

APPENDIX REPORT

Project No.	SHT2011064601EW	Radio Specification	WIFI 2.4G
Test sample No.	YPHT20110646003	Model No.	LS140L
Start test date	2020-12-4	Finish date	2020-12-4
Temperature	24.7°C	Humidity	40%
Test Engineer	Qizhi Zhang	Auditor	Xiaodong Zheo

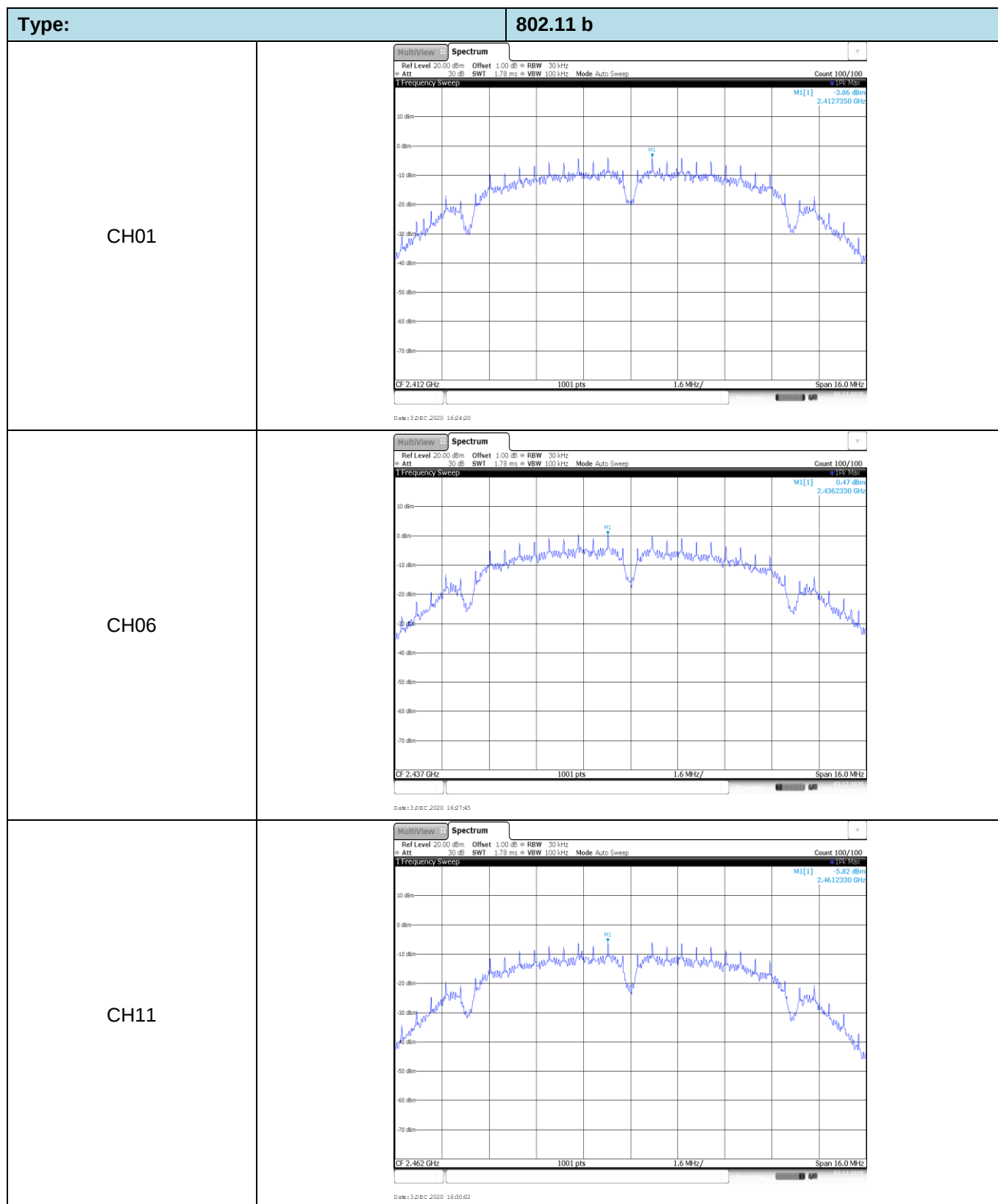
Appendix clause	Test item	Result
A	Conducted Peak Output Power	PASS
B	Power Spectral Density	PASS
C	6 dB Bandwidth	PASS
D	99% Occupied Bandwidth	PASS
E	Duty Cycle	PASS
F	Band edge and Spurious Emissions (conducted)	PASS

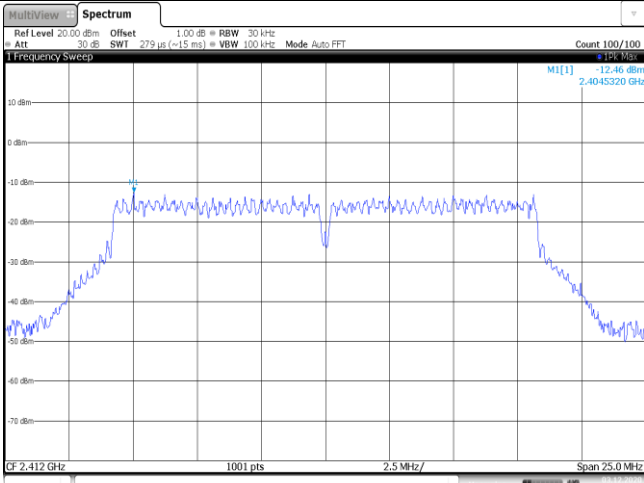
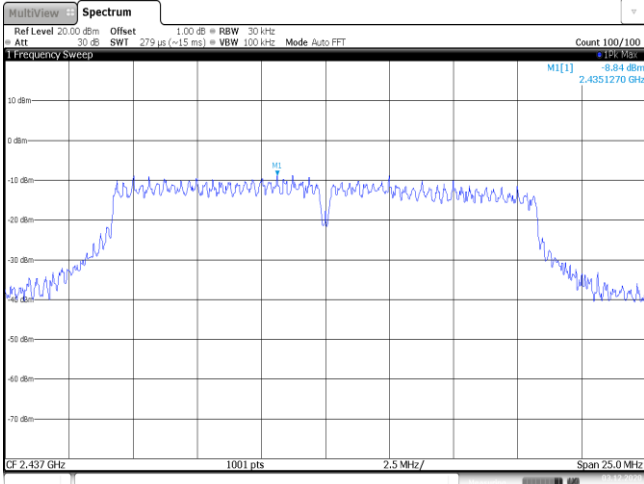
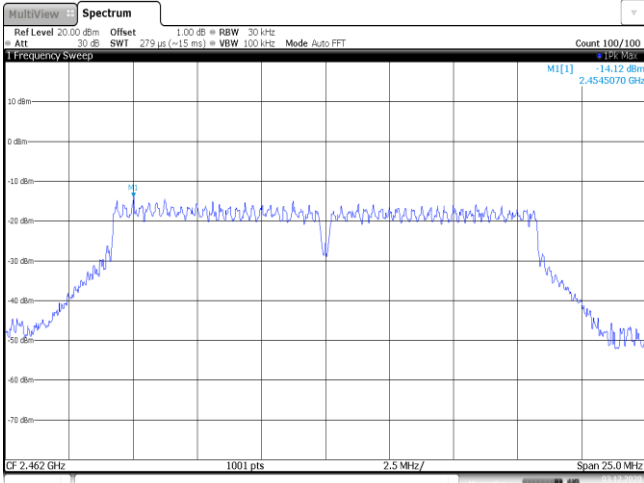
Appendix A: Conducted Peak Output Power

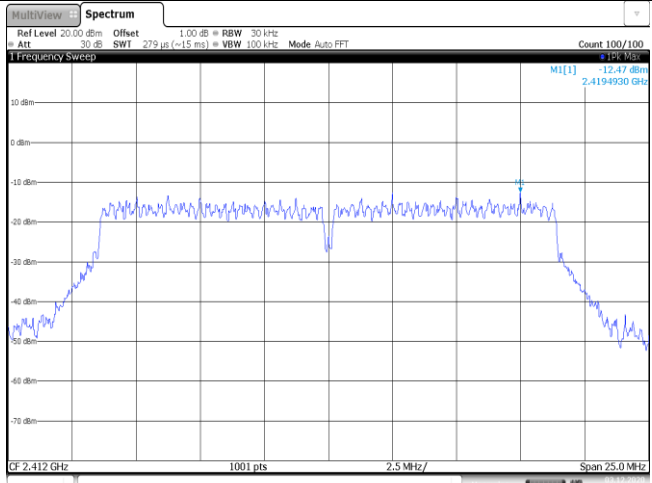
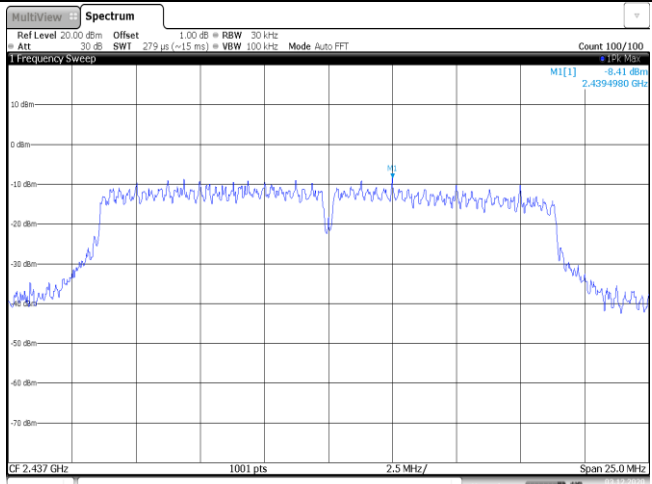
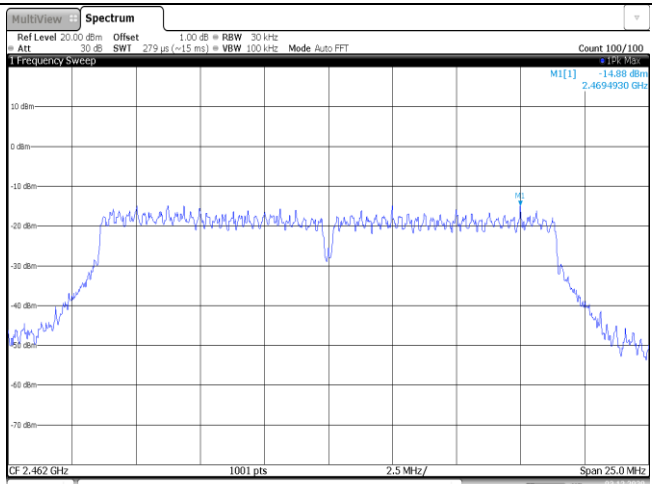
Type	Channel	Peak Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
802.11b	01	9.87	7.41	≤ 30.00	Pass
	06	14.02	11.56		
	11	7.79	5.33		
802.11g	01	12.68	9.94	≤ 30.00	Pass
	06	17.01	14.32		
	11	10.49	7.67		
802.11n (HT20)	01	12.28	9.52	≤ 30.00	Pass
	06	16.31	13.52		
	11	10.13	7.23		

