

FCC DTS REPORT

Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.	Date of Issue: December 13, 2021
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	Report No.: HCT-RF-2112-FC014-R1

FCC ID:	A3LSMX800
APPLICANT:	SAMSUNG Electronics Co., Ltd.
Full test (Because of changing target power) -CH1-CH13 26T, 52T Mode -CH12/13 ALL Mode	
According to the Evaluation report, all of the data contained herein is reused from the reference FCC ID : A3LSMX808U report.(Except for above Mode).	

Model:	SM-X800
EUT Type:	Tablet
Average Output Power:	802.11ax(HE20) SUM (MIMO Ant 1 + MIMO Ant 2): 20.73 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.

Report No.: HCT-RF-2112-FC014-R1

REVIEWED BY



Report prepared by : Woong Jin Kim
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)

* The report shall not be reproduced except in full(only partly) without approval of the laboratory.

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2112-FC014	December 03, 2021	- First Approval Report
HCT-RF-2112-FC014-R1	December 13, 2021	- Revised Antenna Configurations (Page 6)

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1. EUT DESCRIPTION

Model	SM-X800	
Additional Model	-	
EUT Type	Tablet	
Power Supply	DC 3.86 V	
Frequency Range	2 412 MHz ~ 2 472 MHz	
Max. RF Output Power SUM (MIMO Ant 1 + MIMO Ant 2)	<u>Peak Power</u> (For information only)	29.97 dBm
	<u>Average Power</u>	20.73 dBm
Modulation Type	OFDM, OFDMA	
Number of Channels	13 Channels	
Date(s) of Tests	September 13, 2021 ~ December 02, 2021	
Serial number	Radiated : R32RD00VRVM Conducted : R32RA00DAPN	

ANTENNA CONFIGURATIONS

Configurations	SISO		MIMO	
	Ant1	Ant2	SDM	CDD
802.11ax(HE20)	X	O	O	O

Note:

- (1) O = Support, X = Not Support
- (2) SISO = Single Input Single Output
- (3) SDM = Spatial Diversity Multiplexing
- (4) CDD = Cyclic Delay Diversity
- (5) SISO test was performed for the MIMO test result.

2. This device supports simultaneous transmission operation, which allows for two channels to operate independent of one another in the 2.4 GHz and 5 GHz bands simultaneously on each antenna.

RSDB Scenario	2.4 GHz WiFi Ant.1	2.4 GHz WiFi Ant.2	5 GHz WiFi Ant.1	5 GHz WiFi Ant.2	6 GHz WiFi Ant.1	6 GHz WiFi Ant.2	Bluetooth Ant.1	Bluetooth Ant.2	Test case
2.4 GHz WiFi MIMO + 6 GHz WiFi MIMO	on	on			on	on			
2.4 GHz WiFi MIMO + 5 GHz WiFi MIMO	on	on	on	on					<u>Case 1</u>
Bluetooth ANT.1 + 2.4 GHz WiFi ANT.2 + 5 GHz WiFi MIMO		on	on	on			on		
Bluetooth ANT.1 + 2.4 GHz WiFi ANT.2 + 6 GHz WiFi MIMO		on			on	on	on		

Non-DBS	2.4 GHz WiFi Ant.1	2.4 GHz WiFi Ant.2	5 GHz WiFi Ant.1	5 GHz WiFi Ant.2	6 GHz WiFi Ant.1	6 GHz WiFi Ant.2	Bluetooth Ant.1	Bluetooth Ant.2	Test case
Bluetooth ANT.2 + 6 GHz WiFi MIMO					on	on		on	
Bluetooth ANT.2 + 5GHz WiFi MIMO			on	on				on	
Bluetooth ANT.1 + 6 GHz WiFi MIMO					on	on	on		
Bluetooth ANT.1 + 5GHz WiFi MIMO			on	on	-	-	on	-	<u>Case 2</u>

Note : Test case 1,2 Result refer to the SM-X800[BT, DTS, UNII ax] Test Report.)

3. Directional Gain Calculation

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

Directional gain =

$$\bullet \quad \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

Ant Gain (dBi)		N_{ANT} / N_{SS}	Directional Gain (dBi)
ANT1(Core 0)	-5.54	2 / 2	-3.05
ANT2(Core 1)	-6.62		

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 data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission 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.

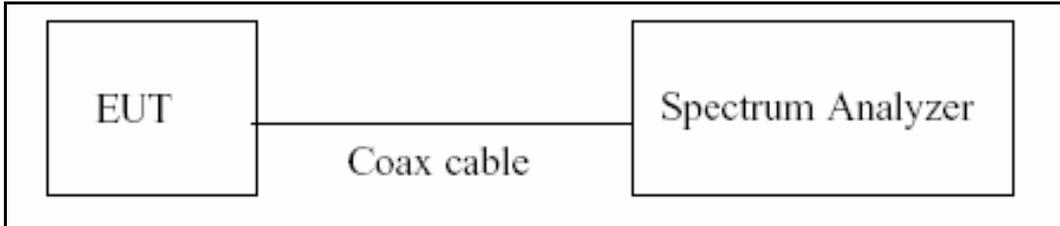
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82 (Confidence level about 95 %, $k = 2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, $k = 2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, $k = 2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, $k = 2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (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 $T \leq 6.25$ 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 $> 50/T$.

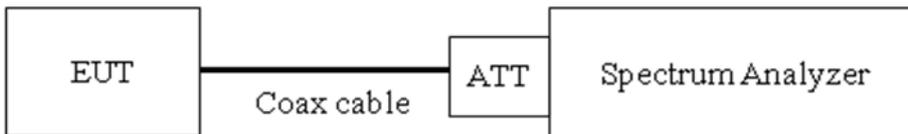
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (\geq RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = $10\log(1/\text{Duty Cycle})$

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 $\geq 3 \times$ 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.

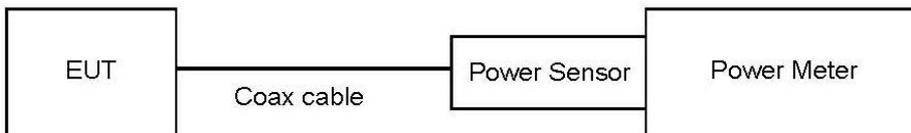
Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

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

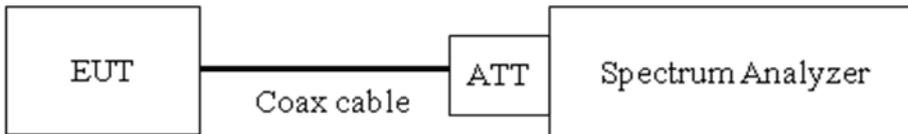
- Conducted Output Power(Peak) = Measured Value + ATT loss + Cable loss
- Conducted Output Power(Average) = Measured Value + ATT loss + Cable loss + Duty Cycle Factor

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) $RBW = 3 \text{ kHz} \leq RBW \leq 100 \text{ kHz}$.
- 4) $VBW \geq 3 \times RBW$.
- 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 $\geq [2 \times \text{span} / RBW]$.
- 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

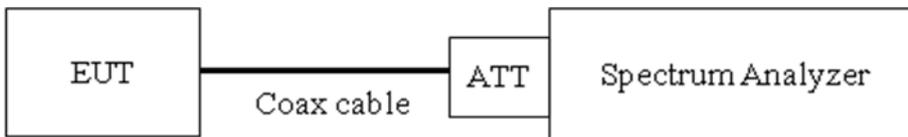
7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

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 $\geq 3 \times$ 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 $\geq 2 \times$ 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	10.04
100	10.07
200	10.12
300	10.17
400	10.20
500	10.21
600	10.21
700	10.23
800	10.24
900	10.26
1000	10.27
2000	10.41
2400	10.45
2500	10.47
3000	10.52
4000	10.60
5000	10.71
6000	10.73
7000	10.80
8000	10.85
9000	10.91
10000	10.97
11000	11.02
12000	11.10
13000	11.19
14000	11.16
15000	11.21
16000	11.22
17000	11.25
18000	11.30
19000	11.32
20000	11.36
21000	11.48
22000	11.55
23000	11.55
24000	11.59
25000	11.68
26000	11.69

Note : 1. 2 400 ~ 2 500 MHz is fundamental frequency range.

2. Factor = Attenuator loss(10 dB) + Cable loss(1ea)

3. EUT Cable Loss : 0.35 dB

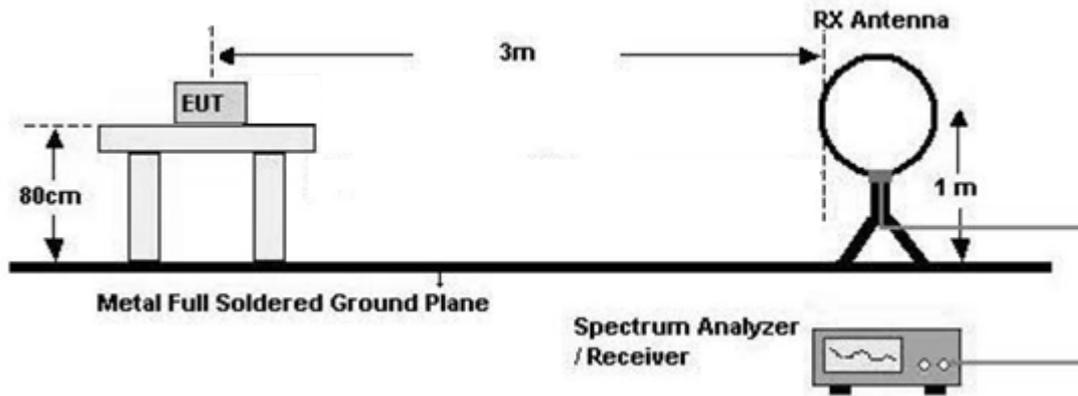
7.6. Radiated Test

Limit

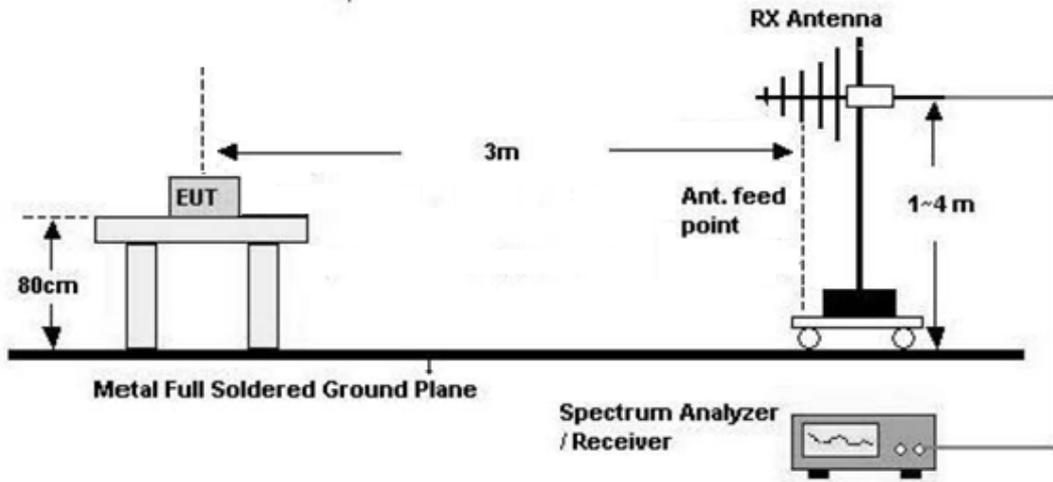
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

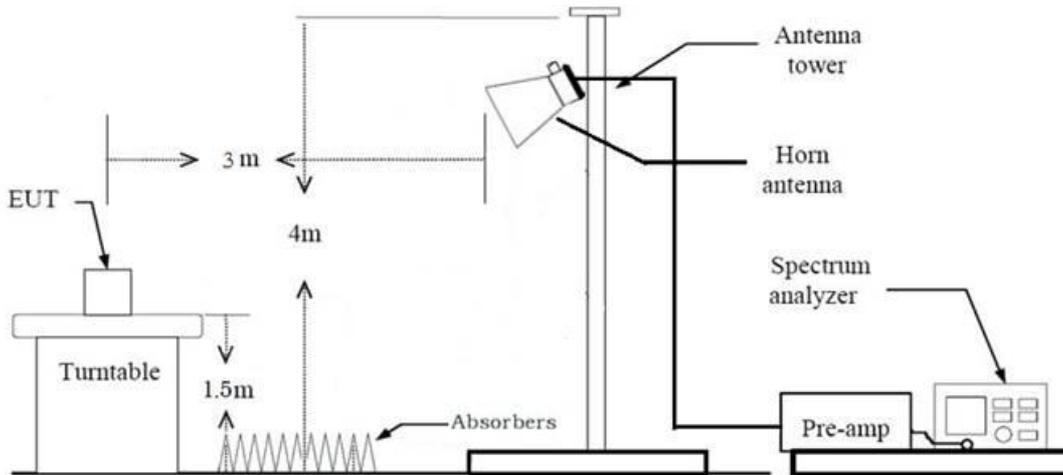
Below 30 MHz



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) = $40\log(3\text{ m}/300\text{ m}) = - 80\text{ dB}$
Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = $40\log(3\text{ m}/30\text{ m}) = - 40\text{ dB}$
Measurement Distance : 3 m
8. Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 9 kHz
 - VBW $\geq 3 \times$ 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 \geq 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 $\geq 3 \times$ RBW

(2) Measurement Type(Average): Duty cycle $\geq 98 \%$

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

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

- Measured Frequency Range : 1 GHz – 25 GHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW $\geq 3 \times$ 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 = $20\log$ (test distance / specific distance) (dB)

