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

Product Name: Bluetooth Headphones

Trade Mark: Billboard

Test Model: BB1999

FCC ID: 2AL9B-BB1999

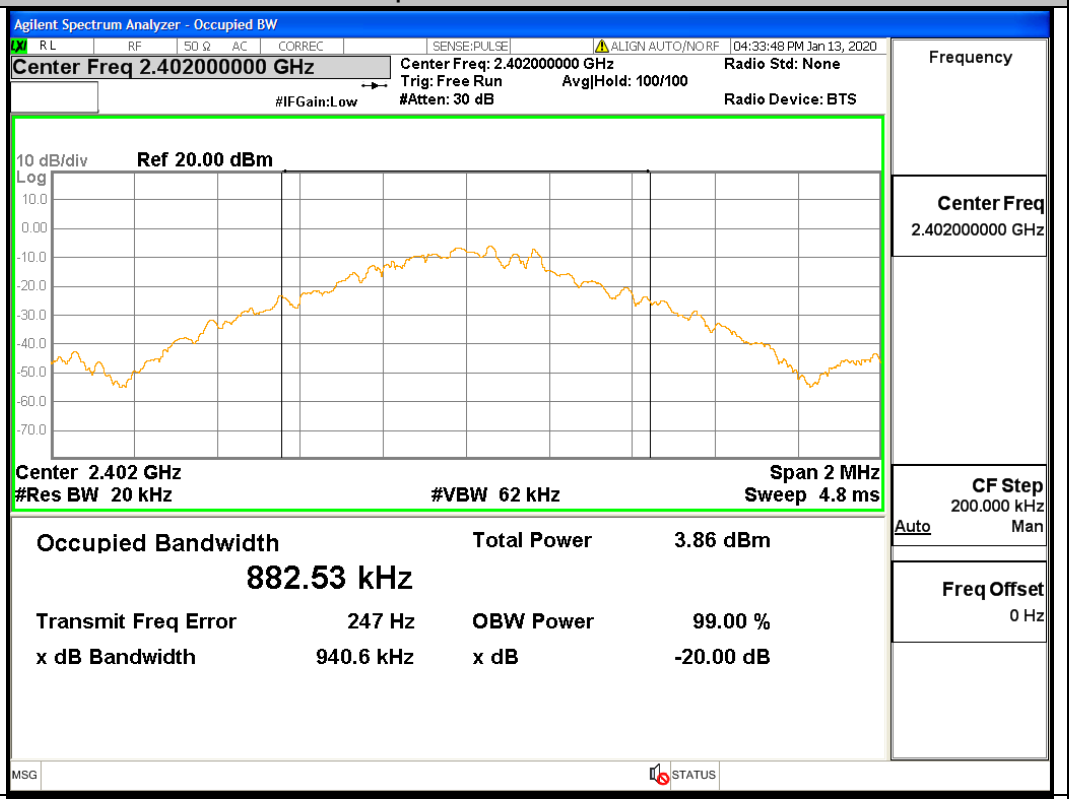
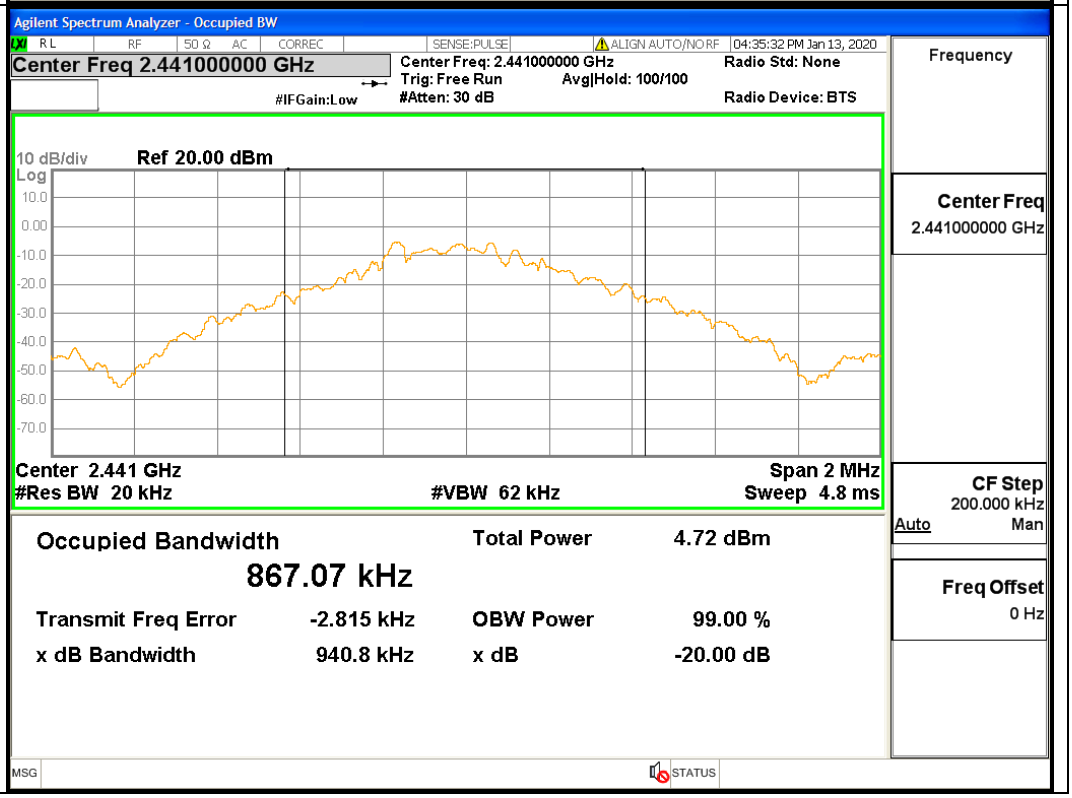
Environmental Conditions

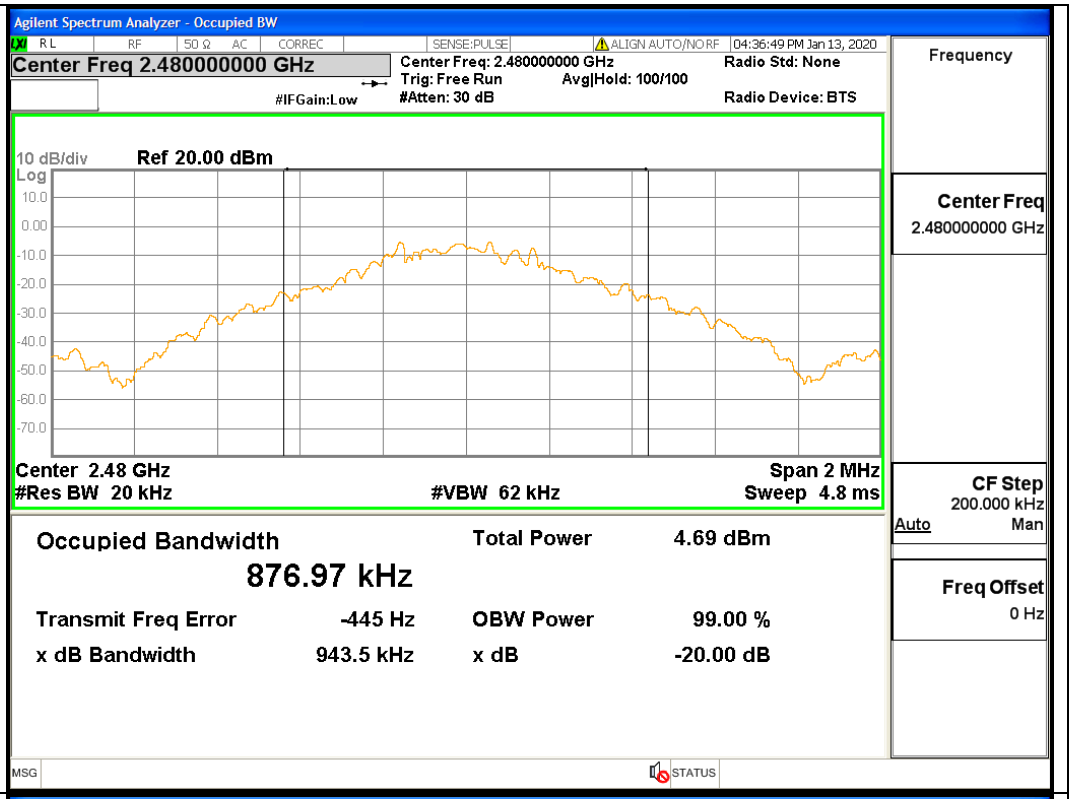
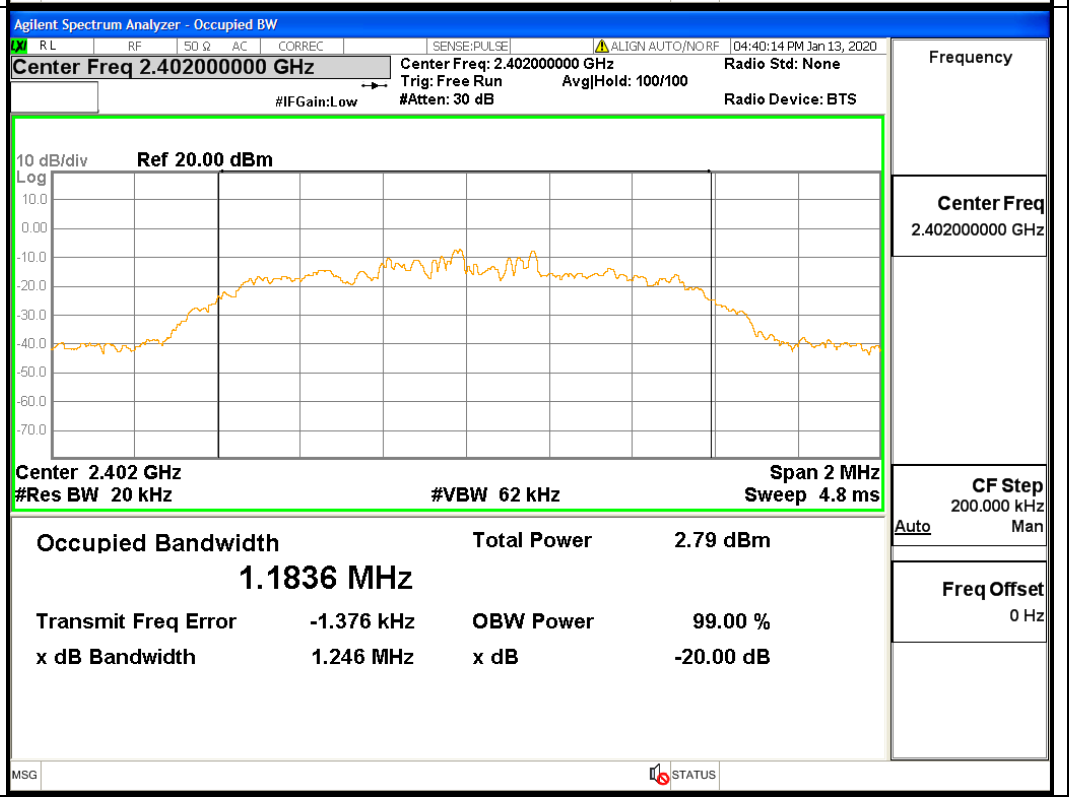
Temperature:	22.7° C
Relative Humidity:	45%
ATM Pressure:	100.0 kPa
Test Engineer:	Gary Qian
Supervised by:	Eden Hu

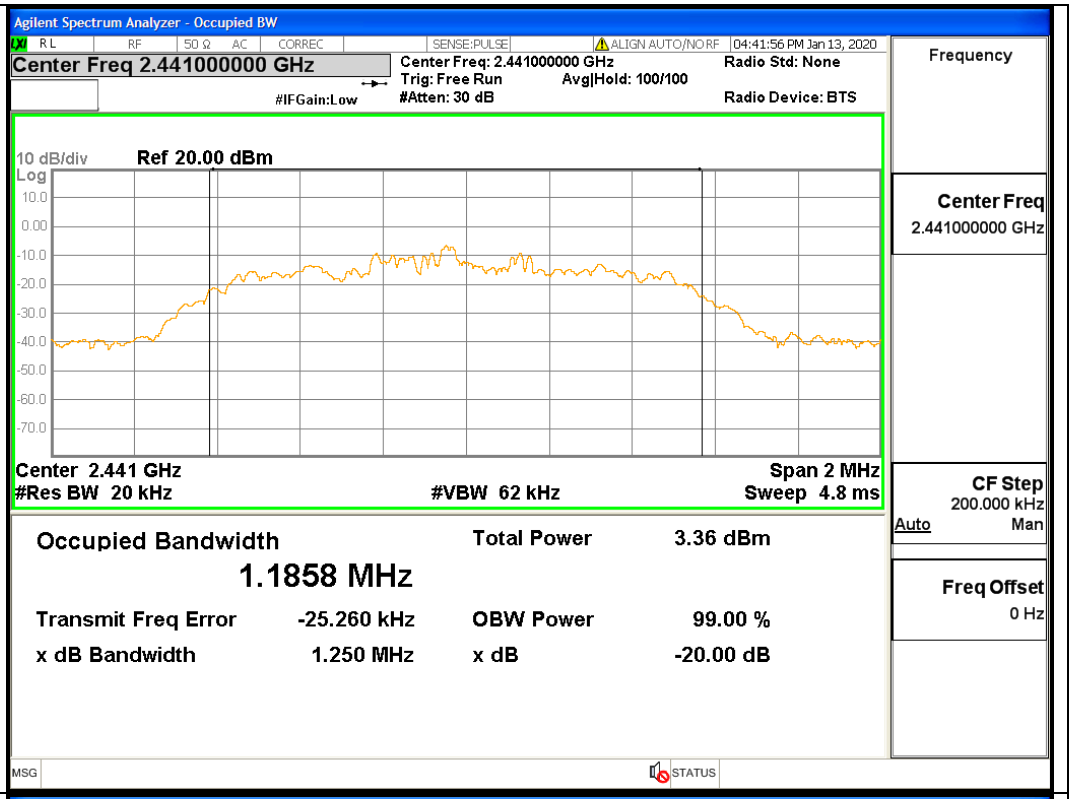
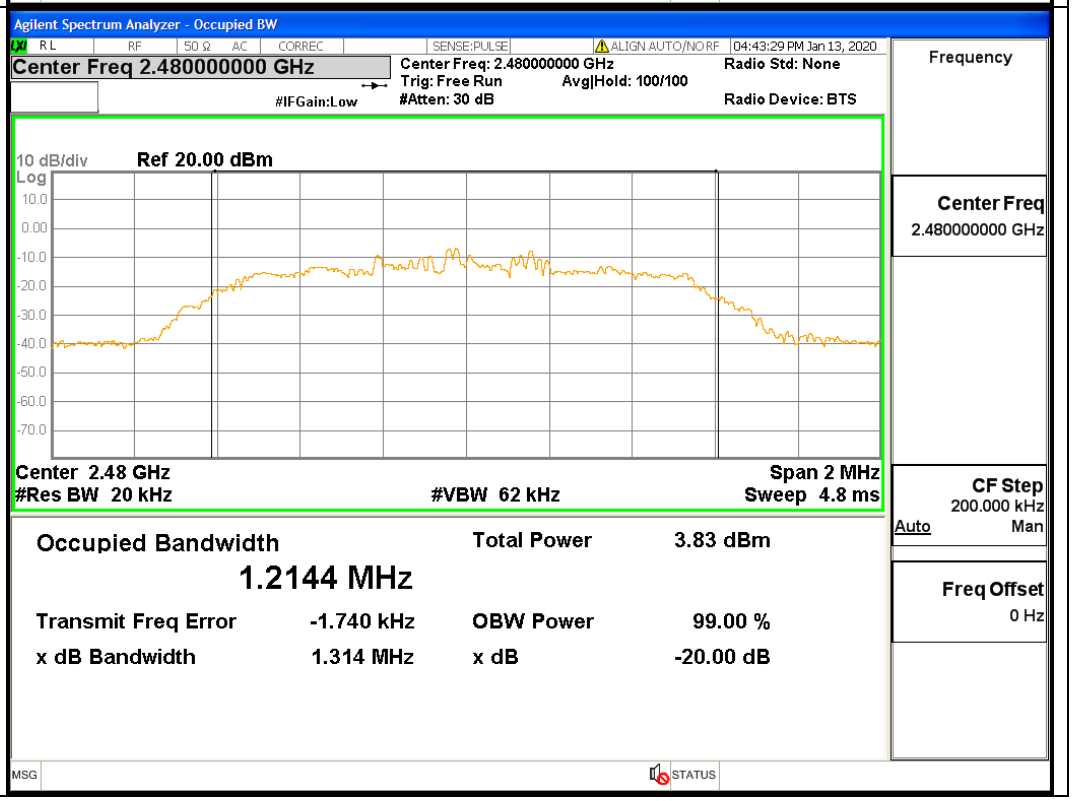
A.1 20 dB Bandwidth

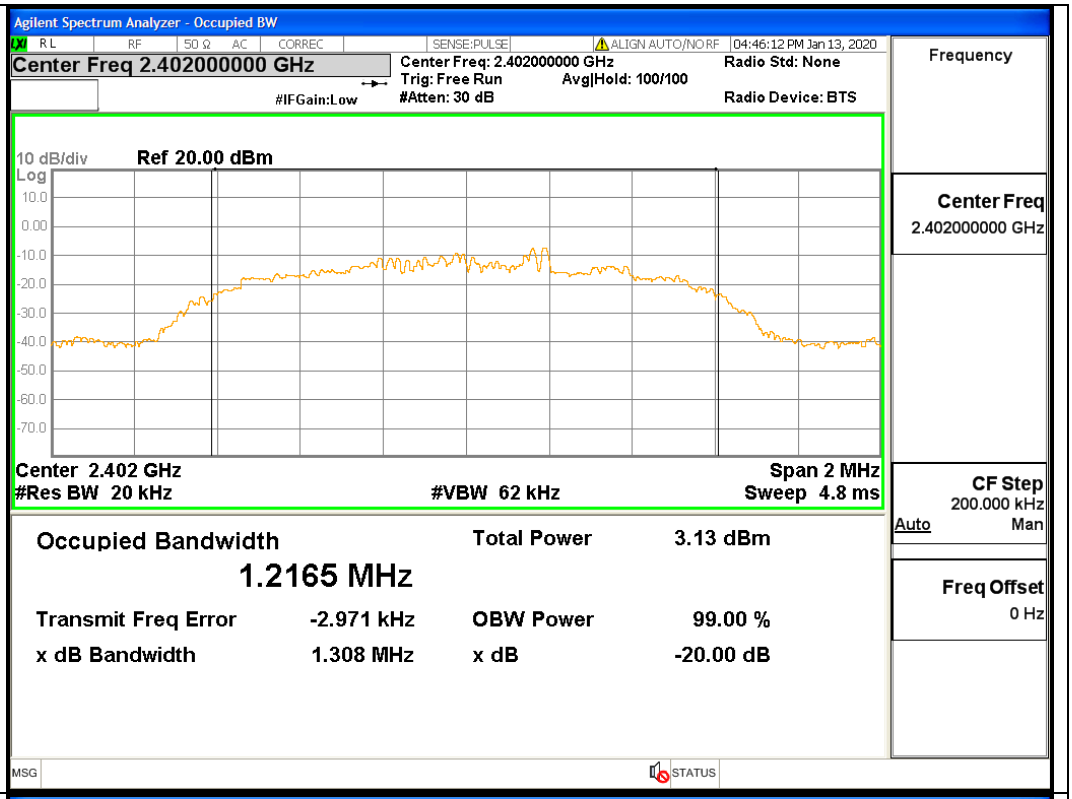
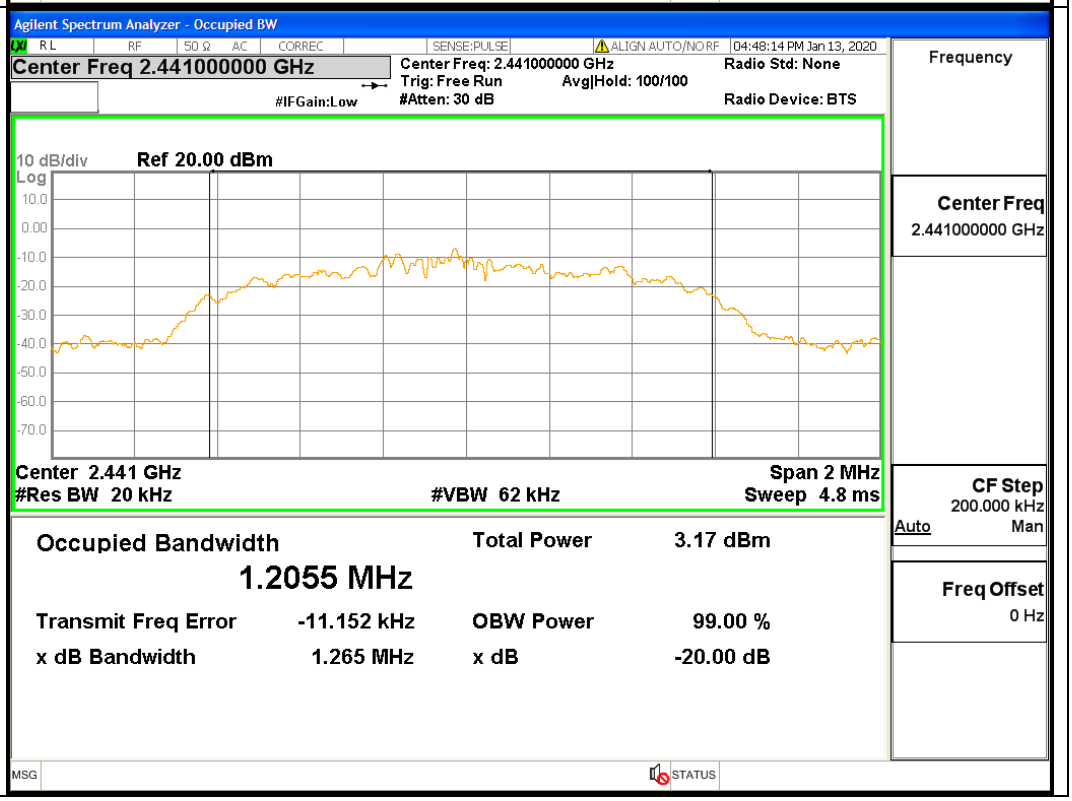
Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.941	Not Specified	PASS
GFSK	MCH	0.941	Not Specified	PASS
GFSK	HCH	0.944	Not Specified	PASS
π/4DQPSK	LCH	1.246	Not Specified	PASS
π/4DQPSK	MCH	1.250	Not Specified	PASS
π/4DQPSK	HCH	1.314	Not Specified	PASS
8DPSK	LCH	1.308	Not Specified	PASS
8DPSK	MCH	1.265	Not Specified	PASS
8DPSK	HCH	1.309	Not Specified	PASS