Appendix B: Power Spectral Density

Type	Channel	Power Spectral Density (dBm/30KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-3.86	≤8.00	Pass
	06	0.47		
	11	-5.82		
802.11g	01	-12.46	≤8.00	Pass
	06	-8.84		
	11	-14.12		
802.11n(HT20)	01	-12.47	≤8.00	Pass
	06	-8.41		
	11	-14.88		

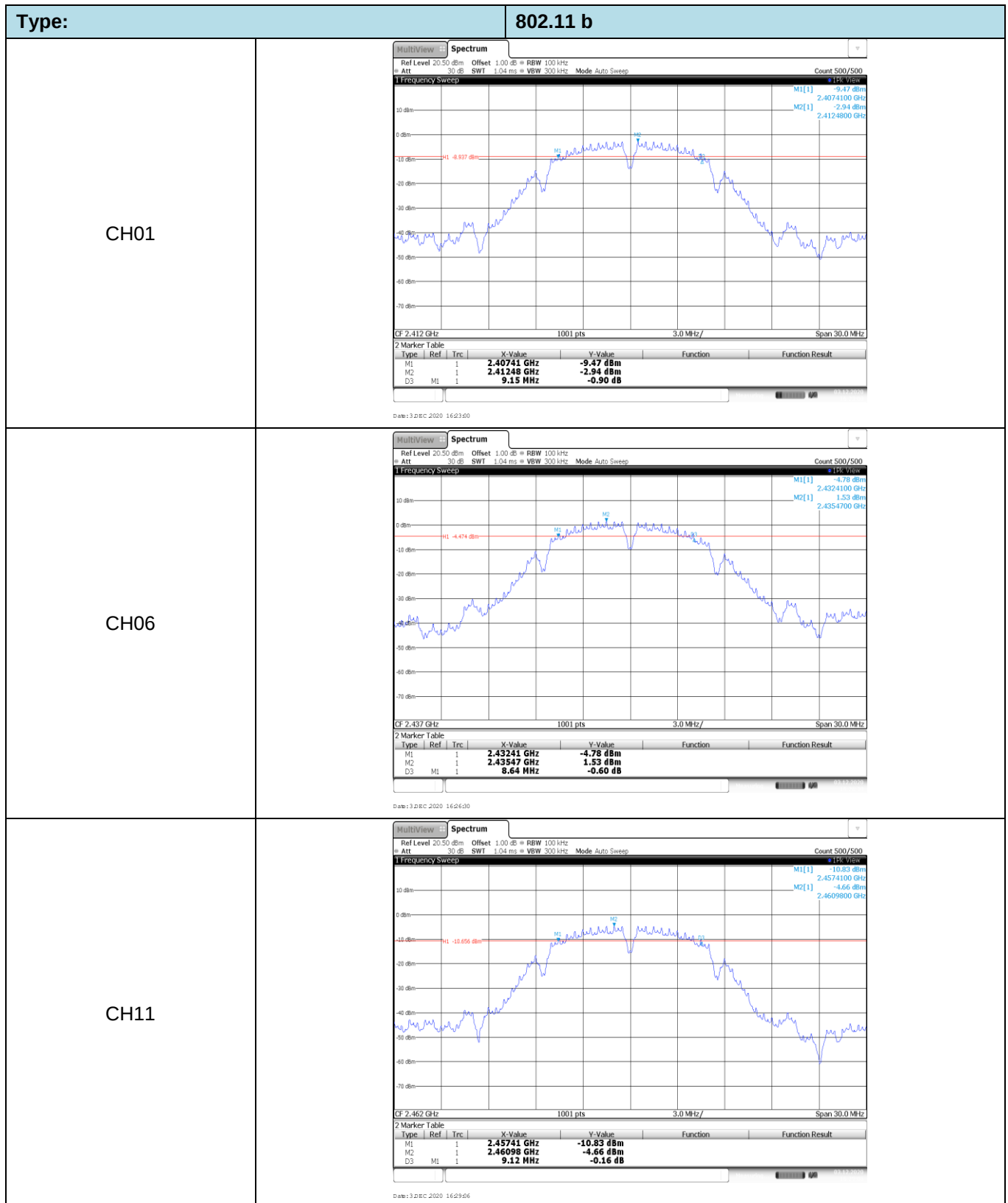


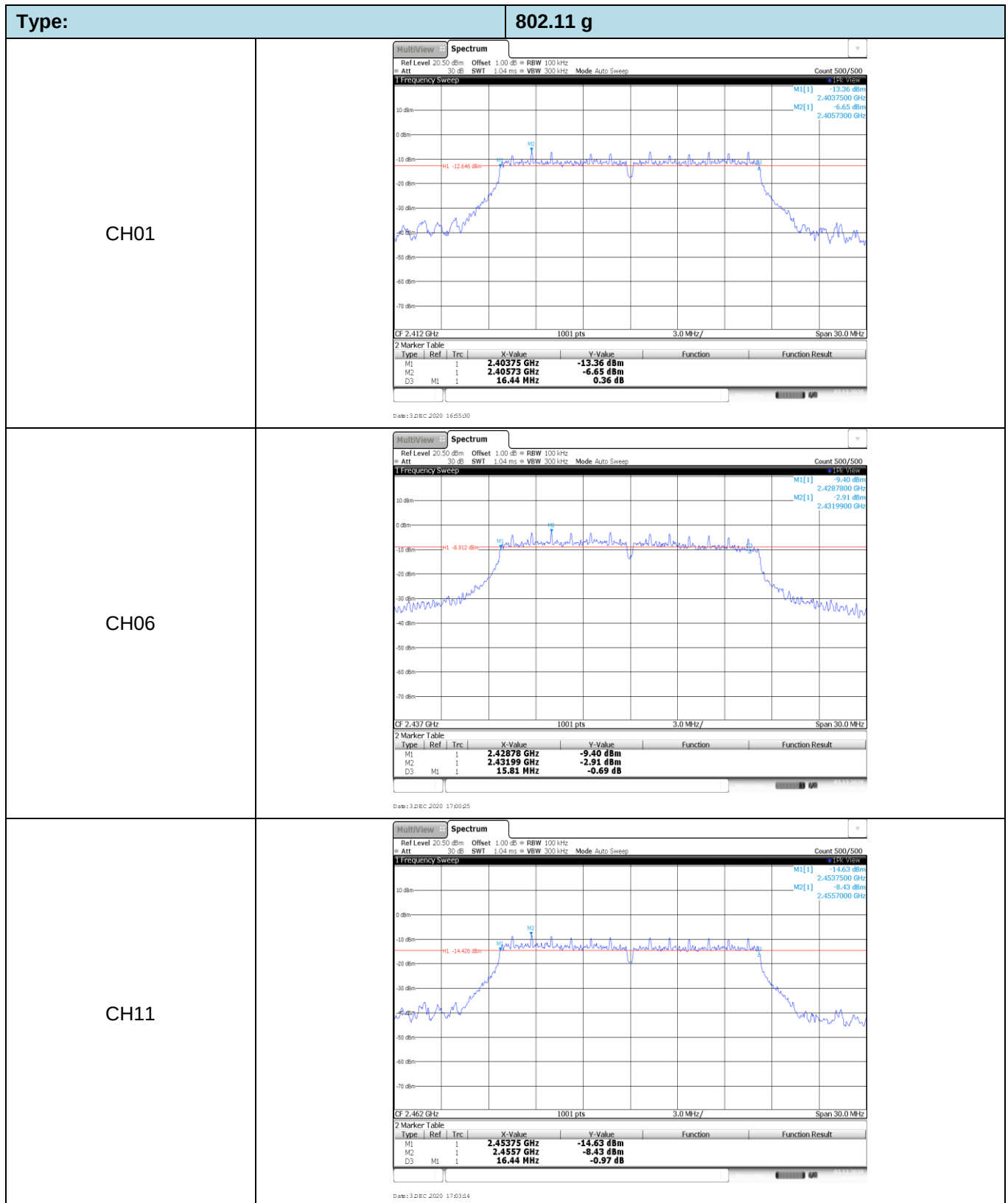
Type:	802.11 g
CH01	 Ref Level 20.00 dBm Offset 30 dB BW 1.00 MHz RBW 30 kHz SWI 279 us (~15 ms) VBW 100 kHz Mode Auto FFT Count 100/100 M1[1] -12.46 dBm 2.4043320 GHz CF 2.412 GHz 1001 pts 2.5 MHz/ Span 25.0 MHz Date: 3 DEC 2020 16:57:57
CH06	 Ref Level 20.00 dBm Offset 30 dB BW 1.00 MHz RBW 30 kHz SWI 279 us (~15 ms) VBW 100 kHz Mode Auto FFT Count 100/100 M1[1] -8.84 dBm 2.4351270 GHz CF 2.437 GHz 1001 pts 2.5 MHz/ Span 25.0 MHz Date: 3 DEC 2020 17:01:54
CH11	 Ref Level 20.00 dBm Offset 30 dB BW 1.00 MHz RBW 30 kHz SWI 279 us (~15 ms) VBW 100 kHz Mode Auto FFT Count 100/100 M1[1] -14.12 dBm 2.4545070 GHz CF 2.462 GHz 1001 pts 2.5 MHz/ Span 25.0 MHz Date: 3 DEC 2020 17:05:08

