

TEST REPORT

FCC UNII Test for LGSWNAC62
Certification

APPLICANT
LG Electronics Inc.

REPORT NO.
HCT-RF-2508-FC011

DATE OF ISSUE
August 21, 2025

Tested by
Kwang Il Yoon



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

TEST REPORT

REPORT NO.
HCT-RF-2508-FC011

DATE OF ISSUE
August 21, 2025

Applicant **LG Electronics Inc.**
222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 17709, Republic of Korea

Product Name RF Module
Model Name LGSWNAC62

FCC ID 2B03LLGSWNAC62

Date of Test June 27, 2025 ~ August 21, 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	August 21, 2025	Initial Release

Notice

Content

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

The 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)

CONTENTS

1. GENERAL INFORMATION	5
EUT DESCRIPTION	5
ANTENNA CONFIGURATIONS	6
2. MAXIMUM OUTPUT POWER	8
3. TEST METHODOLOGY	9
EUT CONFIGURATION	9
EUT EXERCISE	9
GENERAL TEST PROCEDURES	9
DESCRIPTION OF TEST MODES	10
4. INSTRUMENT CALIBRATION	10
5. FACILITIES AND ACCREDITATIONS	10
5.1 FACILITIES	10
5.2 EQUIPMENT	10
6. ANTENNA REQUIREMENTS	11
7. MEASUREMENT UNCERTAINTY	11
8. DESCRIPTION OF TESTS	12
9. SUMMARY OF TEST RESULTS	31
10. TEST RESULT	32
10.1 DUTY CYCLE	32
10.2 26 dB Bandwidth	35
10.3 6 dB BANDWIDTH	41
10.4 OUTPUT POWER MEASUREMENT	45
10.5 POWER SPECTRAL DENSITY	48
10.6 FREQUENCY STABILITY	51
10.6.1 80 MHz BW	52
10.7 STRADDLE CHANNEL	56
10.8 RADIATED SPURIOUS EMISSIONS	71
10.9 RADIATED RESTRICTED BAND EDGE	79
10.10 POWERLINE CONDUCTED EMISSIONS	87
11. LIST OF TEST EQUIPMENT	88
12. ANNEX A_ TEST SETUP PHOTO	90

1. GENERAL INFORMATION

EUT DESCRIPTION

Model	LGSWNAC62	
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	Radiated : 0827A8A2DE32 Conducted : 0827A8B40A42	

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	5 GHz WiFi	BTLE	Test Case
BTLE + 2.4 GHz WiFi	on	-	on	Scenario1
BTLE + 5 GHz WiFi	-	on	on	Scenario2

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	1.24	2.45	2 / 2	4.88	2.45
UNII 2A	1.66	2.66		5.18	2.66
UNII 2C	2.83	2.67		5.76	2.83
UNII 3	2.68	2.78		5.74	2.78

Note

According to Ansi C63.10-2013 section 14.4.3, 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.

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

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

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	13.53	0.023	12.37	0.017	16.00	0.040
	802.11n (HT20)	13.30	0.021	12.31	0.017	15.84	0.038
	802.11n (HT40)	13.62	0.023	12.76	0.019	16.22	0.042
	802.11ac (VHT20)	13.09	0.020	12.32	0.017	15.73	0.037
	802.11ac (VHT40)	13.61	0.023	12.55	0.018	16.12	0.041
	802.11ac (VHT80)	13.55	0.023	12.60	0.018	16.11	0.041
UNII2A	802.11a	13.62	0.023	13.58	0.023	16.61	0.046
	802.11n (HT20)	13.27	0.021	13.35	0.022	16.32	0.043
	802.11n (HT40)	13.95	0.025	12.65	0.018	16.36	0.043
	802.11ac (VHT20)	13.16	0.021	13.42	0.022	16.31	0.043
	802.11ac (VHT40)	13.87	0.024	12.69	0.019	16.33	0.043
	802.11ac (VHT80)	13.33	0.022	12.38	0.017	15.89	0.039
UNII2C	802.11a	13.97	0.025	14.61	0.029	17.31	0.054
	802.11n (HT20)	14.26	0.027	14.31	0.027	17.30	0.054
	802.11n (HT40)	14.06	0.025	13.89	0.025	16.99	0.050
	802.11ac (VHT20)	14.42	0.028	14.25	0.027	17.35	0.054
	802.11ac (VHT40)	14.11	0.026	14.10	0.026	17.12	0.051
	802.11ac (VHT80)	13.46	0.022	13.84	0.024	16.67	0.046
UNII3	802.11a	14.03	0.025	14.24	0.027	17.15	0.052
	802.11n (HT20)	14.56	0.029	13.51	0.022	17.08	0.051
	802.11n (HT40)	14.59	0.029	13.97	0.025	17.30	0.054
	802.11ac (VHT20)	14.51	0.028	13.46	0.022	17.03	0.050
	802.11ac (VHT40)	14.58	0.029	14.37	0.027	17.48	0.056
	802.11ac (VHT80)	14.36	0.027	13.84	0.024	17.12	0.052

3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated December 14, 2017 entitled “Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E” and ANSI C63.10 (Version : 2013) ‘the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices’ were used in the measurement.

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. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and average Measurement Type or modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1 GHz. Above 1 GHz with 1.5 m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013)

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

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 Measurement Typeors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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 C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicate a 95 % level of confidence.

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

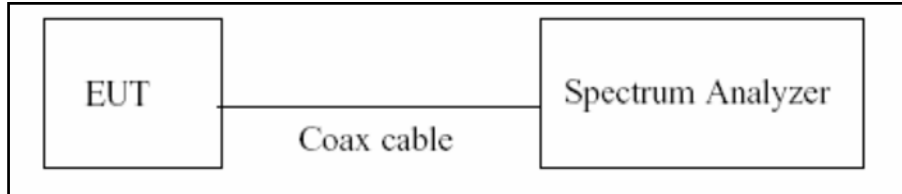
Parameter	Expanded Uncertainty (\pm kHz)
X dB, 99% Bandwidth	95 (Confidence level about 95 %, $k=2$)
Frequency stability	28 (Confidence level about 95 %, $k=2$)

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

8.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure B.2 in KDB 789033 D02 v02r01.

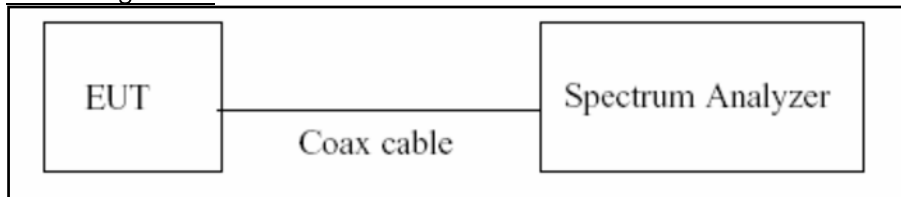
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (\geq RBW)
3. SPAN = 0 Hz
4. Measurement Type or = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = $T_{\text{on}} / T_{\text{total}}$ and Duty Cycle Factor = $10\log(1/\text{Duty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

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.

We tested according to Procedure C.1 in KDB 789033 D02 v02r01.

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.

We tested according to Procedure C.2 in KDB 789033 D02 v02r01.

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.

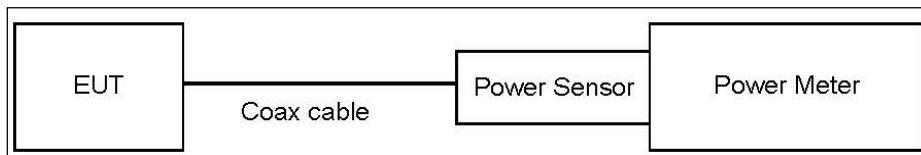
8.3. Output Power Measurement

Limit

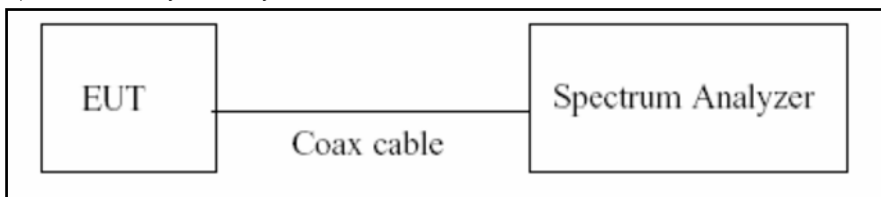
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30 dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30 dBm)

Test Configuration

Power Meter



Spectrum Analyzer(Only Straddle Channel)



Test Procedure(Power Meter)

We tested according to Procedure E.3.a in KDB 789033 D02 v02r01.

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)

The transmitter output is connected to the Spectrum Analyzer.

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

We tested according to Procedure E.2.d) in KDB 789033 D02 v02r01.

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	11.98
UNII 2A	11.98
UNII 2C	11.98
UNII 3	11.98

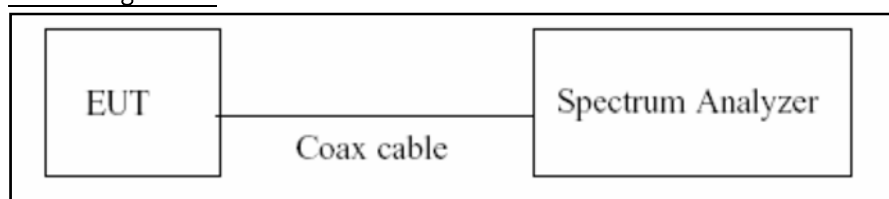
(Actual value of loss for the attenuator and cable combination)

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

We tested according to Procedure F in KDB 789033 D02 v02r01.

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 Type or = RMS(i.e., power averaging), if available. Otherwise, use sample Measurement Type or 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	11.98
UNII 2A	11.98
UNII 2C	11.98
UNII 3	11.98

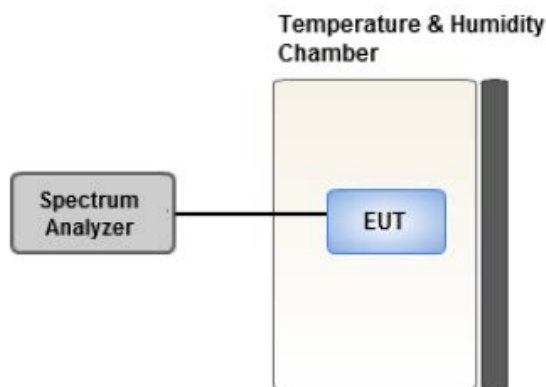
(Actual value of loss for the attenuator and cable combination)

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. Measurement Typeors : Quasi Peak and Average Measurement Typeor.

Sample Calculation

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

8.7. Radiated Test

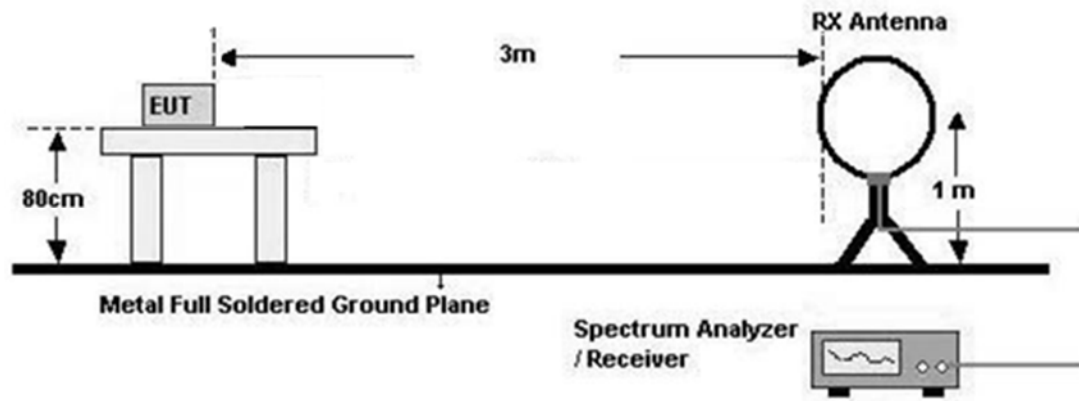
Limit

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.

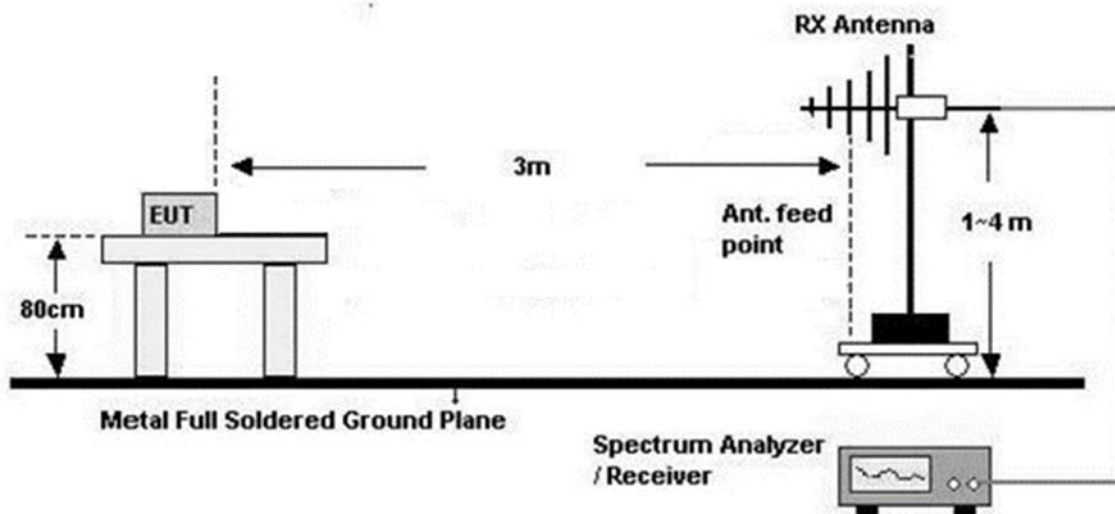
Frequency (MHz)	Field Strength (μ V/m)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

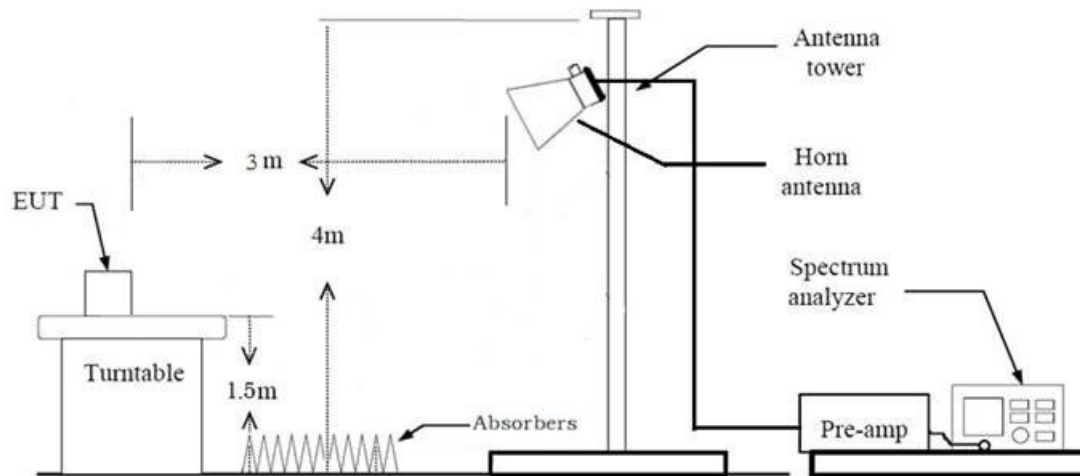
Below 30 MHz



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
 - 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, G.5 in KDB 789033 v02r01):

- 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, G.6.c in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW \geq 3 MHz
- Detector = power averaging (rms), if $\text{span}/(\# \text{ of points in sweep}) \leq \text{RBW}/2$. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, the detector mode shall be set to peak.
- Averaging type = power averaging (rms)
As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
- Sweep time = auto.
- Trace mode = Max Hold.
- Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, the number of traces shall be increased by a factor of $1/x$, where x is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—rather than turning on and off with the transmit cycle, at least 100 traces shall be averaged.)
- If tests are performed with the EUT transmitting at a duty cycle less than 98%, a correction factor shall be added to the measurement results prior to comparing to the emission limit in

order to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

- If power averaging (rms) mode was used in II.G.6.c)(iv), the correction factor is $10 \log (1/x)$, where x is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB must be added to the measured emission levels.

- If linear voltage averaging mode was used in II.G.6.c)(iv), the correction factor is $20 \log (1/x)$, where x is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB must be added to the measured emission levels.

- If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning on and off with the transmit cycle, no duty cycle correction is required for that emission.

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, G.5 in KDB 789033 v02r01):
 - 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, G.5.d in KDB 789033 v02r01):
 - 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)

The actual setting value of VBW

[Ant.1]

Mode	Worst Data rate	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11a	6 Mbps	0.844	0.738	1 000
802.11n(HT20)	MCS0	0.835	0.784	1 000
802.11n(HT40)	MCS0	0.715	1.455	3 000
802.11ac(VHT20)	MCS0	0.835	0.783	1 000
802.11ac(VHT40)	MCS0	0.716	1.448	3 000
802.11ac(VHT80)	MCS0	0.557	2.543	5 000

[Ant.2]

Mode	Worst Data rate	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11a	6 Mbps	0.843	0.744	1 000
802.11n(HT20)	MCS0	0.835	0.783	1 000
802.11n(HT40)	MCS0	0.715	1.455	3 000
802.11ac(VHT20)	MCS0	0.835	0.783	1 000
802.11ac(VHT40)	MCS0	0.715	1.455	3 000
802.11ac(VHT80)	MCS0	0.557	2.538	5 000

8.8. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone
 - Worstcase : Stand alone
2. All configurations of antenna were investigated and the worst case configuration results are reported.
 - Mode : Ant1(SISO), Ant2(SISO), Ant1+Ant2(CDD,SDM)
 - Worstcase : Ant1+Ant2(CDD)
3. EUT Axis
 - Radiated Spurious Emissions : Y
 - 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. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
 - Position : Horizontal, Vertical, Parallel to the ground plane
6. Radiated Spurious Emission
 - All modulation of operation were investigated and the worst case modulation results are reported.
 - Worst-case : 802.11a_6 Mbps

AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone
 - Worstcase : Stand alone

Conducted test

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

Radiated test(Simultaneous transmission Scenario)

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

- Mode : Stand alone
- Worstcase : Stand alone

2. EUT Axis

- Radiated Spurious Emissions : Y

3. All of Simultaneous transmission Scenario were investigated and the worst case configuration results are reported.

Simultaneous transmission Scenario	2.4 GHz WiFi	5 GHz WiFi	BTLE	Test Case
BTLE + 2.4 GHz WiFi	on	-	on	Scenario1
BTLE + 5 GHz WiFi	-	on	on	Scenario2

4. The Simultaneous transmission Scenario mode test investigated both intermodulation and radiated spurious emissions.And the worst results were reported.

