

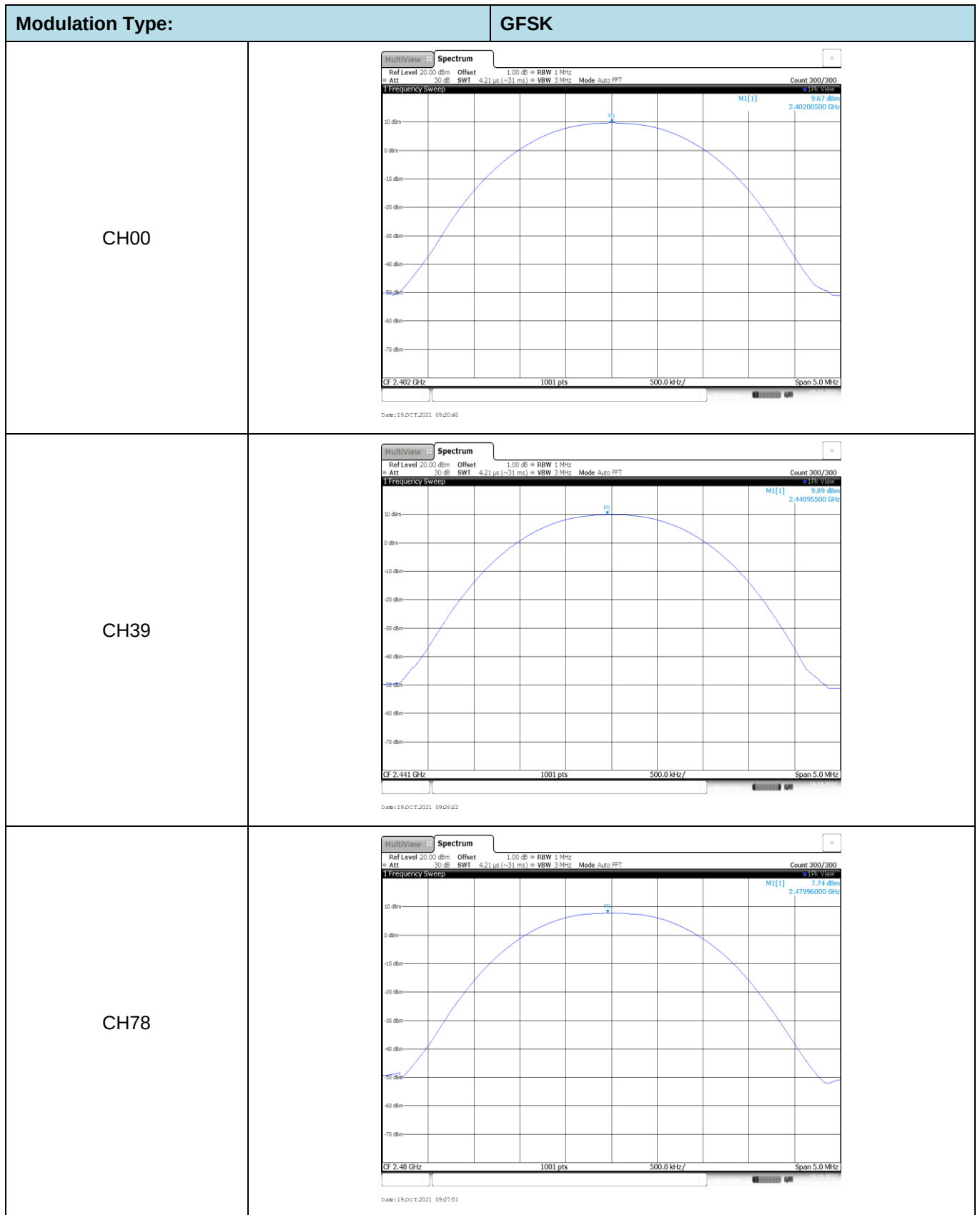
APPENDIX REPORT

Project No.	SHT2106117007EW	Radio Specification	Bluetooth EDR
Test sample No.	YPHT21061170008	Model No.	C6100
Start test date	2021-10-19	Finish date	2021-10-19
Temperature	25.8℃	Humidity	27%
Test Engineer	Xiaoqin Li	Auditor	Xiaodong Zheo

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

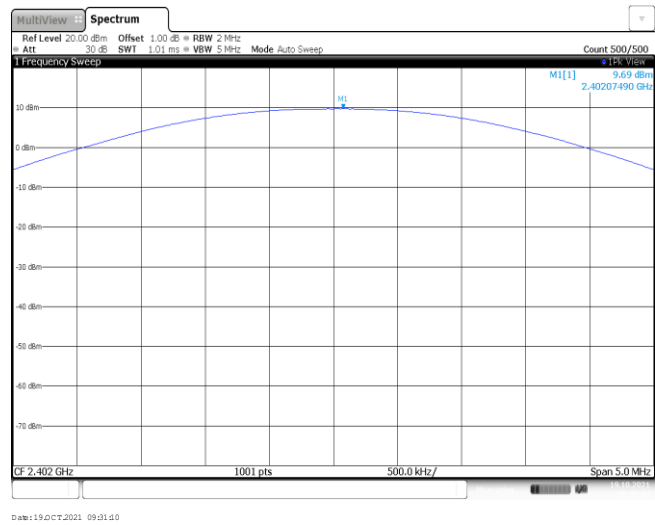
Modulation type	Channel	Peak Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
GFSK	00	9.67	9.56	≤ 30.00	Pass
	39	9.89	9.84		
	78	7.74	7.71		
$\pi/4$ DQPSK	00	9.69	9.61	≤ 21.00	Pass
	39	9.50	9.42		
	78	7.77	7.71		
8DPSK	00	9.68	9.61	≤ 21.00	Pass
	39	9.49	9.42		
	78	7.76	7.70		



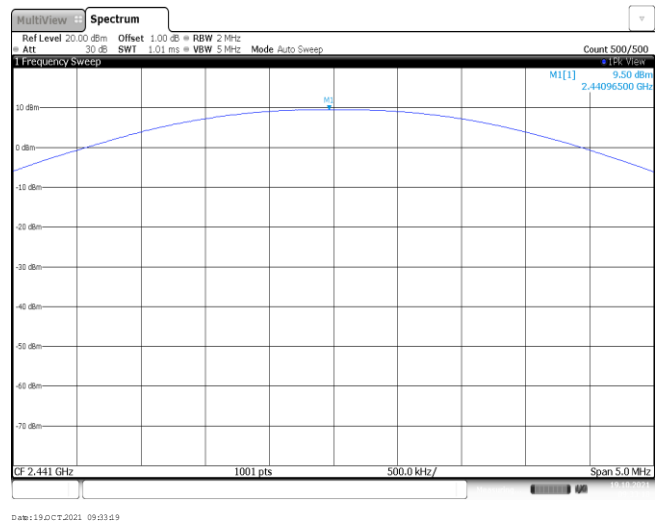
Modulation Type:

 $\pi/4$ DQPSK

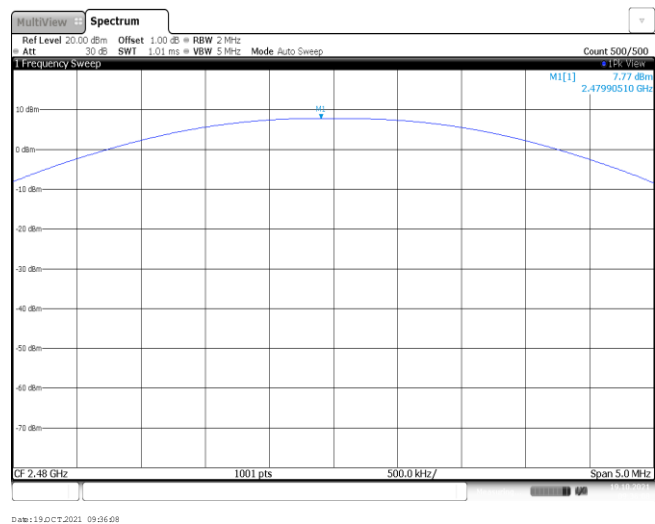
CH00



CH39



CH78



Appendix report page: 5 of 41

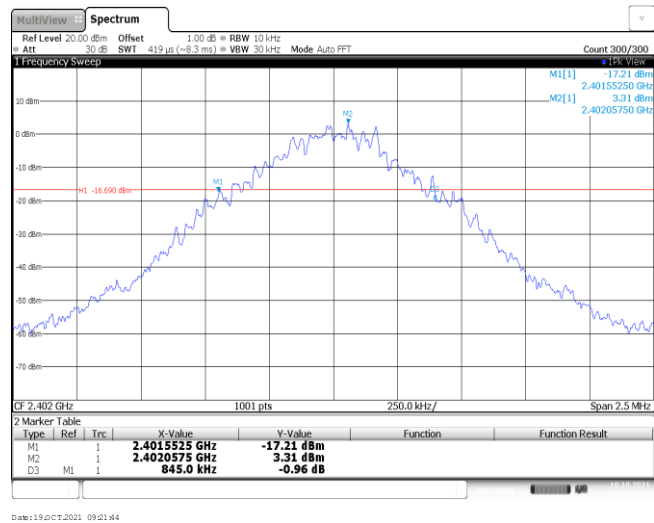
Appendix B : 20 dB Bandwidth

Modulation type	Channel	20 dB Bandwidth (kHz)	Limit (kHz)	Result
GFSK	00	845.00	-	Pass
	39	842.50		
	78	842.50		
$\pi/4$ DQPSK	00	1302.50	-	Pass
	39	1280.00		
	78	1262.50		
8DPSK	00	1305.00	-	Pass
	39	1297.50		
	78	1265.00		

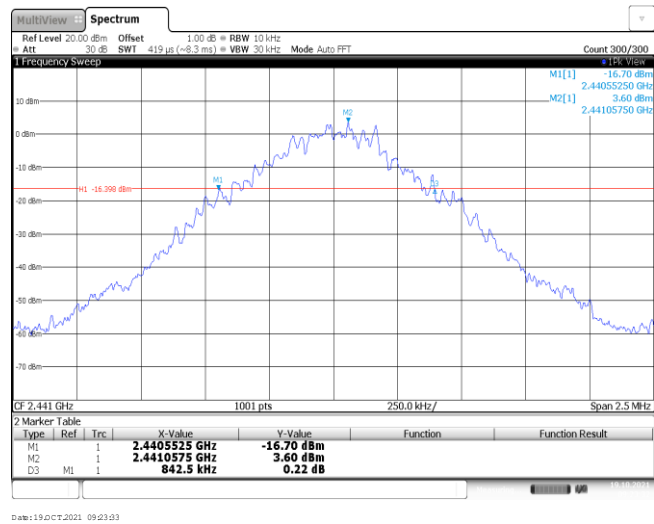
Modulation Type:

GFSK

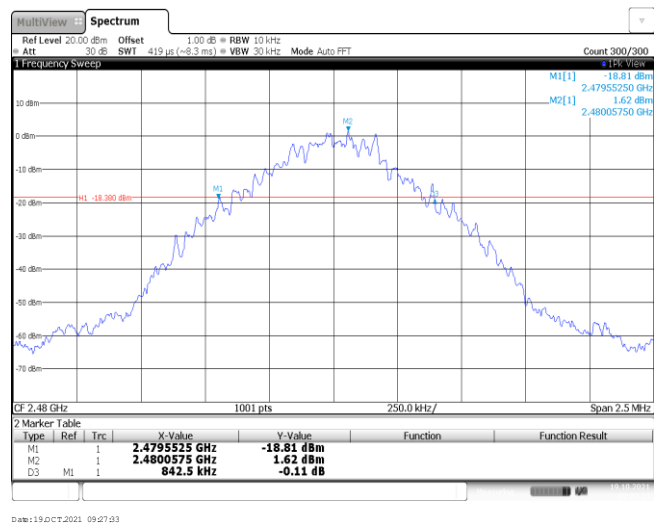
CH00



CH39



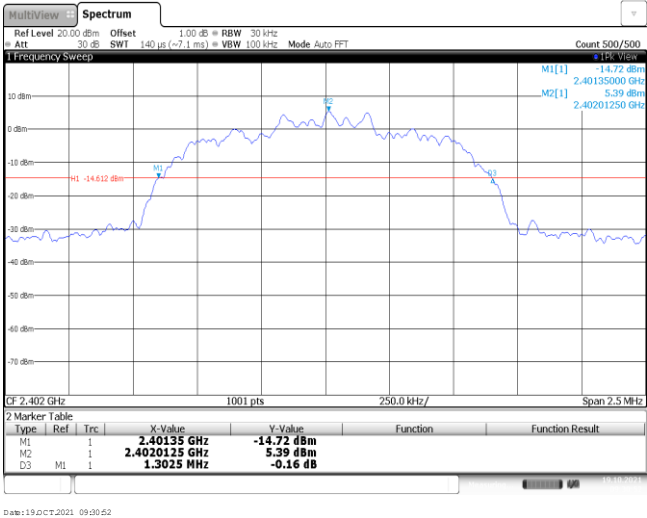
CH78



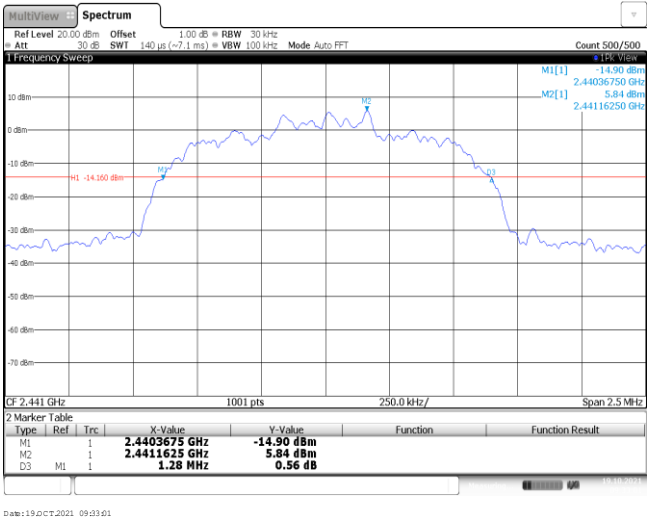
Modulation Type:

π /4DQPSK

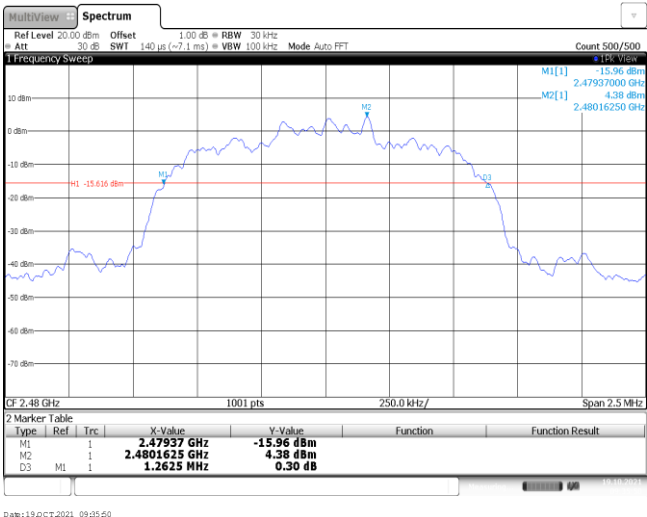
CH00



CH39



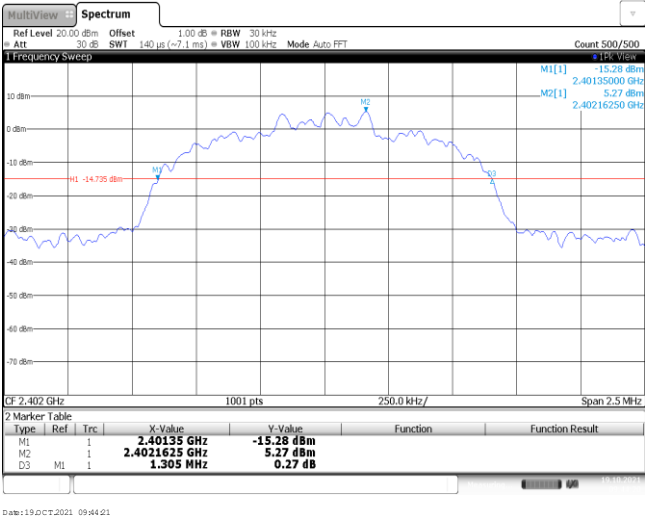
CH78



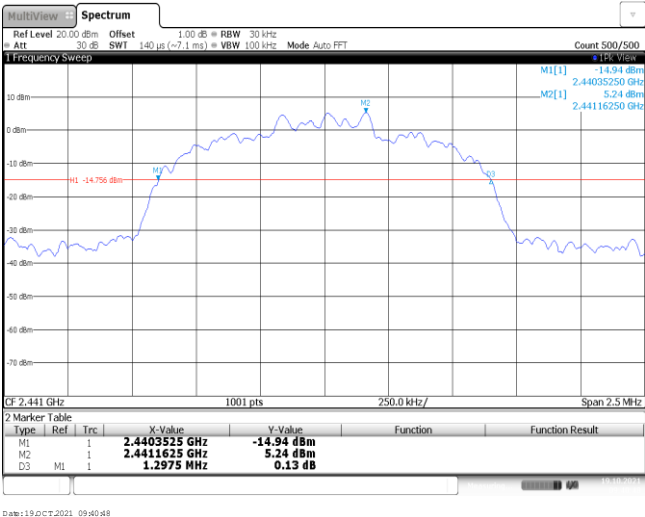
Modulation Type:

8DPSK

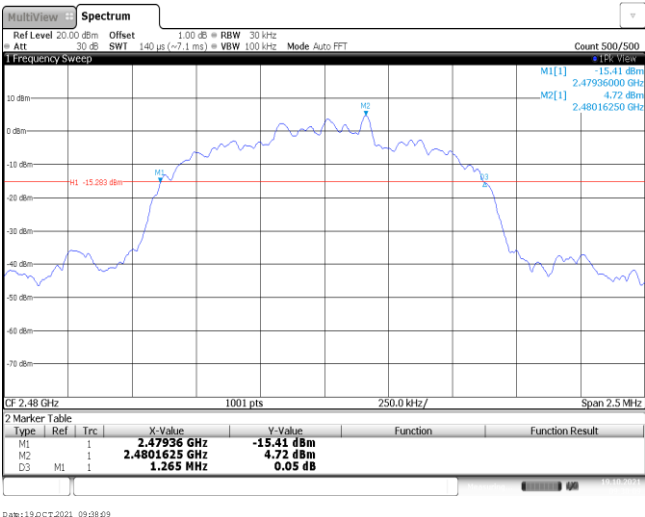
CH00



CH39



CH78



Appendix C: 99% Occupied Bandwidth

Modulation type	Channel	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
GFSK	00	0.78	-	Pass
	39	0.78		
	78	0.76		
$\pi/4$ DQPSK	00	1.16	-	Pass
	39	1.16		
	78	1.15		
8DPSK	00	1.18	-	Pass
	39	1.16		
	78	1.15		

Modulation Type:

GFSK

CH00



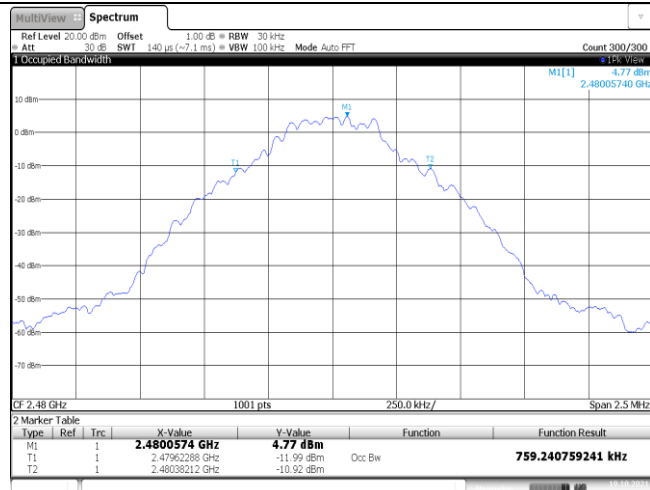
Date: 19/02/2021 09:21:52

CH39



Date: 19/02/2021 09:23:41

CH78

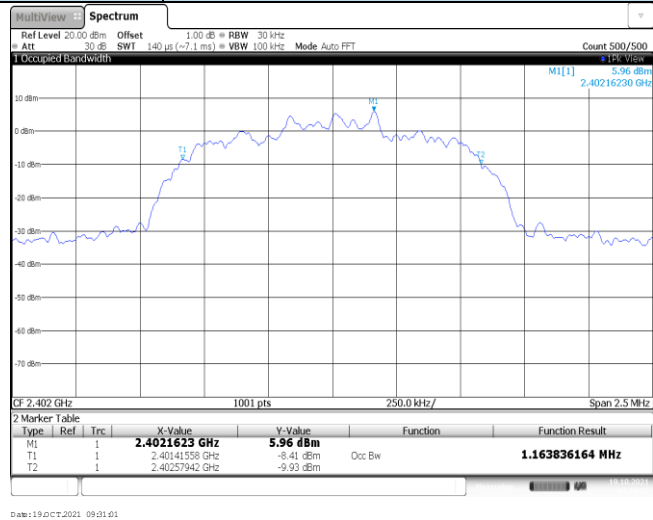


Date: 19/02/2021 09:27:42

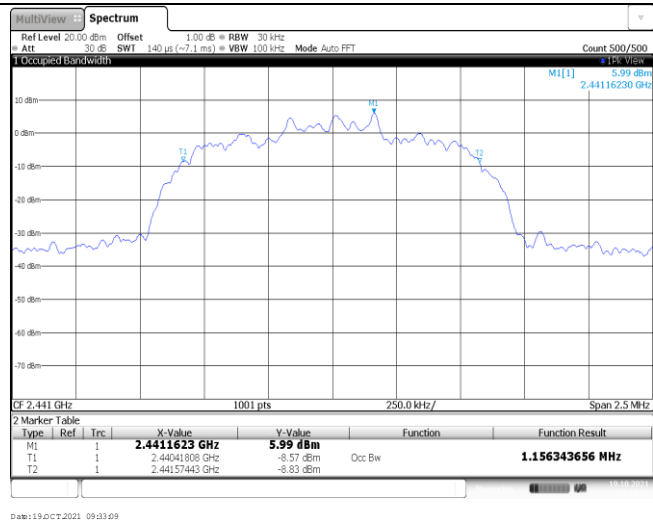
Modulation Type:

 $\pi/4$ DQPSK

CH00



CH39



CH78



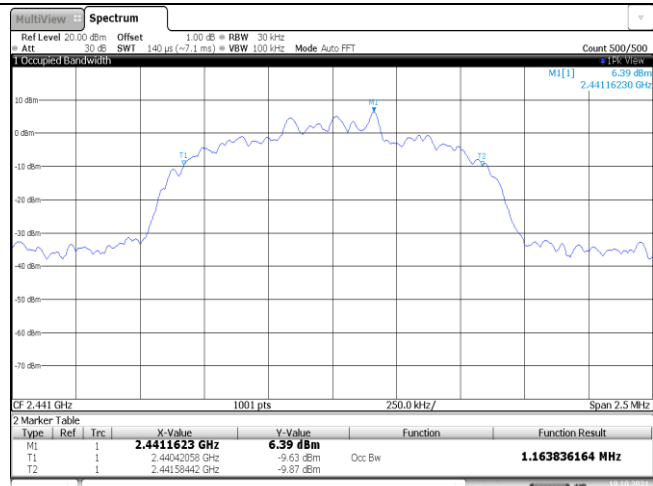
Modulation Type:

8DPSK

CH00



CH39



CH78



Appendix D: Carrier Frequencies Separation

Modulation type	Channel	Carrier Frequencies Separation (MHz)	Limit (kHz) *	Result
GFSK	39	1.00	≥845.00	Pass
π/4DQPSK	39	1.00	≥868.33	Pass
8DPSK	39	1.00	≥870.00	Pass

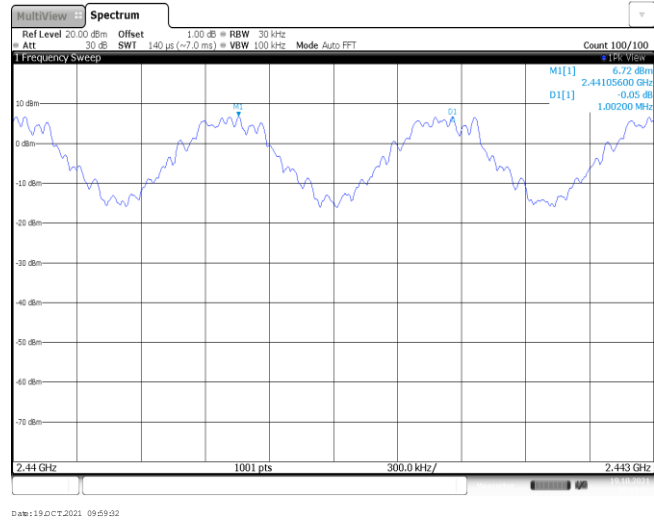
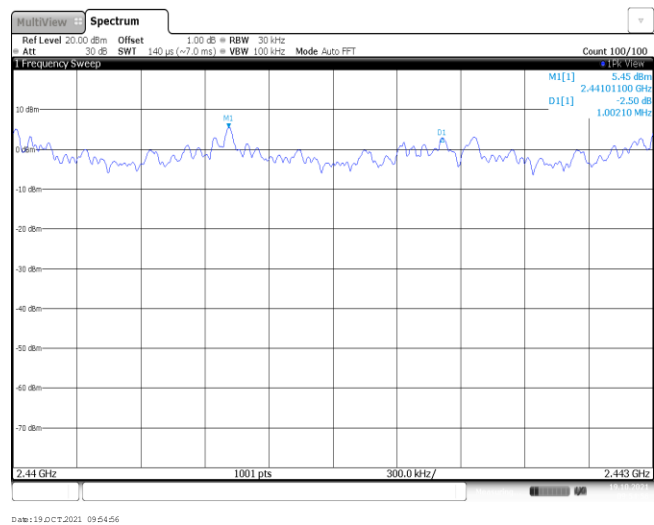
Note:

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

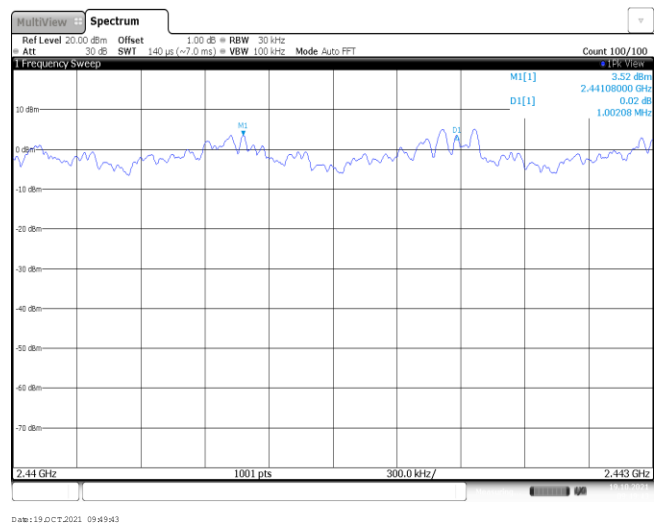
π/4DQPSK limit = 2/3 * The maximum 20 dB Bandwidth for π/4DQPSK modulation on the appendix B.

