



FCC Test Report

Test Report
On Behalf of
MICRO COMPUTER (HK) TECH LIMITED
For
MINI PC

Model No.: UM890 Pro, UM880 Pro, UM*****: where * = "0-9",
"A-Z", "a-z", "character", "space", "blank"

FCC ID: 2A49R-UMPRO

Prepared For: MICRO COMPUTER (HK) TECH LIMITED
RM 18, 28/F, Shui On Centre, 6-8 Harbour Road, Waterfront, Wan Chai, HK,
HONG KONG, China

Prepared By: Shenzhen HUAKE Testing Technology Co., Ltd.
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Date of Test: Dec. 17, 2024 ~ Mar. 05, 2025

Date of Report: Mar. 05, 2025

Report Number: HK2412177766-6E



Test Result Certification

Applicant's Name: MICRO COMPUTER (HK) TECH LIMITED

Address: RM 18, 28/F, Shui On Centre, 6-8 Harbour Road, Waterfront,
Wan Chai, HK, HONG KONG, China

Manufacturer's Name: MICRO COMPUTER (HK) TECH LIMITED

Address: RM 18, 28/F, Shui On Centre, 6-8 Harbour Road, Waterfront,
Wan Chai, HK, HONG KONG, China

Product Description

Trade Mark: N/A

Product Name: MINI PC

Model and/or Type Reference : UM890 Pro, UM880 Pro, UM*****: where * = "0-9", "A-Z",
"a-z", "character", "space", "blank"

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.....: Dec. 17, 2024 ~ Mar. 05, 2025

Date of Issue: Mar. 05, 2025

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	Mar. 05, 2025	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)	N/A
26dB Emission Bandwidth & 99% Occupied Bandwidth	§15.407(a)	PASS
Power Spectral Density	§15.407(a)	PASS
In-Band Emission Mask	§15.407(b)(7)	PASS
Contention-Based Protocol	§15.407(d)(6)	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	MINI PC
Model Name	UM890 Pro
Series Model	UM880 Pro, UM*****: where * = "0-9", "A-Z", "a-z", "character", "space", "blank"
Model Difference	The differences between the models are only different due to the different sales regions and the model naming method, other circuit principles, safety structure and key components are the same, and the differences do not affect the safety and electromagnetic compatibility performance of the product. Test sample model: UM890 Pro.
Trade Mark	N/A
FCC ID	2A49R-UMPRO
Operation Frequency	5.955GHz-6.415GHz 6.435GHz-6.525GHz 6.525GHz-6.875GHz 6.875GHz-7.115GHz
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only 1024QAM for OFDMA in 11ax mode only
Number of Channel	IEEE 802.11a/ax(HE20): 59CH IEEE 802.11ax(HE40): 29CH IEEE 802.11ax(HE80): 14CH IEEE 802.11ax(HE160): 7CH
Antenna Type	FPC Antenna
Antenna Gain	Antenna 1: 2.59dBi Antenna 2: -0.63dBi MIMO: 4.28dBi
Power Source	DC 19V from Adapter with AC100-240V, 50/60Hz, 1.6A
Power Supply	DC 19V from Adapter with AC100-240V, 50/60Hz, 1.6A
Hardware Version	V1.0
Software Version	V1.02
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

For 5925-6425MHz (U-NII-5 band)

24 channels are provided for 802.11a, 802.11ax (HE20):

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	5955 MHz	5	5975 MHz	9	5995 MHz	13	6015 MHz
17	6035 MHz	21	6055 MHz	25	6075 MHz	29	6095 MHz
33	6115 MHz	37	6135 MHz	41	6155 MHz	45	6175 MHz
49	6195 MHz	53	6215 MHz	57	6235 MHz	61	6255 MHz
65	6275 MHz	69	6295 MHz	73	6315 MHz	77	6335 MHz
81	6355 MHz	85	6375 MHz	89	6395 MHz	93	6415 MHz

12 channels are provided for 802.11ax (HE40):

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
3	5965 MHz	11	6005 MHz	19	6045 MHz	27	6085 MHz
35	6125 MHz	43	6165 MHz	51	6205 MHz	59	6245 MHz
67	6285 MHz	75	6325 MHz	83	6365 MHz	91	6405 MHz

6 channels are provided for 802.11ax (HE80):

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
7	5985 MHz	23	6065 MHz	39	6145 MHz	55	6225 MHz
71	6305 MHz	87	6385 MHz				

3 channels are provided for 802.11ax (HE160):

Channel	Frequency	Channel	Frequency	Channel	Frequency
3	6025 MHz	11	6185 MHz	19	6345 MHz

**For 6425-6525MHz (U-NII-6 band)**

5 channels are provided for 802.11a, 802.11ax (HE20):

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
97	6435 MHz	101	6455 MHz	105	6475 MHz	109	6495 MHz
113	6515 MHz						

3 channels are provided for 802.11ax (HE40):

Channel	Frequency	Channel	Frequency	Channel	Frequency
99	6445 MHz	107	6485 MHz	*115	6525 MHz

2 channels are provided for 802.11ax (HE80):

Channel	Frequency	Channel	Frequency
103	6465 MHz	*119	6545 MHz

1 channel is provided for 802.11ax (HE160):

Channel	Frequency
*111	6505 MHz

**For 6525-6875MHz (U-NII-7 band)**

18 channels are provided for 802.11a, 802.11ax (HE20):

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
117	6535 MHz	121	6555 MHz	125	6575 MHz	129	6595 MHz
133	6615 MHz	137	6635 MHz	141	6655 MHz	145	6675 MHz
149	6695 MHz	153	6715 MHz	157	6735 MHz	161	6755 MHz
165	6775 MHz	169	6795 MHz	173	6815 MHz	177	6835 MHz
181	6855 MHz	*185	6875 MHz				

9 channels are provided for 802.11ax (HE40):

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
123	6565 MHz	131	6605 MHz	139	6645 MHz	147	6685 MHz
155	6725 MHz	163	6765 MHz	171	6805 MHz	179	6845 MHz
*187	6885 MHz						

4 channels are provided for 802.11ax (HE80):

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
*119	6545 MHz	135	6625 MHz	151	6705 MHz	167	6785 MHz

2 channels are provided for 802.11ax (HE160):

Channel	Frequency	Channel	Frequency
143	6665 MHz	*175	6825 MHz

**For 6875-7125MHz (U-NII-8 band)**

12 channels are provided for 802.11a, 802.11ax (HE20):

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
189	6895 MHz	193	6915 MHz	197	6935 MHz	201	6955 MHz
205	6975 MHz	209	6995 MHz	213	7015 MHz	217	7035 MHz
221	7055 MHz	225	7075 MHz	229	7095 MHz	233	7115 MHz

5 channels are provided for 802.11ax (HE40):

Channel	Frequency	Channel	Frequency	Channel	Frequency
195	6925 MHz	203	6965 MHz	211	7005 MHz
219	7045 MHz	227	7085 MHz		

2 channels are provided for 802.11ax (HE80):

Channel	Frequency	Channel	Frequency
199	6945 MHz	215	7025 MHz

1 channel is provided for 802.11ax (HE160):

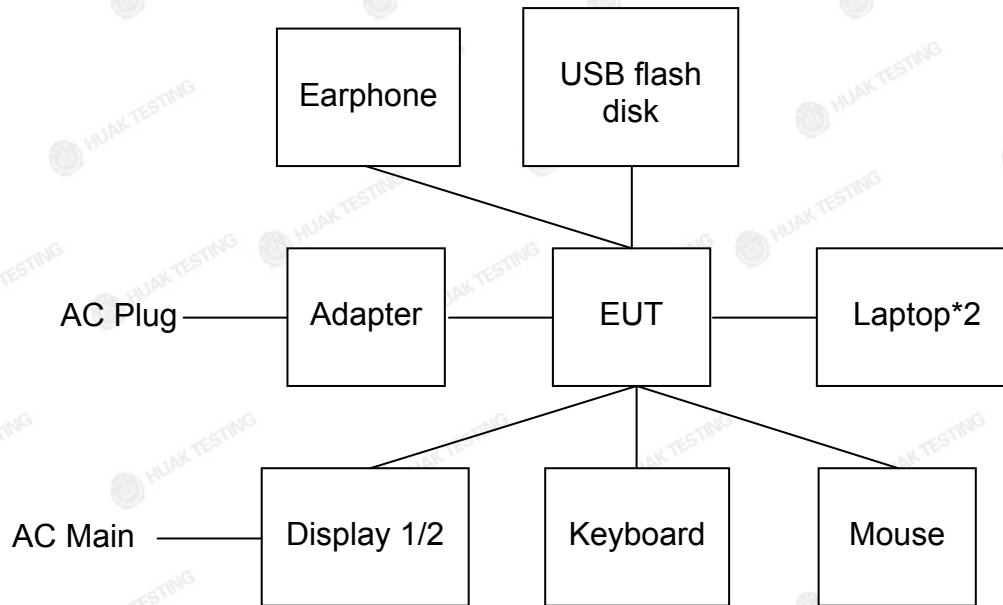
Channel	Frequency
207	6985 MHz

Note: * mean this's straddle channel.

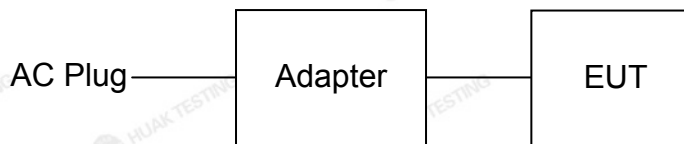


2.3 Description of Test Setup

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.



