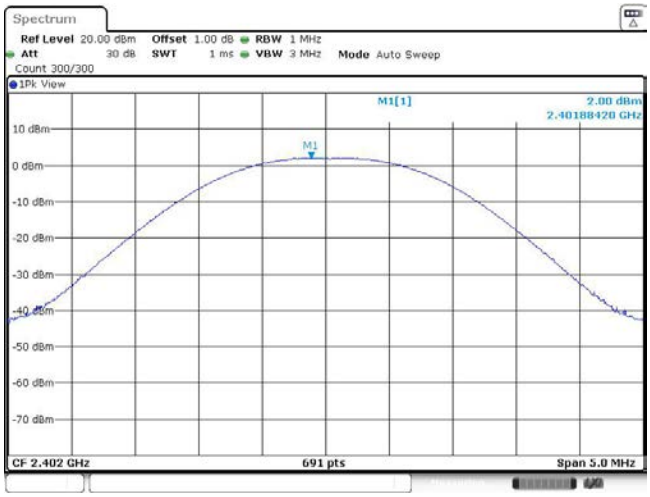
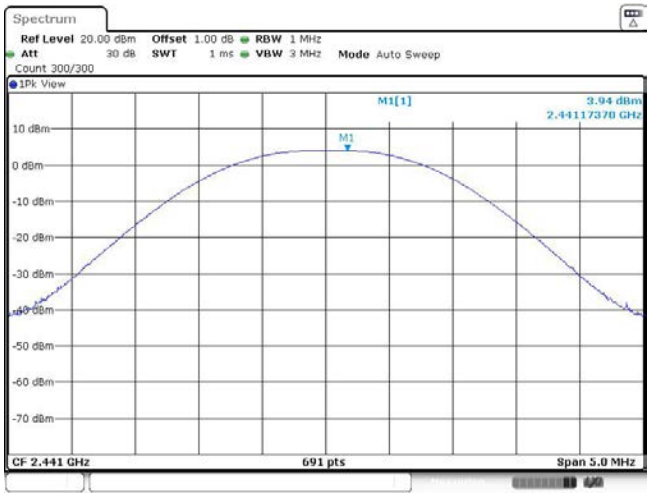
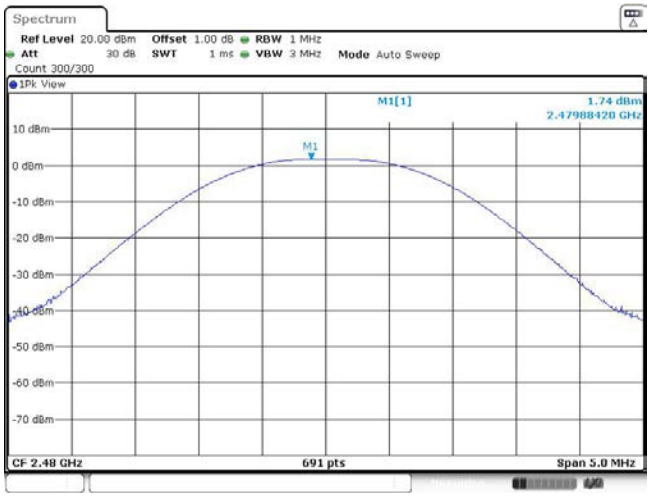
APPENDIX REPORT

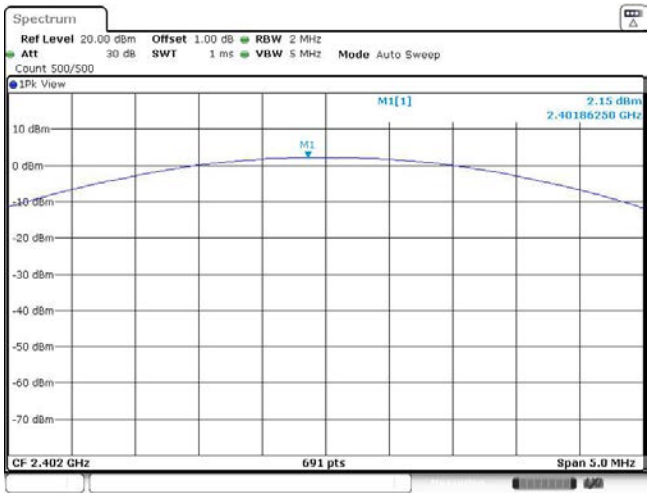
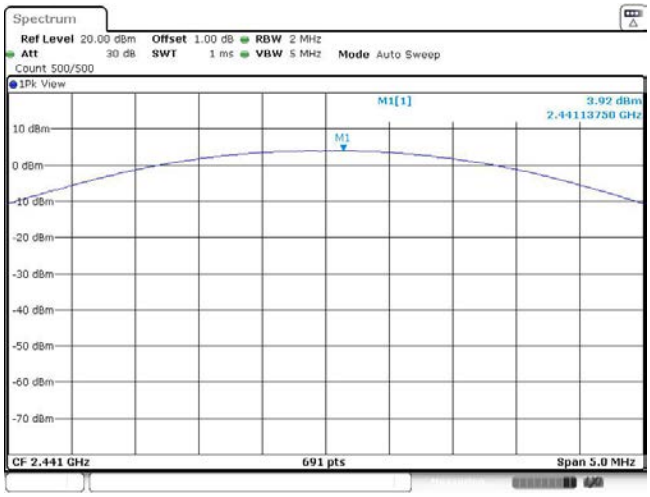
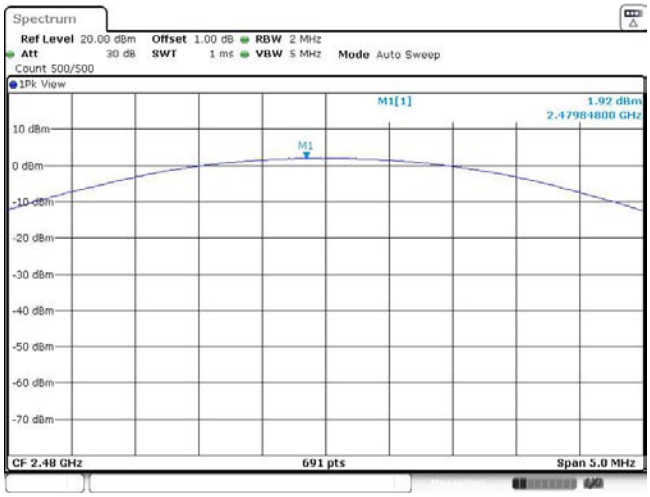
Project No.	SHT2205032401EW	Radio Specification	Bluetooth EDR
Test sample No.	YPHT22050324003	Model No.	Tronik 12
Start test date	2022-05-26	Finish date	2022-05-26
Temperature	24.5℃	Humidity	37%
Test Engineer	Xiaoqin Li	Auditor	Xiaodong Zhao

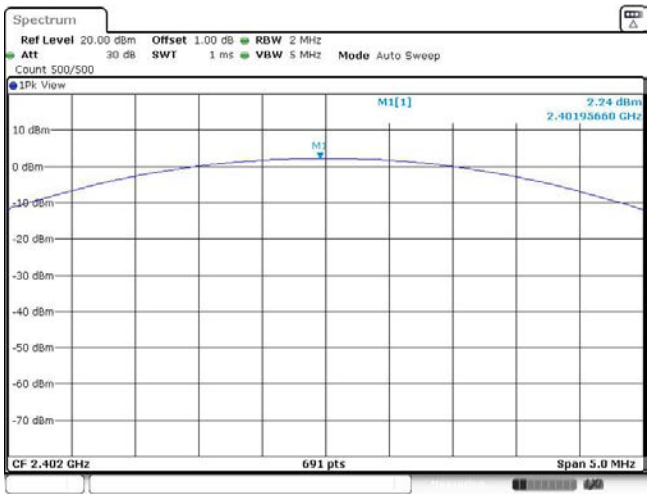
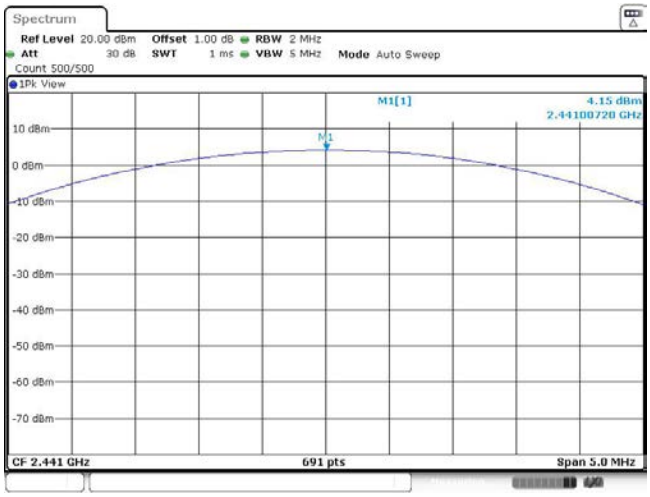
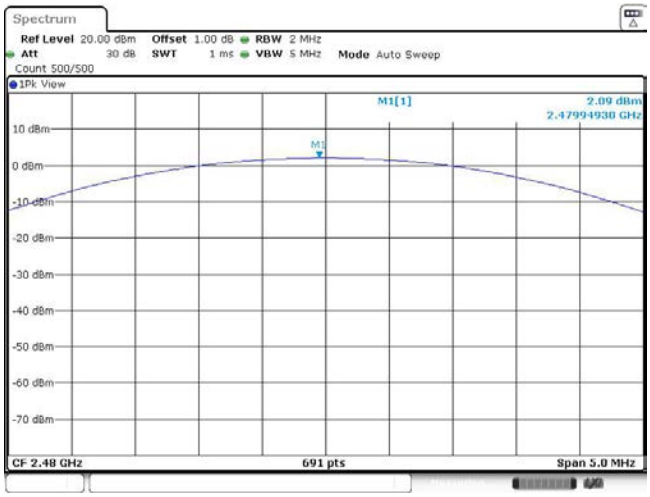
Appendix clause	Test item	Result
A	Peak Output Power	PASS
B	20 dB Bandwidth	PASS
C	99% Occupied Bandwidth	PASS
D	Carrier Frequencies Separation	PASS
E	Hopping Channel Number	PASS
F	Dwell Time	PASS
G	Duty Cycle Correction Factor (DCCF)	PASS
H	Band edge and Spurious Emissions(coducted)	PASS

Appendix A：Peak Output Power

Modulation type	Channel	Peak Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
GFSK	00	2.00	1.98	≤ 30.00	Pass
	39	3.94	3.86		
	78	1.74	1.71		
π/4DQPSK	00	2.15	1.71	≤ 21.00	Pass
	39	3.92	3.35		
	78	1.92	1.41		
8DPSK	00	2.24	1.65	≤ 21.00	Pass
	39	4.15	3.43		
	78	2.09	1.43		

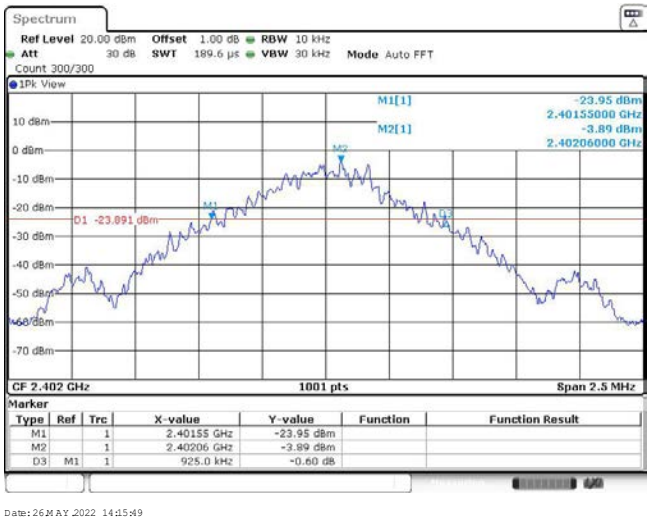
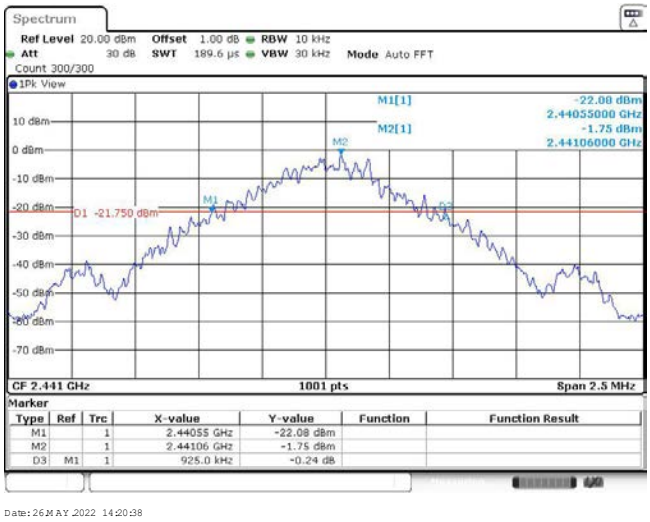
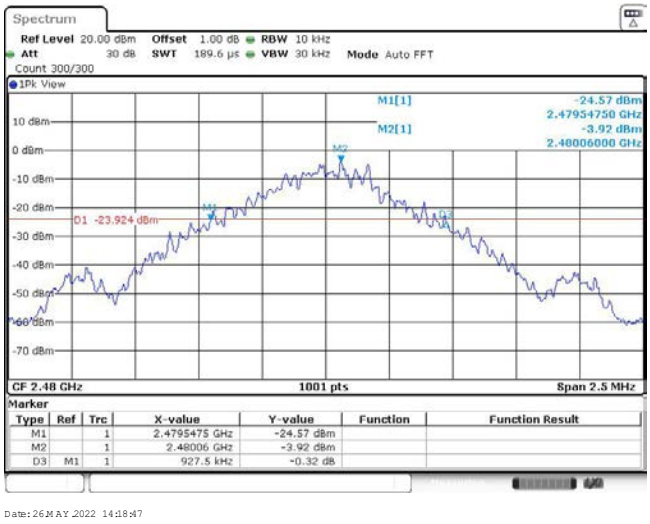
Modulation Type:	GFSK
CH00	 Date:26MAY.2022 14:16:06
CH39	 Date:26MAY.2022 14:20:54
CH78	 Date:26MAY.2022 14:19:03

