

APPENDIX REPORT

Project No.	SHT2106104903EW	Radio Specification	WIFI 5G
Test sample No.	YPHT21061049004	Model No.	V8S1A11
Start test date	2021-08-16	Finish date	2021-08-26
Temperature	26.2°C	Humidity	29%
Test Engineer	Hailey Chen	Auditor	Xiaodong Zheo

Appendix clause	Test item	Result
A	Maximum Conducted Output Power	PASS
B	Maximum Power Spectral Density	PASS
C	26 dB Bandwidth	PASS
D	99% Occupy bandwidth	PASS
E	6 dB Bandwidth	PASS
F	Band Edge	PASS
G	Frequency stability	PASS

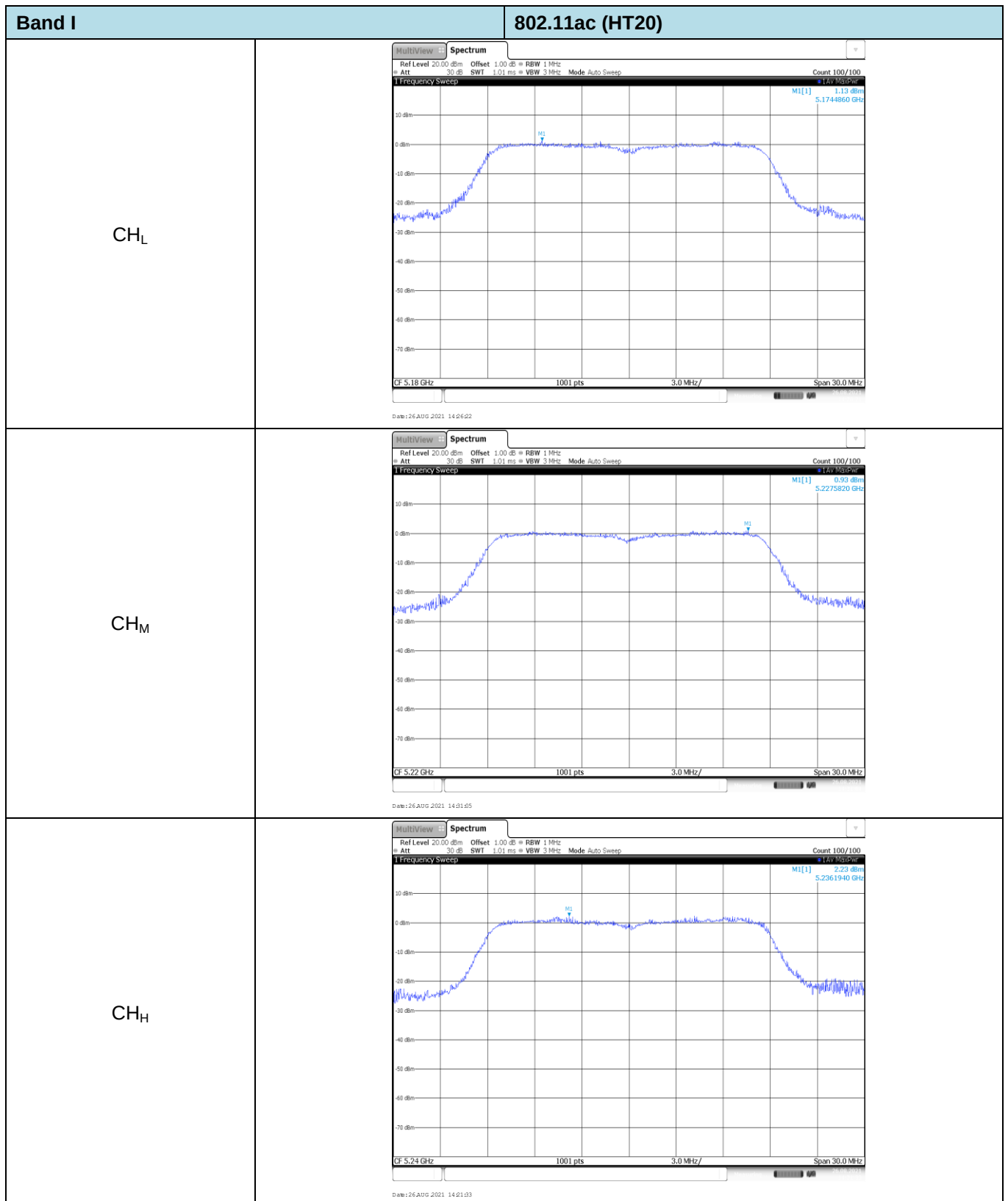
Appendix A: Maximum Conducted Output Power

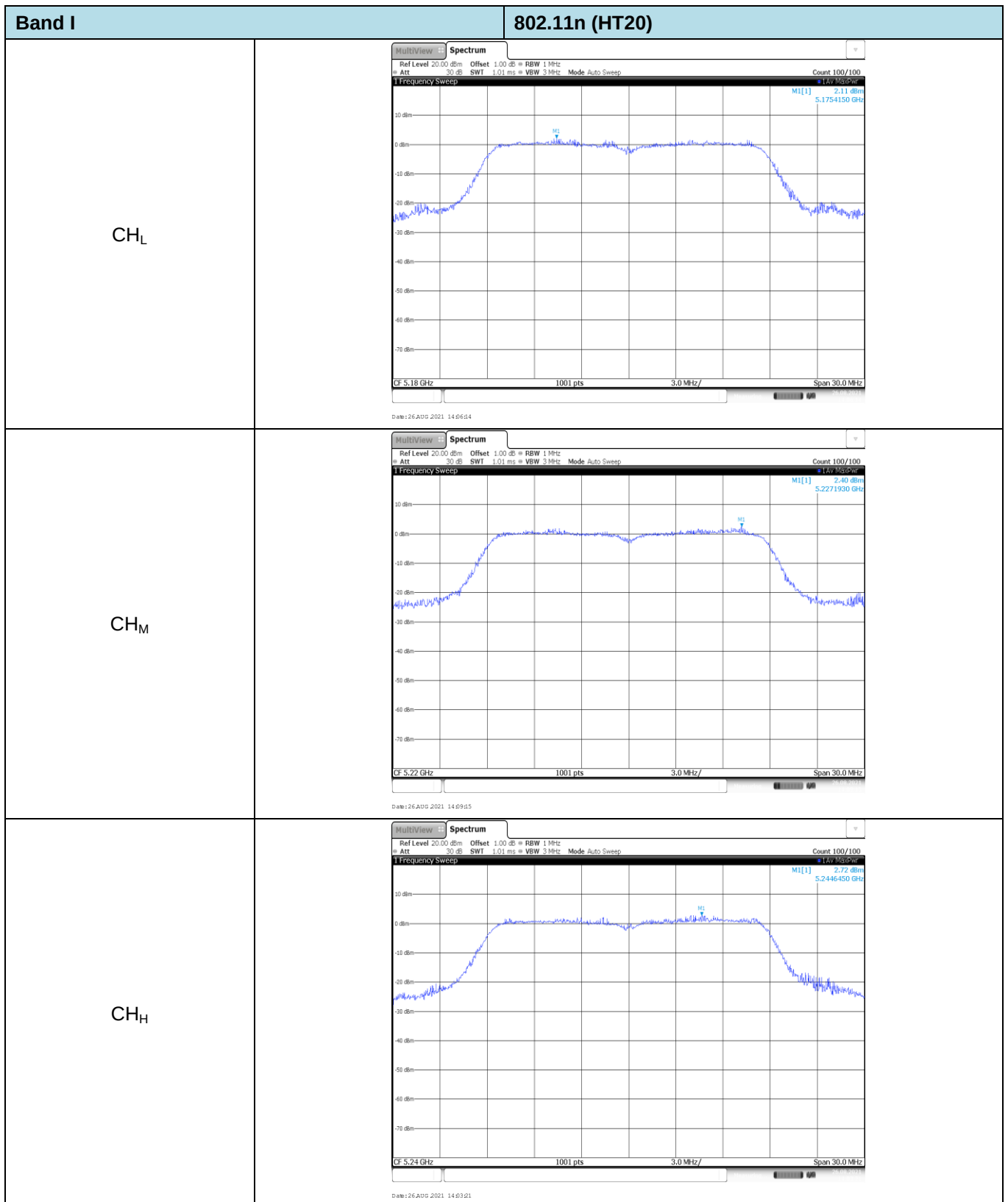
Band	Bandwidth (MHz)	Type	Channel	Reading (dBm)	Duty cycle (%)	Duty cycle factor (dB)	Conducted Output Power (dBm)	Limit (dBm)	Result
I	20	802.11ac	CH _L	11.09	94.53	0.24	11.33	24.00	Pass
			CH _M	11.81	94.53	0.24	12.05		
			CH _H	13.35	92.04	0.36	13.71		
		802.11n	CH _L	11.54	94.91	0.23	11.77	24.00	Pass
			CH _M	12.57	93.29	0.30	12.87		
			CH _H	13.65	92.83	0.32	13.97		
		802.11a	CH _L	11.23	94.10	0.26	11.49	24.00	Pass
			CH _M	12.49	96.88	0.14	12.63		
			CH _H	13.80	96.42	0.16	13.96		
	40	802.11ac	CH _L	10.19	85.94	0.66	10.85	24.00	Pass
			CH _H	11.80	85.21	0.70	12.50		
		802.11n	CH _L	10.29	85.79	0.67	10.96	24.00	Pass
			CH _H	11.94	85.11	0.70	12.64		
	80	802.11ac	CH _M	9.95	80.66	0.93	10.88	24.00	Pass
IV	20	802.11ac	CH _L	12.61	95.77	0.19	12.80	30.00	Pass
			CH _M	12.37	93.72	0.28	12.65		
			CH _H	10.53	94.12	0.26	10.79		
		802.11n	CH _L	12.32	93.29	0.30	12.62	30.00	Pass
			CH _M	11.86	91.67	0.38	12.24		
			CH _H	10.69	91.67	0.38	11.07		
		802.11a	CH _L	12.45	92.20	0.35	12.80	30.00	Pass
			CH _M	11.98	93.67	0.28	12.26		
			CH _H	10.82	92.20	0.35	11.17		
	40	802.11ac	CH _L	12.39	88.88	0.51	12.90	30.00	Pass
			CH _H	11.64	86.63	0.62	12.26		
		802.11n	CH _L	12.16	88.10	0.55	12.71	30.00	Pass
			CH _H	11.46	89.54	0.48	11.94		
	80	802.11ac	CH _M	12.42	80.77	0.93	13.35	30.00	Pass

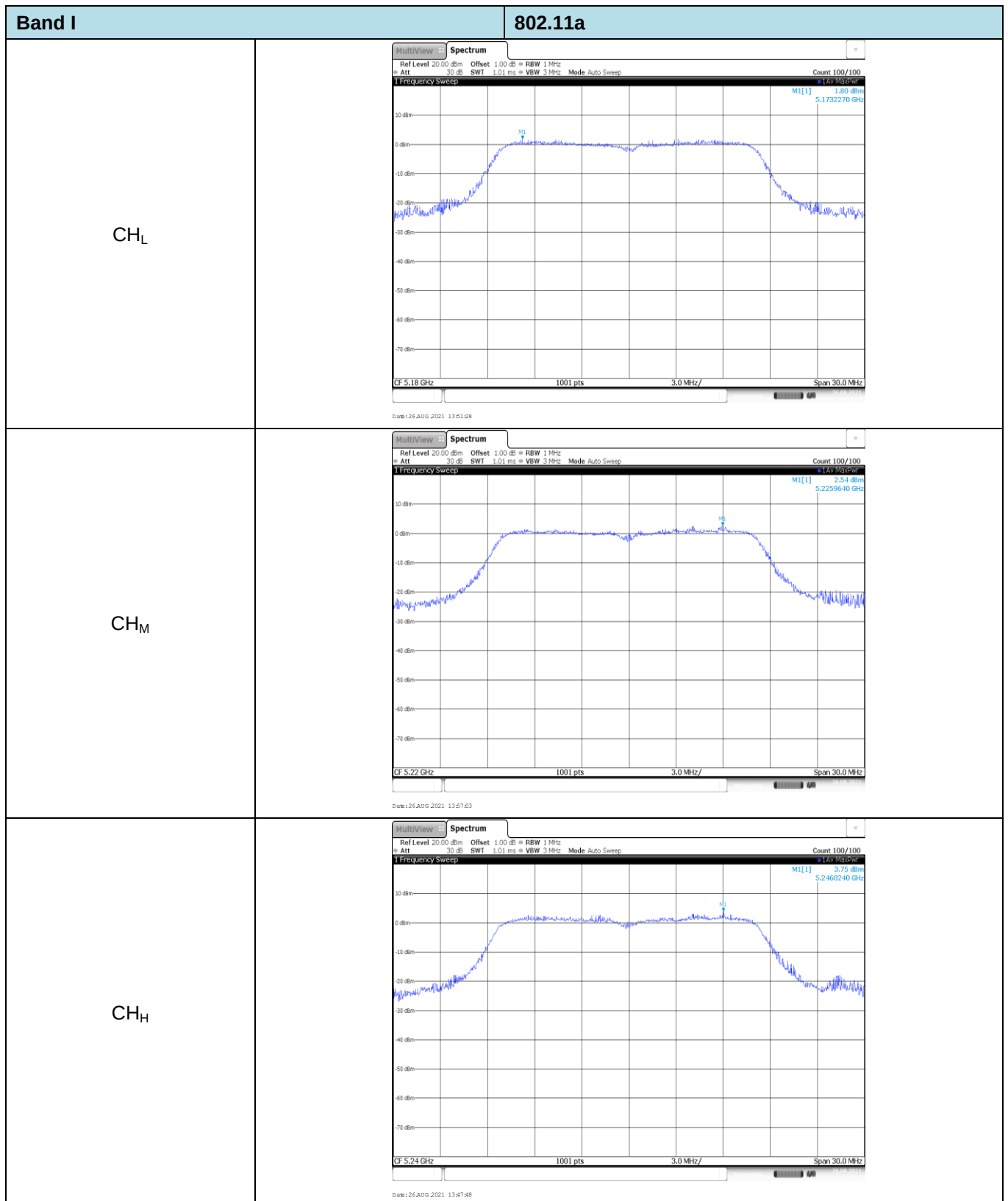
NOTE: duty cycle factor =10LOG(1/ duty cycle)

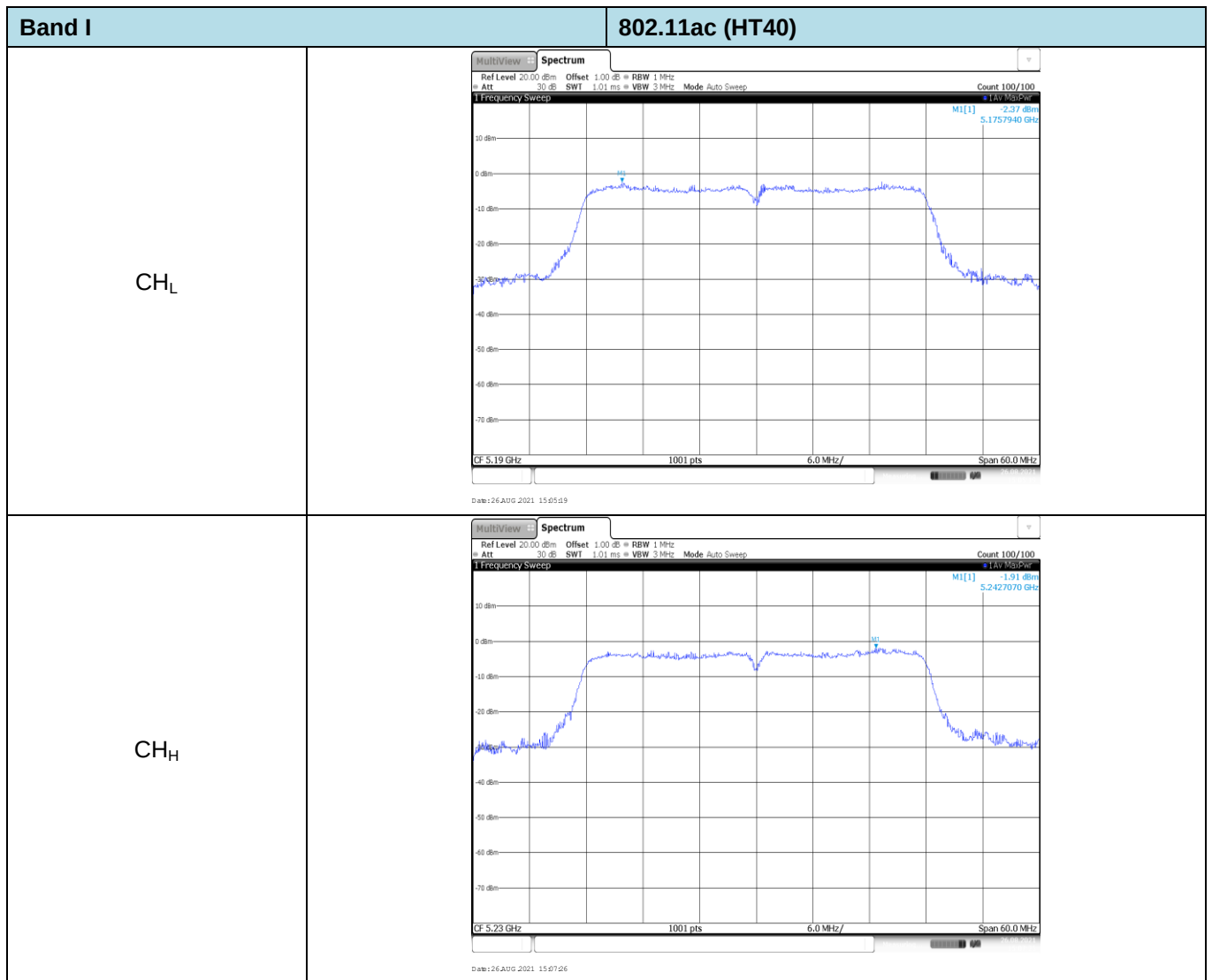
Appendix B: Maximum Power Spectral Density

