Appendix A
RF Test Data for BT(BDR/EDR) (Conducted Measurement)

Product Name: Bluetooth Earphones

Trade Mark: Altec Lansing

Test Model: MZX890

FCC ID: 2AL9B-MZX890

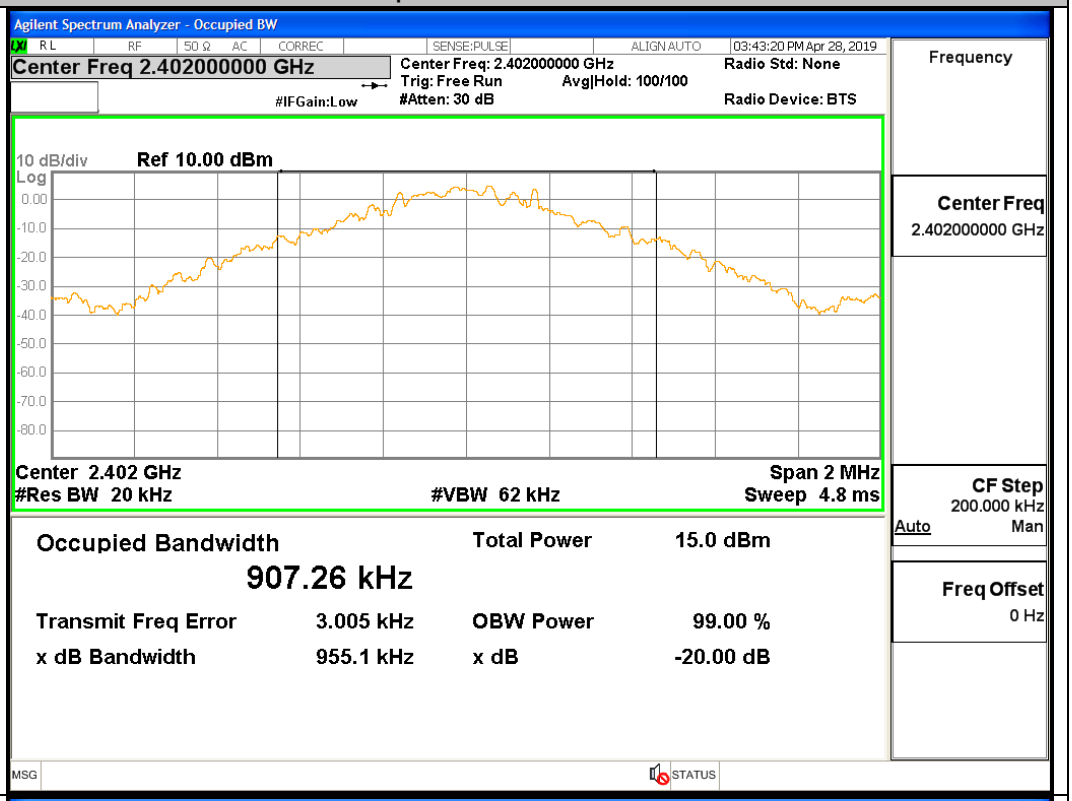
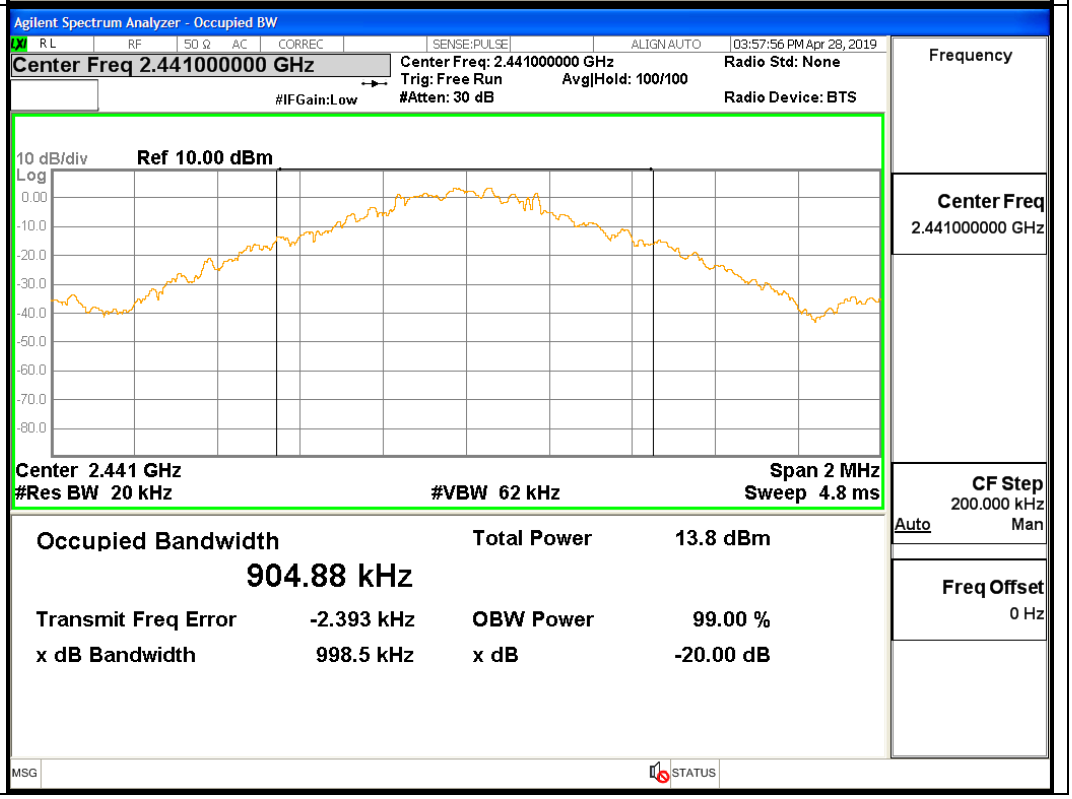
Environmental Conditions

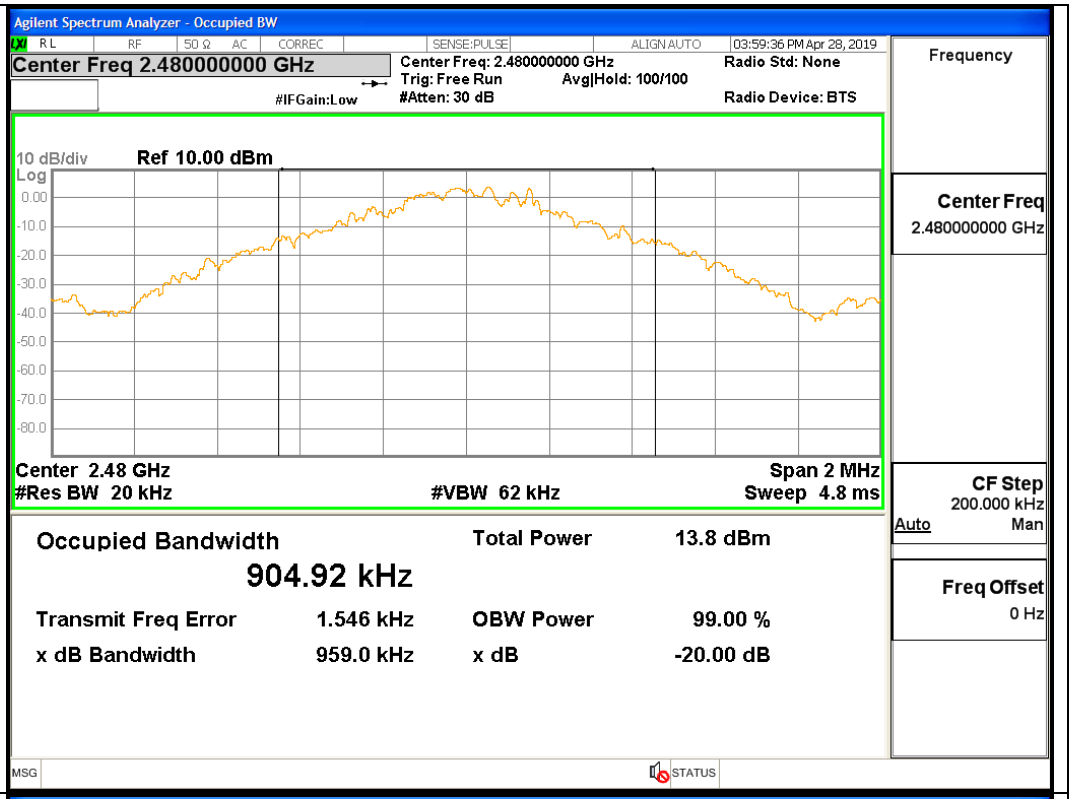
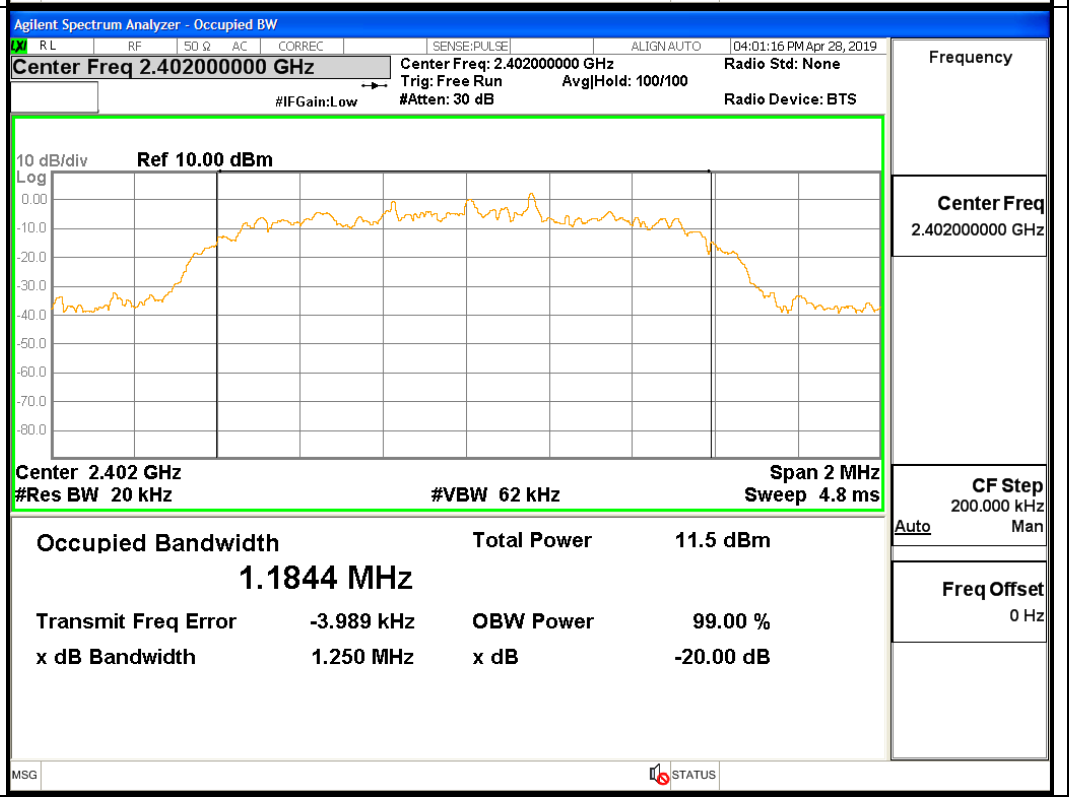
Temperature:	23.3 ° C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Engineer:	Gary Qian
Supervised by:	Eden Hu

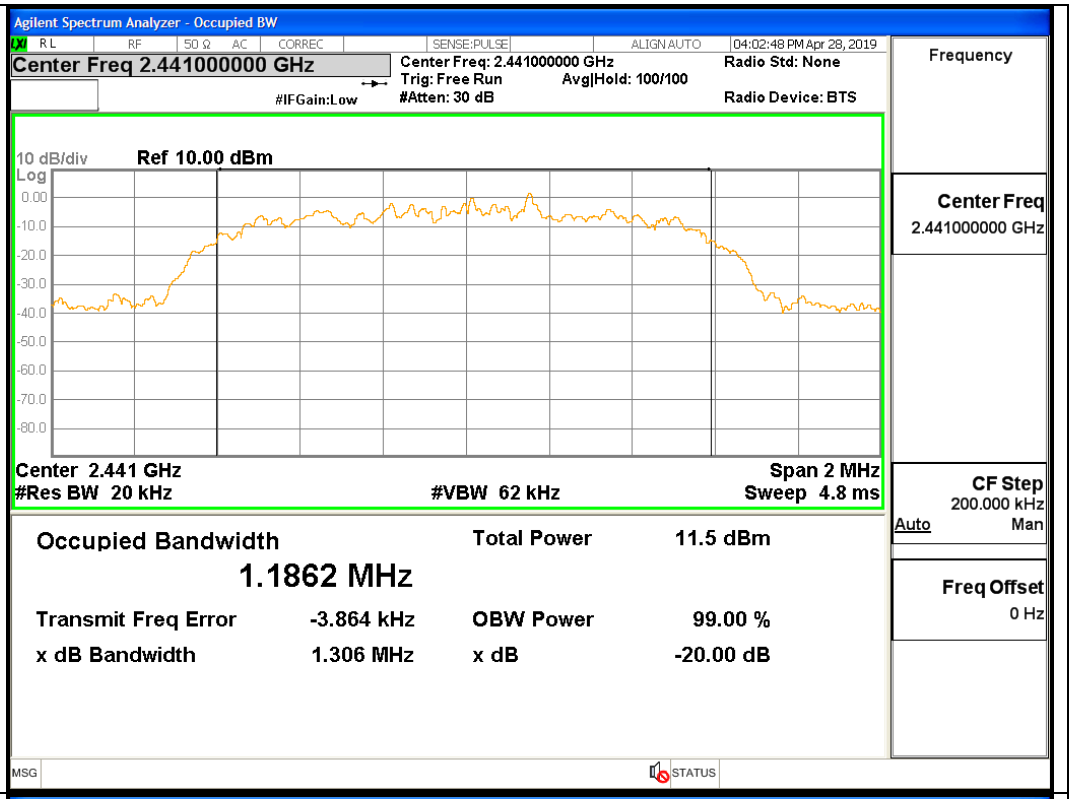
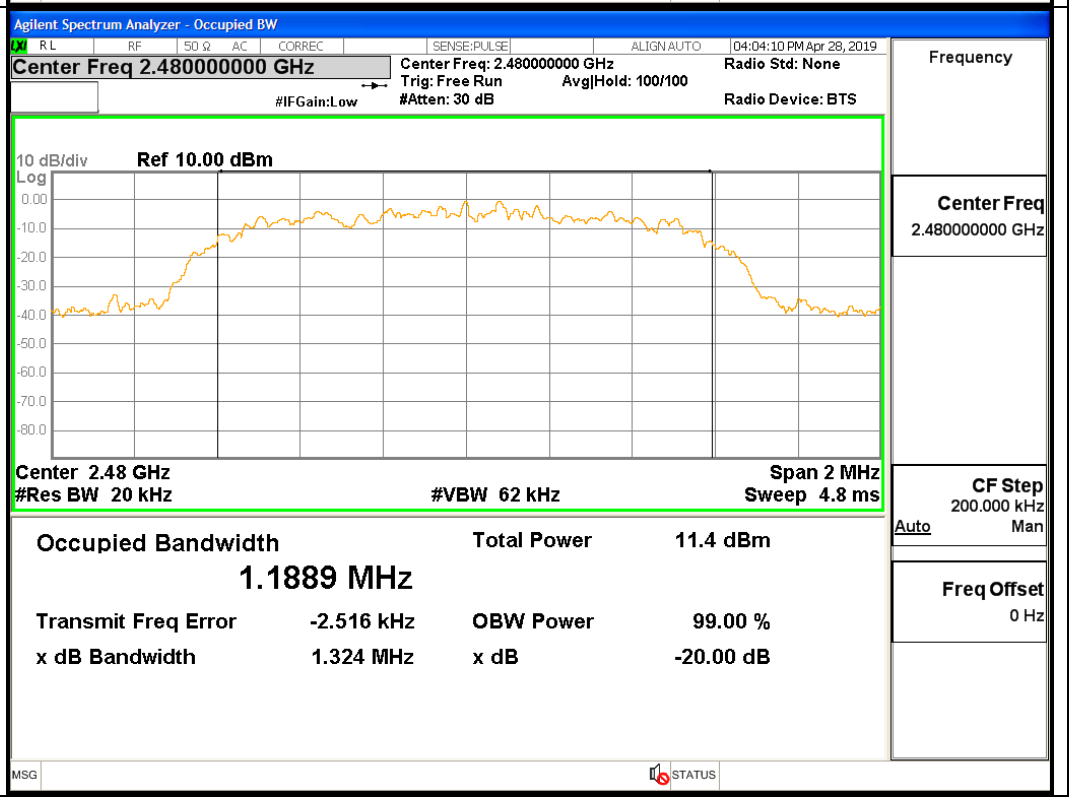
A.1 20 dB Bandwidth

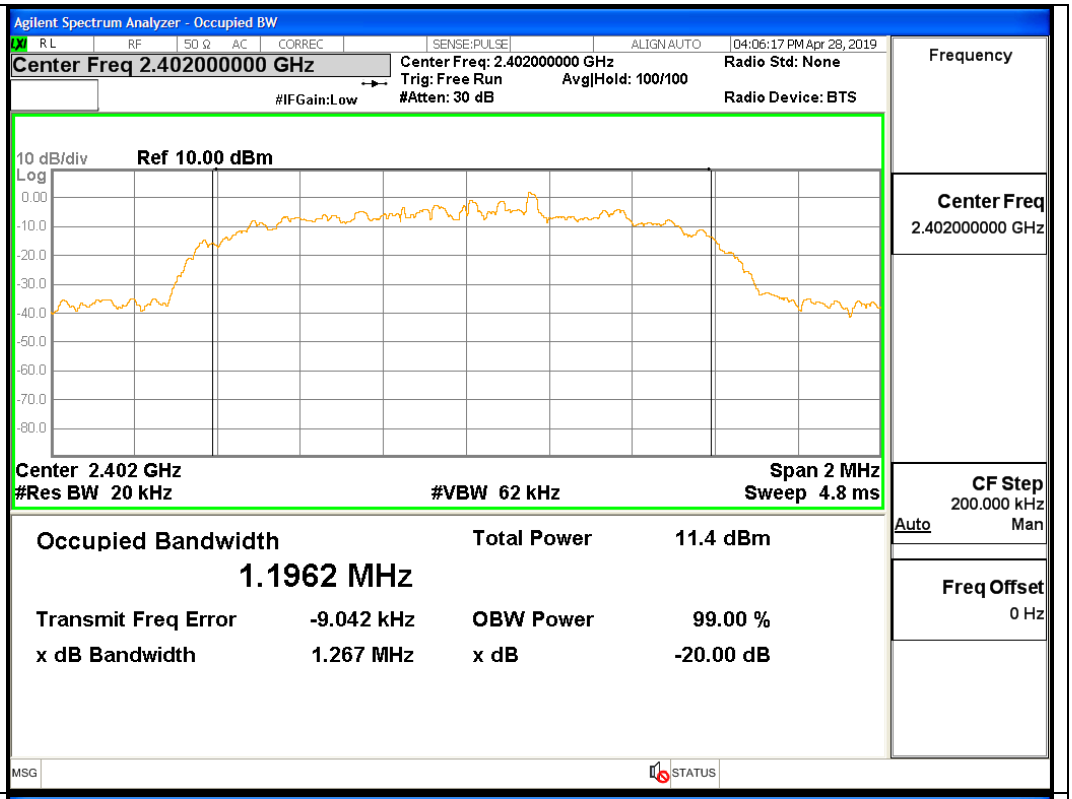
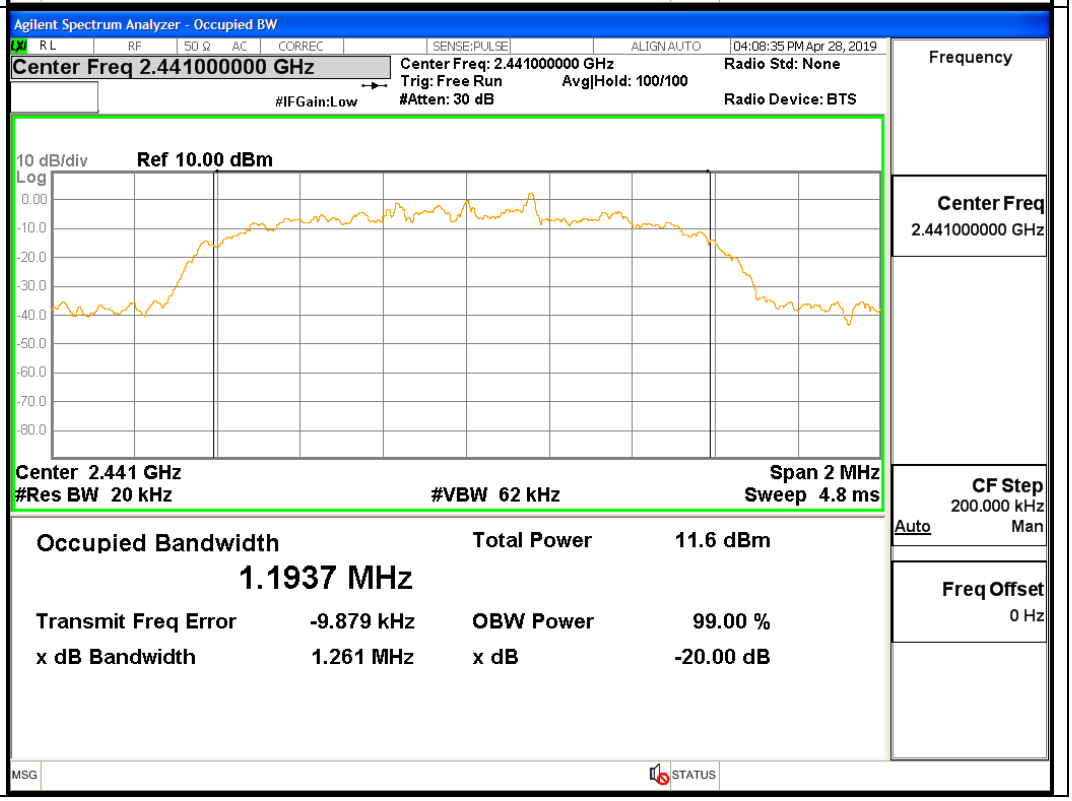
Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.955	Not Specified	PASS
GFSK	MCH	0.999	Not Specified	PASS
GFSK	HCH	0.959	Not Specified	PASS
π/4DQPSK	LCH	1.250	Not Specified	PASS
π/4DQPSK	MCH	1.306	Not Specified	PASS
π/4DQPSK	HCH	1.324	Not Specified	PASS
8DPSK	LCH	1.267	Not Specified	PASS
8DPSK	MCH	1.261	Not Specified	PASS
8DPSK	HCH	1.262	Not Specified	PASS