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

GFSK

 $\pi/4$ DQPSK

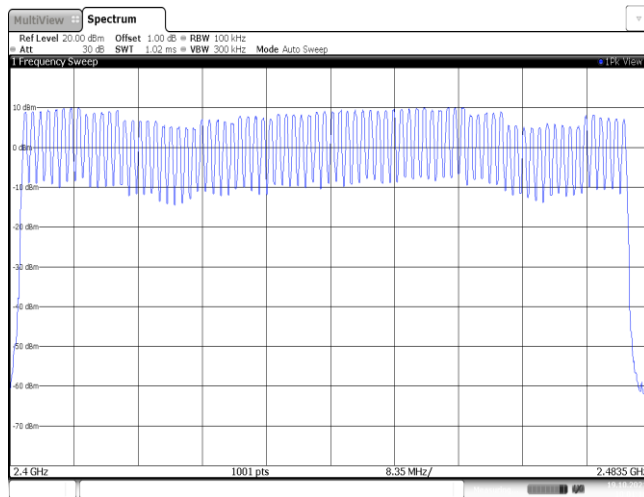
8DPSK



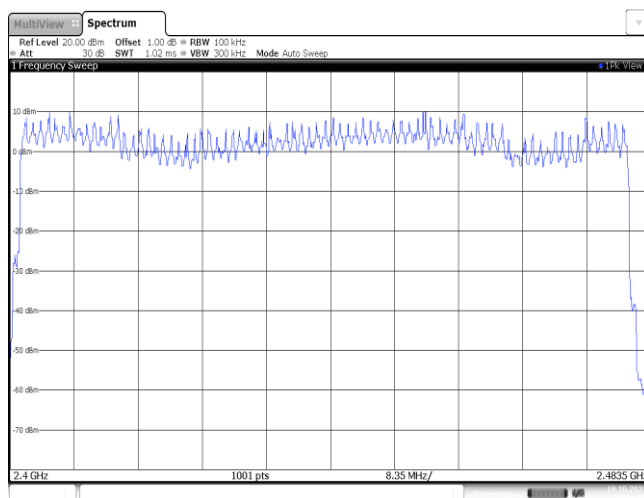
Appendix E: Hopping Channel Number

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

GFSK

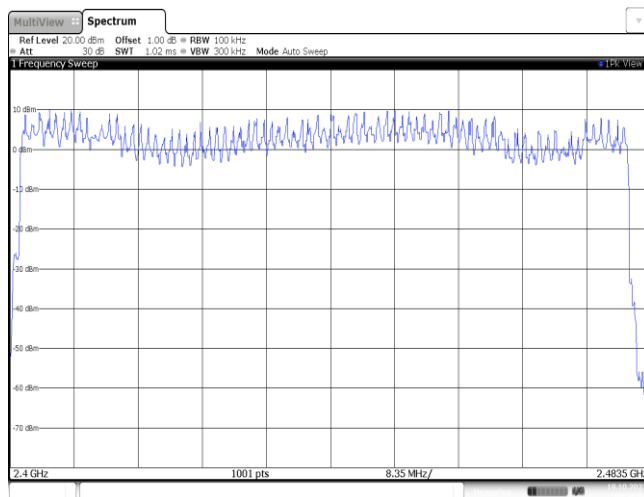


Date: 19/07/2021 10:01:16

 $\pi/4$ DQPSK

Date: 19/07/2021 09:56:05

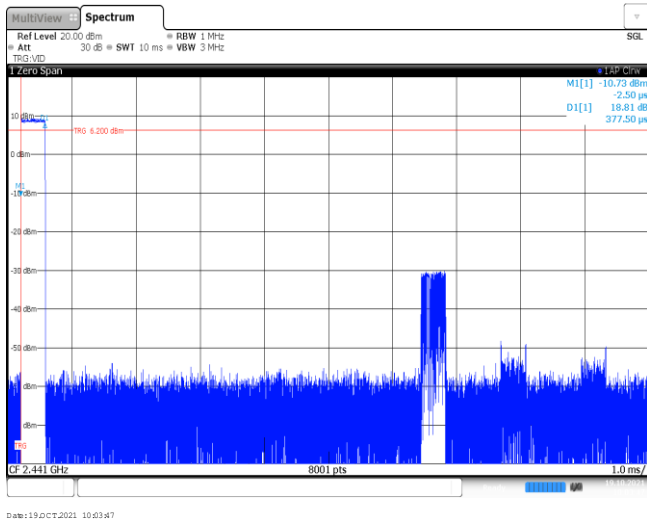
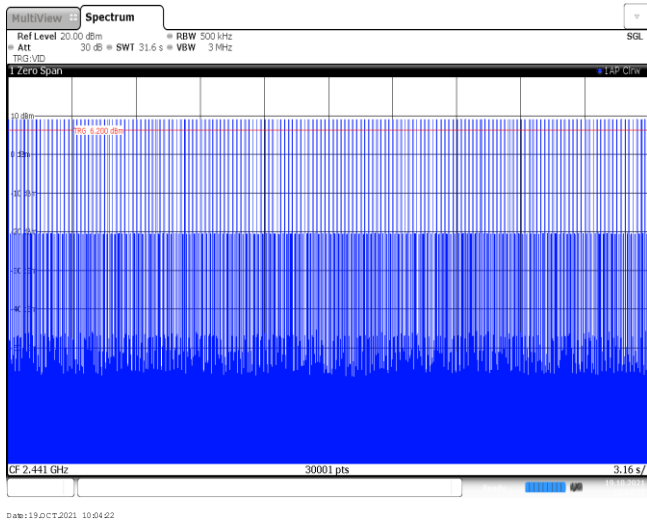
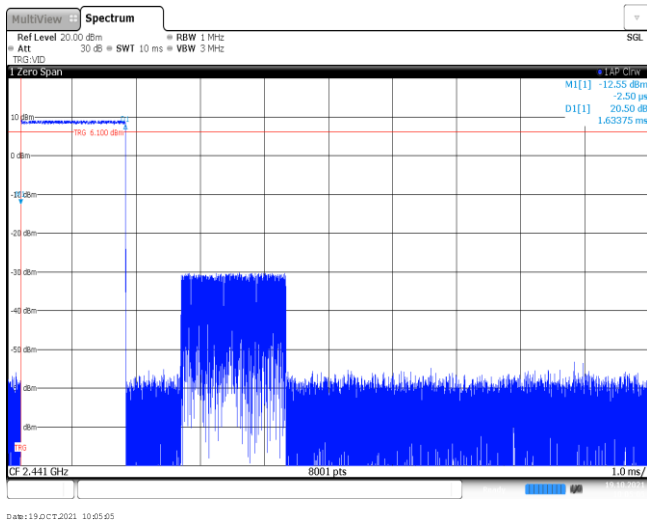
8DPSK



Date: 19/07/2021 09:51:06

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	≤ 0.40	Pass
	DH3	1.63	159	0.26		
	DH5	2.88	98	0.28		
$\pi/4$ DQPSK	2DH1	0.38	314	0.12	≤ 0.40	Pass
	2DH3	1.64	159	0.26		
	2DH5	2.88	108	0.31		
8DPSK	3DH1	0.38	315	0.12	≤ 0.40	Pass
	3DH3	1.64	159	0.26		
	3DH5	2.89	94	0.27		

Modulation Type:		GFSK
DH1 Burst width		
DH1 Burst number		
DH3 Burst width		

MultiView Spectrum

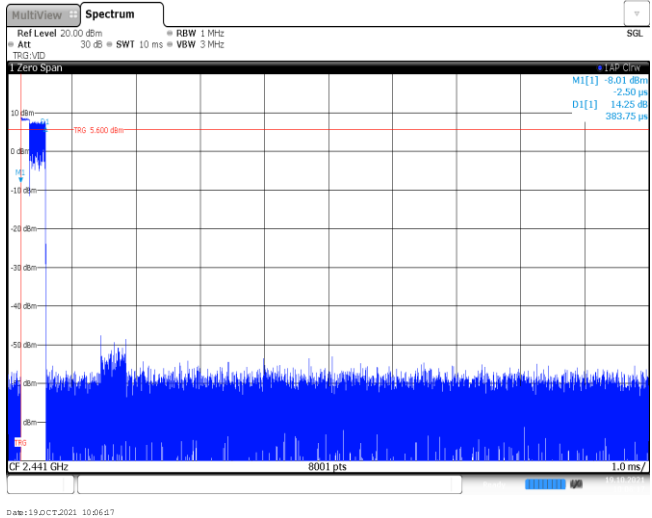
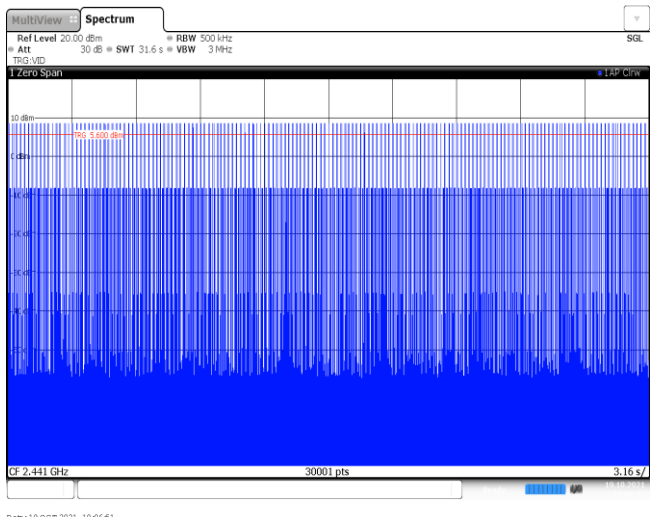
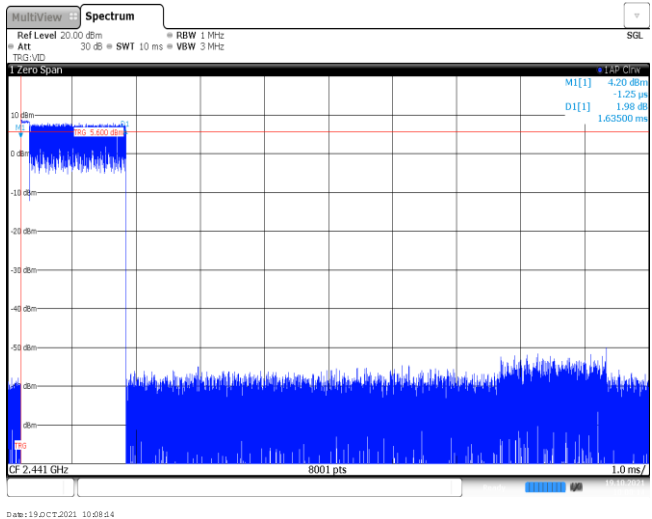
Ref Level 20.00 dBm RBW 500 kHz
 Att 30 dB SWT 31.6 s VBW 3 MHz
 TRG VID

