

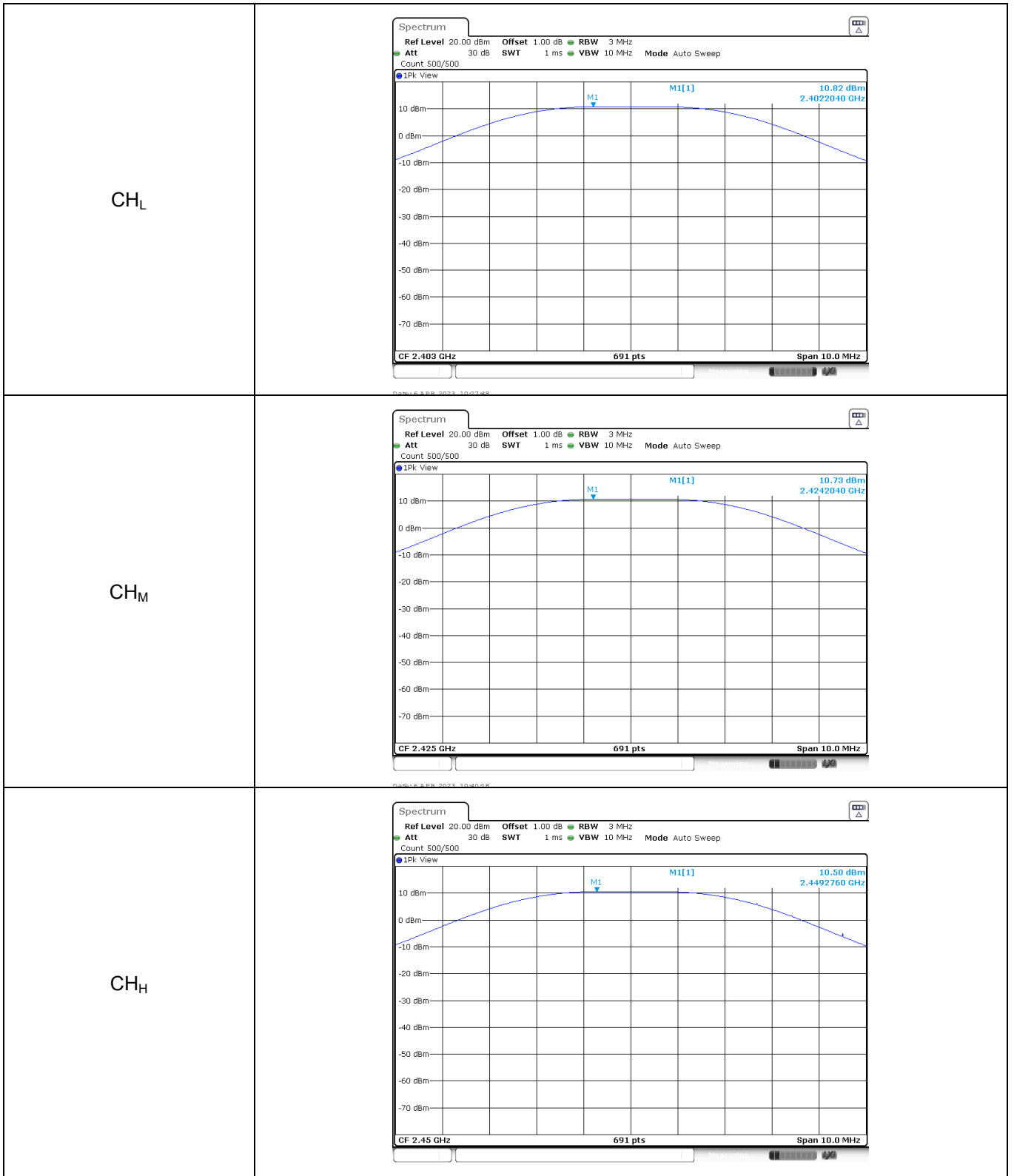
# APPENDIX REPORT

Project No.	SHT2302030201EW	Radio Specification	LORA
Test sample No.	YPHT23020302001	Model No.	R11e-LR2
Start test date	2023-04-06	Finish date	2023-04-06
Temperature	24.4℃	Humidity	88%
Test Engineer	Xiaoqin Li	Auditor	<i>Xiaodong Zheo</i>