2.4 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	MINI PC	N/A	UM890 Pro	N/A	EUT
2	Adapter	N/A	HKA12019063-0D6	Input: 100-240V, 50/60Hz, 1.6A Output: DC19V, 6.32A	Accessory
3	USB Cable	N/A	N/A	Length: 100cm	Accessory
4	Laptop 1	Lenovo	TP00096A	Input: DC 20V, 2.25~3.25A Output: 5VDC, 0.5A	Peripheral
5	Laptop 2	Lenovo	TP00096A	Input: DC 20V, 2.25~3.25A Output: 5VDC, 0.5A	Peripheral
6	Display 1	AOC	N/A	N/A	Peripheral
7	Display 2	PHILIPS	N/A	N/A	Peripheral
8	Keyboard	N/A	N/A	N/A	Peripheral
9	Mouse	N/A	N/A	N/A	Peripheral
10	Earphone	N/A	N/A	N/A	Peripheral
11	USB flash disk	N/A	N/A	N/A	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, 26db Bandwidth and 99% Occupied 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
802.11ax (HE20)	MCS0
802.11ax (HE40)	MCS0
802.11ax (HE80)	MCS0
802.11ax (HE160)	MCS0
Final Test Mode:	
Operation Mode:	Keep the EUT in continuous transmitting with modulation



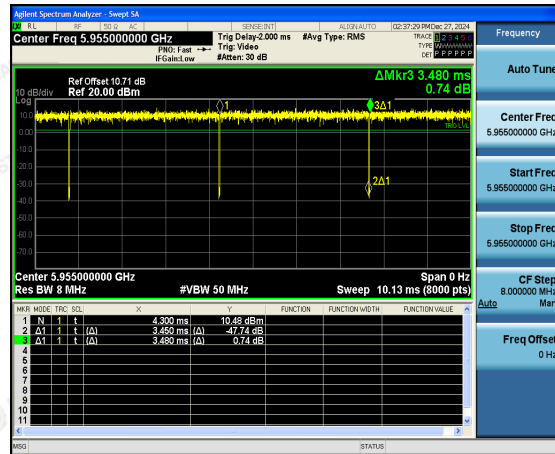
3. Mode Test Duty Cycle

ANT.1:

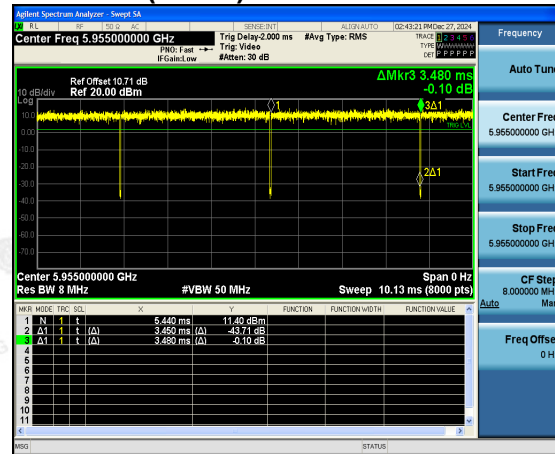
Mode	Duty Cycle	Duty Cycle Factor (dB)
802.11a	0.991	-0.038
802.11ax (HE20)	0.991	-0.038
802.11ax (HE40)	0.991	-0.038
802.11ax (HE80)	0.991	-0.038
802.11ax (HE160)	0.991	-0.038

Test plots as follows:

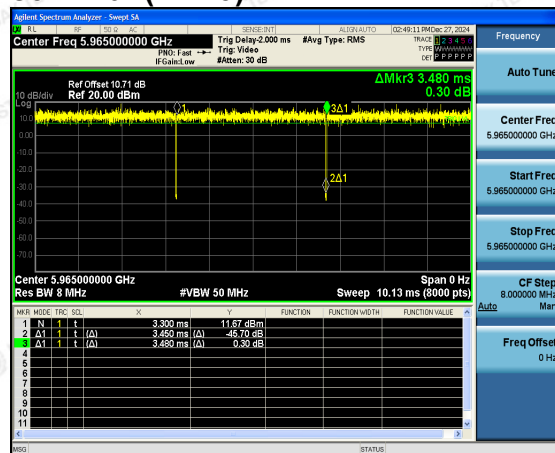
802.11a



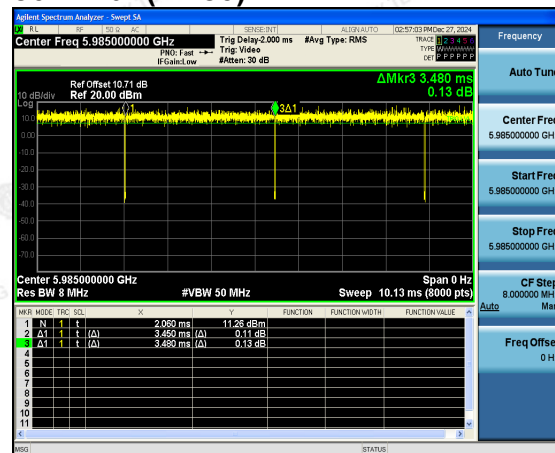
802.11ax(HE20)



802.11ax(HE40)

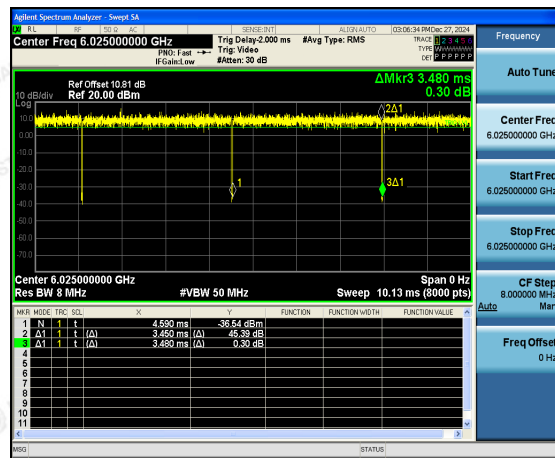


802.11ax(HE80)





802.11ax(HE160)

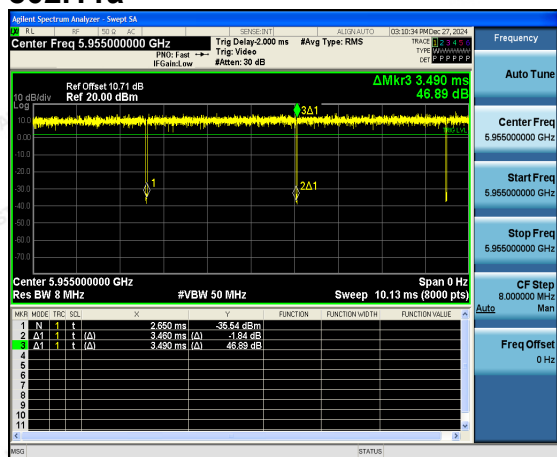


ANT.2:

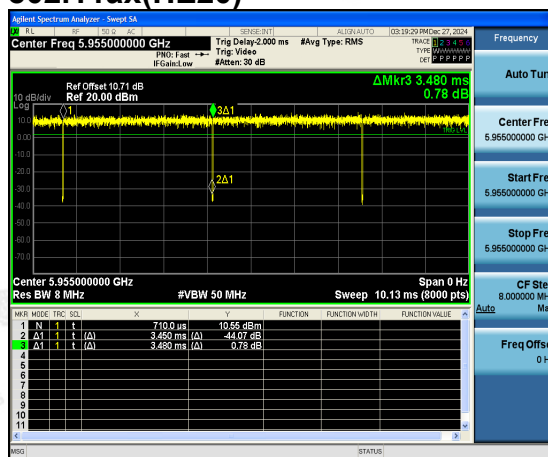
Mode	Duty Cycle	Duty Cycle Factor (dB)
802.11a	0.991	-0.037
802.11ax (HE20)	0.991	-0.038
802.11ax (HE40)	0.991	-0.037
802.11ax (HE80)	0.991	-0.038
802.11ax (HE160)	0.991	-0.038

Test plots as follows:

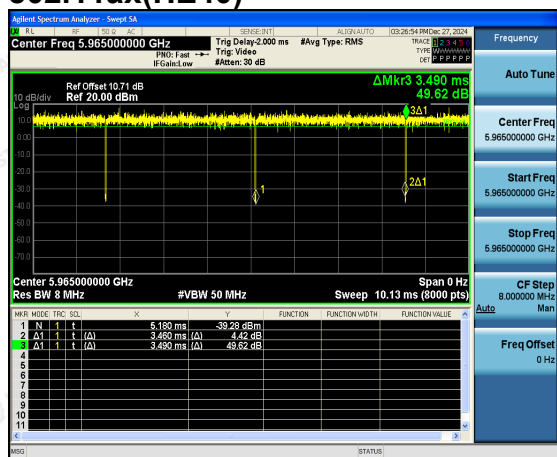
802.11a



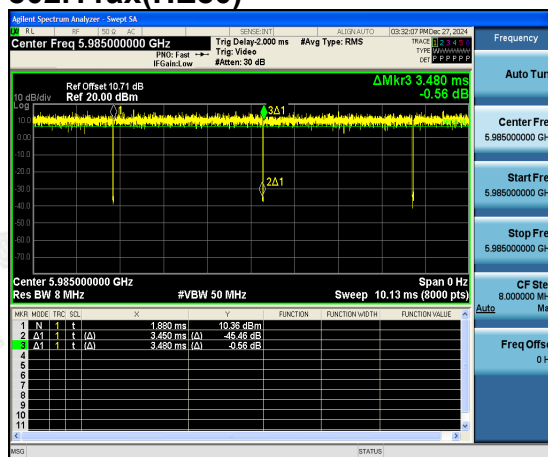
802.11ax(HE20)



802.11ax(HE40)



802.11ax(HE80)



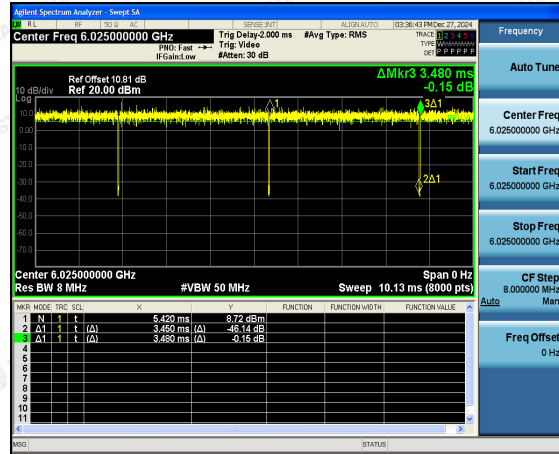
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAQ, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

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802.11ax(HE160)





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).

