

Appendix A

RF Test Data for BT V5.0 (BDR/EDR) (Conducted Measurement)

Product Name: Bluetooth Alarm Clock With USB Charging Ports
Trade Mark: S.E.M. / S-LOGO / NIL / SDIGITAL / S-DIGITAL / S.E.M. AUDIO
LABORATORIES / CONAIR TIME
Test Model: Q-7-BTV3W

Environmental Conditions

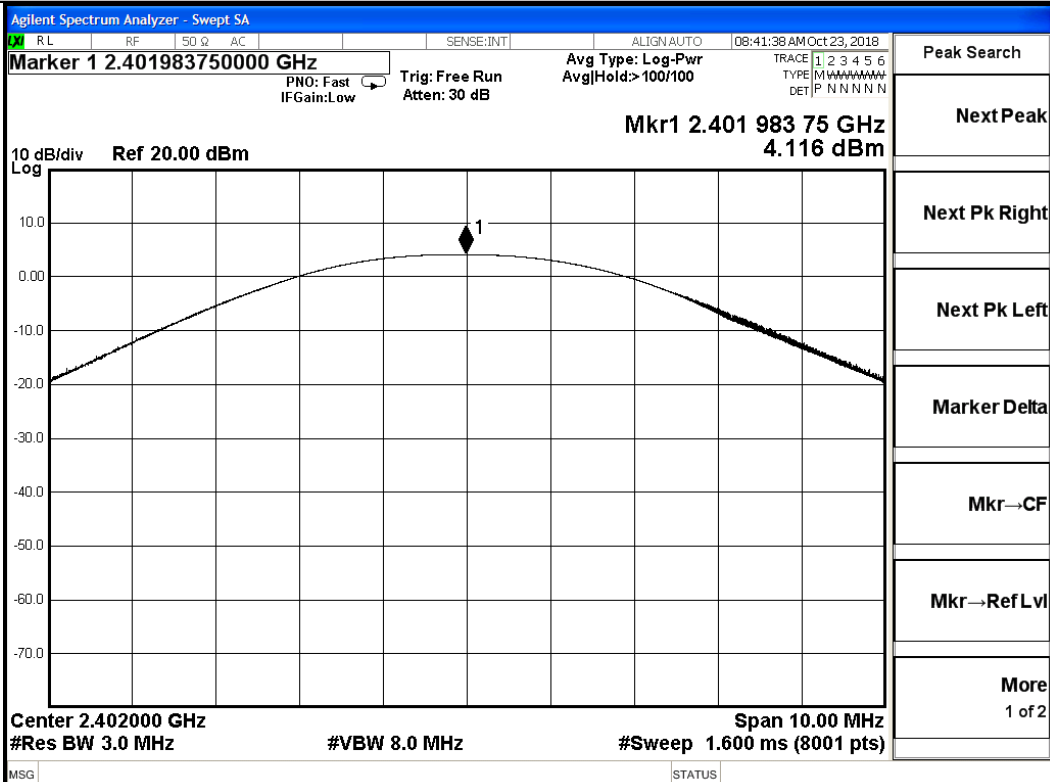
Temperature:	23.5 ° C
Relative Humidity:	66%
ATM Pressure:	100.0 kPa
Test Engineer:	AKING JIN
Supervised by:	JAYDEN ZHUO

A.1 Maximum Conducted Peak Output Power

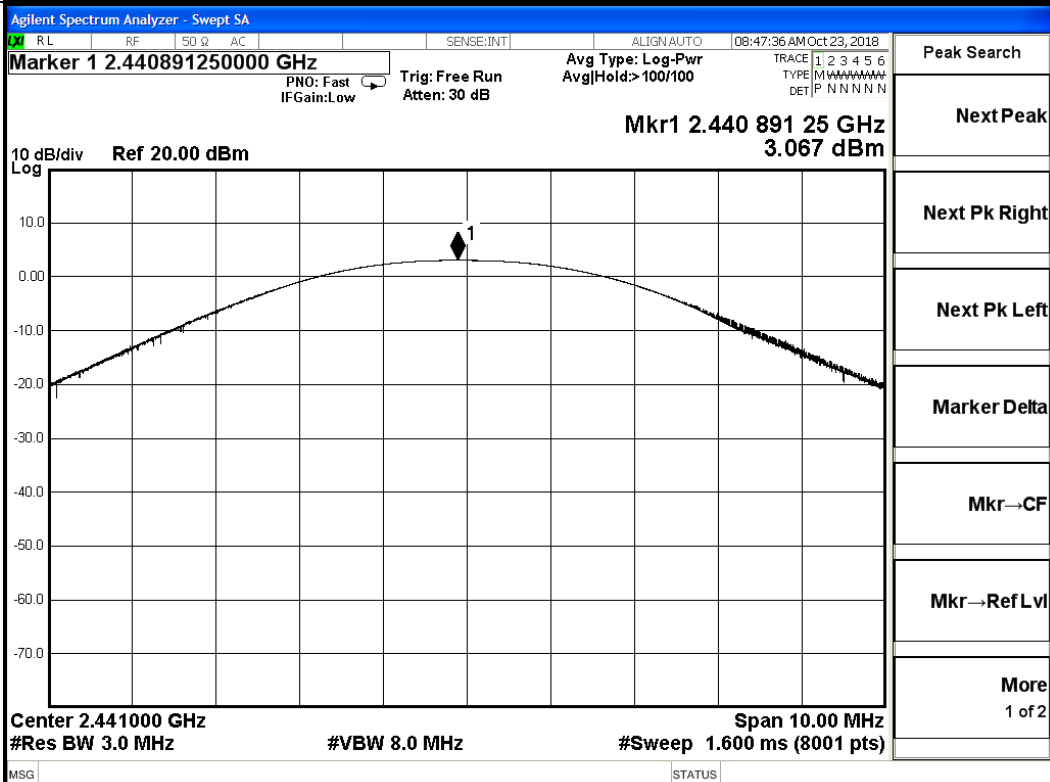
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	4.116	21	PASS
	MCH	3.067	21	PASS
	HCH	1.478	21	PASS
$\pi/4$ DQPSK	LCH	5.860	21	PASS
	MCH	4.994	21	PASS
	HCH	3.561	21	PASS
8DPSK	LCH	6.118	21	PASS
	MCH	5.210	21	PASS
	HCH	3.885	21	PASS

Test Graphs

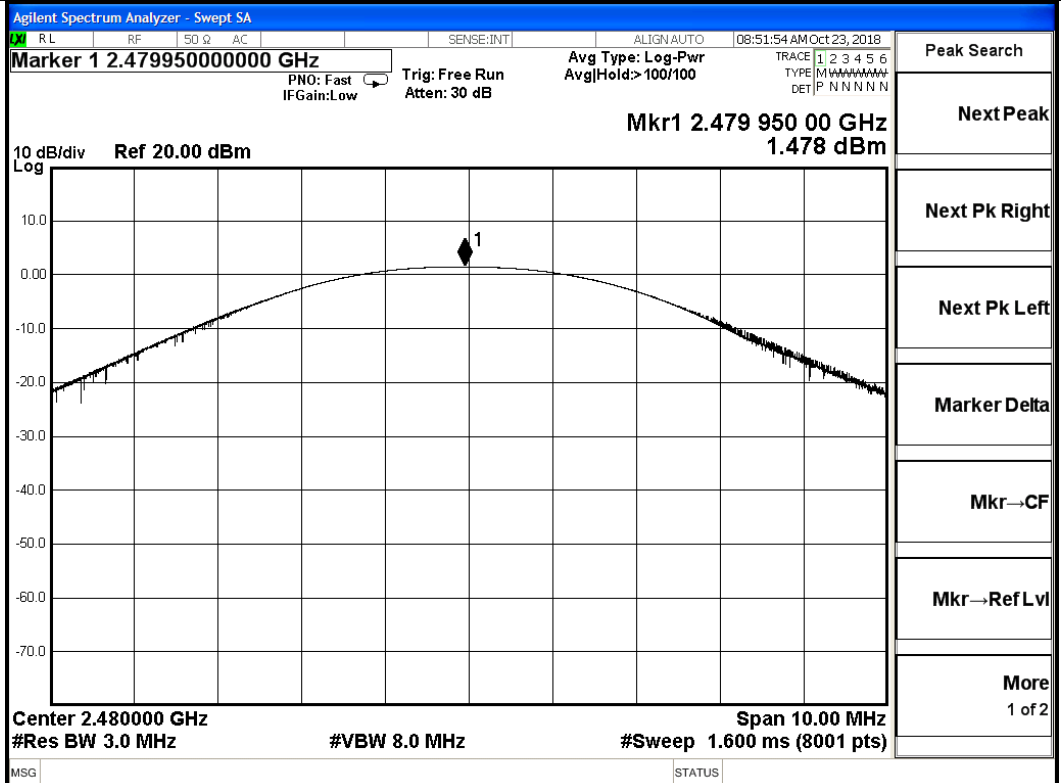
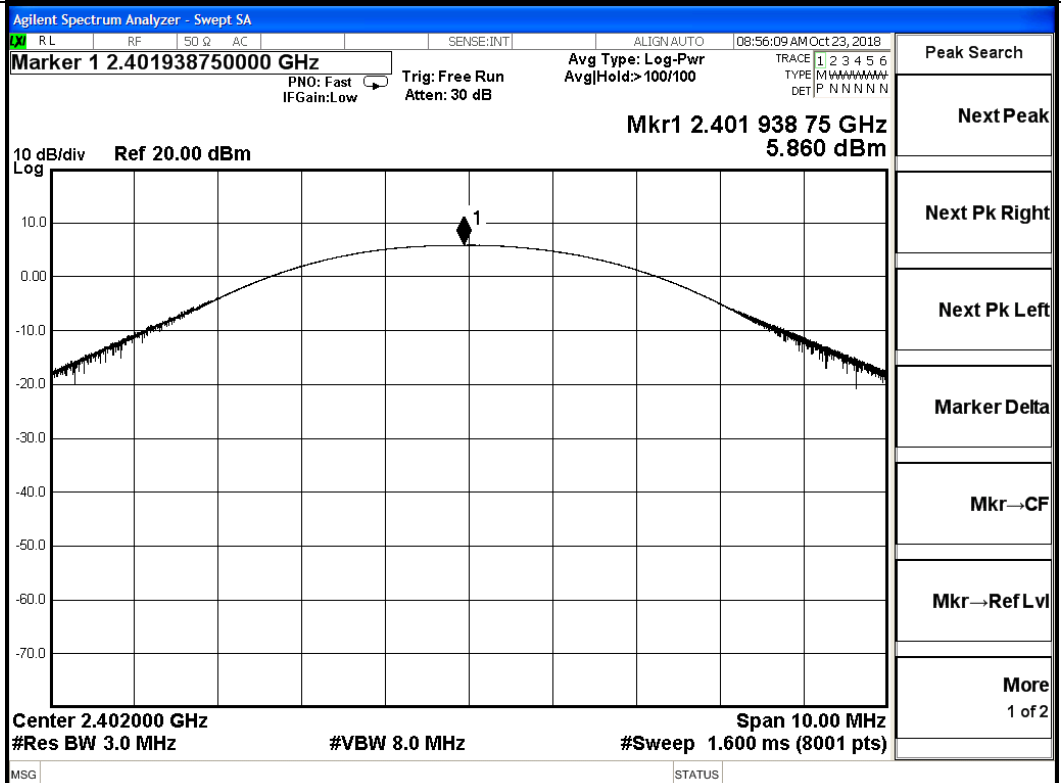
GFSK/LCH

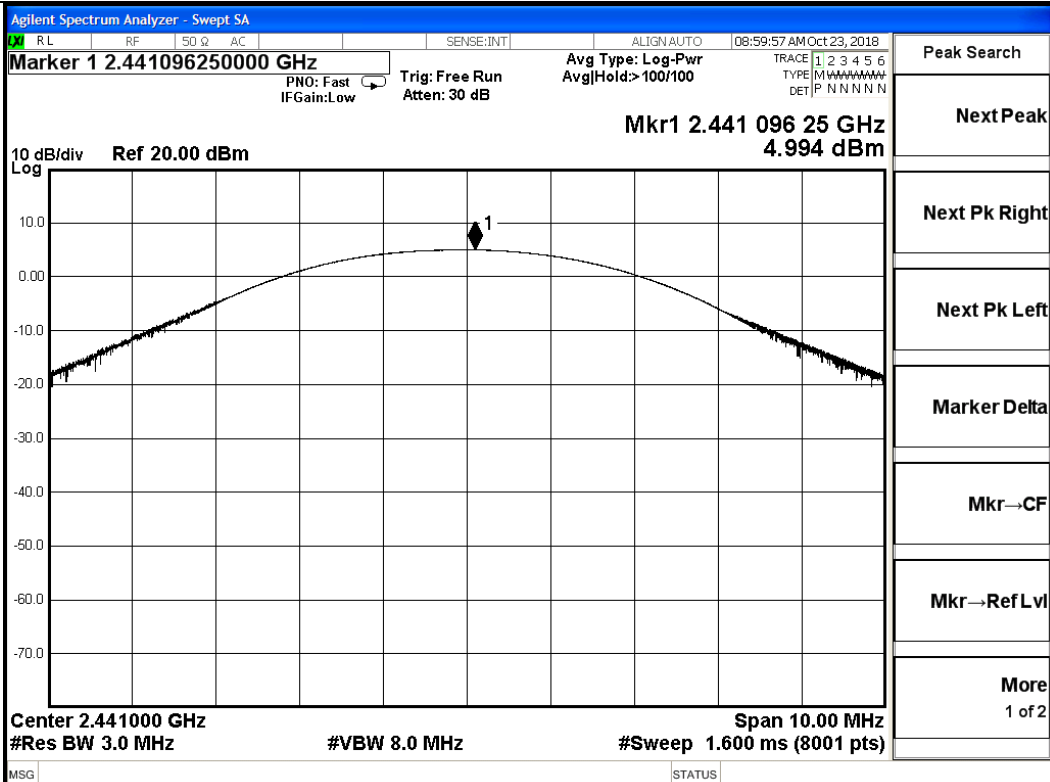
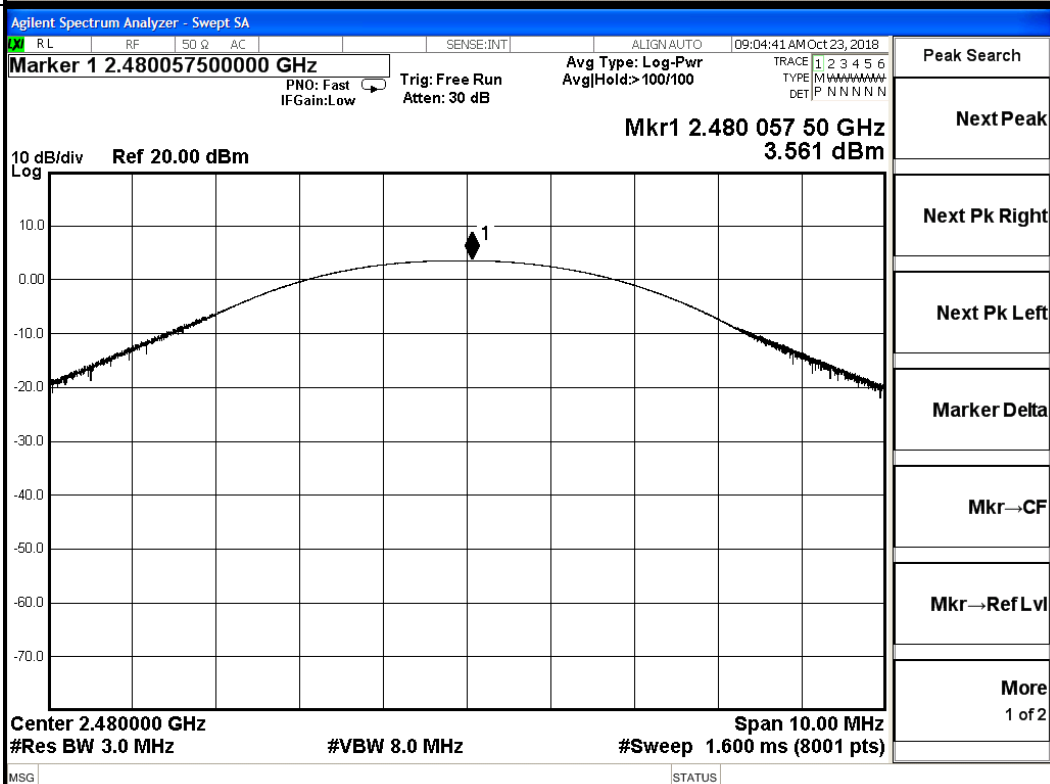


GFSK/MCH

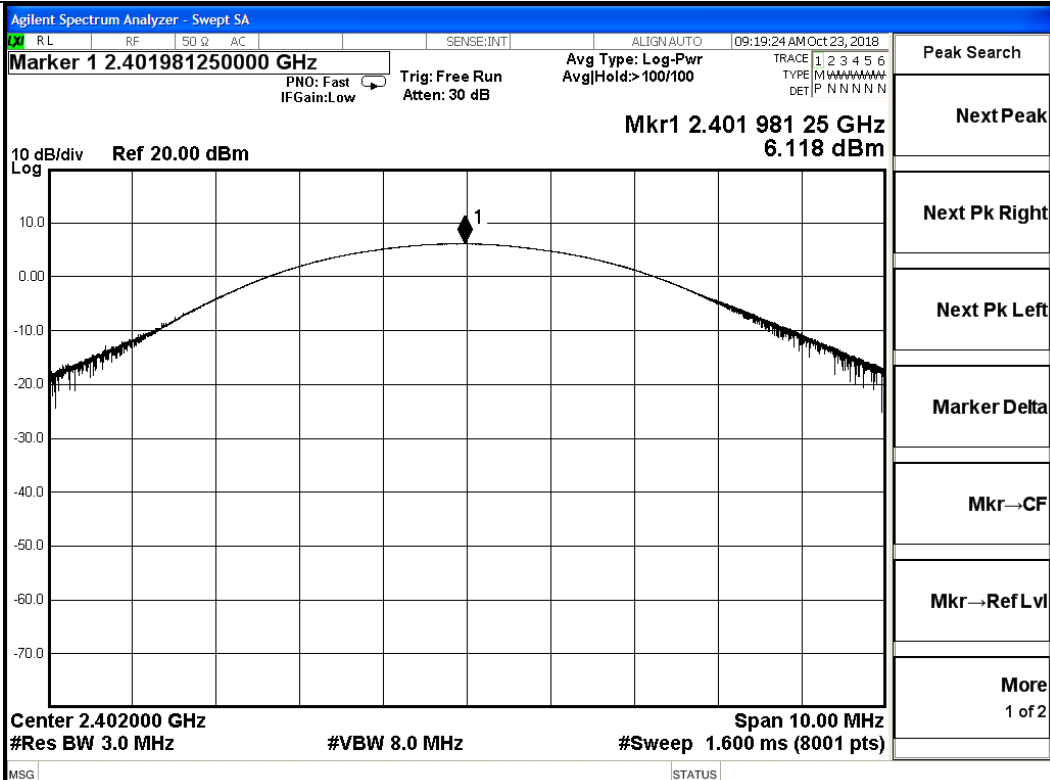


GFSK/HCH

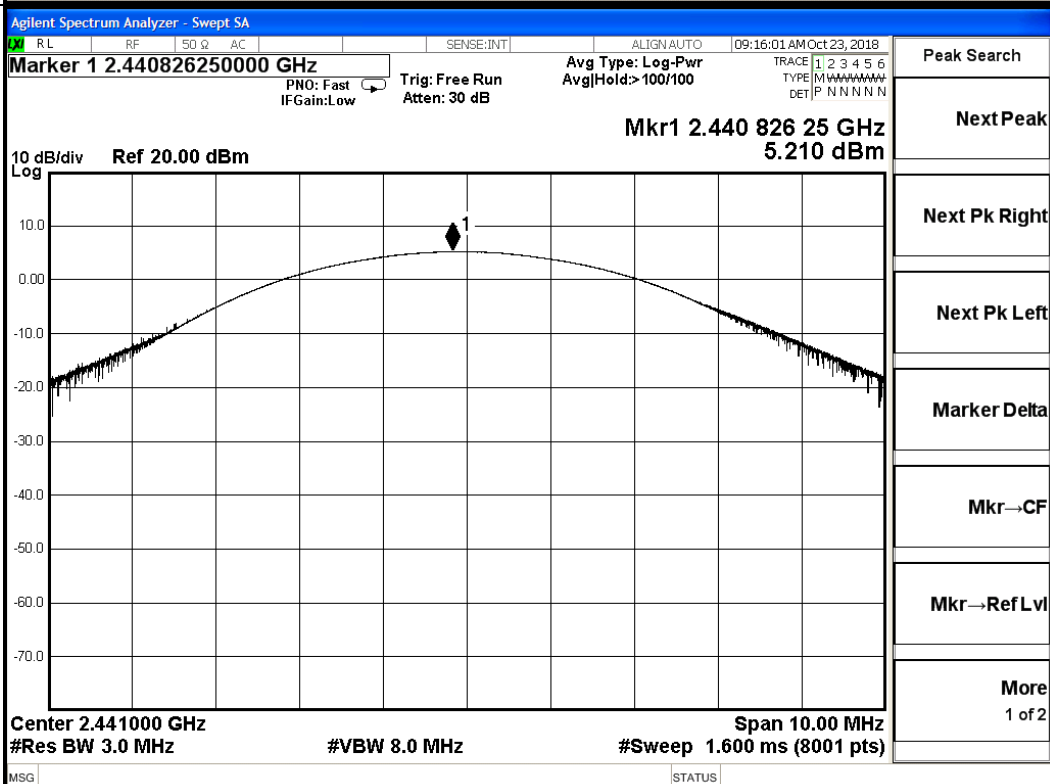
 π /4DQPSK/LCH

$\pi/4$ DQPSK/MCH $\pi/4$ DQPSK/HCH

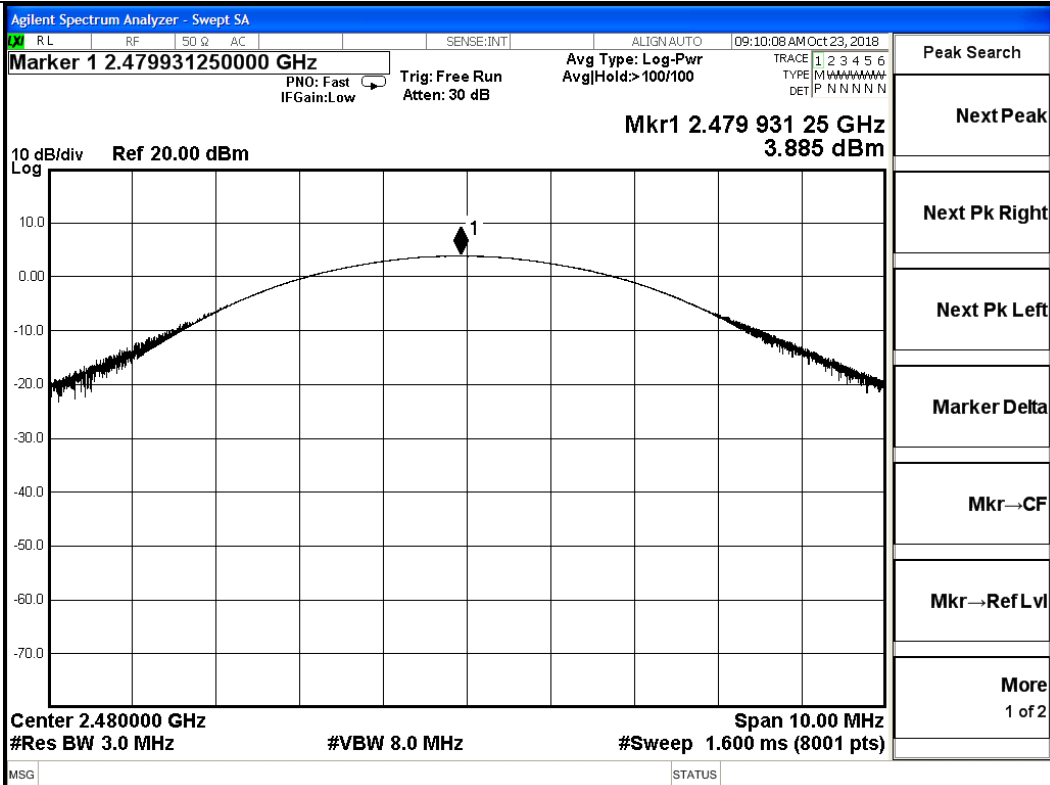
8DPSK/LCH



8DPSK/MCH

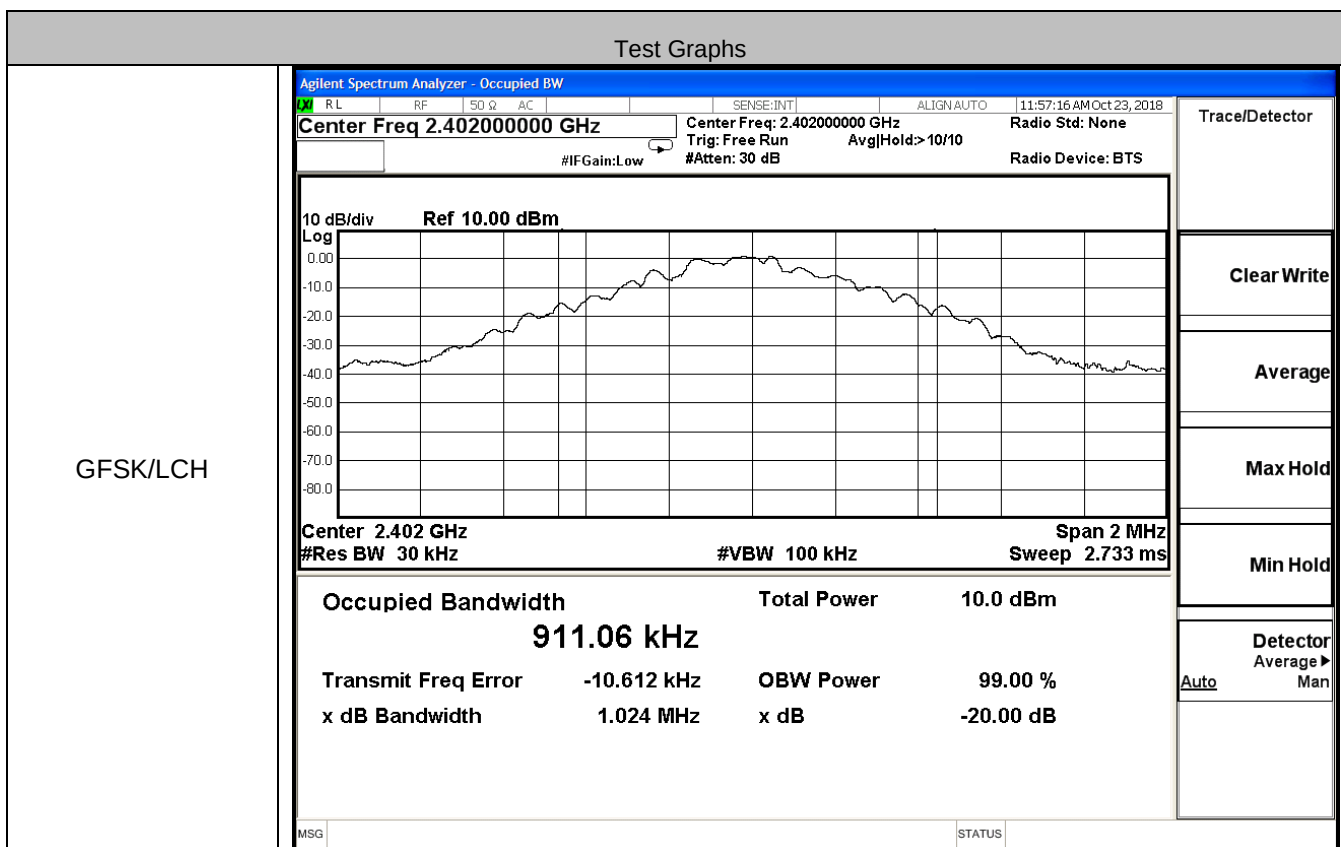


8DPSK/HCH



A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.91106	1.024	Not Specified	PASS
	MCH	0.91122	1.023	Not Specified	PASS
	HCH	0.91157	1.023	Not Specified	PASS
π /4DQPSK	LCH	1.2052	1.357	Not Specified	PASS
	MCH	1.2015	1.356	Not Specified	PASS
	HCH	1.1989	1.356	Not Specified	PASS
8DPSK	LCH	1.1966	1.352	Not Specified	PASS
	MCH	1.1935	1.349	Not Specified	PASS
	HCH	1.1923	1.347	Not Specified	PASS

