

TEST REPORT

FCC UNII Test for LGSWNAC64
Certification

APPLICANT
LG Electronics Inc.

REPORT NO.
HCT-RF-2510-FC034-R1

DATE OF ISSUE
November 25, 2025

Tested by
Kyung Jun Woo



Technical Manager
Jong Seok Lee



Accredited by KOLAS, Republic of KOREA

HCT CO., LTD.
BongJai Huh
BongJai Huh / CEO

HCT CO.,LTD.

2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea
Tel. +82 31 645 6300 Fax. +82 31 645 6401

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Applicant

LG Electronics Inc.

222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 17709, Republic of Korea

Product Name
Model Name

RF Module
LGSWNAC64

FCC ID

2B03LLGSWNAC64

Date of Test

July 21, 2025 ~ August 29, 2025

FCC Classification

Unlicensed National Information Infrastructure(NII)

Test Standard Used

FCC Rule Part(s): Part 15.407

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)

Brand

LG

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	October 20, 2025	Initial Release
1	November 25, 2025	Revised the typo on page 1. (Permissive Change -> Certification)

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 laboratory is not accredited for the test results marked *.

Information provided by the applicant is marked **.

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

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)

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1. GENERAL INFORMATION

EUT DESCRIPTION

Model	LGSWNAC64	
Additional Model	-	
EUT Type	RF Module	
Power Supply	DC 3.30 V	
Modulation Type	OFDM : 802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-1	20 MHz BW : 5180 - 5240 40 MHz BW : 5190 - 5230 80 MHz BW : 5210
	U-NII-2A	20 MHz BW : 5260 - 5320 40 MHz BW : 5270 - 5310 80 MHz BW : 5290
	U-NII-2C	20 MHz BW : 5500 - 5720 40 MHz BW : 5510 - 5710 80 MHz BW : 5530 - 5690
	U-NII-3	20 MHz BW : 5745 - 5825 40 MHz BW : 5755 - 5795 80 MHz BW : 5775
Straddle channel	Supported	
TDWR Band	Supported	
Dynamic Frequency Selection	Slave without radar detection	
Antenna Specification	Type: Metal Press	
Serial number	Conducted : 6C15DB172700 Radiated : 0827A8A35FF0	

ANTENNA CONFIGURATIONS

1. Antenna configuration

Configurations	SISO		MIMO	
	Ant.1	Ant.2	CDD	SDM
802.11a	O	O	O	X
802.11n	O	O	O	O
802.11ac	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 Bands simultaneously on each antenna.

Simultaneous transmission Scenario	2.4 GHz WiFi Ant.1	2.4 GHz WiFi Ant.2	5 GHz WiFi Ant.1	5 GHz WiFi Ant.2	Bluetooth	Test Case
Bluetooth + 2.4 GHz WiFi MIMO	on	on	-	-	on	
Bluetooth + 5 GHz WiFi MIMO	-	-	on	on	on	Scenario 1
2.4 GHz WiFi SISO + 5 GHz WiFi SISO	-	on	on	-	-	
Bluetooth + 2.4 GHz WiFi SISO + 5 GHz WiFi SISO	-	on	on	-	on	Scenario 2

3. Directional Gain Calculation

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

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

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

Band	Ant Gain (dBi)		N _{ANT} / N _{ss}	Directional Gain (dBi)	
	ANT1	ANT2		CDD	SDM
UNII 1	0.34	2.93	2 / 2	4.74	2.93
UNII 2A	0.51	3.11		4.92	3.11
UNII 2C	0.68	2.99		4.92	2.99
UNII 3	2.25	3.10		5.70	3.10

Note

According to Ansi C63.10-2020 section 14.6.3, the directional gain is calculated using the formula, where GN is the gain of the nth antenna and NANT is the total number of antennas used.

$$\text{Directional gain(CDD)} = 10 \cdot \log \left(\left(\frac{10^{(ANT1 \text{ Gain}/20)} + 10^{(ANT2 \text{ Gain}/20)} \right)^2 / 2 \right) \text{ dBi}$$

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

Sample Calculation (Conducted Power, MIMO):

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

$$\text{Ant1} + \text{Ant 2} = \text{MIMO}$$

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

Sample Calculation (E.I.R.P & E.I.R.P Spectral Density, MIMO):

Ex) ANT1 : 15.35 dBm , ANT2 : 15.12 dBm, Directional Gain : 3 dBi

$$\text{Conducted Power} = (15.35 \text{ dBm} + 15.12 \text{ dBm}) = (34.276 \text{ mW} + 32.508 \text{ mW}) = 66.784 \text{ mW} = 18.25 \text{ dBm}$$

$$\text{E.I.R.P} = 18.25 \text{ dBm} + 3 \text{ dBi} = 21.25 \text{ dBm}$$

2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

Band	Mode	MIMO_CDD(Ant.1+ Ant.2)					
		Ant.1 Power		Ant.2 Power		Ant.1 + Ant.2 Power	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
UNII1	802.11a	12.51	0.018	12.11	0.016	15.32	0.034
	802.11n (HT20)	13.06	0.020	12.15	0.016	15.64	0.037
	802.11n (HT40)	12.41	0.017	11.65	0.015	15.06	0.032
	802.11ac (VHT20)	13.02	0.020	12.04	0.016	15.57	0.036
	802.11ac (VHT40)	12.47	0.018	11.86	0.015	15.19	0.033
	802.11ac (VHT80)	12.33	0.017	11.45	0.014	14.92	0.031
UNII2A	802.11a	13.02	0.020	12.41	0.017	15.74	0.037
	802.11n (HT20)	13.07	0.020	12.53	0.018	15.82	0.038
	802.11n (HT40)	12.69	0.019	12.02	0.016	15.38	0.035
	802.11ac (VHT20)	13.00	0.020	12.60	0.018	15.81	0.038
	802.11ac (VHT40)	12.49	0.018	12.29	0.017	15.40	0.035
	802.11ac (VHT80)	12.65	0.018	11.82	0.015	15.27	0.034
UNII2C	802.11a	12.48	0.018	12.26	0.017	15.38	0.035
	802.11n (HT20)	12.51	0.018	12.30	0.017	15.42	0.035
	802.11n (HT40)	12.73	0.019	12.62	0.018	15.69	0.037
	802.11ac (VHT20)	12.49	0.018	12.18	0.017	15.35	0.034
	802.11ac (VHT40)	12.73	0.019	12.41	0.017	15.58	0.036
	802.11ac (VHT80)	12.75	0.019	11.94	0.016	15.37	0.034
UNII3	802.11a	12.66	0.018	12.41	0.017	15.55	0.036
	802.11n (HT20)	12.57	0.018	12.38	0.017	15.49	0.035
	802.11n (HT40)	12.75	0.019	12.45	0.018	15.61	0.036
	802.11ac (VHT20)	12.67	0.018	12.33	0.017	15.51	0.036
	802.11ac (VHT40)	12.63	0.018	12.46	0.018	15.56	0.036
	802.11ac (VHT80)	12.48	0.018	11.36	0.014	14.97	0.031

3. TEST METHODOLOGY

Unlicensed wireless device were tested using the following measurement procedure.

[1] KDB 789033 D02 15.407 Meas Guidance v02r01.

[2] ANSI C63.10-2020.

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 15.407 under the FCC Rules Part 15 Subpart E.

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 C63.10-2020 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and average Measurement Type or modes.

Radiated Emissions

According to the requirements in Section 6.3 ~ Section 6.6 of ANSI C63.10-2020

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.

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.

4. 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).

5. FACILITIES AND ACCREDITATIONS

5.1 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).

5.2 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 ANSI/USEMCSC C63.2-2023, "American National Standard for Specifications of Electromagnetic Interference and Field Strength Measuring Instrumentation in the Frequency Range 9 kHz to 40 GHz".

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR § 15.203, § 15.407:

“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, § 15.407

7. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2020.

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 ($\pm$ kHz)
X dB, 99% Bandwidth	95 (Confidence level about 95 %, $k=2$)
Frequency stability	28 (Confidence level about 95 %, $k=2$)

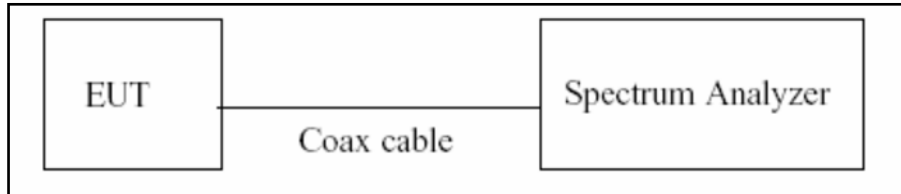
Parameter	Expanded Uncertainty ($\pm$ dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.54 (Confidence level about 95 %, $k=2$)
Conducted Output Power(Power Meter)	0.54 (Confidence level about 95 %, $k=2$)
Conducted Output Power(Signal Analyzer)	0.68 (Confidence level about 95 %, $k=2$)
Power Spectral Density	1.03 (Confidence level about 95 %, $k=2$)
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 %, $k=2$)

8. DESCRIPTION OF TESTS

Test Item	Test Procedure
Duty Cycle	- KDB 789033 D02 – Section B.2
6 dB Bandwidth & 26dB Bandwidth	- KDB 789033 D02 - Section C
Output Power	- KDB 789033 D02 - Section E
Power Spectral Density	- KDB 789033 D02 - Section F
Frequency Stability	- ANSI C63.10-2020 - Section 6.8
AC Power line Conducted Emissions	- ANSI C63.10-2020– Section 6.2
Radiated Test	- KDB 987594 D02 - Section II.G - ANSI C63.10-2020 - Section 6.4 (Below 30 MHz) - ANSI C63.10-2020 - Section 6.5 (30 MHz to 1000 MHz) - ANSI C63.10-2020 - Section 6.6 (1 GHz to 40 GHz)

8.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

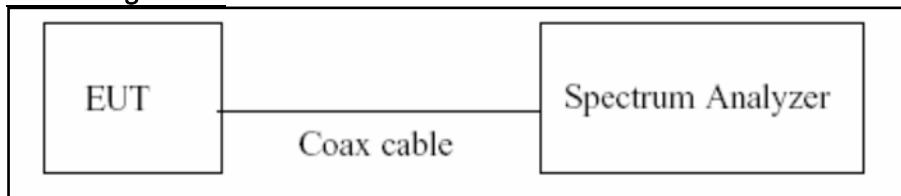
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ($\geq$ RBW)
3. SPAN = 0 Hz
4. Detector = Average
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = $T_{\text{on}} / T_{\text{total}}$ and Duty Cycle Factor = $10\log(1/\text{Duty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

8.2. 6 dB Bandwidth & 26 dB Bandwidth

Limit

Within the 5.725-5.85 GHz(NII-3) band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Configuration



Test Procedure (26 dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

1. RBW = approximately 1 % of the emission bandwidth
2. VBW > RBW
3. Detector = Peak
4. Trace mode = max hold
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

Test Procedure (6 dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

1. RBW = 100 kHz
2. VBW $\geq 3 \times$ RBW
3. Detector = Peak
4. Trace mode = max hold
5. Allow the trace to stabilize
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points(upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note:

1. We tested X dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.
2. DFS test channels should be defined. So, we performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.
3. The 26 dB bandwidth is used to determine the conducted power limits.

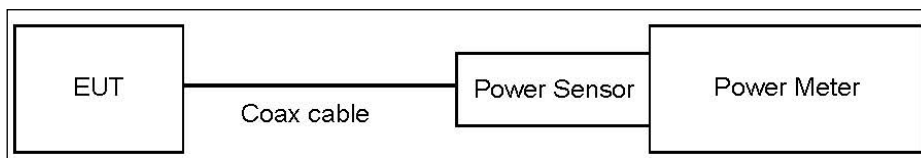
8.3. Output Power Measurement

Limit

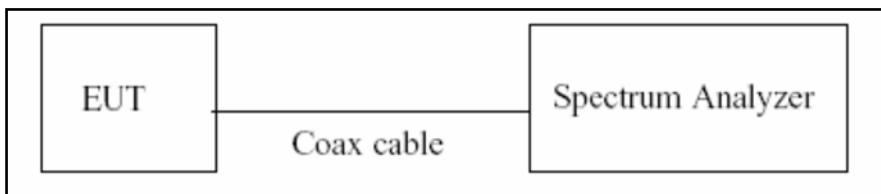
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30 dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30 dBm)

Test Configuration

Power Meter



Spectrum Analyzer(Only Straddle Channel)



Test Procedure(Power Meter)

The transmitter output is connected to the Power Meter.

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.

Test Procedure (Spectrum Analyzer)

We use the spectrum analyzer's integrated band power measurement function

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW $\geq$ 3 MHz.
5. Number of points in sweep $\geq$ 2 x span/RBW.
6. Sweep time = auto.
7. Measurement Type or = RMS.
8. Do not use sweep triggering. Allow the sweep to "free run".
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. 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

Total Power(dBm) = Measured Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

Note

1. Spectrum Measured Levels are not plot data.

The power results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	11.95
UNII 2A	11.95
UNII 2C	11.95
UNII 3	11.95

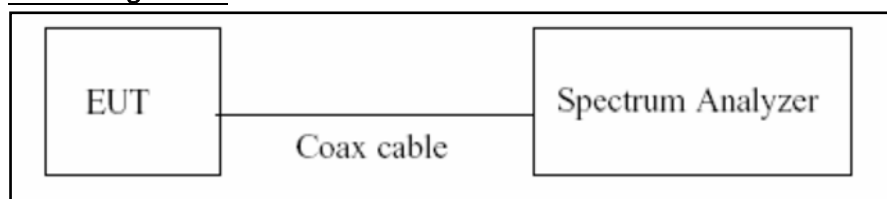
(Actual value of loss for the attenuator and cable combination)

8.4. Power Spectral Density

Limit

Band	Limit
UNII 1	11 dBm/MHz
UNII 2A, 2C	11 dBm/MHz
UNII 3	30 dBm/500 kHz

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz(510 kHz for UNII 3)
→For portion within the NII-3 be used RBW 510kHz
3. VBW $\geq$ 3 MHz
4. Number of points in sweep $\geq$ 2 x span/RBW.
5. Sweep time = auto.
6. Measurement Typeor = RMS(i.e., power averaging), if available. Otherwise, use sample Measurement Typeor mode.
7. Do not use sweep triggering. Allow the sweep to “free run”.
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add $10 \log(1/x)$, where x is the duty cycle, to the peak of the spectrum.

Sample Calculation

Total PSD(dBm) = Measured Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

Note

1. Spectrum Measured Levels are not plot data.

The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	11.95
UNII 2A	11.95
UNII 2C	11.95
UNII 3	11.95

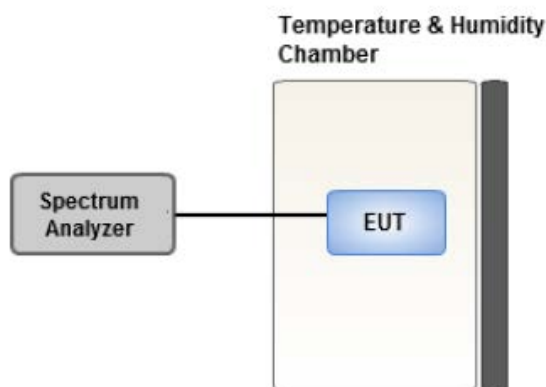
(Actual value of loss for the attenuator and cable combination)

8.5. Frequency Stability

Limit

Maintained within the band

Test Configuration



Test Procedure

1. The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 °C and 50 °C.
2. The temperature was incremented by 10 °C intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.
3. The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.
4. While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

8.6. AC Power line Conducted Emissions

Limit

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

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56 ^(a)	56 to 46 ^(a)
0.50 to 5	56	46
5 to 30	60	50

^(a)Decreases with the logarithm of the frequency.

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

Test Configuration

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

Test Procedure

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

Sample Calculation

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

8.7. Radiated Test

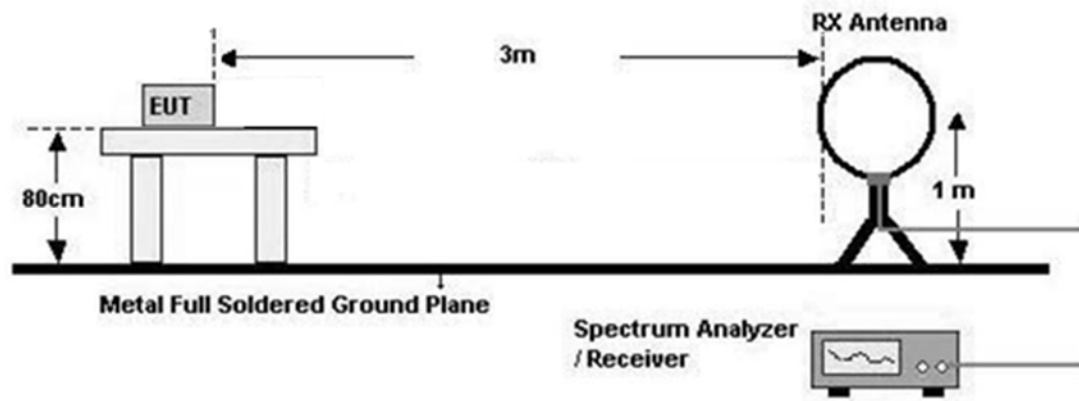
Limit

1. UNII 1: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
2. UNII 2A, 2C: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
3. UNII 3: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
4. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Section 15.209.

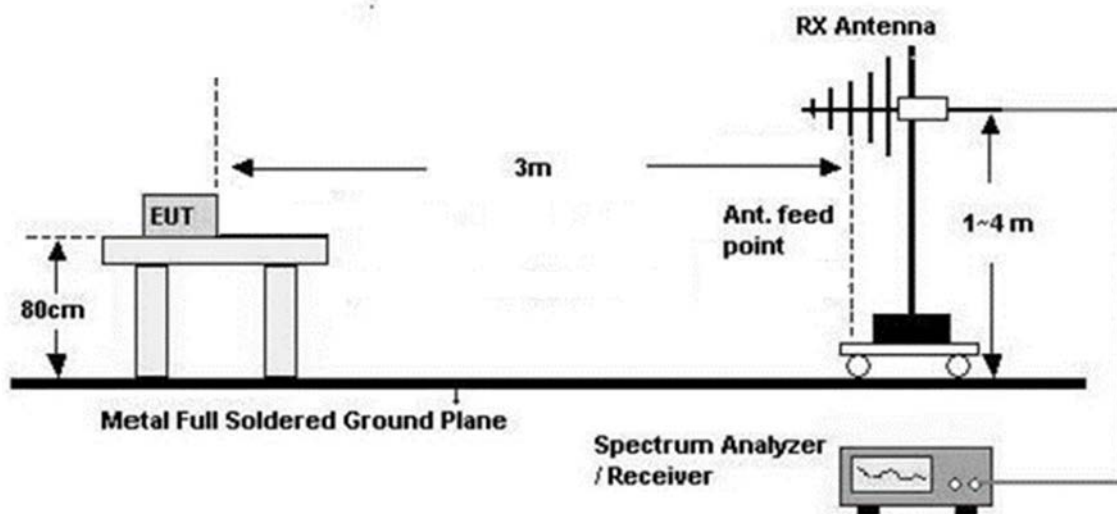
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

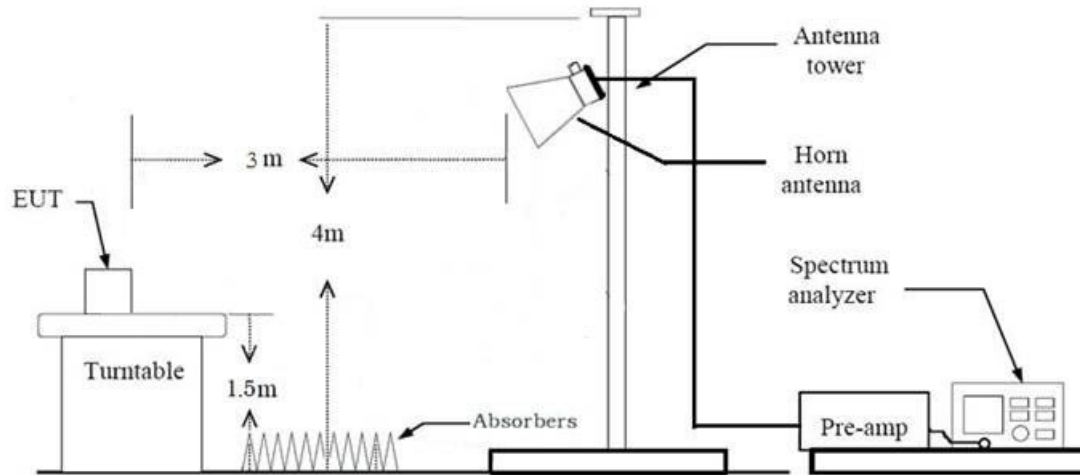
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions (Below 30 MHz)

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

KDB 414788 OFS and Chamber Correlation Justification

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

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

Test Procedure of Radiated spurious emissions (Below 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m 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 $\geq 3 \times$ RBW

(2) Measurement Type(Quasi-peak) :

- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Quasi-Peak
- RBW = 120 kHz

※In general, (1) is used mainly

7.Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)

8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Test Procedure of Radiated spurious emissions (Above 1 GHz)

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

7. Spectrum Setting**(1) Measurement Type (Peak) :**

- RBW = 1 MHz
- VBW $\geq$ 3 MHz
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.

Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately $1/x$, where x is the duty cycle.

(2) Measurement Type (Average) :

- RBW = 1 MHz
- VBW(Duty cycle $\geq$ 98 percent) = VBW $\leq$ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = VBW $\geq$ $1/T$, where T is the minimum transmission duration.
- The analyzer is set to linear detector mode.
- Detector = Peak.
- Sweep time = auto.
- Trace mode = Max Hold.
- Allow Max Hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.

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. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency
10. Distance extrapolation factor = $20\log(\text{test distance} / \text{specific distance})$ (dB)
11. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G)
+ Distance Factor(D.F)

Test Procedure of Radiated Restricted Band Edge

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

7. Spectrum Setting

(1) Measurement Type (Peak) :

- RBW = 1 MHz
- VBW $\geq$ 3 MHz
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.

Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately $1/x$, where x is the duty cycle.

(2) Measurement Type (Peak, Integration Method) :

- RBW = 100 KHz
- VBW $\geq$ 3 x RBW
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.
- Perform a band-power integration across the 1 MHz bandwidth in which the bandedge emission level is to be measured.

(3) Measurement Type (Average) :

- RBW = 1 MHz
- VBW(Duty cycle $\geq$ 98 percent) = VBW $\leq$ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = VBW $\geq$ $1/T$, where T is the minimum transmission duration.
- The analyzer is set to linear detector mode.
- Detector = Peak.
- Sweep time = auto.
- Trace mode = Max Hold.
- Allow Max Hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.

8. Measured Frequency Range :

- 4 500 MHz ~ 5 150 MHz
- 5 350 MHz ~ 5 460 MHz
- 5 460 MHz ~ 5 470 MHz
- (75 MHz or more below the 5 725 MHz) ~ 5 725 MHz
- 5 850 MHz ~ (75 MHz or more above the 5 850 MHz)

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

10. Total

(1) Measurement(Peak)

= Measured Value(Peak)

(2) Measurement(Avg)

= Measured Value (Avg)

- We apply to the offset in the range 1 GHz - 18 GHz.

- The offset = Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F) – Amp. Gain(A.G) +
Attenuator (ATT)

8.8. Worst case configuration and mode

Conducted test

1. All datarate of operation were investigated and the worst case datarate results are reported.
2. All test was performed with continuous signal.(Duty Cycle $\geq$ 98%)

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone(Connector Type FFC / HW ver.1.0), Stand alone(Connector Type Harness / HW ver.1.1)
 - Worstcase : Stand alone(Connector Type FFC / HW ver.1.0)
2. All Antennas 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)
3. EUT Axis
 - Radiated Spurious Emissions : X
 - Radiated Restricted Band Edge : X
4. All datarate of operation were investigated and the worst case datarate results are reported.
 - 802.11a : 6 Mbps
 - 802.11n_HT20 : MCS0
 - 802.11n_HT40 : MCS0
 - 802.11ac_VHT20 : MCS0
 - 802.11ac_VHT40 : MCS0
 - 802.11ac_VHT80 : MCS0
5. Radiated Spurious Emission
 - All modulations of operation were investigated and the worst case modulation results are reported.
 - Worst-case : 802.11a_6 Mbps
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. All test was performed with continuous signal.(Duty Cycle $\geq$ 98%)

Radiated test(Simultaneous transmission Scenario)

1. All modes of operation were investigated and the worst case configuration results are reported.

- Mode : Stand alone(Connector Type FFC / HW ver.1.0), Stand alone(Connector Type Harness / HW ver.1.1)

- Worstcase : Stand alone(Connector Type FFC / HW ver.1.0)

2. EUT Axis

- Radiated Spurious Emissions : X

3. All of Simultaneous transmission Scenario were investigated and the worst case configuration results are reported. (Bluetooth Worst case : BTLE)

Simultaneous transmission Scenario	2.4 GHz WiFi Ant.1	2.4 GHz WiFi Ant.2	5 GHz WiFi Ant.1	5 GHz WiFi Ant.2	Bluetooth	Test Case
Bluetooth + 2.4 GHz WiFi MIMO	on	on	-	-	on	
Bluetooth + 5 GHz WiFi MIMO	-	-	on	on	on	Scenario 1
2.4 GHz WiFi SISO + 5 GHz WiFi SISO	-	on	on	-	-	
Bluetooth + 2.4 GHz WiFi SISO + 5 GHz WiFi SISO	-	on	on	-	on	Scenario 2

4. The Simultaneous transmission Scenario mode test investigated both intermodulation and radiated spurious emissions.

- Worst result: Radiated spurious emissions

- Intermodulation: No signals are generated.

- Radiated spurious emissions: cf. Section 10.8

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

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

Scenario 1	Description	Bluetooth Emission	5 GHz Emission
Bluetooth + 5 GHz WiFi MIMO	Antenna	Bluetooth ANT	ANT ALL
	Channel	39	149
	Data Rate	1 Mbps	6 Mbps
	Mode	1M 37 Bytes	802.11a

Note : BTLE Simultaneous transmission Data refer to [BTLE] Test Report

Scenario 2	Description	Bluetooth Emission	2.4 GHz Emission	5 GHz Emission
Bluetooth + 2.4 GHz WiFi SISO + 5 GHz WiFi SISO	Antenna	Bluetooth ANT	ANT 2	ANT 1
	Channel	39	6	149
	Data Rate	1 Mbps	1 Mbps	6 Mbps
	Mode	1M 37 Bytes	802.11b	802.11a

Note : BTLE Simultaneous transmission Data refer to [BTLE] Test Report

Note : DTS Simultaneous transmission Data refer to [DTS] Test Report

AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone + Notebook
 - Worstcase : Stand alone + Notebook
2. Harness Cable Type, FFC Cable Type were tested and the worst case results are reported.
(Worst case : FFC Cable Type)

9. SUMMARY OF TEST RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26 dB Bandwidth	§ 15.407 (for Power Measurement)	N/A	Conducted	PASS
6 dB Bandwidth	§ 15.407(e)	>500 kHz (5725-5850 MHz)(UNII-3)		PASS
Maximum Conducted Output Power	§ 15.407(a)(1),(2),(3)	< 250 mW(5150-5250 MHz) < 250 mW or 11+10log ₁₀ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10log ₁₀ (BW) dBm (5470-5725 MHz) <1 W (5725-5850 MHz)		PASS
Maximum Power Spectral Density	§ 15.407(a)(1),(2),(3)	<11 dBm/ MHz (5150-5250 MHz) <11 dBm/ MHz (5250-5350 MHz) <11 dBm/ MHz (5470-5725 MHz) <30 dBm/500 kHz(5725-5850 MHz)		PASS
Frequency Stability	§ 15.407(g) § 2.1055	Maintained within the band		PASS
AC Conducted Emissions 150 kHz-30 MHz	15.207 15.407(b)(8)	<FCC 15.207 limits		PASS
Undesirable Emissions	§ 15.407(b) (1),(2),(3),(4) § 15.407(b)(5)(ii),(iii) § 15.35(b)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 8.6 (UNII 3)	Radiated	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(9),(10)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS

Note:

1. UNII 2A, 2C: TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.
2. The decision rule applies 'simple acceptance'

10. TEST RESULT

10.1 DUTY CYCLE

Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6M	-	-	-	-
802.11n	MCS0	-	-	-	-
802.11ac	MCS0	-	-	-	-

Note:

1. Test was performed with continuous Tx.

10.2 26 dB Bandwidth

Note:

Straddle channel data in the table below are for reporting purposes only. Straddle channel data were added in section 10.7.1.

[Ant.1]

Mode : 802.11a				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	30.36	17.367
	5200	40	27.05	17.399
	5240	48	20.05	16.658
UNII2A	5260	52	24.72	17.330
	5300	60	26.34	17.341
	5320	64	26.01	17.351
UNII2C	5500	100	27.20	17.171
	5600	120	27.59	17.282
	5720	144	25.85	17.267
UNII3	5745	149	28.17	17.276
	5785	157	24.63	17.253
	5825	165	26.11	17.188

Mode : 802.11n(HT20)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	26.05	18.356
	5200	40	27.13	18.437
	5240	48	20.51	17.687
UNII2A	5260	52	27.49	18.405
	5300	60	27.03	18.394
	5320	64	26.98	18.451
UNII2C	5500	100	26.94	18.359
	5600	120	27.59	18.376
	5720	144	26.43	18.227
UNII3	5745	149	28.06	18.249
	5785	157	26.26	18.342
	5825	165	26.23	18.393

Mode : 802.11ac(VHT20)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	26.36	18.385
	5200	40	27.01	18.460
	5240	48	20.43	17.718
UNII2A	5260	52	27.66	18.304
	5300	60	27.12	18.367
	5320	64	27.79	18.399
UNII2C	5500	100	31.05	18.267
	5600	120	26.53	18.337
	5720	144	27.16	18.350
UNII3	5745	149	25.37	18.277
	5785	157	27.55	18.407
	5825	165	26.20	18.371

Mode : 802.11n(HT40)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5190	38	40.11	35.837
	5230	46	39.98	35.848
UNII2A	5270	54	39.69	35.822
	5310	62	40.26	35.858
UNII2C	5510	102	40.02	35.825
	5590	118	40.33	35.842
	5710	142	40.04	35.850
UNII3	5755	151	40.13	35.792
	5795	159	40.02	35.894

Mode : 802.11ac(VHT40)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5190	38	40.13	35.906
	5230	46	39.93	35.850
UNII2A	5270	54	40.13	35.873
	5310	62	39.97	35.874
UNII2C	5510	102	40.22	35.888
	5590	118	39.91	35.830
	5710	142	40.34	35.812
UNII3	5755	151	39.97	35.848
	5795	159	40.33	35.849

Mode : 802.11ac(VHT80)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5210	42	79.73	75.000
UNII2A	5290	58	79.56	75.011
UNII2C	5530	106	79.53	75.030
	5610	122	79.74	75.026
	5690	138	79.90	75.031
UNII3	5775	155	79.76	75.086

[Ant.2]

Mode : 802.11a				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	27.26	17.284
	5200	40	26.56	17.348
	5240	48	20.28	16.656
UNII2A	5260	52	26.35	17.264
	5300	60	25.60	17.301
	5320	64	27.51	17.386
UNII2C	5500	100	27.62	17.286
	5600	120	27.30	17.284
	5720	144	25.54	17.230
UNII3	5745	149	26.79	17.234
	5785	157	25.83	17.309
	5825	165	26.82	17.187

Mode : 802.11n(HT20)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	28.15	18.454
	5200	40	27.99	18.415
	5240	48	20.44	17.678
UNII2A	5260	52	27.08	18.449
	5300	60	31.00	18.406
	5320	64	26.80	18.375
UNII2C	5500	100	29.16	18.383
	5600	120	26.49	18.351
	5720	144	27.67	18.428
UNII3	5745	149	26.95	18.456
	5785	157	27.87	18.371
	5825	165	26.65	18.401

Mode : 802.11ac(VHT20)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	27.02	18.347
	5200	40	27.02	18.425
	5240	48	20.39	17.670
UNII2A	5260	52	27.77	18.333
	5300	60	26.43	18.351
	5320	64	30.66	18.434
UNII2C	5500	100	26.78	18.397
	5600	120	27.09	18.379
	5720	144	26.58	18.374
UNII3	5745	149	25.92	18.374
	5785	157	26.93	18.335
	5825	165	28.10	18.412

Mode : 802.11n(HT40)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5190	38	39.78	35.859
	5230	46	40.15	35.843
UNII2A	5270	54	39.90	35.865
	5310	62	40.10	35.871
UNII2C	5510	102	40.04	35.892
	5590	118	39.95	35.873
	5710	142	40.04	35.888
UNII3	5755	151	40.14	35.875
	5795	159	40.43	35.837

Mode : 802.11ac(VHT40)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5190	38	40.13	35.852
	5230	46	40.23	35.908
UNII2A	5270	54	40.07	35.831
	5310	62	40.08	35.893
UNII2C	5510	102	40.17	35.855
	5590	118	40.38	35.815
	5710	142	40.03	35.821
UNII3	5755	151	39.95	35.853
	5795	159	40.28	35.818

Mode : 802.11ac(VHT80)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5210	42	79.75	75.050
UNII2A	5290	58	79.48	75.022
UNII2C	5530	106	79.65	75.055
	5610	122	79.58	75.100
	5690	138	79.60	75.077
UNII3	5775	155	79.68	75.062

[ANT. 1]

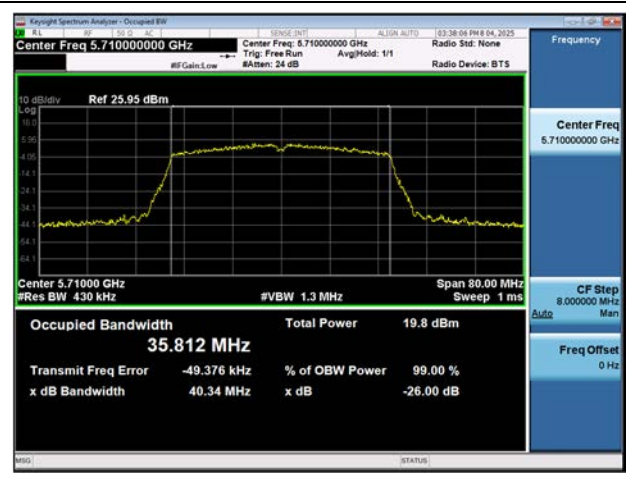
Test Plots

Note: In order to simplify the report, attached plots were only the widest channel per channel bandwidth.

Bandwidth 20M, 802.11ac(VHT20) Ch.100



Bandwidth 40M, 802.11ac(VHT40) Ch.142



Bandwidth 80M, 802.11ac(VHT80) Ch.138



[ANT. 2]

Test Plots

Note: In order to simplify the report, attached plots were only the widest channel per channel bandwidth.

Bandwidth 20M, 802.11n(HT20) Ch.60



Bandwidth 40M, 802.11n(HT40) Ch.159



Bandwidth 80M, 802.11ac(VHT80) Ch.42



10.3 6 dB BANDWIDTH

[Ant.1]

Mode : 802.11a				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	16.51	> 0.5
	5785	157	16.52	> 0.5
	5825	165	16.52	> 0.5

Mode : 802.11n(HT20)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	17.72	> 0.5
	5785	157	17.72	> 0.5
	5825	165	17.79	> 0.5

Mode : 802.11ac(VHT20)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	17.77	> 0.5
	5785	157	17.76	> 0.5
	5825	165	17.72	> 0.5

Mode : 802.11n(HT40)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5755	151	35.33	> 0.5
	5795	159	35.34	> 0.5

Mode : 802.11ac(VHT40)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5755	151	35.11	> 0.5
	5795	159	35.56	> 0.5

Mode : 802.11ac(VHT80)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5775	155	71.55	> 0.5

[Ant.2]

Mode : 802.11a				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	16.50	> 0.5
	5785	157	16.48	> 0.5
	5825	165	16.55	> 0.5

Mode : 802.11n(HT20)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	17.75	> 0.5
	5785	157	17.79	> 0.5
	5825	165	17.79	> 0.5

Mode : 802.11ac(VHT20)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	17.73	> 0.5
	5785	157	17.82	> 0.5
	5825	165	17.80	> 0.5

Mode : 802.11n(HT40)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5755	151	35.12	> 0.5
	5795	159	35.77	> 0.5

Mode : 802.11ac(VHT40)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5755	151	35.82	> 0.5
	5795	159	35.46	> 0.5

Mode : 802.11ac(VHT80)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5775	155	74.88	> 0.5

[ANT. 1]

Test Plots

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

Bandwidth 20M, 802.11a Ch.149



Bandwidth 40M, 802.11ac(VHT40) Ch.151



Bandwidth 80M, 802.11ac(VHT80) Ch.155



[ANT. 2]

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

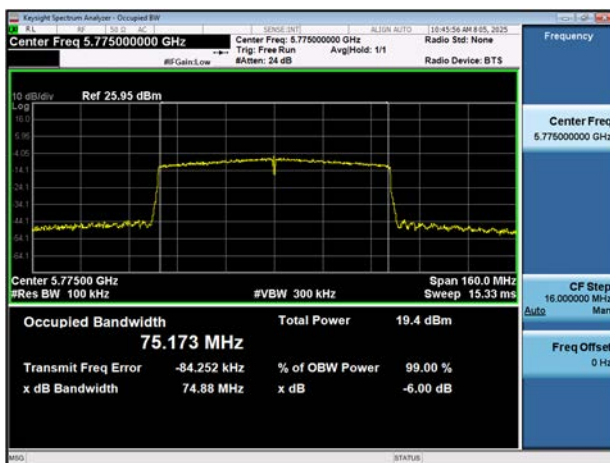
Bandwidth 20M, 802.11a Ch.157



Bandwidth 40M, 802.11n(HT40) Ch.151



Bandwidth 80M, 802.11ac(VHT80) Ch.155



10.4 OUTPUT POWER MEASUREMENT

Straddle channel data in the table below are for reporting purposes only.

Straddle channel data were added in section 10.7.3.

