

TEST REPORT

FCC UNII Test for TRC-1120
Certification

APPLICANT
Ohsung Electronics Co.,Ltd.

REPORT NO.
HCT-RF-2408-FC011

DATE OF ISSUE
August 21, 2024

Tested by
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Accredited by KOLAS, Republic of KOREA

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Applicant	Ohsung Electronics Co.,Ltd. 335-4, Sanho-daero, Gumi-si, Gyeongsangbuk-do, Republic of Korea
Product Name	Remote Controller
Model Name	TRC-1120
Date(s) of Tests	April 25, 2024~ June 14, 2024
FCC ID	OZ5URCTRC1120
FCC Classification	Unlicensed National Information Infrastructure(NII)
Test Standard Used	FCC Rule Part(s): Part 15.407
Test Results	PASS
Location of Test	<input checked="" type="checkbox"/> Permanent Testing Lab <input type="checkbox"/> On Site Testing Lab (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	August 21, 2024	Initial Release

Notice

Content

Engineering Statement:

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

The 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)

This test report provides test result(s) under the lab's valid Scope of Accreditation by A2LA (American Association for Laboratory Accreditation), signatory of the ILAC-MRA.

(A2LA (ISO/IEC 17025) Certificate No. 4114.01)

CONTENTS

1. GENERAL INFORMATION	5
EUT DESCRIPTION	5
2. MAXIMUM OUTPUT POWER	6
3. TEST METHODOLOGY	7
EUT CONFIGURATION	7
EUT EXERCISE	7
GENERAL TEST PROCEDURES	7
DESCRIPTION OF TEST MODES	8
4. INSTRUMENT CALIBRATION	8
5. FACILITIES AND ACCREDITATIONS	8
5.1 FACILITIES	8
5.2 EQUIPMENT	8
6. ANTENNA REQUIREMENTS	9
7. MEASUREMENT UNCERTAINTY	9
8. DESCRIPTION OF TESTS	10
9. SUMMARY OF TEST RESULTS	26
10. TEST RESULT	27
10.1 DUTY CYCLE	27
10.2 26 dB Bandwidth	30
10.3 6 dB BANDWIDTH	34
10.4 OUTPUT POWER MEASUREMENT	36
10.5 POWER SPECTRAL DENSITY	39
10.6 FREQUENCY STABILITY	44
10.6.1 80 MHz BW	45
10.7 STRADDLE CHANNEL	61
10.7.1 26 dB Bandwidth	61
10.7.2 6 dB Bandwidth	63
10.7.3 Output Power	65
10.7.4 Power Spectral Density	68
10.8 RADIATED SPURIOUS EMISSIONS	71
10.9 RADIATED RESTRICTED BAND EDGE	77
10.10 POWERLINE CONDUCTED EMISSIONS	93
11. LIST OF TEST EQUIPMENT	95
12. ANNEX A_ TEST SETUP PHOTO	97

1. GENERAL INFORMATION

EUT DESCRIPTION

Model	TRC-1120	
Additional Model	-	
EUT Type	Remote Controller	
Power Supply	DC 3.70 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 (Exception for 5600 - 5650 MHz)
	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 Measurement Typeion	
Antenna Specification	Type: Internal FPCB Peak gain: 2.28 dBi (UNII 1) / 2.24 dBi (UNII 2A) / 1.85 dBi (UNII 2C) / 2.33 dBi (UNII 3)	
Serial number	Conducted : 00:1F:B8:52:00:2E Radiated : 00:1F:B8:52:00:2D	

2. MAXIMUM OUTPUT POWER

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

Band	Mode	Maximum Output power	
		(dBm)	(W)
UNII1	802.11a	7.83	0.006
	802.11n (HT20)	7.78	0.006
	802.11n (HT40)	7.56	0.006
	802.11ac (VHT20)	7.83	0.006
	802.11ac (VHT40)	7.84	0.006
	802.11ac (VHT80)	7.53	0.006
UNII2A	802.11a	7.68	0.006
	802.11n (HT20)	7.37	0.005
	802.11n (HT40)	7.34	0.005
	802.11ac (VHT20)	7.42	0.006
	802.11ac (VHT40)	7.45	0.006
	802.11ac (VHT80)	7.82	0.006
UNII2C	802.11a	7.66	0.006
	802.11n (HT20)	7.67	0.006
	802.11n (HT40)	7.83	0.006
	802.11ac (VHT20)	7.59	0.006
	802.11ac (VHT40)	7.53	0.006
	802.11ac (VHT80)	7.42	0.006
UNII3	802.11a	7.82	0.006
	802.11n (HT20)	7.77	0.006
	802.11n (HT40)	7.86	0.006
	802.11ac (VHT20)	7.86	0.006
	802.11ac (VHT40)	7.87	0.006
	802.11ac (VHT80)	7.50	0.006

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, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of A NSI C63.4. (Version :2014) and CISPR Publication22.

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.

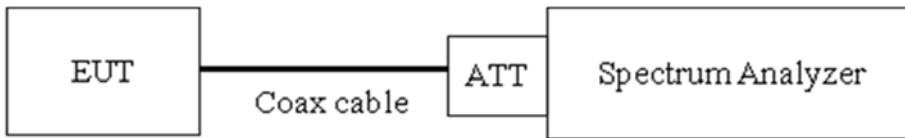
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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

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.

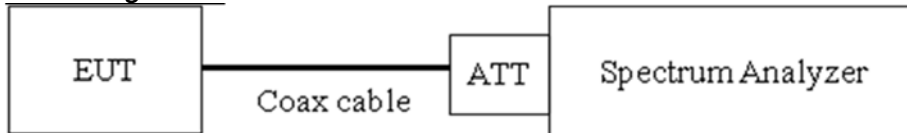
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (\geq RBW)
3. SPAN = 0 Hz
4. Measurement Type or = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = $10\log(1/\text{Duty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

8.2. 6 dB Bandwidth & 26 dB Bandwidth

Limit

Within the 5.725-5.85 GHz 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. Measurement Type= 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. Measurement Type = 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.

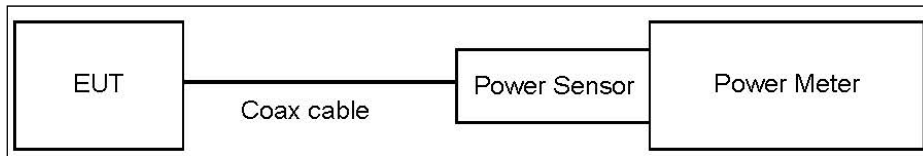
8.3. Output Power Measurement

Limit

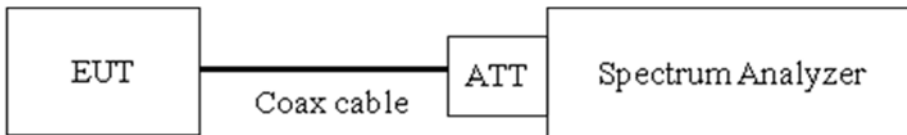
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30 dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30 dBm)

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 powr 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 = EBW
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	13.02
UNII 2A	13.02
UNII 2C	13.02
UNII 3	13.02

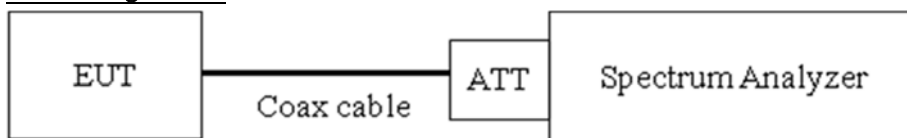
(Actual value of loss for the attenuator and cable combination)

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 = RMS(i.e., power averaging), if available. Otherwise, use sample Measurement Type 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	13.02
UNII 2A	13.02
UNII 2C	13.02
UNII 3	13.02

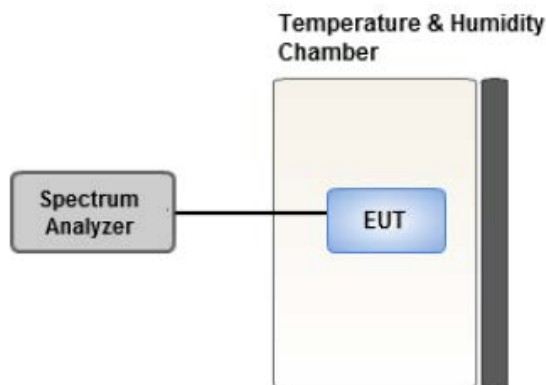
(Actual value of loss for the attenuator and cable combination)

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

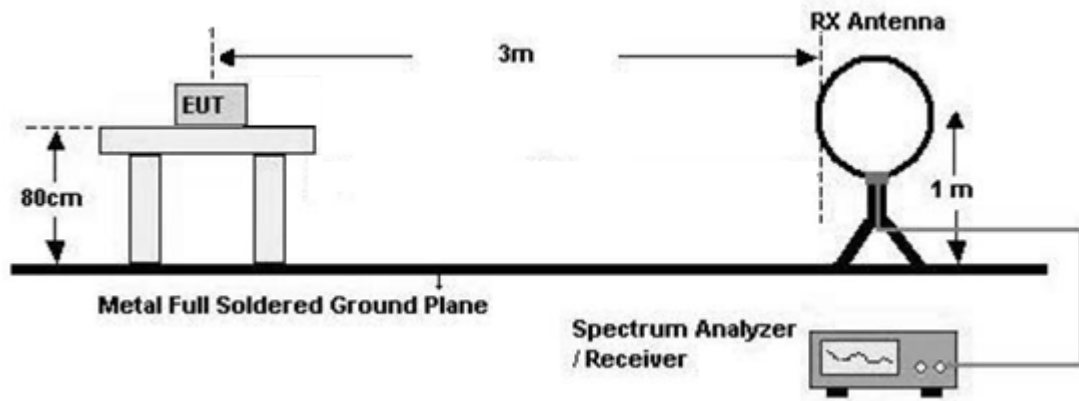
Limit

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.

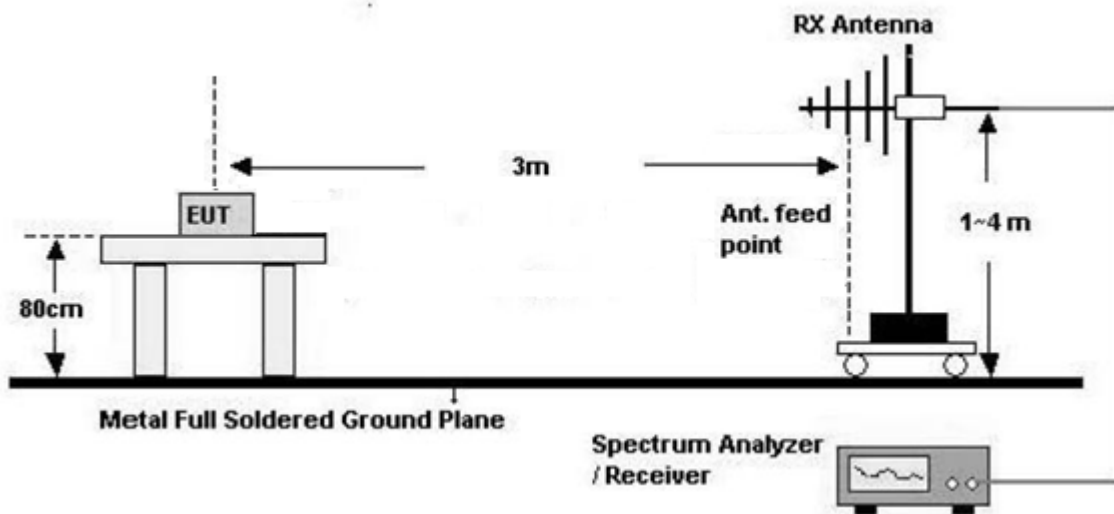
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

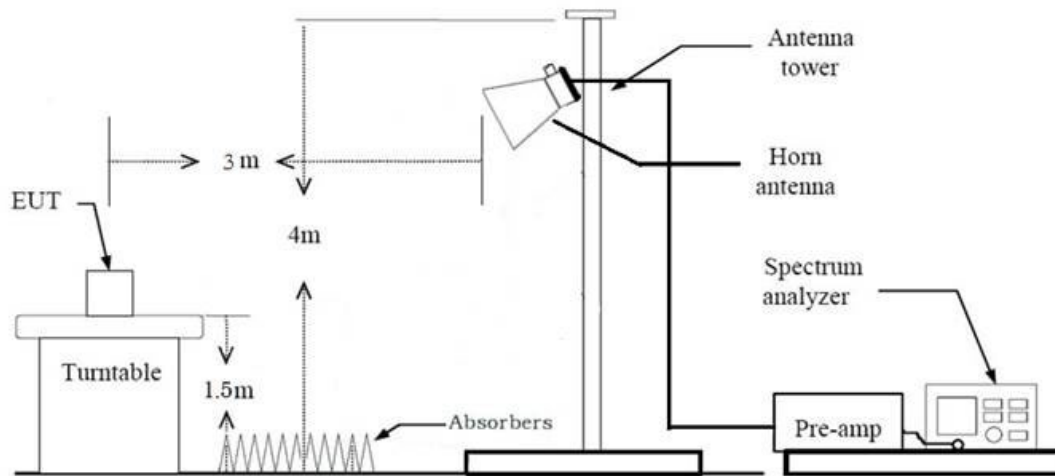
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

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

KDB 414788 OFS and Chamber Correlation Justification

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

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

Test Procedure of Radiated spurious emissions(Below 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8 m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 30 MHz – 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \geq 3 x RBW
 - (2) Measurement Type(Quasi-peak):
 - Measured Frequency Range : 30 MHz – 1 GHz
 - Detector = Quasi-Peak
 - RBW = 120 kHz
- ※In general, (1) is used mainly
7. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Test Procedure of Radiated spurious emissions (Above 1 GHz)

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

8. Spectrum Setting

(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.d in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW(Duty cycle \geq 98 %) = VBW \leq RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 %) = 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 % duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.

9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor
10. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency
11. Distance extrapolation factor = $20\log(\text{test distance} / \text{specific distance})$ (dB)
12. 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. The unit was tested with its standard battery.
8. 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.d in KDB 789033 v02r01):
 - RBW = 1 MHz
 - VBW(Duty cycle \geq 98 %) = $VBW \leq RBW/100$ (i.e., 10 kHz) but not less than 10 Hz.
 - VBW(Duty cycle is < 98 %) = $VBW \geq 1/T$, 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 % duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.
9. 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)

10. Distance extrapolation factor = $20\log(\text{test distance} / \text{specific distance})$ (dB)

11. 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

Mode	Worst Data rate	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11a	6M	0.959	0.181	1 000
802.11n(HT20)	MCS0	0.957	0.192	1 000
802.11n(HT40)	MCS0	0.920	0.360	2 000
802.11ac(VHT20)	MCS0	0.953	0.209	1 000
802.11ac(VHT40)	MCS0	0.918	0.371	2 000
802.11ac(VHT80)	MCS0	0.848	0.718	5 000

8.8. Worst case configuration and mode

Conducted test

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

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + Cradle + Adapter, Stand alone + Adapter
 - Worstcase : Stand alone
2. EUT Axis
 - Radiated Spurious Emissions : Y
 - Radiated Restricted Band Edge : Y
3. All datarate of operation were investigated and the worst case datarate results are reported.
 - Worstcase :
 - 802.11a : 6 Mbps
 - 802.11n_HT20 : MCS0
 - 802.11ac_VHT20 : MCS0
 - 802.11n_HT40 : MCS0
 - 802.11ac_VHT40 : MCS0
 - 802.11ac_VHT80 : MCS0
4. Radiated Spurious Emission
 - All modulation of operation were investigated and the worst case modulation results are reported.
 - Worstcase :
 - 802.11a : 6 Mbps
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

AC Power line Conducted Emissions

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

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)		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		Radiated

10. TEST RESULT

10.1 DUTY CYCLE

Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6	2.062	2.150	0.959	0.181
	9	1.383	1.469	0.941	0.262
	12	1.046	1.132	0.924	0.344
	18	0.707	0.793	0.891	0.499
	24	0.535	0.626	0.854	0.684
	36	0.365	0.453	0.804	0.945
	48	0.276	0.365	0.757	1.209
	54	0.251	0.337	0.744	1.282

Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	1.922	2.009	0.957	0.192
	1	0.980	1.074	0.913	0.397
	2	0.679	0.757	0.896	0.475
	3	0.517	0.600	0.861	0.650
	4	0.362	0.441	0.821	0.855
	5	0.274	0.361	0.759	1.198
	6	0.258	0.347	0.743	1.288
	7	0.238	0.322	0.740	1.309
802.11n (HT40)	0	0.949	1.031	0.920	0.360
	1	0.504	0.585	0.861	0.649
	2	0.352	0.433	0.813	0.901
	3	0.273	0.355	0.770	1.137
	4	0.183	0.259	0.707	1.508
	5	0.162	0.241	0.673	1.719
	6	0.144	0.234	0.615	2.109
	7	0.137	0.230	0.596	2.250

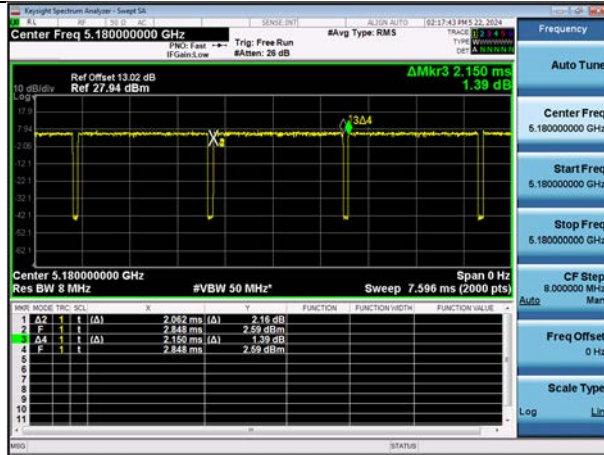
Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	1.929	2.024	0.953	0.209
	1	0.988	1.079	0.915	0.383
	2	0.674	0.763	0.884	0.537
	3	0.517	0.605	0.854	0.688
	4	0.357	0.451	0.792	1.012
	5	0.281	0.370	0.760	1.190
	6	0.251	0.342	0.733	1.347
	7	0.233	0.327	0.713	1.468
	8	0.200	0.291	0.687	1.631
802.11ac (VHT40)	0	0.952	1.037	0.918	0.371
	1	0.497	0.585	0.848	0.714
	2	0.345	0.438	0.786	1.045
	3	0.269	0.357	0.752	1.239
	4	0.194	0.279	0.695	1.578
	5	0.158	0.241	0.656	1.834
	6	0.144	0.234	0.617	2.096
	7	0.135	0.220	0.614	2.121
	8	0.122	0.202	0.604	2.190
	9	0.115	0.193	0.596	2.249
802.11ac (VHT80)	0	0.464	0.547	0.848	0.718
	1	0.256	0.334	0.766	1.155
	2	0.190	0.270	0.704	1.526
	3	0.154	0.232	0.664	1.780
	4	0.118	0.200	0.590	2.291
	5	0.099	0.180	0.550	2.596
	6	0.091	0.176	0.517	2.865
	7	0.086	0.173	0.497	3.035
	8	0.078	0.165	0.474	3.245
	9	0.075	0.163	0.460	3.371

