{Directional gain(SDM)} = G_{max} + 10 \cdot \log(N_{ANT} / N_{ss}),$$

Sample MIMO Calculation:

Ex) Ant 1 : 11.58 dBm Ant 2 : 12.08 dBm

Ant1 + Ant 2 = MIMO

(11.58 dBm + 12.08 dBm) = (14.387 mW + 16.143 mW) = 30.53 mW = 14.88 dBm

2. TEST METHODOLOGY

FCC KDB 558074 D01 15.247 Meas Guidance v05r02 dated April 02, 2019 entitled “guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices and the measurement procedure described in ANSI C63.10(Version : 2013) ‘the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices’.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1 GHz. Above 1 GHz with 1.5 m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013)

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated d ata are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, R ep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Versio n :2014) and CISPR Publication 22. Detailed description of test facility was submitted to the Com mission and accepted dated April 02, 2018 (Registration Number: KR0032).

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. 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 provisions of this section."

(1) The antennas of this E.U.T are permanently attached.

(2) The E.U.T Complies with the requirement of §15.203

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

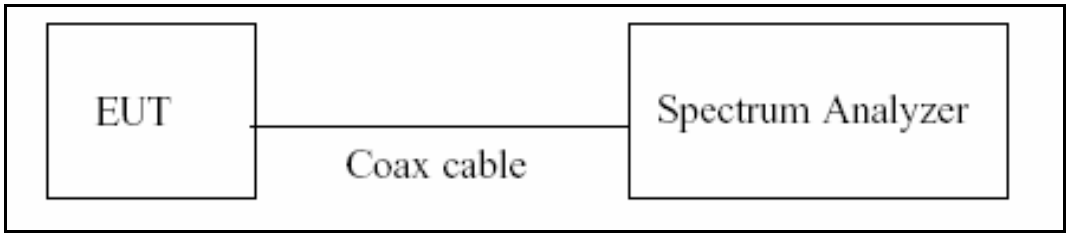
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.90 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.14 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.82 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.74 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.76 (Confidence level about 95 %, k=2)
Radiated Disturbance (Above 40 GHz)	5.52 (Confidence level about 95 %, k=2)

7. DESCRIPTION OF TESTS

7.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to the zero-span measurement method.

The largest available value of RBW is 8 MHz and VBW is 50 MHz.

The zero-span method of measuring duty cycle shall not be used if T ≤ 6.25 microseconds. (50/6.25 = 8)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/*T*.

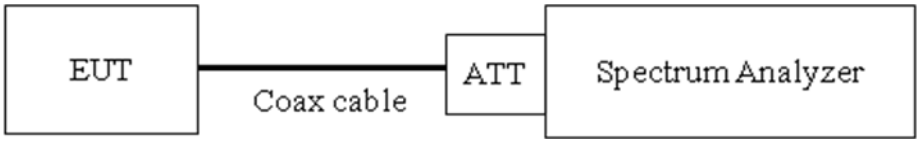
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

7.2. 6 dB Bandwidth

Limit

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to (Procedure 11.8.1 in ANSI 63.10-2013)

1) RBW = 100 kHz
2) VBW ≥ 3 x RBW
3) Detector = Peak
4) Trace mode = max hold
5) Sweep = auto couple
6) Allow the trace to stabilize
7) We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

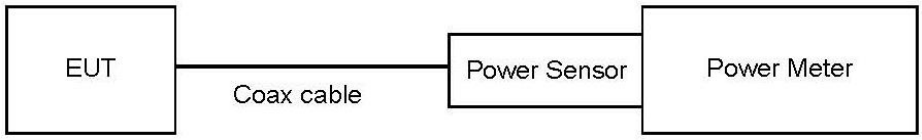
Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

7.3. Output Power

Limit

The maximum permissible conducted output power is 1 Watt.

Test Configuration



Test Procedure

The transmitter output is connected to the Power Meter.

▪ Peak Power (Procedure 11.9.1.3 in ANSI 63.10-2013)

: Measure the peak power of the transmitter.

▪ Average Power (Procedure 11.9.2.3 in ANSI 63.10-2013)

1) Measure the duty cycle.
2) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

▪ Conducted Output Power(Peak) = Measured Value + ATT loss + Cable loss

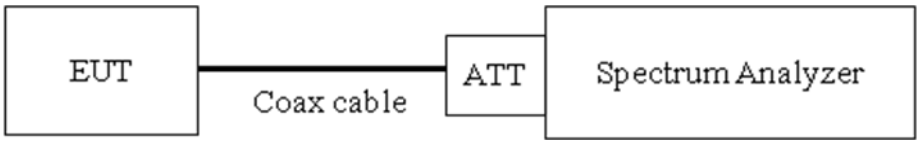
▪ Conducted Output Power(Average) = Measured Value + ATT loss + Cable loss + Duty Cycle Factor

7.4. Power Spectral Density

Limit

The transmitter power density average over 1-second interval shall not be greater than 8 dBm in any 3 kHz BW.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure 8.4 in KDB 558074 v05r02, Procedure 11.10 in ANSI 63.10-2013.

The spectrum analyzer is set to :

1) Set analyzer center frequency to DTS channel center frequency.
2) Set span to at least 1.5 times the OBW.
3) RBW = 3 kHz ≤ RBW ≤ 100 kHz.
4) VBW ≥ 3 x RBW.
5) Sweep = auto couple
6) Detector = power averaging (rms) or sample detector (when rms not available).
7) Ensure that the number of measurement points in the sweep ≥ [2 × span / RBW].
8) Employ trace averaging (rms) mode over a minimum of 100 traces
9) Use the peak marker function to determine the maximum amplitude level.
10) Use the peak marker function to determine the maximum amplitude level within the RBW.
    If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11) if then duty factor shall be added to adjust the result if the duty cycle is less than 98 %

Sample Calculation

▪ Power Spectral Density = Measured Value + ATT loss + Cable loss + Duty Cycle Factor

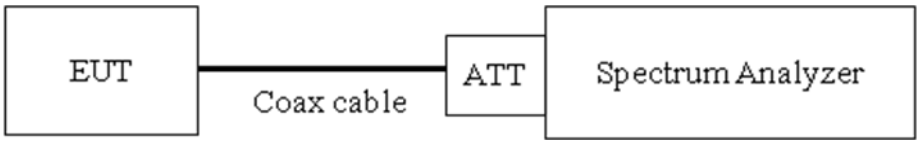
7.5. Conducted Band Edge (Out of Band Emissions) & Conducted Spurious Emissions

Limit

The maximum conducted (Average) output power was used to demonstrate compliance, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least relative to the maximum in-band peak PSD level in 100 kHz.

[Conducted > 30 dBc]

Test Configuration



Test Procedure

The transmitter output is connected to the spectrum analyzer.

(Procedure 11.11 in ANSI 63.10-2013)

1) RBW = 100 kHz
2) VBW ≥ 3 x RBW
3) Set span to encompass the spectrum to be examined
4) Detector = Peak
5) Trace Mode = max hold
6) Sweep time = auto couple
7) Ensure that the number of measurement points ≥ 2 x Span/RBW
8) Allow trace to fully stabilize.
9) Use peak marker function to determine the maximum amplitude level.

Measurements are made over the 30 MHz to 25 GHz range with the transmitter set to the lowest, middle, and highest channels.

Factors for frequency

Freq(MHz)	Factor(dB)
30	20.07
100	20.14
200	20.15
300	20.20
400	20.23
500	20.25
600	20.25
700	20.27
800	20.28
900	20.29
1000	20.33
2000	20.47
2400	20.55
2480	20.53
2500	20.49
3000	20.58
4000	20.67
5000	20.76
5150	20.75
5850	20.84
6000	20.82
7000	20.90
8000	20.94
9000	21.02
10000	21.07
11000	21.12
12000	21.14
13000	21.20
14000	21.24
15000	21.27
16000	21.31
17000	21.38
18000	21.50
19000	21.50
20000	21.56
21000	21.77
22000	21.74
23000	21.94
24000	21.77
25000	21.80
26000	21.80

Note :

1. 2400 ~ 2500 MHz is fundamental frequency range.
2. Factor = Attenuator loss + Cable loss
3. Spectrum offset Loss = Attenuator loss + Cable loss + EUT Cable loss(0.68 dB) = 21.23 dB

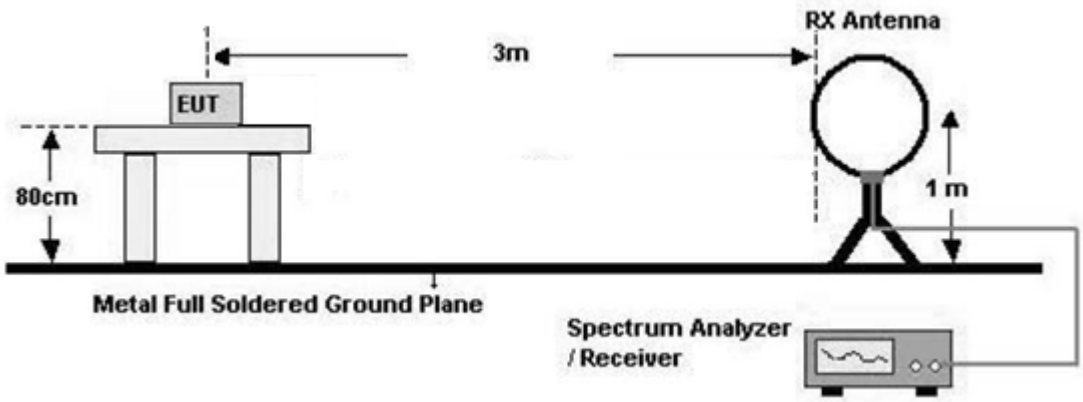
7.6. Radiated Test

Limit

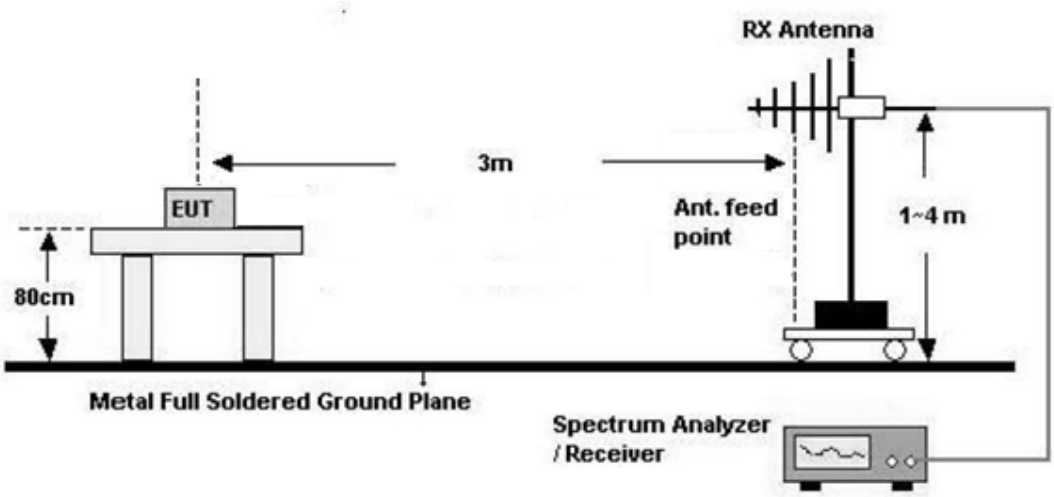
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

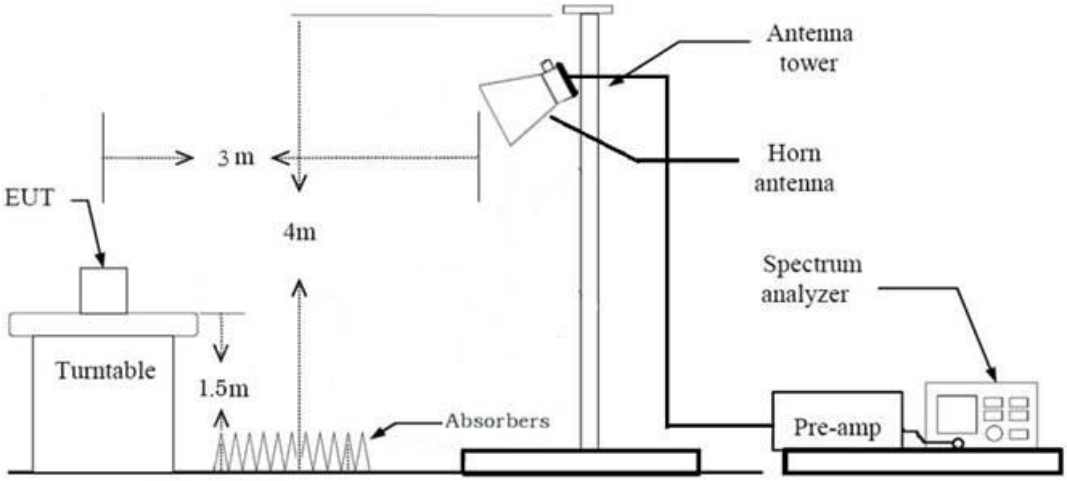
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions (Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT
3. The EUT is placed on a turntable, which is 0.8 m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) = 40log(3 m/300 m) = - 80 dB
   Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = 40log(3 m/30 m) = - 40 dB
   Measurement Distance : 3 m
8. Spectrum Setting
   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Peak
   - Trace = Maxhold
   - RBW = 9 kHz
   - VBW ≥ 3 x RBW
9. Total = Measured value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions (Below 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8 m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 100 kHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Quasi-peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Quasi-Peak
      - RBW = 120 kHz

      In general, (1) is used mainly
7. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Test Procedure of Radiated spurious emissions (Above 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting (Method 8.6 in KDB 558074 v05r02, Procedure 11.12 in ANSI 63.10-2013)
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 1 GHz – 25 GHz
      - Detector = Peak

- Trace = Maxhold
- RBW = 1 MHz
- VBW ≥ 3 x RBW

(2) Measurement Type(Average): Duty cycle ≥ 98 %

- Measured Frequency Range : 1 GHz – 25 GHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).

(3) Measurement Type(Average): Duty cycle < 98 %, duty cycle variations are less than ±2 %

- Measured Frequency Range : 1 GHz – 25 GHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).
- Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 % duty cycle.
- Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.

9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
11. Total(Measurement Type : Peak)
    = Measured value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G) + Distance Factor(D.F)

    Total(Measurement Type : Average, Duty cycle ≥ 98 %)
    = Measured value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G) + Distance Factor(D.F)

    Total(Measurement Type : Average, Duty cycle < 98 %)
    = Measured value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G) + Distance Factor(D.F)
    + Duty Cycle Factor

Test Procedure of Radiated Restricted Band Edge

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting

(1) Measurement Type(Peak):

- Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
- Detector = Peak
- Trace = Maxhold
- RBW = 1 MHz
- VBW ≥ 3 x RBW

(2) Measurement Type(Average): Duty cycle ≥ 98 %,

- Measured Frequency Range : 2310 MHz ~ 2390 MHz / 2483.5 MHz ~ 2500 MHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).

(3) Measurement Type(Average): Duty cycle < 98 %, duty cycle variations are less than ±2 %

- Measured Frequency Range : 2310 MHz ~ 2390 MHz / 2483.5 MHz ~ 2500 MHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).
- Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 % duty cycle.
- Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.

9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
11. Total(Measurement Type : Peak)
    = Measured value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
    Total(Measurement Type : Average, Duty cycle ≥ 98 %)
    = Measured value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
    Total(Measurement Type : Average, Duty cycle < 98 %)
    = Measured value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F) + Duty Cycle Factor

7.7. AC Power line Conducted Emissions

Limit

For an intentional radiator 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, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56[(a)]	56 to 46[(a)]
0.50 to 5	56	46
5 to 30	60	50

[(a)]Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.

Sample Calculation

Quasi-peak (Final Result) = Measured Value + Correction Factor

7.8. Test RU offset for Tones

BW (MHz)	Tones (T)	RU offset	Test RU offset		
			Low	Mid	High
20	26	0~8	0	4	8
	52	37~40	37	38	40
	106	53~54	53	-	54
	242	61	-	61	-

7.9. Worst case configuration and mode

Conducted test

1. All data rate of operation were investigated and the worst case results are reported.
   (Worst case : MCS4)
2. Bandedge (Conducted)
   : All Mode (Channel, Tones, RU Offset) of operation were investigated and the worst case configuration results are reported.