- Worst result: Radiated spurious emissions
- Intermodulation: No signals are generated.
- Radiated spurious emissions: cf. Section 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 2	Description	BTLE Emission	5 GHz Emission
2	Antenna	ANT 1	ANT ALL
	Channel	0	144
	Data Rate	1 Mbps	6 Mbps
	Mode	1M_37byte	802.11a

Note : BT LE Simultaneous transmission Data refer to [BT LE] Test Report

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

10. TEST RESULT

10.1 DUTY CYCLE

[Ant.1]

Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6 Mbps	1.360	1.612	0.844	0.738
802.11n(HT20)	MCS0	1.273	1.525	0.835	0.784
802.11n(HT40)	MCS0	0.633	0.884	0.715	1.455
802.11ac(VHT20)	MCS0	1.276	1.528	0.835	0.783
802.11ac(VHT40)	MCS0	0.636	0.887	0.716	1.448
802.11ac(VHT80)	MCS0	0.316	0.568	0.557	2.543

[Ant.2]

Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6 Mbps	1.359	1.613	0.843	0.744
802.11n(HT20)	MCS0	1.272	1.524	0.835	0.783
802.11n(HT40)	MCS0	0.632	0.884	0.715	1.455
802.11ac(VHT20)	MCS0	1.276	1.528	0.835	0.783
802.11ac(VHT40)	MCS0	0.633	0.884	0.715	1.455
802.11ac(VHT80)	MCS0	0.317	0.568	0.557	2.538

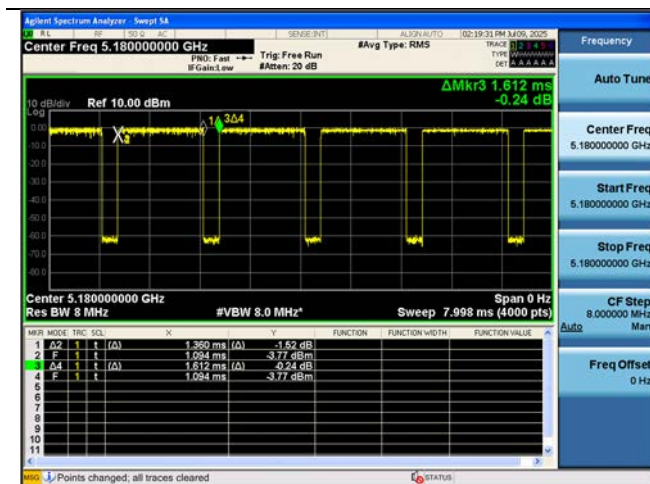
Note:

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

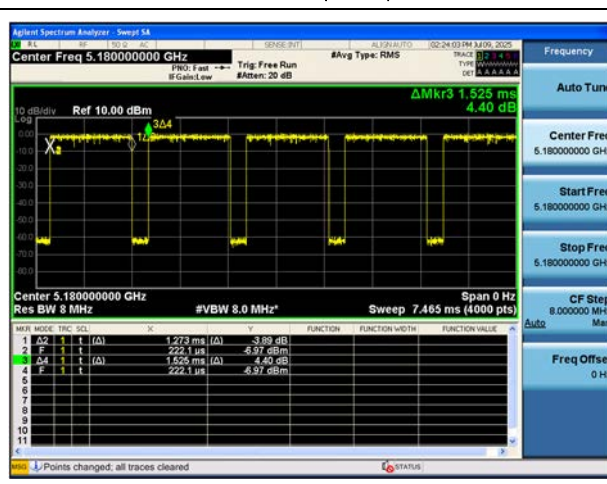
[ANT. 1]

☐ Test Plots

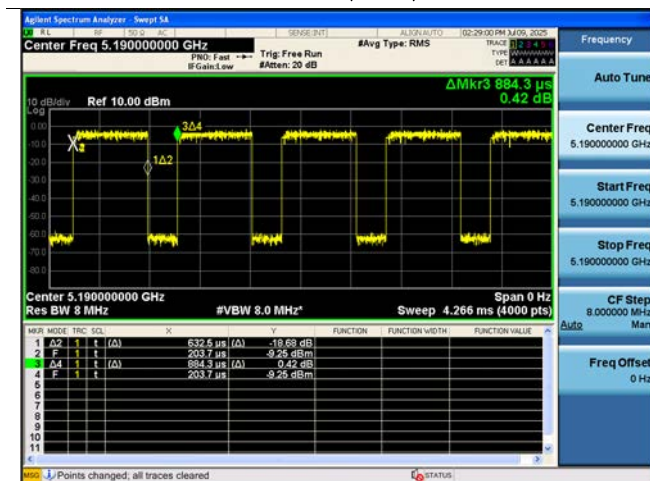
802.11a



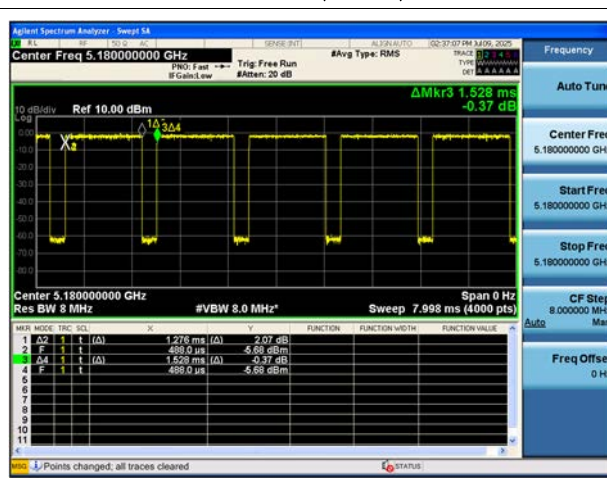
802.11n(HT20)



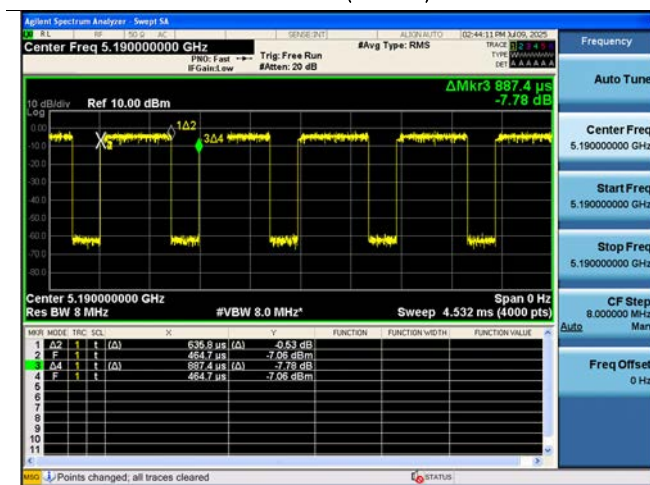
802.11n(HT40)



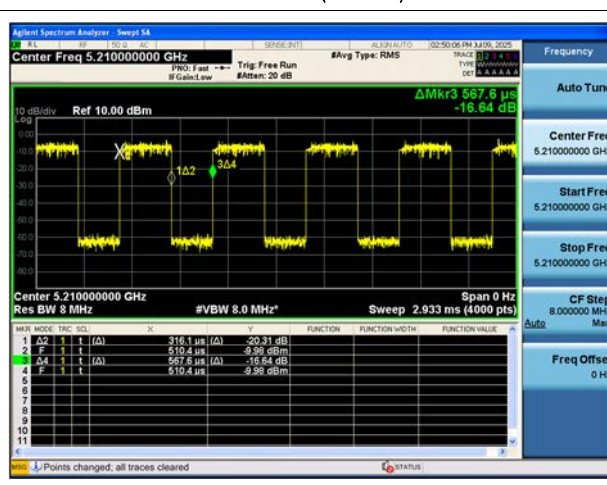
802.11ac(VHT20)



802.11ac(VHT40)



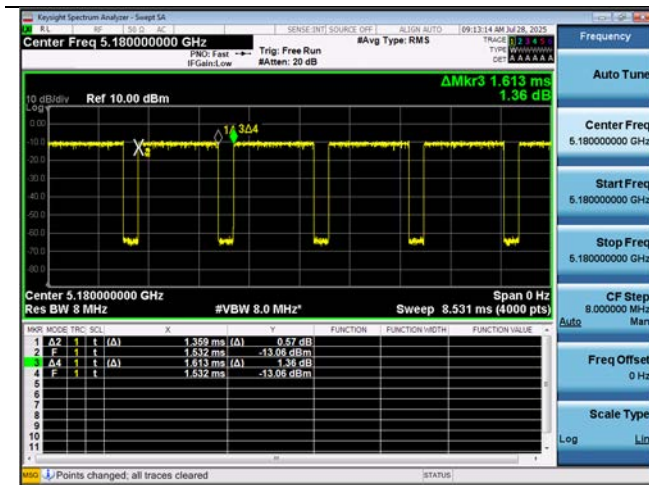
802.11ac(VHT80)



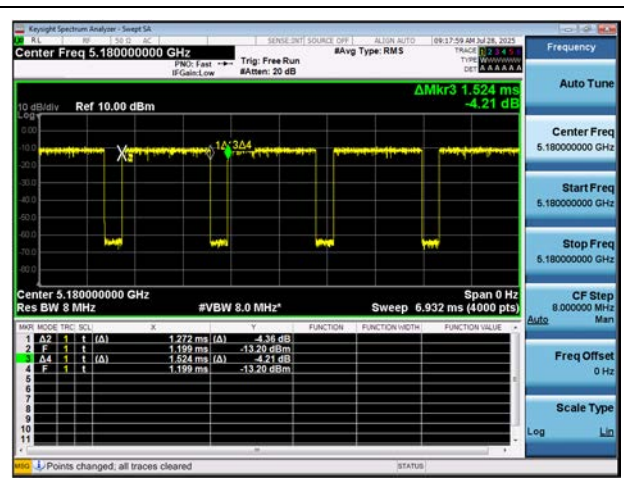
[ANT. 2]

☐ Test Plots

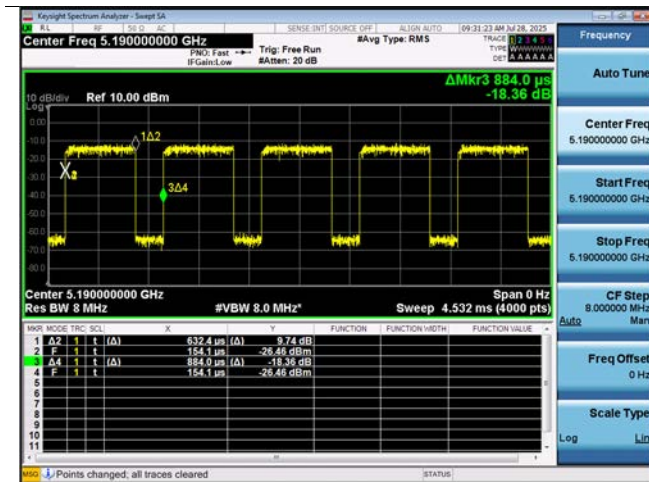
802.11a



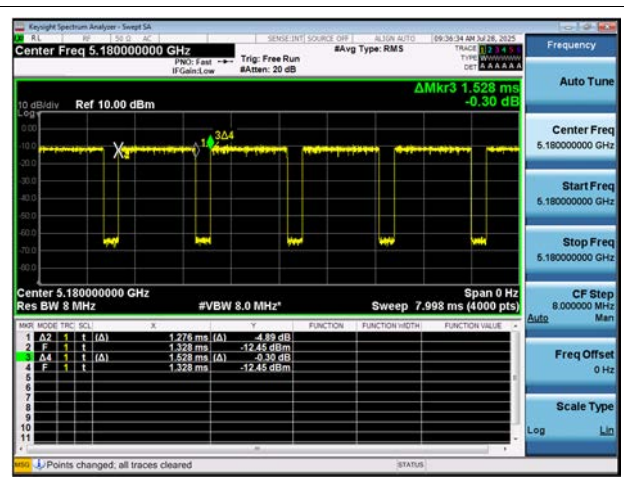
802.11n(HT20)



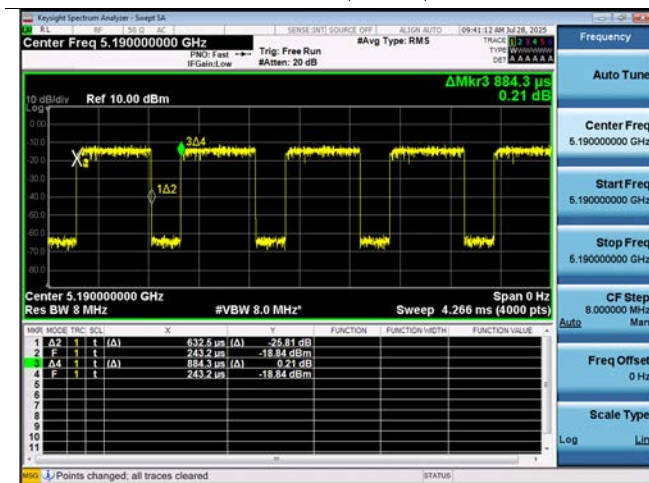
802.11n(HT40)



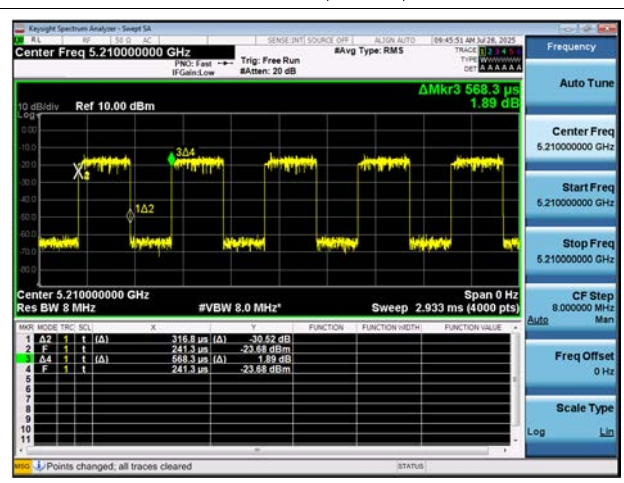
802.11ac(VHT20)



802.11ac(VHT40)



802.11ac(VHT80)



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	18.25	16.270
	5200	40	18.26	16.252
	5240	48	18.19	16.265
UNII2A	5260	52	18.34	16.255
	5300	60	18.24	16.265
	5320	64	18.33	16.260
UNII2C	5500	100	18.22	16.268
	5580	116	18.30	16.258
	5720	144	18.26	16.257
UNII3	5745	149	18.33	16.263
	5785	157	18.23	16.273
	5825	165	18.33	16.261
Mode : 802.11n(HT20)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	19.29	17.448
	5200	40	19.11	17.438
	5240	48	19.21	17.440
UNII2A	5260	52	19.23	17.436
	5300	60	19.19	17.447
	5320	64	19.15	17.428
UNII2C	5500	100	19.19	17.440
	5580	116	19.15	17.439
	5720	144	19.19	17.437
UNII3	5745	149	19.22	17.447
	5785	157	19.16	17.436
	5825	165	19.08	17.447

Mode : 802.11ac(VHT20)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	19.22	17.433
	5200	40	19.31	17.453
	5240	48	19.15	17.436
UNII2A	5260	52	19.28	17.448
	5300	60	19.27	17.441
	5320	64	19.14	17.450
UNII2C	5500	100	19.19	17.437
	5580	116	19.22	17.446
	5720	144	19.21	17.443
UNII3	5745	149	19.09	17.443
	5785	157	19.17	17.441
	5825	165	19.27	17.439

Mode : 802.11n(HT40)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5190	38	38.96	35.881
	5230	46	38.78	35.949
UNII2A	5270	54	38.85	35.877
	5310	62	38.90	35.890
UNII2C	5510	102	39.03	35.825
	5550	110	38.95	35.900
	5710	142	39.04	35.959
UNII3	5755	151	38.99	35.853
	5795	159	38.89	35.891

Mode : 802.11ac(VHT40)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5190	38	38.99	35.907
	5230	46	38.71	35.922
UNII2A	5270	54	38.93	35.907
	5310	62	38.88	35.899
UNII2C	5510	102	38.81	35.877
	5550	110	38.77	35.883
	5710	142	38.84	35.908
UNII3	5755	151	38.94	35.905
	5795	159	38.82	35.900

Mode : 802.11ac(VHT80)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5210	42	80.86	74.664
UNII2A	5290	58	81.30	74.977
UNII2C	5530	106	80.87	74.967
	5610	122	81.03	74.645
	5690	138	81.27	75.027
UNII3	5775	155	81.13	74.928

[Ant.2]

Mode : 802.11a				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	18.27	16.266
	5200	40	18.28	16.268
	5240	48	18.32	16.267
UNII2A	5260	52	18.32	16.267
	5300	60	18.28	16.269
	5320	64	18.30	16.273
UNII2C	5500	100	18.28	16.272
	5580	116	18.31	16.277
	5720	144	18.27	16.275
UNII3	5745	149	18.50	16.284
	5785	157	18.31	16.260
	5825	165	18.21	16.271

Mode : 802.11n(HT20)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	19.09	17.449
	5200	40	19.23	17.439
	5240	48	19.24	17.452
UNII2A	5260	52	19.18	17.434
	5300	60	19.31	17.452
	5320	64	19.15	17.448
UNII2C	5500	100	19.13	17.453
	5580	116	19.22	17.446
	5720	144	19.14	17.461
UNII3	5745	149	19.27	17.446
	5785	157	19.17	17.442
	5825	165	19.24	17.455

Mode : 802.11ac(VHT20)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5180	36	19.27	17.452
	5200	40	19.21	17.453
	5240	48	19.14	17.443
UNII2A	5260	52	19.19	17.454
	5300	60	19.36	17.450
	5320	64	19.21	17.462
UNII2C	5500	100	19.23	17.441
	5580	116	19.34	17.452
	5720	144	19.11	17.455
UNII3	5745	149	19.23	17.467
	5785	157	19.24	17.453
	5825	165	19.17	17.448

Mode : 802.11n(HT40)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5190	38	38.84	35.864
	5230	46	39.06	35.950
UNII2A	5270	54	38.98	35.905
	5310	62	38.90	35.923
UNII2C	5510	102	38.99	35.857
	5550	110	38.92	35.912
	5710	142	38.91	35.864
UNII3	5755	151	38.92	35.932
	5795	159	38.73	35.854

