

# Appendix A

## RF Test Data for BT V4.1(BDR/EDR) (Conducted Measurement)

Product Name: Android tv box



Trade Mark:

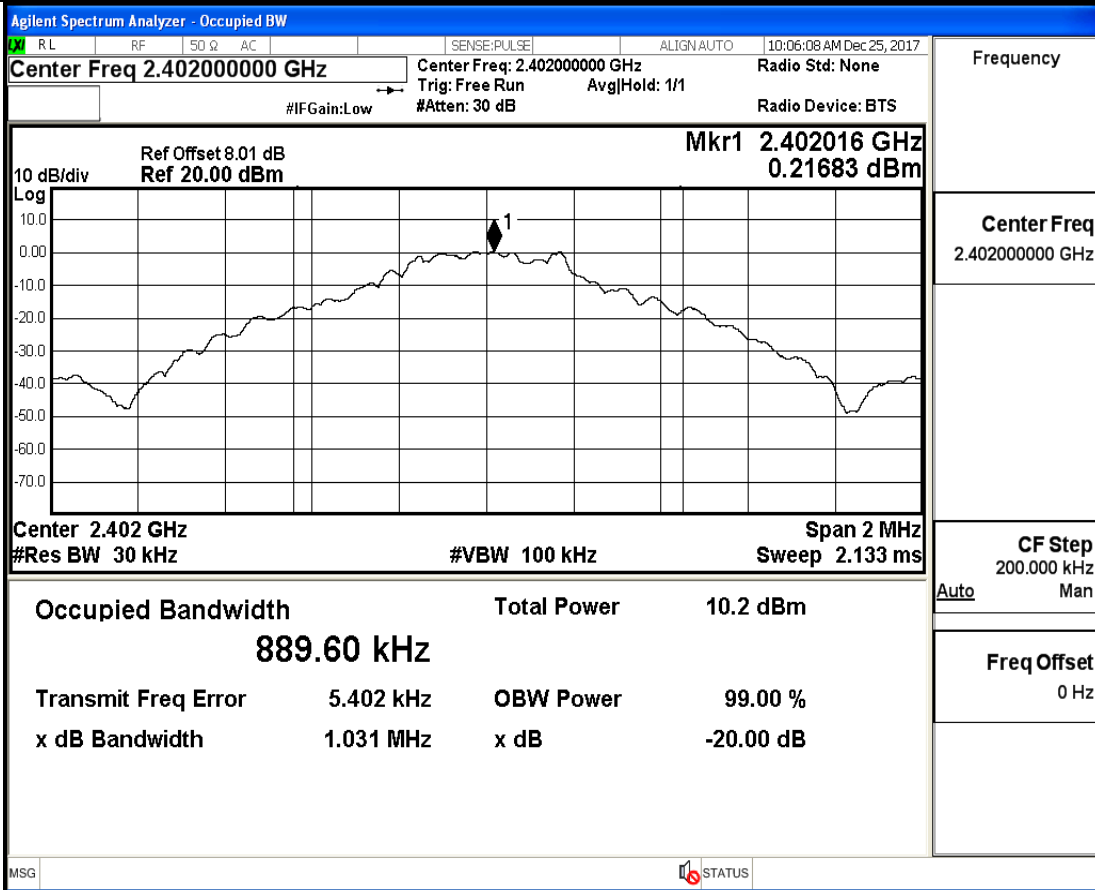
Test Model: RL

FCC ID: 2AF9R-RL

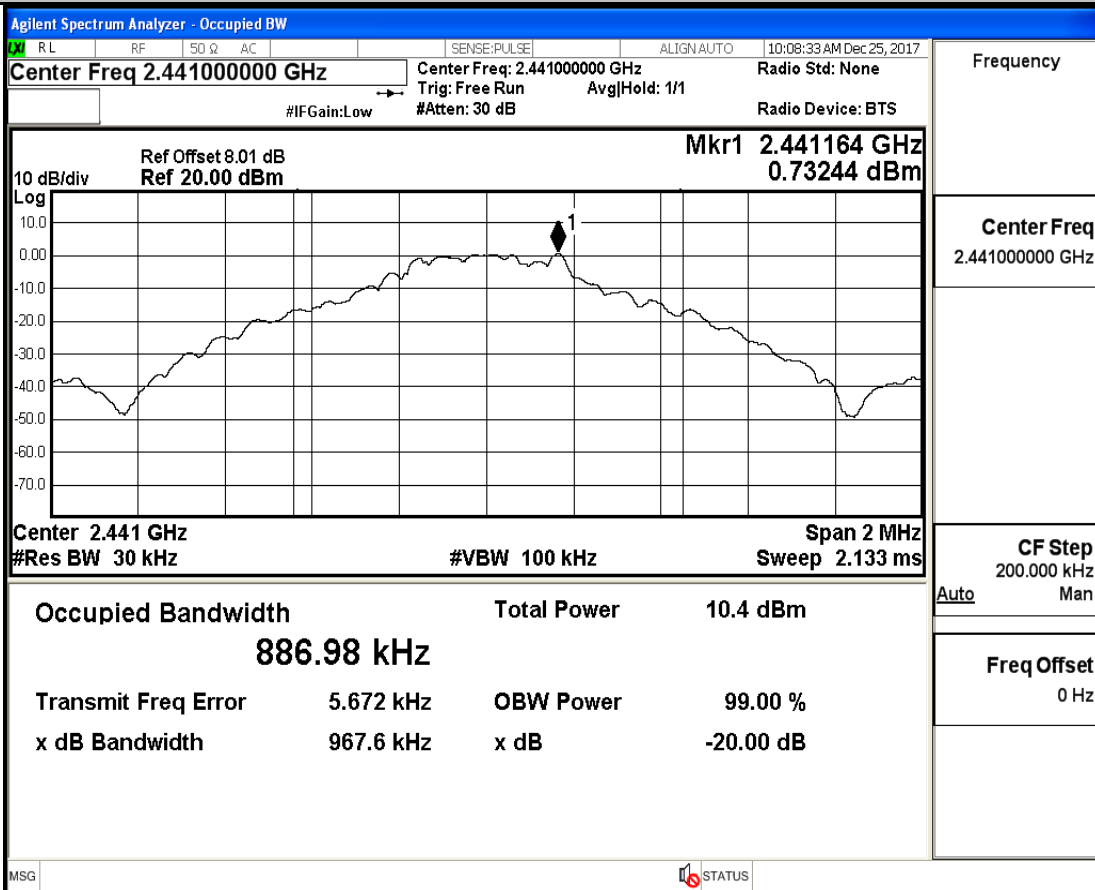
### A.1 20 dB Bandwidth

Test Mode	Test Channel	EBW[MHz]	Limit[MHz]	Verdict
GFSK	2402	1.031	---	PASS
	2441	0.9676	---	PASS
	2480	0.9711	---	PASS
$\pi/4$ -DQPSK	2402	1.289	---	PASS
	2441	1.288	---	PASS
	2480	1.286	---	PASS
8-DPSK	2402	1.293	---	PASS
	2441	1.294	---	PASS
	2480	1.298	---	PASS

