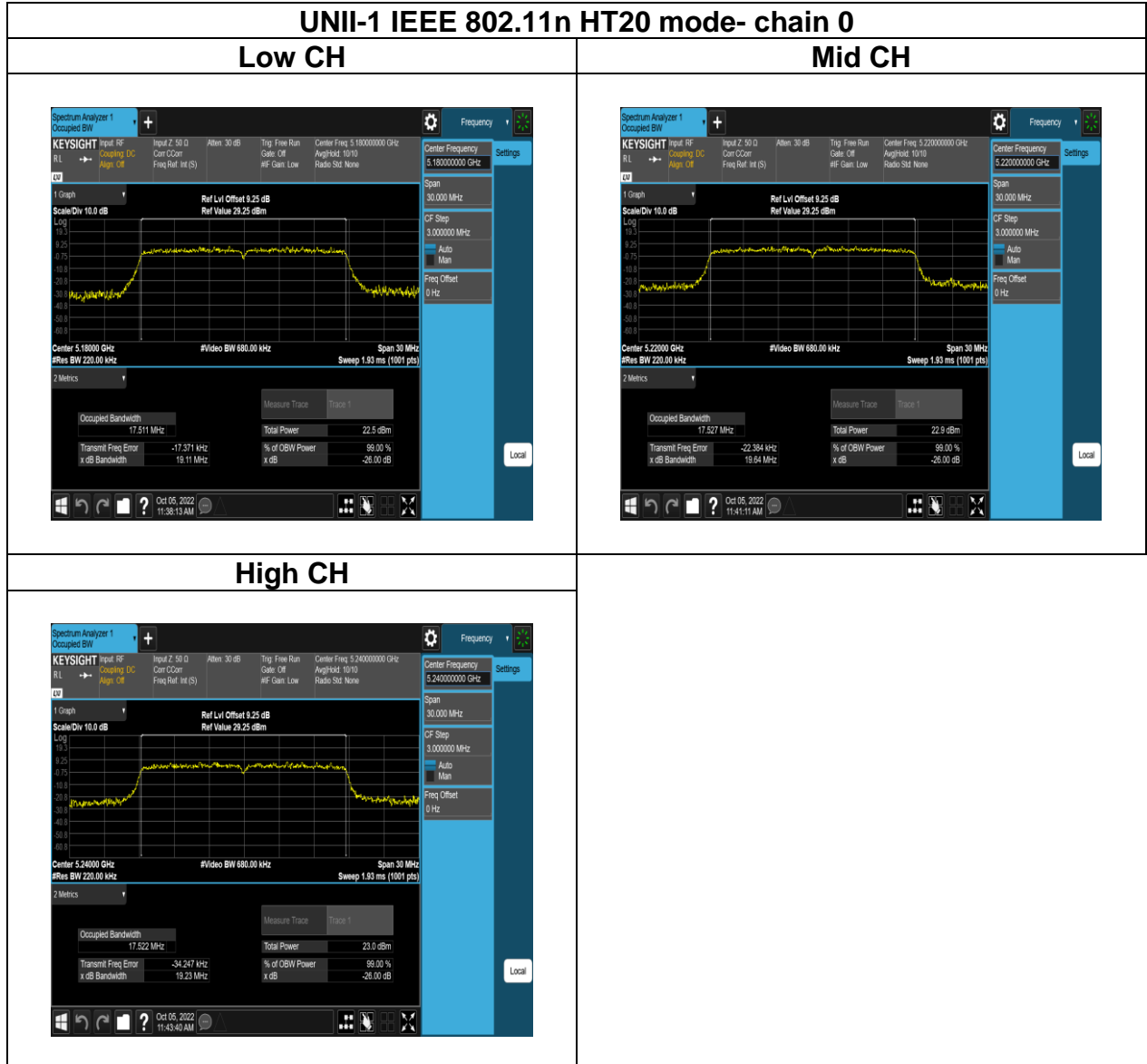
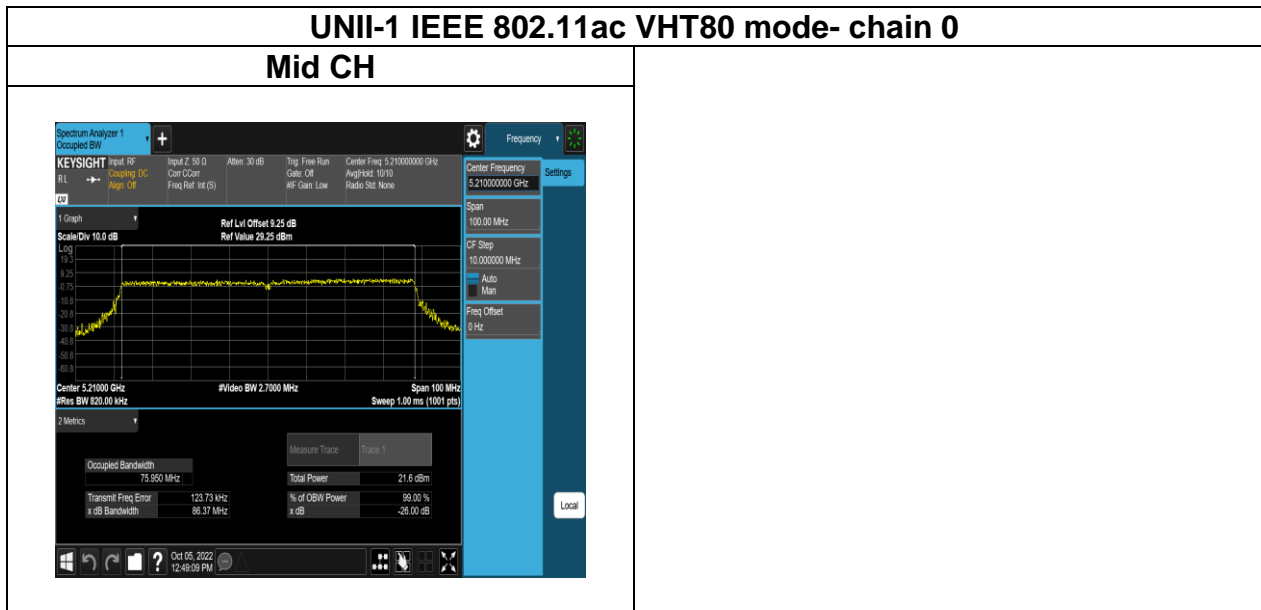
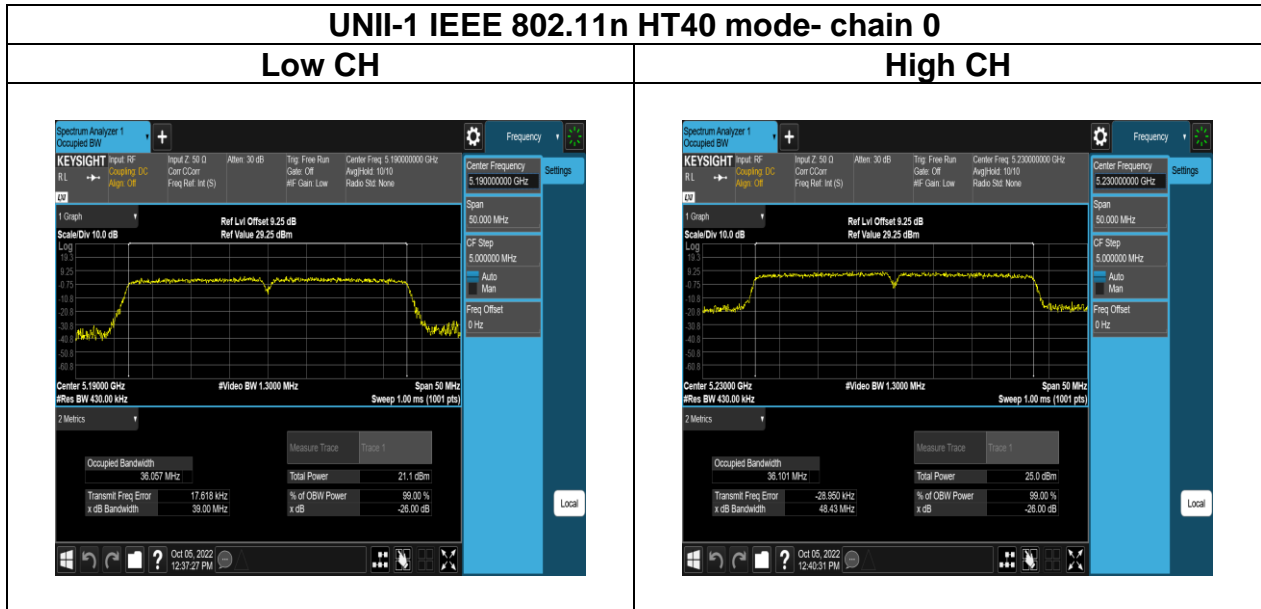