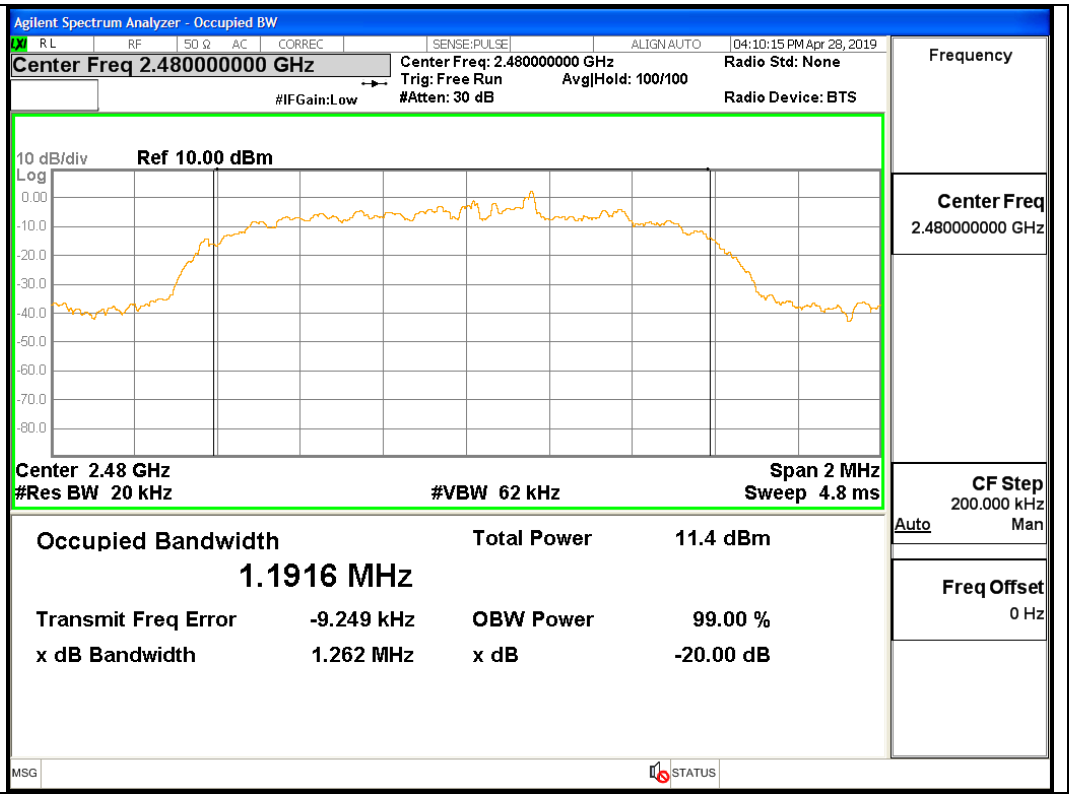
Test Graph

Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

8DPSK/LCH	
8DPSK/MCH	

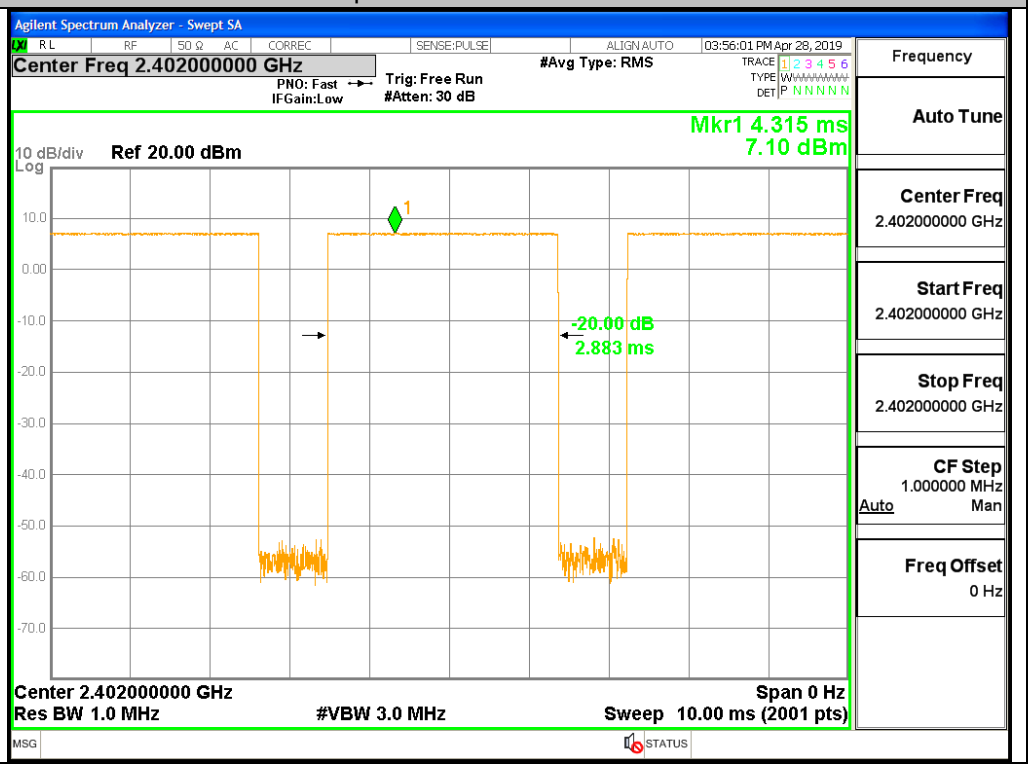
8DPSK/HCH	

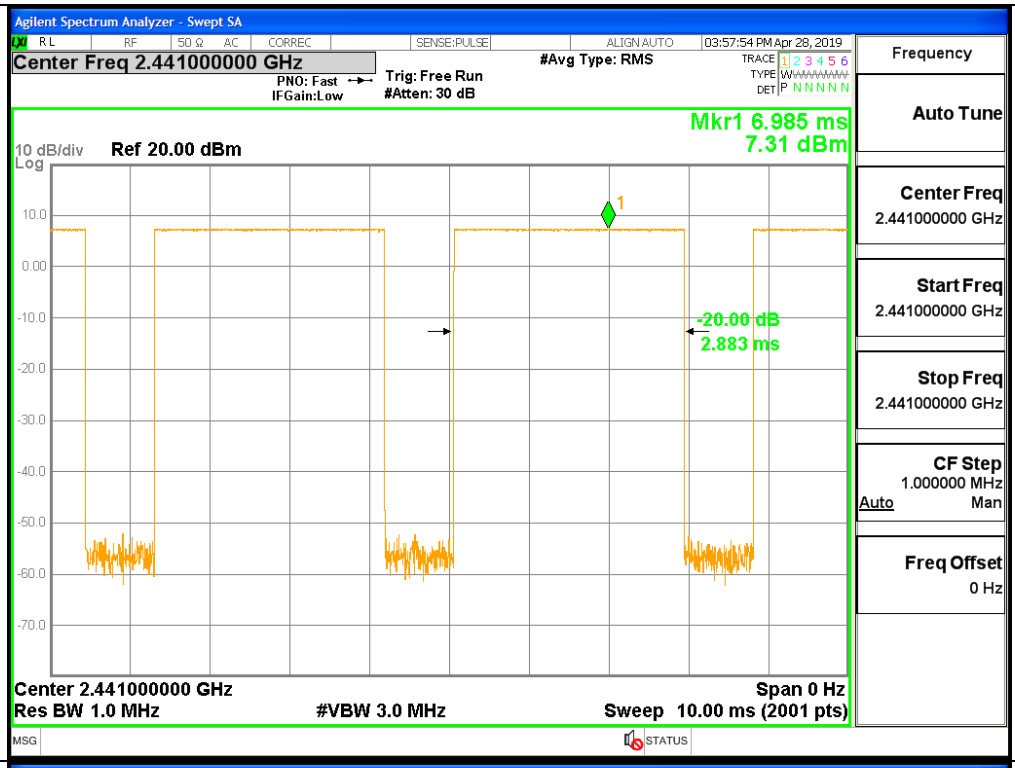
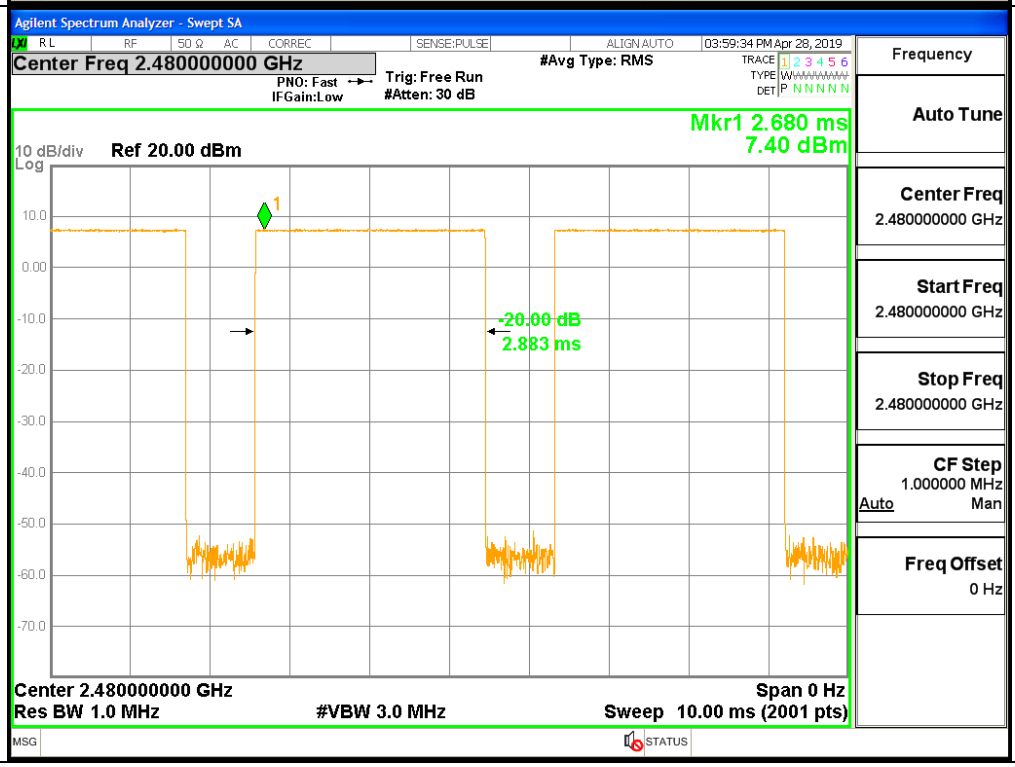
Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
CORREC
SENSE:PULSE
ALIGN AUTO
04:10:15 PM Apr 28, 2019
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 20 kHz
#VBW 62 kHz
Span 2 MHz
Sweep 4.8 ms
CF Step
200.000 kHz
Auto
Man
Occupied Bandwidth
1.1916 MHz
Total Power
11.4 dBm
Transmit Freq Error
-9.249 kHz
OBW Power
99.00 %
x dB Bandwidth
1.262 MHz
x dB
-20.00 dB
Freq Offset
0 Hz
MSG
STATUS

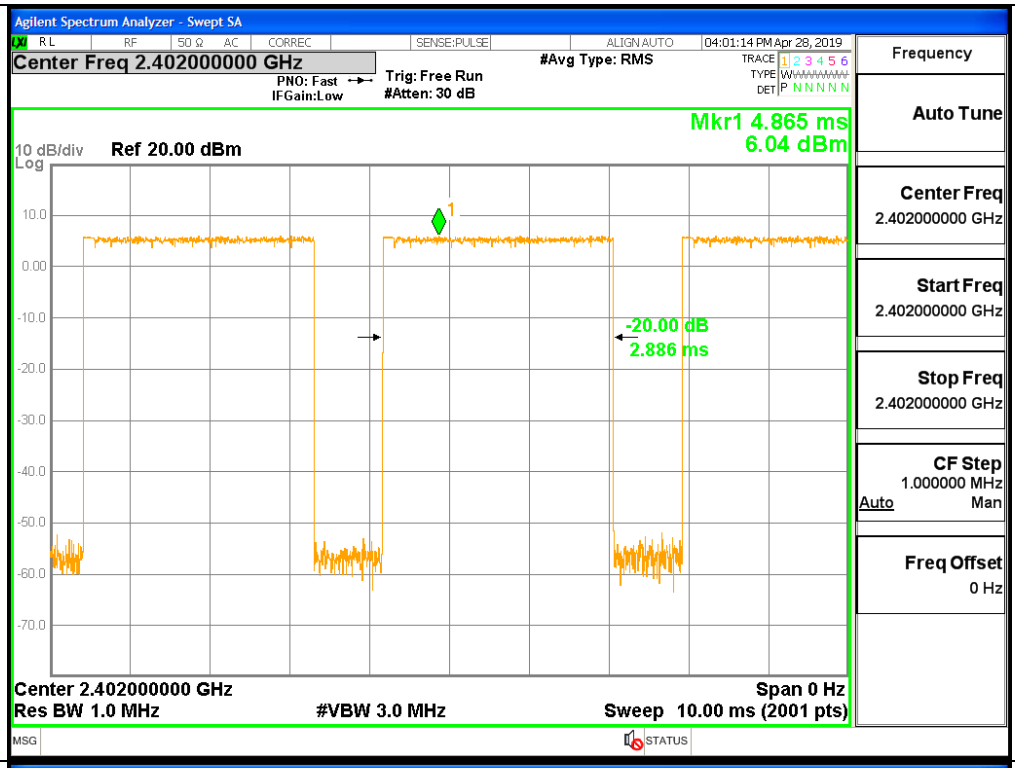
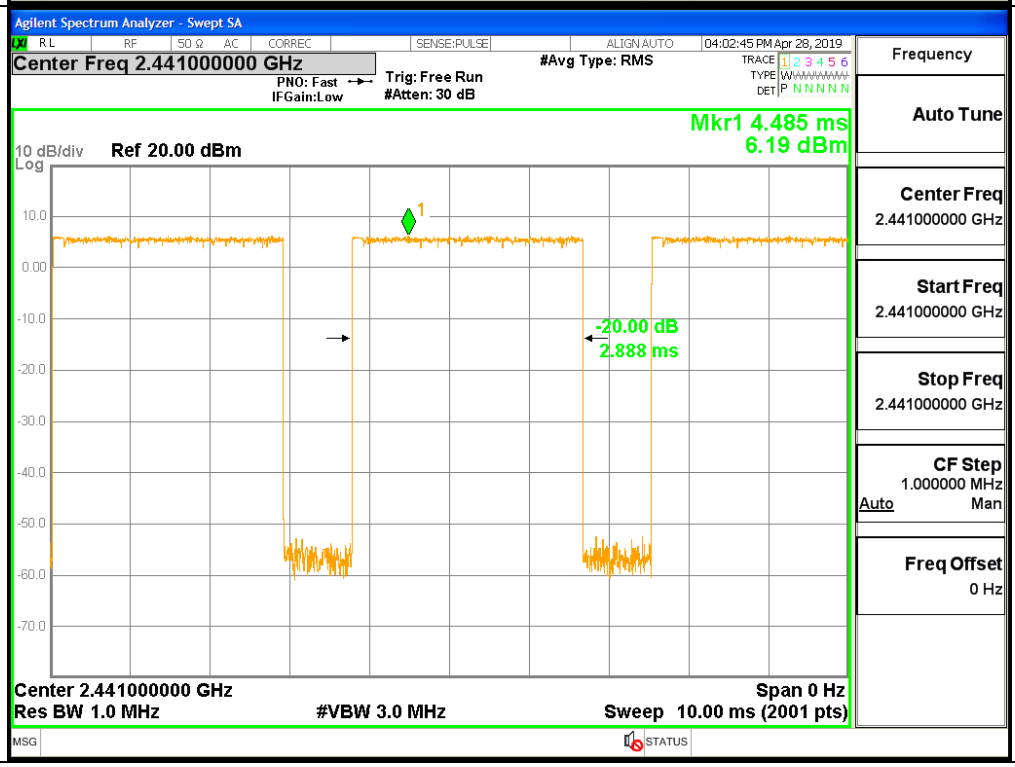
A.2 Dwell Time

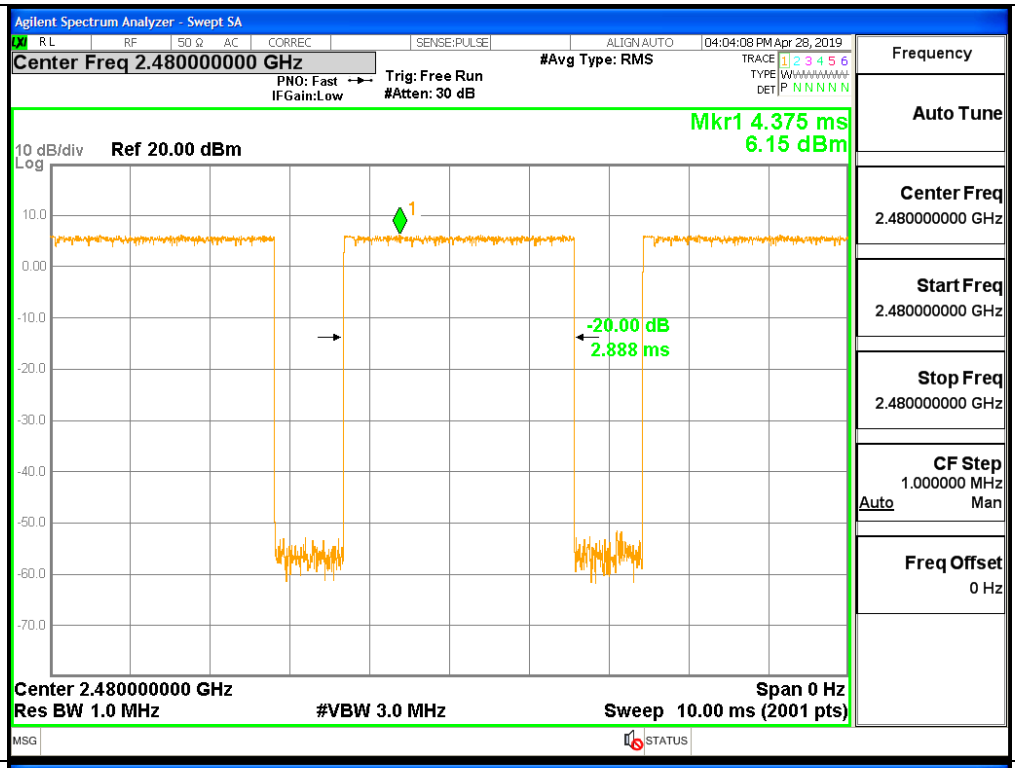
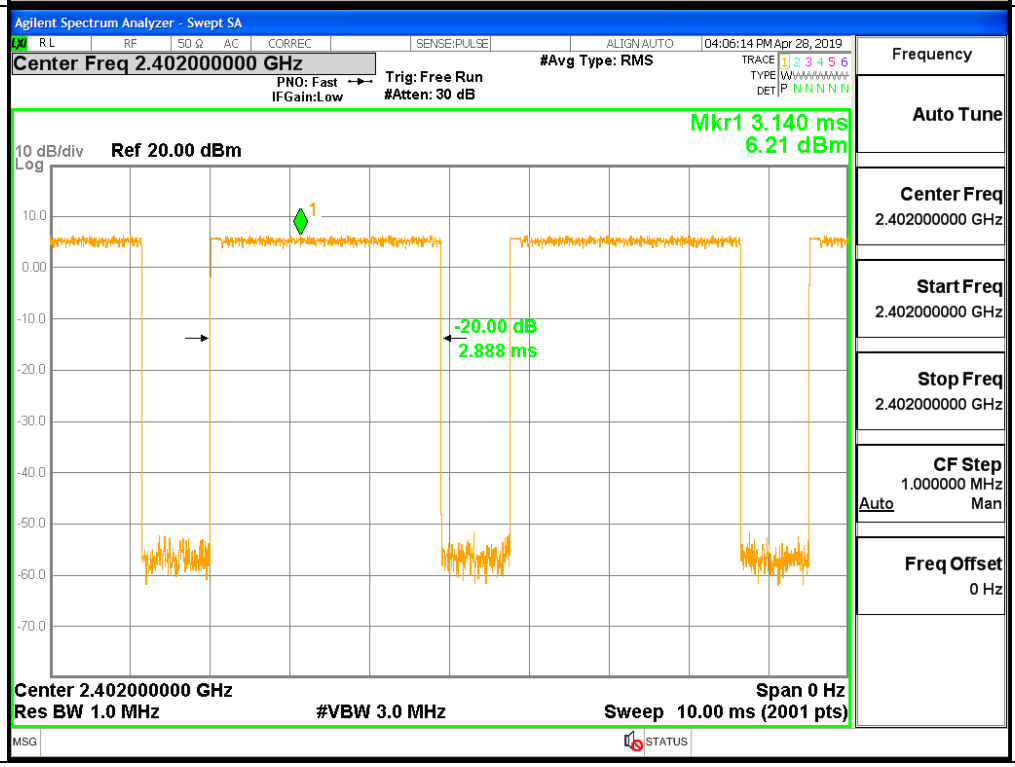
Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002883	106.7	0.307664	0.4	PASS
GFSK	DH5	MCH	0.002883	106.7	0.307597	0.4	PASS
GFSK	DH5	HCH	0.002883	106.7	0.307584	0.4	PASS
π/4DQPSK	2DH5	LCH	0.002886	106.7	0.30792	0.4	PASS
π/4DQPSK	2DH5	MCH	0.002888	106.7	0.308109	0.4	PASS
π/4DQPSK	2DH5	HCH	0.002888	106.7	0.308147	0.4	PASS
8DPSK	3DH5	LCH	0.002888	106.7	0.308129	0.4	PASS
8DPSK	3DH5	MCH	0.002888	106.7	0.308131	0.4	PASS
8DPSK	3DH5	HCH	0.002890	106.7	0.308316	0.4	PASS

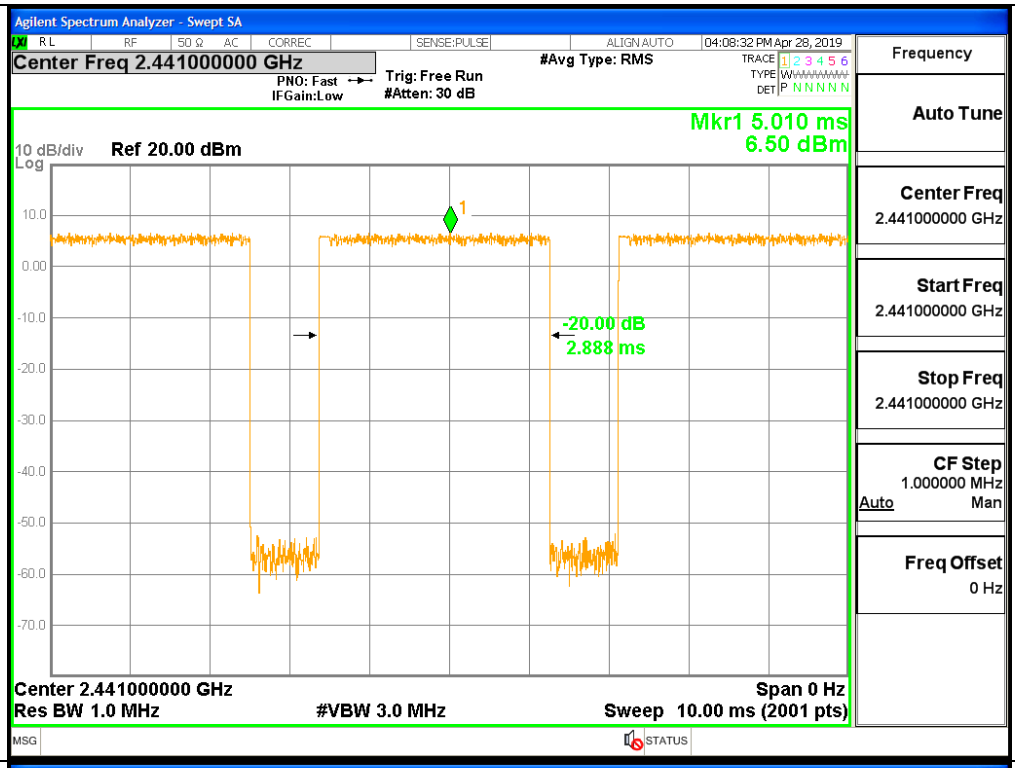
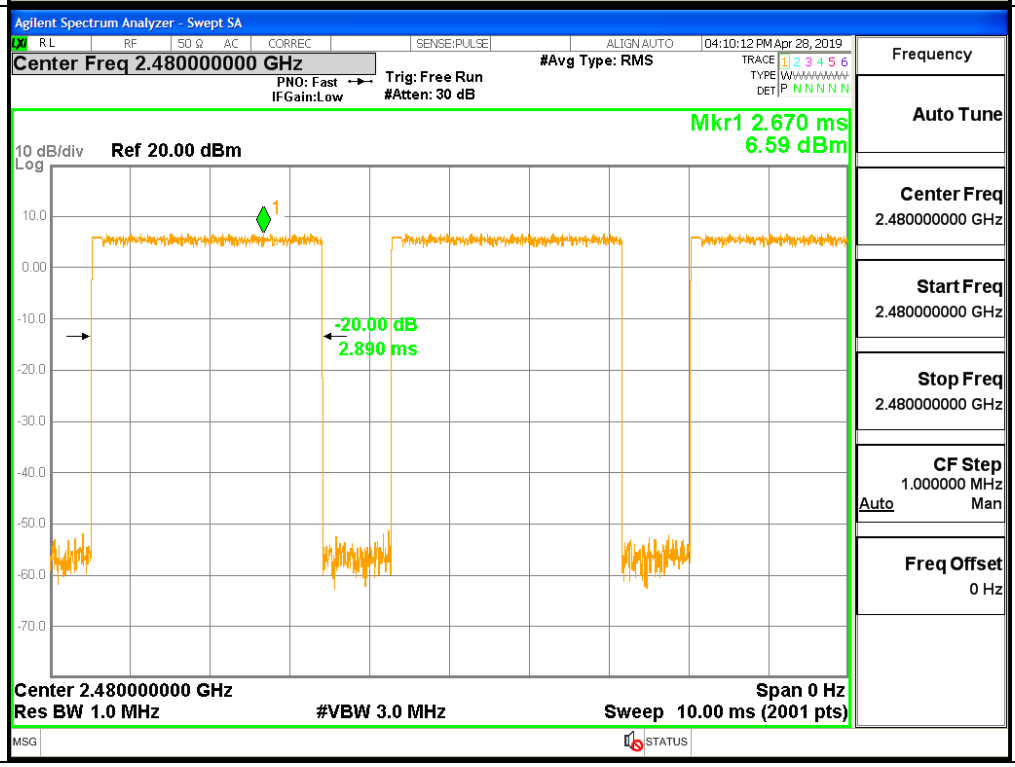
Test Graph

Graphs	
GFSK_DH5/LCH	

GFSK_DH5/MCH	
GFSK_DH5/HCH	

π/4DQPSK _2DH5/LCH	
π/4DQPSK _2DH5/MCH	

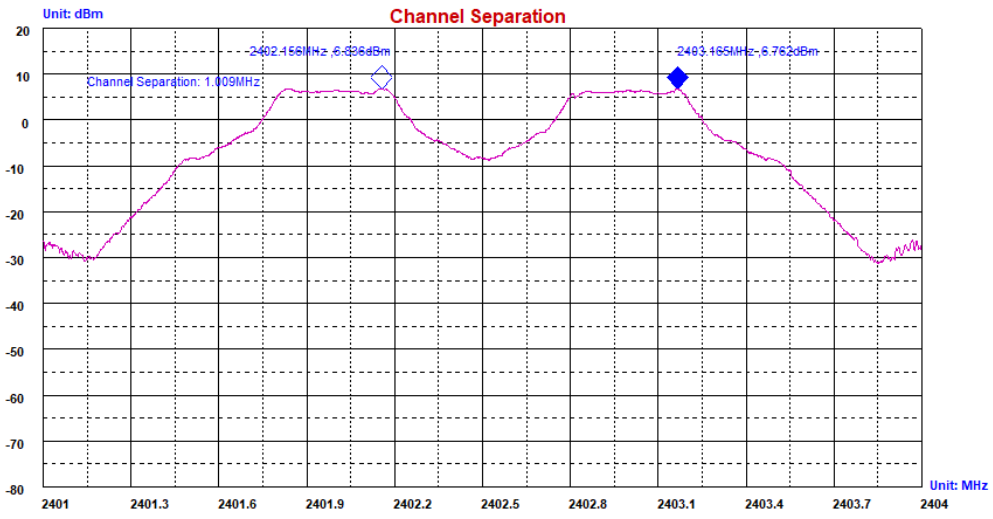
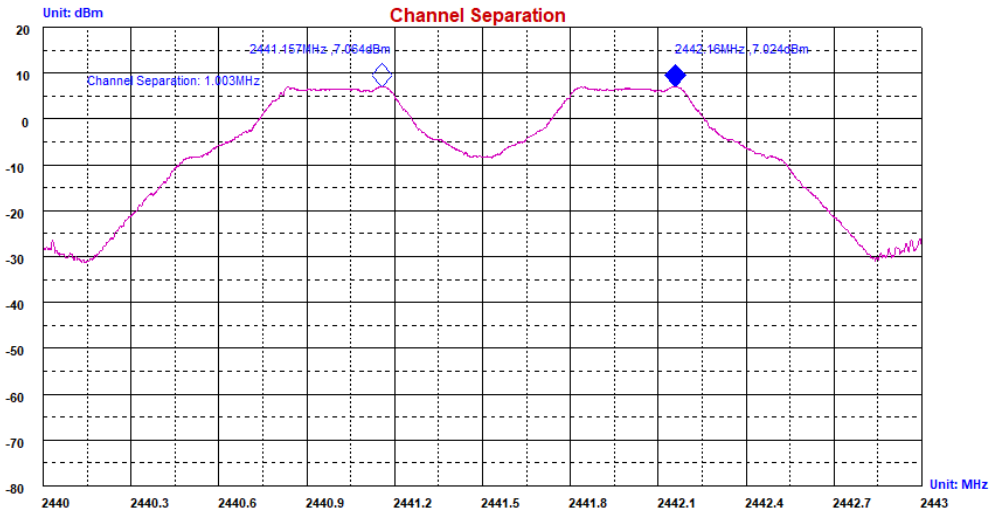
π/4DQPSK _2DH5/HCH	
8DPSK _3DH5/LCH	

