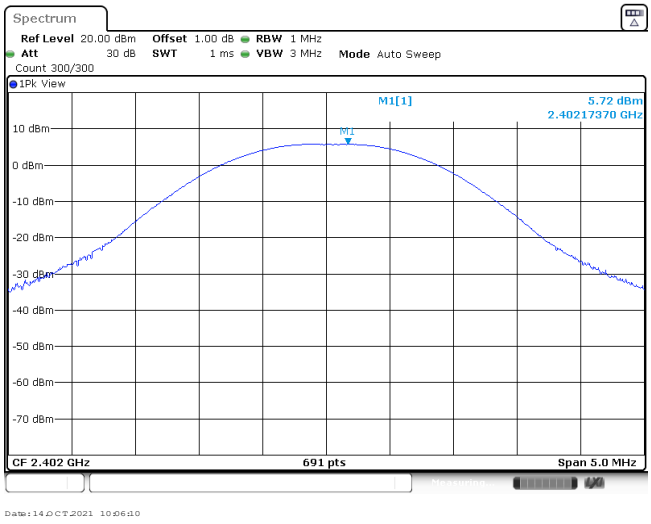
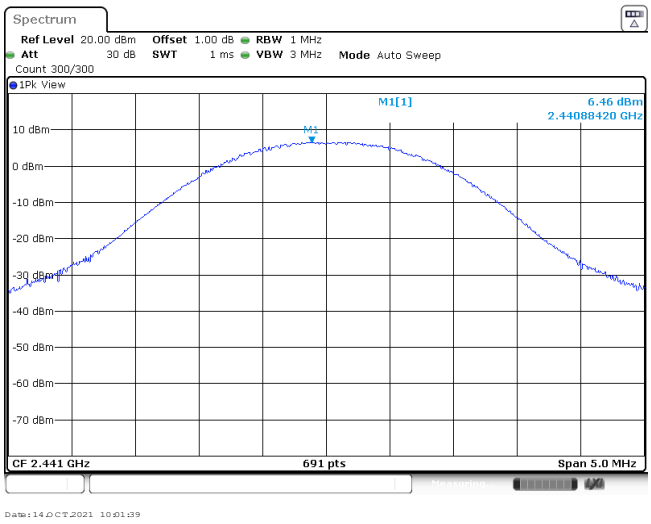
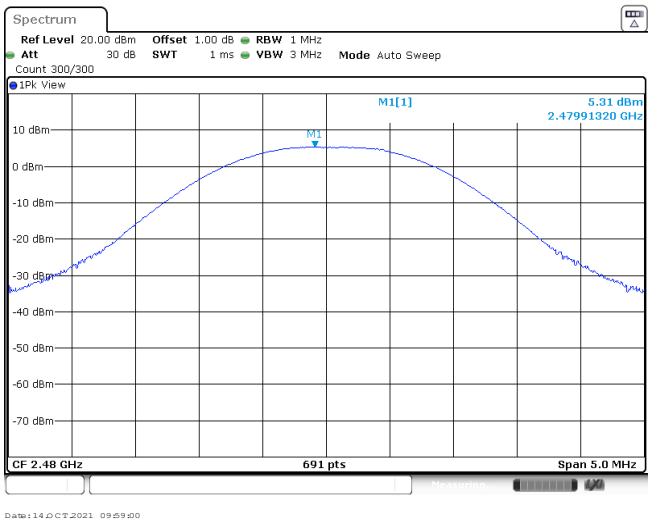
APPENDIX REPORT

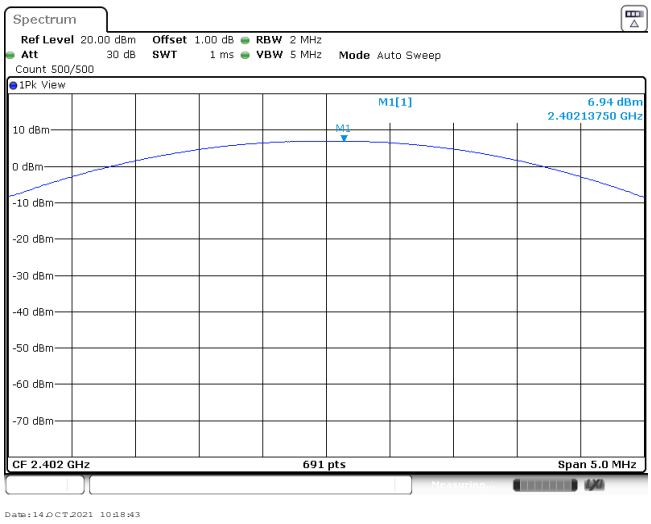
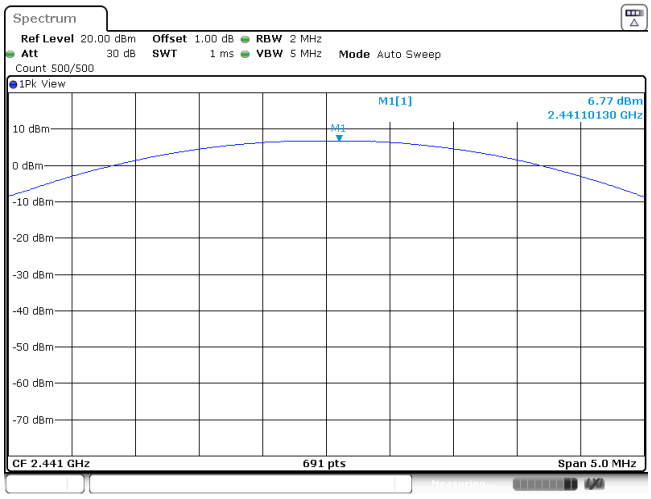
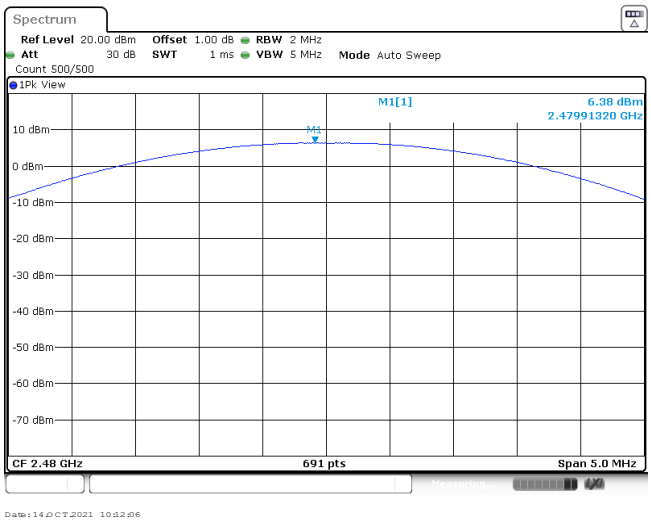
Project No.	SHT2109071201EW	Radio Specification	Bluetooth EDR
Test sample No.	YPHT21090712005	Model No.	A4100
Start test date	2021-10-14	Finish date	2021-10-14
Temperature	26.1℃	Humidity	34%
Test Engineer	Xiaoqin Li	Auditor	Xiaodong Zhao

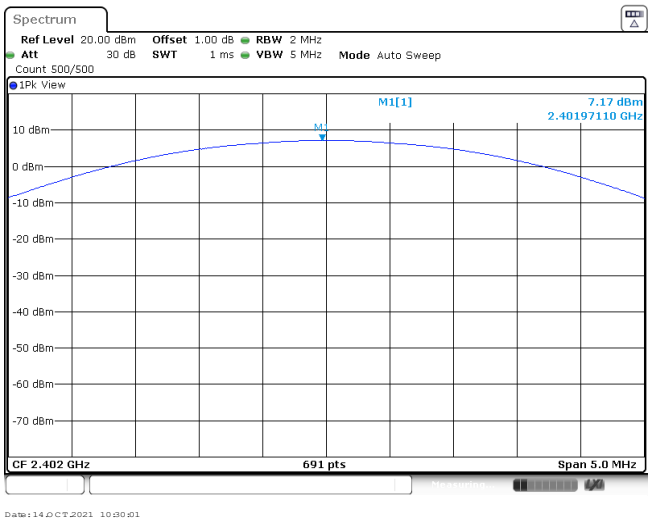
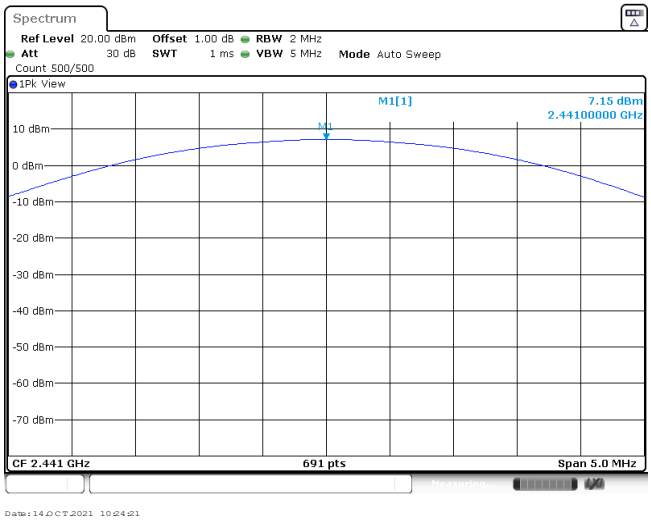
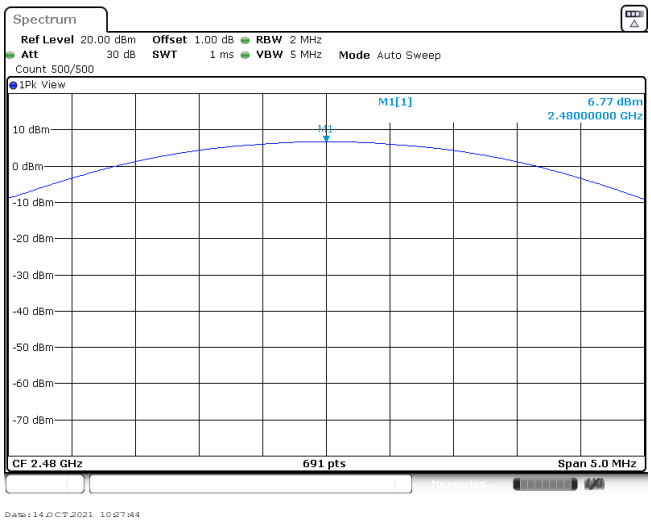
Appendix clause	Test item	Result
A	Peak Output Power	PASS
B	20 dB Bandwidth	PASS
C	99% Occupied Bandwidth	PASS
D	Carrier Frequencies Separation	PASS
E	Hopping Channel Number	PASS
F	Dwell Time	PASS
G	Duty Cycle Correction Factor (DCCF)	PASS
H	Band edge and Spurious Emissions(coducted)	PASS

Appendix A：Peak Output Power

Modulation type	Channel	Peak Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
GFSK	00	5.72	5.52	≤ 30.00	Pass
	39	6.46	5.45		
	78	5.31	4.98		
π/4DQPSK	00	6.94	5.67	≤ 21.00	Pass
	39	6.77	5.24		
	78	6.38	4.58		
8DPSK	00	7.17	5.61	≤ 21.00	Pass
	39	7.15	5.18		
	78	6.77	5.20		

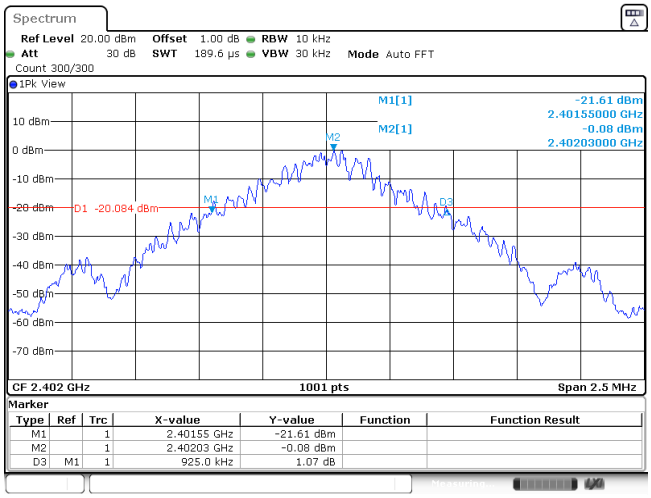
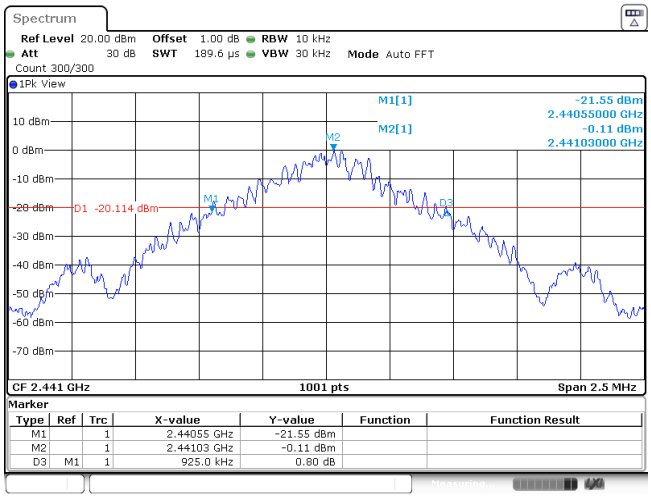
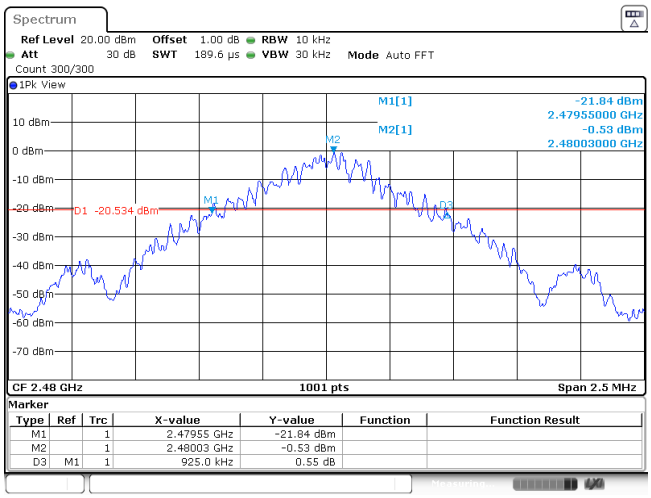
Modulation Type:	GFSK
CH00	
CH39	
CH78	