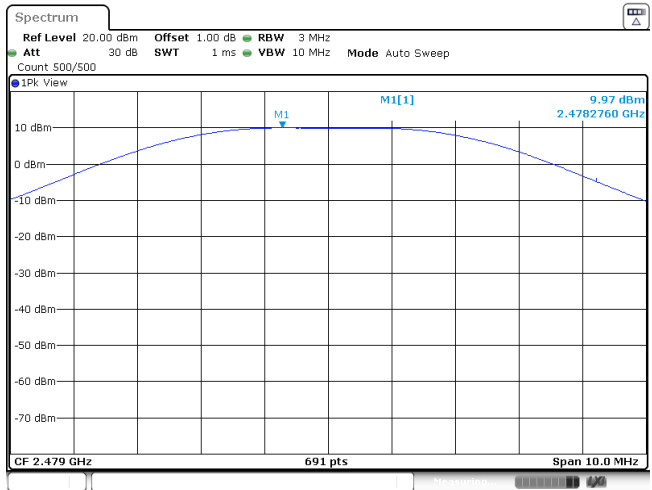
Appendix clause	Test item	Result
A	Peak Output Power	PASS
B	Power Spectral Density	PASS
C	6 dB Bandwidth	PASS
D	99% Occupied Bandwidth	PASS
E	Duty cycle	PASS
F	Band edge and Spurious Emissions (conducted)	PASS

**Appendix A: Peak Output Power**

Channel	Peak Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
CH <sub>L</sub>	10.82	10.81	≤ 30.00	Pass
CH <sub>M</sub>	10.73	10.69		
CH <sub>H</sub>	10.50	10.44		
CH <sub>H+1</sub>	9.97	9.91		

