TEST REPORT

FCC DTS Test for TFBMEEBN6FU
Certification

APPLICANT
LG Electronics Inc.

REPORT NO.
HCT-RF-2507-FC077-R3

DATE OF ISSUE
September 1, 2025

Tested by
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Accredited by KOLAS, Republic of KOREA

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Additional Model
TFBMEEBN6FR, TFBMNENN0FN

Applicant	LG Electronics Inc. 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea
Product Name Model Name	Telematics TFBMEEBN6FU
FCC ID	2BO3LTFBMEEBN6FU
Date of Test	March 14, 2025~ July 11, 2025
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 17, 2025	Initial Release
1	August 04, 2025	Added Note on page 6.
2	August 06, 2025	Revised BTLE Antenna information (Ant.3 → Ant.1)
3	September 01, 2025	Added the Radiated Emissions test method

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). When confirmation of authenticity of this test report is required, please contact www.hct.co.kr This test report provides test result(s) under the scope accredited by the Korea Laboratory Accreditation Scheme (KOLAS), which signed the ILAC-MRA. (KOLAS (KS Q ISO/IEC 17025) Accreditation No. KT197)

CONTENTS

1. EUT DESCRIPTION

Model	TFBMEEBN6FU		
Additional Model	TFBMEEBN6FR, TFBMNENN0FN		
EUT Type	Telematics		
Power Supply	DC 12.0 V		
Frequency Range	2 412 MHz ~ 2 462 MHz		
Max. RF Output Power	Average Power	SISO (Ant.3) : MIMO_CDD (Ant.1+ Ant.2) :	5.71 dBm 5.80 dBm
	Peak Power	SISO (Ant.3) : MIMO_CDD (Ant.1+ Ant.2) :	12.98 dBm 14.04 dBm
Modulation Type	DSSS/CCK : 802.11b OFDM : 802.11g, 802.11n, 802.11ac		
Number of Channels	11 Channels		
Antenna Type	ANT.1 & ANT.2: Shark-fin ANT.3: Carrier + Metal Press		
Serial number	Conducted : 0000009077 Radiated : 0000009074		

ANTENNA CONFIGURATIONS

1. Antenna configuration

Configurations	SISO			MIMO	
	Ant1	Ant2	Ant3	CDD	SDM
802.11b	X	X	O	O	X
802.11g	X	X	O	O	X
802.11n(HT20/HT40)	X	X	O	O	O
802.11ac(VHT20/VHT40)	X	X	O	O	O

Note:

(1) O = Support, X = Not Support

(2) SISO = Single Input Single Output

(3) SDM = Spatial Diversity Multiplexing

(4) CDD = Cyclic Delay Diversity

(5) MIMO = MIMO(Ant.1 + Ant.2), MIMO(Ant.1 + Ant.3)

2.This device supports simultaneous transmission operation, which allows for two channels to operate independent of one another in the 5 GHz and 6 GHz Bands simultaneously on each antenna.

Simultaneous transmission Scenario	5 GHz WiFi Ant.1	5 GHz WiFi Ant.2	5 GHz WiFi Ant.3	6 GHz WiFi Ant.1	6 GHz WiFi Ant.2	6 GHz WiFi Ant.3	BT LE Ant.1	WWAN	Test Case
Bluetooth LE + 5 GHz WiFi MIMO + WWAN	on	on	-	-	-	-	on	on	Scenario1
Bluetooth LE + 5 GHz WiFi MIMO + WWAN	on	-	on	-	-	-	on	on	-
Bluetooth LE + 6 GHz WiFi MIMO + WWAN	-	-	-	on	on	-	on	on	Scenario2
Bluetooth LE + 6 GHz WiFi MIMO + WWAN	-	-	-	on	-	on	on	on	-

Note : TFBMNENN0FN does not support WWAN.

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})

[US-5A7F527]

Ant Gain (dBi)		N_{ANT}/ N_{ss}	Directional Gain (dBi)	
			CDD	SDM
ANT.1	4.99	2/2	7.63	4.99
ANT.2	4.23			

[ROW-5A7F528]

Ant Gain (dBi)		N_{ANT}/ N_{ss}	Directional Gain (dBi)	
			CDD	SDM
ANT.1	5.53	2/2	8.23	5.53
ANT.2	4.89			

[NC-5A7F529]

Ant Gain (dBi)		N_{ANT}/ N_{ss}	Directional Gain (dBi)	
			CDD	SDM
ANT.1	7.34	2/2	9.67	7.34
ANT.2	5.92			

[BUA]

Ant Gain (dBi)
Ant.3
0.88

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.

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

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

Sample MIMO Calculation:

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

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 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, Republic 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.

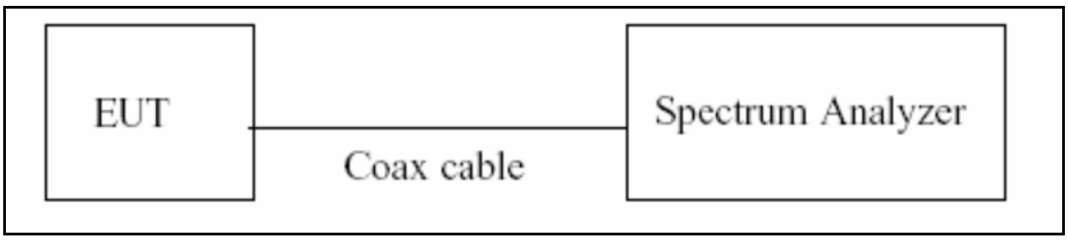
Parameter	Expanded Uncertainty (±kHz)
X dB, 99% Bandwidth	95 (Confidence level about 95 %, *k=2*)
Frequency stability	28 (Confidence level about 95 %, *k=2*)

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.54 (Confidence level about 95 %, *k*=2)
Conducted Output Power(Power Meter)	0.54 (Confidence level about 95 %, k=2)
Conducted Output Power(Signal Analyzer)	0.68 (Confidence level about 95 %, k=2)
Power Spectral Density	1.03 (Confidence level about 95 %, k=2)
Band Edge (Out of Band Emissions)	0.70 (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)	5.68 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.75 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.82 (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*.

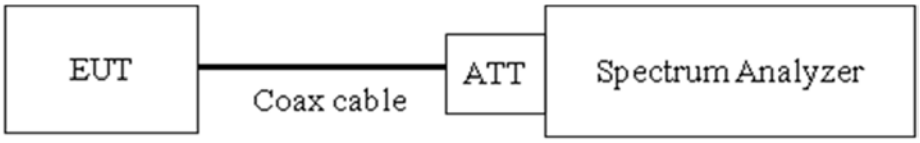
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz or 50 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Average
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

7.2. 6 dB Bandwidth

Limit

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

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

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

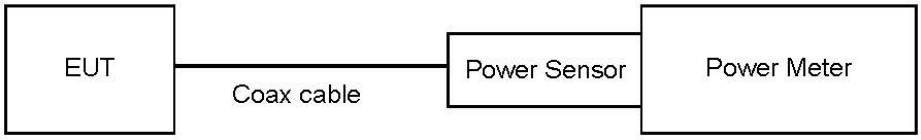
Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

7.3. Output Power

Limit

The maximum permissible conducted output power is 1 Watt.

Test Configuration



Test Procedure

The transmitter output is connected to the Power Meter.

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

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

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

Sample Calculation

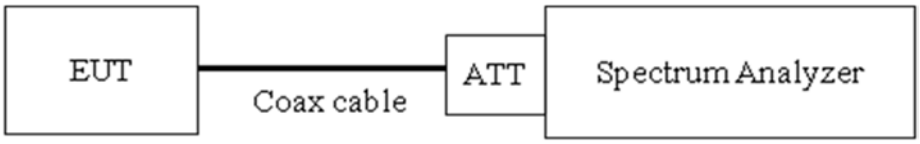
▪ Conducted Output Power(Peak) = Measured Value + ATT loss + Cable loss
▪ Conducted Output Power(Average) = Measured Value + ATT loss + Cable loss + Duty Cycle Factor

7.4. Power Spectral Density

Limit

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

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

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

The spectrum analyzer is set to :

1) Set analyzer center frequency to DTS channel center frequency.
2) Set span to at least 1.5 times the DTS bandwidth.
3) RBW = 3 kHz ≤ RBW ≤ 100 kHz.
4) VBW ≥ 3 x RBW.
5) Sweep = auto couple.
6) Detector = Peak.
7) Trace mode = max hold.
8) Allow trace to fully stabilize.
9) Use the peak marker function to determine the maximum amplitude level within the RBW.
10) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Sample Calculation

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

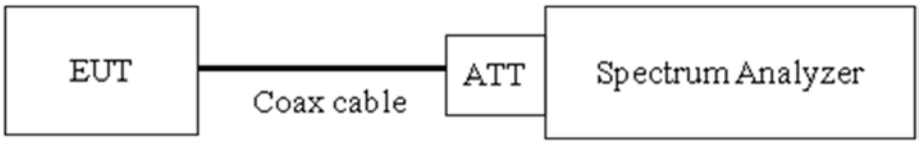
7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

Limit

The maximum conducted (Peak) 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 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

[Conducted > 20 dBc]

Test Configuration



Test Procedure

The transmitter output is connected to the spectrum analyzer.

(Procedure 11.11 in ANSI 63.10-2013)

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

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

Factors for frequency

Freq(MHz)	Factor(dB)
30	20.06
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
5850	20.83
6000	20.93
7000	20.97
8000	21.09
9000	21.18
10000	21.27
11000	21.33
12000	21.33
13000	21.40
14000	21.49
15000	21.52
16000	21.55
17000	21.63
18000	21.65
19000	21.66
20000	21.76
21000	21.82
22000	21.86
23000	21.90
24000	21.92
25000	22.04

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

2. Factor = Attenuator loss + Cable loss

3. Ant.1 Total Port offset = Attenuator loss + Cable loss + EUT cable loss(1 dB) = 21.62 dB

4. Ant.2, 3 Total Port offset = Attenuator loss + Cable loss = 20.62 dB

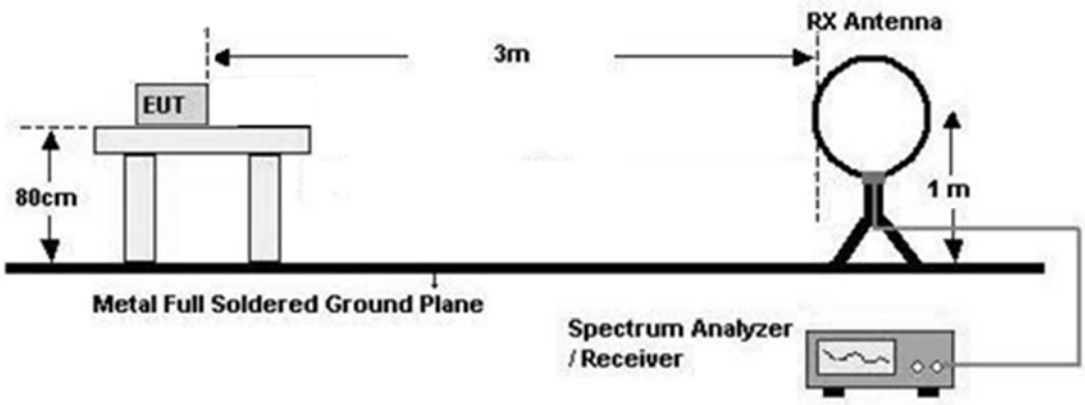
7.6. Radiated Test

Limit

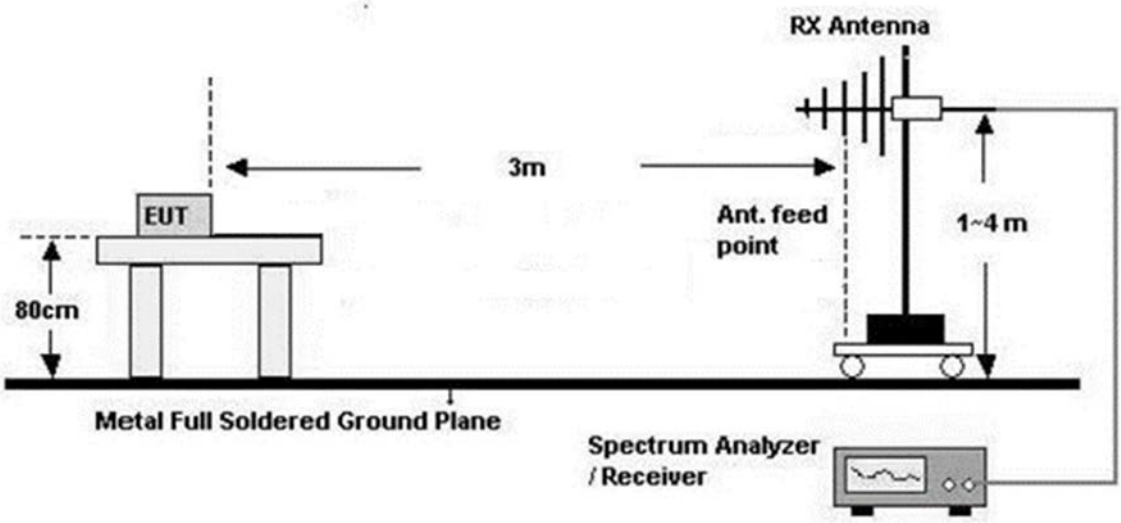
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