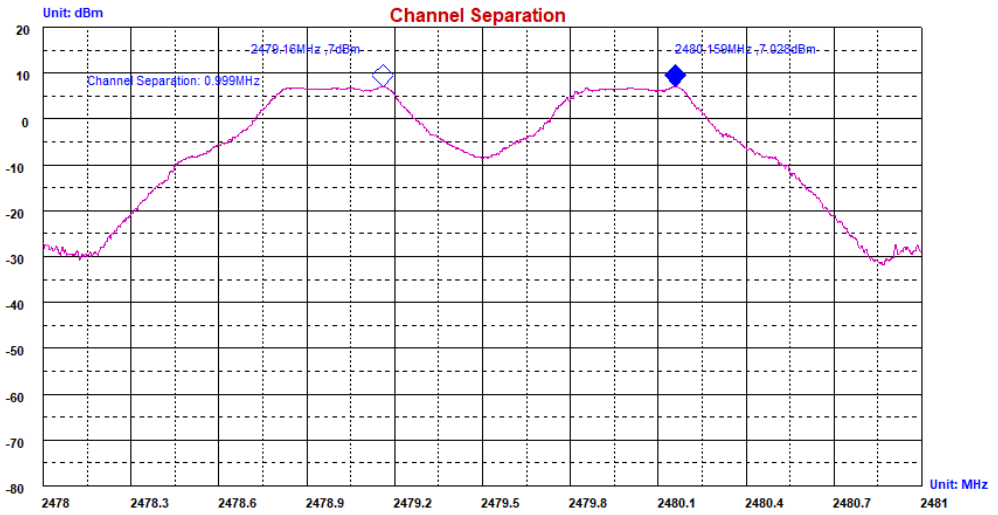
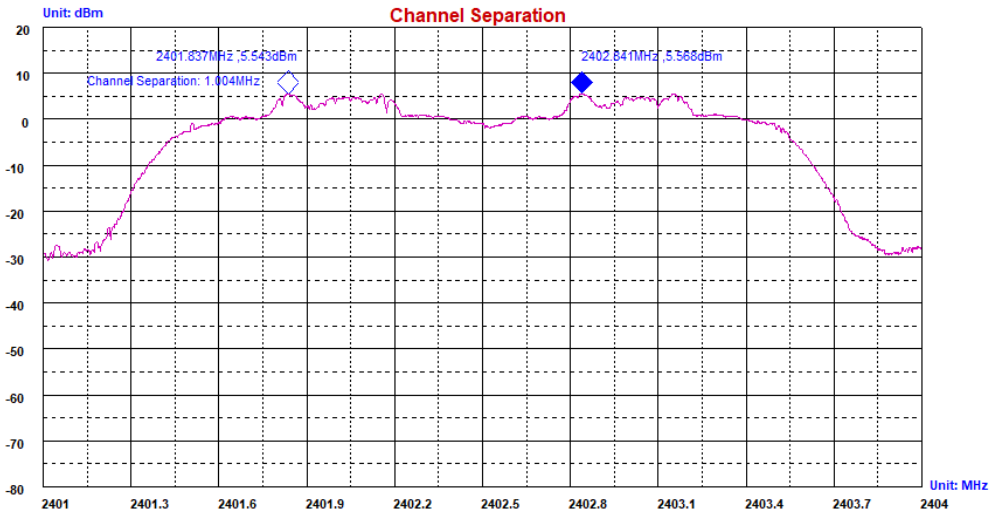
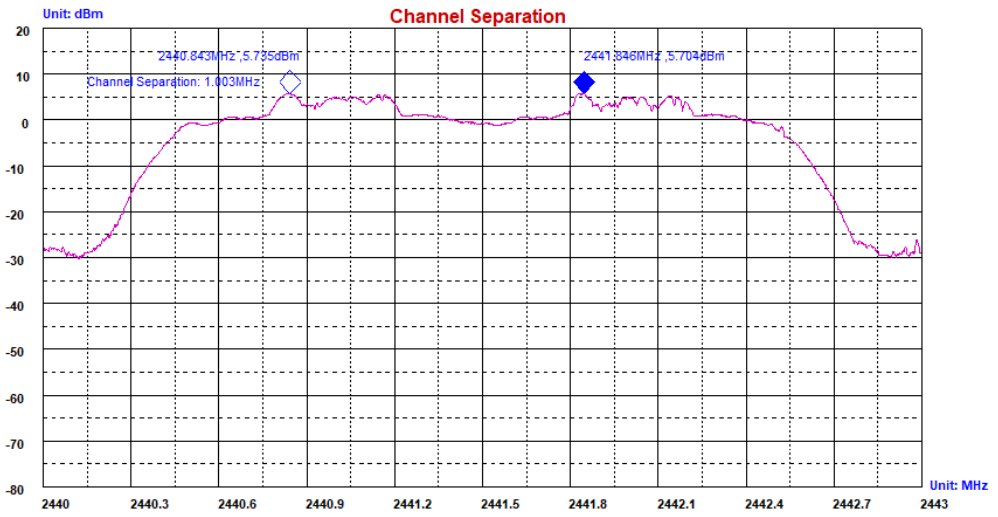
8DPSK _3DH5/MCH	
8DPSK _3DH5/HCH	

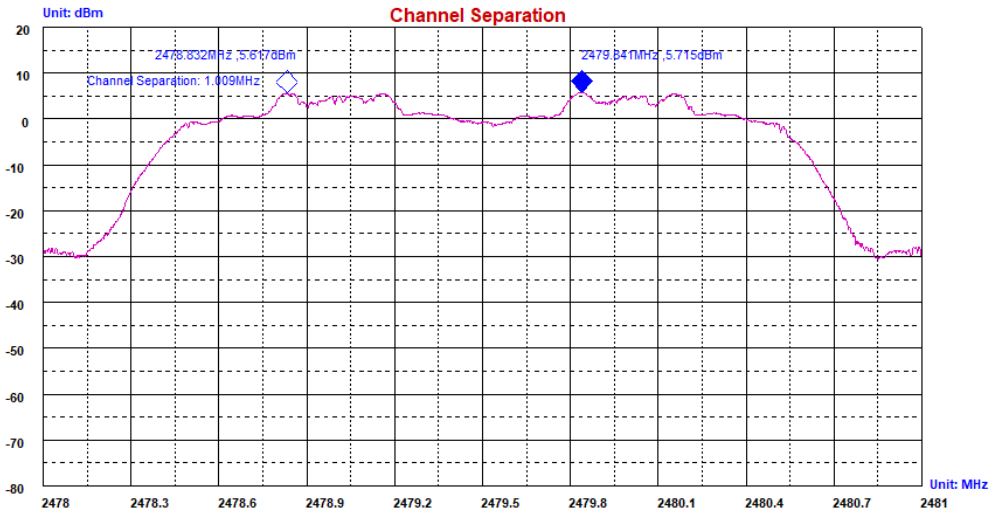
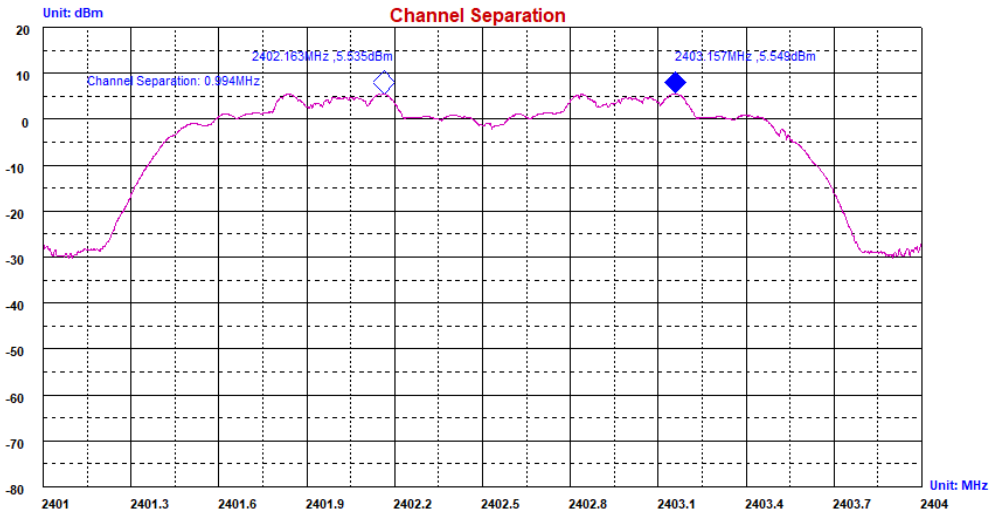
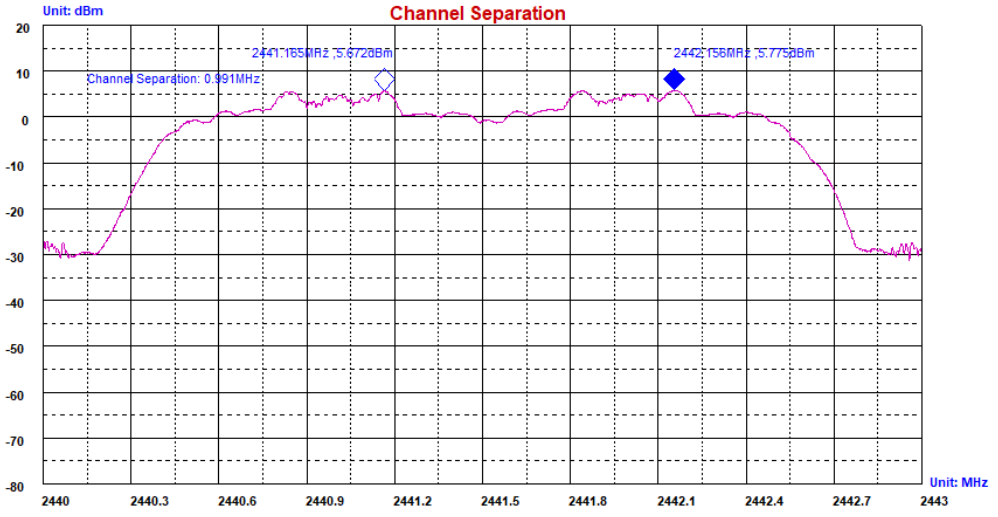
A.3 Carrier Frequency Separation

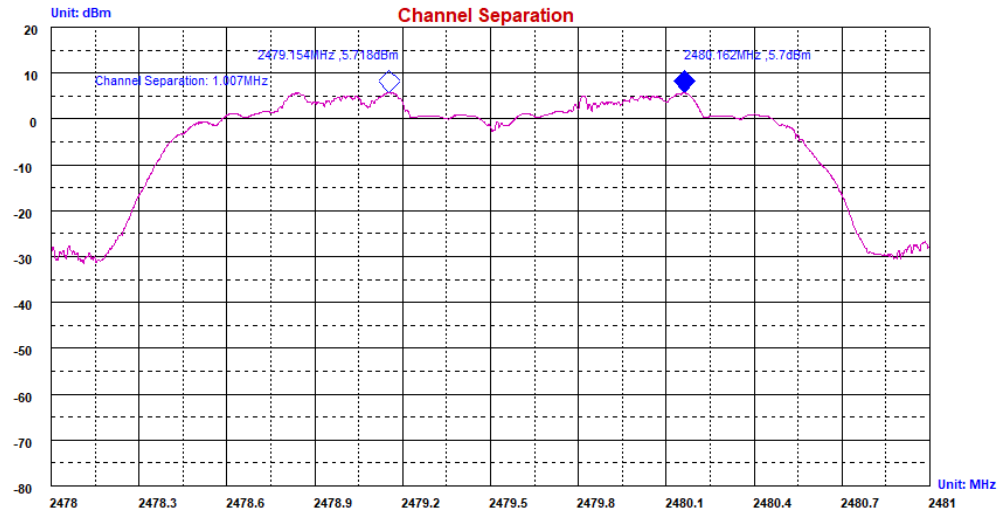
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.009	0.637	PASS
GFSK	MCH	1.003	0.666	PASS
GFSK	HCH	0.999	0.639	PASS
π/4DQPSK	LCH	1.004	0.833	PASS
π/4DQPSK	MCH	1.003	0.871	PASS
π/4DQPSK	HCH	1.009	0.883	PASS
8DPSK	LCH	0.994	0.845	PASS
8DPSK	MCH	0.991	0.841	PASS
8DPSK	HCH	1.007	0.841	PASS

Test Graph

Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	
π/4DQPSK/MCH	

π/4DQPSK/HCH	
8DPSK/LCH	
8DPSK/MCH	

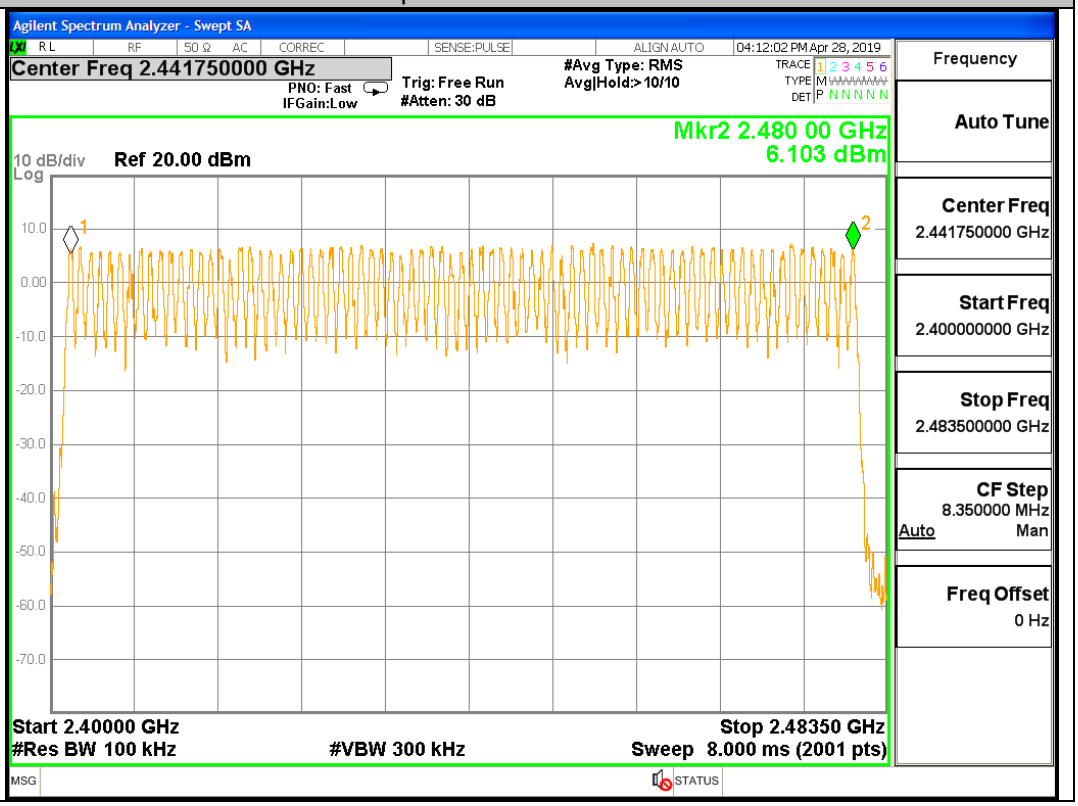
8DPSK/HCH	

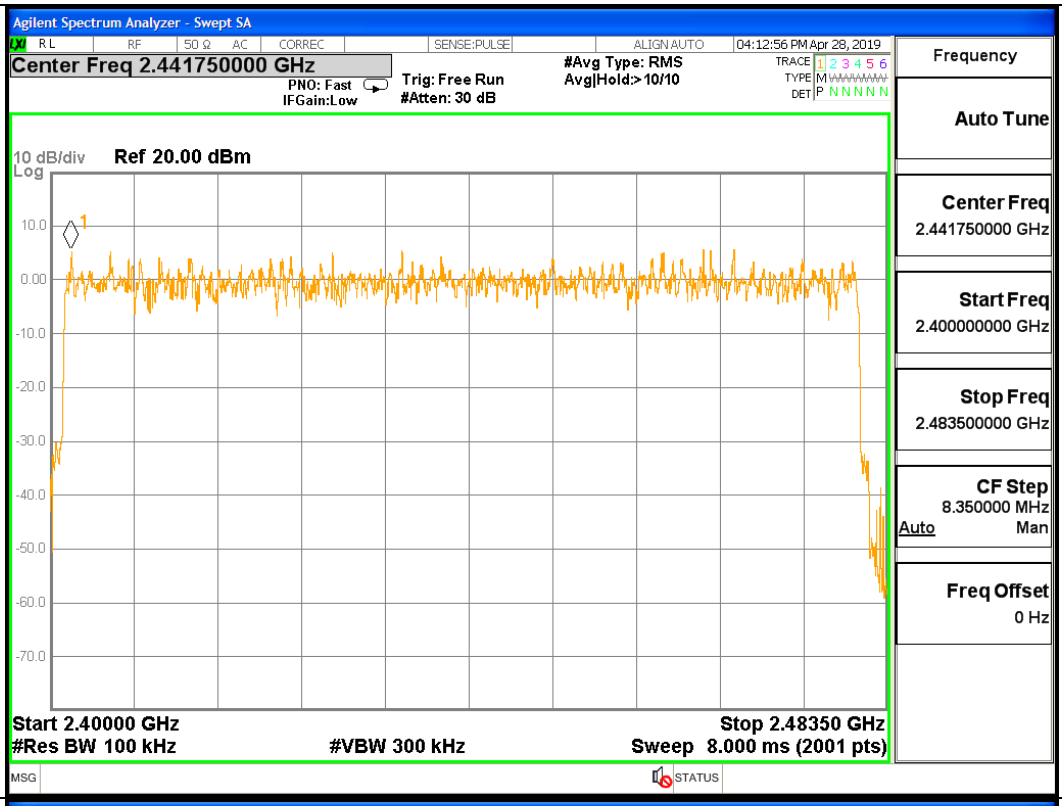
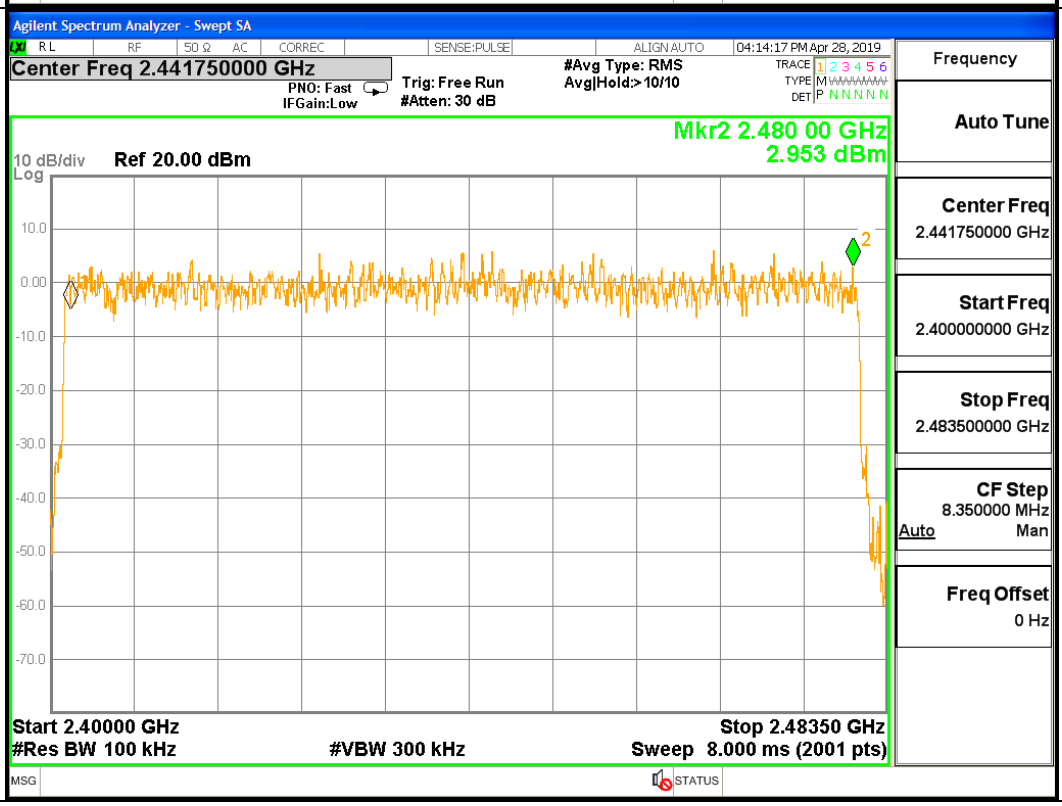
Unit: dBm
Channel Separation
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
2479.154MHz ,5.718dBm
Channel Separation: 1.007MHz
2480.162MHz ,5.7dBm
2478
2478.3
2478.6
2478.9
2479.2
2479.5
2479.8
2480.1
2480.4
2480.7
2481
Unit: MHz

A.4 Hopping Channel Number

Mode	Channel.	Number of Hopping Channel[N]	Limit[N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graph

