TEST REPORT

Product	:	E-POS
Trade mark	:	RONGTA
Model/Type reference	:	AP02, AP02A, AP02B, RP02, TP02, TP02A, TP02B, SP02, SP02A, SP02B
Serial Number	:	N/A
Report Number	:	EED32J00230701
FCC ID	:	2AD6G-AP02
Date of Issue	:	Jan. 26, 2018
Test Standards	:	47 CFR Part 15 Subpart C
Test result	:	PASS

Prepared for:

XIAMEN RONGTA TECHNOLOGY CO., LTD.
3F-1/E Building, No.195 Gaoqishe, Gaodian Village,
Dianqian Street Office, Huli District, Xiamen City, China

Prepared by:

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Date:	Jan. 26, 2018		Check No.:2447672866

CENTRE TESTING INTERNATIONAL GROUP CO.,LTD. Report Seal

2 Version

Version No.	Date	Description
00	Jan. 26, 2018	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Conducted Peak Output Power	47 CFR Part 15 Subpart C Section 15.247 (b)(1)	ANSI C63.10-2013	PASS
20dB Occupied Bandwidth	47 CFR Part 15 Subpart C Section 15.247 (a)(1)	ANSI C63.10-2013	PASS
Carrier Frequencies Separation	47 CFR Part 15 Subpart C Section 15.247 (a)(1)	ANSI C63.10-2013	PASS
Hopping Channel Number	47 CFR Part 15 Subpart C Section 15.247 (b)	ANSI C63.10-2013	PASS
Dwell Time	47 CFR Part 15 Subpart C Section 15.247 (a)(1)	ANSI C63.10-2013	PASS
Pseudorandom Frequency Hopping Sequence	47 CFR Part 15 Subpart C Section 15.247(b)(4)&TCB Exclusion List (7 July 2002)	ANSI C63.10-2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
Radiated Spurious emissions	47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS

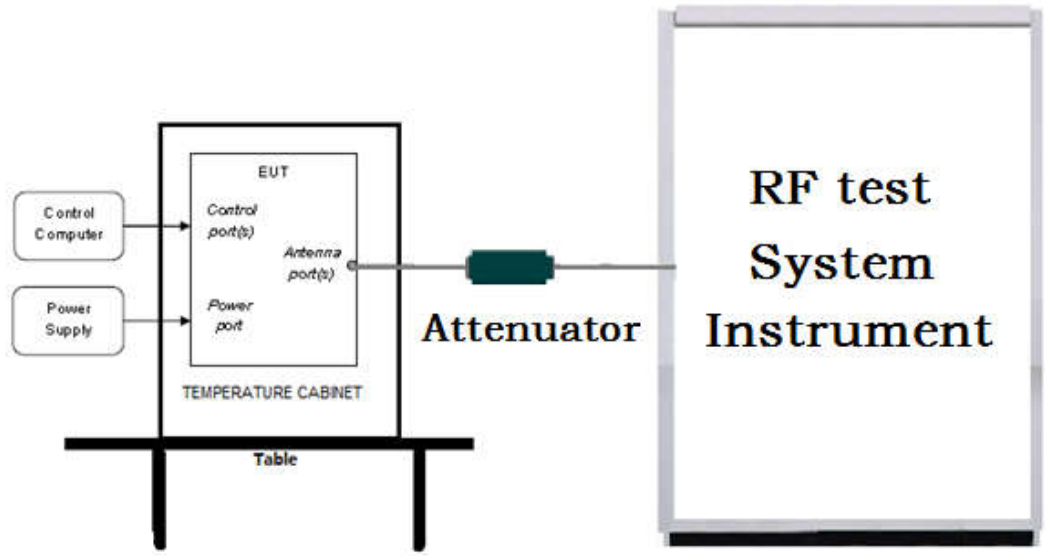
Remark:
Test according to ANSI C63.4-2014 & ANSI C63.10-2013.
The tested sample and the sample information are provided by the client.
Model No.:AP02, AP02A, AP02B, RP02, TP02, TP02A, TP02B, SP02, SP02A, SP02B
Only the model AP02 was tested, since their electrical circuit design, layout, components and internal wiring are identical. Only the model name and color are different.

4 Content

5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

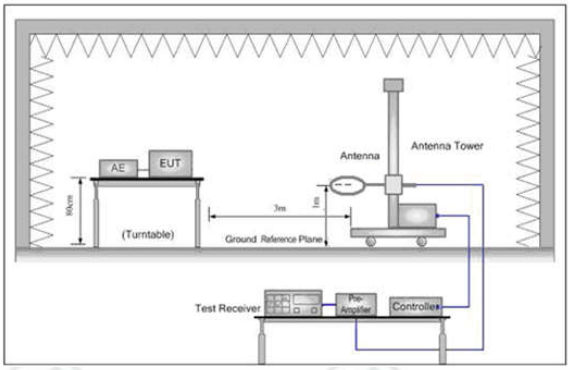


Figure 1. Below 30MHz

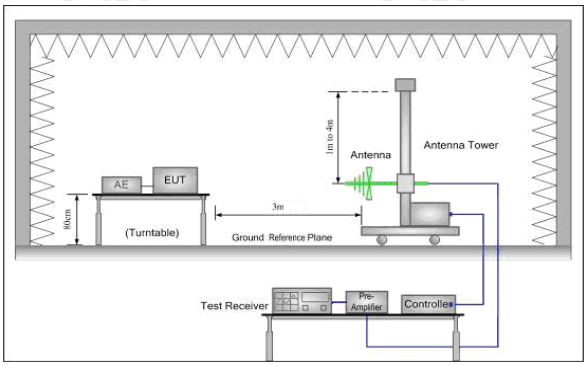


Figure 2. 30MHz to 1GHz

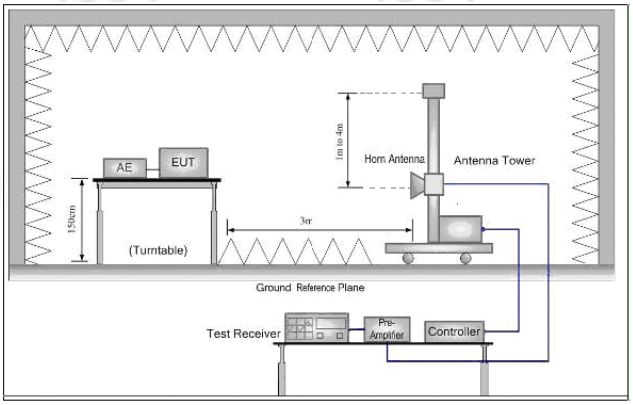
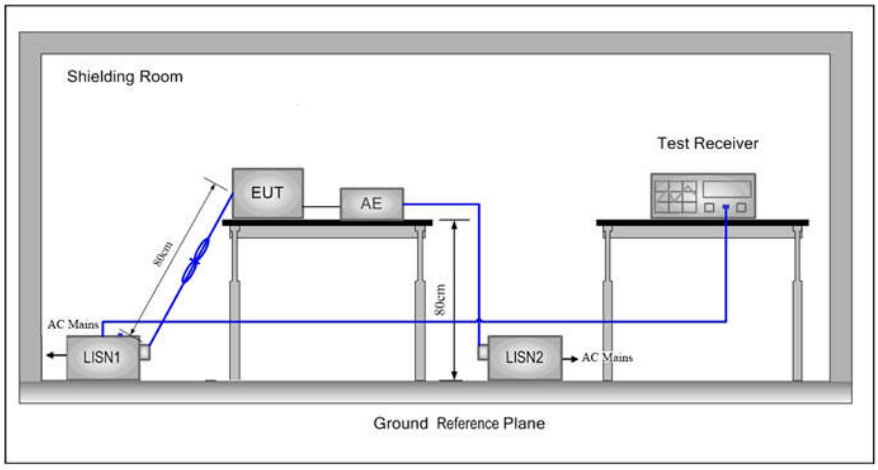


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:	
Temperature:	23°C
Humidity:	55% RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test Mode	Tx	RF Channel		
		Low(L)	Middle(M)	High(H)
GFSK/π/4DQPSK/ 8DPSK(DH1,DH3,DH5)	2402MHz ~2480 MHz	Channel 1	Channel 40	Channel79
		2402MHz	2441MHz	2480MHz

Test mode:

Pre-scan under all rate at lowest

Mode	**GFSK**		
packets	**1-DH1**	**1-DH3**	**1-DH5**
Power(dBm)	-3.591	-3.585	-3.481

Mode	π/4DQPSK		
packets	**2-DH1**	**2-DH3**	**2-DH5**
Power(dBm)	-3.756	-3.7156	-3.636
Mode	8DPSK		
packets	**3-DH1**	**3-DH3**	**3-DH5**
Power(dBm)	-3.516	-3.589	-3.413

Through Pre-scan, 1-DH5 packet the power is the worst case of GFSK, 2-DH5 packet the power is the worst case ofπ/4DQPSK, 3-DH5 packet the power is the worst case of 8DPSK,