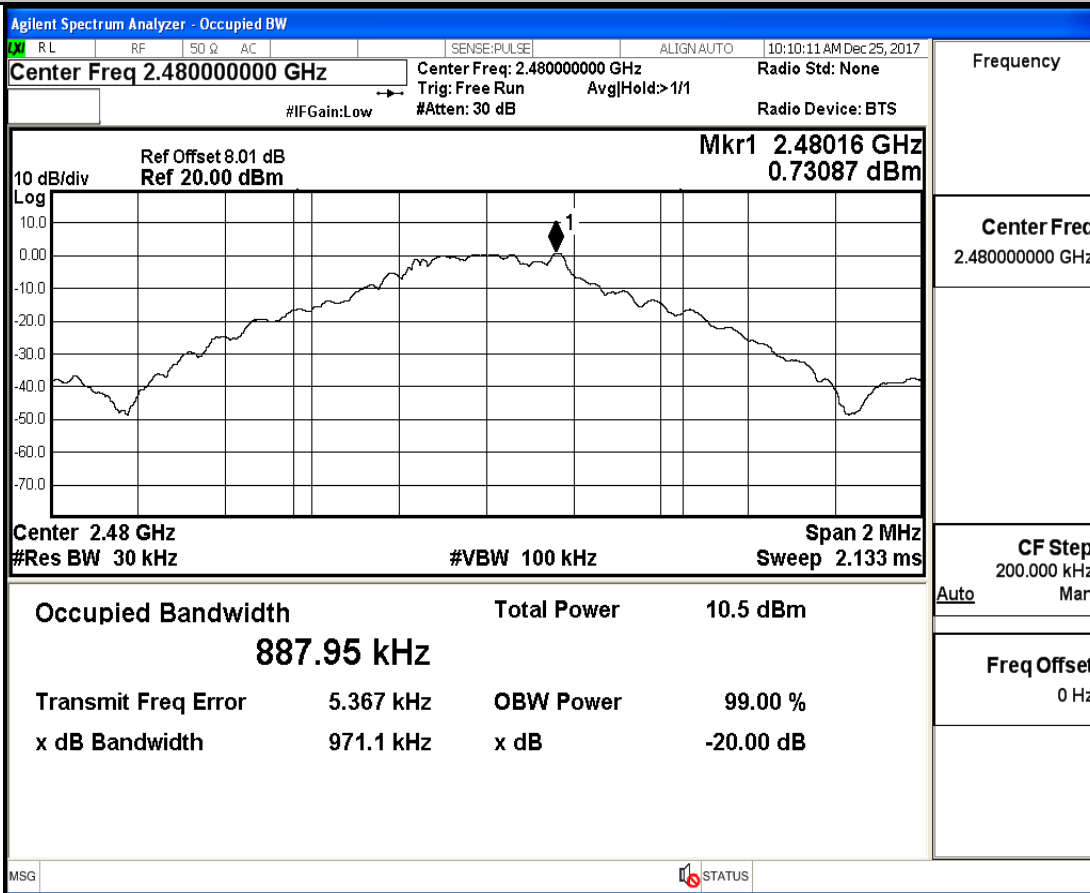
20 dB Bandwidth\_GFSK\_2402



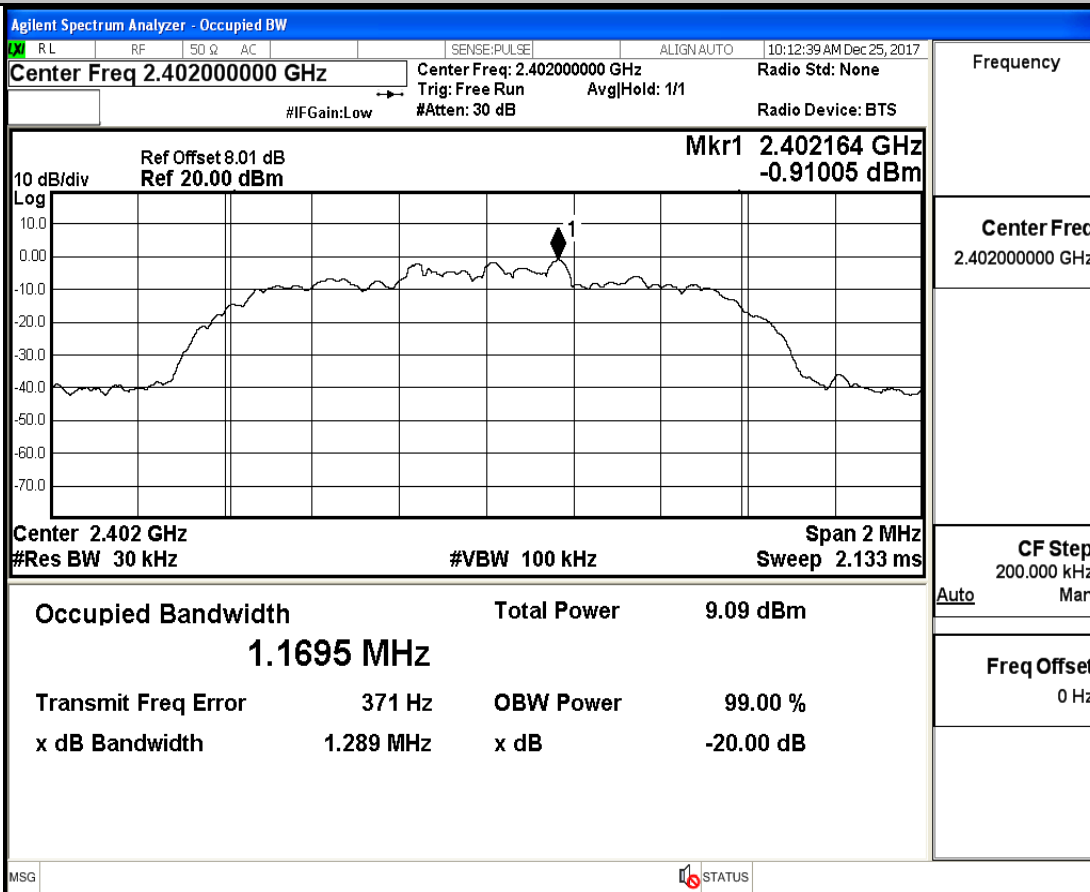
20 dB Bandwidth\_GFSK\_2441



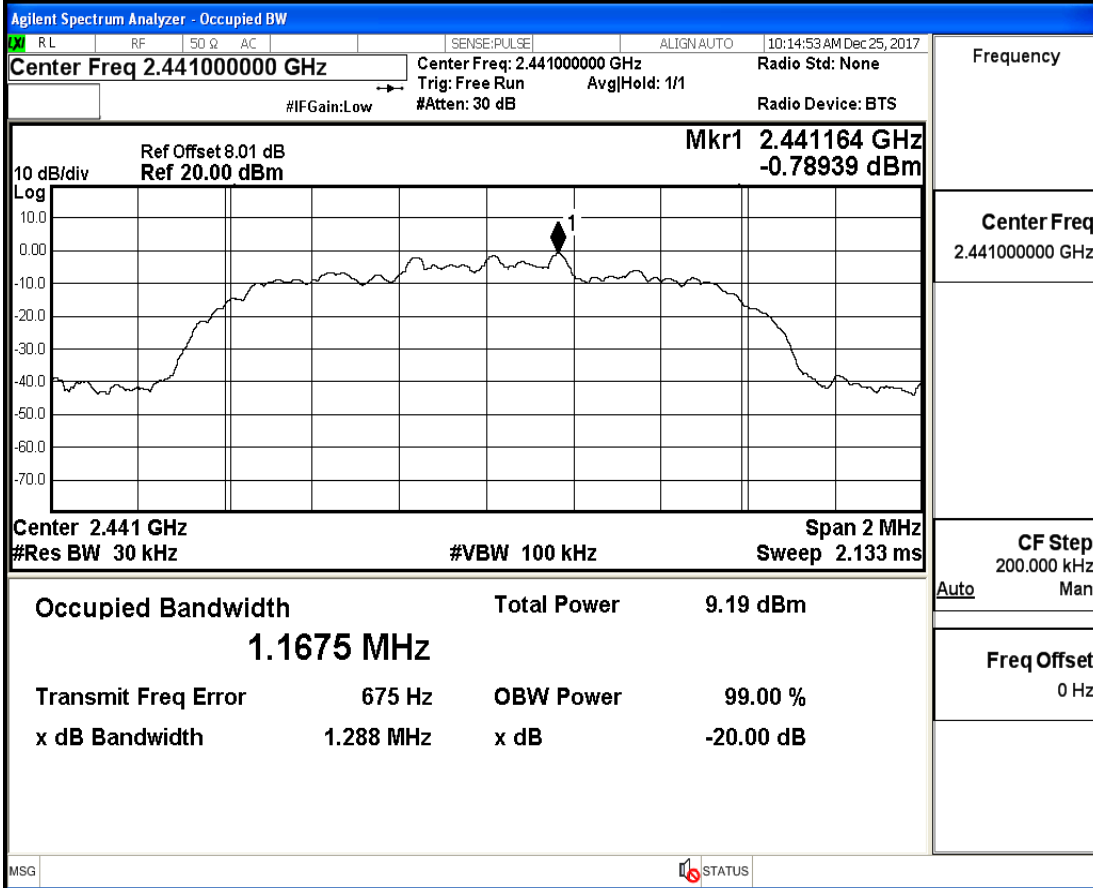
20 dB Bandwidth\_GFSK\_2480



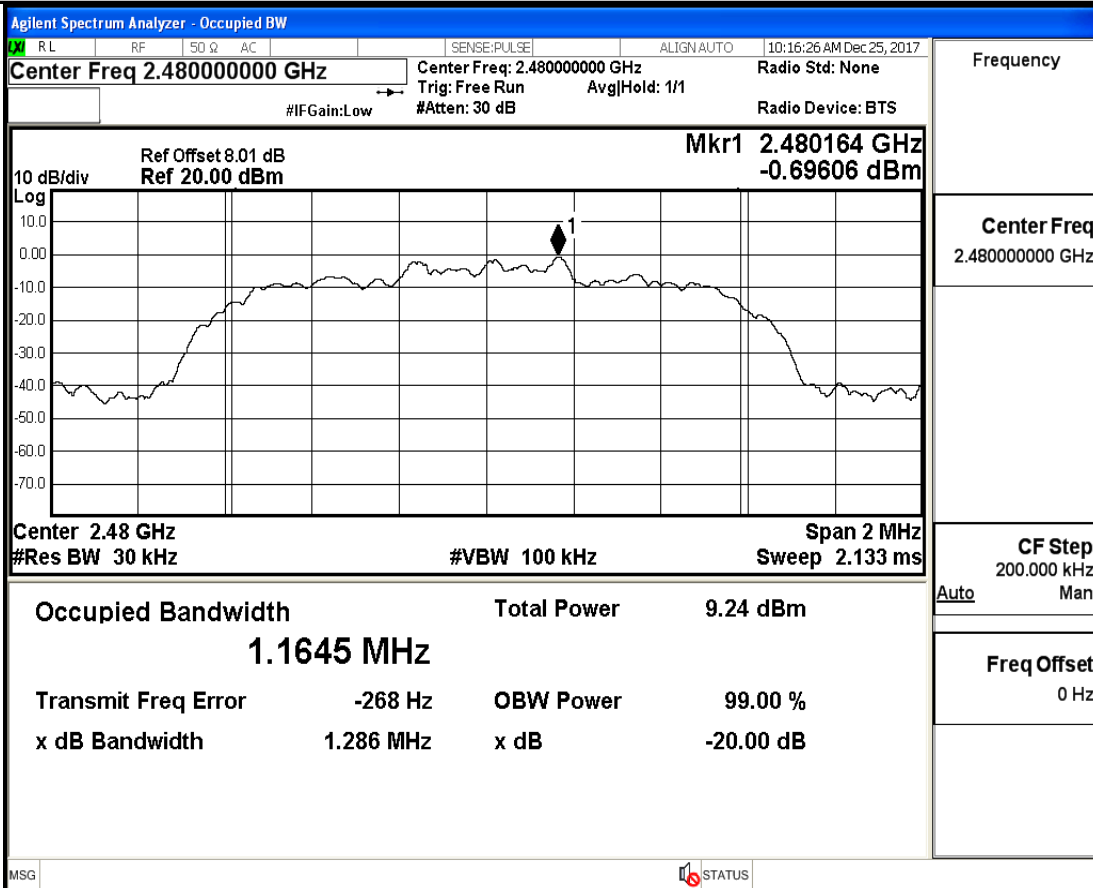
20 dB Bandwidth\_π/4-DQPSK\_2402



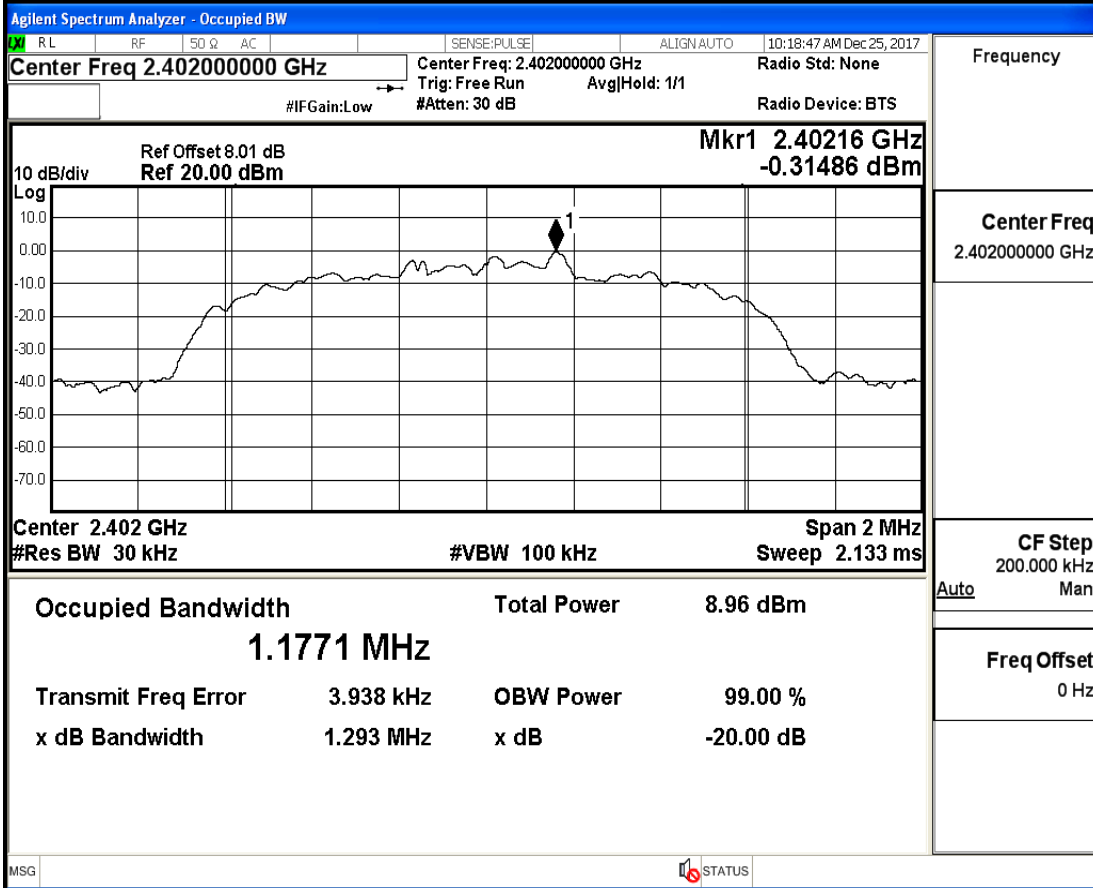
20 dB Bandwidth\_π/4-DQPSK\_2441



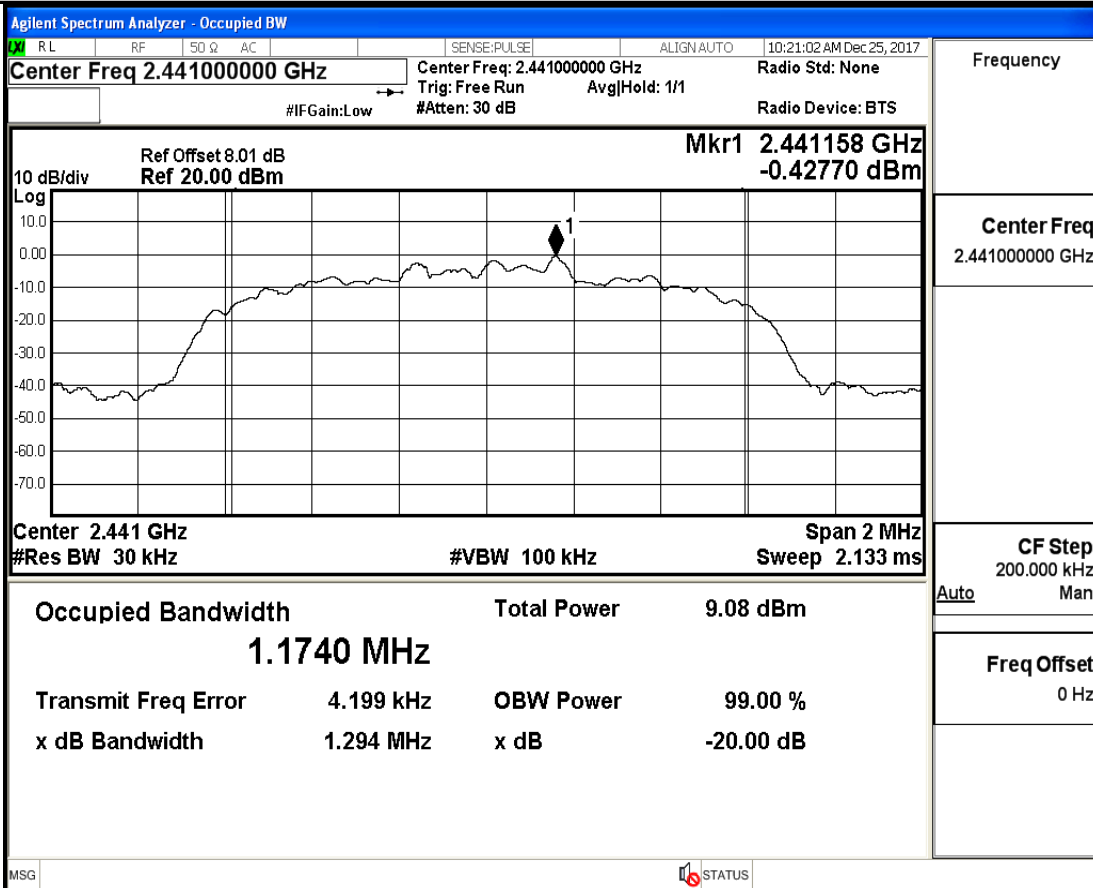
20 dB Bandwidth\_π/4-DQPSK\_2480



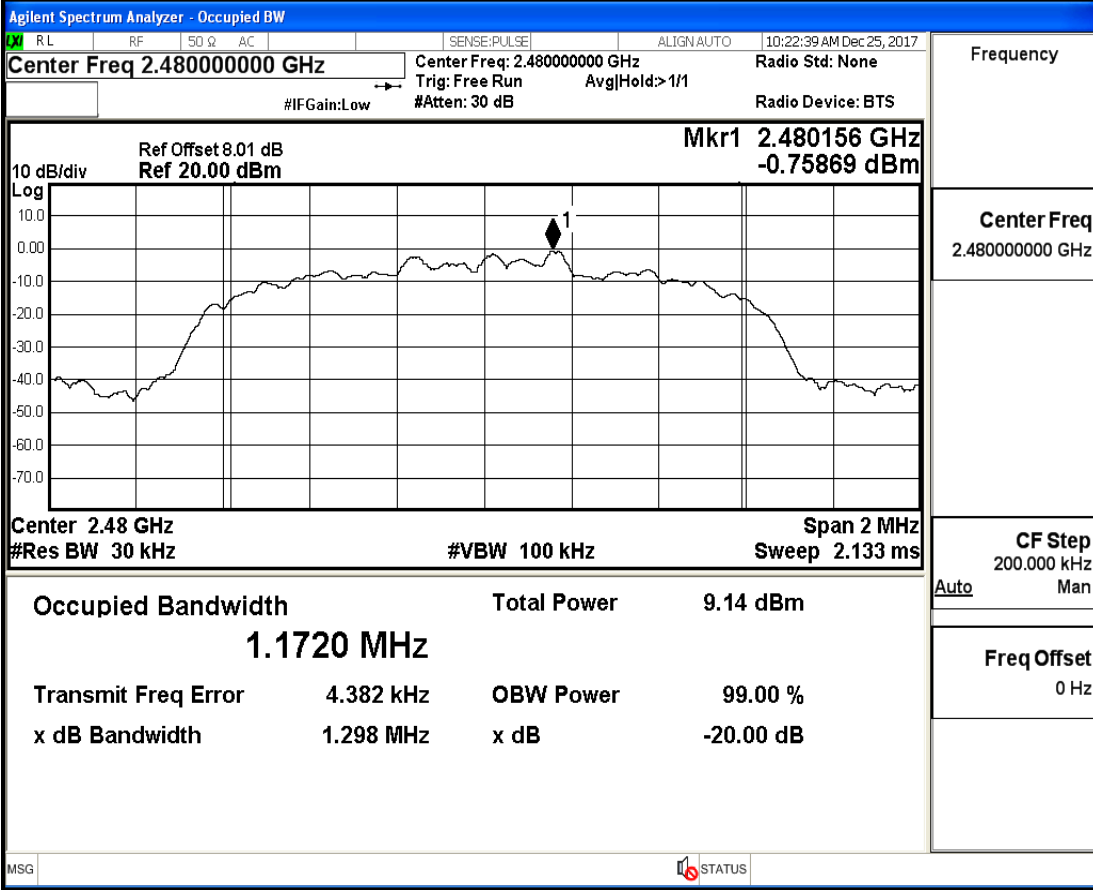
20 dB Bandwidth\_8-DPSK\_2402



20 dB Bandwidth\_8-DPSK\_2441



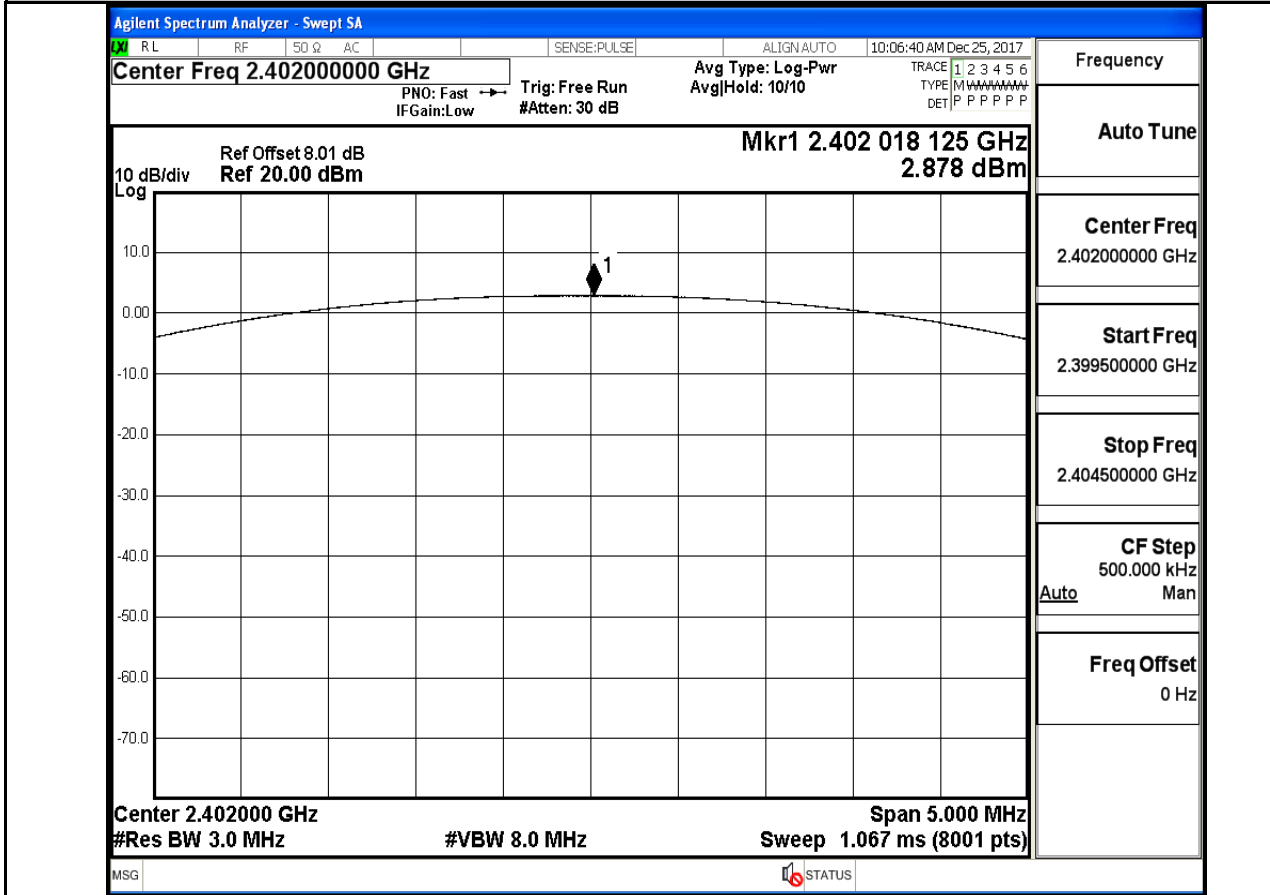
20 dB Bandwidth\_8-DPSK\_2480



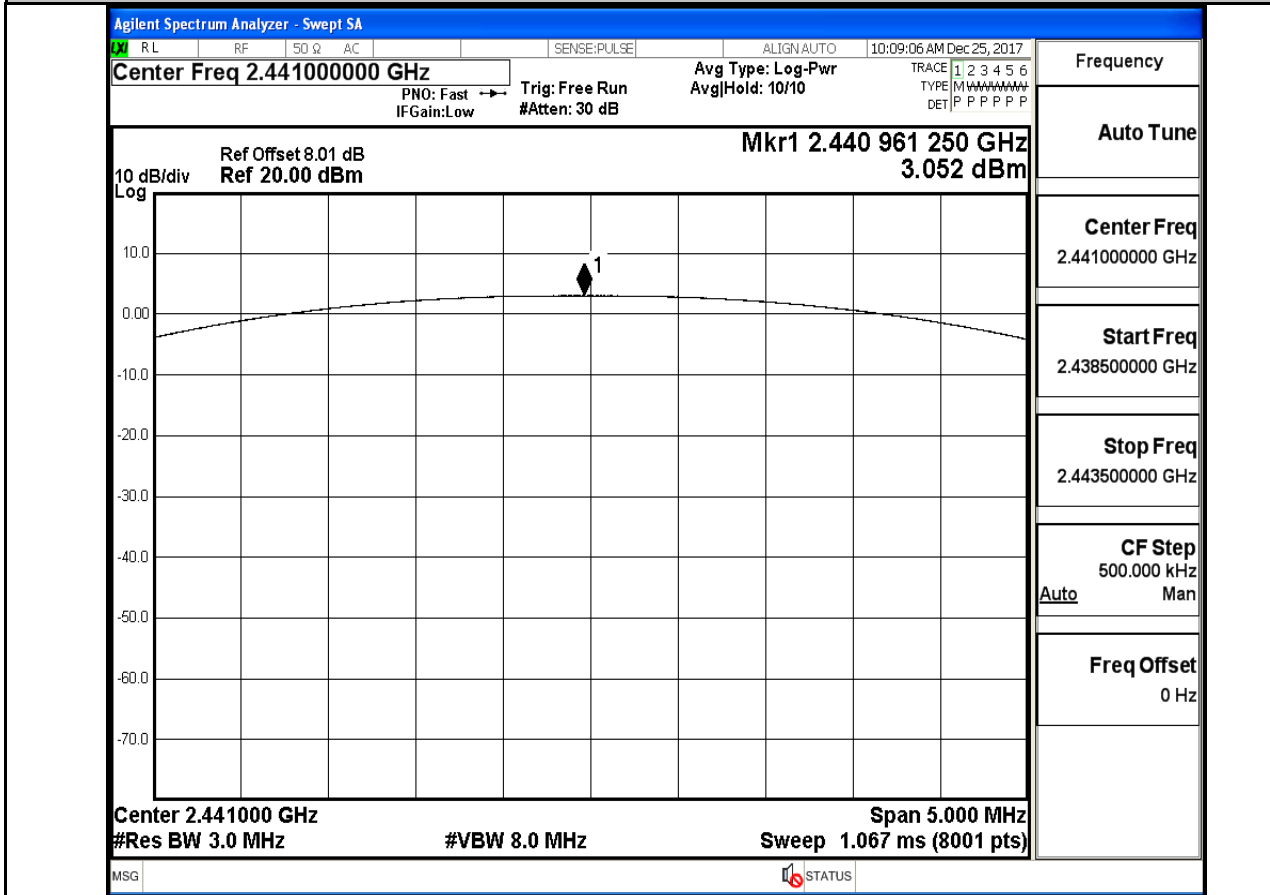
## A.2 Conducted Peak Output Power

Test Mode	Test Channel	Power[dBm]	Limit[dBm]	Verdict
GFSK	2402	2.878	30	PASS
	2441	3.052	30	PASS
	2480	3.159	30	PASS
$\pi/4$ -DQPSK	2402	2.768	21	PASS
	2441	2.927	21	PASS
	2480	3.025	21	PASS
8-DPSK	2402	2.904	21	PASS
	2441	3.068	21	PASS
	2480	3.168	21	PASS

Conducted Peak Output Power\_GFSK\_2402

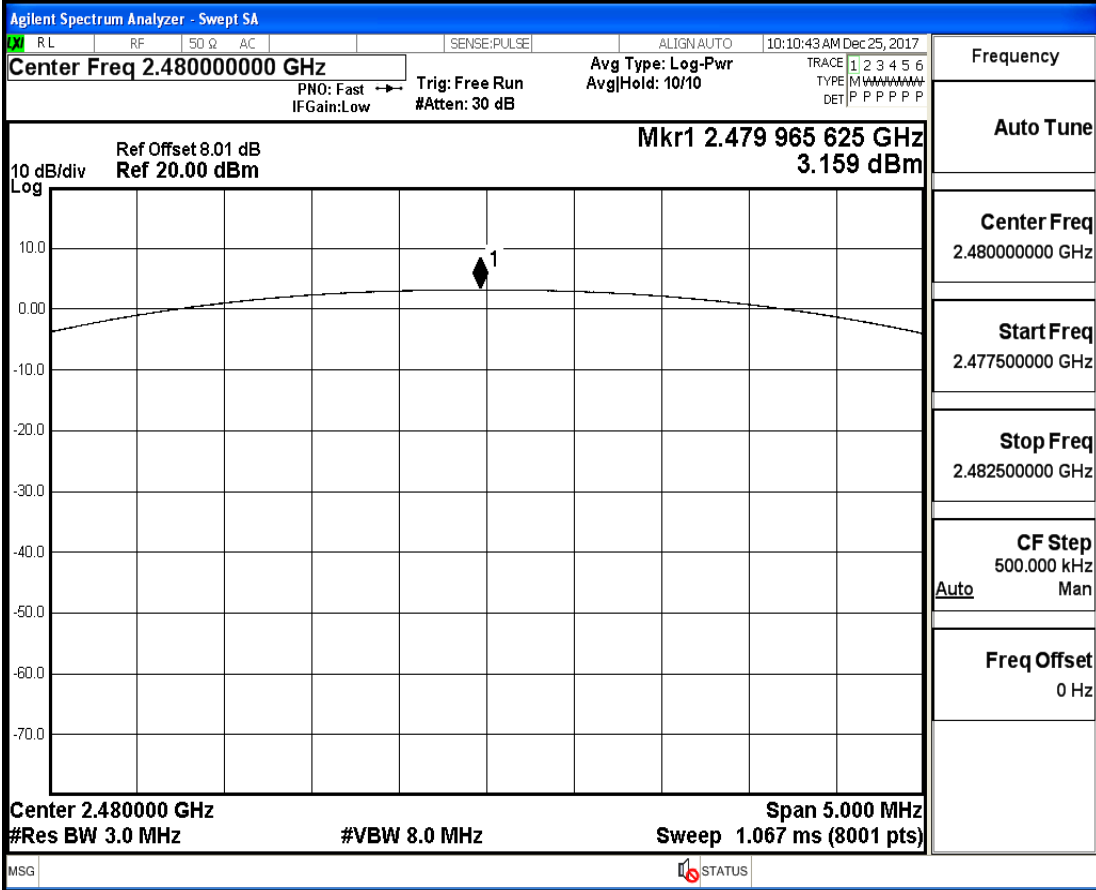


Conducted Peak Output Power\_GFSK\_2441

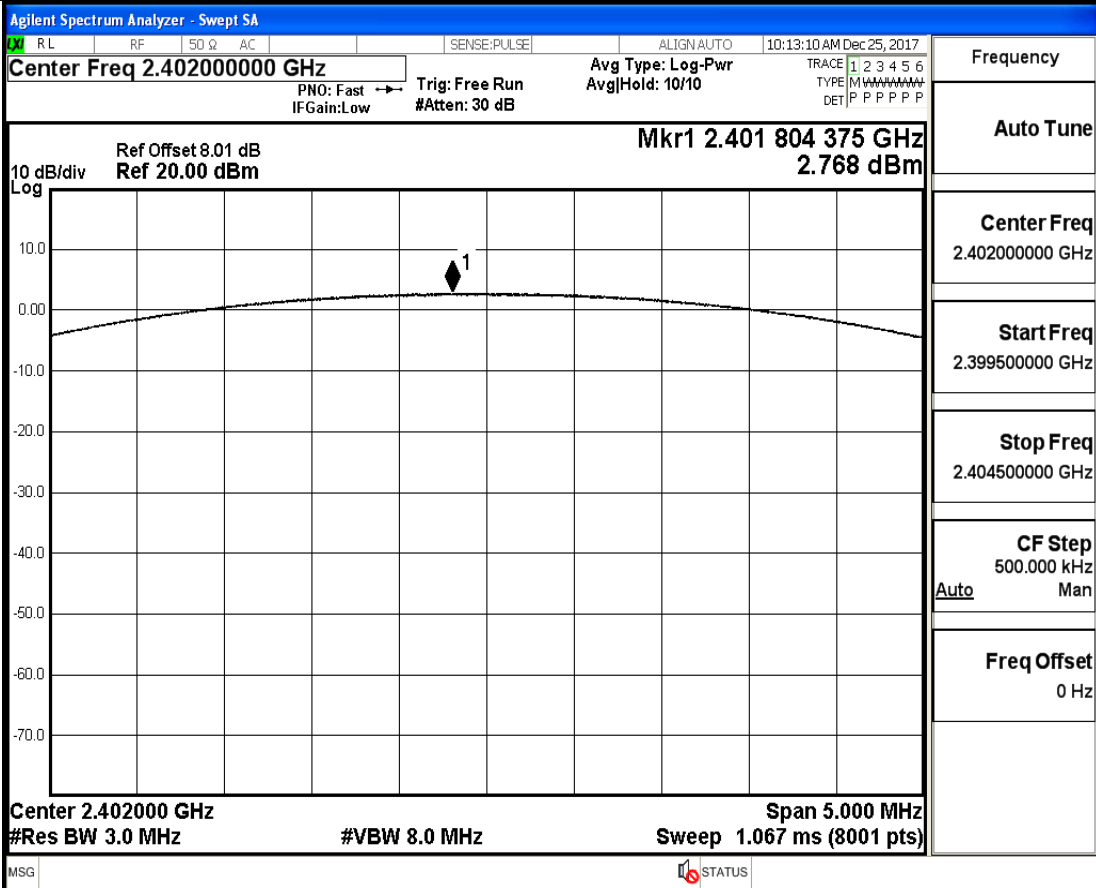




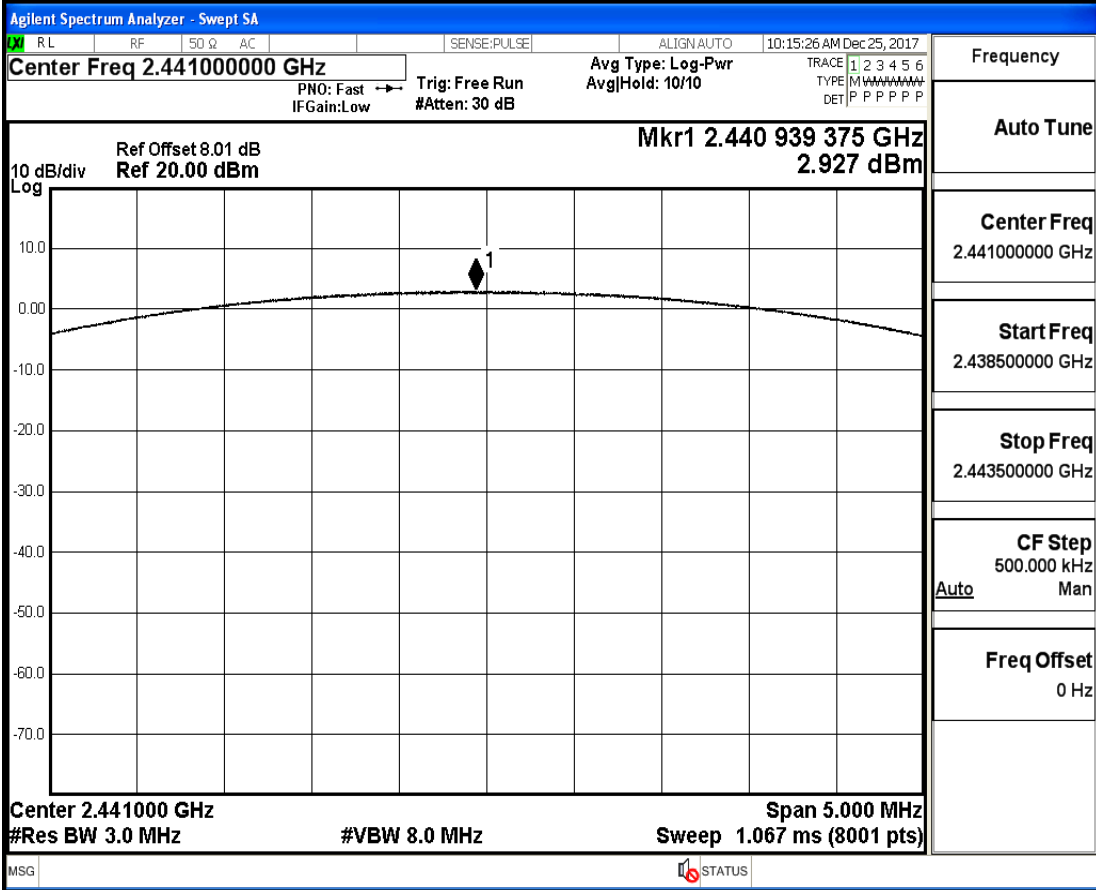
Conducted Peak Output Power\_GFSK\_2480



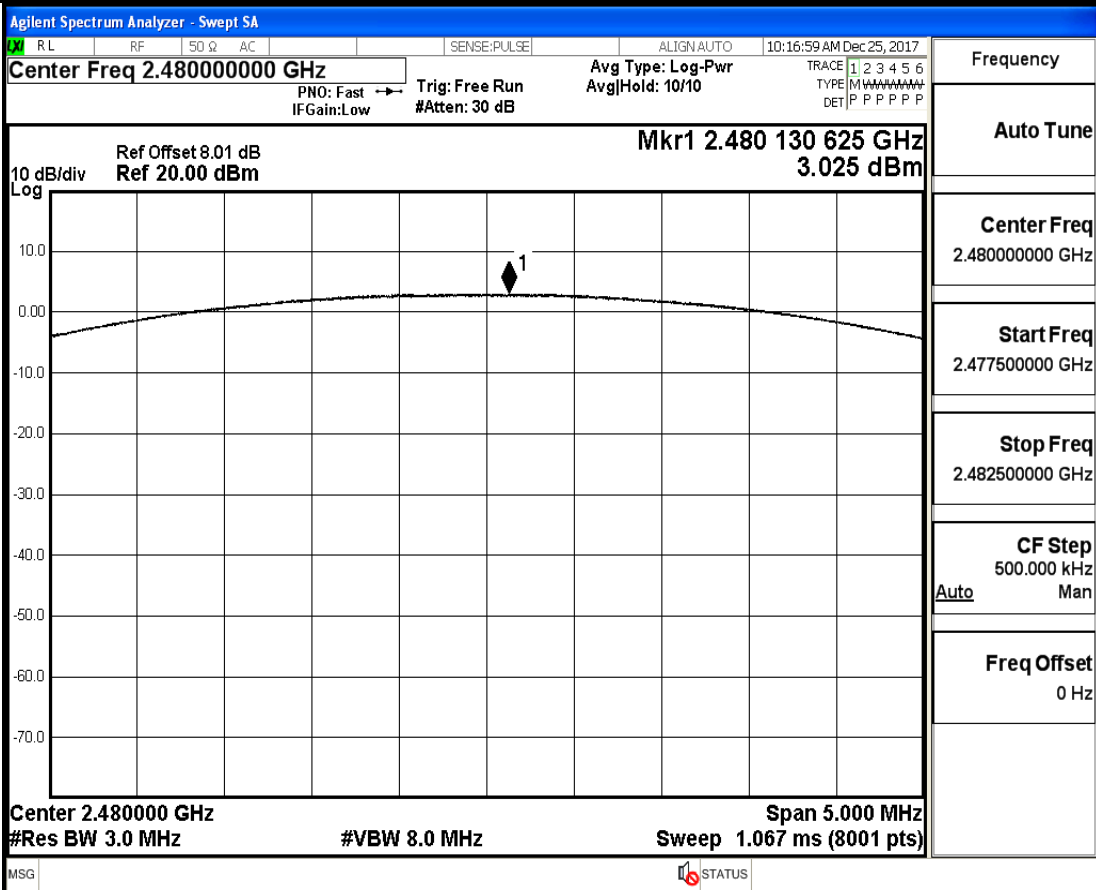
Conducted Peak Output Power\_π/4-DQPSK\_2402



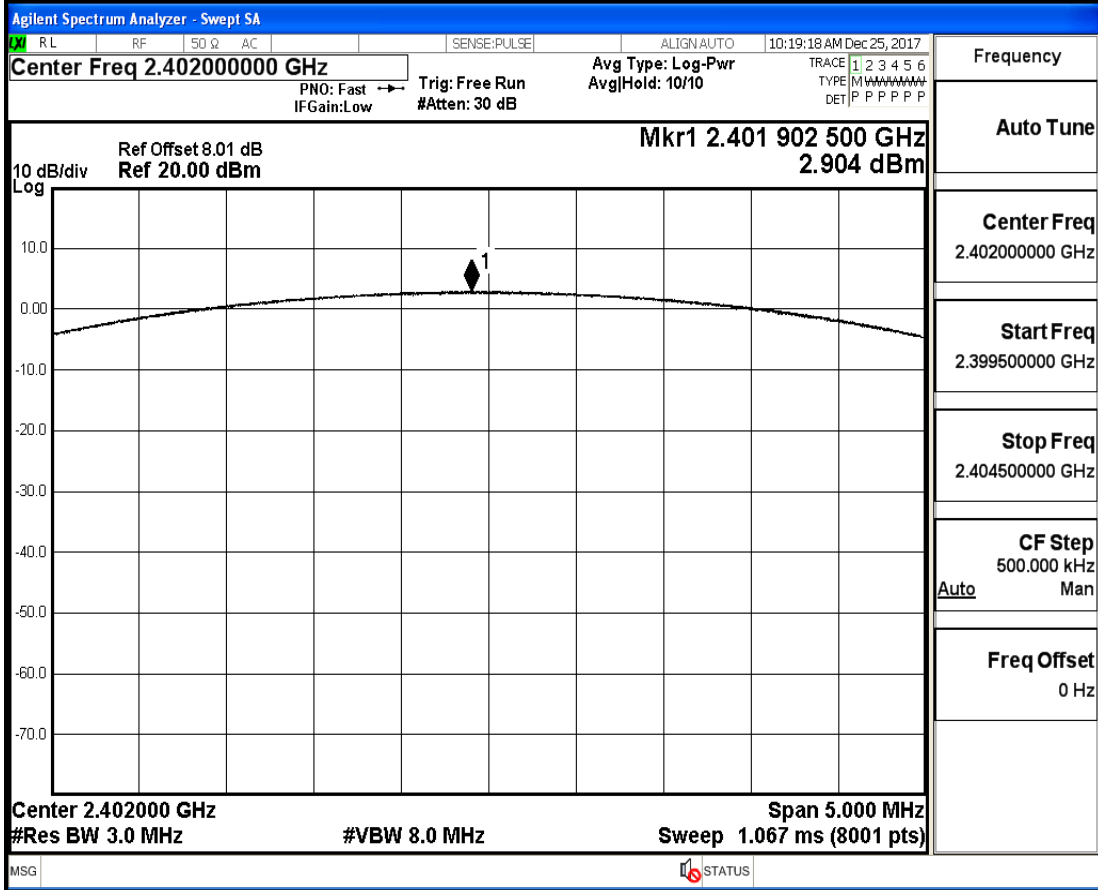
Conducted Peak Output Power  $\pi/4$ -DQPSK\_2441



