

APPENDIX REPORT

Project No.	SHT2104128003EW	Radio Specification	WIFI 5G
Test sample No.	YPHT21041280017	Model No.	E3PDA
Start test date	2021-07-16	Finish date	2021-07-16
Temperature	24.8°C	Humidity	35%
Test Engineer	Hailey Chen	Auditor	Xiaodong Zhao

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	802.11n	CH _L	11.68	97.18	0.12	11.80	24.00	Pass
			CH _M	11.74	97.18	0.12	11.86		
			CH _H	12.84	97.18	0.12	12.96		
		802.11a	CH _L	11.68	97.36	0.12	11.80	24.00	Pass
			CH _M	12.22	97.36	0.12	12.34		
			CH _H	12.27	97.36	0.12	12.39		
	40	802.11n	CH _L	11.08	94.74	0.23	11.31	24.00	Pass
			CH _H	11.80	94.74	0.23	12.03		
II	20	802.11n	CH _L	13.02	97.18	0.12	13.14	24.00	Pass
			CH _M	12.71	97.18	0.12	12.83		
			CH _H	11.49	97.18	0.12	11.61		
		802.11a	CH _L	12.63	97.36	0.12	12.75	24.00	Pass
			CH _M	12.28	97.28	0.12	12.40		
			CH _H	11.96	97.36	0.12	12.08		
	40	802.11n	CH _L	12.15	94.74	0.23	12.38	24.00	Pass
			CH _H	11.29	94.74	0.23	11.52		
IV	20	802.11n	CH _L	14.15	97.18	0.12	14.27	30.00	Pass
			CH _M	13.37	97.18	0.12	13.49		
			CH _H	12.24	97.18	0.12	12.36		
		802.11a	CH _L	14.16	97.28	0.12	14.28	30.00	Pass
			CH _M	12.86	97.36	0.12	12.98		
			CH _H	12.26	97.36	0.12	12.38		
	40	802.11n	CH _L	13.25	94.74	0.23	13.48	30.00	Pass
			CH _H	12.40	94.74	0.23	12.63		

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

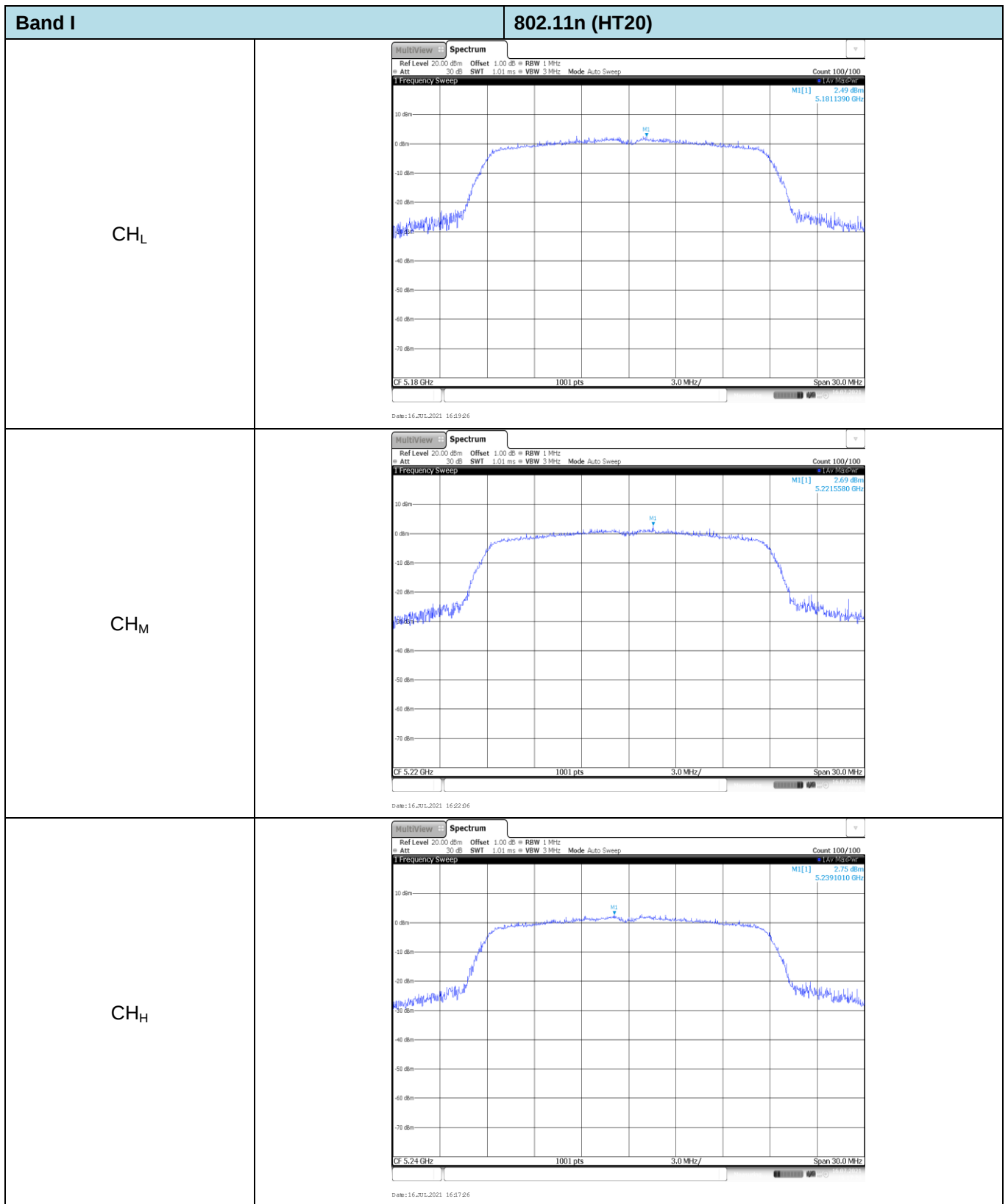
Appendix B: Maximum Power Spectral Density

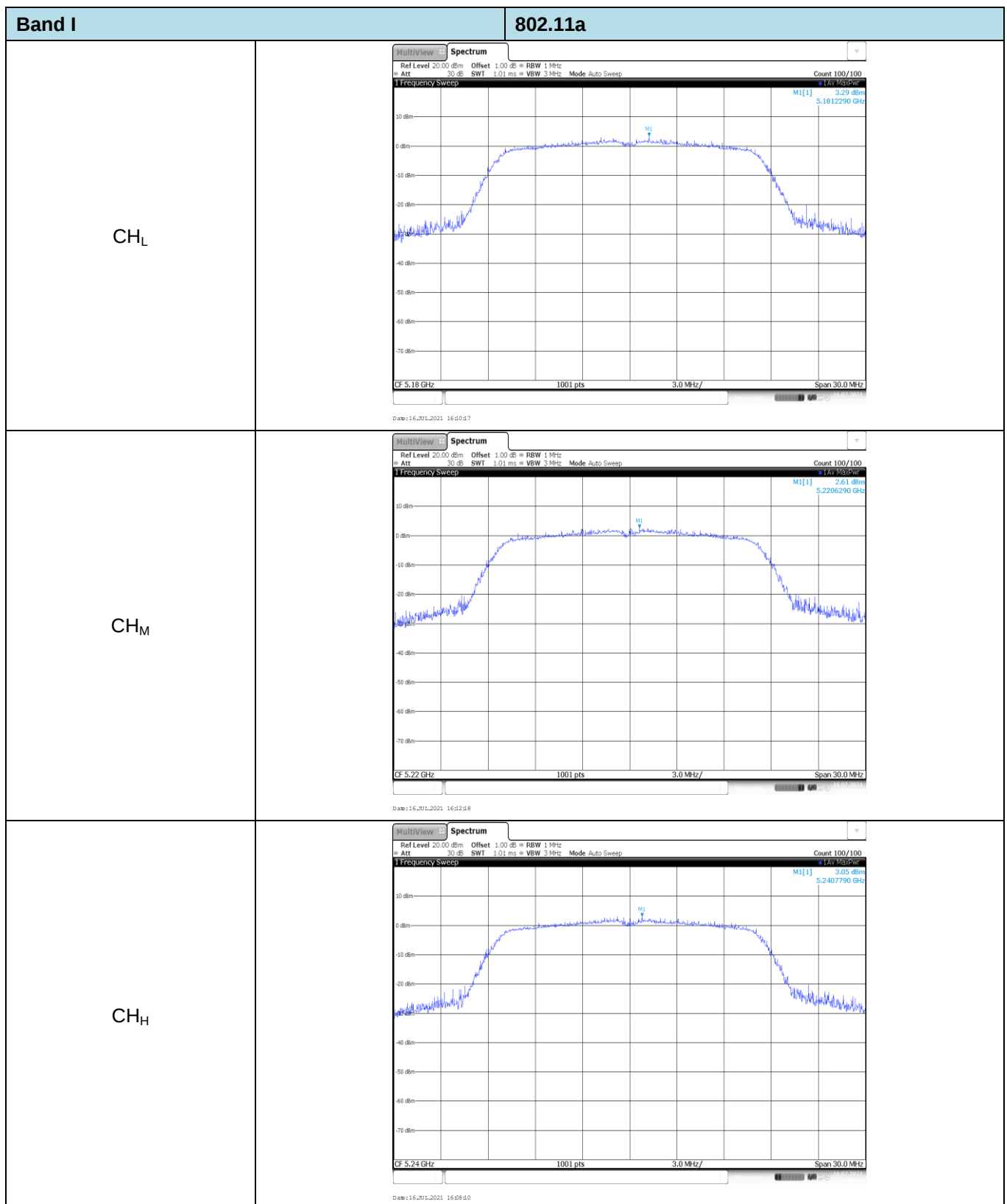
Band	Bandwidth (MHz)	Type	Channel	Reading (dBm)	Duty cycle (%)	Duty cycle factor (dB)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
I	20	802.11n	CH _L	2.49	97.18	0.12	2.61	11.00	Pass
			CH _M	2.69	97.18	0.12	2.81		
			CH _H	2.75	97.18	0.12	2.87		
		802.11a	CH _L	3.29	97.36	0.12	3.41	11.00	Pass
			CH _M	2.61	97.36	0.12	2.73		
			CH _H	3.05	97.36	0.12	3.17		
	40	802.11n	CH _L	-2.14	94.74	0.23	-1.91	11.00	Pass
			CH _H	-2.06	94.74	0.23	-1.83		

Band	Bandwidth (MHz)	Type	Channel	Reading (dBm)	Duty cycle (%)	Duty cycle factor (dB)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
II	20	802.11n	CH _L	2.69	97.18	0.12	2.81	11.00	Pass
			CH _M	3.10	97.18	0.12	3.22		
			CH _H	2.97	97.18	0.12	3.09		
		802.11a	CH _L	3.01	97.36	0.12	3.13	11.00	Pass
			CH _M	2.75	97.28	0.12	2.87		
			CH _H	3.19	97.36	0.12	3.31		
	40	802.11n	CH _L	-1.20	94.74	0.23	-0.97	11.00	Pass
			CH _H	-1.74	94.74	0.23	-1.51		

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	802.11n	CH _L	2.75	97.18	0.12	2.87	30.00	Pass
			CH _M	2.51	97.18	0.12	2.63		
			CH _H	0.52	97.18	0.12	0.64		
		802.11a	CH _L	2.79	97.28	0.12	2.91	30.00	Pass
			CH _M	2.02	97.36	0.12	2.14		
			CH _H	0.75	97.36	0.12	0.87		
	40	802.11n	CH _L	-0.95	94.74	0.23	-0.72	30.00	Pass
			CH _H	-2.05	94.74	0.23	-1.82		

Test plot as follows:

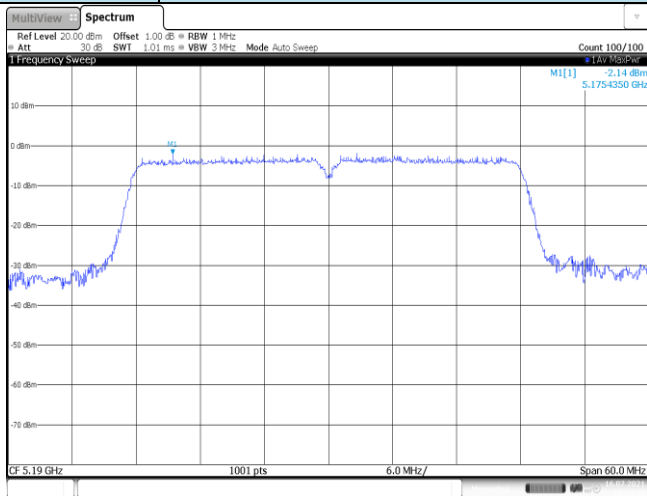




Band I

802.11n (HT40)

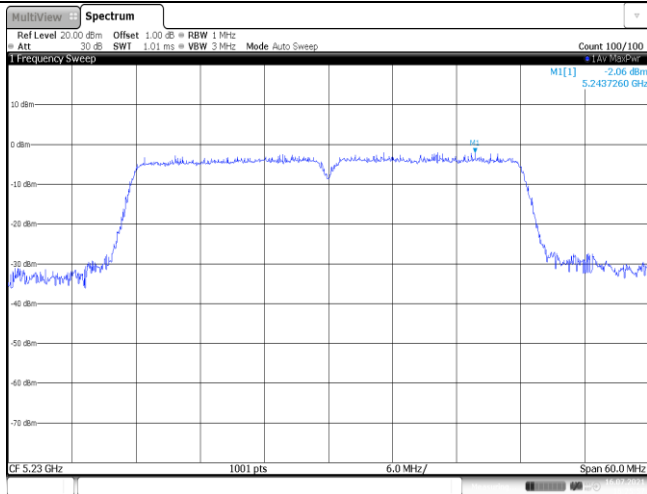
CH_L



Spectrum plot for CH_L showing a signal centered at 5.19 GHz. The plot displays a flat baseline with a small peak at 5.19 GHz. The y-axis is labeled 'dBm' and ranges from -70 to 10. The x-axis is labeled 'Frequency Sweep' and ranges from 5.19 GHz to 5.25 GHz. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 1 MHz, Att 30 dB, SWT 1.01 ms, VBW 3 kHz, Mode Auto Sweep. The count is 100/100. The plot is labeled 'MI[1]' and shows a value of -2.14 dBm at 5.1754350 GHz.