Limit

(UNII 1) : 23.98 dBm

(UNII 2A, 2C) : 23.98 dBm or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)

(UNII 3) : 30.00 dBm

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

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

MIMO_CDD(Ant.1+ Ant.2) Total Power [dBm] = Ant.1 Total Power [dBm] + Ant.2 Total Power [dBm]

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5180	36	6M	a	12.06	11.21	14.67	23.98
5200	40	6M	a	12.18	11.69	14.95	23.98
5240	48	6M	a	12.51	12.11	15.32	23.98
5260	52	6M	a	12.99	12.21	15.63	23.98
5300	60	6M	a	13.02	12.41	15.74	23.98
5320	64	6M	a	12.80	12.44	15.63	23.98
5500	100	6M	a	12.36	12.13	15.26	23.98
5600	120	6M	a	12.27	12.03	15.16	23.98
5720	144	6M	a	12.48	12.26	15.38	23.98
5745	149	6M	a	12.15	12.07	15.12	30.00
5785	157	6M	a	12.13	12.04	15.10	30.00
5825	165	6M	a	12.66	12.41	15.55	30.00
Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5180	36	MCS0	n20	12.24	11.44	14.87	23.98
5200	40	MCS0	n20	12.51	11.62	15.10	23.98
5240	48	MCS0	n20	13.06	12.15	15.64	23.98
5260	52	MCS0	n20	13.01	12.49	15.77	23.98
5300	60	MCS0	n20	13.07	12.53	15.82	23.98
5320	64	MCS0	n20	13.11	12.44	15.80	23.98
5500	100	MCS0	n20	12.48	12.14	15.32	23.98
5600	120	MCS0	n20	12.27	12.06	15.18	23.98
5720	144	MCS0	n20	12.51	12.30	15.42	23.98
5745	149	MCS0	n20	12.16	12.06	15.12	30.00
5785	157	MCS0	n20	12.13	12.03	15.09	30.00
5825	165	MCS0	n20	12.57	12.38	15.49	30.00

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5180	36	MCS0	ac20	12.42	11.47	14.98	23.98
5200	40	MCS0	ac20	12.67	11.68	15.21	23.98
5240	48	MCS0	ac20	13.02	12.04	15.57	23.98
5260	52	MCS0	ac20	13.00	12.60	15.81	23.98
5300	60	MCS0	ac20	13.07	12.46	15.79	23.98
5320	64	MCS0	ac20	13.09	12.39	15.76	23.98
5500	100	MCS0	ac20	12.49	12.18	15.35	23.98
5600	120	MCS0	ac20	12.33	12.09	15.22	23.98
5720	144	MCS0	ac20	12.40	12.25	15.34	23.98
5745	149	MCS0	ac20	12.13	12.01	15.08	30.00
5785	157	MCS0	ac20	12.15	12.03	15.10	30.00
5825	165	MCS0	ac20	12.67	12.33	15.51	30.00
Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5190	38	MCS0	n40	12.26	11.63	14.97	23.98
5230	46	MCS0	n40	12.41	11.65	15.06	23.98
5270	54	MCS0	n40	12.69	12.02	15.38	23.98
5310	62	MCS0	n40	12.52	12.06	15.31	23.98
5510	102	MCS0	n40	12.63	12.38	15.52	23.98
5590	118	MCS0	n40	12.70	12.15	15.44	23.98
5710	142	MCS0	n40	12.73	12.62	15.69	23.98
5755	151	MCS0	n40	12.75	12.45	15.61	30.00
5795	159	MCS0	n40	12.65	12.46	15.57	30.00
Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5190	38	MCS0	ac40	12.16	11.68	14.94	23.98
5230	46	MCS0	ac40	12.47	11.86	15.19	23.98
5270	54	MCS0	ac40	12.67	11.80	15.27	23.98
5310	62	MCS0	ac40	12.49	12.29	15.40	23.98
5510	102	MCS0	ac40	12.65	12.40	15.54	23.98
5590	118	MCS0	ac40	12.71	12.11	15.43	23.98
5710	142	MCS0	ac40	12.73	12.41	15.58	23.98
5755	151	MCS0	ac40	12.68	12.37	15.54	30.00
5795	159	MCS0	ac40	12.63	12.46	15.56	30.00
Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5210	42	MCS0	ac80	12.33	11.45	14.92	23.98
5290	58	MCS0	ac80	12.65	11.82	15.27	23.98
5530	106	MCS0	ac80	12.75	11.94	15.37	23.98
5610	122	MCS0	ac80	12.64	11.50	15.12	23.98
5690	138	MCS0	ac80	12.31	11.15	14.78	23.98
5775	155	MCS0	ac80	12.48	11.36	14.97	30.00

10.5 POWER SPECTRAL DENSITY

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

Ant Total PSD [dBm] = Measured PSD [dBm/MHz] + Duty Cycle Factor [dB]

MIMO_CDD(Ant.1+ Ant.2)Total PSD [dBm/MHz] = Ant.1 Total PSD [dBm/MHz] + Ant.2 Total PSD [dB]

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Power Spectral Density [dBm/MHz]			Limit [dBm/MHz]
				ANT1	ANT2	MIMO	
5180	36	6M	a	1.129	0.234	3.715	11.00
5200	40	6M	a	1.493	0.889	4.212	11.00
5240	48	6M	a	1.423	1.021	4.237	11.00
5260	52	6M	a	2.243	1.591	4.940	11.00
5300	60	6M	a	2.591	1.738	5.196	11.00
5320	64	6M	a	2.646	1.740	5.227	11.00
5500	100	6M	a	1.407	1.261	4.345	11.00
5600	120	6M	a	1.500	1.205	4.365	11.00
5720	144	6M	a	1.620	1.714	4.678	11.00
5745	149	6M	a	-1.612	-1.320	1.547	30 dBm/500kHz
5785	157	6M	a	-1.344	-1.436	1.621	30 dBm/500kHz
5825	165	6M	a	-0.841	-1.089	2.047	30 dBm/500kHz

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Power Spectral Density [dBm/MHz]			Limit [dBm/MHz]
				ANT1	ANT2	MIMO	
5180	36	MCS0	n20	0.627	0.434	3.542	11.00
5200	40	MCS0	n20	1.268	0.718	4.012	11.00
5240	48	MCS0	n20	1.433	0.933	4.200	11.00
5260	52	MCS0	n20	1.982	1.257	4.645	11.00
5300	60	MCS0	n20	2.081	1.443	4.784	11.00
5320	64	MCS0	n20	2.120	1.477	4.821	11.00
5500	100	MCS0	n20	1.443	1.103	4.287	11.00
5600	120	MCS0	n20	1.565	1.020	4.311	11.00
5720	144	MCS0	n20	1.563	1.380	4.483	11.00
5745	149	MCS0	n20	-1.747	-2.000	1.139	30 dBm/500kHz
5785	157	MCS0	n20	-1.663	-1.777	1.291	30 dBm/500kHz
5825	165	MCS0	n20	-1.244	-1.353	1.712	30 dBm/500kHz

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Power Spectral Density [dBm/MHz]			Limit [dBm/MHz]
				ANT1	ANT2	MIMO	
5180	36	MCS0	ac20	0.845	0.192	3.541	11.00
5200	40	MCS0	ac20	1.124	0.574	3.868	11.00
5240	48	MCS0	ac20	1.482	0.838	4.182	11.00
5260	52	MCS0	ac20	2.036	1.379	4.730	11.00
5300	60	MCS0	ac20	2.221	1.483	4.878	11.00
5320	64	MCS0	ac20	2.195	1.371	4.813	11.00
5500	100	MCS0	ac20	1.403	1.269	4.347	11.00
5600	120	MCS0	ac20	1.650	1.225	4.453	11.00
5720	144	MCS0	ac20	1.494	1.226	4.372	11.00
5745	149	MCS0	ac20	-1.625	-2.007	1.198	30 dBm/500kHz
5785	157	MCS0	ac20	-1.579	-1.849	1.298	30 dBm/500kHz
5825	165	MCS0	ac20	-1.059	-1.346	1.810	30 dBm/500kHz

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Power Spectral Density [dBm/MHz]			Limit [dBm/MHz]
				ANT1	ANT2	MIMO	
5190	38	MCS0	n40	-1.054	-1.454	1.761	11.00
5230	46	MCS0	n40	-0.618	-1.257	2.085	11.00
5270	54	MCS0	n40	-0.300	-0.809	2.463	11.00
5310	62	MCS0	n40	0.056	-0.784	2.667	11.00
5510	102	MCS0	n40	-0.005	-0.663	2.689	11.00
5590	118	MCS0	n40	-0.354	-0.812	2.433	11.00
5710	142	MCS0	n40	-0.099	-0.579	2.678	11.00
5755	151	MCS0	n40	-2.986	-3.462	-0.207	30 dBm/500kHz
5795	159	MCS0	n40	-2.852	-3.392	-0.103	30 dBm/500kHz

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Power Spectral Density [dBm/MHz]			Limit [dBm/MHz]
				ANT1	ANT2	MIMO	
5190	38	MCS0	ac40	-0.705	-1.301	2.018	11.00
5230	46	MCS0	ac40	-0.309	-1.168	2.293	11.00
5270	54	MCS0	ac40	-0.020	-0.788	2.623	11.00
5310	62	MCS0	ac40	0.131	-0.767	2.715	11.00
5510	102	MCS0	ac40	-0.274	-0.566	2.593	11.00
5590	118	MCS0	ac40	-0.204	-0.615	2.606	11.00
5710	142	MCS0	ac40	-0.274	-0.447	2.651	11.00
5755	151	MCS0	ac40	-3.162	-3.254	-0.197	30 dBm/500kHz
5795	159	MCS0	ac40	-3.090	-3.149	-0.109	30 dBm/500kHz

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Power Spectral Density [dBm/MHz]			Limit
				ANT1	ANT2	MIMO	[dBm/MHz]
5210	42	MCS0	ac80	-4.606	-4.889	-1.735	11.00
5290	58	MCS0	ac80	-3.991	-4.693	-1.318	11.00
5530	106	MCS0	ac80	-3.974	-4.395	-1.169	11.00
5610	122	MCS0	ac80	-3.862	-4.509	-1.163	11.00
5690	138	MCS0	ac80	-4.414	-5.548	-1.934	11.00
5775	155	MCS0	ac80	-6.619	-7.156	-3.869	30 dBm/500kHz

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

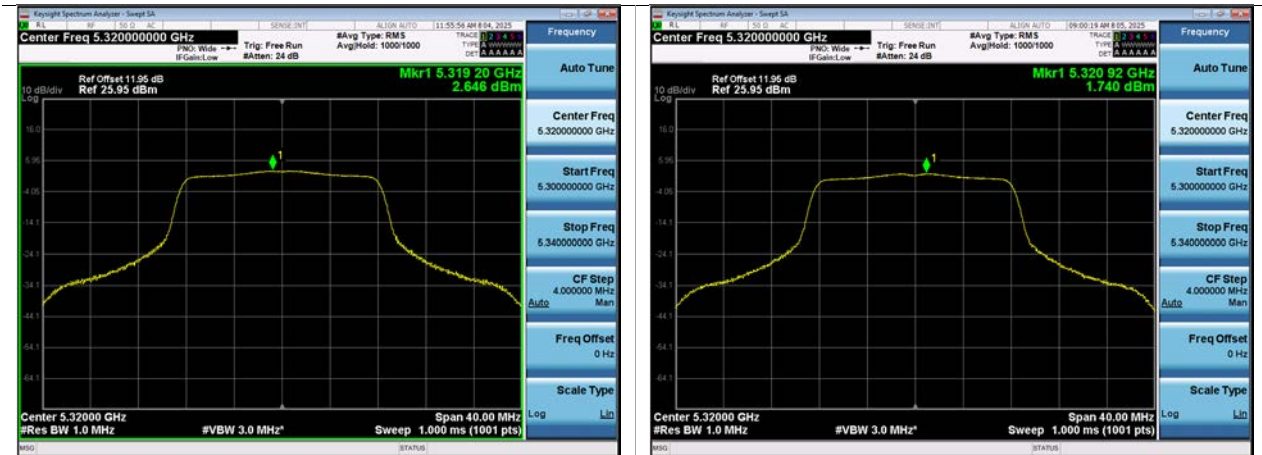
Test Plots

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

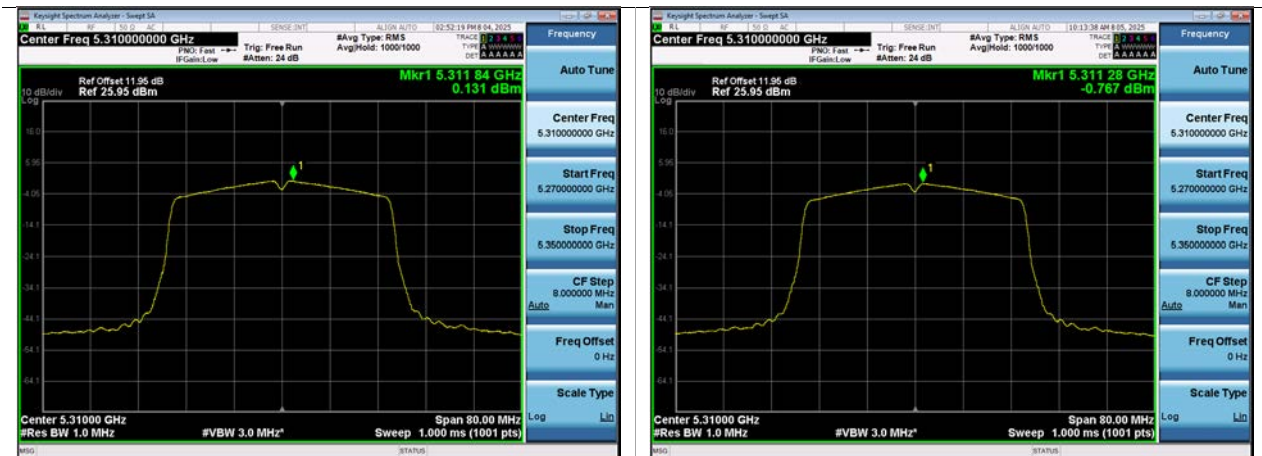
ANT. 1

ANT. 2

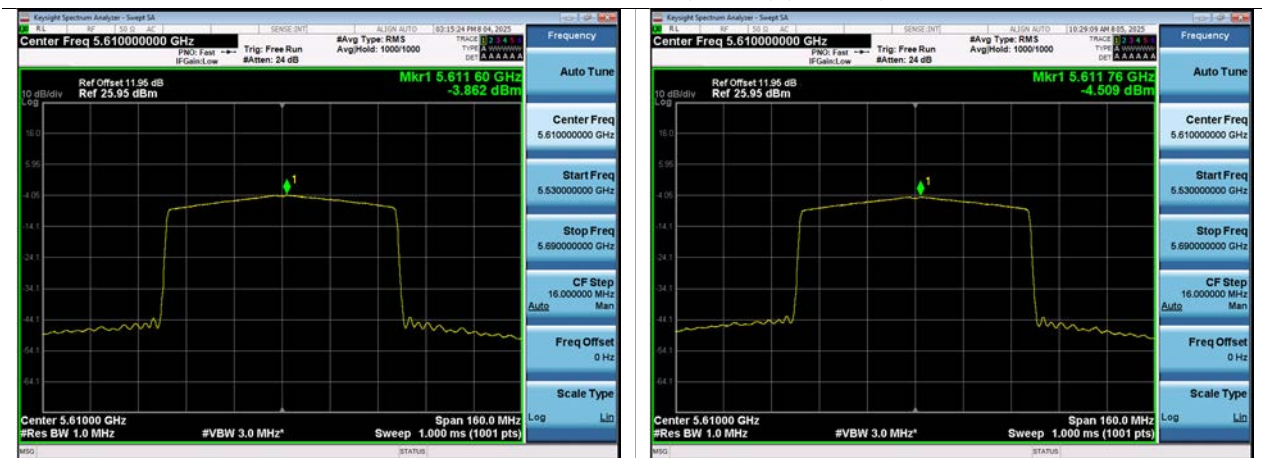
Bandwidth 20M, 802.11a(Ch. 64)



Bandwidth 40M, 802.11ac(VHT40) (Ch. 62)



Bandwidth 80M, 802.11ac(VHT80) (Ch. 122)



10.6 FREQUENCY STABILITY

Note:

1. All modes of operation were investigated and the worst case configuration results are reported.
2. Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

10.6.1 802.11ac 80 MHz BW

[MIMO_CDD(Ant1+Ant2)]

REFERENCE VOLTAGE: 3.30 VDC

Startup after the EUT is energized

OPERATING BAND:			UNII Band 1		UNII Band 2A		UNII Band 2C	
OPERATING FREQUENCY:			5,210,000,000 Hz		5,290,000,000 Hz		5,530,000,000 Hz	
CHANNEL:			42		58		106	
Voltage	Power	Temp.	Frequency	Frequency Error	Frequency	Frequency Error	Frequency	Frequency Error
(%)	(VDC)	(°C)	(kHz)	(kHz)	(kHz)	(kHz)	(kHz)	(kHz)
100%	3.30	+20(Ref)	5210039.77	39.77	5290039.95	39.95	5530033.66	33.66
100%		-30	5210033.13	33.13	5290038.79	38.79	5530034.69	34.69
100%		-20	5210039.30	39.30	5290039.97	39.97	5530032.33	32.33
100%		-10	5210035.38	35.38	5290036.42	36.42	5530031.24	31.24
100%		0	5210046.39	46.39	5290048.98	48.98	5530048.69	48.69
100%		+10	5210046.32	46.32	5290048.79	48.79	5530048.60	48.60
100%		+30	5210053.87	53.87	5290069.96	69.96	5530057.62	57.62
100%		+40	5210054.17	54.17	5290068.14	68.14	5530055.99	55.99
100%		+50	5210077.93	77.93	5290064.32	64.32	5530069.69	69.69
High	3.60	+20	5210068.91	68.91	5290068.70	68.70	5530067.13	67.13
Low	3.135	+20	5210078.89	78.89	5290079.73	79.73	5530072.82	72.82

OPERATING BAND:			UNII Band 3	
OPERATING FREQUENCY:			5,775,000,000 Hz	
CHANNEL:			155	
Voltage	Power	Temp.	Frequency	Frequency Error
(%)	(VDC)	(°C)	(kHz)	(kHz)
100%	3.30	+20(Ref)	5775042.32	42.32
100%		-30	5775041.39	41.39
100%		-20	5775045.72	45.72
100%		-10	5775068.72	68.72
100%		0	5775051.13	51.13
100%		+10	5775056.38	56.38
100%		+30	5775052.10	52.10
100%		+40	5775060.20	60.20
100%		+50	5775067.14	67.14
High	3.60	+20	5775060.73	60.73
Low	3.135	+20	5775074.76	74.76

2 minutes after the EUT is energized

OPERATING BAND:			UNII Band 1		UNII Band 2A		UNII Band 2C	
OPERATING FREQUENCY:			5,210,000,000 Hz		5,290,000,000 Hz		5,530,000,000 Hz	
CHANNEL:			42		58		106	
Voltage	Power	Temp.	Frequency	Frequency Error	Frequency	Frequency Error	Frequency	Frequency Error
(%)	(VDC)	(°C)	(kHz)	(kHz)	(kHz)	(kHz)	(kHz)	(kHz)
100%	3.30	+20(Ref)	5210032.16	32.16	5290036.53	36.53	5530035.95	35.95
100%		-30	5210025.02	25.02	5290036.84	36.84	5530036.92	36.92
100%		-20	5210039.21	39.21	5290034.40	34.40	5530030.71	30.71
100%		-10	5210034.93	34.93	5290036.74	36.74	5530036.84	36.84
100%		0	5210049.92	49.92	5290049.24	49.24	5530046.24	46.24
100%		+10	5210049.53	49.53	5290048.29	48.29	5530042.92	42.92
100%		+30	5210057.66	57.66	5290065.50	65.50	5530064.67	64.67
100%		+40	5210068.01	68.01	5290067.20	67.20	5530069.20	69.20
100%		+50	5210068.41	68.41	5290077.52	77.52	5530077.28	77.28
High	3.60	+20	5210060.41	60.41	5290070.45	70.45	5530066.25	66.25
Low	3.135	+20	5210079.33	79.33	5290064.00	64.00	5530063.30	63.30

OPERATING BAND:			UNII Band 3	
OPERATING FREQUENCY:			5,775,000,000 Hz	
CHANNEL:			155	
Voltage	Power	Temp.	Frequency	Frequency Error
(%)	(VDC)	(°C)	(kHz)	(kHz)
100%	3.30	+20(Ref)	5775041.96	41.96
100%		-30	5775044.57	44.57
100%		-20	5775048.65	48.65
100%		-10	5775059.13	59.13
100%		0	5775050.72	50.72
100%		+10	5775064.54	64.54
100%		+30	5775062.40	62.40
100%		+40	5775055.67	55.67
100%		+50	5775072.32	72.32
High	3.60	+20	5775070.28	70.28
Low	3.135	+20	5775070.00	70.00

5 minutes after the EUT is energized

OPERATING BAND:			UNII Band 1		UNII Band 2A		UNII Band 2C	
OPERATING FREQUENCY:			5,210,000,000 Hz		5,290,000,000 Hz		5,530,000,000 Hz	
CHANNEL:			42		58		106	
Voltage	Power	Temp.	Frequency	Frequency Error	Frequency	Frequency Error	Frequency	Frequency Error
(%)	(VDC)	(°C)	(kHz)	(kHz)	(kHz)	(kHz)	(kHz)	(kHz)
100%	3.30	+20(Ref)	5210036.36	36.36	5290030.17	30.17	5530034.38	34.38
100%		-30	5210030.18	30.18	5290031.92	31.92	5530032.43	32.43
100%		-20	5210037.42	37.42	5290033.00	33.00	5530039.38	39.38
100%		-10	5210030.73	30.73	5290039.03	39.03	5530034.06	34.06
100%		0	5210045.41	45.41	5290043.93	43.93	5530046.57	46.57
100%		+10	5210040.87	40.87	5290042.29	42.29	5530040.57	40.57
100%		+30	5210056.35	56.35	5290054.89	54.89	5530051.99	51.99
100%		+40	5210069.38	69.38	5290062.70	62.70	5530055.81	55.81
100%		+50	5210064.95	64.95	5290079.62	79.62	5530070.96	70.96
High	3.60	+20	5210068.64	68.64	5290074.26	74.26	5530067.51	67.51
Low	3.135	+20	5210073.06	73.06	5290078.29	78.29	5530064.27	64.27

