



RF MEASUREMENT REPORT

FCC ID: Q9DAPIN0725

Applicant: Hewlett Packard Enterprise Company

Product: ACCESS POINT

Model No.: APIN0725

Trademark: 

FCC Classification: Unlicensed National Information Infrastructure (NII)

FCC Rule Part(s): Part 15 Subpart E (Section 15.407)

Result: Complies

Received Date: 2024-12-20

Test Date: 2025-01-07 ~ 2025-02-25

Reviewed By:

Jame Yuan

Approved By:

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB789033. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2412RSU035-U5	V01	Initial Report	2025-04-22	Valid

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1. General Information

1.1. Applicant

Hewlett Packard Enterprise Company

6280 America Center Drive, San Jose CA 95002, United States

1.2. Manufacturer

Hewlett Packard Enterprise Company

6280 America Center Drive, San Jose CA 95002, United States

1.3. Testing Facility

☒	Test Site – MRT Suzhou Laboratory			
	Laboratory Location (Suzhou - Wuzhong)			
	D8 Building, No.2 Tian’edang Rd., Wuzhong Economic Development Zone, Suzhou, China			
	Laboratory Location (Suzhou - SIP)			
	4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China			
	Laboratory Location (Suzhou - Wujiang)			
	Building 1, No.1 Xingdong Road, Wujiang, Suzhou, Jiangsu, People’s Republic of China			
☒	Laboratory Accreditations			
	A2LA: 3628.01		CNAS: L10551	
	FCC: CN1166		ISED: CN0001	
	VCCI:	☐ R-20025	☐ G-20034	☐ C-20020
		☐ T-20020		
		☐ R-20141	☐ G-20134	☐ C-20103
			☐ T-20104	
☐	Test Site – MRT Shenzhen Laboratory			
	Laboratory Location (Shenzhen)			
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China			
	Laboratory Accreditations			
	A2LA: 3628.02		CNAS: L10551	
☐	FCC: CN1284		ISED: CN0105	
	Test Site – MRT Taiwan Laboratory			
	Laboratory Location (Taiwan)			
	No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)			
	Laboratory Accreditations			
☐	TAF: 3261			
	FCC: 291082, TW3261		ISED: TW3261	

1.4. Product Information

Product Name	ACCESS POINT
Model No.	APIN0725
Serial No.	CNT4MPP016 (Conducted) CNT4MPP00W (Radiated)
Software Version	Broadcom BCA: 17.10 RC369.61
Wi-Fi Specification	802.11a/b/g/n/ac/ax/be
Bluetooth Specification	BLE only
Antenna Information	Refer to Section 1.7
Power Type	PoE Input
Operating Temperature	0 ~ 50 °C
Operating Environment	Indoor Use
Accessory	
PoE Injector	Model: ADH-30CR BB Input: 100-240V ~ 1.0A, 50-60Hz Output: 55.0V, 0.55A 30.25W
Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Radio Specification under Test

Frequency Range	For 802.11a/n-HT20/ac-VHT20/ax-HE20/be-EHT20: 5180~5240MHz, 5260~5320MHz, 5500~5720MHz, 5745~5825MHz For 802.11n-HT40/ac-VHT40/ax-HE40/be-EHT40: 5190~5230MHz, 5270~5310MHz, 5510~5710MHz, 5755~5795MHz For 802.11ac-VHT80/ax-HE80/be-EHT80: 5210MHz, 5290MHz, 5530MHz, 5610 MHz, 5690MHz, 5775MHz	
Type of Modulation	802.11a/n/ac: OFDM 802.11ax/be: OFDMA	
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps 802.11ax: up to 1201Mbps 802.11be: up to 1442Mbps	
Channel Puncturing Function	☐ Supported	☒ Unsupported
Support RU	☒ Full RU	☐ Partial RU

1.6. Working Frequencies

802.11a/n-HT20/ac-VHT20/ax-HE20/be-EHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	52	5260 MHz	56	5280 MHz
60	5300 MHz	64	5320 MHz	100	5500 MHz
104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	120	5600 MHz	124	5620 MHz
128	5640 MHz	132	5660 MHz	136	5680 MHz
140	5700 MHz	144	5720 MHz	149	5745 MHz
153	5765 MHz	157	5785 MHz	161	5805 MHz
165	5825 MHz	--	--	--	--

802.11n-HT40/ac-VHT40/ax-HE40/be-EHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz
62	5310 MHz	102	5510 MHz	110	5550MHz
118	5590 MHz	126	5630 MHz	134	5670 MHz
142	5710 MHz	151	5755 MHz	159	5795 MHz

802.11ac-VHT80/ax-HE80/be-EHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	106	5530 MHz
122	5610 MHz	138	5690 MHz	155	5775 MHz

1.7. Antenna Details

Antenna Type	Frequency Band (MHz)	Tx Paths	Uncorrelated Gain (dBi)
PIFA & Dipole	2400 ~ 2483.5	2	3.81
PIFA & Dipole	5150 ~ 5895	2	4.66
PIFA & Dipole	5925 ~ 7125	2	4.84

Notes:

1. The EUT supports Cyclic Delay Diversity (CDD) mode.
2. The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac/ax/be, not include 802.11a/b/g.
3. For beamforming operation, Aruba OS automatically backs power down based on CDD power.
4. The two antennas are cross-polarized.
5. The detail calculation method of directional gain refers to antenna specification provided by the applicant.

2. Test Configuration

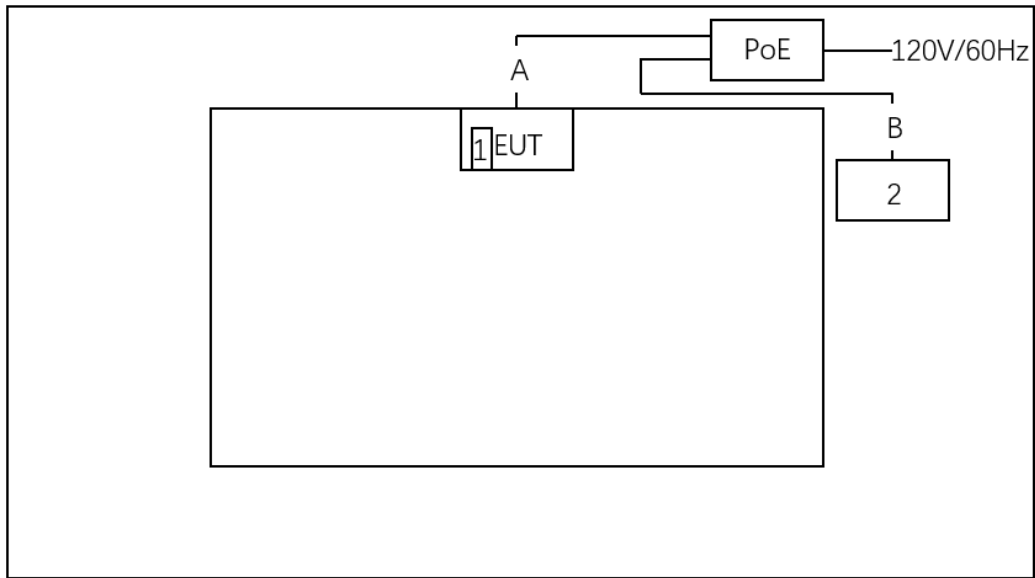
2.1. Test Mode

CDD Mode
Mode 1: Transmit by 802.11a (6Mbps)
Mode 2: Transmit by 802.11ac-VHT20_Nss=1 (MCS0)
Mode 3: Transmit by 802.11ac-VHT40_Nss=1 (MCS0)
Mode 4: Transmit by 802.11ac-VHT80_Nss=1 (MCS0)
Mode 5: Transmit by 802.11ax-HE20_Nss=1 (MCS0)
Mode 6: Transmit by 802.11ax-HE40_Nss=1 (MCS0)
Mode 7: Transmit by 802.11ax-HE80_Nss=1 (MCS0)
Mode 8: Transmit by 802.11be-EHT20_Nss=1 (MCS0)
Mode 9: Transmit by 802.11be-EHT40_Nss=1 (MCS0)
Mode 10: Transmit by 802.11be-EHT80_Nss=1 (MCS0)
Note: 1. The modulation and the data rate picked for testing are determined by the Max. RF conducted power. 2. For CDD mode, this device supports 2N_{ss} and power level is the same of spatial multiplexing. The worst case is N_{ss}=1. 3. 802.11n and 802.11ac have same modulation type and same power value, so we only show 802.11ac test data in report. 4. For beamforming operation, manufacturer automatically backs power down based on CDD power. Therefore, only the CDD mode was evaluated in this report.

2.2. Test System Connection Diagram

The device was tested per the guidance ANSI C63.10: 2013 was used to reference the appropriate EUT setup for radiated emissions testing and AC line conducted testing.

Connection Diagram



No.	Cable Type	Cable Spec.	Length
A	Ethernet Cable	Non-Shielded, Cat 6	>10.0m
B	Ethernet Cable	Non-Shielded, Cat 6	1.2m
No.	Product	Manufacturer	Model No.
1	USB Flash	SanDisk	16G
2	Notebook	DELL	Latitude 5491

2.3. Test Software

The test utility software used during testing was “accessMTool”, and the version was 3.3.0.6.

Note: Final power setting please refer to operational description.

2.4. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15.407
- KDB 789033 D02v02r01
- KDB 662911 D01v02r01
- ANSI C63.10-2013

2.5. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20 ~ 75%RH

3. Antenna Requirements

Excerpt from §15.203 of the FCC Rules/Regulations:

“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.”

- The antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

4. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
Thermohygrometer	testo	608-H1	MRTSUE11330	1 year	2025-06-24	WJ-SR2
Shielding Room	TDK	WJ-SR2	MRTSUE07124	N/A	N/A	WJ-SR2
Signal Analyzer	Keysight	N9020B	MRTSUE07037	1 year	2025-09-03	WJ-SR2/WJ-TR1
USB Power Sensor	Keysight	U2021XA	MRTSUE07141	1 year	2025-03-23	WJ-SR2
Attenuator	MVE	MVE2213	MRTSUE11086	1 year	2025-06-05	WJ-SR2
Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2025-02-03	WJ-SR2
Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2026-01-20	WJ-SR2
High and low temperature-humidity test chamber	GWS	EL-01JA	MRTSUE07114	1 year	2025-05-20	WJ-TR1
Thermohygrometer	testo	608-H1	MRTSUE11337	1 year	2025-06-24	WJ-TR1
TRILOG Broad Band Antenna	Schwarzbeck	VULB 9163	MRTSUE07097	1 year	2025-04-24	WJ-AC2
Preamplifier	EMCI	EMC118A45SE	MRTSUE07102	1 year	2025-04-11	WJ-AC2
Preamplifier	EMCI	EMC184045SE	MRTSUE07103	1 year	2025-04-14	WJ-AC2
Horn Antenna	RFSPIN	DRH18-E	MRTSUE07105	1 year	2025-05-12	WJ-AC2
Anechoic Chamber	TDK	WJ-AC2	MRTSUE07117	1 year	2025-05-14	WJ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11315	1 year	2025-06-24	WJ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11332	1 year	2025-06-24	WJ-AC2
Active Loop Antenna	Schwarzbeck	FMZB 1519-60 D	MRTSUE07076	1 year	2025-11-19	WJ-AC2
Broadband Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE07100	1 year	2025-04-24	WJ-AC2
EMI Test Receiver	R&S	ESR3	MRTSUE07112	1 year	2025-04-21	WJ-SR5
Shielding Room	TDK	WJ-SR5	MRTSUE07127	N/A	N/A	WJ-SR5
Thermohygrometer	testo	608-H1	MRTSUE11317	1 year	2025-06-24	WJ-SR5
Two-Line V-Network	R&S	ENV216	MRTSUE07202	1 year	2025-05-26	WJ-SR5

