

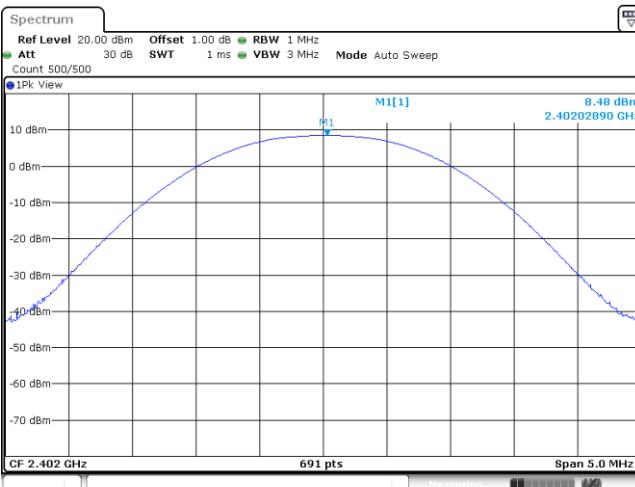
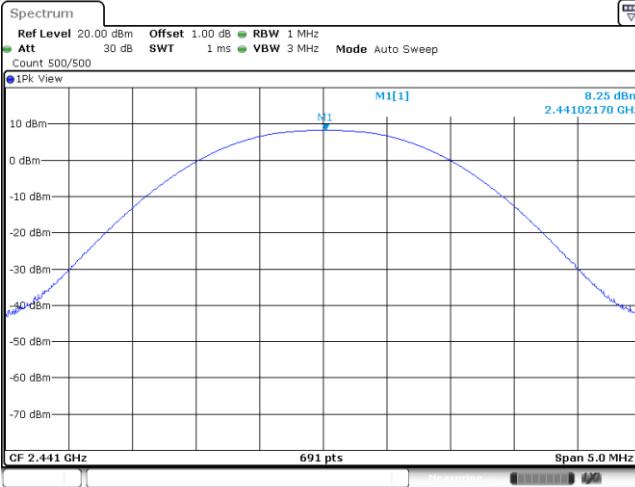
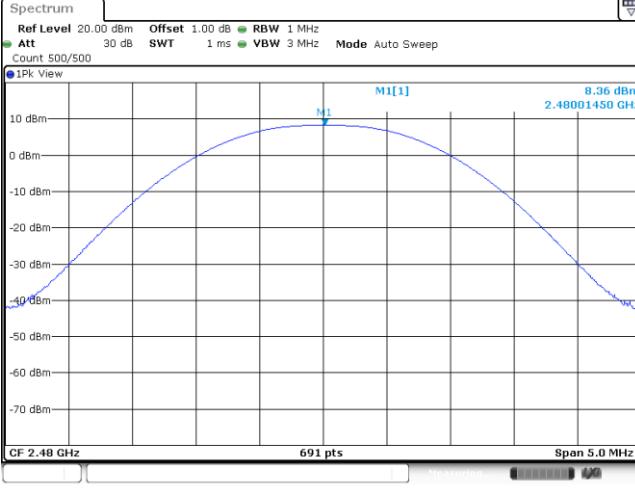
# APPENDIX REPORT

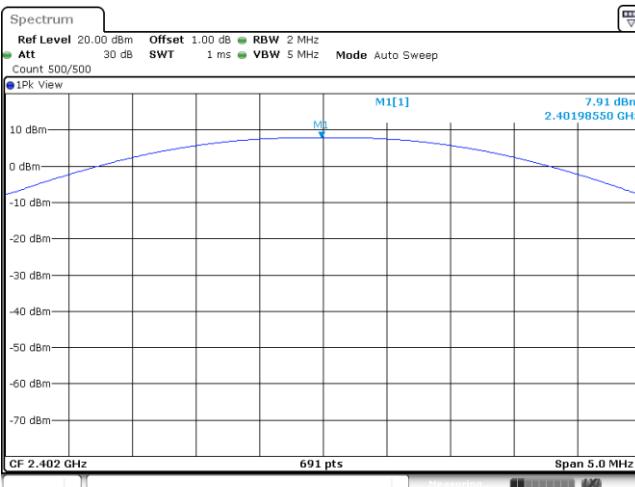
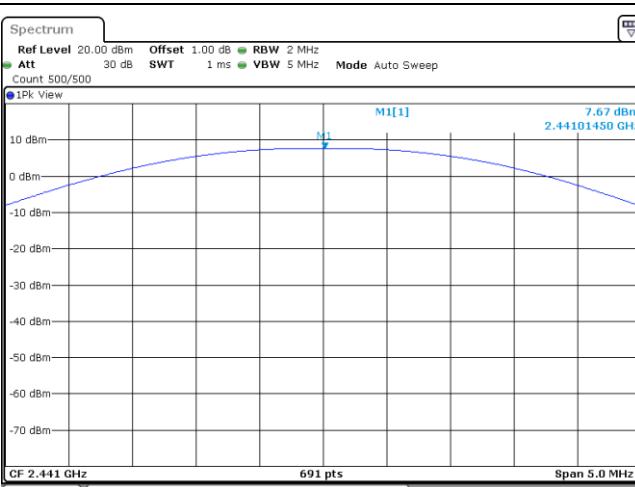
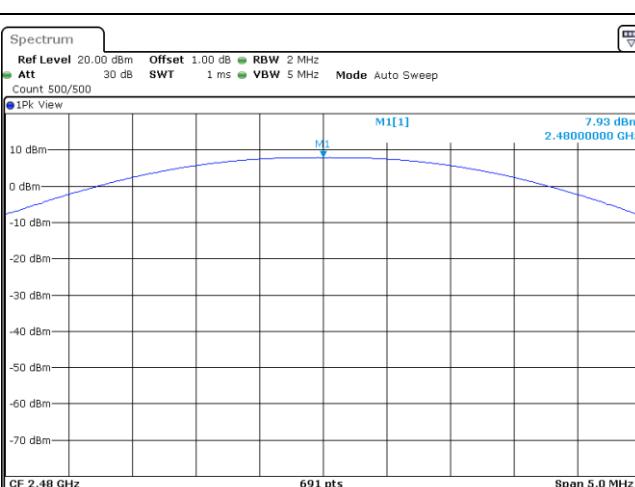
Project No.	SHT1911051203EW	Radio Specification	Bluetooth EDR
Test sample No.	YPHT19110512009	Model No.	iData K1S
Start test date	2019/12/20	Finish date	2019/12/20
Temperature	25°C	Humidity	50%
Test Engineer	Ximing.Huang	Auditor	<i>William.wang</i>

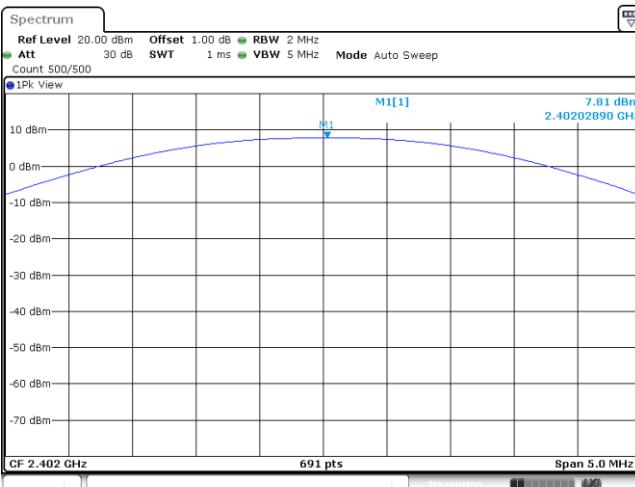
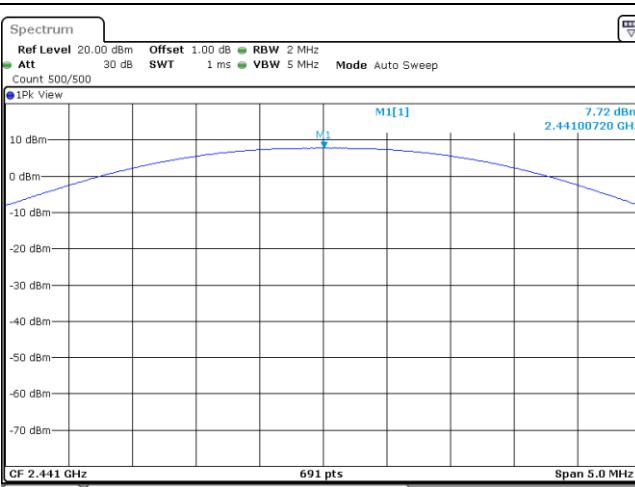
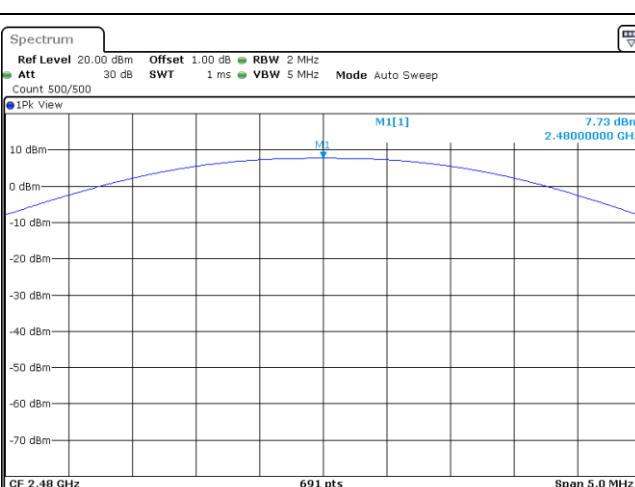
Appendix clause	Test item	Result
A	Peak Output Power	PASS
B	20 dB Bandwidth	PASS
C	99% Occupied Bandwidth	PASS
D	Carrier Frequencies Separation	PASS
E	Hopping Channel Number	PASS
F	Dwell Time	PASS
G	Duty Cycle Correction Factor (DCCF)	PASS
H	Band edge and Spurious Emissions(coducted)	PASS

**Appendix A: Peak Output Power**

Modulation type	Channel	Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
GFSK	00	8.48	8.46	≤ 30.00	Pass
	39	8.25	8.24		
	78	8.36	8.34		
π/4DQPSK	00	7.91	7.18	≤ 21.00	Pass
	39	7.67	6.85		
	78	7.93	7.02		
8DPSK	00	7.81	6.87	≤ 21.00	Pass
	39	7.72	6.63		
	78	7.73	6.65		

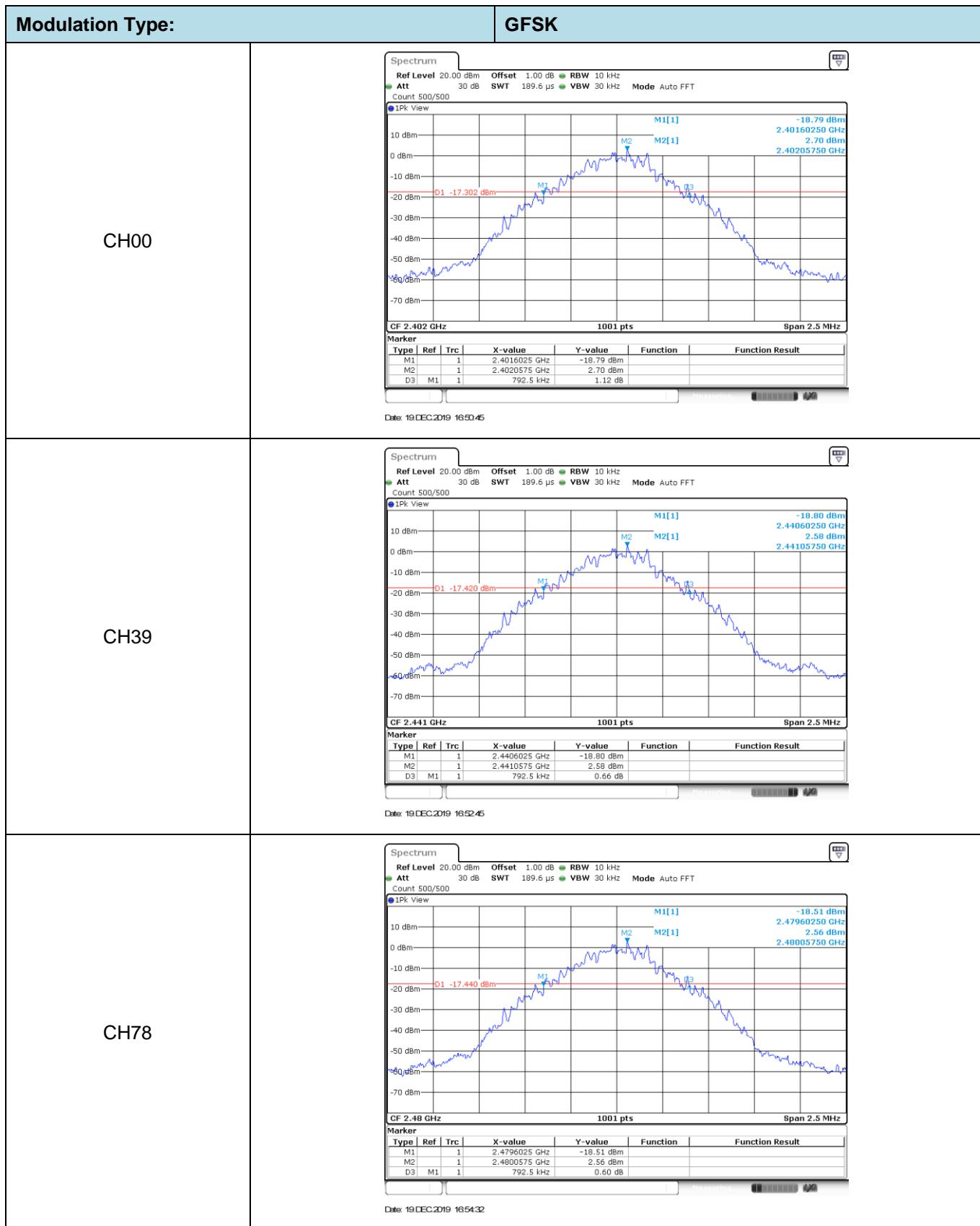
Modulation Type:		GFSK
CH00		 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 1 MHz  Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep  Count 500/500</p> <p>1Pk View</p> <p>M1[1] 8.48 dBm 2.40202890 GHz</p> <p>CF 2.402 GHz 691 pts Span 5.0 MHz</p> <p>Date: 19 DEC 2019 16:51:02</p>
CH39		 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 1 MHz  Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep  Count 500/500</p> <p>1Pk View</p> <p>M1[1] 8.25 dBm 2.44102170 GHz</p> <p>CF 2.441 GHz 691 pts Span 5.0 MHz</p> <p>Date: 19 DEC 2019 16:53:02</p>
CH78		 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 1 MHz  Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep  Count 500/500</p> <p>1Pk View</p> <p>M1[1] 8.36 dBm 2.480001450 GHz</p> <p>CF 2.48 GHz 691 pts Span 5.0 MHz</p> <p>Date: 19 DEC 2019 16:54:49</p>

