

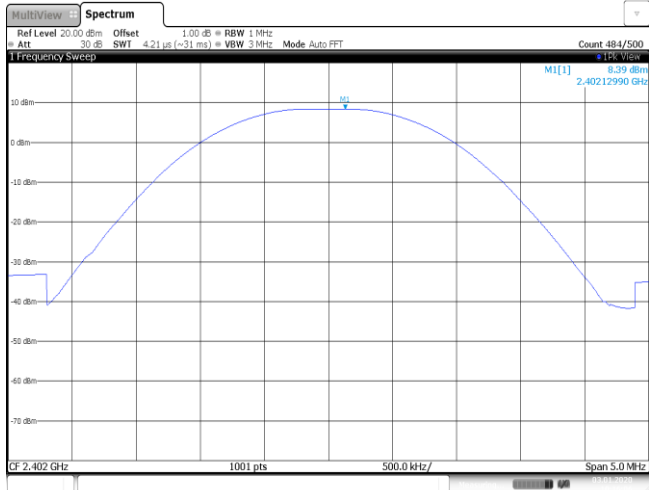
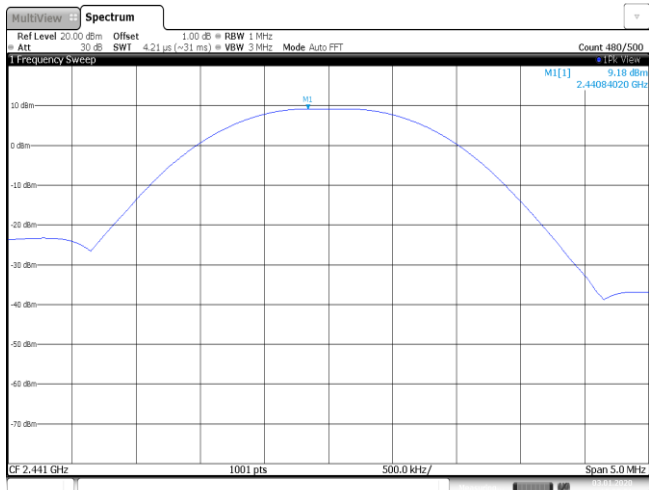
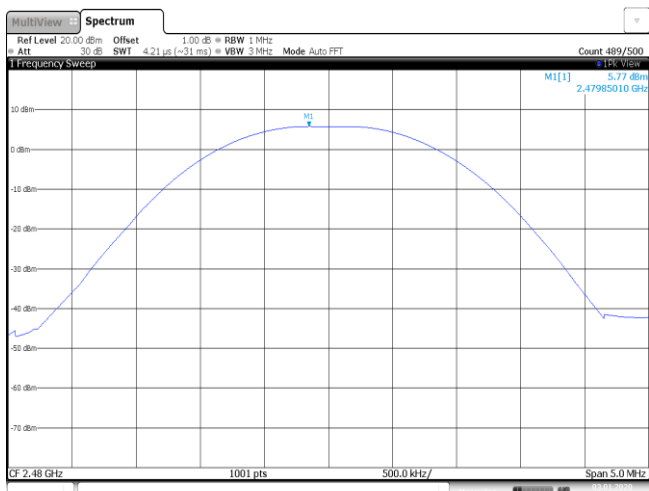
APPENDIX REPORT

Project No.	SHT1911060702EW	Radio Specification	Bluetooth EDR
Test sample No.	YPHT19110607028	Model No.	TE300
Start test date	2020/1/2	Finish date	2020/1/2
Temperature	25°C	Humidity	50%
Test Engineer	Ximing.Huang	Auditor	<i>William.wang</i>

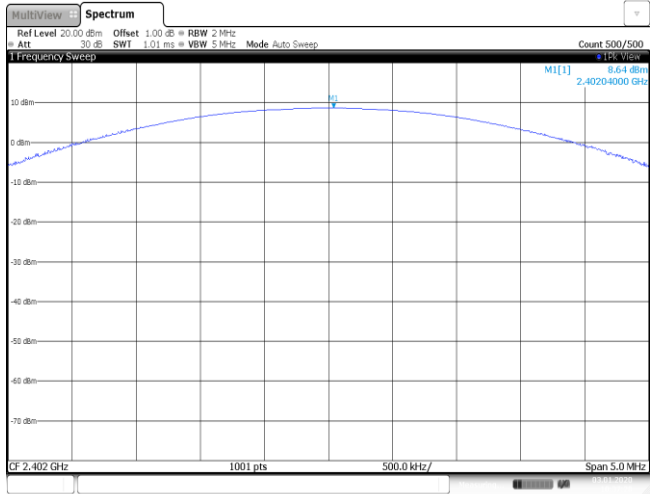
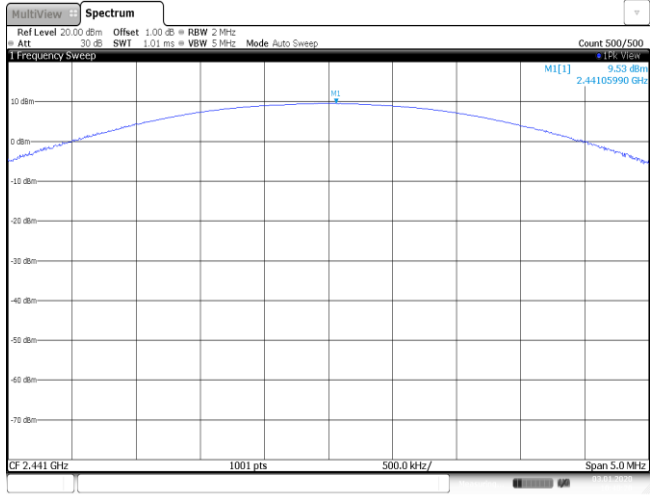
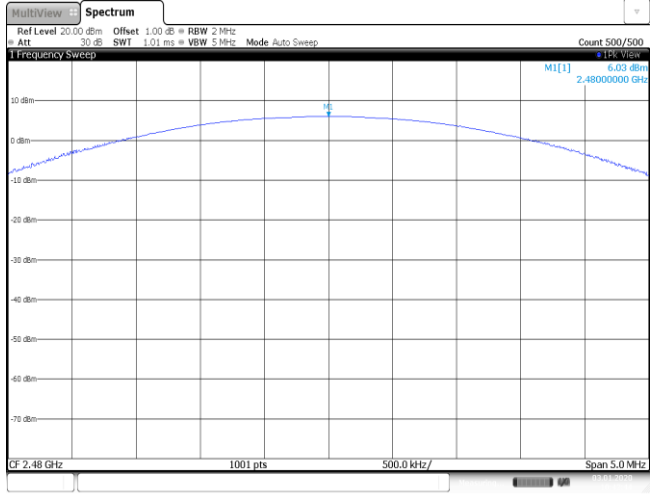
Appendix clause	Test item	Result
A	Peak Output Power	PASS
B	20 dB Bandwidth	PASS
C	99% Occupied Bandwidth	PASS
D	Carrier Frequencies Separation	PASS
E	Hopping Channel Number	PASS
F	Dwell Time	PASS
G	Duty Cycle Correction Factor (DCCF)	PASS
H	Band edge and Spurious Emissions(coducted)	PASS

Appendix A: Peak Output Power

Modulation type	Channel	Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
GFSK	00	8.39	7.85	≤ 30.00	Pass
	39	9.18	8.62		
	78	5.77	5.24		
$\pi/4$ DQPSK	00	8.47	8.01	≤ 21.00	Pass
	39	9.34	8.85		
	78	5.82	5.43		
8DPSK	00	8.64	8.48	≤ 21.00	Pass
	39	9.53	9.02		
	78	6.03	5.46		

Modulation Type:	GFSK
CH00	 Count 484/500 M1[1] 8.39 dBm 2.40212990 GHz CF 2.402 GHz 1001 pts 500.0 kHz/ Span 5.0 MHz Date: 3 JAN 2020 10:16:06
CH39	 Count 480/500 M1[1] 9.18 dBm 2.44084020 GHz CF 2.441 GHz 1001 pts 500.0 kHz/ Span 5.0 MHz Date: 3 JAN 2020 10:22:31
CH78	 Count 489/500 M1[1] 5.77 dBm 2.47985010 GHz CF 2.48 GHz 1001 pts 500.0 kHz/ Span 5.0 MHz Date: 3 JAN 2020 10:25:47

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Modulation Type:	8DPSK
CH00	 The spectrum plot for CH00 shows a peak at 2.402 GHz with a level of 8.64 dBm. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 2 MHz, Att 30 dB, SWI 1.01 ms, VBW 5 MHz, Mode Auto Sweep, Count 500/500. The x-axis is frequency in GHz, ranging from 2.400 to 2.404. The y-axis is power in dBm, ranging from -70 to 10. The plot shows a single peak at 2.402 GHz. Date: 3 JAN 2020 10:37:28
CH39	 The spectrum plot for CH39 shows a peak at 2.441 GHz with a level of 9.53 dBm. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 2 MHz, Att 30 dB, SWI 1.01 ms, VBW 5 MHz, Mode Auto Sweep, Count 500/500. The x-axis is frequency in GHz, ranging from 2.439 to 2.443. The y-axis is power in dBm, ranging from -70 to 10. The plot shows a single peak at 2.441 GHz. Date: 3 JAN 2020 10:40:20
CH78	 The spectrum plot for CH78 shows a peak at 2.48 GHz with a level of 6.03 dBm. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 2 MHz, Att 30 dB, SWI 1.01 ms, VBW 5 MHz, Mode Auto Sweep, Count 500/500. The x-axis is frequency in GHz, ranging from 2.478 to 2.482. The y-axis is power in dBm, ranging from -70 to 10. The plot shows a single peak at 2.48 GHz. Date: 3 JAN 2020 10:42:44

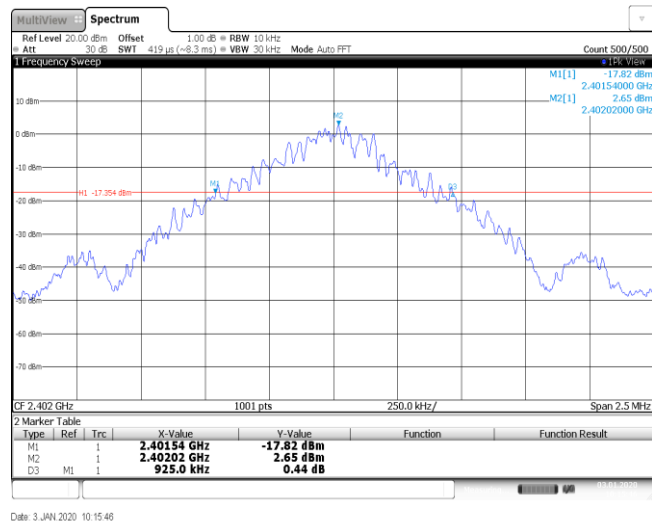
Appendix B : 20 dB Bandwidth

Modulation type	Channel	20 dB Bandwidth (kHz)	Limit (kHz)	Result
GFSK	00	925.00	-	Pass
	39	925.00		
	78	928.00		
$\pi/4$ DQPSK	00	1323.00	-	Pass
	39	1325.00		
	78	1325.00		
8DPSK	00	1305.00	-	Pass
	39	1305.00		
	78	1305.00		

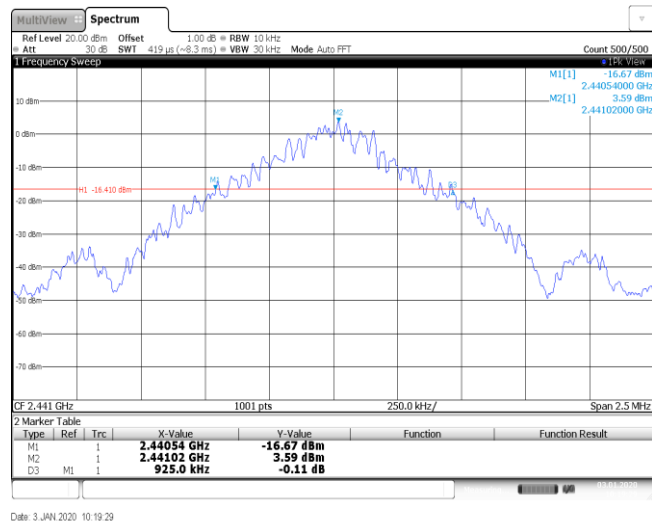
Modulation Type:

GFSK

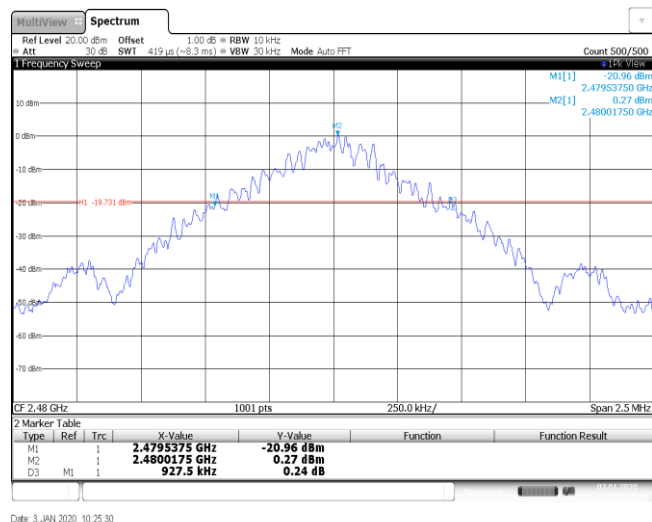
CH00

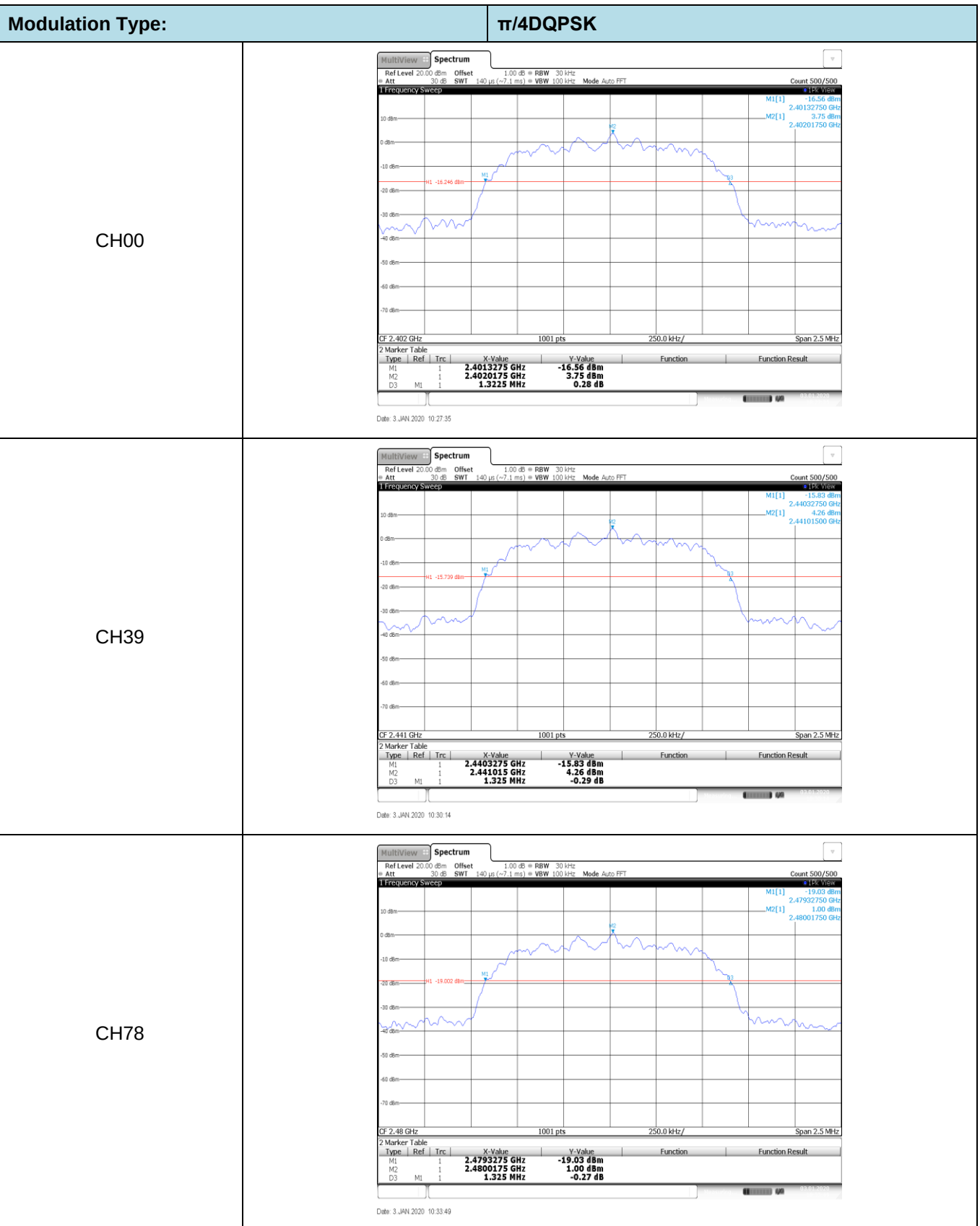


CH39



CH78

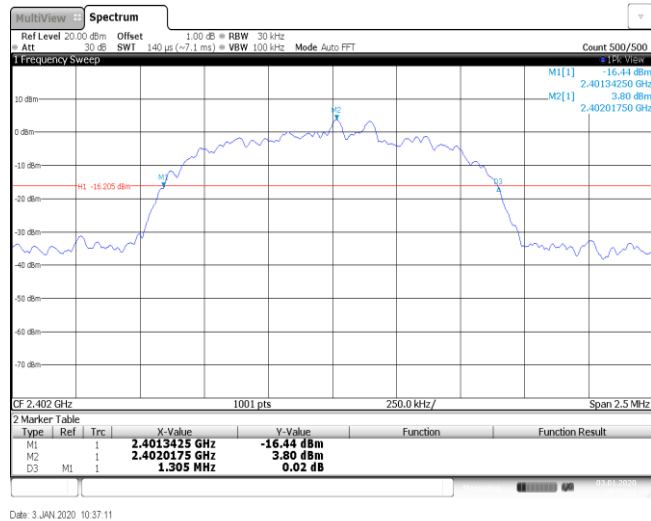




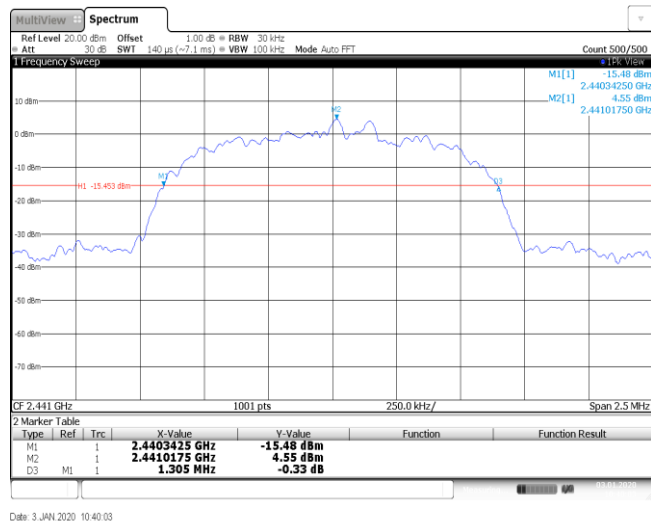
Modulation Type:

8DPSK

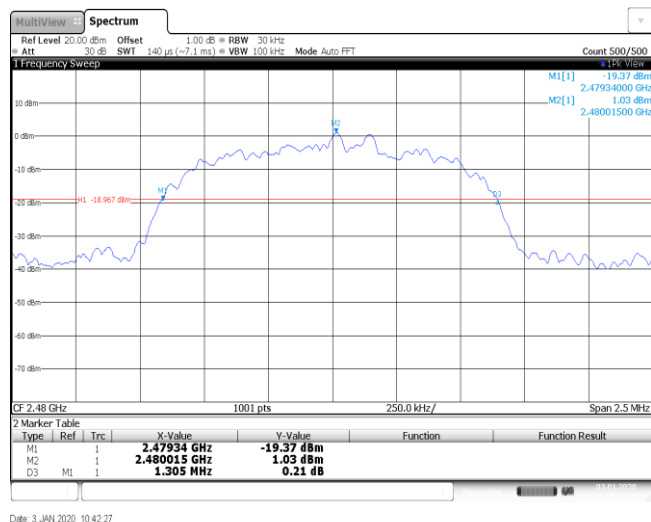
CH00



CH39

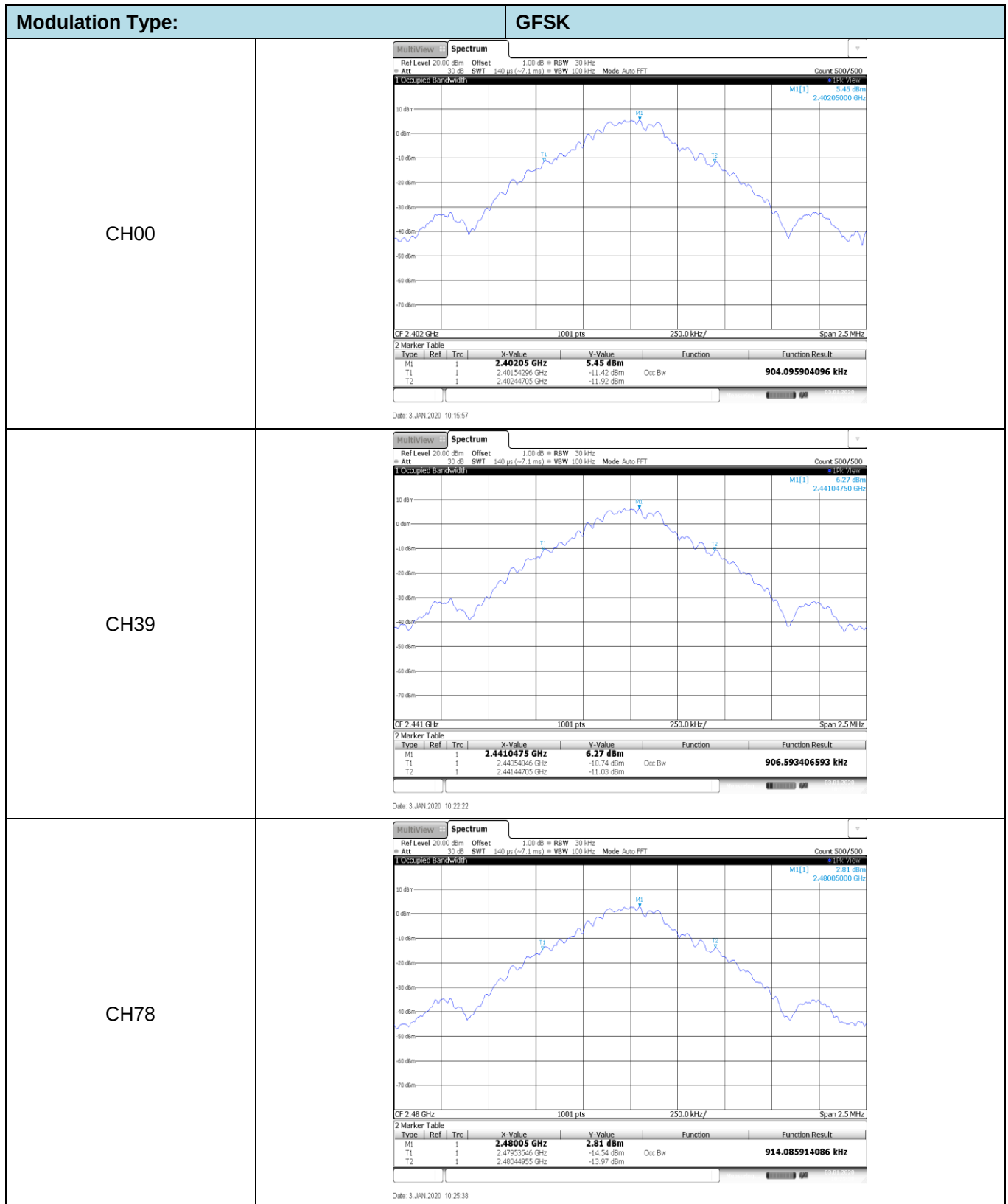


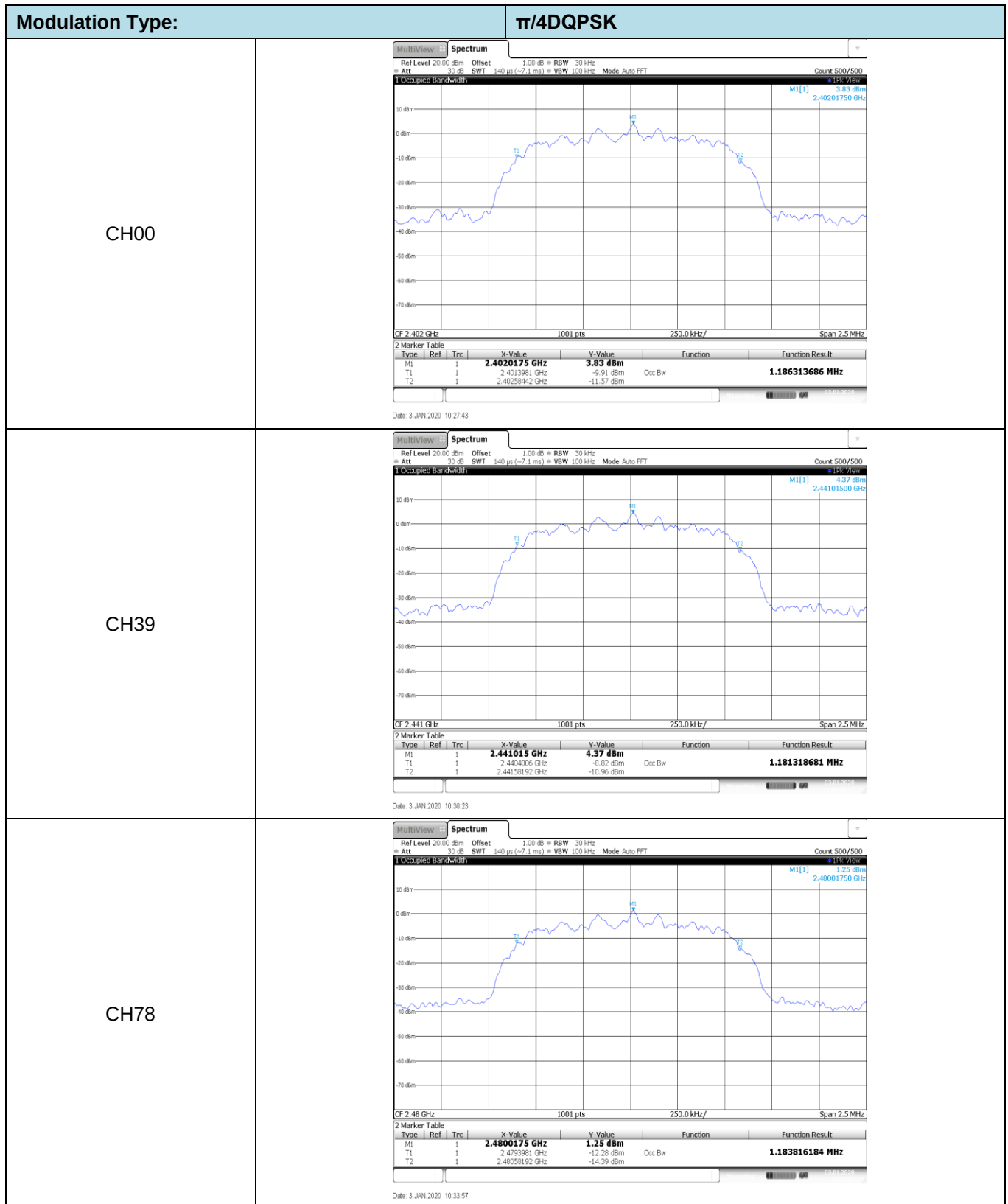
CH78

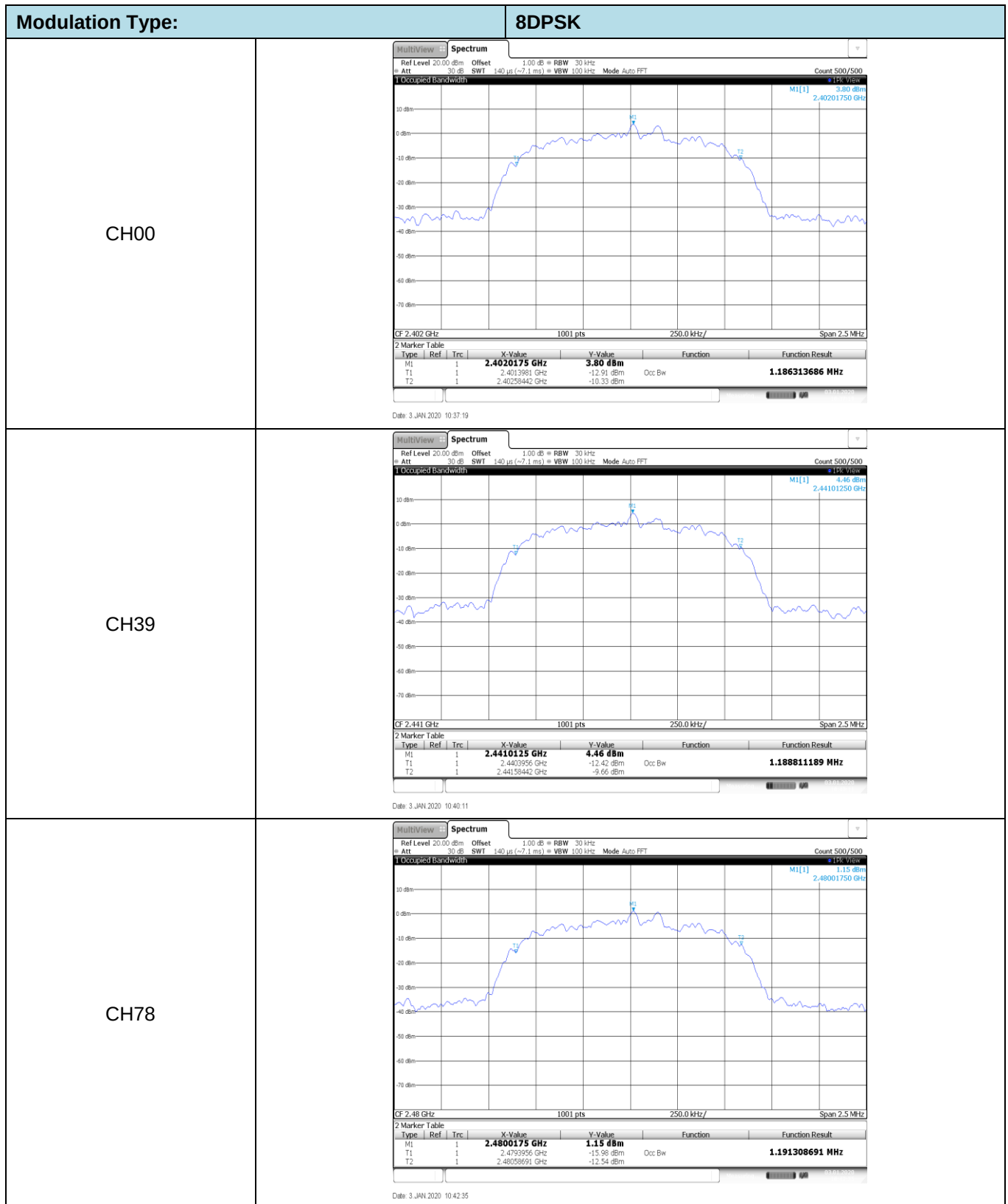


Appendix C: 99% Occupied Bandwidth

Modulation type	Channel	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
GFSK	00	0.90	-	Pass
	39	0.91		
	78	0.91		
$\pi/4$ DQPSK	00	1.19	-	Pass
	39	1.18		
	78	1.18		
8DPSK	00	1.19	-	Pass
	39	1.19		
	78	1.19		







Appendix D: Carrier Frequencies Separation

Modulation type	Channel	Carrier Frequencies Separation (MHz)	Limit (kHz) *	Result
GFSK	39	1.00	≥928.00	Pass
π/4DQPSK	39	1.00	≥883.33	Pass
8DPSK	39	1.00	≥870.00	Pass

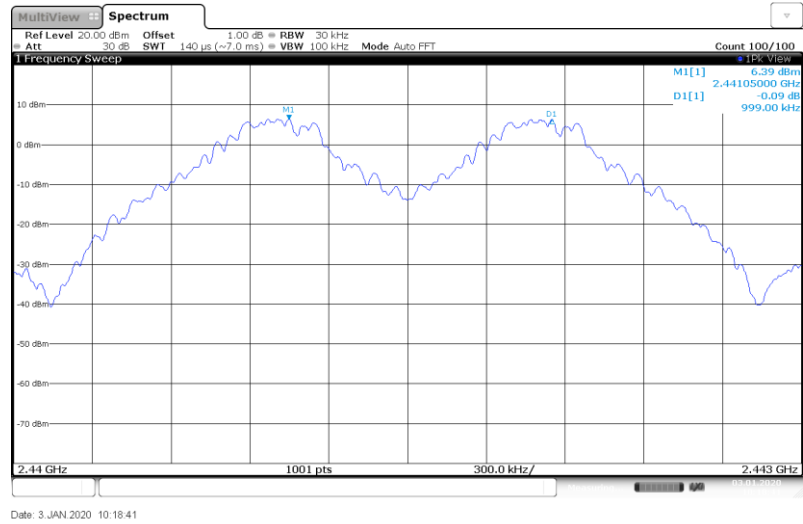
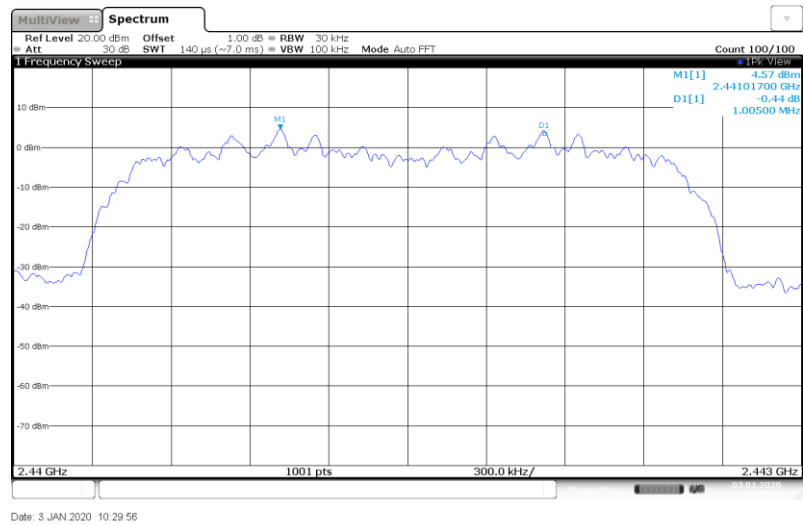
Note:

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

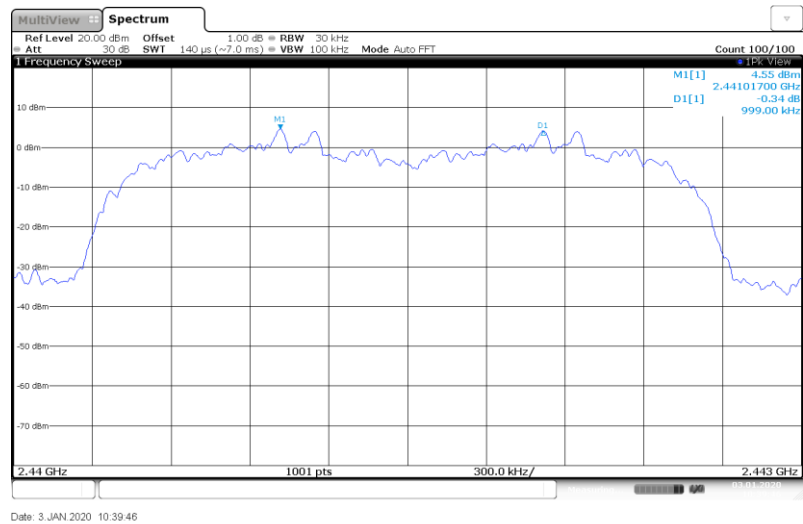
π/4DQPSK limit = 2/3 * The maximum 20 dB Bandwidth for π/4DQPSK modulation on the appendix B.