Mode : 802.11ac(VHT40)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5190	38	38.82	35.908
	5230	46	39.00	35.920
UNII2A	5270	54	38.90	35.924
	5310	62	38.76	35.924
UNII2C	5510	102	38.80	35.906
	5550	110	38.95	35.907
	5710	142	38.94	35.902
UNII3	5755	151	38.97	35.958
	5795	159	38.69	35.918

Mode : 802.11ac(VHT80)				
BAND	Freq. [MHz]	CH.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
UNII1	5210	42	81.15	74.948
UNII2A	5290	58	80.58	74.905
UNII2C	5530	106	80.61	74.682
	5610	122	81.08	74.839
	5690	138	81.20	74.999
UNII3	5775	155	80.94	74.830

[ANT. 1]

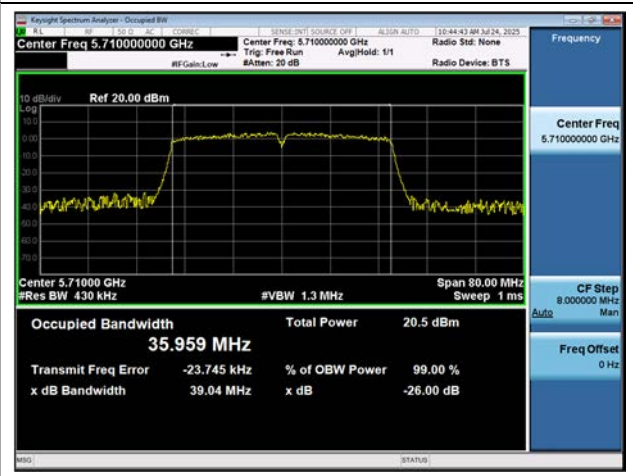
☐ Test Plots

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

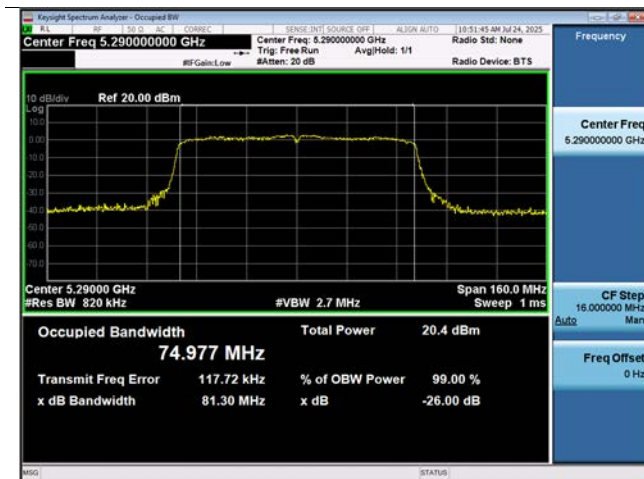
Bandwidth 20M, 802.11ac(VHT20) Ch.40



Bandwidth 40M, 802.11n(HT40) Ch.142



Bandwidth 80M, 802.11ac(VHT80) Ch.58

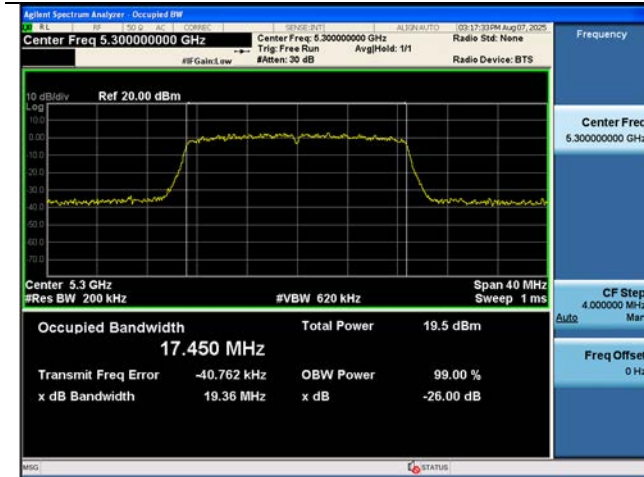


[ANT. 2]

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.60



Bandwidth 40M, 802.11n(HT40) Ch.46



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



10.3 6 dB BANDWIDTH

[Ant.1]

Mode : 802.11a				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	15.55	> 0.5
	5785	157	15.71	> 0.5
	5825	165	15.33	> 0.5
Mode : 802.11n(HT20)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	15.38	> 0.5
	5785	157	15.22	> 0.5
	5825	165	16.03	> 0.5
Mode : 802.11ac(VHT20)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	15.24	> 0.5
	5785	157	15.20	> 0.5
	5825	165	15.18	> 0.5
Mode : 802.11n(HT40)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5755	151	35.18	> 0.5
	5795	159	35.20	> 0.5
Mode : 802.11ac(VHT40)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5755	151	35.20	> 0.5
	5795	159	35.21	> 0.5
Mode : 802.11ac(VHT80)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5775	155	73.87	> 0.5

[Ant.2]

Mode : 802.11a				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	15.60	> 0.5
	5785	157	15.62	> 0.5
	5825	165	15.57	> 0.5
Mode : 802.11n(HT20)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	15.32	> 0.5
	5785	157	15.20	> 0.5
	5825	165	16.96	> 0.5
Mode : 802.11ac(VHT20)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5745	149	16.53	> 0.5
	5785	157	15.14	> 0.5
	5825	165	16.92	> 0.5
Mode : 802.11n(HT40)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5755	151	35.22	> 0.5
	5795	159	35.09	> 0.5
Mode : 802.11ac(VHT40)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5755	151	35.21	> 0.5
	5795	159	35.21	> 0.5
Mode : 802.11ac(VHT80)				
BAND	Freq. [MHz]	CH.	6 dB Bandwidth [MHz]	Limit [MHz]
UNII3	5775	155	75.13	> 0.5

[ANT. 1]

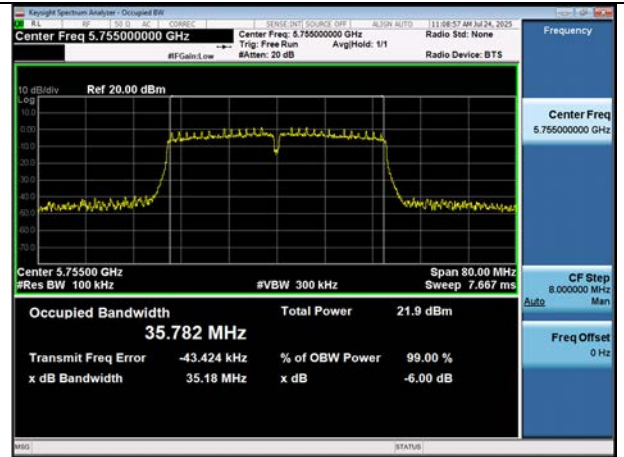
▣ Test Plots

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

Bandwidth 20M, 802.11ac(VHT20) Ch.165



Bandwidth 40M, 802.11n(HT40) 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.

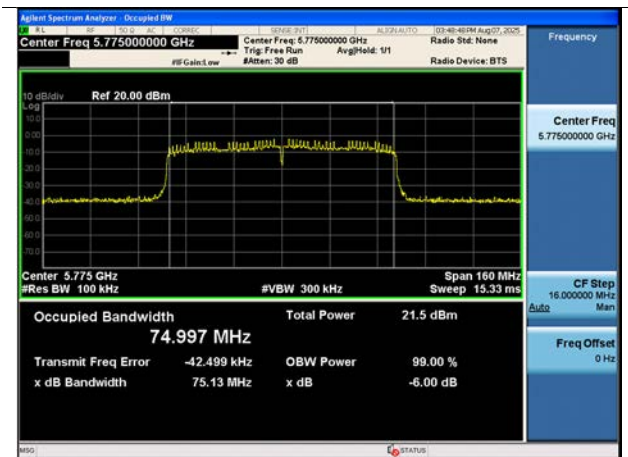
Bandwidth 20M, 802.11ac(VHT20) Ch.157



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



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 $11 \text{ dBm} + 10 \log B$, (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	12.67	12.80	15.74	23.98
5200	40	6M	a	12.79	12.46	15.64	23.98
5240	48	6M	a	13.53	12.37	16.00	23.98
5260	52	6M	a	13.51	13.06	16.30	23.63
5300	60	6M	a	13.21	13.08	16.16	23.61
5320	64	6M	a	13.62	13.58	16.61	23.63
5500	100	6M	a	13.97	14.61	17.31	23.61
5580	116	6M	a	13.73	14.75	17.28	23.62
5720	144	6M	a	13.51	14.18	16.87	23.62
5745	149	6M	a	14.20	13.66	16.95	30.00
5785	157	6M	a	14.03	14.24	17.15	30.00
5825	165	6M	a	13.95	13.44	16.72	30.00

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5180	36	MCS0	n20	12.60	12.47	15.54	23.98
5200	40	MCS0	n20	12.56	12.43	15.51	23.98
5240	48	MCS0	n20	13.30	12.31	15.84	23.98
5260	52	MCS0	n20	13.42	12.75	16.11	23.83
5300	60	MCS0	n20	13.19	12.96	16.09	23.83
5320	64	MCS0	n20	13.27	13.35	16.32	23.82
5500	100	MCS0	n20	14.26	14.31	17.30	23.82
5580	116	MCS0	n20	13.41	14.19	16.83	23.82
5720	144	MCS0	n20	13.29	13.94	16.63	23.82
5745	149	MCS0	n20	14.56	13.51	17.08	30.00
5785	157	MCS0	n20	13.92	14.03	16.98	30.00
5825	165	MCS0	n20	13.92	13.38	16.67	30.00

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5180	36	MCS0	ac20	12.62	12.48	15.56	23.98
5200	40	MCS0	ac20	12.69	12.48	15.60	23.98
5240	48	MCS0	ac20	13.09	12.32	15.73	23.98
5260	52	MCS0	ac20	13.06	12.73	15.91	23.83
5300	60	MCS0	ac20	12.90	12.93	15.92	23.85
5320	64	MCS0	ac20	13.16	13.42	16.31	23.82
5500	100	MCS0	ac20	13.98	14.33	17.17	23.83
5580	116	MCS0	ac20	14.42	14.25	17.35	23.84
5720	144	MCS0	ac20	14.08	13.84	16.97	23.81
5745	149	MCS0	ac20	14.51	13.46	17.03	30.00
5785	157	MCS0	ac20	14.13	13.86	17.00	30.00
5825	165	MCS0	ac20	13.90	13.28	16.61	30.00

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5190	38	MCS0	n40	13.28	11.91	15.66	23.98
5230	46	MCS0	n40	13.62	12.76	16.22	23.98
5270	54	MCS0	n40	13.95	12.65	16.36	23.98
5310	62	MCS0	n40	13.48	13.12	16.32	23.98
5510	102	MCS0	n40	12.17	12.49	15.34	23.98
5550	110	MCS0	n40	14.06	13.89	16.99	23.98
5710	142	MCS0	n40	14.06	13.70	16.90	23.98
5755	151	MCS0	n40	14.45	13.50	17.02	30.00
5795	159	MCS0	n40	14.59	13.97	17.30	30.00

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5190	38	MCS0	ac40	13.25	12.13	15.74	23.98
5230	46	MCS0	ac40	13.61	12.55	16.12	23.98
5270	54	MCS0	ac40	13.87	12.69	16.33	23.98
5310	62	MCS0	ac40	13.46	13.18	16.33	23.98
5510	102	MCS0	ac40	13.68	14.26	16.99	23.98
5550	110	MCS0	ac40	14.11	14.10	17.12	23.98
5710	142	MCS0	ac40	14.05	13.93	17.00	23.98
5755	151	MCS0	ac40	14.45	13.75	17.12	30.00
5795	159	MCS0	ac40	14.58	14.37	17.48	30.00

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Average Power [dBm]			Limit [dBm]
				ANT1	ANT2	MIMO	
5210	42	MCS0	ac80	13.55	12.60	16.11	23.98
5290	58	MCS0	ac80	13.33	12.38	15.89	23.98
5530	106	MCS0	ac80	13.46	13.84	16.67	23.98
5610	122	MCS0	ac80	13.65	13.49	16.58	23.98
5690	138	MCS0	ac80	13.79	13.05	16.45	23.98
5775	155	MCS0	ac80	14.36	13.84	17.12	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	2.072	1.991	5.042	11.00
5200	40	6M	a	2.063	2.054	5.069	11.00
5240	48	6M	a	2.277	1.799	5.055	11.00
5260	52	6M	a	3.004	2.222	5.641	11.00
5300	60	6M	a	2.436	2.404	5.430	11.00
5320	64	6M	a	2.921	2.973	5.957	11.00
5500	100	6M	a	3.306	3.275	6.301	11.00
5580	116	6M	a	3.530	3.240	6.398	11.00
5720	144	6M	a	3.285	2.856	6.086	11.00
5745	149	6M	a	1.695	0.045	3.958	30 dBm/500kHz
5785	157	6M	a	1.679	0.594	4.181	30 dBm/500kHz
5825	165	6M	a	0.866	-0.277	3.342	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	1.745	2.016	4.893	11.00
5200	40	MCS0	n20	1.863	1.928	4.906	11.00
5240	48	MCS0	n20	2.067	1.579	4.840	11.00
5260	52	MCS0	n20	2.772	2.201	5.506	11.00
5300	60	MCS0	n20	2.216	2.223	5.230	11.00
5320	64	MCS0	n20	2.439	2.587	5.524	11.00
5500	100	MCS0	n20	3.008	2.947	5.988	11.00
5580	116	MCS0	n20	3.148	2.883	6.028	11.00
5720	144	MCS0	n20	2.971	2.444	5.726	11.00
5745	149	MCS0	n20	1.482	-0.251	3.712	30 dBm/500kHz
5785	157	MCS0	n20	1.269	0.268	3.808	30 dBm/500kHz
5825	165	MCS0	n20	0.696	-0.887	2.987	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	1.764	1.917	4.851	11.00
5200	40	MCS0	ac20	1.706	1.751	4.739	11.00
5240	48	MCS0	ac20	1.884	1.606	4.757	11.00
5260	52	MCS0	ac20	2.803	2.214	5.529	11.00
5300	60	MCS0	ac20	2.273	2.074	5.185	11.00
5320	64	MCS0	ac20	2.430	2.548	5.499	11.00
5500	100	MCS0	ac20	2.876	2.885	5.891	11.00
5580	116	MCS0	ac20	3.154	2.786	5.984	11.00
5720	144	MCS0	ac20	2.991	2.534	5.779	11.00
5745	149	MCS0	ac20	1.535	-0.385	3.690	30 dBm/500kHz
5785	157	MCS0	ac20	1.428	0.454	3.978	30 dBm/500kHz
5825	165	MCS0	ac20	0.624	-0.812	2.975	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	-0.886	-1.757	1.710	11.00
5230	46	MCS0	n40	0.042	-1.096	2.520	11.00
5270	54	MCS0	n40	0.199	-1.143	2.590	11.00
5310	62	MCS0	n40	-0.164	-0.687	2.592	11.00
5510	102	MCS0	n40	-1.671	-1.934	1.210	11.00
5550	110	MCS0	n40	0.318	-0.207	3.074	11.00
5710	142	MCS0	n40	0.059	-0.515	2.792	11.00
5755	151	MCS0	n40	-2.225	-3.377	0.247	30 dBm/500kHz
5795	159	MCS0	n40	-1.910	-3.077	0.556	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	0.921	-1.814	2.776	11.00
5230	46	MCS0	ac40	-0.393	-1.014	2.318	11.00
5270	54	MCS0	ac40	0.091	-1.040	2.573	11.00
5310	62	MCS0	ac40	-0.355	-0.716	2.479	11.00
5510	102	MCS0	ac40	-1.651	-0.249	2.117	11.00
5550	110	MCS0	ac40	0.064	0.063	3.074	11.00
5710	142	MCS0	ac40	0.315	-0.419	2.974	11.00
5755	151	MCS0	ac40	-2.101	-3.580	0.232	30 dBm/500kHz
5795	159	MCS0	ac40	-1.873	-3.064	0.582	30 dBm/500kHz

Freq. [MHz]	CH.	Datarate	Mode (802.11)	Total Power Spectral Density [dBm/MHz]			Limit [dBm/MHz]
				ANT1	ANT2	MIMO	
5210	42	MCS0	ac80	-3.354	-4.779	-0.998	11.00
5290	58	MCS0	ac80	-3.421	-4.466	-0.902	11.00
5530	106	MCS0	ac80	-3.272	-3.241	-0.246	11.00
5610	122	MCS0	ac80	-3.632	-3.402	-0.505	11.00
5690	138	MCS0	ac80	-3.581	-3.898	-0.726	11.00
5775	155	MCS0	ac80	-5.406	-5.854	-2.614	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.