Software	Version	Function
e3	230711	RE & CE
CONTROLLER CO3000	v 1.03.02	RE Antenna & Turntable
BenchVue Power Meter	2018.1	Power

5. Decision Rules and Measurement Uncertainty

5.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2.
(Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.2. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement
The maximum measurement uncertainty is evaluated as: 9kHz~150kHz: 3.02dB 150kHz~30MHz: 2.56dB
Radiated Emission Measurement
The maximum measurement uncertainty is evaluated as: Coaxial: 9kHz~30MHz: 2.35dB Coplanar: 9kHz~30MHz: 2.37dB Horizontal: 30MHz~200MHz: 3.46dB 200MHz~1GHz: 3.78dB 1GHz~40GHz: 4.97dB Vertical: 30MHz~200MHz: 4.07dB 200MHz~1GHz: 5.28dB 1GHz~40GHz: 4.78dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 2.5dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.3dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 2.5dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 2.6%

6. Test Result

6.1. Summary

FCC Section(s)	Test Description	Test Condition	Verdict
15.407(a)	26dB & 99% Bandwidth	Conducted	Pass
15.407(e)	6dB Bandwidth		Pass
15.407(a)(1)(ii), (2), (3)(i)	Maximum Conducted Output Power		Pass
15.407(h)(1)	Transmit Power Control		Pass
15.407(g)	Frequency Stability		Pass
15.407(a)(1)(ii), (2), (3)(i), (13)	Peak Power Spectral Density		Pass
15.407(h)(2)	Dynamic Frequency Selection (DFS)		Pass Remark 3
15.407(b)(1), (2), (3), (4)(i)	Undesirable Emissions	Radiated	Pass
15.205, 15.209 15.407(b)(8), (9), (10)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)		Pass
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	Pass

Remark:

1. The analyzer plots shown in this section were captured using a correction table to account for cable and attenuator losses in the system connecting the EUT to the analyzer across relevant frequencies.
2. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
3. DFS report refers to "2412RSU035-U7".
- 4.

6.2. 26dB & 99% Bandwidth Measurement

6.2.1. Test Limit

N/A

6.2.2. Test Procedure

KDB 789033 D02v02r01- Section II)C)1) (26dB Bandwidth)

KDB 789033 D02v02r01- Section II)D) (99% Bandwidth)

6.2.3. Test Setting

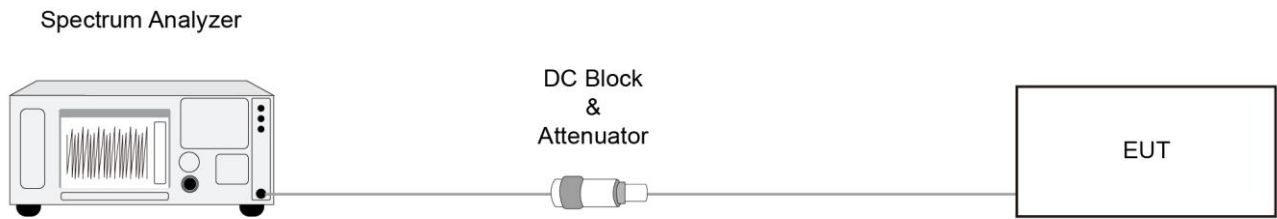
26dB Bandwidth

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth
2. RBW = approximately 1% of the emission bandwidth.
3. VBW > RBW
4. Detector = Peak.
5. Trace mode = max hold.
6. 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%.

99% Bandwidth

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 1% to 5% of the OBW
3. $VBW \geq 3 \times RBW$
4. Span = 1.5 times to 5 times the OBW
5. Detector = peak
6. Trace mode = max hold
7. Allow the trace to stabilize
8. Use the 99% power bandwidth function of the instrument.

6.2.4. Test Setup



6.2.5. Test Result

Refer to Appendix A.2.

6.3. 6dB Bandwidth Measurement

6.3.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

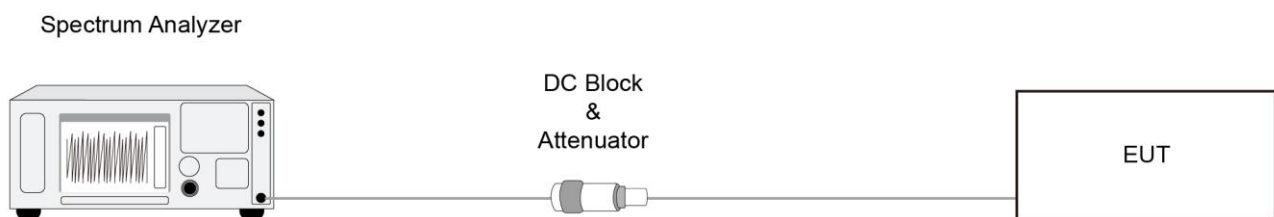
6.3.2. Test Procedure

KDB 789033 D02v02r01- Section II)C)2)

6.3.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. 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.

6.3.4. Test Setup



6.3.5. Test Result

Refer to Appendix A.3.

6.4. Output Power Measurement

6.4.1. Test Limit

For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm).

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

6.4.2. Test Procedure

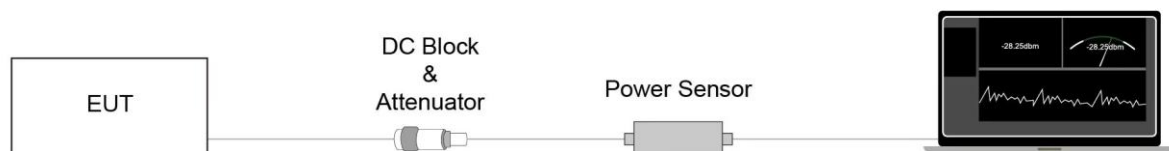
KDB 789033D02v02r01- Section II(E)3)b) Method PM-G

6.4.3. Test Setting

Average Power Measurement

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

6.4.4. Test Setup



6.4.5. Test Result

Refer to Appendix A.4.

6.5. Transmit Power Control Measurement

6.5.1. Test Limit

The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm.

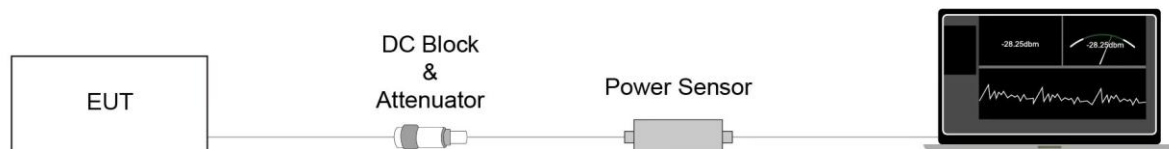
6.5.2. Test Procedure

KDB 789033 D02v02r01- Section II)E)3)b) Method PM-G

6.5.3. Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

6.5.4. Test Setup



6.5.5. Test Result

Device supports TPC mechanism, details refer to the operational description.

6.6. Power Spectral Density Measurement

6.6.1. Test Limit

For the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

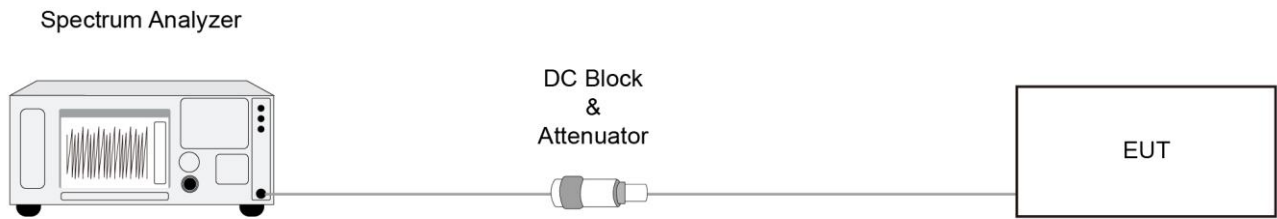
6.6.2. Test Procedure

KDB 789033 D02v02r01-Section II)F)

6.6.3. Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz (510kHz, if measurement bandwidth of Maximum PSD is specified in 500 kHz)
4. VBW = $3 \times \text{RBW}$
5. Number of sweep points $\geq 2 \times (\text{span} / \text{RBW})$
6. Detector = power averaging (Average)
7. Sweep time = auto
8. Trigger = free run
9. Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
10. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
11. Add $10 \cdot \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \cdot \log(1/0.25) = 6 \text{ dB}$ if the duty cycle is 25 percent.

6.6.4. Test Setup



6.6.5. Test Result

Refer to Appendix A.5.

6.7. Frequency Stability Measurement

6.7.1. Test Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

6.7.2. Test Procedure

Frequency Stability Under Temperature Variations:

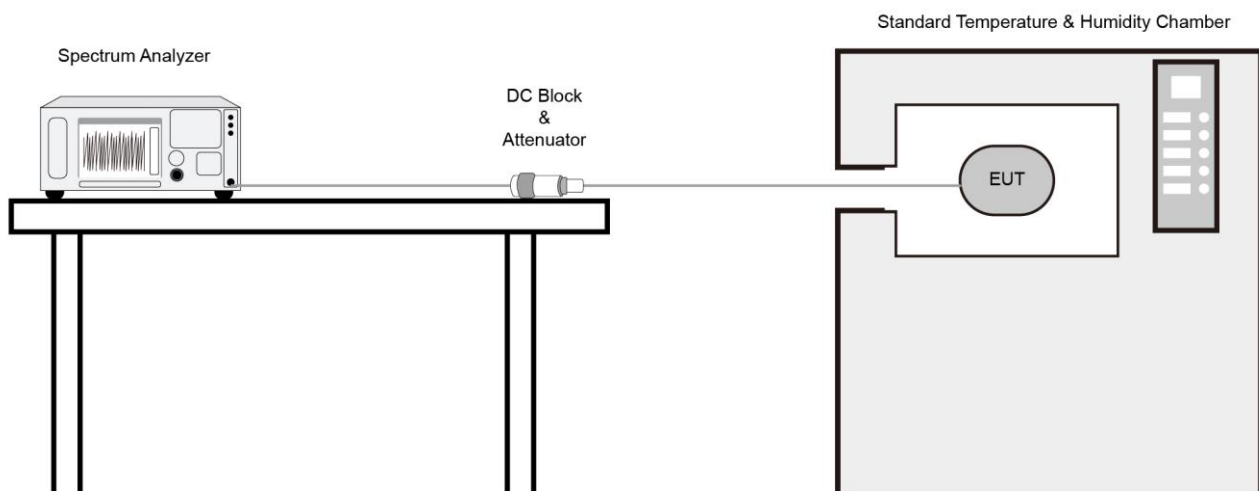
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

6.7.3. Test Setup



6.7.4. Test Result

Refer to Appendix A.6.

