

APPENDIX REPORT

Project No.	SHT2208193404EW	Radio Specification	WIFI 5G
Test sample No.	YPHT22081934002	Radio Specification	NeoPix 320
Start test date	2022-08-29	Model No.	2022-08-30
Temperature	25.3℃	Finish date	38%
Test Engineer	Xiaoxiao Li	Auditor	Xiaodong Zhuo

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	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)		Total Power (dBm)	Limit (dBm)	Result
				Antenna 0	Antenna 1	Antenna 0	Antenna 1	Antenna 0	Antenna 1	Antenna 0	Antenna 1			
I	20	802.11n	CH _L	13.37	13.89	93.06	93.92	0.31	0.27	13.68	14.16	16.97	24.00	Pass
			CH _M	12.68	12.76	93.12	90.37	0.31	0.44	12.99	13.20	16.11		
			CH _H	13.01	13.08	92.72	90.69	0.33	0.42	13.34	13.50	16.41		
		802.11a	CH _L	15.33	15.99	91.28	94.70	0.40	0.24	15.73	16.23	-	24.00	Pass
			CH _M	14.57	14.85	92.05	93.94	0.36	0.27	14.93	15.12	-		
			CH _H	15.00	15.13	90.23	93.94	0.45	0.27	15.45	15.40	-		
	40	802.11n	CH _L	13.32	13.60	84.15	85.55	0.75	0.68	14.07	14.28	17.21	24.00	Pass
			CH _H	13.03	13.02	86.24	84.15	0.64	0.75	13.67	13.77	16.76		

Band	Bandwidth (MHz)	Type	Channel	Reading (dBm)		Duty cycle (%)		Duty cycle factor (dB)		Conducted Output Power (dBm)		Total Power (dBm)	Limit (dBm)	Result
				Antenna 0	Antenna 1	Antenna 0	Antenna 1	Antenna 0	Antenna 1	Antenna 0	Antenna 1			
IV	20	802.11n	CH _L	13.09	15.43	91.89	94.32	0.37	0.25	13.46	15.68	17.75	30.00	Pass
			CH _M	13.68	15.42	89.57	89.57	0.48	0.48	14.16	15.90	18.14		
			CH _H	14.45	15.45	90.31	93.46	0.44	0.29	14.89	15.74	18.33		
		802.11a	CH _L	12.61	15.12	90.28	90.63	0.44	0.43	13.05	15.55	-	30.00	Pass
			CH _M	13.07	15.57	89.89	95.14	0.46	0.22	13.53	15.79	-		
			CH _H	13.63	15.63	95.08	90.23	0.22	0.45	13.85	16.08	-		
	40	802.11n	CH _L	11.93	14.90	89.97	83.50	0.46	0.78	12.39	15.68	17.37	30.00	Pass
			CH _H	13.29	15.00	84.15	87.65	0.75	0.57	14.04	15.57	17.88		

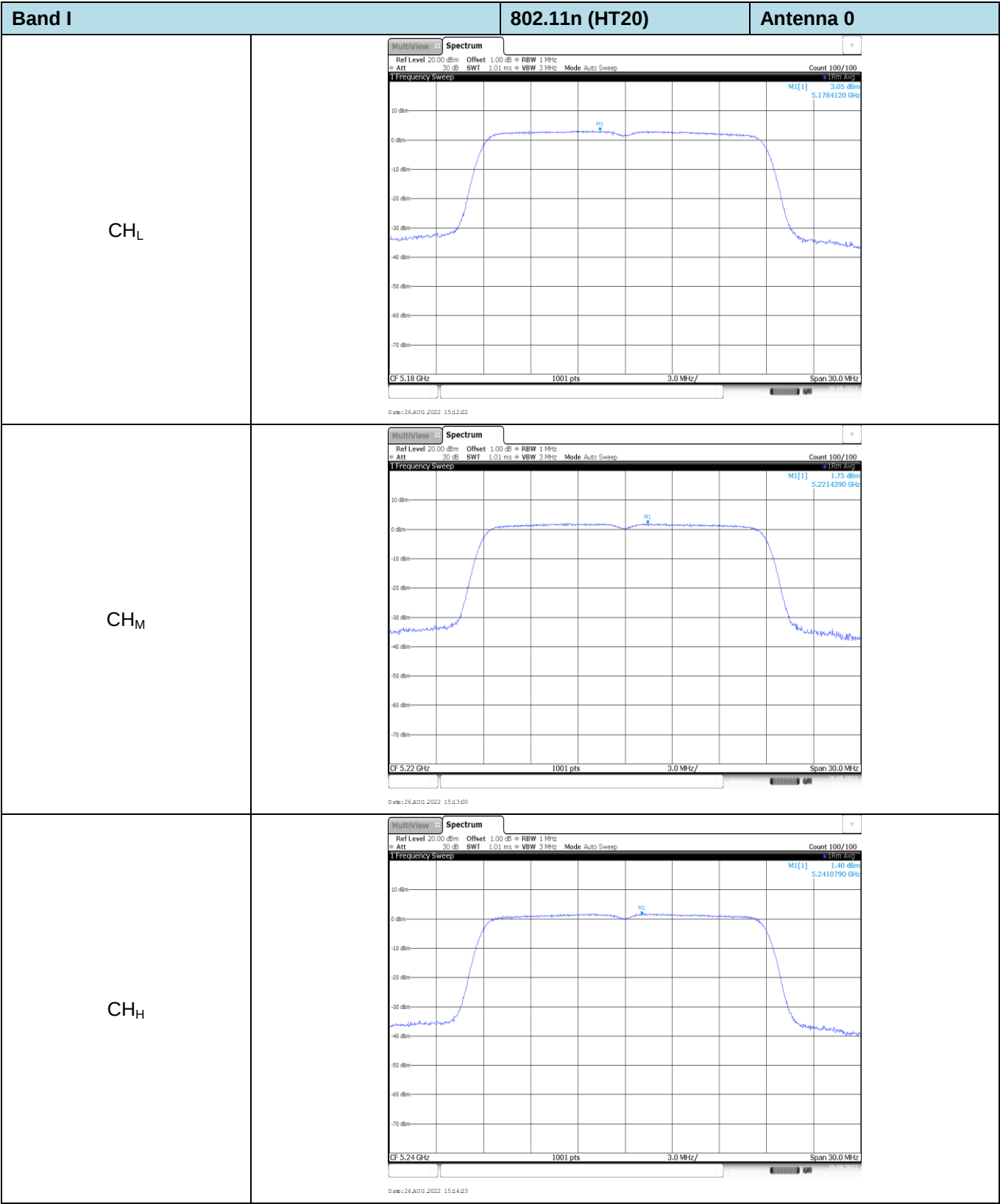
NOTE: duty cycle factor =10LOG(1/ duty cycle)

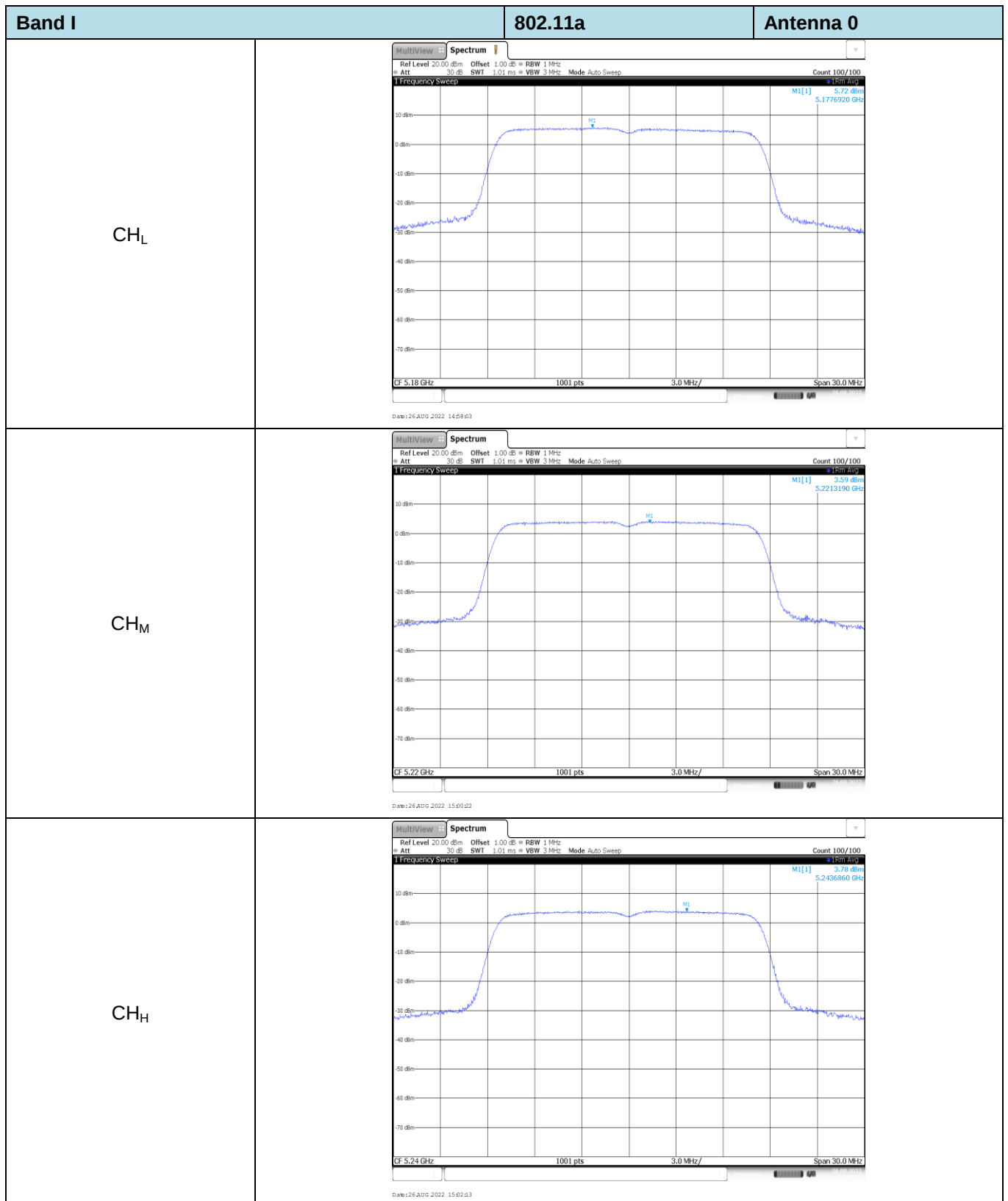
Appendix B: Maximum Power Spectral Density