▣ Test Plots

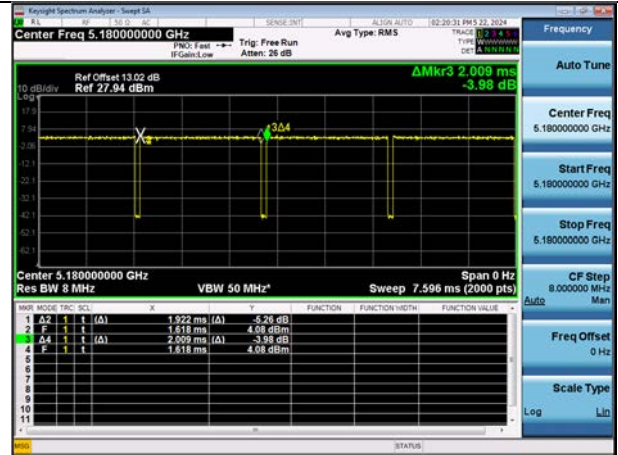
Note:

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

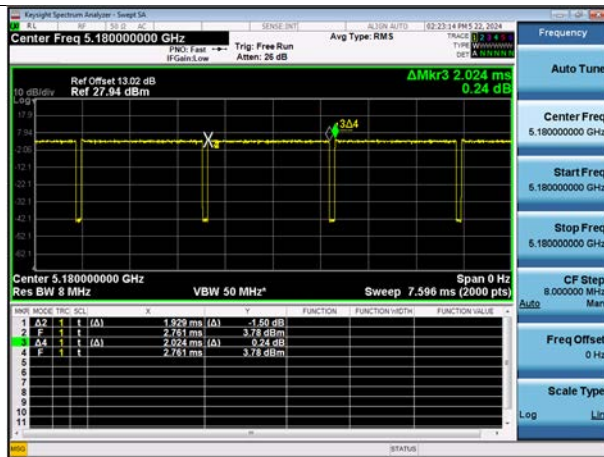
802.11a



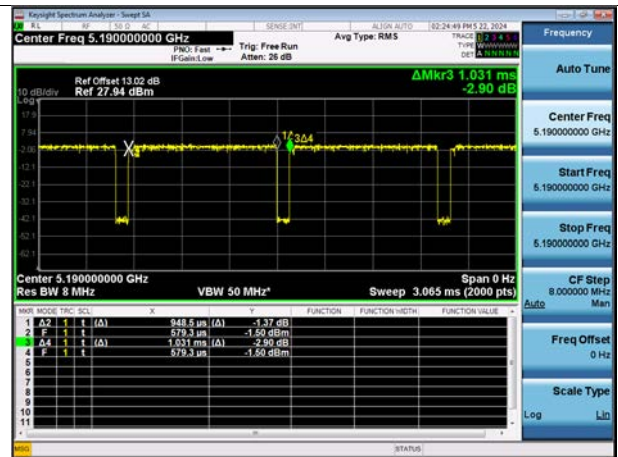
802.11n(HT20)



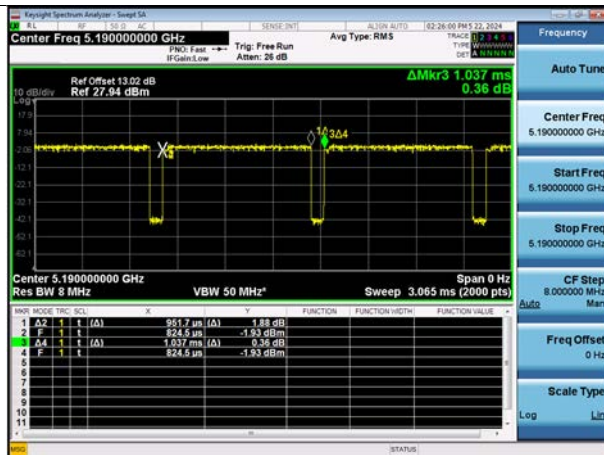
802.11ac(VHT20)



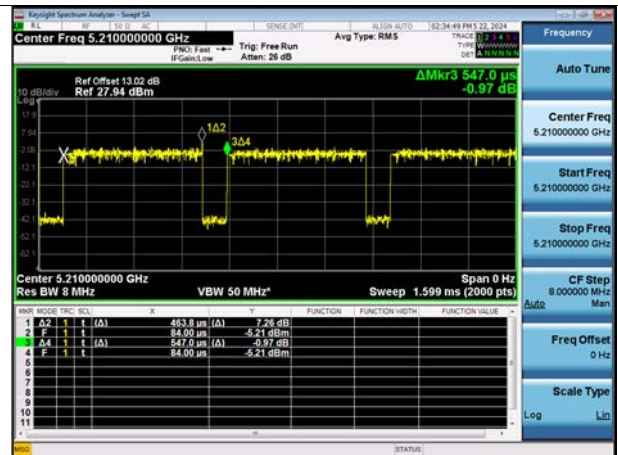
802.11n(HT40)



802.11ac(VHT40)



802.11ac(VHT80)



10.2 26 dB Bandwidth

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

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11a	5180	36	20.00	16.295
	5200	40	19.29	16.301
	5240	48	19.66	16.305
	5260	52	19.56	16.300
	5300	60	19.61	16.301
	5320	64	19.55	16.293
	5500	100	19.24	16.297
	5580	116	18.80	16.294
	5720	144	19.48	16.315
	5745	149	19.22	16.313
	5785	157	19.38	16.281
	5825	165	19.68	16.308

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11n (HT20)	5180	36	20.66	17.403
	5200	40	20.71	17.416
	5240	48	21.22	17.413
	5260	52	20.53	17.403
	5300	60	20.74	17.422
	5320	64	20.53	17.413
	5500	100	20.38	17.411
	5580	116	20.61	17.420
	5720	144	20.74	17.408
	5745	149	20.69	17.410
	5785	157	20.57	17.419
	5825	165	20.70	17.400

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT20)	5180	36	20.67	17.402
	5200	40	20.61	17.411
	5240	48	21.07	17.412
	5260	52	20.63	17.411
	5300	60	20.74	17.415
	5320	64	20.58	17.421
	5500	100	20.44	17.409
	5580	116	20.44	17.410
	5720	144	20.68	17.411
	5745	149	20.64	17.398
	5785	157	20.42	17.416
5825	165	20.59	17.400	

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11n (HT40)	5190	38	44.04	35.878
	5230	46	40.97	35.917
	5270	54	44.68	35.909
	5310	62	41.98	35.922
	5510	102	43.47	35.869
	5550	110	41.03	35.904
	5710	142	41.50	35.884
	5755	151	40.82	35.878
	5795	159	43.03	35.883

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT40)	5190	38	41.23	35.852
	5230	46	42.36	35.848
	5270	54	42.16	35.867
	5310	62	42.52	35.859
	5510	102	43.14	35.851
	5550	110	42.42	35.837
	5710	142	42.04	35.845
	5755	151	41.30	35.822
	5795	159	44.01	35.862

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT80)	5210	42	81.55	74.949
	5290	58	82.09	74.929
	5530	106	82.95	74.986
	5690	138	82.76	74.931
	5775	155	81.74	74.909

▣ Test Plots

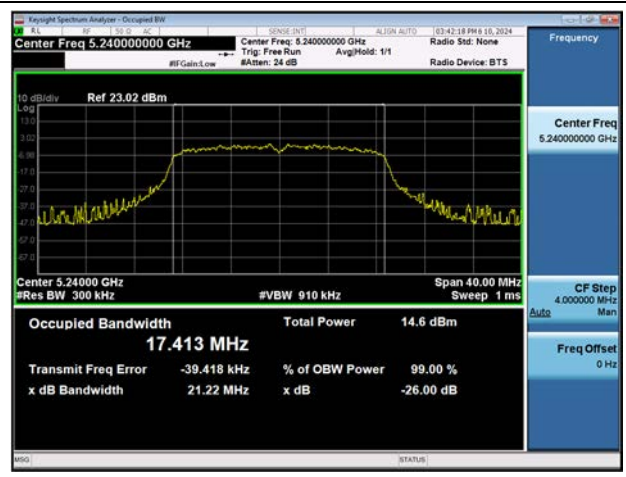
Note:

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

802.11a 26 dB Bandwidth (CH 36)



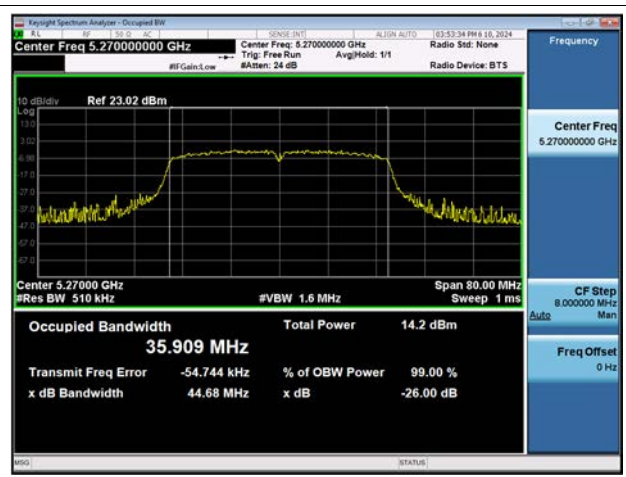
802.11n(HT20) 26 dB Bandwidth (CH 48)



802.11ac(VHT20) 26 dB Bandwidth (CH 48)



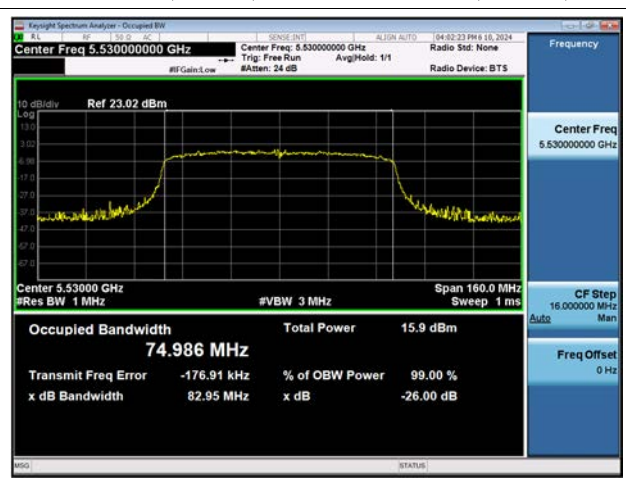
802.11n(HT40) 26 dB Bandwidth (CH 54)



802.11ac(VHT40) 26 dB Bandwidth (CH 159)



802.11ac(VHT80) 26 dB Bandwidth (CH 106)



10.3 6 dB BANDWIDTH

Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11a	5745	149	15.17	> 0.5
	5785	157	15.13	> 0.5
	5825	165	15.13	> 0.5

Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT20)	5745	149	15.16	0.500
	5785	157	15.47	0.500
	5825	165	15.17	0.500

Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT20)	5745	149	15.10	0.500
	5785	157	15.17	0.500
	5825	165	15.46	0.500

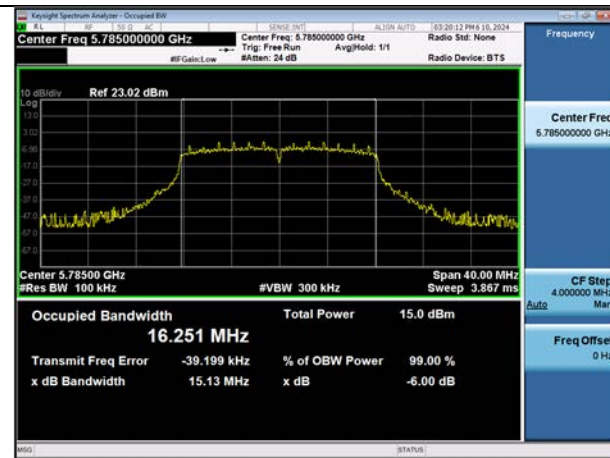
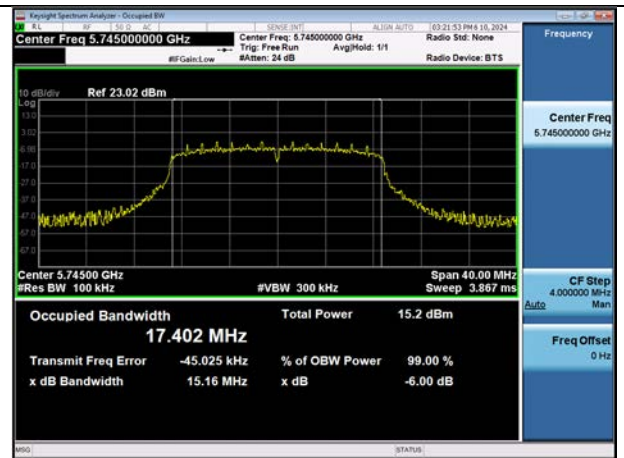
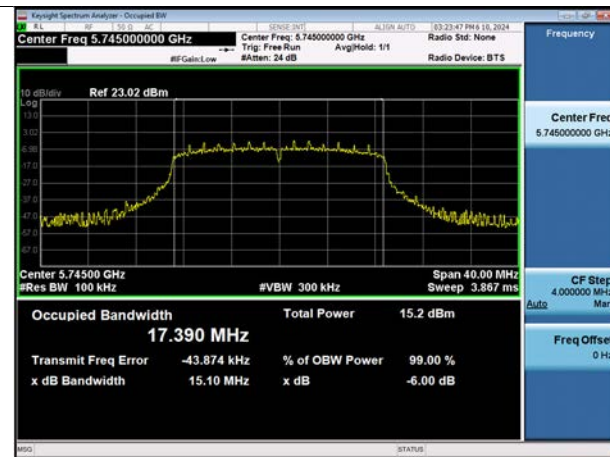
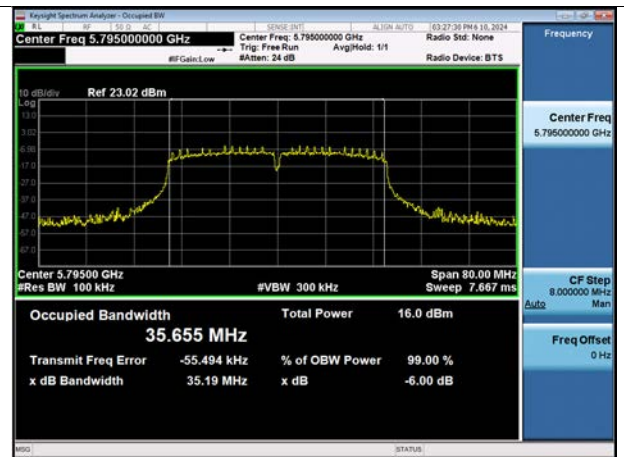
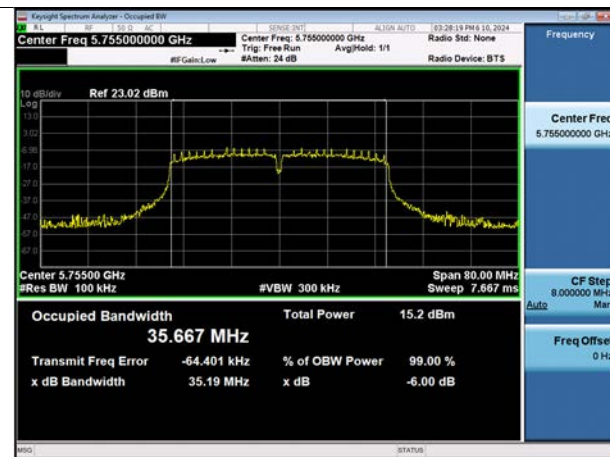
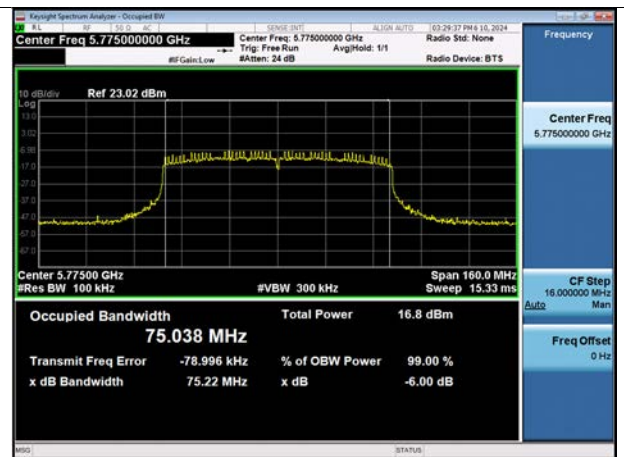
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	5755	151	35.20	0.500
	5795	159	35.19	0.500

Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT40)	5755	151	35.19	0.500
	5795	159	35.20	0.500

Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	5775	155	75.22	0.500

Test Plots

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

802.11a (CH.157)

802.11n(HT20) (CH.149)

802.11ac(VHT20) (CH.149)

802.11n(HT40) (CH.159)

802.11ac(VHT40) (CH.151)

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.

