

TEST REPORT

FCC DTS ax Test for SM-S721U
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2407-FC047

DATE OF ISSUE
July 23, 2024

Tested by
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TEST REPORT

REPORT NO.

HCT-RF-2407-FC047

DATE OF ISSUE

July 23, 2024

Additional Model

SM-S721U1

Applicant**SAMSUNG Electronics Co., Ltd.**

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

**Product Name
Model Name**

Mobile Phone
SM-S721U

FCC ID

A3LSMS721U

Average Output Power

SISO(Ant.1) : 17.25 dBm
SISO(Ant.2) : 17.17 dBm
MIMO_CDD (Ant.1+ Ant.2) : 20.20 dBm

Date of Test

June 03, 2024 ~ July 23, 2024

FCC Classification

Digital Transmission System(DTS)

Test Standard Used

FCC Rule Part(s): Part 15.247

Test Results

PASS

Location of Test

☒ Permanent Testing Lab ☐ On Site Testing Lab
(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	July 23, 2024	Initial Release

Notice

Content

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.

The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.

The test results have only been applied with the test methods required by the standard(s).

The laboratory is not accredited for the test results marked *.

Information provided by the applicant is marked **.

Test results provided by external providers are marked ***.

When confirmation of authenticity of this test report is required, please contact www.hct.co.kr

The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

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1. EUT DESCRIPTION

Model	SM-S721U		
Additional Model	SM-S721U1		
EUT Type	Mobile Phone		
Power Supply	DC 3.88 V		
Frequency Range	2 412 MHz ~ 2 462 MHz		
Max. RF Output Power	<u>Peak Power</u>	SISO(Ant.1)	26.43 dBm
		SISO(Ant.2)	26.78 dBm
		MIMO_CDD(Ant.1+ Ant.2)	29.48 dBm
	<u>Average Power</u>	SISO(Ant.1)	17.25 dBm
		SISO(Ant.2)	17.17 dBm
		MIMO_CDD(Ant.1+ Ant.2)	20.20 dBm
Modulation Type	OFDM, OFDMA		
Number of Channels	11 Channels		
Antenna Specification	Type: Metal		
Serial number	Conducted : 3CX40SW7YH Radiated : 67d5097187197ece		

ANTENNA CONFIGURATIONS

1. Antenna configuration

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

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 or 6GHz 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	BT Ant.1	BT Ant.2	Test Case
Dual Bluetooth + 5 GHz WiFi MIMO			on	on			on	on	Scenario1
Dual Bluetooth + 6 GHz WiFi MIMO					on	on	on	on	
2.4 GHz WiFi MIMO + 5 GHz WiFi MIMO	on	on	on	on					Scenario2
2.4 GHz WiFi MIMO + 6 GHz WiFi MIMO	on	on			on	on			
Bluetooth ANT.1 + 2.4 GHz WiFi ANT.2 + 5 GHz WiFi MIMO		on	on	on			on		Scenario3
Bluetooth ANT.1 + 2.4 GHz WiFi ANT.2 + 6 GHz WiFi MIMO		on			on	on	on		

3. Directional Gain Calculation

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

$$\text{Directional Gain(CDD)} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left(\sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right]$$

$$\text{Directional gain(SDM)} = G_{\max} + 10 \cdot \text{LOG}(N_{ANT}/N_{SS})$$

Ant Gain (dBi)		N _{ANT} / N _{SS}	Directional Gain (dBi)	
			CDD	SDM
ANT.1	-1.58	2/2	-0.03	-1.58
ANT.2	-4.79			

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.

$$\text{Directional gain(CDD)} = 10 \cdot \log \left(\left(\frac{10^{(\text{ANT.0 Gain}/20)} + 10^{(\text{ANT.1 Gain}/20)} \right)^2 / 2 \right) \text{ dBi}$$

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

Sample MIMO Calculation:

Ex) ANT.1 : 11.58 dBm ANT.2 : 12.08 dBm

$$\text{MIMO} = \text{ANT.1} + \text{ANT.2}$$

$$(11.58 \text{ dBm} + 12.08 \text{ dBm}) = (14.387 \text{ mW} + 16.143 \text{ mW}) = 30.53 \text{ mW} = 14.88 \text{ dBm}$$

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 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 March 11, 2024 (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.

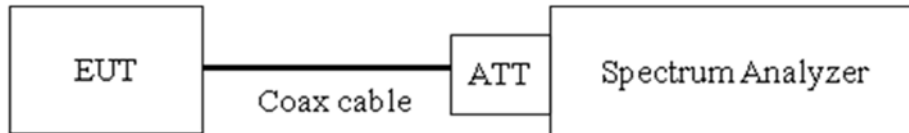
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.70 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.52 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.66 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.58 (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 $> 50/T$.

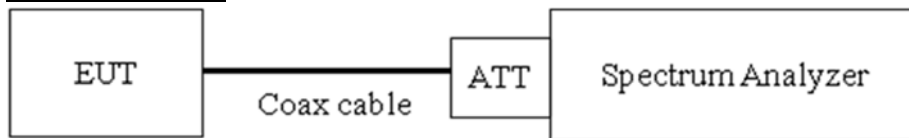
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ($\geq$ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = $T_{\text{on}} / T_{\text{total}}$ and Duty Cycle Factor = $10\log(1/\text{Duty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

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.

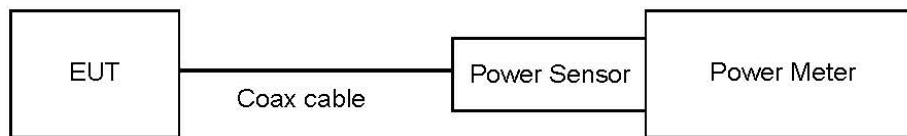
Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

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

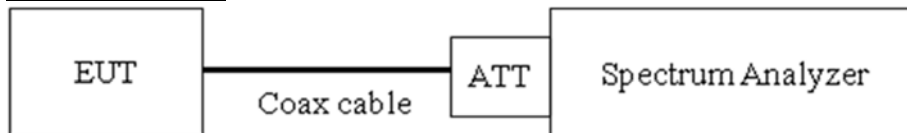
- Conducted Output Power(Peak) = Measured Value + ATT loss + Cable loss
- Conducted Output Power(Average) = Measured Value + ATT loss + Cable loss + Duty Cycle Factor

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

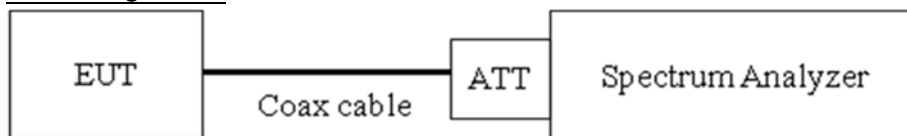
7.5. Conducted Band Edge (Out of Band Emissions) & Conducted Spurious Emissions

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	10.03
100	10.10
200	10.14
300	10.16
400	10.18
500	10.24
600	10.22
700	10.27
800	10.28
900	10.30
1000	10.31
2000	10.49
2400	10.51
2500	10.60
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

Note : 1. 2400 ~ 2500 MHz is fundamental frequency range.

2. Factor = Attenuator loss + Cable loss

3. Total Port offset = Attenuator loss + Cable loss + EUT cable loss(0.10 dB) = 10.70 dB

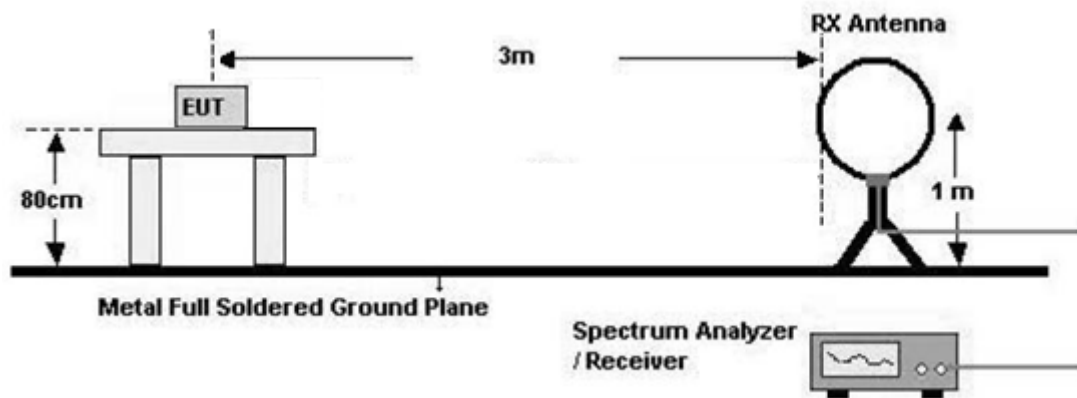
7.6. Radiated Test

Limit

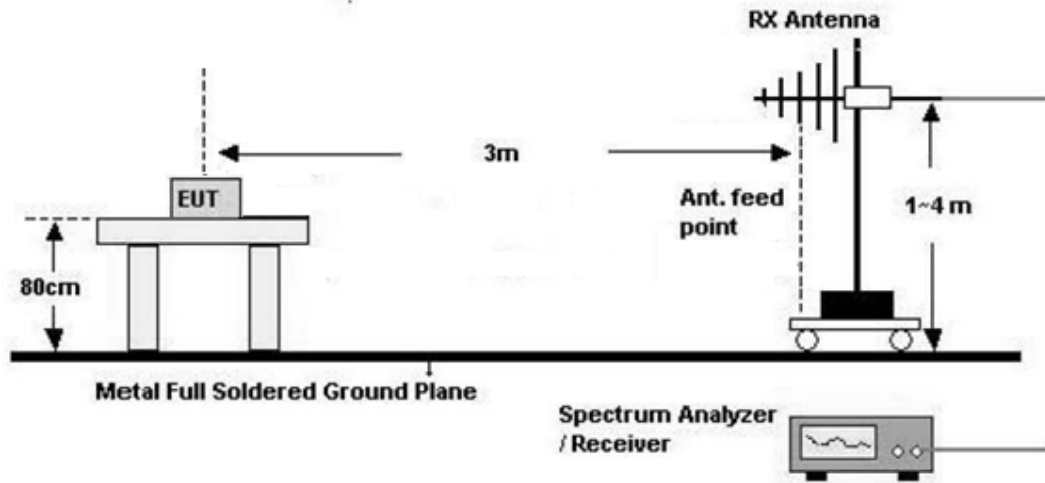
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

