

APPENDIX REPORT

Project No.	SHT2103035601EW	Radio Specification	LORA
Test sample No.	YPHT20090481001	Model No.	T90-DTU
Start test date	2021-04-13	Finish date	2021-04-13
Temperature	24.4°C	Humidity	44%
Test Engineer	Hailey Chen	Auditor	Xiaodong Zhu

Appendix clause	Test item	Result
A	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: Peak Output Power

Type	Channel	Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
LORA	CH _L	8.48	8.46	≤ 30.00	Pass
	CH _M	8.40	8.39		
	CH _H	8.29	8.28		

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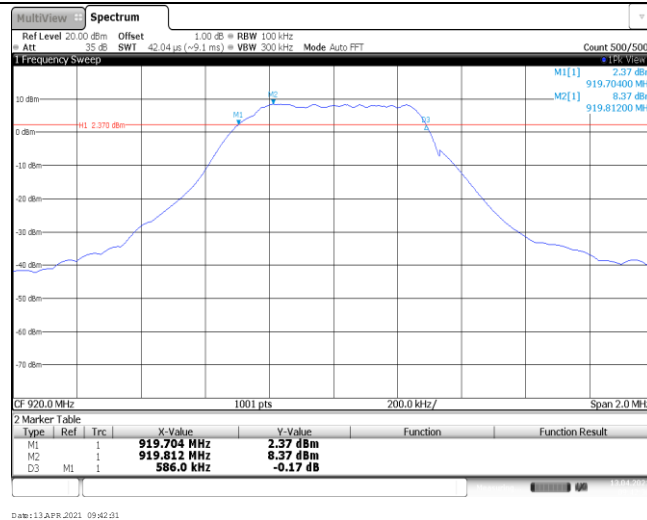
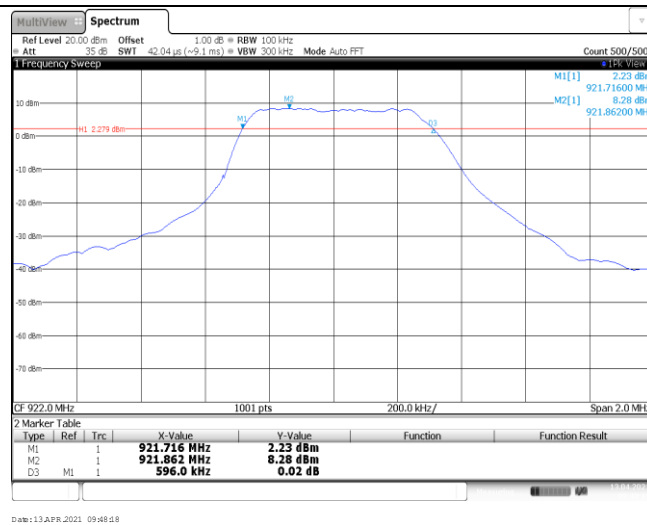
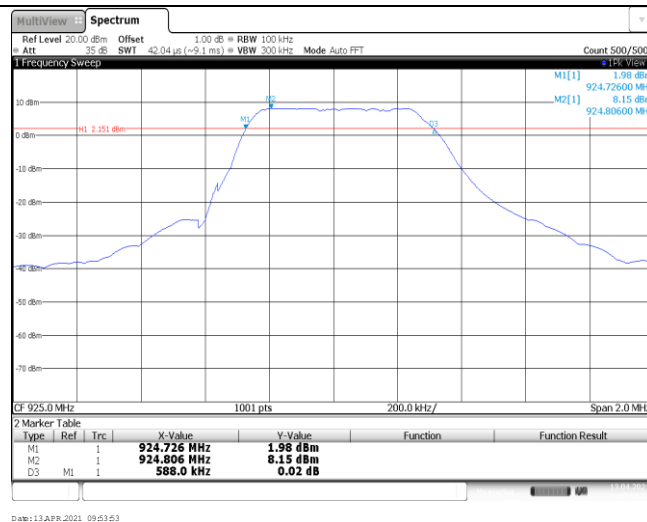
Appendix B: Power Spectral Density

Type	Channel	Power Spectral Density(dBm/3KHz)	Limit (dBm/3KHz)	Result
LORA	CH _L	5.38	≤8.00	Pass
	CH _M	3.85		
	CH _H	4.90		