6.8. Radiated Spurious Emission Measurement

6.8.1. Test Limit

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 Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [$\mu\text{V/m}$]	Measured Distance [Meters]
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

6.8.2. Test Procedure

KDB 789033 D02v02r01- Section II)G)

6.8.3. Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000MHz	1MHz

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = Peak
5. Sweep time = Auto couple
6. Trace mode = Max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; if the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW = 10Hz

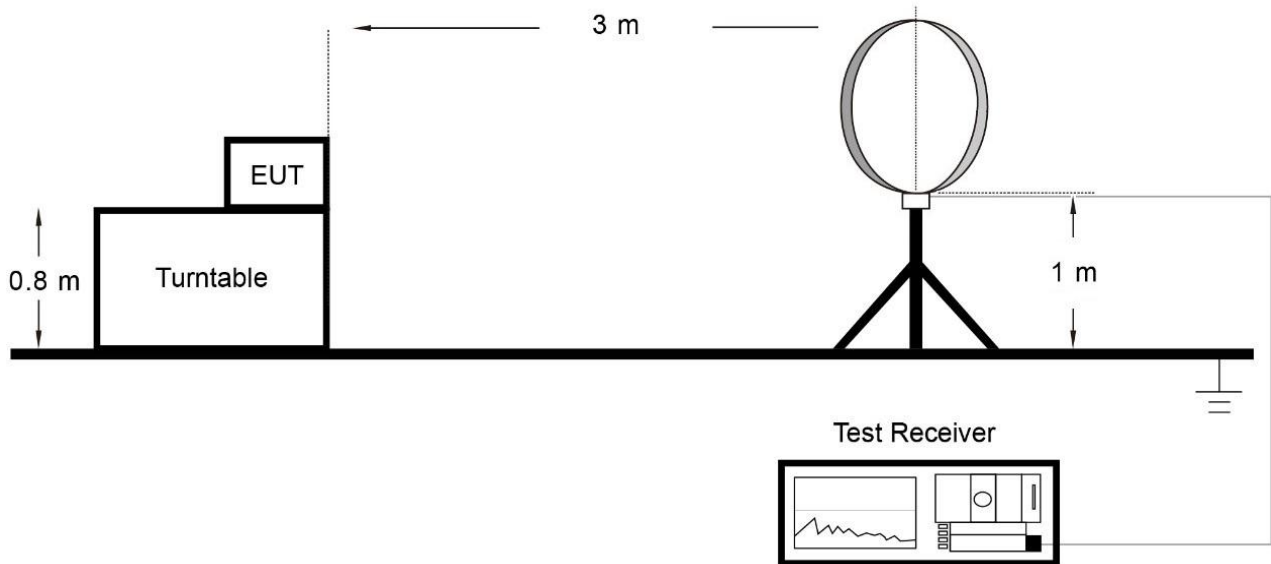
If the EUT duty cycle is $< 98\%$, set $\text{VBW} \geq 1/T$. T is the minimum transmission duration.

802.11a	510 Hz	802.11ac-VHT20	560 Hz	802.11ac-VHT40	1100 Hz
802.11ac-VHT80	2200 Hz	802.11ax-HE20	680 Hz	802.11ax-HE40	1300 Hz
802.11ax-HE80	2700 Hz	802.11be-EHT20	680 Hz	802.11be-EHT40	1300 Hz
802.11be-EHT80	2700 Hz	--	--	--	--

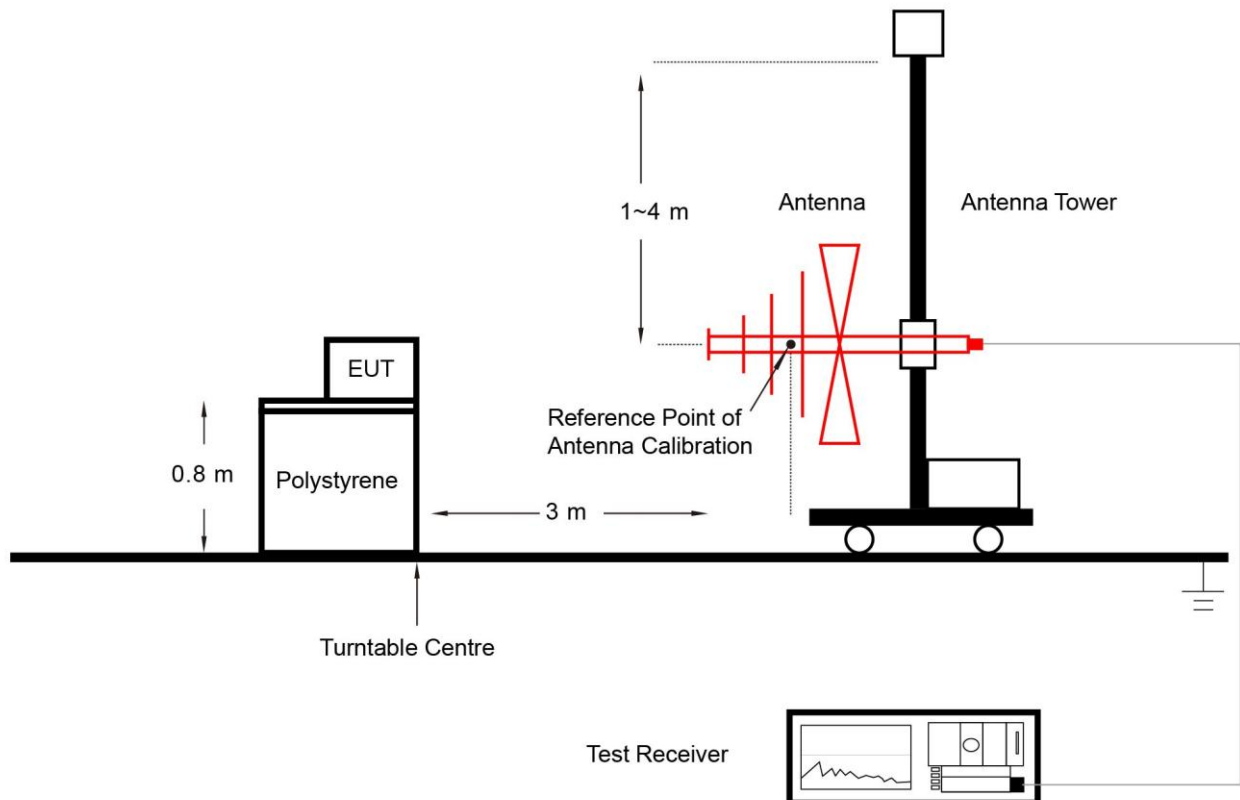
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = Auto
7. Trace mode = Max hold
8. Trace was allowed to stabilize

6.8.4. Test Setup

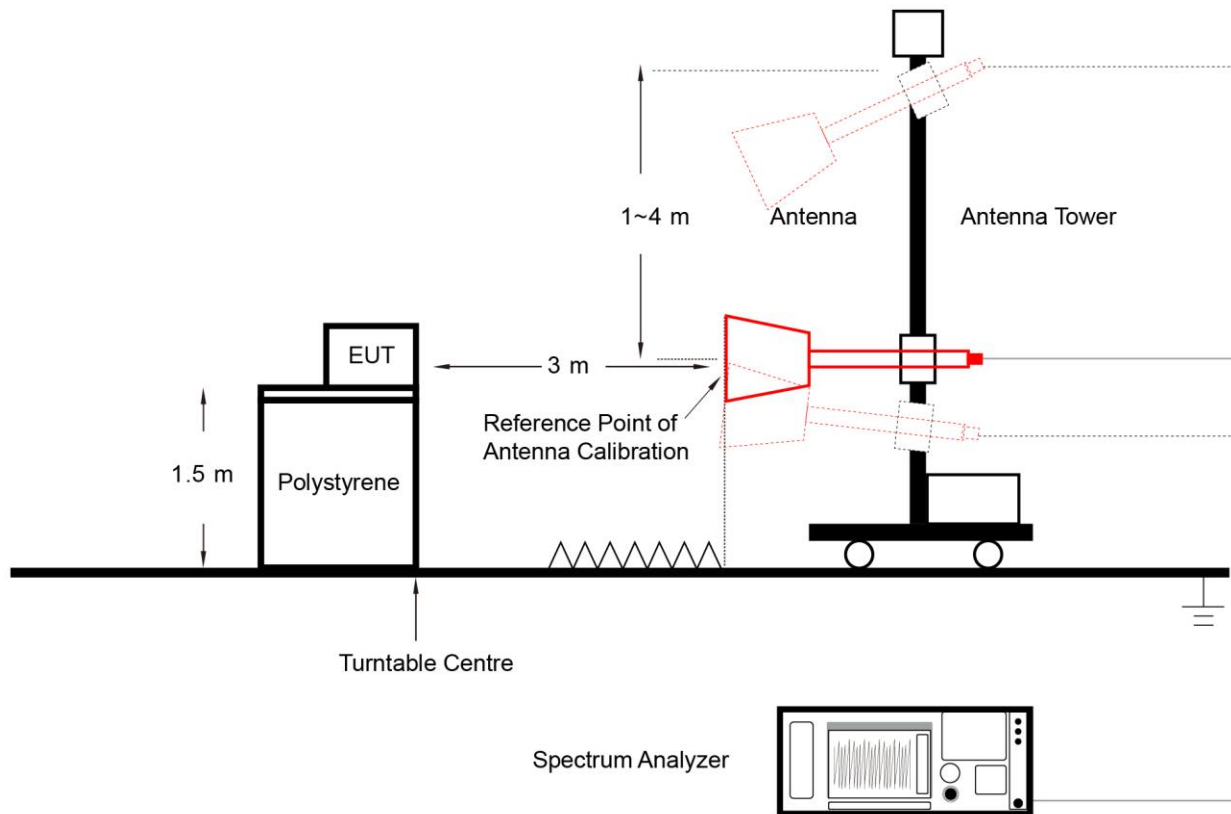
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.8.5. Test Result

Refer to Appendix A.7.

6.9. Radiated Restricted Band Edge Measurement

6.9.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41	--	--	--

For 15.407(b) requirement:

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: 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.

Refer to KDB 789033 D02v02r01 G)2)c), as specified in § 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a maximum emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in § 15.407(b)(4)). However, an out-of-band emission that complies with both the peak and average limits of § 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz maximum emission limit.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [μV/m]	Measured Distance [Meters]
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

6.9.2. Test Procedure

KDB 789033 D02v02r01- Section II)G)

6.9.3. Test Setting

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Field Strength Measurements

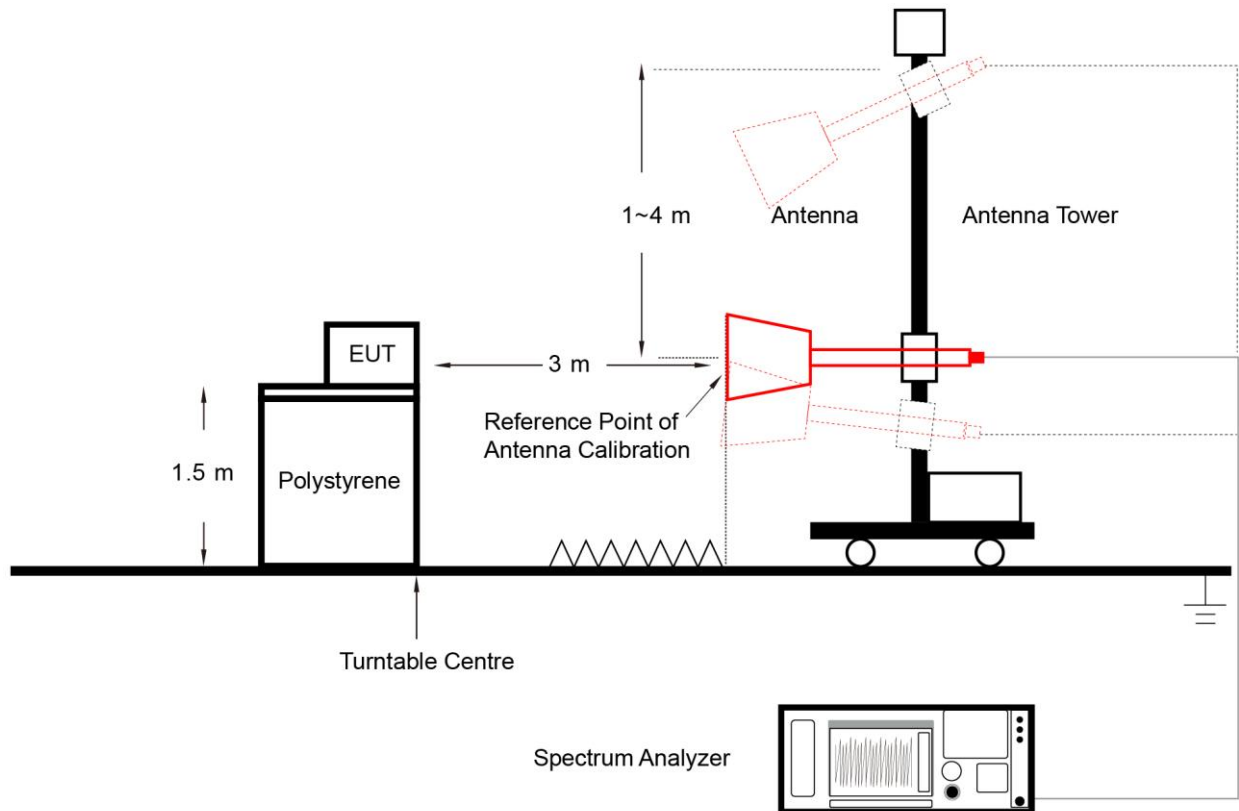
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW = 10 Hz.