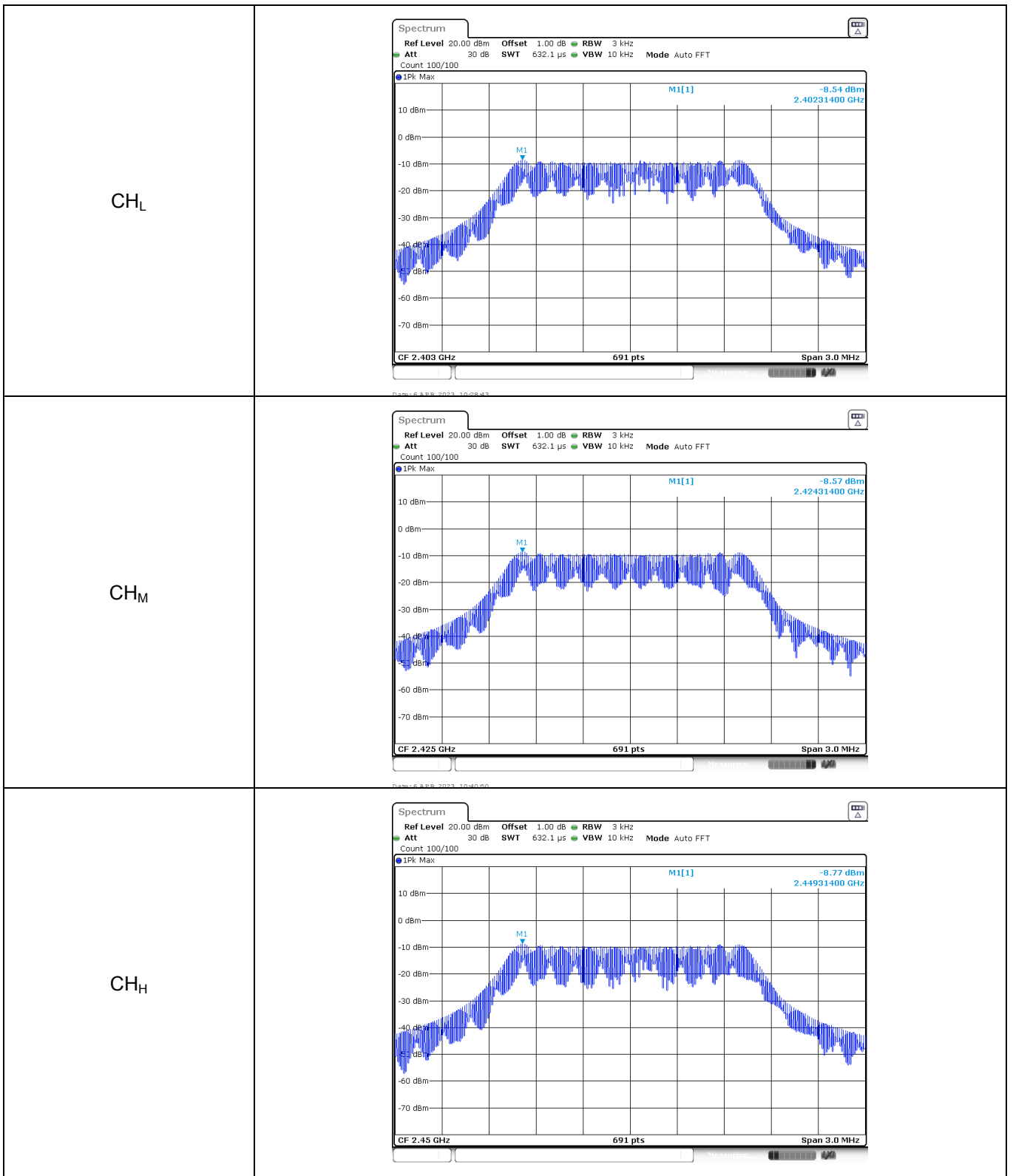


CH<sub>H+1</sub>

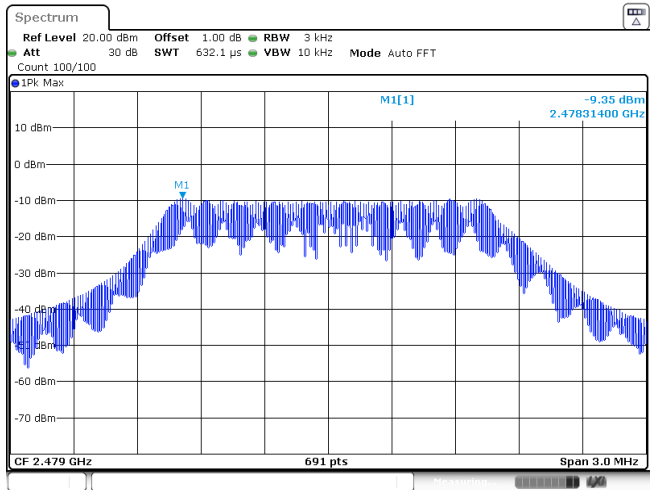


**Appendix B: Power Spectral Density**

Channel	Power Spectral Density(dBm/3KHz)	Limit (dBm/3KHz)	Result
CH <sub>L</sub>	-8.54	≤8.00	Pass
CH <sub>M</sub>	-8.57		
CH <sub>H</sub>	-8.77		
CH <sub>H+1</sub>	-9.35		



CH<sub>H+1</sub>

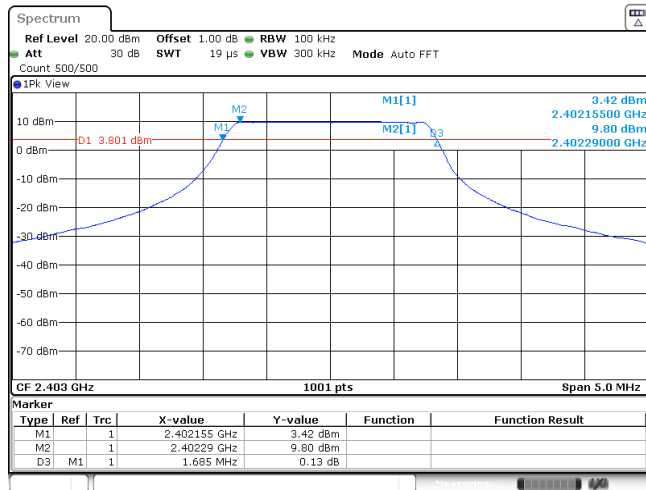


**Appendix C: 6dB bandwidth**

Channel	6dB Bandwidth(kHz)	Limit (kHz)	Result
CH <sub>L</sub>	1685.00	≥500	Pass
CH <sub>M</sub>	1685.00		
CH <sub>H</sub>	1685.00		
CH <sub>H+1</sub>	1680.00		