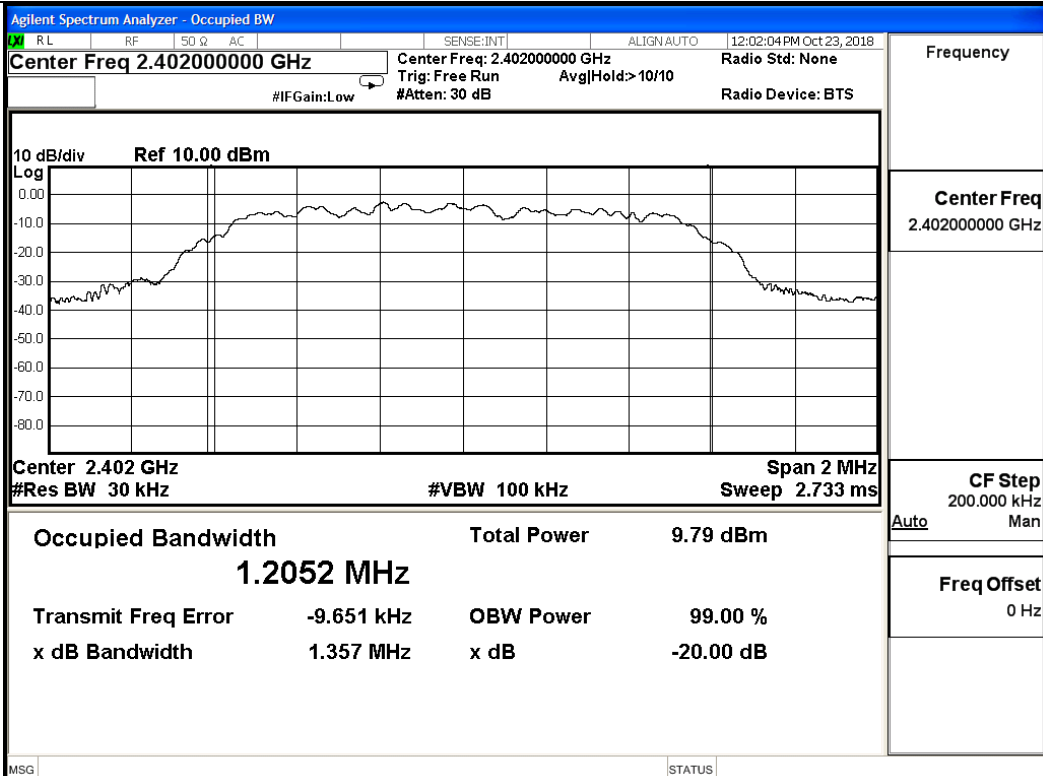
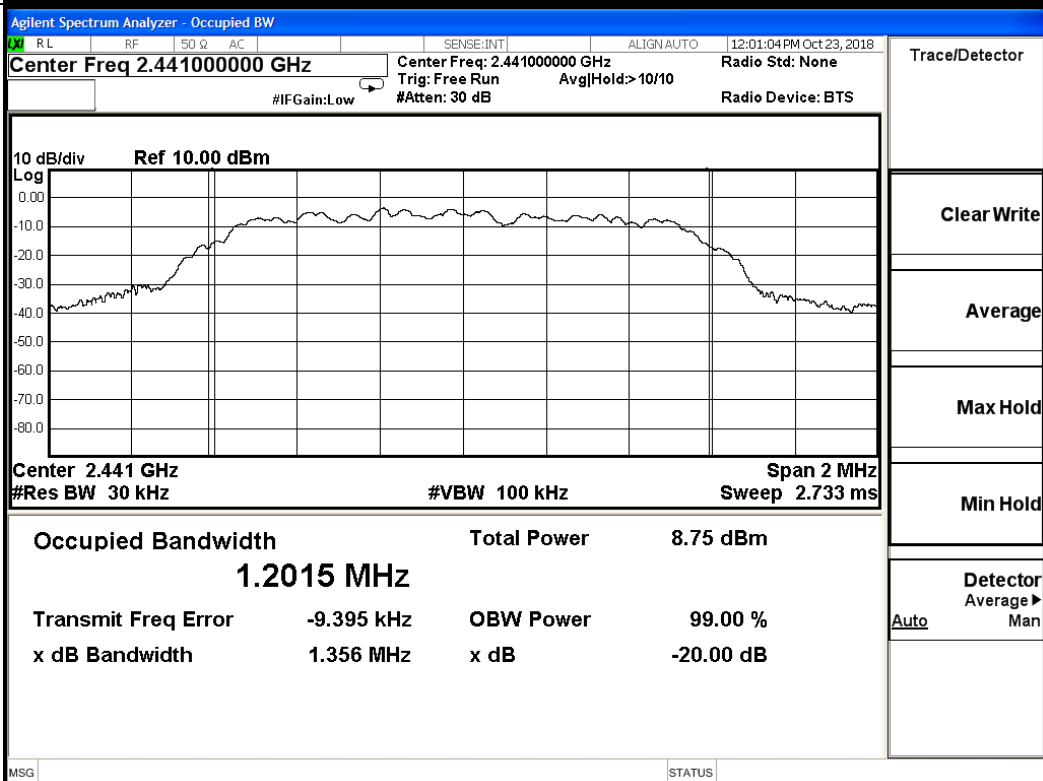


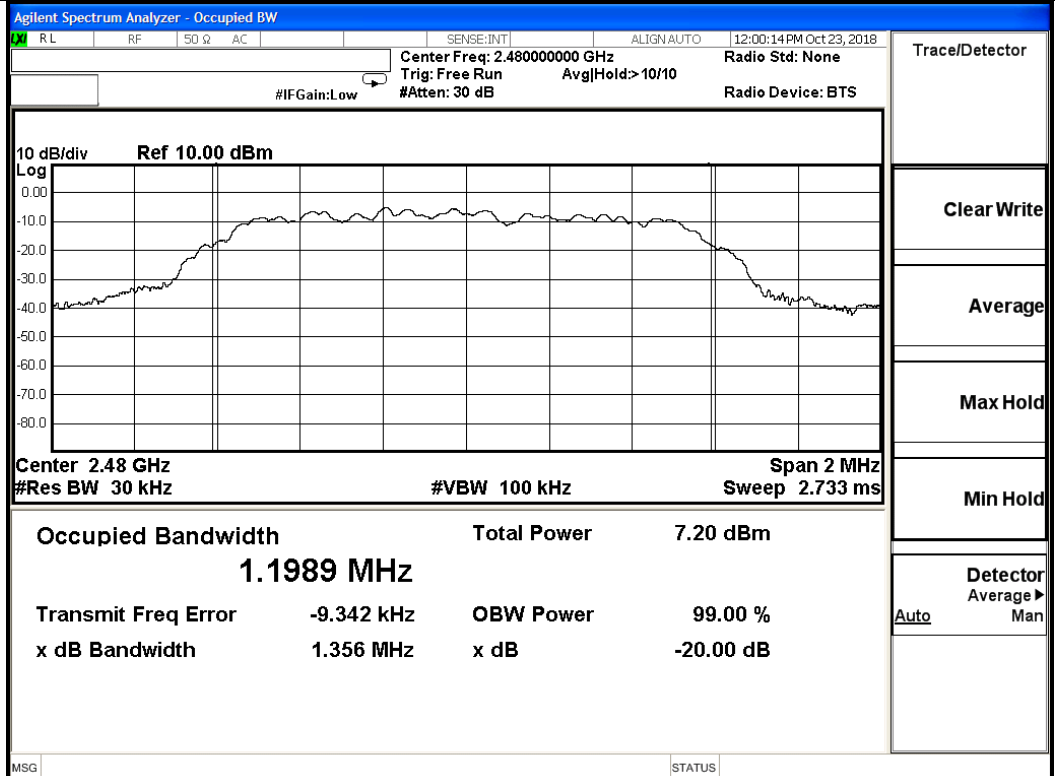
GFSK/MCH



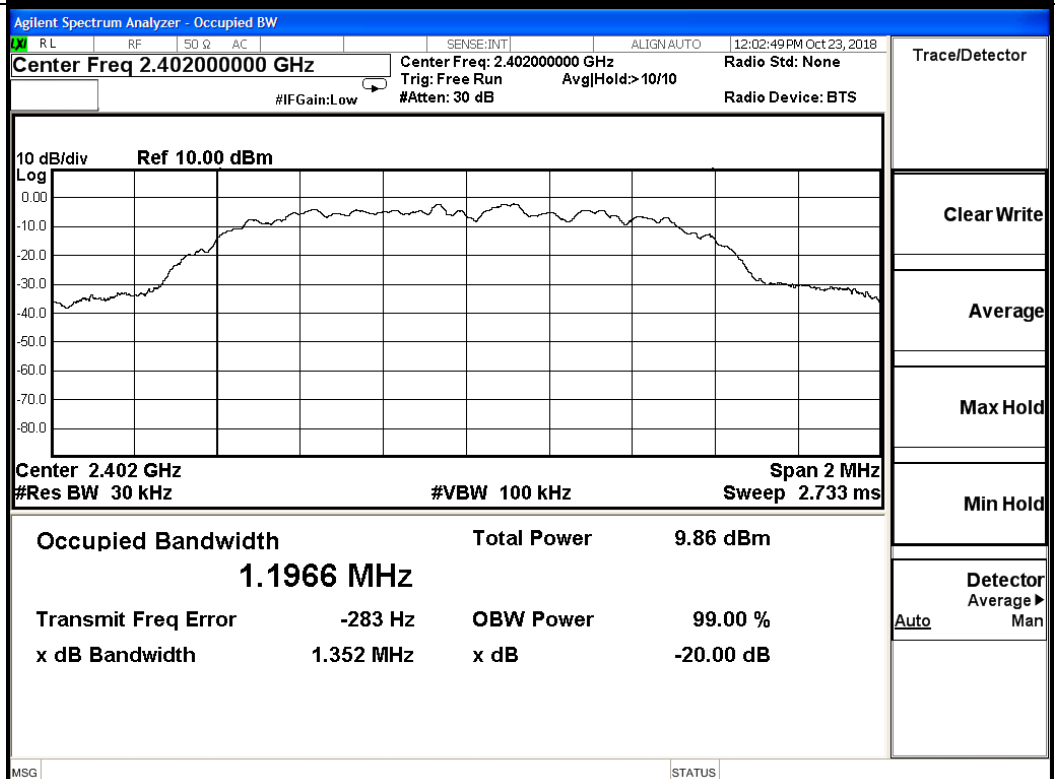
GFSK/HCH



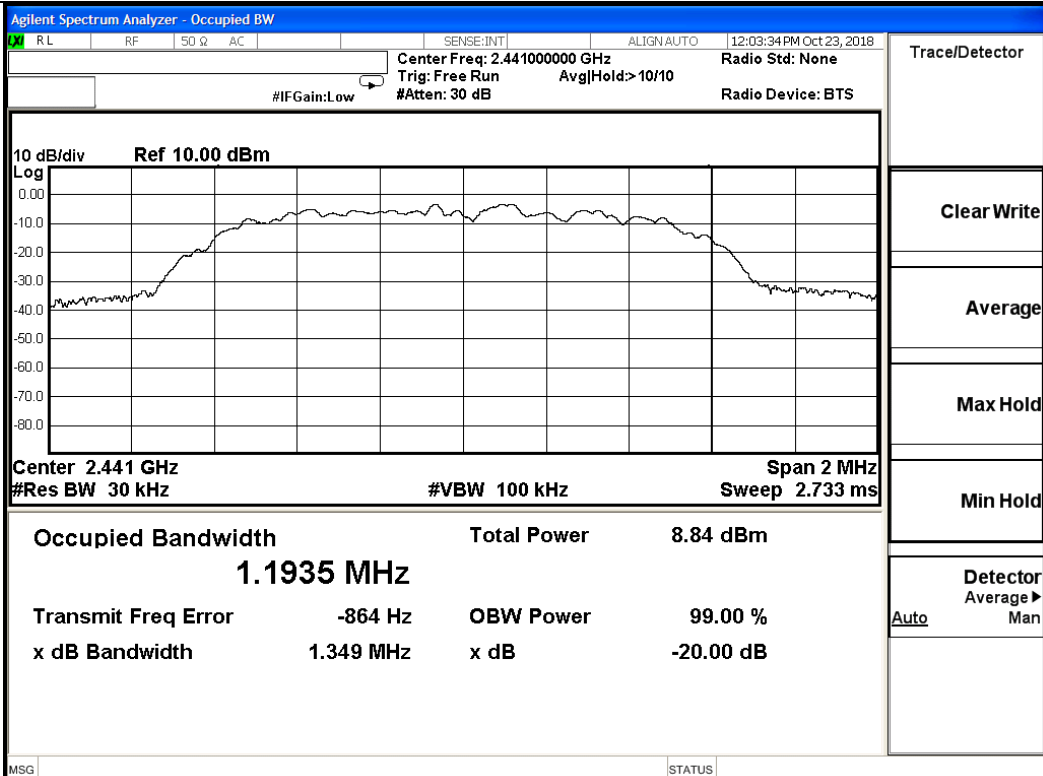
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

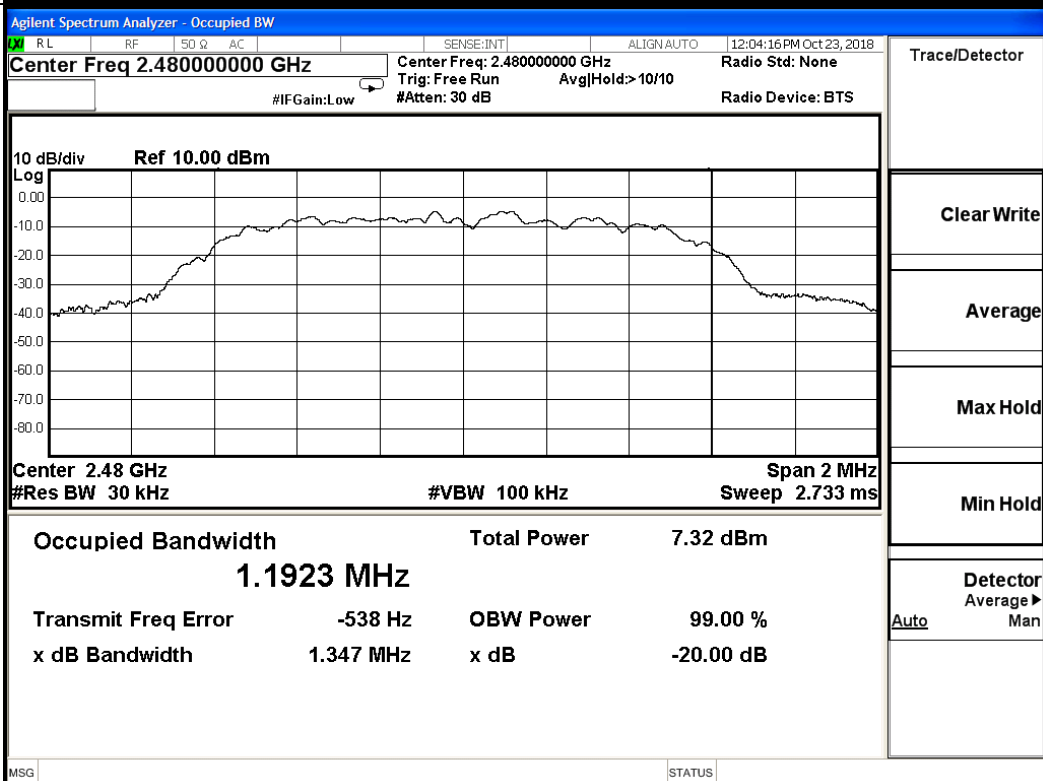
8DPSK/LCH



8DPSK/MCH



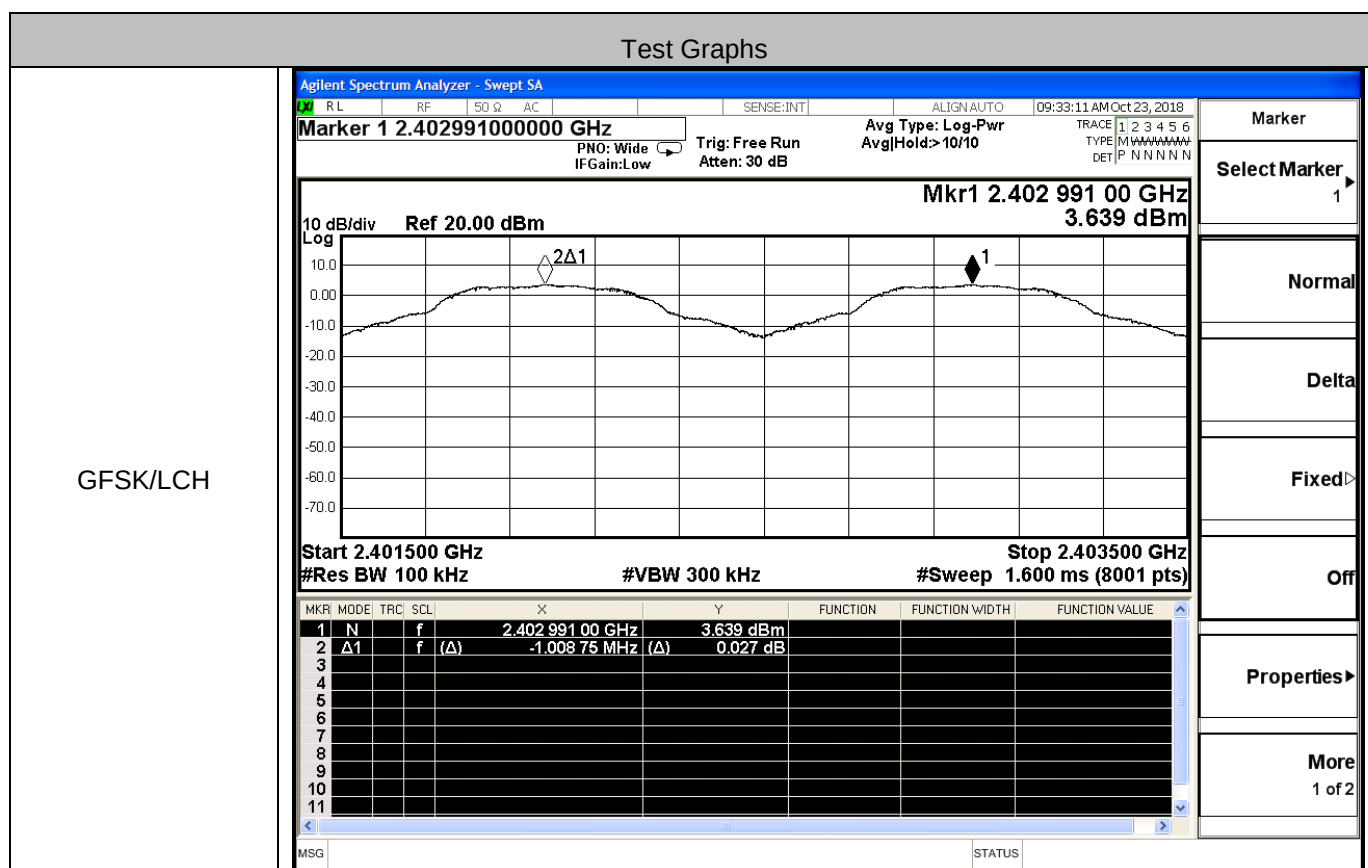
8DPSK/HCH



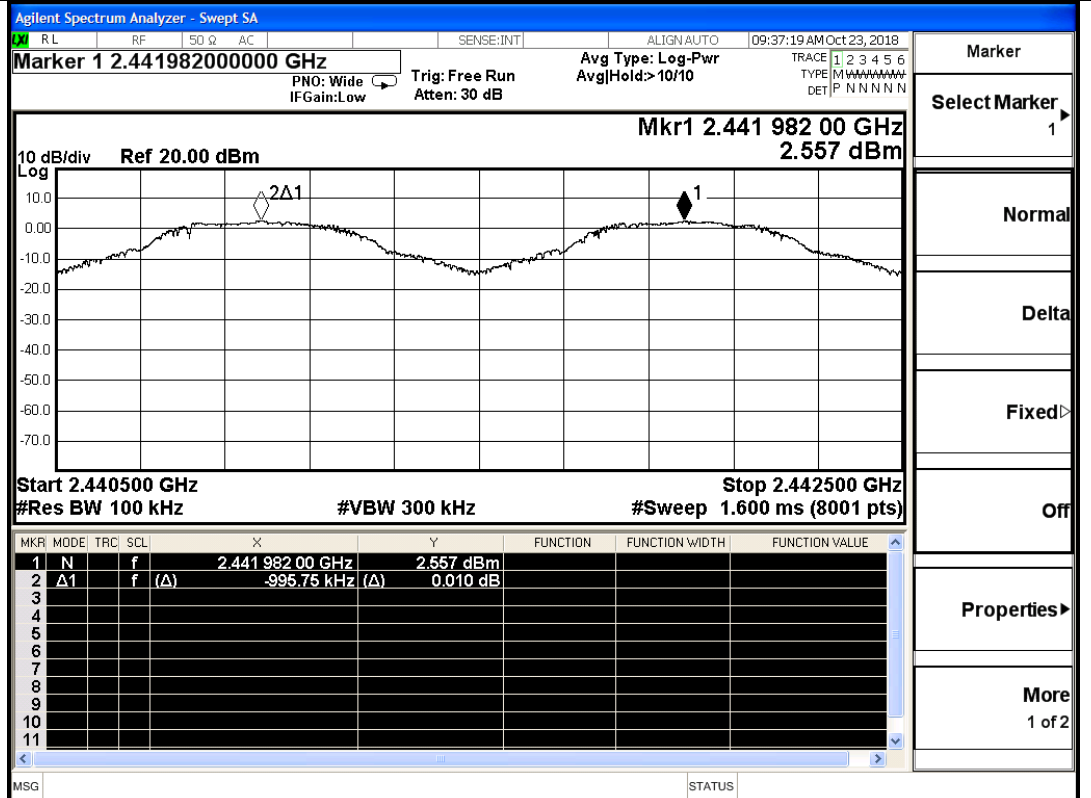
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz] 2/3*20dB Bandwidth	Verdict
GFSK	LCH	1.009	0.683	PASS
	MCH	0.996	0.682	PASS
	HCH	0.997	0.682	PASS
$\pi/4$ DQPSK	LCH	1.008	0.905	PASS
	MCH	1.000	0.904	PASS
	HCH	1.001	0.904	PASS
8DPSK	LCH	1.008	0.901	PASS
	MCH	1.000	0.899	PASS
	HCH	1.000	0.898	PASS

