TEST REPORT

FCC DTS ax Test for SM-S721B/DS
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2407-FC077

DATE OF ISSUE
July 24, 2024

Tested by
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Additional Model
SM-S721B

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-S721B/DS
FCC ID	A3LSMS721B
Average Output Power	SISO(Ant.1) : 15.58 dBm SISO(Ant.2) : 16.56 dBm MIMO_CDD (Ant.1+ Ant.2) : 19.11 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	June 24, 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).

CONTENTS

1. EUT DESCRIPTION

Model	SM-S721B/DS		
Additional Model	SM-S721B		
EUT Type	Mobile Phone		
Power Supply	DC 3.88 V		
Frequency Range	2 412 MHz ~ 2 472 MHz		
Max. RF Output Power	Peak Power	SISO(Ant.1)	25.12 dBm
		SISO(Ant.2)	25.99 dBm
		MIMO_CDD(Ant.1+ Ant.2)	28.53 dBm
	Average Power	SISO(Ant.1)	15.58 dBm
		SISO(Ant.2)	16.56 dBm
		MIMO_CDD(Ant.1+ Ant.2)	19.11 dBm
Modulation Type	OFDM, OFDMA		
Number of Channels	13 Channels		
Antenna Specification	Type: Metal		
Serial number	Conducted : R3CX503F4GT Radiated : R3CX40LGGTE		

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

3. Directional Gain Calculation

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

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

Directional gain(SDM) = Gmax + 10·LOG(N_{ANT}/ N_{ss})

Ant Gain (dBi)		N_{ANT}/ N_{ss}	Directional Gain (dBi)	
			CDD	SDM
ANT.1	-2.42	2/2	-0.20	-4.07
ANT.2	-4.07			

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.

Directional gain(CDD) = 10·log(((10$^{(ANT.0\ Gain/20)}$+10$^{(ANT.1\ Gain/20)}$)^2)/2) dBi

Directional gain(SDM) = Gmax + 10·log(N_{ANT}/ N_{ss})

Sample MIMO Calculation:

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

MIMO = ANT.1 + ANT.2

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

2. TEST METHODOLOGY

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

EUT CONFIGURATION

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

EUT EXERCISE

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

GENERAL TEST PROCEDURES

Conducted Emissions

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

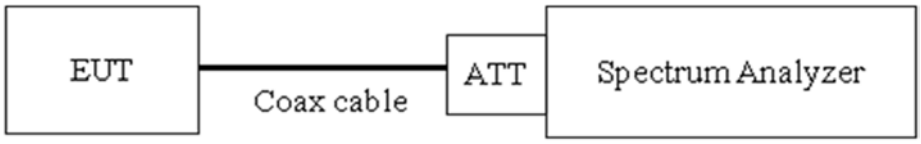
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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 ≤ 6.25 microseconds. (50/6.25 = 8)

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

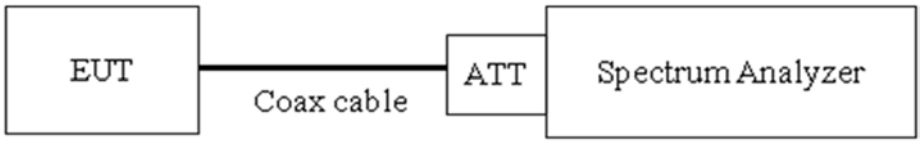
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Measurement Typeor = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

7.2. 6 dB Bandwidth

Limit

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

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

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

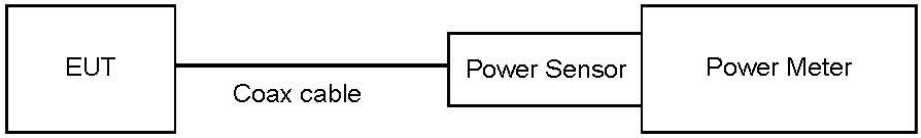
Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

7.3. Output Power

Limit

The maximum permissible conducted output power is 1 Watt.

Test Configuration



Test Procedure

The transmitter output is connected to the Power Meter.

- Peak Power (Procedure 11.9.1.3 in ANSI 63.10-2013)
  : Measure the peak power of the transmitter.

- Average Power (Procedure 11.9.2.3 in ANSI 63.10-2013)
  1) Measure the duty cycle.
  2) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
  3) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

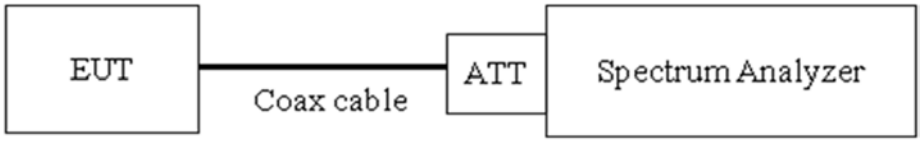
- Conducted Output Power(Peak) = Measured Value + ATT loss + Cable loss
- Conducted Output Power(Average) = Measured Value + ATT loss + Cable loss + Duty Cycle Factor

7.4. Power Spectral Density

Limit

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

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

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

The spectrum analyzer is set to :

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

Sample Calculation

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

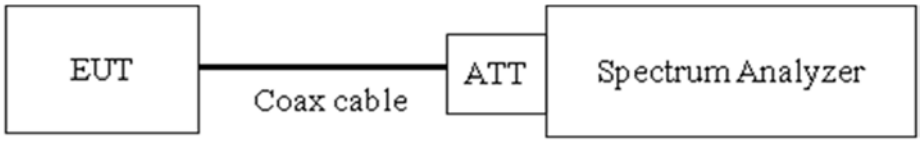
7.5. Conducted Band Edge (Out of Band Emissions) & Conducted Spurious Emissions

Limit

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

[Conducted > 30 dBc]

Test Configuration



Test Procedure

The transmitter output is connected to the spectrum analyzer.

(Procedure 11.11 in ANSI 63.10-2013)

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

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

Factors for frequency

Freq(MHz)	Factor(dB)
30	20.06
100	20.14
200	20.17
300	20.21
400	20.28
500	20.28
600	20.28
700	20.28
800	20.30
900	20.31
1000	20.35
2000	20.55
2400	20.62
2500	20.67
3000	20.74
4000	20.86
5000	20.84
6000	20.83
7000	20.93
8000	20.97
9000	21.09
10000	21.18
11000	21.27
12000	21.33
13000	21.33
14000	21.40
15000	21.49
16000	21.52
17000	21.55
18000	21.63
19000	21.65
20000	21.66
21000	21.76
22000	21.82
23000	21.86
24000	21.90
25000	21.92
26000	22.04

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

2. Factor = Attenuator loss + Cable loss

3. ANT1 Total Port offest = Attenuator loss + Cable loss = 20.62 dB

ANT2 Total Port offest = Attenuator loss + Cable loss + EUT cable loss(0.50 dB) = 21.12 dB

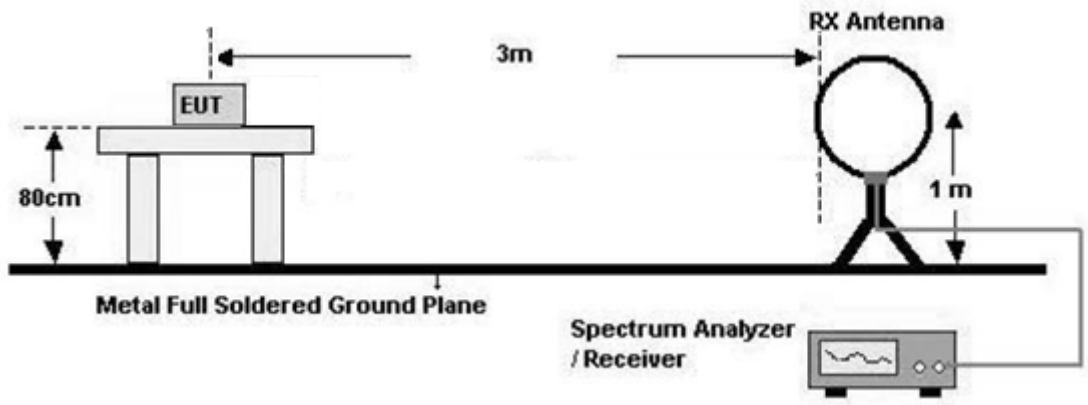
7.6. Radiated Test

Limit

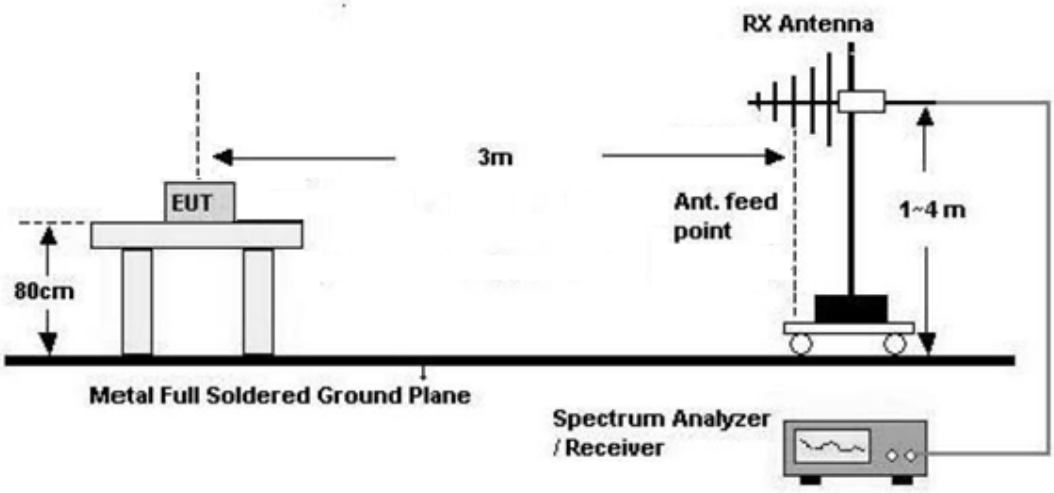
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

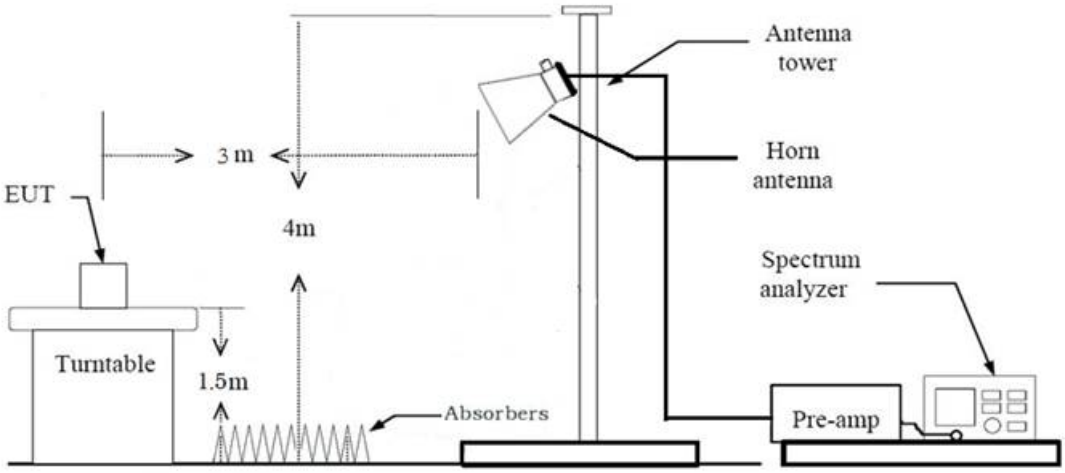
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions (Below 30 MHz)

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

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions (Below 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8 m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in Measurement Typeing 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
      - Measurement Typeor = Peak
      - Trace = Maxhold
      - RBW = 100 kHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Quasi-peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Measurement Typeor = 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 Measurement Typeing 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
- Measurement Typeor = Peak
- Trace = Maxhold
- RBW = 1 MHz
- VBW ≥ 3 x RBW

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

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

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

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

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

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

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

+ Duty Cycle Factor

Test Procedure of Radiated Restricted Band Edge

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in Measurement Typeing 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
      - Measurement Typeor = Peak
      - Trace = Maxhold
      - RBW = 1 MHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Average): Duty cycle ≥ 98 %,
      - Measured Frequency Range : 2310 MHz ~ 2390 MHz / 2483.5 MHz ~ 2500 MHz
      - Measurement Typeor = RMS
      - Averaging type = power (*i.e.*, RMS)
      - RBW = 1 MHz
      - VBW ≥ 3 x RBW
      - Sweep time = auto.
      - Trace mode = average (at least 100 traces).
   (3) Measurement Type(Average): Duty cycle < 98 %, duty cycle variations are less than ±2 %
      - Measured Frequency Range : 2310 MHz ~ 2390 MHz / 2483.5 MHz ~ 2500 MHz
      - Measurement Typeor = RMS
      - Averaging type = power (*i.e.*, RMS)
      - RBW = 1 MHz
      - VBW ≥ 3 x RBW
      - Sweep time = auto.