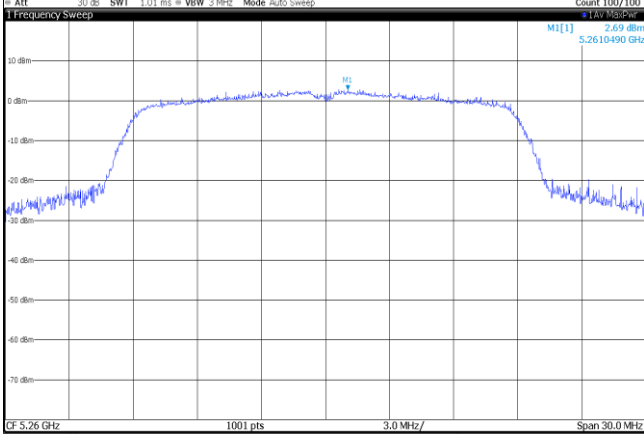
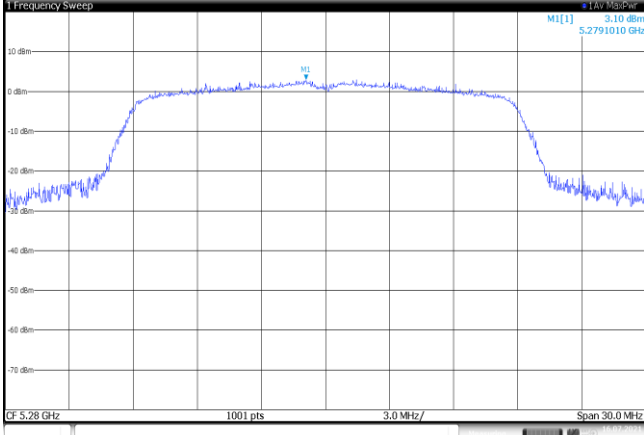
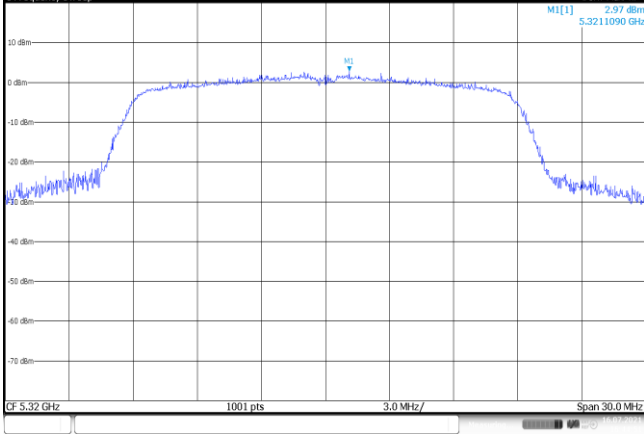
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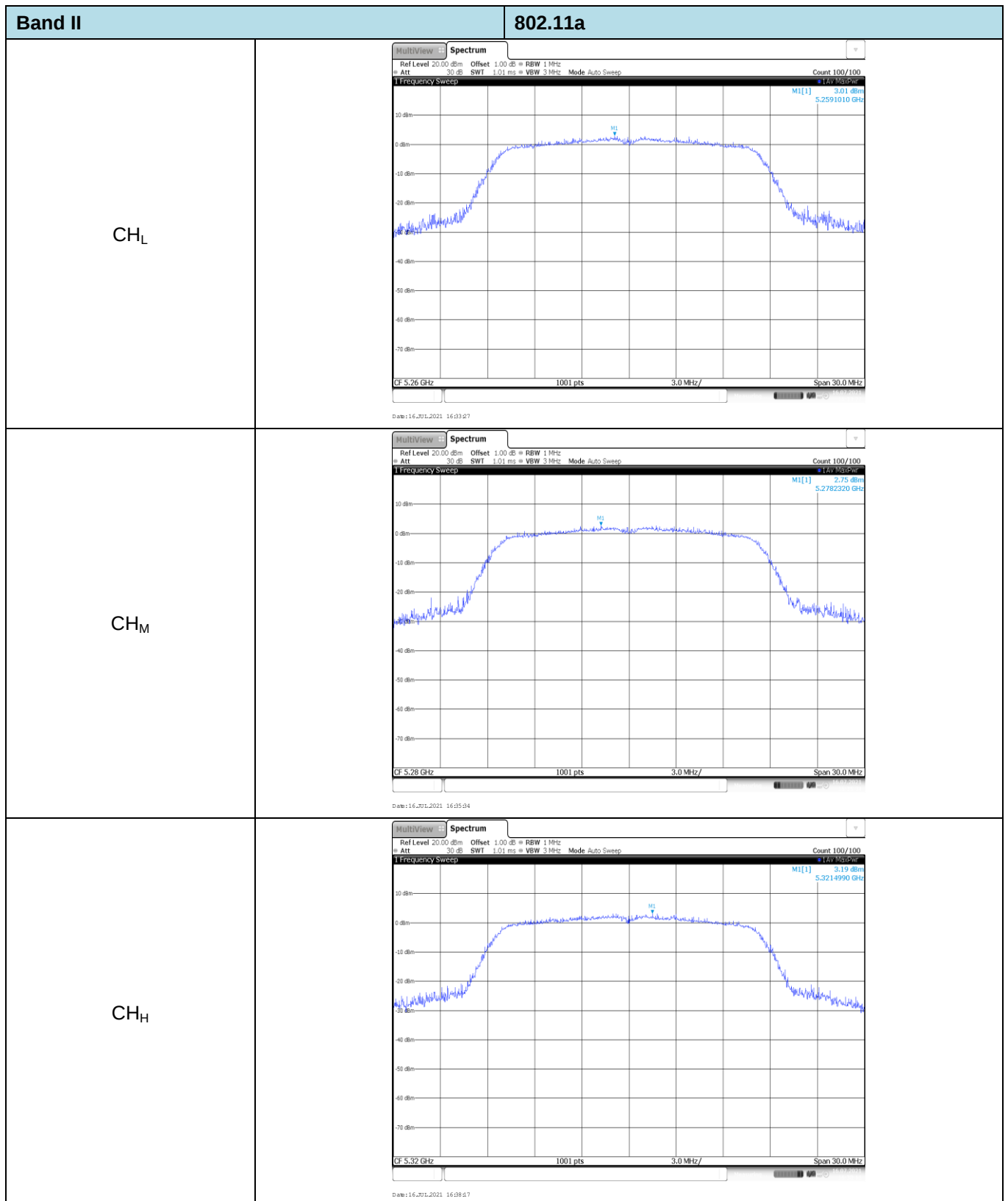
CH_H

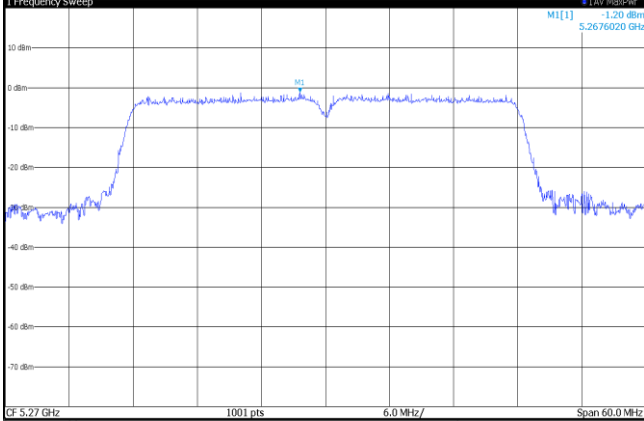
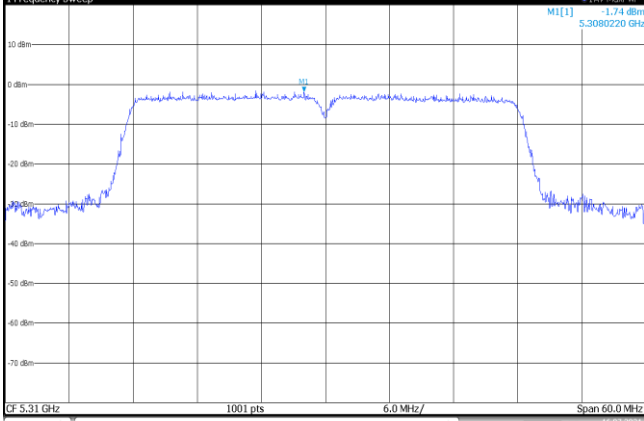


Spectrum plot for CH_H showing a signal centered at 5.23 GHz. The plot displays a flat baseline with a small peak at 5.23 GHz. The y-axis is labeled 'dBm' and ranges from -70 to 10. The x-axis is labeled 'Frequency Sweep' and ranges from 5.23 GHz to 5.29 GHz. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 1 MHz, Att 30 dB, SWT 1.01 ms, VBW 3 kHz, Mode Auto Sweep. The count is 100/100. The plot is labeled 'MI[1]' and shows a value of -2.06 dBm at 5.2437260 GHz.

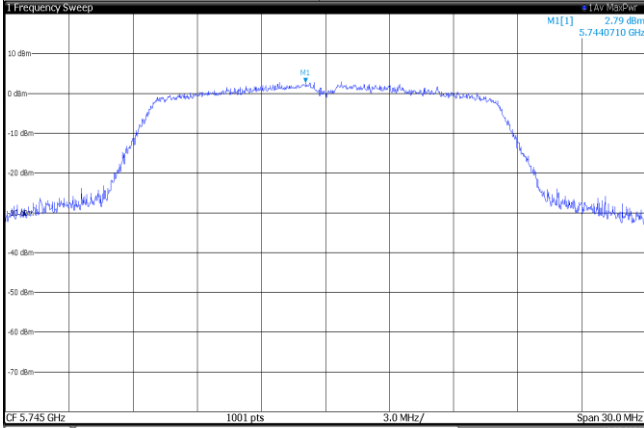
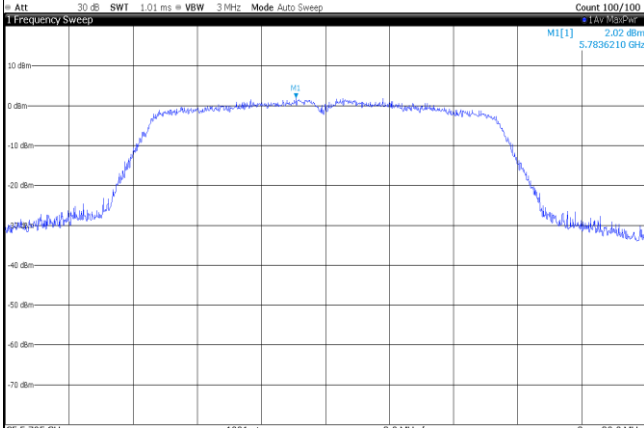
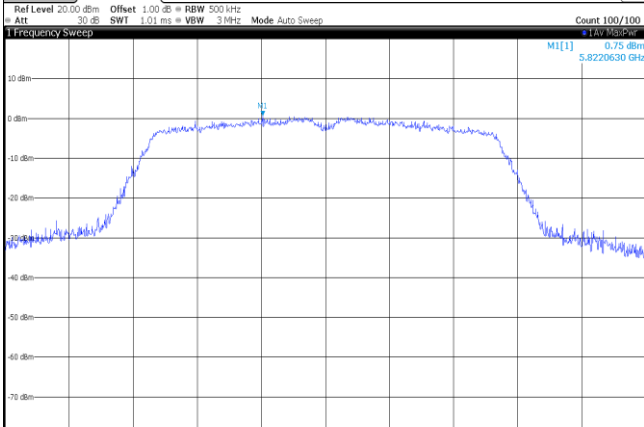
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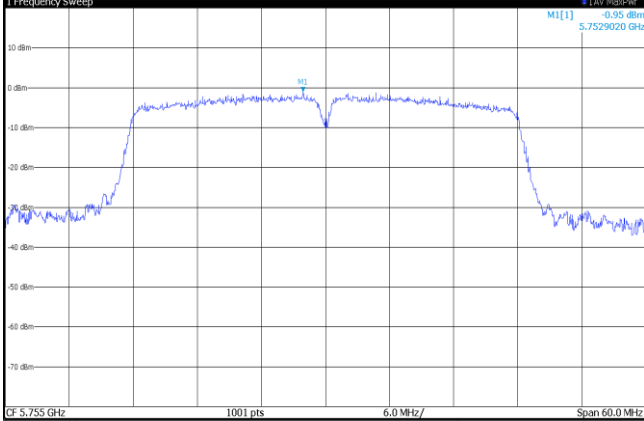
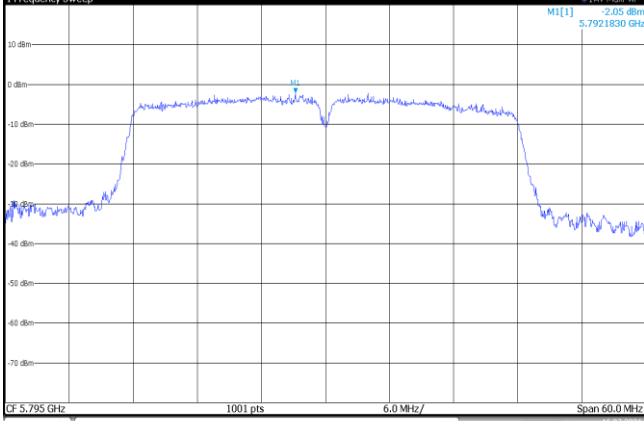
Band II		802.11n (HT20)
CH _L	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑ IAT MSPW 1 Frequency Sweep M1 2.69 dBm 5.2610490 GHz  CF 5.26 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date:16_JUL_2021 16:40:27	
CH _M	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑ IAT MSPW 1 Frequency Sweep M1 3.10 dBm 5.2791010 GHz  CF 5.28 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date:16_JUL_2021 16:43:03	
CH _H	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑ IAT MSPW 1 Frequency Sweep M1 2.97 dBm 5.3211090 GHz  CF 5.32 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date:16_JUL_2021 16:44:52	



Band II		802.11n (HT40)
CH _L	MultiView Spectrum Ref Level 20.00 dBm Att 30 dB Offset 1.00 dB RBW 1 MHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑ IAT MSOPW 1 Frequency Sweep MI[1] -1.20 dBm 5.2676020 GHz  CF 5.27 GHz1001 pts6.0 MHz/Span 60.0 MHz Date: 16 Jul 2021 16:46:47	
CH _H	MultiView Spectrum Ref Level 20.00 dBm Att 30 dB Offset 1.00 dB RBW 1 MHz SWT 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 ↑ IAT MSOPW 1 Frequency Sweep MI[1] -1.74 dBm 5.3080220 GHz  CF 5.31 GHz1001 pts6.0 MHz/Span 60.0 MHz Date: 16 Jul 2021 16:48:01	

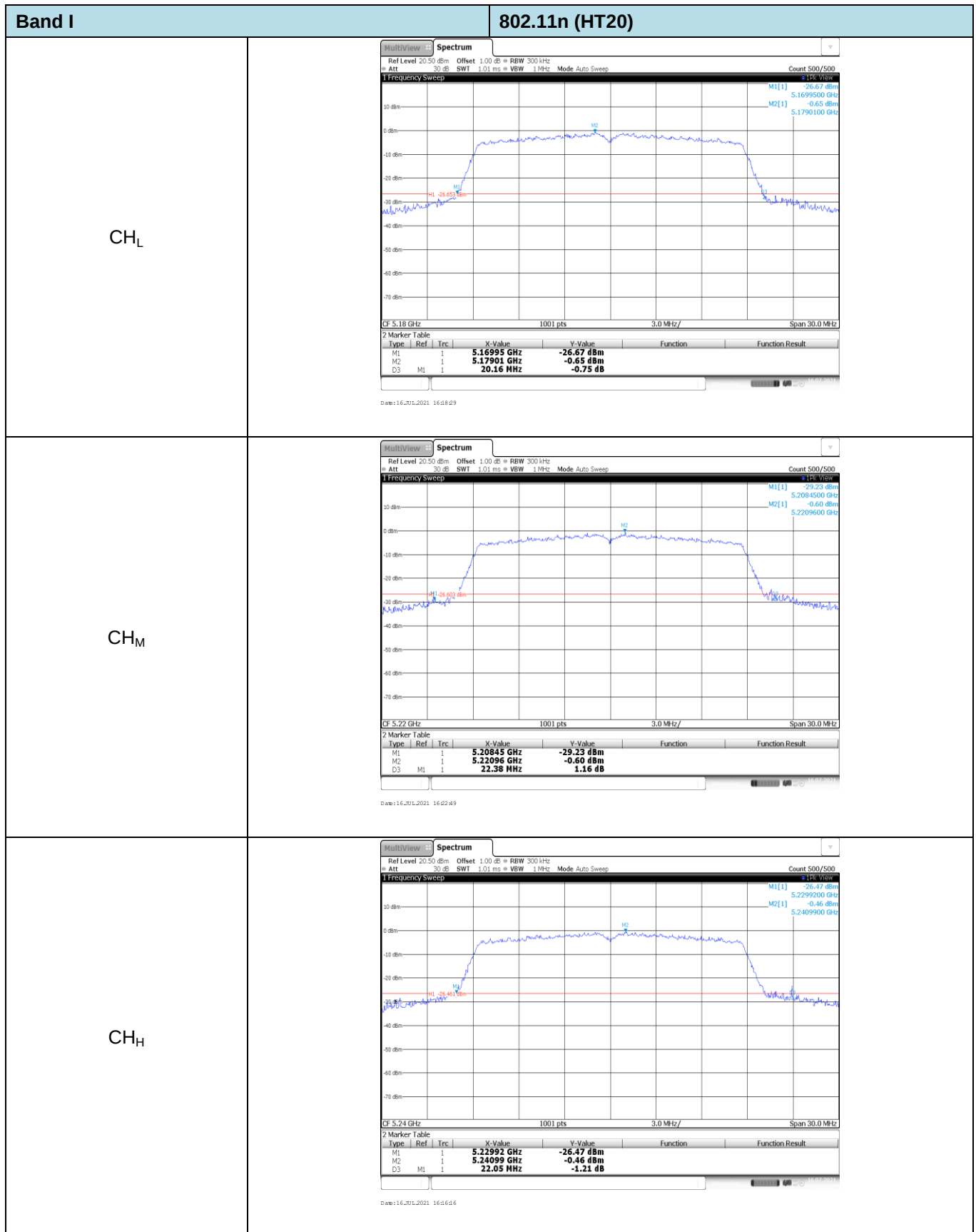
Band IV		802.11n (HT20)
CH _L	MultiView Spectrum Ref Level 20.00 dBm Att 30 dB Offset 1.00 dB RBW 500 kHz SWI 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 2.75 dBm 5.7441910 GHz CF 5.745 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date:16_JUL_2021 17:02:08	
CH _M	MultiView Spectrum Ref Level 20.00 dBm Att 30 dB Offset 1.00 dB RBW 500 kHz SWI 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 2.51 dBm 5.7835910 GHz CF 5.785 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date:16_JUL_2021 17:04:01	
CH _H	MultiView Spectrum Ref Level 20.00 dBm Att 30 dB Offset 1.00 dB RBW 500 kHz SWI 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep M1 0.52 dBm 5.8238610 GHz CF 5.825 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date:16_JUL_2021 17:05:28	

