



FCC Test Report

**Test Report
On Behalf of
Asterfusion Data Technologies Co.,Ltd.
For
Wireless Access Point
Model No.: AP6030, AP6020, AP6031
FCC ID: 2BMIU-AP6030**

Prepared For: Asterfusion Data Technologies Co.,Ltd.
Floor 4, Building A2, Shahutiandi, No.192 Tinglan Road, SIP, Suzhou, China

Prepared By: Shenzhen HUAKE Testing Technology Co., Ltd.
1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping,
Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Date of Test: Nov. 18, 2024 ~ Nov. 27, 2024

Date of Report: Nov. 27, 2024

Report Number: HK2411116634-3E



Test Result Certification

Applicant's Name: Asterfusion Data Technologies Co.,Ltd.

Address: Floor 4, Building A2, Shahutiandi, No.192 Tinglan Road, SIP,
Suzhou, China

Manufacturer's Name: Asterfusion Data Technologies Co.,Ltd.

Address: Floor 4, Building A2, Shahutiandi, No.192 Tinglan Road, SIP,
Suzhou, China

Product Description

Trade Mark: N/A

Product Name: Wireless Access Point

Model and/or Type Reference : AP6030, AP6020, AP6031

Standards: FCC Rules and Regulations Part 15 Subpart E Section 15.407
ANSI C63.10: 2013

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Date of Test.....:

Date (s) of Performance of Tests.....: **Nov. 18, 2024 ~ Nov. 27, 2024**

Date of Issue: **Nov. 27, 2024**

Test Result: **Pass**

Testing Engineer :

(Len Liao)

Technical Manager :

(Sliver Wan)

Authorized Signatory :

(Jason Zhou)



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**** Modified History ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Nov. 27, 2024	Jason Zhou



1. Test Result Summary

1.1 Test Procedures and Results

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Maximum Conducted Output Power	§15.407(a)	PASS
6dB Emission Bandwidth	§15.407(e)	PASS
26dB Emission Bandwidth & 99% Occupied Bandwidth	§15.407(a)	N/A
Power Spectral Density	§15.407(a)	PASS
Band Edge	§15.407(b)/15.209/15.205	PASS
Radiated Emission	§15.407(b)/15.209/15.205	PASS
Frequency Stability	§15.407(g)	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

1.2 Information of the Test Laboratory

Shenzhen HUAKE Testing Technology Co., Ltd.

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01.

FCC Designation Number is CN1229.

Canada IC CAB identifier is CN0045.

CNAS Registration Number is L9589.



1.3 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 0.37\text{dB}$
2	RF Power, Conducted	$\pm 3.35\text{dB}$
3	Spurious Emissions, Conducted	$\pm 2.20\text{dB}$
4	All Emissions, Radiated(<1G)	$\pm 3.90\text{dB}$
5	All Emissions, Radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^{\circ}\text{C}$
7	Humidity	$\pm 1.0\%$



2. EUT Description

2.1 General Description of EUT

Equipment	Wireless Access Point
Model Name	AP6030
Series Model	AP6020, AP6031
Model Difference	All model's the function, software and electric circuit are the same, only with product model named different. Test sample model: AP6030.
Trade Mark	N/A
FCC ID	2BMIU-AP6030
Operation Frequency	IEEE 802.11a/n/ac/ax(HT20)5.745GHz-5.825GHz IEEE 802.11n/ac/ax(HT40)5.755GHz-5.795GHz IEEE 802.11ac/ax(HT80) 5.775GHz
Modulation Technology	IEEE 802.11a/n/ac/ax
Modulation Type	1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Antenna Type	Internal Antenna
Antenna Gain	Antenna 1: 3.7dBi Antenna 2: 4.0dBi MIMO: 6.86dBi
Power Source	DC 48V from POE Adapter
Power Supply	DC 48V from POE Adapter
Hardware Version	V2.0
Software Version	V2.0

Note:

1. The EUT incorporates a MIMO function. Physically, it provides two completed transmitters and receivers (2T2R), two transmit signals are completely correlated, then, Direction gain= GANT + Array Gain (Array Gain=10 log(2) dB for power spectral density; Array Gain=0 for power measurement).
2. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
3. Antenna gain Refer to the antenna specifications.
4. The cable loss data is obtained from the supplier.
5. The test results in the report only apply to the tested sample.



2.2 Operation Frequency Each of Channel

802.11a/802.11n(HT20) 802.11ac(HT20) 802.11ax(HT20)		802.11n(HT40)/ 802.11ac(HT40) 802.11ax(HT40)		802.11ac(HT80) 802.11ax(HT80)	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

2.3 Operation of EUT during Testing

Band IV (5725 - 5850 MHz)		
For 802.11a/n (HT20)/ac(HT20)/axHT20)		
Channel Number	Channel	Frequency (MHz)
149	Low	5745
157	Mid	5785
165	High	5825

For 802.11n (HT40)/ ac(HT40)/axHT40)		
Channel Number	Channel	Frequency (MHz)
151	Low	5755
159	High	5795

For 802.11ac(HT80)/ax(HT80)		
Channel Number	Channel	Frequency (MHz)
155	/	5775

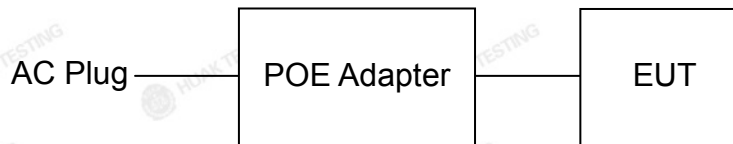


2.4 Description of Test Setup

Operation of EUT during Conducted and Radiation below 1GHz testing:



Operation of EUT during Radiation Above 1GHz testing:



The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position.



2.5 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Trade Mark	Model/Type No.	Specification	Remark
1	Wireless Access Point	N/A	AP6030	N/A	EUT
2	POE Adapter	N/A	STD-POE4805-A	Input: 100-240V, 50/60Hz, 0.8A Output: DC48V, 500mA	Peripheral
3	Laptop	Lenovo	TP00096A	Input: DC 20V, 2.25~3.25A Output: 5VDC, 0.5A	Peripheral

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.



3. General Information

3.1 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering Mode:	Keep the EUT in continuous transmitting by select channel and modulations
The sample was placed 0.8m/1.5m for blow/above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:	
Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.	
Mode	Data rate
802.11a	6 Mbps
802.11n(HT20)	MCS0
802.11n(HT40)	MCS0
802.11ac(HT20)/ac(HT40)/ac(HT80)	MCS0
802.11ax(HT20)/ax(HT40)/ax(HT80)	MCS0
Final Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation



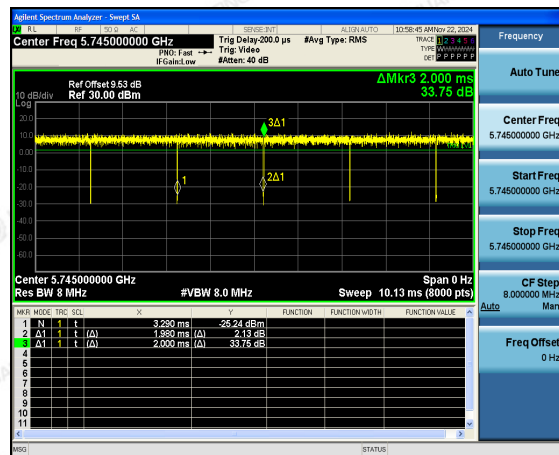
3. Mode Test Duty Cycle

ANT.1:

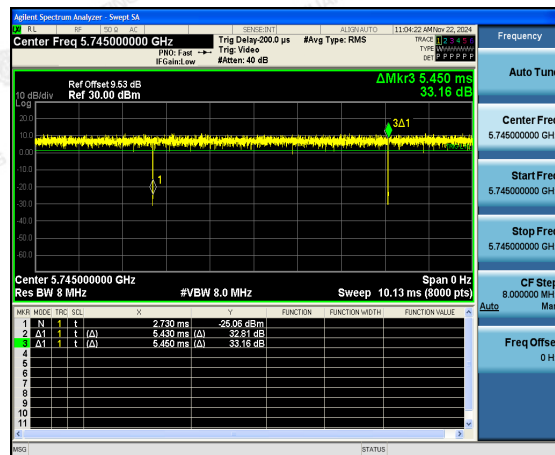
Mode	Duty Cycle	Duty Cycle Factor (dB)
802.11a	0.990	-0.044
802.11n(HT20)	0.996	-0.016
802.11n(HT40)	0.996	-0.016
802.11ac(HT20)	0.996	-0.016
802.11ac(HT40)	0.996	-0.016
802.11ac(HT80)	0.996	-0.016
802.11ax(HT20)	0.996	-0.016
802.11ax(HT40)	0.996	-0.016
802.11ax(HT80)	0.998	-0.008

Test plots as follows:

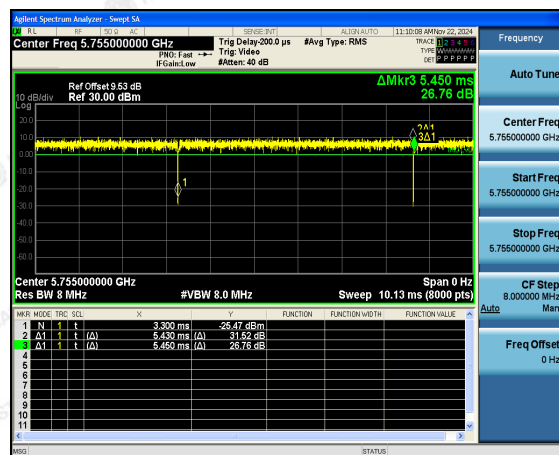
802.11a



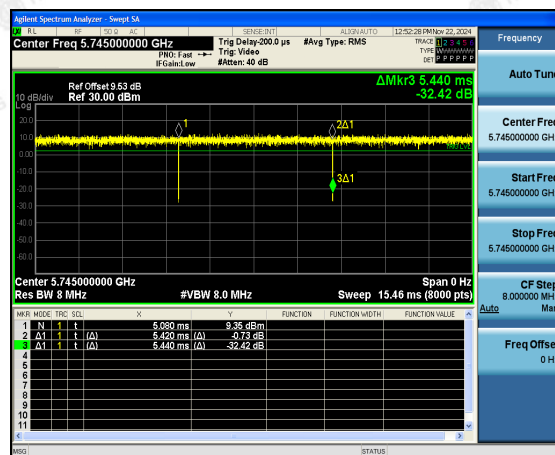
802.11n(HT20)



802.11n(HT40)



802.11ac(HT20)



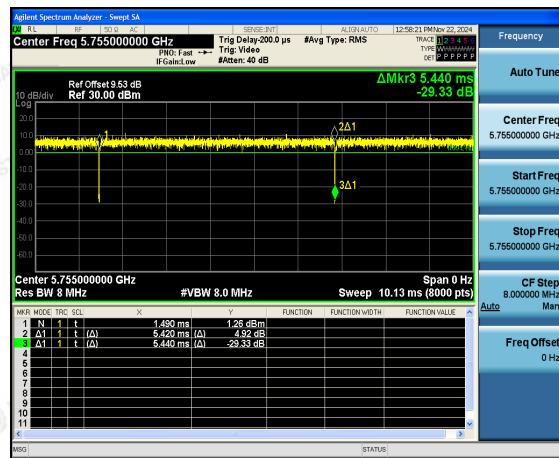
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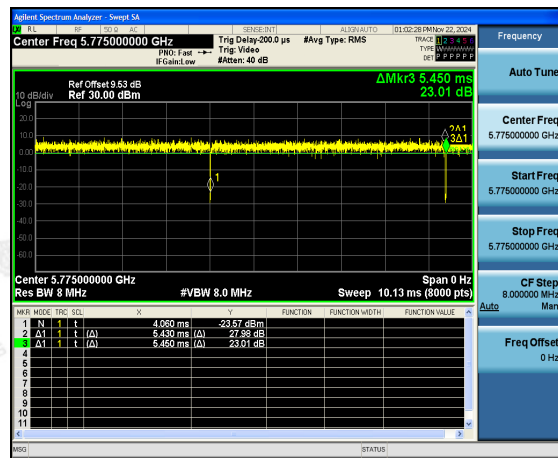
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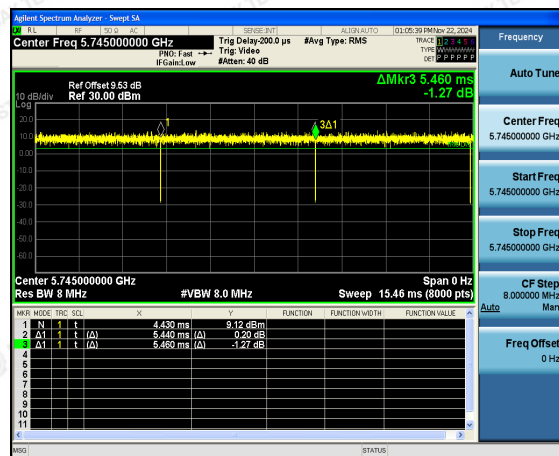
802.11ac(HT40)



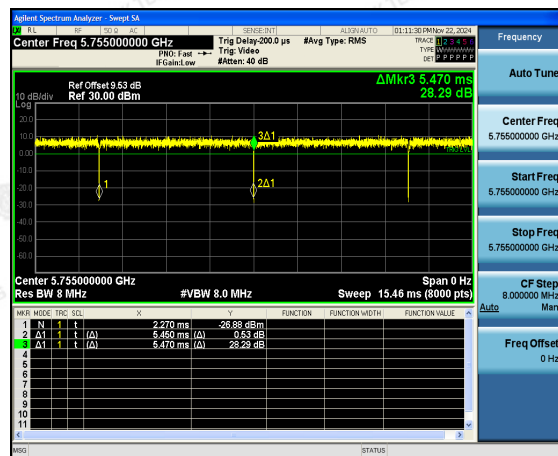
802.11ac(HT80)



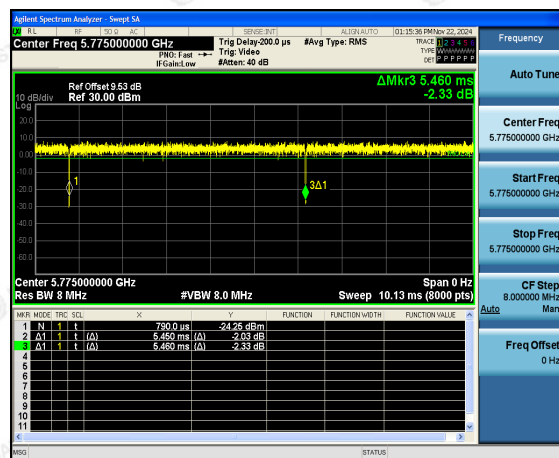
802.11ax(HT20)



802.11ax(HT40)



802.11ax(HT80)



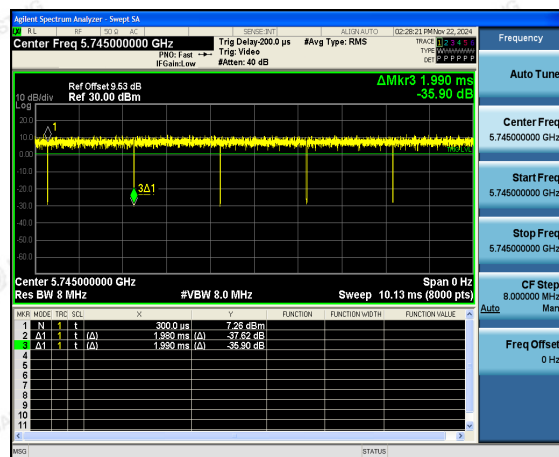


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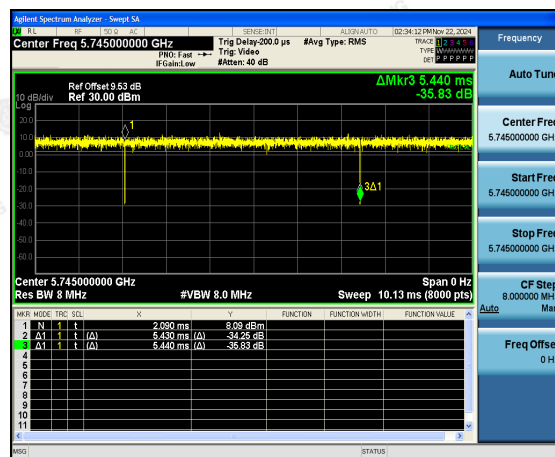
Mode	Duty Cycle	Duty Cycle Factor (dB)
802.11a	0.995	-0.022
802.11n(HT20)	0.998	-0.008
802.11n(HT40)	0.996	-0.016
802.11ac(HT20)	0.996	-0.016
802.11ac(HT40)	0.996	-0.016
802.11ac(HT80)	0.996	-0.016
802.11ax(HT20)	0.996	-0.016
802.11ax(HT40)	0.996	-0.016
802.11ax(HT80)	0.996	-0.016