11. Total(Measurement Type : Peak)

$$= \text{Measured value} + \text{Antenna Factor(A.F)} + \text{Cable Loss(C.L)} - \text{Amp Gain(A.G)} + \text{Distance Factor(D.F)}$$

Total(Measurement Type : Average, Duty cycle $\geq 98 \%$)

$$= \text{Measured value} + \text{Antenna Factor(A.F)} + \text{Cable Loss(C.L)} - \text{Amp Gain(A.G)} + \text{Distance Factor(D.F)}$$

Total(Measurement Type : Average, Duty cycle $< 98 \%$)

$$= \text{Measured value} + \text{Antenna Factor(A.F)} + \text{Cable Loss(C.L)} - \text{Amp Gain(A.G)} + \text{Distance Factor(D.F)} \\ + \text{Duty Cycle Factor}$$

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 \geq 3 x RBW
 - (2) Measurement Type(Average): Duty cycle \geq 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 \geq 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 \geq 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 = $20\log(\text{test distance} / \text{specific distance})$ (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 \geq 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 : MCS0)
2. Bandedge (Conducted)
: All Mode(Channel, Tone, RU Offset) of operation were investigated and the worst case configuration results are reported

Tone	Channel	RU Index
26	1, 11	0, 8
52	1, 11	37, 40
106	1, 11	53, 54
242	1, 11	61

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, Keyboard etc)
 - Worst case : Stand alone
2. EUT Axis
 - Radiated Spurious Emissions : Z
 - 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
 - Mode : Ant2(SISO), Ant1+Ant2(SDM), Ant1+Ant2(CDD)
 - Worst case : Ant1+Ant2(CDD)
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 : 52T	52 T : CH 1 (RU 40), CH 6 (RU 38), CH 11 (RU 38)
	Additional Tone : 26T, 106T, 242T, SU	26 T : CH 1 (RU 4), CH 6 (RU 4), CH 11 (RU 4) 106 T : CH 1 (RU 54), CH 6 (RU 53), CH 11 (RU 53) 242 T : CH 1 (RU 61) / CH 6 (RU 61) / CH 11 (RU 61) SU : CH 1 (None) / CH 6 (None) / CH 11 (None)
Band-Edge	Worst Case : 52T	Low Edge : RU 37 High Edge : RU 40
	Additional Tone : 26T, 106T, 242T, SU	Low Edge : RU 0(26T), RU 53(106T) High Edge : RU 8(26T), RU 54(106T) Low / High Edge : RU 61(242T), None(SU)

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-X800[DTS] Test Report.

9. TEST RESULT

9.1 DUTY CYCLE

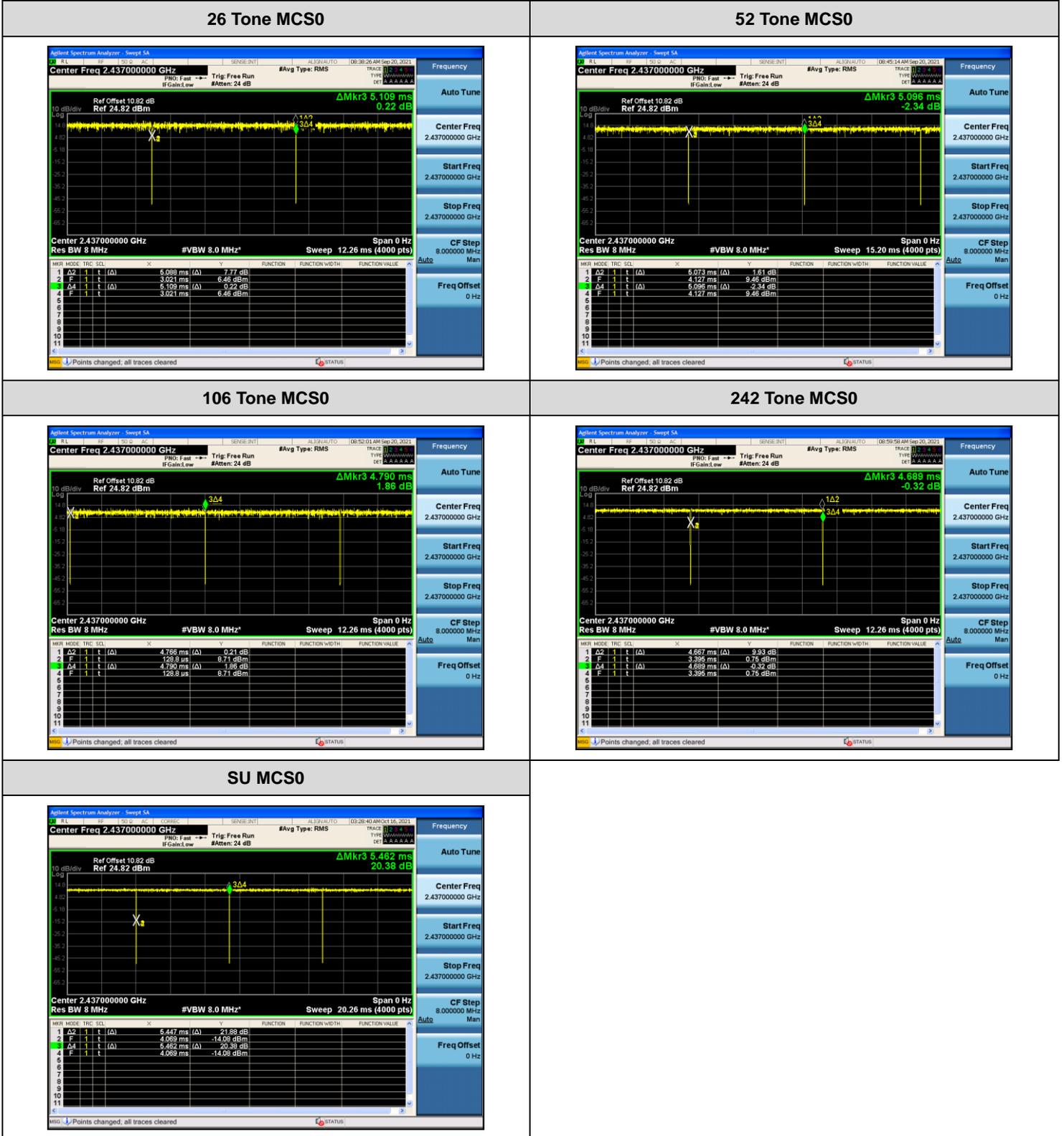
Mode	Tone (T)	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ax (HE20)	26	MCS0	5.088	5.109	0.996	0.02
		MCS1	5.077	5.100	0.996	0.02
		MCS2	5.060	5.081	0.996	0.02
		MCS3	5.206	5.229	0.996	0.02
		MCS4	5.153	5.179	0.995	0.02
		MCS5	5.131	5.149	0.996	0.02
		MCS6	5.119	5.141	0.996	0.02
		MCS7	5.111	5.134	0.996	0.02
		MCS8	5.149	5.172	0.996	0.02
		MCS9	5.107	5.130	0.996	0.02
	52	MCS0	5.073	5.096	0.996	0.02
		MCS1	5.060	5.081	0.996	0.02
		MCS2	5.054	5.077	0.996	0.02
		MCS3	5.209	5.229	0.996	0.02
		MCS4	5.149	5.172	0.996	0.02
		MCS5	5.126	5.145	0.996	0.02
		MCS6	5.115	5.138	0.996	0.02
		MCS7	5.109	5.131	0.996	0.02
		MCS8	5.153	5.176	0.996	0.02
		MCS9	5.109	5.131	0.996	0.02
	106	MCS0	4.766	4.790	0.995	0.02
		MCS1	4.758	4.780	0.995	0.02
		MCS2	4.754	4.777	0.995	0.02
		MCS3	4.902	4.925	0.995	0.02
		MCS4	4.851	4.873	0.996	0.02
		MCS5	4.826	4.849	0.995	0.02
		MCS6	4.818	4.839	0.996	0.02
		MCS7	4.815	4.834	0.996	0.02
		MCS8	4.853	4.875	0.995	0.02
		MCS9	4.811	4.834	0.995	0.02

Mode	Tone (T)	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ax (HE20)	242	MCS0	4.667	4.689	0.995	0.02
		MCS1	4.664	4.686	0.995	0.02
		MCS2	4.666	4.685	0.996	0.02
		MCS3	4.802	4.824	0.996	0.02
		MCS4	4.758	4.777	0.996	0.02
		MCS5	4.727	4.746	0.996	0.02
		MCS6	4.720	4.741	0.995	0.02
		MCS7	4.704	4.727	0.995	0.02
		MCS8	4.747	4.769	0.995	0.02
		MCS9	4.707	4.729	0.995	0.02
802.11ax(SU)	BW 20	MCS0	5.447	5.462	0.997	0.01
		MCS1	5.445	5.461	0.997	0.01
		MCS2	5.445	5.461	0.997	0.01
		MCS3	5.442	5.457	0.997	0.01
		MCS4	5.446	5.462	0.997	0.01
		MCS5	5.445	5.461	0.997	0.01
		MCS6	5.447	5.462	0.997	0.01
		MCS7	5.443	5.461	0.997	0.01
		MCS8	5.443	5.461	0.997	0.01
		MCS9	5.443	5.462	0.997	0.01

Test Plots

Note:

In order to simplify the report, attached plots were only the most lowest datarate.



9.2 6 dB BANDWIDTH

[MIMO ANT1]

BW	Frequency [MHz]	Channel No.	RU Index	6 dB BW (MHz)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	2.141	17.12	18.11	-	-
			Mid	2.705	15.10	-	19.04	19.06
			High	2.147	17.05	17.17	-	-
	2437	6	Low	2.143	17.12	18.14	-	-
			Mid	2.708	15.11	-	19.08	19.09
			High	2.155	17.07	17.17	-	-
	2462	11	Low	2.122	17.10	17.17	-	-
			Mid	2.706	15.09	-	19.07	19.07
			High	2.148	17.07	17.17	-	-
	2467	12	Low	2.147	17.09	17.14	-	-
			Mid	2.701	15.10	-	19.08	19.09
			High	2.147	17.07	17.17	-	-
	2472	13	Low	2.144	17.11	17.17	-	-
			Mid	2.705	15.09	-	19.07	19.07
			High	2.166	17.07	17.16	-	-

Limit : > 500 kHz

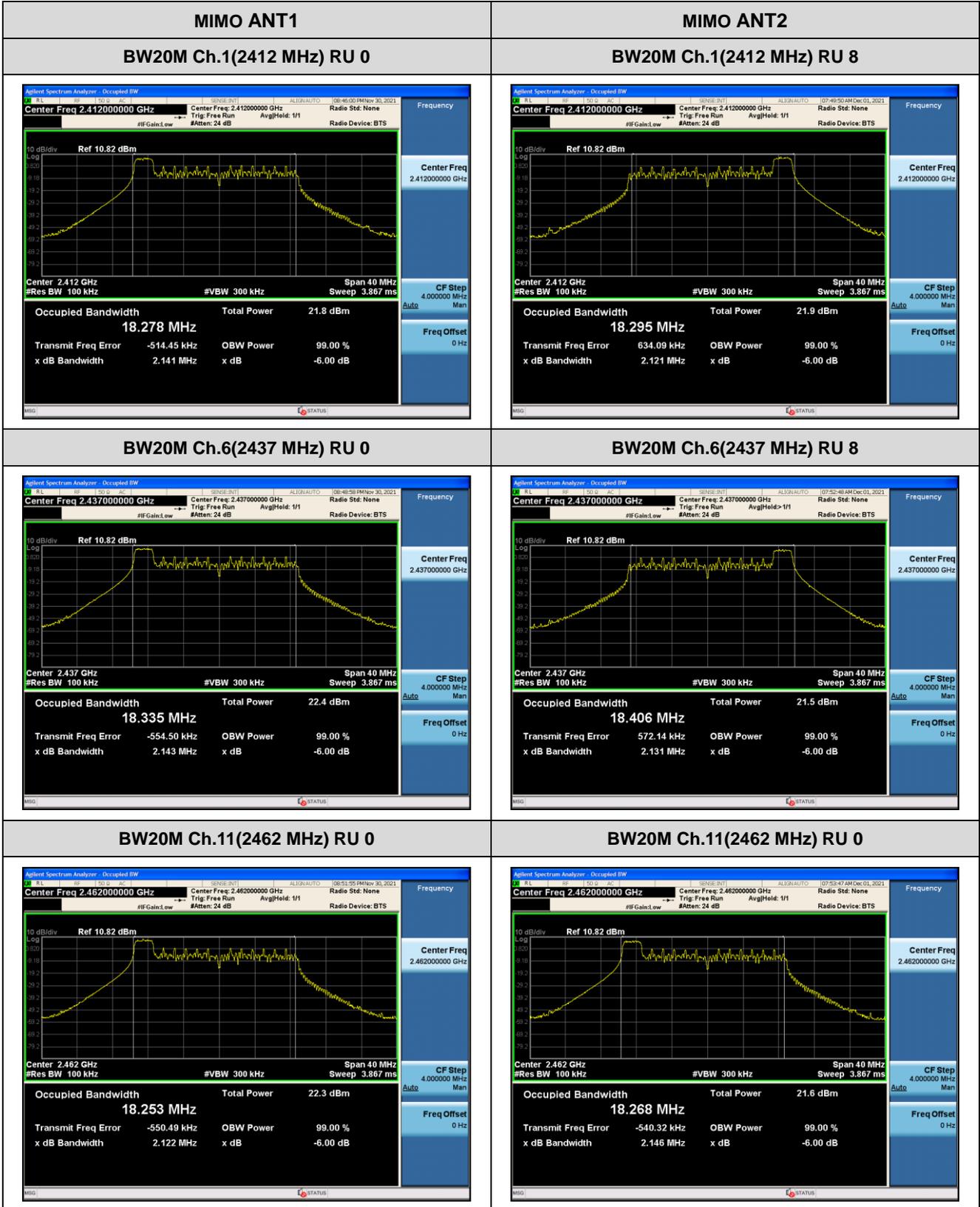
[MIMO ANT2]