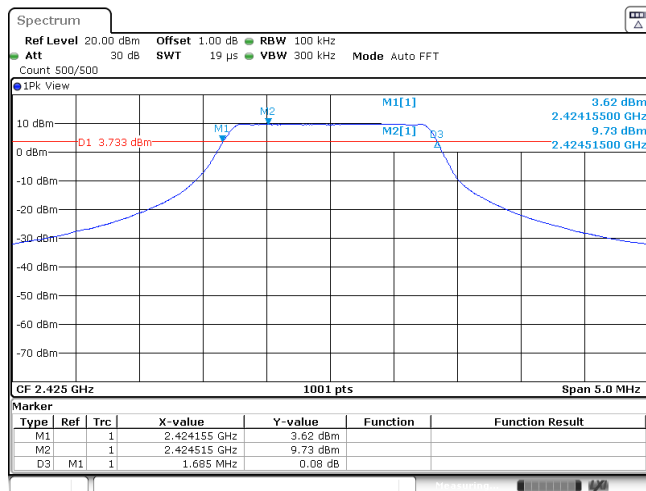


CH<sub>L</sub>



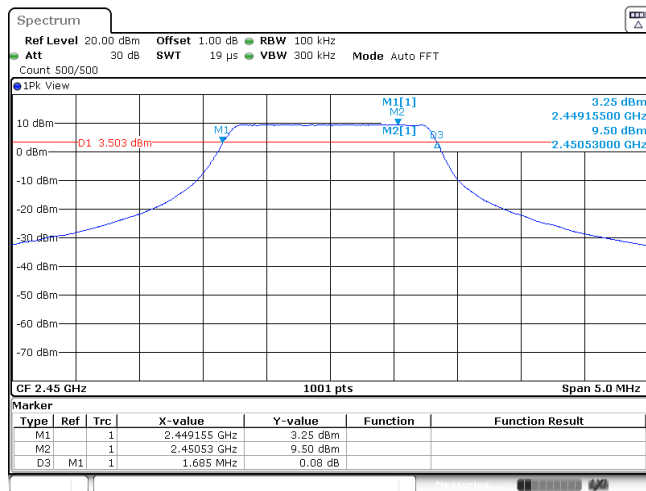
Date: 6 APR 2023 10:07:03

CH<sub>M</sub>



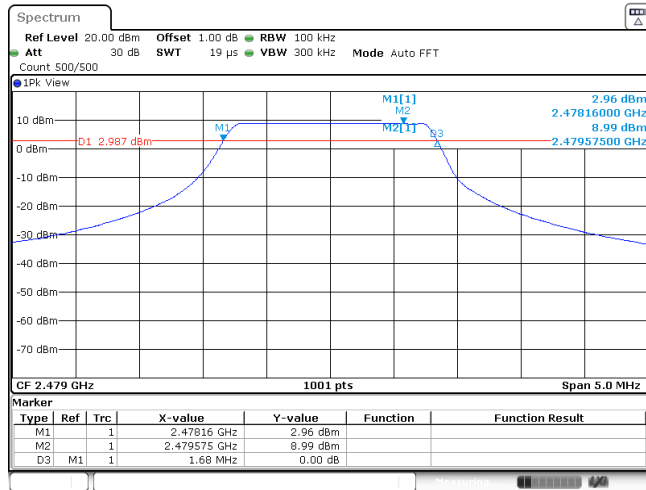
Date: 6 APR 2023 10:08:03

CH<sub>H</sub>



Date: 6 APR 2023 10:06:14

CH<sub>H+1</sub>

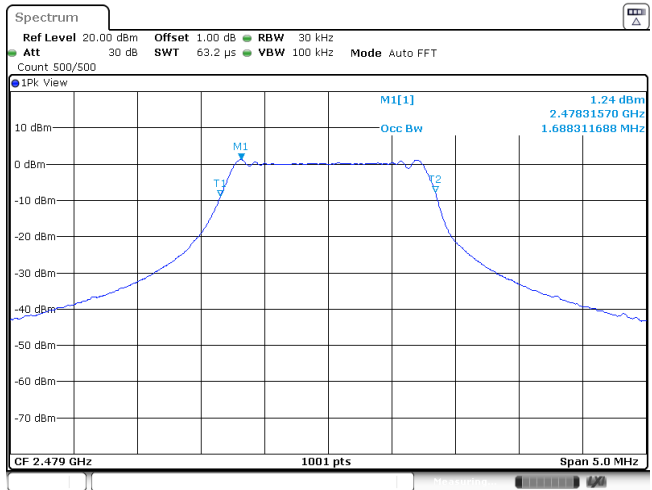


**Appendix D: 99% Occupied Bandwidth**

Channel	99% Occupied Bandwidth(MHz)	Limit (kHz)	Result
CH <sub>L</sub>	1.69	-	Pass
CH <sub>M</sub>	1.69		
CH <sub>H</sub>	1.69		
CH <sub>H+1</sub>	1.69		

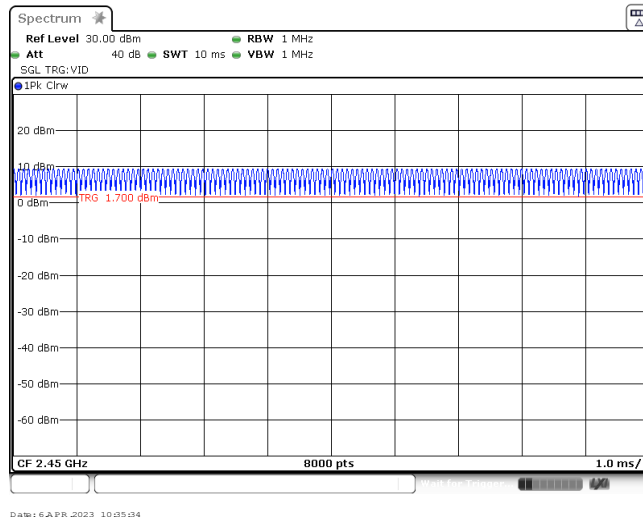
<p>CH<sub>L</sub></p>	
<p>CH<sub>M</sub></p>	
<p>CH<sub>H</sub></p>	