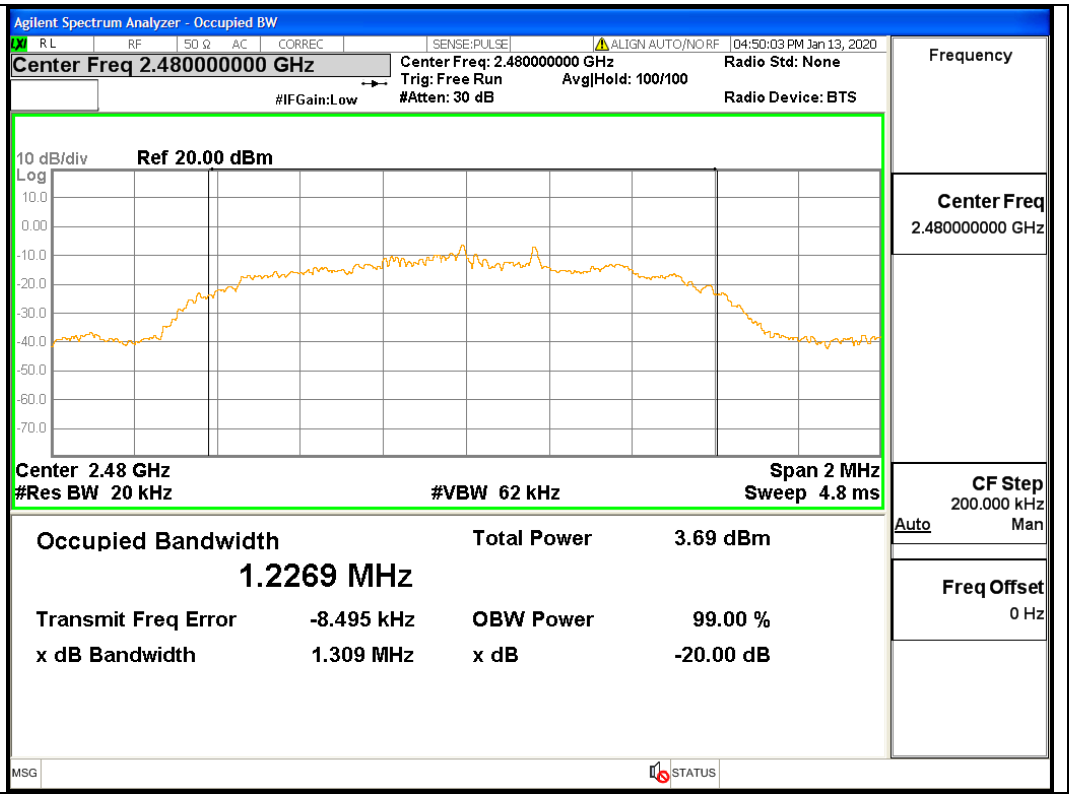
Test Graph

Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

8DPSK/LCH	
8DPSK/MCH	

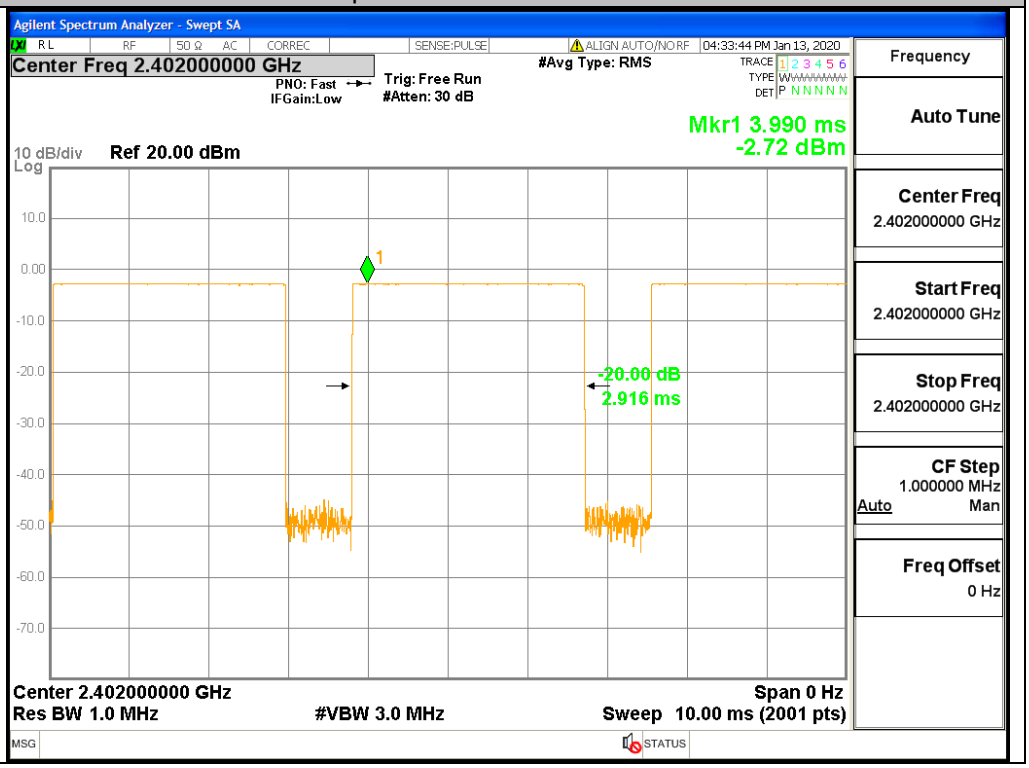
8DPSK/HCH	

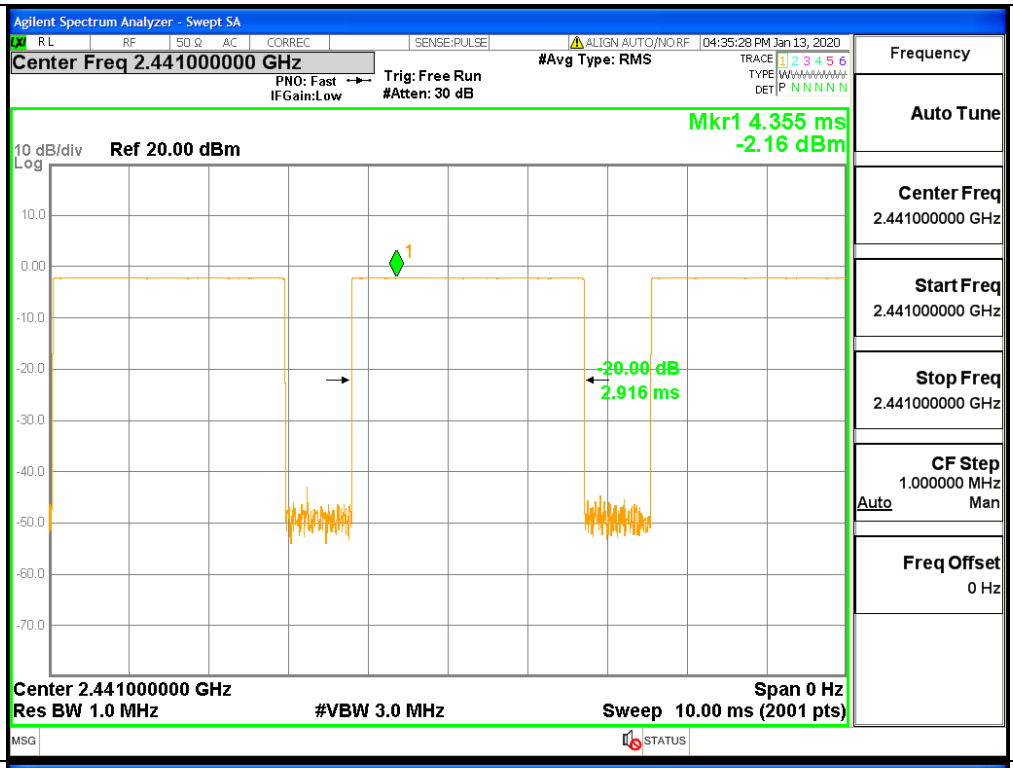
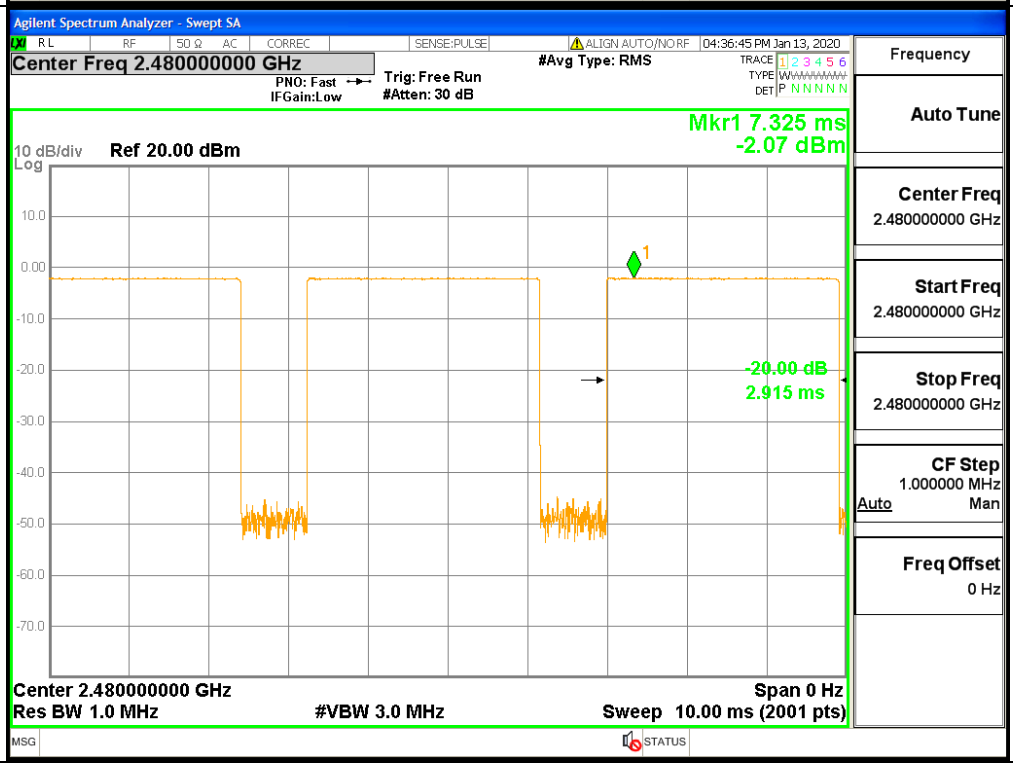
Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
CORREC
SENSE:PULSE
ALIGN AUTO/NO RF
04:50:03 PM Jan 13, 2020
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
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
1.2269 MHz
Total Power
3.69 dBm
Transmit Freq Error
-8.495 kHz
OBW Power
99.00 %
x dB Bandwidth
1.309 MHz
x dB
-20.00 dB
Freq Offset
0 Hz
MSG
STATUS

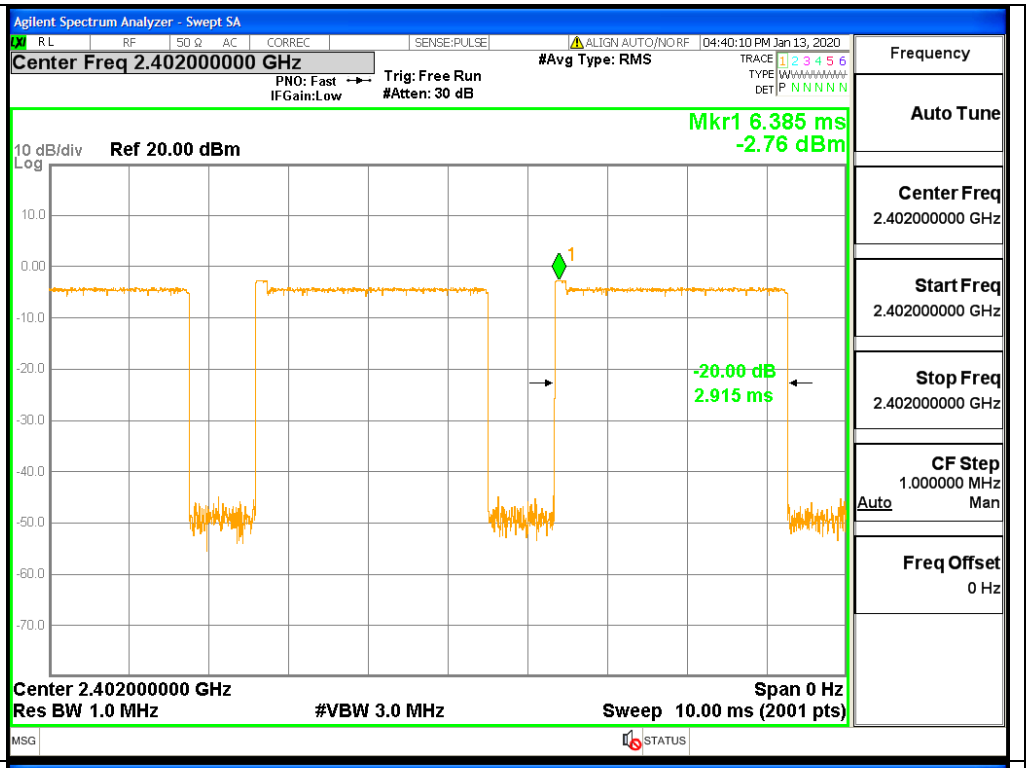
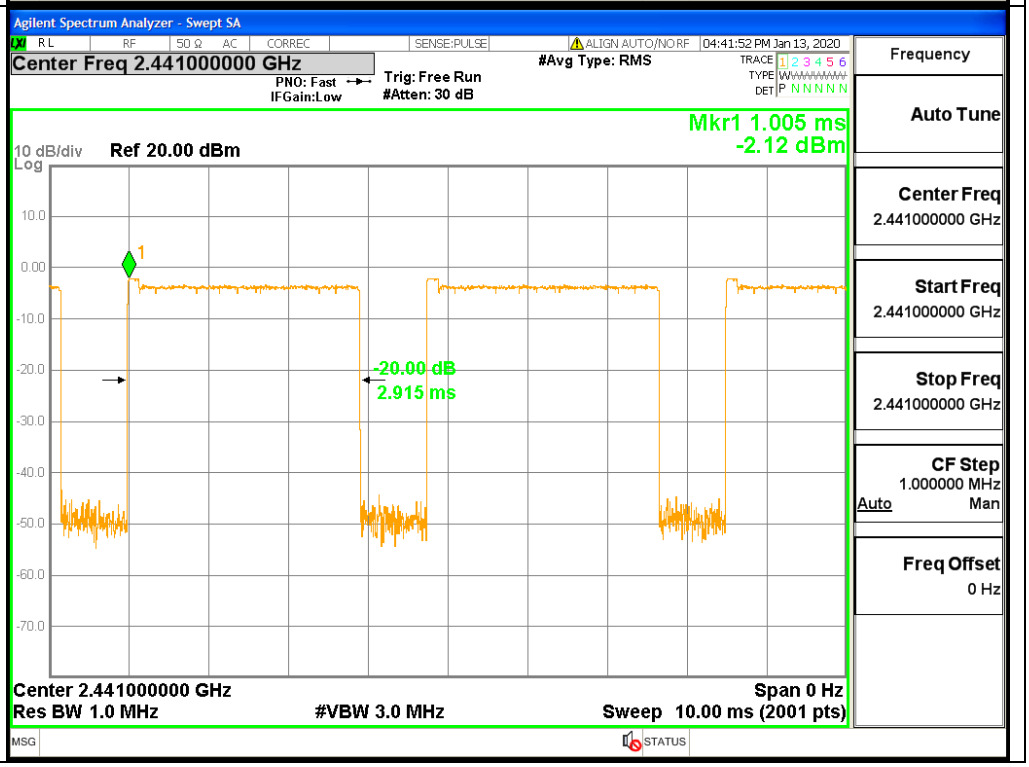
A.2 Dwell Time

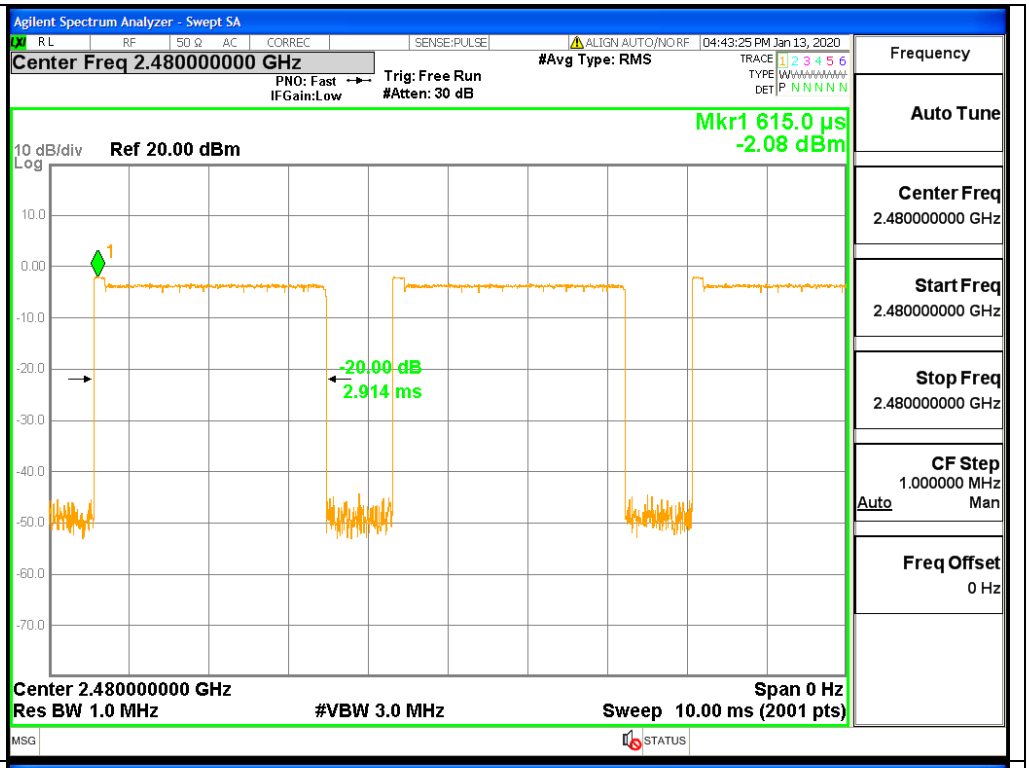
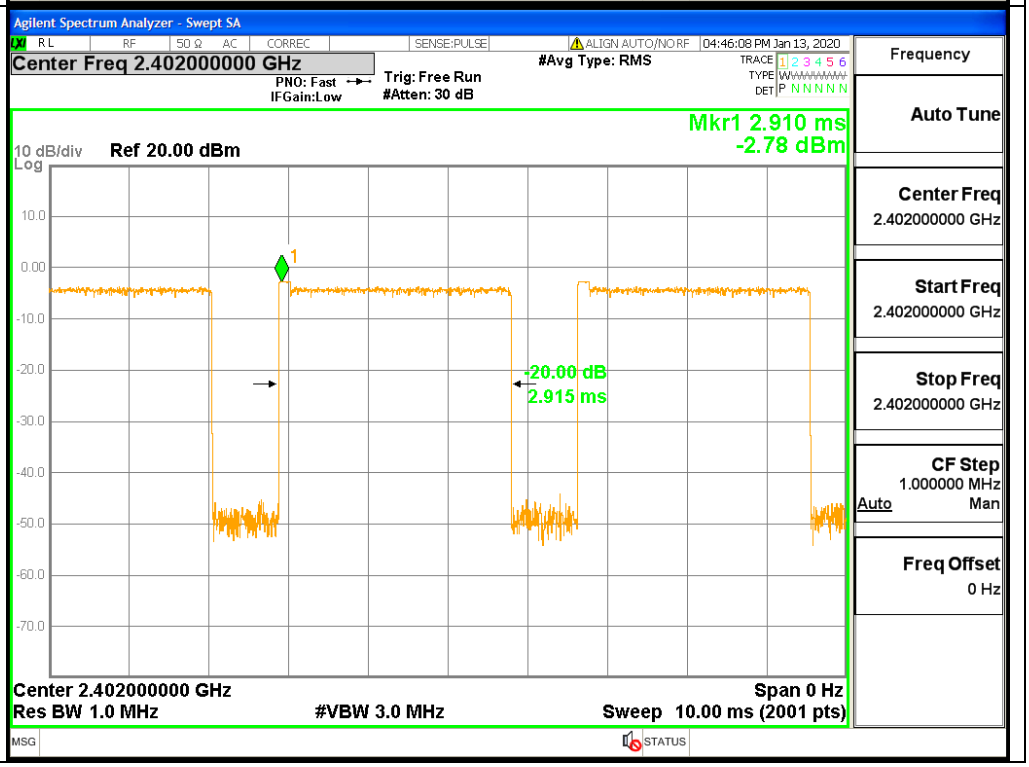
Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002916	106.7	0.311091	0.4	PASS
GFSK	DH5	MCH	0.002916	106.7	0.311102	0.4	PASS
GFSK	DH5	HCH	0.002915	106.7	0.311036	0.4	PASS
π/4DQPSK	2DH5	LCH	0.002915	106.7	0.311069	0.4	PASS
π/4DQPSK	2DH5	MCH	0.002915	106.7	0.311029	0.4	PASS
π/4DQPSK	2DH5	HCH	0.002914	106.7	0.310909	0.4	PASS
8DPSK	3DH5	LCH	0.002915	106.7	0.311068	0.4	PASS
8DPSK	3DH5	MCH	0.002914	106.7	0.31097	0.4	PASS
8DPSK	3DH5	HCH	0.002916	106.7	0.311127	0.4	PASS

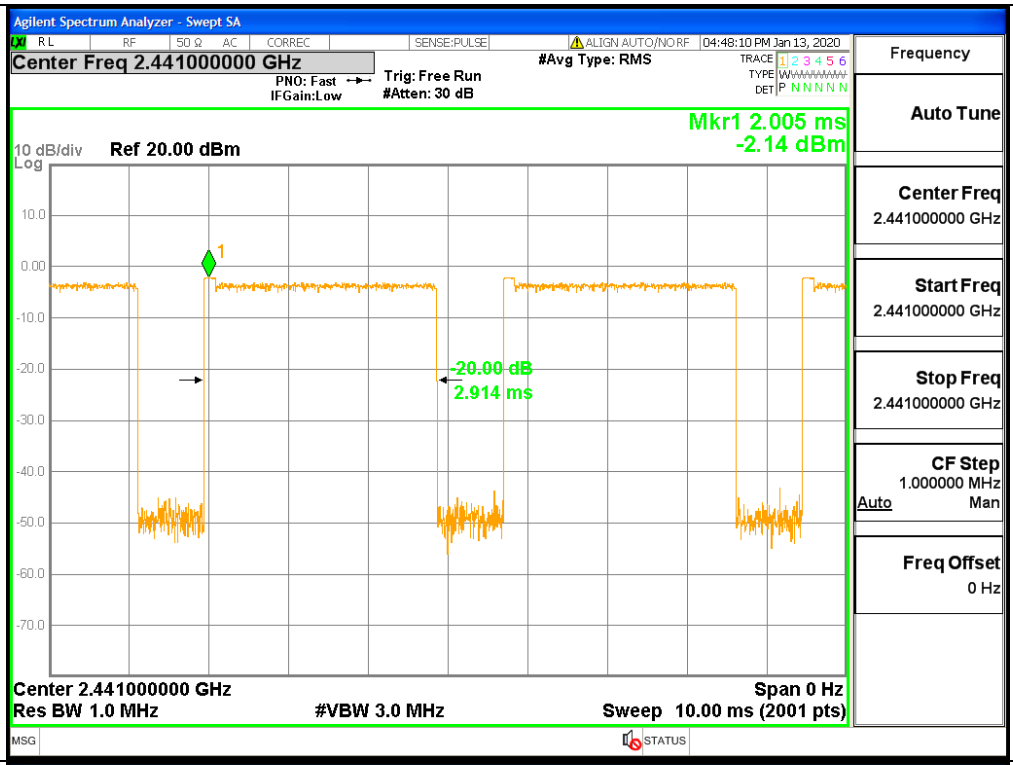
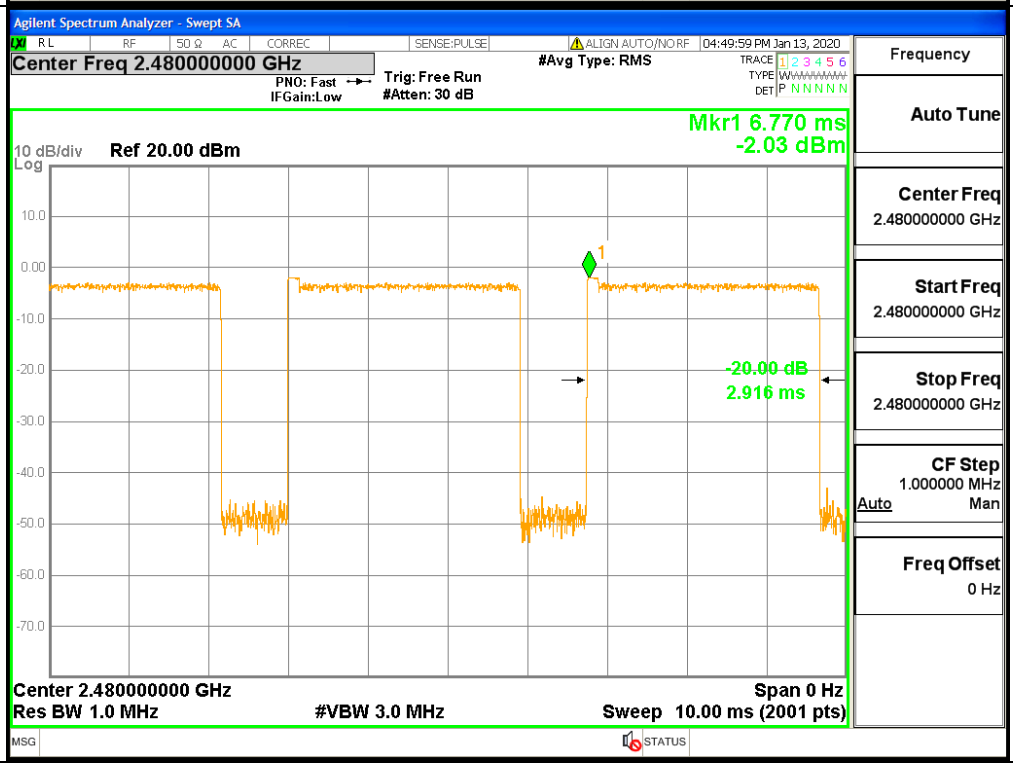
Test Graph

Graphs	
GFSK_DH5/LCH	

GFSK_DH5/MCH	
GFSK_DH5/HCH	

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

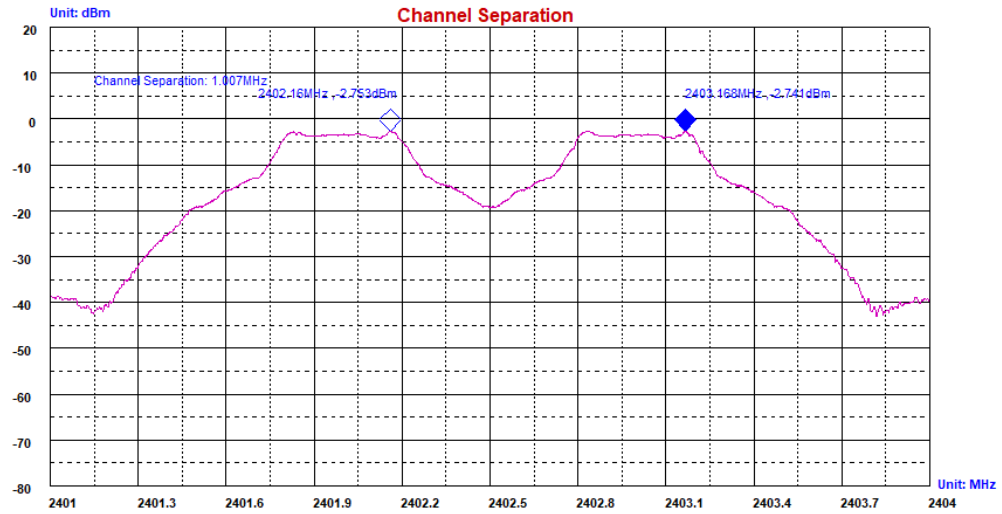
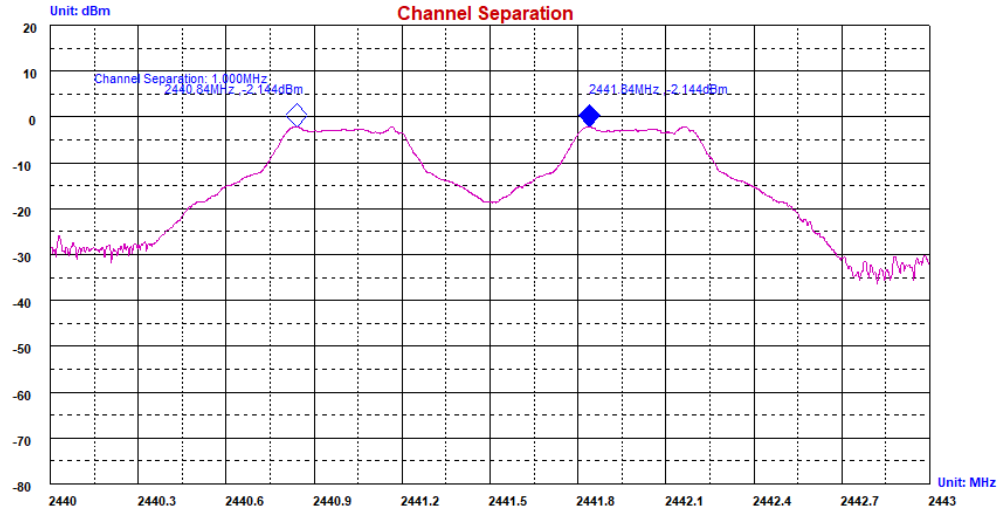
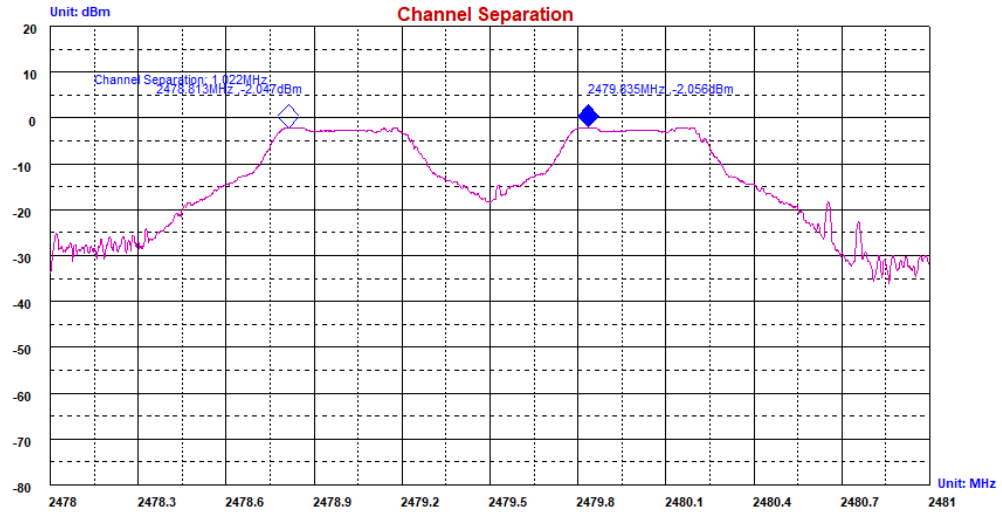
π/4DQPSK _2DH5/HCH	
8DPSK _3DH5/LCH	