OPERATING BAND:			UNII Band 3	
OPERATING FREQUENCY:			5,775,000,000 Hz	
CHANNEL:			155	
Voltage	Power	Temp.	Frequency	Frequency Error
(%)	(VDC)	(°C)	(kHz)	(kHz)
100%	3.30	+20(Ref)	5775044.22	44.22
100%		-30	5775044.17	44.17
100%		-20	5775045.75	45.75
100%		-10	5775068.36	68.36
100%		0	5775050.43	50.43
100%		+10	5775050.87	50.87
100%		+30	5775057.93	57.93
100%		+40	5775052.27	52.27
100%		+50	5775064.33	64.33
High	3.60	+20	5775063.05	63.05
Low	3.135	+20	5775065.53	65.53

10 minutes after the EUT is energized

OPERATING BAND:			UNII Band 1		UNII Band 2A		UNII Band 2C	
OPERATING FREQUENCY:			5,210,000,000 Hz		5,290,000,000 Hz		5,530,000,000 Hz	
CHANNEL:			42		58		106	
Voltage	Power	Temp.	Frequency	Frequency Error	Frequency	Frequency Error	Frequency	Frequency Error
(%)	(VDC)	(°C)	(kHz)	(kHz)	(kHz)	(kHz)	(kHz)	(kHz)
100%	3.30	+20(Ref)	5210031.61	31.61	5290039.91	39.91	5530037.07	37.07
100%		-30	5210033.84	33.84	5290037.16	37.16	5530031.14	31.14
100%		-20	5210037.47	37.47	5290039.95	39.95	5530038.29	38.29
100%		-10	5210039.21	39.21	5290033.11	33.11	5530039.45	39.45
100%		0	5210047.06	47.06	5290049.56	49.56	5530040.27	40.27
100%		+10	5210041.46	41.46	5290041.25	41.25	5530045.43	45.43
100%		+30	5210063.75	63.75	5290055.87	55.87	5530050.30	50.30
100%		+40	5210060.67	60.67	5290069.67	69.67	5530066.37	66.37
100%		+50	5210068.53	68.53	5290065.92	65.92	5530069.02	69.02
High	3.60	+20	5210067.00	67.00	5290076.79	76.79	5530061.45	61.45
Low	3.135	+20	5210068.57	68.57	5290064.99	64.99	5530060.40	60.40

OPERATING BAND:			UNII Band 3	
OPERATING FREQUENCY:			5,775,000,000 Hz	
CHANNEL:			155	
Voltage	Power	Temp.	Frequency	Frequency Error
(%)	(VDC)	(°C)	(kHz)	(kHz)
100%	3.30	+20(Ref)	5775040.27	40.27
100%		-30	5775047.44	47.44
100%		-20	5775047.52	47.52
100%		-10	5775054.56	54.56
100%		0	5775053.44	53.44
100%		+10	5775065.24	65.24
100%		+30	5775057.38	57.38
100%		+40	5775067.03	67.03
100%		+50	5775071.46	71.46
High	3.60	+20	5775065.86	65.86
Low	3.135	+20	5775074.20	74.20

10.7 STRADDLE CHANNEL

Test Description	Note
26 dB Bandwidth	[UNII 2C] 26 dB Bandwidth = 5725 MHz - Measured Frequency[MHz] [UNII 3] 26 dB Bandwidth = Measured Frequency[MHz] - 5725 MHz
6 dB Bandwidth	6 dB Bandwidth = Measured Frequency[MHz] – 5725 MHz - Limit : > 0.5 MHz
Output Power	- Limit(UNII2C) : 23.98 dBm or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.) - Limit(UNII 3) : 30.00 dBm - Total Power (dBm) = Measured Value (dBm) + Duty Cycle Factor (dB)
Power Spectral Density	- Limit(UNII 2C) : 11.0 dBm/MHz - Limit(UNII 3) : 30.0 dBm/500kHz - Total PSD (dBm/MHz) = Measured Value (dBm/MHz) + Duty Cycle Factor (dB)

[ANT. 1]

Mode	Band	Freq. [MHz]	CH.	26dB BW [MHz]	6dB BW [MHz]	Total Power [dBm]	Limit [dBm]	Total PSD [dBm]	Limit [dBm/MHz]
802.11a	UNII2C	5720	144	18.16	-	11.55	23.59	1.719	11
802.11n(HT20)				18.16	-	11.58	23.59	1.684	11
802.11ac(VHT20)				18.04	-	11.59	23.56	1.520	11
802.11a	UNII3	5720	144	7.48	3.20	4.58	30.00	-2.560	30 dBm/500kHz
802.11n(HT20)				8.36	3.84	5.16	30.00	-2.789	30 dBm/500kHz
802.11ac(VHT20)				8.20	3.84	5.17	30.00	-2.527	30 dBm/500kHz

Mode	Band	Freq. [MHz]	Channel	26dB BW [MHz]	6dB BW [MHz]	Total Power [dBm]	Limit [dBm]	Total PSD [dBm]	Limit [dBm/MHz]
802.11n(HT40)	UNII2C	5710	142	35.08	-	12.54	23.98	-0.172	11
802.11ac(VHT40)				35.32	-	12.66	23.98	-0.125	11
802.11n(HT40)	UNII3	5710	142	5.24	2.28	-0.57	30.00	-7.456	30 dBm/500kHz
802.11ac(VHT40)				5.32	2.76	-0.47	30.00	-7.420	30 dBm/500kHz

Mode	Band	Freq. [MHz]	Channel	26dB BW [MHz]	6dB BW [MHz]	Total Power [dBm]	Limit [dBm]	Total PSD [dBm]	Limit [dBm/MHz]
802.11ac(VHT80)	UNII2C	5690	138	75.16	-	12.08	23.98	-4.451	11
802.11ac(VHT80)	UNII3	5690	138	4.84	0.36	-3.84	30.00	-11.044	30 dBm/500kHz

[ANT. 2]

Mode	Band	Freq. [MHz]	CH.	26dB BW [MHz]	6dB BW [MHz]	Total Power [dBm]	Limit [dBm]	Total PSD [dBm]	Limit [dBm/MHz]
802.11a	UNII2C	5720	144	17.56	-	11.70	23.45	1.895	11
802.11n(HT20)				17.88	-	11.52	23.52	1.462	11
802.11ac(VHT20)				17.88	-	11.33	23.52	1.326	11
802.11a	UNII3	5720	144	7.68	3.24	4.78	30.00	-2.261	30 dBm/500kHz
802.11n(HT20)				8.60	3.88	4.98	30.00	-2.855	30 dBm/500kHz
802.11ac(VHT20)				8.00	3.84	4.97	30.00	-3.025	30 dBm/500kHz

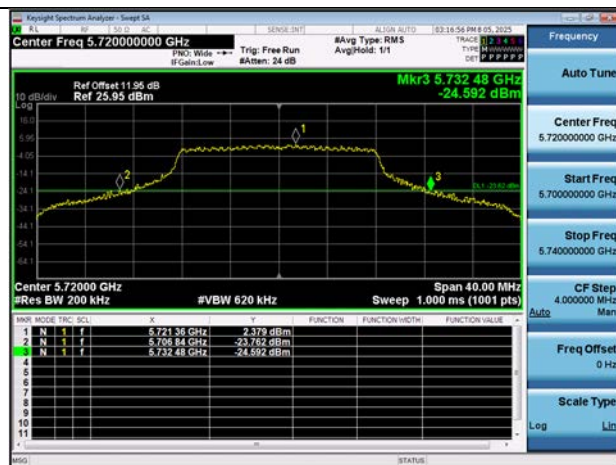
Mode	Band	Freq. [MHz]	Channel	26dB BW [MHz]	6dB BW [MHz]	Total Power [dBm]	Limit [dBm]	Total PSD [dBm]	Limit [dBm/MHz]
802.11n(HT40)	UNII2C	5710	142	35.24	-	12.34	23.98	-0.420	11
802.11ac(VHT40)				35.24	-	12.51	23.98	-0.061	11
802.11n(HT40)	UNII3	5710	142	5.00	2.52	-0.62	30.00	-7.426	30 dBm/500kHz
802.11ac(VHT40)				5.08	2.92	-0.52	30.00	-7.579	30 dBm/500kHz

Mode	Band	Freq. [MHz]	Channel	26dB BW [MHz]	6dB BW [MHz]	Total Power [dBm]	Limit [dBm]	Total PSD [dBm]	Limit [dBm/MHz]
802.11ac(VHT80)	UNII2C	5690	138	75.00	-	11.04	23.98	-5.397	11
802.11ac(VHT80)	UNII3	5690	138	5.00	2.92	-4.63	30.00	-12.034	30 dBm/500kHz

□ Test Plots (26 dB Bandwidth)

[ANT. 1]

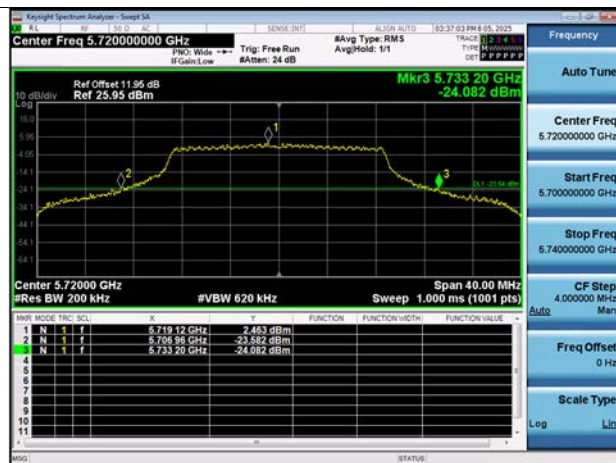
802.11a UNII Band



802.11n(HT20) UNII Band



802.11ac(VHT20) UNII Band



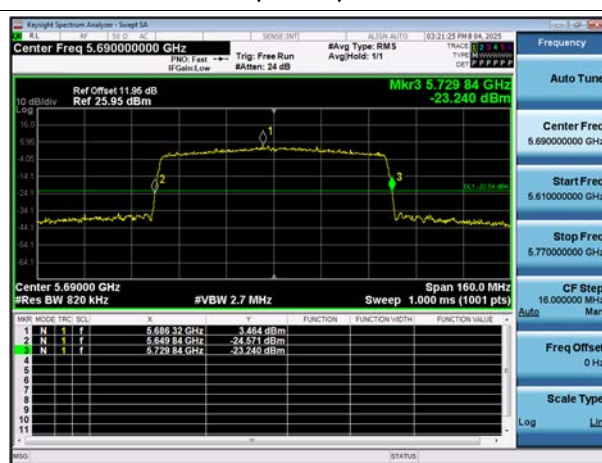
802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band



802.11ac(VHT80) UNII Band



[ANT. 2]

802.11a UNII Band



802.11n(HT20) UNII Band



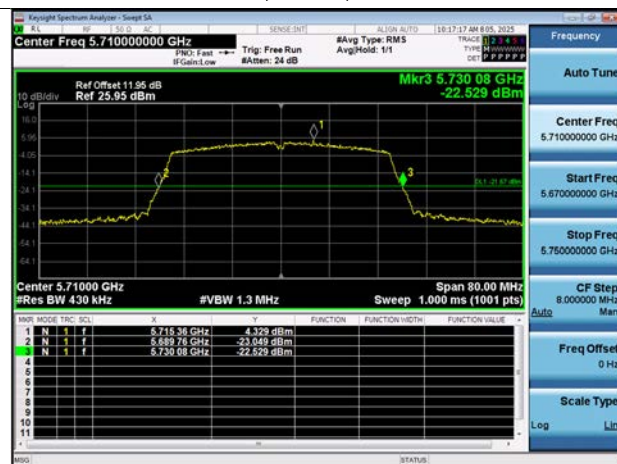
802.11ac(VHT20) UNII Band



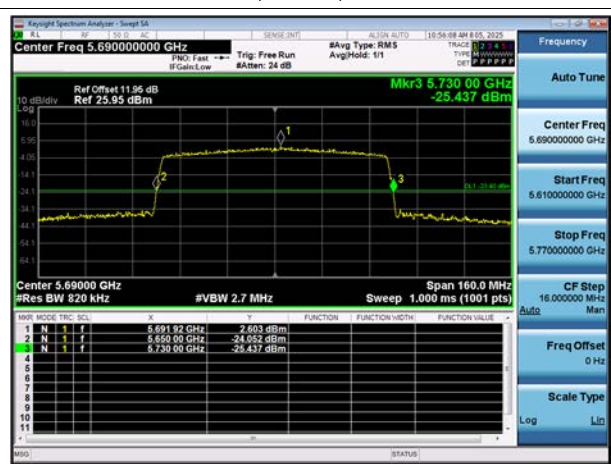
802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band

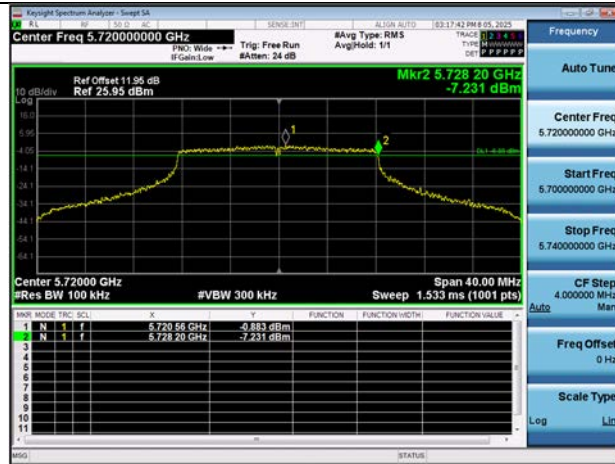


802.11ac(VHT80) UNII Band



Test Plots(UNII 3 Band 6 dB Bandwidth)
[ANT. 1]

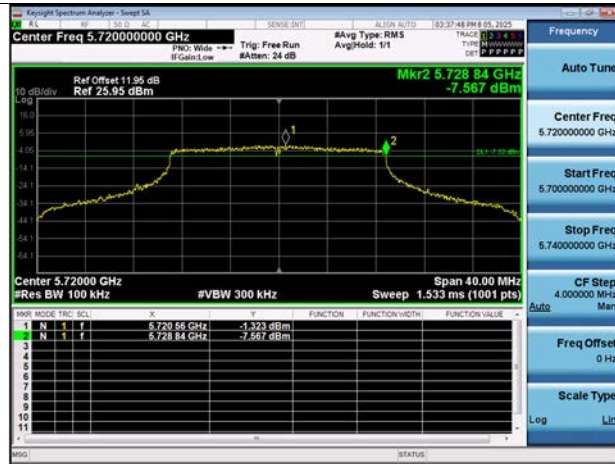
802.11a UNII Band



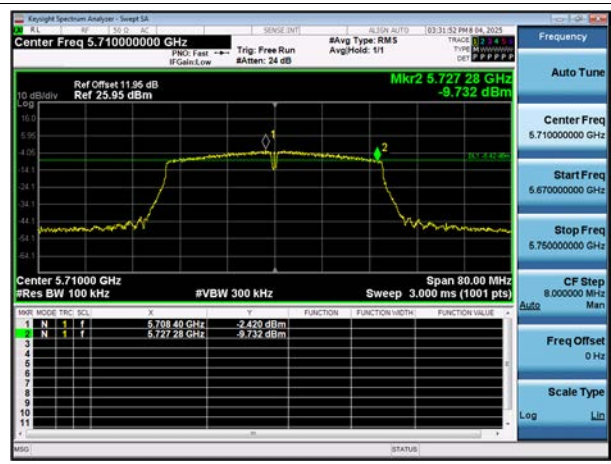
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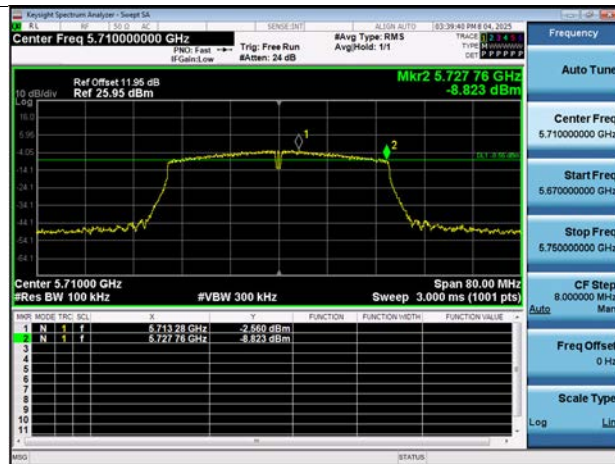
802.11ac(VHT20) UNII Band



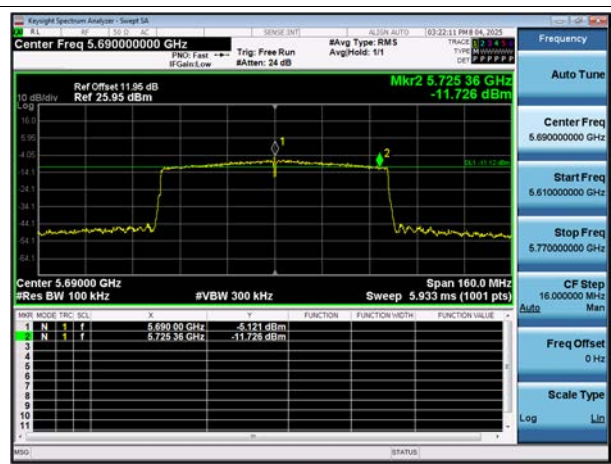
802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band

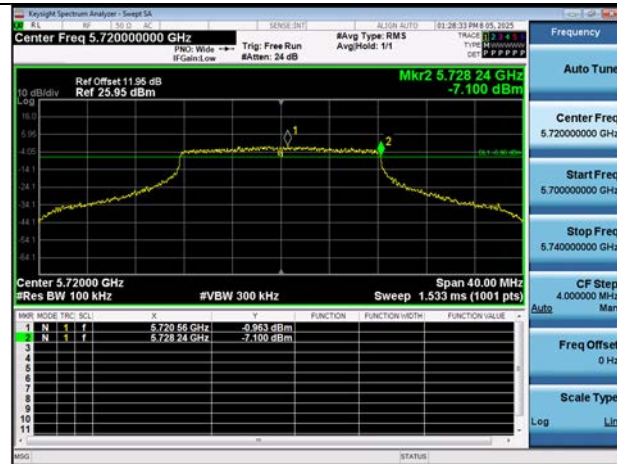


802.11ac(VHT80) UNII Band

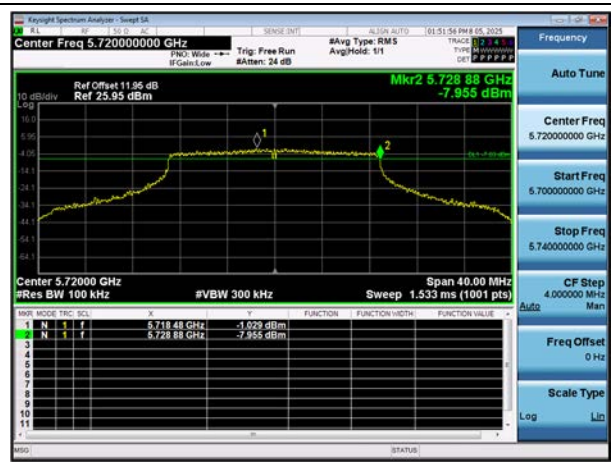


[ANT. 2]