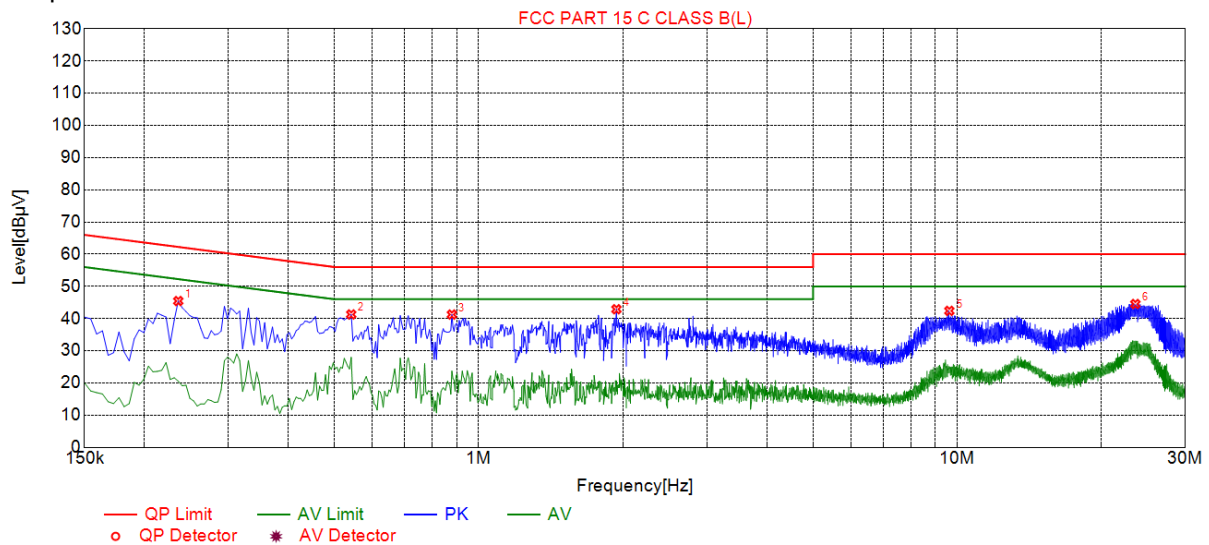
Conducted Emission Shielding Room Test Site (843)					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Receiver	R&S	ESR	HKE-005	Feb. 19, 2025	Feb. 18, 2026
LISN	R&S	ENV216	HKE-002	Feb. 19, 2025	Feb. 18, 2026
LISN	R&S	ENV216	HKE-059	Feb. 19, 2025	Feb. 18, 2026
Coax cable (9KHz-30MHz)	Times	381806-002	N/A	Feb. 19, 2025	Feb. 18, 2026
EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	N/A	N/A
10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	Feb. 19, 2025	Feb. 18, 2026

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	0.2355	45.45	19.83	62.25	16.80	25.62	PK	L
2	0.5415	41.29	19.86	56.00	14.71	21.43	PK	L
3	0.8790	41.25	19.87	56.00	14.75	21.38	PK	L
4	1.9410	42.90	19.96	56.00	13.10	22.94	PK	L
5	9.6360	42.40	19.98	60.00	17.60	22.42	PK	L
6	23.5905	44.52	20.08	60.00	15.48	24.44	PK	L

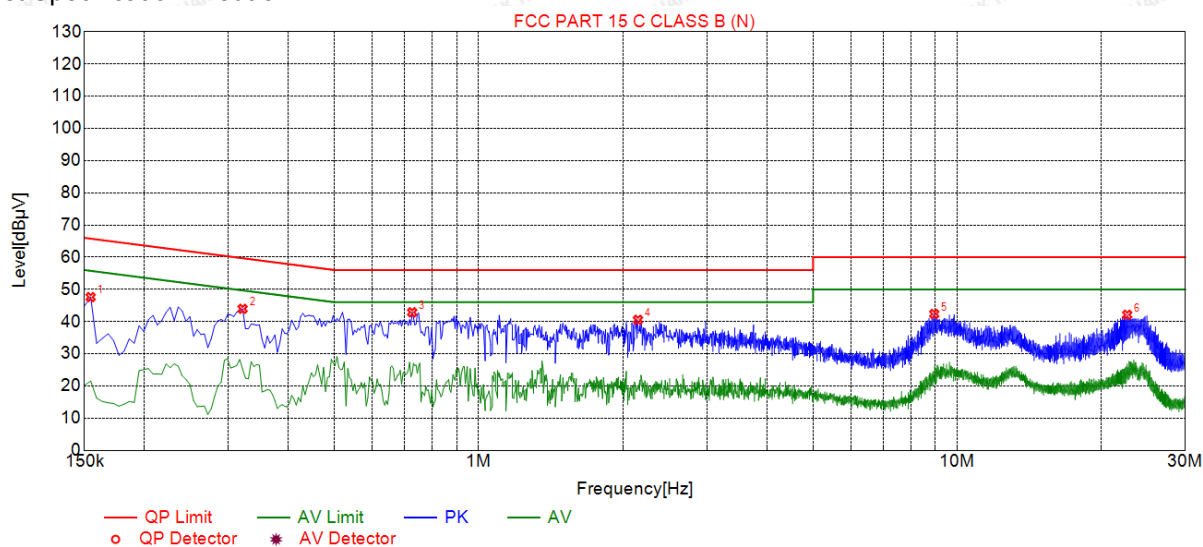
Remark: Margin = Limit – Level

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	0.1545	47.60	19.73	65.75	18.15	27.87	PK	N
2	0.3210	43.96	19.75	59.68	15.72	24.21	PK	N
3	0.7260	42.88	19.74	56.00	13.12	23.14	PK	N
4	2.1525	40.54	19.86	56.00	15.46	20.68	PK	N
5	8.9610	42.37	19.90	60.00	17.63	22.47	PK	N
6	22.6815	42.12	20.12	60.00	17.88	22.00	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
	5955-6415, 6435-6525, 6525-6875, 6875-7115	250mW
Test Setup:	 RF automatic control unit EUT	
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 RF automatic control unit 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 3.5.39	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).

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 19, 2025	Feb. 18, 2026
Power meter	Agilent	E4419B	HKE-085	Feb. 19, 2025	Feb. 18, 2026
Power Sensor	Agilent	E9300A	HKE-086	Feb. 19, 2025	Feb. 18, 2026
RF cable	Times	1-40G	HKE-034	Feb. 19, 2025	Feb. 18, 2026
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 19, 2025	Feb. 18, 2026
RF Test Software	Tonscend	JS1120-3 Version 3.5.39	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

802.11a

Test channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)						Limit (dBm)	Result
		Antenna port 1	Antenna port 2	Ant. 1 gain	Ant 1 E.I.RP (dBm)	Ant. 2 gain	Ant 2 E.I.RP (dBm)		
1	5955	10.01	10.26	2.59	12.60	-0.63	9.63	24	PASS
45	6175	9.41	10.45	2.59	12.00	-0.63	9.82	24	PASS
93	6415	9.88	10.35	2.59	12.47	-0.63	9.72	24	PASS
97	6435	9.91	10.59	2.59	12.50	-0.63	9.96	24	PASS
105	6475	10.00	10.21	2.59	12.59	-0.63	9.58	24	PASS
113	6515	9.36	10.03	2.59	11.95	-0.63	9.40	24	PASS
117	6535	9.72	10.93	2.59	12.31	-0.63	10.30	24	PASS
153	6715	9.24	10.43	2.59	11.83	-0.63	9.80	24	PASS
181	6855	9.17	10.85	2.59	11.76	-0.63	10.22	24	PASS
185	6875	9.28	10.31	2.59	11.87	-0.63	9.68	24	PASS
213	7015	9.73	10.73	2.59	12.32	-0.63	10.10	24	PASS
233	7115	9.52	10.21	2.59	12.11	-0.63	9.58	24	PASS

802.11ax (HE20)