6 General Information

6.1 Client Information

Applicant:	XIAMEN RONGTA TECHNOLOGY CO., LTD.
Address of Applicant:	3F-1/E Building, No.195 Gaoqishe, Gaodian Village, Dianqian Street Office, Huli District, Xiamen City, China
Manufacturer:	XIAMEN RONGTA TECHNOLOGY CO., LTD.
Address of Manufacturer:	3F-1/E Building, No.195 Gaoqishe, Gaodian Village, Dianqian Street Office, Huli District, Xiamen City, China
Factory:	XIAMEN RONGTA TECHNOLOGY CO., LTD.
Address of Factory:	4,5F, G Plant, Gaoqi Industrial Zones, Huli District, Xiamen City, China

6.2 General Description of EUT

Product Name:	E-POS
Mode No.(EUT):	AP02, AP02A, AP02B, RP02, TP02, TP02A, TP02B, SP02, SP02A, SP02B
Test Mode:	AP02
Trade Mark:	RONGTA
EUT Supports Radios application	BT4.0, BT3.0 2402-2480MHz, WiFi b/g/n(HT20) 2.4G wifi 2412-2462MHz, GPRS 850/1900 , UMTS（3G）WCDMA Band II/WCDMA Band V
Hardware version:	C(Manufacturer declare)
Software version :	1.0.0(Manufacturer declare)
Power Supply:	DC 5V by Adapter
	Adapter: Input AC 100-240V,50/60Hz,0.5A. Output DC5V 1A
	DC 3.7V by Battery
	Battery: 3.7V, 6000mAh, 22.2Wh
Sample Received Date:	Oct. 19, 2017
Sample tested Date:	Oct. 19, 2017 to Dec. 22, 2017

6.3 Product Specification subjective to this standard

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth BT3.0
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channel:	79
Sample Type:	Portable
Test Power Grade:	N/A
Test software of EUT	Engineering mode
Antenna Type:	Integral
Antenna Gain:	1.95dBi
Test Voltage:	AC 120V, 60Hz DC 3.7V

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
3	2404MHz	23	2424MHz	43	2444MHz	63	2464MHz
4	2405MHz	24	2425MHz	44	2445MHz	64	2465MHz
5	2406MHz	25	2426MHz	45	2446MHz	65	2466MHz
6	2407MHz	26	2427MHz	46	2447MHz	66	2467MHz
7	2408MHz	27	2428MHz	47	2448MHz	67	2468MHz
8	2409MHz	28	2429MHz	48	2449MHz	68	2469MHz
9	2410MHz	29	2430MHz	49	2450MHz	69	2470MHz
10	2411MHz	30	2431MHz	50	2451MHz	70	2471MHz
11	2412MHz	31	2432MHz	51	2452MHz	71	2472MHz
12	2413MHz	32	2433MHz	52	2453MHz	72	2473MHz
13	2414MHz	33	2434MHz	53	2454MHz	73	2474MHz
14	2415MHz	34	2435MHz	54	2455MHz	74	2475MHz
15	2416MHz	35	2436MHz	55	2456MHz	75	2476MHz
16	2417MHz	36	2437MHz	56	2457MHz	76	2477MHz
17	2418MHz	37	2438MHz	57	2458MHz	77	2478MHz
18	2419MHz	38	2439MHz	58	2459MHz	78	2479MHz
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	40	2441MHz	60	2461MHz		

6.4 Description of Support Units

The EUT has been tested independently.

6.5 Test Facility

Test location

The test site a is located on *Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China.* Test site at Centre Testing International Group Co., Ltd has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

FCC-Designation No.: CN1164

Centre Testing International Group Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The American association for Centre Testing International Group Co., Ltd. EMC laboratory accreditation Designation No.:CN1164

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

6.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.31dB (30MHz-1GHz)
		0.57dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%

7 Equipment List

RF test system					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. Date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Signal Generator	Keysight	E8257D	MY53401106	03-14-2017	03-13-2018
Spectrum Analyzer	Keysight	N9010A	MY54510339	03-14-2017	03-13-2018
Signal Generator	Keysight	N5182B	MY53051549	03-14-2017	03-13-2018
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-12-2017	01-11-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2017	01-11-2018
DC Power	Keysight	E3642A	MY54436035	04-01-2017	03-31-2018
PC-1	Lenovo	R4960d	---	04-01-2017	03-31-2018
power meter & power sensor	R&S	OSP120	101374	03-14-2017	03-13-2018
RF control unit	JS Tonscend	JS0806-2	158060006	03-14-2017	03-13-2018
BT&WI-FI Automatic test software	JS Tonscend	JS1120-2	---	04-01-2017	03-31-2018

Conducted disturbance Test					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Receiver	R&S	ESCI	100009	06-14-2017	06-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-08-2017	05-07-2018
LISN	R&S	ENV216	100098	06-13-2017	06-12-2018
LISN	schwarzbeck	NNLK8121	8121-529	06-13-2017	06-12-2018
Voltage Probe	R&S	ESH2-Z3	--	06-13-2017	06-12-2018
Current Probe	R&S	EZ17	100106	06-13-2017	06-12-2018
ISN	TESEQ GmbH	ISN T800	30297	02-23-2017	02-22-2018

3M Semi/full-anechoic Chamber					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-05-2016	06-05-2019
TRILOG Broadband Antenna	SCHWARZBECK	VULB9163	9163-484	05-23-2017	05-22-2018
Horn Antenna	ETS-LINDGREN	3117	00057410	06-30-2015	06-28-2018
Loop Antenna	ETS	6502	00071730	06-22-2017	06-21-2019
Spectrum Analyzer	R&S	FSP40	100416	06-13-2017	06-12-2018
Receiver	R&S	ESCI	100435	06-14-2017	06-13-2018
Multi device Controller	maturo	NCD/070/10711112	---	01-12-2017	01-11-2018
LISN	schwarzbeck	NNBM8125	81251547	06-13-2017	06-12-2018
LISN	schwarzbeck	NNBM8125	81251548	06-13-2017	06-12-2018
Signal Generator	Agilent	E4438C	MY45095744	03-14-2017	03-13-2018
Signal Generator	Keysight	E8257D	MY53401106	03-14-2017	03-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-08-2017	05-07-2018
Cable line	Fulai(7M)	SF106	5219/6A	01-12-2017	01-11-2018
Cable line	Fulai(6M)	SF106	5220/6A	01-12-2017	01-11-2018
Cable line	Fulai(3M)	SF106	5216/6A	01-12-2017	01-11-2018
Cable line	Fulai(3M)	SF106	5217/6A	01-12-2017	01-11-2018
High-pass filter	Sinoscite	FL3CX03WG18NM12-0398-002	---	01-12-2017	01-11-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2017	01-11-2018
band rejection filter	Sinoscite	FL5CX01CA09CL12-0395-001	---	01-12-2017	01-11-2018
band rejection filter	Sinoscite	FL5CX01CA08CL12-0393-001	---	01-12-2017	01-11-2018
band rejection filter	Sinoscite	FL5CX02CA04CL12-0396-002	---	01-12-2017	01-11-2018
band rejection filter	Sinoscite	FL5CX02CA03CL12-0394-001	---	01-12-2017	01-11-2018

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15C	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicesed Wireless Devices

Test Results List:

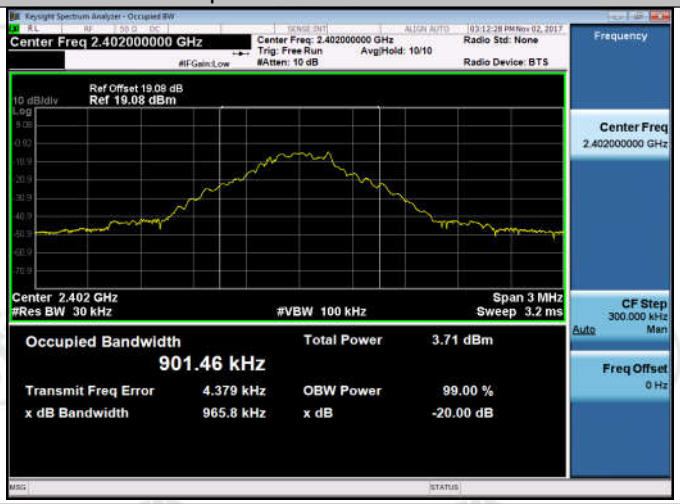
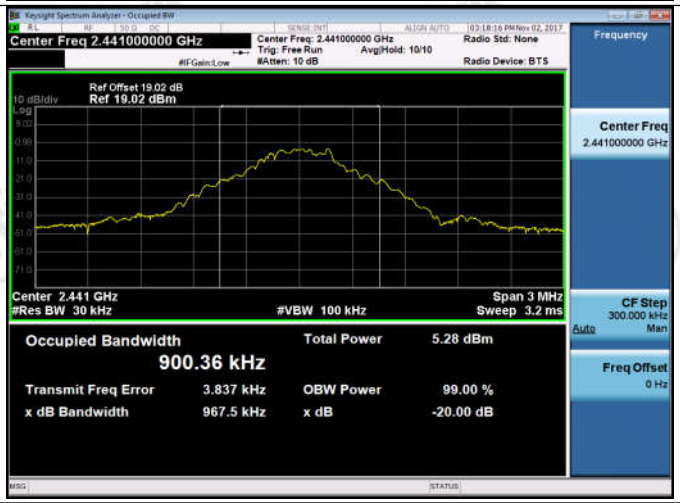
Test requirement	Test method	Test item	Verdict	Note
Part15C Section 15.247 (a)(1)	ANSI 63.10	20dB Occupied Bandwidth	PASS	Appendix A)
Part15C Section 15.247 (a)(1)	ANSI 63.10	Carrier Frequencies Separation	PASS	Appendix B)
Part15C Section 15.247 (a)(1)	ANSI 63.10	Dwell Time	PASS	Appendix C)
Part15C Section 15.247 (b)	ANSI 63.10	Hopping Channel Number	PASS	Appendix D)
Part15C Section 15.247 (b)(1)	ANSI 63.10	Conducted Peak Output Power	PASS	Appendix E)
Part15C Section 15.247(d)	ANSI 63.10	Band-edge for RF Conducted Emissions	PASS	Appendix F)
Part15C Section 15.247(d)	ANSI 63.10	RF Conducted Spurious Emissions	PASS	Appendix G)
Part15C Section 15.247 (a)(1)	ANSI 63.10	Pseudorandom Frequency Hopping Sequence	PASS	Appendix H)
Part15C Section 15.203/15.247 (c)	ANSI 63.10	Antenna Requirement	PASS	Appendix I)
Part15C Section 15.207	ANSI 63.10	AC Power Line Conducted Emission	PASS	Appendix J)
Part15C Section 15.205/15.209	ANSI 63.10	Restricted bands around fundamental frequency (Radiated) Emission)	PASS	Appendix K)
Part15C Section 15.205/15.209	ANSI 63.10	Radiated Spurious Emissions	PASS	Appendix L)