Tones	Channel	RU Index
26	1, 11, 12, 13	0, 8
52	1, 11, 12, 13	37, 40
106	1, 11, 12, 13	53, 54
242	1, 11, 12, 13	61
SU	1, 11, 12, 13	-

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone, Stand alone + External accessories (Earphone, etc)
   - Worst case : Stand alone
2. EUT Axis
   - Radiated Spurious Emissions : X
   - Radiated Restricted Band Edge : Z
3. All data rate of operation were investigated and the worst case results are reported.
   (Worst case : MCS0)
4. All Antenna of operation were investigated and the worst case results are reported
   - Antenna Operation Type : : SISO(Ant.1), MIMO_SDM(Ant.1+Ant.2)
   - Radiated Spurious Emissions Worstcase : MIMO_SDM(Ant.1+Ant.2)
   - Radiated Restricted Band Edge Worstcase : MIMO_SDM(Ant.1+Ant.2)
5. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
   - Position : Horizontal, Vertical, Parallel to the ground plane

6. All mode(Tone, RU Offset) of operation were investigated and the worst case configuration results are reported

TEST	TONE	RU OFFSET
RSE	WORST CASE : SU	SU: -
	ADDITIONAL TONE : 26T, 52T, 106T, 242T	26T : 0, 4 52T : 37, 38 106T : 53 242T : 61
Band-Edge	WORST CASE : 26T	26T : 8
	ADDITIONAL TONE : 26T, 52T, 106T, 242T, SU	Low Edge : 0, 37, 53, 61 High Edge : 40, 54, 61

AC Power line Conducted Emissions

1. Please refer to the SM-X616B [DTS] Test Report.

8. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
6 dB Bandwidth	§15.247(a)(2)	> 500 kHz	Conducted	PASS
Conducted Maximum Output Power	§15.247(b)(3)	< 1 Watt		PASS
Power Spectral Density	§15.247(e)	< 8 dBm / 3 kHz Band		PASS
Band Edge (Out of Band Emissions)	§15.247(d)	Conducted > 30 dBc		PASS
AC Power line Conducted Emissions	§15.207	cf. Section 7.7		PASS (Note1)
Radiated Spurious Emissions	§15.247(d), 15.205, 15.209	cf. Section 7.6	Radiated	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 7.6		PASS

Note1:

1. Please refer to the SM-X616B [DTS] Test Report.

9. TEST RESULT

9.1 DUTY CYCLE

[SISO]

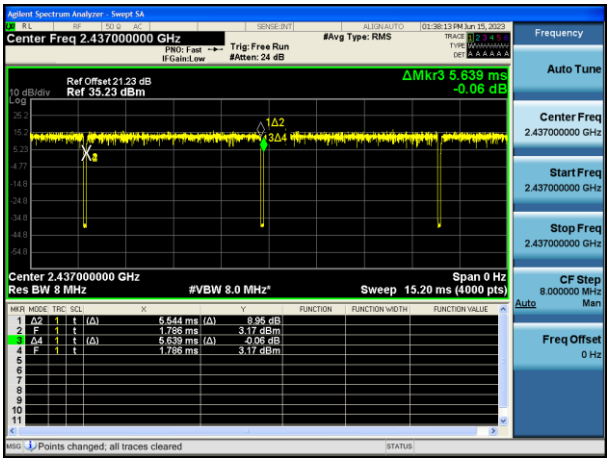
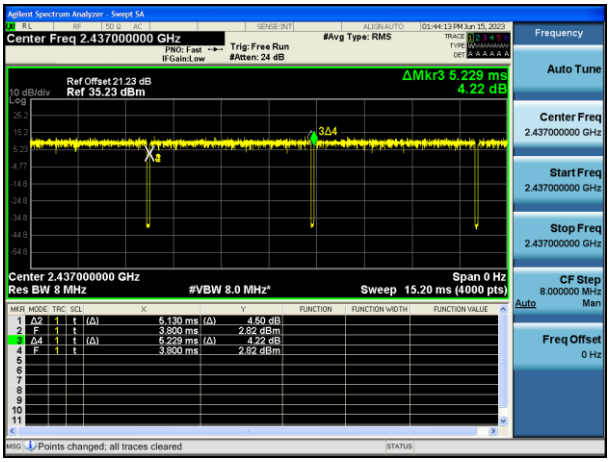
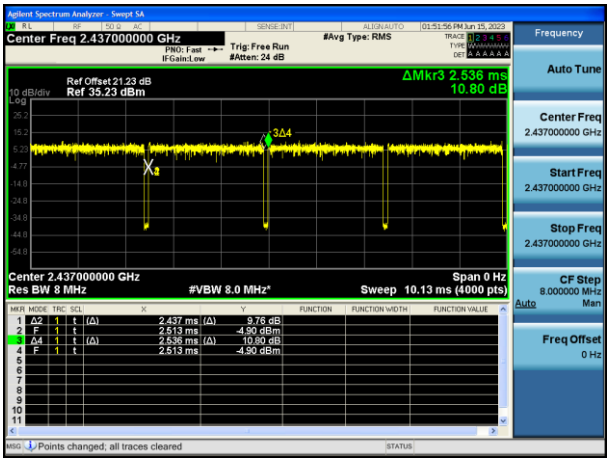
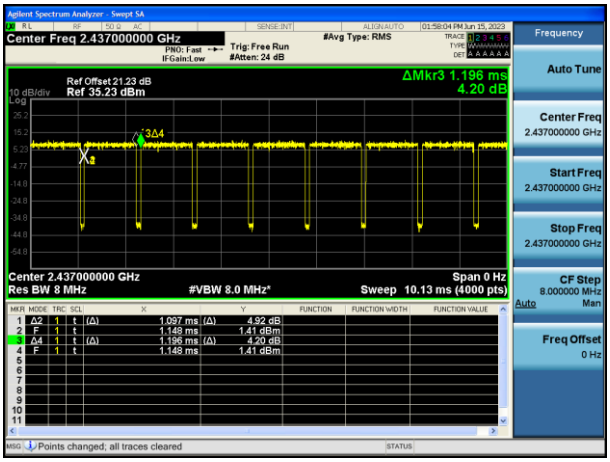
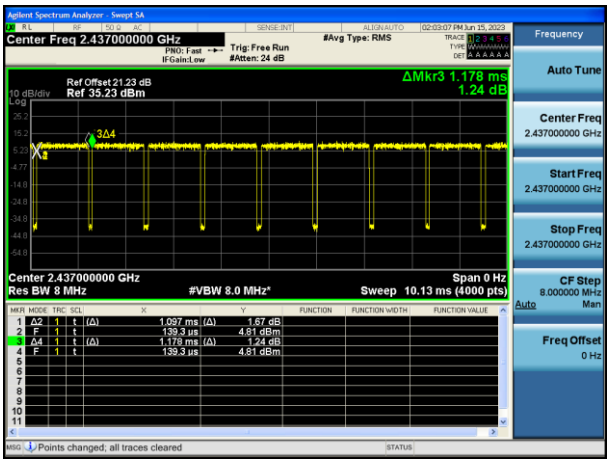
Mode	Tone (T)	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ax (HE20)	26	MCS0	5.544	5.639	0.983	0.074
	52	MCS0	5.130	5.229	0.981	0.083
	106	MCS0	2.437	2.536	0.961	0.173
	242	MCS0	1.097	1.196	0.917	0.375
802.11ax(SU)	BW 20	MCS0	1.097	1.178	0.931	0.310

[MIMO]

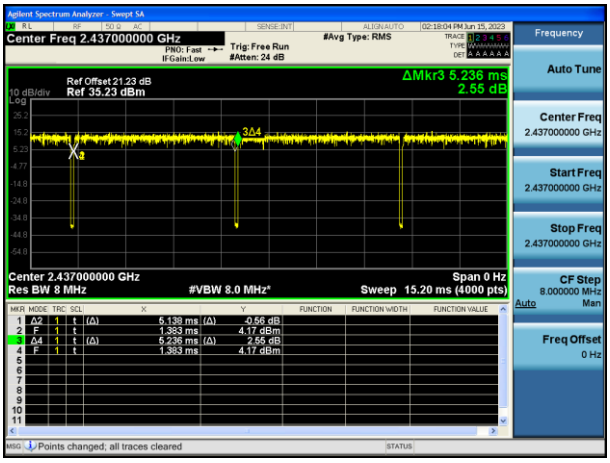
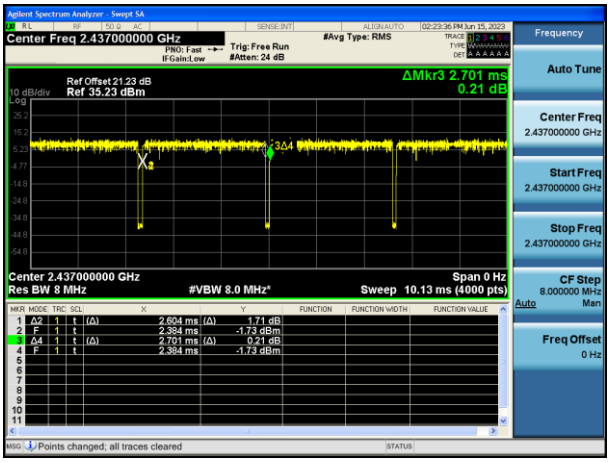
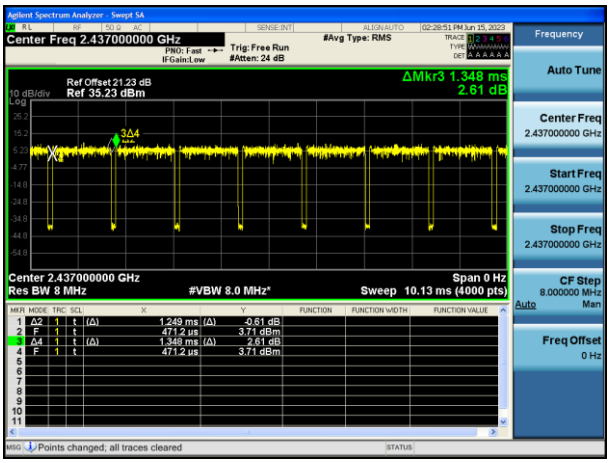
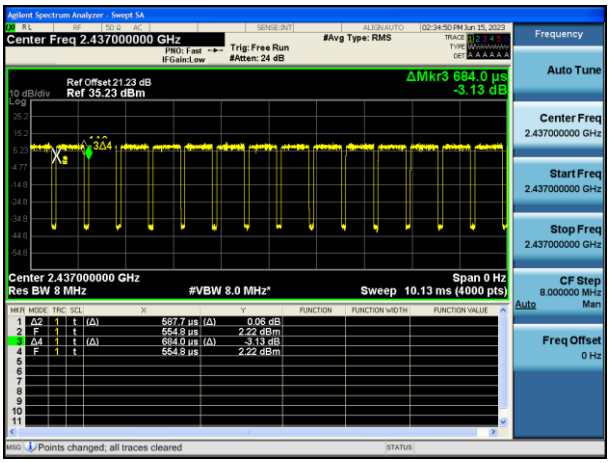
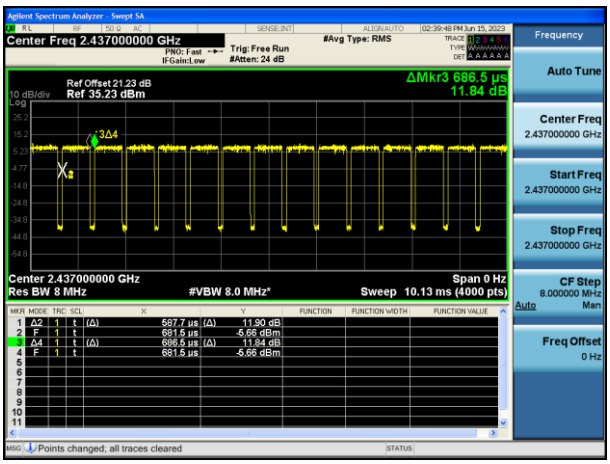
Mode	Tone (T)	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ax (HE20)	26	MCS0	5.138	5.236	0.981	0.083
	52	MCS0	2.604	2.701	0.964	0.158
	106	MCS0	1.249	1.348	0.927	0.331
	242	MCS0	0.588	0.684	0.859	0.659
802.11ax(SU)	BW 20	MCS0	0.588	0.687	0.856	0.675

▣ Test Plots

[SISO]

26 Tones MCS0	52 Tones MCS0
	
106 Tones MCS0	**242 Tones MCS0**
	
SU MCS0	
	

[MIMO]

26 Tones MCS0	52 Tones MCS0
	
106 Tones MCS0	**242 Tones MCS0**
	
SU MCS0	
	

9.2 6 dB BANDWIDTH

[SISO ANT. 1]

BW	Frequency [MHz]	Channel No.	RU Index	6 dB BandWidth (MHz)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	2.129	4.134	17.20	-	-
			Mid	2.682	4.119	-	19.22	19.22
			High	2.107	4.123	17.15	-	-
	2437	6	Low	2.094	4.163	17.21	-	-
			Mid	2.681	4.103	-	19.20	19.23
			High	2.107	4.148	17.18	-	-
	2462	11	Low	2.097	4.127	17.20	-	-
			Mid	2.670	4.122	-	19.24	19.21
			High	2.118	4.161	17.18	-	-
	2467	12	Low	2.105	4.125	17.18	-	-
			Mid	2.669	4.120	-	19.21	19.20
			High	2.068	4.119	17.18	-	-
	2472	13	Low	2.095	4.173	17.15	-	-
			Mid	2.690	4.120	-	19.17	19.15
			High	2.073	16.97	17.16	-	-

Limit : > 500 kHz

[MIMO ANT. 1]

BW	Frequency [MHz]	Channel No.	RU Index	6 dB BandWidth (MHz)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	2.135	17.03	17.20	-	-
			Mid	2.697	4.091	-	19.22	19.20
			High	2.133	4.118	17.16	-	-
	2437	6	Low	2.136	4.173	17.20	-	-
			Mid	2.688	4.121	-	19.20	19.18
			High	2.091	4.109	17.18	-	-
	2462	11	Low	2.128	4.122	17.19	-	-
			Mid	2.680	4.120	-	19.21	19.20
			High	2.118	4.101	17.18	-	-
	2467	12	Low	2.103	4.170	17.20	-	-
			Mid	2.686	4.119	-	19.20	19.19
			High	2.122	4.106	17.16	-	-
	2472	13	Low	2.102	4.175	17.18	-	-
			Mid	2.690	4.120	-	19.15	19.18
			High	2.107	17.01	17.15	-	-