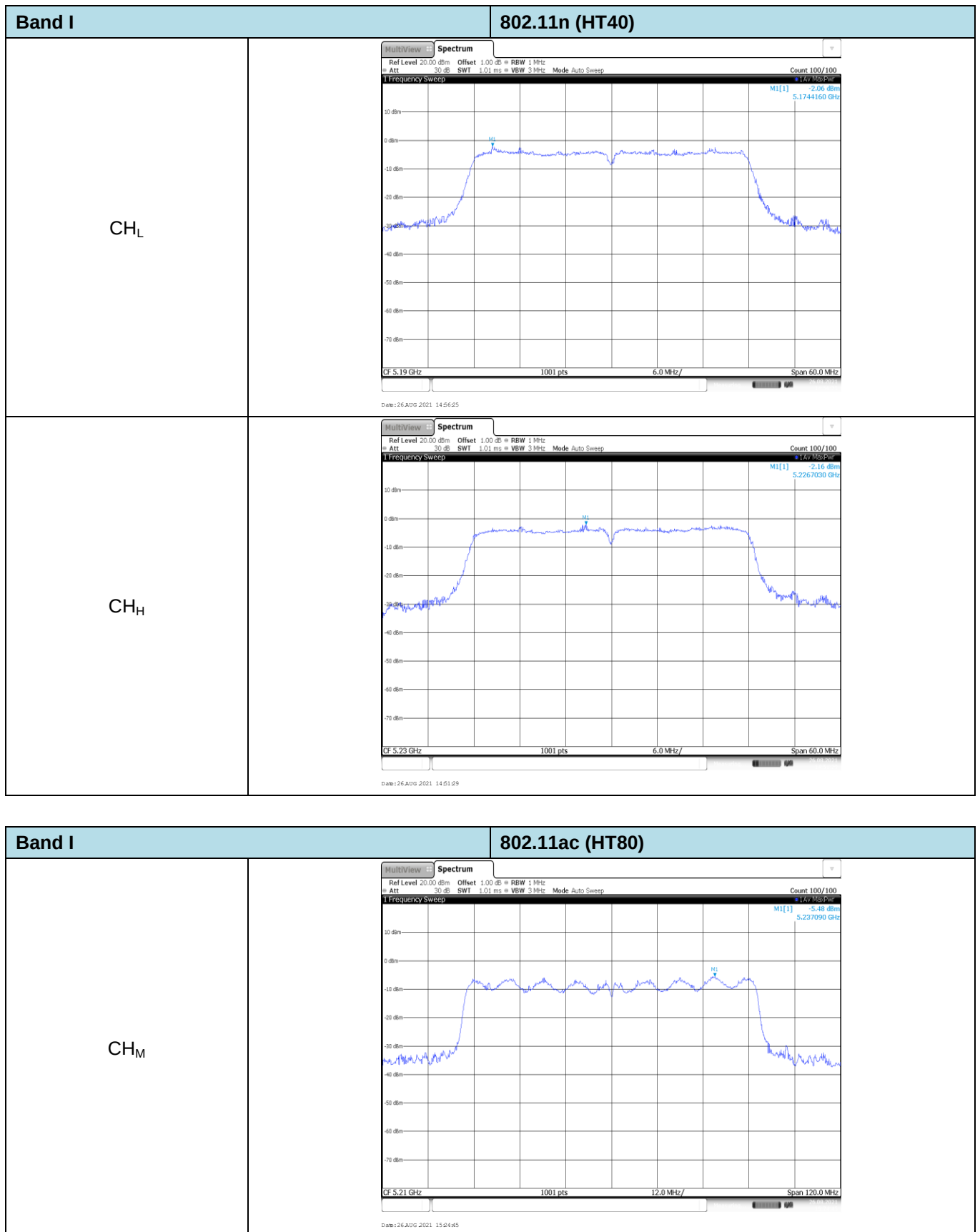
Band	Bandwidth (MHz)	Type	Channel	Reading (dBm)	Duty cycle (%)	Duty cycle factor (dB)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
I	20	802.11ac	CH _L	1.13	94.53	0.24	1.37	11.00	Pass
			CH _M	0.93	94.53	0.24	1.17		
			CH _H	2.23	92.04	0.36	2.59		
		802.11n	CH _L	2.11	94.91	0.23	2.34	11.00	Pass
			CH _M	2.40	93.29	0.30	2.70		
			CH _H	2.72	92.83	0.32	3.04		
		802.11a	CH _L	1.80	94.10	0.26	2.06	11.00	Pass
			CH _M	2.54	96.88	0.14	2.68		
			CH _H	3.75	96.42	0.16	3.91		
	40	802.11ac	CH _L	-2.37	85.94	0.66	-1.71	11.00	Pass
			CH _H	-1.91	85.21	0.70	-1.21		
		802.11n	CH _L	-2.06	85.79	0.67	-1.39	11.00	Pass
			CH _H	-2.16	85.11	0.70	-1.46		
	80	802.11ac	CH _M	-5.48	80.66	0.93	-4.55	11.00	Pass
Band	Bandwidth (MHz)	Type	Channel	Reading (dBm)	Duty cycle (%)	Duty cycle factor (dB)	Power Spectral Density (dBm/500K Hz)	Limit (dBm/500K Hz)	Result
IV	20	802.11ac	CH _L	0.62	95.77	0.19	0.81	30.00	Pass
			CH _M	0.14	93.72	0.28	0.42		
			CH _H	-1.58	94.12	0.26	-1.32		
		802.11n	CH _L	-0.03	93.29	0.30	0.27	30.00	Pass
			CH _M	0.22	91.67	0.38	0.60		
			CH _H	-1.02	91.67	0.38	-0.64		
		802.11a	CH _L	0.08	92.20	0.35	0.43	30.00	Pass
			CH _M	-0.09	93.67	0.28	0.19		
			CH _H	-1.47	92.20	0.35	-1.12		
	40	802.11ac	CH _L	-3.52	88.88	0.51	-3.01	30.00	Pass
			CH _H	-3.42	86.63	0.62	-2.80		
		802.11n	CH _L	-1.80	88.10	0.55	-1.25	30.00	Pass
			CH _H	-3.59	89.54	0.48	-3.11		
	80	802.11ac	CH _M	-4.84	80.77	0.93	-3.91	30.00	Pass

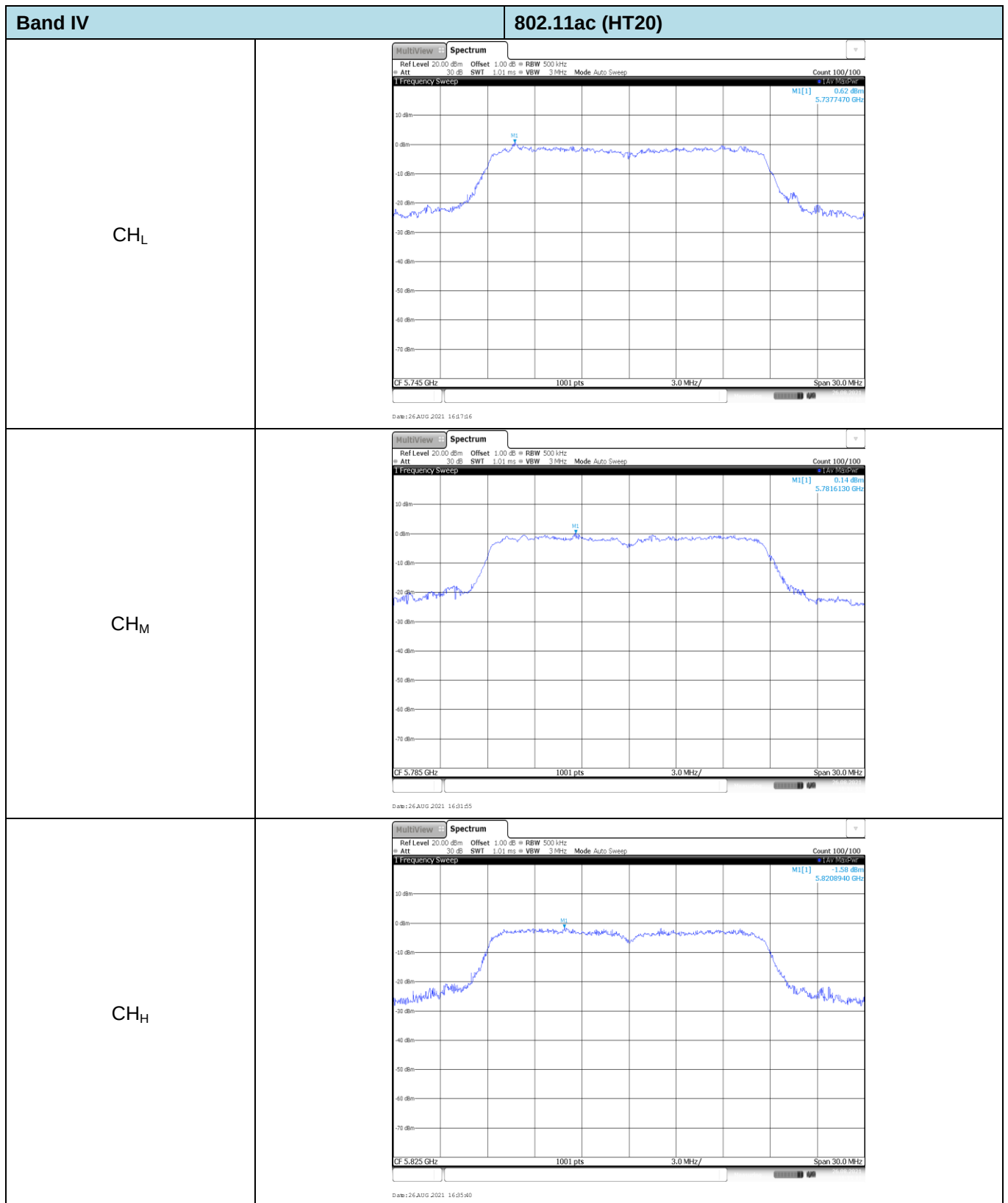


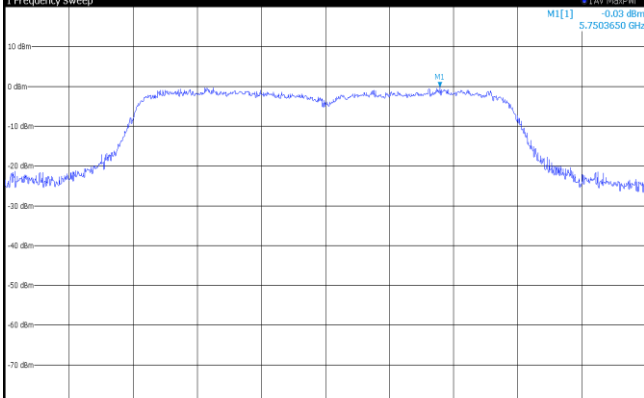
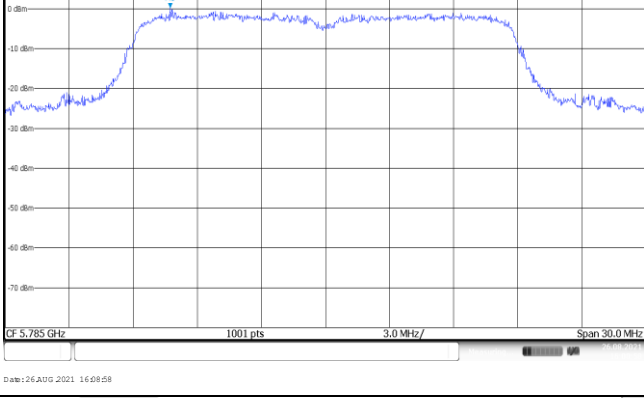
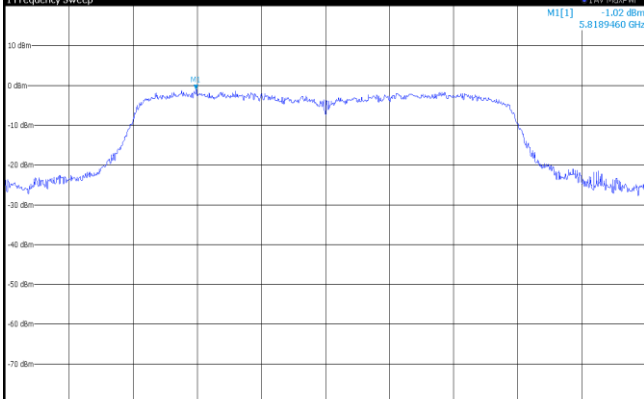


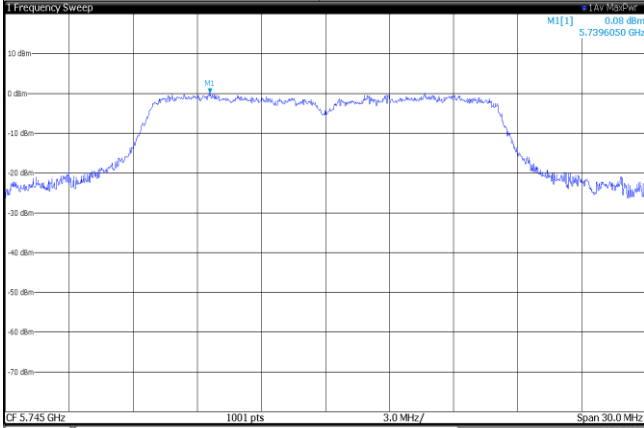
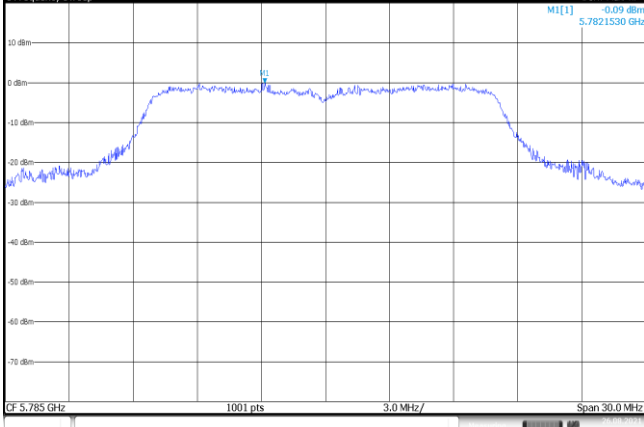
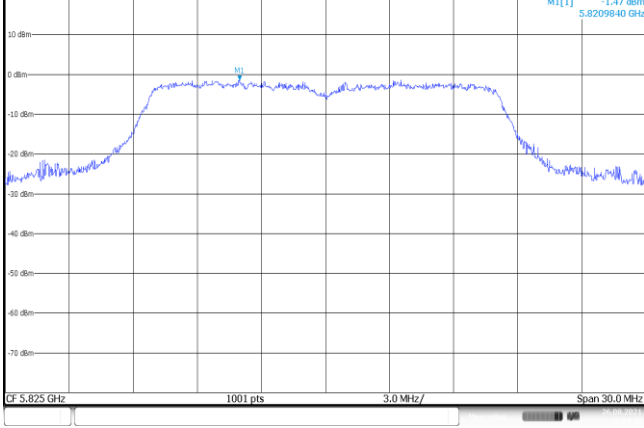




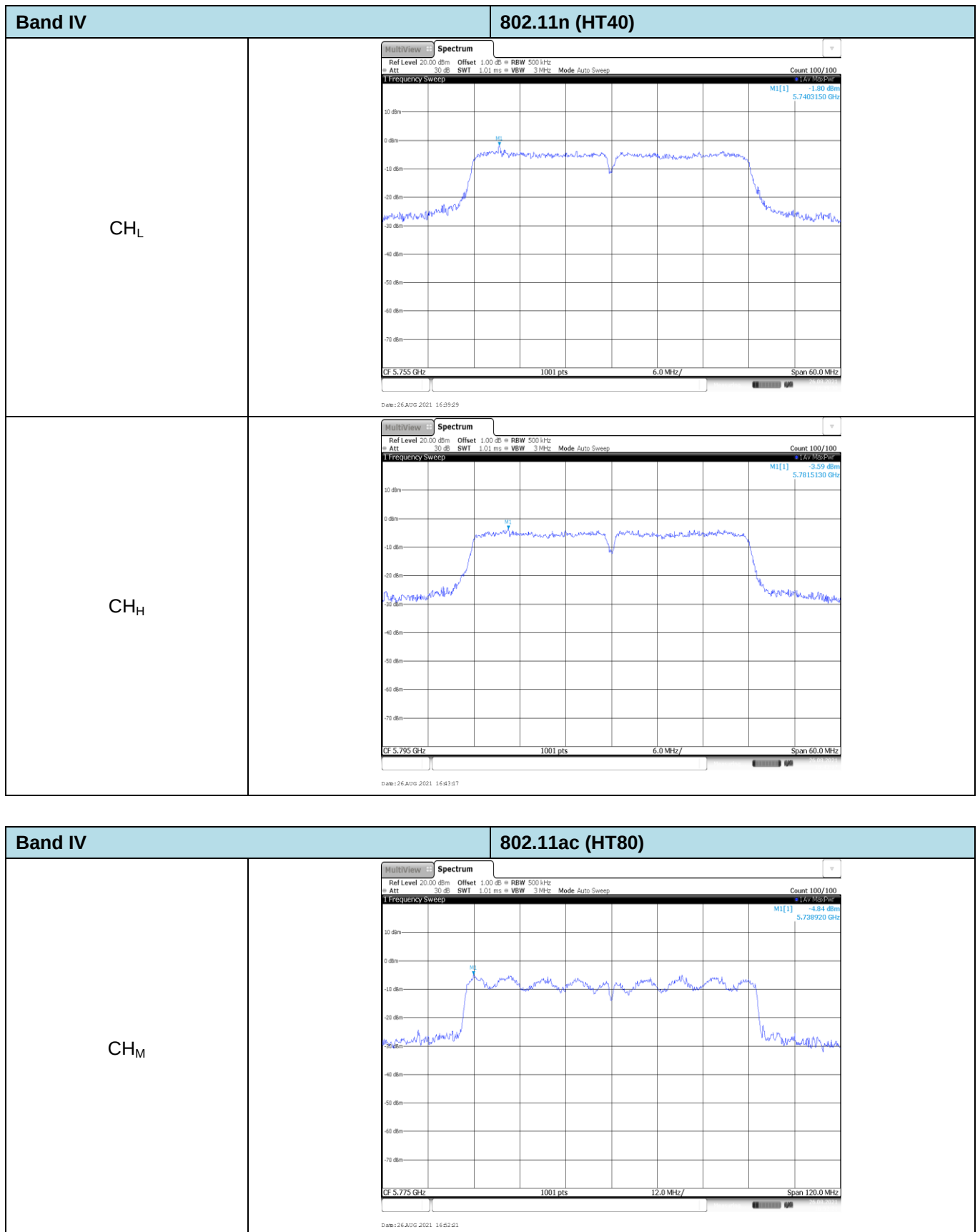




Band IV		802.11n (HT20)
CH _L	MultiView Spectrum Ref Level 20.00 dBm Att 30.0 dB Offset 1.00 dB RBW 500 kHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑TAT MSPwr Frequency Sweep M1[1] -0.03 dBm 5.7503650 GHz  CF 5.745 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 26.AUG.2021 16:06:12	
CH _M	MultiView Spectrum Ref Level 20.00 dBm Att 30.0 dB Offset 1.00 dB RBW 500 kHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑TAT MSPwr Frequency Sweep M1[1] 0.22 dBm 5.7777470 GHz  CF 5.785 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 26.AUG.2021 16:08:58	
CH _H	MultiView Spectrum Ref Level 20.00 dBm Att 30.0 dB Offset 1.00 dB RBW 500 kHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑TAT MSPwr Frequency Sweep M1[1] -1.02 dBm 5.8189460 GHz  CF 5.825 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 26.AUG.2021 16:12:19	