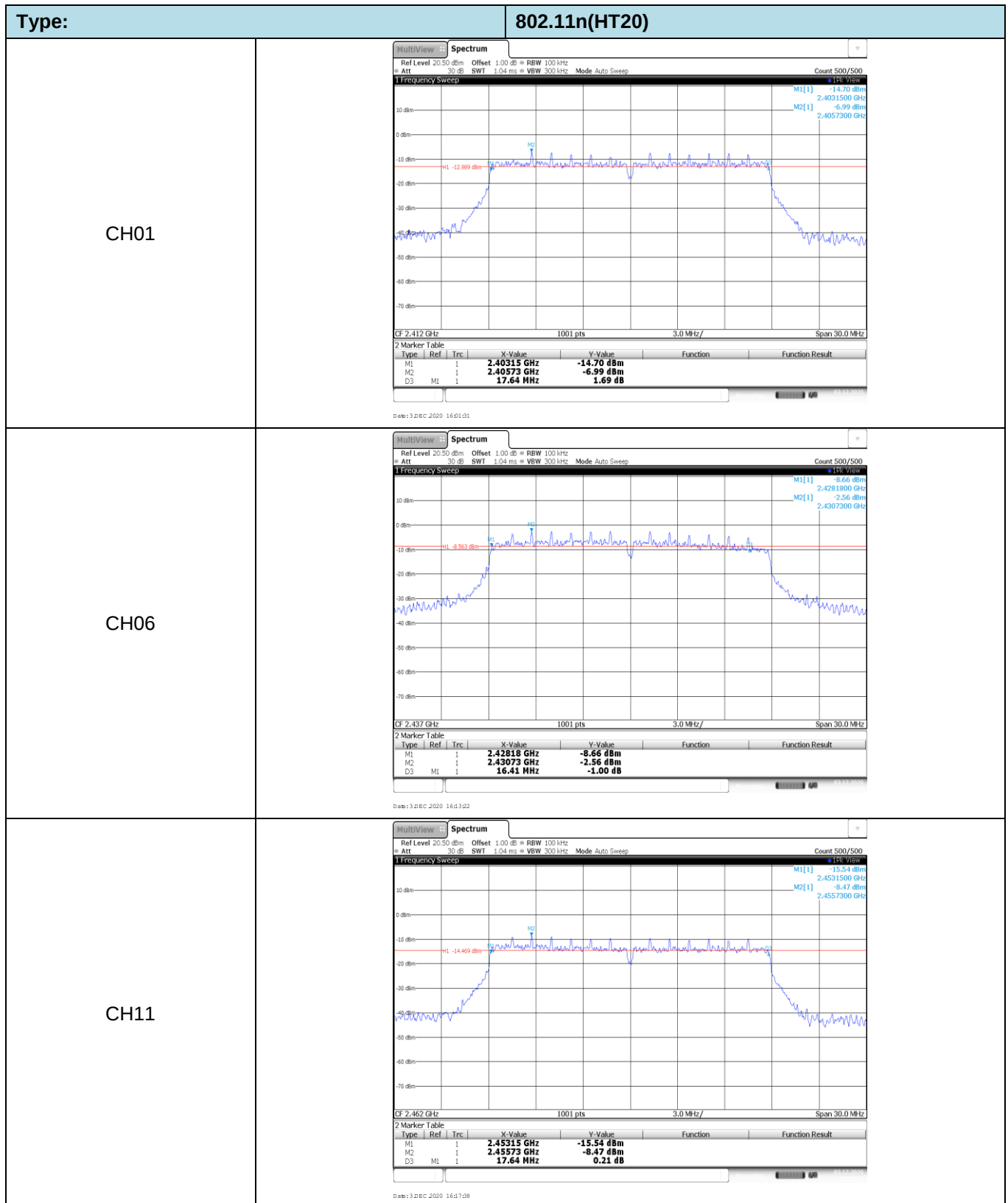
Type:	802.11n(HT20)
CH01	 Ref Level 20.00 dBm Att 30 dB Offset 1.00 dB BW 30 kHz SWI 279 us (~15 ms) VBW 100 kHz Mode Auto FFT Count 100/100 M1[1] -12.47 dBm 2.4194930 GHz CF 2.412 GHz 1001 pts 2.5 MHz/ Span 25.0 MHz Date: 3 DEC 2020 16:03:08
CH06	 Ref Level 20.00 dBm Att 30 dB Offset 1.00 dB BW 30 kHz SWI 279 us (~15 ms) VBW 100 kHz Mode Auto FFT Count 100/100 M1[1] -8.41 dBm 2.4394980 GHz CF 2.437 GHz 1001 pts 2.5 MHz/ Span 25.0 MHz Date: 3 DEC 2020 16:03:01
CH11	 Ref Level 20.00 dBm Att 30 dB Offset 1.00 dB BW 30 kHz SWI 279 us (~15 ms) VBW 100 kHz Mode Auto FFT Count 100/100 M1[1] -14.88 dBm 2.4694930 GHz CF 2.462 GHz 1001 pts 2.5 MHz/ Span 25.0 MHz Date: 3 DEC 2020 16:03:49

Appendix C: 6dB bandwidth

Type	Channel	6dB Bandwidth (MHz)	Limit (MHz)	Result
802.11b	01	9.15	≥0.5	Pass
	06	8.64		
	11	9.12		
802.11g	01	16.44	≥0.5	Pass
	06	15.81		
	11	16.44		
802.11n(HT20)	01	17.64	≥0.5	Pass
	06	16.41		
	11	17.64		