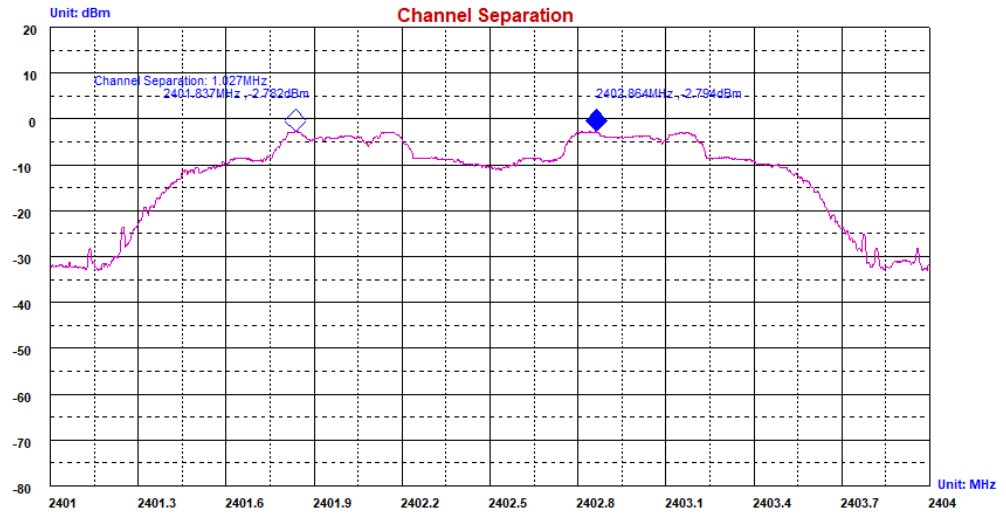
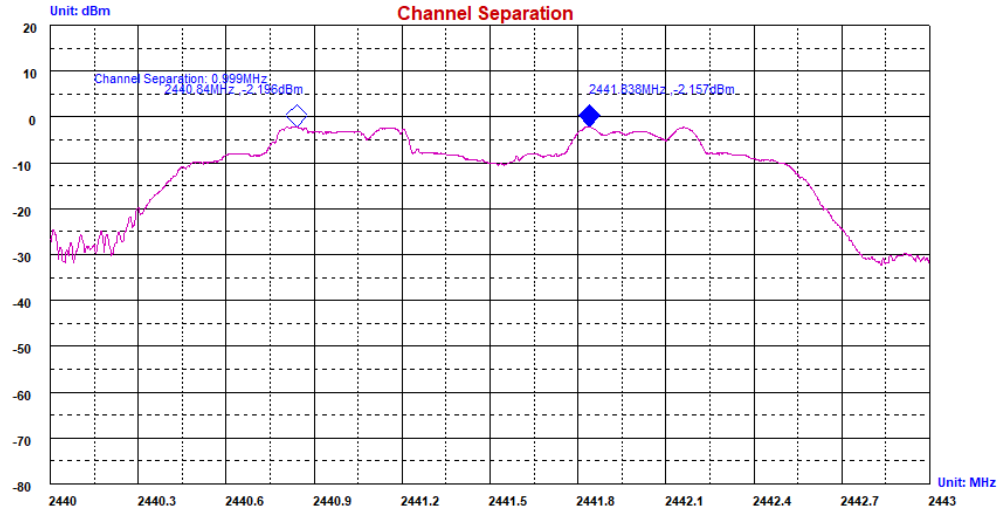
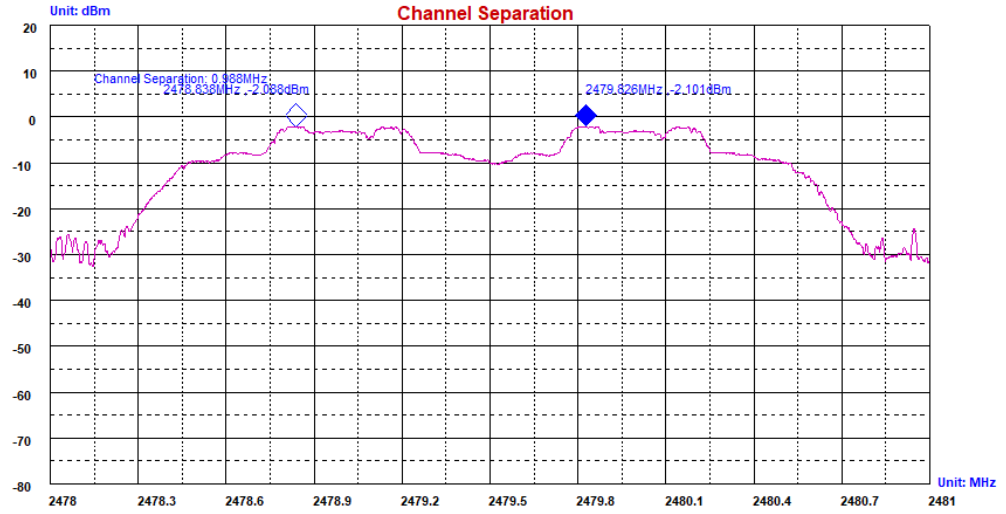
8DPSK _3DH5/MCH	
8DPSK _3DH5/HCH	

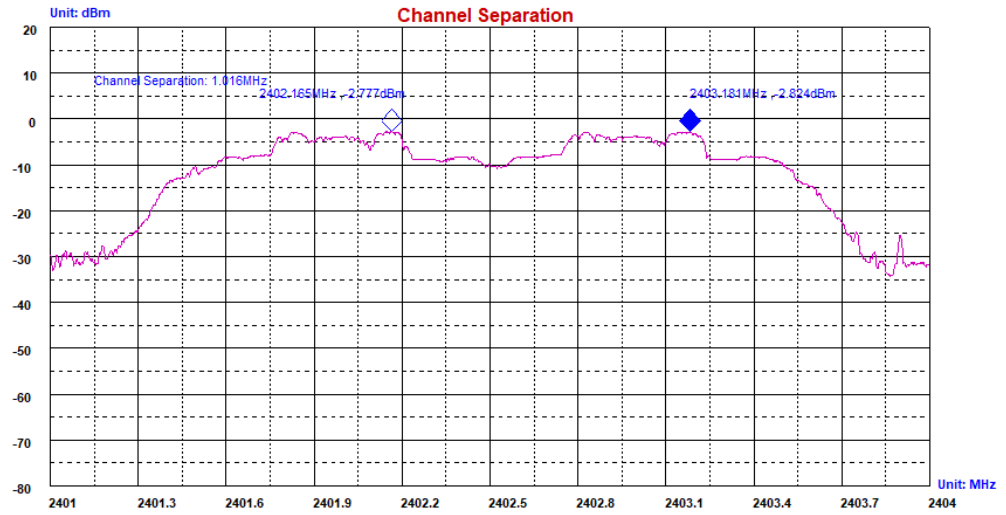
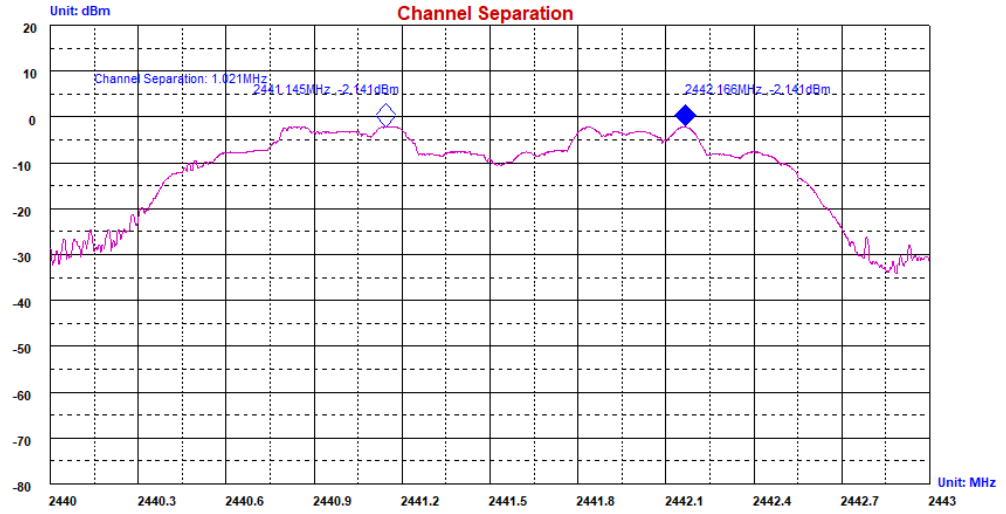
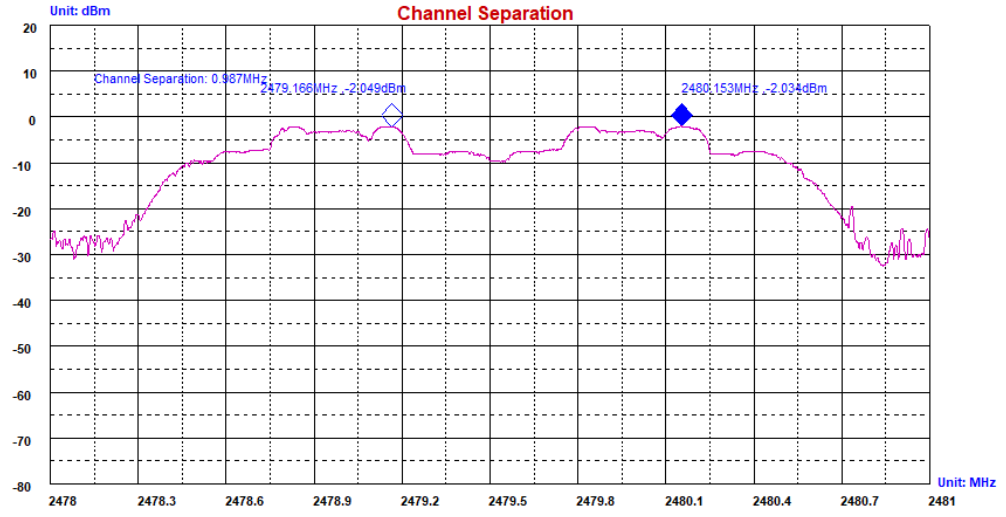
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.007	0.873	PASS
GFSK	MCH	1. 000	0.627	PASS
GFSK	HCH	1.022	0.629	PASS
π/4DQPSK	LCH	1.027	0.831	PASS
π/4DQPSK	MCH	0.999	0.833	PASS
π/4DQPSK	HCH	0.988	0.876	PASS
8DPSK	LCH	1.016	0.872	PASS
8DPSK	MCH	1.021	0.843	PASS
8DPSK	HCH	0.987	0.873	PASS

Test Graph

Graphs	
GFSK/LCH	
GFSK/MCH	
GFSK/HCH	

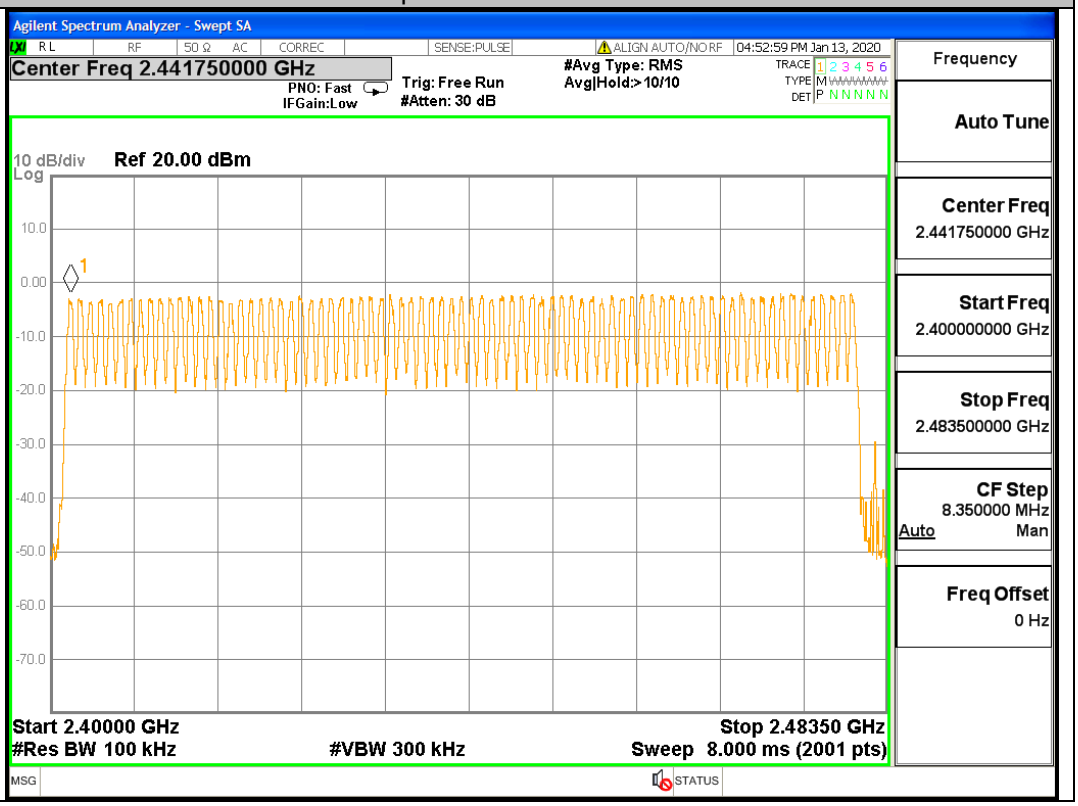
π/4DQPSK/LCH	
π/4DQPSK/MCH	
π/4DQPSK/HCH	

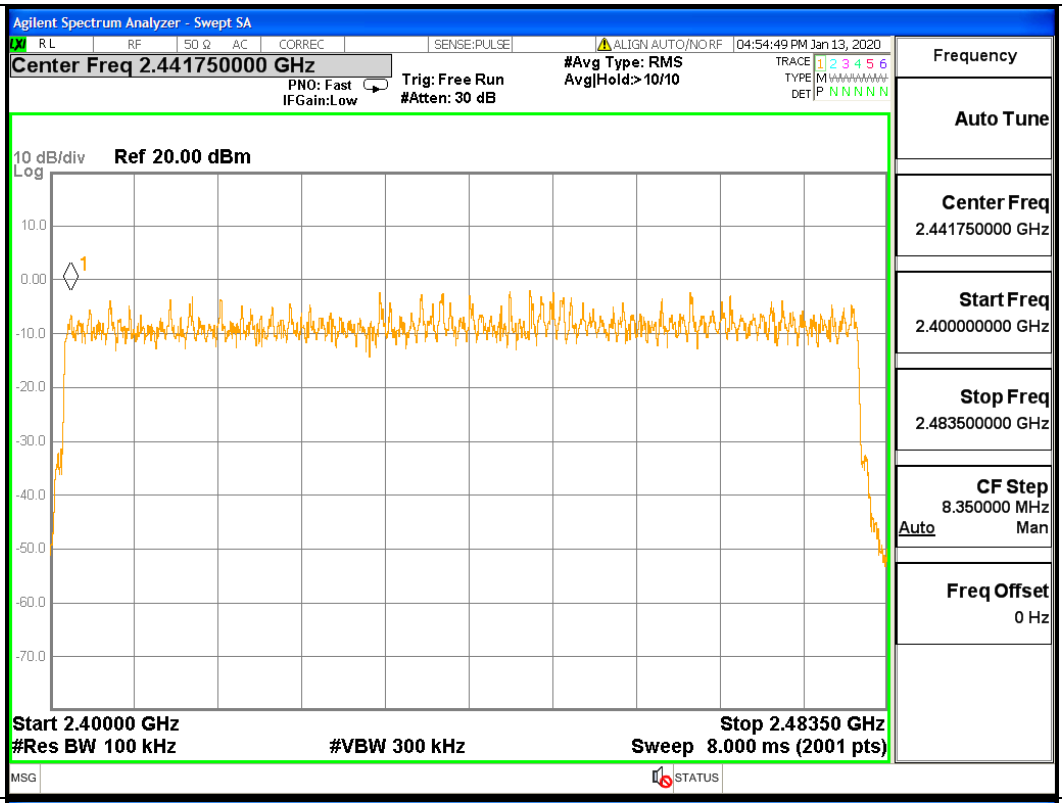
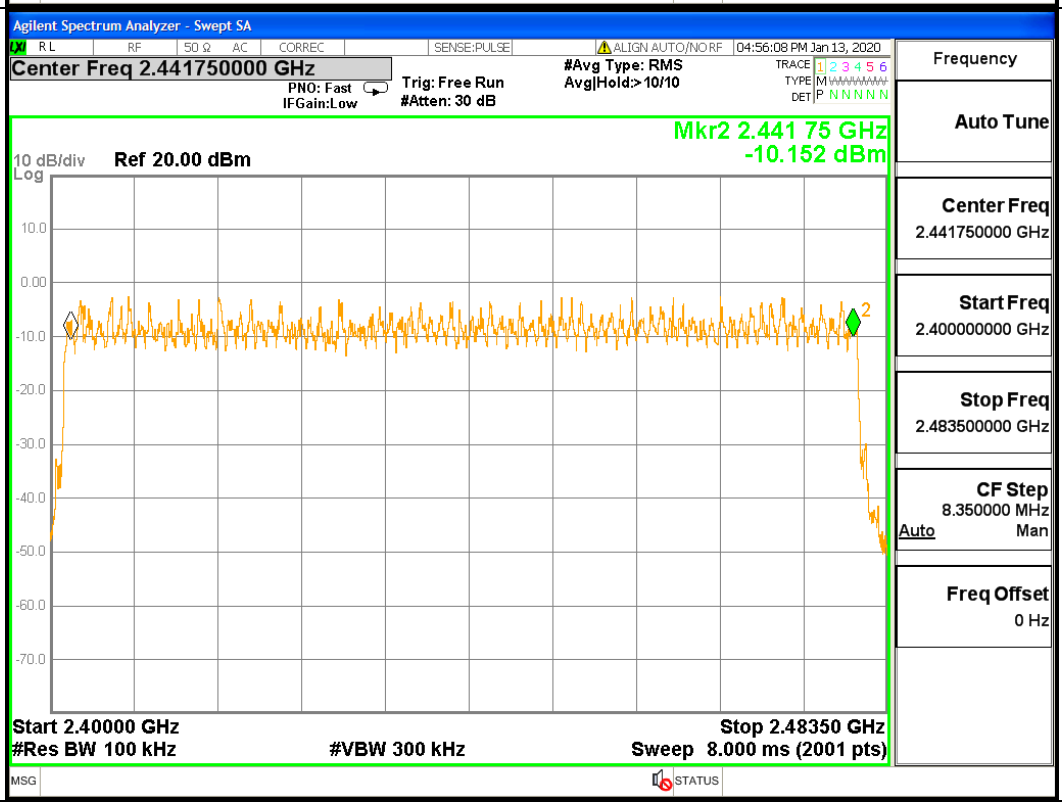
8DPSK/LCH	
8DPSK/MCH	
8DPSK/HCH	

A.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

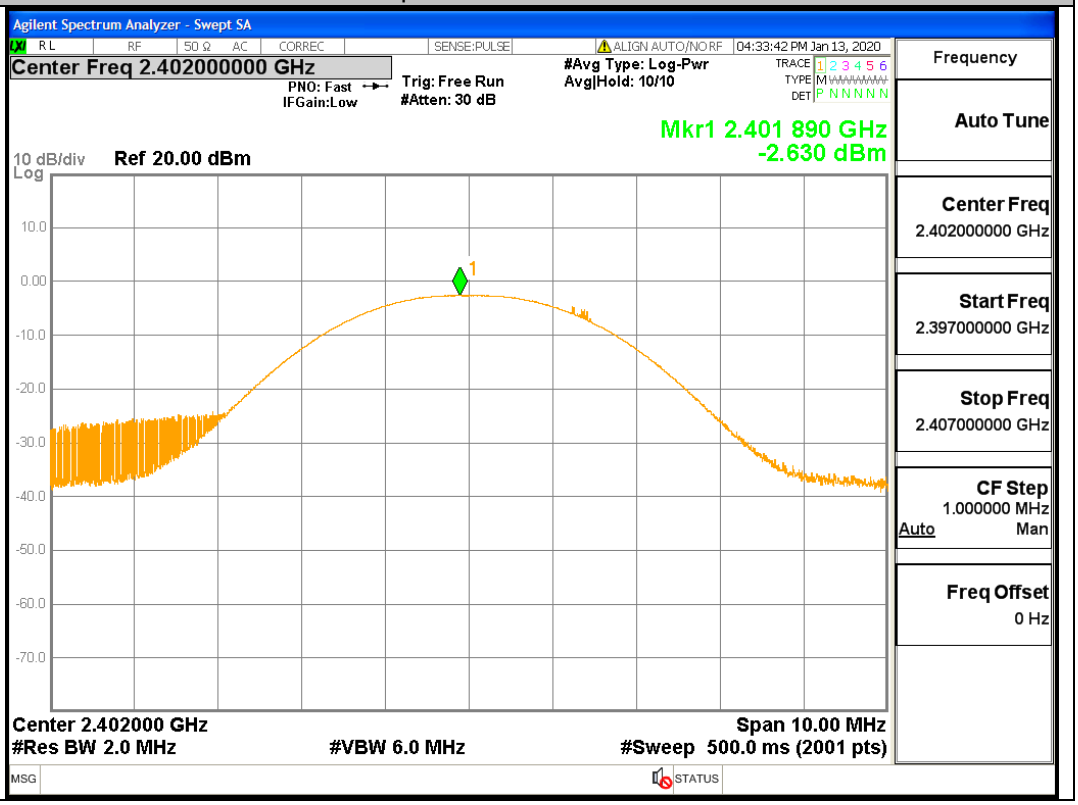
Graphs	
GFSK/Hop	

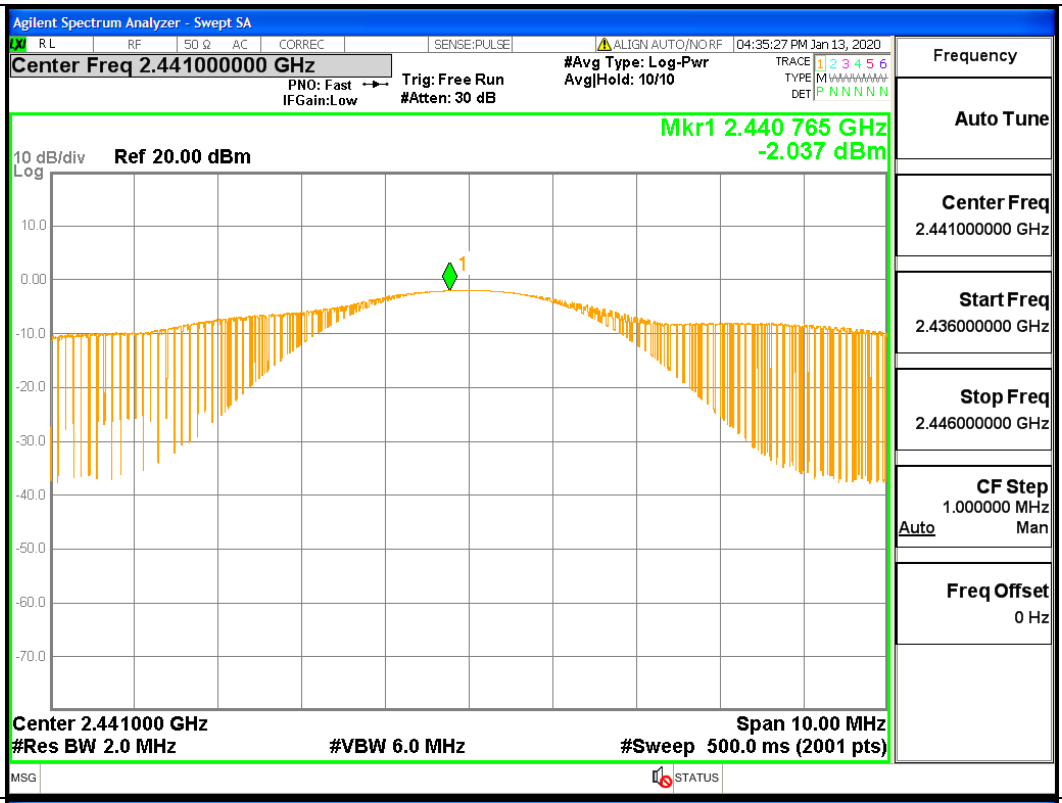
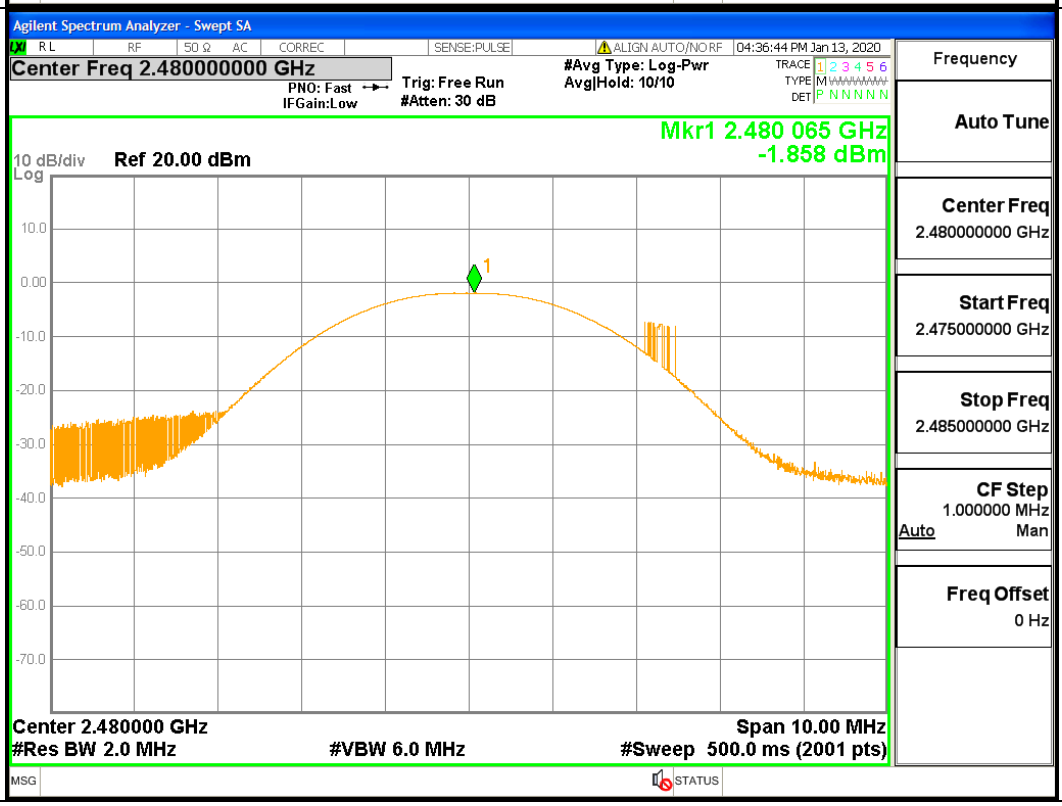
π/4DQPSK/Hop	
8DPSK/Hop	