1 Zero Span 14P CW

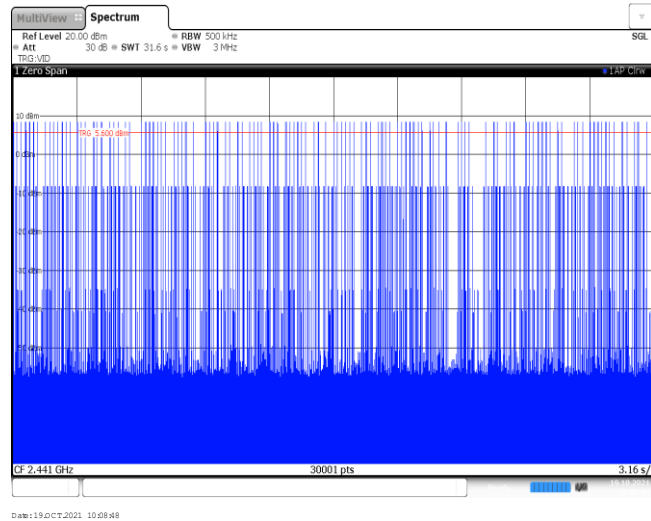
20 dB
 10 dB
 0 dB
 -10 dB
 -20 dB
 -30 dB
 -40 dB
 -50 dB

1% ± 100 dBm

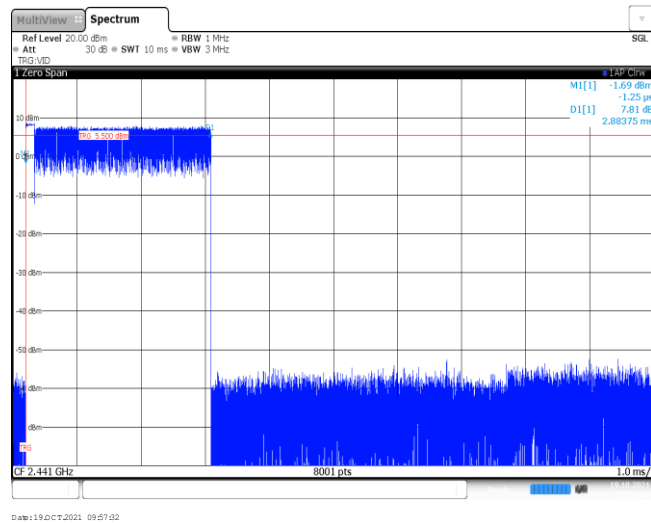
CF 2.441 GHz 30001 pts 3.16 s

Modulation Type:	$\pi/4$ DQPSK
2DH1 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 -60 to 10. A red line indicates a reference level at 5.000 dBm. The signal is characterized by a sharp peak at the carrier frequency, with a noise floor around -60 dBm. The plot includes parameters: Ref Level 20.00 dBm, Att 30 dB, RBW 1 MHz, SWT 10 ms, VBW 3 MHz. The date is 19/07/2021 10:06:17.
2DH1 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 -60 to 10. A red line indicates a reference level at 5.000 dBm. The signal is characterized by a series of sharp peaks, indicating a burst of data. The plot includes parameters: Ref Level 20.00 dBm, Att 30 dB, RBW 500 kHz, SWT 31.6 s, VBW 3 MHz. The date is 19/07/2021 10:06:51.
2DH3 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 -60 to 10. A red line indicates a reference level at 5.000 dBm. The signal is characterized by a sharp peak at the carrier frequency, with a noise floor around -60 dBm. The plot includes parameters: Ref Level 20.00 dBm, Att 30 dB, RBW 1 MHz, SWT 10 ms, VBW 3 MHz. The date is 19/07/2021 10:08:14.

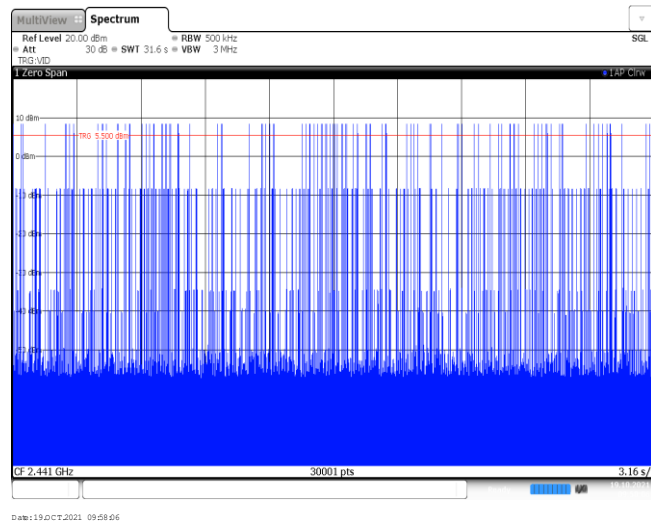
2DH3
Burst number



2DH5
Burst width

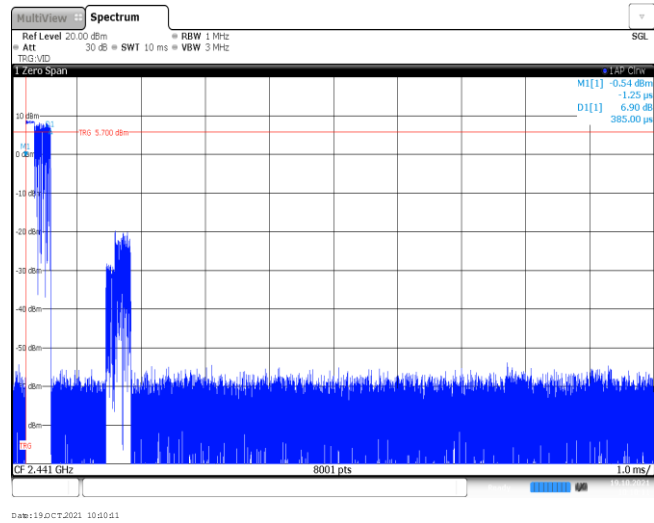
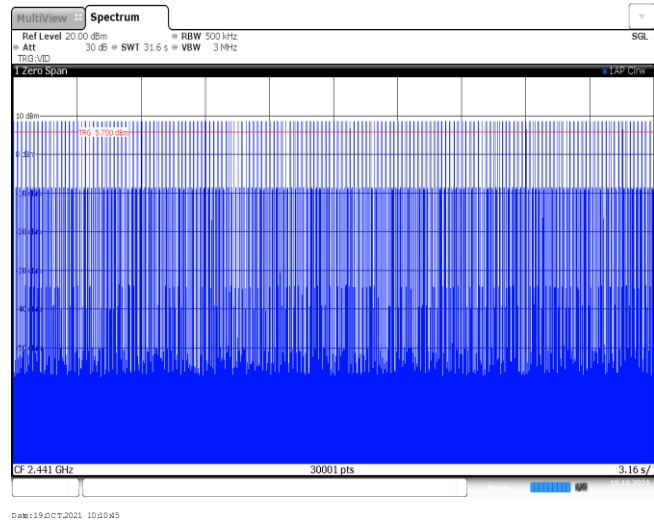
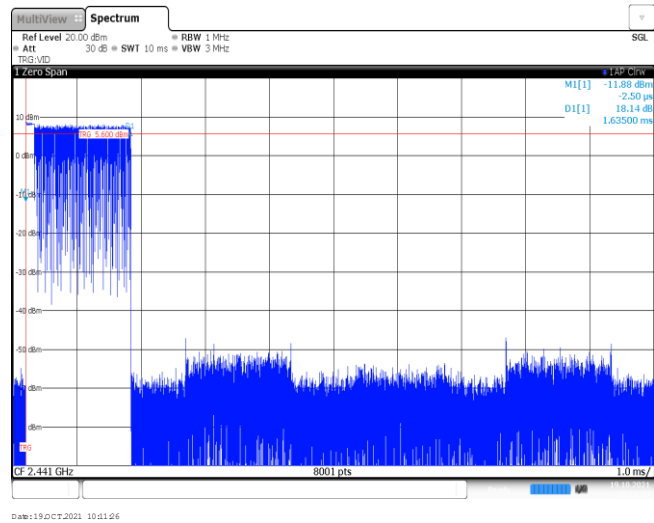


2DH5
Burst number

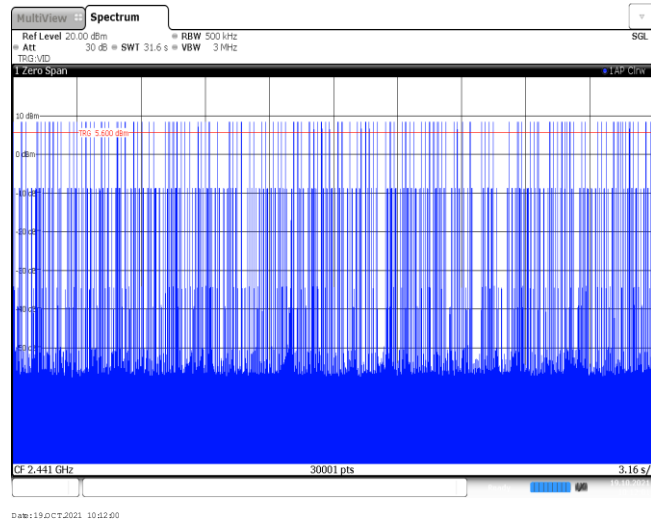


Modulation Type:

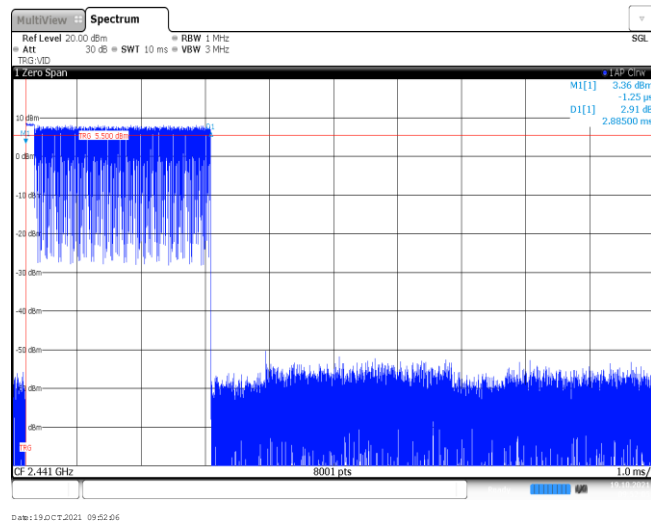
8DPSK

3DH1
Burst width3DH1
Burst number3DH3
Burst width

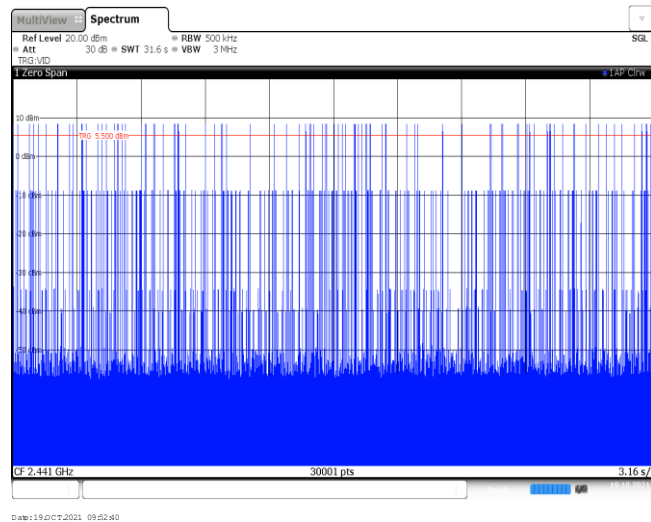
3DH3
Burst number



3DH5
Burst width



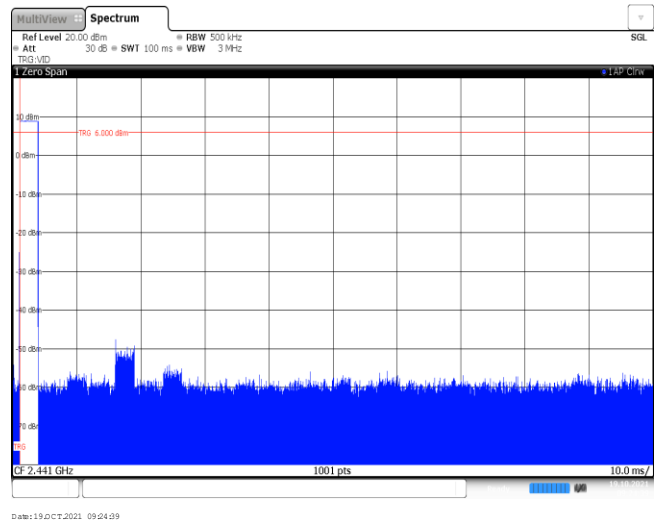
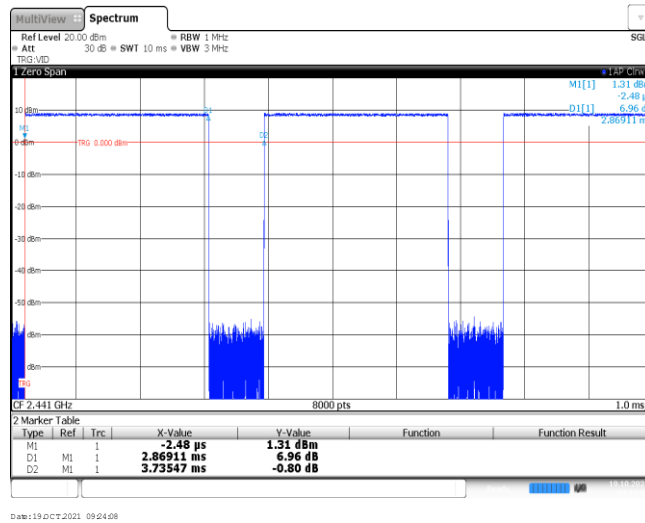
3DH5
Burst number