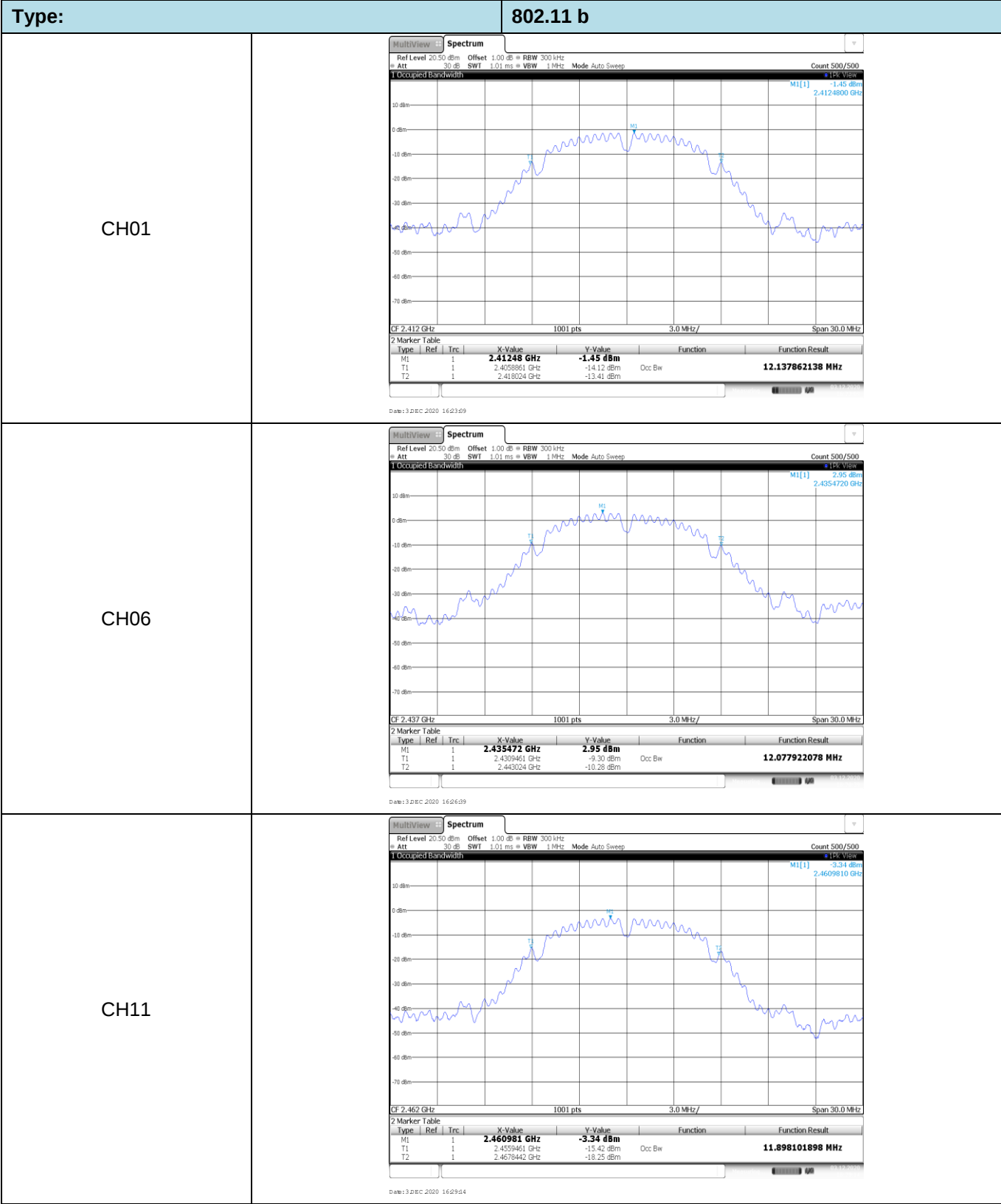


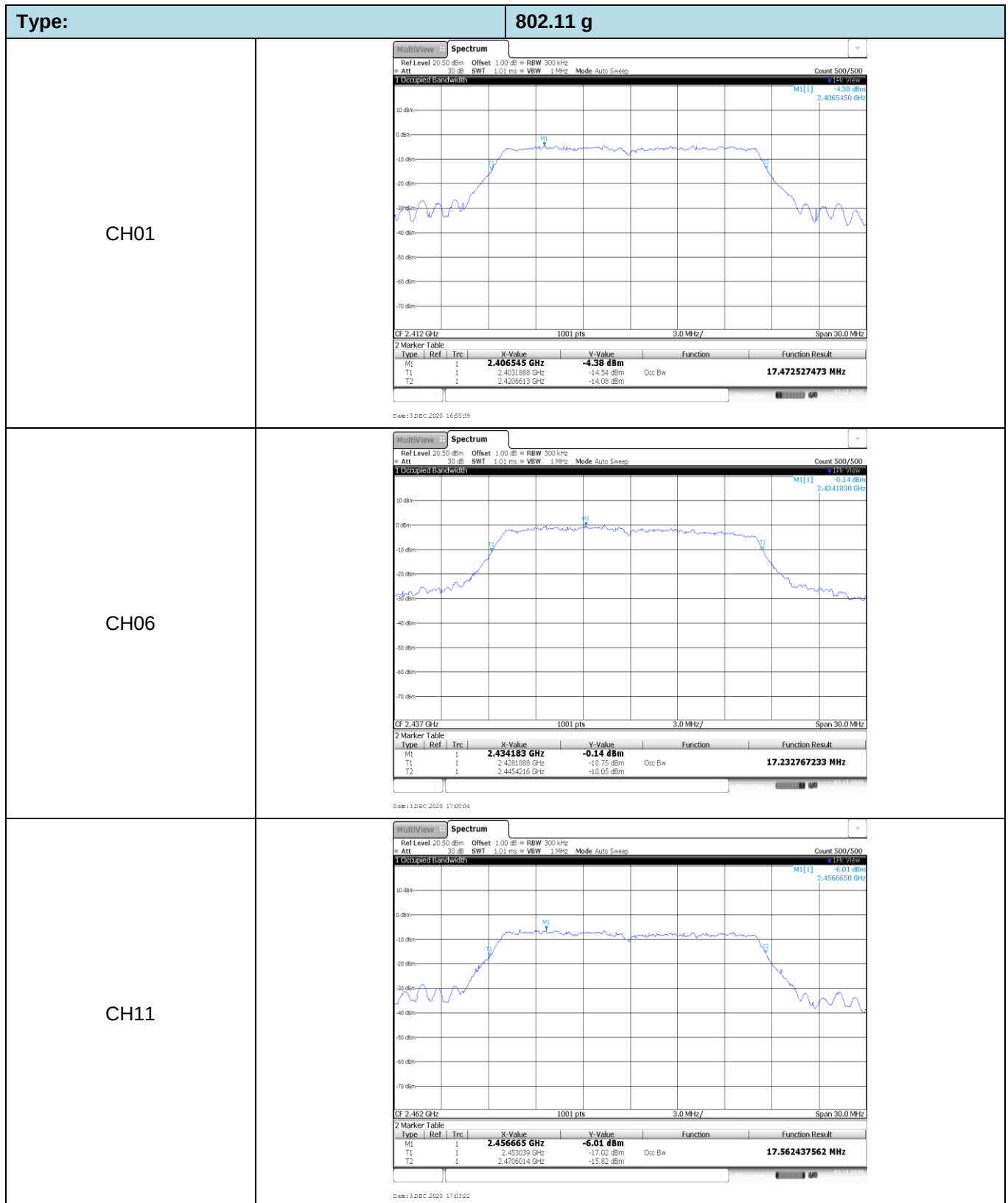


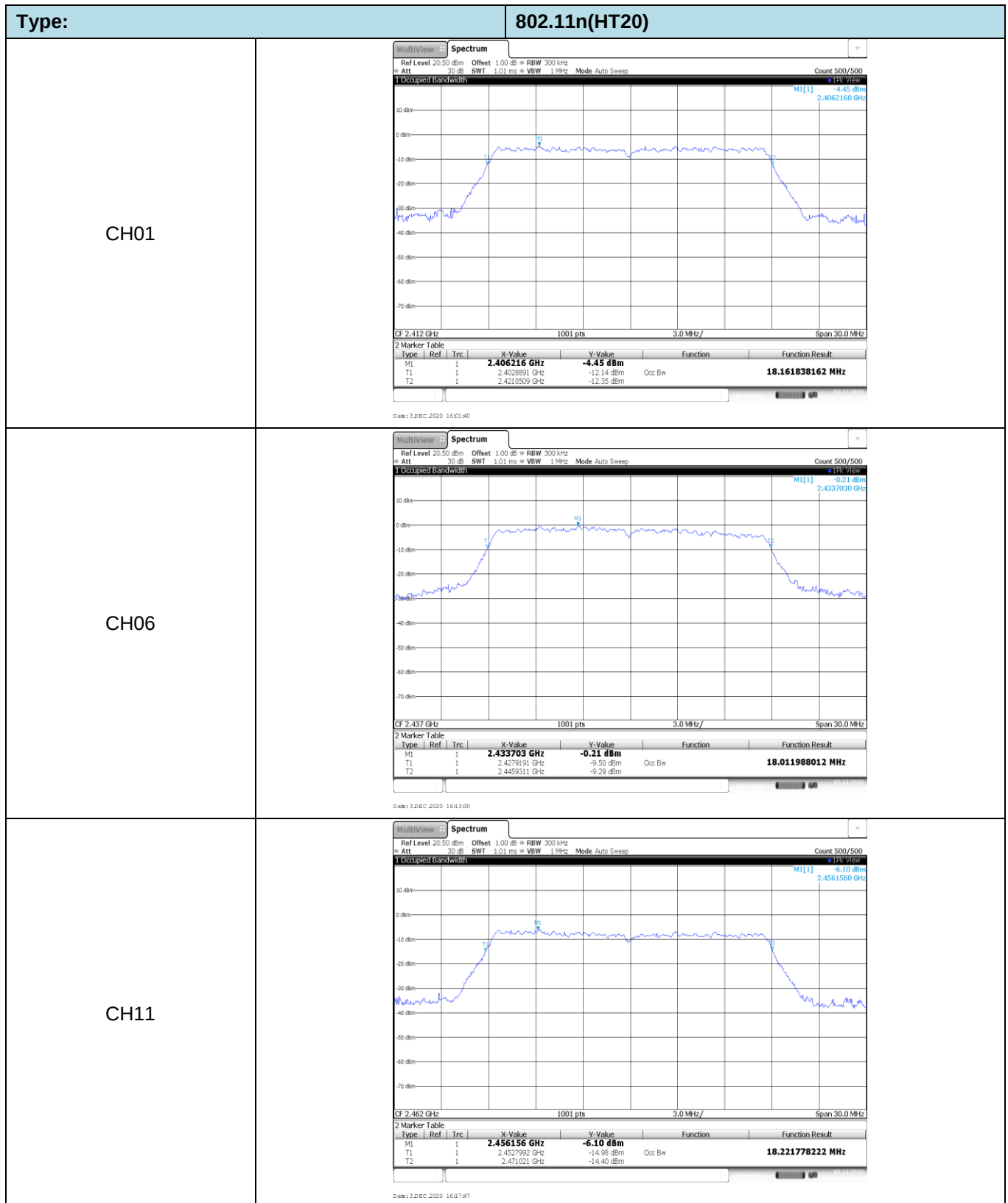


Appendix D: 99% Occupied Bandwidth

Type	Channel	99% Bandwidth (MHz)	Limit (MHz)	Result
802.11b	01	12.14	-	Pass
	06	12.08		
	11	11.90		
802.11g	01	17.47	-	Pass
	06	17.23		
	11	17.56		
802.11n(HT20)	01	18.16	-	Pass
	06	18.01		
	11	18.22		