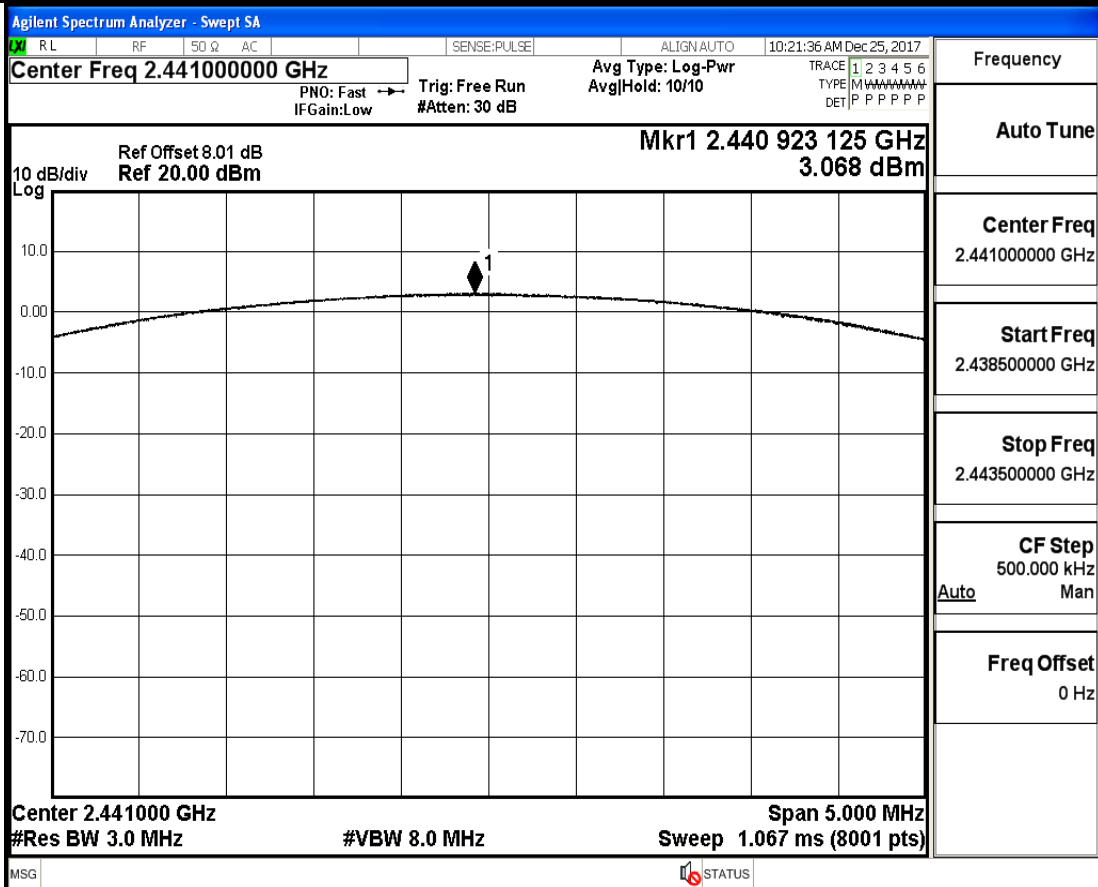
Conducted Peak Output Power  $\pi/4$ -DQPSK\_2480



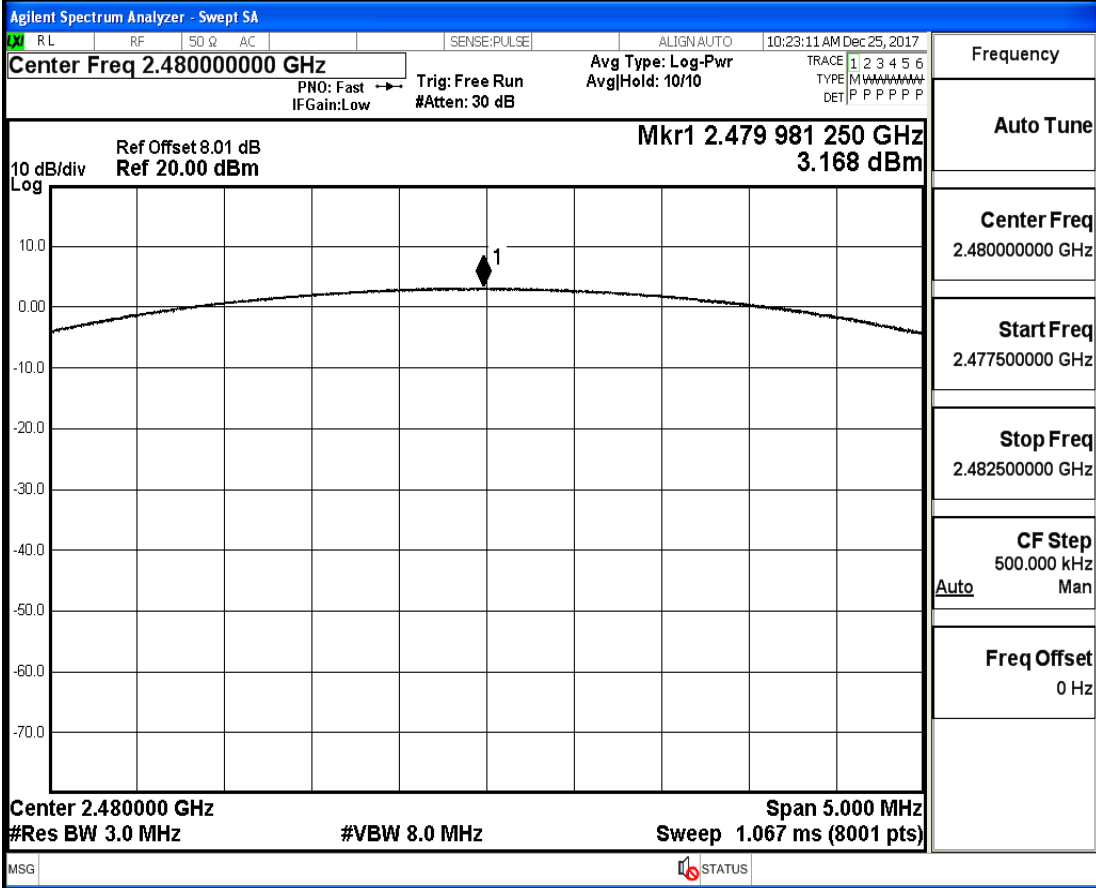
Conducted Peak Output Power\_8-DPSK\_2402



Conducted Peak Output Power\_8-DPSK\_2441



Conducted Peak Output Power\_8-DPSK\_2480

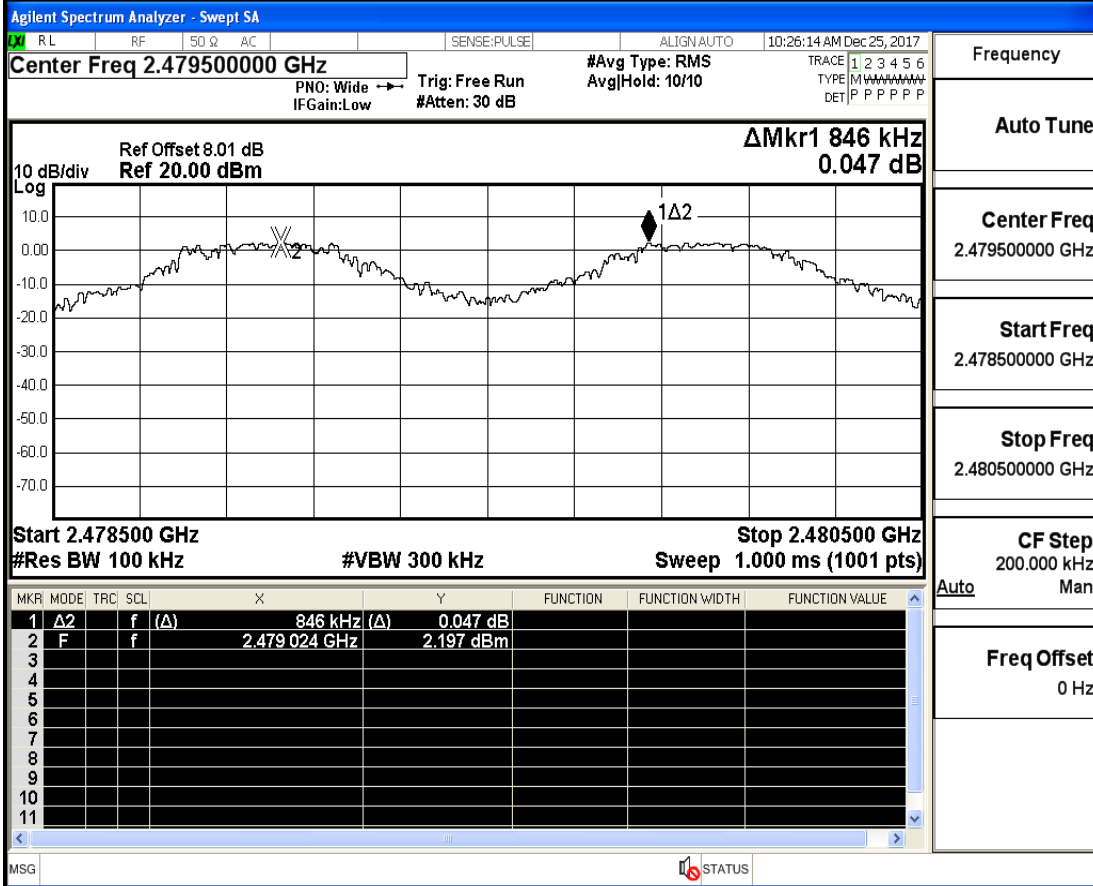


### A.3 Carrier Frequency Separation

Test Mode	Test Channel	Result[MHz]	Limit[MHz]	Verdict
GFSK	2402	1.204	0.69	PASS
	2441	0.826	0.65	PASS
	2480	0.846	0.65	PASS
$\pi/4$ -DQPSK	2402	0.984	0.86	PASS
	2441	1.17	0.86	PASS
	2480	1.004	0.86	PASS
8-DPSK	2402	0.984	0.86	PASS
	2441	1.282	0.86	PASS
	2480	1.08	0.87	PASS

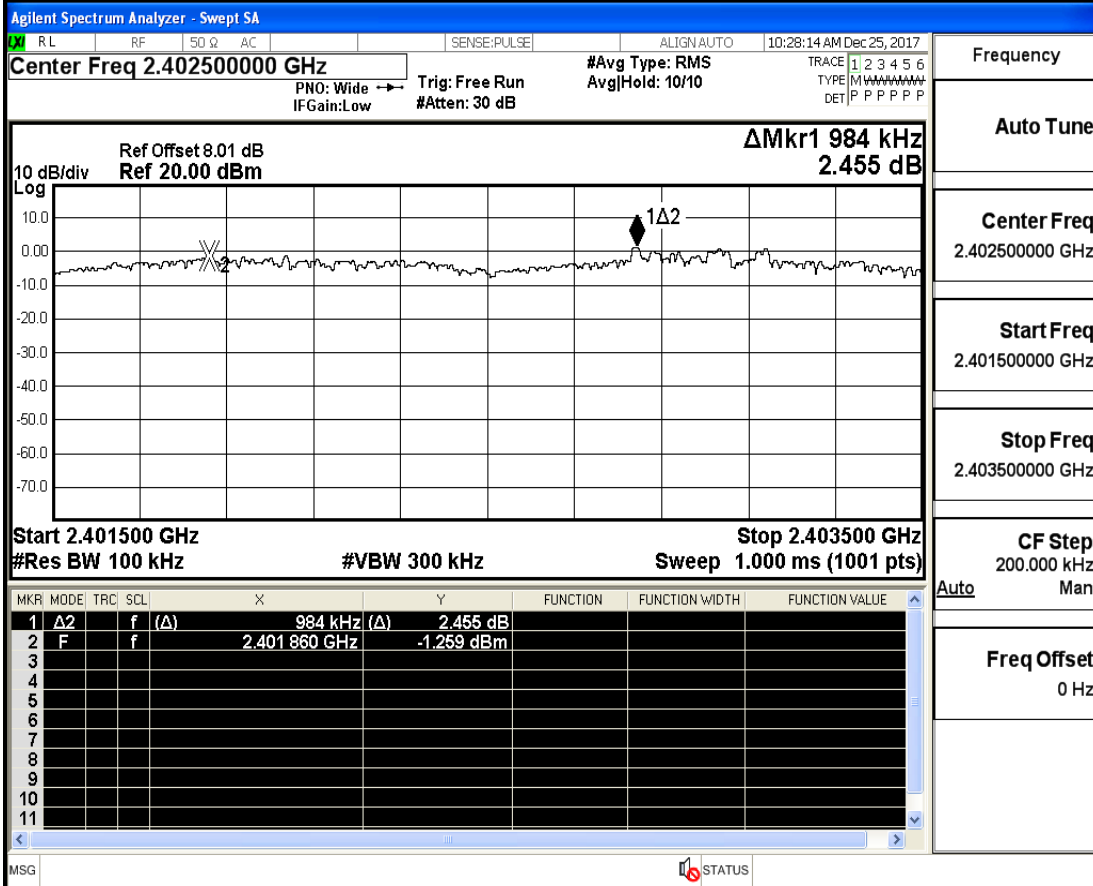


### Carrier Frequency Separation\_GFSK\_2480



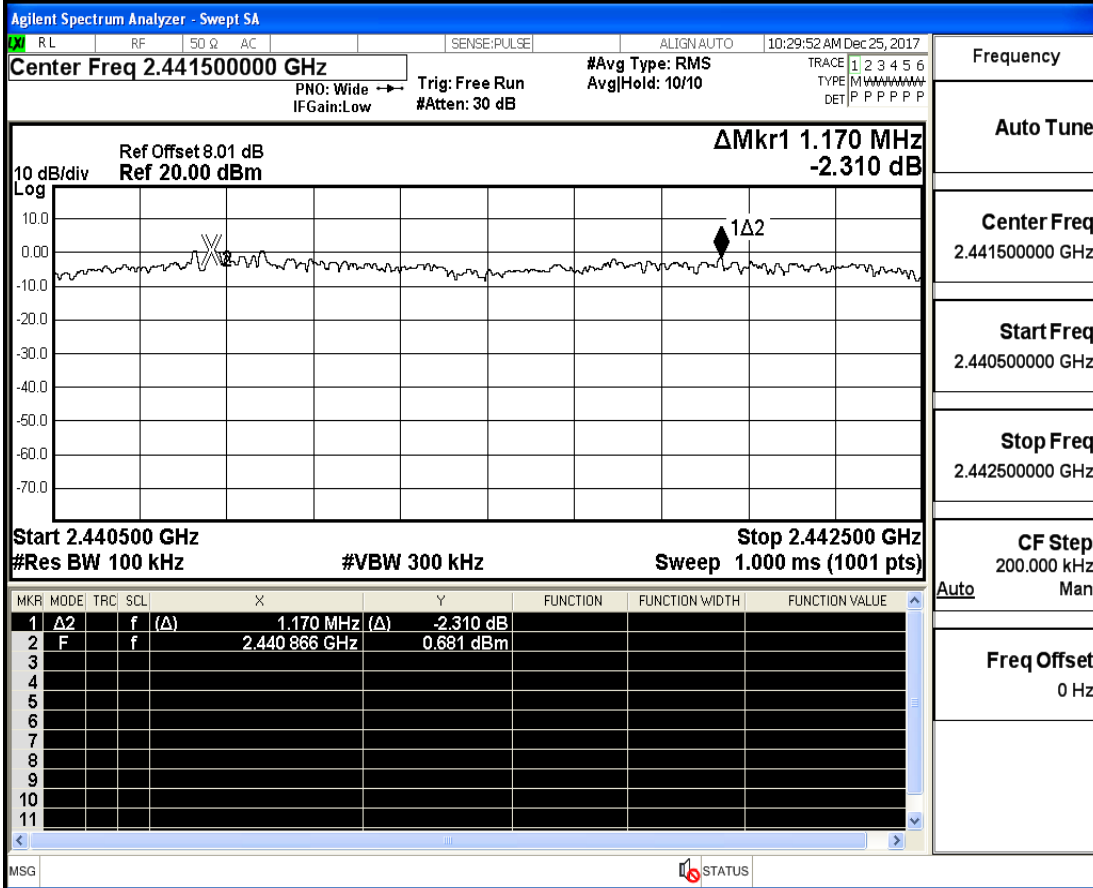
Frequency
Auto Tune
Center Freq 2.479500000 GHz
Start Freq 2.478500000 GHz
Stop Freq 2.480500000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

### Carrier Frequency Separation\_π/4-DQPSK\_2402



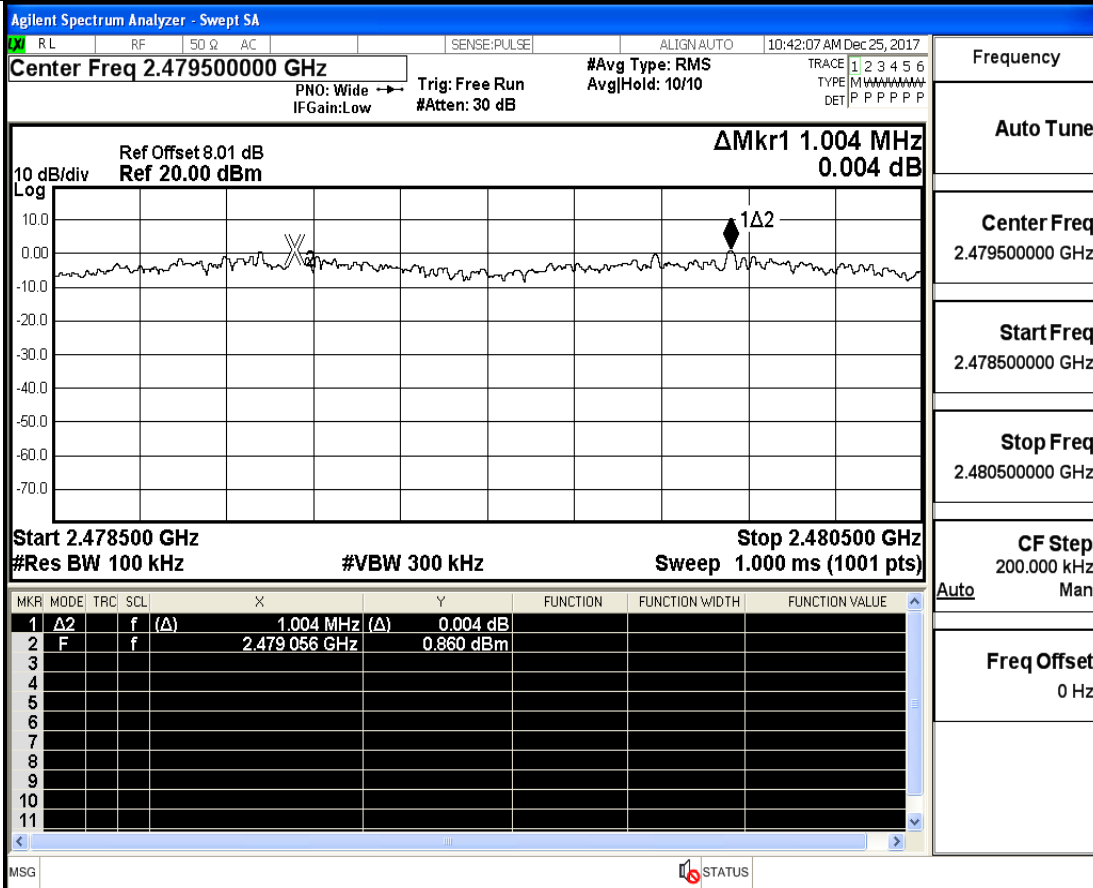
Frequency
Auto Tune
Center Freq 2.402500000 GHz
Start Freq 2.401500000 GHz
Stop Freq 2.403500000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

### Carrier Frequency Separation\_π/4-DQPSK\_2441



Frequency	
Auto Tune	
Center Freq	2.441500000 GHz
Start Freq	2.440500000 GHz
Stop Freq	2.442500000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

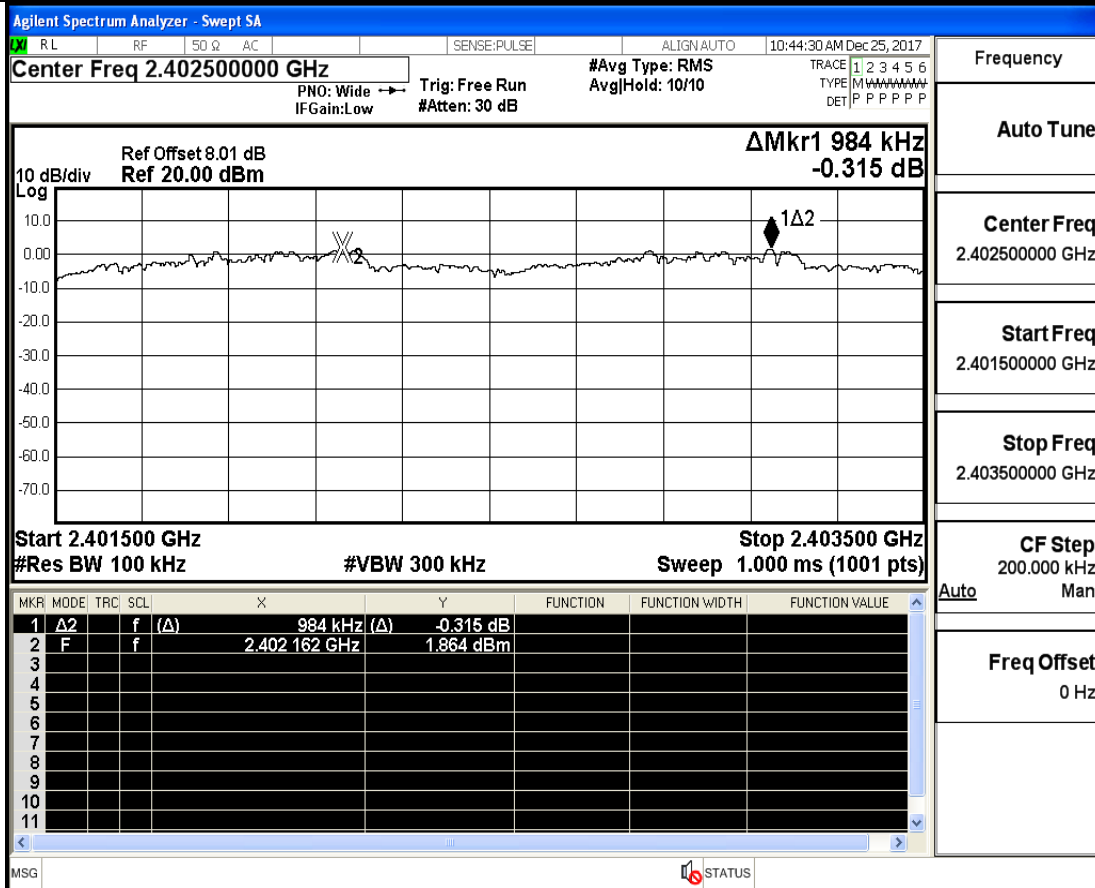
### Carrier Frequency Separation\_π/4-DQPSK\_2480



Frequency	
Auto Tune	
Center Freq	2.479500000 GHz
Start Freq	2.478500000 GHz
Stop Freq	2.480500000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

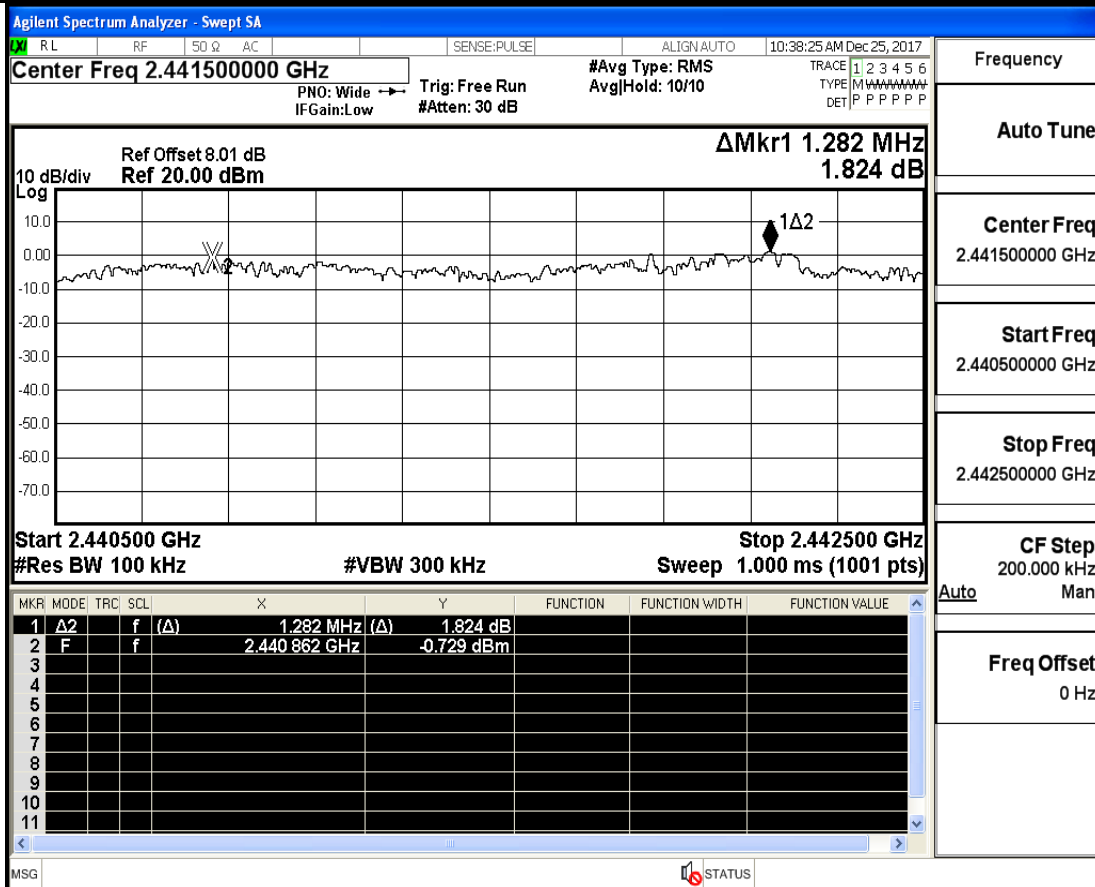


### Carrier Frequency Separation\_8-DPSK\_2402



Frequency
Auto Tune
Center Freq 2.40250000 GHz
Start Freq 2.40150000 GHz
Stop Freq 2.40350000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