Band IV		802.11a
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 STAT MSOPW 1 Frequency Sweep  CF 5.745 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date:16.JUL.2021 17:07:52	
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 STAT MSOPW 1 Frequency Sweep  CF 5.785 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date:16.JUL.2021 17:09:26	
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 STAT MSOPW 1 Frequency Sweep  CF 5.825 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date:16.JUL.2021 17:00:07	

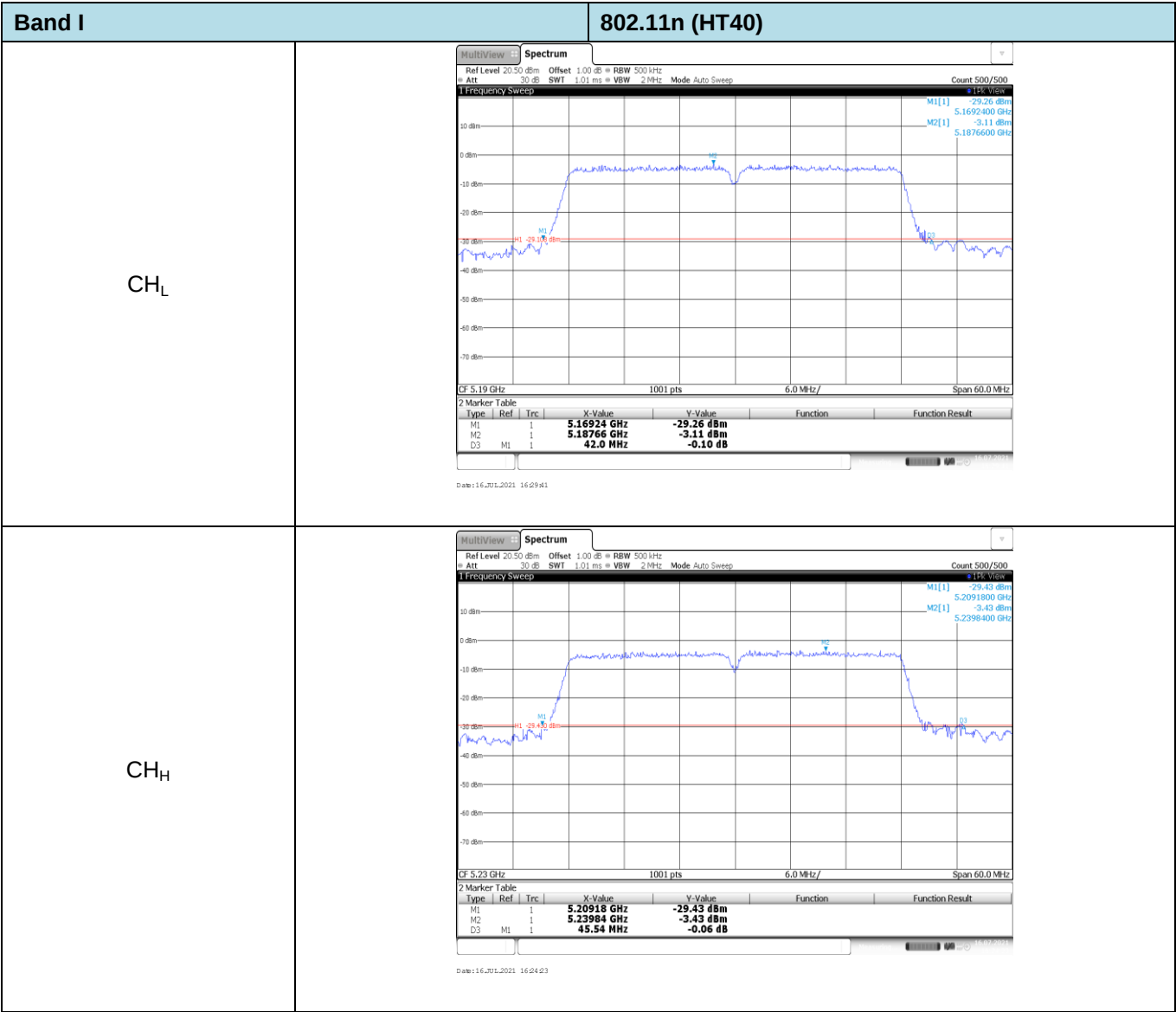
Band IV		802.11n (HT40)
CH _L	MultiView Spectrum Ref Level 20.00 dBm Att 30 dB Offset 1.00 dB RBW 500 kHz SWI 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep MI[1] -0.95 dBm 5.7529020 GHz  CF 5.755 GHz1001 pts6.0 MHz/Span 60.0 MHz Date: 16 Jul 2021 16:53:48	
CH _H	MultiView Spectrum Ref Level 20.00 dBm Att 30 dB Offset 1.00 dB RBW 500 kHz SWI 1.01 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1 Frequency Sweep MI[1] -2.05 dBm 5.7921830 GHz  CF 5.795 GHz1001 pts6.0 MHz/Span 60.0 MHz Date: 16 Jul 2021 16:55:27	

Appendix C: 26dB bandwidth

Band	Bandwidth (MHz)	Type	Channel	26dB bandwidth (MHz)	Result
I	20	802.11n	CH _L	20.16	Pass
			CH _M	22.38	
			CH _H	22.05	
		802.11a	CH _L	20.07	Pass
			CH _M	20.28	
			CH _H	22.20	
	40	802.11n	CH _L	42.00	Pass
			CH _H	45.54	
II	20	802.11n	CH _L	22.83	Pass
			CH _M	21.96	
			CH _H	22.53	
		802.11a	CH _L	20.49	Pass
			CH _M	20.49	
			CH _H	20.79	
	40	802.11n	CH _L	45.72	Pass
			CH _H	42.18	

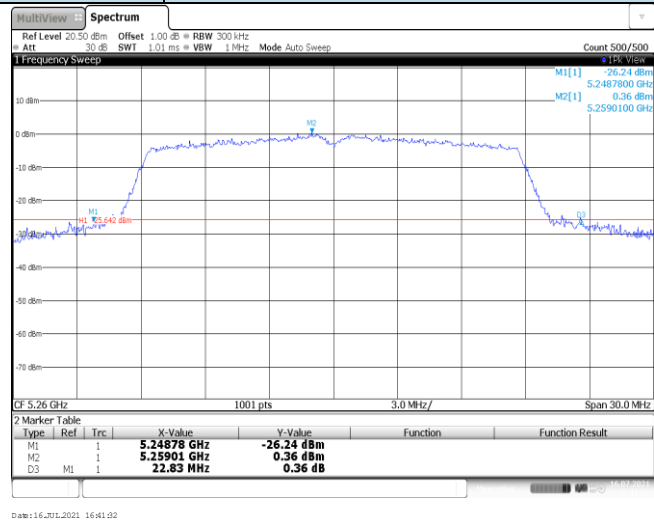


Band I		802.11a
CH _L		

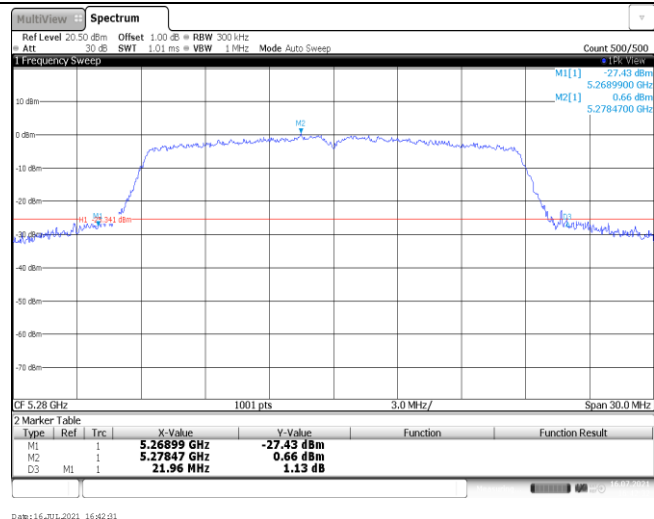


Band II

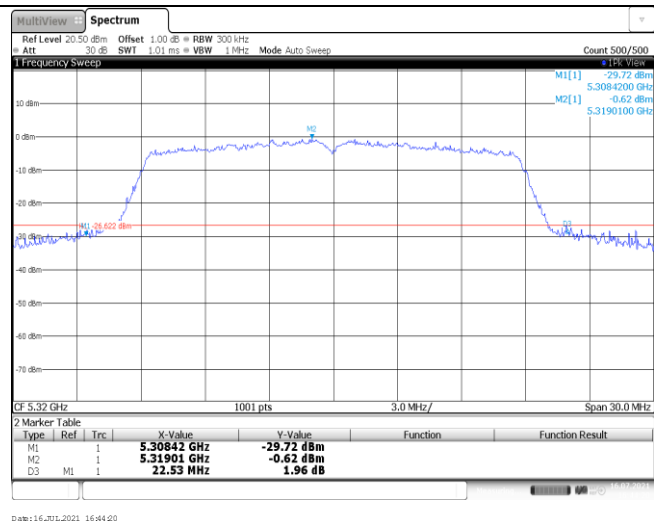
802.11n (HT20)

$$\text{CH}_L$$


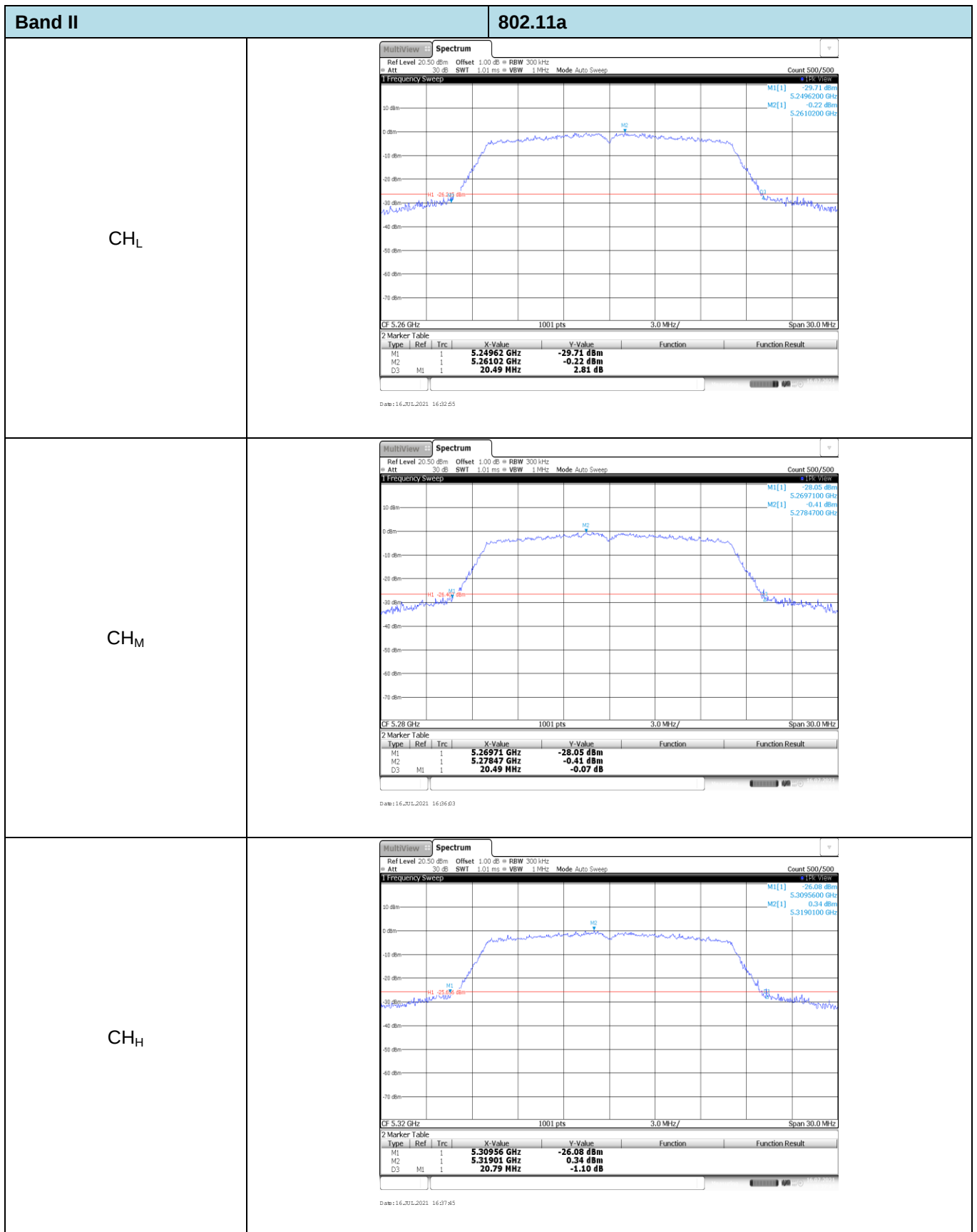
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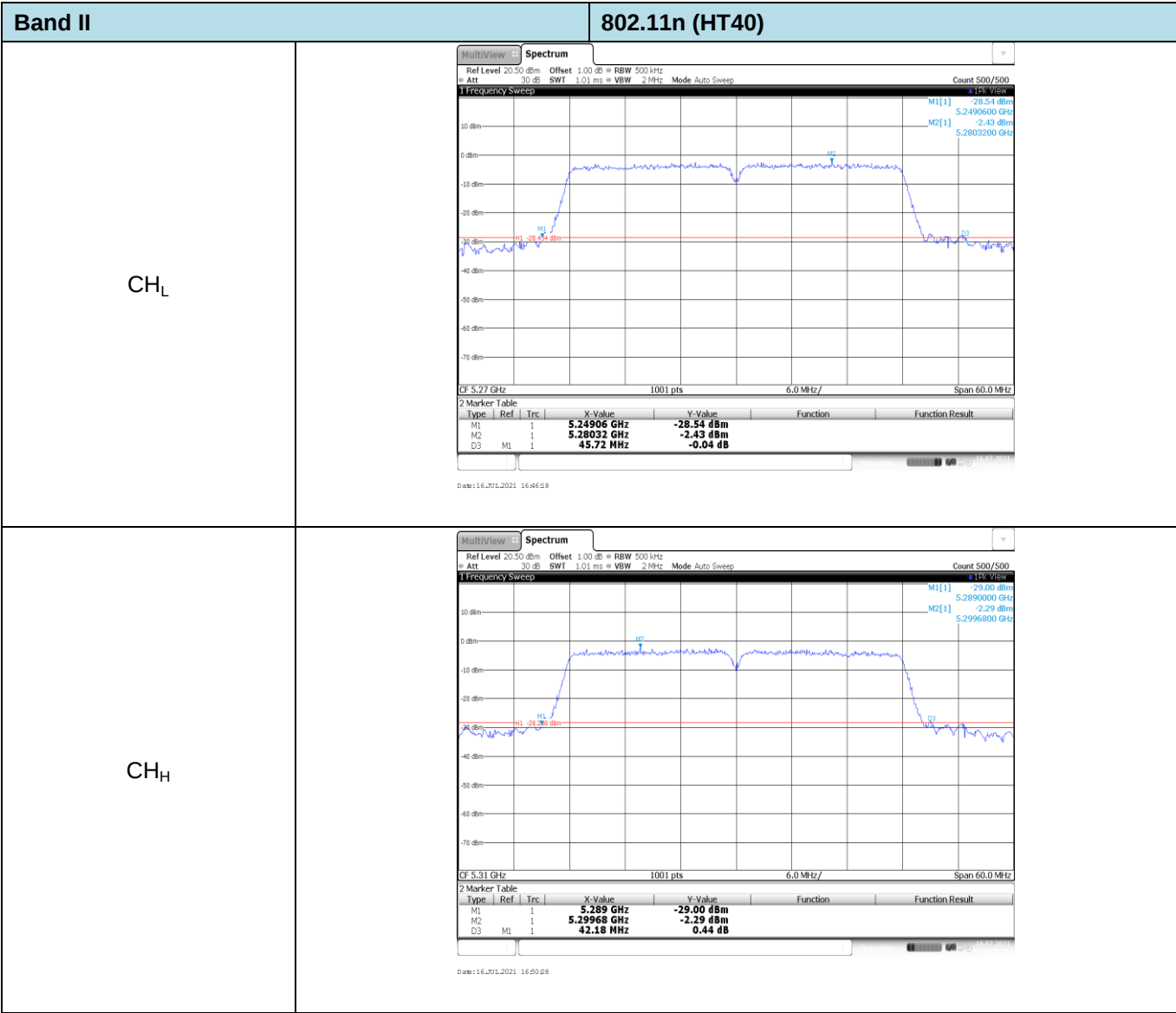
$$\text{CH}_M$$


