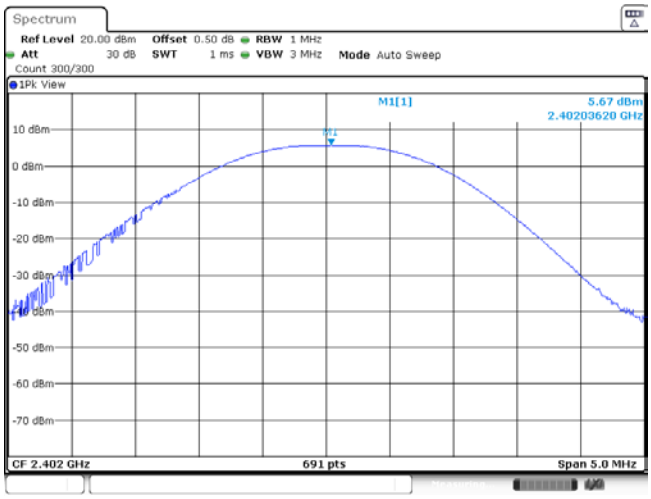
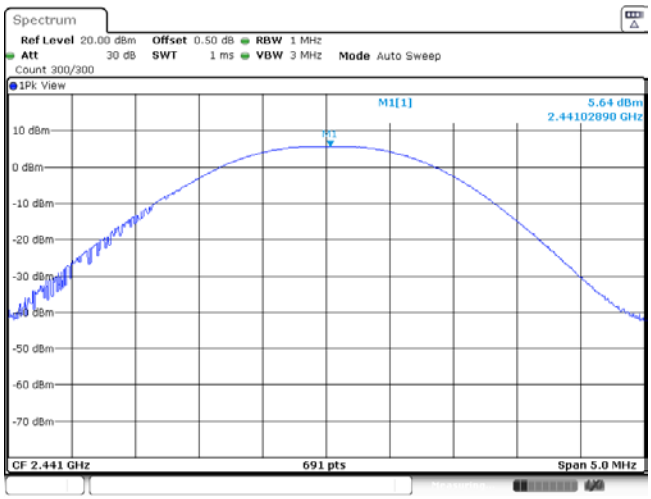
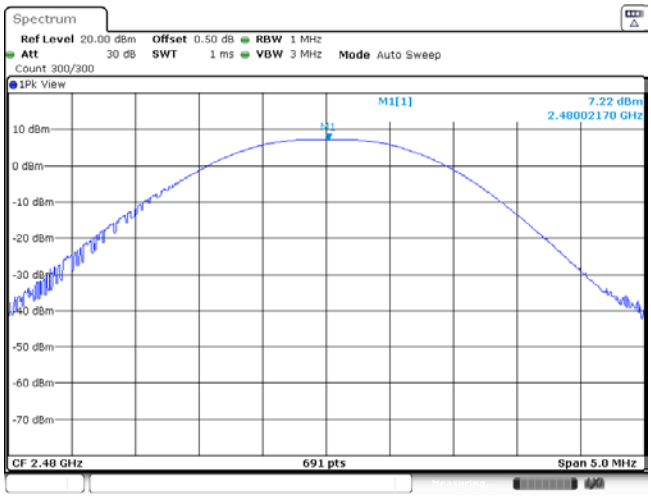
APPENDIX REPORT

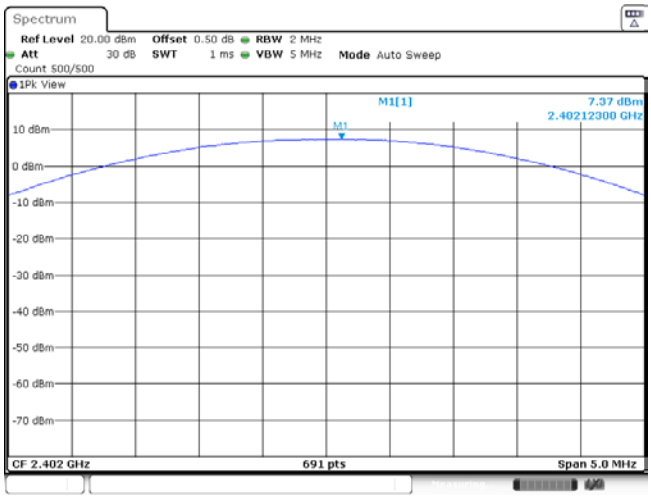
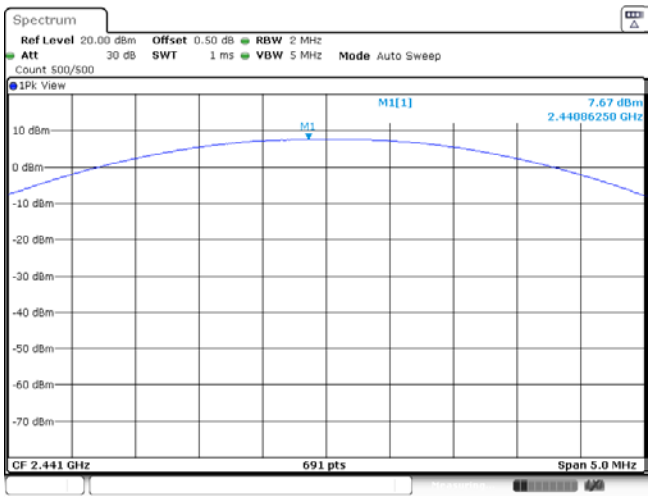
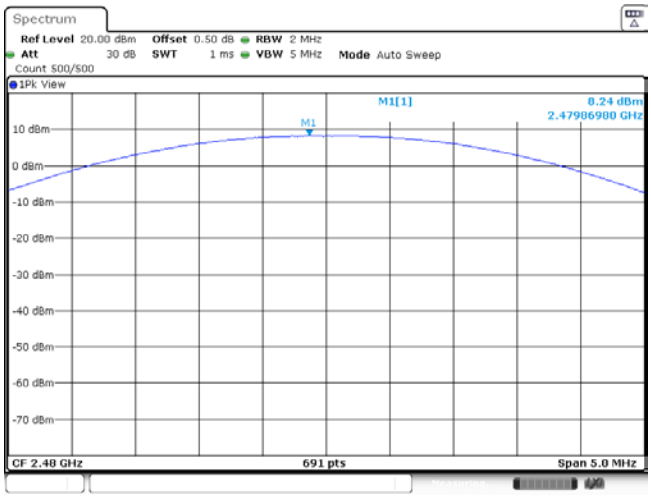
Project No.	SHT2311064901EW	Radio Specification	Bluetooth EDR
Test sample No.	YPHT23110649001	Model No.	ATMET2K
Start test date	2024-03-18	Finish date	2024-03-18
Temperature	25℃	Humidity	51%
Test Engineer	Xiangyu Wei	Auditor	Xiaodong Zhao

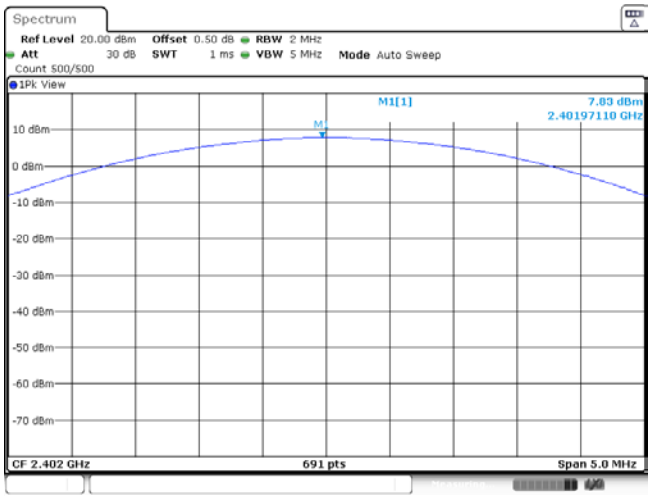
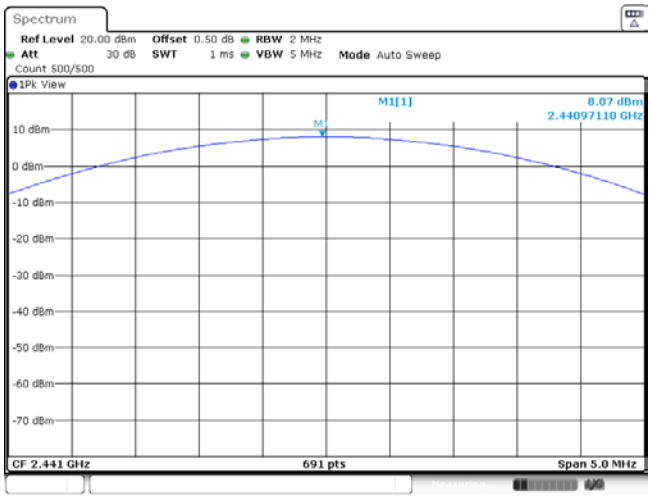
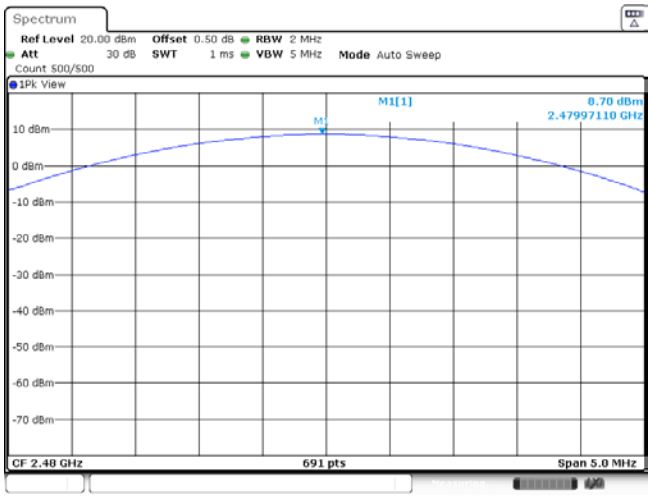
Appendix clause	Test item	Result
A	Peak Output Power	PASS
B	20 dB Bandwidth	PASS
C	99% Occupied Bandwidth	PASS
D	Carrier Frequencies Separation	PASS
E	Hopping Channel Number	PASS
F	Dwell Time	PASS
G	Duty Cycle Correction Factor (DCCF)	PASS
H	Band edge and Spurious Emissions(coducted)	PASS

Appendix A：Peak Output Power

Modulation type	Channel	Peak Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
GFSK	00	5.67	5.62	≤ 30.00	Pass
	39	5.64	5.49		
	78	7.22	7.18		
π/4DQPSK	00	7.37	7.34	≤ 21.00	Pass
	39	7.67	7.65		
	78	8.24	8.22		
8DPSK	00	7.83	7.81	≤ 21.00	Pass
	39	8.07	8.01		
	78	8.70	8.65		

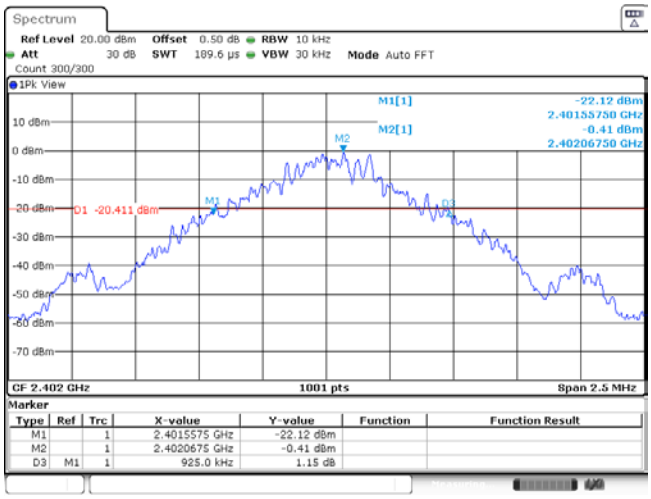
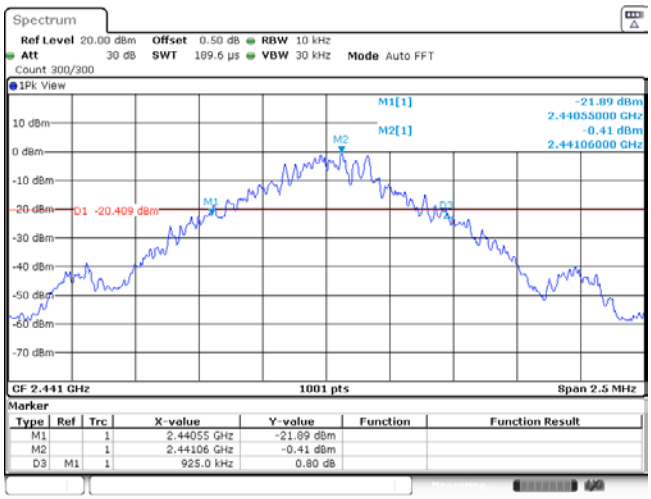
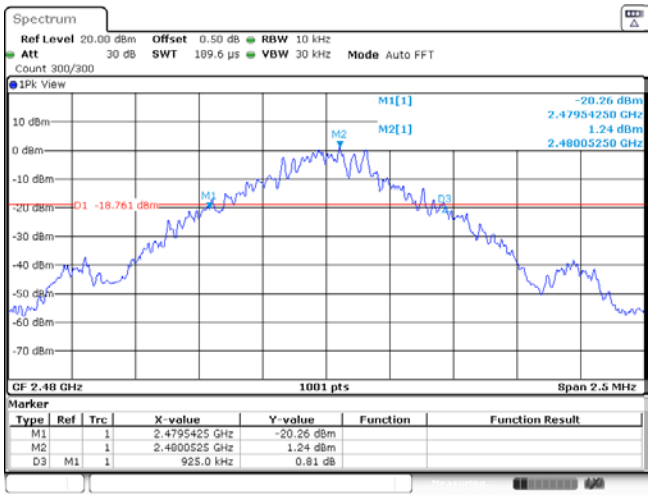
Modulation Type:	GFSK
CH00	 Date: 18.MAR.2024 12:38:20
CH39	 Date: 18.MAR.2024 12:40:04
CH78	 Date: 18.MAR.2024 12:41:22