- Trace mode = average (at least 100 traces).
- Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 % duty cycle.
- Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.

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

7.7. AC Power line Conducted Emissions

Limit

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

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

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

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

Test Configuration

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

Test Procedure

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

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, 12, 13	0, 8
52	1, 11, 12, 13	37, 40
106	1, 11, 12, 13	53, 54
242	1, 11, 12, 13	61
SU	1, 11, 12, 13	-

3. SM-S721B/DS, SM-S721B were tested and the worst case results are reported.
(Worst case: SM-S721B/DS)

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 : Y
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

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

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

8. SM-S721B/DS, SM-S721B were tested and the worst case results are reported.
(Worst case: SM-S721B/DS)

Radiated test(RSDB)

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
   - Worstcase : Stand alone
2. EUT Axis
   - Radiated Spurious Emissions : X
3. All of RSDB Scenario were investigated and the worst case configuration results are reported.

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

4. The RSDB mode test investigated both intermodulation and radiated spurious emissions.
   And the worst results were reported.
   - Worst result: Radiated spurious emissions
   - Intermodulation: No signals are generated.
   - Radiated spurious emissions: cf. Section 9.6

5. The following tables show the worst case configurations determined during testing.

(Worst case: The lowest margin condition the channels and modes were selected for test.)

RSDB Scenario 1	Description	2.4GHz Emission	5 GHz Emission
2.4 GHz WiFi MIMO + 5 GHz WiFi MIMO	Antenna	Ant All	Ant All
	Channel	11	118
	Data Rate	MCS0	MCS0
	Mode	802.11ax(HE20)	802.11ax(HE40)
	Tone, RU	26T, 8	SU, -

Note : UNII ax RSDB Data refer to [UNII ax] Test Report

6. SM-S721B/DS, SM-S721B were tested and the worst case results are reported.

(Worst case: SM-S721B/DS)

AC Power line Conducted Emissions

1. Please refer to the [DTS] Test Report.

2. SM-S721B/DS, SM-S721B were tested and the worst case results are reported.

(Worst case: SM-S721B/DS)

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	4.579	4.603	0.995	0.023
		MCS1	4.564	4.590	0.994	0.025
		MCS2	3.501	3.526	0.993	0.031
		MCS3	2.642	2.668	0.991	0.041
		MCS4	1.783	1.809	0.986	0.061
		MCS5	1.353	1.378	0.982	0.081
		MCS6	1.213	1.239	0.980	0.090
		MCS7	1.102	1.127	0.978	0.099
		MCS8	0.925	0.950	0.973	0.117
		MCS9	0.841	0.866	0.971	0.129
	52	MCS0	4.568	4.590	0.995	0.022
		MCS1	2.640	2.668	0.990	0.046
		MCS2	1.786	1.809	0.987	0.055
		MCS3	1.350	1.376	0.982	0.081
		MCS4	0.925	0.950	0.973	0.117
		MCS5	0.707	0.732	0.965	0.153
		MCS6	0.664	0.689	0.963	0.163
		MCS7	0.659	0.684	0.963	0.164
		MCS8	0.659	0.684	0.963	0.164
		MCS9	0.654	0.679	0.963	0.165
	106	MCS0	2.488	2.513	0.990	0.044
		MCS1	1.277	1.302	0.981	0.085
		MCS2	0.874	0.899	0.972	0.124
		MCS3	0.673	0.697	0.966	0.148
		MCS4	0.621	0.646	0.961	0.174
		MCS5	0.616	0.640	0.961	0.172
		MCS6	0.611	0.636	0.960	0.177
		MCS7	0.611	0.636	0.960	0.177
		MCS8	0.611	0.636	0.960	0.177
		MCS9	0.605	0.631	0.960	0.178
	242	MCS0	1.120	1.145	0.978	0.097
		MCS1	0.603	0.628	0.960	0.179
		MCS2	0.595	0.621	0.959	0.181
		MCS3	0.595	0.621	0.959	0.181
		MCS4	0.600	0.626	0.960	0.179
		MCS5	0.595	0.621	0.959	0.181
		MCS6	0.593	0.618	0.959	0.182
		MCS7	0.593	0.618	0.959	0.182
		MCS8	0.595	0.621	0.959	0.181
		MCS9	0.595	0.621	0.959	0.181

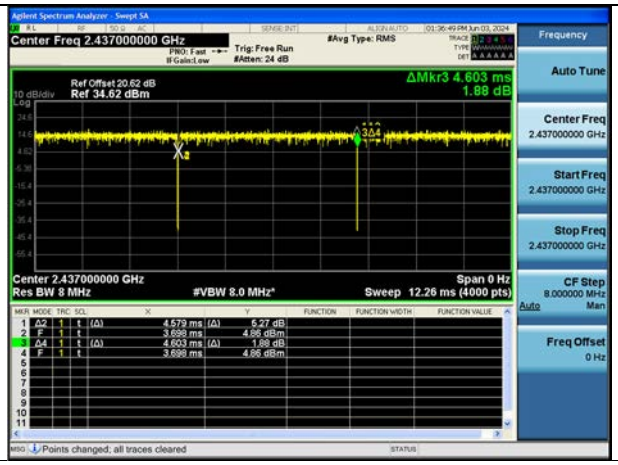
Mode	Tone (T)	Data Rate	On Time (ms)	Total Time (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ax(SU)	BW 20	MCS0	1.122	1.148	0.978	0.097
		MCS1	0.605	0.628	0.963	0.165
		MCS2	0.598	0.623	0.959	0.180
		MCS3	0.598	0.623	0.959	0.180
		MCS4	0.598	0.623	0.959	0.180
		MCS5	0.598	0.623	0.959	0.180
		MCS6	0.593	0.618	0.959	0.182
		MCS7	0.593	0.618	0.959	0.182
		MCS8	0.593	0.618	0.959	0.182
		MCS9	0.593	0.618	0.959	0.182

▣ Test Plots

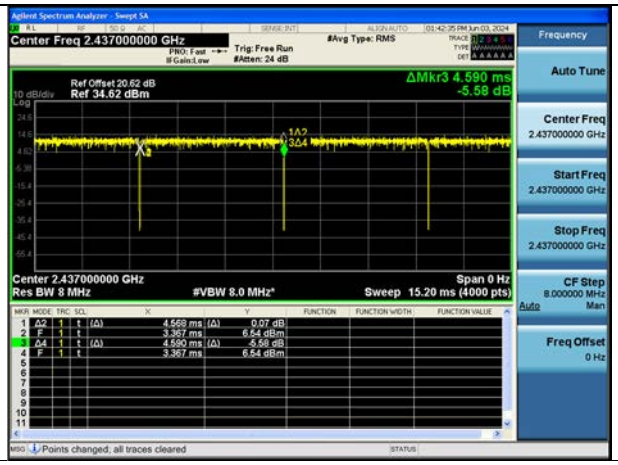
Note:

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

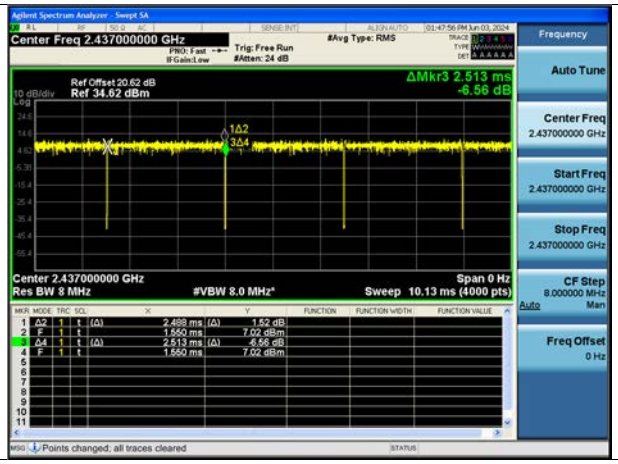
26 Tones (MCS 0)



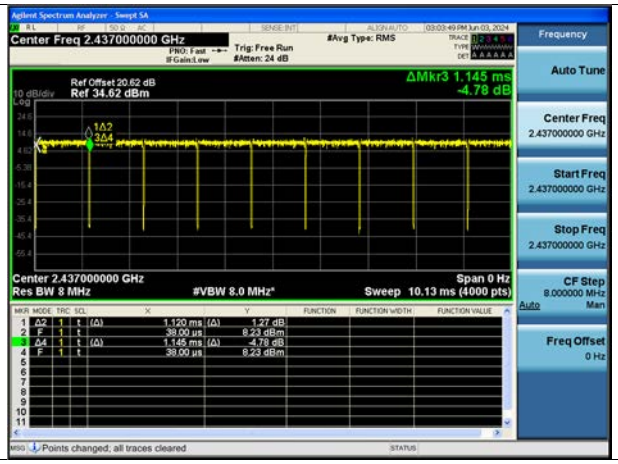
52 Tones (MCS 0)



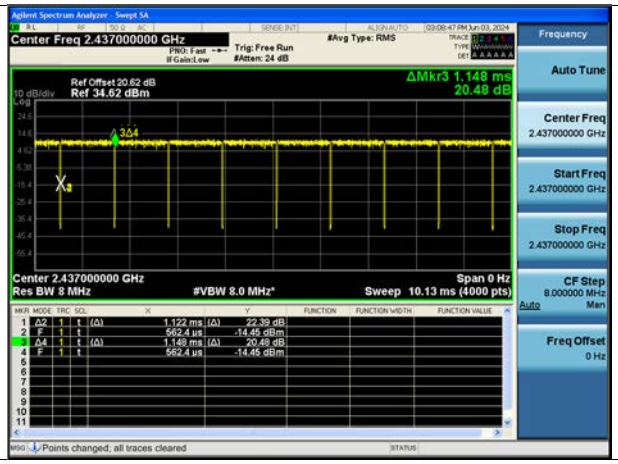
106 Tones (MCS 0)



242 Tones (MCS 0)



SU (MCS 0)



9.2 6 dB BANDWIDTH

Limit : > 500 kHz

[ANT.1]