Limit : > 500 kHz

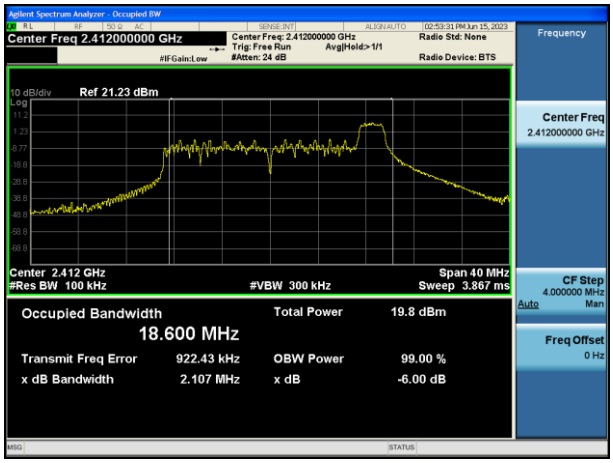
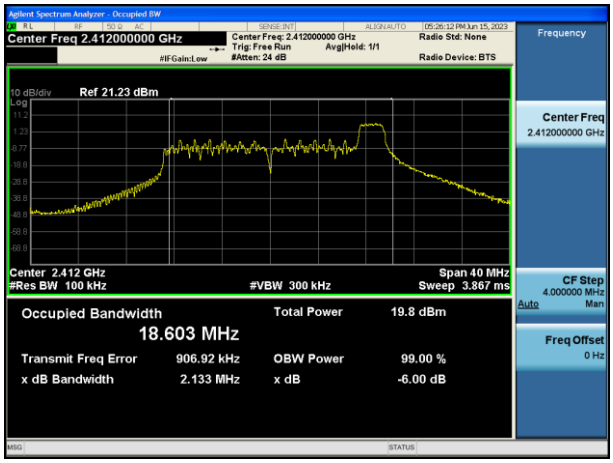
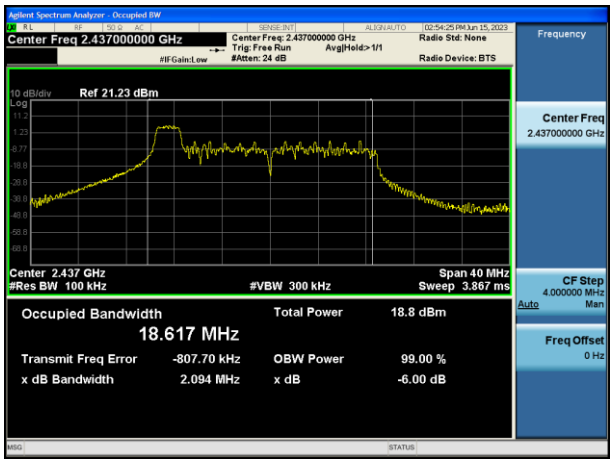
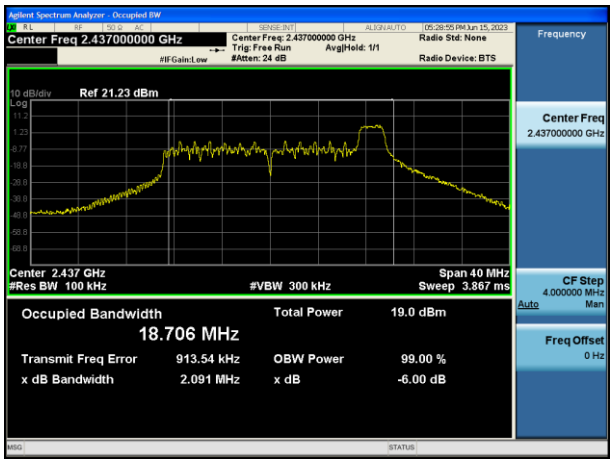
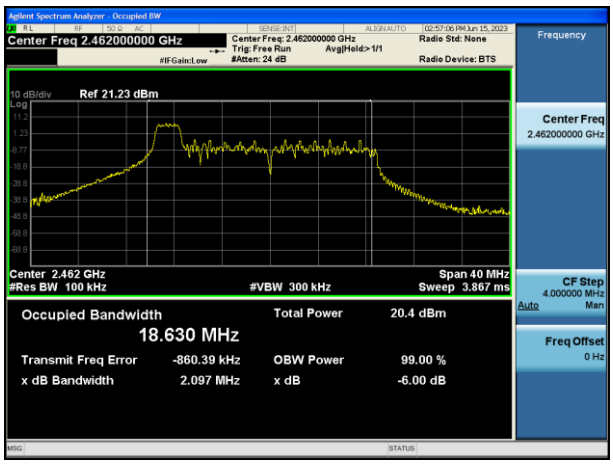
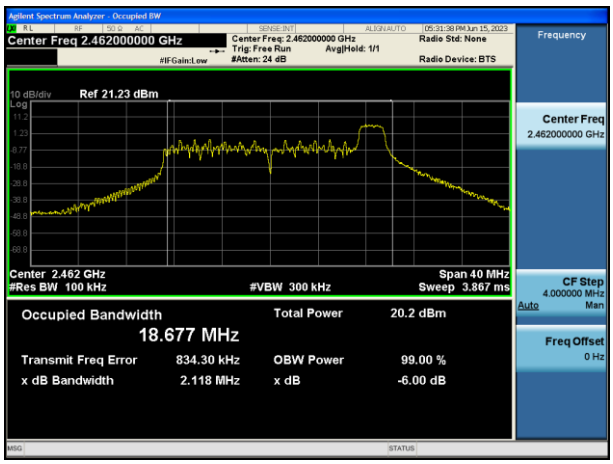
[MIMO ANT. 2]

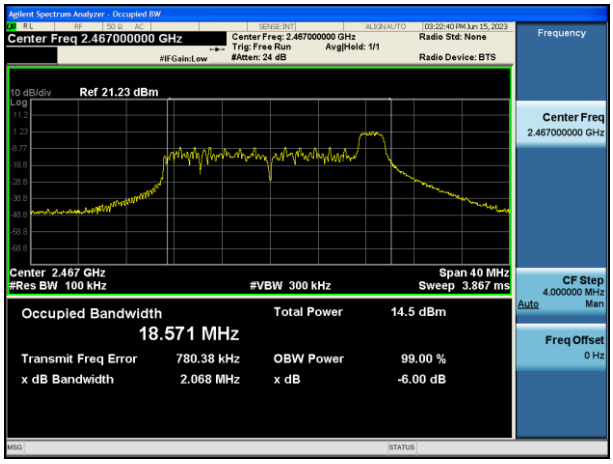
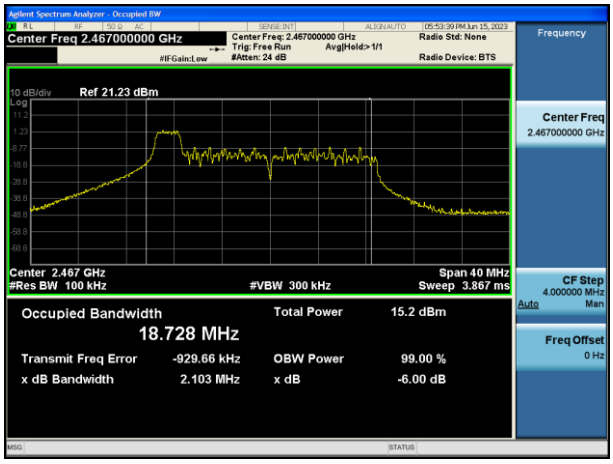
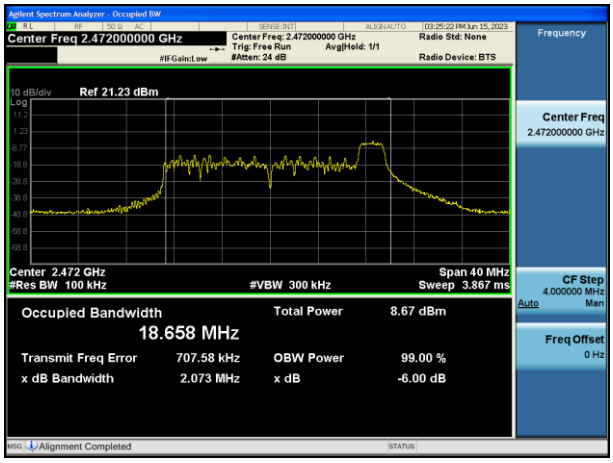
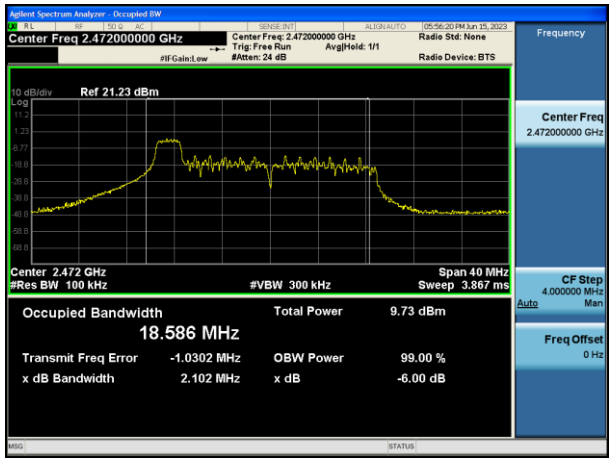
BW	Frequency [MHz]	Channel No.	RU Index	6 dB BandWidth (MHz)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	2.139	17.06	17.20	-	-
			Mid	2.688	12.88	-	19.20	19.19
			High	2.132	4.563	17.17	-	-
	2437	6	Low	2.141	17.04	17.19	-	-
			Mid	2.683	10.39	-	19.21	19.22
			High	2.127	4.179	17.16	-	-
	2462	11	Low	2.135	4.158	17.18	-	-
			Mid	2.670	10.40	-	19.21	19.22
			High	2.108	4.156	17.17	-	-
	2467	12	Low	2.107	4.180	17.17	-	-
			Mid	2.681	4.133	-	19.21	19.20
			High	2.111	17.00	17.18	-	-
	2472	13	Low	2.106	4.156	17.19	-	-
			Mid	2.686	4.131	-	19.20	19.21
			High	2.130	17.04	17.75	-	-

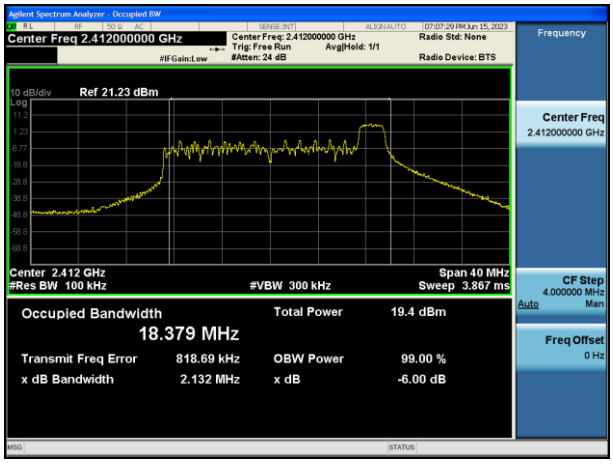
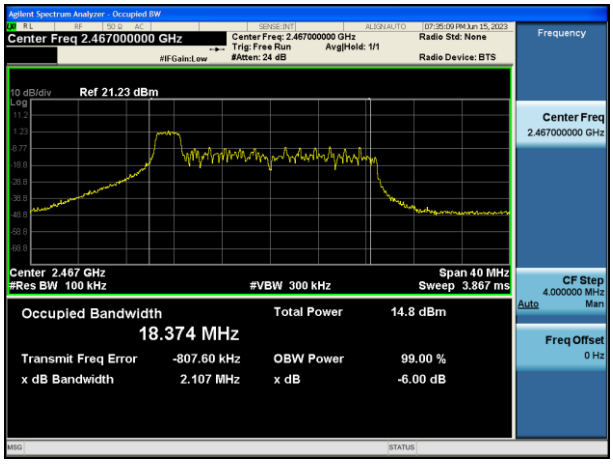
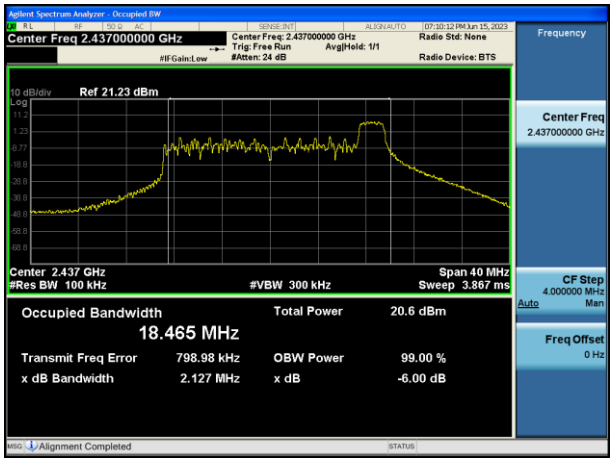
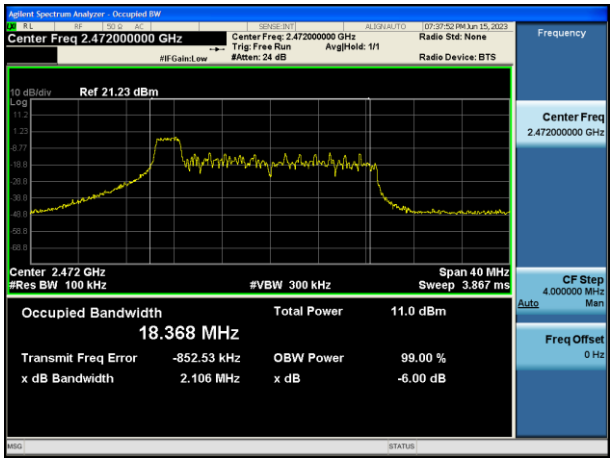
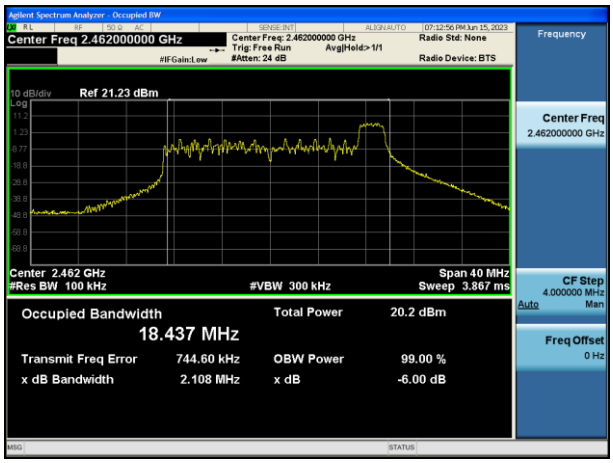
Limit : > 500 kHz

▣ Test Plots

Note: In order to simplify the report, attached plots were only the narrowest 6 dB BW channel.

SISO ANT. 1	MIMO ANT.1
BW20M Ch.1(2412 MHz) RU 8	**BW20M Ch.1(2412 MHz) RU 8**
	
BW20M Ch.6(2437 MHz) RU 0	**BW20M Ch.6(2437 MHz) RU 8**
	
BW20M Ch.11(2462 MHz) RU 0	**BW20M Ch.11(2462 MHz) RU 8**
	

SISO ANT. 1	MIMO ANT.1
BW20M Ch.12(2467 MHz) RU 8	**BW20M Ch.12(2467 MHz) RU 0**
	
BW20M Ch.13(2472 MHz) RU 8	**BW20M Ch.13(2472 MHz) RU 0**
	

MIMO ANT.2	
BW20M Ch.1(2412 MHz) RU 8	**BW20M Ch.12(2467 MHz) RU 0**
	
BW20M Ch.6(2437 MHz) RU 8	**BW20M Ch.13(2472 MHz) RU 0**
	
BW20M Ch.11(2462 MHz) RU 8	
	

9.3 OUTPUT POWER

Peak Power

[SISO ANT. 1]

BW	Frequency [MHz]	Channel No.	RU Index	Peak Power (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	20.53	20.56	20.18	-	-
			Mid	20.56	20.40	-	19.53	22.93
			High	20.67	20.63	20.22	-	-
	2437	6	Low	20.43	20.59	20.10	-	-
			Mid	20.48	20.33	-	19.64	25.36
			High	20.57	20.57	20.27	-	-
	2462	11	Low	21.42	21.51	21.08	-	-
			Mid	21.11	21.16	-	20.41	22.95
			High	21.26	21.05	21.02	-	-
	2467	12	Low	14.16	14.15	13.60	-	-
			Mid	13.65	13.59	-	12.69	12.24
			High	13.36	13.33	13.46	-	-
	2472	13	Low	3.02	3.16	2.88	-	-
			Mid	3.30	3.09	-	2.02	7.79
			High	1.87	2.04	2.32	-	-

Limit : 30 dBm

[MIMO]

Note:

1. MIMO Peak Power = 10·log((10^(ANT. 1 Peak power /10))+(10^(ANT. 2 Peak power /10)))

BW	Frequency [MHz]	Channel No.	RU Index	Peak Power (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	23.29	23.27	23.19	-	-
			Mid	23.12	23.15	-	22.62	25.56
			High	23.59	23.43	23.41	-	-
	2437	6	Low	23.22	23.18	22.67	-	-
			Mid	23.03	22.92	-	22.11	28.14
			High	23.40	23.05	22.71	-	-
	2462	11	Low	23.65	23.43	23.11	-	-
			Mid	23.37	23.16	-	22.49	25.42
			High	23.59	23.08	23.05	-	-
	2467	12	Low	16.03	15.64	15.12	-	-
			Mid	15.18	15.19	-	14.44	14.79
			High	15.02	14.94	15.05	-	-
	2472	13	Low	5.59	5.78	5.67	-	-
			Mid	5.77	5.77	-	4.82	10.64
			High	4.70	4.85	5.12	-	-

Limit : 30 dBm

Average Power

[SISO ANT. 1]

BW	Frequency [MHz]	Channel No.	RU Index	Average Power (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	9.85	9.86	9.96	-	-
			Mid	9.96	10.00	-	10.24	13.57
			High	10.12	10.25	10.11	-	-
	2437	6	Low	9.72	9.89	9.94	-	-
			Mid	9.82	9.95	-	10.26	15.98
			High	10.02	10.23	10.16	-	-
	2462	11	Low	10.78	10.96	10.97	-	-
			Mid	10.61	10.81	-	10.99	13.51
			High	10.53	10.56	10.85	-	-
	2467	12	Low	3.67	3.63	3.48	-	-
			Mid	3.12	3.28	-	3.35	3.09
			High	2.69	2.80	3.27	-	-
	2472	13	Low	-7.65	-7.36	-7.19	-	-
			Mid	-7.11	-7.05	-	-7.29	-1.51
			High	-9.27	-8.79	-8.02	-	-