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

GFSK

 π /4DQPSK

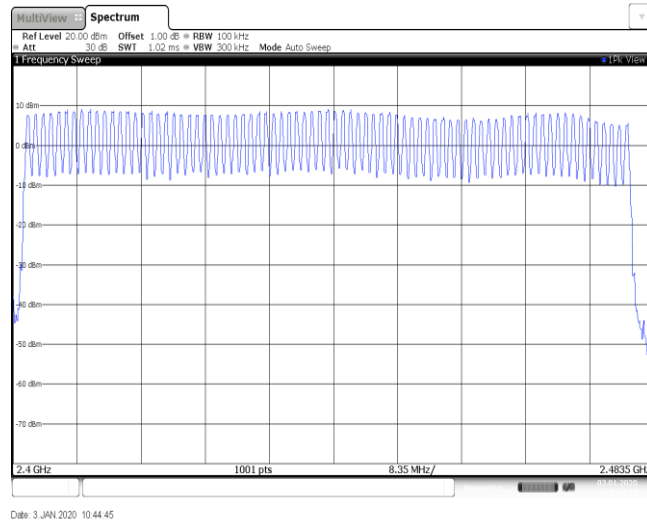
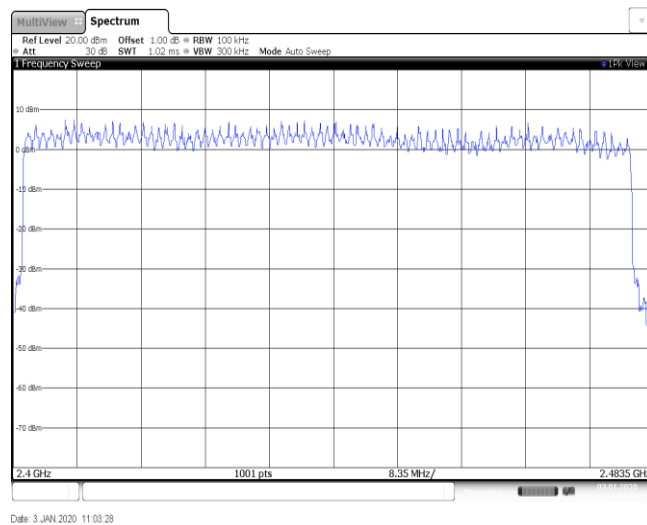
8DPSK



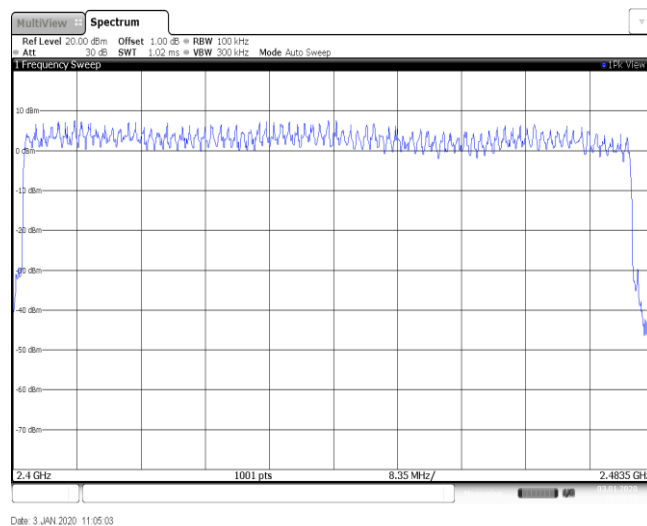
Appendix E: Hopping Channel Number

Modulation type	Channel number	Limit	Result
GFSK	79	≥15.00	Pass
π/4DQPSK	79		
8DPSK	79		

GFSK

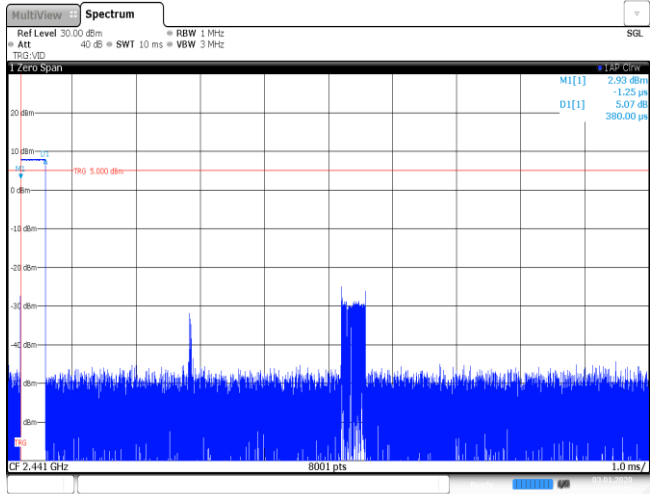
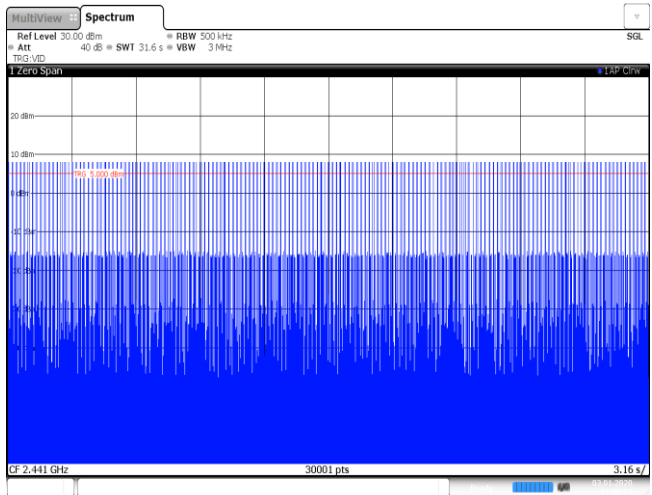
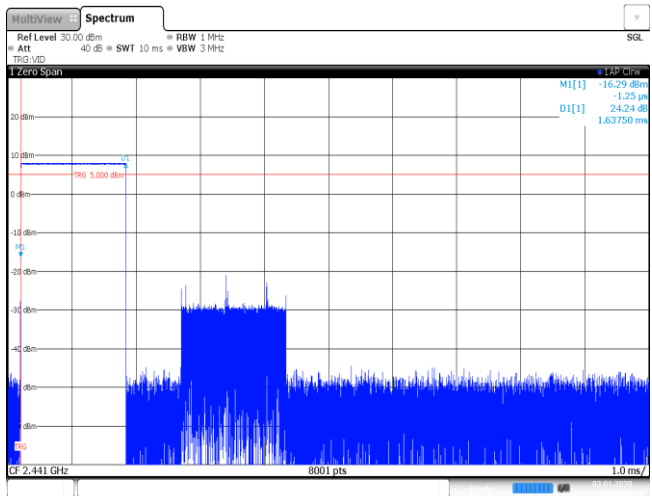
 $\pi/4$ DQPSK

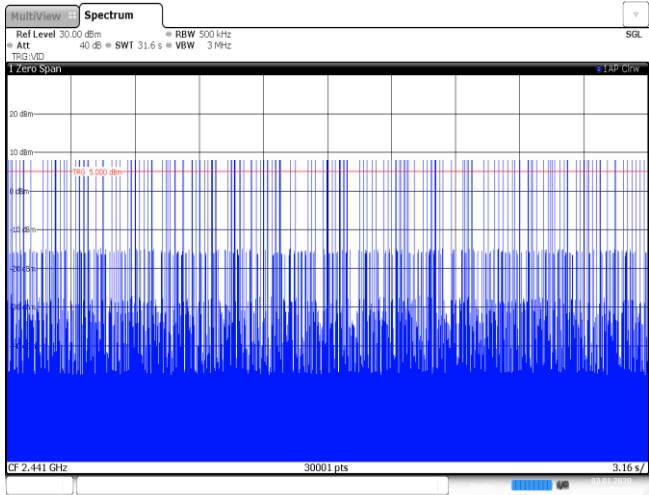
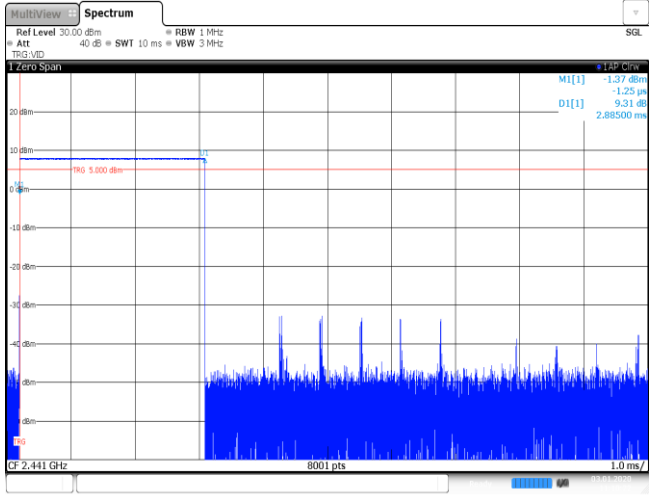
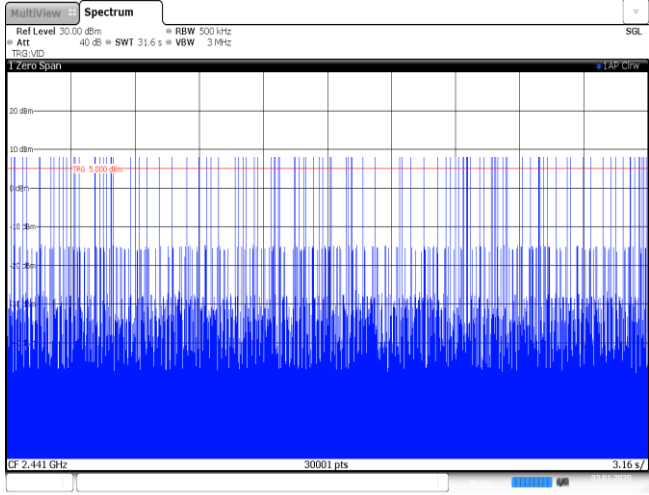
8DPSK

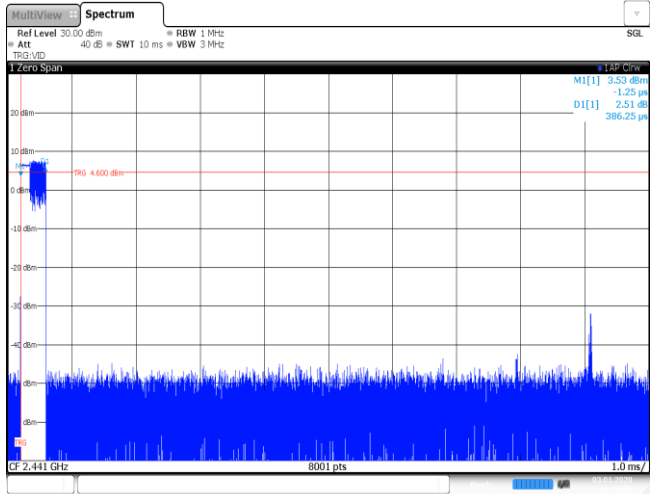
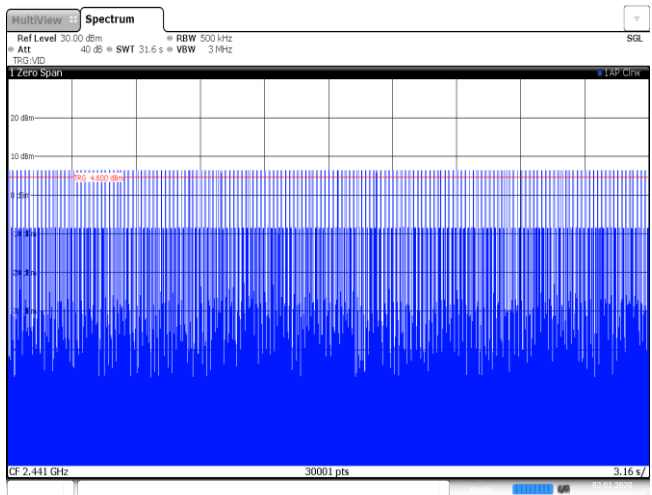
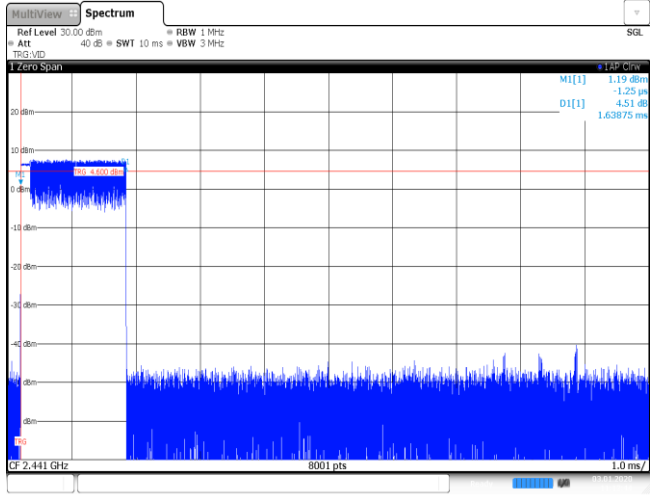