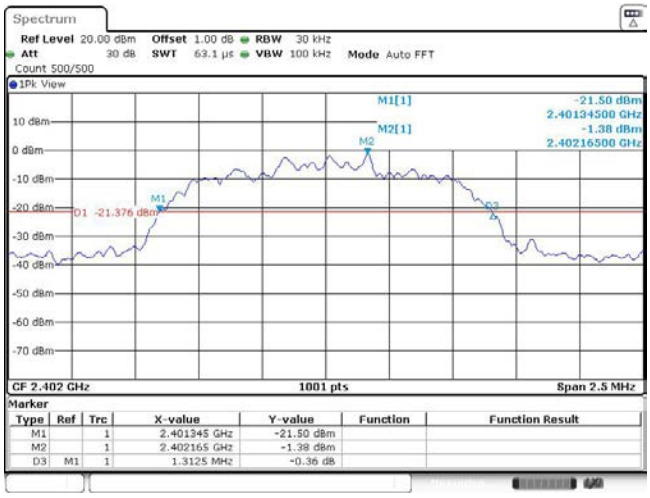
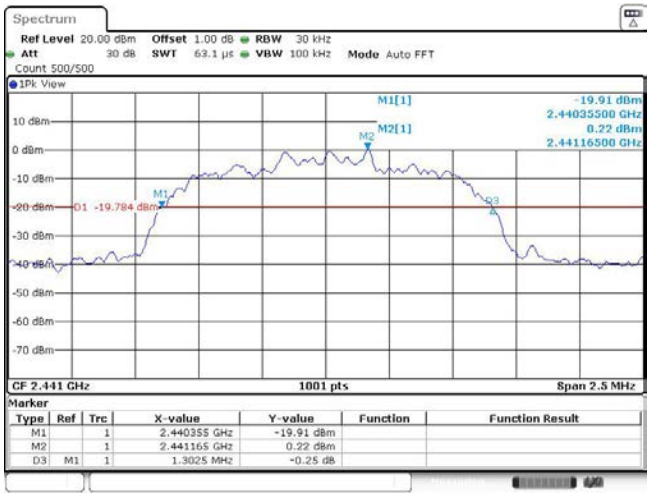
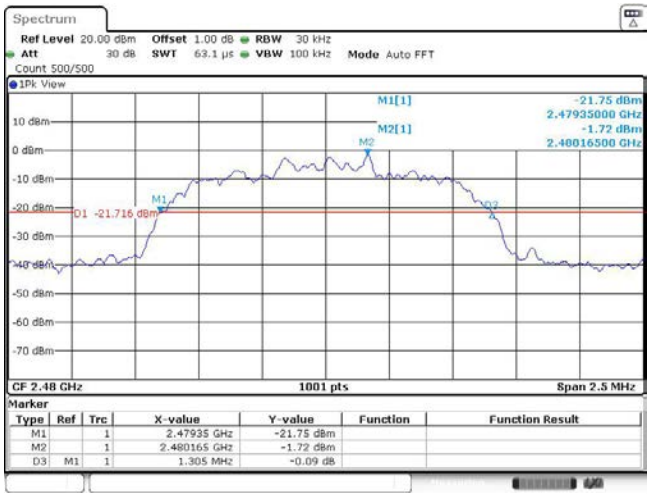
Modulation Type:	π/4DQPSK
CH00	 Date: 26 MAY 2022 14:29:00
CH39	 Date: 26 MAY 2022 14:45:42
CH78	 Date: 26 MAY 2022 14:31:07

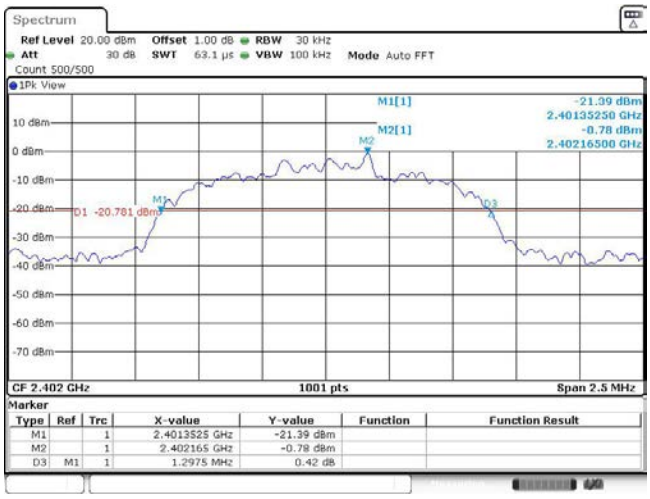
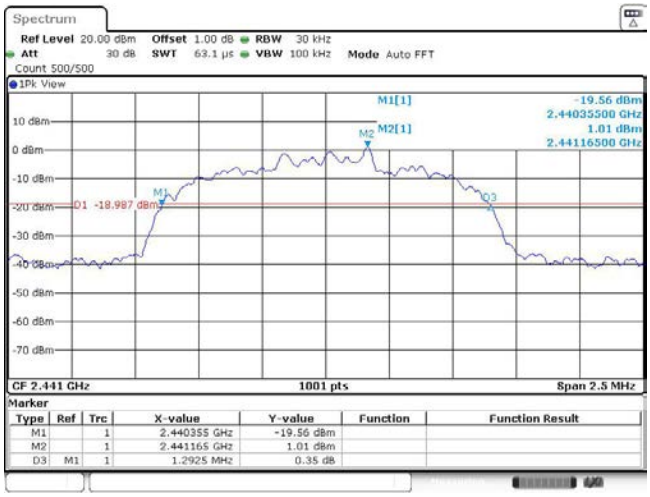
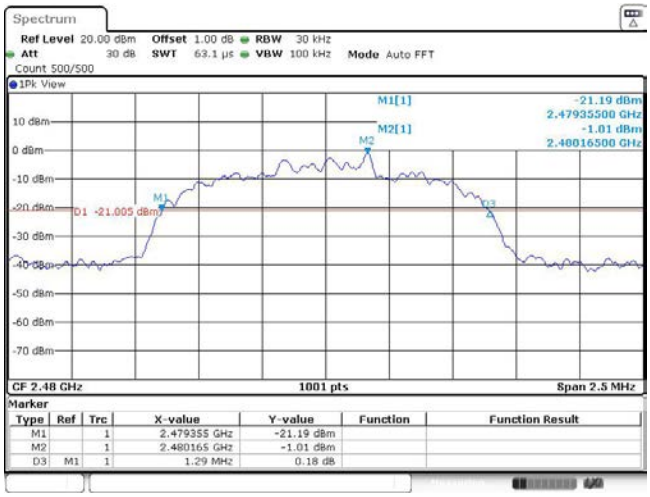
Modulation Type:	8DPSK
CH00	 Date:26MAY.2022 14:52:17
CH39	 Date:26MAY.2022 14:56:17
CH78	 Date:26MAY.2022 14:54:15

Appendix B : 20 dB Bandwidth

Modulation type	Channel	20 dB Bandwidth (kHz)	Limit (kHz)	Result
GFSK	00	925.00	-	Pass
	39	925.00		
	78	927.50		
π/4DQPSK	00	1312.50	-	Pass
	39	1302.50		
	78	1305.00		
8DPSK	00	1297.50	-	Pass
	39	1292.50		
	78	1290.00		

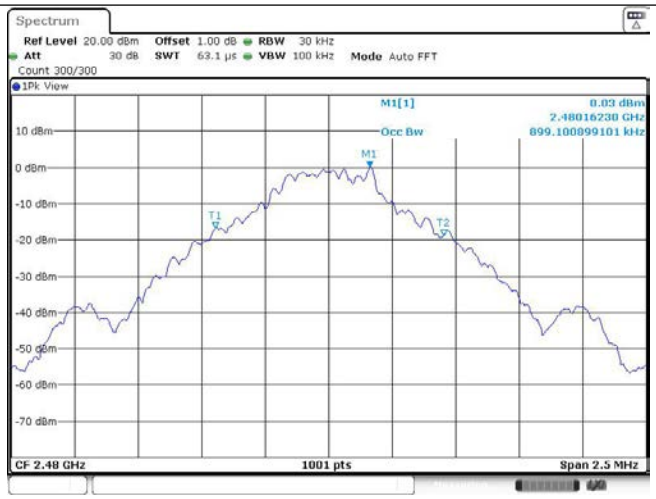
Modulation Type:	GFSK
CH00	
CH39	
CH78	

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	0.90		
	78	0.90		
π/4DQPSK	00	1.19	-	Pass
	39	1.17		
	78	1.18		
8DPSK	00	1.20	-	Pass
	39	1.18		
	78	1.18		

Modulation Type:	**GFSK**
CH00	 Date:26MAY.2022 14:15:57
CH39	 Date:26MAY.2022 14:20:46
CH78	 Date:26MAY.2022 14:18:55

Modulation Type:	**π/4DQPSK**
CH00	 Date:26MAY.2022 14:28:52
CH39	 Date:26MAY.2022 14:45:34
CH78	 Date:26MAY.2022 14:30:59

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

Appendix D：Carrier Frequencies Separation

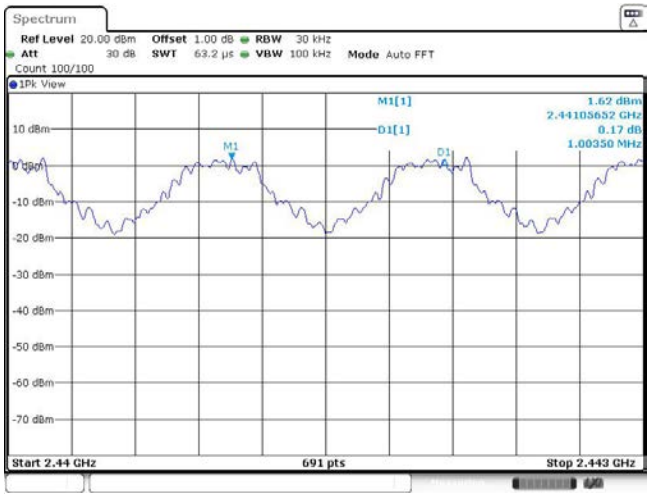
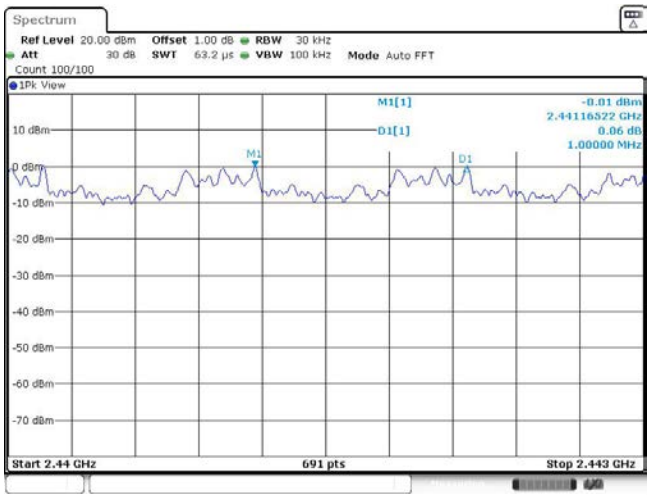
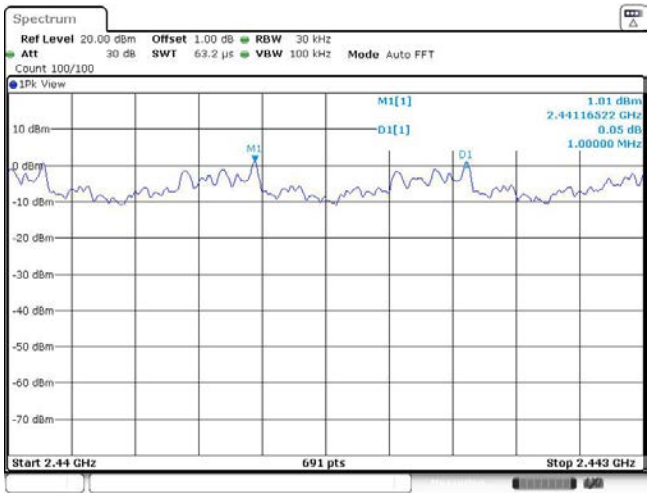
Modulation type	Channel	Carrier Frequencies Separation (MHz)	Limit (kHz) *	Result
GFSK	39	1.00	≥927.50	Pass
π/4DQPSK	39	1.00	≥875.00	Pass
8DPSK	39	1.00	≥865.00	Pass