Band	Bandwidth (MHz)	Type	Channel	Reading (dBm)		Duty cycle (%)		Duty cycle factor (dB)		Power Spectral Density (dBm/MHz)		Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
				Antenna 0	Antenna 1	Antenna 0	Antenna 1	Antenna 0	Antenna 1	Antenna 0	Antenna 1			
I	20	802.11n	CH _L	3.05	2.87	93.06	93.92	0.31	0.27	3.36	3.14	6.19	9.99	Pass
			CH _M	1.75	1.89	93.12	90.37	0.31	0.44	2.06	2.33	5.10		
			CH _H	1.40	1.33	92.72	90.69	0.33	0.42	1.73	1.75	4.87		
		802.11a	CH _L	5.72	5.54	91.28	94.70	0.40	0.24	6.12	5.78	-	9.99	Pass
			CH _M	3.59	4.02	92.05	93.94	0.36	0.27	3.95	4.29	-		
			CH _H	3.78	3.88	90.23	93.94	0.45	0.27	4.23	4.15	-		
	40	802.11n	CH _L	0.03	-0.18	84.15	85.55	0.75	0.68	0.78	0.5	4.15	9.99	Pass
			CH _H	-1.09	-0.69	86.24	84.15	0.64	0.75	-0.45	0.06	2.82		

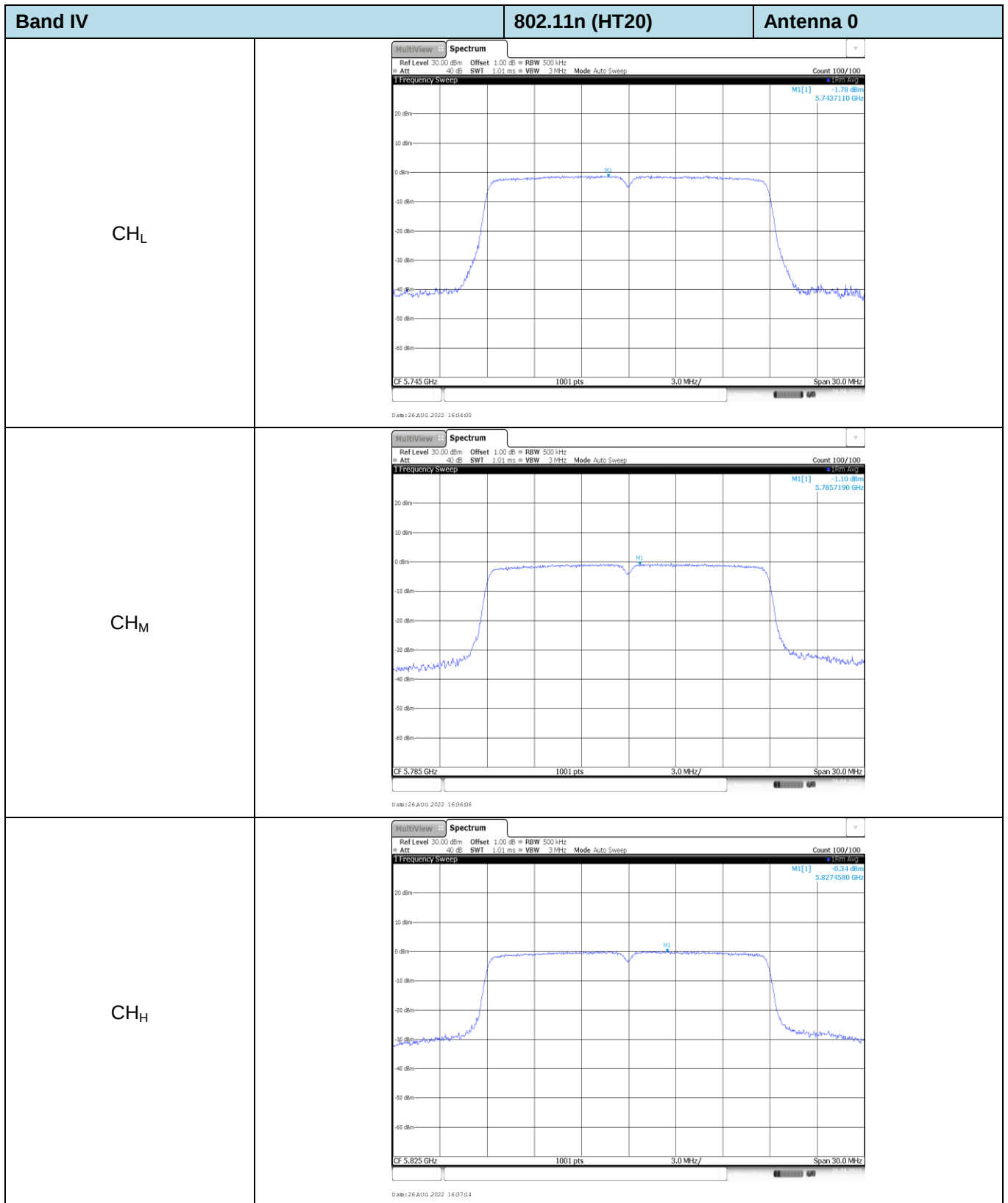
Band	Bandwidth (MHz)	Type	Channel	Reading (dBm)		Duty cycle (%)		Duty cycle factor (dB)		Power Spectral Density (dBm/500kHz)		Total PSD (dBm/MHz)	Limit (dBm/500KHz)	Result
				Antenna 0	Antenna 1	Antenna 0	Antenna 1	Antenna 0	Antenna 1	Antenna 0	Antenna 1			
IV	20	802.11n	CH _L	-1.78	0.13	91.89	94.32	0.37	0.25	-1.41	0.38	2.37	30.00	Pass
			CH _M	-1.10	0.88	89.57	89.57	0.48	0.48	-0.62	1.36	3.23		
			CH _H	-0.34	0.68	90.31	93.46	0.44	0.29	0.1	0.97	3.32		
		802.11a	CH _L	-1.60	0.34	90.28	90.63	0.44	0.43	-1.16	0.77	2.86	30.00	Pass
			CH _M	-1.58	1.47	89.89	95.14	0.46	0.22	-1.12	1.69	3.24		
			CH _H	-1.02	1.26	95.08	90.23	0.22	0.45	-0.8	1.71	3.63		
	40	802.11n	CH _L	-3.63	-2.66	89.97	83.50	0.46	0.78	-3.17	-1.88	0.69	30.00	Pass
			CH _H	-3.91	-2.73	84.15	87.65	0.75	0.57	-3.16	-2.16	0.69		

Test plot as follows:





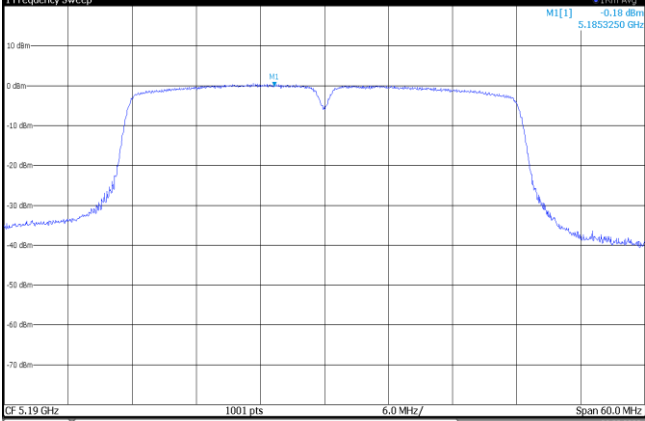
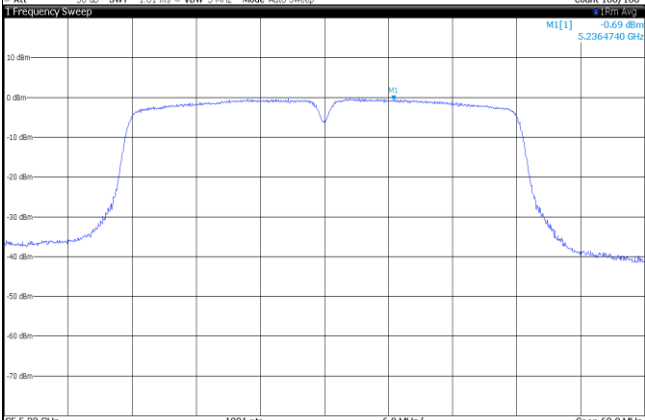
Band I		802.11n (HT40)	Antenna 0
CH _L	MultiView Spectrum Ref Level 20.00 dBm Att 30.00 Offset 1.00 dB RBW 1 MHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 0.03 dBm 5.1871830 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 5.19 GHz 1001 pts 6.0 MHz/ Span 60.0 MHz Date: 26 AUG 2022 15:20:26		
CH _H	MultiView Spectrum Ref Level 20.00 dBm Att 30.00 Offset 1.00 dB RBW 1 MHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 -1.09 dBm 5.2259240 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 5.23 GHz 1001 pts 6.0 MHz/ Span 60.0 MHz Date: 26 AUG 2022 15:21:21		