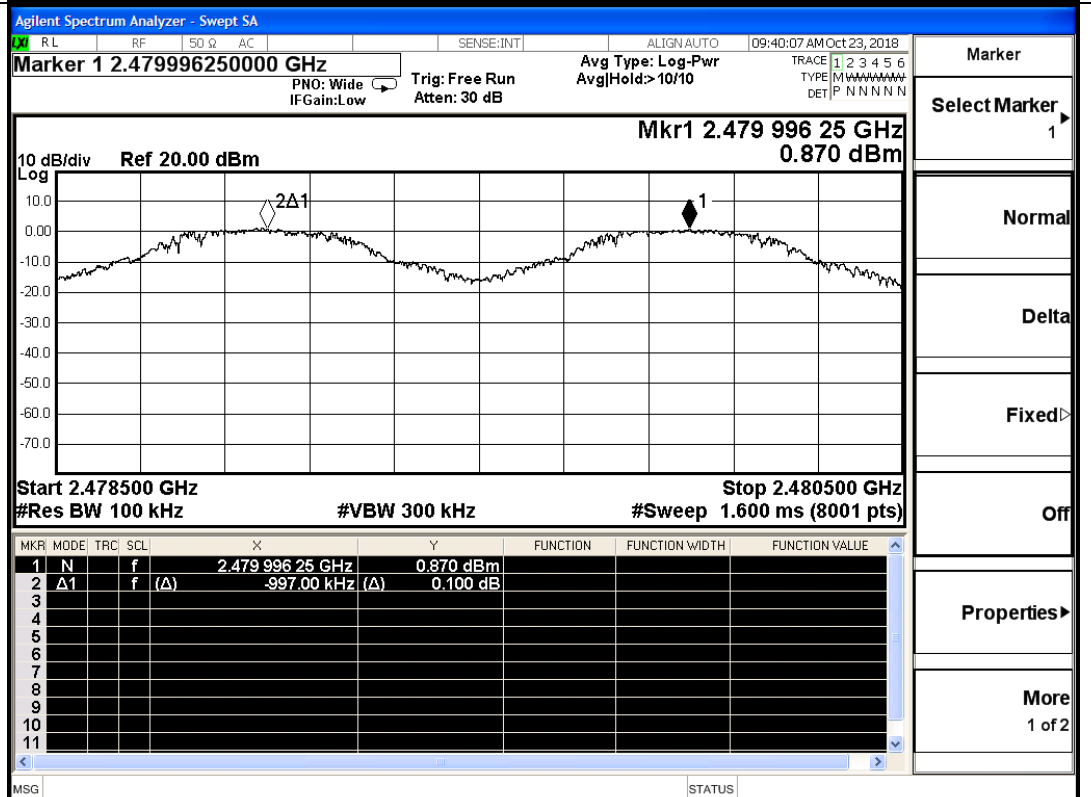
Test Graphs

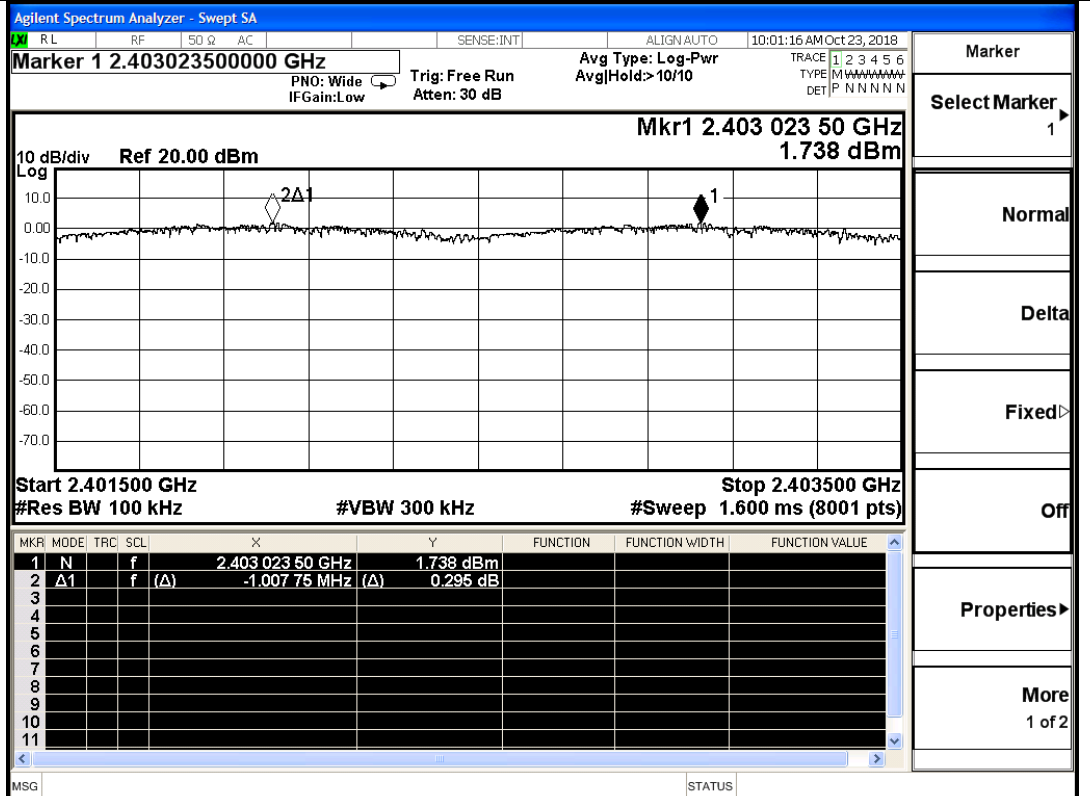
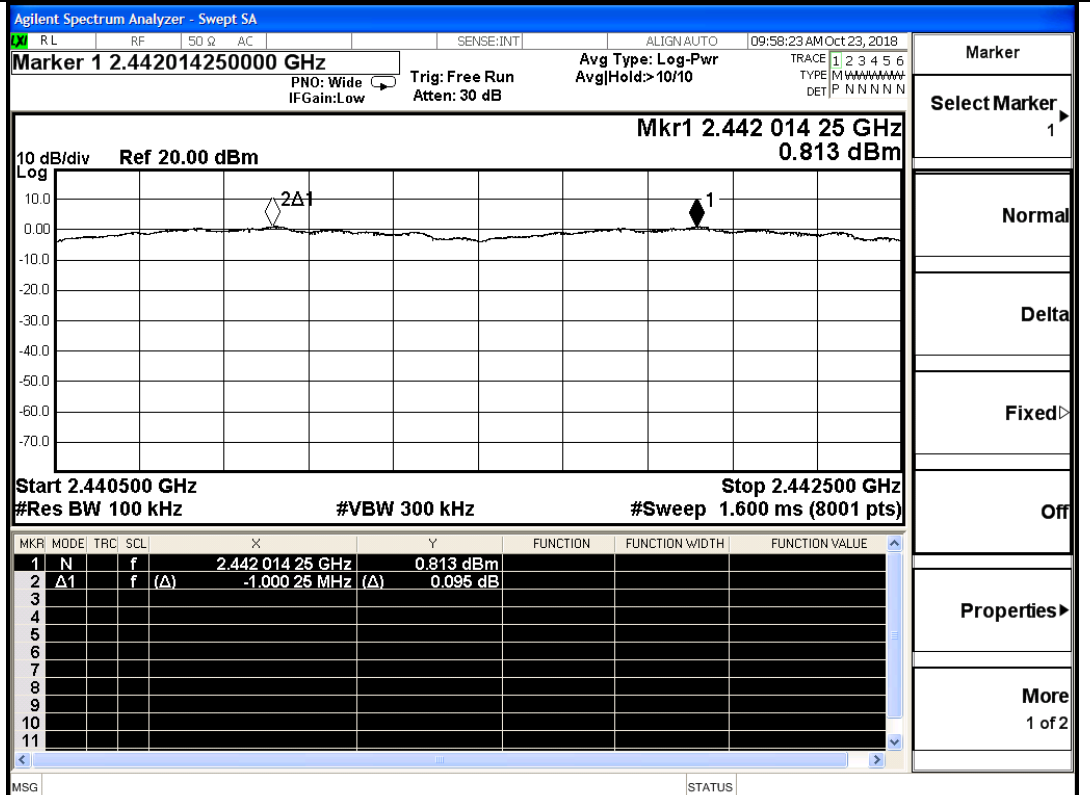


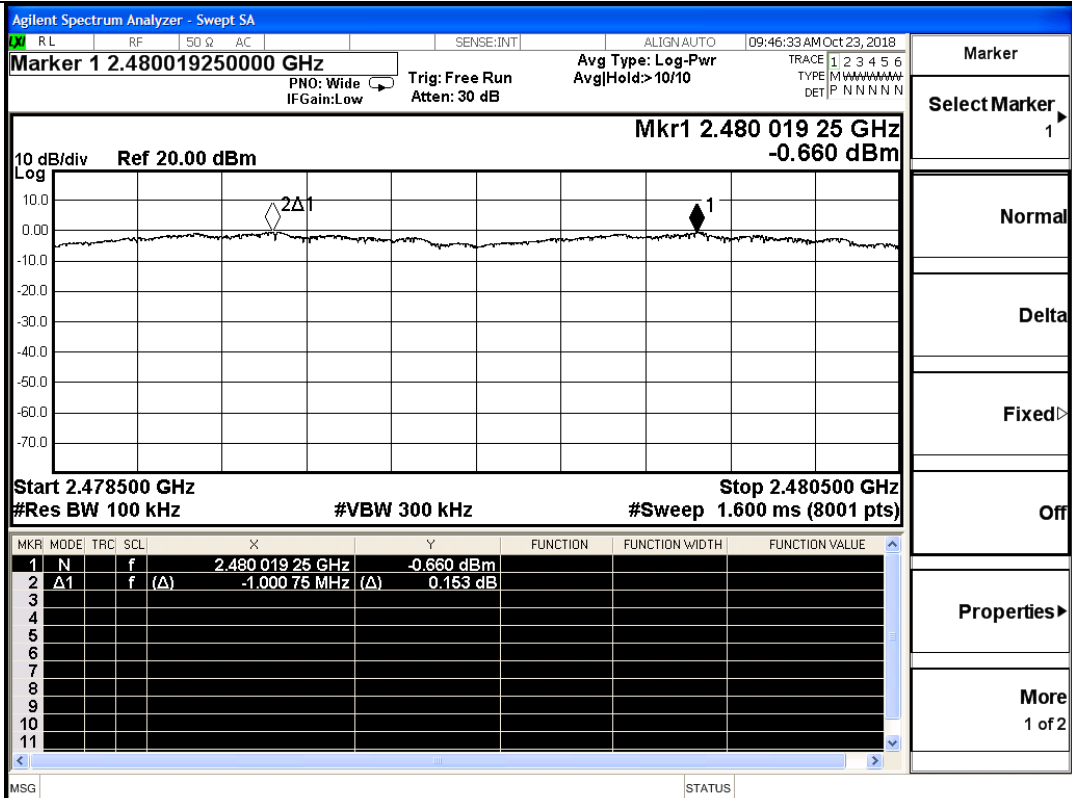
GFSK/MCH



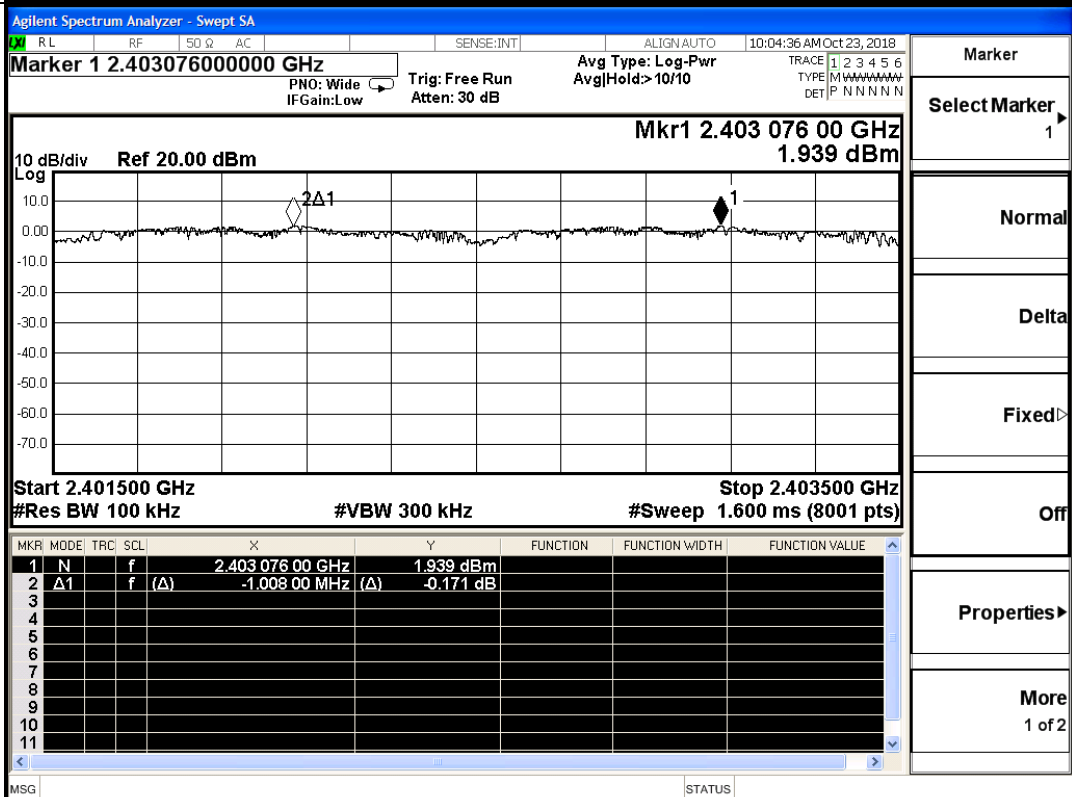
GFSK/HCH



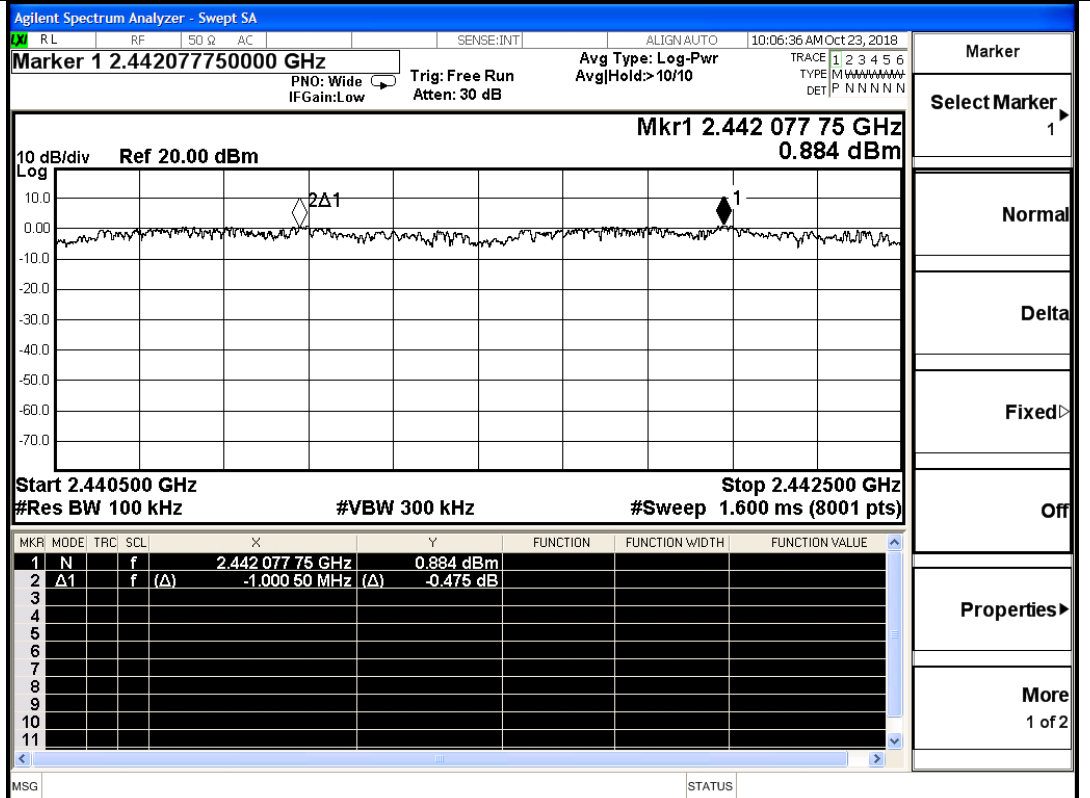
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

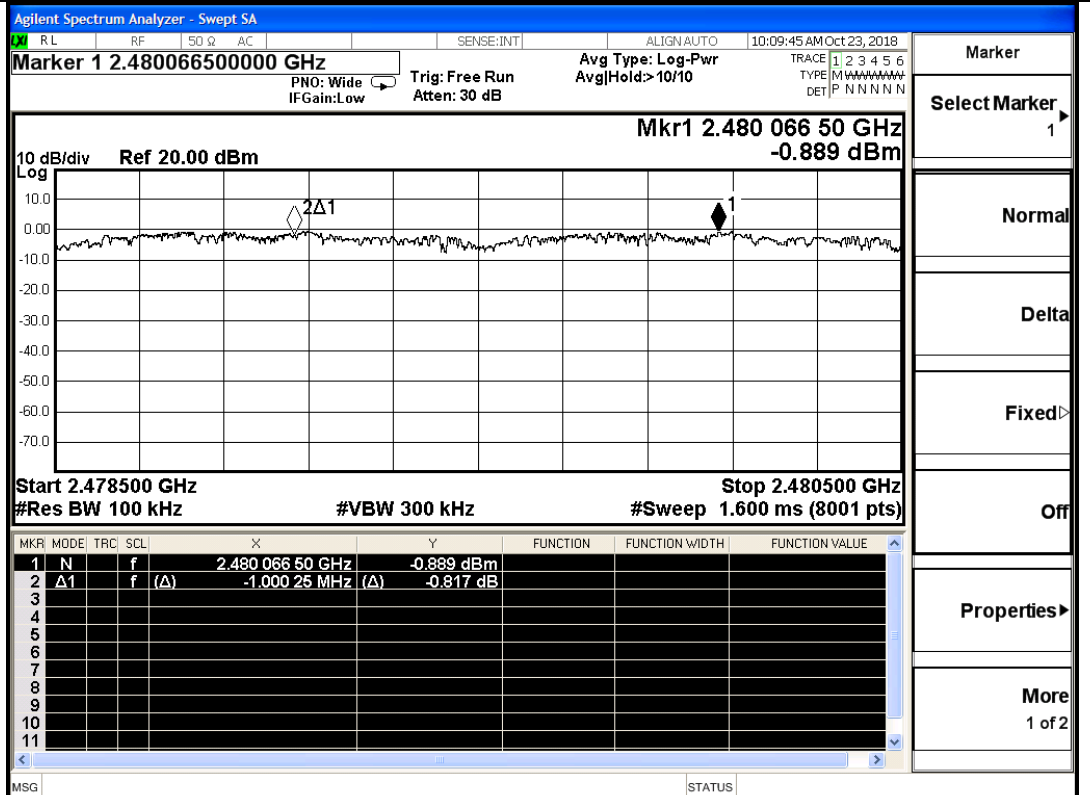
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

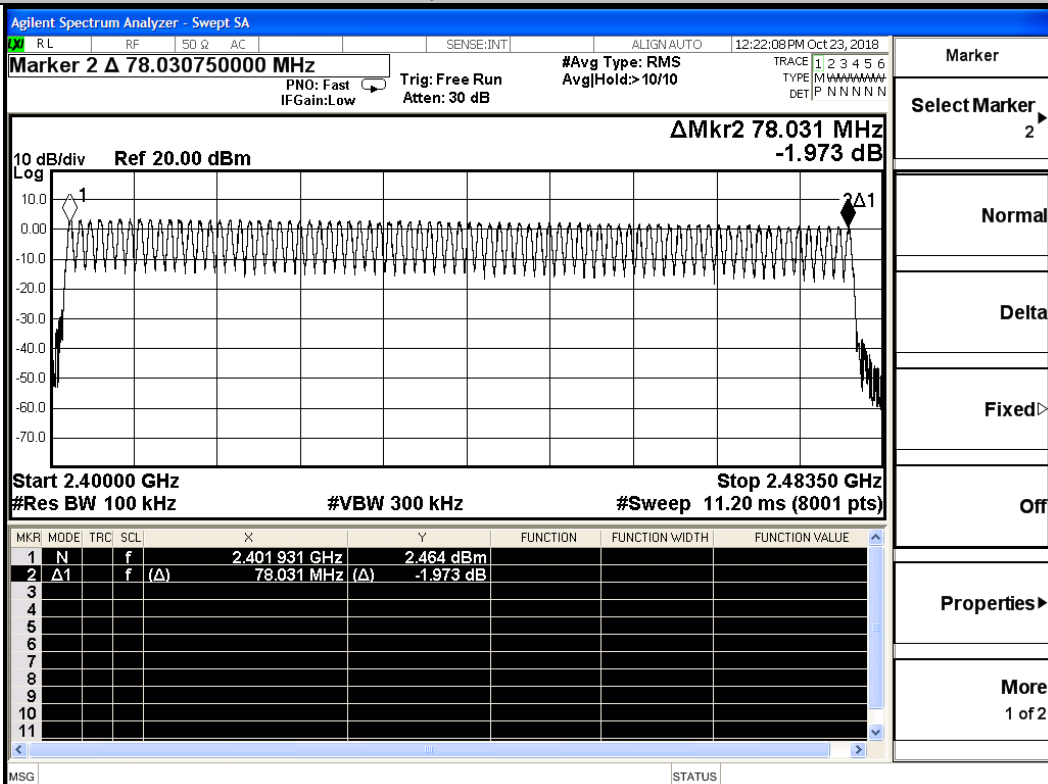


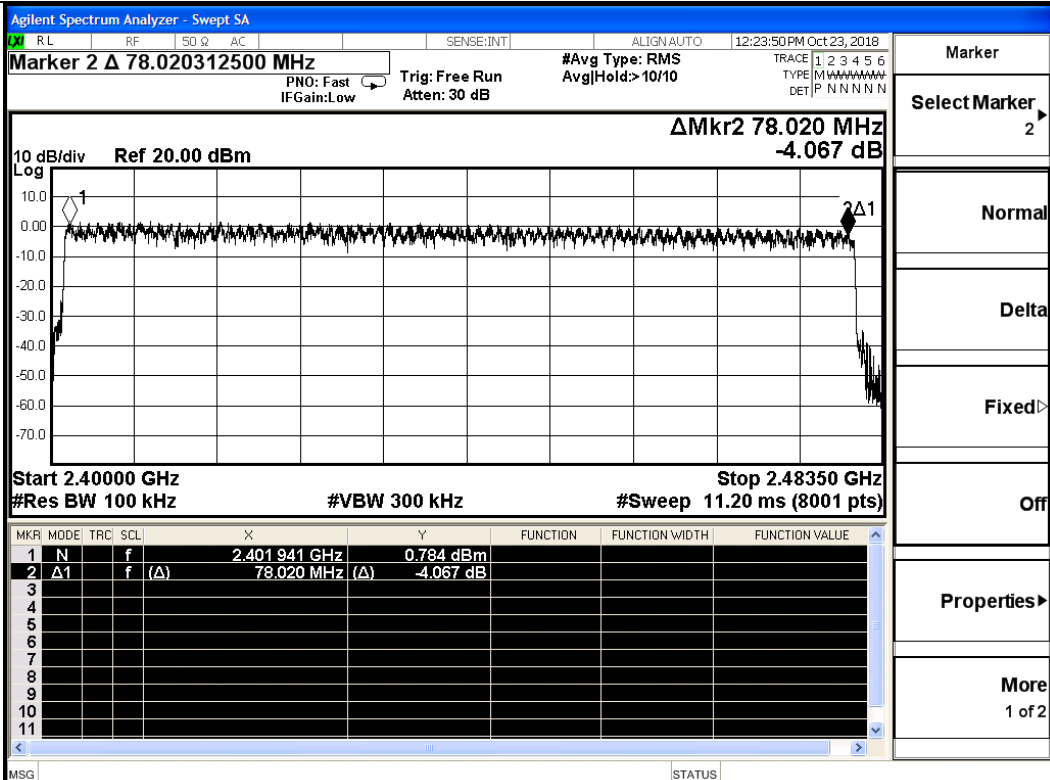
A.4 Hopping Channel Number

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

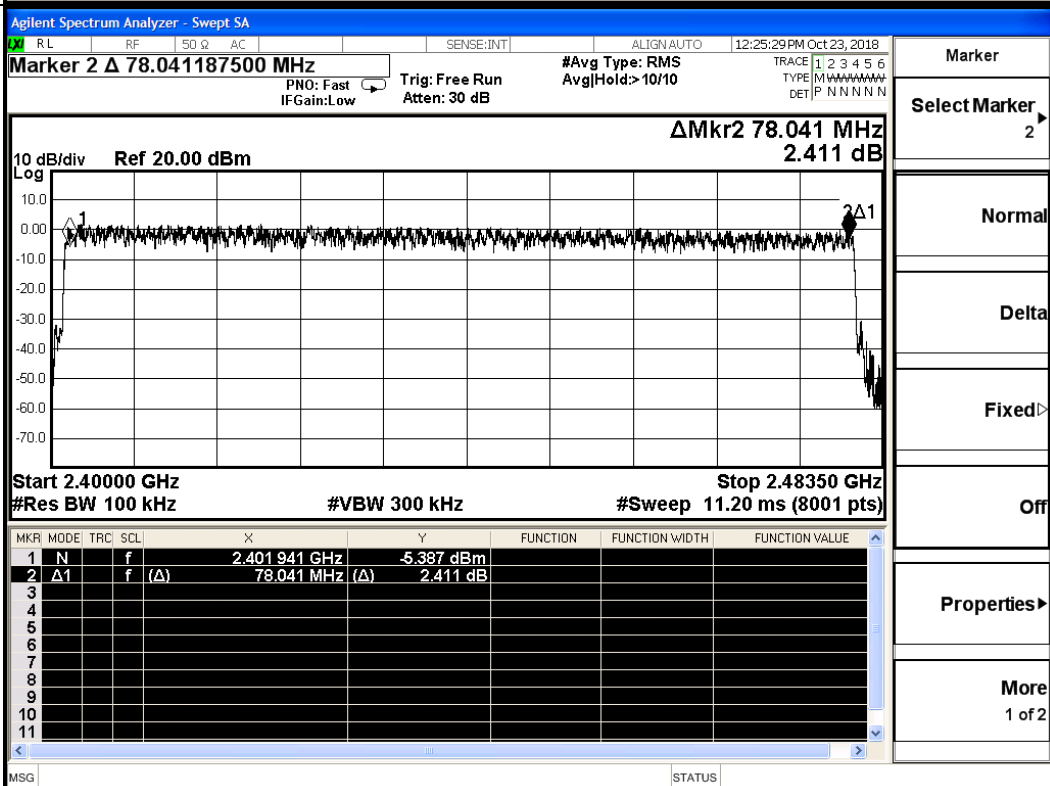
Test Graphs

GFSK/Hop



$\pi/4$ DQPSK/Hop

8DPSK/Hop

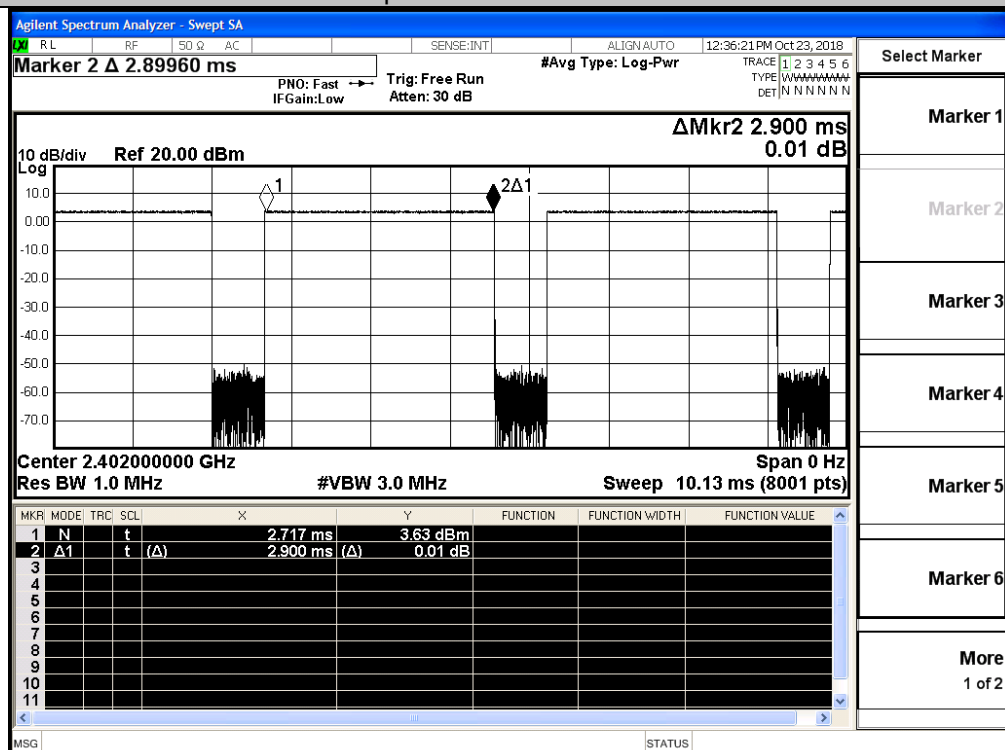


A.5 Dwell Time

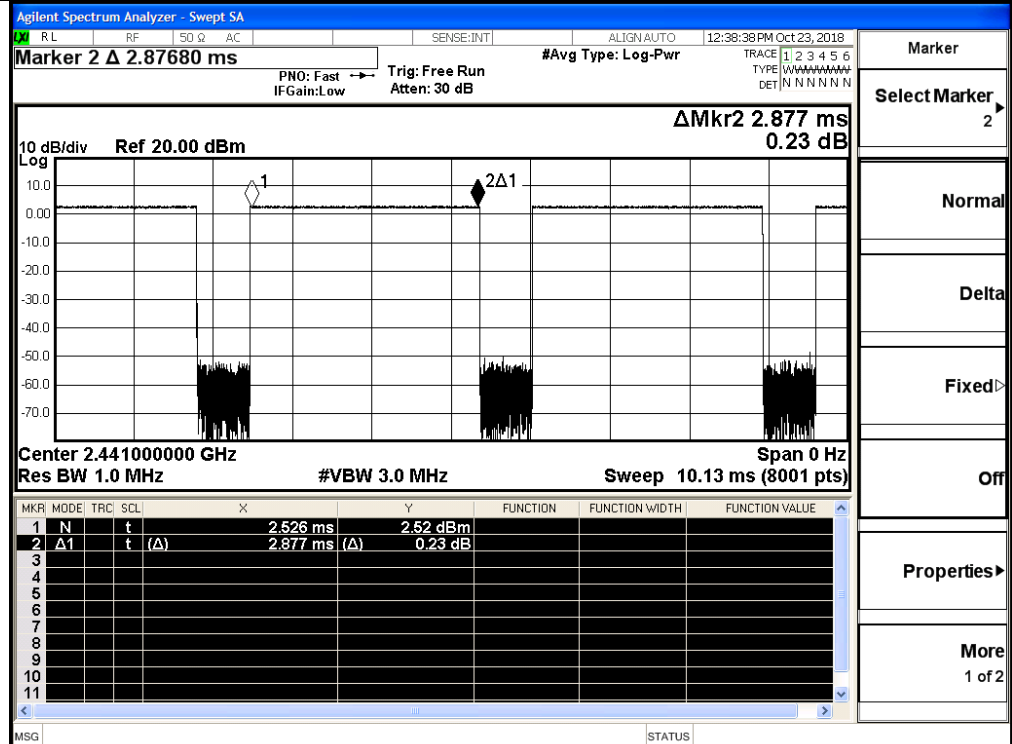
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.90	106.7	0.309	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.89	106.7	0.308	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.83	106.7	0.302	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.82	106.7	0.301	0.4	PASS
	3DH5	MCH	2.87	106.7	0.306	0.4	PASS
	3DH5	HCH	2.86	106.7	0.305	0.4	PASS