CH _L	MultiView Spectrum Ref Level 20.00 dBm Offset 35.0 dB Att 1.00 dB RBW 3 kHz SWT 1.4 ms (-0.2 ms) VBW 10 kHz Mode Auto FFT Count 100/100 1 Frequency Sweep M1[1] 5.38 dBm 919.786200 MHz CF 920.0 MHz 1001 pts 100.0 kHz/ Span 1.0 MHz Date: 13 APR 2021 09:58:50
CH _M	MultiView Spectrum Ref Level 20.00 dBm Offset 35.0 dB Att 1.00 dB RBW 3 kHz SWT 1.4 ms (-0.2 ms) VBW 10 kHz Mode Auto FFT Count 100/100 1 Frequency Sweep M1[1] 3.85 dBm 922.000000 MHz CF 922.0 MHz 1001 pts 100.0 kHz/ Span 1.0 MHz Date: 13 APR 2021 09:51:14
CH _H	MultiView Spectrum Ref Level 20.00 dBm Offset 35.0 dB Att 1.00 dB RBW 3 kHz SWT 1.4 ms (-0.2 ms) VBW 10 kHz Mode Auto FFT Count 100/100 1 Frequency Sweep M1[1] 4.90 dBm 925.000000 MHz CF 925.0 MHz 1001 pts 100.0 kHz/ Span 1.0 MHz Date: 13 APR 2021 09:57:29

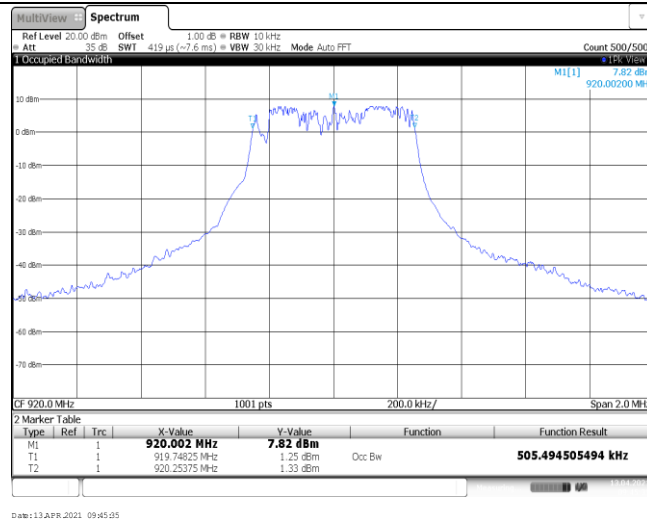
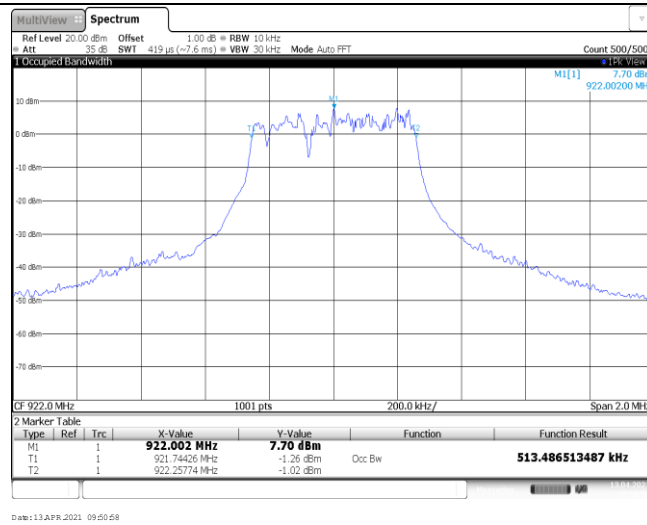
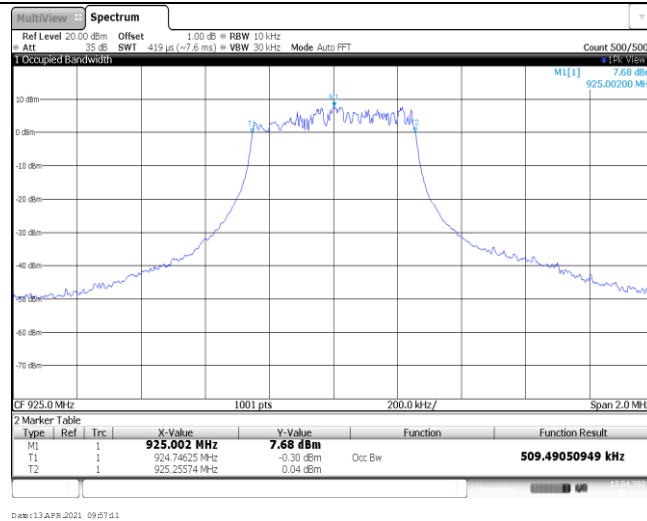
Appendix C: 6dB bandwidth