Limit : 30 dBm

[MIMO]

Note:

1. MIMO Average Power = 10·log(((10^(ANT. 1 Average power /10))+(10^(ANT. 2 Average power /10)))

BW	Frequency [MHz]	Channel No.	RU Index	Average Power (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	12.56	12.64	13.03	-	-
			Mid	12.64	12.82	-	13.36	16.20
			High	12.87	13.15	13.33	-	-
	2437	6	Low	12.51	12.61	12.65	-	-
			Mid	12.52	12.62	-	12.87	18.85
			High	12.67	12.75	12.72	-	-
	2462	11	Low	12.99	13.01	13.05	-	-
			Mid	12.96	12.85	-	13.21	16.13
			High	12.81	12.71	12.96	-	-
	2467	12	Low	5.25	5.36	5.11	-	-
			Mid	4.79	4.91	-	5.17	5.32
			High	4.31	4.54	5.23	-	-
	2472	13	Low	-5.17	-4.78	-4.38	-	-
			Mid	-4.55	-4.33	-	-4.45	1.24
			High	-6.43	-5.80	-5.07	-	-

Limit : 30 dBm

9.4 POWER SPECTRAL DENSITY

Note :

1. Spectrum Measured Levels are not plot data.
   The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss(20 dB) + Cable loss + EUT Cable loss
3. Total PSD = Measured Value + Duty Cycle Factor

[SISO ANT. 1]

BW	Frequency [MHz]	Channel No.	RU Index	Max. Power Spectral Density (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	-6.902	-9.915	-12.382	-	-
			Mid	-6.430	-9.569	-	-13.842	-10.450
			High	-6.190	-9.586	-12.254	-	-
	2437	6	Low	-7.256	-9.887	-12.355	-	-
			Mid	-6.702	-9.697	-	-13.726	-8.003
			High	-6.708	-9.793	-12.491	-	-
	2462	11	Low	-6.236	-9.346	-11.971	-	-
			Mid	-6.323	-9.711	-	-13.958	-10.729
			High	-6.244	-9.871	-12.316	-	-
	2467	12	Low	-13.827	-16.878	-19.897	-	-
			Mid	-13.989	-17.123	-	-21.842	-21.529
			High	-14.817	-17.671	-20.261	-	-
	2472	13	Low	-24.366	-26.928	-29.896	-	-
			Mid	-24.115	-27.070	-	-31.661	-25.200
			High	-25.562	-28.210	-30.366	-	-

Limit : 8 dBm

[MIMO]

1. MIMO PSD = 10·log(((10^(ANT. 1 PSD /10))+(10^(ANT. 2 PSD/10)))

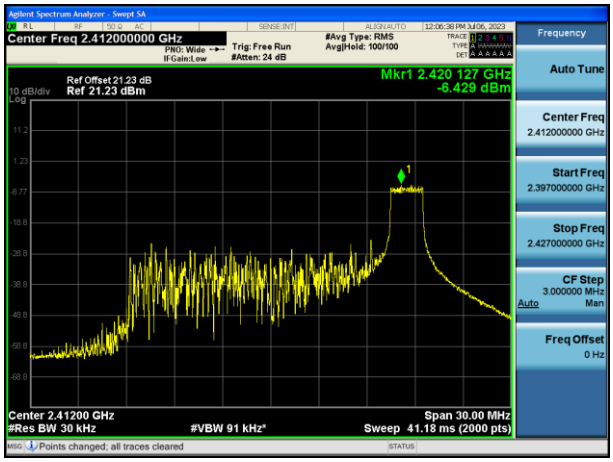
BW	Frequency [MHz]	Channel No.	RU Index	Max. Power Spectral Density (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	-4.924	-7.212	-8.973	-	-
			Mid	-4.386	-6.827	-	-10.687	-7.027
			High	-4.296	-6.792	-8.951	-	-
	2437	6	Low	-4.846	-6.875	-9.632	-	-
			Mid	-4.798	-7.096	-	-10.618	-3.771
			High	-4.635	-7.544	-9.167	-	-
	2462	11	Low	-4.181	-6.555	-8.209	-	-
			Mid	-4.508	-6.333	-	-9.960	-7.259
			High	-4.692	-7.310	-8.973	-	-
	2467	12	Low	-11.538	-14.323	-15.831	-	-
			Mid	-11.929	-13.527	-	-17.200	-17.849
			High	-12.056	-14.577	-16.895	-	-
	2472	13	Low	-21.762	-24.370	-25.872	-	-
			Mid	-21.813	-23.679	-	-26.749	-21.071
			High	-23.279	-25.322	-26.694	-	-

Limit : 8 dBm

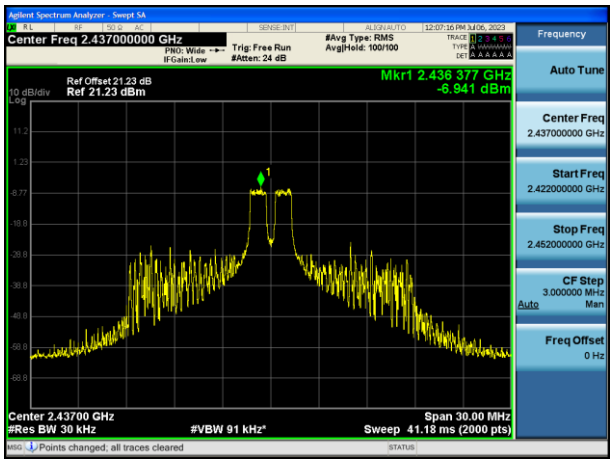
▣ Test Plots

Note: In order to simplify the report, attached plots were only the worst case PSD channel.

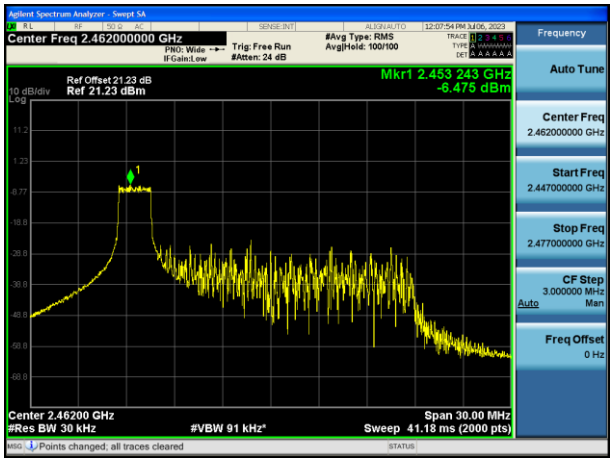
[SISO]

BW20M Ch.1(2412 MHz) RU 8


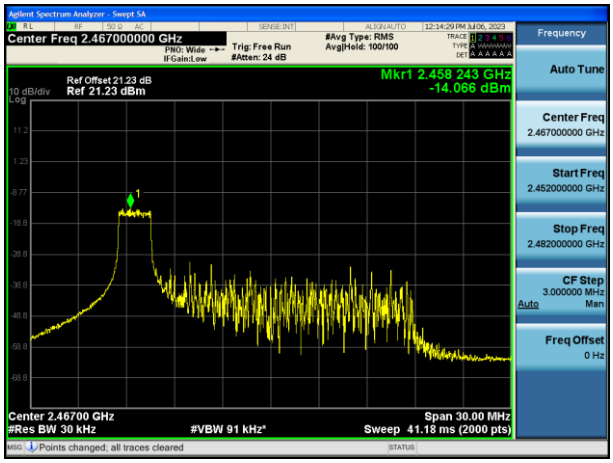
Measured PSD (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)
-6.429	0.239	-6.190

BW20M Ch.6(2437 MHz) RU 4


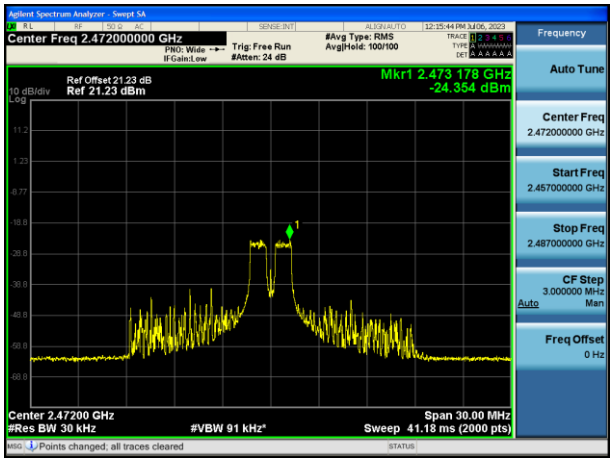
Measured PSD (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)
-6.941	0.239	-6.702

BW20M Ch.11(2462 MHz) RU 0


Measured PSD (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)
-6.475	0.239	-6.236

BW20M Ch.12(2467 MHz) RU 0


Measured PSD (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)
-14.066	0.239	-13.827

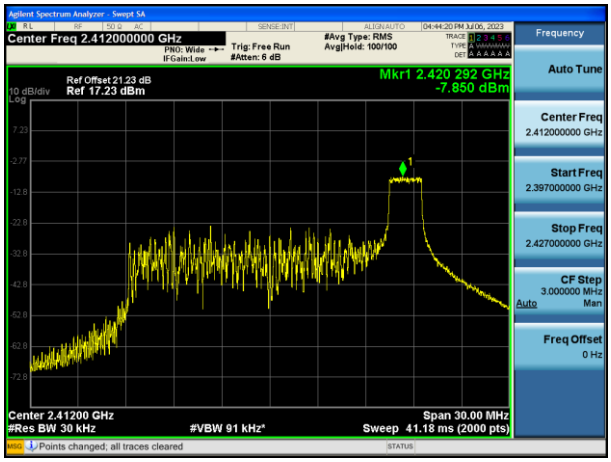
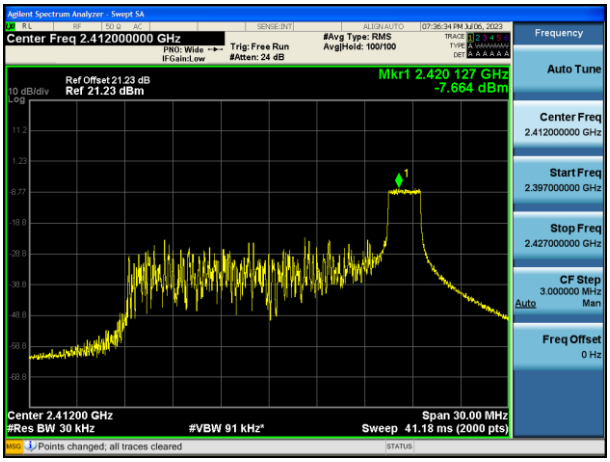
BW20M Ch.13(2472 MHz) RU 4


Measured PSD (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)
-24.354	0.239	-24.115

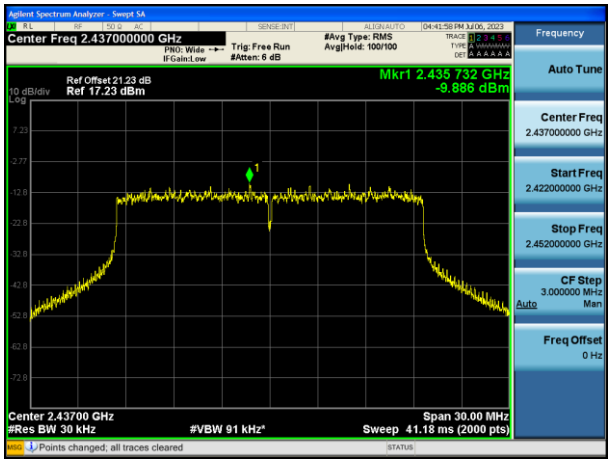
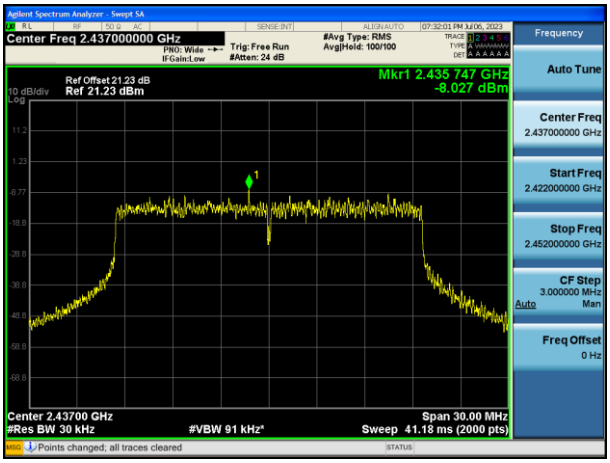
[MIMO]

Note:

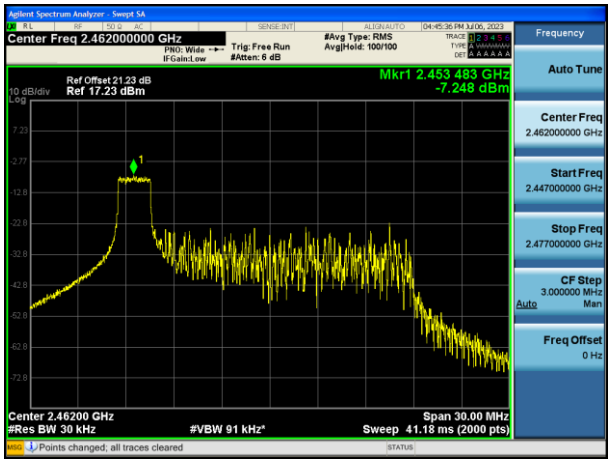
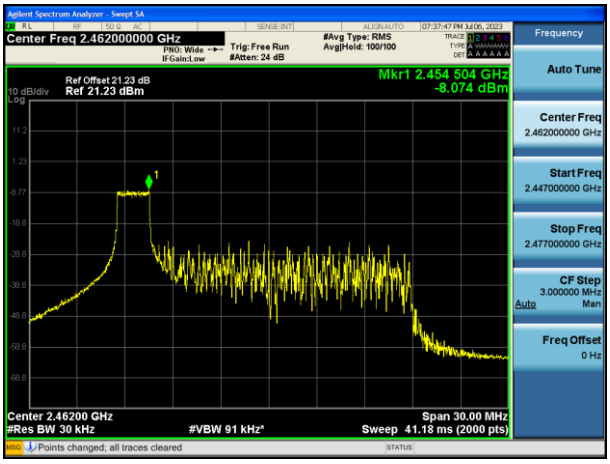
1. In order to simplify the report, attached plots were only the worst case PSD channel.
2. SUM PSD = 10·log(((10^(Ant1 PSD /10))+(10^(Ant2 PSD /10)))
3. MIMO Total PSD = SUM PSD + Duty Cycle Factor

BW20M Ch.1(2412 MHz) RU 8	
ANT. 1	**ANT. 2**
	

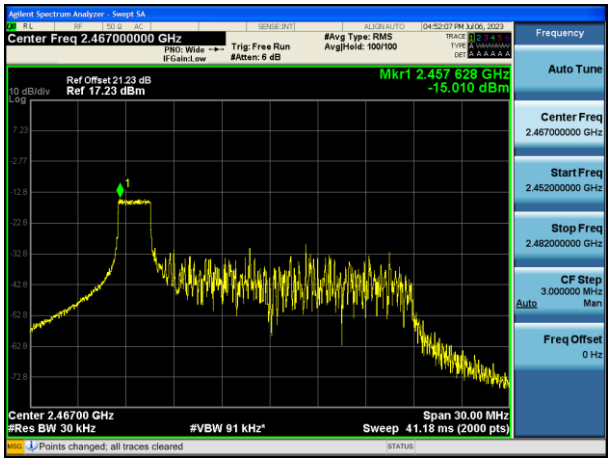
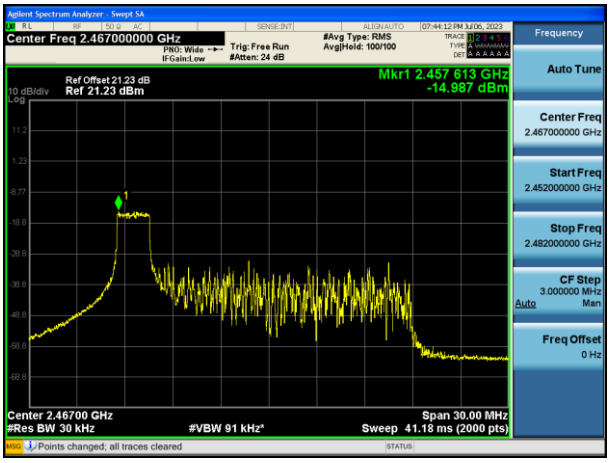
MIMO Measured PSD (dBm)	Duty Cycle Factor (dB)	MIMO Total PSD (dBm)
-4.746	0.450	-4.296