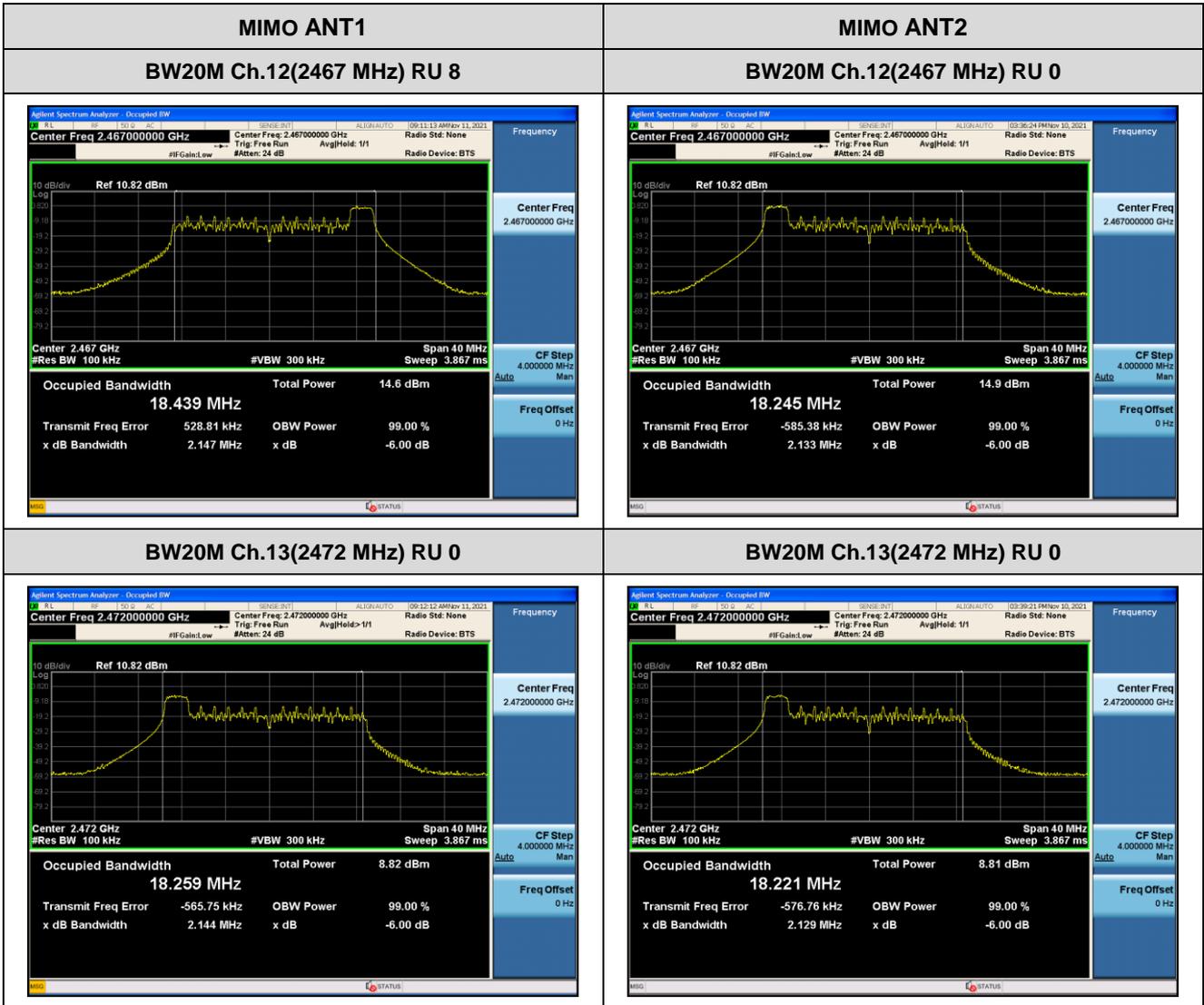
BW	Frequency [MHz]	Channel No.	RU Index	6 dB BW (MHz)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	2.133	17.11	18.16	-	-
			Mid	2.703	15.10	-	19.07	19.06
			High	2.121	17.04	17.16	-	-
	2437	6	Low	2.133	17.10	18.12	-	-
			Mid	2.702	15.10	-	19.08	19.08
			High	2.131	17.08	17.17	-	-
	2462	11	Low	2.135	17.11	17.17	-	-
			Mid	2.700	15.12	-	19.07	19.08
			High	2.131	17.05	17.16	-	-
	2467	12	Low	2.133	17.09	17.17	-	-
			Mid	2.704	15.07	-	18.97	18.96
			High	17.045	17.07	17.16	-	-
	2472	13	Low	2.129	17.07	17.16	-	-
			Mid	2.708	12.57	-	18.95	18.94
			High	17.065	17.08	18.34	-	-

Limit : > 500 kHz

☐ Test Plots

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





9.3 OUTPUT POWER

Peak Power

Power Meter offset

Attenuator loss(10 dB) + Cable loss + EUT Cable loss

[MIMO ANT1]

BW	Frequency [MHz]	Channel No.	RU Index	Total Peak Power (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	23.04	23.84	26.07	-	-
			Mid	23.11	23.61	-	25.30	27.16
			High	23.54	23.78	26.07	-	-
	2437	6	Low	23.46	24.63	26.36	-	-
			Mid	23.59	24.03	-	25.50	27.18
			High	23.43	24.22	26.17	-	-
	2462	11	Low	23.49	24.78	26.25	-	-
			Mid	23.04	24.79	-	25.26	25.79
			High	22.82	23.65	25.84	-	-
	2467	12	Low	16.27	16.26	16.02	-	-
			Mid	15.78	16.08	-	14.97	14.96
			High	15.86	15.76	15.56	-	-
	2472	13	Low	6.63	8.72	9.82	-	-
			Mid	6.34	8.47	-	8.74	8.75
			High	6.46	8.18	9.50	-	-

Limit : 30 dBm

[MIMO ANT2]

BW	Frequency [MHz]	Channel No.	RU Index	Total Peak Power (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	23.08	23.43	25.32	-	-
			Mid	23.27	23.73	-	24.67	26.75
			High	23.71	23.87	25.42	-	-
	2437	6	Low	23.35	23.64	25.57	-	-
			Mid	23.08	24.33	-	24.52	26.73
			High	23.39	23.72	25.31	-	-
	2462	11	Low	23.23	24.01	25.71	-	-
			Mid	23.20	23.90	-	24.70	25.31
			High	23.33	23.73	25.43	-	-
	2467	12	Low	16.24	16.14	16.02	-	-
			Mid	16.30	16.15	-	14.88	14.78
			High	15.52	15.41	15.47	-	-
	2472	13	Low	6.59	8.67	9.90	-	-
			Mid	6.17	8.21	-	8.58	8.42
			High	5.58	7.52	9.10	-	-

Limit : 30 dBm

[SUM (MIMO Ant 1 + MIMO Ant 2)]

1. Total peak power for MIMO= $10 \cdot \text{LOG}((10^{(\text{MIMO Ant1 Total power} / 10)}) + (10^{(\text{MIMO Ant2 Total power} / 10)}))$

BW	Frequency [MHz]	Channel No.	RU Index	SUM Peak Power (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	26.07	26.65	28.72	-	-
			Mid	26.20	26.68	-	28.01	29.97
			High	26.64	26.84	28.77	-	-
	2437	6	Low	26.42	27.17	28.99	-	-
			Mid	26.35	27.19	-	28.05	29.97
			High	26.42	26.99	28.77	-	-
	2462	11	Low	26.37	27.42	29.00	-	-
			Mid	26.13	27.38	-	28.00	28.57
			High	26.09	26.70	28.65	-	-
	2467	12	Low	19.27	19.21	19.03	-	-
			Mid	19.06	19.13	-	17.94	17.88
			High	18.70	18.60	18.53	-	-
2472	13	Low	9.62	11.71	12.87	-	-	
		Mid	9.27	11.35	-	11.67	11.60	
		High	9.05	10.87	12.31	-	-	

Limit : 30 dBm

Average Power

Power Meter offset

Attenuator loss(10 dB) + Cable loss + EUT Cable loss

[MIMO ANT1]

BW	Frequency [MHz]	Channel No.	RU Index	Total Average Power (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	12.04	12.97	15.53	-	-
			Mid	12.66	13.39	-	15.82	17.98
			High	12.62	13.52	15.96	-	-
	2437	6	Low	12.87	13.82	15.97	-	-
			Mid	12.99	13.94	-	15.99	17.97
			High	12.98	13.92	15.96	-	-
	2462	11	Low	12.90	13.93	15.93	-	-
			Mid	12.91	13.97	-	15.79	16.33
			High	12.21	13.29	15.55	-	-
	2467	12	Low	5.56	5.55	5.65	-	-
			Mid	5.11	5.46	-	5.50	5.50
			High	4.82	4.95	5.21	-	-
2472	13	Low	-3.63	-2.06	-0.52	-	-	
		Mid	-4.13	-2.03	-	-0.67	-0.67	
		High	-4.71	-2.52	-0.96	-	-	

Limit : 30 dBm

[MIMO ANT2]

BW	Frequency [MHz]	Channel No.	RU Index	Total Average Power (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	11.61	12.51	14.90	-	-
			Mid	12.56	12.97	-	15.15	17.43
			High	12.52	13.30	15.29	-	-
	2437	6	Low	11.91	12.96	15.13	-	-
			Mid	12.15	13.17	-	15.11	17.40
			High	12.04	13.00	15.04	-	-
	2462	11	Low	12.13	13.17	15.29	-	-
			Mid	12.22	13.27	-	15.30	15.87
			High	11.79	12.88	15.19	-	-
	2467	12	Low	5.50	5.61	5.71	-	-
			Mid	5.34	5.60	-	5.43	5.43
			High	4.14	4.35	4.91	-	-
	2472	13	Low	-3.93	-1.90	-0.30	-	-
			Mid	-4.46	-2.08	-	-0.75	-1.01
			High	-5.44	-3.36	-1.55	-	-

Limit : 30 dBm

[SUM (MIMO Ant 1 + MIMO Ant 2)]

1. Total average power for MIMO= $10 \cdot \text{LOG}((10^{(\text{Ant1 Total power} / 10)}) + (10^{(\text{Ant2 Total power} / 10)}))$

BW	Frequency [MHz]	Channel No.	RU Index	SUM Average Power (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	14.84	15.76	18.24	-	-
			Mid	15.62	16.20	-	18.51	20.73
			High	15.58	16.42	18.65	-	-
	2437	6	Low	15.43	16.42	18.58	-	-
			Mid	15.60	16.58	-	18.58	20.71
			High	15.54	16.49	18.54	-	-
	2462	11	Low	15.54	16.58	18.63	-	-
			Mid	15.59	16.64	-	18.56	19.12
			High	15.02	16.10	18.39	-	-
	2467	12	Low	8.54	8.59	8.69	-	-
			Mid	8.24	8.54	-	8.48	8.48
			High	7.50	7.67	8.08	-	-
	2472	13	Low	-0.77	1.03	2.60	-	-
			Mid	-1.28	0.95	-	2.30	2.18
			High	-2.05	0.09	1.77	-	-

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

Ant1&2 : Attenuator loss(10 dB) + Cable loss + EUT Cable loss

3. Total PSD = Measured Value + Duty Cycle Factor

[MIMO ANT1]

BW	Frequency [MHz]	Channel No.	RU Index	Total PSD (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	-4.89	-6.65	-7.34	-	-
			Mid	-4.14	-6.26	-	-10.38	-8.24
			High	-4.21	-6.14	-6.95	-	-
	2437	6	Low	-3.78	-5.63	-6.73	-	-
			Mid	-3.86	-5.76	-	-10.34	-8.02
			High	-3.84	-5.45	-6.92	-	-
	2462	11	Low	-3.77	-5.26	-6.75	-	-
			Mid	-3.77	-5.78	-	-10.37	-9.86
			High	-4.87	-6.20	-7.23	-	-
	2467	12	Low	-11.34	-13.42	-16.92	-	-
			Mid	-11.81	-14.26	-	-20.48	-20.74
			High	-12.04	-15.02	-17.78	-	-
2472	13	Low	-20.88	-21.37	-23.25	-	-	
		Mid	-21.31	-21.85	-	-26.87	-26.68	
		High	-21.83	-22.09	-23.79	-	-	

Limit : 8 dBm

[MIMO ANT2]

BW	Frequency [MHz]	Channel No.	RU Index	Total PSD (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	-5.35	-7.31	-7.43	-	-
			Mid	-4.82	-6.89	-	-10.78	-8.56
			High	-4.45	-6.56	-7.49	-	-
	2437	6	Low	-5.23	-6.48	-7.32	-	-
			Mid	-4.80	-6.73	-	-10.98	-8.82
			High	-4.93	-6.75	-7.54	-	-
	2462	11	Low	-4.75	-6.34	-7.39	-	-
			Mid	-4.98	-6.57	-	-10.37	-10.11
			High	-4.93	-6.86	-7.47	-	-
	2467	12	Low	-11.60	-14.29	-17.13	-	-
			Mid	-11.77	-14.51	-	-20.67	-20.55
			High	-12.82	-15.34	-17.52	-	-
	2472	13	Low	-20.91	-21.71	-23.22	-	-
			Mid	-21.36	-21.91	-	-26.73	-26.66
			High	-22.67	-22.97	-24.33	-	-

Limit : 8 dBm

[SUM (MIMO Ant 1 + MIMO Ant 2)]