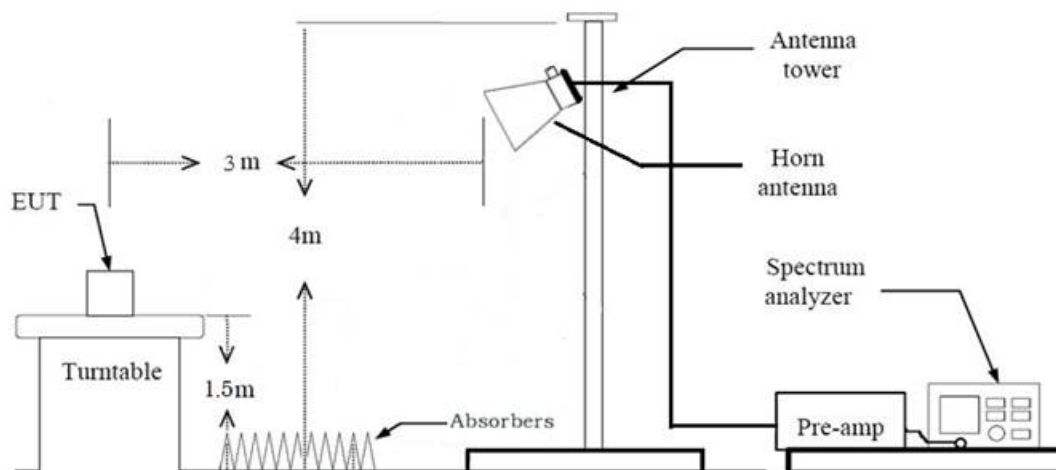
Below 30 MHz



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 = $20 \log (\text{test distance} / \text{specific distance})$ (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 $\geq 98 \%$)

= 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 $\geq 3 \times$ 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 $\geq 3 \times$ 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 : 2310 MHz ~ 2390 MHz / 2483.5 MHz ~ 2500 MHz
- 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 = $20\log(\text{test distance} / \text{specific distance})$ (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 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	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, Tones, RU Offset) of operation were investigated and the worst case configuration results are reported.

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

3. SM-S721U, SM-S721U1 were tested and the worst case results are reported.

(Worst case: SM-S721U)

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. All data rate of operation were investigated and the worst case results are reported.

(Worst case : MCS 0)

3. All Antenna of operation were investigated and the worst case results are reported

- Antenna Operation Type : SISO, MIMO_CDD(Ant.1+Ant.2), MIMO_SDM(Ant.1+Ant.2)

- Worstcase: MIMO_CDD(Ant.1+Ant.2)

4. EUT Axis

- Radiated Spurious Emissions : Y

- Radiated Restricted Band Edge : X

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

8. SM-S721U, SM-S721U1 were tested and the worst case results are reported.
(Worst case: SM-S721U)

Radiated test(RSDB)

1. Please refer to the [DTS], [BT], [UNII] Test Report.
2. SM-S721U, SM-S721U1 were tested and the worst case results are reported.
(Worst case: SM-S721U)

AC Power line Conducted Emissions

1. Please refer to the [DTS] Test Report.
2. SM-S721U, SM-S721U1 were tested and the worst case results are reported.
(Worst case: SM-S721U)

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 [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	4.582	4.603	0.995	0.020
		MCS1	4.565	4.590	0.994	0.024
		MCS2	3.503	3.528	0.993	0.031
		MCS3	2.642	2.668	0.991	0.041
		MCS4	1.787	1.808	0.988	0.051
		MCS5	1.354	1.377	0.983	0.073
		MCS6	1.214	1.236	0.982	0.078
		MCS7	1.102	1.126	0.979	0.094
		MCS8	0.926	0.949	0.976	0.107
		MCS9	0.844	0.867	0.974	0.115
	52	MCS0	4.565	4.590	0.994	0.024
		MCS1	2.642	2.668	0.991	0.041
		MCS2	1.787	1.811	0.987	0.056
		MCS3	1.354	1.377	0.983	0.073
		MCS4	0.926	0.949	0.976	0.106
		MCS5	0.711	0.733	0.969	0.136
		MCS6	0.667	0.690	0.968	0.143
		MCS7	0.659	0.682	0.967	0.145
		MCS8	0.658	0.682	0.966	0.150
		MCS9	0.657	0.679	0.967	0.146
	106	MCS0	2.490	2.516	0.990	0.044
		MCS1	1.277	1.301	0.982	0.079
		MCS2	0.875	0.898	0.974	0.115
		MCS3	0.674	0.696	0.968	0.142
		MCS4	0.623	0.646	0.965	0.156
		MCS5	0.616	0.638	0.965	0.155
		MCS6	0.613	0.636	0.964	0.158
		MCS7	0.613	0.636	0.964	0.158
		MCS8	0.614	0.636	0.965	0.153
		MCS9	0.609	0.632	0.964	0.159
	242	MCS0	1.123	1.147	0.980	0.090
		MCS1	0.606	0.628	0.964	0.160
		MCS2	0.598	0.621	0.963	0.162
		MCS3	0.614	0.636	0.965	0.153
		MCS4	0.601	0.624	0.964	0.161
		MCS5	0.599	0.622	0.963	0.162
		MCS6	0.595	0.617	0.963	0.163
		MCS7	0.593	0.617	0.960	0.179
		MCS8	0.598	0.622	0.963	0.165
		MCS9	0.595	0.617	0.964	0.158

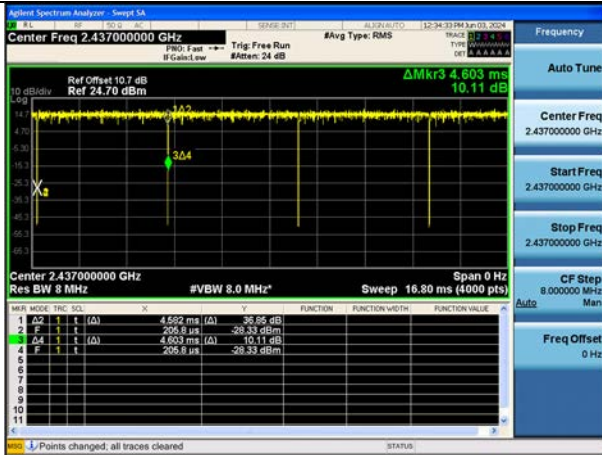
Mode	Tone (T)	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ax(SU)	BW 20	MCS0	5.447	5.467	0.996	0.016
		MCS1	5.447	5.467	0.996	0.016
		MCS2	5.447	5.462	0.997	0.012
		MCS3	5.447	5.467	0.996	0.016
		MCS4	5.447	5.467	0.996	0.016
		MCS5	5.447	5.467	0.996	0.016
		MCS6	5.447	5.462	0.997	0.012
		MCS7	5.447	5.467	0.996	0.016
		MCS8	5.447	5.467	0.996	0.016
		MCS9	5.452	5.467	0.997	0.012

Test Plots

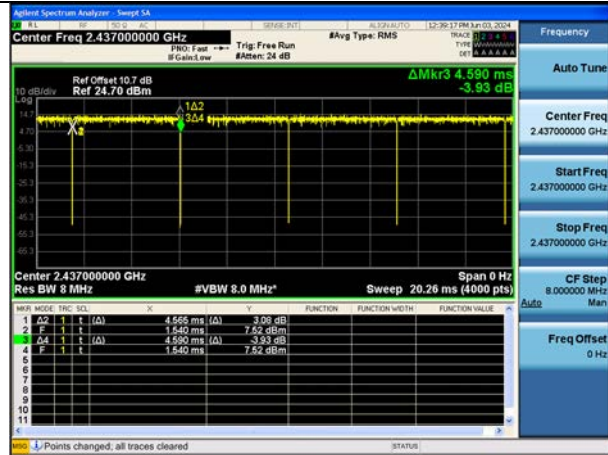
Note:

In order to simplify the report, attached plots were only the lowest data rate.

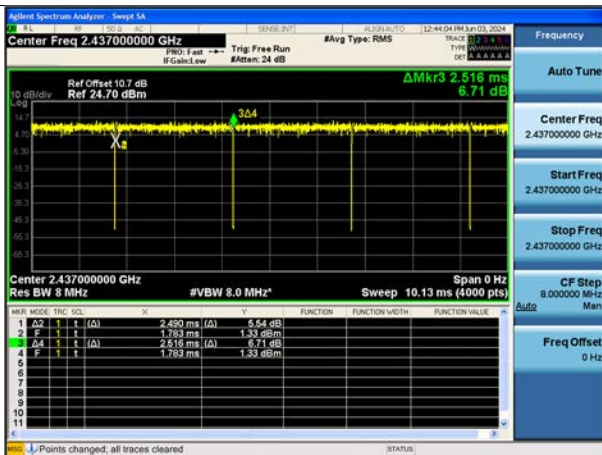
26 Tones (MCS 0)



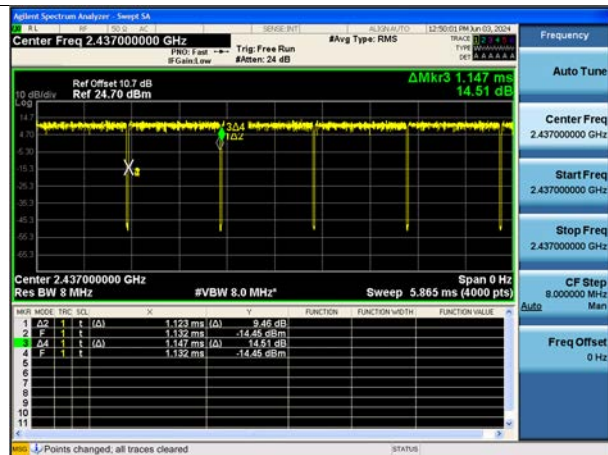
52 Tones (MCS 0)



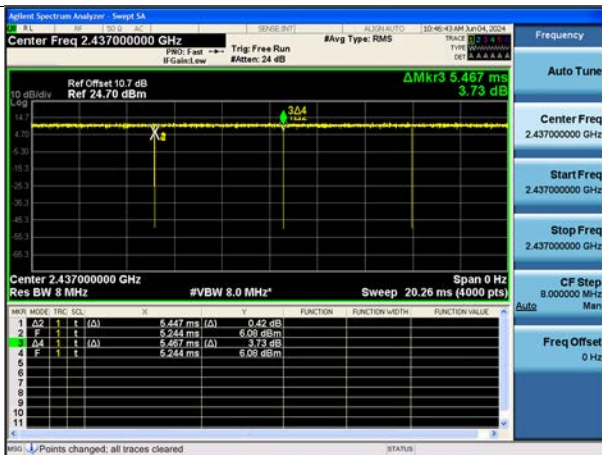
106 Tones (MCS 0)