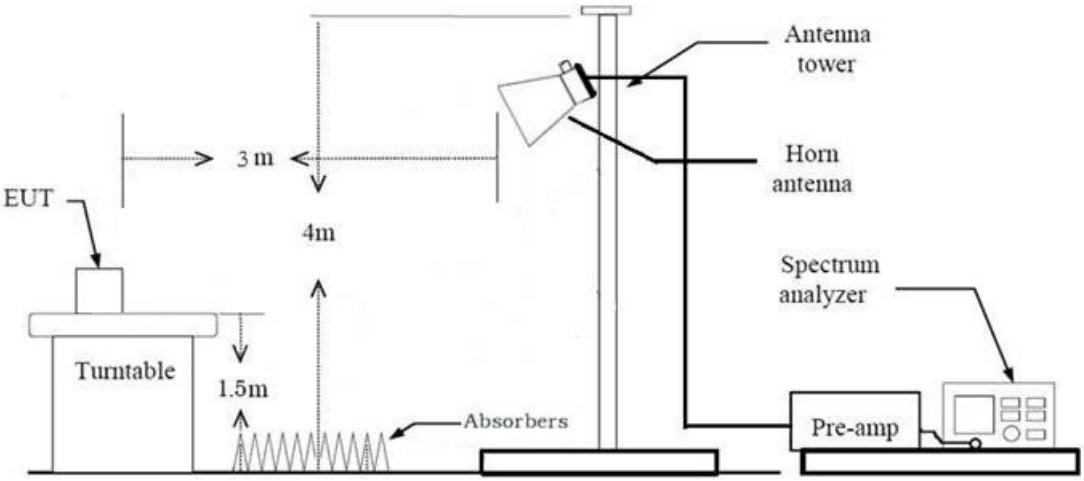
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions (Below 30 MHz)

Test Standard Used : Section 6.4 in ANSI C63.10-2013

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT
3. The EUT is placed on a turntable, which is 0.8 m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) = 40log(3 m/300 m) = - 80 dB
   Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = 40log(3 m/30 m) = - 40 dB
   Measurement Distance : 3 m
8. Spectrum Setting
   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Peak
   - Trace = Max hold
   - 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)

Test Standard Used : Section 6.5 in ANSI C63.10-2013

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 = Max hold
      - RBW = 100 kHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Quasi-peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Quasi-Peak
      - RBW = 120 kHz

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

Test Procedure of Radiated spurious emissions (Above 1 GHz)

Test Standard Used : Section 6.6 in ANSI C63.10-2013

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. Spectrum Setting (Method 8.6 in KDB 558074 v05r02, Procedure 11.12 in ANSI 63.10-2013)

(1) Measurement Type(Peak):

- Measured Frequency Range : 1 GHz – 25 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 1 MHz
- VBW ≥ 3 x RBW

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

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

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

- Measured Frequency Range : 1 GHz – 25 GHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).
- Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.

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.

9. Distance extrapolation factor = 20log (test distance / specific distance) (dB)

10. 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

Test Standard Used : Section 6.10 & 11.12 in ANSI C63.10-2013

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. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 2310 MHz ~ 2390 MHz / 2483.5 MHz ~ 2500 MHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 1 MHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Average): Duty cycle ≥ 98 %,
      - Measured Frequency Range : 2310 MHz ~ 2390 MHz / 2483.5 MHz ~ 2500 MHz
      - Detector = RMS
      - Averaging type = power (*i.e.*, RMS)
      - RBW = 1 MHz
      - VBW ≥ 3 x RBW
      - Sweep time = auto.
      - Trace mode = average (at least 100 traces).
   (3) Measurement Type(Average): Duty cycle < 98 %, duty cycle variations are less than ±2 %
      - Measured Frequency Range : 2310 MHz ~ 2390 MHz / 2483.5 MHz ~ 2500 MHz
      - Detector = RMS
      - Averaging type = power (*i.e.*, RMS)
      - RBW = 1 MHz
      - VBW ≥ 3 x RBW
      - Sweep time = auto.
      - Trace mode = average (at least 100 traces).
      - Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.
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.

9. Distance extrapolation factor = 20log (test distance / specific distance) (dB)

10. Total (Measurement Type : Peak)

= Measured value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

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

= Measured value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

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

= Measured value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F) + Duty Cycle Factor

7.7. AC Power line Conducted Emissions

Limit

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

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

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

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

Test Configuration

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

Test Procedure

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

Sample Calculation

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

7.8. Worst case configuration and mode

Conducted test

1. The EUT was configured with data rate of highest power.
2. TFBMEEBN6FU, Additional Models were tested and the worst case results are reported. (Worst case : TFBMEEBN6FU)
3. Antenna2 and Antenna3 use the same antenna port. Therefore, conducted testing was perfo rmed only once.

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone, Stand alone
   - Worstcase : Stand alone
2. All Antenna of operation were investigated and the worst case results are reported
   - Antenna Operation Type : SISO(Ant.3), MIMO_CDD(Ant.1+Ant.2), MIMO_CDD(Ant.1+Ant.3)
   - Worstcase : MIMO_CDD(Ant.1+Ant.2)
3. EUT Axis
   - Radiated Spurious Emissions : Y
   - Radiated Restricted Band Edge : Y
4. Duty cycle factor applies only 802.11g/n/ac (Duty cycle < 98 %).
5. All data rate of operation were investigated and the test results are worst case in lowest Data Rate of each mode.
   - 802.11b : 1 Mbps
   - 802.11g : 6 Mbps
   - 802.11n(HT20): MCS0
   - 802.11ac(VHT20): MCS0
   - 802.11n(HT40): MCS0
   - 802.11ac(VHT40): MCS0
6. 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. Radiated Spurious Emission
   - All mode of operation were investigated and the worst case results are reported.
   - Mode: 802.11b, 802.11g, 802.11n(HT20), 802.11ac(VHT20), 802.11n(HT40), 802.11ac(VHT40)
   - Worst case: 802.11b, 802.11n(HT40)
8. TFBMEEBN6FU, Additional Models were tested and the worst case results are reported. (Worst case : TFBMNENN0FN)

Radiated test(Simultaneous transmission Scenario)

1. Please refer to the [BT LE], [UNII ax], [UNII 6G] Test Report.

AC Power line Conducted Emissions

1. We don’t perform powerline conducted emission test. The device only employ battery power for operation.

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 > 20 dBc		PASS
AC Power line Conducted Emissions	§ 15.207	cf. Section 7.7		N/A (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

Note:

1. The device only employ battery power for operation
2. The decision rule applies 'simple acceptance'

9. TEST RESULT

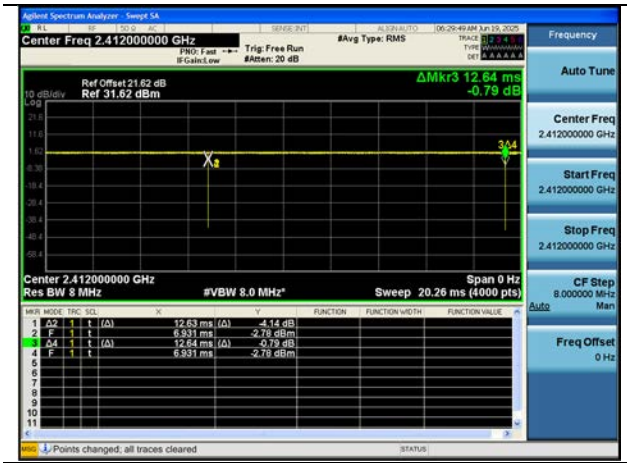
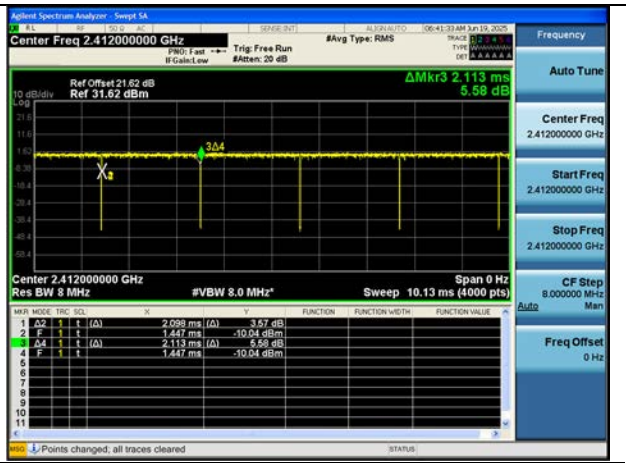
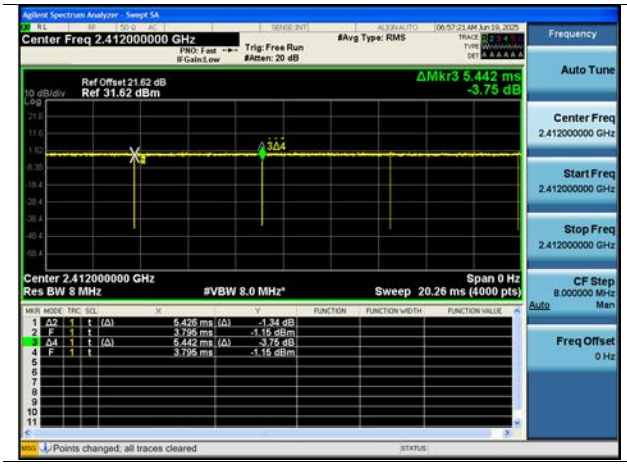
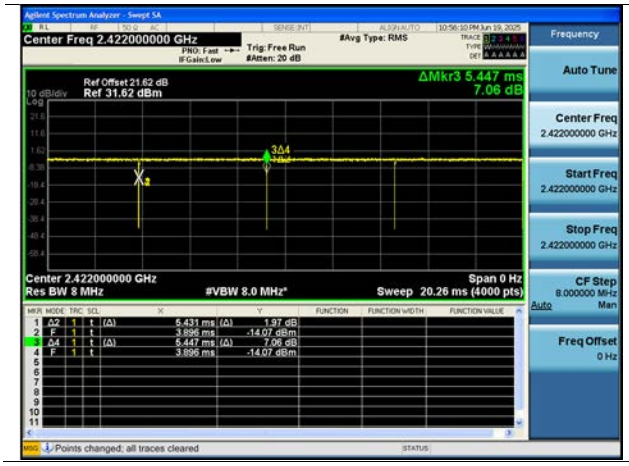
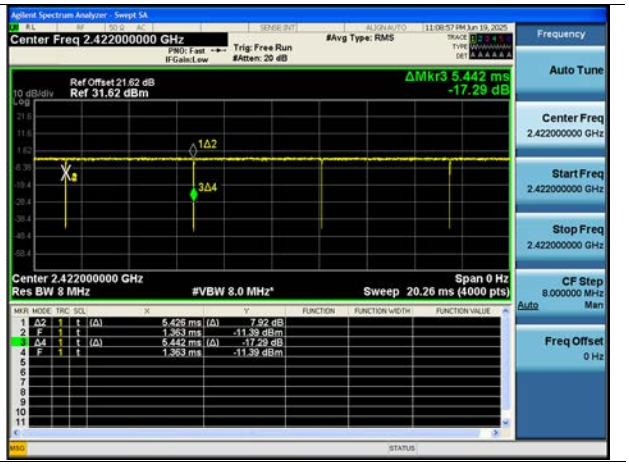
9.1 DUTY CYCLE