Type	Channel	6dB Bandwidth(kHz)	Limit (kHz)	Result
LORA	CH _L	586.00	≥500	Pass
	CH _M	596.00		
	CH _H	588.00		

CH_LCH_MCH_H

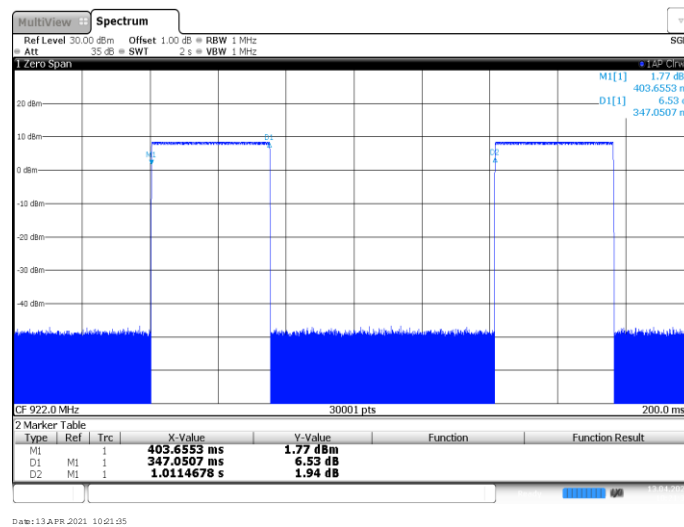
Appendix D: 99% Occupied Bandwidth

Type	Channel	99% Occupied Bandwidth(MHz)	Limit (kHz)	Result
LORA	CH _L	0.51	-	Pass
	CH _M	0.51		
	CH _H	0.51		

CH_LCH_MCH_H

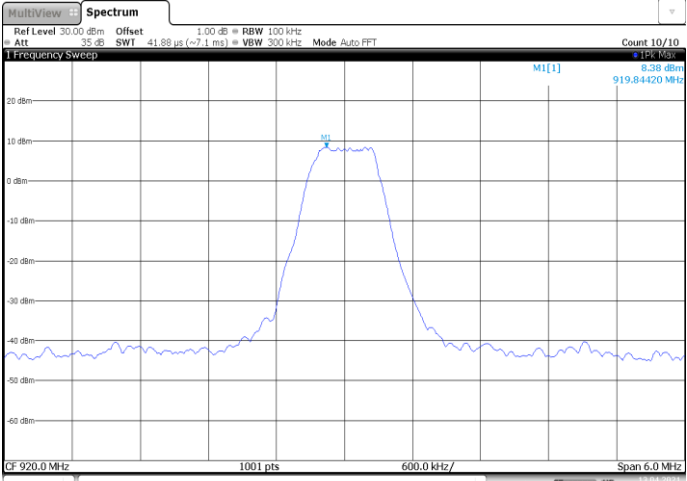
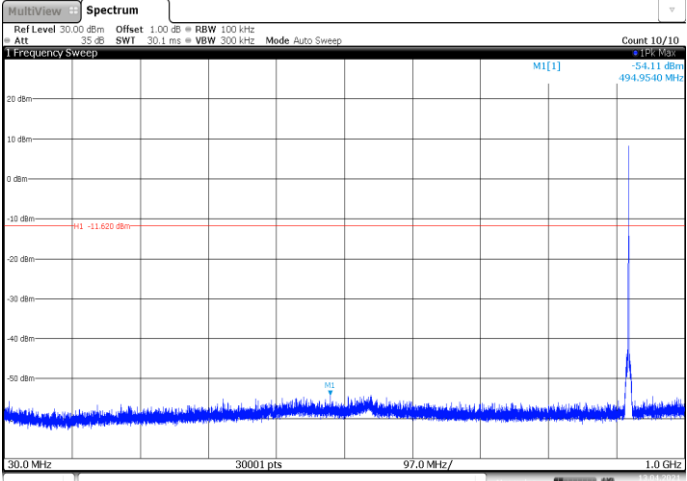
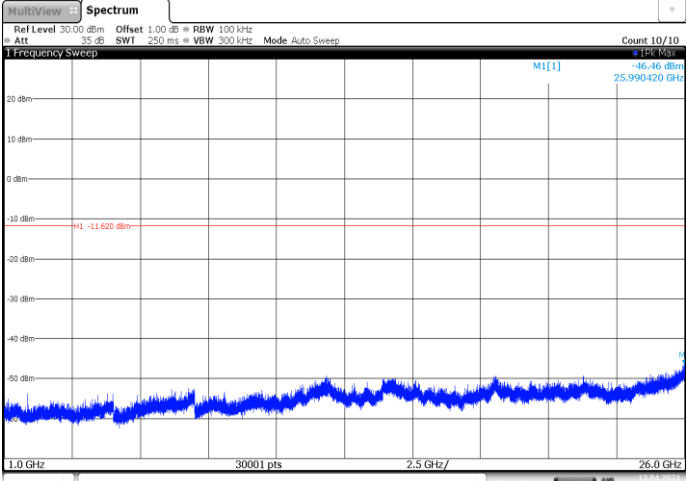
Appendix E: Duty cycle