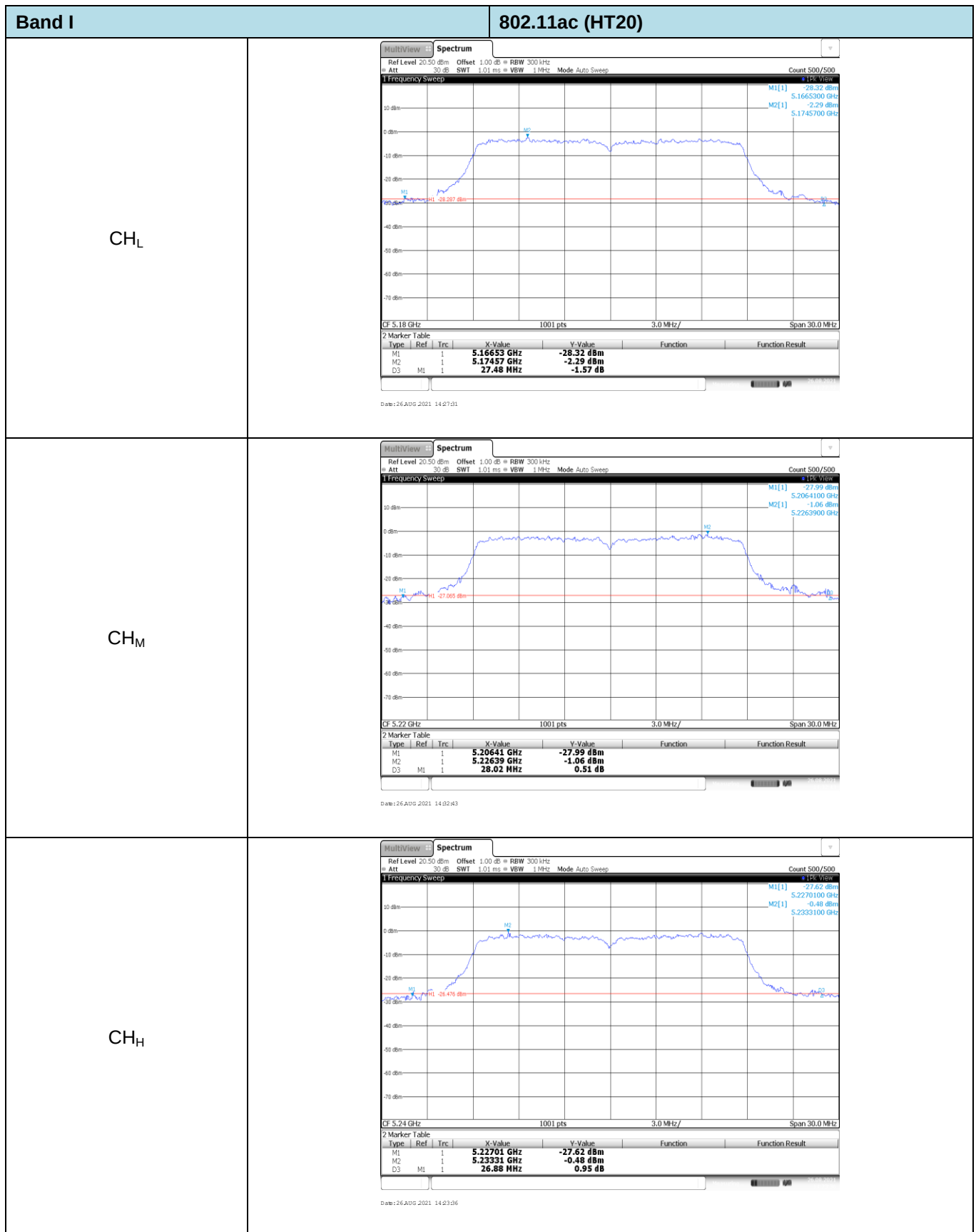
Band IV		802.11a
CH _L	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 500 kHz Att 30 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑ 1A7 MSPwr 1 Frequency Sweep M1[1] 0.08 dBm 5.7396050 GHz  CF 5.745 GHz1001 pts3.0 MHz/Span 30.0 MHz Date: 26.AUG.2021 15:57:47	
CH _M	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 500 kHz Att 30 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑ 1A7 MSPwr 1 Frequency Sweep M1[1] -0.09 dBm 5.7821530 GHz  CF 5.785 GHz1001 pts3.0 MHz/Span 30.0 MHz Date: 26.AUG.2021 16:00:00	
CH _H	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 500 kHz Att 30 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑ 1A7 MSPwr 1 Frequency Sweep M1[1] -1.47 dBm 5.8209840 GHz  CF 5.825 GHz1001 pts3.0 MHz/Span 30.0 MHz Date: 26.AUG.2021 16:03:08	

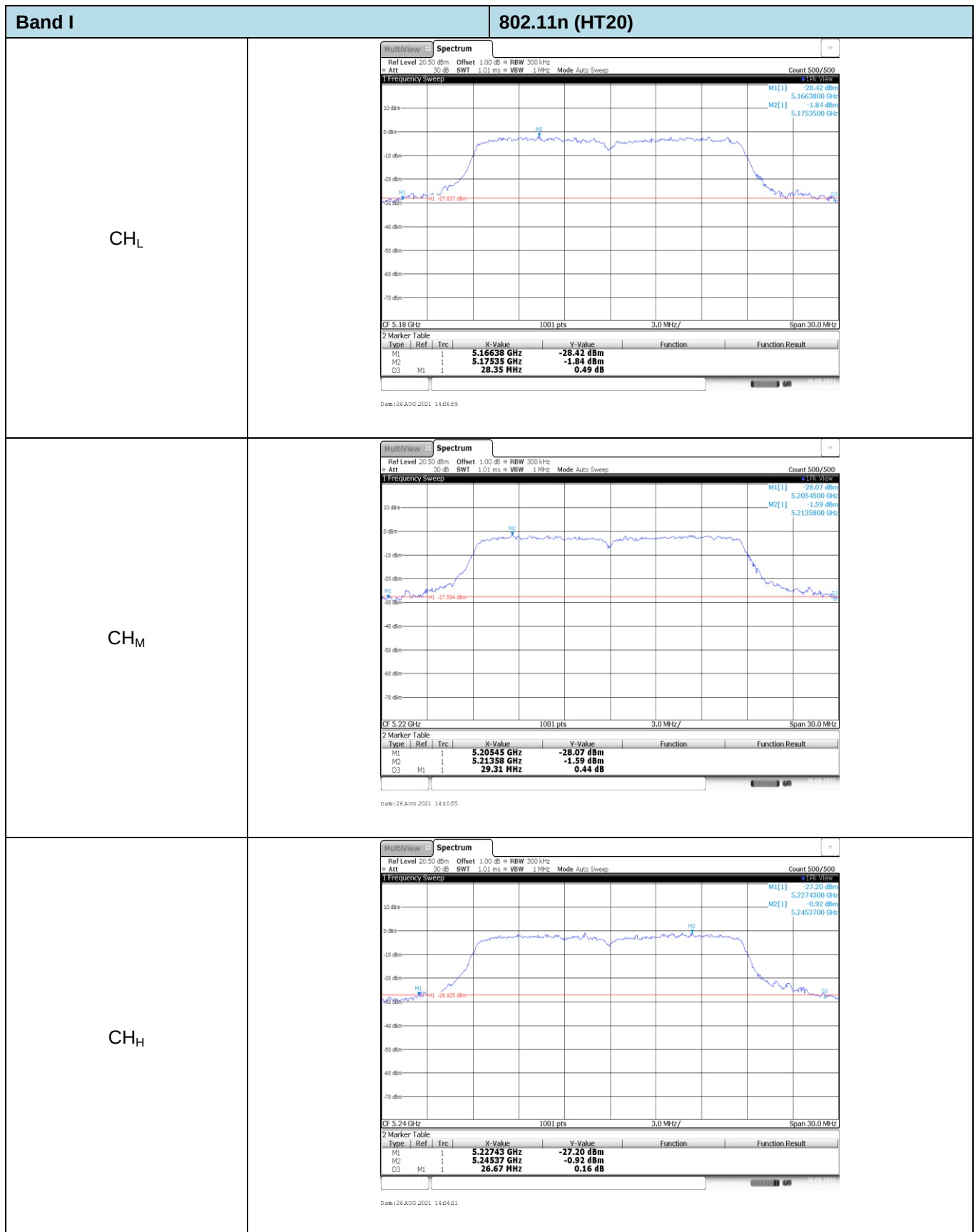
Band IV		802.11ac (HT40)
CH _L	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 500 kHz Att 30 dB SWF 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep MU[1] -3.52 dBm 5.7449900 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 5.755 GHz 1001 pts 6.0 MHz/ Span 60.0 MHz Date: 26.AUG.2021 16:45:46	
CH _H	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 500 kHz Att 30 dB SWF 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep MU[1] -3.42 dBm 5.7816330 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 5.795 GHz 1001 pts 6.0 MHz/ Span 60.0 MHz Date: 26.AUG.2021 16:48:59	

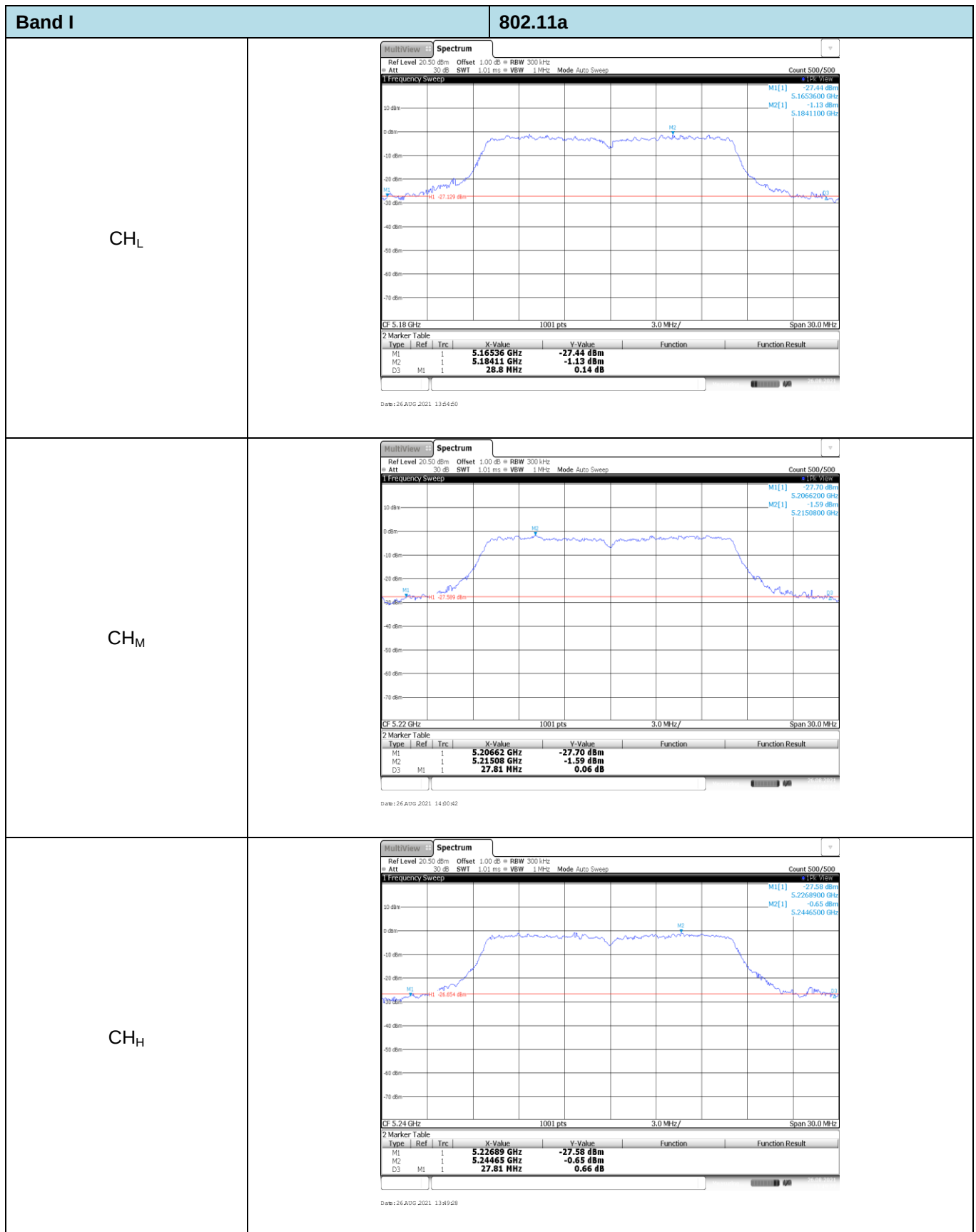


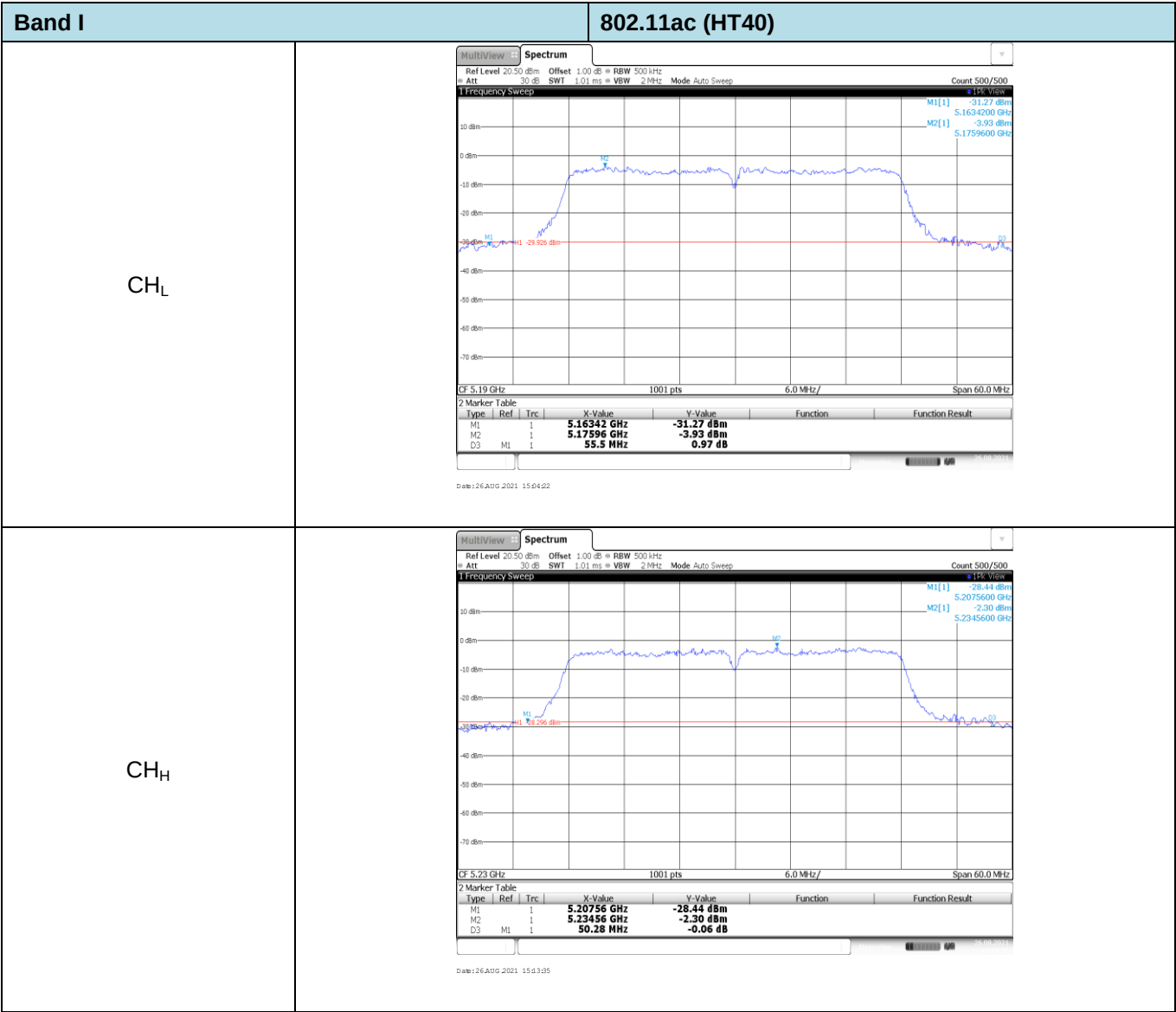
Appendix C: 26dB bandwidth

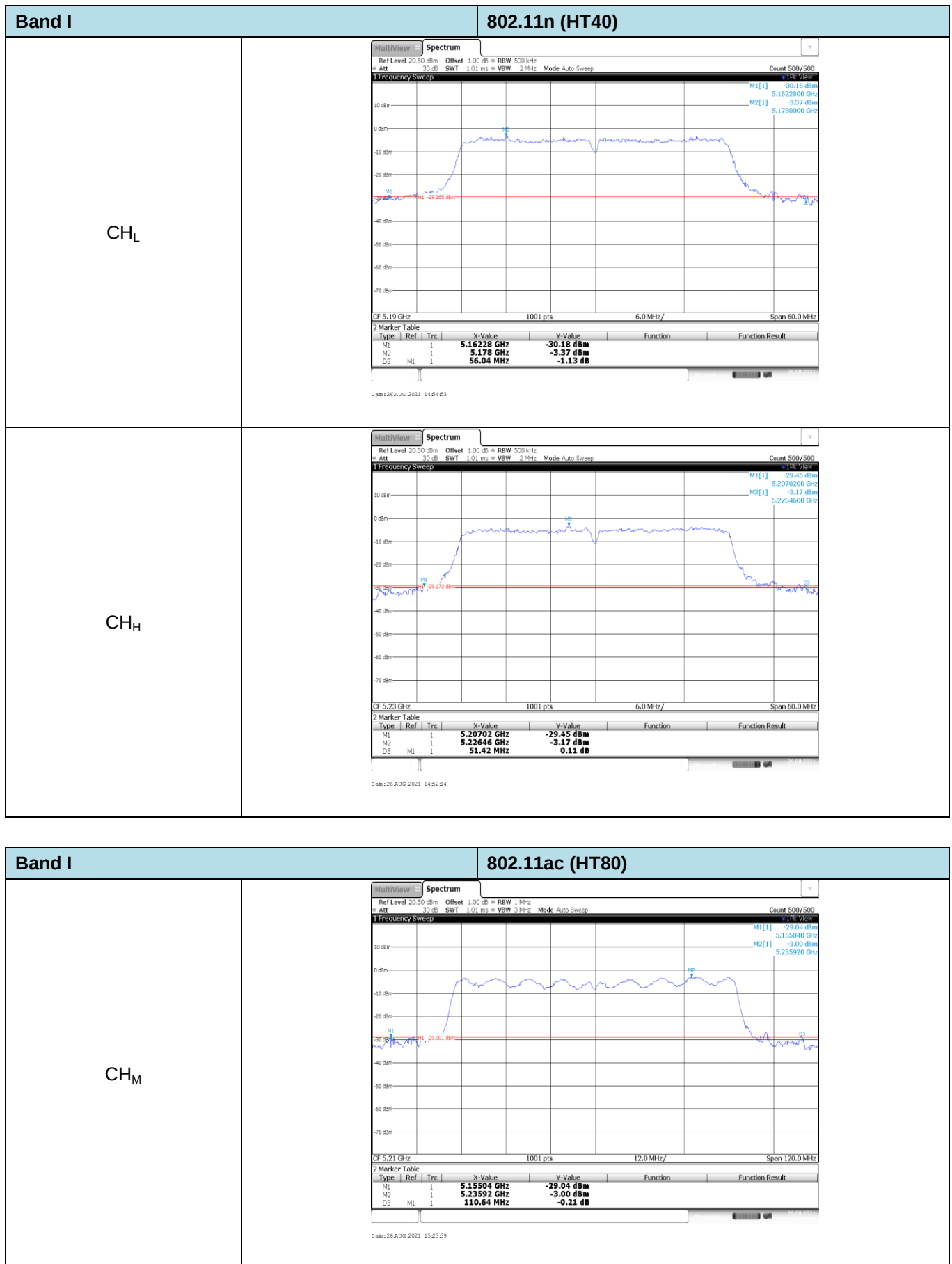
Band	Bandwidth (MHz)	Type	Channel	26dB bandwidth (MHz)	Result
I	20	802.11ac	CH _L	27.48	Pass
			CH _M	28.02	
			CH _H	26.88	
		802.11n	CH _L	28.35	Pass
			CH _M	29.31	
			CH _H	26.67	
		802.11a	CH _L	28.80	Pass
			CH _M	27.81	
			CH _H	27.81	
	40	802.11ac	CH _L	55.50	Pass
			CH _H	50.28	
		802.11n	CH _L	56.04	Pass
			CH _H	51.42	
	80	802.11ac	CH _M	110.64	Pass