242 Tones (MCS 0)



SU (MCS 0)



9.2 6 dB BANDWIDTH

Limit : > 500 kHz

[ANT.1]

Mode	Freq. [MHz]	CH.	6dB Bandwidth [MHz]			99% Occupied Bandwidth [MHz]		
			RU Index : Low	RU Index : Mid	RU Index : High	RU Index : Low	RU Index : Mid	RU Index : High
			ANT1	ANT1	ANT1	ANT1	ANT1	ANT1
HE20 26T	2412	1	2.101	2.712	2.079	18.338	17.175	18.166
	2437	6	2.102	2.698	2.110	18.039	17.071	18.290
	2462	11	2.083	2.703	2.094	18.275	17.295	18.240
HE20 52T	2412	1	17.09	15.11	4.114	18.264	17.250	18.018
	2437	6	12.02	11.31	17.05	18.082	17.188	18.226
	2462	11	17.11	15.13	4.108	18.208	17.272	18.080
HE20 106T	2412	1	18.20	-	17.20	18.278	-	18.130
	2437	6	17.17	-	17.41	18.122	-	18.246
	2462	11	18.18	-	17.40	18.254	-	18.208
HE20 242T	2412	1	-	19.00	-	-	18.993	-
	2437	6	-	19.05	-	-	18.962	-
	2462	11	-	19.05	-	-	19.001	-
HE20 SU	2412	1	-	19.08	-	-	19.044	-
	2437	6	-	19.07	-	-	18.978	-
	2462	11	-	19.13	-	-	19.034	-

[ANT.2]

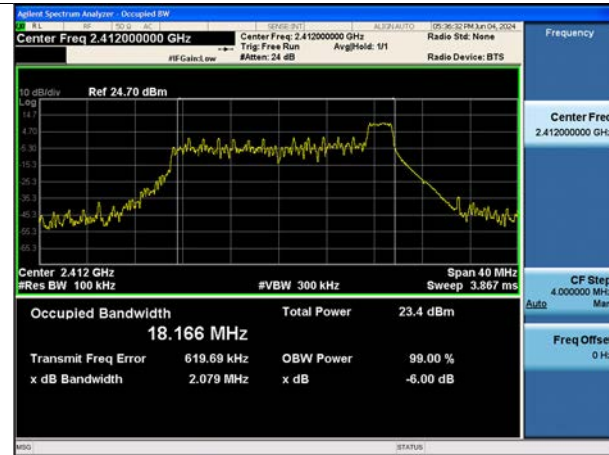
Mode	Freq. [MHz]	CH.	6dB Bandwidth [MHz]			99% Occupied Bandwidth [MHz]		
			RU Index : Low	RU Index : Mid	RU Index : High	RU Index : Low	RU Index : Mid	RU Index : High
			ANT2	ANT2	ANT2	ANT2	ANT2	ANT2
HE20 26T	2412	1	2.107	2.711	2.107	18.179	17.114	18.200
	2437	6	2.111	2.710	2.120	18.270	17.082	18.338
	2462	11	2.091	2.698	2.098	18.064	17.095	18.341
HE20 52T	2412	1	17.07	15.10	17.02	18.149	17.160	18.140
	2437	6	17.10	15.09	17.01	18.186	17.165	18.154
	2462	11	12.07	15.09	17.05	18.088	17.086	18.254
HE20 106T	2412	1	17.18	-	17.39	18.170	-	18.221
	2437	6	18.16	-	17.41	18.233	-	18.240
	2462	11	17.18	-	17.42	18.128	-	18.273
HE20 242T	2412	1	-	19.09	-	-	18.977	-
	2437	6	-	19.10	-	-	19.018	-
	2462	11	-	19.06	-	-	18.982	-
HE20 SU	2412	1	-	19.11	-	-	18.994	-
	2437	6	-	19.18	-	-	19.043	-
	2462	11	-	19.06	-	-	18.986	-

Test Plots

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

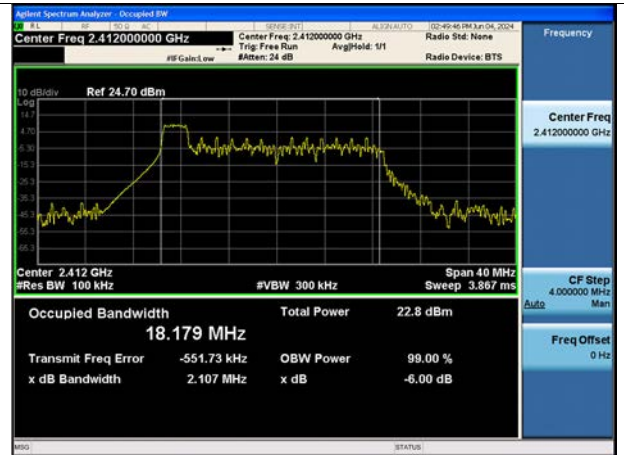
ANT.1

BW20M Ch.1(2412 MHz) RU 8

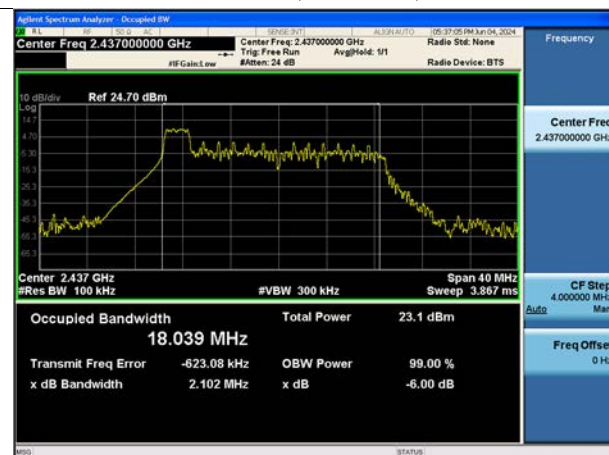


ANT.2

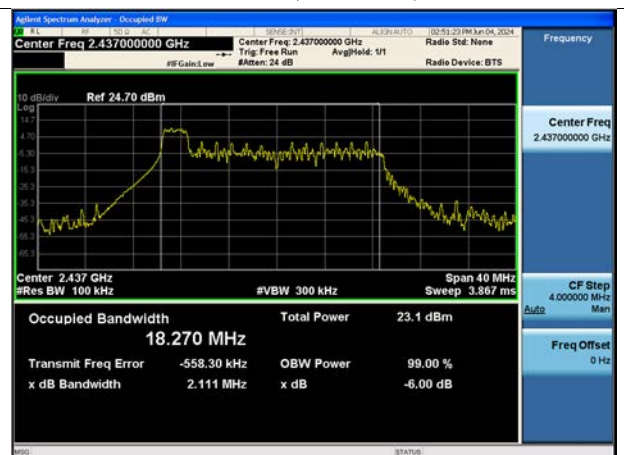
BW20M Ch.1(2412 MHz) RU 0



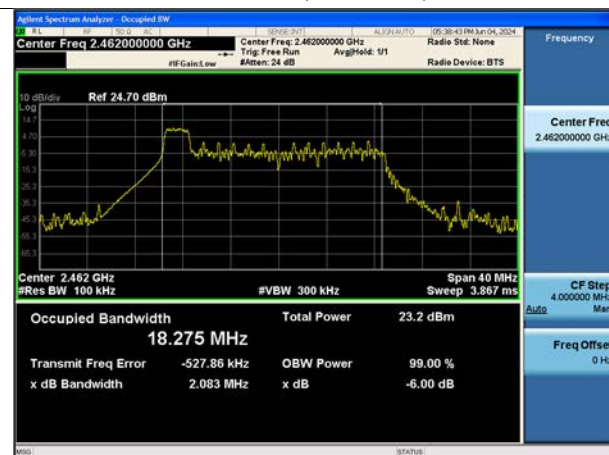
BW20M Ch.6(2437 MHz) RU 0



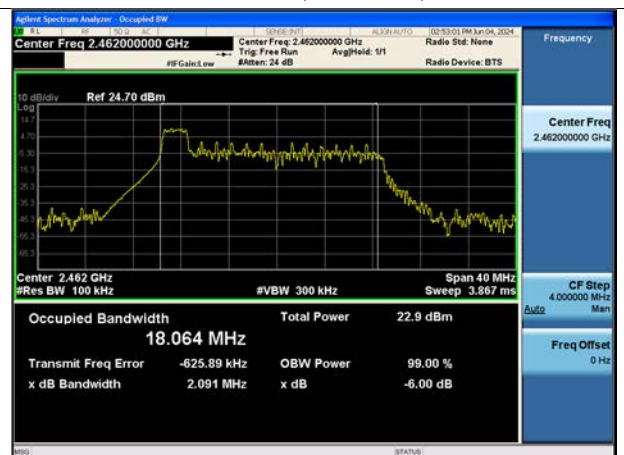
BW20M Ch.6(2437 MHz) RU 0



BW20M Ch.11(2462 MHz) RU 0



BW20M Ch.11(2462 MHz) RU 0



9.3 OUTPUT POWER

Limit : 30 dBm

Peak Power

[MIMO_CDD(Ant.1+Ant.2)]

Note:

1. MIMO Peak Power = $10 \cdot \log((10^{(\text{Ant.1 Peak power} / 10)} + (10^{(\text{Ant.2 Peak power} / 10)}))$

Mode	Freq. [MHz]	CH.	Total Peak Power [dBm]								
			RU Index : Low			RU Index : Mid			RU Index : High		
			ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
HE20 26T	2412	1	23.11	23.67	26.41	22.87	23.53	26.22	23.78	23.65	26.72
	2437	6	23.41	24.08	26.77	22.95	23.66	26.33	22.73	24.39	26.65
	2462	11	23.61	23.93	26.78	22.95	23.01	25.99	23.79	23.05	26.45
HE20 52T	2412	1	23.92	24.61	27.29	23.92	24.68	27.33	24.58	24.61	27.61
	2437	6	24.43	24.75	27.60	24.36	24.68	27.53	23.75	24.94	27.40
	2462	11	24.42	24.92	27.69	24.18	24.58	27.40	24.59	23.91	27.28
HE20 106T	2412	1	25.96	26.35	29.17	-	-	-	26.33	26.25	29.30
	2437	6	26.30	26.63	29.48	-	-	-	25.78	26.78	29.32
	2462	11	26.29	26.34	29.33	-	-	-	26.43	25.75	29.12
HE20 242T	2412	1	-	-	-	24.31	24.49	27.41	-	-	-
	2437	6	-	-	-	25.43	25.91	28.69	-	-	-
	2462	11	-	-	-	23.85	23.63	26.75	-	-	-
HE20 SU	2412	1	-	-	-	25.37	25.50	28.44	-	-	-
	2437	6	-	-	-	26.12	26.50	29.32	-	-	-
	2462	11	-	-	-	25.61	25.38	28.51	-	-	-