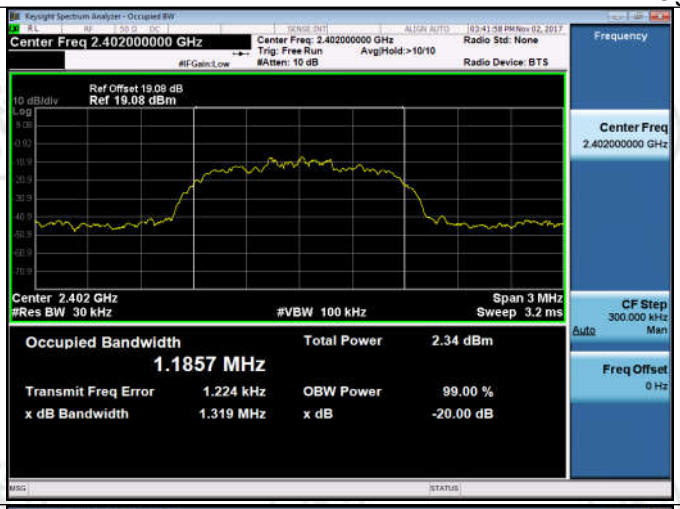
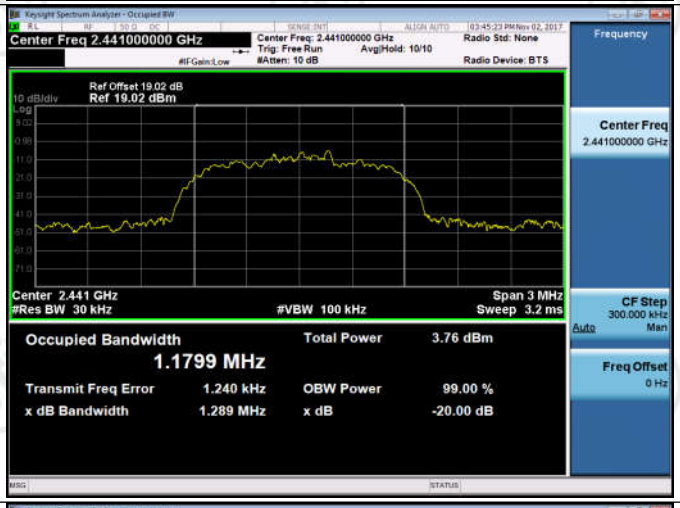
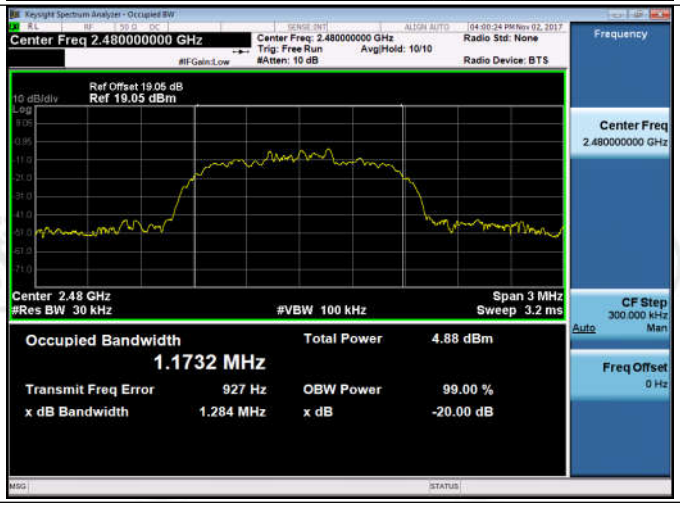
Appendix A): 20dB Occupied Bandwidth

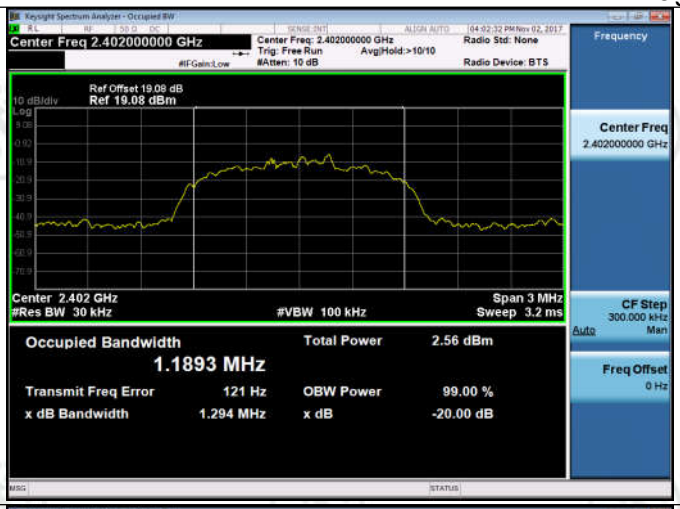
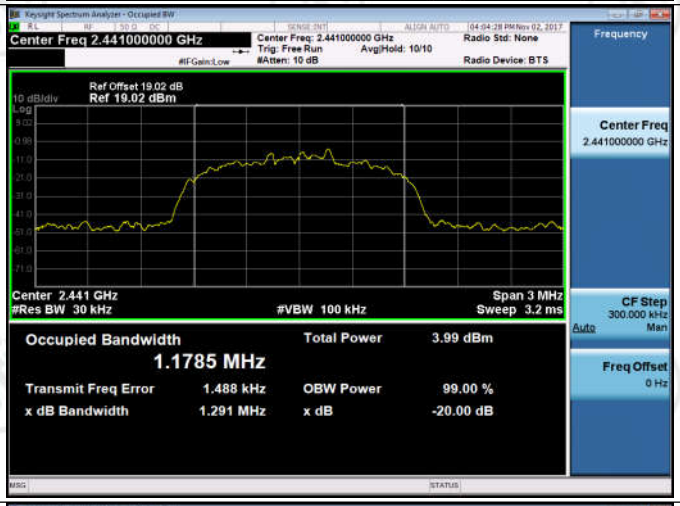
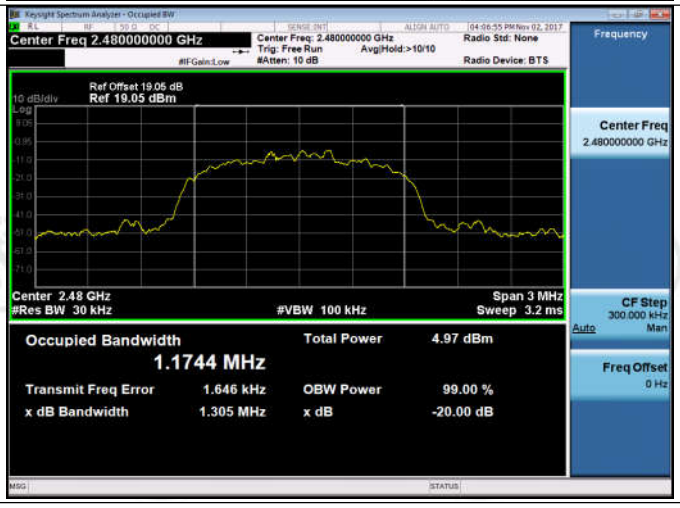
Test Result

Mode	Channel.	20dB Bandwidth [MHz]	99% OBW [MHz]	Verdict	Remark
GFSK	LCH	0.9658	0.9015	PASS	Peak detector
GFSK	MCH	0.9675	0.9004	PASS	
GFSK	HCH	1.011	0.8998	PASS	
π/4DQPSK	LCH	1.319	1.1857	PASS	
π/4DQPSK	MCH	1.289	1.1799	PASS	
π/4DQPSK	HCH	1.284	1.1732	PASS	
8DPSK	LCH	1.294	1.1893	PASS	
8DPSK	MCH	1.291	1.1785	PASS	
8DPSK	HCH	1.305	1.1744	PASS	