Date: 16 JUL 2021 16:42:31

$$\text{CH}_H$$


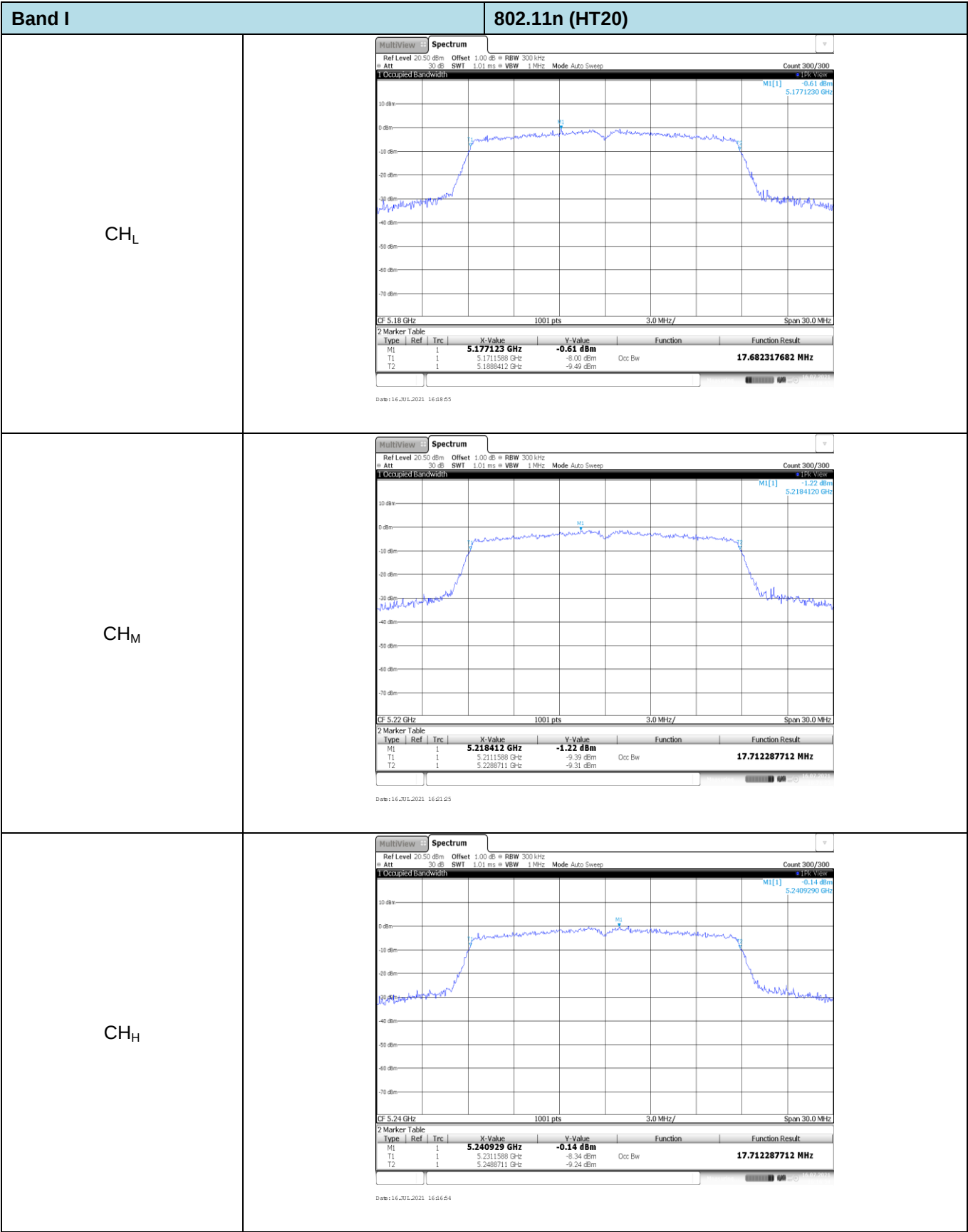
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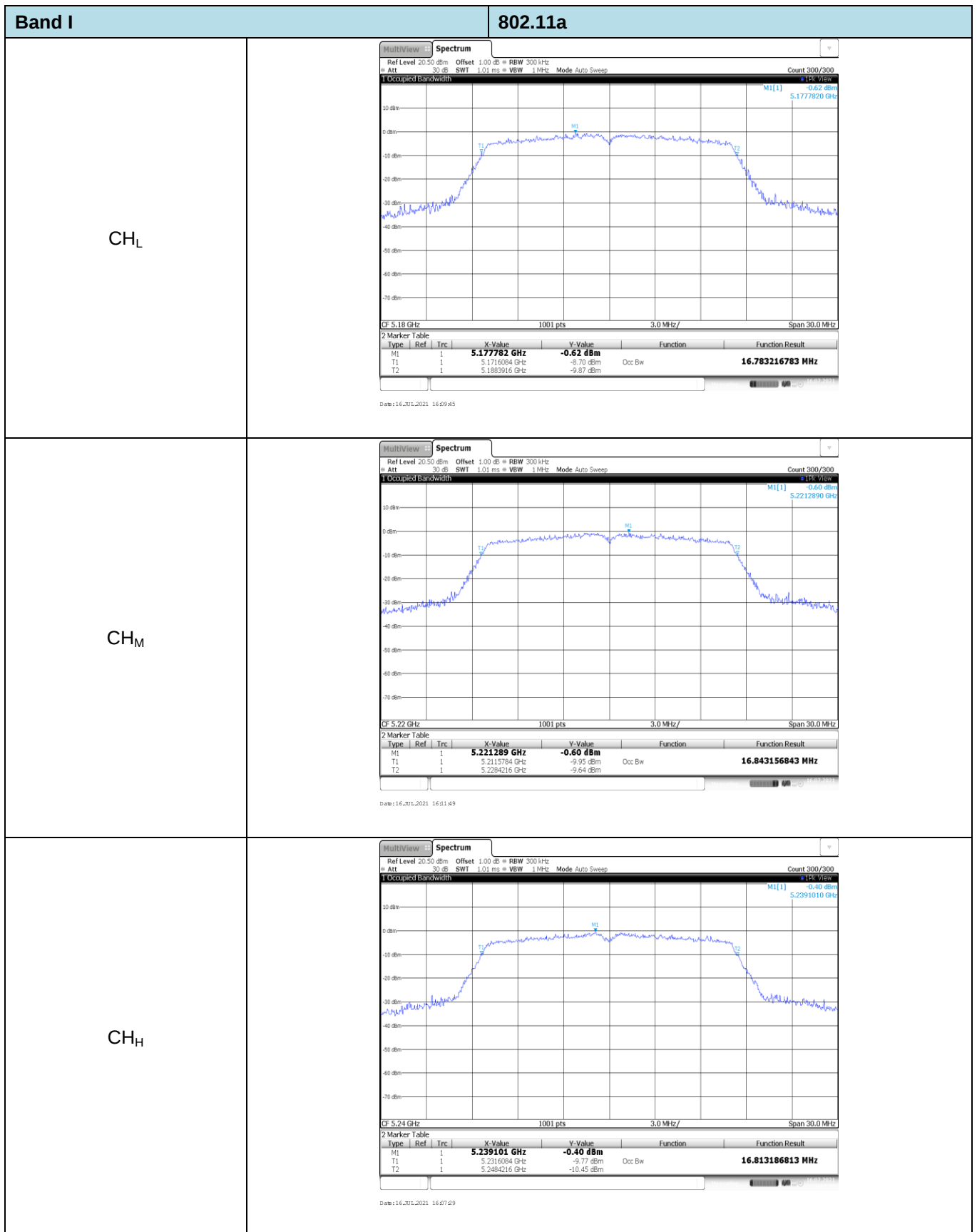