BW20M Ch.6(2437 MHz) SU	
ANT. 1	**ANT. 2**
	

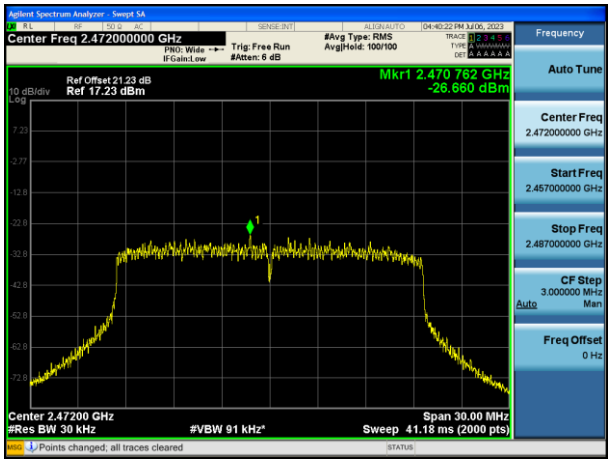
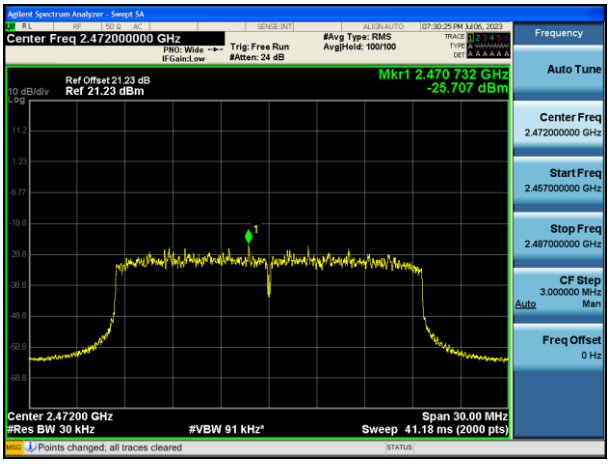
MIMO Measured PSD (dBm)	Duty Cycle Factor (dB)	MIMO Total PSD (dBm)
-5.847	2.076	-3.771

BW20M Ch.11(2462 MHz) RU 0	
ANT. 1	**ANT. 2**
	

MIMO Measured PSD (dBm)	Duty Cycle Factor (dB)	MIMO Total PSD (dBm)
-4.631	0.450	-4.181

BW20M Ch.12(2467 MHz) RU 0	
ANT. 1	**ANT. 2**
	

MIMO Measured PSD (dBm)	Duty Cycle Factor (dB)	MIMO Total PSD (dBm)
-11.988	0.450	-11.538

BW20M Ch.13(2472 MHz) SU	
ANT. 1	**ANT. 2**
	

MIMO Measured PSD (dBm)	Duty Cycle Factor (dB)	MIMO Total PSD (dBm)
-23.147	2.076	-21.071

9.5 BAND EDGE / CONDUCTED SPURIOUS EMISSIONS

Band Edge

[SISO ANT. 1]

BW	Frequency [MHz]	Channel No.	RU Index	Measured Position	Result (dB)		
					26 T	52 T	106 T
HE20	2412	1	Low	Lowest Bandedge	30.214	30.224	31.068
	2462	11	High	Highest Bandedge	51.734	49.537	46.011
	2467	12	High	Highest Bandedge	41.968	41.061	38.675
	2472	13	High	Highest Bandedge	30.599	30.726	31.144

BW	Frequency [MHz]	Channel No.	RU Index	Measured Position	Result (dB)	
					242 T	SU
HE20	2412	1	Mid	Lowest Bandedge	30.687	30.411
	2462	11		Highest Bandedge	42.815	47.106
	2467	12		Highest Bandedge	35.907	36.106
	2472	13		Highest Bandedge	30.093	30.225

Limit : 30 dBc

[MIMO ANT. 1]

BW	Frequency [MHz]	Channel No.	RU Index	Measured Position	Result (dB)		
					26 T	52 T	106 T
HE20	2412	1	Low	Lowest Bandedge	30.551	30.998	30.221
	2462	11	High	Highest Bandedge	60.357	57.029	55.440
	2467	12	High	Highest Bandedge	44.701	43.595	43.011
	2472	13	High	Highest Bandedge	31.863	32.654	31.176

BW	Frequency [MHz]	Channel No.	RU Index	Measured Position	Result (dB)	
					242 T	SU
HE20	2412	1	Mid	Lowest Bandedge	30.711	30.848
	2462	11		Highest Bandedge	50.461	48.580
	2467	12		Highest Bandedge	43.509	42.959
	2472	13		Highest Bandedge	32.019	31.154

Limit : 30 dBc

[MIMO ANT. 2]

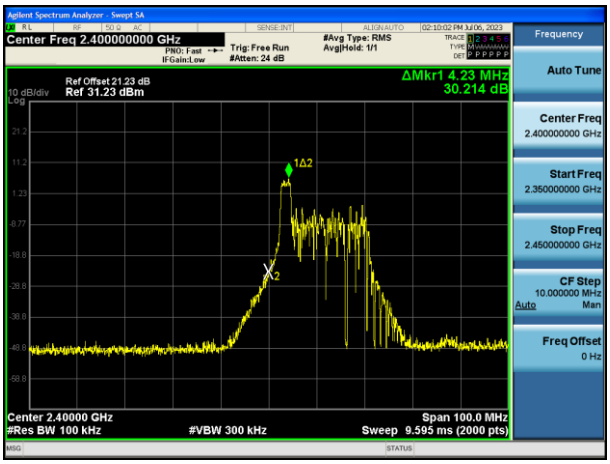
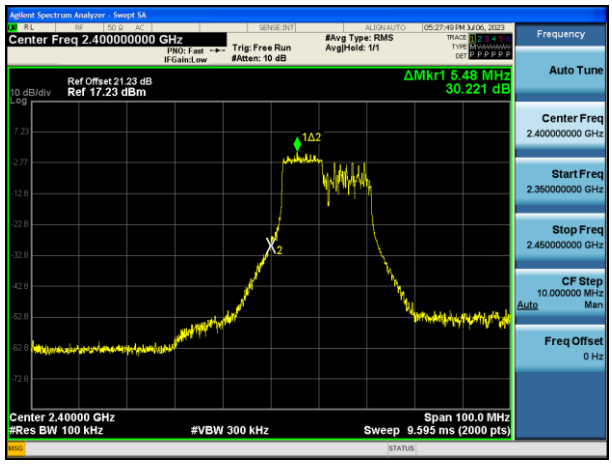
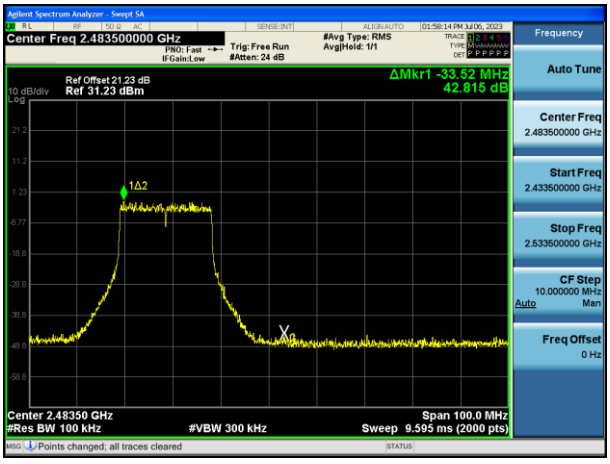
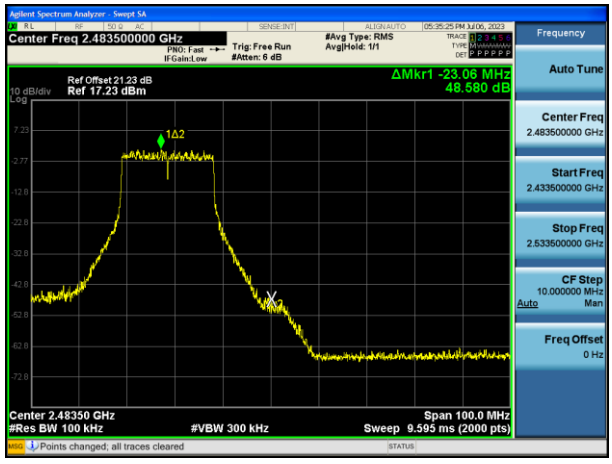
BW	Frequency [MHz]	Channel No.	RU Index	Measured Position	Result (dB)		
					26 T	52 T	106 T
HE20	2412	1	Low	Lowest Bandedge	31.001	31.525	31.504
	2462	11	High	Highest Bandedge	56.822	54.830	51.964
	2467	12	High	Highest Bandedge	42.731	41.837	41.182
	2472	13	High	Highest Bandedge	31.124	31.114	31.235

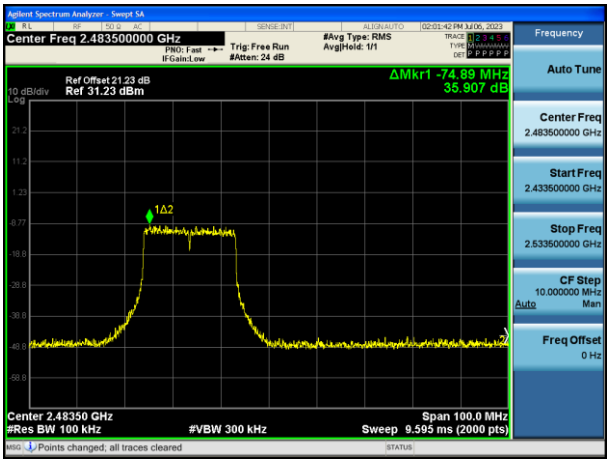
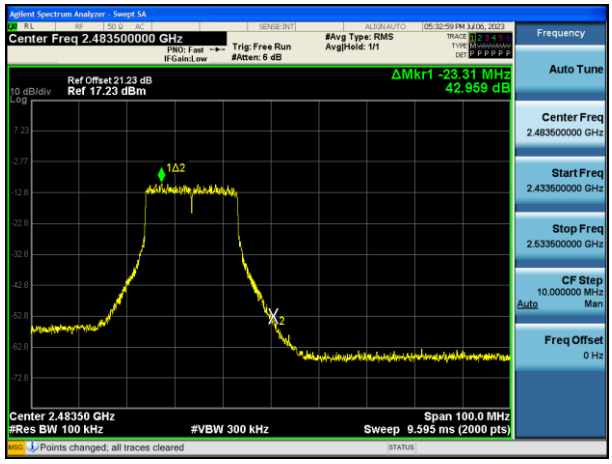
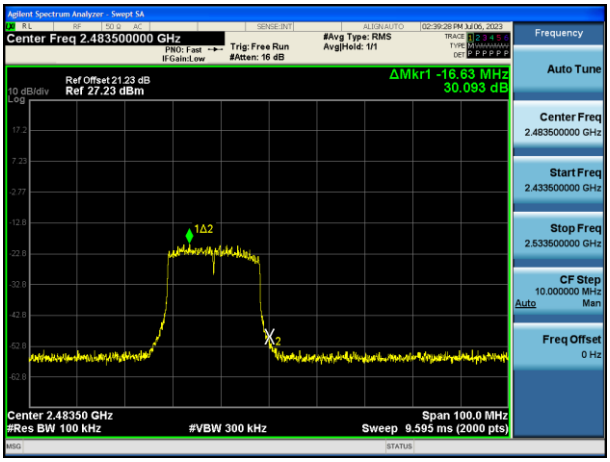
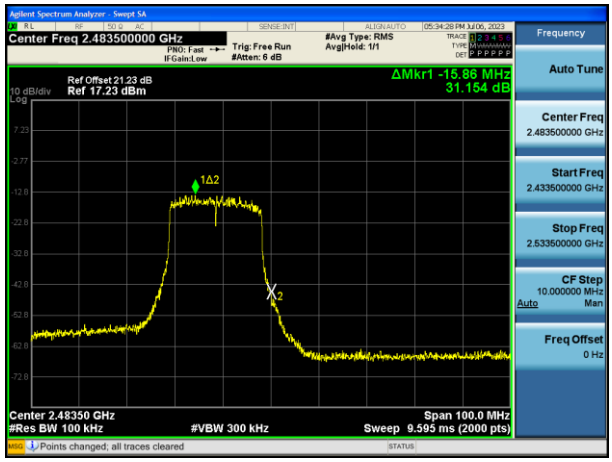
BW	Frequency [MHz]	Channel No.	RU Index	Measured Position	Result (dB)	
					242 T	SU
HE20	2412	1	Mid	Lowest Bandedge	31.321	32.146
	2462	11		Highest Bandedge	48.573	48.295
	2467	12		Highest Bandedge	43.761	42.586
	2472	13		Highest Bandedge	31.721	31.102

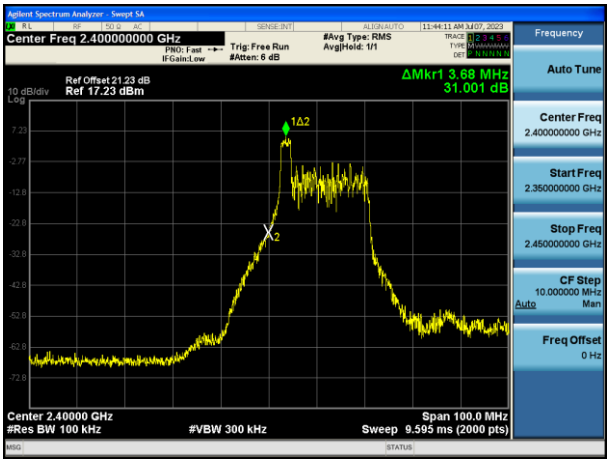
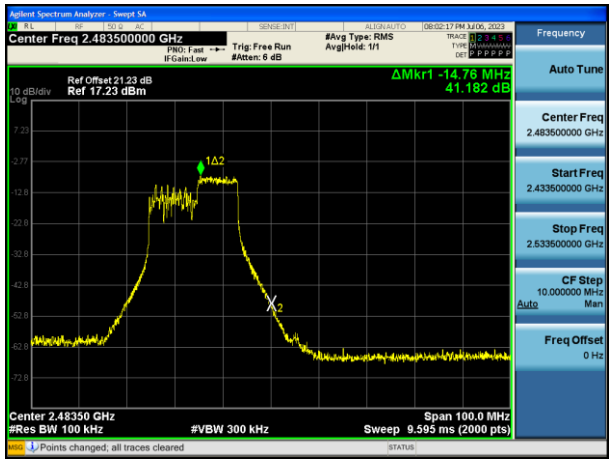
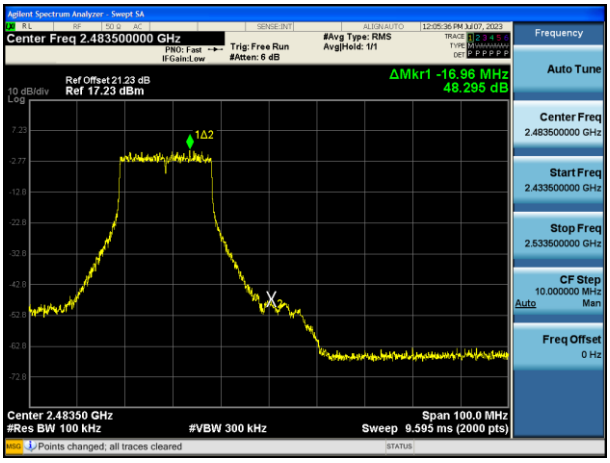
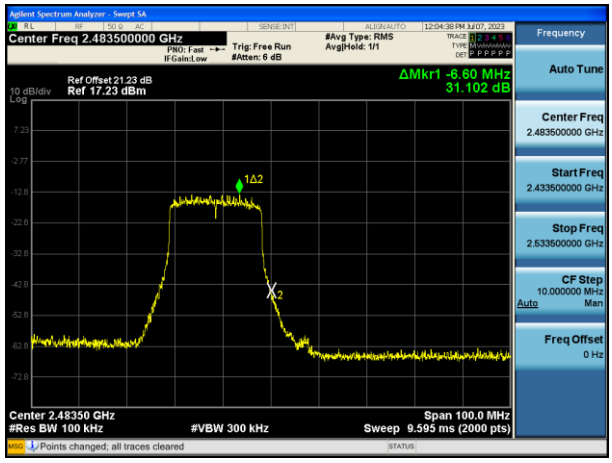
Limit : 30 dBc

▣ Test Plots

Note: In order to simplify the report, attached plots were only the worst case.