Test Graph

Graphs		
GFSK/LCH		
GFSK/MCH		
GFSK/HCH		

π/4DQPSK/LCH		
π/4DQPSK/MCH		
π/4DQPSK/HCH		

8DPSK/LCH		
8DPSK/MCH		
8DPSK/HCH		

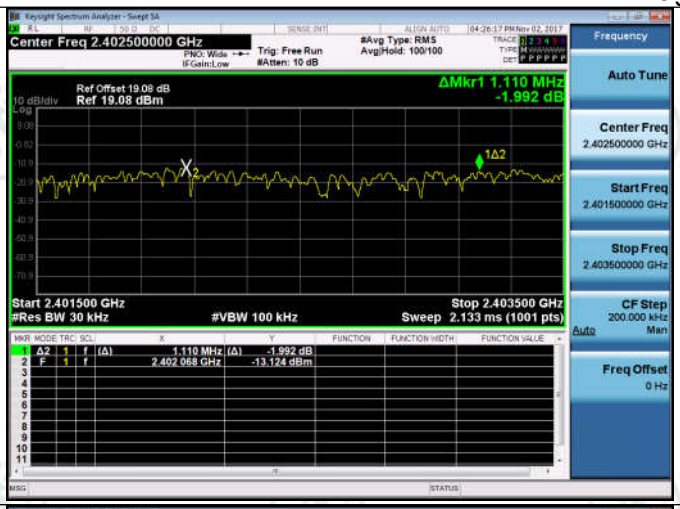
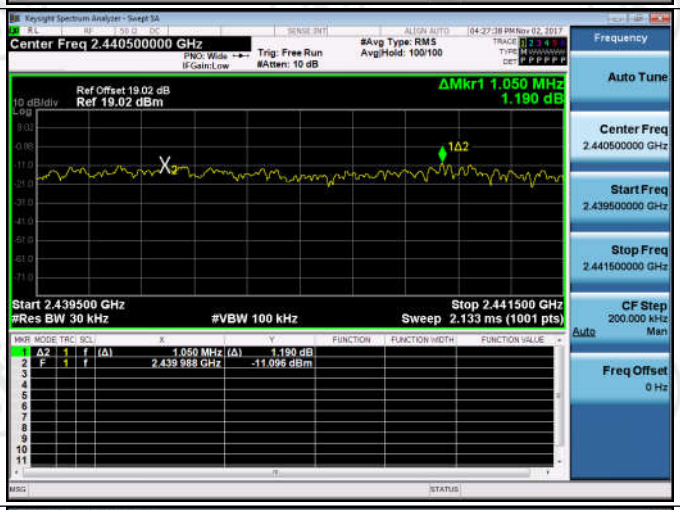
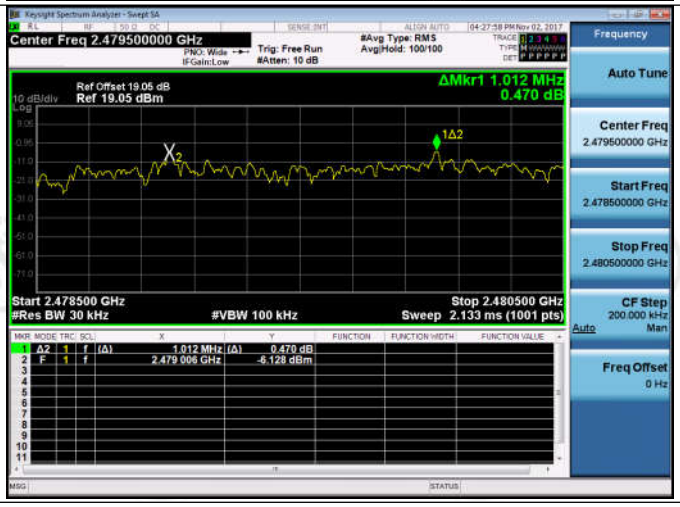
Appendix B): Carrier Frequency Separation

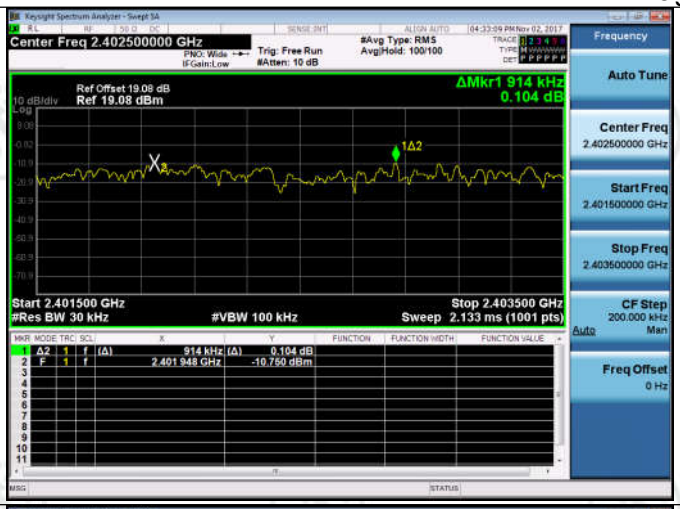
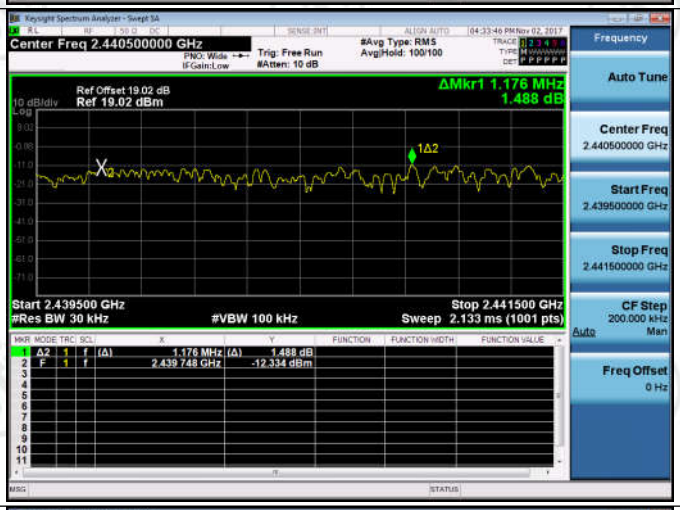
Result Table

Mode	Channel.	Carrier Frequency Separation [MHz]	Verdict
GFSK	LCH	1.164	PASS
GFSK	MCH	0.984	PASS
GFSK	HCH	0.988	PASS
π/4DQPSK	LCH	1.110	PASS
π/4DQPSK	MCH	1.050	PASS
π/4DQPSK	HCH	1.012	PASS
8DPSK	LCH	0.914	PASS
8DPSK	MCH	1.176	PASS
8DPSK	HCH	0.948	PASS

Test Graph

Graphs		
GFSK/LCH		
GFSK/MCH		
GFSK/HCH		

π/4DQPSK/LCH		
π/4DQPSK/MCH		
π/4DQPSK/HCH		

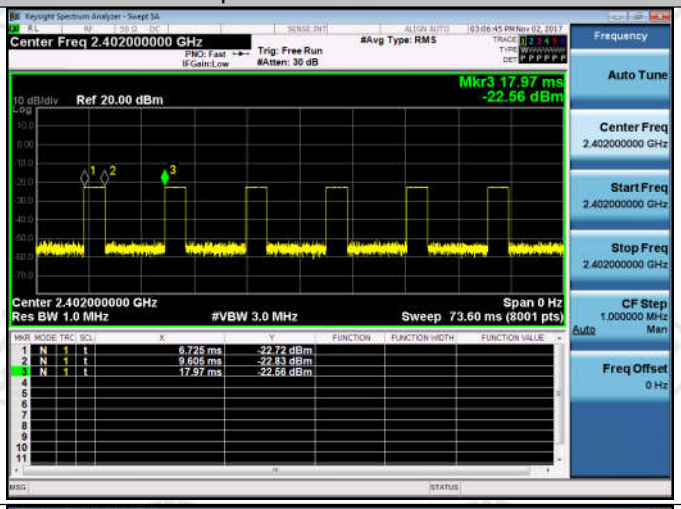
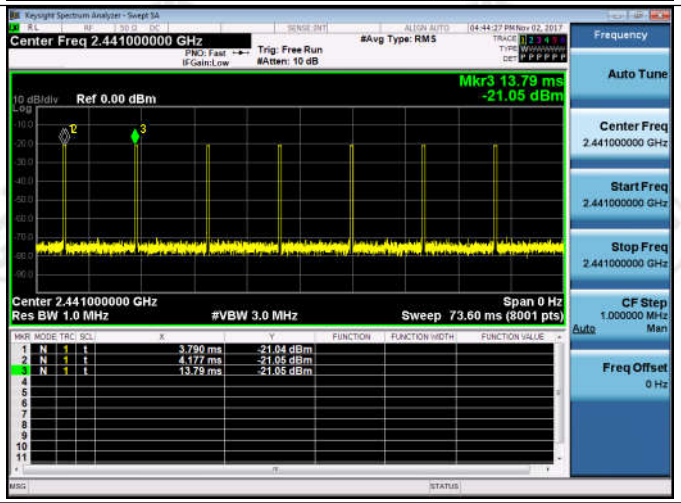
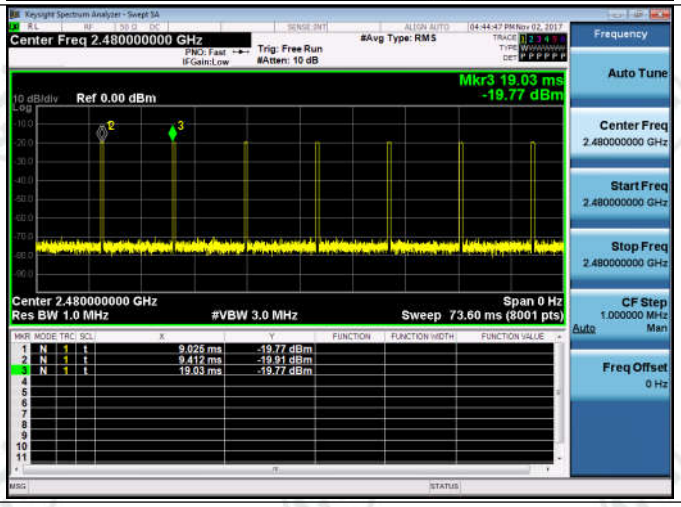
8DPSK/LCH		
8DPSK/MCH		
8DPSK/HCH		