Report No.: TMWK2209003822KR



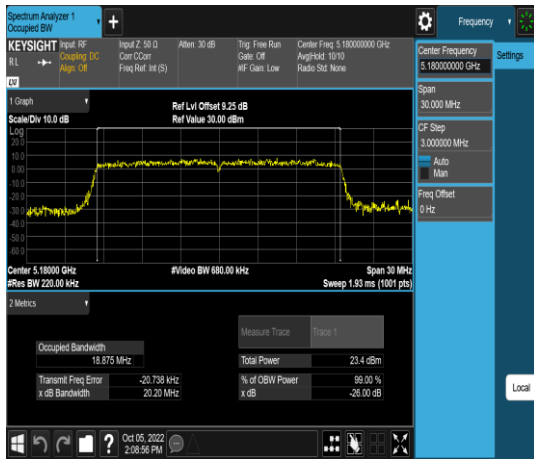
Report No.: TMWK2209003822KR



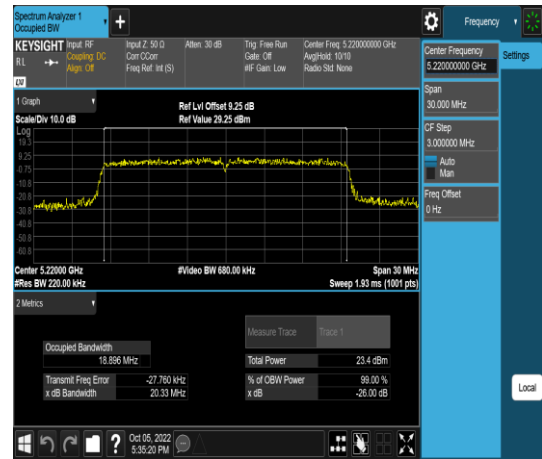
Report No.: TMWK2209003822KR

UNII-1 IEEE 802.11ax HE20 mode- chain 0

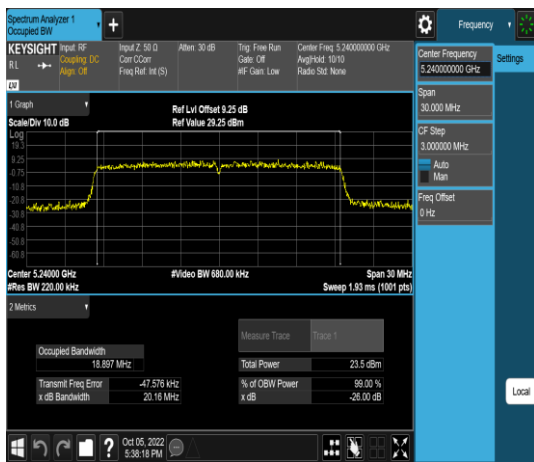
Low CH



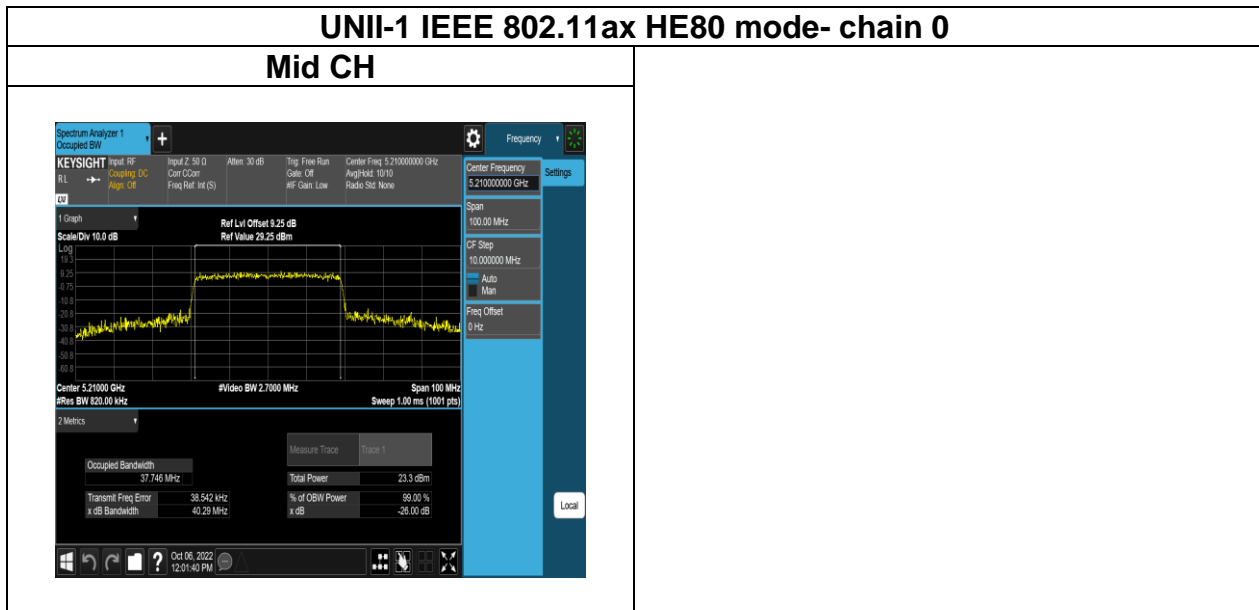
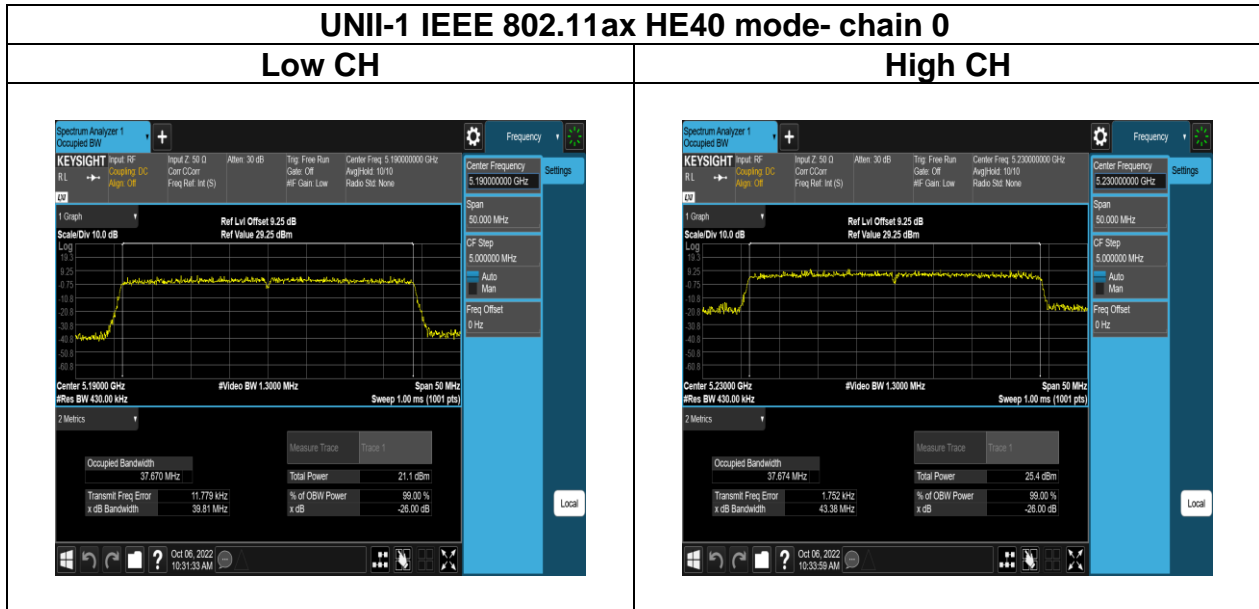
Mid CH