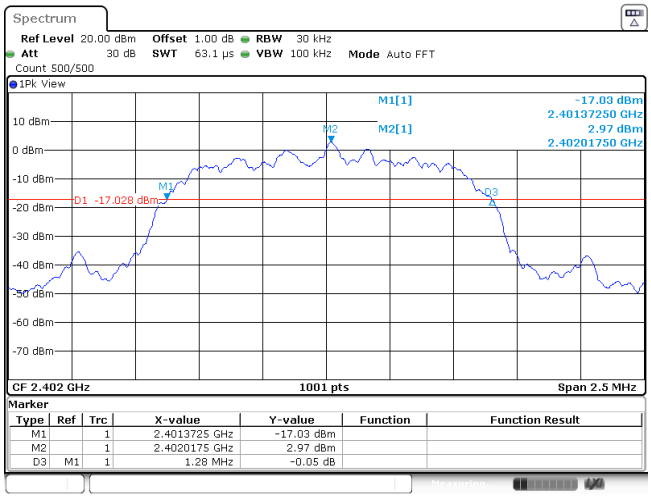
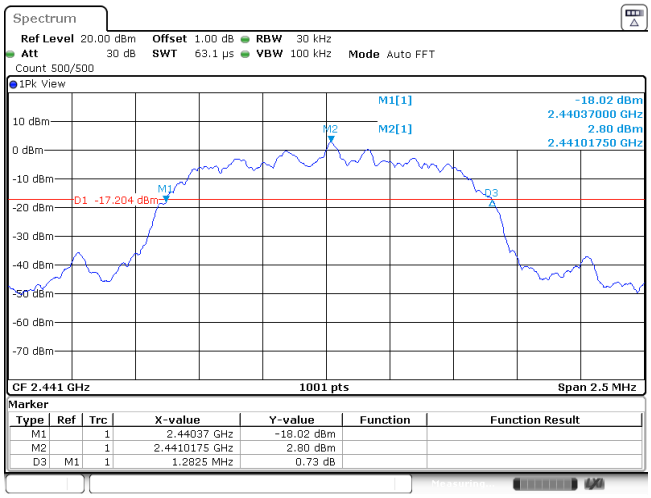
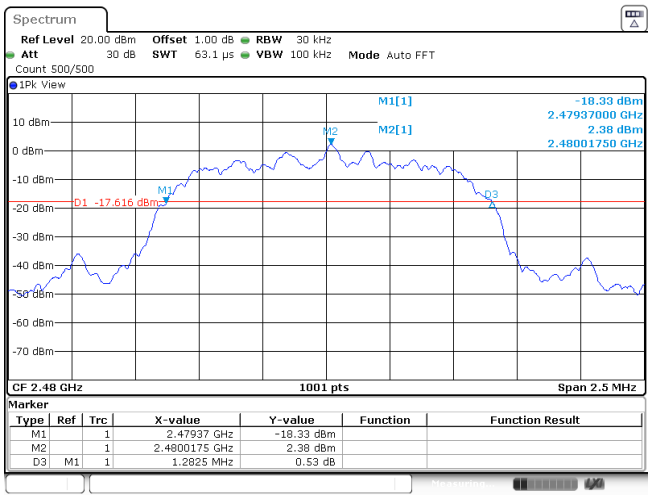
Modulation Type:	**π/4DQPSK**
CH00	
CH39	
CH78	

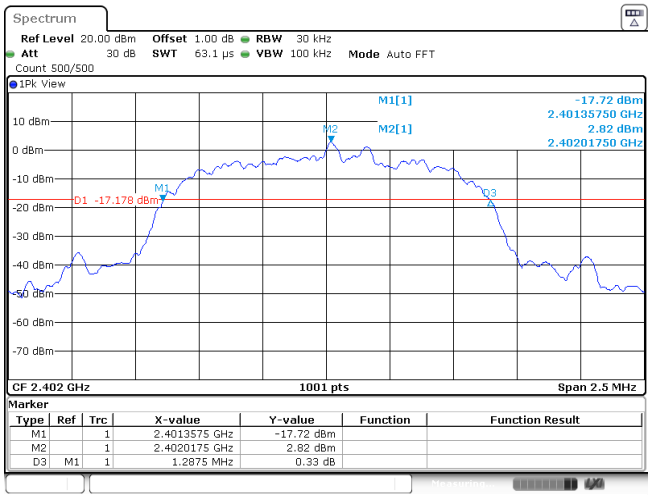
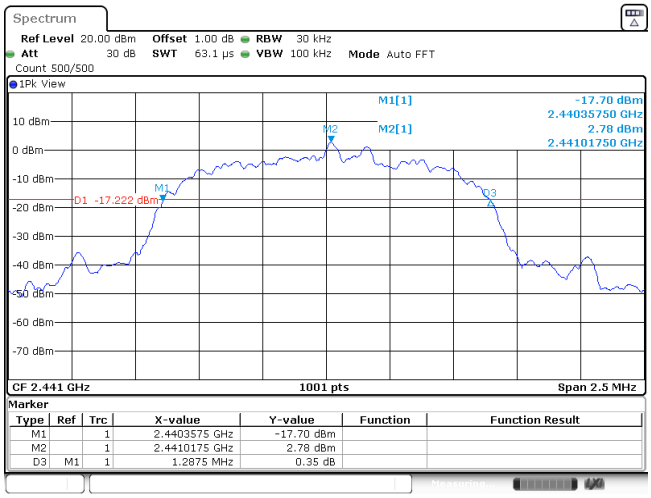
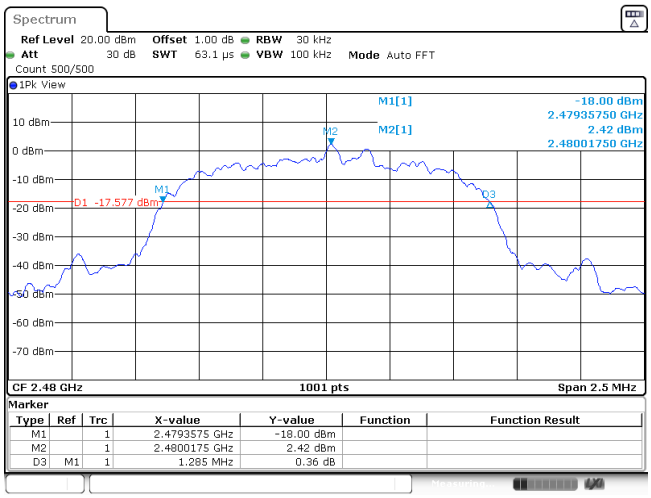
Modulation Type:	**8DPSK**
CH00	
CH39	
CH78	

Appendix B : 20 dB Bandwidth

Modulation type	Channel	20 dB Bandwidth (kHz)	Limit (kHz)	Result
GFSK	00	925.00	-	Pass
	39	925.00		
	78	925.00		
π/4DQPSK	00	1280.00	-	Pass
	39	1282.50		
	78	1282.50		
8DPSK	00	1287.50	-	Pass
	39	1287.50		
	78	1285.00		

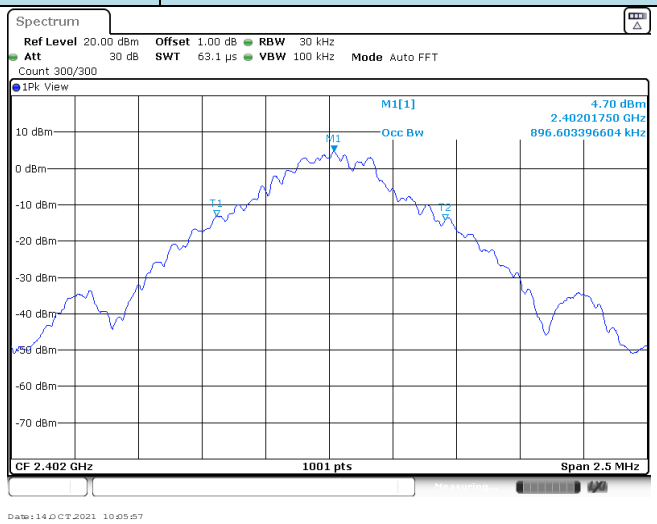
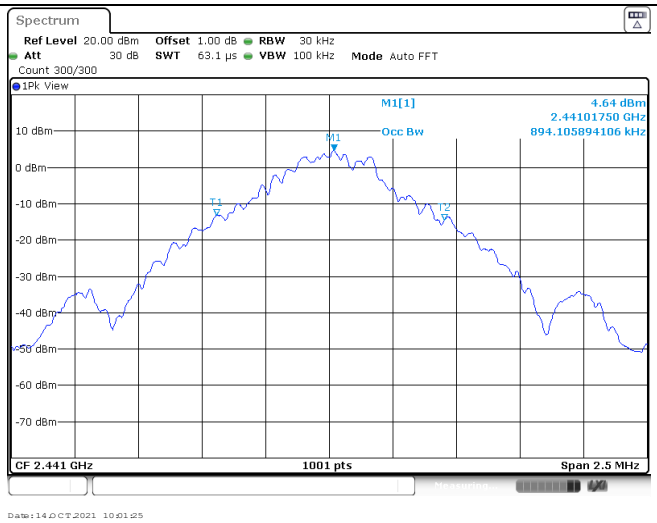
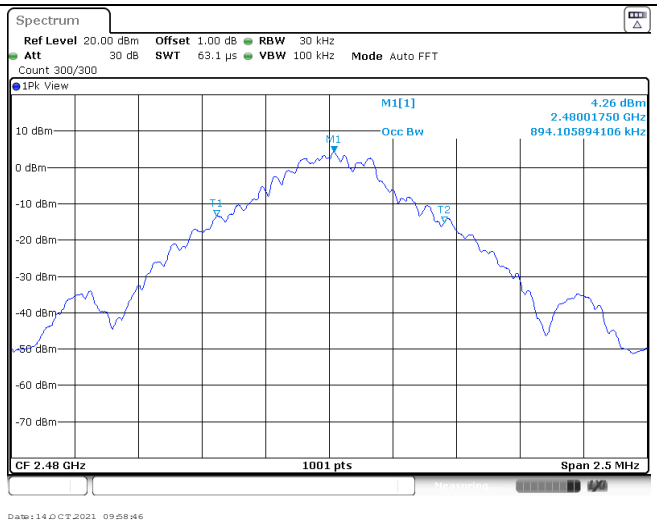
Modulation Type:	**GFSK**
CH00	
CH39	
CH78	

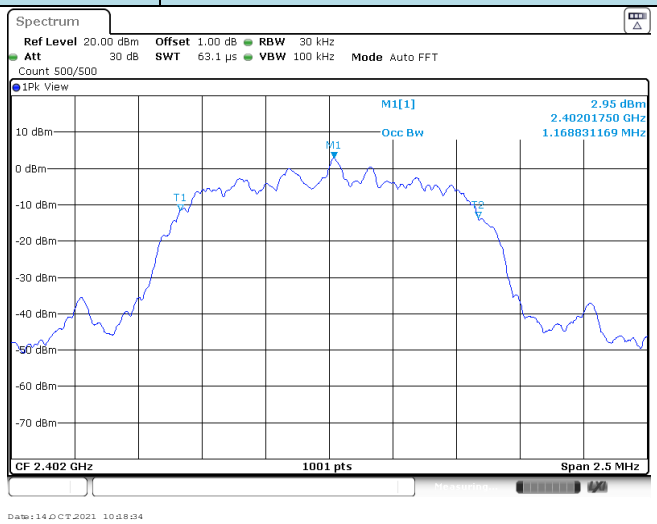
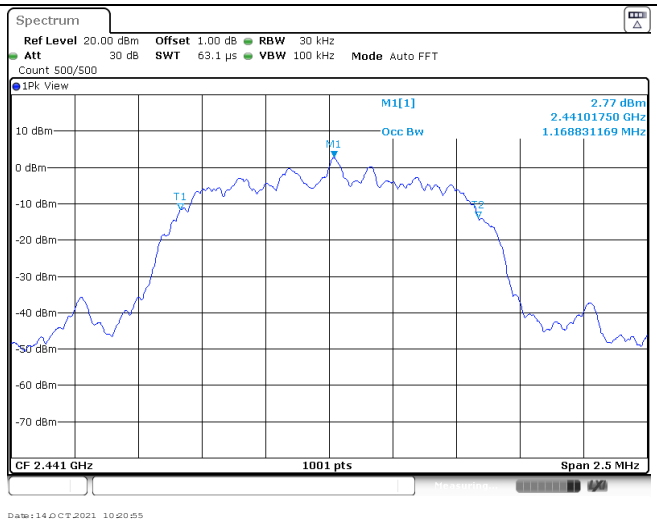
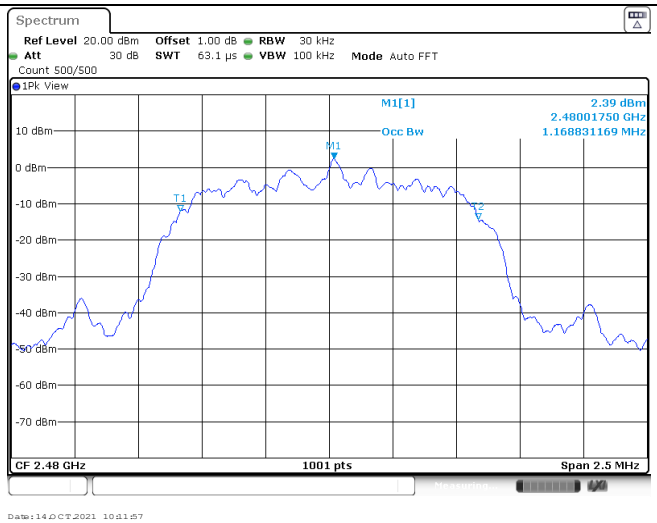
Modulation Type:	**π/4DQPSK**
CH00	
CH39	
CH78	

