

FCC UNII REPORT

Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.	Date of Issue: November 07, 2023
Address: 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea	Test Site/Location: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
	Report No.: HCT-RF-2311-FC015

FCC ID:	A3LSMA155M
APPLICANT:	SAMSUNG Electronics Co., Ltd.
Model:	SM-A155M/DSN
Additional Model:	SM-A155M/N
EUT Type:	Mobile Phone
Modulation type	OFDM
FCC Classification:	Unlicensed National Information Infrastructure(NII)
FCC Rule Part(s):	Part 15.407

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.

Report No.: HCT-RF-2311-FC015

REVIEWED BY



Report prepared by : Kyung Jun Woo
Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee
Manager of Telecommunication Testing Center

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test results were applied only to the test methods required by the standard.

Test Report Statement:

The above Test Report is not related to the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA.

The report shall not be reproduced except in full(only partly) without approval of the laboratory.

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2311-FC015	November 07, 2023	- First Approval Report

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1. GENERAL INFORMATION

EUT DESCRIPTION

Model	SM-A155M/DSN	
Additional Model	SM-A155M/N	
EUT Type	Mobile Phone	
Power Supply	DC 3.88 V	
Modulation Type	OFDM : 802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-1	20 MHz BW : 5180 - 5240 40 MHz BW : 5190 - 5230 80 MHz BW : 5210
	U-NII-2A	20 MHz BW : 5260 - 5320 40 MHz BW : 5270 - 5310 80 MHz BW : 5290
	U-NII-2C	20 MHz BW : 5500 - 5720 40 MHz BW : 5510 - 5710 80 MHz BW : 5530 - 5690
	U-NII-3	20 MHz BW : 5745 - 5825 40 MHz BW : 5755 - 5795 80 MHz BW : 5775
Straddle channel	Supported	
TDWR Band	Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	October 06, 2023 ~ November 07, 2023	
Serial number	Conducted : R38W900BYHD Radiated : R38W900BYPX	

2. MAXIMUM OUTPUT POWER

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

Band	Mode	Power	
		(dBm)	(W)
UNII1	802.11a	16.85	0.048
	802.11n (HT20)	16.81	0.048
	802.11n (HT40)	14.44	0.028
	802.11ac (VHT20)	16.70	0.047
	802.11ac (VHT40)	14.40	0.028
	802.11ac (VHT80)	13.00	0.020
UNII2A	802.11a	17.28	0.053
	802.11n (HT20)	17.13	0.052
	802.11n (HT40)	15.09	0.032
	802.11ac (VHT20)	17.13	0.052
	802.11ac (VHT40)	15.10	0.032
	802.11ac (VHT80)	13.01	0.020
UNII2C	802.11a	16.61	0.046
	802.11n (HT20)	16.71	0.047
	802.11n (HT40)	14.72	0.030
	802.11ac (VHT20)	16.69	0.047
	802.11ac (VHT40)	14.68	0.029
	802.11ac (VHT80)	13.63	0.023
UNII3	802.11a	15.89	0.039
	802.11n (HT20)	15.89	0.039
	802.11n (HT40)	13.88	0.024
	802.11ac (VHT20)	15.88	0.039
	802.11ac (VHT40)	13.84	0.024
	802.11ac (VHT80)	12.68	0.019

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 detector modes.

Radiated Emissions

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

DESCRIPTION OF TEST MODES

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

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 ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated March 31, 2022 (CAB identifier: KR0032).

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

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

All receiving equipment conforms to 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.

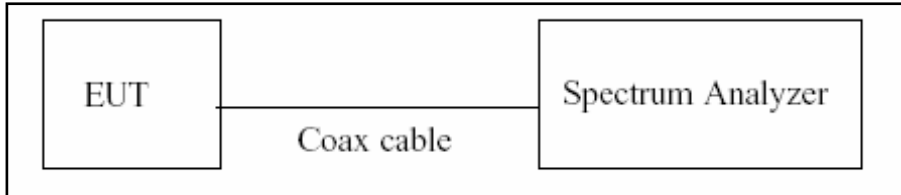
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.90 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.14 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.82 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.74 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.76 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.52 (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.

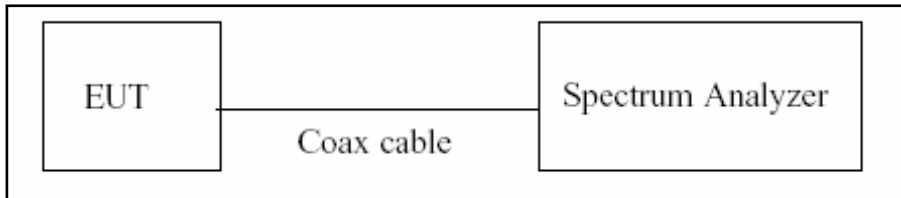
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (\geq RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = $10\log(1/\text{Duty Cycle})$

8.2. 6 dB Bandwidth & 26 dB Bandwidth

Limit

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

Test Configuration



Test Procedure(26 dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

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

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

Test Procedure (6 dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

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

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

Note:

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

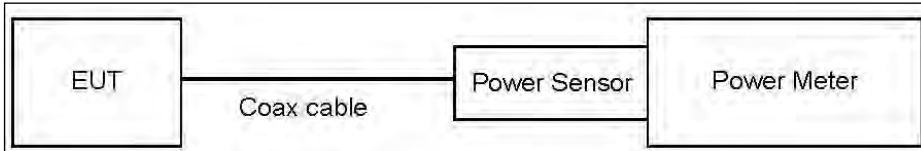
8.3. Output Power Measurement

Limit

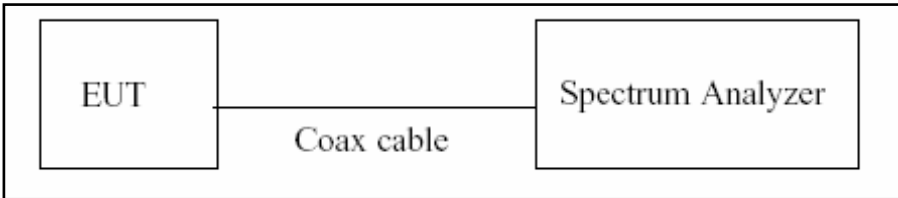
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30 dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30 dBm)

Test Configuration

Power Meter



Spectrum Analyzer(Only Straddle Channel)



Test Procedure(Power Meter)

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

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

Test Procedure (Spectrum Analyzer)

The transmitter output is connected to the Spectrum Analyzer.

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

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

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW ≥ 3 MHz.
5. Number of points in sweep ≥ 2 x span/RBW.
6. Sweep time = auto.
7. Detector = RMS.
8. Do not use sweep triggering. Allow the sweep to “free run”.
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. Add $10\log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

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

Note

1. Spectrum Measured Levels are not plot data.

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

2. Spectrum offset Loss = Attenuator loss + Cable loss

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

Band	Loss(dB)
UNII 1	12.11
UNII 2A	12.11
UNII 2C	12.11
UNII 3	12.11

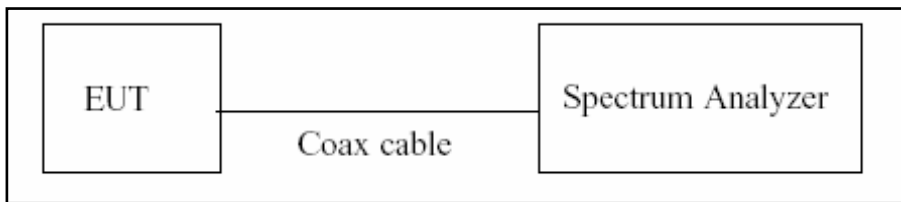
(Actual value of loss for the attenuator and cable combination)

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)
3. VBW ≥ 3 MHz
4. Number of points in sweep ≥ 2 x span/RBW.
5. Sweep time = auto.
6. Detector = RMS(i.e., power averaging), if available. Otherwise, use sample detector 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. Spectrum offset Loss = Attenuator loss + Cable loss

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

Band	Loss(dB)
UNII 1	12.11
UNII 2A	12.11
UNII 2C	12.11
UNII 3	12.11

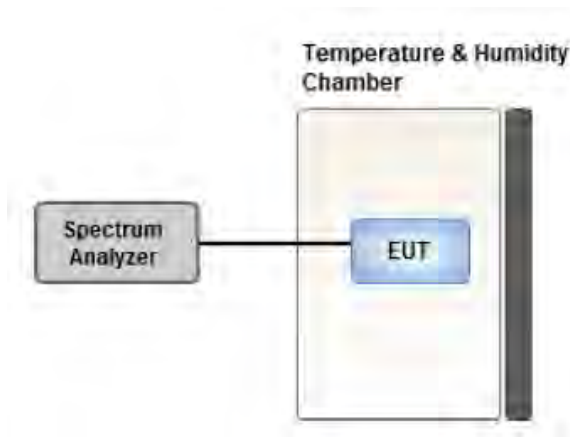
(Actual value of loss for the attenuator and cable combination)

8.5. Frequency Stability

Limit

Maintained within the band

Test Configuration



Test Procedure

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

8.6. AC Power line Conducted Emissions

Limit

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

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

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

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

Test Configuration

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

Test Procedure

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

Sample Calculation

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

8.7. Radiated Test

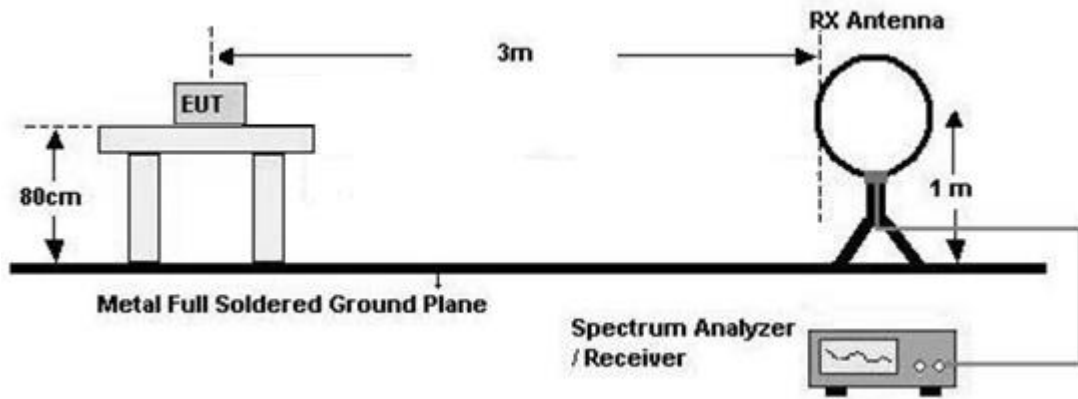
Limit

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

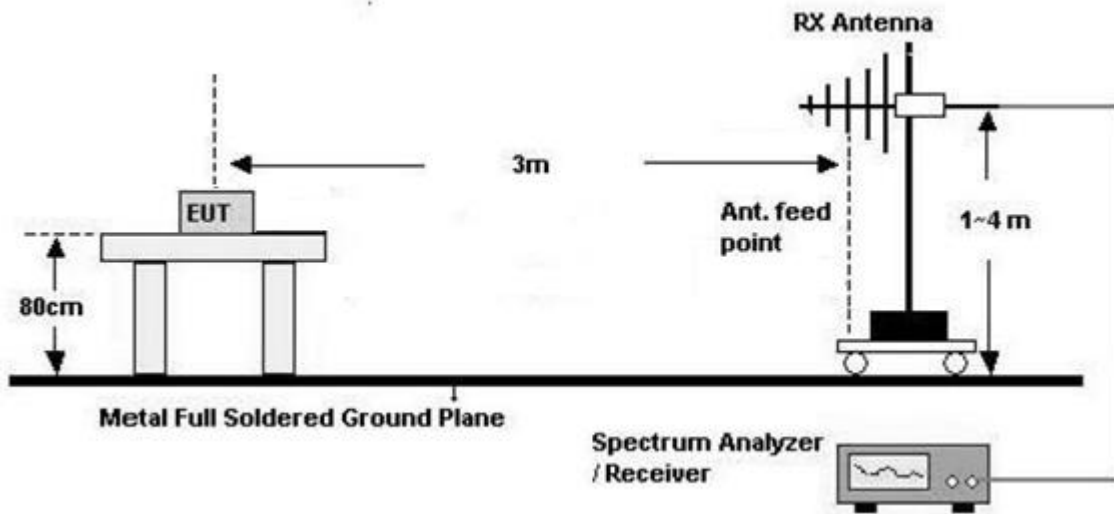
Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Test Configuration

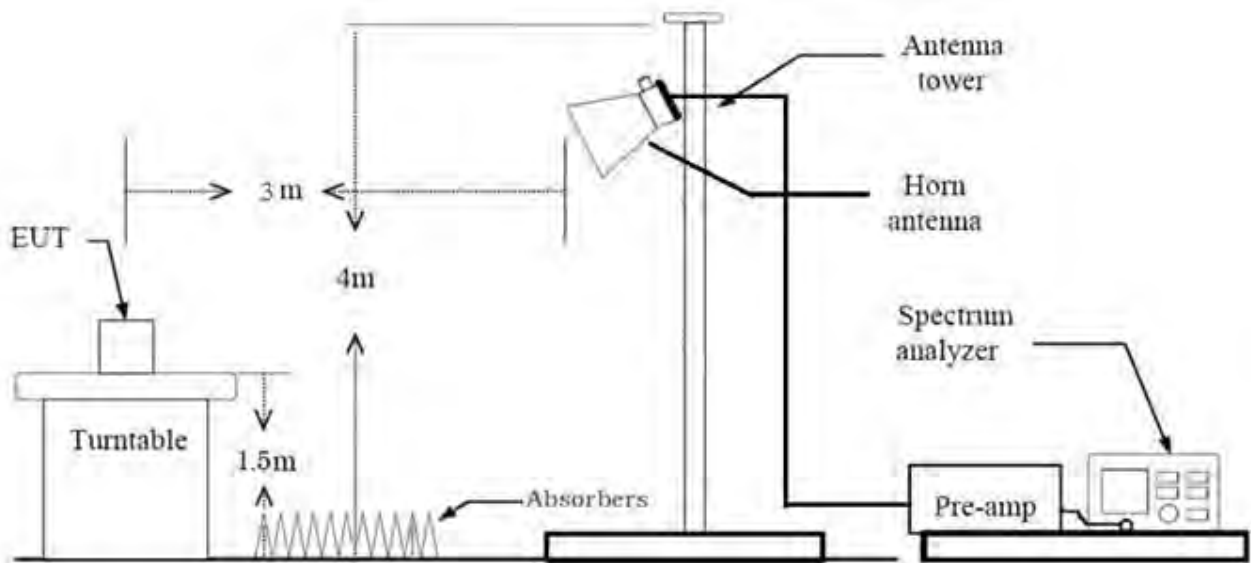
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz

**Test Procedure of Radiated spurious emissions(Below 30 MHz)**

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT
3. The EUT is placed on a turntable, which is 0.8 m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in 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
 - (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)

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.
 - (3) Measurement Type (Average, G.6.c in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW ≥ 3 MHz
- The analyzer is set to linear detector mode.
- Detector = RMS
- Sweep time = auto.
- Trace mode = Average (at least 100 traces).
- Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 % duty cycle.
- Duty Cycle Factor (dB) : Please refer to the please refer to section 10.1.

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 = 20log (test distance / specific distance) (dB)

11. Total

(1)Measurement(Peak)

$$= \text{Measured Value(Peak)} + \text{Measured Value} + \text{Antenna Factor(A.F)} + \text{Cable Loss(C.L)} - \text{Amp Gain(A.G)} + \text{Attenuator(ATT)} + \text{Distance Factor(D.F)}$$

(2)Measurement(Avg)

$$= \text{Measured Value(Avg)} + \text{Measured Value} + \text{Antenna Factor(A.F)} + \text{Cable Loss(C.L)} - \text{Amp Gain(A.G)} + \text{Attenuator(ATT)} + \text{Distance Factor(D.F)}$$

The actual setting value of VBW

Mode	Worst Data rate (Mbps)	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11a	6	0.968	0.142	1 000
802.11n(HT20)	MCS 0	0.962	0.167	1 000
802.11n(HT40)	MCS 0	0.934	0.299	3 000
802.11ac(VHT20)	MCS 0	0.965	0.155	1 000
802.11ac(VHT40)	MCS 0	0.935	0.290	3 000
802.11ac(VHT80)	MCS 0	0.879	0.559	10 000

8.8. Worst case configuration and mode

Conducted test

1. All datarate of operation were investigated and the worst case datarate results are reported.
2. SM-A155M/DSN, SM-A155M/N were tested and the worst case results are reported.
(Worst case : SM-A155M/DSN)

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
 - Worstcase : Stand alone
2. EUT Axis
 - Radiated Spurious Emissions : X
 - Radiated Restricted Band Edge : X
3. All datarate of operation were investigated and the worst case datarate results are reported.
 - 802.11a : 6 Mbps
 - 802.11n_HT20 : MCS 0
 - 802.11n_HT40 : MCS 0
 - 802.11ac_VHT20 : MCS 0
 - 802.11ac_VHT40 : MCS 0
 - 802.11ac_VHT80 : MCS 0
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
6. SM-A155M/DSN, SM-A155M/N were tested and the worst case results are reported.
(Worst case : SM-A155M/DSN)

Radiated test(DBS)

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

- Mode : Stand alone, Stand alone + External accessories(Earphone., etc)
- Worstcase : Stand alone

2. EUT Axis

- Radiated Spurious Emissions : X

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

Description	Bluetooth Emission	5 GHz Emission
Antenna	WIFI/BT	WIFI/BT
Channel	78	165
Data Rate	1 Mbps	6 Mbps
Mode	8DPSK: 3DH5	802.11a

Note : Bluetooth DBS Data refer to Bluetooth Test Report.