Mode	Data Rate	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11b	1 Mbps	12.626	12.636	0.999	0.004
802.11g	6 Mbps	2.098	2.113	0.993	0.031
802.11n (HT20)	MCS0	5.426	5.442	0.997	0.012
802.11ac (VHT20)	MCS0	5.426	5.442	0.997	0.012
802.11n (HT40)	MCS0	5.431	5.447	0.997	0.012
802.11ac (VHT40)	MCS0	5.426	5.442	0.997	0.012

▣ Test Plots

Note:

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

802.11b (1 Mbps)	802.11g (6 Mbps)
	
802.11n(HT20) (MCS0)	802.11ac(VHT20) (MCS0)
	
802.11n(HT40) (MCS0)	802.11ac(VHT40) (MCS0)
	

9.2 6 dB BANDWIDTH

[SISO_Ant.3]

Mode	Frequency [MHz]	Channel No.	99% Occupied Bandwidth [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11b	2412	1	12.845	8.100	0.50
	2437	6	13.312	8.046	0.50
	2462	11	13.194	7.549	0.50
802.11g	2412	1	16.304	15.16	0.50
	2437	6	16.265	15.15	0.50
	2462	11	16.199	15.11	0.50
802.11n (HT20)	2412	1	17.538	14.93	0.50
	2437	6	17.500	15.43	0.50
	2462	11	17.408	13.81	0.50
802.11ac (VHT20)	2412	1	17.526	15.17	0.50
	2437	6	17.477	15.09	0.50
	2462	11	17.406	15.06	0.50
802.11n (HT40)	2422	3	35.764	35.08	0.50
	2437	6	35.801	35.11	0.50
	2452	9	35.854	35.51	0.50
802.11ac (VHT40)	2422	3	35.789	33.86	0.50
	2437	6	35.790	35.09	0.50
	2452	9	35.846	35.38	0.50

[MIMO_CDD(Ant1)]

Mode	Frequency [MHz]	Channel No.	99% Occupied Bandwidth [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11b	2412	1	13.236	8.104	0.50
	2437	6	12.950	7.595	0.50
	2462	11	13.515	7.637	0.50
802.11g	2412	1	16.193	15.12	0.50
	2437	6	16.315	15.18	0.50
	2462	11	16.259	15.35	0.50
802.11n (HT20)	2412	1	17.393	15.01	0.50
	2437	6	17.547	16.31	0.50
	2462	11	17.497	15.74	0.50
802.11ac (VHT20)	2412	1	17.390	15.15	0.50
	2437	6	17.549	14.24	0.50
	2462	11	17.481	15.49	0.50
802.11n (HT40)	2422	3	35.682	31.33	0.50
	2437	6	36.153	36.35	0.50
	2452	9	35.616	33.82	0.50
802.11ac (VHT40)	2422	3	35.731	26.35	0.50
	2437	6	36.159	36.39	0.50
	2452	9	35.600	31.35	0.50

[MIMO_CDD(Ant2&Ant3)]

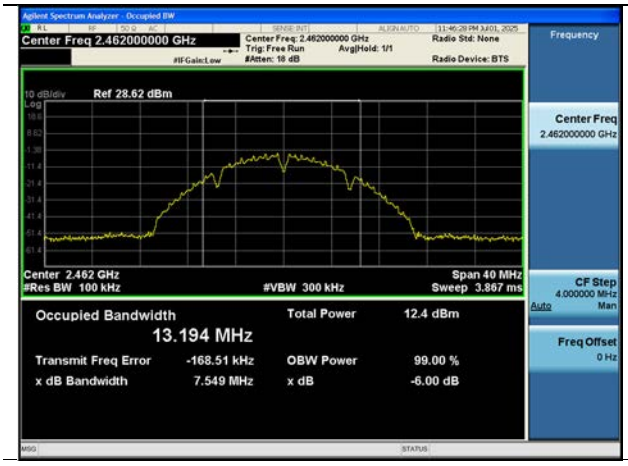
Mode	Frequency [MHz]	Channel No.	99% Occupied Bandwidth [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11b	2412	1	12.833	7.558	0.50
	2437	6	13.145	8.146	0.50
	2462	11	13.197	8.129	0.50
802.11g	2412	1	16.305	15.16	0.50
	2437	6	16.267	15.14	0.50
	2462	11	16.201	15.09	0.50
802.11n (HT20)	2412	1	17.536	15.93	0.50
	2437	6	17.479	15.04	0.50
	2462	11	17.398	15.08	0.50
802.11ac (VHT20)	2412	1	17.535	15.17	0.50
	2437	6	17.476	15.15	0.50
	2462	11	17.393	13.87	0.50
802.11n (HT40)	2422	3	35.773	35.10	0.50
	2437	6	35.806	32.72	0.50
	2452	9	35.851	35.15	0.50
802.11ac (VHT40)	2422	3	35.792	35.10	0.50
	2437	6	35.806	35.14	0.50
	2452	9	35.891	35.16	0.50

▣ Test Plots

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

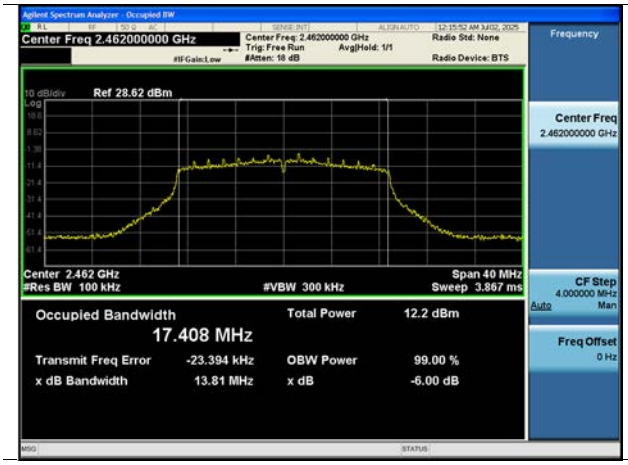
[SISO_Ant.3]

802.11b-CH 11



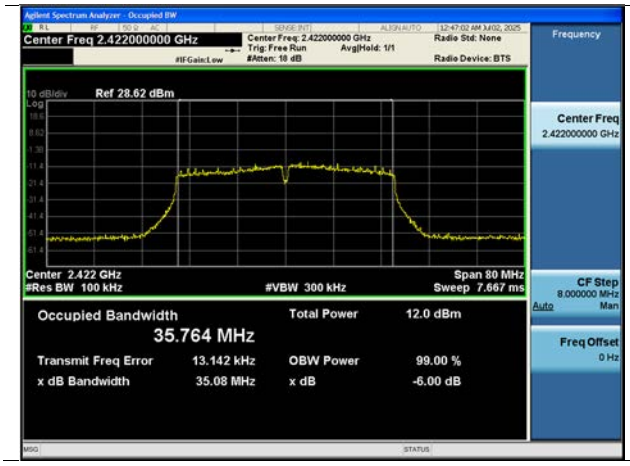
802.11g-CH 11

802.11n_HT20-CH 11



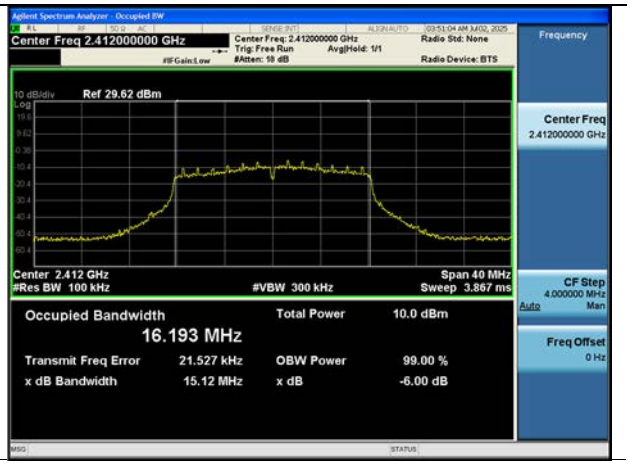
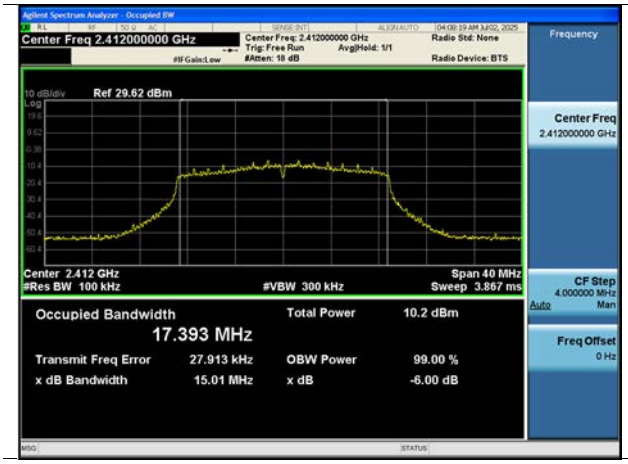
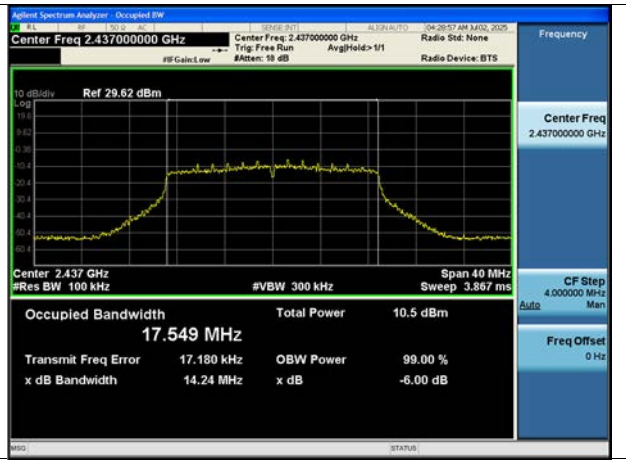
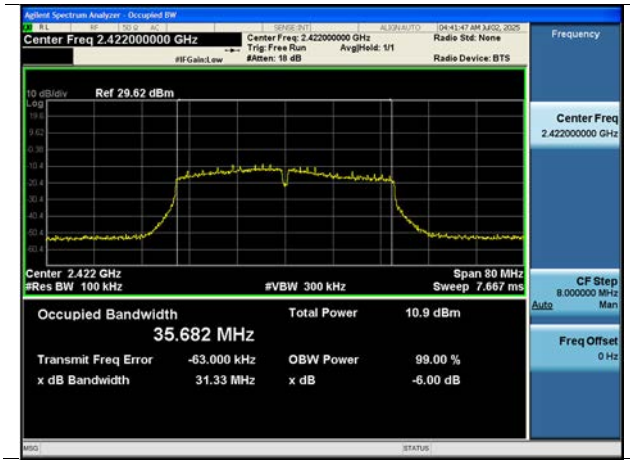
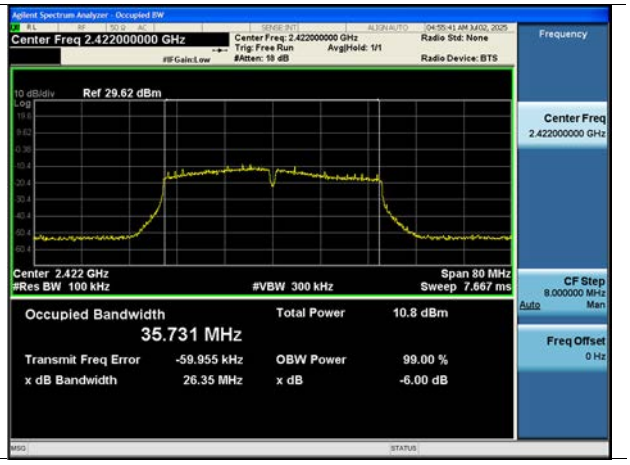
802.11ac_VHT20-CH 11