If the EUT duty cycle is $< 98\%$, set $\text{VBW} \geq 1/T$. T is the minimum transmission duration.

802.11a	510 Hz	802.11ac-VHT20	560 Hz	802.11ac-VHT40	1100 Hz
802.11ac-VHT80	2200 Hz	802.11ax-HE20	680 Hz	802.11ax-HE40	1300 Hz
802.11ax-HE80	2700 Hz	802.11be-EHT20	680 Hz	802.11be-EHT40	1300 Hz
802.11be-EHT80	2700 Hz	--	--	--	--

4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

6.9.4. Test Setup



6.9.5. Test Result

Refer to Appendix A.8.

6.10. AC Conducted Emissions Measurement

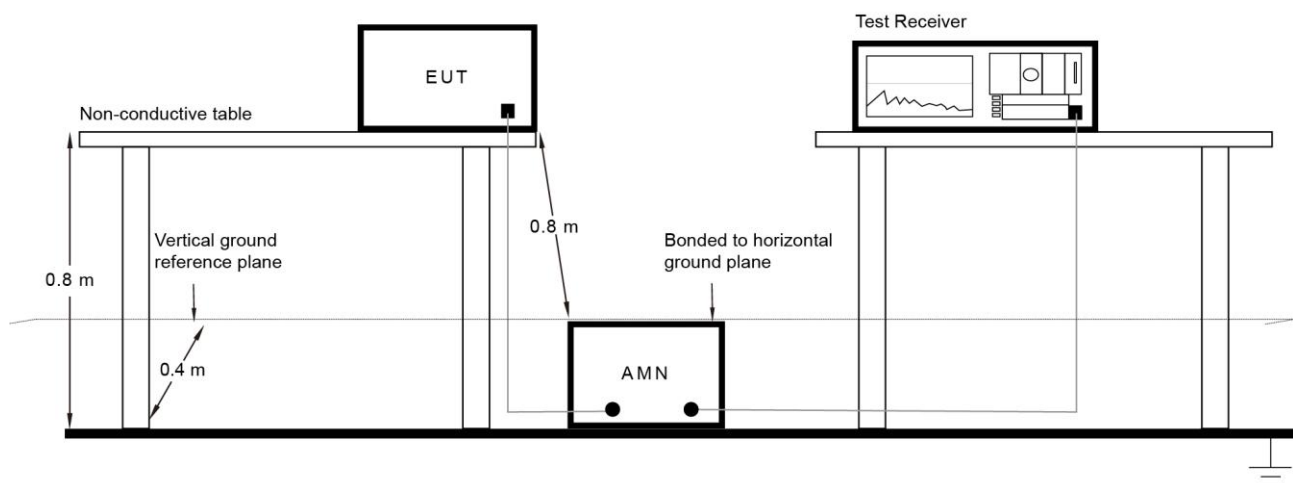
6.10.1. Test Limit

FCC Part 15.207 Limits		
Frequency (MHz)	QP (dB μ V)	AV (dB μ V)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.10.2. Test Setup



6.10.3. Test Result

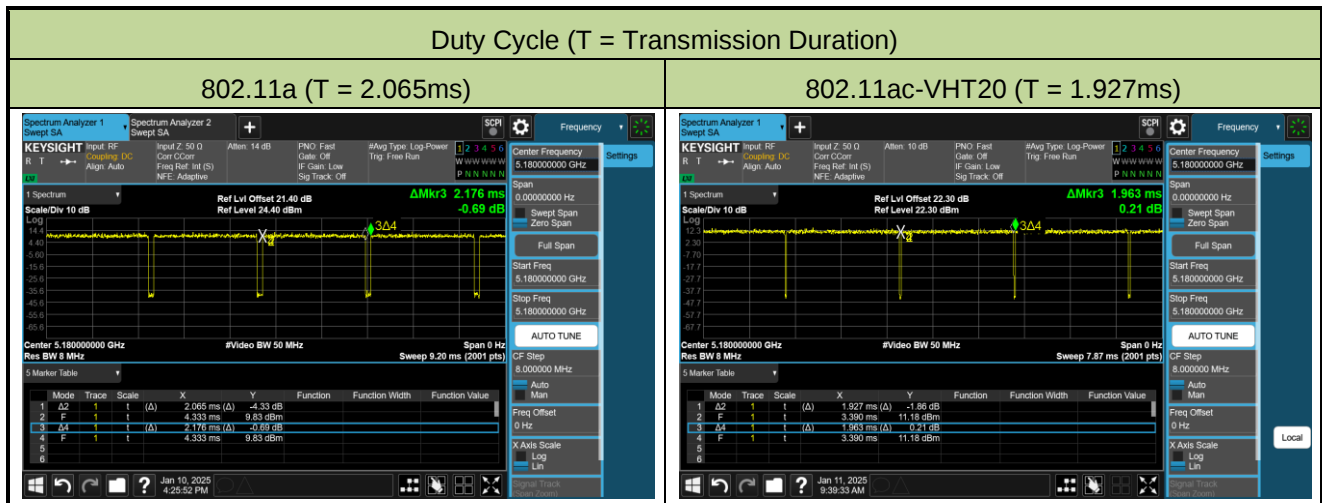
Refer to Appendix A.9.

Appendix A – Test Result

A.1 Duty Cycle Test Result

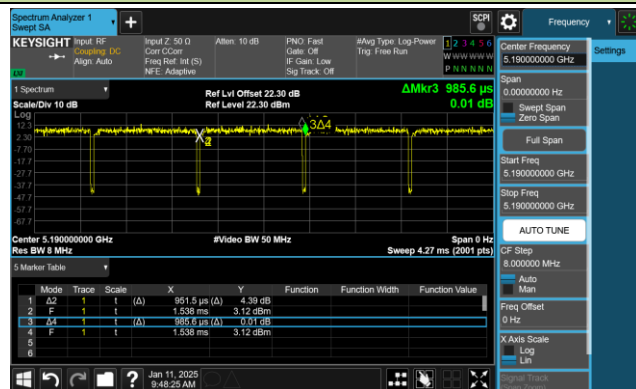
Test Site	WJ-SR2	Test Engineer	Jake Lan
Test Date	2025-01-10 ~ 2025-01-11		

Test Mode	Duty Cycle
802.11a	94.90%
802.11ac-VHT20	98.17%
802.11ac-VHT40	96.54%
802.11ac-VHT80	92.91%
802.11ax-HE20	97.77%
802.11ax-HE40	95.69%
802.11ax-HE80	92.15%
802.11be-EHT20	97.71%
802.11be-EHT40	95.87%
802.11be-EHT80	92.35%

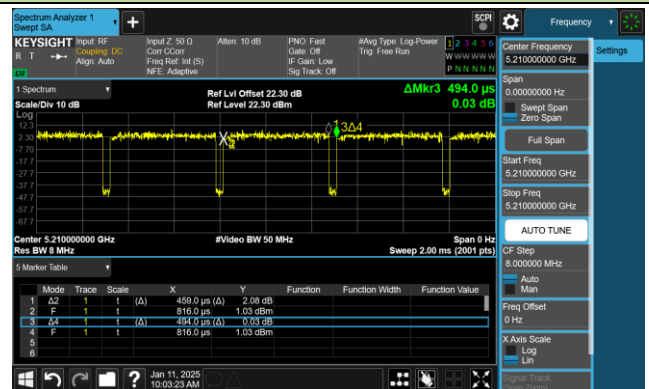


Duty Cycle (T = Transmission Duration)

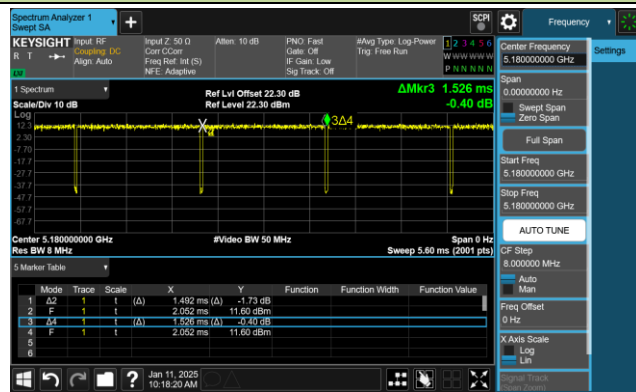
802.11ac-VHT40 (T = 951.5µs)



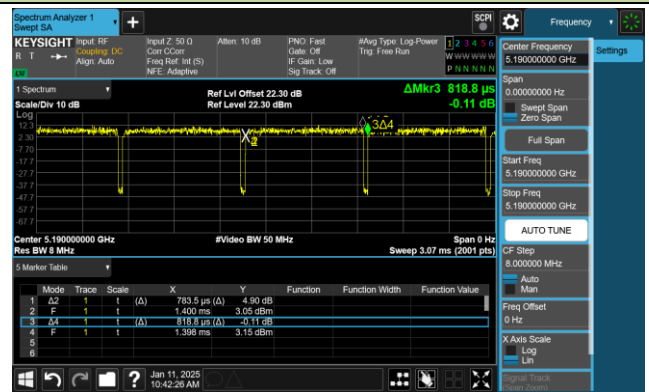
802.11ac-VHT80 (T = 459.0µs)



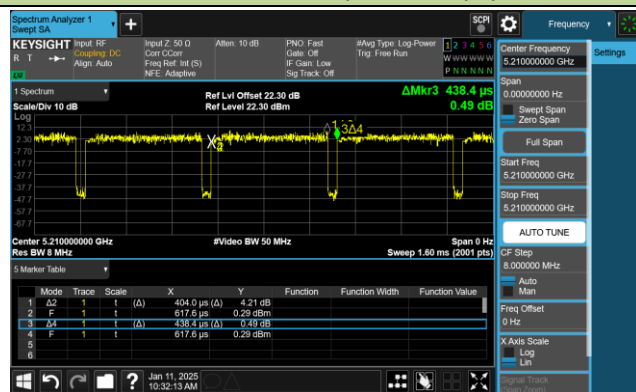
802.11ax-HE20 (T = 1.492ms)



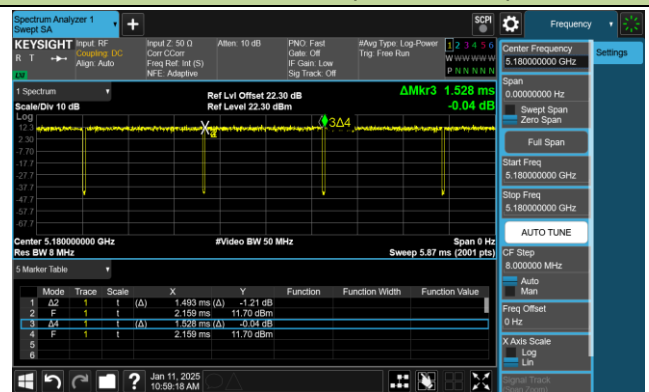
802.11ax-HE40 (T = 783.5µs)



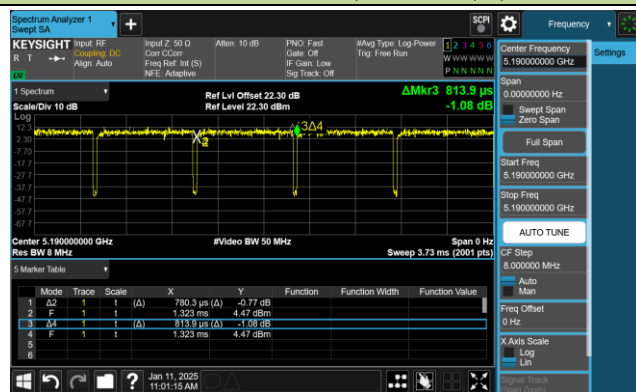
802.11ax-HE80 (T = 404.0µs)