Appendix G: Duty Cycle Correction Factor (DCCF)

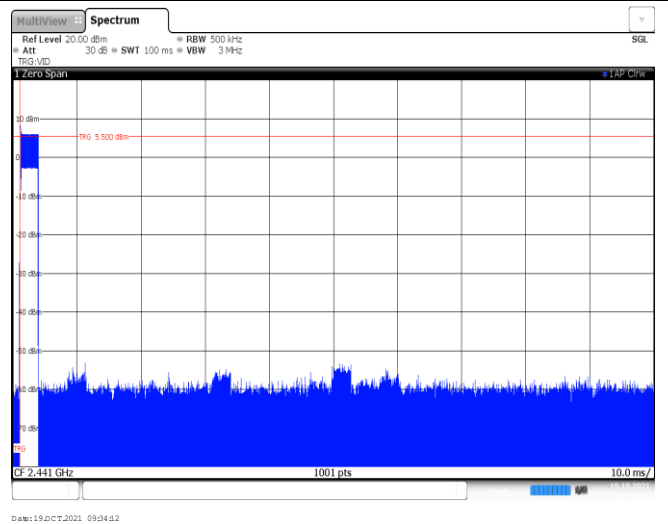
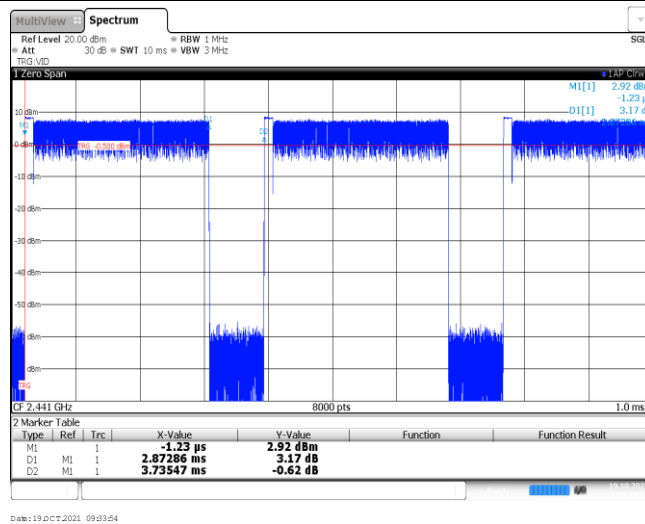
DCCF Calculate Formula					
DCCF=20 * Log(duty cycle) = 20 * Log($T_{\text{on time}} / T_{\text{period}}$)					
Modulation type	Test Frequency (MHz)	$T_{\text{on time}}$ for single burst [ms]	T_{period} [ms]	Burst Quantity	DCCF [dB]
GFSK	2441	2.87	100	1	-30.84
$\pi/4$ DQPSK	2441	2.87	100	1	-30.84
8DPSK	2441	2.88	100	1	-30.81

GFSK



Ton time for single burst

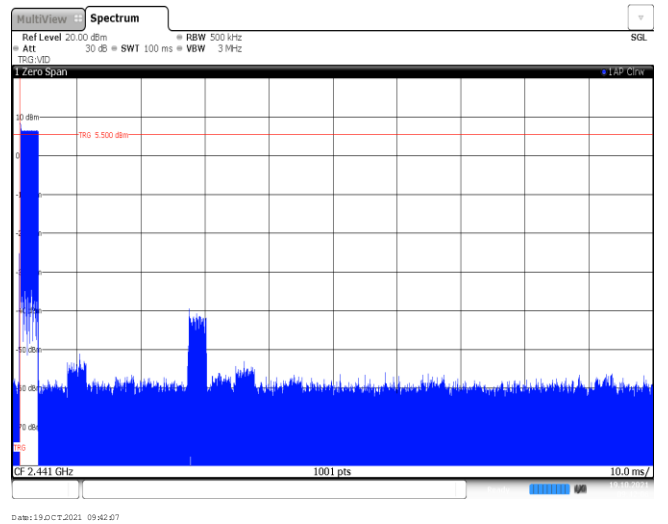
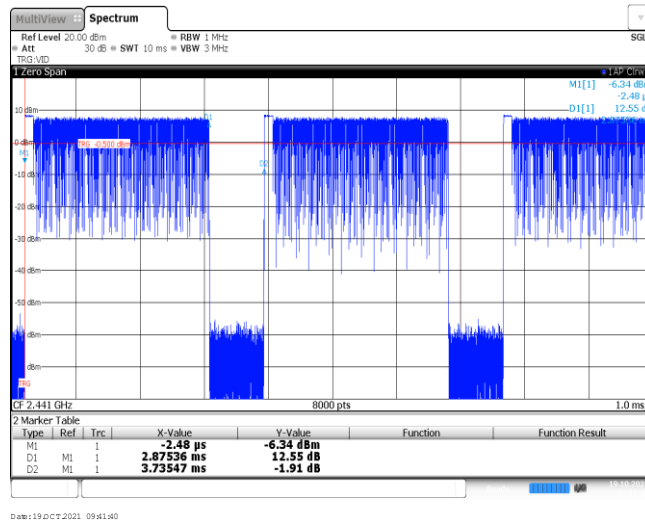
Burst Quantity

 $\pi/4$ DQPSK

Ton time for single burst

Burst Quantity

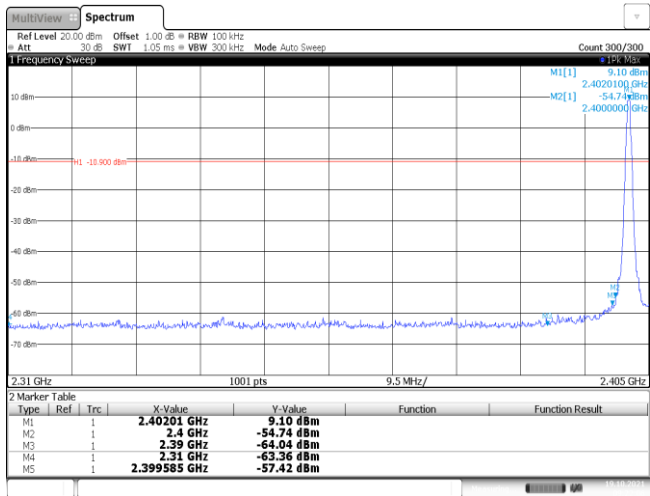
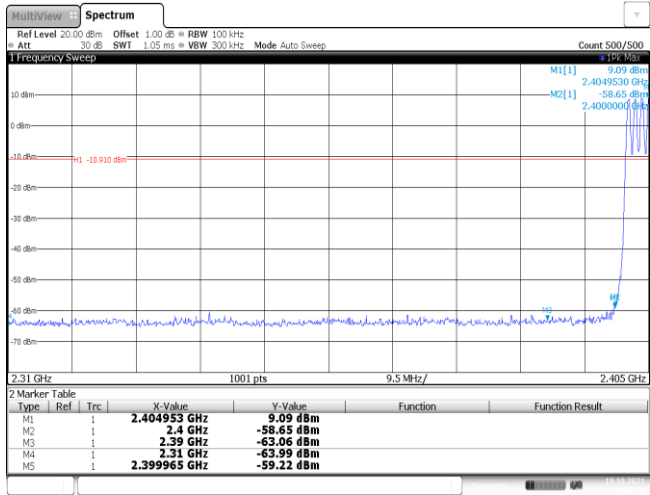
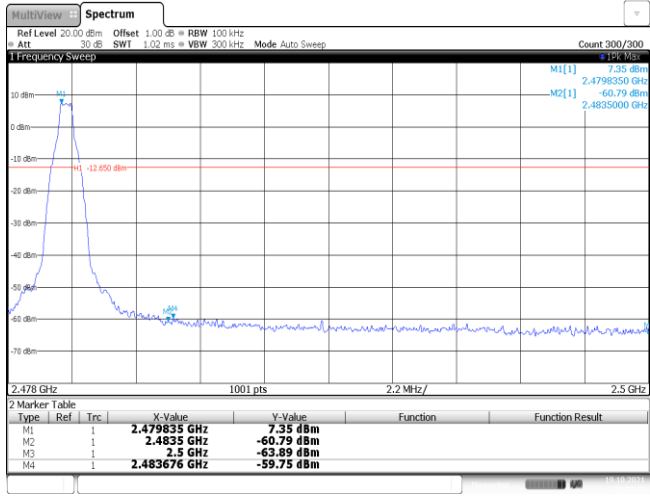
8DPSK



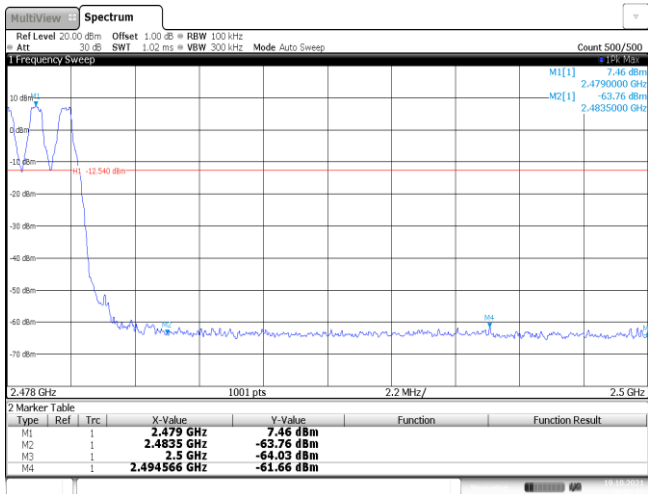
Ton time for single burst

Burst Quantity

Appendix H: Band edge and Spurious Emissions (conducted)

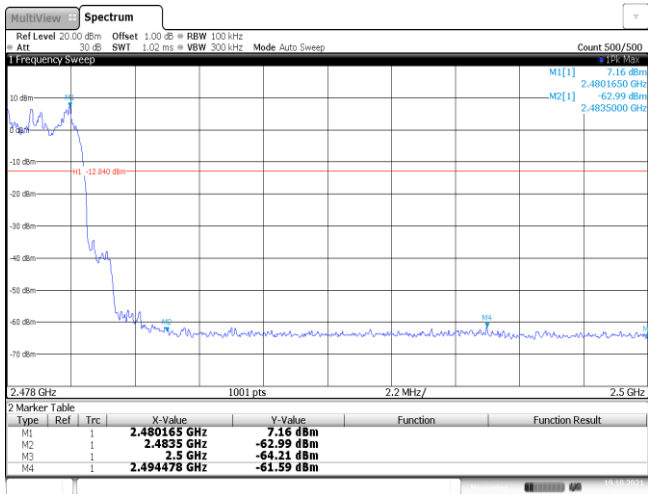
Test Item:	Band edge	Modulation type:	GFSK																																										
CH00 No hopping mode	 2 Marker Table <table><tr><th>Type</th><th>Ref</th><th>Trc</th><th>X-Value</th><th>Y-Value</th><th>Function</th><th>Function Result</th></tr><tr><td>M1</td><td>1</td><td></td><td>2.40201 GHz</td><td>9.10 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-54.74 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-64.04 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-63.36 dBm</td><td></td><td></td></tr><tr><td>M5</td><td>1</td><td></td><td>2.399585 GHz</td><td>-57.42 dBm</td><td></td><td></td></tr></table> Date: 19/OCT/2021 09:22:06	Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.40201 GHz	9.10 dBm			M2	1		2.4 GHz	-54.74 dBm			M3	1		2.39 GHz	-64.04 dBm			M4	1		2.31 GHz	-63.36 dBm			M5	1		2.399585 GHz	-57.42 dBm				
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
M1	1		2.40201 GHz	9.10 dBm																																									
M2	1		2.4 GHz	-54.74 dBm																																									
M3	1		2.39 GHz	-64.04 dBm																																									
M4	1		2.31 GHz	-63.36 dBm																																									
M5	1		2.399585 GHz	-57.42 dBm																																									
CH00 Hopping mode	 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>2.404953 GHz</td><td>9.09 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-58.65 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-63.06 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-63.99 dBm</td><td></td><td></td></tr><tr><td>M5</td><td>1</td><td></td><td>2.399965 GHz</td><td>-59.22 dBm</td><td></td><td></td></tr></table> Date: 19/OCT/2021 10:01:40	Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.404953 GHz	9.09 dBm			M2	1		2.4 GHz	-58.65 dBm			M3	1		2.39 GHz	-63.06 dBm			M4	1		2.31 GHz	-63.99 dBm			M5	1		2.399965 GHz	-59.22 dBm				
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
M1	1		2.404953 GHz	9.09 dBm																																									
M2	1		2.4 GHz	-58.65 dBm																																									
M3	1		2.39 GHz	-63.06 dBm																																									
M4	1		2.31 GHz	-63.99 dBm																																									
M5	1		2.399965 GHz	-59.22 dBm																																									
CH78 No hopping mode	 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>2.479835 GHz</td><td>7.35 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4835 GHz</td><td>-60.79 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.5 GHz</td><td>-63.89 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.483676 GHz</td><td>-59.75 dBm</td><td></td><td></td></tr></table> Date: 19/OCT/2021 09:28:24	Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.479835 GHz	7.35 dBm			M2	1		2.4835 GHz	-60.79 dBm			M3	1		2.5 GHz	-63.89 dBm			M4	1		2.483676 GHz	-59.75 dBm											
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
M1	1		2.479835 GHz	7.35 dBm																																									
M2	1		2.4835 GHz	-60.79 dBm																																									
M3	1		2.5 GHz	-63.89 dBm																																									
M4	1		2.483676 GHz	-59.75 dBm																																									