Test Graphs

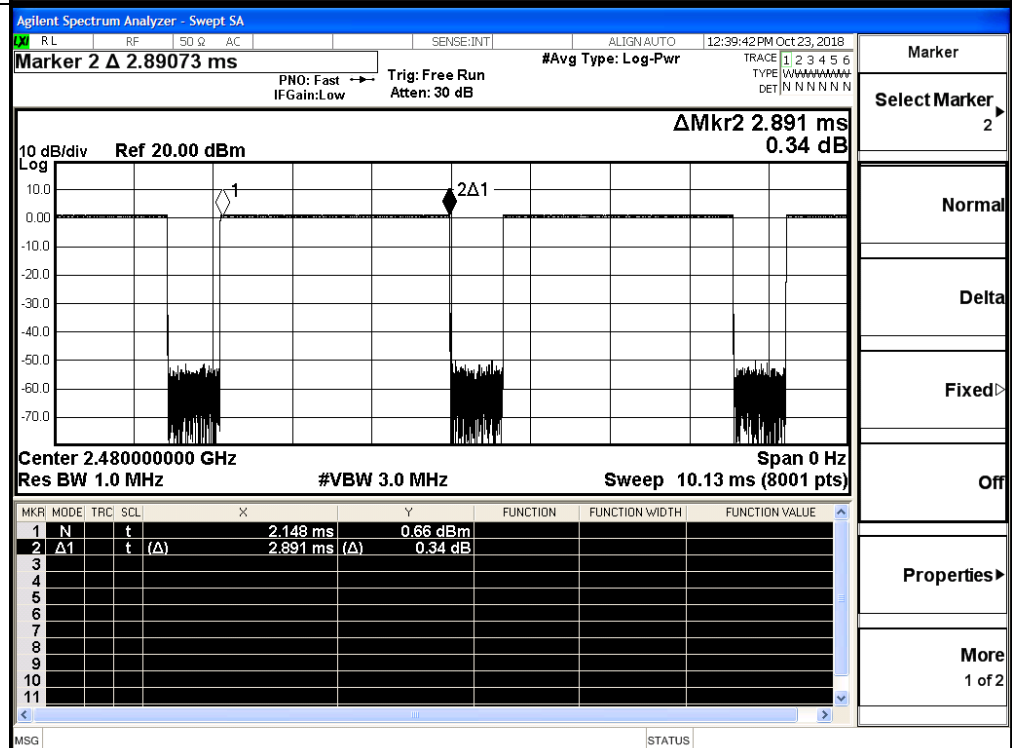
GFSK_DH5/LCH



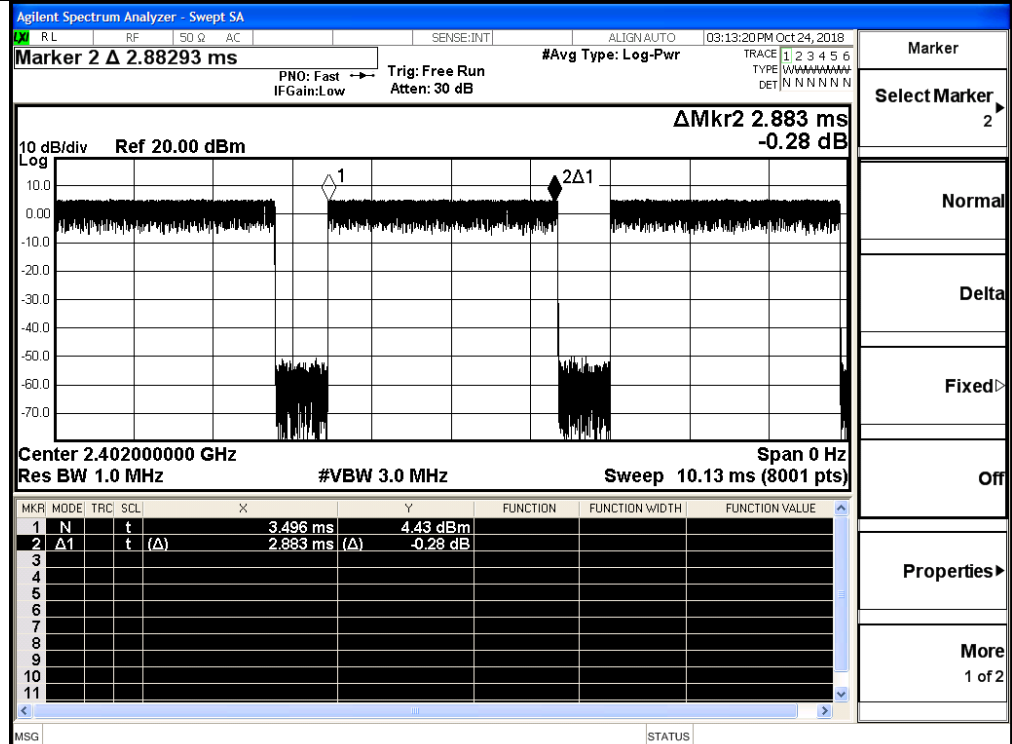
GFSK_DH5/MCH



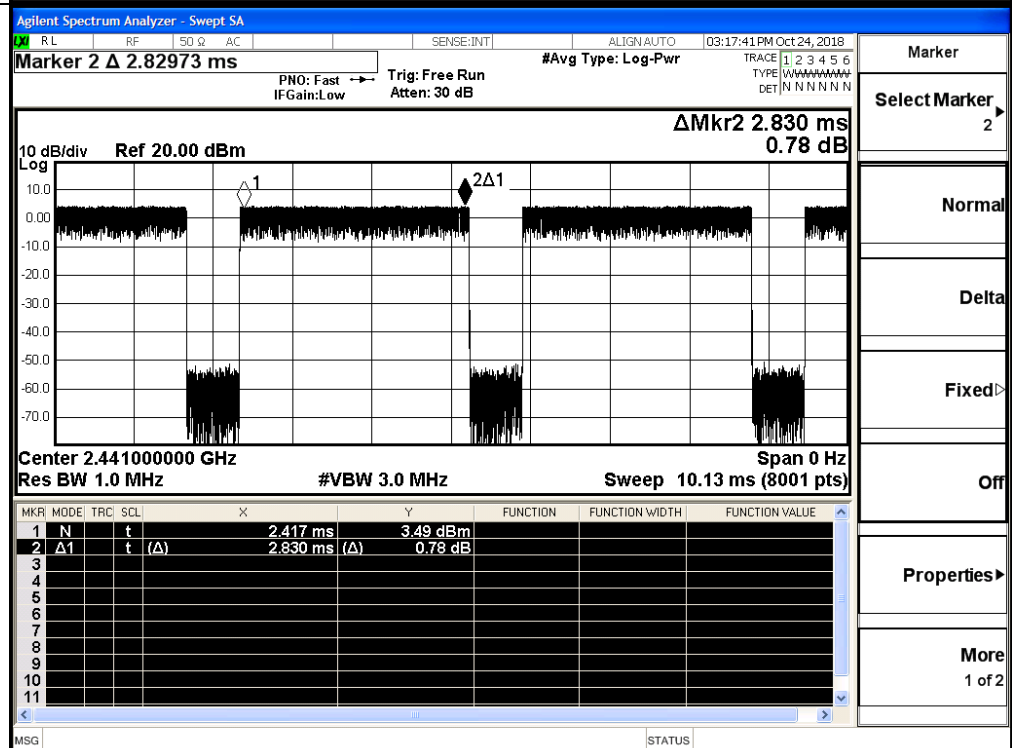
GFSK_DH5/HCH



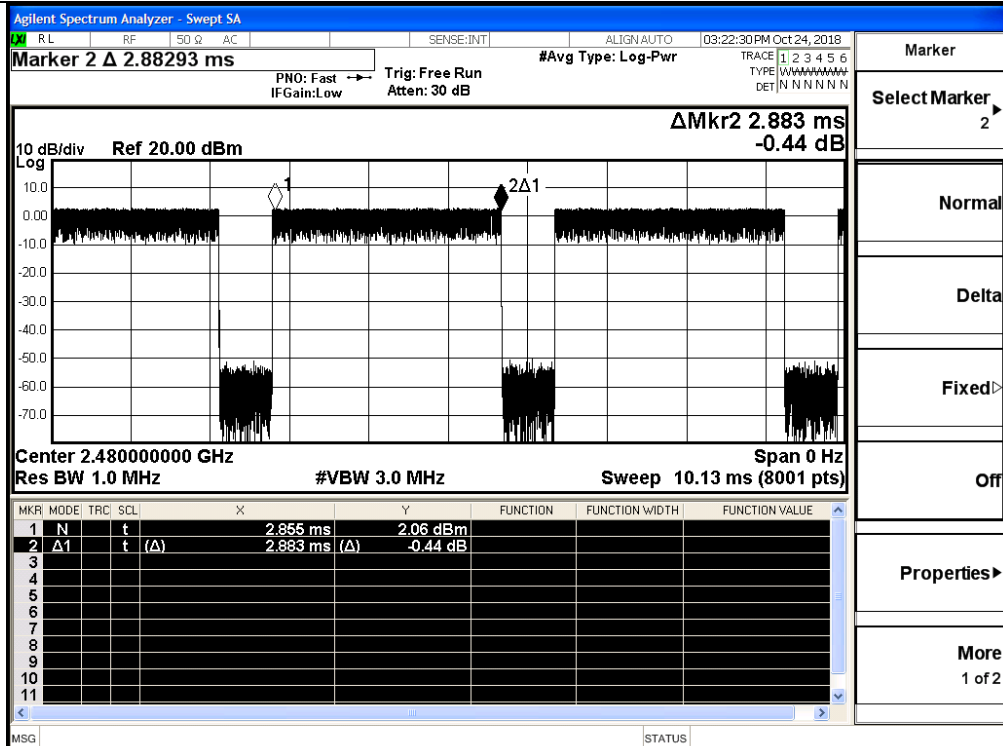
$\pi/4$ DQPSK
_2DH5/LCH



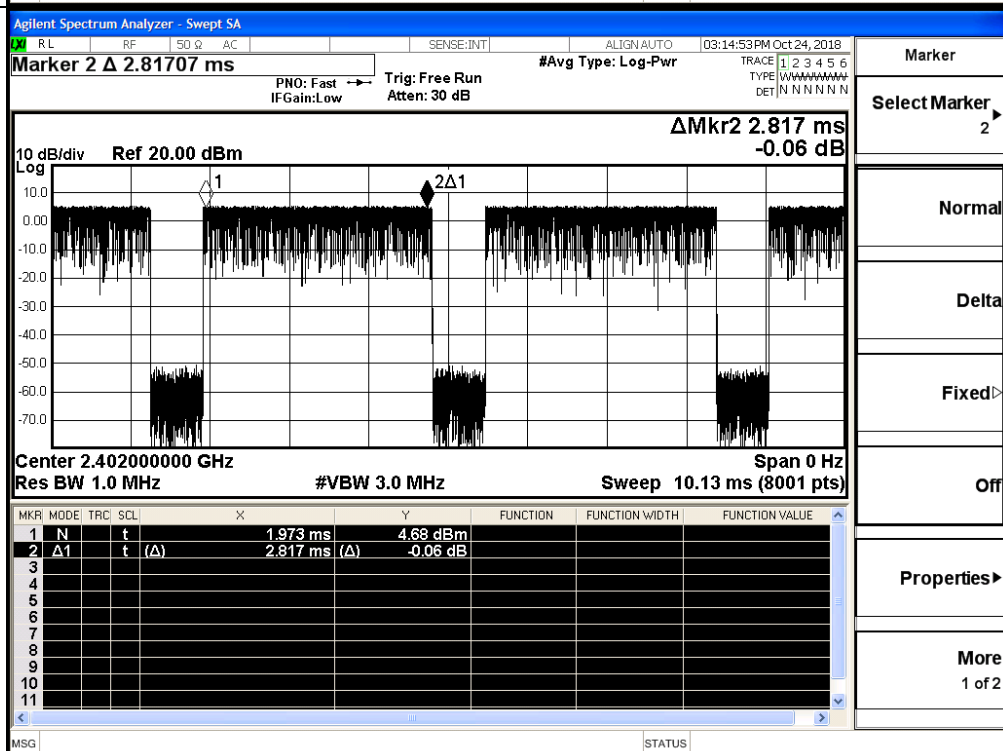
$\pi/4$ DQPSK
_2DH5/MCH



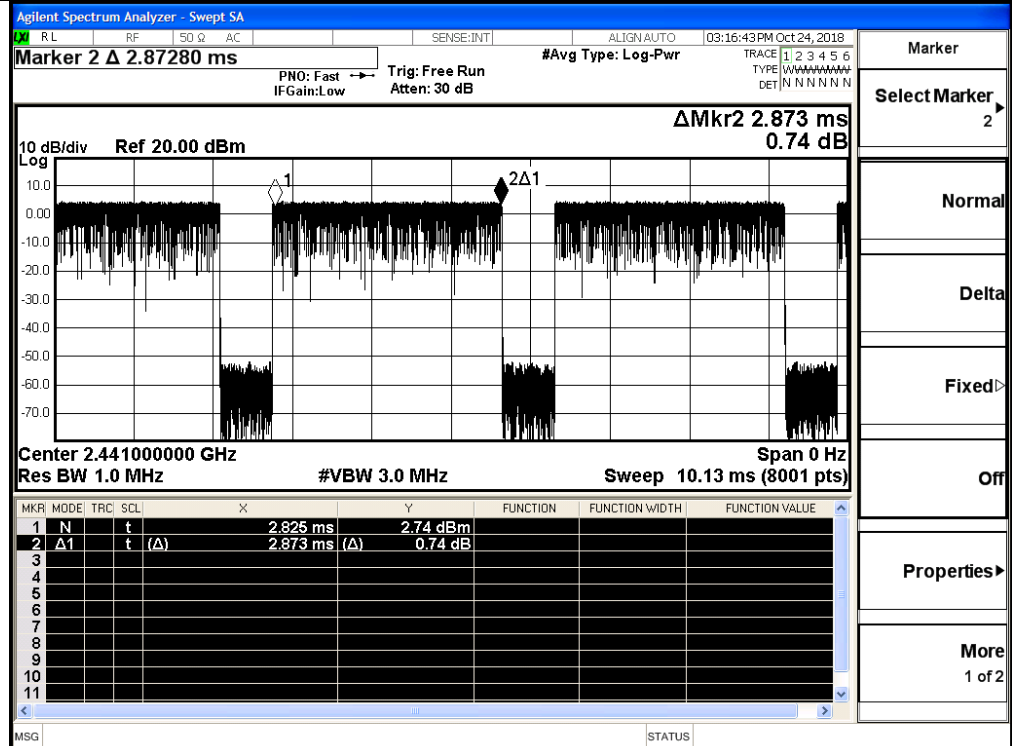
$\pi/4$ DQPSK
_2DH5/HCH



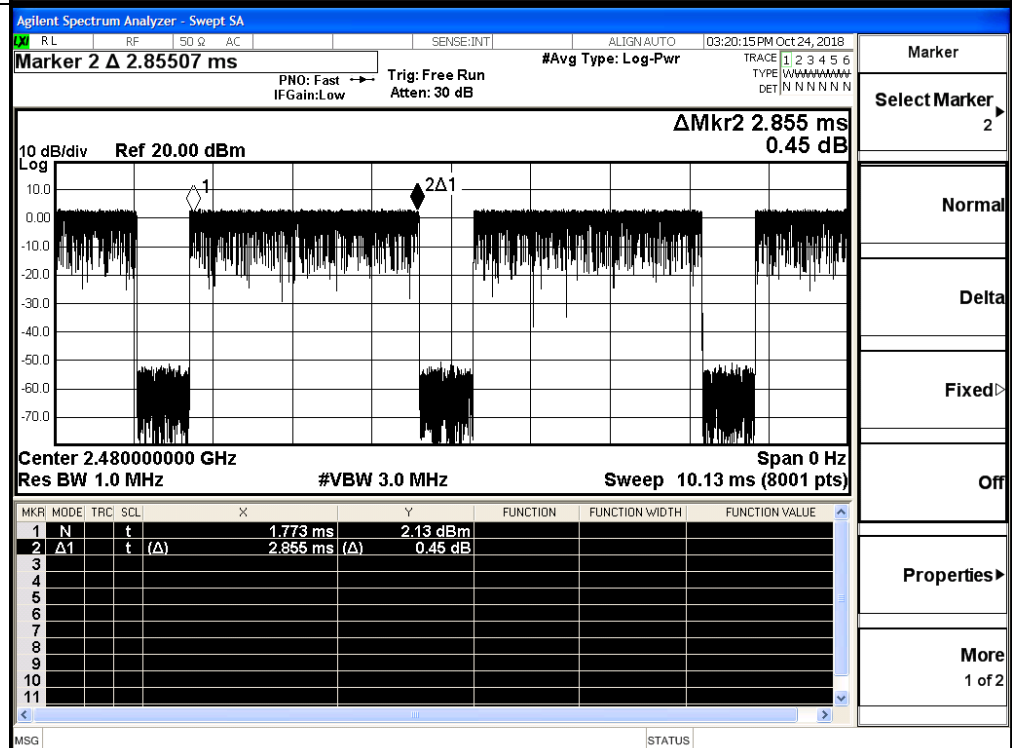
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

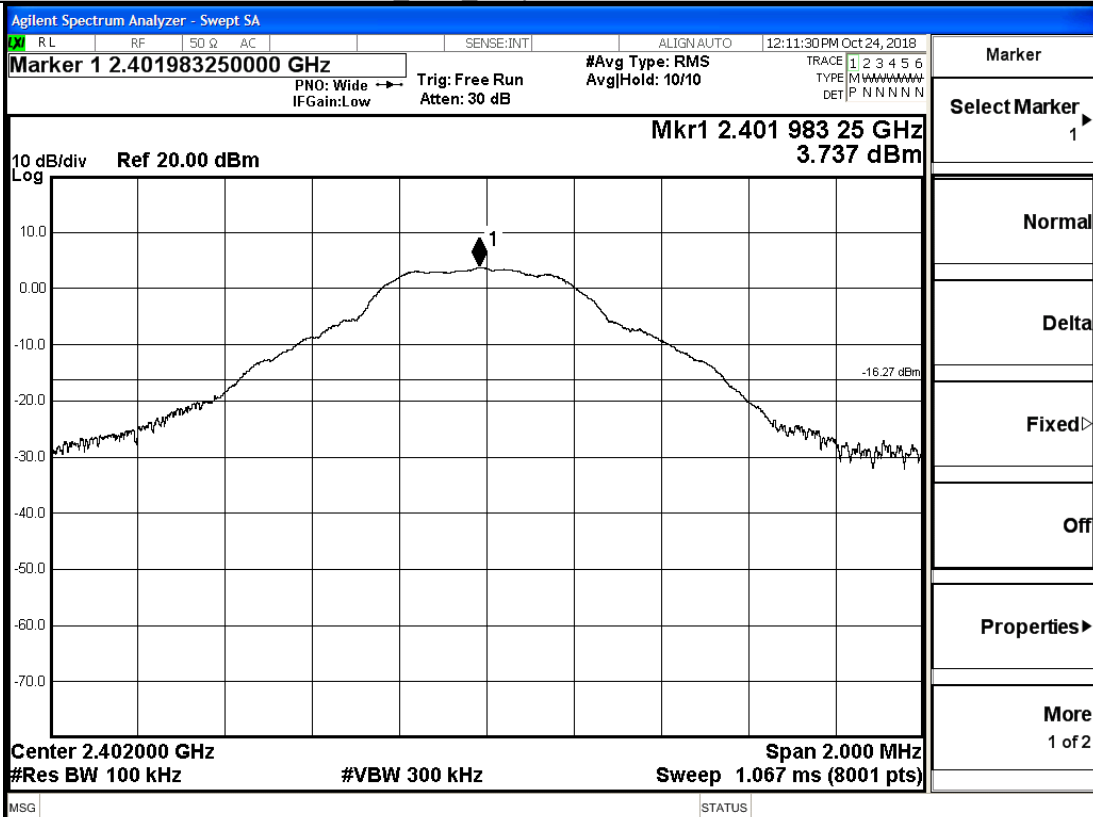


A.6 RF Conducted Spurious Emissions

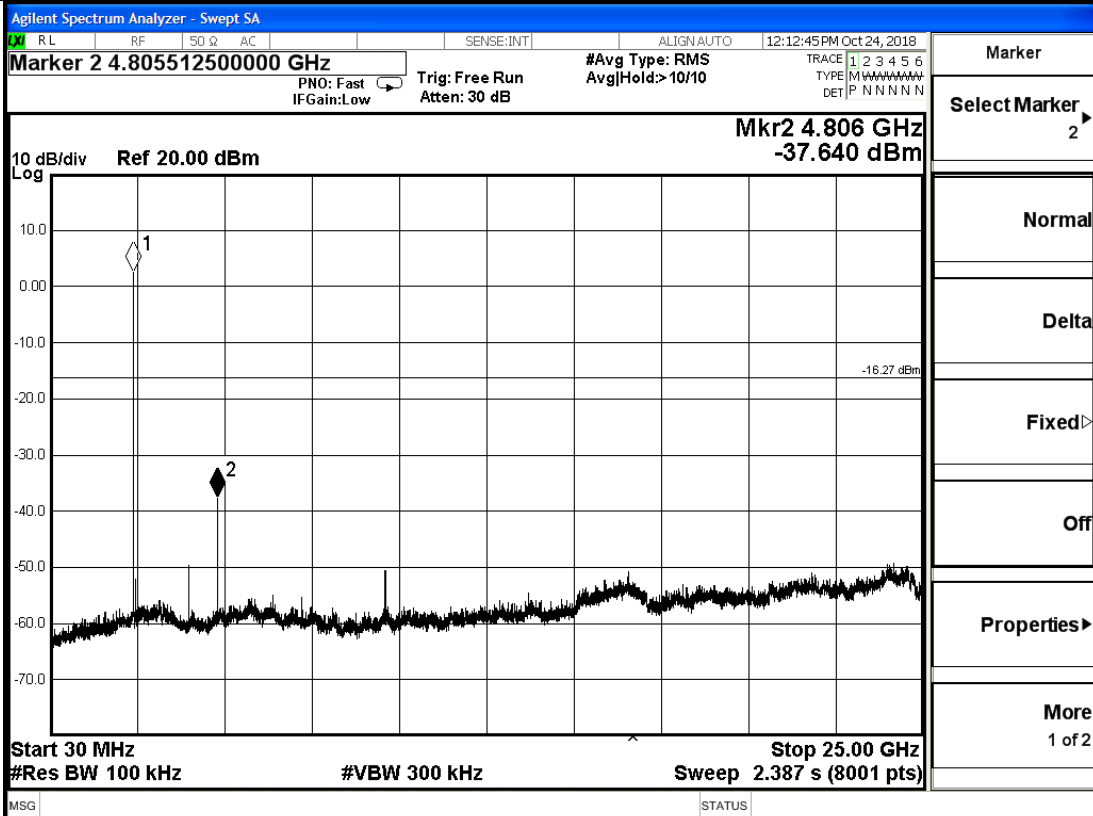
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.737	-37.640	-16.26	PASS
	MCH	2.165	-40.000	-17.84	PASS
	HCH	1.084	-42.456	-18.92	PASS
$\pi/4$ DQPSK	LCH	2.151	-41.136	-17.85	PASS
	MCH	1.147	-41.784	-18.85	PASS
	HCH	-0.427	-43.612	-20.43	PASS
8DPSK	LCH	2.095	-39.929	-17.91	PASS
	MCH	1.138	-42.989	-18.86	PASS
	HCH	-0.483	-41.820	-20.48	PASS