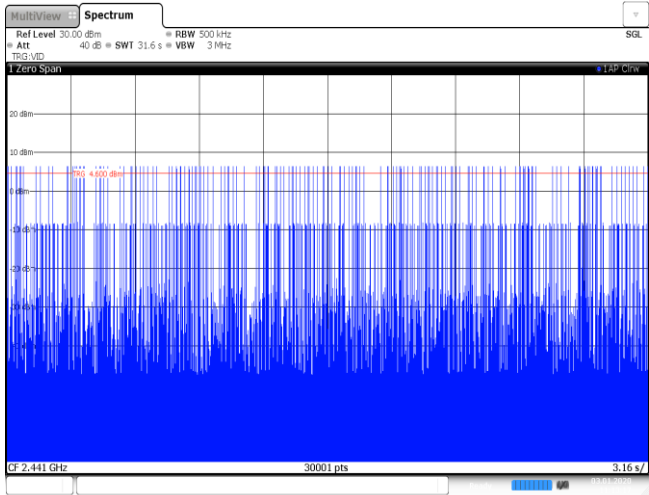
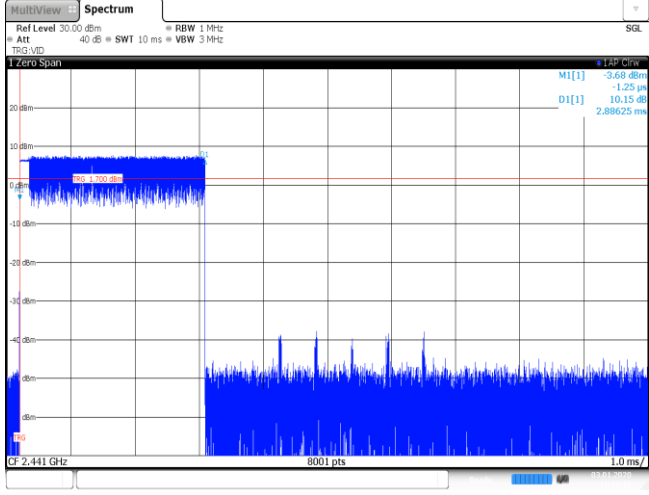
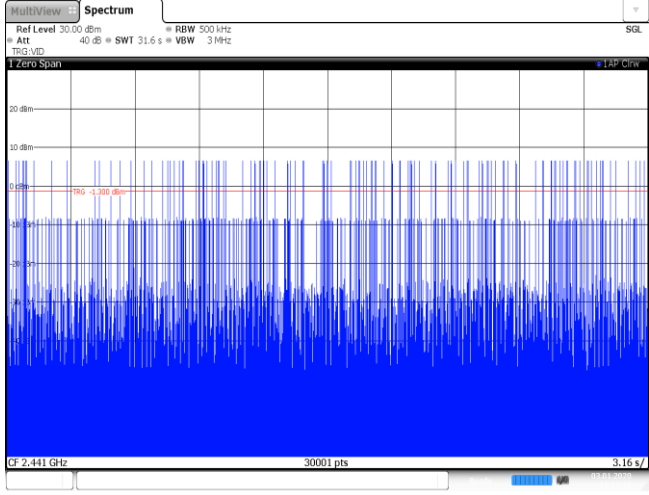
Appendix F: Dwell Time

Modulation type	Packet	Burst Width [ms]	Total Hops[hop*ch]	Dwell time (Second)	Limit (Second)	Result
GFSK	DH1	0.38	314	0.12	≤ 0.40	Pass
	DH3	1.64	164	0.27		
	DH5	2.89	102	0.29		
$\pi/4$ DQPSK	2DH1	0.39	320	0.12	≤ 0.40	Pass
	2DH3	1.64	160	0.26		
	2DH5	2.89	119	0.34		
8DPSK	3DH1	0.39	321	0.12	≤ 0.40	Pass
	3DH3	1.64	162	0.27		
	3DH5	2.89	104	0.30		

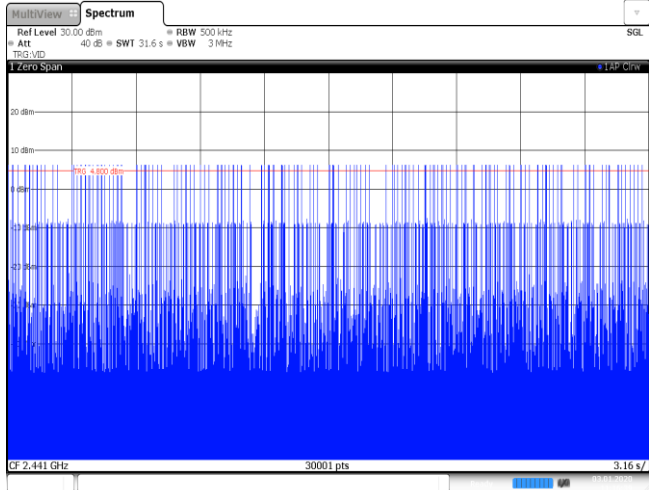
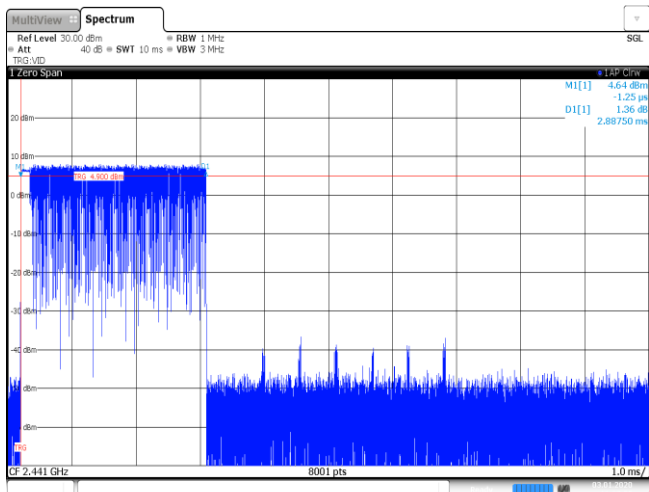
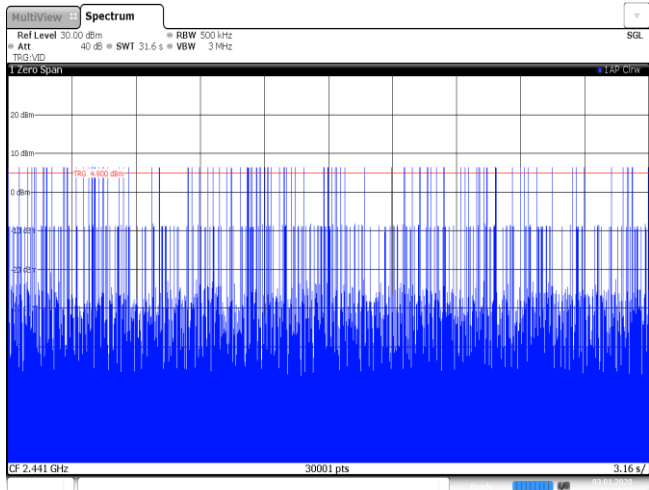
Modulation Type:	GFSK
DH1 Burst width	 The spectrum plot shows a signal at 2.441 GHz with a bandwidth of 8001 pts. The y-axis represents power in dBm, ranging from -40 to 20. A red line indicates a reference level at 5.000 dBm. The signal is characterized by a sharp peak at the center frequency, with a bandwidth of approximately 1.0 ms. The plot includes parameters: Ref Level 30.00 dBm, Att 40 dB, SWT 10 ms, VBW 3 MHz, RBW 1 MHz, and TSG V/D. The date is 3 JAN 2020 11:07:34.
DH1 Burst number	 The spectrum plot shows a signal at 2.441 GHz with a bandwidth of 30001 pts. The y-axis represents power in dBm, ranging from -40 to 20. A red line indicates a reference level at 5.000 dBm. The signal is characterized by a dense, continuous burst of energy across the entire bandwidth, with a duration of approximately 3.16 s. The plot includes parameters: Ref Level 30.00 dBm, Att 40 dB, SWT 31.6 s, VBW 3 MHz, RBW 500 kHz, and TSG V/D. The date is 3 JAN 2020 11:08:08.
DH3 Burst width	 The spectrum plot shows a signal at 2.441 GHz with a bandwidth of 8001 pts. The y-axis represents power in dBm, ranging from -40 to 20. A red line indicates a reference level at 5.000 dBm. The signal is characterized by a sharp peak at the center frequency, with a bandwidth of approximately 1.0 ms. The plot includes parameters: Ref Level 30.00 dBm, Att 40 dB, SWT 10 ms, VBW 3 MHz, RBW 1 MHz, and TSG V/D. The date is 3 JAN 2020 11:08:39.

DH3 Burst number	 Date: 3 JAN 2020 11:09:13
DH5 Burst width	 Date: 3 JAN 2020 11:10:22
DH5 Burst number	 Date: 3 JAN 2020 11:10:56

Modulation Type:	$\pi/4$ DQPSK
2DH1 Burst width	 The spectrum plot shows a signal centered at 2.441 GHz. The y-axis represents power in dBm, ranging from -40 to 20. The x-axis represents frequency in GHz, ranging from 2.440 to 2.442. A red horizontal line is drawn at -10 dBm. The signal is a narrowband burst. The plot includes a 'Zero Span' view. The date is 3 JAN 2020 11:11:35.
2DH1 Burst number	 The spectrum plot shows a signal centered at 2.441 GHz. The y-axis represents power in dBm, ranging from -40 to 20. The x-axis represents frequency in GHz, ranging from 2.440 to 2.442. A red horizontal line is drawn at -10 dBm. The signal is a narrowband burst. The plot includes a 'Zero Span' view. The date is 3 JAN 2020 11:12:09.
2DH3 Burst width	 The spectrum plot shows a signal centered at 2.441 GHz. The y-axis represents power in dBm, ranging from -40 to 20. The x-axis represents frequency in GHz, ranging from 2.440 to 2.442. A red horizontal line is drawn at -10 dBm. The signal is a narrowband burst. The plot includes a 'Zero Span' view. The date is 3 JAN 2020 11:12:44.

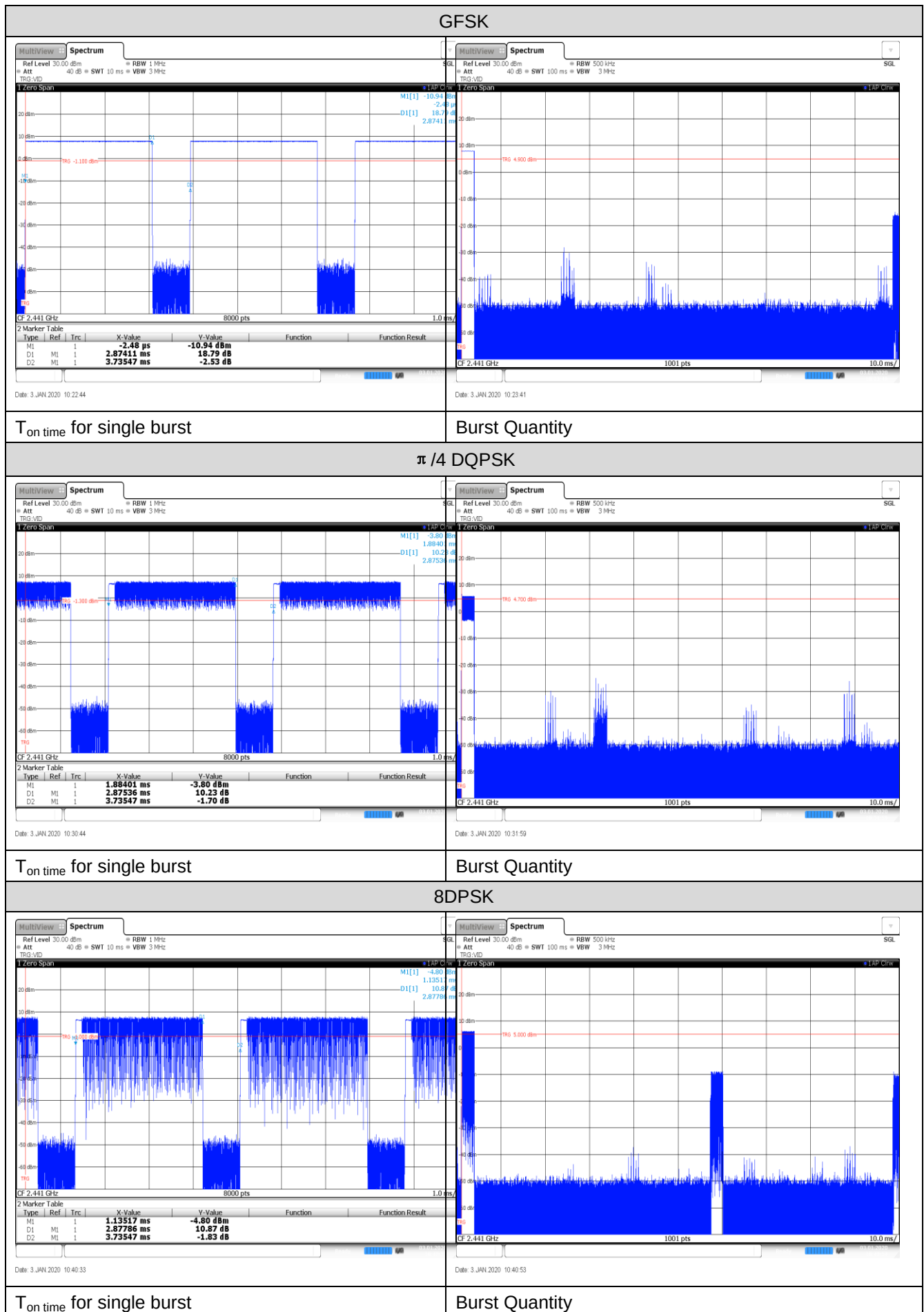
2DH3 Burst number	 Date: 3 JAN 2020 11:13:17
2DH5 Burst width	 Date: 3 JAN 2020 11:13:46
2DH5 Burst number	 Date: 3 JAN 2020 11:14:20

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3DH3 Burst number	 The spectrum plot shows a dense, continuous signal across the frequency range from 2.441 GHz to 3.16 GHz. The y-axis represents power in dBm, ranging from -40 to 20. The x-axis represents frequency in GHz. The plot is labeled 'Spectrum' and includes parameters: Ref Level 30.00 dBm, Att 40 dB, RBW 500 kHz, VSW 3 MHz, and 30001 pts. The date is 3 JAN 2020 11:16:40.
3DH5 Burst width	 The spectrum plot shows a signal burst that starts at approximately 2.441 GHz and ends at approximately 2.88750 GHz. The y-axis represents power in dBm, ranging from -40 to 20. The x-axis represents frequency in GHz. The plot is labeled 'Spectrum' and includes parameters: Ref Level 30.00 dBm, Att 40 dB, RBW 1 MHz, VSW 3 MHz, and 8001 pts. The date is 3 JAN 2020 11:17:20.
3DH5 Burst number	 The spectrum plot shows a dense, continuous signal across the frequency range from 2.441 GHz to 3.16 GHz. The y-axis represents power in dBm, ranging from -40 to 20. The x-axis represents frequency in GHz. The plot is labeled 'Spectrum' and includes parameters: Ref Level 30.00 dBm, Att 40 dB, RBW 500 kHz, VSW 3 MHz, and 30001 pts. The date is 3 JAN 2020 11:17:54.