Test plots as follows:

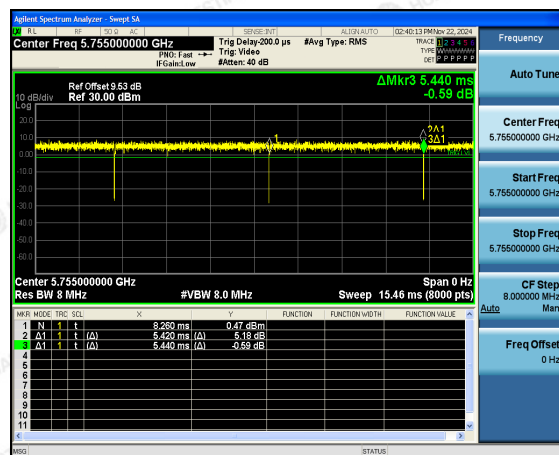
802.11a



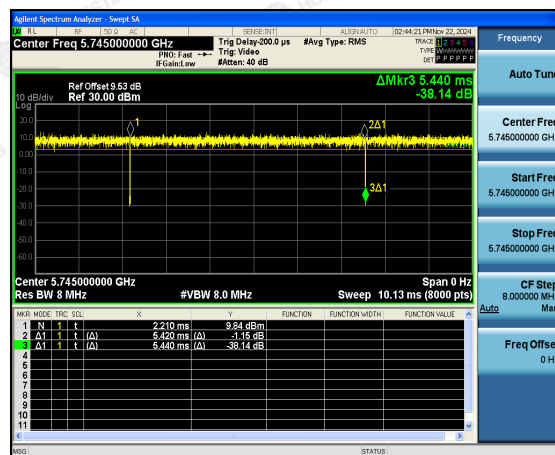
802.11n(HT20)



802.11n(HT40)



802.11ac(HT20)



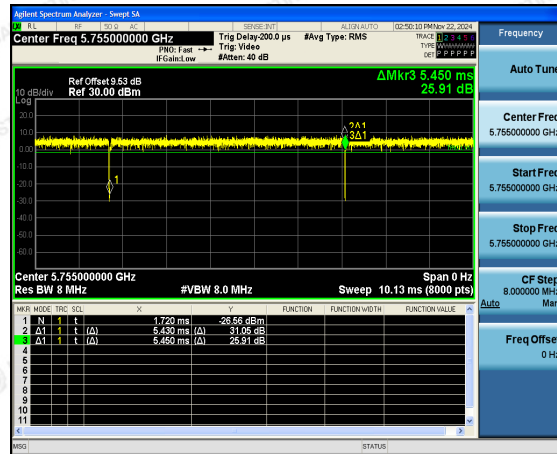
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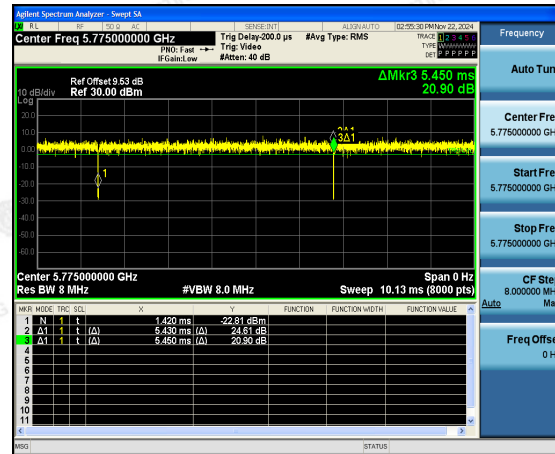
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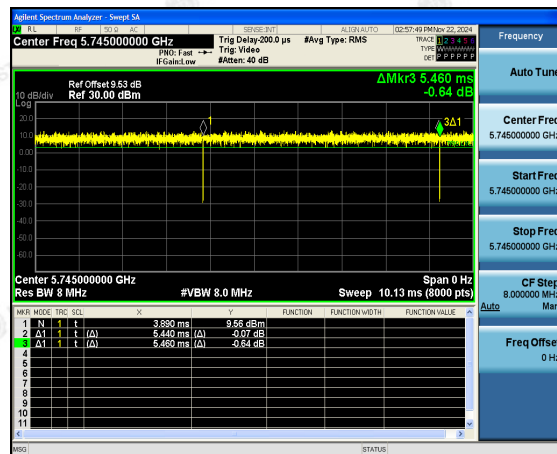
802.11ac(HT40)



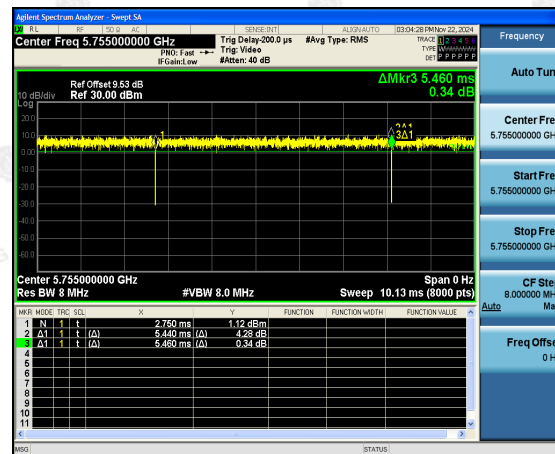
802.11ac(HT80)



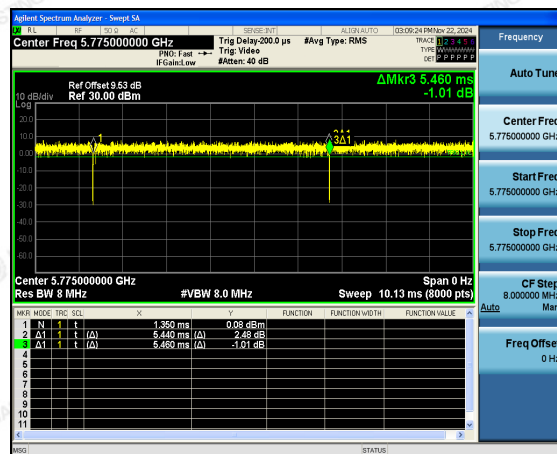
802.11ax(HT20)



802.11ax(HT40)



802.11ax(HT80)





4. Test Results and Measurement Data

4.1 Conducted Emission

4.1.1 Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test Setup:	Reference Plane 40cm E.U.T AC power 80cm LISN Filter AC power EMI Receiver Test table/Insulation plane Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m														
Test Mode:	Tx Mode														
Test Procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.														
Test Result:	Pass														



4.1.2 Test Instruments

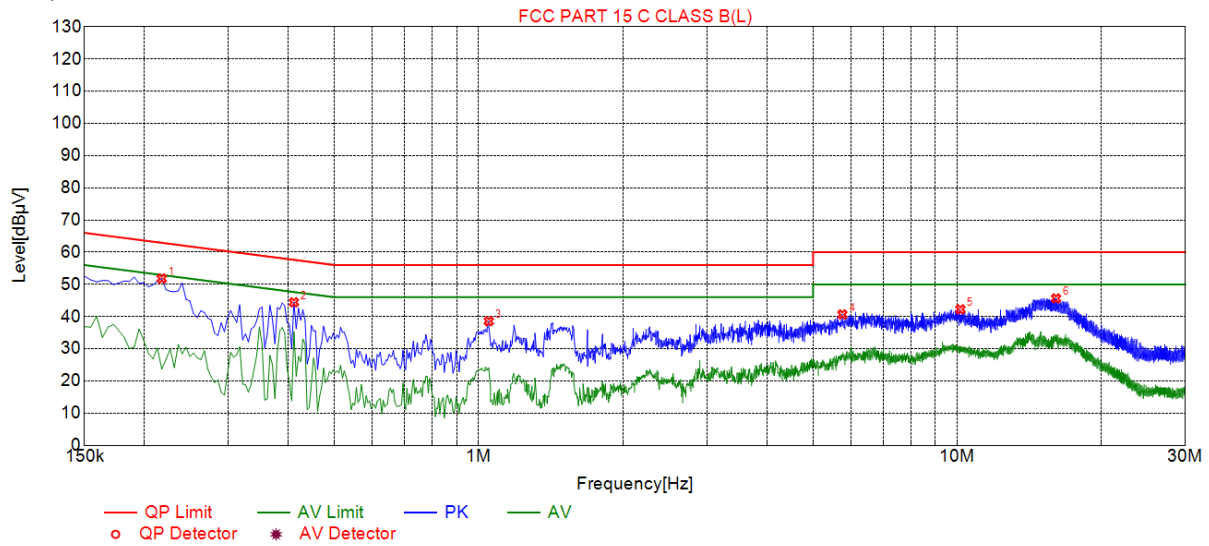
Conducted Emission Shielding Room Test Site (843)					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Receiver	R&S	ESR	HKE-005	Feb. 20, 2024	Feb. 19, 2025
LISN	R&S	ENV216	HKE-002	Feb. 20, 2024	Feb. 19, 2025
LISN	R&S	ENV216	HKE-059	Feb. 20, 2024	Feb. 19, 2025
Coax cable (9KHz-30MHz)	Times	381806-002	N/A	Feb. 20, 2024	Feb. 19, 2025
EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	N/A	N/A
10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	Feb. 20, 2024	Feb. 19, 2025

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



4.1.3 Test Data

Test Specification: Line



Suspected List

NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.2175	51.80	19.85	62.91	11.11	31.95	PK	L
2	0.4110	44.42	19.83	57.63	13.21	24.59	PK	L
3	1.0500	38.57	19.88	56.00	17.43	18.69	PK	L
4	5.7570	40.66	20.10	60.00	19.34	20.56	PK	L
5	10.1625	42.24	19.95	60.00	17.76	22.29	PK	L
6	16.1025	45.64	19.82	60.00	14.36	25.82	PK	L

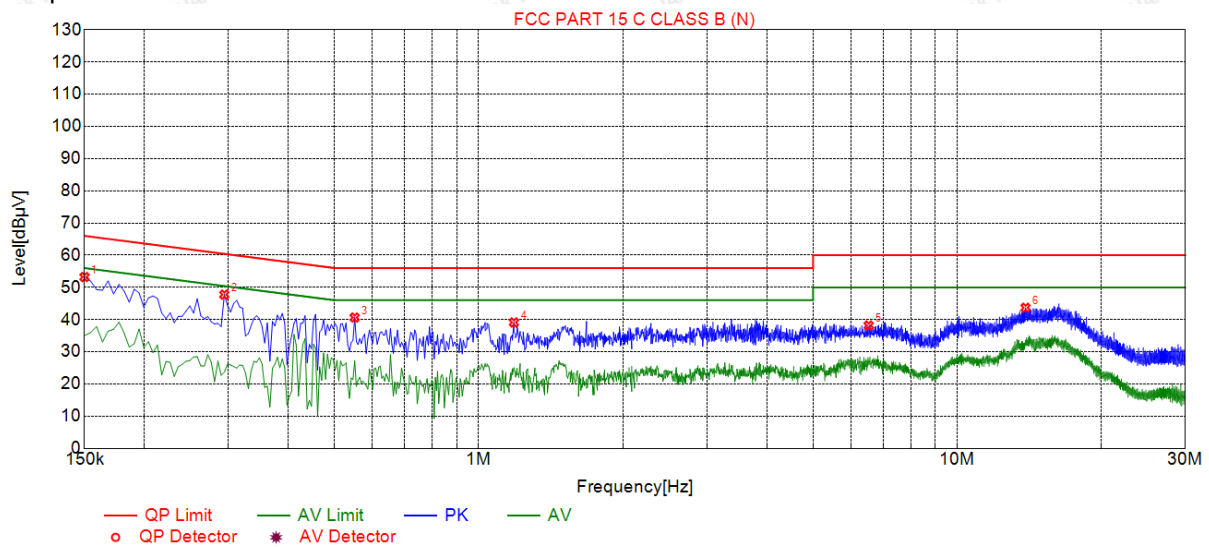
Remark: Margin = Limit – Level

Correction factor = Cable lose + ISN insertion loss

Level=Test receiver reading + correction factor



Test Specification: Neutral



Suspected List

NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.1500	53.22	19.73	66.00	12.78	33.49	PK	N
2	0.2940	47.75	19.73	60.41	12.66	28.02	PK	N
3	0.5505	40.63	19.75	56.00	15.37	20.88	PK	N
4	1.1850	39.11	19.77	56.00	16.89	19.34	PK	N
5	6.5355	38.16	19.97	60.00	21.84	18.19	PK	N
6	13.9065	43.67	19.80	60.00	16.33	23.87	PK	N

Remark: Margin = Limit – Level

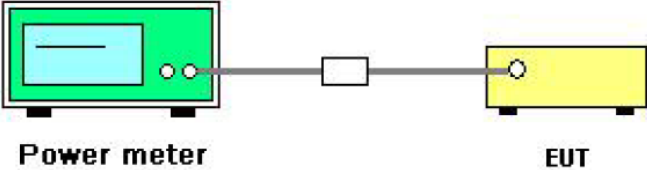
Correction factor = Cable lose + ISN insertion loss

Level=Test receiver reading + correction factor



4.2 Maximum Conducted Output Power

4.2.1 Test Specification

Test Requirement:	FCC Part15 E Section 15.407(a)	
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02.r01 Section E	
Limit:	Frequency Band (MHz)	Limit
	5725-5850	1 W
Test Setup:	 The diagram illustrates the test setup. On the left is a green box labeled 'Power meter'. A cable connects it to a small white box labeled 'Attenuator'. Another cable connects the attenuator to a yellow box labeled 'EUT' (Equipment Under Test).	
Test Mode:	Transmitting mode with modulation	
Test Procedure:	1. The testing follows the Measurement Procedure of KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E, 3, a 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 4. Measure the conducted output power and record the results in the test report.	
Test Result:	PASS	
Remark:	Conducted output power= measurement power +10log(1/x) X is duty cycle=1, so 10log(1/1)=0 Conducted output power= measurement power	



4.2.2 Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025
Power meter	Agilent	E4419B	HKE-085	Feb. 20, 2024	Feb. 19, 2025
Power Sensor	Agilent	E9300A	HKE-086	Feb. 20, 2024	Feb. 19, 2025
RF cable	Times	1-40G	HKE-034	Feb. 20, 2024	Feb. 19, 2025
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025
RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



4.2.3 Test Data

Configuration Band IV (5725 - 5850 MHz)					
Mode	Test channel	Maximum Conducted Output Power (dBm)		Limit (dBm)	Result
		Antenna port 1	Antenna port 2		
802.11a	CH149	5.04	4.98	30	PASS
802.11a	CH157	4.95	4.95	30	PASS
802.11a	CH165	5.19	4.65	30	PASS
802.11n(HT20)	CH149	4.50	4.69	30	PASS
802.11n(HT20)	CH157	4.36	4.30	30	PASS
802.11n(HT20)	CH165	5.74	5.06	30	PASS
802.11n(HT40)	CH151	6.61	4.93	30	PASS
802.11n(HT40)	CH159	6.80	4.35	30	PASS
802.11ac(HT20)	CH149	5.10	5.34	30	PASS
802.11ac(HT20)	CH157	5.40	5.11	30	PASS
802.11ac(HT20)	CH165	5.46	5.00	30	PASS
802.11ac(HT40)	CH151	6.52	4.88	30	PASS
802.11ac(HT40)	CH159	6.59	4.32	30	PASS
802.11ac(HT80)	CH155	6.23	4.59	30	PASS
802.11ax(HT20)	CH149	5.75	5.51	30	PASS
802.11ax(HT20)	CH157	5.17	4.48	30	PASS
802.11ax(HT20)	CH165	5.87	4.23	30	PASS
802.11ax(HT40)	CH151	6.19	6.18	30	PASS
802.11ax(HT40)	CH159	6.41	4.84	30	PASS
802.11ax(HT80)	CH155	6.07	5.76	30	PASS