BW	Frequency [MHz]	Channel No.	RU Index	SUM Total PSD (dBm)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	-2.103	-3.957	-4.375	-	-
			Mid	-1.453	-3.553	-	-7.562	-5.385
			High	-1.319	-3.333	-4.201	-	-
	2437	6	Low	-1.434	-3.025	-4.009	-	-
			Mid	-1.293	-3.209	-	-7.639	-5.389
			High	-1.341	-3.045	-4.210	-	-
	2462	11	Low	-1.221	-2.758	-4.047	-	-
			Mid	-1.325	-3.146	-	-7.358	-6.975
			High	-1.891	-3.506	-4.337	-	-
	2467	12	Low	-8.458	-10.826	-14.016	-	-
			Mid	-8.780	-11.374	-	-17.563	-17.632
			High	-9.403	-12.171	-14.641	-	-
	2472	13	Low	-17.887	-18.525	-20.222	-	-
			Mid	-18.323	-18.868	-	-23.785	-23.660
			High	-19.218	-19.500	-21.041	-	-

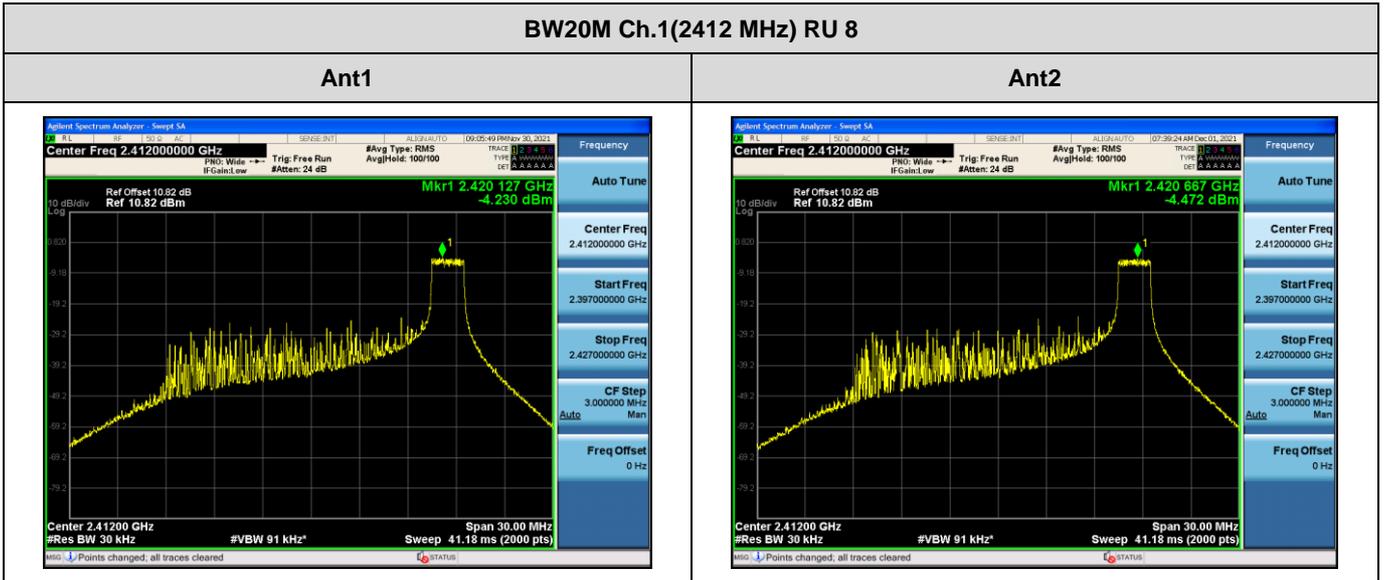
Limit : 8 dBm

Test Plots

Note:

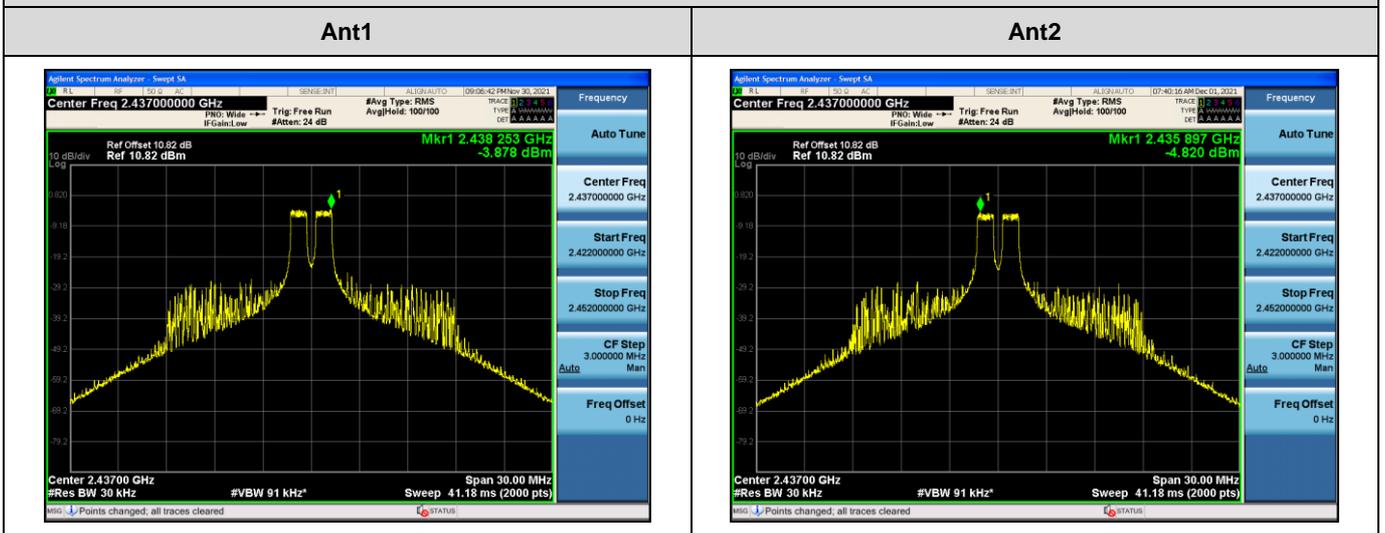
1. In order to simplify the report, attached plots were only the worst case PSD channel.
2. Total PSD(dBm) = Measured Value + Duty Cycle Factor

[SUM (MIMO Ant 1 + MIMO Ant 2)]



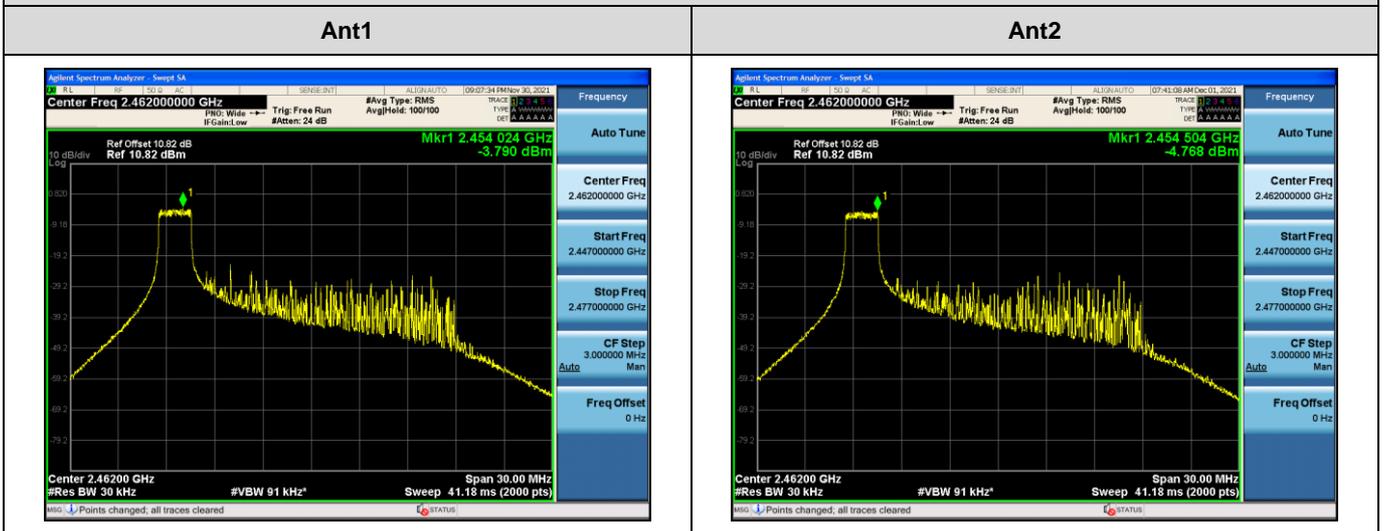
SUM PSD (dBm)	Duty Cycle Factor (dB)	Total SUM PSD (dBm)
-1.339	0.02	-1.319

BW20M Ch.6(2437 MHz) RU 4

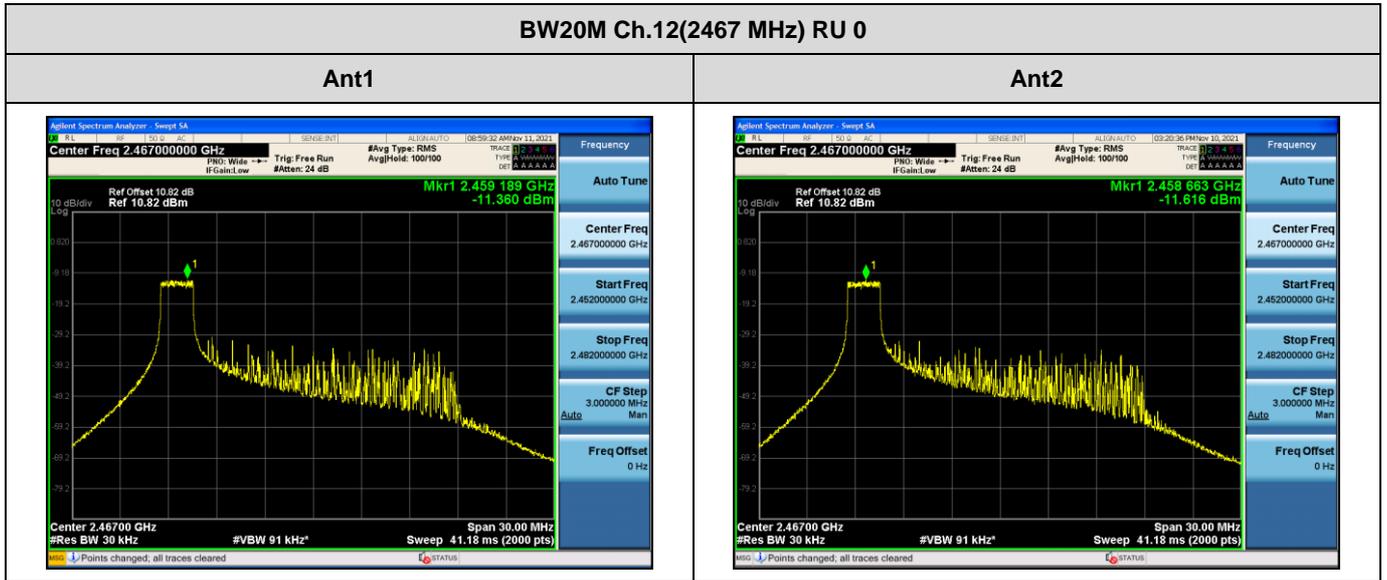


SUM PSD (dBm)	Duty Cycle Factor (dB)	Total SUM PSD (dBm)
-1.313	0.02	-1.293

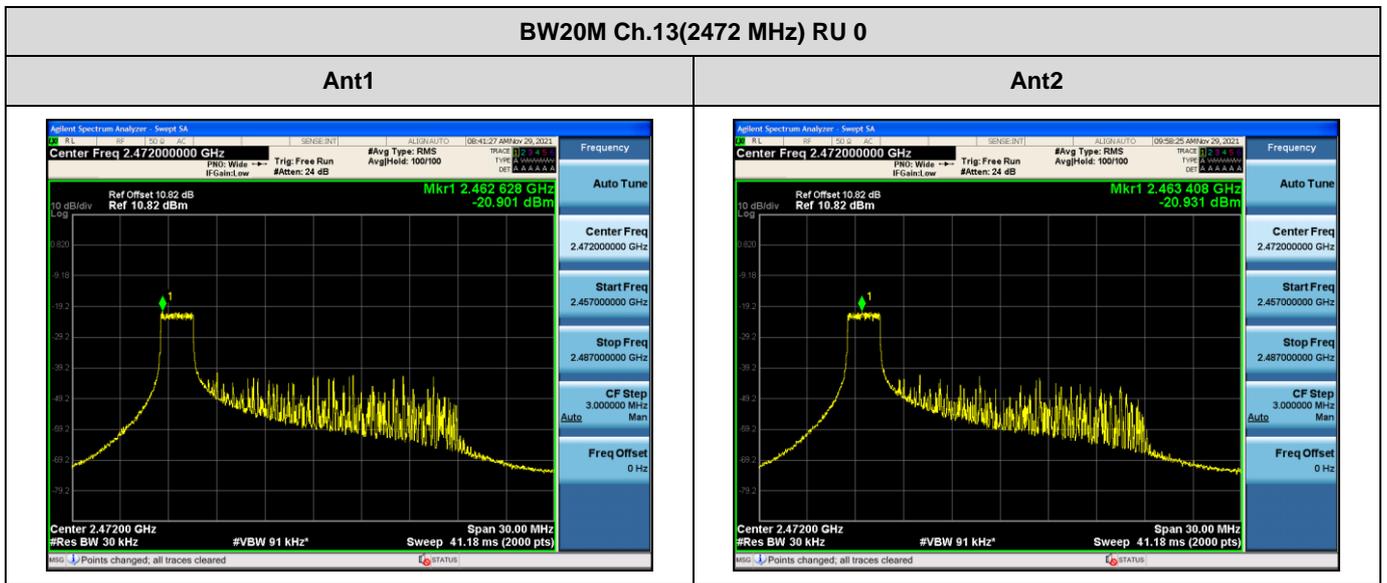
BW20M Ch.11(2462 MHz) RU 0



SUM PSD (dBm)	Duty Cycle Factor (dB)	Total SUM PSD (dBm)
-1.241	0.02	-1.221



SUM PSD (dBm)	Duty Cycle Factor (dB)	Total SUM PSD (dBm)
-8.476	0.02	-8.458



SUM PSD (dBm)	Duty Cycle Factor (dB)	Total SUM PSD (dBm)
-17.906	0.02	-17.887

9.5 BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Band Edge

[MIMO Ant1]