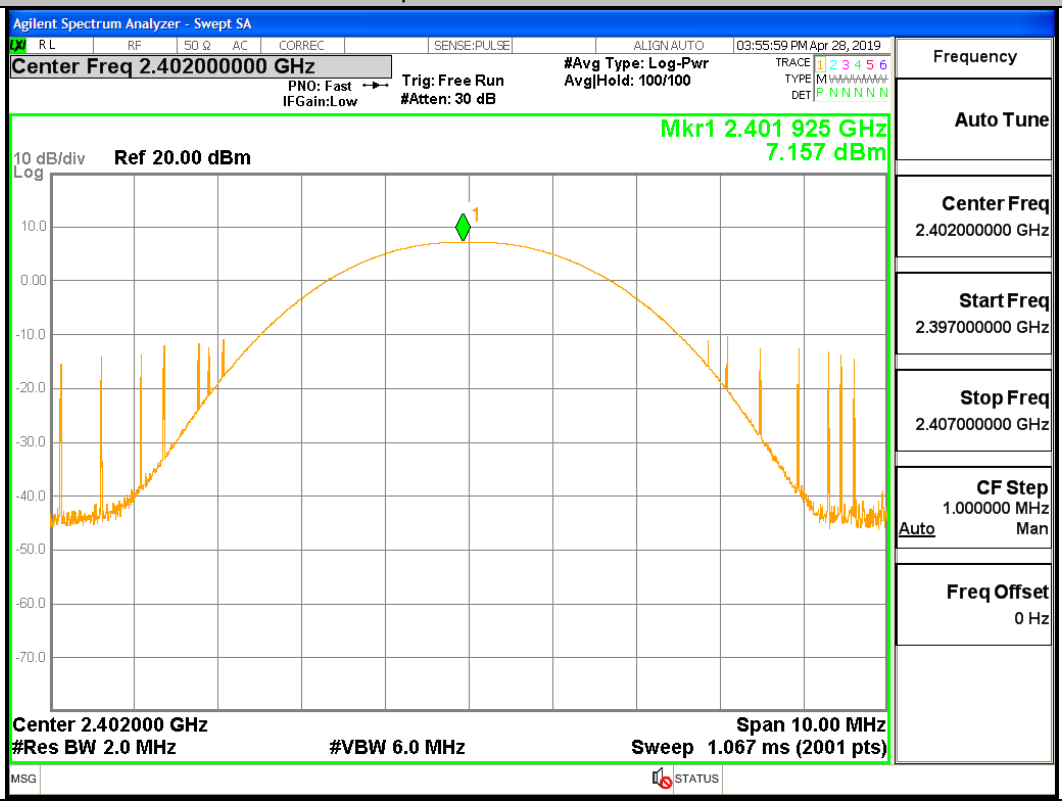
Graphs	
GFSK/Hop	

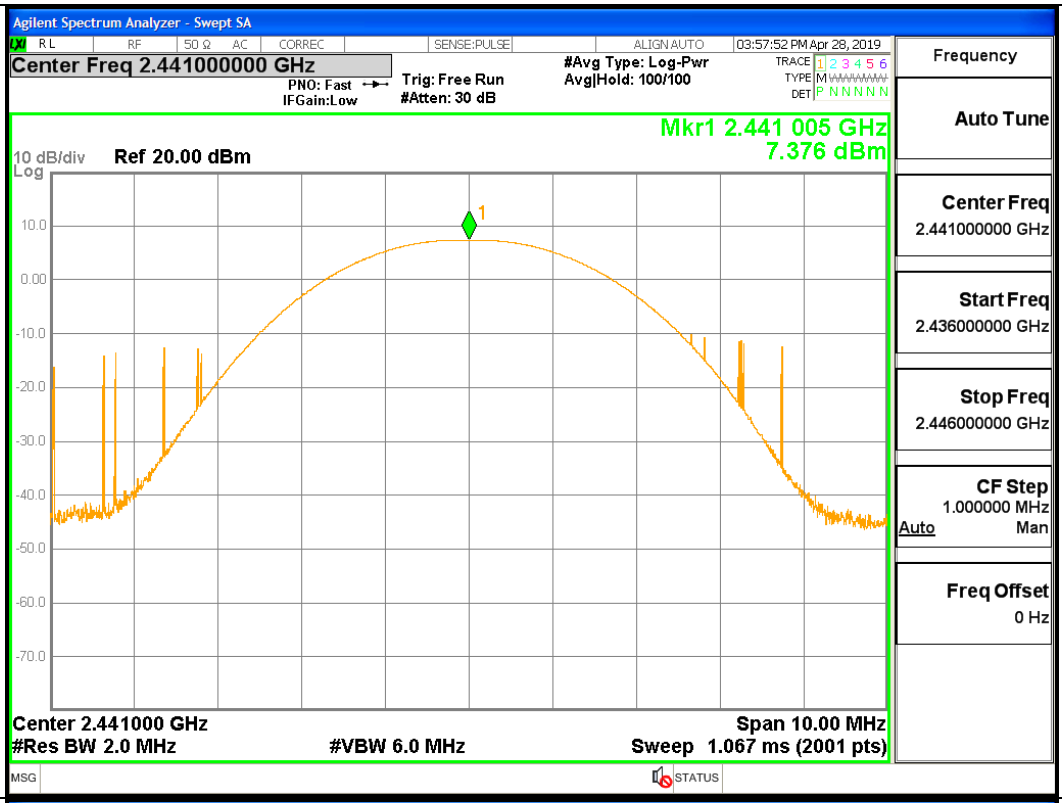
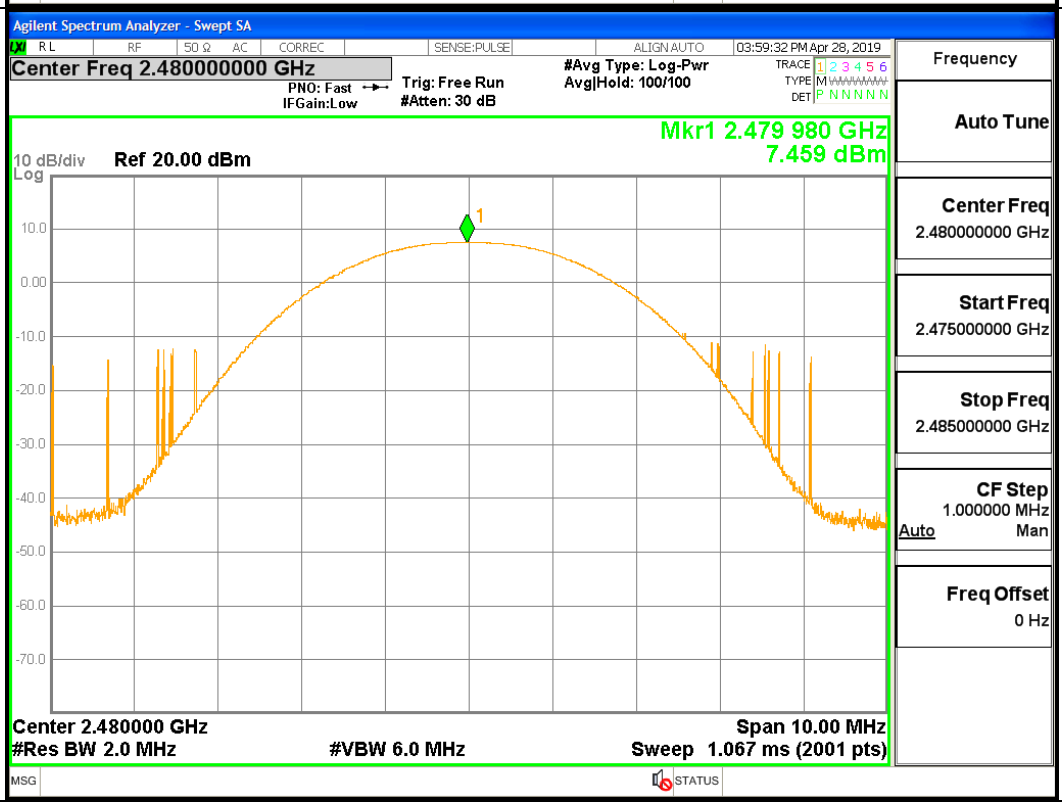
π/4DQPSK/Hop	
8DPSK/Hop	

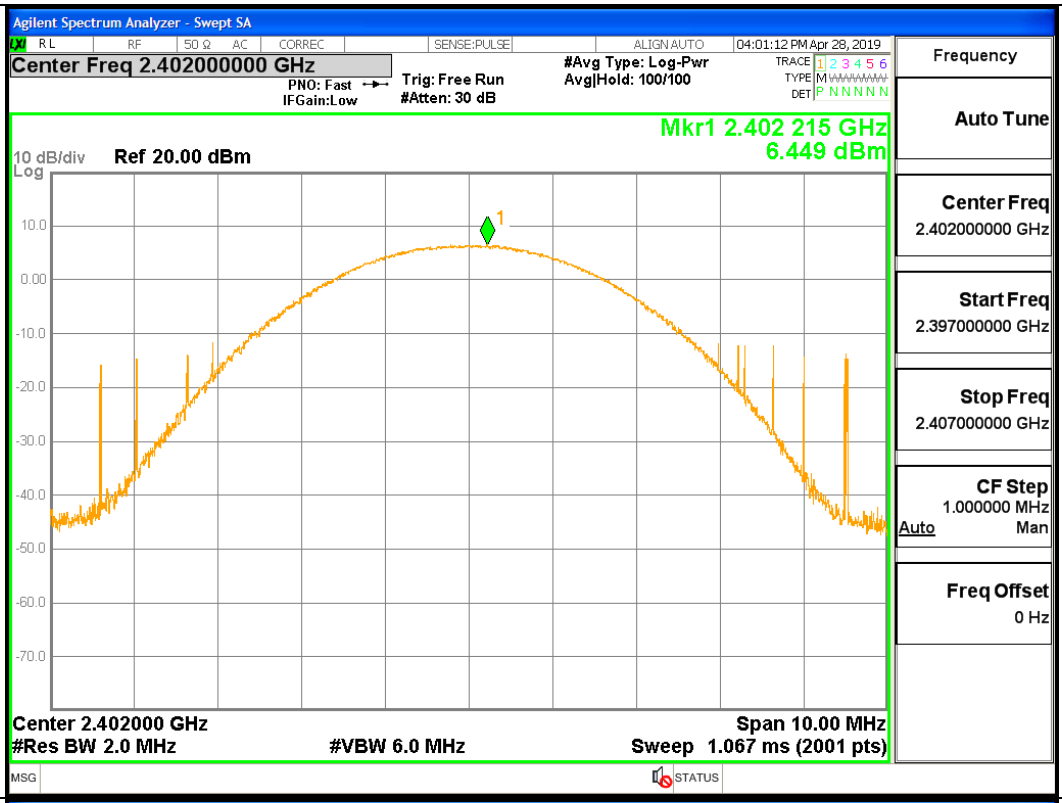
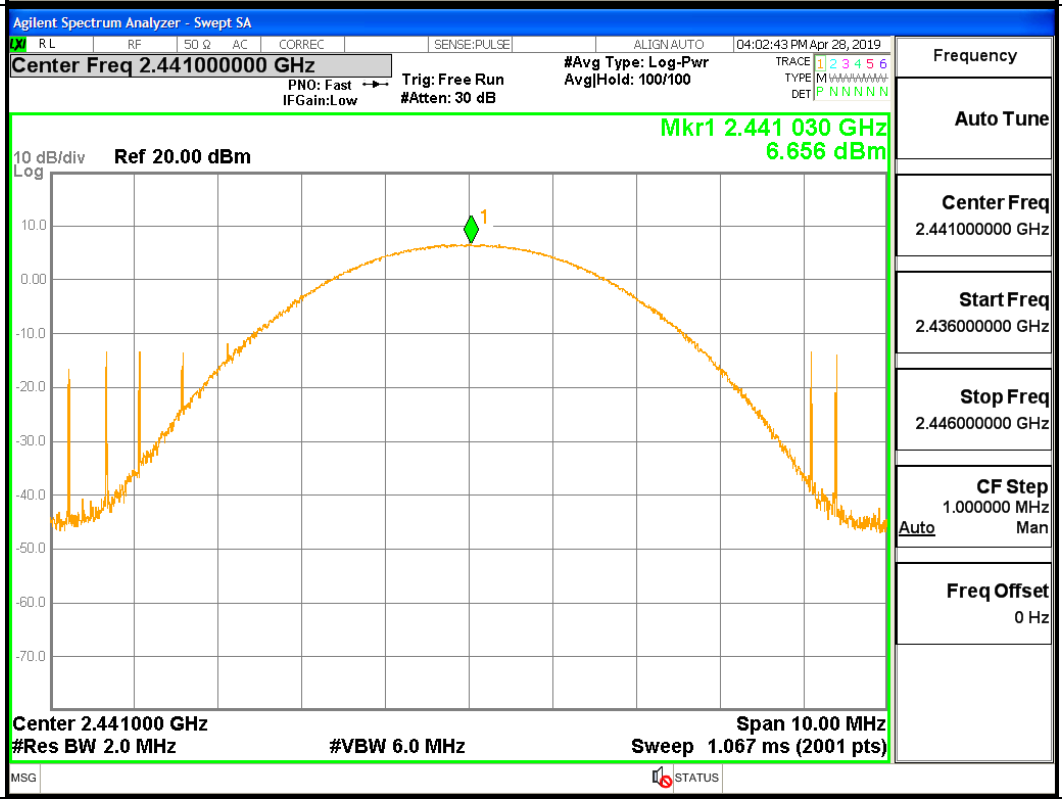
A.5 Conducted Peak Output Power

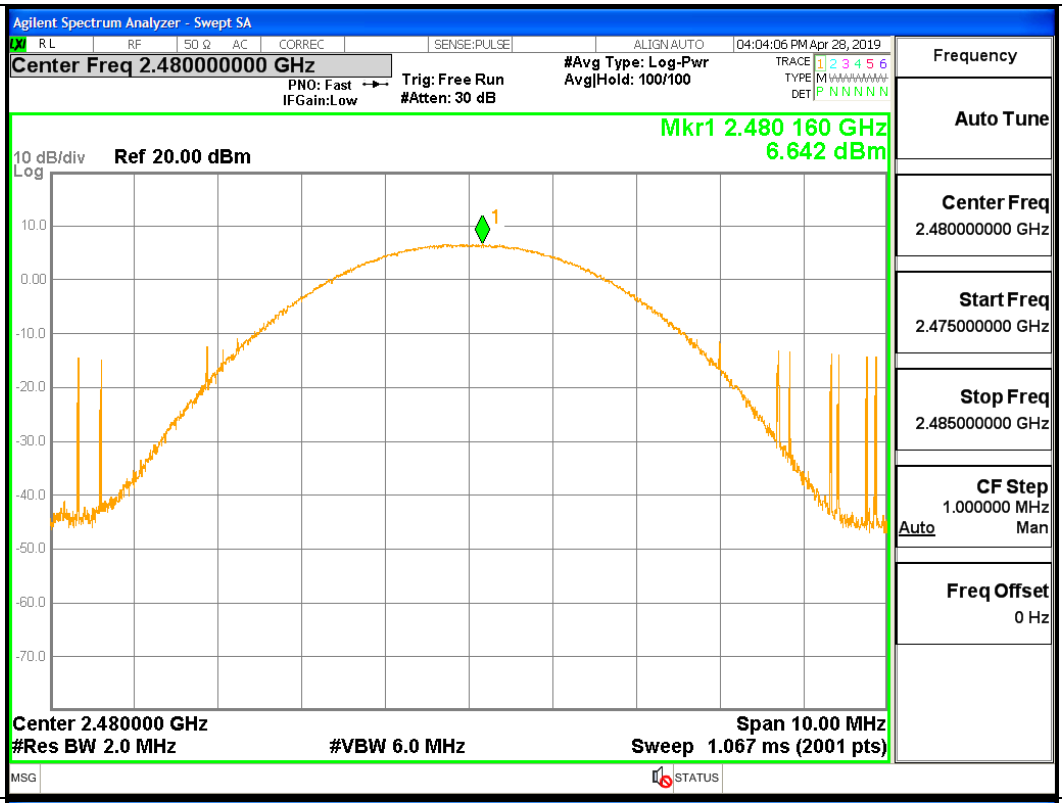
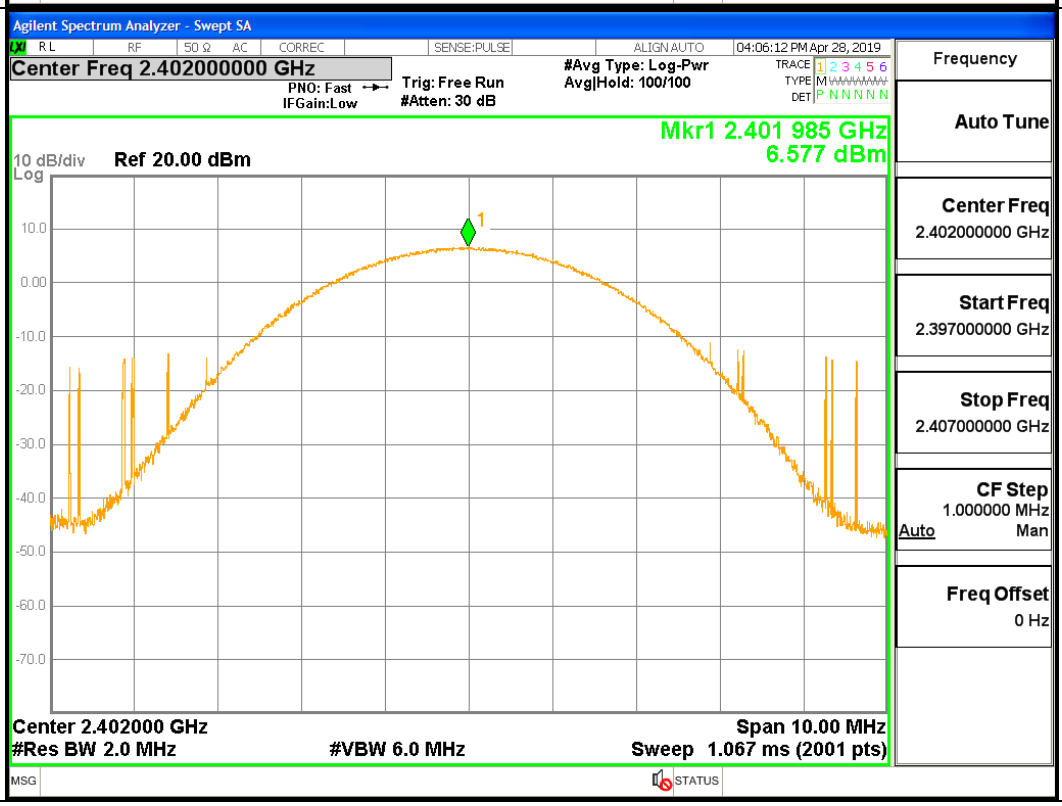
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	7.157	21	PASS
GFSK	MCH	7.376	21	PASS
GFSK	HCH	7.459	21	PASS
π/4DQPSK	LCH	6.449	21	PASS
π/4DQPSK	MCH	6.656	21	PASS
π/4DQPSK	HCH	6.642	21	PASS
8DPSK	LCH	6.577	21	PASS
8DPSK	MCH	6.876	21	PASS
8DPSK	HCH	6.940	21	PASS

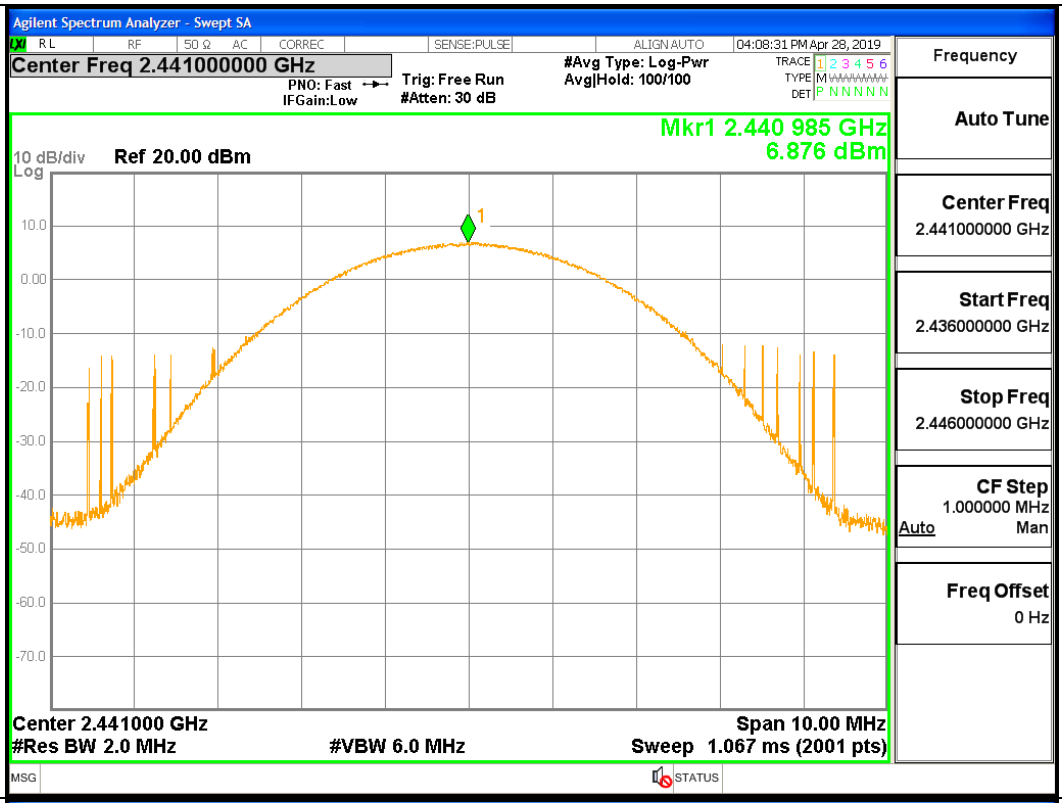
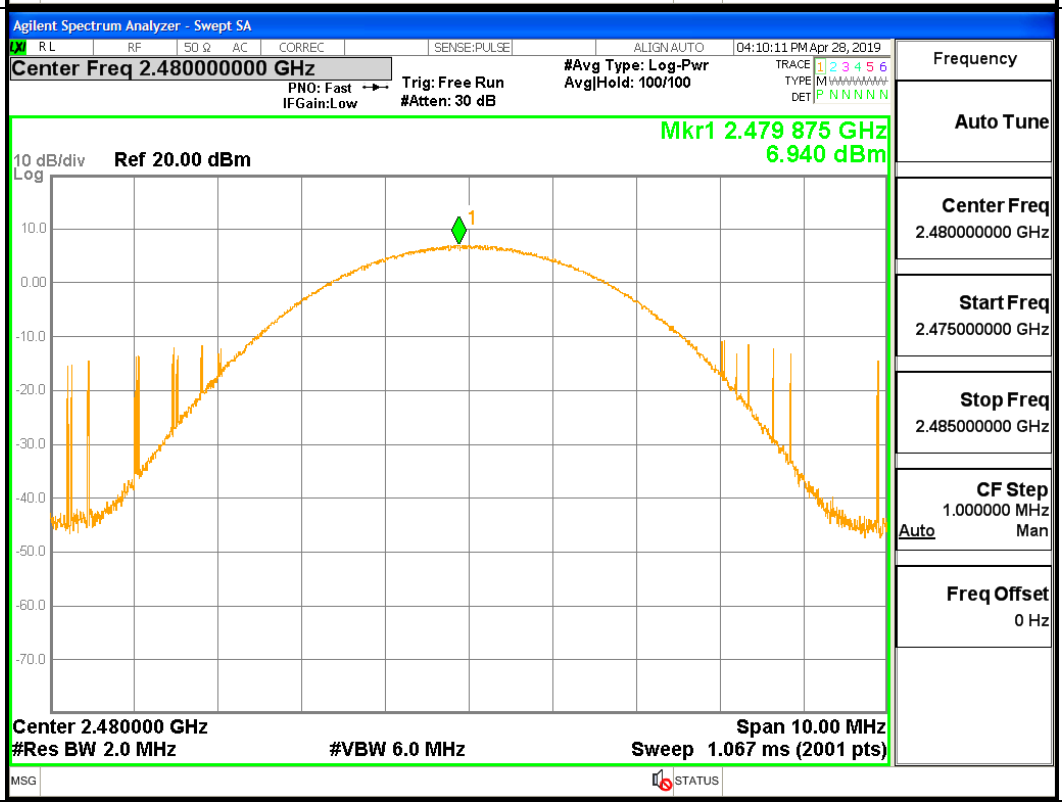
Test Graph

Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

π/4DQPSK/LCH	
π/4DQPSK/MCH	

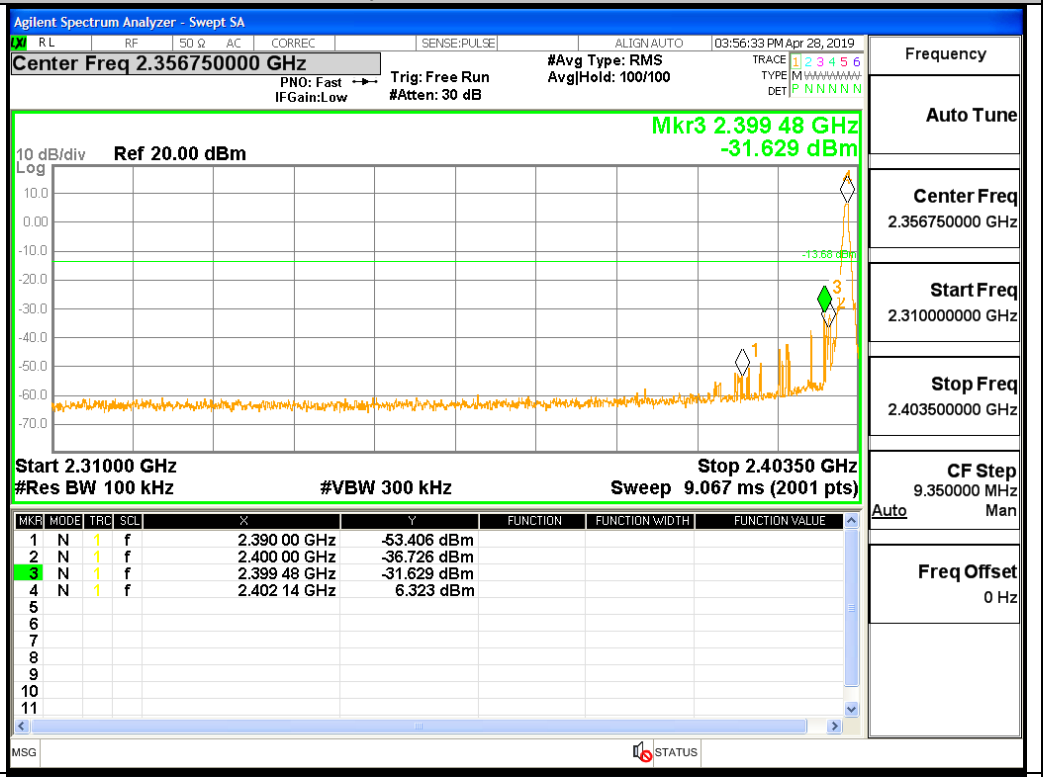
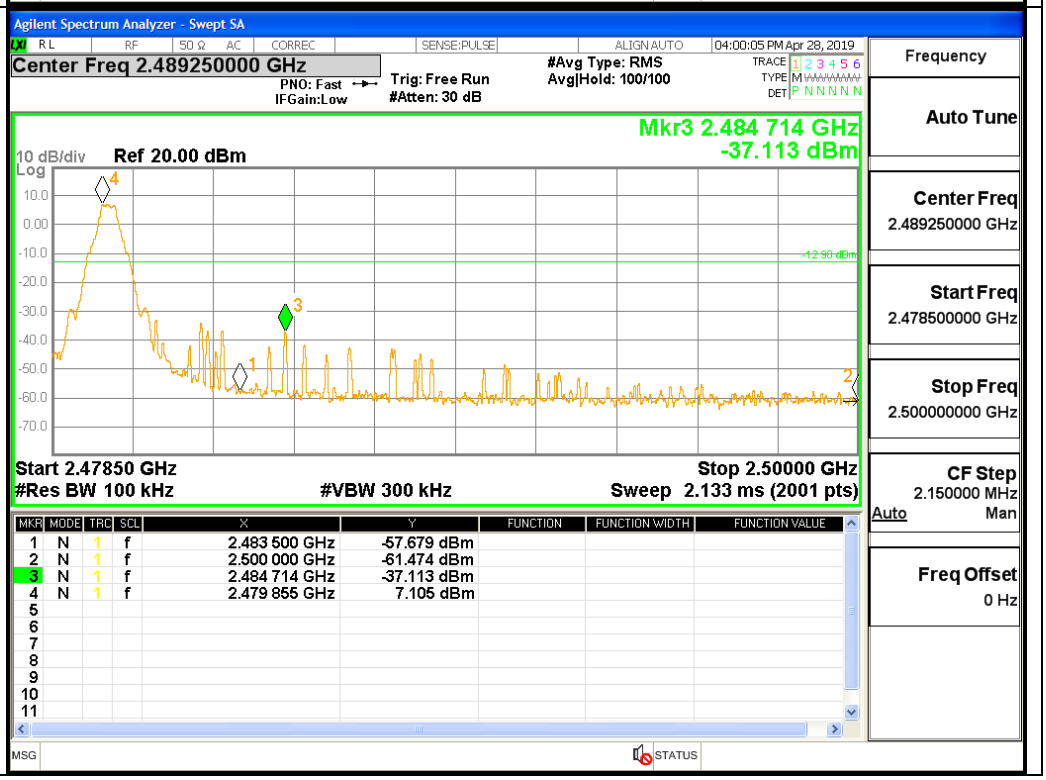
π/4DQPSK/HCH	
8DPSK/LCH	