High CH



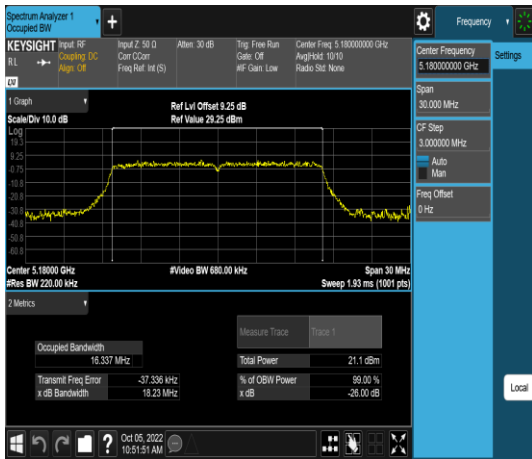
Report No.: TMWK2209003822KR



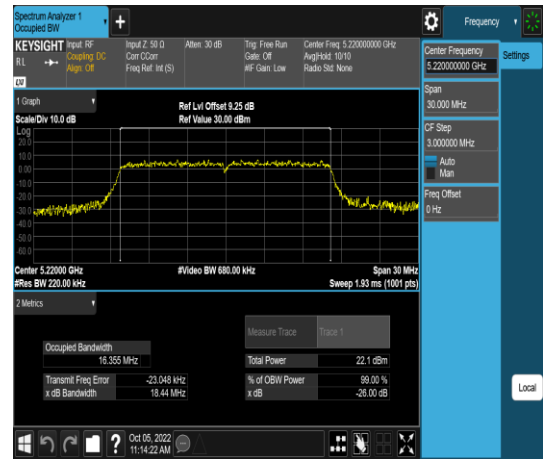
Report No.: TMWK2209003822KR

UNII-1 IEEE 802.11a mode- chain 1

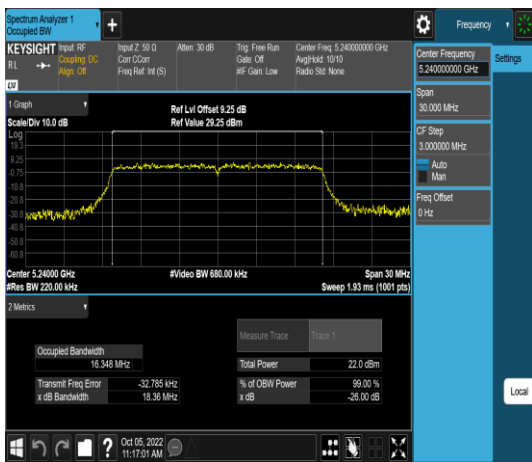
Low CH



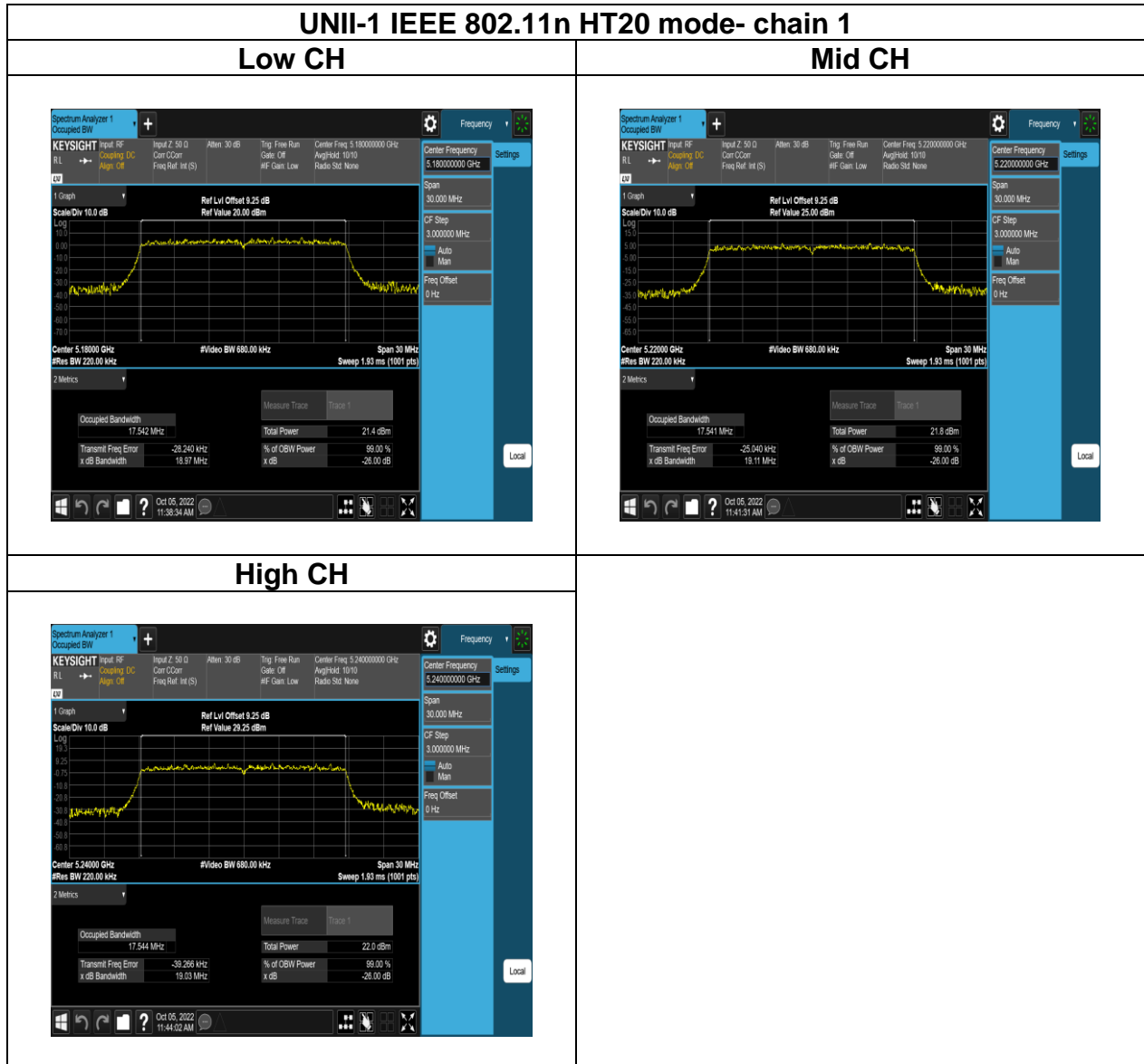
Mid CH



High CH



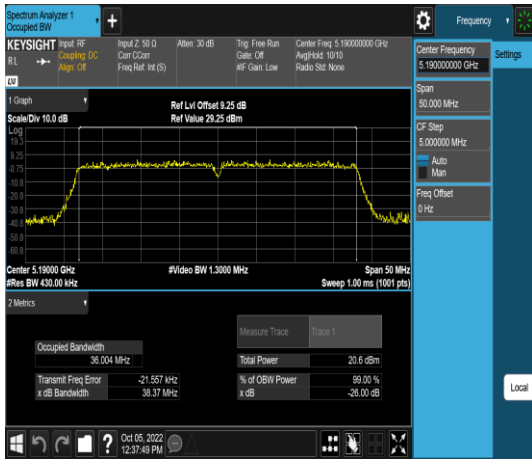
Report No.: TMWK2209003822KR



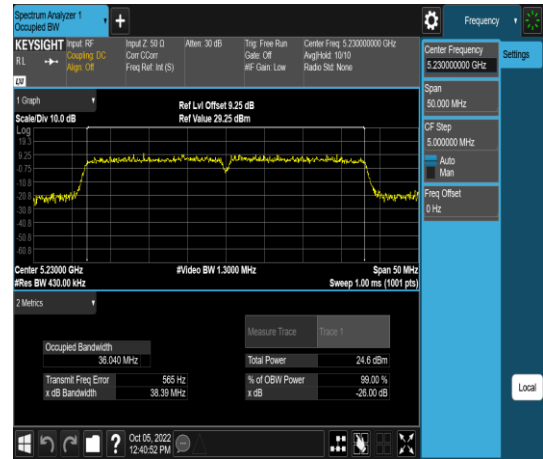
Report No.: TMWK2209003822KR

UNII-1 IEEE 802.11n HT40 mode- chain 1

Low CH

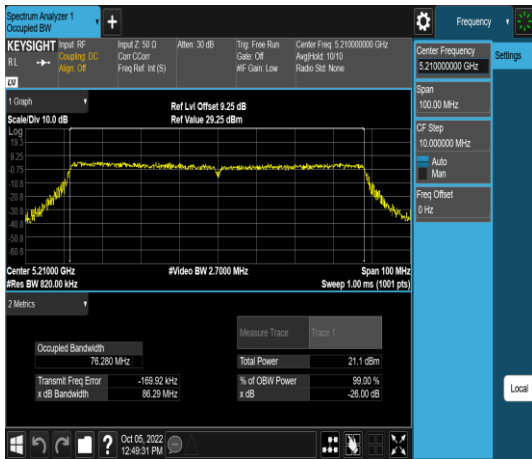


High CH



UNII-1 IEEE 802.11ac VHT80 mode- chain 1

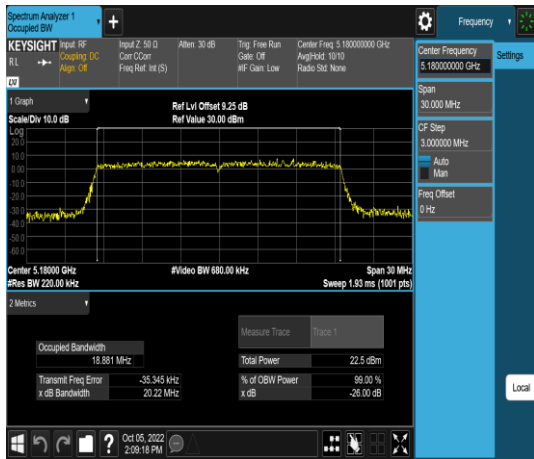
Mid CH



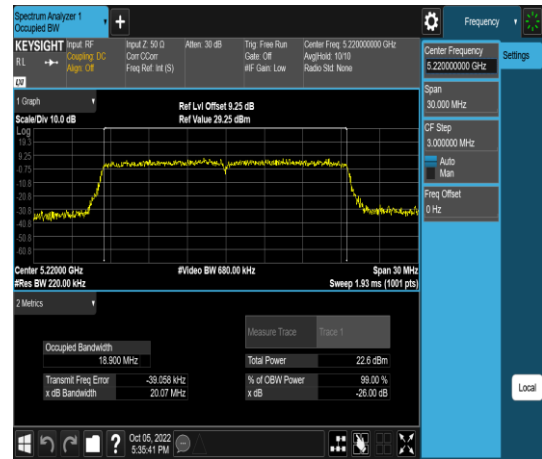
Report No.: TMWK2209003822KR

UNII-1 IEEE 802.11ax HE20 mode- chain 1

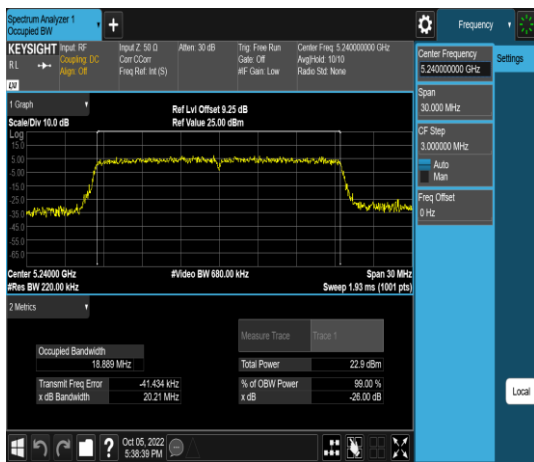
Low CH



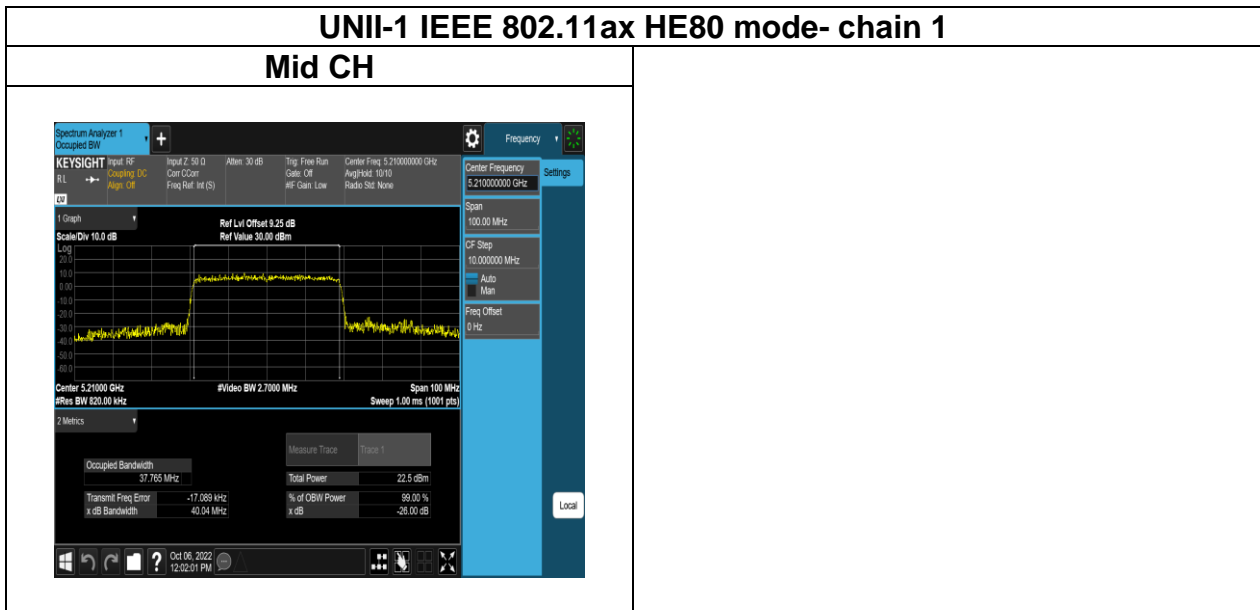
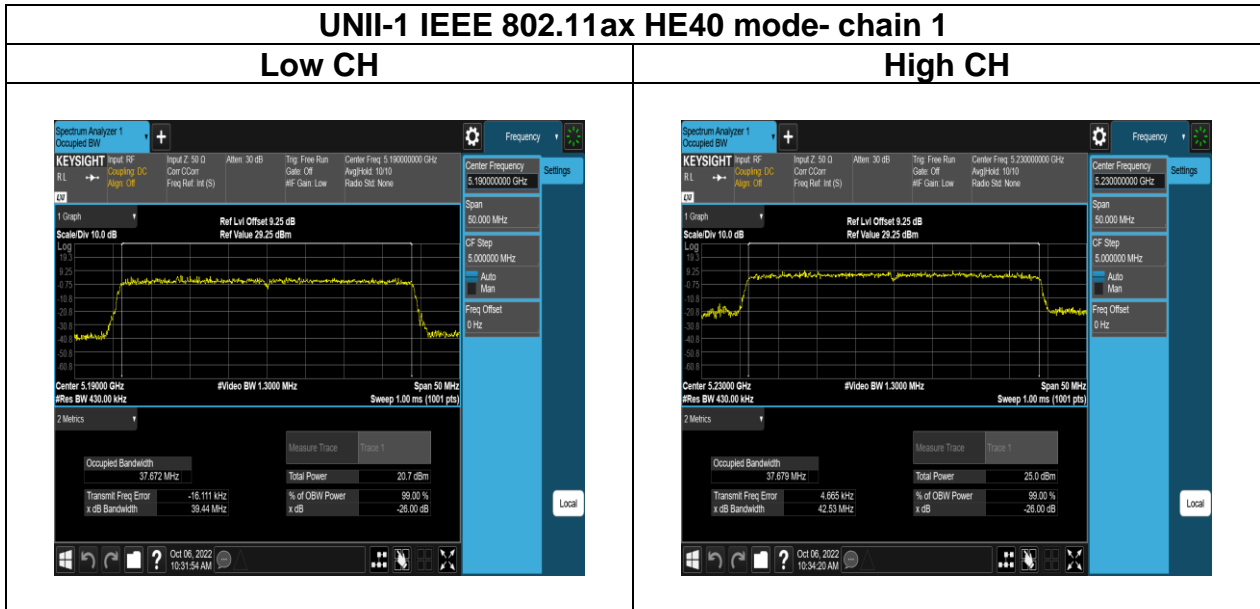
Mid CH



