

APPENDIX REPORT

Project No.	SHT2207088501EW	Radio Specification	Bluetooth EDR
Test sample No.	YPHT22070885003	Model No.	Smart K
Start test date	2022-08-01	Finish date	2022-08-01
Temperature	26.5℃	Humidity	31%
Test Engineer	Xiaoxiao Li	Auditor	Xiaodong Zhu

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

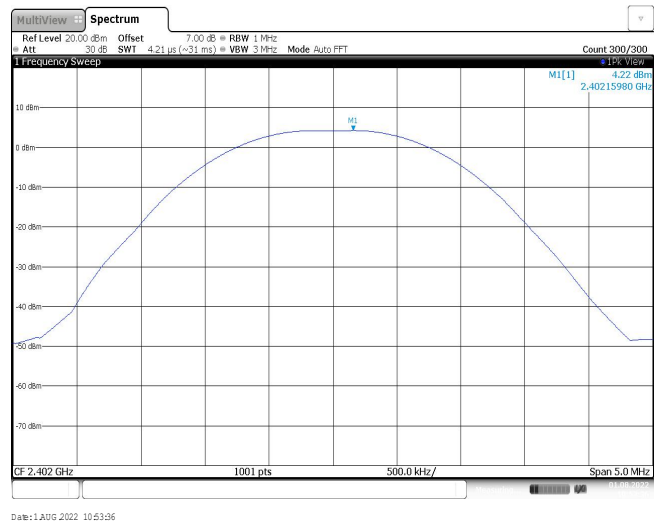
Appendix A: Peak Output Power

Modulation type	Channel	Peak Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
GFSK	00	4.22	4.21	≤ 30.00	Pass
	39	3.11	3.10		
	78	3.64	3.63		
$\pi/4$ DQPSK	00	4.34	3.83	≤ 21.00	Pass
	39	3.99	3.50		
	78	3.58	3.07		
8DPSK	00	4.44	3.91	≤ 21.00	Pass
	39	4.13	3.62		
	78	3.75	3.15		

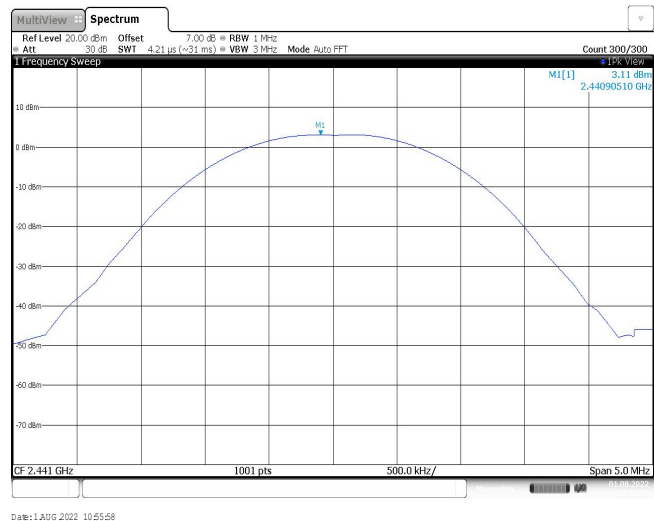
Modulation Type:

GFSK

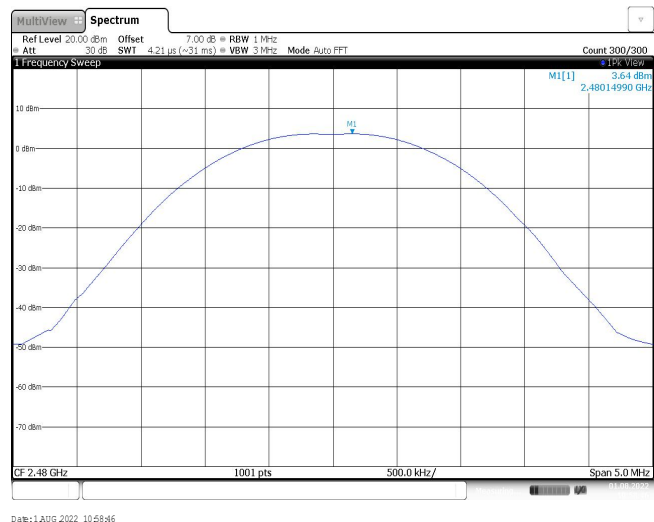
CH00



CH39



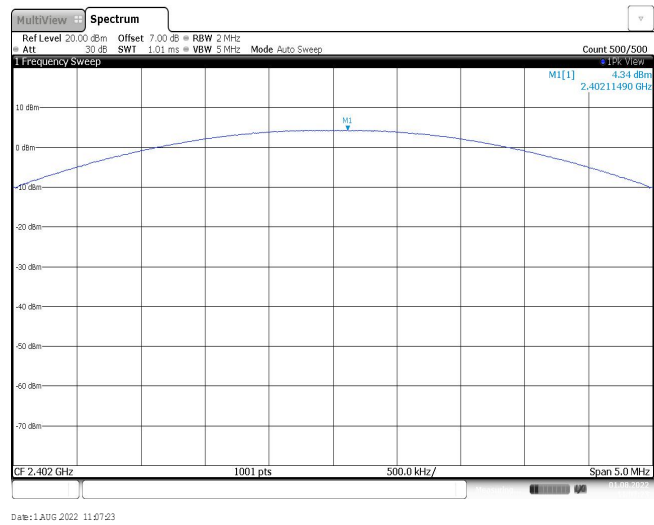
CH78



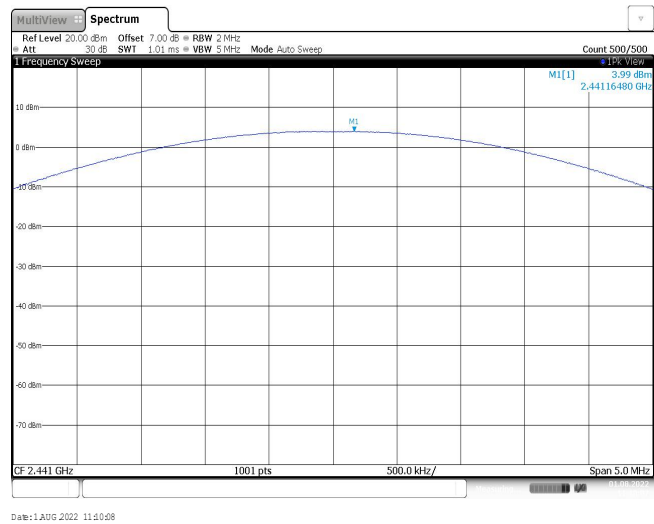
Modulation Type:

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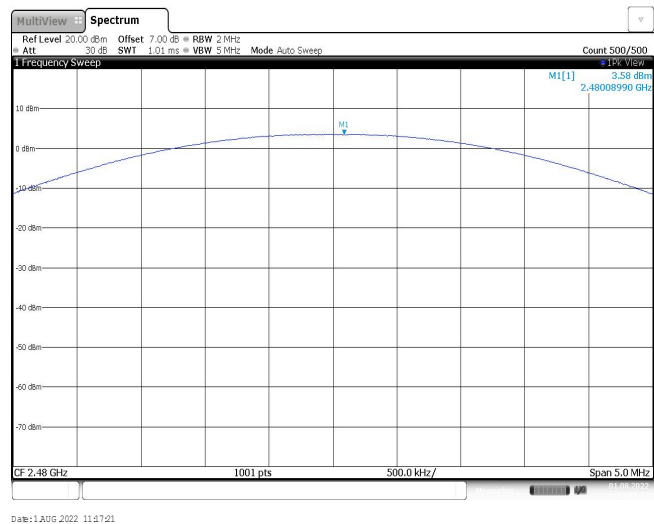
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CH39



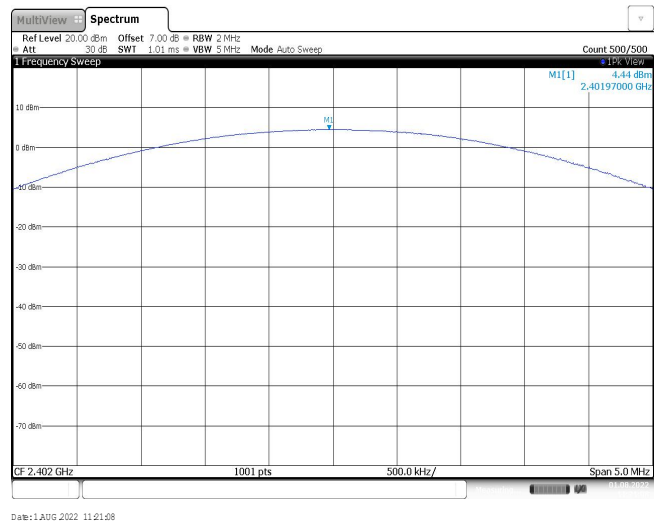
CH78



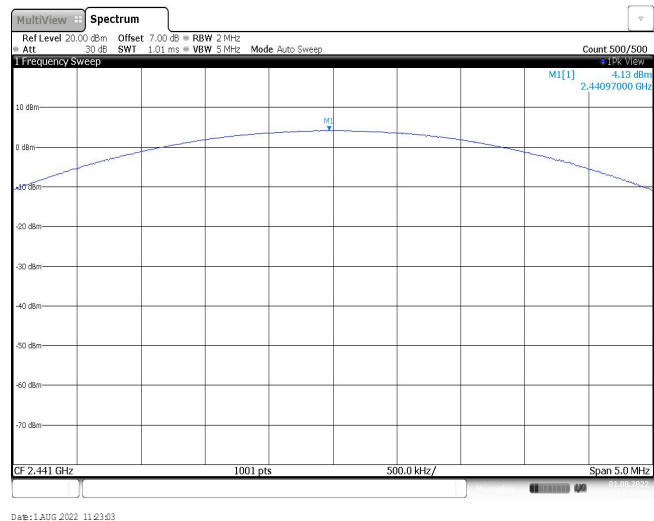
Modulation Type:

8DPSK

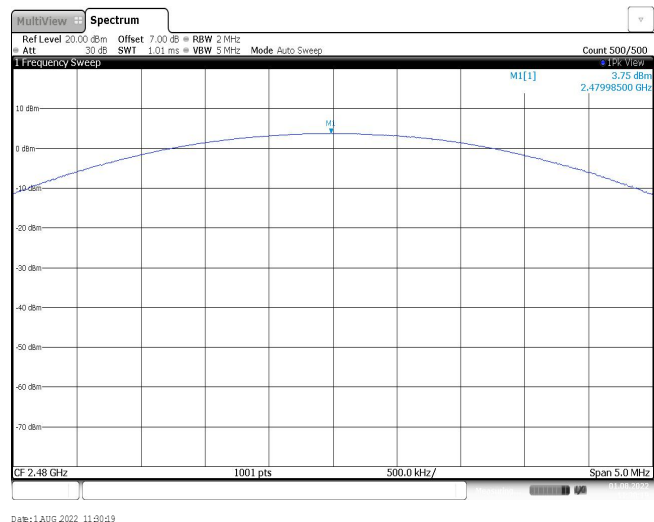
CH00



CH39



CH78



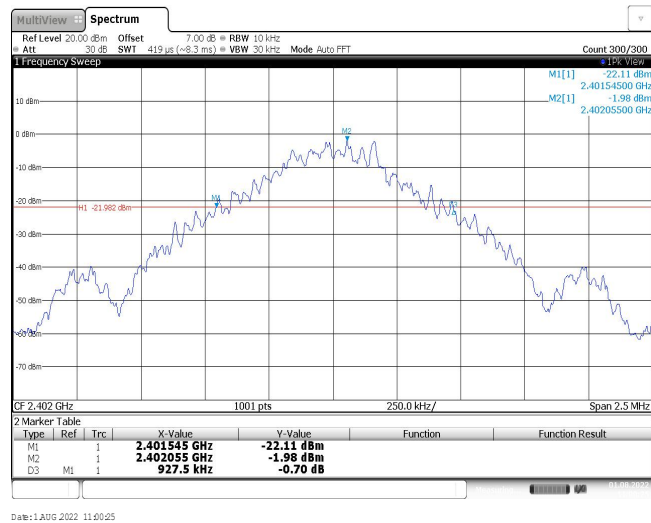
Appendix B : 20 dB Bandwidth

Modulation type	Channel	20 dB Bandwidth (kHz)	Limit (kHz)	Result
GFSK	00	927.50	-	Pass
	39	927.50		
	78	927.50		
$\pi/4$ DQPSK	00	1285.00	-	Pass
	39	1285.00		
	78	1282.50		
8DPSK	00	1292.50	-	Pass
	39	1300.00		
	78	1295.00		