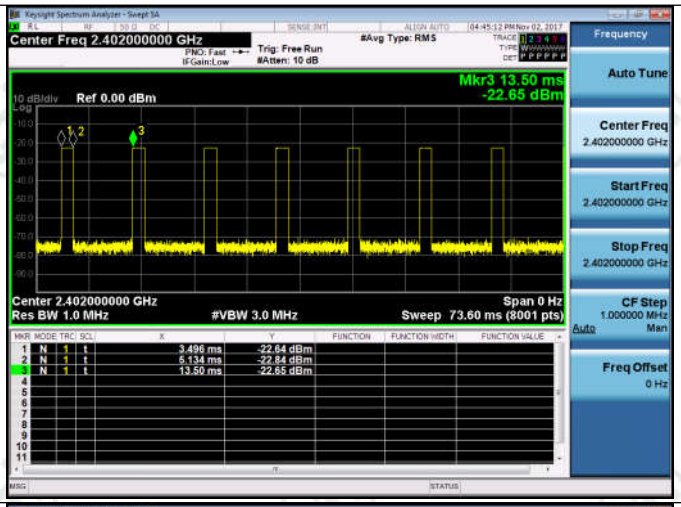
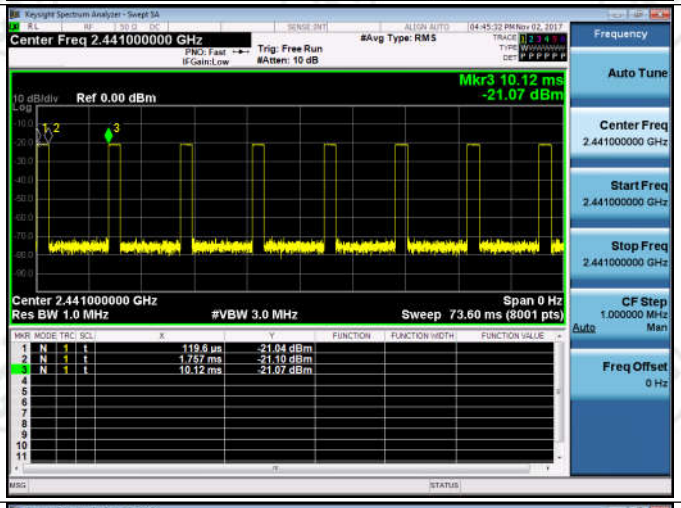
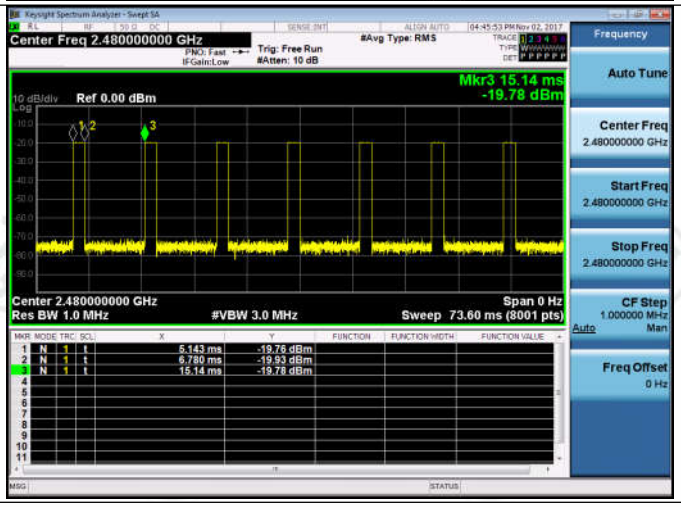
Appendix C): Dwell Time

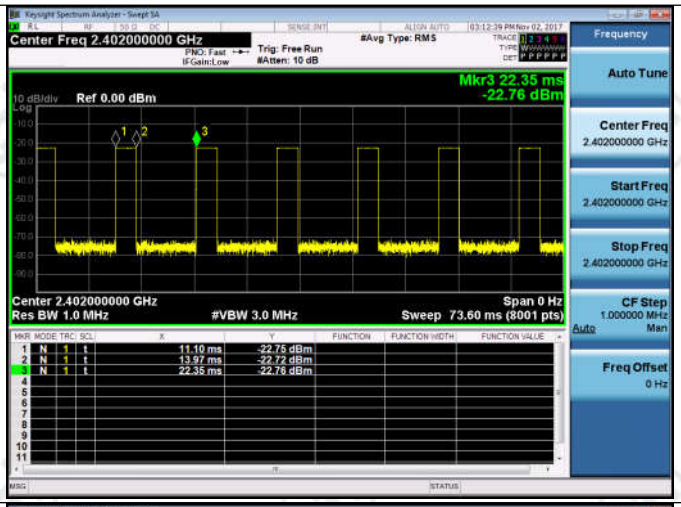
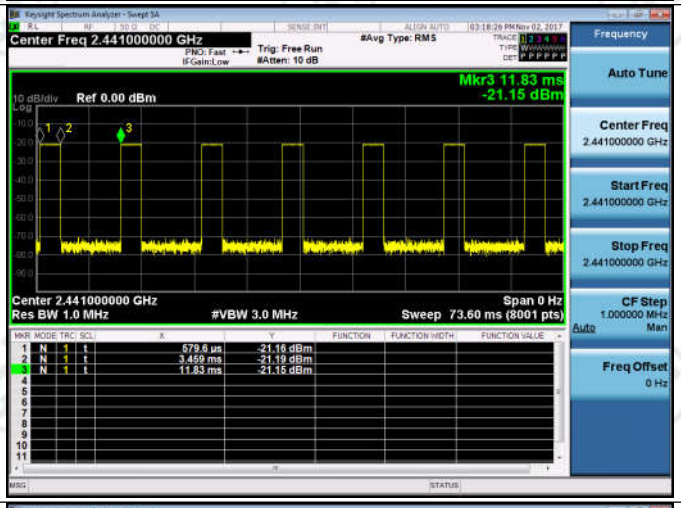
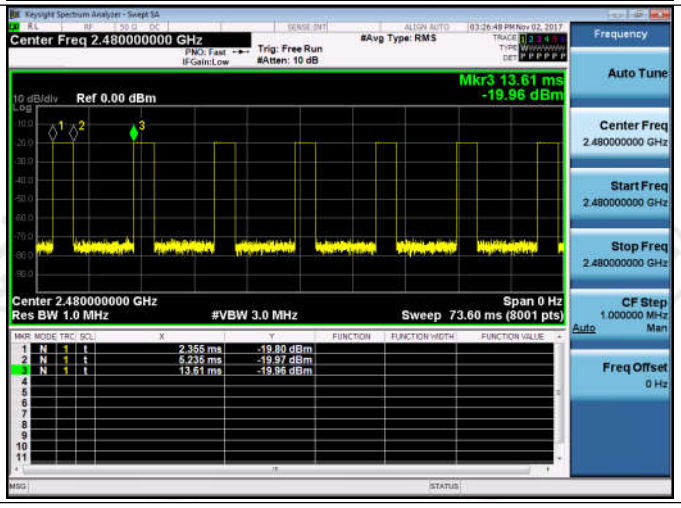
Result Table

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Duty Cycle [%]	Verdict
GFSK	DH1	LCH	2.8796	320	0.921	26	PASS
GFSK	DH1	MCH	0.3864	320	0.124	4	PASS
GFSK	DH1	HCH	0.3864	320	0.124	4	PASS
GFSK	DH3	LCH	1.6376	160	0.262	16	PASS
GFSK	DH3	MCH	1.6376	160	0.262	16	PASS
GFSK	DH3	HCH	1.6376	160	0.262	16	PASS
GFSK	DH5	LCH	2.8796	106.7	0.307	26	PASS
GFSK	DH5	MCH	2.8796	106.7	0.307	26	PASS
GFSK	DH5	HCH	2.8796	106.7	0.307	26	PASS