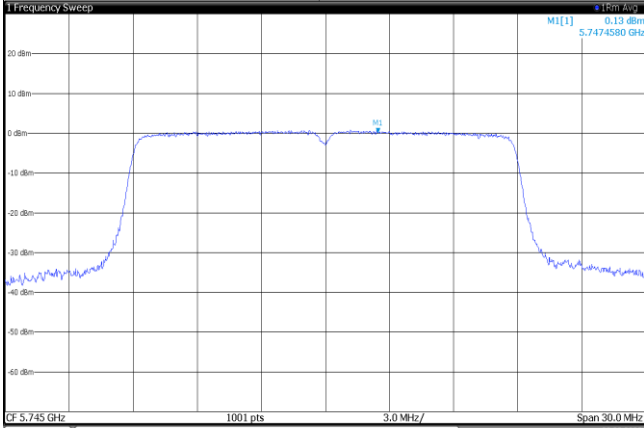
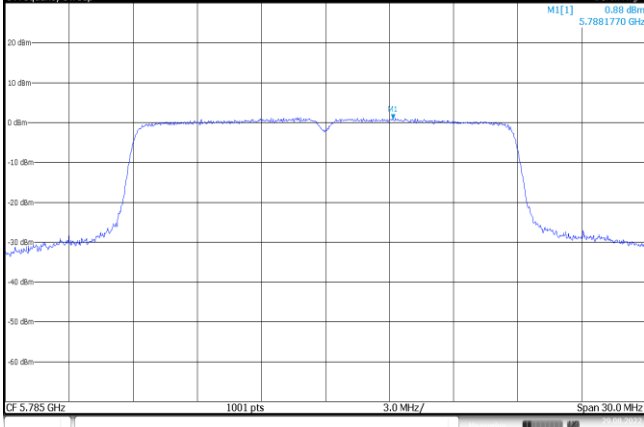
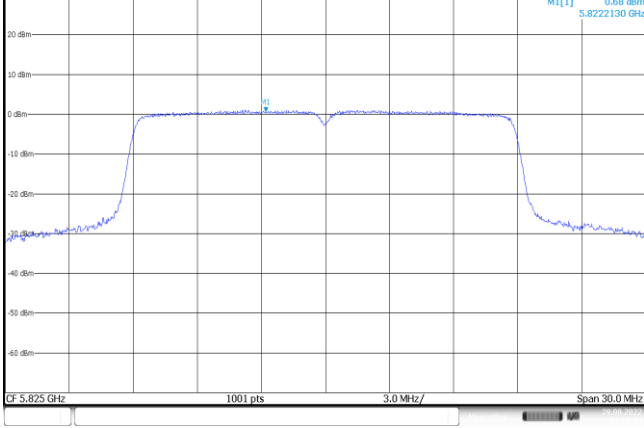


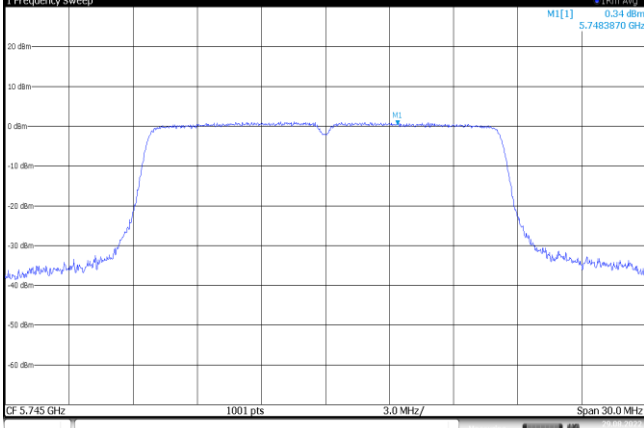
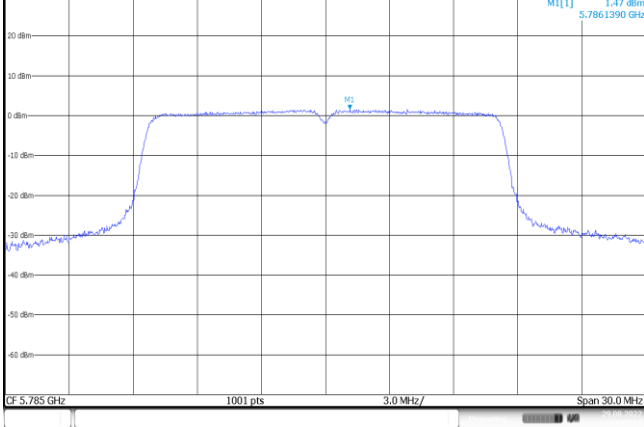
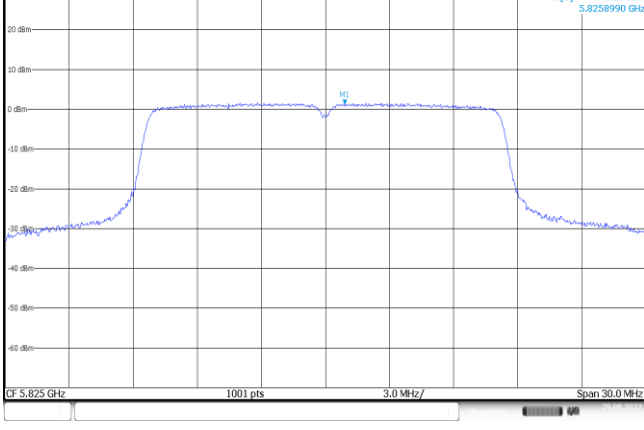
Band IV		802.11a	Antenna 0
CH _L			
CH _M			
CH _H			

Band I		802.11n (HT20)	Antenna 1
CH _L	MultiView Spectrum Ref Level 20.00 dBm Att 30.0 dB Offset 1.00 dB RBW 1 MHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 2.87 dBm 5.1744860 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 5.18 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 26.AUG.2022 15:48:17		
CH _M	MultiView Spectrum Ref Level 20.00 dBm Att 30.0 dB Offset 1.00 dB RBW 1 MHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 1.89 dBm 5.2165230 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 5.22 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 26.AUG.2022 15:49:13		
CH _H	MultiView Spectrum Ref Level 20.00 dBm Att 30.0 dB Offset 1.00 dB RBW 1 MHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 1.33 dBm 5.2446750 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 5.24 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 26.AUG.2022 15:50:09		

Band I	802.11a	Antenna 1
CH _L	MultiView Spectrum Ref Level 30.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 5.54 dBm 5.1787710 GHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 5.18 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 26.AUG.2022 15:41:08	
CH _M	MultiView Spectrum Ref Level 30.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 4.02 dBm 5.2186810 GHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 5.22 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 26.AUG.2022 15:44:09	
CH _H	MultiView Spectrum Ref Level 30.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 3.88 dBm 5.2432670 GHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 5.24 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 26.AUG.2022 15:46:16	

Band I		802.11n (HT40)	Antenna 1
CH _L	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWF 1.01 ms VSW 3.15Hz Mode Auto Sweep Count 100/100 15m Avg 1 Frequency Sweep MU[1] -0.18 dBm 5.1853250 GHz  CF 5.19 GHz 1001 pts 6.0 MHz/ Span 60.0 MHz Date: 26 AUG 2022 15:51:51		
CH _H	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWF 1.01 ms VSW 3.15Hz Mode Auto Sweep Count 100/100 15m Avg 1 Frequency Sweep MU[1] -0.69 dBm 5.2364740 GHz  CF 5.23 GHz 1001 pts 6.0 MHz/ Span 60.0 MHz Date: 26 AUG 2022 15:52:56		

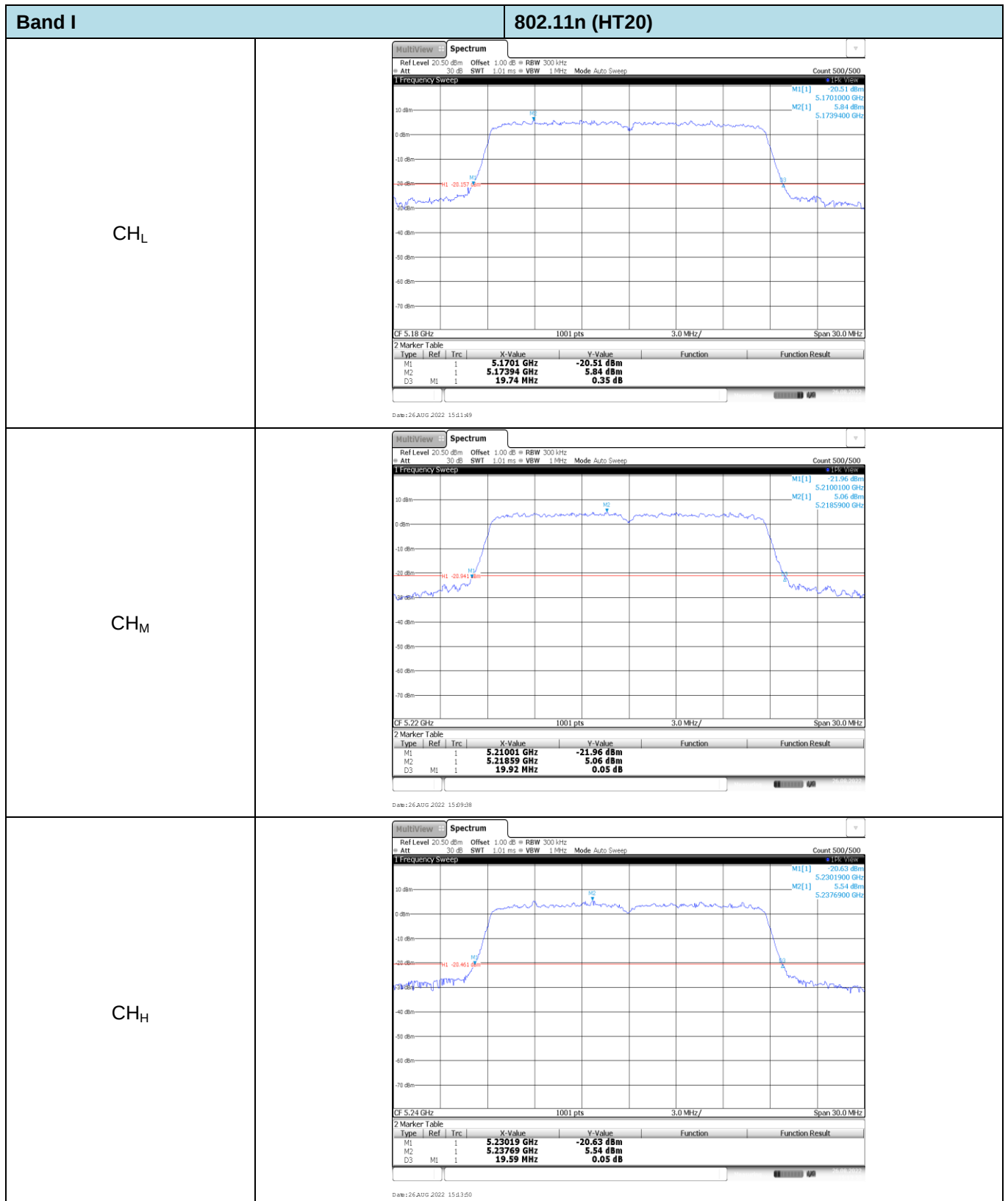
Band IV	802.11n (HT20)	Antenna 1
CH _L	MultiView Spectrum Ref Level 30.00 dBm Offset 1.00 dB RBW 500 kHz Att 40 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1[1] 0.13 dBm 5.7474580 GHz  CF 5.745 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 29 AUG 2022 11:12:59	
CH _M	MultiView Spectrum Ref Level 30.00 dBm Offset 1.00 dB RBW 500 kHz Att 40 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1[1] 0.88 dBm 5.7881770 GHz  CF 5.785 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 29 AUG 2022 11:13:58	
CH _H	MultiView Spectrum Ref Level 30.00 dBm Offset 1.00 dB RBW 500 kHz Att 40 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1[1] 0.68 dBm 5.8222130 GHz  CF 5.825 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 29 AUG 2022 11:15:10	