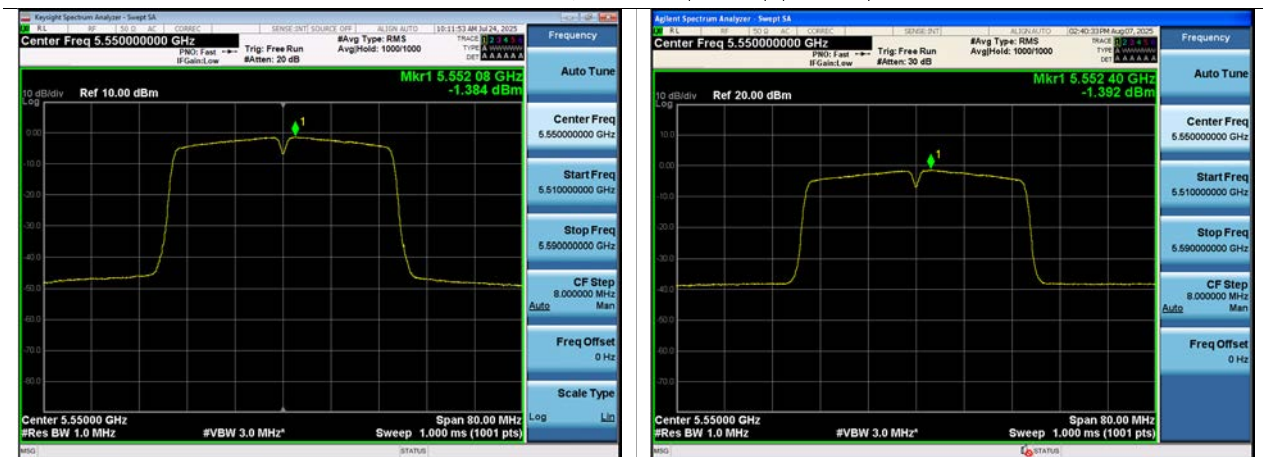
ANT. 1

ANT. 2

Bandwidth 20M, 802.11a(Ch. 116)



Bandwidth 40M, 802.11ac(VHT40) (Ch. 110)



Bandwidth 80M, 802.11ac(VHT80) (Ch. 106)



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 80 MHz BW

REFERENCE VOLTAGE: 3.300 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 %	3.300	+20(Ref)	5 210 060.91	60.91	5 290 061.54	61.54	5 530 084.87	84.87
100 %		-30	5 210 053.14	53.14	5 290 008.00	8.00	5 530 076.05	76.05
100 %		-20	5 210 090.19	90.19	5 290 063.27	63.27	5 530 061.56	61.56
100 %		-10	5 210 006.91	6.91	5 290 083.34	83.34	5 530 010.96	10.96
100 %		0	5 210 050.45	50.45	5 290 082.05	82.05	5 530 077.10	77.10
100 %		+10	5 210 061.00	61.00	5 290 002.04	2.04	5 530 054.44	54.44
100 %		+30	5 210 092.01	92.01	5 290 060.11	60.11	5 530 021.63	21.63
100 %		+40	5 210 066.53	66.53	5 290 058.35	58.35	5 530 014.83	14.83
100 %		+50	5 210 052.94	52.94	5 290 002.45	2.45	5 530 075.90	75.90
High	3.600	+20	5 210 072.73	72.73	5 290 031.72	31.72	5 530 099.52	99.52
Low	3.135	+20	5 210 051.90	51.90	5 290 035.19	35.19	5 530 002.13	2.13

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 %	3.300	+20(Ref)	5 775 062.81	62.81
100 %		-30	5 775 031.44	31.44
100 %		-20	5 775 051.57	51.57
100 %		-10	5 775 024.25	24.25
100 %		0	5 775 049.17	49.17
100 %		+10	5 775 074.01	74.01
100 %		+30	5 775 095.14	95.14
100 %		+40	5 775 062.07	62.07
100 %		+50	5 775 090.07	90.07
High	3.600	+20	5 775 038.05	38.05
Low	3.135	+20	5 775 072.68	72.68

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 %	3.300	+20(Ref)	5 210 097.67	97.67	5 290 003.68	3.68	5 530 011.68	11.68
100 %		-30	5 210 060.86	60.86	5 290 011.78	11.78	5 530 086.98	86.98
100 %		-20	5 210 008.85	8.85	5 290 017.94	17.94	5 530 043.28	43.28
100 %		-10	5 210 062.79	62.79	5 290 016.46	16.46	5 530 056.55	56.55
100 %		0	5 210 096.31	96.31	5 290 019.79	19.79	5 530 013.07	13.07
100 %		+10	5 210 063.50	63.50	5 290 039.96	39.96	5 530 016.55	16.55
100 %		+30	5 210 055.38	55.38	5 290 029.00	29.00	5 530 001.87	1.87
100 %		+40	5 210 041.96	41.96	5 290 015.27	15.27	5 530 093.36	93.36
100 %		+50	5 210 084.63	84.63	5 290 052.92	52.92	5 530 090.51	90.51
High	3.600	+20	5 210 083.44	83.44	5 290 056.73	56.73	5 530 001.17	1.17
Low	3.135	+20	5 210 041.88	41.88	5 290 078.88	78.88	5 530 009.09	9.09

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 %	3.300	+20(Ref)	5 775 089.62	89.62
100 %		-30	5 775 096.34	96.34
100 %		-20	5 775 091.40	91.40
100 %		-10	5 775 081.91	81.91
100 %		0	5 775 013.96	13.96
100 %		+10	5 775 092.92	92.92
100 %		+30	5 775 079.02	79.02
100 %		+40	5 775 094.80	94.80
100 %		+50	5 775 038.59	38.59
High	3.600	+20	5 775 068.78	68.78
Low	3.135	+20	5 775 075.06	75.06

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 %	3.300	+20(Ref)	5 210 064.01	64.01	5 290 077.18	77.18	5 530 044.21	44.21
100 %		-30	5 210 024.84	24.84	5 290 029.21	29.21	5 530 096.53	96.53
100 %		-20	5 210 075.21	75.21	5 290 014.97	14.97	5 530 083.91	83.91
100 %		-10	5 210 049.80	49.80	5 290 021.84	21.84	5 530 046.39	46.39
100 %		0	5 210 084.98	84.98	5 290 055.05	55.05	5 530 077.73	77.73
100 %		+10	5 210 021.92	21.92	5 290 022.89	22.89	5 530 010.00	10.00
100 %		+30	5 210 047.27	47.27	5 290 092.76	92.76	5 530 094.92	94.92
100 %		+40	5 210 097.98	97.98	5 290 073.17	73.17	5 530 002.21	2.21
100 %		+50	5 210 007.21	7.21	5 290 040.06	40.06	5 530 090.52	90.52
High	3.600	+20	5 210 003.90	3.90	5 290 066.90	66.90	5 530 052.22	52.22
Low	3.135	+20	5 210 017.90	17.90	5 290 080.73	80.73	5 530 024.34	24.34

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 %	3.300	+20(Ref)	5 775 064.41	64.41
100 %		-30	5 775 080.28	80.28
100 %		-20	5 775 058.83	58.83
100 %		-10	5 775 096.98	96.98
100 %		0	5 775 098.45	98.45
100 %		+10	5 775 002.68	2.68
100 %		+30	5 775 025.15	25.15
100 %		+40	5 775 026.97	26.97
100 %		+50	5 775 015.25	15.25
High	3.600	+20	5 775 077.83	77.83
Low	3.135	+20	5 775 030.90	30.90

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 %	3.300	+20(Ref)	5 210 018.48	18.48	5 290 002.08	2.08	5 530 025.87	25.87
100 %		-30	5 210 060.31	60.31	5 290 065.44	65.44	5 530 066.80	66.80
100 %		-20	5 210 092.38	92.38	5 290 078.34	78.34	5 530 031.05	31.05
100 %		-10	5 210 050.91	50.91	5 290 003.99	3.99	5 530 072.53	72.53
100 %		0	5 210 070.54	70.54	5 290 093.56	93.56	5 530 006.79	6.79
100 %		+10	5 210 028.59	28.59	5 290 067.68	67.68	5 530 003.38	3.38
100 %		+30	5 210 030.34	30.34	5 290 031.09	31.09	5 530 045.60	45.60
100 %		+40	5 210 079.28	79.28	5 290 055.26	55.26	5 530 033.59	33.59
100 %		+50	5 210 070.62	70.62	5 290 027.61	27.61	5 530 003.49	3.49
High	3.600	+20	5 210 092.14	92.14	5 290 025.95	25.95	5 530 053.14	53.14
Low	3.135	+20	5 210 086.29	86.29	5 290 053.91	53.91	5 530 052.63	52.63

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 %	3.300	+20(Ref)	5 775 029.93	29.93
100 %		-30	5 775 049.13	49.13
100 %		-20	5 775 056.69	56.69
100 %		-10	5 775 023.15	23.15
100 %		0	5 775 084.06	84.06
100 %		+10	5 775 084.11	84.11
100 %		+30	5 775 020.19	20.19
100 %		+40	5 775 045.57	45.57
100 %		+50	5 775 023.70	23.70
High	3.600	+20	5 775 009.48	9.48
Low	3.135	+20	5 775 047.14	47.14

10.7 STRADDLE CHANNEL

Test Description	Note
26 dB Bandwidth	<ol style="list-style-type: none"> [UNII 2C] 26 dB Bandwidth = 5725 MHz - Measured Frequency[MHz] [UNII 3] 26 dB Bandwidth = Measured Frequency[MHz] - 5725 MHz
6 dB Bandwidth	<ol style="list-style-type: none"> 6 dB Bandwidth = Measured Frequency[MHz] - 5725 MHz Limit : > 0.5 MHz
Output Power	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	14.12	-	13.27	22.50	3.684	11
802.11n(HT20)				14.64	-	13.13	22.66	3.445	11
802.11ac(VHT20)				14.68	-	13.07	22.67	3.334	11
802.11a	UNII3	5720	144	4.20	2.72	6.06	30.00	-0.708	30 dBm/500kHz
802.11n(HT20)				4.60	2.76	6.41	30.00	-1.318	30 dBm/500kHz
802.11ac(VHT20)				4.60	2.56	6.42	30.00	-1.064	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	34.60	-	13.71	23.98	0.554	11
802.11ac(VHT40)				34.60	-	13.69	23.98	0.032	11
802.11n(HT40)	UNII3	5710	142	4.52	2.60	1.97	30.00	-5.696	30 dBm/500kHz
802.11ac(VHT40)				4.60	2.60	1.82	30.00	-5.195	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	75.32	-	13.90	23.98	-2.951	11
802.11ac(VHT80)	UNII3	5690	138	5.64	2.60	-2.83	30.00	-9.523	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	14.20	-	12.79	22.52	3.010	11
802.11n(HT20)				14.68	-	12.64	22.67	2.811	11
802.11ac(VHT20)				14.72	-	12.68	22.68	2.769	11
802.11a	UNII3	5720	144	4.12	2.56	5.43	30.00	-1.626	30 dBm/500kHz
802.11n(HT20)				4.60	2.76	5.77	30.00	-1.882	30 dBm/500kHz
802.11ac(VHT20)				4.56	2.56	5.77	30.00	-1.683	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	34.60	-	13.23	23.98	-0.174	11
802.11ac(VHT40)				34.44	-	13.22	23.98	0.308	11
802.11n(HT40)	UNII3	5710	142	4.44	2.60	1.13	30.00	-5.764	30 dBm/500kHz
802.11ac(VHT40)				4.60	2.60	1.15	30.00	-5.838	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	75.80	-	12.98	23.98	-3.513	11
802.11ac(VHT80)	UNII3	5690	138	5.80	2.60	-4.09	30.00	-10.617	30 dBm/500kHz

□ Test Plots (26 dB Bandwidth)
[ANT. 1]

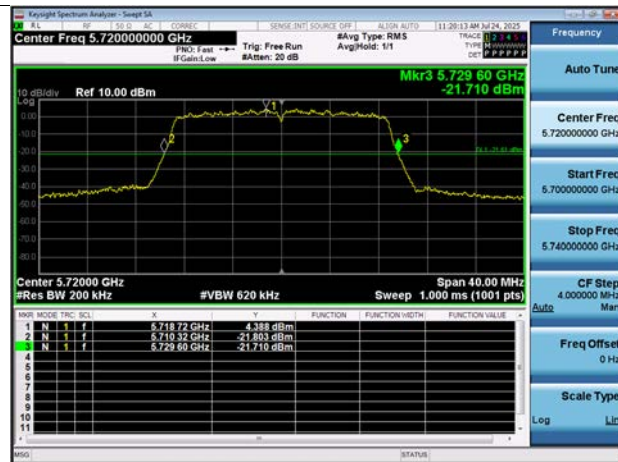
802.11a UNII Band



802.11n(HT20) UNII Band



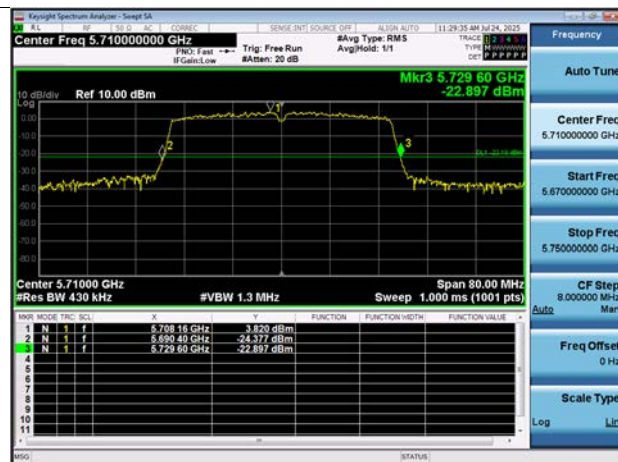
802.11ac(VHT20) UNII Band



802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band



802.11ac(VHT80) UNII Band

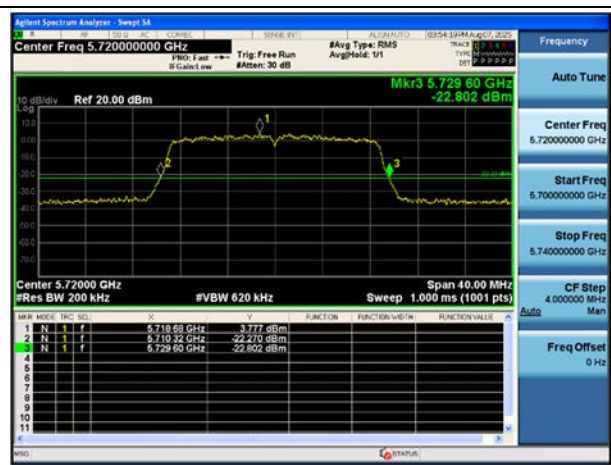


[ANT. 2]

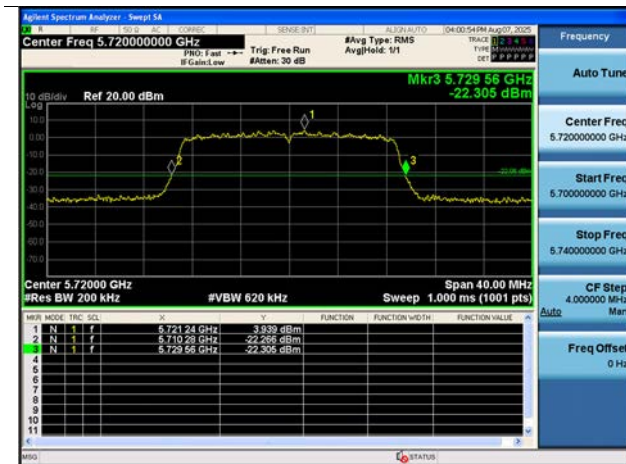
802.11a UNII Band



802.11n(HT20) UNII Band



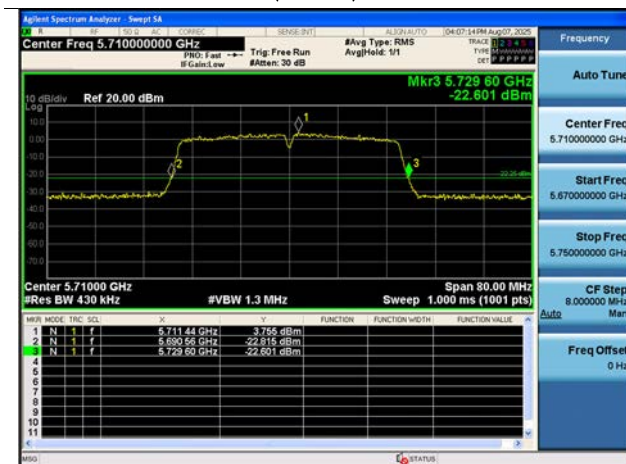
802.11ac(VHT20) UNII Band



802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band

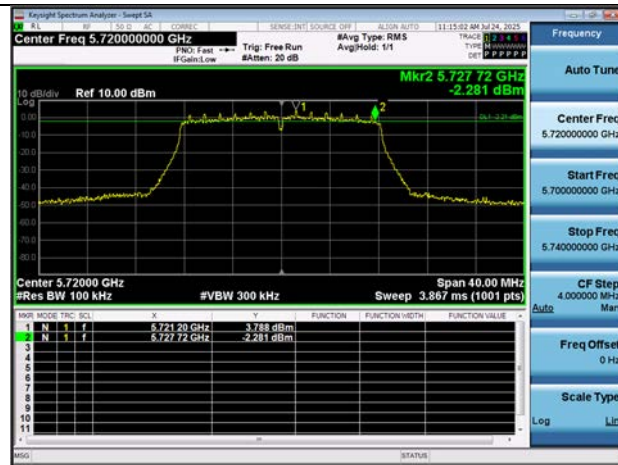


802.11ac(VHT80) UNII Band

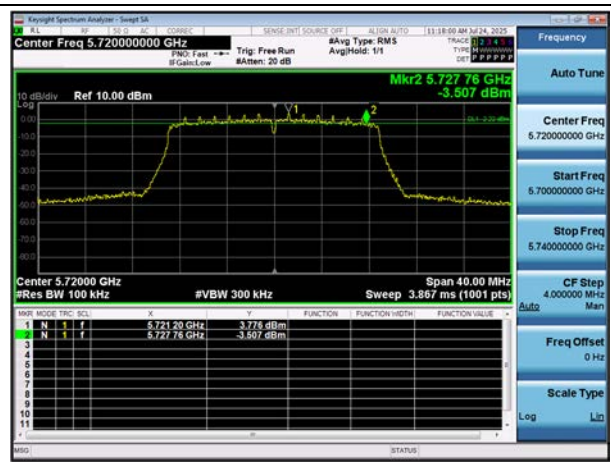


Test Plots(UNII 3 Band 6 dB Bandwidth)
[ANT. 1]