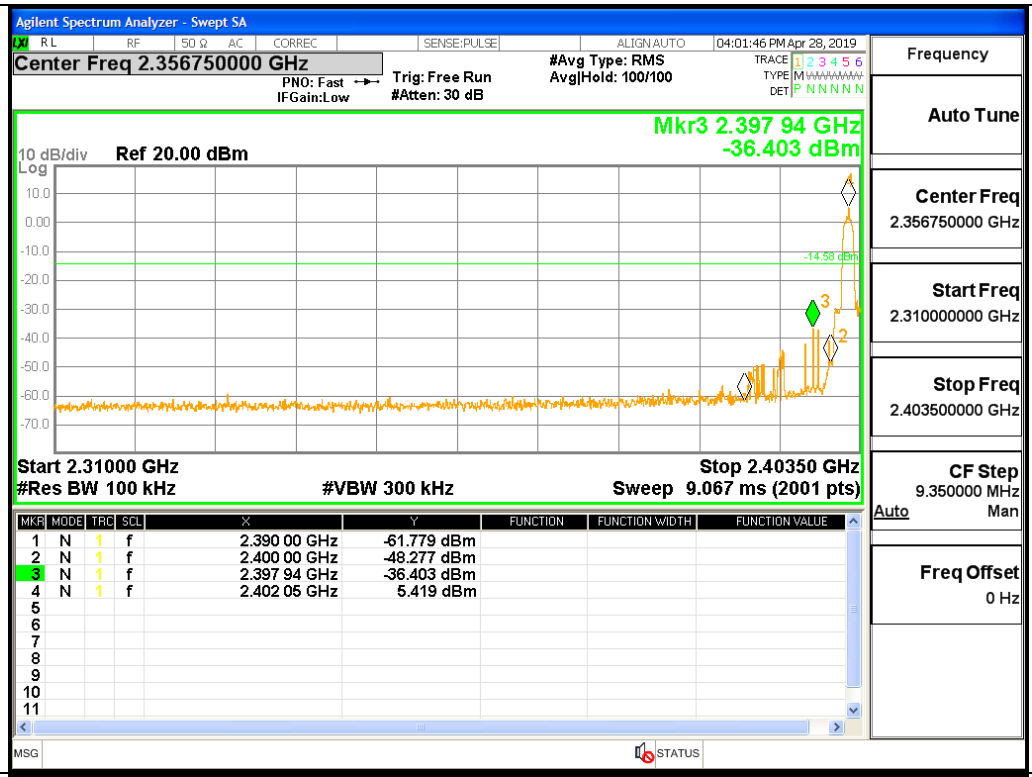
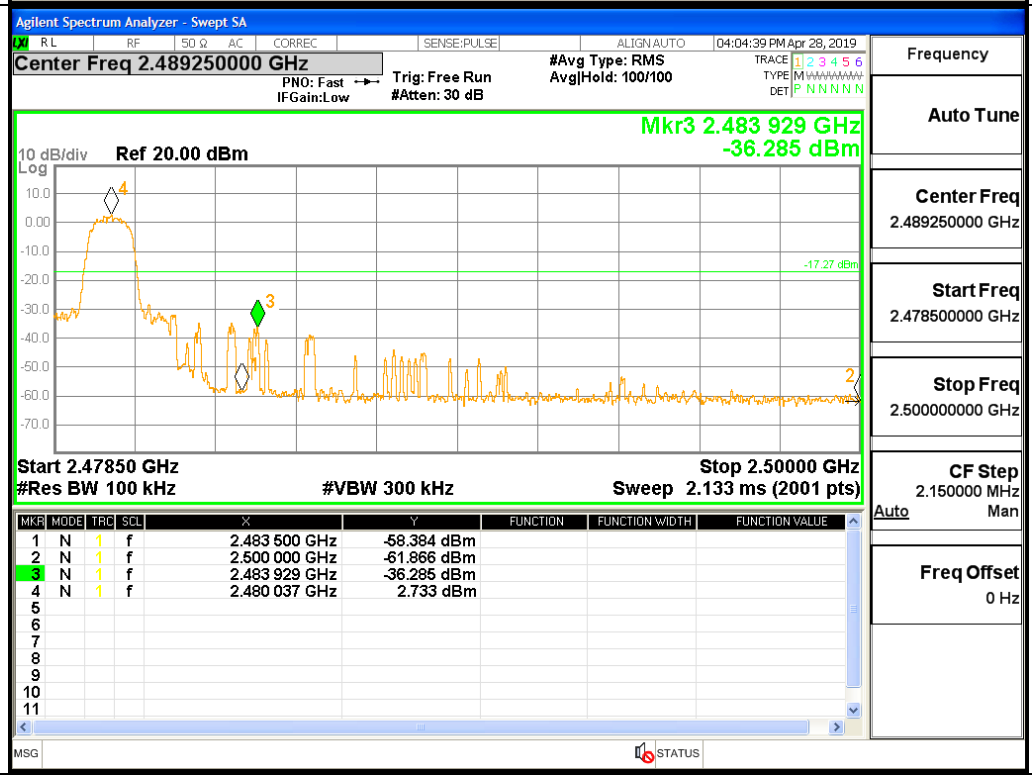
8DPSK/MCH	
8DPSK/HCH	

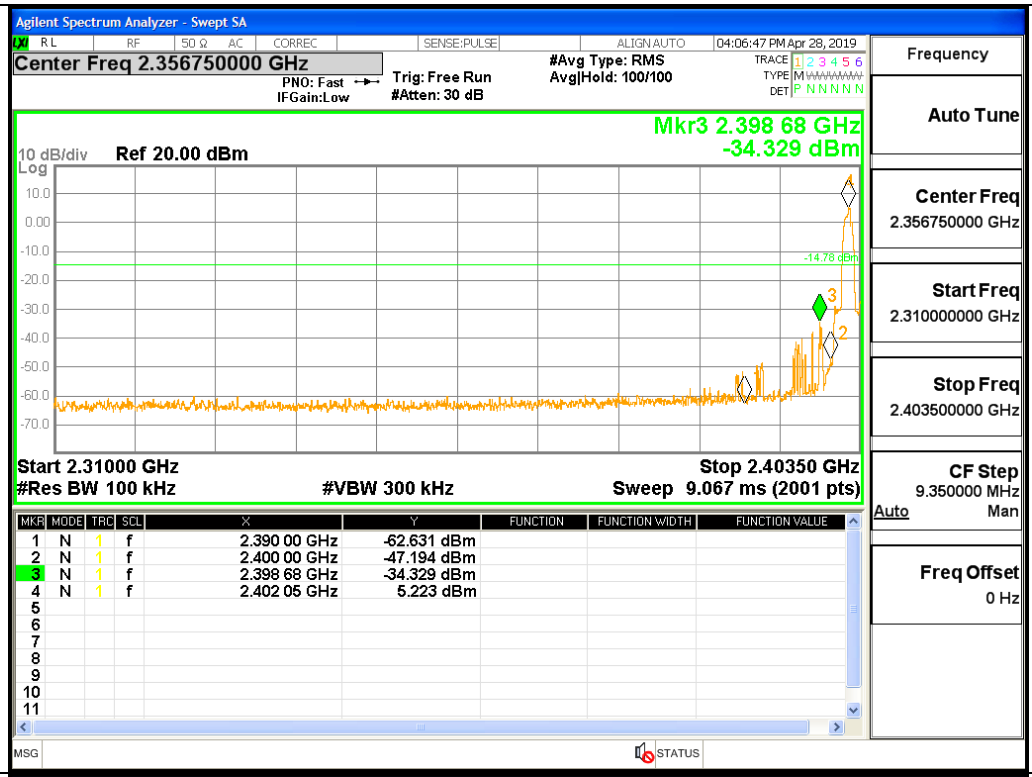
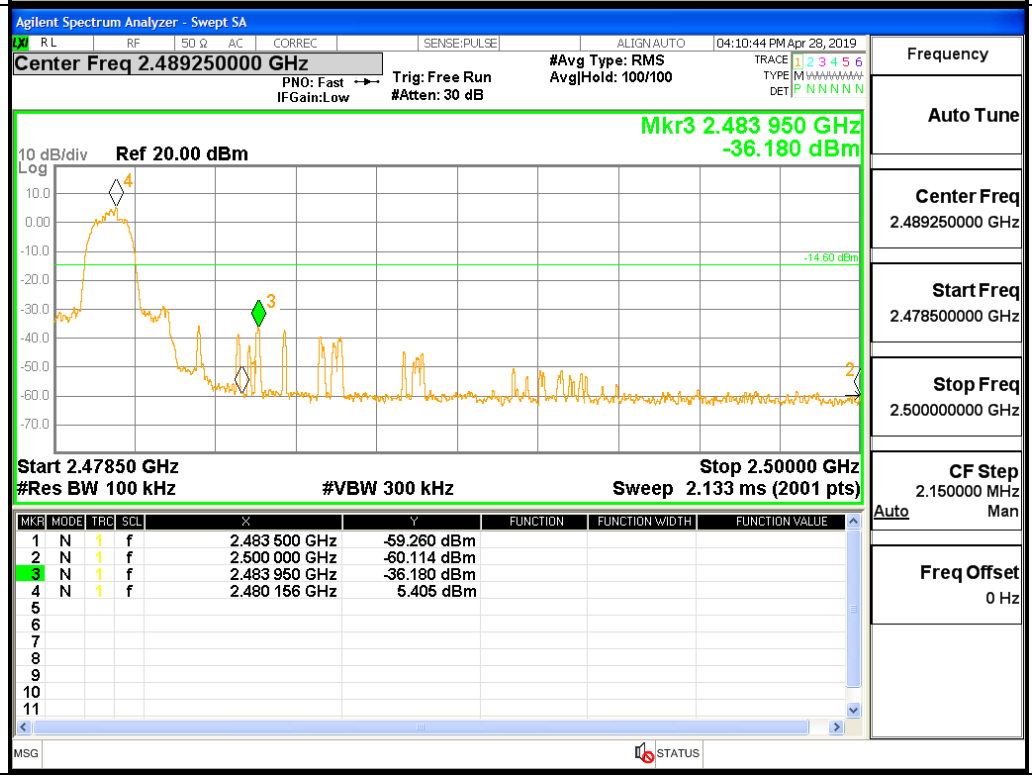
A.6 Band-edge for RF Conducted Emissions

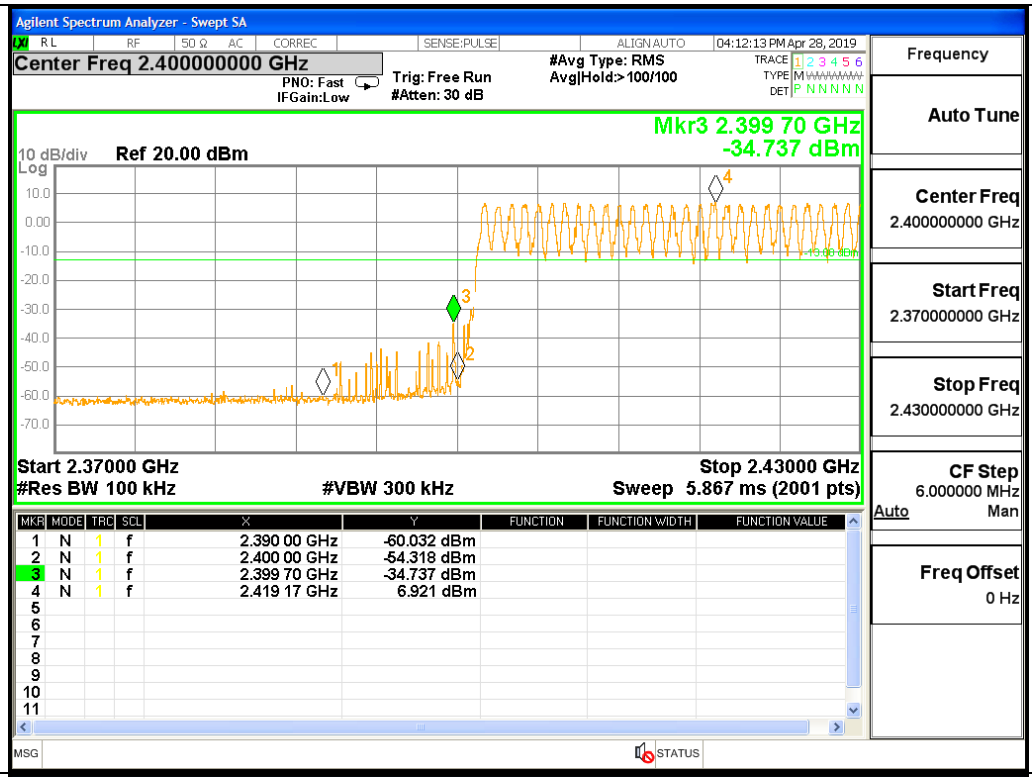
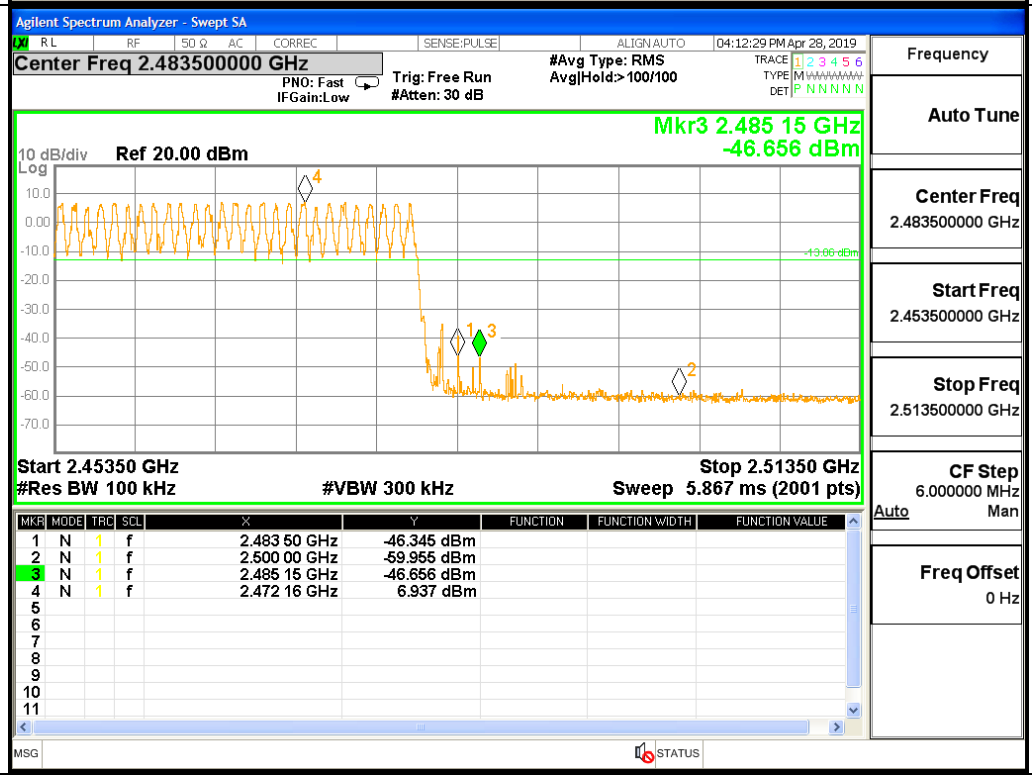
Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2399.48	6.323	-31.629	-13.677	Pass
1DH5	2480	2484.714	7.105	-37.113	-12.895	Pass
2DH5	2402	2397.937	5.419	-36.403	-14.581	Pass
2DH5	2480	2483.929	2.733	-36.285	-17.267	Pass
3DH5	2402	2398.685	5.223	-34.329	-14.777	Pass
3DH5	2480	2483.95	5.405	-36.18	-14.595	Pass
1DH5-Hopping	2402	2399.7	6.921	-34.737	-13.079	Pass
1DH5-Hopping	2480	2485.15	6.937	-46.656	-13.063	Pass
2DH5-Hopping	2402	2399.37	5.493	-38.049	-14.507	Pass
2DH5-Hopping	2480	2483.68	5.613	-38.416	-14.387	Pass
3DH5-Hopping	2402	2399.55	5.524	-38.444	-14.476	Pass
3DH5-Hopping	2480	2487.82	4.947	-44.196	-15.053	Pass

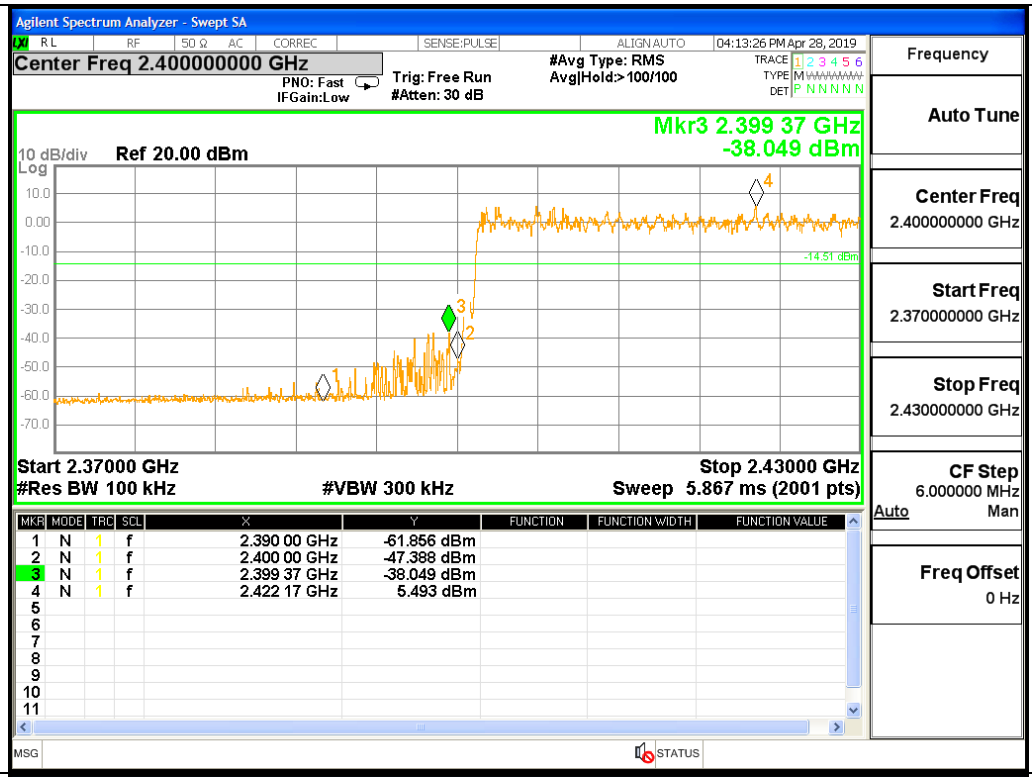
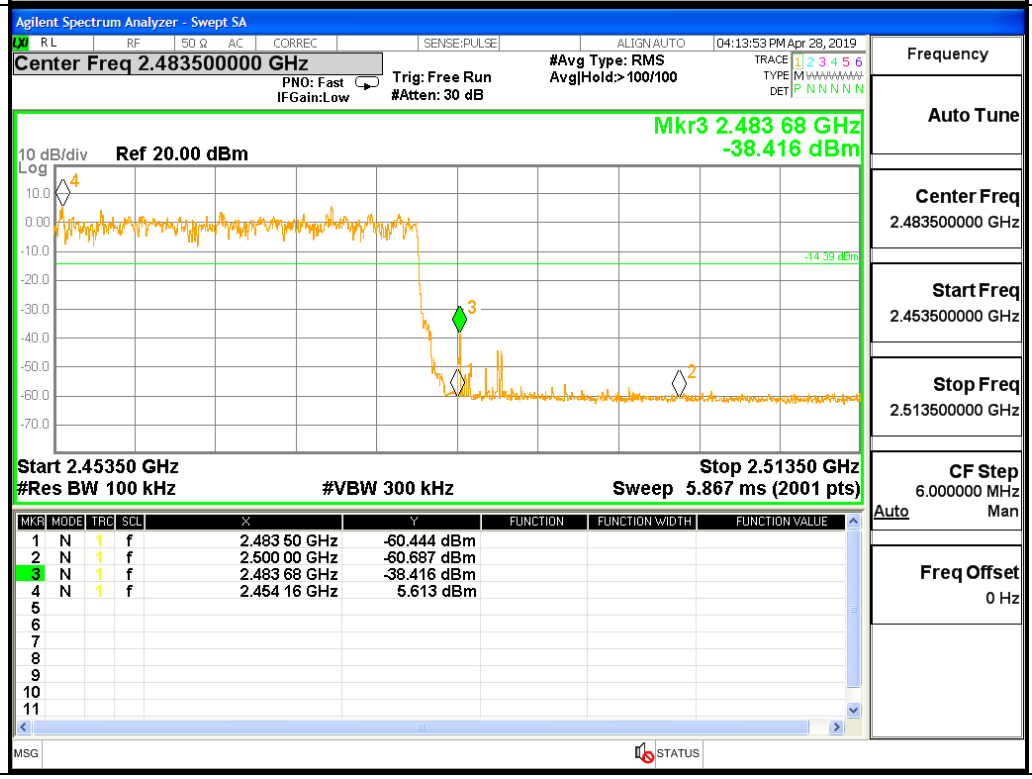
Test Graph

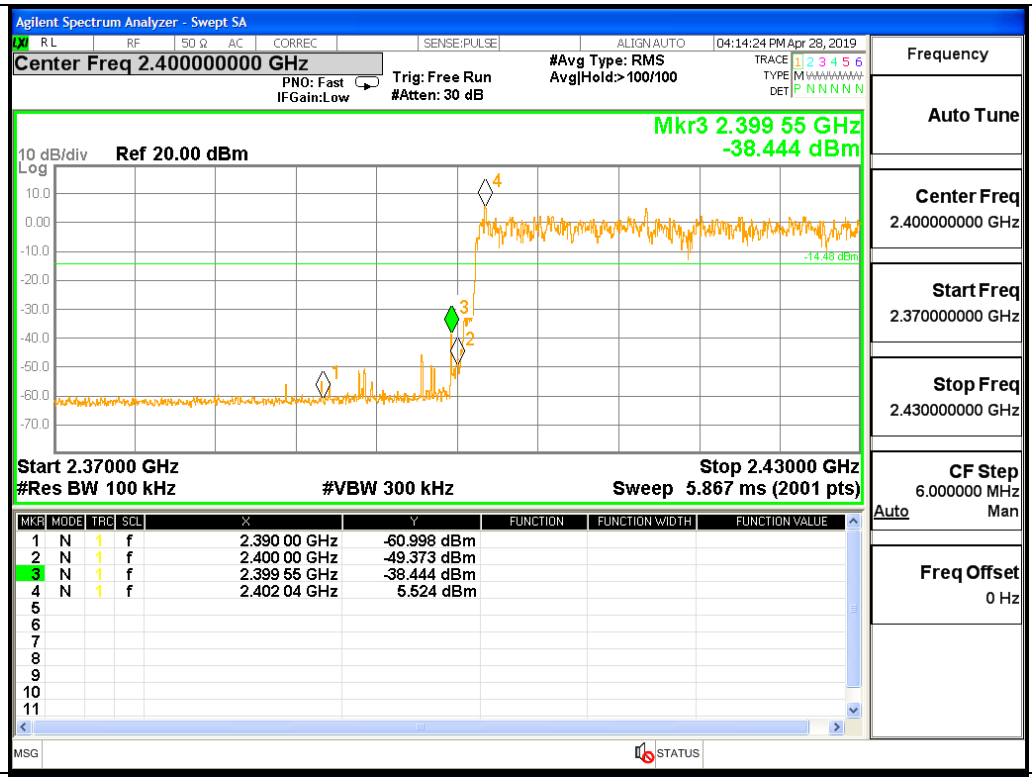
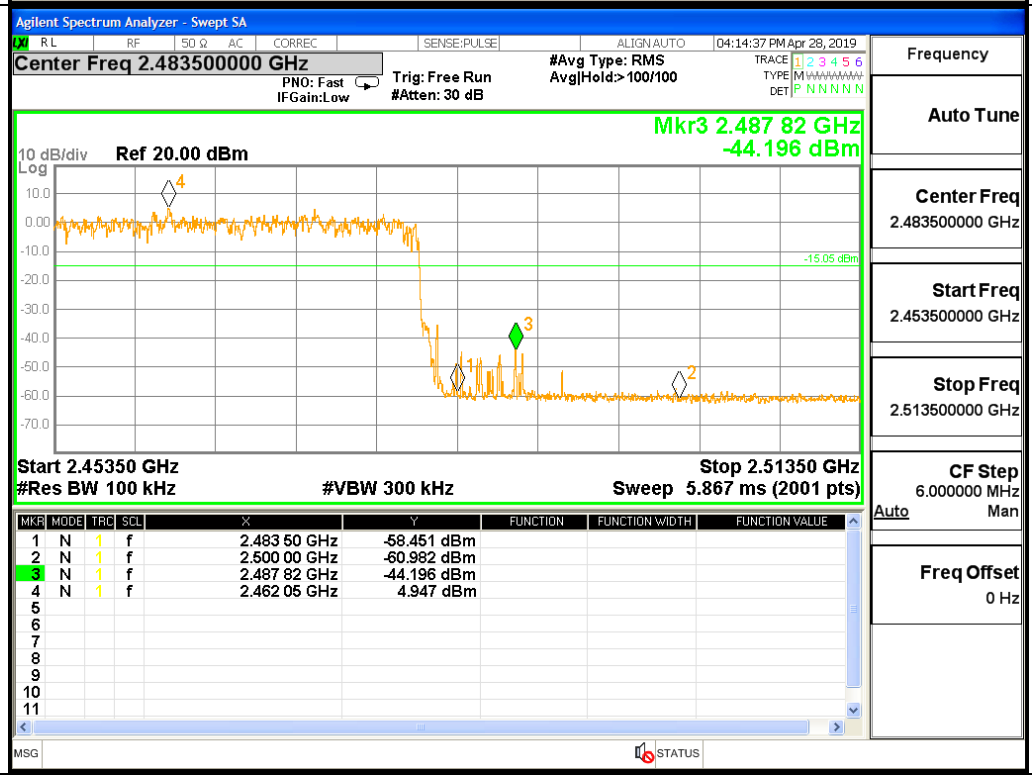
Graphs	
GFSK/LCH/No Hop	
GFSK/HCH/No Hop	