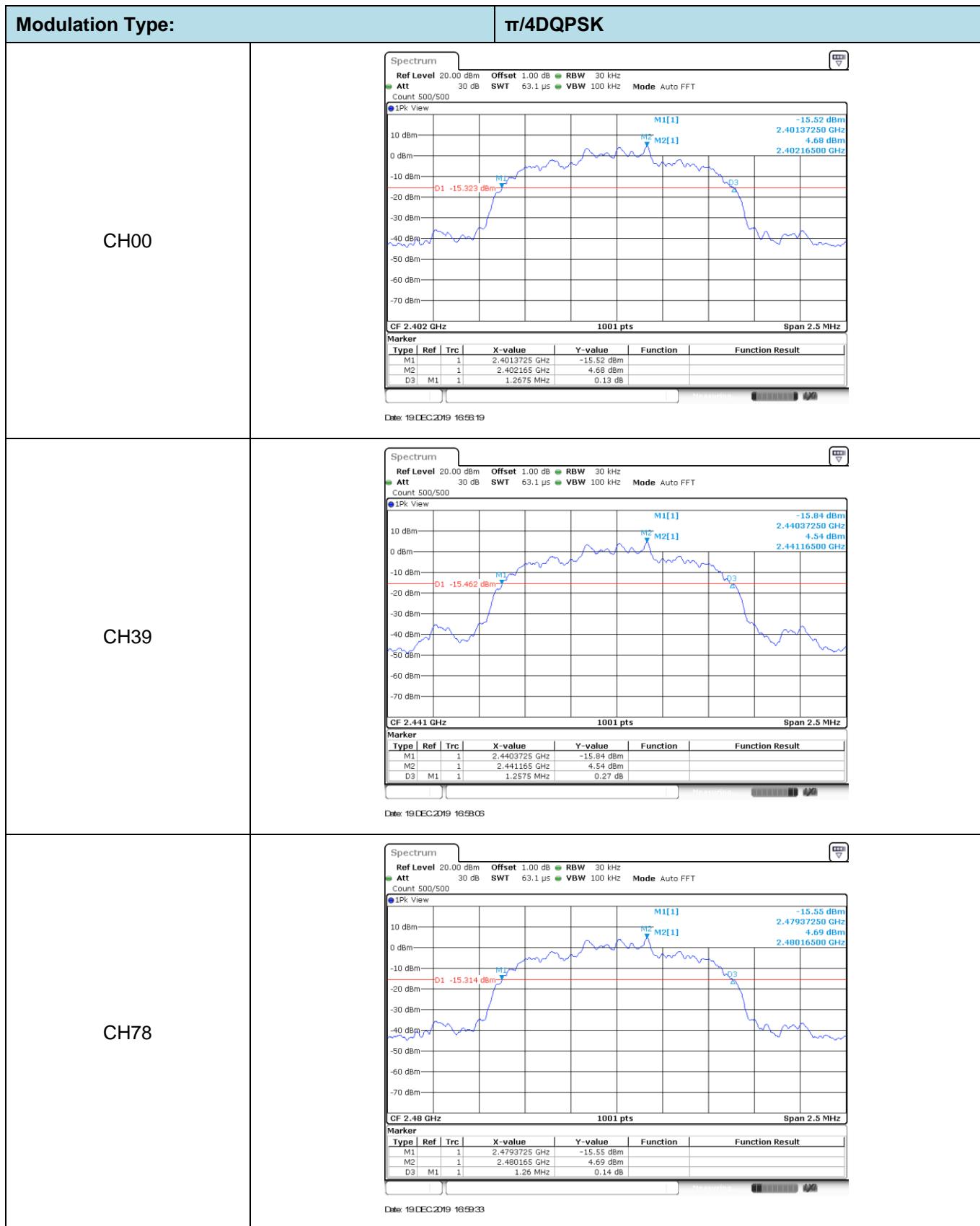
Modulation Type:	$\pi/4$ DQPSK
CH00	 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 2 MHz  Att 30 dB SWT 1 ms VBW 5 MHz Mode Auto Sweep  Count 500/500</p> <p>1Pk View</p> <p>M1[1] 7.91 dBm 2.40198550 GHz</p> <p>CF 2.402 GHz 691 pts Span 5.0 MHz</p> <p>Date: 19 DEC 2019 16:58:36</p>
CH39	 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 2 MHz  Att 30 dB SWT 1 ms VBW 5 MHz Mode Auto Sweep  Count 500/500</p> <p>1Pk View</p> <p>M1[1] 7.67 dBm 2.44101450 GHz</p> <p>CF 2.441 GHz 691 pts Span 5.0 MHz</p> <p>Date: 19 DEC 2019 16:58:23</p>
CH78	 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 2 MHz  Att 30 dB SWT 1 ms VBW 5 MHz Mode Auto Sweep  Count 500/500</p> <p>1Pk View</p> <p>M1[1] 7.93 dBm 2.48000000 GHz</p> <p>CF 2.48 GHz 691 pts Span 5.0 MHz</p> <p>Date: 19 DEC 2019 16:59:50</p>

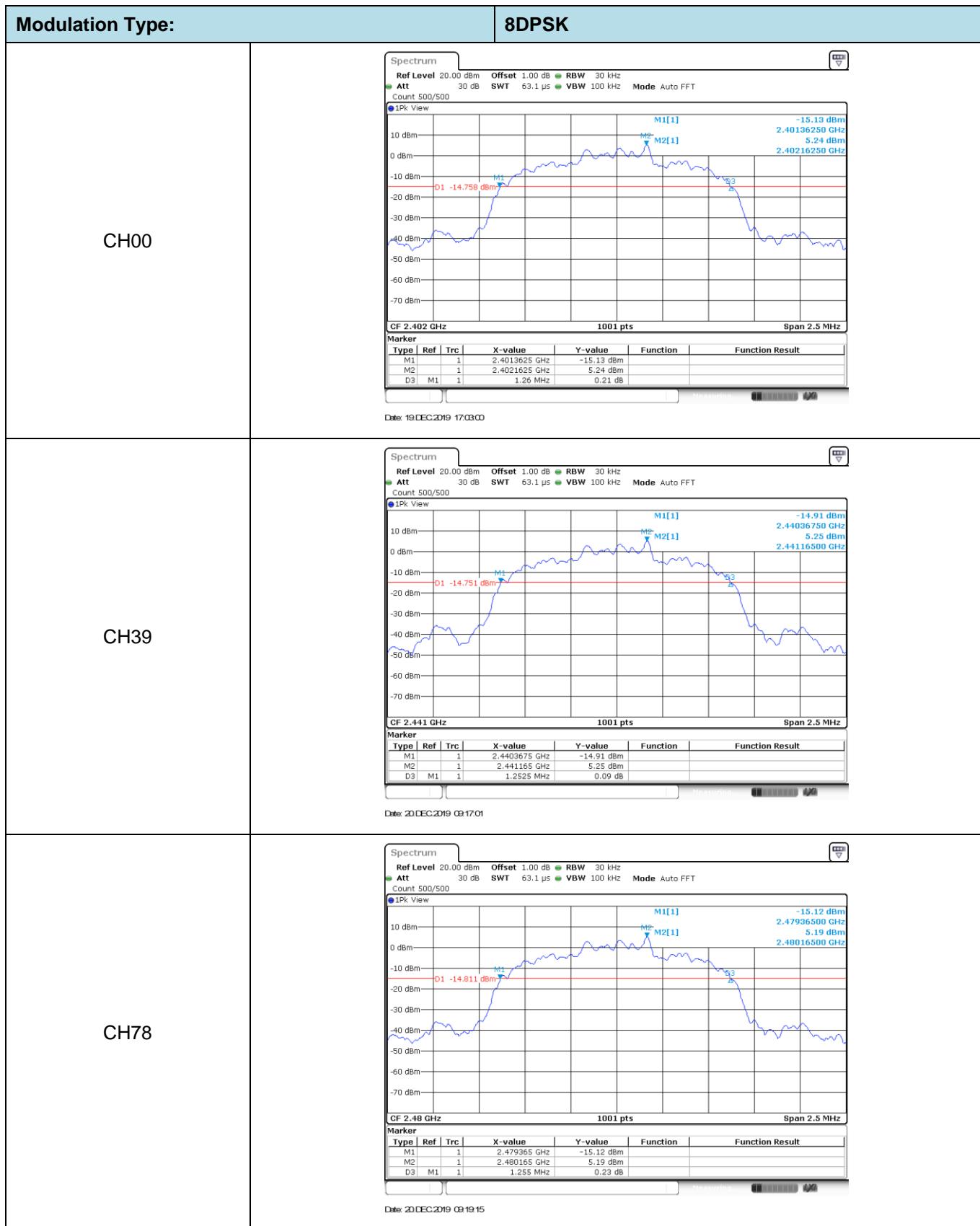
Modulation Type:		8DPSK
CH00		 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 2 MHz  Att 30 dB SWT 1 ms VBW 5 MHz Mode Auto Sweep  Count 500/500</p> <p>1Pk View</p> <p>M1[1] 7.81 dBm 2.40202890 GHz</p> <p>CF 2.402 GHz 691 pts Span 5.0 MHz</p> <p>Date: 19 DEC 2019 17:03:17</p>
CH39		 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 2 MHz  Att 30 dB SWT 1 ms VBW 5 MHz Mode Auto Sweep  Count 500/500</p> <p>1Pk View</p> <p>M1[1] 7.72 dBm 2.44100720 GHz</p> <p>CF 2.441 GHz 691 pts Span 5.0 MHz</p> <p>Date: 20 DEC 2019 09:17:20</p>
CH78		 <p>Spectrum</p> <p>Ref Level 20.00 dBm Offset 1.00 dB RBW 2 MHz  Att 30 dB SWT 1 ms VBW 5 MHz Mode Auto Sweep  Count 500/500</p> <p>1Pk View</p> <p>M1[1] 7.73 dBm 2.48000000 GHz</p> <p>CF 2.48 GHz 691 pts Span 5.0 MHz</p> <p>Date: 20 DEC 2019 09:19:32</p>

**Appendix B : 20 dB Bandwidth**

Modulation type	Channel	20 dB Bandwidth (kHz)	Limit (kHz)	Result
GFSK	00	793.00	-	Pass
	39	793.00		
	78	793.00		
$\pi/4$ DQPSK	00	1267.00	-	Pass
	39	1258.00		
	78	1260.00		
8DPSK	00	1260.00	-	Pass
	39	1253.00		
	78	1255.00		

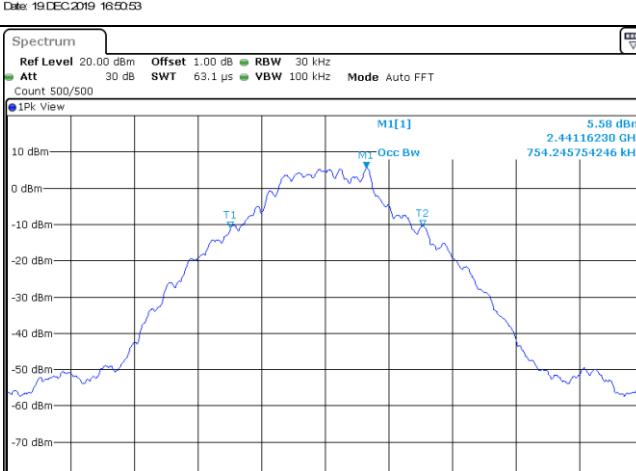
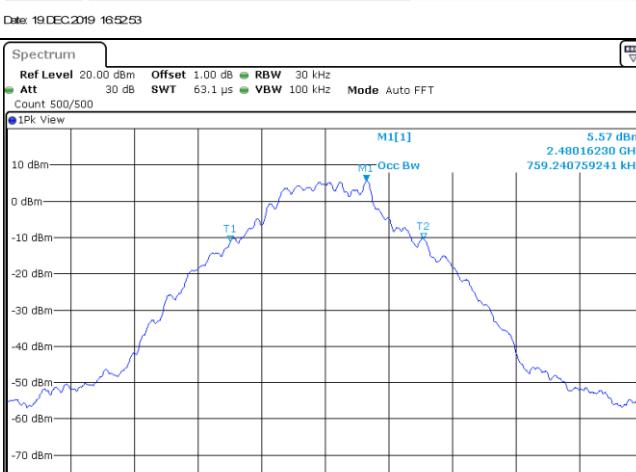