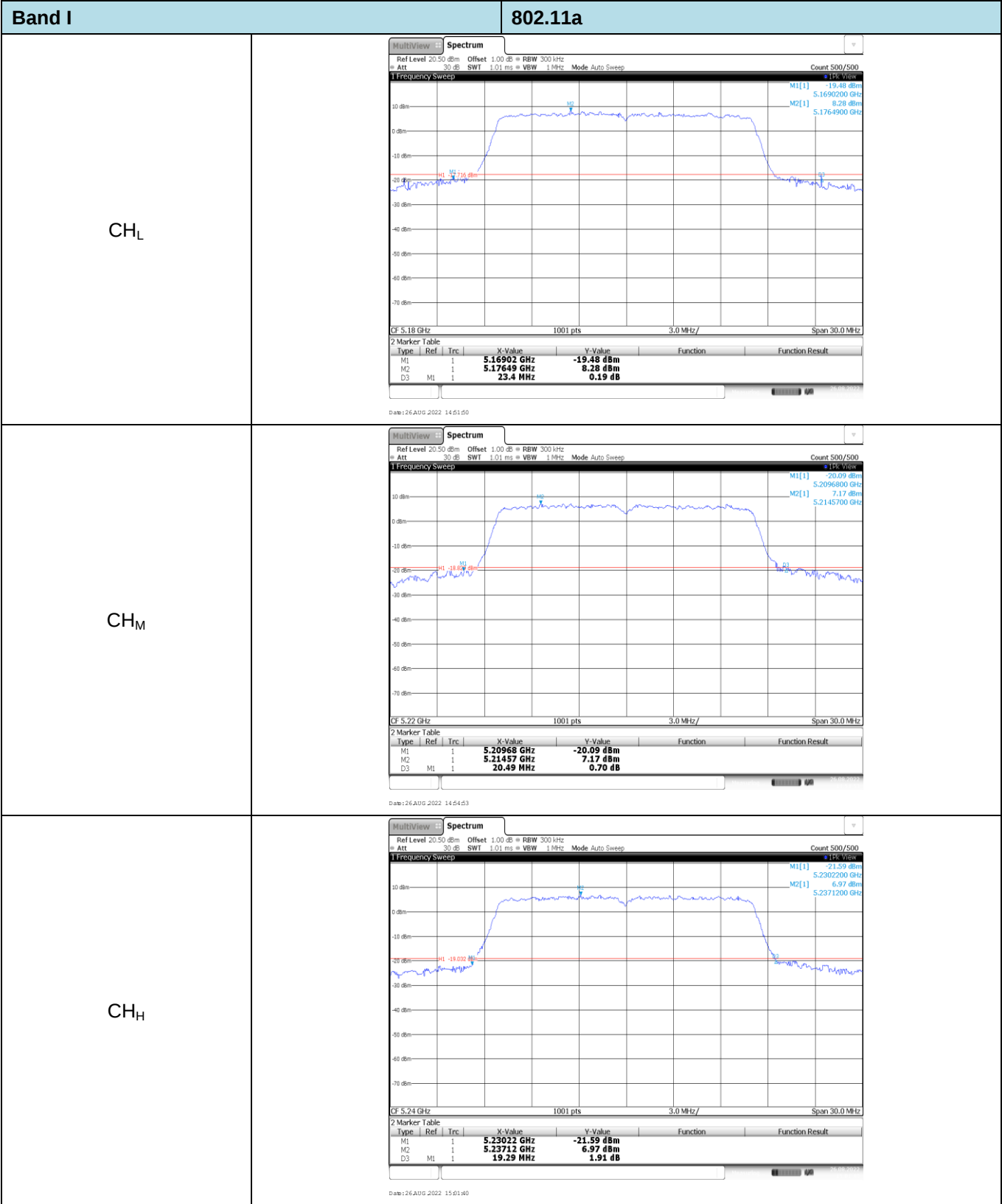
Band IV	802.11a	Antenna 1
CH _L	MultiView Spectrum Ref Level 30.00 dBm Offset 1.00 dB RBW 500 kHz Att 40 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1[1] 0.34 dBm 5.7483870 GHz  CF 5.745 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 29.AUG.2022 11:07:42	
CH _M	MultiView Spectrum Ref Level 30.00 dBm Offset 1.00 dB RBW 500 kHz Att 40 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1[1] 1.47 dBm 5.7861390 GHz  CF 5.785 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 29.AUG.2022 11:08:53	
CH _H	MultiView Spectrum Ref Level 30.00 dBm Offset 1.00 dB RBW 500 kHz Att 40 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1[1] 1.26 dBm 5.8258990 GHz  CF 5.825 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 29.AUG.2022 11:09:54	

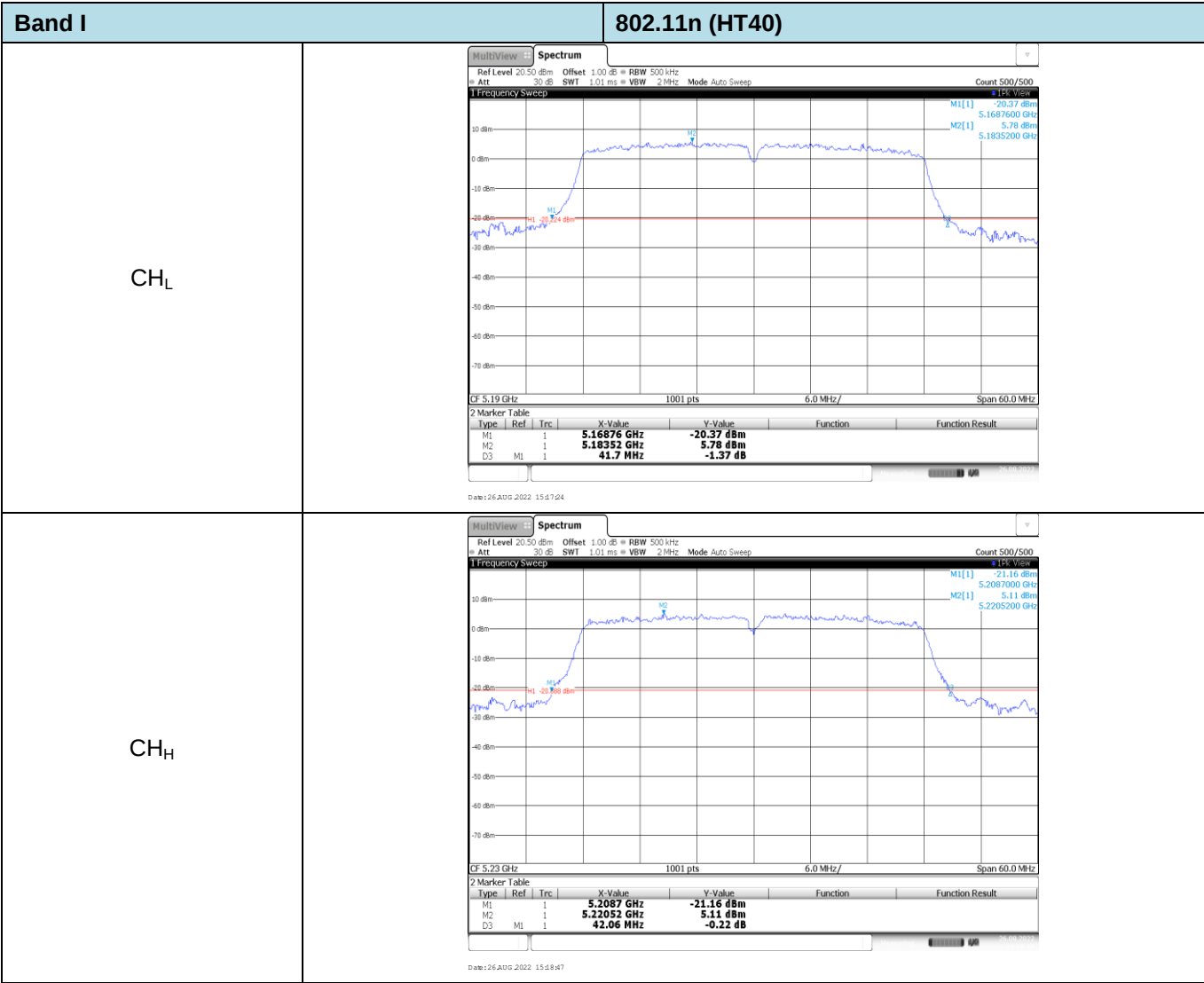
Band IV		802.11n (HT40)	Antenna 1
CH _L	MultiView Spectrum Ref Level 30.00 dBm Att 40.00 dB Offset 1.00 dB RBW 500 kHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep MU[1] -2.66 dBm 5.7499050 GHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 5.755 GHz 1001 pts 6.0 MHz/ Span 60.0 MHz Date: 29 AUG 2022 11:20:25		
CH _H	MultiView Spectrum Ref Level 30.00 dBm Att 40.00 dB Offset 1.00 dB RBW 500 kHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep MU[1] -2.73 dBm 5.7962590 GHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 5.795 GHz 1001 pts 6.0 MHz/ Span 60.0 MHz Date: 29 AUG 2022 11:21:27		