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

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

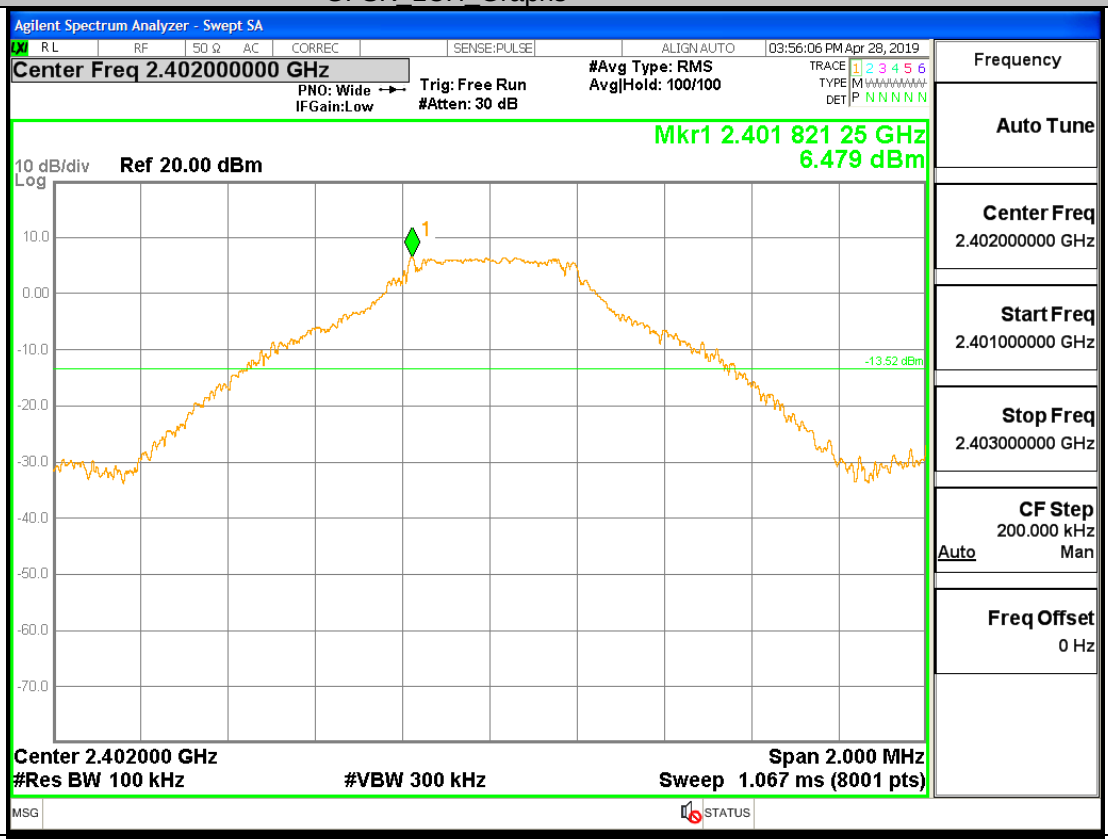
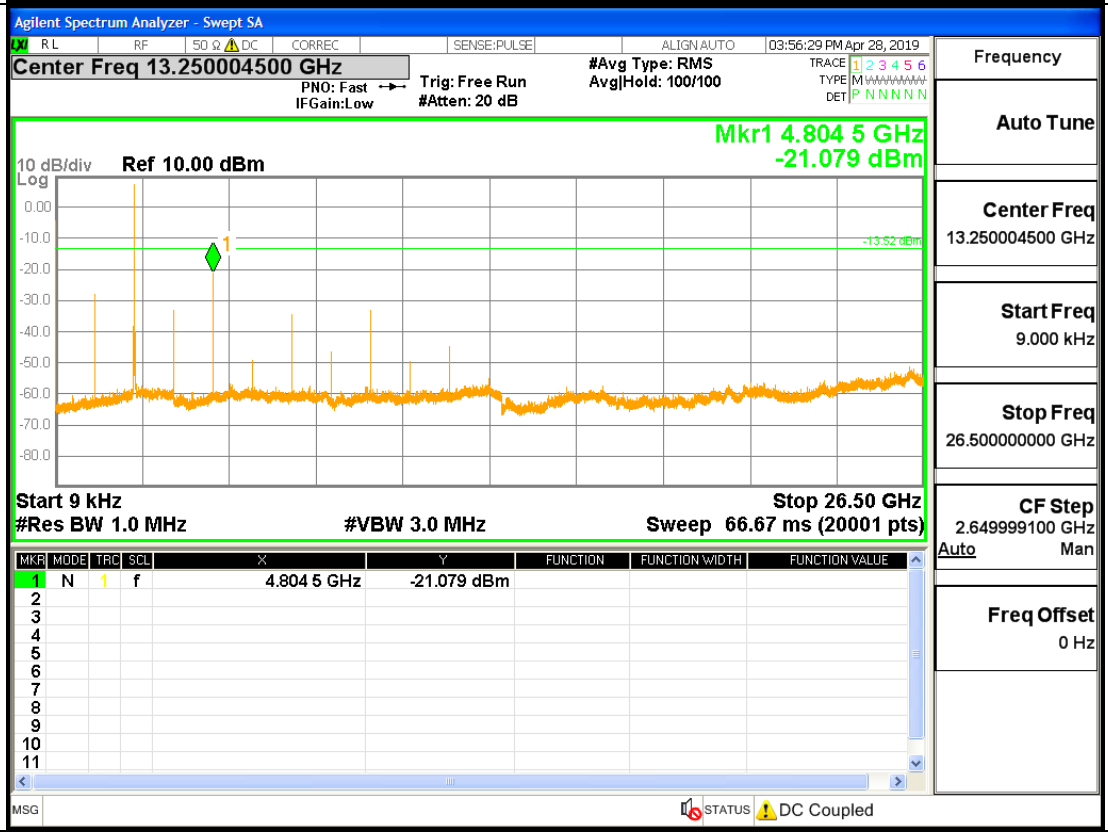
GFSK/LCH/Hop	
GFSK/HCH/Hop	

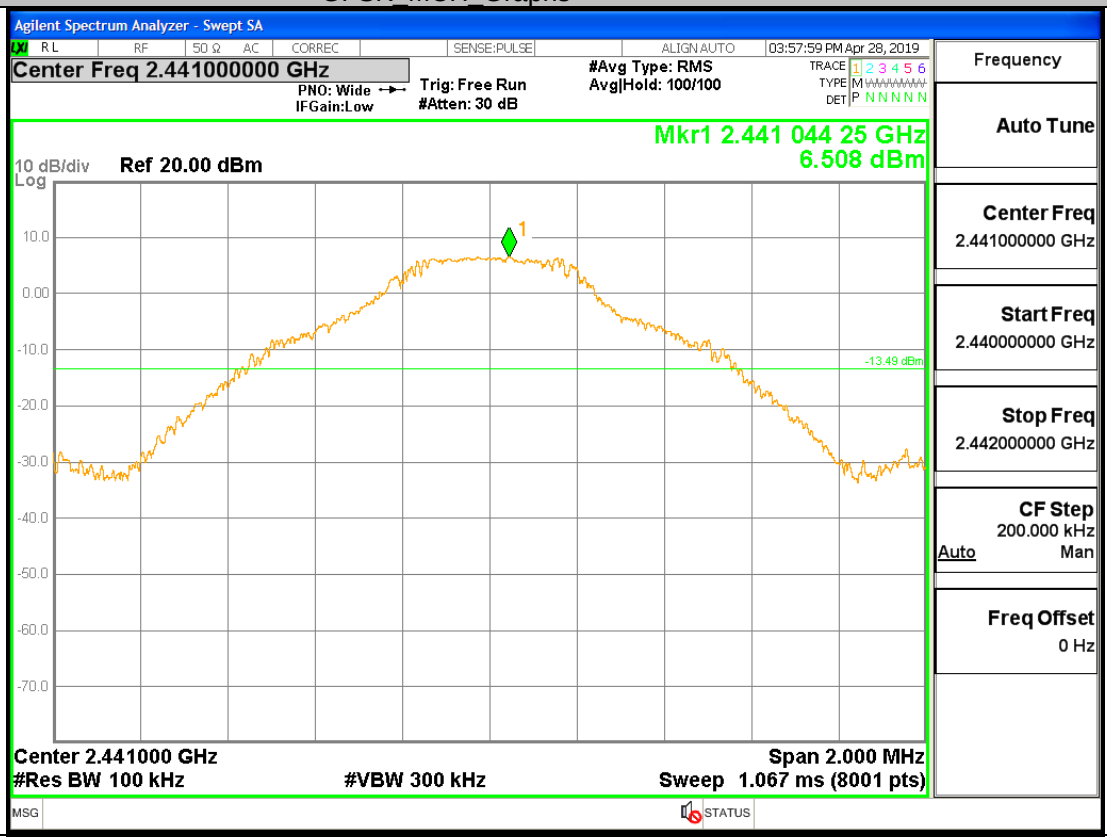
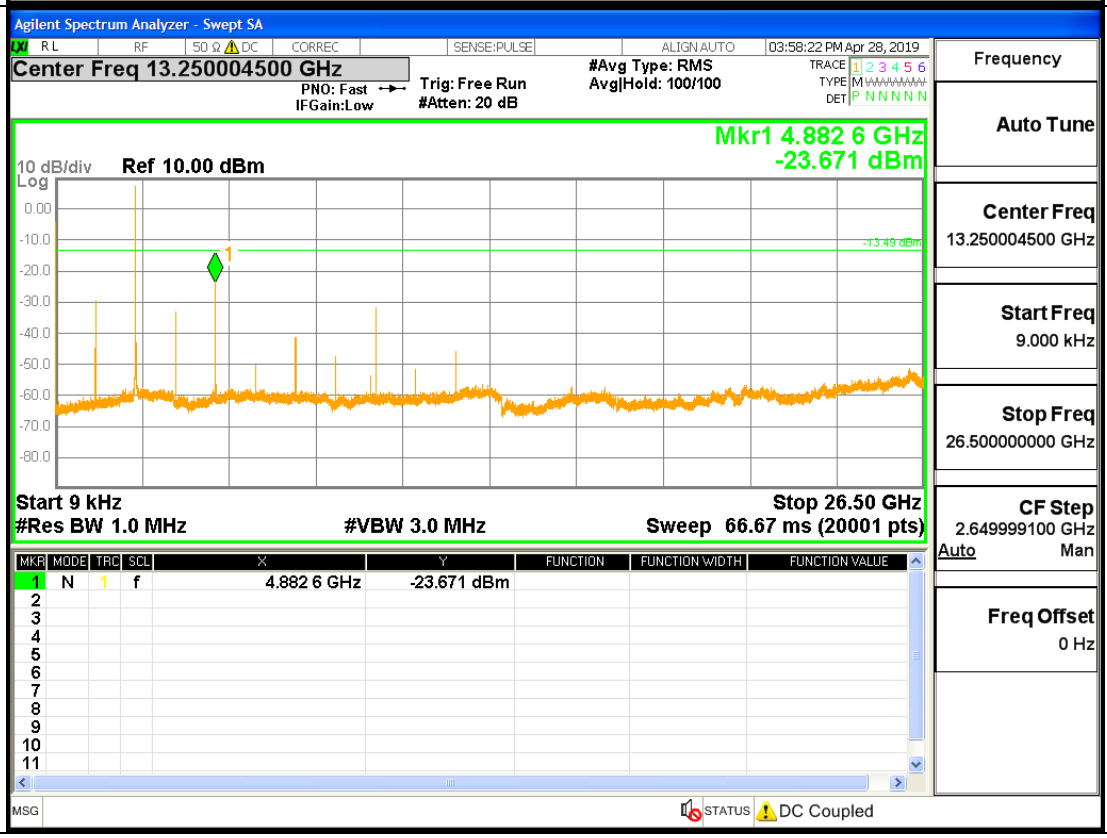
π /4DQPSK/LCH/Hop	
π /4DQPSK/HCH/Hop	

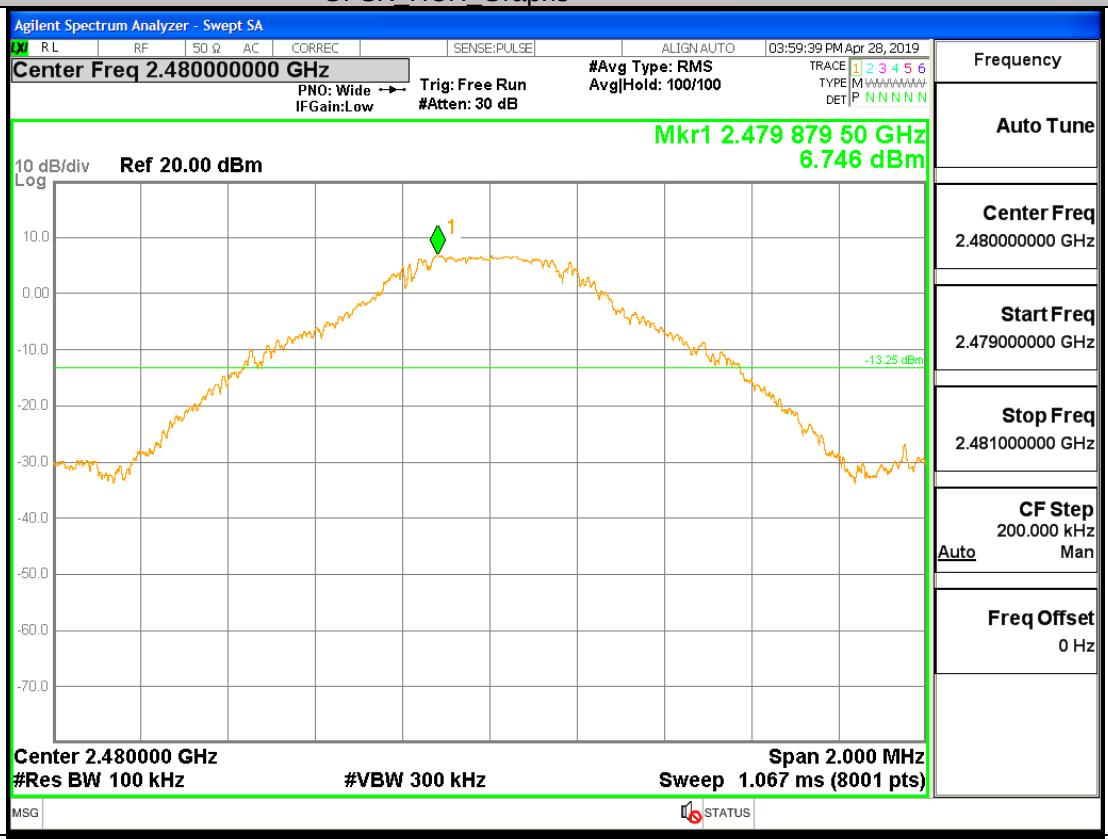
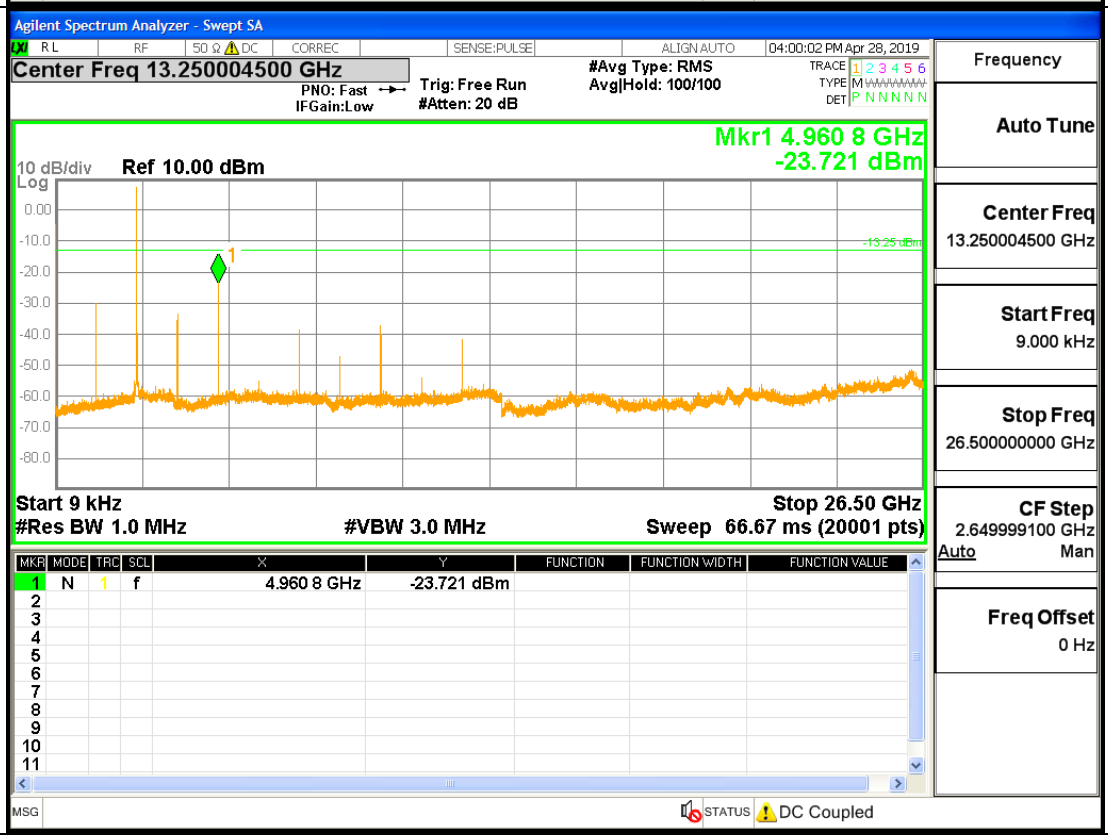
8DPSK/LCH/Hop	
8DPSK/HCH/Hop	

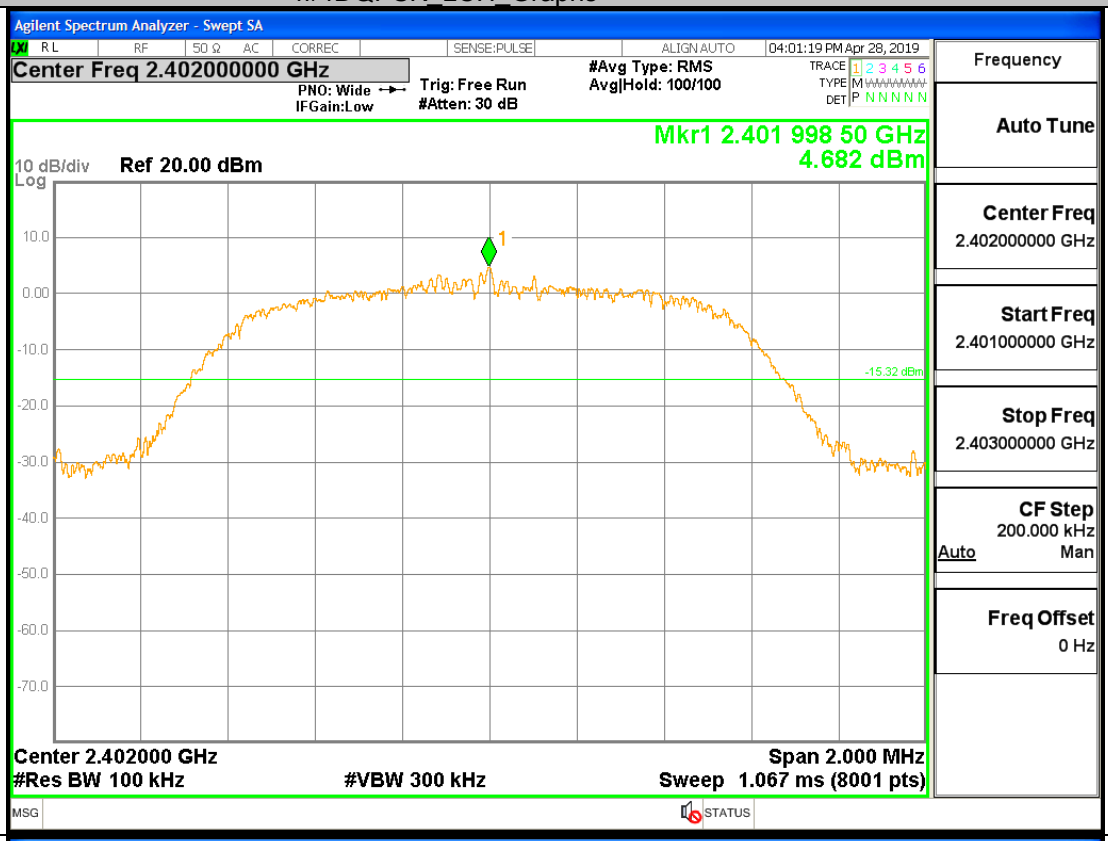
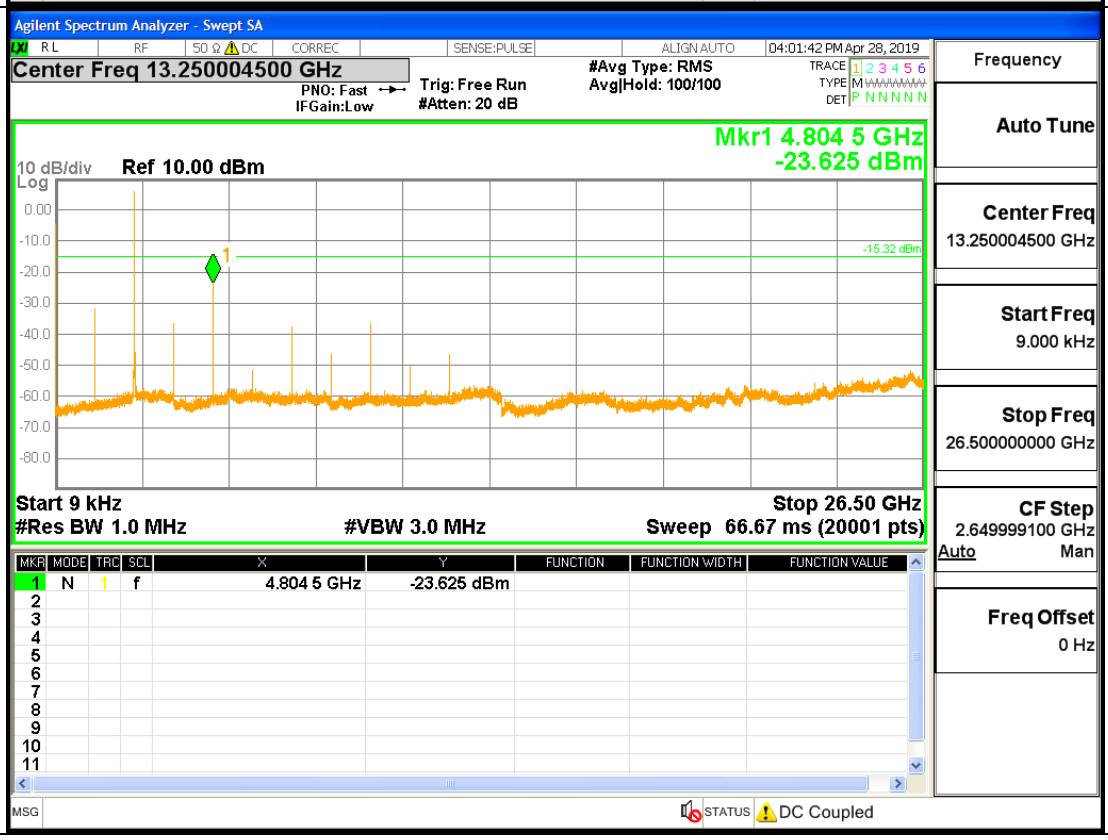
A.7 RF Conducted Spurious Emissions