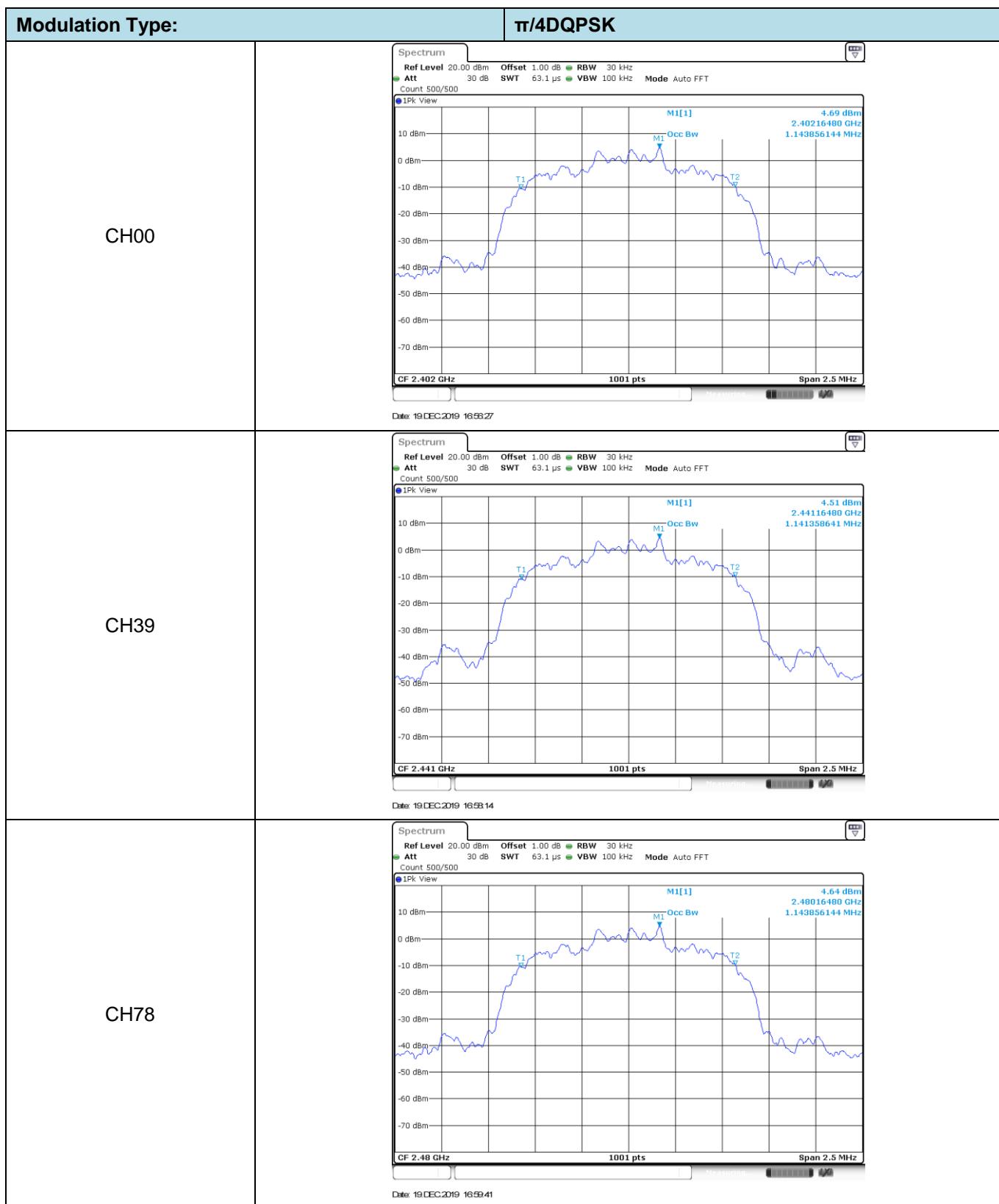




**Appendix C: 99% Occupied Bandwidth**

Modulation type	Channel	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
GFSK	00	0.76	-	Pass
	39	0.75		
	78	0.76		
$\pi/4$ DQPSK	00	1.14	-	Pass
	39	1.14		
	78	1.14		
8DPSK	00	1.15	-	Pass
	39	1.14		
	78	1.15		

Modulation Type:		GFSK
CH00		<p>Spectrum</p> <p>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</p> <p>1Pk View</p>  <p>Date: 19 DEC 2019 16:50:53</p>
CH39		<p>Spectrum</p> <p>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</p> <p>1Pk View</p>  <p>Date: 19 DEC 2019 16:52:53</p>
CH78		<p>Spectrum</p> <p>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</p> <p>1Pk View</p>  <p>Date: 19 DEC 2019 16:54:40</p>



Modulation Type:		8DPSK
CH00		<p>Date: 19 DEC 2019 17:03:08</p>
CH39		<p>Date: 20 DEC 2019 09:17:11</p>
CH78		<p>Date: 20 DEC 2019 09:19:23</p>

## Appendix D: Carrier Frequencies Separation

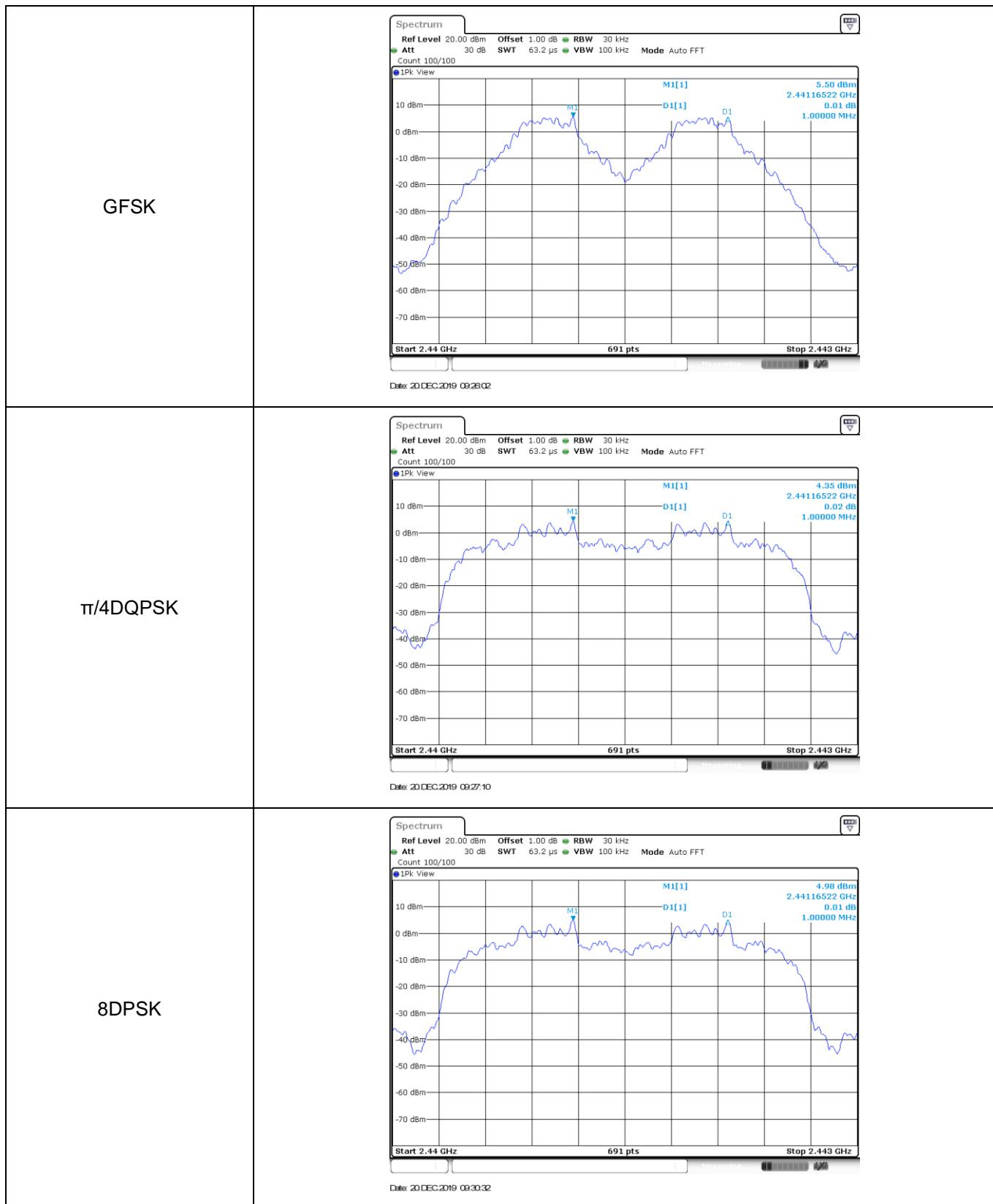
Modulation type	Channel	Carrier Frequencies Separation (MHz)	Limit (kHz) *	Result
GFSK	39	1.00	≥	Pass
π/4DQPSK	39	1.00	≥	Pass
8DPSK	39	1.00	≥	Pass

Note:

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

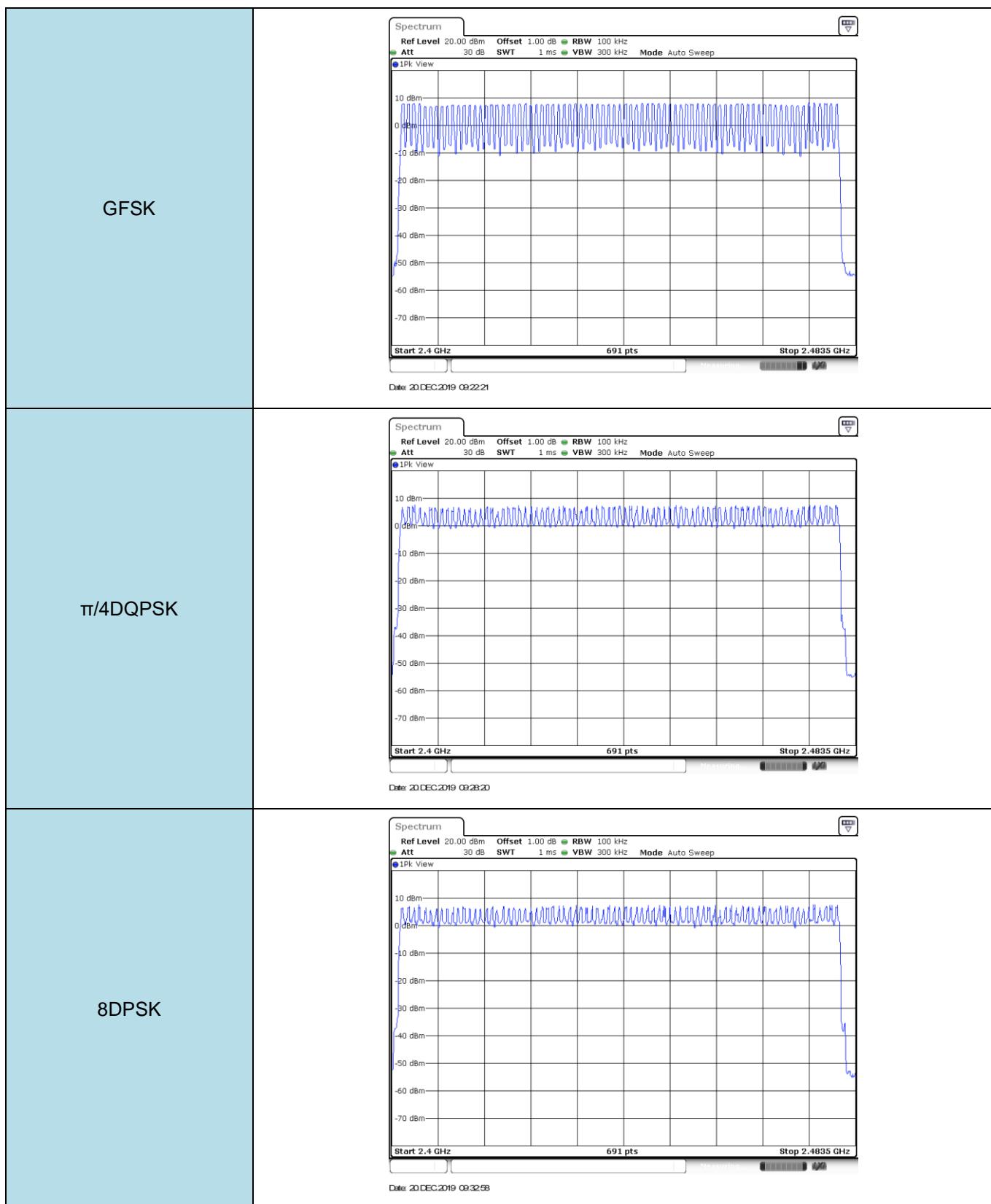
π/4DQPSK limit = 2/3 \* The maximum 20 dB Bandwidth for π/4DQPSK modulation on the appendix B.