Appendix C: 26dB bandwidth

Band	Bandwidth (MHz)	Type	Channel	26dB bandwidth (MHz)	Result
I	20	802.11n	CH _L	19.74	Pass
			CH _M	19.92	
			CH _H	19.59	
		802.11a	CH _L	23.40	Pass
			CH _M	20.49	
			CH _L	19.74	
	40	802.11n	CH _L	41.70	Pass
			CH _H	42.06	







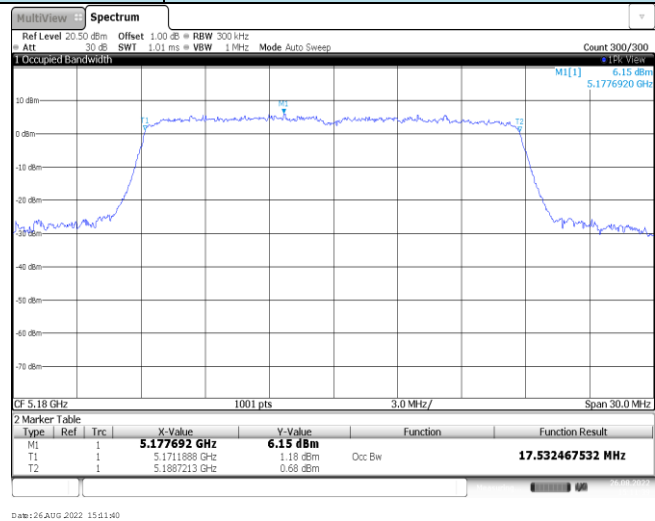
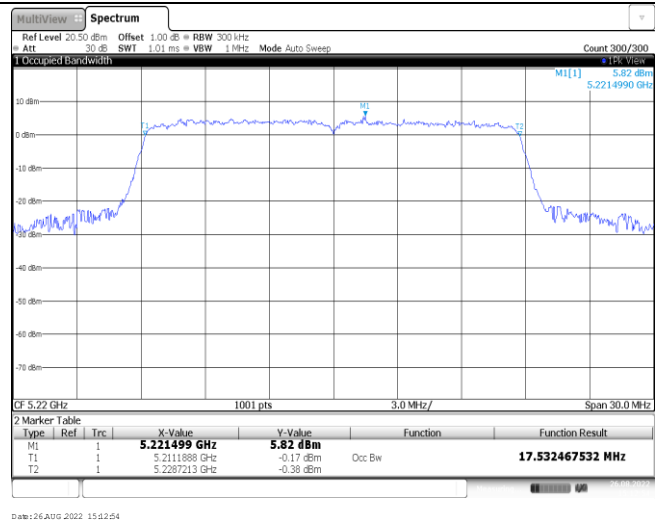
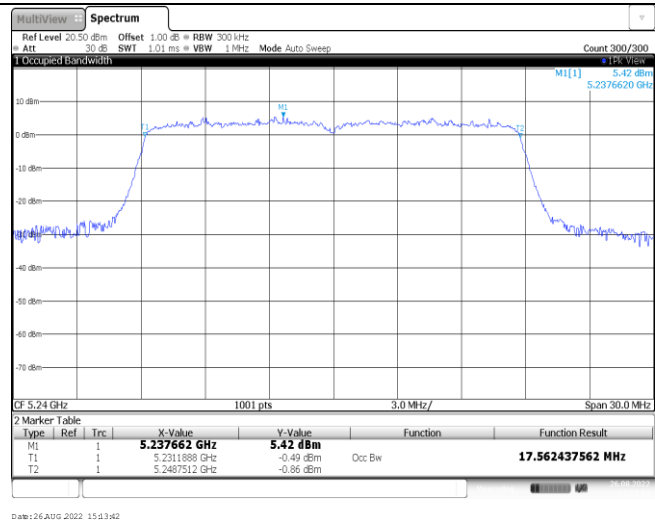
Appendix D: 99% Occupy bandwidth

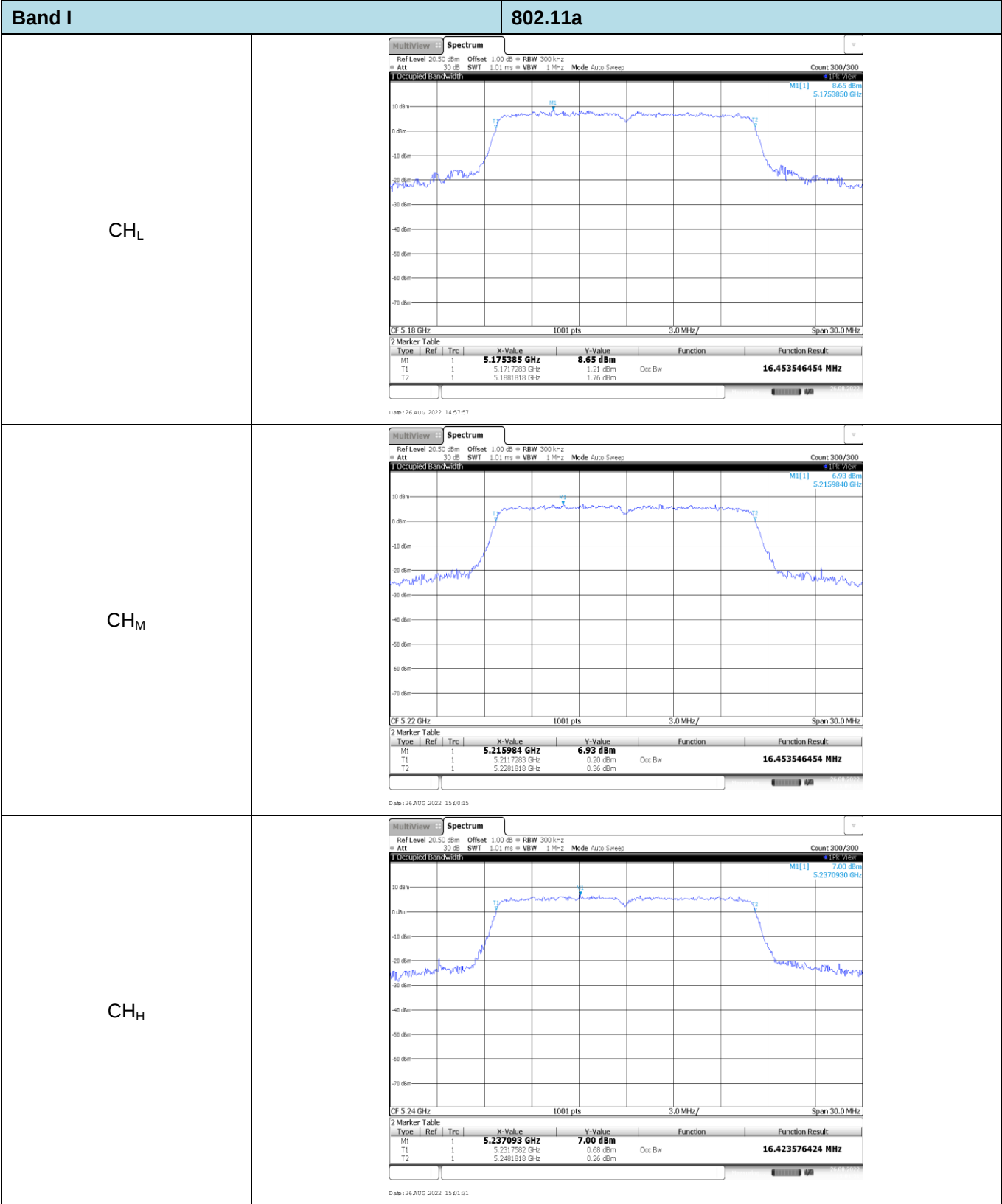
Band	Bandwidth (MHz)	Type	Channel	99% Occupy bandwidth (MHz)	Result
I	20	802.11n	CH _L	17.53	Pass
			CH _M	17.53	
			CH _H	17.56	
		802.11a	CH _L	16.45	Pass
			CH _M	16.45	
			CH _H	16.42	
	40	802.11n	CH _L	36.20	Pass
			CH _H	36.32	