High CH

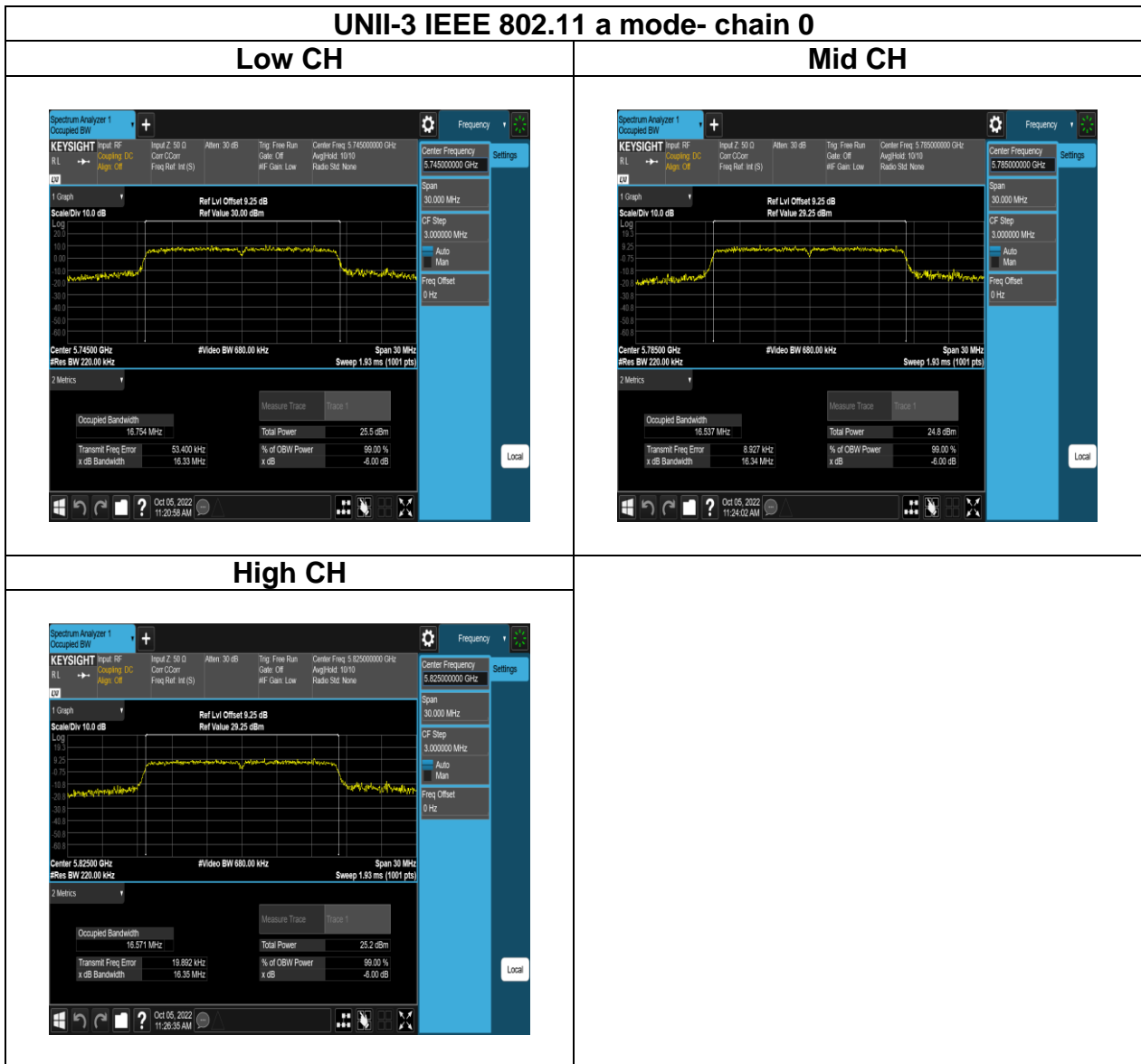


Report No.: TMWK2209003822KR

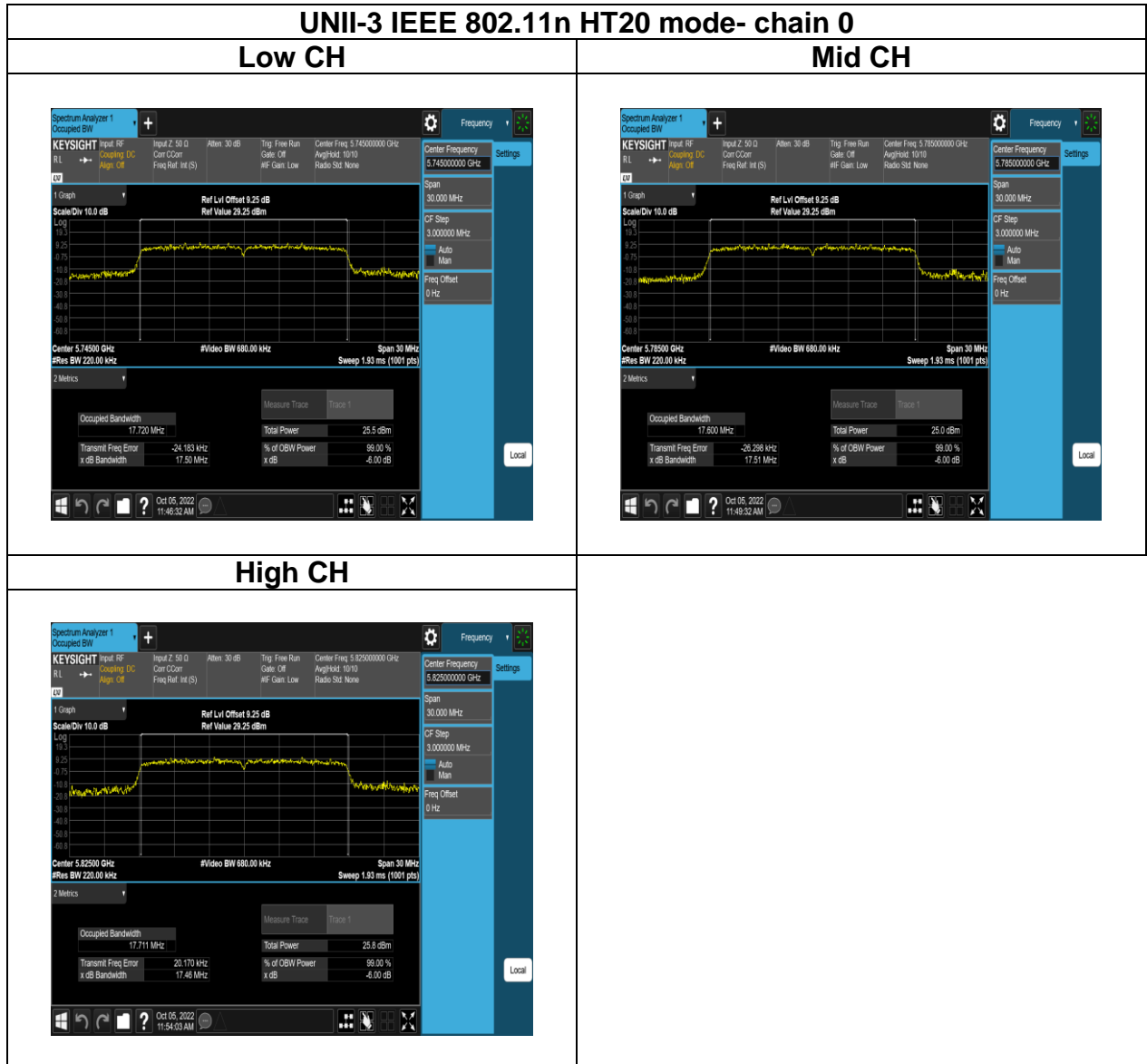


Report No.: TMWK2209003822KR

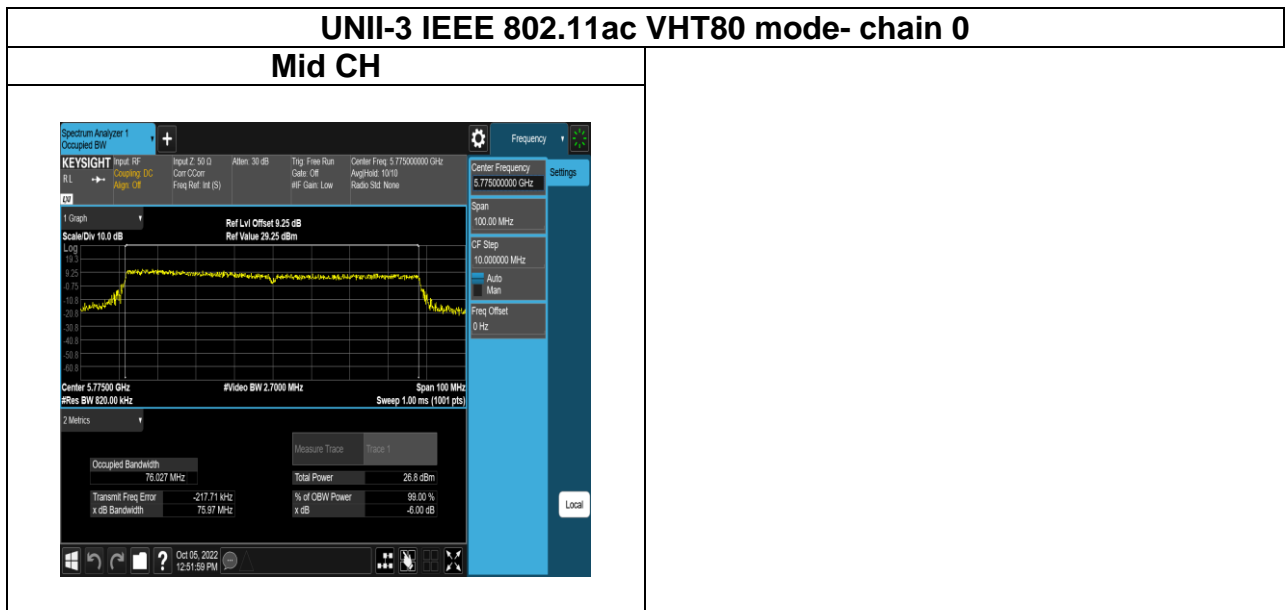
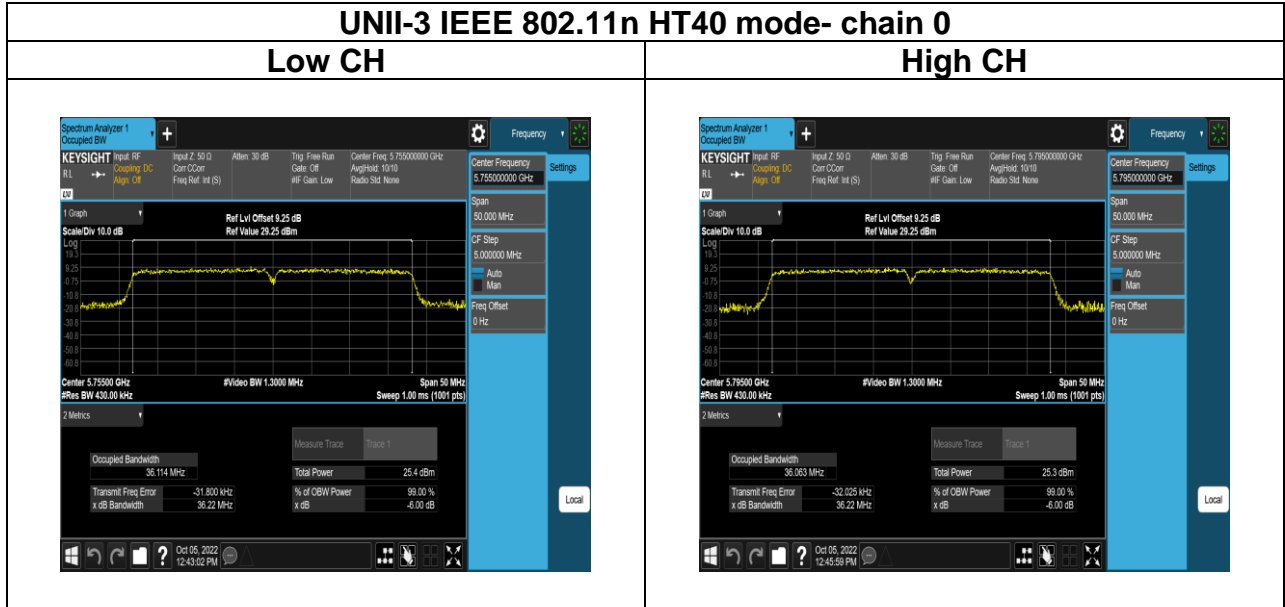
Test Plots (OBW 99%)