CH78
Hopping mode



Test Item:	Band edge	Modulation type:	$\pi/4$ DQPSK																																										
CH00 No hopping mode	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SW 1.05 ms VBW 300 kHz Mode Auto Sweep Count 500/500 Frequency Sweep M1[1] 8.93 dBm 2.401821 GHz M2[1] -49.68 dBm 2.400000 GHz M1 -11.070 dBm M2 M3 M4 M5 2.31 GHz 1001 pts 9.5 MHz/ 2.405 GHz 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>2.401821 GHz</td><td>8.93 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-49.68 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-63.13 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-63.90 dBm</td><td></td><td></td></tr><tr><td>M5</td><td>1</td><td></td><td>2.399775 GHz</td><td>-49.45 dBm</td><td></td><td></td></tr></table> Date: 19/OCT/2021 09:31:44			Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.401821 GHz	8.93 dBm			M2	1		2.4 GHz	-49.68 dBm			M3	1		2.39 GHz	-63.13 dBm			M4	1		2.31 GHz	-63.90 dBm			M5	1		2.399775 GHz	-49.45 dBm		
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
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CH00 Hopping mode	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SW 1.05 ms VBW 300 kHz Mode Auto Sweep Count 500/500 Frequency Sweep M1[1] 8.28 dBm 2.402105 GHz M2[1] -53.18 dBm 2.400000 GHz M1 -11.720 dBm M2 M3 M4 M5 2.31 GHz 1001 pts 9.5 MHz/ 2.405 GHz 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>2.402105 GHz</td><td>8.28 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4 GHz</td><td>-53.18 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.39 GHz</td><td>-62.66 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.31 GHz</td><td>-62.77 dBm</td><td></td><td></td></tr><tr><td>M5</td><td>1</td><td></td><td>2.399965 GHz</td><td>-51.65 dBm</td><td></td><td></td></tr></table> Date: 19/OCT/2021 09:56:19			Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.402105 GHz	8.28 dBm			M2	1		2.4 GHz	-53.18 dBm			M3	1		2.39 GHz	-62.66 dBm			M4	1		2.31 GHz	-62.77 dBm			M5	1		2.399965 GHz	-51.65 dBm		
Type	Ref	Trc	X-Value	Y-Value	Function	Function Result																																							
M1	1		2.402105 GHz	8.28 dBm																																									
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M4	1		2.31 GHz	-62.77 dBm																																									
M5	1		2.399965 GHz	-51.65 dBm																																									
CH78 No hopping mode	MultiView Spectrum Ref Level 20.00 dBm Offset 1.00 dB BW 100 kHz Att 30 dB SW 1.02 ms VBW 300 kHz Mode Auto Sweep Count 500/500 Frequency Sweep M1[1] 7.52 dBm 2.479835 GHz M2[1] -61.10 dBm 2.483500 GHz M1 -12.480 dBm M2 M3 M4 M5 2.478 GHz 1001 pts 2.2 MHz/ 2.5 GHz 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>2.479835 GHz</td><td>7.52 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.4835 GHz</td><td>-61.10 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.5 GHz</td><td>-64.09 dBm</td><td></td><td></td></tr><tr><td>M4</td><td>1</td><td></td><td>2.484732 GHz</td><td>-59.63 dBm</td><td></td><td></td></tr></table> Date: 19/OCT/2021 09:36:40			Type	Ref	Trc	X-Value	Y-Value	Function	Function Result	M1	1		2.479835 GHz	7.52 dBm			M2	1		2.4835 GHz	-61.10 dBm			M3	1		2.5 GHz	-64.09 dBm			M4	1		2.484732 GHz	-59.63 dBm									
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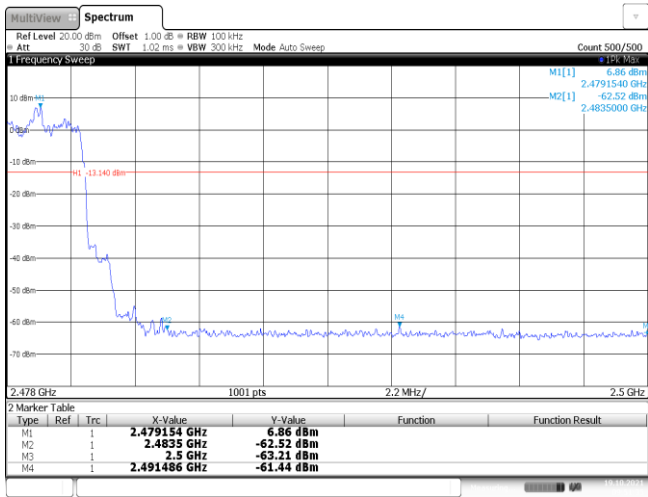
CH78
Hopping mode

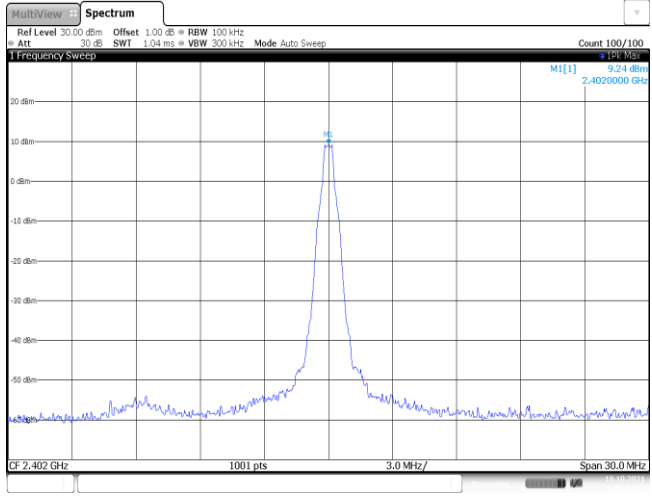
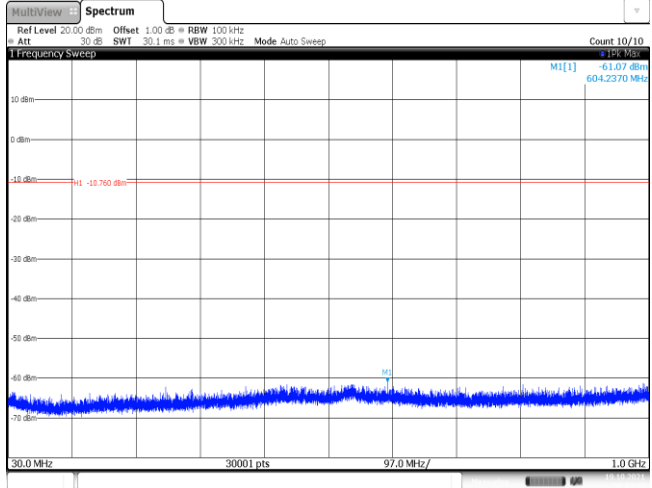
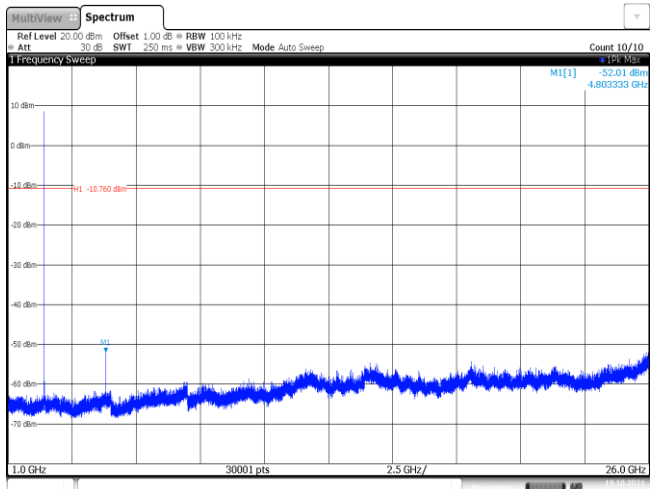


Date: 19 OCT 2021 09:56:33

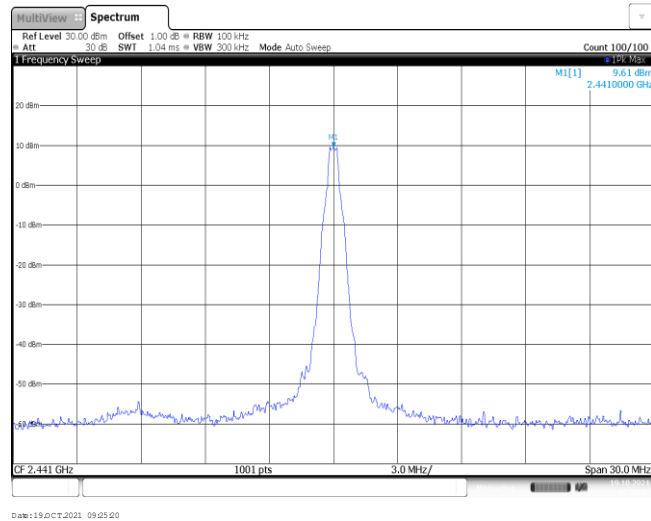
Test Item:	Band edge	Modulation type:	8DPSK
CH00 No hopping mode	<		

CH78
Hoppig mode

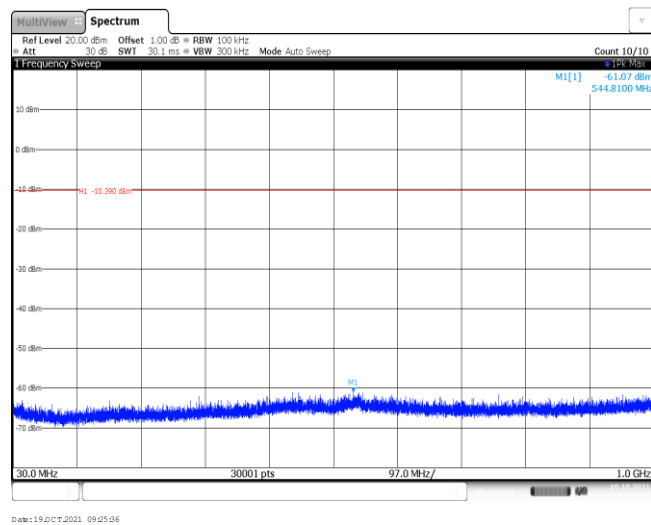


Test Item:	Spurious Emission	Modulation type:	GFSK
CH00 Reference level	 The spectrum plot shows a single sharp peak at 2.402 GHz. The y-axis represents power in dBm, ranging from -60 to 20. The x-axis represents frequency in MHz, ranging from 2.400 to 2.404. The peak is labeled with a magnitude of 9.24 dBm. The plot is titled 'Spectrum' and includes parameters: Ref Level 30.00 dBm, Offset 1.00 dB, RBW 100 kHz, Att 30 dB, SWI 1.04 ms, VBW 300 kHz, Mode Auto Sweep, Count 100/100. The x-axis is labeled 'Frequency Sweep' and 'CF 2.402 GHz'. The y-axis is labeled 'dBm'.		
CH00 30MHz~1000MHz	 The spectrum plot shows a flat noise floor across the 30 MHz to 1000 MHz range. The y-axis represents power in dBm, ranging from -70 to 10. The x-axis represents frequency in MHz, ranging from 30.0 to 1000.0. A red line indicates a limit at -10.760 dBm. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 100 kHz, Att 30 dB, SWI 30.1 ms, VBW 300 kHz, Mode Auto Sweep, Count 10/10. The x-axis is labeled 'Frequency Sweep' and '30.0 MHz'. The y-axis is labeled 'dBm'.		
CH00 1GHz~26GHz	 The spectrum plot shows a flat noise floor across the 1 GHz to 26 GHz range. The y-axis represents power in dBm, ranging from -70 to 10. The x-axis represents frequency in GHz, ranging from 1.0 to 26.0. A red line indicates a limit at -10.760 dBm. The plot is titled 'Spectrum' and includes parameters: Ref Level 20.00 dBm, Offset 1.00 dB, RBW 100 kHz, Att 30 dB, SWI 250 ms, VBW 300 kHz, Mode Auto Sweep, Count 10/10. The x-axis is labeled 'Frequency Sweep' and '1.0 GHz'. The y-axis is labeled 'dBm'.		