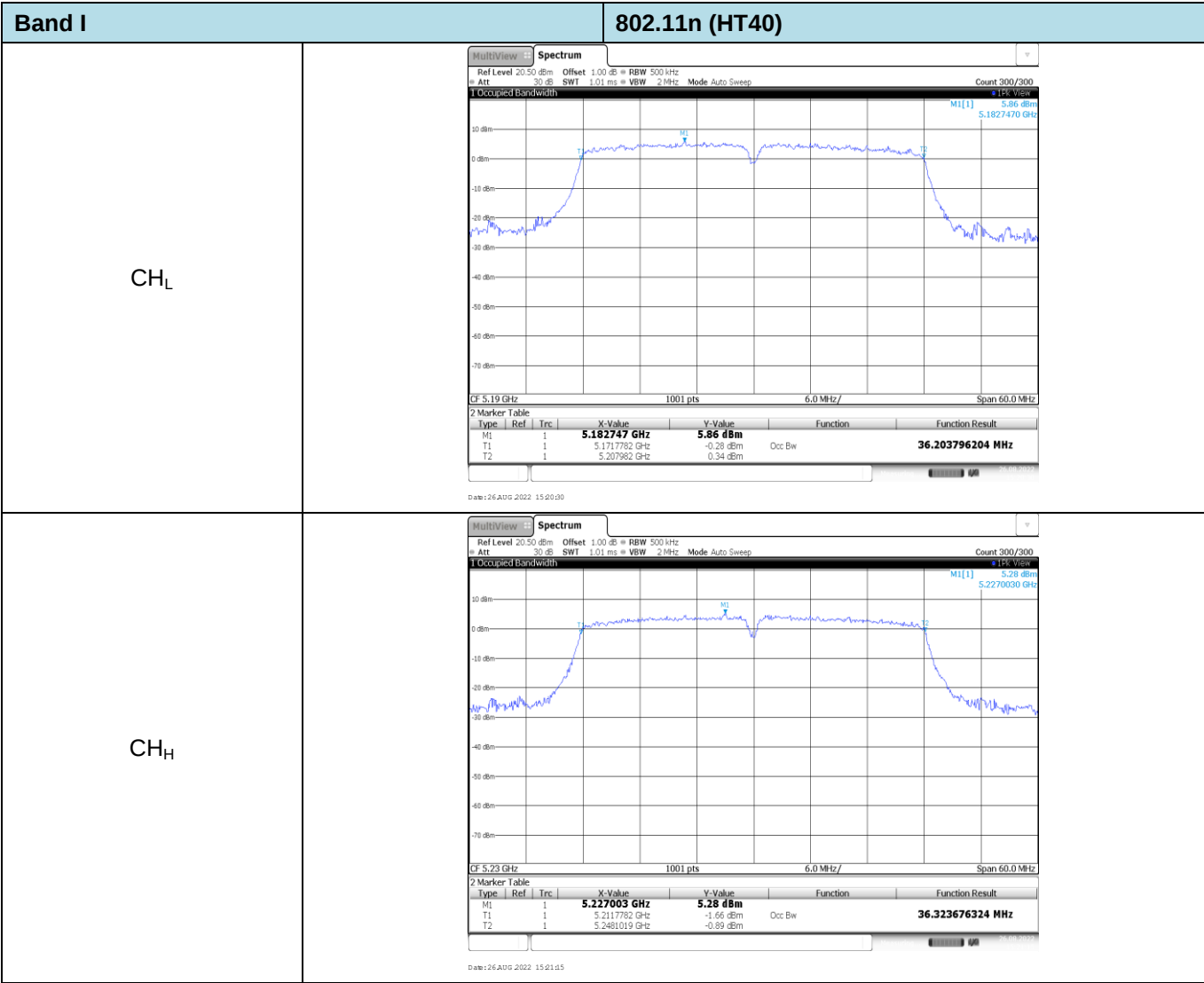
Band	Bandwidth (MHz)	Type	Channel	99% Occupy bandwidth (MHz)	Result
IV	20	802.11n	CH _L	17.56	Pass
			CH _M	17.59	
			CH _H	17.83	
		802.11a	CH _L	16.39	Pass
			CH _M	16.45	
			CH _H	16.51	
	40	802.11n	CH _L	36.21	Pass
			CH _H	36.38	

Band I

802.11n (HT20)

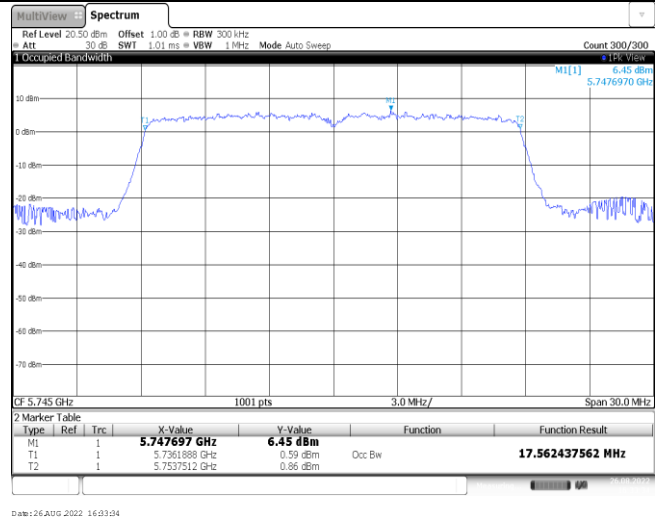
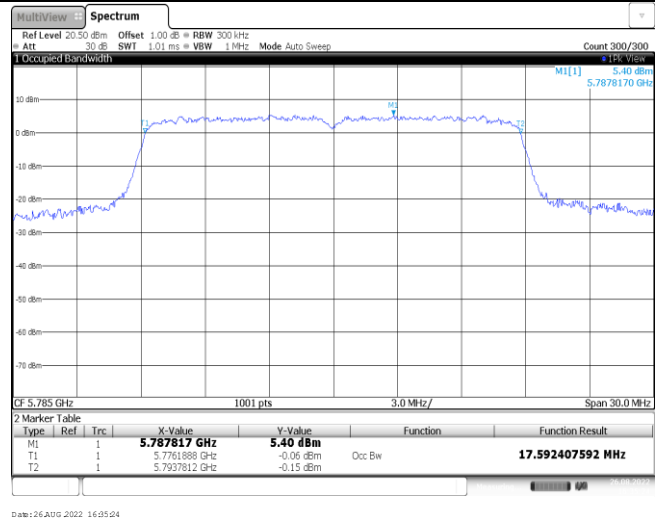
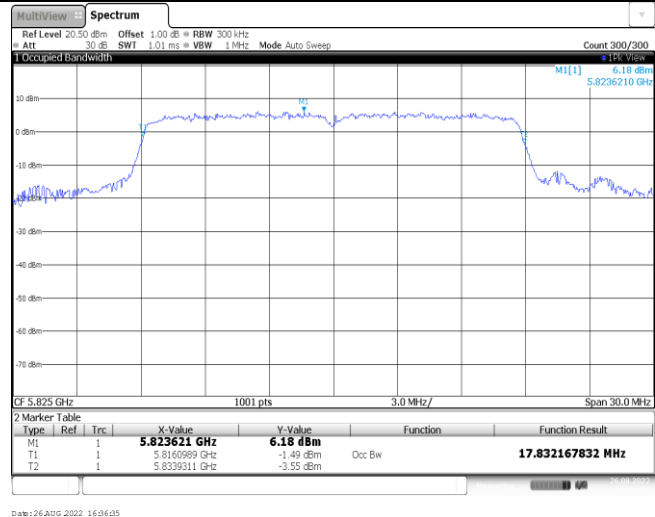
CH_LCH_MCH_H