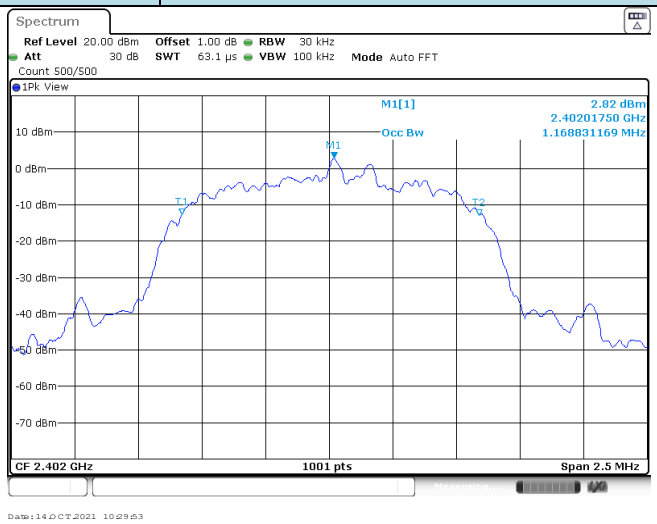
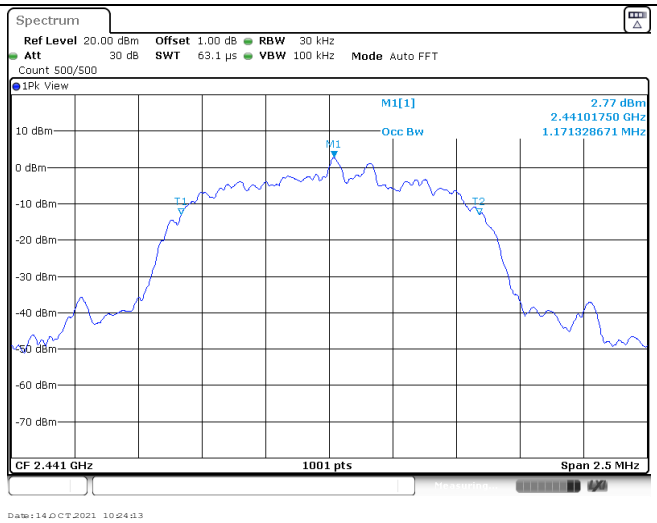
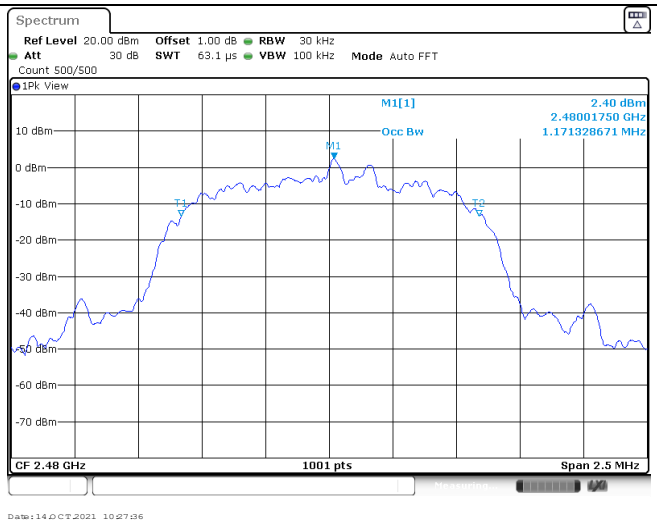
Modulation Type:	**8DPSK**
CH00	
CH39	
CH78	

Appendix C：99% Occupied Bandwidth

Modulation type	Channel	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
GFSK	00	0.90	-	Pass
	39	0.89		
	78	0.89		
π/4DQPSK	00	1.17	-	Pass
	39	1.17		
	78	1.17		
8DPSK	00	1.17	-	Pass
	39	1.17		
	78	1.17		

Modulation Type:	GFSK
CH00	
CH39	
CH78	

Modulation Type:	π/4DQPSK
CH00	
CH39	
CH78	

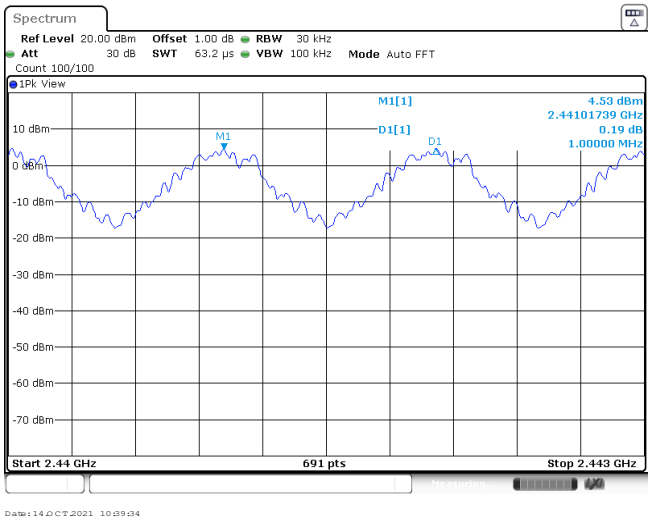
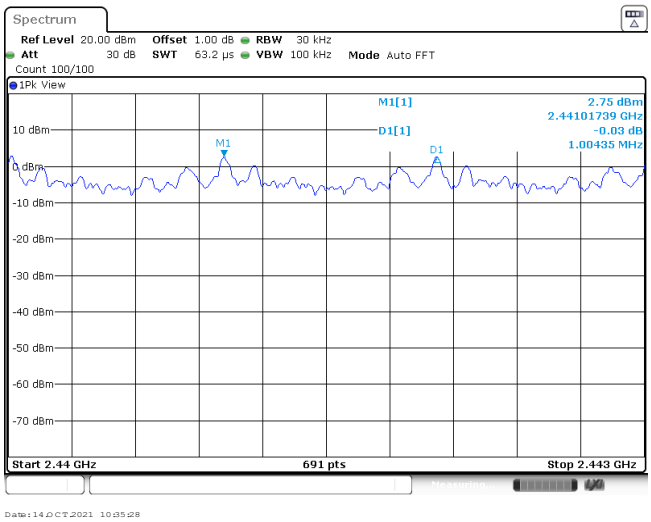
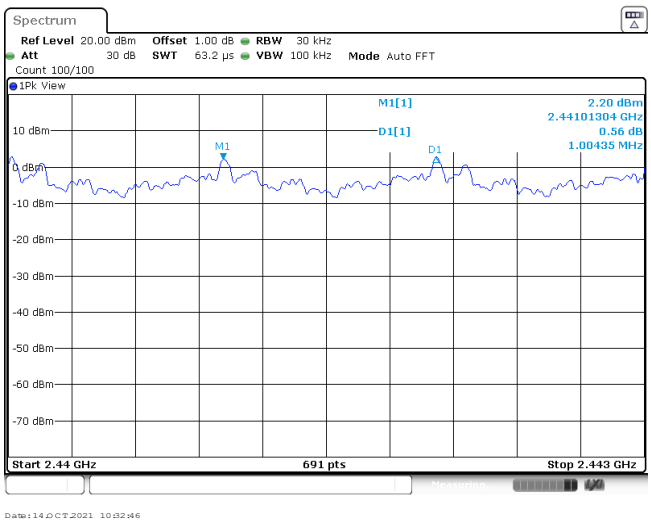
Modulation Type:	8DPSK
CH00	
CH39	
CH78	

Appendix D：Carrier Frequencies Separation

Modulation type	Channel	Carrier Frequencies Separation (MHz)	Limit (kHz) *	Result
GFSK	39	1.00	≥925.00	Pass
π/4DQPSK	39	1.00	≥855.00	Pass
8DPSK	39	1.00	≥858.33	Pass

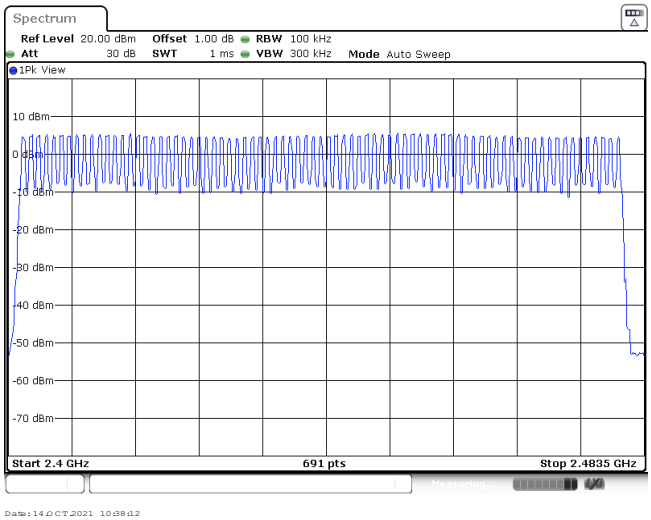
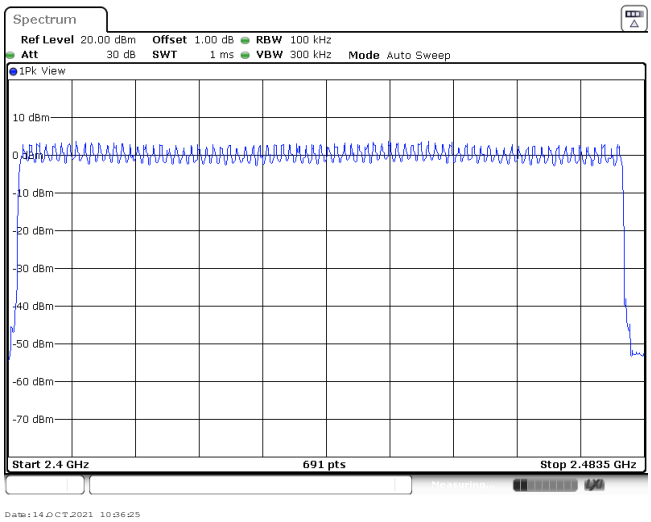
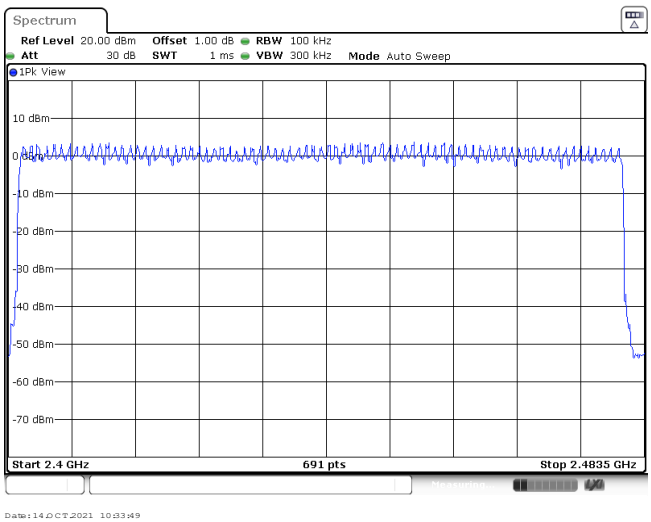
Note:

*: 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	

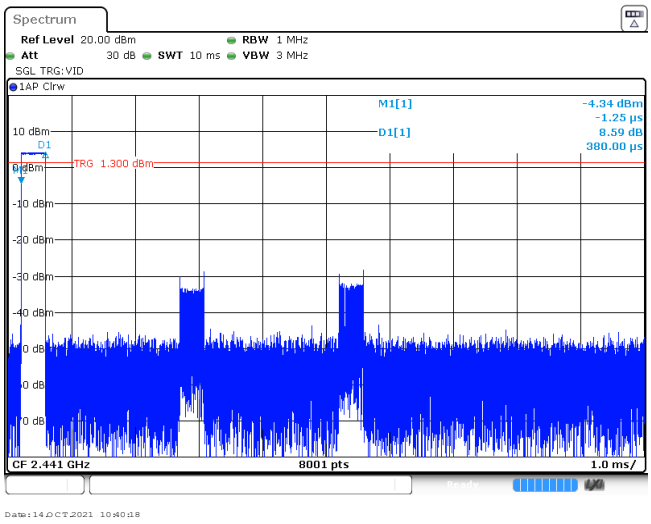
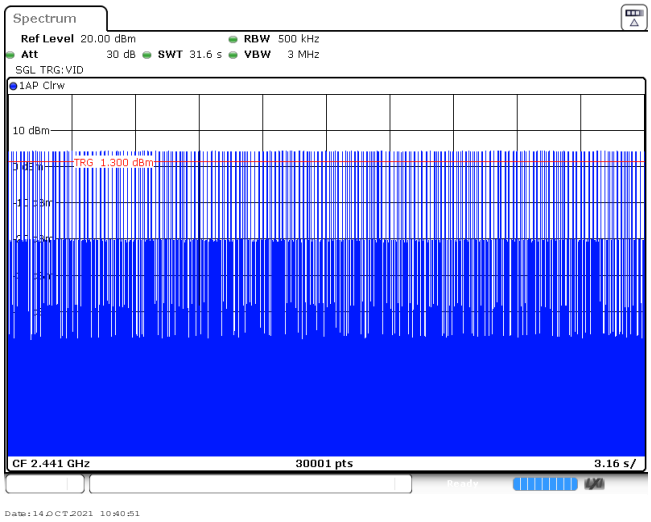
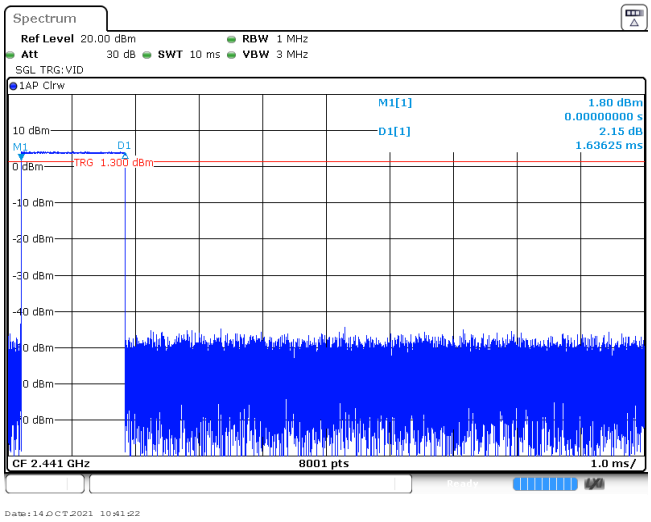
Appendix E：Hopping Channel Number