### Carrier Frequency Separation\_8-DPSK\_2441



Frequency
Auto Tune
Center Freq 2.44150000 GHz
Start Freq 2.44050000 GHz
Stop Freq 2.44250000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

# Carrier Frequency Separation\_8-DPSK\_2480

Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:PULSE ALIGN AUTO 10:38:48 AM Dec 25, 2017

**Center Freq 2.479500000 GHz**

PNO: Wide → Trig: Free Run #Avg Type: RMS  
IFGain:Low #Atten: 30 dB AvgHold: 10/10

TRACE 1 2 3 4 5 6  
TYPE M W W W W W W W W W  
DET P P P P P P P

Ref Offset 8.01 dB  
Ref 20.00 dBm

**ΔMkr1 1.080 MHz**  
**1.012 dB**

10 dB/div Log

Start 2.478500 GHz  
#Res BW 100 kHz

#VBW 300 kHz

Stop 2.480500 GHz  
Sweep 1.000 ms (1001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2			f (Δ)	1.080 MHz (Δ)			1.012 dB
2	F			f	2.478 964 GHz			-0.226 dBm
3								
4								
5								
6								
7								
8								
9								
10								
11								

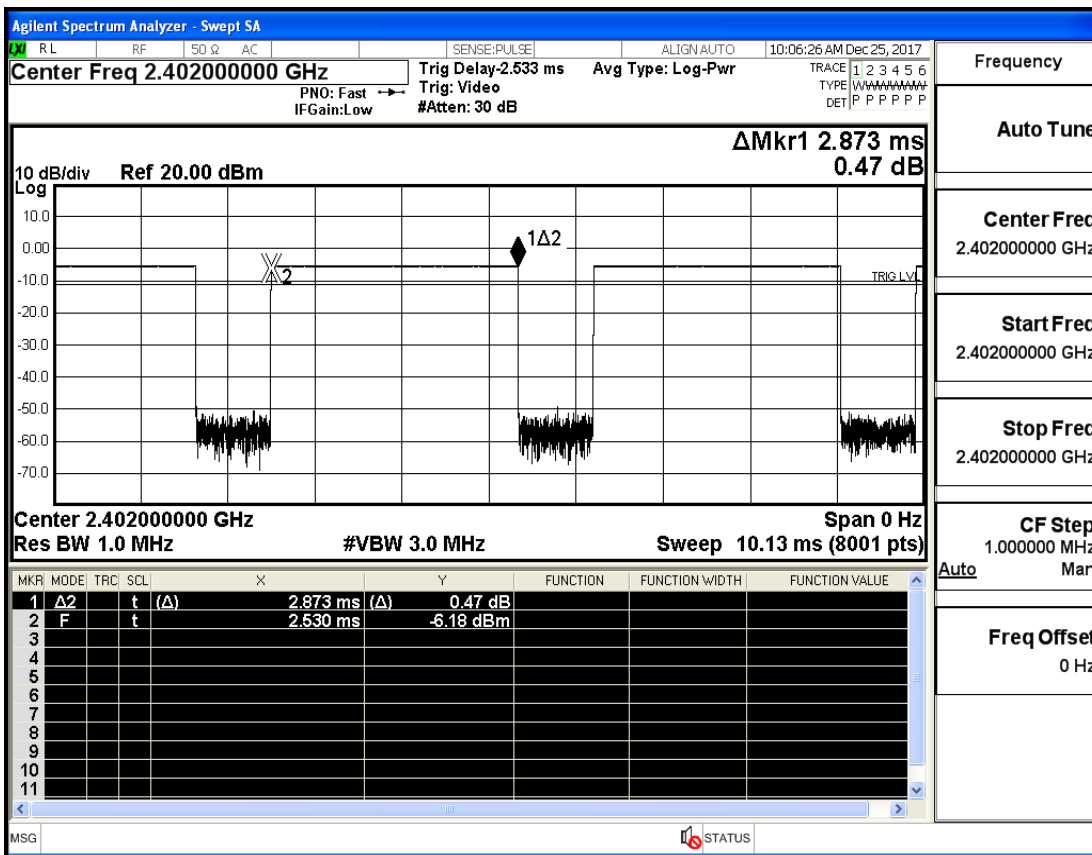
Frequency
Auto Tune
Center Freq 2.479500000 GHz
Start Freq 2.478500000 GHz
Stop Freq 2.480500000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

MSG
STATUS

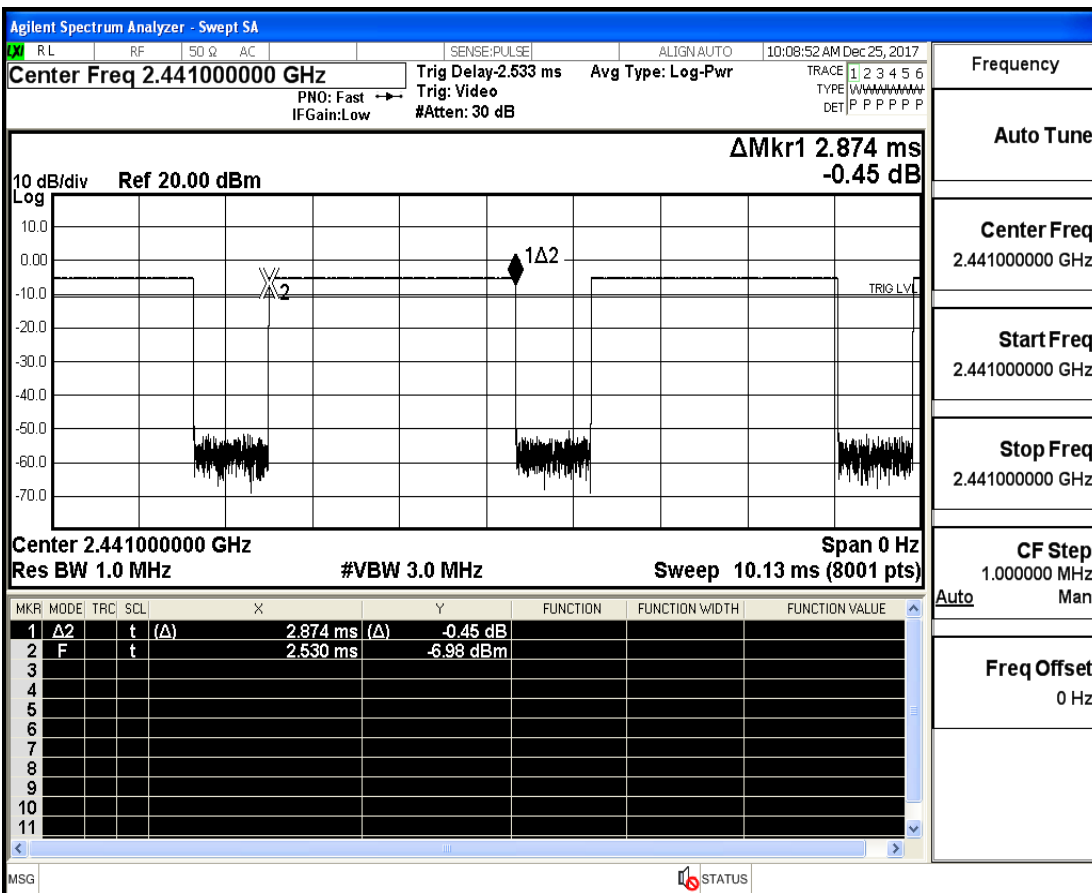
#### A.4 Dwell Time

Test Mode	Test Channel	Burst Width[ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit[s]	Verdict
GFSK	2402	2.87	106.7	0.306	0.4	PASS
	2441	2.87	106.7	0.306	0.4	PASS
	2480	2.87	106.7	0.306	0.4	PASS
$\pi/4$ -DQPSK	2402	2.88	106.7	0.307	0.4	PASS
	2441	2.88	106.7	0.307	0.4	PASS
	2480	2.88	106.7	0.307	0.4	PASS
8-DPSK	2402	2.88	106.7	0.307	0.4	PASS
	2441	2.88	106.7	0.307	0.4	PASS
	2480	2.88	106.7	0.307	0.4	PASS

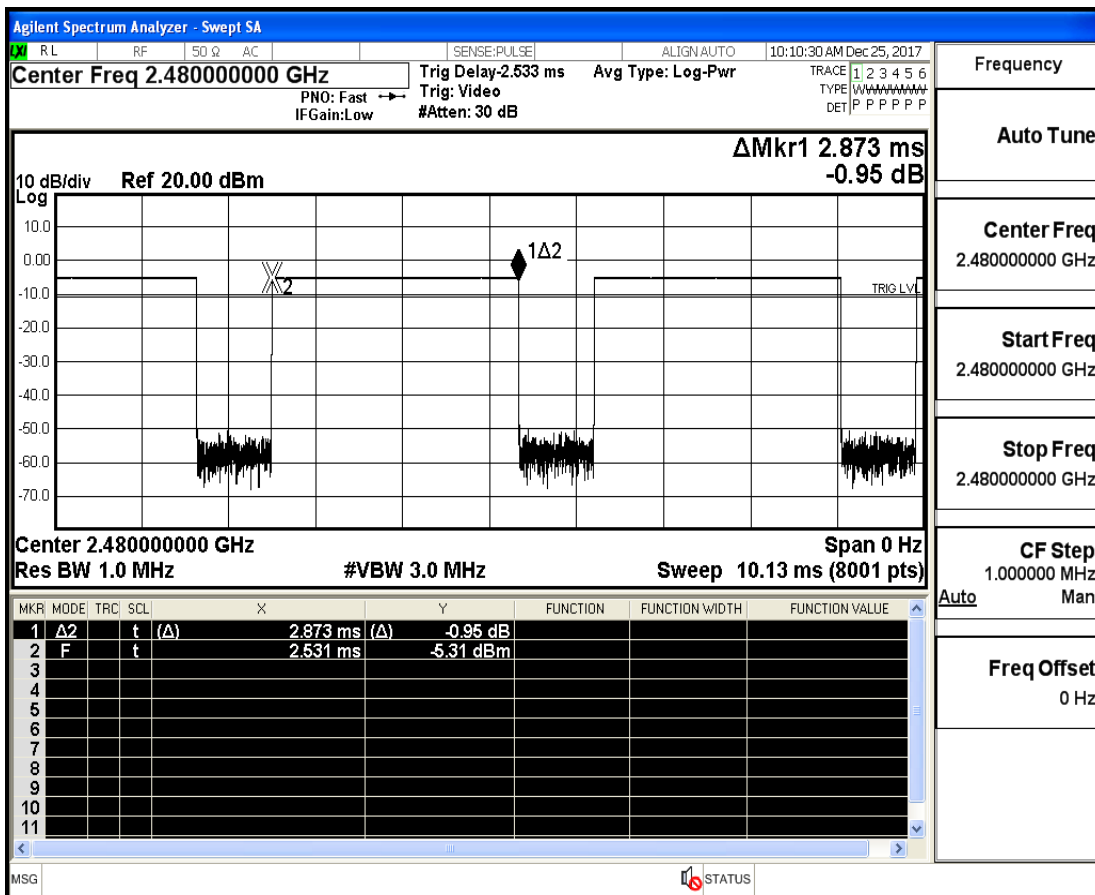
Dwell Time\_GFSK\_2402



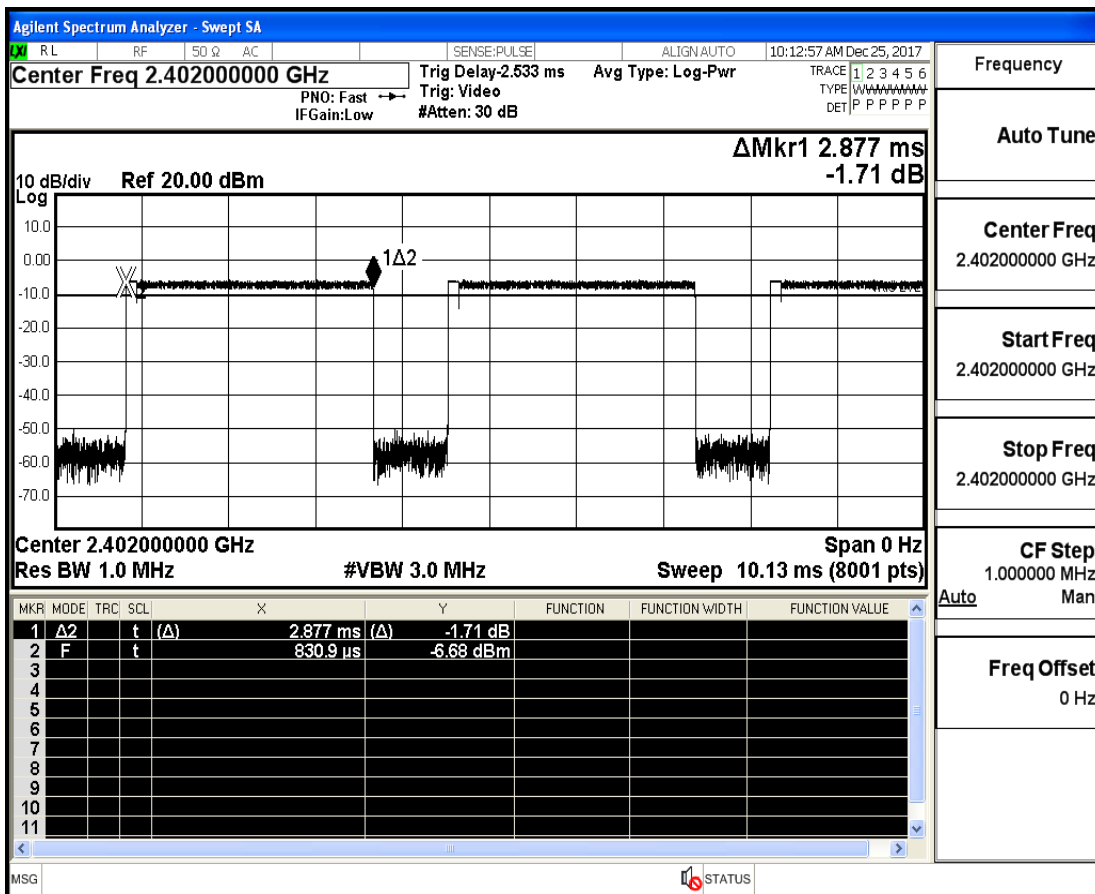
Dwell Time\_GFSK\_2441



Dwell Time\_GFSK\_2480



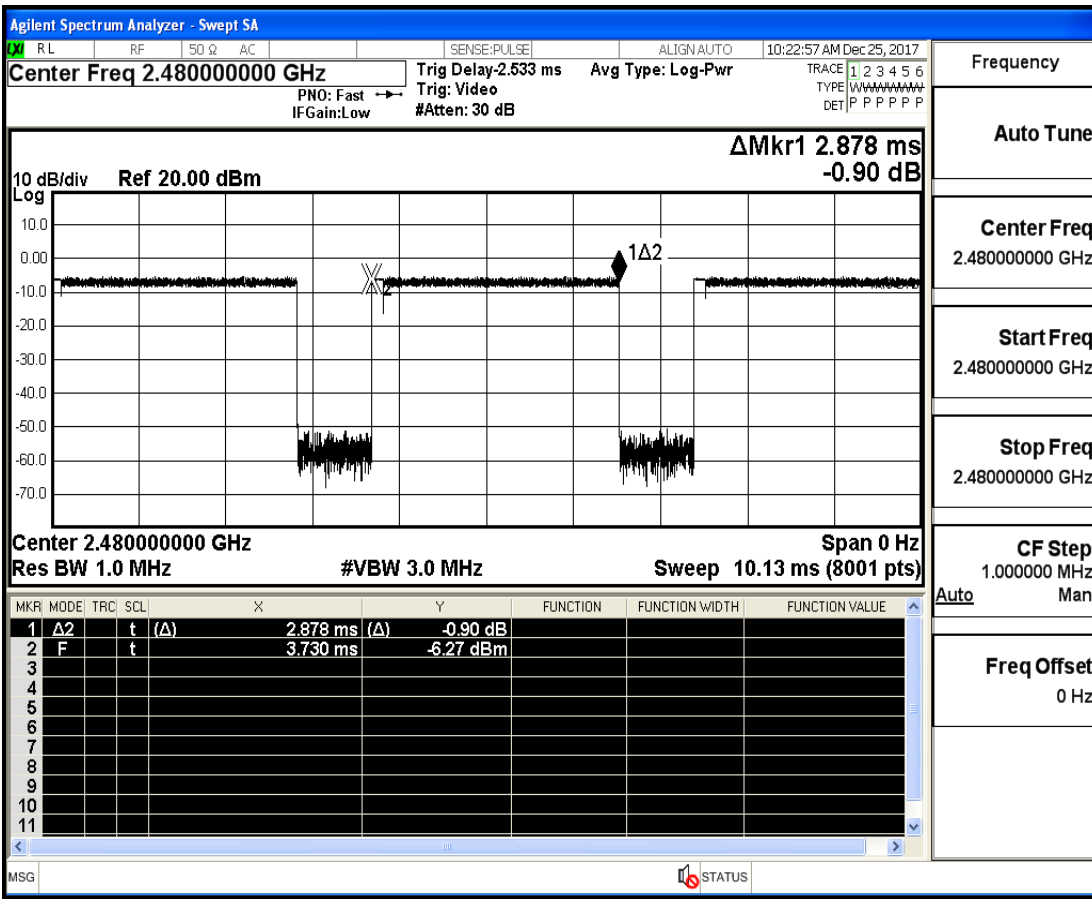
Dwell Time\_π/4-DQPSK\_2402







Dwell Time\_8-DPSK\_2480



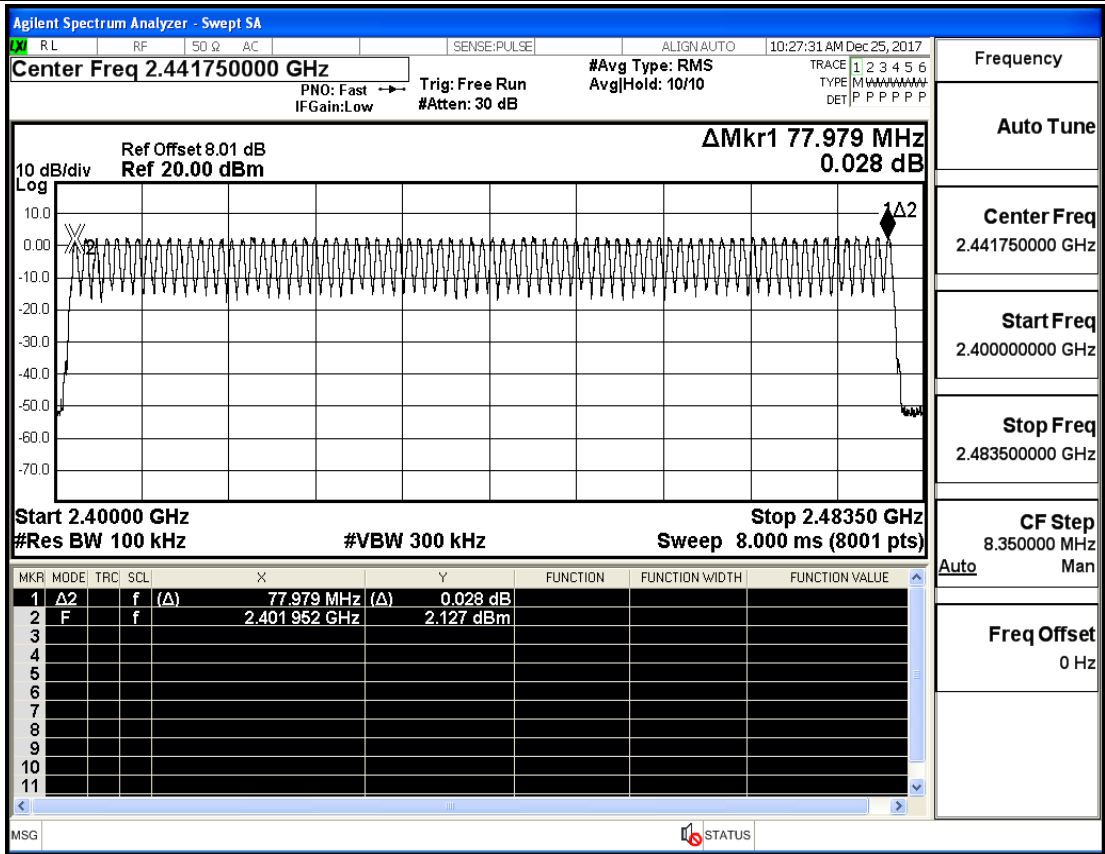
Frequency
Auto Tune
Center Freq 2.480000000 GHz
Start Freq 2.480000000 GHz
Stop Freq 2.480000000 GHz
CF Step 1.000000 MHz
Auto Man
Freq Offset 0 Hz



### A.5 Hopping Channel Number

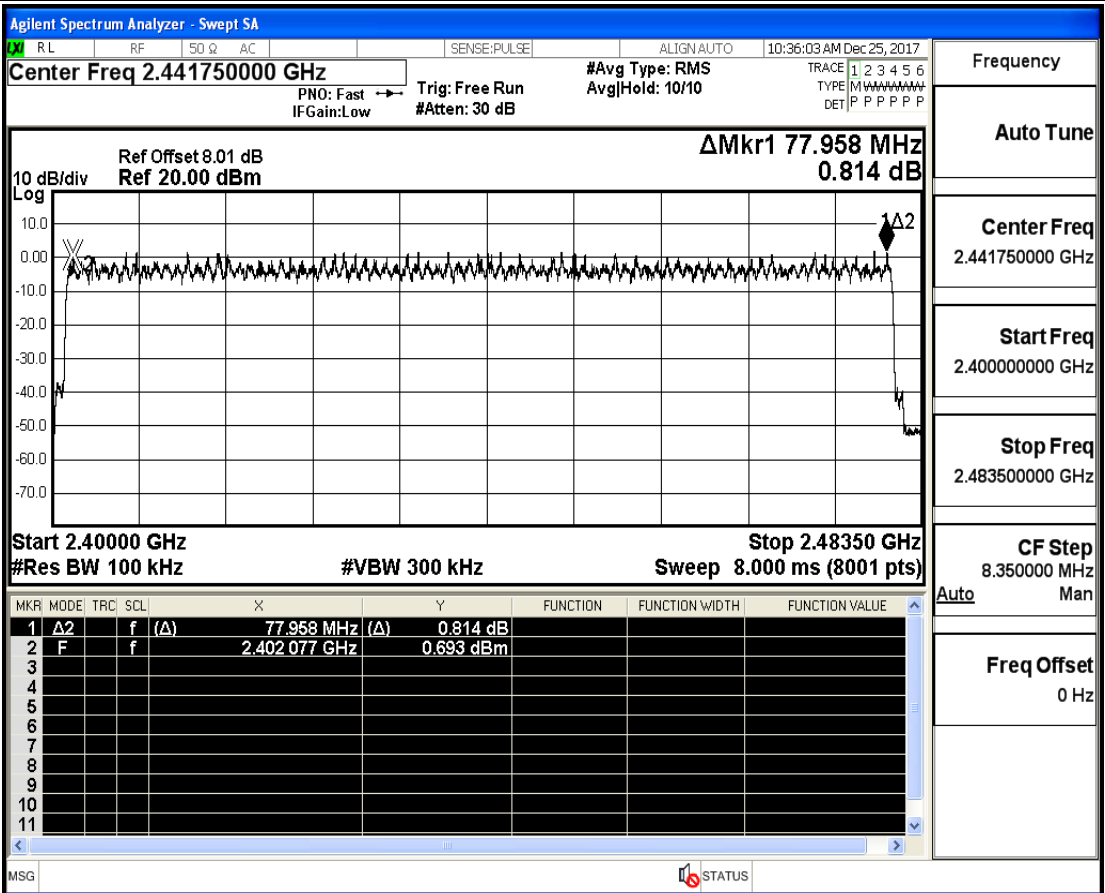
Test Mode	Test Channel	Number of Hopping Channel[N]	Limit[N]	Verdict
GFSK	All	79	$\geq 15$	PASS
$\pi/4$ -DQPSK	All	79	$\geq 15$	PASS
8-DPSK	All	79	$\geq 15$	PASS