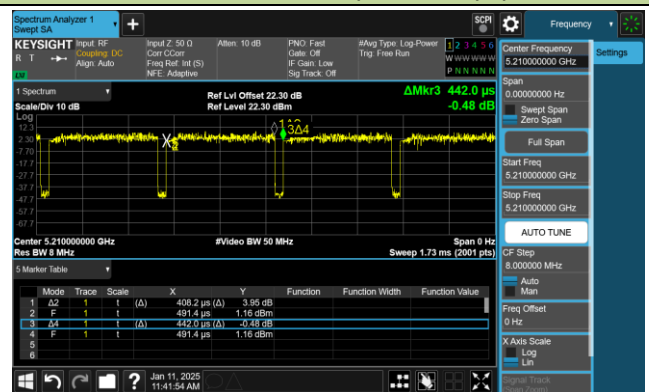
802.11be-EHT20 (T = 1.493ms)



802.11be-EHT40 (T = 780.3µs)



802.11be-EHT80 (T = 408.2µs)



A.2 26dB & 99% Bandwidth Test Result

Test Site	WJ-SR2	Test Engineer	Jake Lan
Test Date	2025-01-21 ~ 2025-01-25		

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	6Mbps	36	5180	30.41	17.933
11a	6Mbps	44	5220	28.53	17.528
11a	6Mbps	48	5240	30.63	17.802
11a	6Mbps	52	5260	30.09	17.674
11a	6Mbps	60	5300	24.91	17.595
11a	6Mbps	64	5320	25.89	17.423
11a	6Mbps	100	5500	25.01	17.460
11a	6Mbps	116	5580	26.93	17.592
11a	6Mbps	140	5700	21.56	16.966
11a	6Mbps	144	5720	29.07	17.724
11a	6Mbps	149	5745	30.49	18.065
11a	6Mbps	157	5785	25.46	17.529
11a	6Mbps	165	5825	27.73	18.060
11ac-VHT20	MCS0	36	5180	28.30	18.584
11ac-VHT20	MCS0	44	5220	30.74	18.747
11ac-VHT20	MCS0	48	5240	28.77	18.547
11ac-VHT20	MCS0	52	5260	30.99	18.887
11ac-VHT20	MCS0	60	5300	30.53	18.809
11ac-VHT20	MCS0	64	5320	31.17	18.637
11ac-VHT20	MCS0	100	5500	27.85	18.667
11ac-VHT20	MCS0	116	5580	27.47	18.692
11ac-VHT20	MCS0	140	5700	22.07	18.355
11ac-VHT20	MCS0	144	5720	28.68	18.573
11ac-VHT20	MCS0	149	5745	28.59	18.604
11ac-VHT20	MCS0	157	5785	28.13	18.660
11ac-VHT20	MCS0	165	5825	31.77	18.721

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
11ac-VHT40	MCS0	38	5190	53.24	36.675
11ac-VHT40	MCS0	46	5230	60.72	36.891
11ac-VHT40	MCS0	54	5270	53.85	36.709
11ac-VHT40	MCS0	62	5310	51.99	36.654
11ac-VHT40	MCS0	102	5510	51.93	36.662
11ac-VHT40	MCS0	110	5550	47.91	36.740
11ac-VHT40	MCS0	134	5670	56.51	36.694
11ac-VHT40	MCS0	142	5710	54.63	36.649
11ac-VHT40	MCS0	151	5755	60.87	36.701
11ac-VHT40	MCS0	159	5795	59.52	36.699
11ac-VHT80	MCS0	42	5210	89.30	76.042
11ac-VHT80	MCS0	58	5290	86.18	75.897
11ac-VHT80	MCS0	106	5530	86.18	75.989
11ac-VHT80	MCS0	122	5610	99.70	76.114
11ac-VHT80	MCS0	138	5690	105.90	76.246
11ac-VHT80	MCS0	155	5775	102.70	76.238
11ax-HE20	MCS0	36	5180	32.63	19.421
11ax-HE20	MCS0	44	5220	31.09	19.458
11ax-HE20	MCS0	48	5240	31.90	19.422
11ax-HE20	MCS0	52	5260	32.53	19.375
11ax-HE20	MCS0	60	5300	32.23	19.342
11ax-HE20	MCS0	64	5320	30.21	19.354
11ax-HE20	MCS0	100	5500	29.93	19.406
11ax-HE20	MCS0	116	5580	27.35	19.487
11ax-HE20	MCS0	140	5700	21.72	19.176
11ax-HE20	MCS0	144	5720	26.92	19.511
11ax-HE20	MCS0	149	5745	30.81	19.487
11ax-HE20	MCS0	157	5785	32.42	19.545
11ax-HE20	MCS0	165	5825	31.73	19.487

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
11ax-HE40	MCS0	38	5190	46.89	37.893
11ax-HE40	MCS0	46	5230	53.08	38.018
11ax-HE40	MCS0	54	5270	51.17	38.055
11ax-HE40	MCS0	62	5310	46.77	37.998
11ax-HE40	MCS0	102	5510	42.84	37.951
11ax-HE40	MCS0	110	5550	50.77	37.983
11ax-HE40	MCS0	134	5670	57.41	38.021
11ax-HE40	MCS0	142	5710	54.17	38.063
11ax-HE40	MCS0	151	5755	40.70	37.906
11ax-HE40	MCS0	159	5795	40.67	37.965
11ax-HE80	MCS0	42	5210	84.06	77.329
11ax-HE80	MCS0	58	5290	81.43	77.162
11ax-HE80	MCS0	106	5530	83.64	77.300
11ax-HE80	MCS0	122	5610	96.62	77.432
11ax-HE80	MCS0	138	5690	101.30	77.666
11ax-HE80	MCS0	155	5775	106.00	77.686
11be-EHT20	MCS0	36	5180	32.53	19.408
11be-EHT20	MCS0	44	5220	30.41	19.382
11be-EHT20	MCS0	48	5240	31.45	19.677
11be-EHT20	MCS0	52	5260	28.27	19.514
11be-EHT20	MCS0	60	5300	29.23	19.446
11be-EHT20	MCS0	64	5320	29.70	19.333
11be-EHT20	MCS0	100	5500	28.05	19.450
11be-EHT20	MCS0	116	5580	37.67	19.399
11be-EHT20	MCS0	140	5700	21.81	19.195
11be-EHT20	MCS0	144	5720	32.77	19.505
11be-EHT20	MCS0	149	5745	32.57	19.586
11be-EHT20	MCS0	157	5785	27.18	19.404
11be-EHT20	MCS0	165	5825	32.75	19.422

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
11be-EHT40	MCS0	38	5190	44.830	37.942
11be-EHT40	MCS0	46	5230	59.290	37.887
11be-EHT40	MCS0	54	5270	51.740	37.998
11be-EHT40	MCS0	62	5310	41.940	37.898
11be-EHT40	MCS0	102	5510	46.440	37.942
11be-EHT40	MCS0	110	5550	41.830	37.979
11be-EHT40	MCS0	134	5670	54.72	37.958
11be-EHT40	MCS0	142	5710	54.91	38.044
11be-EHT40	MCS0	151	5755	51.20	38.065
11be-EHT40	MCS0	159	5795	59.44	38.025
11be-EHT80	MCS0	42	5210	82.88	77.104
11be-EHT80	MCS0	58	5290	86.04	77.286
11be-EHT80	MCS0	106	5530	87.51	77.331
11be-EHT80	MCS0	122	5610	102.30	77.545
11be-EHT80	MCS0	138	5690	103.20	77.607
11be-EHT80	MCS0	155	5775	105.40	77.634

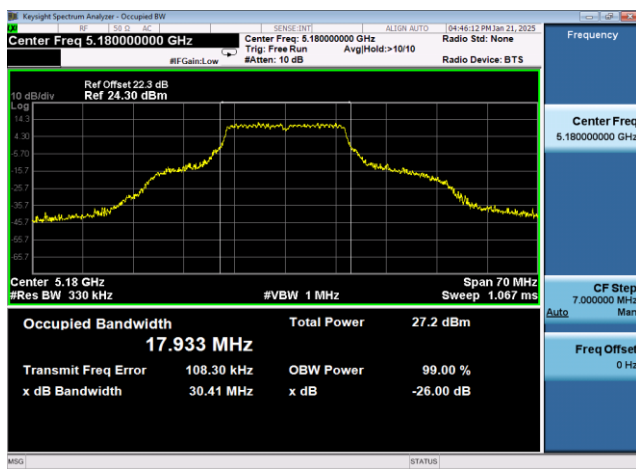
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	F _H (MHz)	Limit (MHz)
802.11a	6Mbps	48	5240	5248.90	< 5250
802.11ac-VHT20	MCS0	48	5240	5249.27	< 5250
802.11ac-VHT40	MCS0	46	5230	5248.45	< 5250
802.11ac-VHT80	MCS0	42	5210	5248.02	< 5250
802.11ax-HE20	MCS0	48	5240	5249.71	< 5250
802.11ax-HE40	MCS0	46	5230	5249.01	< 5250
802.11ax-HE80	MCS0	42	5210	5248.67	< 5250
802.11be-EHT20	MCS0	48	5240	5249.84	< 5250
802.11be-EHT40	MCS0	46	5230	5248.94	< 5250
802.11be-EHT80	MCS0	42	5210	5248.55	< 5250

Note: F_H = Centre frequency + 99% OBW / 2.

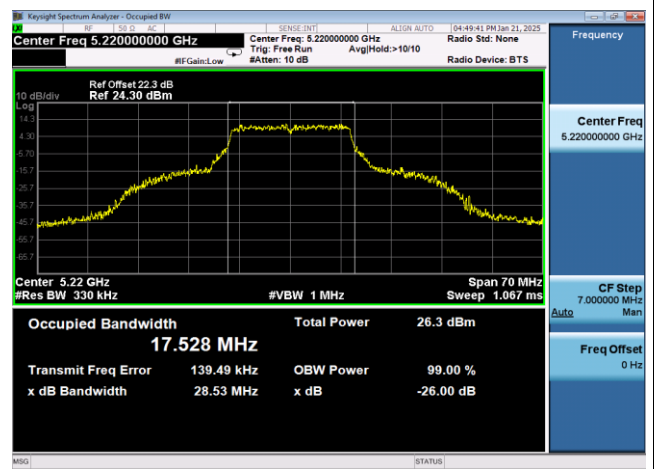
For example, 802.11a 5240MHz, F_H = 5240 MHz + 17.802 MHz / 2 = 5248.90 MHz.