Test Graph

Graphs		
GFSK_DH1/LCH		
GFSK_DH1/MCH		
GFSK_DH1/HCH		

GFSK_DH3/LCH		
GFSK_DH3/MCH		
GFSK_DH3/HCH		

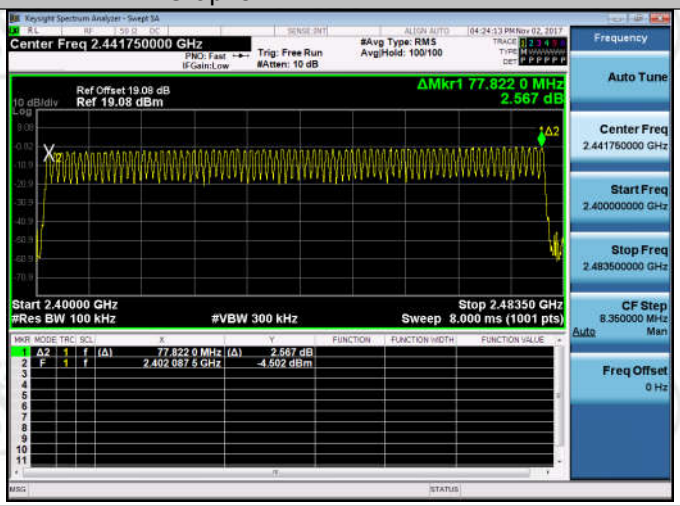
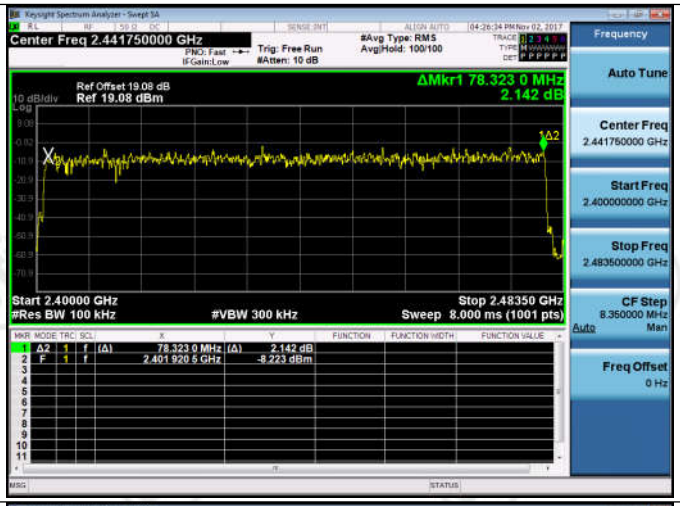
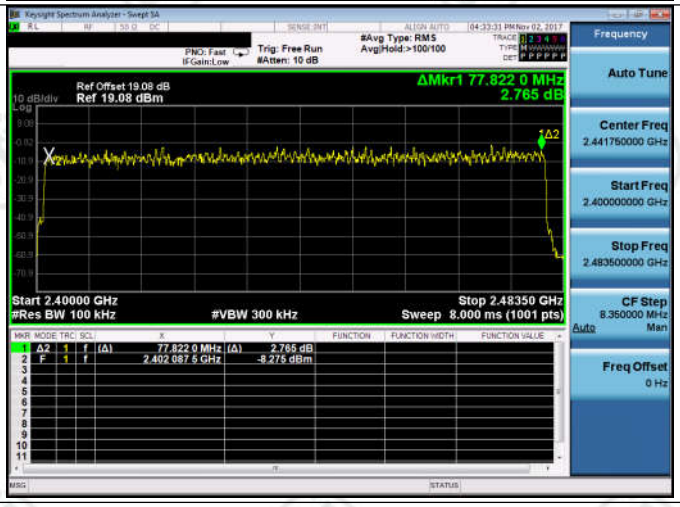
GFSK_DH5/LCH		
GFSK_DH5/MCH		
GFSK_DH5/HCH		

Appendix D): Hopping Channel Number

Result Table

Mode	Channel.	Number of Hopping Channel	Verdict
GFSK	Hop	79	PASS
π/4DQPSK	Hop	79	PASS
8DPSK	Hop	79	PASS

Test Graph

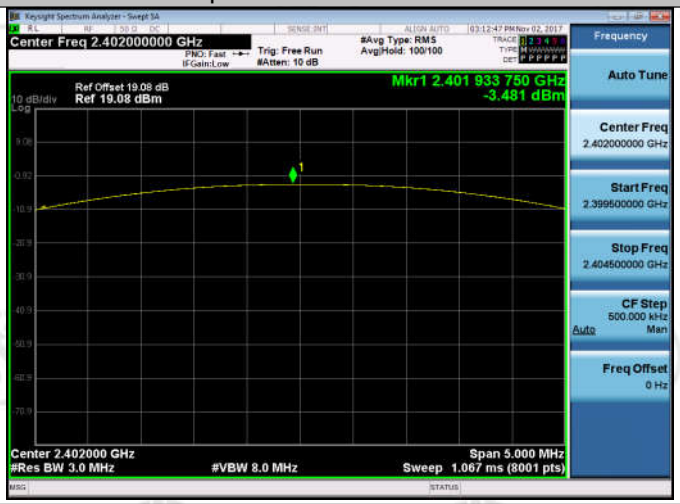
Graphs	
GFSK/Hop	
π/4DQPSK/Hop	
8DPSK/Hop	

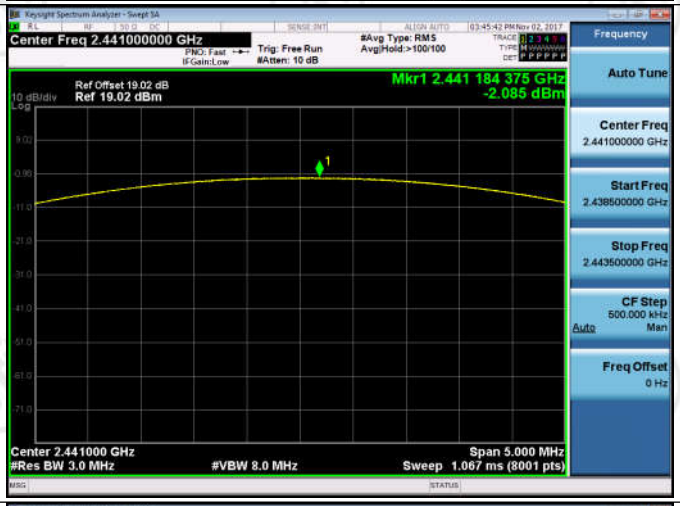
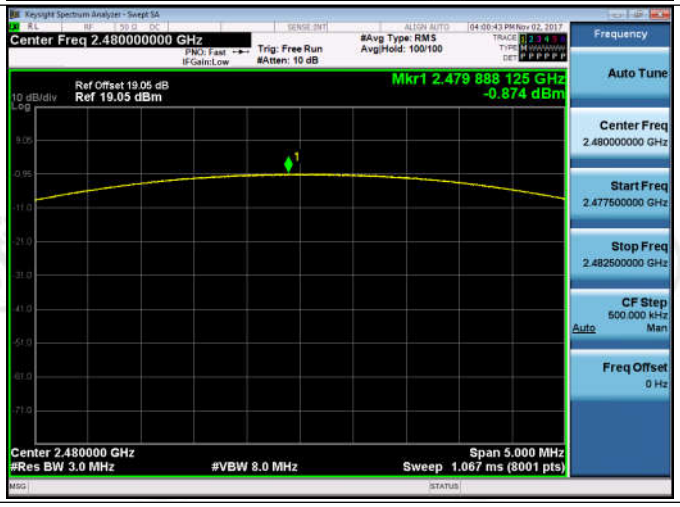
Appendix E): Conducted Peak Output Power

Result Table

Mode	Channel.	Maximum Peak Output Power [dBm]	Verdict
GFSK	LCH	-3.481	PASS
GFSK	MCH	-1.946	PASS
GFSK	HCH	-0.644	PASS
π/4DQPSK	LCH	-3.636	PASS
π/4DQPSK	MCH	-2.085	PASS
π/4DQPSK	HCH	-0.874	PASS
8DPSK	LCH	-3.413	PASS
8DPSK	MCH	-1.858	PASS
8DPSK	HCH	-0.622	PASS