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



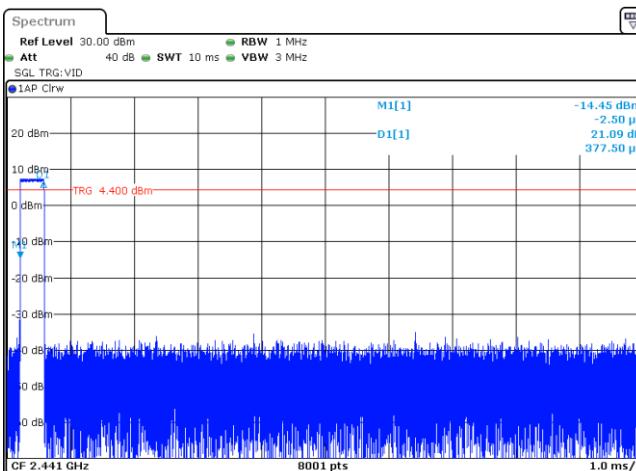
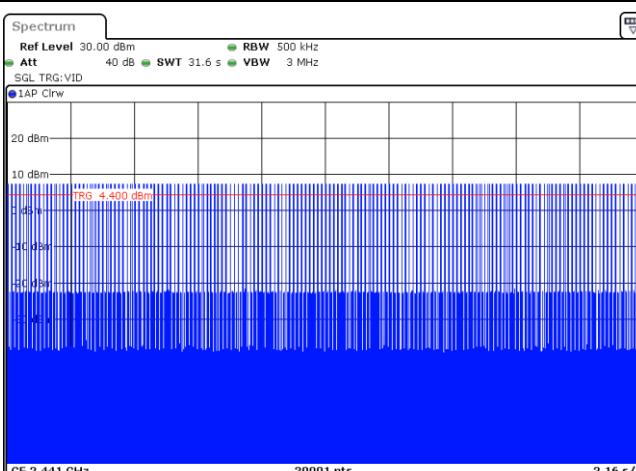
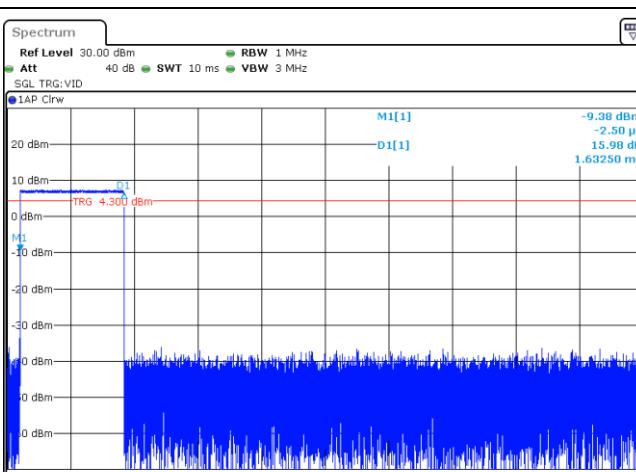
**Appendix E: Hopping Channel Number**

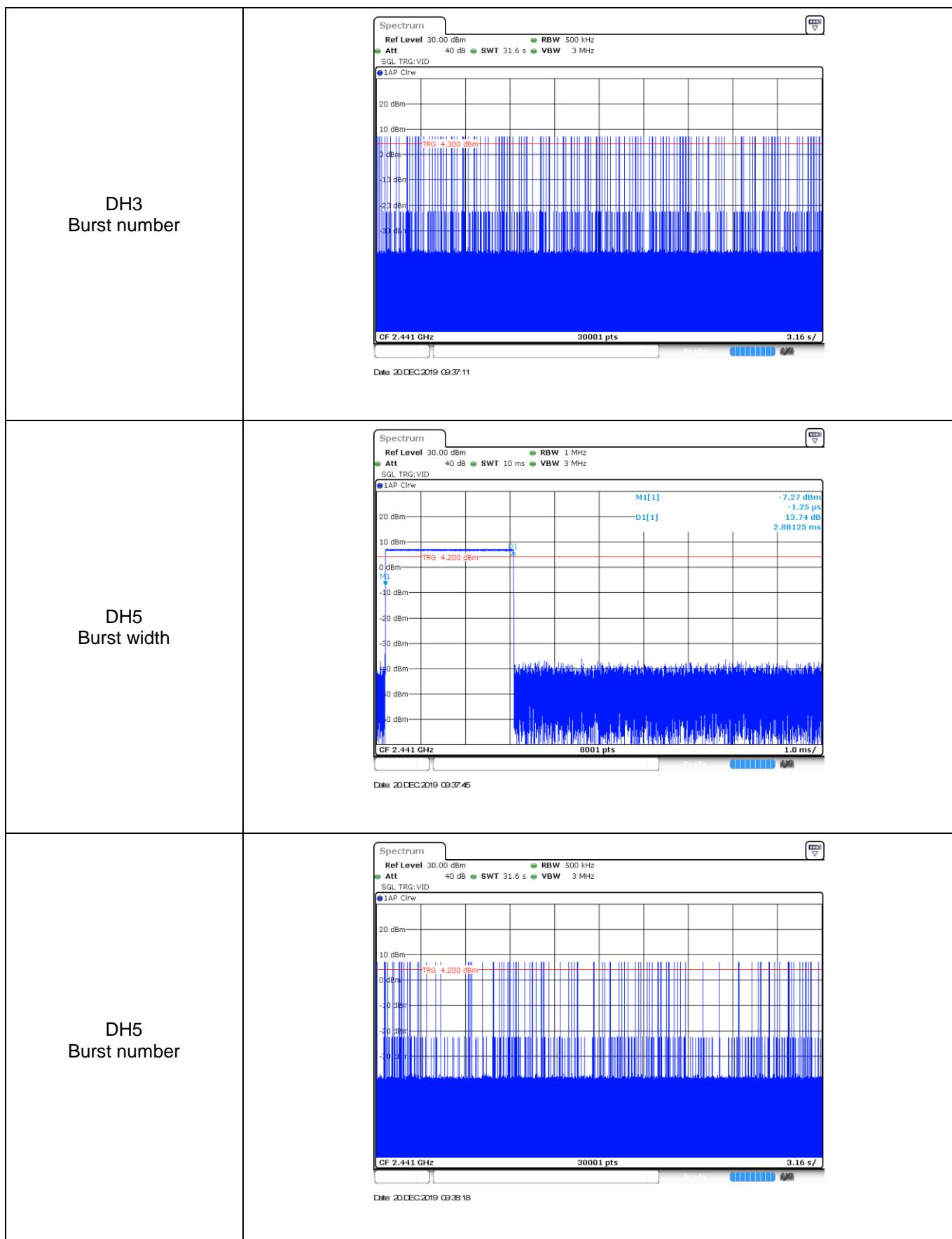
Modulation type	Channel number	Limit	Result
GFSK	79	$\geq 15.00$	Pass
$\pi/4$ DQPSK	79		
8DPSK	79		

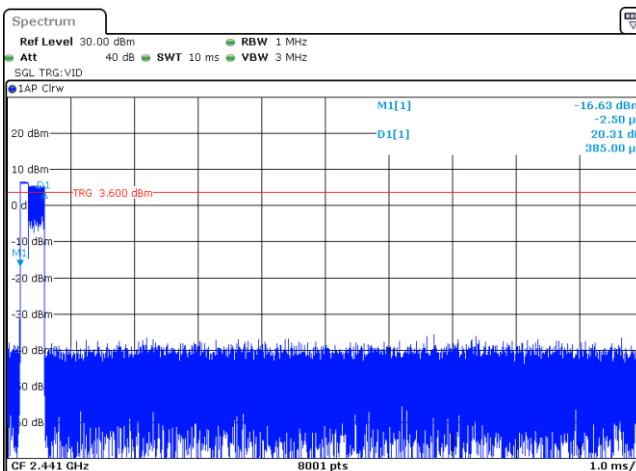
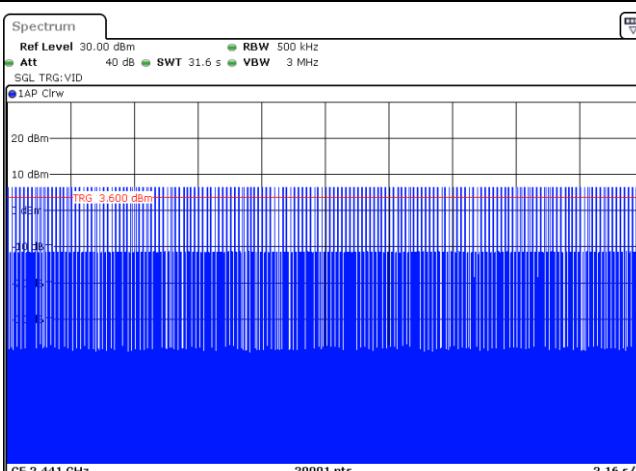
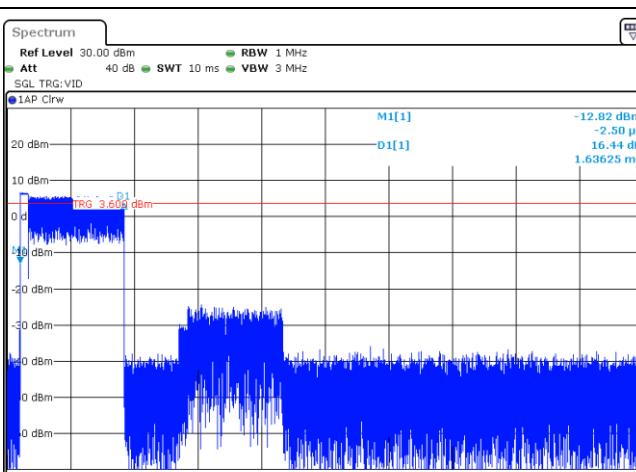


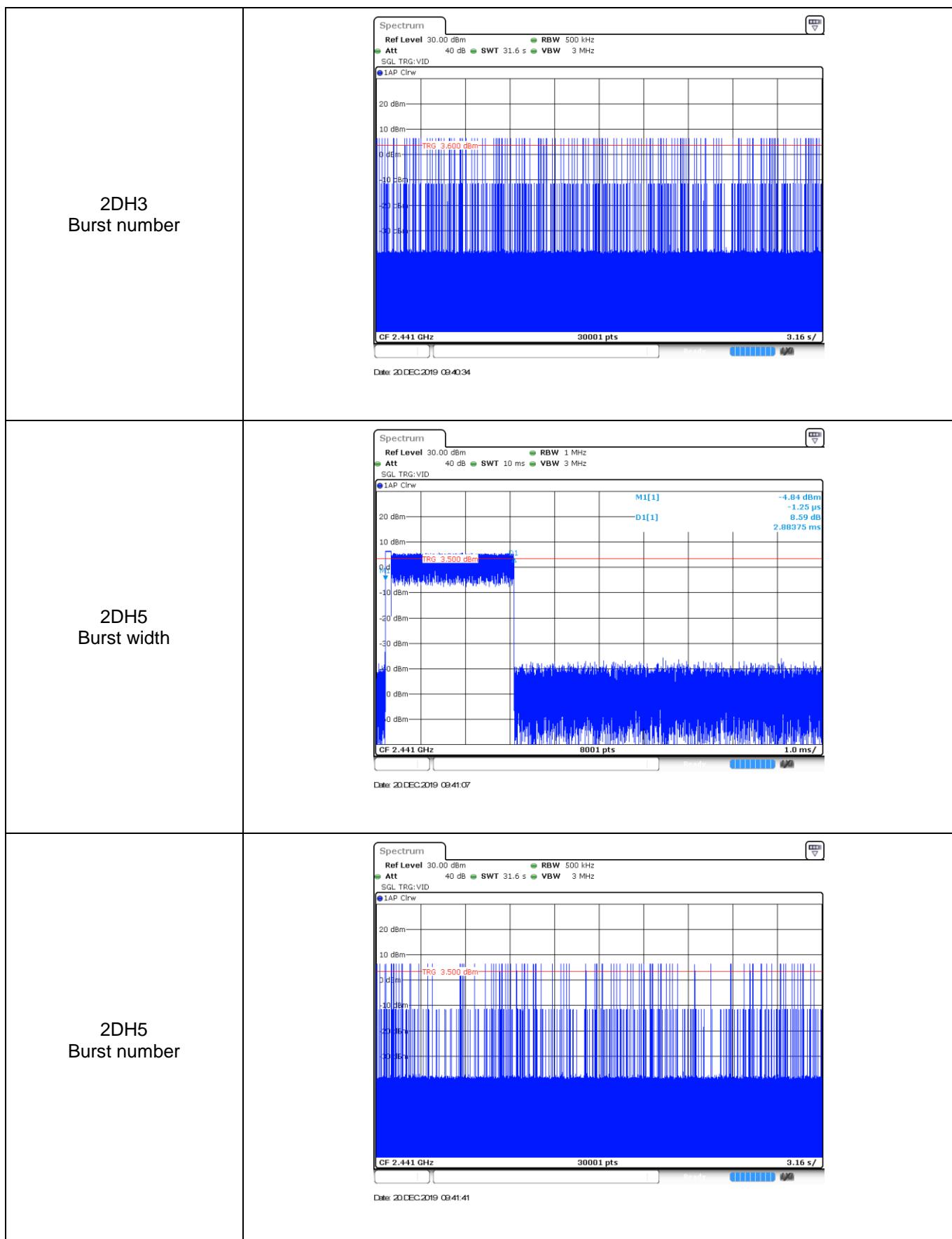
## Appendix F: Dwell Time

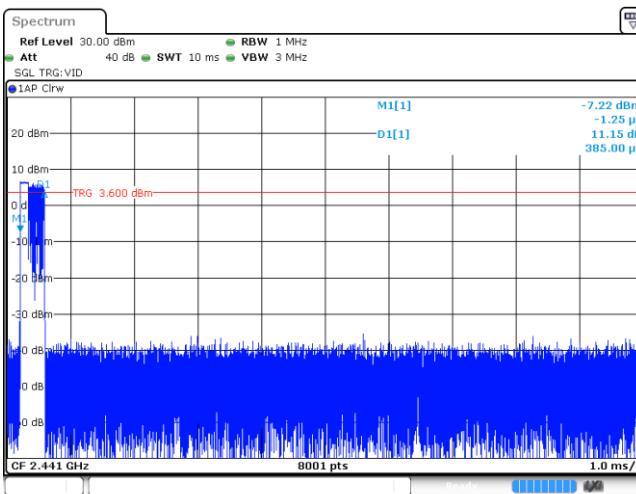
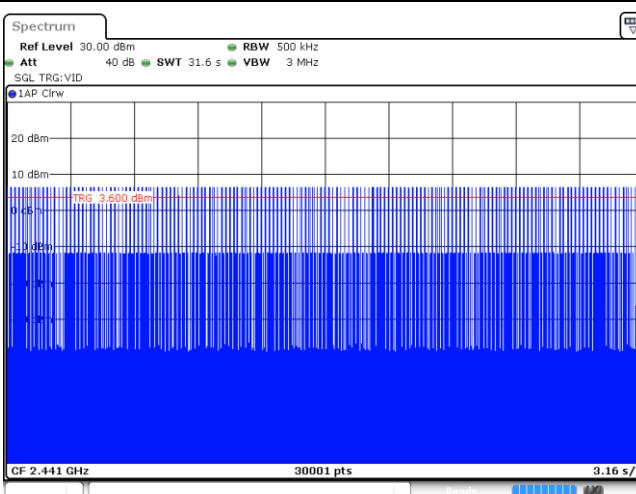
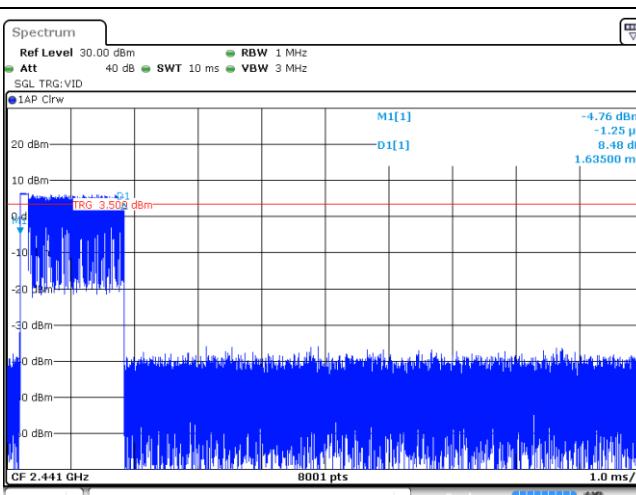
Modulation type	Packet	Burst Width [ms]	Total Hops[hop*ch]	Dwell time (Second)	Limit (Second)	Result
GFSK	DH1	0.38	315	0.12	$\leq 0.40$	Pass
	DH3	1.63	162	0.26		
	DH5	2.88	102	0.29		
$\pi/4$ DQPSK	2DH1	0.39	313	0.12	$\leq 0.40$	Pass
	2DH3	1.64	160	0.26		
	2DH5	2.88	101	0.29		
8DPSK	3DH1	0.38	314	0.12	$\leq 0.40$	Pass
	3DH3	1.64	159	0.26		
	3DH5	2.89	102	0.29		