Report No.: TMWK2209003822KR



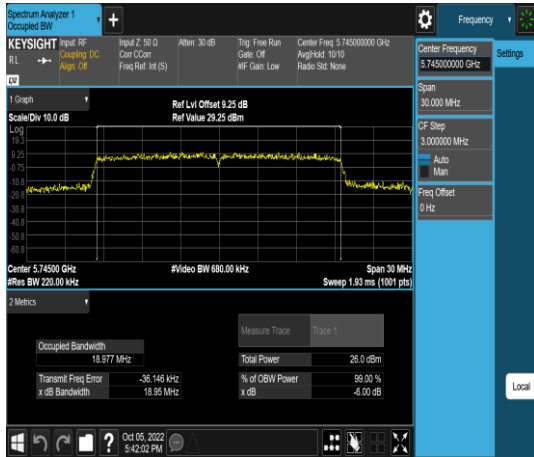
Report No.: TMWK2209003822KR



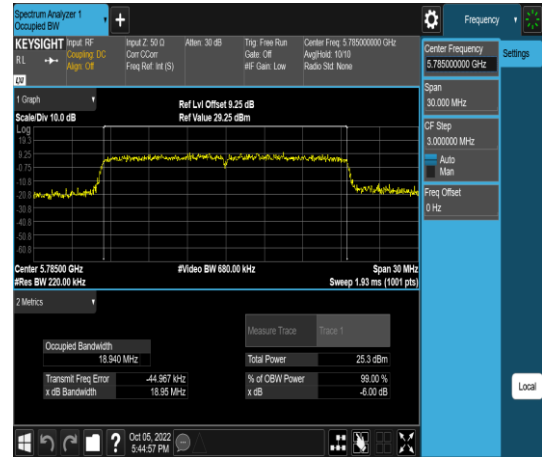
Report No.: TMWK2209003822KR

UNII-3 IEEE 802.11ax HE20 mode- chain 0

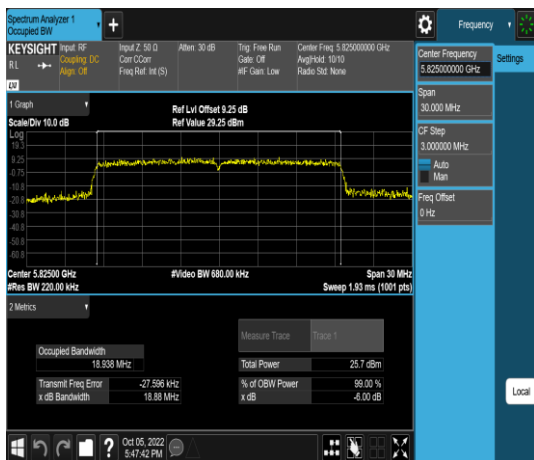
Low CH



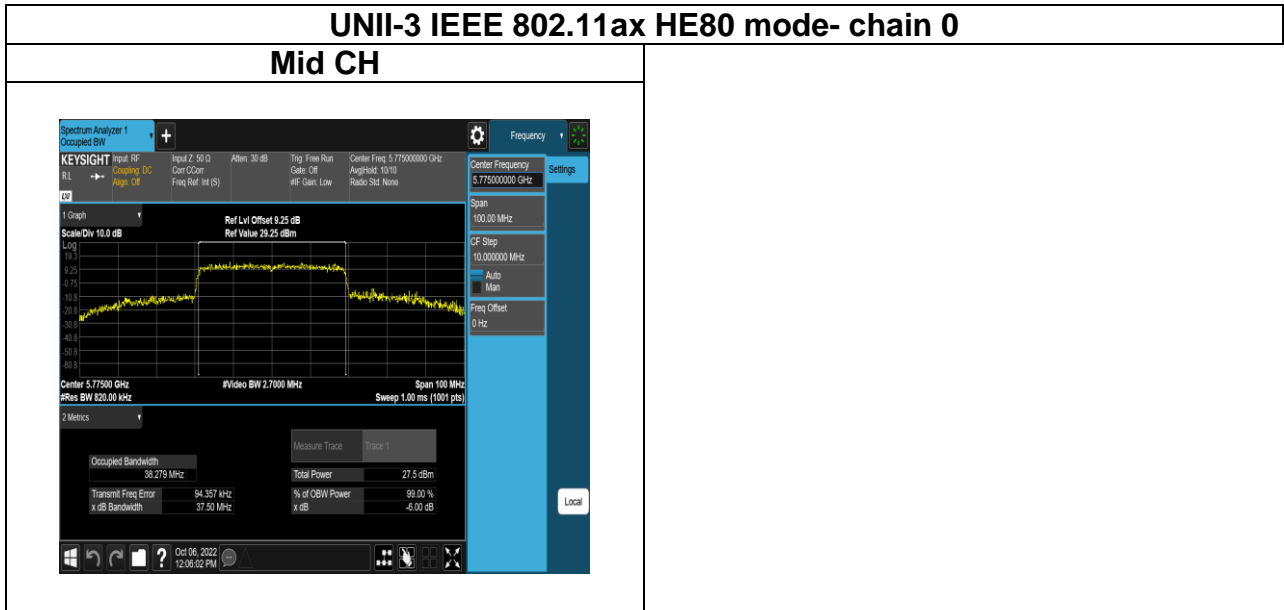
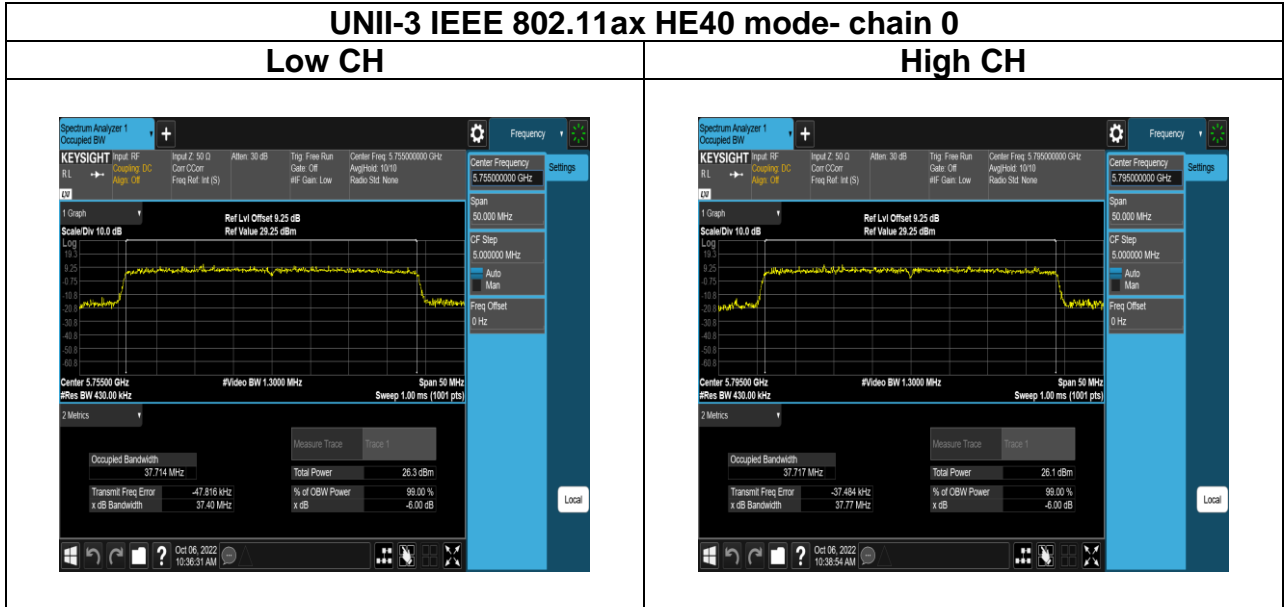
Mid CH