Note:

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

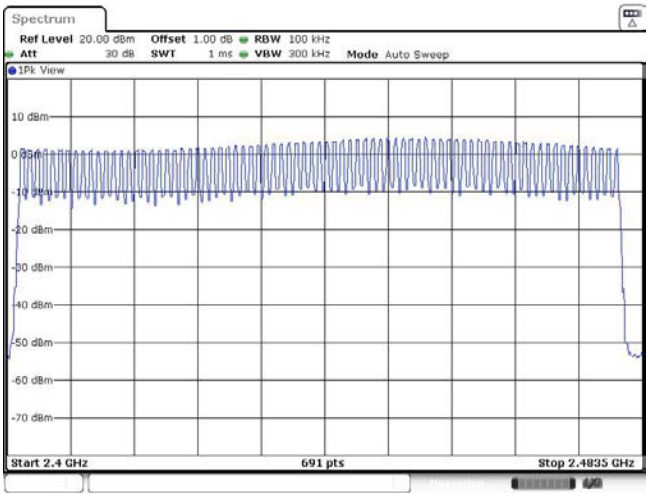
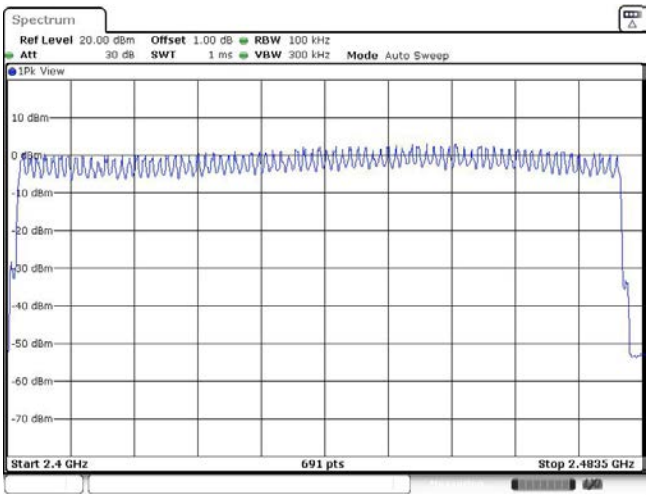
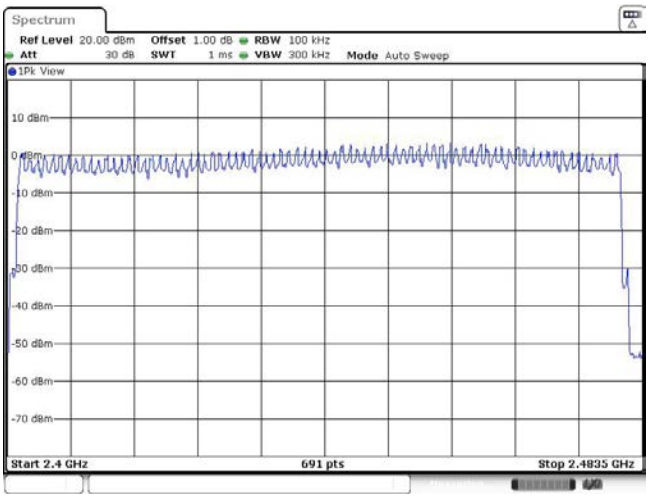
π/4DQPSK limit = 2/3 * The maximum 20 dB Bandwidth for π/4DQPSK modulation on the appendix B.

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

GFSK	 Date:26MAY.2022 14:25:14
π/4DQPSK	 Date:26MAY.2022 14:48:48
8DPSK	 Date:26MAY.2022 14:58:37

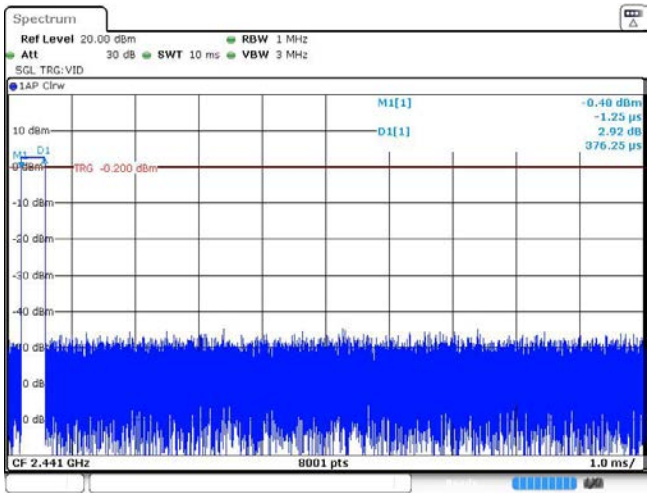
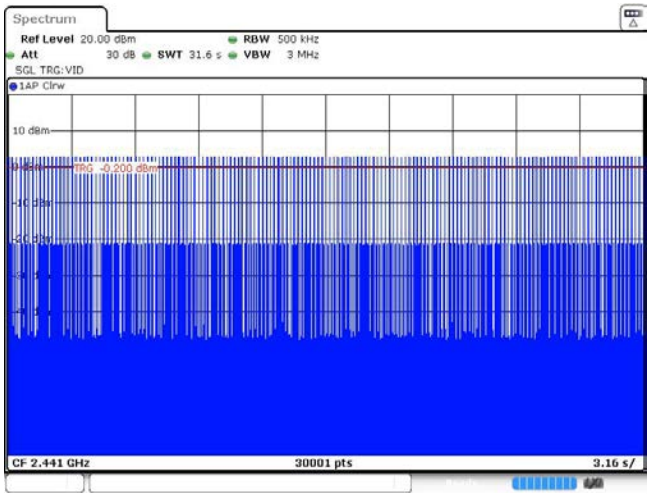
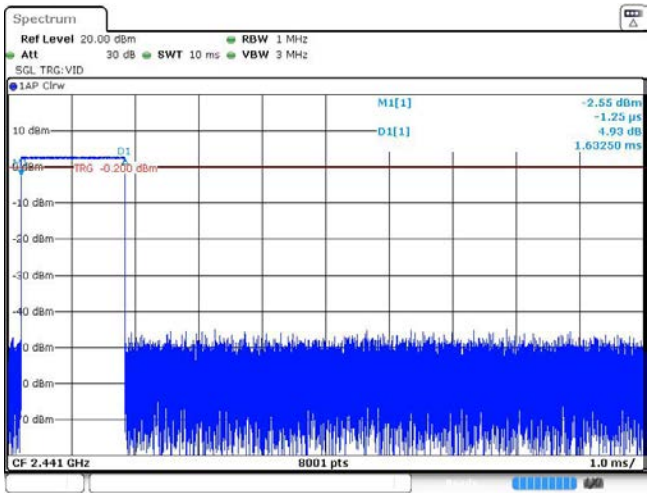
Appendix E：Hopping Channel Number

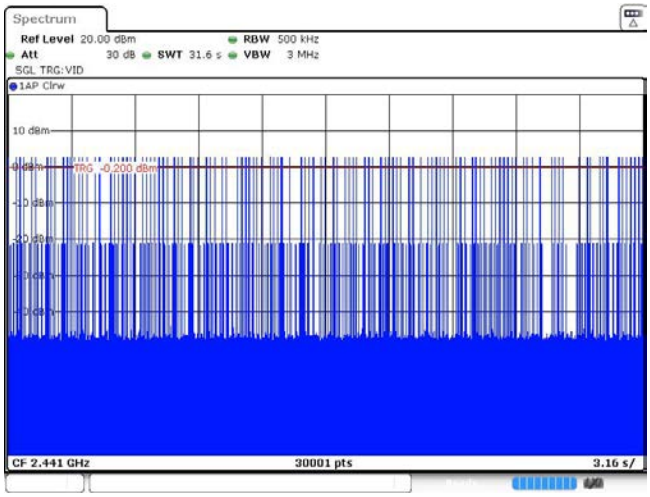
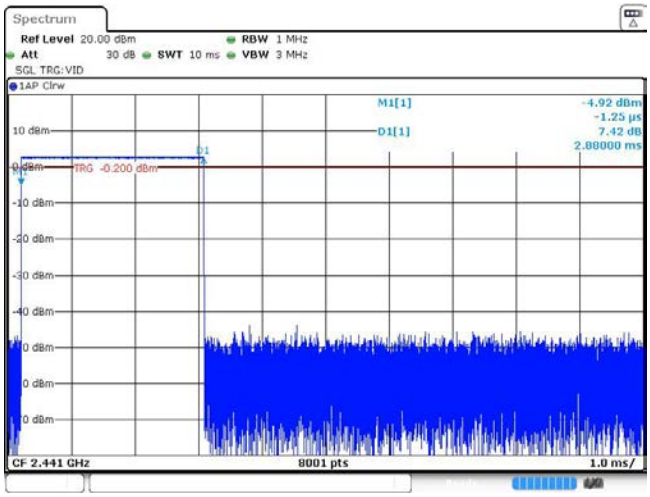
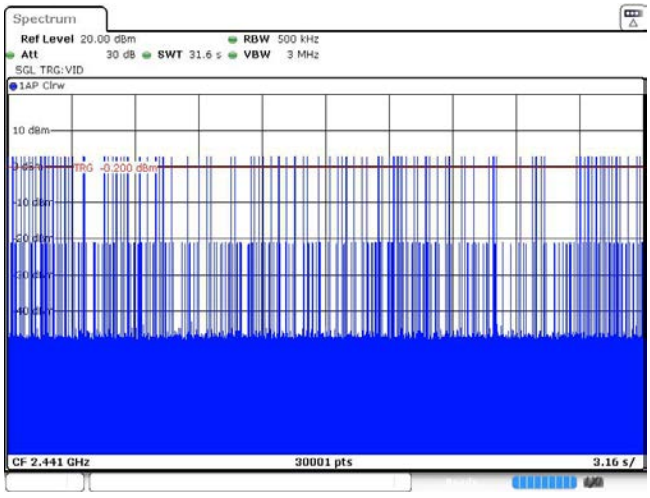
Modulation type	Channel number	Limit	Result
GFSK	79	≥15.00	Pass
π/4DQPSK	79		
8DPSK	79		