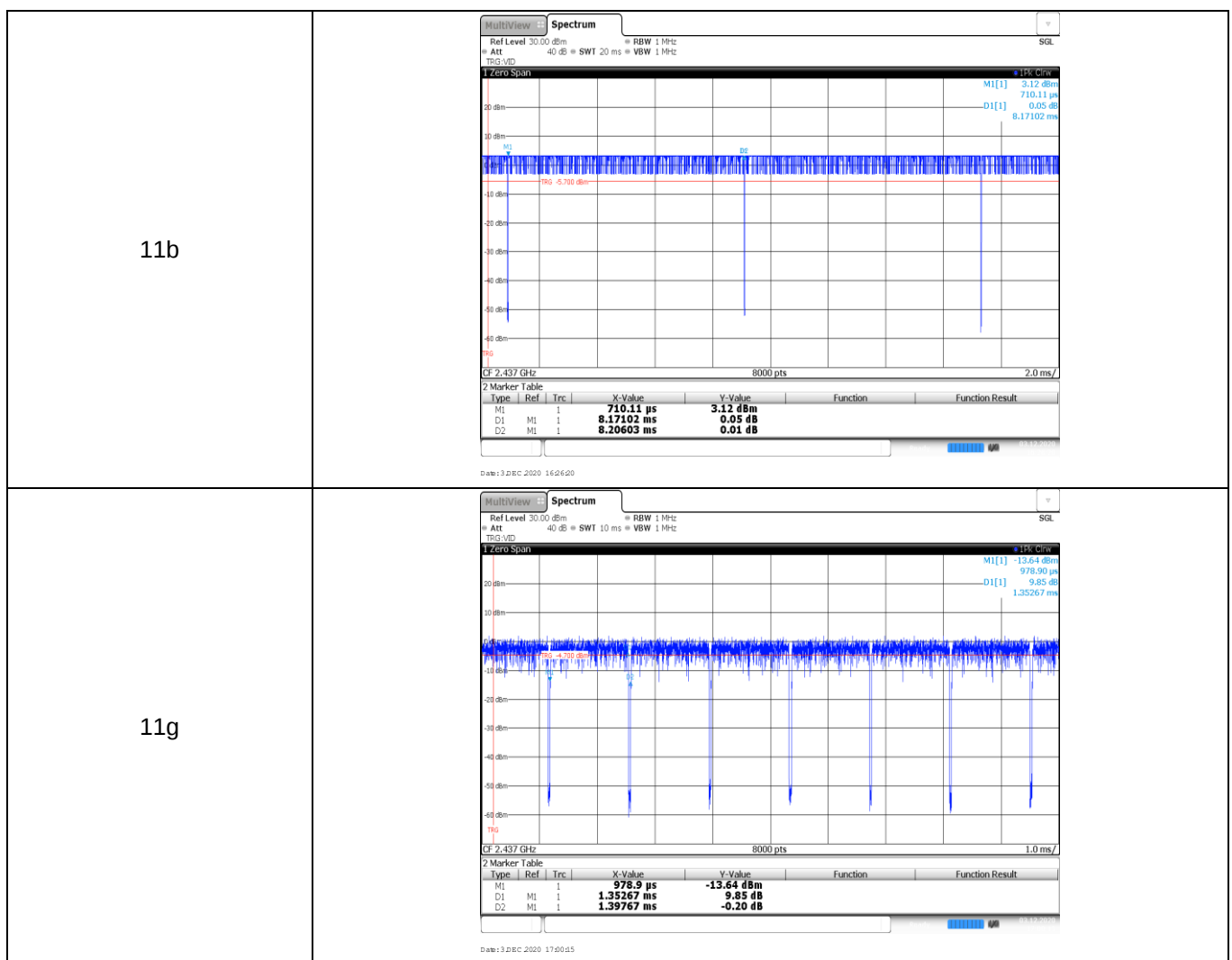


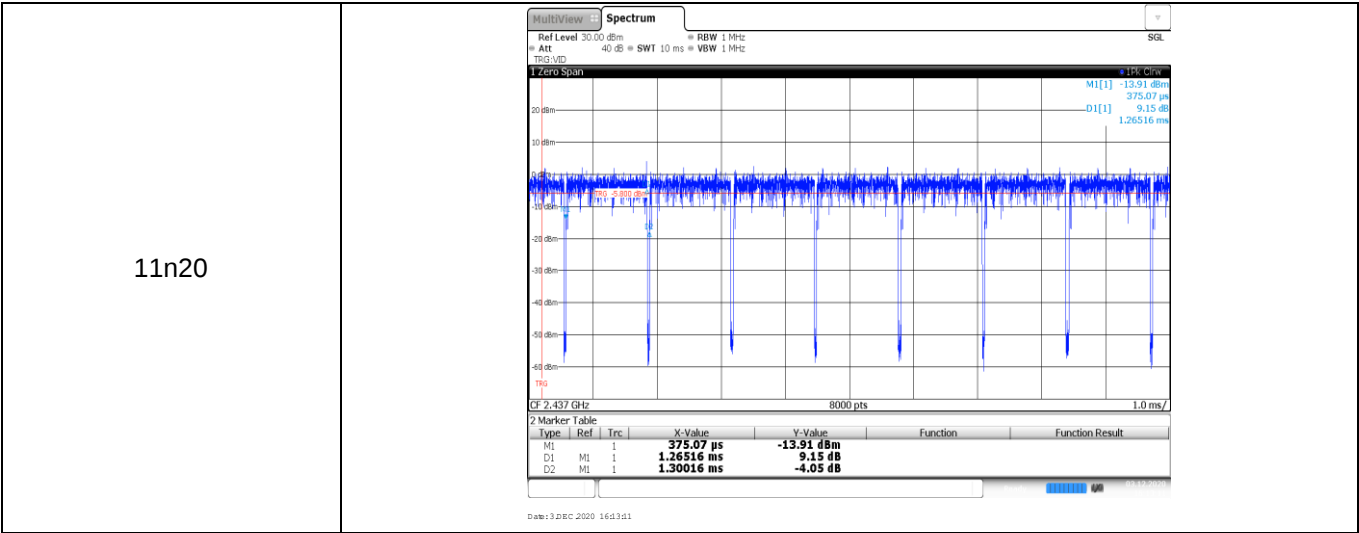




Appendix E: Duty Cycle

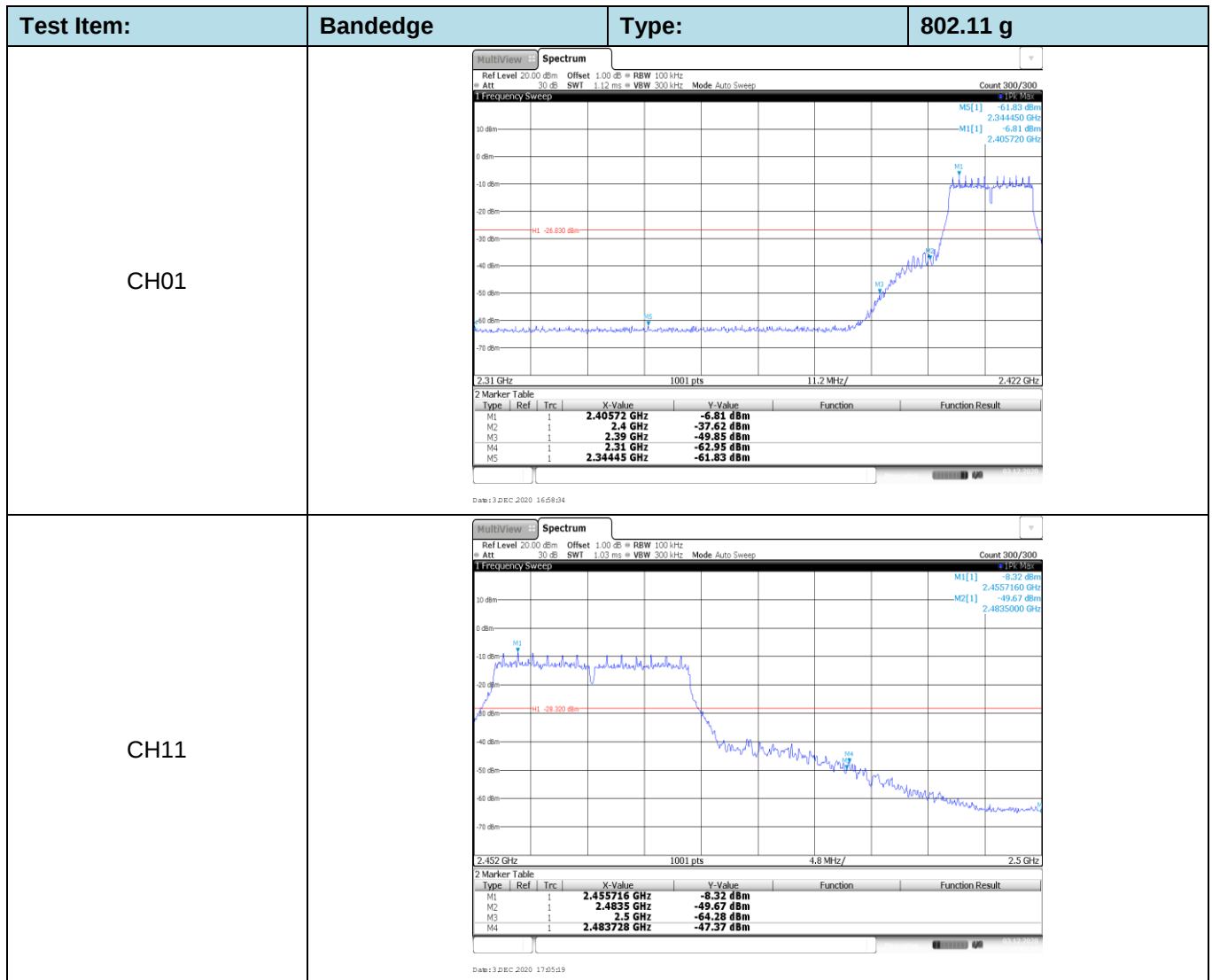
Modulation Type	Test Frequency (MHz)	T _{on time} for single burst (ms)	T _{period} (ms)	Duty cycle	1/T _{on time} (kHz)
11b	2437	8.17	8.21	99.5%	0.1
11g	2437	1.35	1.40	96.4%	0.7
11n20	2437	1.27	1.30	97.7%	0.8

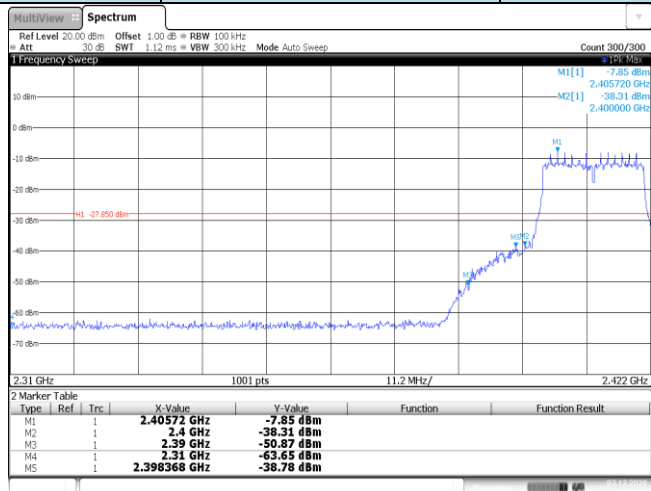
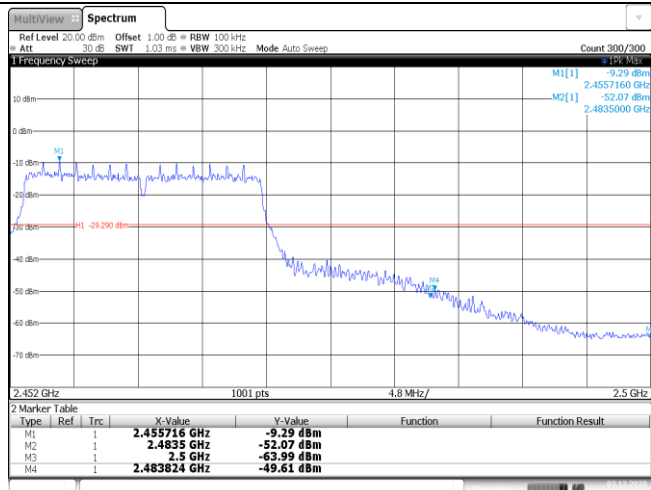


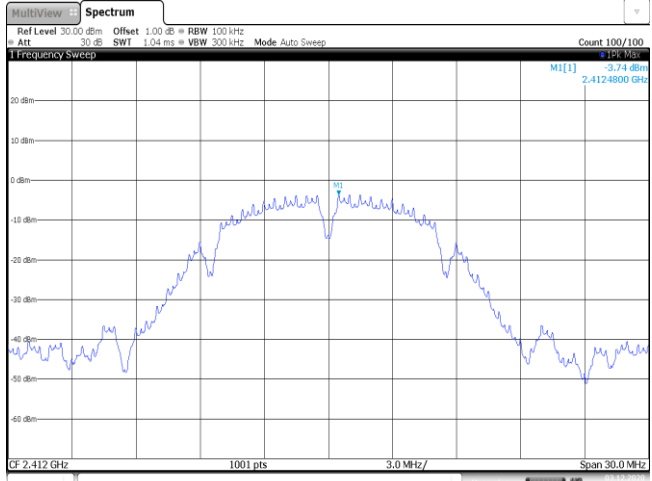
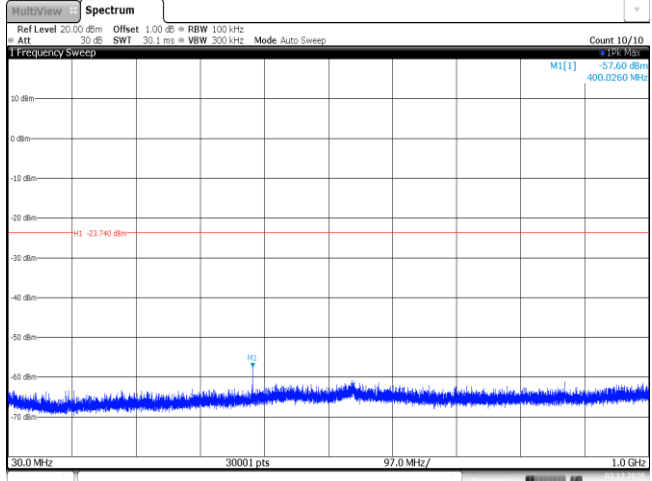
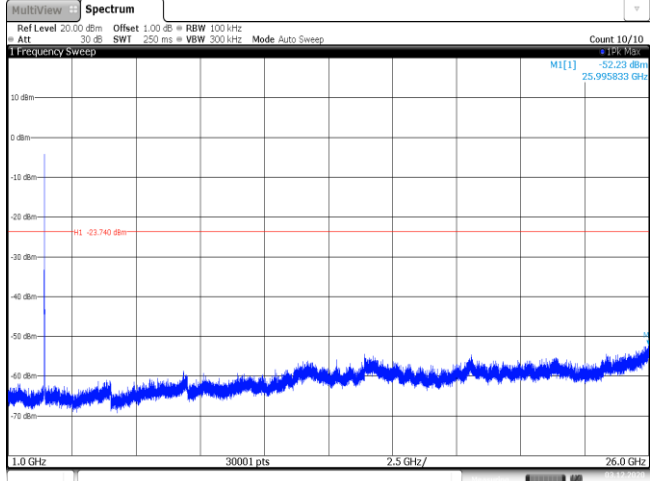


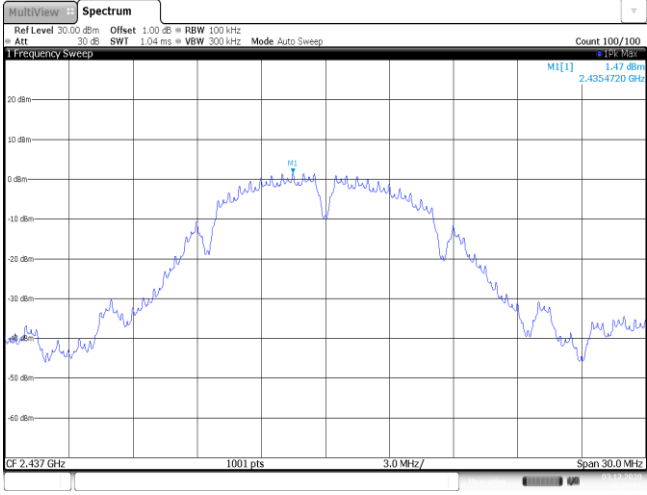
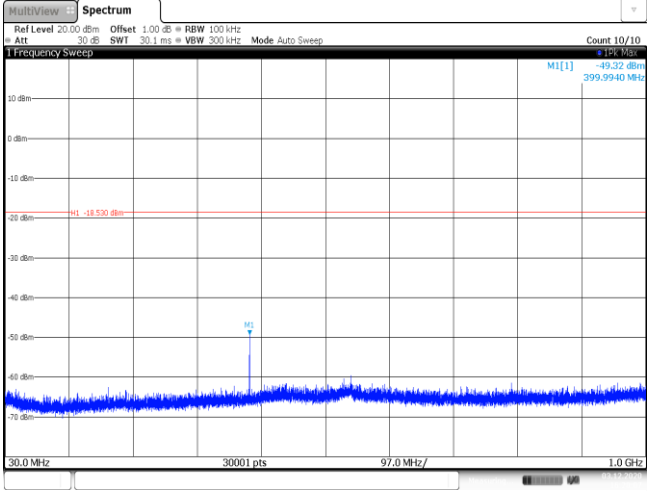
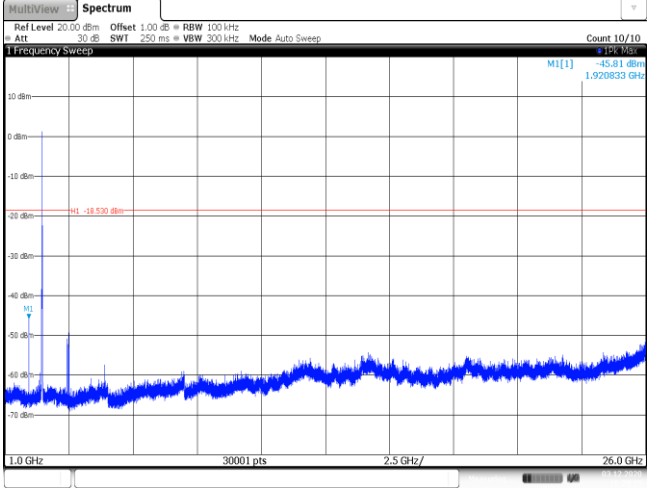
Appendix F: Band edge and Spurious Emissions (conducted)