4. SM-A155M/DSN, SM-A155M/N were tested and the worst case results are reported.

(Worst case : SM-A155M/DSN)

AC Power line Conducted Emissions

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

- Mode : Stand alone + External accessories(Earphone, etc)+Travel Adapter, Stand alone + Travel Adapter
- Worstcase : Stand alone + Travel Adapter

2. SM-A155M/DSN, SM-A155M/N were tested and the worst case results are reported.

(Worst case : SM-A155M/DSN)

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
AC Conducted Emissions 150 kHz-30 MHz	15.207 15.407(b)(9)	<FCC 15.207 limits		PASS
Frequency Stability	§15.407(g) §2.1055	Maintained within the band		PASS
Undesirable Emissions	§15.407(b) (1),(2),(3),(4)	<-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	PASS

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	1.388	1.434	0.968	0.142
	9	0.935	0.980	0.953	0.207
	12	0.707	0.752	0.939	0.272
	18	0.479	0.524	0.913	0.395
	24	0.362	0.410	0.883	0.542
	36	0.256	0.296	0.863	0.639
	48	0.195	0.238	0.819	0.866
	54	0.180	0.223	0.807	0.932

Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	1.297	1.348	0.962	0.167
	1	0.671	0.714	0.940	0.270
	2	0.461	0.507	0.910	0.410
	3	0.355	0.398	0.892	0.498
	4	0.251	0.294	0.853	0.688
	5	0.198	0.241	0.821	0.856
	6	0.180	0.225	0.798	0.981
	7	0.165	0.228	0.722	1.413
802.11n (HT40)	0	0.646	0.692	0.934	0.298
	1	0.345	0.390	0.883	0.540
	2	0.241	0.284	0.848	0.715
	3	0.193	0.236	0.817	0.877
	4	0.142	0.213	0.667	1.761
	5	0.119	0.223	0.534	2.724
	6	0.104	0.220	0.471	3.267
	7	0.099	0.225	0.438	3.583

Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	1.312	1.360	0.965	0.155
	1	0.679	0.722	0.940	0.267
	2	0.466	0.509	0.915	0.384
	3	0.360	0.405	0.887	0.518
	4	0.253	0.299	0.847	0.719
	5	0.203	0.246	0.825	0.837
	6	0.185	0.231	0.802	0.957
	7	0.167	0.223	0.750	1.249
	8	0.149	0.220	0.678	1.687
802.11ac (VHT40)	0	0.652	0.697	0.936	0.289
	1	0.347	0.393	0.884	0.536
	2	0.246	0.289	0.851	0.701
	3	0.198	0.241	0.821	0.856
	4	0.144	0.241	0.600	2.218
	5	0.122	0.228	0.533	2.730
	6	0.109	0.215	0.506	2.960
	7	0.104	0.210	0.494	3.063
	8	0.091	0.218	0.419	3.782
	9	0.089	0.223	0.398	4.004
802.11ac (VHT80)	0	0.324	0.368	0.880	0.554
	1	0.185	0.228	0.811	0.909
	2	0.137	0.215	0.635	1.970
	3	0.111	0.210	0.530	2.756
	4	0.089	0.231	0.385	4.150
	5	0.076	0.228	0.333	4.771
	6	0.073	0.215	0.341	4.670
	7	0.070	0.224	0.313	5.051
	8	0.063	0.223	0.284	5.467
	9	0.063	0.224	0.283	5.486

Note:

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



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.

802.11a Mode		26dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	24.42	16.589
5200	40	22.28	16.613
5240	48	22.33	16.628
5260	52	24.13	16.627
5300	60	20.38	16.677
5320	64	23.40	16.610
5500	100	19.92	16.537
5600	120	19.83	16.532
5720	144	19.54	16.511
5745	149	19.75	16.538
5785	157	19.94	16.563
5825	165	19.81	16.494

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	22.72	17.703
5200	40	23.01	17.721
5240	48	24.20	17.761
5260	52	22.87	17.693
5300	60	22.90	17.696
5320	64	22.90	17.685
5500	100	20.35	17.664
5600	120	20.38	17.653
5720	144	20.30	17.646
5745	149	20.32	17.619
5785	157	20.35	17.643
5825	165	20.32	17.629

802.11ac(VHT20) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.30	17.608
5200	40	20.23	17.623
5240	48	20.63	17.649
5260	52	20.18	17.606
5300	60	20.35	17.621
5320	64	22.80	17.608
5500	100	20.27	17.578
5600	120	20.21	17.577
5720	144	20.12	17.582
5745	149	20.21	17.565
5785	157	20.13	17.567
5825	165	20.22	17.582

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.78	36.151
5230	46	40.26	36.101
5270	54	40.42	36.116
5310	62	40.68	36.137
5510	102	40.51	36.052
5590	118	40.33	36.043
5710	142	40.39	36.071
5755	151	40.22	36.034
5795	159	40.29	36.020

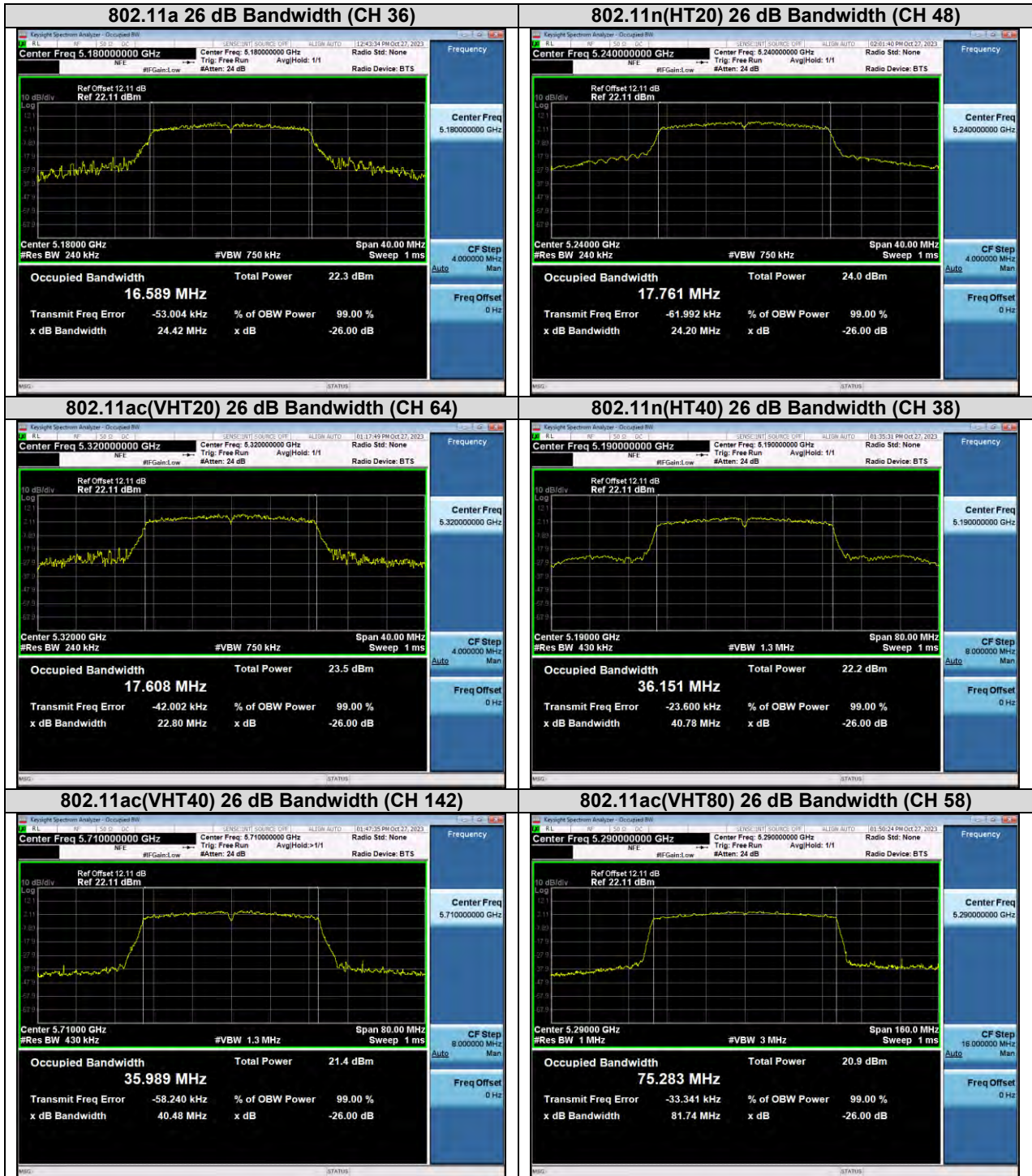
802.11ac(VHT40) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.12	36.017
5230	46	40.17	35.994
5270	54	40.10	35.982
5310	62	40.12	35.986
5510	102	40.23	36.014
5590	118	40.17	35.979
5710	142	40.48	35.989
5755	151	40.08	35.998
5795	159	40.34	35.993

802.11ac(VHT80) Mode		26 dB Bandwidth [MHz]	99 % bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.56	75.300
5290	58	81.74	75.283
5530	106	81.60	75.283
5610	122	81.64	75.280
5690	138	81.60	75.324
5775	155	81.68	75.291

Test Plots

Note:

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



10.3 6 dB BANDWIDTH

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.16	> 0.5	Pass
5785	157	15.16	> 0.5	Pass
5825	165	15.16	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.15	> 0.5	Pass
5785	157	15.15	> 0.5	Pass
5825	165	15.16	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.16	> 0.5	Pass
5785	157	15.16	> 0.5	Pass
5825	165	15.16	> 0.5	Pass

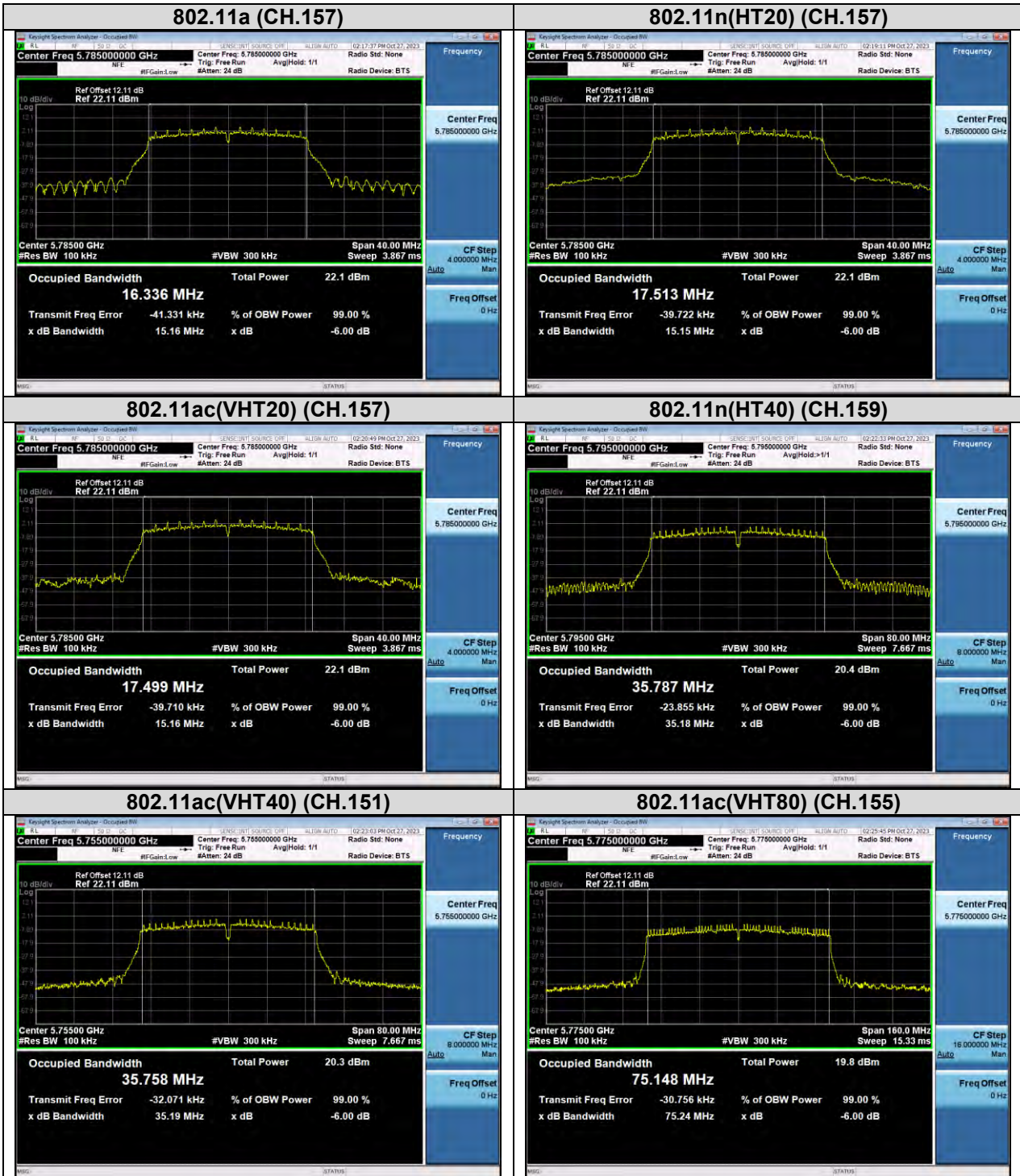
802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.18	> 0.5	Pass
5795	159	35.18	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.19	> 0.5	Pass
5795	159	35.19	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.24	> 0.5	Pass

Test Plots

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



10.4 OUTPUT POWER MEASUREMENT

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

Straddle channel data were added in section 10.7.3.

Limit

(UNII 1) : 23.98 dBm

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

(UNII 3) : 30.00 dBm

Frequency [MHz]	Channel	Datarate	Mode	Mea.Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5180	36	6M	a	16.11	0.142	16.25	23.98
5200	40	6M	a	16.25	0.142	16.39	23.98
5240	48	6M	a	16.71	0.142	16.85	23.98
5260	52	6M	a	16.86	0.142	17.00	23.98
5300	60	6M	a	17.10	0.142	17.24	23.98
5320	64	6M	a	17.14	0.142	17.28	23.98
5500	100	6M	a	16.28	0.142	16.42	23.98
5600	120	6M	a	16.05	0.142	16.19	23.97
5720	144	6M	a	16.47	0.142	16.61	23.91
5745	149	6M	a	15.74	0.142	15.88	30.00
5785	157	6M	a	15.75	0.142	15.89	30.00
5825	165	6M	a	15.64	0.142	15.78	30.00

Frequency [MHz]	Channel	Datarate	Mode	Mea. Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5180	36	MCS0	n20	16.03	0.167	16.20	23.98
5200	40	MCS0	n20	16.13	0.167	16.30	23.98
5240	48	MCS0	n20	16.64	0.167	16.81	23.98
5260	52	MCS0	n20	16.75	0.167	16.92	23.98
5300	60	MCS0	n20	16.94	0.167	17.11	23.98
5320	64	MCS0	n20	16.96	0.167	17.13	23.98
5500	100	MCS0	n20	16.54	0.167	16.71	23.98
5600	120	MCS0	n20	15.94	0.167	16.11	23.98
5720	144	MCS0	n20	16.33	0.167	16.50	23.98
5745	149	MCS0	n20	15.66	0.167	15.83	30.00
5785	157	MCS0	n20	15.72	0.167	15.89	30.00
5825	165	MCS0	n20	15.47	0.167	15.64	30.00

Frequency [MHz]	Channel	Datarate	Mode	Mea. Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5180	36	MCS0	ac20	16.02	0.155	16.18	23.98
5200	40	MCS0	ac20	16.13	0.155	16.29	23.98
5240	48	MCS0	ac20	16.54	0.155	16.70	23.98
5260	52	MCS0	ac20	16.76	0.155	16.92	23.98
5300	60	MCS0	ac20	16.94	0.155	17.10	23.98
5320	64	MCS0	ac20	16.97	0.155	17.13	23.98
5500	100	MCS0	ac20	16.53	0.155	16.69	23.98
5600	120	MCS0	ac20	15.98	0.155	16.14	23.98
5720	144	MCS0	ac20	16.30	0.155	16.46	23.98
5745	149	MCS0	ac20	15.72	0.155	15.88	30.00
5785	157	MCS0	ac20	15.62	0.155	15.78	30.00
5825	165	MCS0	ac20	15.30	0.155	15.46	30.00

Frequency [MHz]	Channel	Datarate	Mode	Mea. Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5190	38	MCS0	n40	13.78	0.298	14.08	23.98
5230	46	MCS0	n40	14.14	0.298	14.44	23.98
5270	54	MCS0	n40	14.55	0.298	14.85	23.98
5310	62	MCS0	n40	14.79	0.298	15.09	23.98
5510	102	MCS0	n40	14.42	0.298	14.72	23.98
5590	118	MCS0	n40	13.89	0.298	14.19	23.98
5710	142	MCS0	n40	14.13	0.298	14.43	23.98
5755	151	MCS0	n40	13.53	0.298	13.83	30.00
5795	159	MCS0	n40	13.58	0.298	13.88	30.00

Frequency [MHz]	Channel	Datarate	Mode	Mea. Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5190	38	MCS0	ac40	13.73	0.289	14.02	23.98
5230	46	MCS0	ac40	14.11	0.289	14.40	23.98
5270	54	MCS0	ac40	14.52	0.289	14.81	23.98
5310	62	MCS0	ac40	14.81	0.289	15.10	23.98
5510	102	MCS0	ac40	14.39	0.289	14.68	23.98
5590	118	MCS0	ac40	13.89	0.289	14.18	23.98
5710	142	MCS0	ac40	14.15	0.289	14.44	23.98
5755	151	MCS0	ac40	13.55	0.289	13.84	30.00
5795	159	MCS0	ac40	13.53	0.289	13.82	30.00

Frequency [MHz]	Channel	Datarate	Mode	Mea. Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
5210	42	MCS0	ac80	12.45	0.554	13.00	23.98
5290	58	MCS0	ac80	12.46	0.554	13.01	23.98
5530	106	MCS0	ac80	13.08	0.554	13.63	23.98
5610	122	MCS0	ac80	12.29	0.554	12.84	23.98
5690	138	MCS0	ac80	12.45	0.554	13.00	23.98
5775	155	MCS0	ac80	12.13	0.554	12.68	30.00