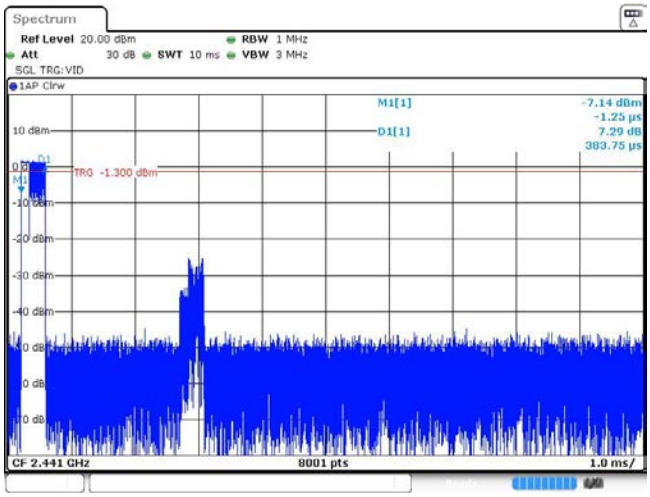
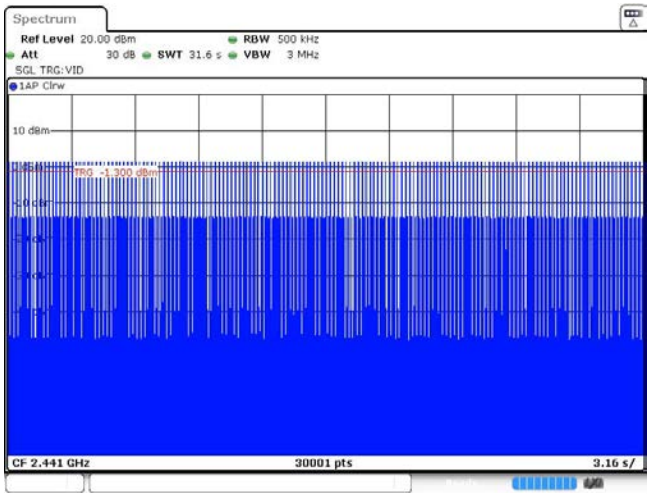
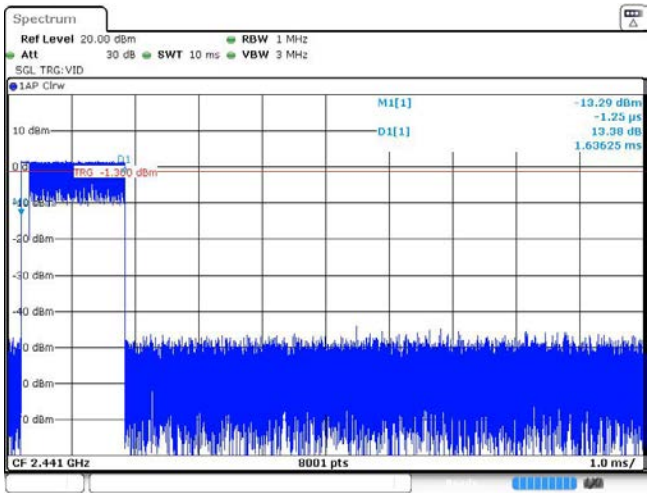
GFSK	 Date:26MAY.2022 14:26:21
π/4DQPSK	 Date:26MAY.2022 14:49:46
8DPSK	 Date:26MAY.2022 15:01:23

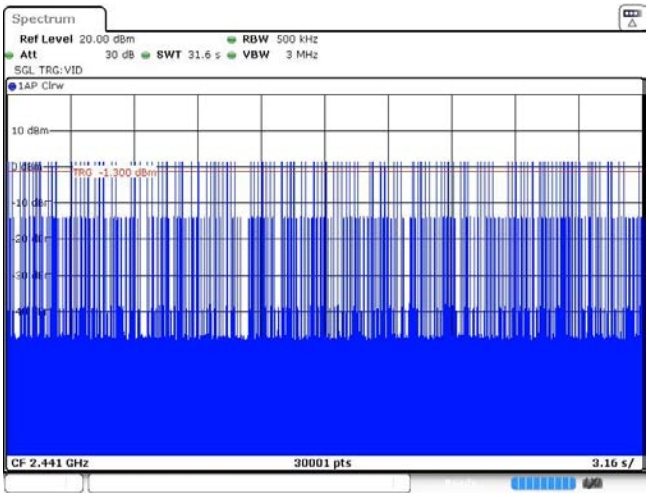
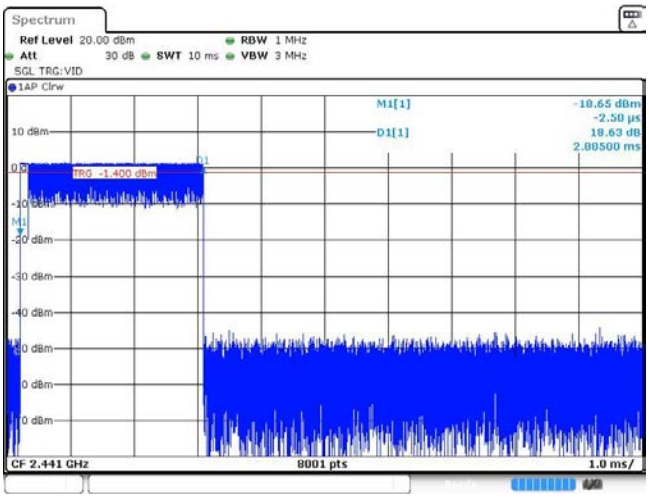
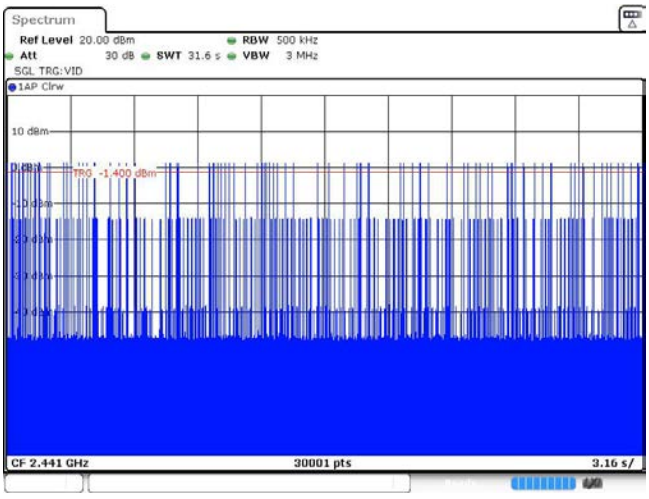
Appendix F：Dwell Time

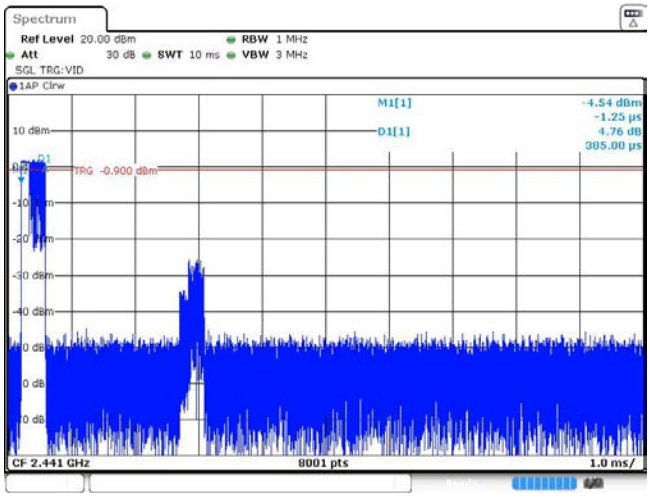
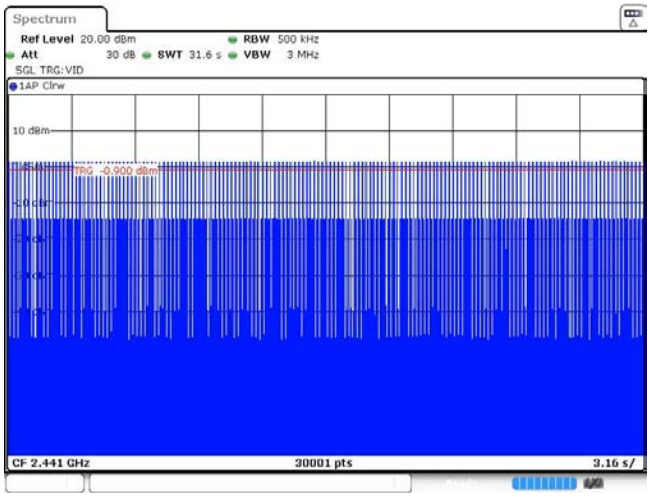
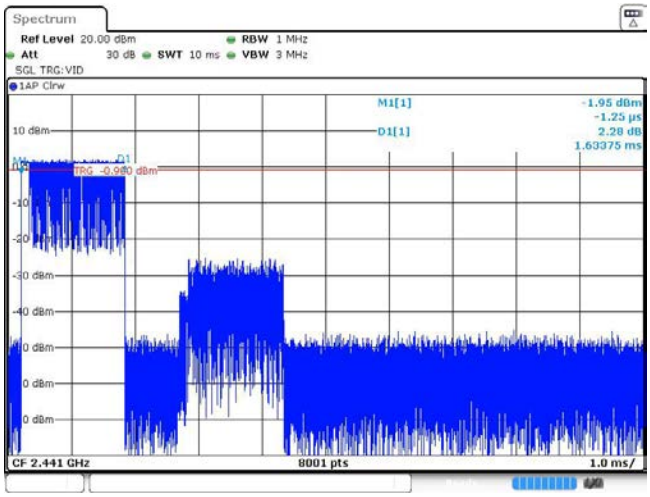
Modulation type	Packet	Burst Width [ms]	Total Hops[hop*ch]	Dwell time (Second)	Limit (Second)	Result
GFSK	DH1	0.38	314	0.12	≤ 0.40	Pass
	DH3	1.63	160	0.26		
	DH5	2.88	125	0.36		
π/4DQPSK	2DH1	0.38	314	0.12	≤ 0.40	Pass
	2DH3	1.64	157	0.26		
	2DH5	2.89	102	0.29		
8DPSK	3DH1	0.38	314	0.12	≤ 0.40	Pass
	3DH3	1.63	158	0.26		
	3DH5	2.89	110	0.32		

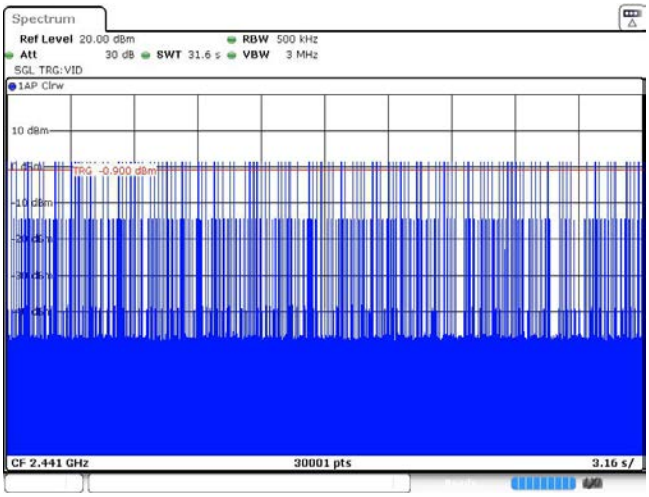
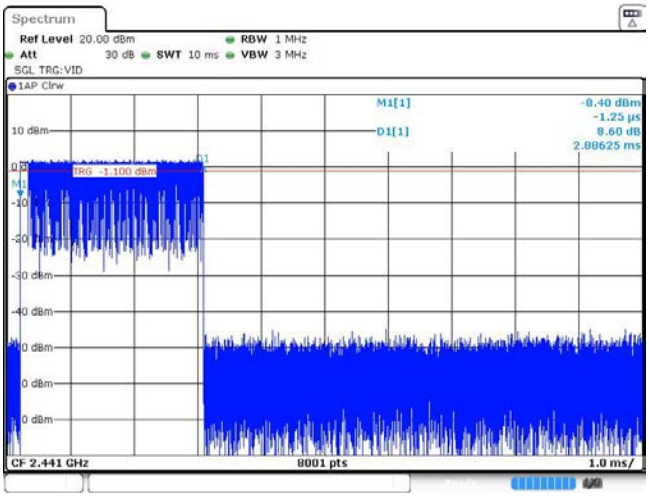
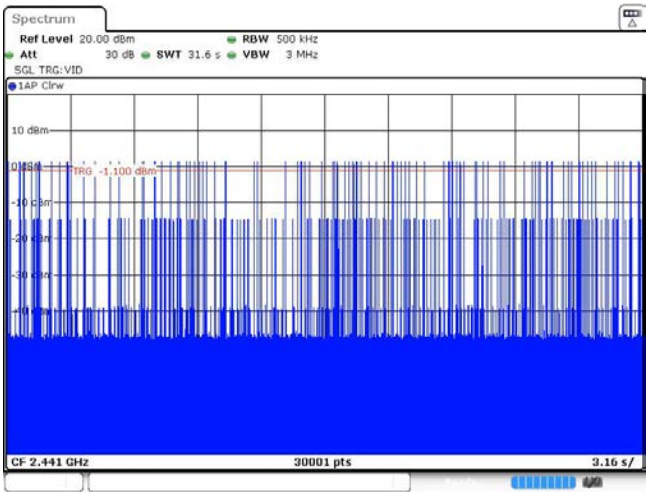
Modulation Type:	**GFSK**
DH1 Burst width	
DH1 Burst number	
DH3 Burst width	

DH3 Burst number	 Date: 26.MAY.2022 15:04:57
DH5 Burst width	 Date: 26.MAY.2022 14:27:26
DH5 Burst number	 Date: 26.MAY.2022 14:27:59