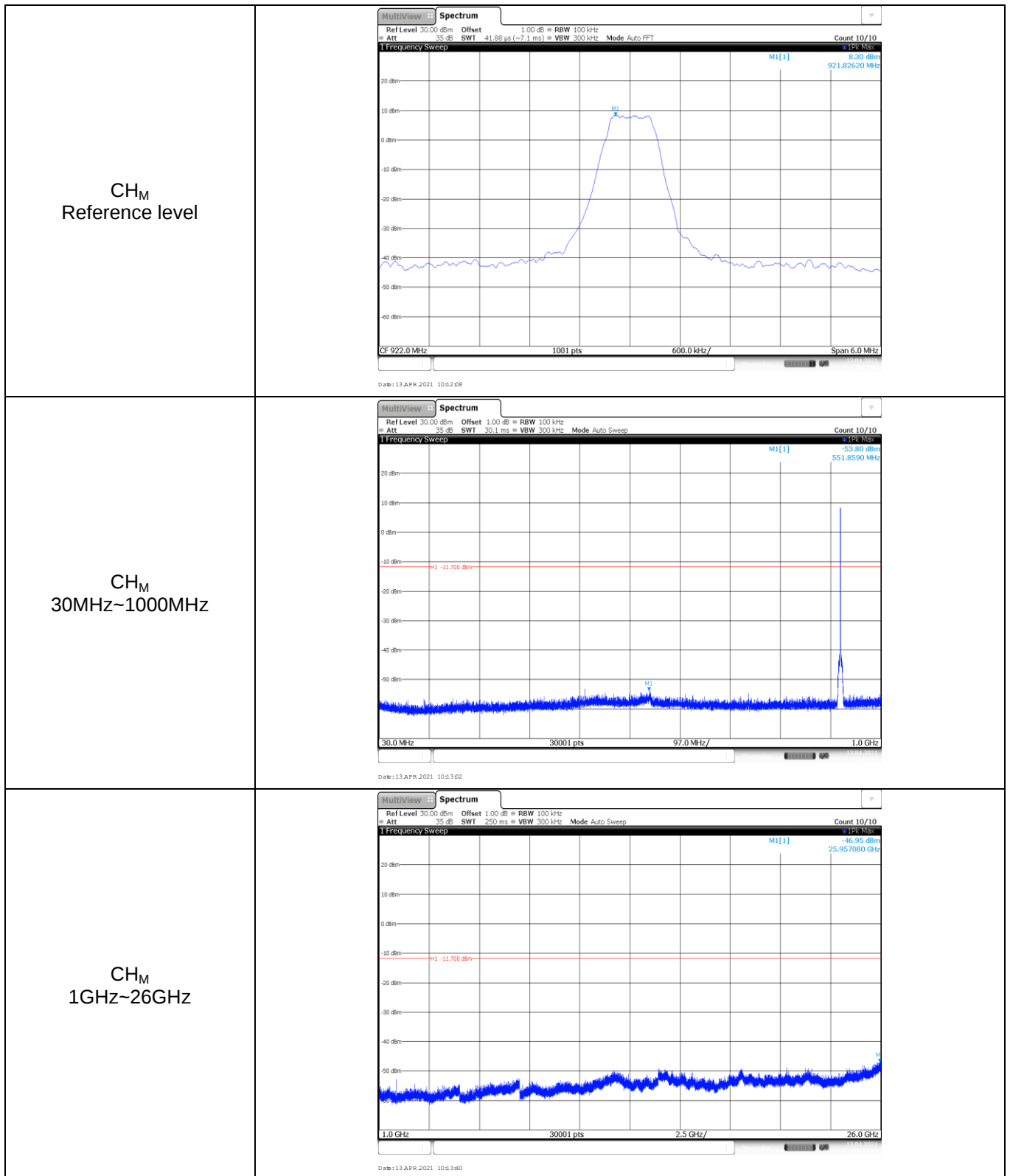
Test Frequency (MHz)	T _{on} time for single burst (ms)	T _{period} (ms)	Duty cycle	1/T _{on} time (kHz)
922	347.05	1011.47	34.3%	0