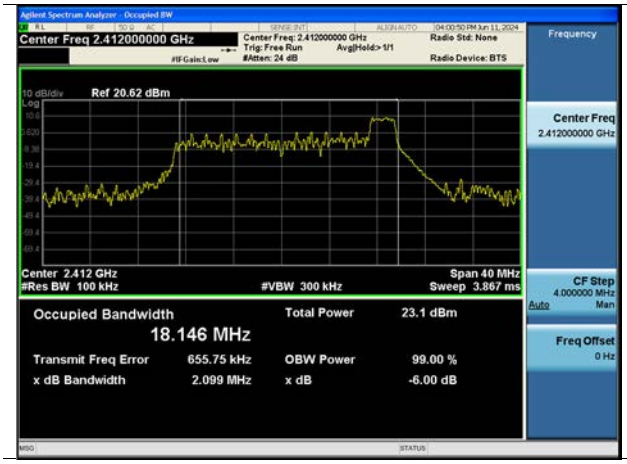
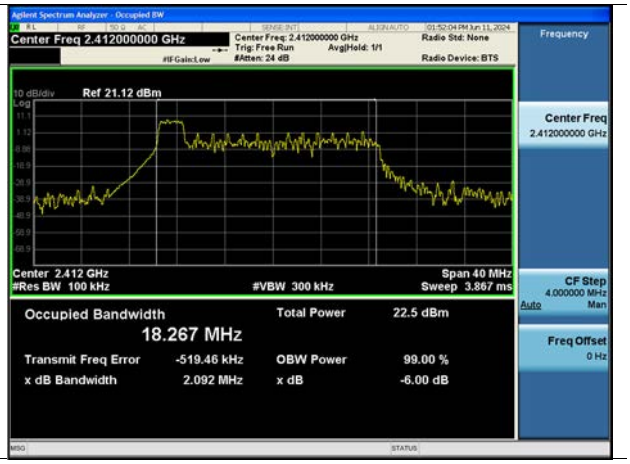
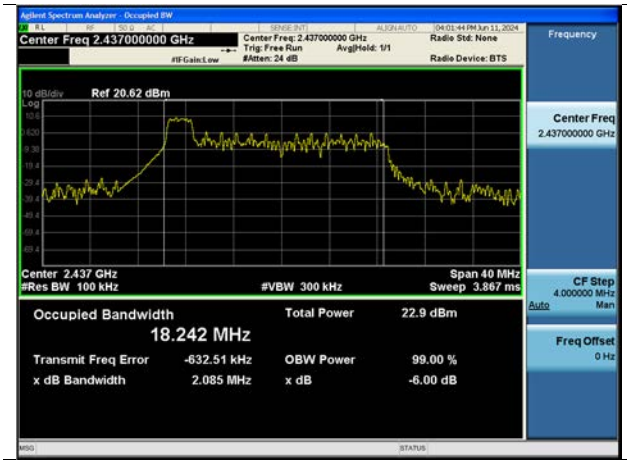
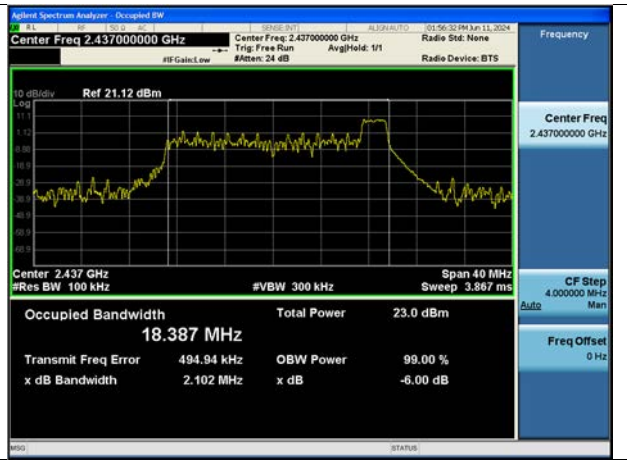
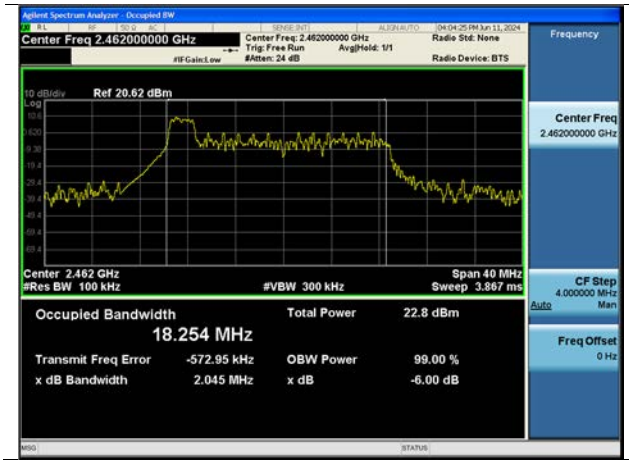
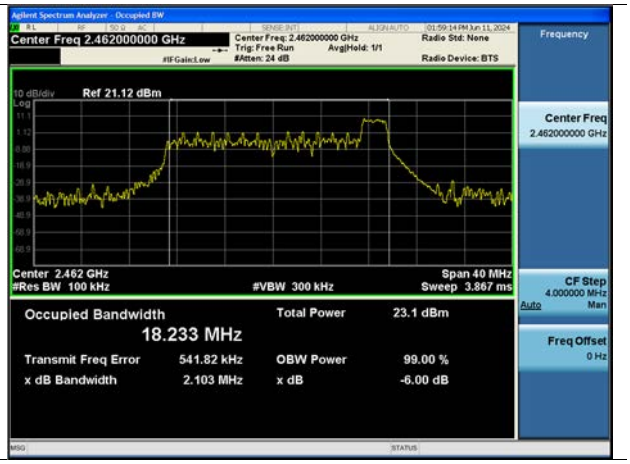
Mode	Freq. [MHz]	CH.	6dB Bandwidth [dBm]			99% Occupied Bandwidth [dBm]		
			RU Index : Low	RU Index : Mid	RU Index : High	RU Index : Low	RU Index : Mid	RU Index : High
			ANT 1	ANT 1	ANT 1	ANT 1	ANT 1	ANT 1
HE20 26T	2412	1	2.109	2.709	2.099	18.395	17.106	18.146
	2437	6	2.085	2.703	2.103	18.242	17.259	18.429
	2462	11	2.045	2.706	2.099	18.254	17.237	18.283
	2467	12	2.118	2.701	2.148	18.237	17.193	18.337
	2472	13	2.109	2.704	2.103	18.231	17.266	18.304
HE20 52T	2412	1	17.11	15.10	4.109	18.275	17.215	18.016
	2437	6	4.147	15.09	17.05	18.188	17.295	18.287
	2462	11	17.09	15.11	17.03	18.206	17.274	18.186
	2467	12	17.09	15.11	17.02	18.176	17.244	18.172
	2472	13	17.02	15.11	17.02	18.184	17.287	18.249
HE20 106T	2412	1	18.16	-	17.17	18.258	-	18.105
	2437	6	17.20	-	17.43	18.201	-	18.306
	2462	11	18.15	-	17.40	18.224	-	18.250
	2467	12	18.15	-	17.40	18.192	-	18.243
	2472	13	18.13	-	17.40	18.210	-	18.275
HE20 242T	2412	1	-	18.98	-	-	18.971	-
	2437	6	-	19.09	-	-	19.048	-
	2462	11	-	19.09	-	-	18.993	-
	2467	12	-	19.11	-	-	18.980	-
	2472	13	-	19.10	-	-	19.006	-
HE20 SU	2412	1	-	19.05	-	-	18.978	-
	2437	6	-	19.11	-	-	19.022	-
	2462	11	-	19.14	-	-	18.988	-
	2467	12	-	19.14	-	-	19.003	-
	2472	13	-	19.12	-	-	19.009	-

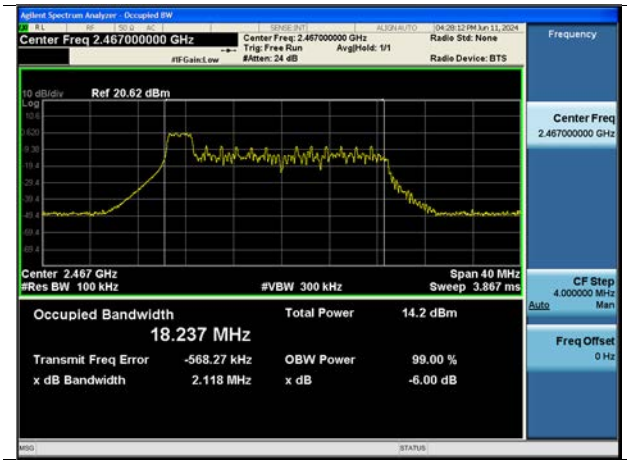
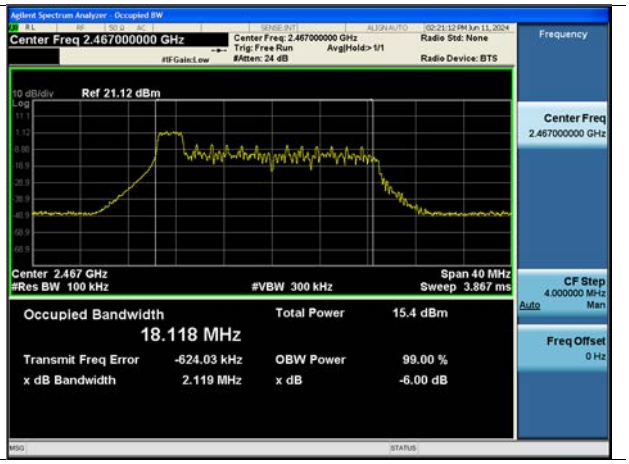
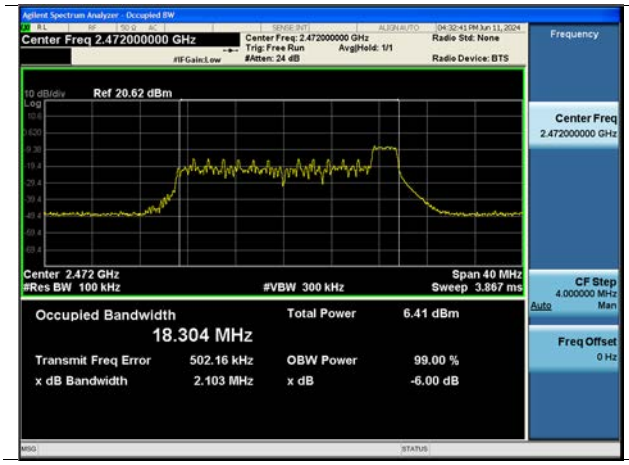
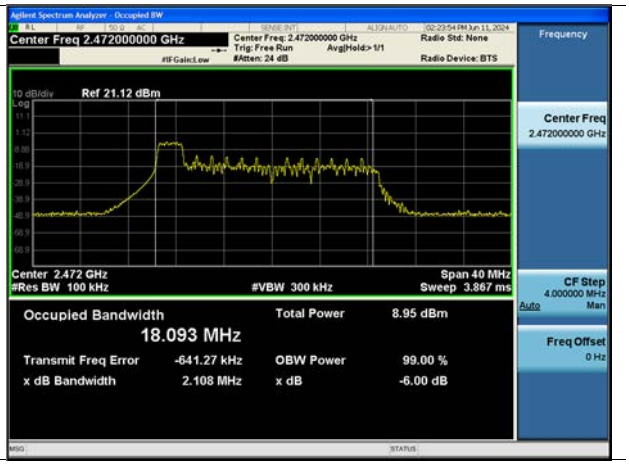
[ANT.2]

Mode	Freq. [MHz]	CH.	6dB Bandwidth [dBm]			99% Occupied Bandwidth [dBm]		
			RU Index : Low	RU Index : Mid	RU Index : High	RU Index : Low	RU Index : Mid	RU Index : High
			ANT 2	ANT 2	ANT 2	ANT 2	ANT 2	ANT 2
HE20 26T	2412	1	2.092	2.712	2.103	18.267	17.082	18.117
	2437	6	2.103	2.702	2.102	18.221	17.289	18.387
	2462	11	2.147	2.708	2.103	18.319	17.095	18.233
	2467	12	2.119	2.701	2.124	18.118	17.137	18.421
	2472	13	2.108	2.698	2.111	18.093	17.263	18.383
HE20 52T	2412	1	17.09	15.10	8.248	18.216	17.148	18.049
	2437	6	17.09	15.11	17.04	18.180	17.301	18.264
	2462	11	17.08	15.11	17.02	18.160	17.154	18.126
	2467	12	12.06	12.57	17.05	18.103	17.172	18.249
	2472	13	4.545	8.867	17.07	18.115	17.261	18.312
HE20 106T	2412	1	18.15	-	17.18	18.211	-	18.131
	2437	6	17.20	-	17.44	18.205	-	18.311
	2462	11	17.19	-	17.40	18.156	-	18.252
	2467	12	17.17	-	17.41	18.122	-	18.260
	2472	13	17.18	-	18.37	18.147	-	18.317
HE20 242T	2412	1	-	18.99	-	-	18.965	-
	2437	6	-	19.08	-	-	19.023	-
	2462	11	-	19.04	-	-	18.979	-
	2467	12	-	19.06	-	-	18.956	-
	2472	13	-	19.06	-	-	19.005	-
HE20 SU	2412	1	-	19.06	-	-	18.974	-
	2437	6	-	19.12	-	-	19.030	-
	2462	11	-	19.10	-	-	18.978	-
	2467	12	-	19.08	-	-	18.980	-
	2472	13	-	19.08	-	-	19.014	-

▣ Test Plots

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

ANT.1	ANT.2
BW20M Ch.1(2412 MHz) RU 8	BW20M Ch.1(2412 MHz) RU 0
	
BW20M Ch.6(2437 MHz) RU 0	BW20M Ch.6(2437 MHz) RU 8
	
BW20M Ch.11(2462 MHz) RU 0	BW20M Ch.11(2462 MHz) RU 8
	

ANT.1	ANT.2
BW20M Ch.12(2467 MHz) RU 0	BW20M Ch.12(2467 MHz) RU 0
	
BW20M Ch.13(2472 MHz) RU 8	BW20M Ch.13(2472 MHz) RU 0
	

9.3 OUTPUT POWER

Limit : 30 dBm

Peak Power

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

Note:

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

Mode	Freq. [MHz]	CH.	Total Peak Power [dBm]								
			RU Index : Low			RU Index : Low			RU Index : Low		
			ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
HE20 26T	2412	1	23.31	23.69	26.51	22.88	23.79	26.37	23.56	24.20	26.90
	2437	6	22.74	23.72	26.27	21.97	23.12	25.54	22.26	23.44	25.83
	2462	11	23.39	24.45	26.93	22.99	24.23	26.66	23.35	24.14	26.77
	2467	12	15.27	16.58	18.98	14.79	16.06	18.48	15.22	15.95	18.61
	2472	13	7.40	10.09	11.96	6.87	8.95	11.05	7.43	9.04	11.32
HE20 52T	2412	1	23.70	24.64	27.21	23.87	24.61	27.24	24.49	24.89	27.71
	2437	6	23.43	24.49	27.00	23.12	23.98	26.58	22.93	24.03	26.51
	2462	11	24.05	25.31	27.73	23.89	25.06	27.52	23.97	24.96	27.47
	2467	12	15.09	16.45	18.81	14.97	16.32	18.70	14.95	15.68	18.34
	2472	13	7.25	9.95	11.82	7.09	9.50	11.47	7.15	8.80	11.06
HE20 106T	2412	1	24.70	25.45	28.10	-	-	-	25.12	25.66	28.41
	2437	6	24.15	25.01	27.61	-	-	-	23.75	24.79	27.31
	2462	11	24.93	25.88	28.44	-	-	-	24.88	25.73	28.33
	2467	12	14.87	16.19	18.59	-	-	-	14.73	15.68	18.24
	2472	13	6.97	9.57	11.48	-	-	-	6.90	8.74	10.92
HE20 242T	2412	1	-	-	-	23.32	24.06	26.69	-	-	-
	2437	6	-	-	-	23.29	24.03	26.63	-	-	-
	2462	11	-	-	-	20.21	21.54	23.87	-	-	-
	2467	12	-	-	-	13.30	14.32	16.80	-	-	-
	2472	13	-	-	-	5.50	7.48	9.59	-	-	-
HE20 SU	2412	1	-	-	-	24.13	24.85	27.51	-	-	-
	2437	6	-	-	-	25.01	25.99	28.53	-	-	-
	2462	11	-	-	-	22.05	23.18	25.66	-	-	-
	2467	12	-	-	-	13.83	15.11	17.52	-	-	-
	2472	13	-	-	-	6.08	8.26	10.32	-	-	-

Average Power

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

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

Mode	Freq. [MHz]	CH.	Total Average Power [dBm]								
			RU Index : Low			RU Index : Low			RU Index : Low		
			ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
HE20 26T	2412	1	12.05	12.61	15.35	12.40	13.02	15.73	13.32	13.68	16.51
	2437	6	12.37	13.17	15.80	11.40	12.16	14.81	11.56	12.38	15.00
	2462	11	12.78	13.62	16.23	12.49	13.57	16.08	12.78	13.48	16.16
	2467	12	4.77	5.98	8.43	4.26	5.65	8.02	4.65	5.03	7.86
	2472	13	-3.10	-0.18	1.62	-3.49	-1.47	0.64	-3.05	-1.77	0.65
HE20 52T	2412	1	12.99	13.79	16.42	13.37	14.01	16.71	14.22	14.56	17.40
	2437	6	13.07	14.01	16.58	12.70	13.59	16.18	12.43	13.43	15.97
	2462	11	13.66	14.70	17.22	13.51	14.69	17.15	13.62	14.46	17.07
	2467	12	4.67	5.99	8.39	4.50	5.97	8.31	4.57	5.10	7.85
	2472	13	-3.00	-0.21	1.63	-3.27	-0.85	1.12	-3.07	-1.80	0.62
HE20 106T	2412	1	14.08	14.80	17.46	-	-	-	15.03	15.44	18.25
	2437	6	13.89	14.72	17.34	-	-	-	13.33	14.17	16.78
	2462	11	14.53	15.47	18.04	-	-	-	14.53	15.34	17.96
	2467	12	4.69	5.98	8.39	-	-	-	4.43	5.18	7.83
	2472	13	-3.27	-0.59	1.29	-	-	-	-3.30	-1.89	0.47
HE20 242T	2412	1	-	-	-	14.48	15.07	17.79	-	-	-
	2437	6	-	-	-	14.41	15.08	17.77	-	-	-
	2462	11	-	-	-	11.36	12.48	14.96	-	-	-
	2467	12	-	-	-	4.34	5.49	7.96	-	-	-
	2472	13	-	-	-	-3.38	-1.18	0.87	-	-	-
HE20 SU	2412	1	-	-	-	14.67	15.41	18.07	-	-	-
	2437	6	-	-	-	15.58	16.56	19.11	-	-	-
	2462	11	-	-	-	12.66	13.73	16.24	-	-	-
	2467	12	-	-	-	4.43	5.64	8.09	-	-	-
	2472	13	-	-	-	-3.26	-1.09	0.97	-	-	-

9.4 POWER SPECTRAL DENSITY

Limit : 8 dBm/3kHz

Note :

1. MIMO Total PSD = 10·log(((10^(Ant.1 PSD /10))+(10^(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 : Low			RU Index : Low		
			ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
HE20 26T	2412	1	-4.400	-4.036	-1.204	-4.387	-3.626	-0.979	-3.552	-2.927	-0.218
	2437	6	-3.900	-3.277	-0.567	-5.518	-4.905	-2.190	-5.461	-4.298	-1.830
	2462	11	-3.891	-3.012	-0.419	-4.507	-3.261	-0.829	-3.581	-3.510	-0.535
	2467	12	-11.668	-10.271	-7.903	-12.471	-11.266	-8.816	-12.177	-11.942	-9.047
	2472	13	-20.045	-16.741	-15.075	-20.649	-18.335	-16.329	-20.141	-18.786	-16.400
HE20 52T	2412	1	-6.033	-5.383	-2.686	-5.535	-4.894	-2.192	-4.914	-4.273	-1.571
	2437	6	-5.172	-4.655	-1.896	-6.224	-4.613	-2.334	-6.821	-5.741	-3.237
	2462	11	-4.632	-4.421	-1.515	-5.015	-3.618	-1.250	-5.310	-4.467	-1.858
	2467	12	-14.069	-13.045	-10.517	-14.156	-12.447	-10.208	-14.018	-13.539	-10.762
	2472	13	-22.079	-18.921	-17.209	-21.561	-18.781	-16.942	-22.172	-20.962	-18.515
HE20 106T	2412	1	-7.814	-7.559	-4.674	-	-	-	-7.133	-6.449	-3.767
	2437	6	-7.913	-7.129	-4.493	-	-	-	-8.723	-7.644	-5.140
	2462	11	-7.439	-6.306	-3.825	-	-	-	-7.471	-7.010	-4.224
	2467	12	-17.498	-16.269	-13.830	-	-	-	-17.565	-17.249	-14.394
	2472	13	-25.602	-22.449	-20.735	-	-	-	-25.514	-24.318	-21.865
HE20 242T	2412	1	-	-	-	-10.124	-9.735	-6.915	-	-	-
	2437	6	-	-	-	-10.688	-9.857	-7.242	-	-	-
	2462	11	-	-	-	-13.410	-12.559	-9.953	-	-	-
	2467	12	-	-	-	-20.892	-19.604	-17.190	-	-	-
	2472	13	-	-	-	-29.202	-25.853	-24.202	-	-	-
HE20 SU	2412	1	-	-	-	-11.452	-10.741	-8.072	-	-	-
	2437	6	-	-	-	-10.269	-9.329	-6.764	-	-	-
	2462	11	-	-	-	-13.593	-12.643	-10.082	-	-	-
	2467	12	-	-	-	-22.047	-20.241	-18.041	-	-	-
	2472	13	-	-	-	-29.679	-26.813	-25.004	-	-	-

▣ Test Plots

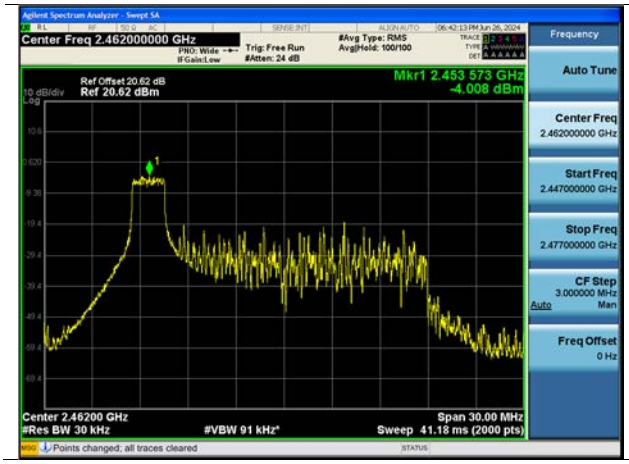
Note: In order to simplify the report, attached plots were only the worst case PSD channel.

ANT.1	ANT.2

BW20M Ch.1(2412 MHz) RU 8

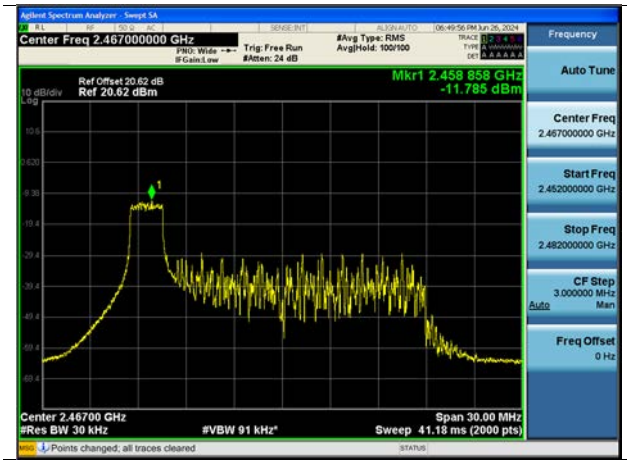
BW20M Ch.6(2437 MHz) RU 0

BW20M Ch.11(2462 MHz) RU 0

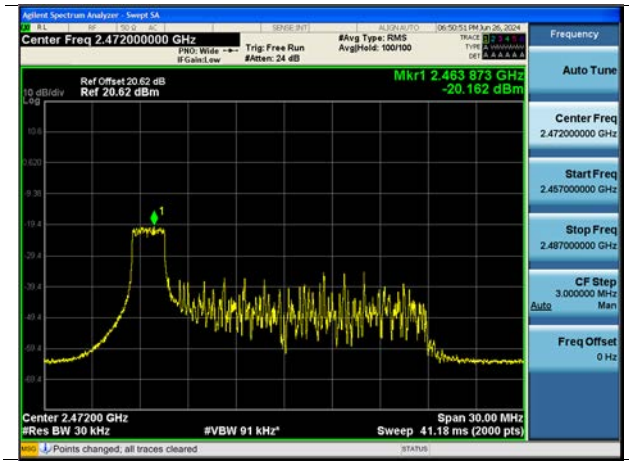


ANT.1	ANT.2

BW20M Ch.12(2467 MHz) RU 0



BW20M Ch.13(2472 MHz) RU 0



9.5 BAND EDGE / CONDUCTED SPURIOUS EMISSIONS

Band Edge

Limit : 30 dBc

[ANT.1]

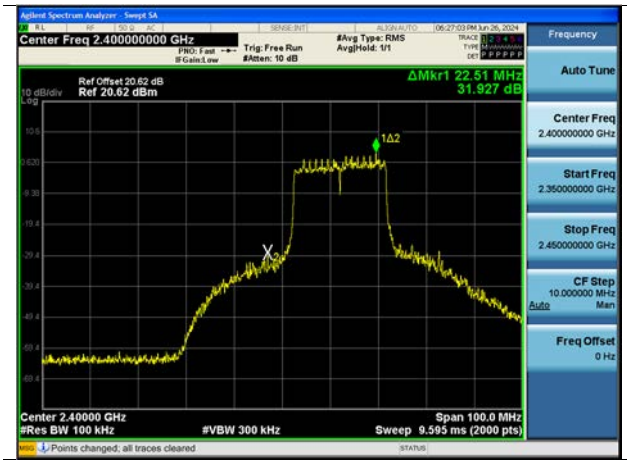
Mode	Freq. [MHz]	CH.	RU Position	Measured Position	Band edge[dB]
HE20 26T	2412	1	Low	Lowest Bandedge	37.309
	2462	11	High	Highest Bandedge	48.321
	2467	12	High	Highest Bandedge	59.860
	2472	13	High	Highest Bandedge	33.633
HE20 52T	2412	1	Low	Lowest Bandedge	32.382
	2462	11	High	Highest Bandedge	46.346
	2467	12	High	Highest Bandedge	58.270
	2472	13	High	Highest Bandedge	36.702
HE20 106T	2412	1	Low	Lowest Bandedge	32.482
	2462	11	High	Highest Bandedge	42.126
	2467	12	High	Highest Bandedge	53.690
	2472	13	High	Highest Bandedge	33.064
HE20 242T	2412	1	Low	Lowest Bandedge	31.927
	2462	11	High	Highest Bandedge	37.141
	2467	12	High	Highest Bandedge	51.969
	2472	13	High	Highest Bandedge	33.408
HE20 SU	2412	1	Low	Lowest Bandedge	36.326
	2462	11	High	Highest Bandedge	48.950
	2467	12	High	Highest Bandedge	51.803
	2472	13	High	Highest Bandedge	32.802