Hopping Channel Number\_GFSK\_2402



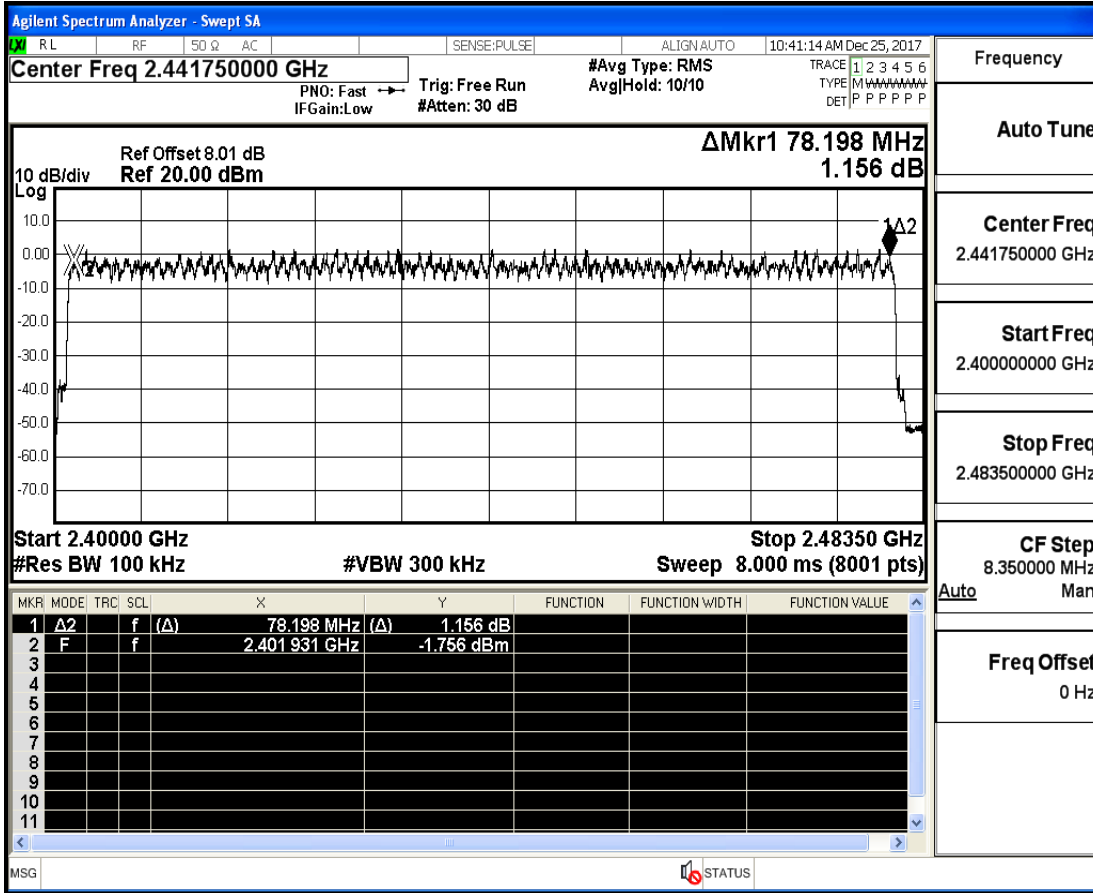
Frequency
Auto Tune
Center Freq 2.441750000 GHz
Start Freq 2.400000000 GHz
Stop Freq 2.483500000 GHz
CF Step 8.350000 MHz
Auto Man
Freq Offset 0 Hz

Hopping Channel Number\_π/4-DQPSK\_2402



Frequency
Auto Tune
Center Freq 2.441750000 GHz
Start Freq 2.400000000 GHz
Stop Freq 2.483500000 GHz
CF Step 8.350000 MHz
Auto Man
Freq Offset 0 Hz

# Hopping Channel Number\_8-DPSK\_2402

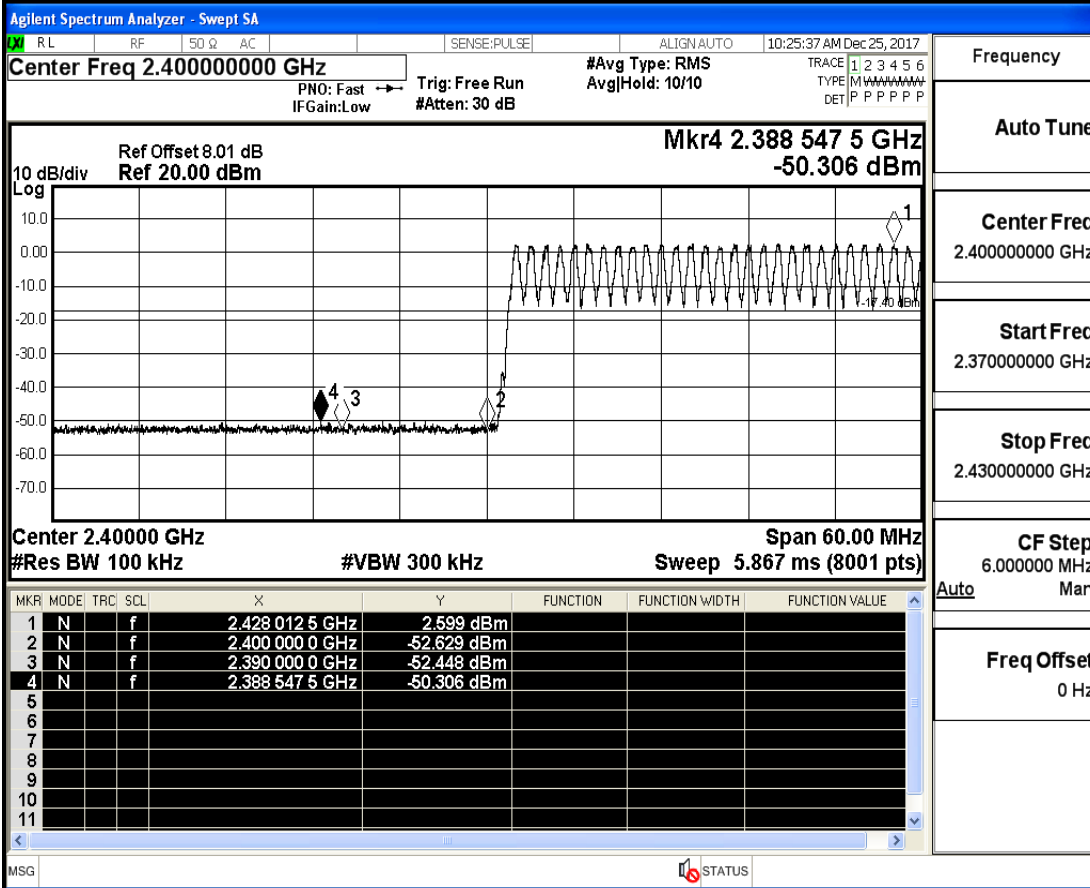


Frequency	
Auto Tune	
Center Freq	2.441750000 GHz
Start Freq	2.400000000 GHz
Stop Freq	2.483500000 GHz
CF Step	8.350000 MHz
Auto	Man
Freq Offset	0 Hz

### A.6 Band-edge for RF Conducted Emissions

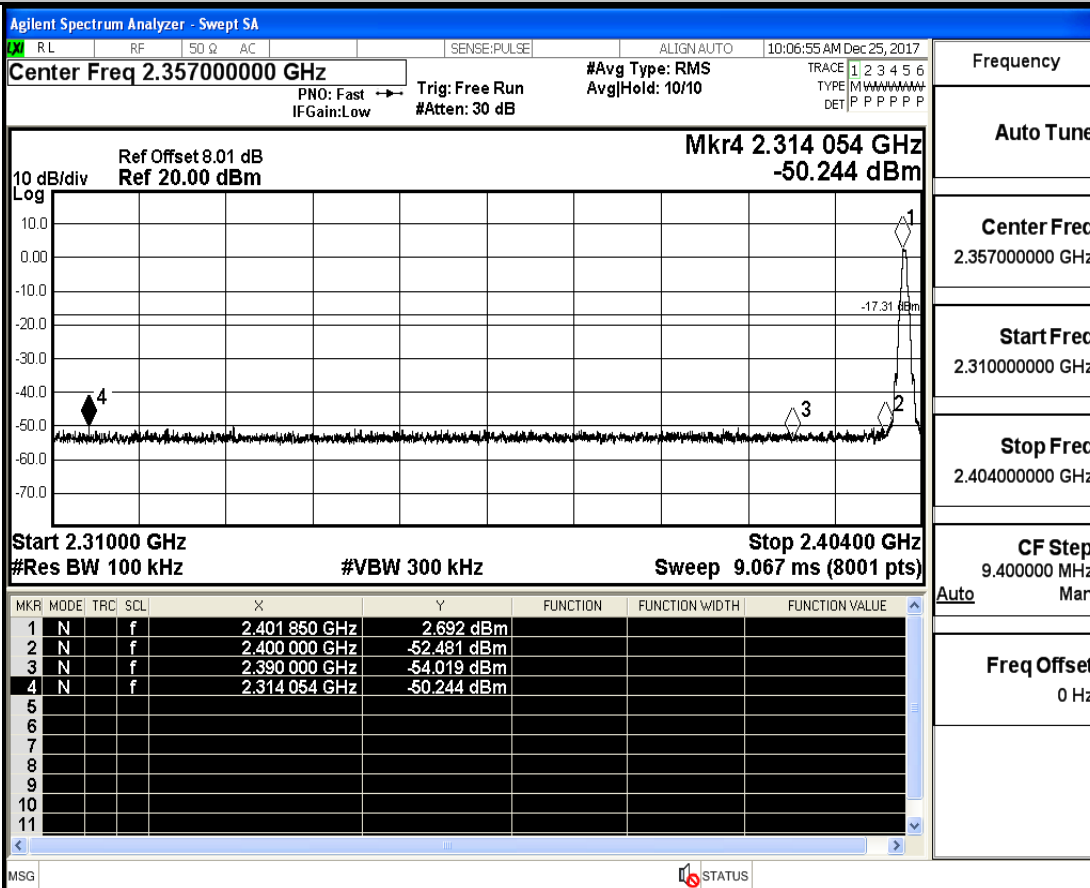
Test Mode	Test Channel	Hopping	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit[dBm]	Verdict
GFSK	2402	On	2.599	-50.306	-17.4	PASS
	2402	Off	2.692	-50.244	-17.31	PASS
	2480	On	2.777	-49.581	-17.22	PASS
	2480	Off	2.757	-50.419	-17.24	PASS
$\pi/4$ -DQPSK	2402	On	1.914	-49.757	-18.09	PASS
	2402	Off	1.922	-50.273	-18.08	PASS
	2480	On	1.716	-49.493	-18.28	PASS
	2480	Off	2.075	-50.203	-17.93	PASS
8-DPSK	2402	On	1.725	-49.031	-18.28	PASS
	2402	Off	1.914	-50.307	-18.09	PASS
	2480	On	1.654	-49.120	-18.35	PASS
	2480	Off	1.981	-50.271	-18.02	PASS

Band-edge for RF Conducted Emissions\_GFSK\_2402\_Hopping On



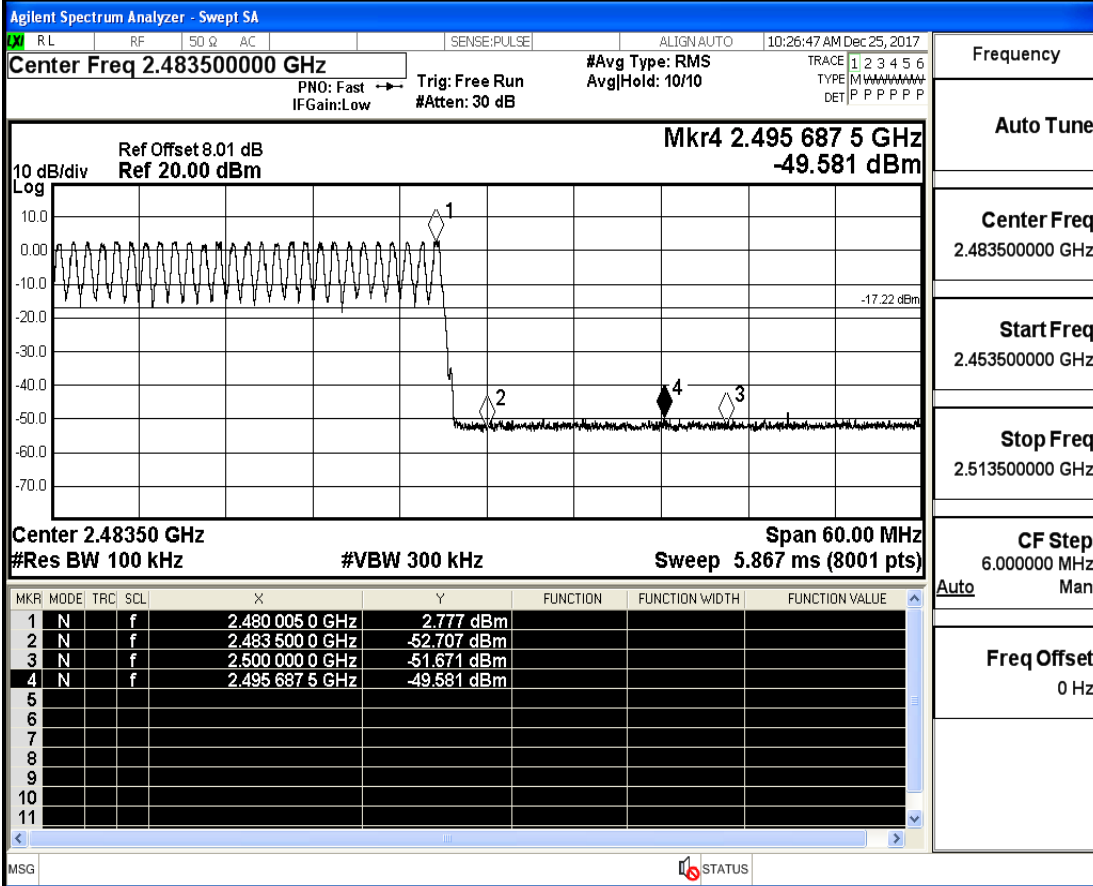
Frequency	
Auto Tune	
Center Freq	2.40000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

Band-edge for RF Conducted Emissions\_GFSK\_2402\_Hopping Off



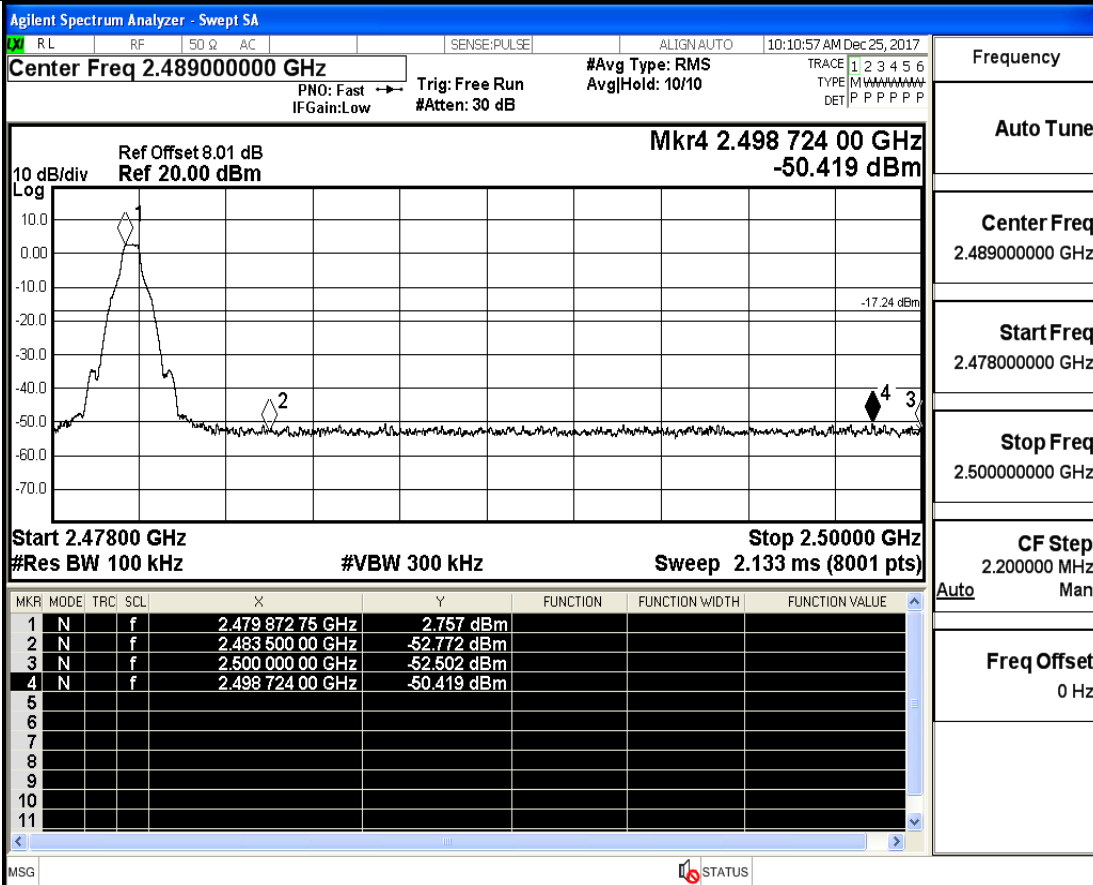
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Freq Offset	0 Hz

Band-edge for RF Conducted Emissions\_GFSK\_2480\_Hopping On



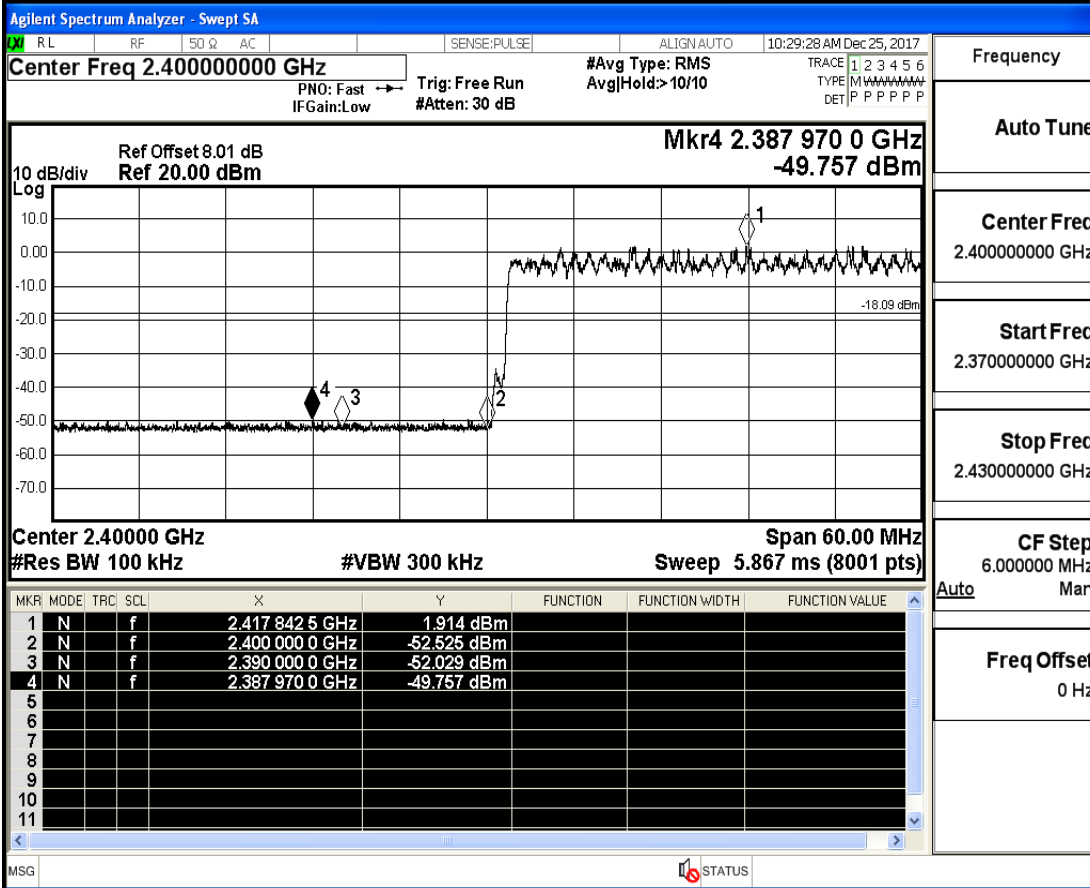
Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

Band-edge for RF Conducted Emissions\_GFSK\_2480\_Hopping Off



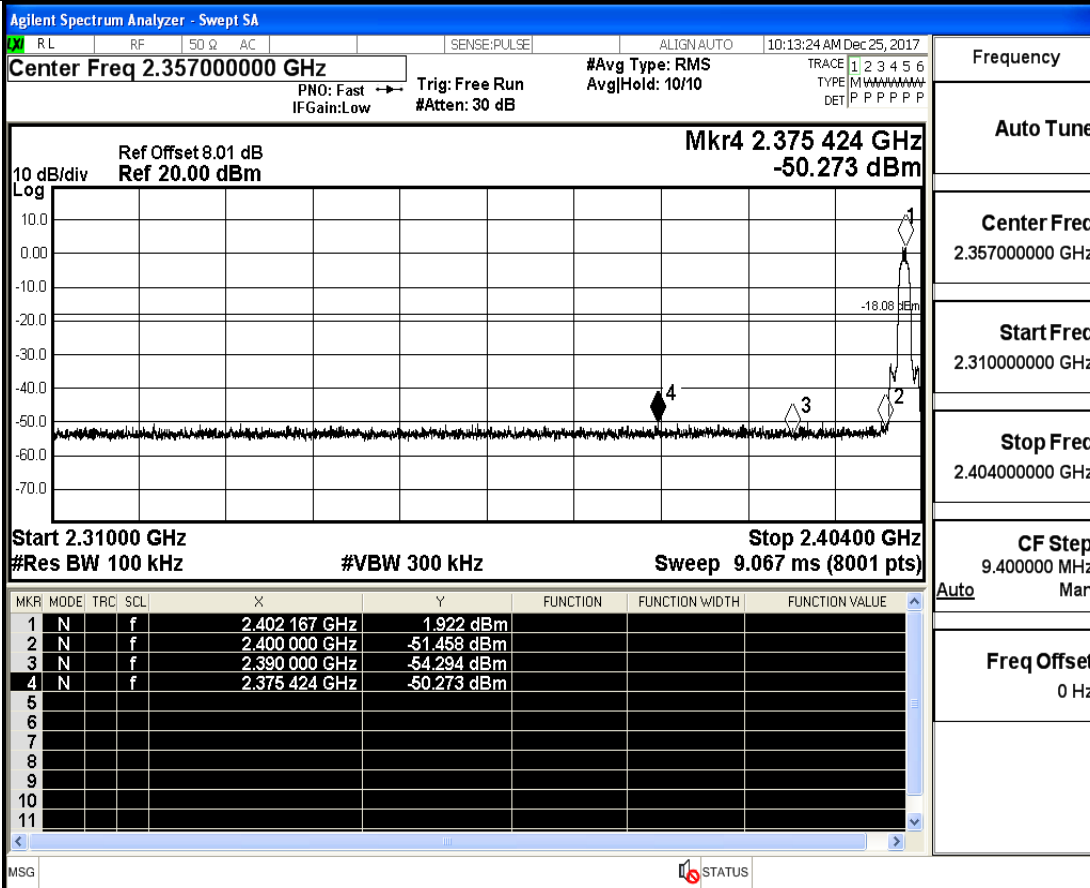
Frequency	
Auto Tune	
Center Freq	2.489000000 GHz
Start Freq	2.478000000 GHz
Stop Freq	2.500000000 GHz
CF Step	2.200000 MHz
Auto	Man
Freq Offset	0 Hz

Band-edge for RF Conducted Emissions  $\pi/4$ -DQPSK\_2402\_Hopping On



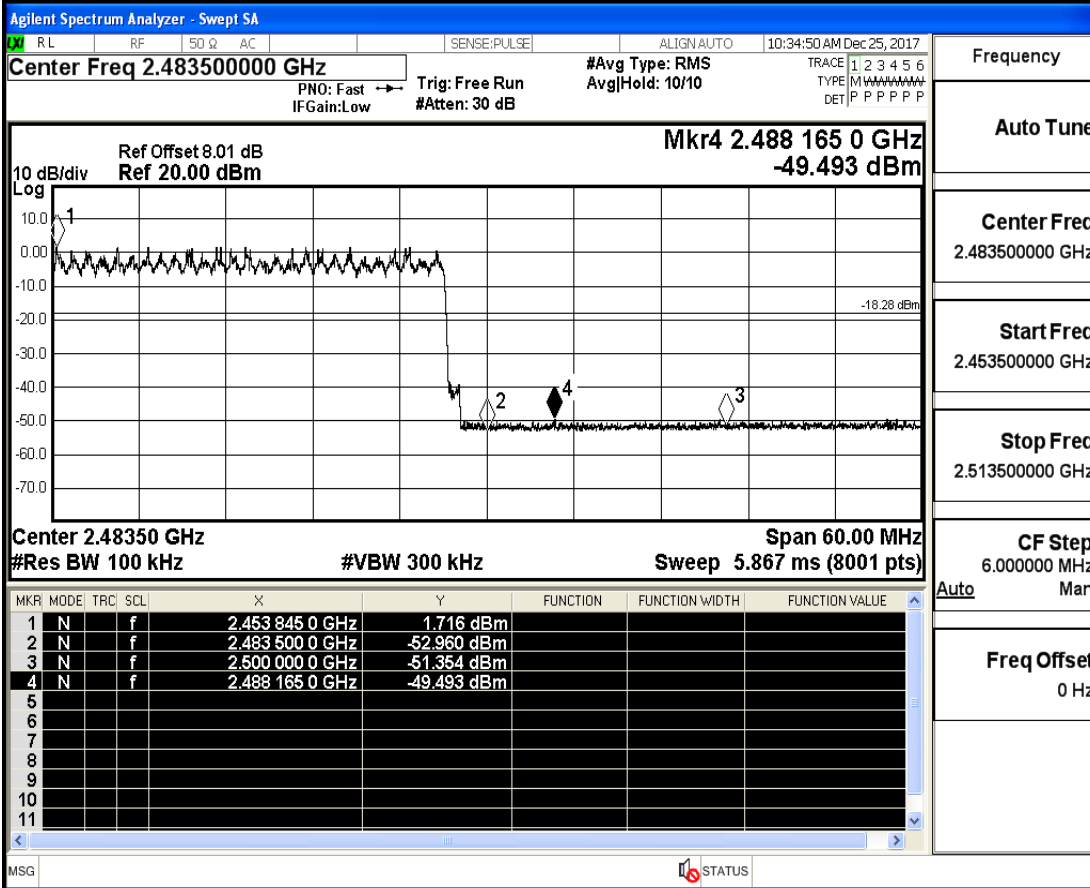
Frequency	
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