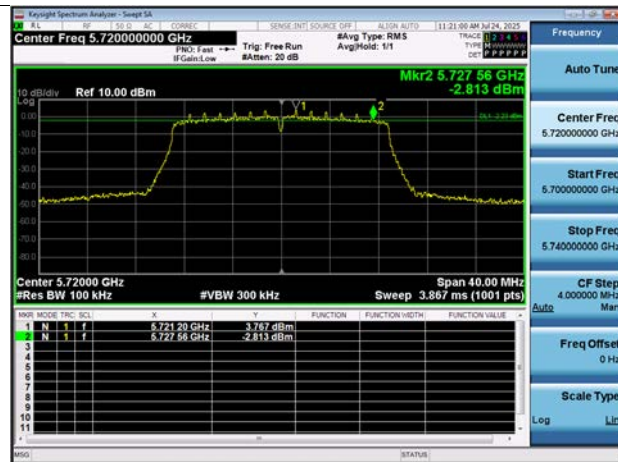
802.11a UNII Band



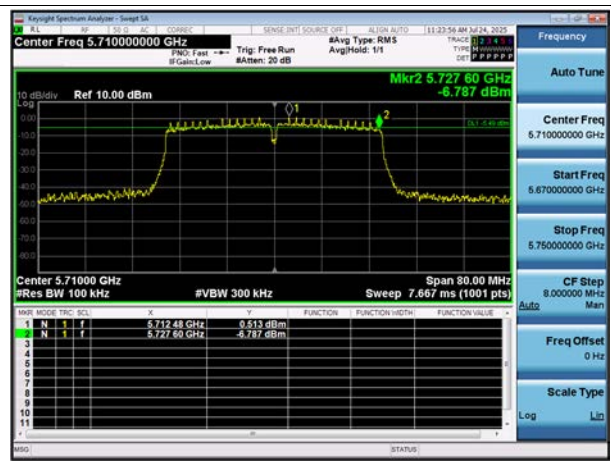
802.11n(HT20) UNII Band



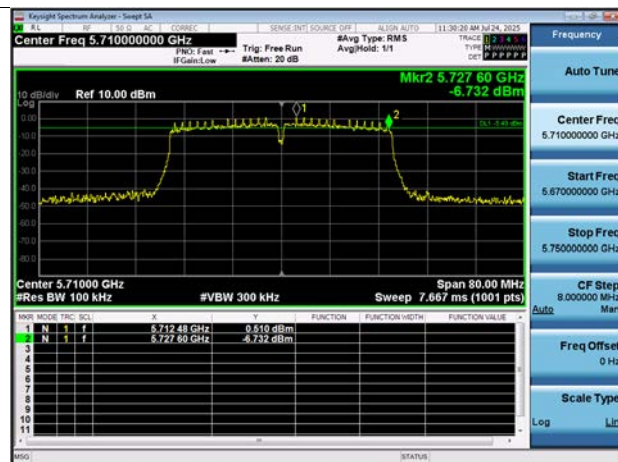
802.11ac(VHT20) UNII Band



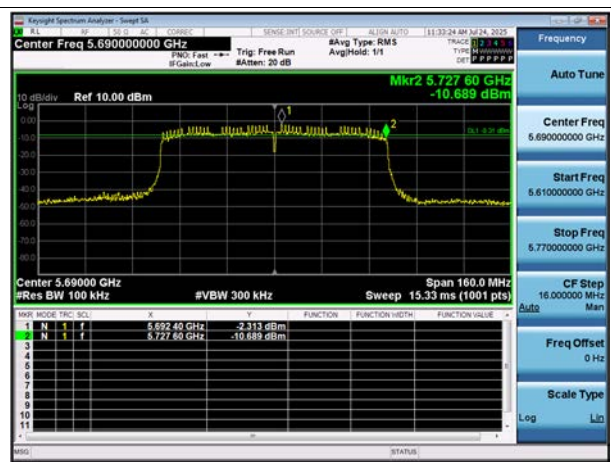
802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band

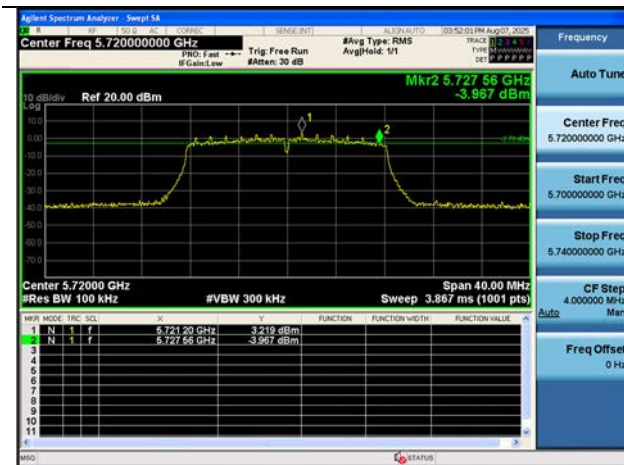


802.11ac(VHT80) UNII Band

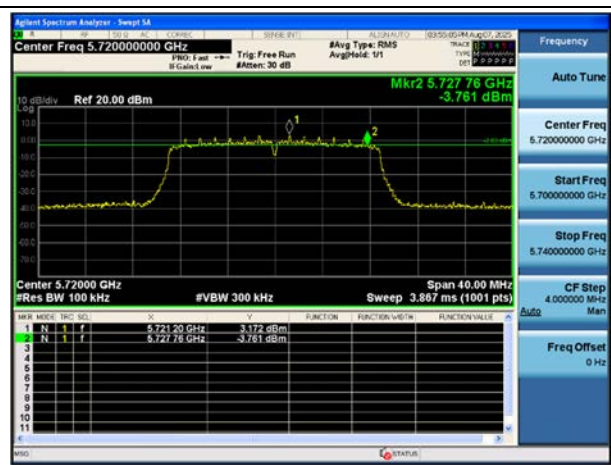


[ANT. 2]

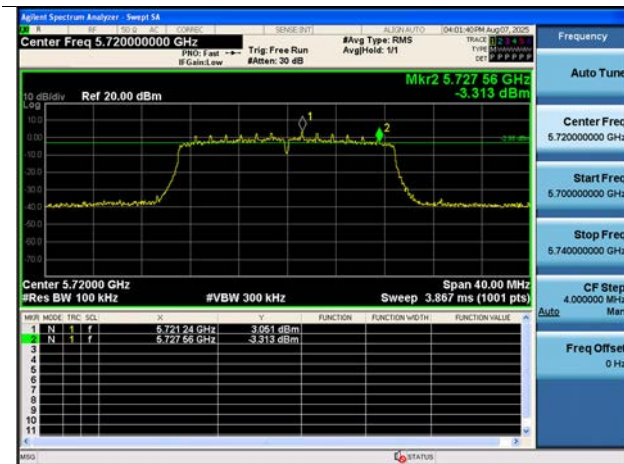
802.11a UNII Band



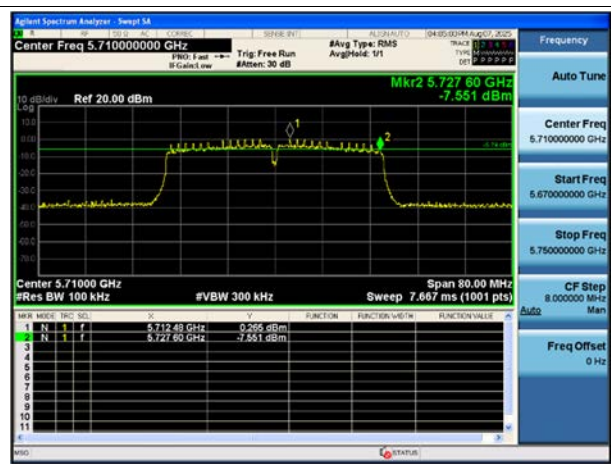
802.11n(HT20) UNII Band



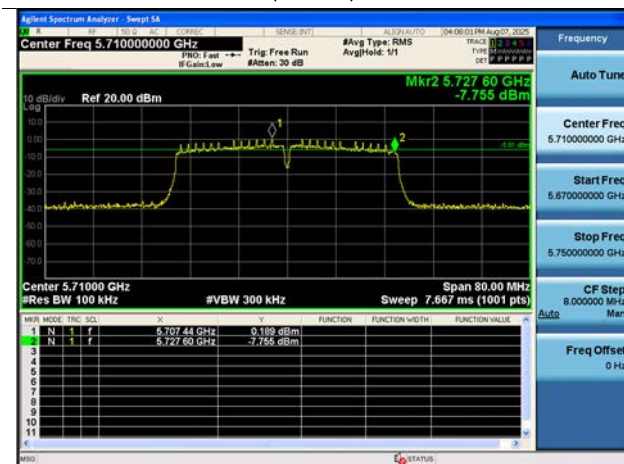
802.11ac(VHT20) UNII Band



802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band

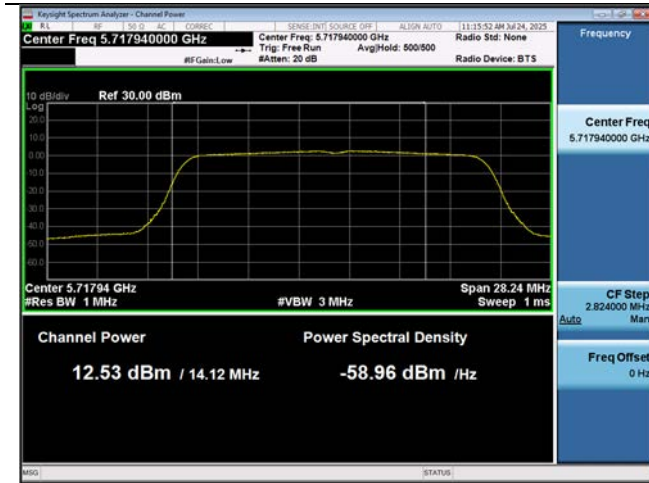


802.11ac(VHT80) UNII Band

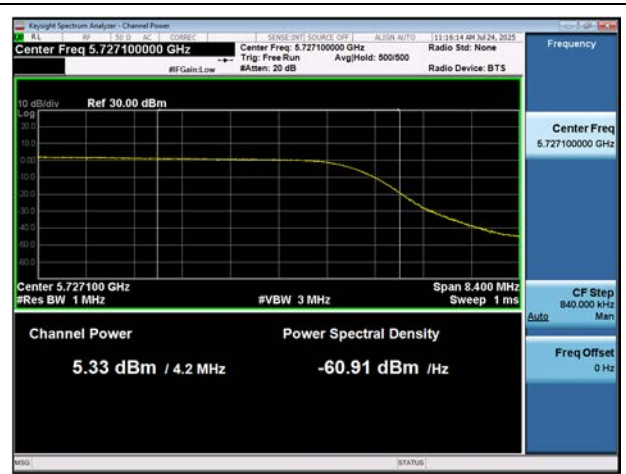


▣ Test Plots(Output Power)
[ANT. 1]

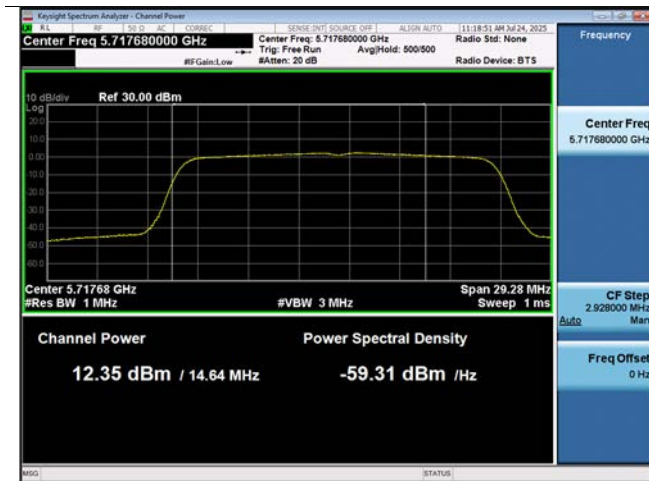
802.11a UNII 2C Band



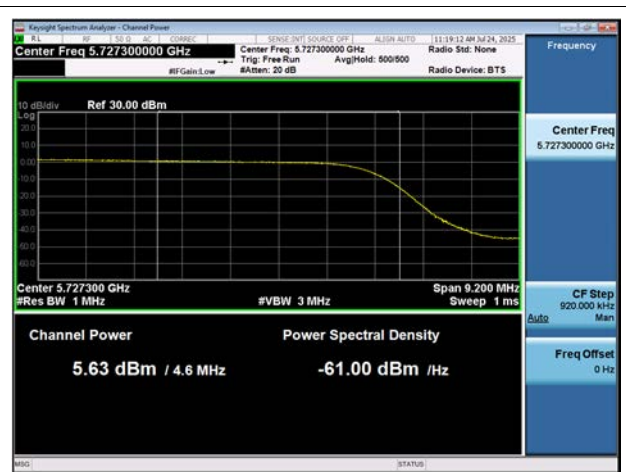
802.11a UNII 3 Band



802.11n(HT20) UNII 2C Band



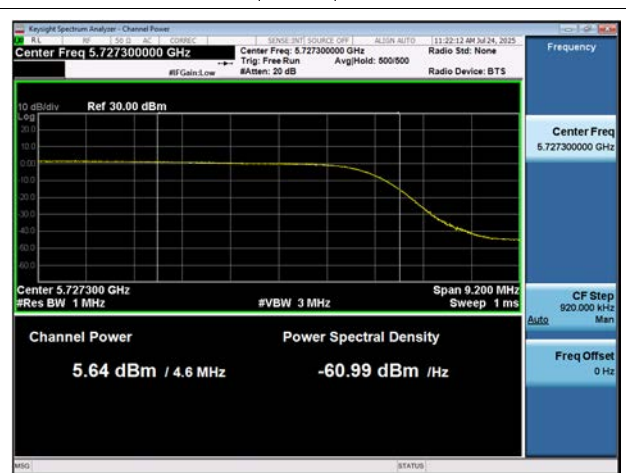
802.11n(HT20) UNII 3 Band



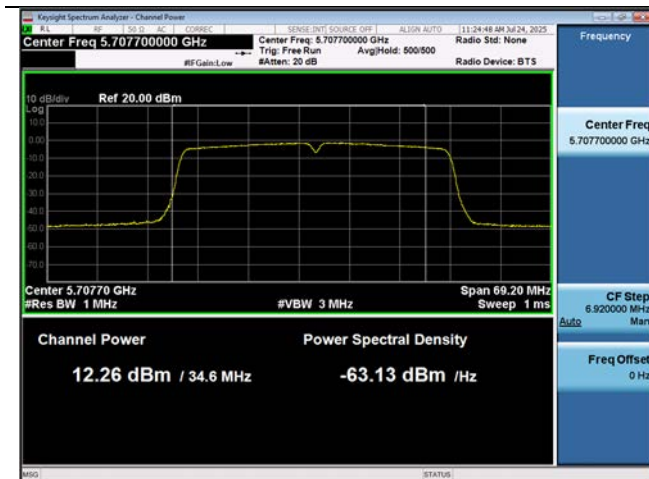
802.11ac(VHT20) UNII 2C Band



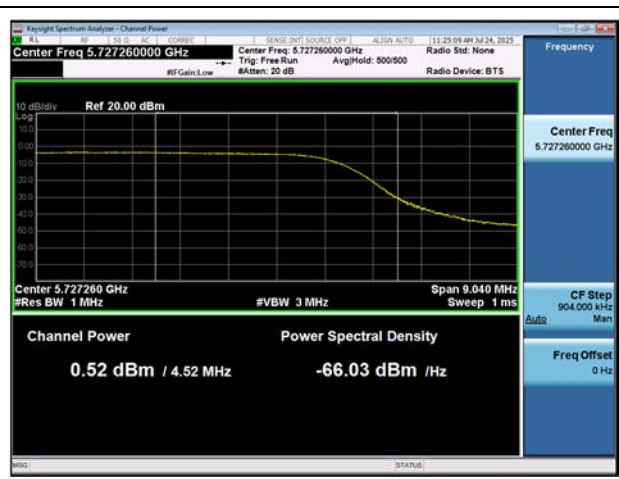
802.11ac(VHT20) UNII 3 Band



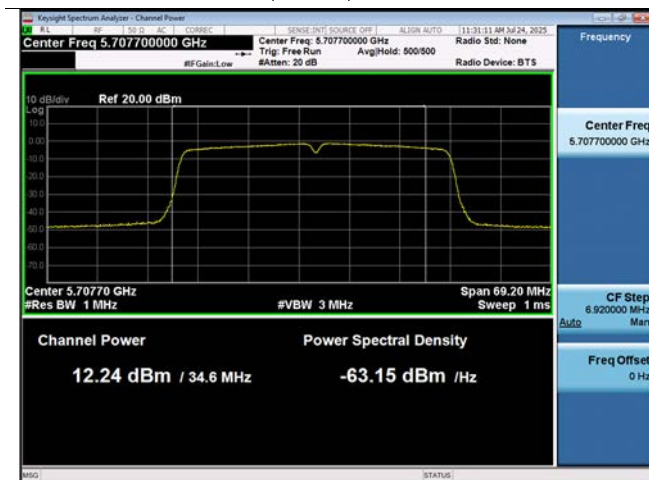
802.11n(HT40) UNII 2C Band



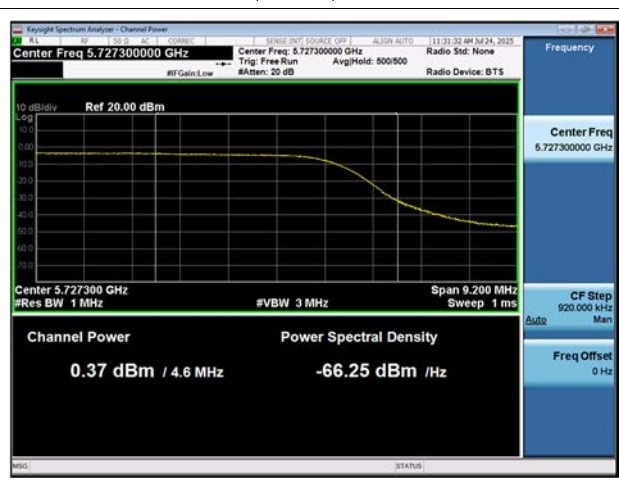
802.11n(HT40) UNII 3 Band



802.11ac(VHT40) UNII 2C Band



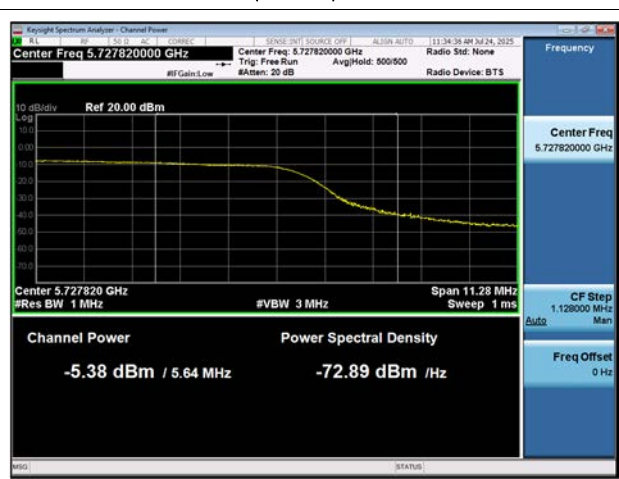
802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band

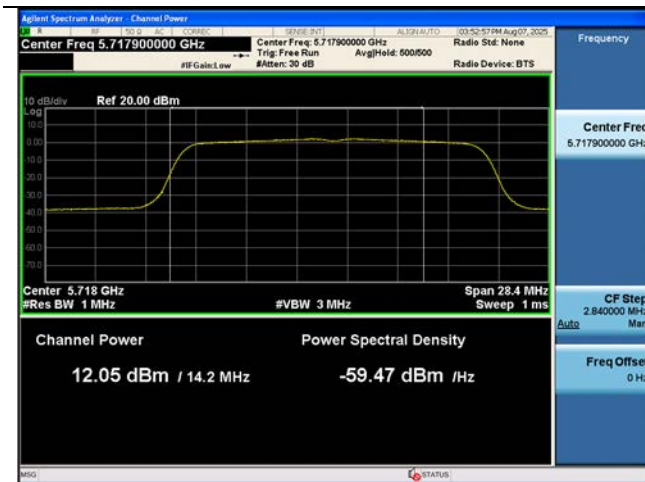


802.11ac(VHT80) UNII 3 Band



[ANT. 2]