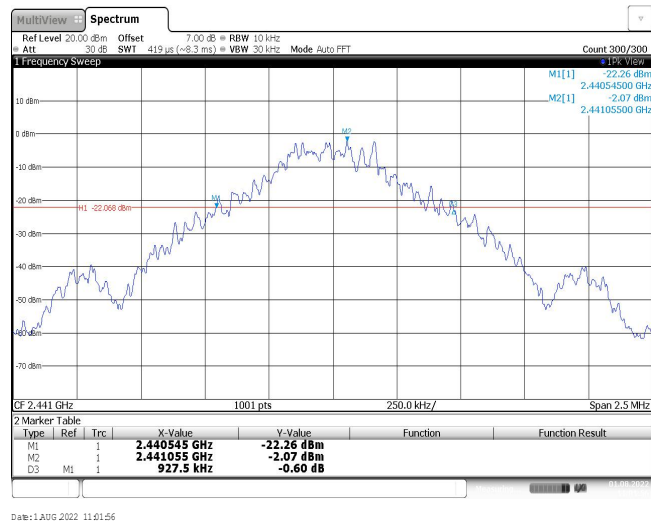
Modulation Type:

GFSK

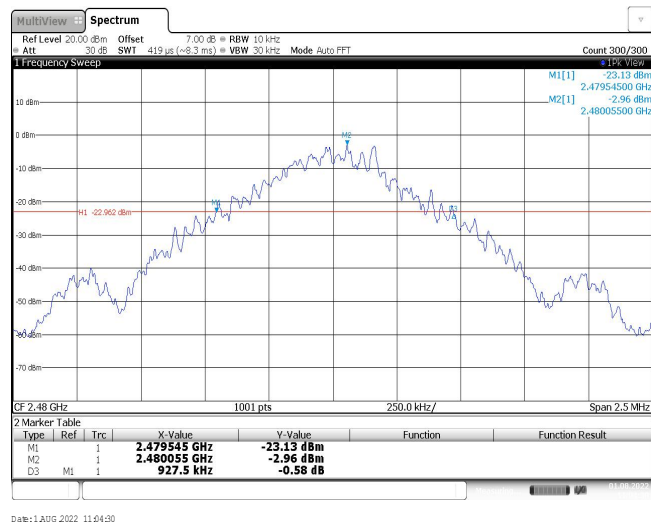
CH00



CH39



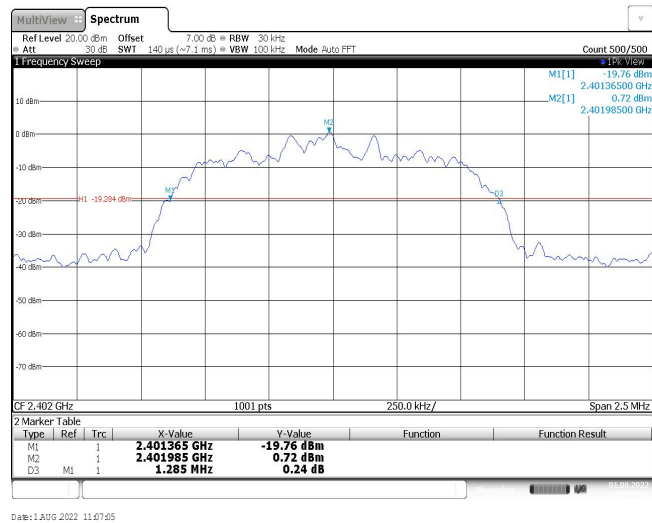
CH78



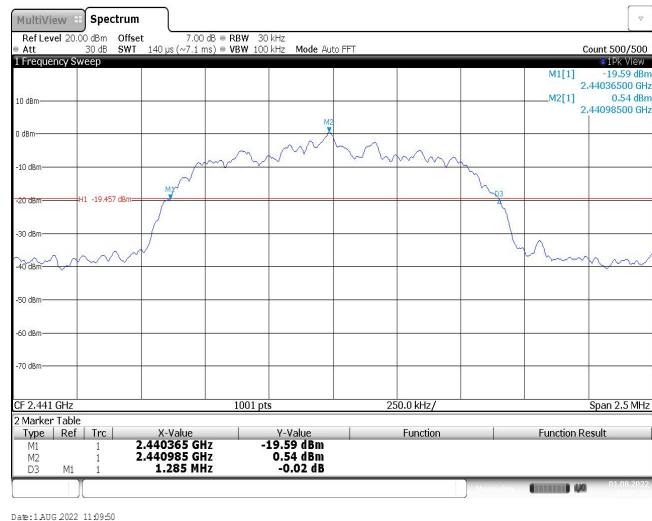
Modulation Type:

 $\pi/4$ DQPSK

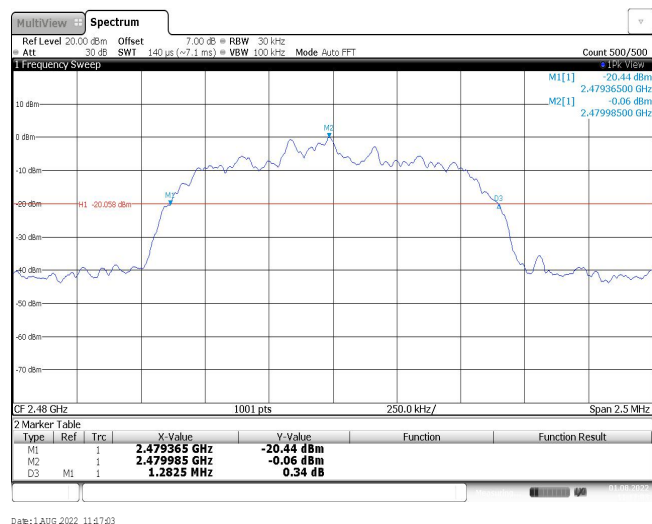
CH00



CH39



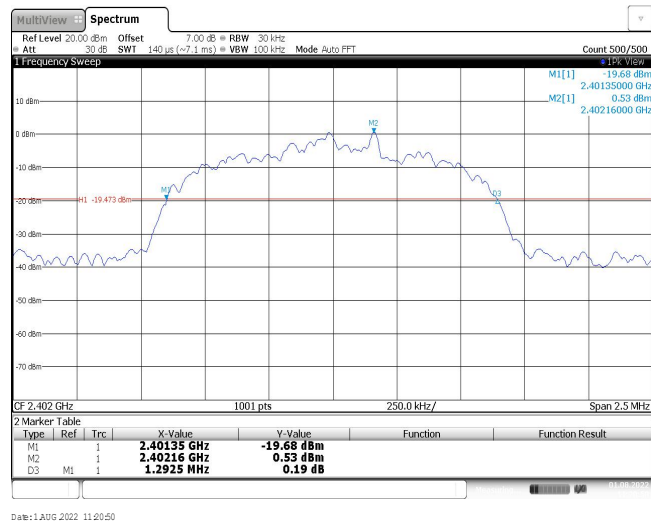
CH78



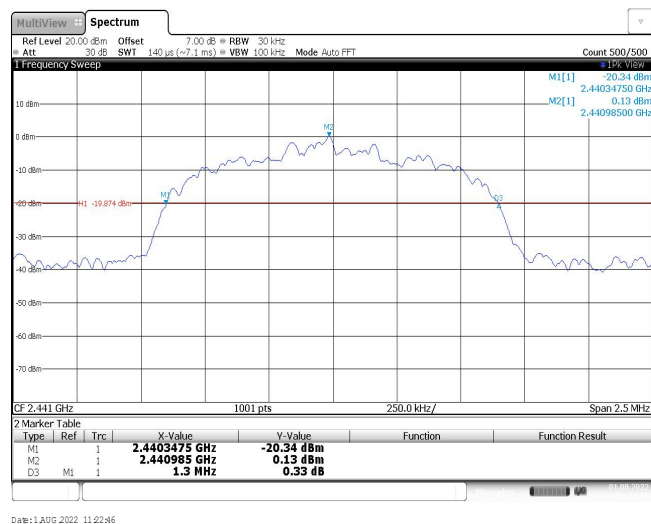
Modulation Type:

8DPSK

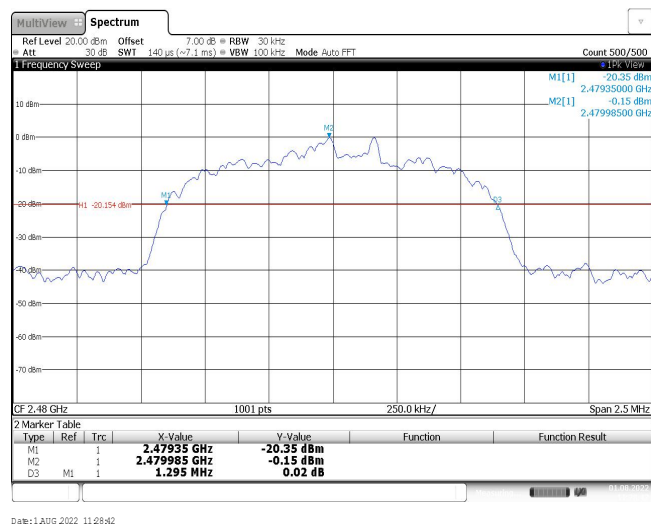
CH00



CH39



CH78



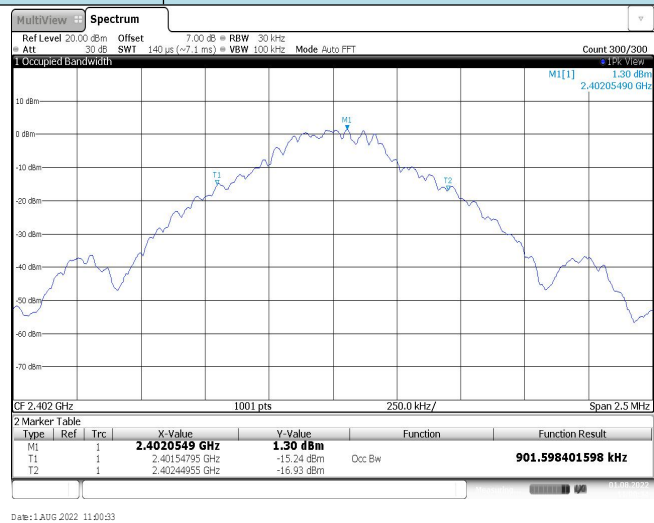
Appendix C: 99% Occupied Bandwidth

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

Modulation Type:

GFSK

CH00

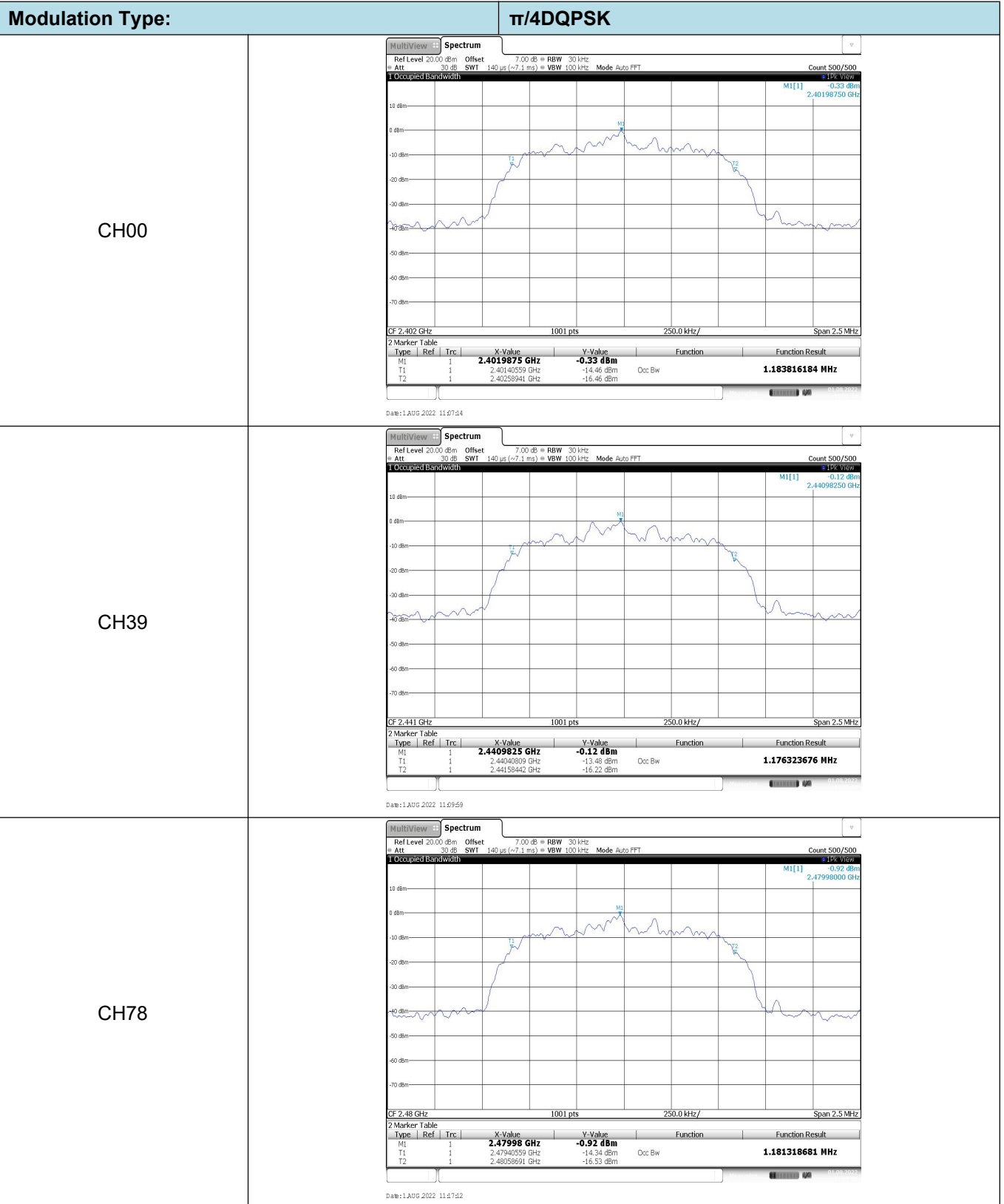


CH39



CH78

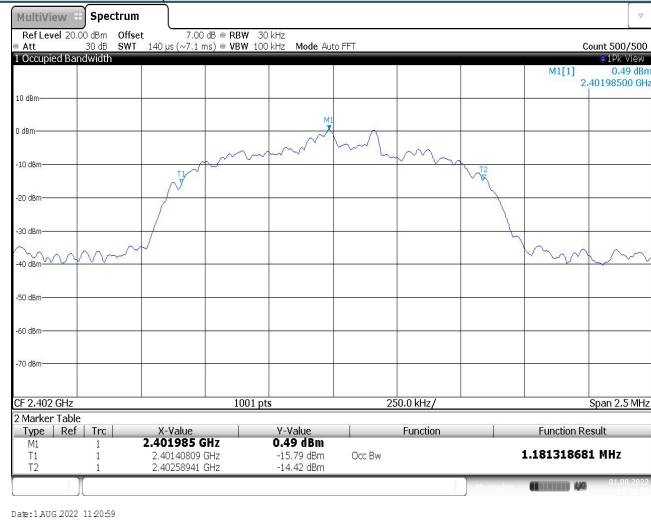




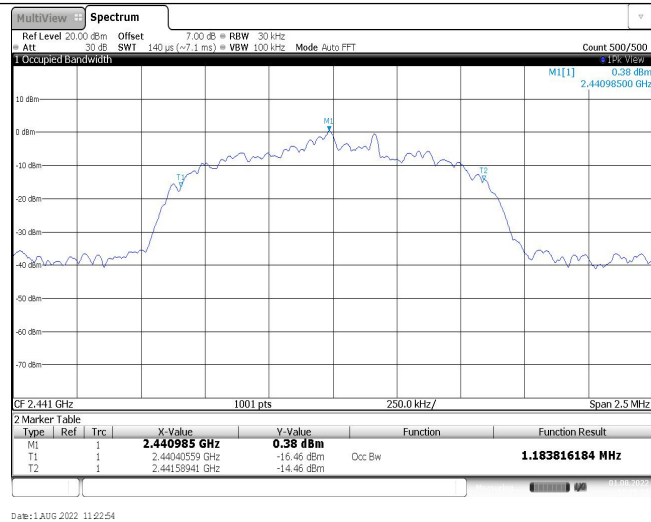
Modulation Type:

8DPSK

CH00



CH39



CH78



Appendix D: Carrier Frequencies Separation

Modulation type	Channel	Carrier Frequencies Separation (MHz)	Limit (kHz) *	Result
GFSK	39	1.00	≥ 927.50	Pass
$\pi/4$ DQPSK	39	1.00	≥ 856.67	Pass
8DPSK	39	1.00	≥ 866.67	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.