[SISO ANT. 1]	[MIMO ANT. 1]
BW 20M Ch.1(2412 MHz) 26T RU 0	**BW 20M Ch.1(2412 MHz) 106T RU 53**
	
BW 20M Ch.11(2462 MHz) 242T RU 61	**BW 20M Ch.11(2462 MHz) SU**
	

[SISO ANT. 1]	[MIMO ANT. 1]
BW 20M Ch.12(2467 MHz) 242T RU 61	**BW 20M Ch.12(2467 MHz) SU**
	
BW 20M Ch.13(2472 MHz) 242T RU 61	**BW 20M Ch.13(2472 MHz) SU**
	

[MIMO ANT. 2]	
BW 20M Ch.1(2412 MHz) 26T RU 0	**BW 20M Ch.12(2467 MHz) 106T RU 54**
	
BW 20M Ch.11(2462 MHz) SU	**BW 20M Ch.13(2472 MHz) SU**
	

Conducted Spurious Emissions

[SISO ANT. 1]

BW	Frequency [MHz]	Channel No.	RU Index	Result (dB)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	54.646	50.892	48.201	-	-
			Mid	53.674	52.117	-	46.886	50.682
			High	54.432	52.116	49.882	-	-
	2437	6	Low	53.804	51.523	47.992	-	-
			Mid	53.577	51.387	-	46.075	53.161
			High	56.692	50.327	49.602	-	-
	2462	11	Low	55.173	52.443	49.721	-	-
			Mid	53.280	52.129	-	46.687	50.619
			High	54.775	51.543	48.828	-	-
	2467	12	Low	47.416	45.433	42.080	-	-
			Mid	46.056	43.322	-	38.870	38.718
			High	46.500	43.112	41.212	-	-
	2472	13	Low	36.987	34.078	32.346	-	-
			Mid	36.817	33.489	-	34.841	34.866
			High	34.046	32.906	34.339	-	-

[MIMO ANT. 1]

BW	Frequency [MHz]	Channel No.	RU Index	Result (dB)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	52.833	53.275	49.094	-	-
			Mid	55.196	51.607	-	47.315	50.500
			High	53.922	52.776	48.306	-	-
	2437	6	Low	52.668	50.588	47.998	-	-
			Mid	51.541	51.111	-	46.349	53.285
			High	54.580	51.086	48.742	-	-
	2462	11	Low	54.399	50.962	49.019	-	-
			Mid	53.516	49.987	-	47.126	49.540
			High	53.950	51.957	49.191	-	-
	2467	12	Low	47.902	44.280	41.469	-	-
			Mid	47.838	43.569	-	39.514	40.168
			High	47.294	42.510	41.637	-	-
	2472	13	Low	35.574	33.245	33.001	-	-
			Mid	38.248	34.920	-	36.861	34.951
			High	34.484	33.091	36.972	-	-

Limit : 30 dBc

[MIMO ANT. 2]

BW	Frequency [MHz]	Channel No.	RU Index	Result (dB)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	52.844	51.697	49.209	-	-
			Mid	53.543	50.949	-	46.768	49.499
			High	52.932	51.132	49.705	-	-
	2437	6	Low	53.253	51.019	48.543	-	-
			Mid	54.075	50.660	-	46.940	53.466
			High	54.790	49.903	49.050	-	-
	2462	11	Low	53.865	53.439	49.829	-	-
			Mid	53.556	50.819	-	46.401	49.926
			High	54.739	50.736	49.940	-	-
	2467	12	Low	46.952	45.667	41.870	-	-
			Mid	46.015	43.701	-	38.692	39.758
			High	45.970	43.190	41.935	-	-
	2472	13	Low	34.130	33.944	31.012	-	-
			Mid	35.286	34.847	-	35.561	35.300
			High	33.844	33.897	32.053	-	-

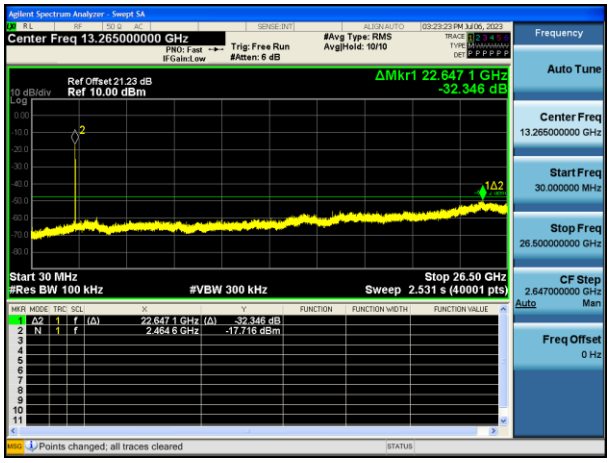
Limit : 30 dBc

▣ Test Plots

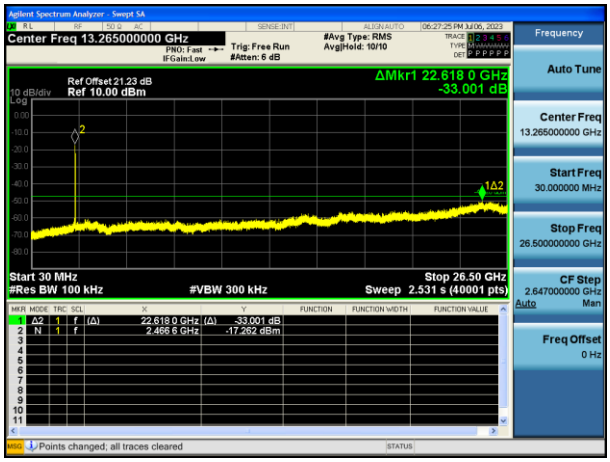
Note:

In order to simplify the report, attached plots were only the worst case.

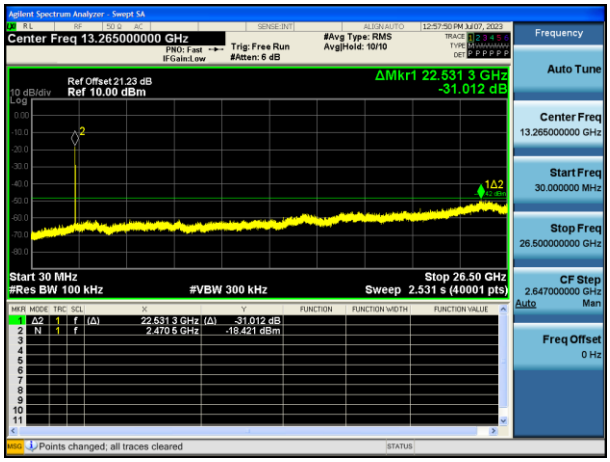
[SISO ANT. 1] BW20M Ch.13(2 472 MHz) 106T RU 53



[MIMO ANT. 1] BW20M Ch.13(2 472 MHz) 106T RU 53



[MIMO ANT. 2] BW20M Ch.13(2 472 MHz) 106T RU 53



9.6 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30 MHz

Frequency	Measured Value	A.F+C.L+D.F	POL	Total	Limit	Margin
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]
No Critical peaks found						

Note:

1. The Measured of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
2. Distance extrapolation factor = 40log (specific distance / test distance) (dB)
3. Limit line = specific Limits (dBμV) + Distance extrapolation factor

Frequency Range : Below 1 GHz

Frequency	Measured Value	A.F+C.L	POL	Total	Limit	Margin
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]
No Critical peaks found						

Note:

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.

Frequency Range : Above 1 GHz

[MIMO]

1. 26 Tones Low RU

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2412 MHz
Channel No.	1 Ch
RU offset	0

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4824	41.68	0.00	3.85	V	45.53	73.98	28.45	PK
4824	28.71	0.08	3.85	V	32.64	53.98	21.34	AV
7236	37.77	0.00	11.91	V	49.68	73.98	24.30	PK
7236	25.69	0.08	11.91	V	37.68	53.98	16.30	AV
4824	41.78	0.00	3.85	H	45.63	73.98	28.35	PK
4824	28.88	0.08	3.85	H	32.81	53.98	21.17	AV
7236	37.87	0.00	11.91	H	49.78	73.98	24.20	PK
7236	25.74	0.08	11.91	H	37.73	53.98	16.25	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2437 MHz
Channel No.	6 Ch
RU offset	0

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4874	40.77	0.00	3.85	V	44.62	73.98	29.36	PK
4874	28.51	0.08	3.85	V	32.44	53.98	21.54	AV
7311	37.71	0.00	12.19	V	49.90	73.98	24.08	PK
7311	25.51	0.08	12.19	V	37.78	53.98	16.20	AV
4874	40.88	0.00	3.85	H	44.73	73.98	29.25	PK
4874	28.62	0.08	3.85	H	32.55	53.98	21.43	AV
7311	37.82	0.00	12.19	H	50.01	73.98	23.97	PK
7311	25.65	0.08	12.19	H	37.92	53.98	16.06	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462 MHz
Channel No.	11 Ch
RU offset	0

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	41.07	0.00	4.14	V	45.21	73.98	28.77	PK
4924	29.11	0.08	4.14	V	33.33	53.98	20.65	AV
7386	38.49	0.00	12.28	V	50.77	73.98	23.21	PK
7386	26.22	0.08	12.28	V	38.58	53.98	15.40	AV
4924	41.02	0.00	4.14	H	45.16	73.98	28.82	PK
4924	29.01	0.08	4.14	H	33.23	53.98	20.75	AV
7386	38.33	0.00	12.28	H	50.61	73.98	23.37	PK
7386	26.12	0.08	12.28	H	38.48	53.98	15.50	AV

Note:

Channel 12 and 13 are less powerful than channel 11. So, The test for high channel was performed at channel 11.

2. 52 Tones Low RU

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2412 MHz
Channel No.	1 Ch
RU offset	37

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4824	41.41	0.00	3.85	V	45.26	73.98	28.72	PK
4824	29.69	0.16	3.85	V	33.70	53.98	20.28	AV
7236	37.51	0.00	11.91	V	49.42	73.98	24.56	PK
7236	26.00	0.16	11.91	V	38.07	53.98	15.91	AV
4824	41.54	0.00	3.85	H	45.39	73.98	28.59	PK
4824	29.76	0.16	3.85	H	33.77	53.98	20.21	AV
7236	37.63	0.00	11.91	H	49.54	73.98	24.44	PK
7236	26.05	0.16	11.91	H	38.12	53.98	15.86	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2437 MHz
Channel No.	6 Ch
RU offset	37

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4874	40.76	0.00	3.85	V	44.61	73.98	29.37	PK
4874	29.03	0.16	3.85	V	33.04	53.98	20.94	AV
7311	37.88	0.00	12.19	V	50.07	73.98	23.91	PK
7311	26.01	0.16	12.19	V	38.36	53.98	15.62	AV
4874	40.84	0.00	3.85	H	44.69	73.98	29.29	PK
4874	29.06	0.16	3.85	H	33.07	53.98	20.91	AV
7311	37.92	0.00	12.19	H	50.11	73.98	23.87	PK
7311	26.03	0.16	12.19	H	38.38	53.98	15.60	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462 MHz
Channel No.	11 Ch
RU offset	37

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	41.38	0.00	4.14	V	45.52	73.98	28.46	PK
4924	29.21	0.16	4.14	V	33.51	53.98	20.47	AV
7386	38.04	0.00	12.28	V	50.32	73.98	23.66	PK
7386	26.25	0.16	12.28	V	38.69	53.98	15.29	AV
4924	41.21	0.00	4.14	H	45.35	73.98	28.63	PK
4924	29.11	0.16	4.14	H	33.41	53.98	20.57	AV
7386	37.95	0.00	12.28	H	50.23	73.98	23.75	PK
7386	26.05	0.16	12.28	H	38.49	53.98	15.49	AV

Note:

Channel 12 and 13 are less powerful than channel 11. So, The test for high channel was performed at channel 11.

3. 106 Tones Low RU

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2412 MHz
Channel No.	1 Ch
RU offset	53

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4824	41.22	0.00	3.85	V	45.07	73.98	28.91	PK
4824	29.55	0.33	3.85	V	33.73	53.98	20.25	AV
7236	37.69	0.00	11.91	V	49.60	73.98	24.38	PK
7236	26.08	0.33	11.91	V	38.32	53.98	15.66	AV
4824	41.32	0.00	3.85	H	45.17	73.98	28.81	PK
4824	29.68	0.33	3.85	H	33.86	53.98	20.12	AV
7236	37.71	0.00	11.91	H	49.62	73.98	24.36	PK
7236	26.14	0.33	11.91	H	38.38	53.98	15.60	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2437 MHz
Channel No.	6 Ch
RU offset	53

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4874	40.88	0.00	3.85	V	44.73	73.98	29.25	PK
4874	28.95	0.33	3.85	V	33.13	53.98	20.85	AV
7311	37.88	0.00	12.19	V	50.07	73.98	23.91	PK
7311	26.01	0.33	12.19	V	38.53	53.98	15.45	AV
4874	40.96	0.00	3.85	H	44.81	73.98	29.17	PK
4874	29.03	0.33	3.85	H	33.21	53.98	20.77	AV
7311	37.97	0.00	12.19	H	50.16	73.98	23.82	PK
7311	26.15	0.33	12.19	H	38.67	53.98	15.31	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462 MHz
Channel No.	11 Ch
RU offset	53

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	41.44	0.00	4.14	V	45.58	73.98	28.40	PK
4924	29.18	0.33	4.14	V	33.65	53.98	20.33	AV
7386	38.75	0.00	12.28	V	51.03	73.98	22.95	PK
7386	26.27	0.33	12.28	V	38.88	53.98	15.10	AV
4924	41.33	0.00	4.14	H	45.47	73.98	28.51	PK
4924	29.01	0.33	4.14	H	33.48	53.98	20.50	AV
7386	38.65	0.00	12.28	H	50.93	73.98	23.05	PK
7386	26.12	0.33	12.28	H	38.73	53.98	15.25	AV

Note:

Channel 12 and 13 are less powerful than channel 11. So, The test for high channel was performed at channel 11.

4. 26 Tones Mid RU

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2412 MHz
Channel No.	01 Ch
RU offset	4

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4824	41.01	0.00	3.85	V	44.86	73.98	29.12	PK
4824	28.73	0.08	3.85	V	32.66	53.98	21.32	AV
7236	37.55	0.00	11.91	V	49.46	73.98	24.52	PK
7236	25.69	0.08	11.91	V	37.68	53.98	16.30	AV
4824	41.18	0.00	3.85	H	45.03	73.98	28.95	PK
4824	28.83	0.08	3.85	H	32.76	53.98	21.22	AV
7236	37.66	0.00	11.91	H	49.57	73.98	24.41	PK
7236	25.71	0.08	11.91	H	37.70	53.98	16.28	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2437 MHz
Channel No.	06 Ch
RU offset	4

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4874	40.55	0.00	3.85	V	44.40	73.98	29.58	PK
4874	28.48	0.08	3.85	V	32.41	53.98	21.57	AV
7311	37.77	0.00	12.19	V	49.96	73.98	24.02	PK
7311	25.69	0.08	12.19	V	37.96	53.98	16.02	AV
4874	40.73	0.00	3.85	H	44.58	73.98	29.40	PK
4874	28.54	0.08	3.85	H	32.47	53.98	21.51	AV
7311	37.87	0.00	12.19	H	50.06	73.98	23.92	PK
7311	25.79	0.08	12.19	H	38.06	53.98	15.92	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462 MHz
Channel No.	11 Ch
RU offset	4

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	41.05	0.00	4.14	V	45.19	73.98	28.79	PK
4924	29.15	0.08	4.14	V	33.37	53.98	20.61	AV
7386	38.35	0.00	12.28	V	50.63	73.98	23.35	PK
7386	26.19	0.08	12.28	V	38.55	53.98	15.43	AV
4924	40.98	0.00	4.14	H	45.12	73.98	28.86	PK
4924	28.95	0.08	4.14	H	33.17	53.98	20.81	AV
7386	38.22	0.00	12.28	H	50.50	73.98	23.48	PK
7386	26.10	0.08	12.28	H	38.46	53.98	15.52	AV

Note:

Channel 12 and 13 are less powerful than channel 11. So, The test for high channel was performed at channel 11.