802.11a UNII Band



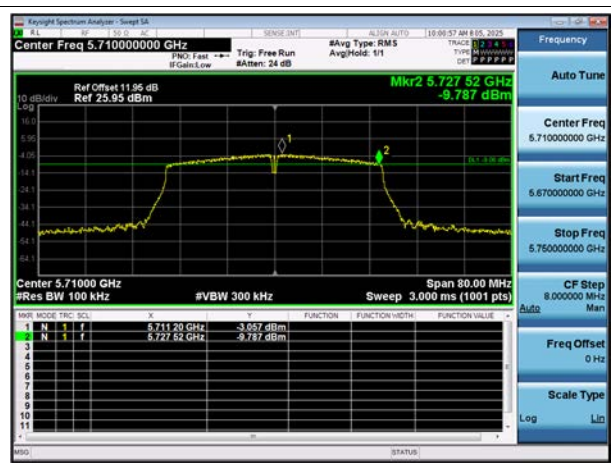
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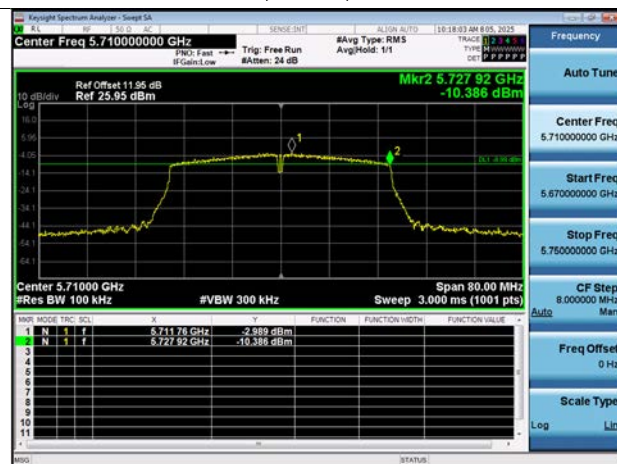
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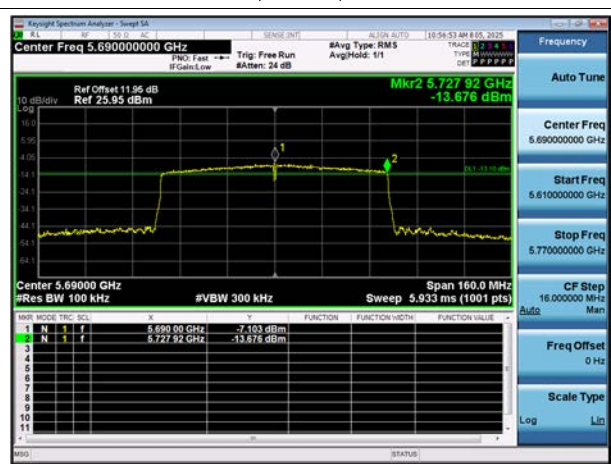
802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band

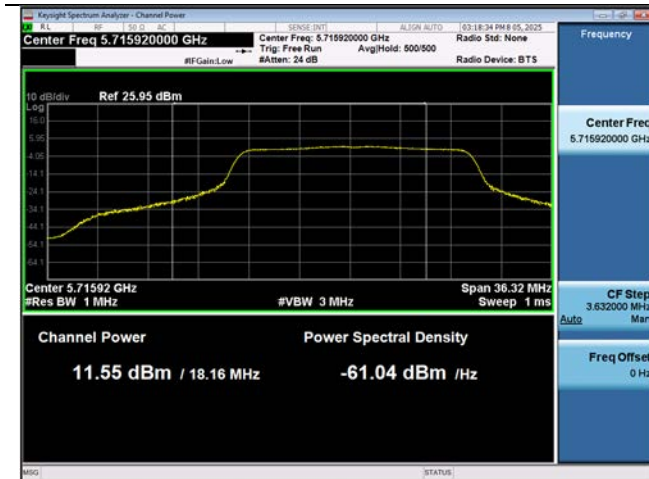


802.11ac(VHT80) UNII Band

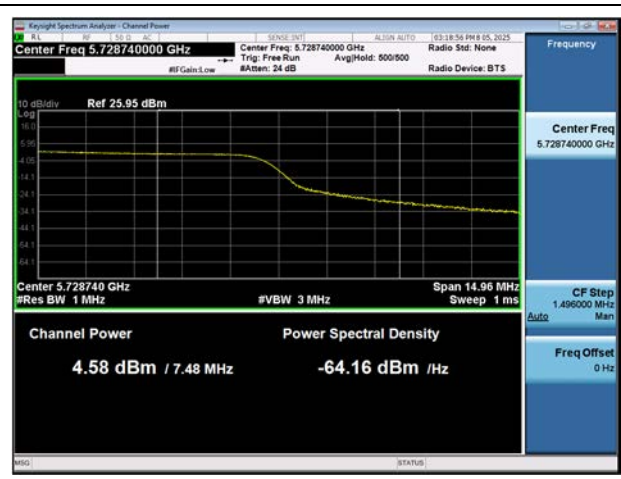


☐ Test Plots(Output Power)
[ANT. 1]

802.11a UNII 2C Band



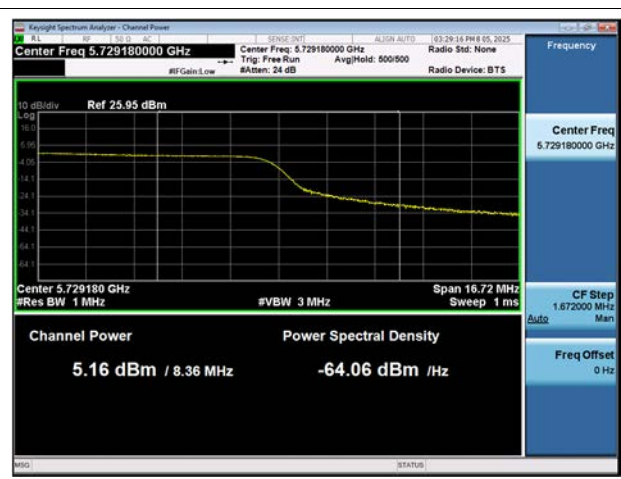
802.11a UNII 3 Band



802.11n(HT20) UNII 2C Band



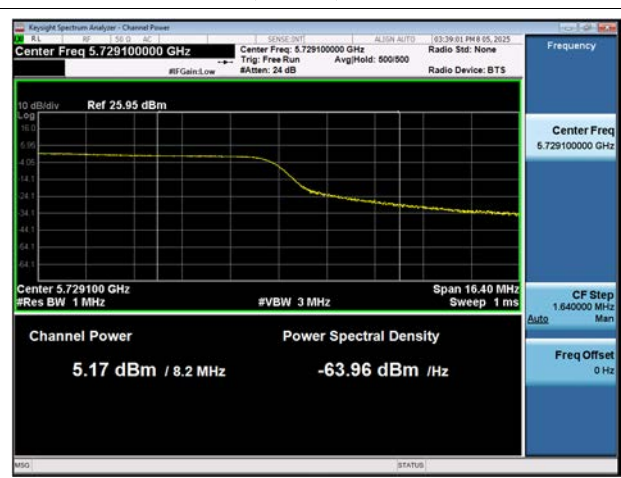
802.11n(HT20) UNII 3 Band



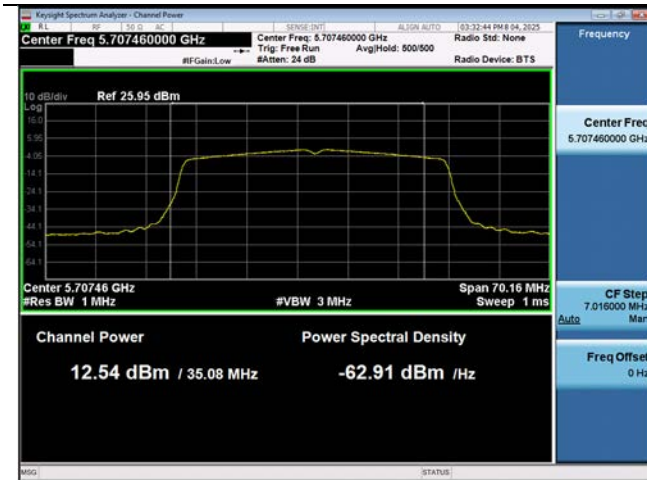
802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band



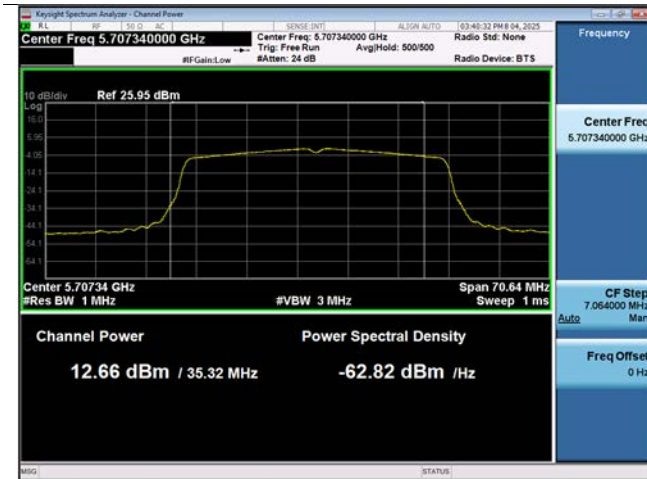
802.11n(HT40) UNII 2C Band



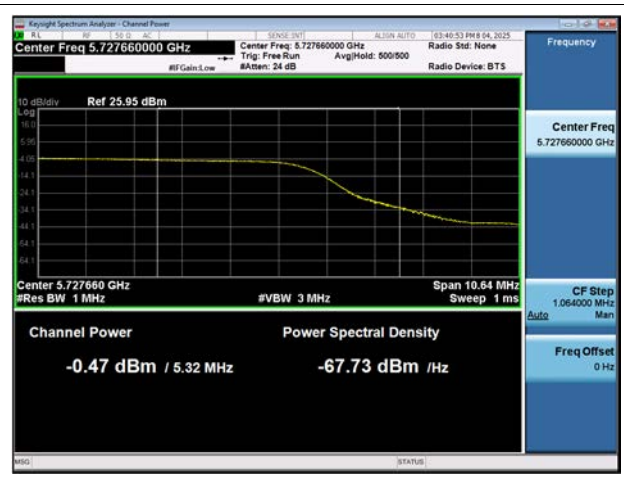
802.11n(HT40) UNII 3 Band



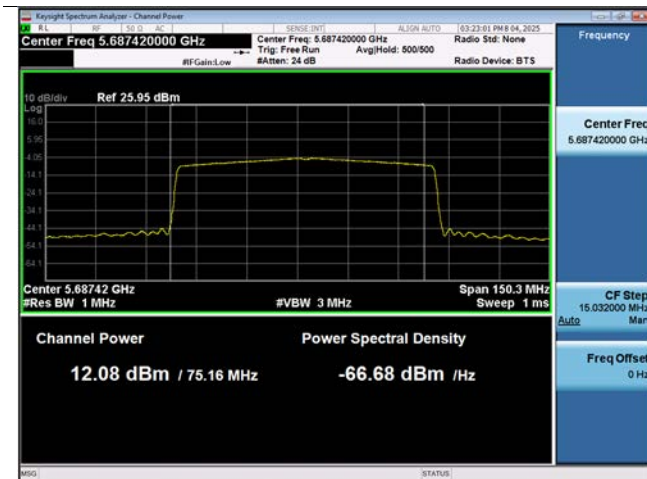
802.11ac(VHT40) UNII 2C Band



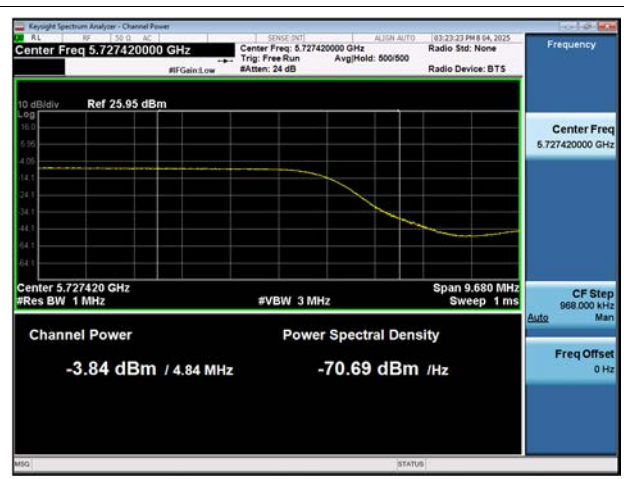
802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band



802.11ac(VHT80) UNII 3 Band



[ANT. 2]

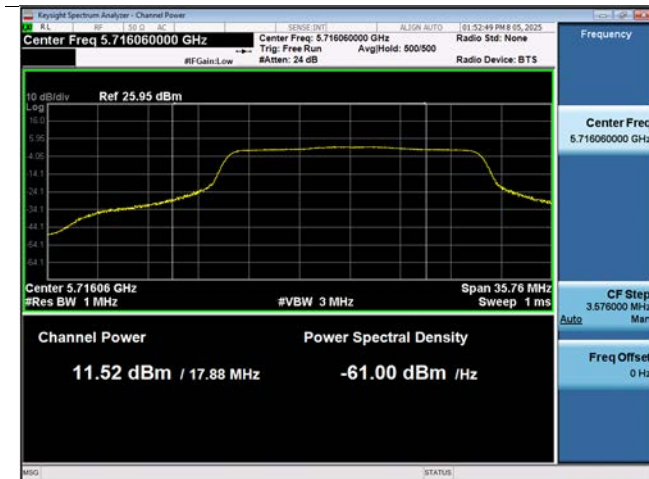
802.11a UNII 2C Band



802.11a UNII 3 Band



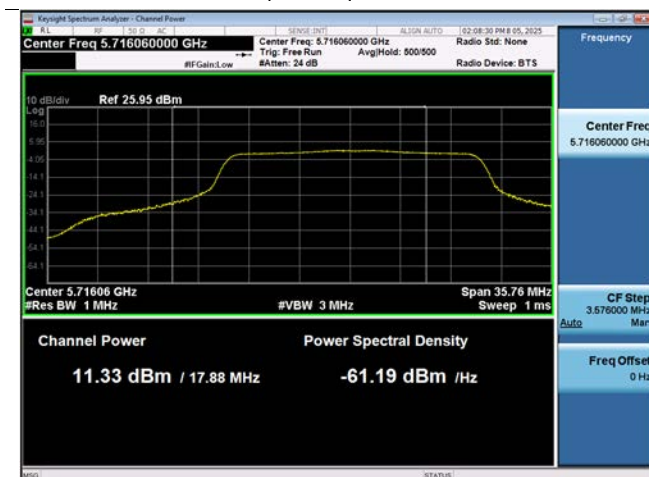
802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



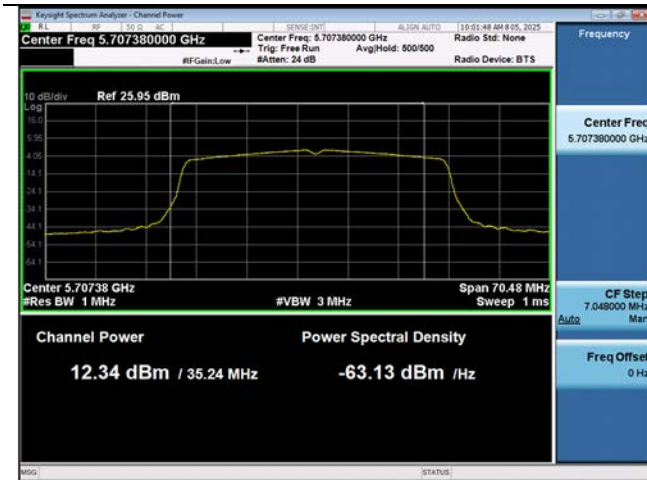
802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band



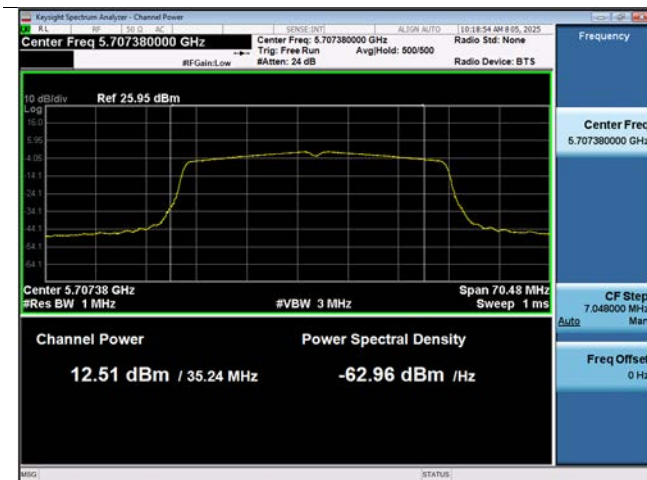
802.11n(HT40) UNII 2C Band



802.11n(HT40) UNII 3 Band



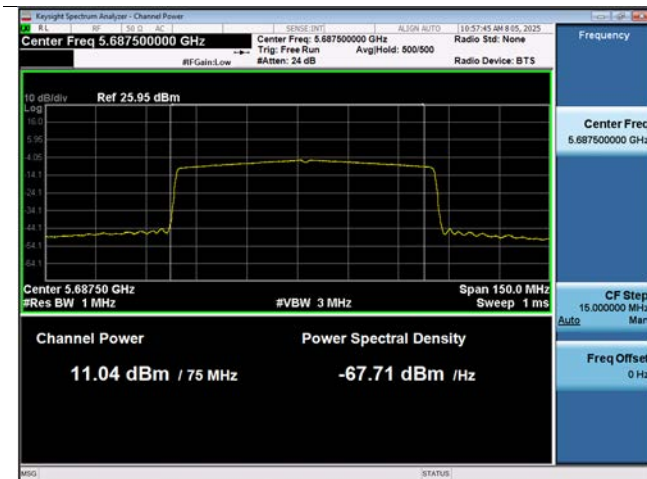
802.11ac(VHT40) UNII 2C Band



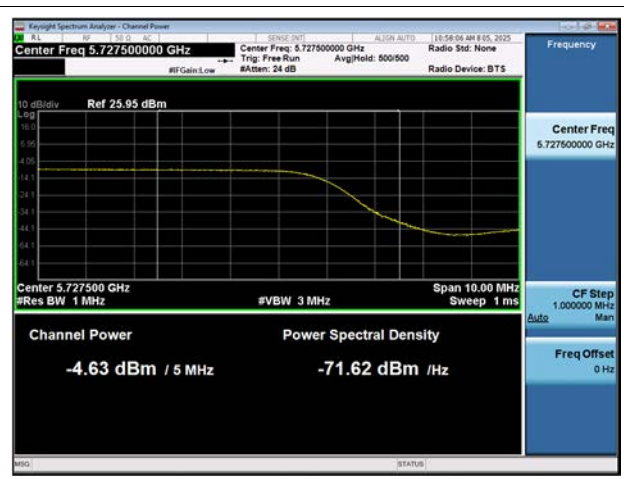
802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band



802.11ac(VHT80) UNII 3 Band

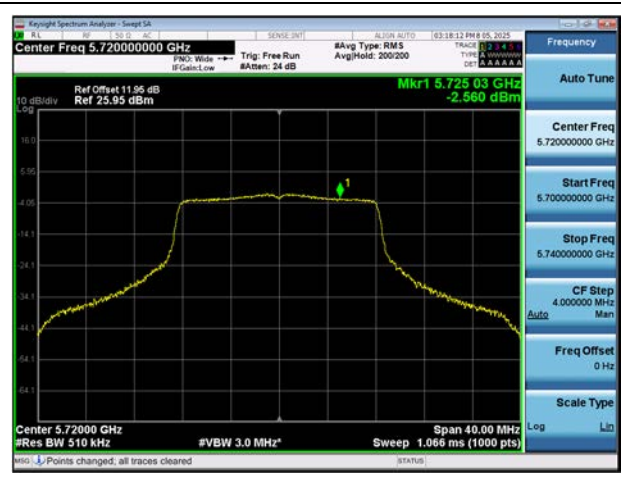


▣ Test Plots(Power Spectral Density)
[ANT. 1]