802.11n_HT40-CH 3



802.11ac_VHT40-CH 3

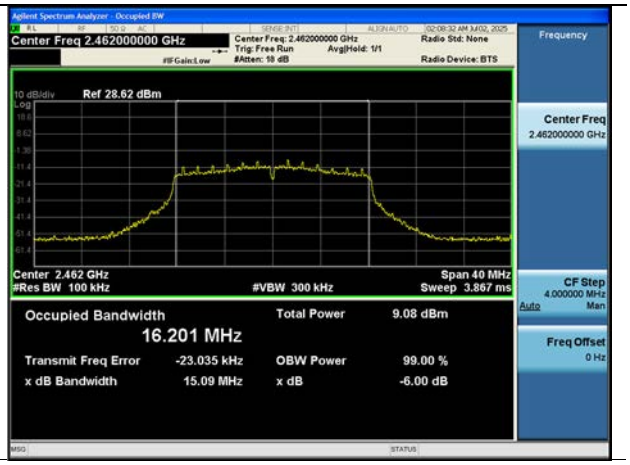
[MIMO_CDD(Ant1)]

802.11b-CH 6	802.11g-CH 1
	
802.11n_HT20-CH 1	802.11ac_VHT20-CH 6
	
802.11n_HT40-CH 3	802.11ac_VHT40-CH 3
	

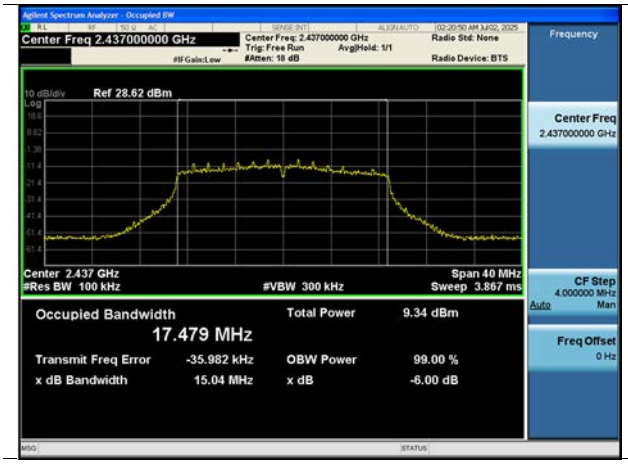
[MIMO_CDD(Ant2&Ant3)]

802.11b-CH 1

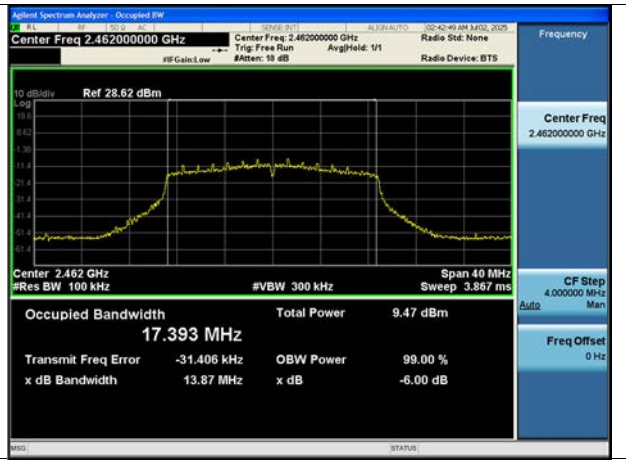
802.11g-CH 11



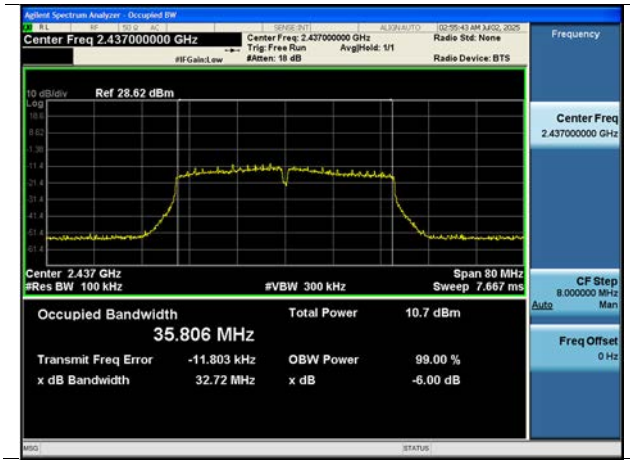
802.11n_HT20-CH 6



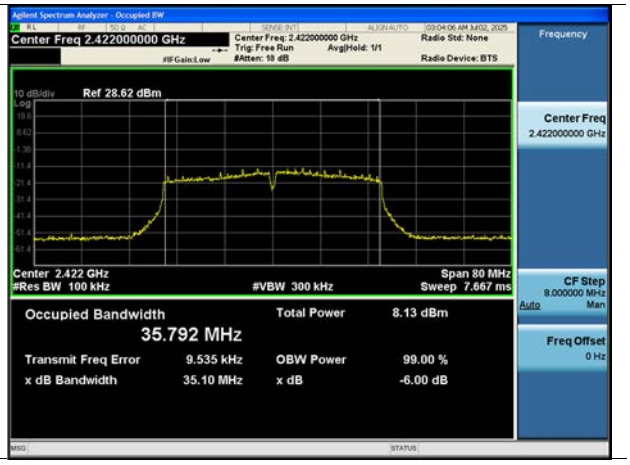
802.11ac_VHT20-CH 11



802.11n_HT40-CH 6



802.11ac_VHT40-CH 3



9.3 OUTPUT POWER

Note :

1. MIMO_CDD(Ant1+Ant2) Power = 10•log((10^(Ant. 1 power /10))+(10^(Ant. 2 power /10)))

Peak Power

[SISO_Ant.3]

Mode	Frequency [MHz]	Channel No.	Data Rate	Conducted Peak Power [dBm]	Limit [dBm]
802.11b	2412	1	1M	7.76	30
	2437	6	1M	7.26	30
	2462	11	1M	8.58	30
802.11g	2412	1	6M	12.30	30
	2437	6	6M	12.20	30
	2462	11	6M	12.81	30
802.11n HT20	2412	1	MCS0	12.24	30
	2437	6	MCS0	12.14	30
	2462	11	MCS0	12.77	30
802.11ac VHT20	2412	1	MCS0	12.16	30
	2437	6	MCS0	12.14	30
	2462	11	MCS0	12.75	30
802.11n HT40	2422	3	MCS0	12.74	30
	2437	6	MCS0	12.98	30
	2452	9	MCS0	12.92	30
802.11n HT40	2422	3	MCS0	12.67	30
	2437	6	MCS0	12.95	30
	2452	9	MCS0	12.83	30

[MIMO_CDD(Ant1+Ant2)]

Mode	Frequency [MHz]	Channel No.	Data Rate	Total Peak Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
802.11b	2412	1	1M	4.91	4.08	7.52	30
	2437	6	1M	6.37	5.00	8.75	30
	2462	11	1M	5.17	3.11	7.27	30
802.11g	2412	1	6M	10.56	8.74	12.75	30
	2437	6	6M	10.96	9.88	13.46	30
	2462	11	6M	11.57	9.59	13.70	30
802.11n HT20	2412	1	MCS0	10.76	8.96	12.96	30
	2437	6	MCS0	10.97	9.75	13.41	30
	2462	11	MCS0	11.73	9.79	13.88	30
802.11ac VHT20	2412	1	MCS0	10.75	8.98	12.96	30
	2437	6	MCS0	10.94	9.81	13.43	30
	2462	11	MCS0	11.77	9.88	13.94	30
802.11n HT40	2422	3	MCS0	11.49	8.77	13.35	30
	2437	6	MCS0	10.68	11.35	14.04	30
	2452	9	MCS0	12.01	8.87	13.73	30
802.11n HT40	2422	3	MCS0	11.49	8.72	13.34	30
	2437	6	MCS0	10.62	11.22	13.94	30
	2452	9	MCS0	11.93	8.71	13.62	30

Average Power

Note :

1. Total Power [dBm] = Measured Power [dBm] + Duty Cycle Factor [dB]

[SISO_Ant.3]

Mode	Frequency [MHz]	Channel No.	Data Rate	Conducted Average Power [dBm]			Limit [dBm]
				Measured Value	D.C.F	Summed	
802.11b	2412	1	1M	4.72	0.004	4.72	30
	2437	6	1M	4.37	0.004	4.37	30
	2462	11	1M	5.70	0.004	5.71	30
802.11g	2412	1	6M	4.60	0.031	4.63	30
	2437	6	6M	4.49	0.031	4.53	30
	2462	11	6M	5.09	0.031	5.12	30
802.11n HT20	2412	1	MCS0	4.20	0.012	4.21	30
	2437	6	MCS0	4.12	0.012	4.13	30
	2462	11	MCS0	4.72	0.012	4.73	30
802.11ac VHT20	2412	1	MCS0	4.13	0.012	4.14	30
	2437	6	MCS0	4.08	0.012	4.09	30
	2462	11	MCS0	4.72	0.012	4.73	30
802.11n HT40	2422	3	MCS0	4.52	0.012	4.53	30
	2437	6	MCS0	4.81	0.012	4.83	30
	2452	9	MCS0	4.62	0.012	4.63	30
802.11ac VHT40	2422	3	MCS0	4.48	0.012	4.50	30
	2437	6	MCS0	4.81	0.012	4.82	30
	2452	9	MCS0	4.61	0.012	4.62	30

[MIMO_CDD(Ant1+Ant2)]

Mode	Frequency [MHz]	Channel No.	Data Rate	Conducted Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
802.11b	2412	1	1M	2.08	0.96	4.57	30
	2437	6	1M	3.45	2.02	5.80	30
	2462	11	1M	2.14	0.16	4.27	30
802.11g	2412	1	6M	2.77	0.68	4.86	30
	2437	6	6M	3.22	1.84	5.60	30
	2462	11	6M	3.52	1.69	5.71	30
802.11n HT20	2412	1	MCS0	2.64	0.68	4.78	30
	2437	6	MCS0	2.92	1.47	5.27	30
	2462	11	MCS0	3.58	1.58	5.71	30
802.11ac VHT20	2412	1	MCS0	2.64	0.67	4.78	30
	2437	6	MCS0	2.89	1.47	5.25	30
	2462	11	MCS0	3.53	1.52	5.65	30
802.11n HT40	2422	3	MCS0	3.15	0.35	4.98	30
	2437	6	MCS0	2.45	2.88	5.68	30
	2452	9	MCS0	3.72	0.31	5.35	30
802.11ac VHT40	2422	3	MCS0	3.18	0.33	4.99	30
	2437	6	MCS0	2.43	2.87	5.67	30
	2452	9	MCS0	3.71	0.29	5.34	30

9.4 POWER SPECTRAL DENSITY

Note :

1. MIMO_CDD(Ant1+Ant2) PSD = 10•log((10^(Ant. 1 PSD /10))+(10^(Ant. 2 PSD /10)))
2. Total PSD = Measured Value + Duty Cycle Factor

[SISO_Ant.3]