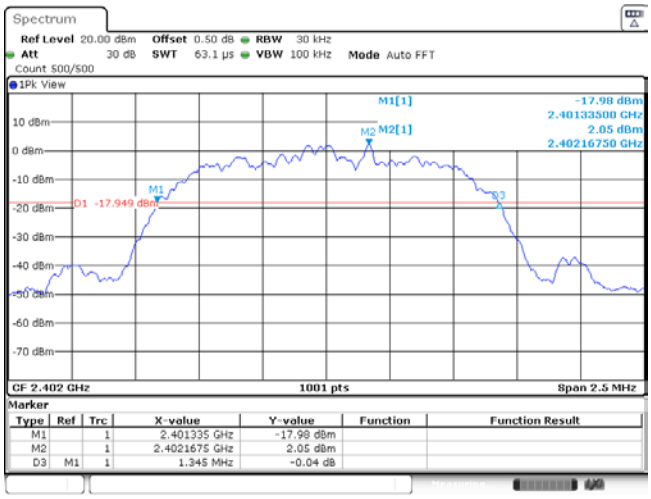
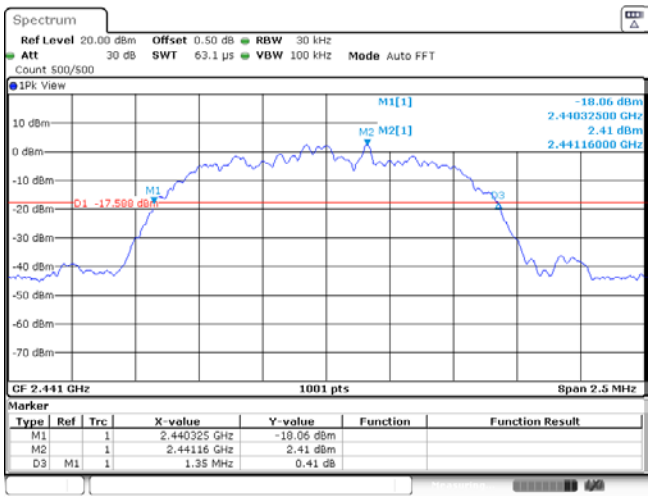
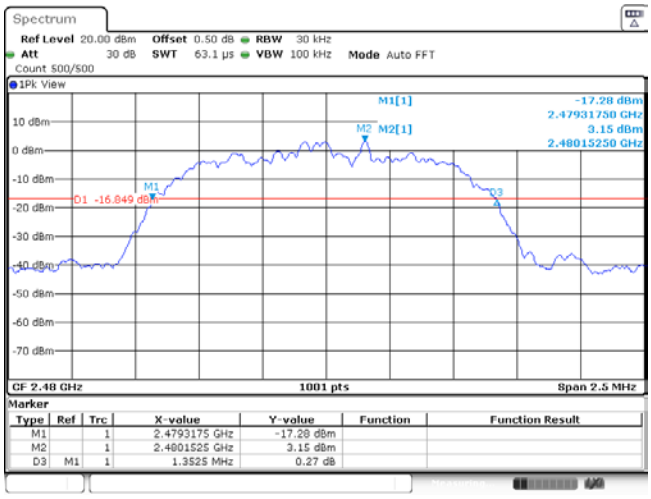
Modulation Type:	**π/4DQPSK**
CH00	 Date: 18.MAR.2024 12:43:08
CH39	 Date: 18.MAR.2024 12:44:40
CH78	 Date: 18.MAR.2024 12:46:25

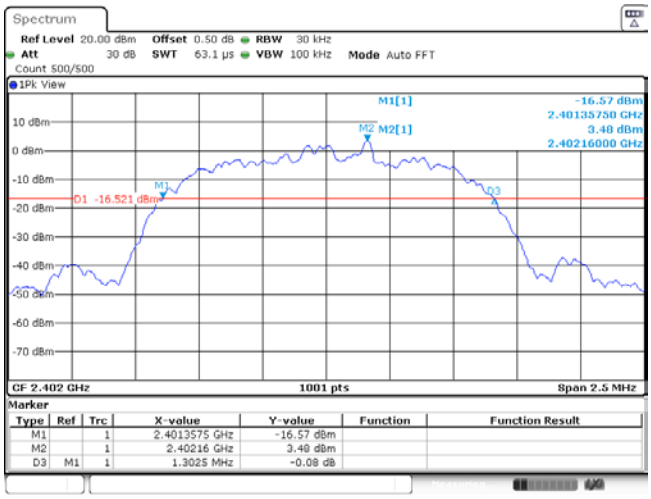
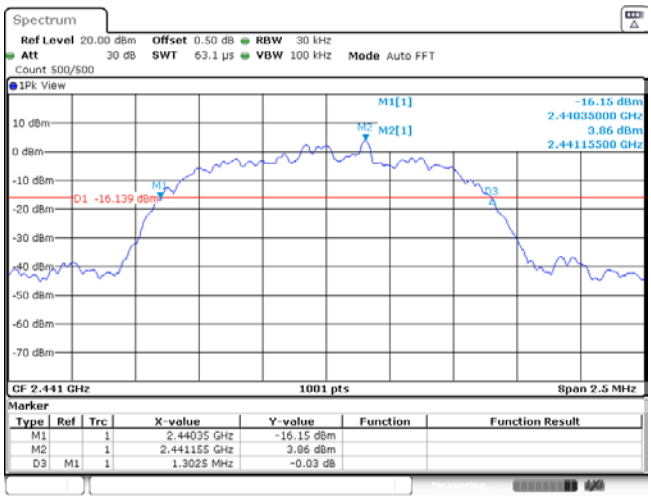
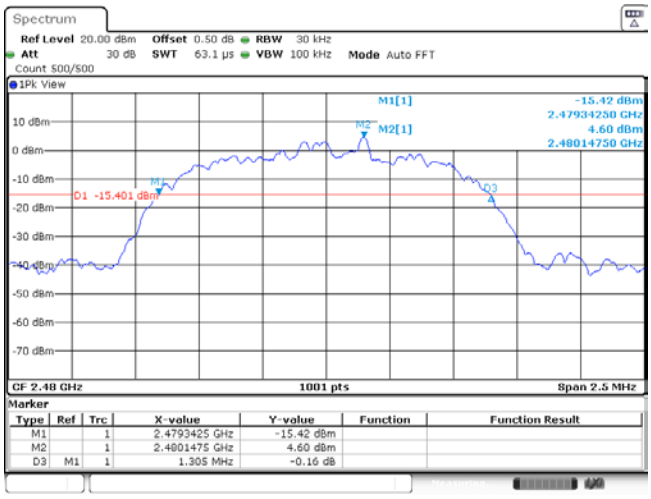
Modulation Type:	**8DPSK**
CH00	 Date: 18.MAR.2024 12:48:22
CH39	 Date: 18.MAR.2024 12:50:16
CH78	 Date: 18.MAR.2024 12:51:37

Appendix B : 20 dB Bandwidth

Modulation type	Channel	20 dB Bandwidth (kHz)	Limit (kHz)	Result
GFSK	00	925.00	-	Pass
	39	925.00		
	78	925.00		
π/4DQPSK	00	1345.00	-	Pass
	39	1350.00		
	78	1352.00		
8DPSK	00	1302.00	-	Pass
	39	1303.00		
	78	1305.00		

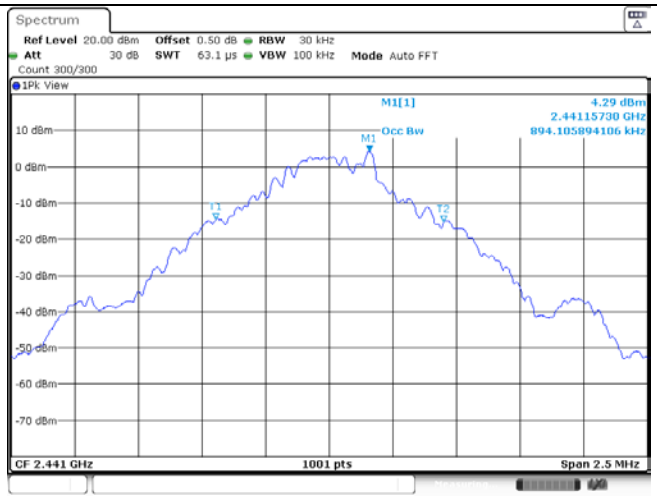
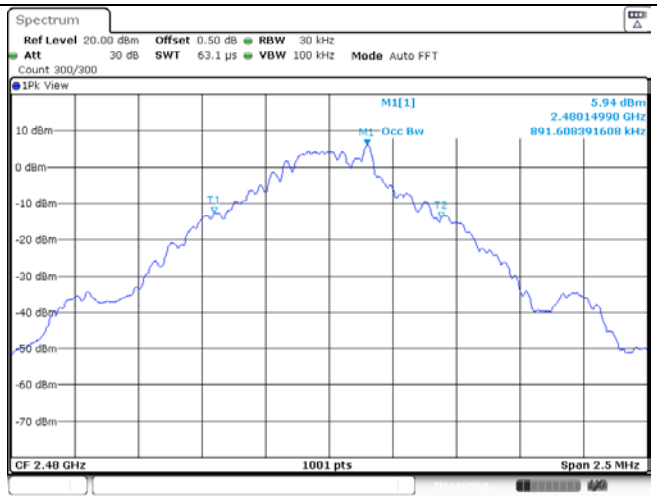
Modulation Type:	GFSK
CH00	
CH39	
CH78	

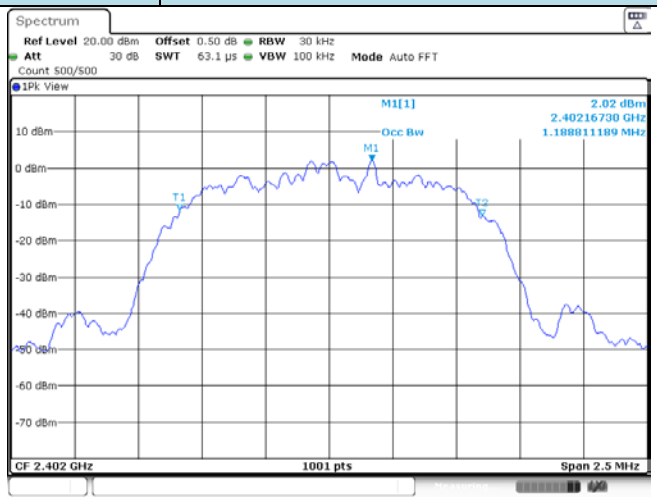
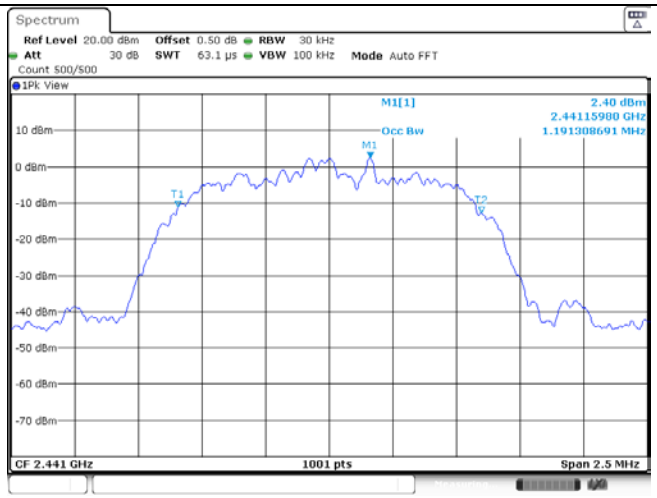
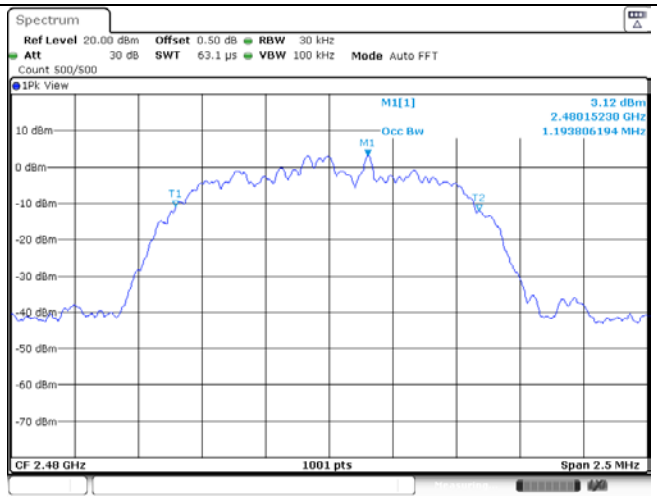
Modulation Type:	**π/4DQPSK**
CH00	
CH39	
CH78	