10.5 POWER SPECTRAL DENSITY

Frequency [MHz]	Channel	Datarate	Mode	Mea. PSD [dBm/MHz]	D.C.F [dB]	Total PSD [dBm/MHz]	Limit
5180	36	6M	a	5.481	0.142	5.623	11 dBm/MHz
5200	40	6M	a	5.842	0.142	5.984	11 dBm/MHz
5240	48	6M	a	6.652	0.142	6.794	11 dBm/MHz
5260	52	6M	a	6.826	0.142	6.968	11 dBm/MHz
5300	60	6M	a	6.760	0.142	6.902	11 dBm/MHz
5320	64	6M	a	6.705	0.142	6.847	11 dBm/MHz
5500	100	6M	a	6.830	0.142	6.972	11 dBm/MHz
5600	120	6M	a	5.833	0.142	5.975	11 dBm/MHz
5720	144	6M	a	6.524	0.142	6.666	11 dBm/MHz
5745	149	6M	a	3.609	0.142	3.751	30 dBm/500kHz
5785	157	6M	a	3.207	0.142	3.349	30 dBm/500kHz
5825	165	6M	a	2.691	0.142	2.833	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	5.392	0.167	5.559	11 dBm/MHz
5200	40	MCS0	n20	6.102	0.167	6.269	11 dBm/MHz
5240	48	MCS0	n20	6.952	0.167	7.119	11 dBm/MHz
5260	52	MCS0	n20	6.481	0.167	6.648	11 dBm/MHz
5300	60	MCS0	n20	6.823	0.167	6.990	11 dBm/MHz
5320	64	MCS0	n20	7.009	0.167	7.176	11 dBm/MHz
5500	100	MCS0	n20	6.357	0.167	6.524	11 dBm/MHz
5600	120	MCS0	n20	5.235	0.167	5.402	11 dBm/MHz
5720	144	MCS0	n20	6.293	0.167	6.460	11 dBm/MHz
5745	149	MCS0	n20	3.033	0.167	3.200	30 dBm/500kHz
5785	157	MCS0	n20	2.800	0.167	2.967	30 dBm/500kHz
5825	165	MCS0	n20	2.341	0.167	2.508	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	5.531	0.155	5.686	11 dBm/MHz
5200	40	MCS0	ac20	5.796	0.155	5.951	11 dBm/MHz
5240	48	MCS0	ac20	6.384	0.155	6.539	11 dBm/MHz
5260	52	MCS0	ac20	6.574	0.155	6.729	11 dBm/MHz
5300	60	MCS0	ac20	7.102	0.155	7.257	11 dBm/MHz
5320	64	MCS0	ac20	6.893	0.155	7.048	11 dBm/MHz
5500	100	MCS0	ac20	6.572	0.155	6.727	11 dBm/MHz
5600	120	MCS0	ac20	5.835	0.155	5.990	11 dBm/MHz
5720	144	MCS0	ac20	6.362	0.155	6.517	11 dBm/MHz
5745	149	MCS0	ac20	3.004	0.155	3.159	30 dBm/500kHz
5785	157	MCS0	ac20	2.725	0.155	2.880	30 dBm/500kHz
5825	165	MCS0	ac20	2.314	0.155	2.469	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	0.138	0.298	0.436	11 dBm/MHz
5230	46	MCS0	n40	0.891	0.298	1.189	11 dBm/MHz
5270	54	MCS0	n40	1.523	0.298	1.821	11 dBm/MHz
5310	62	MCS0	n40	1.533	0.298	1.831	11 dBm/MHz
5510	102	MCS0	n40	1.165	0.298	1.463	11 dBm/MHz
5590	118	MCS0	n40	0.160	0.298	0.458	11 dBm/MHz
5710	142	MCS0	n40	1.168	0.298	1.466	11 dBm/MHz
5755	151	MCS0	n40	-2.340	0.298	-2.042	30 dBm/500kHz
5795	159	MCS0	n40	-2.492	0.298	-2.194	30 dBm/500kHz

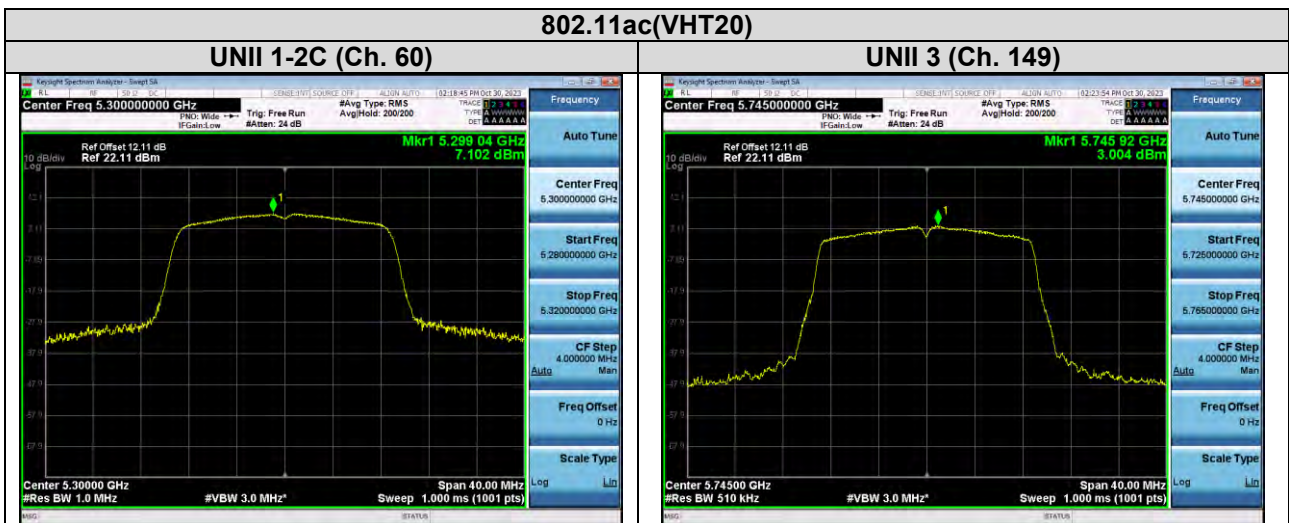
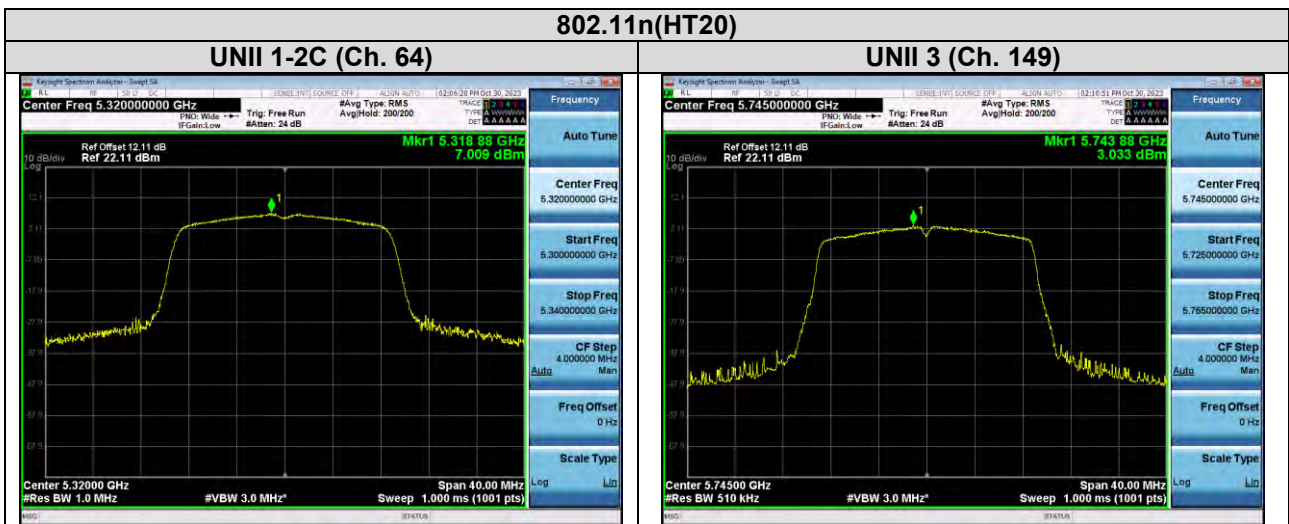
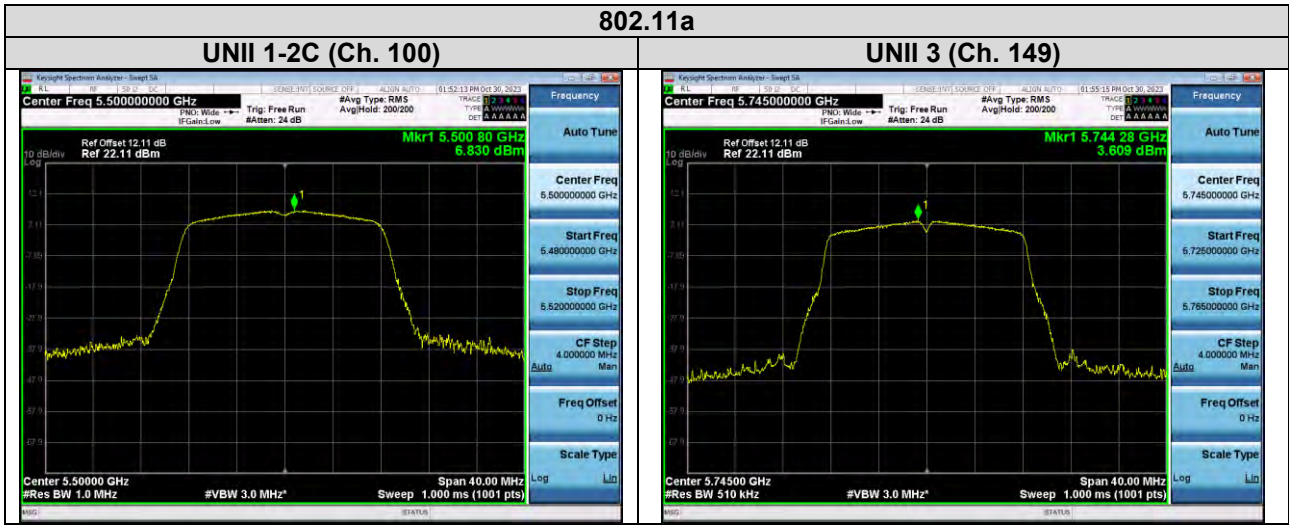
Frequency [MHz]	Channel	Datarate	Mode	Mea. PSD [dBm/MHz]	D.C.F [dB]	Total PSD [dBm/MHz]	Limit
5190	38	MCS0	ac40	0.415	0.289	0.704	11 dBm/MHz
5230	46	MCS0	ac40	0.976	0.289	1.265	11 dBm/MHz
5270	54	MCS0	ac40	1.319	0.289	1.608	11 dBm/MHz
5310	62	MCS0	ac40	1.667	0.289	1.956	11 dBm/MHz
5510	102	MCS0	ac40	1.126	0.289	1.415	11 dBm/MHz
5590	118	MCS0	ac40	-0.126	0.289	0.163	11 dBm/MHz
5710	142	MCS0	ac40	0.589	0.289	0.878	11 dBm/MHz
5755	151	MCS0	ac40	-2.379	0.289	-2.090	30 dBm/500kHz
5795	159	MCS0	ac40	-2.671	0.289	-2.382	30 dBm/500kHz

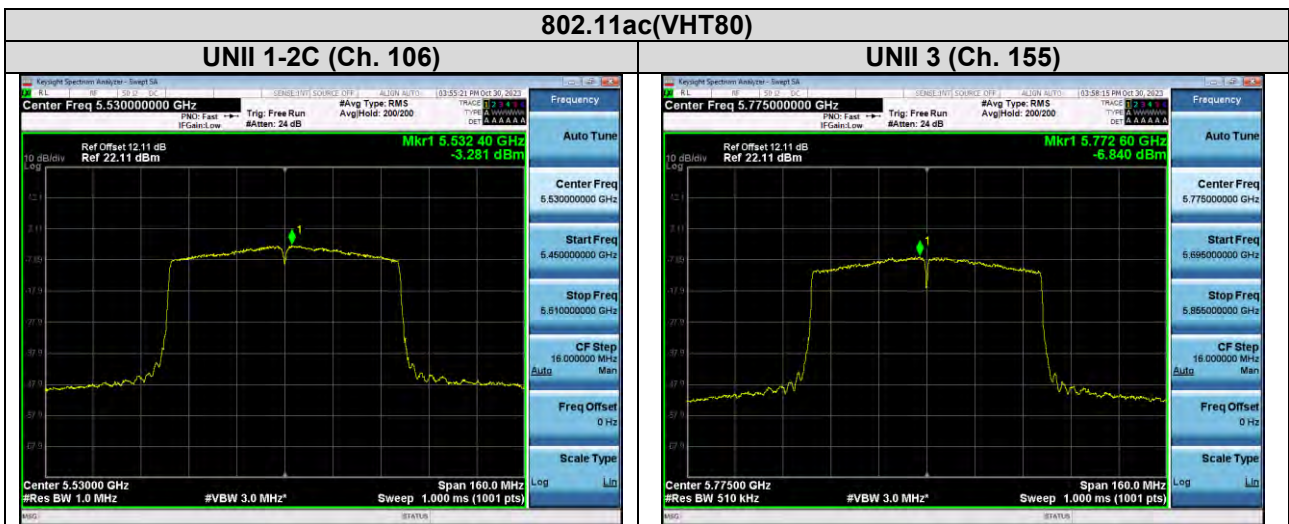
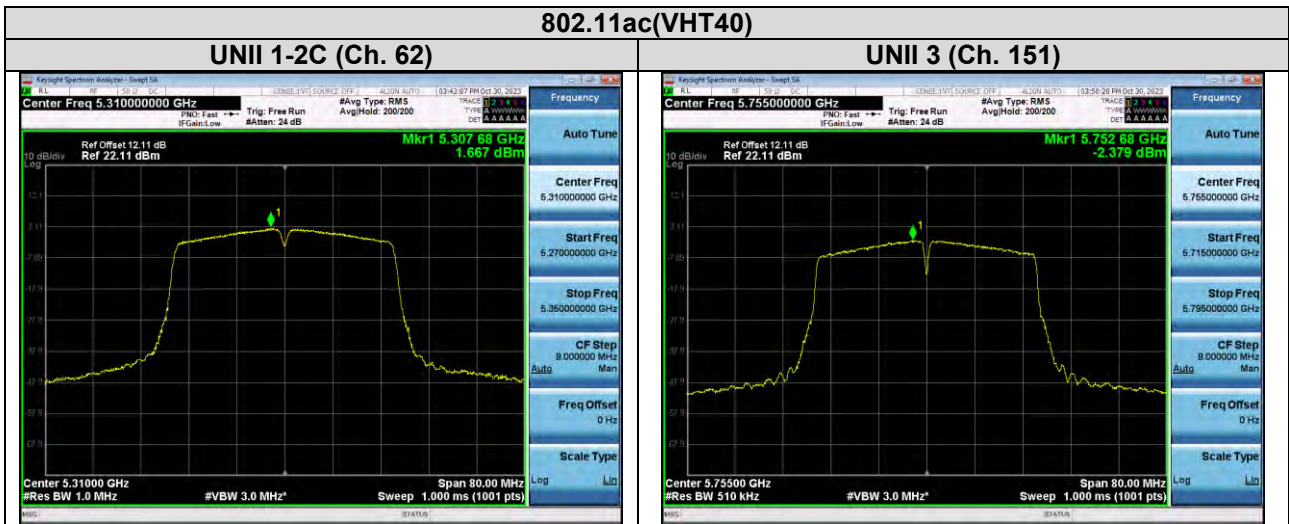
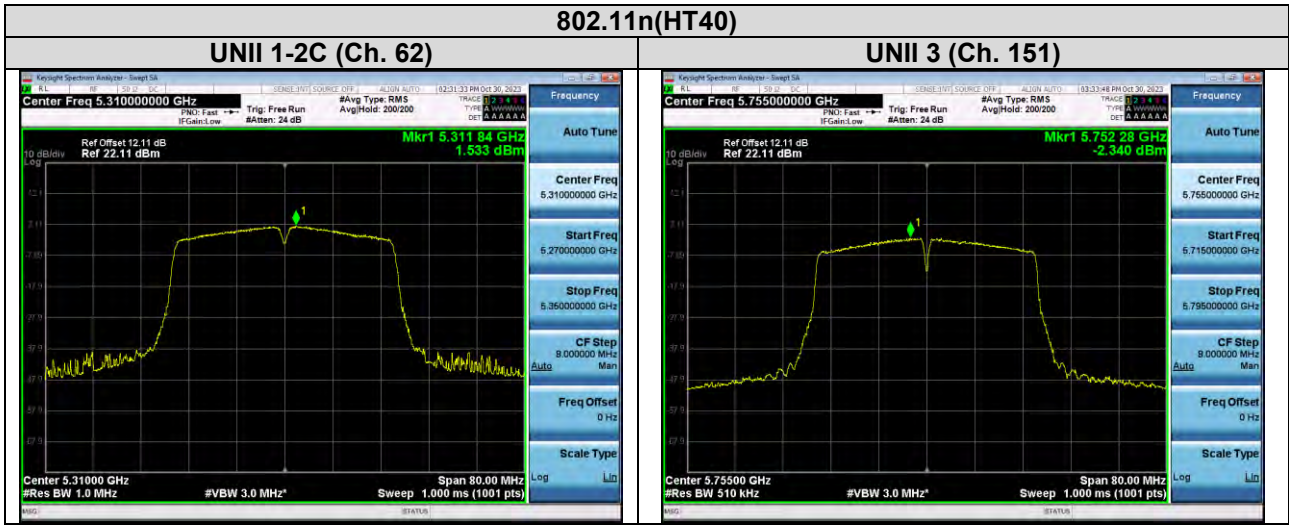
Frequency [MHz]	Channel	Datarate	Mode	Mea. PSD [dBm/MHz]	D.C.F [dB]	Total PSD [dBm/MHz]	Limit
5210	42	MCS0	ac80	-3.924	0.554	-3.370	11 dBm/MHz
5290	58	MCS0	ac80	-3.849	0.554	-3.295	11 dBm/MHz
5530	106	MCS0	ac80	-3.281	0.554	-2.727	11 dBm/MHz
5610	122	MCS0	ac80	-4.479	0.554	-3.925	11 dBm/MHz
5690	138	MCS0	ac80	-3.975	0.554	-3.421	11 dBm/MHz
5775	155	MCS0	ac80	-6.840	0.554	-6.286	30 dBm/500kHz

Test Plots

Note:

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





10.6 FREQUENCY STABILITY.

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:	3.88 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5210046.20	46.20
100%		-30	5210005.61	5.61
100%		-20	5210043.33	43.33
100%		-10	5210053.76	53.76
100%		0	5210050.56	50.56
100%		+10	5210088.37	88.37
100%		+30	5210058.23	58.23
100%		+40	5210099.44	99.44
100%		+50	5210044.61	44.61
High		4.47	+20	5210012.17
Low	3.65	+20	5210040.69	40.69

Note:

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.

OPERATING BAND:	<u>UNII Band 2A</u>
OPERATING FREQUENCY:	<u>5,290,000,000 Hz</u>
CHANNEL:	<u>58</u>
REFERENCE VOLTAGE:	<u>3.88 VDC</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5290033.83	33.83
100%		-30	5290077.29	77.29
100%		-20	5290056.26	56.26
100%		-10	5290098.95	98.95
100%		0	5290097.84	97.84
100%		+10	5290004.04	4.04
100%		+30	5290096.45	96.45
100%		+40	5290095.25	95.25
100%		+50	5290085.19	85.19
High		4.47	+20	5210078.24
Low	3.65	+20	5210061.55	61.55

Note:

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.