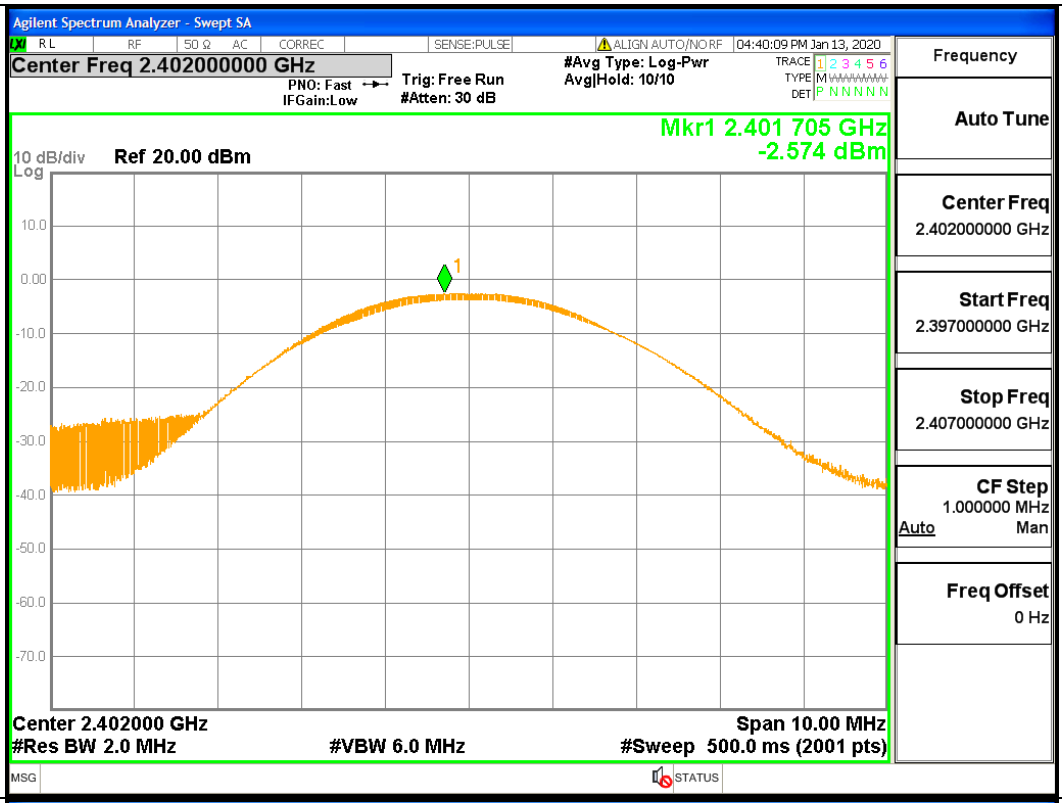
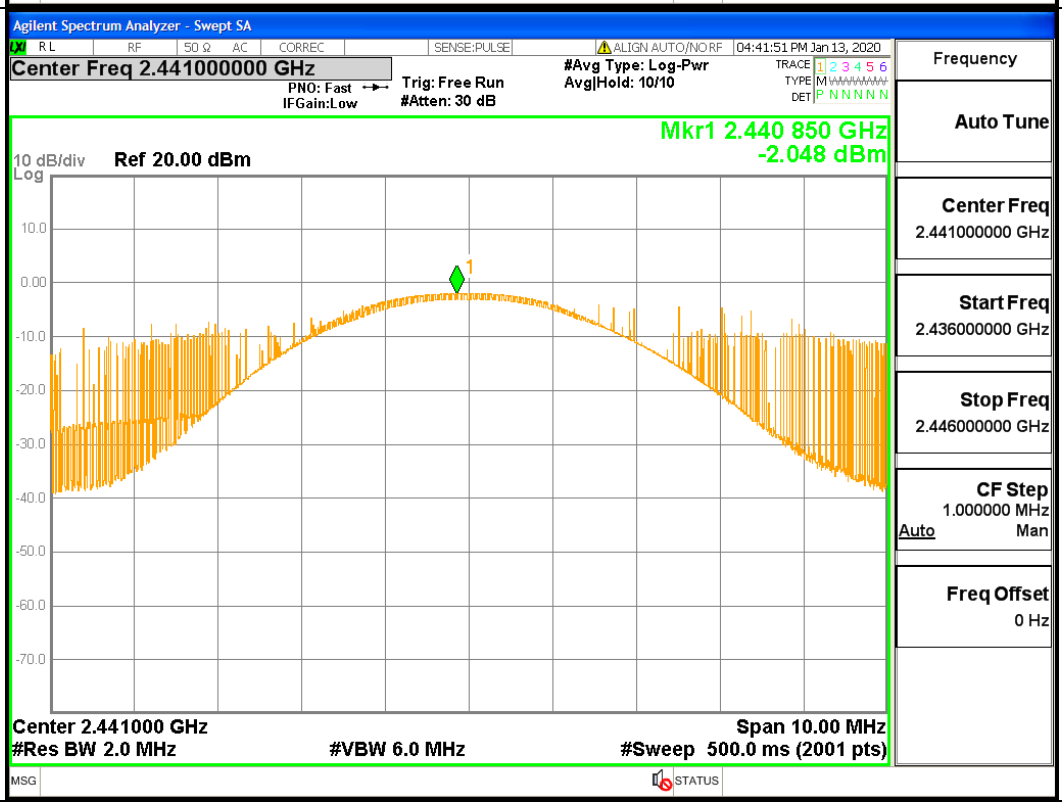
A.5 Conducted Peak Output Power

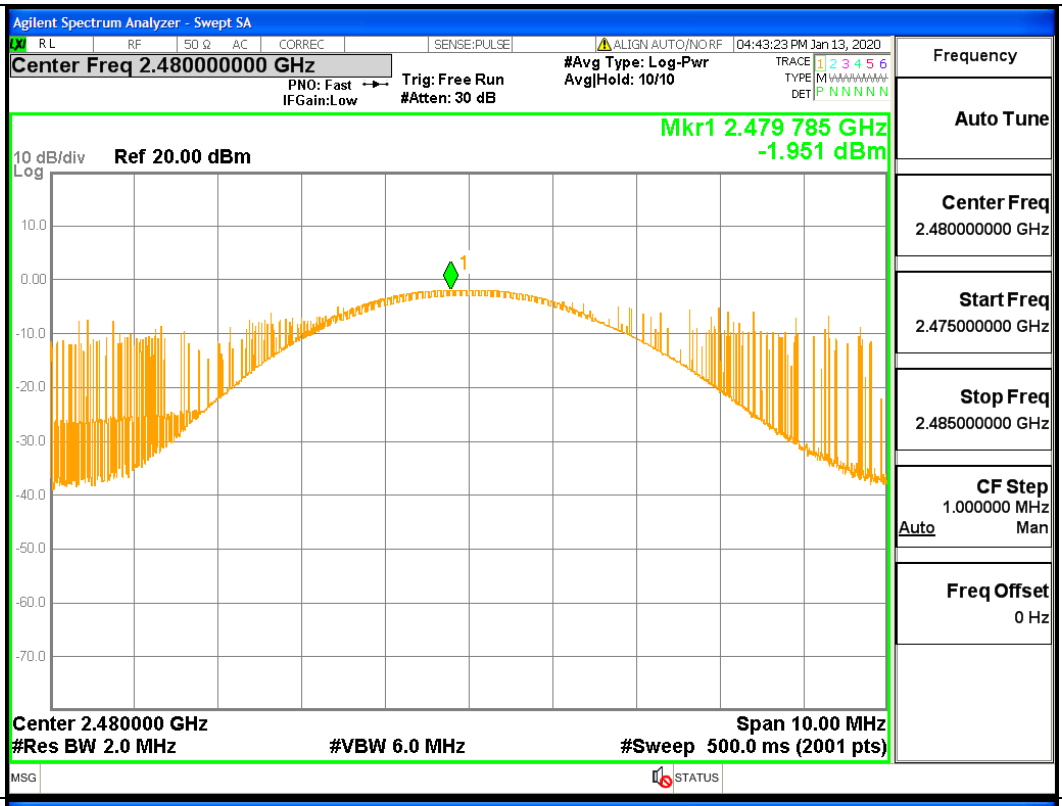
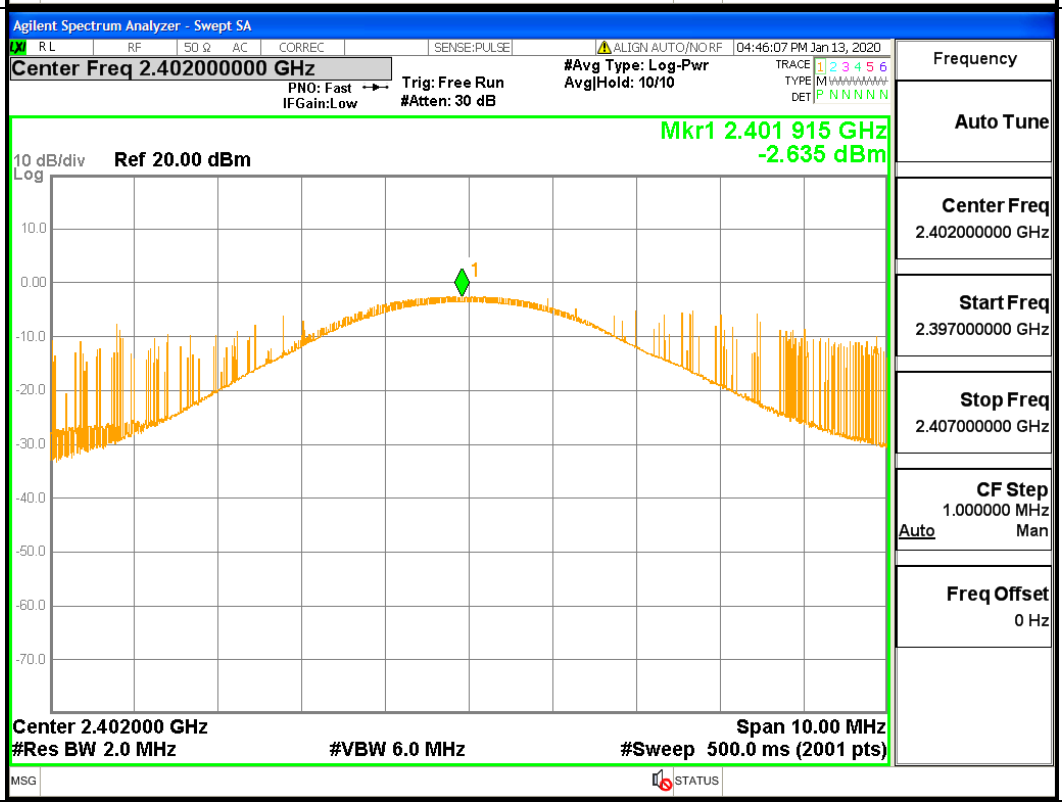
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.630	21	PASS
GFSK	MCH	-2.037	21	PASS
GFSK	HCH	-1.858	21	PASS
π/4DQPSK	LCH	-2.574	21	PASS
π/4DQPSK	MCH	-2.048	21	PASS
π/4DQPSK	HCH	-1.951	21	PASS
8DPSK	LCH	-2.635	21	PASS
8DPSK	MCH	-2.036	21	PASS
8DPSK	HCH	-1.916	21	PASS

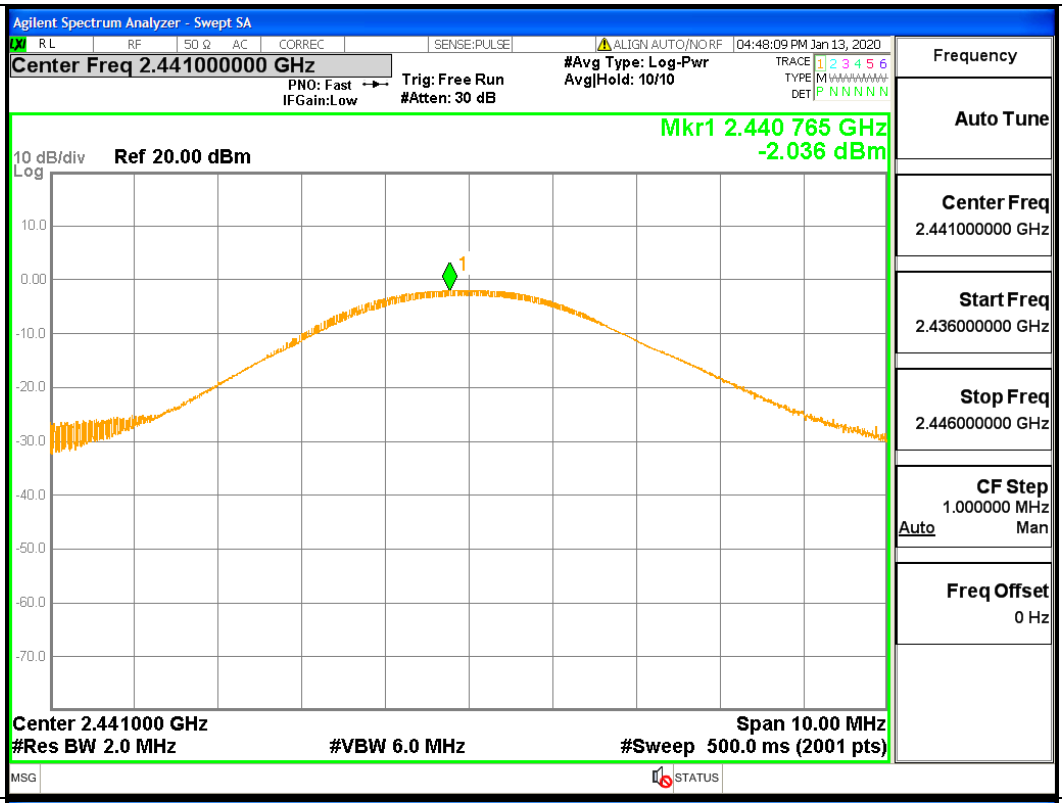
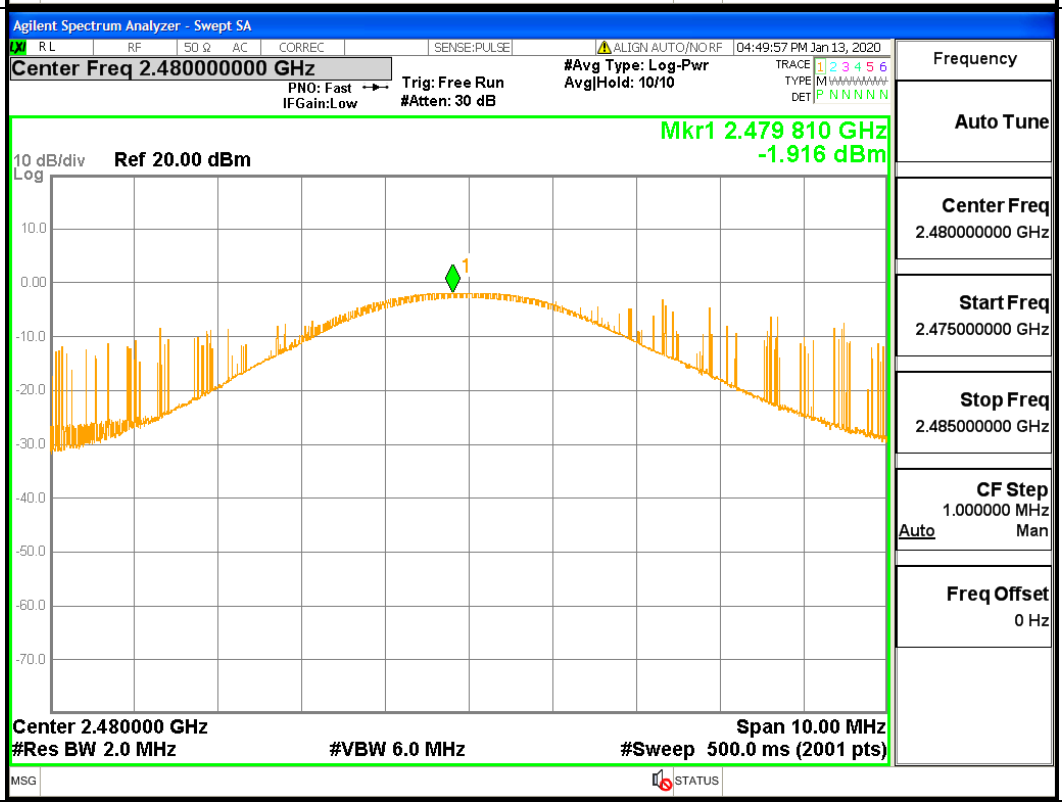
Test Graph

Graphs	
GFSK/LCH	

GFSK/MCH	
GFSK/HCH	

π/4DQPSK/LCH	
π/4DQPSK/MCH	

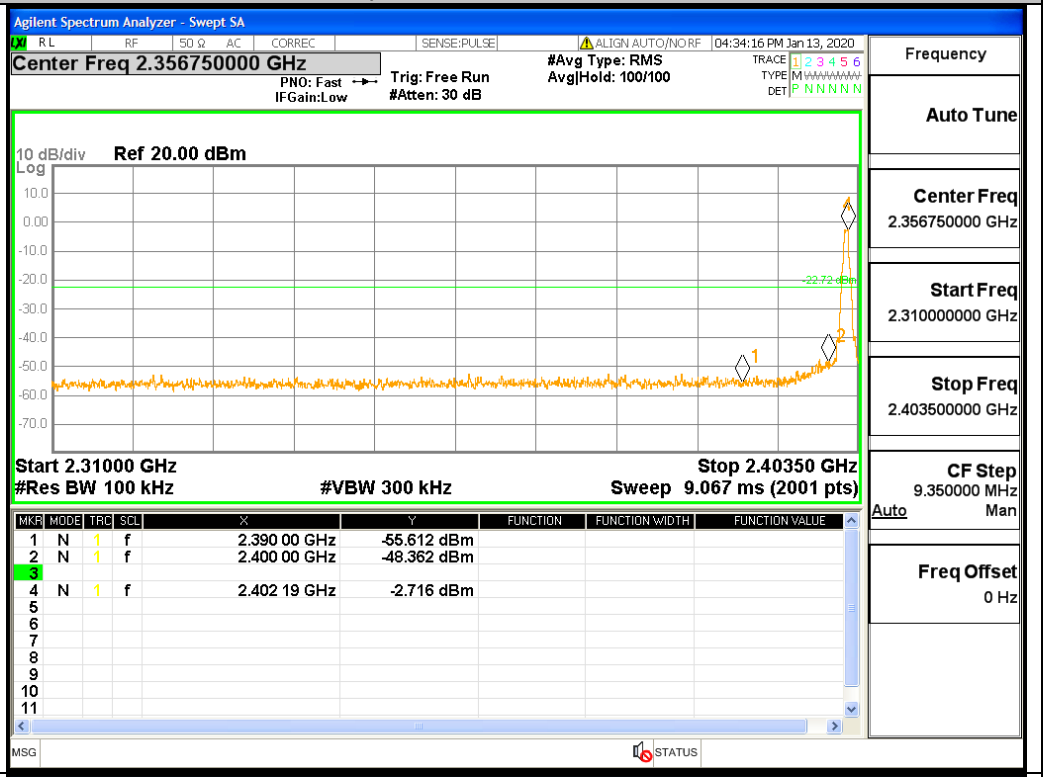
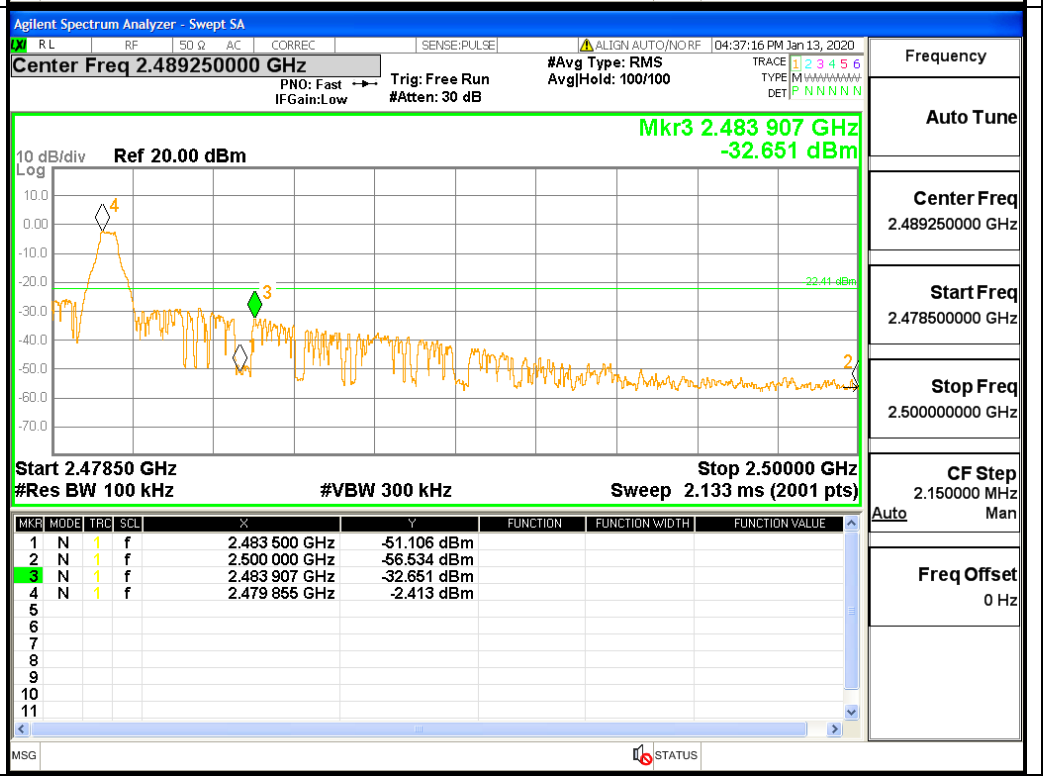
π/4DQPSK/HCH	
8DPSK/LCH	

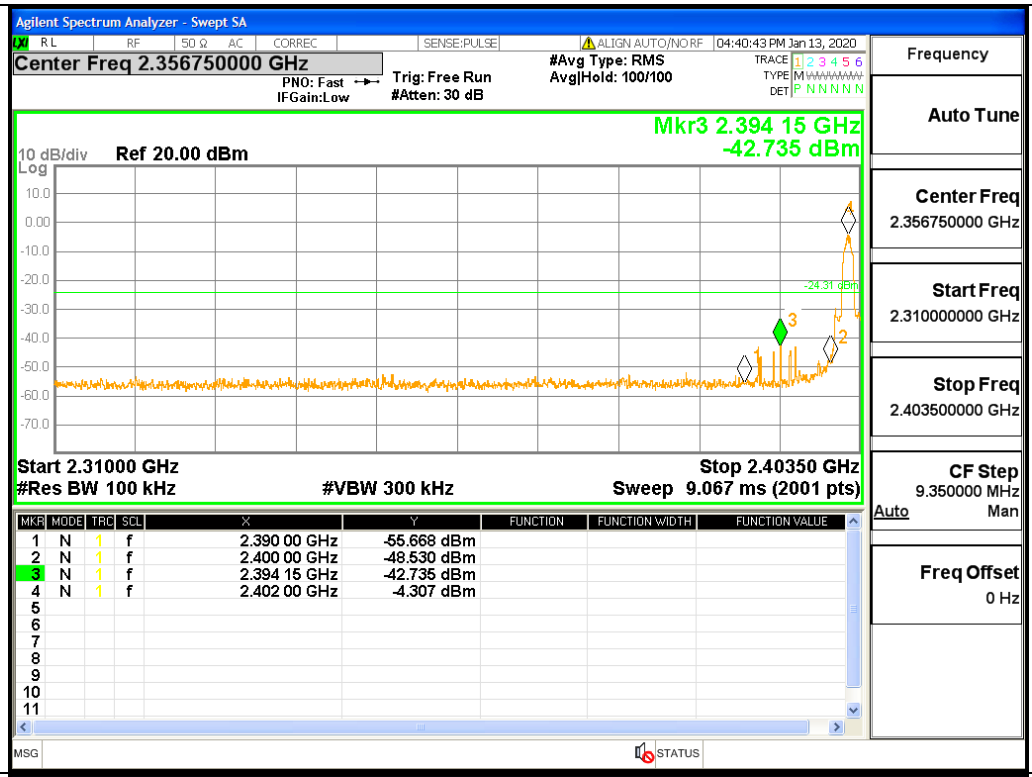
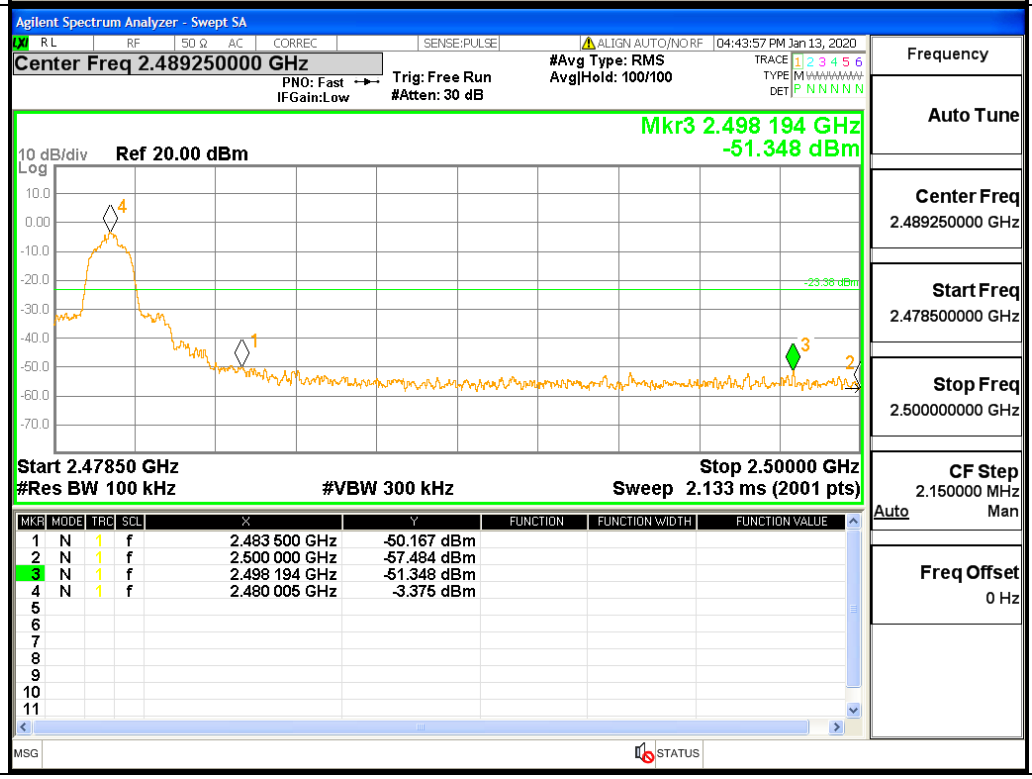
8DPSK/MCH	
8DPSK/HCH	