Note:

1. Limit

(UNII 1) : 23.98 dBm

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

(UNII 3) : 30.00 dBm

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

Frequency [MHz]	Channel	Datarate	Mode	Mea.Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5180	36	6M	a	7.05	0.18	7.23	23.98
5200	40	6M	a	7.65	0.18	7.83	23.98
5240	48	6M	a	7.62	0.18	7.80	23.98
5260	52	6M	a	7.46	0.18	7.64	23.91
5300	60	6M	a	7.50	0.18	7.68	23.92
5320	64	6M	a	7.40	0.18	7.58	23.91
5500	100	6M	a	7.37	0.18	7.55	23.84
5580	116	6M	a	7.48	0.18	7.66	23.74
5720	144	6M	a	7.40	0.18	7.58	23.90
5745	149	6M	a	7.64	0.18	7.82	30.00
5785	157	6M	a	6.97	0.18	7.15	30.00
5825	165	6M	a	6.82	0.18	7.00	30.00

Frequency [MHz]	Channel	Datarate	Mode	Mea. Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5180	36	MCS0	n20	7.59	0.19	7.78	23.98
5200	40	MCS0	n20	7.20	0.19	7.39	23.98
5240	48	MCS0	n20	7.28	0.19	7.47	23.98
5260	52	MCS0	n20	7.08	0.19	7.27	23.98
5300	60	MCS0	n20	7.18	0.19	7.37	23.98
5320	64	MCS0	n20	6.98	0.19	7.17	23.98
5500	100	MCS0	n20	6.82	0.19	7.01	23.98
5580	116	MCS0	n20	7.48	0.19	7.67	23.98
5720	144	MCS0	n20	7.22	0.19	7.41	23.98
5745	149	MCS0	n20	7.40	0.19	7.59	30.00
5785	157	MCS0	n20	7.58	0.19	7.77	30.00
5825	165	MCS0	n20	7.42	0.19	7.61	30.00

Frequency [MHz]	Channel	Datarate	Mode	Mea. Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5180	36	MCS0	ac20	7.62	0.21	7.83	23.98
5200	40	MCS0	ac20	7.22	0.21	7.43	23.98
5240	48	MCS0	ac20	7.24	0.21	7.45	23.98
5260	52	MCS0	ac20	7.19	0.21	7.40	23.98
5300	60	MCS0	ac20	7.21	0.21	7.42	23.98
5320	64	MCS0	ac20	6.81	0.21	7.02	23.98
5500	100	MCS0	ac20	6.78	0.21	6.99	23.98
5580	116	MCS0	ac20	7.38	0.21	7.59	23.98
5720	144	MCS0	ac20	7.21	0.21	7.42	23.98
5745	149	MCS0	ac20	7.55	0.21	7.76	30.00
5785	157	MCS0	ac20	7.65	0.21	7.86	30.00
5825	165	MCS0	ac20	7.41	0.21	7.62	30.00

Frequency [MHz]	Channel	Datarate	Mode	Mea. Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5190	38	MCS0	n40	7.20	0.36	7.56	23.98
5230	46	MCS0	n40	7.11	0.36	7.47	23.98
5270	54	MCS0	n40	6.86	0.36	7.22	23.98
5310	62	MCS0	n40	6.98	0.36	7.34	23.98
5510	102	MCS0	n40	7.40	0.36	7.76	23.98
5550	110	MCS0	n40	7.47	0.36	7.83	23.98
5710	142	MCS0	n40	7.00	0.36	7.36	23.98
5755	151	MCS0	n40	7.17	0.36	7.53	30.00
5795	159	MCS0	n40	7.50	0.36	7.86	30.00

Frequency [MHz]	Channel	Datarate	Mode	Mea. Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5190	38	MCS0	ac40	7.47	0.37	7.84	23.98
5230	46	MCS0	ac40	7.07	0.37	7.44	23.98
5270	54	MCS0	ac40	7.08	0.37	7.45	23.98
5310	62	MCS0	ac40	7.05	0.37	7.42	23.98
5510	102	MCS0	ac40	6.71	0.37	7.08	23.98
5550	110	MCS0	ac40	6.63	0.37	7.00	23.98
5710	142	MCS0	ac40	7.16	0.37	7.53	23.98
5755	151	MCS0	ac40	7.35	0.37	7.72	30.00
5795	159	MCS0	ac40	7.50	0.37	7.87	30.00

Frequency [MHz]	Channel	Datarate	Mode	Mea. Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5210	42	MCS0	ac80	6.81	0.72	7.53	23.98
5290	58	MCS0	ac80	7.10	0.72	7.82	23.98
5530	106	MCS0	ac80	6.70	0.72	7.42	23.98
5690	138	MCS0	ac80	6.54	0.72	7.26	23.98
5775	155	MCS0	ac80	6.78	0.72	7.50	30.00

10.5 POWER SPECTRAL DENSITY

Note:

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

Frequency [MHz]	Channel	Datarate	Mode	Mea. PSD [dBm/MHz]	D.C.F [dB]	Total PSD [dBm/MHz]	Limit
5180	36	6M	a	-3.973	0.181	-3.792	11 dBm/MHz
5200	40	6M	a	-3.023	0.181	-2.842	11 dBm/MHz
5240	48	6M	a	-3.892	0.181	-3.711	11 dBm/MHz
5260	52	6M	a	-3.244	0.181	-3.063	11 dBm/MHz
5300	60	6M	a	-2.874	0.181	-2.693	11 dBm/MHz
5320	64	6M	a	-3.209	0.181	-3.028	11 dBm/MHz
5500	100	6M	a	-3.196	0.181	-3.015	11 dBm/MHz
5580	116	6M	a	-2.926	0.181	-2.745	11 dBm/MHz
5720	144	6M	a	-3.456	0.181	-3.275	11 dBm/MHz
5745	149	6M	a	-5.498	0.181	-5.317	30 dBm/500kHz
5785	157	6M	a	-6.155	0.181	-5.974	30 dBm/500kHz
5825	165	6M	a	-6.356	0.181	-6.175	30 dBm/500kHz

Frequency [MHz]	Channel	Datarate	Mode	Mea. PSD [dBm/MHz]	D.C.F [dB]	Total PSD [dBm/MHz]	Limit
5180	36	MCS0	n20	-3.433	0.192	-3.241	11 dBm/MHz
5200	40	MCS0	n20	-3.605	0.192	-3.413	11 dBm/MHz
5240	48	MCS0	n20	-3.440	0.192	-3.248	11 dBm/MHz
5260	52	MCS0	n20	-3.809	0.192	-3.617	11 dBm/MHz
5300	60	MCS0	n20	-3.239	0.192	-3.047	11 dBm/MHz
5320	64	MCS0	n20	-3.756	0.192	-3.564	11 dBm/MHz
5500	100	MCS0	n20	-3.632	0.192	-3.440	11 dBm/MHz
5580	116	MCS0	n20	-3.300	0.192	-3.108	11 dBm/MHz
5720	144	MCS0	n20	-3.755	0.192	-3.563	11 dBm/MHz
5745	149	MCS0	n20	-6.081	0.192	-5.889	30 dBm/500kHz
5785	157	MCS0	n20	-5.633	0.192	-5.441	30 dBm/500kHz
5825	165	MCS0	n20	-5.833	0.192	-5.641	30 dBm/500kHz

Frequency [MHz]	Channel	Datarate	Mode	Mea. PSD [dBm/MHz]	D.C.F [dB]	Total PSD [dBm/MHz]	Limit
5180	36	MCS0	ac20	-3.520	0.209	-3.311	11 dBm/MHz
5200	40	MCS0	ac20	-3.495	0.209	-3.286	11 dBm/MHz
5240	48	MCS0	ac20	-3.498	0.209	-3.289	11 dBm/MHz
5260	52	MCS0	ac20	-3.678	0.209	-3.469	11 dBm/MHz
5300	60	MCS0	ac20	-3.391	0.209	-3.182	11 dBm/MHz
5320	64	MCS0	ac20	-3.684	0.209	-3.475	11 dBm/MHz
5500	100	MCS0	ac20	-2.728	0.209	-2.519	11 dBm/MHz
5580	116	MCS0	ac20	-3.339	0.209	-3.130	11 dBm/MHz
5720	144	MCS0	ac20	-3.717	0.209	-3.508	11 dBm/MHz
5745	149	MCS0	ac20	-5.914	0.209	-5.705	30 dBm/500kHz
5785	157	MCS0	ac20	-5.709	0.209	-5.500	30 dBm/500kHz
5825	165	MCS0	ac20	-5.713	0.209	-5.504	30 dBm/500kHz

Frequency [MHz]	Channel	Datarate	Mode	Mea. PSD [dBm/MHz]	D.C.F [dB]	Total PSD [dBm/MHz]	Limit
5190	38	MCS0	n40	-6.669	0.360	-6.309	11 dBm/MHz
5230	46	MCS0	n40	-6.993	0.360	-6.633	11 dBm/MHz
5270	54	MCS0	n40	-6.989	0.360	-6.629	11 dBm/MHz
5310	62	MCS0	n40	-6.764	0.360	-6.404	11 dBm/MHz
5510	102	MCS0	n40	-6.134	0.360	-5.774	11 dBm/MHz
5550	110	MCS0	n40	-5.907	0.360	-5.547	11 dBm/MHz
5710	142	MCS0	n40	-7.113	0.360	-6.753	11 dBm/MHz
5755	151	MCS0	n40	-9.644	0.360	-9.284	30 dBm/500kHz
5795	159	MCS0	n40	-9.020	0.360	-8.660	30 dBm/500kHz

Frequency [MHz]	Channel	Datarate	Mode	Mea. PSD [dBm/MHz]	D.C.F [dB]	Total PSD [dBm/MHz]	Limit
5190	38	MCS0	ac40	-6.797	0.371	-6.426	11 dBm/MHz
5230	46	MCS0	ac40	-6.988	0.371	-6.617	11 dBm/MHz
5270	54	MCS0	ac40	-7.087	0.371	-6.716	11 dBm/MHz
5310	62	MCS0	ac40	-6.738	0.371	-6.367	11 dBm/MHz
5510	102	MCS0	ac40	-7.074	0.371	-6.703	11 dBm/MHz
5550	110	MCS0	ac40	-6.850	0.371	-6.479	11 dBm/MHz
5710	142	MCS0	ac40	-7.100	0.371	-6.729	11 dBm/MHz
5755	151	MCS0	ac40	-9.616	0.371	-9.245	30 dBm/500kHz
5795	159	MCS0	ac40	-8.927	0.371	-8.556	30 dBm/500kHz

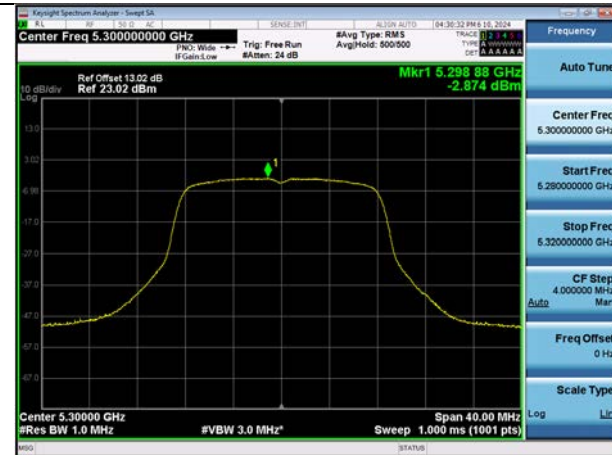
Frequency [MHz]	Channel	Datarate	Mode	Mea. PSD [dBm/MHz]	D.C.F [dB]	Total PSD [dBm/MHz]	Limit
5210	42	MCS0	ac80	-10.397	0.718	-9.679	11 dBm/MHz
5290	58	MCS0	ac80	-9.909	0.718	-9.191	11 dBm/MHz
5530	106	MCS0	ac80	-10.153	0.718	-9.435	11 dBm/MHz
5690	138	MCS0	ac80	-10.672	0.718	-9.954	11 dBm/MHz
5775	155	MCS0	ac80	-13.327	0.718	-12.609	30 dBm/500kHz

Test Plots

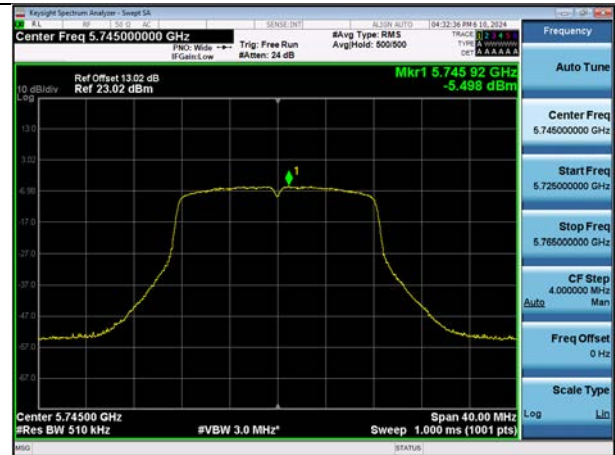
Note:

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

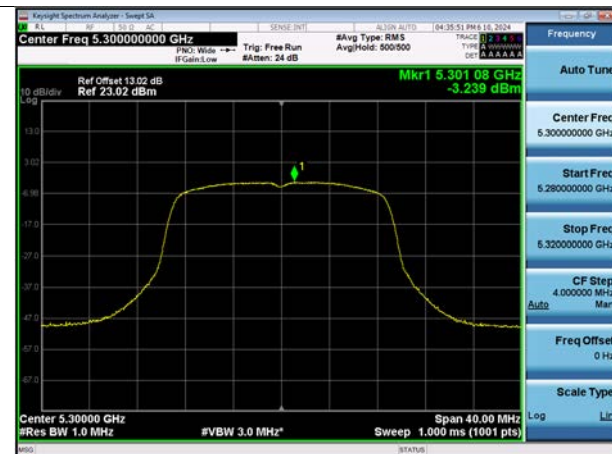
802.11a UNII 1-2C (Ch.60)



802.11a UNII 3 (Ch.149)



802.11n(HT20) UNII 1-2C (Ch.60)



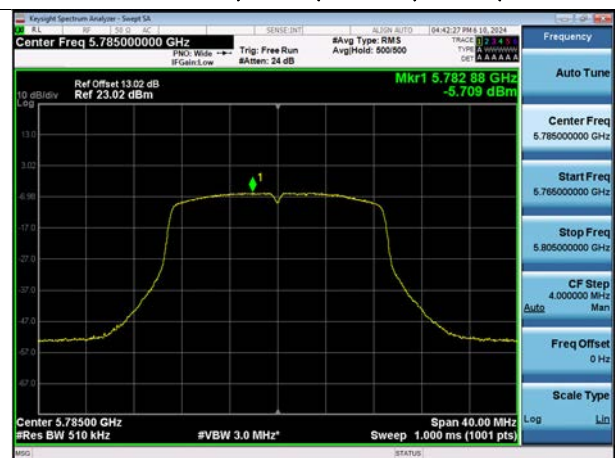
802.11 n(HT20) UNII 3 (Ch.157)



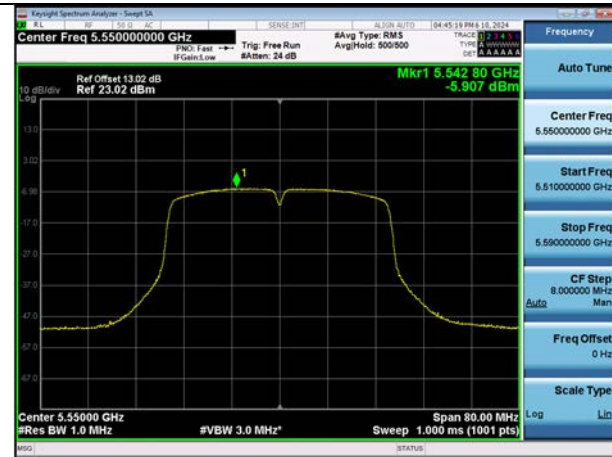
802.11ac(VHT20) UNII 1-2C (Ch.100)



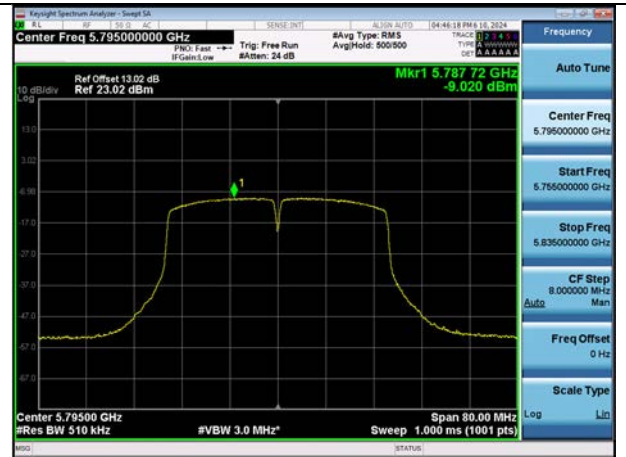
802.11 ac(VHT20) UNII 3 (Ch.157)



802.11n(HT40) UNII 1-2C (Ch.110)



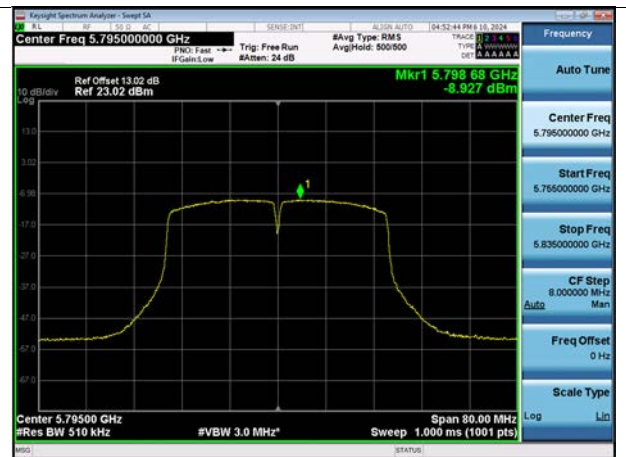
802.11n(HT40) UNII 3 (Ch.159)



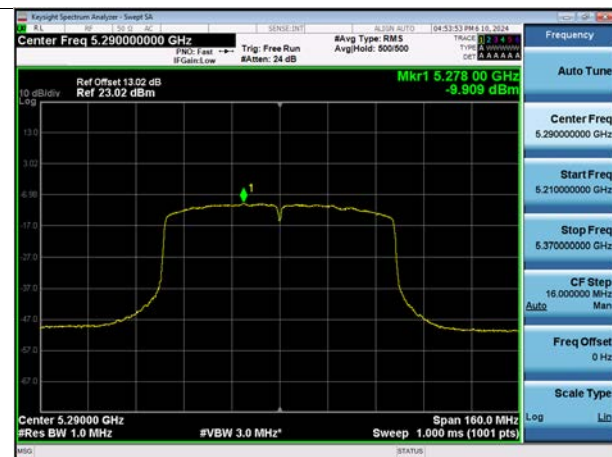
802.11ac(VHT40) UNII 1-2C (Ch.62)



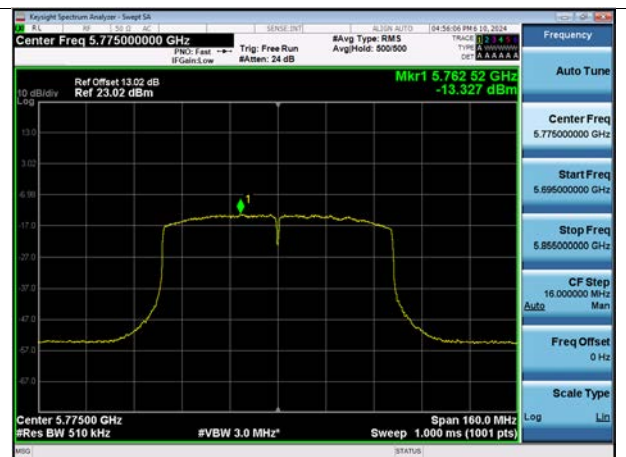
802.11 ac(VHT40) UNII 3 (Ch.159)



802.11ac(VHT80) UNII 1-2C (Ch.58)



802.11 ac(VHT80) UNII 3 (Ch.155)



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

Startup after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5210002.09	2.09
100%		-30	5210048.64	48.64
100%		-20	5210094.40	94.40
100%		-10	5210082.52	82.52
100%		0	5210021.22	21.22
100%		+10	5210082.42	82.42
100%		+30	5210036.12	36.12
100%		+40	5210051.24	51.24
100%		+50	5210089.08	89.08
High		4.2	+20	5210066.82
Low	3.6	+20	5210049.20	49.20