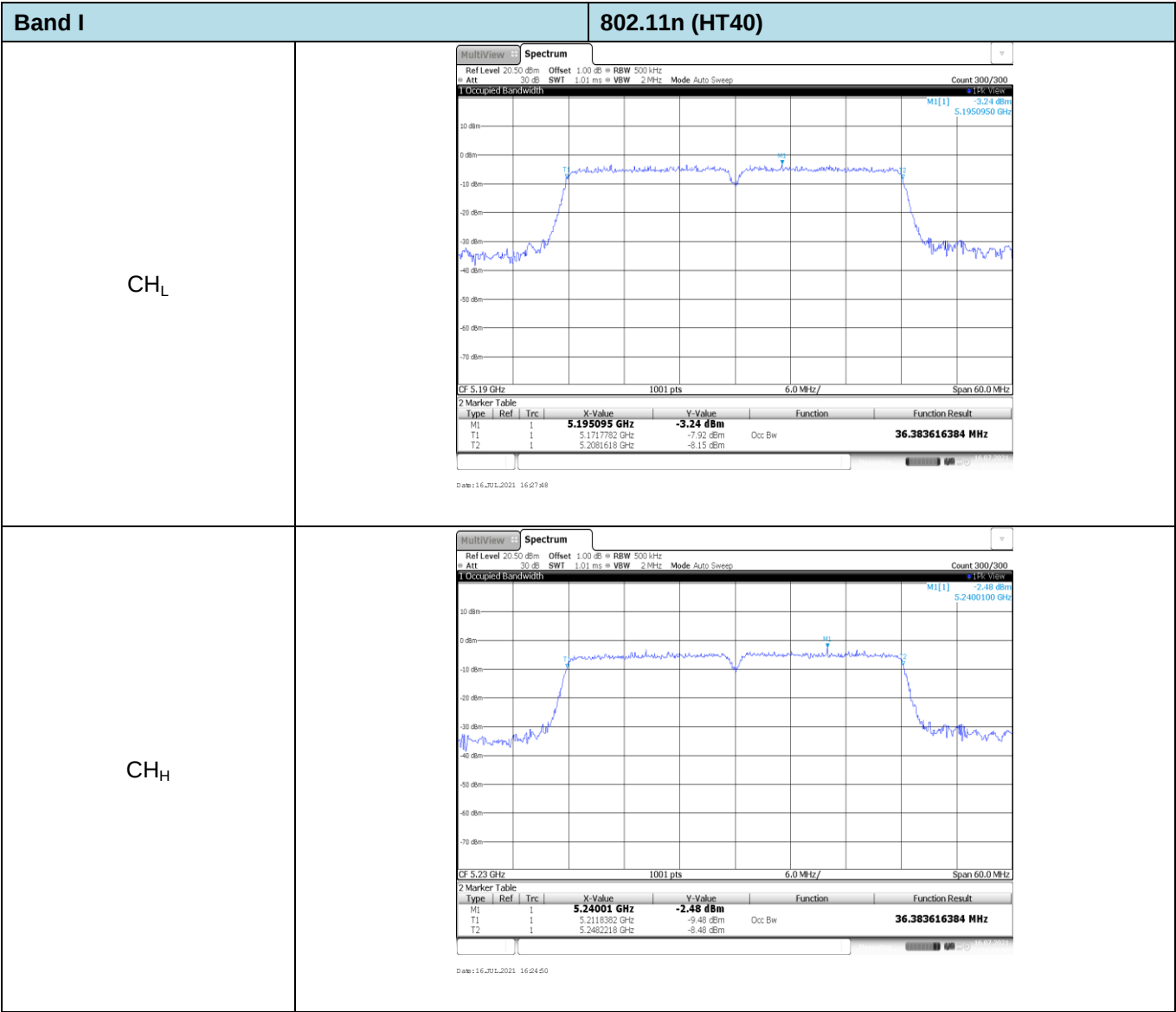


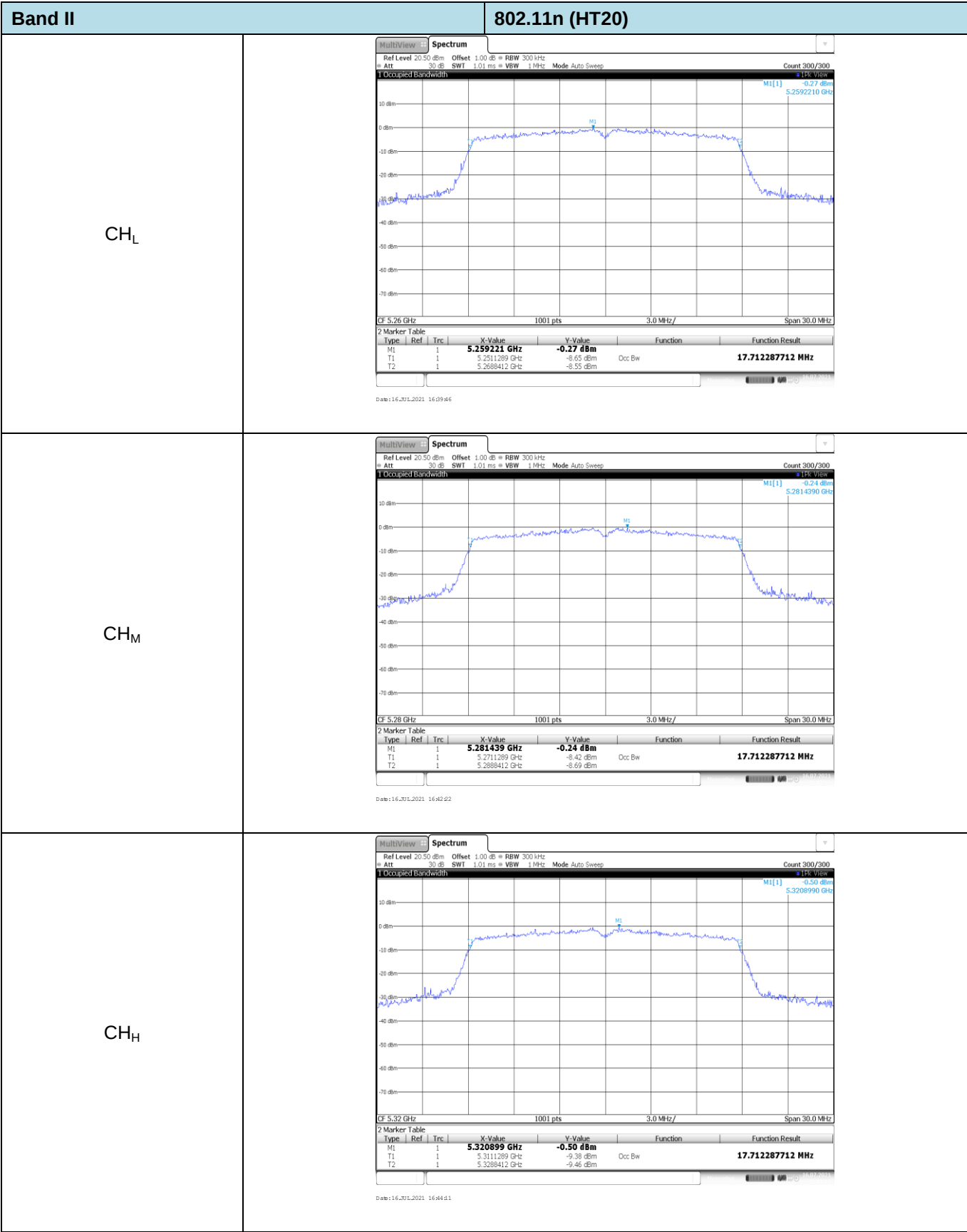
Appendix D: 99% Occupy bandwidth

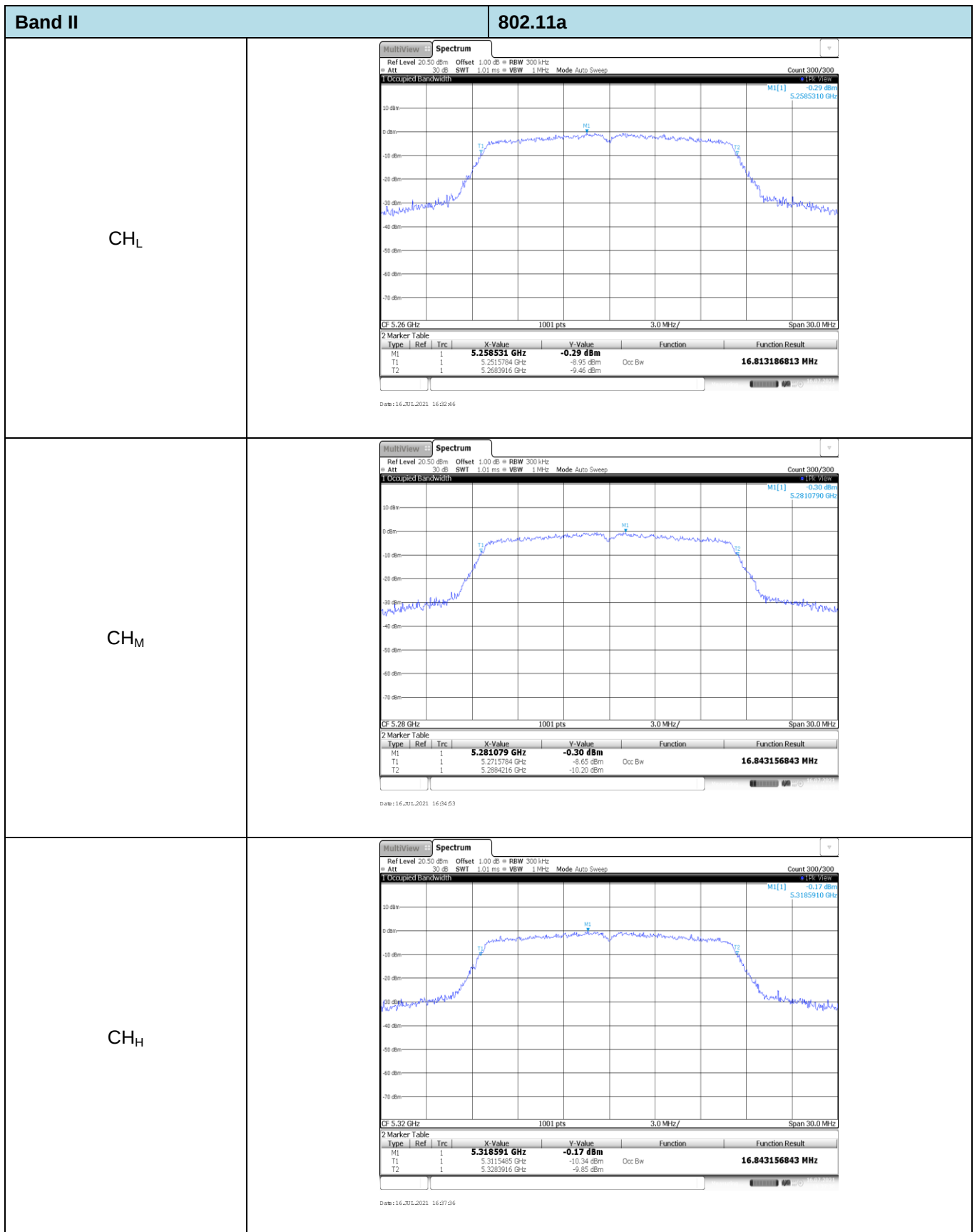
Band	Bandwidth (MHz)	Type	Channel	99% Occupy bandwidth (MHz)	Result
I	20	802.11n	CH _L	17.68	Pass
			CH _M	17.71	
			CH _H	17.71	
		802.11a	CH _L	16.78	Pass
			CH _M	16.84	
			CH _H	16.81	
	40	802.11n	CH _L	36.38	Pass
			CH _H	36.38	
II	0	802.11n	CH _L	17.71	Pass
			CH _M	17.71	
			CH _H	17.71	
		802.11a	CH _L	16.81	Pass
			CH _M	16.84	
			CH _H	16.84	
	40	802.11n	CH _L	36.44	Pass
			CH _H	36.32	
IV	20	802.11n	CH _L	17.68	Pass
			CH _M	17.74	
			CH _H	17.71	
		802.11a	CH _L	16.81	Pass
			CH _M	16.81	
			CH _H	16.78	
	40	802.11n	CH _L	36.03	Pass
			CH _H	36.21	