Test Graph

Graphs	
GFSK/LCH	
GFSK/MCH	
GFSK/HCH	

π/4DQPSK/LCH		
π/4DQPSK/MCH		
π/4DQPSK/HCH		

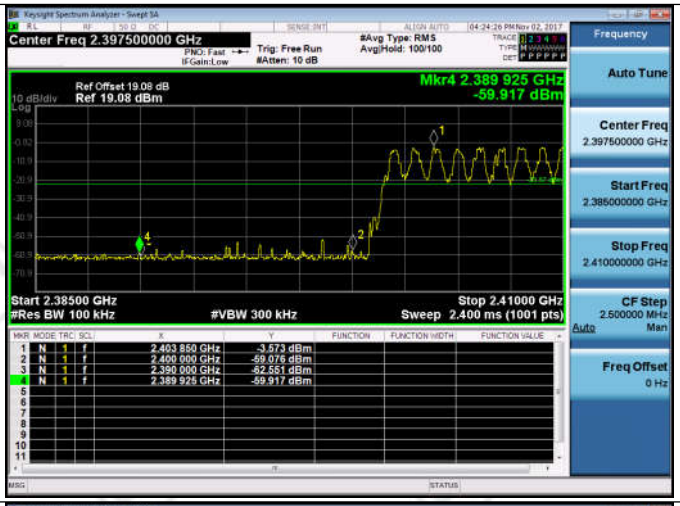
8DPSK/LCH		
8DPSK/MCH		
8DPSK/HCH		

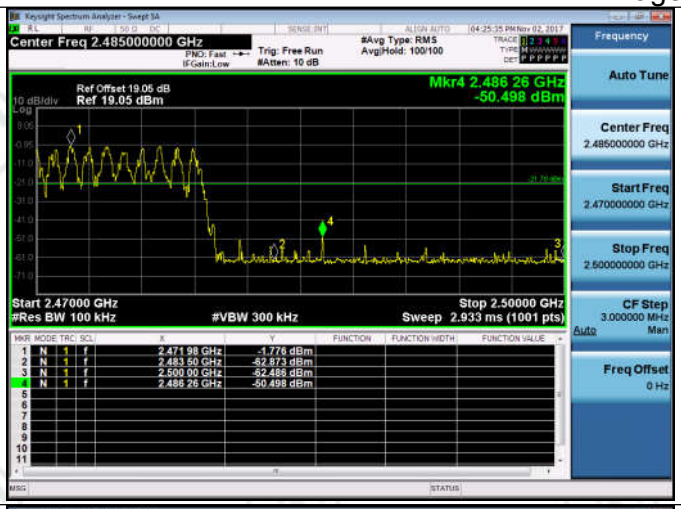
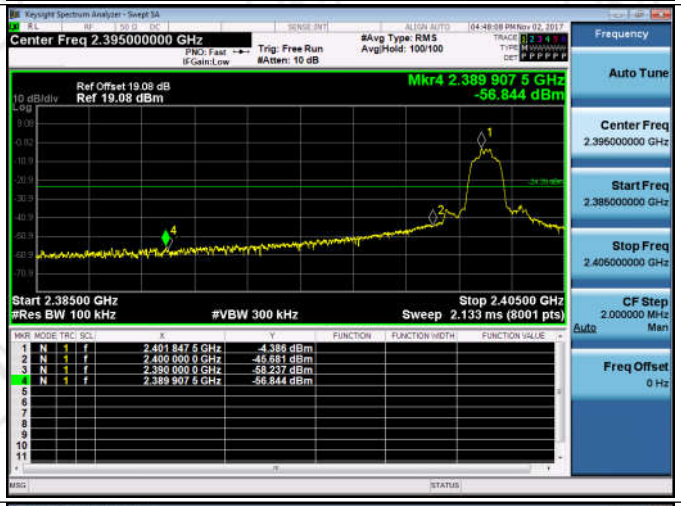
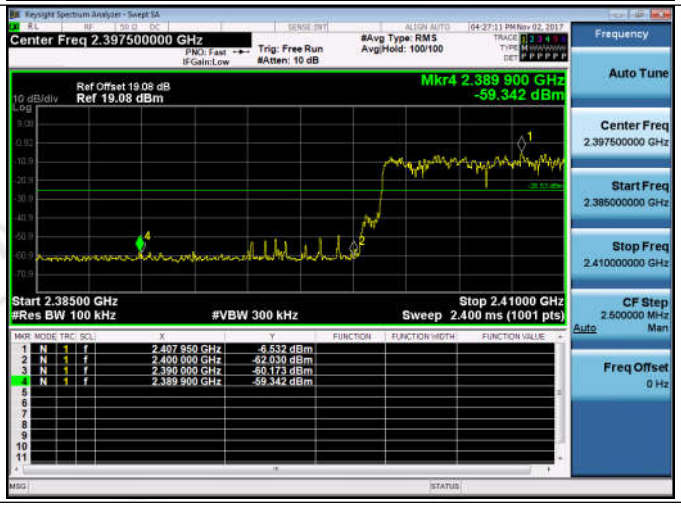
Appendix F): Band-edge for RF Conducted Emissions

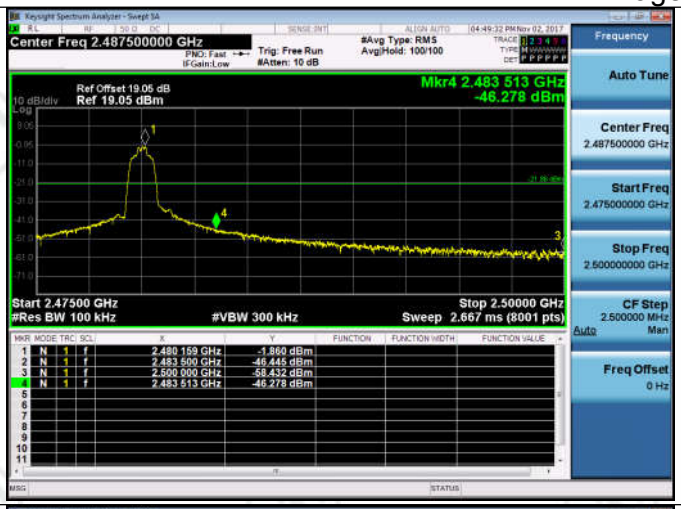
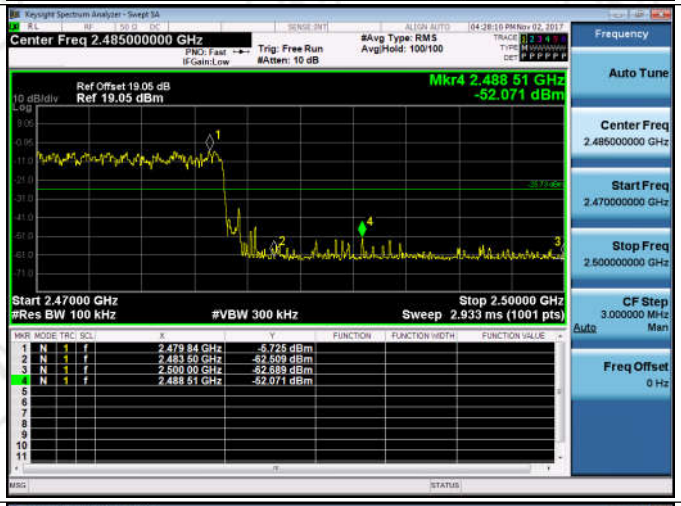
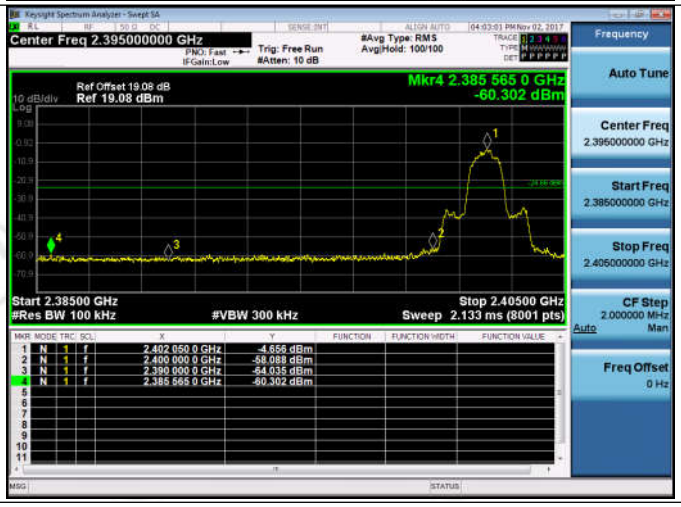
Result Table