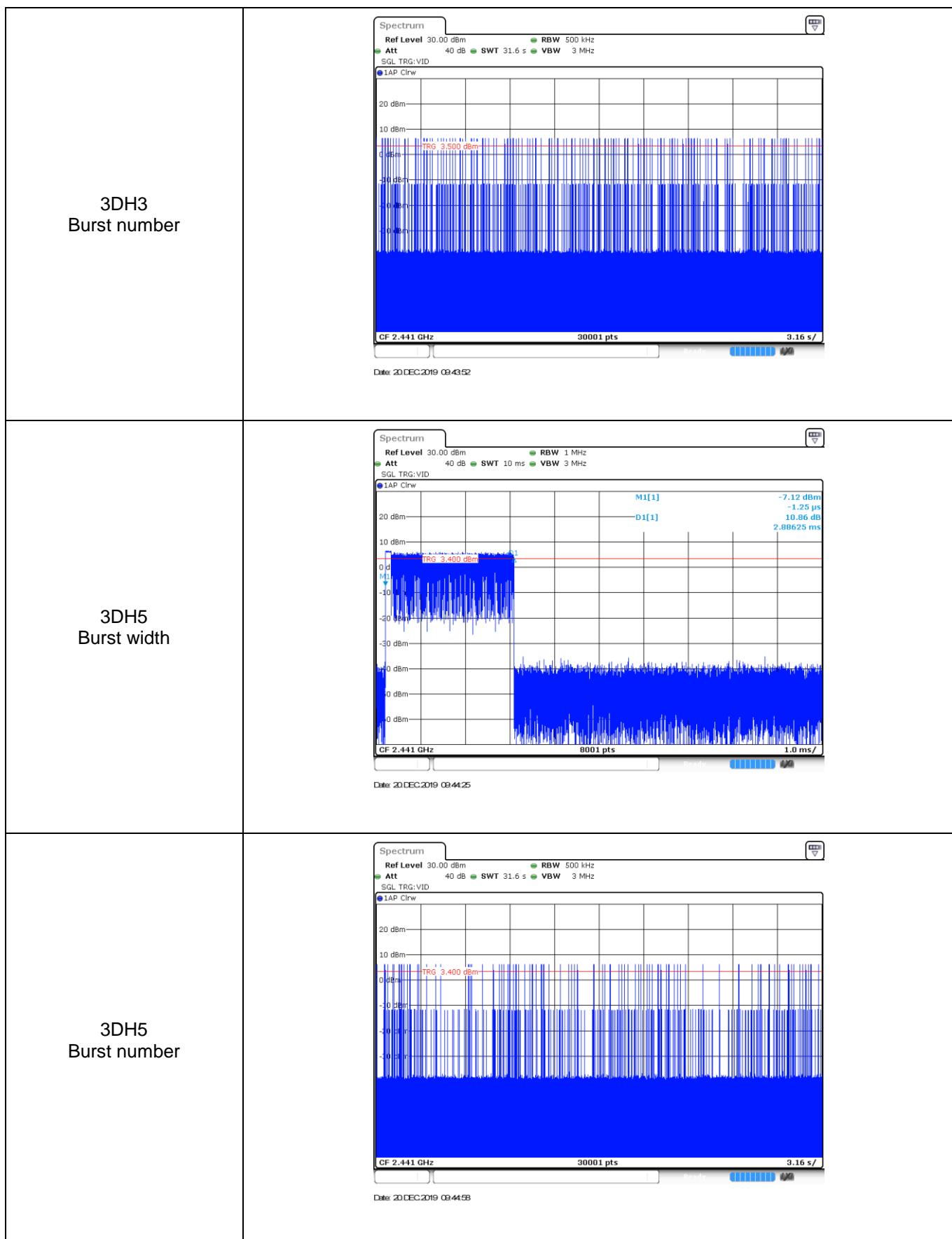
Modulation Type:	GFSK
DH1 Burst width	 <p>Spectrum Ref Level 30.00 dBm RBW 1 MHz Att 40 dB SWT 10 ms VBW 3 MHz SGL TRG:VID 1AP Clrw</p> <p>M1[1] -14.45 dBm D1[1] -2.50 μs 21.09 dB 377.50 μs</p> <p>CF 2.441 GHz 8001 pts 1.0 ms/</p> <p>Date: 20 DEC 2019 09:35:03</p>
DH1 Burst number	 <p>Spectrum Ref Level 30.00 dBm RBW 500 kHz Att 40 dB SWT 31.6 s VBW 3 MHz SGL TRG:VID 1AP Clrw</p> <p>TRG 4.400 dBm</p> <p>CF 2.441 GHz 30001 pts 3.16 s/</p> <p>Date: 20 DEC 2019 09:35:37</p>
DH3 Burst width	 <p>Spectrum Ref Level 30.00 dBm RBW 1 MHz Att 40 dB SWT 10 ms VBW 3 MHz SGL TRG:VID 1AP Clrw</p> <p>M1[1] -9.98 dBm D1[1] -2.50 μs 15.99 dB 1.63250 ms</p> <p>D1 M1</p> <p>CF 2.441 GHz 8001 pts 1.0 ms/</p> <p>Date: 20 DEC 2019 09:36:37</p>



Modulation Type:	$\pi/4$ DQPSK
2DH1 Burst width	 <p>Spectrum  Ref Level 30.00 dBm RBW 1 MHz  Att 40 dB SWT 10 ms VBW 3 MHz  SGL TRG:VID  1AP Clrw</p> <p>M1[1] -16.63 dBm  D1[1] -2.50 μs  20.31 dB  385.00 μs</p> <p>Date: 20 DEC 2019 09:38:50</p>
2DH1 Burst number	 <p>Spectrum  Ref Level 30.00 dBm RBW 500 kHz  Att 40 dB SWT 31.6 s VBW 3 MHz  SGL TRG:VID  1AP Clrw</p> <p>M1[1] -12.82 dBm  D1[1] -2.50 μs  16.44 dB  1.63625 ms</p> <p>Date: 20 DEC 2019 09:39:24</p>
2DH3 Burst width	 <p>Spectrum  Ref Level 30.00 dBm RBW 1 MHz  Att 40 dB SWT 10 ms VBW 3 MHz  SGL TRG:VID  1AP Clrw</p> <p>M1[1] -12.82 dBm  D1[1] -2.50 μs  16.44 dB  1.63625 ms</p> <p>Date: 20 DEC 2019 09:40:01</p>



Modulation Type:	8DPSK
3DH1 Burst width	 <p>Spectrum analysis plot showing a single burst waveform. The plot includes parameters: Ref Level 30.00 dBm, Att 40 dB, SWT 10 ms, RBW 1 MHz, SGL TRG:VID, and 1AP Clrw. The burst is labeled M1[1] and D1[1]. The plot shows a sharp peak at approximately -7.22 dBm with a duration of 1.15 μs over a 385.00 μs interval. The x-axis is centered at CF 2.441 GHz with a scale of 1.0 ms/pt. The y-axis ranges from -30 dBm to 20 dBm.</p> <p>Date: 20 DEC 2019 09:42:15</p>
3DH1 Burst number	 <p>Spectrum analysis plot showing multiple burst waveforms. The plot includes parameters: Ref Level 30.00 dBm, Att 40 dB, SWT 31.6 s, RBW 500 kHz, SGL TRG:VID, and 1AP Clrw. The bursts are labeled M1[1] and D1[1]. The plot shows a series of vertical spikes at approximately -4.76 dBm with a duration of 8.49 dB over a 1.63500 ms interval. The x-axis is centered at CF 2.441 GHz with a scale of 3.16 s/pt. The y-axis ranges from -30 dBm to 20 dBm.</p> <p>Date: 20 DEC 2019 09:42:48</p>
3DH3 Burst width	 <p>Spectrum analysis plot showing a single burst waveform. The plot includes parameters: Ref Level 30.00 dBm, Att 40 dB, SWT 10 ms, RBW 1 MHz, SGL TRG:VID, and 1AP Clrw. The burst is labeled M1[1] and D1[1]. The plot shows a sharp peak at approximately -4.76 dBm with a duration of 1.25 μs over a 1.63500 ms interval. The x-axis is centered at CF 2.441 GHz with a scale of 1.0 ms/pt. The y-axis ranges from -30 dBm to 20 dBm.</p> <p>Date: 20 DEC 2019 09:43:18</p>

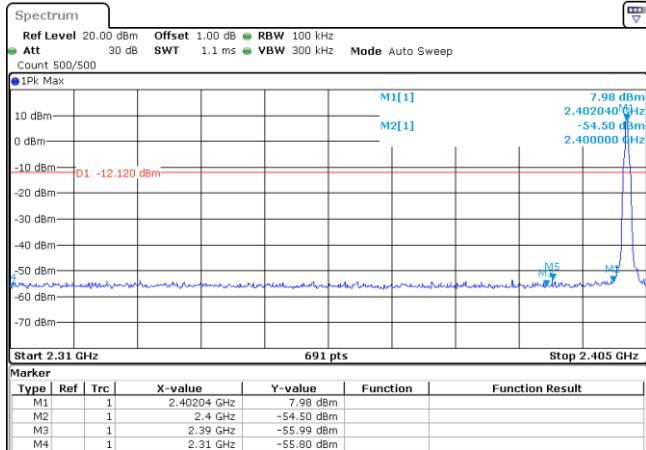
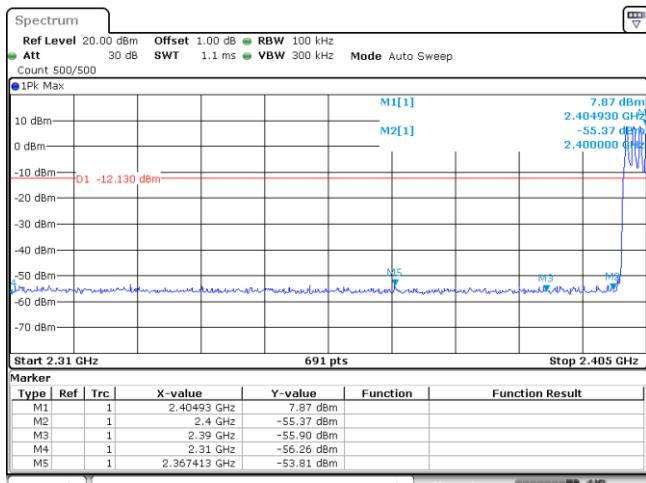
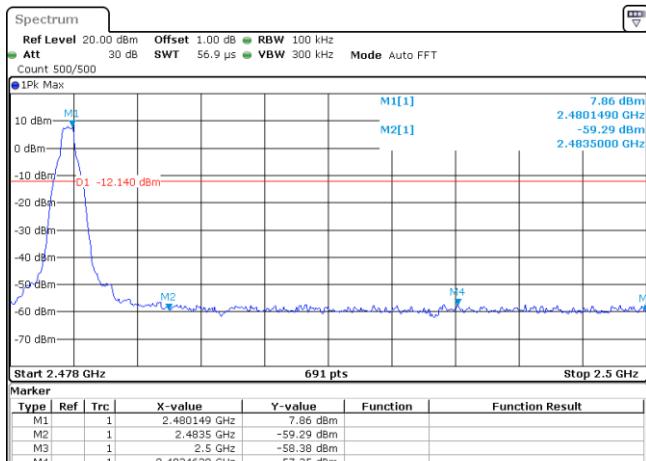