CH<sub>H+1</sub>

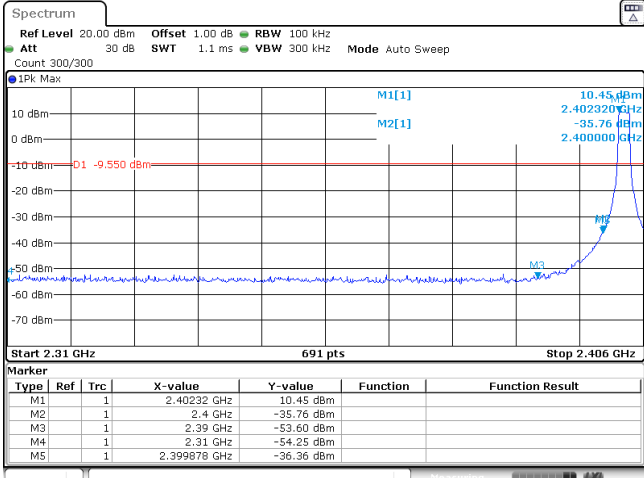
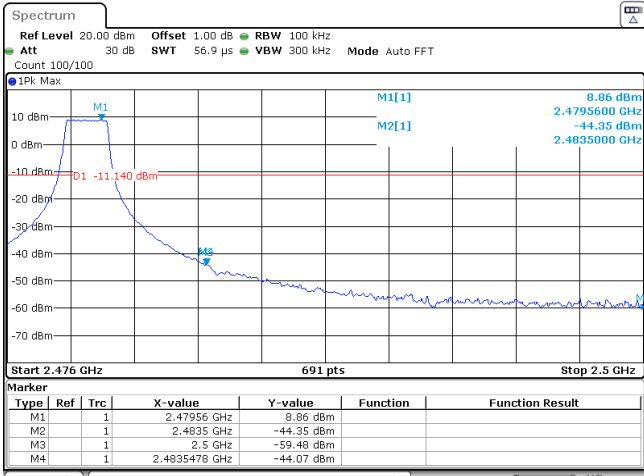


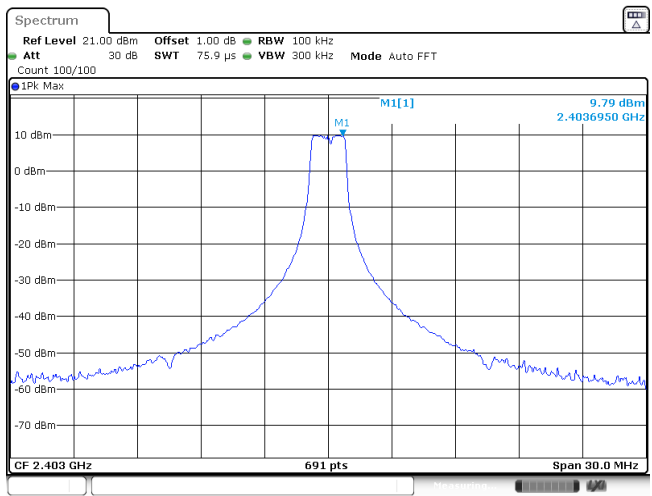
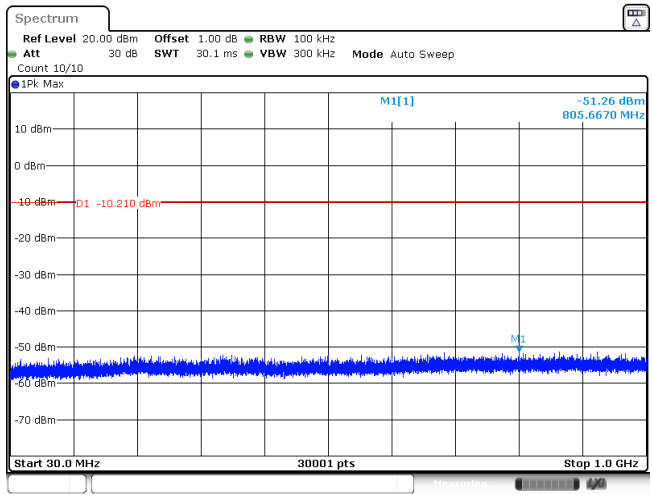
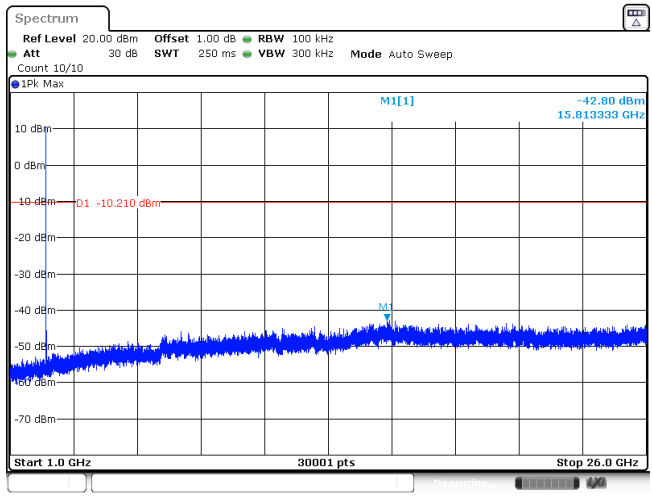
### Appendix E: Duty cycle