**Configuration Band IV (5725 - 5850 MHz)**

Mode	Test channel	Maximum Conducted Output Power (dBm)		MIMO	Limit (dBm)	Result
		Antenna port 1	Antenna port 2			
802.11n(HT20)	CH149	4.50	4.69	7.61	30	PASS
802.11n(HT20)	CH157	4.36	4.30	7.34	30	PASS
802.11n(HT20)	CH165	5.74	5.06	8.42	30	PASS
802.11n(HT40)	CH151	6.61	4.93	8.86	30	PASS
802.11n(HT40)	CH159	6.80	4.35	8.76	30	PASS
802.11ac(HT20)	CH149	5.10	5.34	8.23	30	PASS
802.11ac(HT20)	CH157	5.40	5.11	8.27	30	PASS
802.11ac(HT20)	CH165	5.46	5.00	8.25	30	PASS
802.11ac(HT40)	CH151	6.52	4.88	8.79	30	PASS
802.11ac(HT40)	CH159	6.59	4.32	8.61	30	PASS
802.11ac(HT80)	CH155	6.23	4.59	8.50	30	PASS
802.11ax(HT20)	CH149	5.75	5.51	8.64	30	PASS
802.11ax(HT20)	CH157	5.17	4.48	7.85	30	PASS
802.11ax(HT20)	CH165	5.87	4.23	8.14	30	PASS
802.11ax(HT40)	CH151	6.19	6.18	9.20	30	PASS
802.11ax(HT40)	CH159	6.41	4.84	8.71	30	PASS
802.11ax(HT80)	CH155	6.07	5.76	8.93	30	PASS



4.3 6dB Emission Bandwidth

4.3.1 Test Specification

Test Requirement:	FCC CFR47 Part 15 Section 15.407(e)
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v01r04 Section C
Limit:	>500kHz
Test Setup:	 Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. 4. Measure and record the results in the test report.
Test Result:	PASS

4.3.2 Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025
RF cable	Times	1-40G	HKE-034	Feb. 20, 2024	Feb. 19, 2025
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025
RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**4.3.3 Test Data****ANT. 1**

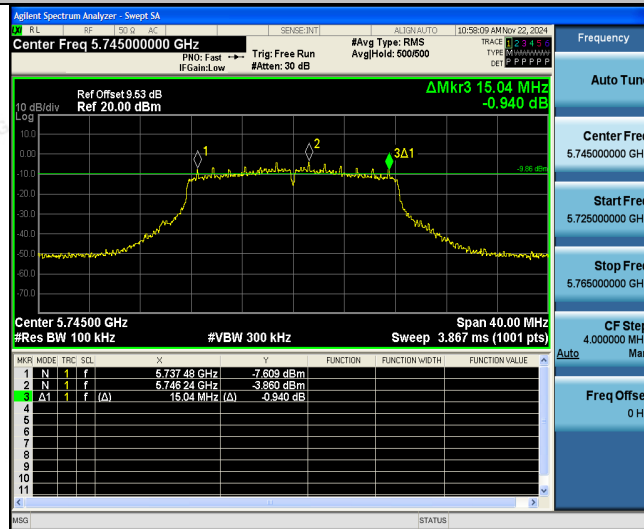
Band IV (5725 - 5850 MHz)					
Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
802.11a	CH149	5745	15.040	0.5	PASS
802.11a	CH157	5785	15.040	0.5	PASS
802.11a	CH165	5825	15.000	0.5	PASS
802.11n(HT20)	CH149	5745	15.080	0.5	PASS
802.11n(HT20)	CH157	5785	15.080	0.5	PASS
802.11n(HT20)	CH165	5825	14.880	0.5	PASS
802.11n(HT40)	CH151	5755	34.960	0.5	PASS
802.11n(HT40)	CH159	5795	34.960	0.5	PASS
802.11ac(HT20)	CH149	5745	13.880	0.5	PASS
802.11ac(HT20)	CH157	5785	15.080	0.5	PASS
802.11ac(HT20)	CH165	5825	13.800	0.5	PASS
802.11ac(HT40)	CH151	5755	34.320	0.5	PASS
802.11ac(HT40)	CH159	5795	32.800	0.5	PASS
802.11ac(HT80)	CH155	5775	68.800	0.5	PASS
802.11ax(HT20)	CH149	5745	16.840	0.5	PASS
802.11ax(HT20)	CH157	5785	13.160	0.5	PASS
802.11ax(HT20)	CH165	5825	15.440	0.5	PASS
802.11ax(HT40)	CH151	5755	35.120	0.5	PASS
802.11ax(HT40)	CH159	5795	35.200	0.5	PASS
802.11ax(HT80)	CH155	5775	66.240	0.5	PASS

Test plots as follows:

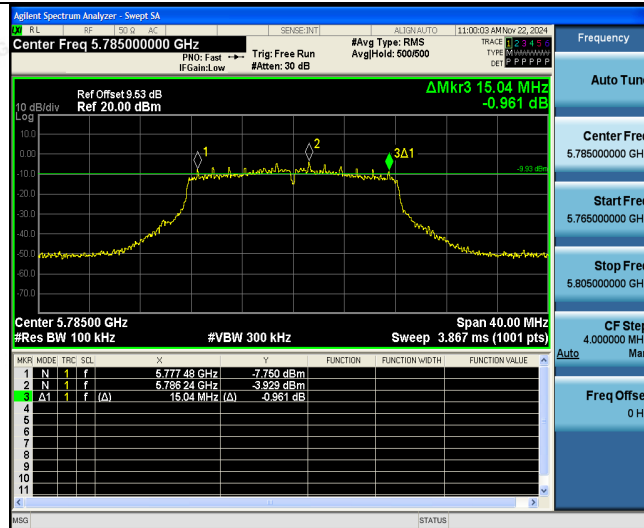


Band IV (5725 – 5850 MHz)

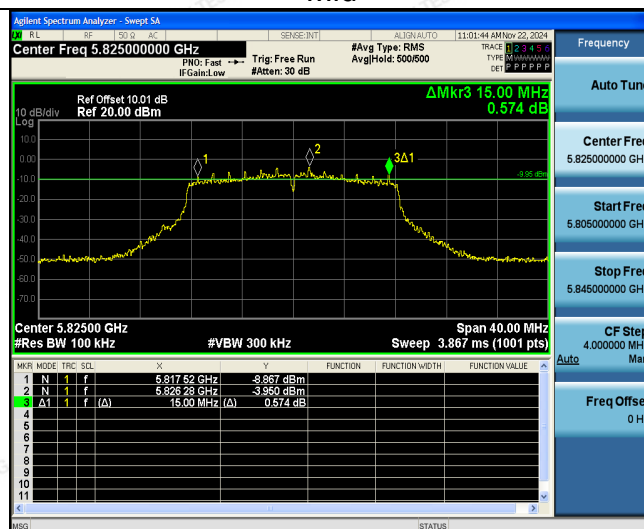
802.11a



Low



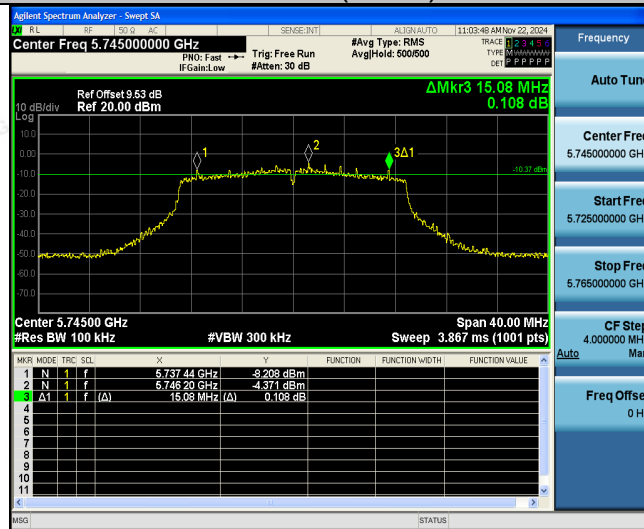
Mid



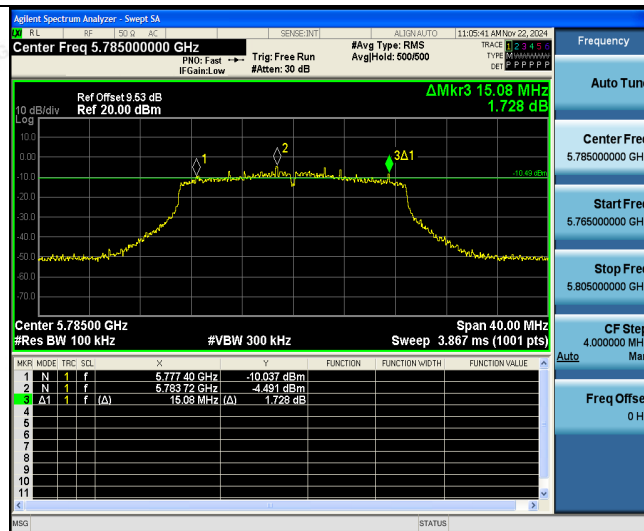
High



802.11n(HT20)



Low



Mid



High

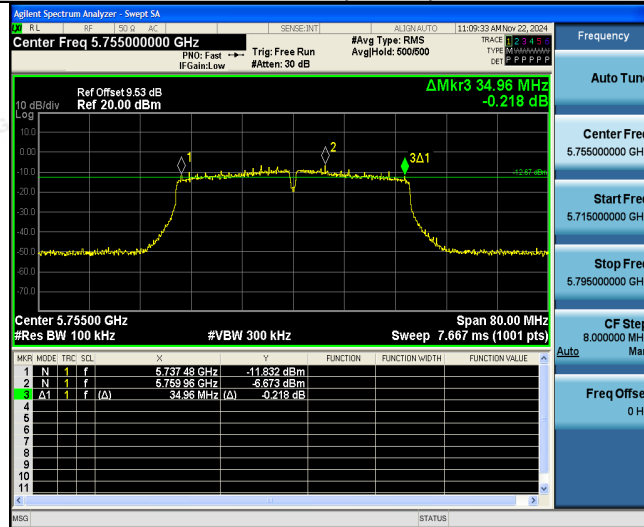
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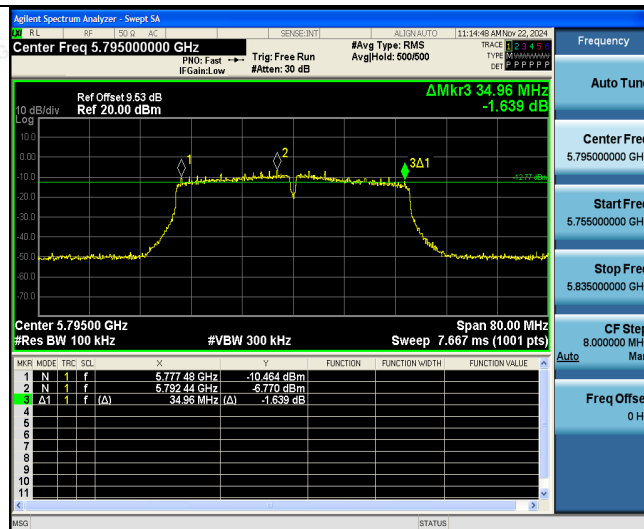
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



802.11n(HT40)



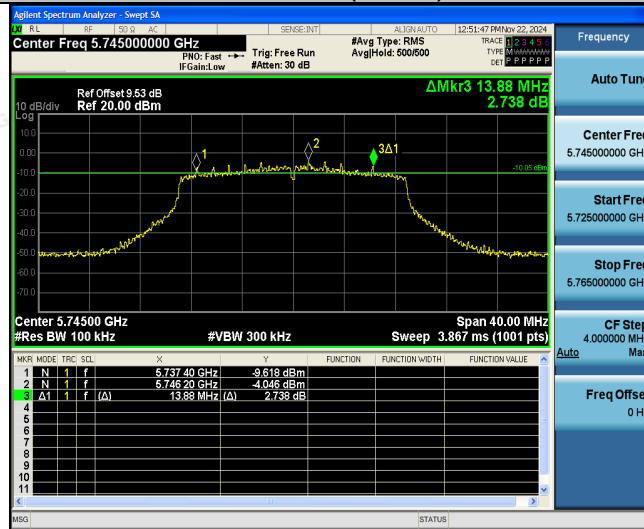
Low



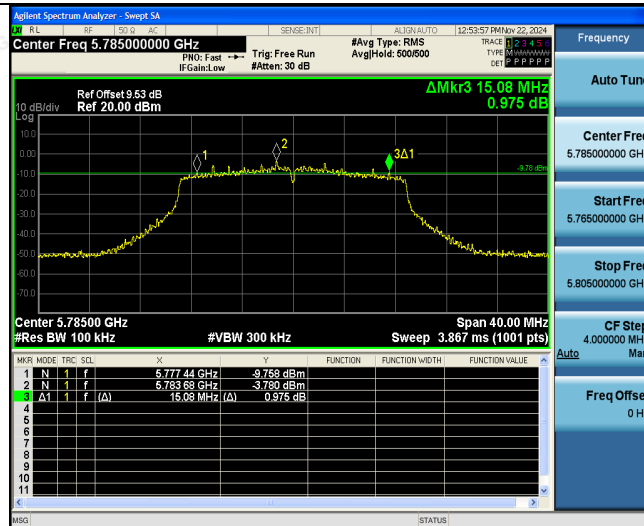
High



802.11ac(HT20)



Low



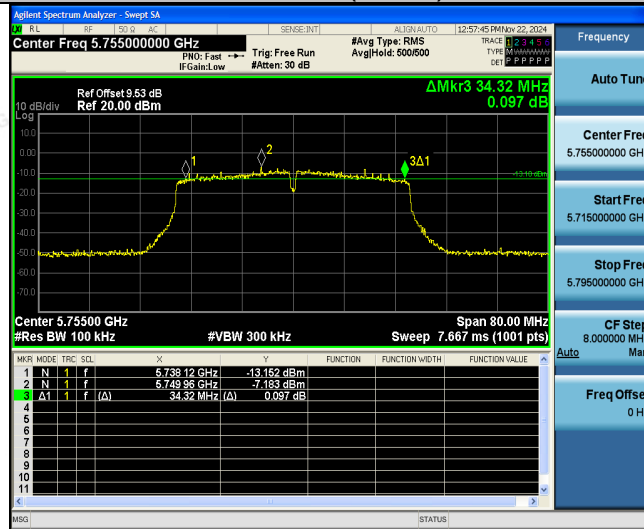
Mid



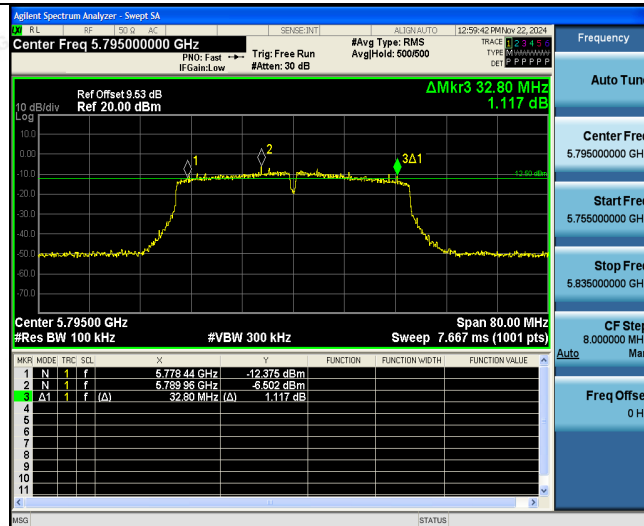
High



802.11ac(HT40)