Test channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)			Maximum E.I.R.P (dBm)					Limit (dBm)	Result
		Antenna port 1	Antenna port 2	MIMO	Ant. 1 gain	Ant 1 E.I.RP (dBm)	Ant. 2 gain	Ant 2 E.I.RP (dBm)	MIMO		
1	5955	11.13	10.40	13.79	2.59	13.72	-0.63	9.77	15.19	24	PASS
45	6175	10.32	10.65	13.50	2.59	12.91	-0.63	10.02	14.71	24	PASS
93	6415	9.53	10.53	13.07	2.59	12.12	-0.63	9.90	14.16	24	PASS
97	6435	10.35	11.04	13.72	2.59	12.94	-0.63	10.41	14.87	24	PASS
105	6475	9.76	10.83	13.34	2.59	12.35	-0.63	10.20	14.42	24	PASS
113	6515	9.45	10.52	13.03	2.59	12.04	-0.63	9.89	14.11	24	PASS
117	6535	9.58	10.32	12.98	2.59	12.17	-0.63	9.69	14.11	24	PASS
153	6715	9.69	10.84	13.31	2.59	12.28	-0.63	10.21	14.38	24	PASS
181	6855	9.75	11.12	13.50	2.59	12.34	-0.63	10.49	14.52	24	PASS
185	6875	9.86	10.93	13.44	2.59	12.45	-0.63	10.30	14.52	24	PASS
213	7015	9.90	10.86	13.42	2.59	12.49	-0.63	10.23	14.52	24	PASS
233	7115	9.81	10.31	13.08	2.59	12.40	-0.63	9.68	14.26	24	PASS

**802.11ax (HE40)**

Test channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)			Maximum E.I.R.P (dBm)					Limit (dBm)	Result
		Antenna port 1	Antenna port 2	MIMO	Ant. 1 gain	Ant 1 E.I.RP (dBm)	Ant. 2 gain	Ant 2 E.I.RP (dBm)	MIMO		
3	5965	9.58	11.14	13.44	2.59	12.17	-0.63	10.51	14.43	24	PASS
43	6165	9.85	10.21	13.04	2.59	12.44	-0.63	9.58	14.25	24	PASS
91	6405	10.05	10.18	13.13	2.59	12.64	-0.63	9.55	14.37	24	PASS
99	6445	9.81	11.04	13.48	2.59	12.40	-0.63	10.41	14.53	24	PASS
107	6485	9.86	10.39	13.14	2.59	12.45	-0.63	9.76	14.32	24	PASS
115	6525	9.66	10.33	13.02	2.59	12.25	-0.63	9.70	14.17	24	PASS
123	6565	9.46	9.98	12.74	2.59	12.05	-0.63	9.35	13.92	24	PASS
155	6725	9.95	10.30	13.14	2.59	12.54	-0.63	9.67	14.35	24	PASS
179	6845	9.95	10.75	13.38	2.59	12.54	-0.63	10.12	14.51	24	PASS
187	6885	9.67	11.07	13.44	2.59	12.26	-0.63	10.44	14.45	24	PASS
211	7005	10.33	10.56	13.46	2.59	12.92	-0.63	9.93	14.69	24	PASS
227	7085	10.23	10.83	13.55	2.59	12.82	-0.63	10.20	14.71	24	PASS

802.11ax (HE80)

Test channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)			Maximum E.I.R.P (dBm)					Limit (dBm)	Result
		Antenna port 1	Antenna port 2	MIMO	Ant. 1 gain	Ant 1 E.I.RP (dBm)	Ant. 2 gain	Ant 2 E.I.RP (dBm)	MIMO		
7	5985	10.89	10.22	13.58	2.59	13.48	-0.63	9.59	14.97	24	PASS
39	6145	9.52	10.64	13.13	2.59	12.11	-0.63	10.01	14.20	24	PASS
87	6385	9.71	11.15	13.50	2.59	12.30	-0.63	10.52	14.51	24	PASS
103	6465	9.73	10.87	13.35	2.59	12.32	-0.63	10.24	14.41	24	PASS
119	6545	10.12	10.39	13.27	2.59	12.71	-0.63	9.76	14.49	24	PASS
135	6625	9.96	11.03	13.54	2.59	12.55	-0.63	10.40	14.62	24	PASS
151	6705	9.89	10.75	13.35	2.59	12.48	-0.63	10.12	14.47	24	PASS
167	6785	9.81	10.77	13.33	2.59	12.40	-0.63	10.14	14.43	24	PASS
183	6865	9.67	10.41	13.07	2.59	12.26	-0.63	9.78	14.20	24	PASS
199	6945	9.76	10.48	13.15	2.59	12.35	-0.63	9.85	14.29	24	PASS
215	7025	9.86	10.61	13.26	2.59	12.45	-0.63	9.98	14.40	24	PASS

**802.11ax (HE160)**

Test channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)			Maximum E.I.R.P (dBm)					Limit (dBm)	Result
		Antenna port 1	Antenna port 2	MIMO	Ant. 1 gain	Ant 1 E.I.RP (dBm)	Ant. 2 gain	Ant 2 E.I.RP (dBm)	MIMO		
15	6025	9.51	11.94	13.90	2.59	12.10	-0.63	11.31	14.73	24	PASS
47	6185	9.52	10.37	12.98	2.59	12.11	-0.63	9.74	14.10	24	PASS
79	6345	9.34	10.32	12.87	2.59	11.93	-0.63	9.69	13.96	24	PASS
111	6505	9.83	10.88	13.40	2.59	12.42	-0.63	10.25	14.48	24	PASS
143	6665	9.71	10.62	13.20	2.59	12.30	-0.63	9.99	14.31	24	PASS
175	6825	9.66	11.18	13.50	2.59	12.25	-0.63	10.55	14.49	24	PASS
207	6985	9.23	10.66	13.01	2.59	11.82	-0.63	10.03	14.03	24	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:	N/A

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 3.5.39	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).



RF Test Room

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 19, 2025	Feb. 18, 2026
RF cable	Times	1-40G	HKE-034	Feb. 19, 2025	Feb. 18, 2026
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 19, 2025	Feb. 18, 2026
RF Test Software	Tonscend	JS1120-3 Version 3.5.39	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

N/A



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:	PASS

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 3.5.39	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).



RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 19, 2025	Feb. 18, 2026
RF cable	Times	1-40G	HKE-034	Feb. 19, 2025	Feb. 18, 2026
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 19, 2025	Feb. 18, 2026
RF Test Software	Tonscend	JS1120-3 Version 3.5.39	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 Data

ANT. 1

Mode	Test channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
802.11a	1	5955	18.47	16.397	PASS
802.11a	45	6175	21.80	16.909	PASS
802.11a	93	6415	21.89	16.949	PASS
802.11a	97	6435	21.77	16.899	PASS
802.11a	105	6475	21.80	17.001	PASS
802.11a	113	6515	21.71	16.988	PASS
802.11a	117	6535	21.77	16.959	PASS
802.11a	153	6715	21.73	16.948	PASS
802.11a	181	6855	22.46	16.933	PASS
802.11a	185	6875	21.87	16.946	PASS
802.11a	213	7015	21.92	17.002	PASS
802.11a	233	7115	21.63	16.973	PASS
802.11ax(HE20)	1	5955	20.10	18.764	PASS
802.11ax(HE20)	45	6175	22.73	19.117	PASS
802.11ax(HE20)	93	6415	22.27	19.131	PASS
802.11ax(HE20)	97	6435	23.01	19.133	PASS
802.11ax(HE20)	105	6475	22.43	19.149	PASS
802.11ax(HE20)	113	6515	23.23	19.110	PASS
802.11ax(HE20)	117	6535	22.37	19.133	PASS
802.11ax(HE20)	153	6715	22.77	19.112	PASS
802.11ax(HE20)	181	6855	22.57	19.117	PASS
802.11ax(HE20)	185	6875	22.63	19.094	PASS
802.11ax(HE20)	213	7015	22.63	19.093	PASS
802.11ax(HE20)	233	7115	22.86	19.126	PASS
802.11ax(HE40)	3	5965	39.85	37.575	PASS
802.11ax(HE40)	43	6165	40.25	37.815	PASS
802.11ax(HE40)	91	6405	40.06	37.585	PASS
802.11ax(HE40)	99	6445	40.02	37.530	PASS
802.11ax(HE40)	107	6485	40.06	37.557	PASS
802.11ax(HE40)	115	6525	40.13	37.630	PASS
802.11ax(HE40)	123	6565	39.94	37.565	PASS
802.11ax(HE40)	155	6725	40.06	37.669	PASS

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802.11ax(HE40)	179	6845	40.11	37.527	PASS
802.11ax(HE40)	187	6885	40.22	37.703	PASS
802.11ax(HE40)	211	7005	40.08	37.571	PASS
802.11ax(HE40)	227	7085	56.09	37.938	PASS
802.11ax(HE80)	7	5985	80.97	77.000	PASS
802.11ax(HE80)	39	6145	81.43	76.946	PASS
802.11ax(HE80)	87	6385	81.28	76.806	PASS
802.11ax(HE80)	103	6465	81.17	76.716	PASS
802.11ax(HE80)	119	6545	81.27	76.837	PASS
802.11ax(HE80)	135	6625	81.41	76.907	PASS
802.11ax(HE80)	151	6705	81.16	76.823	PASS
802.11ax(HE80)	167	6785	81.17	76.897	PASS
802.11ax(HE80)	183	6865	81.10	76.706	PASS
802.11ax(HE80)	199	6945	81.18	76.940	PASS
802.11ax(HE80)	215	7025	81.14	76.789	PASS
802.11ax(HE160)	15	6025	165.60	156.04	PASS
802.11ax(HE160)	47	6185	165.60	155.43	PASS
802.11ax(HE160)	79	6345	165.80	155.17	PASS
802.11ax(HE160)	111	6505	165.40	155.24	PASS
802.11ax(HE160)	143	6665	165.80	155.79	PASS
802.11ax(HE160)	175	6825	165.60	155.65	PASS
802.11ax(HE160)	207	6985	165.60	155.57	PASS