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5290082.86	82.86
100%		-30	5290063.72	63.72
100%		-20	5290056.53	56.53
100%		-10	5290072.29	72.29
100%		0	5290010.87	10.87
100%		+10	5290058.90	58.90
100%		+30	5290015.50	15.50
100%		+40	5290045.31	45.31
100%		+50	5290048.78	48.78
High		4.2	+20	5290084.66
Low	3.6	+20	5290083.69	83.69

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5690096.57	96.57
100%		-30	5690003.04	3.04
100%		-20	5690004.60	4.60
100%		-10	5690015.35	15.35
100%		0	5690074.77	74.77
100%		+10	5690046.71	46.71
100%		+30	5690026.67	26.67
100%		+40	5690019.48	19.48
100%		+50	5690098.80	98.80
High		4.2	+20	5690018.28
Low	3.6	+20	5690029.58	29.58

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5775021.95	21.95
100%		-30	5775019.41	19.41
100%		-20	5775099.00	99.00
100%		-10	5775098.17	98.17
100%		0	5775034.38	34.38
100%		+10	5775083.05	83.05
100%		+30	5775086.28	86.28
100%		+40	5775011.91	11.91
100%		+50	5775022.89	22.89
High		4.2	+20	5775094.29
Low	3.6	+20	5775078.78	78.78

2 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5210004.01	4.01
100%		-30	5210019.49	19.49
100%		-20	5210025.88	25.88
100%		-10	5210053.99	53.99
100%		0	5210052.92	52.92
100%		+10	5210092.78	92.78
100%		+30	5210011.71	11.71
100%		+40	5210036.12	36.12
100%		+50	5210005.91	5.91
High		4.2	+20	5210082.05
Low	3.6	+20	5210066.72	66.72

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5290028.07	28.07
100%		-30	5290046.20	46.20
100%		-20	5290040.11	40.11
100%		-10	5290044.08	44.08
100%		0	5290065.92	65.92
100%		+10	5290073.68	73.68
100%		+30	5290017.69	17.69
100%		+40	5290076.58	76.58
100%		+50	5290037.06	37.06
High		4.2	+20	5290004.64
Low	3.6	+20	5290043.44	43.44

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5690089.85	89.85
100%		-30	5690077.99	77.99
100%		-20	5690092.92	92.92
100%		-10	5690034.91	34.91
100%		0	5690075.22	75.22
100%		+10	5690093.86	93.86
100%		+30	5690015.57	15.57
100%		+40	5690016.39	16.39
100%		+50	5690055.05	55.05
High		4.2	+20	5690076.65
Low	3.6	+20	5690073.24	73.24

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5775014.51	14.51
100%		-30	5775021.01	21.01
100%		-20	5775071.26	71.26
100%		-10	5775007.11	7.11
100%		0	5775079.71	79.71
100%		+10	5775043.68	43.68
100%		+30	5775020.29	20.29
100%		+40	5775074.03	74.03
100%		+50	5775020.55	20.55
High		4.2	+20	5775040.85
Low	3.6	+20	5775087.06	87.06

5 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5210095.05	95.05
100%		-30	5210073.67	73.67
100%		-20	5210044.88	44.88
100%		-10	5210029.67	29.67
100%		0	5210016.11	16.11
100%		+10	5210035.08	35.08
100%		+30	5210033.83	33.83
100%		+40	5210022.86	22.86
100%		+50	5210080.16	80.16
High		4.2	+20	5210091.43
Low	3.6	+20	5210088.14	88.14

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5290079.71	79.71
100%		-30	5290058.35	58.35
100%		-20	5290076.31	76.31
100%		-10	5290022.74	22.74
100%		0	5290082.60	82.60
100%		+10	5290097.02	97.02
100%		+30	5290092.41	92.41
100%		+40	5290039.42	39.42
100%		+50	5290016.66	16.66
High		4.2	+20	5290046.60
Low	3.6	+20	5290089.73	89.73

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5690036.41	36.41
100%		-30	5690038.68	38.68
100%		-20	5690064.79	64.79
100%		-10	5690082.24	82.24
100%		0	5690057.58	57.58
100%		+10	5690007.78	7.78
100%		+30	5690086.80	86.80
100%		+40	5690067.92	67.92
100%		+50	5690081.83	81.83
High		4.2	+20	5690026.28
Low	3.6	+20	5690066.25	66.25

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5775026.02	26.02
100%		-30	5775039.30	39.30
100%		-20	5775085.63	85.63
100%		-10	5775022.91	22.91
100%		0	5775048.49	48.49
100%		+10	5775095.65	95.65
100%		+30	5775019.77	19.77
100%		+40	5775066.45	66.45
100%		+50	5775006.52	6.52
High		4.2	+20	5775023.33
Low	3.6	+20	5775012.69	12.69

10 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5210036.50	36.50
100%		-30	5210053.93	53.93
100%		-20	5210080.52	80.52
100%		-10	5210071.61	71.61
100%		0	5210049.05	49.05
100%		+10	5210001.08	1.08
100%		+30	5210023.13	23.13
100%		+40	5210075.24	75.24
100%		+50	5210053.96	53.96
High		4.2	+20	5210021.58
Low	3.6	+20	5210096.85	96.85

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5290079.91	79.91
100%		-30	5290055.06	55.06
100%		-20	5290047.11	47.11
100%		-10	5290013.15	13.15
100%		0	5290082.47	82.47
100%		+10	5290009.16	9.16
100%		+30	5290087.30	87.30
100%		+40	5290087.38	87.38
100%		+50	5290058.43	58.43
High		4.2	+20	5290088.40
Low	3.6	+20	5290045.75	45.75

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5690080.20	80.20
100%		-30	5690055.83	55.83
100%		-20	5690024.76	24.76
100%		-10	5690058.48	58.48
100%		0	5690096.42	96.42
100%		+10	5690024.69	24.69
100%		+30	5690010.91	10.91
100%		+40	5690030.07	30.07
100%		+50	5690047.35	47.35
High		4.2	+20	5690060.51
Low	3.6	+20	5690012.16	12.16

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.70 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.7	+20(Ref)	5775021.41	21.41
100%		-30	5775086.55	86.55
100%		-20	5775077.22	77.22
100%		-10	5775051.54	51.54
100%		0	5775089.86	89.86
100%		+10	5775066.38	66.38
100%		+30	5775049.46	49.46
100%		+40	5775024.48	24.48
100%		+50	5775082.45	82.45
High		4.2	+20	5775058.52
Low	3.6	+20	5775075.32	75.32

10.7 STRADDLE CHANNEL

10.7.1 26 dB Bandwidth

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26 dB Bandwidth [MHz]
802.11a	UNII 2C	5720	144	5709.76	15.24
802.11n(HT20)				5709.60	15.40
802.11ac(VHT20)				5709.52	15.48
802.11a	UNII 3	5720	144	5729.52	4.52
802.11n(HT20)				5730.32	5.32
802.11ac(VHT20)				5730.16	5.16

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26 dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5687.92	37.08
802.11ac(VHT40)				5689.68	35.32
802.11n(HT40)	UNII 3	5710	142	5730.96	5.96
802.11ac(VHT40)				5731.92	6.92

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26 dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5649.20	75.80
	UNII 3	5690	138	5730.64	5.64

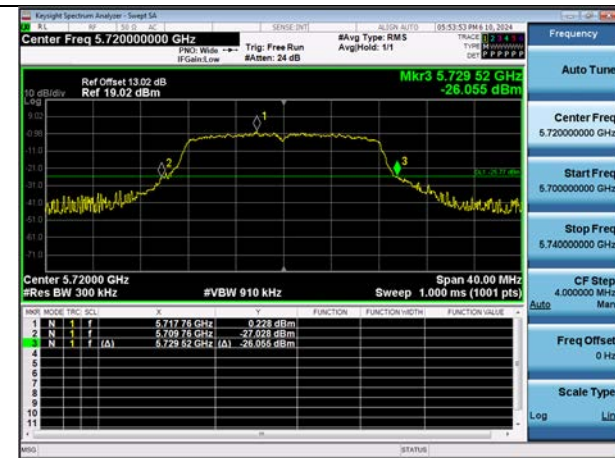
Note:

[UNII 2C] 26 dB Bandwidth = 5 725 MHz - Measured Frequency[MHz]

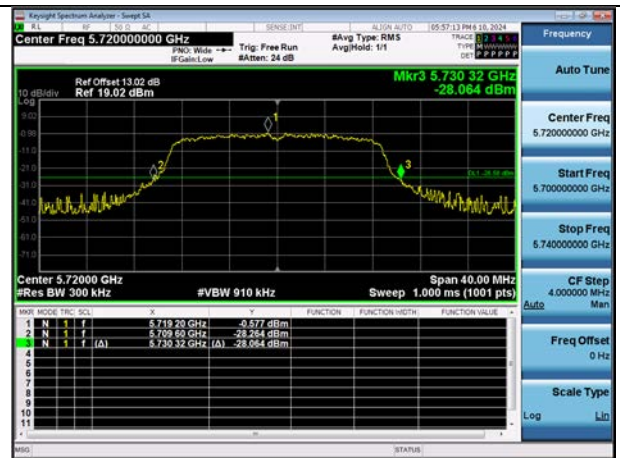
[UNII 3C] 26 dB Bandwidth = Measured Frequency[MHz] – 5 725 MHz

Test Plots (26 dB Bandwidth)

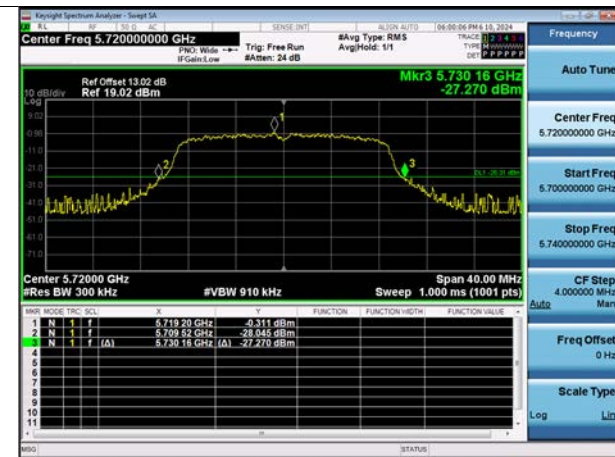
802.11a UNII Band



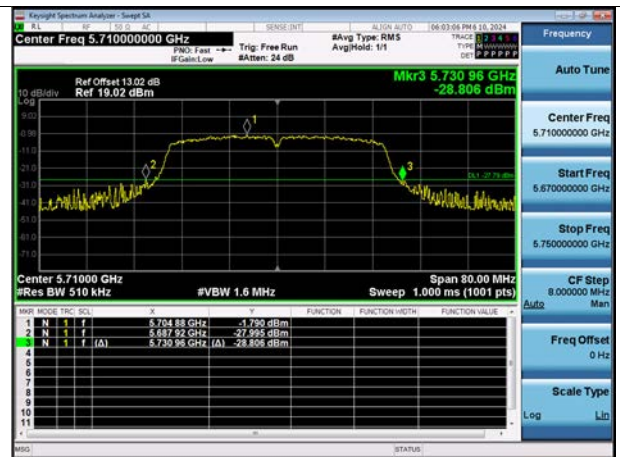
802.11n(HT20) UNII Band



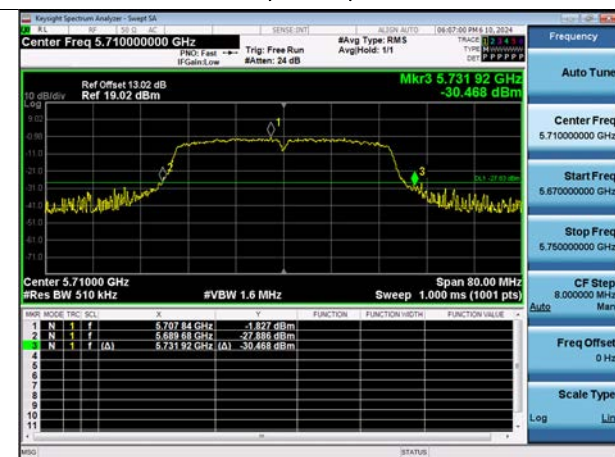
802.11ac(VHT20) UNII Band



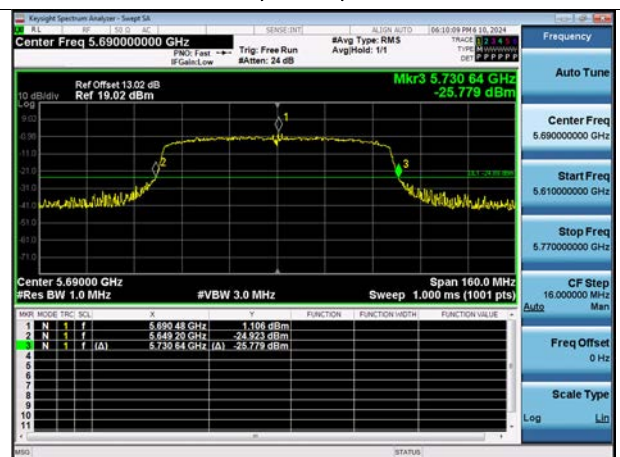
802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band



802.11ac(VHT80) UNII Band



10.7.2 6 dB Bandwidth

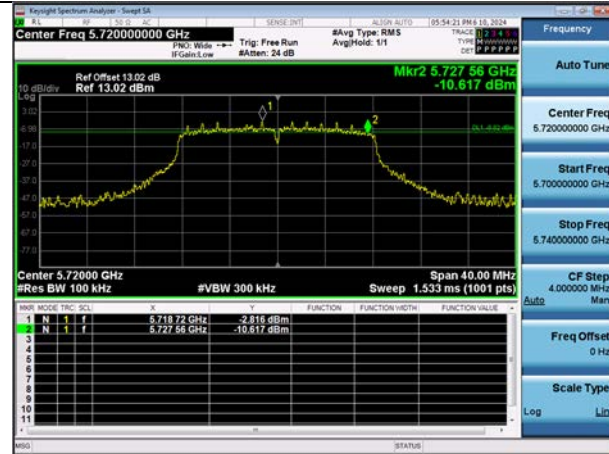
Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11a	UNII3	5720	144	5727.56	2.56	> 0.5
802.11n(HT20)				5727.56	2.56	> 0.5
802.11ac(VHT20)				5727.56	2.56	> 0.5
802.11n(HT40)	UNII3	5710	142	5727.60	2.60	> 0.5
802.11ac(VHT40)				5727.60	2.60	> 0.5
802.11ac(VHT80)	UNII3	5690	138	5727.60	2.60	> 0.5

Note:

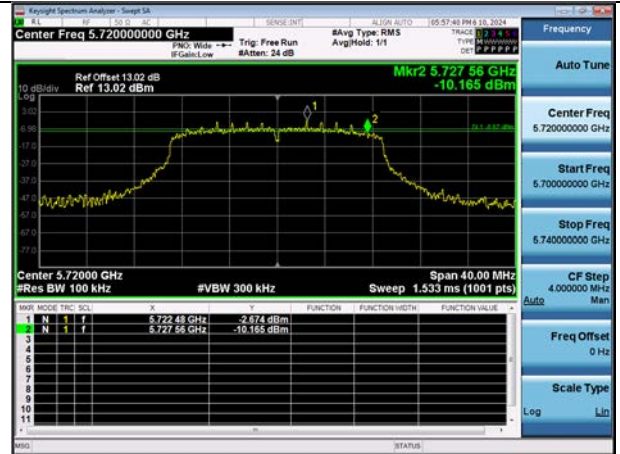
6 dB Bandwidth = Measured Frequency[MHz] - 5 725MHz

☐ Test Plots (UNII 3 Band 6 dB Bandwidth)

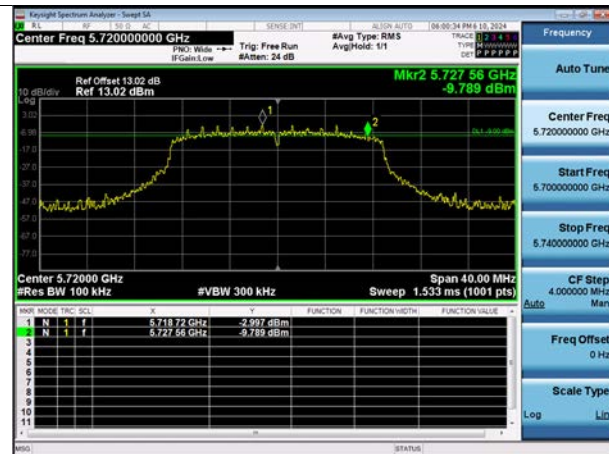
802.11a UNII Band



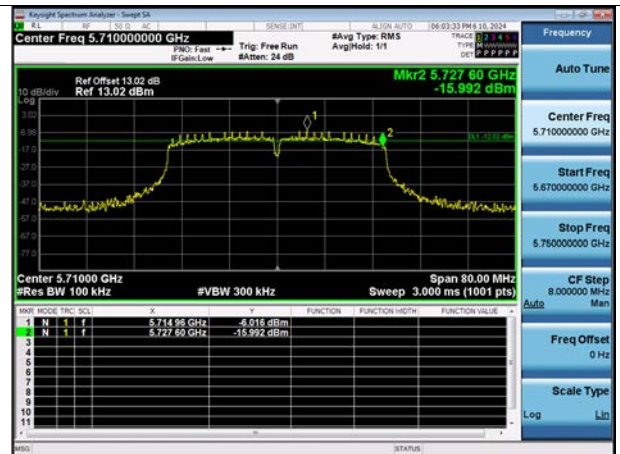
802.11n(HT20) UNII Band



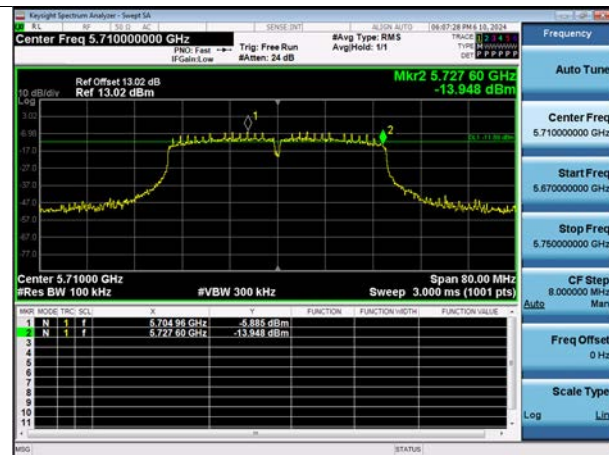
802.11ac(VHT20) UNII Band



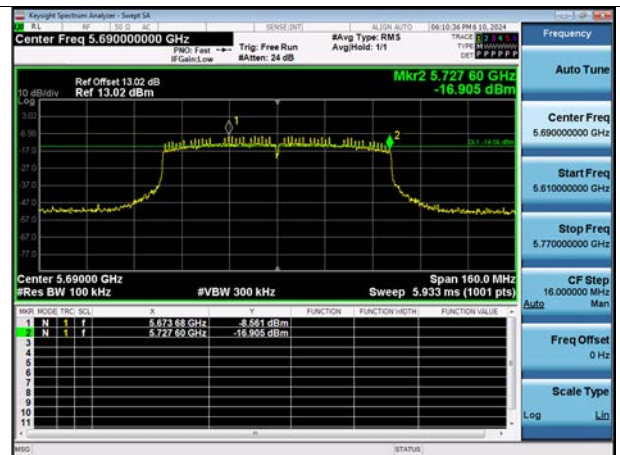
802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band