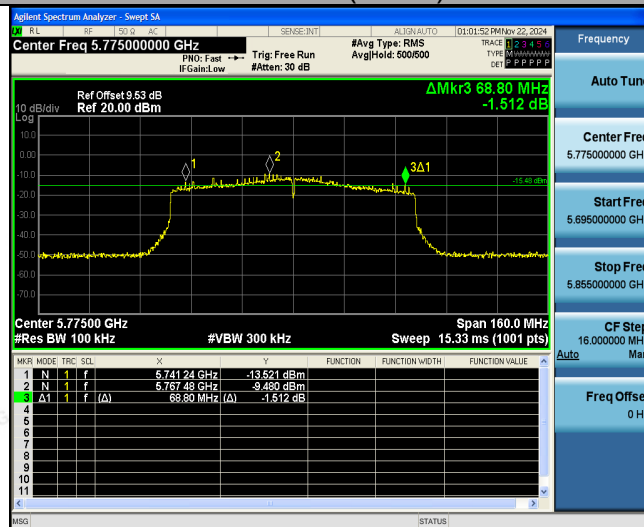


Low



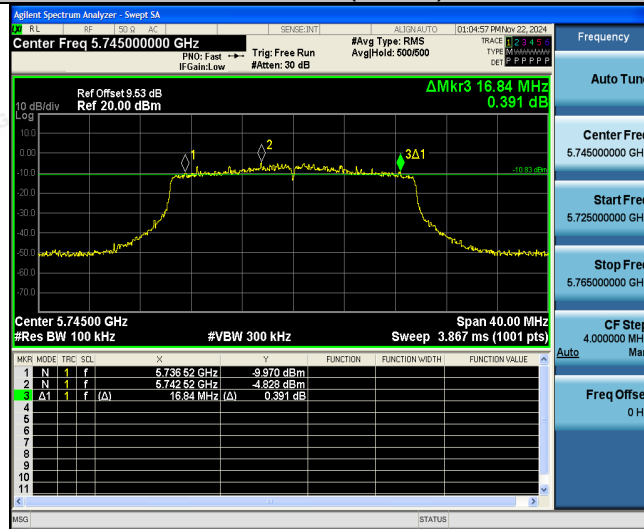
High

802.11ac(HT80)

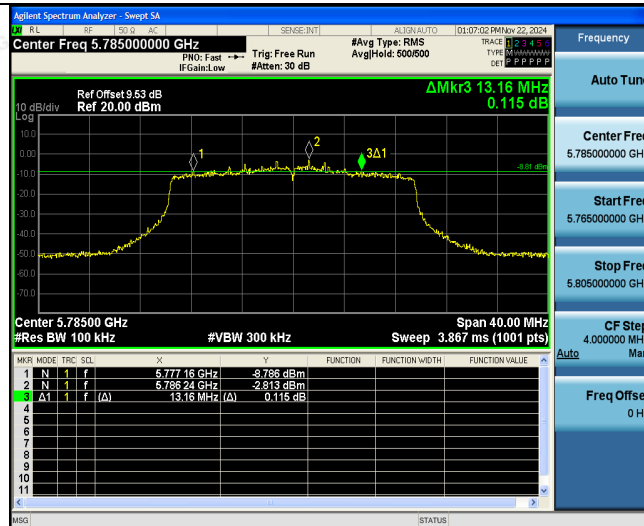




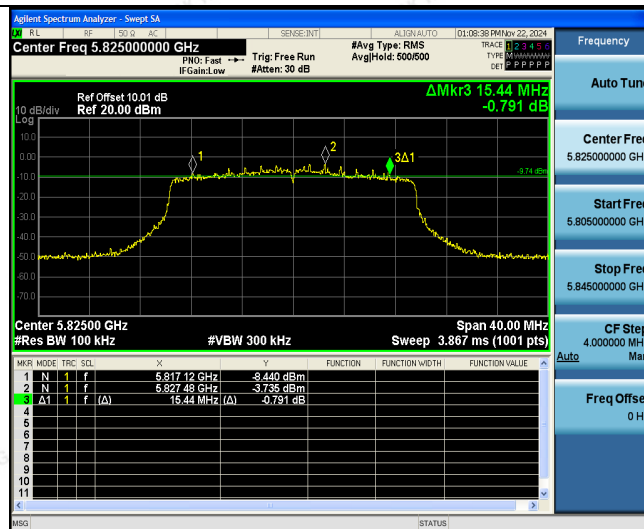
802.11ax(HT20)



Low



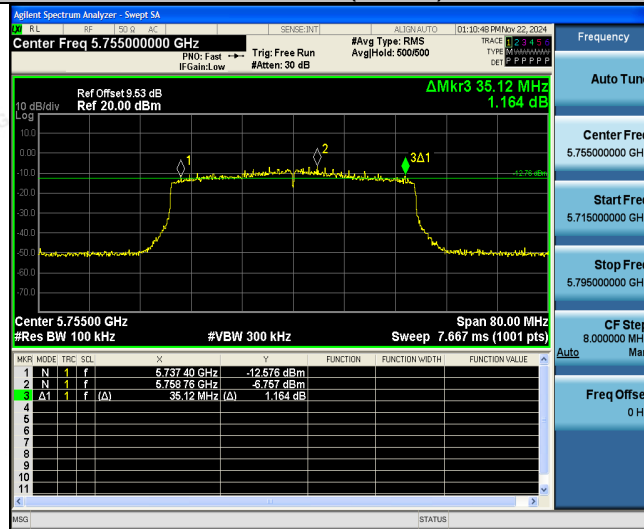
Mid



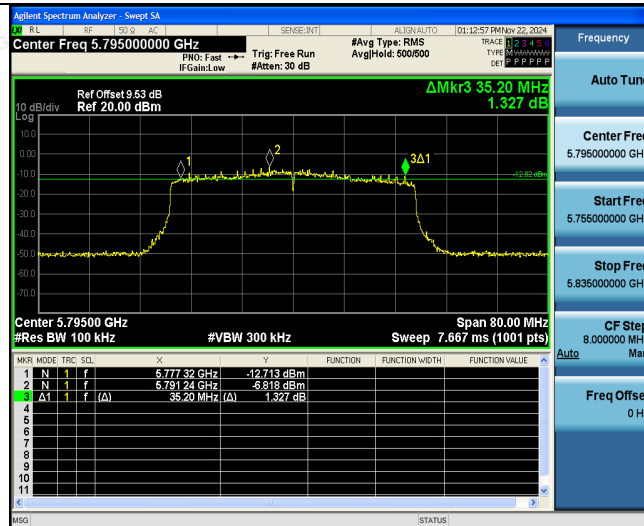
High



802.11ax(HT40)

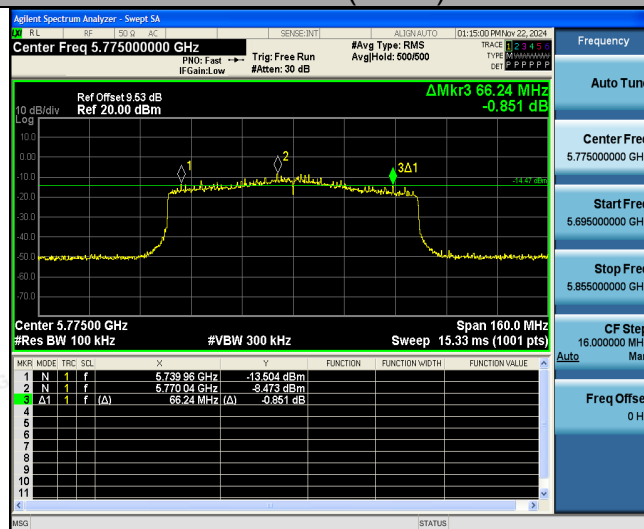


Low



High

802.11ax(HT80)



**ANT. 2**

Band IV (5725 - 5850 MHz)					
Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
802.11a	CH149	5745	15.080	0.5	PASS
802.11a	CH157	5785	15.080	0.5	PASS
802.11a	CH165	5825	15.080	0.5	PASS
802.11n(HT20)	CH151	5745	15.120	0.5	PASS
802.11n(HT20)	CH159	5785	14.600	0.5	PASS
802.11n(HT20)	CH149	5825	15.080	0.5	PASS
802.11n(HT40)	CH157	5755	35.120	0.5	PASS
802.11n(HT40)	CH165	5795	35.280	0.5	PASS
802.11ac(HT20)	CH151	5745	13.880	0.5	PASS
802.11ac(HT20)	CH159	5785	13.800	0.5	PASS
802.11ac(HT20)	CH155	5825	15.120	0.5	PASS
802.11ac(HT40)	CH149	5755	35.040	0.5	PASS
802.11ac(HT40)	CH157	5795	35.040	0.5	PASS
802.11ac(HT80)	CH165	5775	58.720	0.5	PASS
802.11ax(HT20)	CH151	5745	14.840	0.5	PASS
802.11ax(HT20)	CH159	5785	15.840	0.5	PASS
802.11ax(HT20)	CH155	5825	16.360	0.5	PASS
802.11ax(HT40)	CH149	5755	34.560	0.5	PASS
802.11ax(HT40)	CH157	5795	33.840	0.5	PASS
802.11ax(HT80)	CH165	5775	67.680	0.5	PASS

Test plots as follows:



Band IV (5725 – 5850 MHz)



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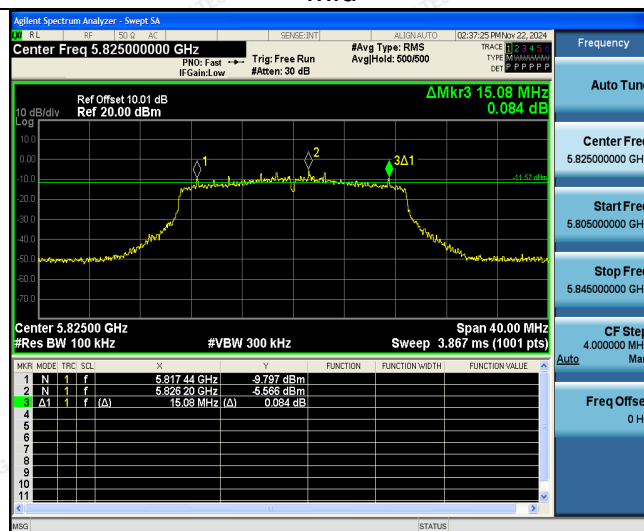
802.11n(HT20)



Low



Mid



High

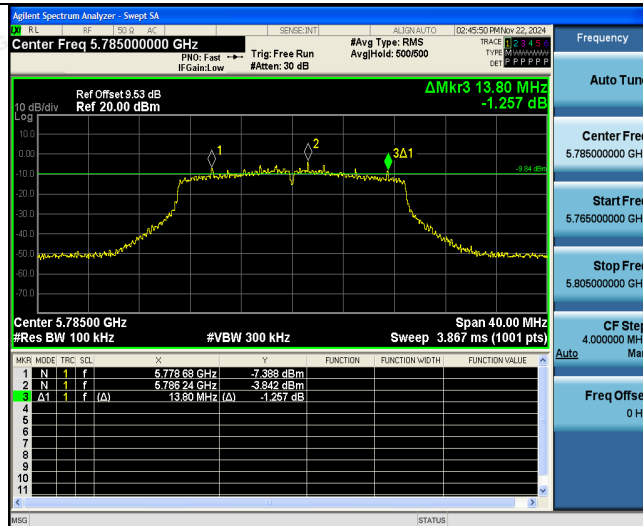




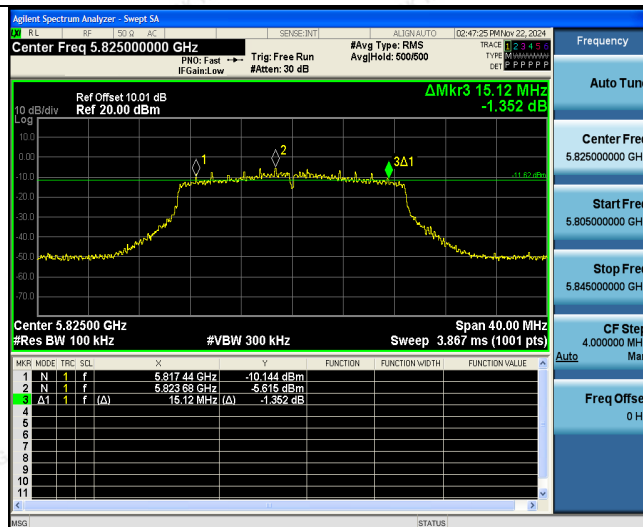
802.11ac(HT20)



Low



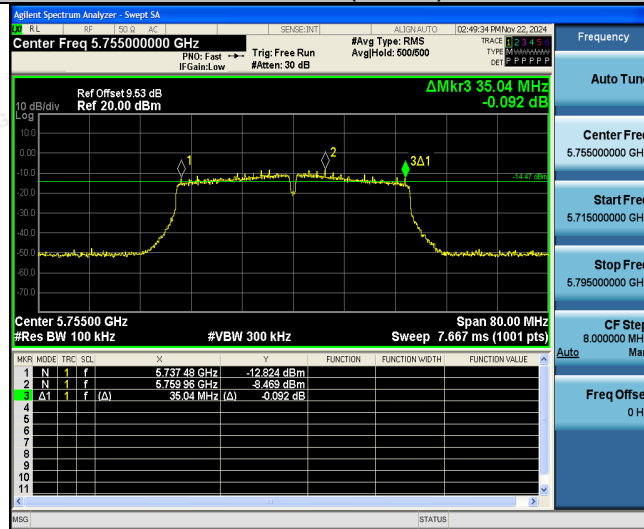
Mid



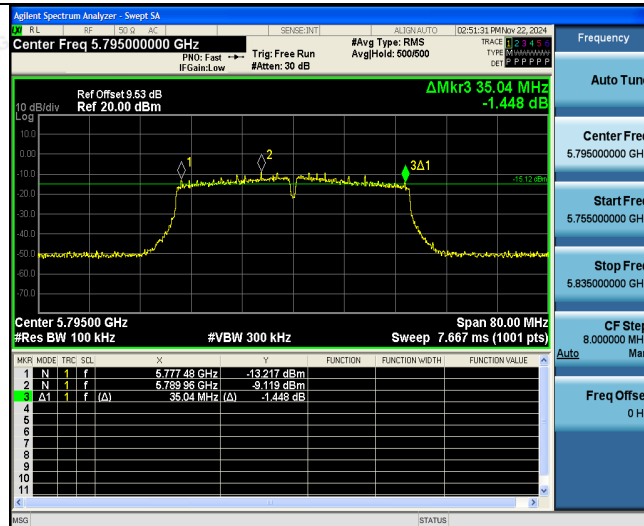
High



802.11ac(HT40)

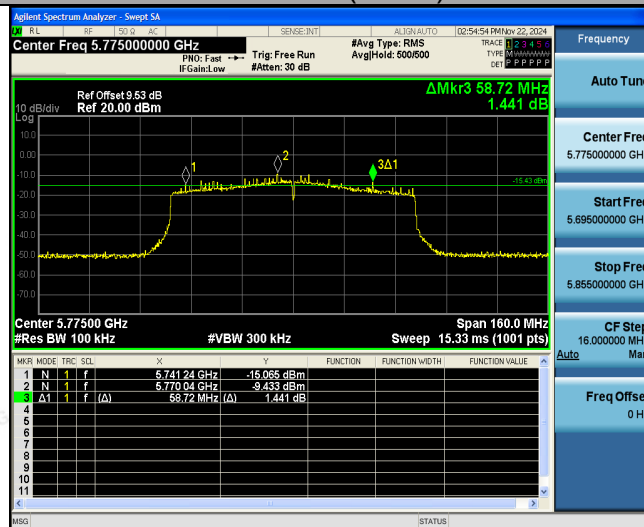


Low



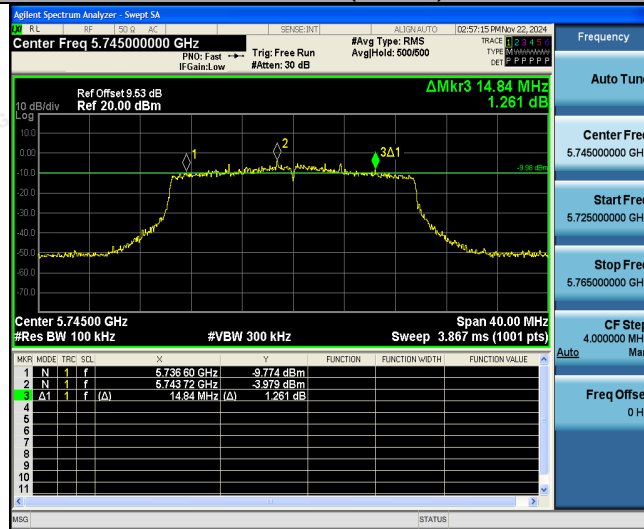
High

802.11ac(HT80)