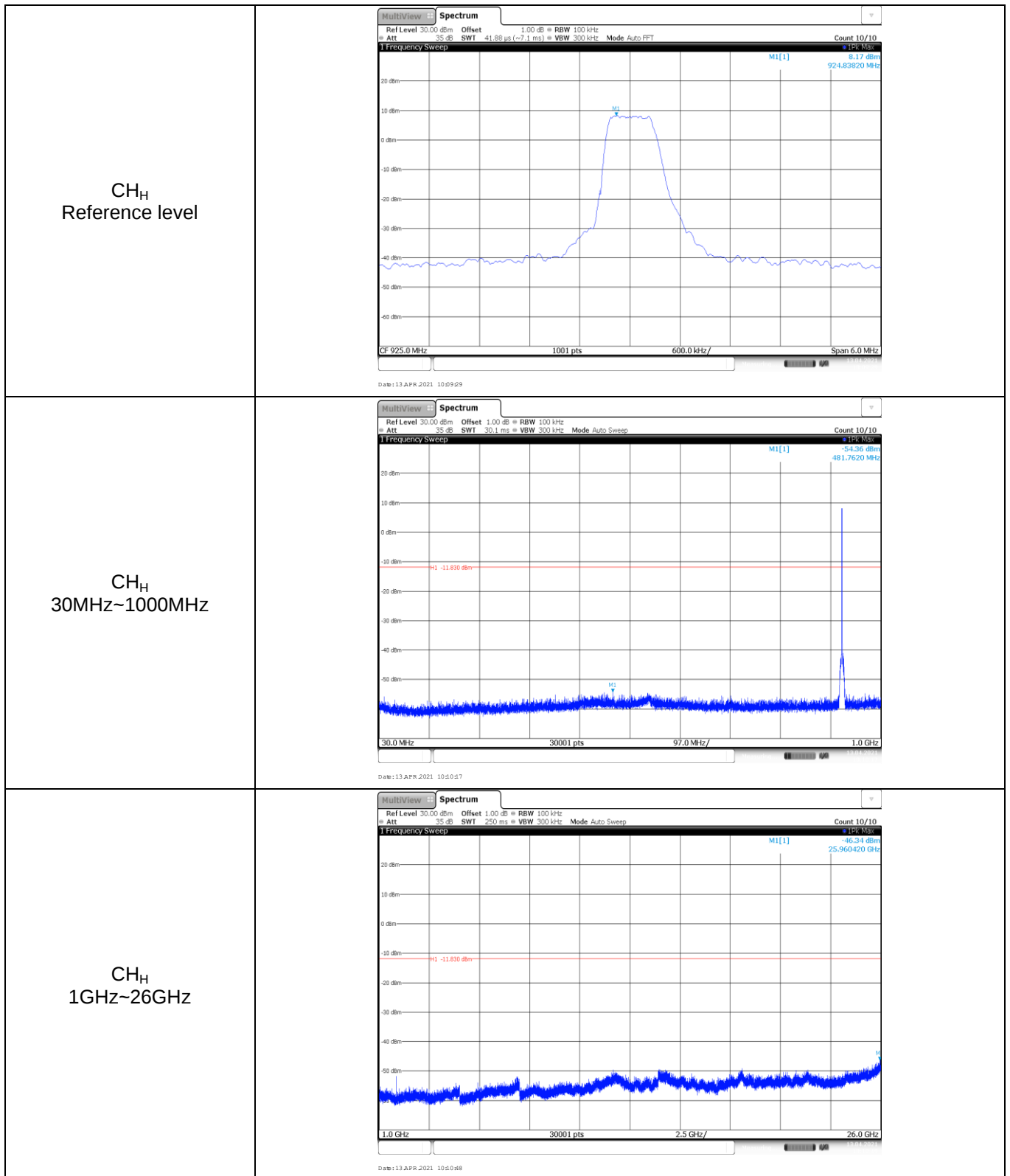


Appendix F: Band edge and Spurious Emissions (conducted)

Test Item:	Band edge																					
CH _L	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 35 dB SWI 1.04 ms VBW 300 kHz Mode Auto Sweep Count 300/300 1 Frequency Sweep 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm 919.742 MHz 902.0000 MHz 927 dBm 919.7420 MHz CF 902.0 MHz 1001 pts 4.0 MHz/ Span 40.0 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>919.742 MHz</td><td>8.37 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>902.0 MHz</td><td>-59.73 dBm</td><td></td><td></td></tr></table> Date: 13 APR 2021 10:01:00	Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		919.742 MHz	8.37 dBm			M2	1		902.0 MHz	-59.73 dBm		
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																
M1	1		919.742 MHz	8.37 dBm																		
M2	1		902.0 MHz	-59.73 dBm																		
CH _H	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 35 dB SWI 41.84 μs (<6.9 ms) VBW 300 kHz Mode Auto FFT Count 300/300 1 Frequency Sweep 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm 924.803 MHz 928.00000 MHz 8.27 dBm 924.80300 MHz CF 928.0 MHz 1001 pts 1.0 MHz/ Span 10.0 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>924.803 