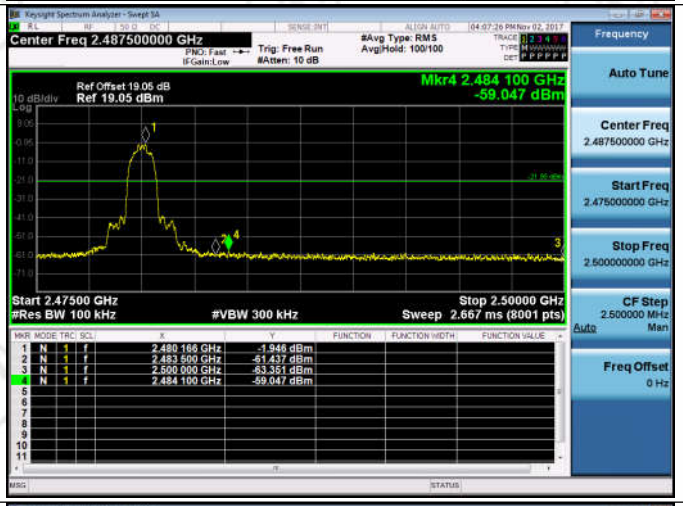
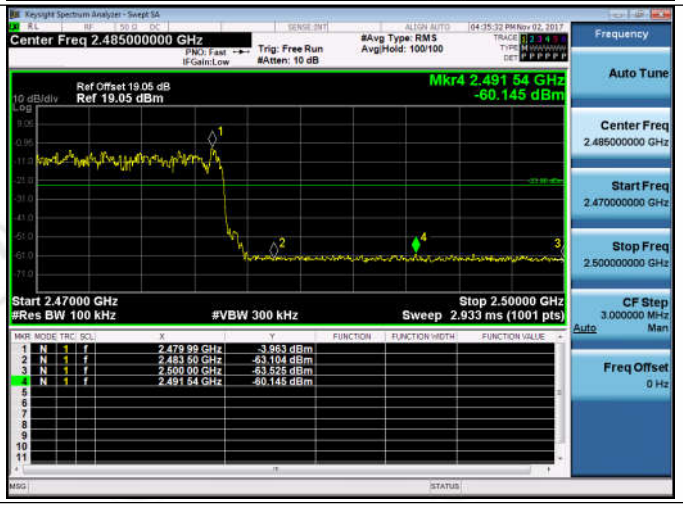
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-3.572	Off	-55.280	-23.57	PASS
			-3.573	On	-59.917	-23.57	PASS
GFSK	HCH	2480	-0.859	Off	-43.094	-20.86	PASS
			-1.776	On	-50.498	-21.78	PASS
π/4DQPSK	LCH	2402	-4.386	Off	-56.844	-24.39	PASS
			-6.532	On	-59.342	-26.53	PASS
π/4DQPSK	HCH	2480	-1.860	Off	-46.278	-21.86	PASS
			-5.725	On	-52.071	-25.73	PASS
8DPSK	LCH	2402	-4.656	Off	-60.302	-24.66	PASS
			-4.355	On	-61.557	-24.36	PASS
8DPSK	HCH	2480	-1.946	Off	-59.047	-21.95	PASS
			-3.963	On	-60.145	-23.96	PASS

Test Graph

Graphs	
GFSK/LCH/No Hop	
GFSK/LCH/Hop	
GFSK/HCH/No Hop	

GFSK/HCH/Hop		
π/4DQPSK/LCH/No Hop		
π/4DQPSK/LCH/Hop		

π/4DQPSK/HCH/No Hop		
π/4DQPSK/HCH/Hop		
8DPSK/LCH/No Hop		

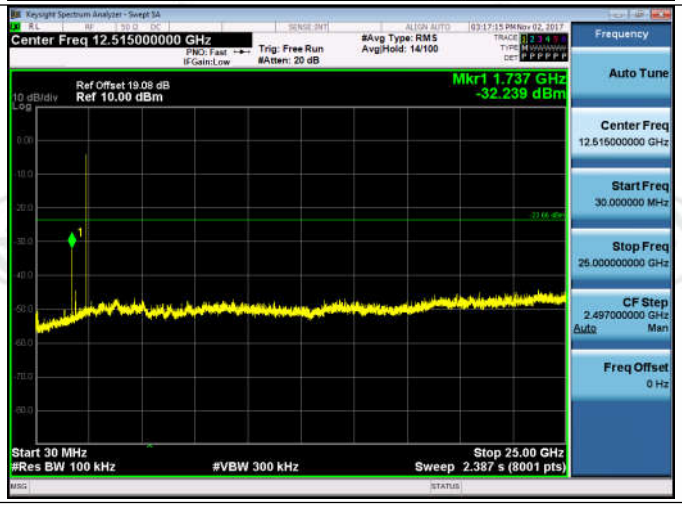
8DPSK/LCH/Hop		
8DPSK/HCH/No Hop		
8DPSK/HCH/Hop		

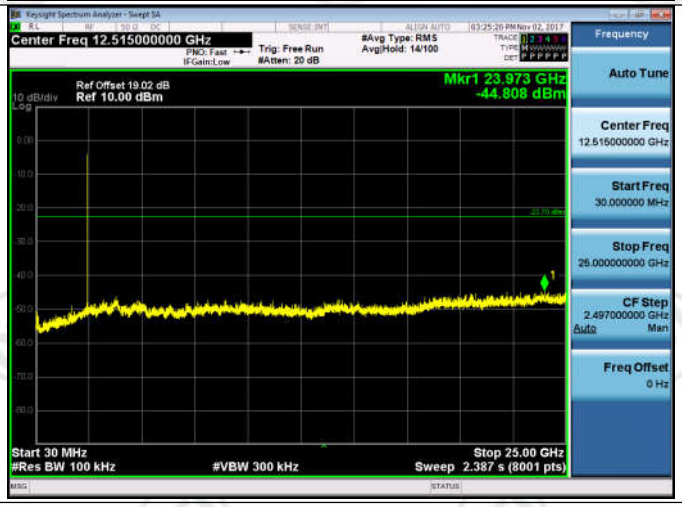
Appendix G): RF Conducted Spurious Emissions

Result Table

Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
GFSK	LCH	-3.655	<Limit	PASS
GFSK	MCH	-2.701	<Limit	PASS
GFSK	HCH	-1.488	<Limit	PASS
π/4DQPSK	LCH	-4.736	<Limit	PASS
π/4DQPSK	MCH	-3.734	<Limit	PASS
π/4DQPSK	HCH	-2.073	<Limit	PASS
8DPSK	LCH	-4.448	<Limit	PASS
8DPSK	MCH	-3.118	<Limit	PASS
8DPSK	HCH	-2.003	<Limit	PASS

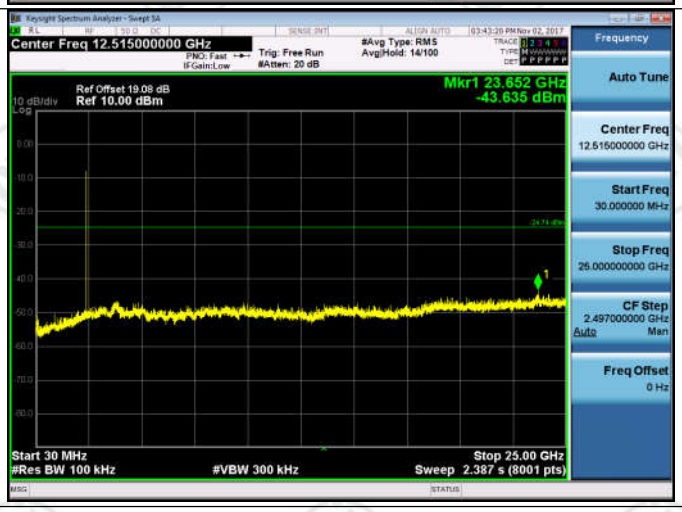
Test Graph

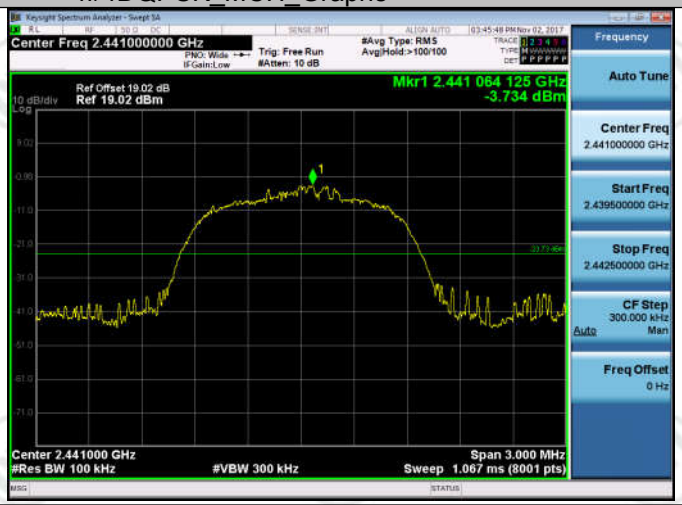
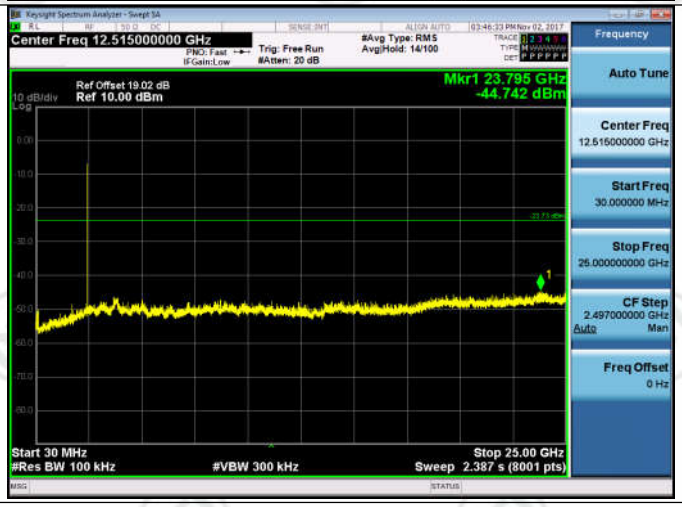
GFSK_LCH_Graphs		
Pref		
Puw		

GFSK_MCH_Graphs	
Pref	
Puw	

GFSK_HCH_Graphs	
Pref	

Puw	

π/4DQPSK_LCH_Graphs	
Pref	
Puw	

π/4DQPSK_MCH_Graphs	
Pref	
Puw	

π/4DQPSK_HCH_Graphs	
Pref