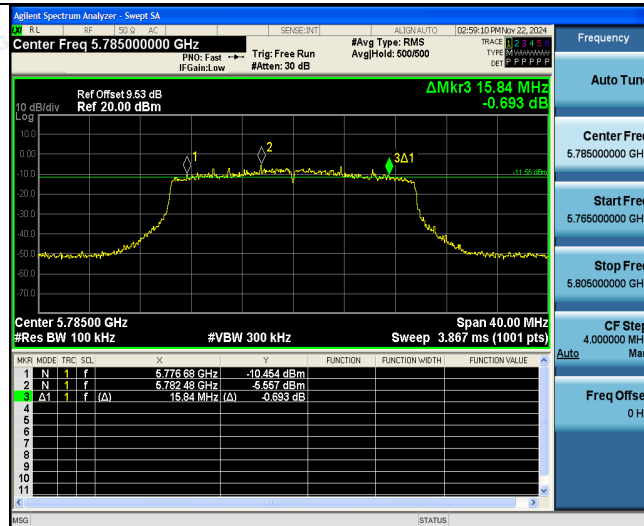




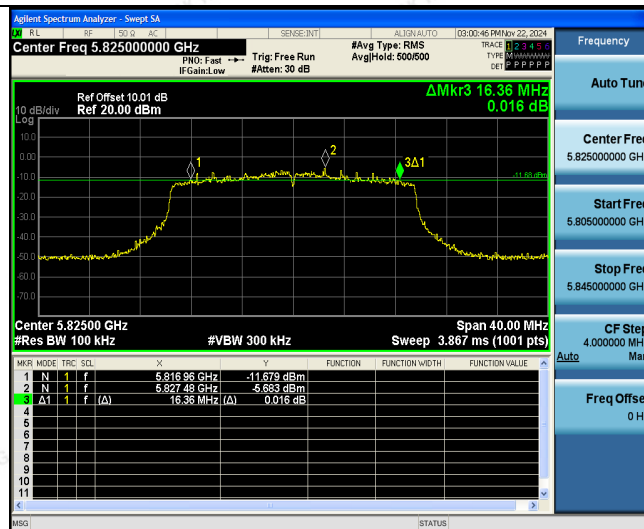
802.11ax(HT20)



Low



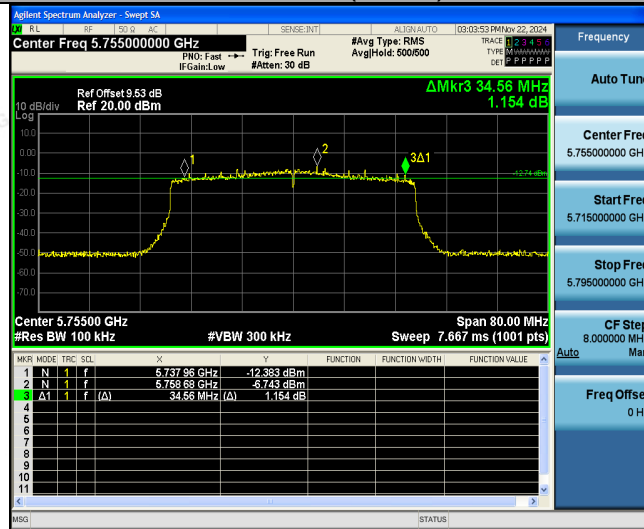
Mid



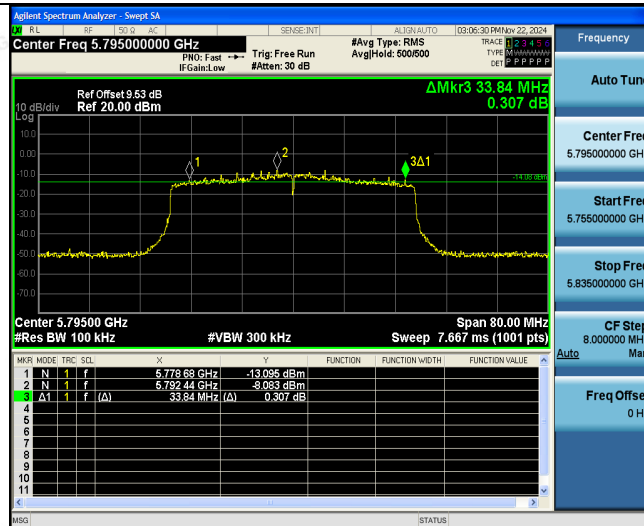
High



802.11ax(HT40)

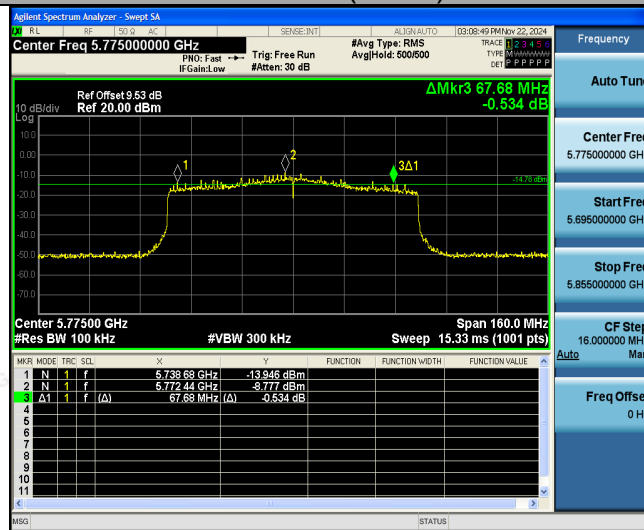


Low



High

802.11ax(HT80)





4.4 26dB Bandwidth and 99% Occupied Bandwidth

4.4.1 Test Specification

Test Requirement:	47 CFR Part 15C Section 15.407 (a)
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
Limit:	No restriction limits
Test Setup:	 Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth $RBW = 1\% \text{ EBW}$, $VBW \geq 3RBW$, In order to make an accurate measurement. 4. Measure and record the results in the test report.
Test Result:	N/A

4.4.2 Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025
RF cable	Times	1-40G	HKE-034	Feb. 20, 2024	Feb. 19, 2025
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025
RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

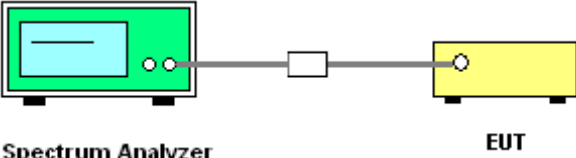
4.4.3 Test Result

N/A



4.5 Power Spectral Density

4.5.1 Test Specification

Test Requirement:	FCC Part15 E Section 15.407 (a)
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section F
Limit:	$\leq 30.00\text{dBm}/500\text{KHz}$ for Band IV 5725MHz-5850MHz
Test Setup:	 Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. 2. Set RBW = 510 kHz/1 MHz, VBW $\geq 3 \times \text{RBW}$, Sweep time = Auto, Detector = RMS. 3. Allow the sweeps to continue until the trace stabilizes. 4. Use the peak marker function to determine the maximum amplitude level. 5. The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.
Test Result:	PASS

4.5.2 Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025
RF cable	Times	1-40G	HKE-034	Feb. 20, 2024	Feb. 19, 2025
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025
RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



4.5.3 Test Data

ANT. 1

Configuration Band IV (5725 - 5850 MHz)						
Mode	Test channel	Level [dBm/510kHz]	10log(500/510)	Power Spectral Density	Limit (dBm/500kHz)	Result
802.11a	CH149	-0.50	-0.086	-0.586	30	PASS
802.11a	CH157	-1.21	-0.086	-1.296	30	PASS
802.11a	CH165	-1.30	-0.086	-1.386	30	PASS
802.11n(HT20)	CH149	-1.46	-0.086	-1.546	30	PASS
802.11n(HT20)	CH157	-1.61	-0.086	-1.696	30	PASS
802.11n(HT20)	CH165	-0.15	-0.086	-0.236	30	PASS
802.11n(HT40)	CH151	-2.36	-0.086	-2.446	30	PASS
802.11n(HT40)	CH159	-2.74	-0.086	-2.826	30	PASS
802.11ac(HT20)	CH149	-0.24	-0.086	-0.326	30	PASS
802.11ac(HT20)	CH157	-0.48	-0.086	-0.566	30	PASS
802.11ac(HT20)	CH165	-0.04	-0.086	-0.126	30	PASS
802.11ac(HT40)	CH151	-2.92	-0.086	-3.006	30	PASS
802.11ac(HT40)	CH159	-2.89	-0.086	-2.976	30	PASS
802.11ac(HT80)	CH155	-5.53	-0.086	-5.616	30	PASS
802.11ax(HT20)	CH149	1.85	-0.086	1.764	30	PASS
802.11ax(HT20)	CH157	0.78	-0.086	0.694	30	PASS
802.11ax(HT20)	CH165	1.93	-0.086	1.844	30	PASS
802.11ax(HT40)	CH151	-0.82	-0.086	-0.906	30	PASS
802.11ax(HT40)	CH159	0.59	-0.086	0.504	30	PASS
802.11ax(HT80)	CH155	-3.47	-0.086	-3.556	30	PASS

Note: 1. Power Spectral Density= Level [dBm/510kHz]+ (10log(Limit RBW/Test RBW))

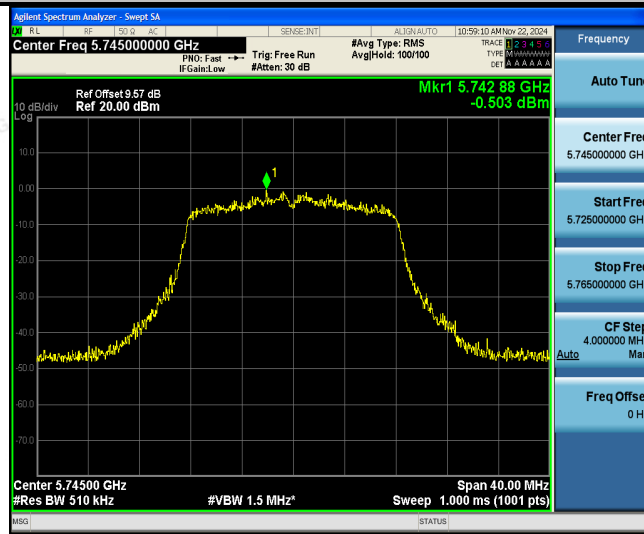
2. Instrument attenuation and cable loss See test diagram

Test plots as follows:

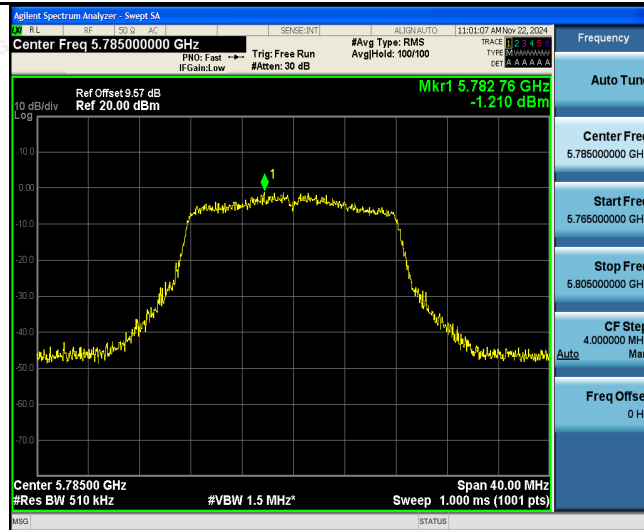


Band IV (5725 – 5850 MHz)

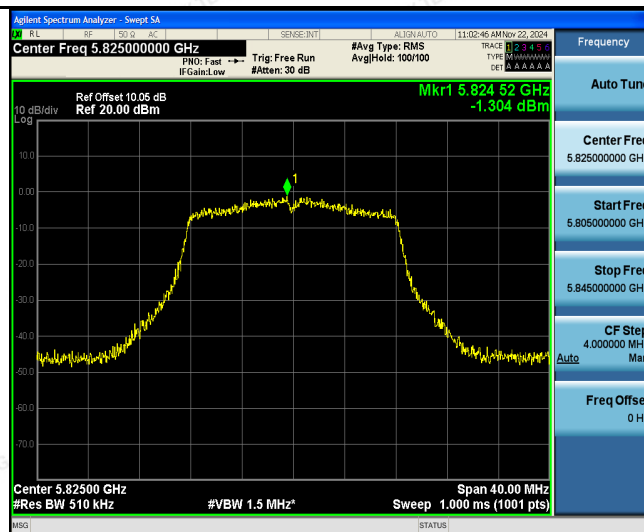
802.11a



Low



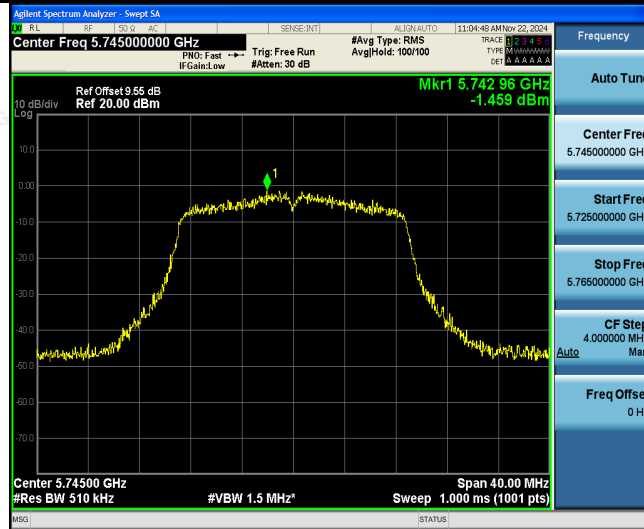
Mid



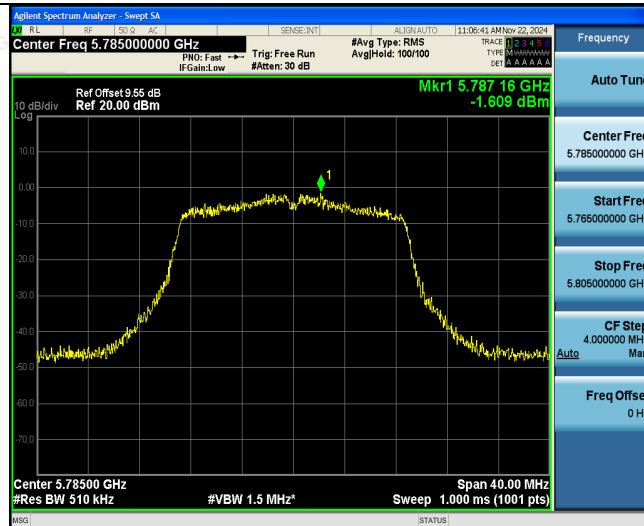
High



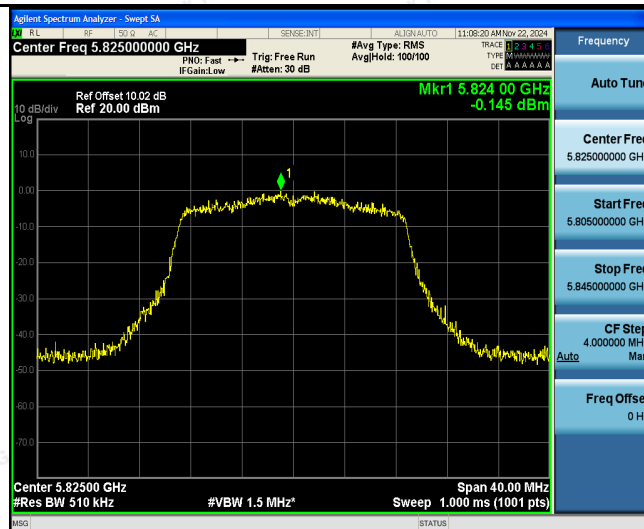
802.11n(HT20)