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.88 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5530015.50	15.50
100%		-30	5530043.64	43.64
100%		-20	5530090.38	90.38
100%		-10	5530032.55	32.55
100%		0	5530038.86	38.86
100%		+10	5530063.12	63.12
100%		+30	5530029.58	29.58
100%		+40	5530078.22	78.22
100%		+50	5530056.10	56.10
High		4.47	+20	5210064.10
Low	3.65	+20	5210073.17	73.17

Note:

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.

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.88 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5775045.08	45.08
100%		-30	5775037.79	37.79
100%		-20	5775052.73	52.73
100%		-10	5775061.71	61.71
100%		0	5775037.53	37.53
100%		+10	5775003.83	3.83
100%		+30	5775085.44	85.44
100%		+40	5775028.69	28.69
100%		+50	5775033.81	33.81
High		4.47	+20	5210034.20
Low	3.65	+20	5210071.45	71.45

Note:

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.

2 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.88 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5210014.56	14.56
100%		-30	5210048.22	48.22
100%		-20	5210098.27	98.27
100%		-10	5210060.93	60.93
100%		0	5210089.27	89.27
100%		+10	5210017.57	17.57
100%		+30	5210024.30	24.30
100%		+40	5210018.07	18.07
100%		+50	5210058.18	58.18
High		4.47	+20	5210055.23
Low	3.65	+20	5210011.06	11.06

Note:

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.

OPERATING BAND:	<u>UNII Band 2A</u>
OPERATING FREQUENCY:	<u>5,290,000,000 Hz</u>
CHANNEL:	<u>58</u>
REFERENCE VOLTAGE:	<u>3.88 VDC</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5290021.58	21.58
100%		-30	5290022.34	22.34
100%		-20	5290018.85	18.85
100%		-10	5290024.72	24.72
100%		0	5290096.25	96.25
100%		+10	5290014.48	14.48
100%		+30	5290020.67	20.67
100%		+40	5290087.50	87.5
100%		+50	5290097.67	97.67
High		4.47	+20	5210016.54
Low	3.65	+20	5210062.70	62.70

Note:

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.

OPERATING BAND: UNII Band 2C
 OPERATING FREQUENCY: 5,530,000,000 Hz
 CHANNEL: 106
 REFERENCE VOLTAGE: 3.88 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5530026.95	26.95
100%		-30	5530072.31	72.31
100%		-20	5530036.69	36.69
100%		-10	5530049.18	49.18
100%		0	5530036.24	36.24
100%		+10	5530004.86	4.86
100%		+30	5530026.09	26.09
100%		+40	5530058.32	58.32
100%		+50	5530075.40	75.40
High		4.47	+20	5210004.82
Low	3.65	+20	5210032.64	32.64

Note:

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.

OPERATING BAND:	<u>UNII Band 3</u>
OPERATING FREQUENCY:	<u>5,775,000,000 Hz</u>
CHANNEL:	<u>155</u>
REFERENCE VOLTAGE:	<u>3.88 VDC</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5775068.35	68.35
100%		-30	5775095.87	95.87
100%		-20	5775077.95	77.95
100%		-10	5775051.58	51.58
100%		0	5775038.23	38.23
100%		+10	5775090.97	90.97
100%		+30	5775009.81	9.81
100%		+40	5775033.97	33.97
100%		+50	5775099.61	99.61
High		4.47	+20	5210053.15
Low	3.65	+20	5210010.38	10.38

Note:

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.

5 minutes after the EUT is energized

OPERATING BAND:	<u>UNII Band 1</u>
OPERATING FREQUENCY:	<u>5,210,000,000 Hz</u>
CHANNEL:	<u>42</u>
REFERENCE VOLTAGE:	<u>3.88 VDC</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5210024.71	24.71
100%		-30	5210083.36	83.36
100%		-20	5210005.94	5.94
100%		-10	5210014.40	14.40
100%		0	5210061.44	61.44
100%		+10	5210031.54	31.54
100%		+30	5210071.48	71.48
100%		+40	5210081.30	81.30
100%		+50	5210035.62	35.62
High		4.47	+20	5210059.17
Low	3.65	+20	5210092.52	92.52

Note:

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.

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.88 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5290050.43	50.43
100%		-30	5290063.16	63.16
100%		-20	5290053.87	53.87
100%		-10	5290063.08	63.08
100%		0	5290076.43	76.43
100%		+10	5290073.39	73.39
100%		+30	5290042.76	42.76
100%		+40	5290097.10	97.1
100%		+50	5290002.19	2.19
High		4.47	+20	5210019.55
Low	3.65	+20	5210068.08	68.08

Note:

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.

OPERATING BAND:	<u>UNII Band 2C</u>
OPERATING FREQUENCY:	<u>5,530,000,000 Hz</u>
CHANNEL:	<u>106</u>
REFERENCE VOLTAGE:	<u>3.88 VDC</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5530054.64	54.64
100%		-30	5530091.86	91.86
100%		-20	5530073.60	73.6
100%		-10	5530024.60	24.6
100%		0	5530038.05	38.05
100%		+10	5530078.43	78.43
100%		+30	5530029.92	29.92
100%		+40	5530096.16	96.16
100%		+50	5530007.16	7.16
High		4.47	+20	5210014.45
Low	3.65	+20	5210024.70	24.70

Note:

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.

OPERATING BAND:	<u>UNII Band 3</u>
OPERATING FREQUENCY:	<u>5,775,000,000 Hz</u>
CHANNEL:	<u>155</u>
REFERENCE VOLTAGE:	<u>3.88 VDC</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5775083.86	83.86
100%		-30	5775080.32	80.32
100%		-20	5775077.54	77.54
100%		-10	5775018.78	18.78
100%		0	5775094.90	94.9
100%		+10	5775097.48	97.48
100%		+30	5775009.82	9.82
100%		+40	5775067.23	67.23
100%		+50	5775033.52	33.52
High		4.47	+20	5210071.11
Low	3.65	+20	5210063.52	63.52

Note:

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 minutes after the EUT is energized

OPERATING BAND:	<u>UNII Band 1</u>
OPERATING FREQUENCY:	<u>5,210,000,000 Hz</u>
CHANNEL:	<u>42</u>
REFERENCE VOLTAGE:	<u>3.88 VDC</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5210074.50	74.50
100%		-30	5210020.50	20.50
100%		-20	5210050.58	50.58
100%		-10	5210045.89	45.89
100%		0	5210014.21	14.21
100%		+10	5210090.23	90.23
100%		+30	5210042.41	42.41
100%		+40	5210080.97	80.97
100%		+50	5210072.25	72.25
High		4.47	+20	5210081.48
Low	3.65	+20	5210029.41	29.41

Note:

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.

OPERATING BAND:	<u>UNII Band 2A</u>
OPERATING FREQUENCY:	<u>5,290,000,000 Hz</u>
CHANNEL:	<u>58</u>
REFERENCE VOLTAGE:	<u>3.88 VDC</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5290003.87	3.87
100%		-30	5290098.34	98.34
100%		-20	5290074.08	74.08
100%		-10	5290042.72	42.72
100%		0	5290033.55	33.55
100%		+10	5290066.12	66.12
100%		+30	5290035.26	35.26
100%		+40	5290060.72	60.72
100%		+50	5290026.15	26.15
High		4.47	+20	5210076.90
Low	3.65	+20	5210035.97	35.97

Note:

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.

OPERATING BAND:	<u>UNII Band 2C</u>
OPERATING FREQUENCY:	<u>5,530,000,000 Hz</u>
CHANNEL:	<u>106</u>
REFERENCE VOLTAGE:	<u>3.88 VDC</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5530026.97	26.97
100%		-30	5530002.03	2.03
100%		-20	5530083.38	83.38
100%		-10	5530060.89	60.89
100%		0	5530033.89	33.89
100%		+10	5530066.44	66.44
100%		+30	5530052.20	52.2
100%		+40	5530031.39	31.39
100%		+50	5530071.10	71.10
High		4.47	+20	5210060.48
Low	3.65	+20	5210093.47	93.47

Note:

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.

OPERATING BAND:	<u>UNII Band 3</u>
OPERATING FREQUENCY:	<u>5,775,000,000 Hz</u>
CHANNEL:	<u>155</u>
REFERENCE VOLTAGE:	<u>3.88 VDC</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5775040.20	40.20
100%		-30	5775008.80	8.80
100%		-20	5775087.77	87.77
100%		-10	5775095.30	95.3
100%		0	5775046.80	46.8
100%		+10	5775003.40	3.40
100%		+30	5775076.05	76.05
100%		+40	5775053.32	53.32
100%		+50	5775028.19	28.19
High		4.47	+20	5210036.46
Low	3.65	+20	5210096.47	96.47

Note:

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.

10.7 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	5709.92	15.08
802.11n(HT20)				5709.80	15.20
802.11ac(VHT20)				5709.80	15.20
802.11a	UNII 3	5720	144	5730.04	5.04
802.11n(HT20)				5730.16	5.16
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	5689.60	35.40
802.11ac(VHT40)				5689.84	35.16
802.11n(HT40)	UNII 3	5710	142	5730.16	5.16
802.11ac(VHT40)				5730.00	5.00

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26 dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5649.04	75.96
	UNII 3	5690	138	5730.96	5.96

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)



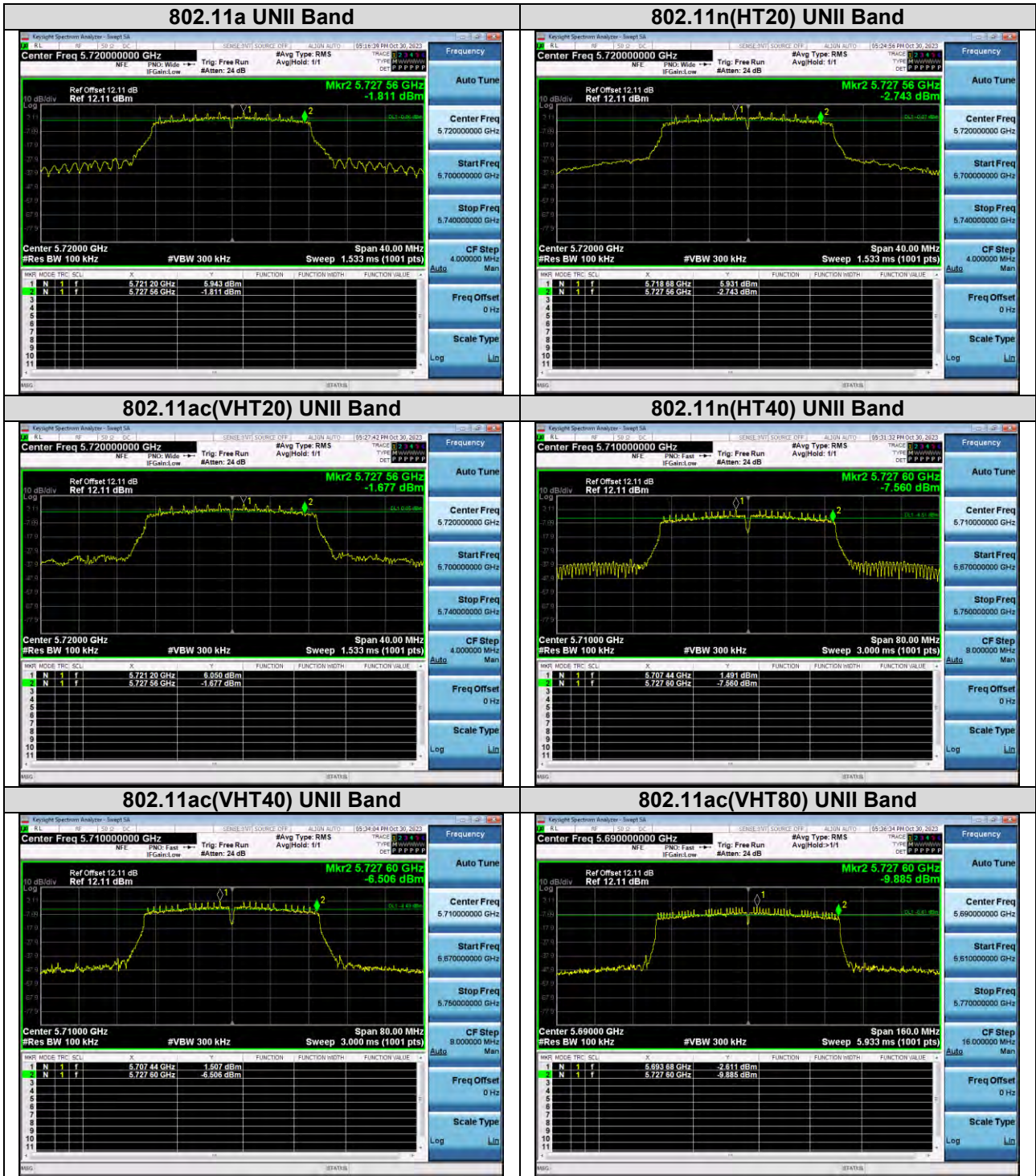
10.7.2 6 dB Bandwidth

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
802.11a	UNII 3	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)	UNII 3	5710	142	5727.60	2.60	> 0.5
802.11ac(VHT40)				5727.60	2.60	> 0.5
802.11ac(VHT80)	UNII 3	5690	138	5727.60	2.60	> 0.5

Note:

6 dB Bandwidth = Measured Frequency[MHz] – 5725MHz

Test Plots(6 dB Bandwidth)



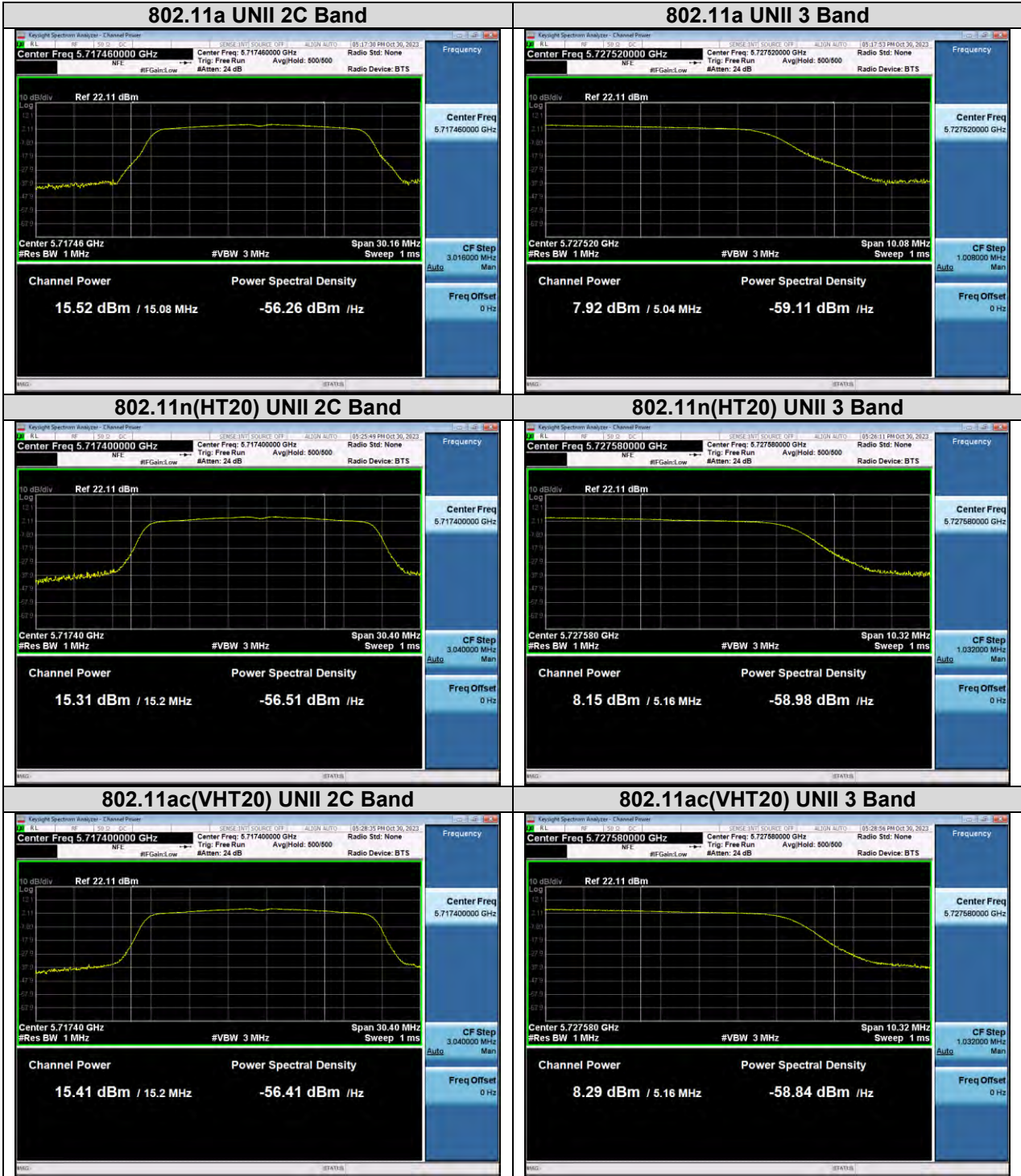
10.7.3 Output Power

Mode	Frequency [MHz]	Channel	Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]	Worstcase Datarate
802.11a	5720 (UNII 2C Band)	144	15.52	0.142	15.67	22.78	6 Mbps
802.11n(HT20)			15.31	0.167	15.48	22.82	MCS0
802.11ac(VHT20)			15.41	0.155	15.57	22.82	MCS0
802.11a	5720 (UNII 3 Band)	144	7.92	0.142	8.06	30.00	6 Mbps
802.11n(HT20)			8.15	0.167	8.31	30.00	MCS0
802.11ac(VHT20)			8.29	0.155	8.44	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 (UNII 2C Band)	142	13.88	0.299	14.18	23.98	MCS0
802.11ac(VHT40)			13.91	0.290	14.20	23.98	MCS0
802.11n(HT40)	5120 (UNII 3 Band)	142	1.50	0.299	1.80	30.00	MCS0
802.11ac(VHT40)			1.49	0.290	1.78	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	12.36	0.559	12.92	23.98	MCS0
	5690 (UNII 3 Band)	138	-3.51	0.559	-2.96	30.00	MCS0