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

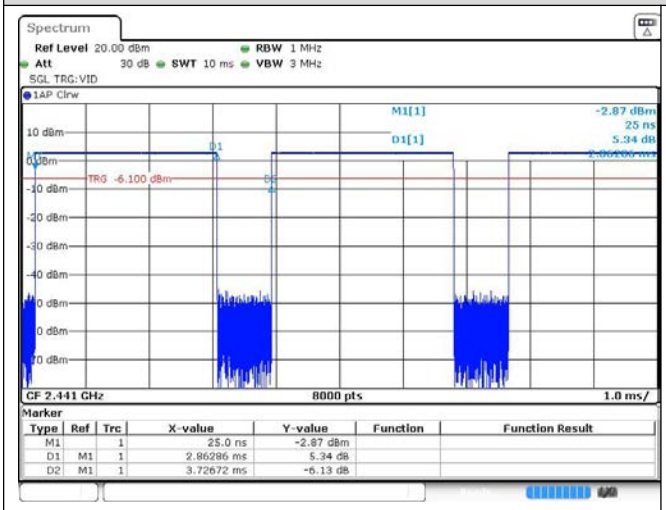
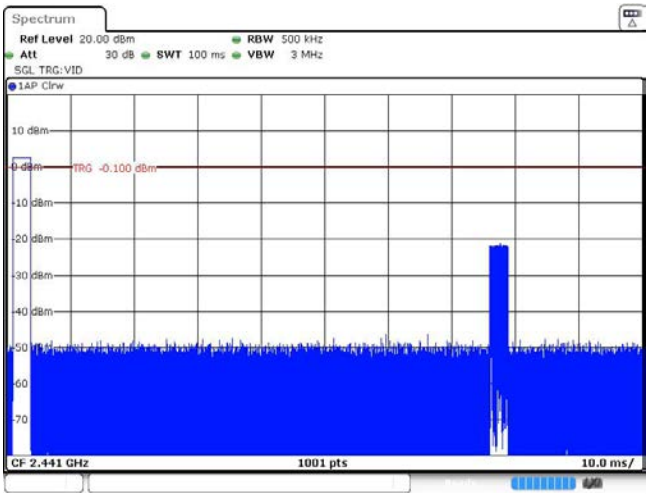
2DH3 Burst number	 Date: 26 MAY 2022 15:06:44
2DH5 Burst width	 Date: 26 MAY 2022 14:50:41
2DH5 Burst number	 Date: 26 MAY 2022 14:51:14

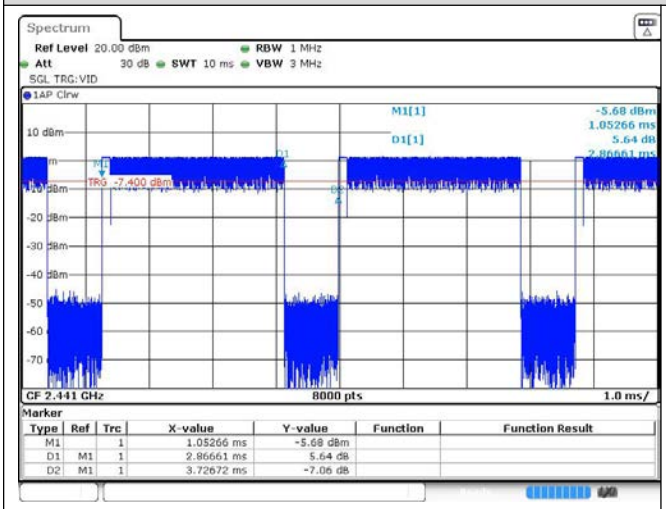
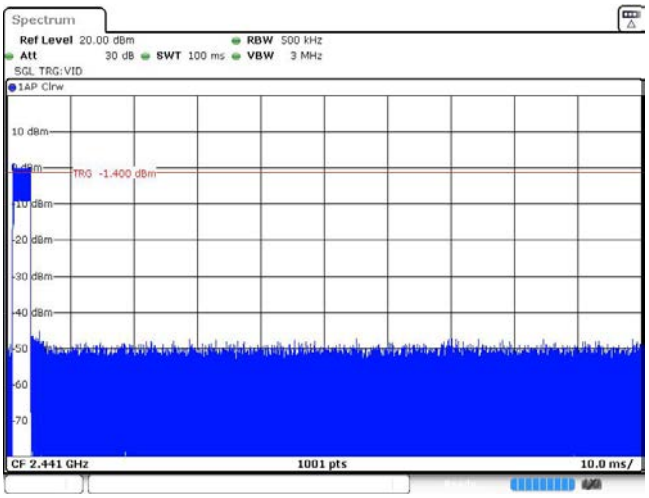
Modulation Type:	**8DPSK**
3DH1 Burst width	
3DH1 Burst number	
3DH3 Burst width	

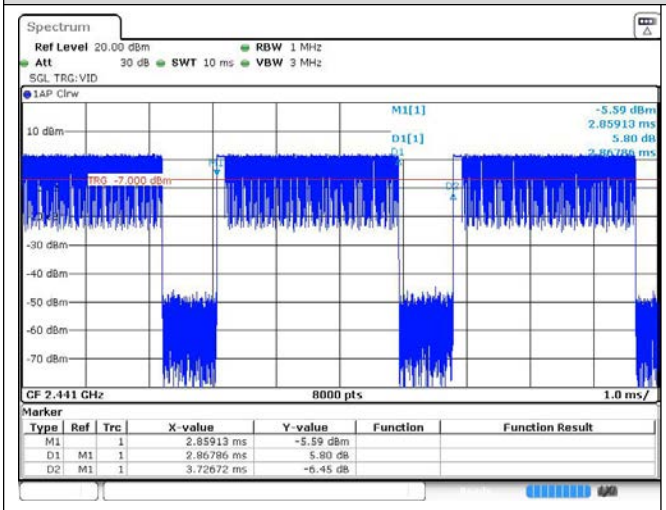
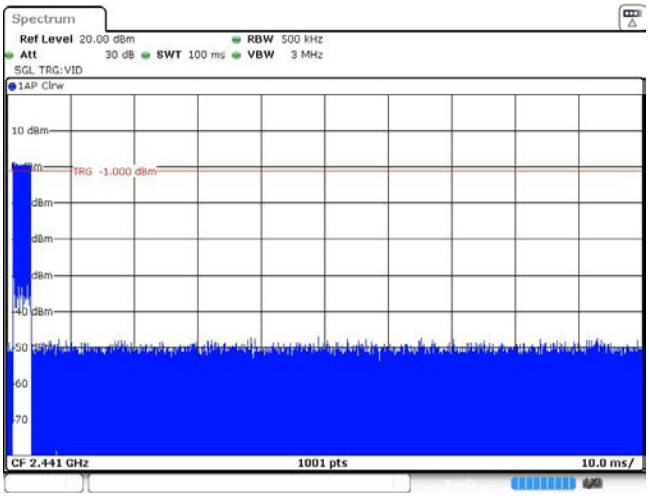
3DH3 Burst number	 Date: 26 MAY 2022 15:08:31
3DH5 Burst width	 Date: 26 MAY 2022 15:02:13
3DH5 Burst number	 Date: 26 MAY 2022 15:02:46

Appendix G：Duty Cycle Correction Factor (DCCF)

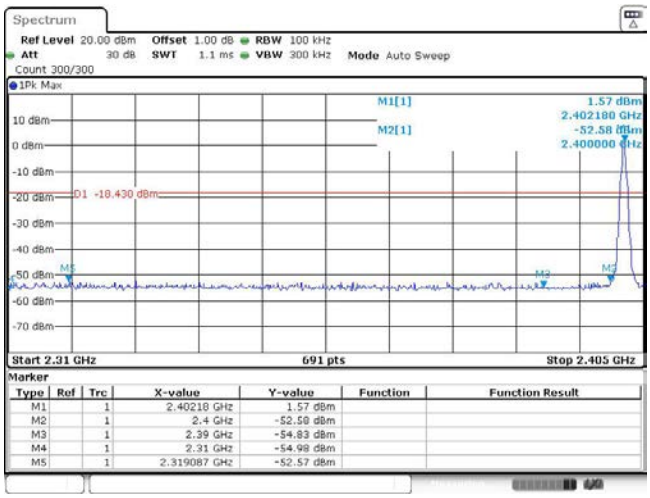
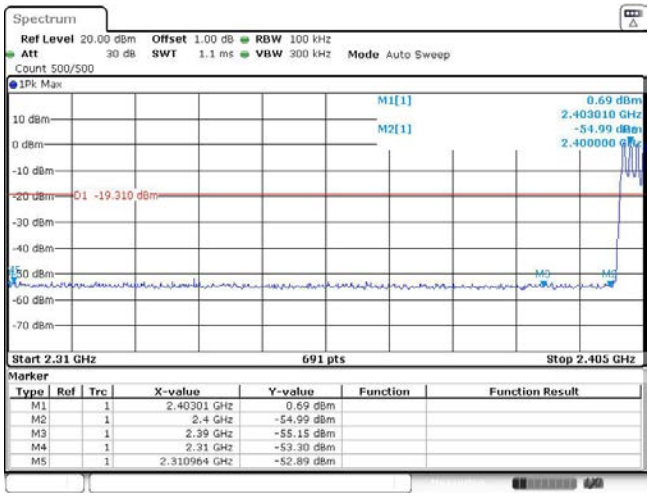
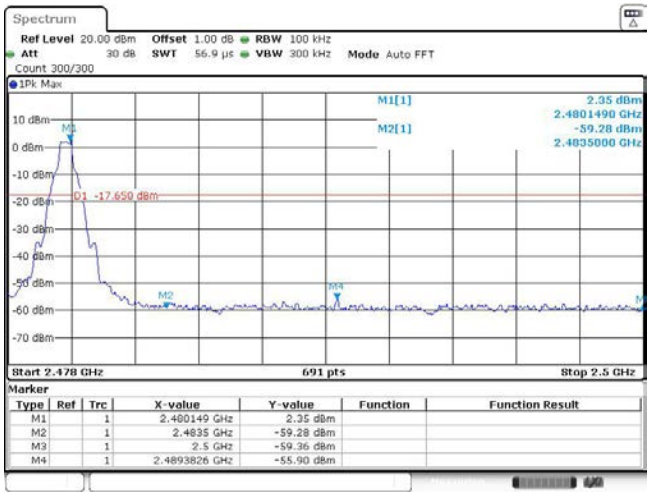
DCCF Calculate Formula					
DCCF=20 * Log(duty cycle) = 20 * Log($T_{on\ time}$ / T_{period})					
Modulation type	Test Frequency（MHz）	$T_{on\ time}$ for single burst [ms]	T_{period} [ms]	Burst Quantity	DCCF [dB]
GFSK	2441	2.86	100	2	-24.85
π /4 DQPSK	2441	2.87	100	1	-30.84
8DPSK	2441	2.87	100	1	-30.84