BW	Frequency [MHz]	Channel No.	Data Rate	Power Spectral Density [dBm]			Limit [dBm/3kHz]
				Measured Value	D.C.F	Summed	
802.11b	2412	1	1M	-9.786	0.004	-9.782	8
	2437	6	1M	-10.384	0.004	-10.380	8
	2462	11	1M	-8.455	0.004	-8.451	8
802.11g	2412	1	6M	-10.643	0.031	-10.612	8
	2437	6	6M	-11.012	0.031	-10.981	8
	2462	11	6M	-10.133	0.031	-10.102	8
802.11n HT20	2412	1	MCS0	-10.848	0.012	-10.836	8
	2437	6	MCS0	-9.957	0.012	-9.945	8
	2462	11	MCS0	-9.928	0.012	-9.916	8
802.11ac VHT20	2412	1	MCS0	-10.679	0.012	-10.667	8
	2437	6	MCS0	-10.684	0.012	-10.672	8
	2462	11	MCS0	-10.016	0.012	-10.004	8
802.11n HT40	2422	3	MCS0	-13.153	0.012	-13.141	8
	2437	6	MCS0	-12.980	0.012	-12.968	8
	2452	9	MCS0	-13.036	0.012	-13.024	8
802.11ac VHT40	2422	3	MCS0	-13.076	0.012	-13.064	8
	2437	6	MCS0	-13.006	0.012	-12.994	8
	2452	9	MCS0	-13.467	0.012	-13.455	8

[MIMO_CDD(Ant1+Ant2)]

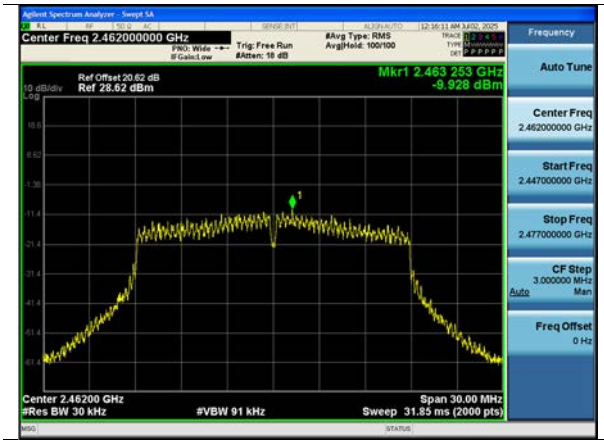
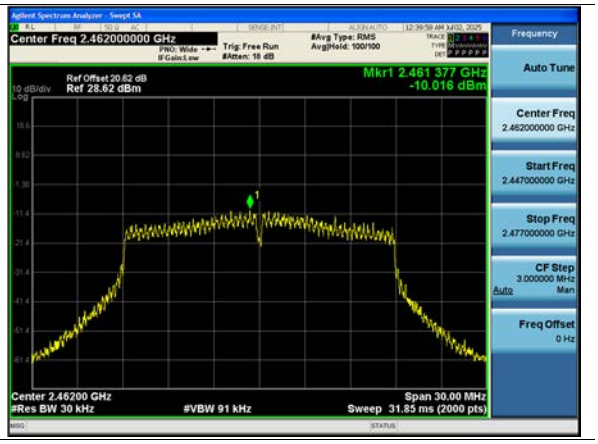
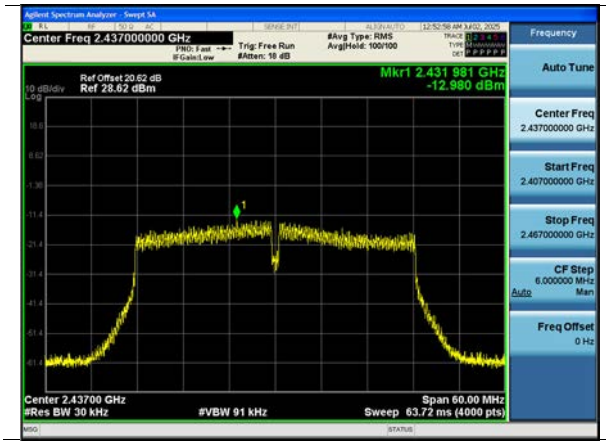
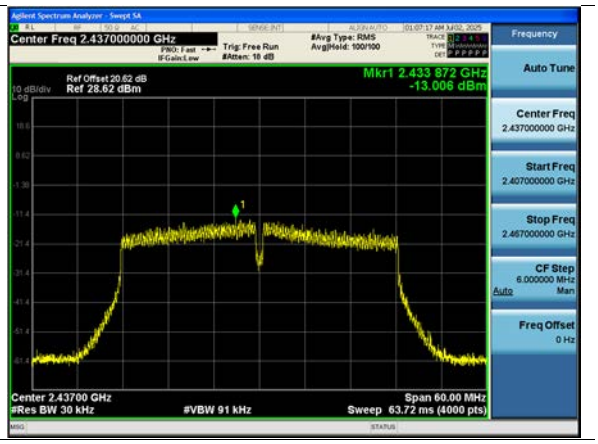
BW	Frequency [MHz]	Channel No.	Data Rate	Total Power Spectral Density [dBm/kHz]			Limit [dBm/3kHz]
				ANT1	ANT2	MIMO	
802.11b	2412	1	1M	-12.818	-13.47	-10.123	8
	2437	6	1M	-10.369	-11.03	-7.677	8
	2462	11	1M	-11.976	-14.16	-9.920	8
802.11g	2412	1	6M	-12.124	-14.46	-10.127	8
	2437	6	6M	-11.376	-13.46	-9.282	8
	2462	11	6M	-11.818	-12.56	-9.165	8
802.11n HT20	2412	1	MCS0	-12.062	-14.92	-10.251	8
	2437	6	MCS0	-13.105	-13.84	-10.448	8
	2462	11	MCS0	-11.908	-13.23	-9.508	8
802.11ac VHT20	2412	1	MCS0	-11.298	-13.87	-9.384	8
	2437	6	MCS0	-11.604	-13.66	-9.500	8
	2462	11	MCS0	-10.726	-11.92	-8.270	8
802.11n HT40	2422	3	MCS0	-14.185	-16.85	-12.306	8
	2437	6	MCS0	-16.434	-14.27	-12.211	8
	2452	9	MCS0	-12.514	-17.75	-11.376	8
802.11ac VHT40	2422	3	MCS0	-14.087	-16.70	-12.190	8
	2437	6	MCS0	-16.347	-14.56	-12.355	8
	2452	9	MCS0	-13.406	-17.49	-11.974	8

▣ Test Plots

Note :

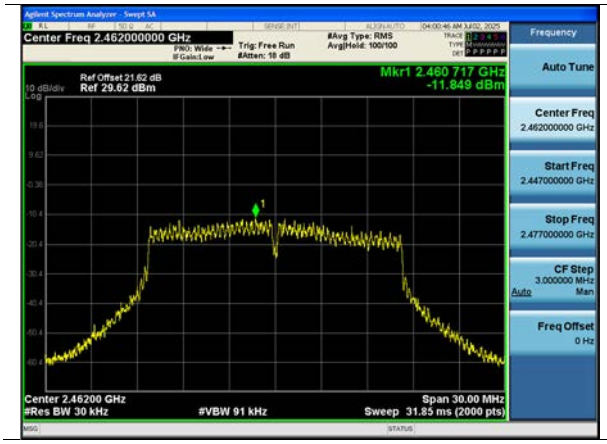
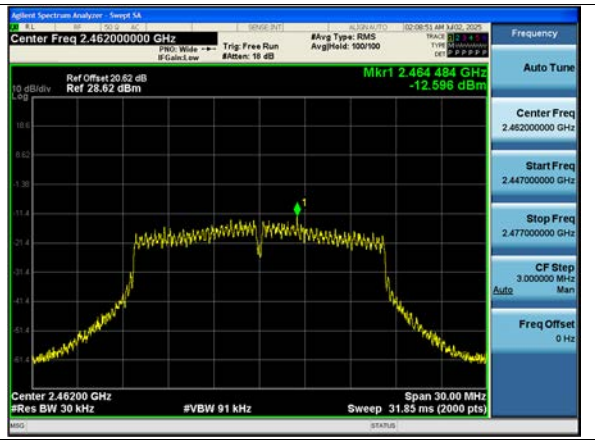
In order to simplify the report, attached plots were only the worst case PSD channel.

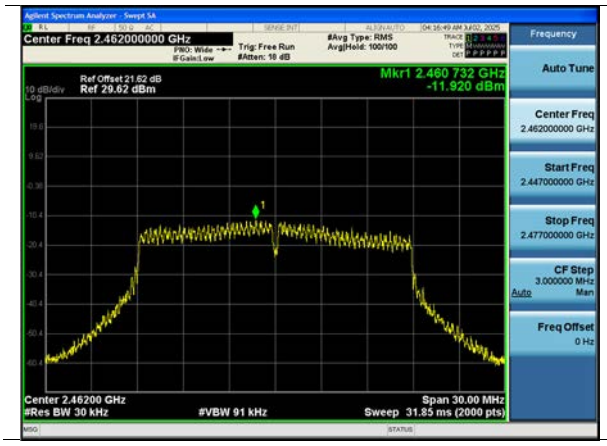
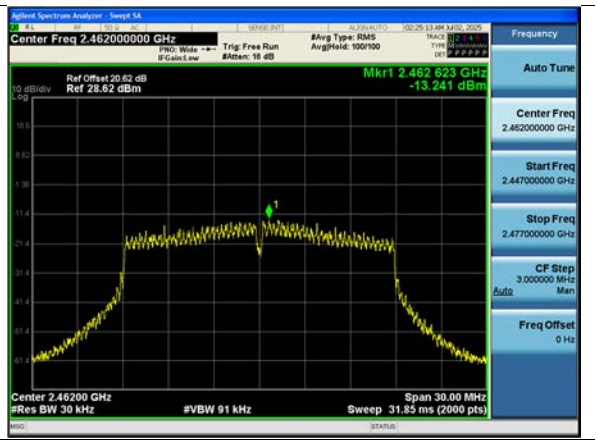
[SISO_Ant.3]

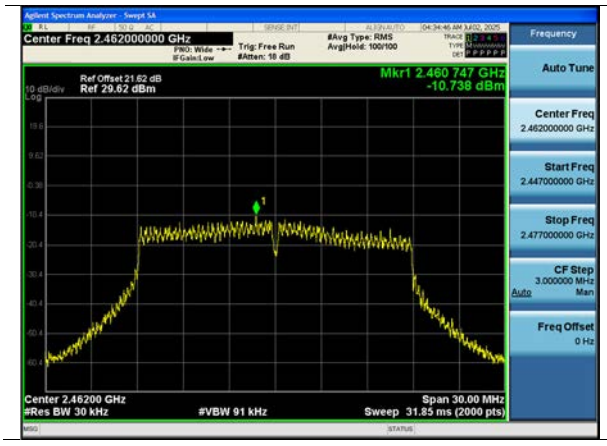
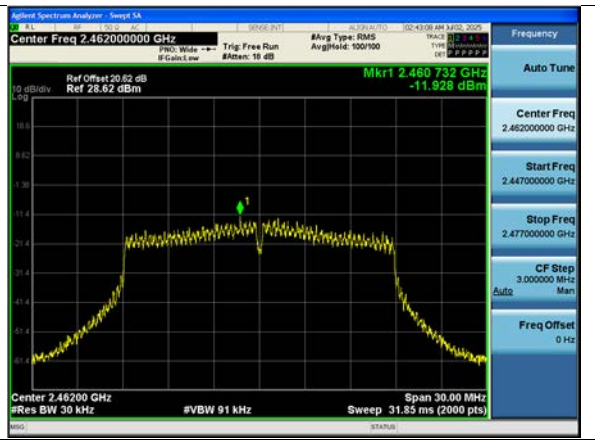
Power Spectral Density (802.11b-CH 11)	Power Spectral Density (802.11g-CH 11)
	