BW	Frequency [MHz]	Channel No.	RU Index	Measured Position	Result (dB)		
					26 T	52 T	106 T
HE20	2412	1	Low	Lowest Bandedge	34.098	33.397	34.321
	2462	11	Low	Lowest Bandedge	62.291	59.960	56.868
	2467	12	High	Highest Bandedge	56.488	53.267	51.903
	2472	13	High	Highest Bandedge	30.703	32.113	30.286

Limit : 30 dBc

BW	Frequency [MHz]	Channel No.	RU Index	Measured Position	Result (dB)	
					242 T	SU
HE20	2412	1	Mid	Lowest Bandedge	36.674	35.571
	2462	11		Lowest Bandedge	55.371	52.720
	2467	12		Highest Bandedge	48.066	49.509
	2472	13		Highest Bandedge	31.591	33.926

Limit : 30 dBc

[MIMO Ant2]

BW	Frequency [MHz]	Channel No.	RU Index	Measured Position	Result (dB)		
					26 T	52 T	106 T
HE20	2412	1	Low	Lowest Bandedge	34.039	33.529	34.593
	2462	11	Low	Lowest Bandedge	63.100	61.023	58.626
	2467	12	High	Highest Bandedge	56.198	53.326	51.028
	2472	13	High	Highest Bandedge	31.079	31.238	31.143

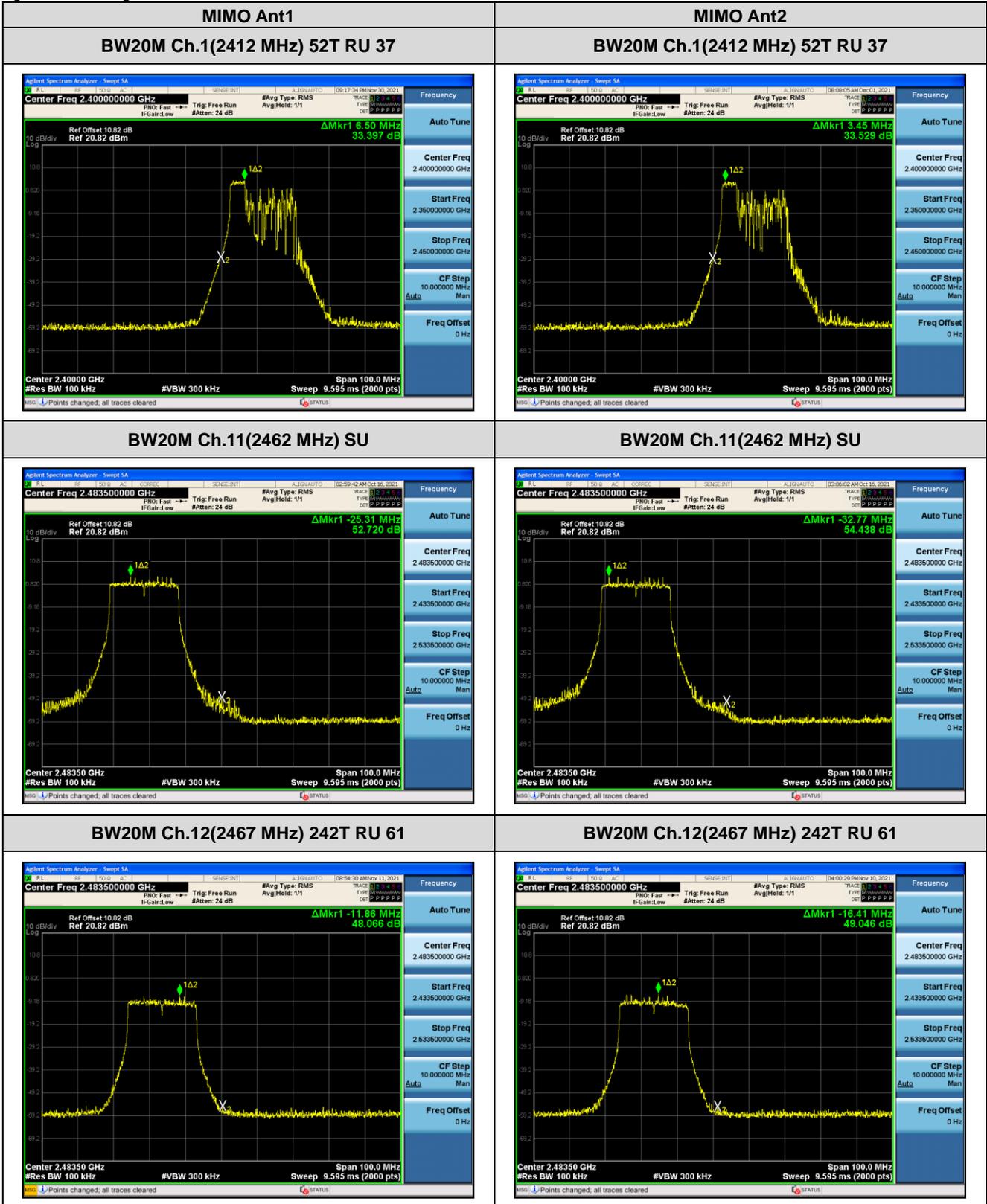
Limit : 30 dBc

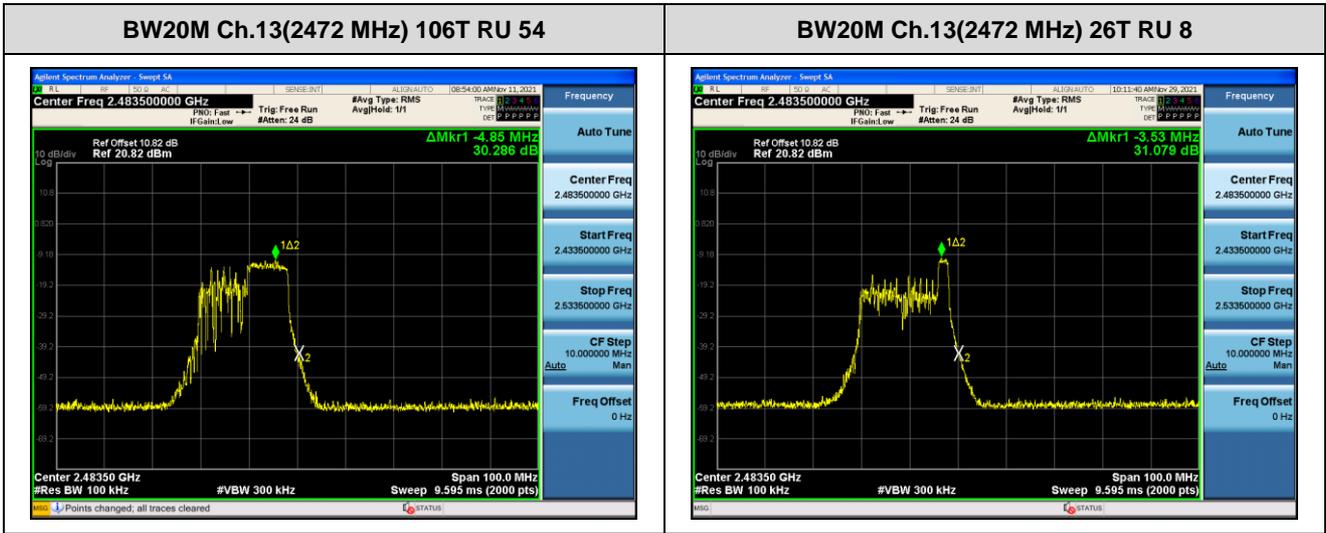
BW	Frequency [MHz]	Channel No.	RU Index	Measured Position	Result (dB)	
					242 T	SU
HE20	2412	1	Mid	Lowest Bandedge	36.071	36.322
	2462	11		Lowest Bandedge	55.674	54.438
	2467	12		Highest Bandedge	49.046	50.145
	2472	13		Highest Bandedge	33.490	33.876

Limit : 30 dBc

Test Plots

Note: In order to simplify the report, attached plots were only the worst case.
[MIMO Ant1]





Conducted Spurious Emissions

[MIMO ANT1]

BW	Frequency [MHz]	Channel No.	RU Index	Result (dB)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	48.366	47.457	47.251	-	-
			Mid	49.176	46.738	-	46.118	48.214
			High	49.040	47.205	47.309	-	-
	2437	6	Low	50.165	48.006	47.933	-	-
			Mid	48.311	48.746	-	45.668	46.593
			High	48.102	47.353	48.399	-	-
	2462	11	Low	48.906	48.321	47.336	-	-
			Mid	48.958	47.539	-	47.967	43.855
			High	49.100	46.175	46.032	-	-

Limit : 30 dBc

Note: Channel 12 and 13 are less powerful than channel 11 so the test for high channel was performed at channel 11.

[MIMO ANT2]

BW	Frequency [MHz]	Channel No.	RU Index	Result (dB)				
				26 T	52 T	106 T	242 T	SU
HE20	2412	1	Low	45.283	45.729	46.630	-	-
			Mid	49.188	46.302	-	47.394	47.821
			High	48.511	47.327	48.232	-	-
	2437	6	Low	48.274	47.227	46.991	-	-
			Mid	48.542	47.133	-	45.850	45.072
			High	49.458	47.000	46.911	-	-
	2462	11	Low	49.524	47.668	47.410	-	-
			Mid	48.860	47.237	-	45.820	46.139
			High	48.869	46.133	46.457	-	-

Limit : 30 dBc

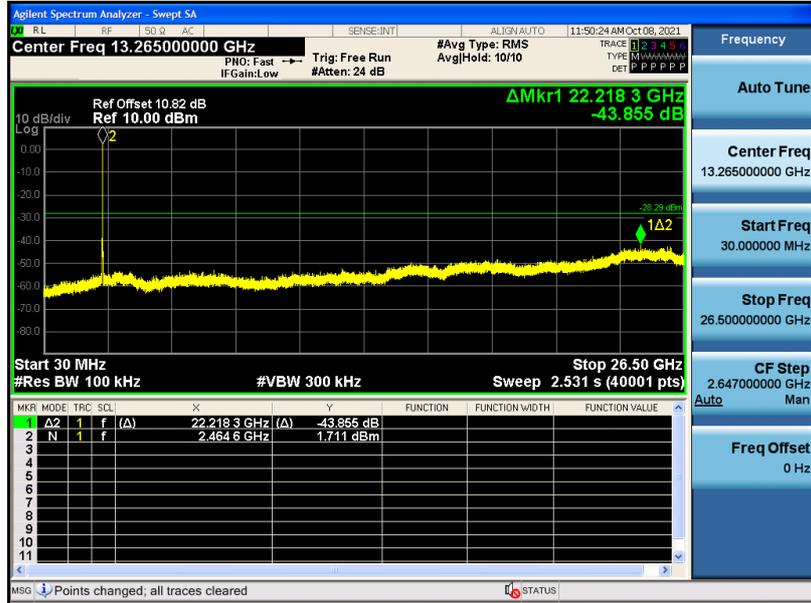
Note: Channel 12 and 13 are less powerful than channel 11 so the test for high channel was performed at channel 11.