802.11ac(VHT80) UNII Band



10.7.3 Output Power

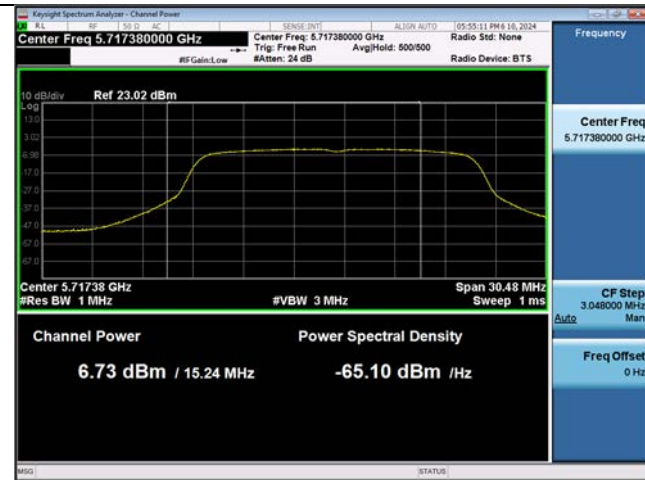
Mode	Frequency [MHz]	Channel	Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]	Worstcase Datarate
802.11a	5720	144	6.73	0.181	6.91	22.83	6 Mbps
802.11n(HT20)	(UNII 2C		6.47	0.192	6.66	22.88	MCS0
802.11ac(VHT20)	Band)		6.53	0.209	6.73	22.90	MCS0
802.11a	5720	144	-0.65	0.181	-0.46	30.00	6 Mbps
802.11n(HT20)	(UNII 3		-0.51	0.192	-0.32	30.00	MCS0
802.11ac(VHT20)	Band)		-0.44	0.209	-0.23	30.00	MCS0

Mode	Frequency [MHz]	Channel	Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]	Worstcase Datarate
802.11n(HT40)	5710	142	6.84	0.360	7.20	23.98	MCS0
802.11ac(VHT40)	(UNII 2C Band)		6.91	0.371	7.28	23.98	MCS0
802.11n(HT40)	5710	142	-5.64	0.360	-5.28	30.00	MCS0
802.11ac(VHT40)	(UNII 3 Band)		-5.60	0.371	-5.23	30.00	MCS0

Mode	Frequency [MHz]	Channel	Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]	Worstcase Datarate
802.11ac(VHT80)	5690 (UNII 2C Band)	138	6.56	0.718	7.28	23.98	MCS0
	5690 (UNII 3 Band)	138	-10.13	0.718	-9.41	30.00	MCS0

☐ Test Plots(Straddle Output Power)

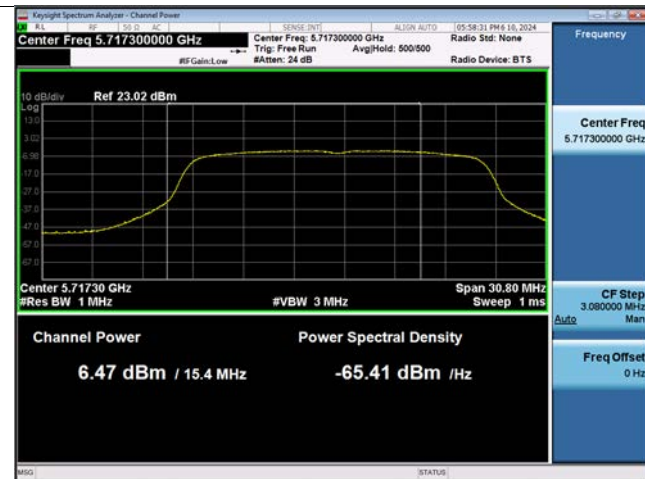
802.11a UNII 2C Band



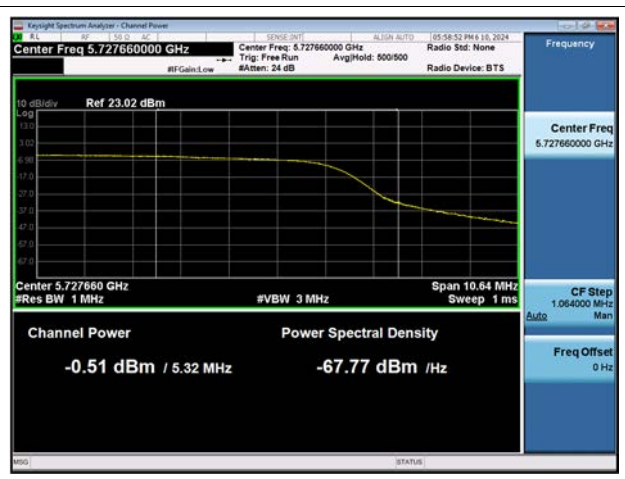
802.11a UNII 3 Band



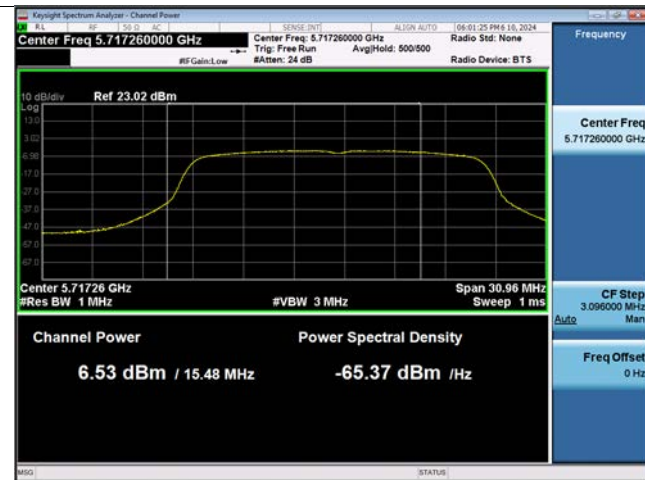
802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



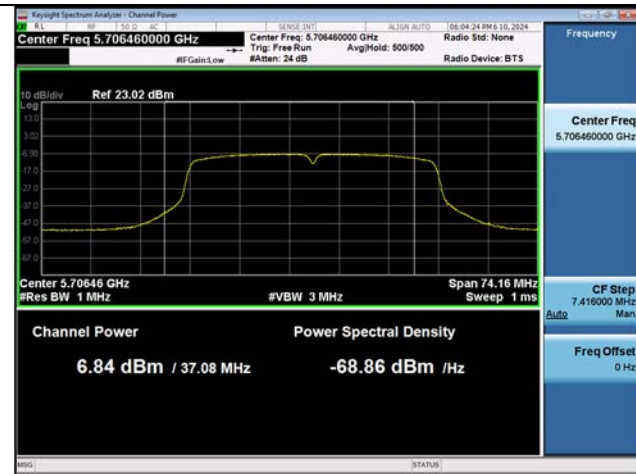
802.11ac(VHT20) UNII 2C Band



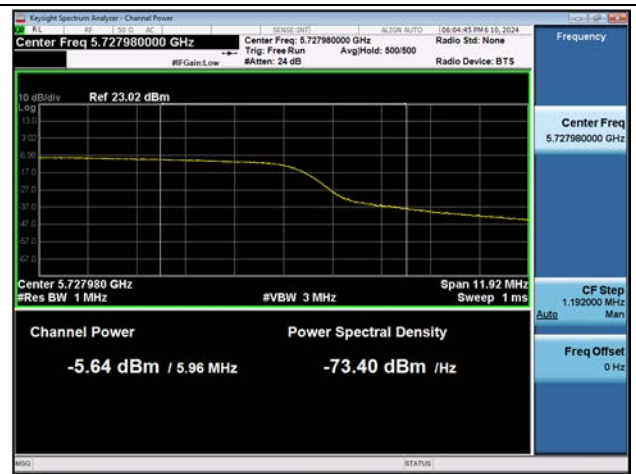
802.11ac(VHT20) UNII 3 Band



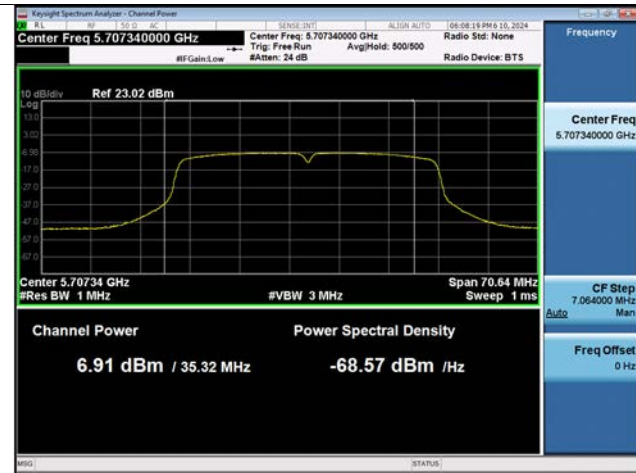
802.11n(HT40) UNII 2C Band



802.11n(HT40) UNII 3 Band



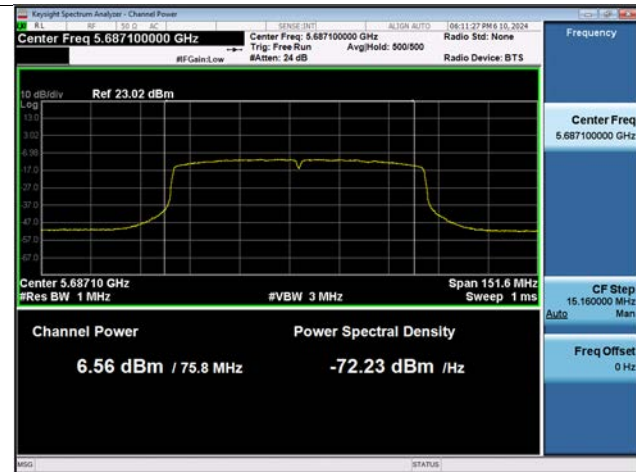
802.11ac(VHT40) UNII 2C Band



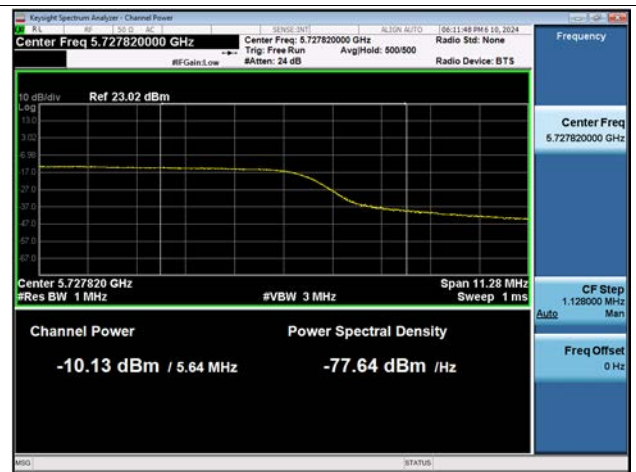
802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band



802.11ac(VHT80) UNII 3 Band



10.7.4 Power Spectral Density

Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11a	5720	144	-3.259	0.181	-3.077	11	6 Mbps
802.11n(HT20)	(UNII 2C		-3.714	0.192	-3.522	dBm/ MHz	MCS0
802.11ac(VHT20)	Band)		-3.622	0.209	-3.413		
802.11a	5720	144	-7.180	0.181	-6.999	30	6 Mbps
802.11n(HT20)	(UNII 3		-7.448	0.192	-7.256	dBm/ 500 kHz	MCS0
802.11ac(VHT20)	Band)		-7.476	0.209	-7.267		

Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11n(HT40)	5710	142	-6.872	0.360	-6.513	11	MCS0
802.11ac(VHT40)	(UNII 2C Band)		-6.813	0.371	-6.442	dBm/ MHz	MCS0
802.11n(HT40)	5710	142	-12.575	0.360	-12.215		30 dB
802.11ac(VHT40)	(UNII 3 Band)		-12.331	0.371	-11.959	m/500 kHz	MCS0

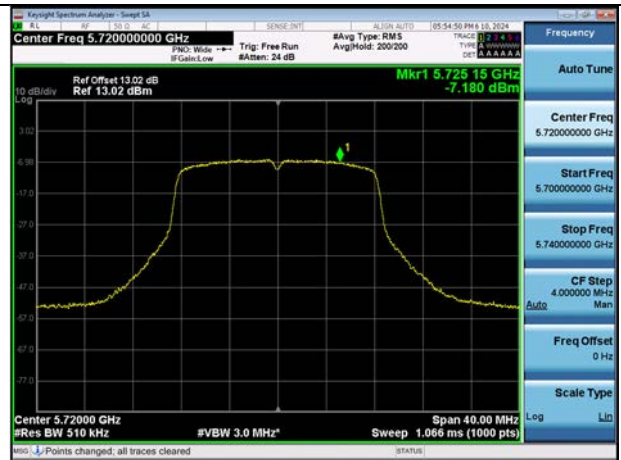
Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11ac(VHT80)	5690	138	-10.454	0.718	-9.735	11	MCS0
	(UNII 2C Band)					dBm/ MHz	
	5690	138	-17.286	0.718	-16.568	30 dB	MCS0
	(UNII 3 Band)					m/500 kHz	

▣ Test Plots(Straddle Power Spectral Density)

802.11a UNII 2C Band



802.11a UNII 3 Band



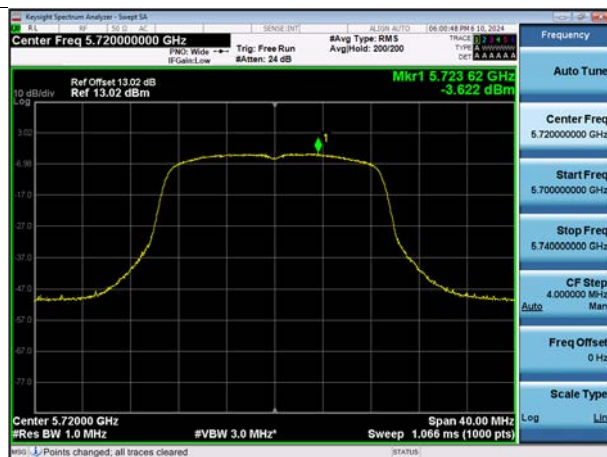
802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



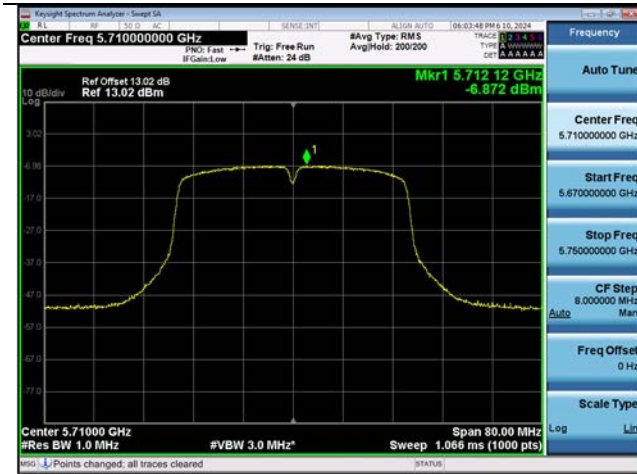
802.11ac(VHT20) UNII 2C Band



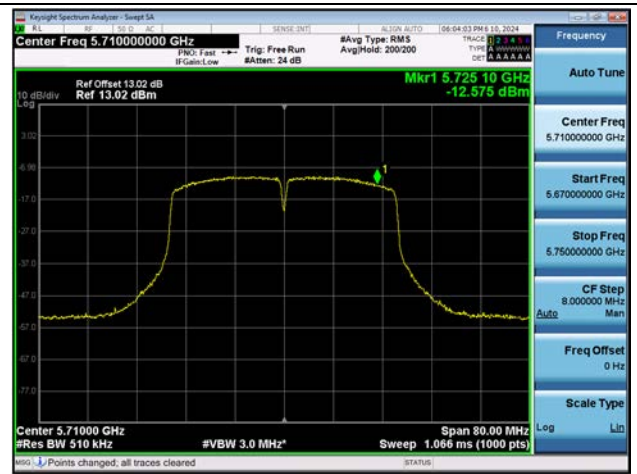
802.11ac(VHT20) UNII 3 Band



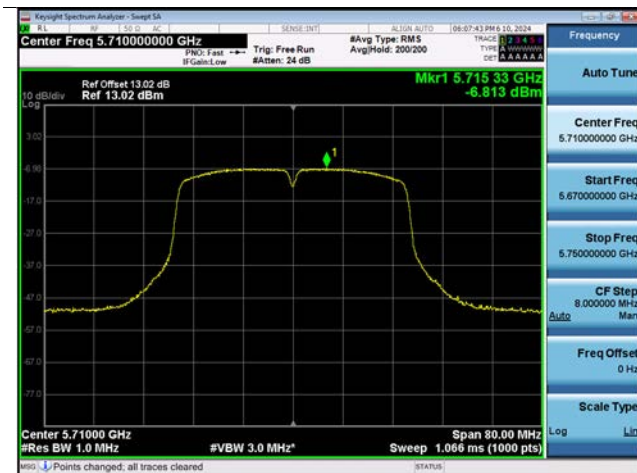
802.11n(HT40) UNII 2C Band



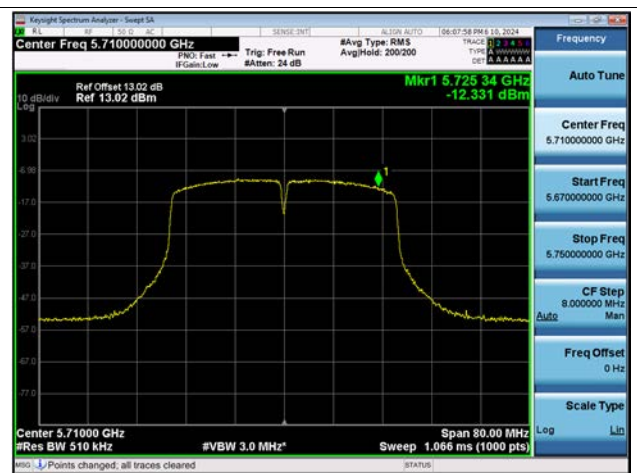
802.11n(HT40) UNII 3 Band



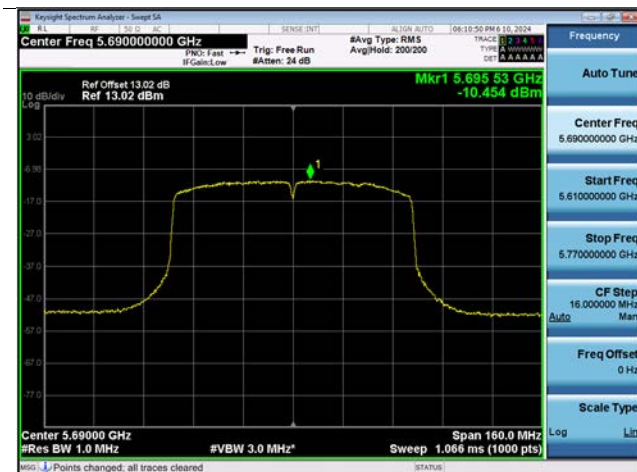
802.11ac(VHT40) UNII 2C Band



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]	[dB μ V]	[dB/m]	[H/V]	[dB μ V/m]	[dB μ V/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 (dB μ V) + Distance extrapolation factor