Power Spectral Density (802.11n(HT20)-CH 11)	Power Spectral Density (802.11ac(VHT20)-CH 11)
	
Power Spectral Density (802.11n(HT40)-CH 6)	Power Spectral Density (802.11ac(VHT40)-CH 6)
	

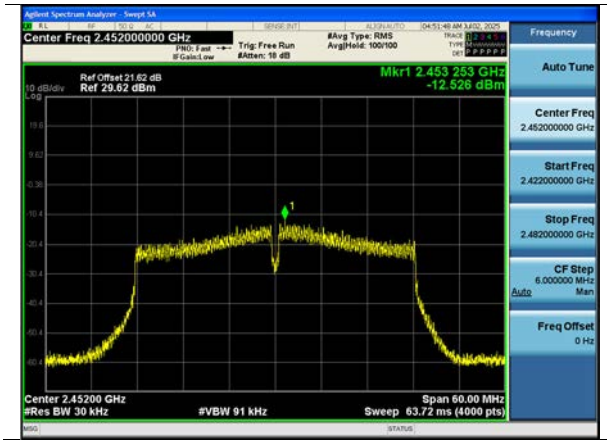
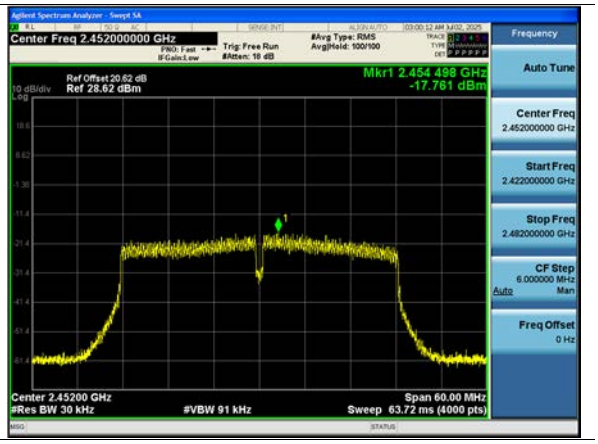
[MIMO_CDD(Ant1+Ant2)]

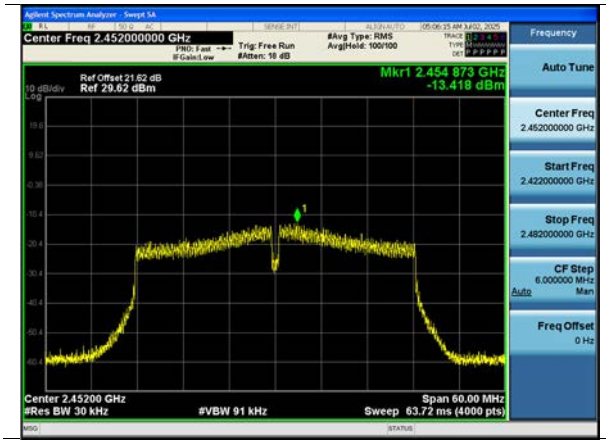
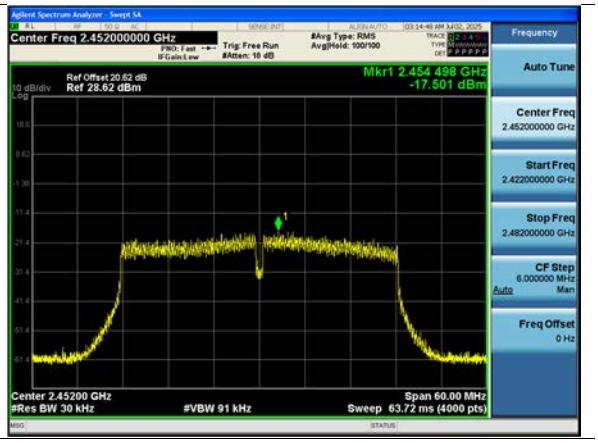
Power Spectral Density (802.11b-CH 6)	
ANT. 1	ANT. 2
	

Power Spectral Density (802.11g-CH 11)	
ANT. 1	ANT. 2
	

Power Spectral Density 802.11n(HT20)-CH 11)	
ANT. 1	ANT. 2
	

Power Spectral Density (802.11ac(VHT20)-CH 11)	
ANT. 1	ANT. 2
	

Power Spectral Density (802.11n(HT40)-CH 9)	
ANT. 1	ANT. 2
	

Power Spectral Density (802.11ac(VHT40)-CH 9)	
ANT. 1	ANT. 2
	

9.5 BAND EDGE / CONDUCTED SPURIOUS EMISSIONS

Band Edge

Limit : 20 dBc

[SISO_Ant.3]

Mode	Freq. [MHz]	CH.	Measured Position	Band edge[dB]
802.11b	2412	1	Lowest Bandedge	48.545
	2462	11	Highest Bandedge	49.287
802.11g	2412	1	Lowest Bandedge	40.662
	2462	11	Highest Bandedge	46.769
802.11n (HT20)	2412	1	Lowest Bandedge	38.586
	2462	11	Highest Bandedge	46.490
802.11ac (VHT20)	2412	1	Lowest Bandedge	37.241
	2462	11	Highest Bandedge	46.247
802.11n (HT40)	2422	3	Lowest Bandedge	39.493
	2452	9	Highest Bandedge	42.857
802.11ac (VHT40)	2422	3	Lowest Bandedge	38.496
	2452	9	Highest Bandedge	43.549

[MIMO_CDD(Ant1)]

Mode	Freq. [MHz]	CH.	Measured Position	Band edge[dB]
802.11b	2412	1	Lowest Bandedge	45.019
	2462	11	Highest Bandedge	43.276
802.11g	2412	1	Lowest Bandedge	42.307
	2462	11	Highest Bandedge	45.005
802.11n (HT20)	2412	1	Lowest Bandedge	39.697
	2462	11	Highest Bandedge	44.804
802.11ac (VHT20)	2412	1	Lowest Bandedge	38.736
	2462	11	Highest Bandedge	45.119
802.11n (HT40)	2422	3	Lowest Bandedge	40.196
	2452	9	Highest Bandedge	41.996
802.11ac (VHT40)	2422	3	Lowest Bandedge	40.935
	2452	9	Highest Bandedge	42.844

[MIMO_CDD(Ant2&Ant3)]

Mode	Freq. [MHz]	CH.	Measured Position	Band edge[dB]
802.11b	2412	1	Lowest Bandedge	44.347
	2462	11	Highest Bandedge	43.552
802.11g	2412	1	Lowest Bandedge	38.702
	2462	11	Highest Bandedge	45.037
802.11n (HT20)	2412	1	Lowest Bandedge	38.754
	2462	11	Highest Bandedge	44.482
802.11ac (VHT20)	2412	1	Lowest Bandedge	35.272
	2462	11	Highest Bandedge	43.819
802.11n (HT40)	2422	3	Lowest Bandedge	37.834
	2452	9	Highest Bandedge	39.334
802.11ac (VHT40)	2422	3	Lowest Bandedge	37.535
	2452	9	Highest Bandedge	39.908

Conducted Spuirous Emission

Limit : 20 dBc

[SISO_Ant.3]

Mode	Frequency [MHz]	Channel No.	Data Rate	Conducted Spurious Emission [dBc]
802.11b	2412	1	1M	42.126
	2437	6	1M	41.765
	2462	11	1M	43.500
802.11g	2412	1	6M	37.889
	2437	6	6M	37.822
	2462	11	6M	38.681
802.11n HT20	2412	1	MCS0	37.360
	2437	6	MCS0	37.909
	2462	11	MCS0	38.997
802.11ac VHT20	2412	1	MCS0	35.976
	2437	6	MCS0	37.969
	2462	11	MCS0	38.790
802.11n HT40	2422	3	MCS0	34.756
	2437	6	MCS0	37.950
	2452	9	MCS0	35.625
802.11ac VHT40	2422	3	MCS0	34.768
	2437	6	MCS0	36.540
	2452	9	MCS0	35.165

[MIMO_CDD(Ant1)]

Mode	Frequency [MHz]	Channel No.	Data Rate	Conducted Spurious Emission [dBc]
802.11b	2412	1	1M	37.940
	2437	6	1M	39.757
	2462	11	1M	38.547
802.11g	2412	1	6M	37.224
	2437	6	6M	36.049
	2462	11	6M	36.322
802.11n HT20	2412	1	MCS0	35.193
	2437	6	MCS0	35.887
	2462	11	MCS0	36.555
802.11ac VHT20	2412	1	MCS0	36.568
	2437	6	MCS0	35.211
	2462	11	MCS0	35.613
802.11n HT40	2422	3	MCS0	33.843
	2437	6	MCS0	31.059
	2452	9	MCS0	33.851
802.11ac VHT40	2422	3	MCS0	33.860
	2437	6	MCS0	30.632
	2452	9	MCS0	35.101

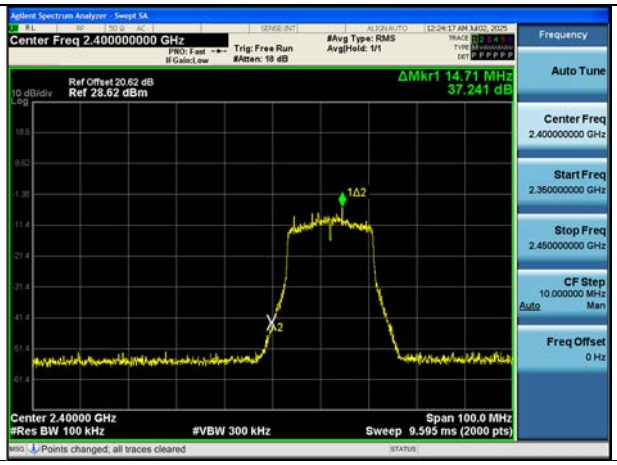
[MIMO_CDD(Ant2&Ant3)]

Mode	Frequency [MHz]	Channel No.	Data Rate	Conducted Spurious Emission [dBc]
802.11b	2412	1	1M	37.735
	2437	6	1M	37.990
	2462	11	1M	37.610
802.11g	2412	1	6M	36.502
	2437	6	6M	36.679
	2462	11	6M	36.479
802.11n HT20	2412	1	MCS0	34.339
	2437	6	MCS0	35.761
	2462	11	MCS0	38.834
802.11ac VHT20	2412	1	MCS0	34.437
	2437	6	MCS0	34.731
	2462	11	MCS0	36.002
802.11n HT40	2422	3	MCS0	31.623
	2437	6	MCS0	34.375
	2452	9	MCS0	31.425
802.11ac VHT40	2422	3	MCS0	31.513
	2437	6	MCS0	34.039
	2452	9	MCS0	32.749