Band-edge for RF Conducted Emissions  $\pi/4$ -DQPSK\_2402\_Hopping Off



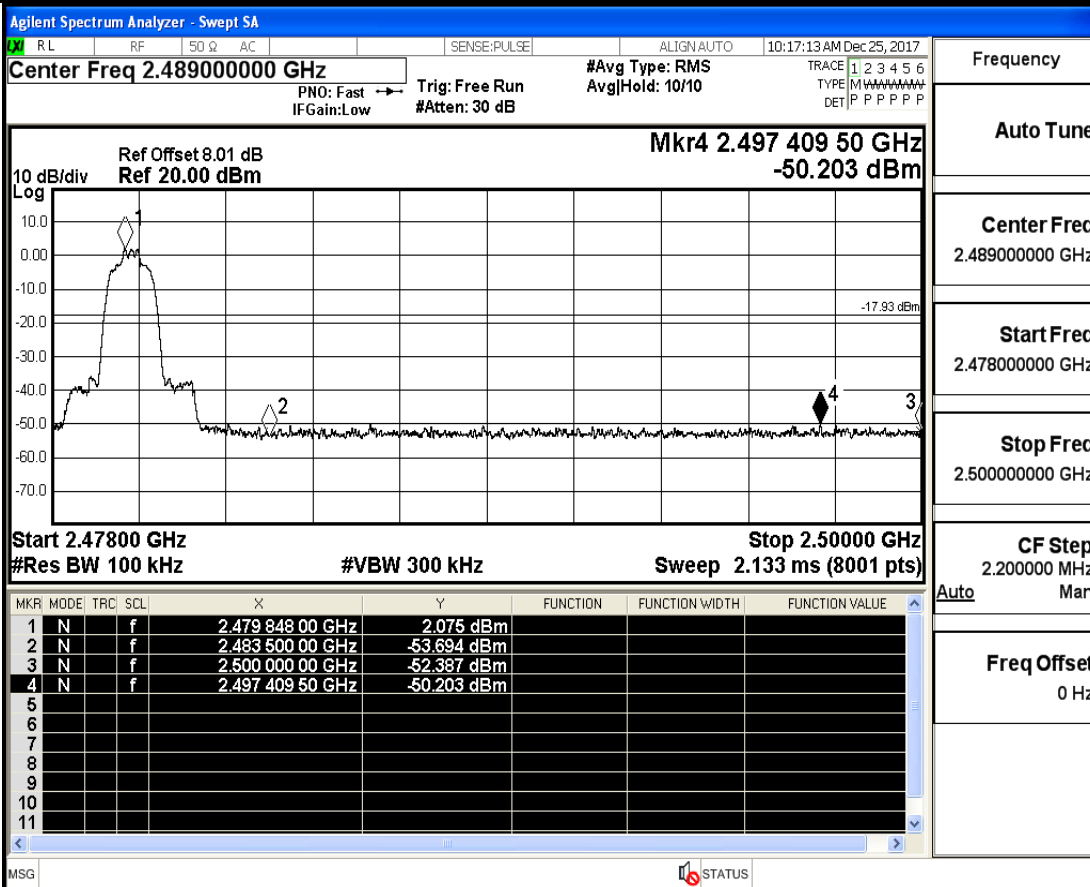
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Auto	Man
Freq Offset	0 Hz

Band-edge for RF Conducted Emissions  $\pi/4$ -DQPSK\_2480\_Hopping On



Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

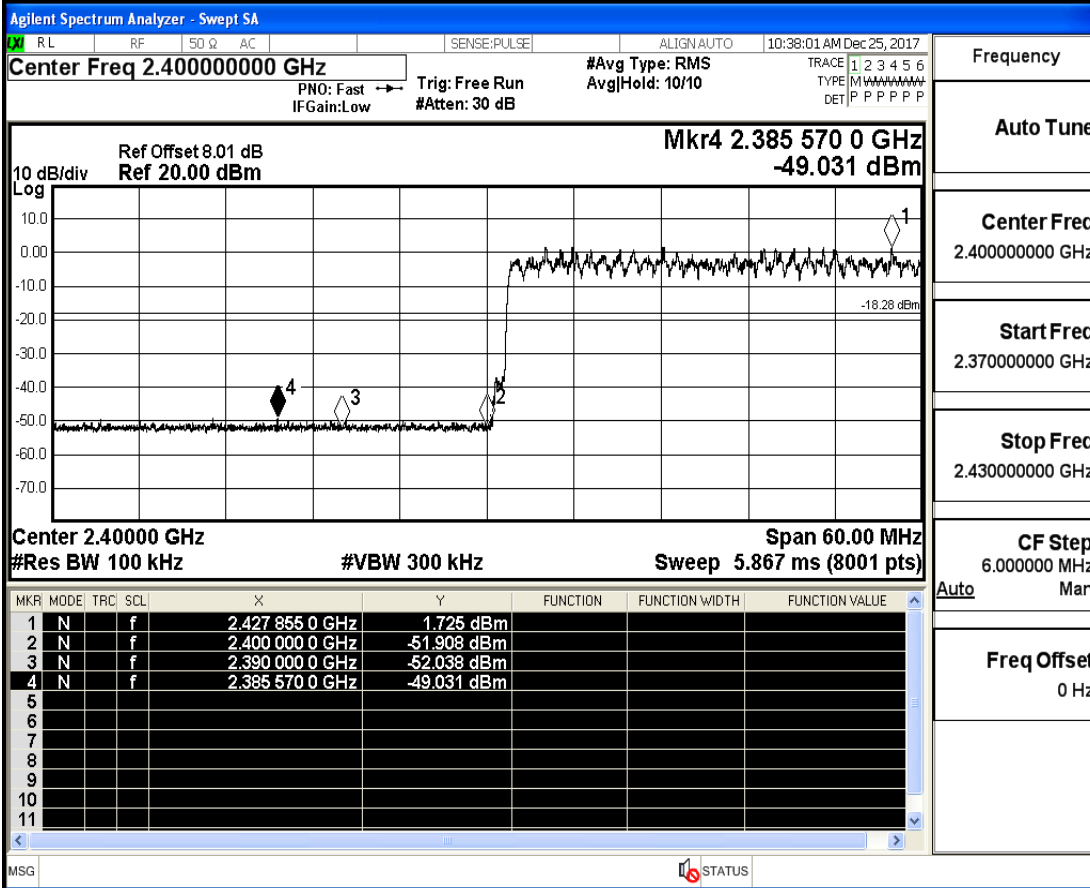
Band-edge for RF Conducted Emissions  $\pi/4$ -DQPSK\_2480\_Hopping Off



Frequency	
Auto Tune	
Center Freq	2.489000000 GHz
Start Freq	2.478000000 GHz
Stop Freq	2.500000000 GHz
CF Step	2.200000 MHz
Auto	Man
Freq Offset	0 Hz

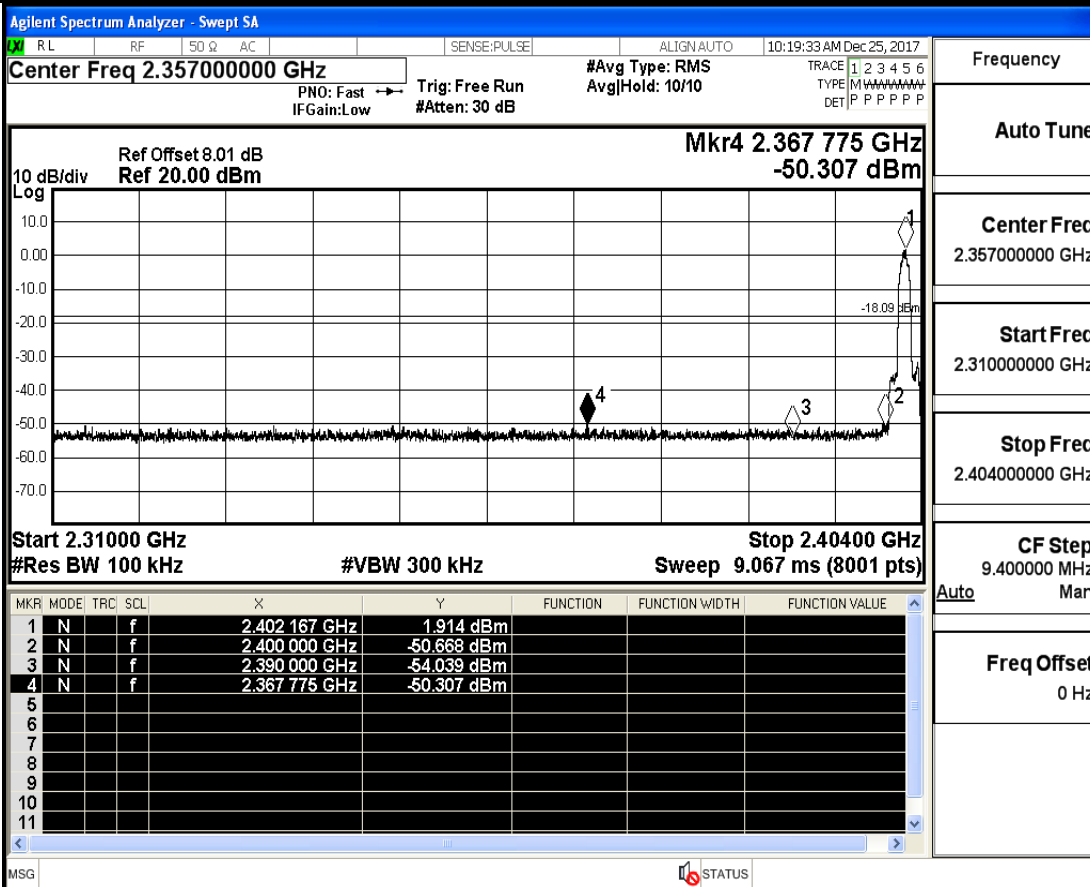


Band-edge for RF Conducted Emissions\_8-DPSK\_2402\_Hopping On



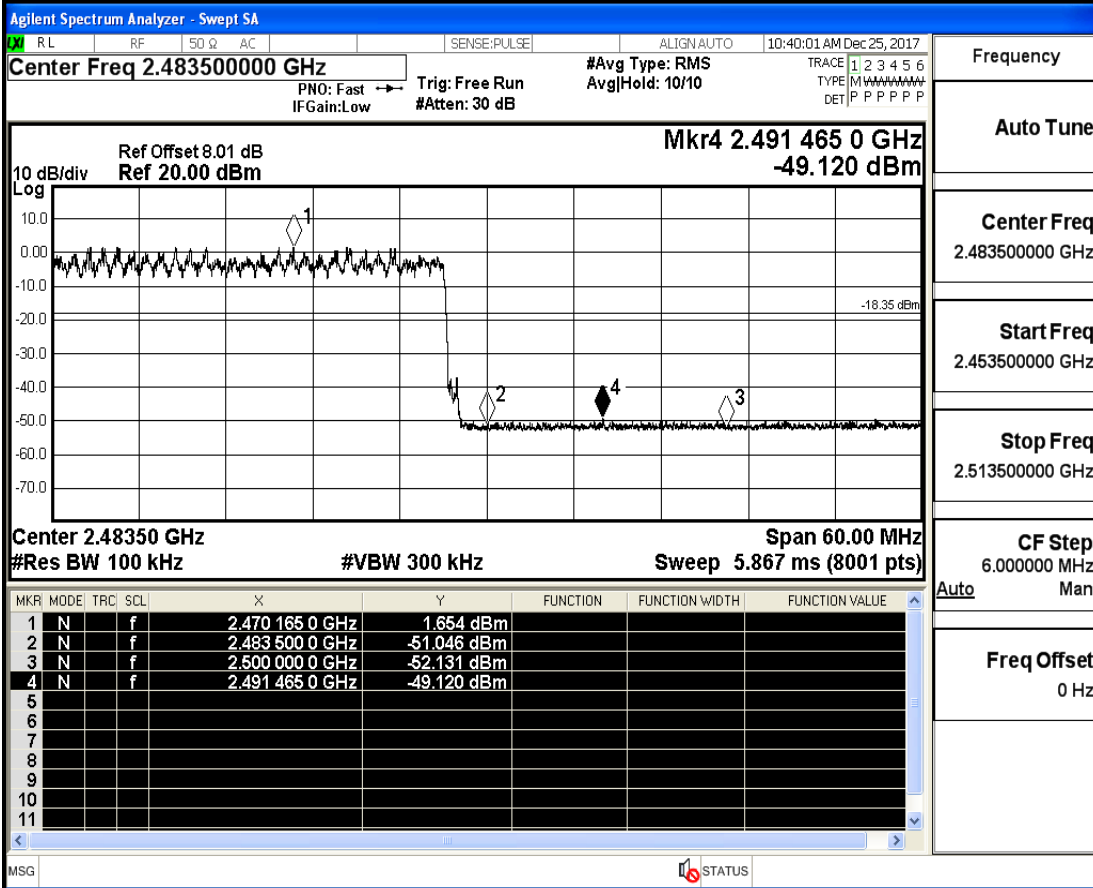
Frequency	
Auto Tune	
Center Freq	2.40000000 GHz
Start Freq	2.37000000 GHz
Stop Freq	2.43000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

Band-edge for RF Conducted Emissions\_8-DPSK\_2402\_Hopping Off



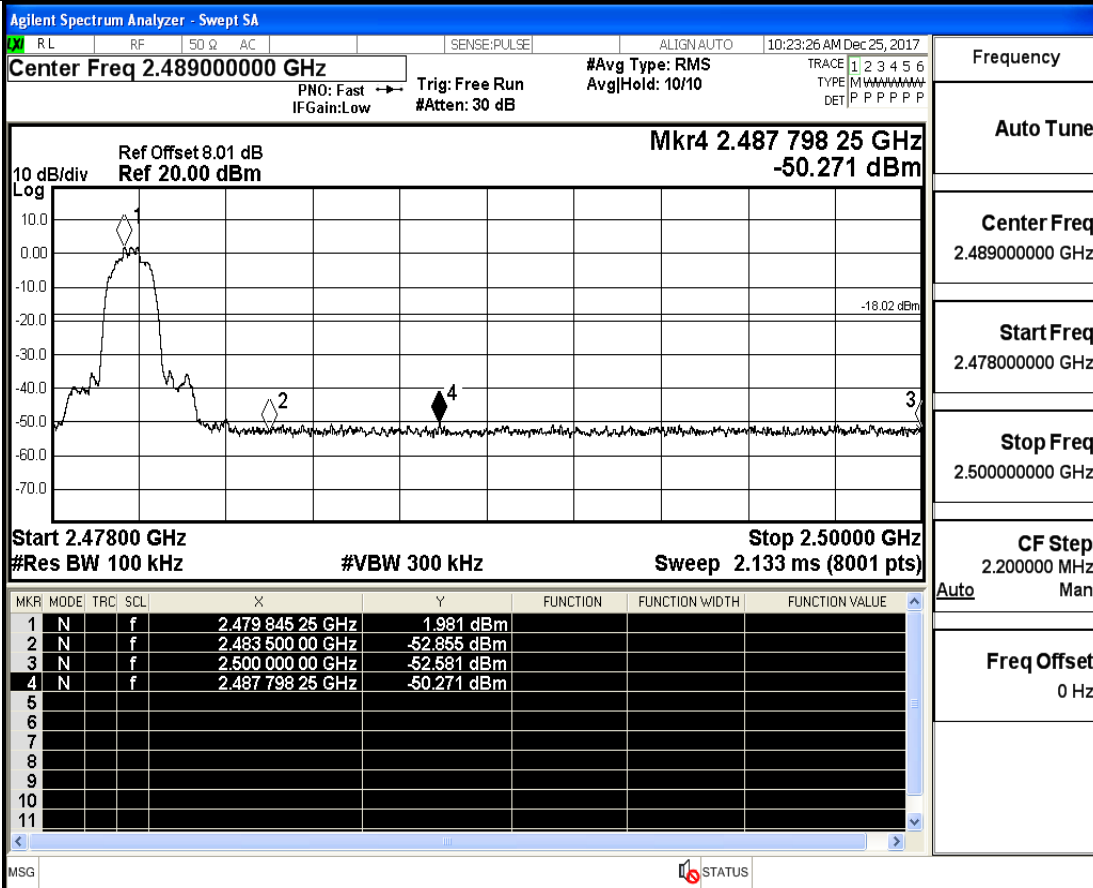
Frequency	
Auto Tune	
Center Freq	2.35700000 GHz
Start Freq	2.31000000 GHz
Stop Freq	2.40400000 GHz
CF Step	9.400000 MHz
Freq Offset	0 Hz

### Band-edge for RF Conducted Emissions\_8-DPSK\_2480\_Hopping On



Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Auto Man	
Freq Offset	0 Hz

### Band-edge for RF Conducted Emissions\_8-DPSK\_2480\_Hopping Off

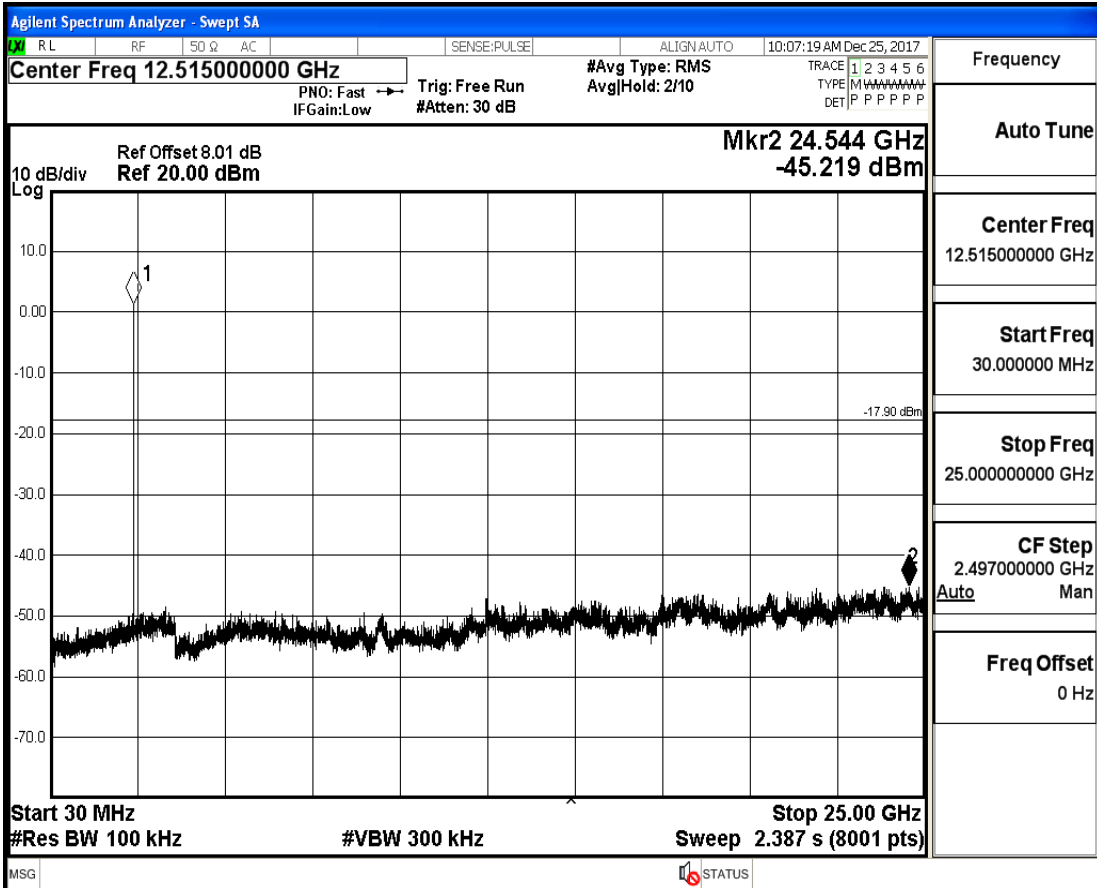
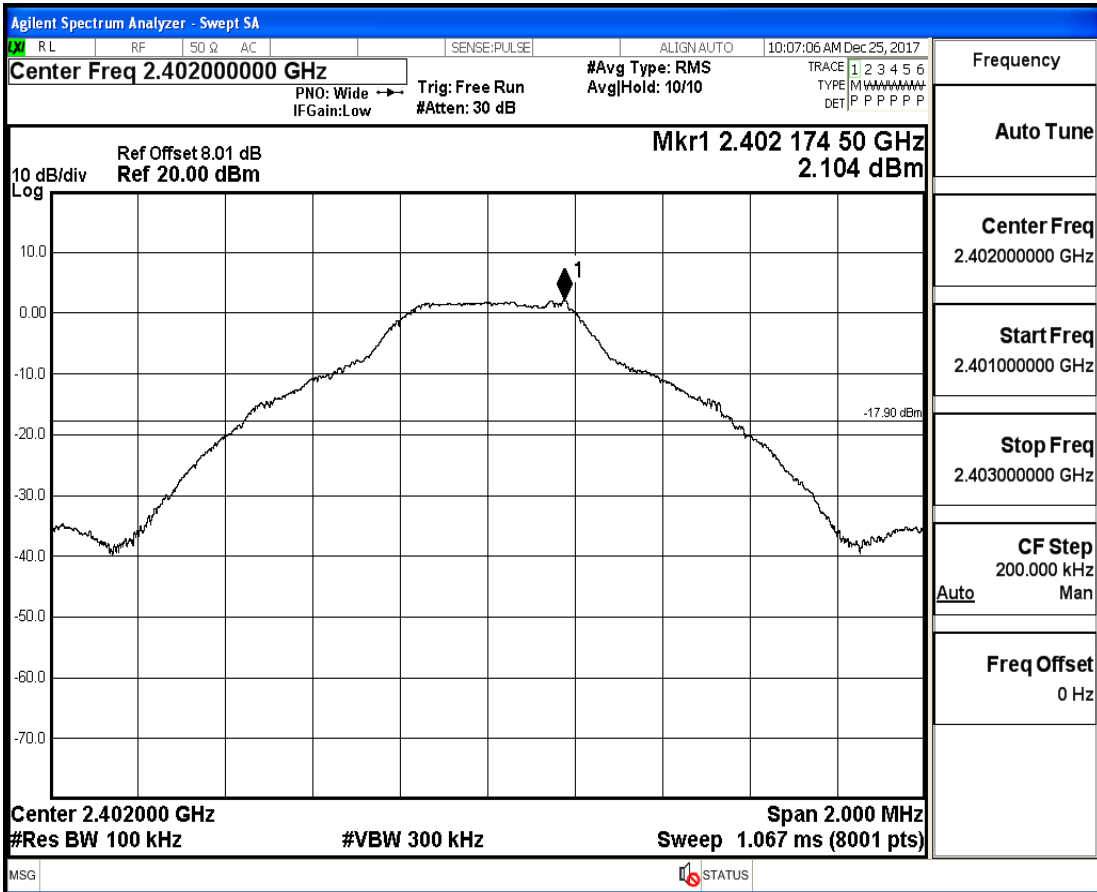


Frequency	
Auto Tune	
Center Freq	2.489000000 GHz
Start Freq	2.478000000 GHz
Stop Freq	2.500000000 GHz
CF Step	2.200000 MHz
Auto Man	
Freq Offset	0 Hz