☐ Test Plots

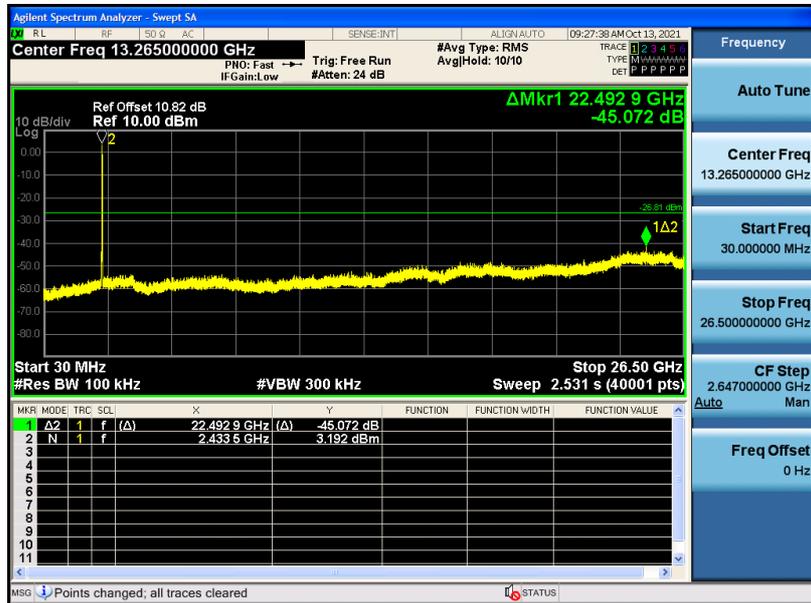
Note:

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

[MIMO ANT1] BW20M Ch.11(2 462 MHz) SU



[MIMO ANT2] BW20M Ch.6(2 437 MHz) SU



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]	[dB μ V/m]	[dB/m]	[H/V]	[dB μ V/m]	[dB μ V/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 = $40\log(\text{specific distance} / \text{test distance})$ (dB)
3. Limit line = specific Limits (dB μ V) + Distance extrapolation factor

Frequency Range : Below 1 GHz

Frequency	Measured Value	A.F+C.L	POL	Total	Limit	Margin
[MHz]	[dB μ V/m]	[dB/m]	[H/V]	[dB μ V/m]	[dB μ V/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 Tone

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2412
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	43.51	0.00	3.46	V	46.97	73.98	27.01	PK
4824	31.33	0.02	3.46	V	34.81	53.98	19.17	AV
7236	38.55	0.00	12.51	V	51.06	73.98	22.92	PK
7236	26.98	0.02	12.51	V	39.51	53.98	14.47	AV
4824	43.88	0.00	3.46	H	47.34	73.98	26.64	PK
4824	31.45	0.02	3.46	H	34.93	53.98	19.05	AV
7236	38.69	0.00	12.51	H	51.20	73.98	22.78	PK
7236	27.10	0.02	12.51	H	39.63	53.98	14.35	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2437
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	42.78	0.00	3.42	V	46.20	73.98	27.78	PK
4874	30.76	0.02	3.42	V	34.20	53.98	19.78	AV
7311	39.33	0.00	11.76	V	51.09	73.98	22.89	PK
7311	27.32	0.02	11.76	V	39.10	53.98	14.88	AV
4874	42.84	0.00	3.42	H	46.26	73.98	27.72	PK
4874	30.90	0.02	3.42	H	34.34	53.98	19.64	AV
7311	39.44	0.00	11.76	H	51.20	73.98	22.78	PK
7311	27.45	0.02	11.76	H	39.23	53.98	14.75	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462
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	42.98	0.00	4.55	V	47.53	73.98	26.45	PK
4924	30.94	0.02	4.55	V	35.51	53.98	18.47	AV
7386	39.22	0.00	12.13	V	51.35	73.98	22.63	PK
7386	27.48	0.02	12.13	V	39.63	53.98	14.35	AV
4924	43.11	0.00	4.55	H	47.66	73.98	26.32	PK
4924	31.05	0.02	4.55	H	35.62	53.98	18.36	AV
7386	39.38	0.00	12.13	H	51.51	73.98	22.47	PK
7386	27.54	0.02	12.13	H	39.69	53.98	14.29	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 Tone

Operation Mode: 802.11ax(HE20)
 Transfer MCS Index: 0
 Operating Frequency 2412
 Channel No. 01 Ch
 RU offset 40

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	44.56	0.00	3.46	V	48.02	73.98	25.96	PK
4824	31.99	0.02	3.46	V	35.47	53.98	18.51	AV
7236	39.41	0.00	12.51	V	51.92	73.98	22.06	PK
7236	27.12	0.02	12.51	V	39.65	53.98	14.33	AV
4824	44.86	0.00	3.46	H	48.32	73.98	25.66	PK
4824	32.54	0.02	3.46	H	36.02	53.98	17.96	AV
7236	39.55	0.00	12.51	H	52.06	73.98	21.92	PK
7236	27.31	0.02	12.51	H	39.84	53.98	14.14	AV

Operation Mode: 802.11ax(HE20)
 Transfer MCS Index: 0
 Operating Frequency 2437
 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	44.32	0.00	3.42	V	47.74	73.98	26.24	PK
4874	32.02	0.02	3.42	V	35.46	53.98	18.52	AV
7311	40.21	0.00	11.76	V	51.97	73.98	22.01	PK
7311	28.02	0.02	11.76	V	39.80	53.98	14.18	AV
4874	44.48	0.00	3.42	H	47.90	73.98	26.08	PK
4874	32.14	0.02	3.42	H	35.58	53.98	18.40	AV
7311	40.39	0.00	11.76	H	52.15	73.98	21.83	PK
7311	28.19	0.02	11.76	H	39.97	53.98	14.01	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462
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	43.11	0.00	4.55	V	47.66	73.98	26.32	PK
4924	32.44	0.02	4.55	V	37.01	53.98	16.97	AV
7386	39.81	0.00	12.13	V	51.94	73.98	22.04	PK
7386	27.65	0.02	12.13	V	39.80	53.98	14.18	AV
4924	44.56	0.00	4.55	H	49.11	73.98	24.87	PK
4924	32.51	0.02	4.55	H	37.08	53.98	16.90	AV
7386	39.95	0.00	12.13	H	52.08	73.98	21.90	PK
7386	27.66	0.02	12.13	H	39.81	53.98	14.17	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 Tone

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2412
Channel No.	01 Ch
RU offset	54

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	44.02	0.00	3.46	V	47.48	73.98	26.50	PK
4824	31.71	0.02	3.46	V	35.19	53.98	18.79	AV
7236	39.31	0.00	12.51	V	51.82	73.98	22.16	PK
7236	27.11	0.02	12.51	V	39.64	53.98	14.34	AV
4824	44.22	0.00	3.46	H	47.68	73.98	26.30	PK
4824	31.81	0.02	3.46	H	35.29	53.98	18.69	AV
7236	39.42	0.00	12.51	H	51.93	73.98	22.05	PK
7236	27.28	0.02	12.51	H	39.81	53.98	14.17	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2437
Channel No.	06 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	43.05	0.00	3.42	V	46.47	73.98	27.51	PK
4874	31.22	0.02	3.42	V	34.66	53.98	19.32	AV
7311	40.59	0.00	11.76	V	52.35	73.98	21.63	PK
7311	27.91	0.02	11.76	V	39.69	53.98	14.29	AV
4874	43.28	0.00	3.42	H	46.70	73.98	27.28	PK
4874	31.35	0.02	3.42	H	34.79	53.98	19.19	AV
7311	40.75	0.00	11.76	H	52.51	73.98	21.47	PK
7311	28.03	0.02	11.76	H	39.81	53.98	14.17	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462
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	42.48	0.00	4.55	V	47.03	73.98	26.95	PK
4924	30.51	0.02	4.55	V	35.08	53.98	18.90	AV
7386	39.47	0.00	12.13	V	51.60	73.98	22.38	PK
7386	27.55	0.02	12.13	V	39.70	53.98	14.28	AV
4924	42.68	0.00	4.55	H	47.23	73.98	26.75	PK
4924	30.68	0.02	4.55	H	35.25	53.98	18.73	AV
7386	39.51	0.00	12.13	H	51.64	73.98	22.34	PK
7386	27.61	0.02	12.13	H	39.76	53.98	14.22	AV

Note:

Channel 12 and 13 are less powerful than channel 11 so the test for high channel was performed at channel 11.

4. 242 Tone

Operation Mode: 802.11ax(HE20)
 Transfer MCS Index: 0
 Operating Frequency: 2412
 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	42.71	0.00	3.46	V	46.17	73.98	27.81	PK
4824	30.61	0.02	3.46	V	34.09	53.98	19.89	AV
7236	39.81	0.00	12.51	V	52.32	73.98	21.66	PK
7236	27.02	0.02	12.51	V	39.55	53.98	14.43	AV
4824	42.89	0.00	3.46	H	46.35	73.98	27.63	PK
4824	30.78	0.02	3.46	H	34.26	53.98	19.72	AV
7236	39.90	0.00	12.51	H	52.41	73.98	21.57	PK
7236	27.18	0.02	12.51	H	39.71	53.98	14.27	AV

Operation Mode: 802.11ax(HE20)
 Transfer MCS Index: 0
 Operating Frequency: 2437
 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	42.55	0.00	3.42	V	45.97	73.98	28.01	PK
4874	30.61	0.02	3.42	V	34.05	53.98	19.93	AV
7311	39.41	0.00	11.76	V	51.17	73.98	22.81	PK
7311	27.59	0.02	11.76	V	39.37	53.98	14.61	AV
4874	42.62	0.00	3.42	H	46.04	73.98	27.94	PK
4874	30.78	0.02	3.42	H	34.22	53.98	19.76	AV
7311	39.55	0.00	11.76	H	51.31	73.98	22.67	PK
7311	27.71	0.02	11.76	H	39.49	53.98	14.49	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462
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	42.44	0.00	4.55	V	46.99	73.98	26.99	PK
4924	30.48	0.02	4.55	V	35.05	53.98	18.93	AV
7386	39.33	0.00	12.13	V	51.46	73.98	22.52	PK
7386	27.41	0.02	12.13	V	39.56	53.98	14.42	AV
4924	42.61	0.00	4.55	H	47.16	73.98	26.82	PK
4924	30.68	0.02	4.55	H	35.25	53.98	18.73	AV
7386	39.46	0.00	12.13	H	51.59	73.98	22.39	PK
7386	27.56	0.02	12.13	H	39.71	53.98	14.27	AV

Note:

Channel 12 and 13 are less powerful than channel 11 so the test for high channel was performed at channel 11.

5. SU

Operation Mode: 802.11ax(HE20)
 Transfer MCS Index: 0
 Operating Frequency: 2412
 Channel No.: 01 Ch
 RU offset: None

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	43.22	0.00	3.46	V	46.68	73.98	27.30	PK
4824	30.78	0.01	3.46	V	34.25	53.98	19.73	AV
7236	39.71	0.00	12.51	V	52.22	73.98	21.76	PK
7236	27.33	0.01	12.51	V	39.85	53.98	14.13	AV
4824	43.43	0.00	3.46	H	46.89	73.98	27.09	PK
4824	30.89	0.01	3.46	H	34.36	53.98	19.62	AV
7236	39.83	0.00	12.51	H	52.34	73.98	21.64	PK
7236	27.42	0.01	12.51	H	39.94	53.98	14.04	AV

Operation Mode: 802.11ax(HE20)
 Transfer MCS Index: 0
 Operating Frequency: 2437
 Channel No.: 06 Ch
 RU offset: None

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	43.02	0.00	3.42	V	46.44	73.98	27.54	PK
4874	30.98	0.01	3.42	V	34.41	53.98	19.57	AV
7311	39.68	0.00	11.76	V	51.44	73.98	22.54	PK
7311	27.69	0.01	11.76	V	39.46	53.98	14.52	AV
4874	43.12	0.00	3.42	H	46.54	73.98	27.44	PK
4874	31.12	0.01	3.42	H	34.55	53.98	19.43	AV
7311	39.74	0.00	11.76	H	51.50	73.98	22.48	PK
7311	27.82	0.01	11.76	H	39.59	53.98	14.39	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2462
Channel No.	11 Ch
RU offset	None

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	42.55	0.00	4.55	V	47.10	73.98	26.88	PK
4924	30.69	0.01	4.55	V	35.25	53.98	18.73	AV
7386	39.81	0.00	12.13	V	51.94	73.98	22.04	PK
7386	27.48	0.01	12.13	V	39.62	53.98	14.36	AV
4924	42.67	0.00	4.55	H	47.22	73.98	26.76	PK
4924	30.78	0.01	4.55	H	35.34	53.98	18.64	AV
7386	39.93	0.00	12.13	H	52.06	73.98	21.92	PK
7386	27.55	0.01	12.13	H	39.69	53.98	14.29	AV

Note:

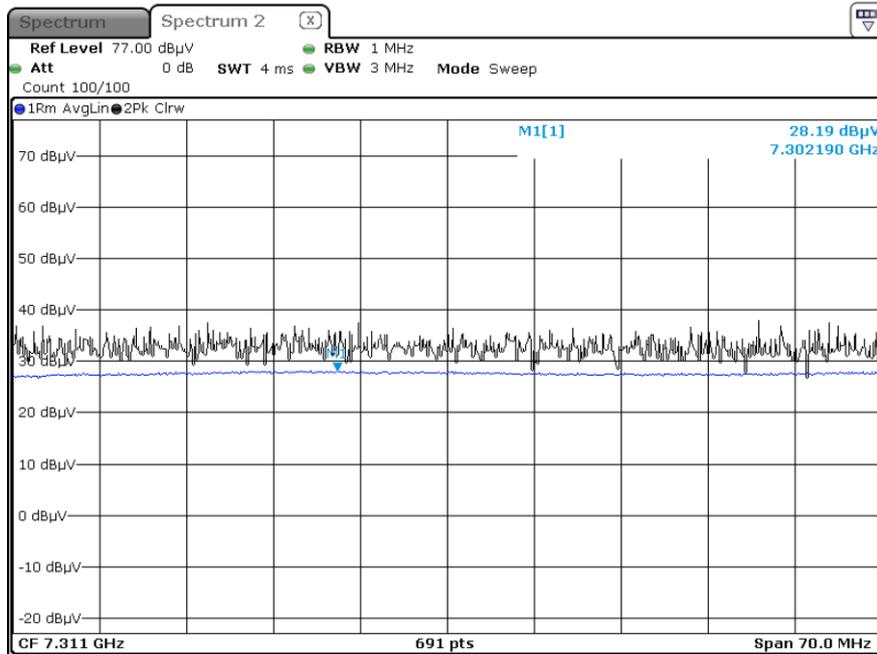
Channel 12 and 13 are less powerful than channel 11 so the test for high channel was performed at channel 11.