Appendix G: Duty Cycle Correction Factor (DCCF)

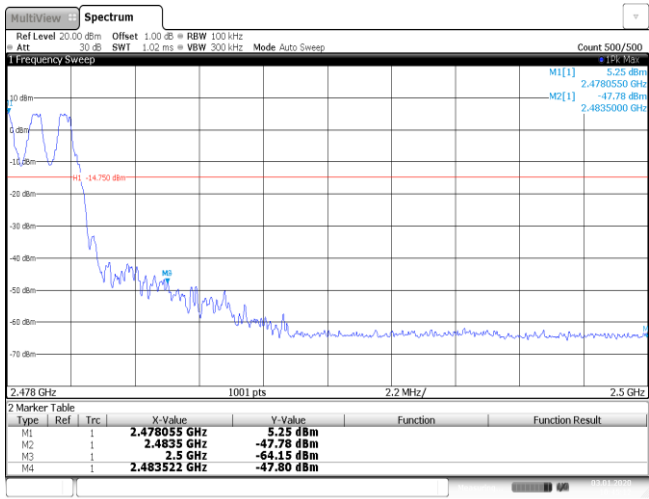
DCCF Calculate Formula					
$DCCF = 20 * \text{Log}(\text{duty cycle}) = 20 * \text{Log}(T_{\text{on time}} / T_{\text{period}})$					
Modulation type	Test Frequency (MHz)	$T_{\text{on time}}$ for single burst [ms]	T_{period} [ms]	Burst Quantity	DCCF [dB]
GFSK	2441	2.87	100	2	-24.82
$\pi/4$ DQPSK	2441	2.88	100	1	-30.81
8DPSK	2441	2.88	100	3	-21.27



Appendix H: Band edge and Spurious Emissions (conducted)

Test Item:	Band edge	Modulation type:	GFSK
CH00 No hopping mode	<		

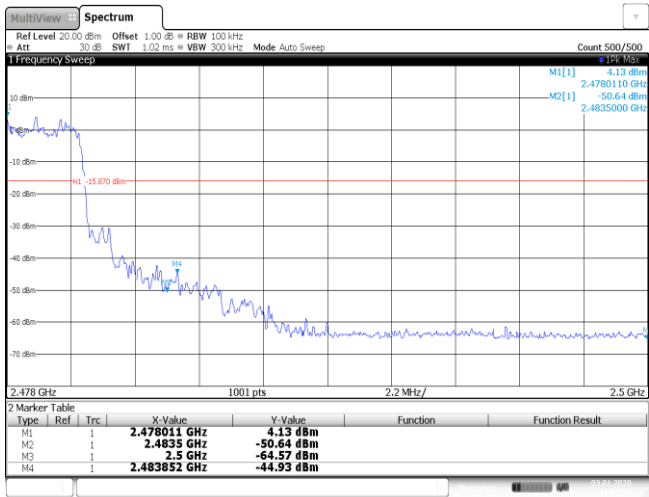
CH78
Hopping mode



Date: 3 JAN 2020 10:45:12

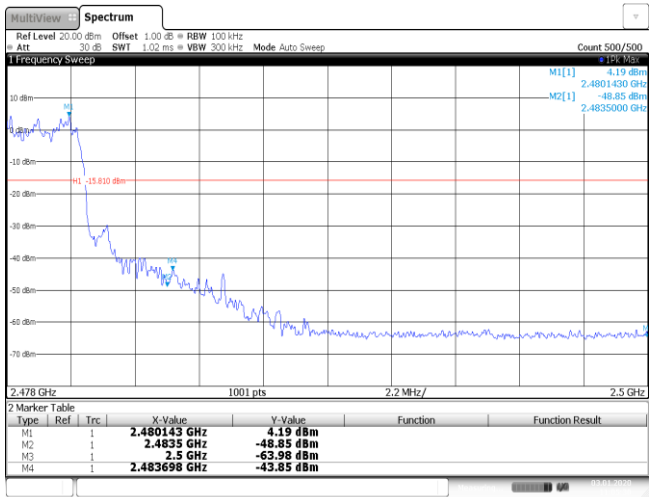
Test Item:	Band edge	Modulation type:	$\pi/4$ DQPSK
CH00 No hopping mode	</		

CH78
Hopping mode

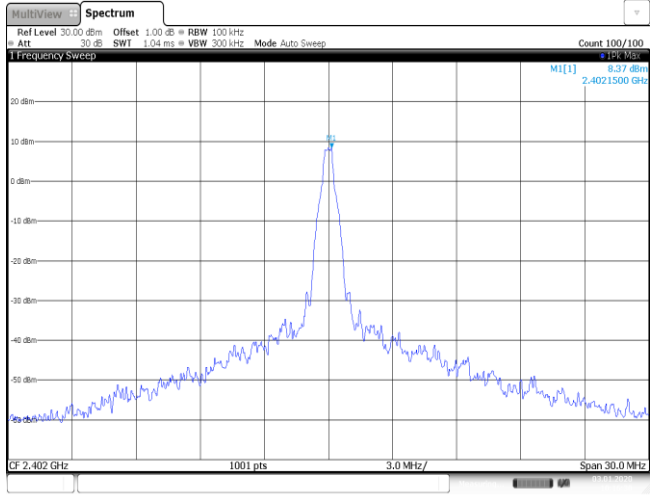
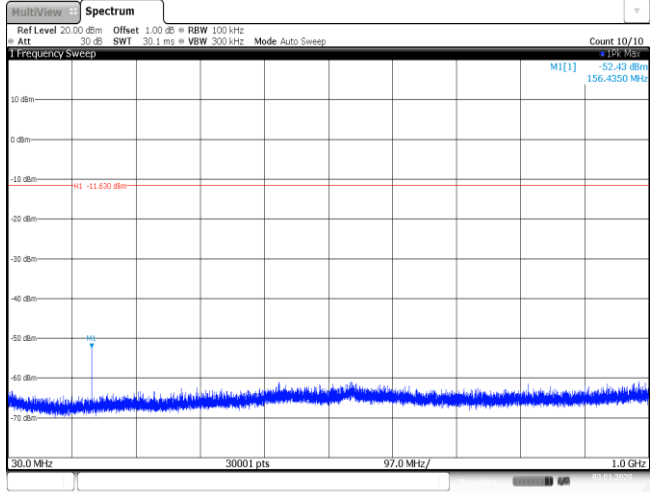
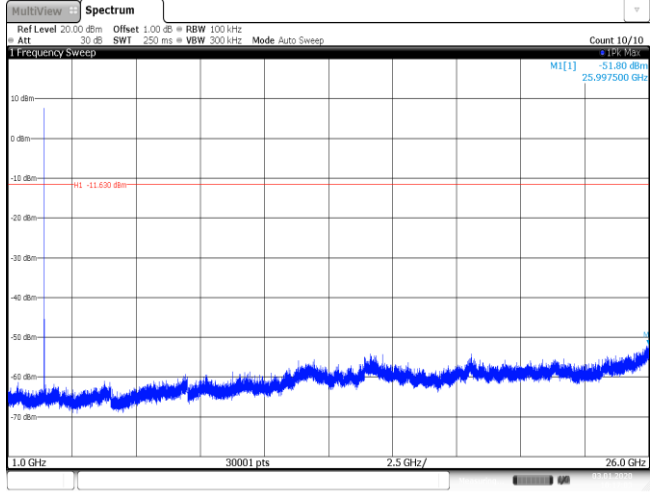


Test Item:	Band edge	Modulation type:	8DPSK
CH00 No hopping mode	</		

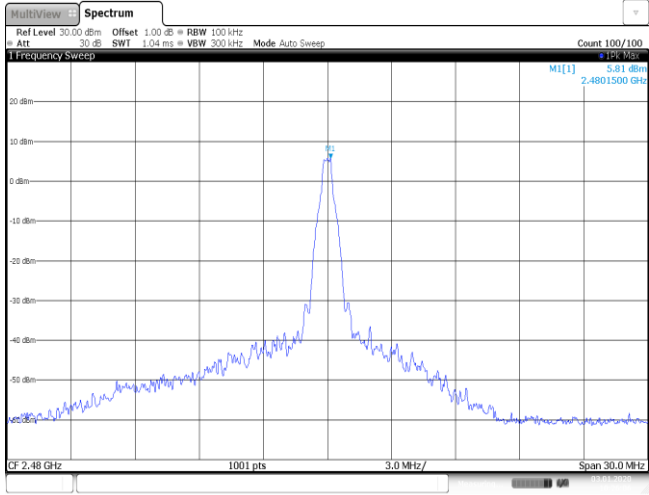
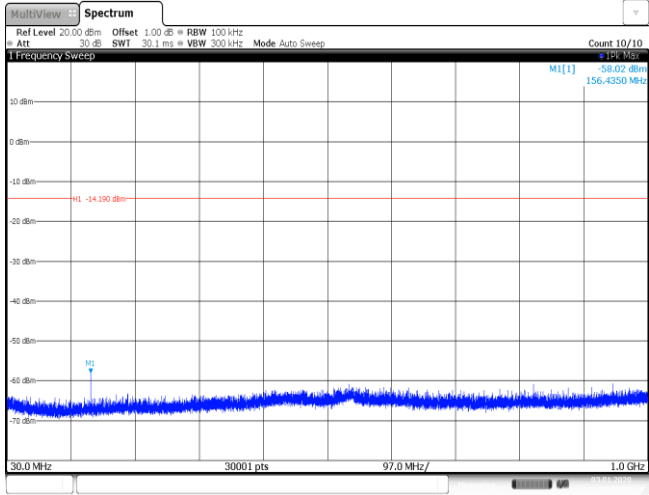
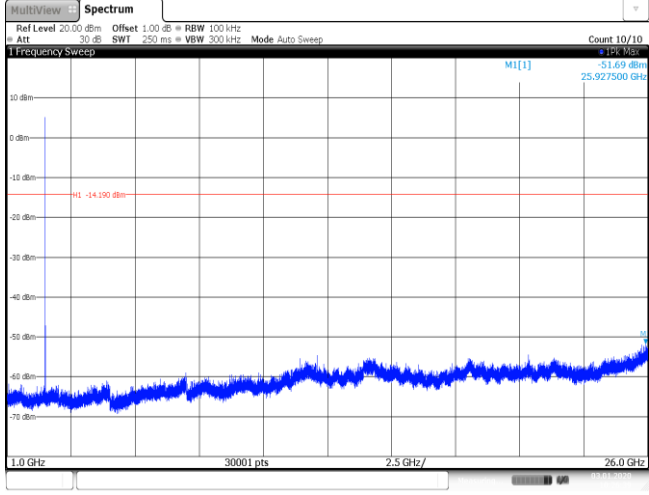
CH78
Hoppig mode