Test Frequency (MHz)	T <sub>on time</sub> for single burst (ms)	T <sub>period</sub> (ms)	Duty cycle	1/T <sub>on time</sub> (kHz)
2425	1	1	100%	1

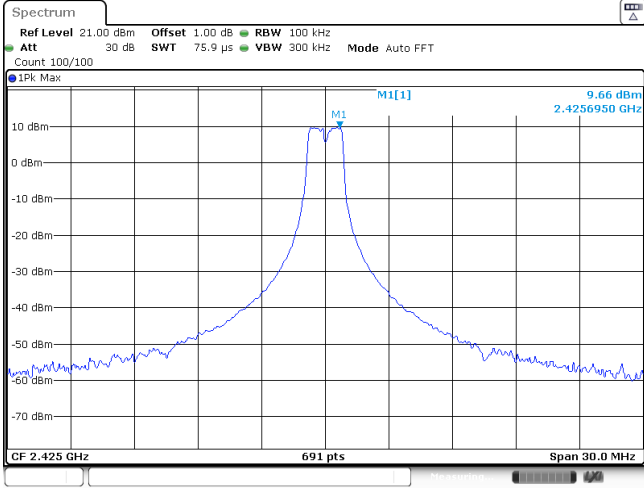
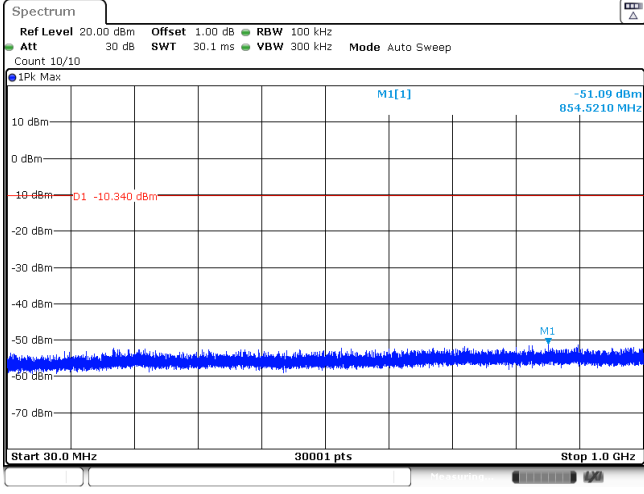
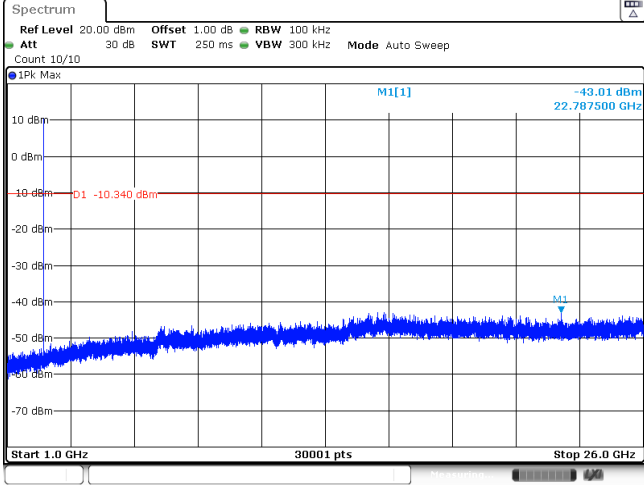