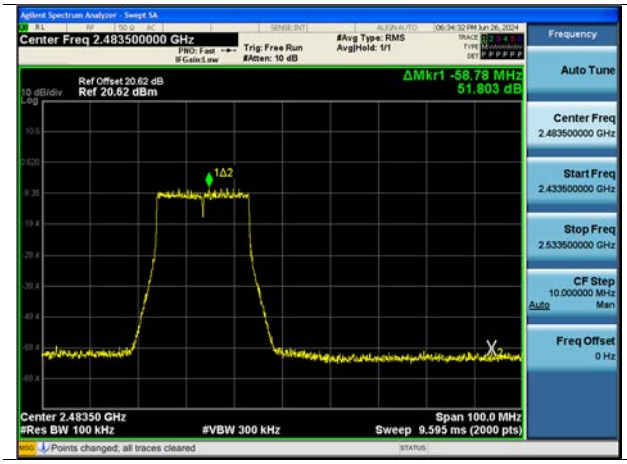
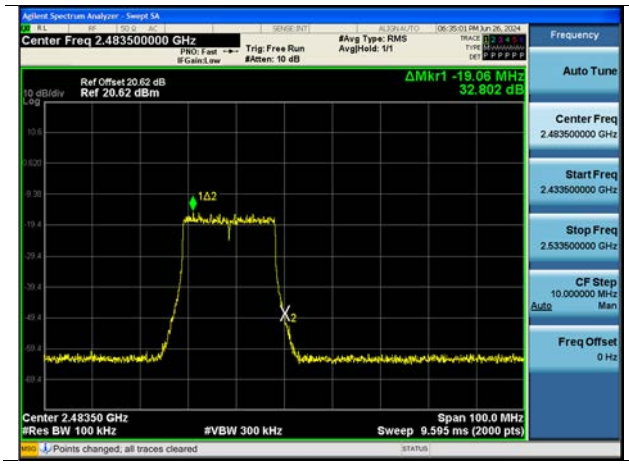
[ANT.2]

Mode	Freq. [MHz]	CH.	RU Position	Measured Position	Band edge[dB]
HE20 26T	2412	1	Low	Lowest Bandedge	38.958
	2462	11	High	Highest Bandedge	57.492
	2467	12	High	Highest Bandedge	57.944
	2472	13	High	Highest Bandedge	33.102
HE20 52T	2412	1	Low	Lowest Bandedge	38.074
	2462	11	High	Highest Bandedge	53.101
	2467	12	High	Highest Bandedge	54.426
	2472	13	High	Highest Bandedge	35.697
HE20 106T	2412	1	Low	Lowest Bandedge	35.982
	2462	11	High	Highest Bandedge	44.862
	2467	12	High	Highest Bandedge	50.847
	2472	13	High	Highest Bandedge	33.089
HE20 242T	2412	1	Low	Lowest Bandedge	36.052
	2462	11	High	Highest Bandedge	42.335
	2467	12	High	Highest Bandedge	49.765
	2472	13	High	Highest Bandedge	34.814
HE20 SU	2412	1	Low	Lowest Bandedge	34.341
	2462	11	High	Highest Bandedge	40.243
	2467	12	High	Highest Bandedge	44.671
	2472	13	High	Highest Bandedge	35.451

▣ Test Plots

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

[ANT.1]	[ANT.2]
BW 20M Ch.1(2412 MHz) 242T RU 61	BW 20M Ch.1(2412 MHz) SU
	
BW 20M Ch.11(2462 MHz) 242T RU 61	BW 20M Ch.11(2462 MHz) SU
	

[ANT.1]	[ANT.2]
BW 20M Ch.12(2467 MHz) SU	BW 20M Ch.12(2467 MHz) SU
	
BW 20M Ch.13(2472 MHz) SU	BW 20M Ch.13(2472 MHz) 106T RU 54
	

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	53.919	53.750	55.606
	2437	6	54.201	52.483	52.697
	2462	11	53.112	54.672	55.044
	2467	12	47.397	46.998	46.902
	2472	13	38.025	37.937	38.307
HE20 52T	2412	1	53.212	52.904	53.622
	2437	6	53.440	53.319	52.024
	2462	11	53.212	52.999	53.521
	2467	12	44.446	44.660	43.252
	2472	13	37.134	35.461	36.197
HE20 106T	2412	1	49.303	-	51.776
	2437	6	49.790	-	49.439
	2462	11	49.708	-	49.290
	2467	12	40.694	-	39.278
	2472	13	32.069	-	32.128
HE20 242T	2412	1	-	49.501	-
	2437	6	-	49.293	-
	2462	11	-	44.825	-
	2467	12	-	39.332	-
	2472	13	-	34.517	-
HE20 SU	2412	1	-	48.538	-
	2437	6	-	50.105	-
	2462	11	-	46.693	-
	2467	12	-	38.470	-
	2472	13	-	35.782	-

[ANT.2]

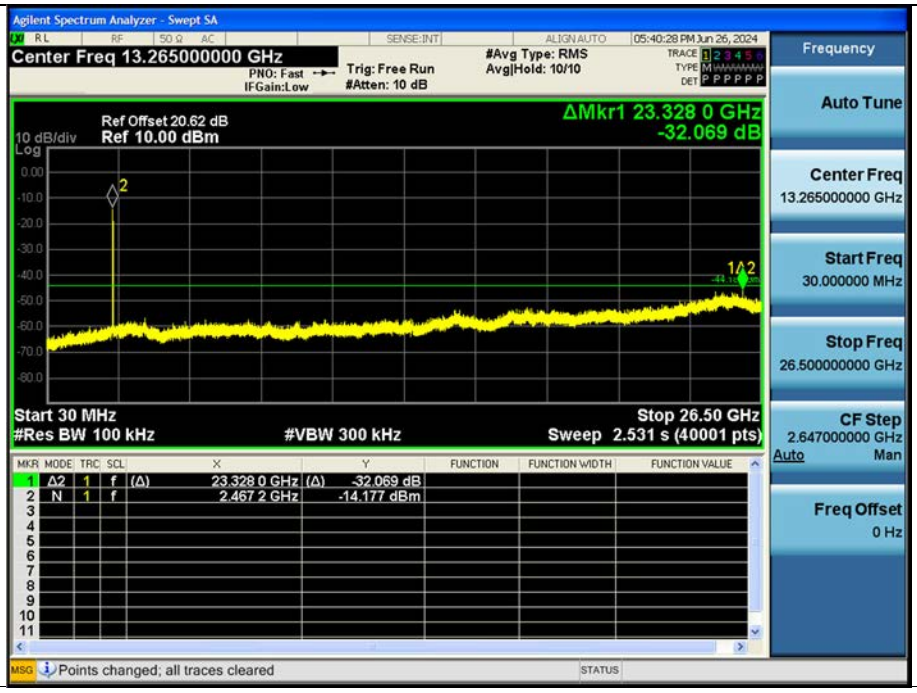
Mode	Freq. [MHz]	CH.	Conducted Spurious Emissions [dB]		
			RU Index : Low	RU Index : Mid	RU Index : High
			ANT2	ANT2	ANT2
HE20 26T	2412	1	54.321	53.316	55.314
	2437	6	54.357	52.951	53.601
	2462	11	55.172	54.788	54.782
	2467	12	46.906	46.727	45.952
	2472	13	41.248	37.972	38.472
HE20 52T	2412	1	52.309	52.655	53.170
	2437	6	53.525	52.344	52.815
	2462	11	54.242	54.406	53.075
	2467	12	44.605	44.819	44.464
	2472	13	38.955	38.030	36.898
HE20 106T	2412	1	50.308	-	49.805
	2437	6	50.601	-	47.897
	2462	11	50.774	-	50.713
	2467	12	41.355	-	39.882
	2472	13	33.913	-	34.007
HE20 242T	2412	1	-	48.651	-
	2437	6	-	49.717	-
	2462	11	-	47.231	-
	2467	12	-	39.439	-
	2472	13	-	32.962	-
HE20 SU	2412	1	-	49.045	-
	2437	6	-	48.327	-
	2462	11	-	48.273	-
	2467	12	-	39.703	-
	2472	13	-	32.994	-

▣ Test Plots

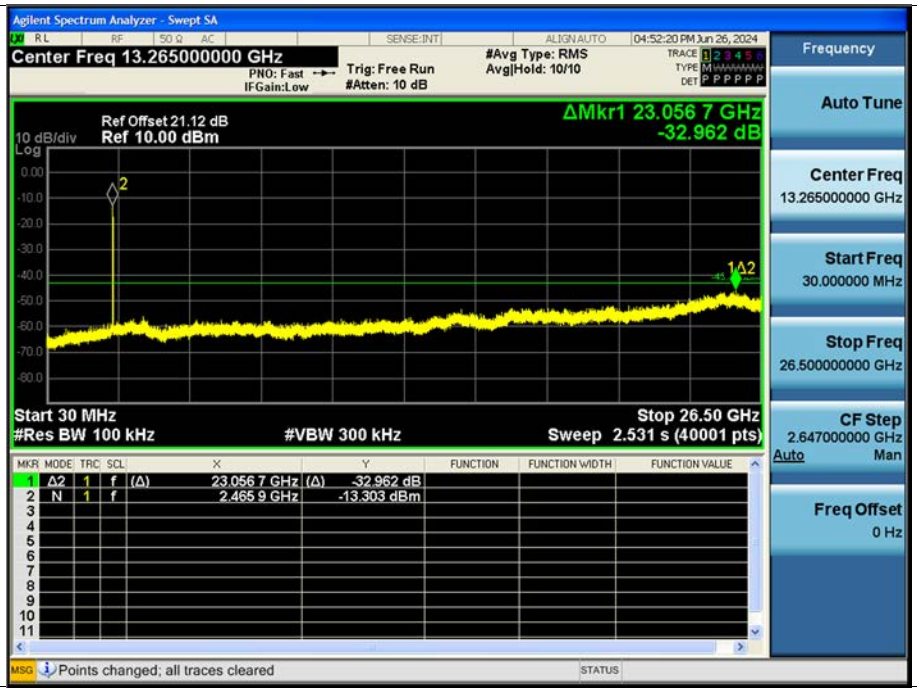
Note:

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

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



[ANT.2] BW20M Ch.13(2 472 MHz) 242T RU 61



9.6 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30 MHz

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

Note:

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

Frequency Range : Below 1 GHz

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

Note:

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

Frequency Range : Above 1 GHz

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

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.1	2412		MHz	Transfer Rate : MCS 0			**26T**	**0**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4824	41.58	0.00	4.99	V	46.57	73.98	27.41	PK
4824	29.96	0.02	4.99	V	34.97	53.98	19.01	AV
7236	39.39	0.00	12.93	V	52.32	73.98	21.66	PK
7236	26.61	0.02	12.93	V	39.56	53.98	14.42	AV
4824	42.11	0.00	4.99	H	47.10	73.98	26.88	PK
4824	29.63	0.02	4.99	H	34.64	53.98	19.34	AV
7236	38.76	0.00	12.93	H	51.69	73.98	22.29	PK
7236	26.42	0.02	12.93	H	39.37	53.98	14.61	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.6	2437		MHz	Transfer Rate : MCS 0			**26T**	**0**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4874	41.63	0.00	5.25	V	46.88	73.98	27.10	PK
4874	29.85	0.02	5.25	V	35.12	53.98	18.86	AV
7311	38.46	0.00	12.82	V	51.28	73.98	22.70	PK
7311	26.45	0.02	12.82	V	39.29	53.98	14.69	AV
4874	41.75	0.00	5.25	H	47.00	73.98	26.98	PK
4874	29.49	0.02	5.25	H	34.76	53.98	19.22	AV
7311	39.23	0.00	12.82	H	52.05	73.98	21.93	PK
7311	26.30	0.02	12.82	H	39.14	53.98	14.84	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11	2462		MHz	Transfer Rate : MCS 0			**26T**	**0**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4924	41.98	0.00	5.45	V	47.43	73.98	26.55	PK
4924	29.60	0.02	5.45	V	35.07	53.98	18.91	AV
7386	39.16	0.00	12.63	V	51.79	73.98	22.19	PK
7386	26.68	0.02	12.63	V	39.33	53.98	14.65	AV
4924	41.88	0.00	5.45	H	47.33	73.98	26.65	PK
4924	29.44	0.02	5.45	H	34.91	53.98	19.07	AV
7386	38.93	0.00	12.63	H	51.56	73.98	22.42	PK
7386	26.68	0.02	12.63	H	39.33	53.98	14.65	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.1	2412		MHz	Transfer Rate : MCS 0			**26T**	**4**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4824	42.06	0.00	4.99	V	47.05	73.98	26.93	PK
4824	29.44	0.02	4.99	V	34.45	53.98	19.53	AV
7236	39.50	0.00	12.93	V	52.43	73.98	21.55	PK
7236	26.66	0.02	12.93	V	39.61	53.98	14.37	AV
4824	41.83	0.00	4.99	H	46.82	73.98	27.16	PK
4824	29.61	0.02	4.99	H	34.62	53.98	19.36	AV
7236	38.73	0.00	12.93	H	51.66	73.98	22.32	PK
7236	26.41	0.02	12.93	H	39.36	53.98	14.62	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.6	2437		MHz	Transfer Rate : MCS 0			**26T**	**4**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4874	41.43	0.00	5.25	V	46.68	73.98	27.30	PK
4874	29.25	0.02	5.25	V	34.52	53.98	19.46	AV
7311	38.68	0.00	12.82	V	51.50	73.98	22.48	PK
7311	26.49	0.02	12.82	V	39.33	53.98	14.65	AV
4874	42.14	0.00	5.25	H	47.39	73.98	26.59	PK
4874	29.44	0.02	5.25	H	34.71	53.98	19.27	AV
7311	38.57	0.00	12.82	H	51.39	73.98	22.59	PK
7311	26.32	0.02	12.82	H	39.16	53.98	14.82	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11	2462		MHz	Transfer Rate : MCS 0			**26T**	**4**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4924	41.58	0.00	5.45	V	47.03	73.98	26.95	PK
4924	29.58	0.02	5.45	V	35.05	53.98	18.93	AV
7386	39.18	0.00	12.63	V	51.81	73.98	22.17	PK
7386	26.69	0.02	12.63	V	39.34	53.98	14.64	AV
4924	41.62	0.00	5.45	H	47.07	73.98	26.91	PK
4924	29.42	0.02	5.45	H	34.89	53.98	19.09	AV
7386	39.69	0.00	12.63	H	52.32	73.98	21.66	PK
7386	27.12	0.02	12.63	H	39.77	53.98	14.21	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.1	2412		MHz	Transfer Rate : MCS 0			**26T**	**8**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4824	41.60	0.00	4.99	V	46.59	73.98	27.39	PK
4824	29.46	0.02	4.99	V	34.47	53.98	19.51	AV
7236	38.92	0.00	12.93	V	51.85	73.98	22.13	PK
7236	26.63	0.02	12.93	V	39.58	53.98	14.40	AV
4824	41.93	0.00	4.99	H	46.92	73.98	27.06	PK
4824	29.60	0.02	4.99	H	34.61	53.98	19.37	AV
7236	38.87	0.00	12.93	H	51.80	73.98	22.18	PK
7236	26.44	0.02	12.93	H	39.39	53.98	14.59	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.6	2437		MHz	Transfer Rate : MCS 0			**26T**	**8**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4874	41.51	0.00	5.25	V	46.76	73.98	27.22	PK
4874	29.25	0.02	5.25	V	34.52	53.98	19.46	AV
7311	38.79	0.00	12.82	V	51.61	73.98	22.37	PK
7311	26.51	0.02	12.82	V	39.35	53.98	14.63	AV
4874	42.03	0.00	5.25	H	47.28	73.98	26.70	PK
4874	29.42	0.02	5.25	H	34.69	53.98	19.29	AV
7311	38.81	0.00	12.82	H	51.63	73.98	22.35	PK
7311	26.30	0.02	12.82	H	39.14	53.98	14.84	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11	2462		MHz	Transfer Rate : MCS 0			**26T**	**8**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4924	41.56	0.00	5.45	V	47.01	73.98	26.97	PK
4924	29.29	0.02	5.45	V	34.76	53.98	19.22	AV
7386	38.89	0.00	12.63	V	51.52	73.98	22.46	PK
7386	26.70	0.02	12.63	V	39.35	53.98	14.63	AV
4924	41.77	0.00	5.45	H	47.22	73.98	26.76	PK
4924	29.45	0.02	5.45	H	34.92	53.98	19.06	AV
7386	40.76	0.00	12.63	H	53.39	73.98	20.59	PK
7386	27.63	0.02	12.63	H	40.28	53.98	13.70	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.1	2412		MHz	Transfer Rate : MCS 0			**242T**	**61**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4824	41.66	0.00	4.99	V	46.65	73.98	27.33	PK
4824	29.38	0.10	4.99	V	34.47	53.98	19.51	AV
7236	38.68	0.00	12.93	V	51.61	73.98	22.37	PK
7236	26.71	0.10	12.93	V	39.74	53.98	14.24	AV
4824	41.97	0.00	4.99	H	46.96	73.98	27.02	PK
4824	29.48	0.10	4.99	H	34.57	53.98	19.41	AV
7236	38.67	0.00	12.93	H	51.60	73.98	22.38	PK
7236	26.43	0.10	12.93	H	39.46	53.98	14.52	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.6	2437		MHz	Transfer Rate : MCS 0			**242T**	**61**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4874	41.75	0.00	5.25	V	47.00	73.98	26.98	PK
4874	29.35	0.10	5.25	V	34.70	53.98	19.28	AV
7311	39.34	0.00	12.82	V	52.16	73.98	21.82	PK
7311	26.53	0.10	12.82	V	39.45	53.98	14.53	AV
4874	42.02	0.00	5.25	H	47.27	73.98	26.71	PK
4874	29.49	0.10	5.25	H	34.84	53.98	19.14	AV
7311	38.75	0.00	12.82	H	51.57	73.98	22.41	PK
7311	26.34	0.10	12.82	H	39.26	53.98	14.72	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11	2462		MHz	Transfer Rate : MCS 0			**242T**	**61**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4924	41.78	0.00	5.45	V	47.23	73.98	26.75	PK
4924	29.30	0.10	5.45	V	34.85	53.98	19.13	AV
7386	39.51	0.00	12.63	V	52.14	73.98	21.84	PK
7386	26.68	0.10	12.63	V	39.41	53.98	14.57	AV
4924	41.88	0.00	5.45	H	47.33	73.98	26.65	PK
4924	29.57	0.10	5.45	H	35.12	53.98	18.86	AV
7386	39.30	0.00	12.63	H	51.93	73.98	22.05	PK
7386	26.78	0.10	12.63	H	39.51	53.98	14.47	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.1	2412		MHz	Transfer Rate : MCS 0			SU	
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4824	41.95	0.00	4.99	V	46.94	73.98	27.04	PK
4824	29.43	0.10	4.99	V	34.52	53.98	19.46	AV
7236	39.05	0.00	12.93	V	51.98	73.98	22.00	PK
7236	26.62	0.10	12.93	V	39.65	53.98	14.33	AV
4824	42.00	0.00	4.99	H	46.99	73.98	26.99	PK
4824	29.58	0.10	4.99	H	34.67	53.98	19.31	AV
7236	38.50	0.00	12.93	H	51.43	73.98	22.55	PK
7236	26.36	0.10	12.93	H	39.39	53.98	14.59	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.6	2437		MHz	Transfer Rate : MCS 0			SU	
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4874	41.83	0.00	5.25	V	47.08	73.98	26.90	PK
4874	29.28	0.10	5.25	V	34.63	53.98	19.35	AV
7311	38.86	0.00	12.82	V	51.68	73.98	22.30	PK
7311	26.47	0.10	12.82	V	39.39	53.98	14.59	AV
4874	41.92	0.00	5.25	H	47.17	73.98	26.81	PK
4874	29.47	0.10	5.25	H	34.82	53.98	19.16	AV
7311	38.52	0.00	12.82	H	51.34	73.98	22.64	PK
7311	26.27	0.10	12.82	H	39.19	53.98	14.79	AV

Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11	2462		MHz	Transfer Rate : MCS 0			SU	
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4924	41.91	0.00	5.45	V	47.36	73.98	26.62	PK
4924	29.66	0.10	5.45	V	35.21	53.98	18.77	AV
7386	39.23	0.00	12.63	V	51.86	73.98	22.12	PK
7386	26.68	0.10	12.63	V	39.41	53.98	14.57	AV
4924	41.75	0.00	5.45	H	47.20	73.98	26.78	PK
4924	29.45	0.10	5.45	H	35.00	53.98	18.98	AV
7386	39.35	0.00	12.63	H	51.98	73.98	22.00	PK
7386	27.03	0.10	12.63	H	39.76	53.98	14.22	AV

[RSDB]

Scenario 1

Ant All(MIMO) 2.4 GHz 802.11ax(HE20) 26T, RU8, Ch.11+ Ant All(MIMO) 5 GHz 802.11ax(HE40) SU_Ch.118

802.11ax HE20 MCS 0

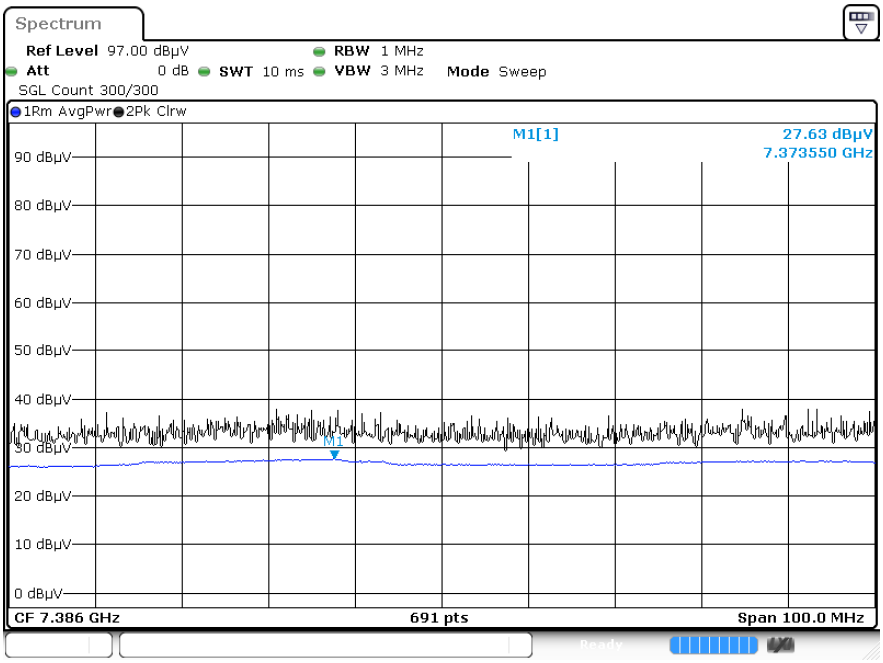
Band :	DTS			Operation Mode : 802.11ax HE20			RU Tone&offset	
CH.11	2462		MHz	Transfer Rate : MCS 0			**26T**	**8**
Frequency	Measured value	Duty Cycle Factor	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
4924	51.21	0.00	5.45	V	56.66	73.98	17.32	PK
4924	39.50	0.02	5.45	V	44.97	53.98	9.01	AV
7386	38.77	0.00	12.63	V	51.40	73.98	22.58	PK
7386	26.32	0.02	12.63	V	38.97	53.98	15.01	AV
4924	51.65	0.00	5.45	H	57.10	73.98	16.88	PK
4924	40.06	0.02	5.45	H	45.53	53.98	8.45	AV
7386	38.86	0.00	12.63	H	51.49	73.98	22.49	PK
7386	26.40	0.02	12.63	H	39.05	53.98	14.93	AV

