

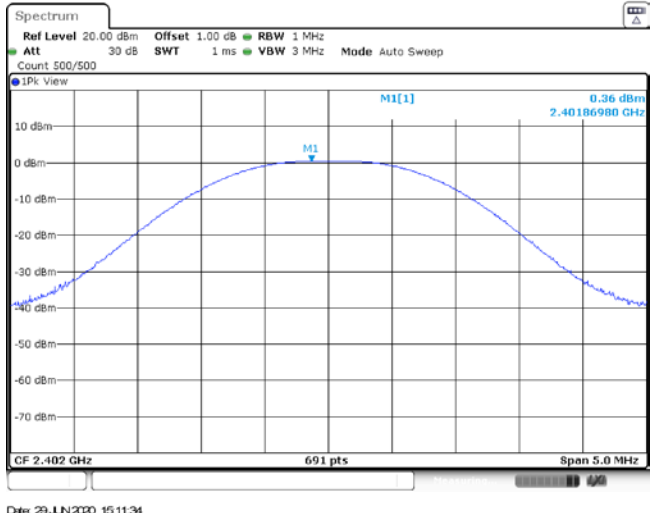
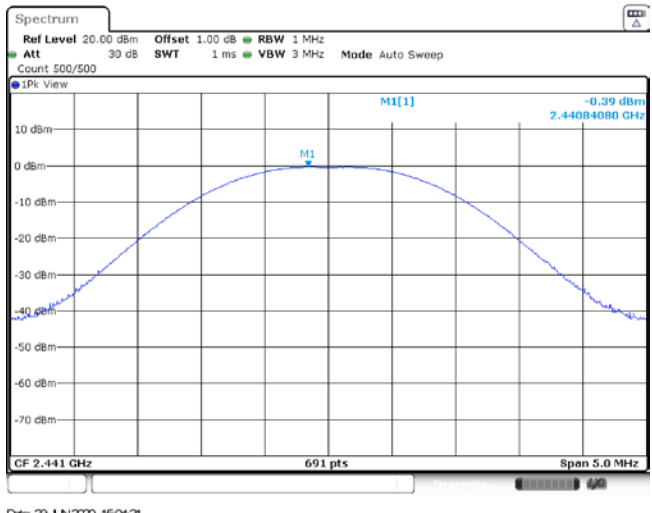
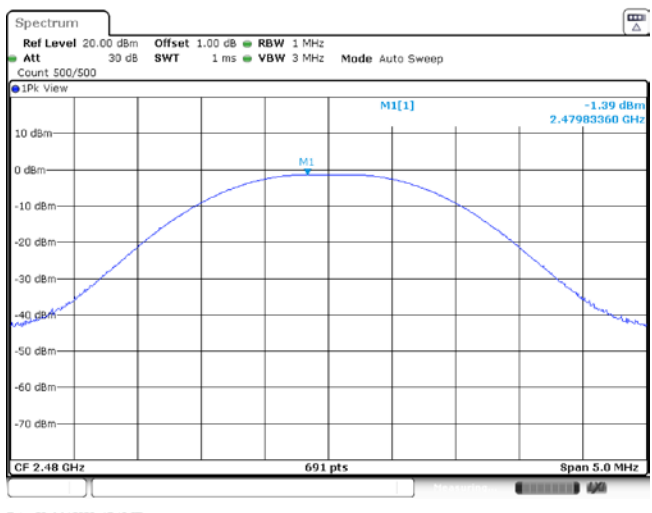
APPENDIX REPORT

Project No.	SHT2006066501EW	Radio Specification	Bluetooth EDR
Test sample No.	YPHT20060665002	Model No.	CT90
Start test date	2020/6/29	Finish date	2020/6/29
Temperature	25°C	Humidity	50%
Test Engineer	Jiongsheng.Feng	Auditor	<i>William.wang</i>

Appendix clause	Test item	Result
A	Peak Output Power	PASS
B	20 dB Bandwidth	PASS
C	99% Occupied Bandwidth	PASS
D	Carrier Frequencies Separation	PASS
E	Hopping Channel Number	PASS
F	Dwell Time	PASS
G	Duty Cycle Correction Factor (DCCF)	PASS
H	Band edge and Spurious Emissions(coducted)	PASS

Appendix A: Peak Output Power

Modulation type	Channel	Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
GFSK	00	0.36	0.32	≤ 30.00	Pass
	39	-0.39	-0.40		
	78	-1.39	-1.41		