GFSK_LCH_Graphs

Pref

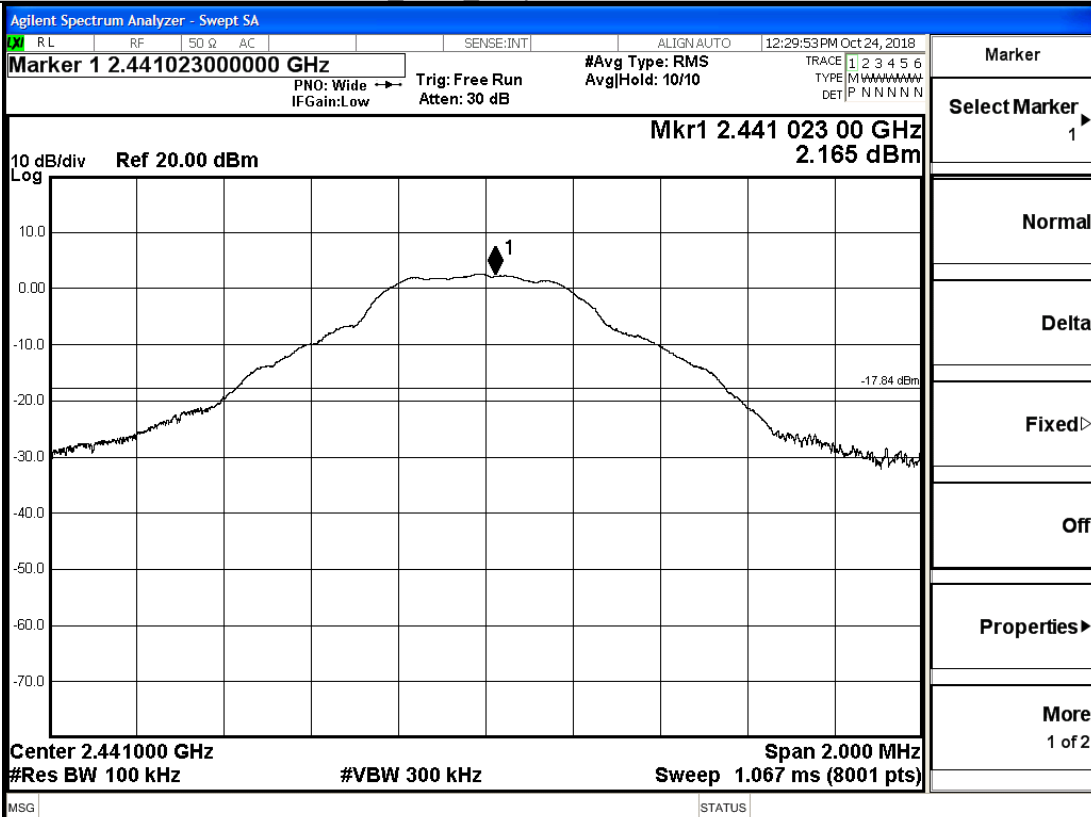


Puw

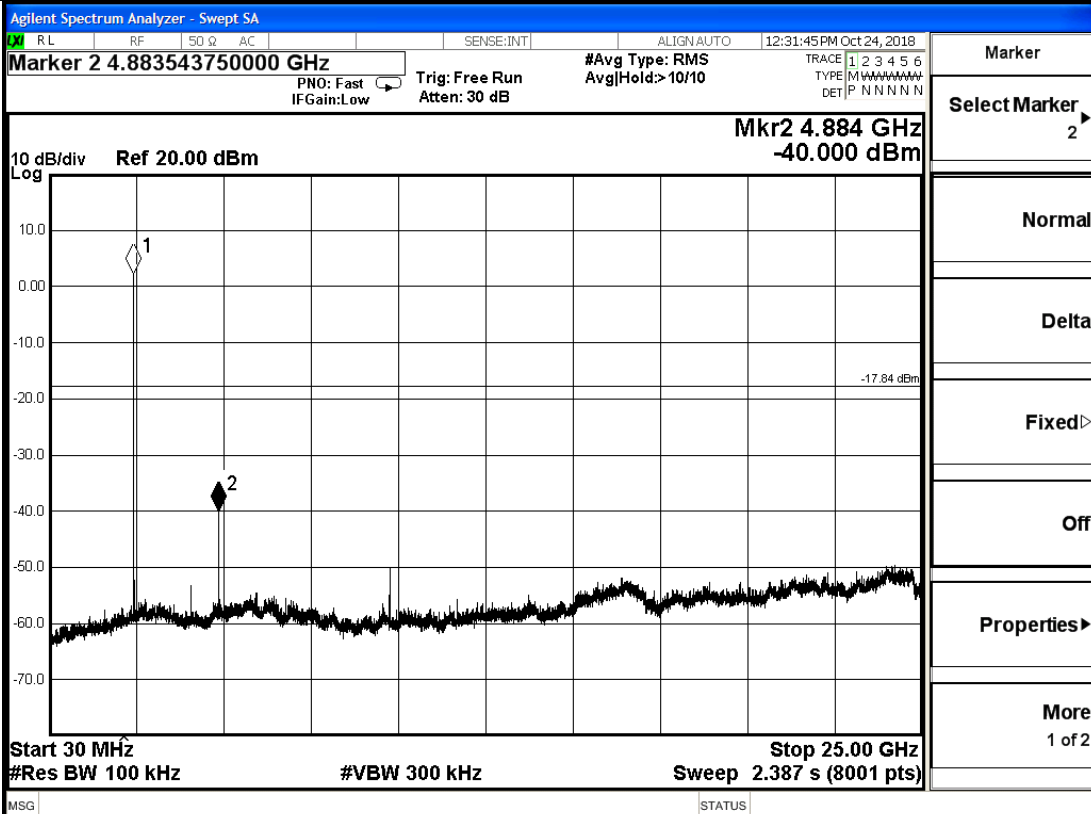


GFSK_MCH_Graphs

Pref

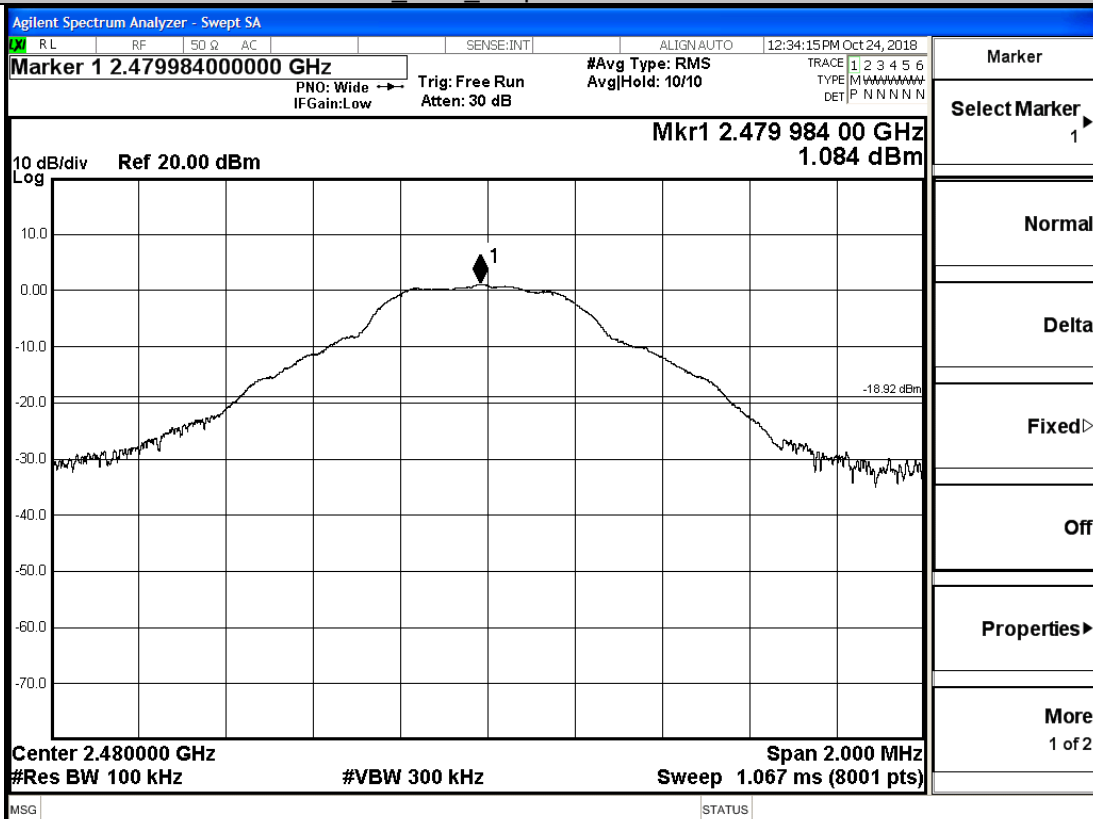


Puw

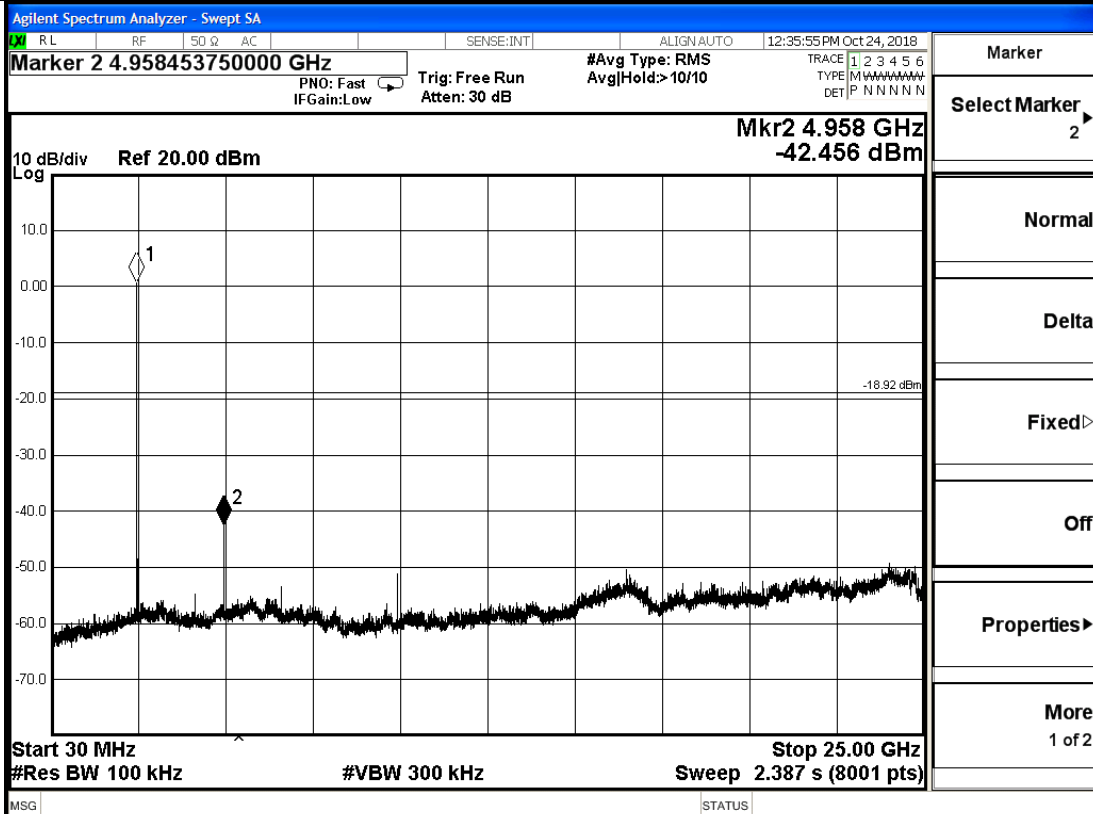


GFSK HCH_Graphs

Pref

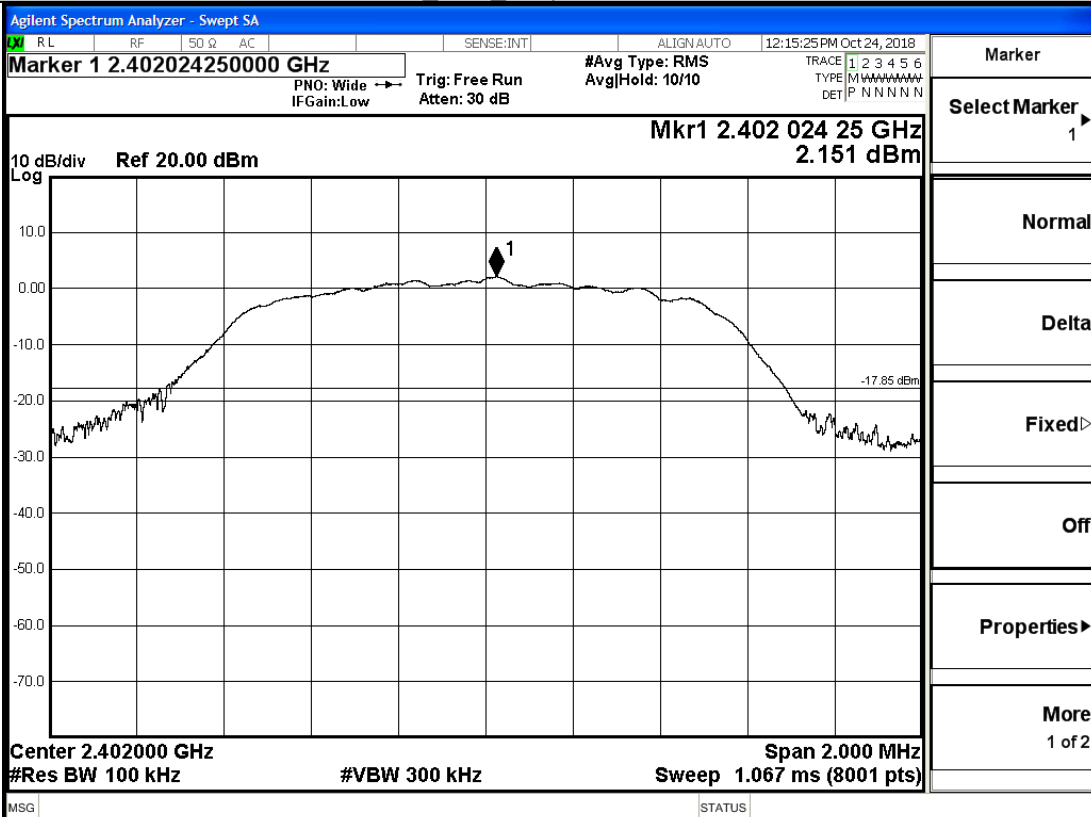


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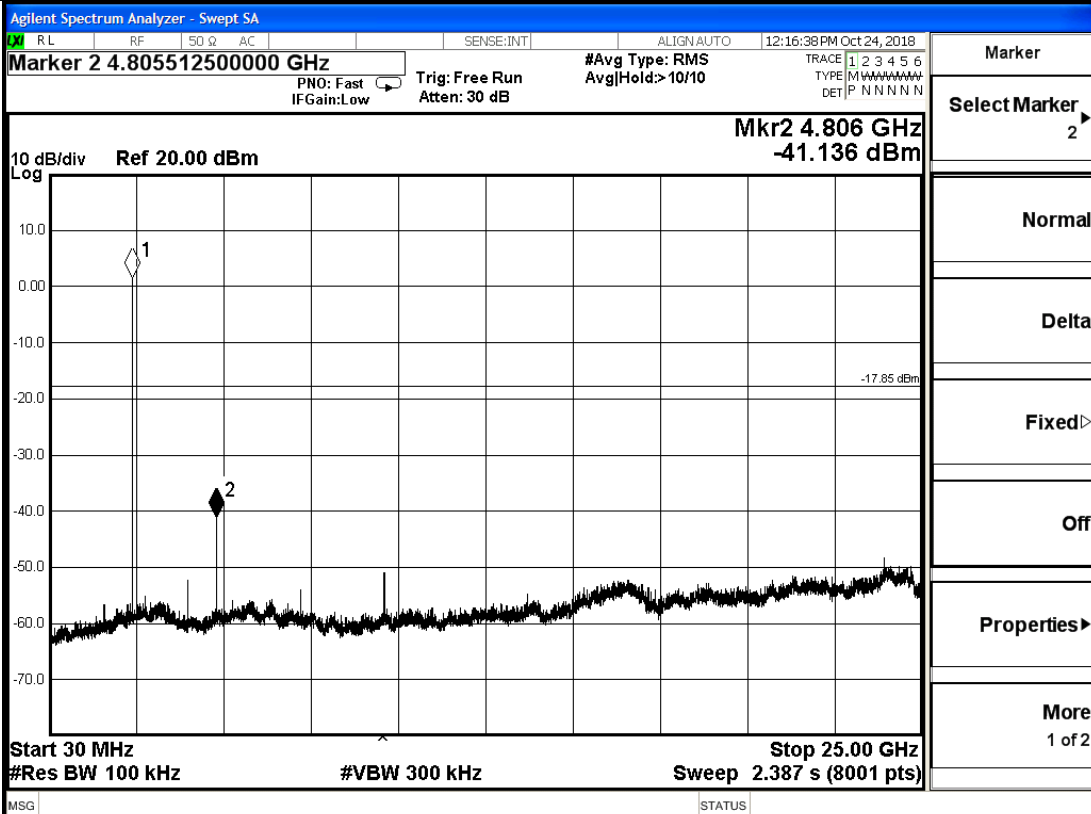