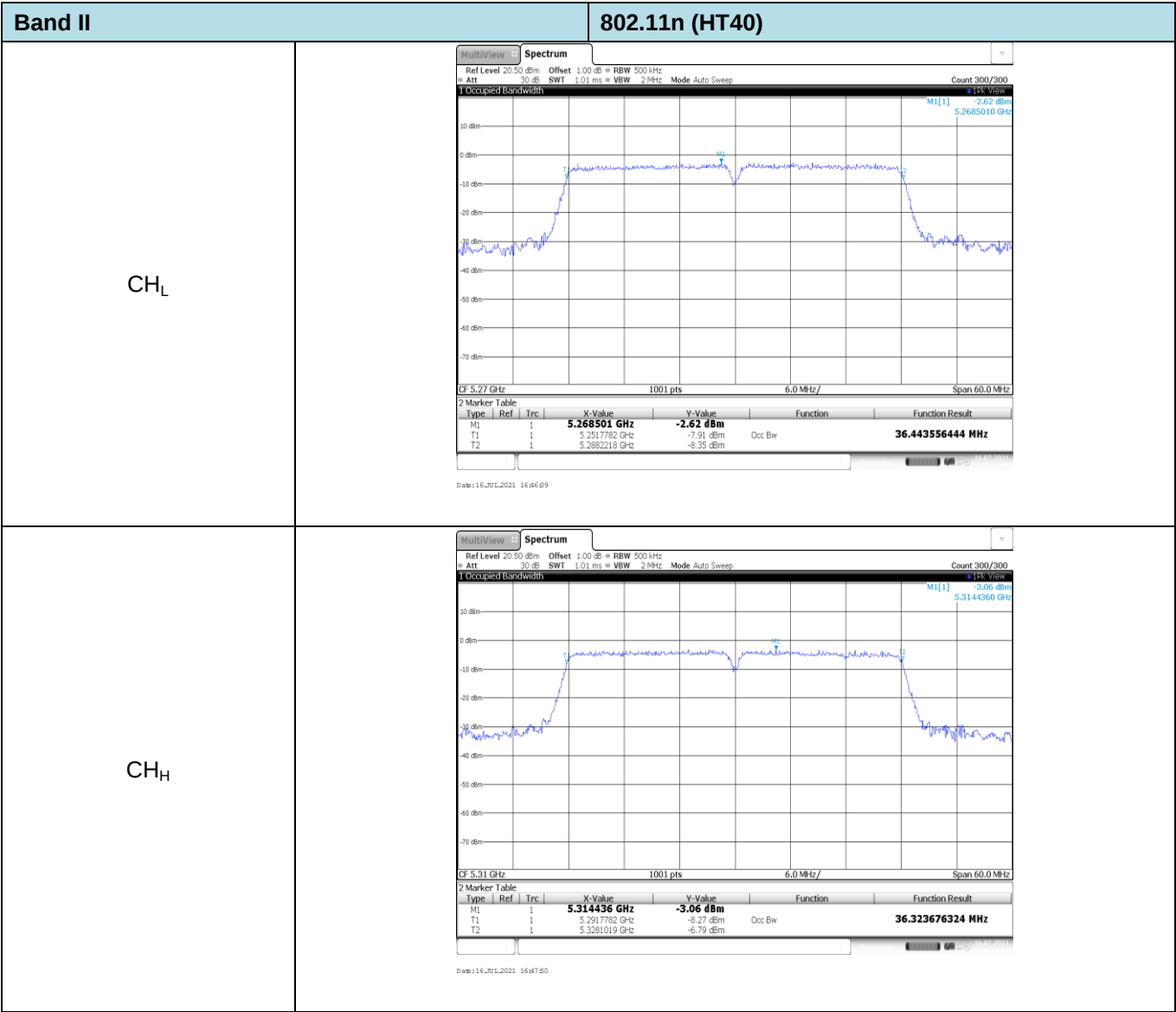


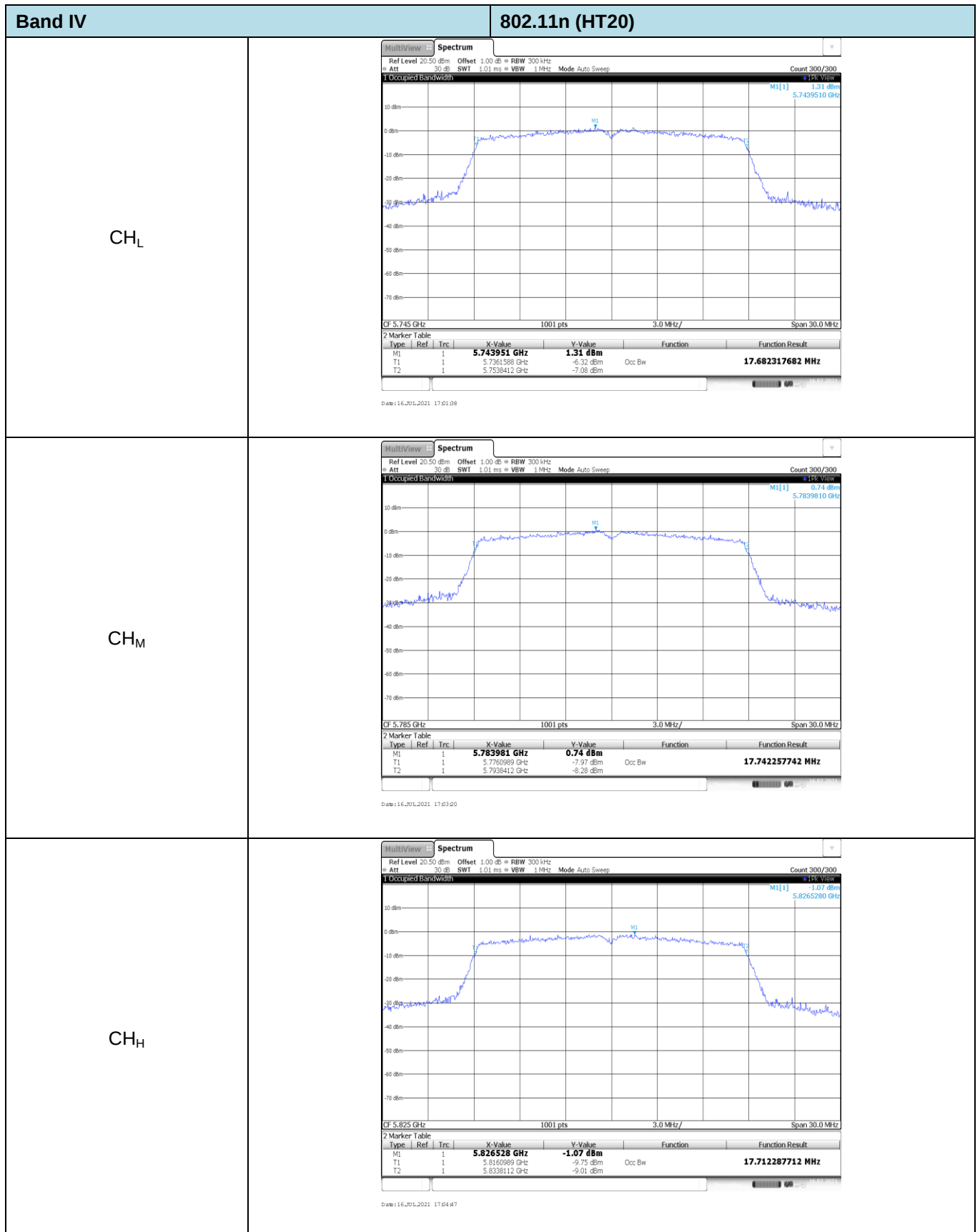


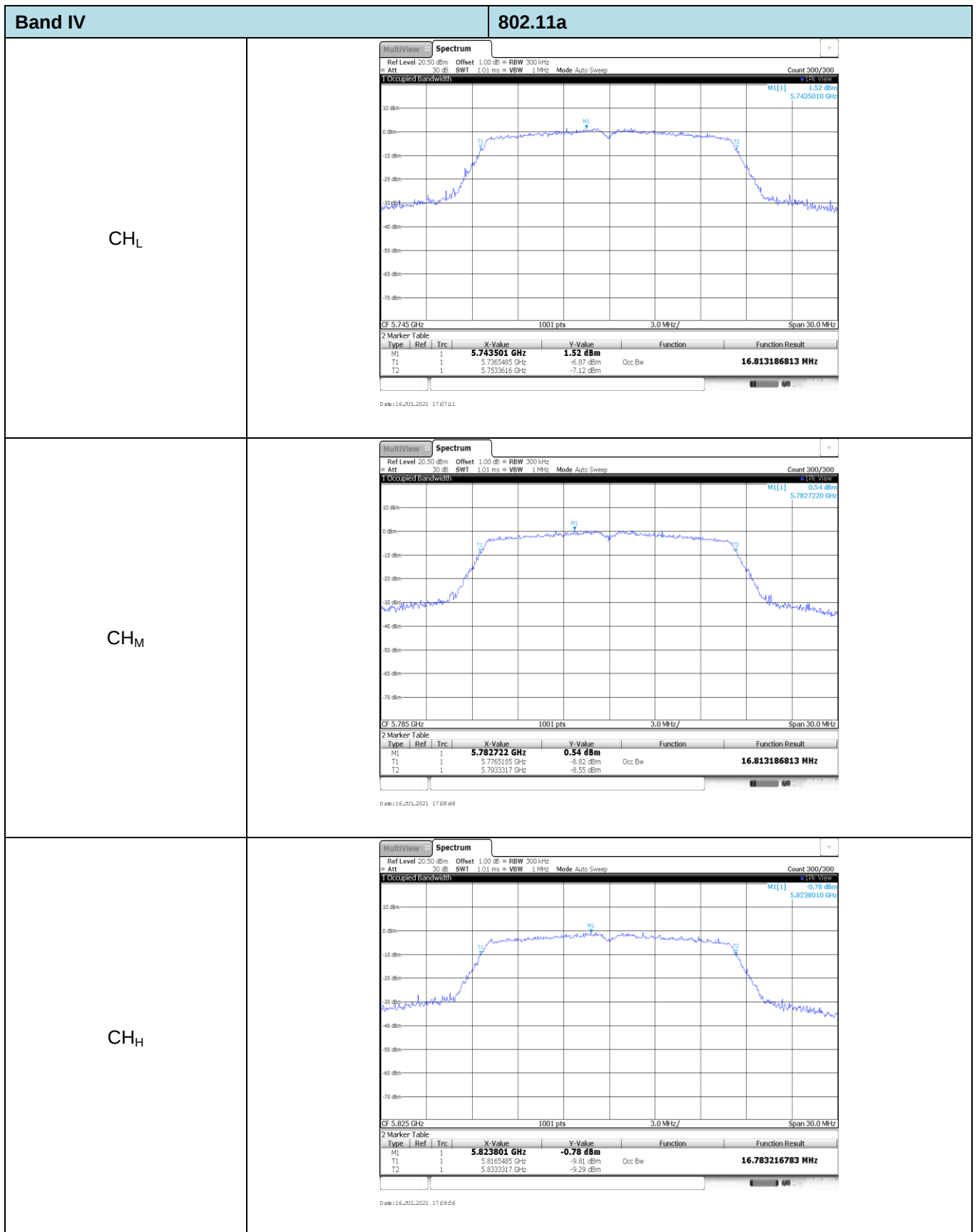


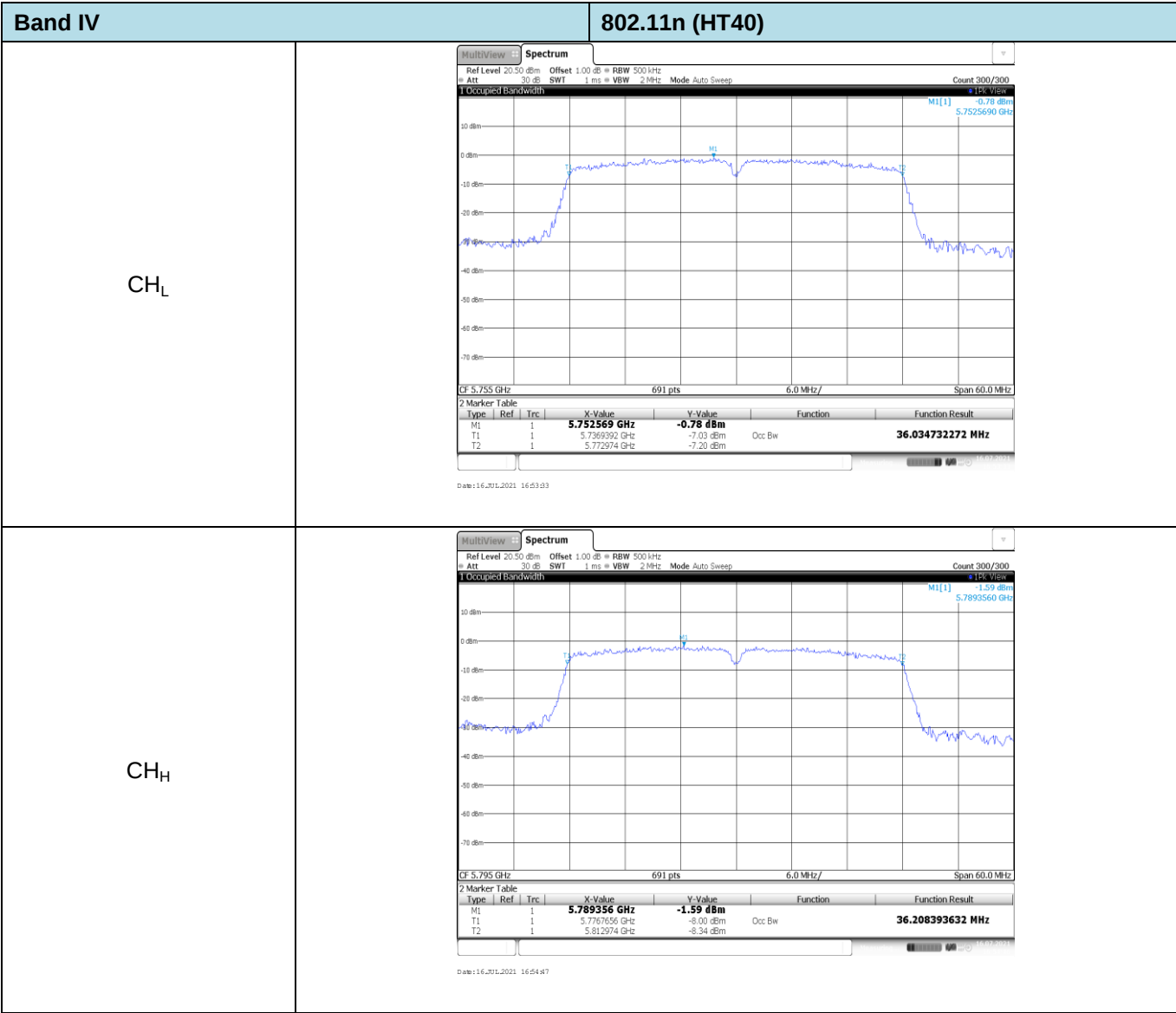










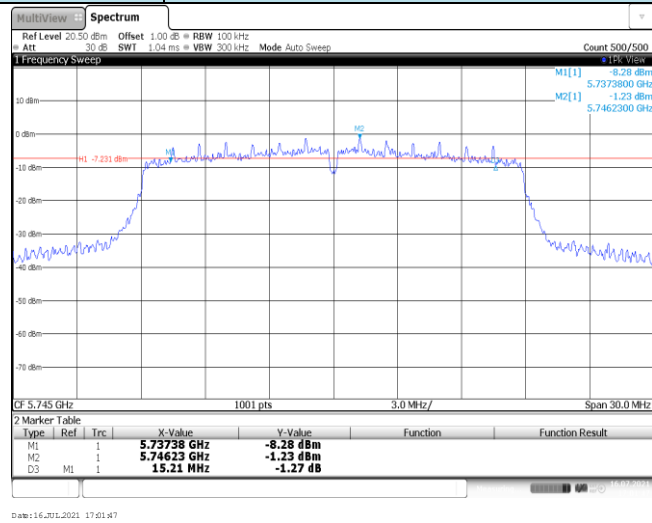
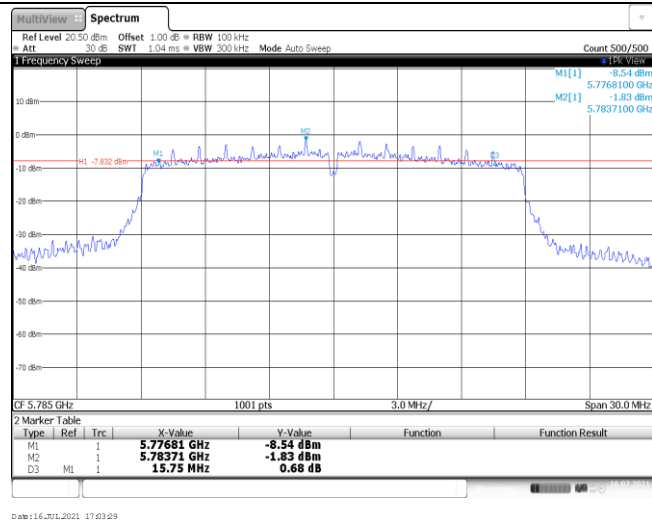
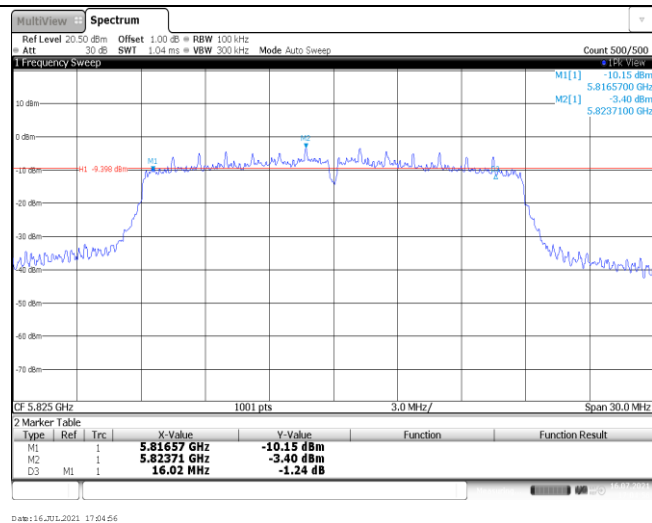


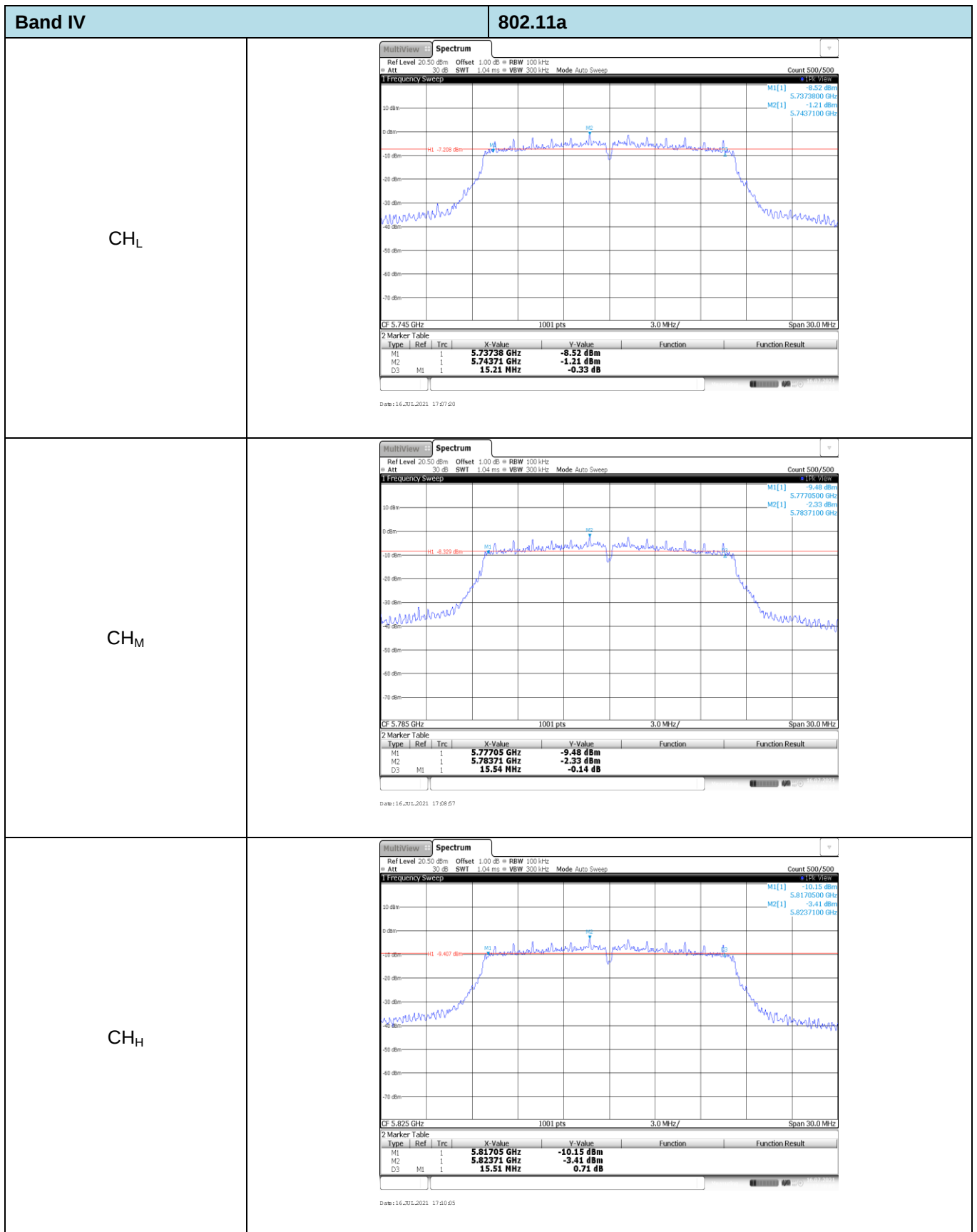
Appendix E: 6dB Bandwidth

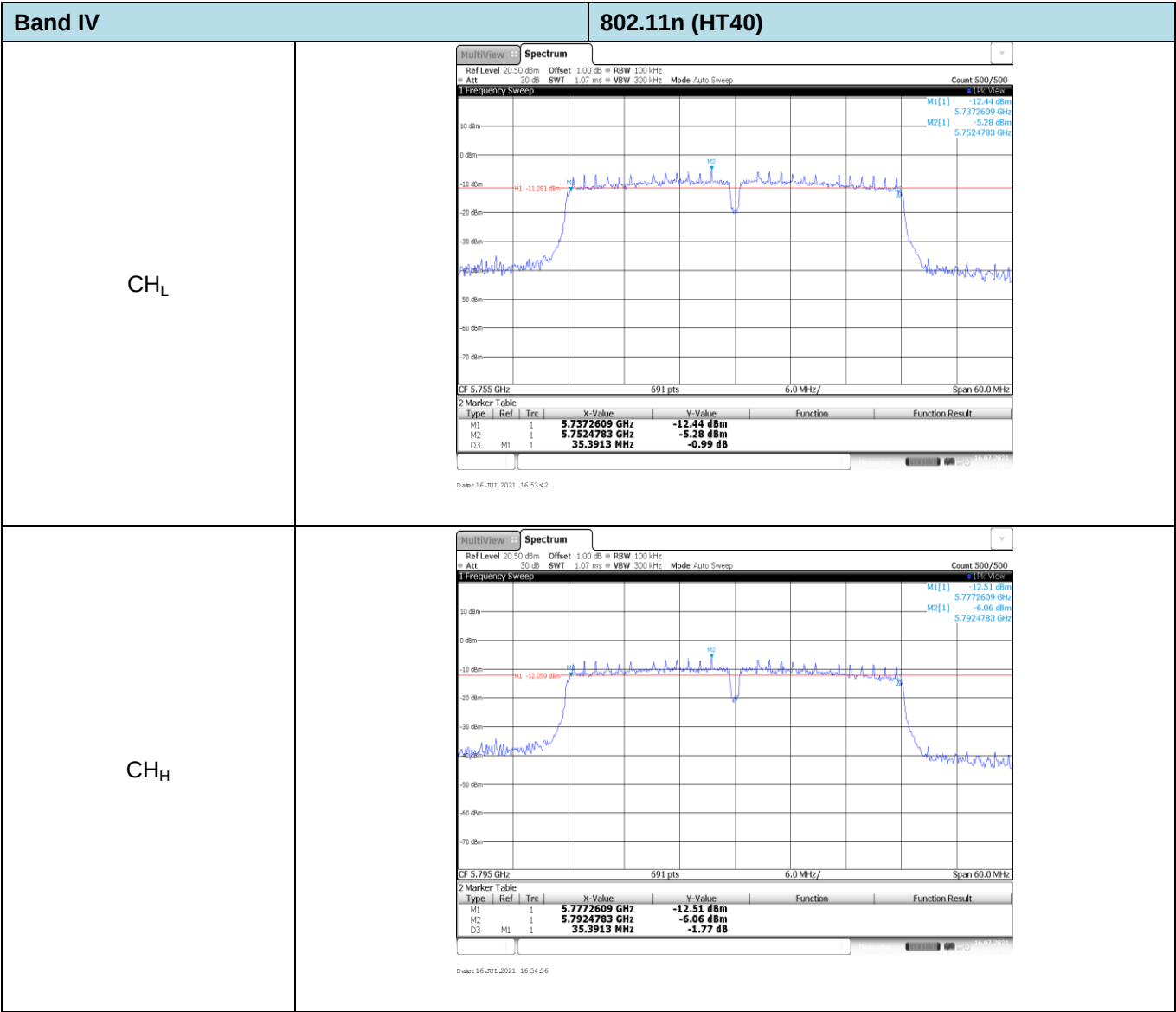
Band	Bandwidth (MHz)	Type	Channel	6dB bandwidth (MHz)	Result
IV	20	802.11n	CH _L	15.21	Pass
			CH _M	15.75	
			CH _H	16.02	
		802.11a	CH _L	15.21	Pass
			CH _M	15.54	
			CH _H	15.51	
	40	802.11n	CH _L	35.39	Pass
			CH _H	35.39	

Band IV

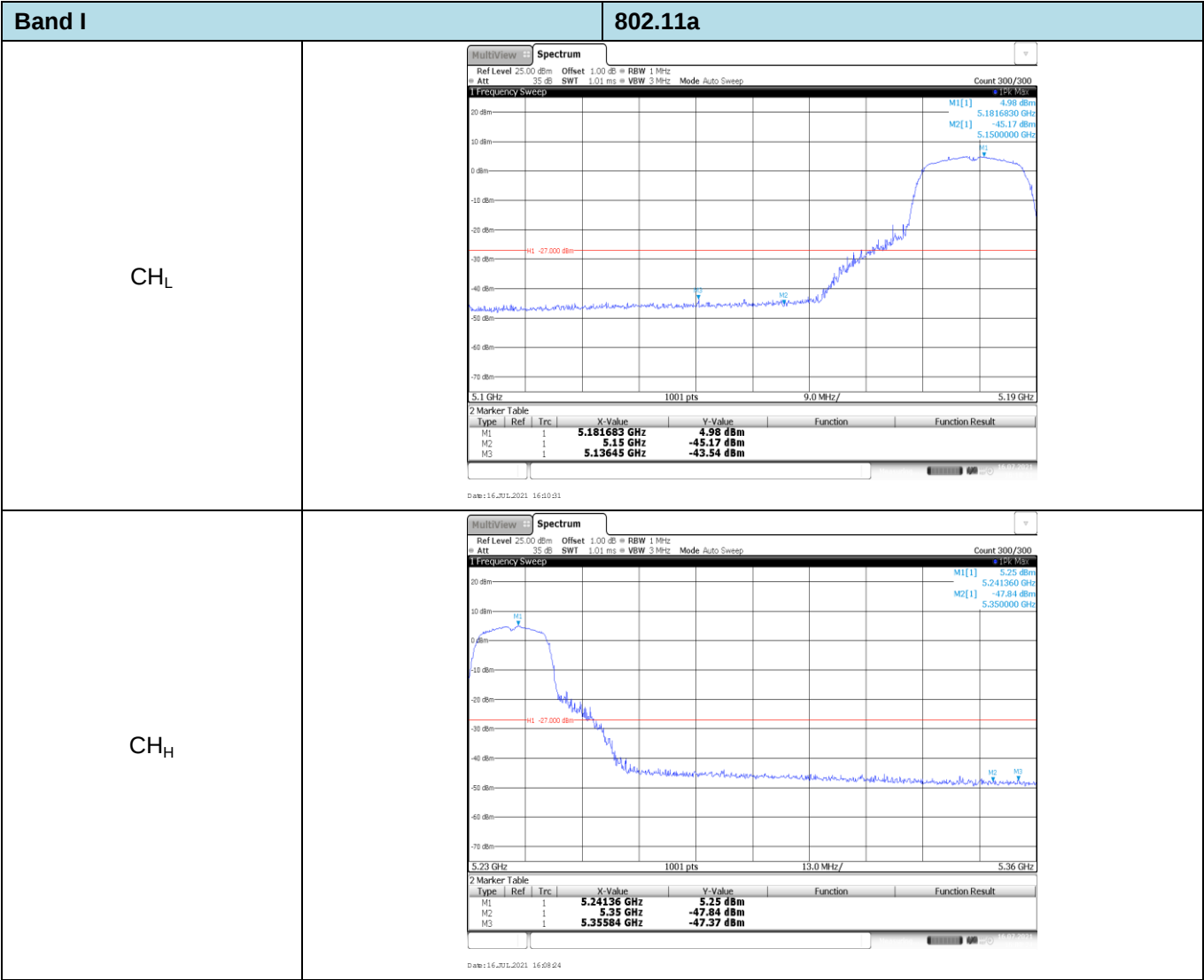
802.11n (HT20)