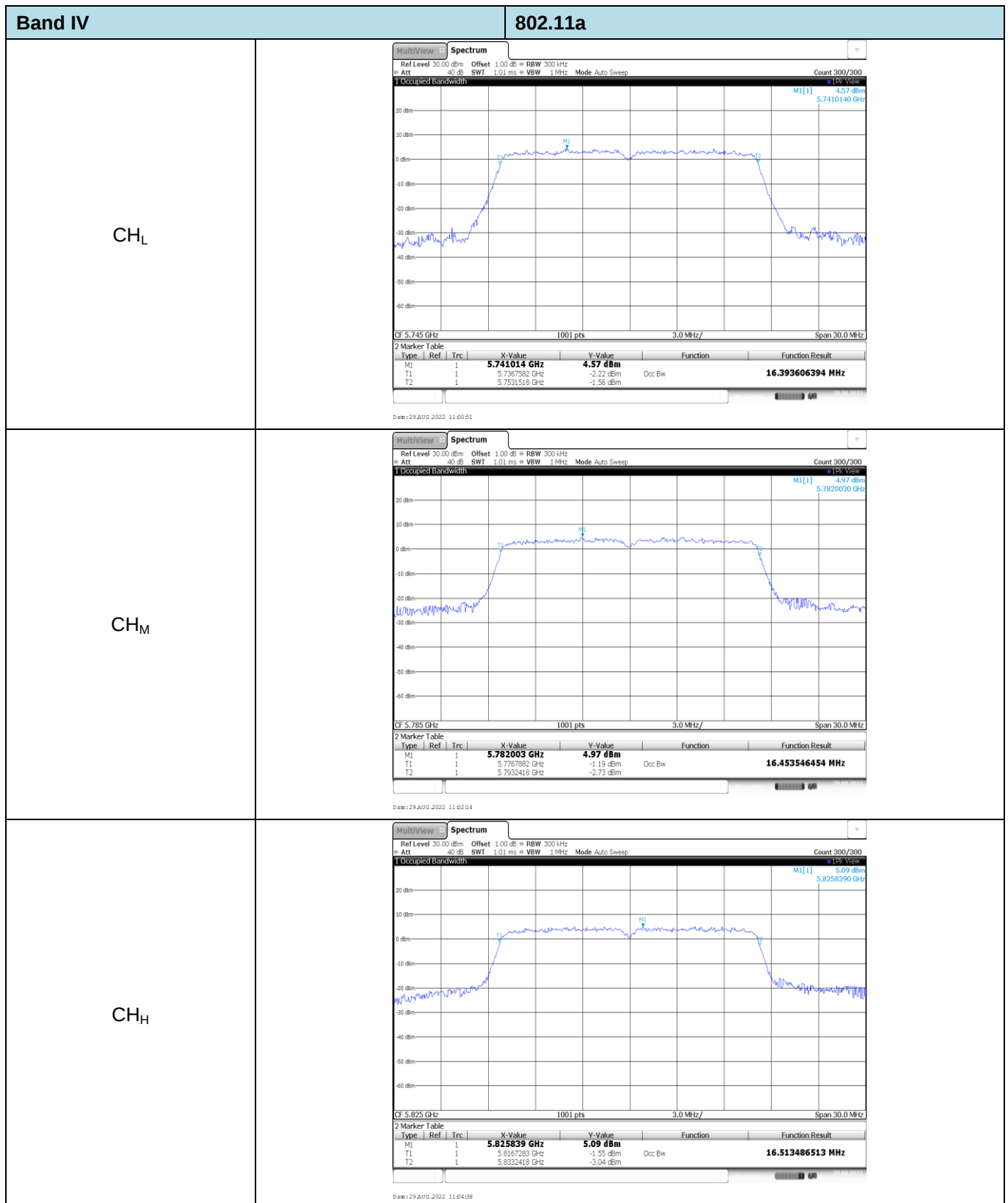


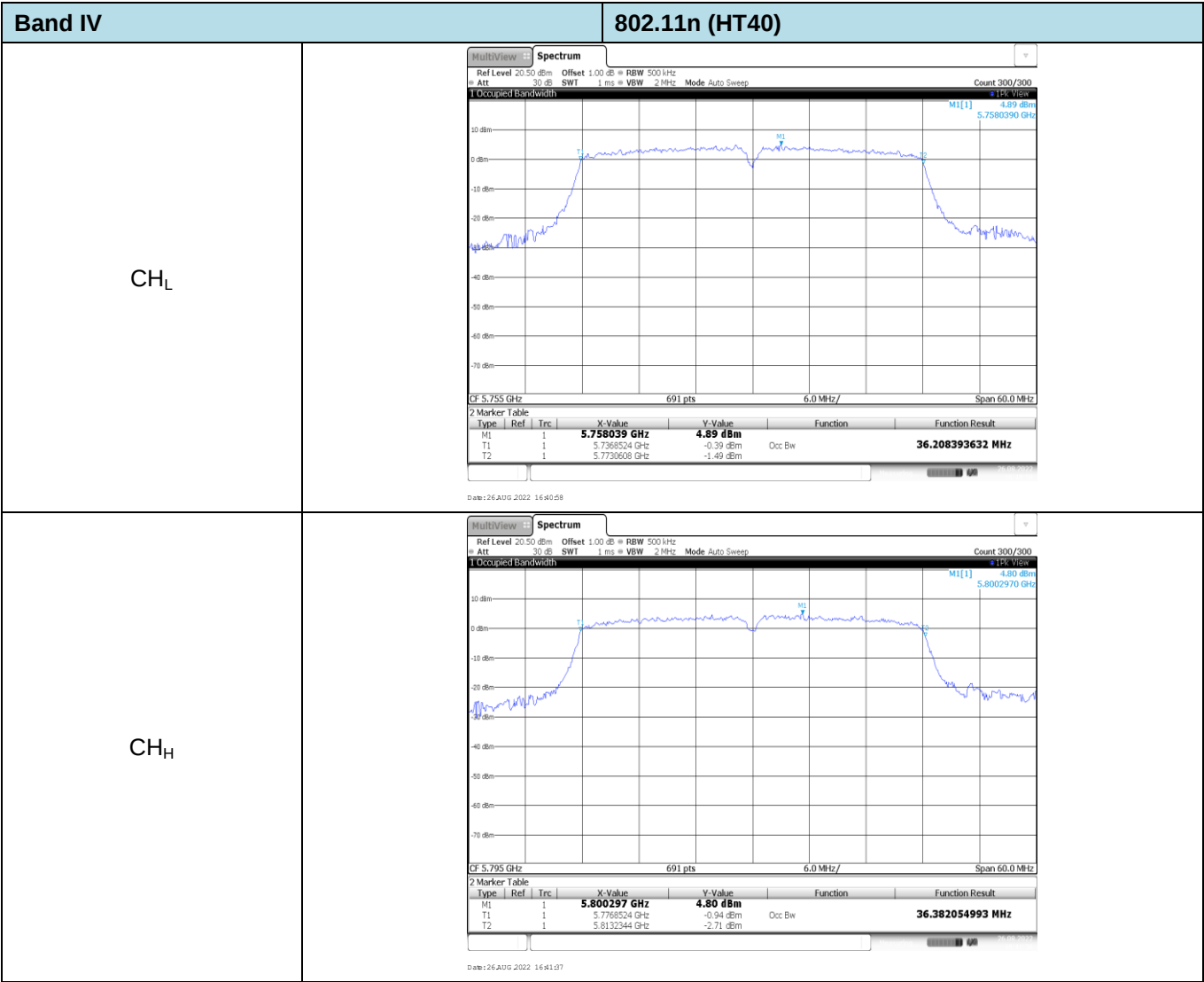


Band IV

802.11n (HT20)