$\pi/4$ DQPSK LCH_Graphs

Pref

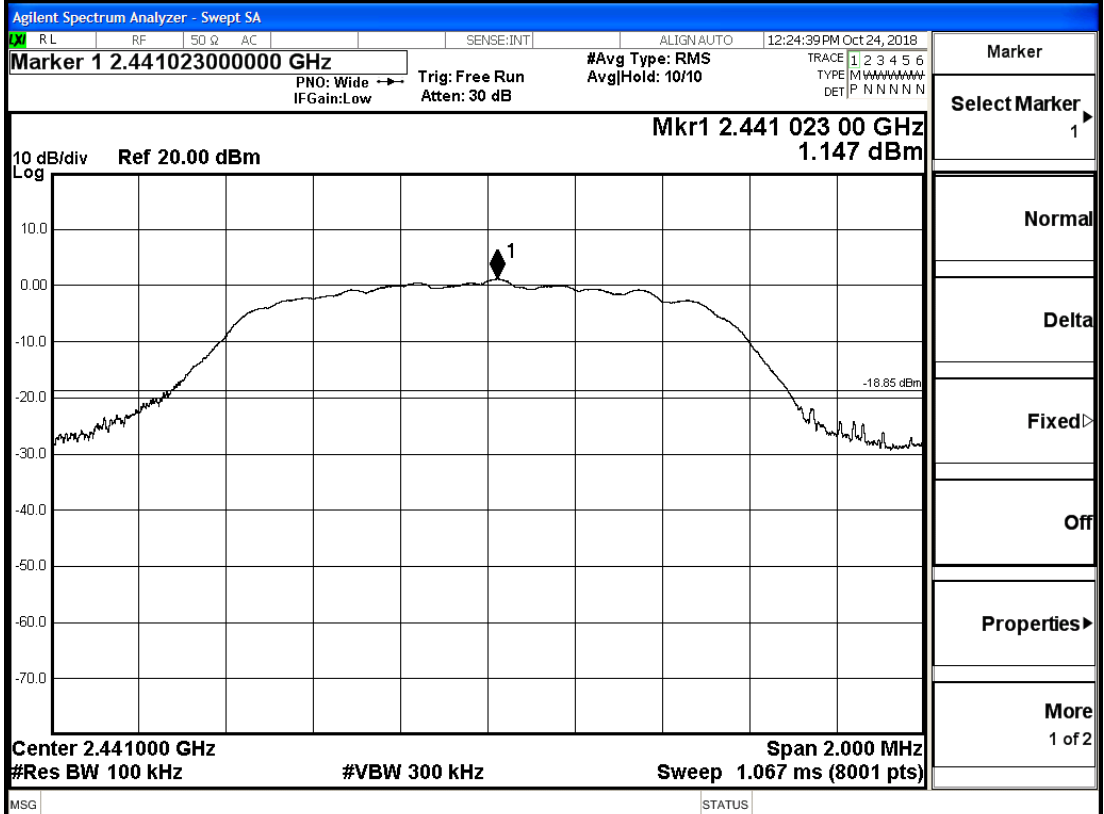


Puw

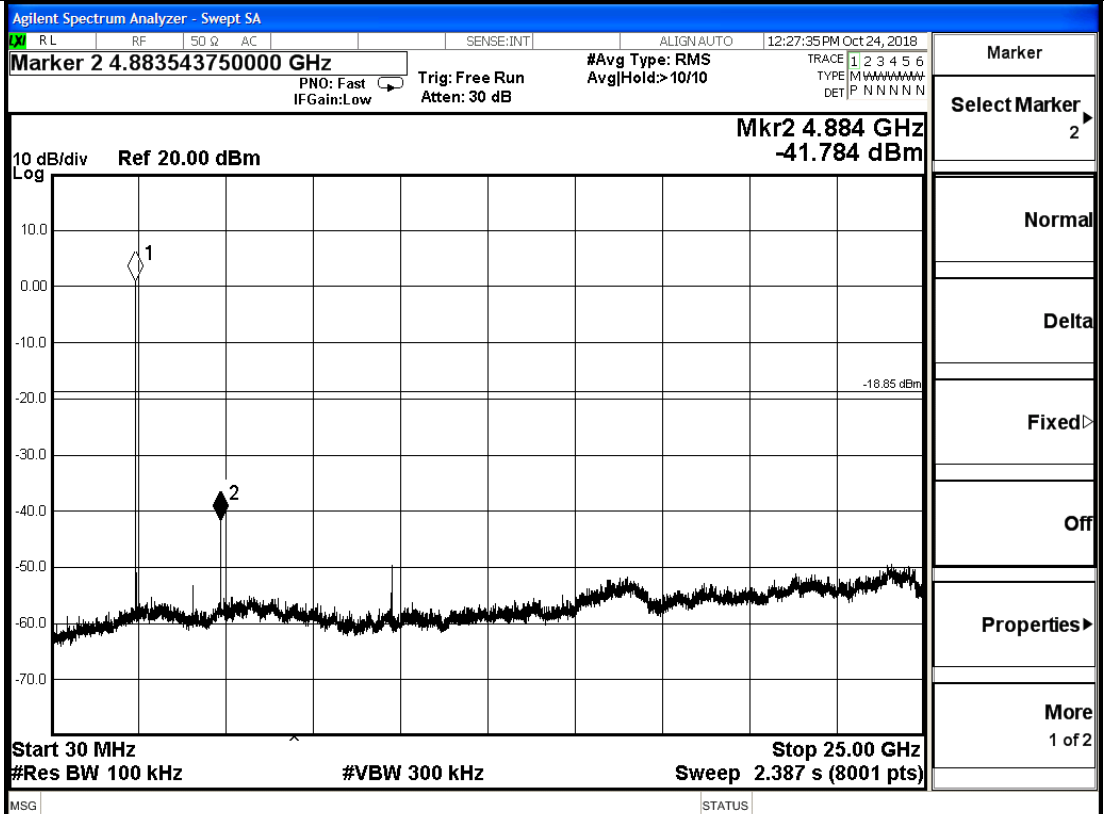


π /4DQPSK_MCH_Graphs

Pref

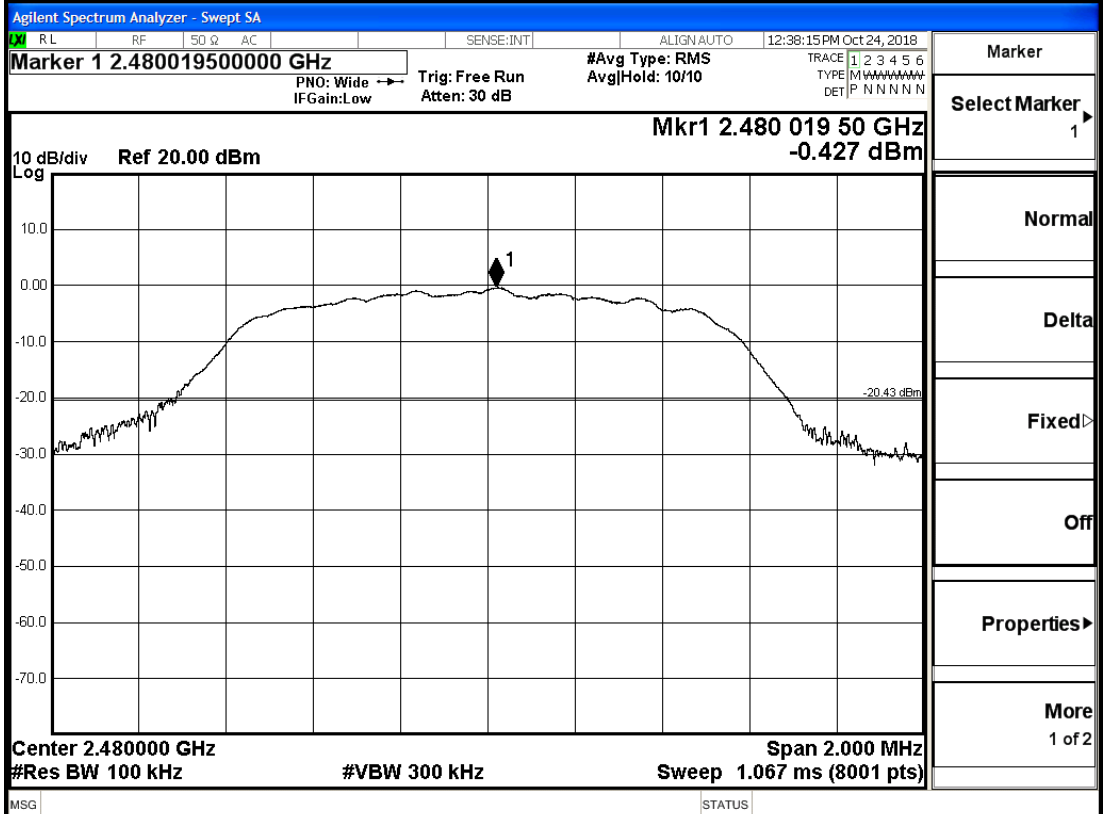


Puw

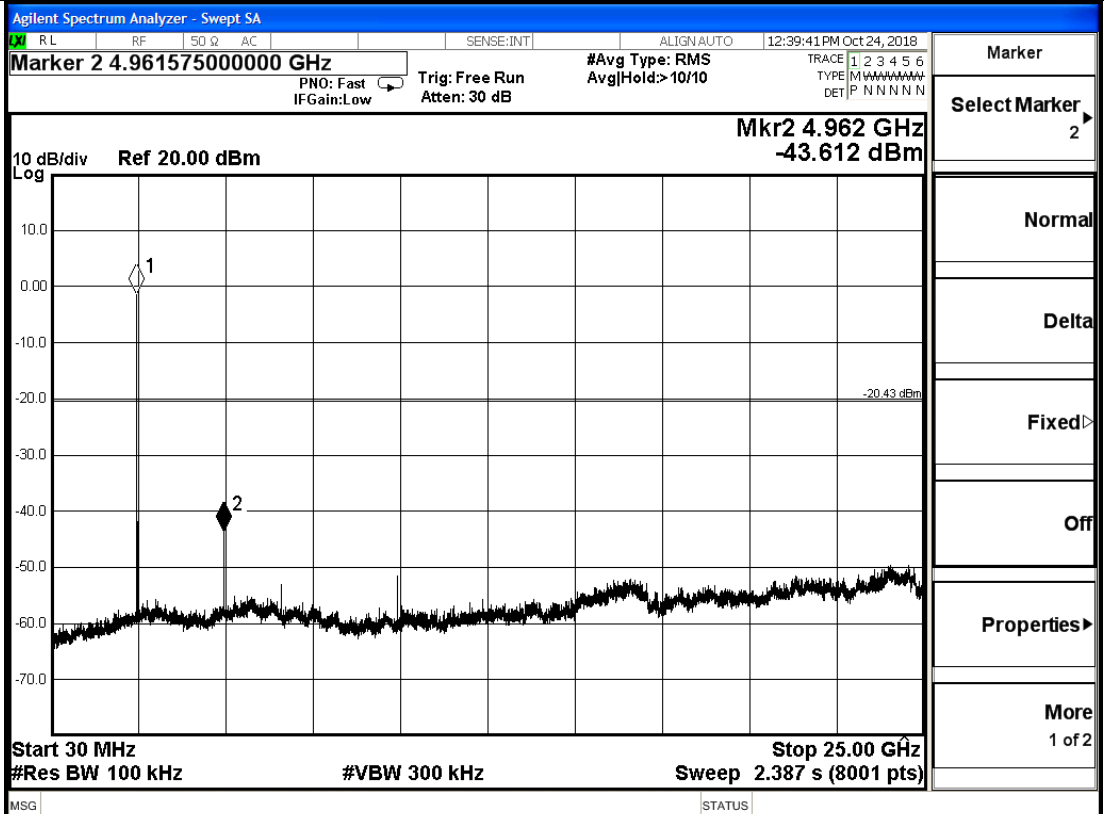


$\pi/4$ DQPSK_HCH_Graphs

Pref

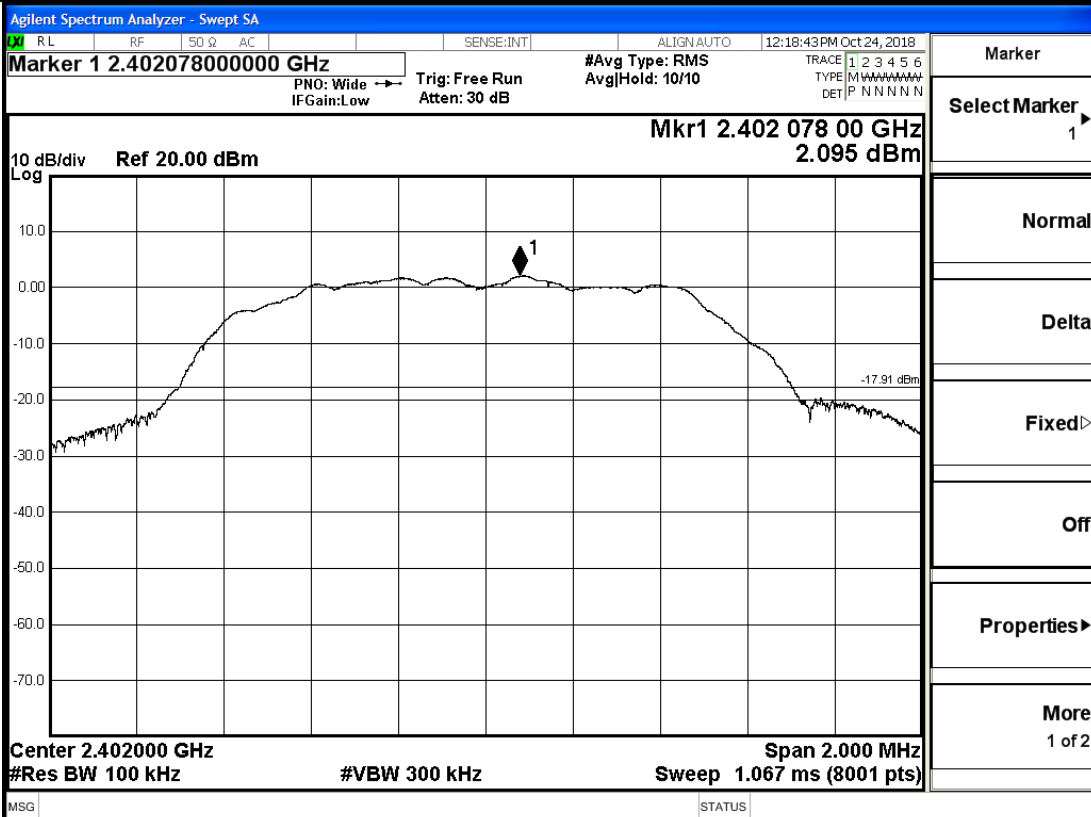


Puw

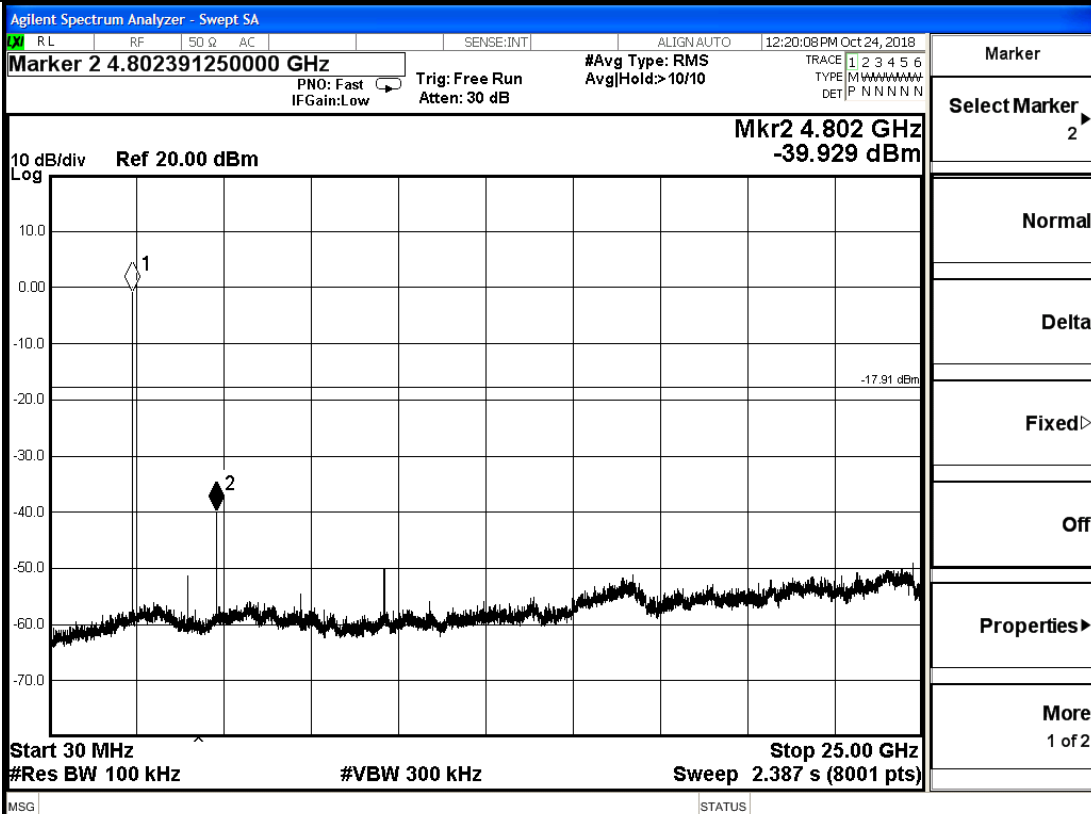


8DPSK_LCH_Graphs

Pref

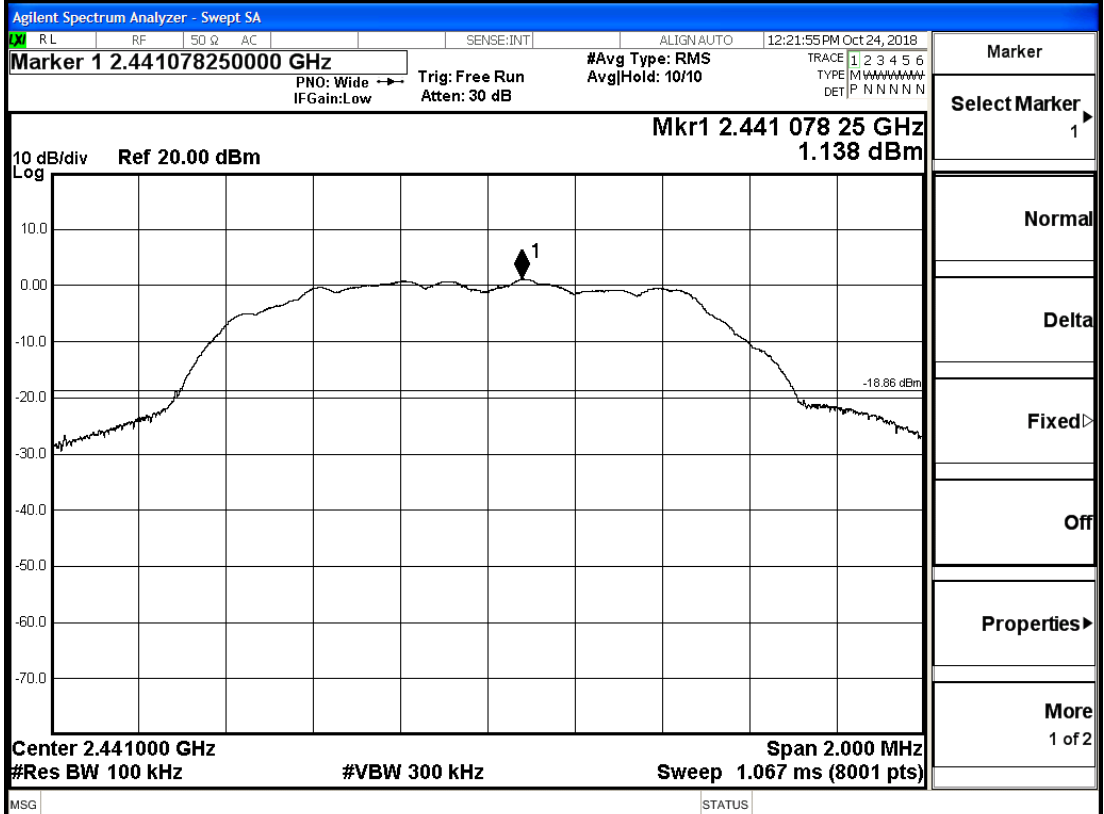


Puw

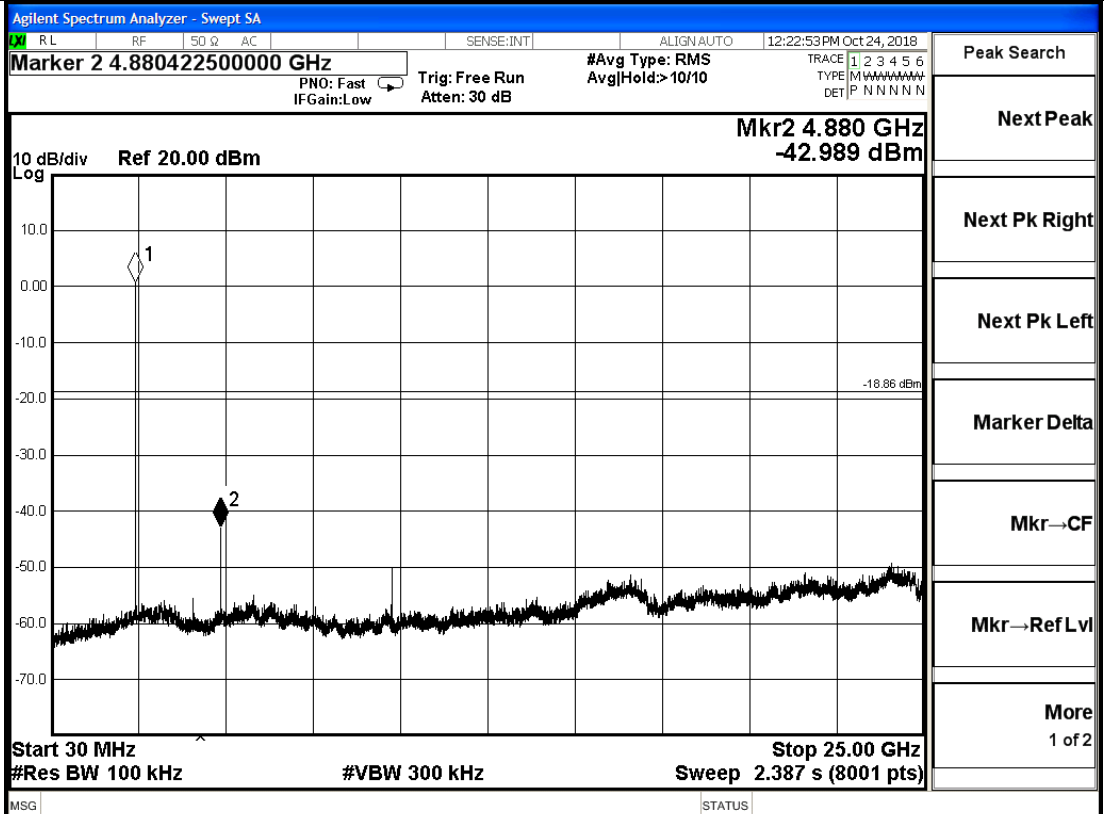


8DPSK_MCH_Graphs

Pref

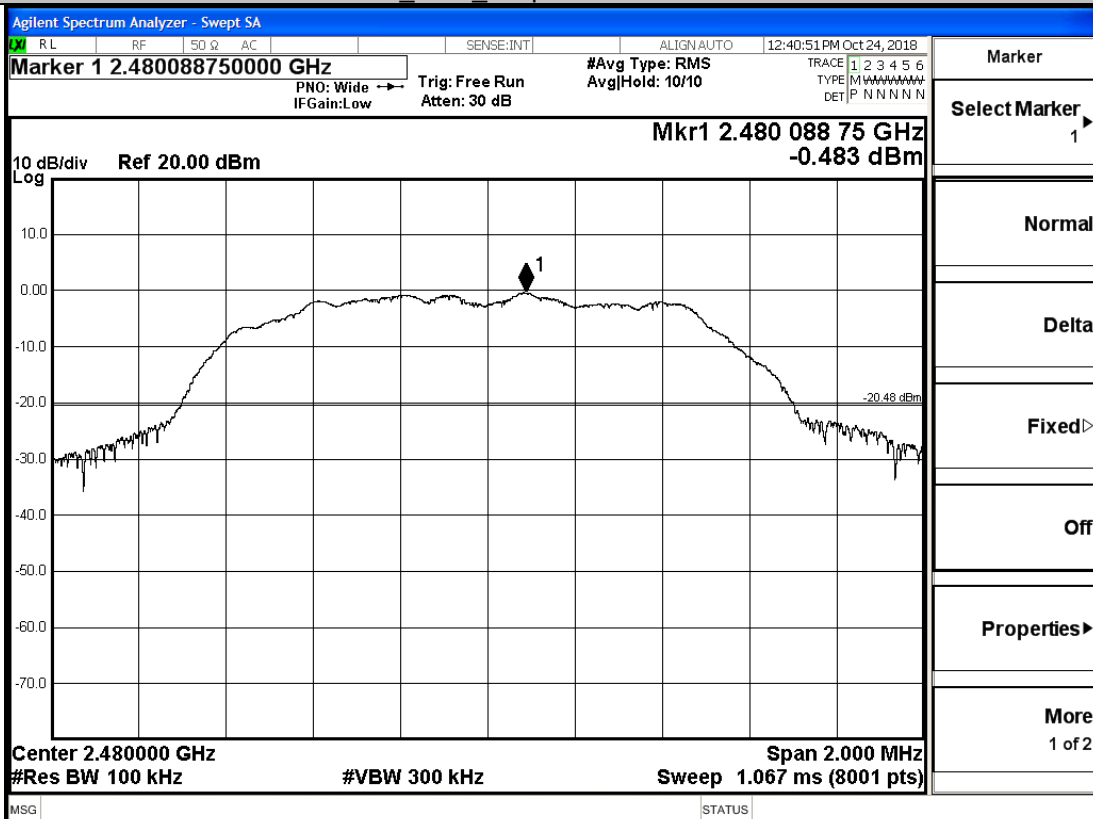


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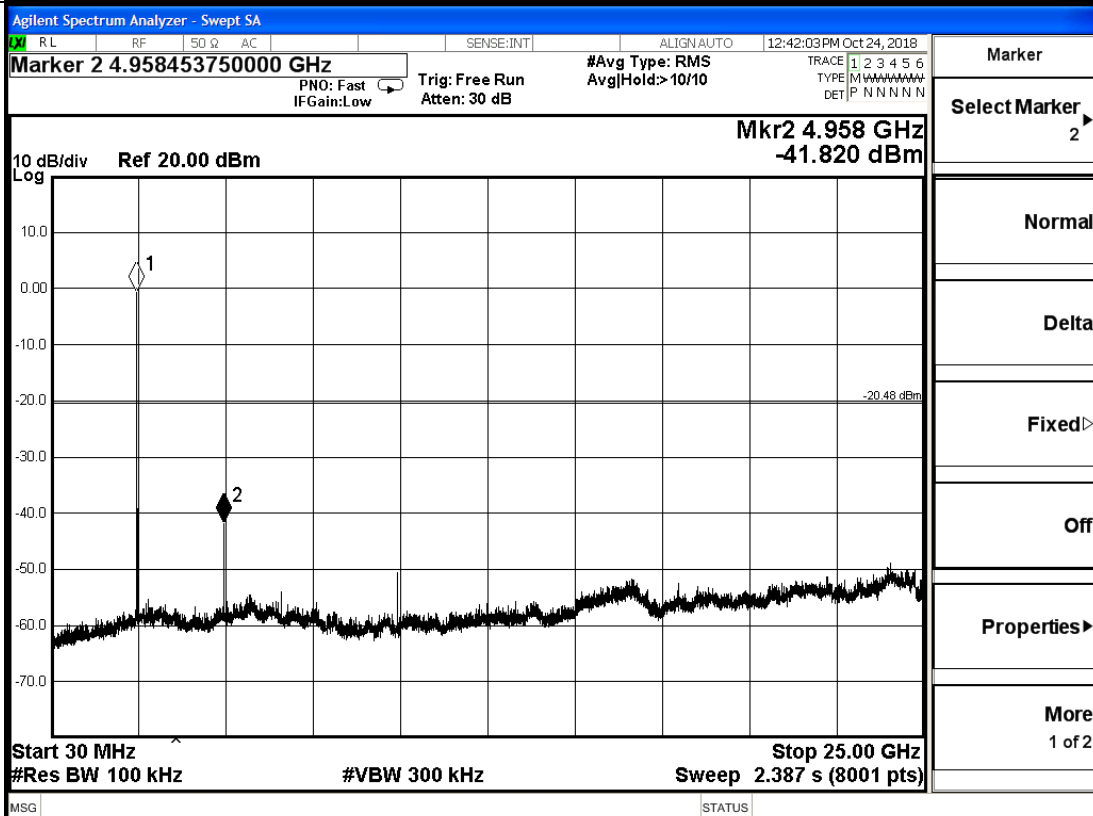


8DPSK_HCH_Graphs

Pref



Puw

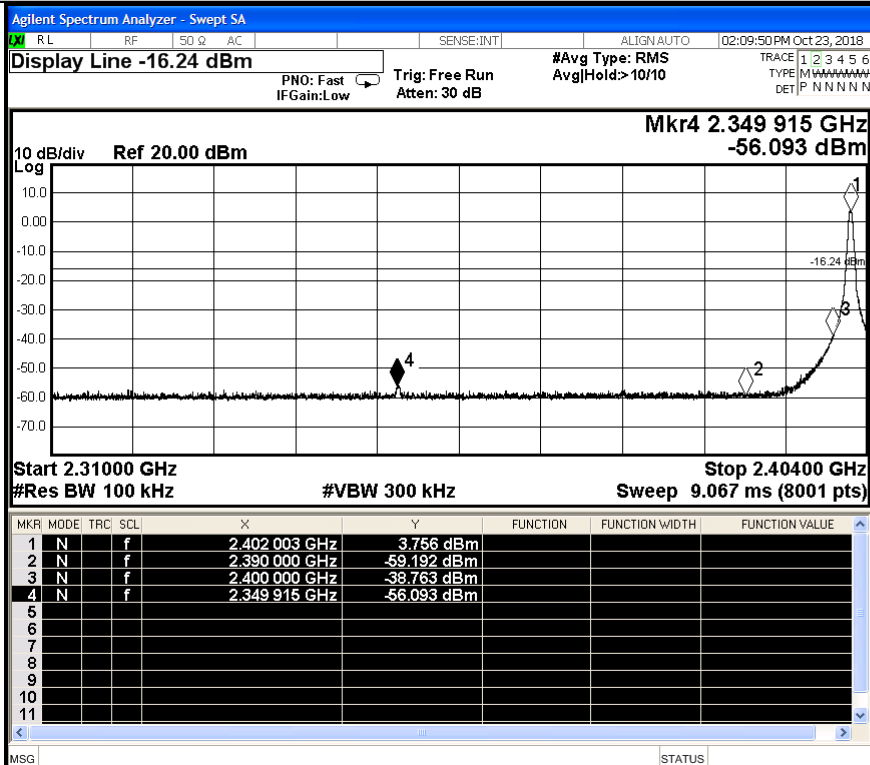


A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.756	Off	-38.763	-16.24	PASS
			2.874	On	-56.957	-17.13	PASS
	HCH	2480	1.169	Off	-58.644	-18.83	PASS
			0.232	On	-58.644	-19.77	PASS
$\pi/4$ DQPSK	LCH	2402	1.802	Off	-37.768	-18.20	PASS
			1.454	On	-55.911	-18.55	PASS
	HCH	2480	-0.492	Off	-49.907	-20.49	PASS
			-1.977	On	-56.673	-21.98	PASS
8DPSK	LCH	2402	2.379	Off	-37.923	-17.62	PASS
			0.566	On	-50.081	-19.43	PASS
	HCH	2480	-0.369	Off	-47.108	-20.37	PASS
			-0.724	On	-51.310	-20.72	PASS