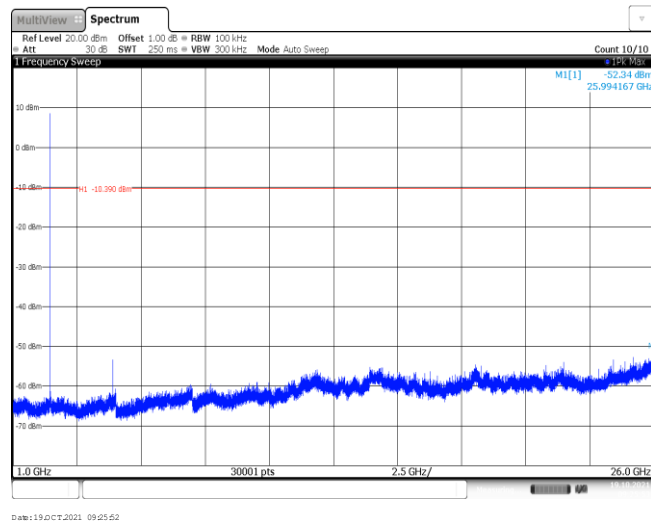
CH39
Reference level



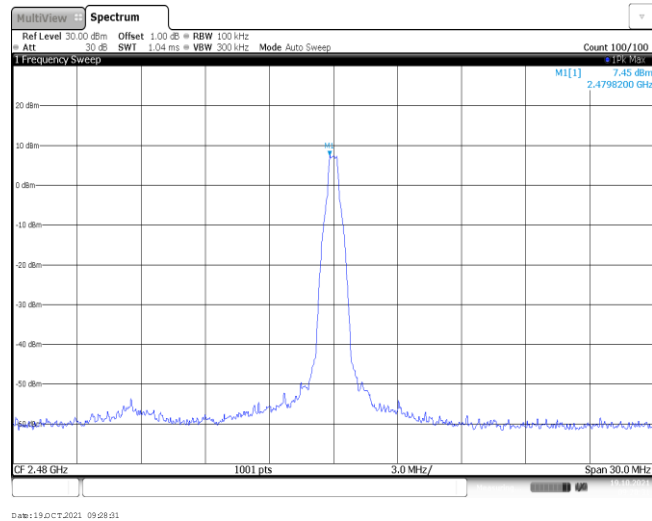
CH39
30MHz~1000MHz



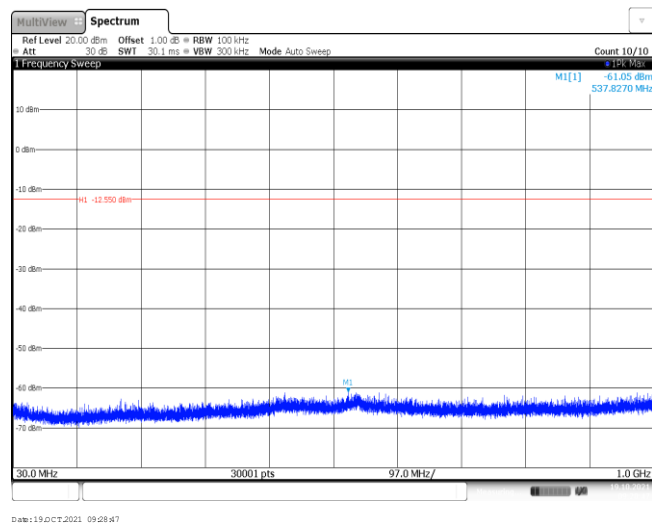
CH39
1GHz~26GHz



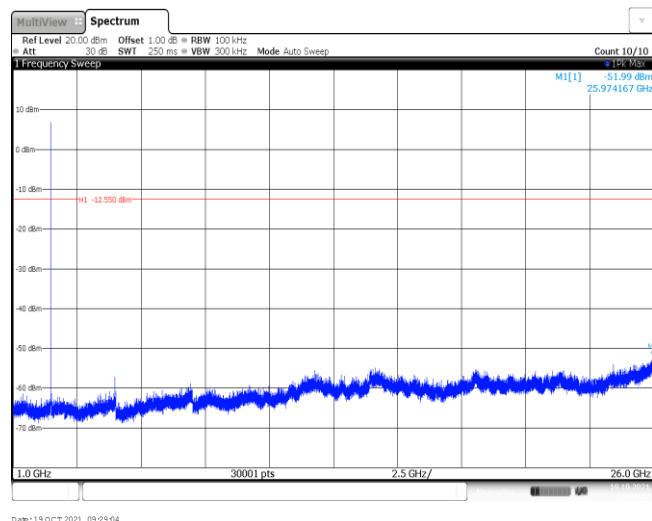
CH78
Reference level

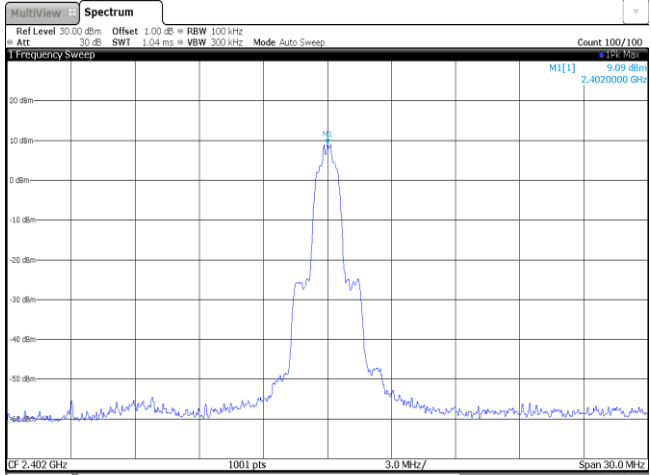
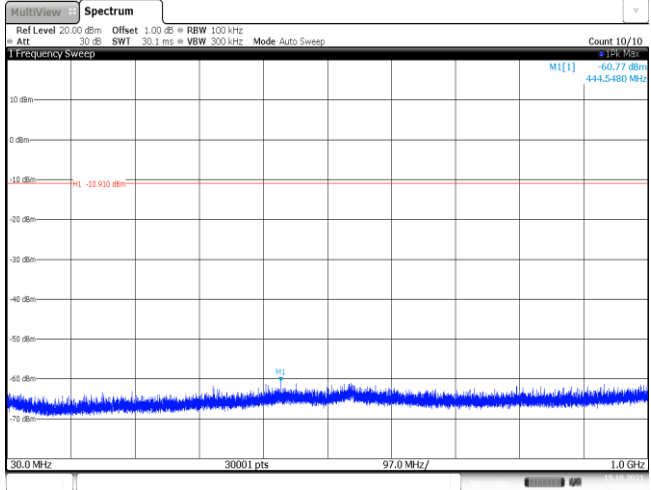
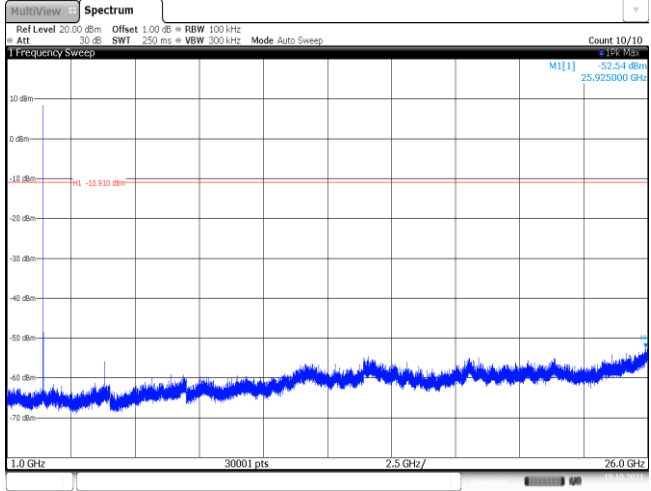


CH78
30MHz~1000MHz

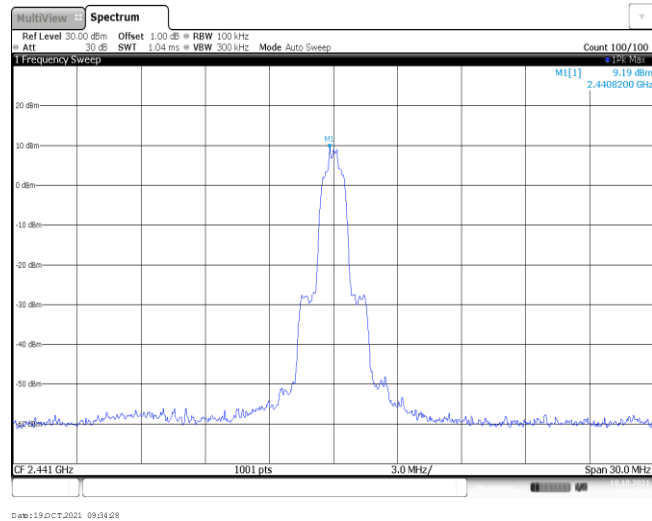


CH78
1GHz~26GHz

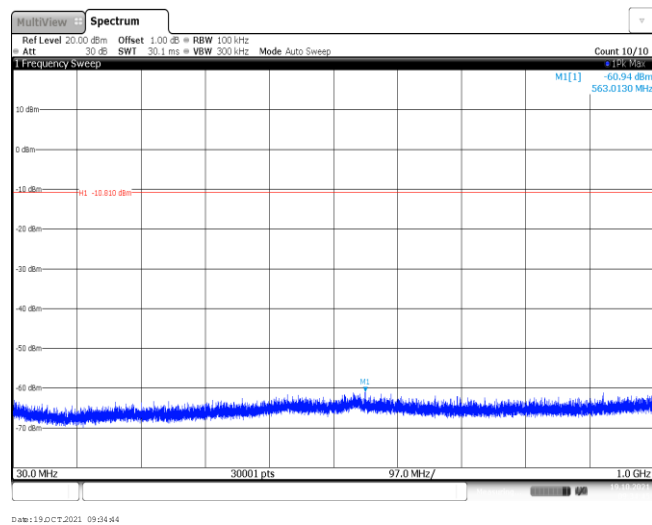


Test Item:	Spurious Emission	Modulation type:	$\pi/4$ DQPSK
CH00 Reference level	 CH00 Reference level		
CH00 30MHz~1000MHz	 CH00 30MHz~1000MHz		
CH00 1GHz~26GHz	 CH00 1GHz~26GHz		