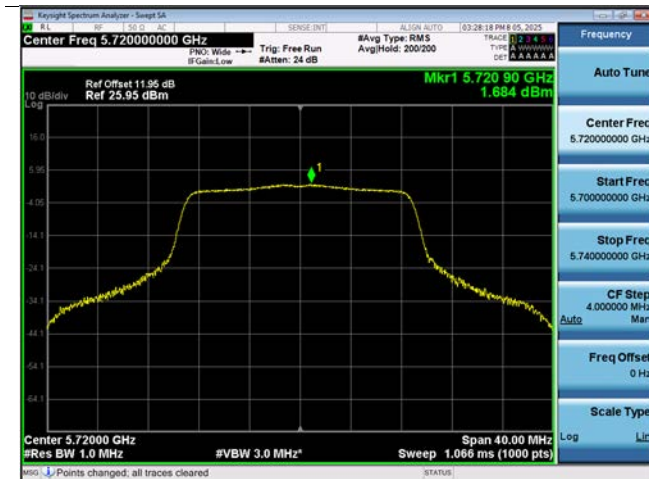
802.11a UNII 2C Band



802.11a UNII 3 Band



802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



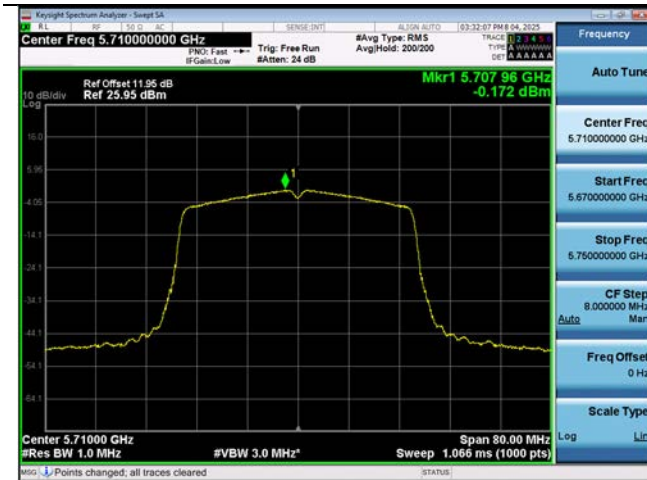
802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band



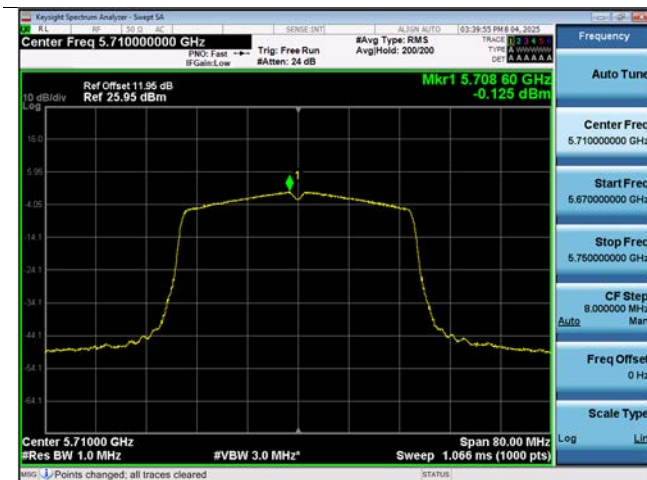
802.11n(HT40) UNII 2C Band



802.11n(HT40) UNII 3 Band



802.11ac(VHT40) UNII 2C Band



802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band

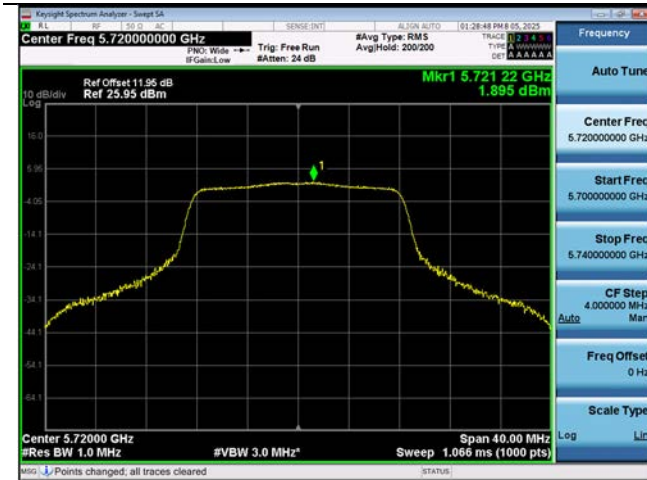


802.11ac(VHT80) UNII 3 Band

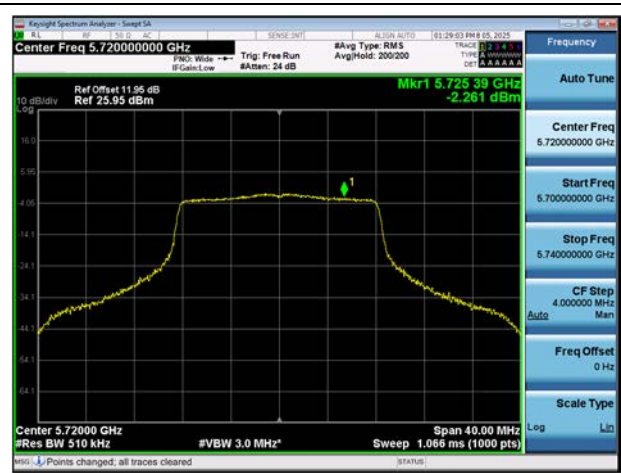


[ANT. 2]

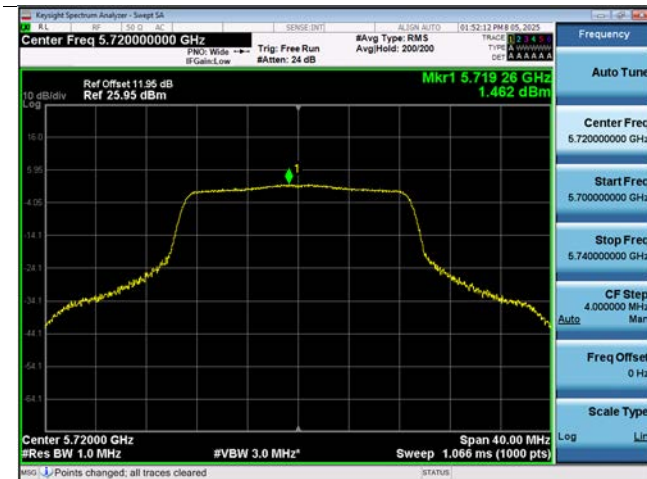
802.11a UNII 2C Band



802.11a UNII 3 Band



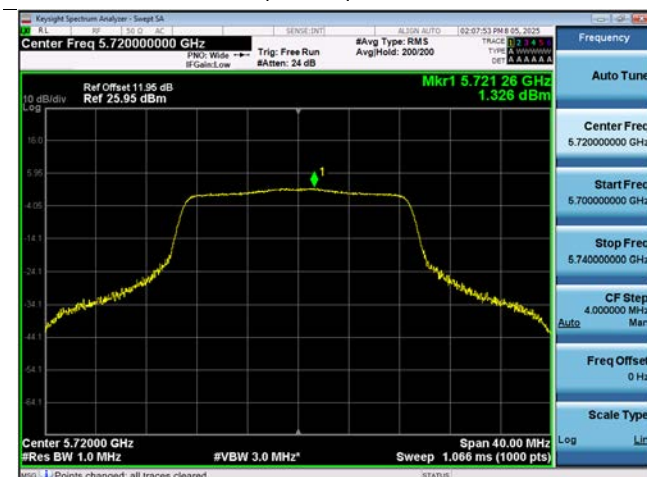
802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



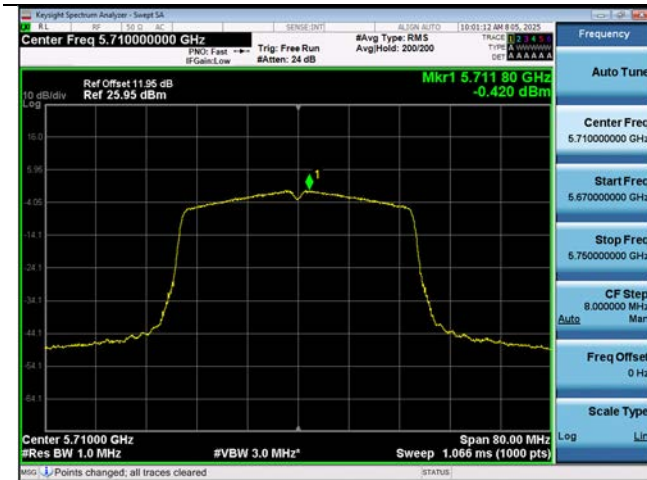
802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band



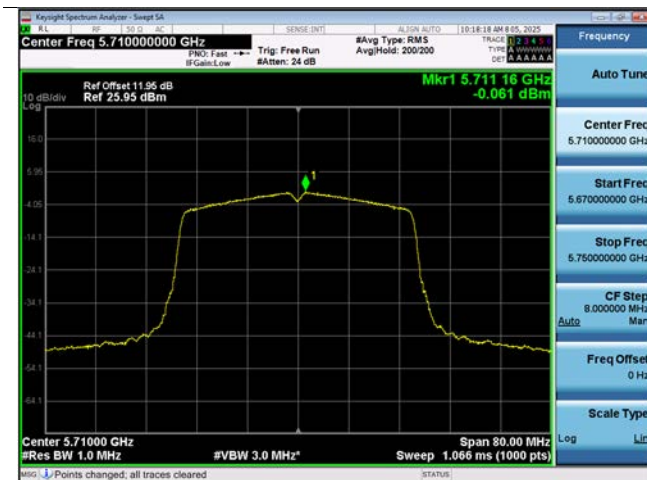
802.11n(HT40) UNII 2C Band



802.11n(HT40) UNII 3 Band



802.11ac(VHT40) UNII 2C Band



802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band



802.11ac(VHT80) UNII 3 Band



10.8 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30 MHz

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin
[MHz]	[dBμV]	[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 = $40 \log (\text{specific distance} / \text{test distance})$ (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]	[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 : UNII 1			Operation Mode : 802.11a				
CH.36 5180 MHz			Transfer Rate : 6 Mbps				
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
10360	57.10	5.79	V	62.89	68.20	5.31	PK
15540	48.71	6.58	V	55.29	73.98	18.69	PK
15540	33.89	6.58	V	40.47	53.98	13.51	AV
10360	57.30	5.79	H	63.09	68.20	5.11	PK
15540	49.00	6.58	H	55.58	73.98	18.40	PK
15540	34.12	6.58	H	40.70	53.98	13.28	AV

Band : UNII 1			Operation Mode : 802.11a				
CH.40 5200 MHz			Transfer Rate : 6 Mbps				
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
10400	54.81	5.60	V	60.41	68.20	7.79	PK
15600	47.79	6.35	V	54.14	73.98	19.84	PK
15600	33.79	6.35	V	40.14	53.98	13.84	AV
10400	55.12	5.60	H	60.72	68.20	7.48	PK
15600	47.93	6.35	H	54.28	73.98	19.70	PK
15600	34.16	6.35	H	40.51	53.98	13.47	AV

Band : UNII 1			Operation Mode : 802.11a				
CH.48 5240 MHz			Transfer Rate : 6 Mbps				
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
10480	56.68	6.05	V	62.73	68.20	5.47	PK
15720	47.46	5.76	V	53.22	73.98	20.76	PK
15720	34.11	5.76	V	39.87	53.98	14.11	AV
10480	56.95	6.05	H	63.00	68.20	5.20	PK
15720	47.64	5.76	H	53.40	73.98	20.58	PK
15720	34.25	5.76	H	40.01	53.98	13.97	AV

Band : UNII 2A			Operation Mode : 802.11a				
CH.52 5260 MHz			Transfer Rate : 6 Mbps				
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
10520	56.12	6.25	V	62.37	68.20	5.83	PK
15780	47.84	6.05	V	53.89	73.98	20.09	PK
15780	33.79	6.05	V	39.84	53.98	14.14	AV
10520	56.29	6.25	H	62.54	68.20	5.66	PK
15780	48.20	6.05	H	54.25	73.98	19.73	PK
15780	34.00	6.05	H	40.05	53.98	13.93	AV

Band : UNII 2A			Operation Mode : 802.11a				
CH.60 5300 MHz			Transfer Rate : 6 Mbps				
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
10600	55.40	6.31	V	61.71	73.98	12.27	PK
10600	40.61	6.31	V	46.92	53.98	7.06	AV
15900	48.68	7.24	V	55.92	73.98	18.06	PK
15900	33.94	7.24	V	41.18	53.98	12.80	AV
10600	55.71	6.31	H	62.02	73.98	11.96	PK
10600	40.83	6.31	H	47.14	53.98	6.84	AV
15900	48.75	7.24	H	55.99	73.98	17.99	PK
15900	34.10	7.24	H	41.34	53.98	12.64	AV

Band : UNII 2A			Operation Mode : 802.11a				
CH.64 5320 MHz			Transfer Rate : 6 Mbps				
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
10640	55.42	5.89	V	61.31	73.98	12.67	PK
10640	41.73	5.89	V	47.62	53.98	6.36	AV
15960	47.64	6.54	V	54.18	73.98	19.80	PK
15960	33.70	6.54	V	40.24	53.98	13.74	AV
10640	55.72	5.89	H	61.61	73.98	12.37	PK
10640	41.97	5.89	H	47.86	53.98	6.12	AV
15960	47.78	6.54	H	54.32	73.98	19.66	PK
15960	33.96	6.54	H	40.50	53.98	13.48	AV

Band : UNII 2C			Operation Mode : 802.11a				
CH.100 5500 MHz			Transfer Rate : 6 Mbps				
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
11000	55.13	6.36	V	61.49	73.98	12.49	PK
11000	41.34	6.36	V	47.70	53.98	6.28	AV
16500	47.57	8.54	V	56.11	68.20	12.09	PK
11000	55.53	6.36	H	61.89	73.98	12.09	PK
11000	41.49	6.36	H	47.85	53.98	6.13	AV
16500	47.84	8.54	H	56.38	68.20	11.82	PK

Band : UNII 2C			Operation Mode : 802.11a				
CH.120 5600 MHz			Transfer Rate : 6 Mbps				
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
11200	58.07	5.70	V	63.77	73.98	10.21	PK
11200	42.79	5.70	V	48.49	53.98	5.49	AV
16800	47.66	9.99	V	57.65	68.20	10.55	PK
11200	58.36	5.70	H	64.06	73.98	9.92	PK
11200	43.09	5.70	H	48.79	53.98	5.19	AV
16800	47.82	9.99	H	57.81	68.20	10.39	PK

Band : UNII 2C			Operation Mode : 802.11a				
CH.144 5720 MHz			Transfer Rate : 6 Mbps				
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
11440	60.81	5.92	V	66.73	73.98	7.25	PK
11440	44.73	5.92	V	50.65	53.98	3.33	AV
17160	47.85	9.69	V	57.54	68.20	10.66	PK
11440	60.88	5.92	H	66.80	73.98	7.18	PK
11440	44.99	5.92	H	50.91	53.98	3.07	AV
17160	48.03	9.69	H	57.72	68.20	10.48	PK

Band : UNII 3			Operation Mode : 802.11a				
CH.149 5745 MHz			Transfer Rate : 6 Mbps				
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
11490	60.04	5.88	V	65.92	73.98	8.06	PK
11490	44.64	5.88	V	50.52	53.98	3.46	AV
17235	47.11	10.22	V	57.33	68.20	10.87	PK
11490	60.45	5.88	H	66.33	73.98	7.65	PK
11490	45.09	5.88	H	50.97	53.98	3.01	AV
17235	47.20	10.22	H	57.42	68.20	10.78	PK

Band : UNII 3			Operation Mode : 802.11a				
CH.157 5785 MHz			Transfer Rate : 6 Mbps				
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
11570	58.16	6.03	V	64.19	73.98	9.79	PK
11570	44.17	6.03	V	50.20	53.98	3.78	AV
17355	46.05	11.36	V	57.41	68.20	10.79	PK
11570	58.53	6.03	H	64.56	73.98	9.42	PK
11570	44.24	6.03	H	50.27	53.98	3.71	AV
17355	46.44	11.36	H	57.80	68.20	10.40	PK

Band : UNII 3			Operation Mode : 802.11a				
CH.165 5825 MHz			Transfer Rate : 6 Mbps				
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
11650	62.93	5.42	V	68.35	73.98	5.63	PK
11650	44.74	5.42	V	50.16	53.98	3.82	AV
17475	47.63	11.65	V	59.28	68.20	8.92	PK
11650	63.12	5.42	H	68.54	73.98	5.44	PK
11650	45.15	5.42	H	50.57	53.98	3.41	AV
17475	47.75	11.65	H	59.40	68.20	8.80	PK

[Simultaneous transmission Scenario]

Scenario 1

BT LE Ch. 39_1 Mbps_1M 37 Bytes + ANT ALL(MIMO)_5 GHz 802.11a Ch. 149_6 Mbps

Frequency	Measured value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
11490	60.04	5.88	V	65.92	73.98	8.06	PK
11490	44.51	5.88	V	50.39	53.98	3.59	AV
17235	47.09	10.22	V	57.31	68.20	10.89	PK
11490	60.38	5.88	H	66.26	73.98	7.72	PK
11490	44.72	5.88	H	50.60	53.98	3.38	AV
17235	47.55	10.22	H	57.77	68.20	10.43	PK

Scenario 2

BT LE Ch. 39_1 Mbps_1M 37 Bytes + ANT 2_2.4 GHz 802.11b Ch. 6_1 Mbps + ANT 1_5 GHz 802.11a Ch. 149_6 Mbps

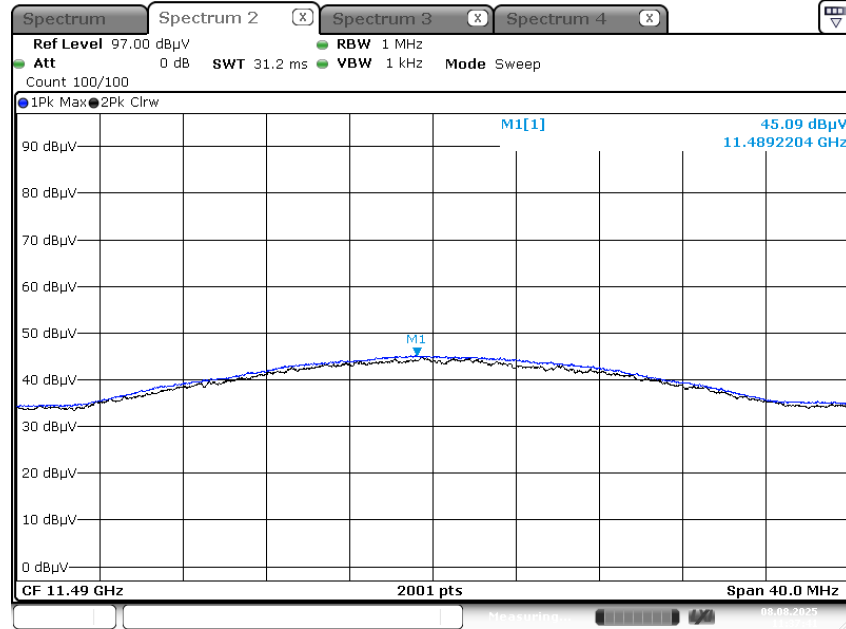
Frequency	Measured value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
11490	59.01	5.88	V	64.89	73.98	9.09	PK
11490	44.04	5.88	V	49.92	53.98	4.06	AV
17235	46.85	10.22	V	57.07	68.20	11.13	PK
11490	59.14	5.88	H	65.02	73.98	8.96	PK
11490	44.08	5.88	H	49.96	53.98	4.02	AV
17235	46.93	10.22	H	57.15	68.20	11.05	PK

Test Plots

Note: Only the worst case plots for Radiated Spurious Emissions.