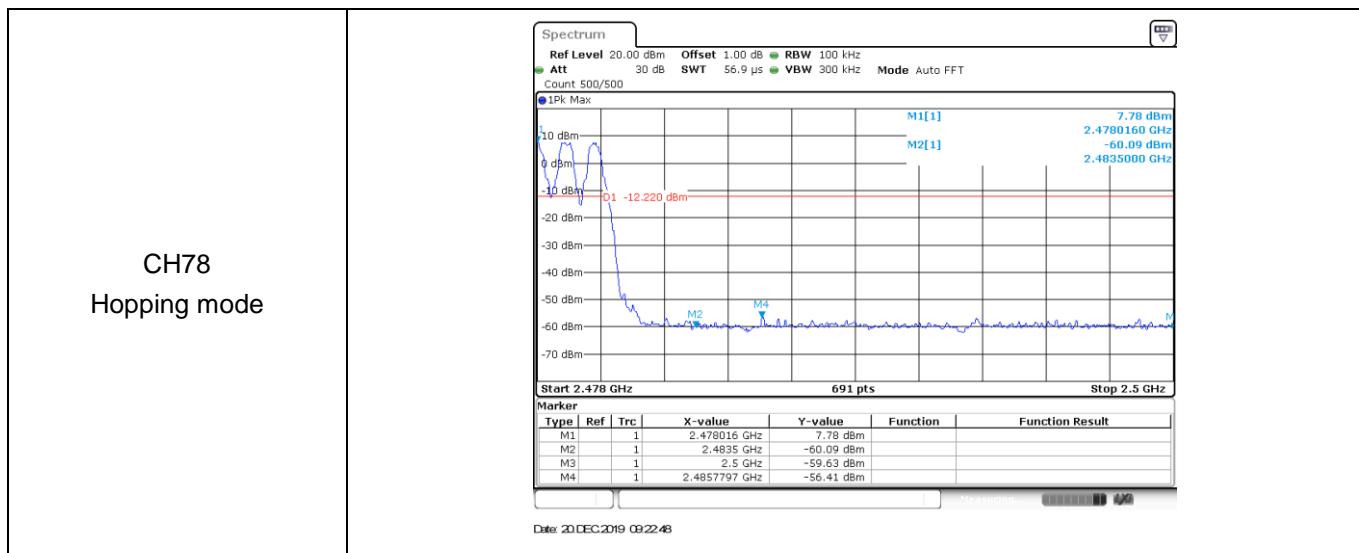
## Appendix G: Duty Cycle Correction Factor (DCCF)

DCCF Calculate Formula					
$DCCF = 20 * \log(\text{duty cycle}) = 20 * \log(T_{\text{on time}} / T_{\text{period}})$					
Modulation type	Test Frequency (MHz)	$T_{\text{on time}}$ for single burst [ms]	$T_{\text{period}}$ [ms]	Burst Quantity	DCCF [dB]
GFSK	2441	2.86	100	4	-18.83
$\pi/4$ DQPSK	2441	2.87	100	1	-30.84
8DPSK	2441	2.87	100	2	-24.82

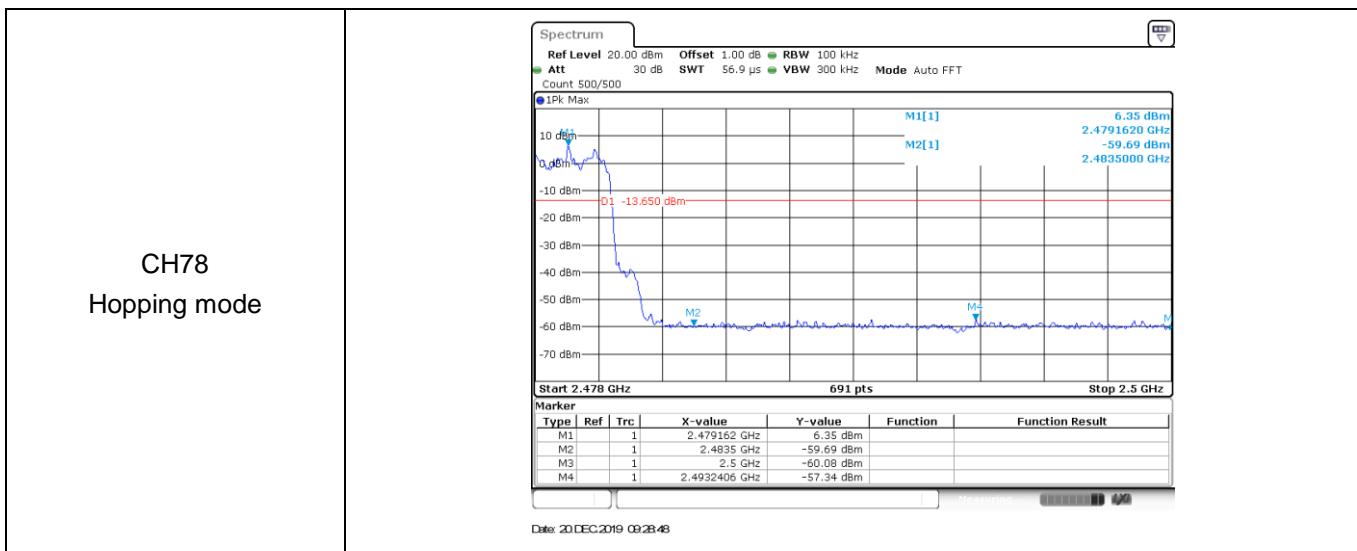


## Appendix H: Band edge and Spurious Emissions (conducted)

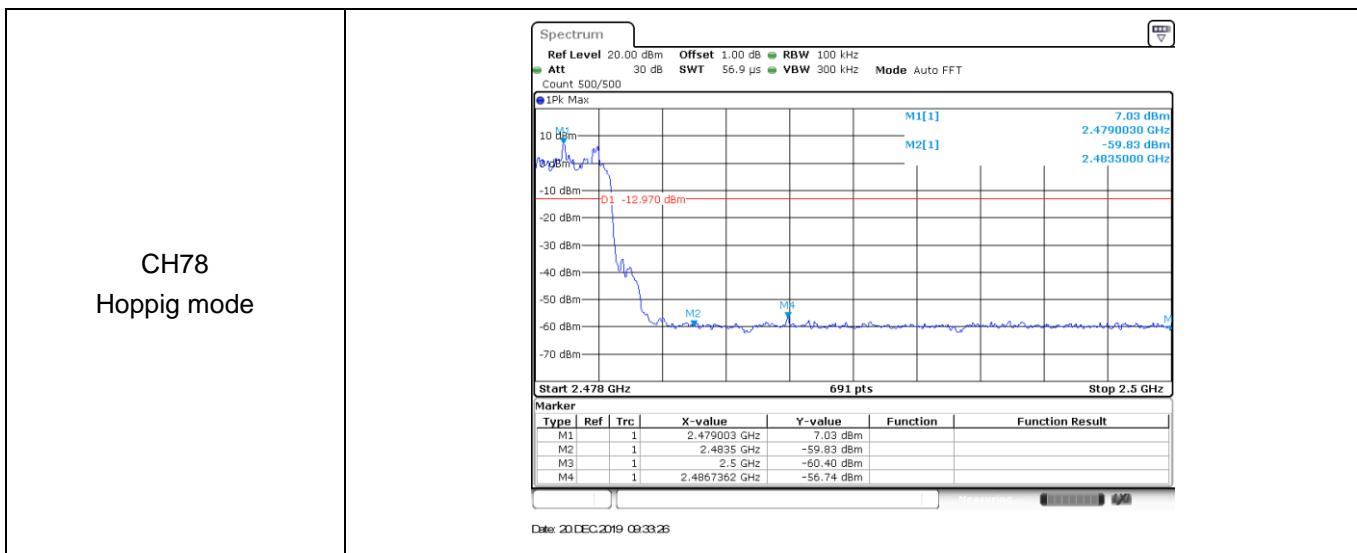
Test Item:	Band edge	Modulation type:	GFSK																																										
CH00 No hopping mode	 <p>Spectrum Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 1.1 ms VBW 300 kHz Mode Auto Sweep Count 500/500 1Pk Max</p> <table border="1"> <thead> <tr> <th>Type</th><th>Ref</th><th>Trc</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>2.40204 GHz</td><td>7.98 dBm</td><td></td><td></td></tr> <tr> <td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-54.50 dBm</td><td></td><td></td></tr> <tr> <td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-55.99 dBm</td><td></td><td></td></tr> <tr> <td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-55.80 dBm</td><td></td><td></td></tr> <tr> <td>M5</td><td>1</td><td></td><td>2.390957 GHz</td><td>-53.55 dBm</td><td></td><td></td></tr> </tbody> </table> <p>Date: 19 DEC 2019 16:51:16</p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.40204 GHz	7.98 dBm			M2	1		2.4 GHz	-54.50 dBm			M3	1		2.39 GHz	-55.99 dBm			M4	1		2.31 GHz	-55.80 dBm			M5	1		2.390957 GHz	-53.55 dBm				
Type	Ref	Trc	X-value	Y-value	Function	Function Result																																							
M1	1		2.40204 GHz	7.98 dBm																																									
M2	1		2.4 GHz	-54.50 dBm																																									
M3	1		2.39 GHz	-55.99 dBm																																									
M4	1		2.31 GHz	-55.80 dBm																																									
M5	1		2.390957 GHz	-53.55 dBm																																									
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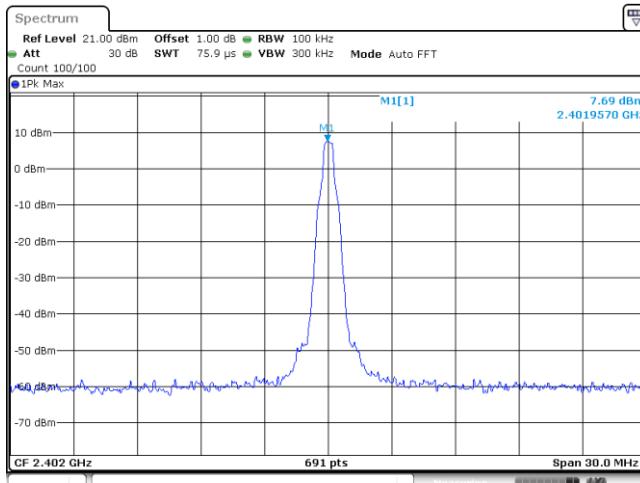
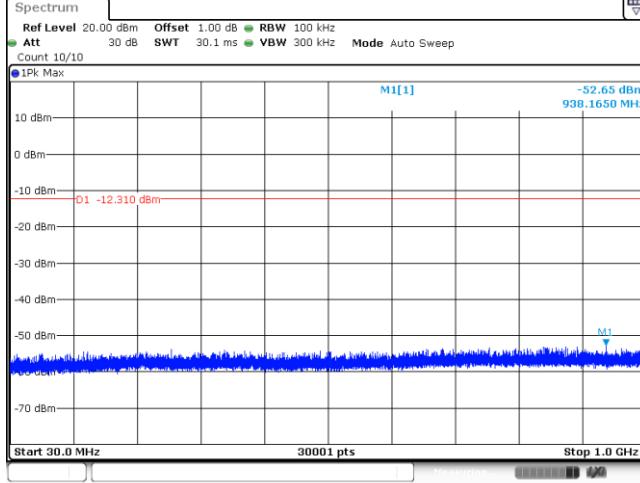
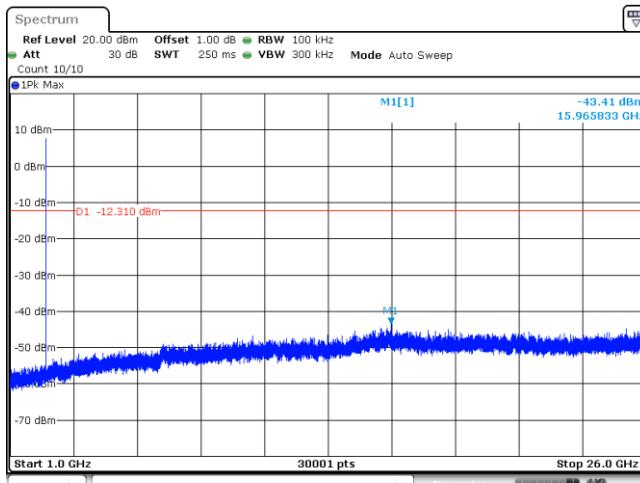