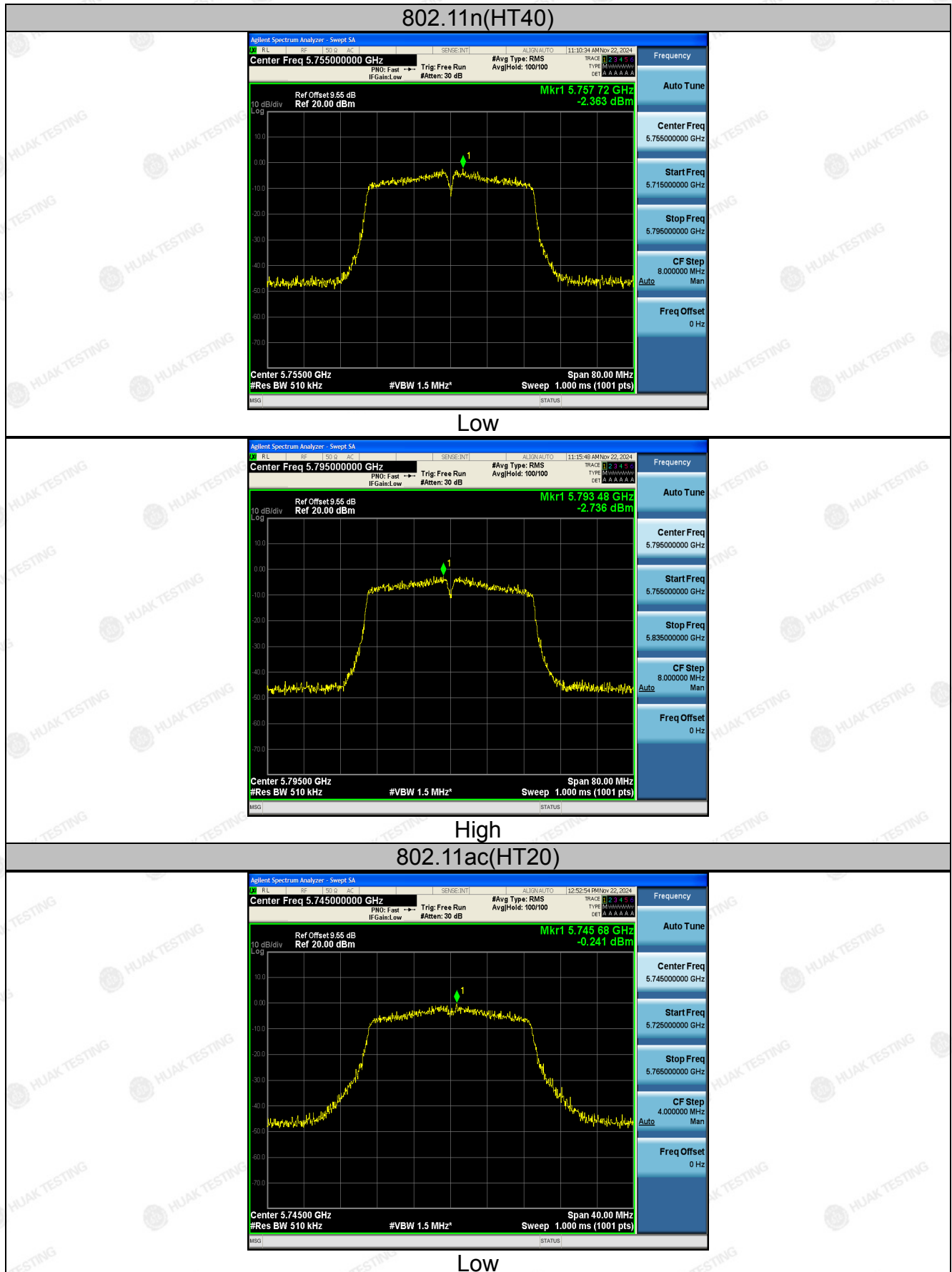
Low



Mid



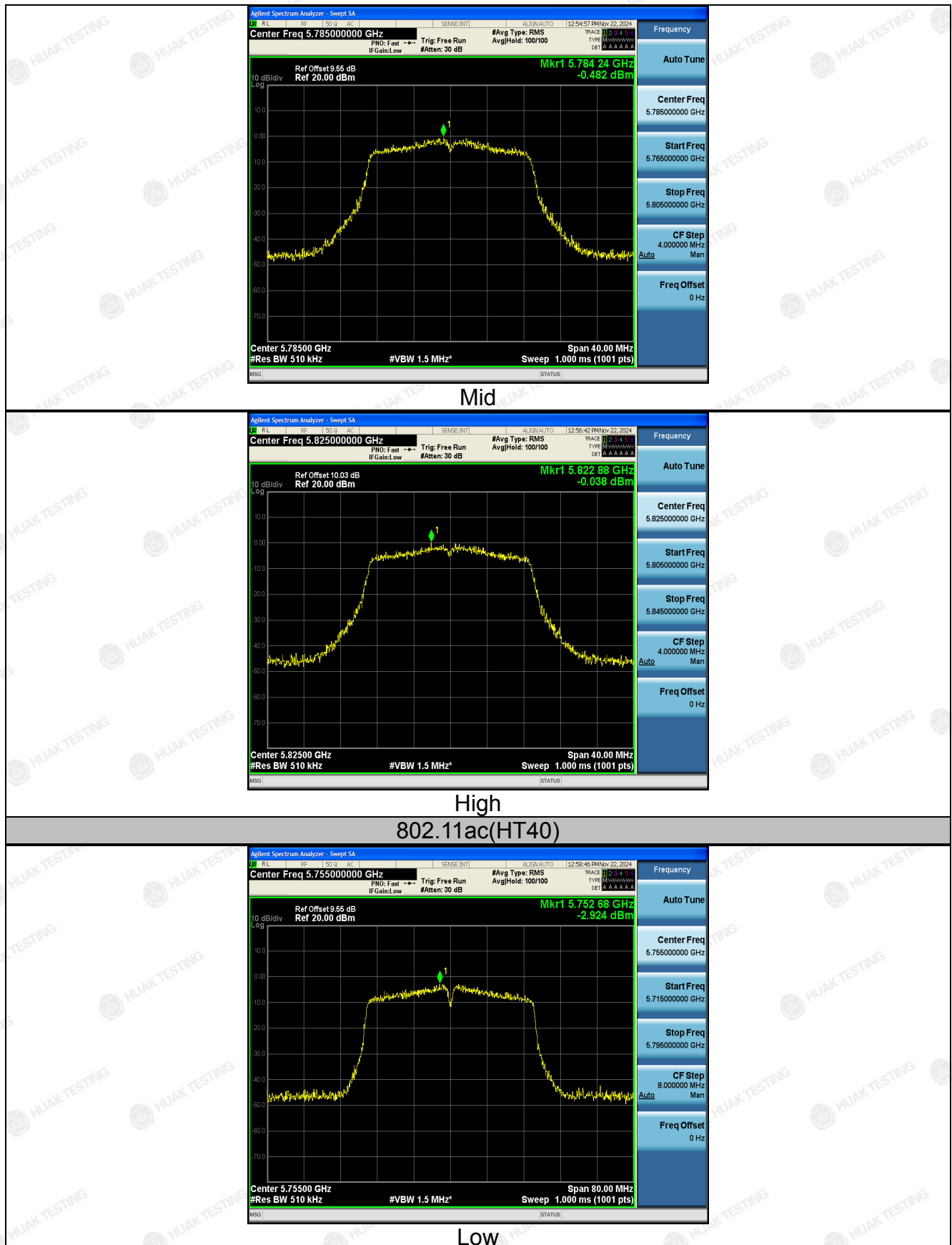
High



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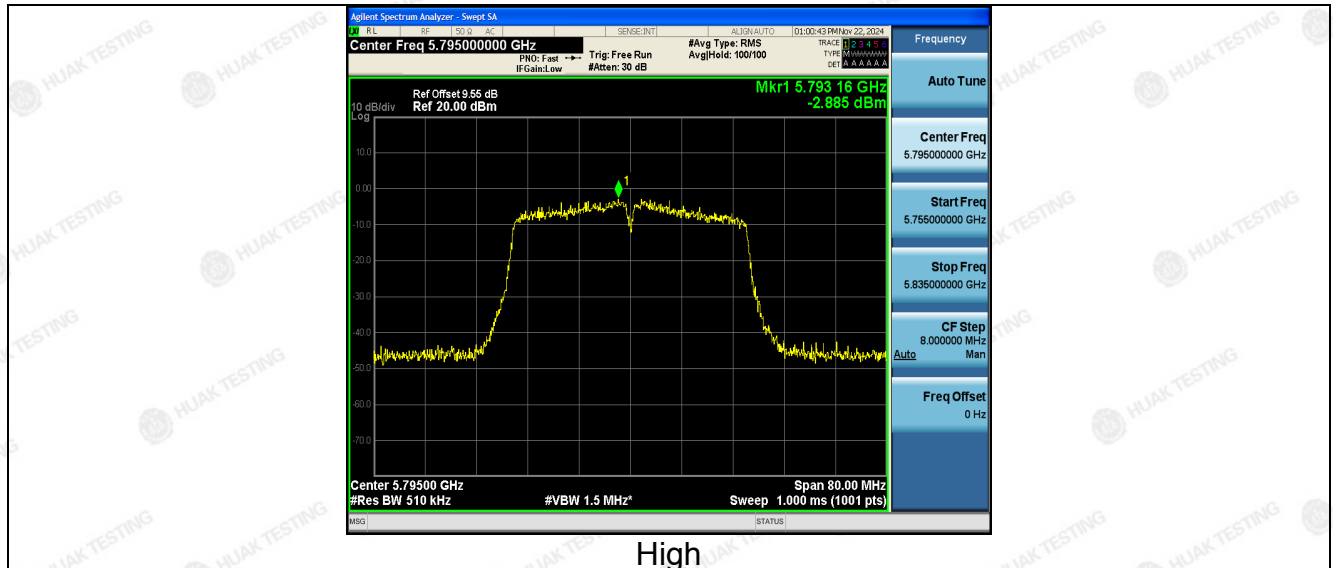
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



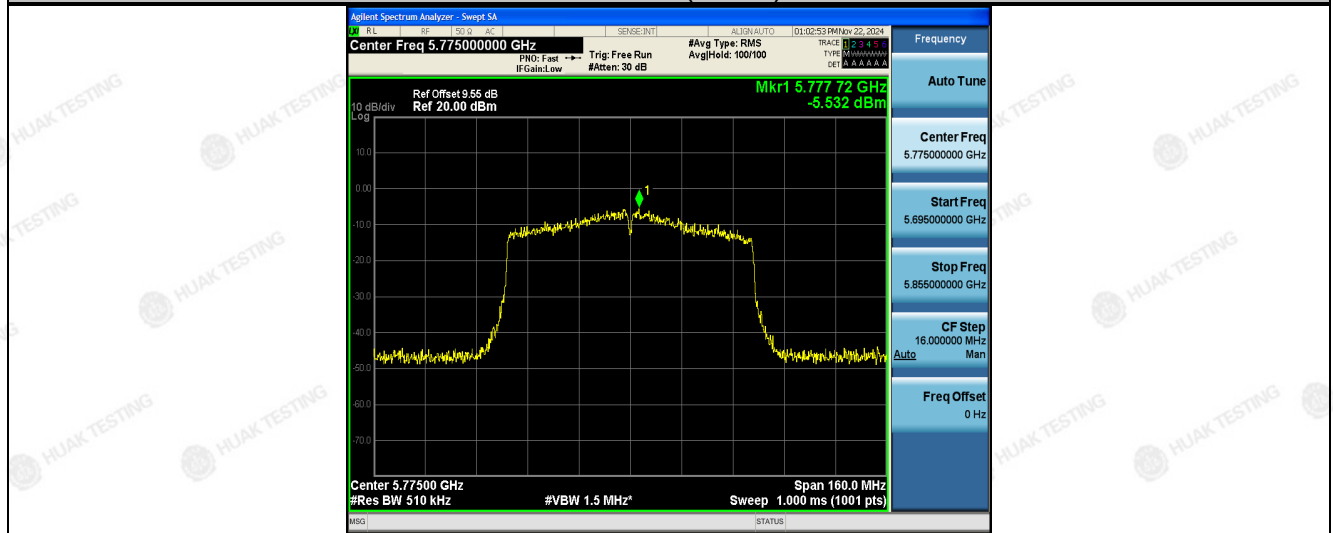
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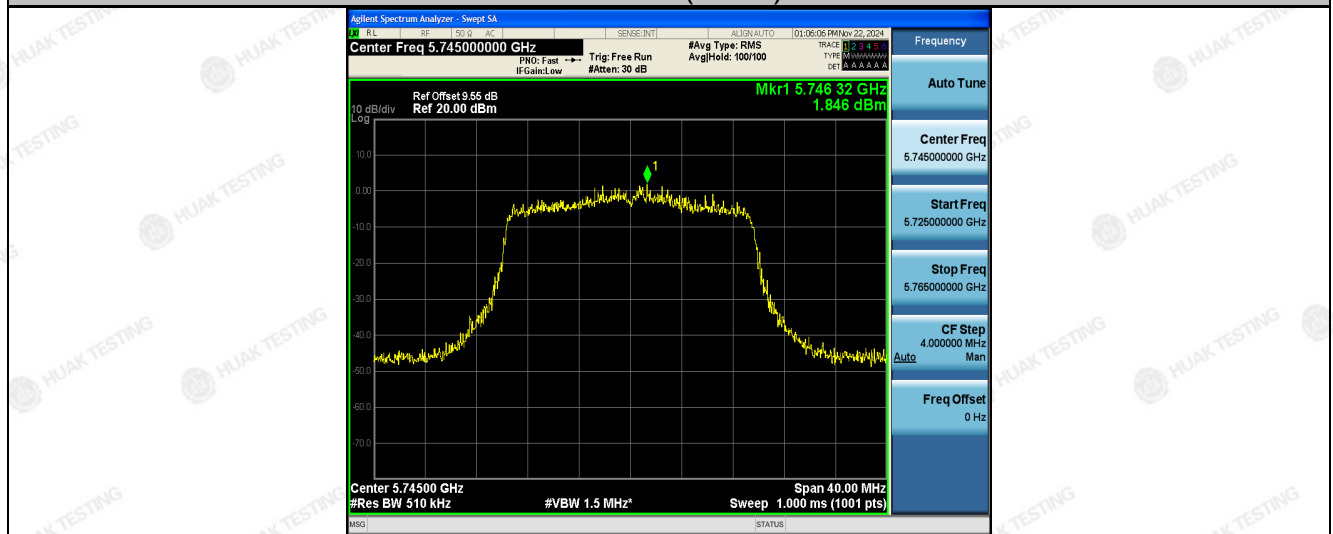
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

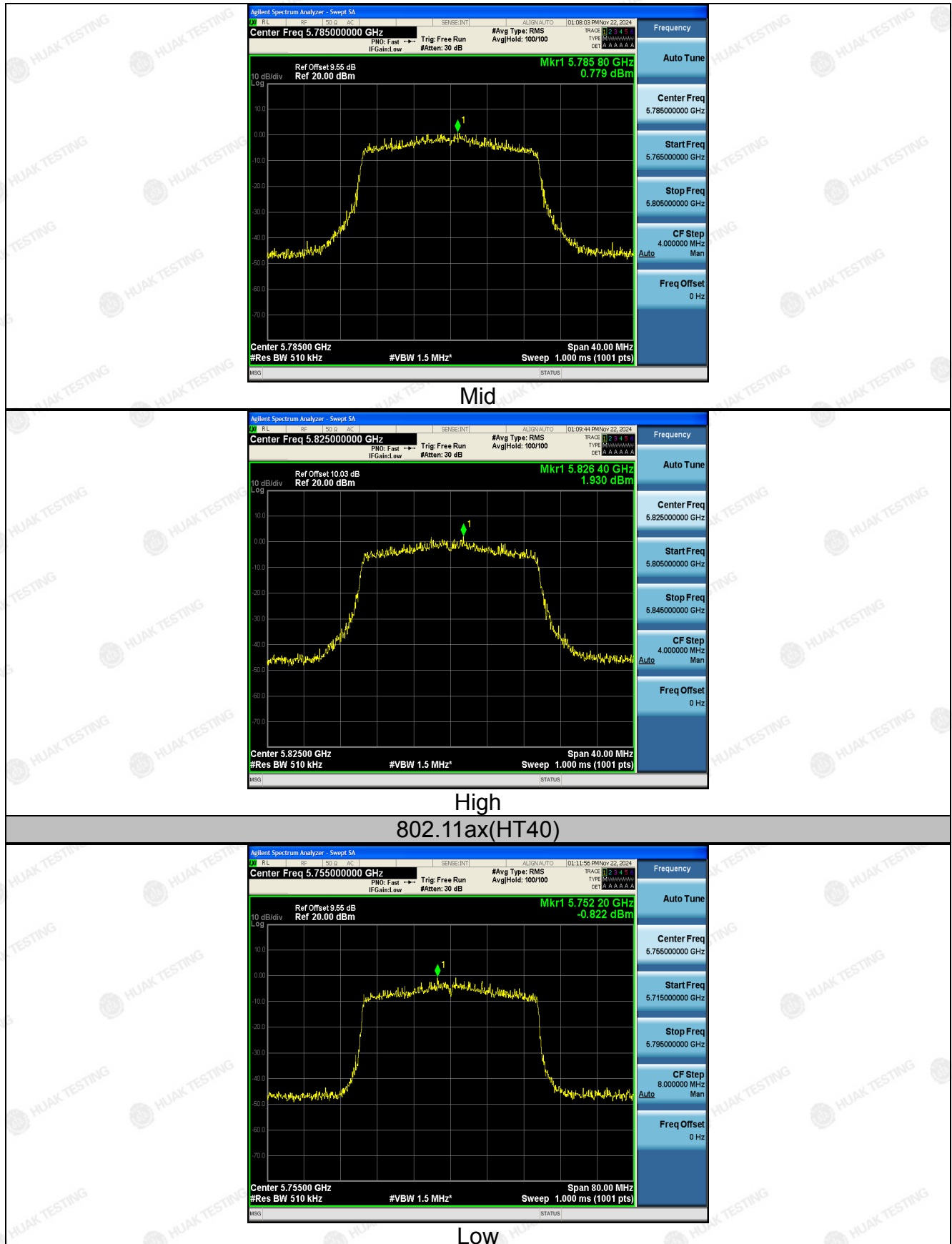


802.11ac(HT80)