Test plots as follows:



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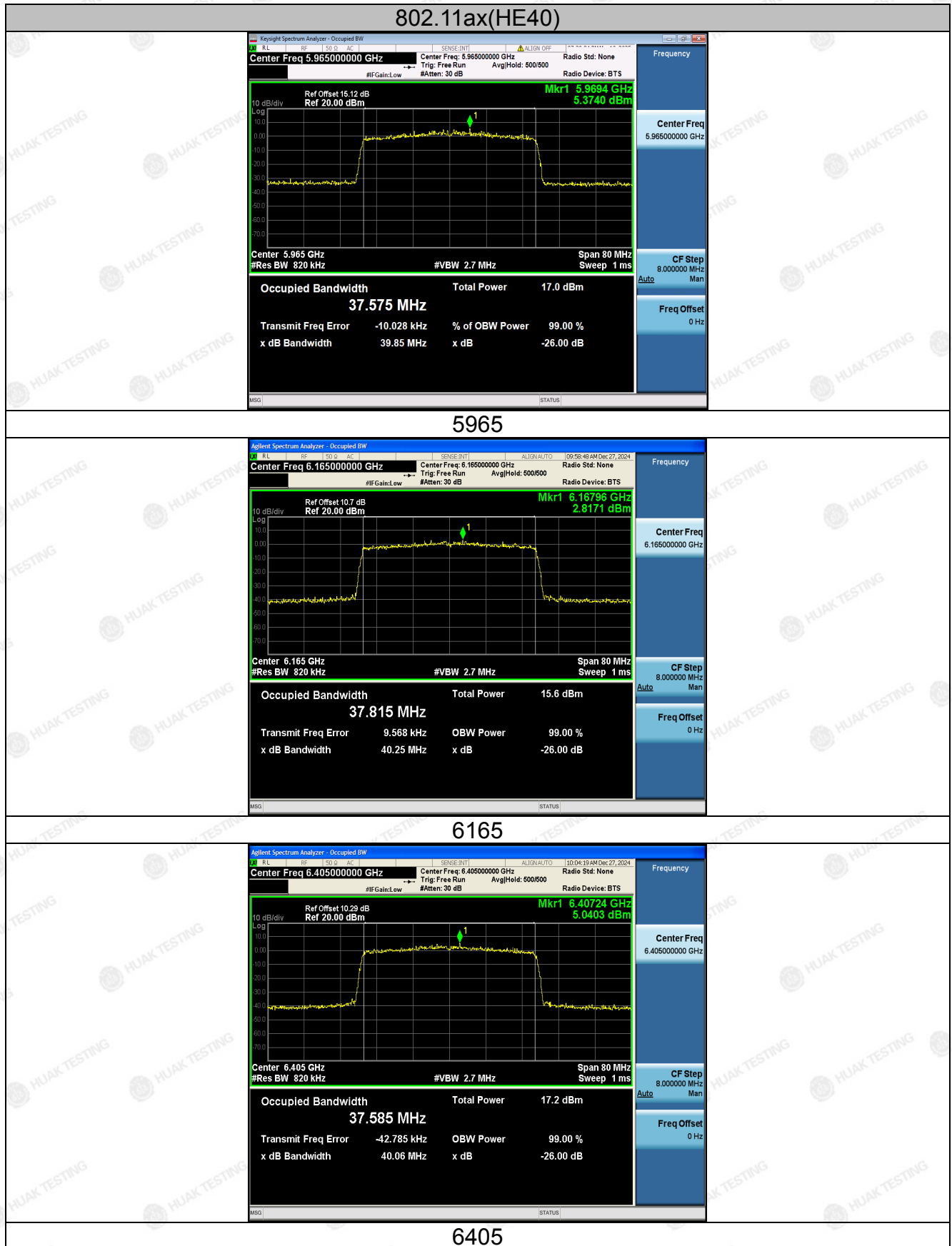
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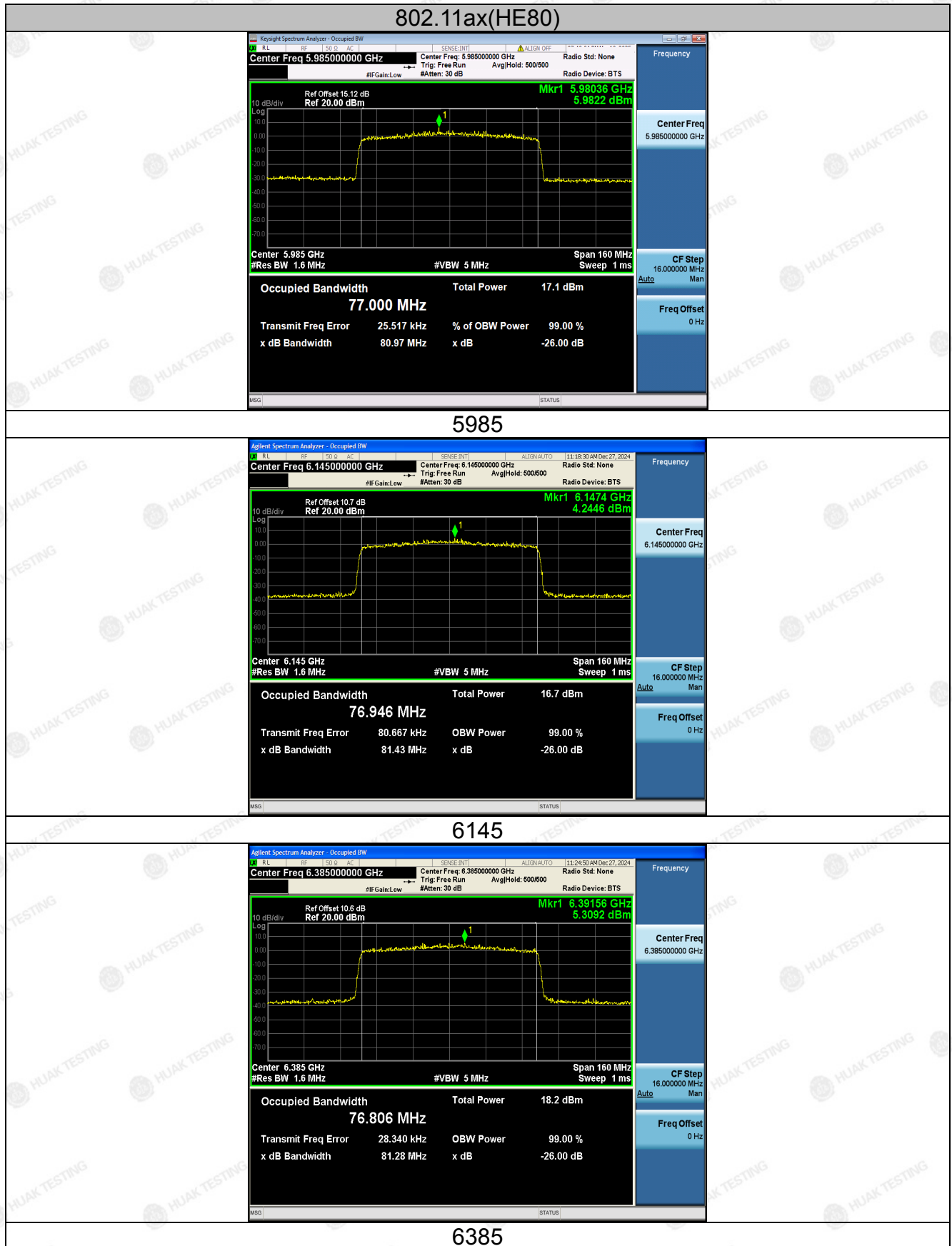
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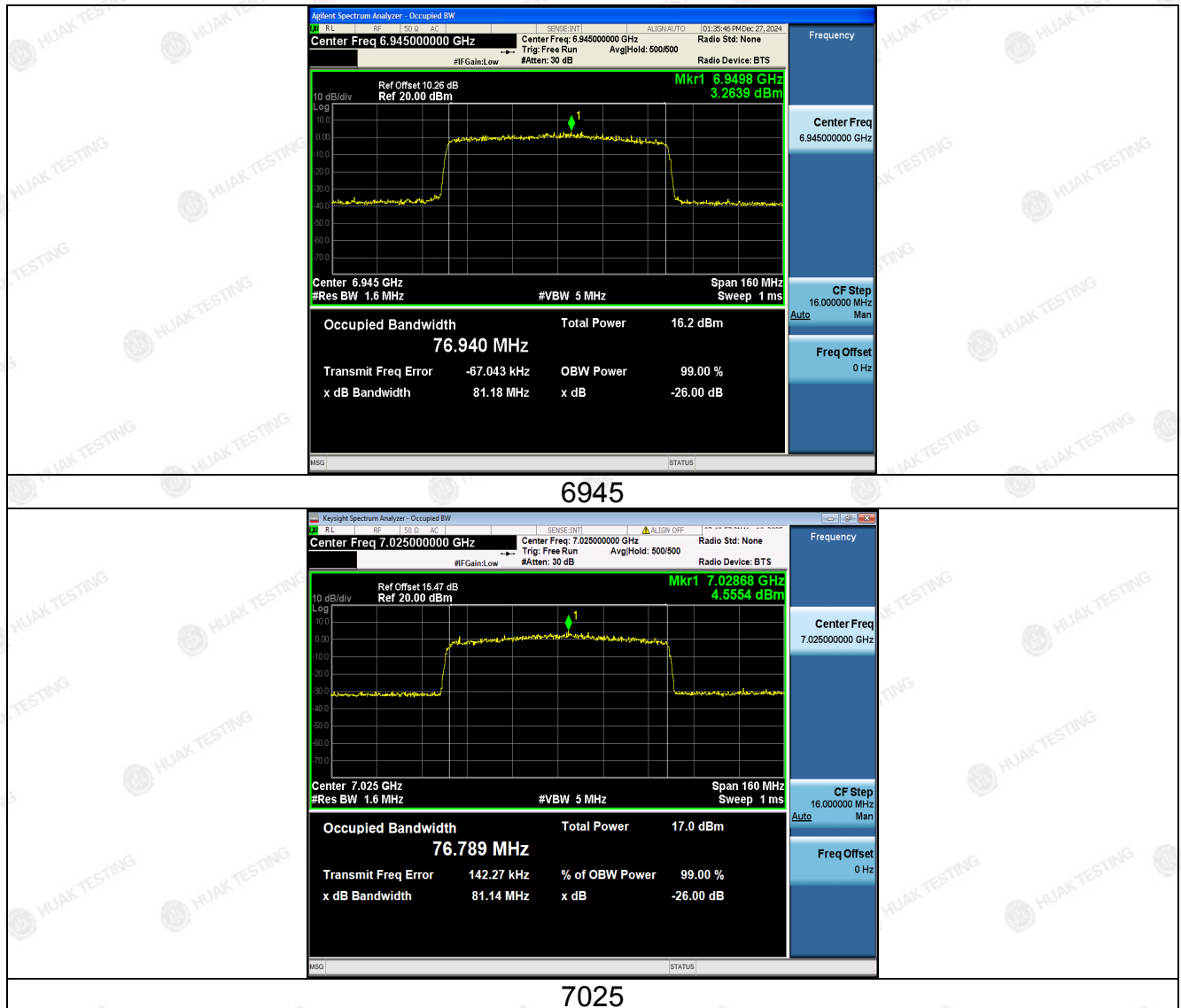