Modulation Type:	GFSK
CH00	
CH39	
CH78	

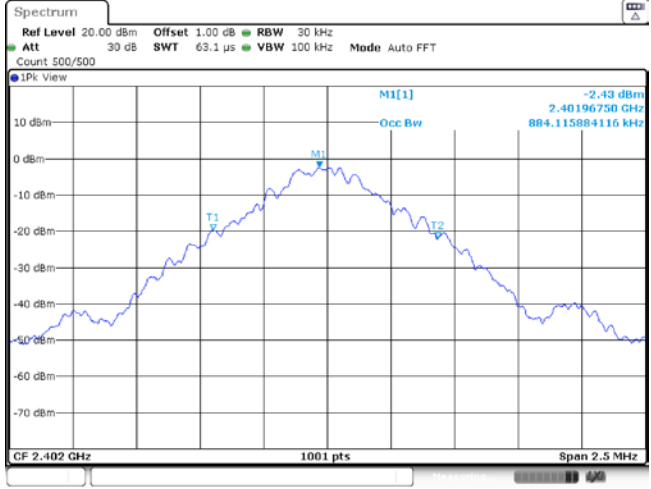
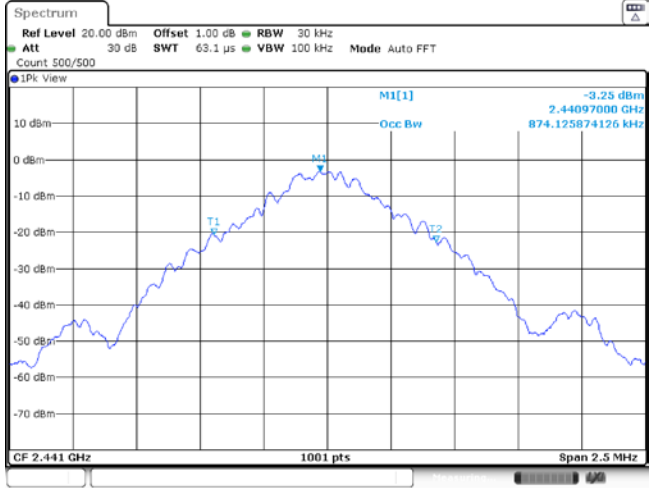
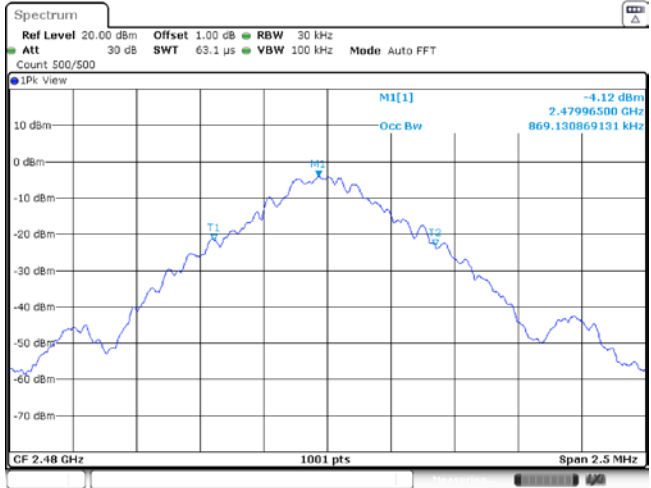
Appendix B : 20 dB Bandwidth

Modulation type	Channel	20 dB Bandwidth (kHz)	Limit (kHz)	Result
GFSK	00	922.50	-	Pass
	39	922.50		
	78	925.00		

Modulation Type:		GFSK
CH00	Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 10 kHz Att 30 dB SWT 189.6 μs VBW 30 kHz Mode Auto FFT Count 500/500 1Pk View <	

Appendix C: 99% Occupied Bandwidth

Modulation type	Channel	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
GFSK	00	0.88	-	Pass
	39	0.87		
	78	0.87		

Modulation Type: GFSK	
CH00	 Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 30 kHz Att 30 dB SWT 63.1 μs VBW 100 kHz Mode Auto FFT Count 500/500 1Pk View M1[1] -2.43 dBm 2.40196750 GHz 884.115884116 kHz CF 2.402 GHz 1001 pts Span 2.5 MHz Date: 29 JUN 2020 15:11:25
CH39	 Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 30 kHz Att 30 dB SWT 63.1 μs VBW 100 kHz Mode Auto FFT Count 500/500 1Pk View M1[1] -9.25 dBm 2.44097000 GHz 874.125874126 kHz CF 2.441 GHz 1001 pts Span 2.5 MHz Date: 29 JUN 2020 15:04:12
CH78	 Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 30 kHz Att 30 dB SWT 63.1 μs VBW 100 kHz Mode Auto FFT Count 500/500 1Pk View M1[1] -4.12 dBm 2.47996500 GHz 869.130869131 kHz CF 2.48 GHz 1001 pts Span 2.5 MHz Date: 29 JUN 2020 15:18:58