Test Plots





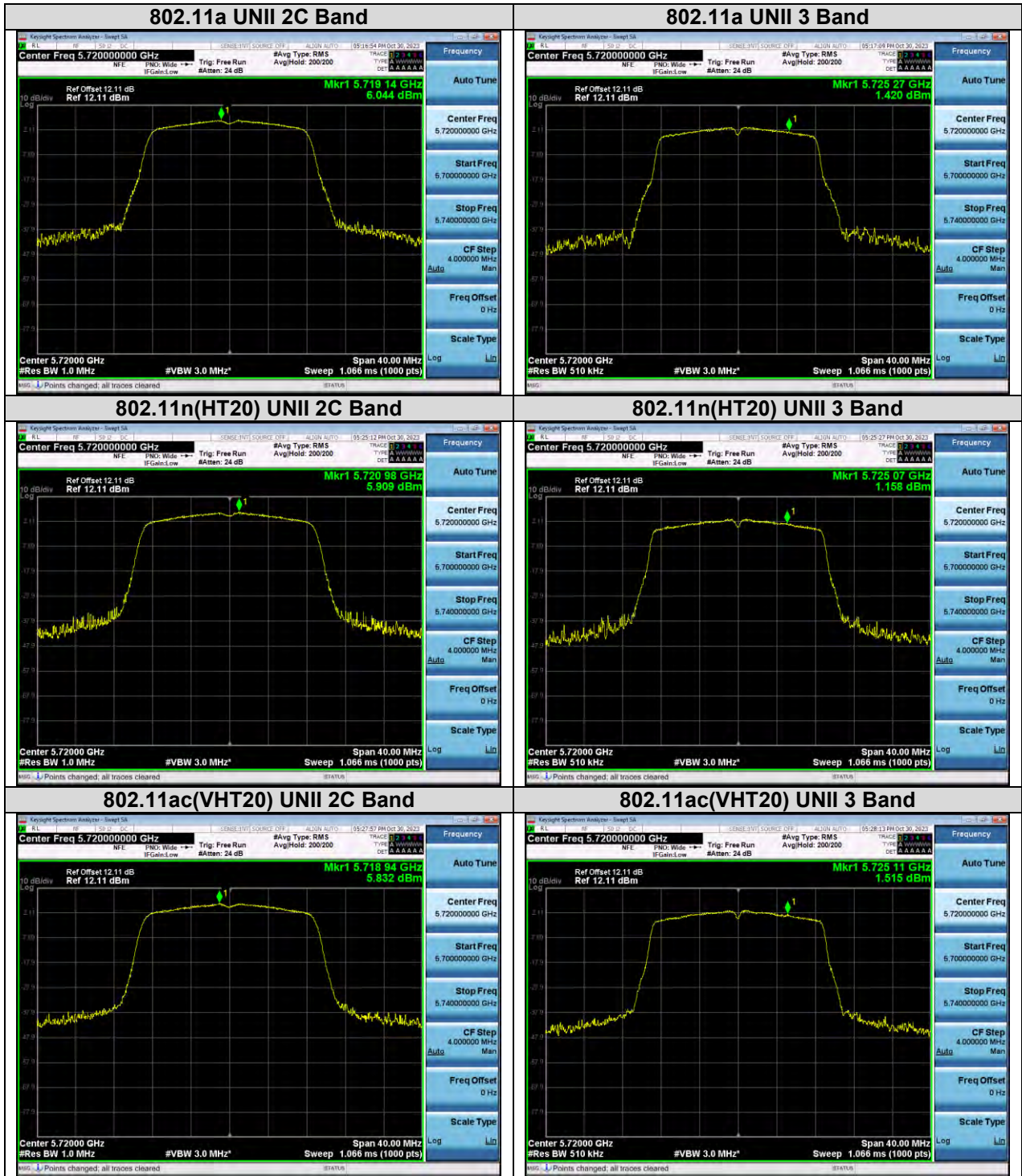
10.7.4 Power Spectral Density

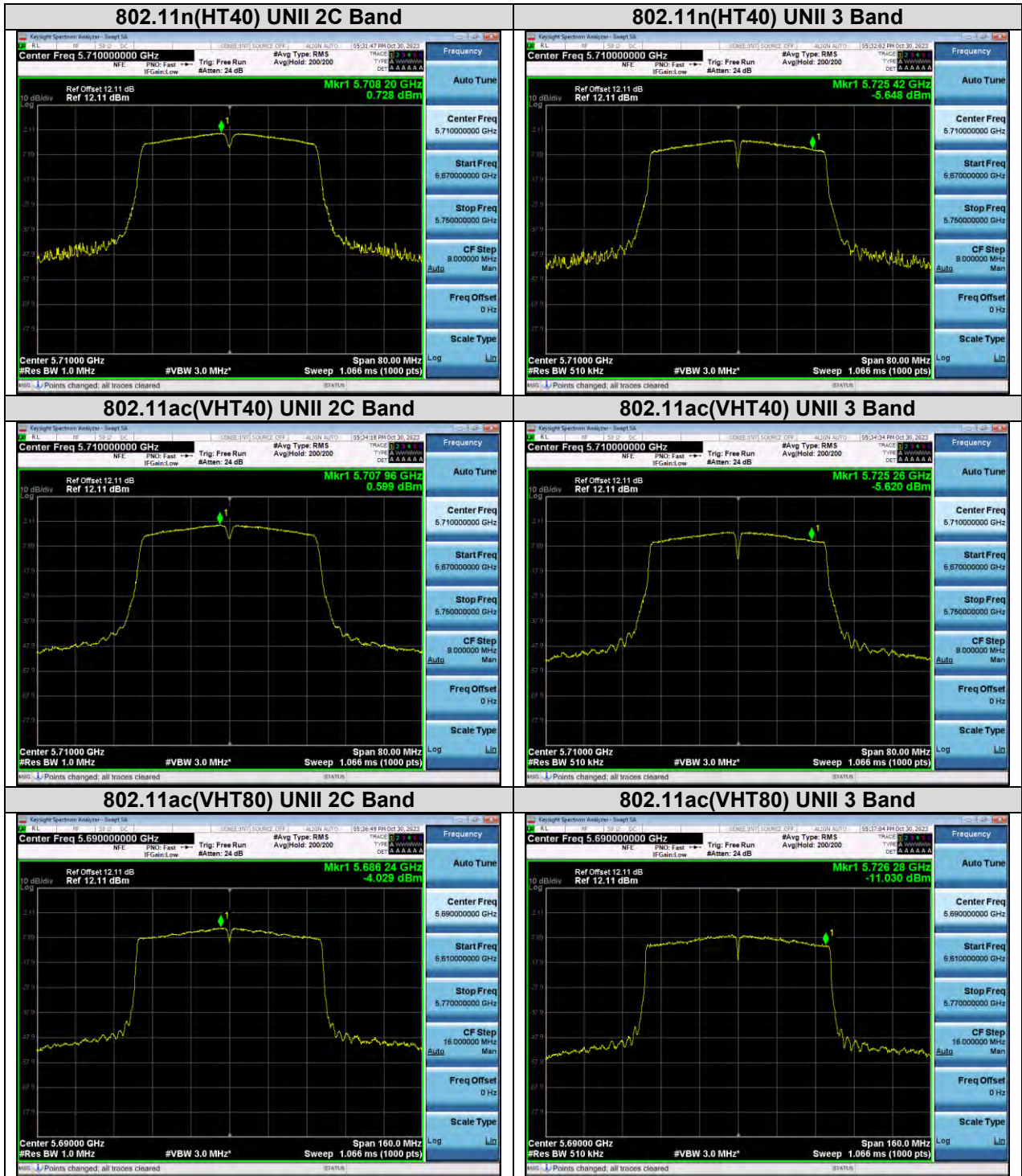
Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11a	5720 (UNII 2C)	144	6.044	0.142	6.186	11 dBm/ MHz	6 Mbps
802.11n(HT20)			5.909	0.167	6.077		MCS0
802.11ac(VHT20)			5.832	0.155	5.987		MCS0
802.11a	5720 (UNII 3)	144	1.420	0.142	1.561	30 dBm/ 500 kHz	6 Mbps
802.11n(HT20)			1.158	0.167	1.325		MCS0
802.11ac(VHT20)			1.515	0.155	1.671		MCS0

Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11n(HT40)	5710 (UNII 2C)	142	0.728	0.299	1.026	11 dBm/ MHz	MCS0
802.11ac(VHT40)			0.599	0.290	0.889		MCS0
802.11n(HT40)	5710 (UNII 3)	142	-5.648	0.299	-5.349	30 dBm/ 500 kHz	MCS0
802.11ac(VHT40)			-5.620	0.290	-5.330		MCS0

Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11ac(VHT80)	5690 (UNII 2C)	138	-4.029	0.559	-3.470	11 dBm/ MHz	MCS0
	5690 (UNII 3)	138	-11.030	0.559	-10.472	30 dBm/ 500 kHz	MCS0

Test Plots





10.8 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30 MHz

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

Note:

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

Frequency Range : Below 1 GHz

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

Note:

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

Frequency Range : Above 1 GHz

Band : UNII 1
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5180 MHz
 Channel No. 36 Ch

Frequency [MHz]	Measured Value [dBμV]	POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
10360	54.71	V	54.71	68.20	13.49	PK
15540	53.20	V	53.20	73.98	20.78	PK
15540	39.86	V	39.86	53.98	14.12	AV
10360	54.76	H	54.76	68.20	13.44	PK
15540	53.23	H	53.23	73.98	20.75	PK
15540	40.09	H	40.09	53.98	13.89	AV

Band : UNII 1
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5200 MHz
 Channel No. 40 Ch

Frequency [MHz]	Measured Value [dBμV]	POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
10400	54.17	V	54.17	68.20	14.03	PK
15600	53.22	V	53.22	73.98	20.76	PK
15600	39.03	V	39.03	53.98	14.95	AV
10400	54.31	H	54.31	68.20	13.89	PK
15600	53.67	H	53.67	73.98	20.31	PK
15600	39.11	H	39.11	53.98	14.87	AV

Band : UNII 1
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5240 MHz
 Channel No. 48 Ch

Frequency [MHz]	Measured Value [dB μ V]	POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
10480	54.45	V	54.45	68.20	13.75	PK
15720	52.30	V	52.30	73.98	21.68	PK
15720	38.14	V	38.14	53.98	15.84	AV
10480	54.80	H	54.80	68.20	13.40	PK
15720	52.39	H	52.39	73.98	21.59	PK
15720	38.58	H	38.58	53.98	15.40	AV

Band : UNII 2A
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5260 MHz
 Channel No. 52 Ch

Frequency [MHz]	Measured Value [dB μ V]	POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
10520	54.26	V	54.26	68.20	13.94	PK
15780	53.11	V	53.11	73.98	20.87	PK
15780	38.76	V	38.76	53.98	15.22	AV
10520	54.58	H	54.58	68.20	13.62	PK
15780	54.18	H	54.18	73.98	19.80	PK
15780	38.91	H	38.91	53.98	15.07	AV

Band : UNII 2A
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5300 MHz
 Channel No. 60 Ch

Frequency [MHz]	Measured Value [dBμV]	POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
10600	53.73	V	53.73	73.98	20.25	PK
10600	41.10	V	41.10	53.98	12.88	AV
15900	52.99	V	52.99	73.98	20.99	PK
15900	39.15	V	39.15	53.98	14.83	AV
10600	54.05	H	54.05	73.98	19.93	PK
10600	41.31	H	41.31	53.98	12.67	AV
15900	53.49	H	53.49	73.98	20.49	PK
15900	39.65	H	39.65	53.98	14.33	AV

Band : UNII 2A
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5320 MHz
 Channel No. 64 Ch

Frequency [MHz]	Measured Value [dBμV]	POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
10640	55.06	V	55.06	73.98	18.92	PK
10640	41.14	V	41.14	53.98	12.84	AV
15960	51.84	V	51.84	73.98	22.14	PK
15960	39.24	V	39.24	53.98	14.74	AV
10640	55.21	H	55.21	73.98	18.77	PK
10640	41.29	H	41.29	53.98	12.69	AV
15960	52.95	H	52.95	73.98	21.03	PK
15960	39.42	H	39.42	53.98	14.56	AV

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Measured Value [dB μ V]	POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
11000	53.06	V	53.06	73.98	20.92	PK
11000	39.71	V	39.71	53.98	14.27	AV
16500	52.31	V	52.31	68.20	15.89	PK
11000	53.37	H	53.37	73.98	20.61	PK
11000	39.79	H	39.79	53.98	14.19	AV
16500	52.70	H	52.70	68.20	15.50	PK

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5600 MHz
Channel No.	120 Ch

Frequency [MHz]	Measured Value [dB μ V]	POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
11200	54.29	V	54.29	73.98	19.69	PK
11200	40.54	V	40.54	53.98	13.44	AV
16800	55.10	V	55.10	68.20	13.10	PK
11200	54.74	H	54.74	73.98	19.24	PK
11200	40.89	H	40.89	53.98	13.09	AV
16800	55.22	H	55.22	68.20	12.98	PK

Band : UNII 2C
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5720 MHz
 Channel No. 144 Ch

Frequency [MHz]	Measured Value [dBμV]	POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11440	52.64	V	52.64	73.98	21.34	PK
11440	39.93	V	39.93	53.98	14.05	AV
17160	52.96	V	52.96	68.20	15.24	PK
11440	52.61	H	52.61	73.98	21.37	PK
11440	40.04	H	40.04	53.98	13.94	AV
17160	55.50	H	55.50	68.20	12.70	PK

Band : UNII 3
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5745MHz
 Channel No. 149 Ch

Frequency [MHz]	Measured Value [dBμV]	POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11490	53.50	V	53.50	73.98	20.48	PK
11490	40.28	V	40.28	53.98	13.70	AV
17235	54.72	V	54.72	68.20	13.48	PK
11490	53.71	H	53.71	73.98	20.27	PK
11490	40.45	H	40.45	53.98	13.53	AV
17235	54.85	H	54.85	68.20	13.35	PK

Band : UNII 3
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5785 MHz
 Channel No. 157 Ch

Frequency [MHz]	Measured Value [dBμV]	POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11570	54.26	V	54.26	73.98	19.72	PK
11570	41.22	V	41.22	53.98	12.76	AV
17355	55.29	V	55.29	68.20	12.91	PK
11570	54.51	H	54.51	73.98	19.47	PK
11570	41.58	H	41.58	53.98	12.40	AV
17355	55.76	H	55.76	68.20	12.44	PK

Band : UNII 3
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5825 MHz
 Channel No. 165 Ch

Frequency [MHz]	Measured Value [dBμV]	POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11650	54.28	V	54.28	73.98	19.70	PK
11650	41.46	V	41.46	53.98	12.52	AV
17475	55.73	V	55.73	68.20	12.47	PK
11650	54.40	H	54.40	73.98	19.58	PK
11650	41.60	H	41.60	53.98	12.38	AV
17475	55.76	H	55.76	68.20	12.44	PK

[RSDB Mode]**Bluetooth_Ch. 78_3DH5_8DPSK + WLAN_5 GHz_802.11a_6 Mbps_Ch.165**

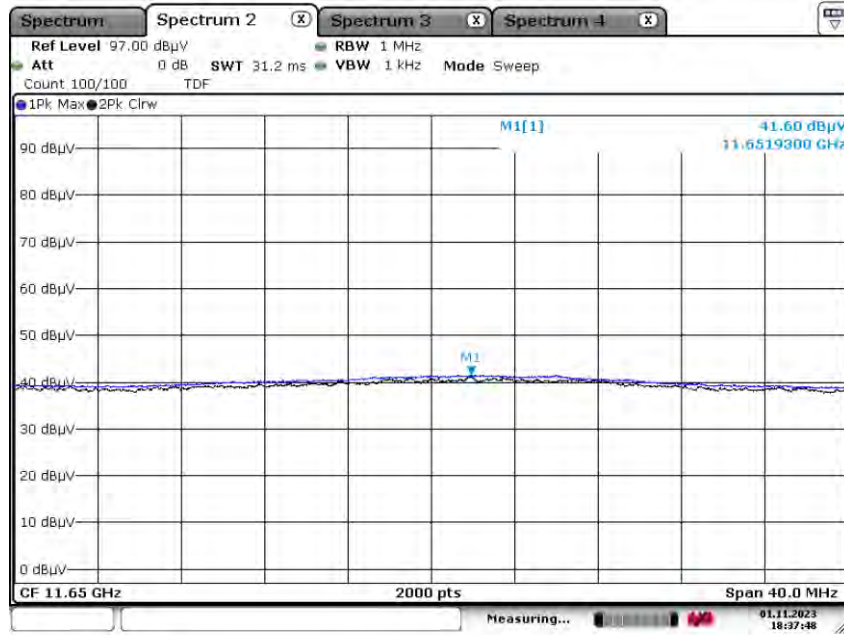
Frequency [MHz]	Measured Value [dB μ V]	POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
11650	54.69	V	54.69	73.98	19.29	PK
11650	41.44	V	41.44	53.98	12.54	AV
17475	55.32	V	55.32	68.20	12.88	PK
11650	54.77	H	54.77	73.98	19.21	PK
11650	41.48	H	41.48	53.98	12.50	AV
17475	55.40	H	55.40	68.20	12.80	PK

Note :

Bluetooth RSDB Data refer to Bluetooth Test Report.