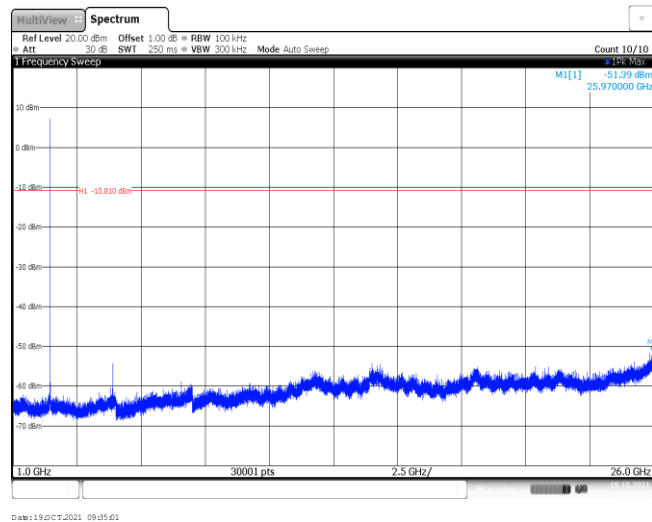
CH39
Reference level



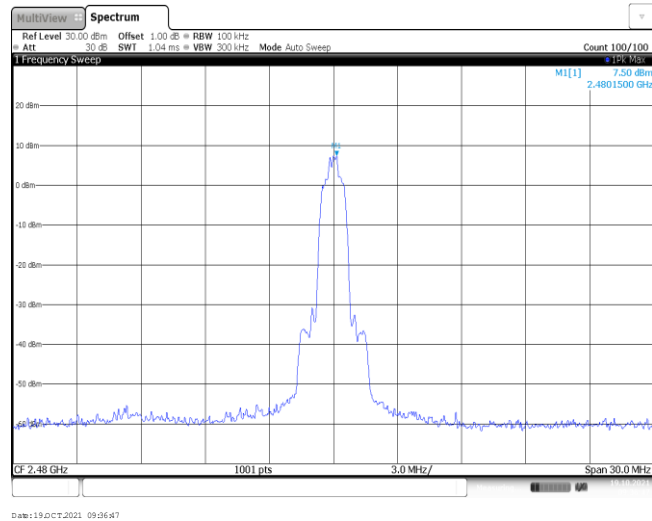
CH39
30MHz~1000MHz



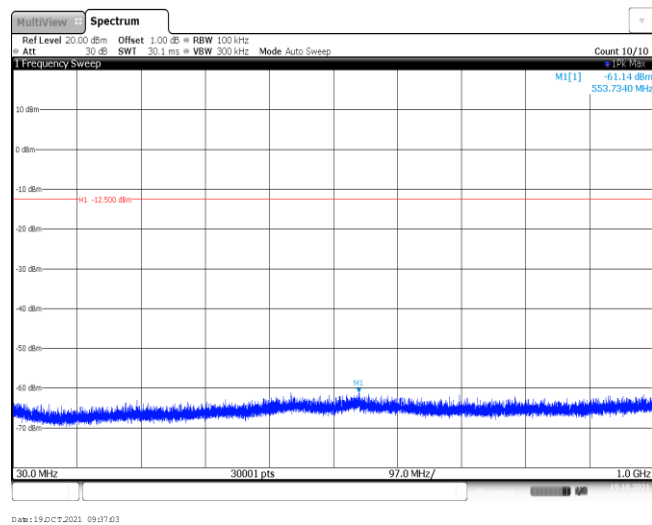
CH39
1GHz~26GHz



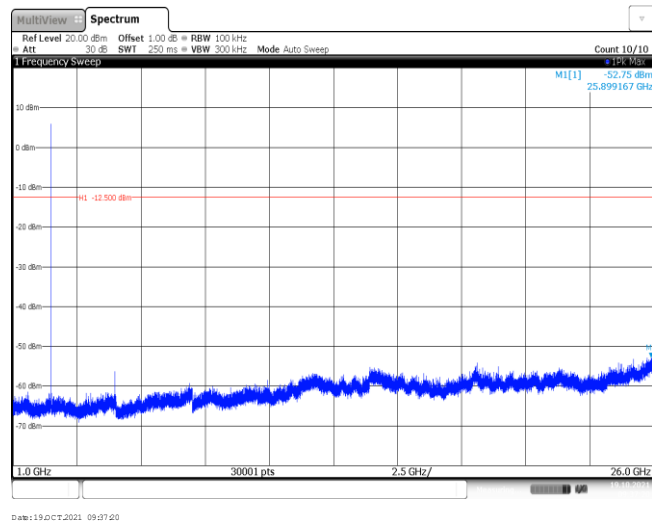
CH78
Reference level

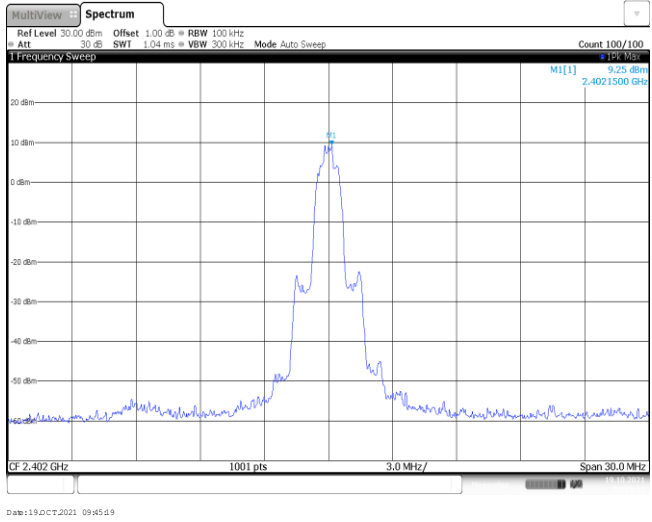
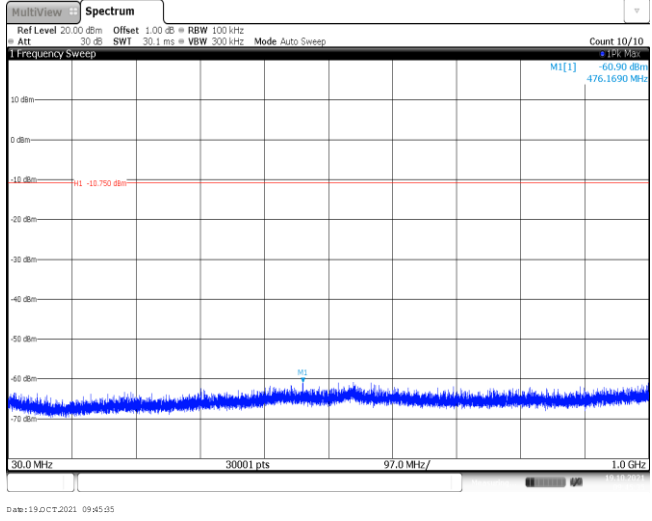
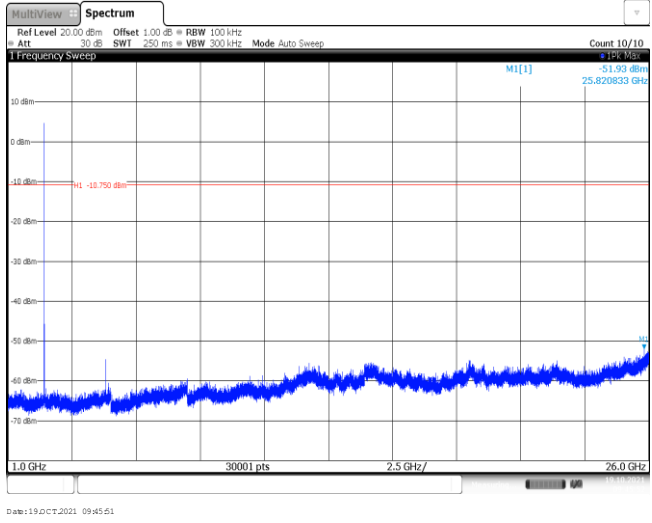


CH78
30MHz~1000MHz

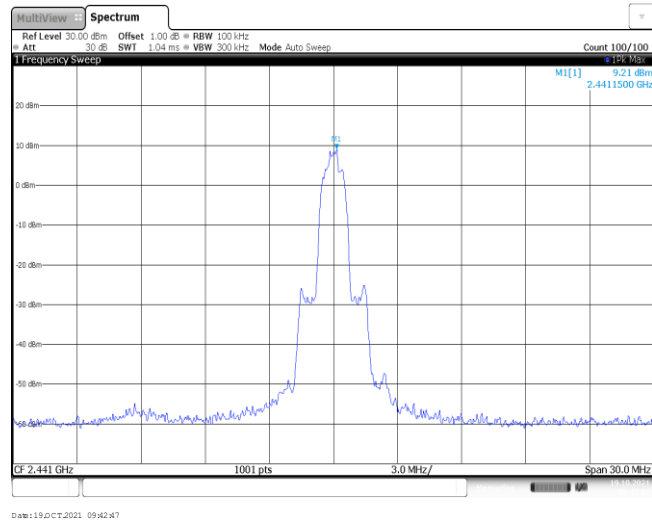


CH78
1GHz~26GHz

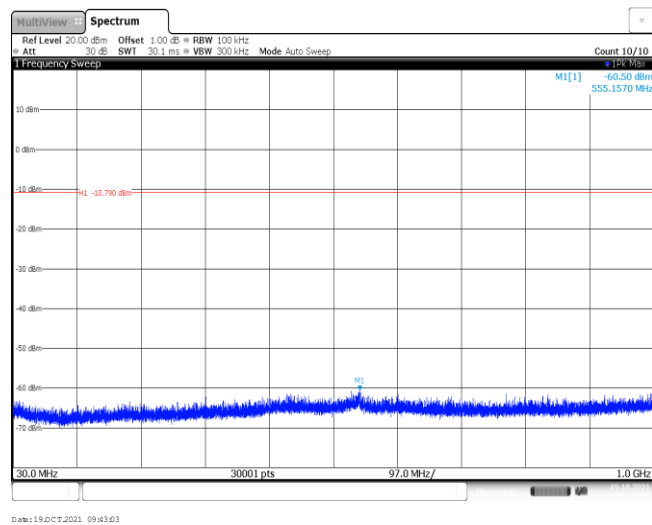


Test Item:	Spurious Emission	Modulation type:	8DPSK
CH00 Reference level			
CH00 30MHz~1000MHz			
CH00 1GHz~26GHz			

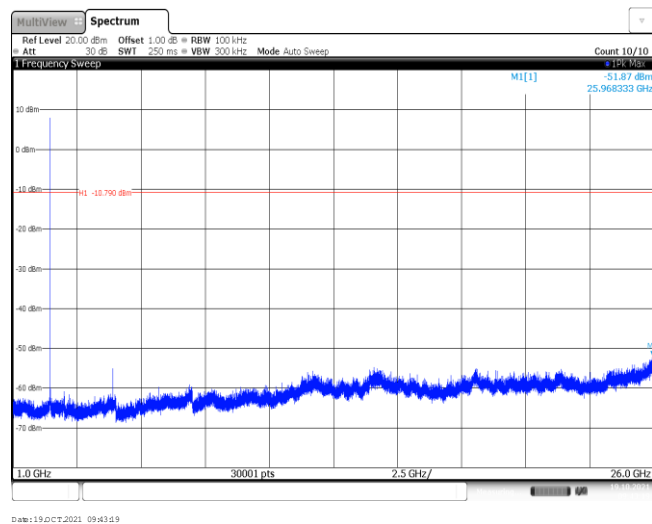
CH39
Reference level

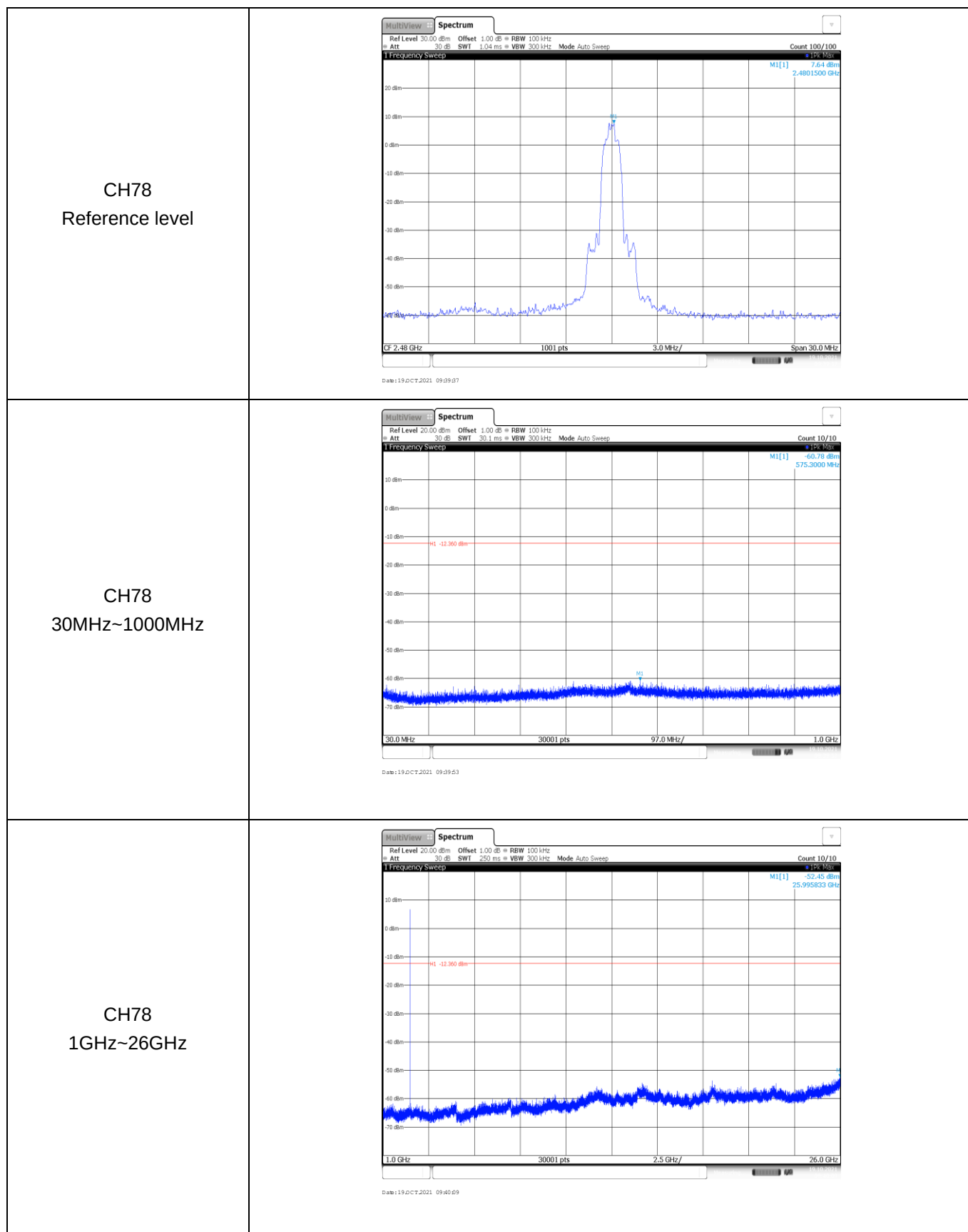


CH39
30MHz~1000MHz



CH39
1GHz~26GHz





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