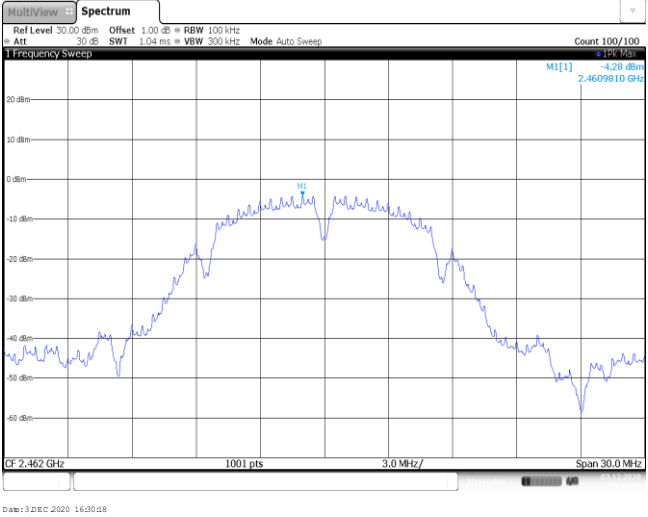
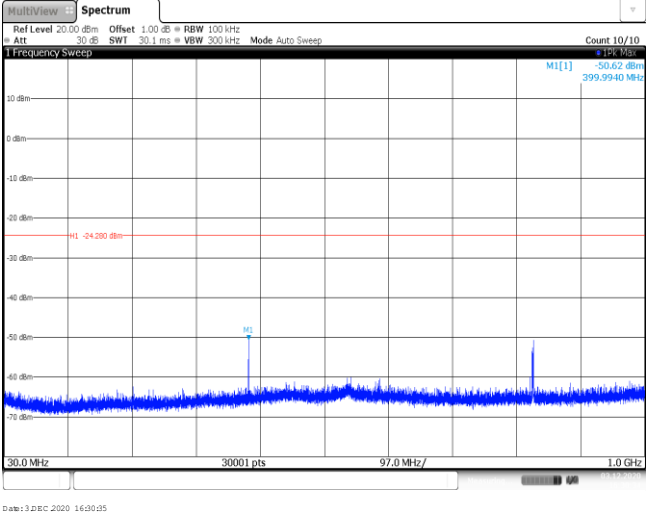
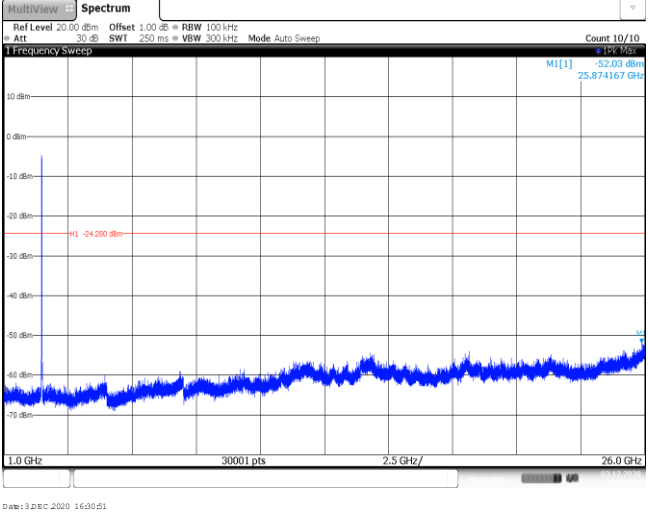
Test Item:	Bandedge	Type:	802.11 b																																										
CH01	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz ATT 30 dB SWT 1.12 ms VBW 300 kHz Mode Auto Sweep Count 300/300 Frequency Sweep 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm M1 M2 M3 M4 M5 M1[1] -3.10 dBm M2[1] 2.413440 GHz M2[1] -44.75 dBm M2[1] 2.400000 GHz 2.31 GHz 1001 pts 11.2 MHz/ 2.422 GHz <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>2.41344 GHz</td><td>-3.10 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-44.75 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-60.64 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-63.35 dBm</td><td></td><td></td></tr><tr><td>M5</td><td>1</td><td></td><td>2.349154 GHz</td><td>-59.50 dBm</td><td></td><td></td></tr></table> Date: 3 DEC 2020 16:24:46			Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.41344 GHz	-3.10 dBm			M2	1		2.4 GHz	-44.75 dBm			M3	1		2.39 GHz	-60.64 dBm			M4	1		2.31 GHz	-63.35 dBm			M5	1		2.349154 GHz	-59.50 dBm		
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
M1	1		2.41344 GHz	-3.10 dBm																																									
M2	1		2.4 GHz	-44.75 dBm																																									
M3	1		2.39 GHz	-60.64 dBm																																									
M4	1		2.31 GHz	-63.35 dBm																																									
M5	1		2.349154 GHz	-59.50 dBm																																									
CH11	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz ATT 30 dB SWT 1.03 ms VBW 300 kHz Mode Auto Sweep Count 300/300 Frequency Sweep 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm M1 M2 M3 M4 M1[1] -4.46 dBm M2[1] 2.4634850 GHz M2[1] -55.29 dBm M2[1] 2.4835000 GHz 2.452 GHz 1001 pts 4.8 MHz/ 2.5 GHz <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>2.463485 GHz</td><td>-4.46 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4835 GHz</td><td>-55.29 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.5 GHz</td><td>-63.69 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.483536 GHz</td><td>-55.77 dBm</td><td></td><td></td></tr></table> Date: 3 DEC 2020 17:06:59			Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.463485 GHz	-4.46 dBm			M2	1		2.4835 GHz	-55.29 dBm			M3	1		2.5 GHz	-63.69 dBm			M4	1		2.483536 GHz	-55.77 dBm									
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
M1	1		2.463485 GHz	-4.46 dBm																																									
M2	1		2.4835 GHz	-55.29 dBm																																									
M3	1		2.5 GHz	-63.69 dBm																																									
M4	1		2.483536 GHz	-55.77 dBm																																									

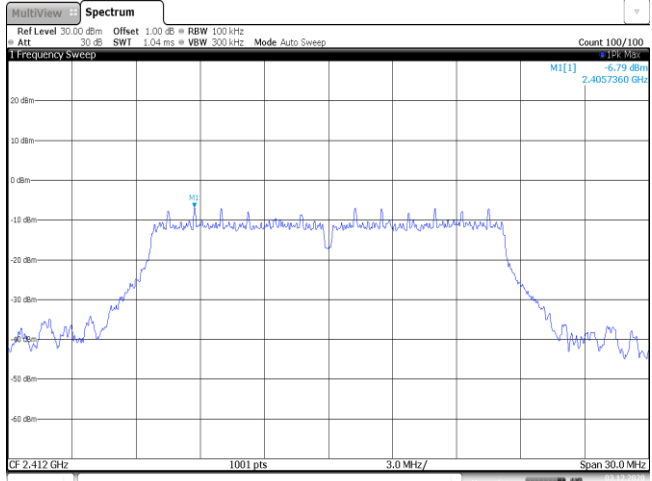
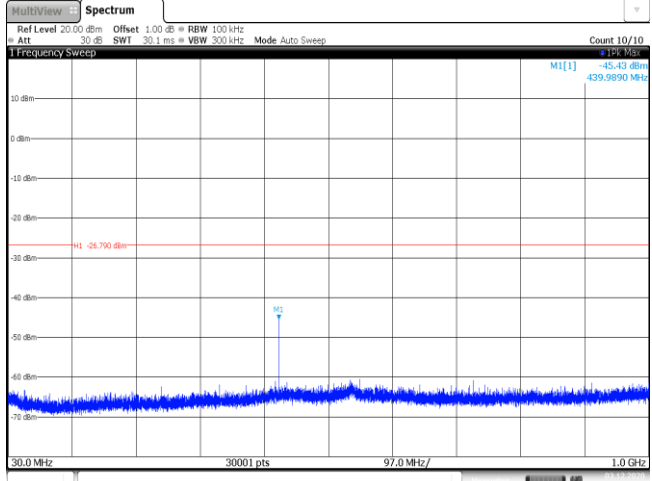
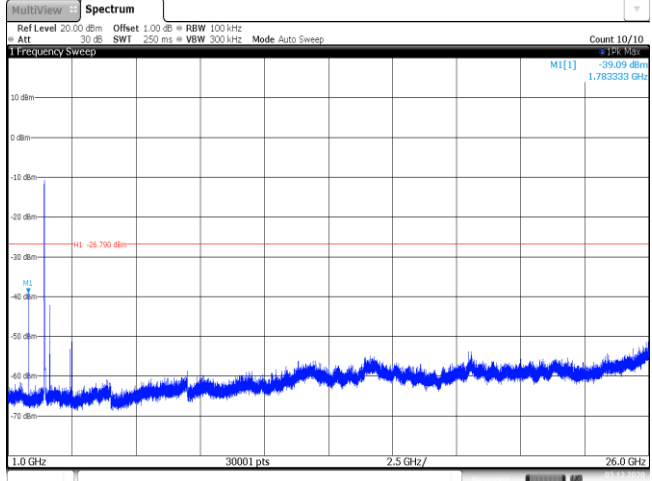