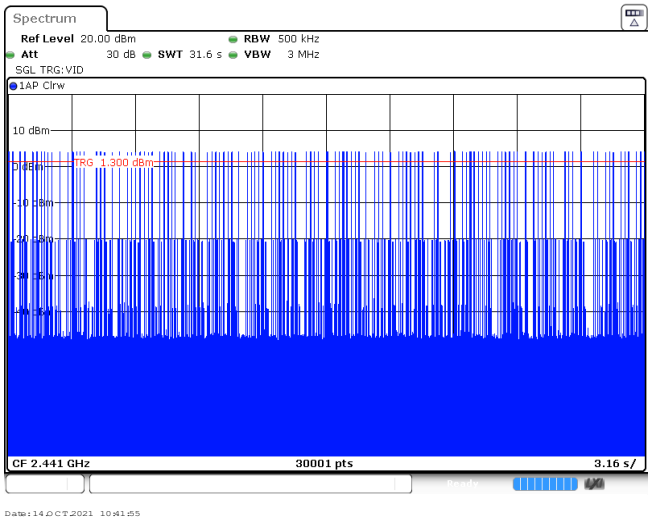
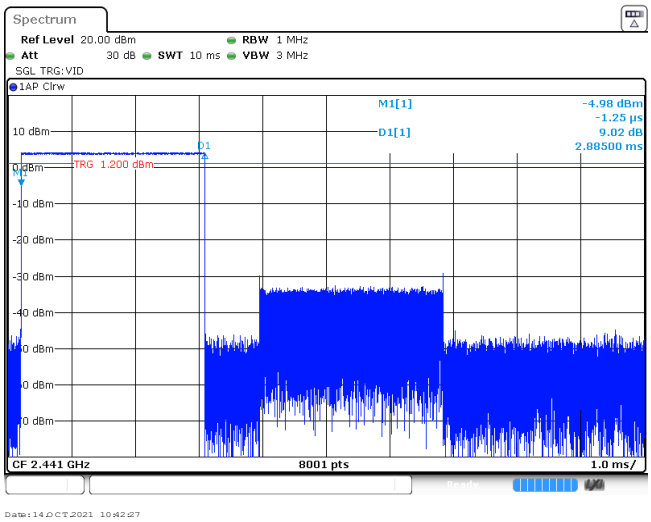
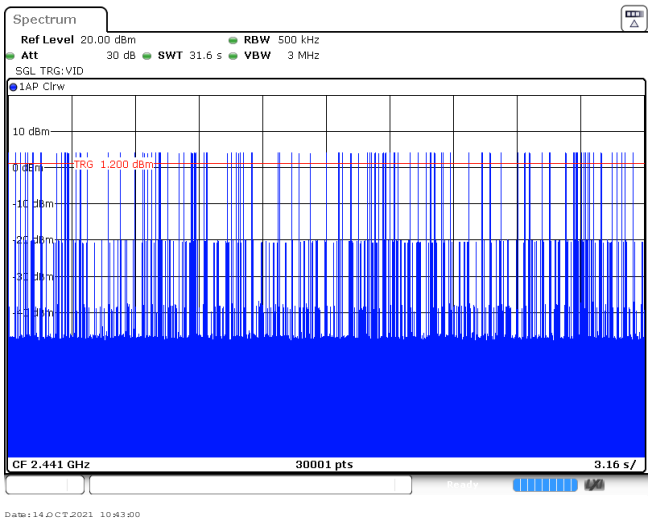
Modulation type	Channel number	Limit	Result
GFSK	79	≥15.00	Pass
π/4DQPSK	79		
8DPSK	79		

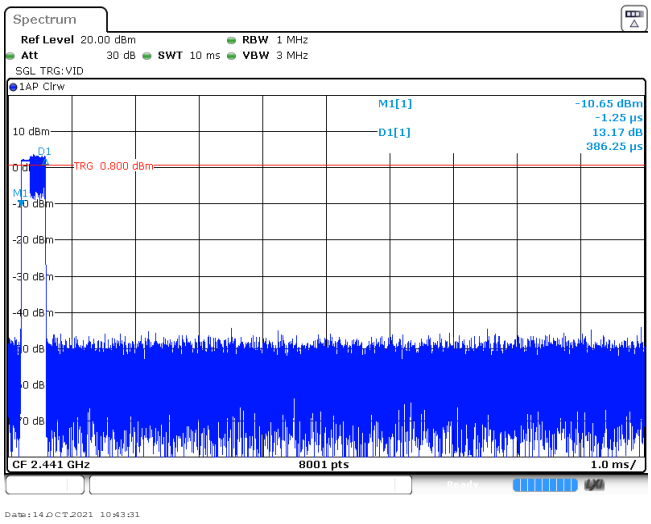
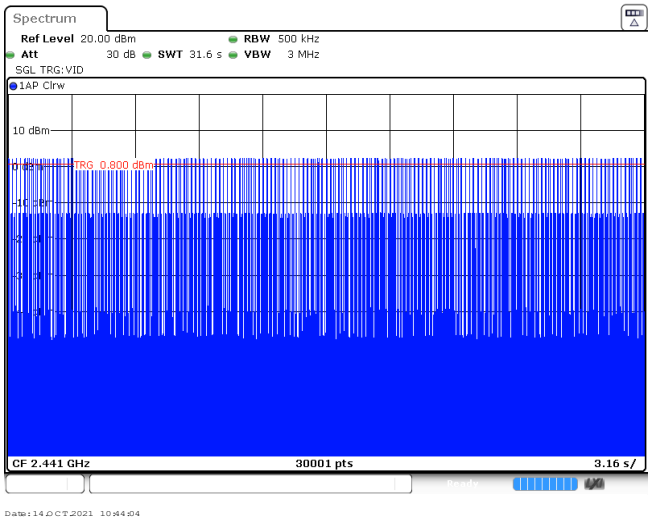
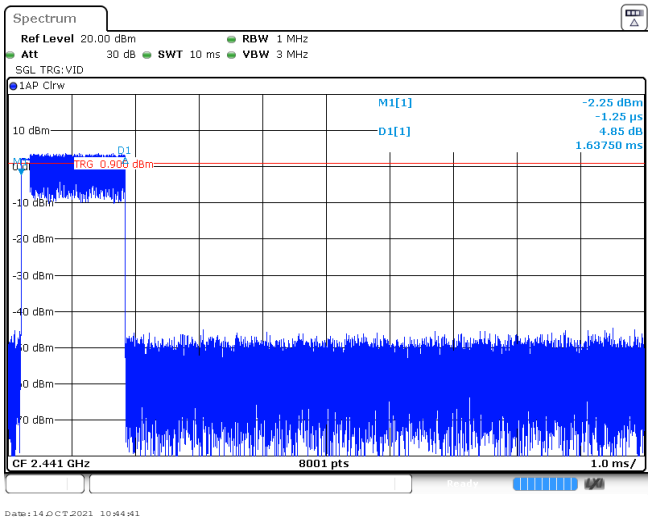
GFSK	
π/4DQPSK	
8DPSK	

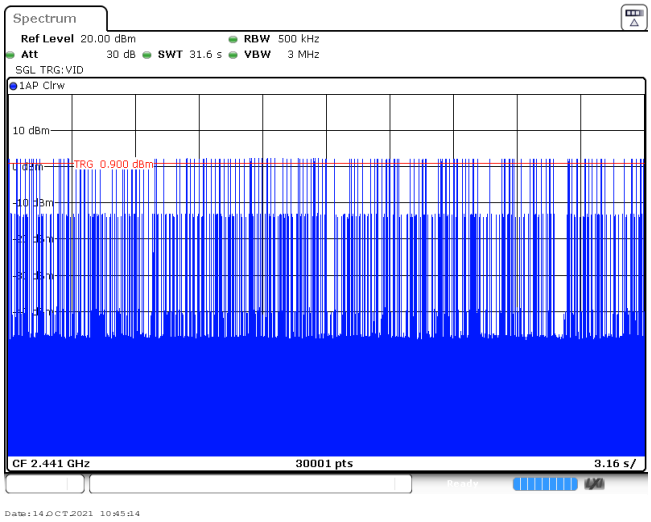
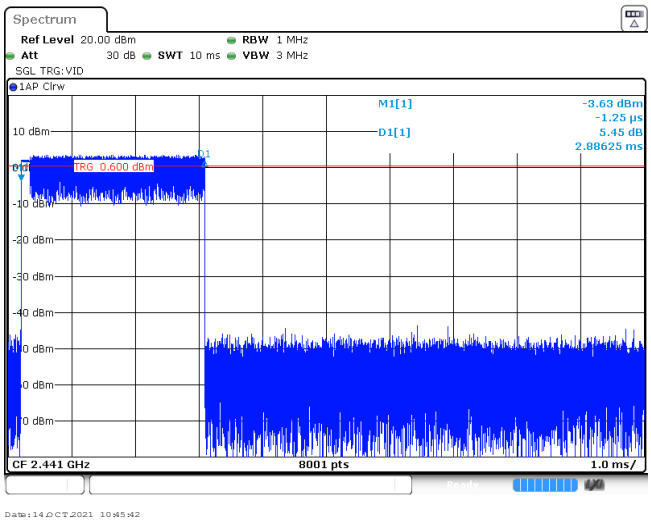
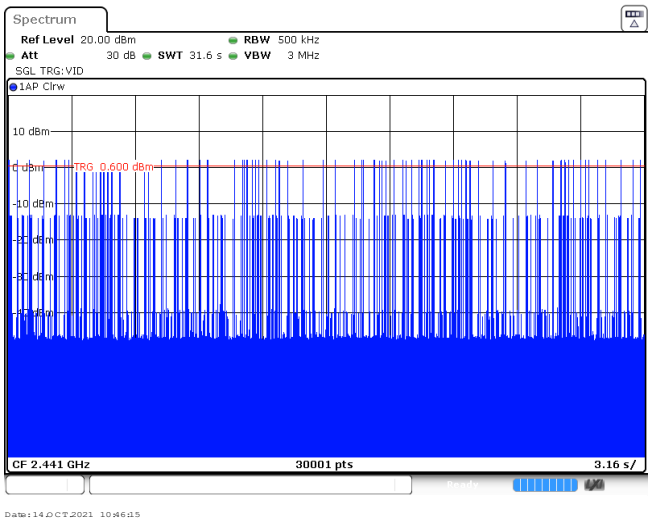
Appendix F：Dwell Time

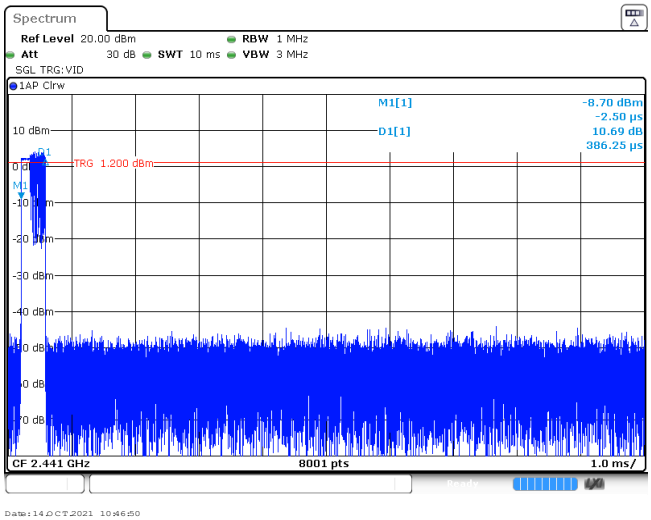
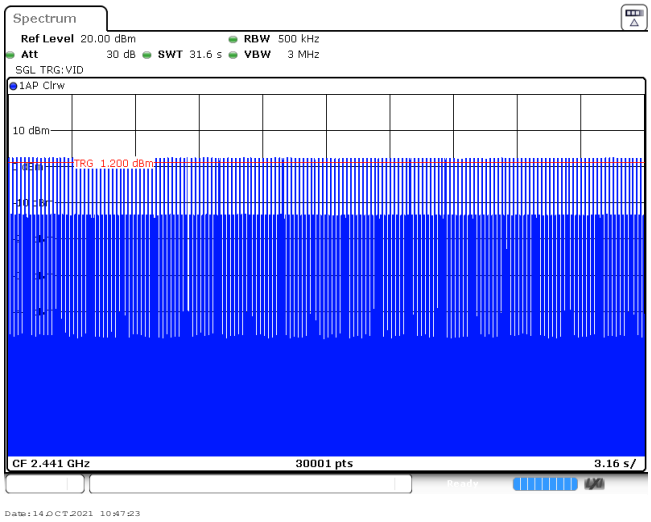
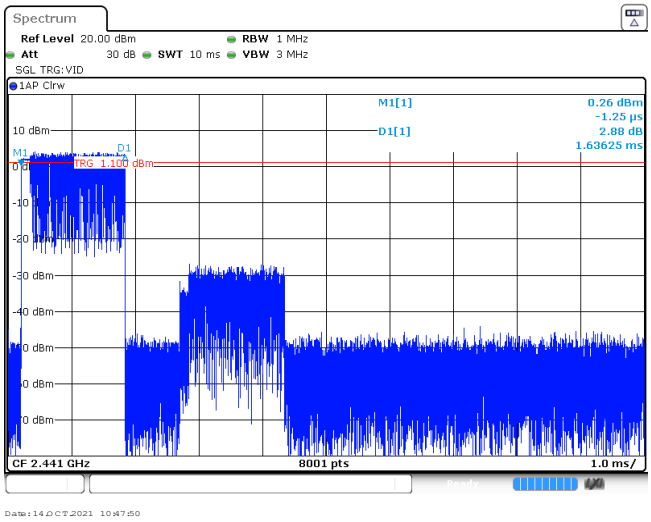
Modulation type	Packet	Burst Width [ms]	Total Hops[hop*ch]	Dwell time (Second)	Limit (Second)	Result
GFSK	DH1	0.38	319	0.12	≤ 0.40	Pass
	DH3	1.64	164	0.27		
	DH5	2.89	116	0.34		
π/4DQPSK	2DH1	0.39	320	0.12	≤ 0.40	Pass
	2DH3	1.64	171	0.28		
	2DH5	2.89	98	0.28		
8DPSK	3DH1	0.39	320	0.12	≤ 0.40	Pass
	3DH3	1.64	160	0.26		
	3DH5	2.89	98	0.28		