802.11a 26dB Bandwidth & 99% Bandwidth

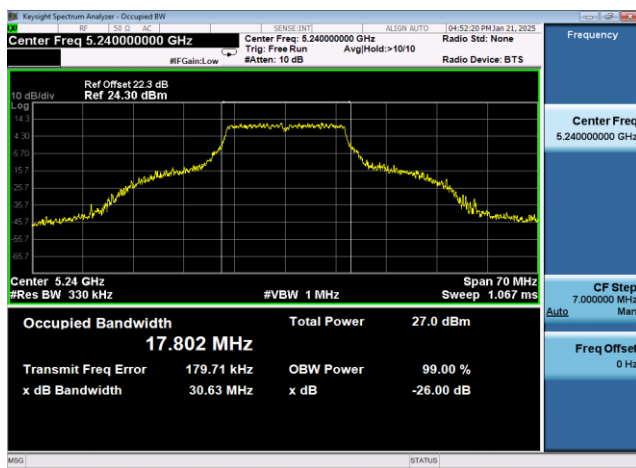
Channel 36 (5180MHz)



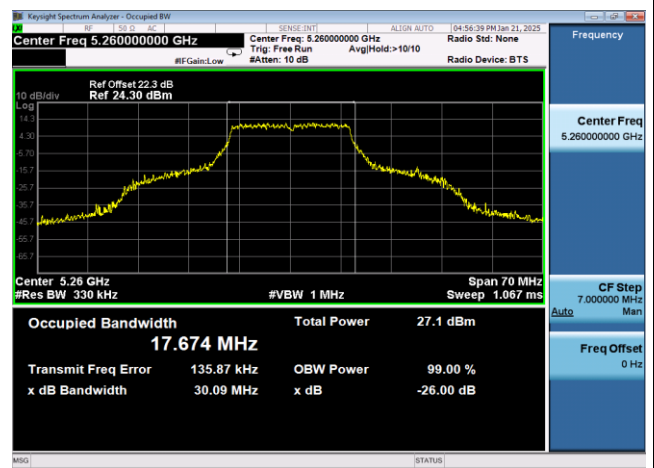
Channel 44 (5220MHz)



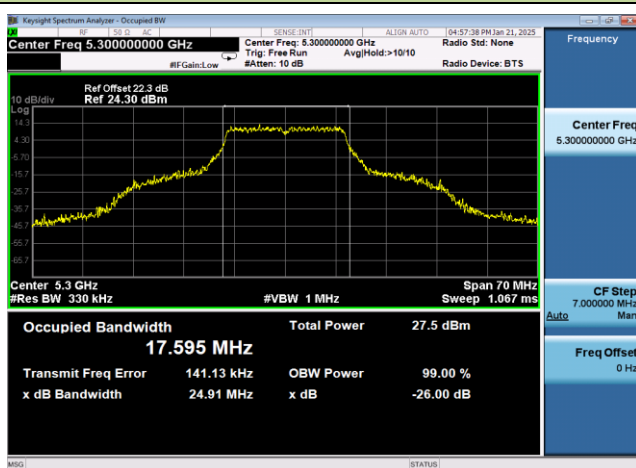
Channel 48 (5240MHz)



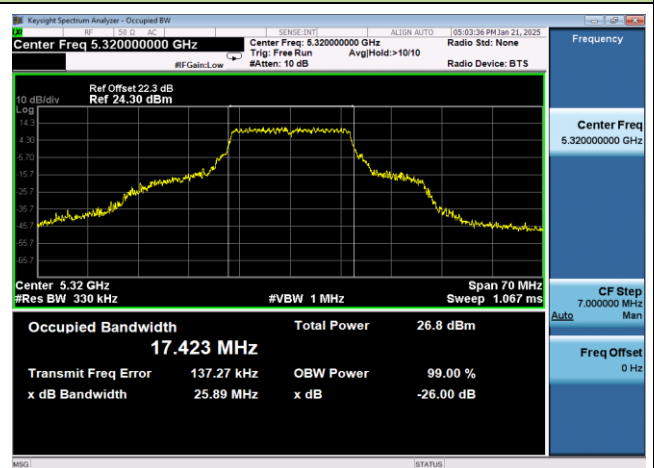
Channel 52 (5260MHz)



Channel 60 (5300MHz)

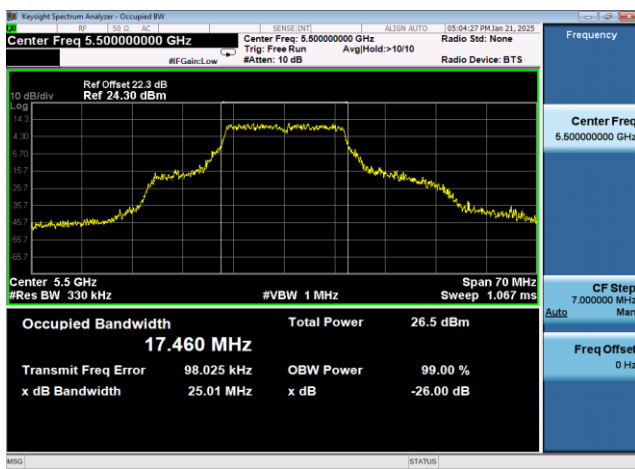


Channel 64 (5320MHz)

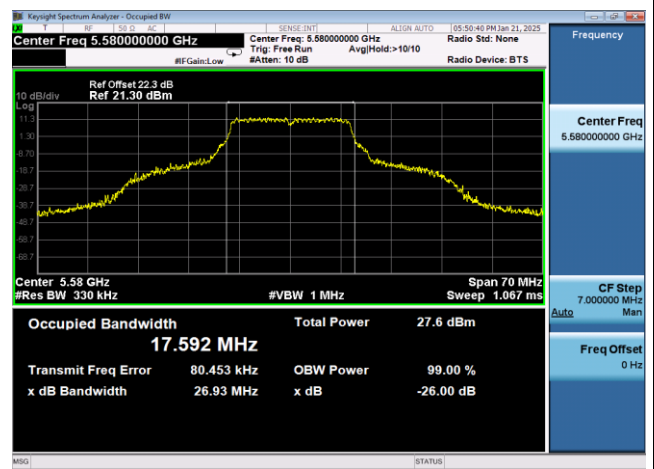


802.11a 26dB Bandwidth & 99% Bandwidth

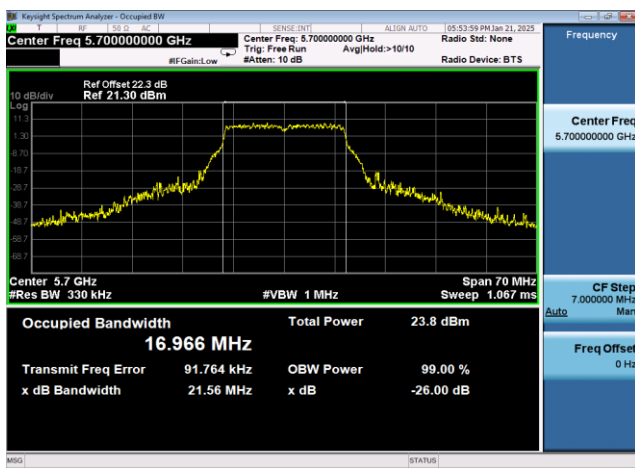
Channel 100 (5500MHz)



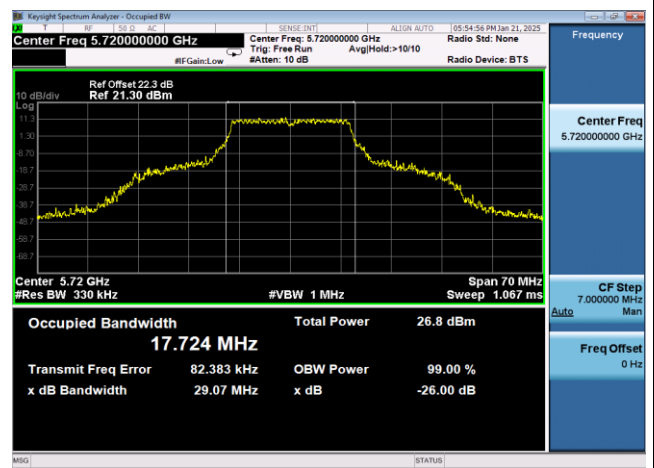
Channel 116 (5580MHz)



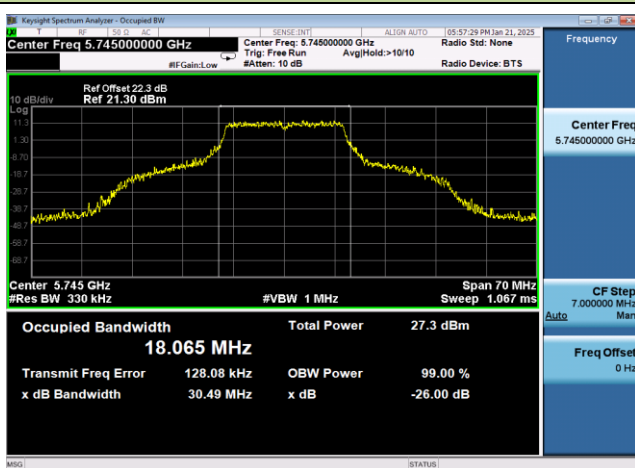
Channel 140 (5700MHz)



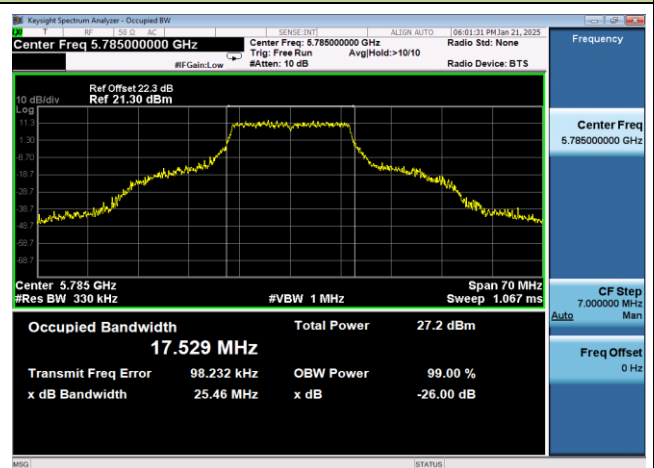
Channel 144(5720MHz)



Channel 149 (5745MHz)

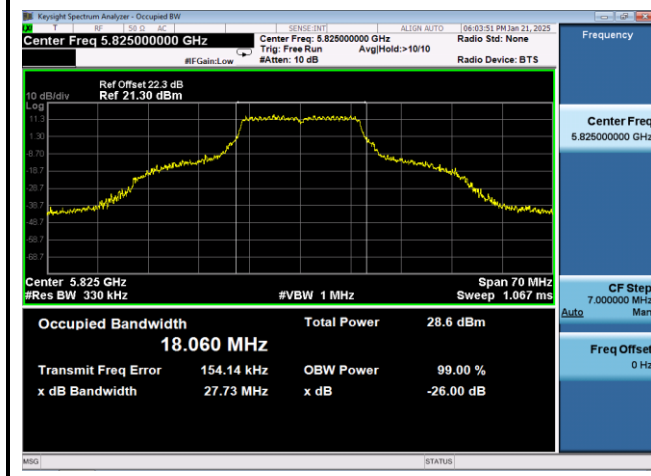


Channel 157 (5785MHz)



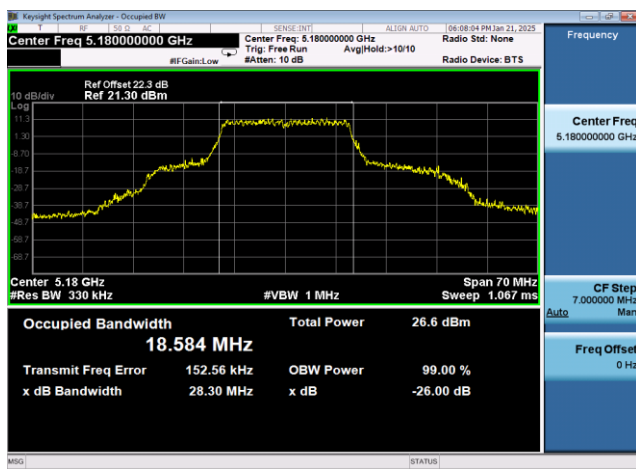
802.11a 26dB Bandwidth & 99% Bandwidth

Channel 165 (5825MHz)