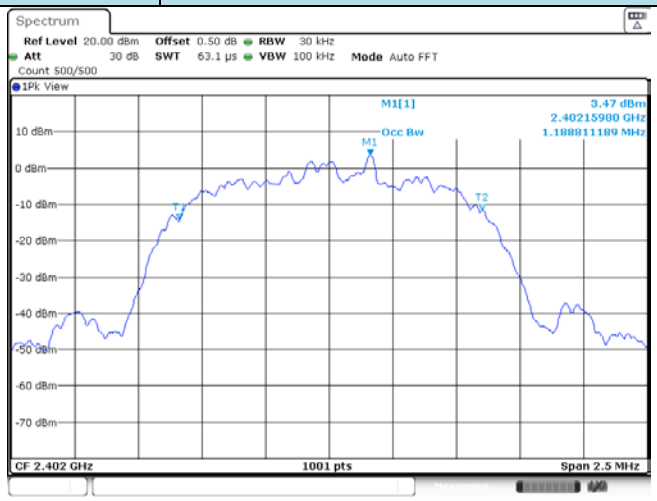
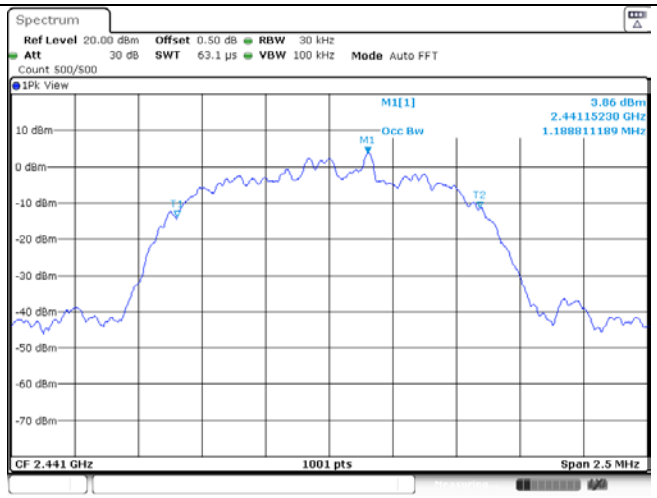
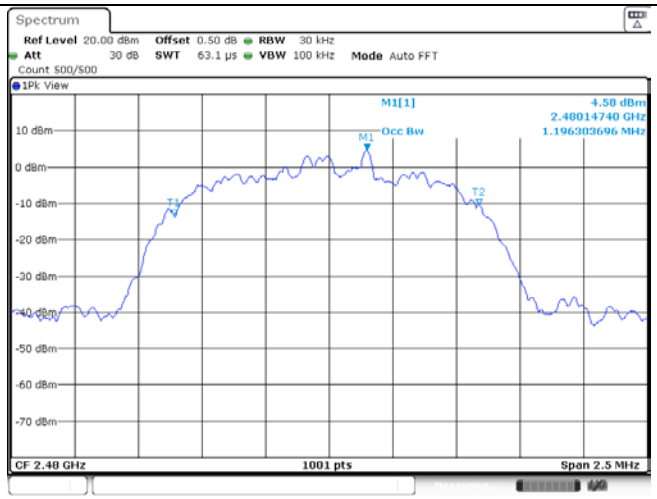
Modulation Type:	**8DPSK**
CH00	
CH39	
CH78	

Appendix C：99% Occupied Bandwidth

Modulation type	Channel	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
GFSK	00	0.89	-	Pass
	39	0.89		
	78	0.89		
π/4DQPSK	00	1.19	-	Pass
	39	1.19		
	78	1.19		
8DPSK	00	1.19	-	Pass
	39	1.19		
	78	1.20		

Modulation Type:	**GFSK**
CH00	
CH39	
CH78	

Modulation Type:	π/4DQPSK
CH00	 Date: 18.MAR.2024 12:43:00
CH39	 Date: 18.MAR.2024 12:44:32
CH78	 Date: 18.MAR.2024 12:46:17

Modulation Type:	**8DPSK**
CH00	 Date: 18.MAR.2024 12:48:13
CH39	 Date: 18.MAR.2024 12:50:98
CH78	 Date: 18.MAR.2024 12:51:29

Appendix D：Carrier Frequencies Separation

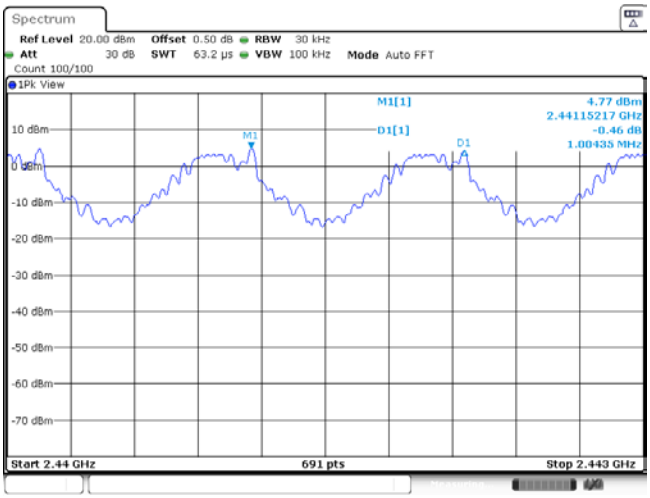
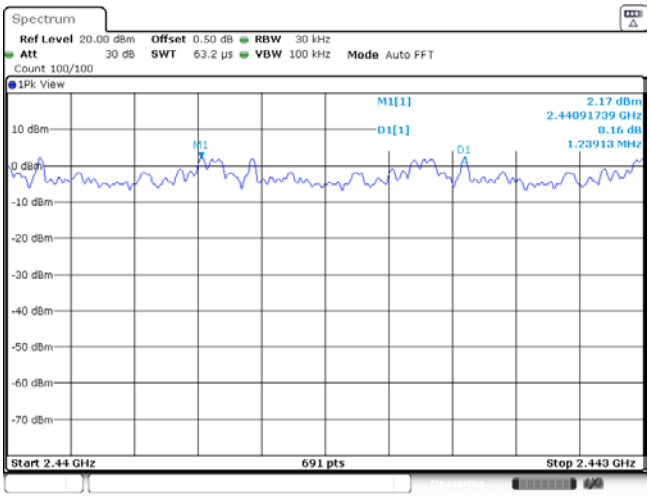
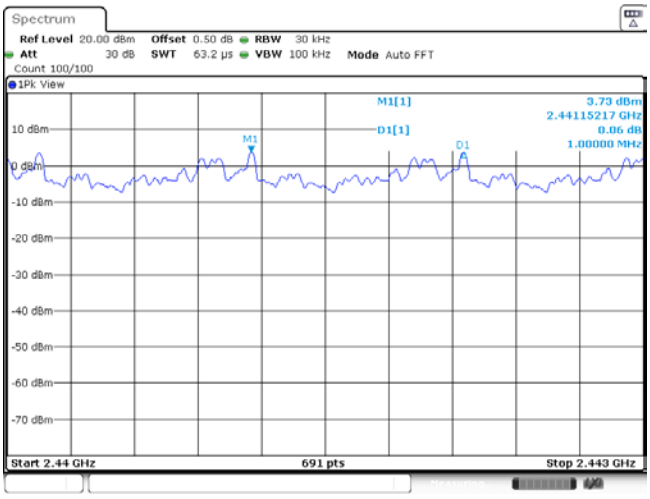
Modulation type	Channel	Carrier Frequencies Separation (MHz)	Limit (kHz) *	Result
GFSK	39	1.00	≥925	Pass
π/4DQPSK	39	1.24	≥901	Pass
8DPSK	39	1.00	≥870	Pass

Note:

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

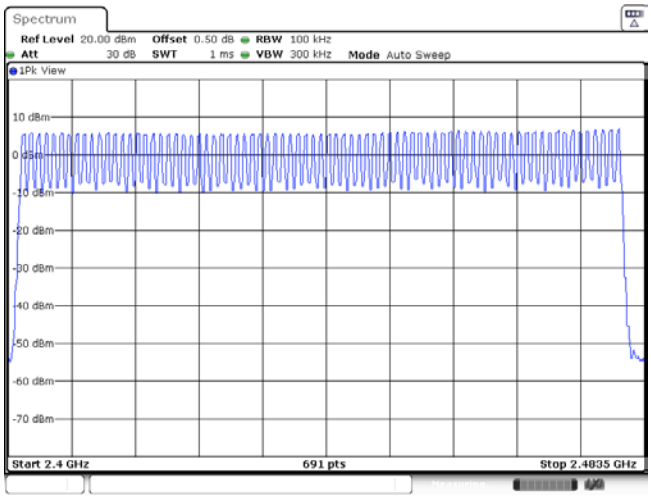
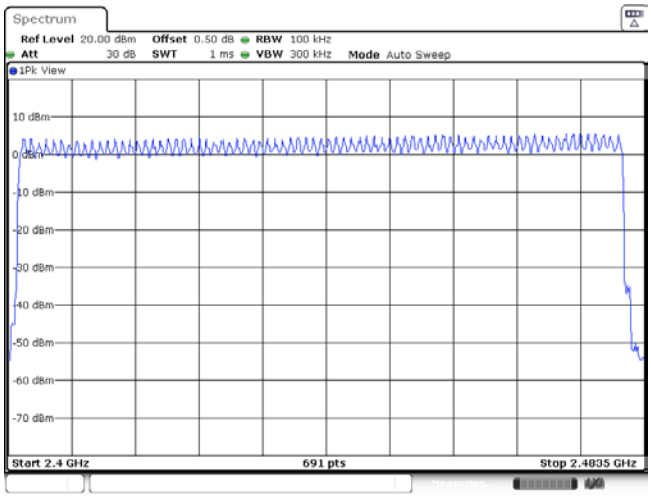
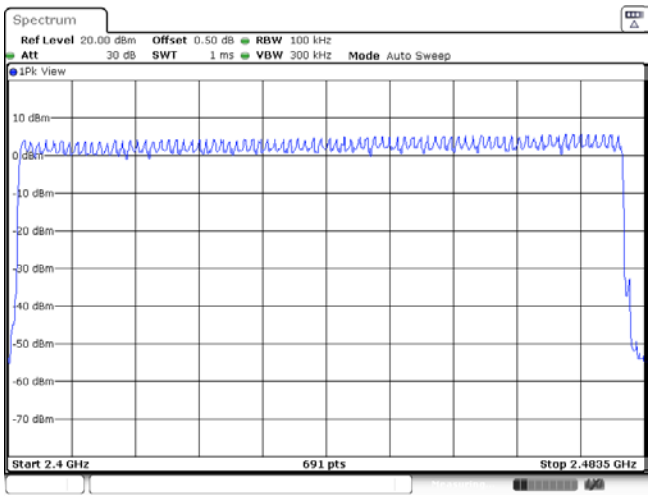
π/4DQPSK limit = 2/3 * The maximum 20 dB Bandwidth for π/4DQPSK modulation on the appendix B.

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

GFSK	 Date: 18.MAR.2024 12:54:26
π/4DQPSK	 Date: 18.MAR.2024 12:56:29
8DPSK	 Date: 18.MAR.2024 12:58:34

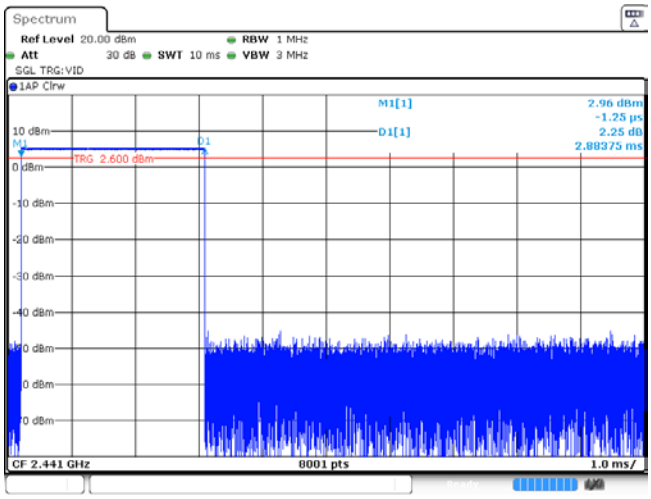
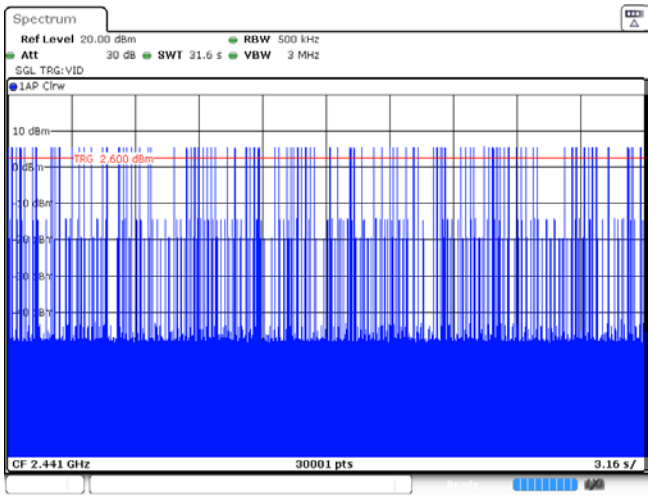
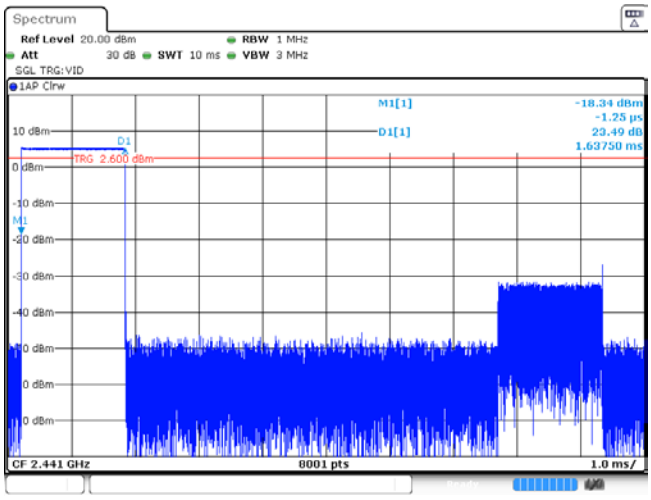
Appendix E：Hopping Channel Number