Test Graphs

GFSK/LCH/No Hop



Display

Annotation

Title

Graticule

On

Off

Display Line

On

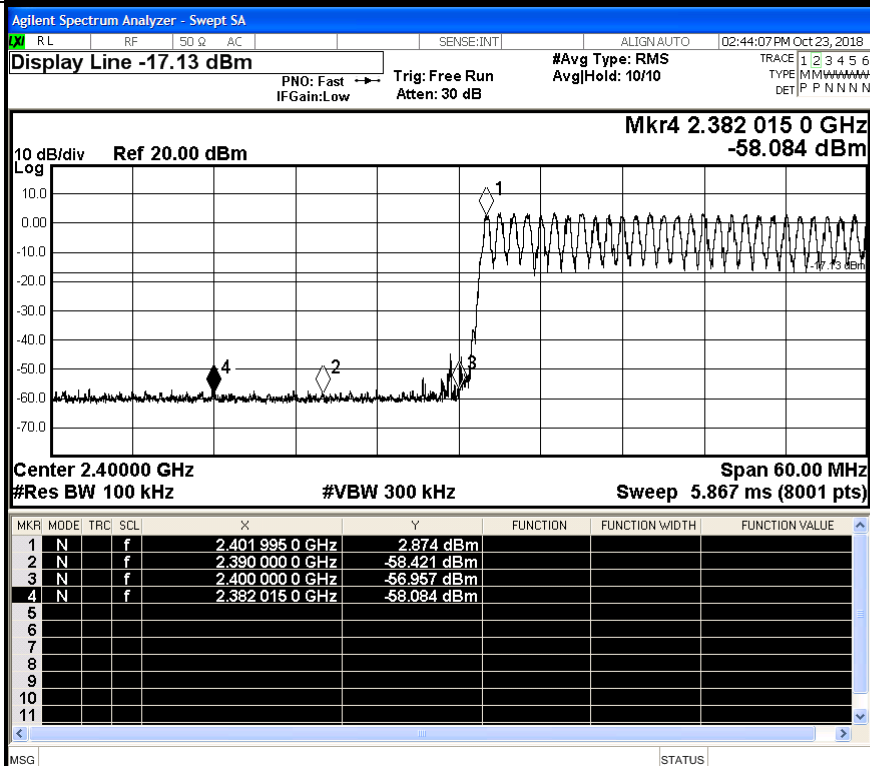
Off

System

Display

Settings

GFSK/LCH/Hop



Display

Annotation

Title

Graticule

On

Off

Display Line

On

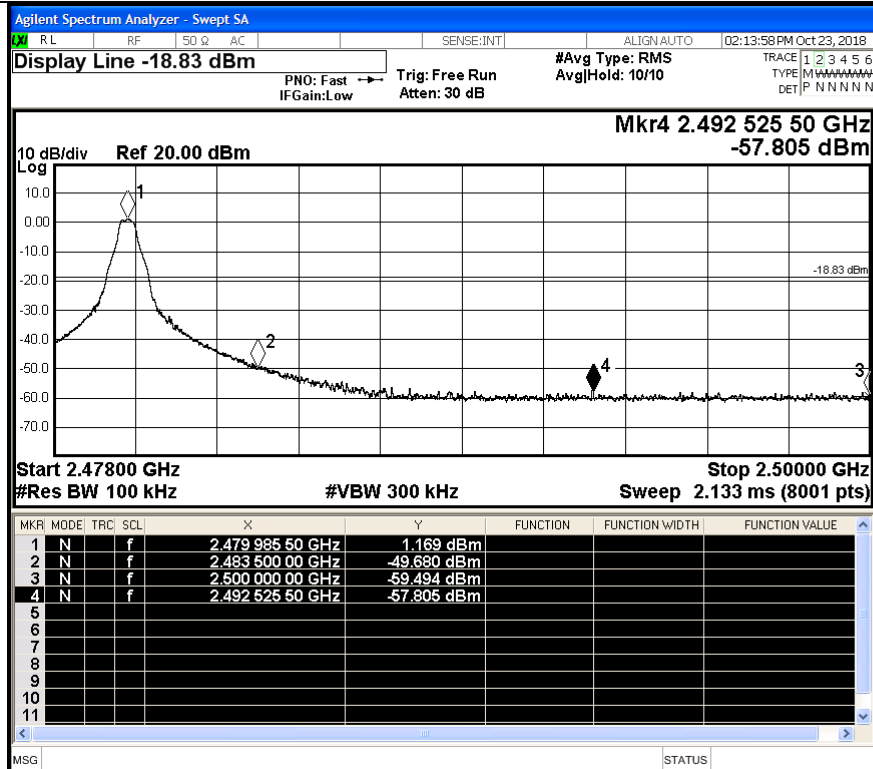
Off

System

Display

Settings

GFSK/HCH/No Hop



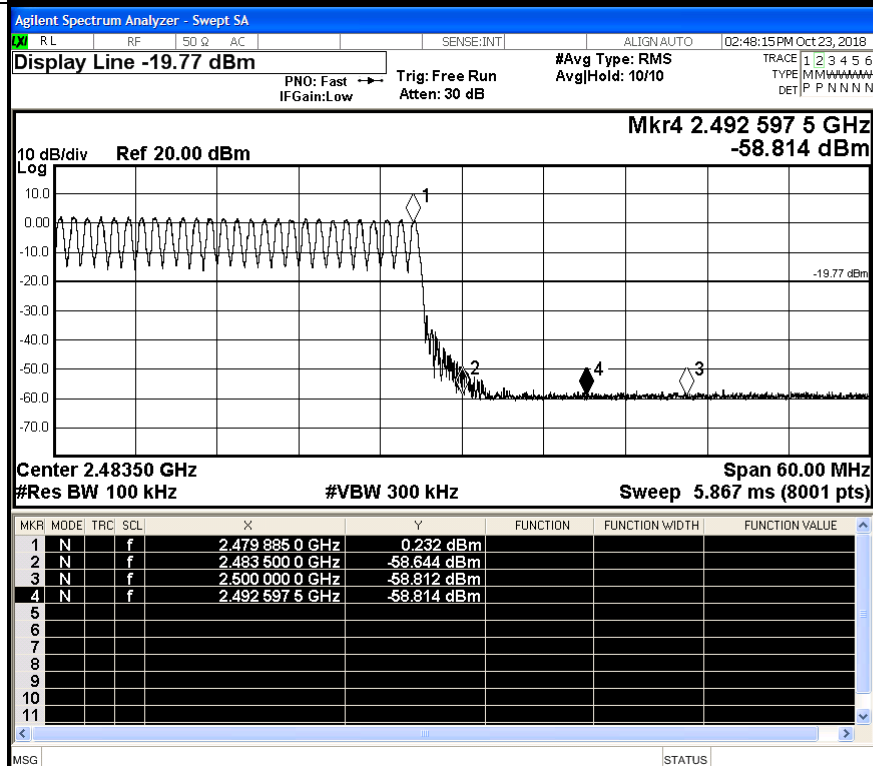
Display

Annotation▶

Title▶

Graticule
On OffDisplay Line
On Off
-18.83 dBmSystem
Display▶
Settings

GFSK/HCH/Hop



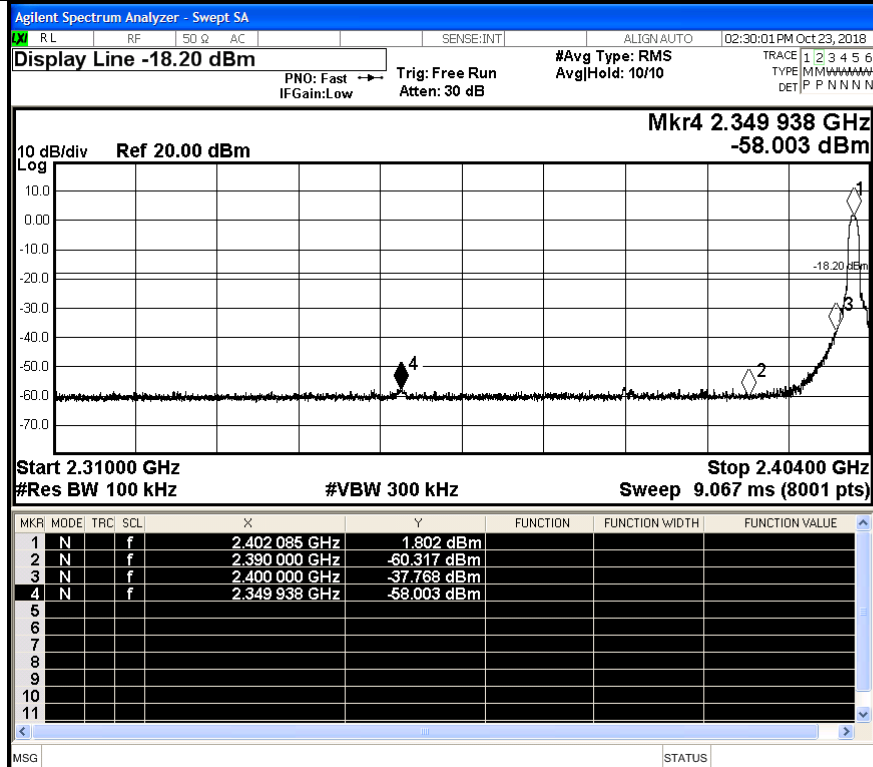
Display

Annotation▶

Title▶

Graticule
On OffDisplay Line
On Off
-19.77 dBmSystem
Display▶
Settings

$\pi/4$ DQPSK/LCH/No
Hop



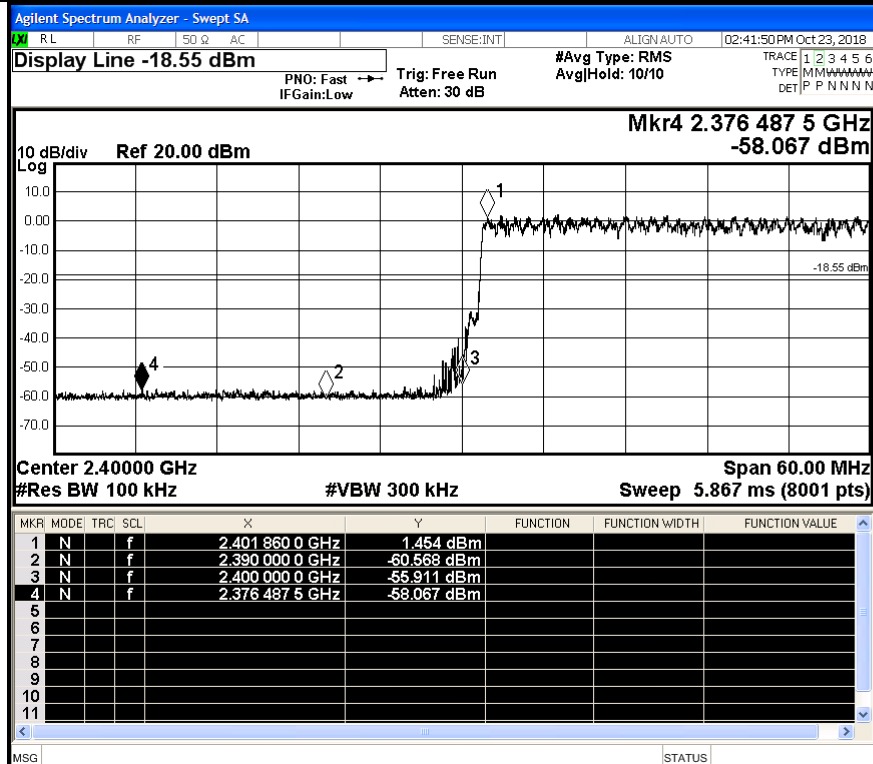
Display

Annotation▶

Title▶

Graticule
On OffDisplay Line
On OffSystem
Display▶
Settings

$\pi/4$ DQPSK/LCH/Hop



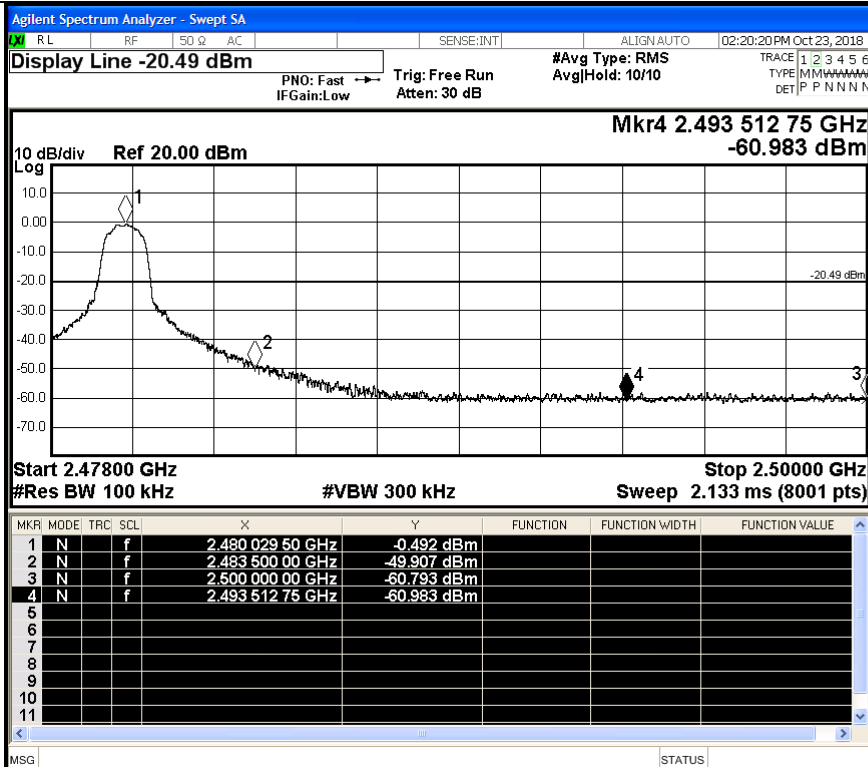
Display

Annotation▶

Title▶

Graticule
On OffDisplay Line
On OffSystem
Display▶
Settings

$\pi/4$ DQPSK/HCH/No
Hop



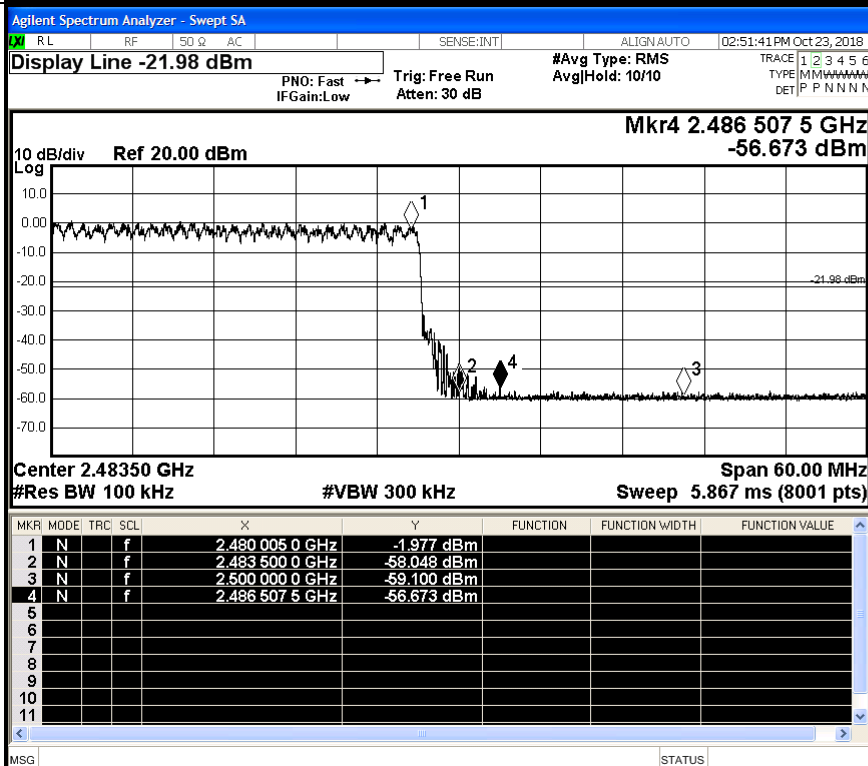
Display

Annotation►

Title►

Graticule
On OffDisplay Line
On Off
-20.49 dBmSystem
Display►
Settings

$\pi/4$ DQPSK/HCH/Hop



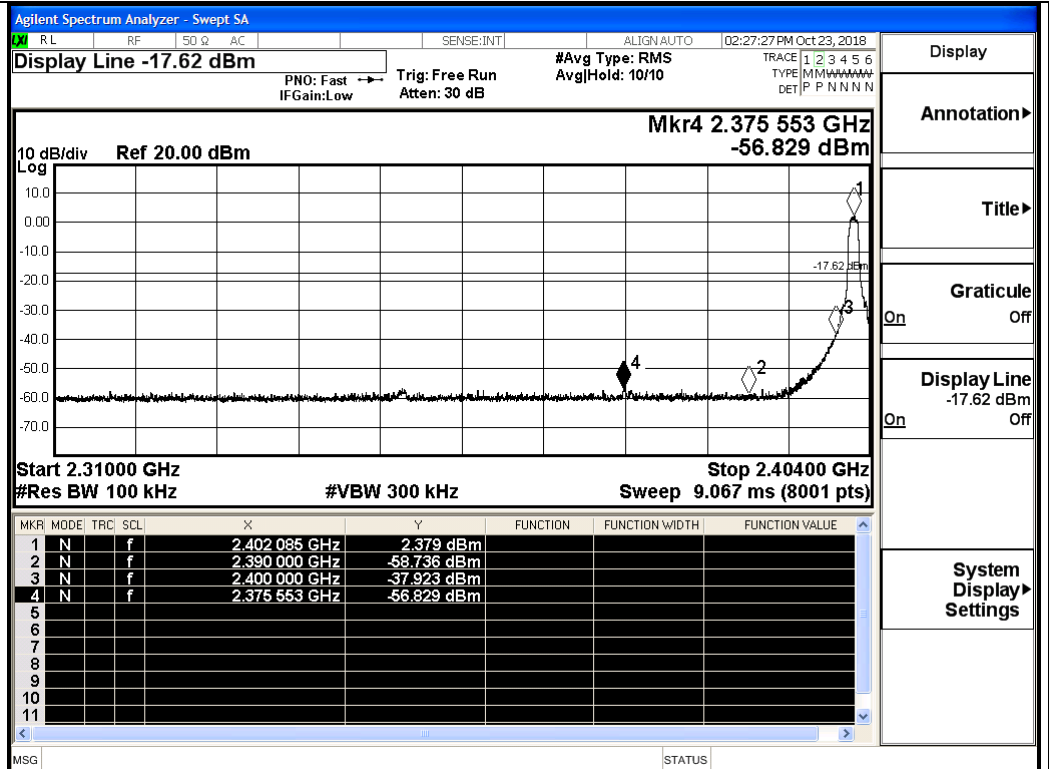
Display

Annotation►

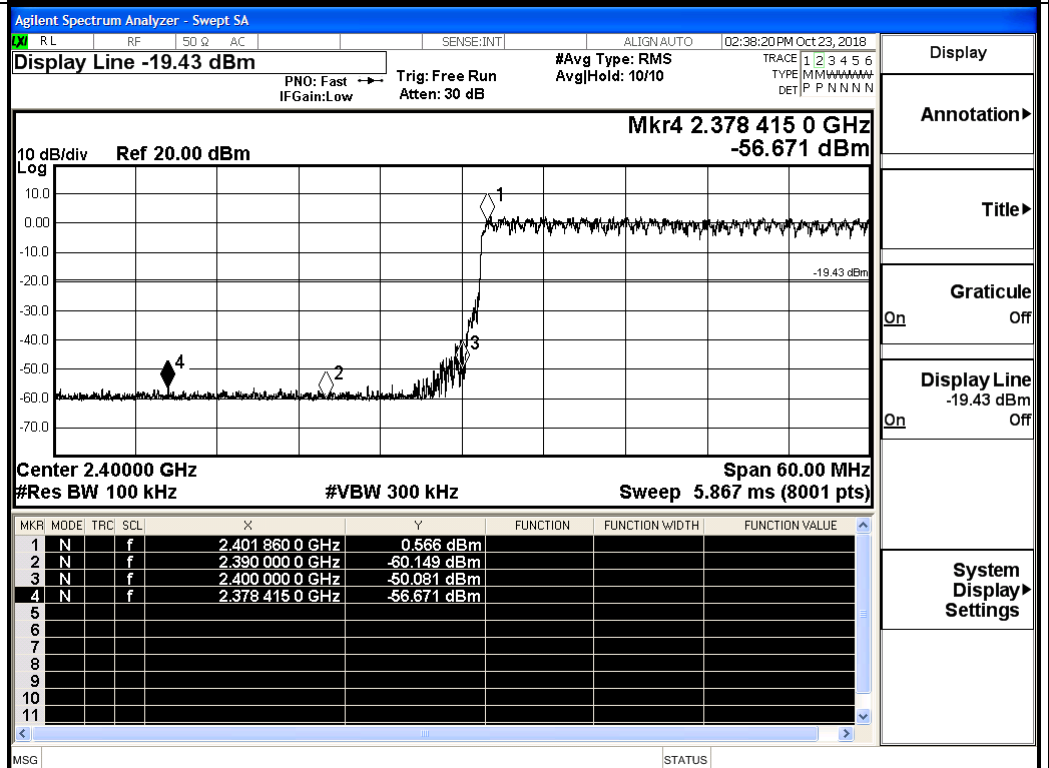
Title►

Graticule
On OffDisplay Line
On Off
-21.98 dBmSystem
Display►
Settings

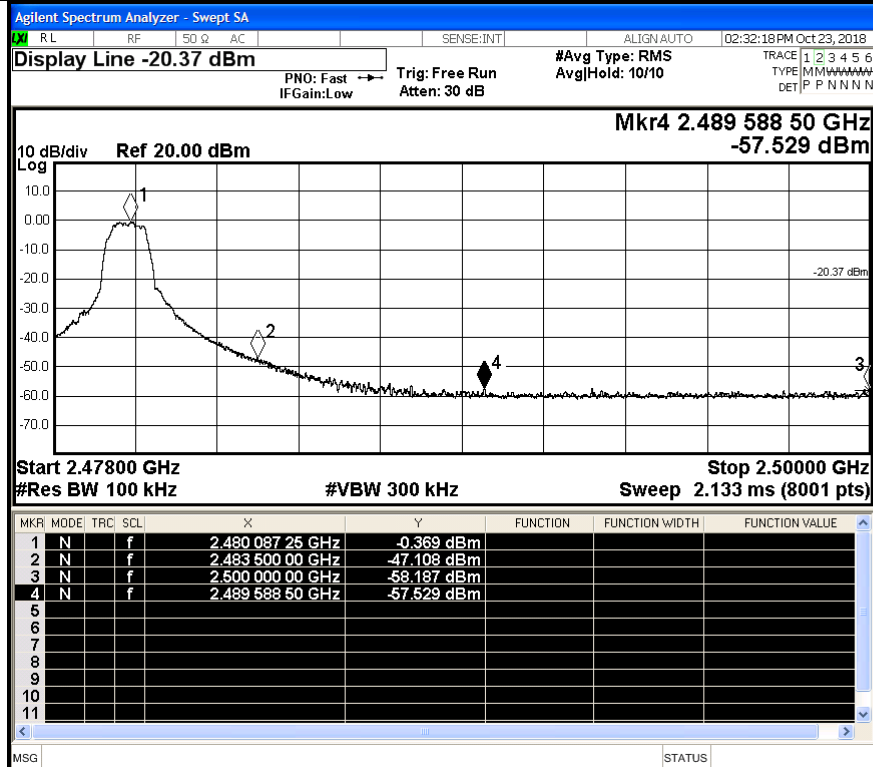
8DPSK/LCH/No Hop



8DPSK/LCH/Hop



8DPSK/HCH/No Hop



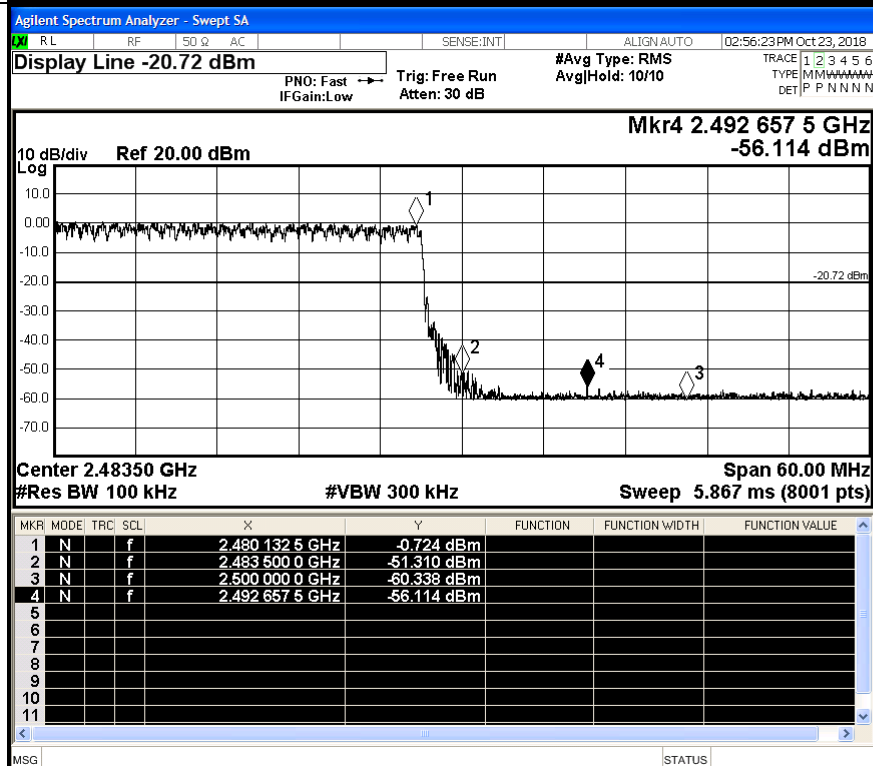
Display

Annotation►

Title►

Graticule
On OffDisplay Line
On OffSystem
Display►
Settings

8DPSK/HCH/Hop



Display

Annotation►

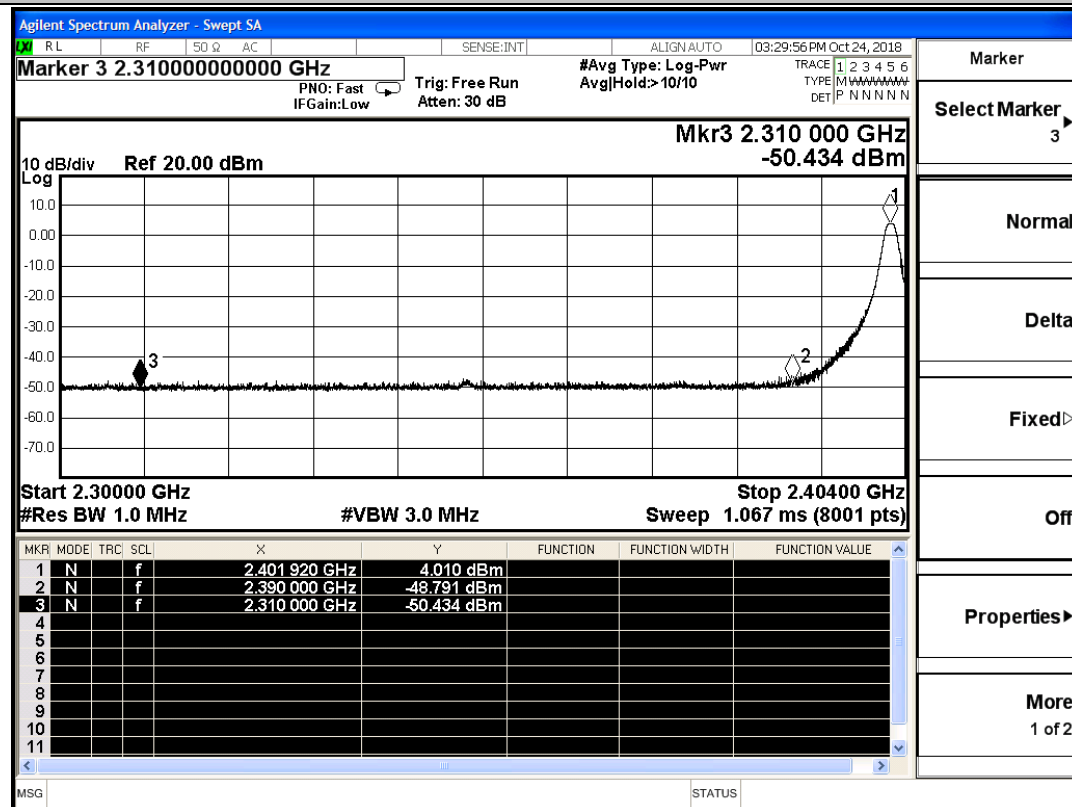
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Graticule
On OffDisplay Line
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Display►
Settings

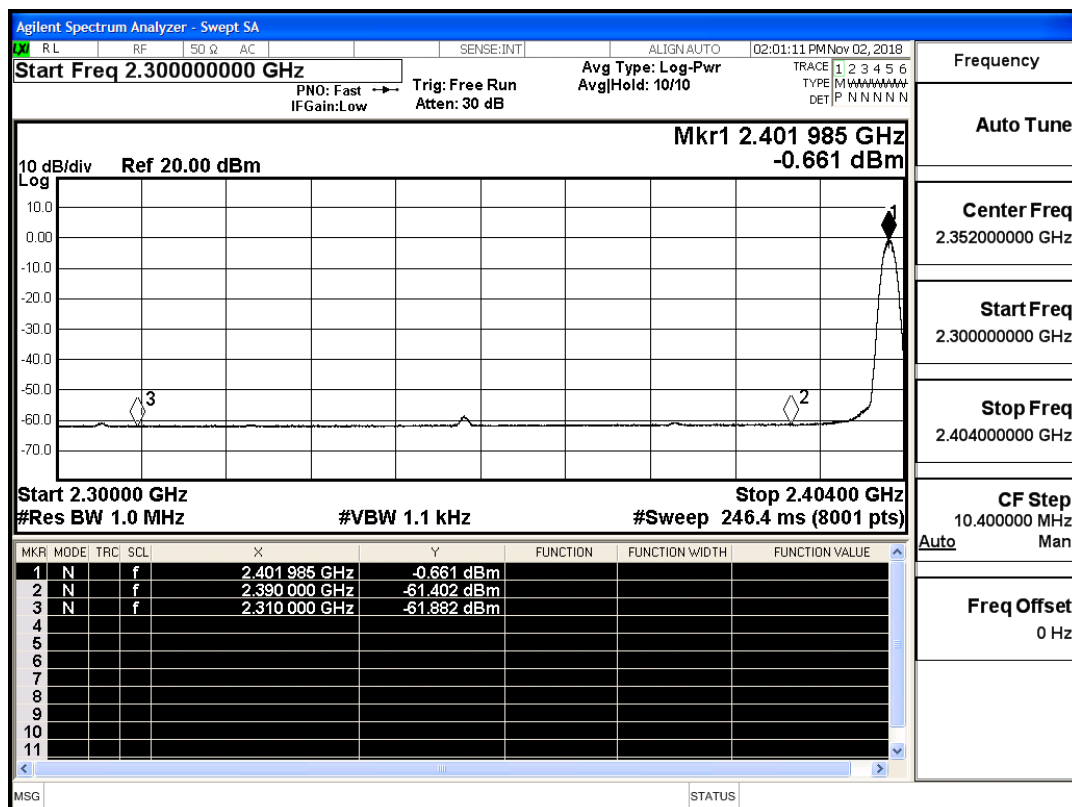
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.791	2.0	0	48.437	PEAK	74	PASS
	Off	2310.0	-61.402	2.0	0	35.826	AV	54	PASS
	Off	2390.0	-50.434	2.0	0	46.794	PEAK	74	PASS
	Off	2390.0	-61.882	2.0	0	35.346	AV	54	PASS
	Off	2483.5	-30.143	2.0	0	67.085	PEAK	74	PASS
	Off	2483.5	-58.297	2.0	0	38.931	AV	54	PASS
	Off	2500.0	-50.321	2.0	0	46.907	PEAK	74	PASS
	Off	2500.0	-61.405	2.0	0	35.823	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-49.445	2.0	0	47.783	PEAK	74	PASS
	Off	2310.0	-61.308	2.0	0	35.920	AV	54	PASS
	Off	2390.0	-49.764	2.0	0	47.464	PEAK	74	PASS
	Off	2390.0	-61.848	2.0	0	35.380	AV	54	PASS
	Off	2483.5	-29.102	2.0	0	68.126	PEAK	74	PASS
	Off	2483.5	-58.222	2.0	0	39.006	AV	54	PASS
	Off	2500.0	-49.427	2.0	0	47.801	PEAK	74	PASS
	Off	2500.0	-61.560	2.0	0	35.668	AV	54	PASS
8DPSK	Off	2310.0	-49.062	2.0	0	48.166	PEAK	74	PASS
	Off	2310.0	-61.495	2.0	0	35.733	AV	54	PASS
	Off	2390.0	-50.789	2.0	0	46.439	PEAK	74	PASS
	Off	2390.0	-62.074	2.0	0	35.154	AV	54	PASS
	Off	2483.5	-28.372	2.0	0	68.856	PEAK	74	PASS
	Off	2483.5	-58.345	2.0	0	38.883	AV	54	PASS
	Off	2500.0	-49.359	2.0	0	47.869	PEAK	74	PASS
	Off	2500.0	-61.557	2.0	0	35.671	AV	54	PASS