Appendix D: Carrier Frequencies Separation

Modulation type	Channel	Carrier Frequencies Separation (MHz)	Limit (kHz) *	Result
GFSK	39	1.00	≥925	Pass

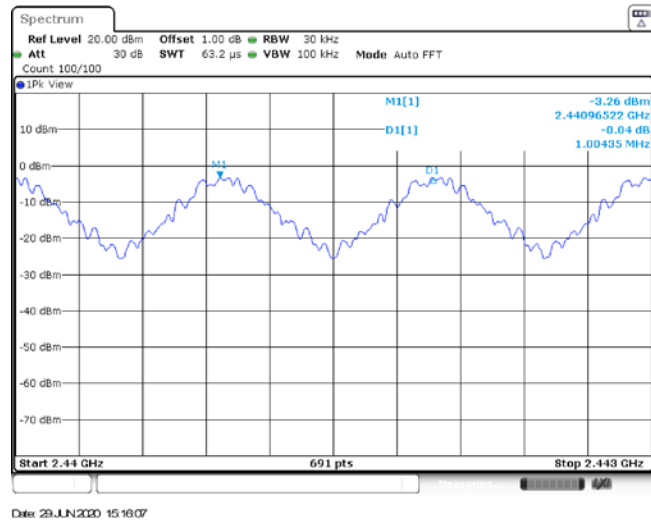
Note:

*: GFSK limit = The maximum 20 dB Bandwidth for GFSK modulation on the appendix B.

$\pi/4$ DQPSK limit = $2/3$ * The maximum 20 dB Bandwidth for $\pi/4$ DQPSK modulation on the appendix B.

8DPSK limit = $2/3$ * The maximum 20 dB Bandwidth for 8DPSK modulation on the appendix B