5. 52 Tones Mid RU

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2412 MHz
Channel No.	01 Ch
RU offset	38

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4824	41.32	0.00	3.85	V	45.17	73.98	28.81	PK
4824	29.88	0.16	3.85	V	33.89	53.98	20.09	AV
7236	37.95	0.00	11.91	V	49.86	73.98	24.12	PK
7236	26.01	0.16	11.91	V	38.08	53.98	15.90	AV
4824	41.48	0.00	3.85	H	45.33	73.98	28.65	PK
4824	29.99	0.16	3.85	H	34.00	53.98	19.98	AV
7236	38.00	0.00	11.91	H	49.91	73.98	24.07	PK
7236	26.13	0.16	11.91	H	38.20	53.98	15.78	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2437 MHz
Channel No.	06 Ch
RU offset	38

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4874	40.79	0.00	3.85	V	44.64	73.98	29.34	PK
4874	28.77	0.16	3.85	V	32.78	53.98	21.20	AV
7311	37.71	0.00	12.19	V	49.90	73.98	24.08	PK
7311	25.89	0.16	12.19	V	38.24	53.98	15.74	AV
4874	40.88	0.00	3.85	H	44.73	73.98	29.25	PK
4874	28.89	0.16	3.85	H	32.90	53.98	21.08	AV
7311	37.83	0.00	12.19	H	50.02	73.98	23.96	PK
7311	25.97	0.16	12.19	H	38.32	53.98	15.66	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462 MHz
Channel No.	11 Ch
RU offset	38

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	41.68	0.00	4.14	V	45.82	73.98	28.16	PK
4924	29.12	0.16	4.14	V	33.42	53.98	20.56	AV
7386	37.96	0.00	12.28	V	50.24	73.98	23.74	PK
7386	26.29	0.16	12.28	V	38.73	53.98	15.25	AV
4924	41.55	0.00	4.14	H	45.69	73.98	28.29	PK
4924	29.01	0.16	4.14	H	33.31	53.98	20.67	AV
7386	37.89	0.00	12.28	H	50.17	73.98	23.81	PK
7386	26.11	0.16	12.28	H	38.55	53.98	15.43	AV

Note:

Channel 12 and 13 are less powerful than channel 11. So, The test for high channel was performed at channel 11.

6. 242 Tones Mid RU

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2412 MHz
Channel No.	01 Ch
RU offset	61

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4824	41.11	0.00	3.85	V	44.96	73.98	29.02	PK
4824	29.41	0.66	3.85	V	33.92	53.98	20.06	AV
7236	37.89	0.00	11.91	V	49.80	73.98	24.18	PK
7236	26.01	0.66	11.91	V	38.58	53.98	15.40	AV
4824	41.29	0.00	3.85	H	45.14	73.98	28.84	PK
4824	29.52	0.66	3.85	H	34.03	53.98	19.95	AV
7236	37.99	0.00	11.91	H	49.90	73.98	24.08	PK
7236	26.11	0.66	11.91	H	38.68	53.98	15.30	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2437 MHz
Channel No.	06 Ch
RU offset	61

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4874	40.78	0.00	3.85	V	44.63	73.98	29.35	PK
4874	29.05	0.66	3.85	V	33.56	53.98	20.42	AV
7311	37.95	0.00	12.19	V	50.14	73.98	23.84	PK
7311	25.98	0.66	12.19	V	38.83	53.98	15.15	AV
4874	40.92	0.00	3.85	H	44.77	73.98	29.21	PK
4874	29.07	0.66	3.85	H	33.58	53.98	20.40	AV
7311	38.01	0.00	12.19	H	50.20	73.98	23.78	PK
7311	26.02	0.66	12.19	H	38.87	53.98	15.11	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462 MHz
Channel No.	11 Ch
RU offset	61

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	41.65	0.00	4.14	V	45.79	73.98	28.19	PK
4924	29.10	0.66	4.14	V	33.90	53.98	20.08	AV
7386	38.81	0.00	12.28	V	51.09	73.98	22.89	PK
7386	26.05	0.66	12.28	V	38.99	53.98	14.99	AV
4924	41.55	0.00	4.14	H	45.69	73.98	28.29	PK
4924	28.95	0.66	4.14	H	33.75	53.98	20.23	AV
7386	38.71	0.00	12.28	H	50.99	73.98	22.99	PK
7386	26.01	0.66	12.28	H	38.95	53.98	15.03	AV

Note:

Channel 12 and 13 are less powerful than channel 11. So, The test for high channel was performed at channel 11.

7. SU

Operation Mode: 802.11ax(HE20)

Transfer MCS Index: 0

Operating Frequency 2412 MHz

Channel No. 01 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4824	41.22	0.00	3.85	V	45.07	73.98	28.91	PK
4824	28.71	0.67	3.85	V	33.23	53.98	20.75	AV
7236	38.22	0.00	11.91	V	50.13	73.98	23.85	PK
7236	25.41	0.67	11.91	V	37.99	53.98	15.99	AV
4824	41.37	0.00	3.85	H	45.22	73.98	28.76	PK
4824	28.88	0.67	3.85	H	33.40	53.98	20.58	AV
7236	38.36	0.00	11.91	H	50.27	73.98	23.71	PK
7236	25.50	0.67	11.91	H	38.08	53.98	15.90	AV

Operation Mode: 802.11ax(HE20)

Transfer MCS Index: 0

Operating Frequency 2437 MHz

Channel No. 06 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4874	41.26	0.00	3.85	V	45.11	73.98	28.87	PK
4874	28.62	0.67	3.85	V	33.14	53.98	20.84	AV
7311	38.10	0.00	12.19	V	50.29	73.98	23.69	PK
7311	25.89	0.67	12.19	V	38.75	53.98	15.23	AV
4874	41.39	0.00	3.85	H	45.24	73.98	28.74	PK
4874	28.72	0.67	3.85	H	33.24	53.98	20.74	AV
7311	38.22	0.00	12.19	H	50.41	73.98	23.57	PK
7311	25.91	0.67	12.19	H	38.77	53.98	15.21	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462 MHz
Channel No.	11 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L -A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4924	41.21	0.00	4.14	V	45.35	73.98	28.63	PK
4924	29.21	0.67	4.14	V	34.02	53.98	19.96	AV
7386	38.63	0.00	12.28	V	50.91	73.98	23.07	PK
7386	26.12	0.67	12.28	V	39.07	53.98	14.91	AV
4924	41.15	0.00	4.14	H	45.29	73.98	28.69	PK
4924	29.11	0.67	4.14	H	33.92	53.98	20.06	AV
7386	38.59	0.00	12.28	H	50.87	73.98	23.11	PK
7386	26.07	0.67	12.28	H	39.02	53.98	14.96	AV

Note:

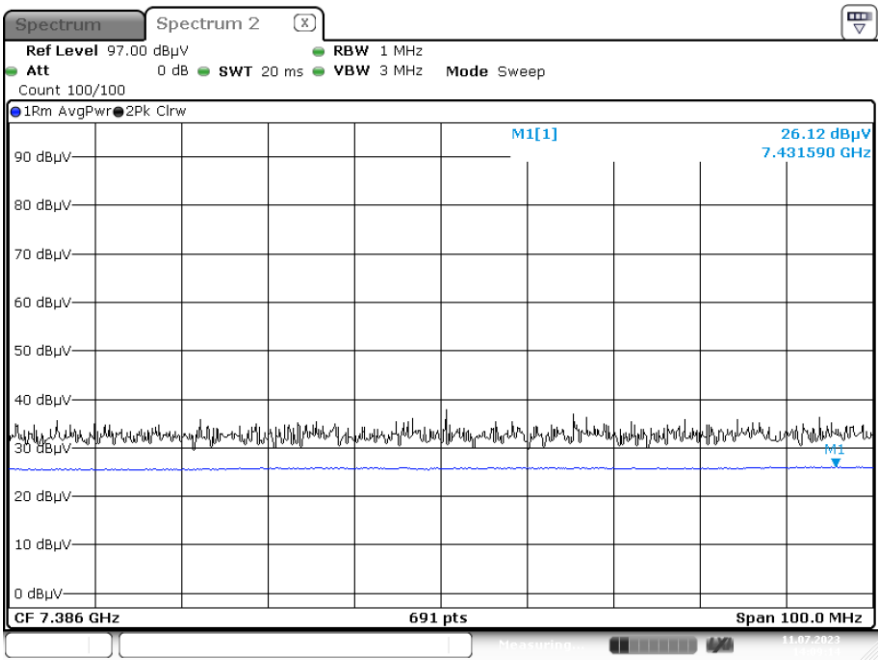
Channel 12 and 13 are less powerful than channel 11. So, The test for high channel was performed at channel 11.

▣ Test Plots

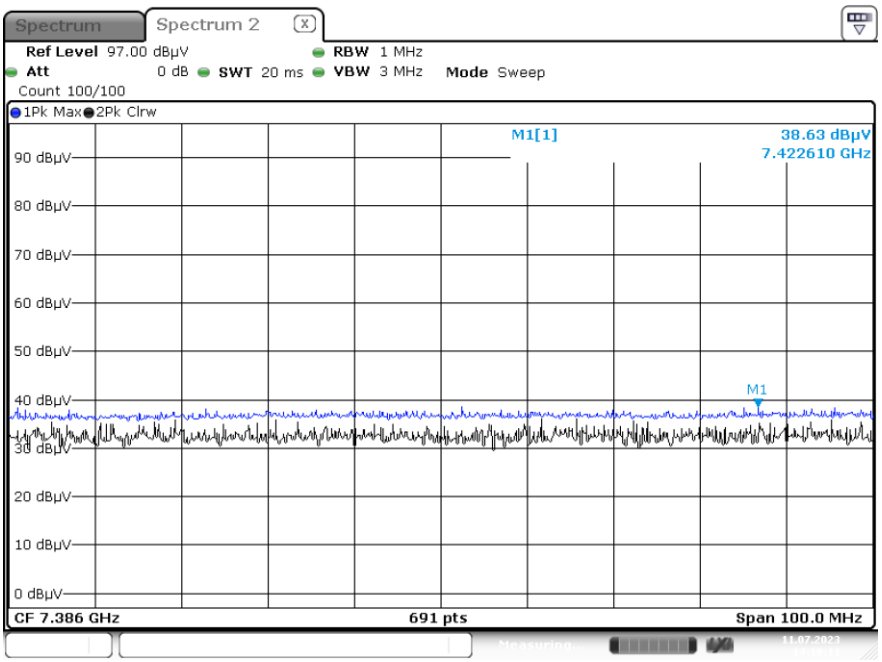
Note:

In order to simplify, Plots of worst case are only reported.

Radiated Spurious Emissions plot – Average result (802.11ax(HE20)_ SU, Ch.11 3rd Harmonic, X-V)



Radiated Spurious Emissions plot – Peak result (802.11ax(HE20)_ SU, Ch.11 3rd Harmonic, X-V)



9.7 RADIATED RESTRICTED BAND EDGES

[MIMO]

1. 26 Tones

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	0
Operating Frequency	2412 MHz
Channel No.	01 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F.+CL+ATT-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2390	18.32	0.00	36.84	H	55.16	73.98	18.82	PK
2390.0	8.43	0.08	36.84	H	45.35	53.98	8.63	AV
# 2390	17.89	0.00	36.84	V	54.73	73.98	19.25	PK
2390.0	8.31	0.08	36.84	V	45.23	53.98	8.75	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	8
Operating Frequency	2462 MHz
Channel No.	11 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F.+CL+ATT-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2483.5	21.32	0.00	36.73	H	58.05	73.98	15.93	PK
2483.5	10.31	0.08	36.73	H	47.12	53.98	6.86	AV
# 2483.5	20.95	0.00	36.73	V	57.68	73.98	16.30	PK
2483.5	10.01	0.08	36.73	V	46.82	53.98	7.16	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	8
Operating Frequency	2467 MHz
Channel No.	12 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2483.5	27.16	0.00	36.73	H	63.89	73.98	10.09	PK
# 2483.5	14.07	0.08	36.73	H	50.88	53.98	3.10	AV
# 2483.5	26.95	0.00	36.73	V	63.68	73.98	10.30	PK
# 2483.5	13.85	0.08	36.73	V	50.66	53.98	3.32	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	8
Operating Frequency	2472 MHz
Channel No.	13 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2483.5	27.98	0.00	36.73	H	64.71	73.98	9.27	PK
# 2483.5	14.69	0.08	36.73	H	51.50	53.98	2.48	AV
# 2483.5	27.62	0.00	36.73	V	64.35	73.98	9.63	PK
# 2483.5	14.28	0.08	36.73	V	51.09	53.98	2.89	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

2. 52 Tones

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	37
Operating Frequency	2412 MHz
Channel No.	01 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F.+CL+ATT-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2390	18.48	0.00	36.84	H	55.32	73.98	18.66	PK
2390.0	9.09	0.16	36.84	H	46.09	53.98	7.89	AV
# 2390	18.01	0.00	36.84	V	54.85	73.98	19.13	PK
2390.0	8.99	0.16	36.84	V	45.99	53.98	7.99	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	40
Operating Frequency	2462 MHz
Channel No.	11 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F.+CL+ATT-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2483.5	22.55	0.00	36.73	H	59.28	73.98	14.70	PK
2483.5	10.10	0.16	36.73	H	46.99	53.98	6.99	AV
# 2483.5	22.01	0.00	36.73	V	58.74	73.98	15.24	PK
2483.5	9.85	0.16	36.73	V	46.74	53.98	7.24	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	40
Operating Frequency	2467 MHz
Channel No.	12 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2483.5	25.91	0.00	36.73	H	62.64	73.98	11.34	PK
# 2483.5	12.94	0.16	36.73	H	49.83	53.98	4.15	AV
# 2483.5	25.62	0.00	36.73	V	62.35	73.98	11.63	PK
# 2483.5	12.78	0.16	36.73	V	49.67	53.98	4.31	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	40
Operating Frequency	2472 MHz
Channel No.	13 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2483.5	25.29	0.00	36.73	H	62.02	73.98	11.96	PK
# 2483.5	12.33	0.16	36.73	H	49.22	53.98	4.76	AV
# 2483.5	25.09	0.00	36.73	V	61.82	73.98	12.16	PK
# 2483.5	12.01	0.16	36.73	V	48.90	53.98	5.08	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

3. 106 Tones

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	53
Operating Frequency	2412 MHz
Channel No.	01 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2390	21.55	0.00	36.84	H	58.39	73.98	15.59	PK
2390.0	9.38	0.33	36.84	H	46.55	53.98	7.43	AV
# 2390	21.01	0.00	36.84	V	57.85	73.98	16.13	PK
2390.0	9.21	0.33	36.84	V	46.38	53.98	7.60	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	54
Operating Frequency	2462 MHz
Channel No.	11 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2483.5	22.74	0.00	36.73	H	59.47	73.98	14.51	PK
2483.5	10.44	0.33	36.73	H	47.50	53.98	6.48	AV
# 2483.5	22.48	0.00	36.73	V	59.21	73.98	14.77	PK
2483.5	10.31	0.33	36.73	V	47.37	53.98	6.61	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	54
Operating Frequency	2467 MHz
Channel No.	12 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2483.5	23.88	0.00	36.73	H	60.61	73.98	13.37	PK
# 2483.5	10.90	0.33	36.73	H	47.96	53.98	6.02	AV
# 2483.5	23.51	0.00	36.73	V	60.24	73.98	13.74	PK
# 2483.5	10.69	0.33	36.73	V	47.75	53.98	6.23	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	54
Operating Frequency	2472 MHz
Channel No.	13 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2483.5	23.87	0.00	36.73	H	60.60	73.98	13.38	PK
# 2483.5	10.47	0.33	36.73	H	47.53	53.98	6.45	AV
# 2483.5	23.51	0.00	36.73	V	60.24	73.98	13.74	PK
# 2483.5	10.21	0.33	36.73	V	47.27	53.98	6.71	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