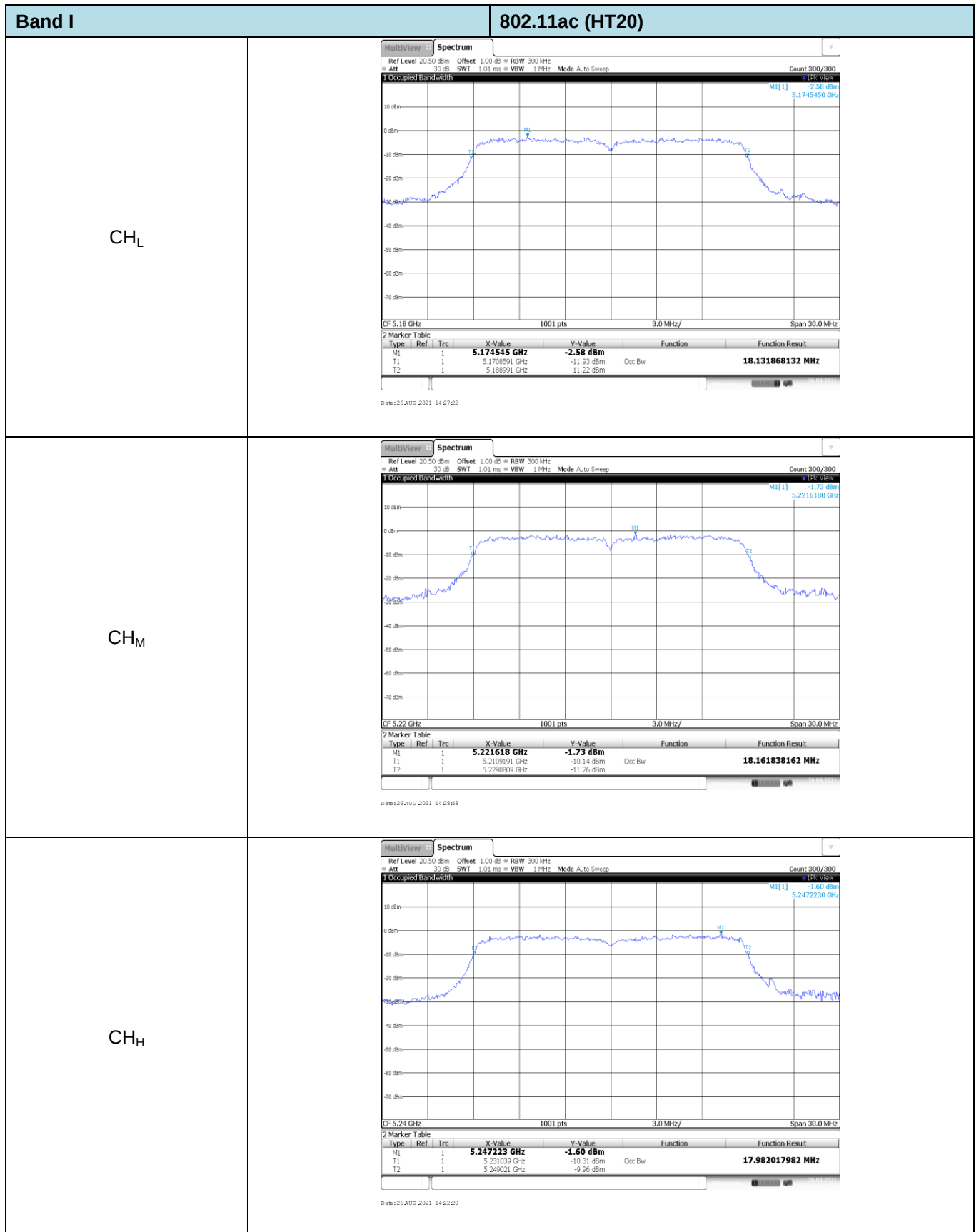


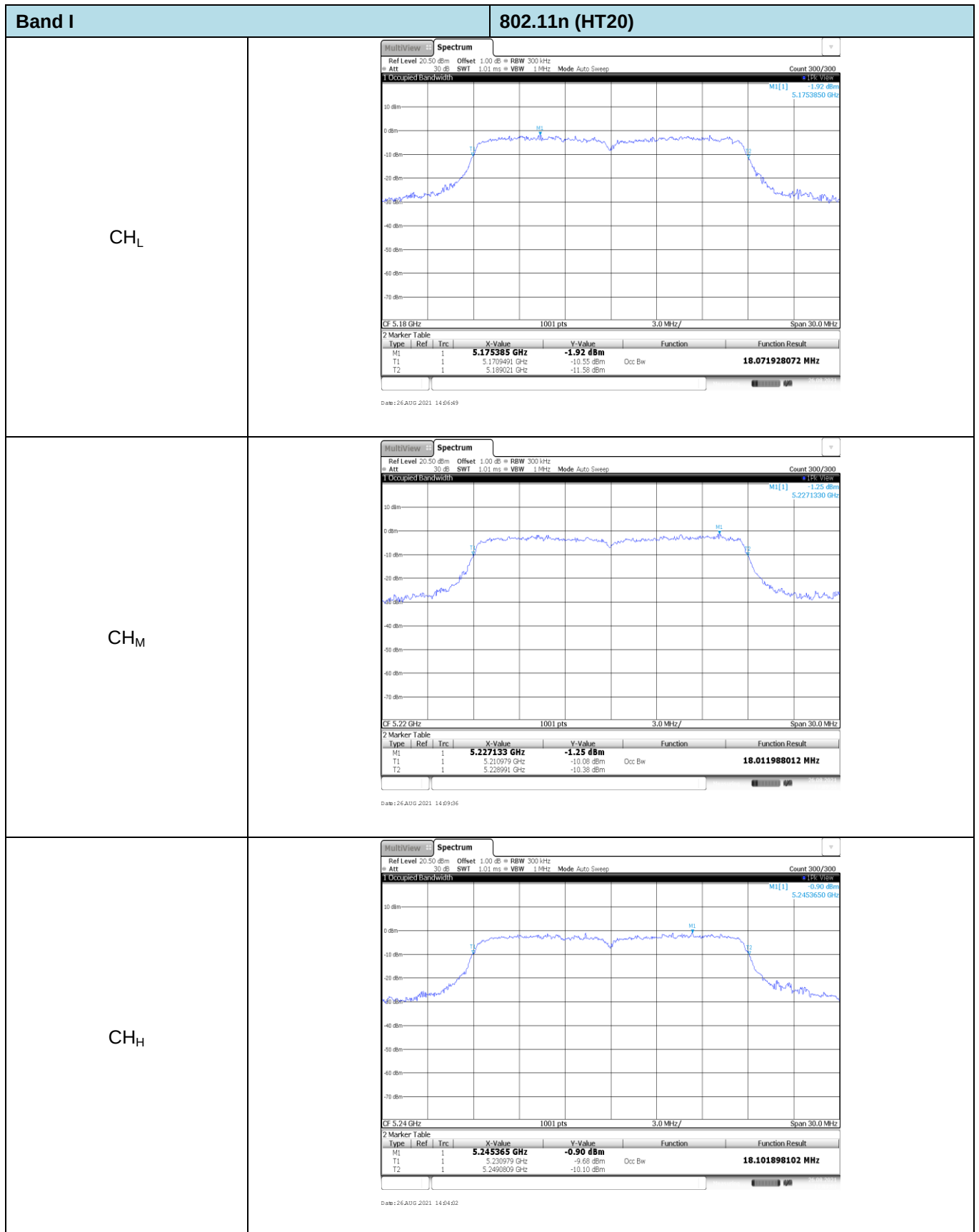


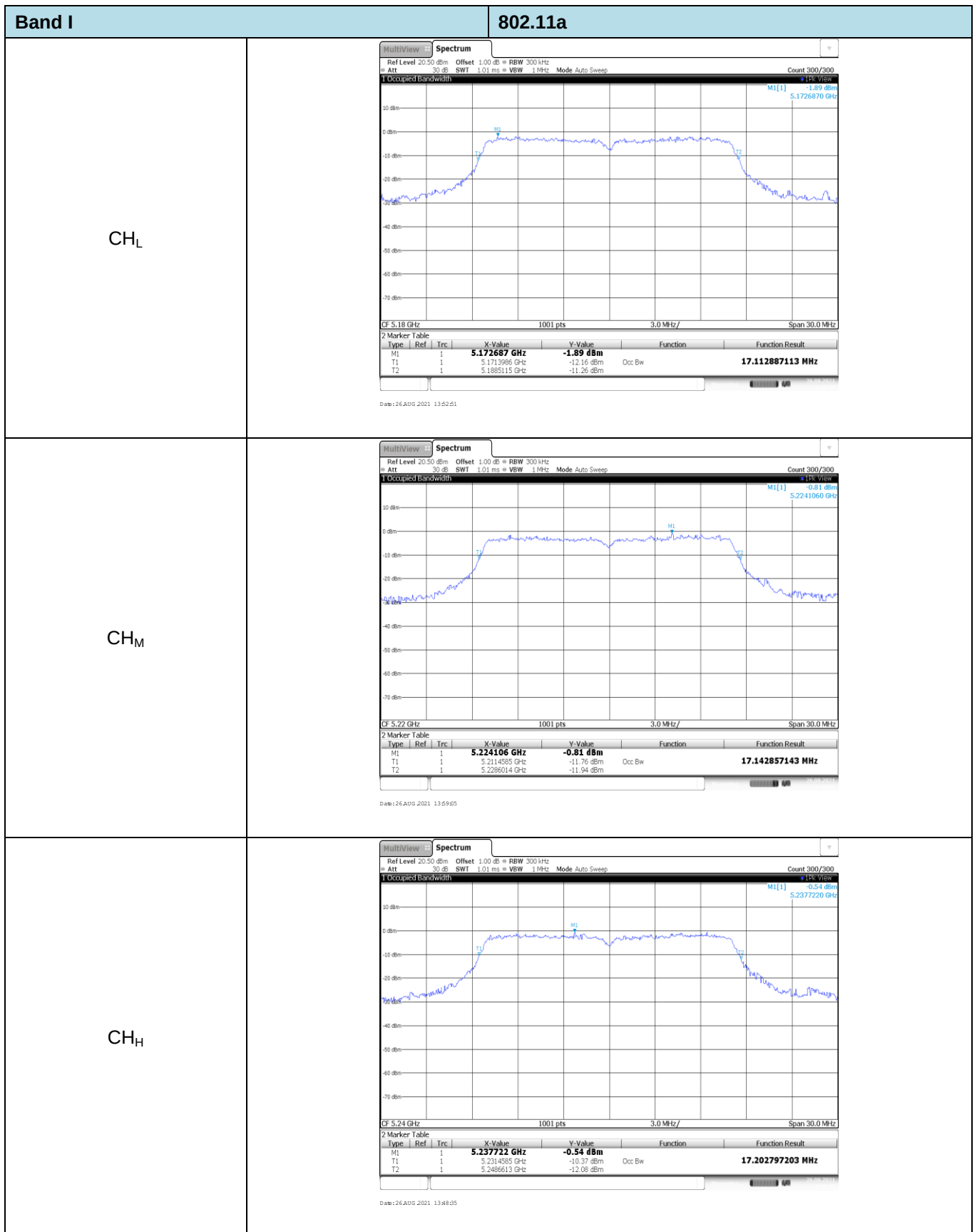


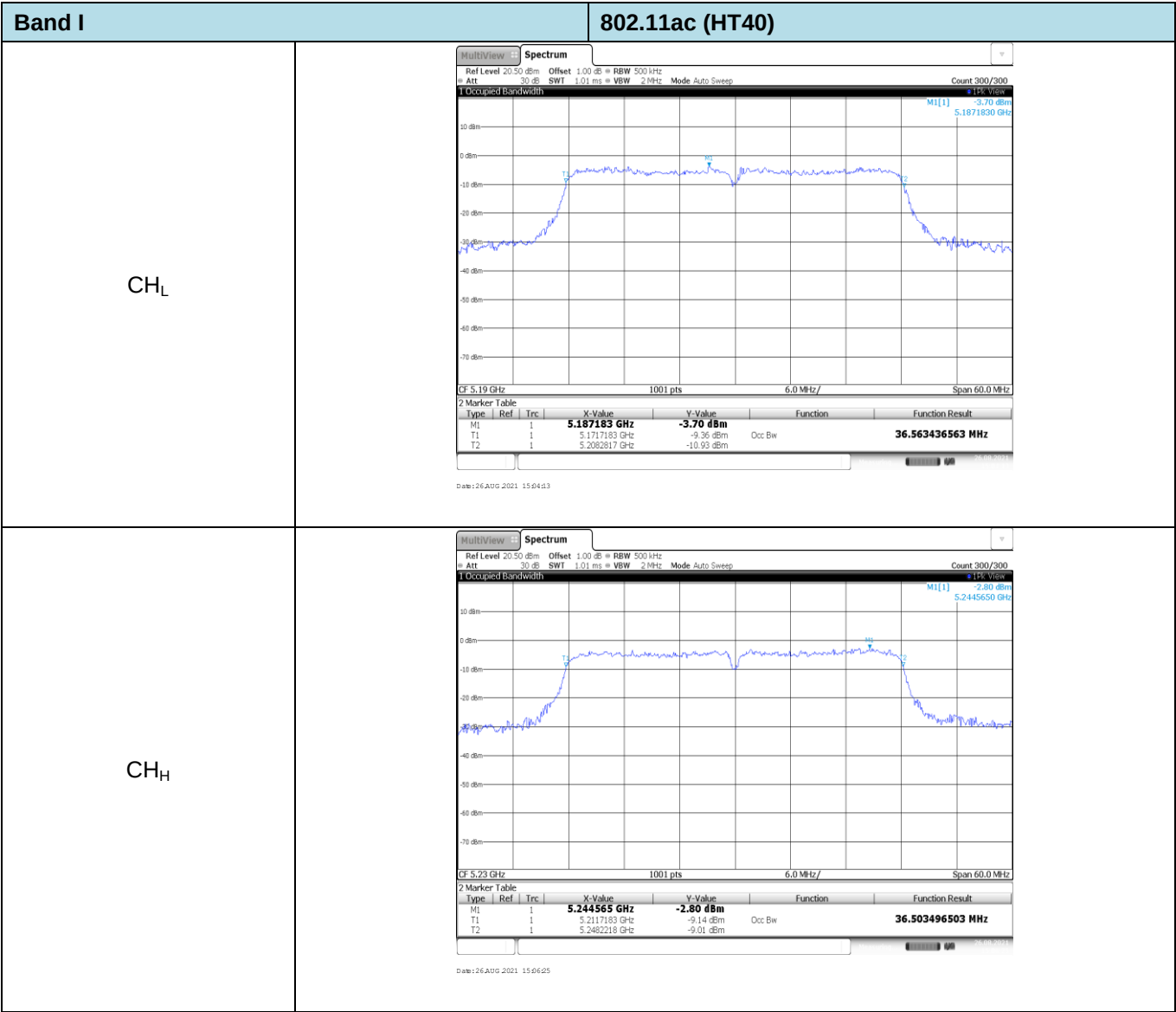
Appendix D: 99% Occupy bandwidth

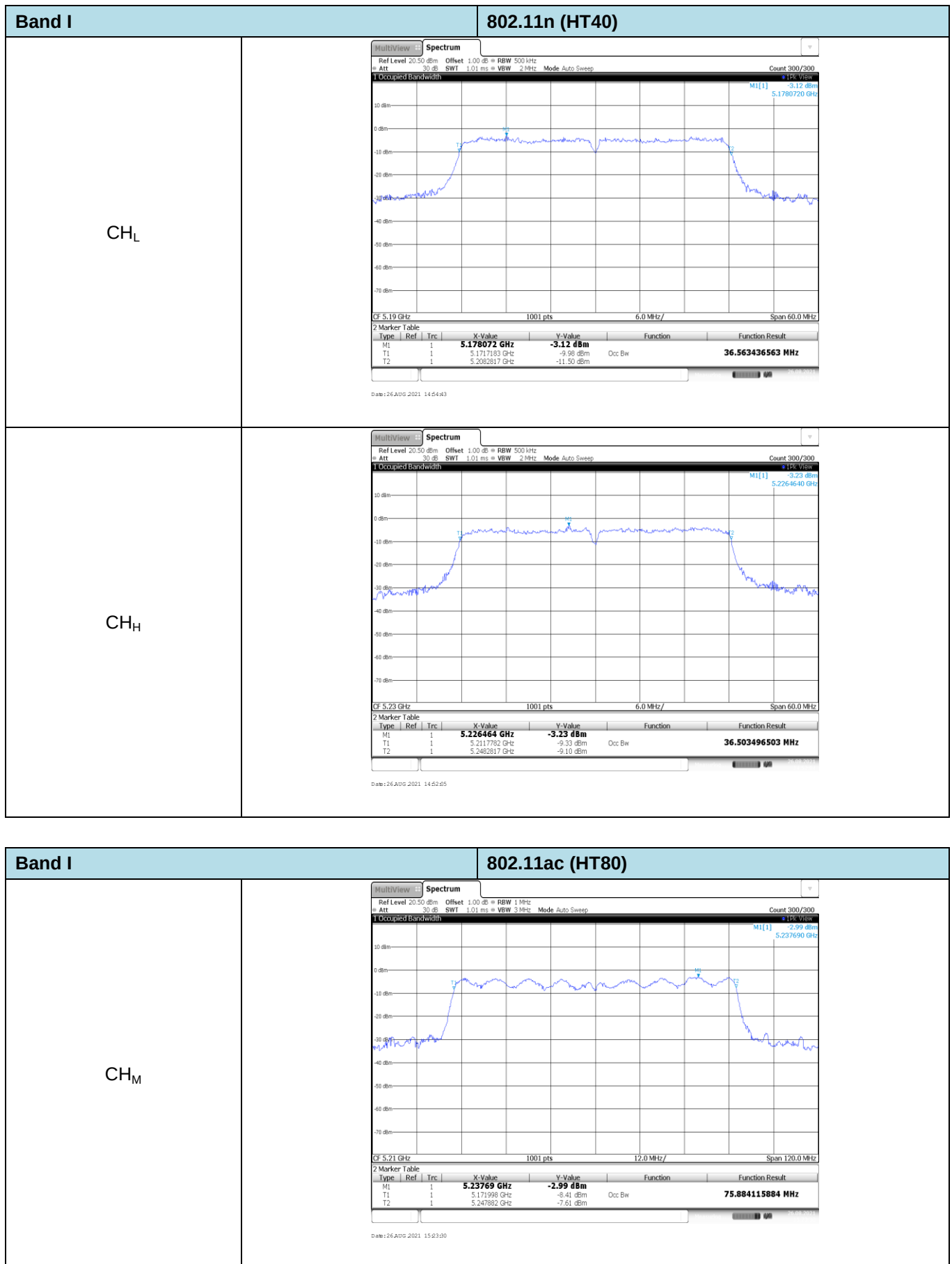
Band	Bandwidth (MHz)	Type	Channel	99% Occupy bandwidth (MHz)	Result
I	20	802.11ac	CH _L	18.13	Pass
			CH _M	18.16	
			CH _H	17.98	
		802.11n	CH _L	18.07	Pass
			CH _M	18.01	
			CH _H	18.10	
		802.11a	CH _L	17.11	Pass
			CH _M	17.14	
			CH _H	17.20	
	40	802.11ac	CH _L	36.56	Pass
			CH _H	36.50	
		802.11n	CH _L	36.56	Pass
			CH _H	36.50	
	80	802.11ac	CH _M	75.88	Pass
IV	20	802.11ac	CH _L	18.55	Pass
			CH _M	18.61	
			CH _H	18.19	
		802.11n	CH _L	18.37	Pass
			CH _M	18.25	
			CH _H	18.31	
		802.11a	CH _L	17.59	Pass
			CH _M	17.83	
			CH _H	17.65	
	40	802.11ac	CH _L	36.98	Pass
			CH _H	36.92	
		802.11n	CH _L	37.60	Pass
			CH _H	36.99	
	80	802.11ac	CH _M	76.72	Pass