### Appendix F: Band edge and Spurious Emissions (conducted)

Test Item:	Band edge																																										
CH <sub>L</sub>	 <p><b>Marker Table for CH<sub>L</sub>:</b></p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>2.40232 GHz</td> <td>10.45 dBm</td> <td></td> <td></td> </tr> <tr> <td>M2</td> <td>1</td> <td></td> <td>2.4 GHz</td> <td>-35.76 dBm</td> <td></td> <td></td> </tr> <tr> <td>M3</td> <td>1</td> <td></td> <td>2.39 GHz</td> <td>-53.60 dBm</td> <td></td> <td></td> </tr> <tr> <td>M4</td> <td>1</td> <td></td> <td>2.31 GHz</td> <td>-54.25 dBm</td> <td></td> <td></td> </tr> <tr> <td>M5</td> <td>1</td> <td></td> <td>2.399878 GHz</td> <td>-36.36 dBm</td> <td></td> <td></td> </tr> </tbody> </table>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.40232 GHz	10.45 dBm			M2	1		2.4 GHz	-35.76 dBm			M3	1		2.39 GHz	-53.60 dBm			M4	1		2.31 GHz	-54.25 dBm			M5	1		2.399878 GHz	-36.36 dBm		
Type	Ref	Trc	X-value	Y-value	Function	Function Result																																					
M1	1		2.40232 GHz	10.45 dBm																																							
M2	1		2.4 GHz	-35.76 dBm																																							
M3	1		2.39 GHz	-53.60 dBm																																							
M4	1		2.31 GHz	-54.25 dBm																																							
M5	1		2.399878 GHz	-36.36 dBm																																							
CH <sub>H</sub>	 <p><b>Marker Table for CH<sub>H</sub>:</b></p> <table border="1"> <thead> <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> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>2.47956 GHz</td> <td>8.86 dBm</td> <td></td> <td></td> </tr> <tr> <td>M2</td> <td>1</td> <td></td> <td>2.4835 GHz</td> <td>-44.35 dBm</td> <td></td> <td></td> </tr> <tr> <td>M3</td> <td>1</td> <td></td> <td>2.5 GHz</td> <td>-59.48 dBm</td> <td></td> <td></td> </tr> <tr> <td>M4</td> <td>1</td> <td></td> <td>2.4835478 GHz</td> <td>-44.07 dBm</td> <td></td> <td></td> </tr> </tbody> </table>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.47956 GHz	8.86 dBm			M2	1		2.4835 GHz	-44.35 dBm			M3	1		2.5 GHz	-59.48 dBm			M4	1		2.4835478 GHz	-44.07 dBm									
Type	Ref	Trc	X-value	Y-value	Function	Function Result																																					
M1	1		2.47956 GHz	8.86 dBm																																							
M2	1		2.4835 GHz	-44.35 dBm																																							
M3	1		2.5 GHz	-59.48 dBm																																							
M4	1		2.4835478 GHz	-44.07 dBm																																							

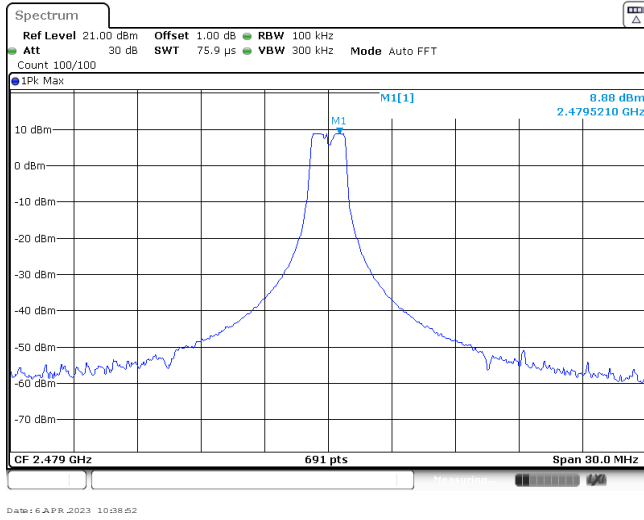
Test Item:	SE
<p>CH<sub>L</sub> Reference level</p>	 <p>Spectrum</p> <p>Ref Level 21.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 75.9 μs VBW 300 kHz Mode Auto FFT Count 100/100</p> <p>1Pk Max</p> <p>M1[1] 9.79 dBm 2.4036950 GHz</p> <p>CF 2.403 GHz 691 pts Span 30.0 MHz</p> <p>Date: 6 APR 2023 10:29:00</p>
<p>CH<sub>L</sub> 30MHz~1000MHz</p>	 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 30.1 ms VBW 300 kHz Mode Auto Sweep Count 10/10</p> <p>1Pk Max</p> <p>M1[1] -51.26 dBm 805.6670 MHz</p> <p>D1 -10.210 dBm</p> <p>Start 30.0 MHz 30001 pts Stop 1.0 GHz</p> <p>Date: 6 APR 2023 10:29:05</p>
<p>CH<sub>L</sub> 1GHz~26GHz</p>	 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 250 ms VBW 300 kHz Mode Auto Sweep Count 10/10</p> <p>1Pk Max</p> <p>M1[1] -42.80 dBm 15.813333 GHz</p> <p>D1 -10.210 dBm</p> <p>Start 1.0 GHz 30001 pts Stop 26.0 GHz</p> <p>Date: 6 APR 2023 10:29:00</p>