802.11ax(HT20)

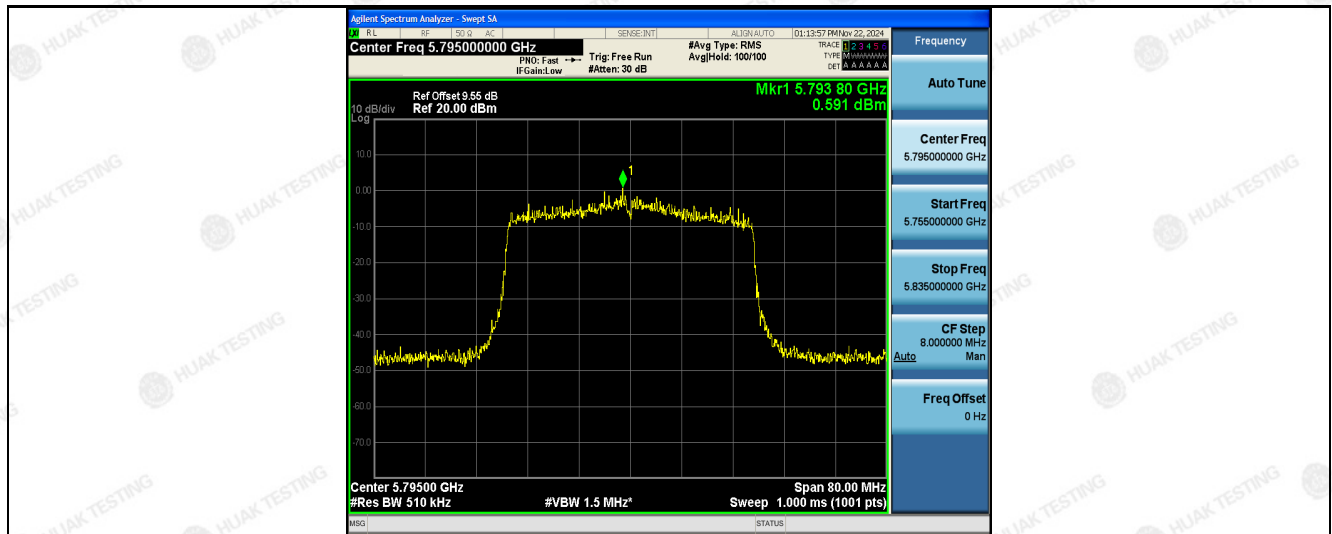




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High
802.11ax(HT80)





ANT. 2

Configuration Band IV (5725 - 5850 MHz)						
Mode	Test channel	Level [dBm/510kHz]	$10\log(500/510)$	Power Spectral Density	Limit (dBm/500kHz)	Result
802.11a	CH149	-0.74	-0.086	-0.826	30	PASS
802.11a	CH157	-2.43	-0.086	-2.516	30	PASS
802.11a	CH161	-1.90	-0.086	-1.986	30	PASS
802.11n(HT20)	CH149	-1.50	-0.086	-1.586	30	PASS
802.11n(HT20)	CH157	-3.05	-0.086	-3.136	30	PASS
802.11n(HT20)	CH161	-2.83	-0.086	-2.916	30	PASS
802.11n(HT40)	CH151	-4.20	-0.086	-4.286	30	PASS
802.11n(HT40)	CH159	-4.53	-0.086	-4.616	30	PASS
802.11ac(HT20)	CH149	-0.14	-0.086	-0.226	30	PASS
802.11ac(HT20)	CH157	-1.33	-0.086	-1.416	30	PASS
802.11ac(HT20)	CH161	-2.09	-0.086	-2.176	30	PASS
802.11ac(HT40)	CH151	-4.36	-0.086	-4.446	30	PASS
802.11ac(HT40)	CH159	-5.65	-0.086	-5.736	30	PASS
802.11ac(HT80)	CH155	-6.86	-0.086	-6.946	30	PASS
802.11ax(HT20)	CH149	0.93	-0.086	0.844	30	PASS
802.11ax(HT20)	CH157	0.87	-0.086	0.784	30	PASS
802.11ax(HT20)	CH161	0.31	-0.086	0.224	30	PASS
802.11ax(HT40)	CH151	-2.15	-0.086	-2.236	30	PASS
802.11ax(HT40)	CH159	-2.64	-0.086	-2.726	30	PASS
802.11ax(HT80)	CH155	-4.48	-0.086	-4.566	30	PASS

Note: 1. Power Spectral Density= Level [dBm/510kHz]+ (10log(Limit RBW/Test RBW))

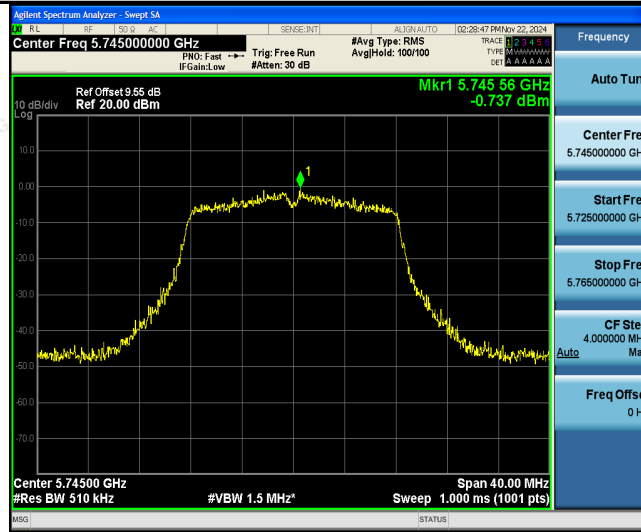
2. Instrument attenuation and cable loss See test diagram

Test plots as follows:

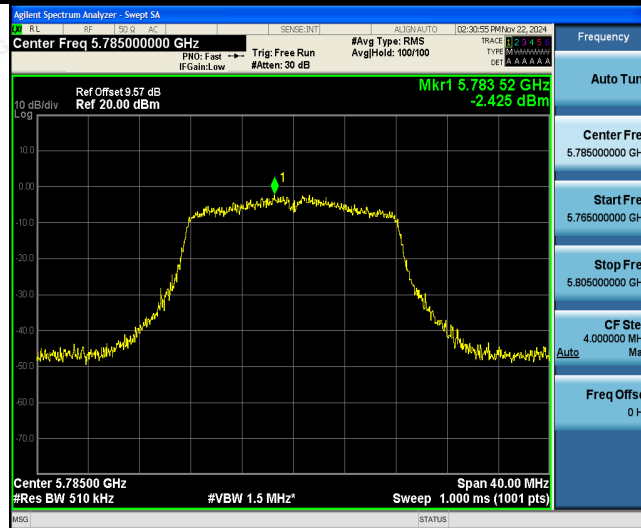


Band IV (5725 – 5850 MHz)

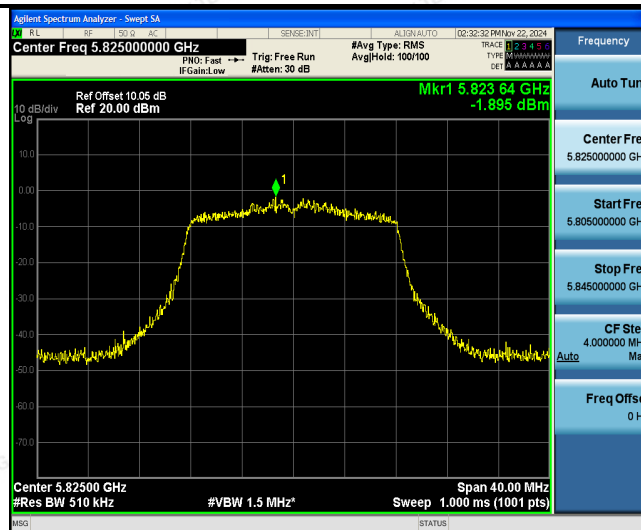
802.11a



Low



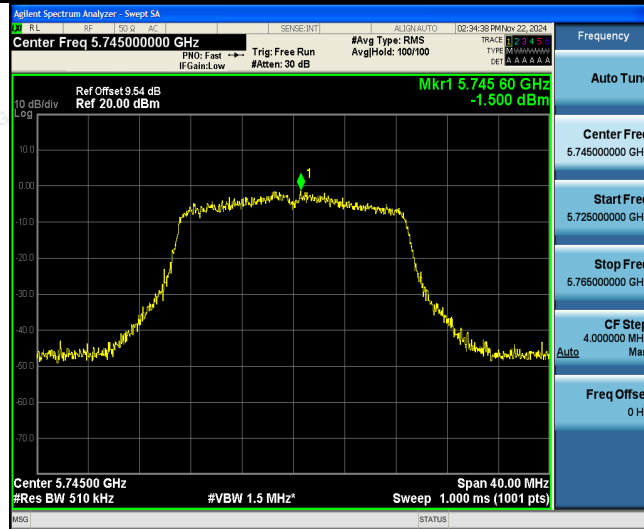
Mid



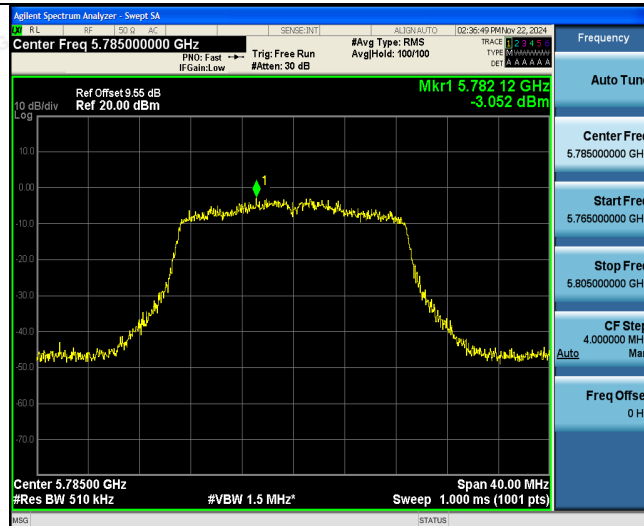
High



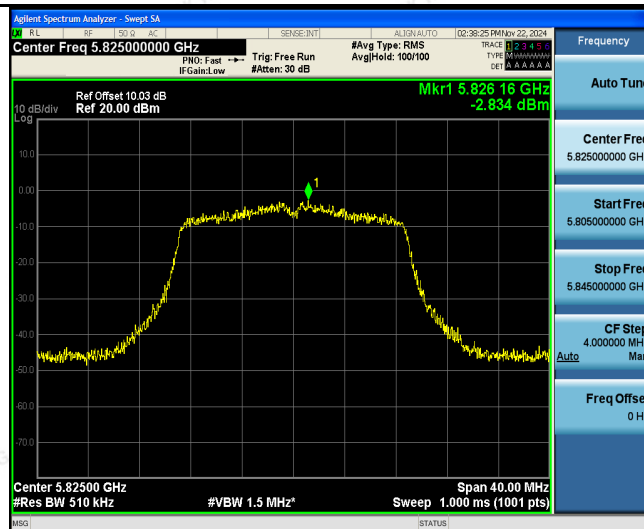
802.11n(HT20)



Low



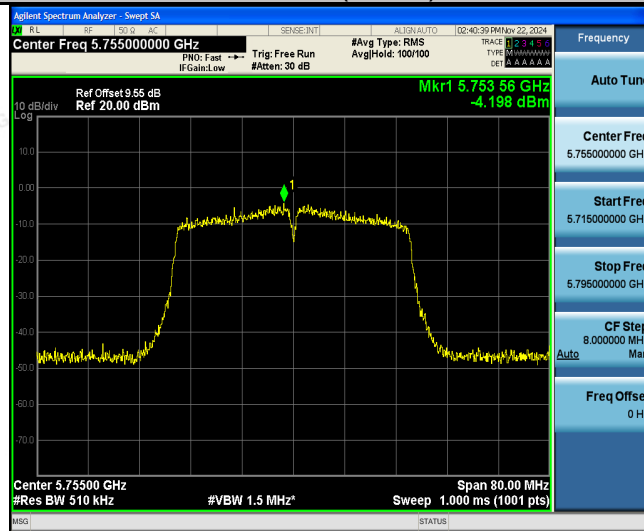
Mid



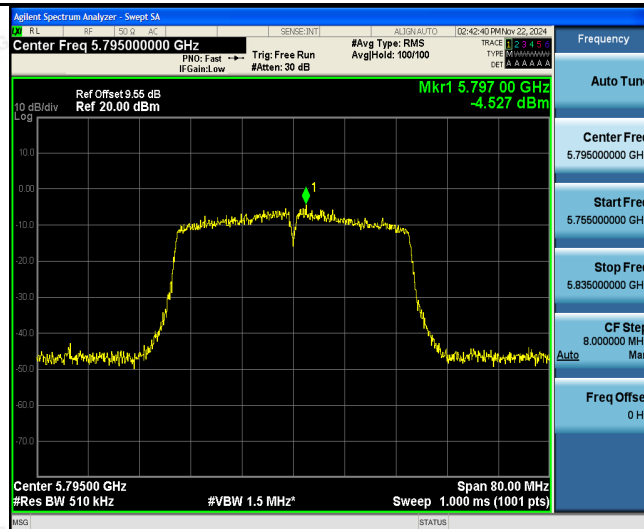
High



802.11n(HT40)



Low

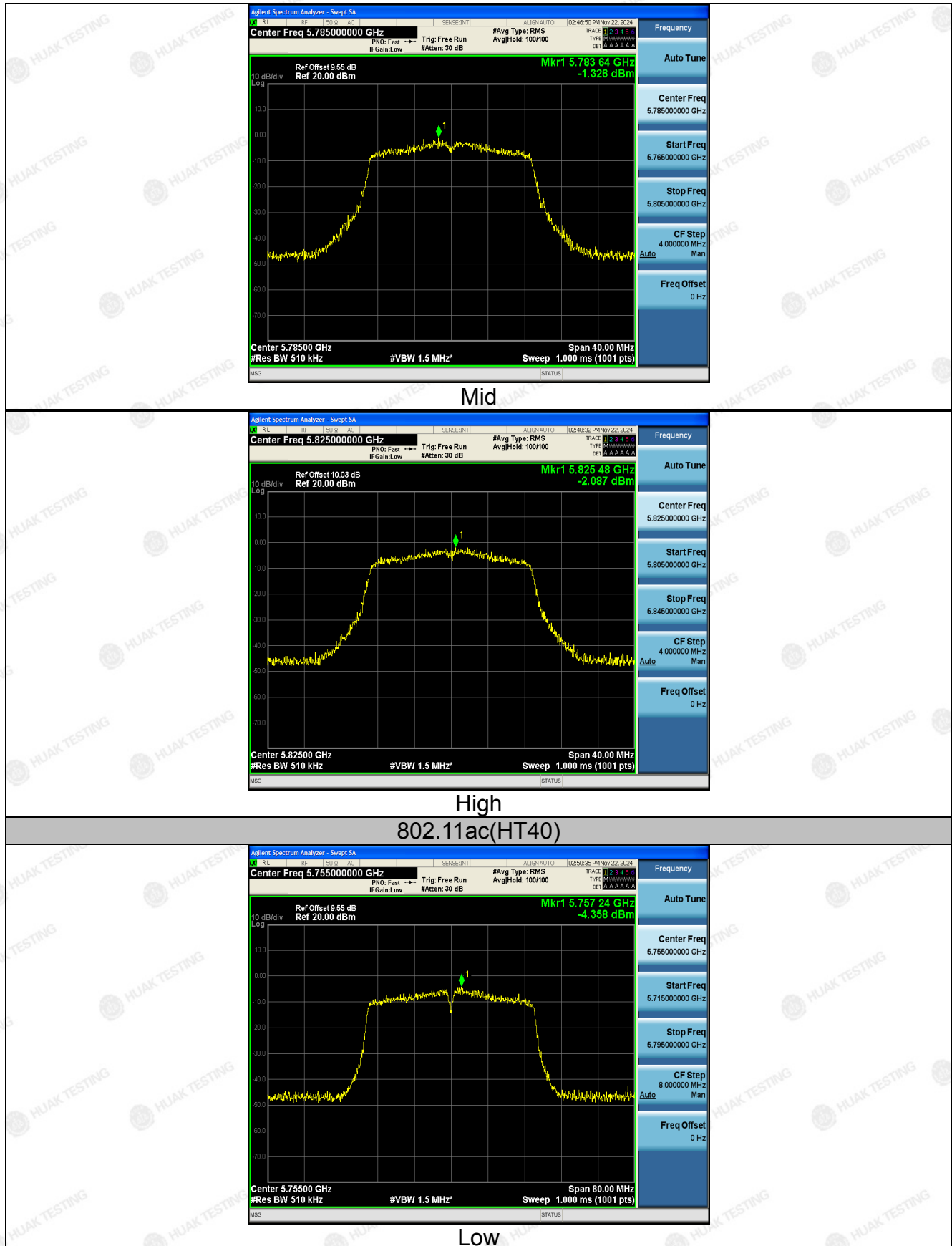


High

802.11ac(HT20)