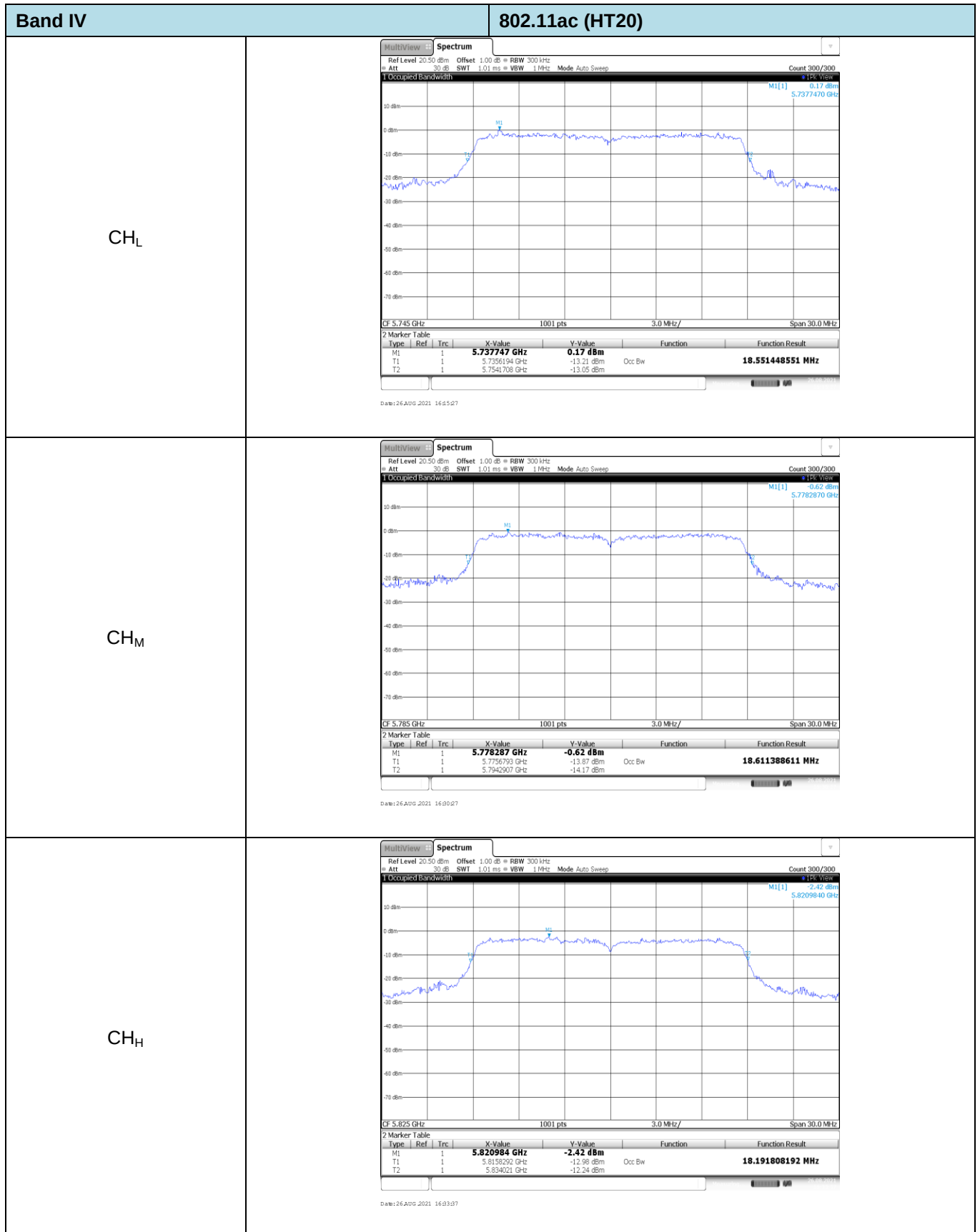


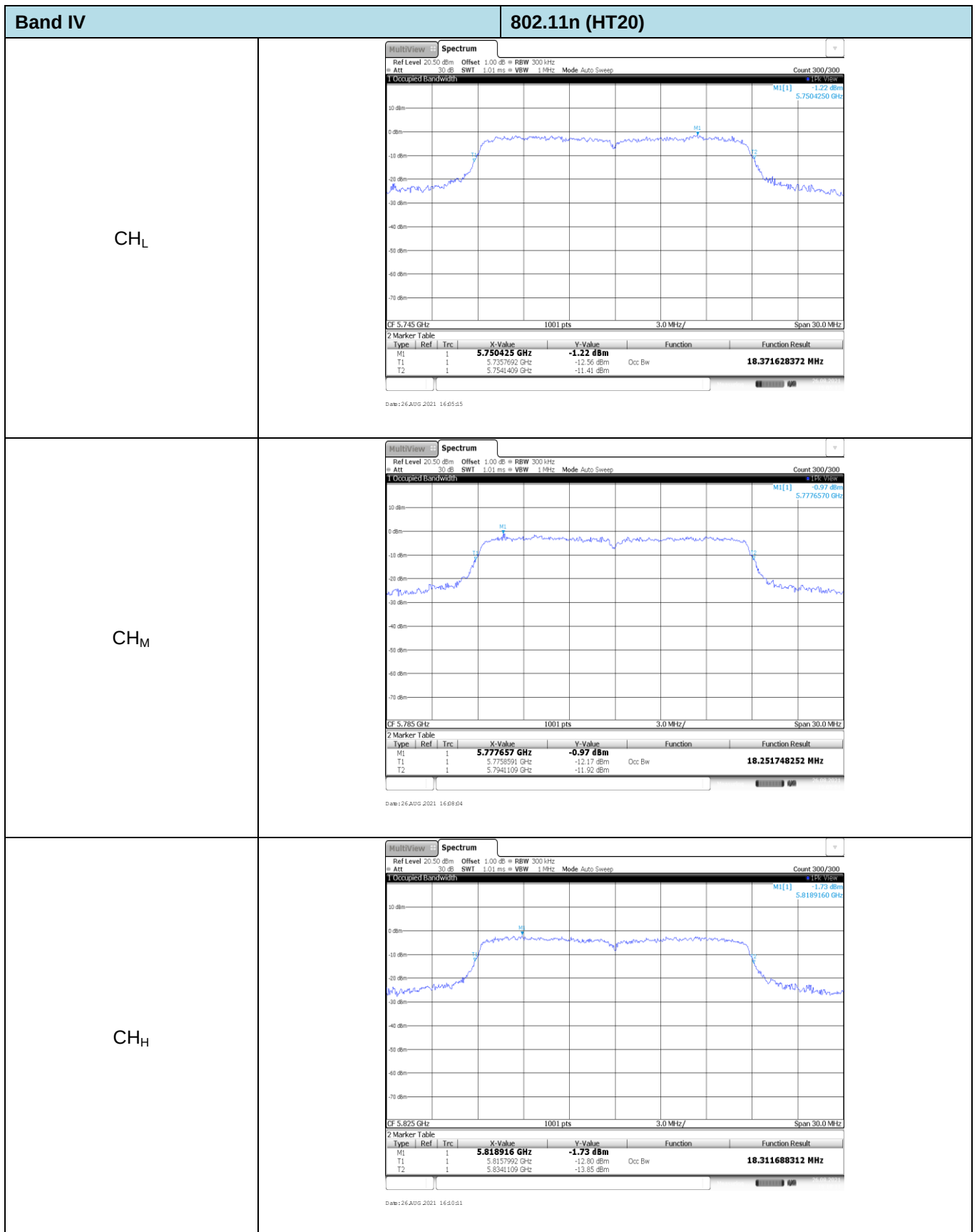


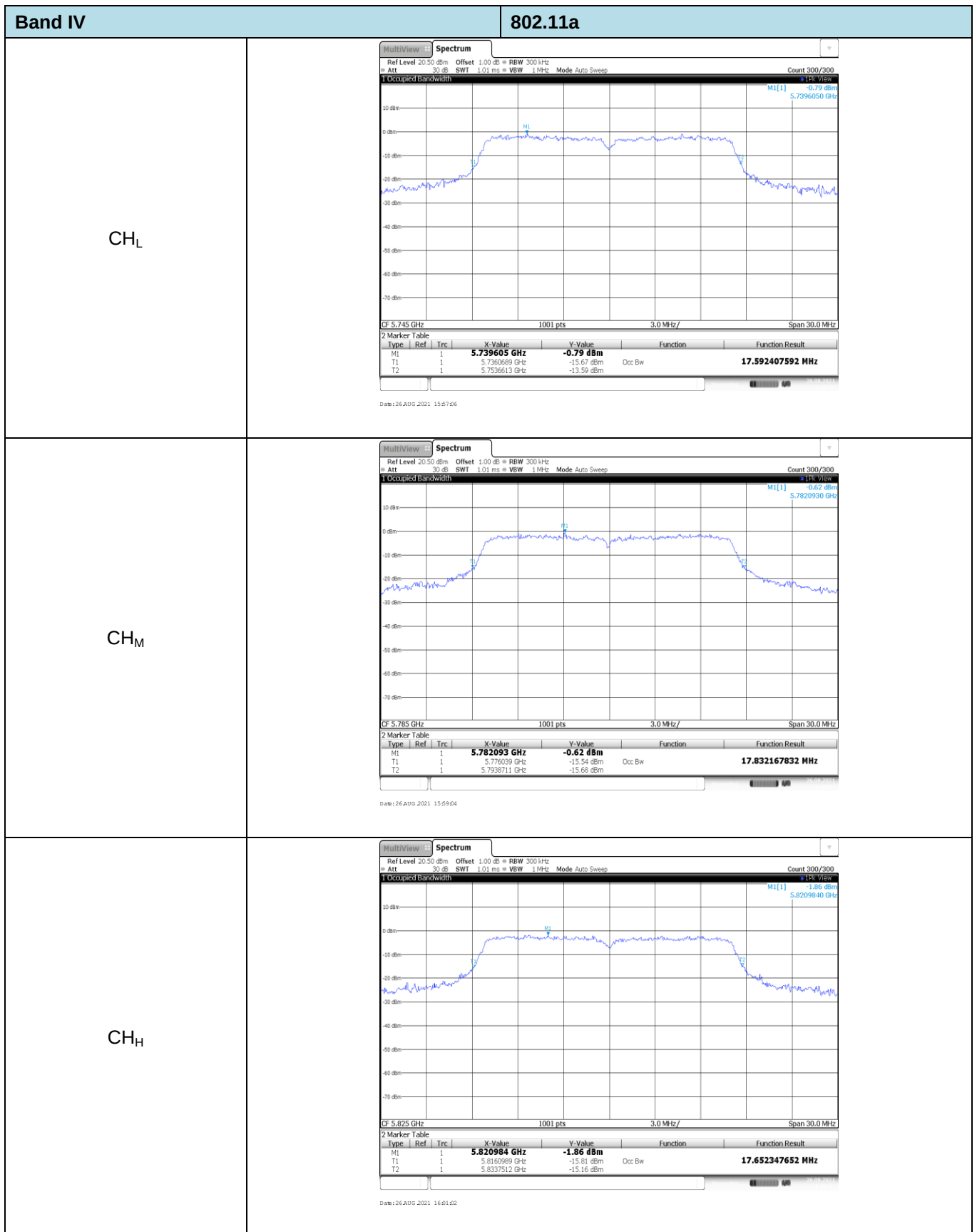


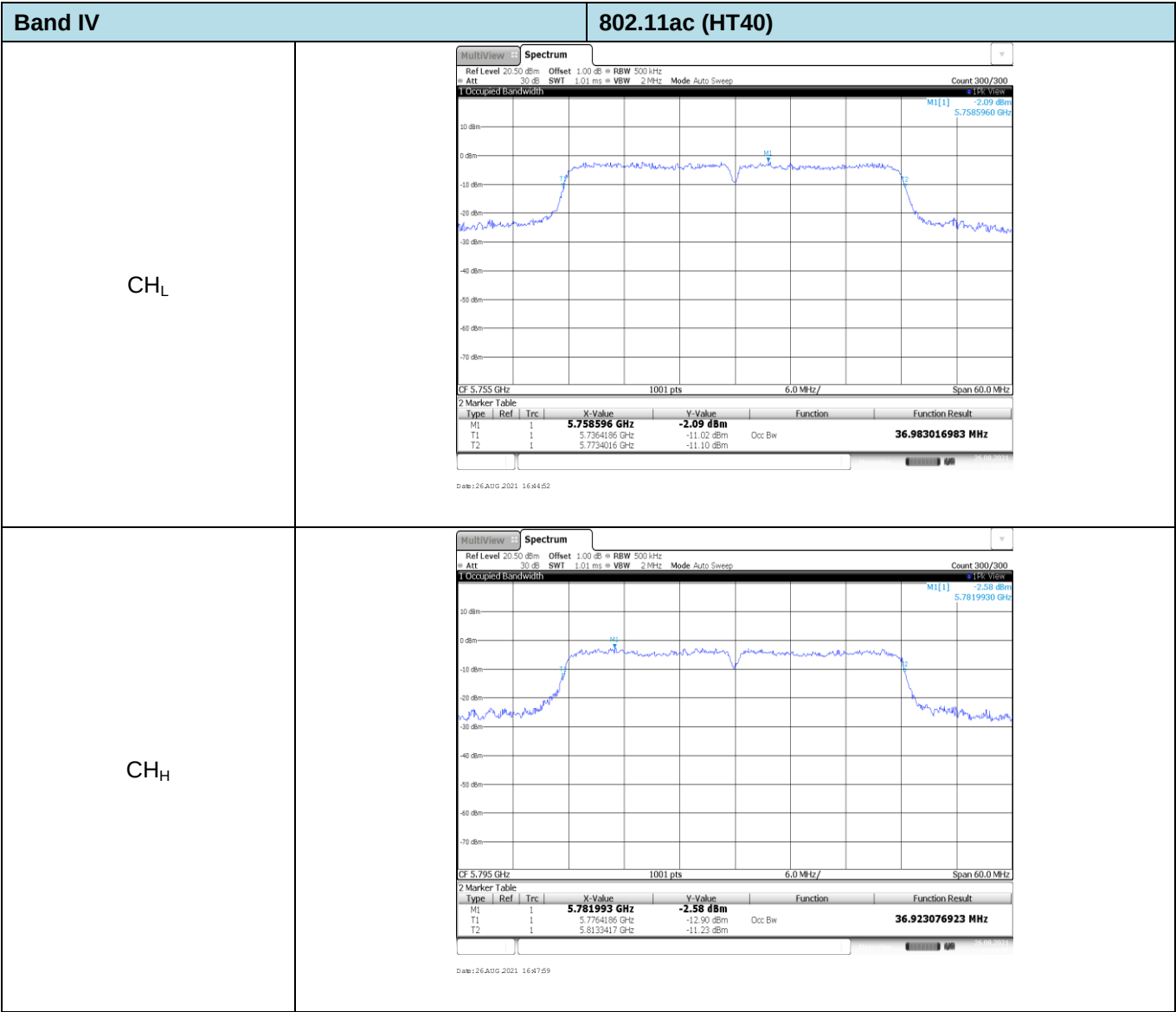


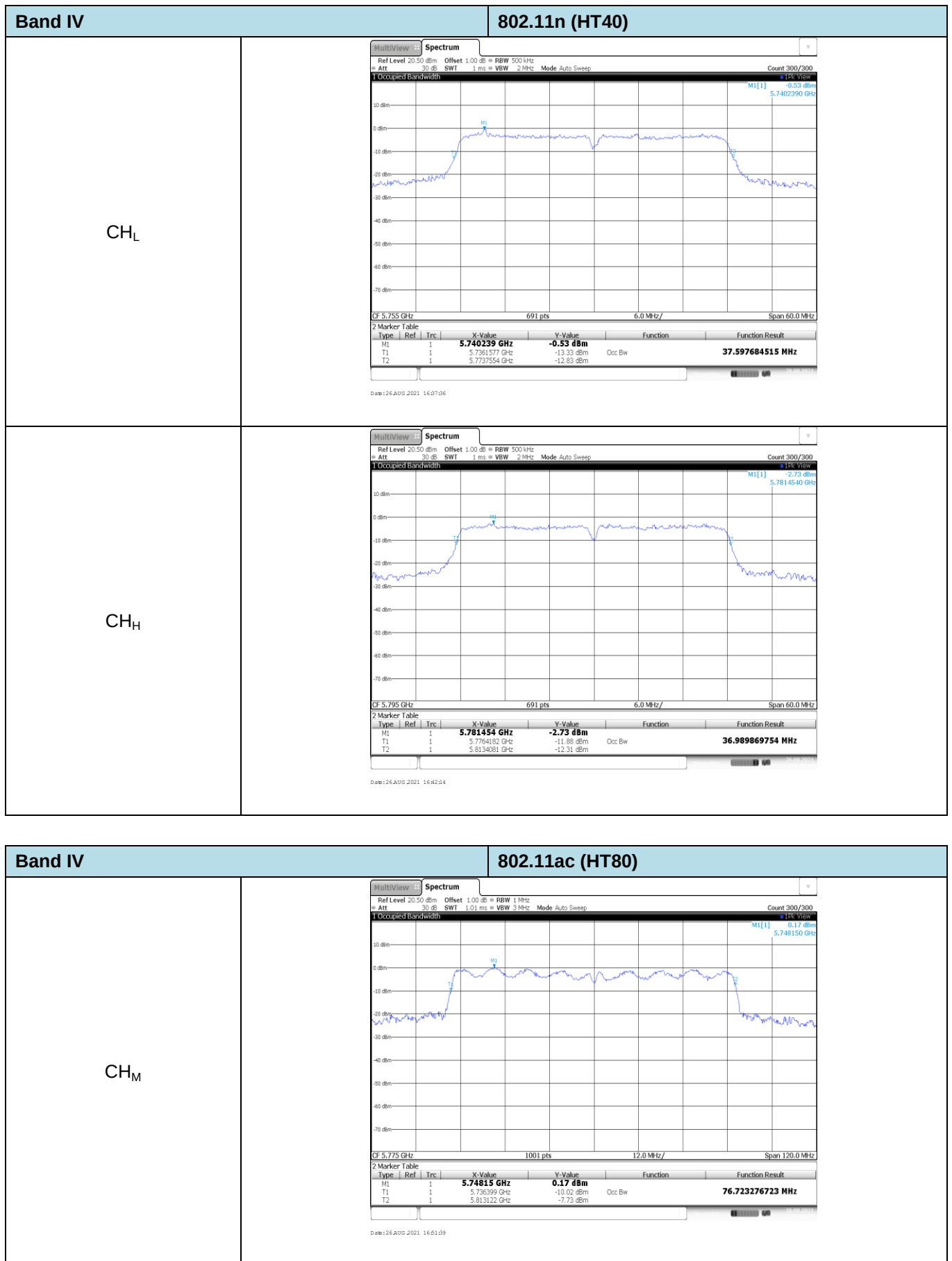












Appendix E: 6dB Bandwidth

Band	Bandwidth (MHz)	Type	Channel	6dB bandwidth (MHz)	Result
IV	20	802.11ac	CH _L	17.13	Pass
			CH _M	17.34	
			CH _H	17.01	
		802.11n	CH _L	16.98	Pass
			CH _M	16.98	
			CH _H	17.19	
		802.11a	CH _L	16.38	Pass
			CH _M	16.38	
			CH _H	16.35	
	40	802.11ac	CH _L	35.28	Pass
			CH _H	35.52	
		802.11n	CH _L	35.74	Pass
			CH _H	35.91	
	80	802.11ac	CH _M	75.48	Pass

Test channel	802.11ac (HT20)
CH _L	MultiView Spectrum Ref Level 20.50 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 1.04 ms VBW 300 kHz Mode Auto Sweep Count 500/500 1 Frequency Sweep

Test channel	802.11n (HT20)
CH _L	MultiView Spectrum Ref Level 20.50 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 1.04 ms VBW 300 kHz Mode Auto Sweep Count 500/500 1 Frequency Sweep

Test channel	802.11a																												
CH _L	MultViewSpectrum Ref Level 20.50 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWF 1.04 ms VBW 300 kHz Mode Auto Sweep Count 500/500 1 Frequency Sweep M1[1] -9.91 dBm 5.7367800 GHz M2[1] -3.23 dBm 5.7399600 GHz CF 5.745 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz 2 Marker Table <table><tr><th>Type</th><th>Ref</th><th>Trc</th><th>X-Value</th><th>Y-Value</th><th>Function</th><th>Function Result</th></tr><tr><td>M1</td><td>1</td><td></td><td>5.73678 GHz</td><td>-9.91 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>5.73996 GHz</td><td>-3.23 dBm</td><td></td><td></td></tr><tr><td>D3</td><td>M1</td><td>1</td><td>16.38 MHz</td><td>-0.65 dB</td><td></td><td></td></tr></table> Date: 26 AUG 2021 15:57:45	Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		5.73678 GHz	-9.91 dBm			M2	1		5.73996 GHz	-3.23 dBm			D3	M1	1	16.38 MHz	-0.65 dB		
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																							
M1	1		5.73678 GHz	-9.91 dBm																									
M2	1		5.73996 GHz	-3.23 dBm																									
D3	M1	1	16.38 MHz	-0.65 dB																									
CH _M	MultViewSpectrum Ref Level 20.50 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWF 1.04 ms VBW 300 kHz Mode Auto Sweep Count 500/500 1 Frequency Sweep M1[1] -9.81 dBm 5.7767800 GHz M2[1] -3.20 dBm 5.7899500 GHz CF 5.785 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz 2 Marker Table <table><tr><th>Type</th><th>Ref</th><th>Trc</th><th>X-Value</th><th>Y-Value</th><th>Function</th><th>Function Result</th></tr><tr><td>M1</td><td>1</td><td></td><td>5.77678 GHz</td><td>-9.81 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>5.78995 GHz</td><td>-3.20 dBm</td><td></td><td></td></tr><tr><td>D3</td><td>M1</td><td>1</td><td>16.38 MHz</td><td>-1.06 dB</td><td></td><td></td></tr></table> Date: 26 AUG 2021 15:59:13	Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		5.77678 GHz	-9.81 dBm			M2	1		5.78995 GHz	-3.20 dBm			D3	M1	1	16.38 MHz	-1.06 dB		