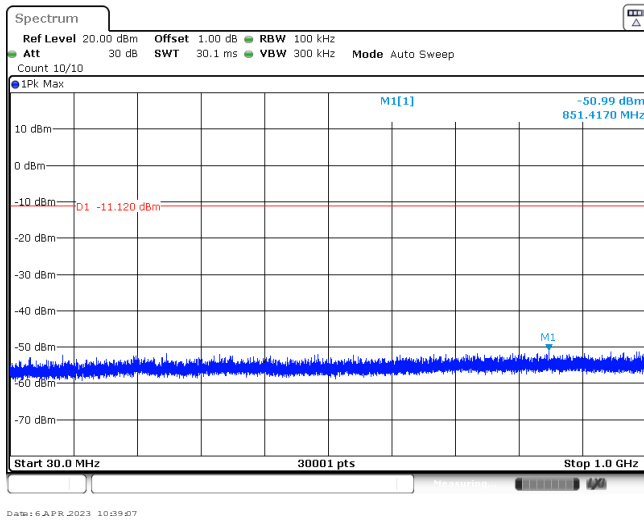
<p style="text-align: center;">CH<sub>M</sub> Reference level</p>	 <p style="font-size: small;">Spectrum Ref Level 21.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 75.9 μs VBW 300 kHz Mode Auto FFT Count 100/100 IPK Max M1[1] 9.66 dBm 2.4256950 GHz CF 2.425 GHz 691 pts Span 30.0 MHz Date: 6 APR 2023 10:40:55</p>
<p style="text-align: center;">CH<sub>M</sub> 30MHz~1000MHz</p>	 <p style="font-size: small;">Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 30.1 ms VBW 300 kHz Mode Auto Sweep Count 10/10 IPK Max M1[1] -51.09 dBm 854.5210 MHz D1 -10.340 dBm Start 30.0 MHz 30001 pts Stop 1.0 GHz Date: 6 APR 2023 10:41:10</p>
<p style="text-align: center;">CH<sub>M</sub> 1GHz~26GHz</p>	 <p style="font-size: small;">Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 250 ms VBW 300 kHz Mode Auto Sweep Count 10/10 IPK Max M1[1] -43.01 dBm 22.787500 GHz D1 -10.340 dBm Start 1.0 GHz 30001 pts Stop 26.0 GHz Date: 6 APR 2023 10:41:25</p>

<p style="text-align: center;">CH<sub>H</sub> Reference level</p>	<p style="text-align: center;">Date: 6 APR 2023 10:36:50</p>
<p style="text-align: center;">CH<sub>H</sub> 30MHz~1000MHz</p>	<p style="text-align: center;">Date: 6 APR 2023 10:37:05</p>
<p style="text-align: center;">CH<sub>H</sub> 1GHz~26GHz</p>	<p style="text-align: center;">Date: 6 APR 2023 10:37:21</p>

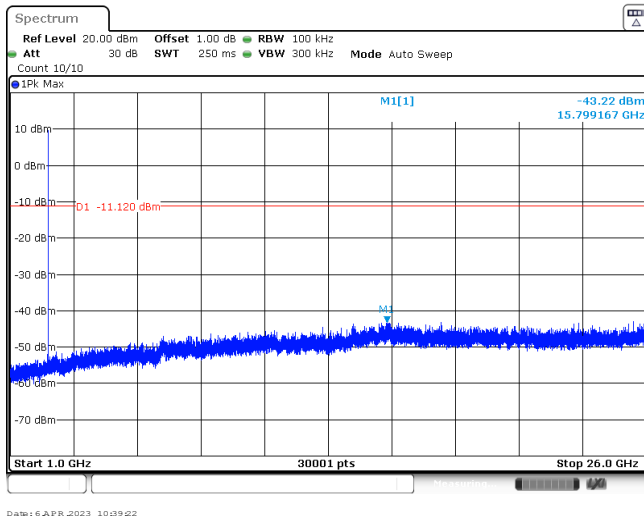
CH<sub>H+1</sub>  
Reference level



CH<sub>H+1</sub>  
30MHz~1000MHz



CH<sub>H+1</sub>  
1GHz~26GHz



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