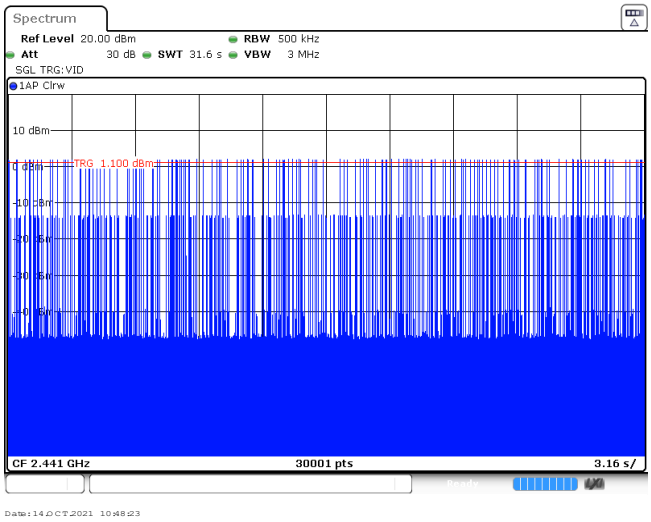
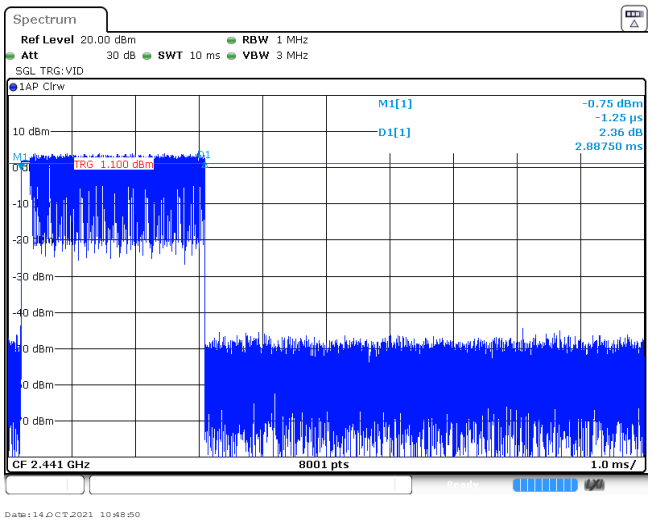
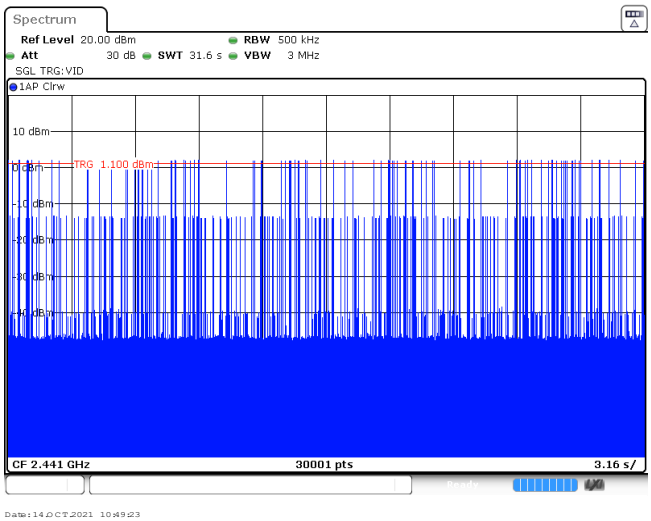
Modulation Type:	**GFSK**
DH1 Burst width	
DH1 Burst number	
DH3 Burst width	

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	

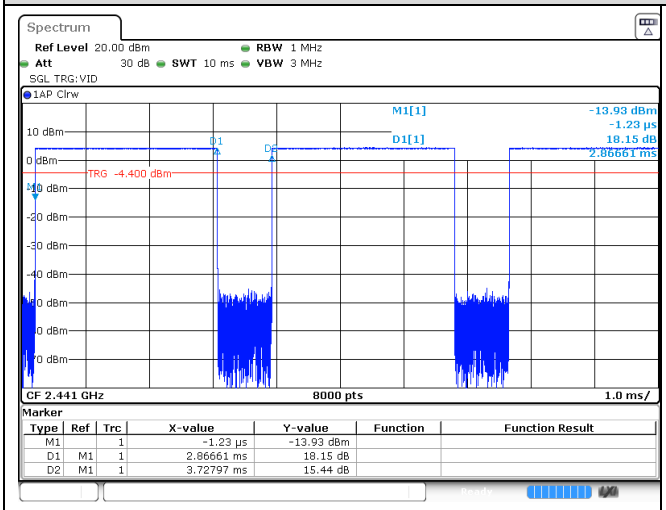
Modulation Type:	8DPSK
3DH1 Burst width	
3DH1 Burst number	
3DH3 Burst width	

3DH3 Burst number	
3DH5 Burst width	
3DH5 Burst number	

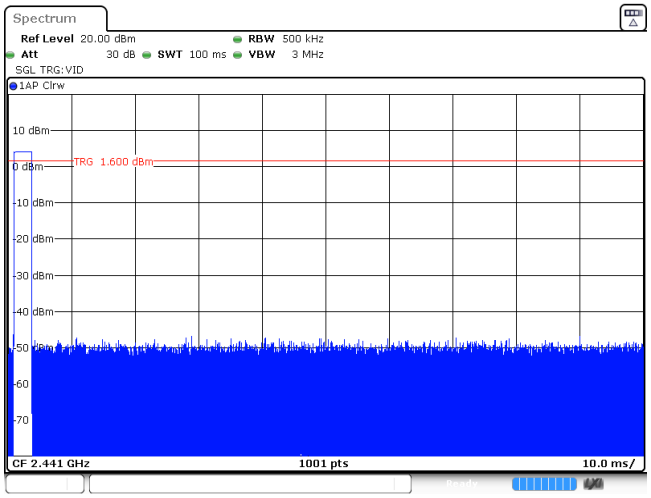
Appendix G：Duty Cycle Correction Factor (DCCF)

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	-30.84
π/4 DQPSK	2441	2.87	100	1	-30.84
8DPSK	2441	2.87	100	1	-30.84

GFSK

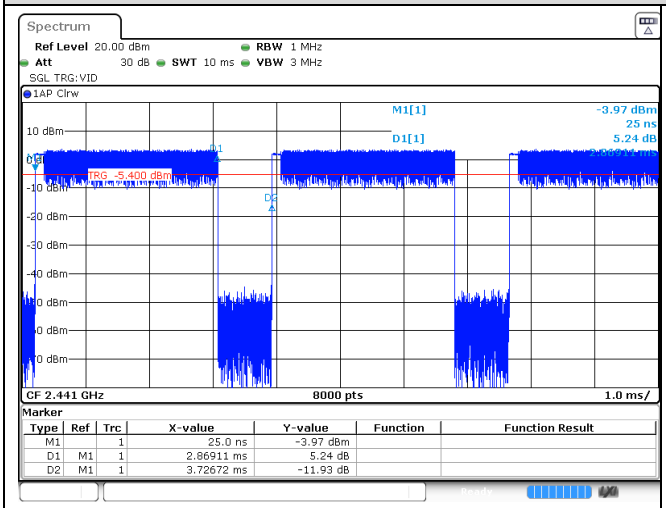


$T_{on\ time}$ for single burst

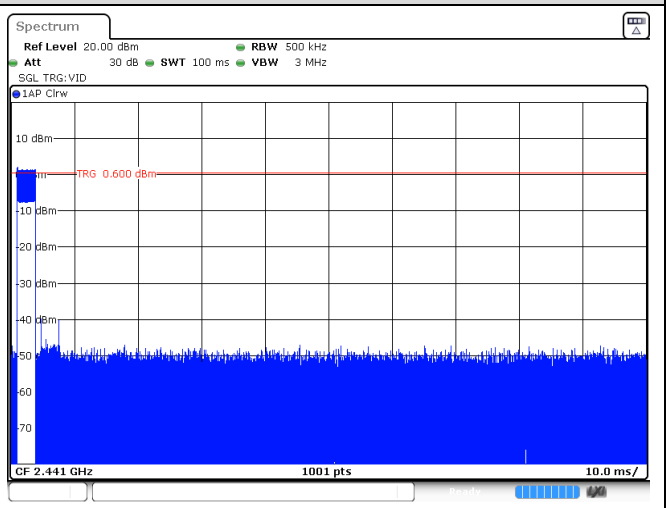


Burst Quantity

π/4 DQPSK

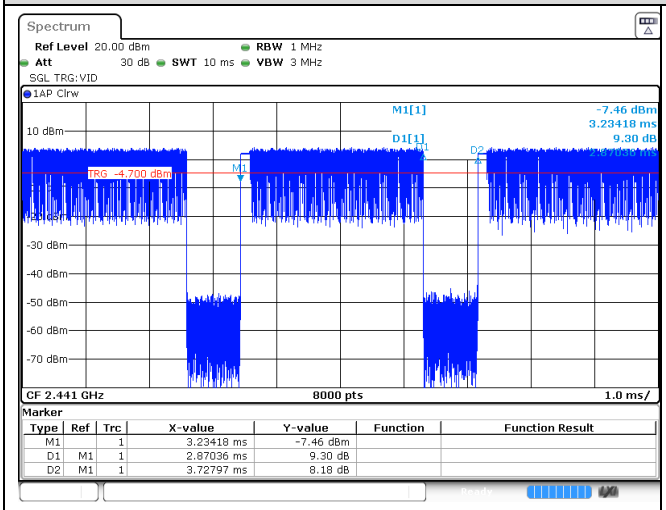


$T_{on\ time}$ for single burst

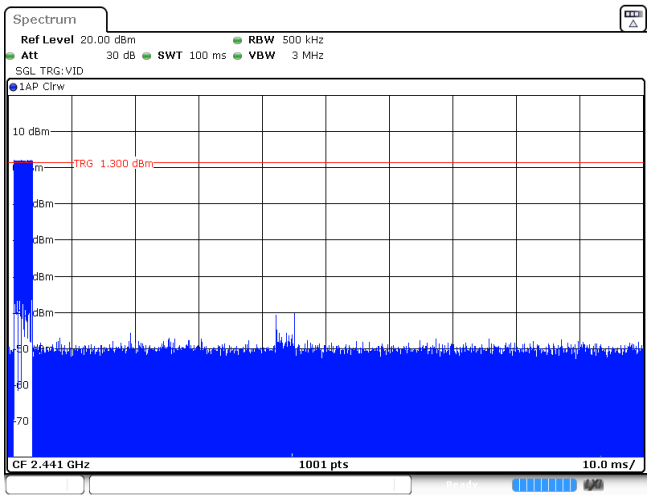


Burst Quantity

8DPSK

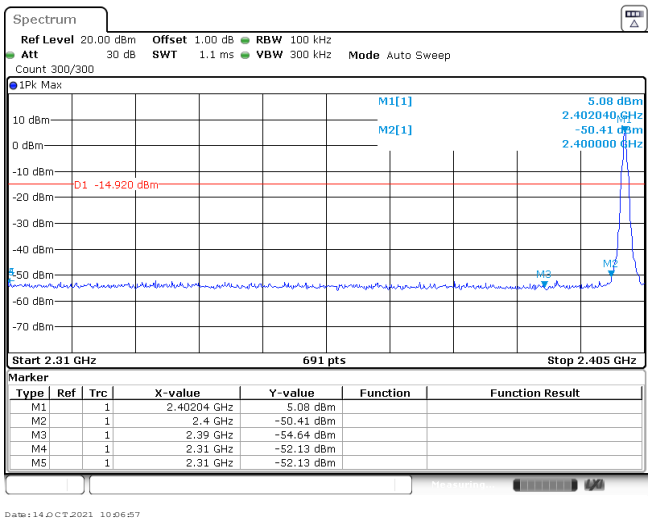
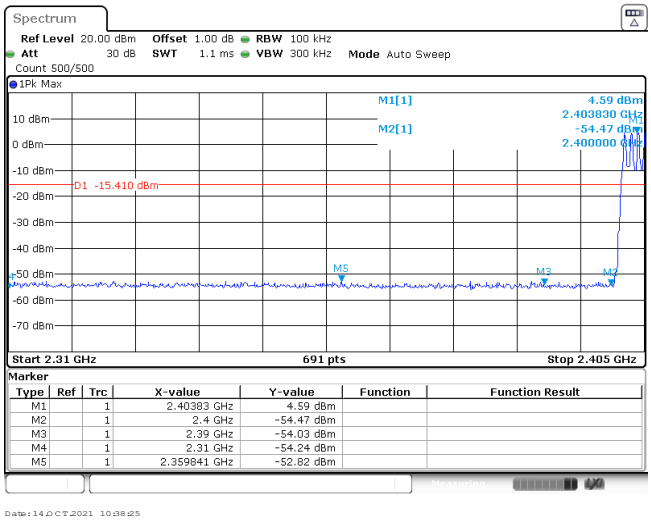
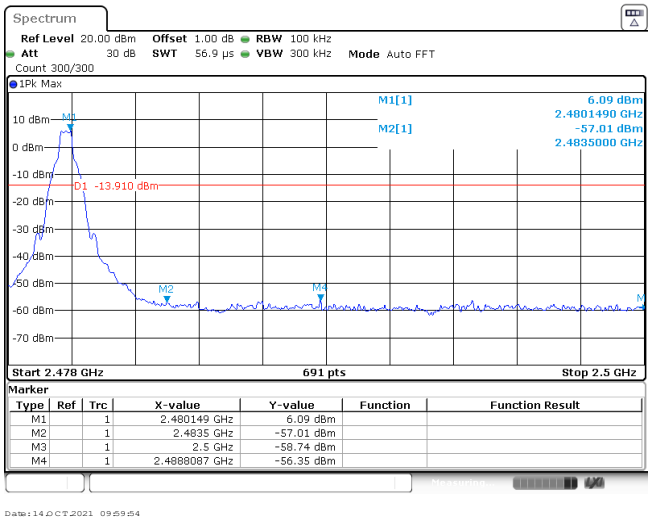