Average Power

[MIMO_CDD(Ant.1+Ant.2)]

Note:

1. MIMO Average Power = $10 \cdot \log(((10^{(\text{Ant.1 Average power} / 10)}) + (10^{(\text{Ant.2 Average power} / 10)}))$

Mode	Freq. [MHz]	CH.	Total Average Power [dBm]								
			RU Index : Low			RU Index : Mid			RU Index : High		
			ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
HE20 26T	2412	1	13.04	13.05	16.06	12.84	13.20	16.03	13.62	13.18	16.42
	2437	6	13.65	13.71	16.69	13.14	13.23	16.20	12.44	13.89	16.24
	2462	11	13.72	13.55	16.65	13.12	12.77	15.96	13.60	12.12	15.93
HE20 52T	2412	1	13.99	14.24	17.13	13.89	14.30	17.11	14.96	14.25	17.63
	2437	6	14.78	14.46	17.64	14.67	14.23	17.47	13.66	14.70	17.23
	2462	11	14.63	14.59	17.62	14.78	14.29	17.56	14.88	13.32	17.18
HE20 106T	2412	1	15.95	16.14	19.06	-	-	-	16.73	16.05	19.42
	2437	6	16.60	16.30	19.47	-	-	-	15.75	16.48	19.14
	2462	11	16.40	16.27	19.35	-	-	-	16.67	15.30	19.05
HE20 242T	2412	1	-	-	-	15.52	15.76	18.65	-	-	-
	2437	6	-	-	-	17.20	17.17	20.20	-	-	-
	2462	11	-	-	-	15.12	14.84	17.99	-	-	-
HE20 SU	2412	1	-	-	-	15.98	16.19	19.09	-	-	-
	2437	6	-	-	-	17.25	17.13	20.20	-	-	-
	2462	11	-	-	-	16.18	15.96	19.08	-	-	-

9.4 POWER SPECTRAL DENSITY

Limit : 8 dBm/3kHz

Note :

1. MIMO Total PSD = $10 \cdot \log(((10^{(\text{Ant.1 PSD}/10)}) + (10^{(\text{Ant.2 PSD}/10)}))$
2. Total PSD = Measured Value + Duty Cycle Factor

[MIMO_CDD(Ant.1+Ant.2)]

Mode	Freq. [MHz]	CH.	Total Power Spectral Density [dBm/MHz]								
			RU Index : Low			RU Index : Mid			RU Index : High		
			ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
HE20 26T	2412	1	-4.359	-4.105	-1.220	-4.758	-4.355	-1.542	-3.215	-3.980	-0.571
	2437	6	-3.477	-3.536	-0.496	-4.191	-3.873	-1.019	-4.950	-3.258	-1.012
	2462	11	-3.795	-3.841	-0.808	-4.623	-4.464	-1.533	-3.405	-5.231	-1.213
HE20 52T	2412	1	-6.335	-5.846	-3.073	-6.374	-5.635	-2.978	-4.854	-5.835	-2.307
	2437	6	-5.252	-5.443	-2.336	-5.525	-5.790	-2.645	-6.413	-5.388	-2.860
	2462	11	-5.373	-5.593	-2.471	-5.856	-5.978	-2.906	-5.239	-6.766	-2.925
HE20 106T	2412	1	-7.030	-6.794	-3.900	-	-	-	-5.710	-6.907	-3.257
	2437	6	-6.252	-6.485	-3.357	-	-	-	-6.597	-5.998	-3.277
	2462	11	-6.421	-6.768	-3.581	-	-	-	-5.859	-7.497	-3.591
HE20 242T	2412	1	-	-	-	-9.715	-9.979	-6.835	-	-	-
	2437	6	-	-	-	-8.284	-8.316	-5.290	-	-	-
	2462	11	-	-	-	-10.193	-10.318	-7.245	-	-	-
HE20 SU	2412	1	-	-	-	-10.280	-10.603	-7.428	-	-	-
	2437	6	-	-	-	-9.330	-9.457	-6.383	-	-	-
	2462	11	-	-	-	-10.123	-10.472	-7.284	-	-	-

Test Plots

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

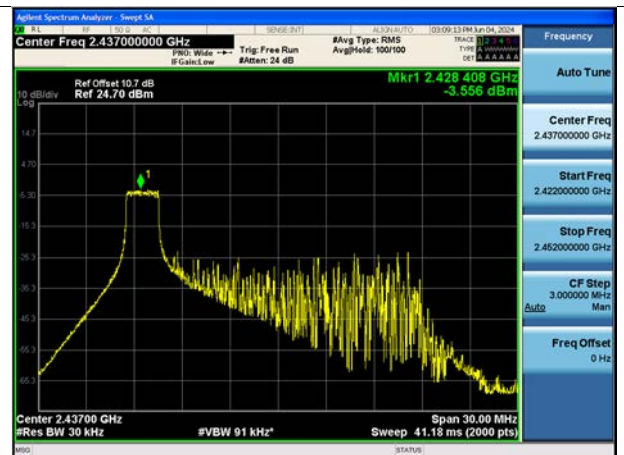
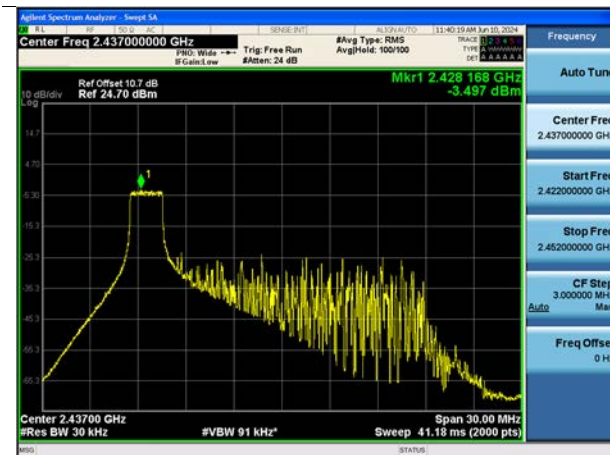
ANT.1

ANT.2

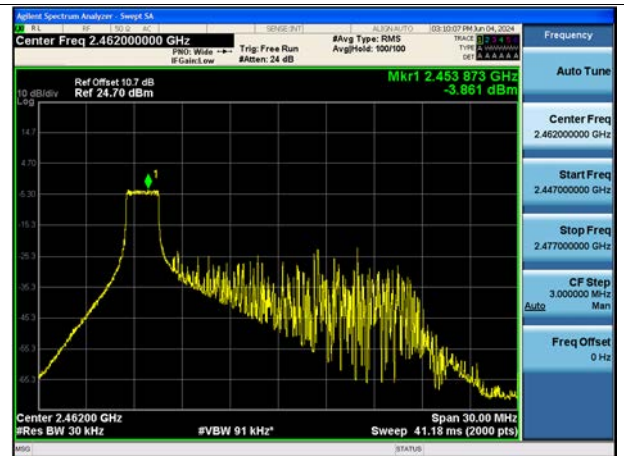
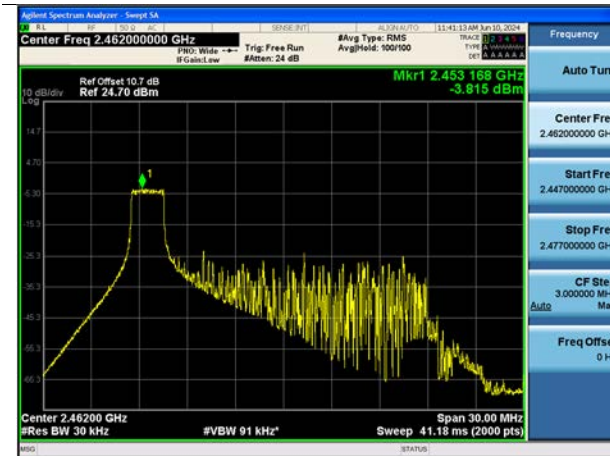
BW20M Ch.1(2412 MHz) RU 8



BW20M Ch.6(2437 MHz) RU 0



BW20M Ch.11(2462 MHz) RU 0



9.5 BAND EDGE / CONDUCTED SPURIOUS EMISSIONS

Band Edge

Limit : 30 dBc

[ANT.1]