Note : UNII ax RSDB Data refer to [UNII ax] Test Report

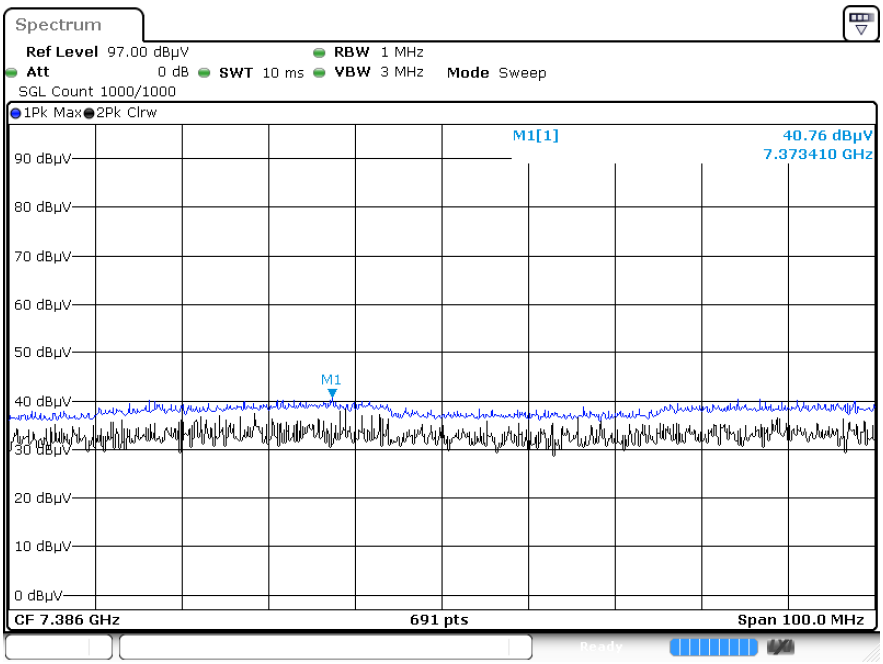
▣ **Test Plots(26T RU 8)**

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)

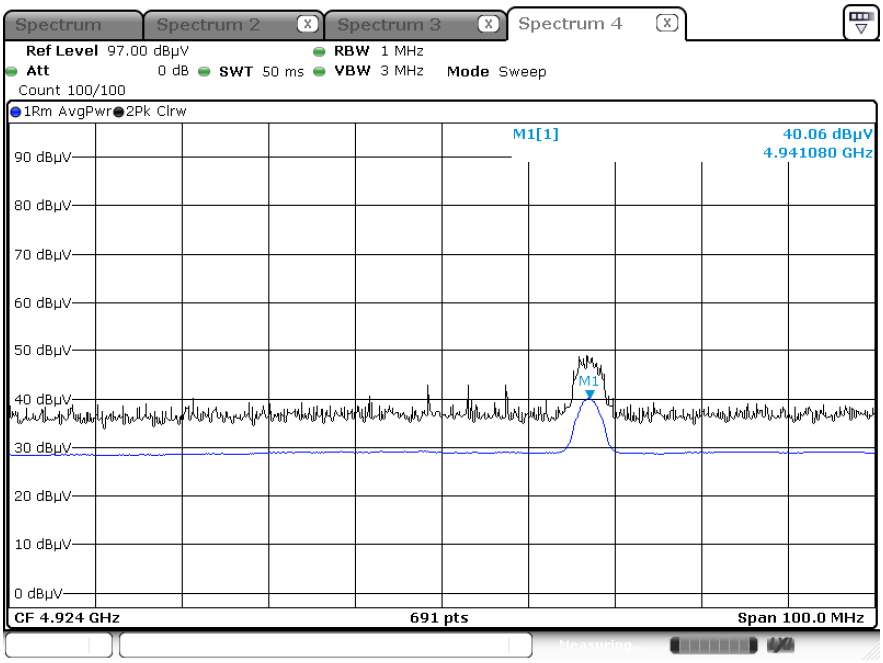


[RSDB]

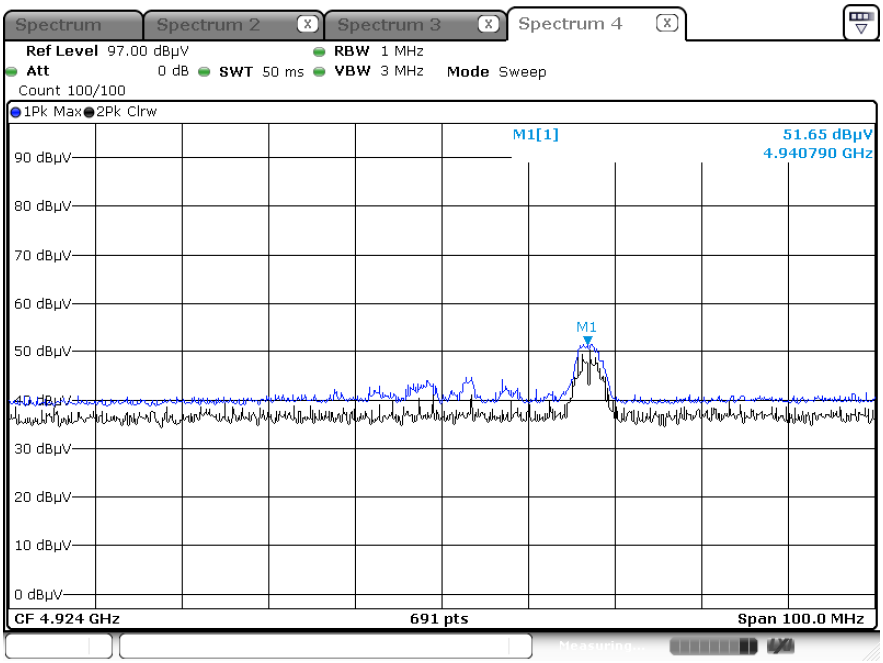
Scenario 1

Ant All(MIMO) 2.4 GHz 802.11ax(HE20) 26T, RU8, Ch.11+ Ant All(MIMO) 5 GHz 802.11ax(HE40) SU_Ch.118

Radiated Spurious Emissions plot –Average Result (2nd Harmonic, X-H)



Radiated Spurious Emissions plot – Peak Result (2nd Harmonic, X-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
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Channel No	RU Index	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]	
1	0	2390.0	21.55	0.00	36.66	H	58.21	73.98	15.77	PK
		2390.0	6.89	0.02	36.66	H	43.57	53.98	10.41	AV
		2390.0	21.48	0.00	36.66	V	58.14	73.98	15.84	PK
		2390.0	6.75	0.02	36.66	V	43.43	53.98	10.55	AV
11	8	2483.5	27.96	0.00	37.22	H	65.18	73.98	8.80	PK
		2483.5	7.95	0.02	37.22	H	45.19	53.98	8.79	AV
		2483.5	27.89	0.00	37.22	V	65.11	73.98	8.87	PK
		2483.5	7.88	0.02	37.22	V	45.12	53.98	8.86	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2467 MHz, 2472 MHz
Channel No.	12 Ch, 13 Ch

Channel No	RU Index	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]	
12	8	2390.0	18.45	0.00	36.66	H	55.11	73.98	18.87	PK
		2390.0	6.08	0.02	36.66	H	42.76	53.98	11.22	AV
		2390.0	18.22	0.00	36.66	V	54.88	73.98	19.10	PK
		2390.0	5.89	0.02	36.66	V	42.57	53.98	11.41	AV
13	8	# 2483.5	27.01	0.00	37.22	H	64.23	73.98	9.75	PK
		# 2483.5	13.64	0.02	37.22	H	50.88	53.98	3.10	AV
		# 2483.5	26.85	0.00	37.22	V	64.07	73.98	9.91	PK
		# 2483.5	13.45	0.02	37.22	V	50.69	53.98	3.29	AV

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

2. 52 Tones

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

Channel No	RU Index	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]	
1	37	2390.0	19.52	0.00	36.66	H	56.18	73.98	17.80	PK
		2390.0	7.35	0.02	36.66	H	44.03	53.98	9.95	AV
		2390.0	19.32	0.00	36.66	V	55.98	73.98	18.00	PK
		2390.0	7.12	0.02	36.66	V	43.80	53.98	10.18	AV
11	40	2483.5	30.49	0.00	37.22	H	67.71	73.98	6.27	PK
		2483.5	8.35	0.02	37.22	H	45.59	53.98	8.39	AV
		2483.5	30.25	0.00	37.22	V	67.47	73.98	6.51	PK
		2483.5	8.21	0.02	37.22	V	45.45	53.98	8.53	AV

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2467 MHz, 2472 MHz
Channel No.	12 Ch, 13 Ch

Channel No	RU Index	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]	
12	37	2390.0	17.94	0.00	36.66	H	54.60	73.98	19.38	PK
		2390.0	5.82	0.02	36.66	H	42.50	53.98	11.48	AV
		2390.0	17.75	0.00	36.66	V	54.41	73.98	19.57	PK
		2390.0	5.62	0.02	36.66	V	42.30	53.98	11.68	AV
13	40	# 2483.5	25.52	0.00	37.22	H	62.74	73.98	11.24	PK
		# 2483.5	12.20	0.02	37.22	H	49.44	53.98	4.54	AV
		# 2483.5	24.12	0.00	37.22	V	61.34	73.98	12.64	PK
		# 2483.5	12.01	0.02	37.22	V	49.25	53.98	4.73	AV

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

3. 106 Tones

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

Channel No	RU Index	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]	
1	53	2390.0	25.08	0.00	36.66	H	61.74	73.98	12.24	PK
		2390.0	8.29	0.04	36.66	H	44.99	53.98	8.99	AV
		2390.0	24.85	0.00	36.66	V	61.51	73.98	12.47	PK
		2390.0	8.12	0.04	36.66	V	44.82	53.98	9.16	AV
11	54	# 2483.5	27.14	0.00	37.22	H	64.36	73.98	9.62	PK
		# 2483.5	13.20	0.04	37.22	H	50.46	53.98	3.52	AV
		# 2483.5	26.89	0.00	37.22	V	64.11	73.98	9.87	PK
		# 2483.5	13.05	0.04	37.22	V	50.31	53.98	3.67	AV

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

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2467 MHz, 2472 MHz
Channel No.	12 Ch, 13 Ch

Channel No	RU Index	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]	
12	53	2390.0	18.10	0.00	36.66	H	54.76	73.98	19.22	PK
		2390.0	5.75	0.04	36.66	H	42.45	53.98	11.53	AV
		2390.0	17.85	0.00	36.66	V	54.51	73.98	19.47	PK
		2390.0	5.62	0.04	36.66	V	42.32	53.98	11.66	AV
13	54	# 2483.5	23.47	0.00	37.22	H	60.69	73.98	13.29	PK
		# 2483.5	11.21	0.04	37.22	H	48.47	53.98	5.51	AV
		# 2483.5	23.22	0.00	37.22	V	60.44	73.98	13.54	PK
		# 2483.5	11.05	0.04	37.22	V	48.31	53.98	5.67	AV

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

4. 242 Tones

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

Channel No	RU Index	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]	
1	61	# 2390	23.64	0.00	36.66	H	60.30	73.98	13.68	PK
		# 2390	13.14	0.10	36.66	H	49.90	53.98	4.08	AV
		# 2390	23.35	0.00	36.66	V	60.01	73.98	13.97	PK
		# 2390	12.85	0.10	36.66	V	49.61	53.98	4.37	AV
11	61	# 2483.5	23.49	0.00	37.22	H	60.71	73.98	13.27	PK
		# 2483.5	13.24	0.10	37.22	H	50.56	53.98	3.42	AV
		# 2483.5	23.12	0.00	37.22	V	60.34	73.98	13.64	PK
		# 2483.5	12.95	0.10	37.22	V	50.27	53.98	3.71	AV

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

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2467 MHz, 2472 MHz
Channel No.	12 Ch, 13 Ch

Channel No	RU Index	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]	
12	61	2390.0	18.04	0.00	36.66	H	54.70	73.98	19.28	PK
		2390.0	5.92	0.10	36.66	H	42.68	53.98	11.30	AV
		2390.0	17.85	0.00	36.66	V	54.51	73.98	19.47	PK
		2390.0	5.74	0.10	36.66	V	42.5	53.98	11.48	AV
13	61	# 2483.5	21.41	0.00	37.22	H	58.63	73.98	15.35	PK
		# 2483.5	10.12	0.10	37.22	H	47.44	53.98	6.54	AV
		# 2483.5	21.25	0.00	37.22	V	58.47	73.98	15.51	PK
		# 2483.5	9.85	0.10	37.22	V	47.17	53.98	6.81	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, 2462 MHz
Channel No.	01 Ch, 11 Ch

Channel No	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]	
1	# 2390	22.26	0.00	36.66	H	58.92	73.98	15.06	PK
	# 2390	12.02	0.10	36.66	H	48.78	53.98	5.20	AV
	# 2390	22.01	0.00	36.66	V	58.67	73.98	15.31	PK
	# 2390	11.85	0.10	36.66	V	48.61	53.98	5.37	AV
11	# 2483.5	25.18	0.00	37.22	H	62.40	73.98	11.58	PK
	# 2483.5	14.16	0.10	37.22	H	51.48	53.98	2.50	AV
	# 2483.5	12.75	0.00	37.22	V	49.97	73.98	24.01	PK
	# 2483.5	13.85	0.10	37.22	V	51.17	53.98	2.81	AV