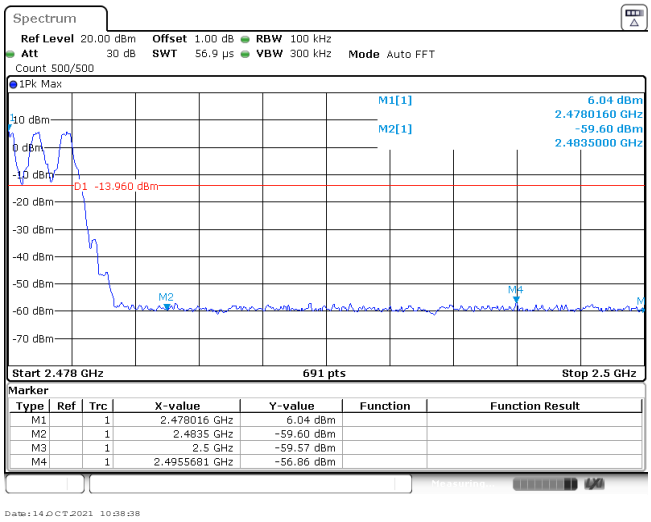
$T_{on\ time}$ for single burst

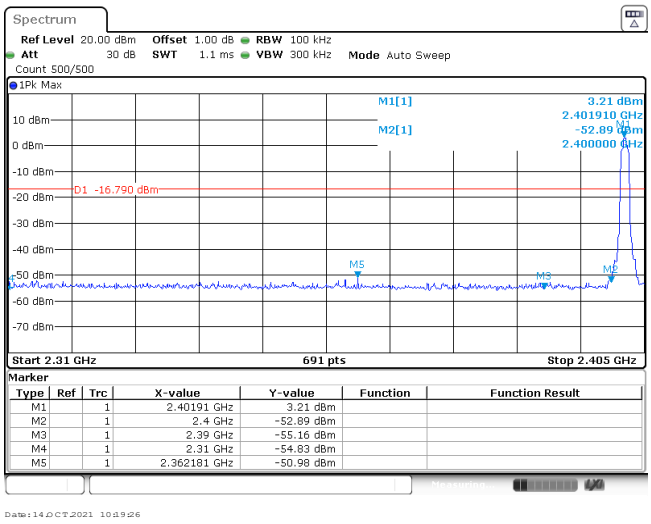
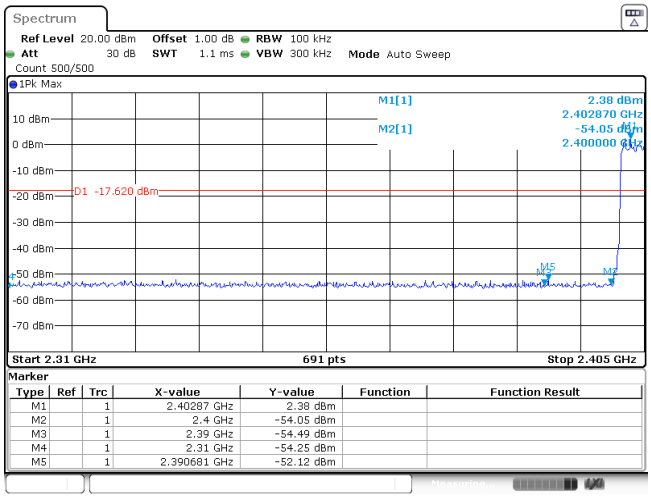
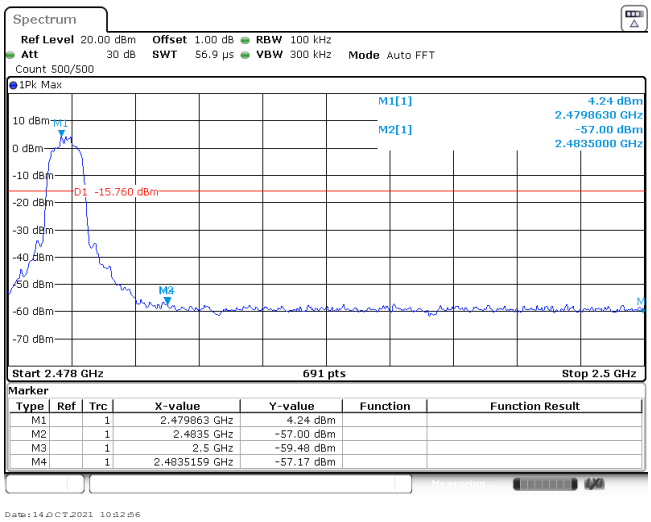


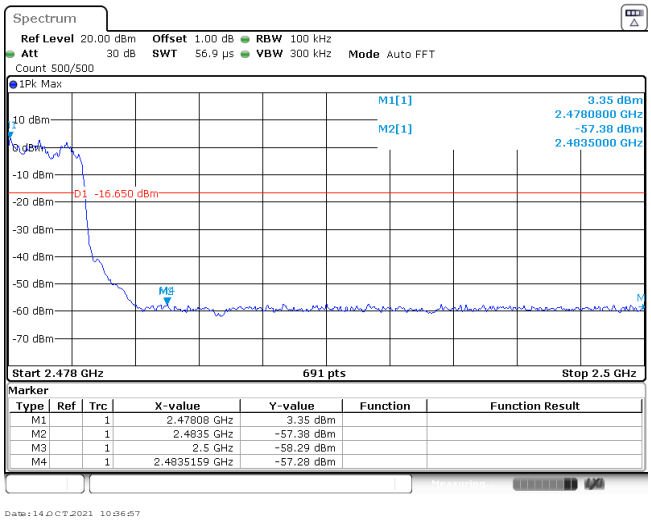
Burst Quantity

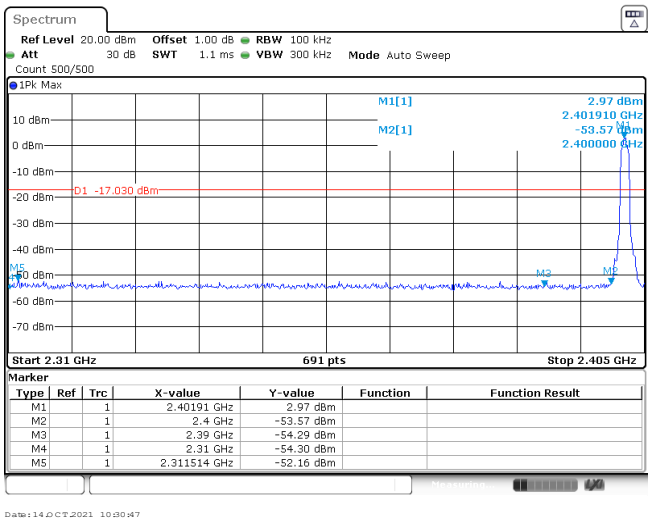
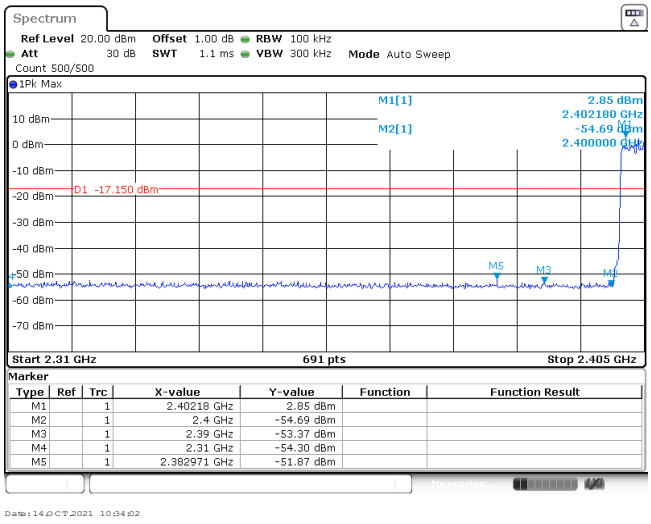
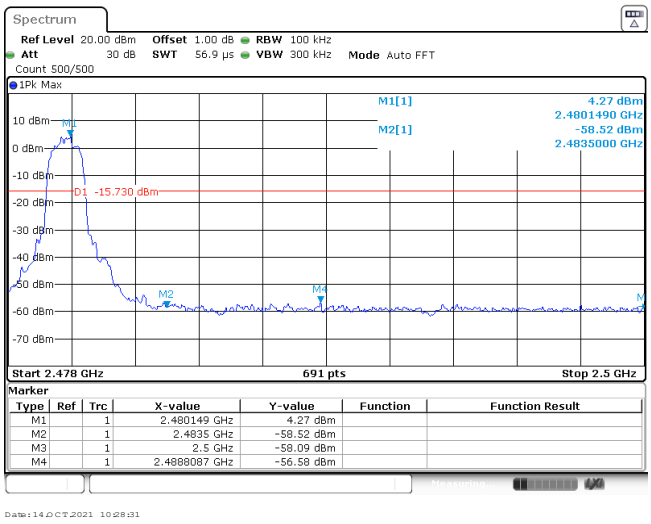
Appendix H：Band edge and Spurious Emissions (conducted)

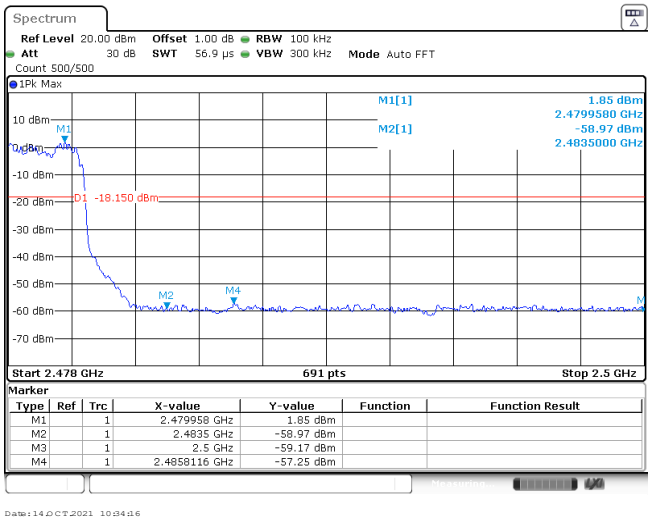
Test Item:	Band edge	Modulation type:	GFSK
CH00 No hopping mode			
CH00 Hopping mode			
CH78 No hopping mode			

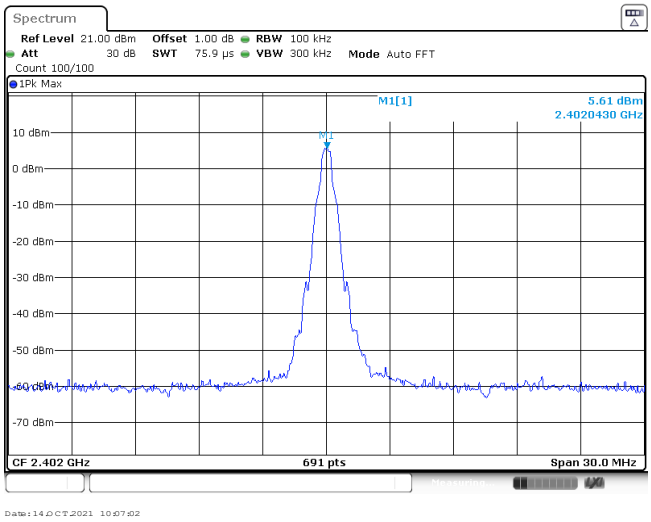
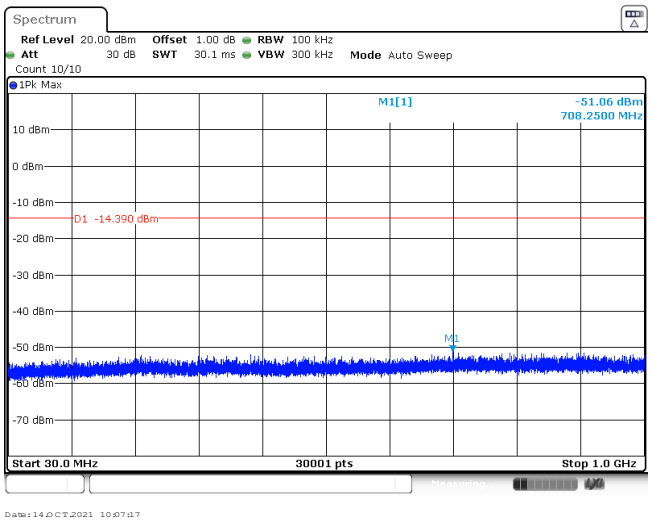
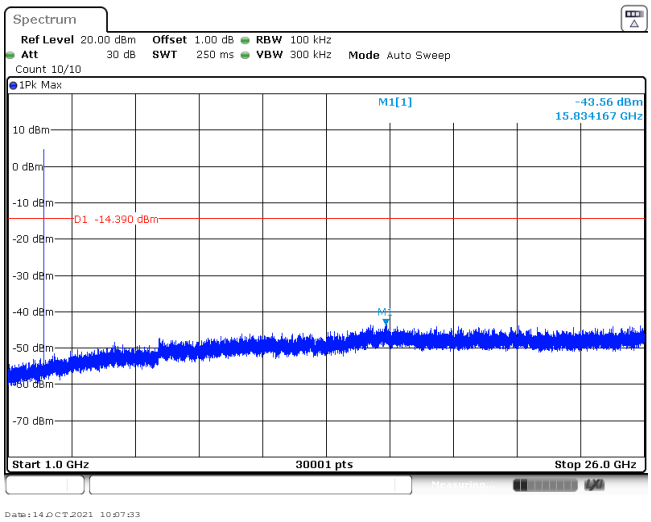
CH78 Hopping mode	