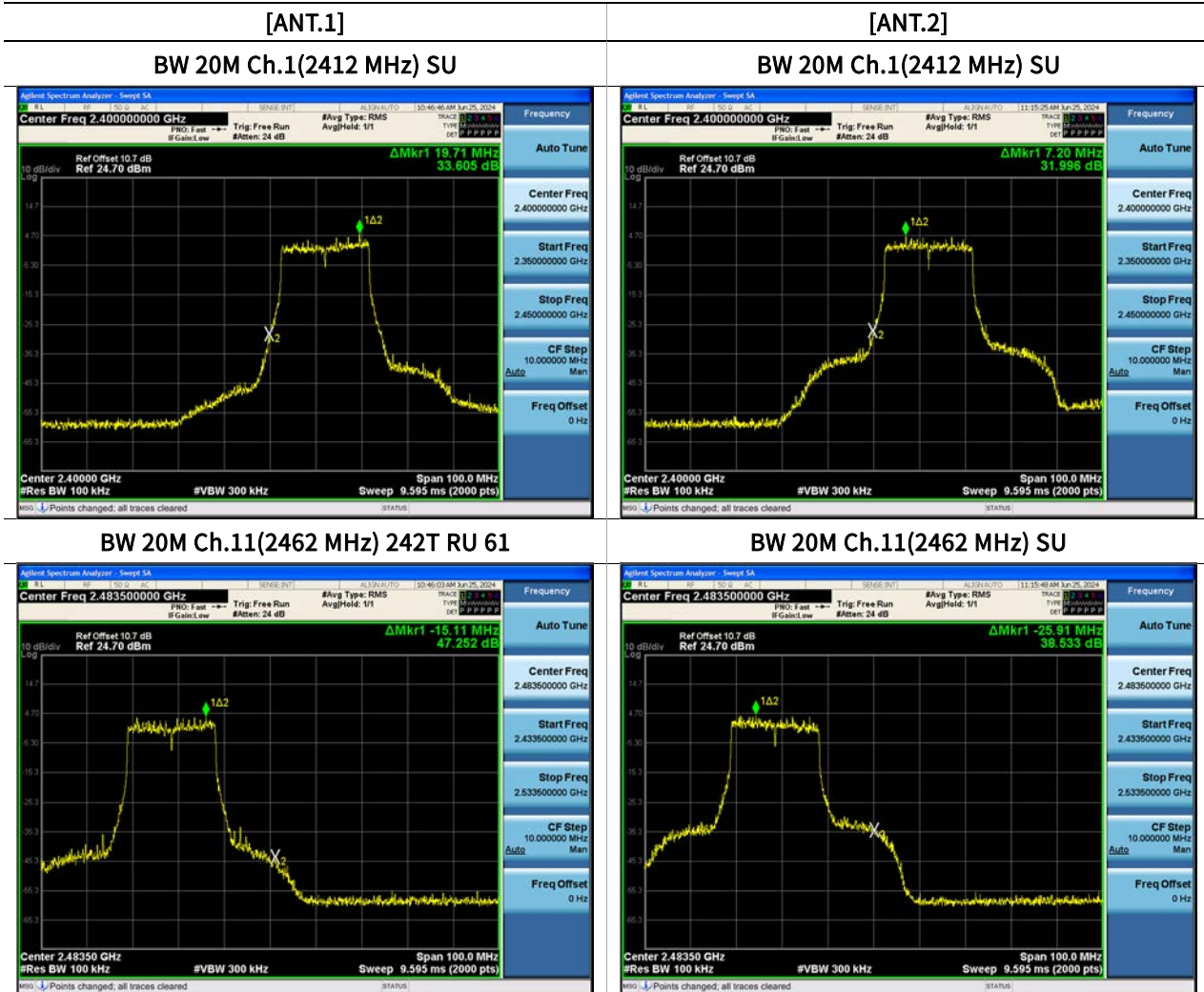
Mode	Freq. [MHz]	CH.	RU Index	Measured Position	Band edge [dB]
HE20	2412	1	Low	Lowest Bandedge	35.741
26T	2462	11	High	Highest Bandedge	61.753
HE20	2412	1	Low	Lowest Bandedge	34.606
52T	2462	11	High	Highest Bandedge	57.402
HE20	2412	1	Low	Lowest Bandedge	35.303
106T	2462	11	High	Highest Bandedge	51.398
HE20	2412	1	Low	Lowest Bandedge	37.938
242T	2462	11	High	Highest Bandedge	47.252
HE20	2412	1	Low	Lowest Bandedge	33.605
SU	2462	11	High	Highest Bandedge	47.890

[ANT.2]

Mode	Freq. [MHz]	CH.	RU Index	Measured Position	Band edge [dB]
HE20	2412	1	Low	Lowest Bandedge	35.244
26T	2462	11	High	Highest Bandedge	57.210
HE20	2412	1	Low	Lowest Bandedge	35.378
52T	2462	11	High	Highest Bandedge	47.454
HE20	2412	1	Low	Lowest Bandedge	35.665
106T	2462	11	High	Highest Bandedge	46.165
HE20	2412	1	Low	Lowest Bandedge	36.277
242T	2462	11	High	Highest Bandedge	39.081
HE20	2412	1	Low	Lowest Bandedge	31.996
SU	2462	11	High	Highest Bandedge	38.533

Test Plots

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



Conducted Spurious Emissions

Limit : 30 dBc

[ANT.1]

Mode	Freq. [MHz]	CH.	Conducted Spurious Emissions [dB]		
			RU Index : Low	RU Index : Mid	RU Index : High
			ANT1	ANT1	ANT1
HE20 26T	2412	1	65.176	63.320	66.625
	2437	6	65.173	65.720	65.012
	2462	11	63.778	65.110	65.127
HE20 52T	2412	1	62.026	63.090	63.423
	2437	6	64.871	63.744	63.216
	2462	11	63.611	62.951	63.185
HE20 106T	2412	1	62.109	-	64.029
	2437	6	63.399	-	61.697
	2462	11	63.342	-	63.048
HE20 242T	2412	1	-	61.220	-
	2437	6	-	61.718	-
	2462	11	-	59.902	-
HE20 SU	2412	1	-	59.989	-
	2437	6	-	63.419	-
	2462	11	-	60.884	-

[ANT.2]

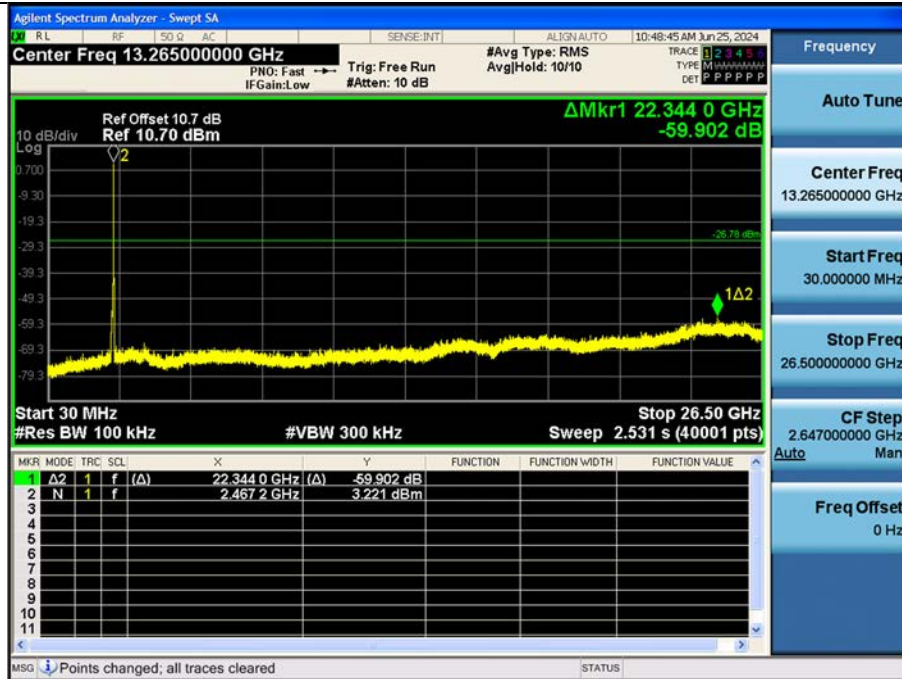
Mode	Freq. [MHz]	CH.	Conducted Spurious Emissions [dB]		
			RU Index : Low	RU Index : Mid	RU Index : High
			ANT2	ANT2	ANT2
HE20 26T	2412	1	65.759	64.948	64.842
	2437	6	62.038	64.617	63.974
	2462	11	65.748	61.965	58.197
HE20 52T	2412	1	62.481	62.124	63.763
	2437	6	52.165	62.180	63.688
	2462	11	63.507	62.879	61.373
HE20 106T	2412	1	62.658	-	57.522
	2437	6	63.808	-	57.301
	2462	11	57.530	-	61.897
HE20 242T	2412	1	-	59.606	-
	2437	6	-	60.309	-
	2462	11	-	61.138	-
HE20 SU	2412	1	-	61.384	-
	2437	6	-	60.823	-
	2462	11	-	62.246	-

Test Plots

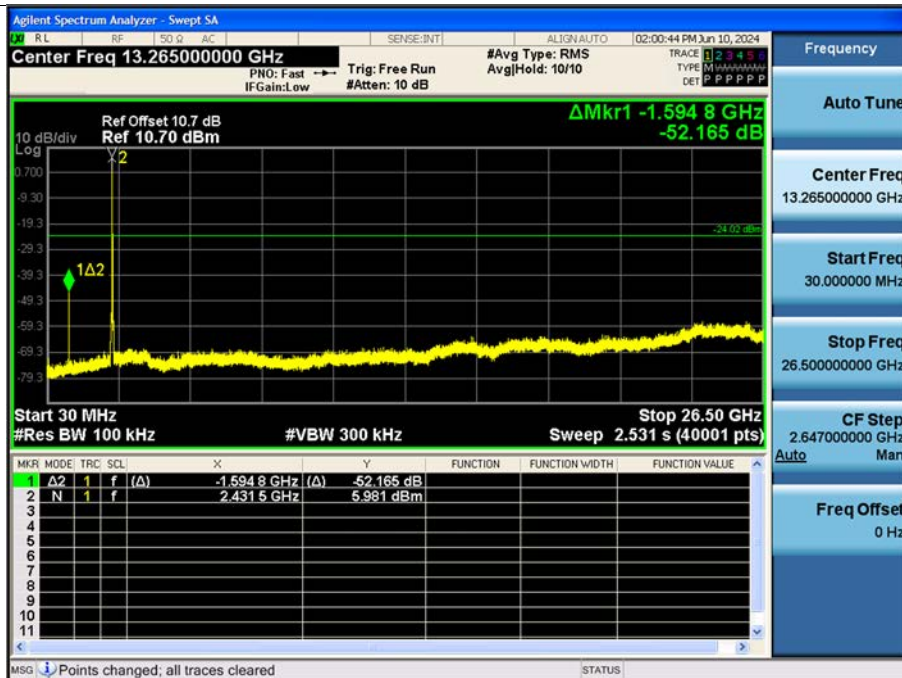
Note:

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

[ANT.1] BW20M Ch.11(2 462 MHz) 242T RU 61



[ANT.2] BW20M Ch.6(2 437 MHz) 52T RU 37



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 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_CDD(Ant.1+Ant.2)]