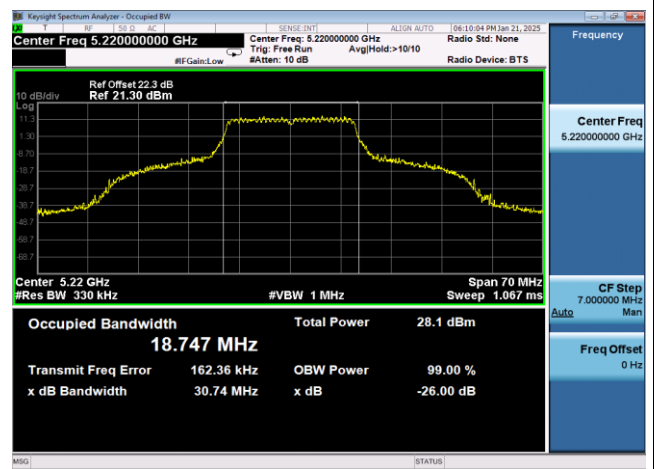


802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth

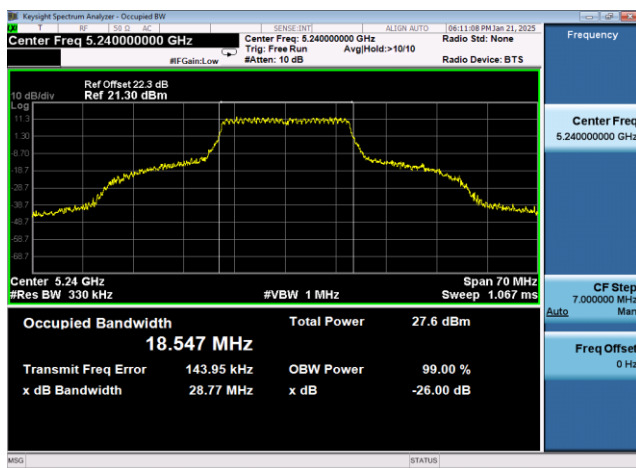
Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)



Channel 52 (5260MHz)



Channel 60 (5300MHz)

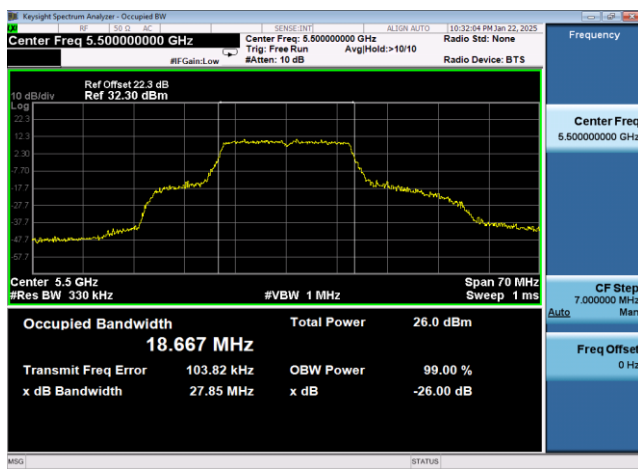


Channel 64 (5320MHz)

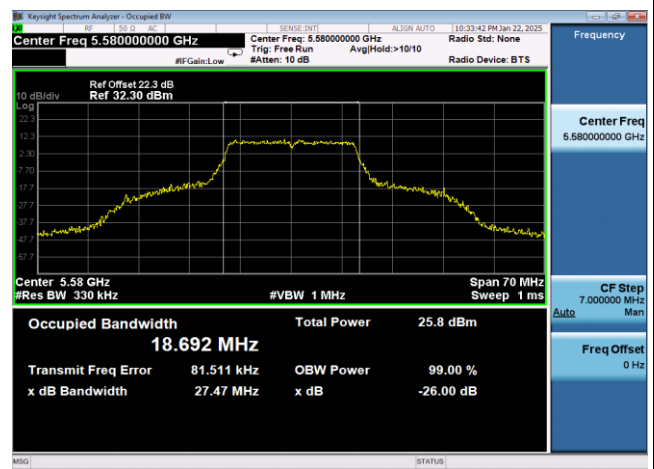


802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth

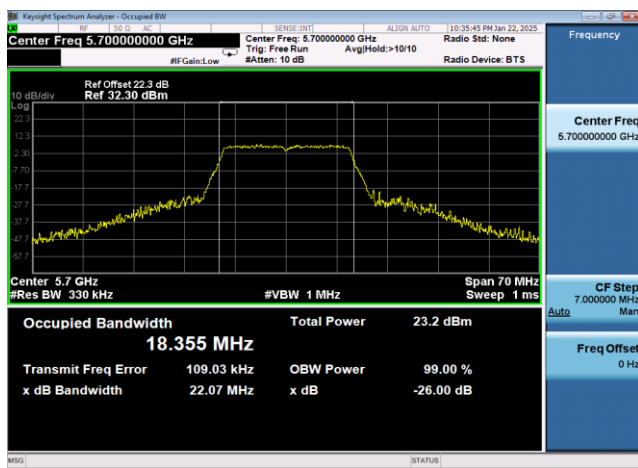
Channel 100 (5500MHz)



Channel 116 (5580MHz)



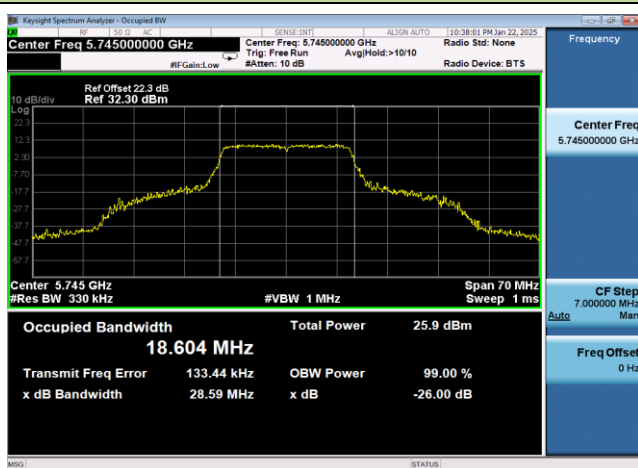
Channel 140 (5700MHz)



Channel 144(5720MHz)

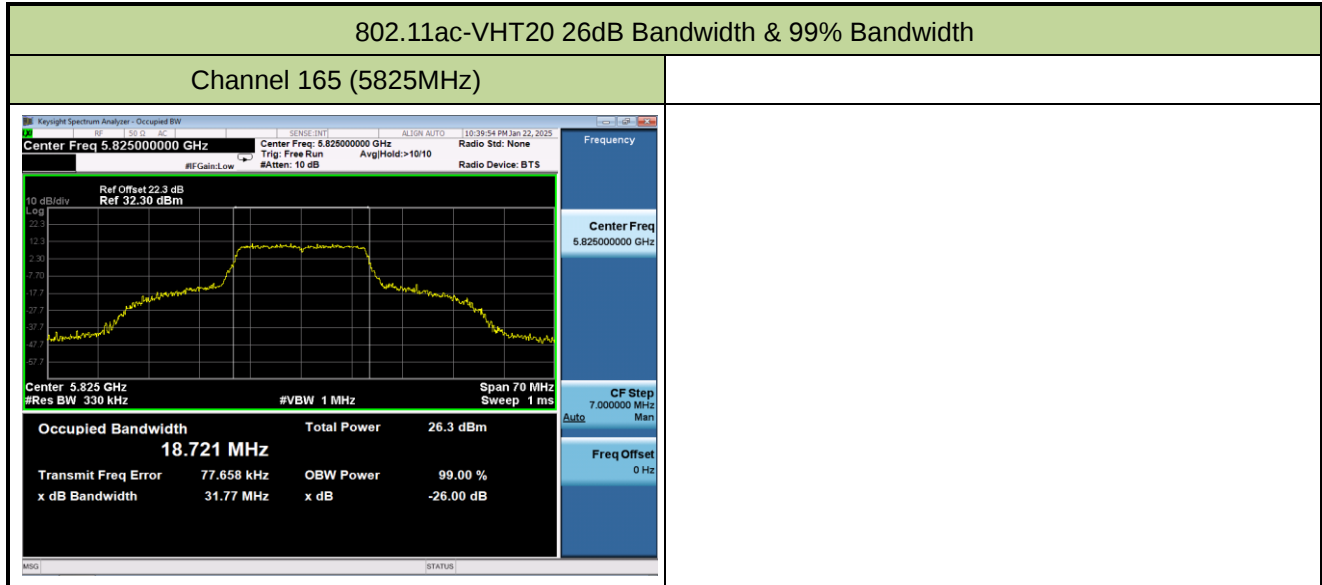


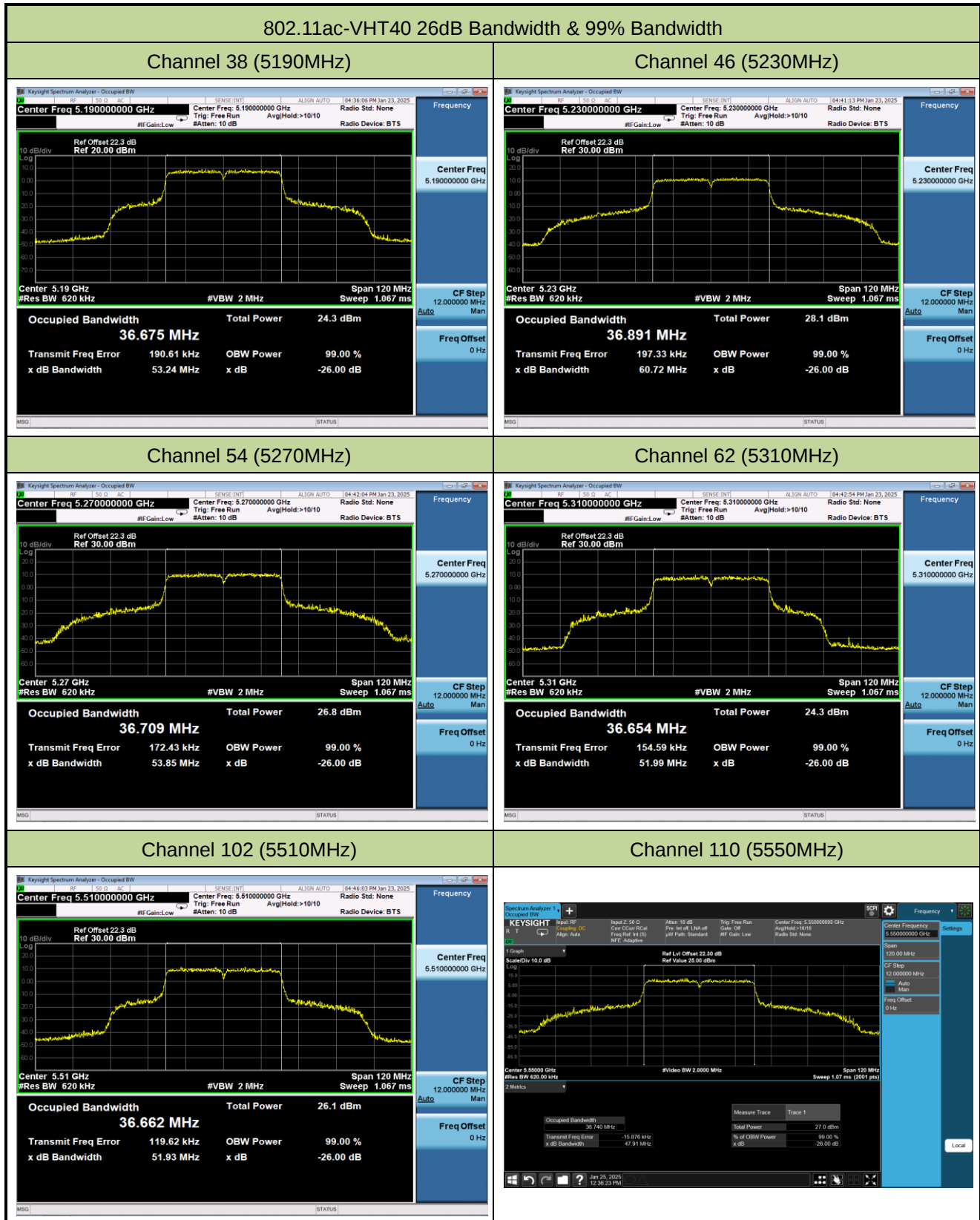
Channel 149 (5745MHz)