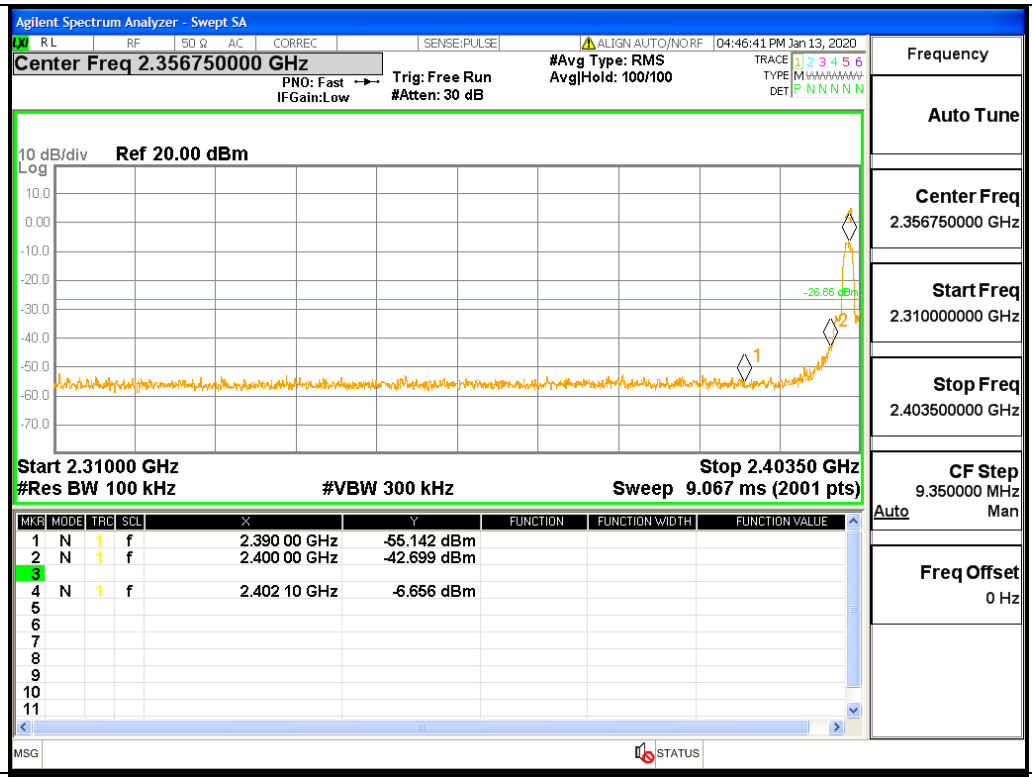
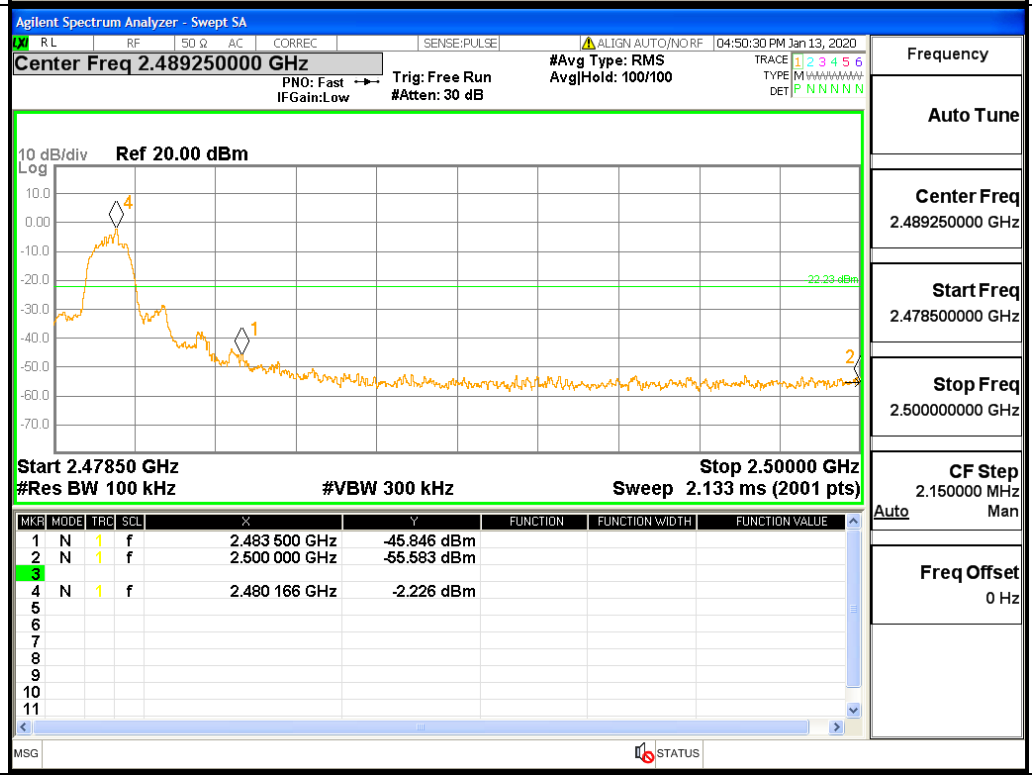
A.6 Band-edge for RF Conducted Emissions

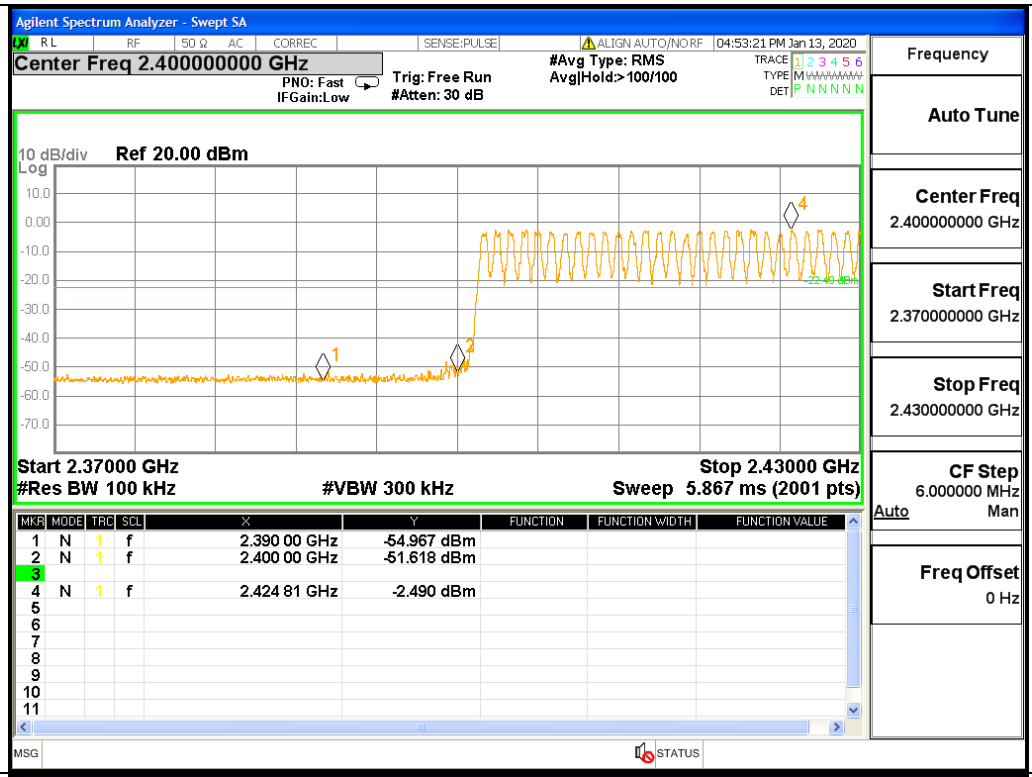
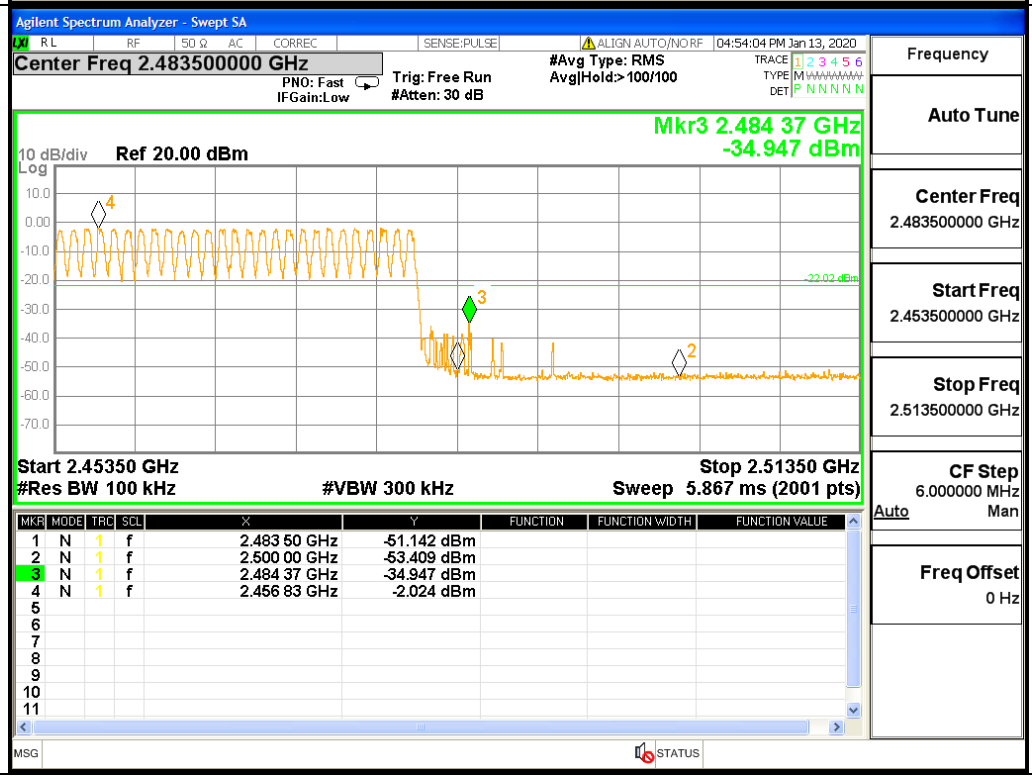
Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2400	-2.716	-48.36	-22.716	Pass
1DH5	2480	2483.907	-2.413	-32.651	-22.413	Pass
2DH5	2402	2394.15	-4.307	-42.735	-24.307	Pass
2DH5	2480	2483.5	-3.375	-50.17	-23.375	Pass
3DH5	2402	2400	-6.656	-42.7	-26.656	Pass
3DH5	2480	2483.5	-2.226	-45.85	-22.226	Pass
1DH5-Hopping	2402	2400	-2.49	-51.62	-22.49	Pass
1DH5-Hopping	2480	2484.37	-2.024	-34.947	-22.024	Pass
2DH5-Hopping	2402	2398.05	-2.507	-36.532	-22.507	Pass
2DH5-Hopping	2480	2489.26	-2.018	-43.555	-22.018	Pass
3DH5-Hopping	2402	2397.36	-2.509	-36.793	-22.509	Pass
3DH5-Hopping	2480	2483.5	-1.966	-36.628	-21.966	Pass

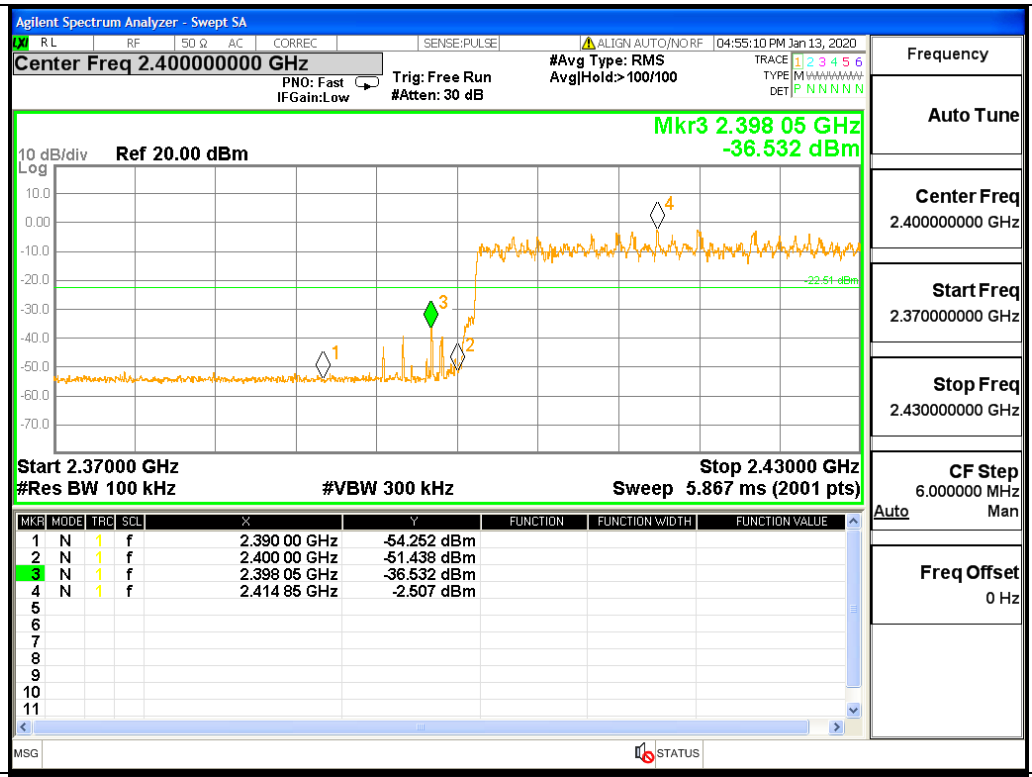
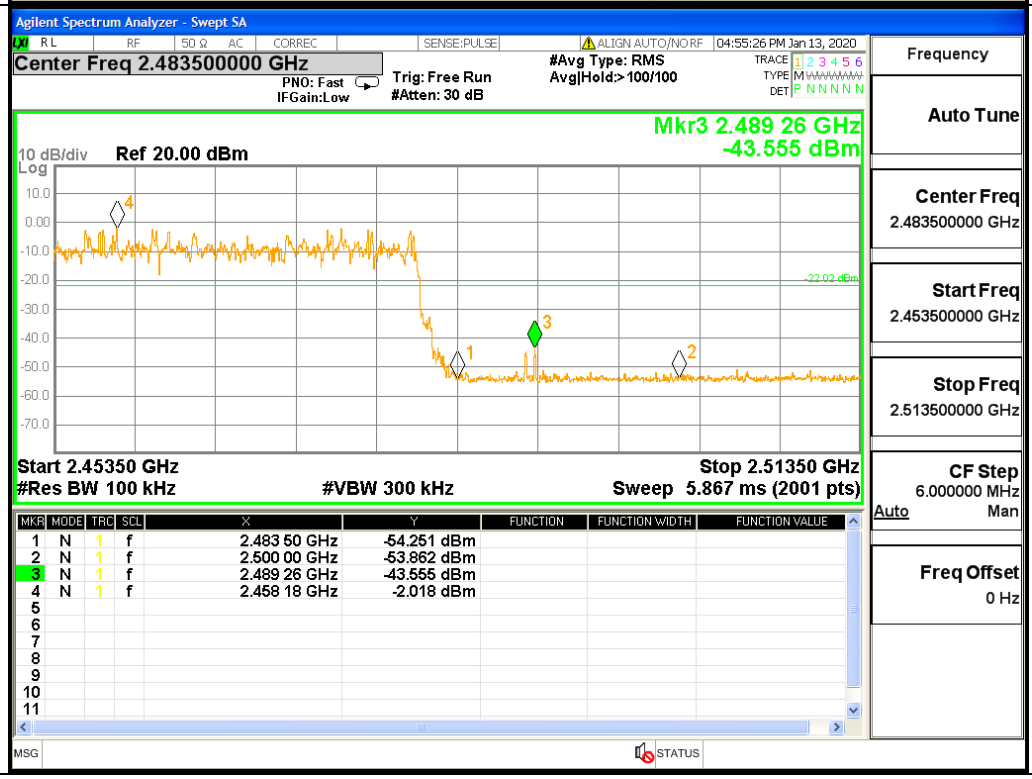
Test Graph

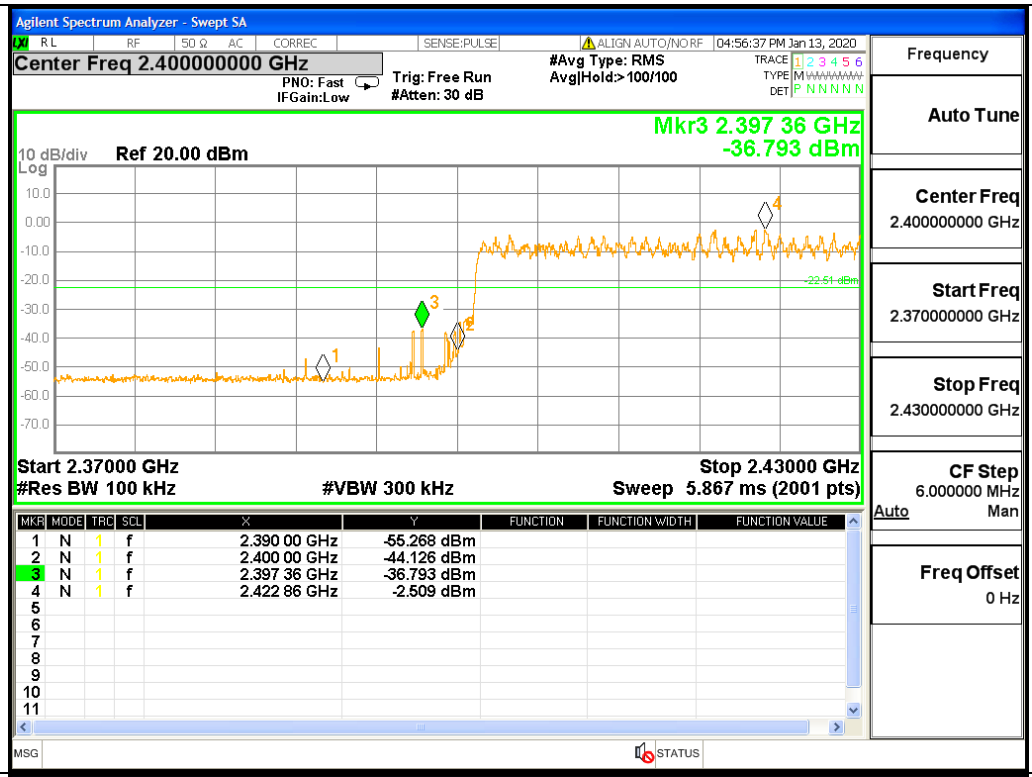
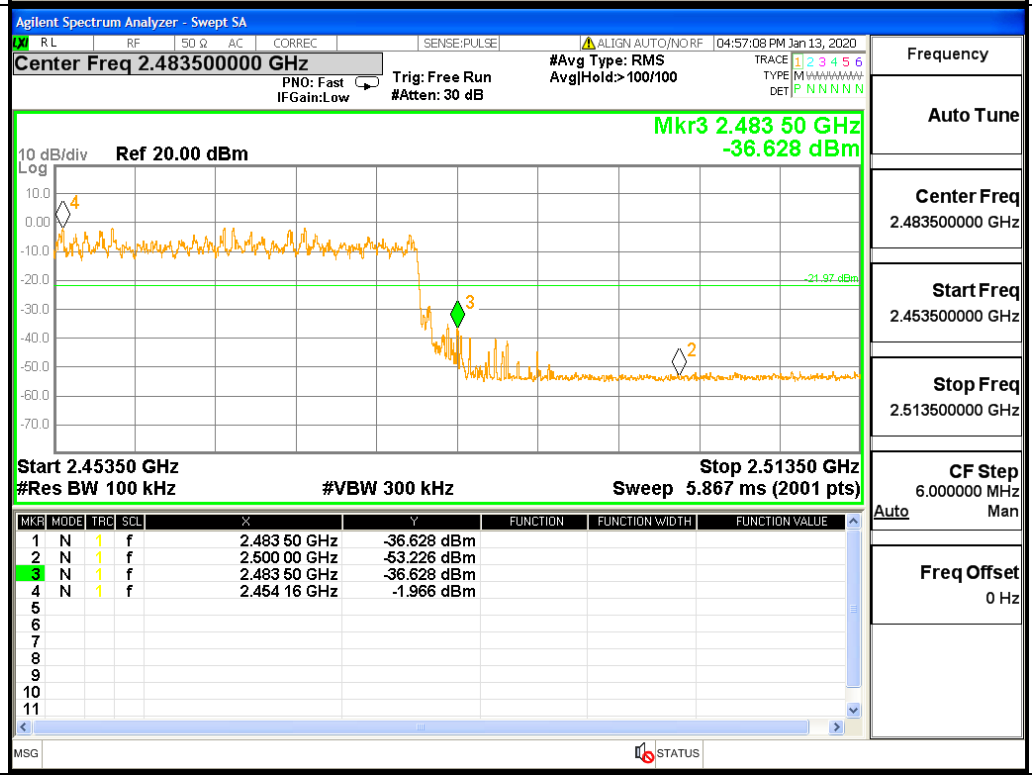
Graphs	
GFSK/LCH/No Hop	
GFSK/HCH/No Hop	

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

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

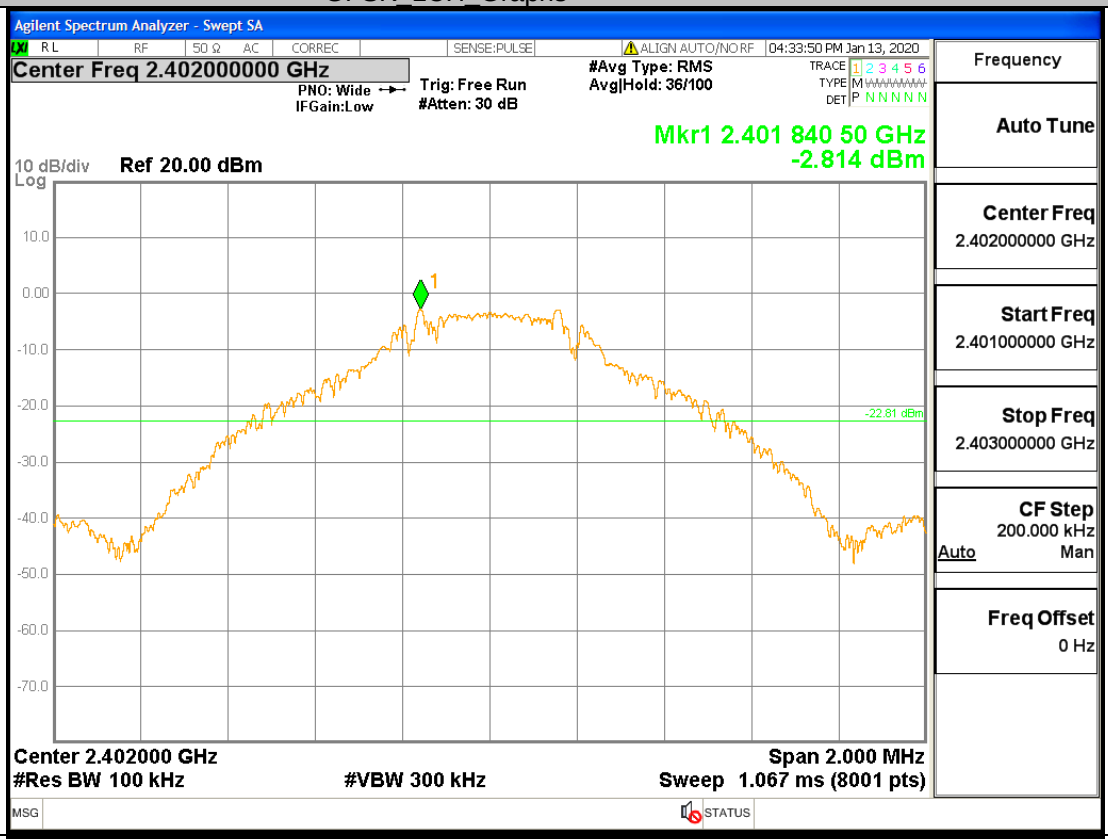
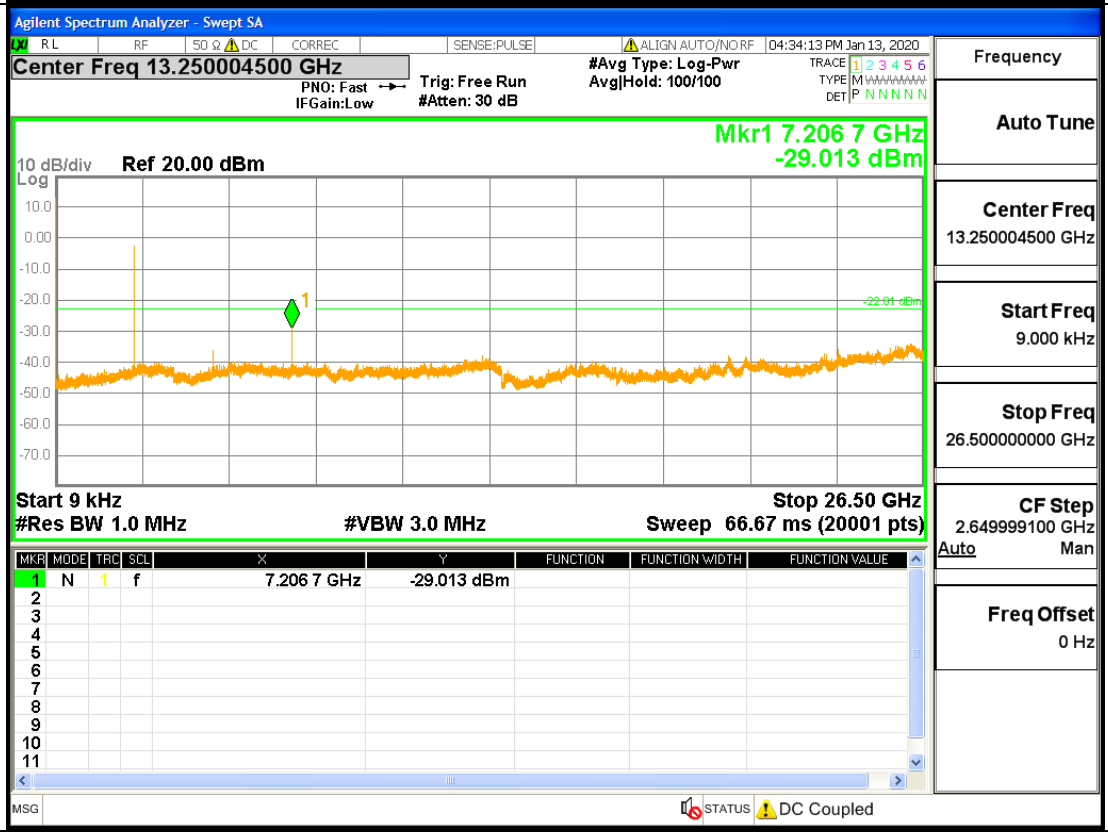
GFSK/LCH/Hop	
GFSK/HCH/Hop	