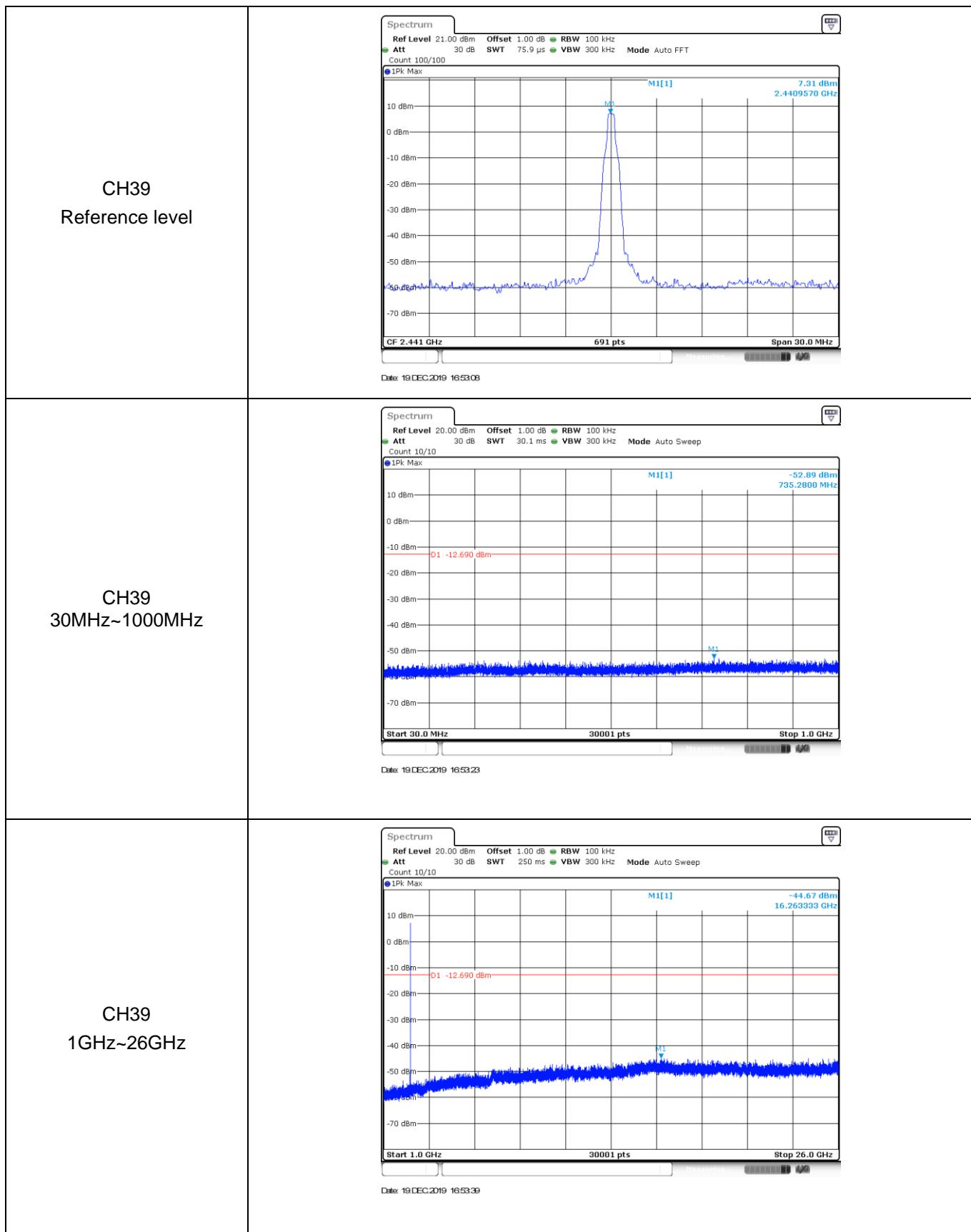
Test Item:	Band edge	Modulation type:	$\pi/4$ DQPSK																																										
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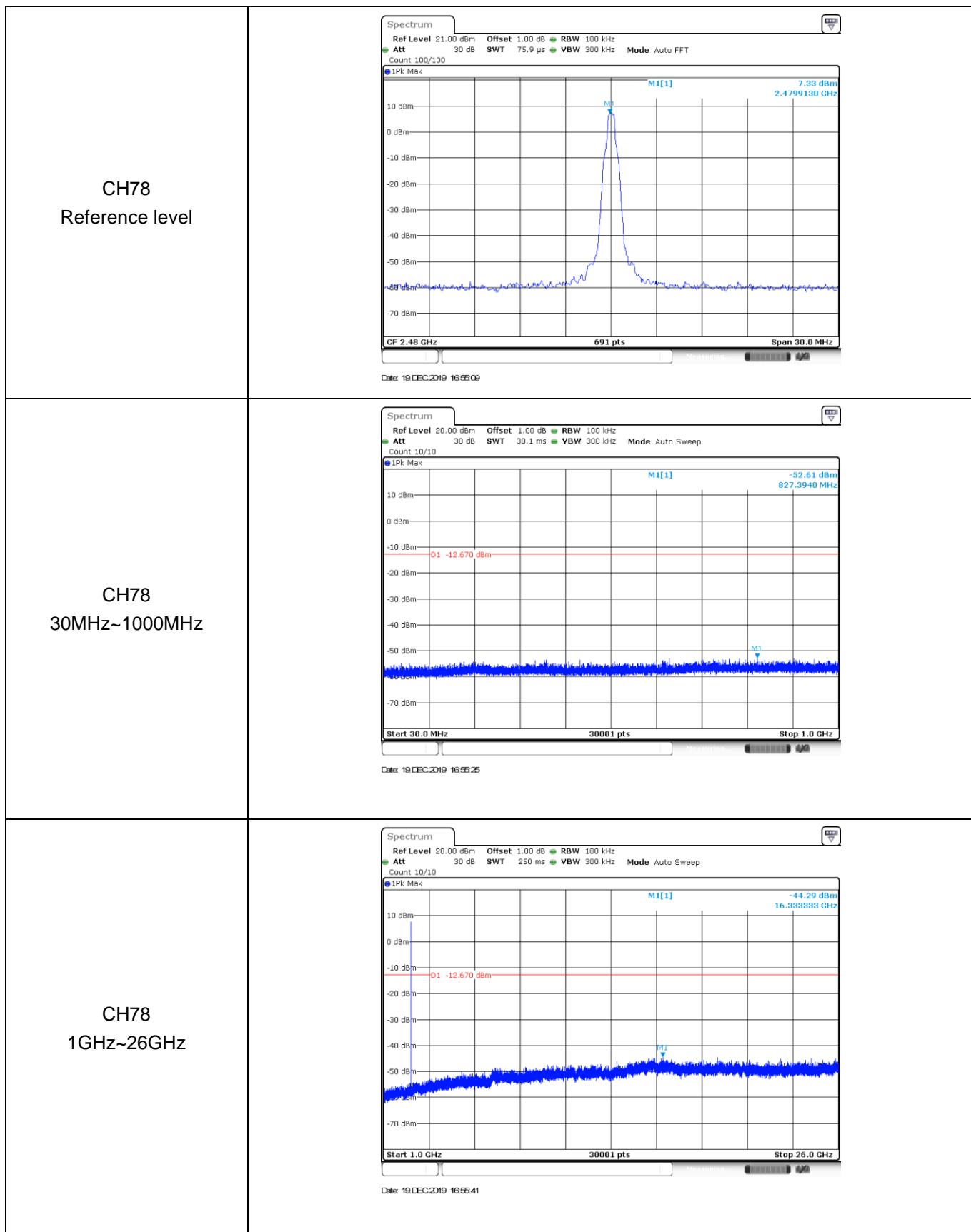


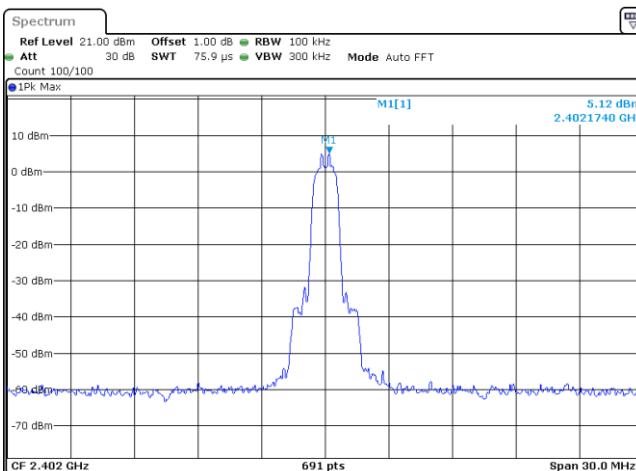
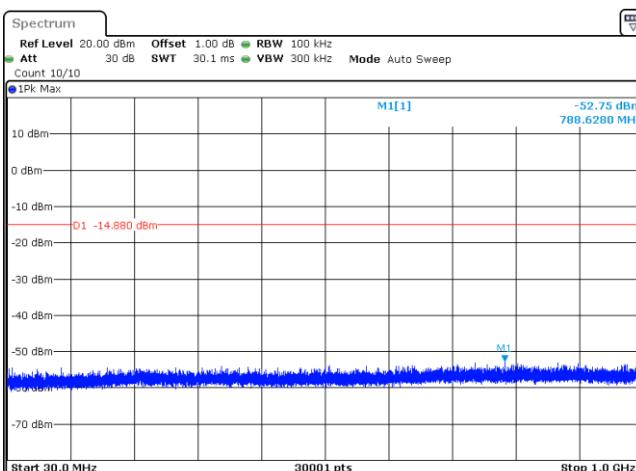
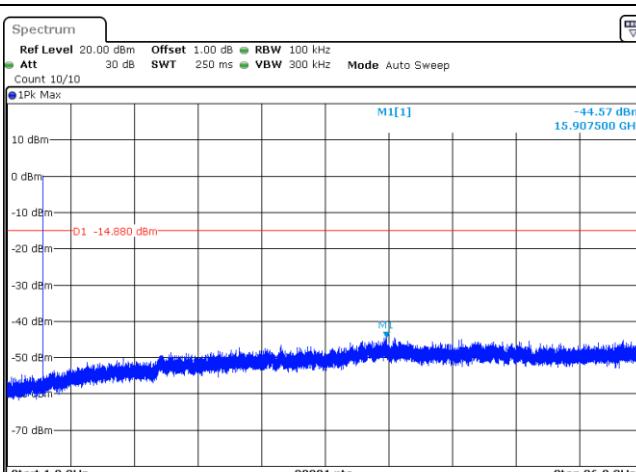
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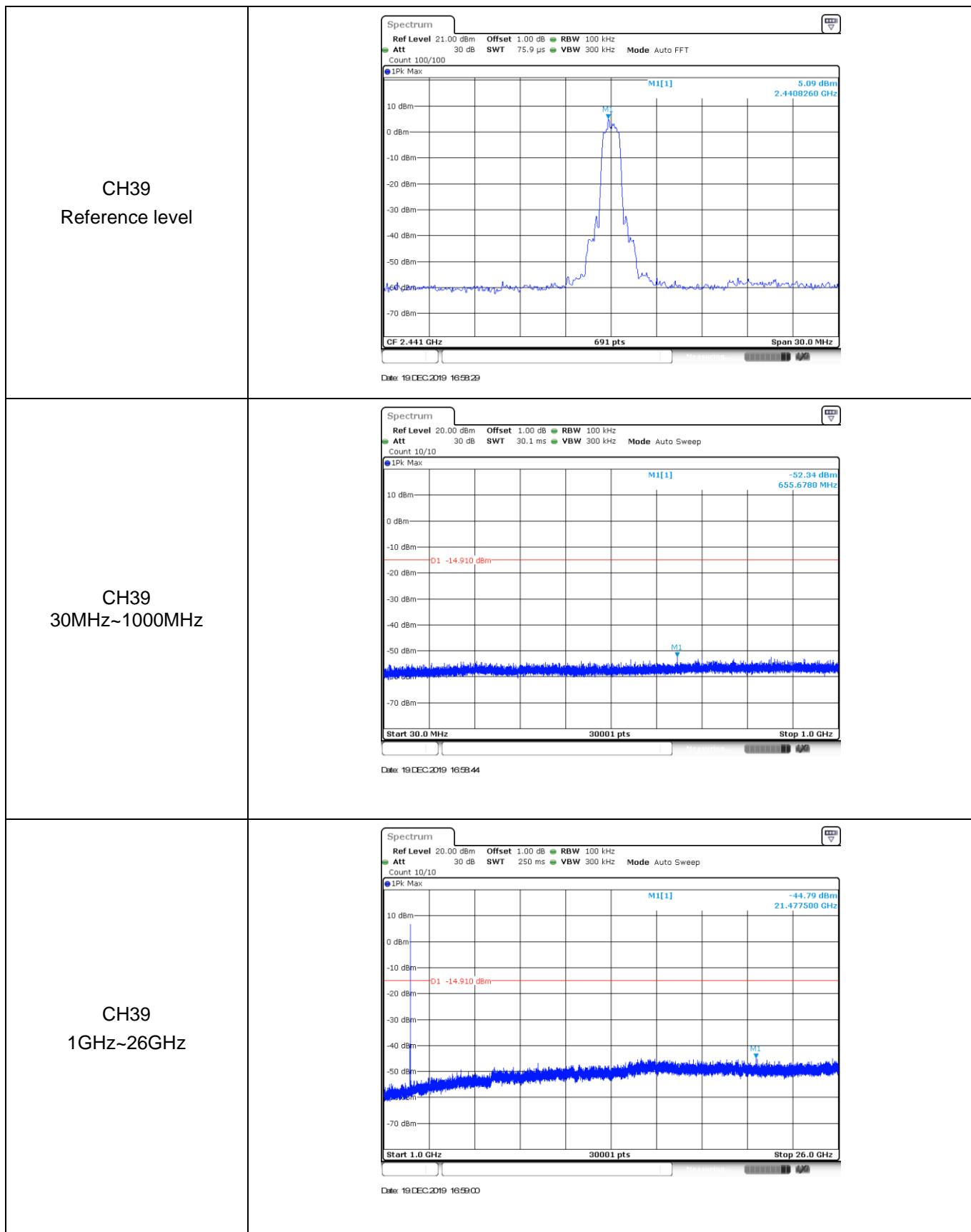