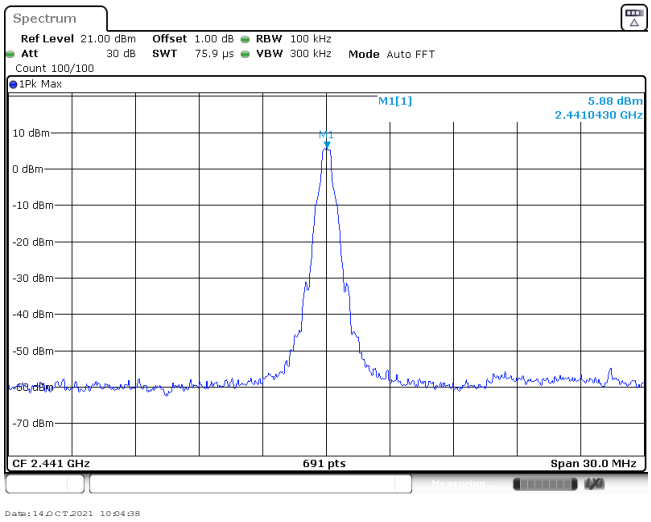
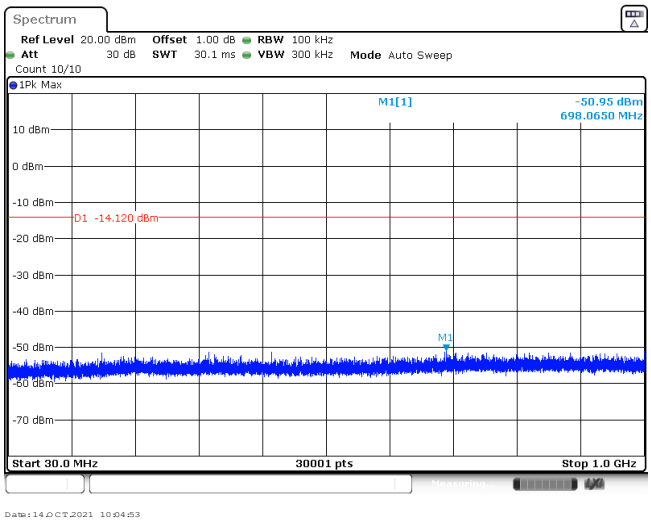
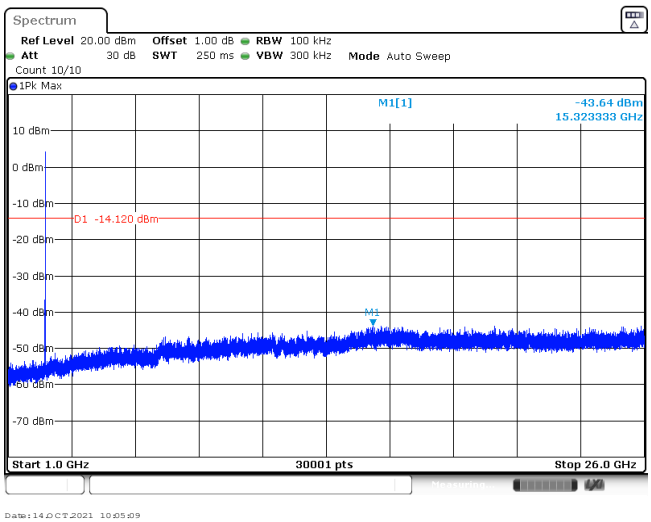
Test Item:	Band edge	Modulation type:	π/4DQPSK
CH00 No hopping mode	
CH00 Hopping mode	
CH78 No hopping mode	

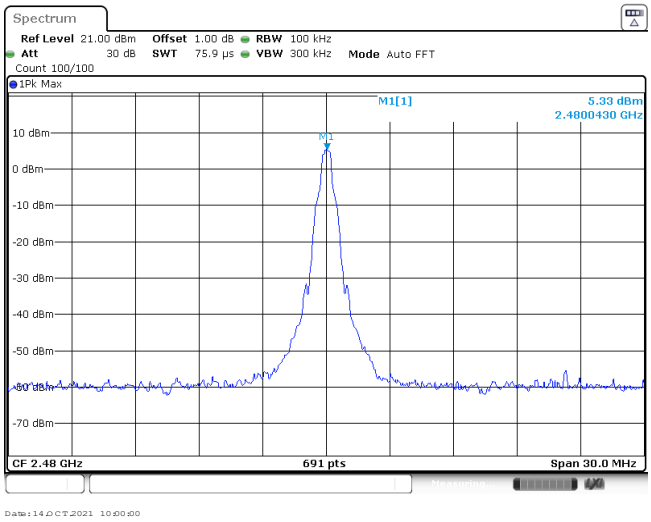
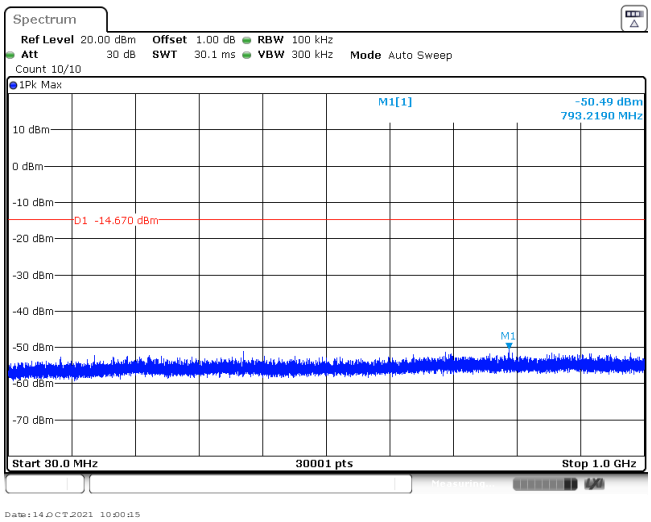
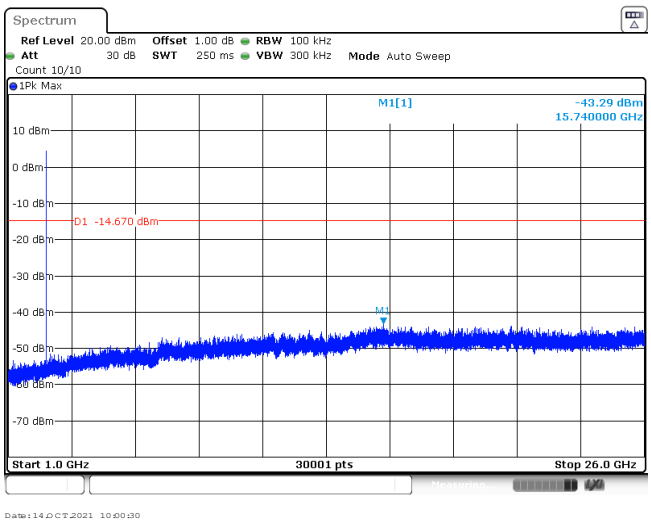
CH78 Hopping mode	

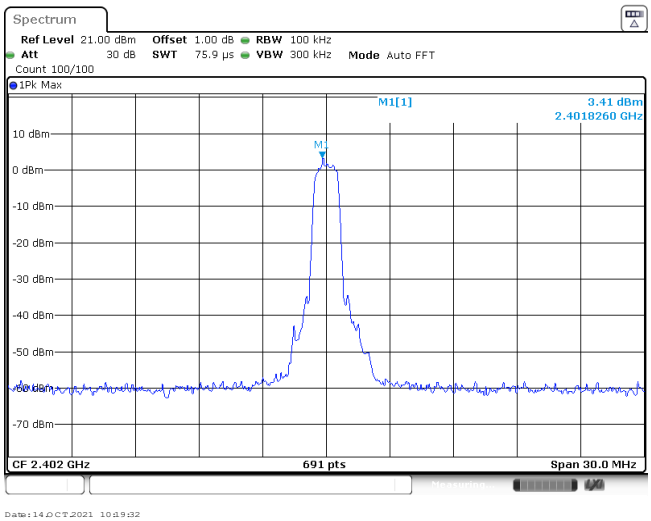
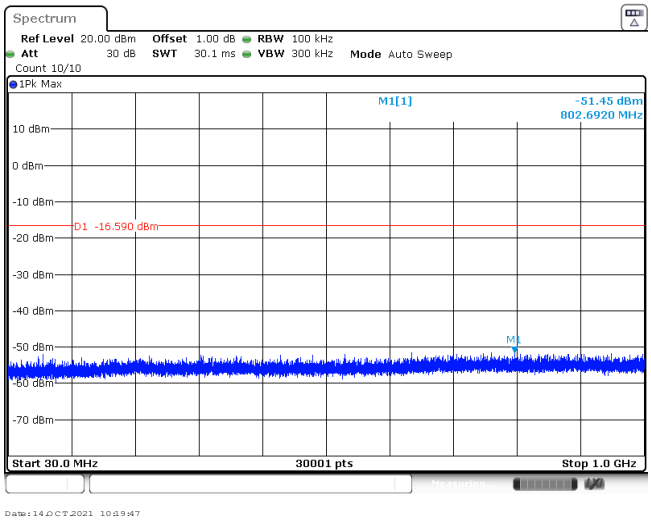
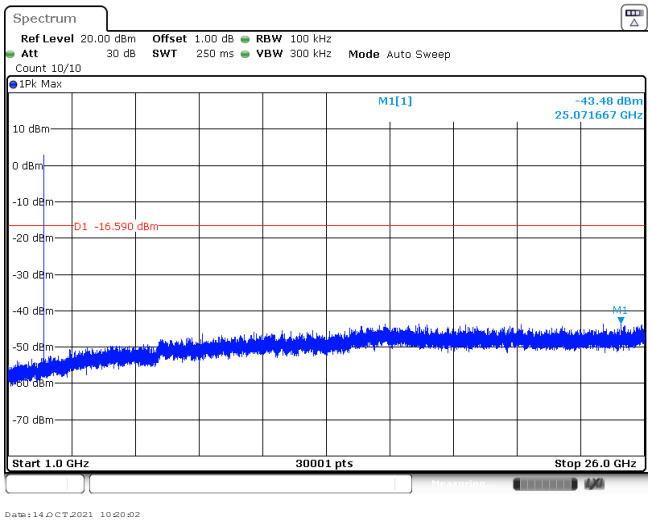
Test Item:	Band edge	Modulation type:	8DPSK
CH00 No hopping mode			
CH00 Hopping mode			
CH78 No hopping mode			

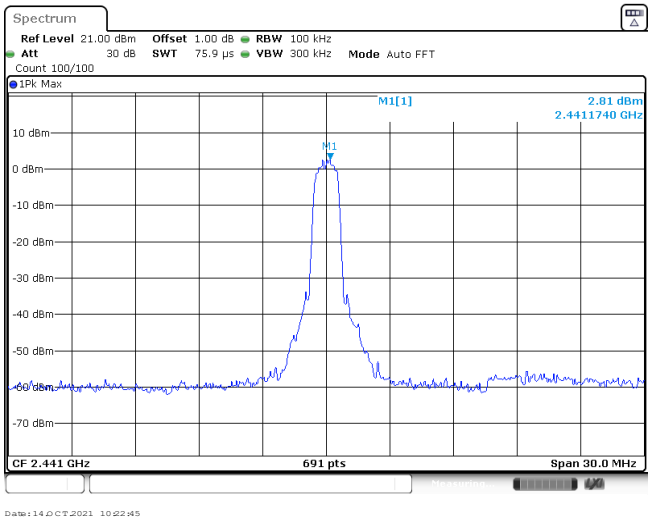
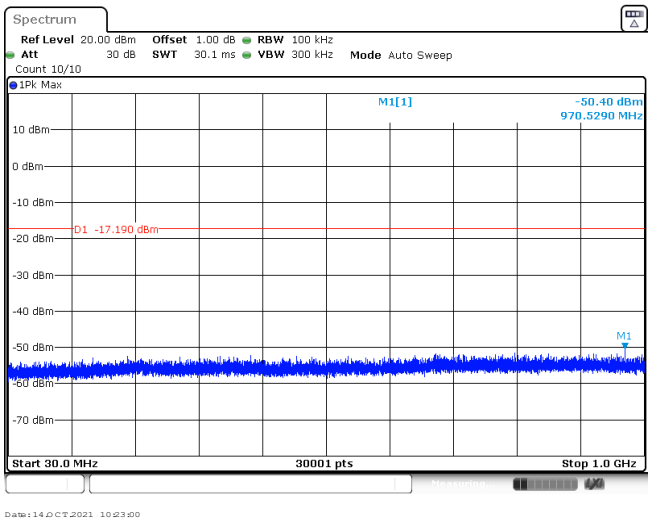
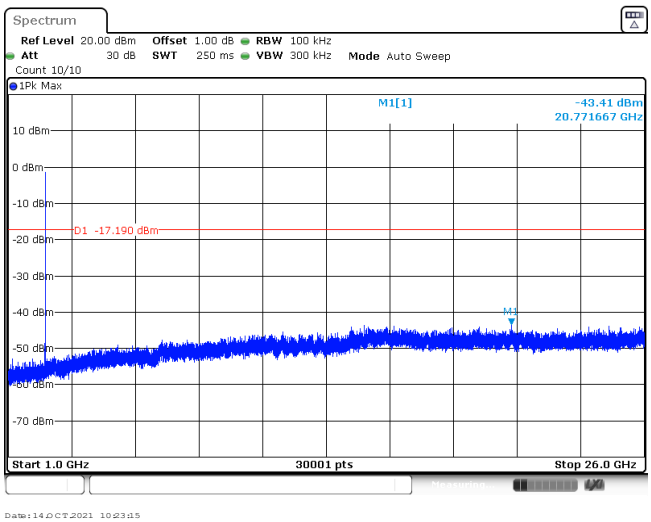
CH78 Hoppig mode	