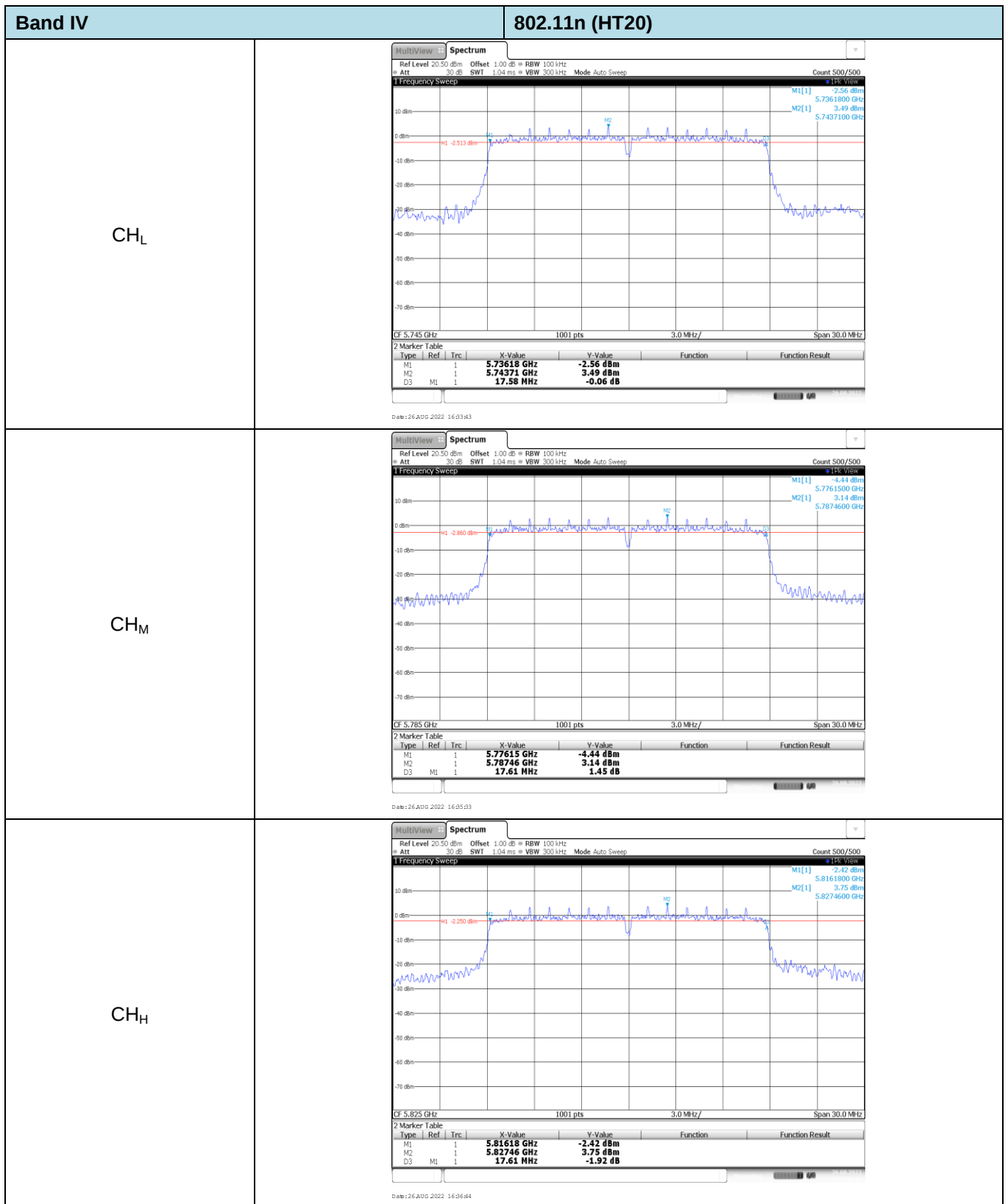
CH_LCH_MCH_H

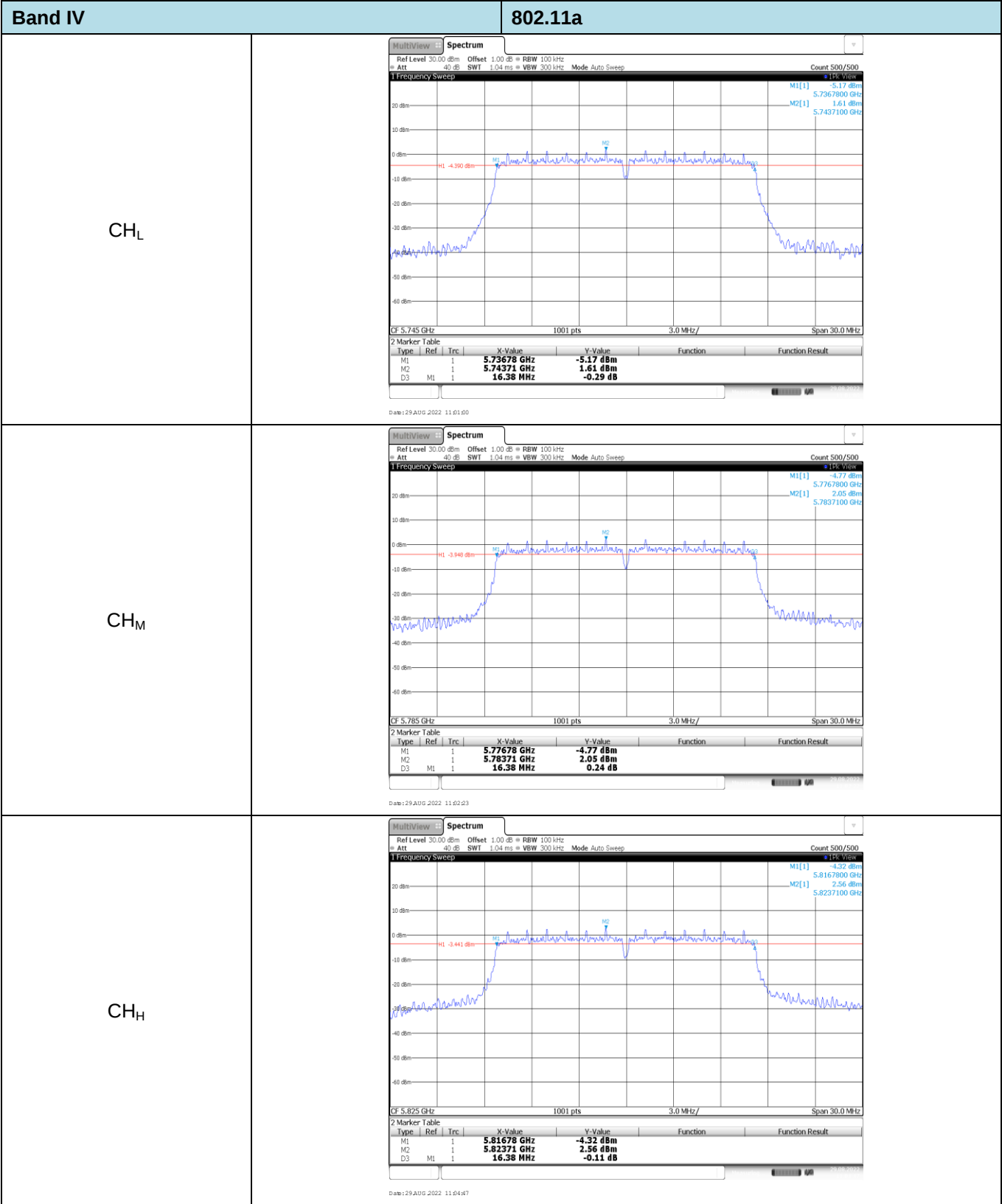


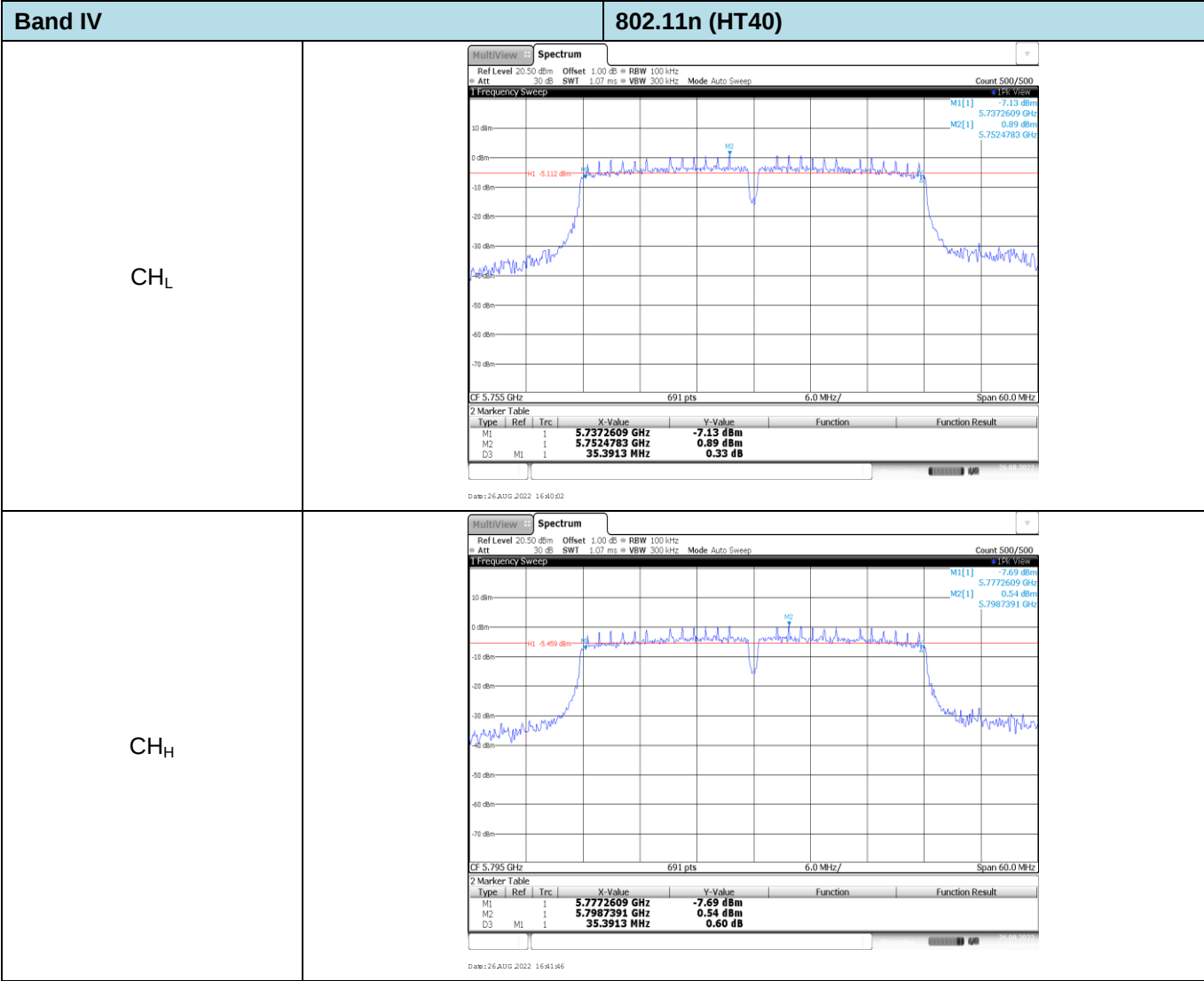


Appendix E: 6dB Bandwidth

Band	Bandwidth (MHz)	Type	Channel	6dB bandwidth (MHz)	Result
IV	20	802.11n	CH _L	17.58	Pass
			CH _M	17.61	
			CH _H	17.61	
		802.11a	CH _L	16.38	Pass
			CH _M	16.38	
			CH _H	16.38	
	40	802.11n	CH _L	35.39	Pass
			CH _H	35.39	
			CH _H	35.39	







Appendix F: Frequency stability**Voltage VS Frequency stability**

Band: I				Test Frequency: 5180.00MHz		
Temperature (°C)	Voltage (V)	Frequency Deviation (Hz)		Frequency Deviation (ppm)		Result
		Antenna 0	Antenna 1	Antenna 0	Antenna 1	
T _N	V _L	-22000.00	-26000.00	-4.24710	-5.01931	PASS
T _N	V _N	-20000.00	-26000.00	-3.86100	-5.01931	PASS
T _N	V _H	-23000.00	-25000.00	-4.44015	-4.82626	PASS

Band: IV				Test Frequency: 5745.00MHz		
Temperature (°C)	Voltage (V)	Frequency Deviation (Hz)		Frequency Deviation (ppm)		Result
		Antenna 0	Antenna 1	Antenna 0	Antenna 1	
T _N	V _L	-32000.00	-30000.00	-5.57006	-5.22193	PASS
T _N	V _N	-32000.00	-28000.00	-5.57006	-4.87380	PASS
T _N	V _H	-32000.00	-30000.00	-5.57006	-5.22193	PASS

Temperature VS Frequency stability

Band: I				Test Frequency: 5180.00MHz		
Voltage (V)	Temperature (°C)	Frequency Deviation (Hz)		Frequency Deviation (ppm)		Result
		Antenna 0	Antenna 1	Antenna 0	Antenna 1	
V _N	-20	-24000.00	-25000.00	-4.63321	-4.82626	PASS
V _N	-10	-24000.00	-25000.00	-4.63321	-4.82626	PASS
V _N	0	-24000.00	-25000.00	-4.63321	-4.82626	PASS
V _N	10	-24000.00	-25000.00	-4.63321	-4.82626	PASS
V _N	20	-25000.00	-25000.00	-4.82626	-4.82626	PASS
V _N	30	-25000.00	-24000.00	-4.82626	-4.63321	PASS
V _N	40	-25000.00	-24000.00	-4.82626	-4.63321	PASS
V _N	50	-25000.00	-24000.00	-4.82626	-4.63321	PASS

Band: IV				Test Frequency: 5745.00MHz		
Voltage (V)	Temperature (°C)	Frequency Deviation (Hz)		Frequency Deviation (ppm)		Result
		Antenna 0	Antenna 1	Antenna 0	Antenna 1	
V _N	-20	-32000.00	-31000.00	-5.57006	-5.39600	PASS
V _N	-10	-32000.00	-31000.00	-5.57006	-5.39600	PASS
V _N	0	-32000.00	-31000.00	-5.57006	-5.39600	PASS
V _N	10	-32000.00	-32000.00	-5.57006	-5.57006	PASS
V _N	20	-32000.00	-31000.00	-5.57006	-5.39600	PASS
V _N	30	-32000.00	-31000.00	-5.57006	-5.39600	PASS
V _N	40	-32000.00	-31000.00	-5.57006	-5.39600	PASS
V _N	50	-32000.00	-31000.00	-5.57006	-5.39600	PASS

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