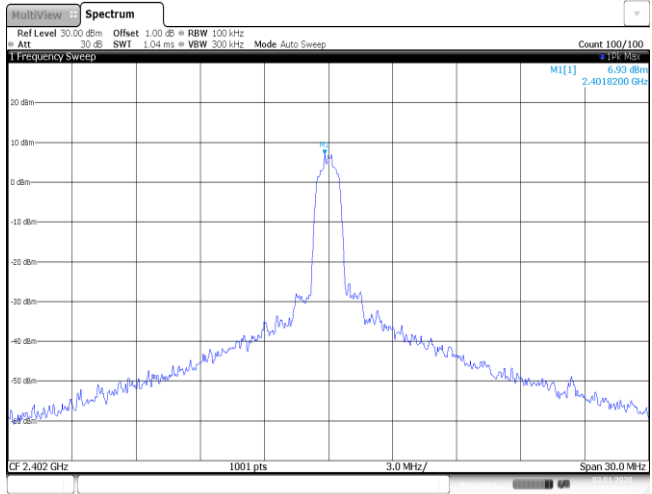
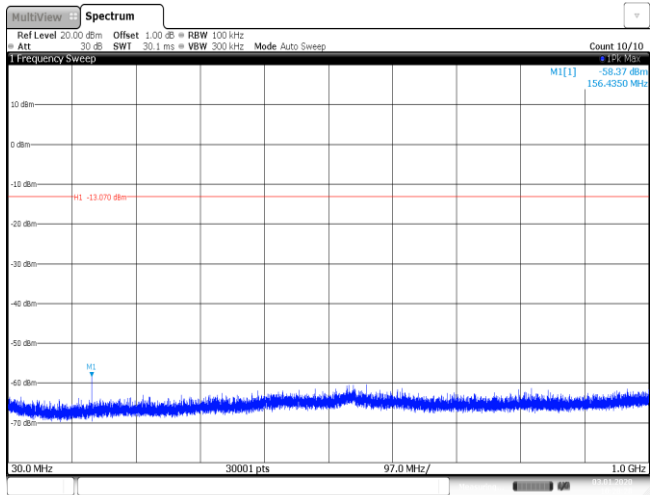
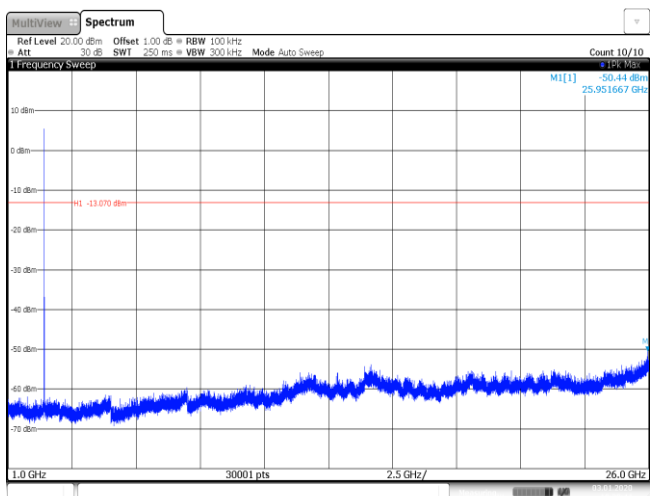


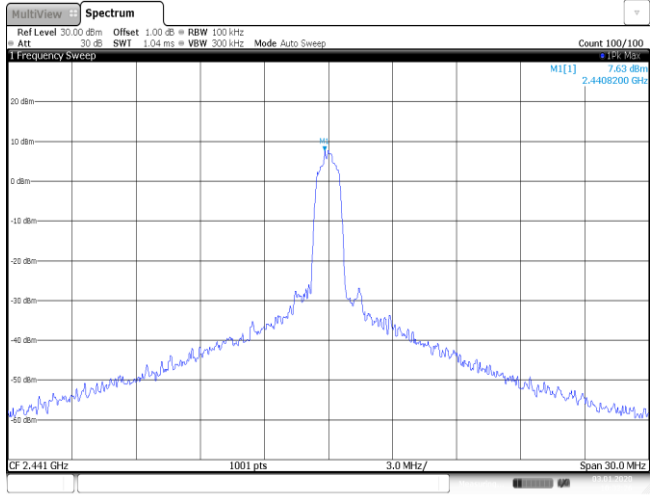
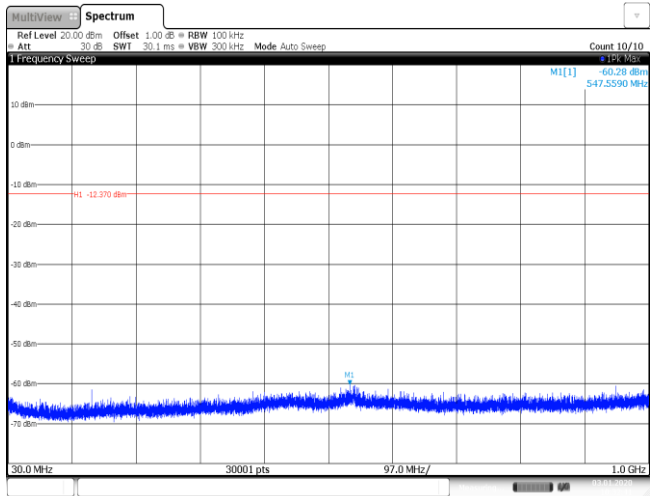
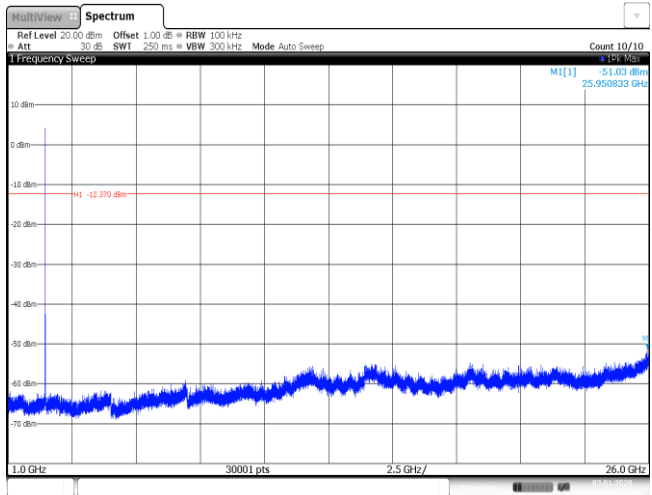
Date: 3 JAN 2020 11:05:30

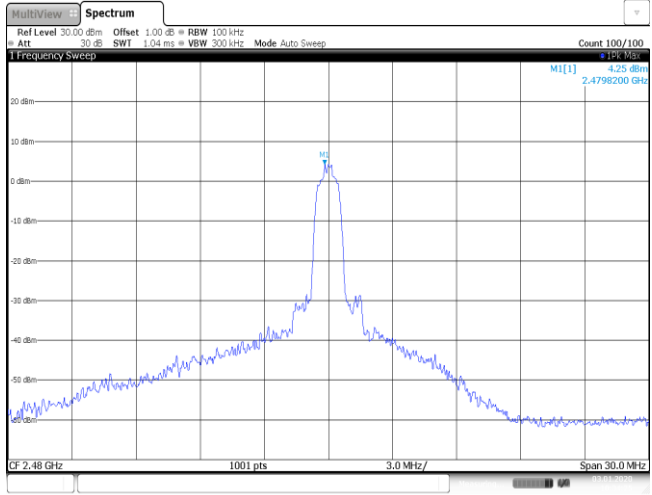
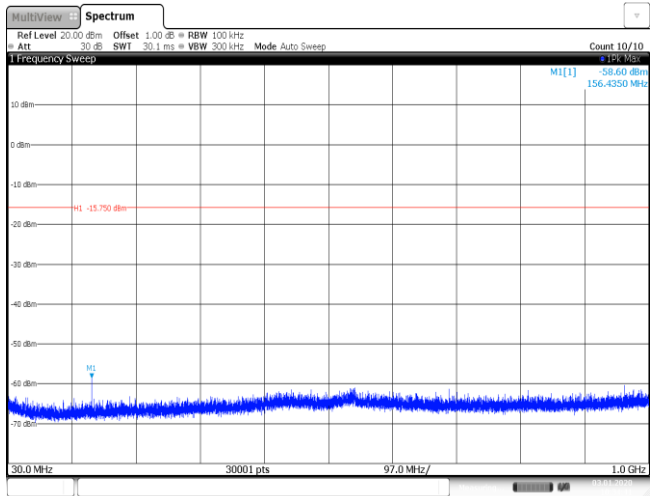
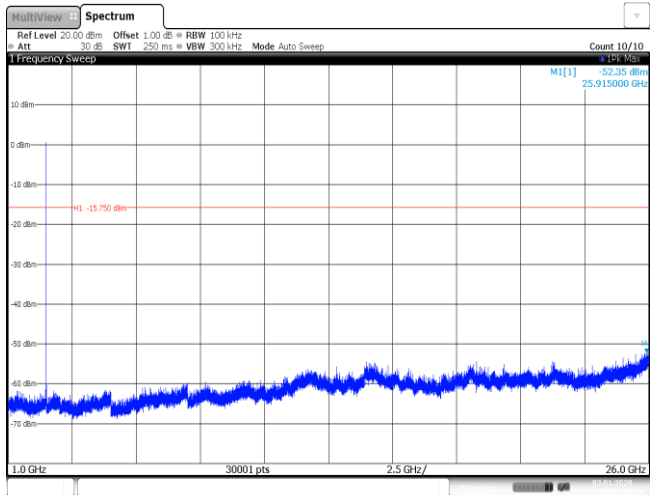
Test Item:	Spurious Emission	Modulation type:	GFSK
CH00 Reference level			
CH00 30MHz~1000MHz			
CH00 1GHz~26GHz			

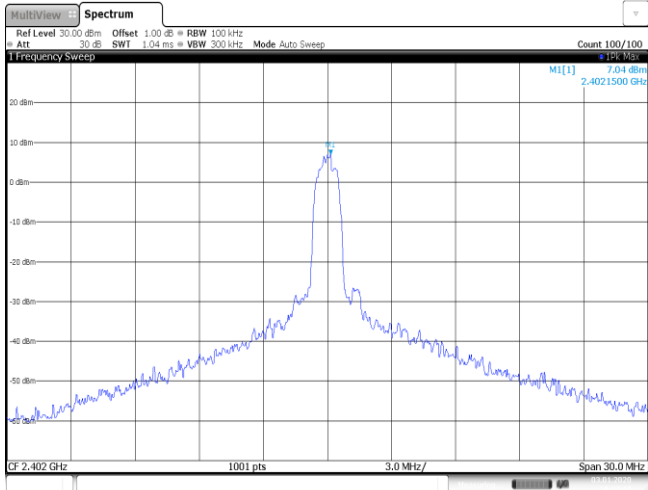
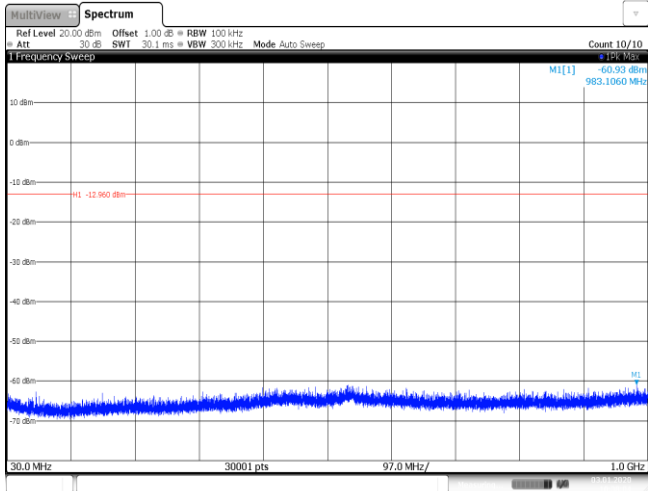
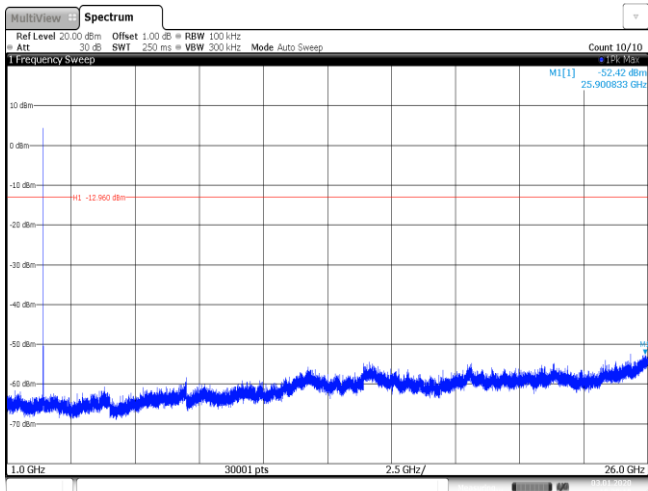
CH39 Reference level	This spectrum plot shows a single prominent peak at 2.441 GHz. The y-axis represents power in dBm, ranging from -60 to 20. The x-axis represents frequency in MHz, with a span of 30.0 MHz. The peak is labeled with a count of 100/100. The plot is titled 'Spectrum' and includes parameters: Ref Level 30.00 dBm, Offset 1.00 dB, RBW 100 kHz, Mode Auto Sweep, Count 100/100, and Span 30.0 MHz.
CH39 30MHz~1000MHz	This spectrum plot shows a flat noise floor across the 30 MHz to 1000 MHz range. The y-axis ranges from -70 to 10 dBm. The x-axis ranges from 30.0 MHz to 1.0 GHz. A red horizontal line is drawn at -10.650 dBm. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 100 kHz, Mode Auto Sweep, Count 10/10, and Span 97.0 MHz.
CH39 1GHz~26GHz	This spectrum plot shows a flat noise floor across the 1 GHz to 26 GHz range. The y-axis ranges from -70 to 10 dBm. The x-axis ranges from 1.0 GHz to 26.0 GHz. A red horizontal line is drawn at -10.650 dBm. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 100 kHz, Mode Auto Sweep, Count 10/10, and Span 2.5 GHz.