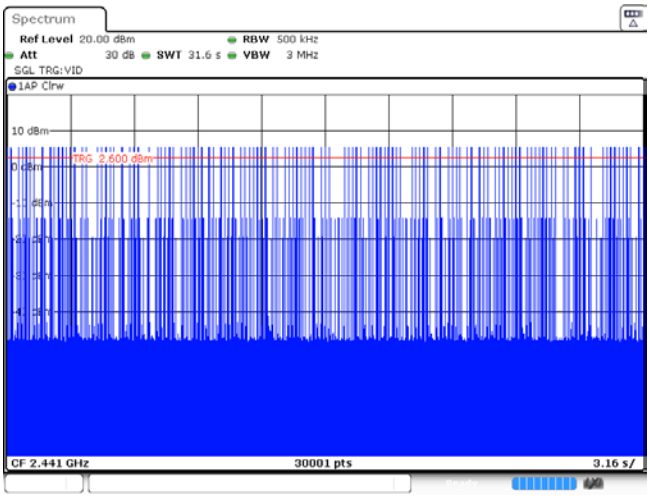
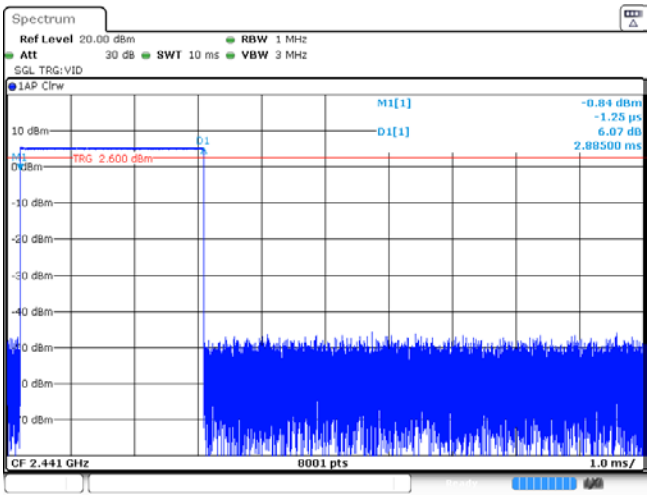
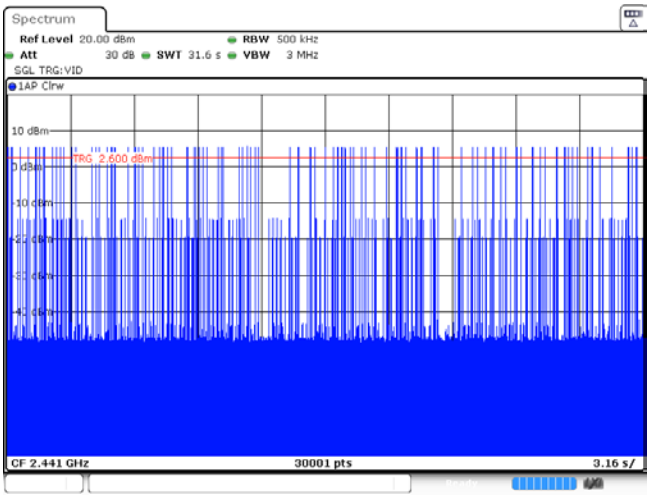
Modulation type	Channel number	Limit	Result
GFSK	79	≥15.00	Pass
π/4DQPSK	79		
8DPSK	79		

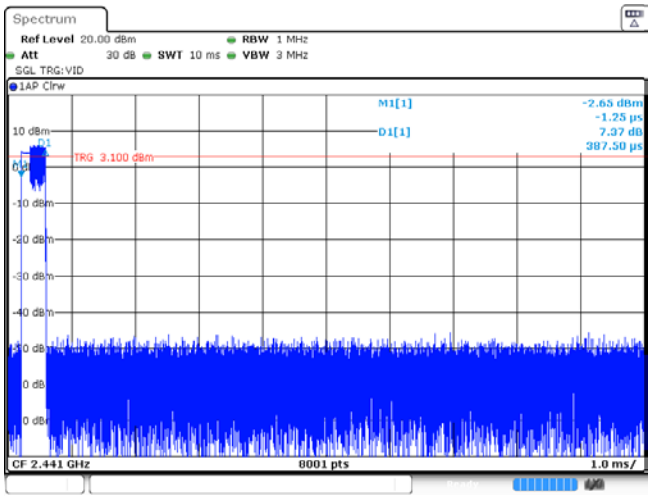
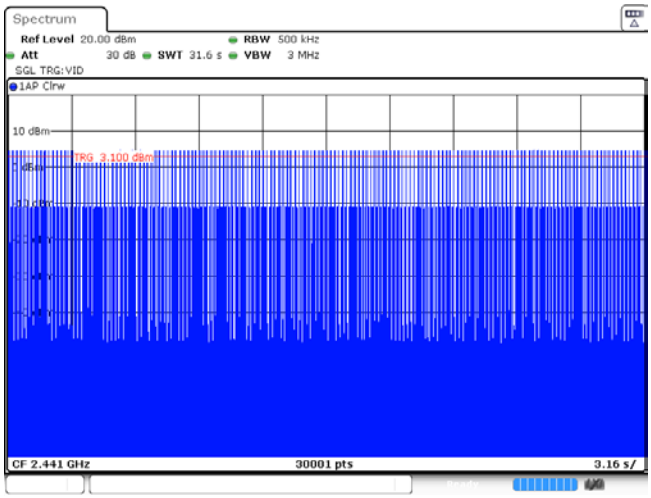
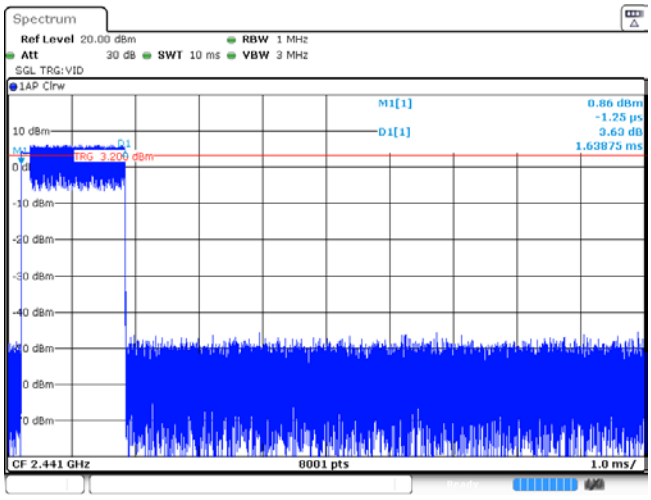
GFSK	 Date: 18.MAR.2024 13:00:31
π/4DQPSK	 Date: 18.MAR.2024 13:01:59
8DPSK	 Date: 18.MAR.2024 13:03:24

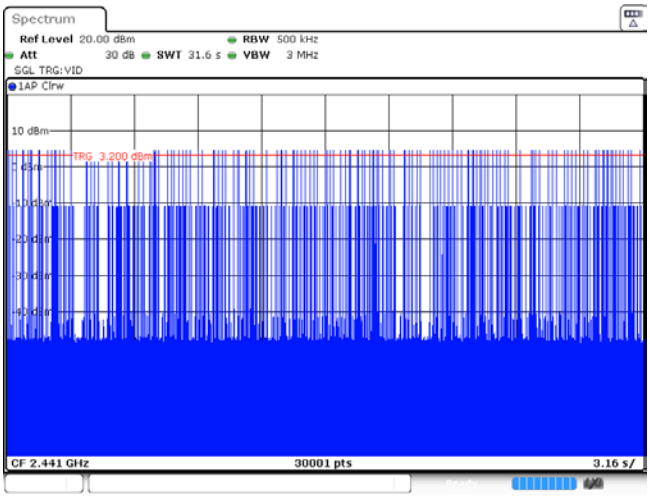
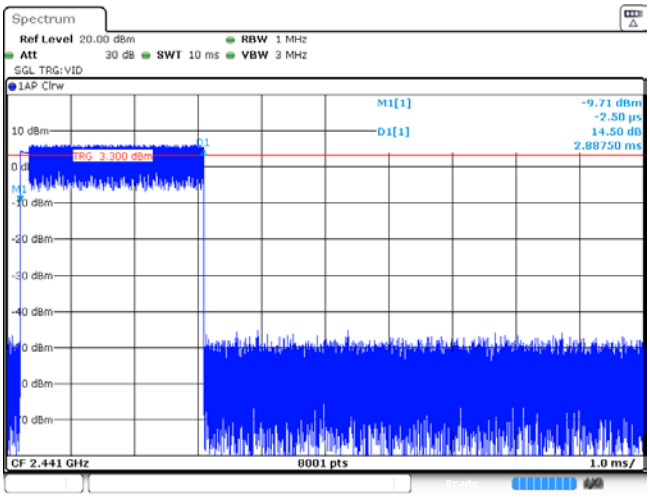
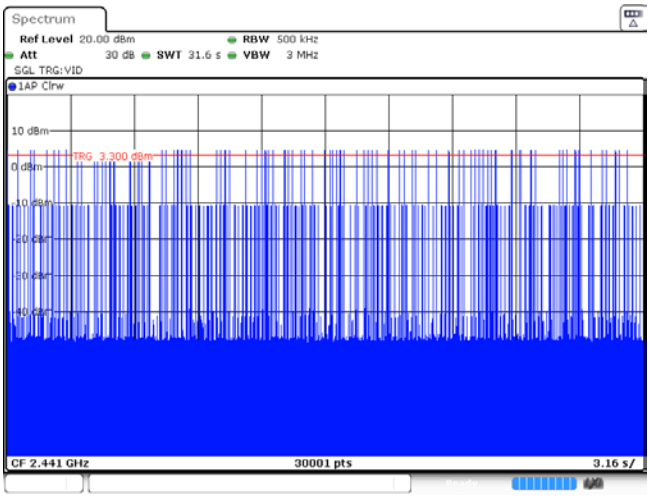
Appendix F：Dwell Time

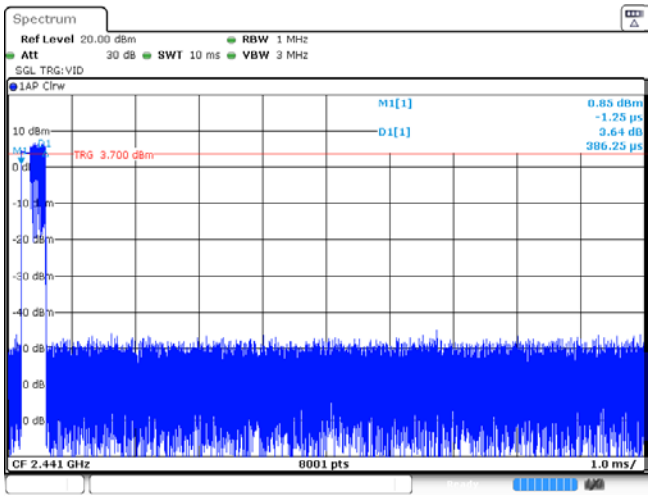
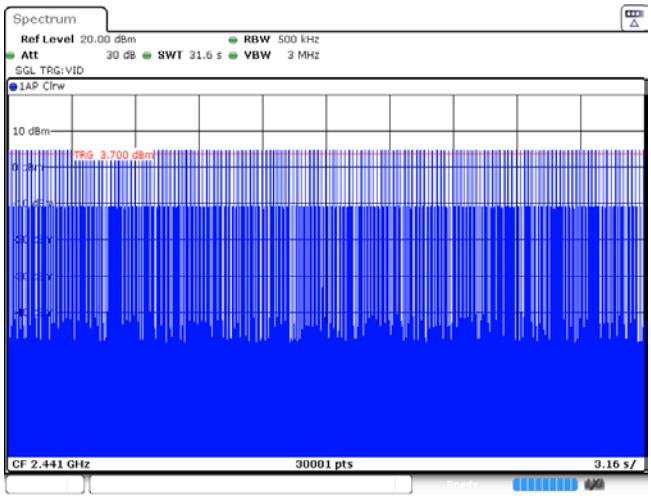
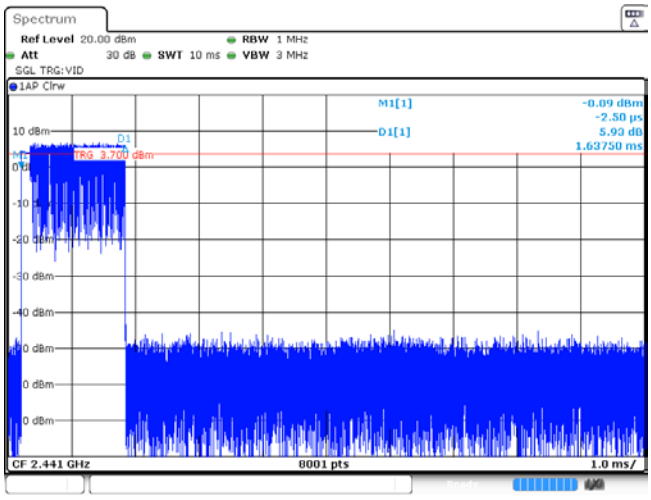
Modulation type	Packet	Burst Width [ms]	Total Hops[hop*ch]	Dwell time (Second)	Limit (Second)	Result
GFSK	DH1	2.88	123.00	0.36	≤ 0.40	Pass
	DH3	1.64	164.00	0.27		
	DH5	2.89	112.00	0.32		
π/4DQPSK	2DH1	0.39	321.00	0.12	≤ 0.40	Pass
	2DH3	1.64	154.00	0.25		
	2DH5	2.89	102.00	0.30		
8DPSK	3DH1	0.39	320.00	0.12	≤ 0.40	Pass
	3DH3	1.64	163.00	0.27		
	3DH5	2.89	101.00	0.29		