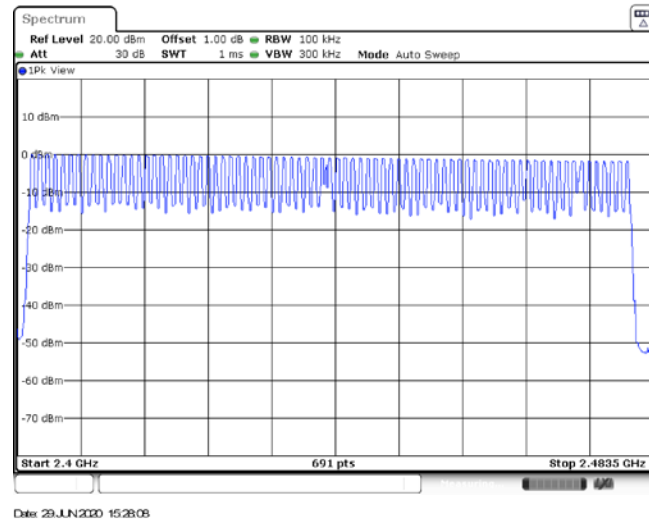
GFSK



Appendix E: Hopping Channel Number

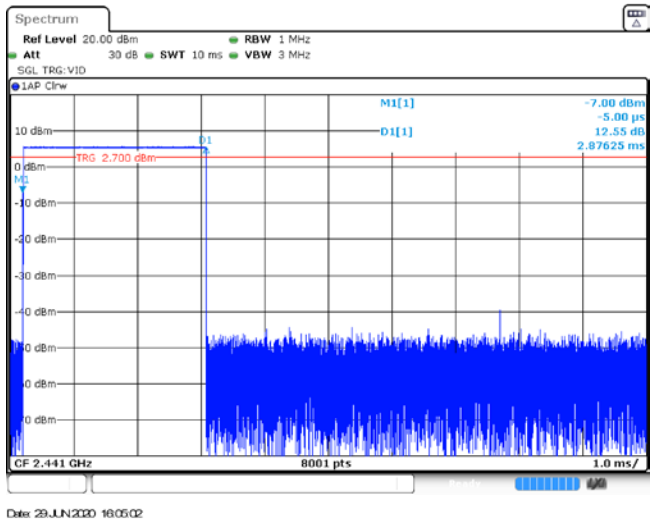
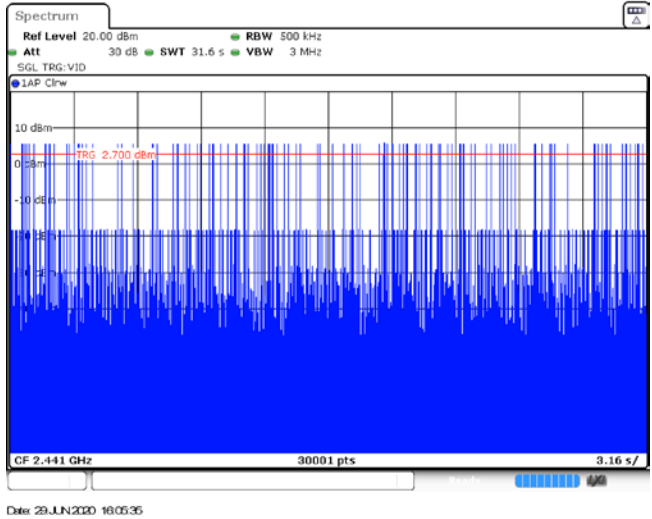
Modulation type	Channel number	Limit	Result
GFSK	79	≥ 15.00	Pass

GFSK



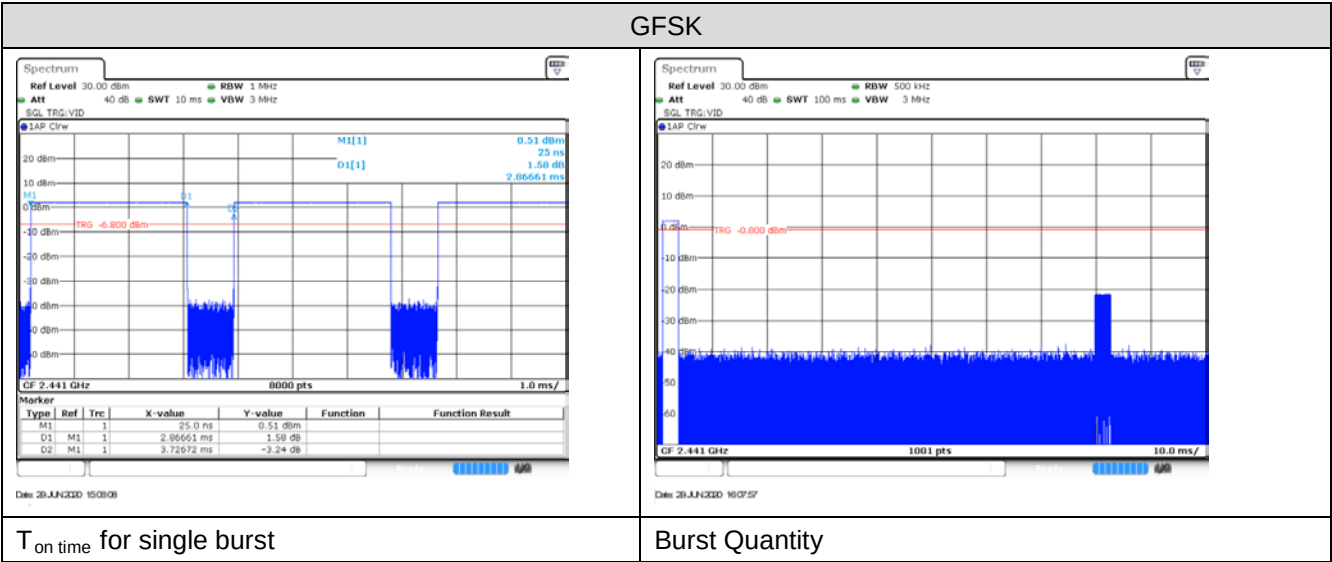
Appendix F: Dwell Time

Modulation type	Packet	Burst Width [ms]	Total Hops[hop*ch]	Dwell time (Second)	Limit (Second)	Result
	DH5	2.88	117.00	0.34	≤ 0.40	PASS

Modulation Type: GFSK	
DH5 Burst width	
DH5 Burst number	

Appendix G: Duty Cycle Correction Factor (DCCF)