MHz</td><td>8.27 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>928.0 MHz</td><td>-42.41 dBm</td><td></td><td></td></tr></table> Date: 13 APR 2021 10:03:44	Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		924.803 MHz	8.27 dBm			M2	1		928.0 MHz	-42.41 dBm		
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																
M1	1		924.803 MHz	8.27 dBm																		
M2	1		928.0 MHz	-42.41 dBm																		

Test Item:	SE
CH _L Reference level	 Ref Level 30.00 dBm Offset 1.00 dB RBW 100 kHz Att 35 dB SWI 41.88 μs (~7.1 ms) VBW 300 kHz Mode Auto FFT Count 10/10 1 PK MS 8.38 dBm 919.84420 MHz MI[1] CF 920.0 MHz 1001 pts 600.0 kHz/ Span 6.0 MHz Date: 13 APR 2021 10:44:44
CH _L 30MHz~1000MHz	 Ref Level 30.00 dBm Offset 1.00 dB RBW 100 kHz Att 35 dB SWI 30.1 ms VBW 300 kHz Mode Auto Sweep Count 10/10 1 PK MS -54.11 dBm 494.9540 MHz MI[1] 30.0 MHz 30001 pts 97.0 MHz/ 1.0 GHz Date: 13 APR 2021 10:55:28
CH _L 1GHz~26GHz	 Ref Level 30.00 dBm Offset 1.00 dB RBW 100 kHz Att 35 dB SWI 250 ms VBW 300 kHz Mode Auto Sweep Count 10/10 1 PK MS -46.46 dBm 25.990420 GHz MI[1] 1.0 GHz 30001 pts 2.5 GHz/ 26.0 GHz Date: 13 APR 2021 10:16:00





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