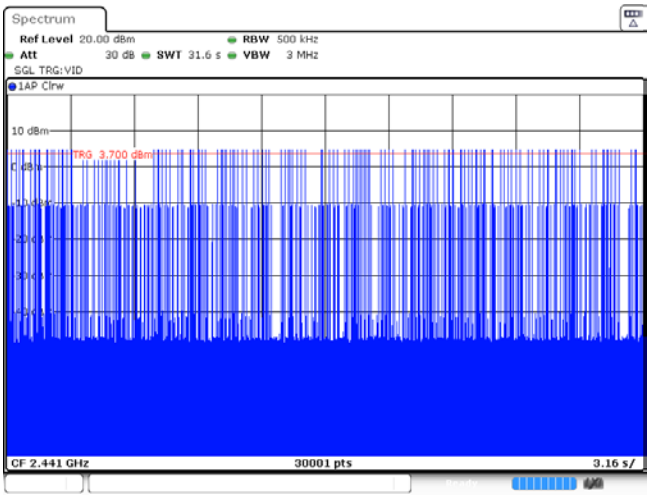
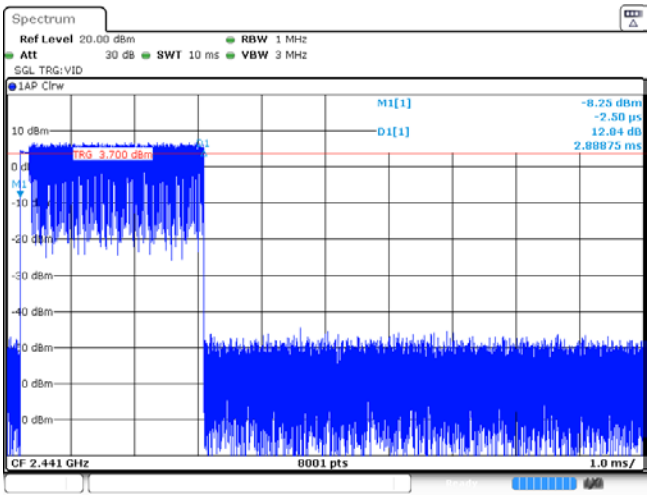
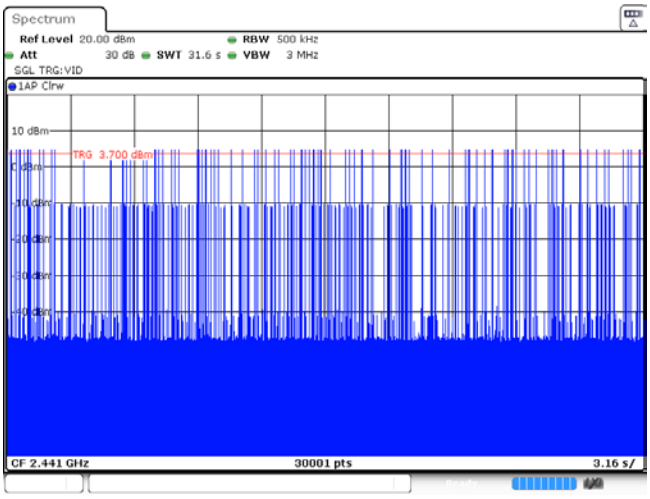
Modulation Type:	**GFSK**
DH1 Burst width	
DH1 Burst number	
DH3 Burst width	

DH3 Burst number	
DH5 Burst width	
DH5 Burst number	

Modulation Type:	**π/4DQPSK**
2DH1 Burst width	
2DH1 Burst number	
2DH3 Burst width	

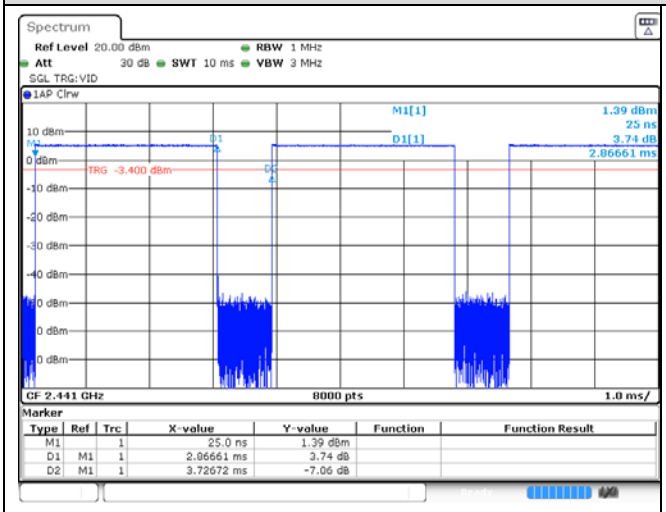
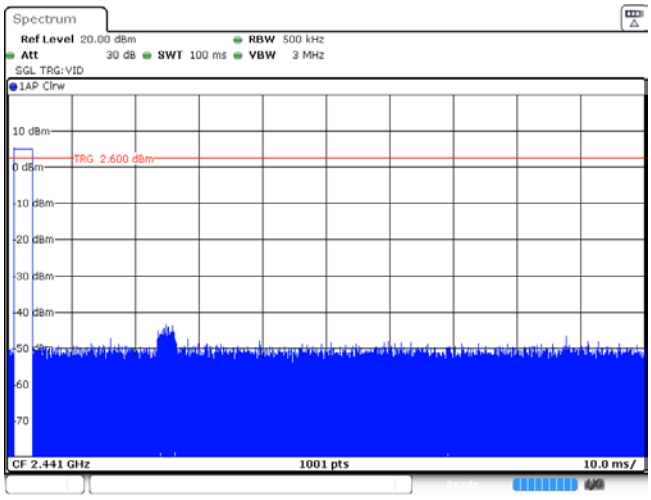
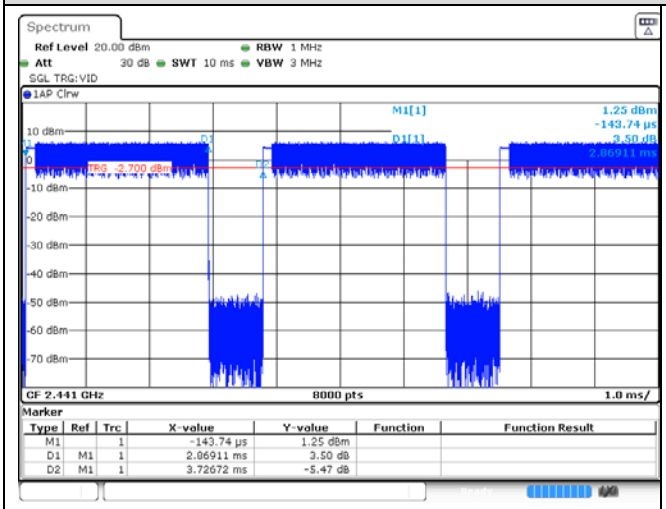
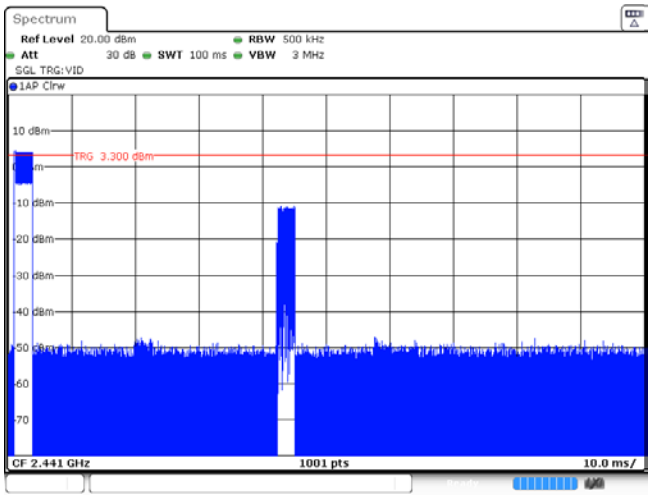
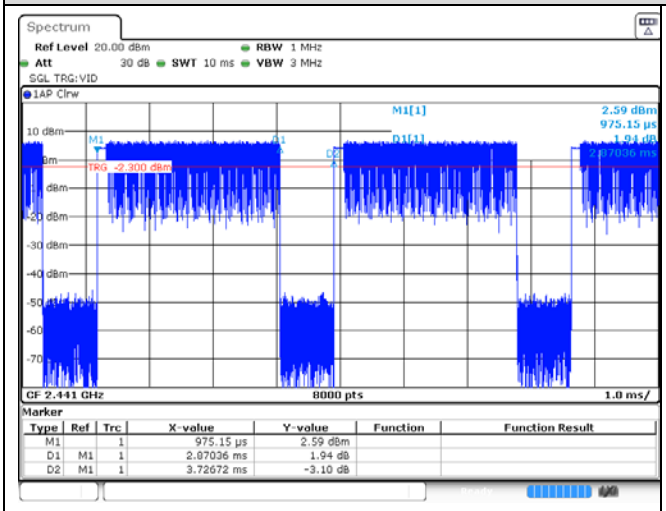
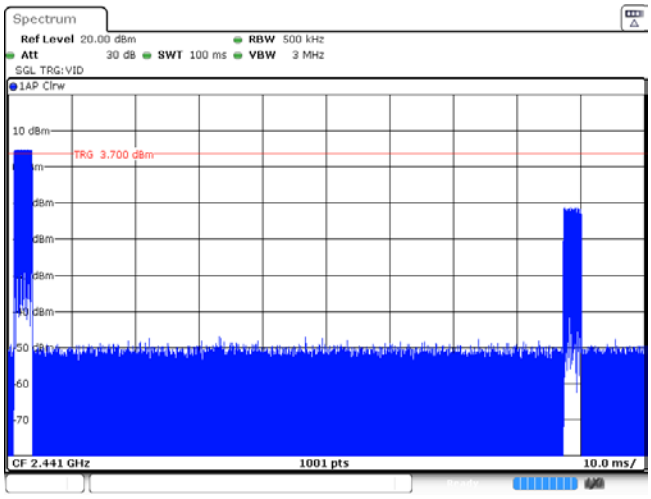
2DH3 Burst number	
2DH5 Burst width	
2DH5 Burst number	

Modulation Type:	**8DPSK**
3DH1 Burst width	
3DH1 Burst number	
3DH3 Burst width	

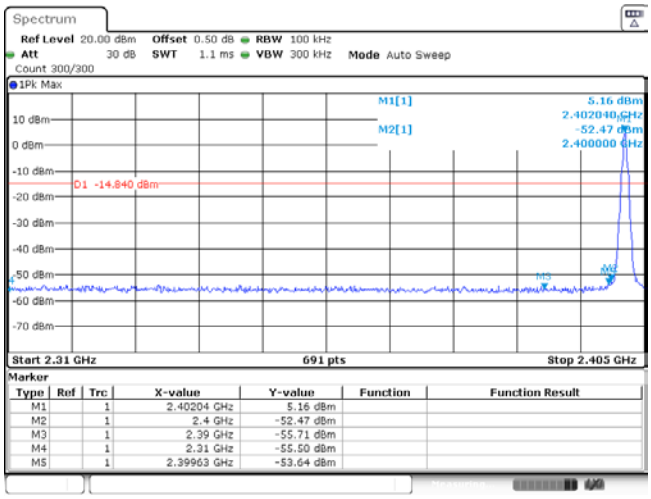
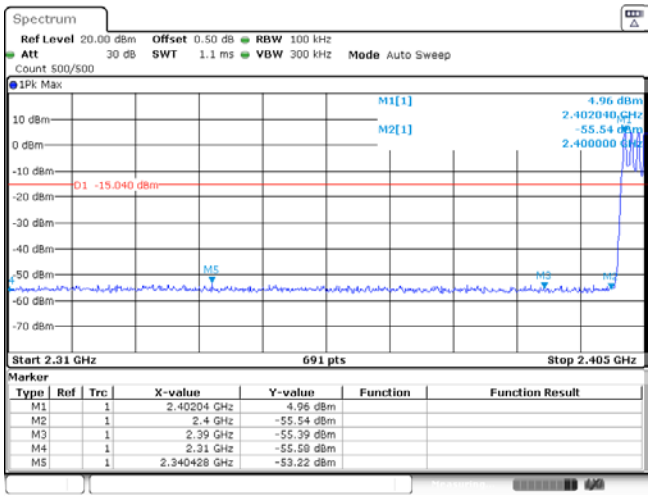
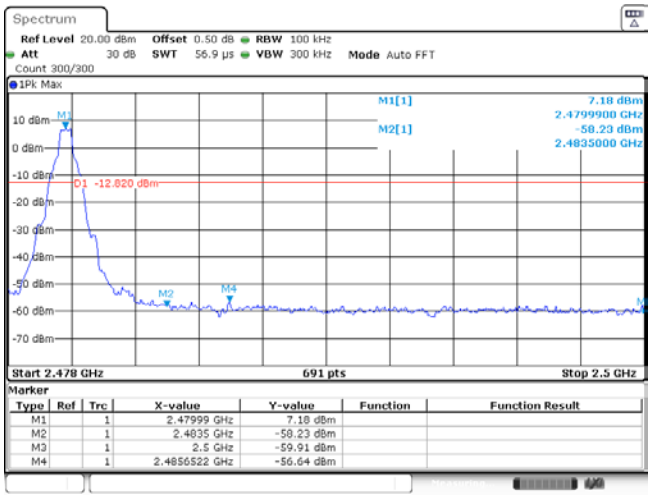
3DH3 Burst number	 Date: 18.MAR.2024 13:14:24
3DH5 Burst width	 Date: 18.MAR.2024 13:14:59
3DH5 Burst number	 Date: 18.MAR.2024 13:15:32

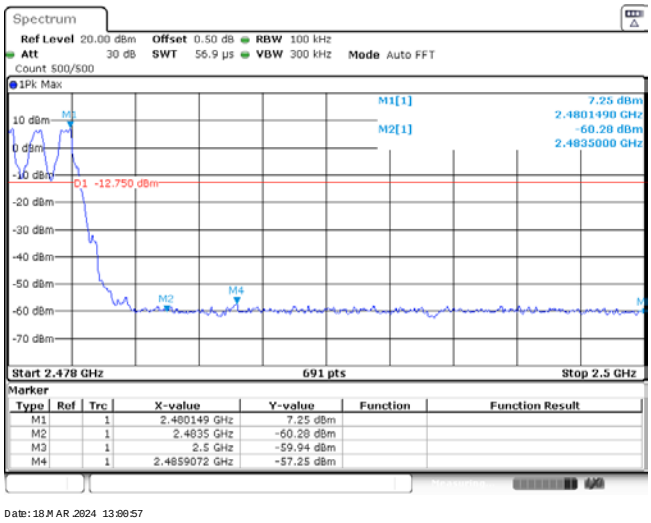
Appendix G：Duty Cycle Correction Factor (DCCF)