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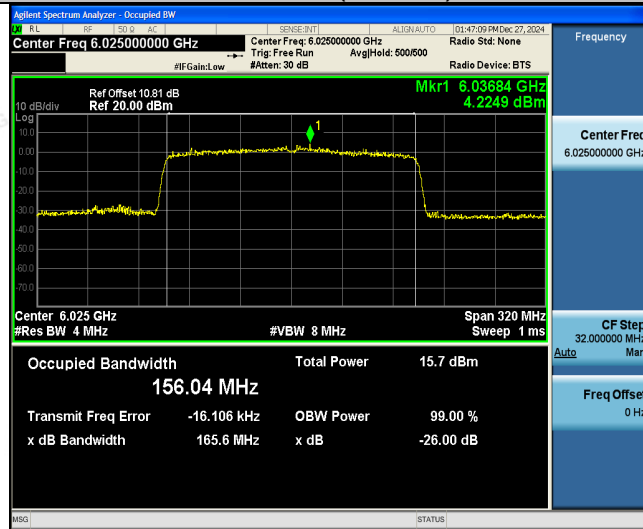
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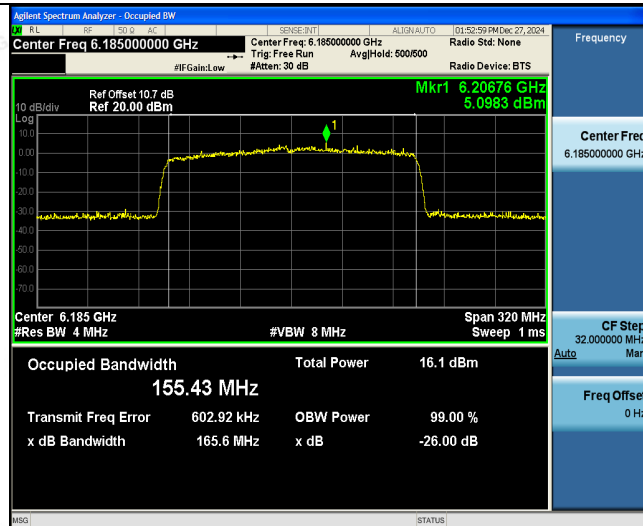




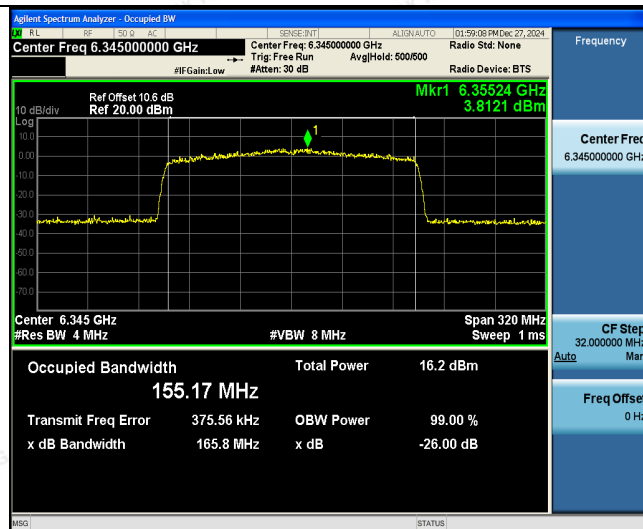
802.11ax(HE160)



6025

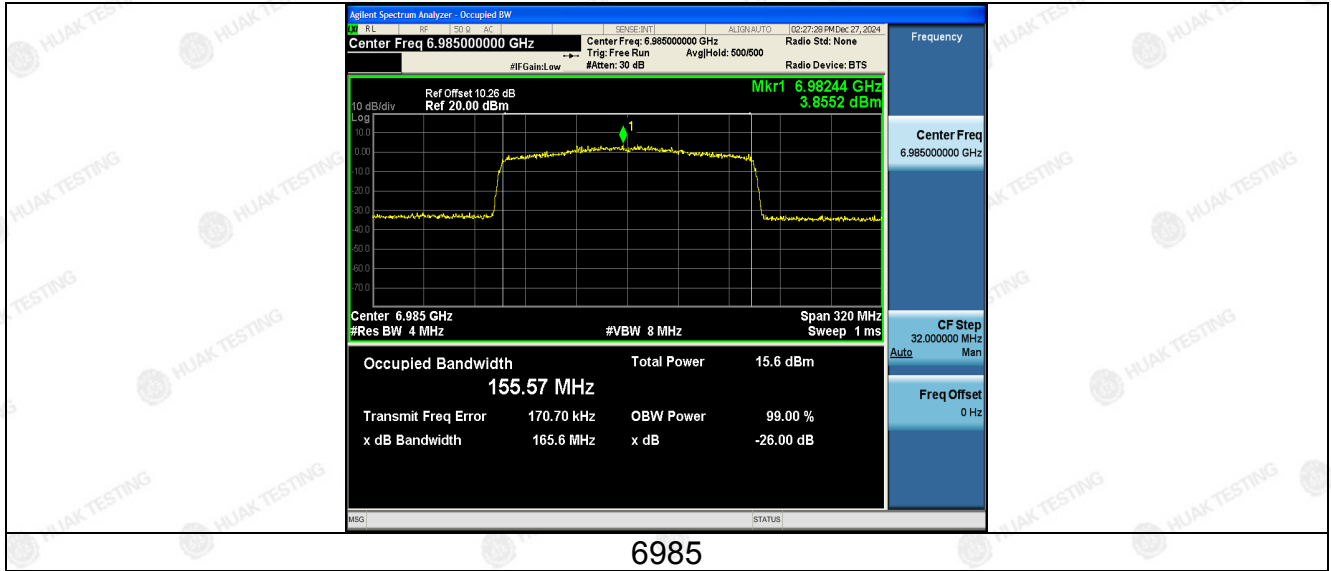


6185



6345







ANT. 2

Mode	Test channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
802.11a	1	5955	18.59	16.422	PASS
802.11a	45	6175	21.62	16.963	PASS
802.11a	93	6415	21.81	16.965	PASS
802.11a	97	6435	21.74	16.987	PASS
802.11a	105	6475	21.52	16.951	PASS
802.11a	113	6515	22.04	16.939	PASS
802.11a	117	6535	21.95	16.917	PASS
802.11a	153	6715	22.04	16.945	PASS
802.11a	181	6855	21.77	16.949	PASS
802.11a	185	6875	21.50	17.017	PASS
802.11a	213	7015	21.74	16.972	PASS
802.11a	233	7115	21.99	16.953	PASS
802.11ax(HE20)	1	5955	20.13	18.806	PASS
802.11ax(HE20)	45	6175	22.16	19.068	PASS
802.11ax(HE20)	93	6415	22.54	19.153	PASS
802.11ax(HE20)	97	6435	21.68	19.067	PASS
802.11ax(HE20)	105	6475	22.01	19.112	PASS
802.11ax(HE20)	113	6515	22.24	19.098	PASS
802.11ax(HE20)	117	6535	22.05	19.098	PASS
802.11ax(HE20)	153	6715	22.66	19.116	PASS
802.11ax(HE20)	181	6855	22.02	19.094	PASS
802.11ax(HE20)	185	6875	22.63	19.087	PASS
802.11ax(HE20)	213	7015	22.28	19.057	PASS
802.11ax(HE20)	233	7115	22.41	19.117	PASS
802.11ax(HE40)	3	5965	39.66	37.498	PASS
802.11ax(HE40)	43	6165	39.94	37.603	PASS
802.11ax(HE40)	91	6405	39.91	37.545	PASS
802.11ax(HE40)	99	6445	39.98	37.494	PASS
802.11ax(HE40)	107	6485	39.86	37.581	PASS
802.11ax(HE40)	115	6525	39.98	37.585	PASS
802.11ax(HE40)	123	6565	40.07	37.614	PASS
802.11ax(HE40)	155	6725	40.01	37.603	PASS
802.11ax(HE40)	179	6845	40.06	37.515	PASS
802.11ax(HE40)	187	6885	39.91	37.582	PASS