Frequency Range : Below 1 GHz

Frequency	Measured Value	A.F+C.L	POL	Total	Limit	Margin
[MHz]	[dB μ V]	[dB/m]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]

No Critical peaks found

Note:

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

Frequency Range : Above 1 GHz

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

Band :		UNII 1		Operation Mode : 802.11a			
CH.36		5180 MHz		Transfer Rate : 6 Mbps			
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
10360	55.98	1.60	V	57.58	68.20	10.62	PK
15540	54.71	3.51	V	58.22	73.98	15.76	PK
15540	40.84	3.51	V	44.35	53.98	9.63	AV

Band :		UNII 1		Operation Mode : 802.11a			
CH.40		5200 MHz		Transfer Rate : 6 Mbps			
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
10400	56.15	2.41	V	58.56	68.20	9.64	PK
15600	54.30	3.83	V	58.13	73.98	15.85	PK
15600	40.97	3.83	V	44.80	53.98	9.18	AV

Band :		UNII 1		Operation Mode : 802.11a			
CH.48		5240 MHz		Transfer Rate : 6 Mbps			
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
10480	56.48	2.22	V	58.70	68.20	9.50	PK
15720	55.18	3.15	V	58.33	73.98	15.65	PK
15720	41.56	3.15	V	44.71	53.98	9.27	AV

Band : UNII 2A			Operation Mode : 802.11a				
CH.52 5260 MHz			Transfer Rate : 6Mbps				
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
10520	56.77	2.95	V	59.72	68.20	8.48	PK
15780	54.93	3.42	V	58.35	73.98	15.63	PK
15780	41.11	3.42	V	44.53	53.98	9.45	AV

Band : UNII 2A			Operation Mode : 802.11a				
CH.60 5300 MHz			Transfer Rate : 6Mbps				
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
10600	57.95	2.63	V	60.58	73.98	13.40	PK
10600	47.98	2.63	V	50.61	53.98	3.37	AV
15900	55.31	3.15	V	58.46	73.98	15.52	PK
15900	40.78	3.15	V	43.93	53.98	10.05	AV

Band : UNII 2A			Operation Mode : 802.11a				
CH.64 5320 MHz			Transfer Rate : 6Mbps				
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
10640	54.75	2.04	V	56.79	73.98	17.19	PK
10640	43.04	2.04	V	45.08	53.98	8.90	AV
15960	55.06	2.38	V	57.44	73.98	16.54	PK
15960	40.57	2.38	V	42.95	53.98	11.03	AV

Band : UNII 2C			Operation Mode : 802.11a				
CH.100 5500 MHz			Transfer Rate : 6Mbps				
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
11000	56.38	4.10	V	60.48	73.98	13.50	PK
11000	45.84	4.10	V	49.94	53.98	4.04	AV
16500	55.23	3.98	V	59.21	68.20	8.99	PK

Band : UNII 2C			Operation Mode : 802.11a				
CH.120 5600 MHz			Transfer Rate : 6Mbps				
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
11160	56.24	3.41	V	59.65	73.98	14.33	PK
11160	45.70	3.41	V	49.11	53.98	4.87	AV
16740	54.68	3.57	V	58.25	68.20	9.95	PK

Band : UNII 2C			Operation Mode : 802.11a				
CH.144 5720 MHz			Transfer Rate : 6Mbps				
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
11440	55.89	2.36	V	58.25	73.98	15.73	PK
11440	45.58	2.36	V	47.94	53.98	6.04	AV
17160	55.70	4.52	V	60.22	68.20	7.98	PK

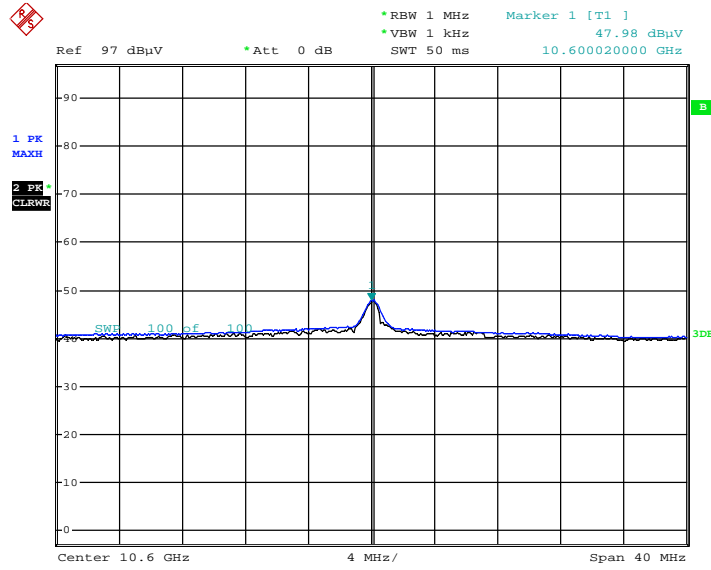
Band :		UNII 3		Operation Mode : 802.11a			
CH.149		5745 MHz		Transfer Rate : 6Mbps			
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect
11490	54.62	4.56	V	59.18	73.98	14.80	PK
11490	44.09	4.56	V	48.65	53.98	5.33	AV
17235	55.31	3.82	V	59.13	68.20	9.07	PK

Band :		UNII 3		Operation Mode : 802.11a			
CH.157		5785 MHz		Transfer Rate : 6Mbps			
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect
11570	55.45	3.15	V	58.60	73.98	15.38	PK
11570	45.11	3.15	V	48.26	53.98	5.72	AV
17355	54.79	6.16	V	60.95	68.20	7.25	PK

Band :		UNII 3		Operation Mode : 802.11a			
CH.165		5825 MHz		Transfer Rate : 6Mbps			
Frequency [MHz]	Measured value [dB μ V]	CL+AF+DF-AG [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect
11650	56.16	3.98	V	60.14	73.98	13.84	PK
11650	45.08	3.98	V	49.06	53.98	4.92	AV
17475	55.33	6.52	V	61.85	68.20	6.35	PK

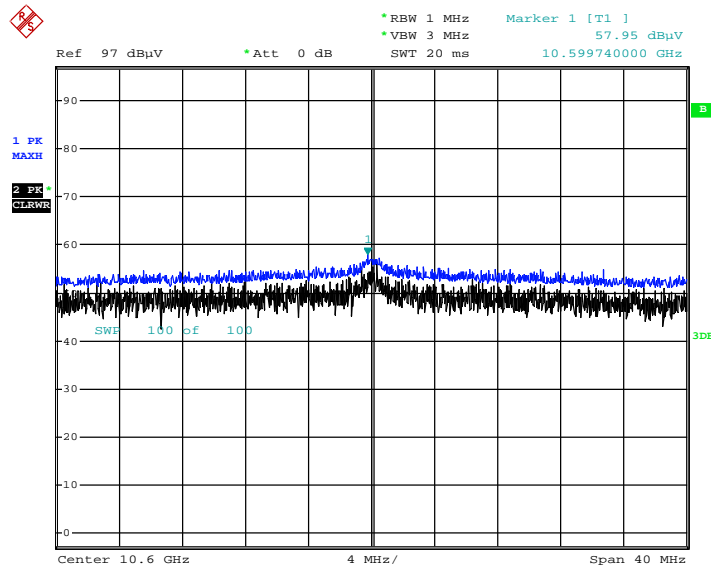
▣ Test Plots

Radiated Spurious Emissions plot – Average Result (802.11a, Ch.60 Spurious Emissions, 2nd, X-V)



Date: 1.JAN.2003 05:03:14

Radiated Spurious Emissions plot – Peak Result (802.11a, Ch.60 Spurious Emissions, 2nd, X-V)



Date: 1.JAN.2003 05:04:21

Note:

Only the worst case plots for Radiated Spurious Emissions.

10.9 RADIATED RESTRICTED BAND EDGE

Operation Mode: 802.11a

Band	UNII 1
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5150	65.49	H	65.49	73.98	8.49	PK
5150	45.03	H	45.03	53.98	8.95	AV

Band	UNII 2A
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5350	68.78	H	68.78	73.98	5.20	PK
5350	45.11	H	45.11	53.98	8.87	AV

Band	UNII 2C
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5460	64.36	H	64.36	73.98	9.62	PK
5460	43.95	H	43.95	53.98	10.03	AV
#5470	58.50	H	58.50	68.20	9.70	PK

Note : # Integration method Used (KDB 789033 D02 v02r01 Section 3) d) (ii)

Operation Mode: 802.11n (HT20)

Band	UNII 1
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5150	66.94	H	66.94	73.98	7.04	PK
5150	44.50	H	44.50	53.98	9.48	AV

Band	UNII 2A
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5350	68.12	H	68.12	73.98	5.86	PK
5350	44.69	H	44.69	53.98	9.29	AV

Band	UNII 2C
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5460	63.58	H	63.58	73.98	10.40	PK
5460	44.04	H	44.04	53.98	9.94	AV
#5470	58.70	H	58.70	68.20	9.50	PK

Note : # Integration method Used (KDB 789033 D02 v02r01 Section 3) d) (ii)

Operation Mode: 802.11ac (VHT20)

Band	UNII 1
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5150	66.75	H	66.75	73.98	7.23	PK
5150	44.40	H	44.40	53.98	9.58	AV

Band	UNII 2A
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5350	68.66	H	68.66	73.98	5.32	PK
5350	44.87	H	44.87	53.98	9.11	AV

Band	UNII 2C
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5460	65.20	H	65.20	73.98	8.78	PK
5460	44.01	H	44.01	53.98	9.97	AV
#5470	59.12	H	59.12	68.20	9.08	PK

Note : # Integration method Used (KDB 789033 D02 v02r01 Section 3) d) (ii)

Operation Mode: 802.11n (HT40) (MCS0)

Band	UNII 1
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5150	68.83	H	68.83	73.98	5.15	PK
5150	46.27	H	46.27	53.98	7.71	AV

Note : # Integration method Used (KDB 789033 D02 v02r01 Section 3) d) (ii)

Band	UNII 2A
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5350	70.37	H	70.37	73.98	3.61	PK
5350	47.01	H	47.01	53.98	6.97	AV

Band	UNII 2C
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5460	67.88	H	67.88	73.98	6.10	PK
5460	44.45	H	44.45	53.98	9.53	AV
#5470	60.34	H	60.34	68.20	7.86	PK

Note : # Integration method Used (KDB 789033 D02 v02r01 Section 3) d) (ii)

Operation Mode: 802.11ac (VHT40) (MCS0)

Band	UNII 1
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5150	67.82	H	67.82	73.98	6.16	PK
5150	46.68	H	46.68	53.98	7.30	AV

Band	UNII 2A
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5350	70.42	H	70.42	73.98	3.56	PK
5350	47.15	H	47.15	53.98	6.83	AV

Band	UNII 2C
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5460	66.87	H	66.87	73.98	7.11	PK
5460	44.20	H	44.20	53.98	9.78	AV
#5470	61.09	H	61.09	68.20	7.11	PK

Note : # Integration method Used (KDB 789033 D02 v02r01 Section 3) d) (ii)

Operation Mode: 802.11ac (VHT80) (MCS0)

Band	UNII 1
Operating Frequency	5210 MHz
Channel No.	42 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5150	65.43	H	65.43	73.98	8.55	PK
5150	49.29	H	49.29	53.98	4.69	AV

Band	UNII 2A
Operating Frequency	5290 MHz
Channel No.	58 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5350	67.08	H	67.08	73.98	6.90	PK
5350	50.48	H	50.48	53.98	3.50	AV

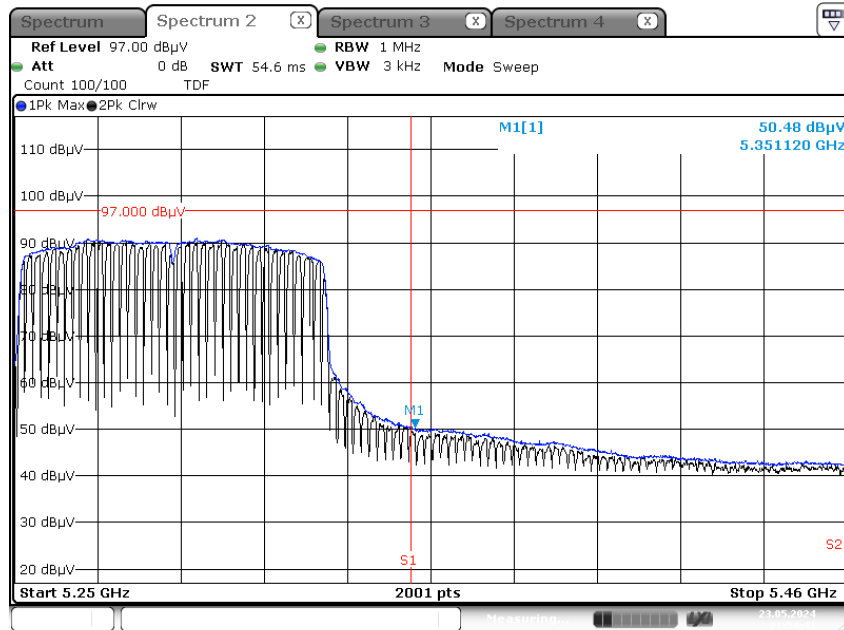
Band	UNII 2C
Operating Frequency	5530 MHz
Channel No.	106 Ch

Frequency	Measured Value	Ant. POL	Total	Limit	Margin	Measurement
[MHz]	[dB μ V]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	Type
5460	66.31	H	66.31	73.98	7.67	PK
5460	48.59	H	48.59	53.98	5.39	AV
#5470	59.68	H	59.68	68.20	8.52	PK

Note : # Integration method Used (KDB 789033 D02 v02r01 Section 3) d) (ii)

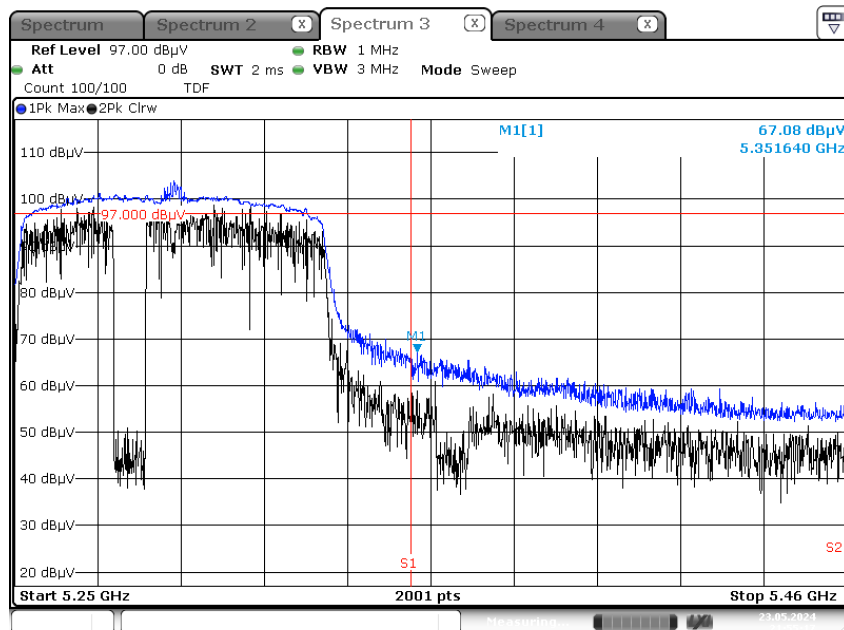
▣ Test Plots(UNII 1, 2A, 2C)

Average Result (802.11 ac_VHT80_ MCS0, Ch.58, Y-H)



Date: 23.MAY.2024 21:54:41

Peak Result (802.11 ac_VHT80_ MCS0, Ch.58, Y-H)



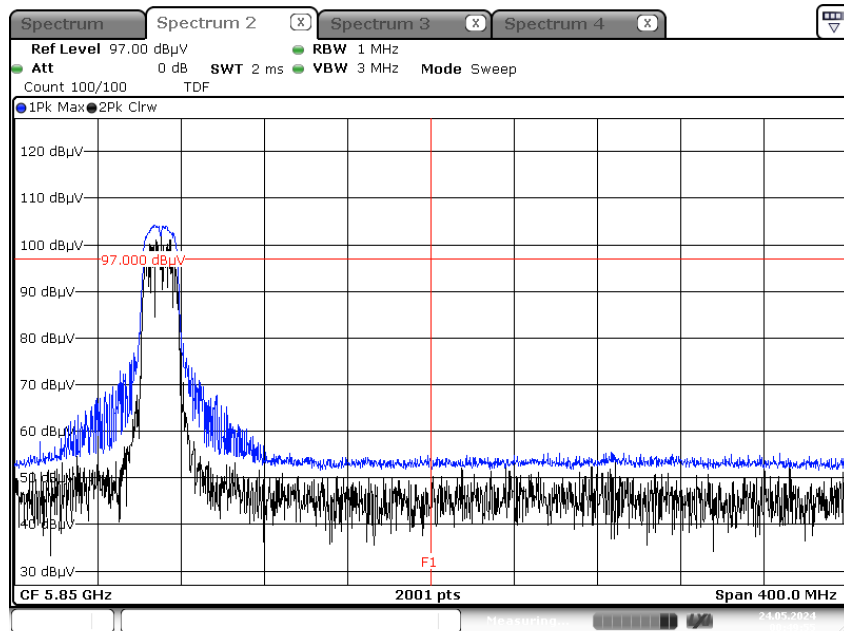
Date: 23.MAY.2024 21:55:17

Note:

Only the worst case plots for Radiated Restricted Band Edge.