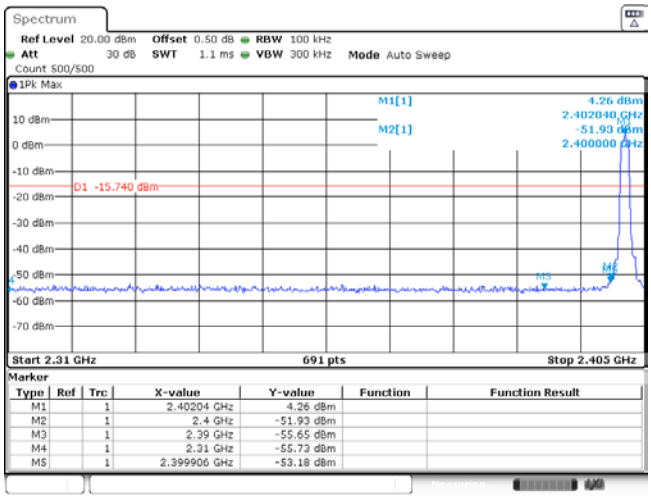
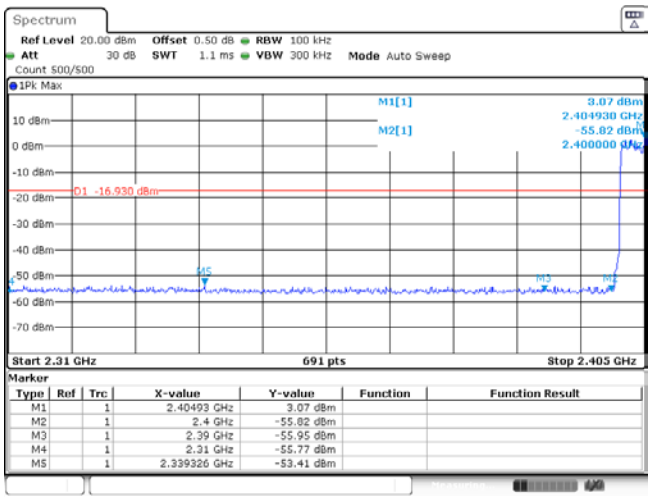
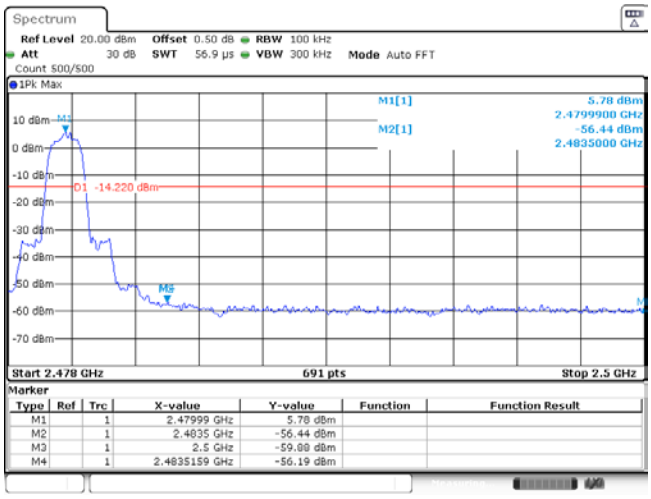
DCCF Calculate Formula					
DCCF=20 * Log(duty cycle) = 20 * Log($T_{on\ time}$ / T_{period})					
Modulation type	Test Frequency（MHz）	$T_{on\ time}$ for single burst [ms]	T_{period} [ms]	Burst Quantity	DCCF [dB]
GFSK	2441	2.87	100	1.00	-30.84
π /4 DQPSK	2441	2.87	100	1.00	-30.84
8DPSK	2441	2.87	100	1.00	-30.84

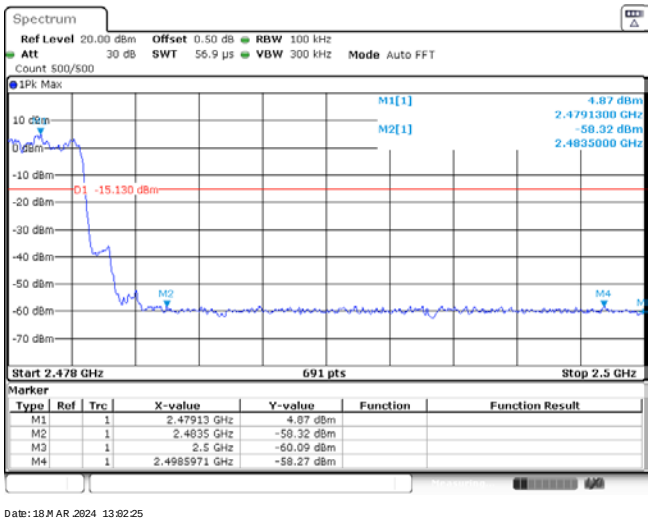
GFSK	
	
$T_{on\ time}$ for single burst	Burst Quantity
π /4 DQPSK	
	
$T_{on\ time}$ for single burst	Burst Quantity
8DPSK	
	
$T_{on\ time}$ for single burst	Burst Quantity

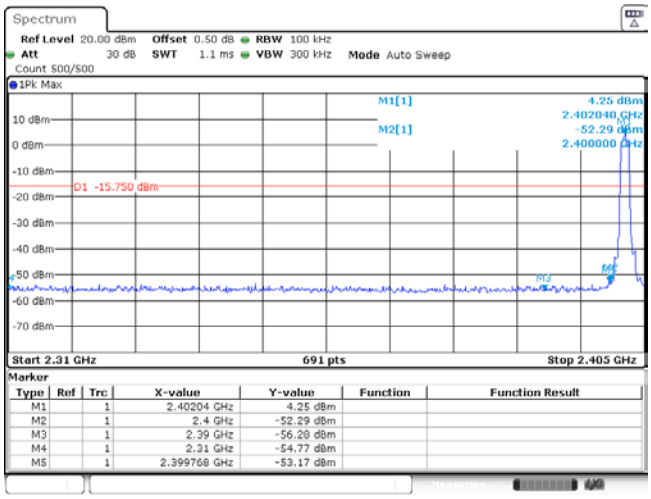
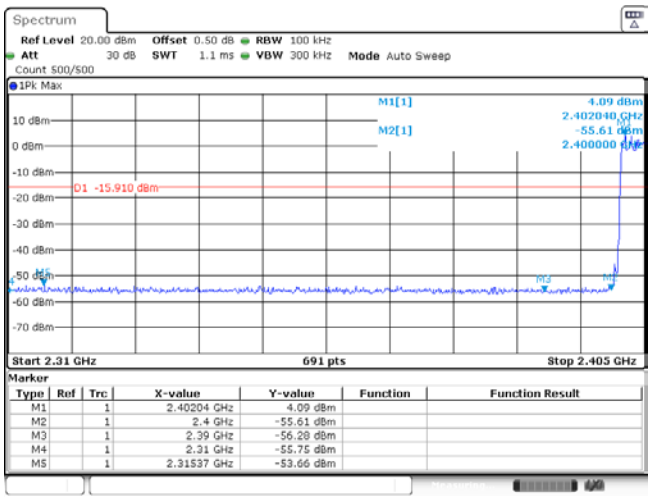
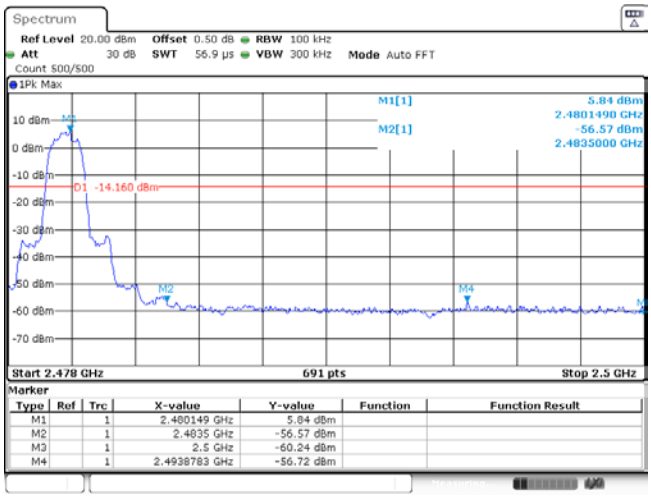
Appendix H：Band edge and Spurious Emissions (conducted)

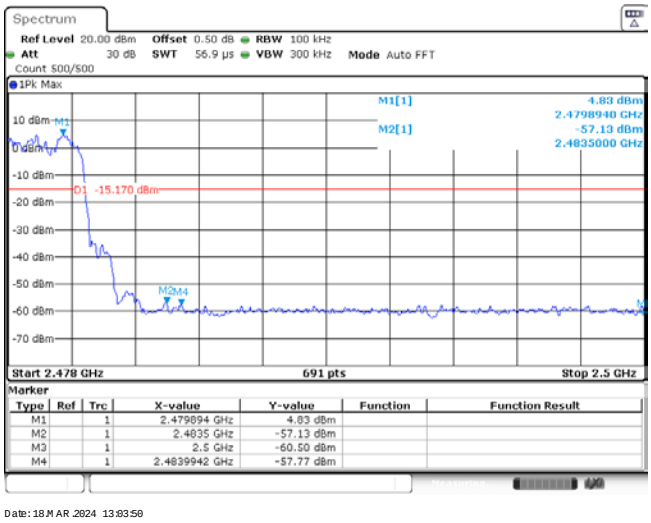
Test Item:	Band edge	Modulation type:	GFSK
CH00 No hopping mode			
CH00 Hopping mode			
CH78 No hopping mode			

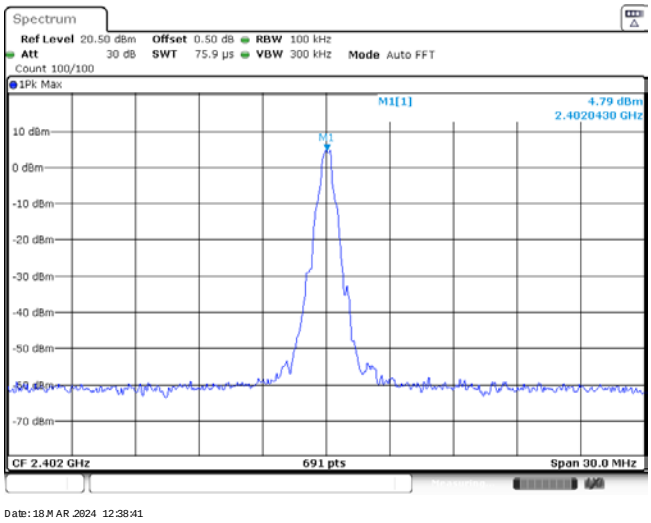
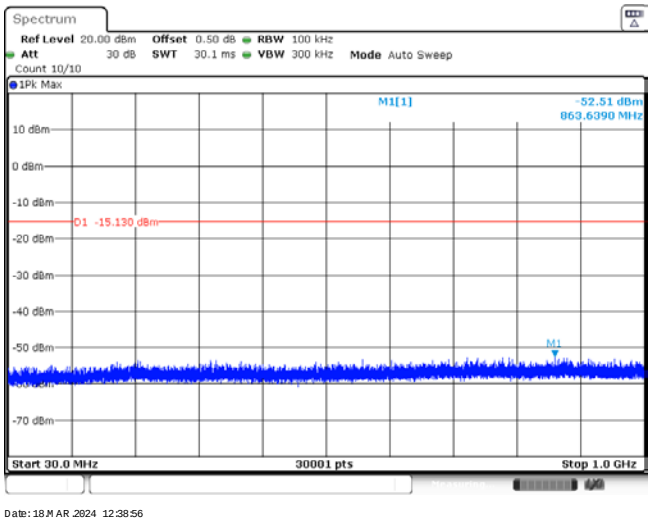
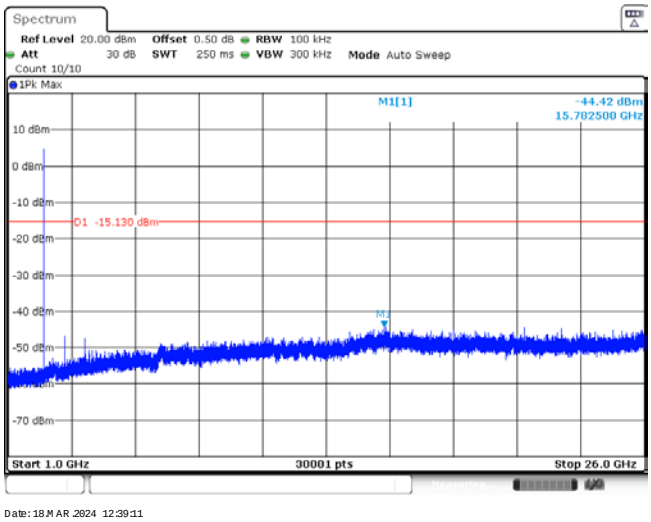
CH78 Hopping mode	