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																							
M1	1		5.77678 GHz	-9.81 dBm																									
M2	1		5.78995 GHz	-3.20 dBm																									
D3	M1	1	16.38 MHz	-1.06 dB																									
CH _H	MultViewSpectrum Ref Level 20.50 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWF 1.04 ms VBW 300 kHz Mode Auto Sweep Count 500/500 1 Frequency Sweep M1[1] -10.33 dBm 5.8167800 GHz M2[1] -3.74 dBm 5.8187000 GHz CF 5.825 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz 2 Marker Table <table><tr><th>Type</th><th>Ref</th><th>Trc</th><th>X-Value</th><th>Y-Value</th><th>Function</th><th>Function Result</th></tr><tr><td>M1</td><td>1</td><td></td><td>5.81678 GHz</td><td>-10.33 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>5.8187 GHz</td><td>-3.74 dBm</td><td></td><td></td></tr><tr><td>D3</td><td>M1</td><td>1</td><td>16.35 MHz</td><td>0.38 dB</td><td></td><td></td></tr></table> Date: 26 AUG 2021 16:01:11	Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		5.81678 GHz	-10.33 dBm			M2	1		5.8187 GHz	-3.74 dBm			D3	M1	1	16.35 MHz	0.38 dB		
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																							
M1	1		5.81678 GHz	-10.33 dBm																									
M2	1		5.8187 GHz	-3.74 dBm																									
D3	M1	1	16.35 MHz	0.38 dB																									

Test channel

802.11ac (HT40)

CH_L

Ref Level 20.50 dBm Offset 1.00 dB RBW 100 kHz
Att 30 dB SWI 1.07 ms VBW 300 kHz Mode Auto Sweep Count 500/500

1 Frequency Sweep

M1[1] -12.84 dBm 5.737000 GHz
M2[1] -5.90 dBm 5.739940 GHz

CF 5.755 GHz 1001 pts 6.0 MHz/ Span 60.0 MHz

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1	1		5.7373 GHz	-12.84 dBm		
M2	1		5.73994 GHz	-5.90 dBm		
D3	M1	1	35.26 MHz	0.84 dB		

Date: 26 AUG 2021 16:45:00

CH_H

Ref Level 20.50 dBm Offset 1.00 dB RBW 100 kHz
Att 30 dB SWI 1.07 ms VBW 300 kHz Mode Auto Sweep Count 500/500

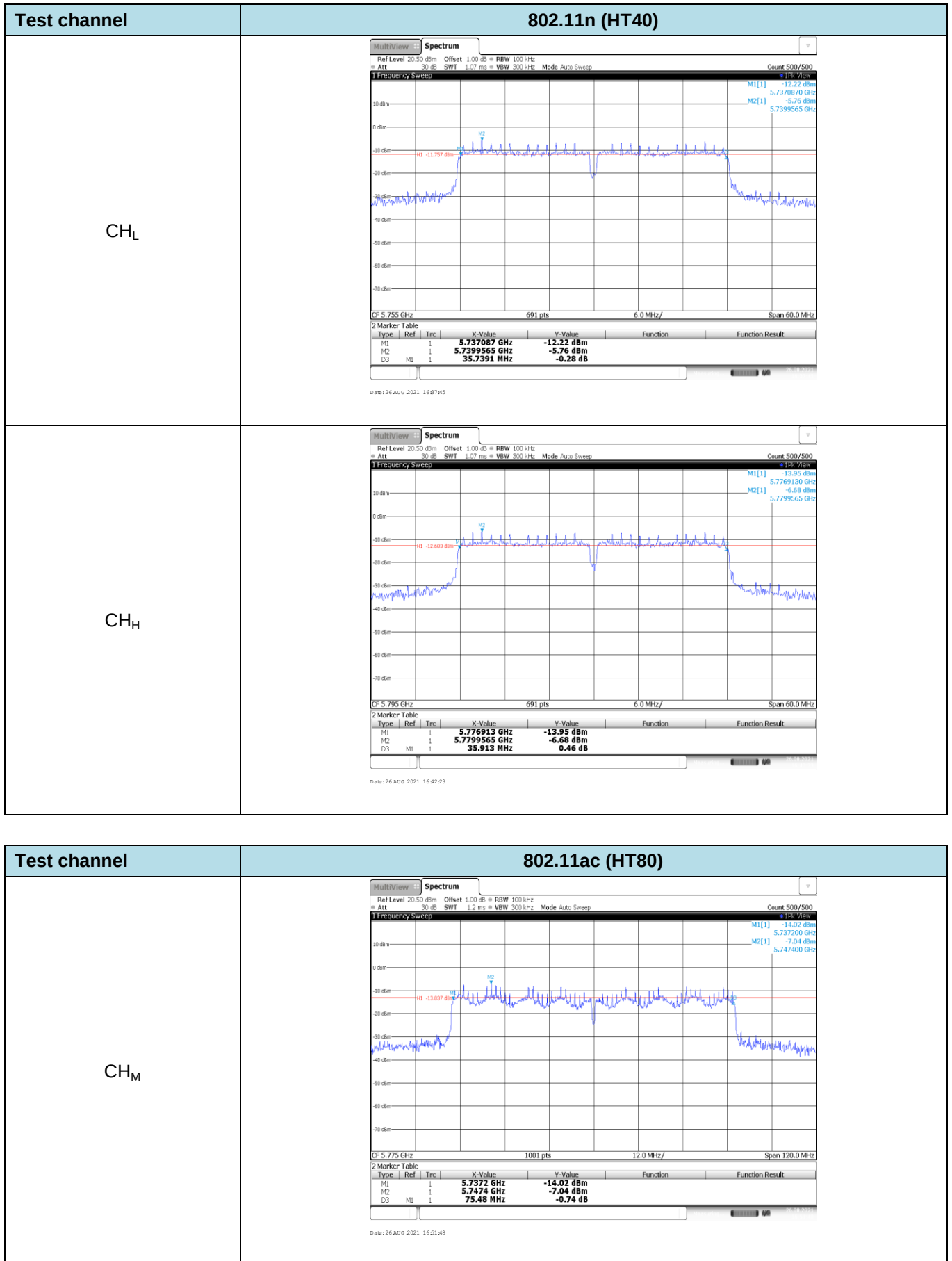
1 Frequency Sweep

M1[1] -13.29 dBm 5.7771200 GHz
M2[1] -6.55 dBm 5.7799400 GHz

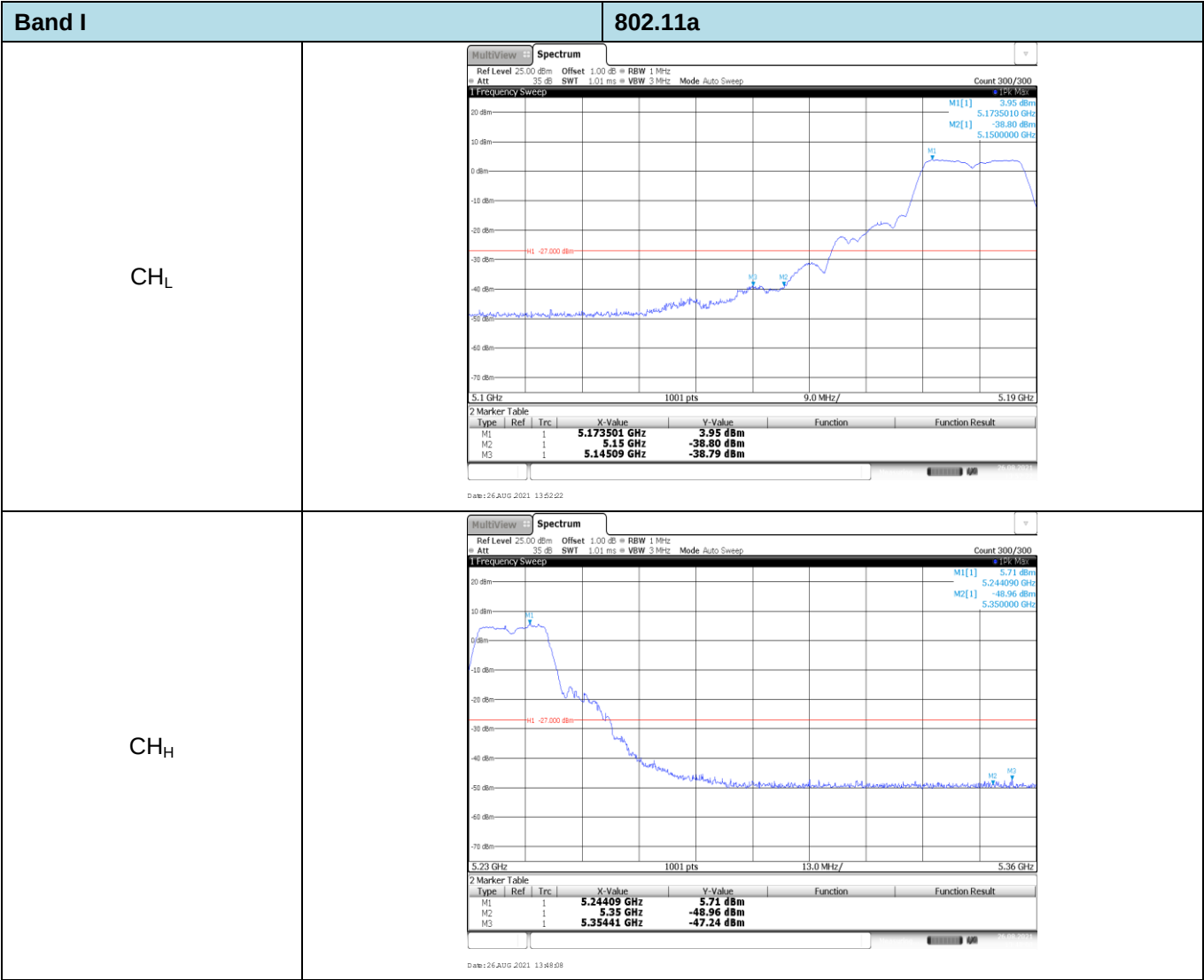
CF 5.795 GHz 1001 pts 6.0 MHz/ Span 60.0 MHz

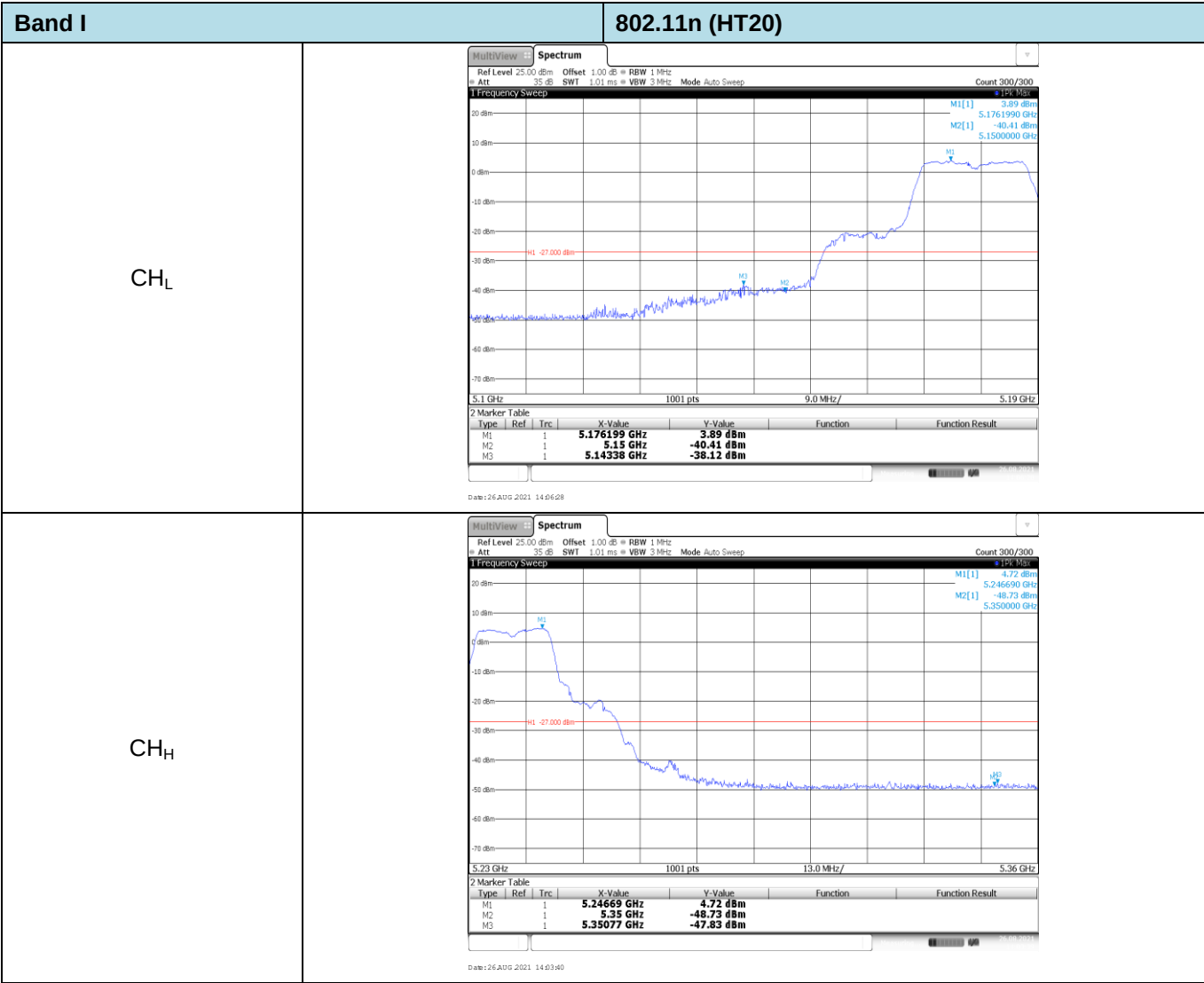
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1	1		5.77712 GHz	-13.29 dBm		
M2	1		5.77994 GHz	-6.55 dBm		
D3	M1	1	35.52 MHz	-0.84 dB		