Test Item:	Bandedge	Type:	802.11 n(HT20)																																										
CH01	 Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SWI 1.12 ms VBW 300 kHz Mode Auto Sweep Count 300/300 1 Frequency Sweep 2.31 GHz 1001 pts 11.2 MHz/ 2.422 GHz 2 Marker Table <table><tr><th>Type</th><th>Ref</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>2.40572 GHz</td><td>-7.85 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-38.31 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-50.87 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-63.65 dBm</td><td></td><td></td></tr><tr><td>M5</td><td>1</td><td></td><td>2.398368 GHz</td><td>-38.78 dBm</td><td></td><td></td></tr></table> Date: 3 DEC 2020 16:03:48	Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.40572 GHz	-7.85 dBm			M2	1		2.4 GHz	-38.31 dBm			M3	1		2.39 GHz	-50.87 dBm			M4	1		2.31 GHz	-63.65 dBm			M5	1		2.398368 GHz	-38.78 dBm				
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
M1	1		2.40572 GHz	-7.85 dBm																																									
M2	1		2.4 GHz	-38.31 dBm																																									
M3	1		2.39 GHz	-50.87 dBm																																									
M4	1		2.31 GHz	-63.65 dBm																																									
M5	1		2.398368 GHz	-38.78 dBm																																									
CH11	 Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SWI 1.03 ms VBW 300 kHz Mode Auto Sweep Count 300/300 1 Frequency Sweep 2.452 GHz 1001 pts 4.8 MHz/ 2.5 GHz 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>2.455716 GHz</td><td>-9.29 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4835 GHz</td><td>-52.07 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.5 GHz</td><td>-63.99 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.483824 GHz</td><td>-49.61 dBm</td><td></td><td></td></tr></table> Date: 3 DEC 2020 16:19:59	Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.455716 GHz	-9.29 dBm			M2	1		2.4835 GHz	-52.07 dBm			M3	1		2.5 GHz	-63.99 dBm			M4	1		2.483824 GHz	-49.61 dBm											
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
M1	1		2.455716 GHz	-9.29 dBm																																									
M2	1		2.4835 GHz	-52.07 dBm																																									
M3	1		2.5 GHz	-63.99 dBm																																									
M4	1		2.483824 GHz	-49.61 dBm																																									

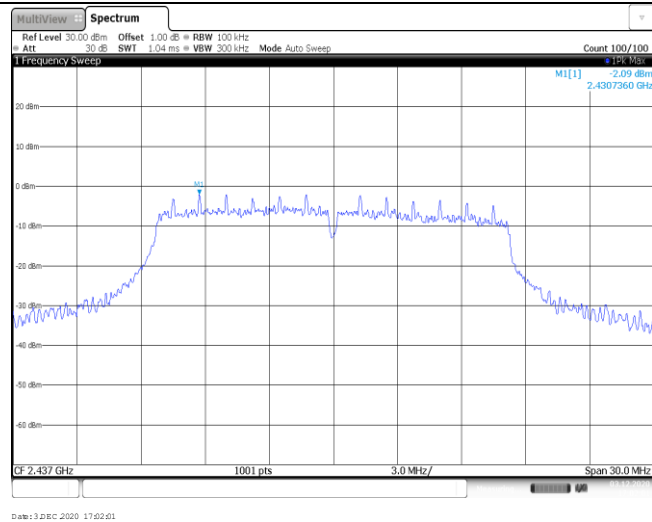
Test Item:	SE	Type:	802.11 b
CH01 Reference level		 Ref Level 30.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SWI 1.04 ms VBW 300 kHz Mode Auto Sweep Count 100/100 MI[1] 3.74 dBm 2.4124800 GHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm 2.412 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 3 DEC 2020 16:24:53	
CH01 30MHz~1000MHz		 Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SWI 30.1 ms VBW 300 kHz Mode Auto Sweep Count 10/10 MI[1] -57.60 dBm 400.6260 MHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm 30.0 MHz 30001 pts 97.0 MHz/ 1.0 GHz Date: 3 DEC 2020 16:25:09	
CH01 1GHz~26GHz		 Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SWI 250 ms VBW 300 kHz Mode Auto Sweep Count 10/10 MI[1] -52.23 dBm 25.995633 GHz 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm 1.0 GHz 30001 pts 25.0 GHz/ 26.0 GHz Date: 3 DEC 2020 16:25:26	

CH06 Reference level	
CH06 30MHz~1000MHz	
CH06 1GHz~26GHz	

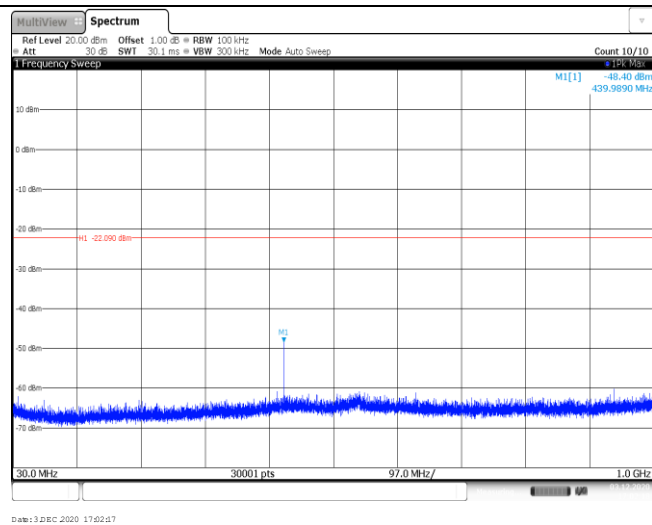
CH11 Reference level	
CH11 30MHz~1000MHz	
CH11 1GHz~26GHz	

Test Item:	SE	Type:	802.11 g
CH01 Reference level		 CH01 Reference level	
CH01 30MHz~1000MHz		 CH01 30MHz~1000MHz	
CH01 1GHz~26GHz		 CH01 1GHz~26GHz	