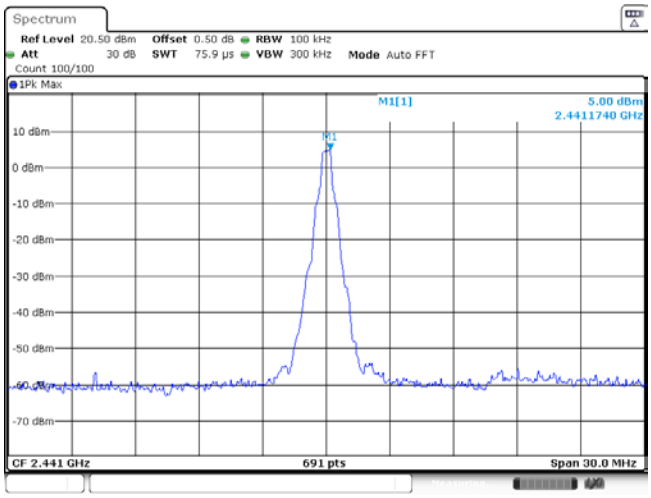
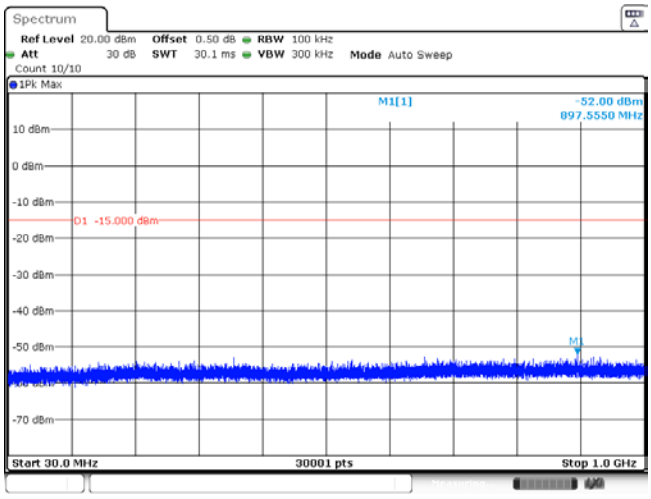
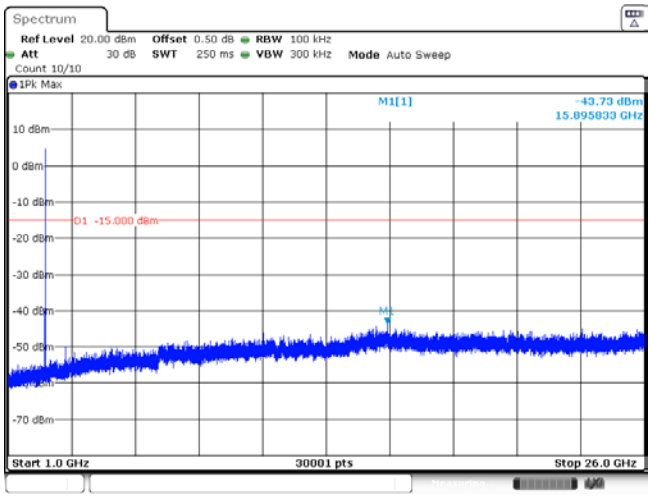
Test Item:	Band edge	Modulation type:	π/4DQPSK
CH00 No hopping mode			
CH00 Hopping mode			
CH78 No hopping mode			

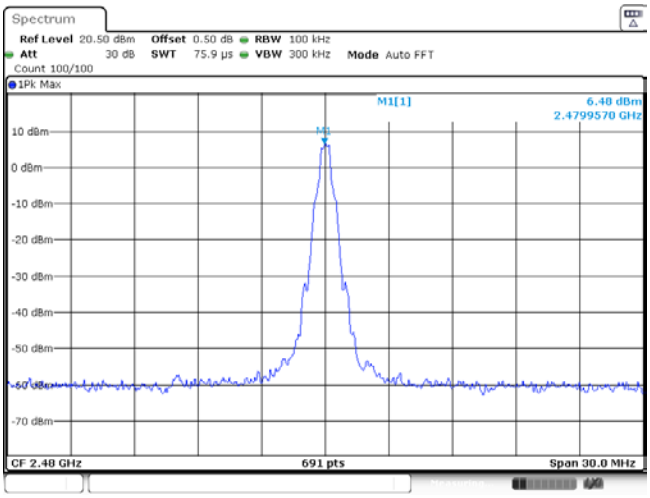
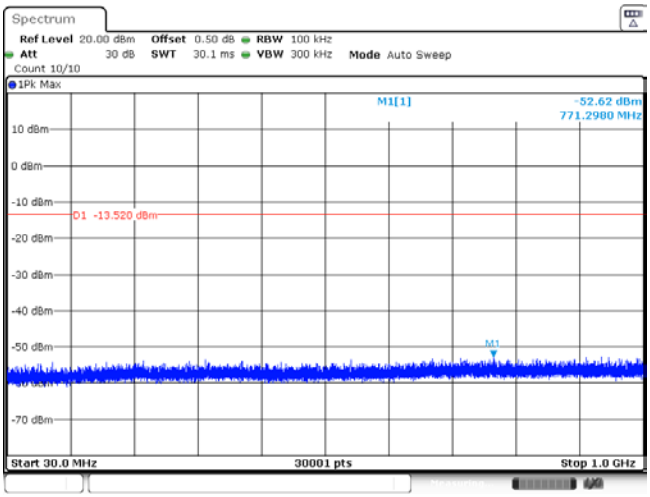
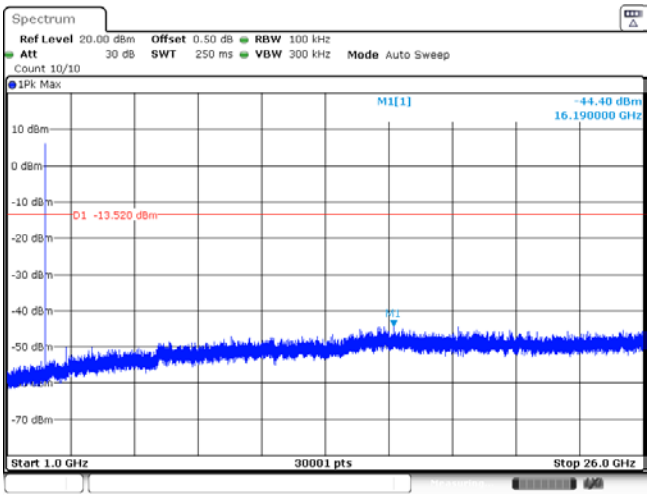
CH78 Hopping mode	

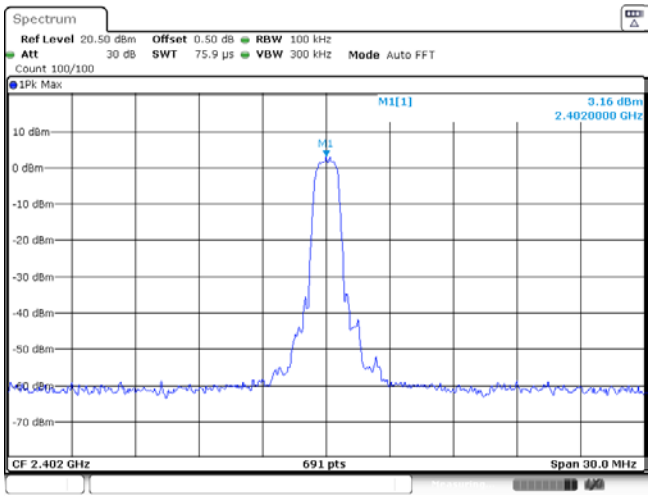
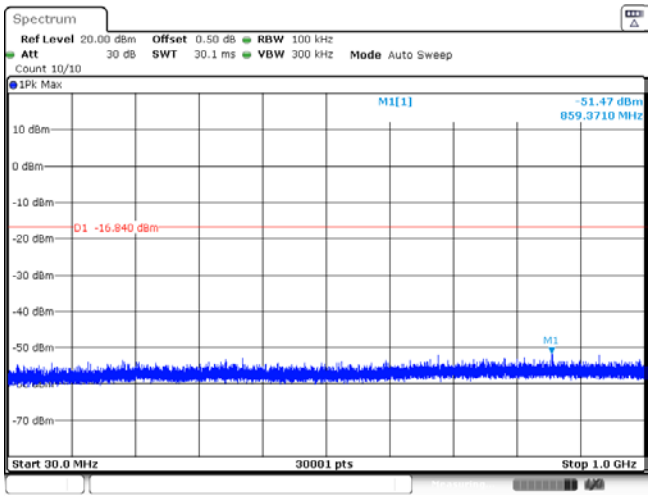
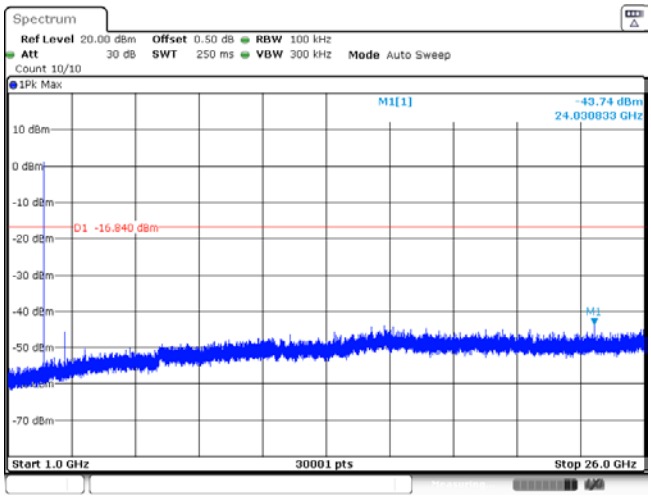
Test Item:	Band edge	Modulation type:	8DPSK
CH00 No hopping mode			
CH00 Hopping mode			
CH78 No hopping mode			

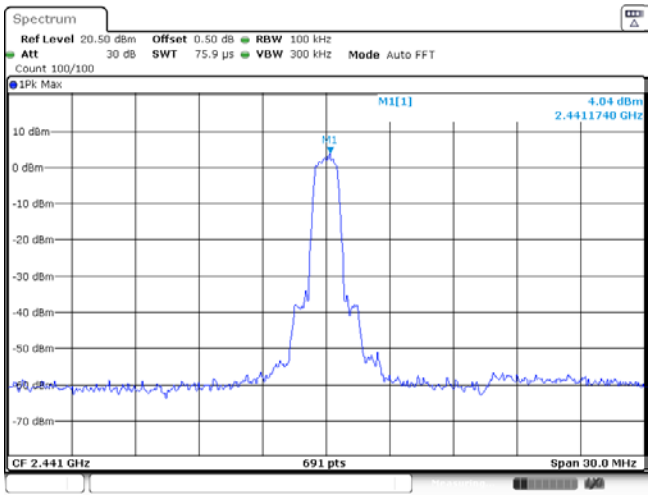
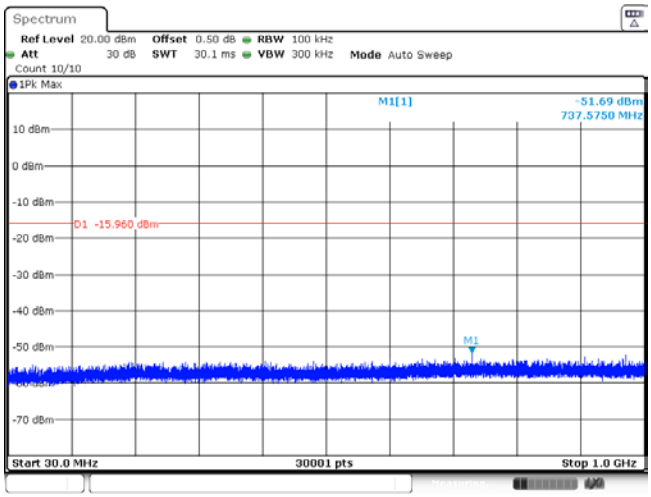
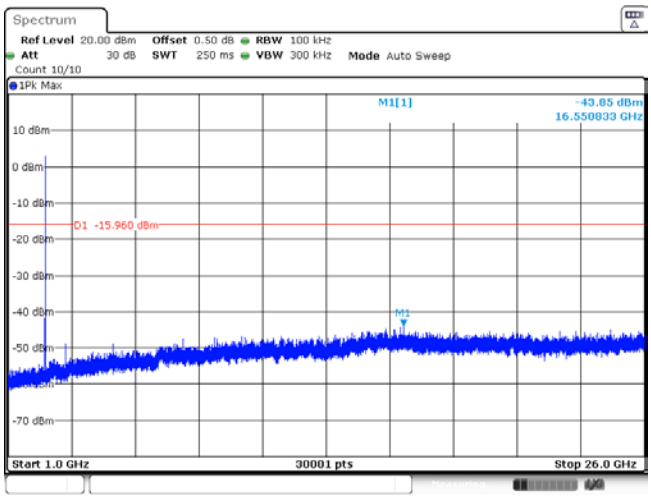
CH78 Hoppig mode	