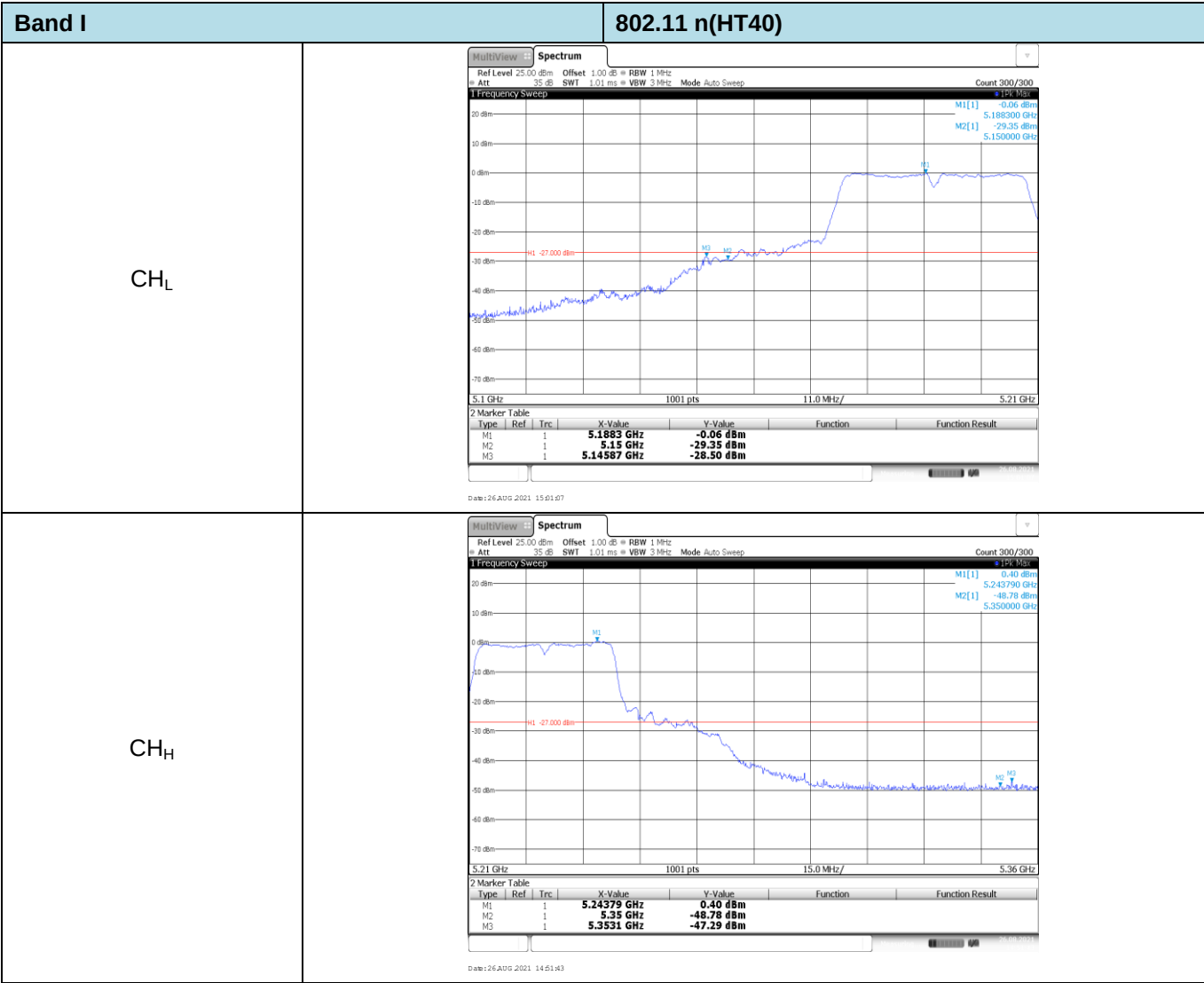
Date: 26 AUG 2021 16:48:08

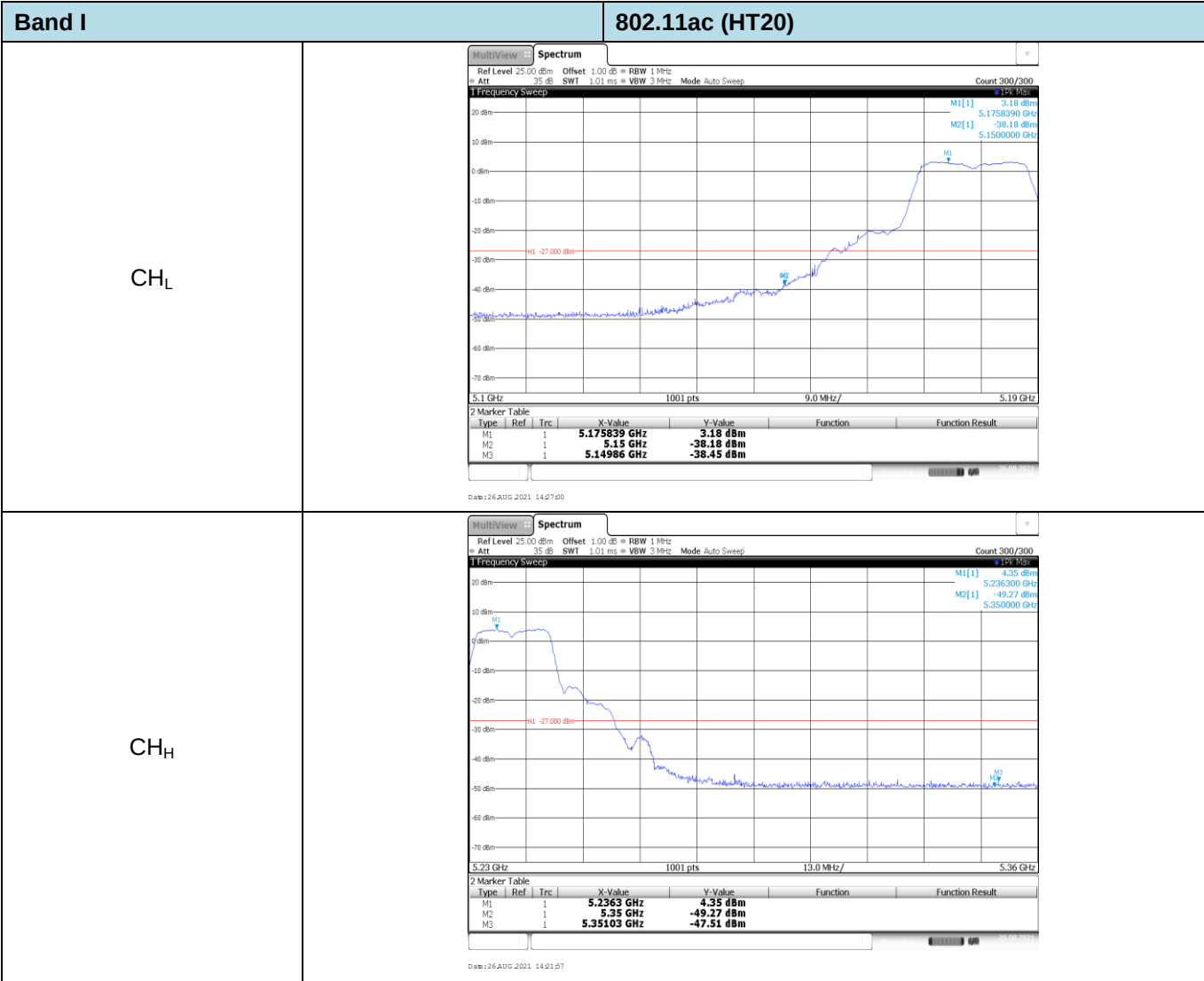


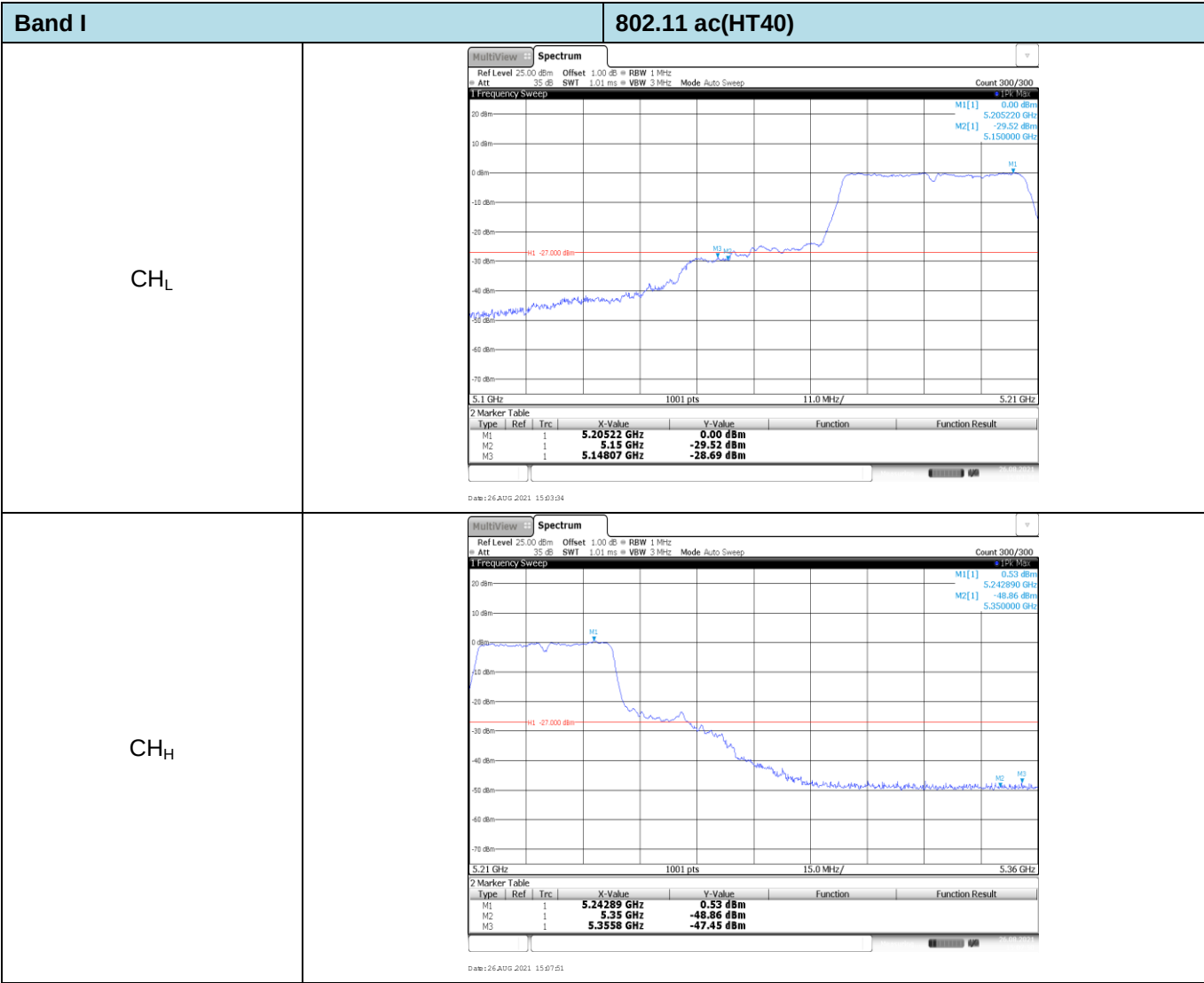
Appendix F: Band edge

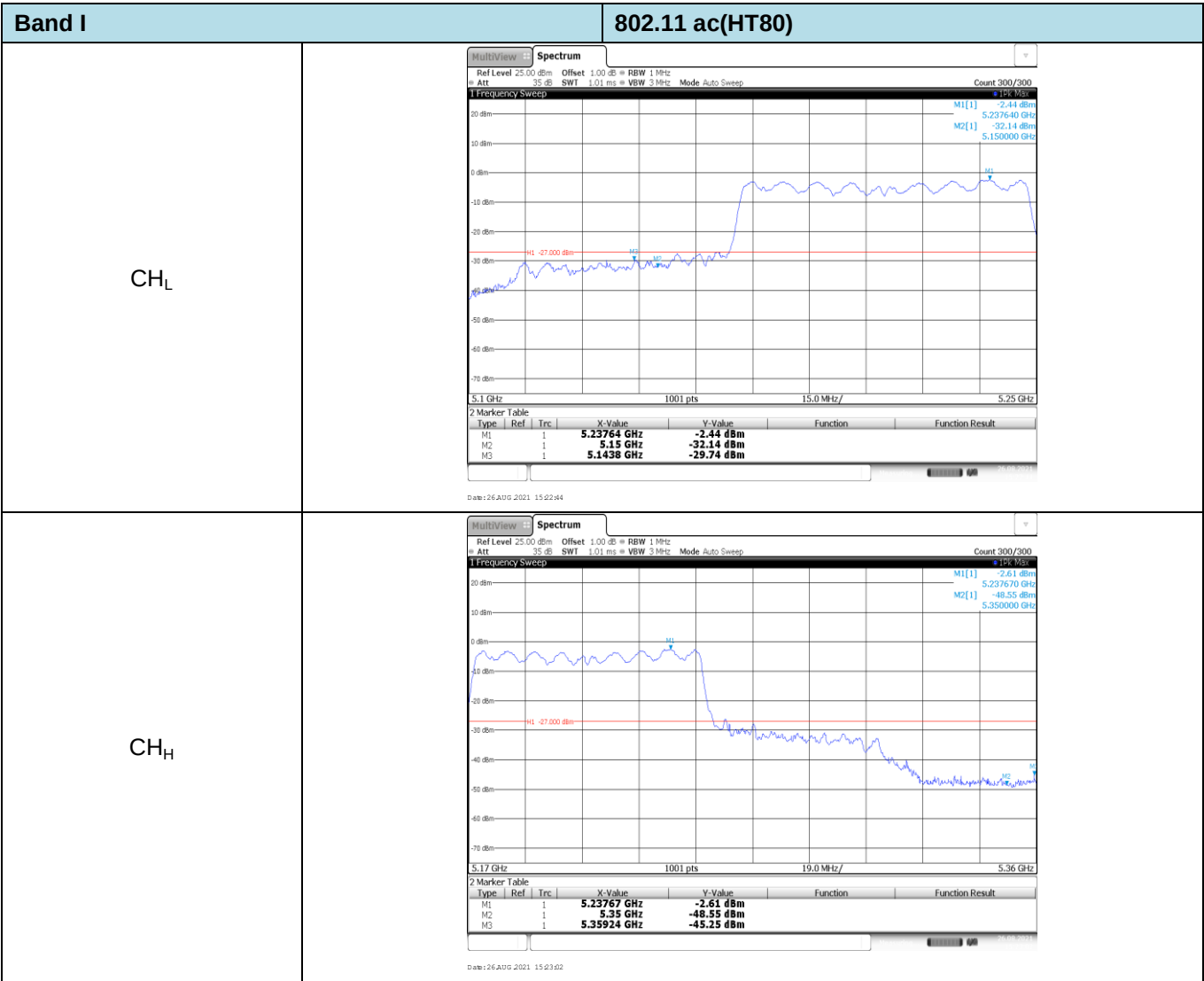


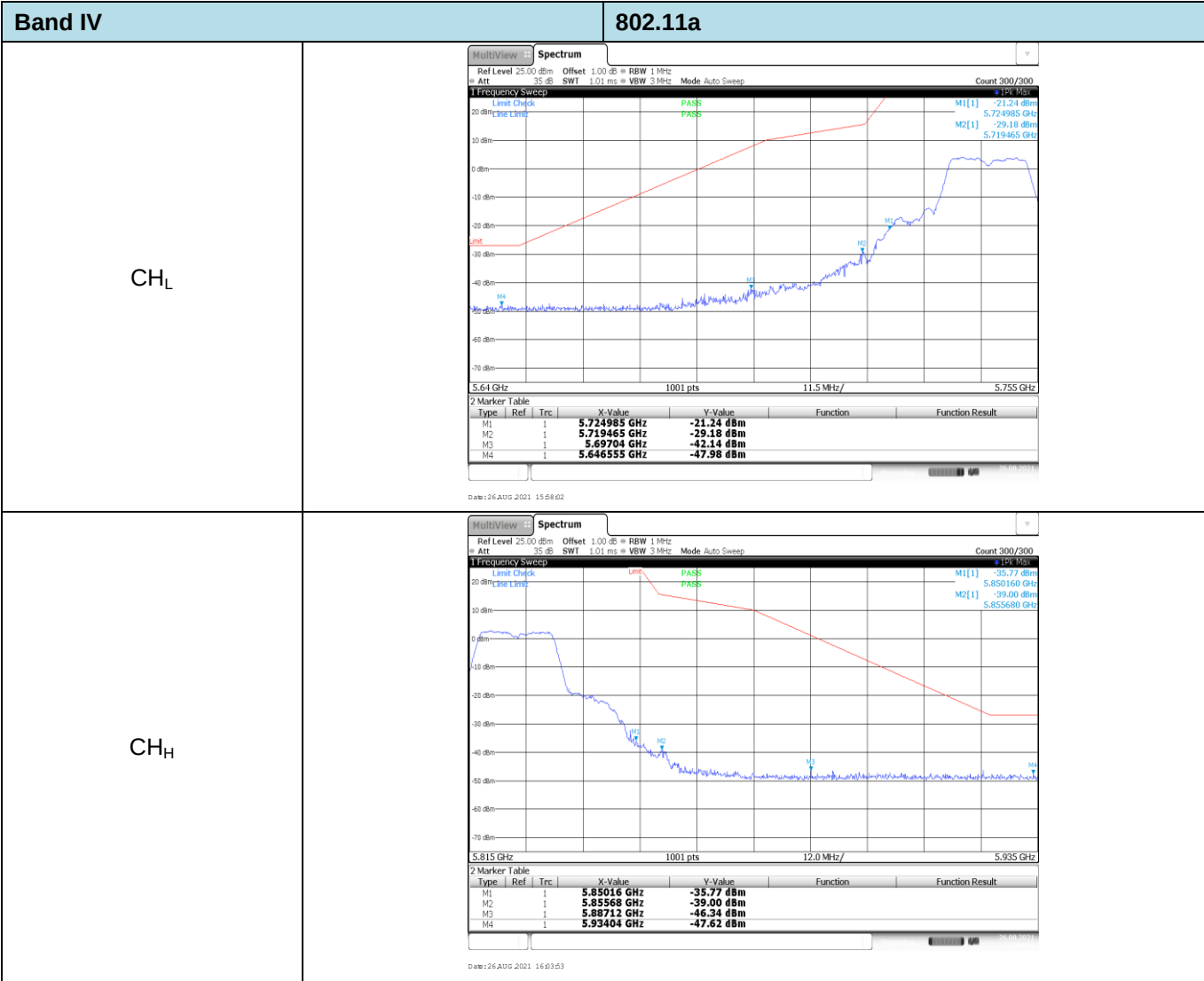


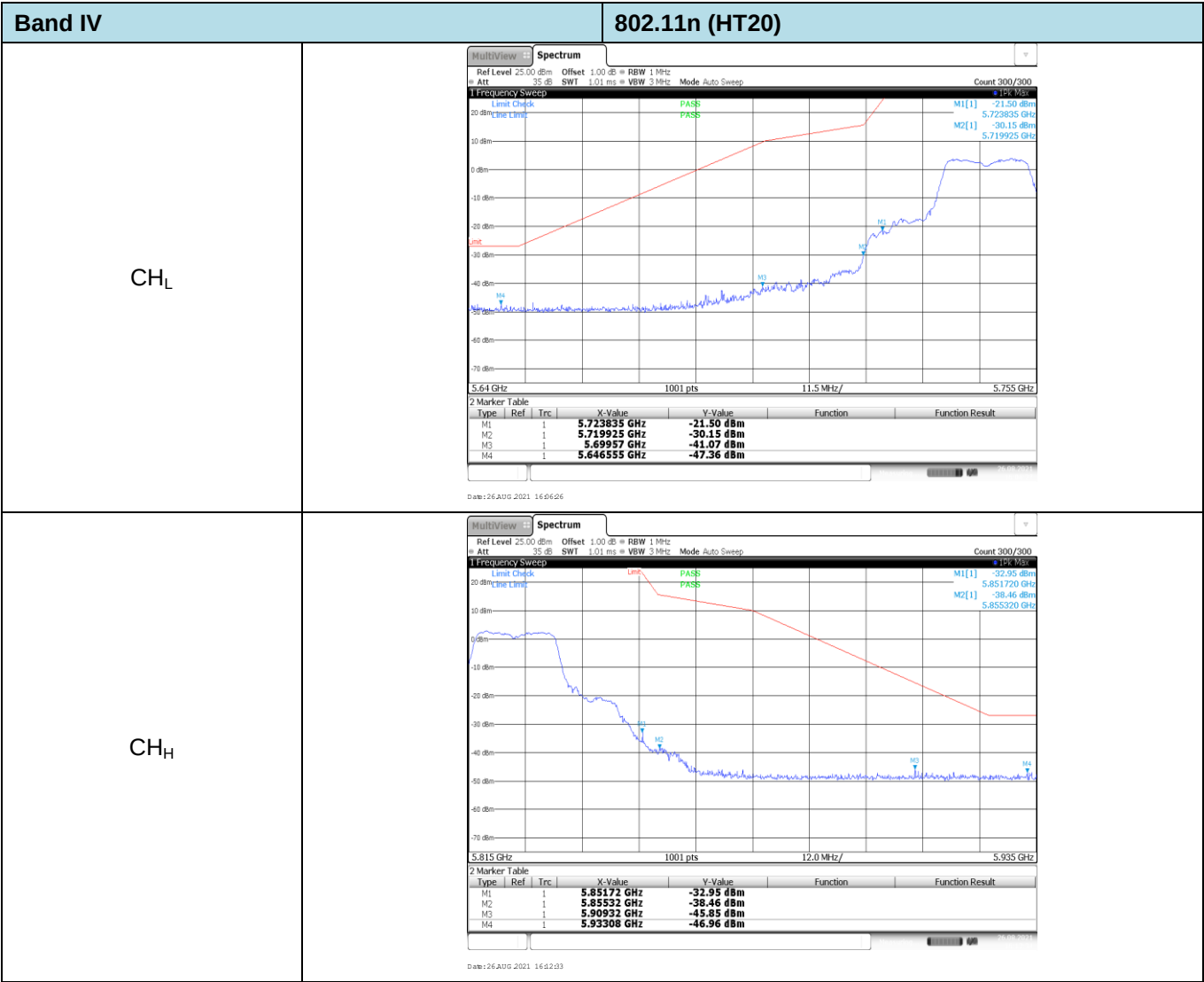


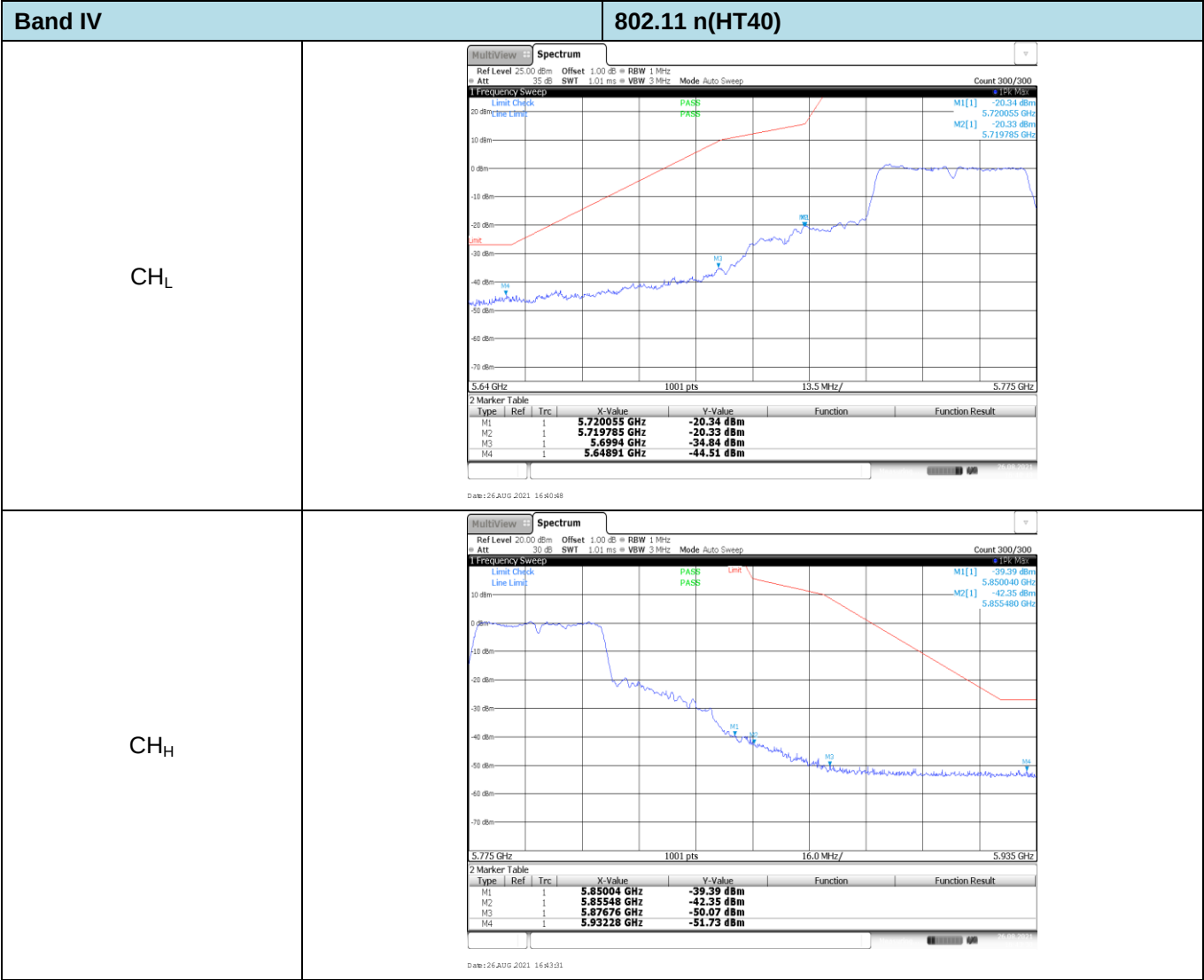


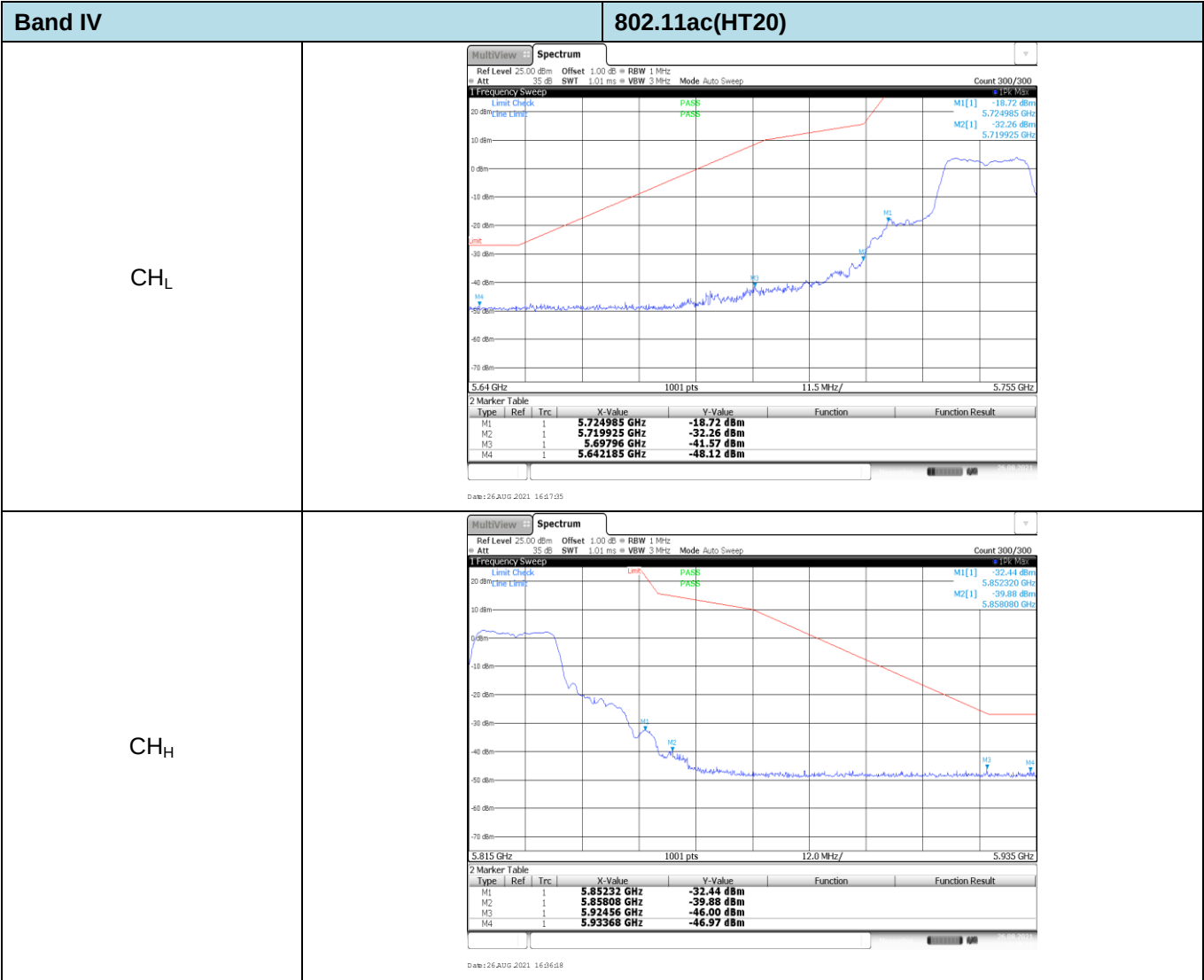


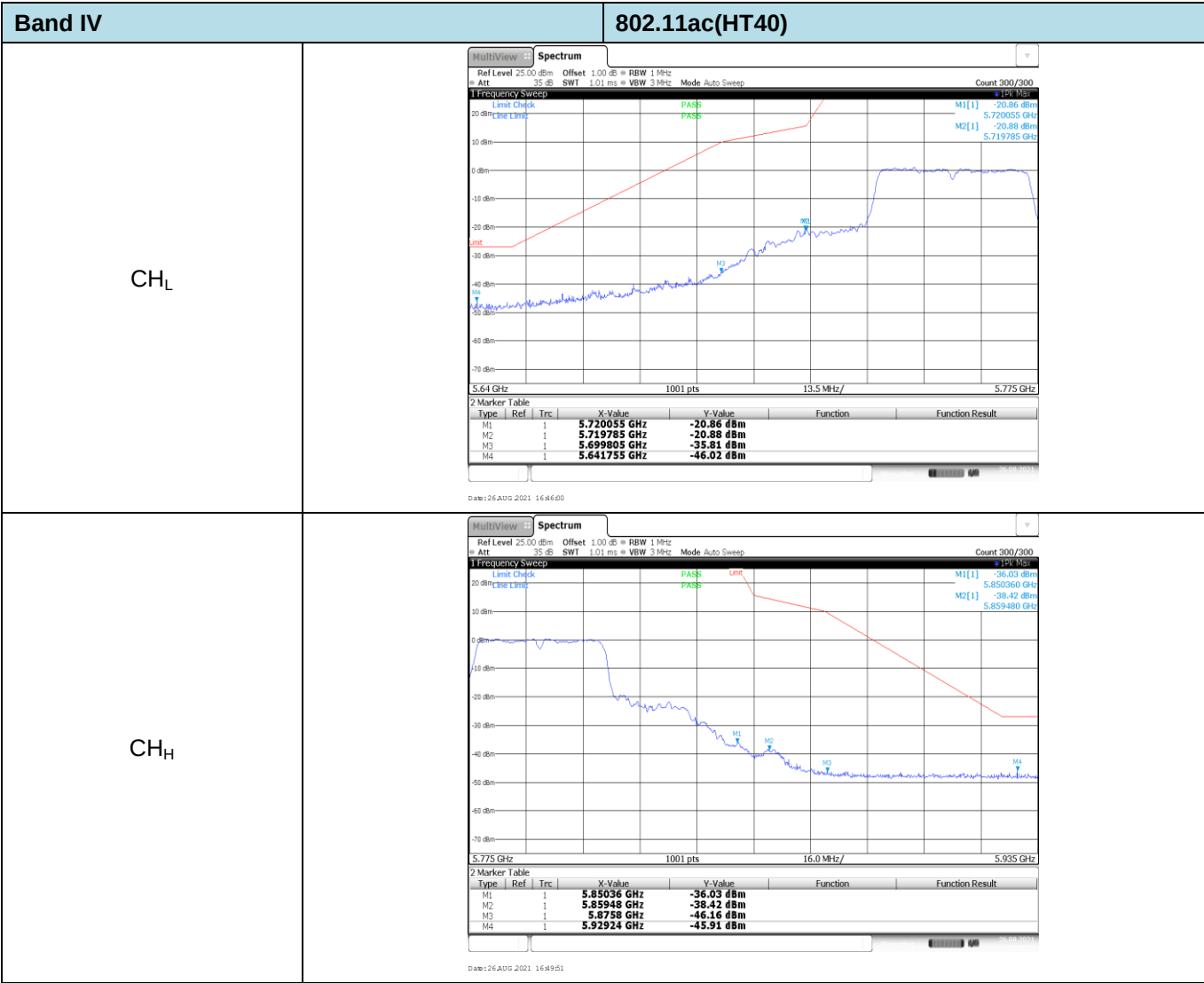












Band IV

802.11ac(HT80)

CH_L

1 Frequency Sweep

Ref Level 25.00 dBm Offset 1.00 dB BW 1 MHz

Att 35 dB SWI 1.01 ms VBW 3 MHz Mode Auto Sweep

Count 300/300

M1[1] -22.05 dBm 5.720185 GHz

M2[1] -21.75 dBm 5.707715 GHz

M3 5.6989 GHz -22.74 dBm

M4 5.625585 GHz -38.05 dBm

2 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1	1		5.720185 GHz	-22.05 dBm		
M2	1		5.707715 GHz	-21.75 dBm		
M3	1		5.6989 GHz	-22.74 dBm		
M4	1		5.625585 GHz	-38.05 dBm		

Date: 26 AUG 2021 16:54:29

CH_H

1 Frequency Sweep

Ref Level 25.00 dBm Offset 1.00 dB BW 1 MHz

Att 35 dB SWI 1.01 ms VBW 3 MHz Mode Auto Sweep

Count 300/300

M1[1] -27.49 dBm 5.850800 GHz

M2[1] -28.72 dBm 5.860200 GHz

M3 5.879 GHz -32.12 dBm

M4 5.9332 GHz -44.14 dBm

2 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1	1		5.8508 GHz	-27.49 dBm		
M2	1		5.8602 GHz	-28.72 dBm		
M3	1		5.879 GHz	-32.12 dBm		