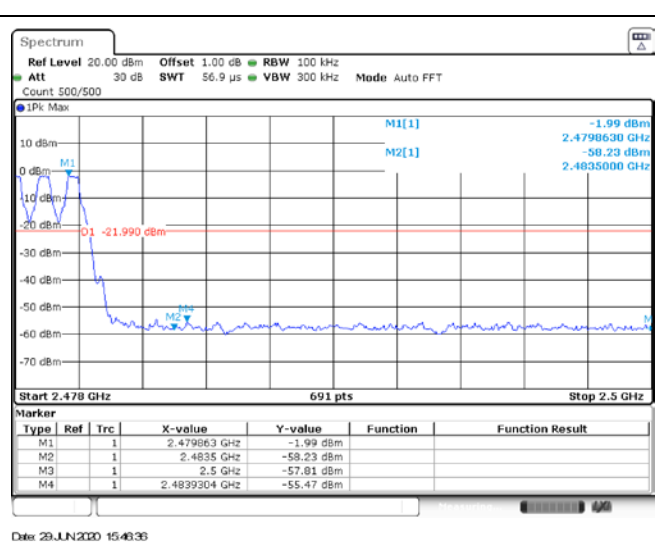
DCCF Calculate Formula					
$DCCF = 20 * \text{Log}(\text{duty cycle}) = 20 * \text{Log}(T_{\text{on time}} / T_{\text{period}})$					
Modulation type	Test Frequency (MHz)	$T_{\text{on time}}$ for single burst [ms]	T_{period} [ms]	Burst Quantity	DCCF [dB]
GFSK	2441	2.87	100	2.00	-24.82

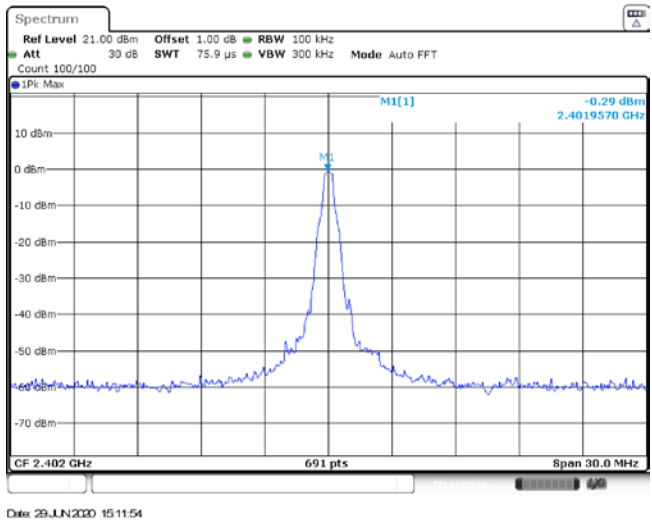
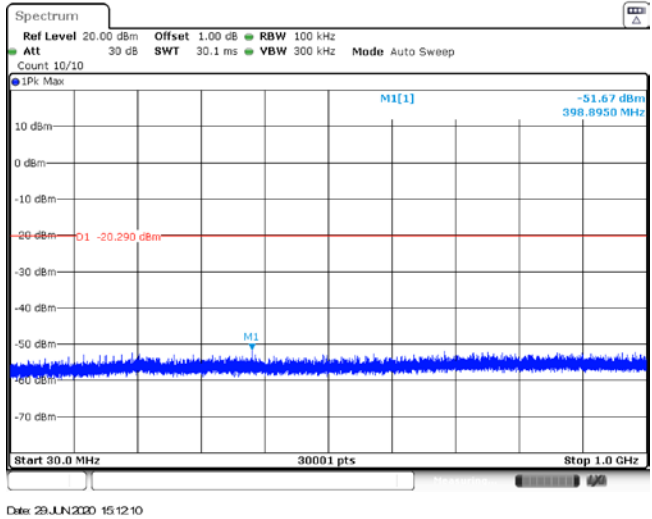
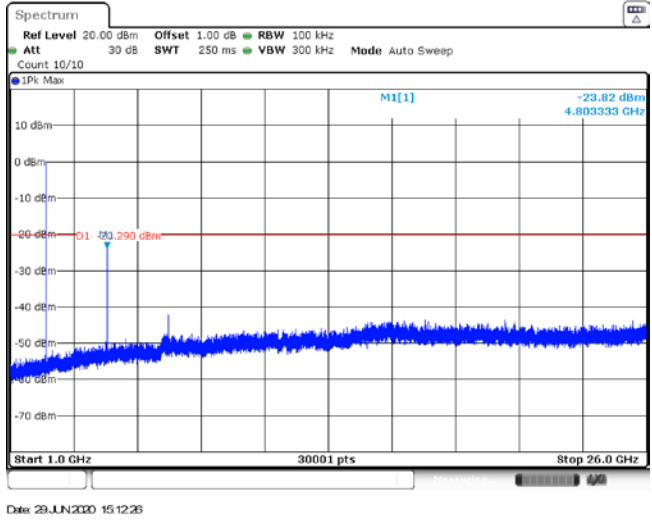