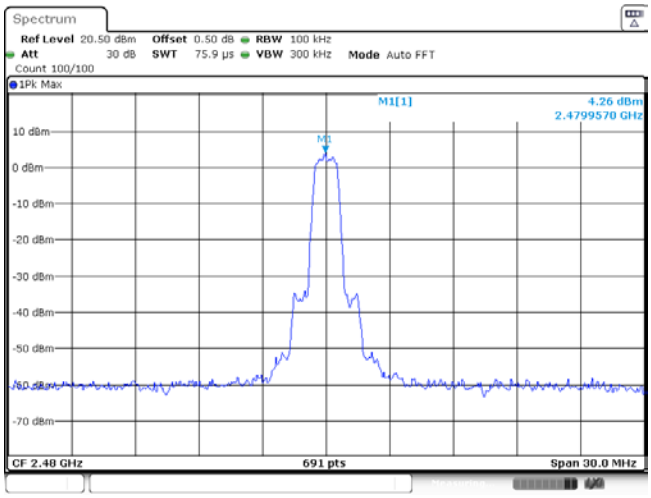
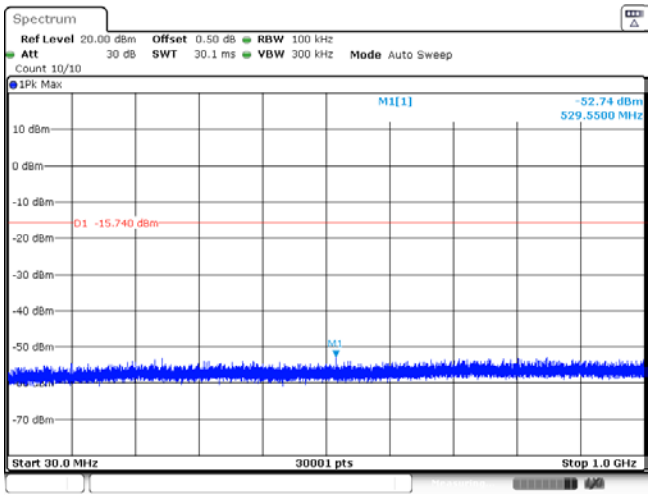
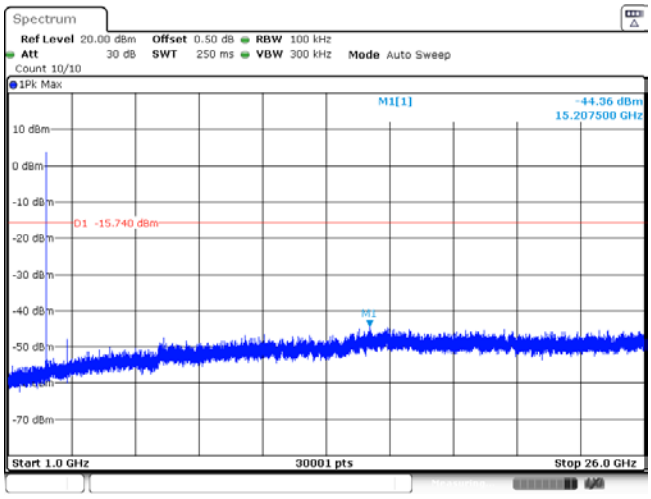
Test Item:	Spurious Emission	Modulation type:	GFSK
CH00 Reference level			
CH00 30MHz~1000MHz			
CH00 1GHz~26GHz			

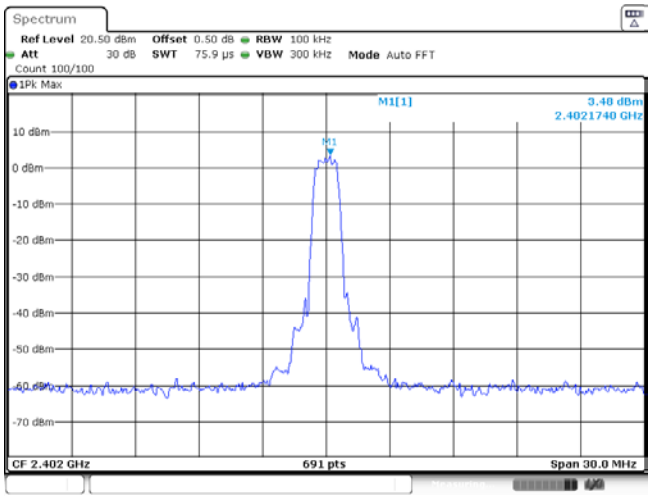
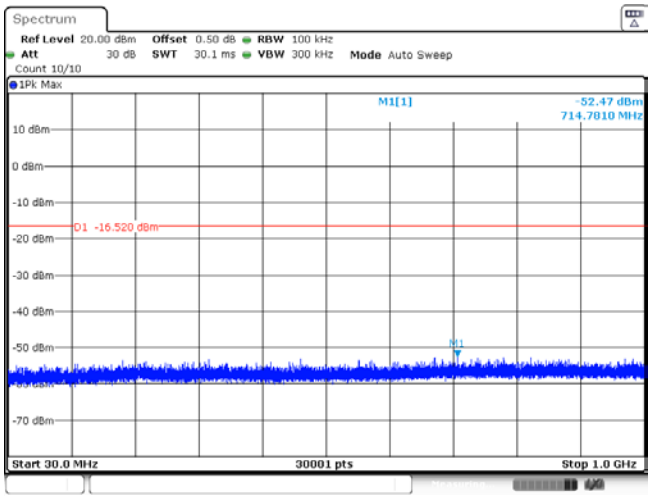
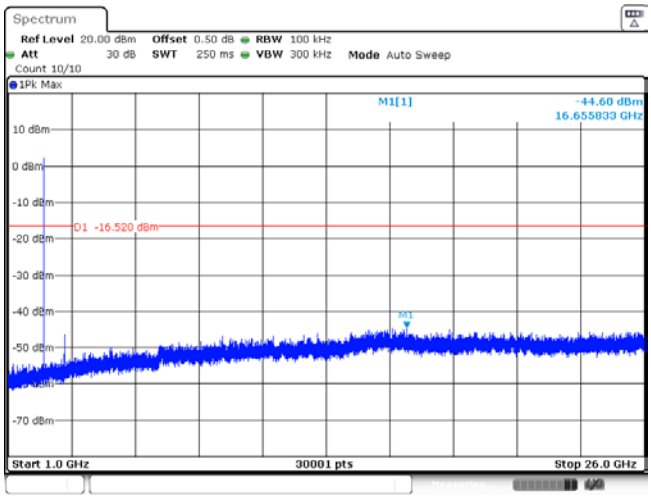
CH39 Reference level	 Date: 18.MAR.2024 12:40:09
CH39 30MHz~1000MHz	 Date: 18.MAR.2024 12:40:24
CH39 1GHz~26GHz	 Date: 18.MAR.2024 12:40:40

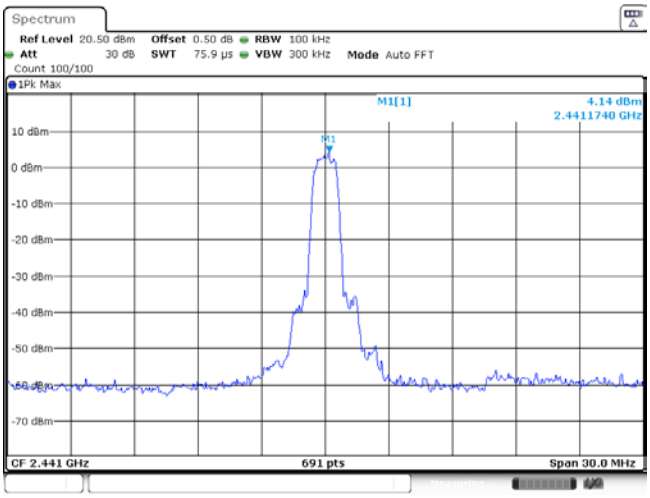
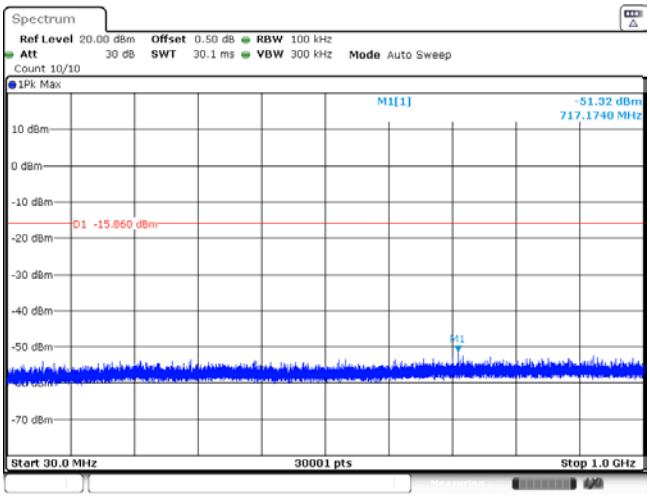
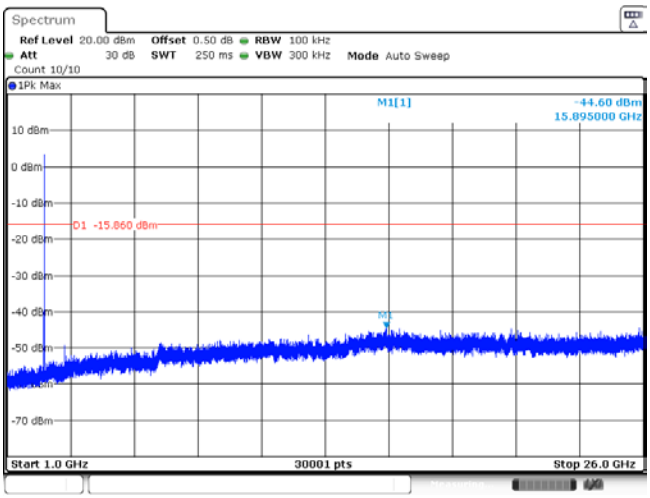
CH78 Reference level	 Date: 18.MAR.2024 12:41:41
CH78 30MHz~1000MHz	 Date: 18.MAR.2024 12:41:56
CH78 1GHz~26GHz	 Date: 18.MAR.2024 12:42:11

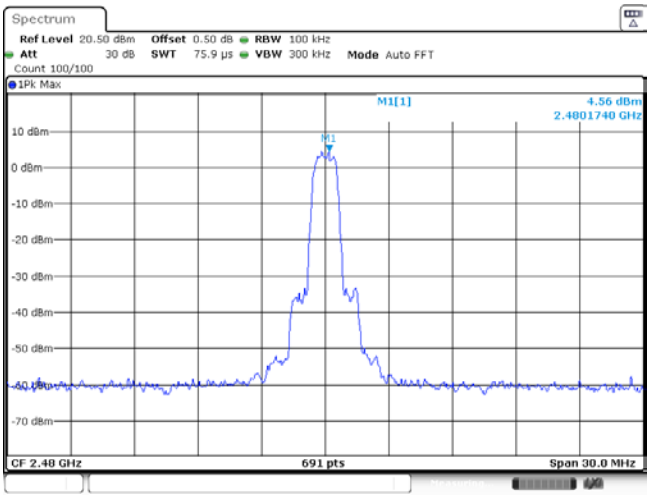
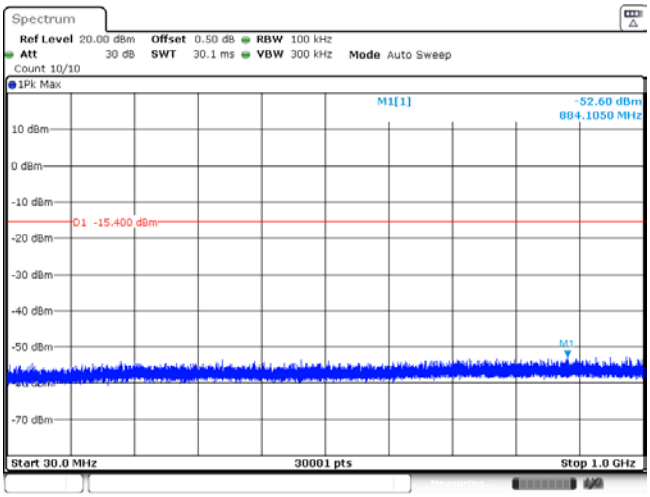
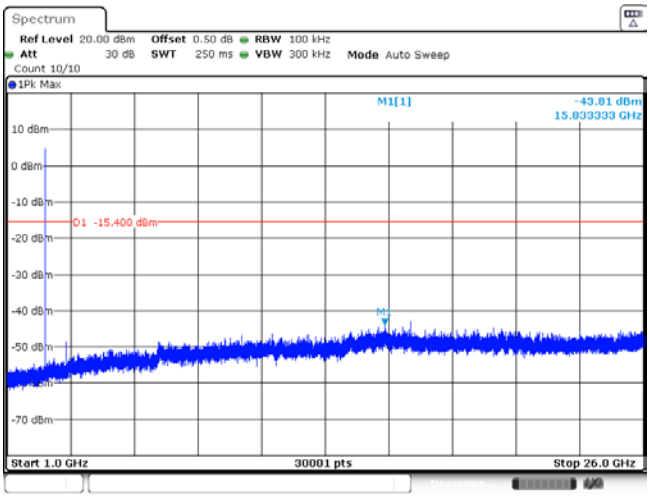
Test Item:	Spurious Emission	Modulation type:	π/4DQPSK
CH00 Reference level	 Date: 18.MAR.2024 12:43:27		
CH00 30MHz~1000MHz	 Date: 18.MAR.2024 12:43:42		
CH00 1GHz~26GHz	 Date: 18.MAR.2024 12:43:57		

CH39 Reference level	 Date: 18.MAR.2024 12:44:45
CH39 30MHz~1000MHz	 Date: 18.MAR.2024 12:45:00
CH39 1GHz~26GHz	 Date: 18.MAR.2024 12:45:16

CH78 Reference level	 Date: 18.MAR.2024 12:46:43
CH78 30MHz~1000MHz	 Date: 18.MAR.2024 12:46:58
CH78 1GHz~26GHz	 Date: 18.MAR.2024 12:47:14

Test Item:	Spurious Emission	Modulation type:	8DPSK
CH00 Reference level	 Date: 18.MAR.2024 12:48:40		
CH00 30MHz~1000MHz	 Date: 18.MAR.2024 12:48:55		
CH00 1GHz~26GHz	 Date: 18.MAR.2024 12:49:10		

CH39 Reference level	 Date: 18.MAR.2024 12:50:22
CH39 30MHz~1000MHz	 Date: 18.MAR.2024 12:50:37
CH39 1GHz~26GHz	 Date: 18.MAR.2024 12:50:52

CH78 Reference level	 Date: 18.MAR.2024 12:51:55
CH78 30MHz~1000MHz	 Date: 18.MAR.2024 12:52:10
CH78 1GHz~26GHz	 Date: 18.MAR.2024 12:52:26

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