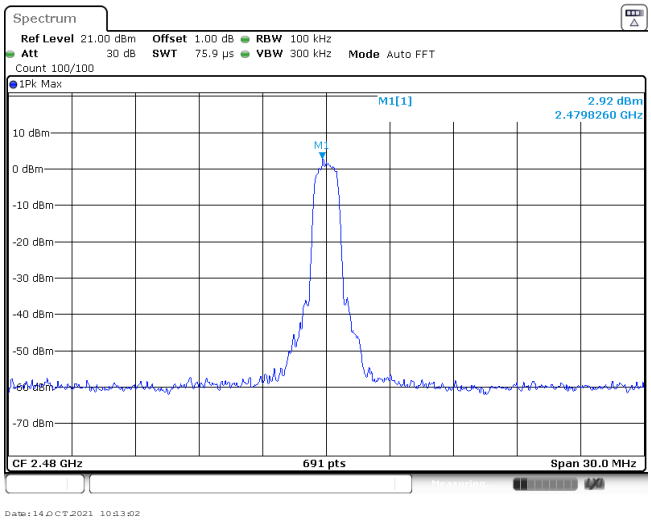
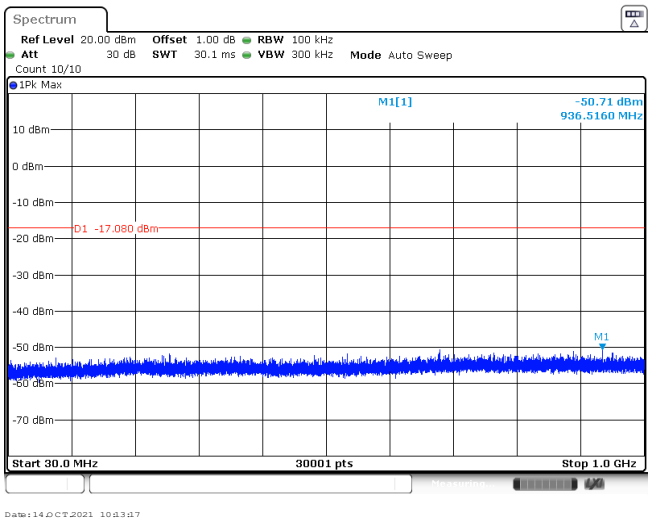
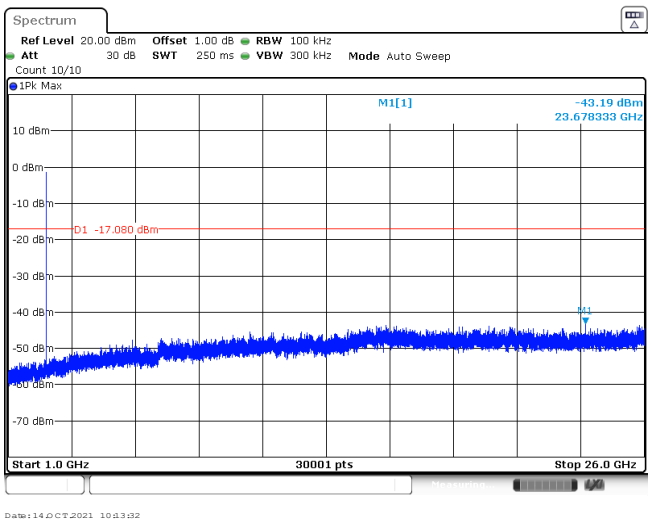
Test Item:	Spurious Emission	Modulation type:	GFSK
CH00 Reference level			
CH00 30MHz~1000MHz			
CH00 1GHz~26GHz			

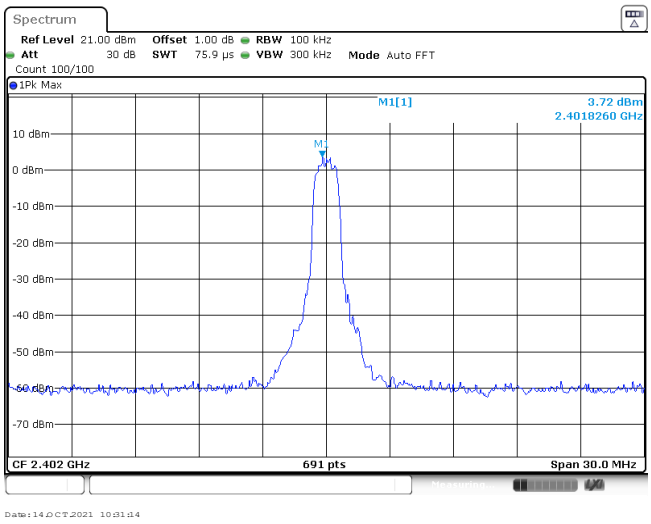
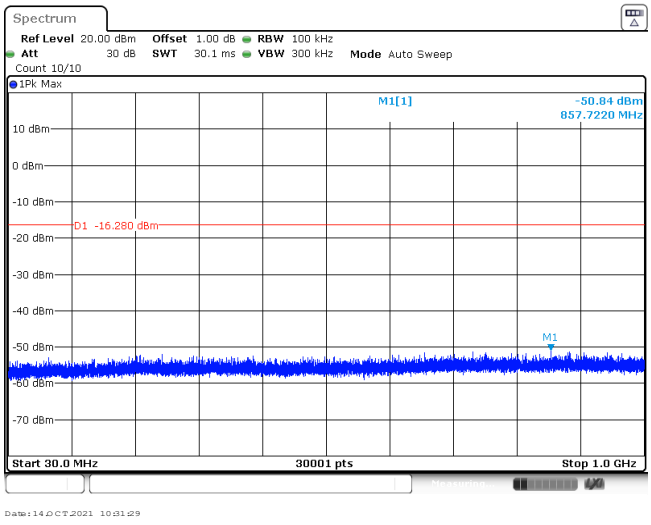
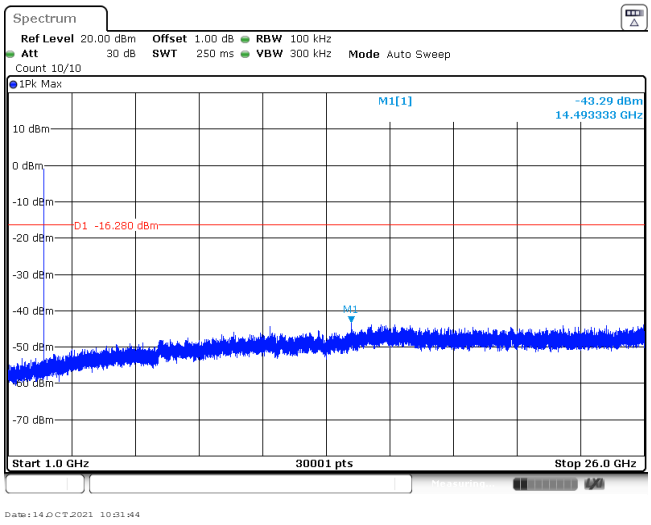
CH39 Reference level	
CH39 30MHz~1000MHz	
CH39 1GHz~26GHz	

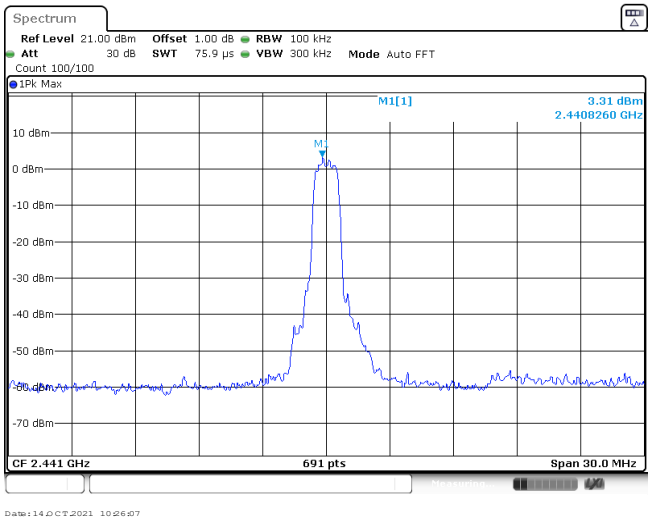
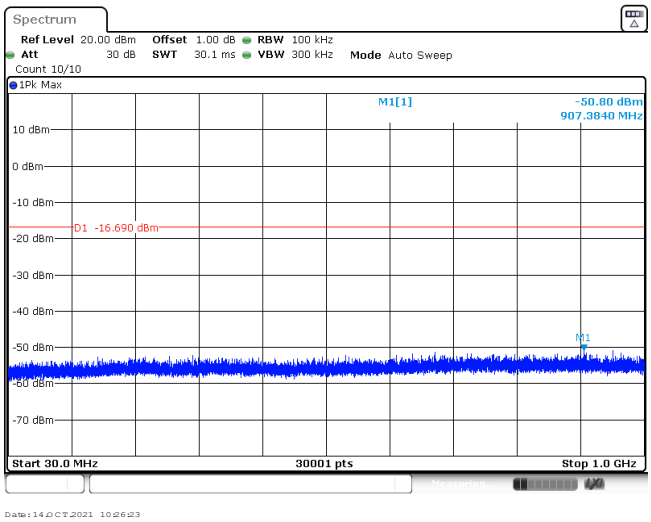
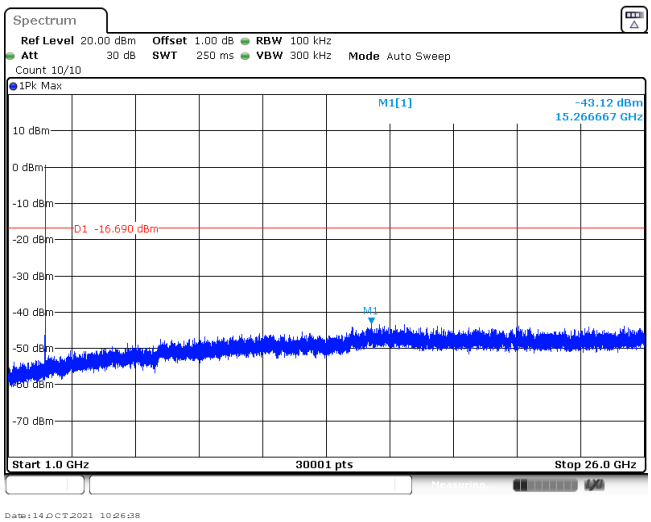
CH78 Reference level	
CH78 30MHz~1000MHz	
CH78 1GHz~26GHz	

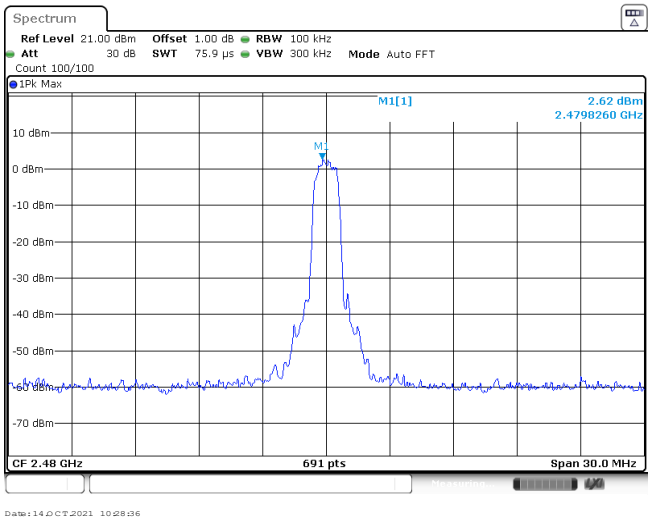
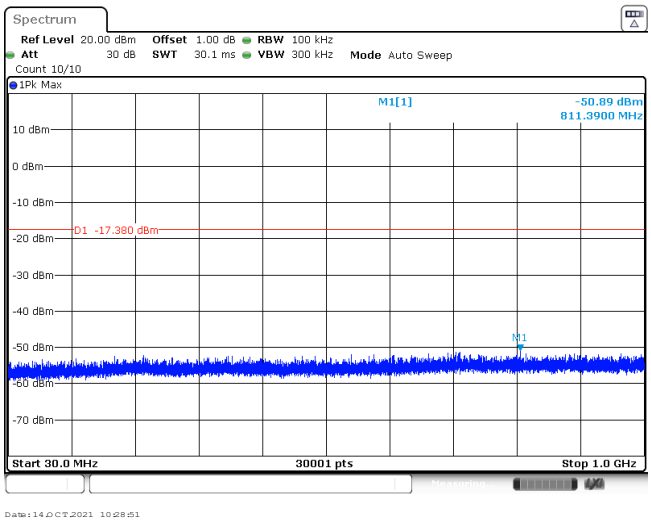
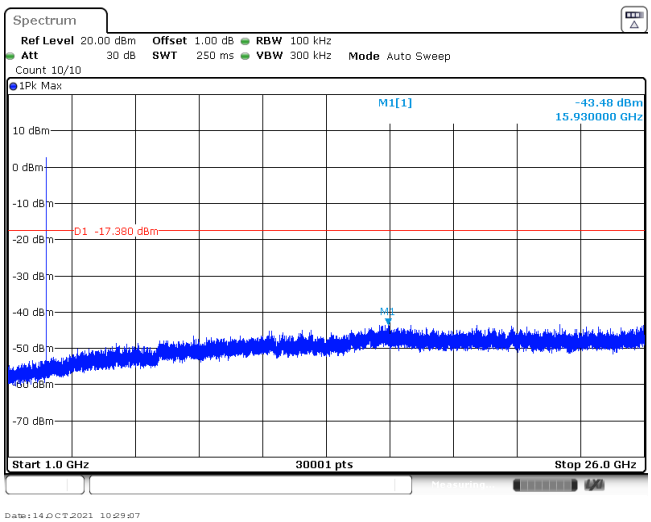
Test Item:	Spurious Emission	Modulation type:	π/4DQPSK
CH00 Reference level			
CH00 30MHz~1000MHz			
CH00 1GHz~26GHz			

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	

CH78 Reference level	
CH78 30MHz~1000MHz	
CH78 1GHz~26GHz	

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