High CH



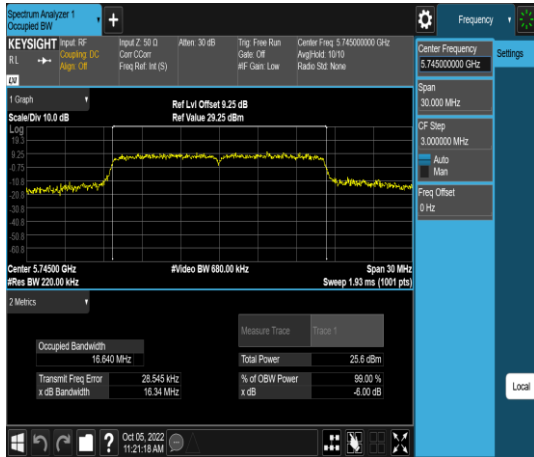
Report No.: TMWK2209003822KR



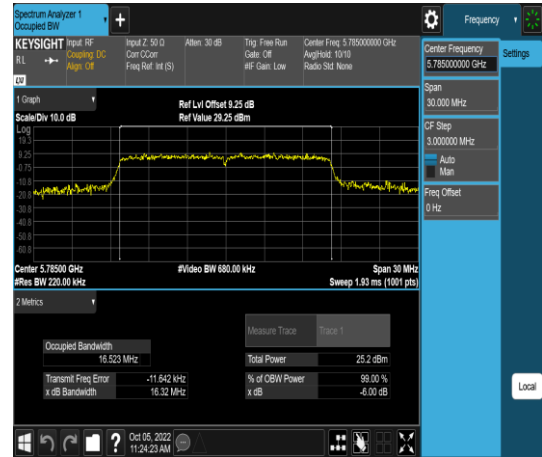
Report No.: TMWK2209003822KR

UNII-3 IEEE 802.11 a mode- chain 1

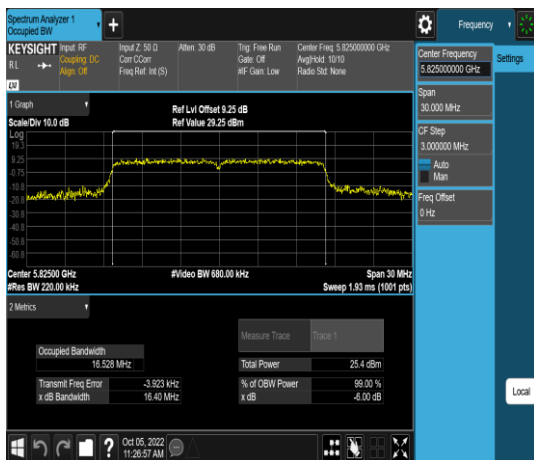
Low CH



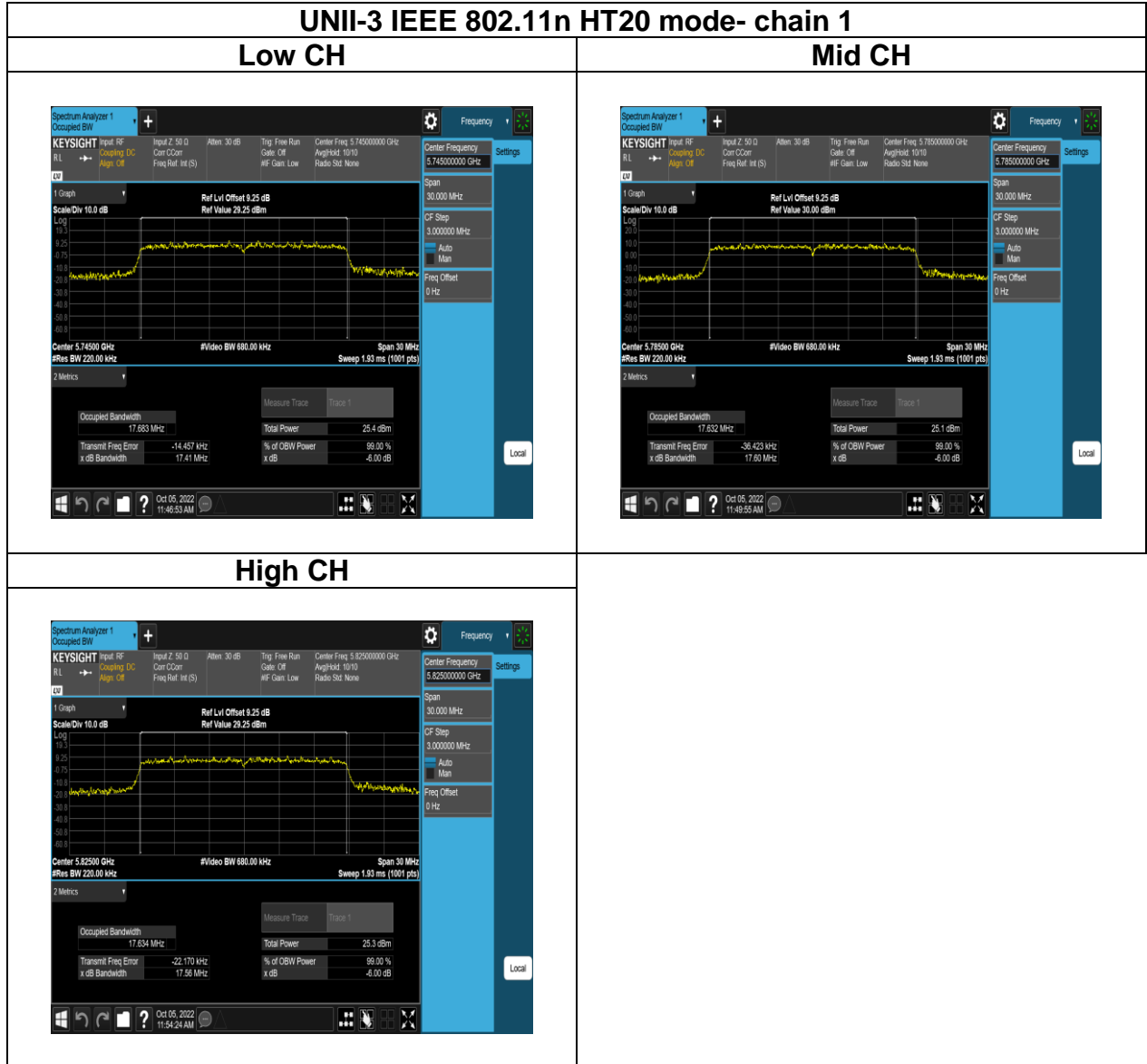
Mid CH



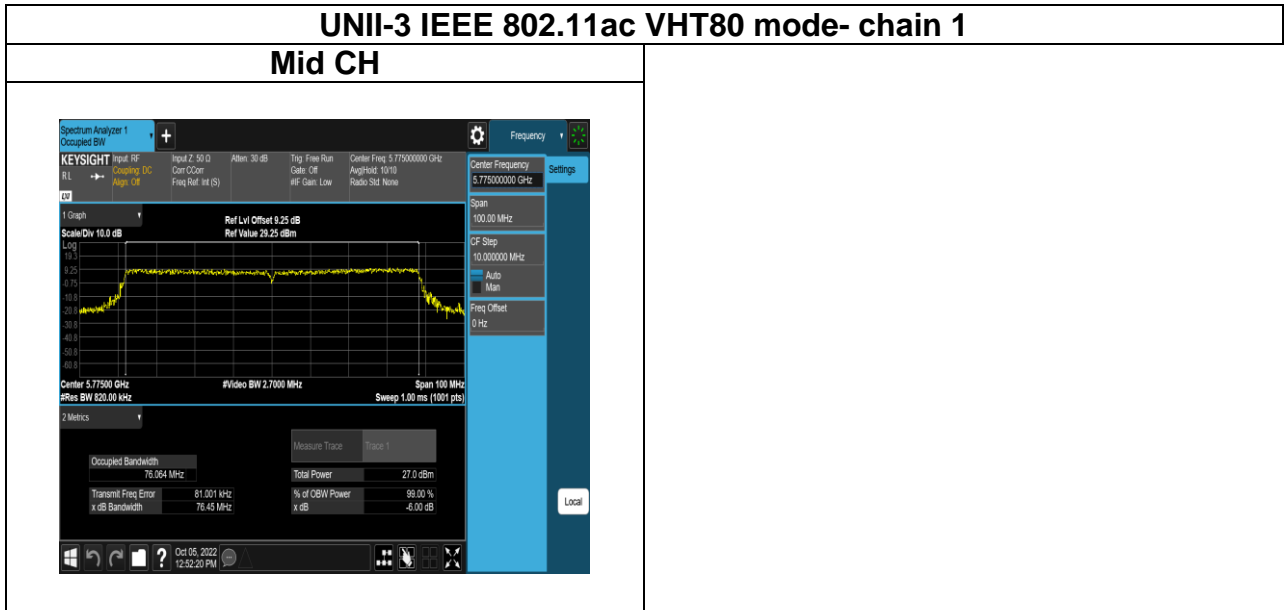
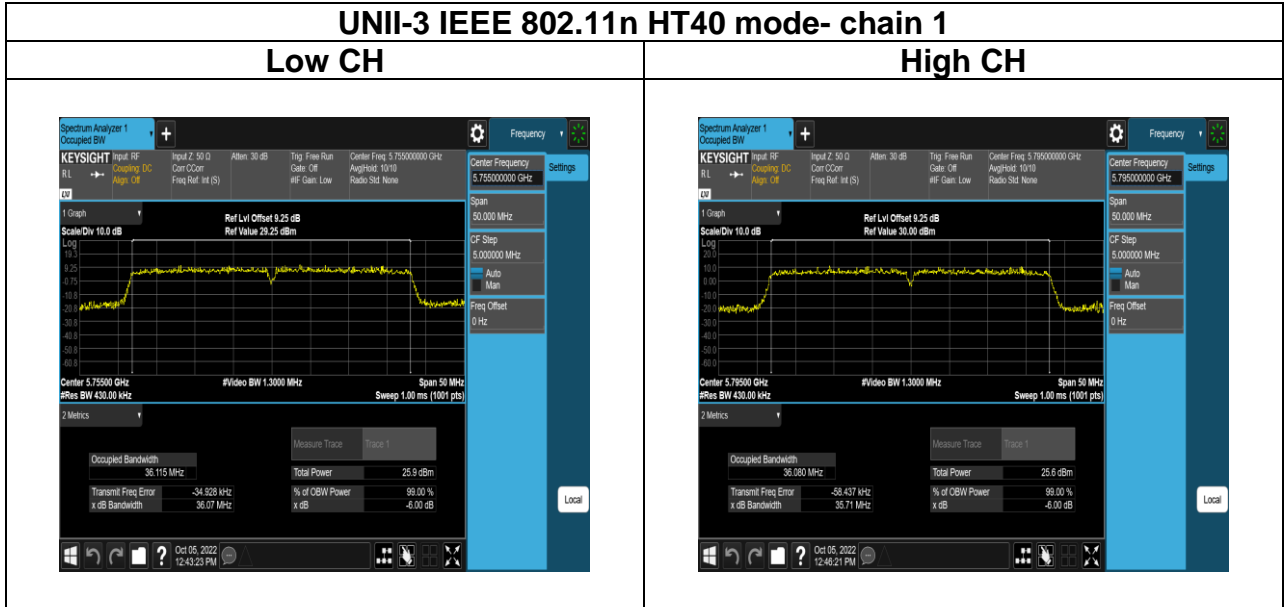
High CH



Report No.: TMWK2209003822KR



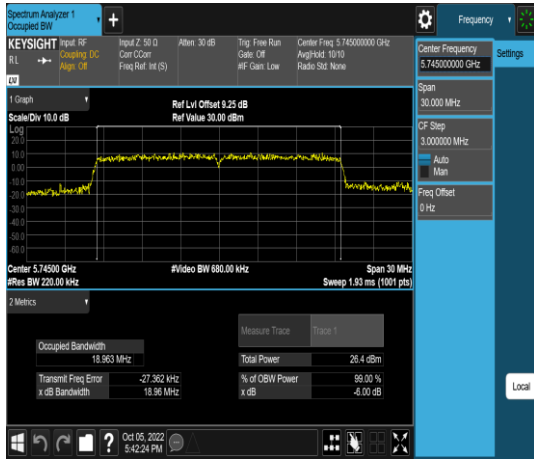
Report No.: TMWK2209003822KR



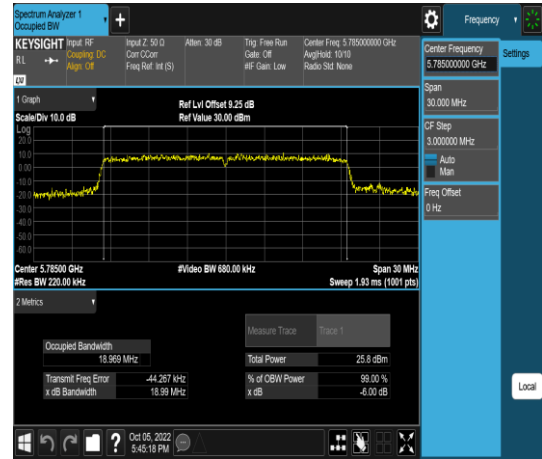
Report No.: TMWK2209003822KR

UNII-3 IEEE 802.11ax HE20 mode- chain 1

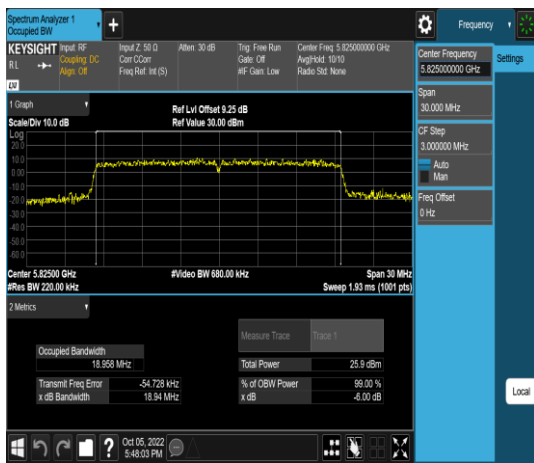
Low CH



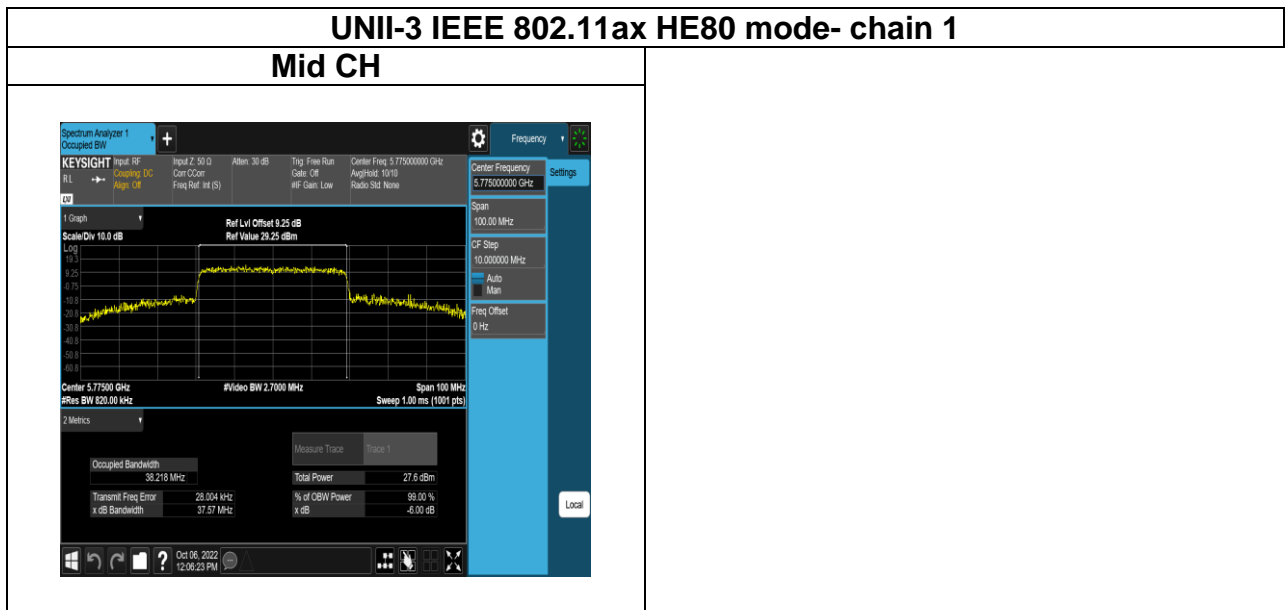
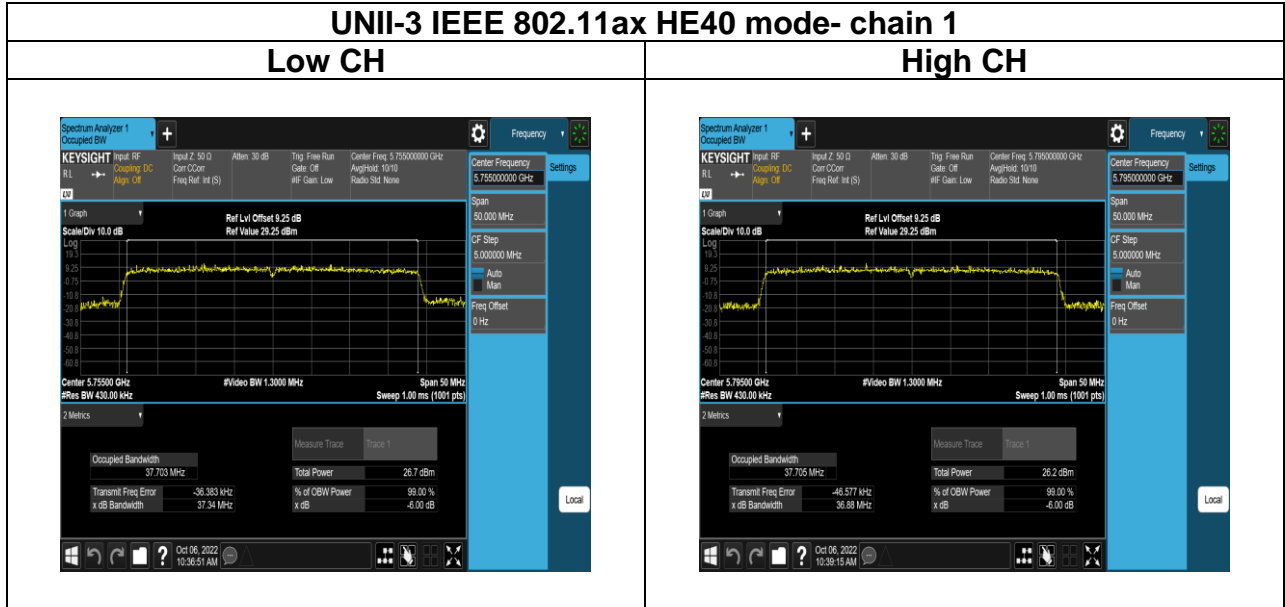
Mid CH



High CH



Report No.: TMWK2209003822KR



4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.407 (a)(1) and 15.407(a)(3),

FCC:

UNII-1 :

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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(iv) For client devices, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-3:

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-1 Limit	<input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 30dBm <input type="checkbox"/> Antenna with DG greater than 6 dBi : [Limit = 24 – (DG – 6)]
UNII-3 Limit	<input type="checkbox"/> Antenna not exceed 6 dBi : 30dBm <input checked="" type="checkbox"/> Antenna with DG greater than 6 dBi : [Limit = 30 – (DG – 6)]

Report No.: TMWK2209003822KR

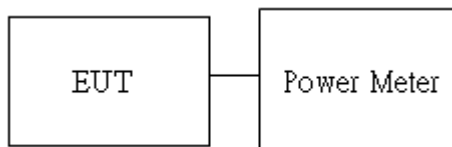
4.3.2 Test Procedure

Test method Refer as KDB 789033 D02, Section E.3.b for BW 20MHz and 40MHz, E.2.b for BW 80MHz.