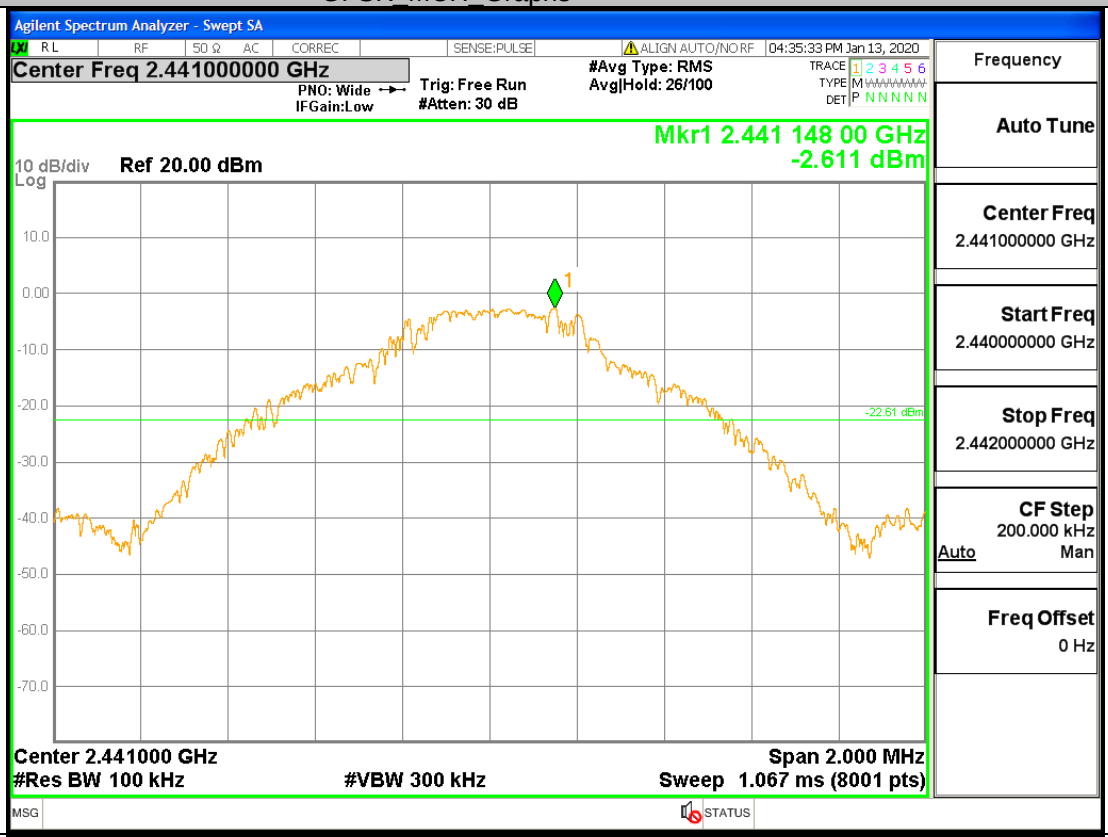
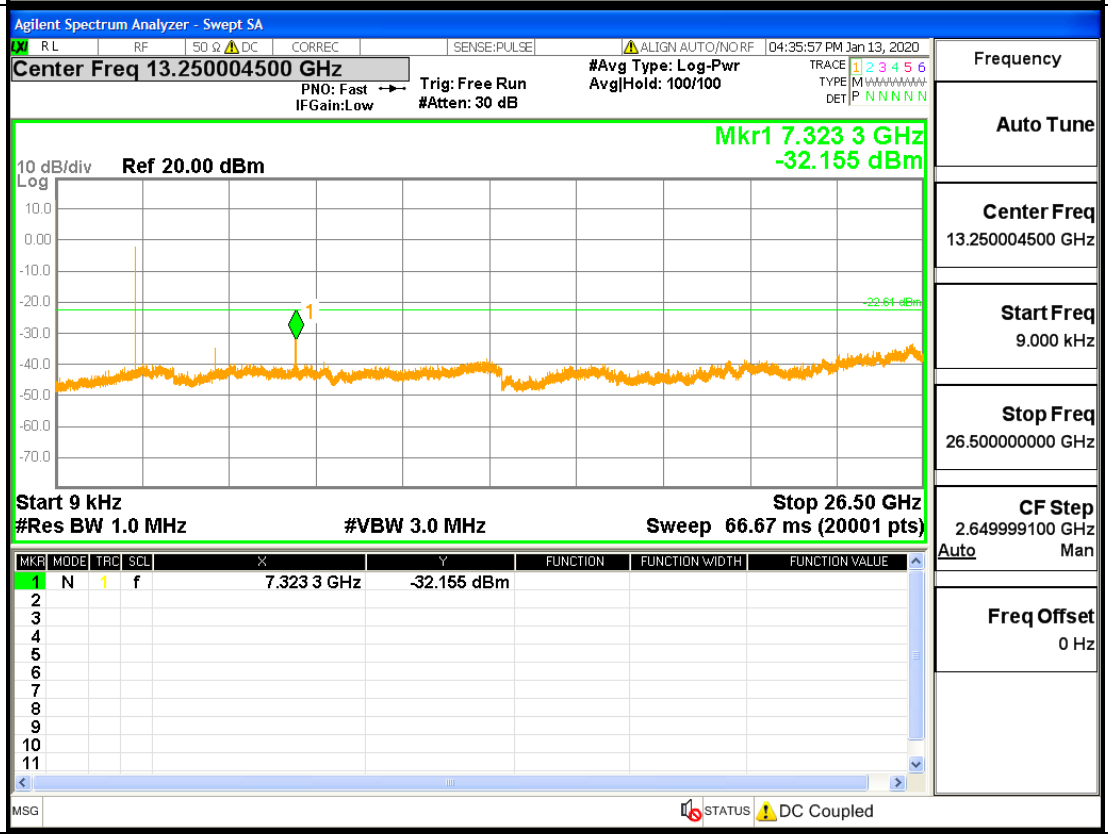
π/4DQPSK/LCH/Hop	
π /4DQPSK/HCH/Hop	

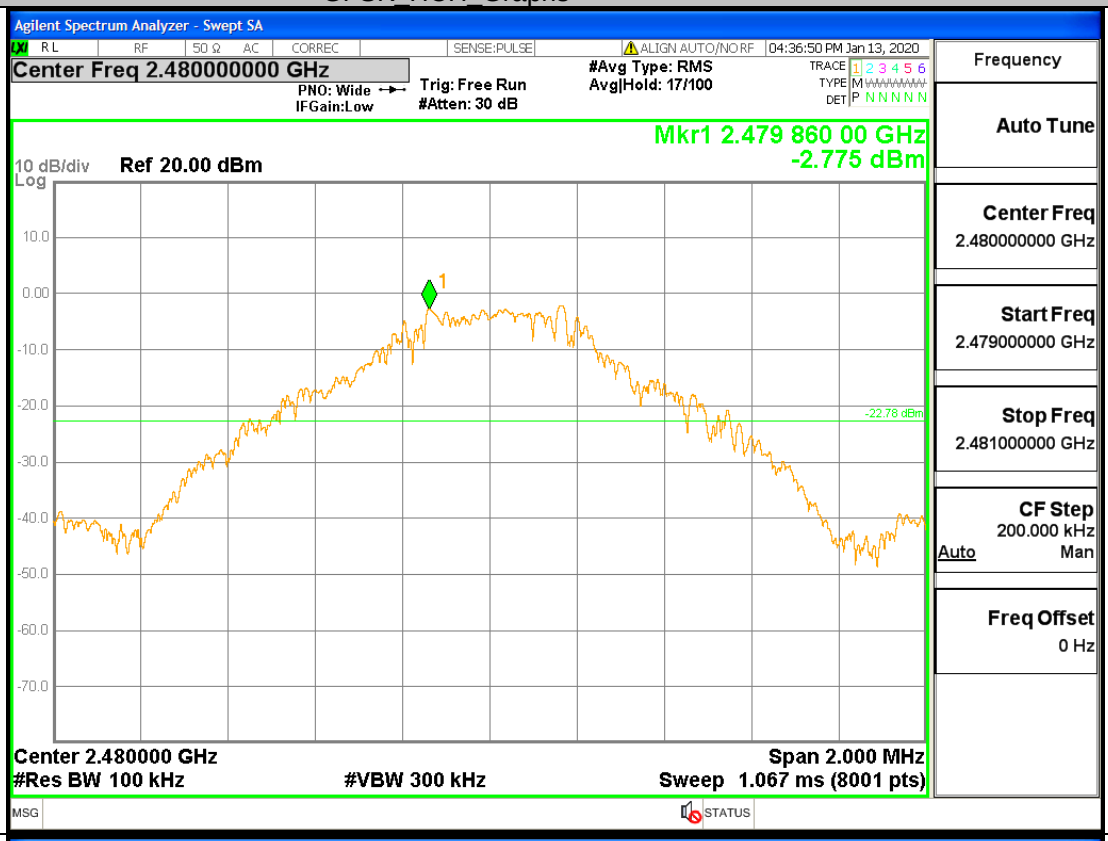
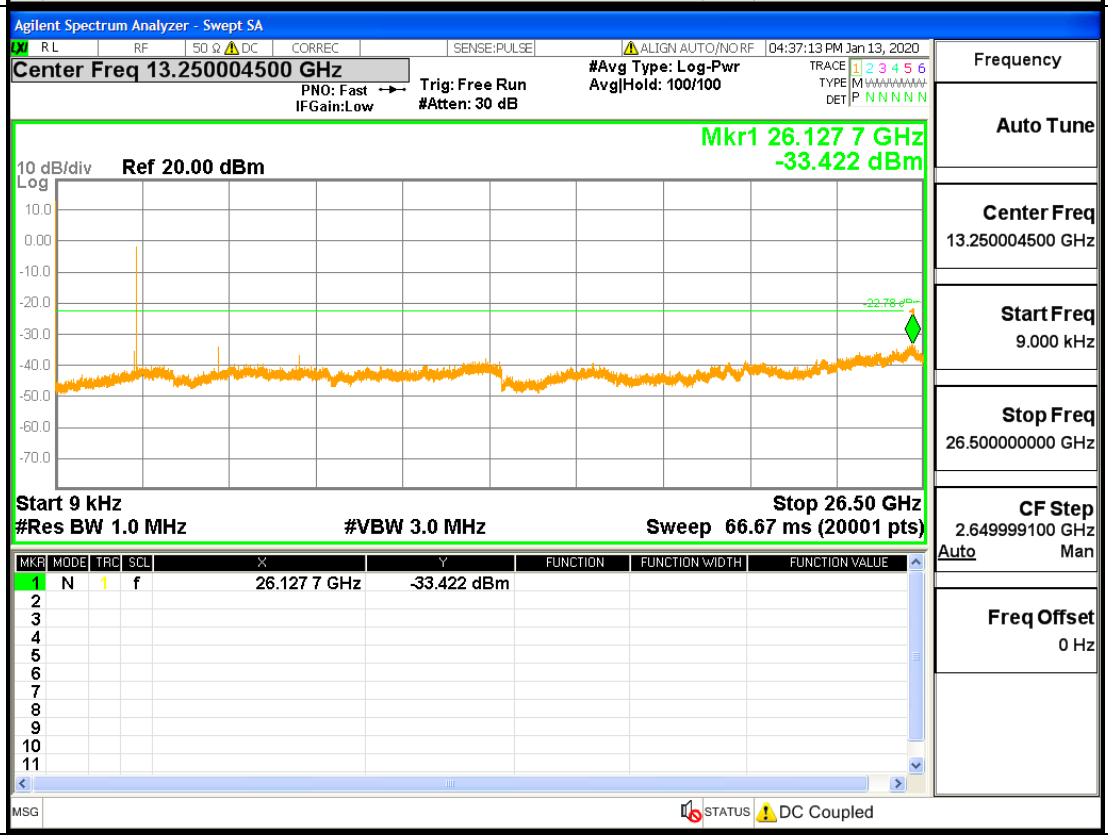
8DPSK/LCH/Hop	
8DPSK/HCH/Hop	

A.7 RF Conducted Spurious Emissions

Test Graph

GFSK_LCH_Graphs	
Pref	
Puw	

GFSK_MCH_Graphs	
Pref	
Puw	

GFSK_HCH_Graphs	
Pref	
Puw	

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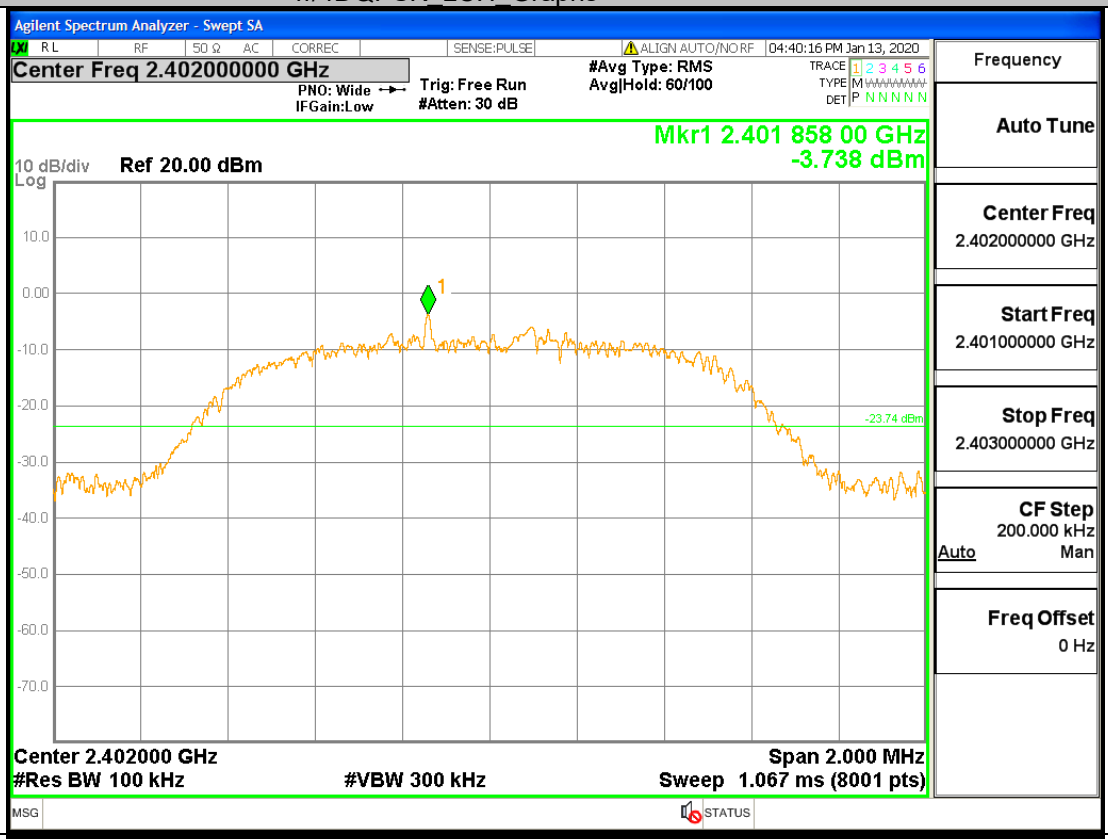
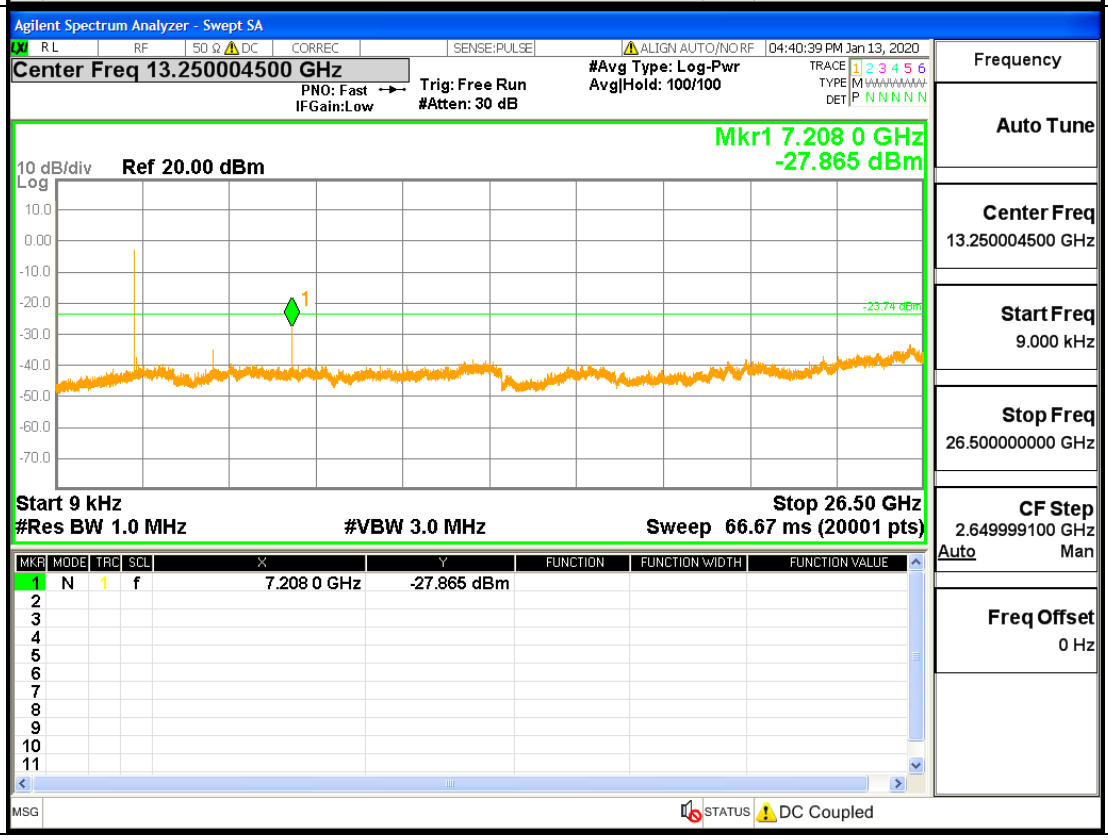
Pref	
Puw	

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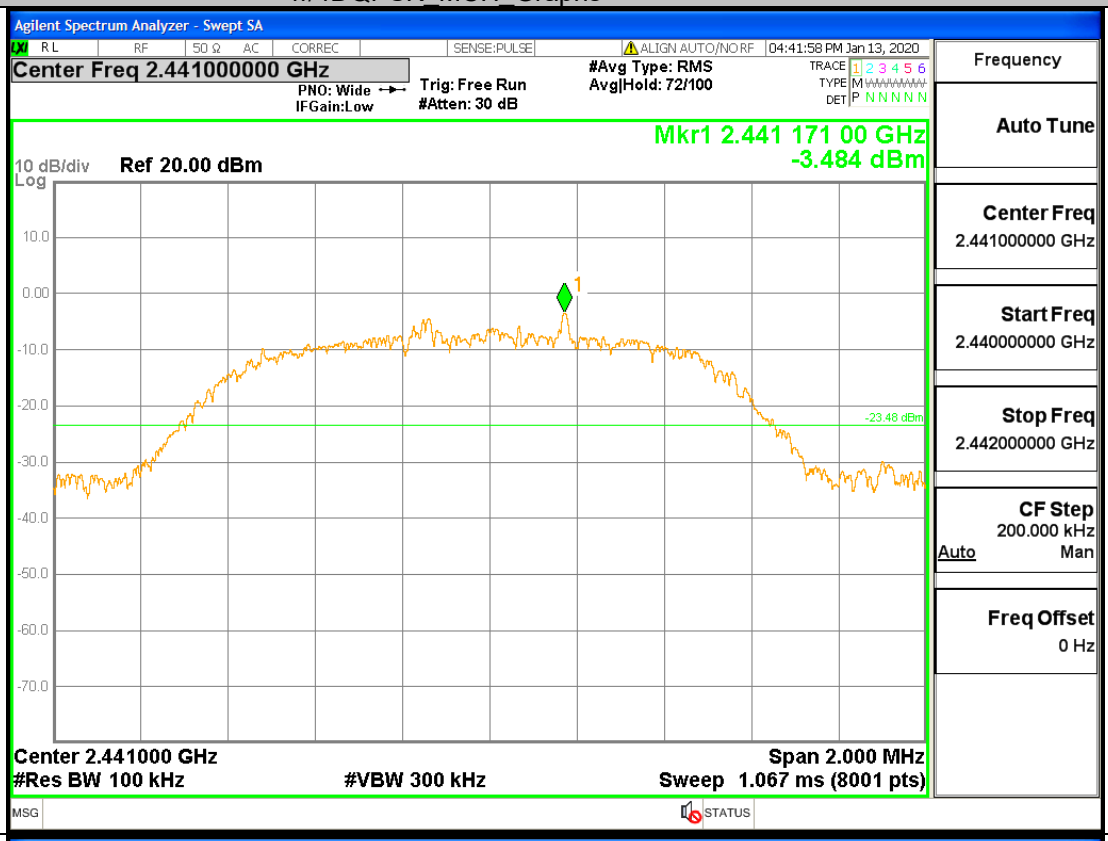
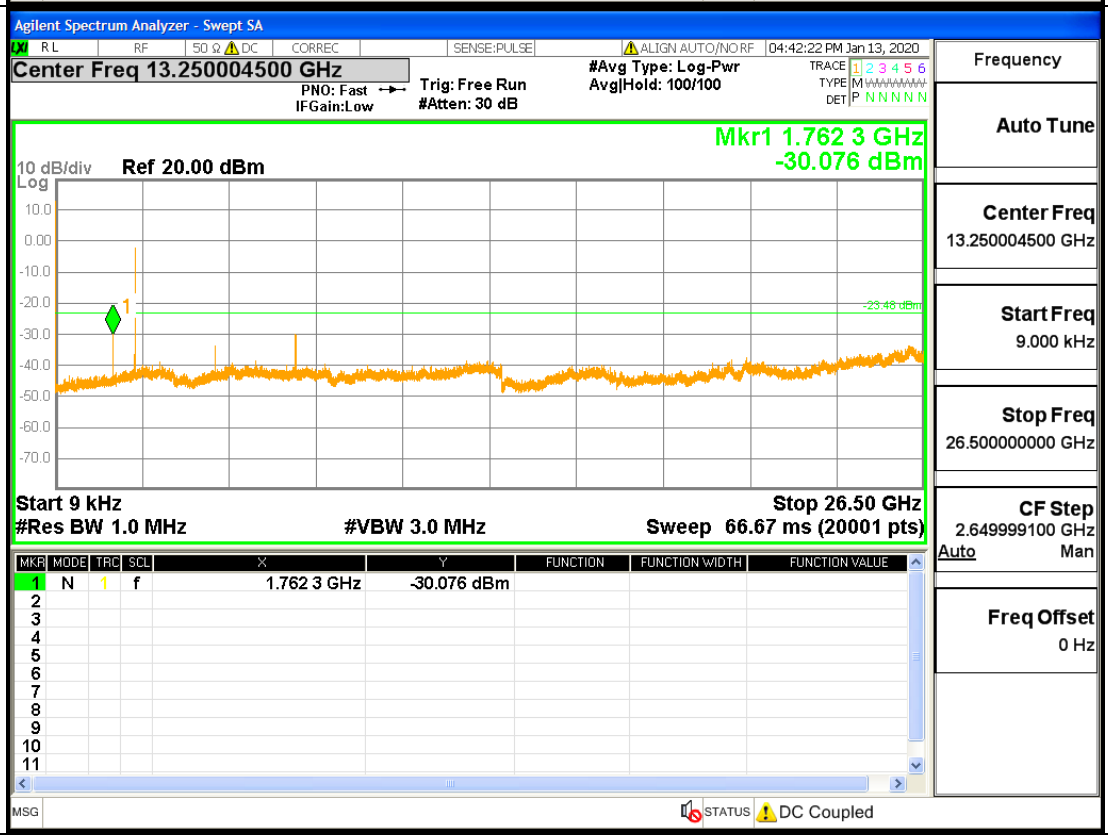
Pref	
Puw	