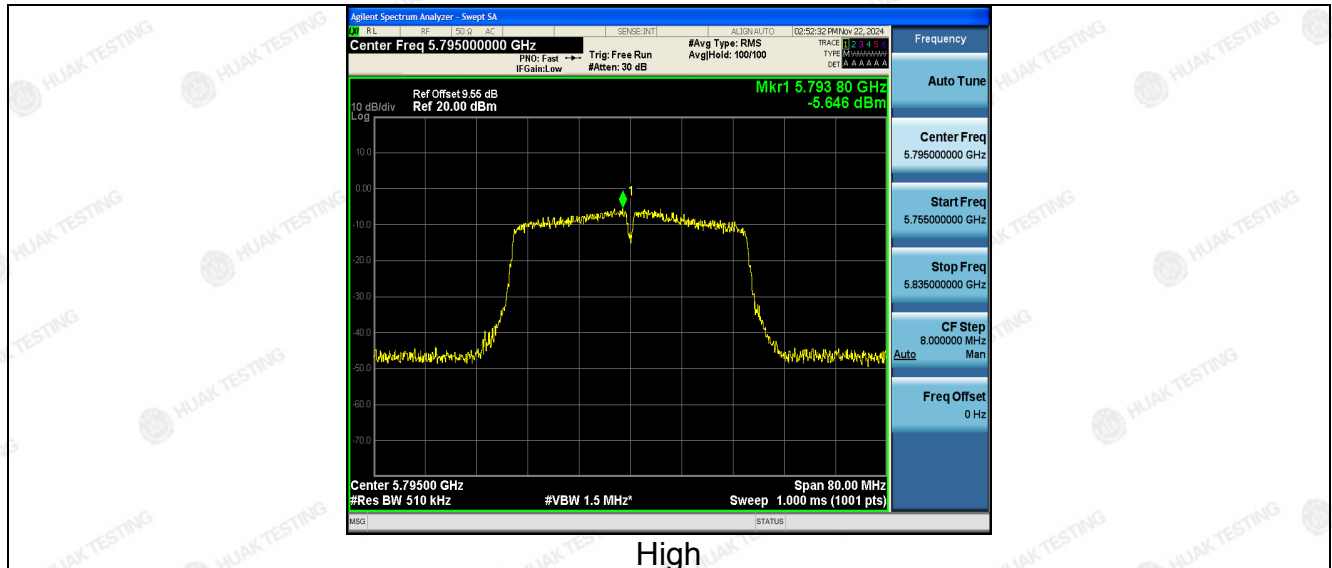
Low



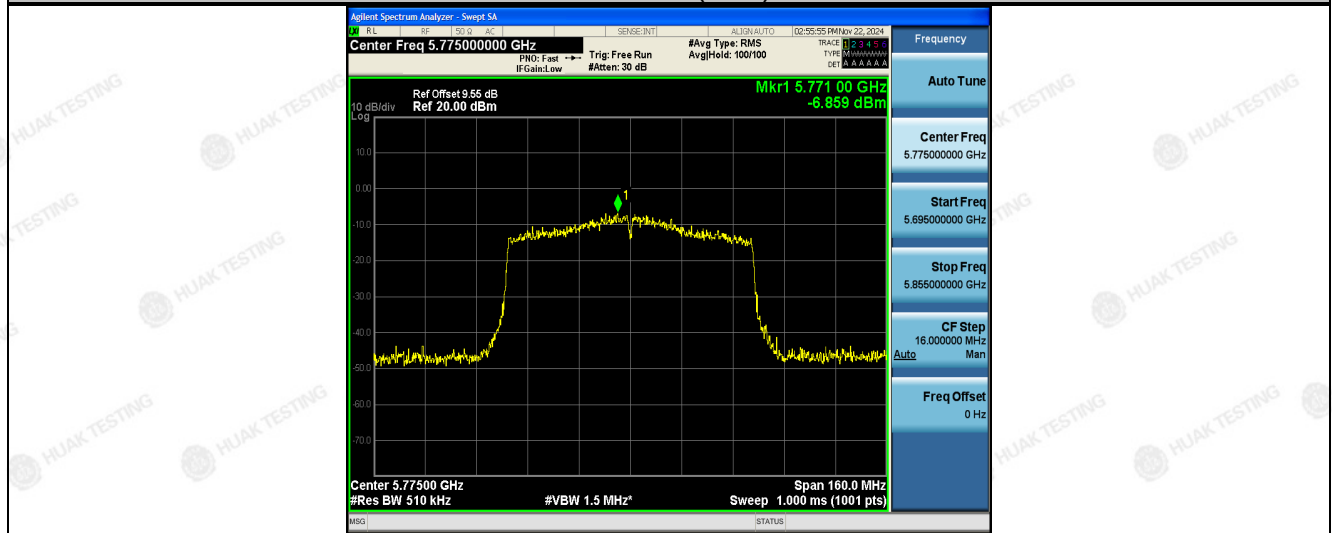
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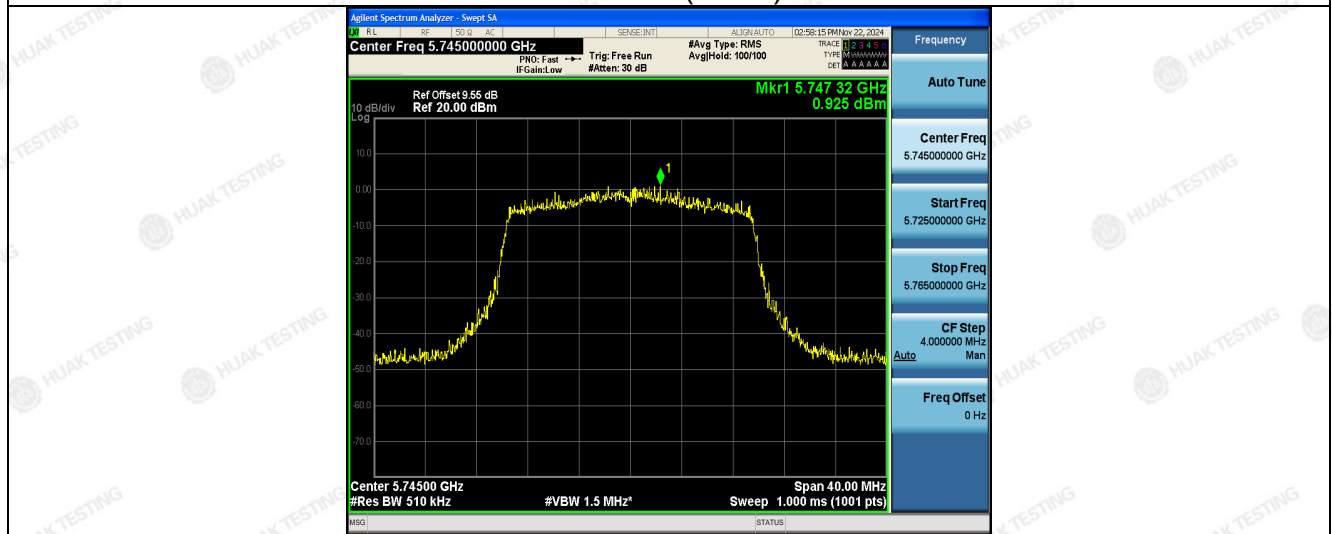
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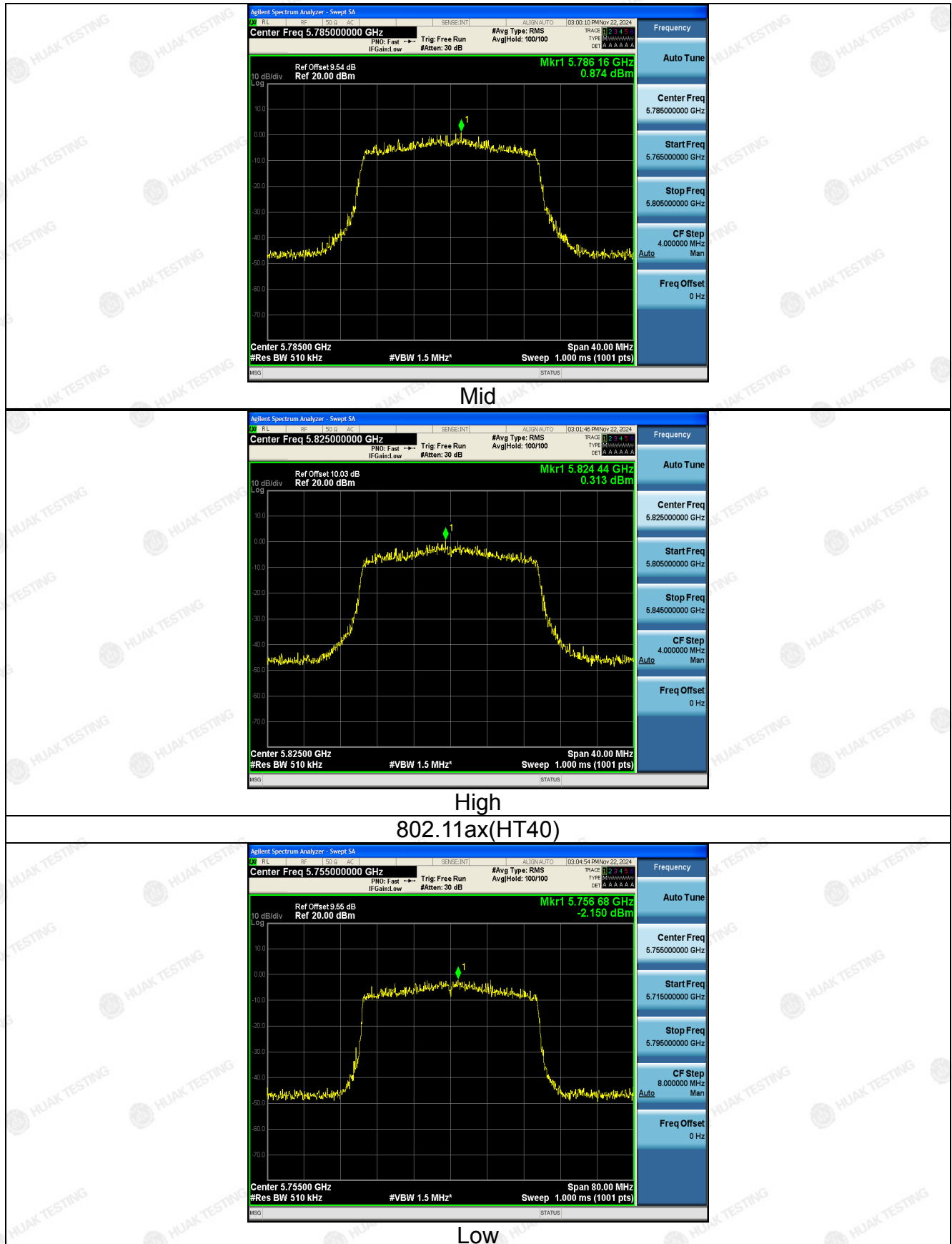
High
802.11ac(T80)



802.11ax(HT20)



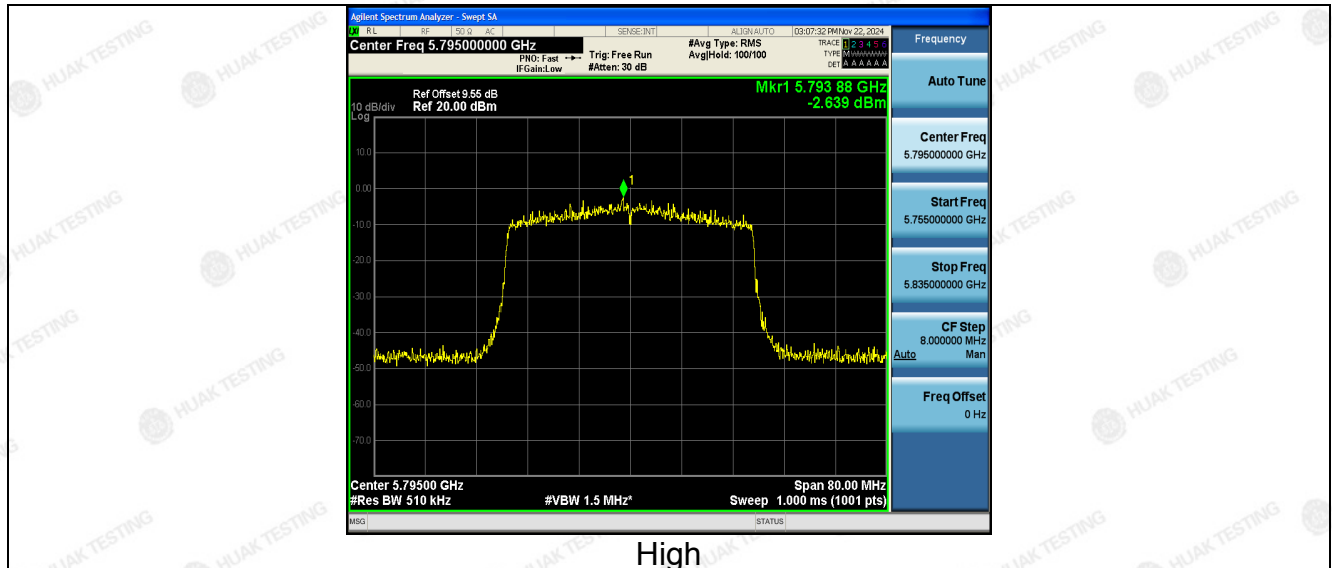
Low



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High
802.11ax(T80)





For MIMO antenna port 1+antenna port 2

Configuration Band IV (5725 - 5850 MHz)

Mode	Test Channel	Power Density (dBm)	Limit (dBm)	Result
802.11n(HT20)	CH149	1.44	29.14	PASS
802.11n(HT20)	CH157	0.65	29.14	PASS
802.11n(HT20)	CH161	1.64	29.14	PASS
802.11n(HT40)	CH151	-0.26	29.14	PASS
802.11n(HT40)	CH159	-0.62	29.14	PASS
802.11ac(HT20)	CH149	2.73	29.14	PASS
802.11ac(HT20)	CH157	2.04	29.14	PASS
802.11ac(HT20)	CH161	1.98	29.14	PASS
802.11ac(HT40)	CH151	-0.66	29.14	PASS
802.11ac(HT40)	CH159	-1.13	29.14	PASS
802.11ac(HT80)	CH155	-3.22	29.14	PASS
802.11ax(HT20)	CH149	4.34	29.14	PASS
802.11ax(HT20)	CH157	3.75	29.14	PASS
802.11ax(HT20)	CH161	4.12	29.14	PASS
802.11ax(HT40)	CH151	1.49	29.14	PASS
802.11ax(HT40)	CH159	2.19	29.14	PASS
802.11ax(HT80)	CH155	-1.02	29.14	PASS
	Note: 1. According to KDB 662911, Result power = $10\log(10^{(\text{ant1}/10)} + 10^{(\text{ant2}/10)})$. 2. Result unit: W, The end result is converted to units of dBm. Limit=30dBm-(direction gain-6dBi)=29.14dBm			

Note: This product supports antenna 1 and antenna 2 launch, but only support 802.11 n/ac/ax for MIMO mode, not support 802.11 a for MIMO mode.