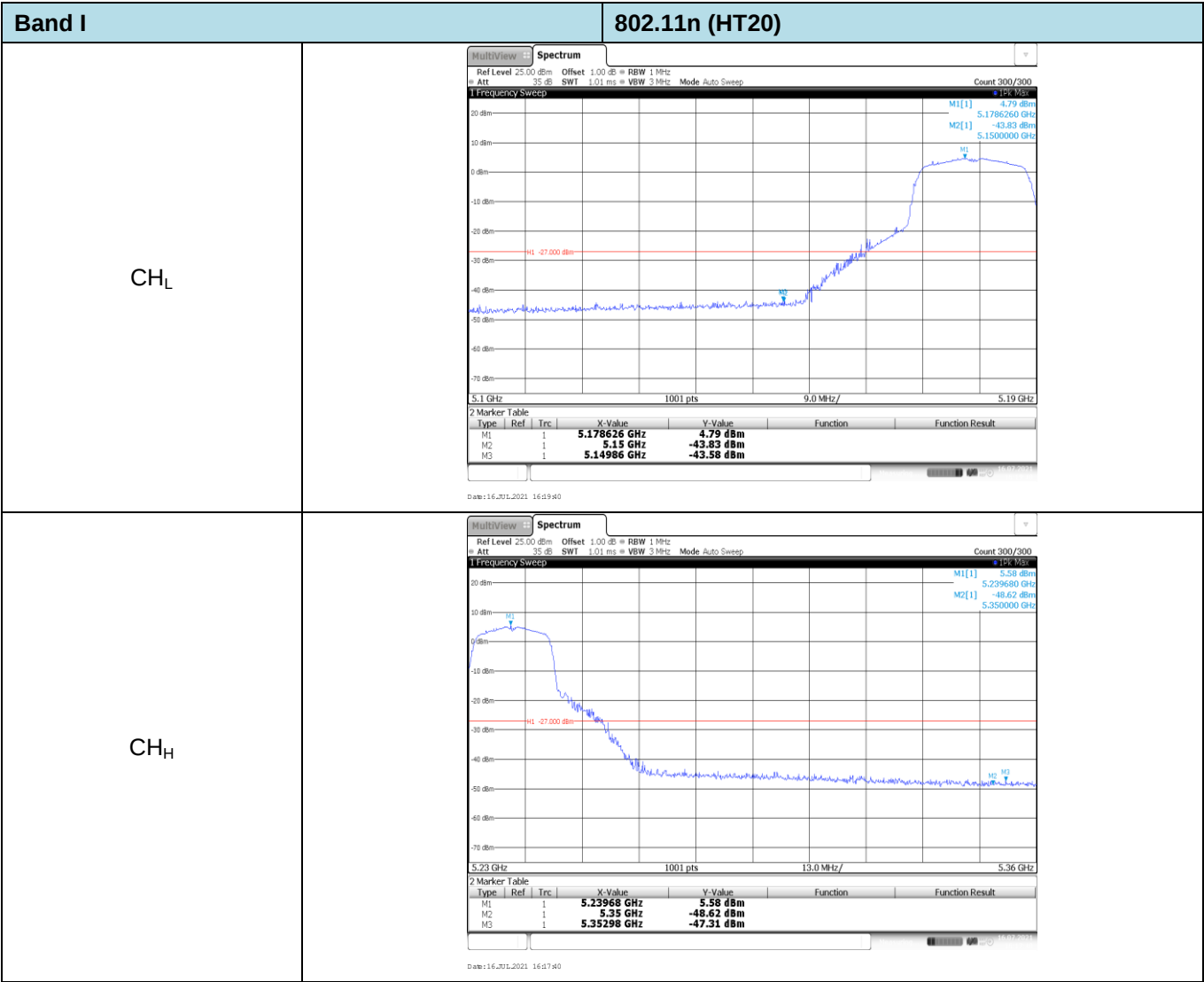
CH_LCH_MCH_H

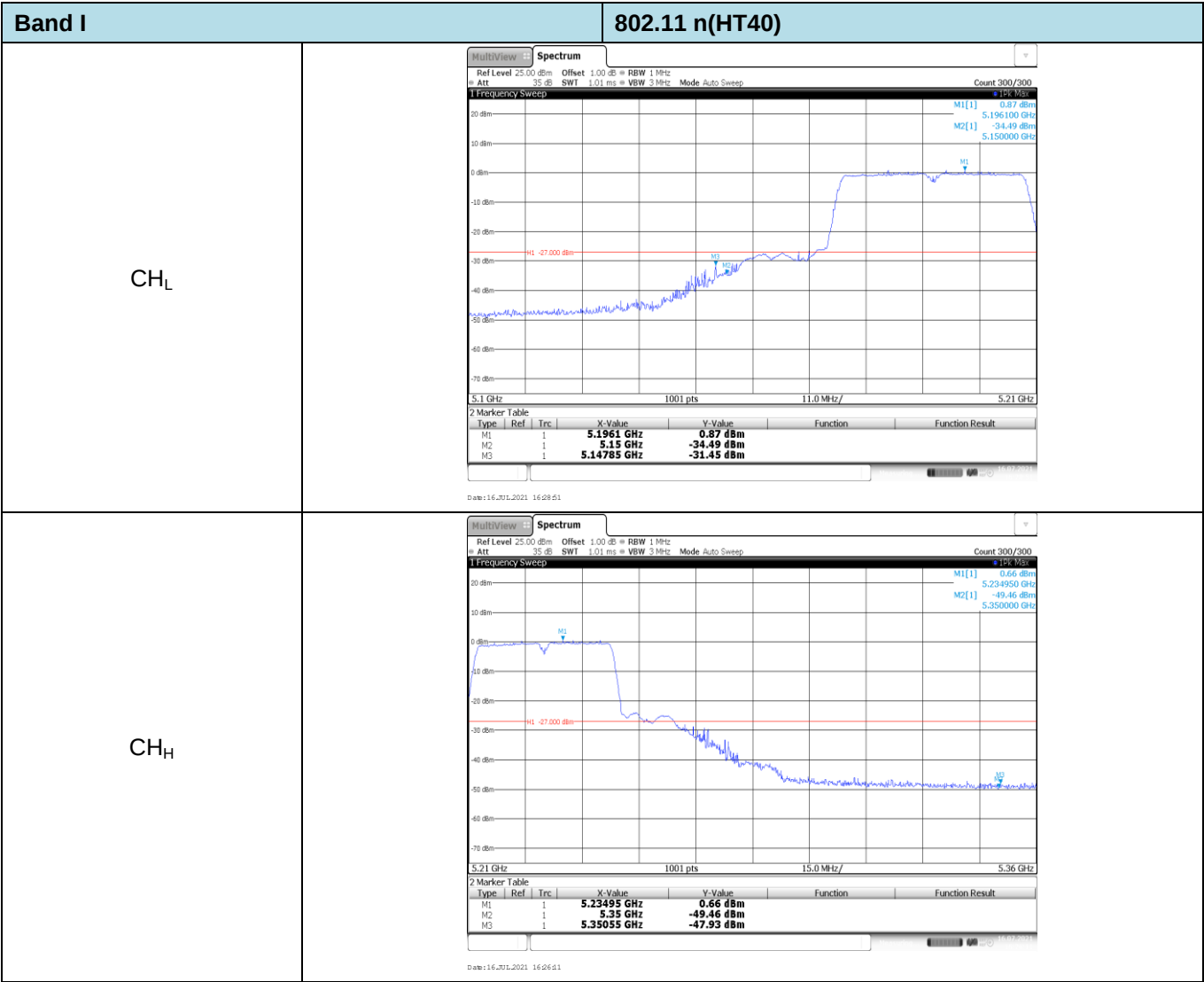


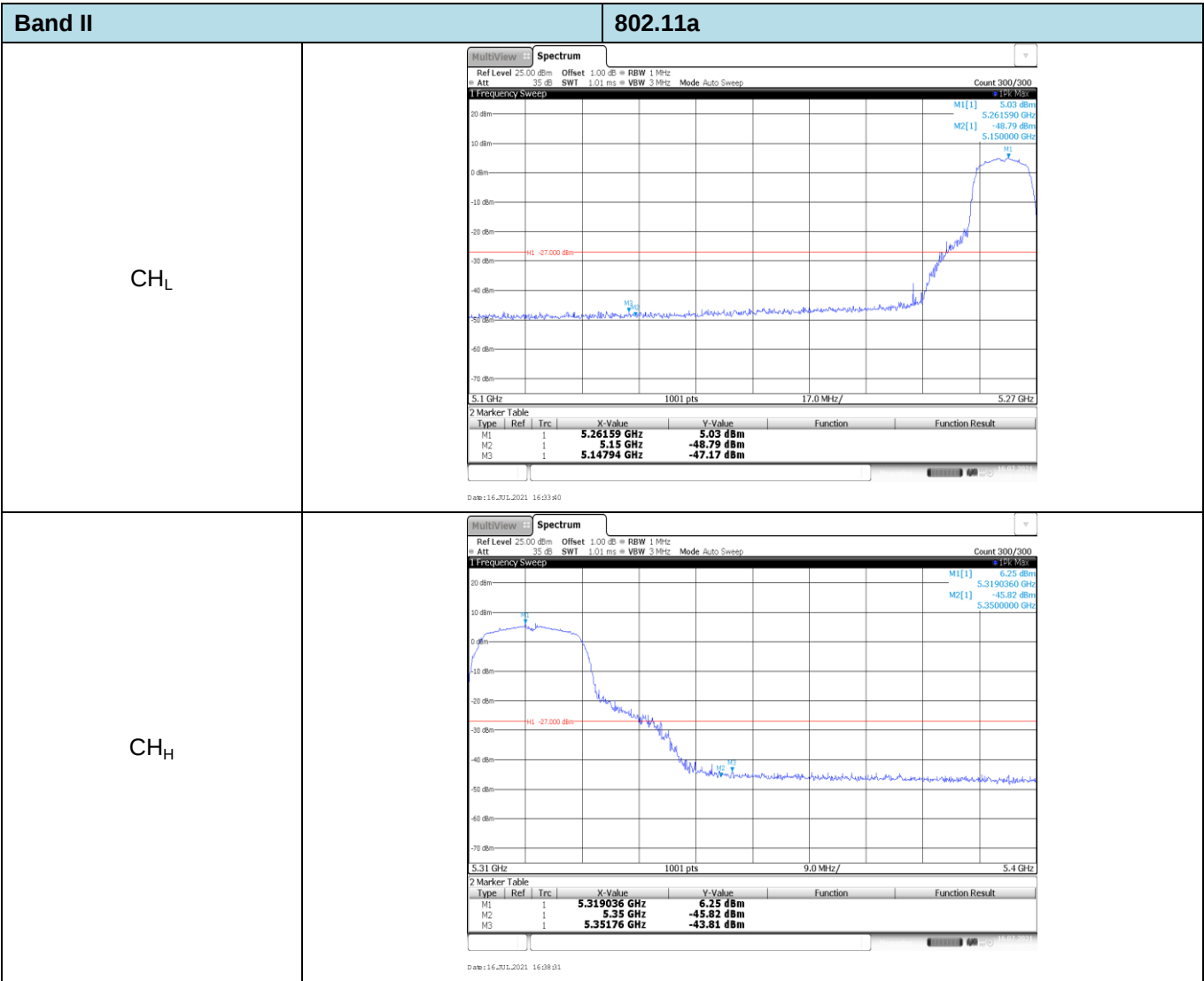


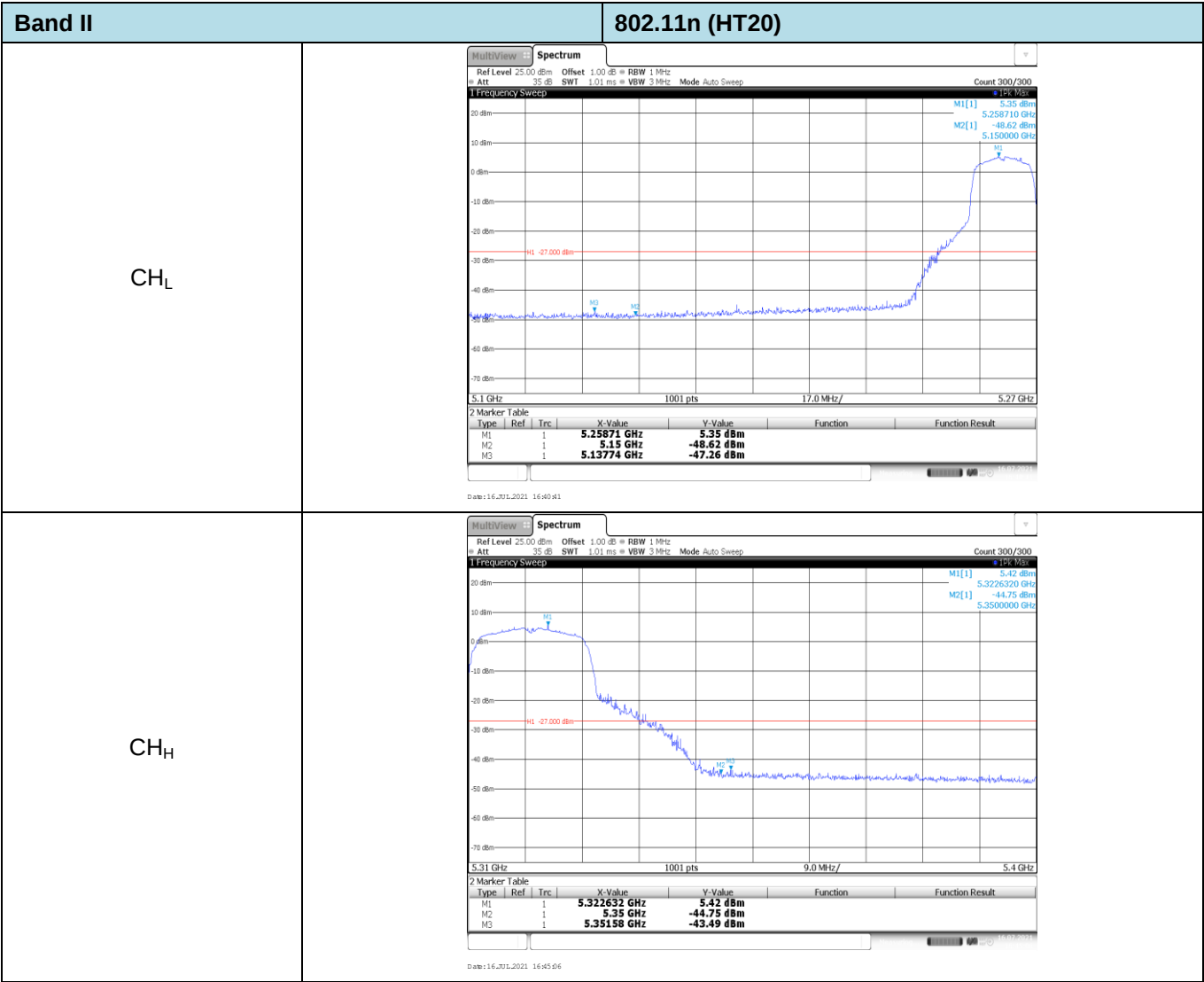
Appendix F: Band edge

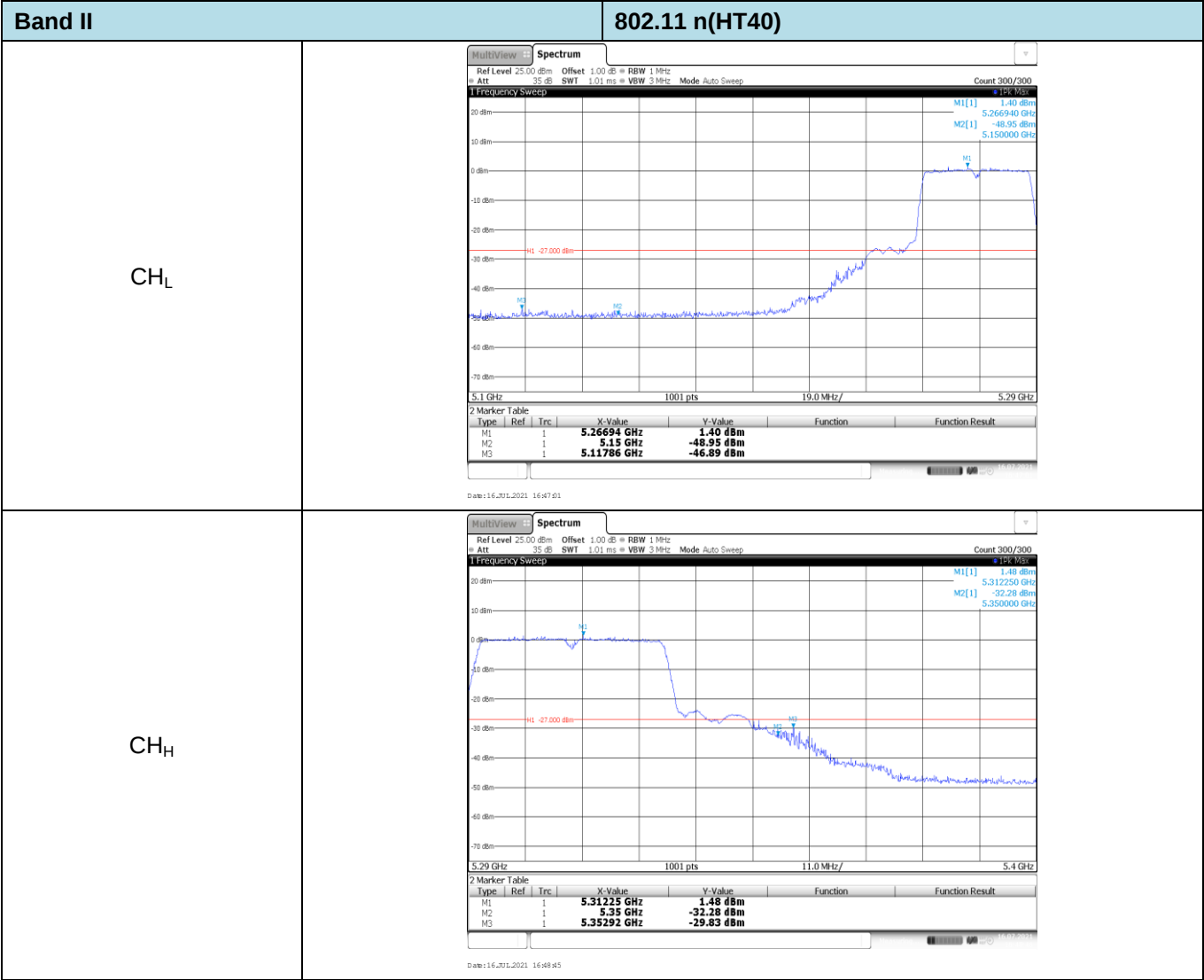


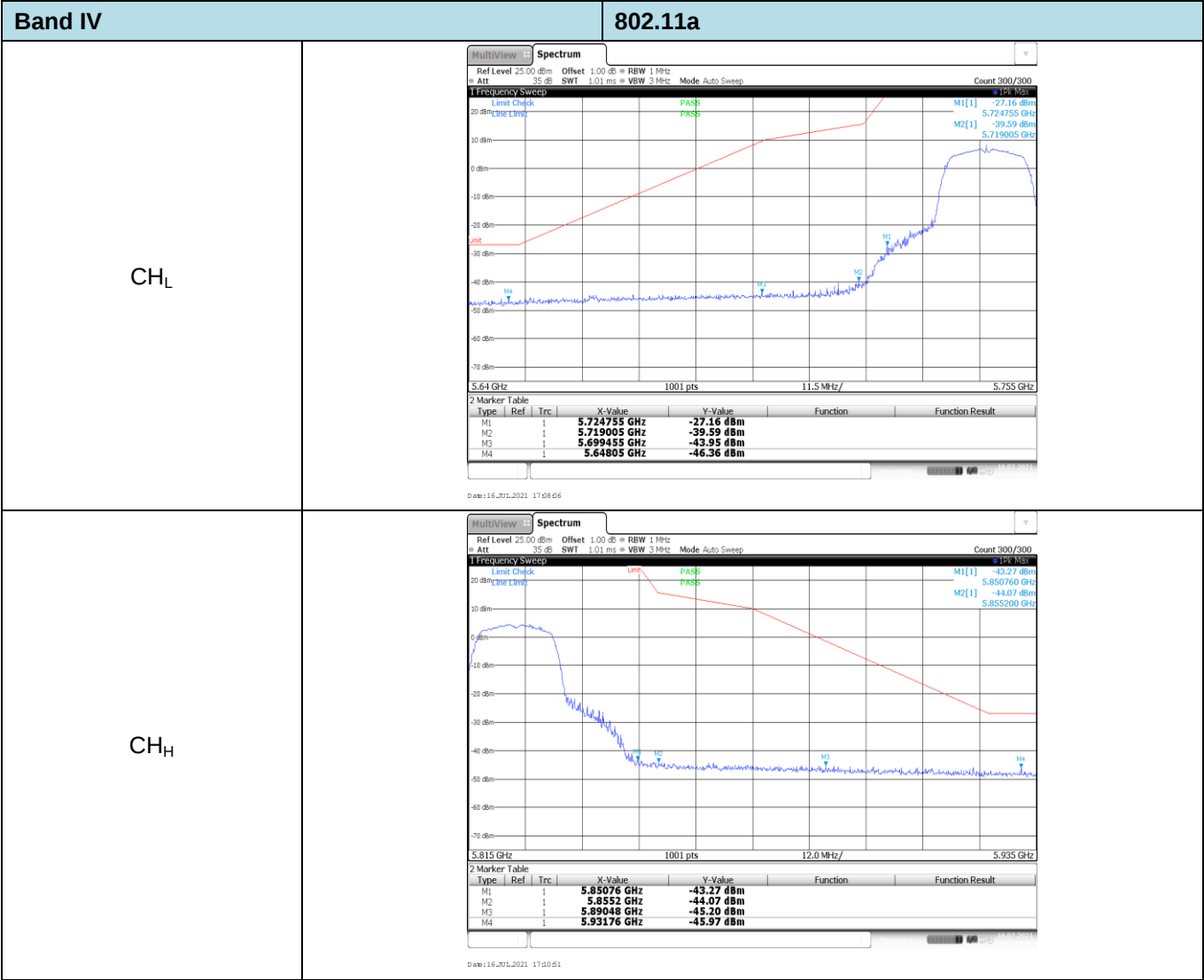


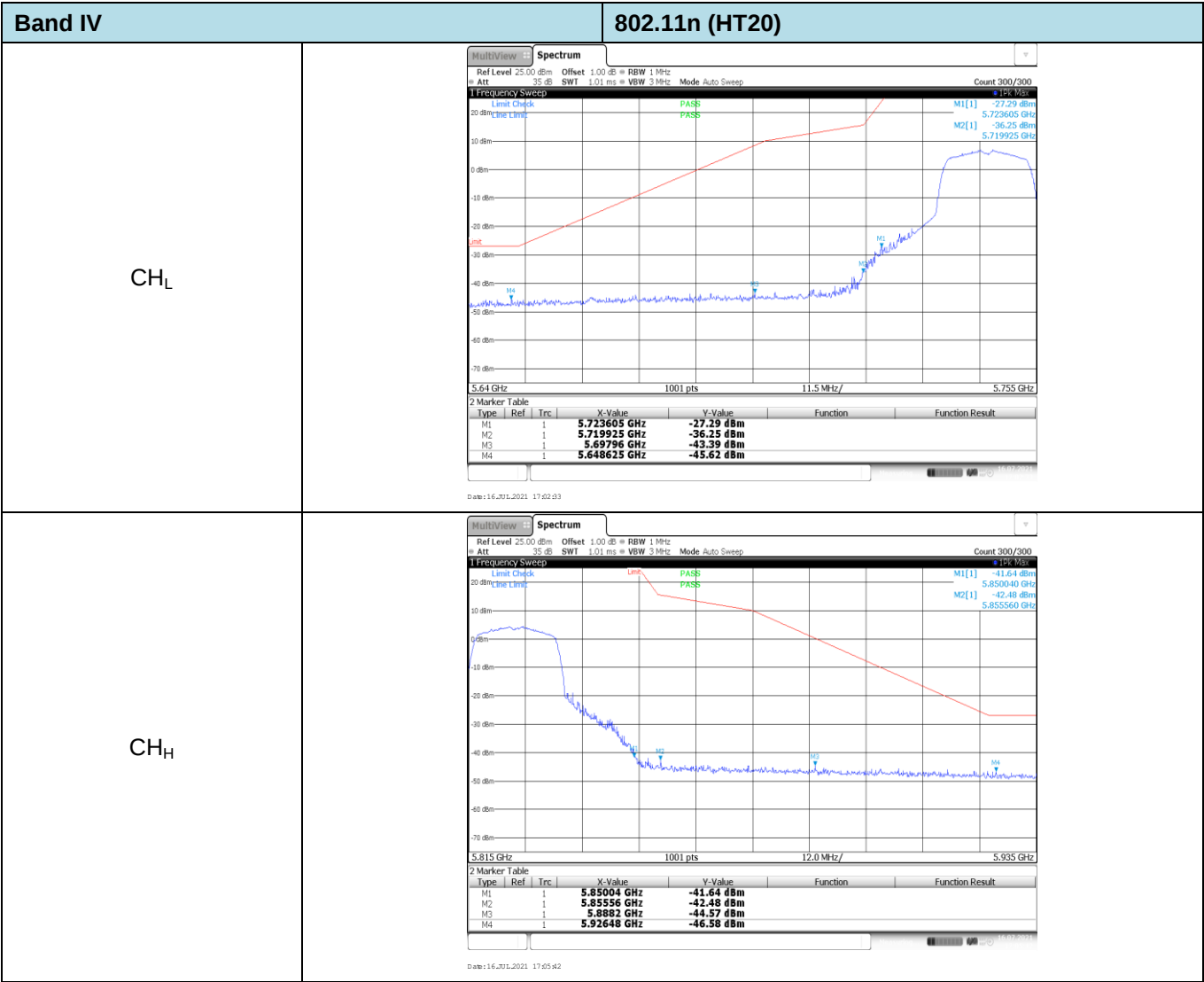


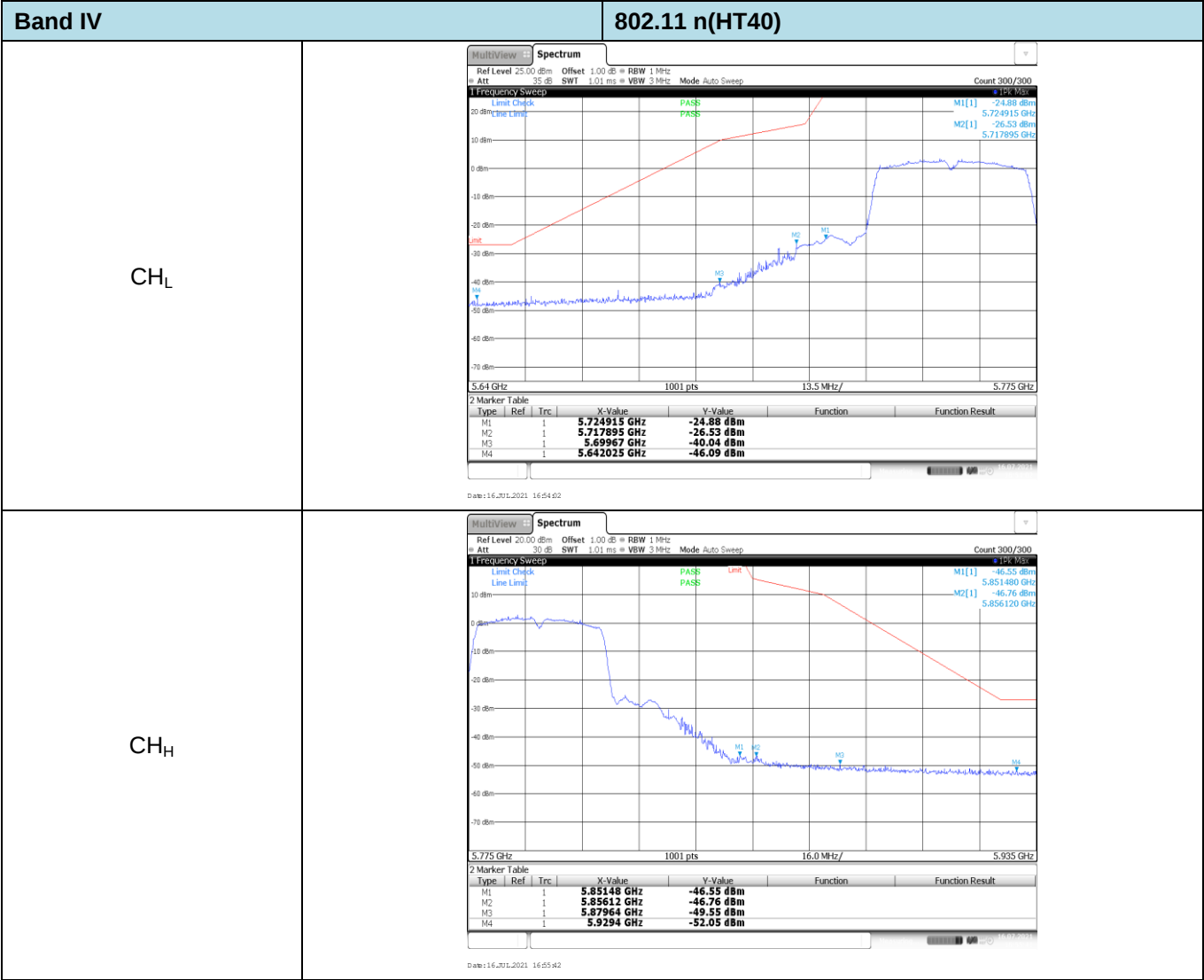












Appendix G: Frequency stability**Voltage VS Frequency stability**

Band: I			Test Frequency: 5180.00MHz	
Temperature (°C)	Voltage (V)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
T _N	V _L	-3000.00	-0.57915	PASS
T _N	V _N	-3000.00	-0.57915	PASS
T _N	V _H	-3000.00	-0.57915	PASS

Band: II			Test Frequency: 5260.00MHz	
Temperature (°C)	Voltage (V)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
T _N	V _L	-7000.00	-1.33080	PASS
T _N	V _N	-7000.00	-1.33080	PASS
T _N	V _H	-7000.00	-1.33080	PASS

Band: IV			Test Frequency: 5745.00MHz	
Temperature (°C)	Voltage (V)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
T _N	V _L	-7000.00	-1.21845	PASS
T _N	V _N	-7000.00	-1.21845	PASS