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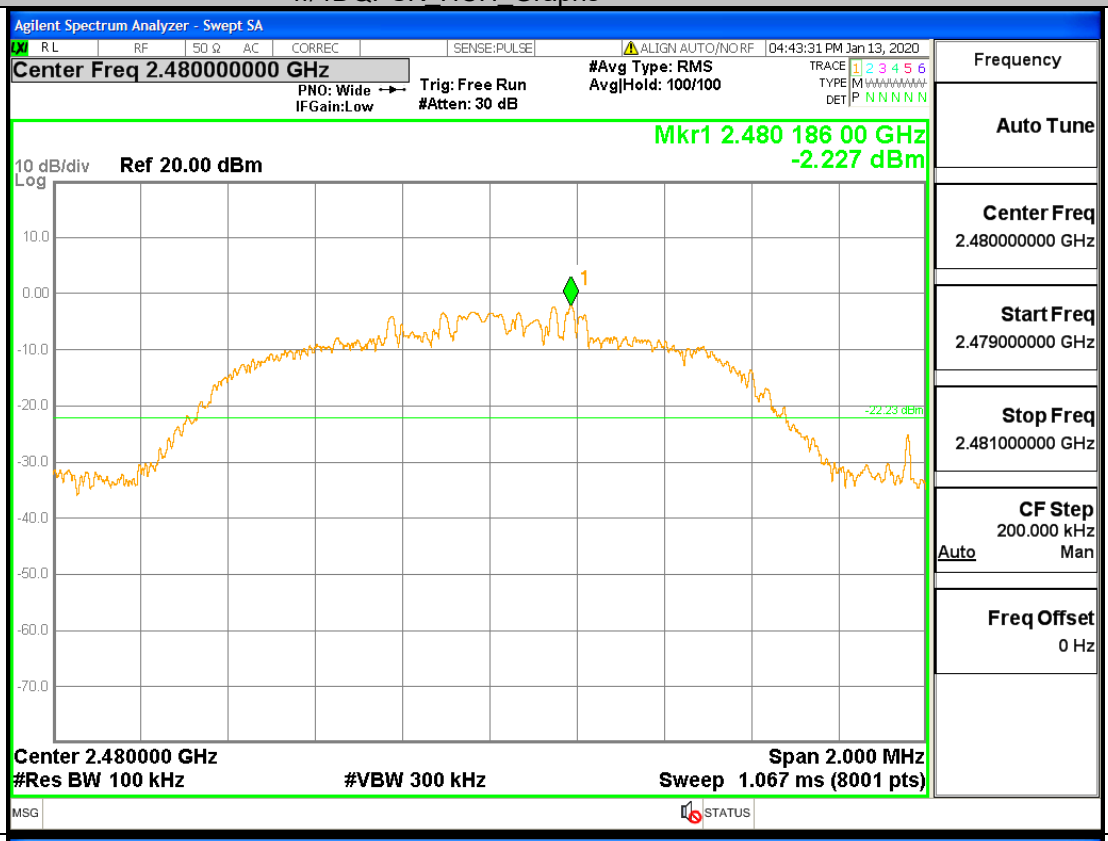
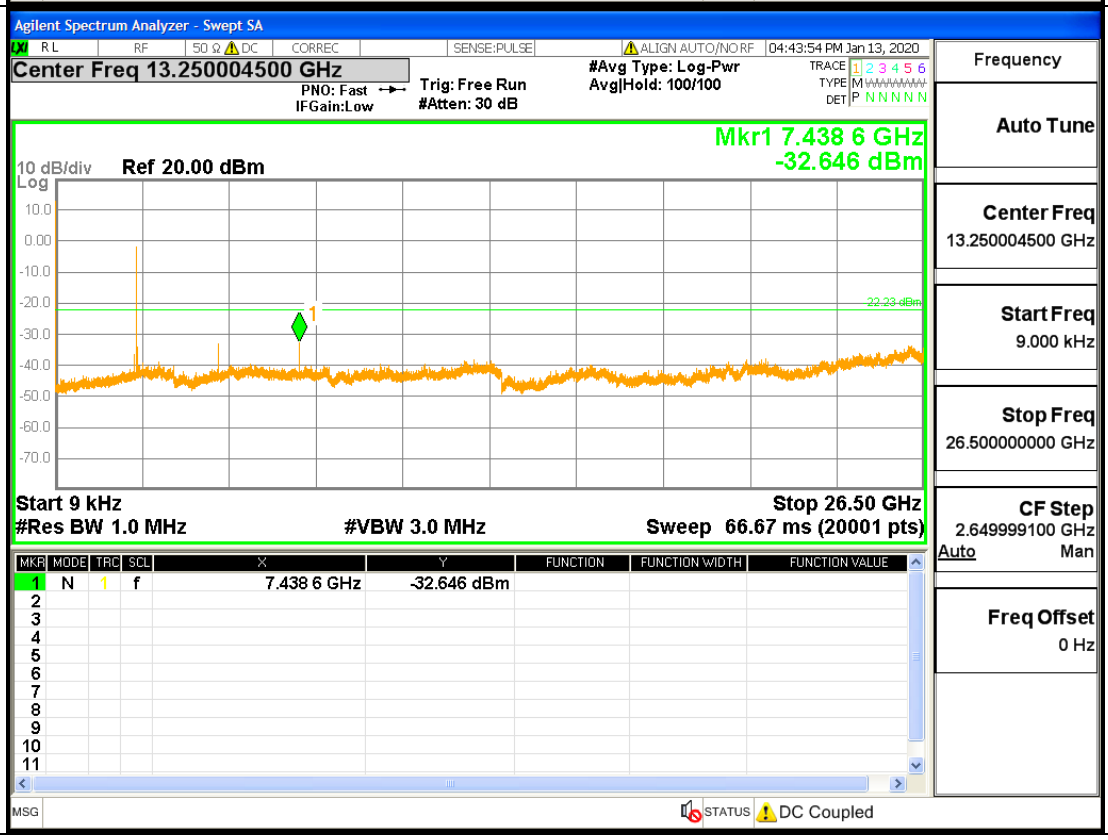
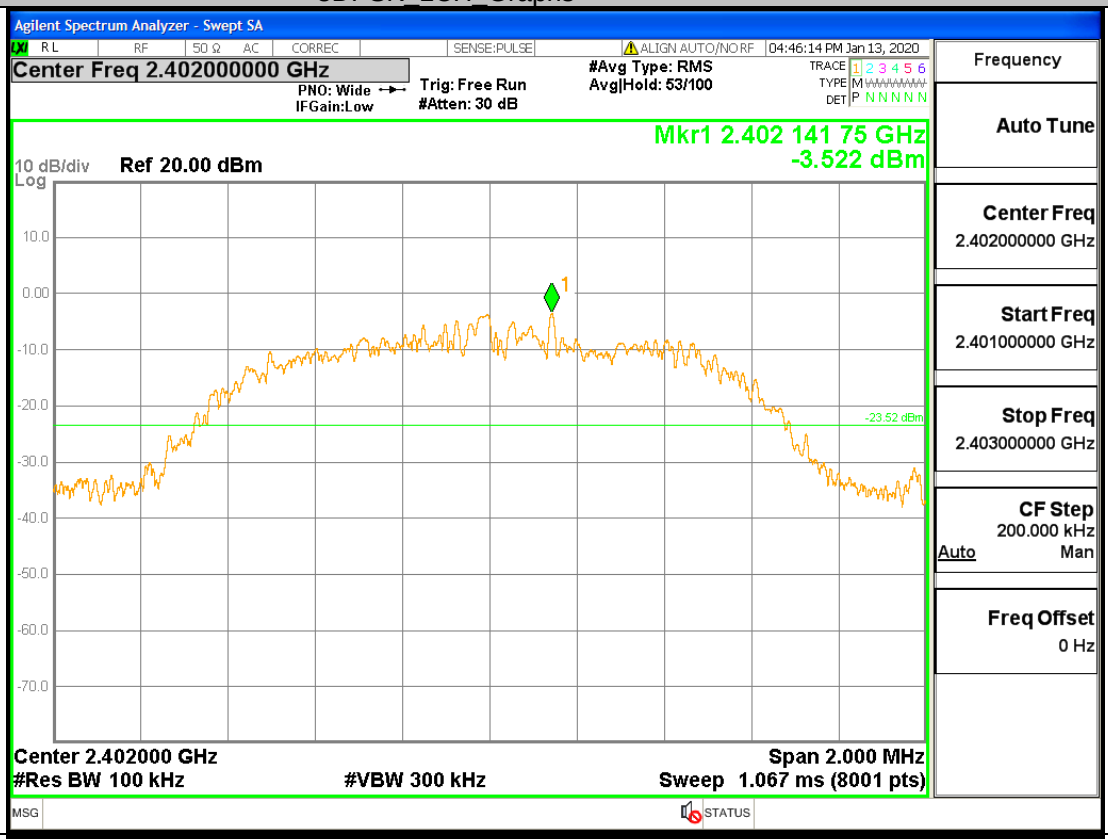
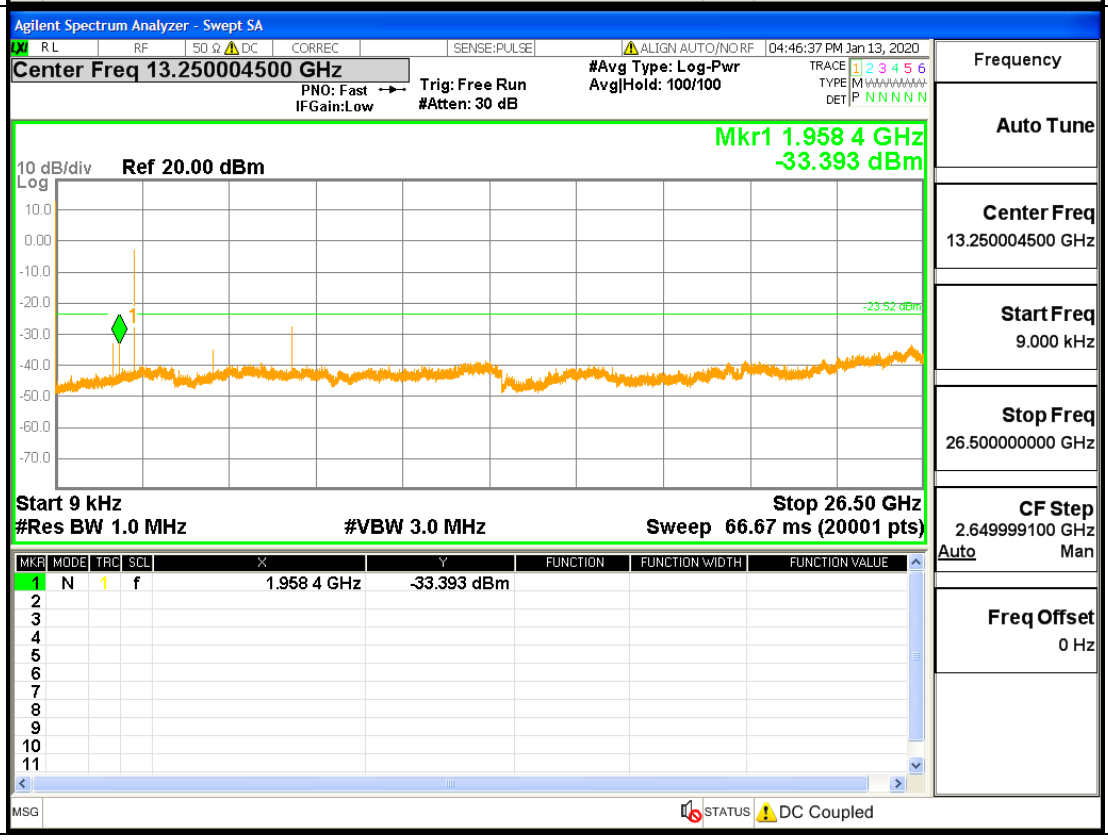
Pref	
Puw	

8DPSK_LCH_Graphs	
Pref	
Puw	

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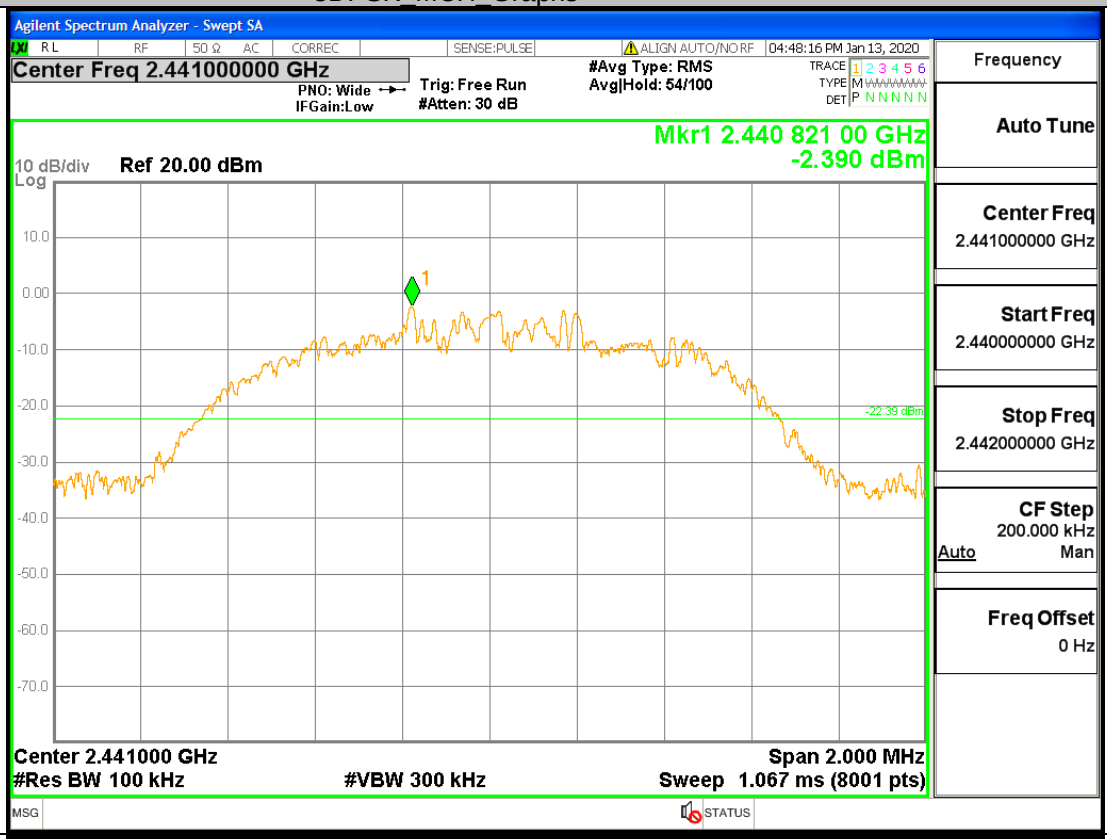
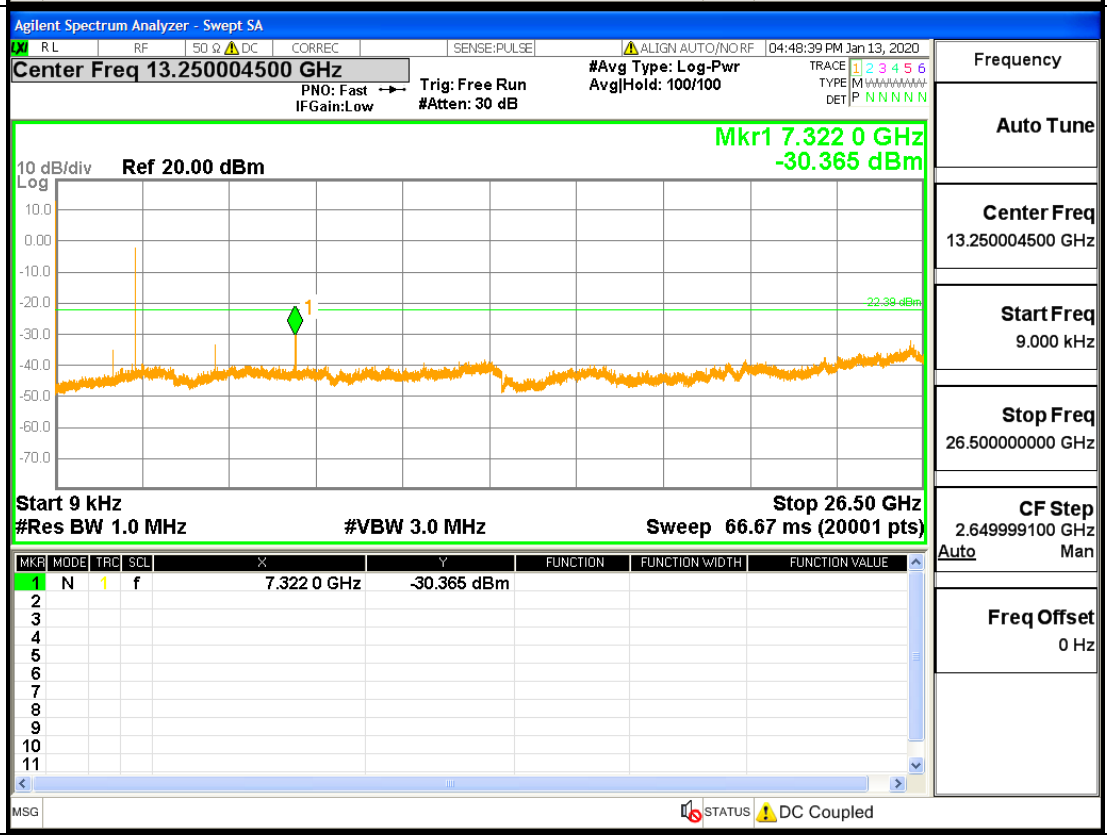
Pref	
Puw	

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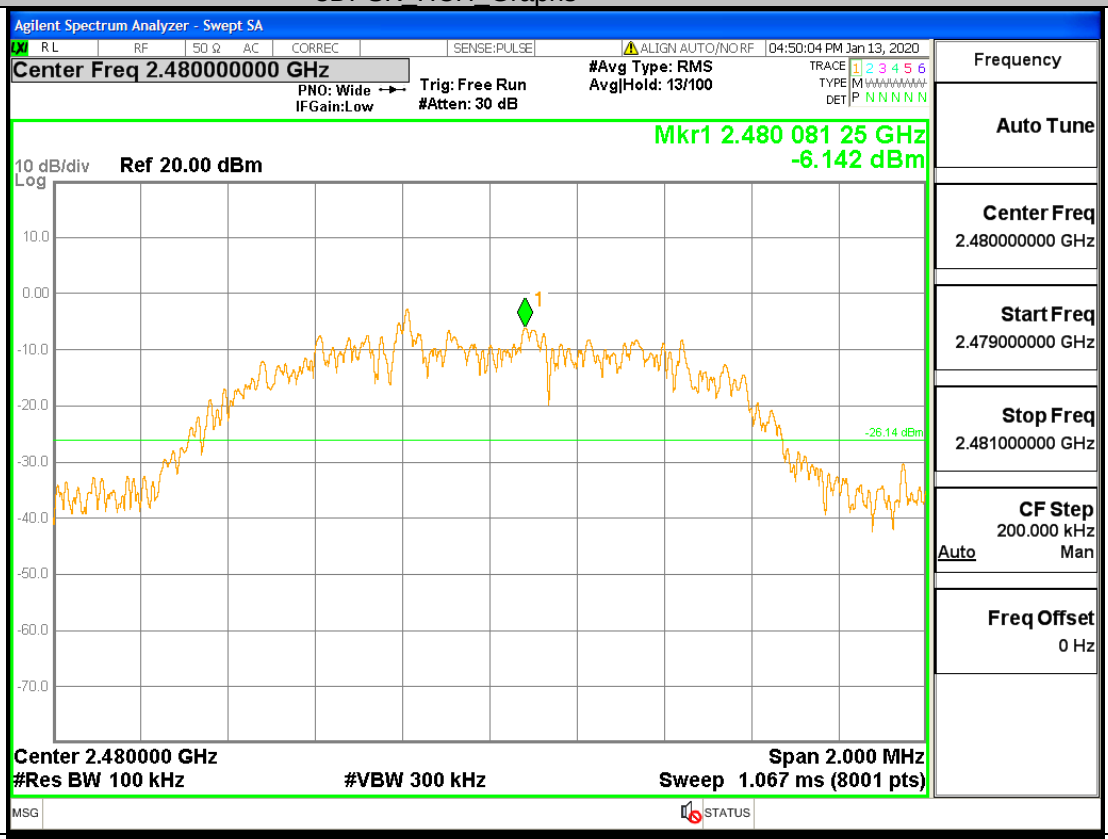
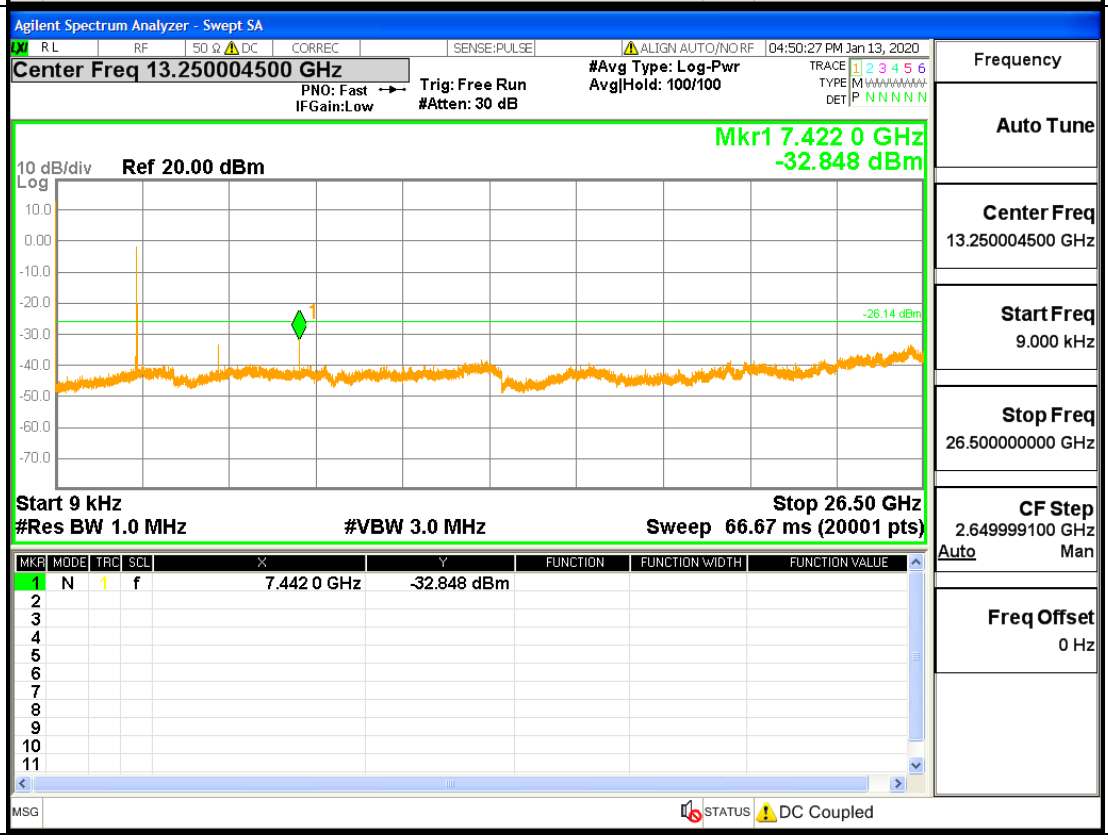
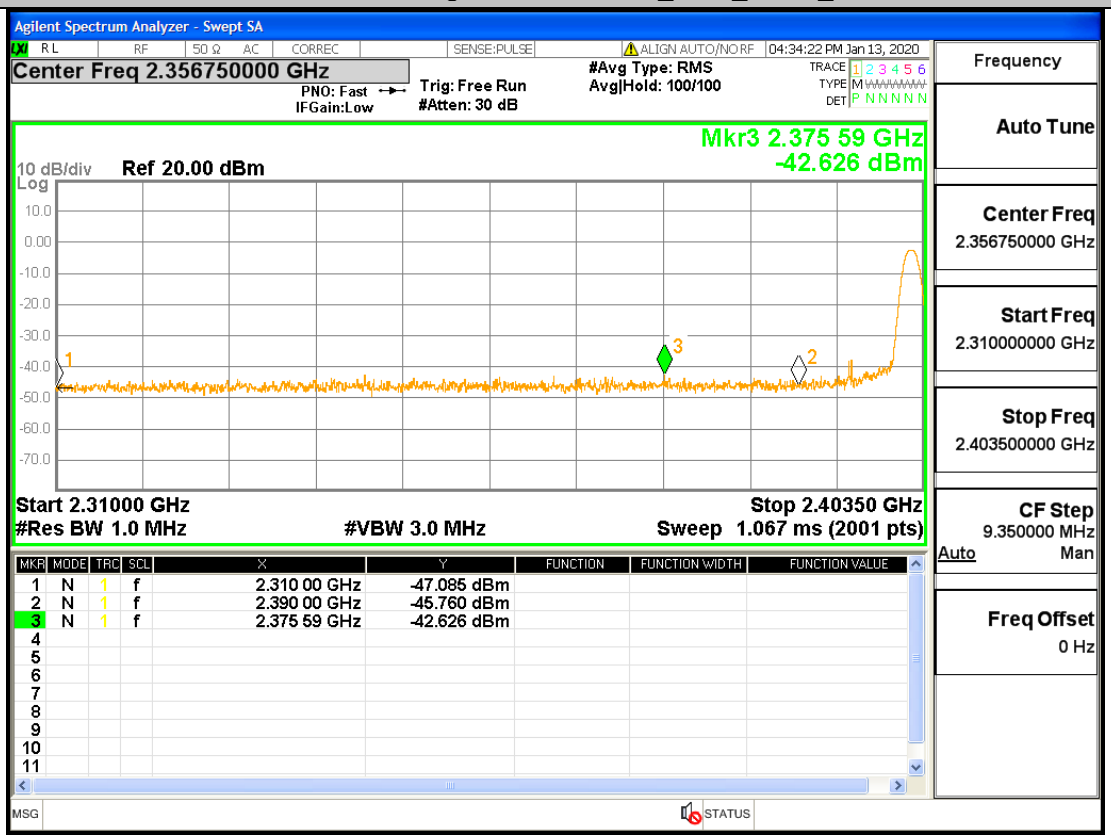
Pref	
Puw	