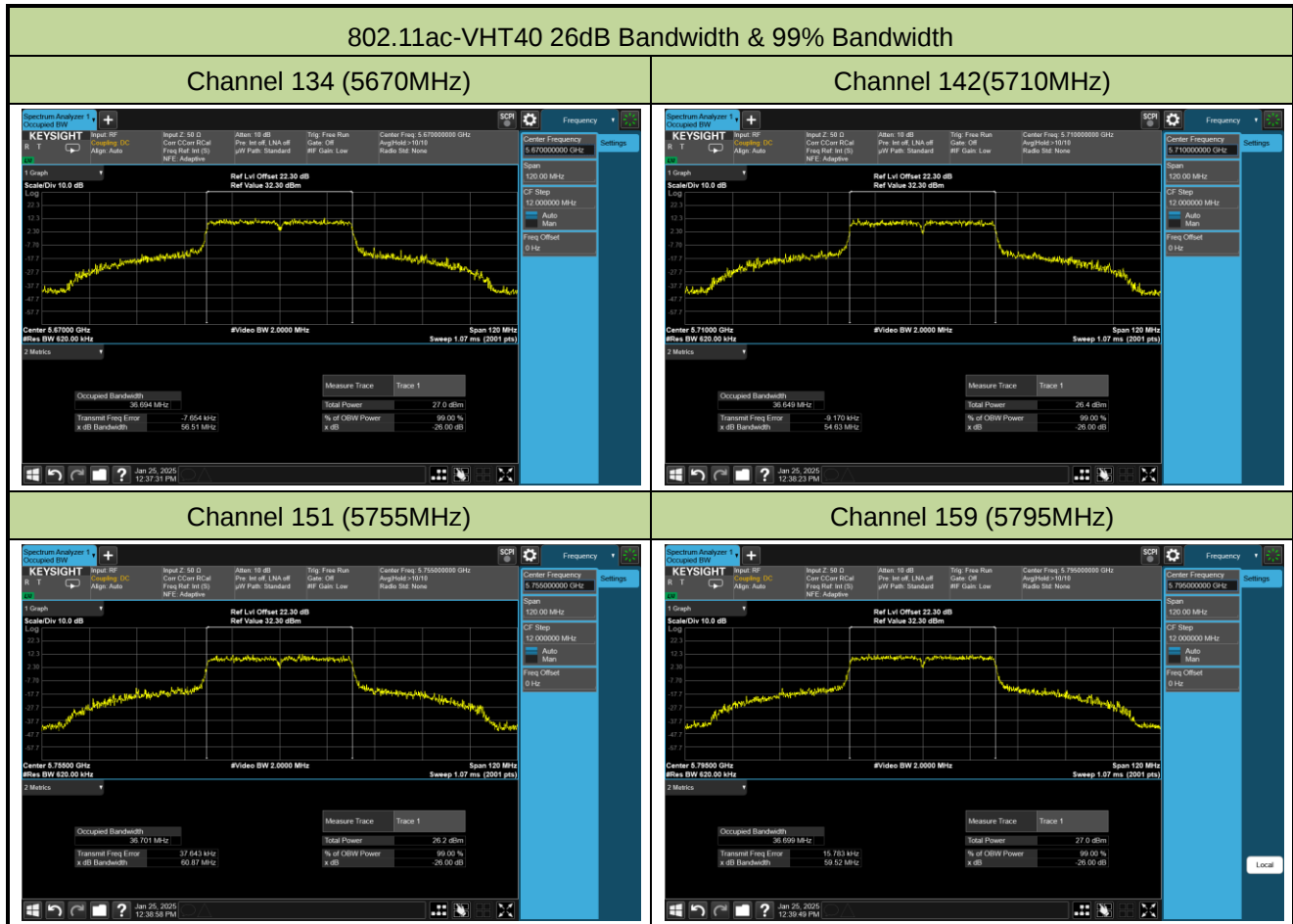


Channel 157 (5785MHz)







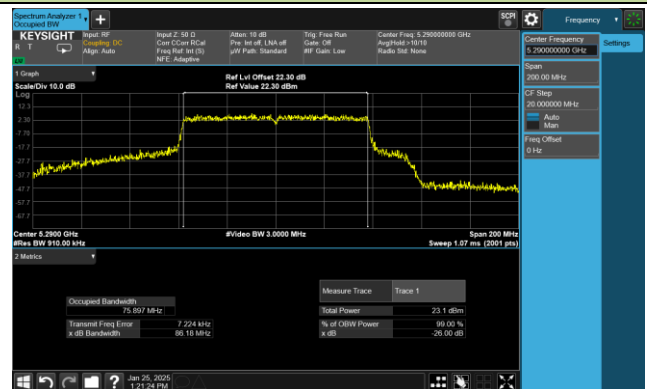


802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth

Channel 42 (5210MHz)



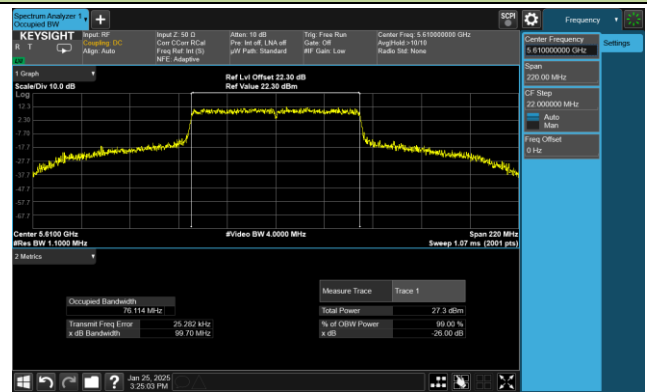
Channel 58 (5290MHz)



Channel 106 (5530MHz)



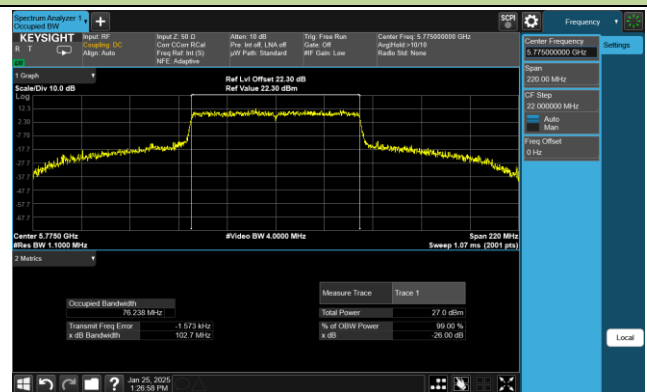
Channel 122 (5610MHz)



Channel 138 (5690MHz)

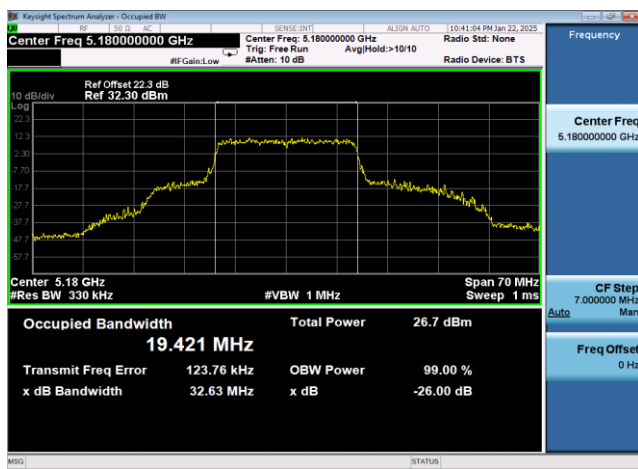


Channel 155 (5775MHz)

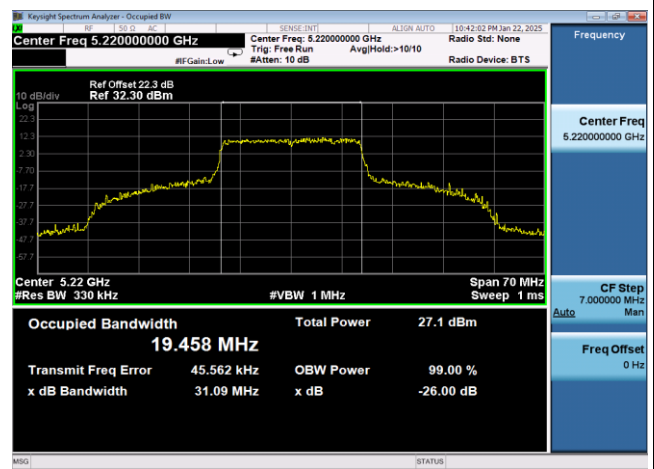


802.11ax-HE20 26dB Bandwidth & 99% Bandwidth

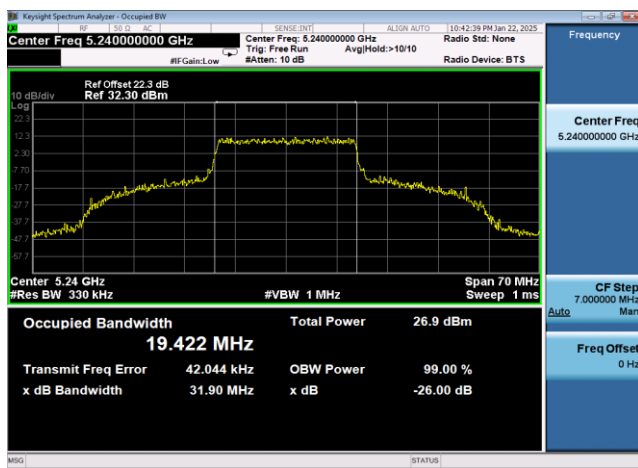
Channel 36 (5180MHz)



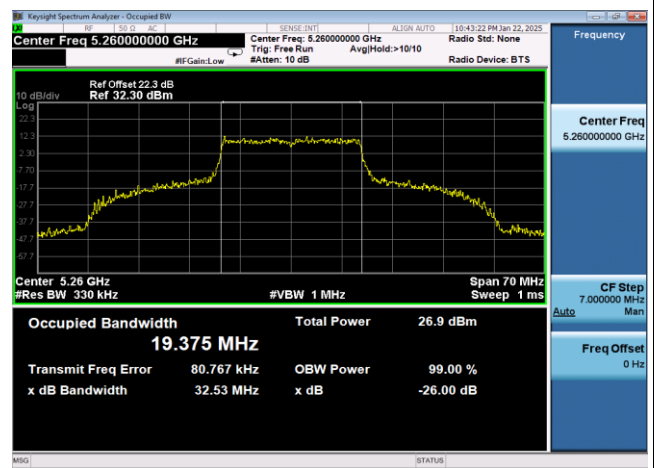
Channel 44 (5220MHz)



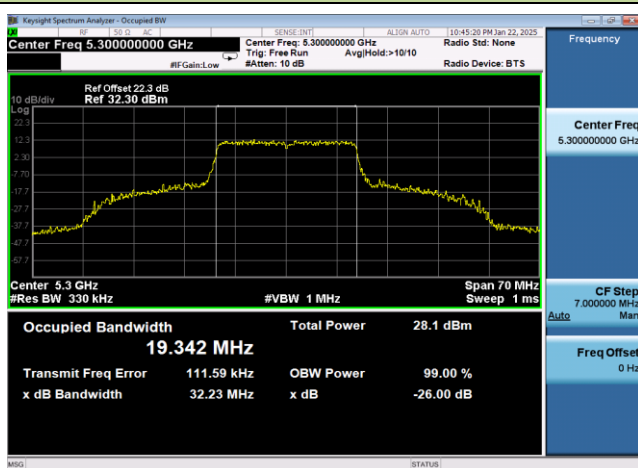
Channel 48 (5240MHz)



Channel 52 (5260MHz)



Channel 60 (5300MHz)



Channel 64 (5320MHz)