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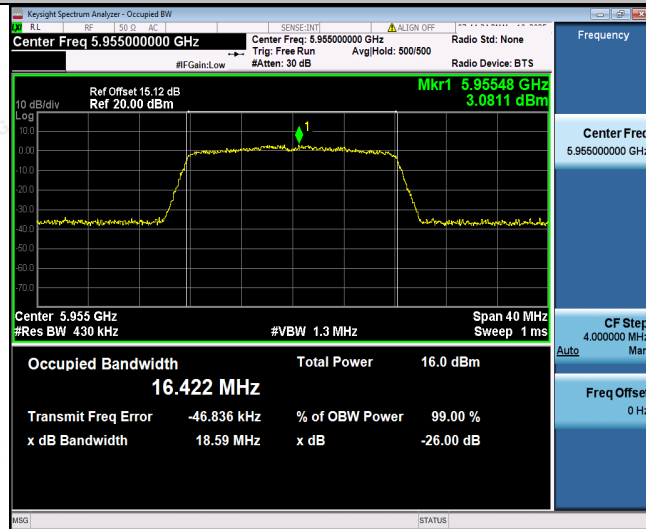


802.11ax(HE40)	211	7005	40.01	37.495	PASS
802.11ax(HE40)	227	7085	54.57	37.927	PASS
802.11ax(HE80)	7	5985	81.23	76.937	PASS
802.11ax(HE80)	39	6145	81.15	76.860	PASS
802.11ax(HE80)	87	6385	81.24	77.052	PASS
802.11ax(HE80)	103	6465	81.49	76.990	PASS
802.11ax(HE80)	119	6545	81.23	76.845	PASS
802.11ax(HE80)	135	6625	81.39	76.946	PASS
802.11ax(HE80)	151	6705	81.22	77.010	PASS
802.11ax(HE80)	167	6785	81.22	76.891	PASS
802.11ax(HE80)	183	6865	81.03	76.831	PASS
802.11ax(HE80)	199	6945	81.19	76.692	PASS
802.11ax(HE80)	215	7025	81.40	77.023	PASS
802.11ax(HE160)	15	6025	165.90	155.90	PASS
802.11ax(HE160)	47	6185	165.90	155.54	PASS
802.11ax(HE160)	79	6345	165.60	155.18	PASS
802.11ax(HE160)	111	6505	165.80	155.07	PASS
802.11ax(HE160)	143	6665	165.70	155.73	PASS
802.11ax(HE160)	175	6825	165.50	155.27	PASS
802.11ax(HE160)	207	6985	165.80	155.60	PASS

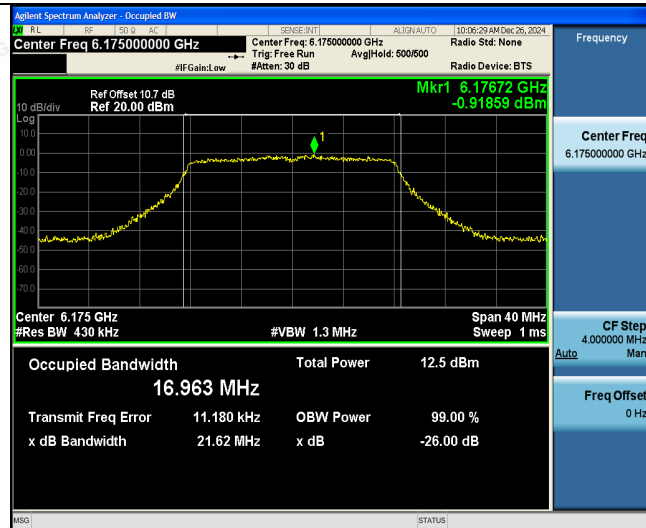
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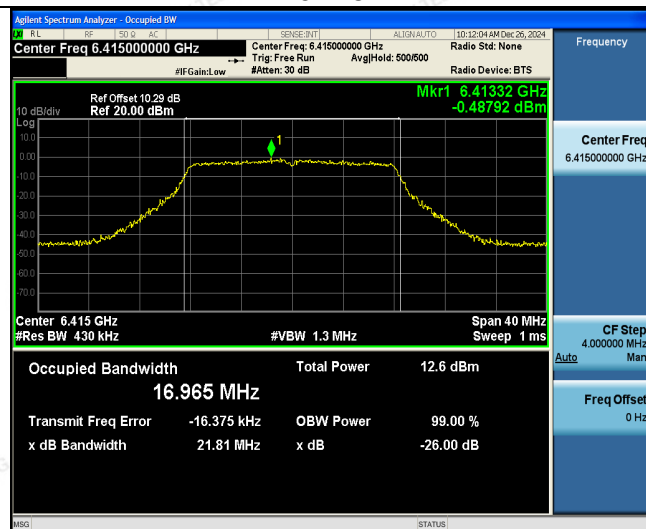
802.11a



5955



6175



6415



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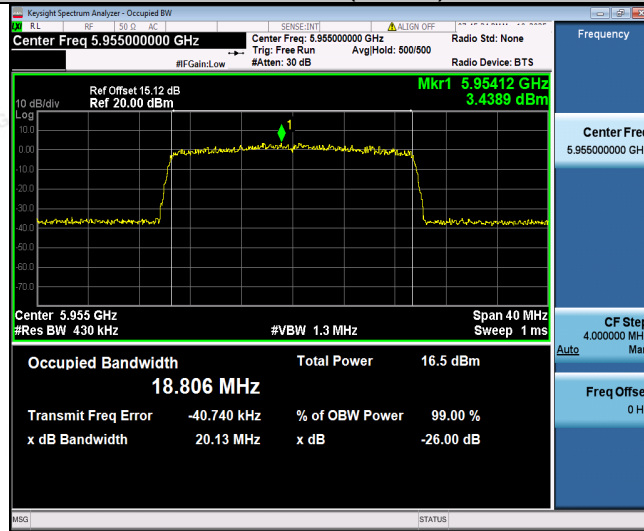
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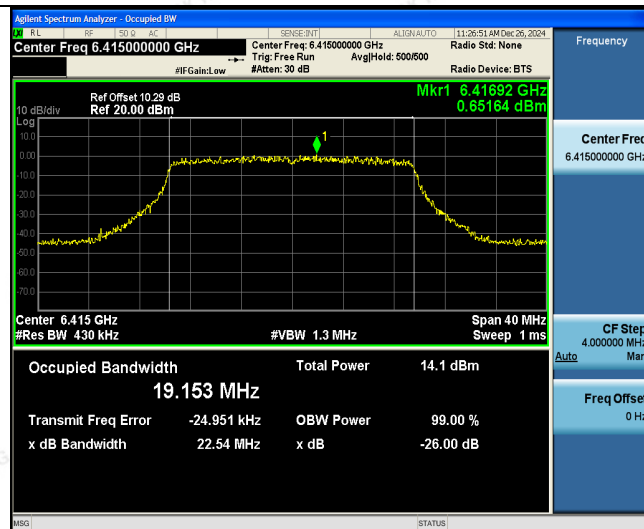
802.11ax(HE20)