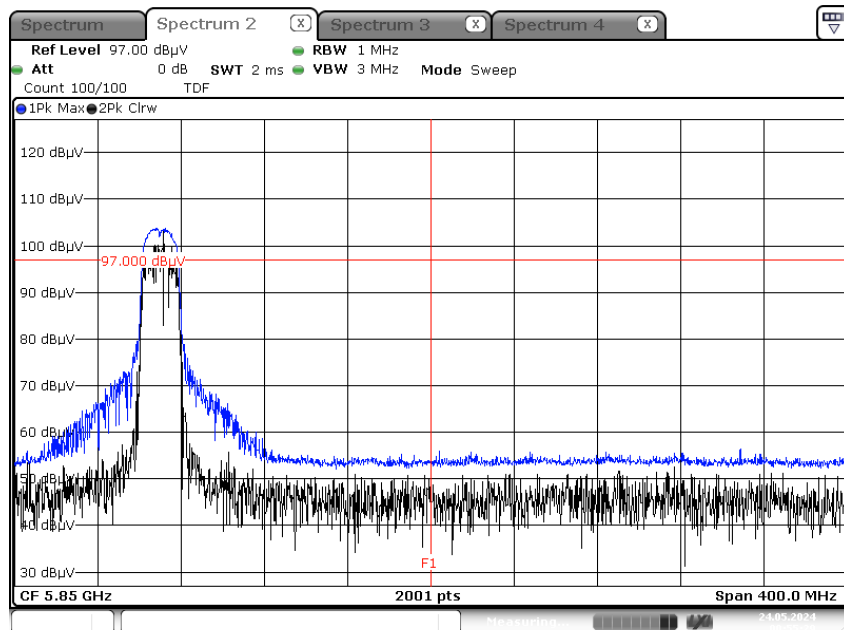
Test Plots(Straddle Channel)

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



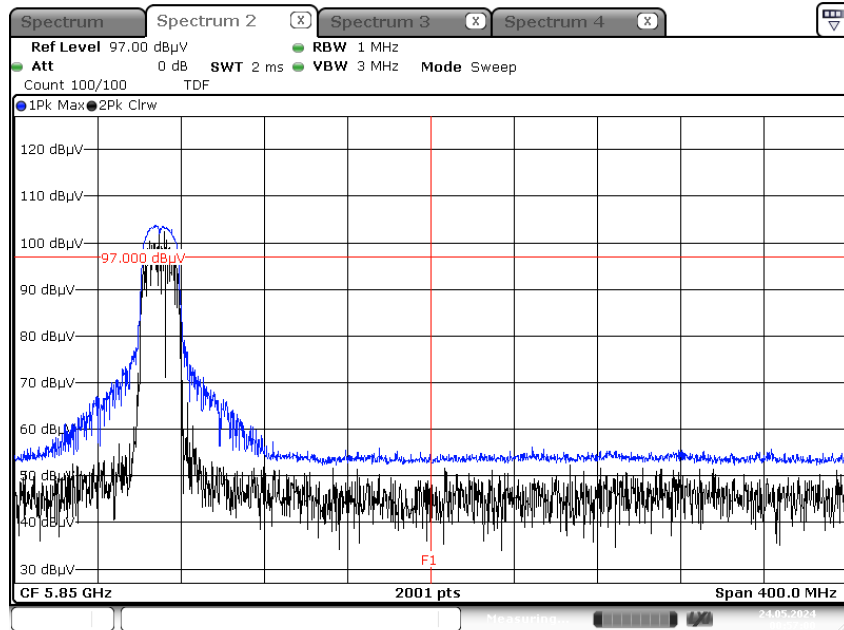
Date: 24.MAY.2024 00:49:55

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



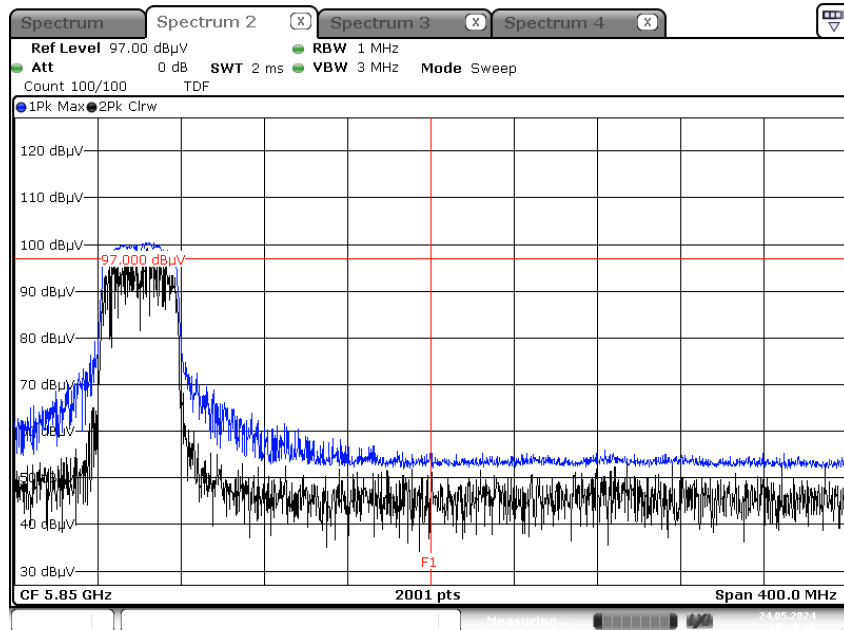
Date: 24.MAY.2024 00:55:30

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



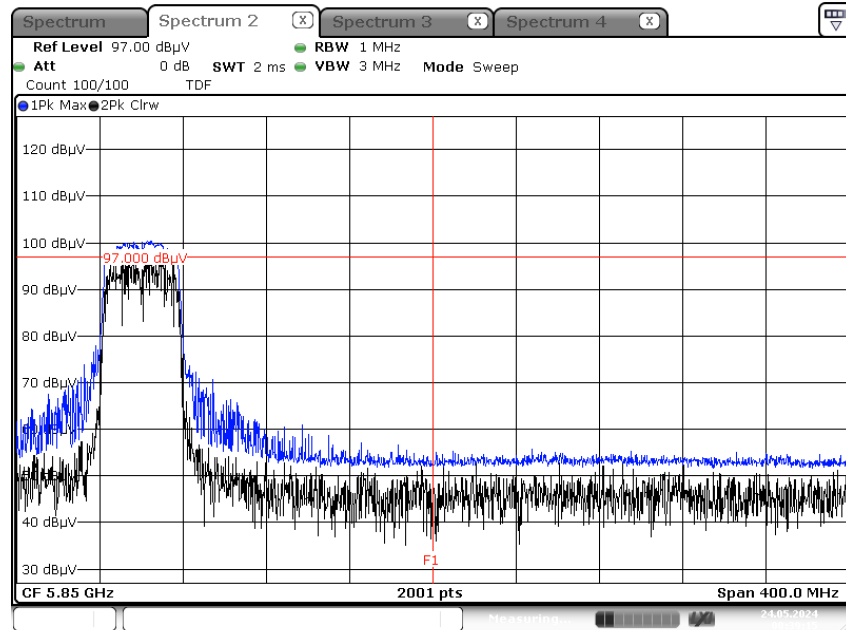
Date: 24.MAY.2024 00:57:00

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

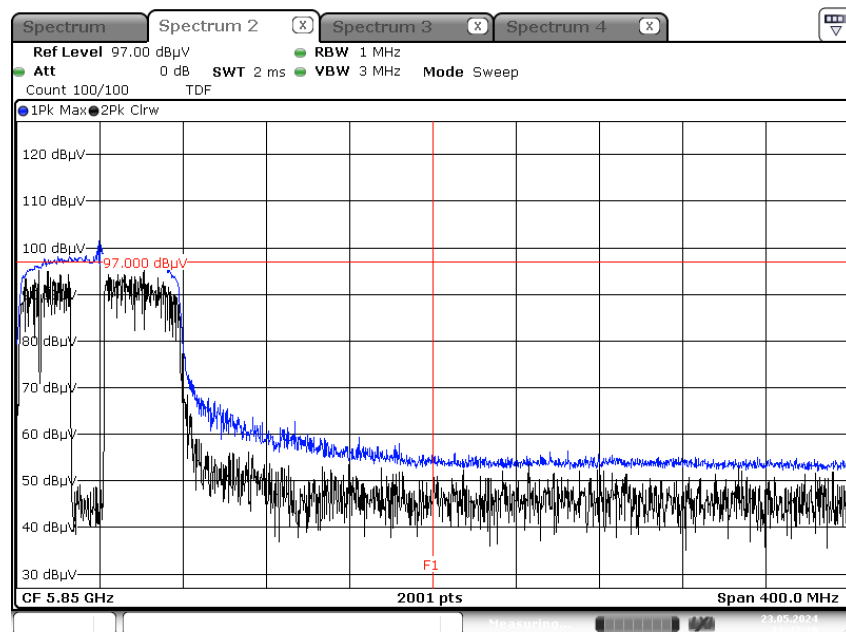


Date: 24.MAY.2024 00:38:36

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



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

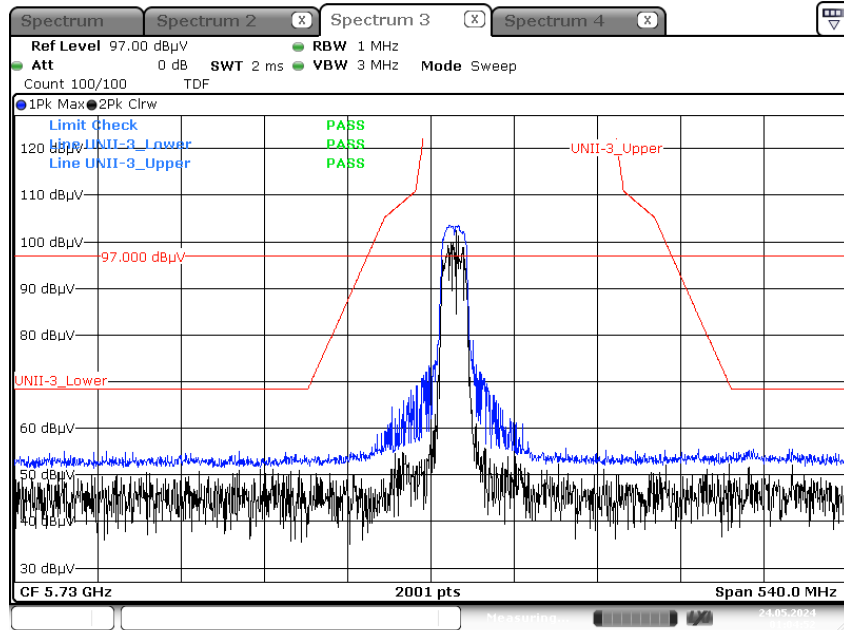


Note :

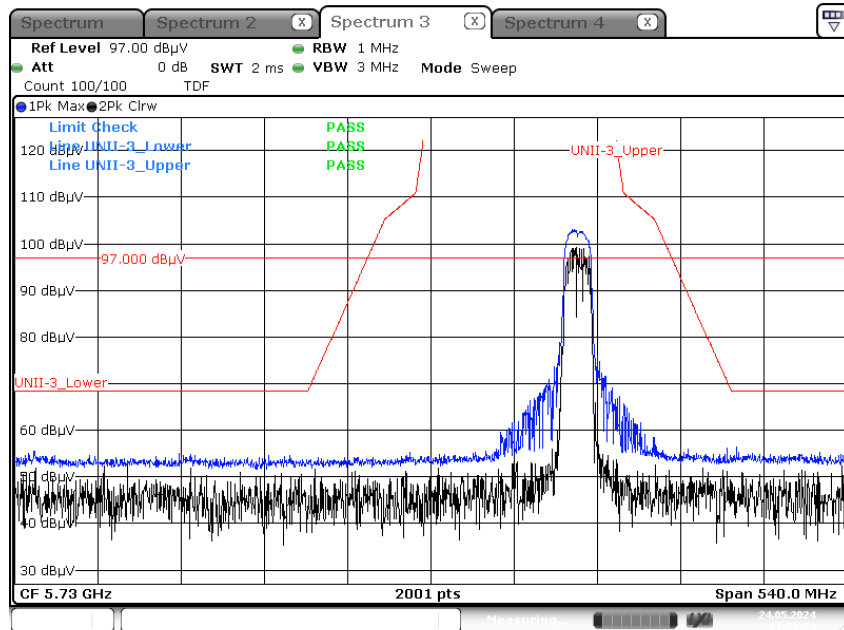
1. Only the worst case plots for Radiated Restricted Band Edge.
2. Red line : 5 850 MHz
3. Ambient Noise (Because of ambient noise, We attached only the worst plot without a data table)

▣ Test Plots(UNII 3)

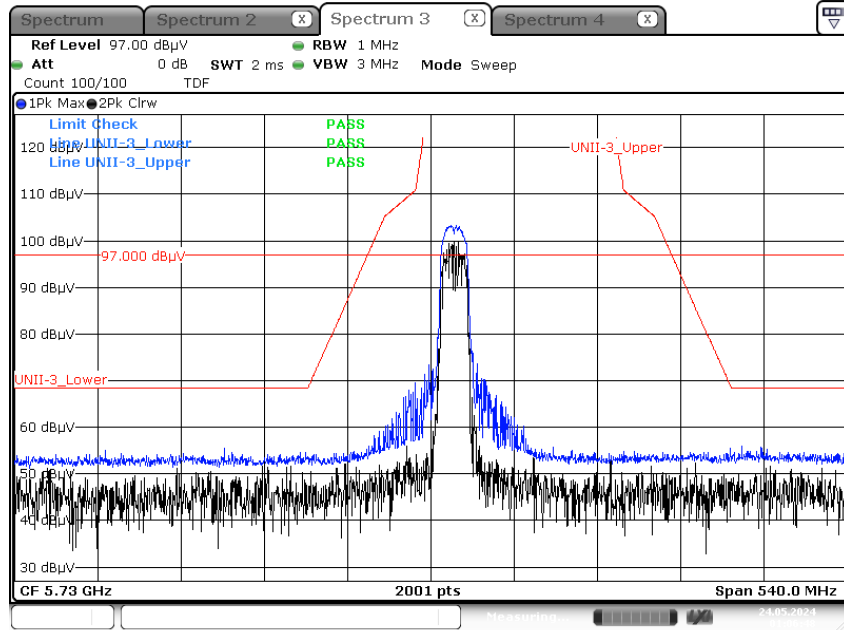
Peak Result (802.11a, Ch.149, Y-H)



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

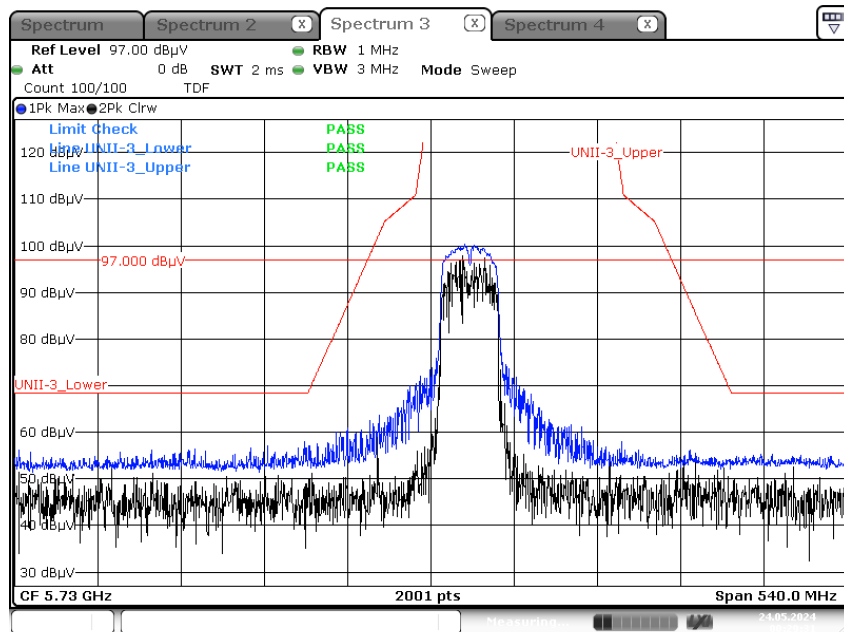


Peak Result (802.11ac_VHT20, Ch.149, Y-H)



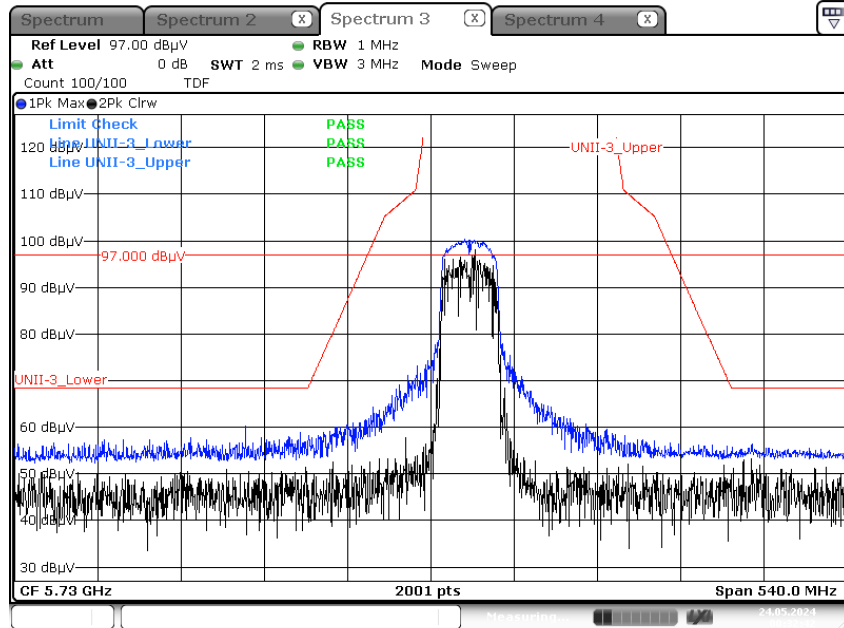
Date: 24.MAY.2024 01:06:48

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

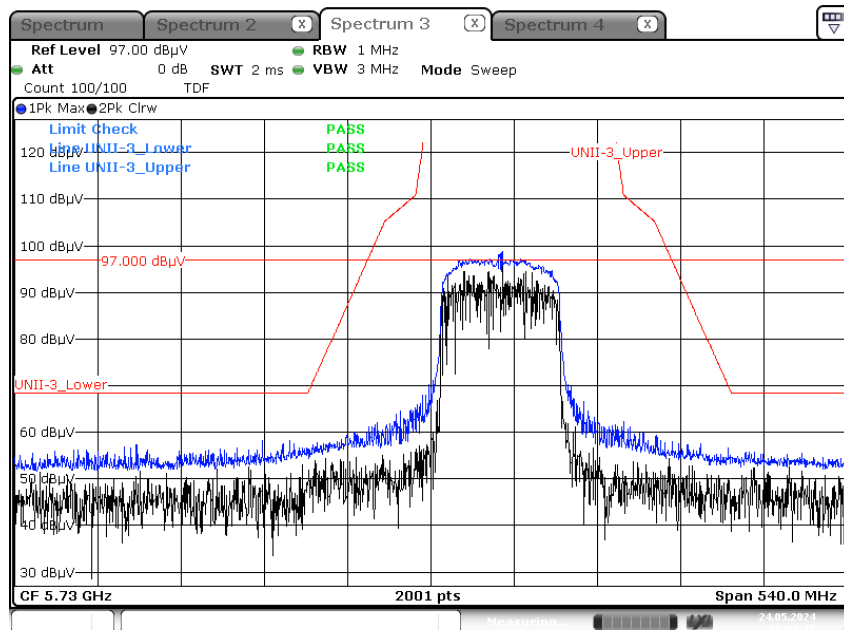


Date: 24.MAY.2024 00:29:31

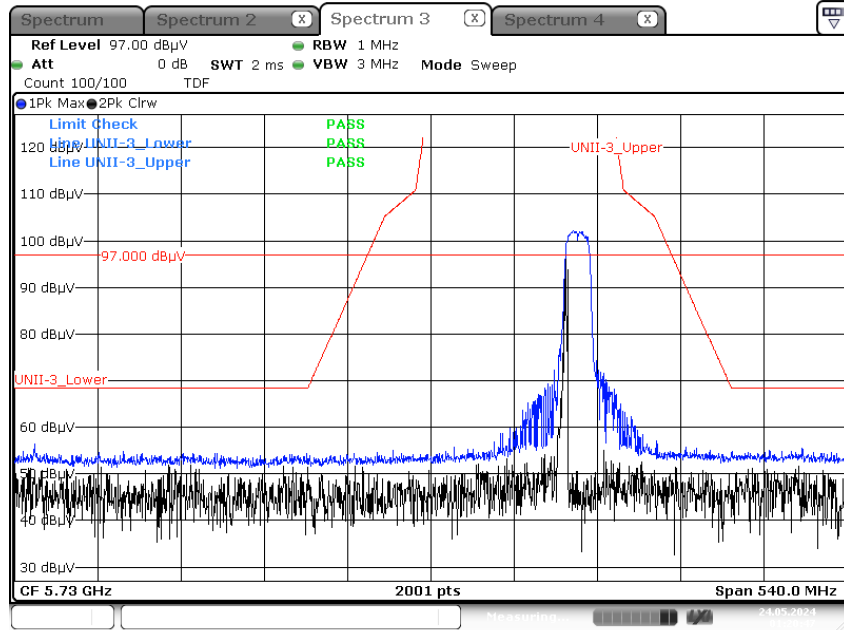
Peak Result (802.11ac_VHT40, Ch.151, Y-H)