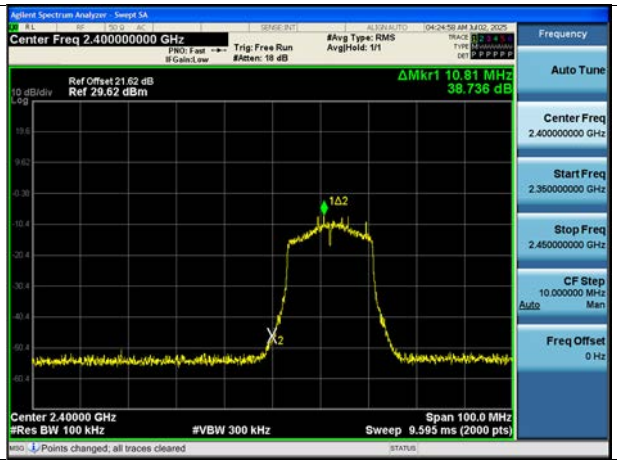
▣ Test Plots

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

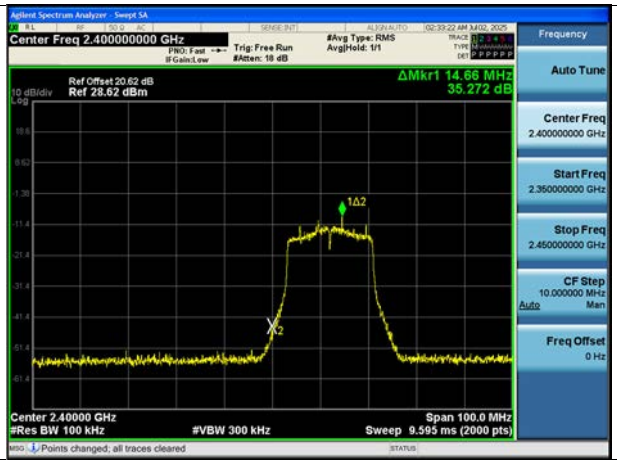
[SISO_Ant.3] 802.11ac(VHT20) - CH 1



[MIMO_CDD(Ant1)] 802.11ac(VHT20) - CH 1



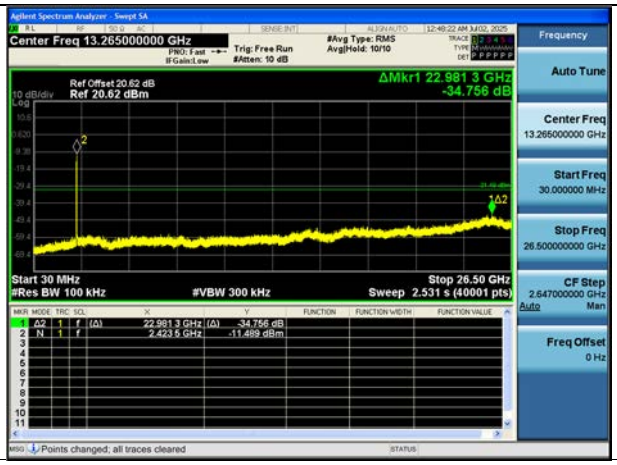
[MIMO_CDD(Ant2&Ant3)] 802.11ac(VHT20) - CH 1



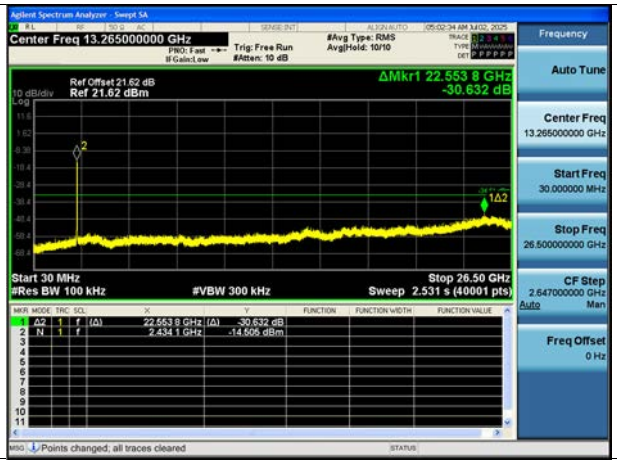
▣ Test Plots(Conducted Spurious Emission)

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

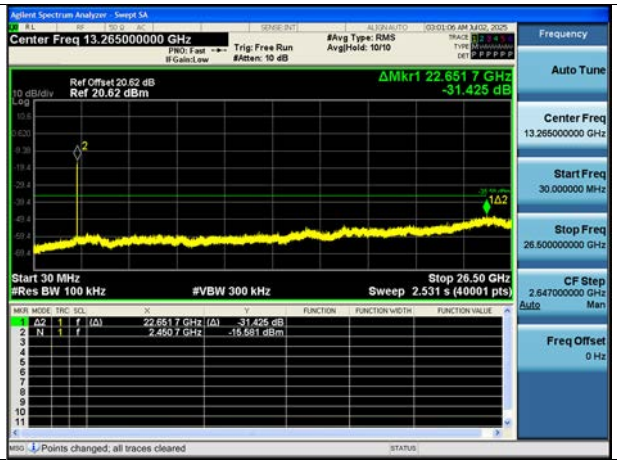
[SISO_Ant.3] 802.11n(HT40) - CH 3



[MIMO_CDD(Ant1)] 802.11ac(VHT40) - CH 6



[MIMO_CDD(Ant2&Ant3)] 802.11n(HT40) - CH 9



Limit

SISO_Ant.3: -31.489 dBm, MIMO_CDD(Ant1): -34.505 dBm, MIMO_CDD(Ant2+Ant3): -35.581 dBm

9.6 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30 MHz

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

Note:

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

Frequency Range : Below 1 GHz

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

Note:

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

Frequency Range : Above 1 GHz

[MIMO_CDD(Ant1+Ant2)]

Band :	DTS		Operation Mode :	802.11b			
CH.1	2412		Transfer Rate :	1Mbps			
Frequency [MHz]	Measured value [dBµV]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4824	40.05	4.99	V	45.04	73.98	28.94	PK
4824	30.85	4.99	V	35.84	53.98	18.14	AV
7236	38.89	12.93	V	51.82	73.98	22.16	PK
7236	26.65	12.93	V	39.58	53.98	14.40	AV
4824	42.23	4.99	H	47.22	73.98	26.76	PK
4824	31.03	4.99	H	36.02	53.98	17.96	AV
7236	39.13	12.93	H	52.06	73.98	21.92	PK
7236	26.67	12.93	H	39.60	53.98	14.38	AV

Band :	DTS		Operation Mode :	802.11b			
CH.6	2437		Transfer Rate :	1Mbps			
Frequency [MHz]	Measured value [dBµV]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4874	42.12	5.25	V	47.37	73.98	26.61	PK
4874	32.05	5.25	V	37.30	53.98	16.68	AV
7311	38.95	12.82	V	51.77	73.98	22.21	PK
7311	26.44	12.82	V	39.26	53.98	14.72	AV
4874	42.61	5.25	H	47.86	73.98	26.12	PK
4874	32.55	5.25	H	37.80	53.98	16.18	AV
7311	39.08	12.82	H	51.90	73.98	22.08	PK
7311	26.59	12.82	H	39.41	53.98	14.57	AV

Band :	DTS		Operation Mode :	802.11b			
CH.11	2462		Transfer Rate :	1Mbps			
Frequency [MHz]	Measured value [dBµV]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4924	42.44	5.45	V	47.89	73.98	26.09	PK
4924	32.85	5.45	V	38.30	53.98	15.68	AV
7386	38.95	12.63	V	51.58	73.98	22.40	PK
7386	26.71	12.63	V	39.34	53.98	14.64	AV
4924	42.68	5.45	H	48.13	73.98	25.85	PK
4924	33.17	5.45	H	38.62	53.98	15.36	AV
7386	39.06	12.63	H	51.69	73.98	22.29	PK
7386	26.85	12.63	H	39.48	53.98	14.50	AV

Band :	DTS			Operation Mode :	802.11n40			
CH.3	2422 MHz	MHz		Transfer Rate :	MCS0			
Frequency [MHz]	Measured value [dBµV]	D.C.F [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4844	42.12	0.00	5.02	V	47.14	73.98	26.84	PK
4844	29.51	0.01	5.02	V	34.54	53.98	19.44	AV
7266	38.66	0.00	12.69	V	51.35	73.98	22.63	PK
7266	26.51	0.01	12.69	V	39.21	53.98	14.77	AV
4844	42.34	0.00	5.02	H	47.36	73.98	26.62	PK
4844	29.67	0.01	5.02	H	34.70	53.98	19.28	AV
7266	38.75	0.00	12.69	H	51.44	73.98	22.54	PK
7266	26.58	0.01	12.69	H	39.28	53.98	14.70	AV

Band :	DTS			Operation Mode :	802.11n40			
CH.6	2437	MHz		Transfer Rate :	MCS0			
Frequency [MHz]	Measured value [dBµV]	D.C.F [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4874	41.99	0.00	5.25	V	47.24	73.98	26.74	PK
4874	29.45	0.01	5.25	V	34.71	53.98	19.27	AV
7311	39.01	0.00	12.82	V	51.83	73.98	22.15	PK
7311	26.41	0.01	12.82	V	39.24	53.98	14.74	AV
4874	42.04	0.00	5.25	H	47.29	73.98	26.69	PK
4874	29.51	0.01	5.25	H	34.77	53.98	19.21	AV
7311	39.09	0.00	12.82	H	51.91	73.98	22.07	PK
7311	26.59	0.01	12.82	H	39.42	53.98	14.56	AV

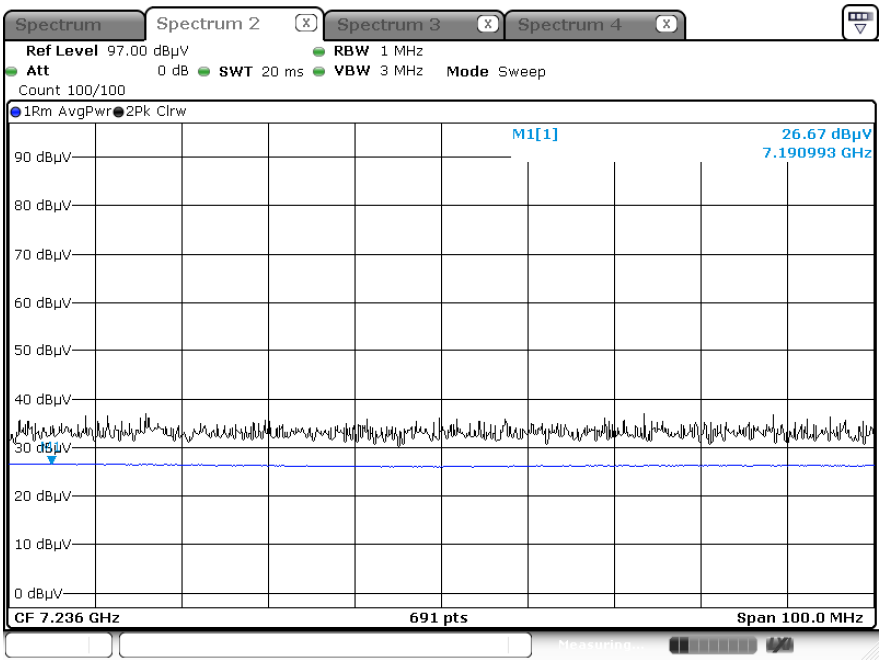
Band :	DTS			Operation Mode :	802.11n40			
CH.9	2452	MHz		Transfer Rate :	MCS0			
Frequency [MHz]	Measured value [dBµV]	D.C.F [dB]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4904	42.05	0.00	5.44	V	47.49	73.98	26.49	PK
4904	29.99	0.01	5.44	V	35.44	53.98	18.54	AV
7356	38.55	0.00	12.71	V	51.26	73.98	22.72	PK
7356	26.66	0.01	12.71	V	39.38	53.98	14.60	AV
4904	42.25	0.00	5.44	H	47.69	73.98	26.29	PK
4904	30.07	0.01	5.44	H	35.52	53.98	18.46	AV
7356	38.63	0.00	12.71	H	51.34	73.98	22.64	PK
7356	26.73	0.01	12.71	H	39.45	53.98	14.53	AV

▣ Test Plots

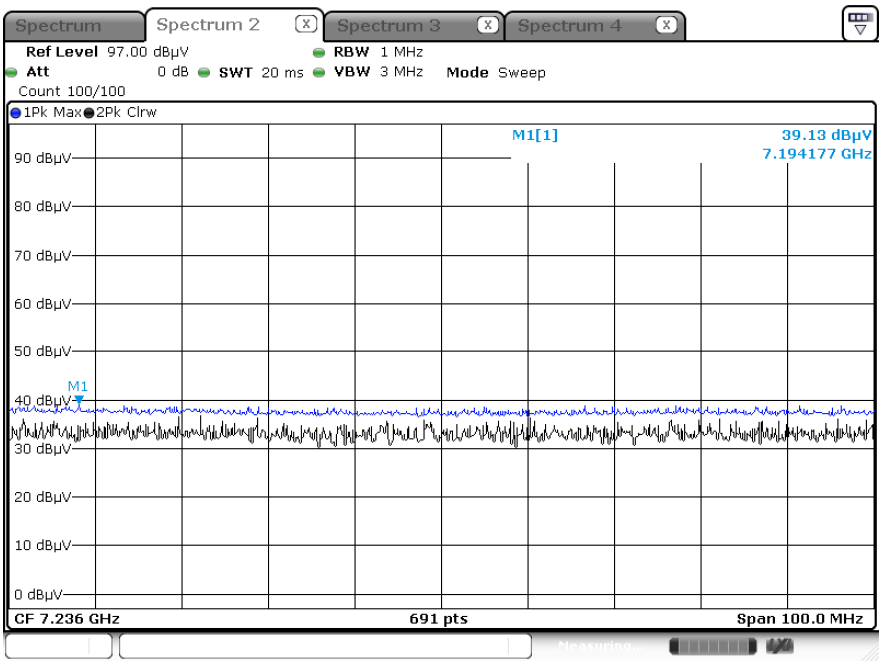
Note: In order to simplify the report, Plot of worst case are only reported.