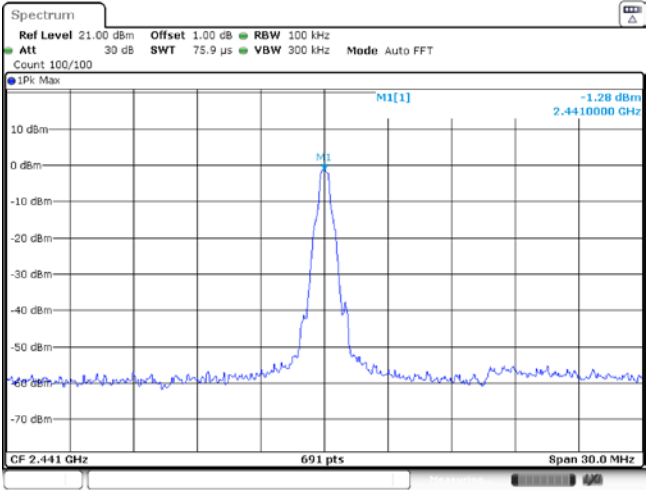
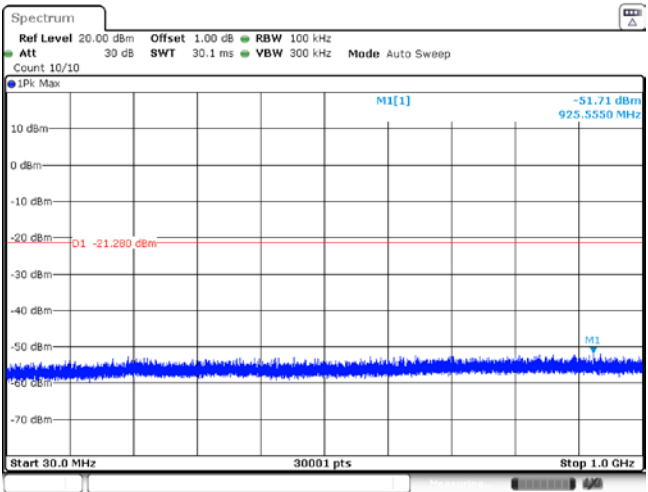
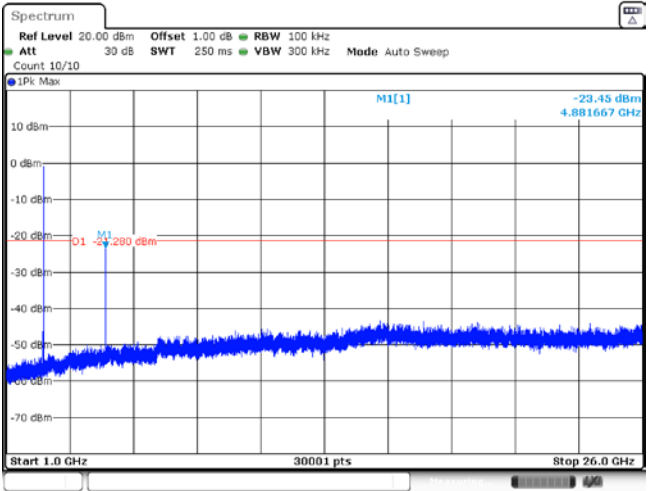
Appendix H: Band edge and Spurious Emissions (conducted)