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

Operation Mode:	802.11ax(HE20)
Transfer MCS Index:	0
Operating Frequency	2467 MHz, 2472 MHz
Channel No.	12 Ch, 13 Ch

Channel No	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]	
12	2390.0	17.86	0.00	36.66	H	54.52	73.98	19.46	PK
	2390.0	5.95	0.10	36.66	H	42.71	53.98	11.27	AV
	2390.0	17.75	0.00	36.66	V	54.41	73.98	19.57	PK
	2390.0	5.75	0.10	36.66	V	42.51	53.98	11.47	AV
13	# 2483.5	21.92	0.00	37.22	H	59.14	73.98	14.84	PK
	# 2483.5	11.13	0.10	37.22	H	48.45	53.98	5.53	AV
	# 2483.5	21.69	0.00	37.22	V	58.91	73.98	15.07	PK
	# 2483.5	10.89	0.10	37.22	V	48.21	53.98	5.77	AV

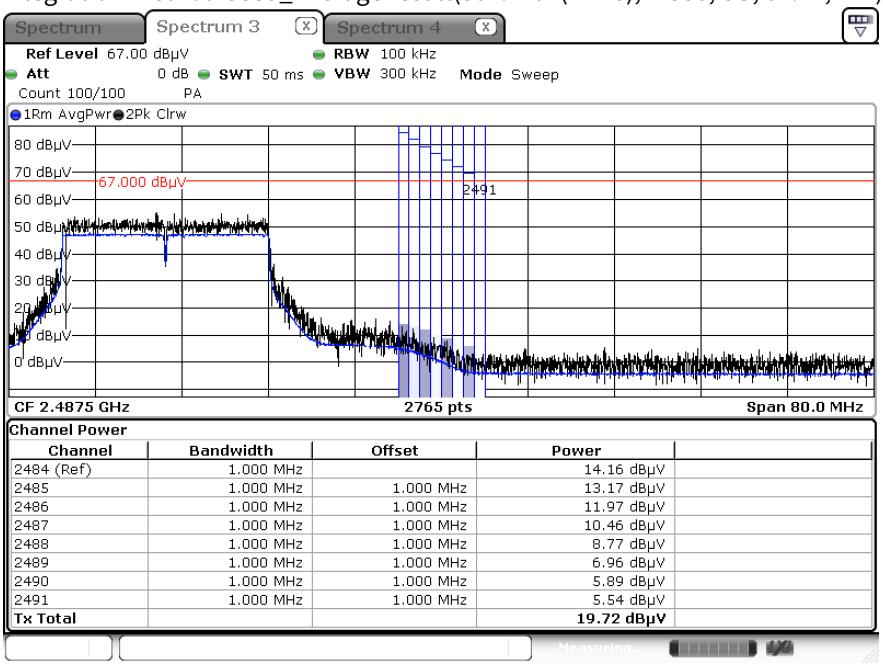
Note : # integration method Used (ANSI C63.10 Section11.13.

▣ Test Plots

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

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

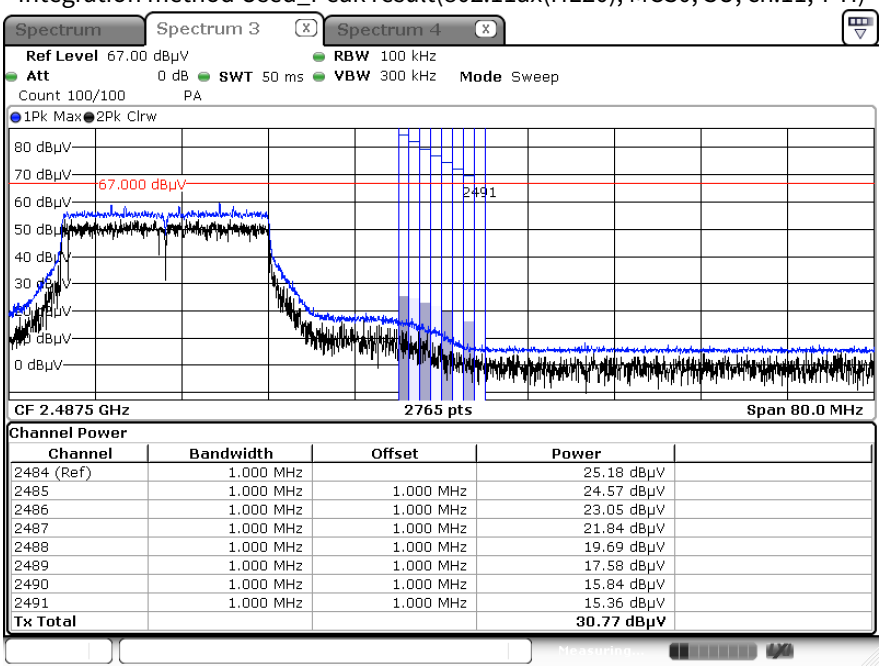
Integration method Used_Average result(802.11ax(HE20), MCS0, SU, ch.11, Y-H)



Channel Power

Channel	Bandwidth	Offset	Power
2484 (Ref)	1.000 MHz		14.16 dBµV
2485	1.000 MHz	1.000 MHz	13.17 dBµV
2486	1.000 MHz	1.000 MHz	11.97 dBµV
2487	1.000 MHz	1.000 MHz	10.46 dBµV
2488	1.000 MHz	1.000 MHz	8.77 dBµV
2489	1.000 MHz	1.000 MHz	6.96 dBµV
2490	1.000 MHz	1.000 MHz	5.89 dBµV
2491	1.000 MHz	1.000 MHz	5.54 dBµV
Tx Total			**19.72 dBµV**

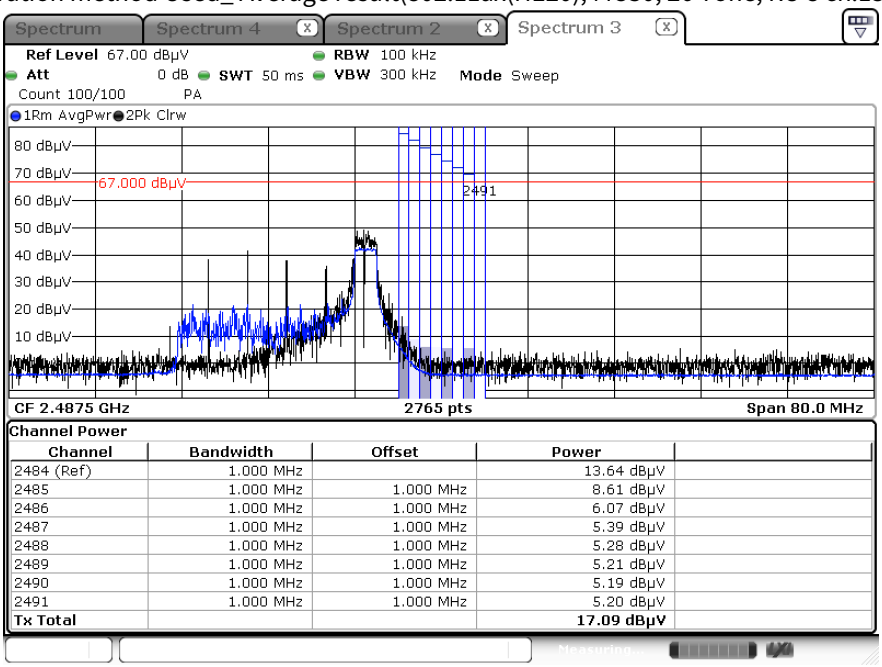
Integration method Used_Peak result(802.11ax(HE20), MCS0, SU, ch.11, Y-H)



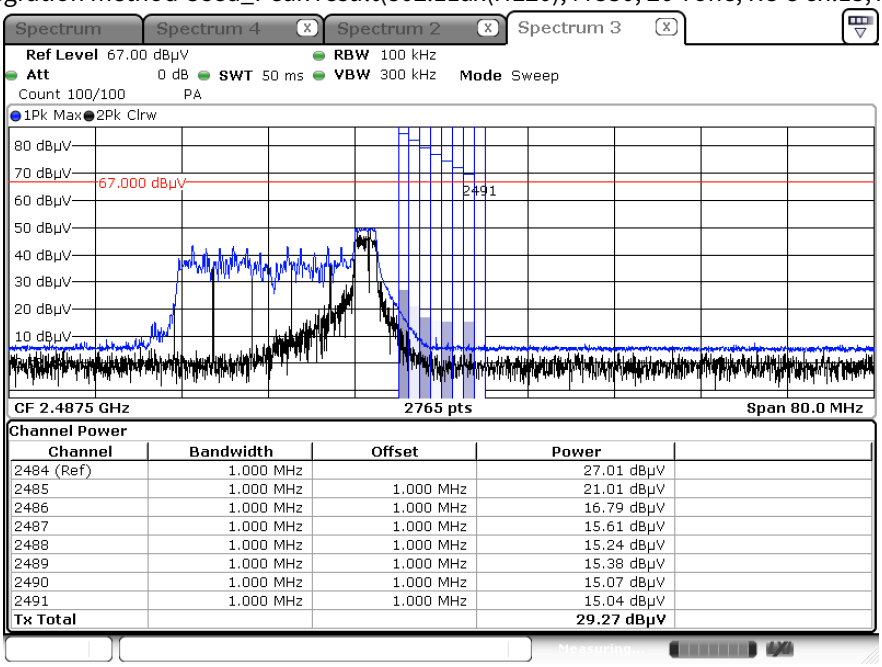
Channel Power

Channel	Bandwidth	Offset	Power
2484 (Ref)	1.000 MHz		25.18 dBµV
2485	1.000 MHz	1.000 MHz	24.57 dBµV
2486	1.000 MHz	1.000 MHz	23.05 dBµV
2487	1.000 MHz	1.000 MHz	21.84 dBµV
2488	1.000 MHz	1.000 MHz	19.69 dBµV
2489	1.000 MHz	1.000 MHz	17.58 dBµV
2490	1.000 MHz	1.000 MHz	15.84 dBµV
2491	1.000 MHz	1.000 MHz	15.36 dBµV
Tx Total			**30.77 dBµV**

Integration method Used_ Average result(802.11ax(HE20), MCS0, 26 Tone, RU 8 ch.13, X-H)



Integration method Used_Peak result(802.11ax(HE20), MCS0, 26 Tone, RU 8 ch.13, 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	MY49432108	02/20/2025	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	10545	02/06/2025	Annual
DC Power Supply	E3632A	Agilent	KR75303243	04/19/2025	Annual
Attenuator(10 dB) (DC-26.5 GHz)	8493C	HP	07560	06/05/2025	Annual
Attenuator(10 dB) (DC-26.5 GHz)	8493C	HP	08285	05/28/2025	Annual
Attenuator(20 dB)	18N-20dB	Rohde & Schwarz	8	02/20/2025	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
Bluetooth Tester	CBT	Rohde & Schwarz	100752	01/03/2025	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.

Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	S1AM	08/03/2025	Biennial
Turn Table	DS2000-S-1t	Innco system	DS2000/572/54610422/P	N/A	N/A
Amp & Filter Bank Switch Controller	FBSM-01B	T&M system	TM19050002	N/A	N/A
Loop Antenna	1513	Schwarzbeck	1513-333	03/07/2026	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	08/16/2024	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1300	01/03/2026	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-2296	05/16/2026	Biennial
Horn Antenna (15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Spectrum Analyzer	FSV(10 Hz ~ 40 GHz)	Rohde & Schwarz	101055	05/09/2025	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/02/2025	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
High Pass Filter (7 GHz ~ 18 GHz)	WHKX10-7150-8000-18000-50SS	Wainwright Instruments	1	02/28/2025	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/17/2024	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/26/2025	Annual
Bluetooth Tester	TC-3000C	TESCOM	3000C000175	03/19/2025	Annual
RF Switching System	FMSR-05B (HPF(3~18GHz) + LNA1(1~18GHz))	T&M system	S1L1	01/02/2025	Annual
RF Switching System	FMSR -05B (ATT(10dB) + LNA1(1~18GHz))	T&M system	S1L2	01/02/2025	Annual
RF Switching System	FMSR -05B (ATT(3dB) + LNA1(1~18GHz))	T&M system	S1L3	01/02/2025	Annual
RF Switching System	FMSR -05B (LNA1(1~18GHz))	T&M system	S1L4	01/02/2025	Annual
RF Switching System	FMSR -05B (HPF(7~18GHz) + LNA2(6~18GHz))	T&M system	S1L5	01/02/2025	Annual
RF Switching System	FMSR -05B (Thru(30MHz ~ 18GHz))	T&M system	S1L6	01/02/2025	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-FC077-P