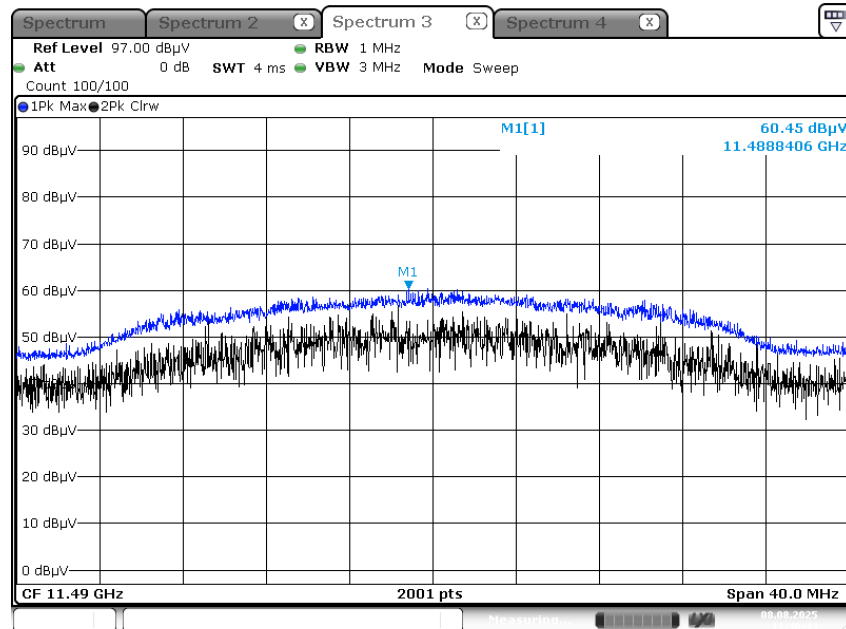
[MIMO_CDD(Ant1+Ant2)]

Radiated Spurious Emissions plot – Average Result (802.11a, Ch.149 Spurious Emissions, X-H)



Date: 8.AUG.2025 11:37:41

Radiated Spurious Emissions plot – Peak Result (802.11a, Ch.149 Spurious Emissions, X-H)



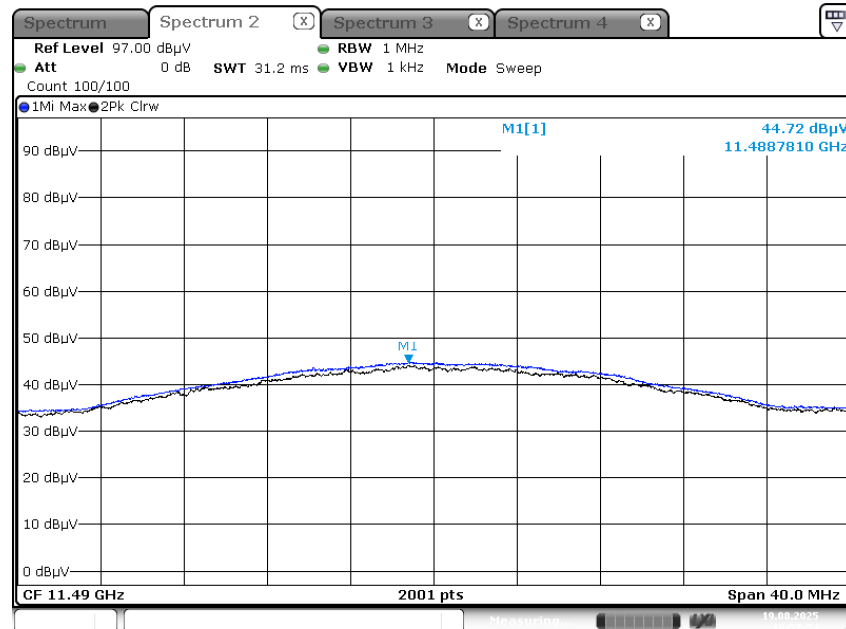
Date: 8.AUG.2025 11:40:44

[Simultaneous transmission Scenario]

Scenario 1

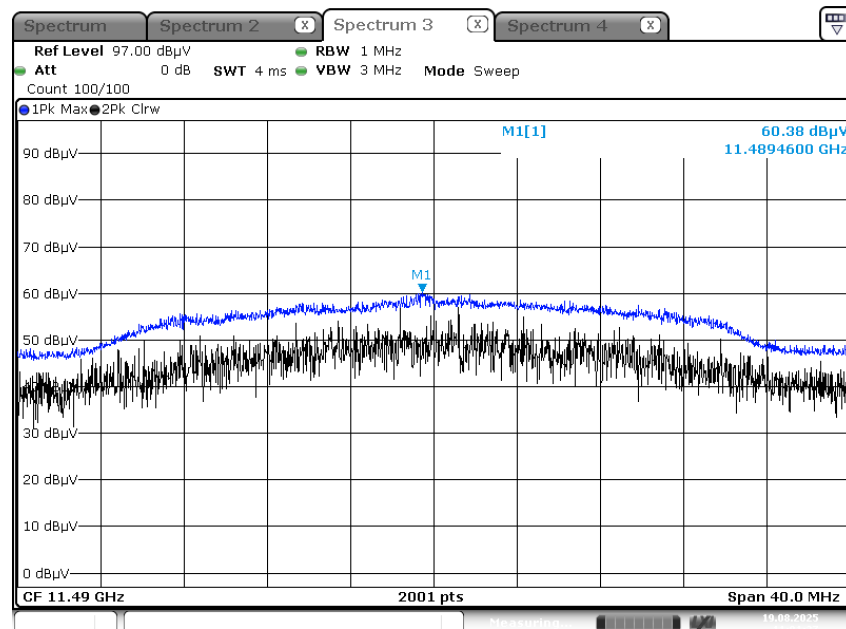
BT LE Ch. 39_1 Mbps_1M 37 Bytes + ANT ALL(MIMO)_5 GHz 802.11a Ch. 149_6 Mbps

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



Date: 19.AUG.2025 10:57:54

Radiated Spurious Emissions plot – Peak Result (Spurious Emissions, X-H)

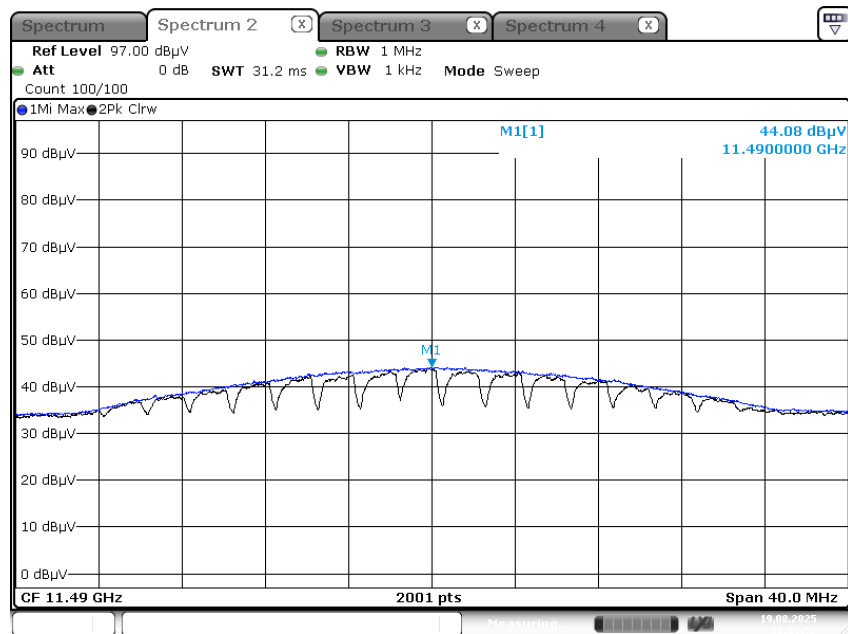


Date: 19.AUG.2025 11:01:27

Scenario 2

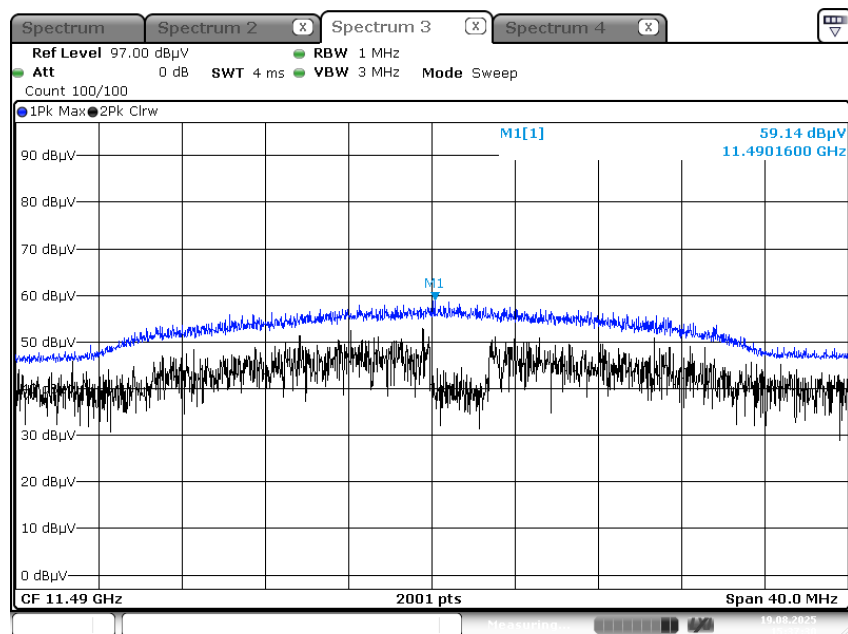
BT LE Ch. 39_1 Mbps_1M 37 Bytes + ANT 2_2.4 GHz 802.11b Ch. 6_1 Mbps + ANT 1_5 GHz 802.11a Ch. 149_6 Mbps

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



Date: 19.AUG.2025 15:35:58

Radiated Spurious Emissions plot – Peak Result (Spurious Emissions, X-H)



Date: 19.AUG.2025 15:37:31

10.9 RADIATED RESTRICTED BAND EDGE

[MIMO_CDD(Ant1+Ant2)]

Operation Mode : 802.11a		Tone & RU Index : N/A		Transfer Rate : 6M		
Channel No. : 36		Frequency : 5180 MHz		Band : UNII-1		
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4500 - 5150	62.47	H	62.47	73.98	11.51	PK
4500 - 5150	49.14	H	49.14	53.98	4.84	AV

Operation Mode : 802.11a		Tone & RU Index : N/A		Transfer Rate : 6M		
Channel No. : 64		Frequency : 5320 MHz		Band : UNII-2A		
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	59.49	H	59.49	73.98	14.49	PK
5350 - 5460	45.90	H	45.90	53.98	8.08	AV

Operation Mode : 802.11a		Tone & RU Index : N/A		Transfer Rate : 6M		
Channel No. : 100		Frequency : 5500 MHz		Band : UNII-2C		
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	61.22	H	61.22	73.98	12.76	PK
5350 - 5460	48.84	H	48.84	53.98	5.14	AV
5460 - 5470	62.58	H	62.58	68.20	5.62	PK

Operation Mode : 802.11n_20		Tone & RU Index : N/A		MCS index : MCS0		
Channel No. : 36		Frequency : 5180 MHz		Band : UNII-1		
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4500 - 5150	61.76	H	61.76	73.98	12.22	PK
4500 - 5150	49.38	H	49.38	53.98	4.60	AV

Operation Mode : 802.11n_20		Tone & RU Index : N/A		MCS index : MCS0		
Channel No. : 64		Frequency : 5320 MHz		Band : UNII-2A		
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	59.07	H	59.07	73.98	14.91	PK
5350 - 5460	45.72	H	45.72	53.98	8.26	AV

Operation Mode :	802.11n_20	Tone & RU Index :	N/A	MCS index :		MCS0
Channel No. :	100	Frequency :	5500 MHz	Band :		UNII-2C
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	61.40	H	61.40	73.98	12.58	PK
5350 - 5460	49.28	H	49.28	53.98	4.70	AV
5460 - 5470	62.40	H	62.40	68.20	5.80	PK

Operation Mode :	802.11ac_20	Tone & RU Index :	N/A	MCS index :	MCS0	
Channel No. :	36	Frequency :	5180 MHz	Band :	UNII-1	
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4500 - 5150	61.74	H	61.74	73.98	12.24	PK
4500 - 5150	49.41	H	49.41	53.98	4.57	AV

Operation Mode :	802.11ac_20	Tone & RU Index :	N/A	MCS index :		MCS0
Channel No. :	64	Frequency :	5320 MHz	Band :		UNII-2A
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	58.67	H	58.67	73.98	15.31	PK
5350 - 5460	45.68	H	45.68	53.98	8.30	AV

Operation Mode :	802.11ac_20	Tone & RU Index :	N/A	MCS index :		MCS0
Channel No. :	100	Frequency :	5500 MHz	Band :		UNII-2C
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	61.61	H	61.61	73.98	12.37	PK
5350 - 5460	48.59	H	48.59	53.98	5.39	AV
5460 - 5470	62.60	H	62.60	68.20	5.60	PK

Operation Mode : 802.11n_40		Tone & RU Index : N/A		MCS index : MCS0		
Channel No. : 38		Frequency : 5190 MHz		Band : UNII-1		
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4500 - 5150	62.09	H	62.09	73.98	11.89	PK
4500 - 5150	49.58	H	49.58	53.98	4.40	AV

Operation Mode : 802.11n_40		Tone & RU Index : N/A		MCS index : MCS0		
Channel No. : 62		Frequency : 5310 MHz		Band : UNII-2A		
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	57.61	H	57.61	73.98	16.37	PK
5350 - 5460	44.78	H	44.78	53.98	9.20	AV

Operation Mode : 802.11n_40		Tone & RU Index : N/A		MCS index : MCS0		
Channel No. :	102	Frequency :	5510 MHz	Band :		UNII-2C
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	61.99	H	61.99	73.98	11.99	PK
5350 - 5460	48.47	H	48.47	53.98	5.51	AV
5460 - 5470	62.77	H	62.77	68.20	5.43	PK

Operation Mode :	802.11ac_40	Tone & RU Index :	N/A	MCS index :		MCS0
Channel No. :	38	Frequency :	5190 MHz	Band :		UNII-1
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4500 - 5150	61.58	H	61.58	73.98	12.40	PK
4500 - 5150	49.56	H	49.56	53.98	4.42	AV

Operation Mode : 802.11ac_40		Tone & RU Index : N/A		MCS index : MCS0		
Channel No. : 62		Frequency : 5310 MHz		Band : UNII-2A		
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	58.26	H	58.26	73.98	15.72	PK
5350 - 5460	45.21	H	45.21	53.98	8.77	AV

Operation Mode :	802.11ac_40	Tone & RU Index :	N/A	MCS index :	MCS0	
Channel No. :	102	Frequency :	5510 MHz	Band :	UNII-2C	
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	61.75	H	61.75	73.98	12.23	PK
5350 - 5460	48.15	H	48.15	53.98	5.83	AV
5460 - 5470	62.47	H	62.47	68.20	5.73	PK

Operation Mode :	802.11ac_80	Tone & RU Index :	N/A	MCS index :	MCS0	
Channel No. :	42	Frequency :	5210 MHz	Band :	UNII-1	
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4500 - 5150	64.27	H	64.27	73.98	9.71	PK
4500 - 5150	50.71	H	50.71	53.98	3.27	AV

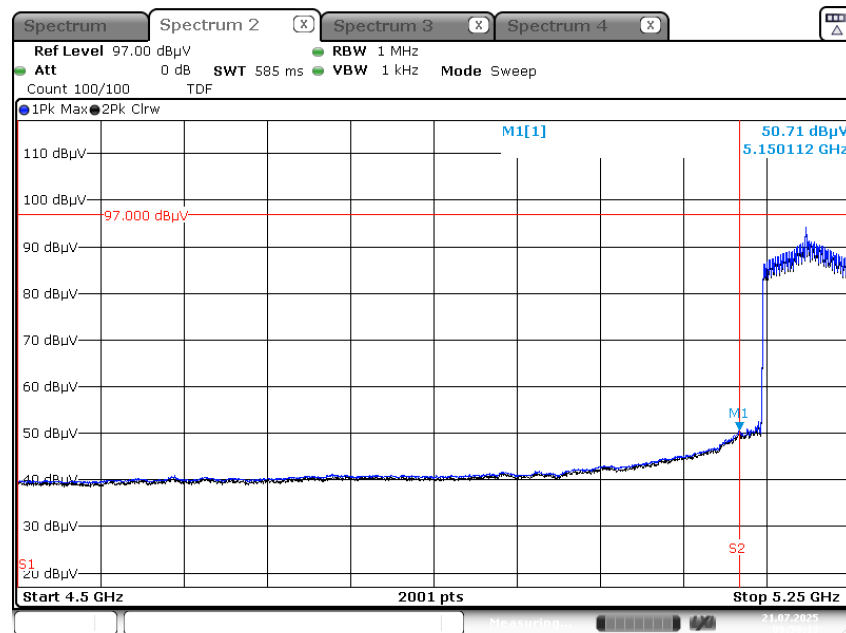
Operation Mode : 802.11ac_80		Tone & RU Index : N/A	MCS index : MCS0			
Channel No. : 58		Frequency : 5290 MHz	Band : UNII-2A			
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350 - 5460	60.87	H	60.87	73.98	13.11	PK
5350 - 5460	48.48	H	48.48	53.98	5.50	AV

Operation Mode :		802.11ac_80	Tone & RU Index :		N/A	MCS index :		MCS0
Channel No. :		106	Frequency :		5530 MHz	Band :		UNII-2C
Frequency [MHz]	Measured Value [dBμV]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type		
5350 - 5460	62.20	H	62.20	73.98	11.78	PK		
5350 - 5460	49.05	H	49.05	53.98	4.93	AV		
5460 - 5470	64.02	H	64.02	68.20	4.18	PK		

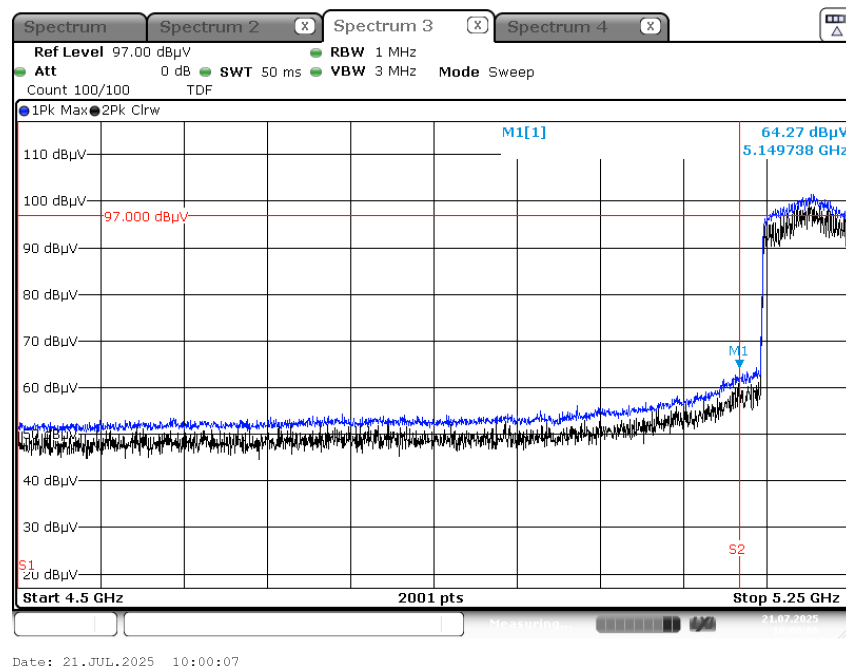
[MIMO_CDD(Ant1+Ant2)]

▣ Test Plots(UNII 1, 2A, 2C)

Average Result (802.11ac80_ MCS0, Ch. 42, X-H)



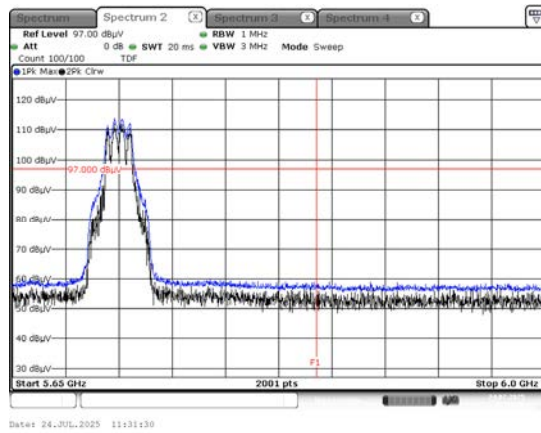
Peak Result (802.11ac80_ MCS0, Ch. 42, X-H)



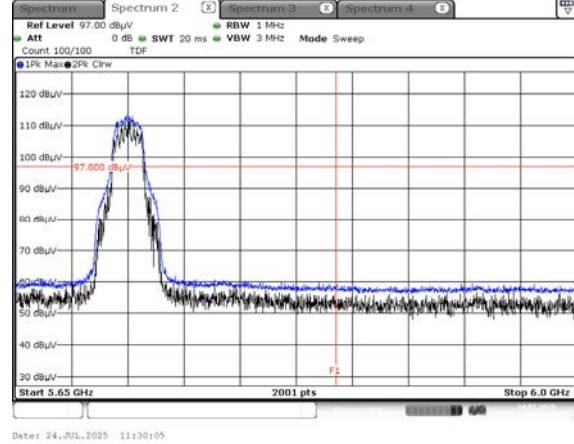
Note: Only the worst case plots for Radiated Restricted Band Edge.