5955



6175



6415



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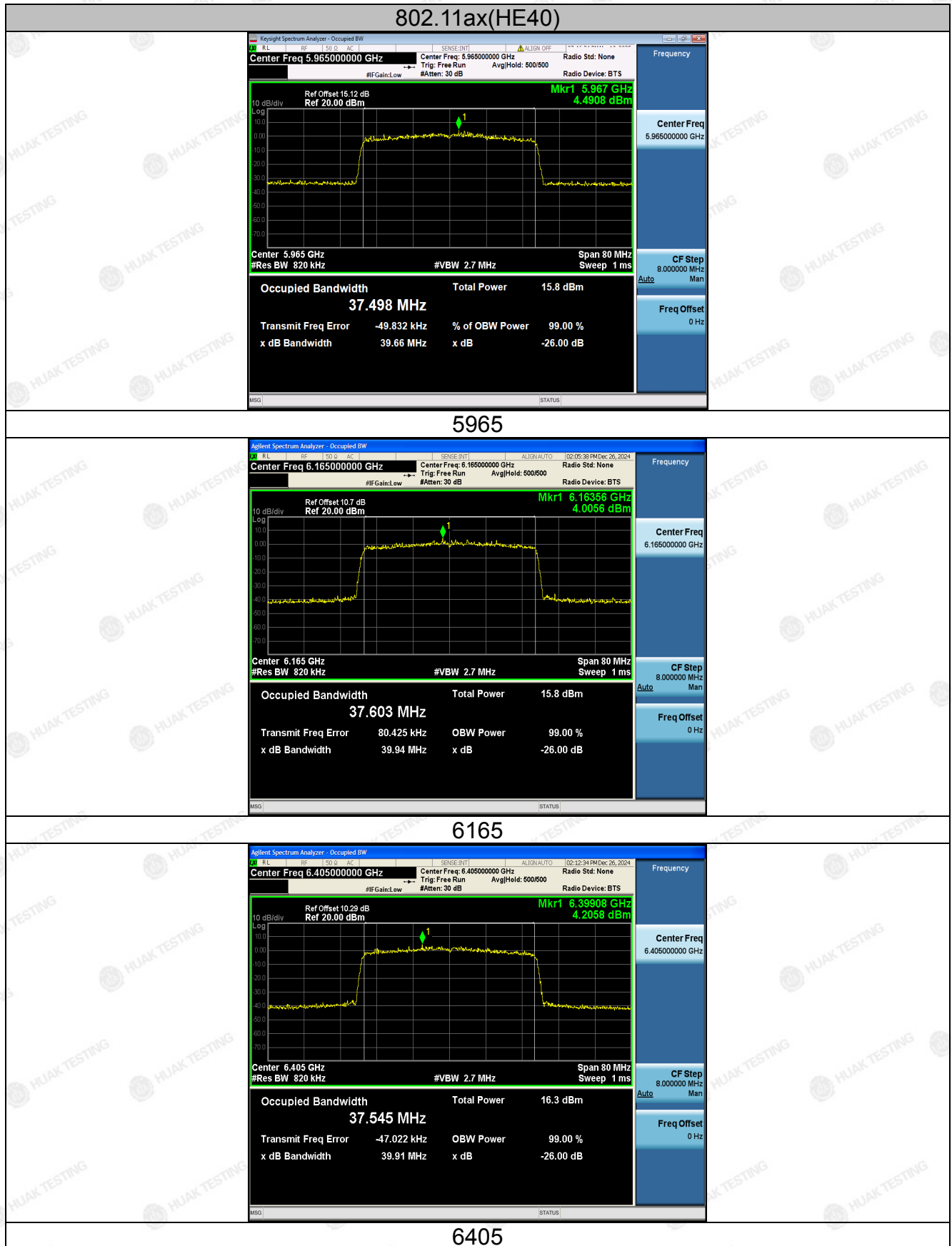
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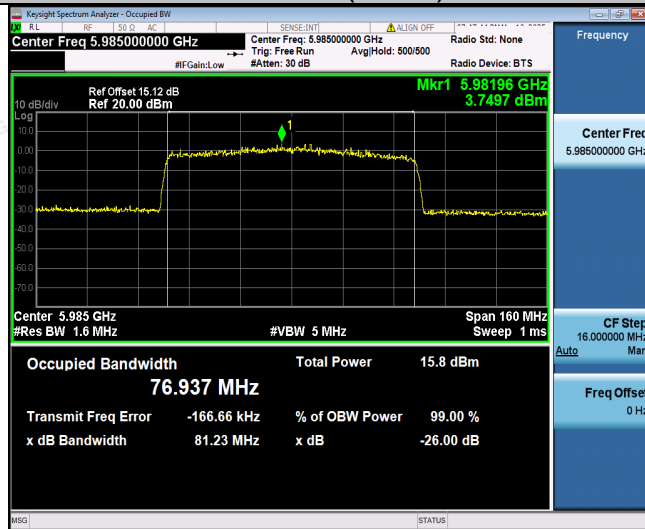
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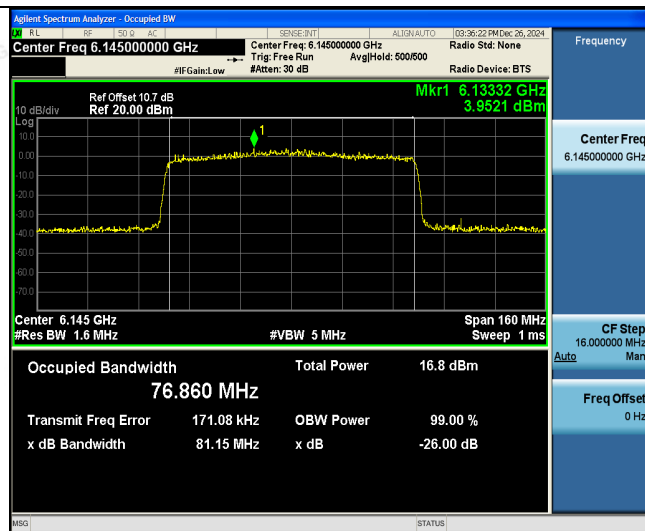
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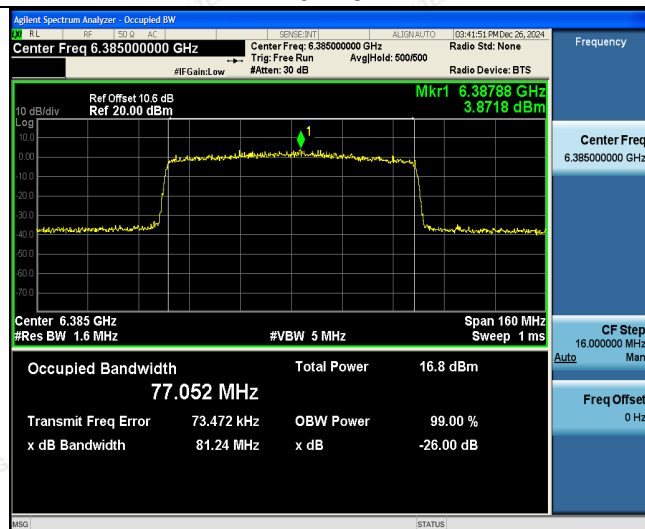
802.11ax(HE80)



5985



6145



6385



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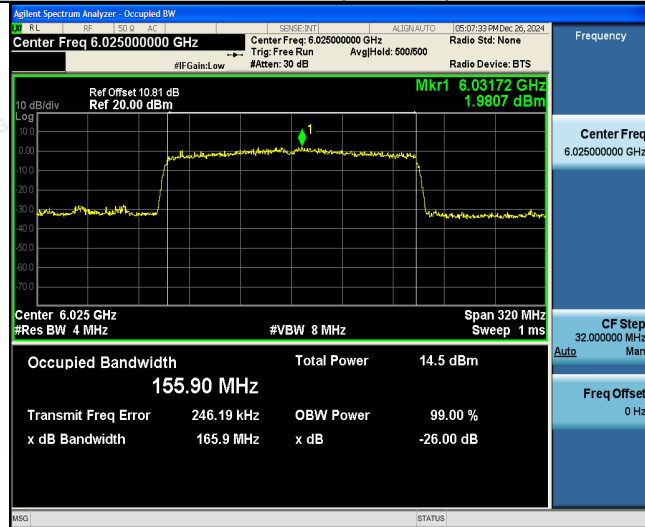
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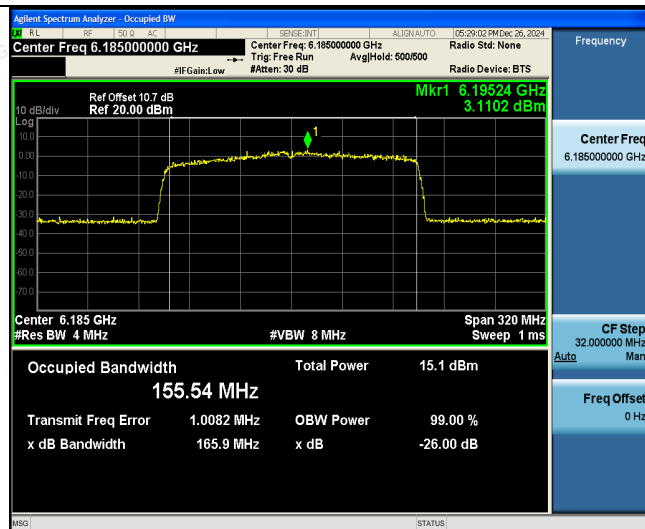




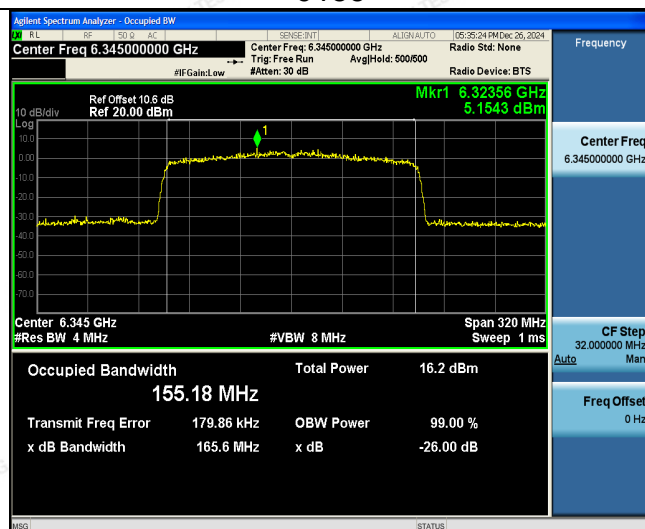
802.11ax(HE160)



6025



6185



6345



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