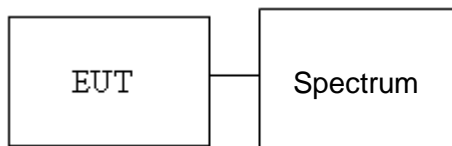
1. The EUT RF output connected to the power meter or spectrum by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Average output power. in the test report.

4.3.3 Test Setup

For BW 20MHz and 40MHz



For BW 80MHz



Report No.: TMWK2209003822KR

4.3.4 Test Result

Temperature: 22 ~ 25.5°C

Test date: October 5 ~ 19, 2022

Humidity: 48 ~ 52% RH

Tested by: David Li

802.11a_2TX

CH	Frequency (MHz)	Data Rate	Power set	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
				Ch0	Ch1				
36	5180	6	9	7.17	6.82	10.03	10.069	30	PASS
44	5220	6	9	7.23	6.78	10.05	10.116	30	PASS
48	5240	6	9	7.39	6.96	10.22	10.520	30	PASS
149	5745	6	9	8.58	8.43	11.54	14.256	30	PASS
157	5785	6	9	8.68	8.61	11.68	14.723	30	PASS
165	5825	6	9	8.9	8.63	11.80	15.136	30	PASS

802.11n_HT20_2TX

CH	Frequency (MHz)	Data Rate	Power set	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
				Ch0	Ch1				
36	5180	MCS0	9	7.38	6.92	10.22	10.520	30	PASS
44	5220	MCS0	9	7.38	7.11	10.31	10.740	30	PASS
48	5240	MCS0	9	7.29	6.8	10.11	10.257	30	PASS
149	5745	MCS0	9	8.52	8.46	11.55	14.289	30	PASS
157	5785	MCS0	9	8.86	8.74	11.86	15.346	30	PASS
165	5825	MCS0	9	9.04	8.91	12.04	15.996	30	PASS

802.11n_HT40_2TX

CH	Frequency (MHz)	Data Rate	Power set	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
				Ch0	Ch1				
38	5190	MCS0	9	7.41	7.15	10.39	10.940	30	PASS
46	5230	MCS0	9	7.64	7.1	10.49	11.194	30	PASS
151	5755	MCS0	9	8.78	8.72	11.86	15.346	30	PASS
159	5795	MCS0	9	8.92	8.81	11.98	15.776	30	PASS

802.11ac_VHT20_2TX

CH	Frequency (MHz)	Data Rate	Power set	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
				Ch0	Ch1				
36	5180	MCS0	9	7.11	6.71	9.95	9.886	30	PASS
44	5220	MCS0	9	7.26	6.77	10.06	10.139	30	PASS
48	5240	MCS0	9	7.23	6.71	10.02	10.046	30	PASS
149	5745	MCS0	9	8.32	8.23	11.31	13.521	30	PASS
157	5785	MCS0	9	8.67	8.72	11.73	14.894	30	PASS
165	5825	MCS0	9	8.66	8.53	11.63	14.555	30	PASS

802.11ac_VHT40_2TX

CH	Frequency (MHz)	Data Rate	Power set	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
				Ch0	Ch1				
38	5190	MCS0	9	7.45	7.06	10.32	10.765	30	PASS
46	5230	MCS0	9	7.66	7.05	10.43	11.041	30	PASS
151	5755	MCS0	9	8.74	8.66	11.76	14.997	30	PASS
159	5795	MCS0	9	8.92	8.73	11.89	15.453	30	PASS

802.11ac_VHT80_2TX

CH	Frequency (MHz)	Data Rate	Power set	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
				Ch0	Ch1				
42	5210	MCS0	9.5	7.24	6.05	9.78	9.506	30	PASS
155	5775	MCS0	9	8.54	8.22	11.47	14.028	30	PASS

802.11ax_HE20_2TX

CH	Frequency (MHz)	Data Rate	RU config.	Power set	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
					Ch0	Ch1				
36	5180	MCS0	full	9	7.2	6.8	10.05	10.116	30	PASS
		MCS0	26/0	9	4.54	4.24	7.44	5.546	30	PASS
		MCS0	52/37	9	6.66	6.31	9.53	8.974	30	PASS
		MCS0	106/53	9	7.15	6.67	9.96	9.908	30	PASS
44	5220	MCS0	full	9	7.11	6.71	9.96	9.908	30	PASS
48	5240	MCS0	full	9	7.27	6.73	10.05	10.116	30	PASS
149	5745	MCS0	full	9	8.42	8.28	11.40	13.804	30	PASS
		MCS0	26/0	9	5.98	5.94	9.01	7.962	30	PASS
		MCS0	52/37	9	7.94	7.83	10.93	12.388	30	PASS
		MCS0	106/53	9	8.33	8.23	11.33	13.583	30	PASS
157	5785	MCS0	full	9	8.56	8.44	11.55	14.289	30	PASS
165	5825	MCS0	full	9	8.67	8.56	11.66	14.655	30	PASS
		MCS0	26/8	9	6.09	6.12	9.15	8.222	30	PASS
		MCS0	52/40	9	8.26	8.27	11.31	13.521	30	PASS
		MCS0	106/54	9	8.63	8.49	11.61	14.488	30	PASS

802.11ax_HE40_2TX

CH	Frequency (MHz)	Data Rate	RU config.	Power set	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
					Ch0	Ch1				
38	5190	MCS0	full	9	7.38	6.89	10.22	10.520	30	PASS
		MCS0	242/61	9	7.32	6.79	10.14	10.328	30	PASS
46	5230	MCS0	full	9	7.41	7.05	10.31	10.740	30	PASS
151	5755	MCS0	full	9	8.68	8.75	11.79	15.101	30	PASS
		MCS0	242/61	9	8.66	8.59	11.70	14.791	30	PASS
159	5795	MCS0	full	9	8.92	8.71	11.89	15.453	30	PASS
		MCS0	242/62	9	8.8	8.67	11.81	15.171	30	PASS

802.11ax_HE80_2TX

CH	Frequency (MHz)	Data Rate	RU config.	Power set	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
					Ch0	Ch1				
42	5210	MCS0	full	9	6.79	6.26	9.67	9.268	30	PASS
		MCS0	484/65	9	6.64	5.88	9.41	8.730	30	PASS
155	5775	MCS0	full	9	8.57	8.56	11.70	14.791	30	PASS
		MCS0	484/65	9	8.16	8	11.21	13.213	30	PASS
		MCS0	484/66	9	8.44	8.57	11.64	14.588	30	PASS

Report No.: TMWK2209003822KR

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.407 (a)(1), 15.407(a)(2) and 15.407(a)(3)

UNII-1:

FCC: The maximum power spectral density shall not exceed 11 dBm in any 1 MHz band.

UNII-3:

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

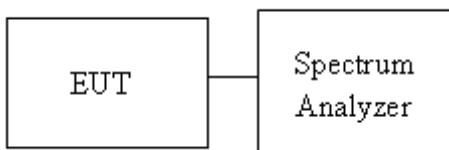
UNII-1 Limit	<input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 11 dBm/MHz <input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 10 dBm/MHz for IC <input type="checkbox"/> Antenna with DG greater than 6 dBi : [Limit = 11 – (DG – 6)]
UNII-3 Limit	<input type="checkbox"/> Antenna not exceed 6 dBi : 30 dBm/500kHz <input checked="" type="checkbox"/> Antenna with DG greater than 6 dBi : [Limit = 30 – (DG – 6)]

4.4.2 Test Procedure

Test method Refer as KDB 789033 D02

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. UNII-1 SA set RBW = 1MHz, VBW = 3MHz and Detector = RMS, to measurement Power Density.
4. UNII-3, SA set RBW = 300kHz, VBW = 1MHz and Detector = RMS, to measurement Power Density
5. The path loss and Duty Factor were compensated to the results for each measurement by SA.
6. Mark the maximum level.
7. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup



Report No.: TMWK2209003822KR

4.4.4 Test Result

Temperature: 22 ~ 25.5°C

Test date: October 5 ~ 19, 2022

Humidity: 48 ~ 52% RH

Tested by: David Li

POWER DENSITY 802.11a MODE							
Frequency (MHz)	Ch0 PSD (dBm/MHz)	Ch1 PSD (dBm/MHz)	Duty Factor (dB)	Total Corr'd PSD(dBm/MHz)		Limit	Margin (dB)
5180	-4.654	-6.015	0.000	-2.271		17.00 dBm/MHz	-19.27
5220	-4.832	-6.159	0.000	-2.435		17.00 dBm/MHz	-19.43
5240	-4.611	-5.921	0.000	-2.206		17.00 dBm/MHz	-19.21
Frequency (MHz)	Ch0 PSD (dBm/300kHz)	Ch1 PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Total Corr'd PSD (dBm/500kHz)	Limit	Margin (dB)
5745	-7.641	-7.874	0.000	2.220	-2.526	30.00 dBm/500kHz	-32.53
5785	-7.792	-10.226	0.000	2.220	-3.610	30.00 dBm/500kHz	-33.61
5825	-7.811	-8.228	0.000	2.220	-2.784	30.00 dBm/500kHz	-32.78

POWER DENSITY 802.11n HT20 MODE							
Frequency (MHz)	Ch0 PSD (dBm/MHz)	Ch1 PSD (dBm/MHz)	Duty Factor (dB)	Total Corr'd PSD(dBm/MHz)		Limit	Margin (dB)
5180	-5.267	-6.283	0.000	-2.735		17.00 dBm/MHz	-19.74
5220	-4.340	-5.707	0.000	-1.960		17.00 dBm/MHz	-18.96
5240	-4.089	-5.593	0.000	-1.766		17.00 dBm/MHz	-18.77
Frequency (MHz)	Ch0 PSD (dBm/300kHz)	Ch1 PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Total Corr'd PSD (dBm/500kHz)	Limit	Margin (dB)
5745	-7.704	-7.649	0.000	2.220	-2.446	30.00 dBm/500kHz	-32.45
5785	-7.902	-8.101	0.000	2.220	-2.770	30.00 dBm/500kHz	-32.77
5825	-8.024	-8.392	0.000	2.220	-2.974	30.00 dBm/500kHz	-32.97

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POWER DENSITY 802.11n HT40 MODE							
Frequency (MHz)	Ch0 PSD (dBm/MHz)	Ch1 PSD (dBm/MHz)	Duty Factor (dB)	Total Corr'd PSD(dBm/MHz)	Limit	Margin (dB)	
5190	-7.655	-8.445	0.100	-4.922	17.00 dBm/MHz	-21.92	
5230	-7.505	-8.555	0.100	-4.888	17.00 dBm/MHz	-21.89	
Frequency (MHz)	Ch0 PSD (dBm/300kHz)	Ch1 PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Total Corr'd PSD (dBm/500kHz)	Limit	Margin (dB)
5755	-10.094	-10.424	0.100	2.220	-4.926	30.00 dBm/500kHz	-34.93
5795	-10.524	-11.004	0.100	2.220	-5.427	30.00 dBm/500kHz	-35.43

POWER DENSITY 802.11ac VHT80 MODE							
Frequency (MHz)	Ch0 PSD (dBm/MHz)	Ch1 PSD (dBm/MHz)	Duty Factor (dB)	Total Corr'd PSD(dBm/MHz)	Limit	Margin (dB)	
5210	-9.530	-10.428	0.000	-6.946	17.00 dBm/MHz	-23.95	
Frequency (MHz)	Ch0 PSD (dBm/300kHz)	Ch1 PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Total Corr'd PSD (dBm/500kHz)	Limit	Margin (dB)
5775	-11.990	-13.402	0.000	2.220	-7.409	30.00 dBm/500kHz	-37.41