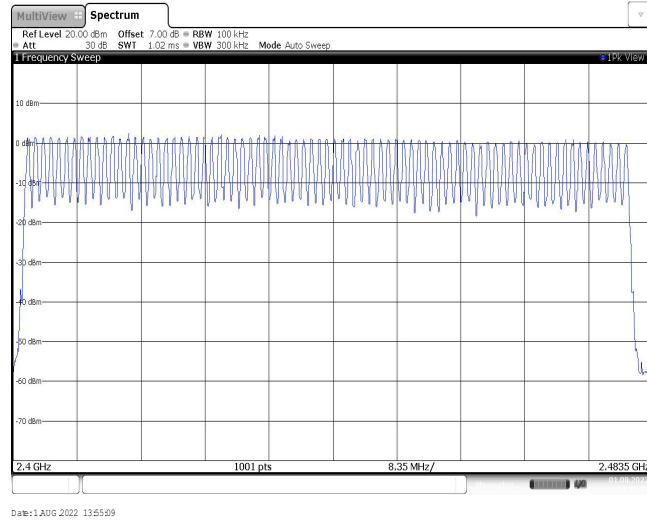
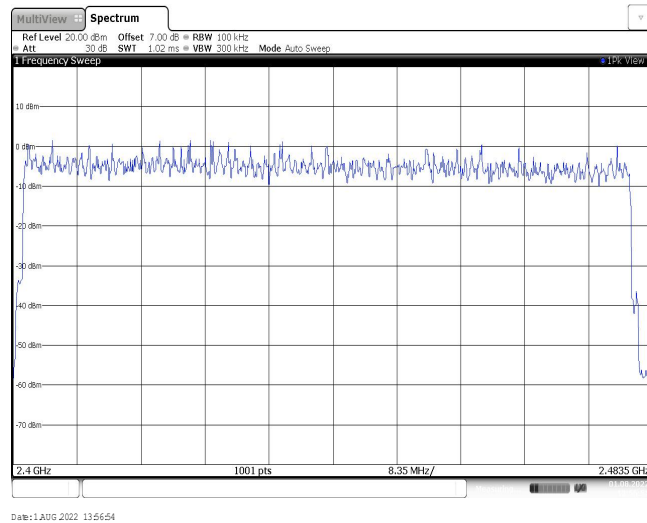
8DPSK limit = $2/3$ * The maximum 20 dB Bandwidth for 8DPSK modulation on the appendix B

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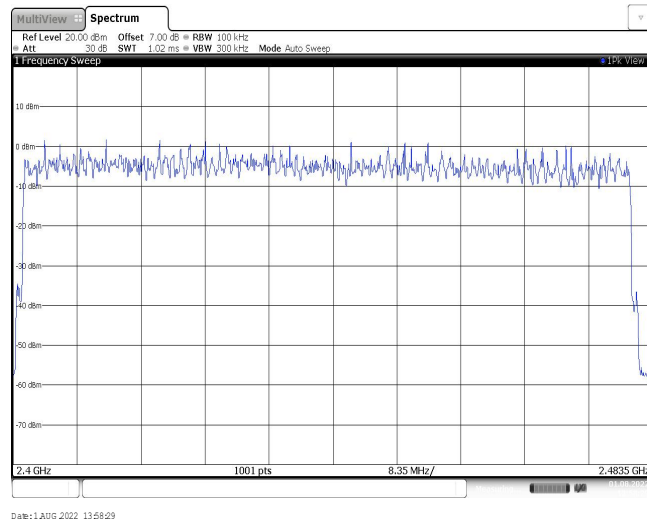
Appendix E: Hopping Channel Number

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

GFSK

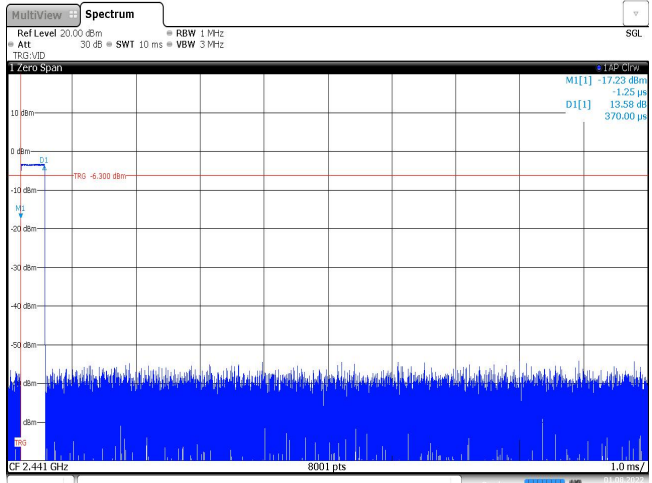
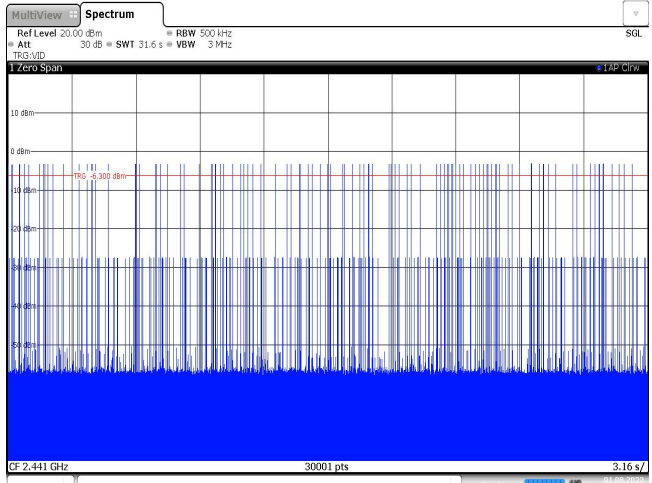
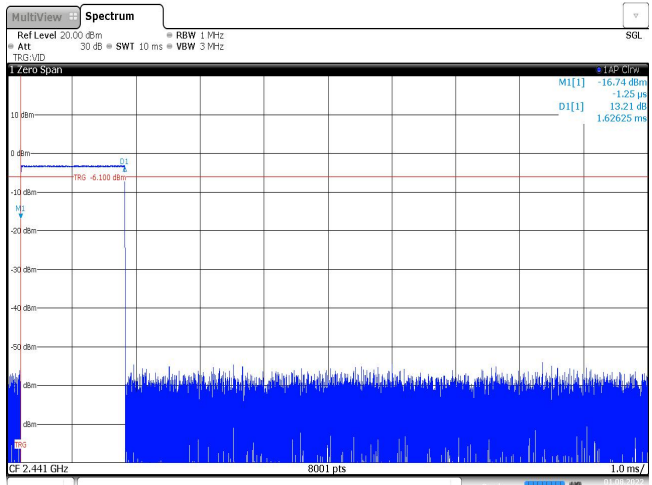
 $\pi/4$ DQPSK