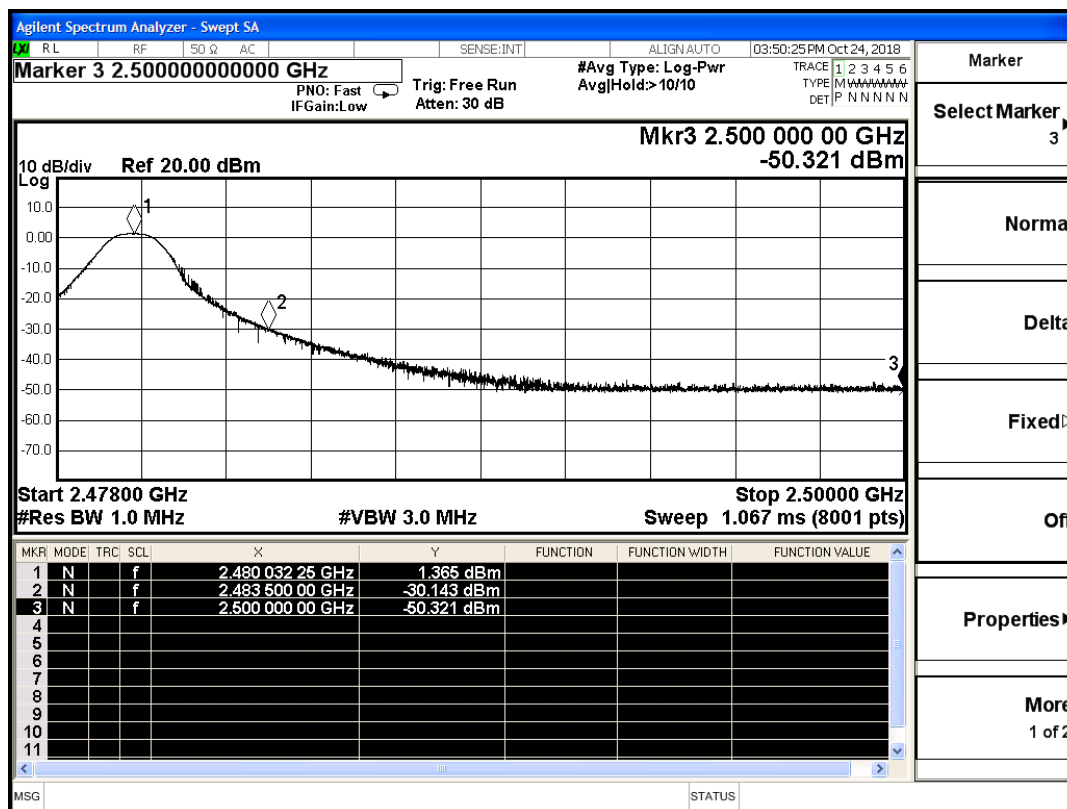
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



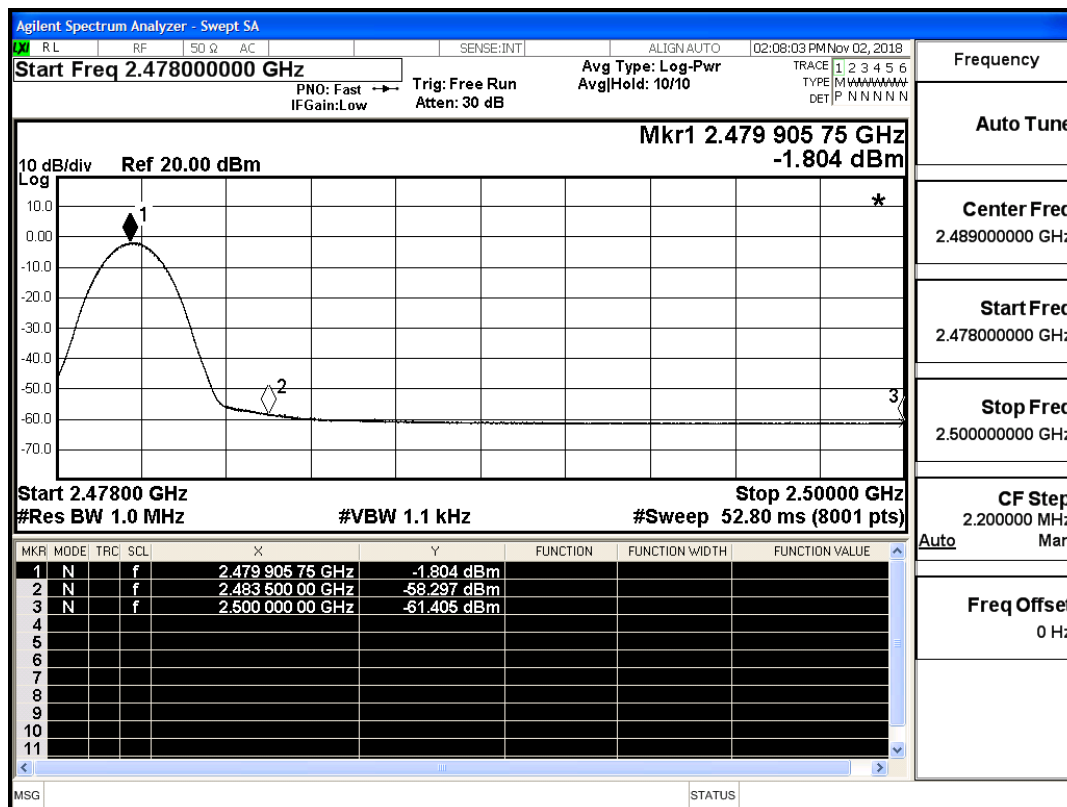
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



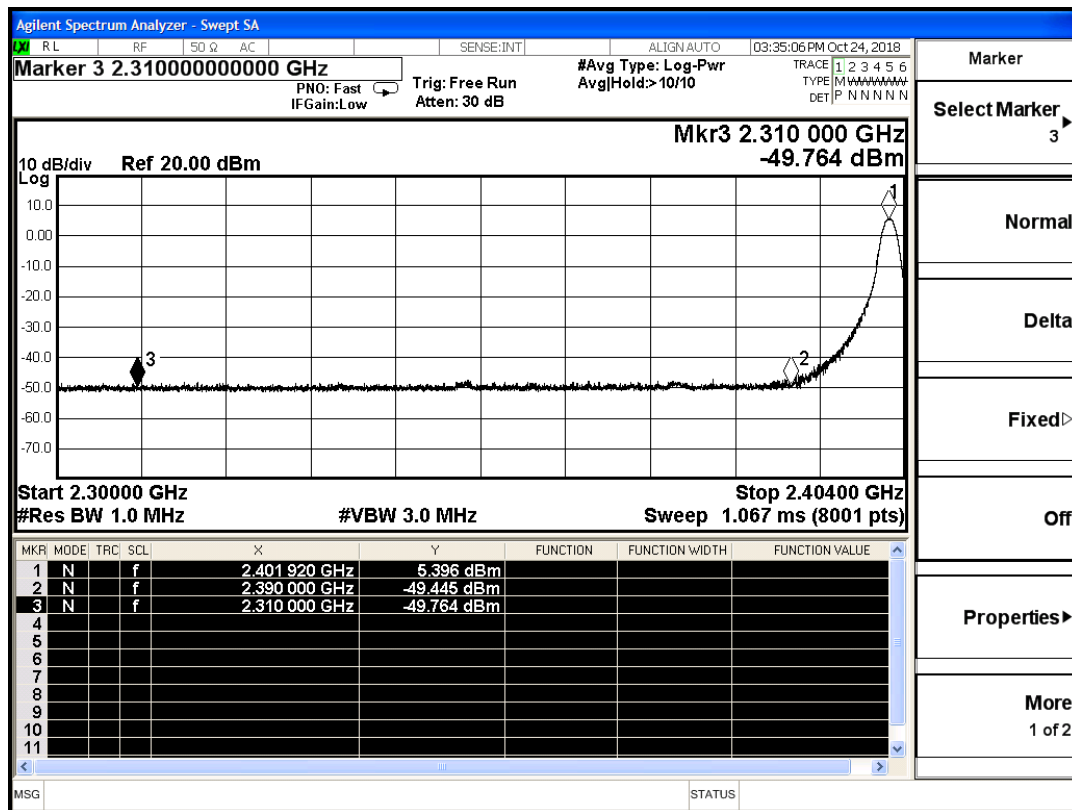
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



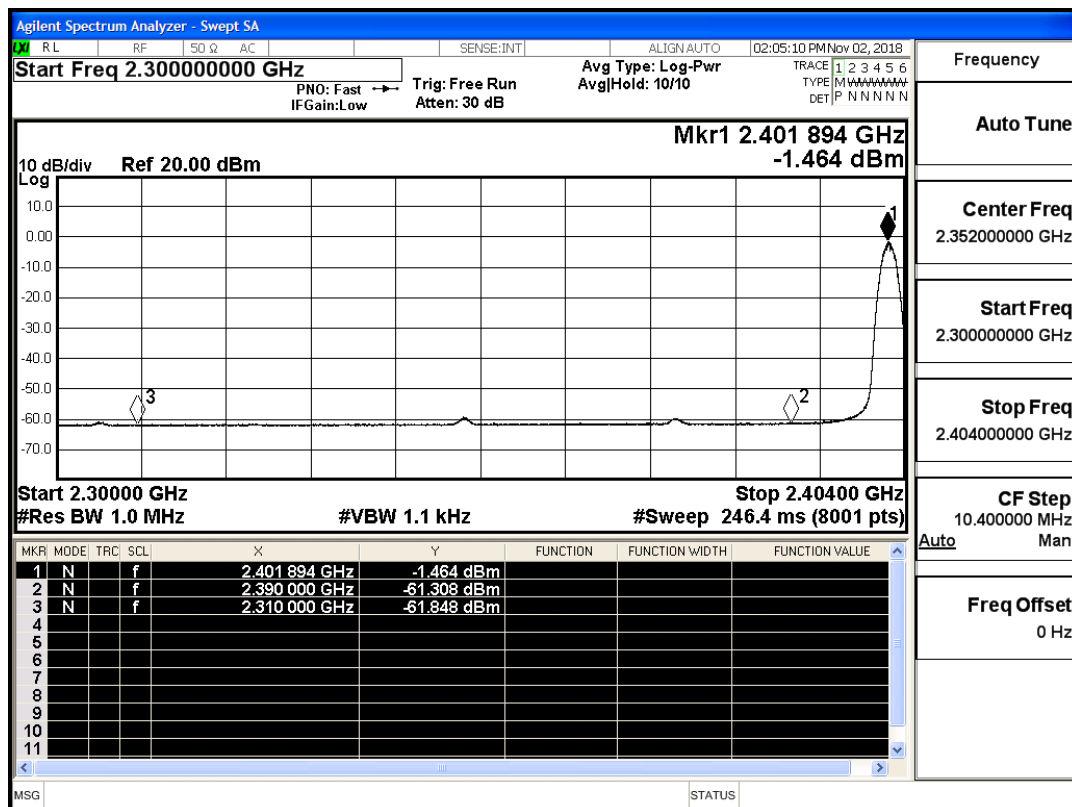
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



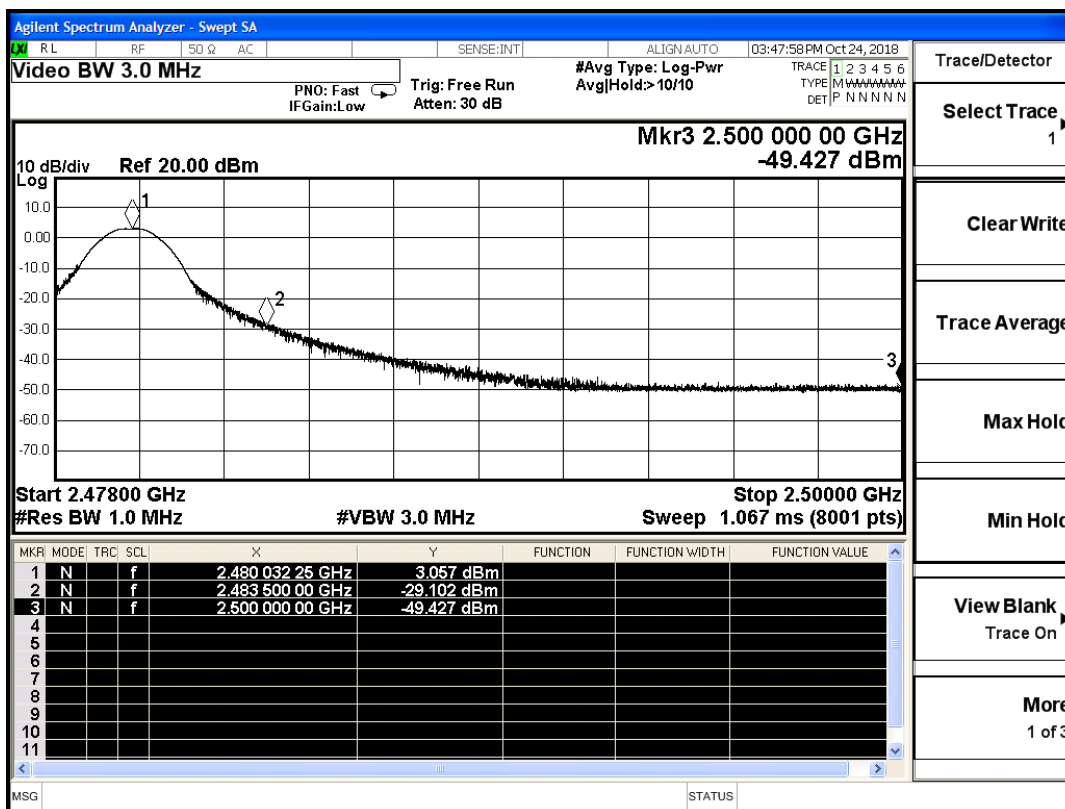
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



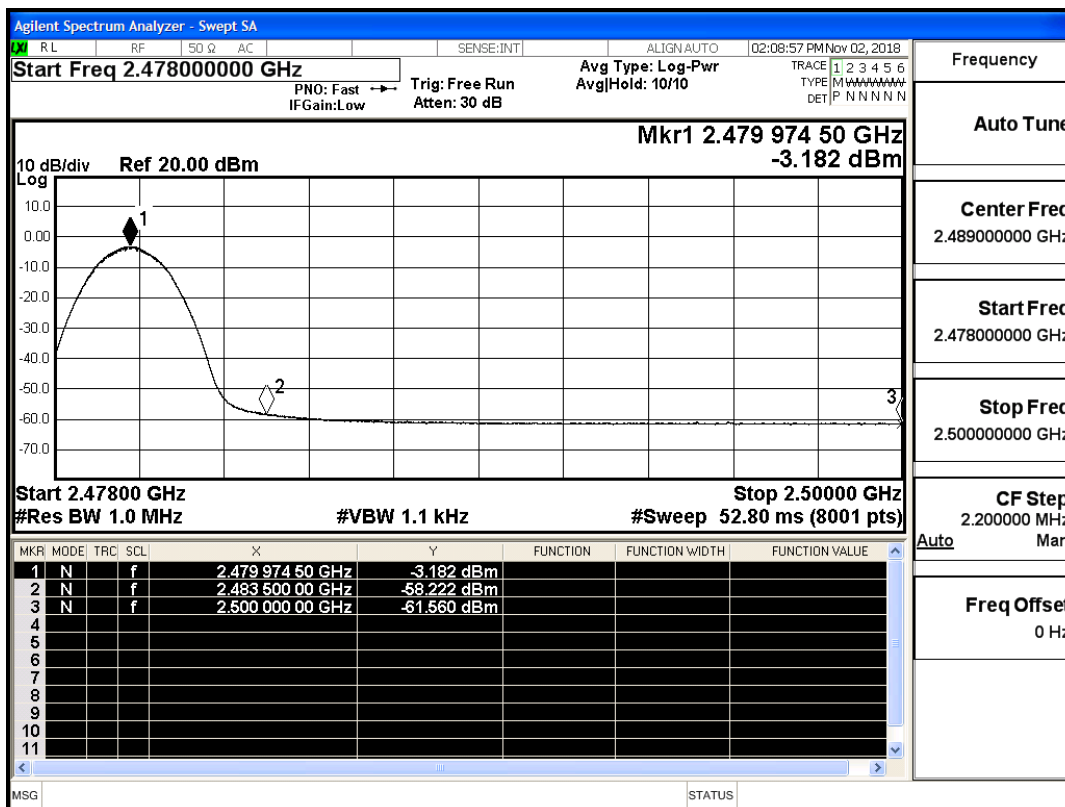
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



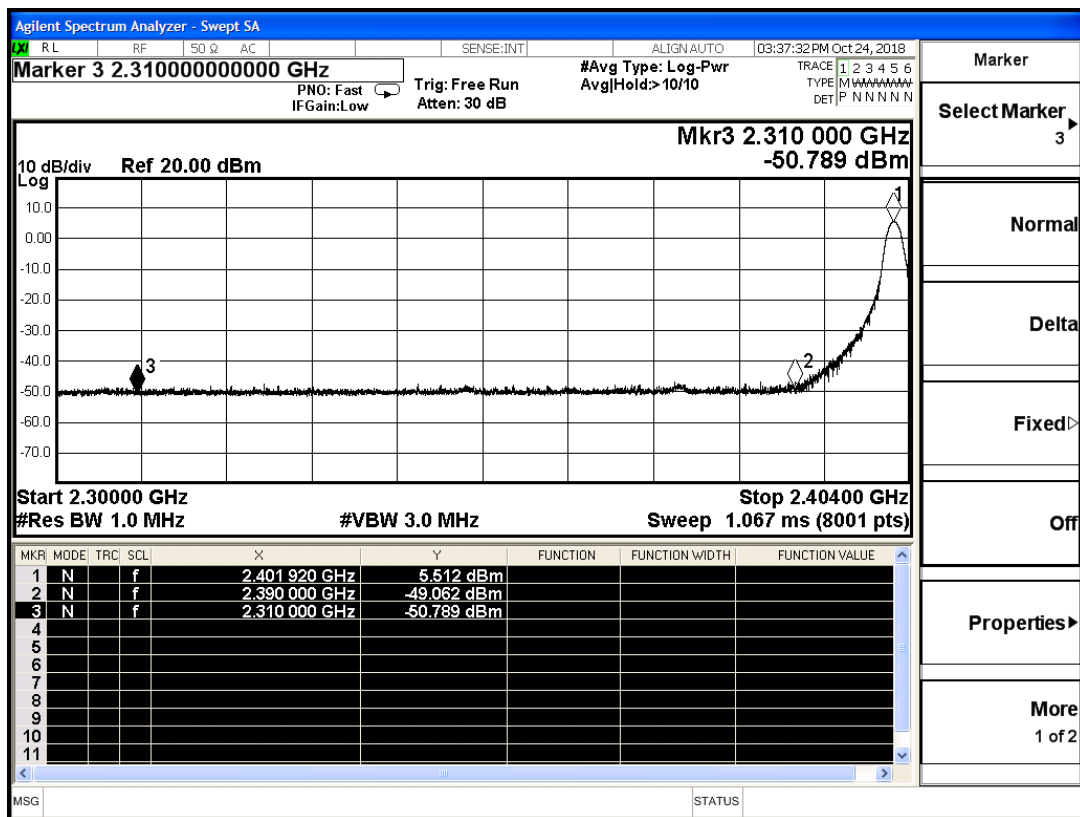
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



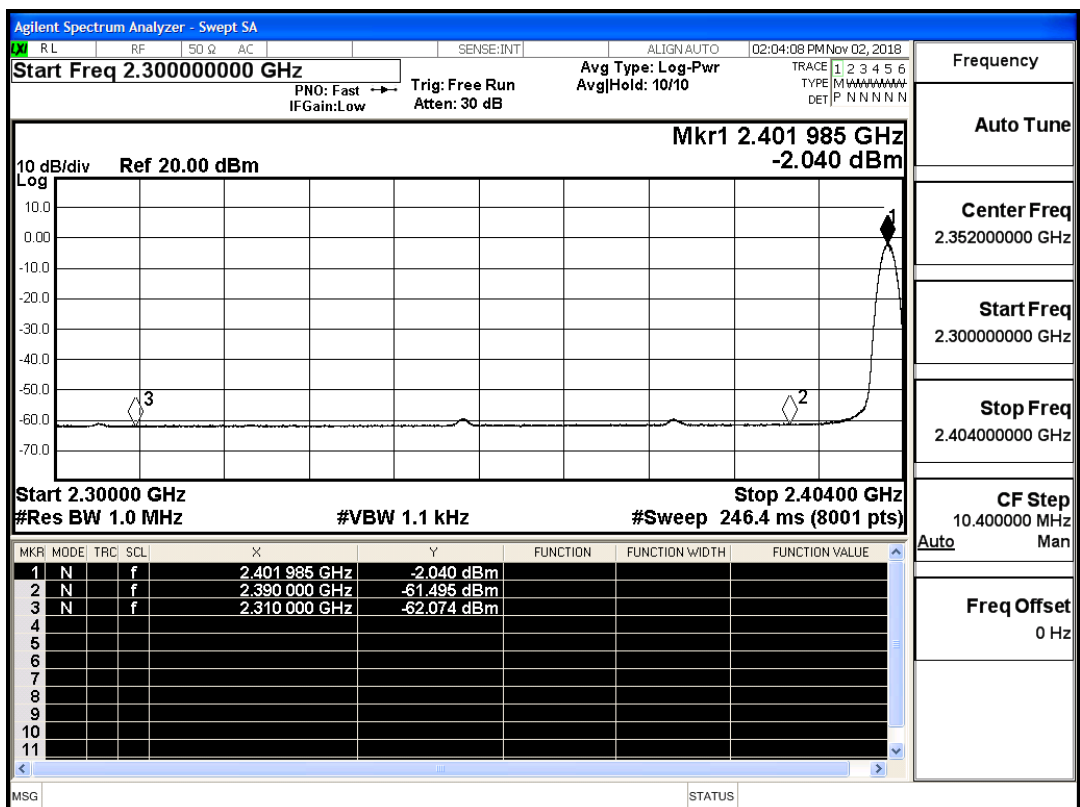
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



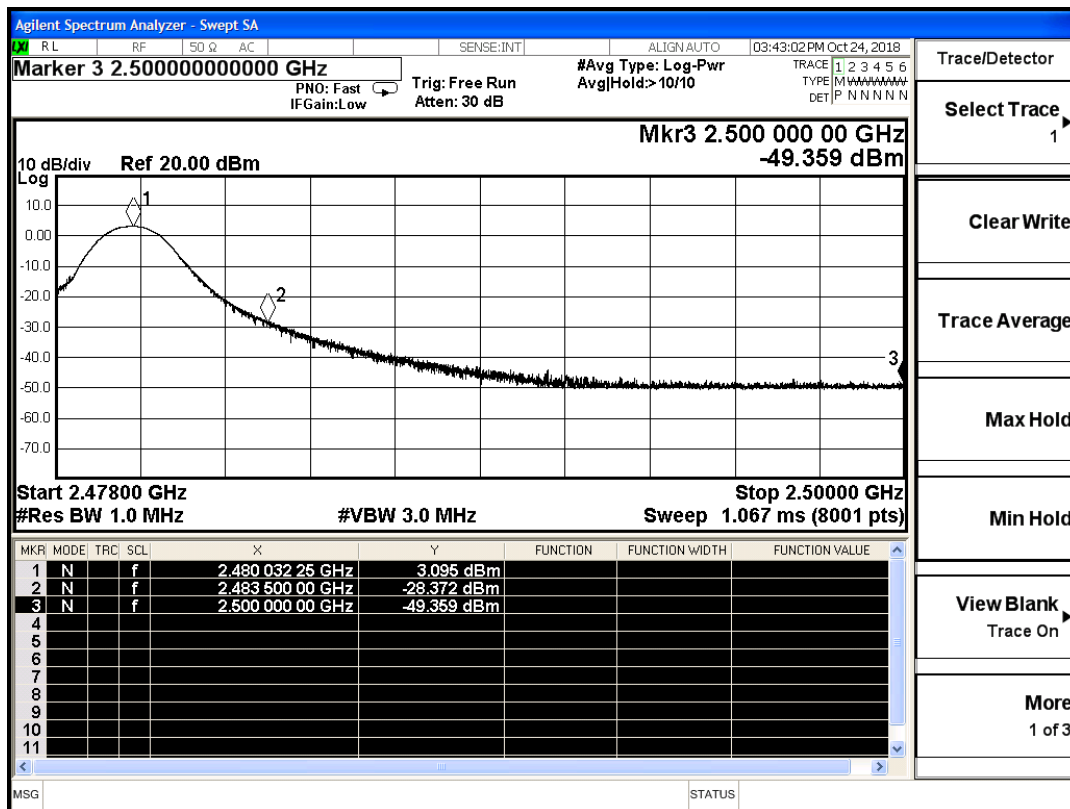
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (High Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)