M4	1		5.9332 GHz	-44.14 dBm		

Date: 26 AUG 2021 16:53:00

Appendix G: Frequency stability**Voltage VS Frequency stability**

Band: I			Test Frequency: 5180.00MHz	
Temperature (°C)	Voltage (V)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
T _N	V _L	-19000.00	-3.66795	PASS
T _N	V _N	-28000.00	-5.40541	PASS
T _N	V _H	-12000.00	-2.31660	PASS

Band: IV			Test Frequency: 5745.00MHz	
Temperature (°C)	Voltage (V)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
T _N	V _L	-2000.00	-0.34813	PASS
T _N	V _N	-16000.00	-2.78503	PASS
T _N	V _H	5000.00	0.87032	PASS

Temperature VS Frequency stability

Band: I			Test Frequency: 5180.00MHz	
Voltage (V)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
V _N	-20	6000.00	1.15830	PASS
V _N	-10	13000.00	2.50965	PASS
V _N	0	-31000.00	-5.98456	PASS
V _N	10	-22000.00	-4.24710	PASS
V _N	20	-12000.00	-2.31660	PASS
V _N	30	-2000.00	-0.38610	PASS
V _N	40	8000.00	1.54440	PASS
V _N	50	15000.00	2.89575	PASS

Band: IV			Test Frequency: 5745.00MHz	
Voltage (V)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
V _N	-20	19000.00	3.30722	PASS
V _N	-10	24000.00	4.17755	PASS
V _N	0	29000.00	5.04787	PASS
V _N	10	31000.00	5.39600	PASS
V _N	20	29000.00	5.04787	PASS
V _N	30	30000.00	5.22193	PASS
V _N	40	27000.00	4.69974	PASS
V _N	50	27000.00	4.69974	PASS

-----End of Report-----