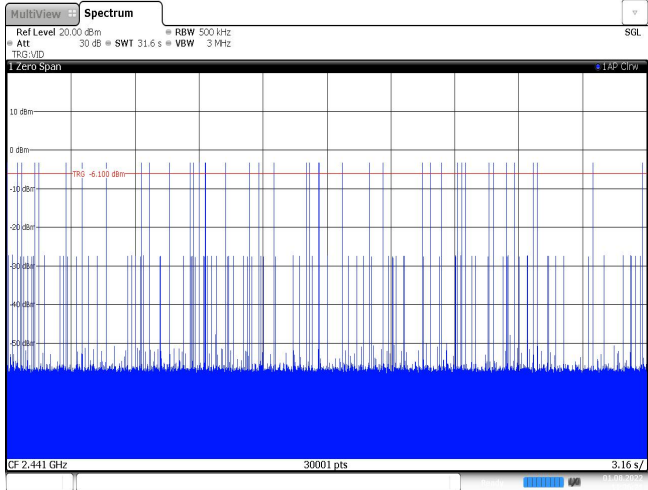
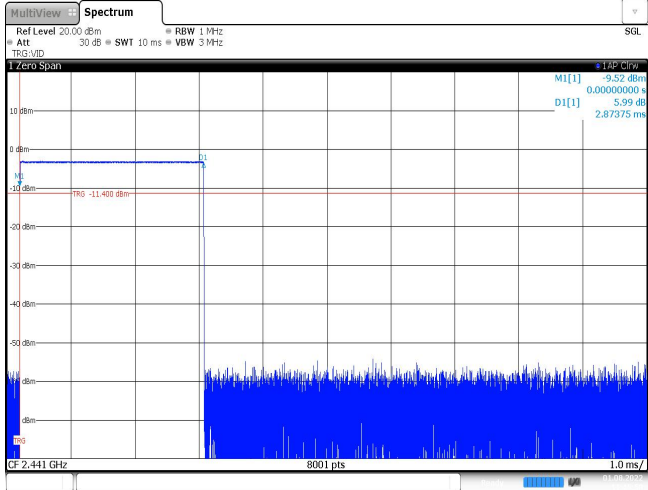
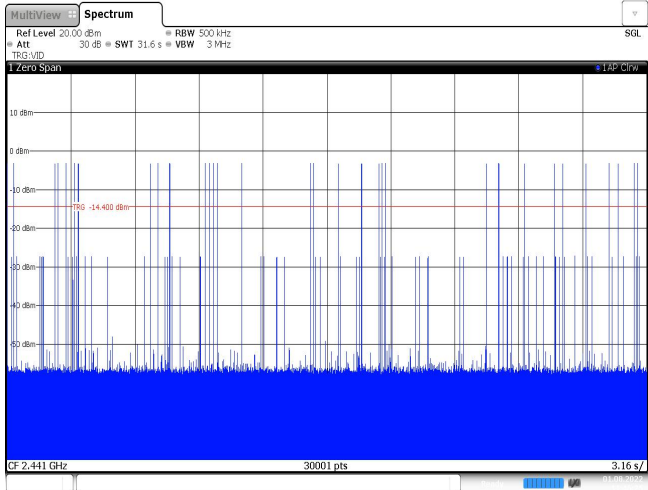
8DPSK

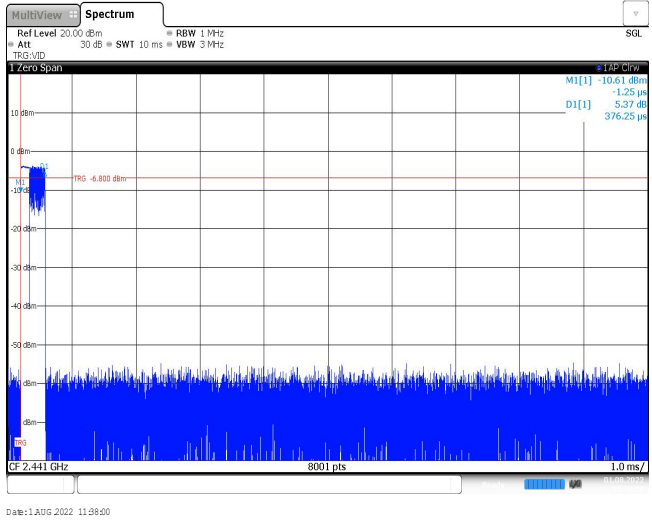
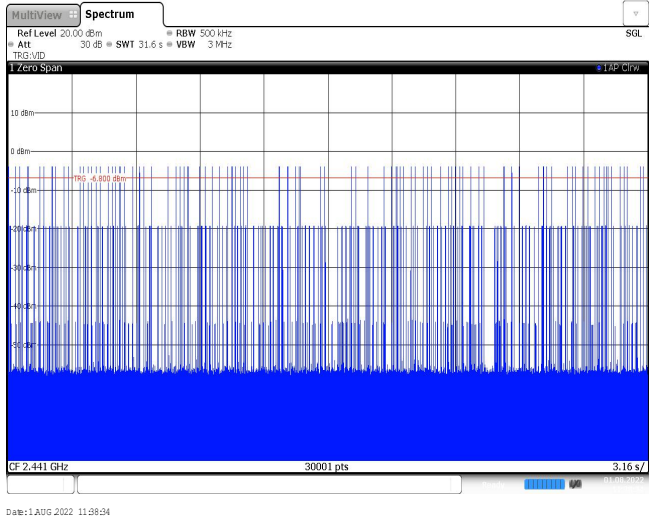
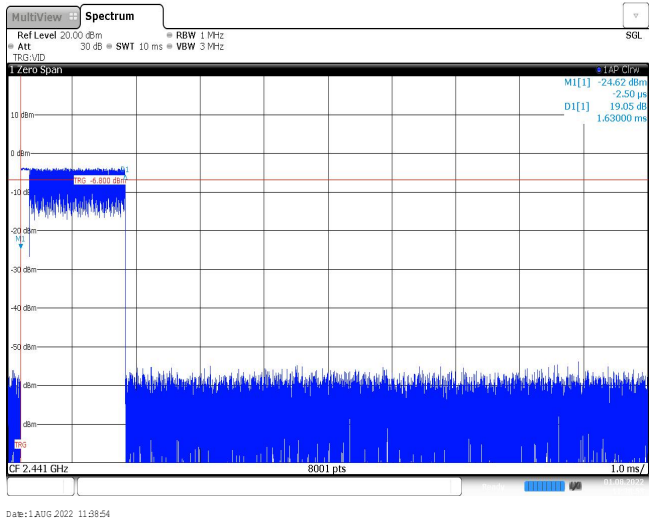