Test Graph

GFSK_LCH_Graphs	
Pref	
Puw	

GFSK_MCH_Graphs	
Pref	
Puw	

GFSK_HCH_Graphs	
Pref	
Puw	

π/4DQPSK_LCH_Graphs	
Pref	
Puw	

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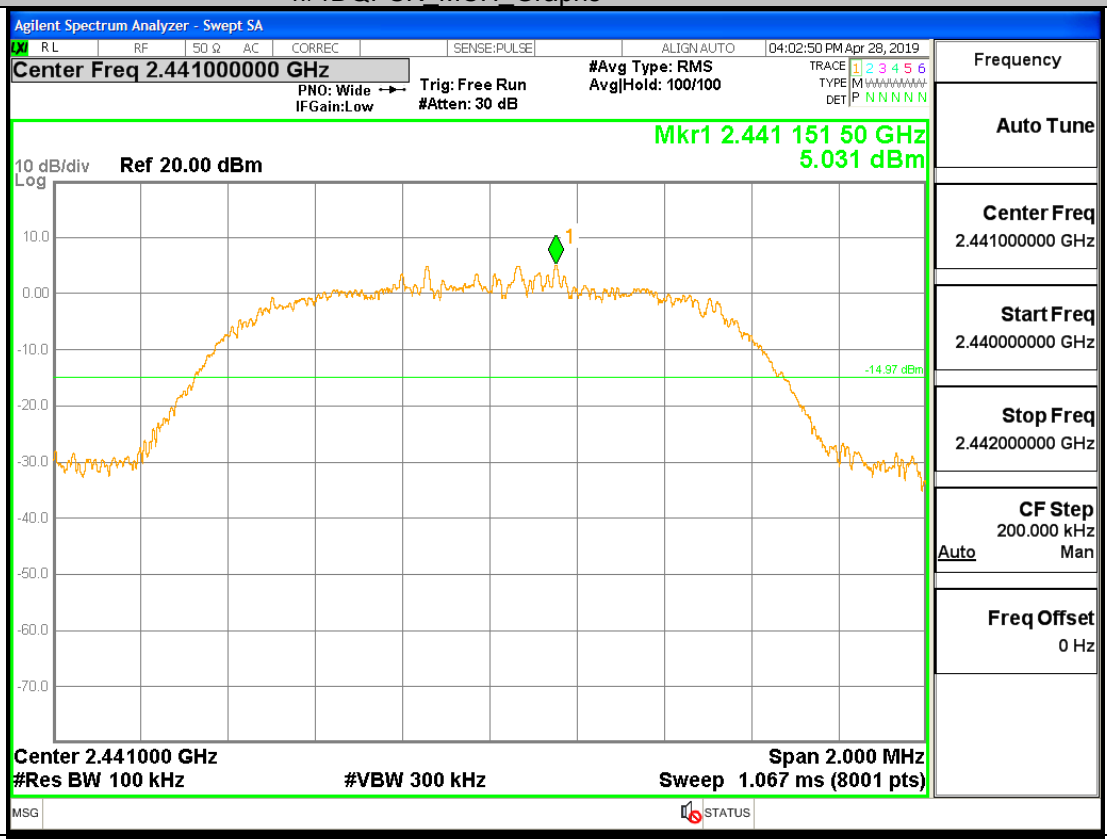
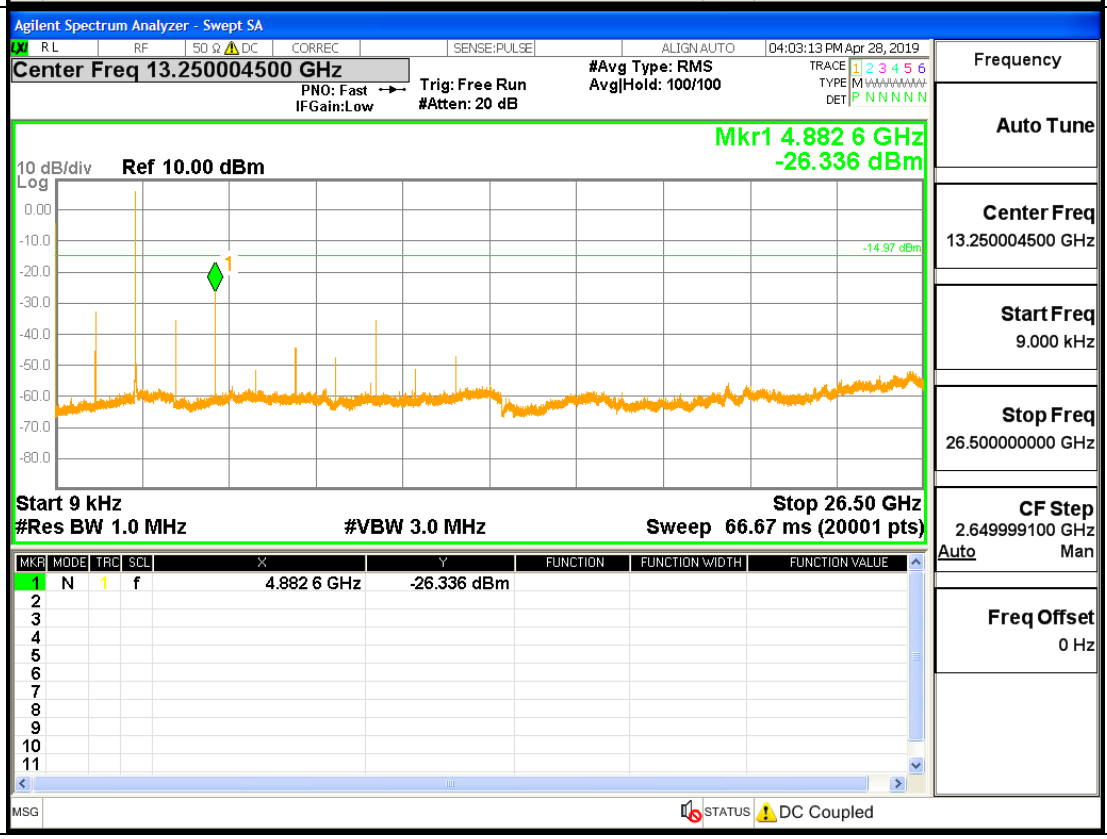
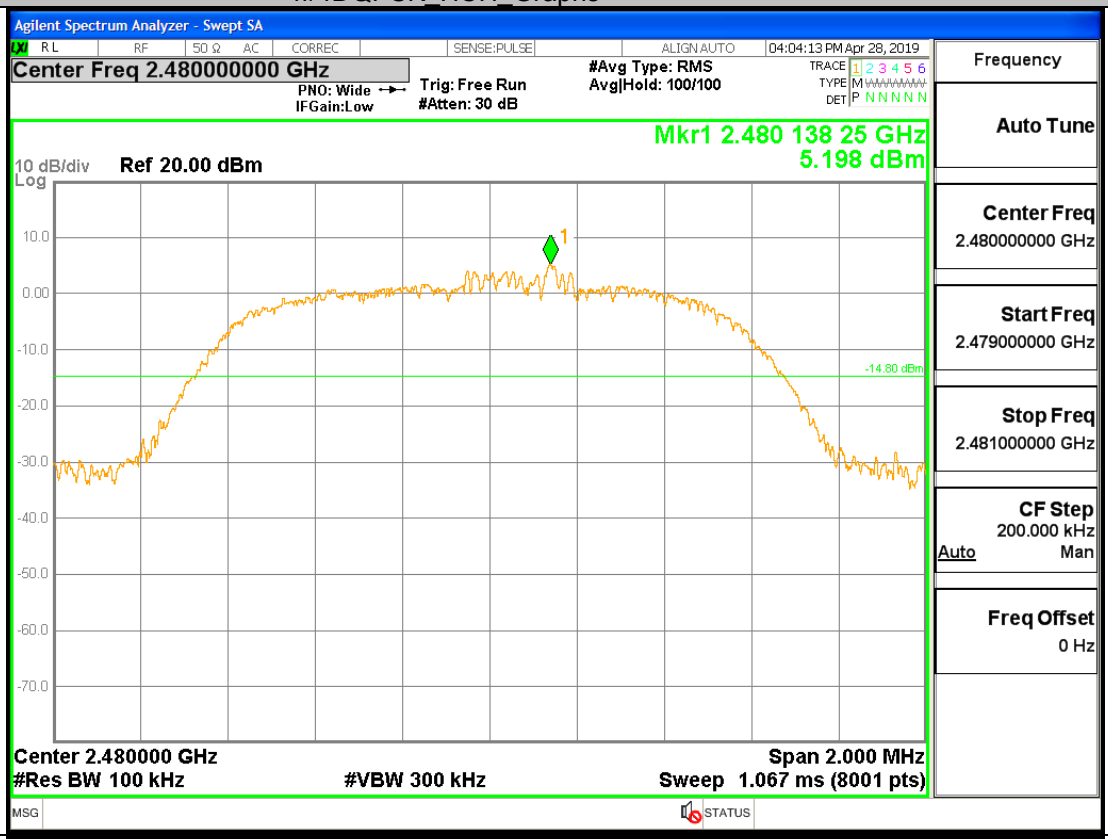
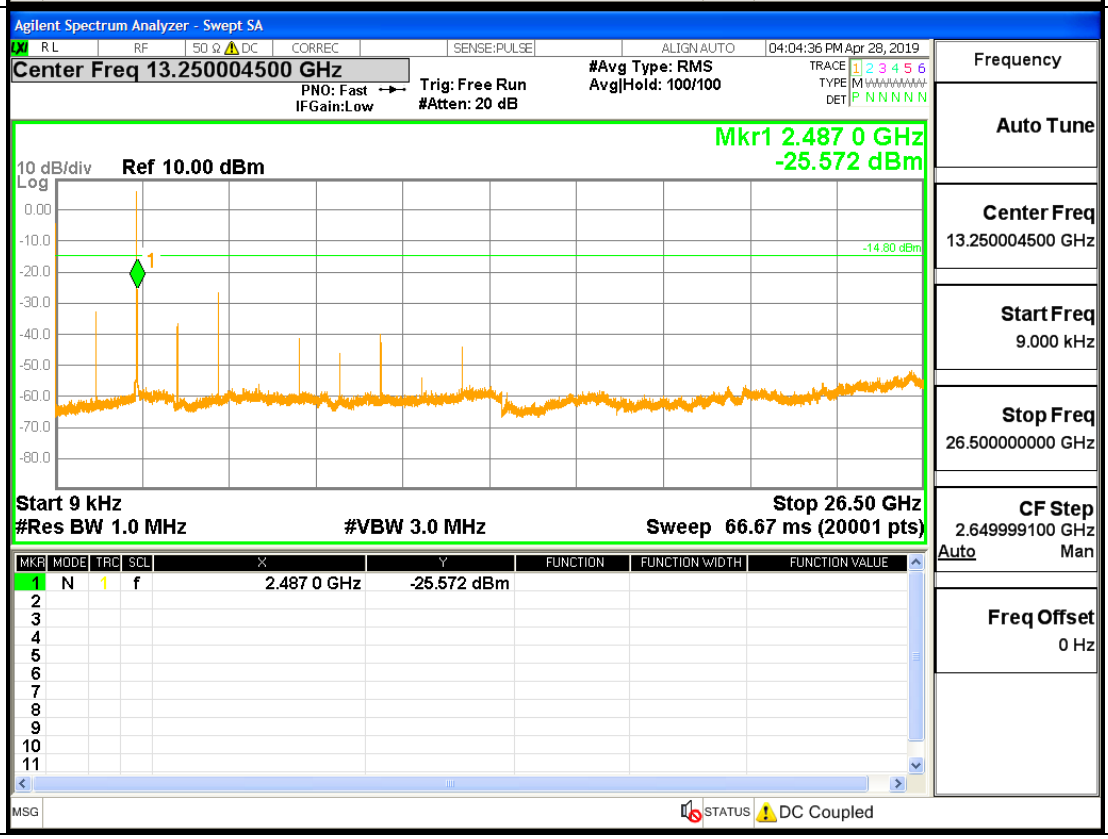
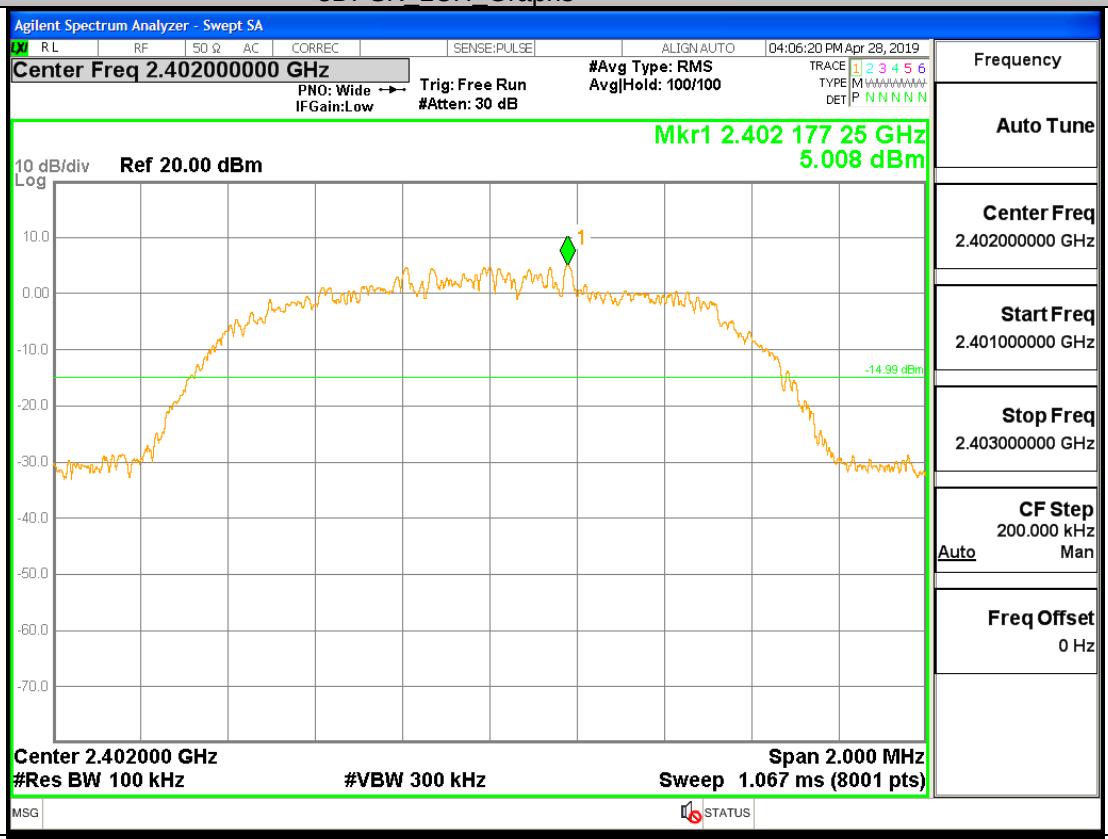
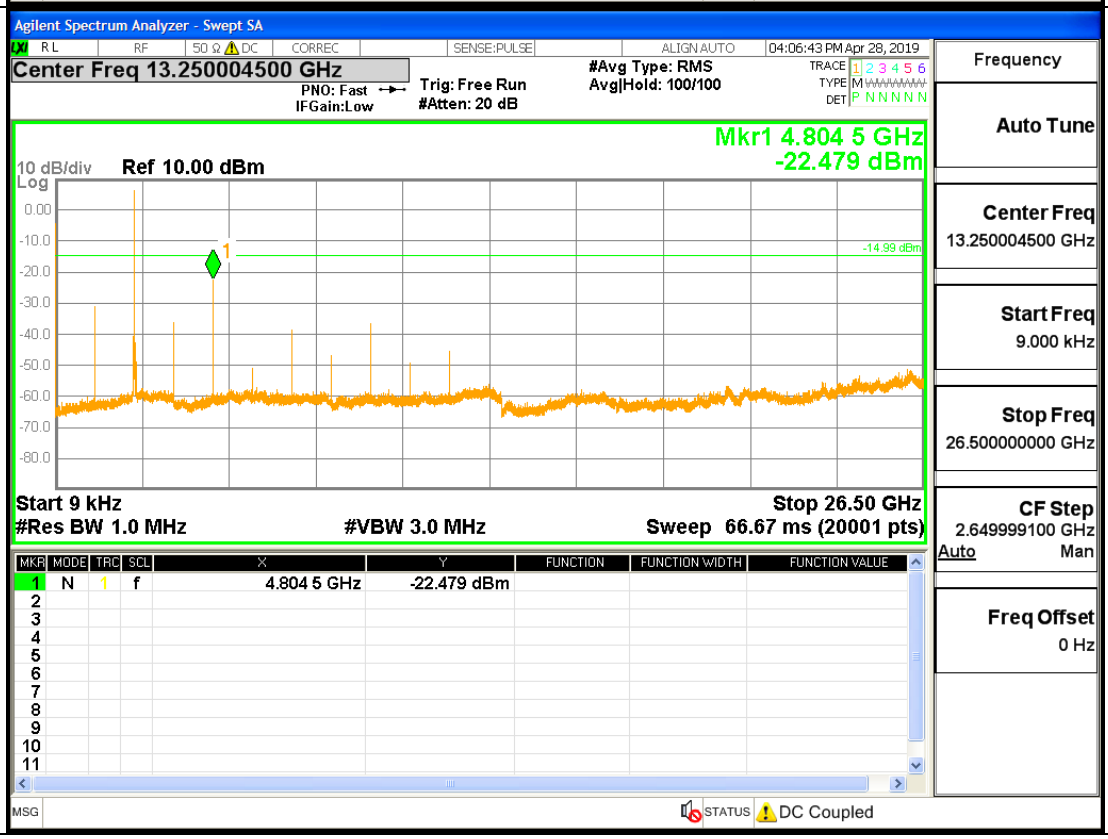
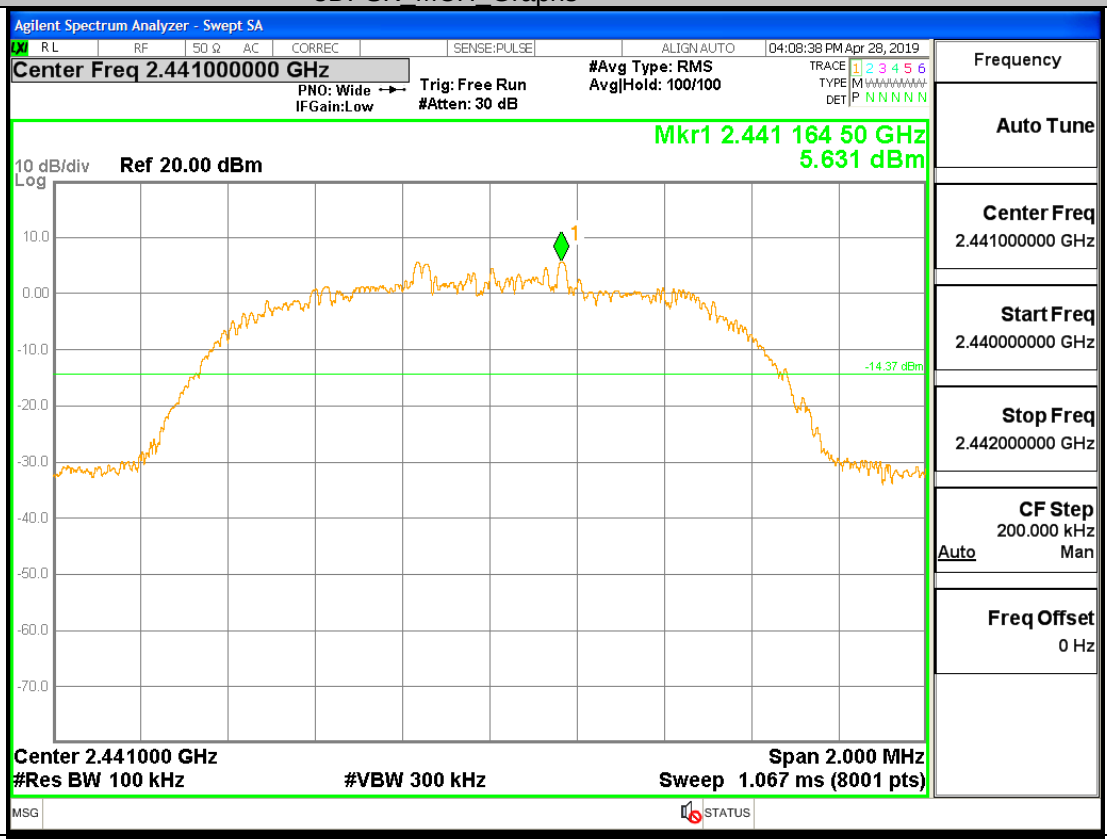
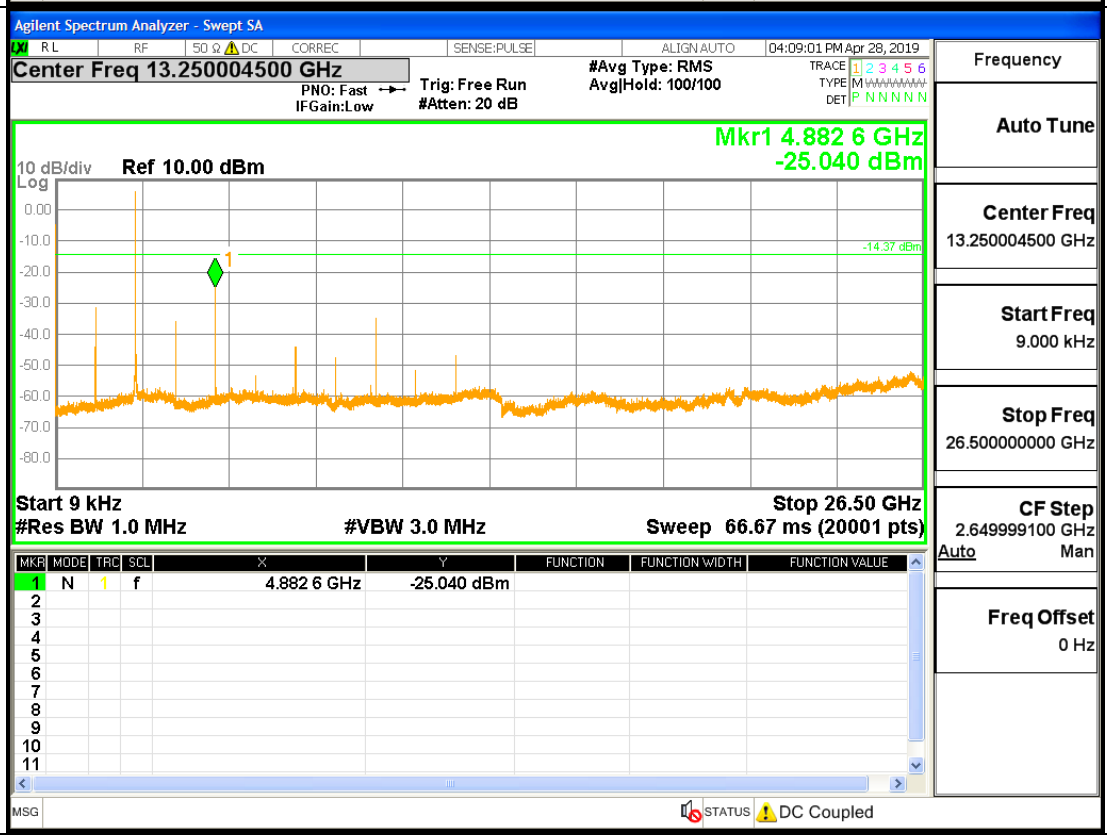
Pref	
Puw	

π/4DQPSK_HCH_Graphs	
Pref	
Puw	

8DPSK_LCH_Graphs	
Pref	
Puw	

8DPSK_MCH_Graphs	
Pref	
Puw	

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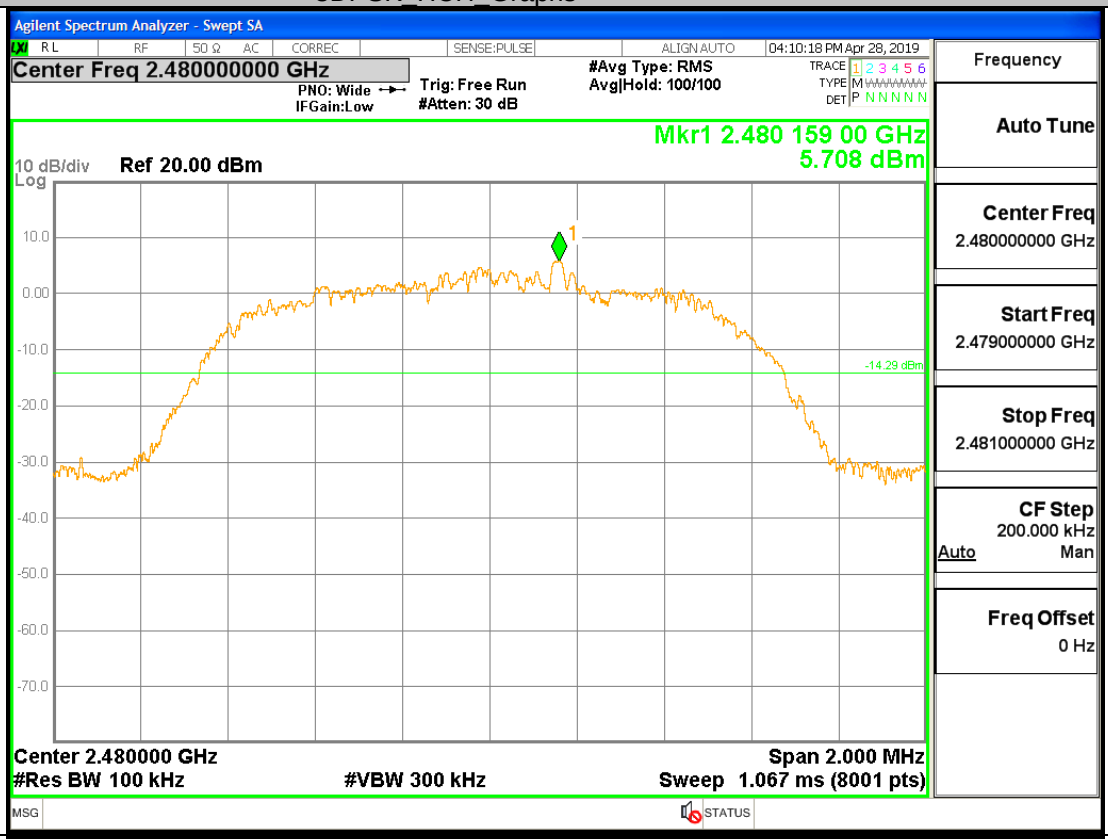
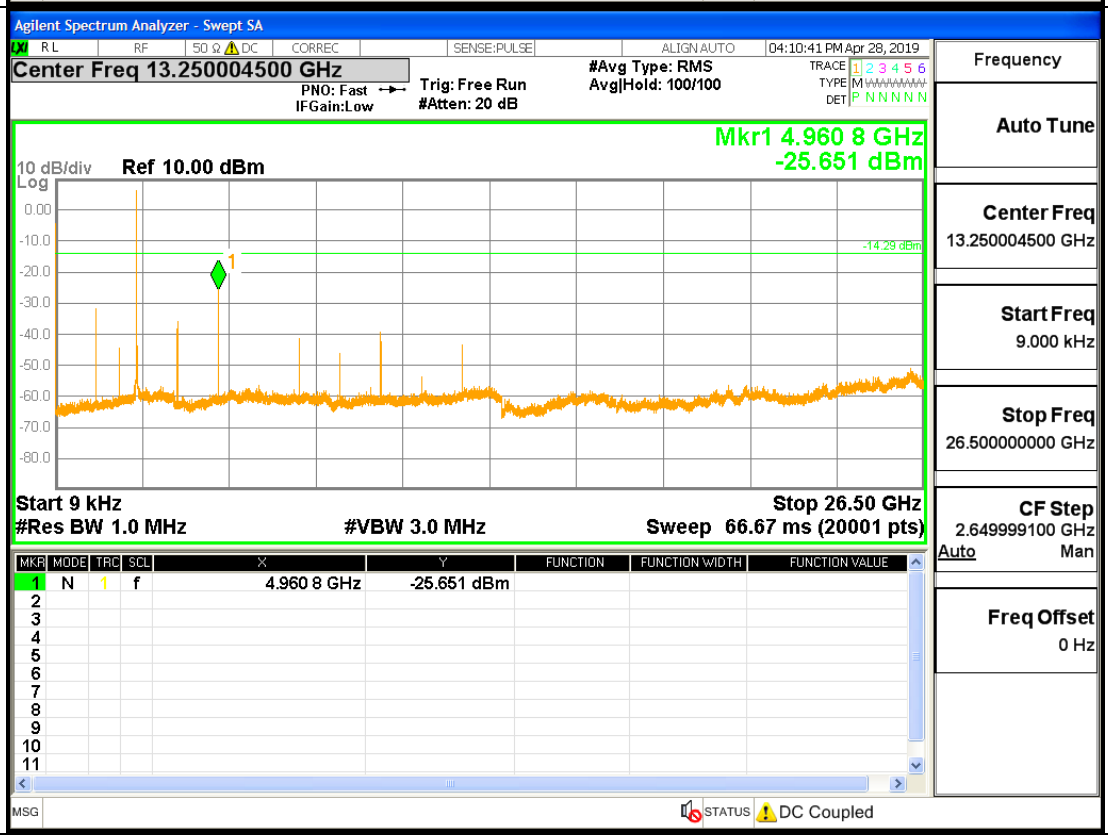
Pref	
Puw	