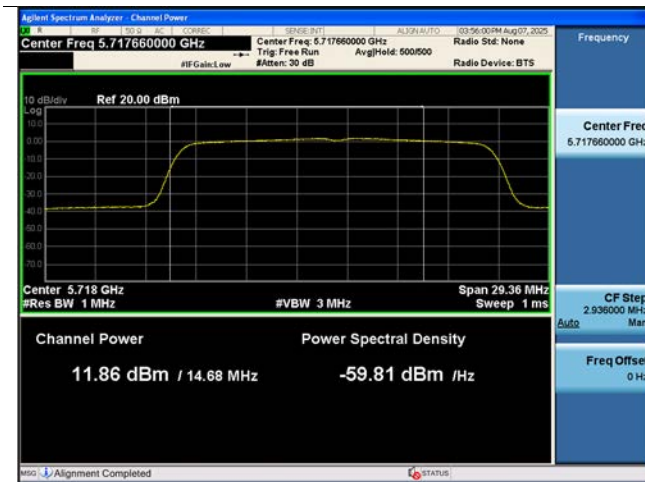
802.11a UNII 2C Band



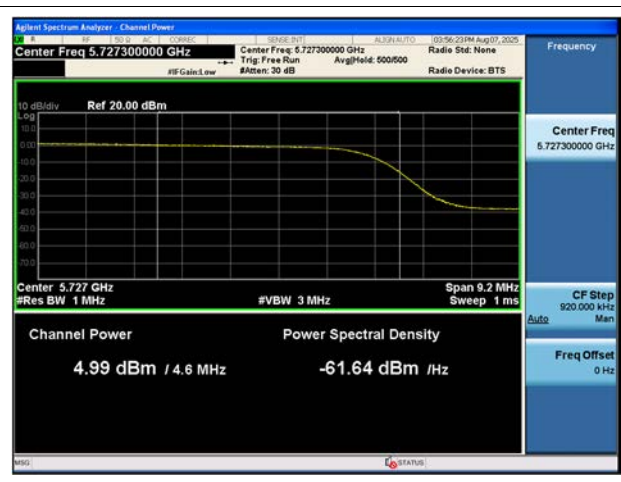
802.11a UNII 3 Band



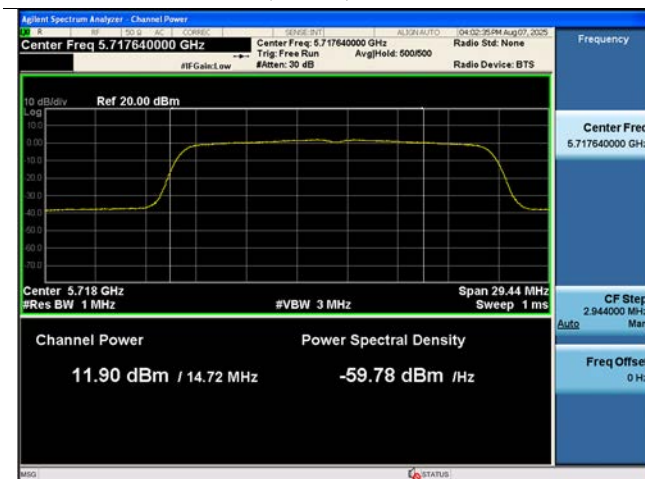
802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



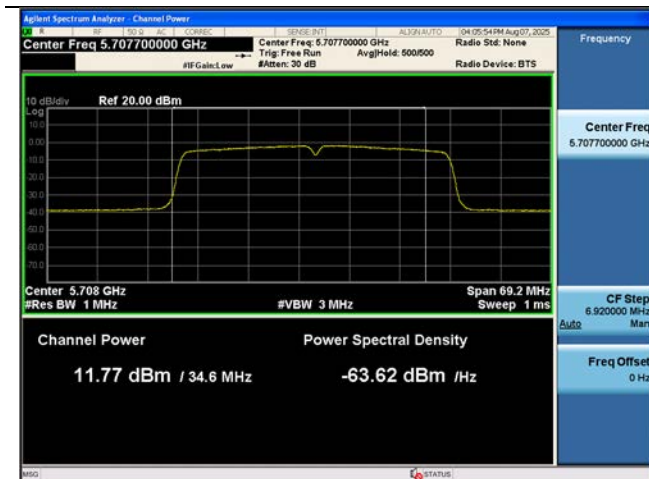
802.11ac(VHT20) UNII 2C Band



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

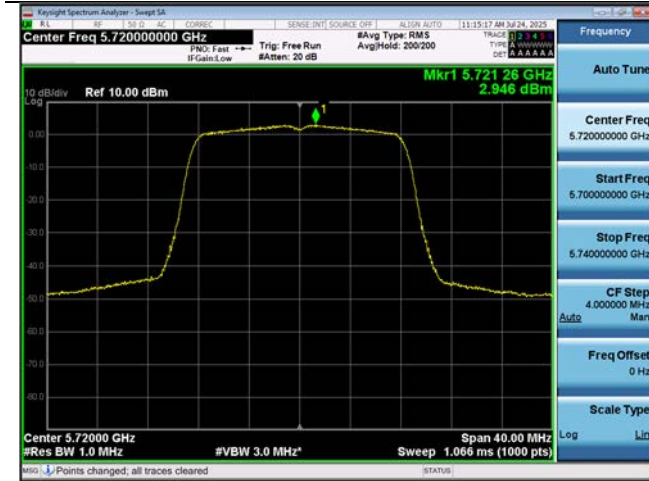


802.11ac(VHT80) UNII 3 Band

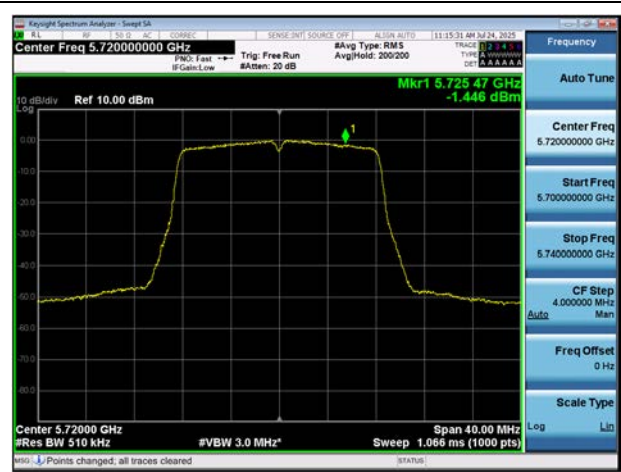


▣ Test Plots(Power Spectral Density)
[ANT. 1]

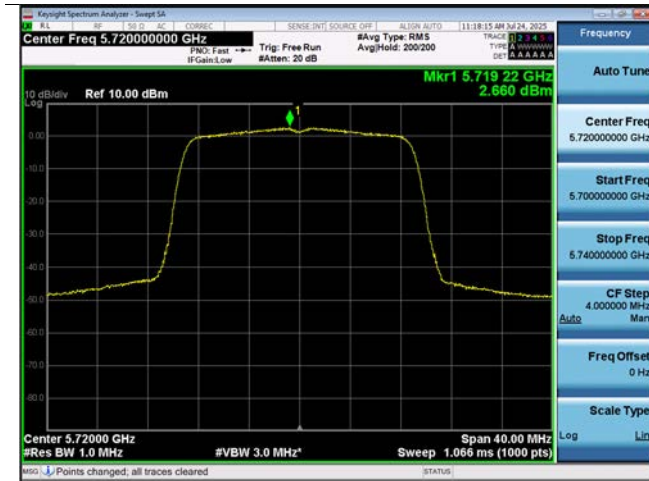
802.11a UNII 2C Band



802.11a UNII 3 Band



802.11n(HT20) UNII 2C Band



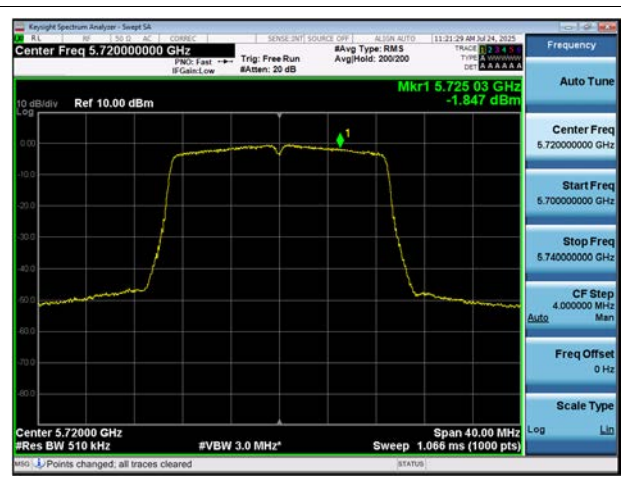
802.11n(HT20) UNII 3 Band



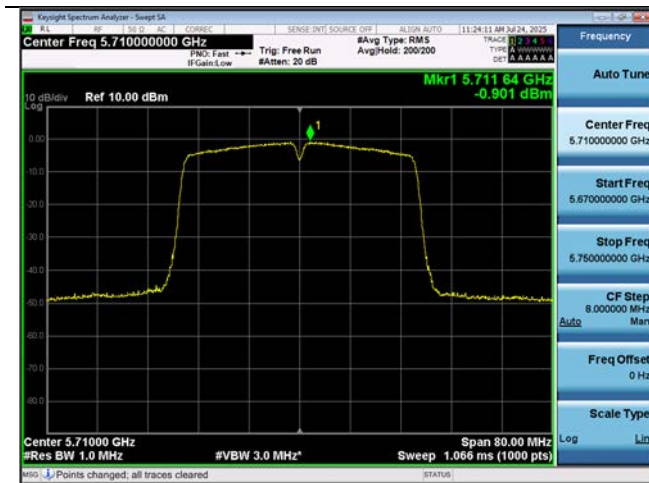
802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band



802.11n(HT40) UNII 2C Band



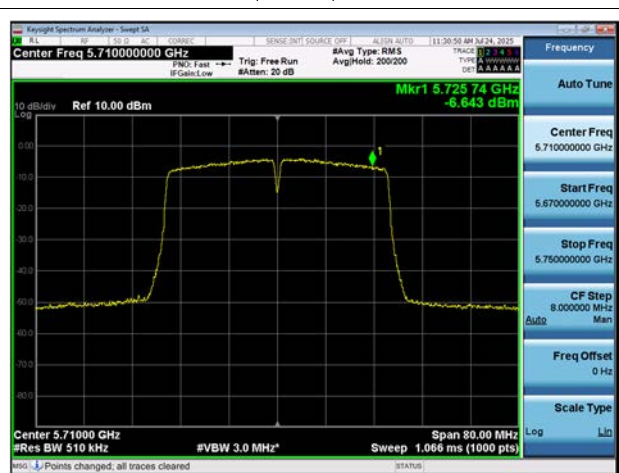
802.11n(HT40) UNII 3 Band



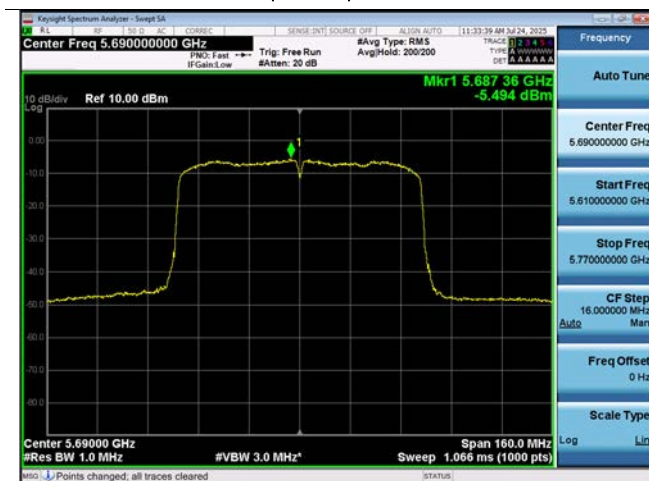
802.11ac(VHT40) UNII 2C Band



802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band

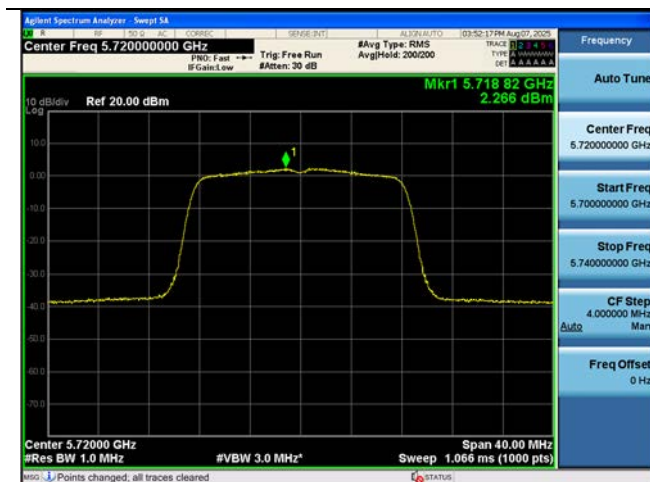


802.11ac(VHT80) UNII 3 Band



[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	A.F+D.F+C.L	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	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 5180MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
10360	59.33	-0.54	V	-	58.79	68.20	9.41	PK
15540	53.11	-0.44	V	-	52.67	73.98	21.31	PK
15540	40.16	-0.44	V	0.74	40.46	53.98	13.52	AV
10360	60.41	-0.54	H	-	59.87	68.20	8.33	PK
15540	52.12	-0.44	H	-	51.68	73.98	22.30	PK
15540	40.15	-0.44	H	0.74	40.45	53.98	13.53	AV

Band : UNII 1			Operation Mode : 802.11a					
CH.40 5200MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
10400	58.43	0.01	V	-	58.44	68.20	9.76	PK
15600	52.69	-1.16	V	-	51.53	73.98	22.45	PK
15600	40.60	-1.16	V	0.74	40.18	53.98	13.80	AV
10400	60.65	0.01	H	-	60.66	68.20	7.54	PK
15600	52.80	-1.16	H	-	51.64	73.98	22.34	PK
15600	40.30	-1.16	H	0.74	39.88	53.98	14.10	AV

Band : UNII 1			Operation Mode : 802.11a					
CH.48 5240MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
10480	58.21	0.34	V	-	58.55	68.20	9.65	PK
15720	52.48	-1.23	V	-	51.25	73.98	22.73	PK
15720	40.05	-1.23	V	0.74	39.56	53.98	14.42	AV
10480	58.67	0.34	H	-	59.01	68.20	9.19	PK
15720	52.23	-1.23	H	-	51.00	73.98	22.98	PK
15720	40.03	-1.23	H	0.74	39.54	53.98	14.44	AV

Band : UNII 2A			Operation Mode : 802.11a					
CH.52 5260MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
10520	57.35	-0.06	V	-	57.29	68.20	10.91	PK
15780	53.08	-1.43	V	-	51.65	73.98	22.33	PK
15780	39.97	-1.43	V	0.74	39.28	53.98	14.70	AV
10520	58.52	-0.06	H	-	58.46	68.20	9.74	PK
15780	52.21	-1.43	H	-	50.78	73.98	23.20	PK
15780	39.84	-1.43	H	0.74	39.15	53.98	14.83	AV

Band : UNII 2A			Operation Mode : 802.11a					
CH.60 5300MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
10600	57.89	-0.16	V	-	57.73	73.98	16.25	PK
10600	44.44	-0.16	V	0.74	45.02	53.98	8.96	AV
15900	52.37	-1.91	V	-	50.46	73.98	23.52	PK
15900	40.23	-1.91	V	0.74	39.06	53.98	14.92	AV
10600	60.18	-0.16	H	-	60.02	73.98	13.96	PK
10600	45.91	-0.16	H	0.74	46.49	53.98	7.49	AV
15900	52.42	-1.91	H	-	50.51	73.98	23.47	PK
15900	40.23	-1.91	H	0.74	39.06	53.98	14.92	AV

Band : UNII 2A			Operation Mode : 802.11a					
CH.64 5320MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
10640	58.78	0.06	V	-	58.84	73.98	15.14	PK
10640	45.16	0.06	V	0.74	45.96	53.98	8.02	AV
15960	52.05	-1.56	V	-	50.49	73.98	23.49	PK
15960	39.91	-1.56	V	0.74	39.09	53.98	14.89	AV
10640	60.60	0.06	H	-	60.66	73.98	13.32	PK
10640	45.85	0.06	H	0.74	46.65	53.98	7.33	AV
15960	51.75	-1.56	H	-	50.19	73.98	23.79	PK
15960	39.79	-1.56	H	0.74	38.97	53.98	15.01	AV

Band : UNII 2C			Operation Mode : 802.11a					
CH.100 5500MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11000	56.75	0.19	V	-	56.94	73.98	17.04	PK
11000	43.83	0.19	V	0.74	44.76	53.98	9.22	AV
16500	52.14	0.67	V	-	52.81	68.20	15.39	PK
11000	59.30	0.19	H	-	59.49	73.98	14.49	PK
11000	45.95	0.19	H	0.74	46.88	53.98	7.10	AV
16500	52.86	0.67	H	-	53.53	68.20	14.67	PK

Band : UNII 2C			Operation Mode : 802.11a					
CH.116 5580MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11160	59.49	-0.12	V	-	59.37	73.98	14.61	PK
11160	45.98	-0.12	V	0.74	46.60	53.98	7.38	AV
16740	53.47	0.30	V	-	53.77	68.20	14.43	PK
11160	60.97	-0.12	H	-	60.85	73.98	13.13	PK
11160	47.63	-0.12	H	0.74	48.25	53.98	5.73	AV
16740	53.27	0.30	H	-	53.57	68.20	14.63	PK

Band : UNII 2C			Operation Mode : 802.11a					
CH.144 5720MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11440	61.14	0.40	V	-	61.54	73.98	12.44	PK
11440	47.49	0.40	V	0.74	48.63	53.98	5.35	AV
17160	54.17	1.42	V	-	55.59	68.20	12.61	PK
11440	60.62	0.40	H	-	61.02	73.98	12.96	PK
11440	46.78	0.40	H	0.74	47.92	53.98	6.06	AV
17160	54.05	1.42	H	-	55.47	68.20	12.73	PK