▣ Test Plots

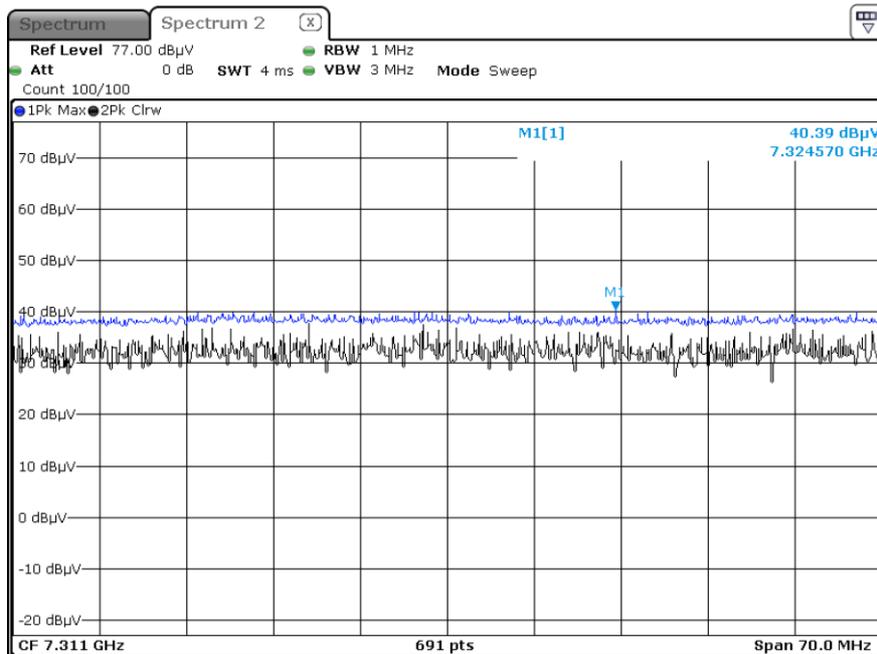
[MIMO]

(52 Tone RU38) – Z-H

Radiated Spurious Emissions plot – Average result (802.11ax(HE20), Ch.6 3rd Harmonic)



Radiated Spurious Emissions plot – Peak result (802.11ax(HE20), Ch.6 3rd Harmonic)



Note:

Plot of worst case are only reported.

9.7 RADIATED RESTRICTED BAND EDGES

[MIMO]

1. 26 Tone

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	25.012	0.00	34.04	H	59.05	73.98	14.93	PK
2390.0	10.995	0.02	34.04	H	45.06	53.98	8.93	AV
2390.0	24.899	0.00	34.04	V	58.94	73.98	15.04	PK
2390.0	10.812	0.02	34.04	V	44.87	53.98	9.11	AV
2483.5	27.468	0.00	35.00	H	62.47	73.98	11.51	PK
2483.5	11.321	0.02	35.00	H	46.34	53.98	7.64	AV
2483.5	27.259	0.00	35.00	V	62.26	73.98	11.72	PK
2483.5	11.212	0.02	35.00	V	46.23	53.98	7.75	AV

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+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	26.727	0.00	35.00	H	61.73	73.98	12.25	PK
2483.5	9.246	0.02	35.00	H	44.27	53.98	9.71	AV
2483.5	26.135	0.00	35.00	V	61.14	73.98	12.85	PK
2483.5	9.043	0.02	35.00	V	44.06	53.98	9.92	AV

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+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
# 2484	16.450	0.02	35.00	H	51.47	53.98	2.51	AV
# 2484	30.320	0.00	35.00	H	65.32	73.98	8.66	PK
# 2485	25.470	0.00	35.00	H	60.47	73.98	13.51	PK
2484.5	15.530	0.02	35.00	H	50.55	53.98	3.43	AV
2485.5	32.503	0.00	35.00	H	67.50	73.98	6.48	PK
# 2484	16.369	0.02	35.00	V	51.39	53.98	2.59	AV
# 2484	30.235	0.00	35.00	V	65.24	73.98	8.75	PK
# 2485	25.168	0.00	35.00	V	60.17	73.98	13.81	PK
2484.5	15.279	0.02	35.00	V	50.30	53.98	3.68	AV
2485.5	32.476	0.00	35.00	V	67.48	73.98	6.50	PK

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

2. 52 Tone

Operation Mode: 802.11ax(HE20)
 Transfer MCS Index: 0
 Operating Frequency: 2412 MHz, 2462 MHz
 Channel No. 01 Ch, 11 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	25.195	0.00	34.04	H	59.24	73.98	14.75	PK
2390.0	12.985	0.02	34.04	H	47.05	53.98	6.94	AV
2390.0	25.001	0.00	34.04	V	59.04	73.98	14.94	PK
2390.0	12.845	0.02	34.04	V	46.91	53.98	7.08	AV
2483.5	30.186	0.00	35.00	H	65.19	73.98	8.79	PK
2483.5	13.197	0.02	35.00	H	48.22	53.98	5.76	AV
2483.5	30.002	0.00	35.00	V	65.00	73.98	8.98	PK
2483.5	12.989	0.02	35.00	V	48.01	53.98	5.97	AV

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+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	25.088	0.00	35.00	H	60.09	73.98	13.89	PK
2483.5	8.638	0.02	35.00	H	43.66	53.98	10.32	AV
2483.5	24.964	0.00	35.00	V	59.96	73.98	14.02	PK
2483.5	8.488	0.02	35.00	V	43.51	53.98	10.47	AV

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+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2484	16.660	0.02	35.00	H	51.68	53.98	2.30	AV
# 2484	29.890	0.00	35.00	H	64.89	73.98	9.09	PK
# 2485	25.360	0.00	35.00	H	60.36	73.98	13.62	PK
2484.5	15.493	0.02	35.00	H	50.51	53.98	3.47	AV
2485.5	32.111	0.00	35.00	H	67.11	73.98	6.87	PK
# 2484	16.548	0.02	35.00	V	51.57	53.98	2.41	AV
# 2484	29.674	0.00	35.00	V	64.67	73.98	9.31	PK
# 2485	25.152	0.00	35.00	V	60.15	73.98	13.83	PK
2484.5	15.411	0.02	35.00	V	50.43	53.98	3.55	AV
2485.5	31.977	0.00	35.00	V	66.98	73.98	7.00	PK

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

3. 106 Tone

Operation Mode: 802.11ax(HE20)
 Transfer MCS Index: 0
 Operating Frequency: 2412 MHz, 2462 MHz
 Channel No. 01 Ch, 11 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	29.275	0.00	34.04	H	63.32	73.98	10.67	PK
2390.0	13.673	0.02	34.04	H	47.73	53.98	6.25	AV
2390.0	29.059	0.00	34.04	V	63.10	73.98	10.88	PK
2390.0	13.578	0.02	34.04	V	47.64	53.98	6.34	AV
2483.5	31.739	0.00	35.00	H	66.74	73.98	7.24	PK
2483.5	13.869	0.02	35.00	H	48.89	53.98	5.09	AV
2483.5	31.513	0.00	35.00	V	66.51	73.98	7.47	PK
2483.5	13.715	0.02	35.00	V	48.74	53.98	5.25	AV

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+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	23.731	0.00	35.00	H	58.73	73.98	15.25	PK
2483.5	8.084	0.02	35.00	H	43.10	53.98	10.88	AV
2483.5	23.656	0.00	35.00	V	58.66	73.98	15.32	PK
2483.5	7.998	0.02	35.00	V	43.02	53.98	10.96	AV

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+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
# 2484	28.660	0.00	35.00	H	63.66	73.98	10.32	PK
# 2484	15.770	0.02	35.00	H	50.79	53.98	3.19	AV
2484.5	14.242	0.02	35.00	H	49.26	53.98	4.72	AV
2484.5	35.160	0.00	35.00	H	70.16	73.98	3.82	PK
# 2484	28.510	0.00	35.00	V	63.51	73.98	10.47	PK
# 2484	15.640	0.02	35.00	V	50.66	53.98	3.32	AV
2484.5	14.138	0.02	35.00	V	49.16	53.98	4.82	AV
2484.5	34.986	0.00	35.00	V	69.99	73.98	3.99	PK

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

4. 242 Tone

Operation Mode: 802.11ax(HE20)
 Transfer MCS Index: 0
 Operating Frequency: 2412 MHz, 2462 MHz
 Channel No. 01 Ch, 11 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	28.493	0.00	34.04	H	62.53	73.98	11.45	PK
2390.0	13.238	0.02	34.04	H	47.30	53.98	6.68	AV
2390.0	28.312	0.00	34.04	V	62.35	73.98	11.63	PK
2390.0	13.021	0.02	34.04	V	47.081	53.98	6.90	AV
2483.5	30.174	0.00	35.00	H	65.17	73.98	8.81	PK
2483.5	13.116	0.02	35.00	H	48.14	53.98	5.84	AV
2483.5	29.985	0.00	35.00	V	64.99	73.98	9.00	PK
2483.5	12.985	0.02	35.00	V	48.01	53.98	5.98	AV

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+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	22.230	0.00	35.00	H	57.23	73.98	16.75	PK
2483.5	8.327	0.02	35.00	H	43.35	53.98	10.63	AV
2483.5	21.998	0.00	35.00	V	57.00	73.98	16.98	PK
2483.5	8.112	0.02	35.00	V	43.132	53.98	10.85	AV

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+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
#2484	25.140	0.00	35.00	H	60.14	73.98	13.84	PK
#2484	13.510	0.02	35.00	H	48.53	53.98	5.45	AV
2484.5	11.727	0.02	35.00	H	46.75	53.98	7.23	AV
2484.5	32.335	0.00	35.00	H	67.34	73.98	6.65	PK
#2484	24.921	0.00	35.00	V	59.92	73.98	14.06	PK
#2484	13.411	0.02	35.00	V	48.43	53.98	5.55	AV
2484.5	11.512	0.02	35.00	V	46.53	53.98	7.45	AV
2484.5	32.025	0.00	35.00	V	67.03	73.98	6.96	PK

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, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor [dB]	A.F+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	27.290	0.00	34.04	H	61.33	73.98	12.65	PK
2390.0	14.910	0.01	34.04	H	48.96	53.98	5.02	AV
2390.0	27.022	0.00	34.04	V	61.06	73.98	12.92	PK
2390.0	14.789	0.01	34.04	V	48.84	53.98	5.14	AV
2483.5	25.743	0.00	35.00	H	60.74	73.98	13.24	PK
2483.5	13.998	0.01	35.00	H	49.01	53.98	4.97	AV
2483.5	25.634	0.00	35.00	V	60.63	73.98	13.35	PK
2483.5	13.716	0.01	35.00	V	48.73	53.98	5.25	AV

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+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	32.811	0.00	35.00	H	67.81	73.98	6.17	PK
2483.5	10.170	0.01	35.00	H	45.18	53.98	8.80	AV
2483.5	32.445	0.00	35.00	V	67.45	73.98	6.54	PK
2483.5	10.060	0.01	35.00	V	45.07	53.98	8.91	AV

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+C.L +D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	19.531	0.00	35.00	H	54.53	73.98	19.45	PK
2483.5	7.816	0.01	35.00	H	42.83	53.98	11.15	AV
2483.5	19.153	0.00	35.00	V	54.15	73.98	19.83	PK
2483.5	7.646	0.01	35.00	V	42.66	53.98	11.32	AV

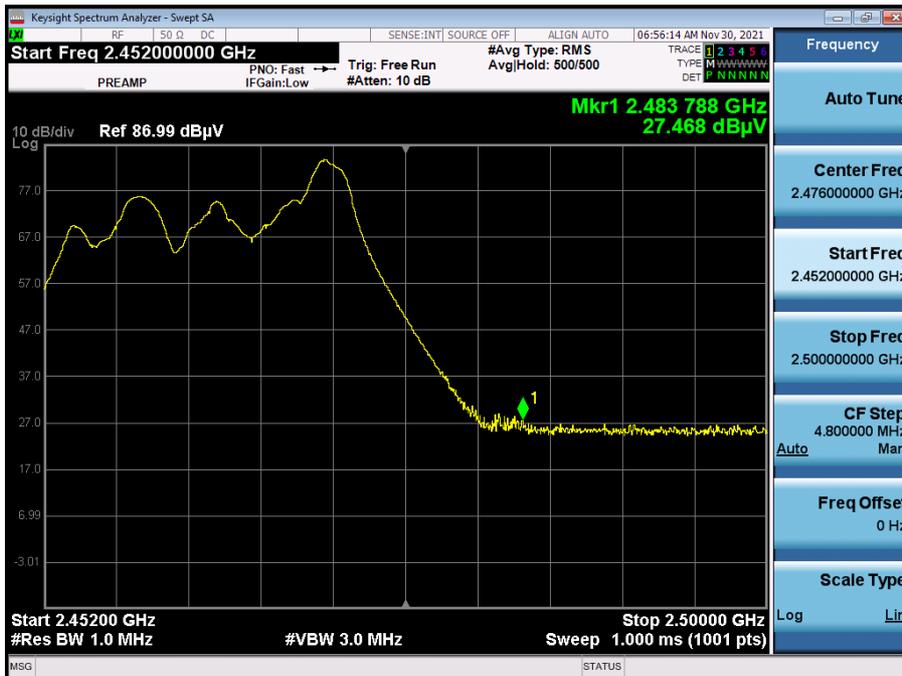
■ Test Plots (26 Tone, RU 8) Z-H

[MIMO]

Radiated Restricted Band Edges plot – Average result (802.11ax(HE20) Ch.11)