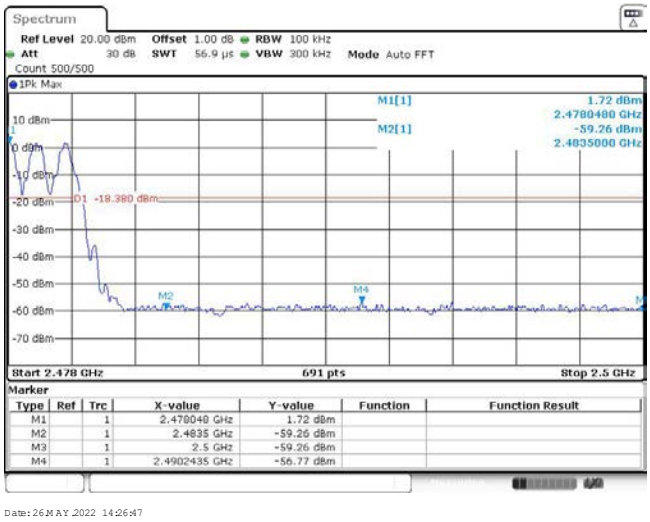
GFSK	
	
$T_{on\ time}$ for single burst	Burst Quantity

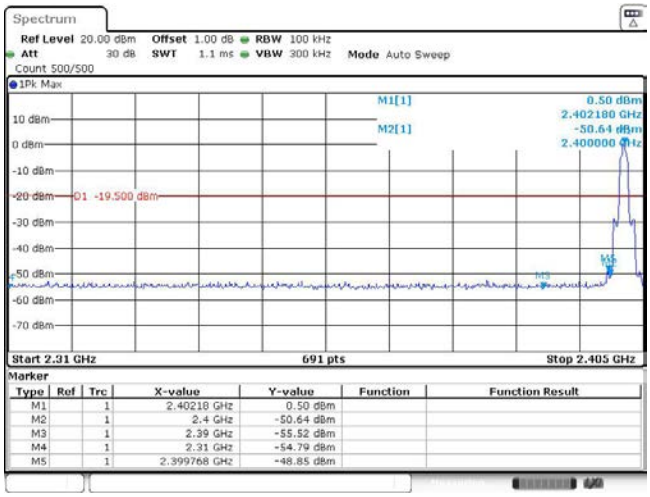
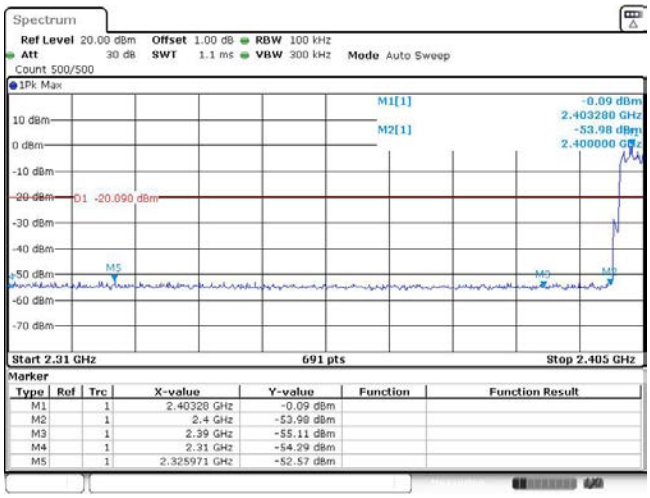
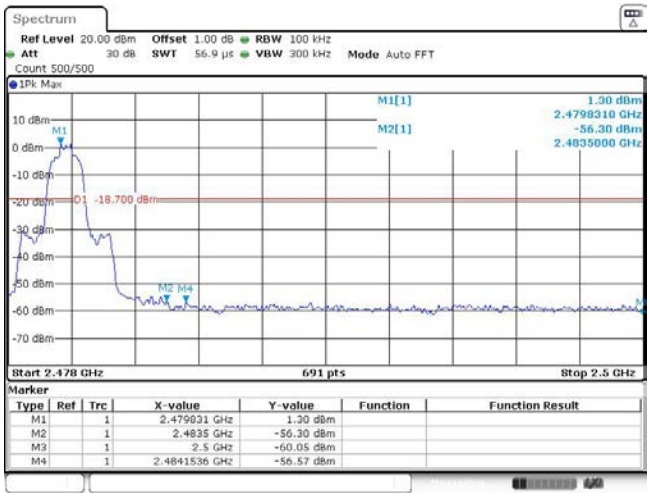
π /4 DQPSK	
	
$T_{on\ time}$ for single burst	Burst Quantity

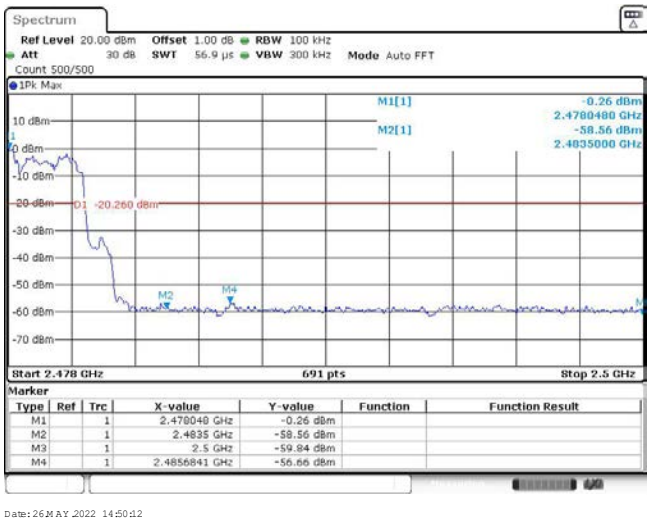
8DPSK	
	
$T_{on\ time}$ for single burst	Burst Quantity

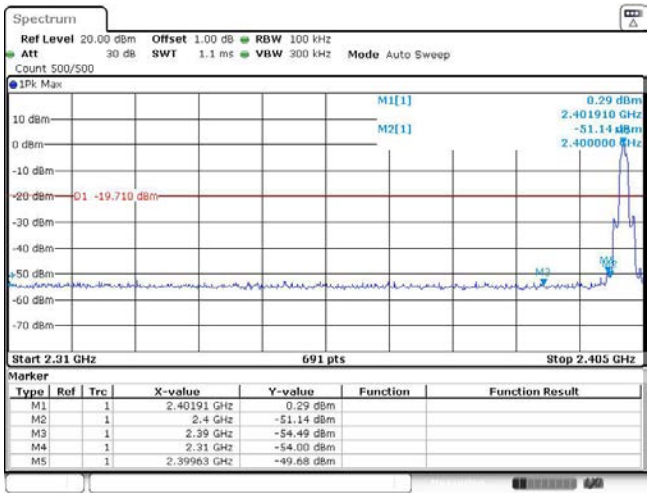
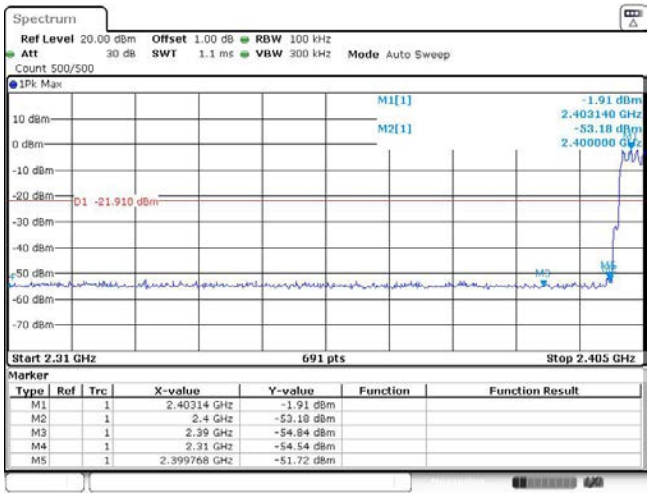
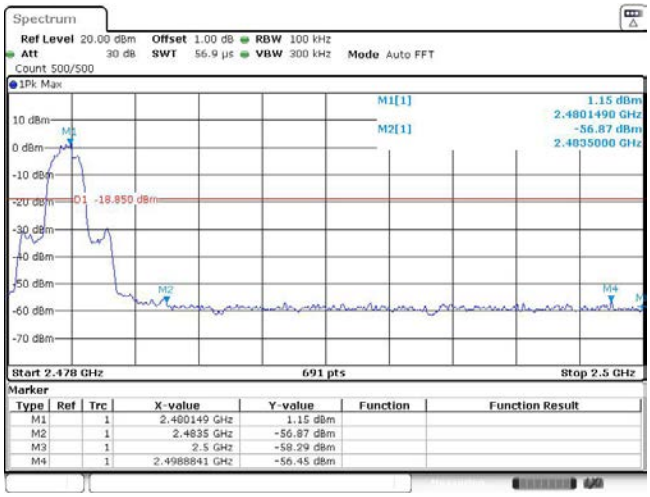
Appendix H：Band edge and Spurious Emissions (conducted)

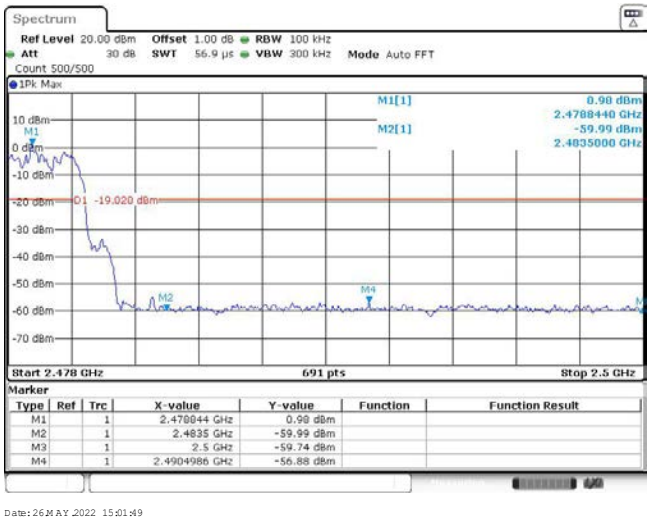
Test Item:	Band edge	Modulation type:	GFSK
CH00 No hopping mode			
CH00 Hopping mode			
CH78 No hopping mode			

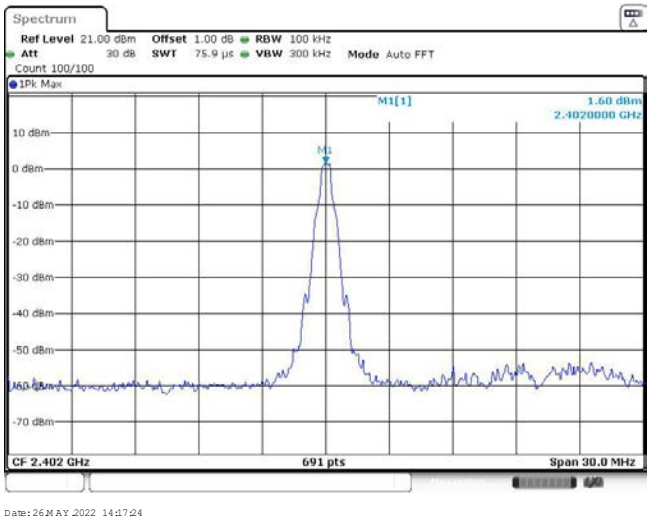
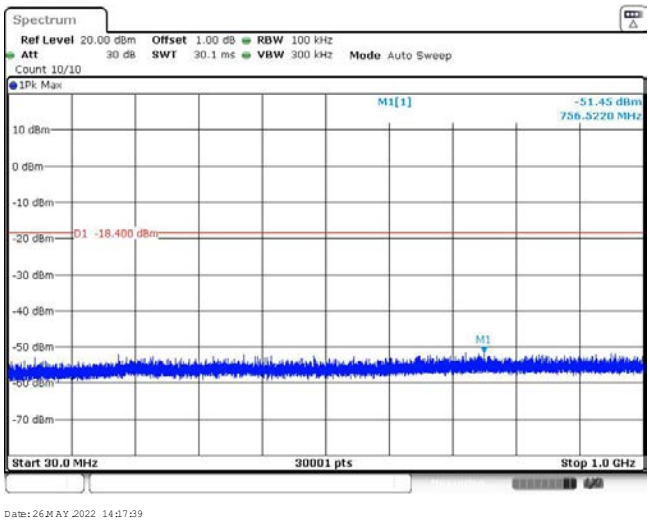
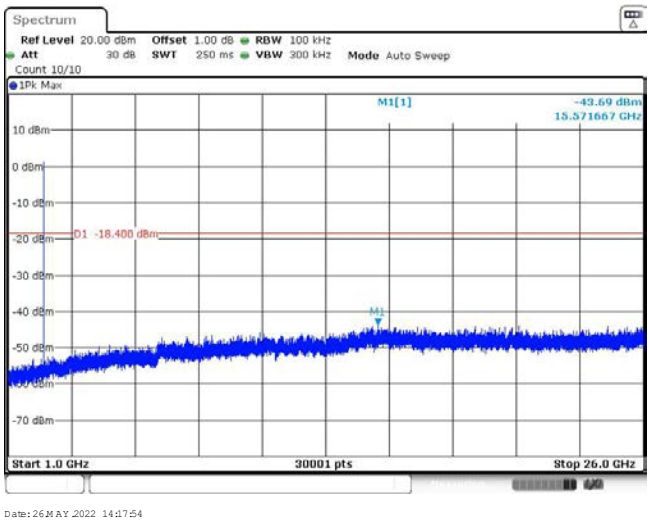
CH78 Hopping mode	

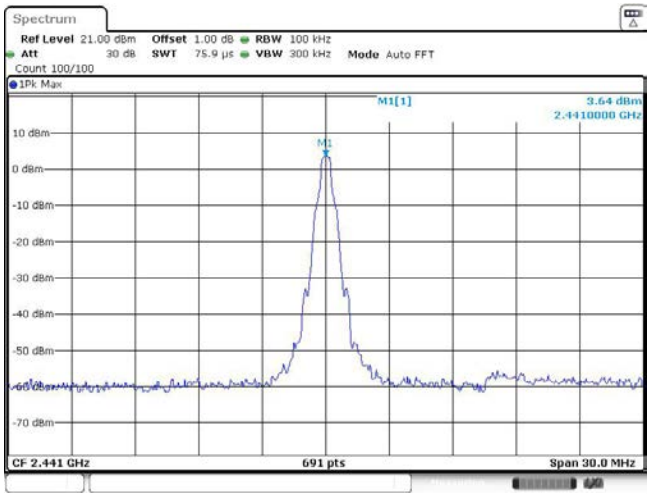
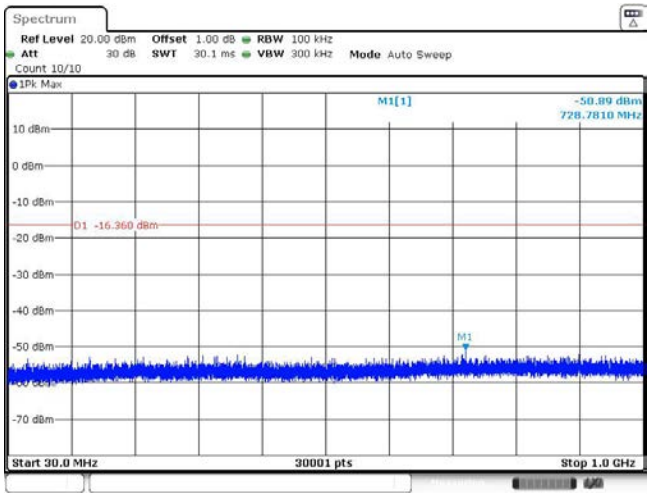
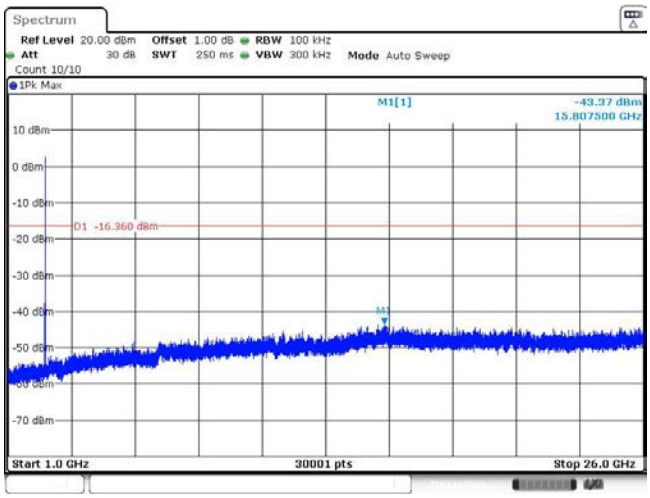
Test Item:	Band edge	Modulation type:	π/4DQPSK
CH00 No hopping mode			
CH00 Hopping mode			
CH78 No hopping mode			