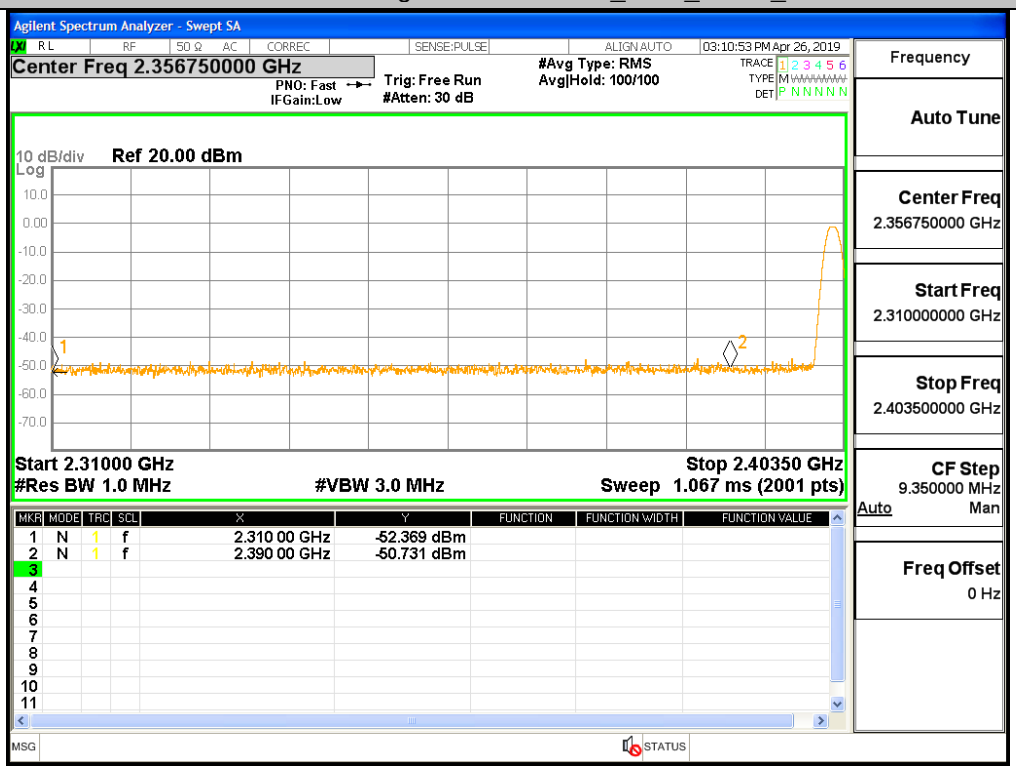
A.8 Restrict-band band-edge measurements

Type	Carrier Frequency (MHz)	Frequency(MHz)	Gain	Ground Factor	Peak Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2390.00	2.00	0.00	-50.73	46.47	74	Pass
1DH5	2480	2493.58	2.00	0.00	-46.87	50.33	74	Pass
2DH5	2402	2353.62	2.00	0.00	-46.54	50.66	74	Pass
2DH5	2480	2483.50	2.00	0.00	-49.66	47.54	74	Pass
3DH5	2402	2390.00	2.00	0.00	-50.80	46.40	74	Pass
3DH5	2480	2500.00	2.00	0.00	-51.20	46.00	74	Pass

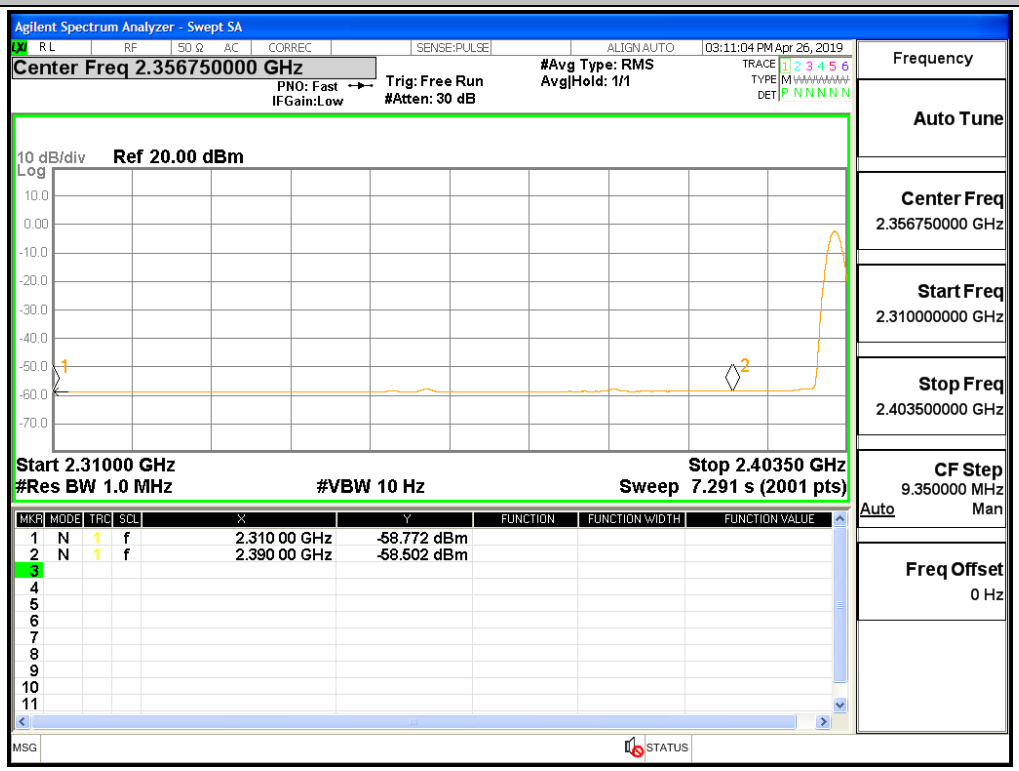
Type	Carrier Frequency (MHz)	Frequency(MHz)	Gain	Ground Factor	Average Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2390.00	2.00	0.00	-58.51	38.70	54	Pass
1DH5	2480	2483.50	2.00	0.00	-57.16	40.04	54	Pass
2DH5	2402	2390.00	2.00	0.00	-58.79	38.41	54	Pass
2DH5	2480	2483.50	2.00	0.00	-56.76	40.45	54	Pass
3DH5	2402	2390.00	2.00	0.00	-58.50	38.70	54	Pass
3DH5	2480	2483.50	2.00	0.00	-56.76	40.44	54	Pass

Test Graph

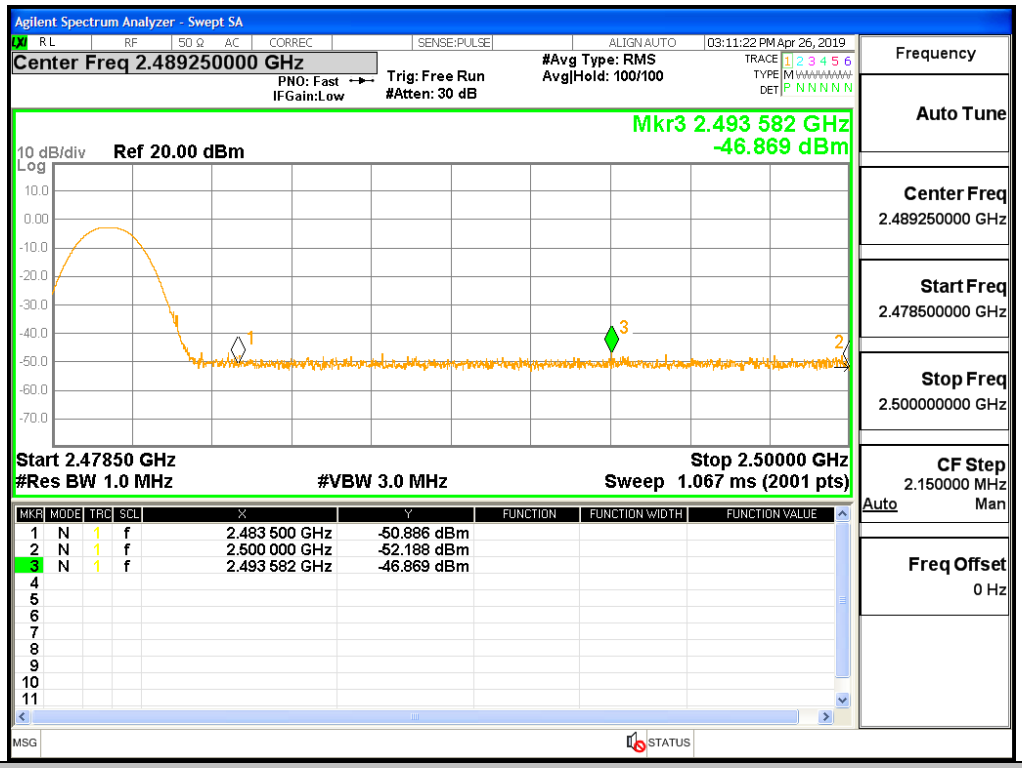
Restrict-band band-edge measurements_2402_PEAK_DH5



Restrict-band band-edge measurements_2402_AV_DH5

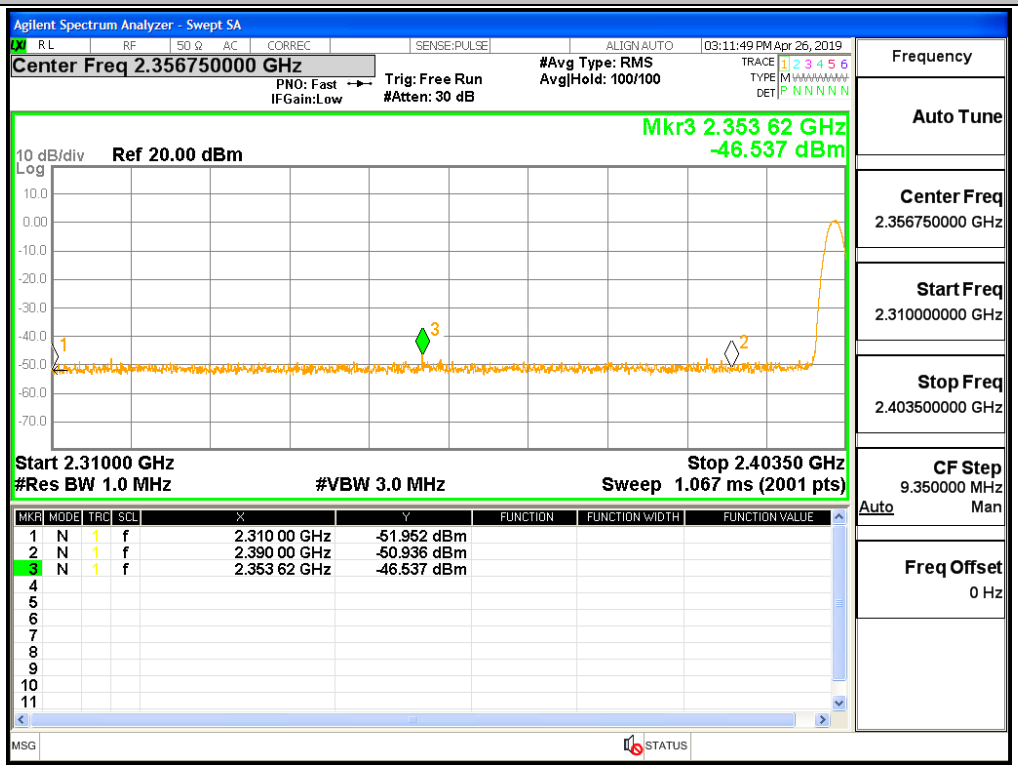


Restrict-band band-edge measurements_2480_PEAK_DH5

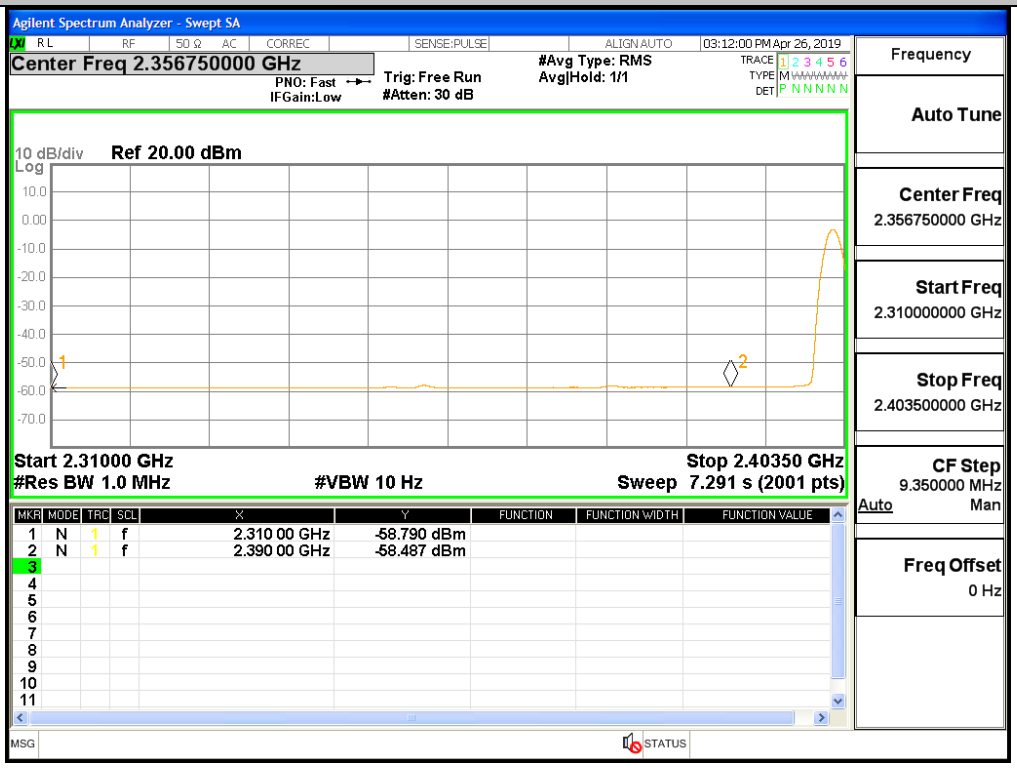


Restrict-band band-edge measurements_2480_AV_DH5

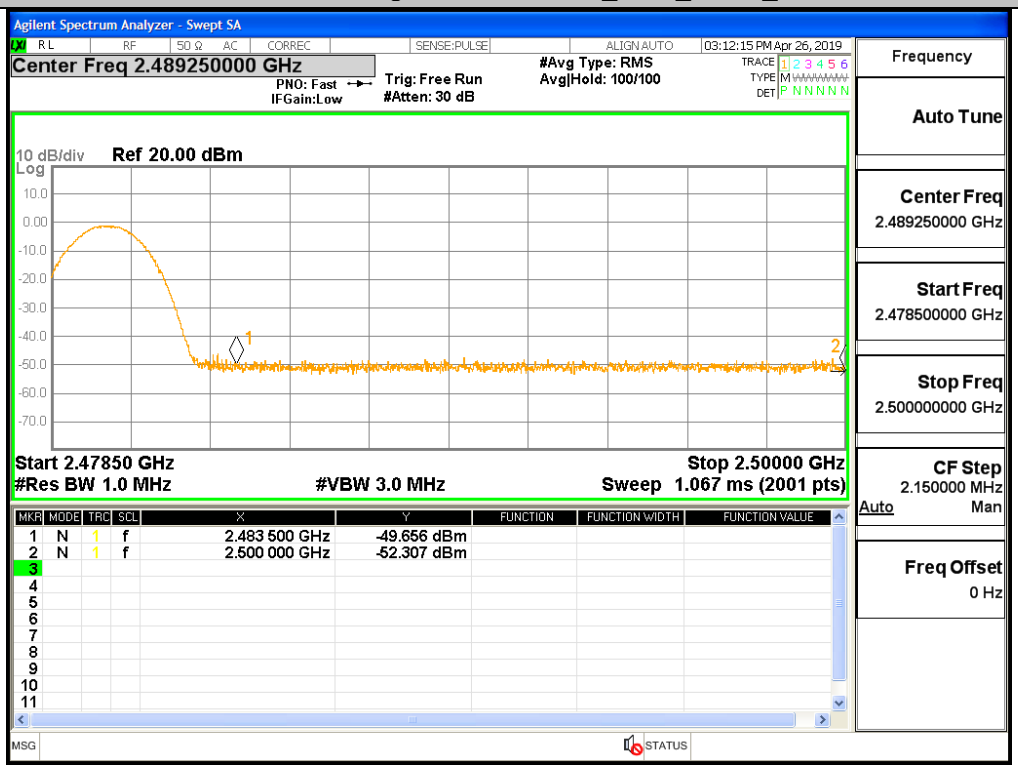
Restrict-band band-edge measurements_2402_PEAK_2DH5



Restrict-band band-edge measurements_2402_AV_2DH5

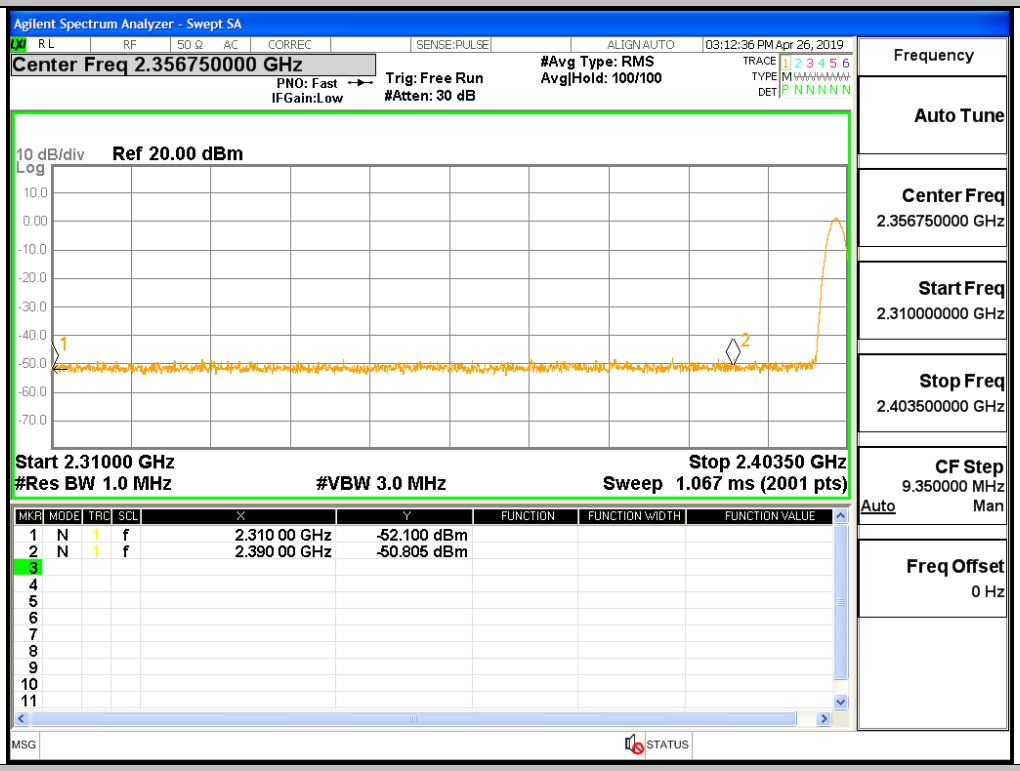


Restrict-band band-edge measurements_2480_PEAK_2DH5

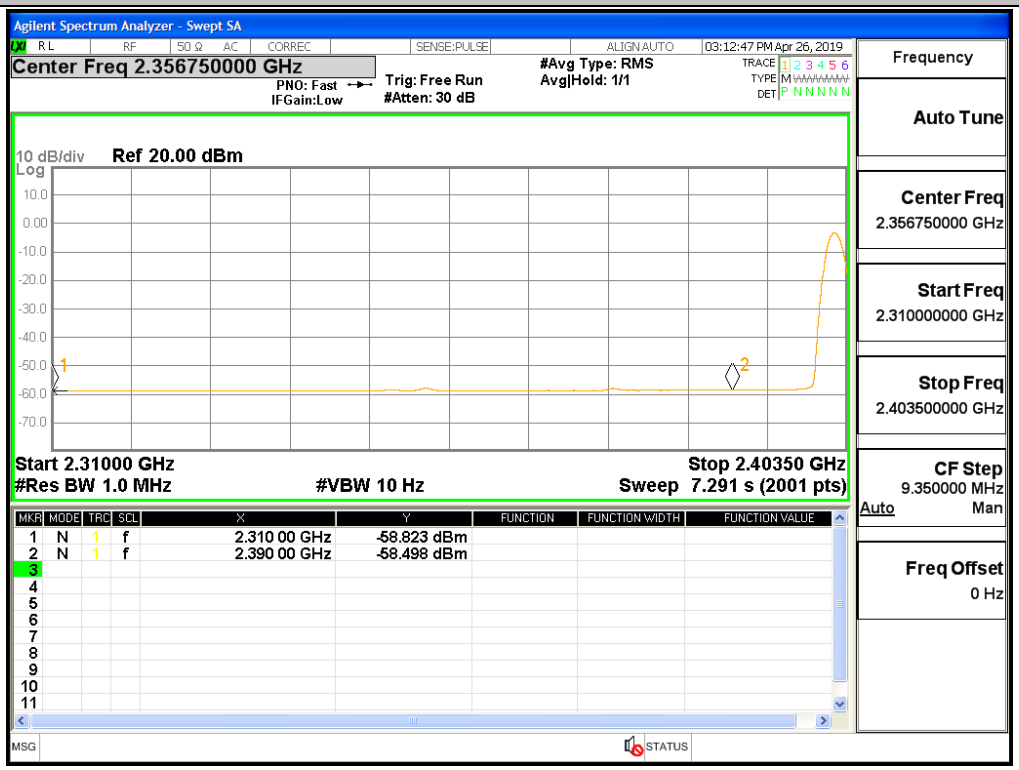


Restrict-band band-edge measurements_2480_AV_2DH5

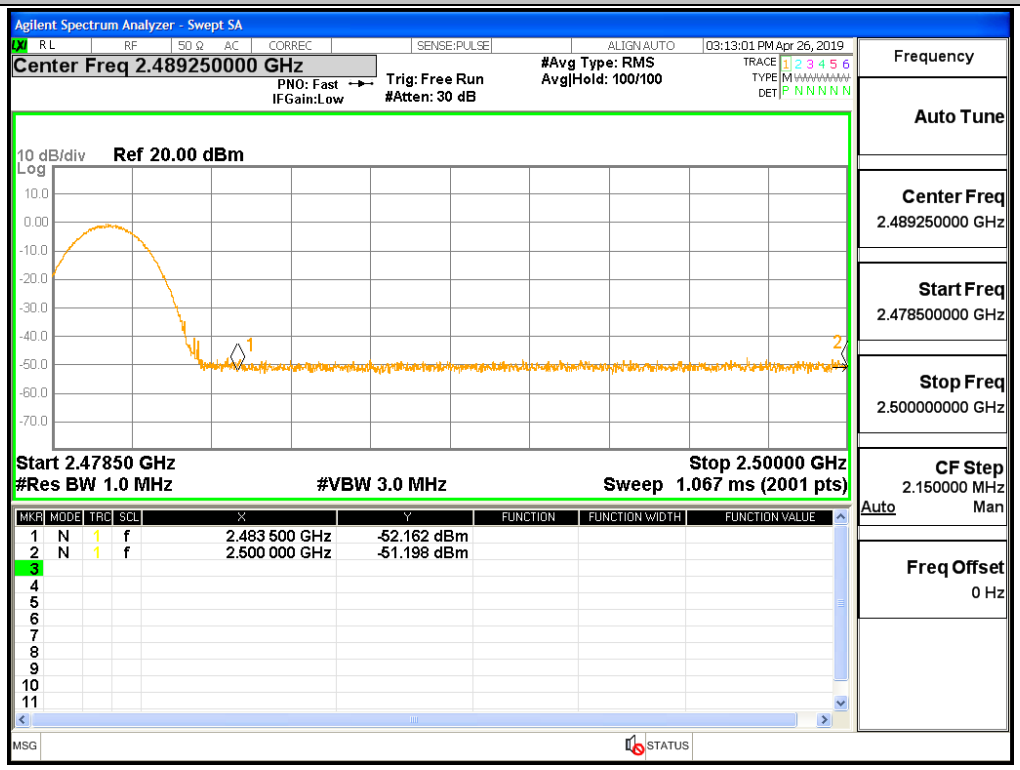
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5