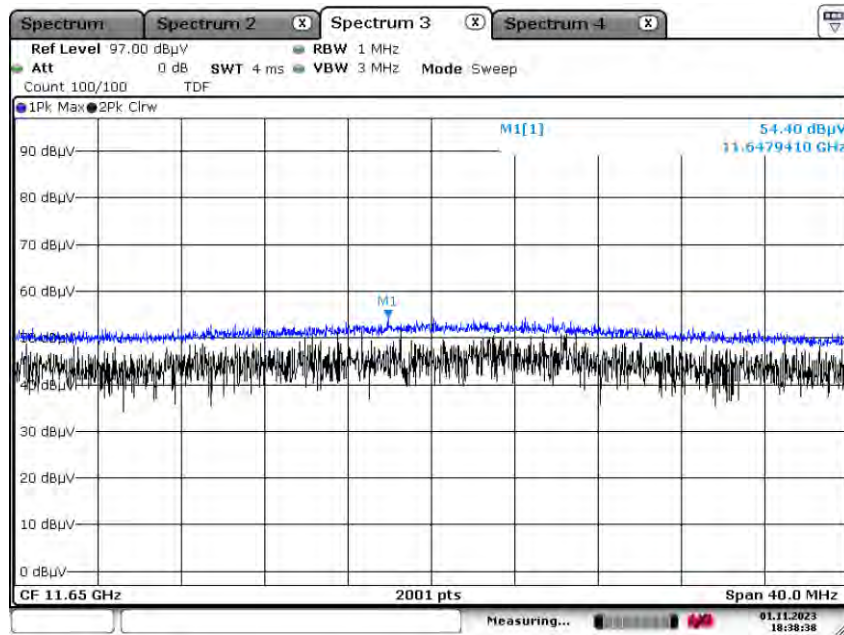
▣ Test Plots

Peak Result (802.11a, Ch.165 2nd Spurious Emissions, X-H)



Date: 1.NOV.2023 18:37:48

Average Result (802.11a, Ch.165 2nd Spurious Emissions, X-H)

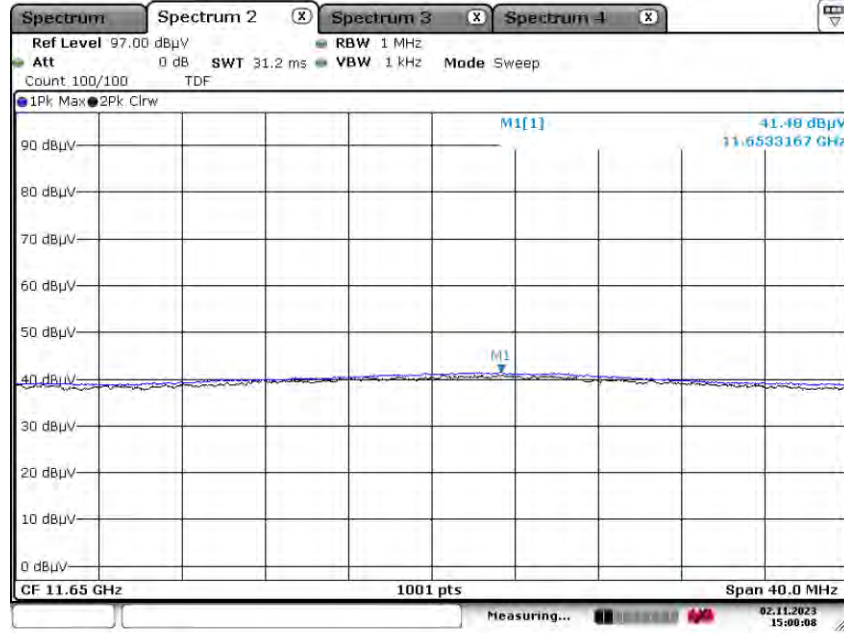


Date: 1.NOV.2023 18:38:38

[RSDB Mode]

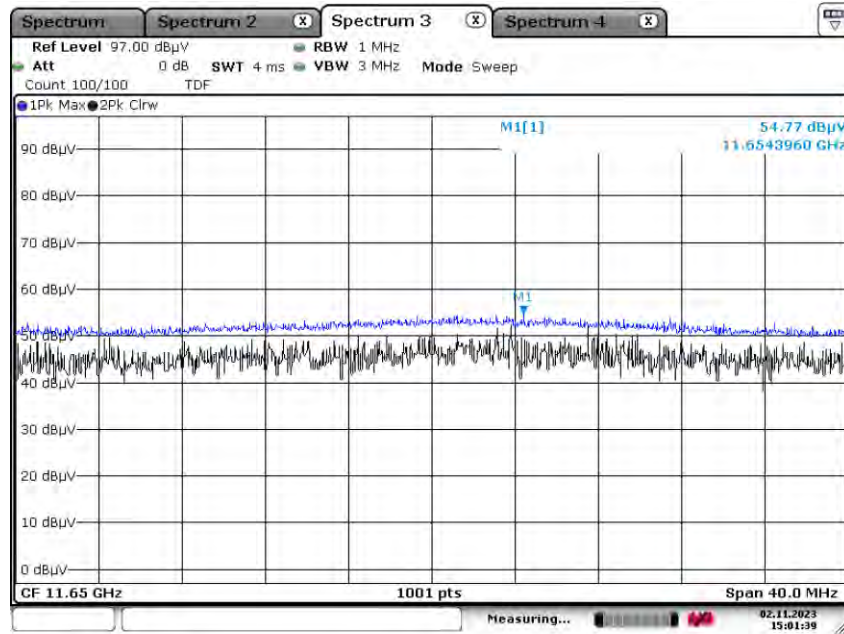
Bluetooth_Ch. 78_3DH5_8DPSK + WLAN_5 GHz_802.11a_6 Mbps_Ch.165

Average Result (2nd Spurious Emissions, X-H)



Date: 2.NOV.2023 15:00:08

Peak Result (2nd Spurious Emissions, X-H)



Date: 2.NOV.2023 15:01:39

Note:

Only the worst case plots for Radiated Spurious Emissions.

10.9 RADIATED RESTRICTED BAND EDGE

Band : UNII 1
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5180 MHz
 Channel No. 36 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF-AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5150	65.86	-3.06	H	62.80	73.98	11.18	PK
5150	46.65	-3.06	H	43.59	53.98	10.39	AV
5150	66.75	-3.06	V	63.69	73.98	10.29	PK
5150	47.32	-3.06	V	44.26	53.98	9.72	AV

Band : UNII 2A
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5320 MHz
 Channel No. 64 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF-AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350	67.24	-3.16	H	64.08	73.98	9.90	PK
5350	48.35	-3.16	H	45.19	53.98	8.79	AV
5350	66.93	-3.16	V	63.77	73.98	10.21	PK
5350	48.22	-3.16	V	45.06	53.98	8.92	AV

Band : UNII 2C
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5500 MHz
 Channel No. 100 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5460	63.16	-2.84	H	60.32	73.98	13.66	PK
5460	45.30	-2.84	H	42.46	53.98	11.52	AV
#5470	62.58	-2.82	H	59.76	68.20	8.44	PK
5460	62.65	-2.84	V	59.81	73.98	14.17	PK
5460	43.29	-2.84	V	40.45	53.98	13.53	AV
#5470	62.18	-2.82	V	59.36	68.20	8.84	PK

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

Band : UNII 1
 Operation Mode: 802.11 n_HT20
 Transfer MCS Index: 0
 Operating Frequency 5180 MHz
 Channel No. 36 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5150	66.56	-3.06	H	63.50	73.98	10.48	PK
5150	46.30	-3.06	H	43.24	53.98	10.74	AV
5150	65.18	-3.06	V	62.12	73.98	11.86	PK
5150	46.15	-3.06	V	43.09	53.98	10.89	AV

Band : UNII 2A
 Operation Mode: 802.11 n_HT20
 Transfer MCS Index: 0
 Operating Frequency 5320 MHz
 Channel No. 64 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350	69.70	-3.16	H	66.54	73.98	7.44	PK
5350	48.97	-3.16	H	45.81	53.98	8.17	AV
5350	69.39	-3.16	V	66.23	73.98	7.75	PK
5350	48.47	-3.16	V	45.31	53.98	8.67	AV

Band : UNII 2C
 Operation Mode: 802.11 n_HT20
 Transfer MCS Index: 0
 Operating Frequency: 5500 MHz
 Channel No. 100 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5460	64.07	-2.84	H	61.23	73.98	12.75	PK
5460	45.90	-2.84	H	43.06	53.98	10.92	AV
#5470	64.67	-2.82	H	61.85	68.20	6.35	PK
5460	63.84	-2.84	V	61.00	73.98	12.98	PK
5460	45.82	-2.84	V	42.98	53.98	11.00	AV
#5470	63.50	-2.82	V	60.68	68.20	7.52	PK

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

Band :	UNII 1
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	0
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5150	66.57	-3.06	H	63.51	73.98	10.47	PK
5150	46.86	-3.06	H	43.80	53.98	10.18	AV
5150	64.27	-3.06	V	61.21	73.98	12.77	PK
5150	46.63	-3.06	V	43.57	53.98	10.41	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	0
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350	69.41	-3.16	H	66.25	73.98	7.73	PK
5350	48.81	-3.16	H	45.65	53.98	8.33	AV
5350	68.56	-3.16	V	65.40	73.98	8.58	PK
5350	47.98	-3.16	V	44.82	53.98	9.16	AV

Band : UNII 2C
 Operation Mode: 802.11 ac_VHT20
 Transfer MCS Index: 0
 Operating Frequency: 5500 MHz
 Channel No. 100 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5460	63.16	-2.84	H	60.32	73.98	13.66	PK
5460	46.68	-2.84	H	43.84	53.98	10.14	AV
#5470	63.92	-2.82	H	61.10	68.20	7.10	PK
5460	62.51	-2.84	V	59.67	73.98	14.31	PK
5460	46.08	-2.84	V	43.24	53.98	10.74	AV
#5470	63.24	-2.82	V	60.42	68.20	7.78	PK

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

Band : UNII 1
 Operation Mode: 802.11 n_HT40
 Transfer MCS Index: 0
 Operating Frequency 5190 MHz
 Channel No. 38 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5150	68.76	-3.06	H	65.70	73.98	8.28	PK
5150	46.85	-3.06	H	43.79	53.98	10.19	AV
5150	48.18	-3.06	V	45.12	73.98	28.86	PK
5150	46.64	-3.06	V	43.58	53.98	10.40	AV

Band : UNII 2A
 Operation Mode: 802.11 n_HT40
 Transfer MCS Index: 0
 Operating Frequency 5310 MHz
 Channel No. 62 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350	70.84	-3.16	H	67.68	73.98	6.30	PK
5350	53.16	-3.16	H	50.00	53.98	3.98	AV
5350	69.52	-3.16	V	66.36	73.98	7.62	PK
5350	52.18	-3.16	V	49.02	53.98	4.96	AV

Band :	UNII 2C
Operation Mode:	802.11 n_HT40
Transfer MCS Index:	0
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5460	66.76	-2.84	H	63.92	73.98	10.06	PK
5460	46.71	-2.84	H	43.87	53.98	10.11	AV
#5470	67.65	-2.82	H	64.83	68.20	3.37	PK
5460	65.68	-2.84	V	62.84	73.98	11.14	PK
5460	45.79	-2.84	V	42.95	53.98	11.03	AV
#5470	66.61	-2.82	V	63.79	68.20	4.41	PK

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

Band :	UNII 1
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	0
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5150	66.23	-3.06	H	63.17	73.98	10.81	PK
5150	47.29	-3.06	H	44.23	53.98	9.75	AV
5150	47.26	-3.06	V	44.20	73.98	29.78	PK
5150	45.85	-3.06	V	42.79	53.98	11.19	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	0
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350	69.62	-3.16	H	66.46	73.98	7.52	PK
5350	52.04	-3.16	H	48.88	53.98	5.10	AV
5350	68.55	-3.16	V	65.39	73.98	8.59	PK
5350	51.96	-3.16	V	48.80	53.98	5.18	AV

Band : UNII 2C
 Operation Mode: 802.11 ac_VHT40
 Transfer MCS Index: 0
 Operating Frequency: 5510 MHz
 Channel No. 102 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5460	63.18	-2.84	H	60.34	73.98	13.64	PK
5460	46.99	-2.84	H	44.15	53.98	9.83	AV
#5470	66.29	-2.82	H	63.47	68.20	4.73	PK
5460	61.88	-2.84	V	59.04	73.98	14.94	PK
5460	46.25	-2.84	V	43.41	53.98	10.57	AV
#5470	64.61	-2.82	V	61.79	68.20	6.41	PK

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

Band : UNII 1
 Operation Mode: 802.11 ac_VHT80
 Transfer MCS Index: 0
 Operating Frequency: 5210 MHz
 Channel No. 42 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5150	65.76	-3.06	H	62.70	73.98	11.28	PK
5150	51.16	-3.06	H	48.10	53.98	5.88	AV
5150	65.05	-3.06	V	61.99	73.98	11.99	PK
5150	49.95	-3.06	V	46.89	53.98	7.09	AV

Band : UNII 2A
 Operation Mode: 802.11 ac_VHT80
 Transfer MCS Index: 0
 Operating Frequency: 5290 MHz
 Channel No. 58 Ch

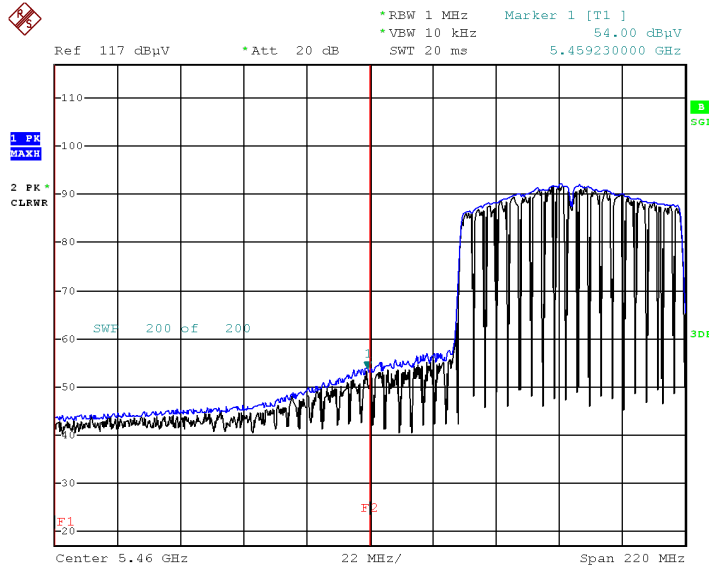
Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350	67.11	-3.16	H	63.95	73.98	10.03	PK
5350	54.29	-3.16	H	51.13	53.98	2.85	AV
5350	65.87	-3.16	V	62.71	73.98	11.27	PK
5350	51.59	-3.16	V	48.43	53.98	5.55	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	0
Operating Frequency	5530 MHz
Channel No.	106 Ch

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF- AG+ATT [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5460	67.88	-2.84	H	65.04	73.98	8.94	PK
5460	54.00	-2.84	H	51.16	53.98	2.82	AV
5470	68.51	-2.82	H	65.69	68.20	2.51	PK
5460	66.60	-2.84	V	63.76	73.98	10.22	PK
5460	52.03	-2.84	V	49.19	53.98	4.79	AV
5470	68.41	-2.82	V	65.59	68.20	2.61	PK

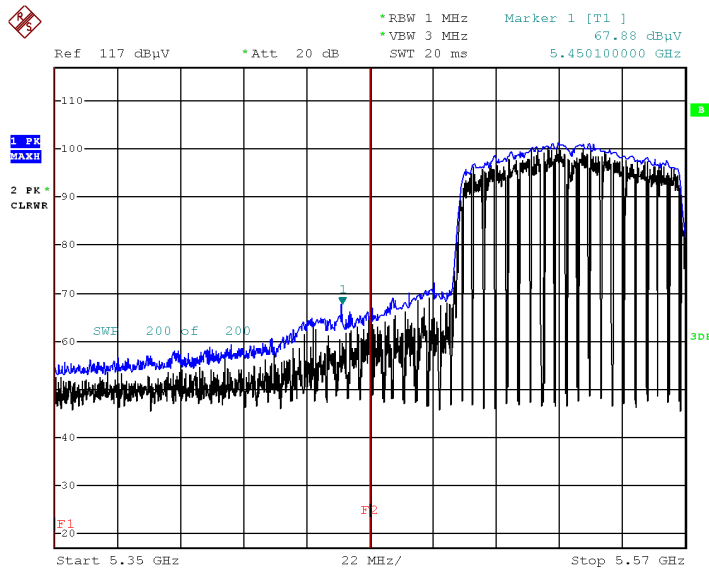
▣ Test Plots(UNII 1, 2A, 2C)

Average Result_(802.11 ac_VHT80, MCS0, Ch.106, X-H)



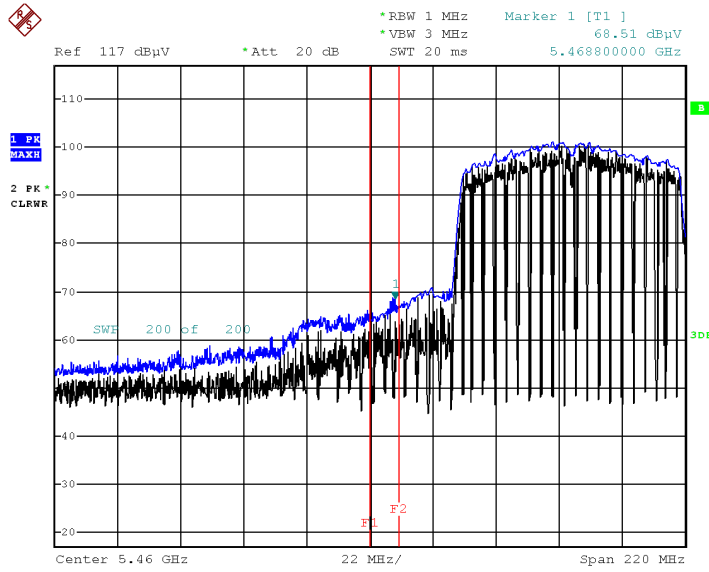
Date: 28.JAN.2003 10:13:00

Peak Result (802.11 ac_VHT80, MCS0, Ch.106, X-H)



Date: 28.JAN.2003 10:22:34

Peak Result (802.11 ac_VHT80, MCS0, Ch.106, X-H)



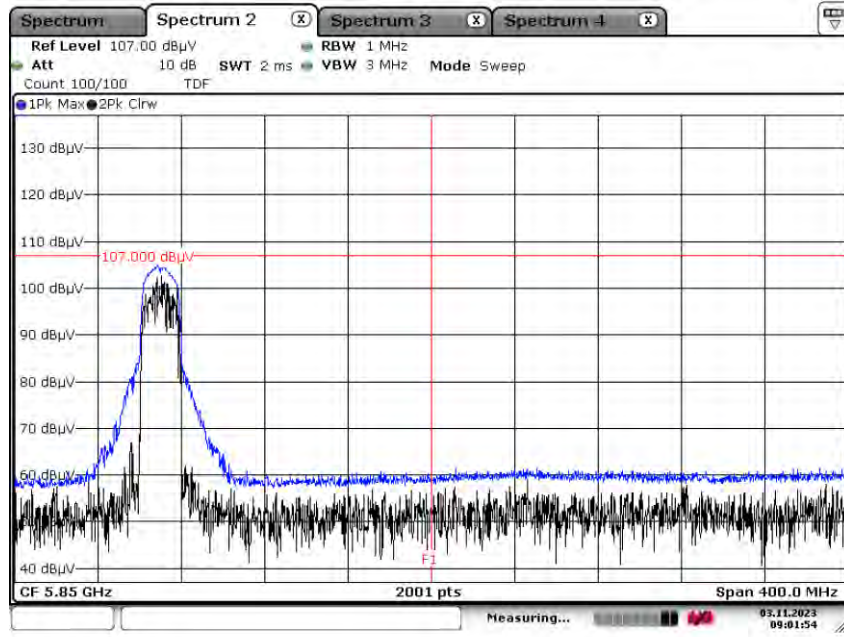
Date: 28.JAN.2003 10:21:11

Note:

Only the worst case plots for Radiated Restricted Band Edge.