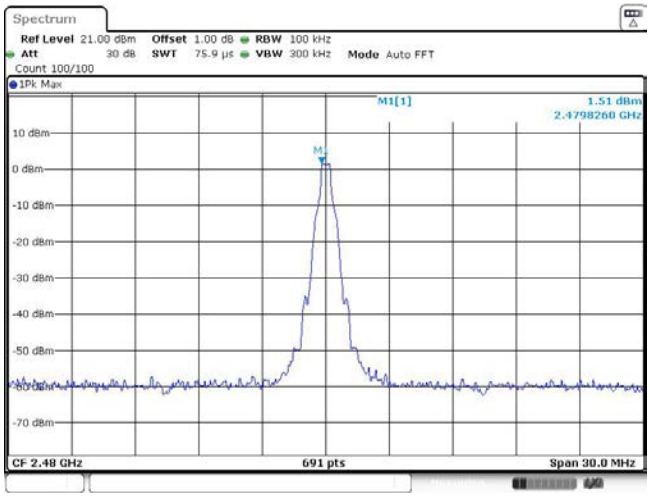
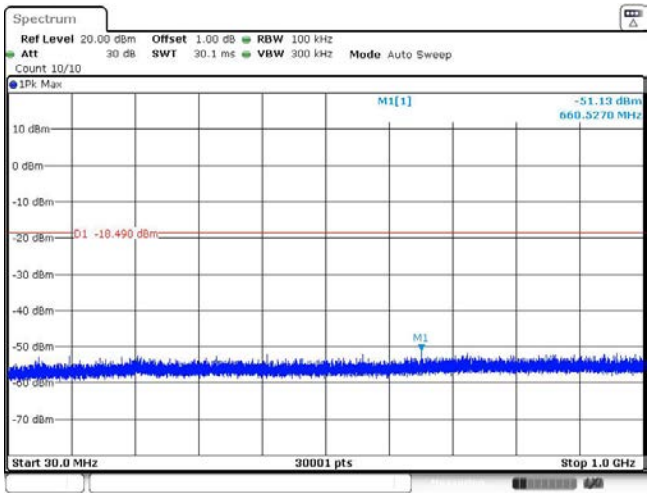
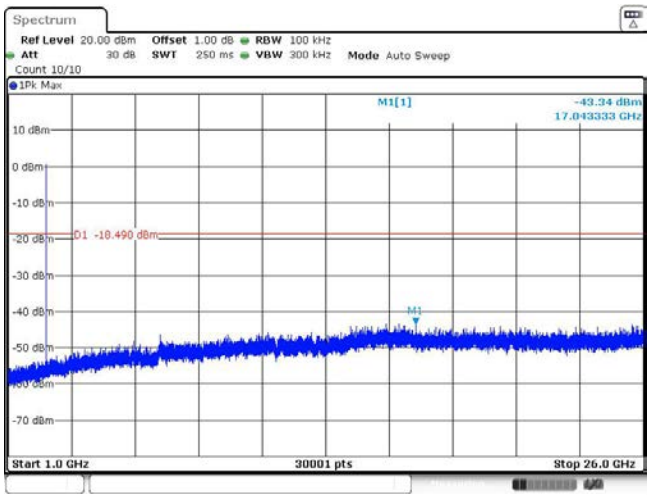
CH78 Hopping mode	

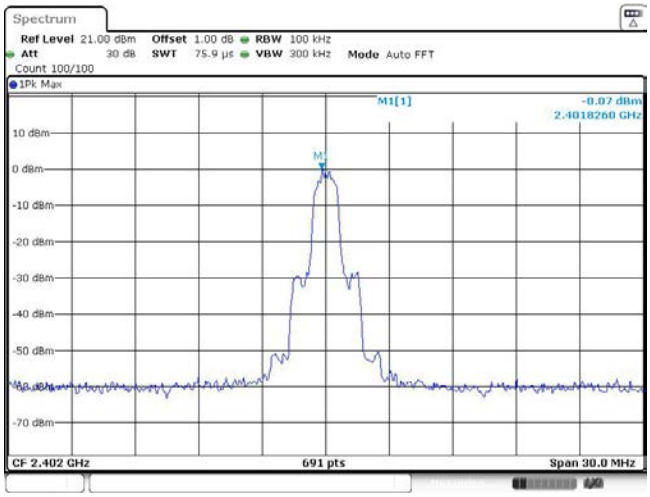
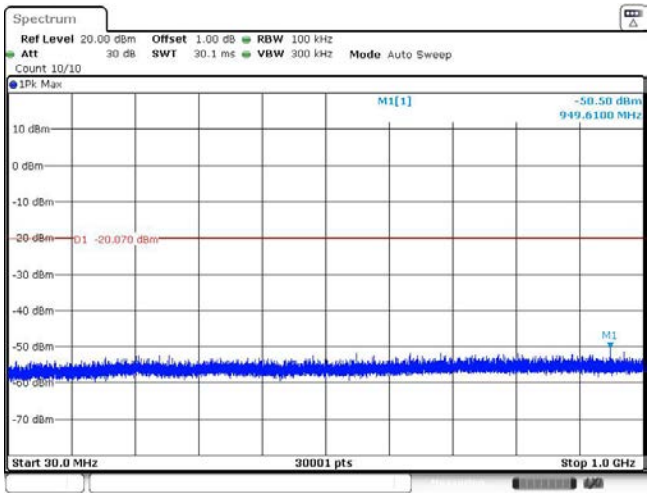
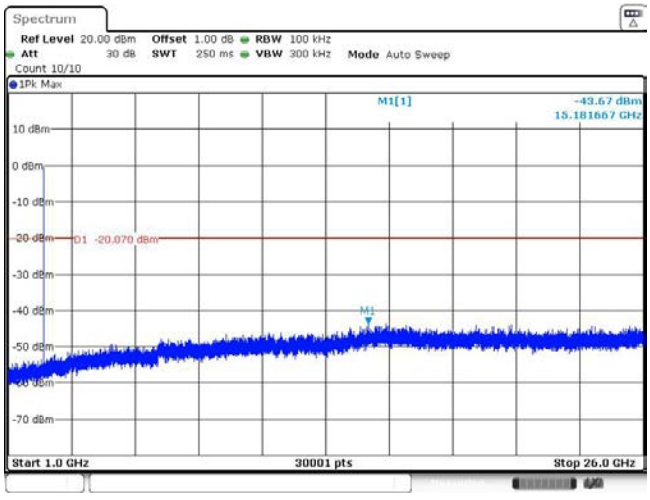
Test Item:	Band edge	Modulation type:	8DPSK
CH00 No hopping mode			
CH00 Hopping mode			
CH78 No hopping mode			

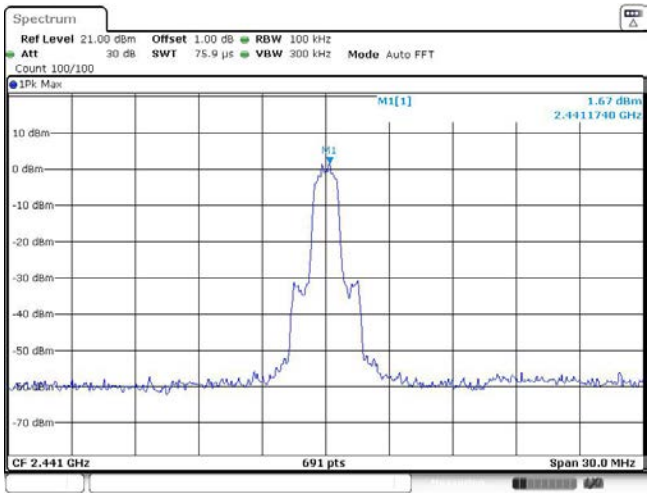
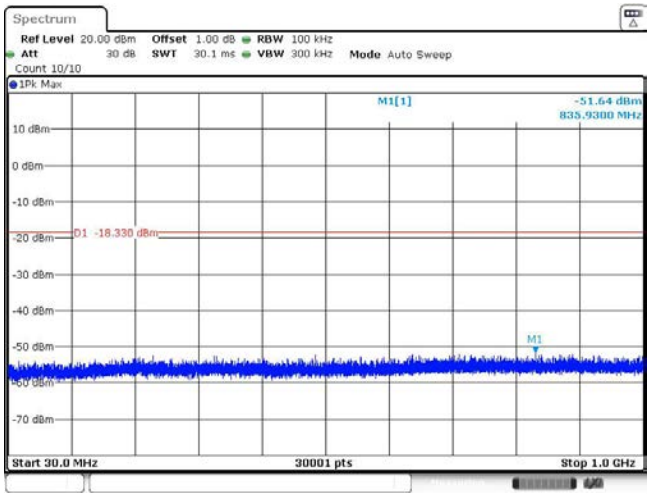
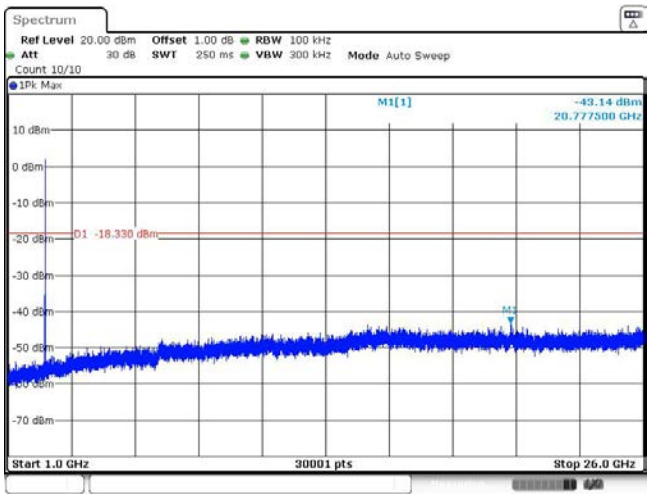
CH78 Hoppig mode	