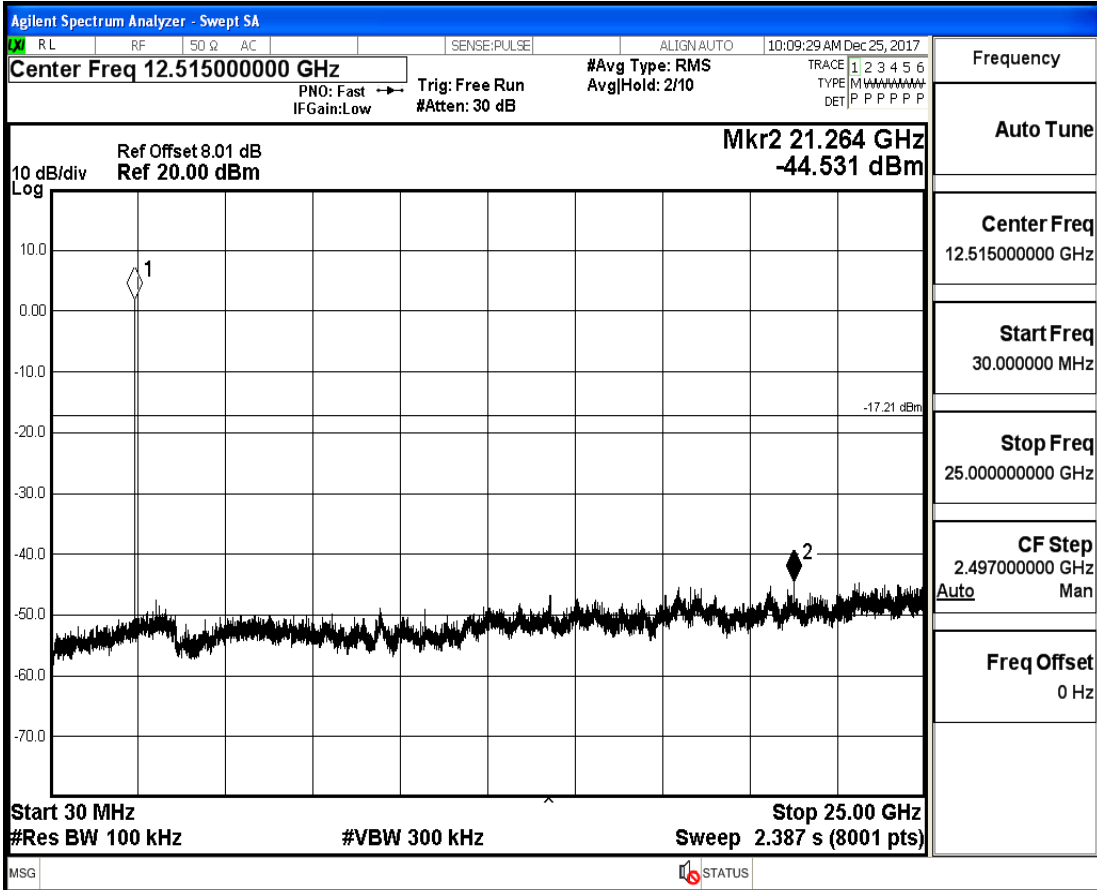
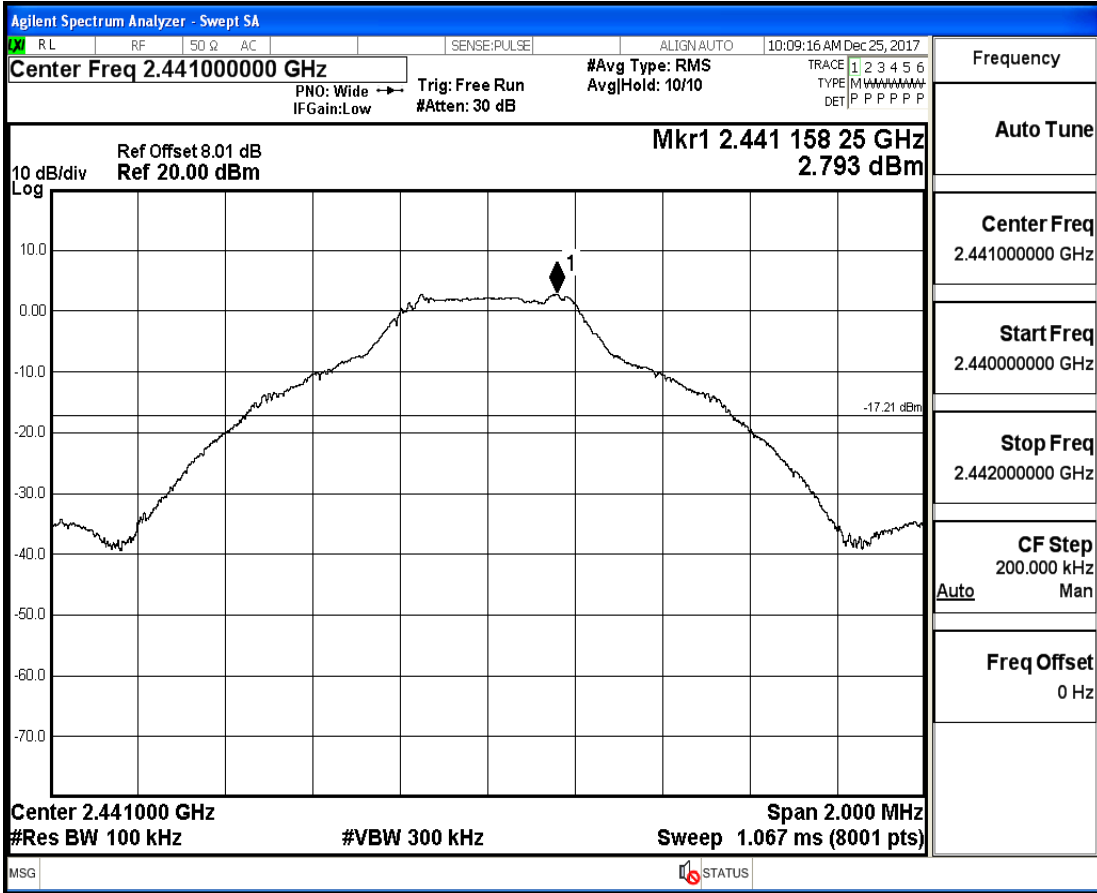
### A.7 RF Conducted Spurious Emissions

Test Mode	Test Channel	StartFre [MHz]	StopFre [MHz]	RBW [kHz]	VBW [kHz]	Pref[dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	2402	30	25000	100	300	2.104	-45.219	<- 17.896	PASS
	2441	30	25000	100	300	2.793	-44.531	<- 17.207	PASS
	2480	30	25000	100	300	2.941	-44.159	<- 17.059	PASS
$\pi/4$ -DQPSK	2402	30	25000	100	300	1.789	-44.442	<- 18.211	PASS
	2441	30	25000	100	300	1.863	-43.844	<- 18.137	PASS
	2480	30	25000	100	300	1.952	-44.371	<- 18.048	PASS
8-DPSK	2402	30	25000	100	300	1.461	-44.663	<- 18.539	PASS
	2441	30	25000	100	300	1.568	-44.744	<- 18.432	PASS
	2480	30	25000	100	300	1.462	-44.737	<- 18.538	PASS

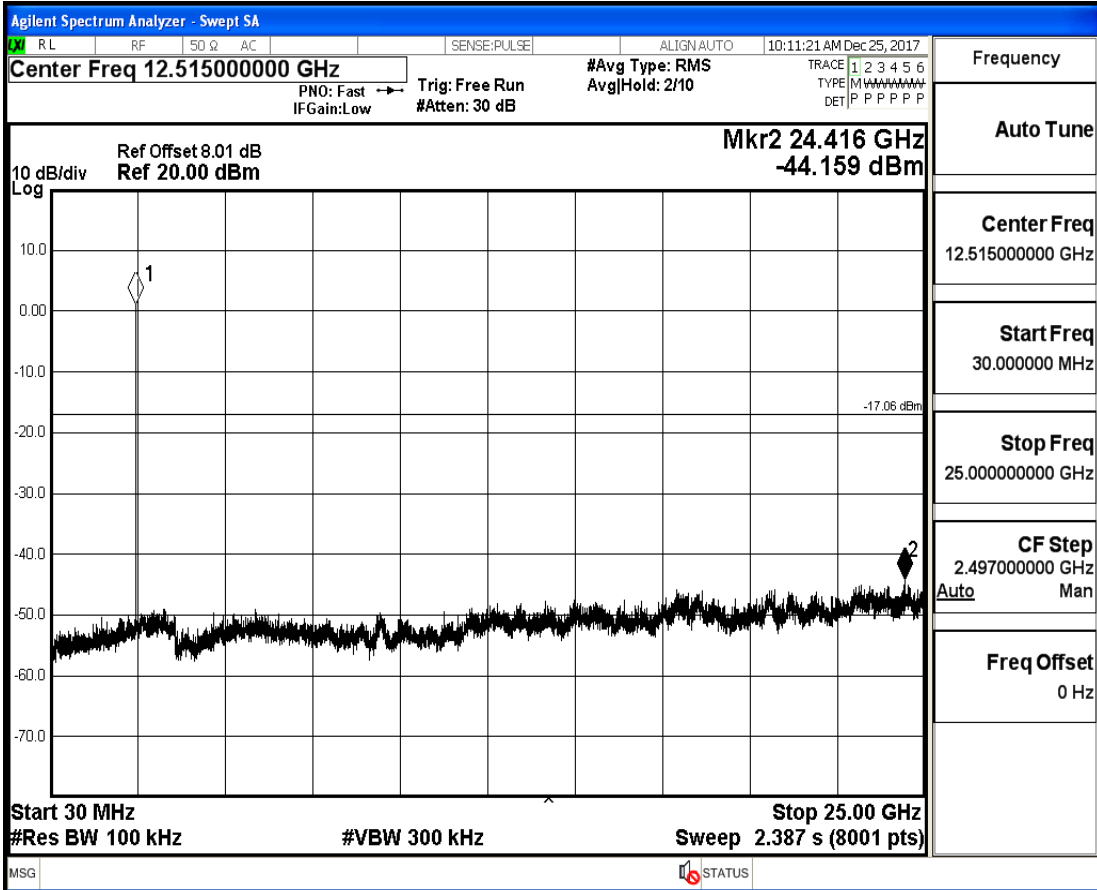
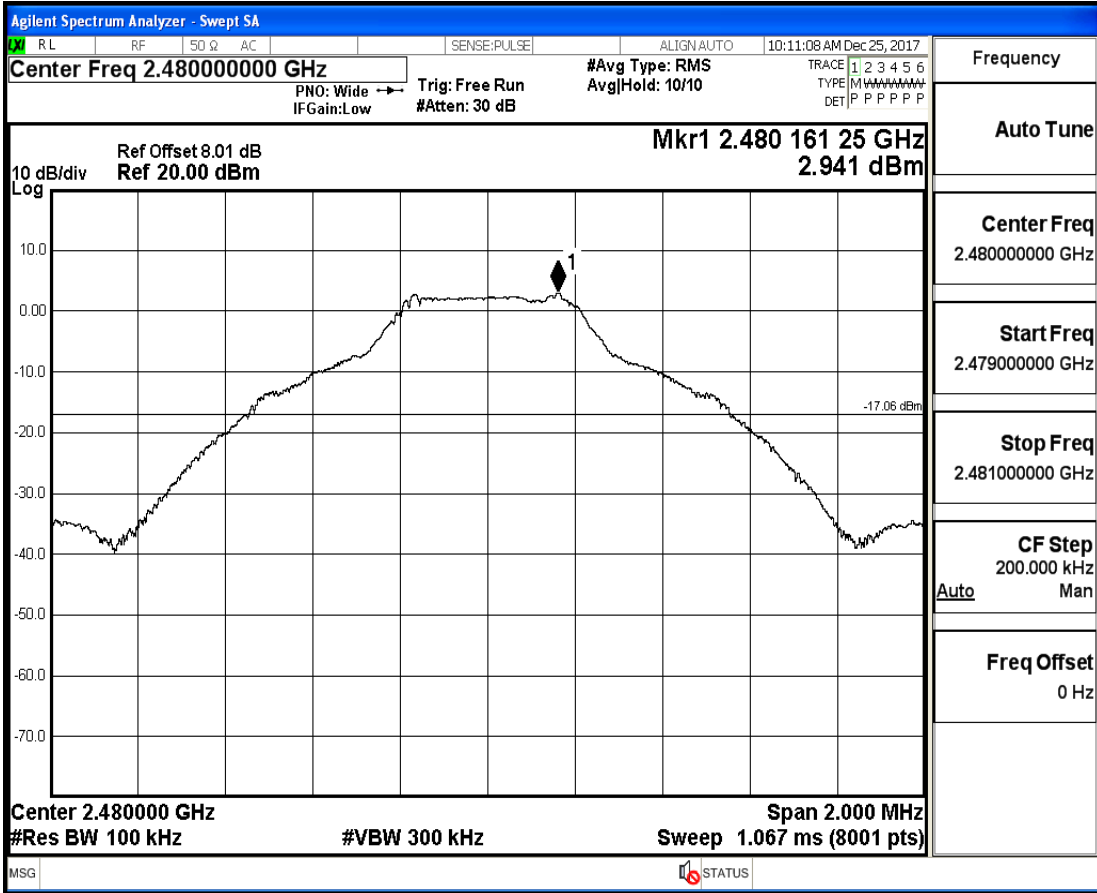
RF Conducted Spurious Emissions\_GFSK\_2402



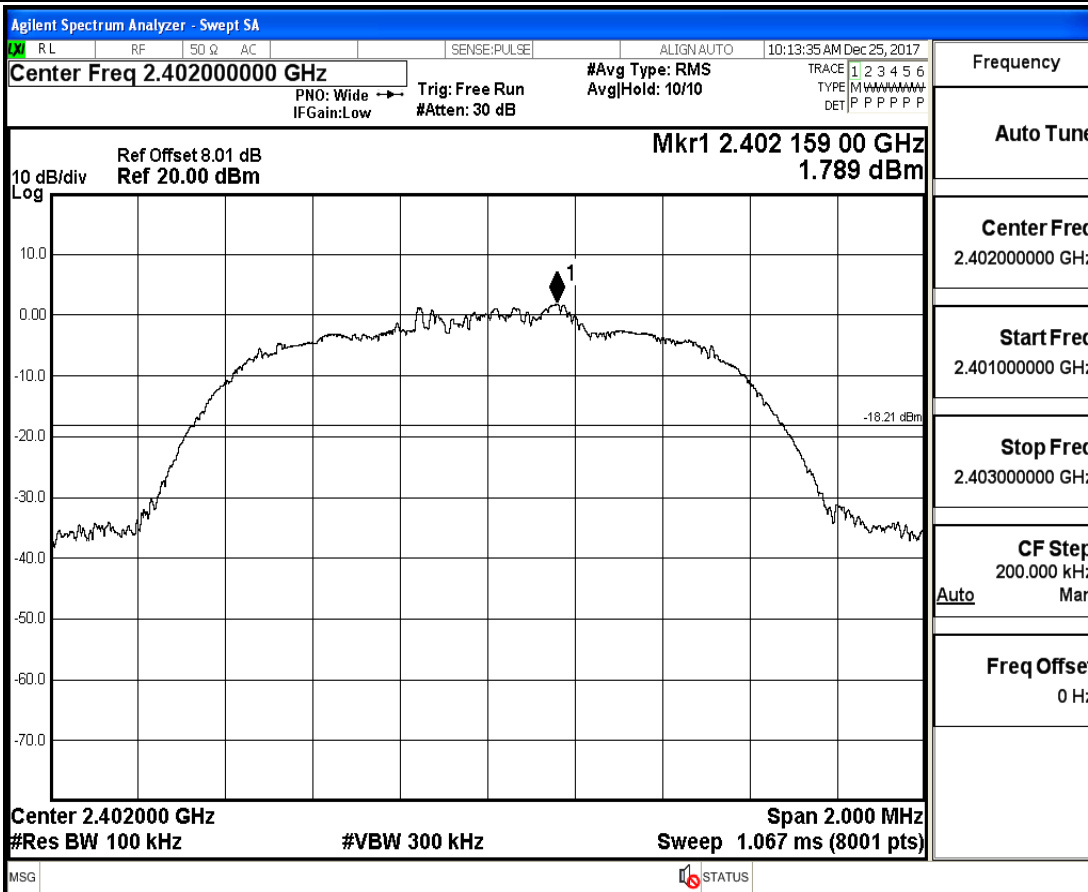
# RF Conducted Spurious Emissions\_GFSK\_2441



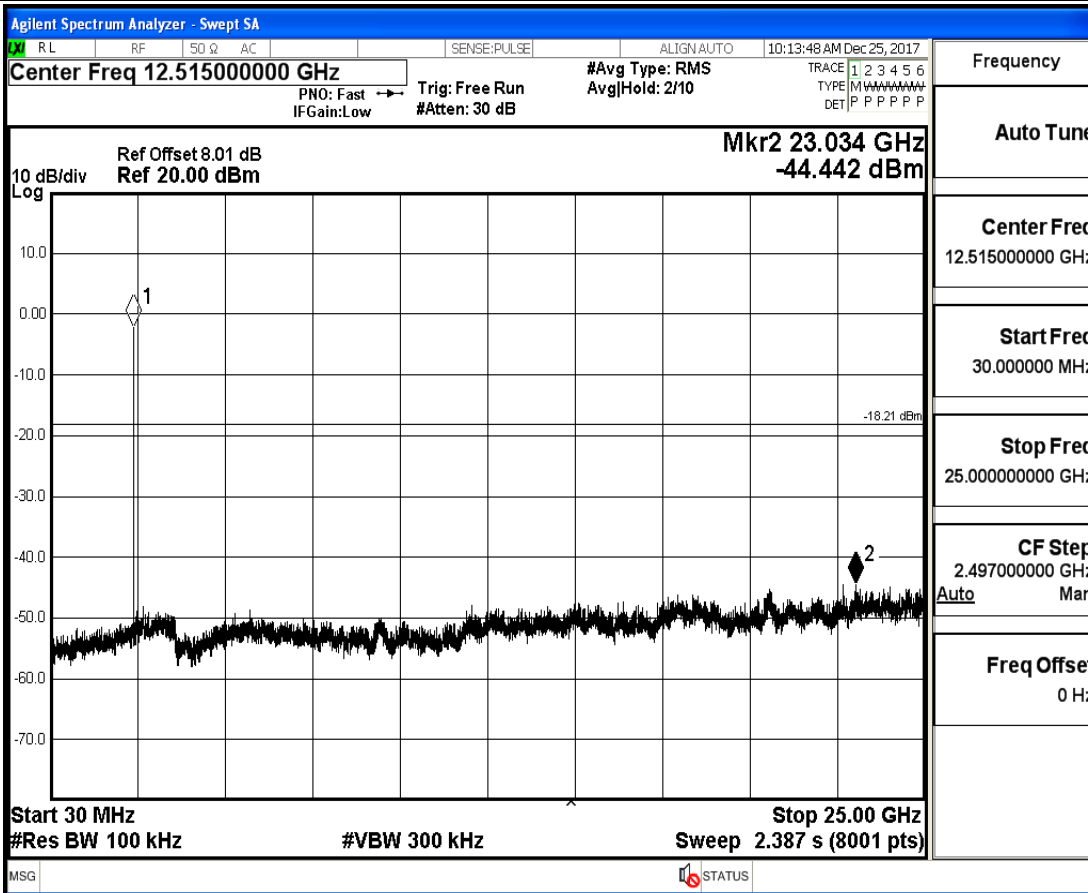
# RF Conducted Spurious Emissions\_GFSK\_2480



RF Conducted Spurious Emissions\_π/4-DQPSK\_2402

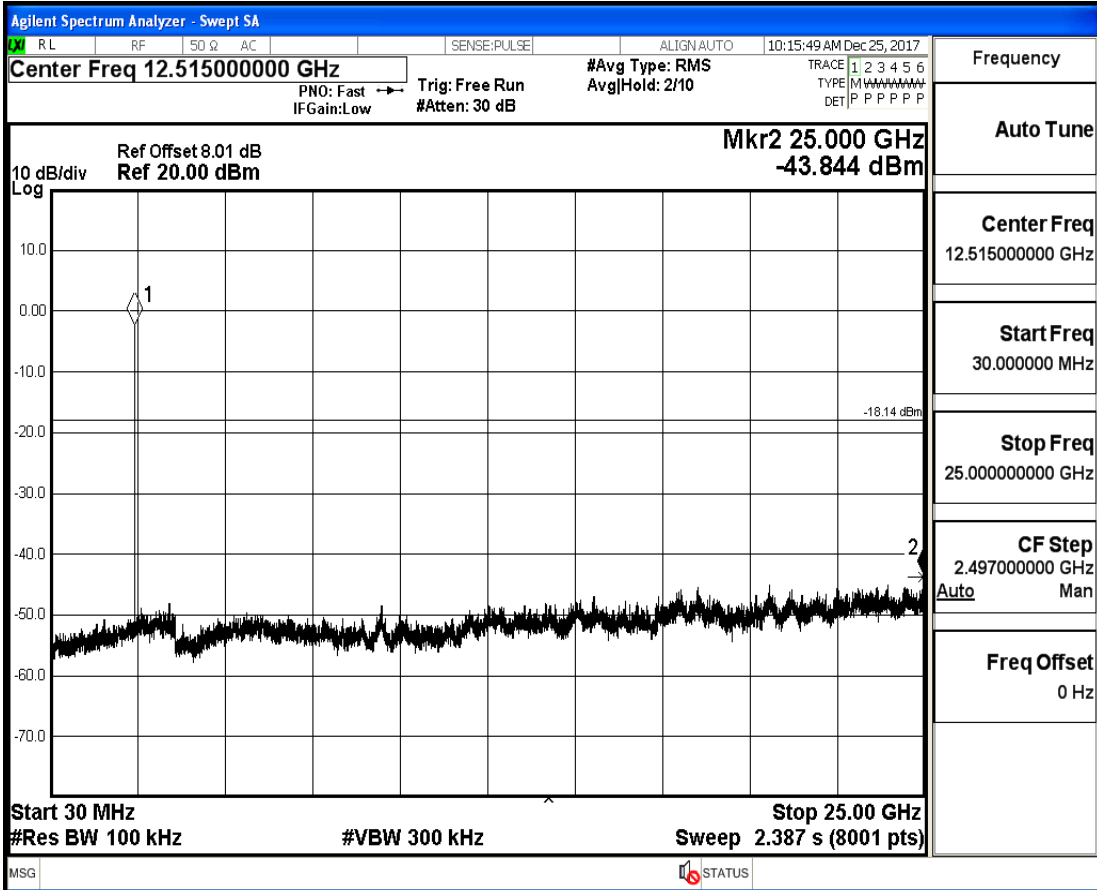
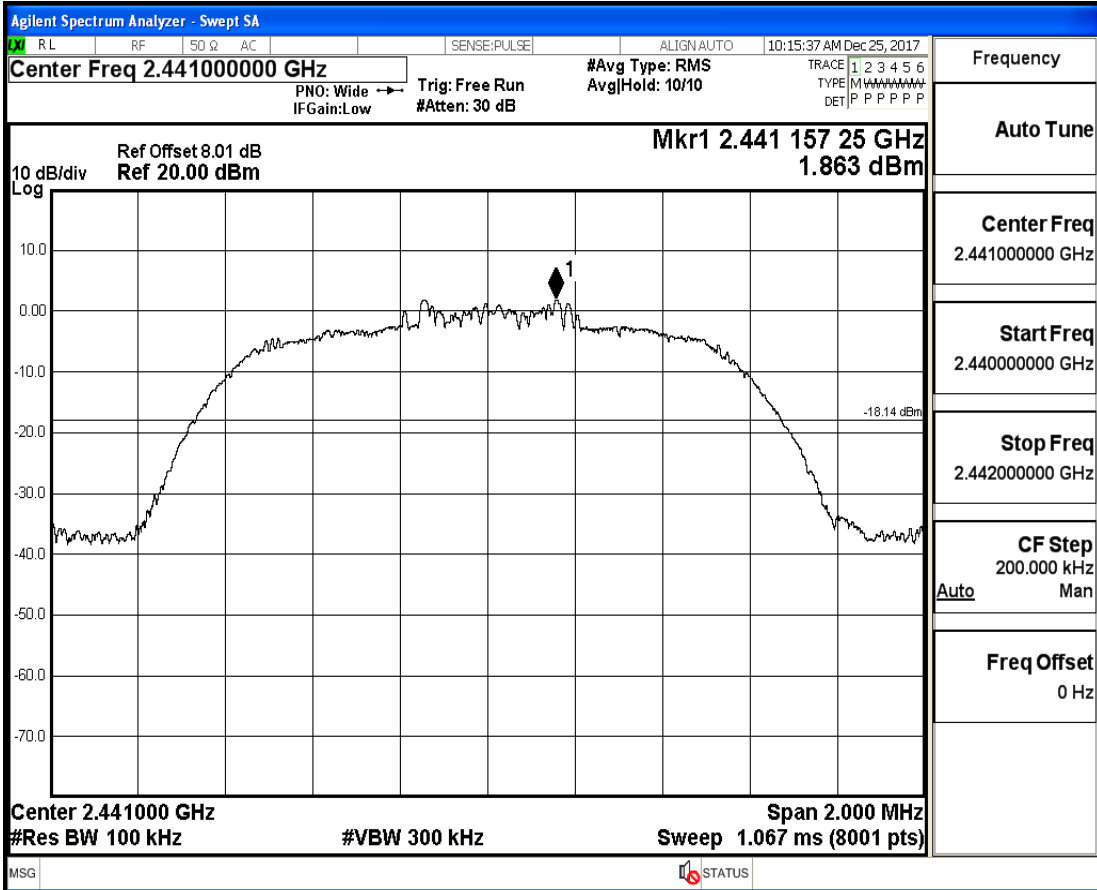


Frequency
Auto Tune
Center Freq 2.402000000 GHz
Start Freq 2.401000000 GHz
Stop Freq 2.403000000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz