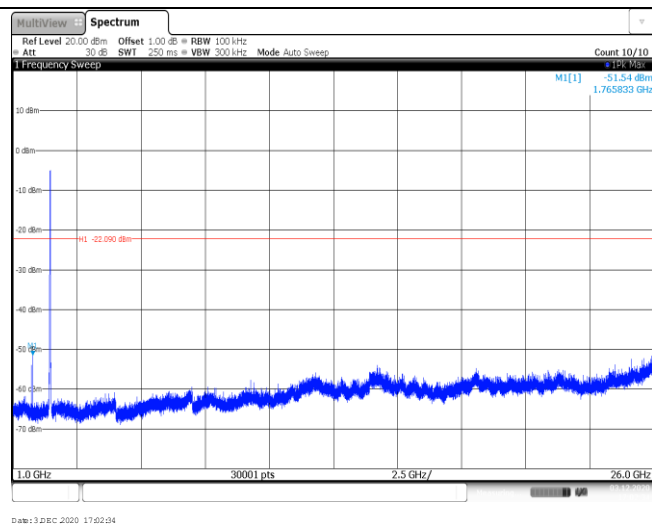
CH06
Reference level



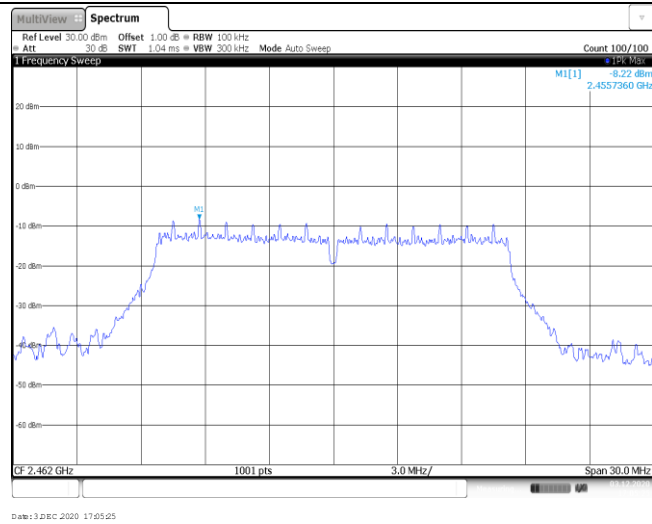
CH06
30MHz~1000MHz



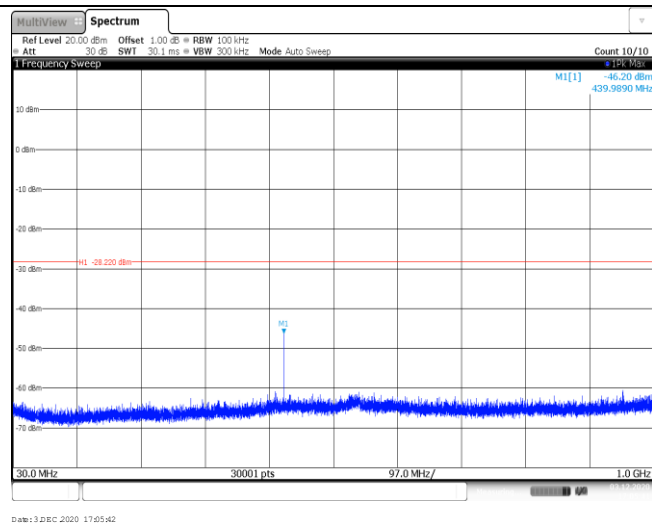
CH06
1GHz~26GHz



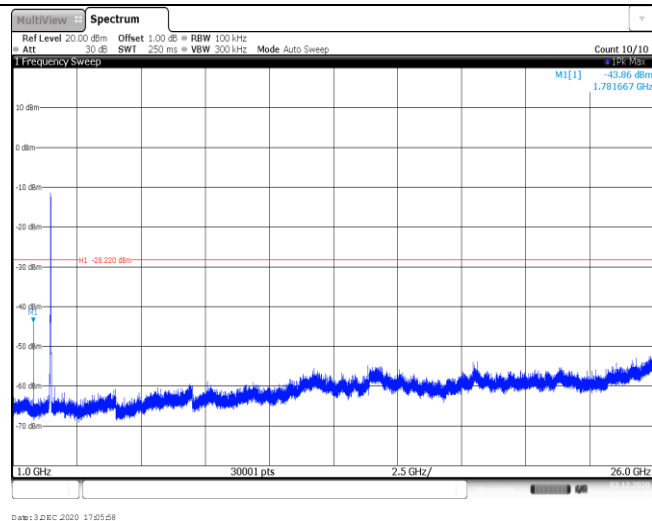
CH11
Reference level

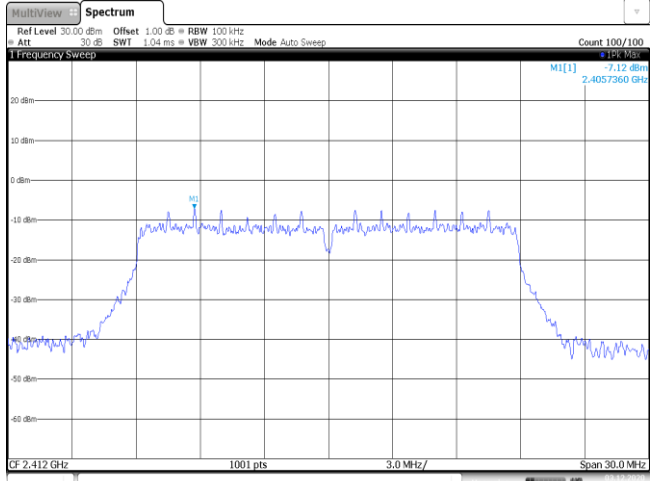
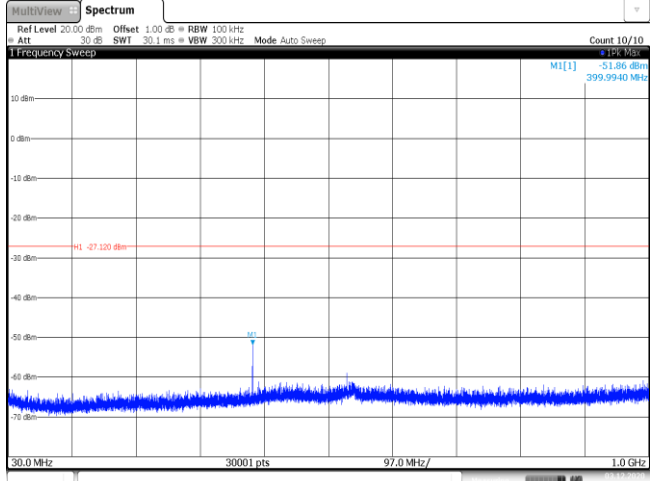
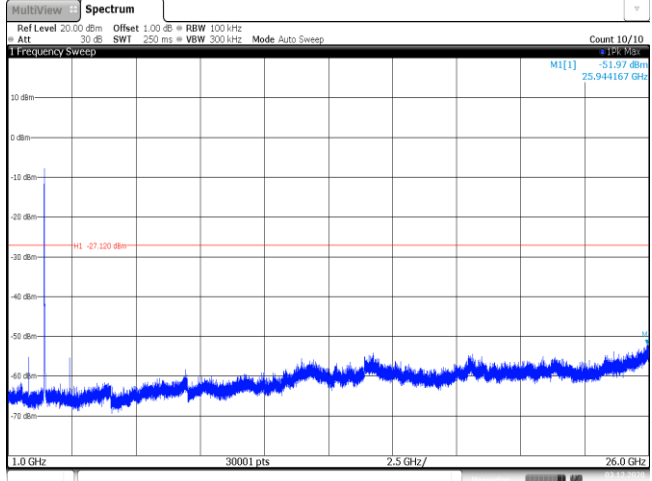


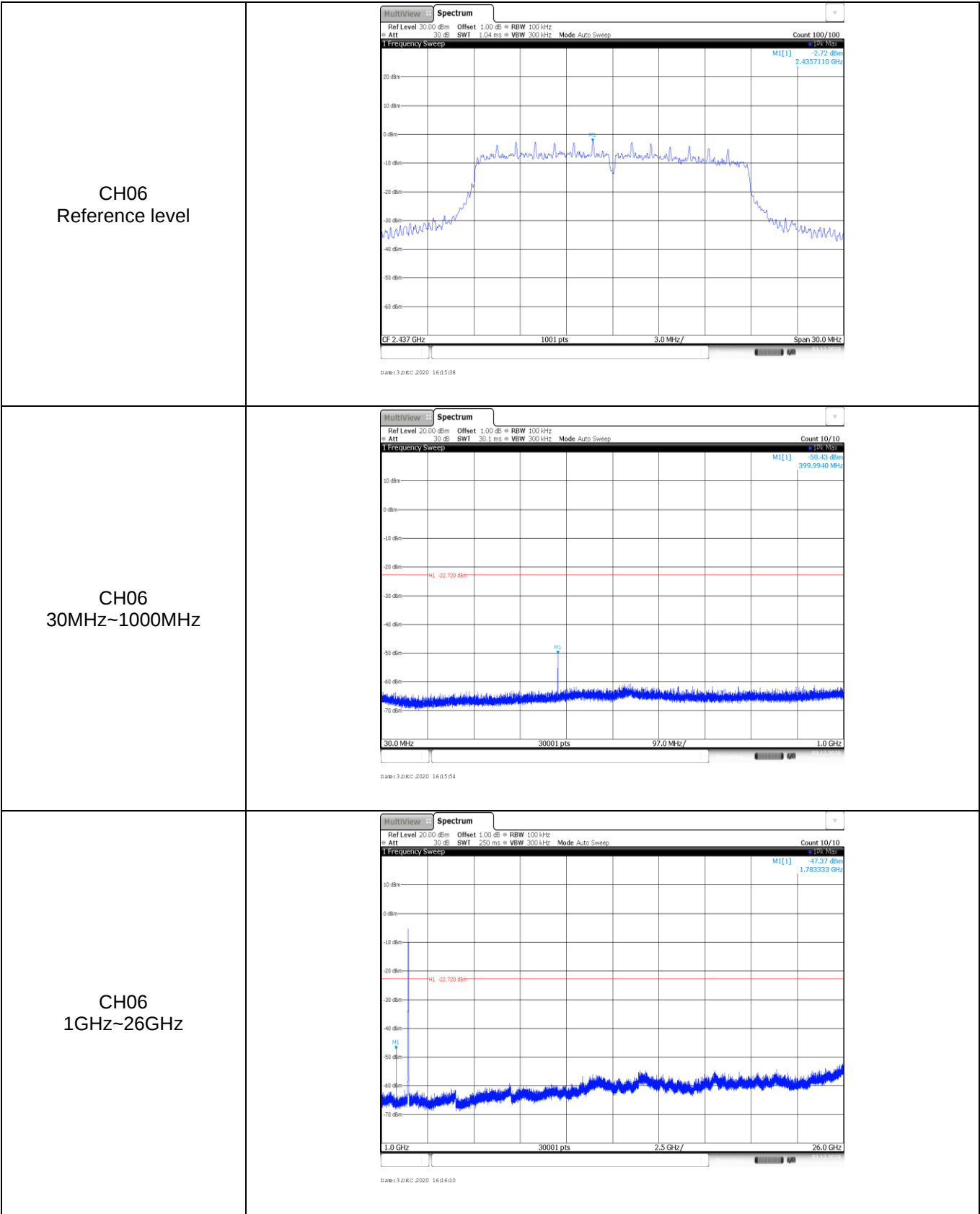
CH11
30MHz~1000MHz

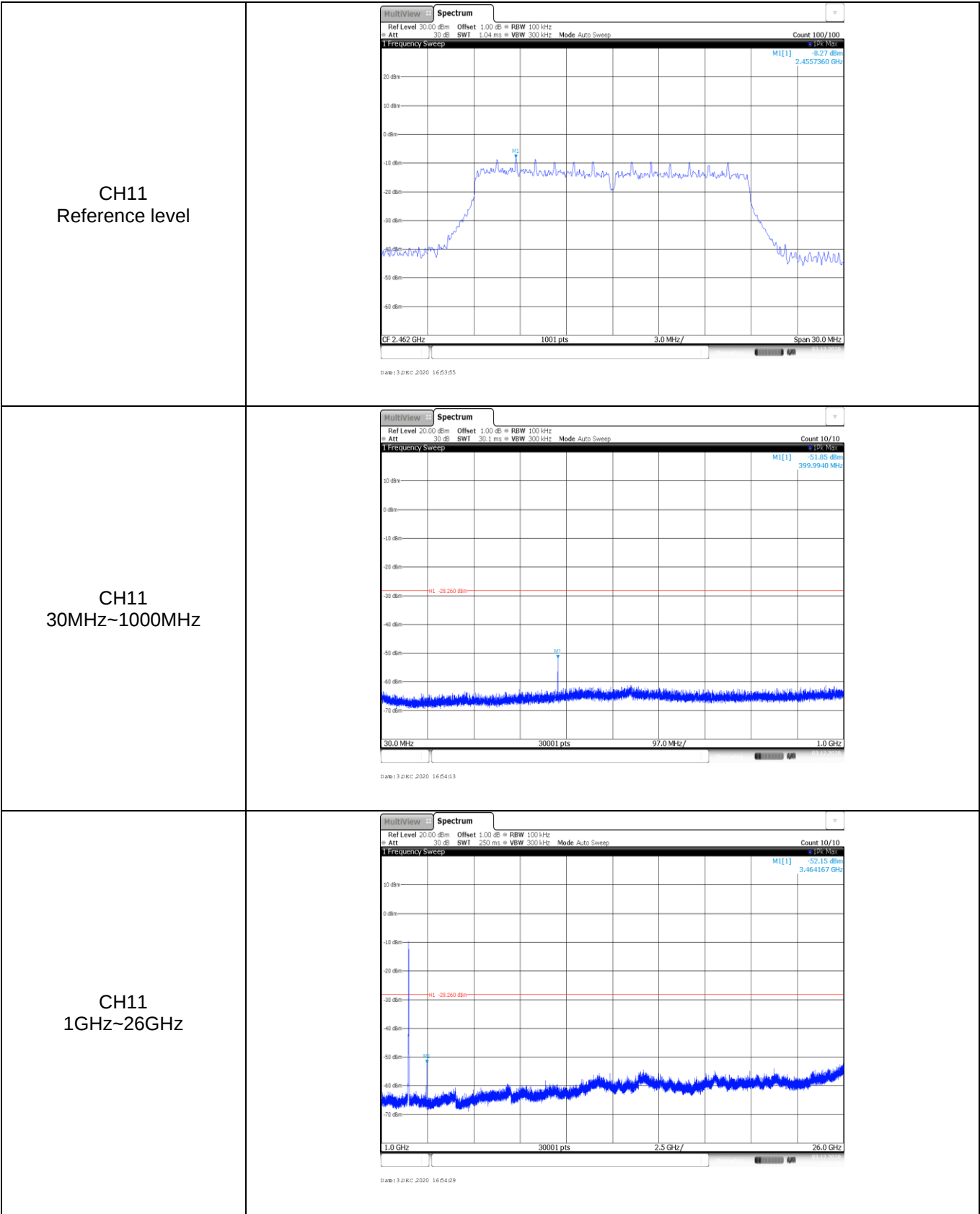


CH11
1GHz~26GHz



Test Item:	SE	Type:	802.11 n(HT20)
CH01 Reference level		 Ref Level 30.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SWI 1.04 ms VBW 300 kHz Mode Auto Sweep Count 100/100 MI[1] 7.12 dBm 2.4057360 GHz 20 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm CF 2.412 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 3 DEC 2020 16:03:55	
CH01 30MHz~1000MHz		 Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SWI 30.1 ms VBW 300 kHz Mode Auto Sweep Count 10/10 MI[1] -51.86 dBm 399.9940 MHz 20 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm 30.0 MHz 30001 pts 97.0 MHz/ 1.0 GHz Date: 3 DEC 2020 16:04:01	
CH01 1GHz~26GHz		 Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SWI 250 ms VBW 300 kHz Mode Auto Sweep Count 10/10 MI[1] -51.97 dBm 25.944167 GHz 20 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm 1.0 GHz 30001 pts 2.5 GHz/ 26.0 GHz Date: 3 DEC 2020 16:04:28	





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