[MIMO_CDD(Ant1+Ant2)]

Radiated Spurious Emissions plot – Average Result (802.11b_1 Mbps, Ch.1 3rd Harmonic, Y-H)



Radiated Spurious Emissions plot – Peak Result (802.11b_1 Mbps, Ch.1 3rd Harmonic, Y-H)



9.7 RADIATED RESTRICTED BAND EDGES

[MIMO_CDD(Ant1+Ant2)]

802.11b	Channel	1 Ch	Freq	2412 MHz		Transfer Rate	1 Mbps
Frequency	Measured Value	A.F.+C.L+D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
2390.0	17.78	36.66	H	54.44	73.98	19.54	PK
2390.0	5.59	36.66	H	42.25	53.98	11.73	AV

802.11b	Channel	11 Ch	Freq	2462 MHz		Transfer Rate	1 Mbps
Frequency	Measured Value	A.F.+C.L+D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
2483.5	18.27	37.22	H	55.49	73.98	18.49	PK
2483.5	5.91	37.22	H	43.13	53.98	10.85	AV

802.11g		Channel	1 Ch	Freq	2412 MHz		Transfer Rate	6 Mbps
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]	
2390.0	18.33	0.00	36.66	H	54.99	73.98	18.99	PK
2390.0	5.64	0.03	36.66	H	42.33	53.98	11.65	AV

802.11g		Channel	11 Ch	Freq	2462 MHz		Transfer Rate	6 Mbps
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	18.27	0.00	37.22	H	55.49	73.98	18.49	PK
2483.5	6.26	0.03	37.22	H	43.51	53.98	10.47	AV

802.11n (HT20)		Channel	1 Ch	Freq	2412 MHz		Transfer MCS Index	MCS0
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]	
2390.0	17.87	0.00	36.66	H	54.53	73.98	19.45	PK
2390.0	5.64	0.01	36.66	H	42.31	53.98	11.67	AV

802.11n (HT20)		Channel	11 Ch	Freq	2462 MHz		Transfer MCS Index	MCS0
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	18.51	0.00	37.22	H	55.73	73.98	18.25	PK
2483.5	6.36	0.01	37.22	H	43.59	53.98	10.39	AV

802.11ac (VHT20)		Channel	1 Ch	Freq	2412 MHz		Transfer MCS Index	MCS0
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]	
2390.0	17.65	0.00	36.66	H	54.31	73.98	19.67	PK
2390.0	5.72	0.01	36.66	H	42.39	53.98	11.59	AV

802.11ac (VHT20)		Channel	11 Ch	Freq	2462 MHz		Transfer MCS Index	MCS0
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	18.37	0.00	37.22	H	55.59	73.98	18.39	PK
2483.5	6.32	0.01	37.22	H	43.55	53.98	10.43	AV

802.11n (HT40)		Channel	3 Ch	Freq	2422 MHz		Transfer MCS Index	MCS0
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]	
2390.0	18.30	0.00	36.66	H	54.96	73.98	19.02	PK
2390.0	7.07	0.01	36.66	H	43.74	53.98	10.24	AV

802.11n (HT40)		Channel	9 Ch	Freq	2452 MHz		Transfer MCS Index	MCS0
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	18.01	0.00	37.22	H	55.23	73.98	18.75	PK
2483.5	6.20	0.01	37.22	H	43.43	53.98	10.55	AV

802.11ac (VHT40)		Channel	3 Ch	Freq	2422 MHz		Transfer MCS Index	MCS0
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]	
2390.0	18.64	0.00	36.66	H	55.30	73.98	18.68	PK
2390.0	7.18	0.01	36.66	H	43.85	53.98	10.13	AV

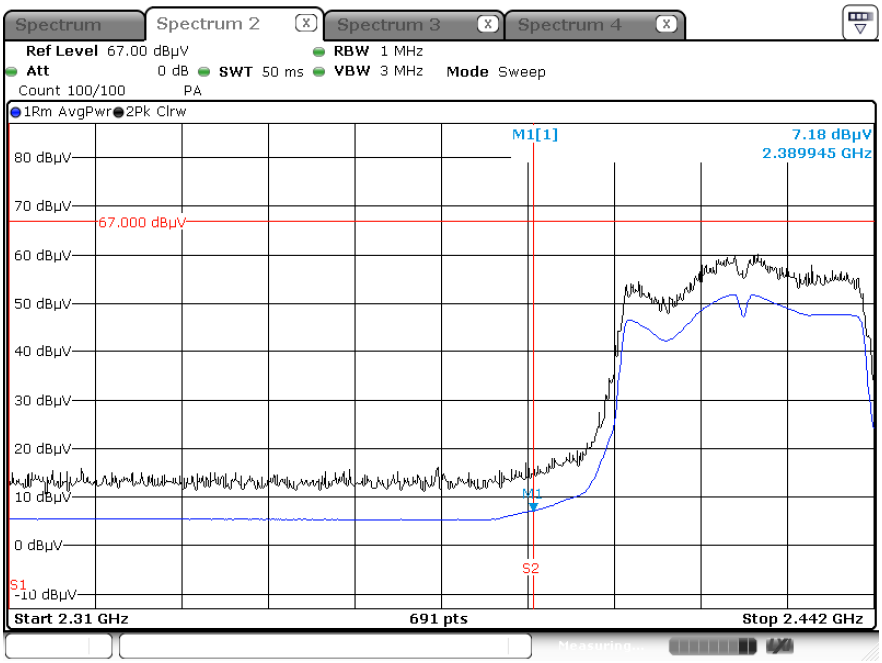
802.11ac (VHT40)		Channel	9 Ch	Freq	2452 MHz		Transfer MCS Index	MCS0
Frequency	Measured Value	Duty Cycle Factor	A.F.+C.L+D.F	ANT. POL	Total	Limit	Margin	Measurement Type
[MHz]	[dBµV]	[dB]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
2483.5	18.10	0.00	37.22	H	55.32	73.98	18.66	PK
2483.5	6.15	0.01	37.22	H	43.38	53.98	10.60	AV

▣ Test Plots

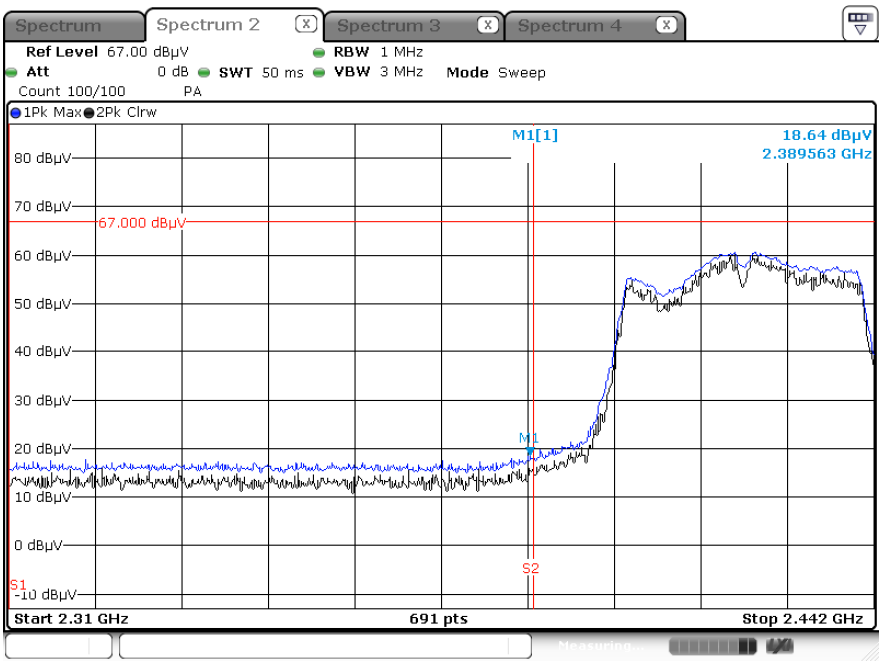
Note: In order to simplify the report, Plots of worst case are only reported.

[MIMO_CDD(Ant1+Ant2)]

Radiated Restricted Band Edges plot – Average Result (802.11ac (VHT40)_ MCS0, Ch.9, Y-H)



Radiated Restricted Band Edges plot – Peak Result (802.11ac (VHT40)_ MCS0, Ch.9, Y-H)



10. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	07/15/2026	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	08/27/2025	Annual
Temperature Chamber	SU-642	ESPEC	0093008124	02/11/2026	Annual
Signal Analyzer	N9030A	Agilent	MY49432108	02/18/2026	Annual
Power Measurement Set	OSP 120	Rohde & Schwarz	100935	08/01/2025	Annual
Power Meter	N1911A	Agilent	MY45100523	02/21/2026	Annual
Power Sensor	N1921A	Agilent	MY57820067	02/04/2026	Annual
Directional Coupler	87300B	Agilent	3116A03621	10/21/2025	Annual
Power Splitter	11667B	Hewlett Packard	10545	01/23/2026	Annual
DC Power Supply	E3632A	Agilent	KR75303243	04/16/2026	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C	HP	07560	05/27/2026	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C	HP	08285	05/19/2026	Annual
Attenuator(20 dB)	18N-20dB	Rohde & Schwarz	8	02/18/2026	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A
Bluetooth Tester	CBT	Rohde & Schwarz	100752	12/27/2025	Annual
Automation Software	FCC WLAN Conducted	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	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	S1AM	07/30/2025	Annual
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	1513-175	01/06/2027	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	08/28/2026	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	09/20/2026	Biennial
Spectrum Analyzer	FSV(10 Hz ~ 40 GHz)	Rohde & Schwarz	101055	05/07/2026	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	12/26/2025	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	05/27/2026	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	05/27/2026	Annual
High Pass Filter(7 GHz ~ 18 GHz)	WHKX10-7150-8000-18000-50SS	Wainwright Instruments	1	02/21/2026	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/07/2025	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/19/2026	Annual
Bluetooth Tester	TC-3000C	TESCOM	3000C000175	03/12/2026	Annual
RF Switching System	FMSR-05B (HPF(3~18GHz) + LNA1(1~18GHz))	T&M system	S1L1	12/23/2025	Annual
RF Switching System	FMSR -05B (ATT(10dB) + LNA1(1~18GHz))	T&M system	S1L2	12/23/2025	Annual
RF Switching System	FMSR -05B (ATT(3dB) + LNA1(1~18GHz))	T&M system	S1L3	12/23/2025	Annual
RF Switching System	FMSR -05B (LNA1(1~18GHz))	T&M system	S1L4	12/23/2025	Annual
RF Switching System	FMSR -05B (HPF(7~18GHz) + LNA2(6~18GHz))	T&M system	S1L5	12/23/2025	Annual
RF Switching System	FMSR -05B (Thru(30MHz ~ 18GHz))	T&M system	S1L6	12/23/2025	Annual
Automation Software	FCC WLAN Radiated	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.
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-2507-FC077-P