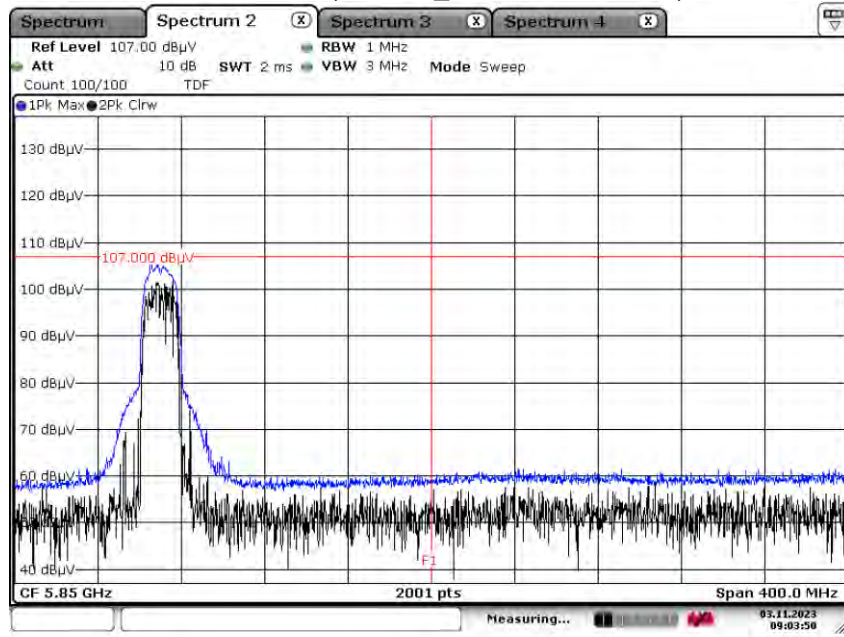
▣ Test Plots(Straddle Channel)

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



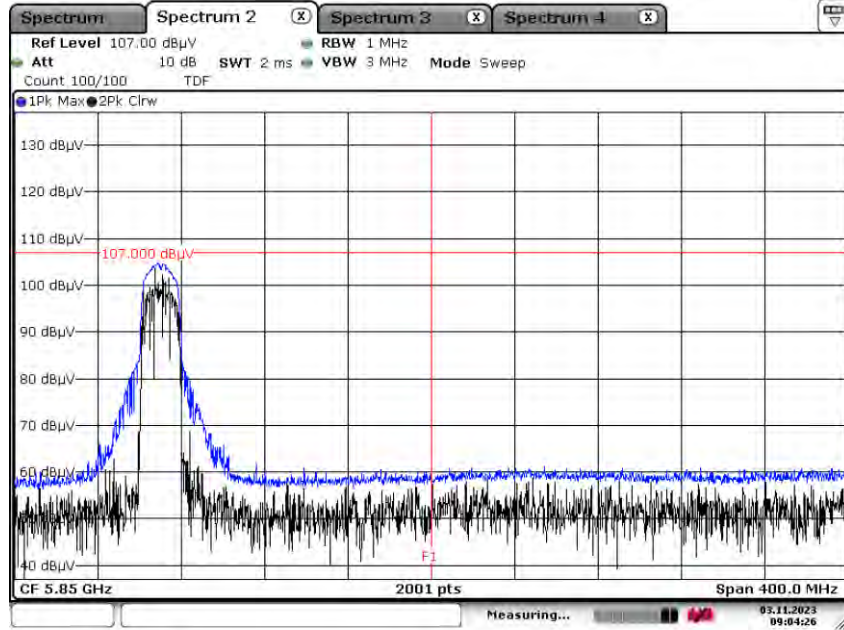
Date: 3 NOV. 2023 09:01:54

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



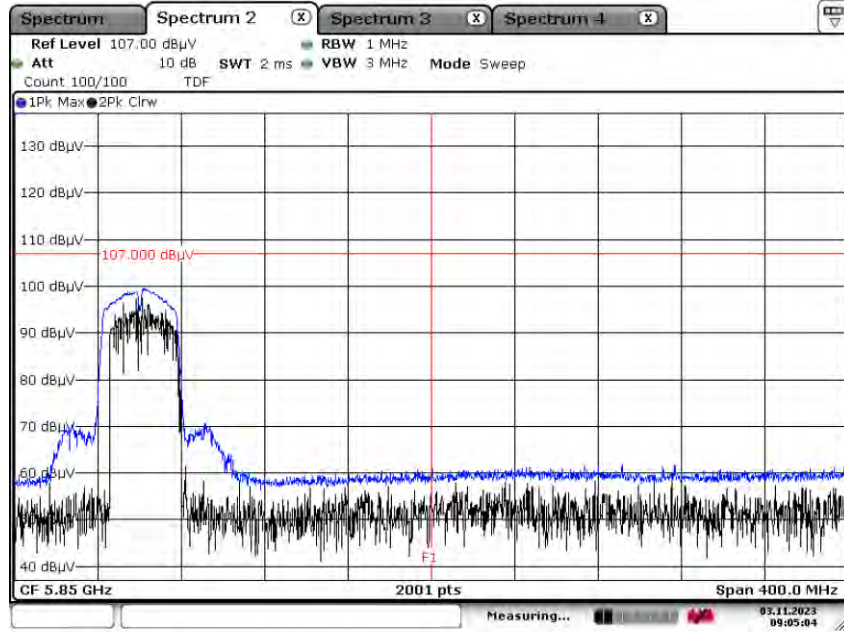
Date: 3 NOV. 2023 09:03:51

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



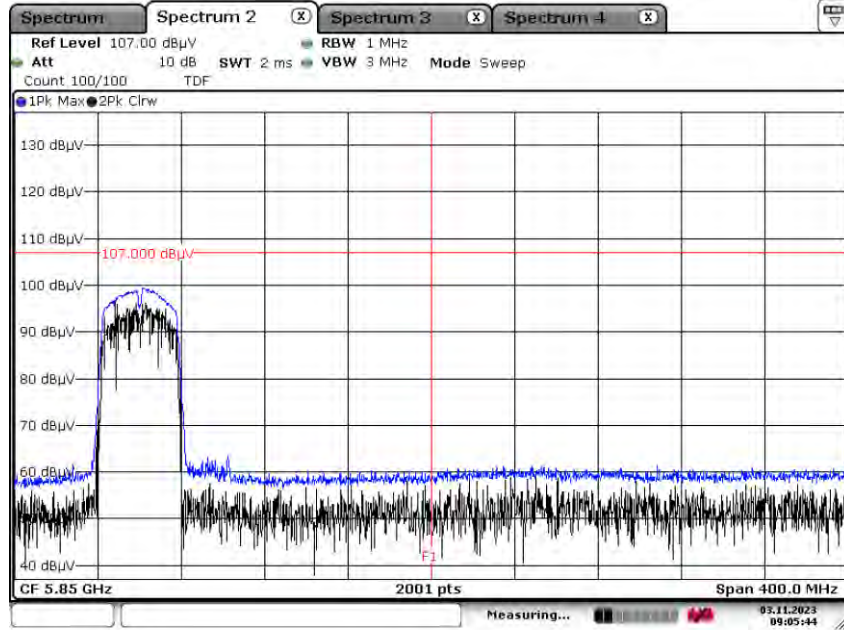
Date: 3 NOV. 2023 09:04:26

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



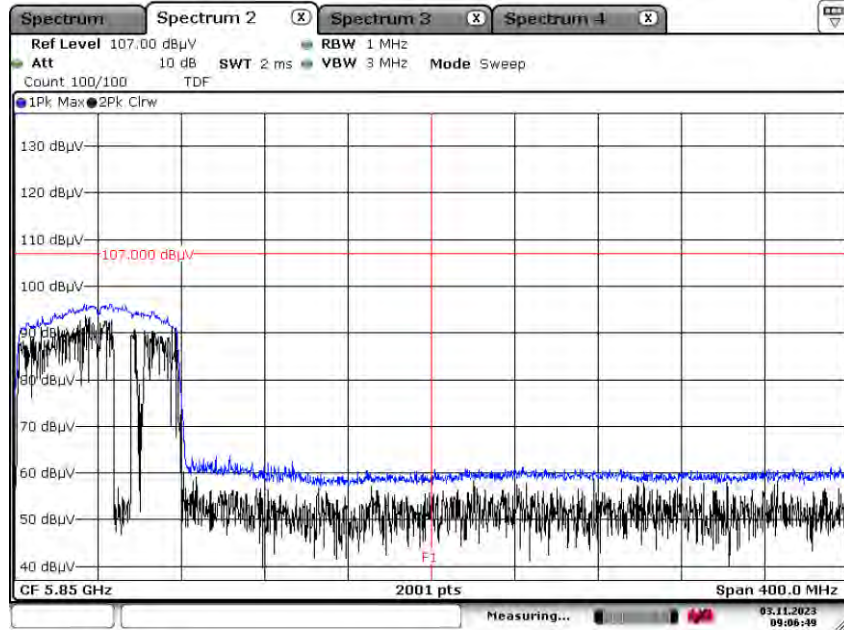
Date: 3 NOV. 2023 09:05:04

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



Date: 3 NOV. 2023 09:05:44

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



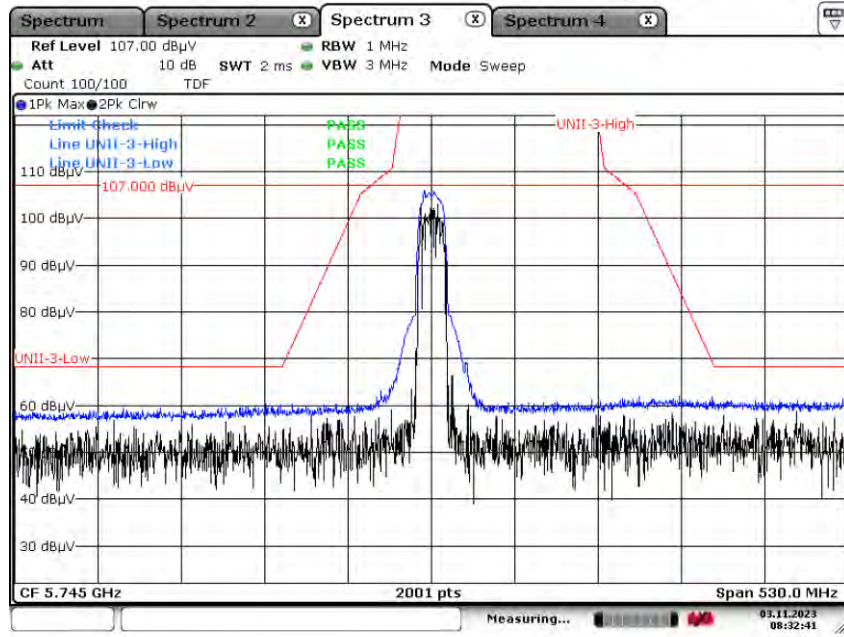
Date: 3 NOV. 2023 09:06:49

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)

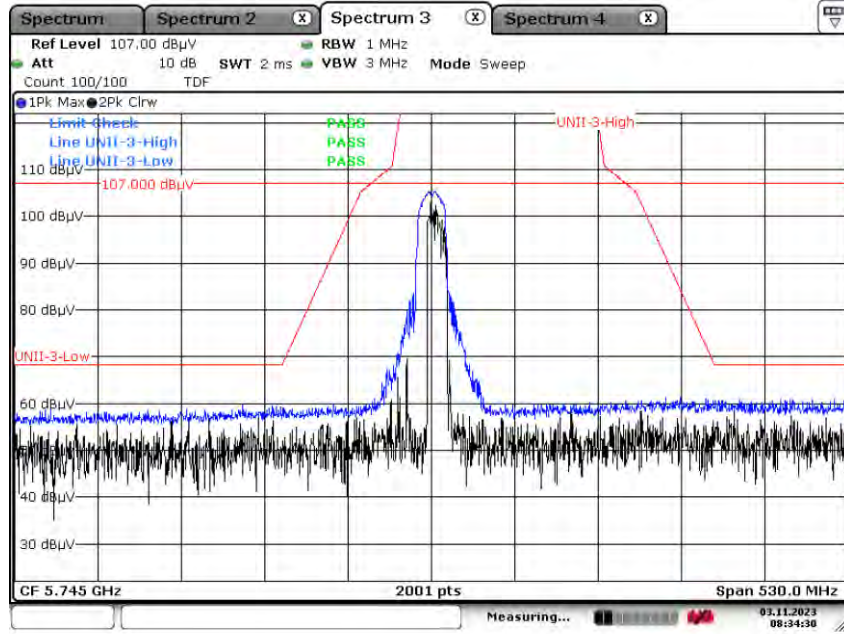
▣ Test Plots(UNII 3)