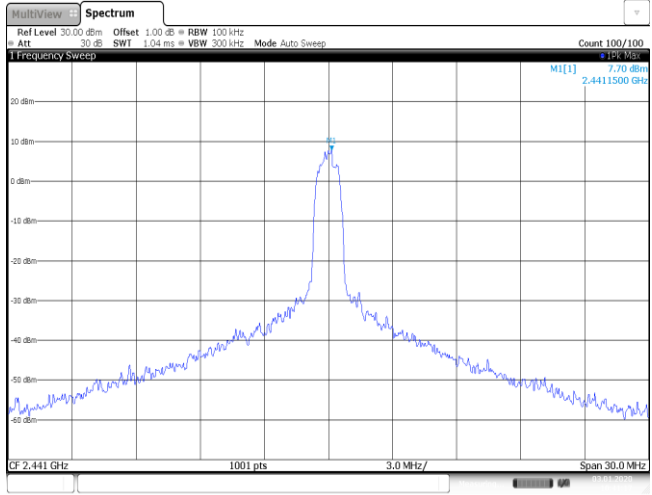
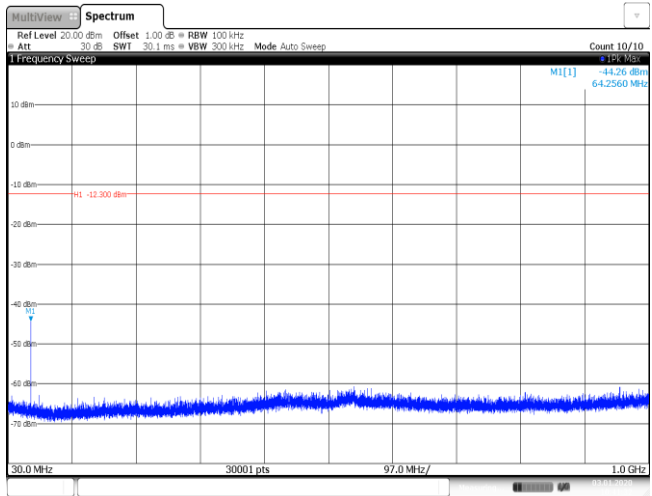
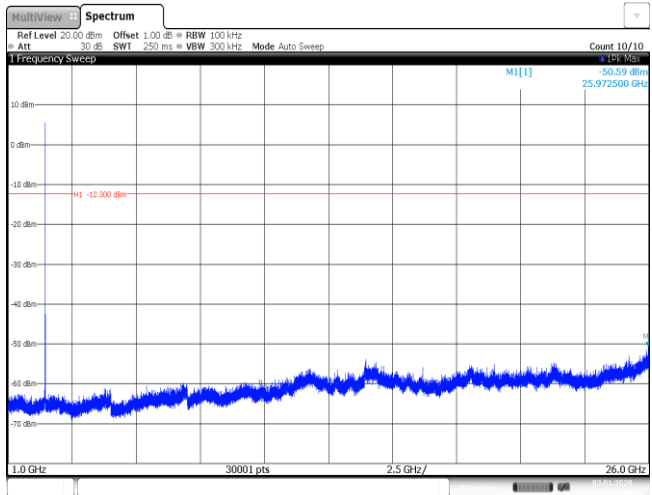
CH78 Reference level	 Ref Level 30.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWF 1.04 ms VBW 300 kHz Mode Auto Sweep Count 100/100 MI[1] 5.81 dBm 2.4801500 GHz CF 2.48 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 3 JAN 2020 10:28:07
CH78 30MHz~1000MHz	 Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWF 30.1 ms VBW 300 kHz Mode Auto Sweep Count 10/10 MI[1] -58.02 dBm 156.4350 MHz MI -14.100 dBm 30.0 MHz 30001 pts 97.0 MHz/ 1.0 GHz Date: 3 JAN 2020 10:28:23
CH78 1GHz~26GHz	 Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWF 250 ms VBW 300 kHz Mode Auto Sweep Count 10/10 MI[1] -51.69 dBm 25.927500 GHz MI -14.100 dBm 1.0 GHz 30001 pts 2.5 GHz/ 26.0 GHz Date: 3 JAN 2020 10:28:39

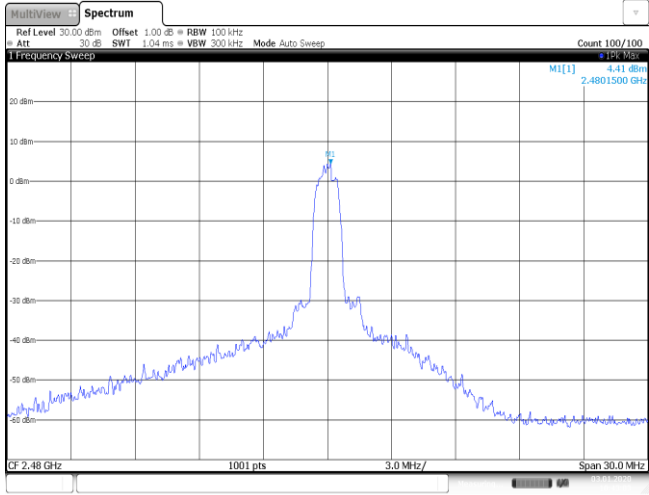
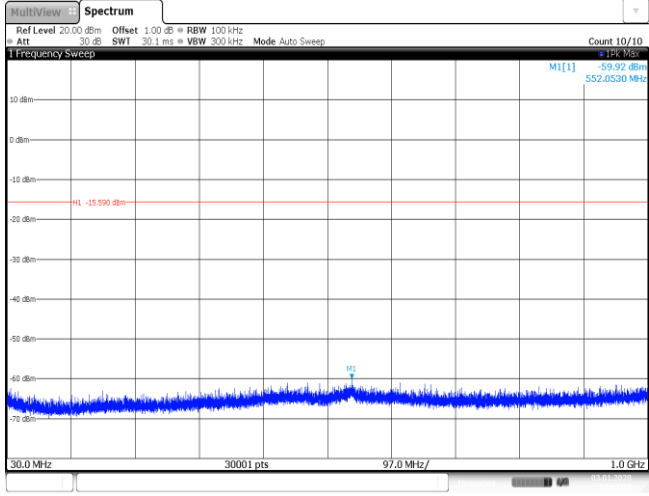
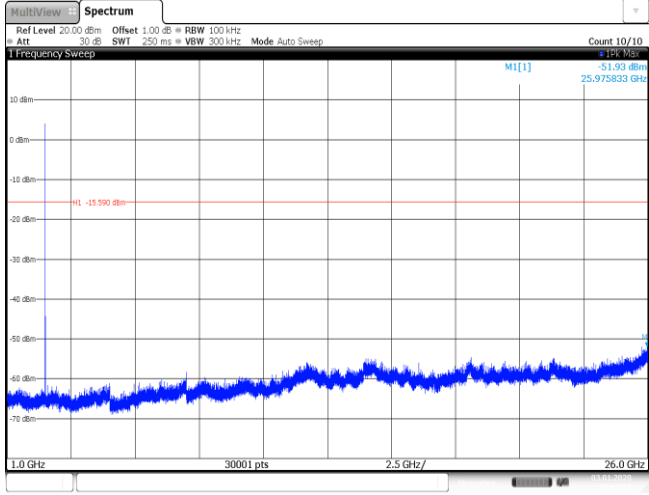
Test Item:	Spurious Emission	Modulation type:	$\pi/4$ DQPSK
CH00 Reference level	 CH00 Reference level		
CH00 30MHz~1000MHz	 CH00 30MHz~1000MHz		
CH00 1GHz~26GHz	 CH00 1GHz~26GHz		

CH39 Reference level	 The spectrum plot shows a single sharp peak at 2.441 GHz with a power level of approximately 10 dBm. The y-axis ranges from -60 dBm to 20 dBm, and the x-axis ranges from 2.441 GHz to 2.448 GHz. The plot is titled 'Spectrum' and includes parameters: Ref Level 30.00 dBm, Offset 1.00 dB, RBW 100 kHz, Att 30 dB, SWF 1.04 ms, VBW 300 kHz, Mode Auto Sweep, Count 100/100. The date is 3 JAN 2020 10:32:28.
CH39 30MHz~1000MHz	 The spectrum plot shows a noisy baseline across the 30 MHz to 1000 MHz range. The y-axis ranges from -70 dBm to 10 dBm, and the x-axis ranges from 30.0 MHz to 1.0 GHz. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 100 kHz, Att 30 dB, SWF 30.1 ms, VBW 300 kHz, Mode Auto Sweep, Count 10/10. The date is 3 JAN 2020 10:32:41.
CH39 1GHz~26GHz	 The spectrum plot shows a noisy baseline across the 1 GHz to 26 GHz range. The y-axis ranges from -70 dBm to 10 dBm, and the x-axis ranges from 1.0 GHz to 26.0 GHz. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 100 kHz, Att 30 dB, SWF 250 ms, VBW 300 kHz, Mode Auto Sweep, Count 10/10. The date is 3 JAN 2020 10:32:57.

CH78 Reference level	 The spectrum plot shows a frequency sweep from 2.48 GHz to 2.4798200 GHz. The y-axis represents power in dBm, ranging from -60 to 20. A prominent peak is visible at approximately 2.4798200 GHz, reaching a power level of about 10 dBm. The plot includes a grid and various measurement parameters such as Ref Level, Offset, RBW, and VSW. Date: 3 JAN 2020 10:34:28
CH78 30MHz~1000MHz	 The spectrum plot shows a frequency sweep from 30.0 MHz to 1000 MHz. The y-axis represents power in dBm, ranging from -70 to 10. The plot shows a relatively flat noise floor around -60 dBm. A red horizontal line is drawn at -15.750 dBm. The plot includes a grid and various measurement parameters such as Ref Level, Offset, RBW, and VSW. Date: 3 JAN 2020 10:34:42
CH78 1GHz~26GHz	 The spectrum plot shows a frequency sweep from 1.0 GHz to 26.0 GHz. The y-axis represents power in dBm, ranging from -70 to 10. The plot shows a relatively flat noise floor around -60 dBm. A red horizontal line is drawn at -15.750 dBm. The plot includes a grid and various measurement parameters such as Ref Level, Offset, RBW, and VSW. Date: 3 JAN 2020 10:34:58

Test Item:	Spurious Emission	Modulation type:	8DPSK
CH00 Reference level	 Date: 3 JAN 2020 10:37:48		
CH00 30MHz~1000MHz	 Date: 3 JAN 2020 10:38:04		
CH00 1GHz~26GHz	 Date: 3 JAN 2020 10:38:20		

CH39 Reference level	 The spectrum plot shows a frequency sweep from 2.441 GHz to 2.441500 GHz. The y-axis represents power in dBm, ranging from -60 to 20. A prominent peak is visible at approximately 2.44125 GHz, reaching about 10 dBm. The plot includes a grid and various measurement parameters at the top: Ref Level 30.00 dBm, Offset 1.00 dB, RBW 100 kHz, Mode Auto Sweep, Count 100/100, and Span 30.0 MHz. The date is 3 JAN 2020 10:41:17.
CH39 30MHz~1000MHz	 The spectrum plot shows a frequency sweep from 30.0 MHz to 1.0 GHz. The y-axis represents power in dBm, ranging from -70 to 10. The plot shows a relatively flat noise floor around -60 dBm. A red horizontal line is drawn at -12.300 dBm. The plot includes a grid and various measurement parameters at the top: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 100 kHz, Mode Auto Sweep, Count 10/10, and Span 97.0 MHz. The date is 3 JAN 2020 10:41:33.
CH39 1GHz~26GHz	 The spectrum plot shows a frequency sweep from 1.0 GHz to 26.0 GHz. The y-axis represents power in dBm, ranging from -70 to 10. The plot shows a relatively flat noise floor around -60 dBm. A red horizontal line is drawn at -12.300 dBm. The plot includes a grid and various measurement parameters at the top: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 100 kHz, Mode Auto Sweep, Count 10/10, and Span 2.5 GHz. The date is 3 JAN 2020 10:41:49.

CH78 Reference level	 Ref Level 30.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWF 1.04 ms VBW 300 kHz Mode Auto Sweep Count 100/100 MI[1] 4.41 dBm 2.4801500 GHz CF 2.48 GHz 1001 pts 3.0 MHz/ Span 30.0 MHz Date: 3 JAN 2020 10:43:04
CH78 30MHz~1000MHz	 Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWF 30.1 ms VBW 300 kHz Mode Auto Sweep Count 10/10 MI[1] -59.92 dBm 552.0530 MHz MI -15.590 dBm 30.0 MHz 30001 pts 97.0 MHz/ 1.0 GHz Date: 3 JAN 2020 10:43:20
CH78 1GHz~26GHz	 Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWF 250 ms VBW 300 kHz Mode Auto Sweep Count 10/10 MI[1] -51.93 dBm 25.975833 GHz MI -15.590 dBm 1.0 GHz 30001 pts 2.5 GHz/ 26.0 GHz Date: 3 JAN 2020 10:43:36

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