Test Plots(Straddle Channel)

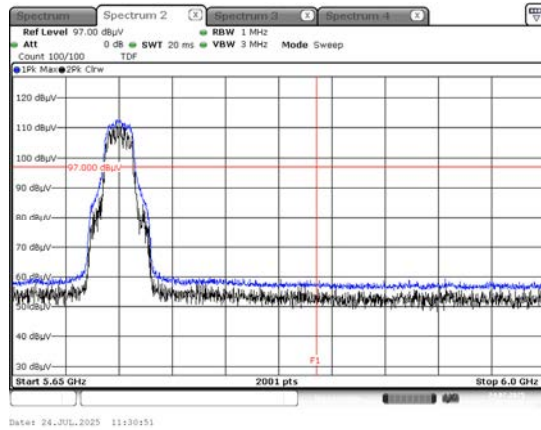
Peak Result (802.11a, Ch.144, X-H)



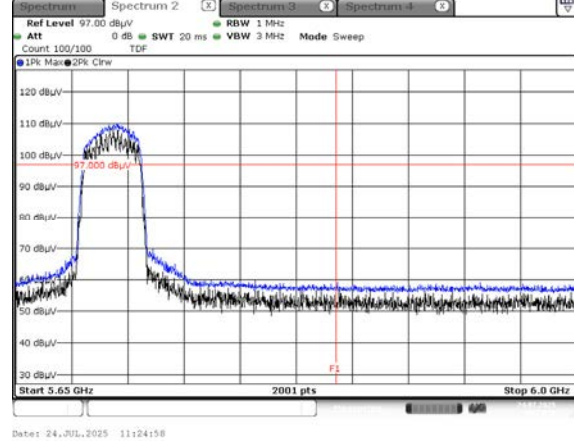
Peak Result (802.11n_HT20, Ch.144, X-H)



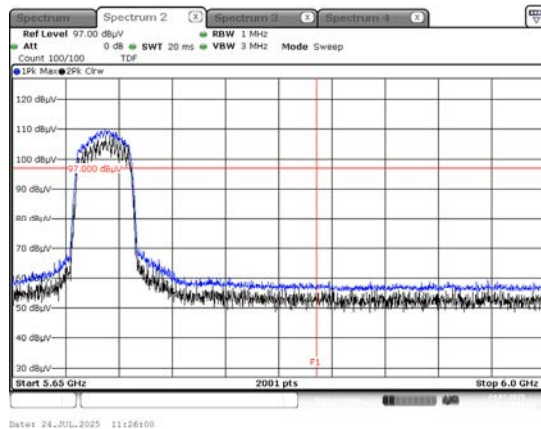
Peak Result (802.11ac_VHT20, Ch.144, X-H)



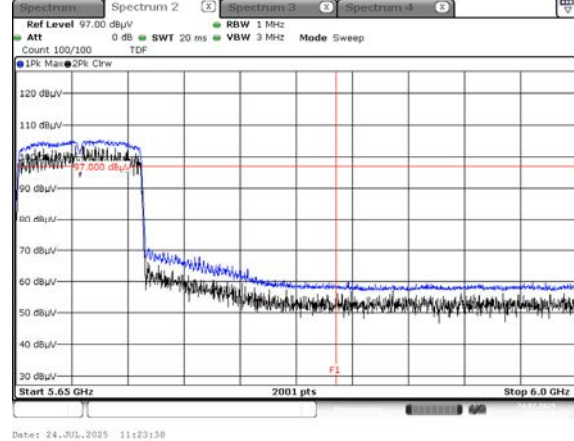
Peak Result (802.11n_HT40, Ch.142, X-H)



Peak Result (802.11ac_VHT40, Ch.142, X-H)



Peak Result (802.11ac_VHT80, Ch.138, X-H)

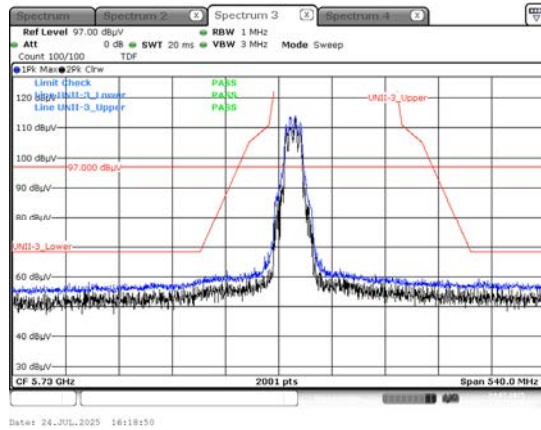


Note :

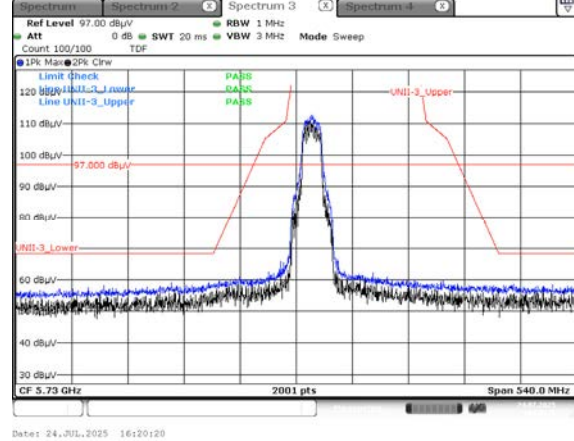
1. Only the worst case plots for Radiated Restricted Band Edge.
2. Red line : 5 850 MHz

Test Plots(UNII 3)

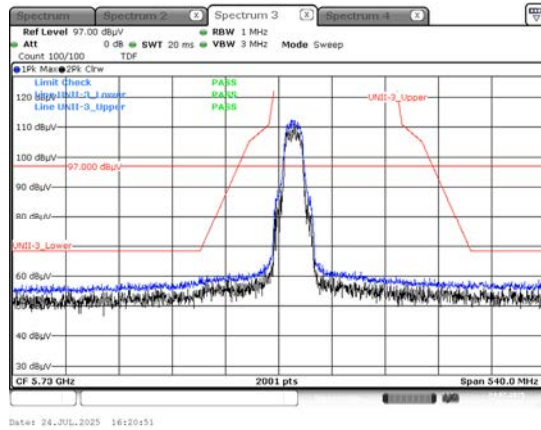
Peak Result (802.11a, Ch.149, X-H)



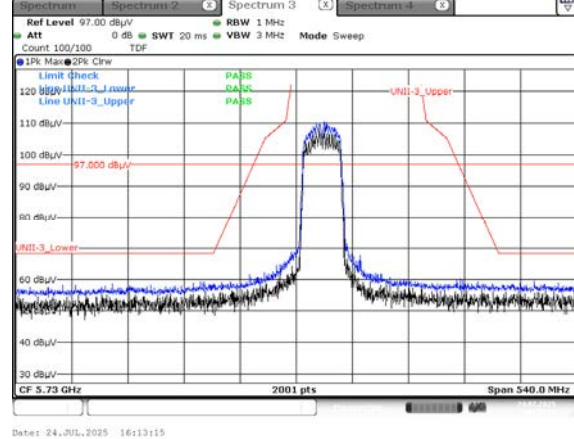
Peak Result (802.11n_HT20, Ch.149, X-H)



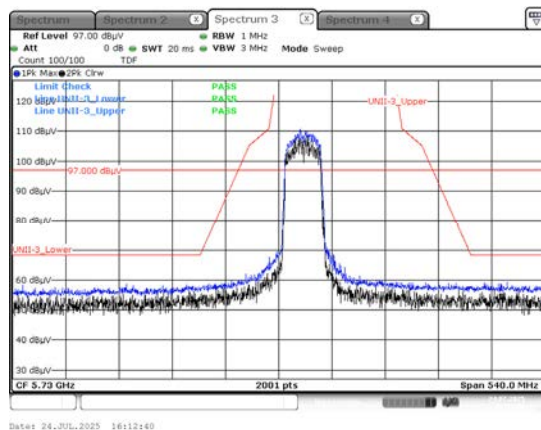
Peak Result (802.11ac_VHT20, Ch.149, X-H)



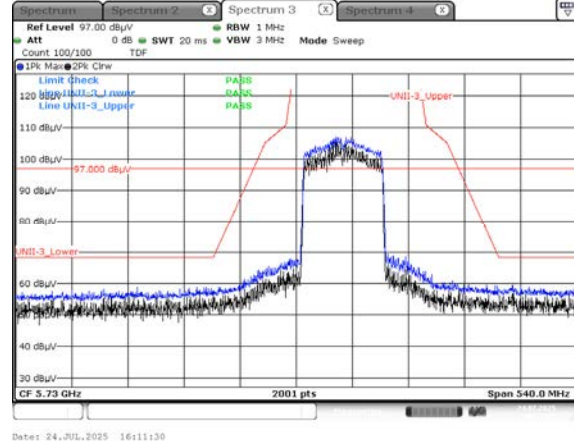
Peak Result (802.11n_HT40, Ch.151, X-H)



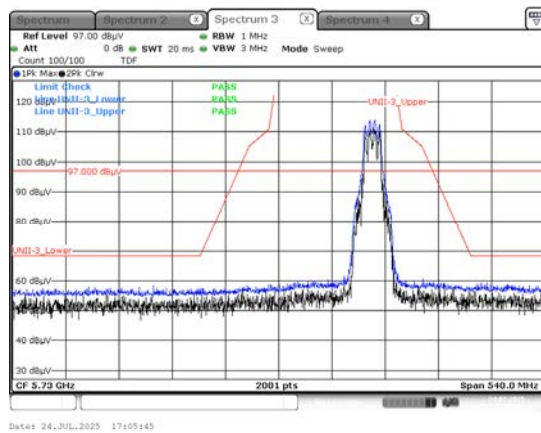
Peak Result (802.11ac_VHT40, Ch.151, X-H)



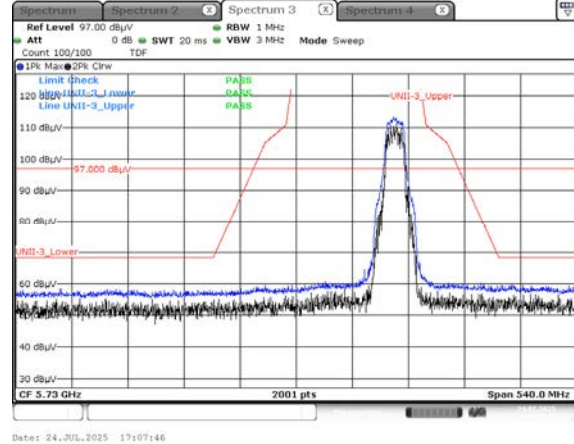
Peak Result (802.11ac_VHT80, Ch.155, X-H)



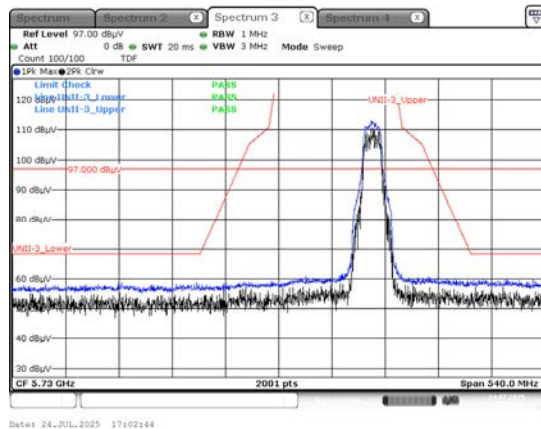
Peak Result (802.11a, Ch.165, X-H)



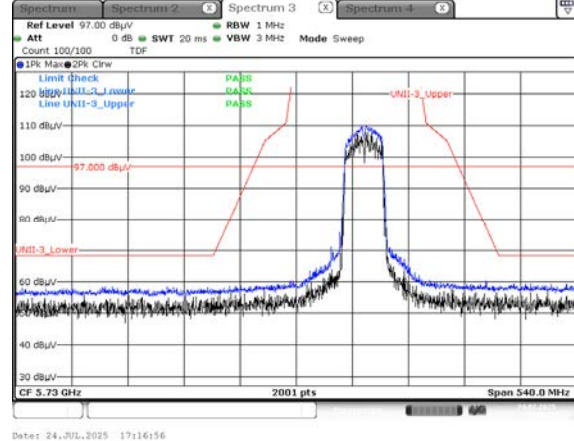
Peak Result (802.11n_HT20, Ch.165, X-H)



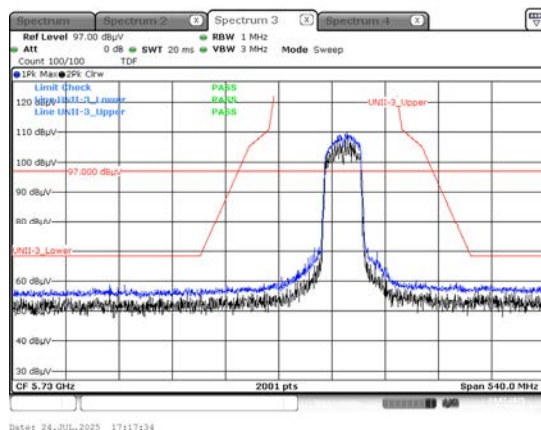
Peak Result (802.11ac_VHT20, Ch.165, X-H)



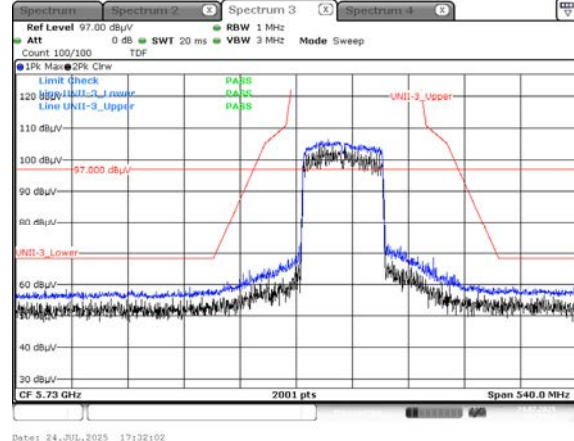
Peak Result (802.11n_HT40, Ch.159, X-H)



Peak Result (802.11ac_VHT40, Ch.159, X-H)



Peak Result (802.11ac_VHT80, Ch.155, X-H)



Note :

1. Only the worst case plots for U-NII-3 Out of Band e.i.r.p Emission.

10.10 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions

Test

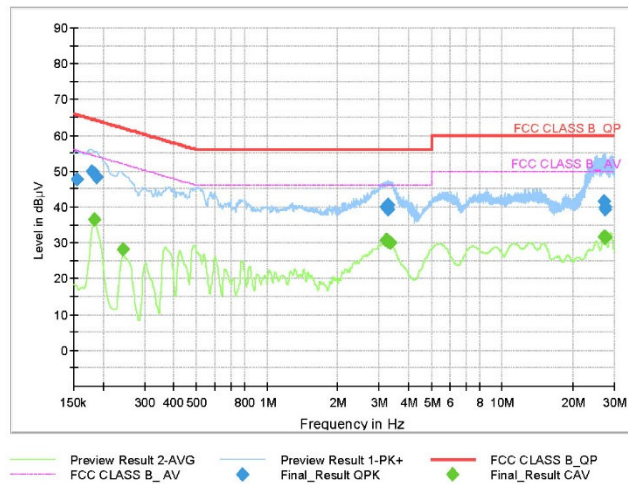
1 / 1

Test Report

Common Information

EUT : LGSWNAX61
Operating Conditions : 5G WLAN Mode
Comment :

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1545	47.61	65.75	18.14	9.000	L1	9.6
0.1793	49.98	64.52	14.55	9.000	L1	9.6
0.1883	48.45	64.11	15.66	9.000	L1	9.6
3.2068	39.97	56.00	16.03	9.000	N	9.7
3.2585	40.58	56.00	15.42	9.000	N	9.7
3.2810	39.47	56.00	16.53	9.000	N	9.7
27.2390	41.66	60.00	18.34	9.000	N	10.0
27.3740	39.44	60.00	20.56	9.000	N	10.0
27.5113	40.06	60.00	19.94	9.000	N	10.0

Final Result CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1838	36.48	54.31	17.83	9.000	N	9.6
0.2445	28.07	51.94	23.87	9.000	N	9.6
3.2068	30.65	46.00	15.35	9.000	N	9.7
3.2203	30.76	46.00	15.24	9.000	N	9.7
3.2833	30.39	46.00	15.61	9.000	N	9.7
3.3440	30.16	46.00	15.84	9.000	N	9.7
27.2008	31.67	50.00	18.33	9.000	L1	10.0
27.3605	31.70	50.00	18.30	9.000	L1	10.0
27.5698	31.40	50.00	18.60	9.000	L1	10.0

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11. 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	08/20/2026	Annual
Temperature Chamber	SU-642	ESPEC	93022487	06/26/2026	Annual
Signal Analyzer	N9030A	Keysight	MY55410508	07/23/2026	Annual
Power Measurement Set	OSP 120	Rohde & Schwarz	100935	07/24/2026	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	KR75305528	12/24/2025	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C-010	Agilent	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
Automation Software	FCC WLAN Conducted	HCT CO., LTD.	-	-	-
Automation Software	FCC BT Conducted	HCT CO., LTD.	-	-	-
Bluetooth Tester	CBT	Rohde & Schwarz	100752	12/27/2025	Annual

Note:

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

Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller (Antenna mast & Turn Table)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	S3AM	07/25/2026	Annual
Turn Table	DS1500-S-1t	Innco system	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/07/2026	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	08/28/2026	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1191	11/07/2025	Biennial
Horn Antenna (15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170124	03/23/2027	Biennial
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
Band Reject Filter	WRCJV5100/5850-40/50-8EEK	Wainwright Instruments	1	01/09/2026	Annual
Amp & Filter Bank Switch Controller	FBSM-01A	TNM system	0	N/A	N/A
RF Switching System	FBSR-03A (3G HPF+LNA)	T&M SYSTEM	S3L1	10/31/2025	Annual
RF Switching System	FBSR-03A (10dB ATT+LNA)	T&M SYSTEM	S3L2	10/31/2025	Annual
RF Switching System	FBSR-03A (7G HPF+LNA)	T&M SYSTEM	S3L3	10/31/2025	Annual
RF Switching System	FBSR-03A (3dB ATT+LNA)	T&M SYSTEM	S3L4	10/31/2025	Annual
Automation Software	FCC WLAN Radiated	HCT CO., LTD.	-	-	-
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
Spectrum Analyzer	FSV40 (9 kHz ~ 40 GHz)	Rohde & Schwarz	100900	08/27/2026	Annual

Note:

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

12. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2511-FC019-P