T _N	V _H	-7000.00	-1.21845	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	-3000.00	-0.57915	PASS
V _N	-10	-3000.00	-0.57915	PASS
V _N	0	-3000.00	-0.57915	PASS
V _N	10	-3000.00	-0.57915	PASS
V _N	20	-3000.00	-0.57915	PASS
V _N	30	-3000.00	-0.57915	PASS
V _N	40	-3000.00	-0.57915	PASS
V _N	50	-3000.00	-0.57915	PASS

Band: II			Test Frequency: 5260.00MHz	
Voltage (V)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
V _N	-20	-7000.00	-1.33080	PASS
V _N	-10	-7000.00	-1.33080	PASS
V _N	0	-7000.00	-1.33080	PASS
V _N	10	-7000.00	-1.33080	PASS
V _N	20	-7000.00	-1.33080	PASS
V _N	30	-6000.00	-1.14068	PASS
V _N	40	-7000.00	-1.33080	PASS
V _N	50	-7000.00	-1.33080	PASS

Band: IV			Test Frequency: 5745.00MHz	
Voltage (V)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
V _N	-20	-7000.00	-1.21845	PASS
V _N	-10	-7000.00	-1.21845	PASS
V _N	0	-7000.00	-1.21845	PASS
V _N	10	-7000.00	-1.21845	PASS
V _N	20	-8000.00	-1.39252	PASS
V _N	30	-7000.00	-1.21845	PASS
V _N	40	-7000.00	-1.21845	PASS
V _N	50	-7000.00	-1.21845	PASS

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