A.8 Restrict-band band-edge measurements

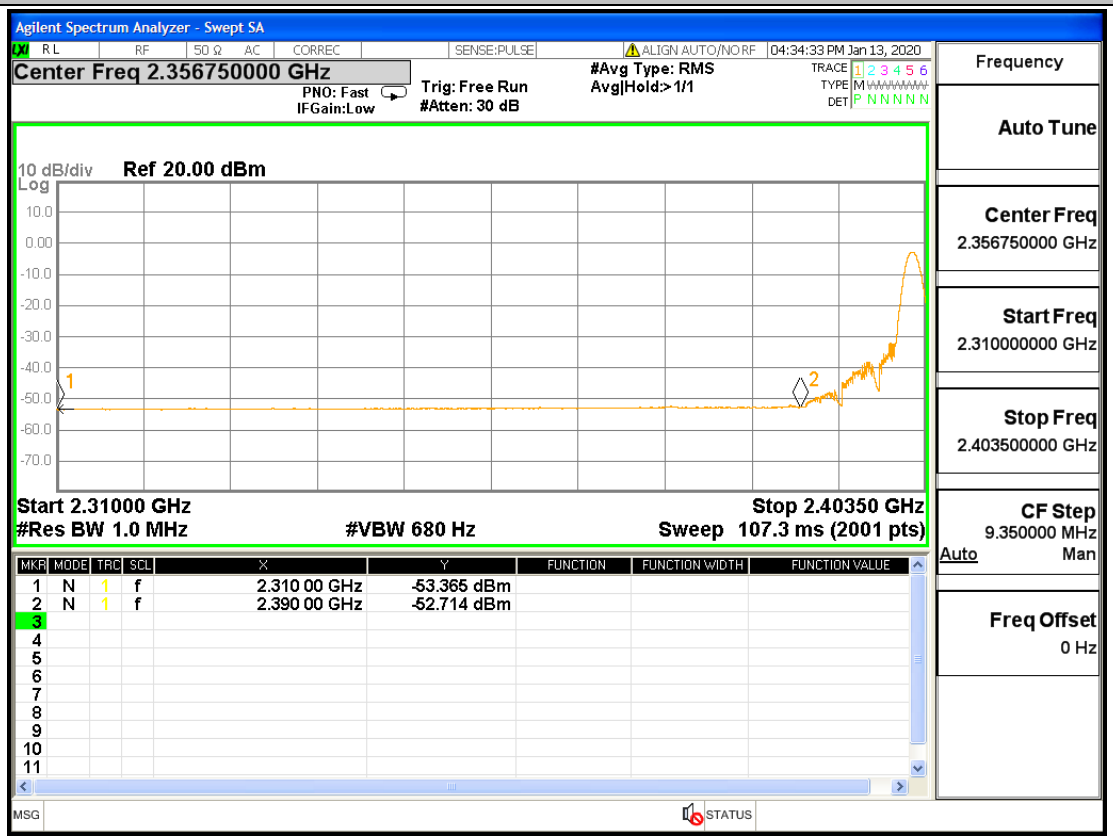
Type	Carrier Frequency (MHz)	Frequency(MHz)	Gain	Ground Factor	Peak Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2375.59	2.00	0.00	-42.626	54.574	74	Pass
1DH5	2480	2483.5	2.00	0.00	-42.601	54.599	74	Pass
2DH5	2402	2390	2.00	0.00	-44.18	53.020	74	Pass
2DH5	2480	2483.5	2.00	0.00	-41.956	55.244	74	Pass
3DH5	2402	2390	2.00	0.00	-46.496	50.704	74	Pass
3DH5	2480	2483.864	2.00	0.00	-31.326	65.874	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	-52.714	44.486	54	Pass
1DH5	2480	2483.5	2.00	0.00	-46.587	50.613	54	Pass
2DH5	2402	2390	2.00	0.00	-52.077	45.123	54	Pass
2DH5	2480	2483.5	2.00	0.00	-48.362	48.788	54	Pass
3DH5	2402	2390	2.00	0.00	-52.866	44.334	54	Pass
3DH5	2480	2483.5	2.00	0.00	-45.097	52.103	54	Pass

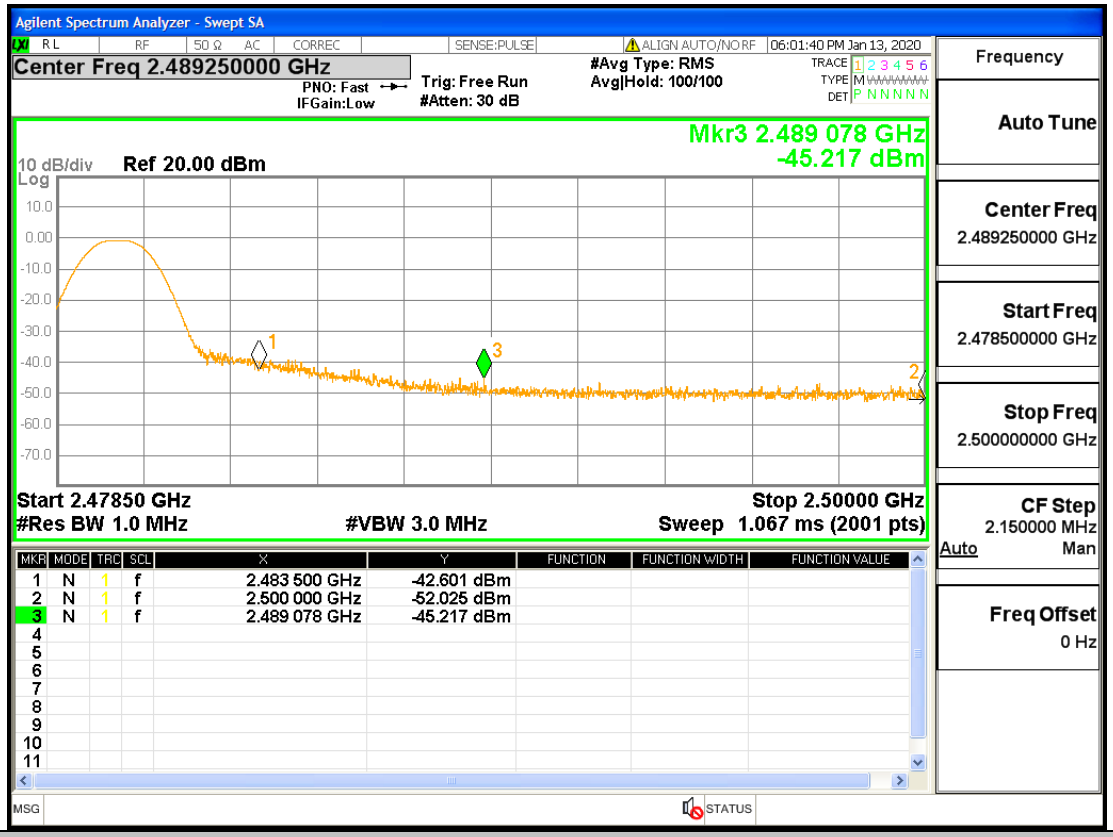
Restrict-band band-edge measurements_2402_PEAK_DH5



Restrict-band band-edge measurements_2402_AV_DH5

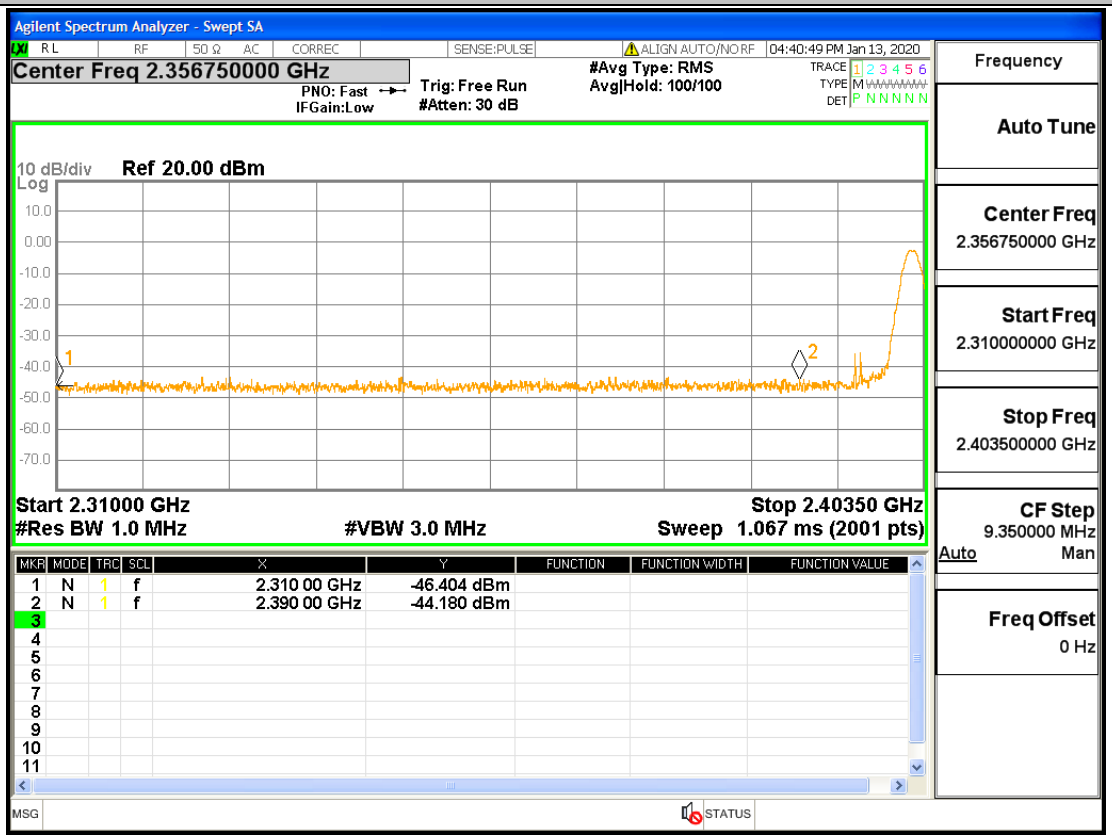


Restrict-band band-edge measurements_2480_PEAK_DH5

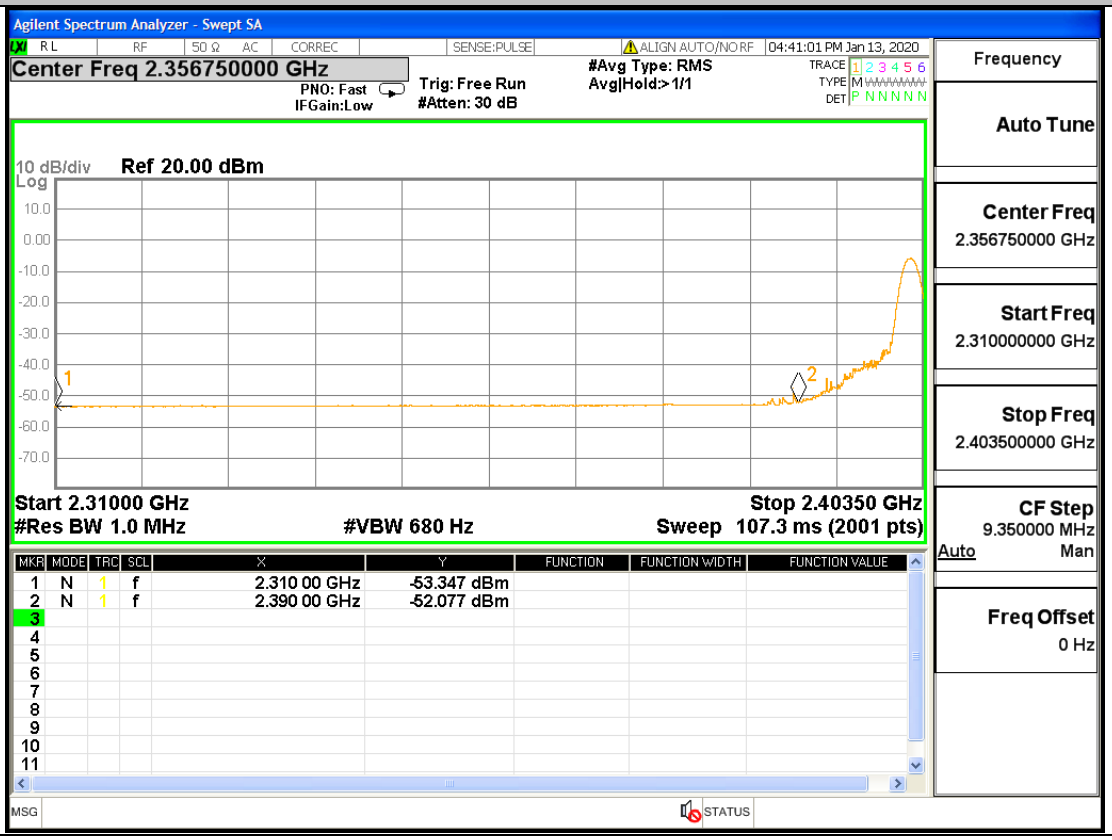


Restrict-band band-edge measurements_2480_AV_DH5

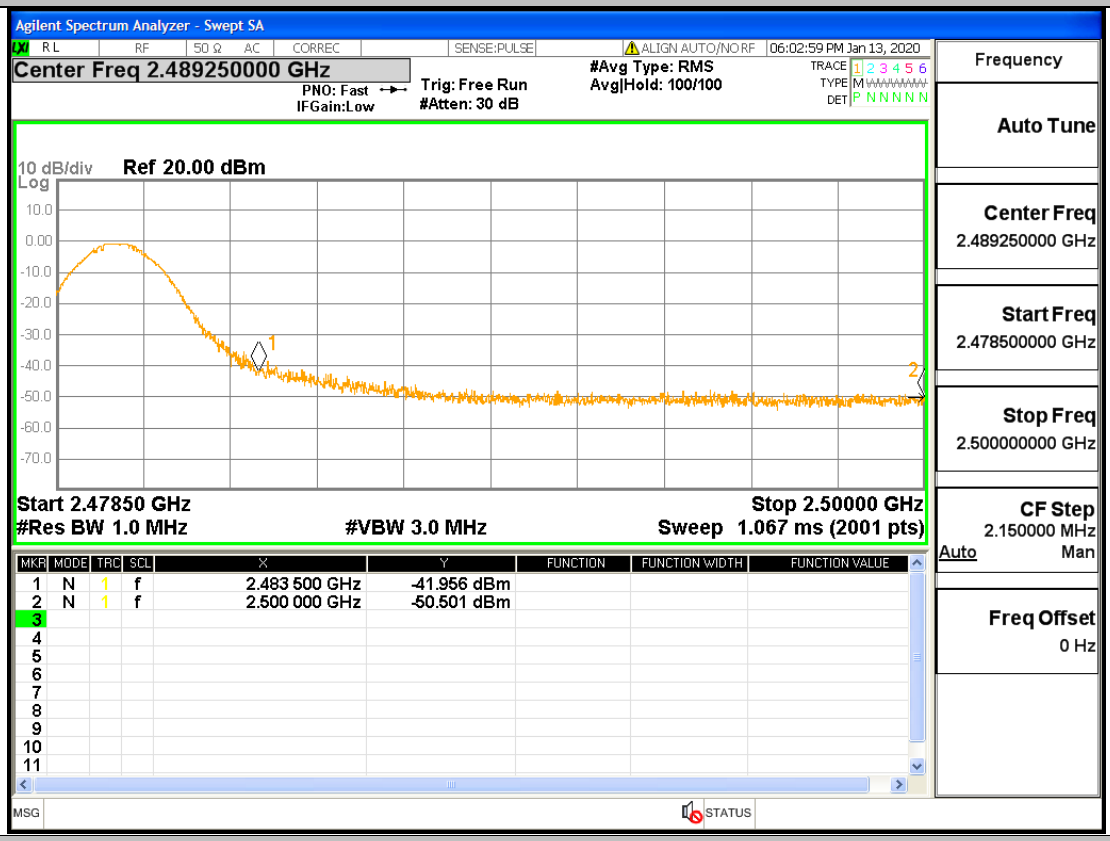
Restrict-band band-edge measurements_2402_PEAK_2DH5



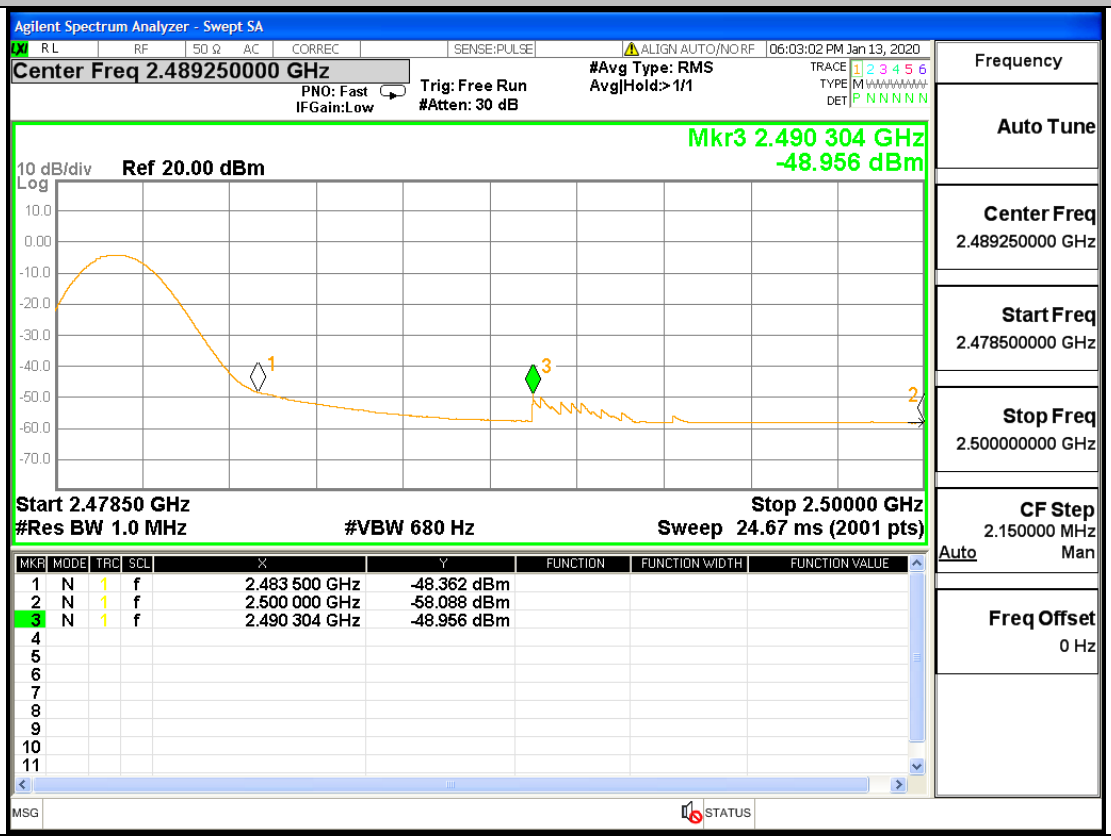
Restrict-band band-edge measurements_2402_AV_2DH5



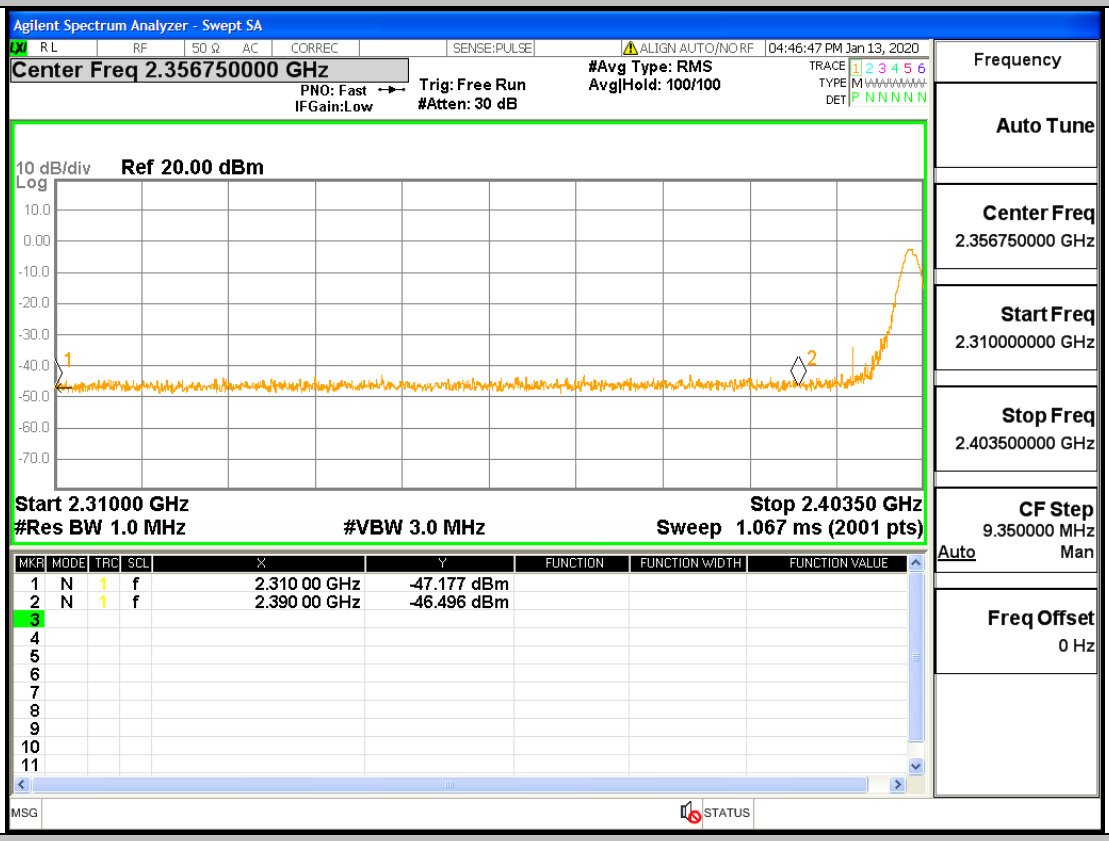
Restrict-band band-edge measurements_2480_PEAK_2DH5



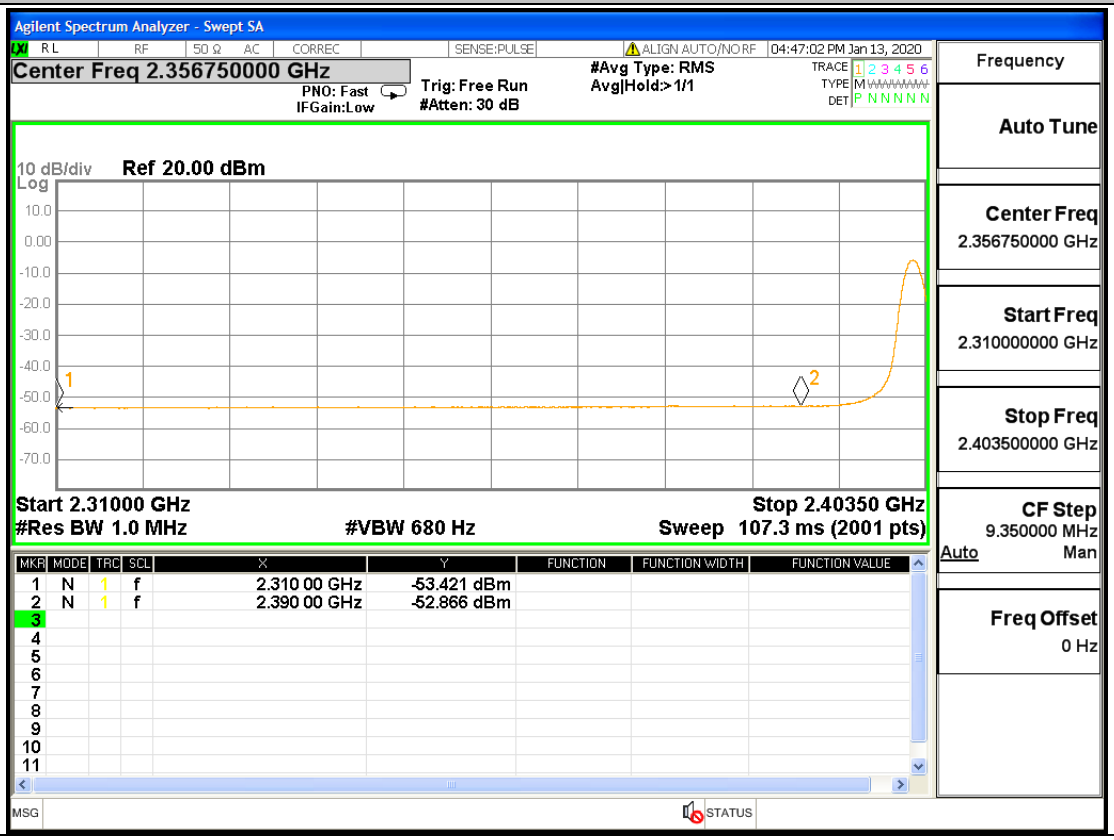
Restrict-band band-edge measurements_2480_AV_2DH5



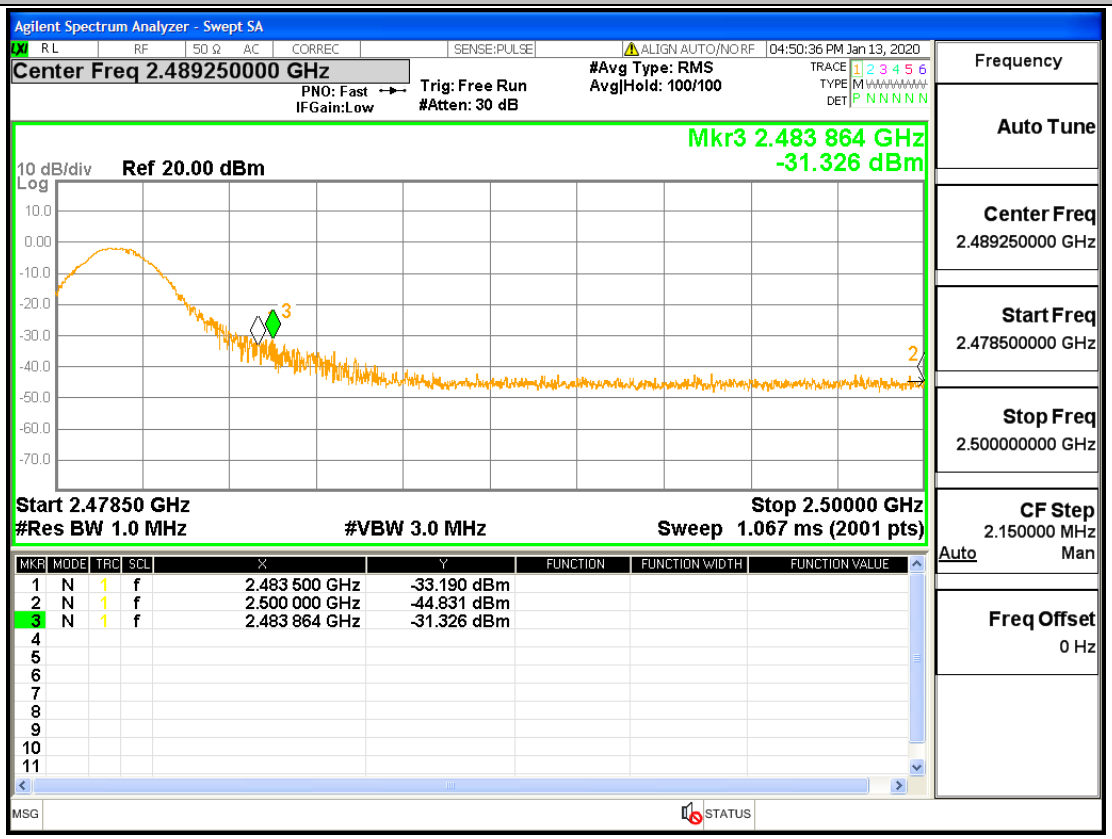
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5