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.1		2412		MHz		Transfer Rate : MCS 0		26T
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4824	43.71	0.00	4.15	V	47.86	73.98	26.12	PK
4824	33.29	0.00	4.15	V	37.44	53.98	16.54	AV
7236	39.28	0.00	13.01	V	52.29	73.98	21.69	PK
7236	26.95	0.00	13.01	V	39.96	53.98	14.02	AV
4824	44.81	0.00	4.15	H	48.96	73.98	25.02	PK
4824	33.18	0.00	4.15	H	37.33	53.98	16.65	AV
7236	40.05	0.00	13.01	H	53.06	73.98	20.92	PK
7236	26.98	0.00	13.01	H	39.99	53.98	13.99	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.6		2437		MHz		Transfer Rate : MCS 0		26T
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4874	44.14	0.00	4.11	V	48.25	73.98	25.73	PK
4874	33.21	0.00	4.11	V	37.32	53.98	16.66	AV
7311	39.41	0.00	12.33	V	51.74	73.98	22.24	PK
7311	27.61	0.00	12.33	V	39.94	53.98	14.04	AV
4874	44.51	0.00	4.11	H	48.62	73.98	25.36	PK
4874	33.10	0.00	4.11	H	37.21	53.98	16.77	AV
7311	39.57	0.00	12.33	H	51.90	73.98	22.08	PK
7311	27.61	0.00	12.33	H	39.94	53.98	14.04	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11		2462		MHz		Transfer Rate : MCS 0		26T
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	43.76	0.00	5.10	V	48.86	73.98	25.12	PK
4924	32.76	0.00	5.10	V	37.86	53.98	16.12	AV
7386	39.40	0.00	12.74	V	52.14	73.98	21.84	PK
7386	27.80	0.00	12.74	V	40.54	53.98	13.44	AV
4924	44.36	0.00	5.10	H	49.46	73.98	24.52	PK
4924	32.73	0.00	5.10	H	37.83	53.98	16.15	AV
7386	40.13	0.00	12.74	H	52.87	73.98	21.11	PK
7386	27.75	0.00	12.74	H	40.49	53.98	13.49	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.1	2412		MHz	Transfer Rate : MCS 0			52T	37
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4824	43.91	0.00	4.15	V	48.06	73.98	25.92	PK
4824	33.32	0.00	4.15	V	37.47	53.98	16.51	AV
7236	38.66	0.00	13.01	V	51.67	73.98	22.31	PK
7236	27.06	0.00	13.01	V	40.07	53.98	13.91	AV
4824	44.10	0.00	4.15	H	48.25	73.98	25.73	PK
4824	33.04	0.00	4.15	H	37.19	53.98	16.79	AV
7236	39.04	0.00	13.01	H	52.05	73.98	21.93	PK
7236	27.02	0.00	13.01	H	40.03	53.98	13.95	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.6	2437		MHz	Transfer Rate : MCS 0			52T	37
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4874	44.93	0.00	4.11	V	49.04	73.98	24.94	PK
4874	33.20	0.00	4.11	V	37.31	53.98	16.67	AV
7311	40.55	0.00	12.33	V	52.88	73.98	21.10	PK
7311	27.71	0.00	12.33	V	40.04	53.98	13.94	AV
4874	44.56	0.00	4.11	H	48.67	73.98	25.31	PK
4874	33.07	0.00	4.11	H	37.18	53.98	16.80	AV
7311	39.36	0.00	12.33	H	51.69	73.98	22.29	PK
7311	27.69	0.00	12.33	H	40.02	53.98	13.96	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11	2462		MHz	Transfer Rate : MCS 0			52T	37
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	43.88	0.00	5.10	V	48.98	73.98	25.00	PK
4924	32.56	0.00	5.10	V	37.66	53.98	16.32	AV
7386	39.46	0.00	12.74	V	52.20	73.98	21.78	PK
7386	27.73	0.00	12.74	V	40.47	53.98	13.51	AV
4924	44.17	0.00	5.10	H	49.27	73.98	24.71	PK
4924	32.86	0.00	5.10	H	37.96	53.98	16.02	AV
7386	39.47	0.00	12.74	H	52.21	73.98	21.77	PK
7386	27.81	0.00	12.74	H	40.55	53.98	13.43	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.1 2412 MHz				Transfer Rate : MCS 0			106T	53
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4824	44.00	0.00	4.15	V	48.15	73.98	25.83	PK
4824	33.13	0.00	4.15	V	37.28	53.98	16.70	AV
7236	38.87	0.00	13.01	V	51.88	73.98	22.10	PK
7236	27.08	0.00	13.01	V	40.09	53.98	13.89	AV
4824	44.73	0.00	4.15	H	48.88	73.98	25.10	PK
4824	33.24	0.00	4.15	H	37.39	53.98	16.59	AV
7236	38.68	0.00	13.01	H	51.69	73.98	22.29	PK
7236	27.06	0.00	13.01	H	40.07	53.98	13.91	AV

Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.6 2437 MHz				Transfer Rate : MCS 0			106T	53
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4874	43.88	0.00	4.11	V	47.99	73.98	25.99	PK
4874	33.19	0.00	4.11	V	37.30	53.98	16.68	AV
7311	40.17	0.00	12.33	V	52.50	73.98	21.48	PK
7311	27.58	0.00	12.33	V	39.91	53.98	14.07	AV
4874	44.13	0.00	4.11	H	48.24	73.98	25.74	PK
4874	33.21	0.00	4.11	H	37.32	53.98	16.66	AV
7311	39.41	0.00	12.33	H	51.74	73.98	22.24	PK
7311	27.66	0.00	12.33	H	39.99	53.98	13.99	AV

Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11 2462 MHz				Transfer Rate : MCS 0			106T	53
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	43.94	0.00	5.10	V	49.04	73.98	24.94	PK
4924	32.69	0.00	5.10	V	37.79	53.98	16.19	AV
7386	39.44	0.00	12.74	V	52.18	73.98	21.80	PK
7386	27.82	0.00	12.74	V	40.56	53.98	13.42	AV
4924	43.94	0.00	5.10	H	49.04	73.98	24.94	PK
4924	32.75	0.00	5.10	H	37.85	53.98	16.13	AV
7386	39.84	0.00	12.74	H	52.58	73.98	21.40	PK
7386	27.81	0.00	12.74	H	40.55	53.98	13.43	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.1	2412	MHz		Transfer Rate : MCS 0			242T	61
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4824	43.75	0.00	4.15	V	47.90	73.98	26.08	PK
4824	33.13	0.00	4.15	V	37.28	53.98	16.70	AV
7236	38.96	0.00	13.01	V	51.97	73.98	22.01	PK
7236	27.05	0.00	13.01	V	40.06	53.98	13.92	AV
4824	44.56	0.00	4.15	H	48.71	73.98	25.27	PK
4824	33.22	0.00	4.15	H	37.37	53.98	16.61	AV
7236	39.09	0.00	13.01	H	52.10	73.98	21.88	PK
7236	26.93	0.00	13.01	H	39.94	53.98	14.04	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.6	2437	MHz		Transfer Rate : MCS 0			242T	61
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4874	44.09	0.00	4.11	V	48.20	73.98	25.78	PK
4874	33.04	0.00	4.11	V	37.15	53.98	16.83	AV
7311	39.36	0.00	12.33	V	51.69	73.98	22.29	PK
7311	27.59	0.00	12.33	V	39.92	53.98	14.06	AV
4874	44.69	0.00	4.11	H	48.80	73.98	25.18	PK
4874	33.21	0.00	4.11	H	37.32	53.98	16.66	AV
7311	40.06	0.00	12.33	H	52.39	73.98	21.59	PK
7311	27.70	0.00	12.33	H	40.03	53.98	13.95	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11	2462	MHz		Transfer Rate : MCS 0			242T	61
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	43.83	0.00	5.10	V	48.93	73.98	25.05	PK
4924	32.43	0.00	5.10	V	37.53	53.98	16.45	AV
7386	39.54	0.00	12.74	V	52.28	73.98	21.70	PK
7386	27.64	0.00	12.74	V	40.38	53.98	13.60	AV
4924	43.84	0.00	5.10	H	48.94	73.98	25.04	PK
4924	32.86	0.00	5.10	H	37.96	53.98	16.02	AV
7386	40.16	0.00	12.74	H	52.90	73.98	21.08	PK
7386	27.71	0.00	12.74	H	40.45	53.98	13.53	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.1	2412	MHz		Transfer Rate : MCS 0			SU	
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4824	44.05	0.00	4.15	V	48.20	73.98	25.78	PK
4824	33.03	0.00	4.15	V	37.18	53.98	16.80	AV
7236	39.00	0.00	13.01	V	52.01	73.98	21.97	PK
7236	26.95	0.00	13.01	V	39.96	53.98	14.02	AV
4824	44.44	0.00	4.15	H	48.59	73.98	25.39	PK
4824	33.28	0.00	4.15	H	37.43	53.98	16.55	AV
7236	39.01	0.00	13.01	H	52.02	73.98	21.96	PK
7236	26.96	0.00	13.01	H	39.97	53.98	14.01	AV

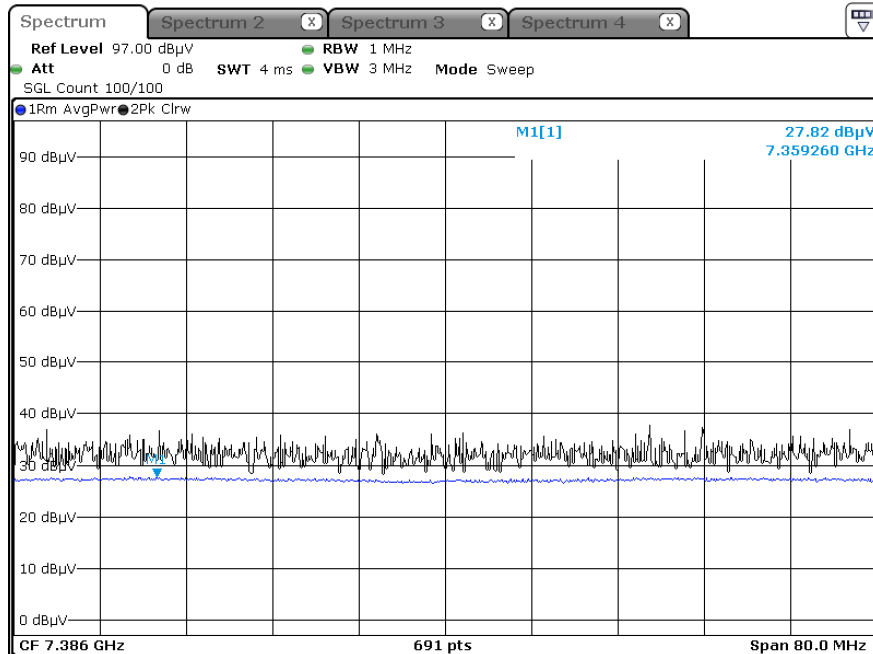
802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.6	2437	MHz		Transfer Rate : MCS 0			SU	
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4874	44.18	0.00	4.11	V	48.29	73.98	25.69	PK
4874	32.88	0.00	4.11	V	36.99	53.98	16.99	AV
7311	39.10	0.00	12.33	V	51.43	73.98	22.55	PK
7311	27.66	0.00	12.33	V	39.99	53.98	13.99	AV
4874	44.42	0.00	4.11	H	48.53	73.98	25.45	PK
4874	33.29	0.00	4.11	H	37.40	53.98	16.58	AV
7311	39.31	0.00	12.33	H	51.64	73.98	22.34	PK
7311	27.56	0.00	12.33	H	39.89	53.98	14.09	AV