Band : UNII 3			Operation Mode : 802.11a					
CH.149 5745MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11490	60.28	0.06	V	-	60.34	73.98	13.64	PK
11490	47.03	0.06	V	0.74	47.83	53.98	6.15	AV
17235	53.53	1.51	V	-	55.04	68.20	13.16	PK
11490	60.78	0.06	H	-	60.84	73.98	13.14	PK
11490	46.76	0.06	H	0.74	47.56	53.98	6.42	AV
17235	54.01	1.51	H	-	55.52	68.20	12.68	PK

Band : UNII 3			Operation Mode : 802.11a					
CH.157 5785MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11570	60.81	-0.03	V	-	60.78	73.98	13.20	PK
11570	47.12	-0.03	V	0.74	47.83	53.98	6.15	AV
17355	53.91	3.59	V	-	57.50	68.20	10.70	PK
11570	60.03	-0.03	H	-	60.00	73.98	13.98	PK
11570	46.79	-0.03	H	0.74	47.50	53.98	6.48	AV
17355	52.91	3.59	H	-	56.50	68.20	11.70	PK

Band : UNII 3			Operation Mode : 802.11a					
CH.165 5825MHz			Transfer Rate : 6 Mbps					
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF- AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11650	60.36	-0.29	V	-	60.07	73.98	13.91	PK
11650	47.03	-0.29	V	0.74	47.48	53.98	6.50	AV
17475	52.51	3.63	V	-	56.14	68.20	12.06	PK
11650	60.62	-0.29	H	-	60.33	73.98	13.65	PK
11650	46.78	-0.29	H	0.74	47.23	53.98	6.75	AV
17475	54.30	3.63	H	-	57.93	68.20	10.27	PK

[Simultaneous transmission Scenario)

Scenario 2

WLAN 5 GHz 802.11a_Ch. 144 + BT LE 1M_37byte_Ch.0

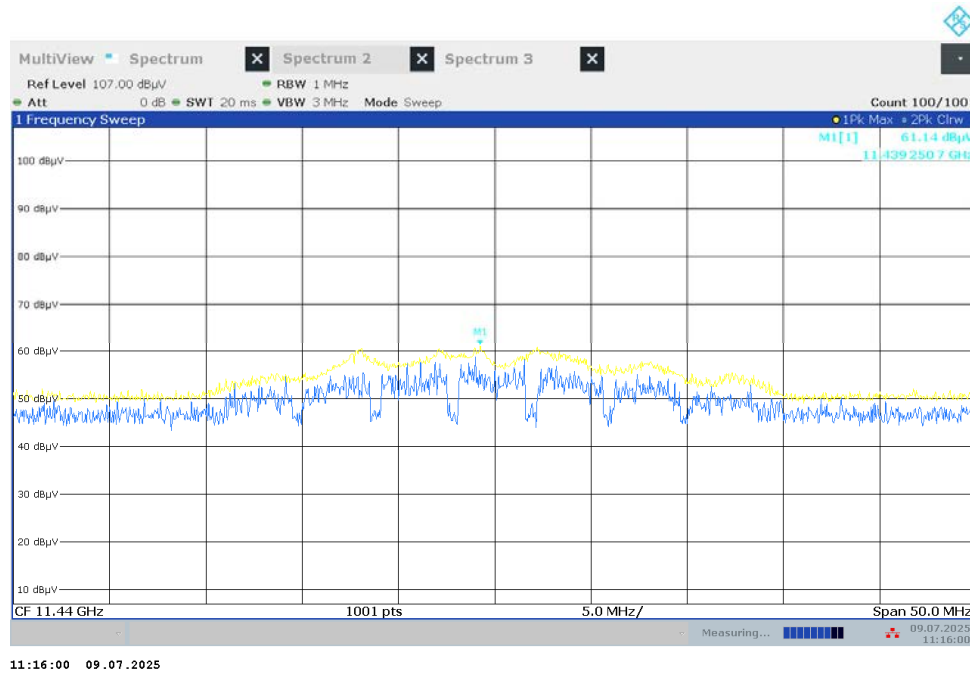
Frequency [MHz]	Measured value [dBμV]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Duty Cycle Factor [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11440	61.78	0.40	V	-	62.18	73.98	11.80	PK
11440	48.64	0.40	V	0.74	49.78	53.98	4.20	AV
17160	54.28	1.42	V	-	55.70	68.20	12.50	PK

Test Plots

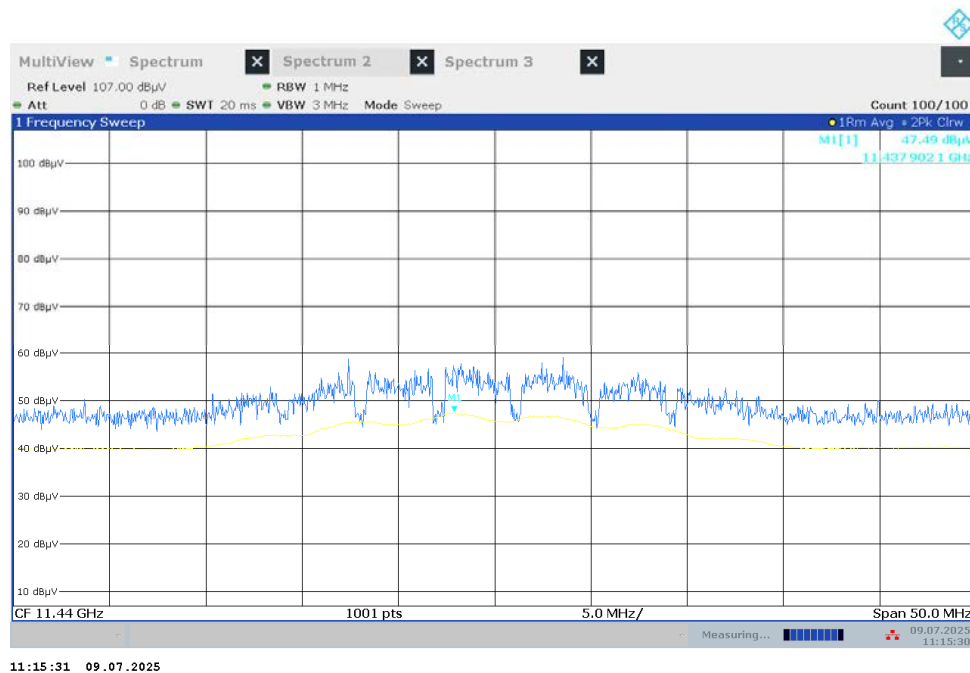
Note: Only the worst case plot for Radiated Spurious Emissions.

[MIMO_CDD(Ant1+Ant2)]

Radiated Spurious Emissions plot – Peak Result (802.11a, Ch.144 Spurious Emissions,Y-V)



Radiated Spurious Emissions plot – Average Result (802.11a, Ch.144 Spurious Emissions,Y-V)

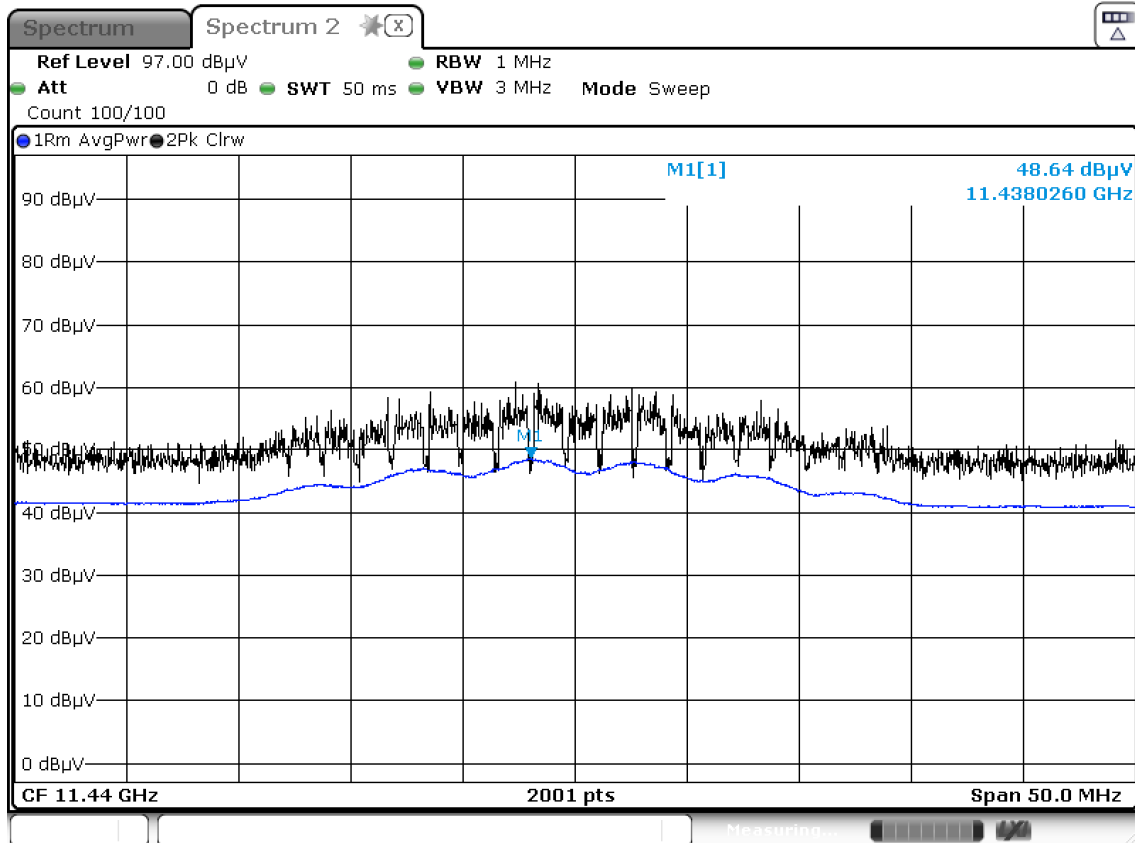


[Simultaneous transmission Scenario]

Scenario 2

WLAN 5 GHz 802.11a_Ch. 144 + BT LE 1M_37byte_Ch.0

Radiated Spurious Emissions plot – Average Result (Spurious Emissions, Y-V)



10.9 RADIATED RESTRICTED BAND EDGE

[MIMO_CDD(Ant1+Ant2)]

802.11 a		6 Mbps					
Channel	Ch.36	5180 MHz	UNII 1				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5150	59.69	1.86	H	61.55	73.98	12.43	PK
5150	46.63	1.86	H	48.49	53.98	5.49	AV

802.11 a		6 Mbps					
Channel	Ch. 64	5320 MHz	UNII 2A				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5350	58.56	1.23	H	59.79	73.98	14.19	PK
5350	45.74	1.23	H	46.97	53.98	7.01	AV

802.11 a		6 Mbps					
Channel	Ch. 100	5500 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	58.03	1.91	H	59.94	73.98	14.04	PK
5460	44.16	1.91	H	46.07	53.98	7.91	AV
5470	56.89	1.99	H	58.88	68.20	9.32	PK

802.11 n_HT20		MCS 0					
Channel	Ch. 36	5180 MHz	UNII 1				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5150	59.02	1.86	H	60.88	73.98	13.10	PK
5150	46.59	1.86	H	48.45	53.98	5.53	AV

802.11 n_HT20		MCS 0					
Channel	Ch. 64	5320 MHz	UNII 2A				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5350	58.67	1.23	H	59.90	73.98	14.08	PK
5350	45.47	1.23	H	46.70	53.98	7.28	AV

802.11 n_HT20		MCS 0					
Channel	Ch. 100	5500 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	57.37	1.91	H	59.28	73.98	14.70	PK
5460	44.11	1.91	H	46.02	53.98	7.96	AV
5470	57.04	1.99	H	59.03	68.20	9.17	PK

802.11 ac_VHT20		MCS 0					
Channel	Ch. 36	5180 MHz	UNII 1				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5150	59.40	1.86	H	61.26	73.98	12.72	PK
5150	46.69	1.86	H	48.55	53.98	5.43	AV

802.11 ac_VHT20		MCS 0					
Channel	Ch. 64	5320 MHz	UNII 2A				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5350	58.41	1.23	H	59.64	73.98	14.34	PK
5350	45.51	1.23	H	46.74	53.98	7.24	AV

802.11 ac_VHT20		MCS 0					
Channel	Ch. 100	5500 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	57.09	1.91	H	59.00	73.98	14.98	PK
5460	44.14	1.91	H	46.05	53.98	7.93	AV
5470	57.03	1.99	H	59.02	68.20	9.18	PK

802.11 n_HT40		MCS 0					
Channel	Ch. 38	5190 MHz	UNII 1				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5150	66.57	1.86	H	68.43	73.98	5.55	PK
5150	48.09	1.86	H	49.95	53.98	4.03	AV

802.11 n_HT40		MCS 0					
Channel	Ch. 62	5310 MHz	UNII 2A				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5350	66.41	1.23	H	67.64	73.98	6.34	PK
5350	47.88	1.23	H	49.11	53.98	4.87	AV

802.11 n_HT40		MCS 0					
Channel	Ch. 102	5510 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	57.64	1.91	H	59.55	73.98	14.43	PK
5460	41.98	1.91	H	43.89	53.98	10.09	AV
5470	63.01	1.99	H	65.00	68.20	3.20	PK

802.11 ac_VHT40		MCS 0					
Channel	Ch. 38	5190 MHz	UNII 1				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5150	64.68	1.86	H	66.54	73.98	7.44	PK
5150	48.04	1.86	H	49.90	53.98	4.08	AV

802.11 ac_VHT40		MCS 0					
Channel	Ch. 62	5310 MHz	UNII 2A				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5350	62.86	1.23	H	64.09	73.98	9.89	PK
5350	47.74	1.23	H	48.97	53.98	5.01	AV

802.11 ac_VHT40		MCS 0					
Channel	Ch. 102	5510 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	57.51	1.91	H	59.42	73.98	14.56	PK
5460	44.86	1.91	H	46.77	53.98	7.21	AV
5470	61.04	1.99	H	63.03	68.20	5.17	PK

802.11 ac_VHT80		MCS 0					
Channel	Ch. 42	5210 MHz	UNII 1				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5150	60.57	1.86	H	62.43	73.98	11.55	PK
5150	48.07	1.86	H	49.93	53.98	4.05	AV

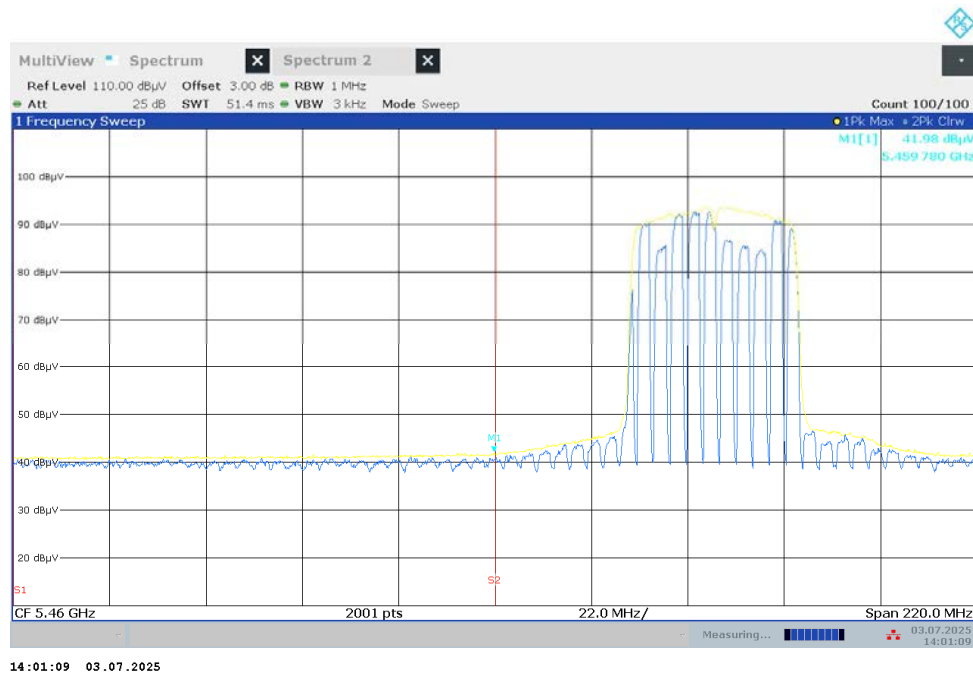
802.11 ac_VHT80		MCS 0					
Channel	Ch. 58	5290 MHz	UNII 2A				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5350	60.24	1.23	H	61.47	73.98	12.51	PK
5350	48.26	1.23	H	49.49	53.98	4.49	AV

802.11 ac_VHT80		MCS 0					
Channel	Ch. 106	5530 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	61.66	1.91	H	63.57	73.98	10.41	PK
5460	48.18	1.91	H	50.09	53.98	3.89	AV
5470	61.74	1.99	H	63.73	68.20	4.47	PK
5460	62.16	1.91	V	64.07	73.98	9.91	PK
5460	47.90	1.91	V	49.81	53.98	4.17	AV
5470	61.23	1.99	V	63.22	68.20	4.98	PK

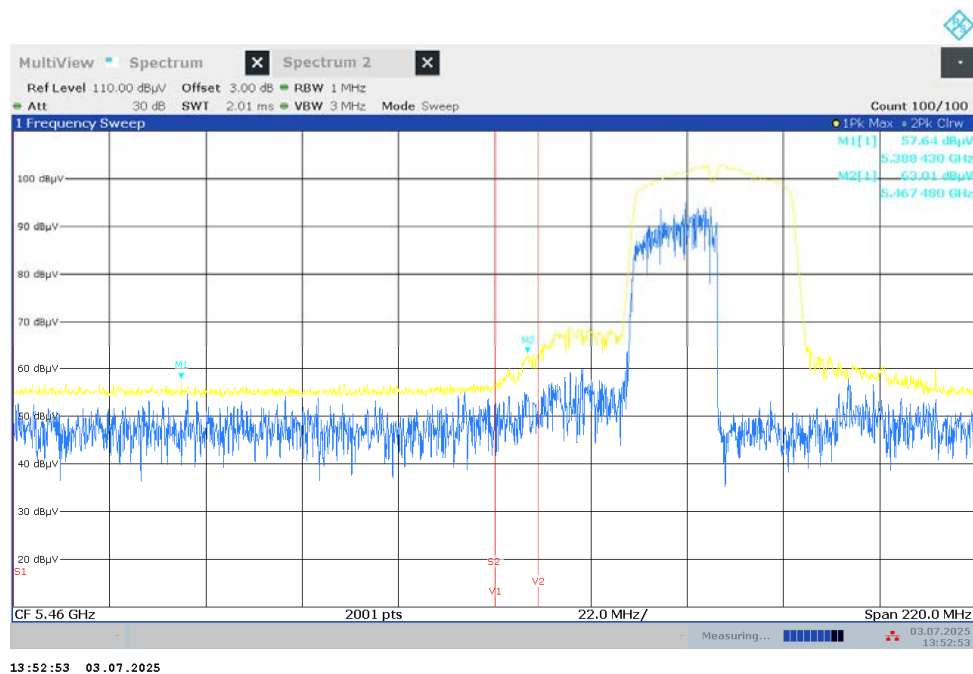
[MIMO_CDD(Ant1+Ant2)]

▣ Test Plots(UNII 1, 2A, 2C)

Average Result (802.11n40_ MCS0, Ch. 102, X-H)



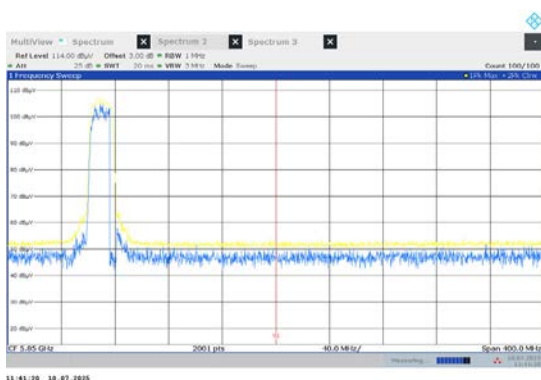
Peak Result (802.11n40_ MCS0, Ch. 102, X-H)



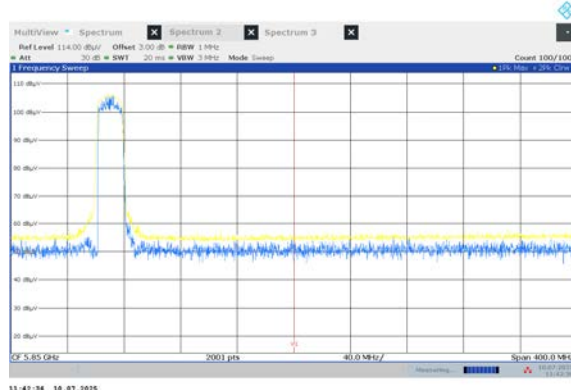
Note: Only the worst case plots for Radiated Restricted Band Edge.