POWER DENSITY 802.11ax HE20 MODE								
Frequency (MHz)	RU config.	Ch0 PSD (dBm/MHz)	Ch1 PSD (dBm/MHz)	Duty Factor (dB)	Total Corr'd PSD(dBm/MHz)	Limit	Margin (dB)	
5180	full	-5.172	-6.224	0.000	-2.656	17.00 dBm/MHz	-19.66	
	26/0	1.156	0.210	0.000	3.719	17.00 dBm/MHz	-13.28	
	52/37	0.092	-1.102	0.000	2.546	17.00 dBm/MHz	-14.45	
	106/53	-2.153	-3.226	0.000	0.354	17.00 dBm/MHz	-16.65	
5220	full	-5.110	-6.023	0.000	-2.532	17.00 dBm/MHz	-19.53	
5240	full	-4.770	-5.815	0.000	-2.251	17.00 dBm/MHz	-19.25	
Frequency (MHz)	RU config.	Ch0 PSD (dBm/300kHz)	Ch1 PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Total Corr'd PSD (dBm/500kHz)	Limit	Margin (dB)
5745	full	-7.751	-7.825	0.000	2.220	-2.558	30.00 dBm/500kHz	-32.56
	26/0	-1.547	-1.217	0.000	2.220	3.851	30.00 dBm/500kHz	-26.15
	52/37	-1.352	-2.130	0.000	2.220	3.507	30.00 dBm/500kHz	-26.49
	106/53	-4.385	-4.805	0.000	2.220	0.640	30.00 dBm/500kHz	-29.36
5785	full	-8.236	-8.560	0.000	2.220	-3.165	30.00 dBm/500kHz	-33.16
5825	full	-8.056	-8.494	0.000	2.220	-3.039	30.00 dBm/500kHz	-33.04
	26/8	-1.262	-1.308	0.000	2.220	3.945	30.00 dBm/500kHz	-26.05
	52/40	-2.202	-2.683	0.000	2.220	2.794	30.00 dBm/500kHz	-27.21
	106/54	-4.355	-5.323	0.000	2.220	0.418	30.00 dBm/500kHz	-29.58

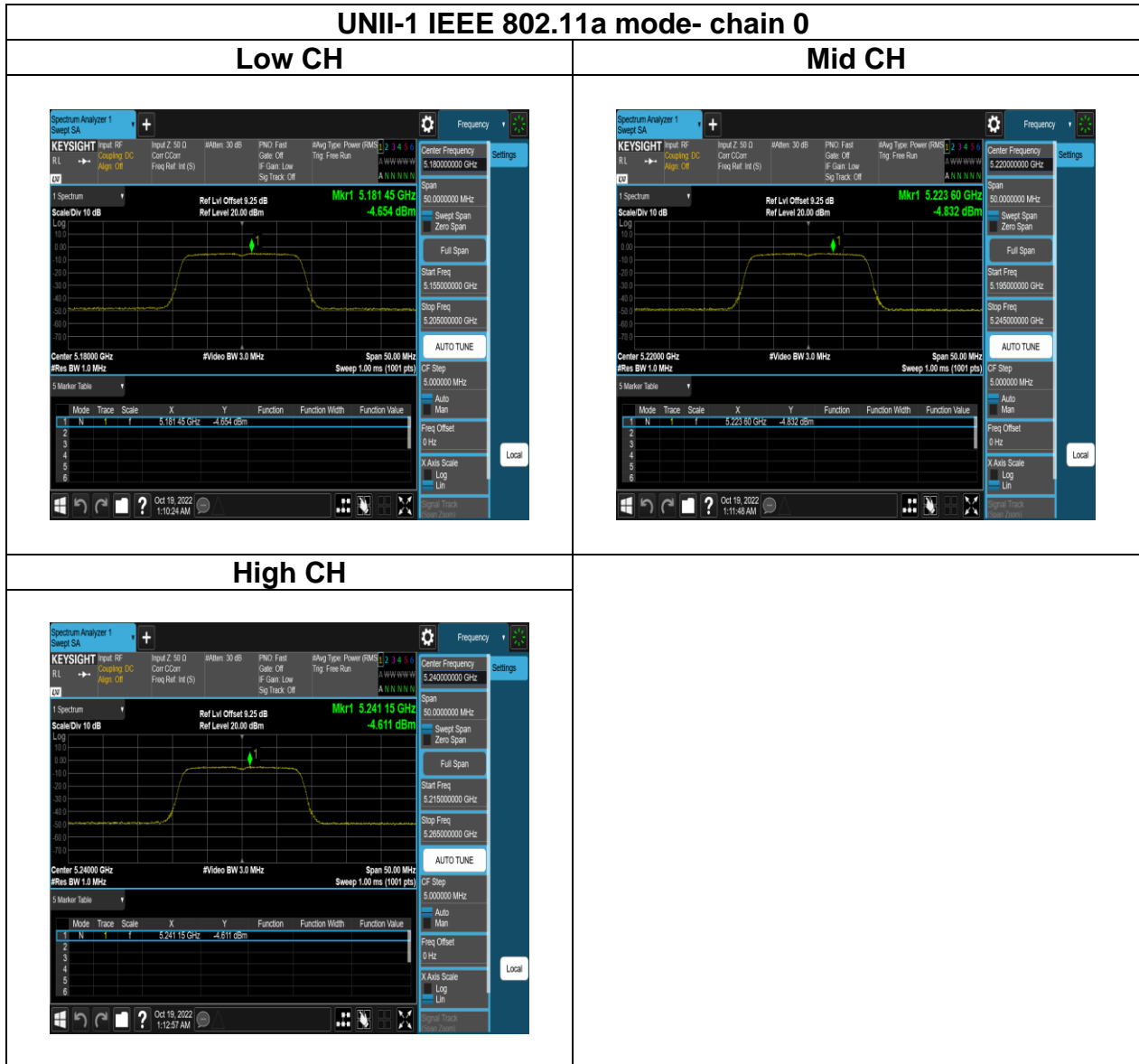
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POWER DENSITY 802.11ax HE40 MODE								
Frequency (MHz)	RU config.	Ch0 PSD (dBm/MHz)	Ch1 PSD (dBm/MHz)	Duty Factor (dB)	Total Corr'd PSD(dBm/MHz)	Limit	Margin (dB)	
5190	full	-8.262	-8.972	0.000	-5.592	17.00 dBm/MHz	-22.59	
	242/61	-4.955	-6.270	0.000	-2.553	17.00 dBm/MHz	-19.55	
5230	full	-7.714	-9.201	0.000	-5.384	17.00 dBm/MHz	-22.38	
Frequency (MHz)	RU config.	Ch0 PSD (dBm/300kHz)	Ch1 PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Total Corr'd PSD (dBm/500kHz)	Limit	Margin (dB)
5755	full	-10.769	-11.256	0.000	2.220	-5.775	30.00 dBm/500kHz	-35.78
	242/61	-7.497	-7.949	0.000	2.220	-2.487	30.00 dBm/500kHz	-32.49
5795	full	-11.072	-11.632	0.000	2.220	-6.113	30.00 dBm/500kHz	-36.11
	242/62	-8.155	-8.506	0.000	2.220	-3.097	30.00 dBm/500kHz	-33.10

POWER DENSITY 802.11ax HE80 MODE								
Frequency (MHz)	RU config.	Ch0 PSD (dBm/MHz)	Ch1 PSD (dBm/MHz)	Duty Factor (dB)	Total Corr'd PSD(dBm/MHz)	Limit	Margin (dB)	
5210	full	-10.420	-10.629	0.120	-7.393	17.00 dBm/MHz	-24.39	
	484/65	-8.869	-7.697	0.120	-5.113	17.00 dBm/MHz	-22.11	
Frequency (MHz)	RU config.	Ch0 PSD (dBm/300kHz)	Ch1 PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Total Corr'd PSD (dBm/500kHz)	Limit	Margin (dB)
5775	full	-12.320	-13.723	0.120	2.220	-7.615	30.00 dBm/500kHz	-37.61
	484/65	-9.153	-12.029	0.120	2.220	-5.007	30.00 dBm/500kHz	-35.01
	484/66	-12.779	-10.930	0.120	2.220	-6.407	30.00 dBm/500kHz	-36.41

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Test Plots



UNII-1 IEEE 802.11n HT20 mode- chain 0

Low CH



Mid CH



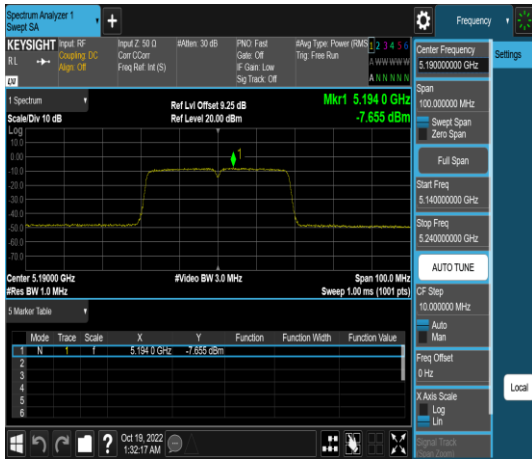
High CH



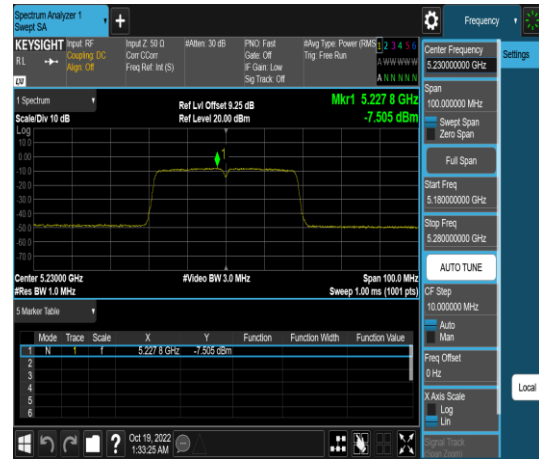
Report No.: TMWK2209003822KR

UNII-1 IEEE 802.11n HT40 mode- chain 0

Low CH



High CH



UNII-1 IEEE 802.11ac VHT80 mode- chain 0

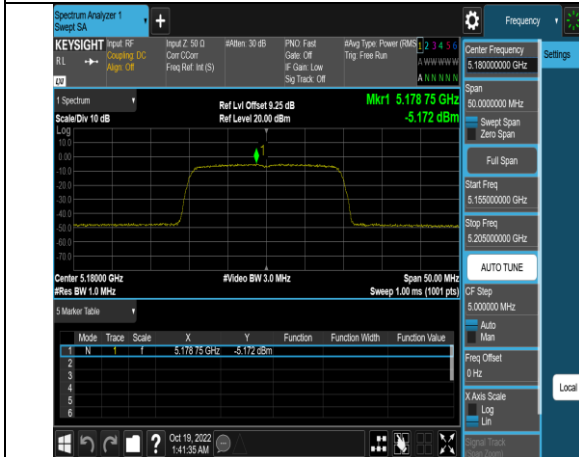
Mid CH



Report No.: TMWK2209003822KR

UNII-1 IEEE 802.11ax HE20 mode- chain 0

Low CH full



Low CH 26/0



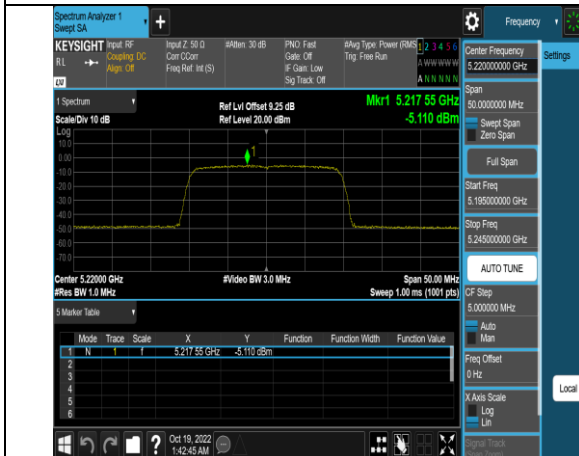
Low CH 52/37



Low CH 106/53



Mid CH full



High CH full