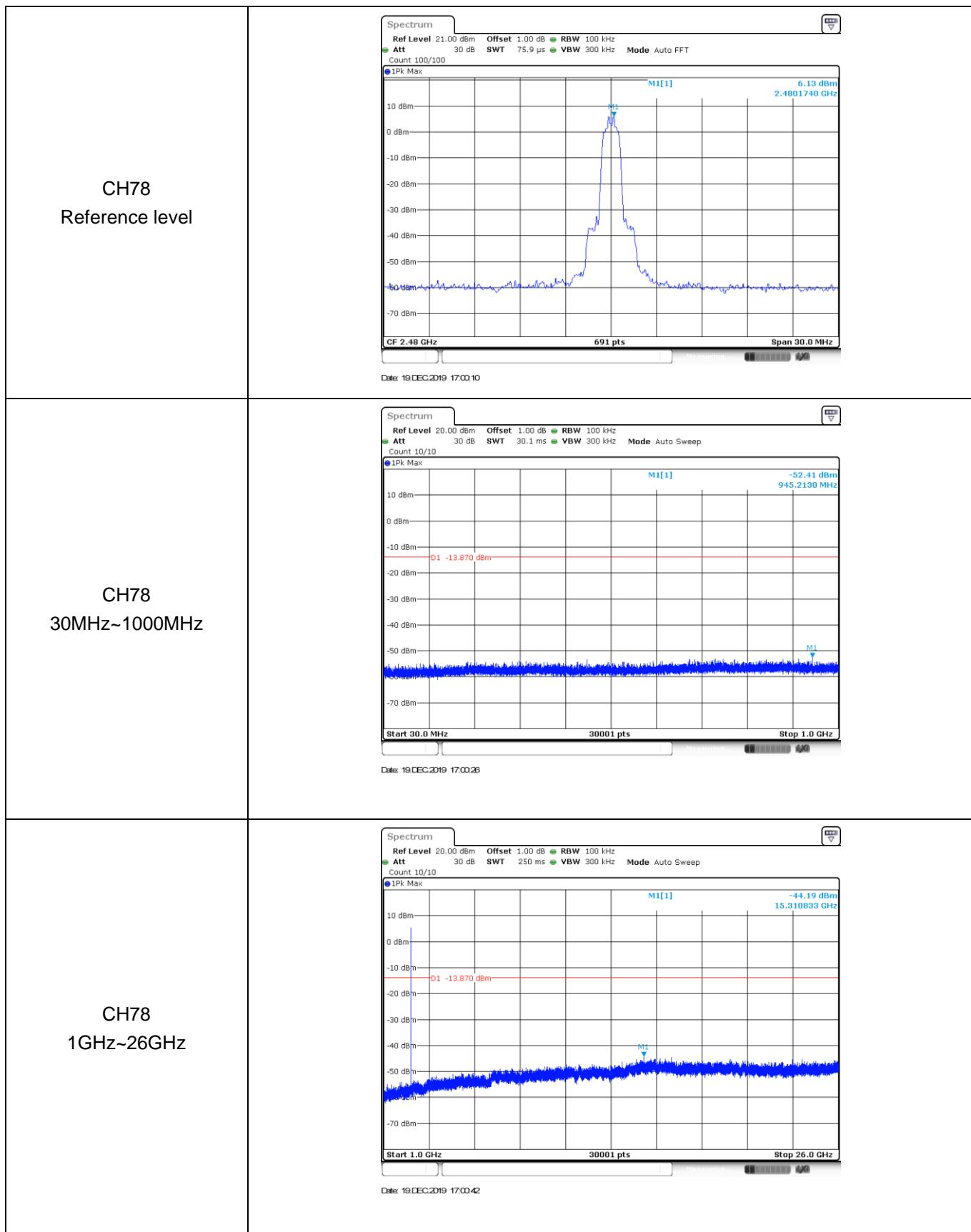
Test Item:	Spurious Emission	Modulation type:	GFSK
CH00 Reference level	 <p>Spectrum Ref Level 21.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 75.9 μs VBW 300 kHz Mode Auto FFT Count 100/100 • 1Pk Max M1[1] 7.69 dBm 2.4019570 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.402 GHz 691 pts Span 30.0 MHz Date: 19 DEC 2019 16:51:22</p>		
CH00 30MHz~1000MHz	 <p>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] -52.65 dBm 938.1650 MHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm Start 30.0 MHz 30001 pts Stop 1.0 GHz Date: 19 DEC 2019 16:51:38</p>		
CH00 1GHz~26GHz	 <p>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] -43.41 dBm 15.965833 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm Start 1.0 GHz 30001 pts Stop 26.0 GHz Date: 19 DEC 2019 16:51:54</p>		

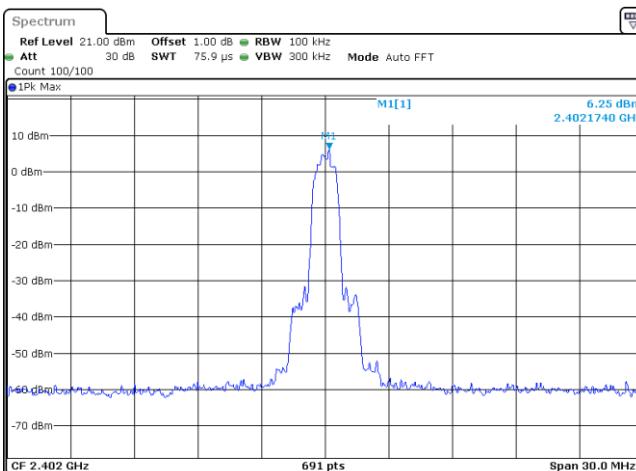
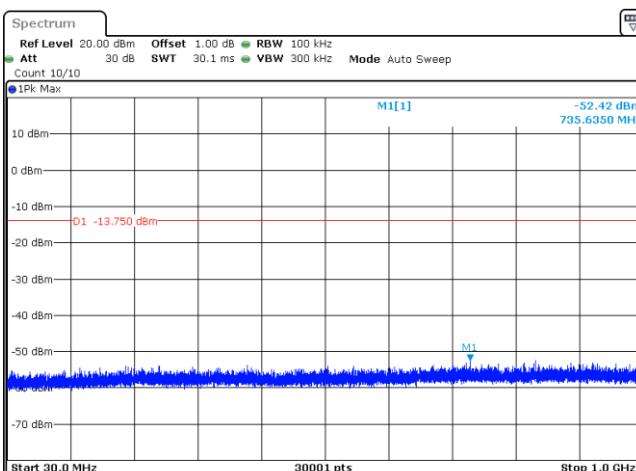
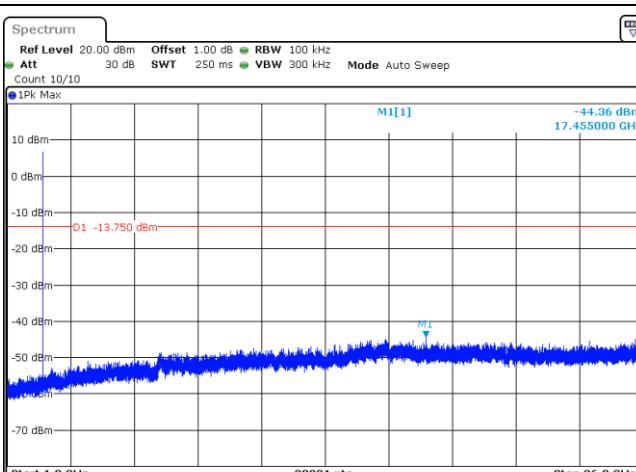


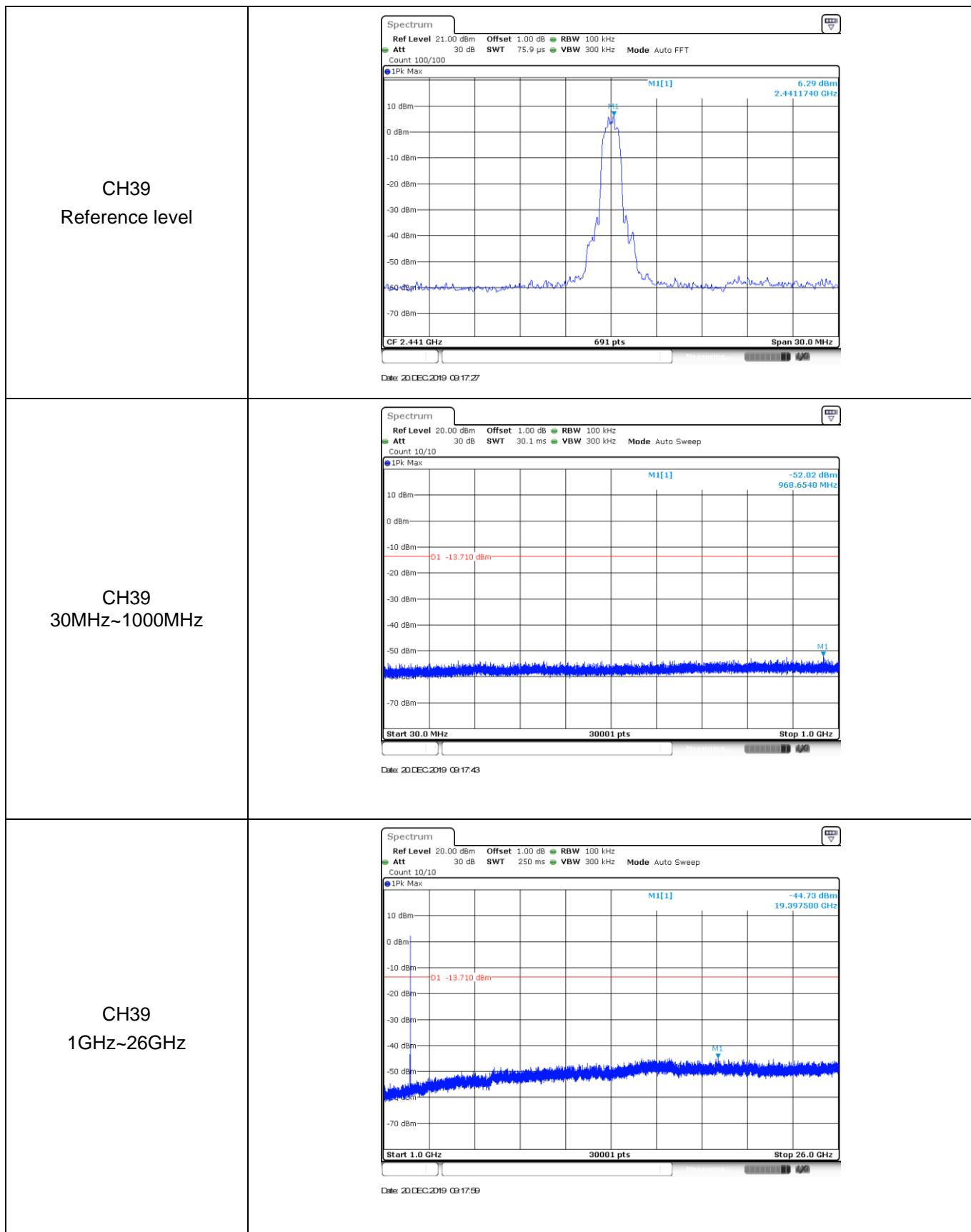


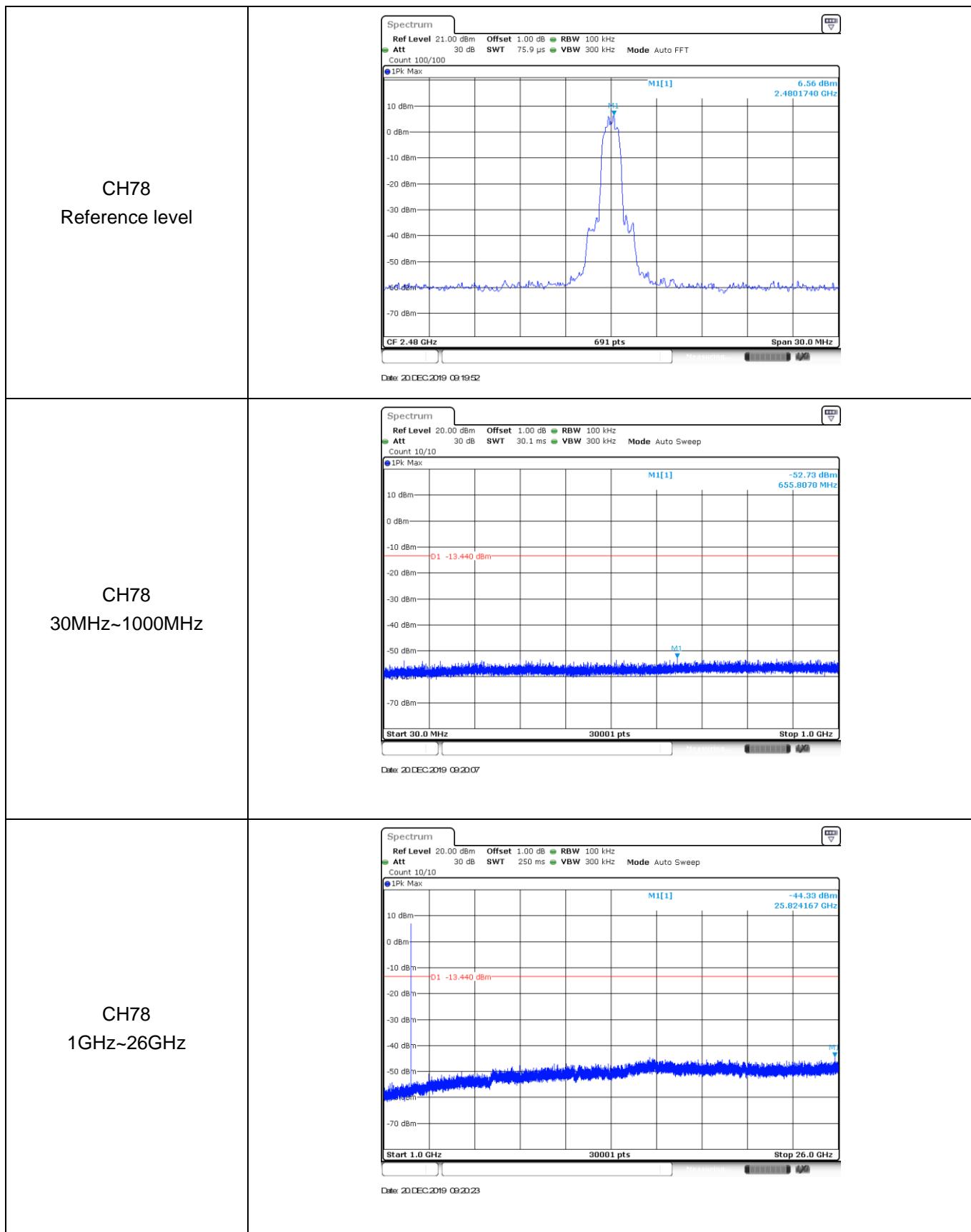
Test Item:	Spurious Emission	Modulation type:	$\pi/4$ DQPSK
CH00 Reference level			
CH00 30MHz~1000MHz			
CH00 1GHz~26GHz			





Test Item:	Spurious Emission	Modulation type:	8DPSK
CH00 Reference level			
CH00 30MHz~1000MHz			
CH00 1GHz~26GHz			





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