Appendix F: Dwell Time

Modulation type	Packet	Burst Width [ms]	Total Hops[hop*ch]	Dwell time (Second)	Limit (Second)	Result
GFSK	DH1	0.37	105	0.04	≤ 0.40	Pass
	DH3	1.63	39	0.06		
	DH5	2.87	32	0.09		
$\pi/4$ DQPSK	2DH1	0.38	103	0.04	≤ 0.40	Pass
	2DH3	1.63	42	0.07		
	2DH5	2.88	36	0.10		
8DPSK	3DH1	0.38	105	0.04	≤ 0.40	Pass
	3DH3	1.63	45	0.07		
	3DH5	2.88	29	0.08		

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 -90 to 10. The x-axis represents time in ms, ranging from 0 to 1.0. The plot shows a burst of signal at the beginning, followed by a period of low power. The signal is identified as DH1 with a burst width of 1.25 μs and a power level of -17.23 dBm. The plot also shows a trigger level at -6.300 dBm and a trigger delay of 1.0 ms. Date: 1 AUG 2022 11:24:54
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 -90 to 10. The x-axis represents time in s, ranging from 0 to 3.16. The plot shows a burst of signal at the beginning, followed by a period of low power. The signal is identified as DH1 with a burst number of 31.6 s and a power level of -17.23 dBm. The plot also shows a trigger level at -6.300 dBm and a trigger delay of 1.0 ms. Date: 1 AUG 2022 11:25:28
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 -90 to 10. The x-axis represents time in ms, ranging from 0 to 1.0. The plot shows a burst of signal at the beginning, followed by a period of low power. The signal is identified as DH3 with a burst width of 1.62625 ms and a power level of -16.74 dBm. The plot also shows a trigger level at -6.100 dBm and a trigger delay of 1.0 ms. Date: 1 AUG 2022 11:25:47

DH3 Burst number	 The screenshot shows a spectrum analyzer interface with the title 'Spectrum'. The y-axis represents power in dBm, ranging from -60 to 10. The x-axis represents frequency in GHz, centered at 2.441 GHz. A red horizontal line indicates a threshold at -14.400 dBm. The plot shows a dense series of vertical spikes, indicating a burst of signal. The status bar at the bottom shows 'CF 2.441 GHz', '30001 pts', and a date of '1 AUG 2022 11:56:21'.
DH5 Burst width	 The screenshot shows a spectrum analyzer interface with the title 'Spectrum'. The y-axis represents power in dBm, ranging from -60 to 10. The x-axis represents frequency in GHz, centered at 2.441 GHz. A red horizontal line indicates a threshold at -11.400 dBm. The plot shows a single, sharp vertical spike. The status bar at the bottom shows 'CF 2.441 GHz', '8001 pts', and a date of '1 AUG 2022 11:45:50'.
DH5 Burst number	 The screenshot shows a spectrum analyzer interface with the title 'Spectrum'. The y-axis represents power in dBm, ranging from -60 to 10. The x-axis represents frequency in GHz, centered at 2.441 GHz. A red horizontal line indicates a threshold at -14.400 dBm. The plot shows a dense series of vertical spikes, indicating a burst of signal. The status bar at the bottom shows 'CF 2.441 GHz', '30001 pts', and a date of '1 AUG 2022 11:46:25'.

Modulation Type: $\pi/4$ DQPSK	
2DH1 Burst width	 Ref Level 20.00 dBm Att 30 dB RBW 1 MHz SWT 10 ms VBW 3 MHz TSG VID SGL 1 Zero Span M1[1] -10.61 dBm D1[1] -1.25 μs 5.37 dB 376.25 μs CF 2.441 GHz 8001 pts 1.0 ms/ Date:1 AUG 2022 11:38:50
2DH1 Burst number	 Ref Level 20.00 dBm Att 30 dB RBW 500 kHz SWT 31.6 s VBW 3 MHz TSG VID SGL 1 Zero Span M1[1] -24.62 dBm D1[1] 2.50 μs 19.05 dB 1.63000 ms CF 2.441 GHz 30001 pts 3.16 s/ Date:1 AUG 2022 11:38:54
2DH3 Burst width	 Ref Level 20.00 dBm Att 30 dB RBW 1 MHz SWT 10 ms VBW 3 MHz TSG VID SGL 1 Zero Span M1[1] -24.62 dBm D1[1] 2.50 μs 19.05 dB 1.63000 ms CF 2.441 GHz 8001 pts 1.0 ms/ Date:1 AUG 2022 11:38:54