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

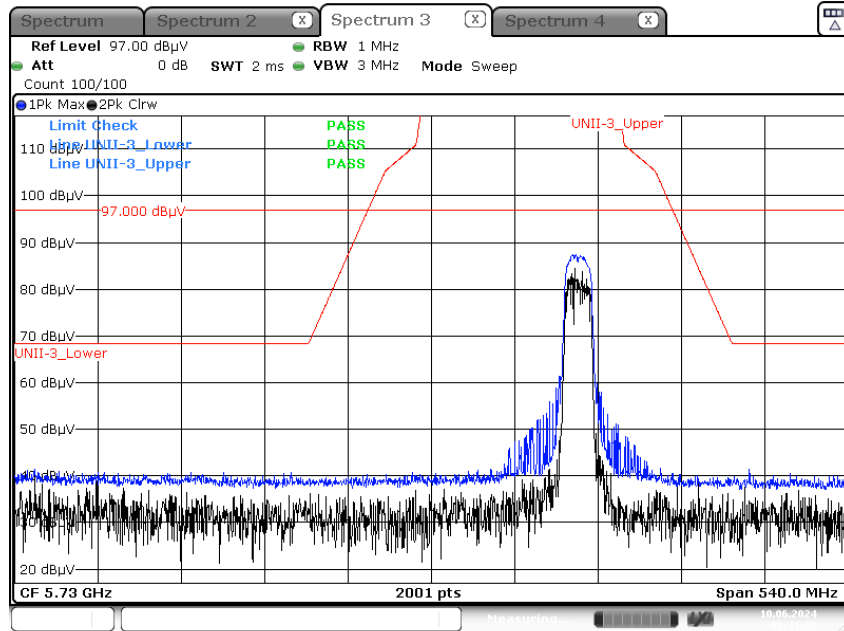


Peak Result (802.11a, Ch.165, Y-H)



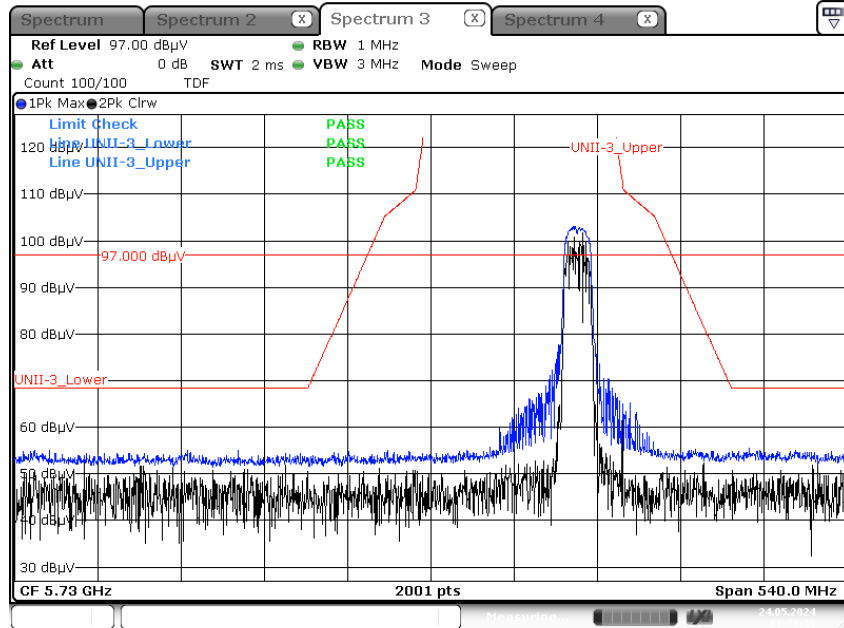
Date: 24.MAY.2024 01:20:48

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



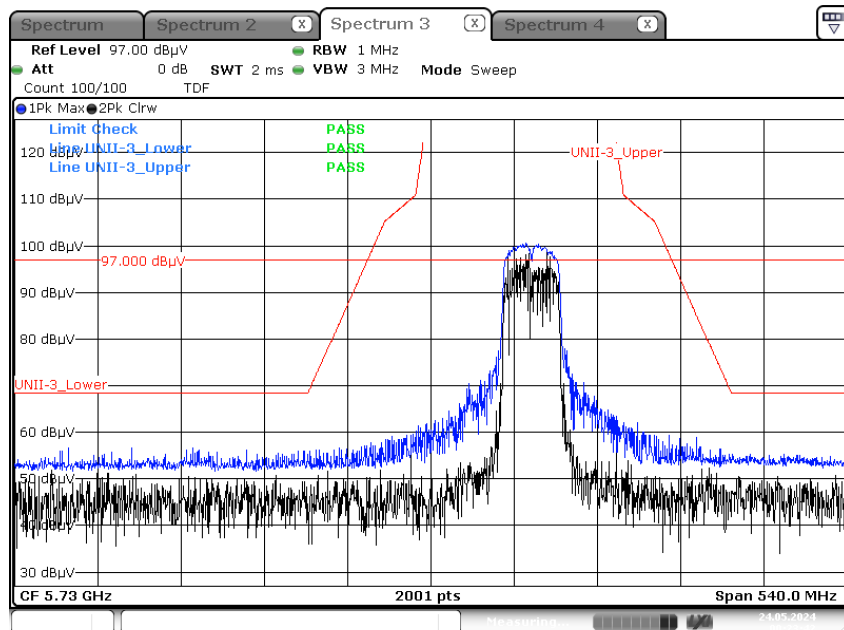
Date: 10.JUN.2024 09:41:02

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



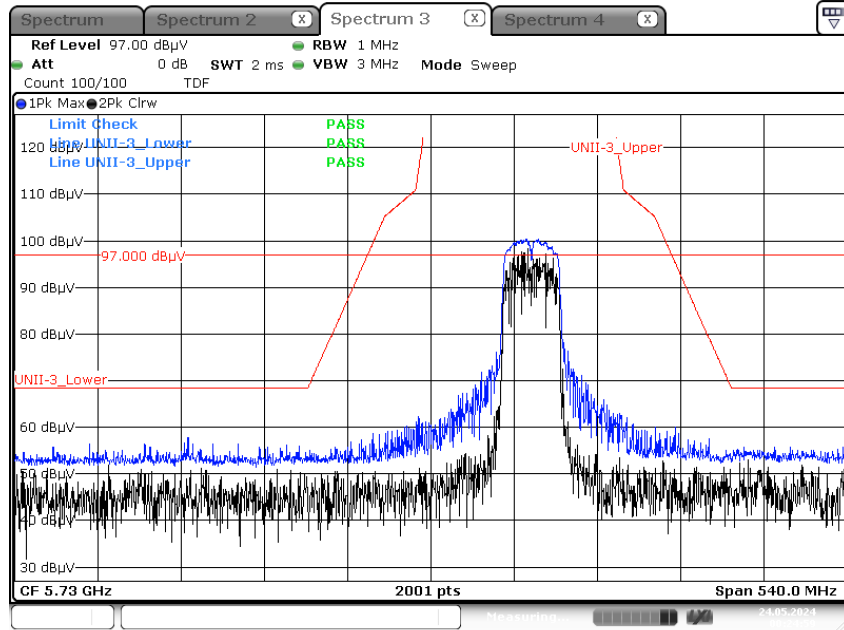
Date: 24.MAY.2024 01:22:46

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

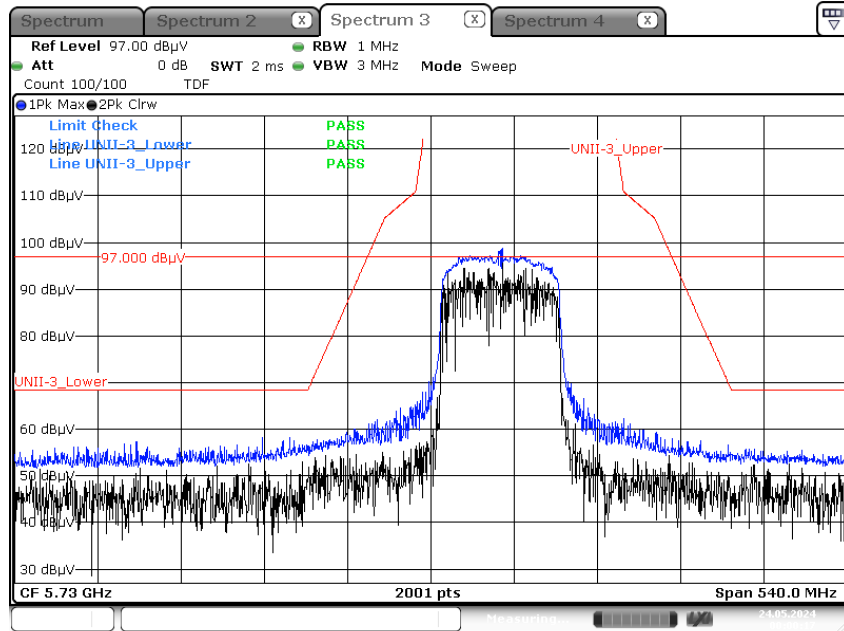


Date: 24.MAY.2024 00:23:42

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



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



Note :

1. Only the worst case plots for U-NII-3 Out of Band e.i.r.p Emission.
2. U-NII-3 Low & High Band Edge RedLine is Final Test Limit about factor value compensation.

10.10 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions

Cradle+ Adapter

5G WLAN Mode

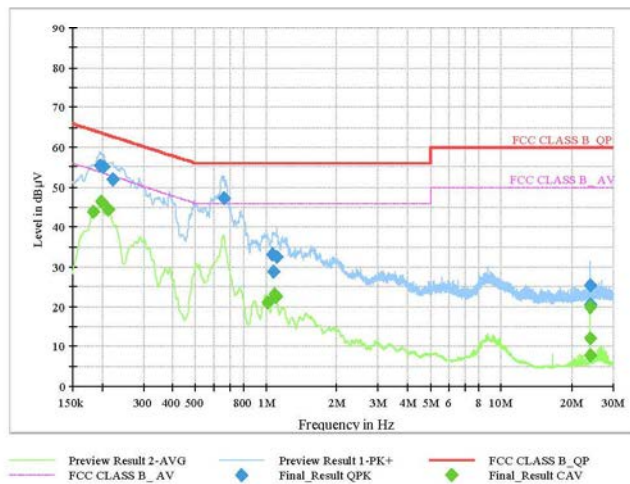
1 / 1

Test Report

Common Information

EUT : TRC-1120
 Operating Conditions : 5G WLAN Mode
 Comment :

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1973	55.46	63.73	8.27	9.000	N	9.6
0.2040	55.07	63.45	8.37	9.000	N	9.6
0.2220	51.79	62.74	10.96	9.000	N	9.6
0.6620	47.18	56.00	8.82	9.000	N	9.7
1.0670	33.13	56.00	22.87	9.000	N	9.7
1.0738	28.75	56.00	27.25	9.000	L1	9.7
1.1075	32.60	56.00	23.40	9.000	N	9.7
24.0035	25.52	60.00	34.48	9.000	N	10.7
24.0215	20.40	60.00	39.60	9.000	N	10.7

Final Result CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1838	43.93	54.31	10.38	9.000	N	9.6
0.1995	46.59	53.63	7.05	9.000	N	9.6
0.2130	44.56	53.09	8.53	9.000	N	9.6
1.0153	21.13	46.00	24.87	9.000	N	9.7
1.0828	23.16	46.00	22.84	9.000	N	9.7
1.0963	22.53	46.00	23.47	9.000	N	9.7
24.0013	19.80	50.00	30.20	9.000	N	10.7
24.0395	12.20	50.00	37.80	9.000	N	10.7
24.0800	7.85	50.00	42.15	9.000	N	10.7

2024-05-30

오전 10:24:34

Only Adapter

5G WLAN Mode

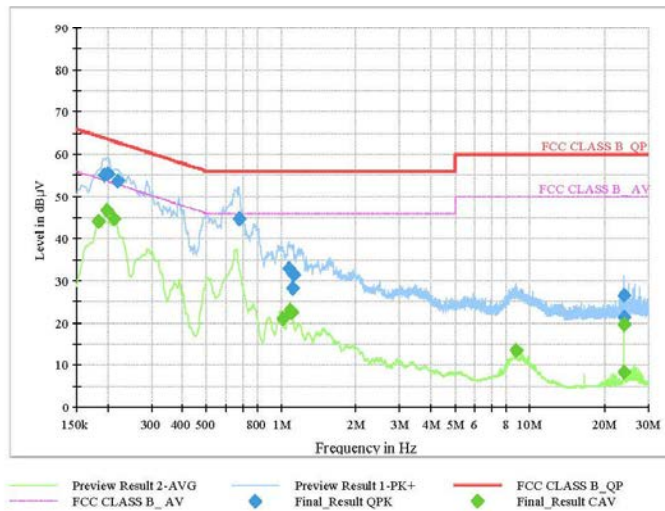
1 / 1

Test Report

Common Information

EUT : TRC-1120
 Operating Conditions : 5G WLAN Mode
 Comment :

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1950	55.22	63.82	8.60	9.000	N	9.6
0.2018	55.50	63.54	8.04	9.000	N	9.6
0.2198	53.58	62.83	9.25	9.000	N	9.6
0.6755	44.79	56.00	11.21	9.000	N	9.7
1.0760	32.77	56.00	23.23	9.000	N	9.7
1.1098	28.18	56.00	27.82	9.000	L1	9.7
1.1210	31.32	56.00	24.68	9.000	N	9.7
23.9923	21.39	60.00	38.61	9.000	N	10.7
23.9990	26.54	60.00	33.46	9.000	N	10.7

Final Result CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1838	44.05	54.31	10.26	9.000	N	9.6
0.1995	46.61	53.63	7.02	9.000	N	9.6
0.2130	44.69	53.09	8.40	9.000	N	9.6
1.0153	21.09	46.00	24.91	9.000	N	9.7
1.0828	23.17	46.00	22.83	9.000	N	9.7
1.0963	22.49	46.00	23.51	9.000	N	9.7
8.8408	13.57	50.00	36.43	9.000	N	10.1
24.0013	19.55	50.00	30.45	9.000	N	10.7
24.0800	8.36	50.00	41.64	9.000	N	10.7

2024-05-30

오전 10:37:25

11. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	07/17/2025	Annual
EMI Test Receiver	ESCI	Rohde & Schwarz	100584	05/08/2025	Annual
Temperature Chamber	SU-642	ESPEC	93008124	02/19/2025	Annual
Signal Analyzer	N9030A	Keysight	MY55410508	09/04/2024	Annual
Power Meter	N1911A	Agilent	MY45100523	02/28/2025	Annual
Power Sensor	N1921A	Agilent	MY57820067	02/22/2025	Annual
Directional Coupler	87300B	Agilent	3116A03621	10/30/2024	Annual
Power Splitter	11667B	Hewlett Packard	10545	02/06/2025	Annual
DC Power Supply	E3632A	Agilent	KR75305528	01/02/2025	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C-010	Agilent	08285	06/02/2024	Annual
Attenuator(20 dB)	18N-20dB	Rohde & Schwarz	8	02/20/2025	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A
FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	HCT CO., LTD.	N/A	N/A	N/A
Bluetooth Tester	CBT	Rohde & Schwarz	100808	02/15/2025	Annual

Note:

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

Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller(Antenna mast)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	S3AM	08/03/2025	Biennial
Controller	EM2090	Emco	060520	N/A	N/A
Turn Table	N/A	Ets	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/07/2026	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	08/16/2024	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1191	11/07/2025	Biennial
Horn Antenna(15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170124	03/28/2025	Biennial
Amp & Filter Bank Switch Controller	FBSM-01A	TNM system	0	N/A	N/A
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/02/2025	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	06/12/2024	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	06/12/2024	Annual
Band Reject Filter	WRCJV5100/5850-40/50-8EEK	Wainwright Instruments	1	02/14/2025	Annual
RF Switching System	FBSR-03A (3G HPF+LNA)	T&M SYSTEM	S3L1	11/17/2024	Annual
RF Switching System	FBSR-03A (10dB ATT+LNA)	T&M SYSTEM	S3L2	11/17/2024	Annual
RF Switching System	FBSR-03A (7G HPF+LNA)	T&M SYSTEM	S3L3	11/17/2024	Annual
RF Switching System	FBSR-03A (3dB ATT+LNA)	T&M SYSTEM	S3L4	11/17/2024	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/17/2024	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/26/2025	Annual
Bluetooth Tester	TC-3000C	TESCOM	3000C000175	03/19/2025	Annual
Spectrum Analyzer	FSP40 (9 kHz ~ 40 GHz)	Rohde & Schwarz	100843	10/30/2024	Annual
Spectrum Analyzer	FSV40 (9 kHz ~ 40 GHz)	Rohde & Schwarz	100900	12/06/2024	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-2408-FC011-P