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



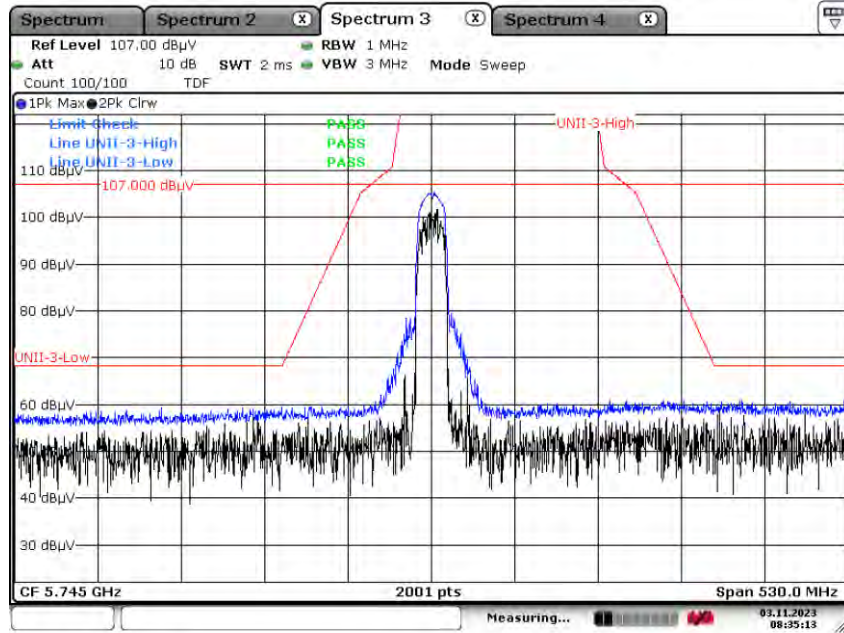
Date: 3 NOV. 2023 08:32:41

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



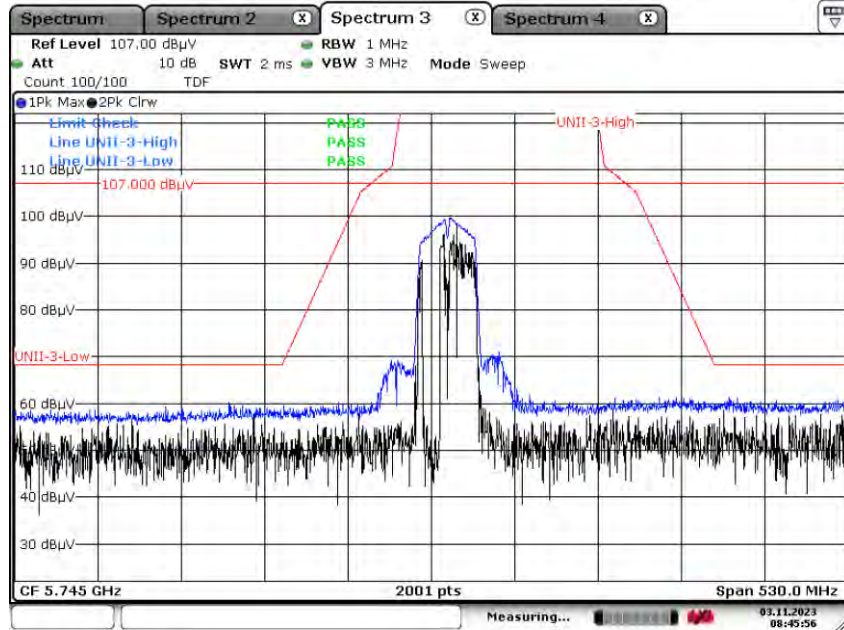
Date: 3 NOV. 2023 08:34:31

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



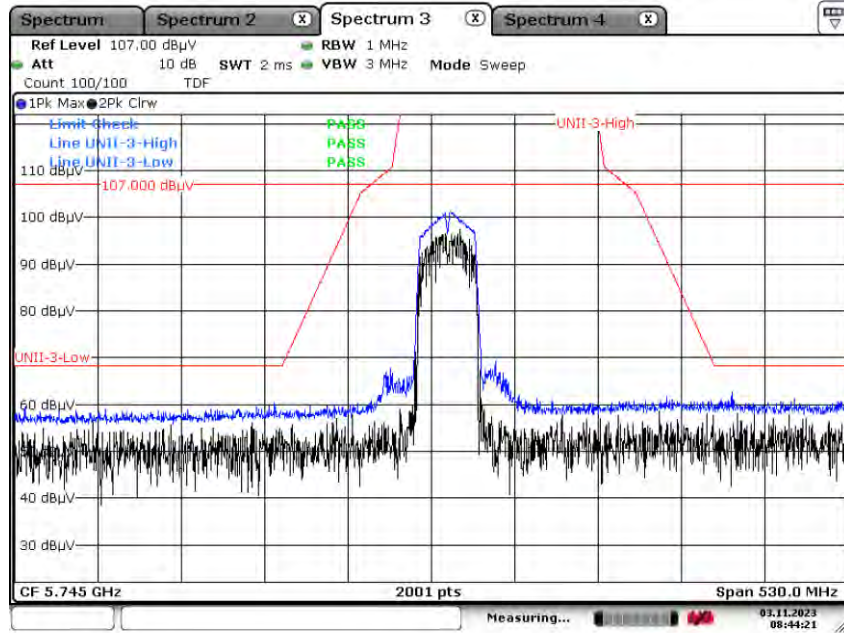
Date: 3 NOV. 2023 08:35:14

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



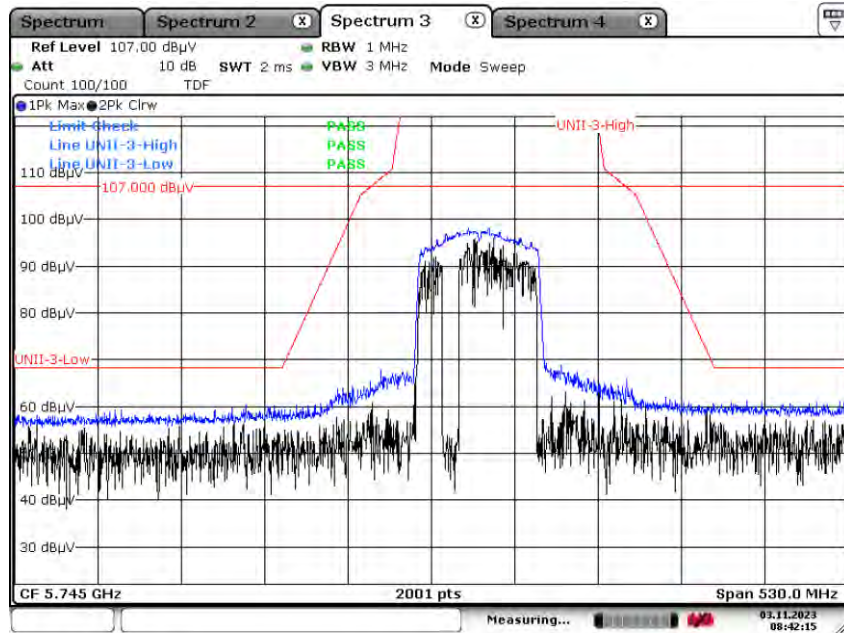
Date: 3 NOV. 2023 08:45:57

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



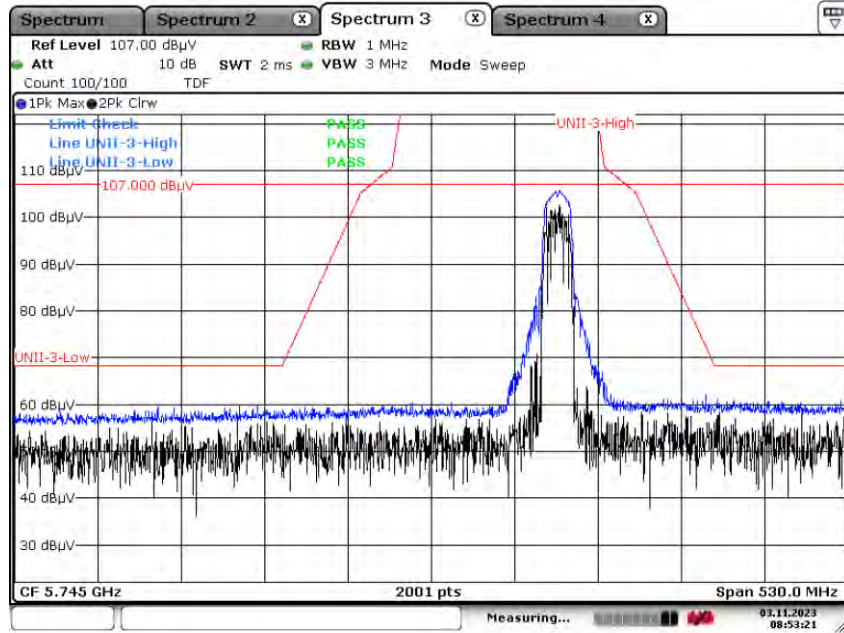
Date: 3.NOV.2023 08:44:21

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



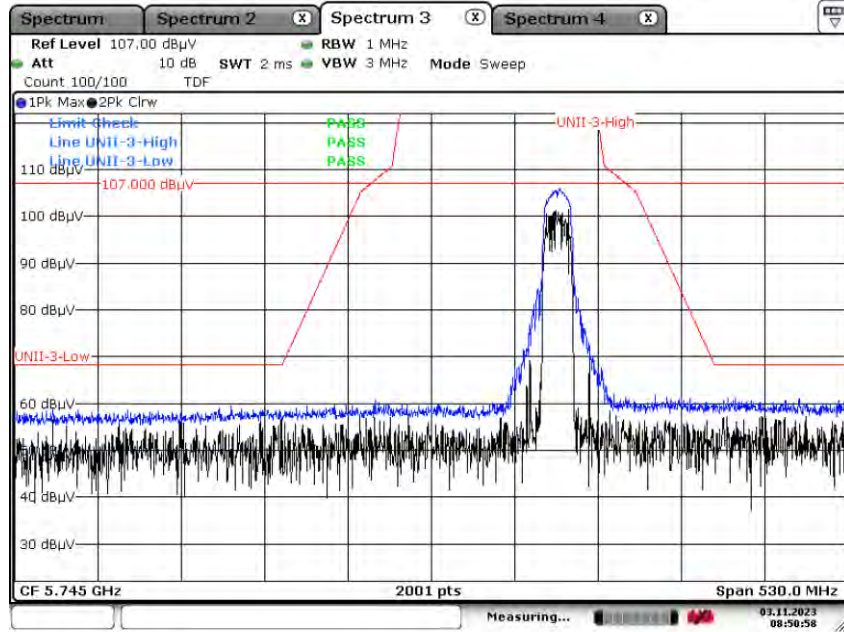
Date: 3.NOV.2023 08:42:16

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



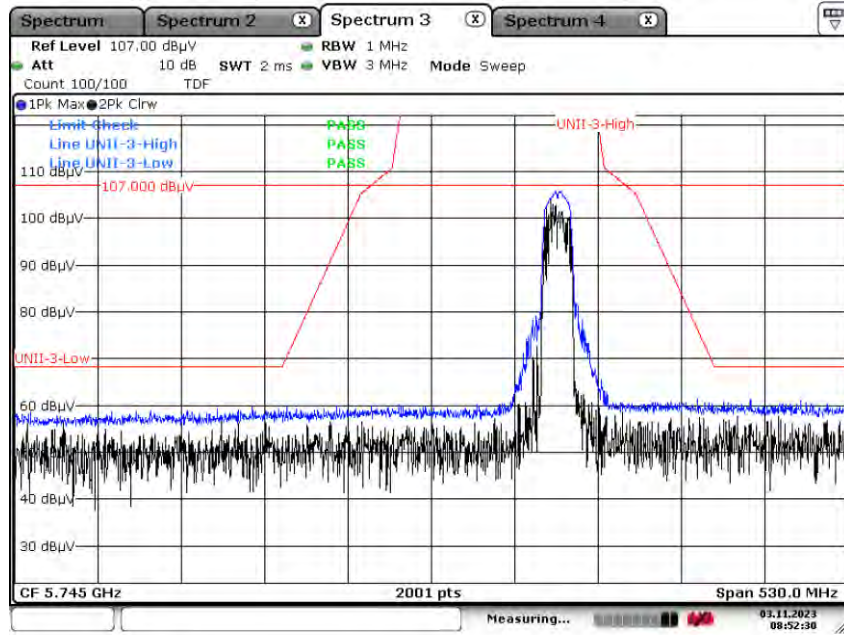
Date: 3 NOV. 2023 08:53:20

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



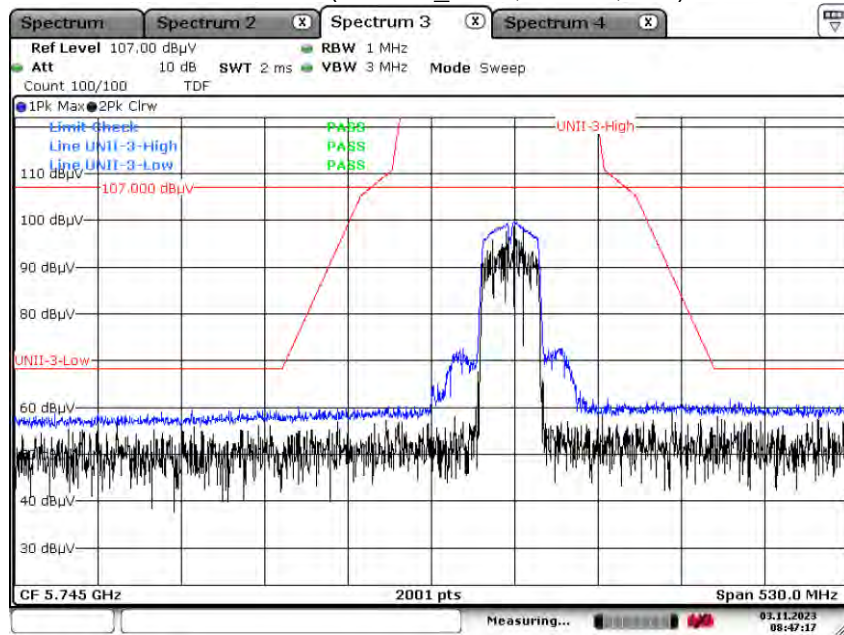
Date: 3 NOV. 2023 08:50:58

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



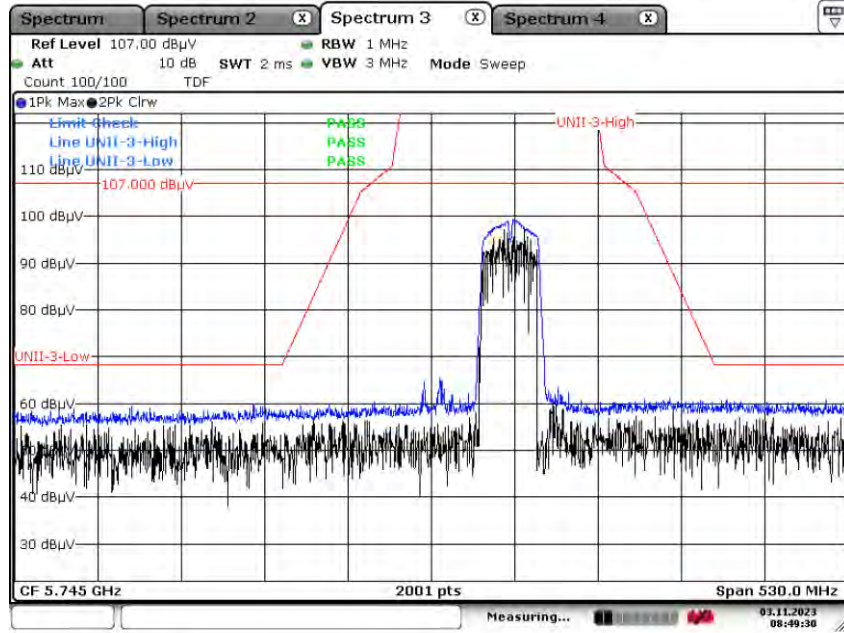
Date: 3 NOV.2023 08:52:30

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



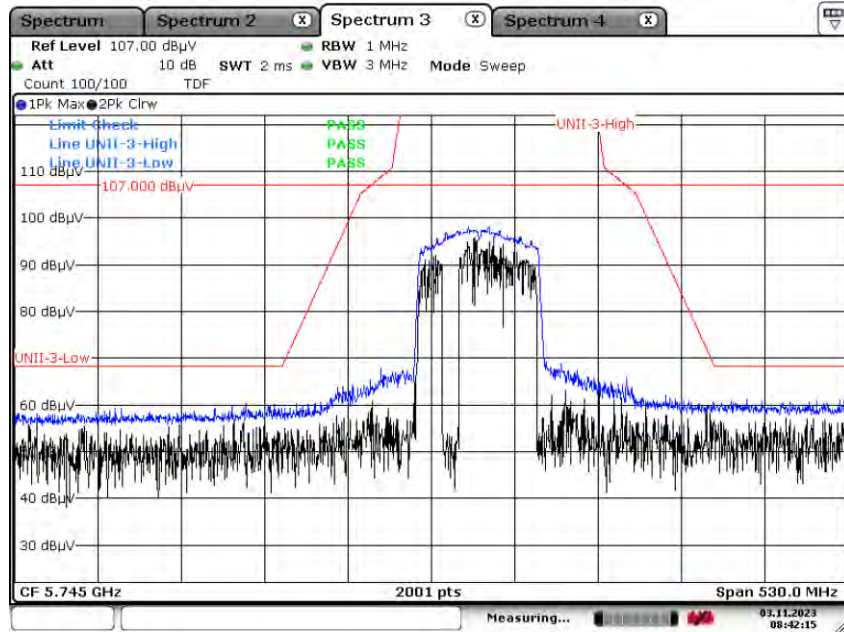
Date: 3 NOV.2023 08:47:16

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



Date: 3.NOV.2023 08:49:30

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



Date: 3.NOV.2023 08:42:16

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

Test

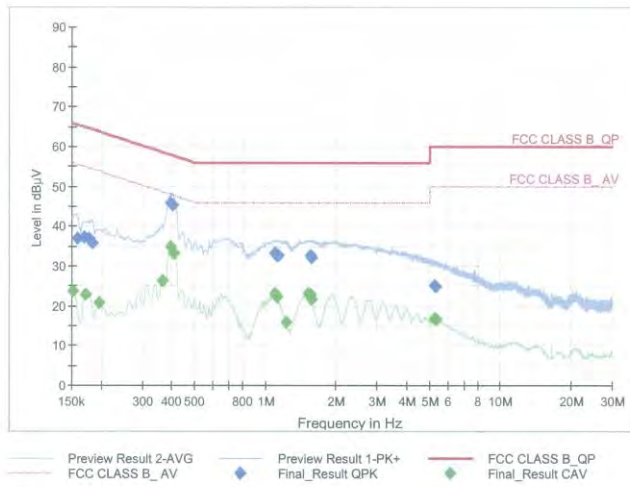
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Test Report

Common Information

EUT : SM-A155M/DSN
 Operating Conditions : 5G WLAN Mode
 Comment :

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (KHz)	Line	Corr. (dB)
0.1590	36.90	65.52	28.61	9.000	N	9.6
0.1703	37.30	64.95	27.64	9.000	N	9.6
0.1770	36.79	64.63	27.83	9.000	L1	9.6
0.1838	35.90	64.31	28.41	9.000	N	9.6
0.3953	45.92	57.95	12.03	9.000	L1	9.6
0.4020	45.21	57.81	12.61	9.000	L1	9.6
1.1008	33.23	56.00	22.77	9.000	L1	9.7
1.1098	33.07	56.00	22.93	9.000	L1	9.7
1.1210	32.68	56.00	23.32	9.000	L1	9.7
1.1300	32.64	56.00	23.36	9.000	L1	9.7
1.5575	32.52	56.00	23.48	9.000	L1	9.7
1.5688	32.07	56.00	23.93	9.000	L1	9.7
5.2318	24.98	60.00	35.02	9.000	L1	9.8
5.2408	25.03	60.00	34.97	9.000	L1	9.8
5.2655	24.96	60.00	35.04	9.000	L1	9.8
5.2700	25.16	60.00	34.84	9.000	L1	9.8
5.2768	24.94	60.00	35.06	9.000	L1	9.8
5.3195	24.75	60.00	35.25	9.000	L1	9.8

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오전 9:29:50

Test

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Final Result CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1523	23.69	55.88	32.18	9.000	L1	9.6
0.1725	22.90	54.84	31.94	9.000	L1	9.6
0.1973	20.71	53.73	33.01	9.000	L1	9.6
0.3660	26.33	48.59	22.26	9.000	L1	9.6
0.3930	34.77	48.00	13.23	9.000	L1	9.6
0.4088	33.29	47.67	14.38	9.000	L1	9.6
1.1030	23.08	46.00	22.92	9.000	L1	9.7
1.1278	22.33	46.00	23.67	9.000	L1	9.7
1.2268	15.93	46.00	30.07	9.000	L1	9.7
1.5283	23.16	46.00	22.84	9.000	L1	9.7
1.5508	22.70	46.00	23.30	9.000	L1	9.7
1.5755	21.52	46.00	24.48	9.000	L1	9.7
5.2723	16.81	50.00	33.19	9.000	L1	9.8
5.2790	16.75	50.00	33.25	9.000	L1	9.8
5.2925	16.76	50.00	33.24	9.000	L1	9.8
5.2993	16.77	50.00	33.23	9.000	L1	9.8
5.3060	16.63	50.00	33.37	9.000	L1	9.8
5.3195	16.53	50.00	33.47	9.000	L1	9.8

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11. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	08/02/2024	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	05/26/2024	Annual
Temperature Chamber	SU-642	ESPEC	93008124	02/22/2024	Annual
Signal Analyzer	N9030A	Keysight	MY55410508	09/04/2024	Annual
Power Meter	N1911A	Agilent	MY45100523	03/06/2024	Annual
Power Sensor	N1921A	Agilent	MY57820067	03/06/2024	Annual
Directional Coupler	87300B	Agilent	3116A03621	10/30/2024	Annual
Power Splitter	11667B	Hewlett Packard	10545	02/06/2024	Annual
DC Power Supply	E3632A	Agilent	KR75305528	01/03/2024	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C-010	Agilent	08285	06/02/2024	Annual
Attenuator(20 dB)	18N-20dB	Rohde & Schwarz	8	03/08/2024	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	02/16/2024	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.

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
Switch	S46	KEITHLEY	1088024	N/A	N/A
Controller (Antenna Mast & Turn Table)	CO3000	Innco systems	CO3000/1251/48920320/P	N/A	N/A
Antenna Position Tower	MA4640/800-XP-ET	Innco systems	S4AM	N/A	N/A
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	03/17/2024	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	08/16/2024	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	02296	05/18/2024	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1191	11/18/2023	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	01/05/2024	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	02/09/2024	Annual
RF Switching System	FBSR-03A (3G HPF+LNA)	T&M SYSTEM	S3L1	12/05/2023	Annual
RF Switching System	FBSR-03A (10dB ATT+LNA)	T&M SYSTEM	S3L2	12/05/2023	Annual
RF Switching System	FBSR-03A (7G HPF+LNA)	T&M SYSTEM	S3L3	12/05/2023	Annual
RF Switching System	FBSR-03A (3dB ATT+LNA)	T&M SYSTEM	S3L4	12/05/2023	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/01/2023	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/02/2024	Annual
Bluetooth Tester	TC-3000C	TESCOM	3000C000175	03/28/2024	Annual
Spectrum Analyzer	FSW	Rohde & Schwarz	101736	05/18/2024	Annual
Spectrum Analyzer	FSP40	Rohde & Schwarz	100843	10/30/2024	Annual
Spectrum Analyzer	FSVA40 (10 Hz ~ 40 GHz)	Rohde & Schwarz	101502	03/17/2024	Annual

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Turn Table	N/A	Ets	N/A	N/A	N/A
Turn Table	DS2000-S	Innco systems	N/A	N/A	N/A
RF Switching System	FBSR-04C (3G HPF+LNA)	TNM system	S4L1	08/18/2024	Annual
RF Switching System	FBSR-04C (10 dB ATT+LNA)	TNM system	S4L2	08/18/2024	Annual
RF Switching System	FBSR-04C (3 dB ATT+LNA)	TNM system	S4L3	08/18/2024	Annual
RF Switching System	FBSR-04C (LNA)	TNM system	S4L4	08/18/2024	Annual
RF Switching System	FBSR-04C (7G HPF+LNA)	TNM system	S4L5	08/18/2024	Annual
RF Switching System	FBSR-04C (Thru)	TNM system	S4L6	08/18/2024	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-2311-FC015-P