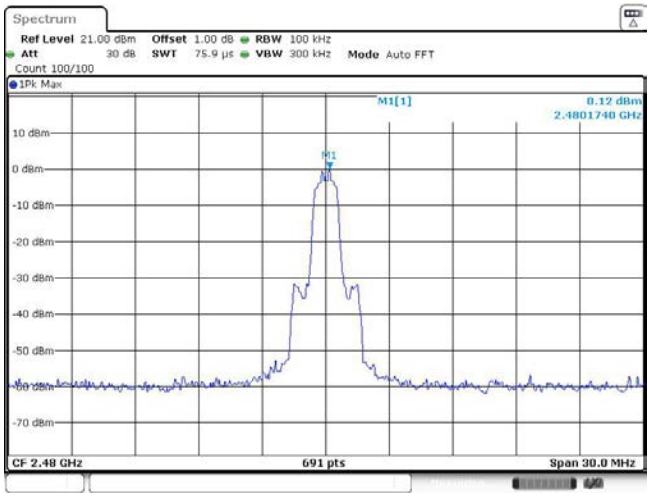
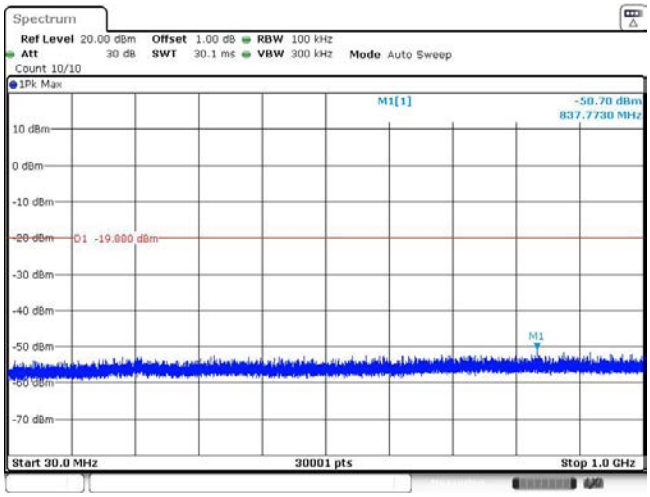
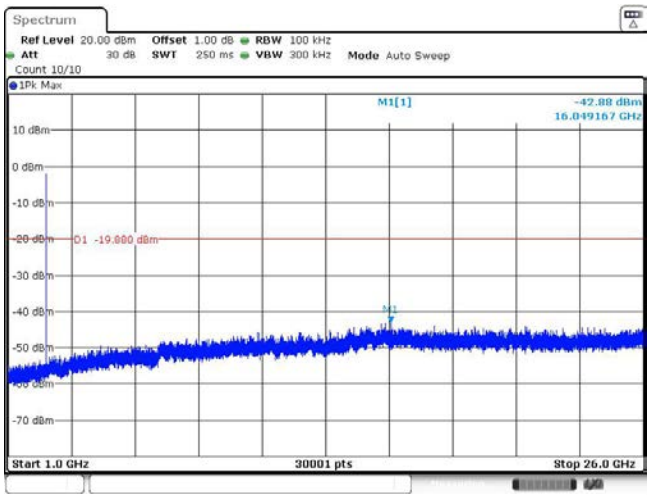
Test Item:	Spurious Emission	Modulation type:	GFSK
CH00 Reference level			
CH00 30MHz~1000MHz			
CH00 1GHz~26GHz			

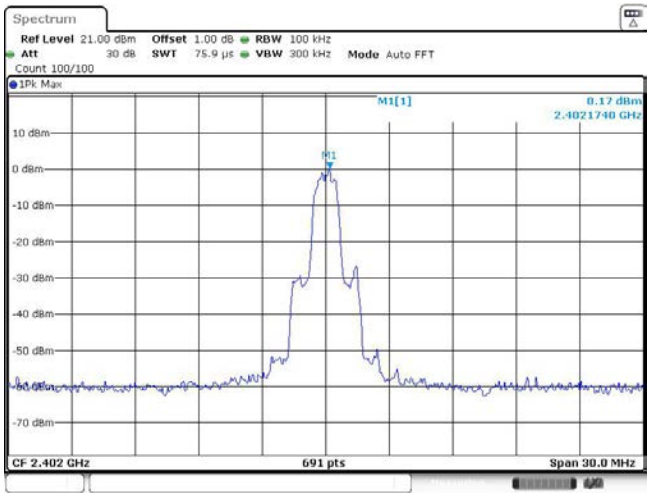
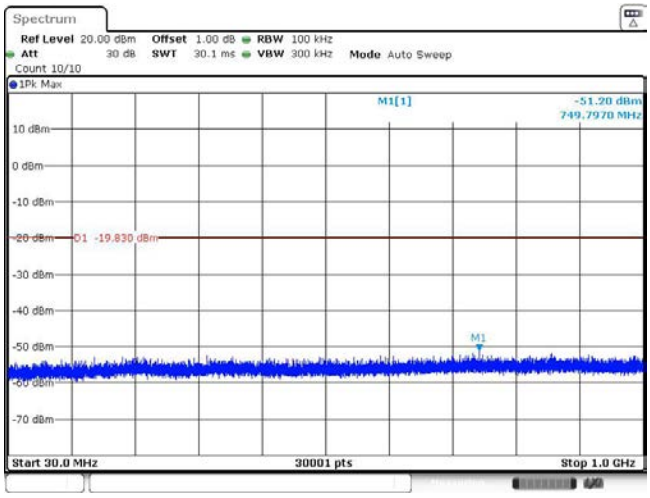
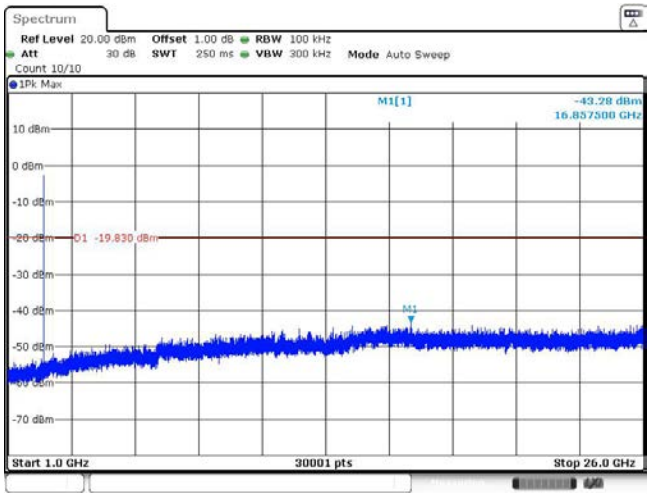
CH39 Reference level	 Date:26MAY.2022 14:21:19
CH39 30MHz~1000MHz	 Date:26MAY.2022 14:23:01
CH39 1GHz~26GHz	 Date:26MAY.2022 14:23:16

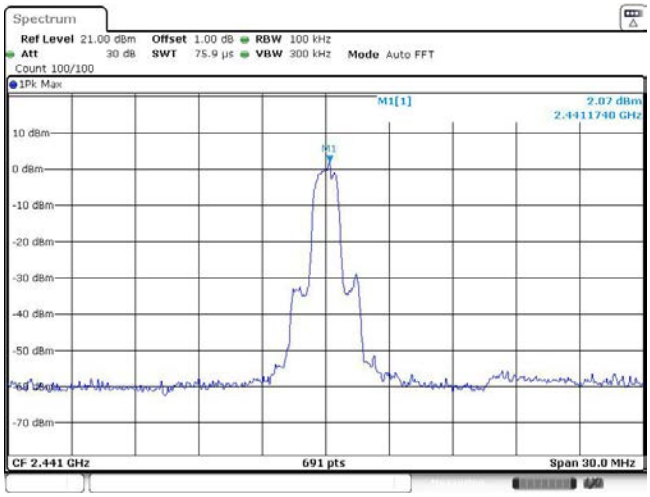
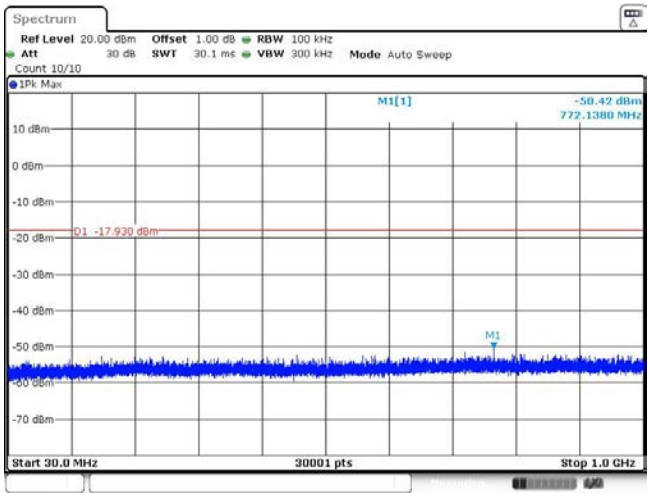
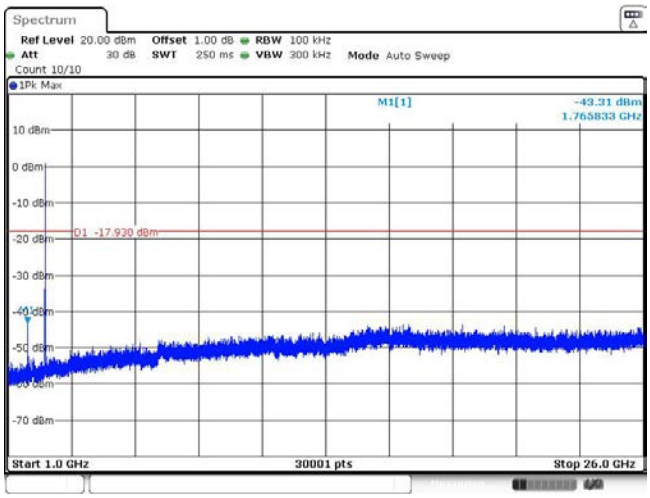
CH78 Reference level	 Date:26MAY.2022 14:19:38
CH78 30MHz~1000MHz	 Date:26MAY.2022 14:19:53
CH78 1GHz~26GHz	 Date:26MAY.2022 14:20:08

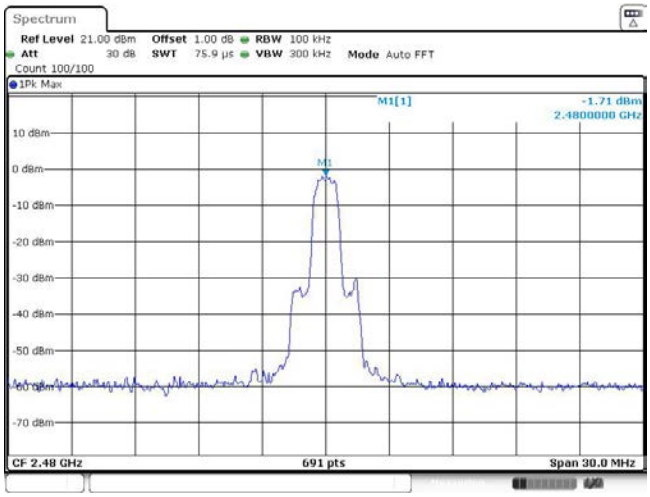
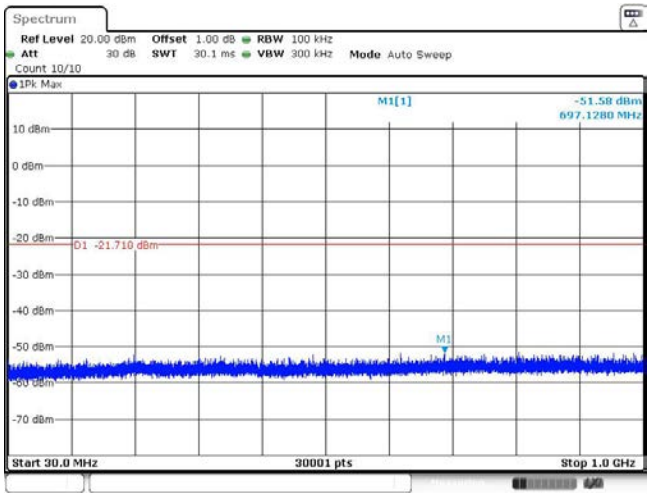
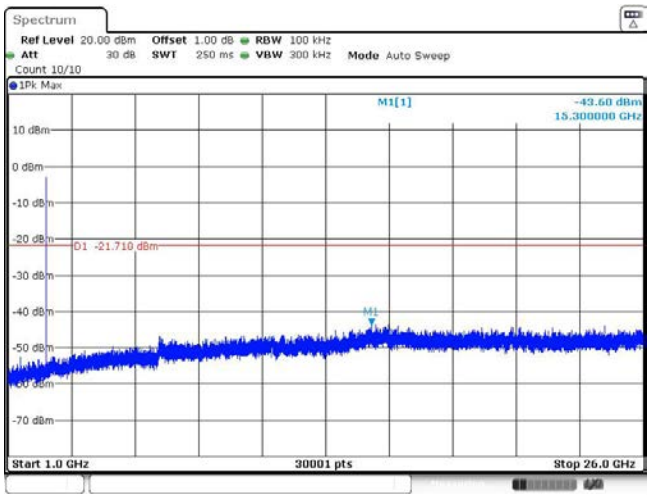
Test Item:	Spurious Emission	Modulation type:	π/4DQPSK
CH00 Reference level			
CH00 30MHz~1000MHz			
CH00 1GHz~26GHz			

CH39 Reference level	 Date:26MAY.2022 14:46:04
CH39 30MHz~1000MHz	 Date:26MAY.2022 14:46:19
CH39 1GHz~26GHz	 Date:26MAY.2022 14:46:34

CH78 Reference level	 Date:26MAY.2022 14:31:39
CH78 30MHz~1000MHz	 Date:26MAY.2022 14:31:54
CH78 1GHz~26GHz	 Date:26MAY.2022 14:32:09

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

CH39 Reference level	 Date: 26 MAY 2022 14:56:37
CH39 30MHz~1000MHz	 Date: 26 MAY 2022 14:56:52
CH39 1GHz~26GHz	 Date: 26 MAY 2022 14:57:07

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

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