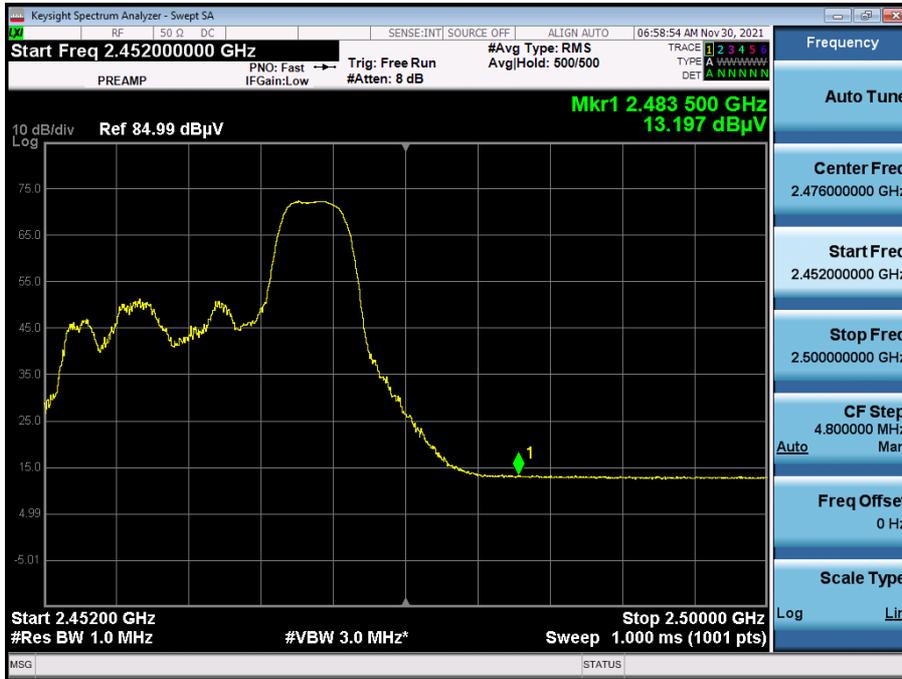
Radiated Restricted Band Edges plot – Peak result (802.11ax(HE20) Ch.11)



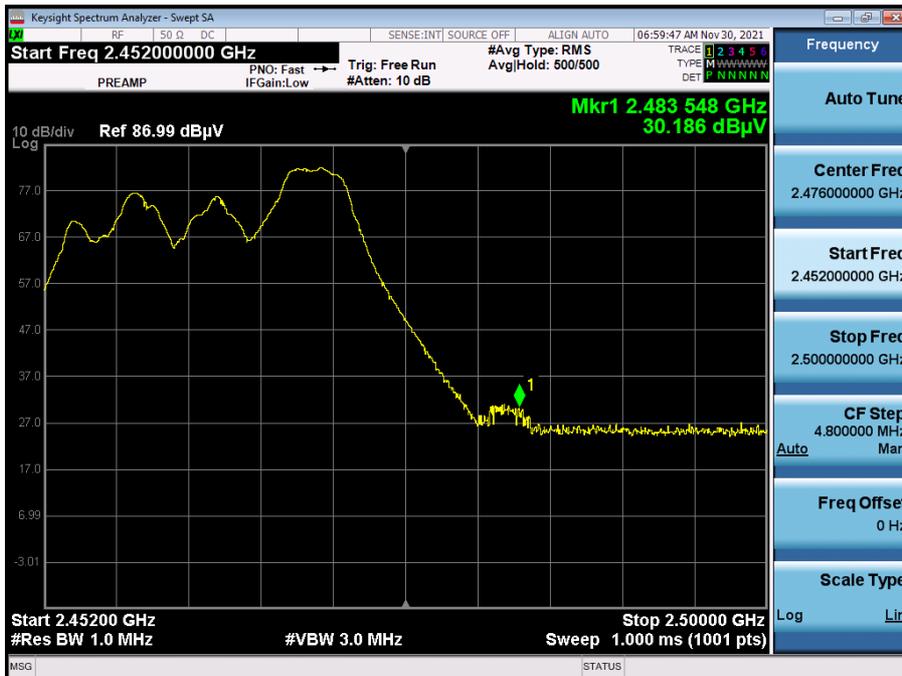
■ Test Plots (52 Tone, RU 40) Z-H

[MIMO]

Radiated Restricted Band Edges plot – Average result (802.11ax(HE20) Ch.11)



Radiated Restricted Band Edges plot – Peak result (802.11ax(HE20) Ch.11)



■ Test Plots (106 Tone, RU 54) Z-H

[MIMO]

Radiated Restricted Band Edges plot – Average result (802.11ax(HE20) Ch.11)



Radiated Restricted Band Edges plot – Peak result (802.11ax(HE20) Ch.11)



■ Test Plots (242 Tone, RU 61) Z-H

[MIMO]

Radiated Restricted Band Edges plot – Average result (802.11ax(HE20) Ch.11)



Radiated Restricted Band Edges plot – Peak result (802.11ax(HE20) Ch.11)



■ Test Plots (SU) Z-H

[MIMO]

Radiated Restricted Band Edges plot – Average result (802.11ax(HE20) Ch.11)



Radiated Restricted Band Edges plot – Peak result (802.11ax(HE20) Ch.11)



Note:

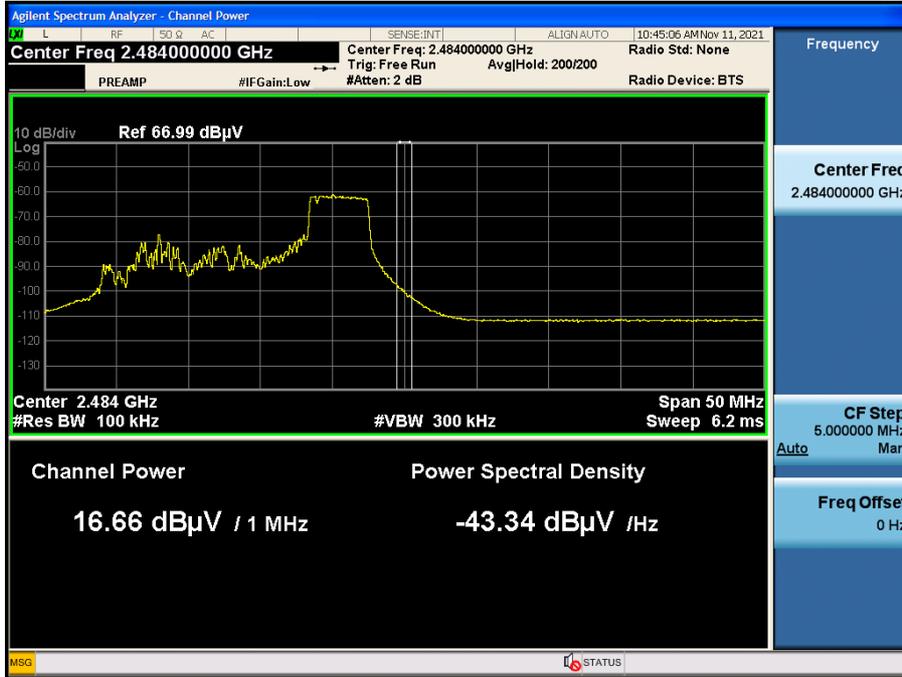
Plot of worst case are only reported.

■ Test Plots (CH12 ~CH13)_Z-H

[MIMO]

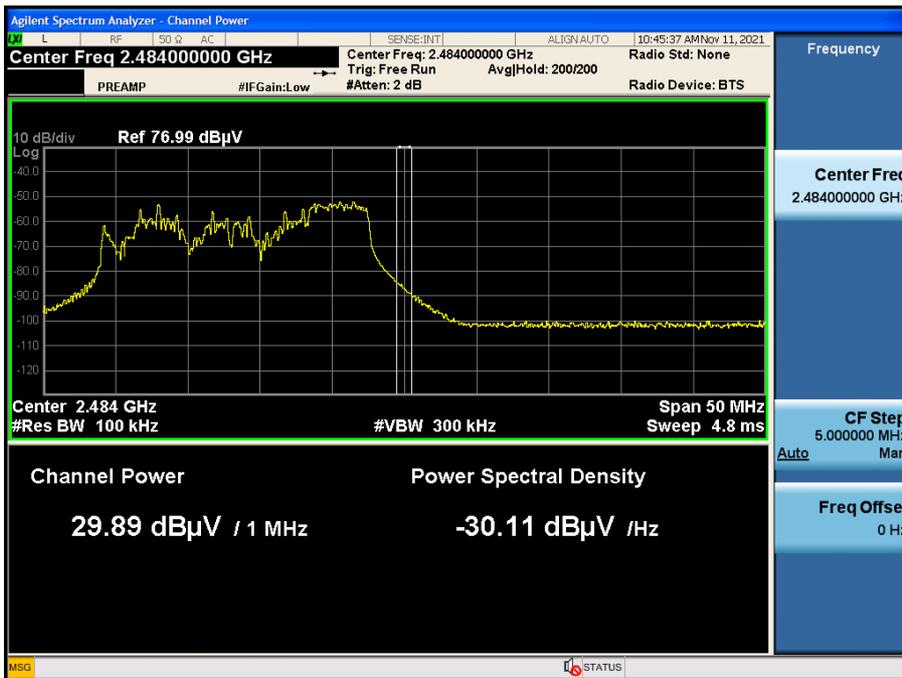
Radiated Restricted Band Edges plot – Average result (802.11ax(HE20)_52T_RU40_Ch.13)

integration method Used_2483.5 ~ 2484.5



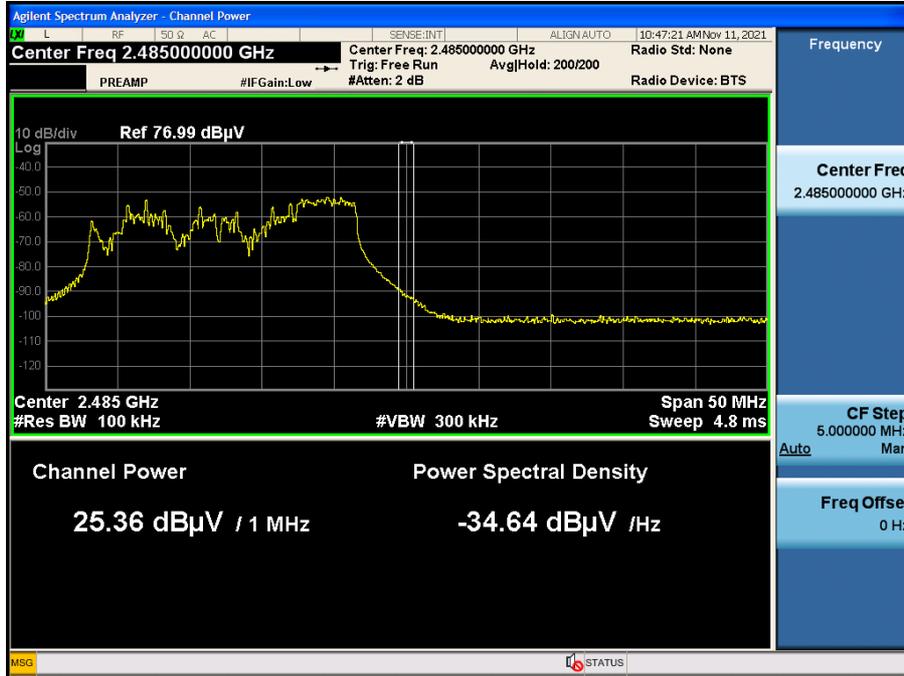
Radiated Restricted Band Edges plot – Peak result (802.11ax(HE20)_52T_RU40_Ch.13)

integration method Used_2483.5 ~ 2484.5



Radiated Restricted Band Edges plot – Peak result (802.11ax(HE20)_52T_RU40_Ch.13)

integration method Used_2484.5 ~ 2485.5



Radiated Restricted Band Edges plot – Average result (802.11ax(HE20)_52T_RU40_Ch.13)

Standard method Used_2484.5 ~ 2500



Radiated Restricted Band Edges plot – Peak result (802.11ax(HE20)_52T_RU40_Ch.13)

Standard method Used_2485.5 ~ 2500



Note:

Plot of worst case are only reported.

10. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	08/23/2022	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	06/17/2022	Annual
Temperature Chamber	SU-642	ESPAC	0093008124	03/15/2022	Annual
Signal Analyzer	N9030A	Agilent	MY49431210	01/11/2022	Annual
Power Measurement Set	OSP 120	Rohde & Schwarz	101231	07/02/2022	Annual
BLUETOOTH TESTER	CBT	Rohde & Schwarz	100808	02/23/2022	Annual
Power Meter	N1911A	Agilent	MY45100523	04/08/2022	Annual
Power Sensor	N1921A	Keysight	MY57820067	04/08/2022	Annual
Directional Coupler	87300B	Agilent	3116A03621	11/02/2022	Annual
Power Splitter	11667B	Hewlett Packard	05001	05/20/2022	Annual
DC Power Supply	E3632A	Hewlett Packard	MY50360067	02/16/2022	Annual
Attenuator(10 dB)	8493C	Hewlett Packard	07560	06/18/2022	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

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
Controller	EM1000	Audix	060520	N/A	N/A
Turn Table	N/A	Audix	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/19/2022	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	760	02/22/2023	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	02299	05/19/2022	Biennial
Horn Antenna (15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170541	11/16/2023	Biennial
Spectrum Analyzer	FSV40-N	Rohde & Schwarz	102168	07/05/2022	Annual
Signal Analyzer	N9030A	Agilent	MY49431210	01/11/2022	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	06/24/2022	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	06/24/2022	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/06/2022	Annual
Band Reject Filter	WRCJV5100/5850-40/50-8EEK	Wainwright Instruments	1	02/08/2022	Annual
High Pass Filter	WHK3.0/18G-10EF	Wainwright Instruments	8	02/03/2022	Annual
High Pass Filter	WHKX8-6090-7000-18000-40SS	Wainwright Instruments	25	02/03/2022	Annual
Attenuator (3 dB)	18B-03	Api tech.	1	02/03/2022	Annual
Attenuator(10 dB)	8493C-10	Agilent	08285	02/03/2022	Annual
Power Amplifier	CBLU1183540	CERNEX	22964	02/03/2022	Annual
Power Amplifier	CBL06185030	CERNEX	22965	02/03/2022	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/04/2021	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/23/2022	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-2112-FC014-P