Test Plots(Straddle Channel)

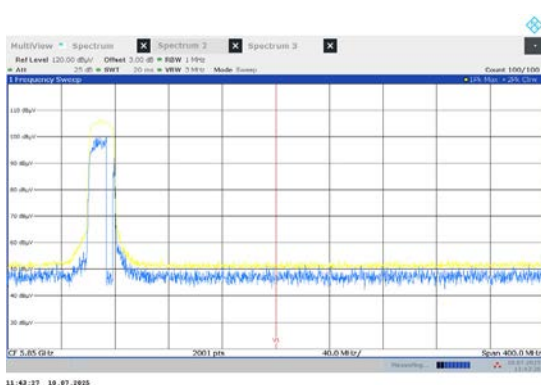
Peak Result (802.11a, Ch.144, X-H)



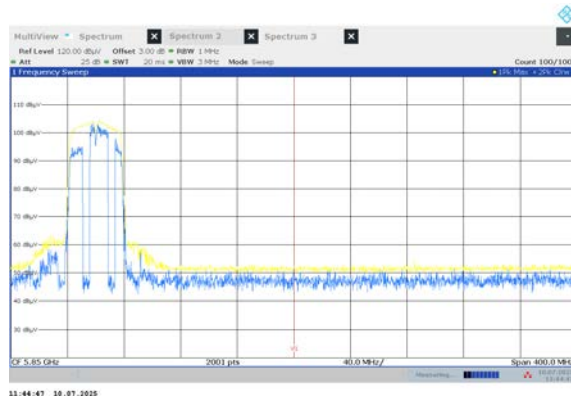
Peak Result (802.11n_HT20, Ch.144, X-H)



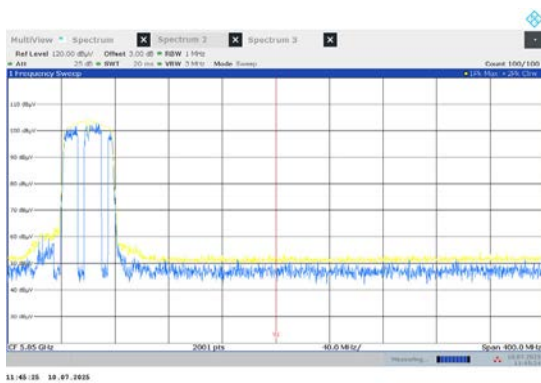
Peak Result (802.11ac_VHT20, Ch.144, X-H)



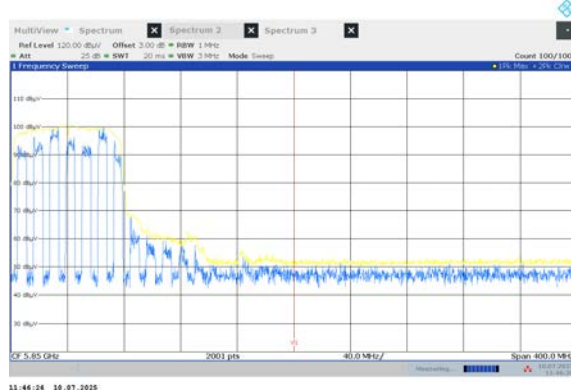
Peak Result (802.11n_HT40, Ch.142, X-H)



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



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

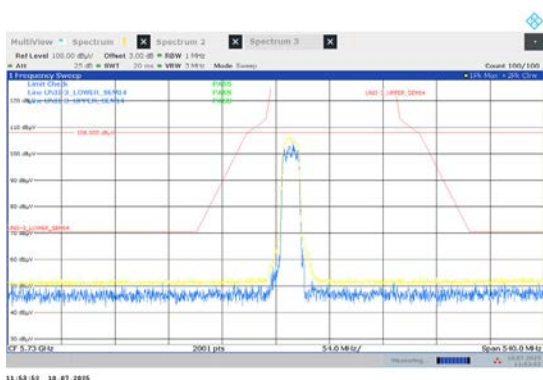


Note :

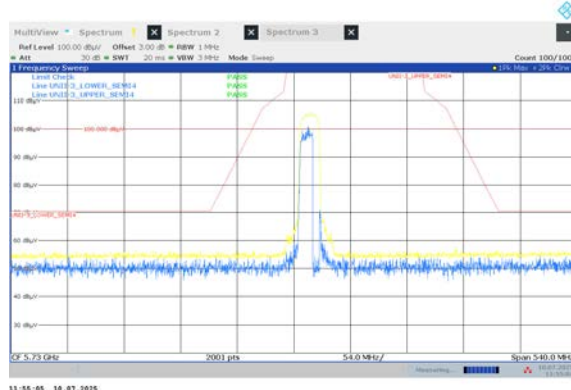
1. Only the worst case plots for Radiated Restricted Band Edge.
2. Red line : 5 850 MHz

Test Plots(UNII 3)

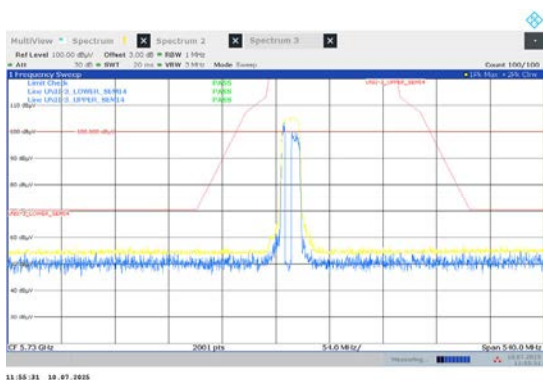
Peak Result (802.11a, Ch.149, X-H)



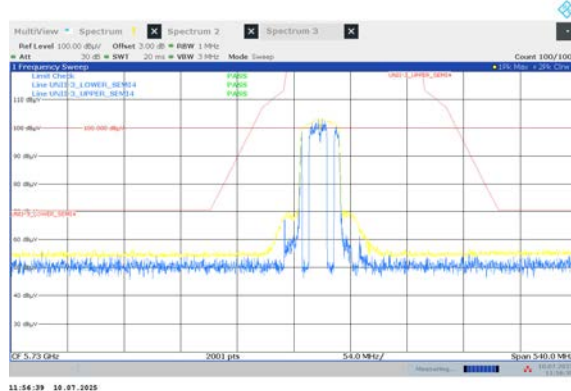
Peak Result (802.11n_HT20, Ch.149, X-H)



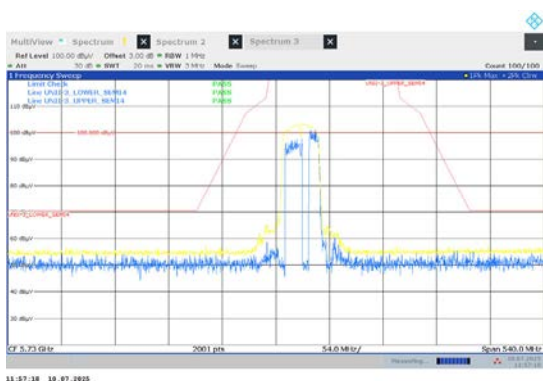
Peak Result (802.11ac_VHT20, Ch.149, X-H)



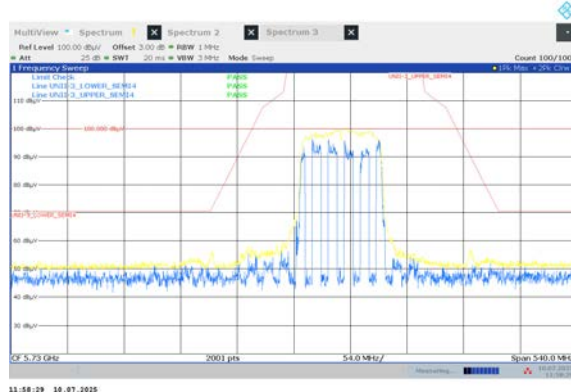
Peak Result (802.11n_HT40, Ch.151, X-H)



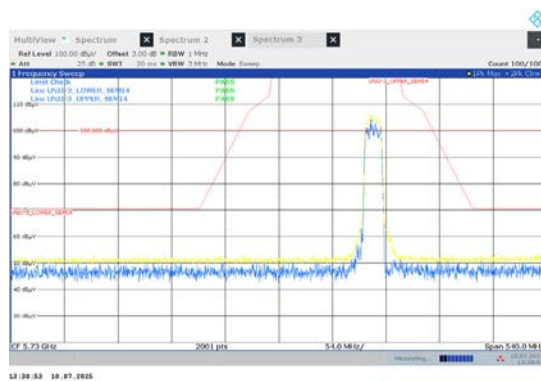
Peak Result (802.11ac_VHT40, Ch.151, X-H)



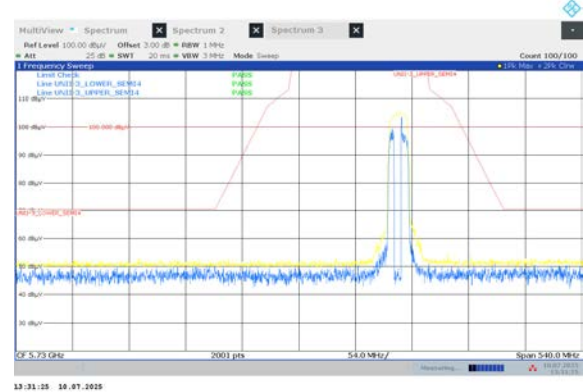
Peak Result (802.11ac_VHT80, Ch.155, X-H)



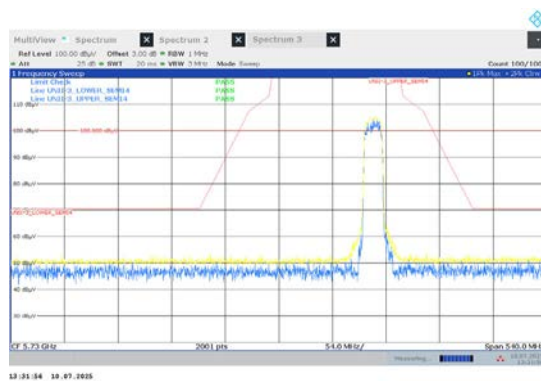
Peak Result (802.11a, Ch.165, X-H)



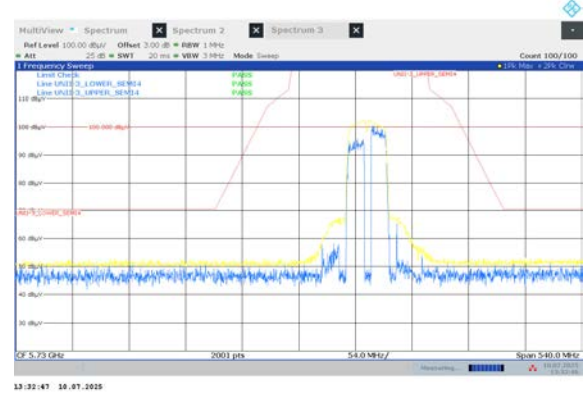
Peak Result (802.11n_HT20, Ch.165, X-H)



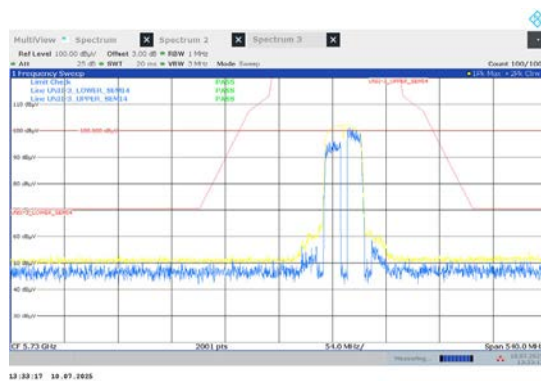
Peak Result (802.11ac_VHT20, Ch.165, X-H)



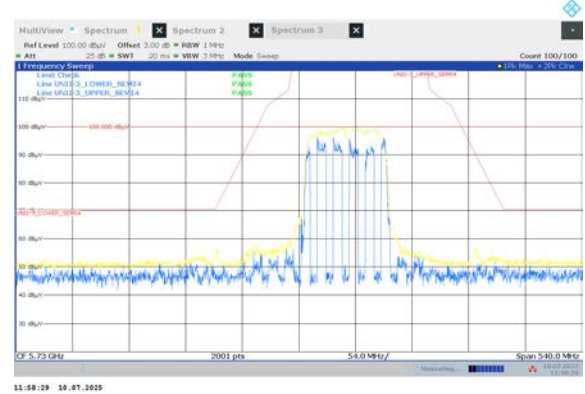
Peak Result (802.11n_HT40, Ch.159, X-H)



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

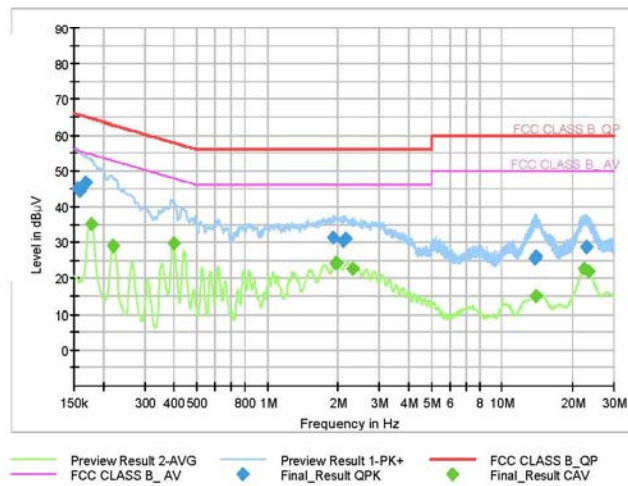
WLAN 5GHz

1 / 1

Test Report**Common Information**

EUT : LGSWNAC62
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	45.26	65.75	20.49	9.000	L1	9.6
0.1590	44.42	65.52	21.10	9.000	N	9.6
0.1680	46.88	65.06	18.18	9.000	L1	9.6
1.9153	31.38	56.00	24.62	9.000	N	9.6
2.1200	30.54	56.00	25.46	9.000	N	9.6
2.1628	30.95	56.00	25.05	9.000	N	9.6
13.7953	25.56	60.00	34.44	9.000	N	9.9
13.9235	26.36	60.00	33.64	9.000	N	9.9
22.8695	28.71	60.00	31.29	9.000	N	10.0

Final Result CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1770	35.10	54.63	19.53	9.000	L1	9.6
0.2198	29.14	52.83	23.69	9.000	L1	9.7
0.3975	29.81	47.91	18.10	9.000	L1	9.7
1.9558	24.37	46.00	21.63	9.000	N	9.6
1.9760	24.22	46.00	21.78	9.000	N	9.6
2.3135	22.64	46.00	23.36	9.000	N	9.7
13.9100	15.04	50.00	34.96	9.000	N	9.9
22.2710	22.69	50.00	27.31	9.000	N	10.0
23.3038	21.99	50.00	28.01	9.000	N	10.0

2025-07-17

오전 9:57:15

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	08/27/2025	Annual
Signal Analyzer	N9020A	Keysight	MY46471250	08/04/2026	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
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
FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	HCT CO., LTD.	N/A	N/A	N/A

Note:

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

Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	S4AM	08/01/2026	Annual
Turn Table	1060	Innco system	N/A	N/A	N/A
Turn Table	N/A	Ets.	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	06/23/2027	Biennial
BILOG Antenna	VULB 9168	Schwarzbeck	9168-0895	08/28/2026	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1191	11/07/2025	Biennial
Horn Antenna	BBHA9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Amp & Filter Bank Switch Controller	FBSM-01B	TNM system	TM20090002	N/A	N/A
RF Switching System	FBSR-04C (3 GHz HPF + LNA)	TNM system	S4L1	03/12/2026	Annual
RF Switching System	FBSR-04C (10 dB ATT + LNA)	TNM system	S4L2	03/12/2026	Annual
RF Switching System	FBSR-04C (3 dB ATT + LNA)	TNM system	S4L3	03/12/2026	Annual
RF Switching System	FBSR-04C (LNA)	TNM system	S4L4	03/12/2026	Annual
RF Switching System	FBSR-04C (Thru)	TNM system	S4L6	03/12/2026	Annual
Spectrum Analyzer	FSV30 (10 Hz ~ 30 GHz)	Rohde & Schwarz	100746	07/01/2026	Annual
Spectrum Analyzer	FSW (2 Hz ~ 67 GHz)	Rohde & Schwarz	101736	05/27/2026	Annual

Note:

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

12. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2508-FC011-P