802.11ax HE20 MCS 0								
Band : DTS				Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11	2462	MHz		Transfer Rate : MCS 0			SU	
Frequency [MHz]	Measured value [dBμV]	Duty Cycle Factor [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4924	44.21	0.00	5.10	V	49.31	73.98	24.67	PK
4924	32.62	0.00	5.10	V	37.72	53.98	16.26	AV
7386	39.50	0.00	12.74	V	52.24	73.98	21.74	PK
7386	27.51	0.00	12.74	V	40.25	53.98	13.73	AV
4924	43.32	0.00	5.10	H	48.42	73.98	25.56	PK
4924	32.61	0.00	5.10	H	37.71	53.98	16.27	AV
7386	39.12	0.00	12.74	H	51.86	73.98	22.12	PK
7386	27.47	0.00	12.74	H	40.21	53.98	13.77	AV

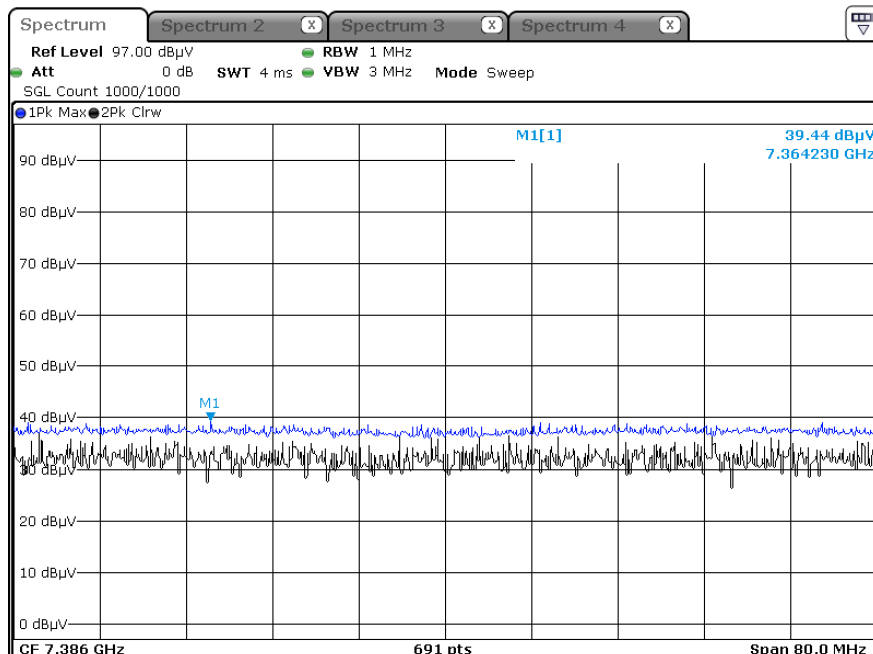
Test Plots(106T RU 53)

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

Radiated Spurious Emissions plot – Average result (802.11ax(HE20), Ch.11 3rd Harmonic, Y-H)



Radiated Spurious Emissions plot – Peak result (802.11ax(HE20), Ch.11 3rd Harmonic, Y-H)



9.7 RADIATED RESTRICTED BAND EDGES

[MIMO_CDD(Ant.1+Ant.2)]

1. 26 Tones

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

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
2390.0	24.56	0.00	34.73	H	59.29	73.98	14.69	PK
2390.0	10.71	0.00	34.73	H	45.44	53.98	8.54	AV
2390.0	23.84	0.00	34.73	V	58.57	73.98	15.41	PK
2390.0	10.44	0.00	34.73	V	45.17	53.98	8.81	AV

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

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
2483.5	24.29	0.00	35.59	H	59.88	73.98	14.10	PK
2483.5	10.38	0.00	35.59	H	45.97	53.98	8.01	AV
2483.5	23.62	0.00	35.59	V	59.21	73.98	14.77	PK
2483.5	9.86	0.00	35.59	V	45.45	53.98	8.53	AV

2. 52 Tones

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

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
2390.0	22.12	0.00	34.73	H	56.85	73.98	17.13	PK
2390.0	10.86	0.00	34.73	H	45.59	53.98	8.39	AV
2390.0	21.41	0.00	34.73	V	56.14	73.98	17.84	PK
2390.0	10.34	0.00	34.73	V	45.07	53.98	8.91	AV

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

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
2483.5	27.88	0.00	35.59	H	63.47	73.98	10.51	PK
2483.5	11.54	0.00	35.59	H	47.13	53.98	6.85	AV
2483.5	26.25	0.00	35.59	V	61.84	73.98	12.14	PK
2483.5	10.56	0.00	35.59	V	46.15	53.98	7.83	AV

3. 106 Tones

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

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
2390.0	27.64	0.00	34.73	H	62.37	73.98	11.61	PK
2390.0	12.53	0.00	34.73	H	47.26	53.98	6.72	AV
2390.0	25.62	0.00	34.73	V	60.35	73.98	13.63	PK
2390.0	11.17	0.00	34.73	V	45.90	53.98	8.08	AV

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

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
2483.5	28.07	0.00	35.59	H	63.66	73.98	10.32	PK
2483.5	11.31	0.00	35.59	H	46.90	53.98	7.08	AV
2483.5	26.12	0.00	35.59	V	61.71	73.98	12.27	PK
2483.5	10.56	0.00	35.59	V	46.15	53.98	7.83	AV

4. 242 Tones

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

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
#2380~2390	26.07	0.00	34.73	H	60.80	73.98	13.18	PK
#2380~2390	15.83	0.00	34.73	H	50.56	53.98	3.42	AV
2310~2380	21.88	0.00	34.73	H	56.61	73.98	17.37	PK
2310~2380	9.85	0.00	34.73	H	44.58	53.98	9.40	AV
#2380~2390	25.24	0.00	34.73	V	59.97	73.98	14.01	PK
#2380~2390	14.99	0.00	34.73	V	49.72	53.98	4.26	AV
2310~2380	21.43	0.00	34.73	V	56.16	73.98	17.82	PK
2310~2380	9.80	0.00	34.73	V	44.53	53.98	9.45	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	2417 MHz
Channel No.	2 Ch

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
2390.0	29.18	0.00	34.73	H	63.91	73.98	10.07	PK
2390.0	15.29	0.00	34.73	H	50.02	53.98	3.96	AV
2390.0	28.38	0.00	34.73	V	63.11	73.98	10.87	PK
2390.0	14.82	0.00	34.73	V	49.55	53.98	4.43	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
RU Index:	61
Operating Frequency	2457 MHz
Channel No.	10 Ch

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
#2483.5~2493.5	25.88	0.00	35.59	H	61.47	73.98	12.51	PK
#2483.5~2493.5	15.72	0.00	35.59	H	51.31	53.98	2.67	AV
2493.5~2500	21.36	0.00	35.59	H	56.95	73.98	17.03	PK
2493.5~2500	9.29	0.00	35.59	H	44.88	53.98	9.10	AV
#2483.5~2493.5	24.05	0.00	35.59	V	59.64	73.98	14.34	PK
#2483.5~2493.5	14.82	0.00	35.59	V	50.41	53.98	3.57	AV
2493.5~2500	20.87	0.00	35.59	V	56.46	73.98	17.52	PK
2493.5~2500	9.22	0.00	35.59	V	44.81	53.98	9.17	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	Measured Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
#2483.5~2493.5	25.88	0.00	35.59	H	61.47	73.98	12.51	PK
#2483.5~2493.5	15.54	0.00	35.59	H	51.13	53.98	2.85	AV
2493.5~2500	21.13	0.00	35.59	H	56.72	73.98	17.26	PK
2493.5~2500	9.32	0.00	35.59	H	44.91	53.98	9.07	AV
#2483.5~2493.5	25.07	0.00	35.59	V	60.66	73.98	13.32	PK
#2483.5~2493.5	14.42	0.00	35.59	V	50.01	53.98	3.97	AV
2493.5~2500	20.45	0.00	35.59	V	56.04	73.98	17.94	PK
2493.5~2500	9.25	0.00	35.59	V	44.84	53.98	9.14	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	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
#2380~2390	25.98	0.00	34.73	H	60.71	73.98	13.27	PK
#2380~2390	14.99	0.00	34.73	H	49.72	53.98	4.26	AV
2310~2380	22.44	0.00	34.73	H	57.17	73.98	16.81	PK
2310~2380	9.71	0.00	34.73	H	44.44	53.98	9.54	AV
#2380~2390	24.84	0.00	34.73	V	59.57	73.98	14.41	PK
#2380~2390	13.97	0.00	34.73	V	48.70	53.98	5.28	AV
2310~2380	21.32	0.00	34.73	V	56.05	73.98	17.93	PK
2310~2380	9.69	0.00	34.73	V	44.42	53.98	9.56	AV

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

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2417 MHz
Channel No.	2 Ch

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
2390.0	32.96	0.00	34.73	H	67.69	73.98	6.29	PK
2390.0	15.33	0.00	34.73	H	50.06	53.98	3.92	AV
2390.0	30.27	0.00	34.73	V	65.00	73.98	8.98	PK
2390.0	14.24	0.00	34.73	V	48.97	53.98	5.01	AV

Operation Mode: 802.11ax(HE20)

Transfer MCS Index: 0

Operating Frequency: 2457 MHz

Channel No. 10 Ch

Frequency	Measure d Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
#2483.5~2493.5	25.74	0.00	35.59	H	61.33	73.98	12.65	PK
#2483.5~2493.5	15.38	0.00	35.59	H	50.97	53.98	3.01	AV
2493.5~2500	22.07	0.00	35.59	H	57.66	73.98	16.32	PK
2493.5~2500	9.33	0.00	35.59	H	44.92	53.98	9.06	AV
#2483.5~2493.5	24.77	0.00	35.59	V	60.36	73.98	13.62	PK
#2483.5~2493.5	14.98	0.00	35.59	V	50.57	53.98	3.41	AV
2493.5~2500	21.21	0.00	35.59	V	56.80	73.98	17.18	PK
2493.5~2500	9.31	0.00	35.59	V	44.90	53.98	9.08	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	Measured Value	Duty Cycle Factor	A.F+C.L +D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
#2483.5~2493.5	25.14	0.00	35.59	H	60.73	73.98	13.25	PK
#2483.5~2493.5	14.64	0.00	35.59	H	50.23	53.98	3.75	AV
2493.5~2500	21.21	0.00	35.59	H	56.80	73.98	17.18	PK
2493.5~2500	9.32	0.00	35.59	H	44.91	53.98	9.07	AV
#2483.5~2493.5	24.12	0.00	35.59	V	59.71	73.98	14.27	PK
#2483.5~2493.5	13.62	0.00	35.59	V	49.21	53.98	4.77	AV
2493.5~2500	20.05	0.00	35.59	V	55.64	73.98	18.34	PK
2493.5~2500	9.29	0.00	35.59	V	44.88	53.98	9.10	AV