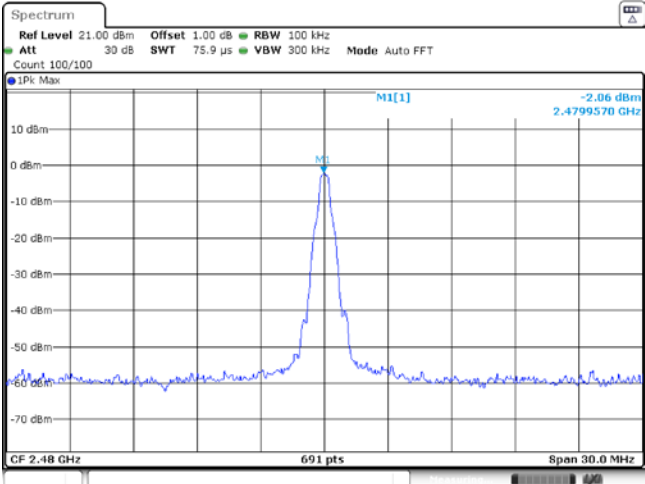
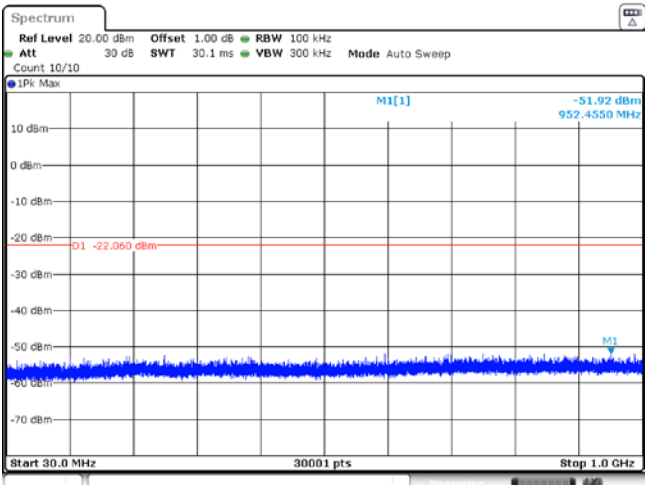
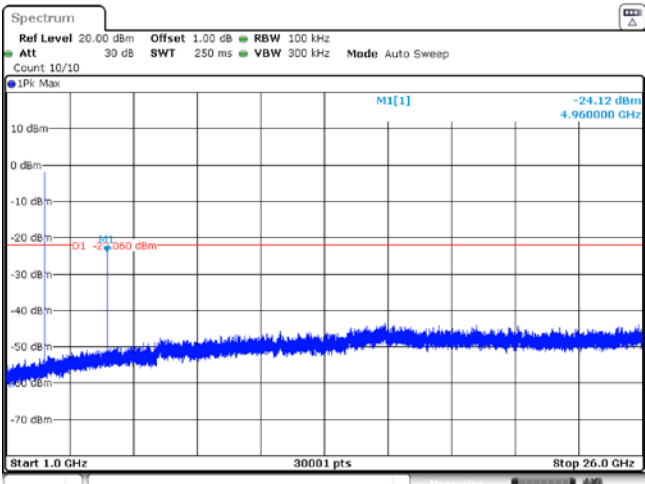
Test Item:	Band edge	Modulation type:	GFSK																																										
CH00 No hopping mode	Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 1.1 ms VBW 300 kHz Mode Auto Sweep Count 500/500 1Pk Max M1[1] -0.07 dBm 2.402040 GHz M2[1] -46.16 dBm 2.400000 GHz O1 -20.070 dBm Start 2.31 GHz 691 pts Stop 2.405 GHz Marker <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>2.40204 GHz</td><td>-0.07 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-46.16 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-55.07 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-54.43 dBm</td><td></td><td></td></tr><tr><td>M5</td><td>1</td><td></td><td>2.39963 GHz</td><td>-50.43 dBm</td><td></td><td></td></tr></table> Date: 29.JUN.2020 15:11:48			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.40204 GHz	-0.07 dBm			M2	1		2.4 GHz	-46.16 dBm			M3	1		2.39 GHz	-55.07 dBm			M4	1		2.31 GHz	-54.43 dBm			M5	1		2.39963 GHz	-50.43 dBm		
Type	Ref	Trc	X-value	Y-value	Function	Function Result																																							
M1	1		2.40204 GHz	-0.07 dBm																																									
M2	1		2.4 GHz	-46.16 dBm																																									
M3	1		2.39 GHz	-55.07 dBm																																									
M4	1		2.31 GHz	-54.43 dBm																																									
M5	1		2.39963 GHz	-50.43 dBm																																									
CH00 Hopping mode	Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 1.1 ms VBW 300 kHz Mode Auto Sweep Count 500/500 1Pk Max M1[1] -0.08 dBm 2.403970 GHz M2[1] -47.61 dBm 2.400000 GHz O1 -20.080 dBm Start 2.31 GHz 691 pts Stop 2.405 GHz Marker <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>2.40397 GHz</td><td>-0.08 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-47.61 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-54.53 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-53.88 dBm</td><td></td><td></td></tr><tr><td>M5</td><td>1</td><td></td><td>2.375536 GHz</td><td>-52.01 dBm</td><td></td><td></td></tr></table> Date: 29.JUN.2020 15:29:34			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.40397 GHz	-0.08 dBm			M2	1		2.4 GHz	-47.61 dBm			M3	1		2.39 GHz	-54.53 dBm			M4	1		2.31 GHz	-53.88 dBm			M5	1		2.375536 GHz	-52.01 dBm		
Type	Ref	Trc	X-value	Y-value	Function	Function Result																																							
M1	1		2.40397 GHz	-0.08 dBm																																									
M2	1		2.4 GHz	-47.61 dBm																																									
M3	1		2.39 GHz	-54.53 dBm																																									
M4	1		2.31 GHz	-53.88 dBm																																									
M5	1		2.375536 GHz	-52.01 dBm																																									
CH78 No hopping mode	Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 56.9 μs VBW 300 kHz Mode Auto FFT Count 500/500 1Pk Max M1[1] -1.90 dBm 2.4798630 GHz M2[1] -57.64 dBm 2.4835000 GHz O1 -21.900 dBm Start 2.478 GHz 691 pts Stop 2.5 GHz Marker <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>2.479863 GHz</td><td>-1.90 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4835 GHz</td><td>-57.64 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.5 GHz</td><td>-59.42 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.4961101 GHz</td><td>-54.76 dBm</td><td></td><td></td></tr></table> Date: 29.JUN.2020 15:19:20			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.479863 GHz	-1.90 dBm			M2	1		2.4835 GHz	-57.64 dBm			M3	1		2.5 GHz	-59.42 dBm			M4	1		2.4961101 GHz	-54.76 dBm									
Type	Ref	Trc	X-value	Y-value	Function	Function Result																																							
M1	1		2.479863 GHz	-1.90 dBm																																									
M2	1		2.4835 GHz	-57.64 dBm																																									
M3	1		2.5 GHz	-59.42 dBm																																									
M4	1		2.4961101 GHz	-54.76 dBm																																									