4. 242 Tones

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	61
Operating Frequency	2412 MHz
Channel No.	01 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F.+CL+ATT-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2390	21.62	0.00	36.84	H	58.46	73.98	15.52	PK
2390.0	9.47	0.66	36.84	H	46.97	53.98	7.01	AV
# 2390	21.11	0.00	36.84	V	57.95	73.98	16.03	PK
2390.0	8.95	0.66	36.84	V	46.45	53.98	7.53	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	61
Operating Frequency	2462 MHz
Channel No.	11 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F.+CL+ATT-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2483.5	23.25	0.00	36.73	H	59.98	73.98	14.00	PK
2483.5	10.69	0.66	36.73	H	48.08	53.98	5.90	AV
# 2483.5	22.98	0.00	36.73	V	59.71	73.98	14.27	PK
2483.5	10.01	0.66	36.73	V	47.40	53.98	6.58	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	61
Operating Frequency	2467 MHz
Channel No.	12 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2483.5	22.57	0.00	36.73	H	59.30	73.98	14.68	PK
# 2483.5	8.89	0.66	36.73	H	46.28	53.98	7.70	AV
# 2483.5	22.31	0.00	36.73	V	59.04	73.98	14.94	PK
# 2483.5	8.71	0.66	36.73	V	46.10	53.98	7.88	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	61
Operating Frequency	2472 MHz
Channel No.	13 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2483.5	20.50	0.00	36.73	H	57.23	73.98	16.75	PK
# 2483.5	8.14	0.66	36.73	H	45.53	53.98	8.45	AV
# 2483.5	20.22	0.00	36.73	V	56.95	73.98	17.03	PK
# 2483.5	7.98	0.66	36.73	V	45.37	53.98	8.61	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

5. SU

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2412 MHz
Channel No.	01 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2390	24.13	0.00	36.84	H	60.97	73.98	13.01	PK
# 2390	12.41	0.67	36.84	H	49.92	53.98	4.06	AV
# 2390	23.95	0.00	36.84	V	60.79	73.98	13.19	PK
# 2390	12.05	0.67	36.84	V	49.56	53.98	4.42	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462 MHz
Channel No.	11 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2483.5	26.85	0.00	36.73	H	63.58	73.98	10.40	PK
# 2483.5	13.48	0.67	36.73	H	50.88	53.98	3.10	AV
# 2483.5	26.54	0.00	36.73	V	63.27	73.98	10.71	PK
# 2483.5	13.01	0.67	36.73	V	50.41	53.98	3.57	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2467 MHz
Channel No.	12 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2483.5	22.55	0.00	36.73	H	59.28	73.98	14.70	PK
# 2483.5	8.95	0.67	36.73	H	46.35	53.98	7.63	AV
# 2483.5	22.29	0.00	36.73	V	59.02	73.98	14.96	PK
# 2483.5	8.88	0.67	36.73	V	46.28	53.98	7.70	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2472 MHz
Channel No.	13 Ch

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F.+CL+AT T-A.G+D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2483.5	26.15	0.00	36.73	H	62.88	73.98	11.10	PK
# 2483.5	12.45	0.67	36.73	H	49.85	53.98	4.13	AV
# 2483.5	25.85	0.00	36.73	V	62.58	73.98	11.40	PK
# 2483.5	12.05	0.67	36.73	V	49.45	53.98	4.53	AV

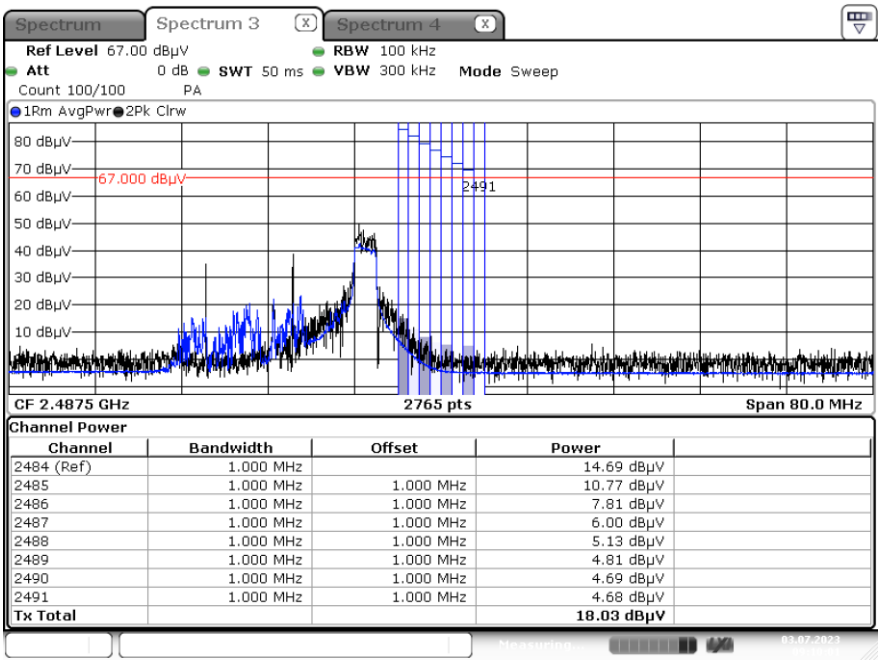
Note : # integration method Used (ANSI C63.10 Section11.13.3)

▣ Test Plots [MIMO]

Note:

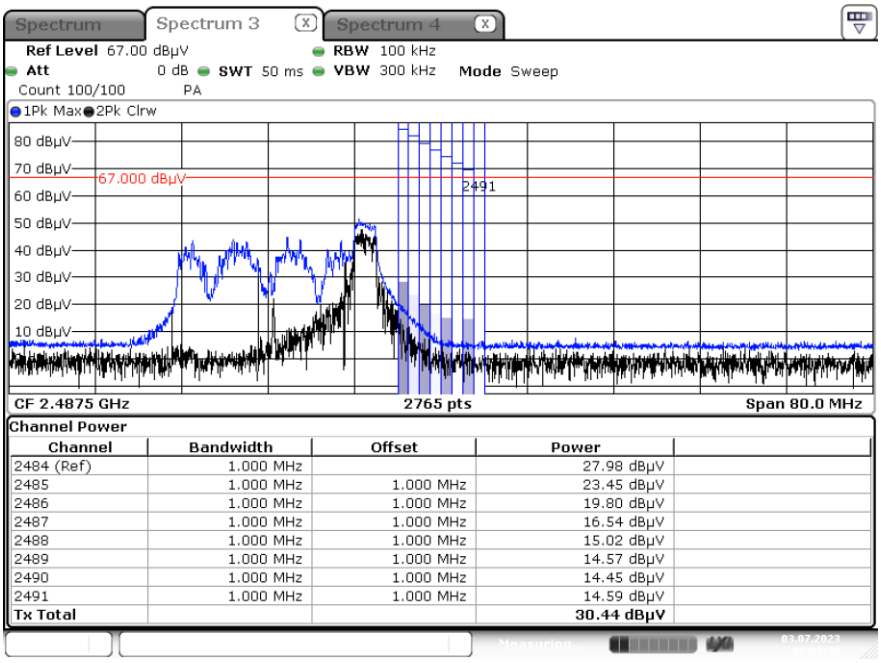
In order to simplify the report, Plots of worst case are only reported.

Average result(802.11ax(HE20), MCS0, 26 Tone, RU 8 ch.13, Z-H)



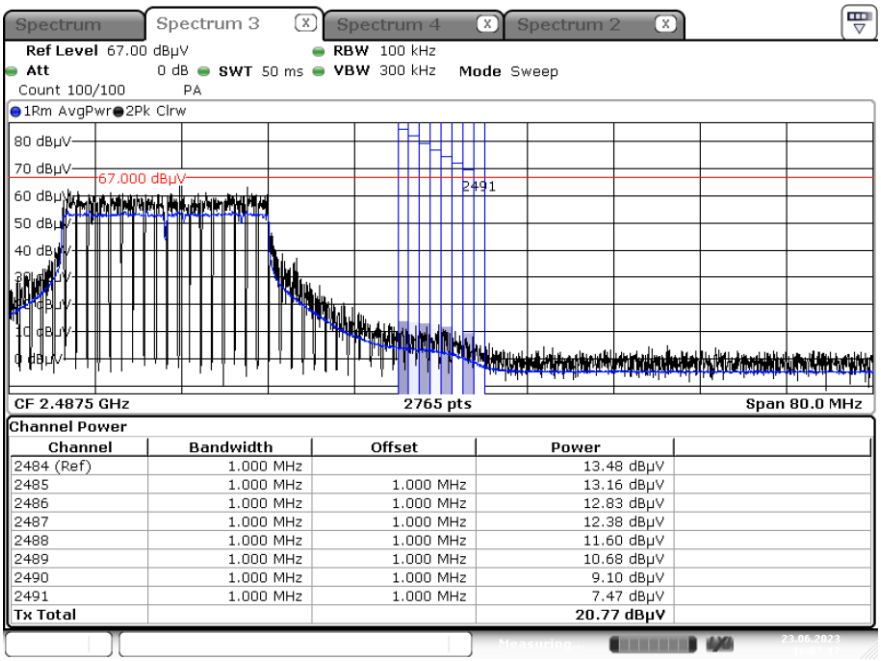
Channel	Bandwidth	Offset	Power
2484 (Ref)	1.000 MHz		14.69 dBµV
2485	1.000 MHz	1.000 MHz	10.77 dBµV
2486	1.000 MHz	1.000 MHz	7.81 dBµV
2487	1.000 MHz	1.000 MHz	6.00 dBµV
2488	1.000 MHz	1.000 MHz	5.13 dBµV
2489	1.000 MHz	1.000 MHz	4.81 dBµV
2490	1.000 MHz	1.000 MHz	4.69 dBµV
2491	1.000 MHz	1.000 MHz	4.68 dBµV
Tx Total			18.03 dBµV

Peak result(802.11ax(HE20), MCS0, 26 Tone, RU 8 ch.13, Z-H)



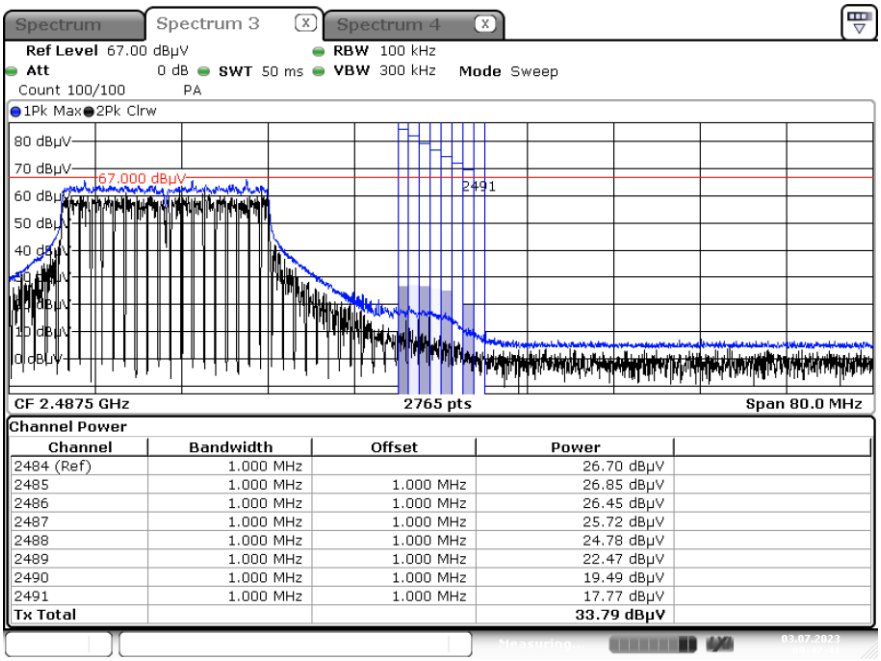
Channel	Bandwidth	Offset	Power
2484 (Ref)	1.000 MHz		27.98 dBµV
2485	1.000 MHz	1.000 MHz	23.45 dBµV
2486	1.000 MHz	1.000 MHz	19.80 dBµV
2487	1.000 MHz	1.000 MHz	16.54 dBµV
2488	1.000 MHz	1.000 MHz	15.02 dBµV
2489	1.000 MHz	1.000 MHz	14.57 dBµV
2490	1.000 MHz	1.000 MHz	14.45 dBµV
2491	1.000 MHz	1.000 MHz	14.59 dBµV
Tx Total			30.44 dBµV

Average result(802.11ax(HE20), MCS0, SU, ch.11, Z-H)



Channel	Bandwidth	Offset	Power
2484 (Ref)	1.000 MHz		13.48 dBµV
2485	1.000 MHz	1.000 MHz	13.16 dBµV
2486	1.000 MHz	1.000 MHz	12.83 dBµV
2487	1.000 MHz	1.000 MHz	12.38 dBµV
2488	1.000 MHz	1.000 MHz	11.60 dBµV
2489	1.000 MHz	1.000 MHz	10.68 dBµV
2490	1.000 MHz	1.000 MHz	9.10 dBµV
2491	1.000 MHz	1.000 MHz	7.47 dBµV
Tx Total			**20.77 dBµV**

Peak result(802.11ax(HE20), MCS0, SU, ch.11, Z-H)



Channel	Bandwidth	Offset	Power
2484 (Ref)	1.000 MHz		26.70 dBµV
2485	1.000 MHz	1.000 MHz	26.85 dBµV
2486	1.000 MHz	1.000 MHz	26.45 dBµV
2487	1.000 MHz	1.000 MHz	25.72 dBµV
2488	1.000 MHz	1.000 MHz	24.78 dBµV
2489	1.000 MHz	1.000 MHz	22.47 dBµV
2490	1.000 MHz	1.000 MHz	19.49 dBµV
2491	1.000 MHz	1.000 MHz	17.77 dBµV
Tx Total			**33.79 dBµV**

10. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	08/22/2023	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	05/26/2024	Annual
Temperature Chamber	SU-642	ESPEC	0093008124	02/22/2024	Annual
Signal Analyzer	N9030A	Agilent	MY49432108	03/02/2024	Annual
Power Measurement Set	OSP 120	Rohde & Schwarz	101231	06/09/2024	Annual
Power Meter	N1911A	Agilent	MY45100523	03/06/2024	Annual
Power Sensor	N1921A	Agilent	MY57820067	03/06/2024	Annual
Directional Coupler	87300B	Agilent	3116A03621	11/02/2023	Annual
Power Splitter	11667B	Hewlett Packard	10545	02/06/2024	Annual
DC Power Supply	E3632A	Agilent	KR75303243	04/24/2024	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C	HP	07560	06/12/2024	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C	HP	08285	06/02/2024	Annual
Attenuator(20 dB)	18N-20dB	Rohde & Schwarz	8	03/08/2024	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A
FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	HCT CO., LTD.	N/A	N/A	N/A
Bluetooth Tester	CBT	Rohde & Schwarz	100808	02/16/2024	Annual

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller(Antenna mast)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	N/A	N/A	N/A
EM1000 / Controller	EM1000	Audix	060520	N/A	N/A
Turn Table	N/A	Audix	N/A	N/A	N/A
Amp & Filter Bank Switch Controller	FBSM-01B	T&M system	TM19050002	N/A	N/A
Loop Antenna	1513	Schwarzbeck	1513-333	03/17/2024	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	08/16/2024	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1300	01/18/2024	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-2296	05/18/2024	Biennial
Horn Antenna(15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Spectrum Analyzer	FSV(10 Hz ~ 40 GHz)	Rohde & Schwarz	101055	05/12/2024	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/05/2024	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	06/12/2024	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	06/12/2024	Annual
High Pass Filter(7 GHz ~ 18 GHz)	WHKX10-7150-8000-18000-50SS	Wainwright Instruments	1	03/02/2024	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/01/2023	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/02/2024	Annual
Bluetooth Tester	TC-3000C	TESCOM	3000C000175	03/28/2024	Annual
RF Switching System	FMSR-05B (HPF(3~18GHz) + LNA1(1~18GHz))	T&M system	S1L1	01/17/2024	Annual
RF Switching System	FMSR -05B (ATT(10dB) + LNA1(1~18GHz))	T&M system	S1L2	01/17/2024	Annual
RF Switching System	FMSR -05B (ATT(3dB) + LNA1(1~18GHz))	T&M system	S1L3	01/17/2024	Annual
RF Switching System	FMSR -05B (LNA1(1~18GHz))	T&M system	S1L4	01/17/2024	Annual
RF Switching System	FMSR -05B (HPF(7~18GHz) + LNA2(6~18GHz))	T&M system	S1L5	01/17/2024	Annual
RF Switching System	FMSR -05B (Thru(30MHz ~ 18GHz))	T&M system	S1L6	01/17/2024	Annual

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

11. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2307-FC019-P