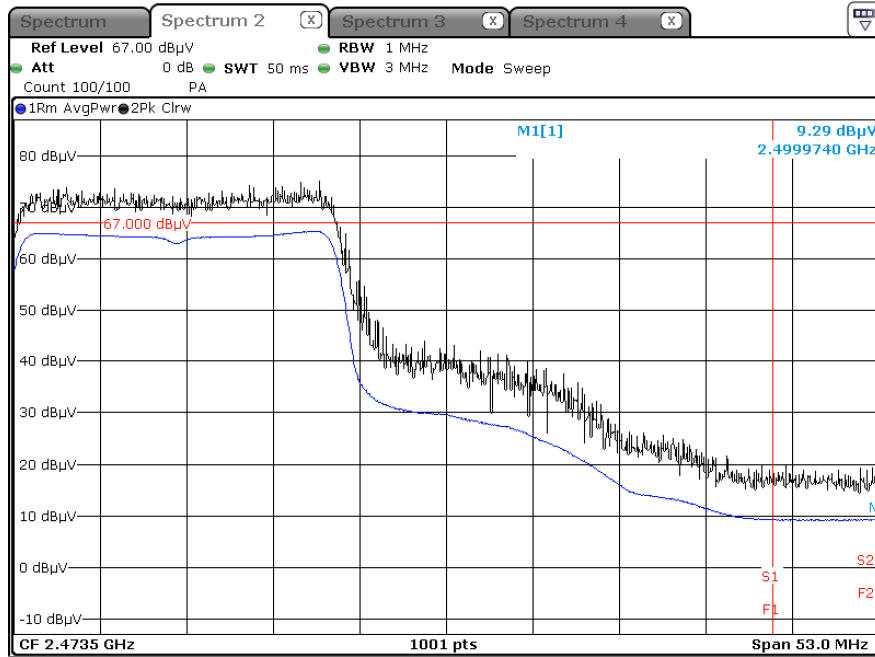
Note : # integration method Used (ANSI C63.10 Section11.13.3)

Test Plots

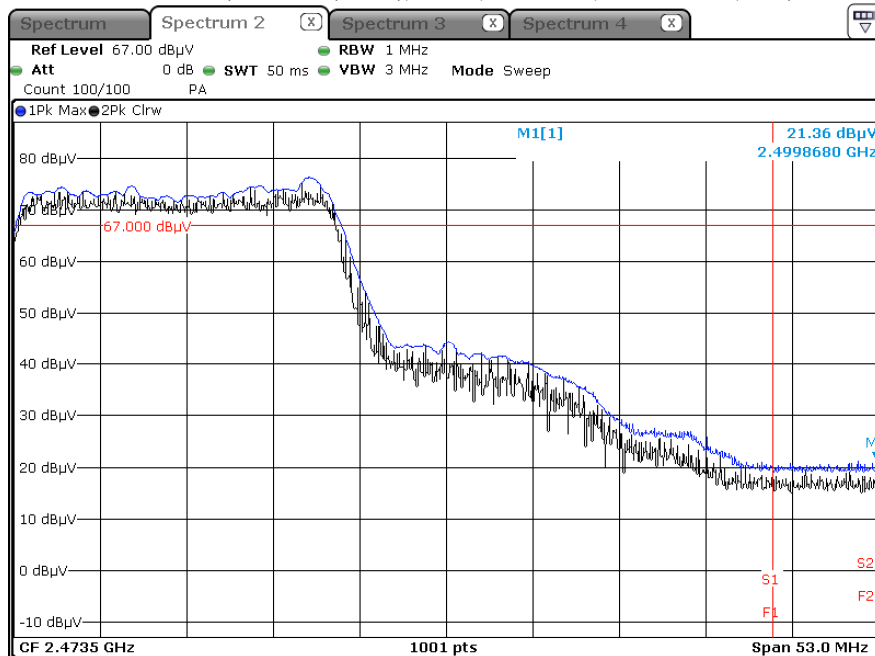
[MIMO_CDD(Ant.1+Ant.2)]

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

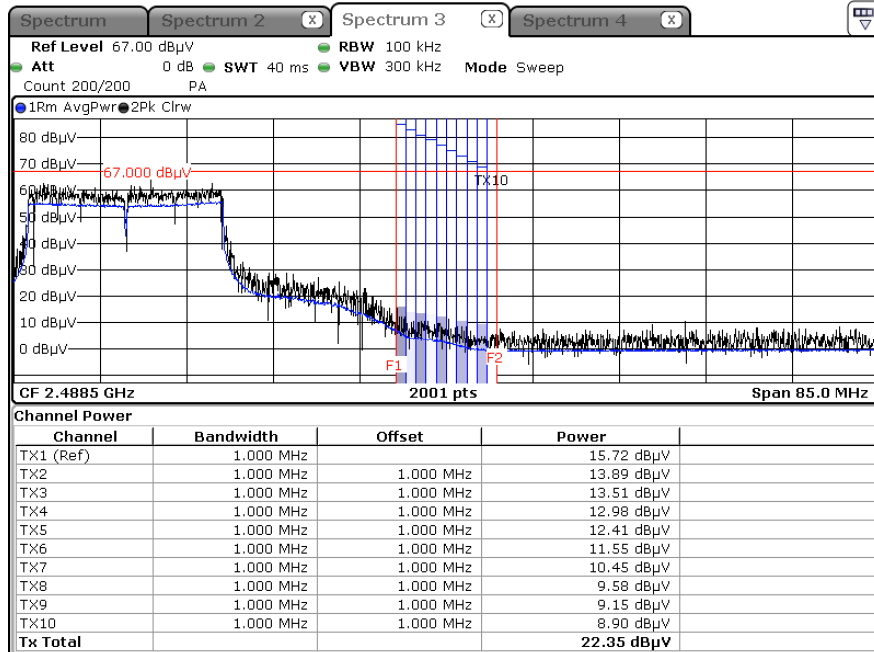
Average result(802.11ax(HE20), MCS0, 242 Tone, RU 61 ch.10, X-H)



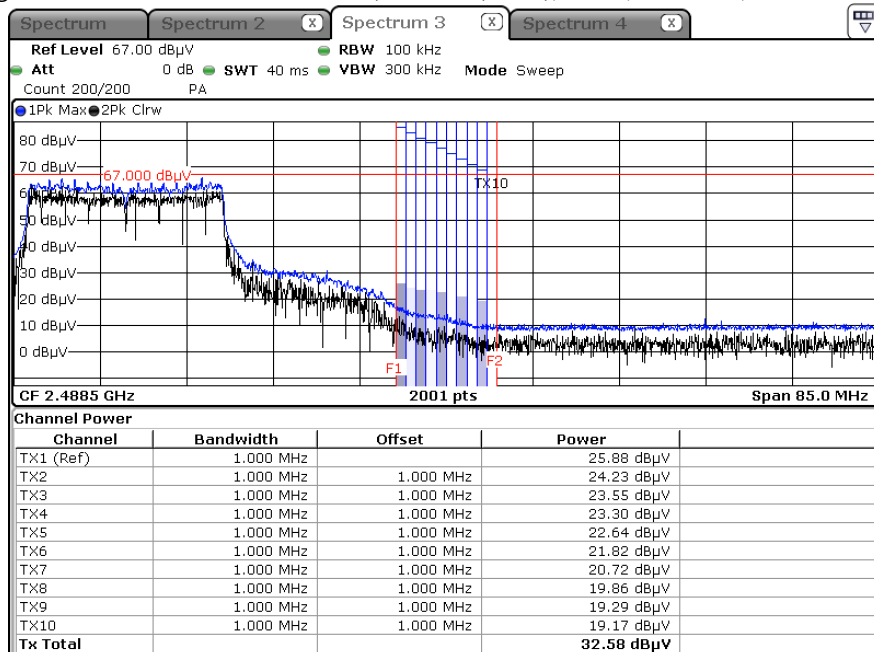
Peak result(802.11ax(HE20), MCS0, 242 Tone, RU 61 ch.10, X-H)



Integration method Used_ Average result(802.11ax(HE20), MCS0, 242 Tone, RU 61 ch.10, X-H)



Integration method Used_ Peak result(802.11ax(HE20), MCS0, 242 Tone, RU 61 ch.10, X-H)



10. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	07/17/2025	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	07/02/2025	Annual
Temperature Chamber	SU-642	ESPEC	0093008124	02/19/2025	Annual
Signal Analyzer	N9030A	Agilent	MY49431210	12/19/2024	Annual
Power Measurement Set	OSP 120	Rohde & Schwarz	100935	08/11/2024	Annual
Power Meter	N1911A	Agilent	MY45100523	02/28/2025	Annual
Power Sensor	N1921A	Agilent	MY57820067	02/22/2025	Annual
Directional Coupler	87300B	Agilent	3116A03621	10/30/2024	Annual
Power Splitter	11667B	Hewlett Packard	05001	04/17/2025	Annual
DC Power Supply	E3632A	H.P	KR75303243	04/19/2025	Annual
Attenuator(10 dB)	8493C	Hewlett Packard	07560	06/05/2025	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	S2AM	08/03/2025	Biennial
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	03/07/2026	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	760	02/24/2025	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	02299	01/29/2026	Biennial
Horn Antenna (15GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Spectrum Analyzer	FSV40	Rohde & Schwarz	100901	02/22/2025	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	06/04/2025	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	06/04/2025	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/02/2025	Annual
Band Reject Filter	WRCJV5100/5850-40/50-8EEK	Wainwright Instruments	1	02/14/2025	Annual
RF Switching System	FMSR-04B (3G HPF+LNA)	T&M SYSTEM	S2L1	12/27/2024	Annual
RF Switching System	FMSR-04B (10dB ATT+LNA)	T&M SYSTEM	S2L2	12/27/2024	Annual
RF Switching System	FMSR-04B (3dB ATT+LNA)	T&M SYSTEM	S2L3	12/27/2024	Annual
RF Switching System	FMSR-04B (LNA)	T&M SYSTEM	S2L4	12/27/2024	Annual
RF Switching System	FMSR-04B (7G HPF+LNA)	T&M SYSTEM	S2L5	12/27/2024	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/17/2024	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/26/2025	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-2407-FC047-P