CH78
Hopping mode



Test Item:	Spurious Emission	Modulation type:	GFSK
CH00 Reference level			
CH00 30MHz~1000MHz			
CH00 1GHz~26GHz			

CH39 Reference level	 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 1Pk Max M1[1] -1.28 dBm 2.4410000 GHz CF 2.441 GHz 691 pts Span 30.0 MHz Date: 29 JUN 2020 15:04:27
CH39 30MHz~1000MHz	 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 1Pk Max M1[1] -51.71 dBm 925.5550 MHz Start 30.0 MHz 30001 pts Stop 1.0 GHz Date: 29 JUN 2020 15:04:43
CH39 1GHz~26GHz	 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 1Pk Max M1[1] -29.45 dBm 4.881667 GHz Start 1.0 GHz 30001 pts Stop 26.0 GHz Date: 29 JUN 2020 15:05:10

CH78 Reference level	 The spectrum plot shows a single sharp peak at 2.4799570 GHz with a power level of -2.06 dBm. The y-axis ranges from -70 dBm to 10 dBm, and the x-axis shows a span of 30.0 MHz. The plot is titled 'Spectrum' and includes parameters: Ref Level 21.00 dBm, Att 30 dB, Offset 1.00 dB, RBW 100 kHz, SWT 75.9 μs, VBW 300 kHz, Mode Auto FFT, Count 100/100, and 691 pts.
CH78 30MHz~1000MHz	 The spectrum plot shows a noise floor across the 30.0 MHz to 1.0 GHz range. A red horizontal line indicates a level of -22.060 dBm. The y-axis ranges from -70 dBm to 10 dBm, and the x-axis shows a span of 30001 pts. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Att 30 dB, Offset 1.00 dB, RBW 100 kHz, SWT 30.1 ms, VBW 300 kHz, Mode Auto Sweep, Count 10/10, and 30001 pts.
CH78 1GHz~26GHz	 The spectrum plot shows a noise floor across the 1.0 GHz to 26.0 GHz range. A red horizontal line indicates a level of -22.060 dBm. The y-axis ranges from -70 dBm to 10 dBm, and the x-axis shows a span of 30001 pts. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Att 30 dB, Offset 1.00 dB, RBW 100 kHz, SWT 250 ms, VBW 300 kHz, Mode Auto Sweep, Count 10/10, and 30001 pts.

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