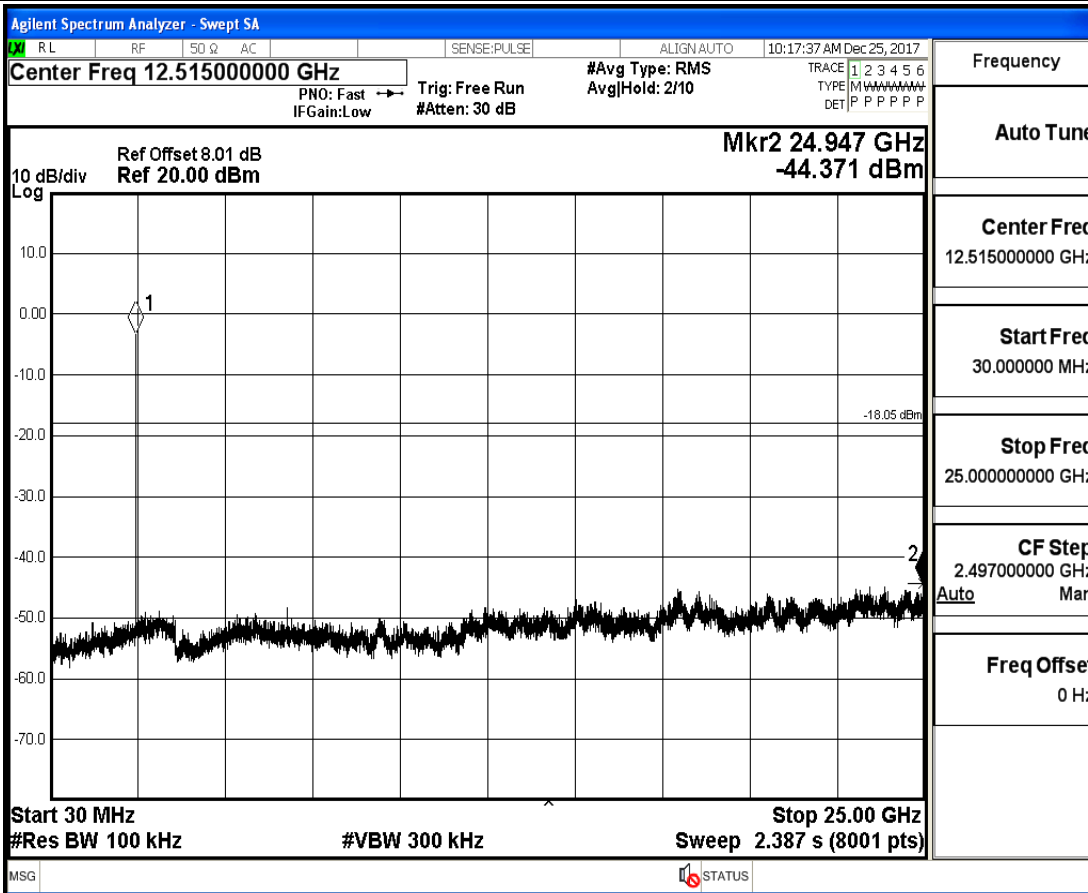
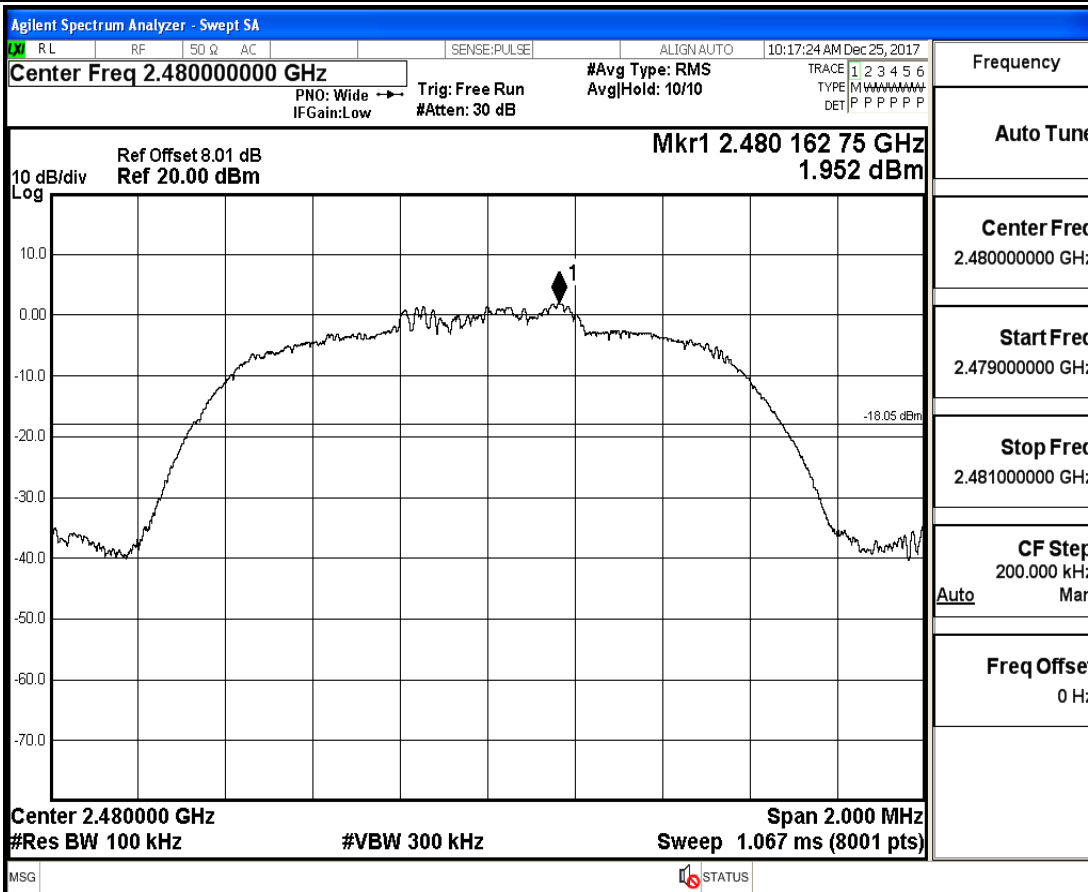
Frequency
Auto Tune
Center Freq 12.515000000 GHz
Start Freq 30.0000000 MHz
Stop Freq 25.000000000 GHz
CF Step 2.497000000 GHz Auto Man
Freq Offset 0 Hz

RF Conducted Spurious Emissions\_π/4-DQPSK\_2441

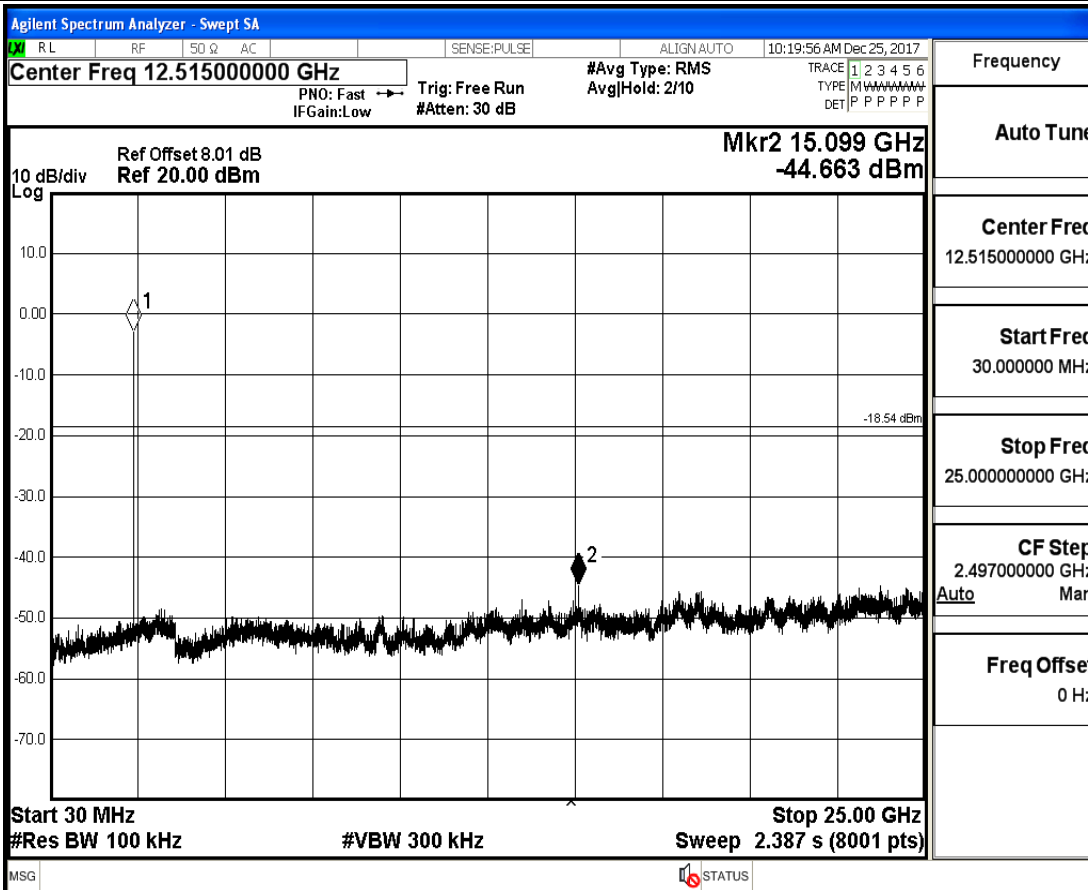
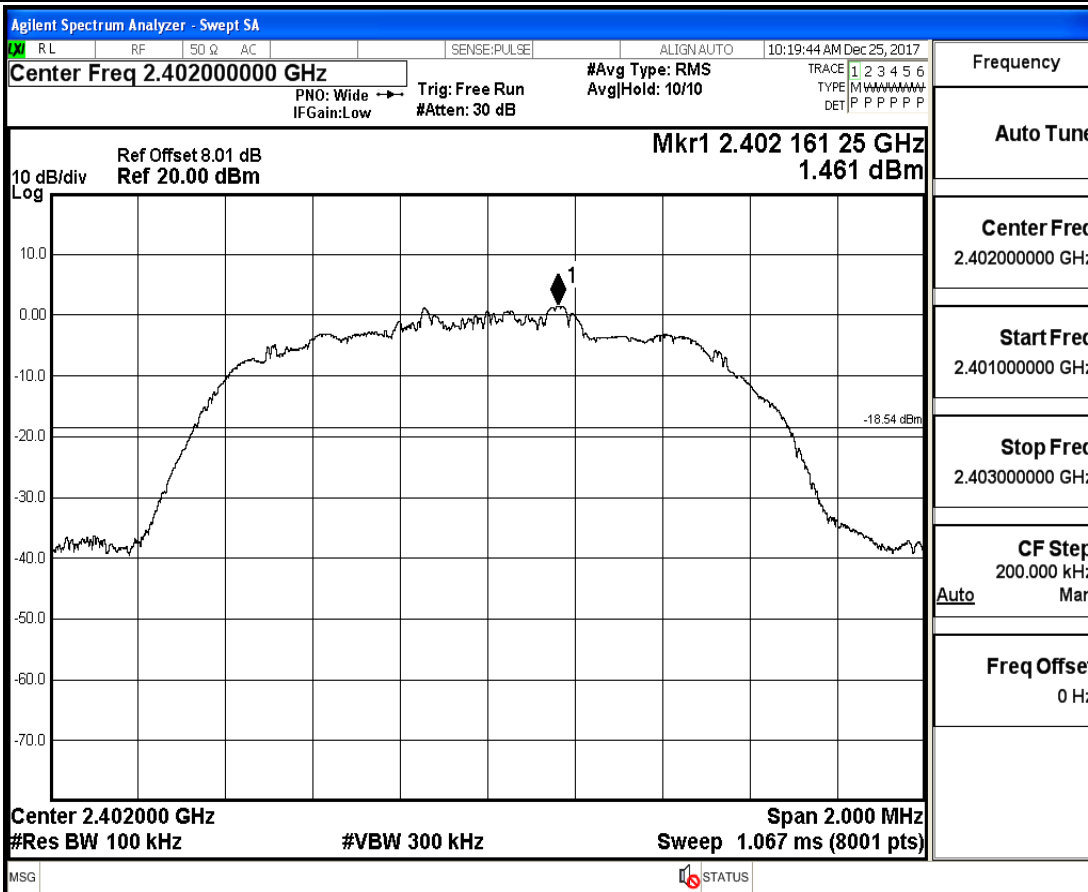




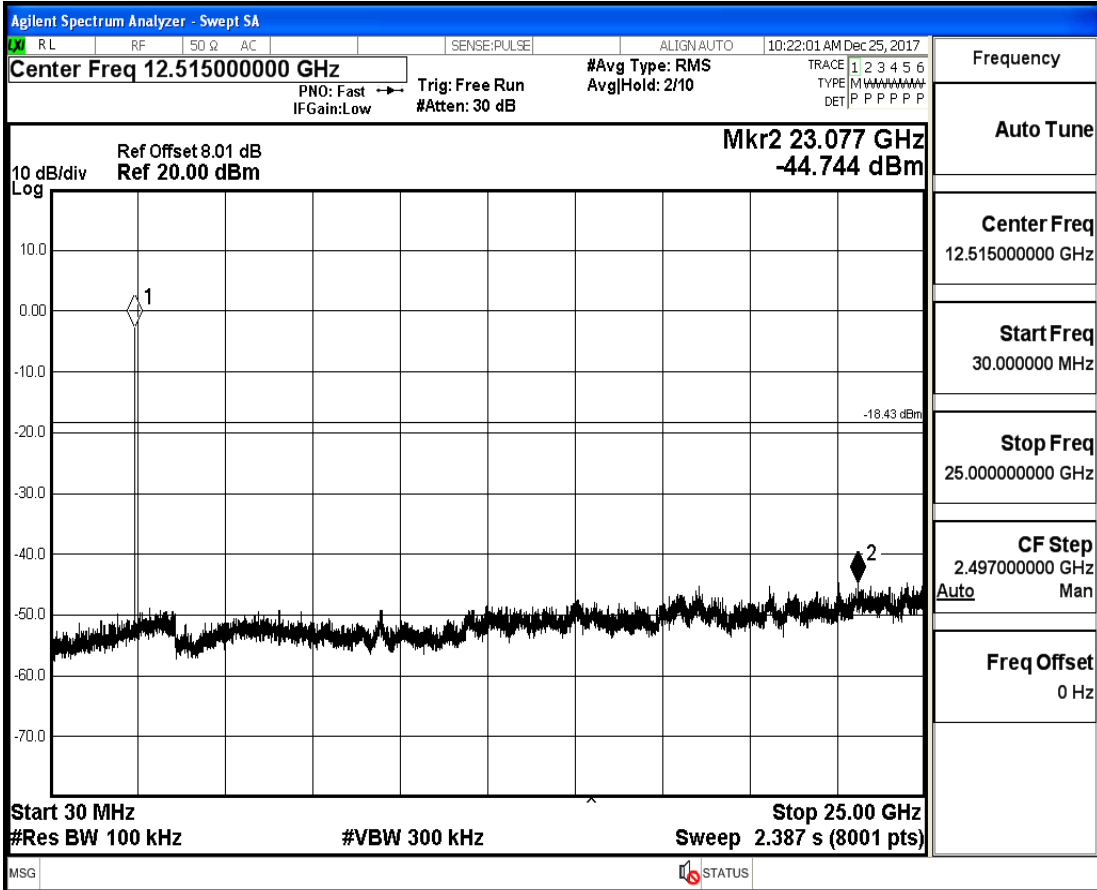
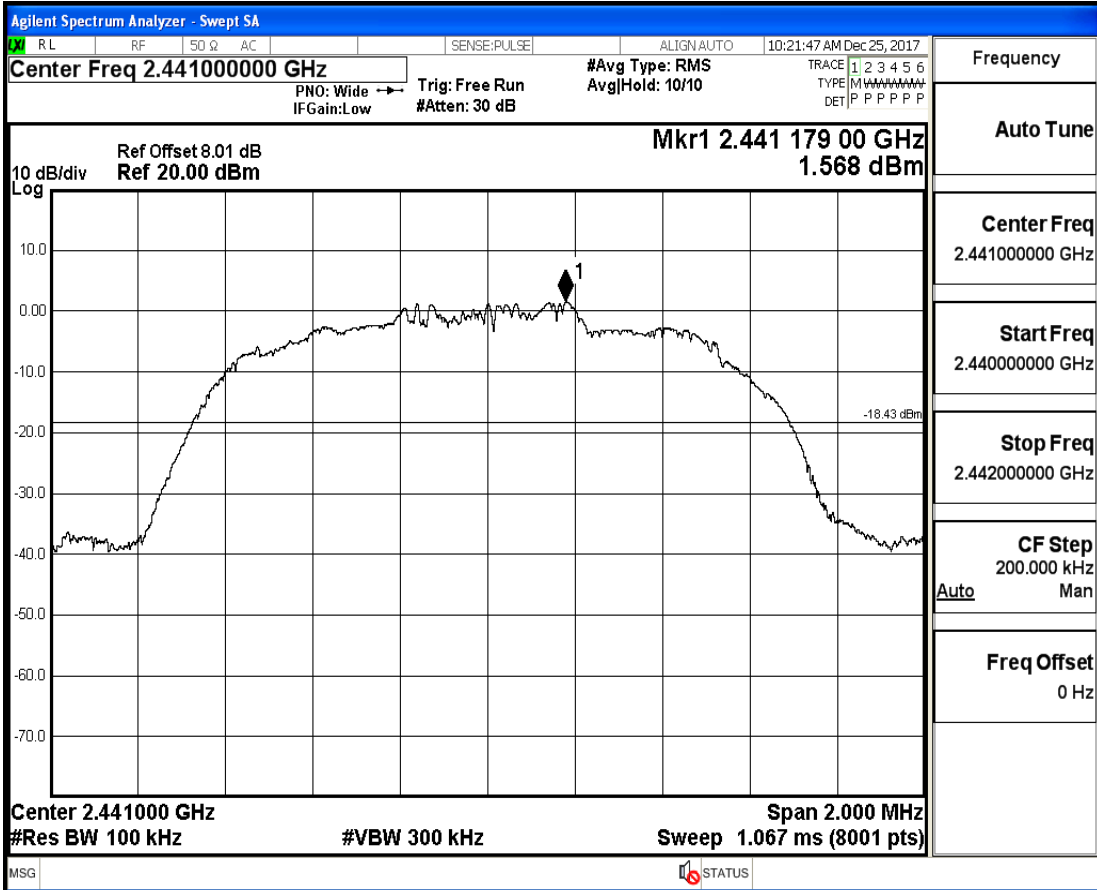
RF Conducted Spurious Emissions\_π/4-DQPSK\_2480



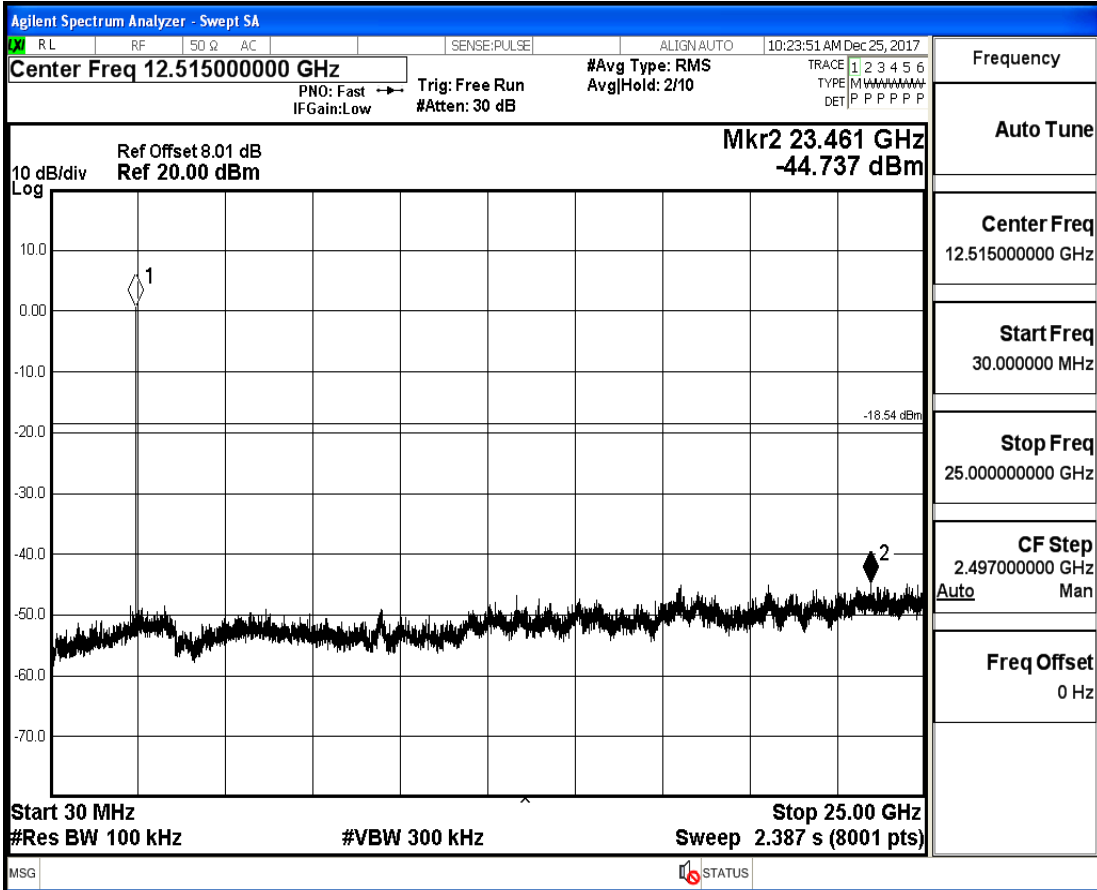
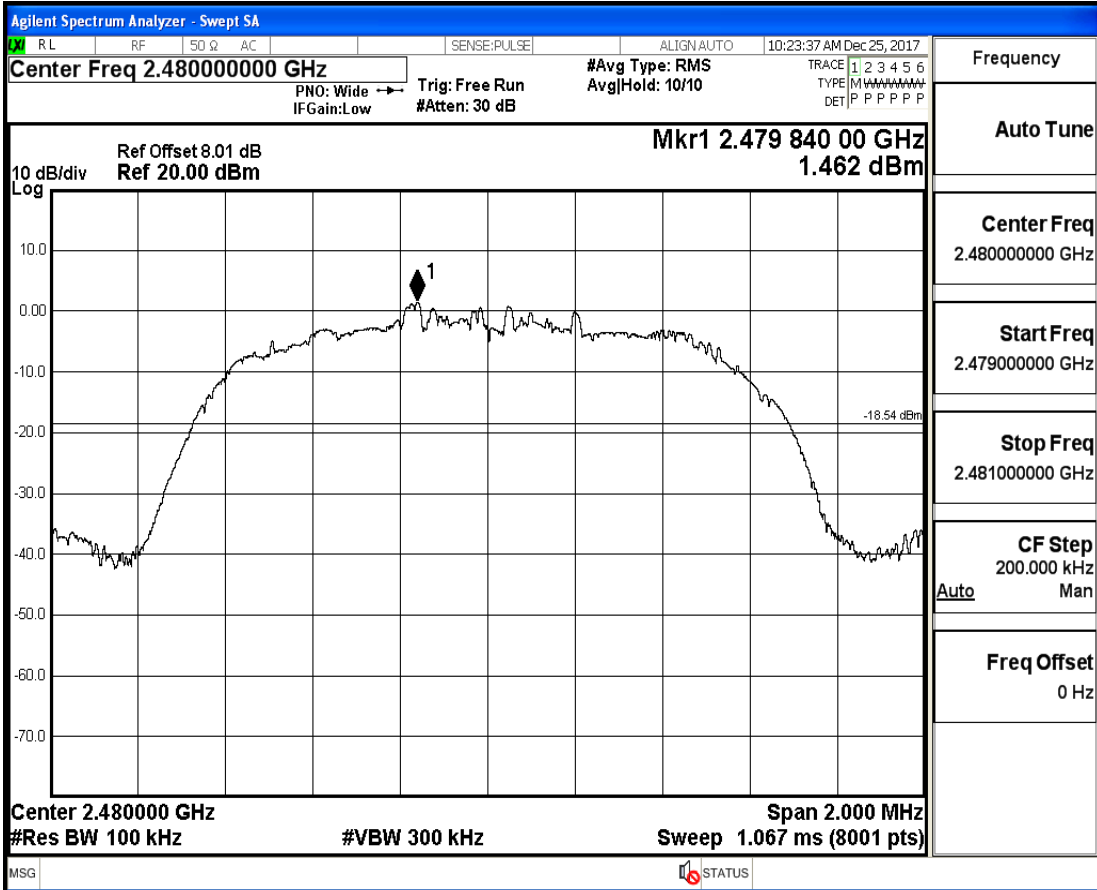
## RF Conducted Spurious Emissions\_8-DPSK\_2402



# RF Conducted Spurious Emissions\_8-DPSK\_2441



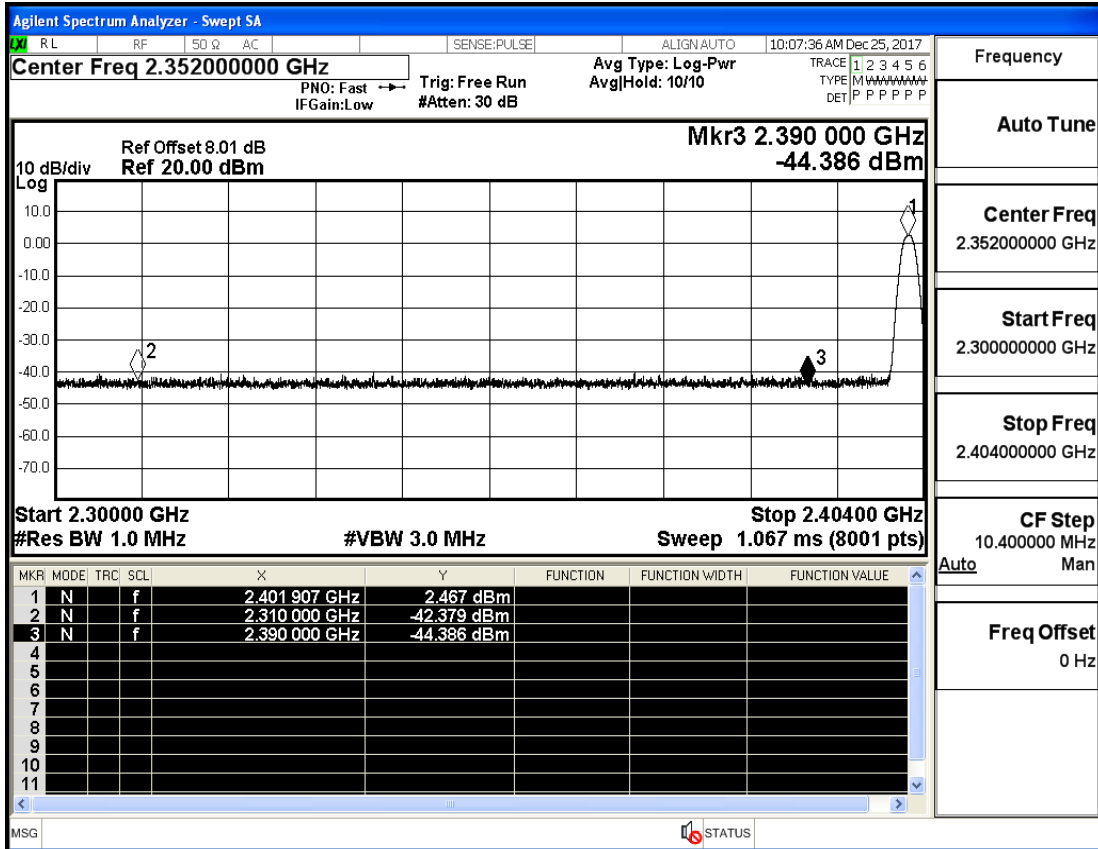
## RF Conducted Spurious Emissions\_8-DPSK\_2480



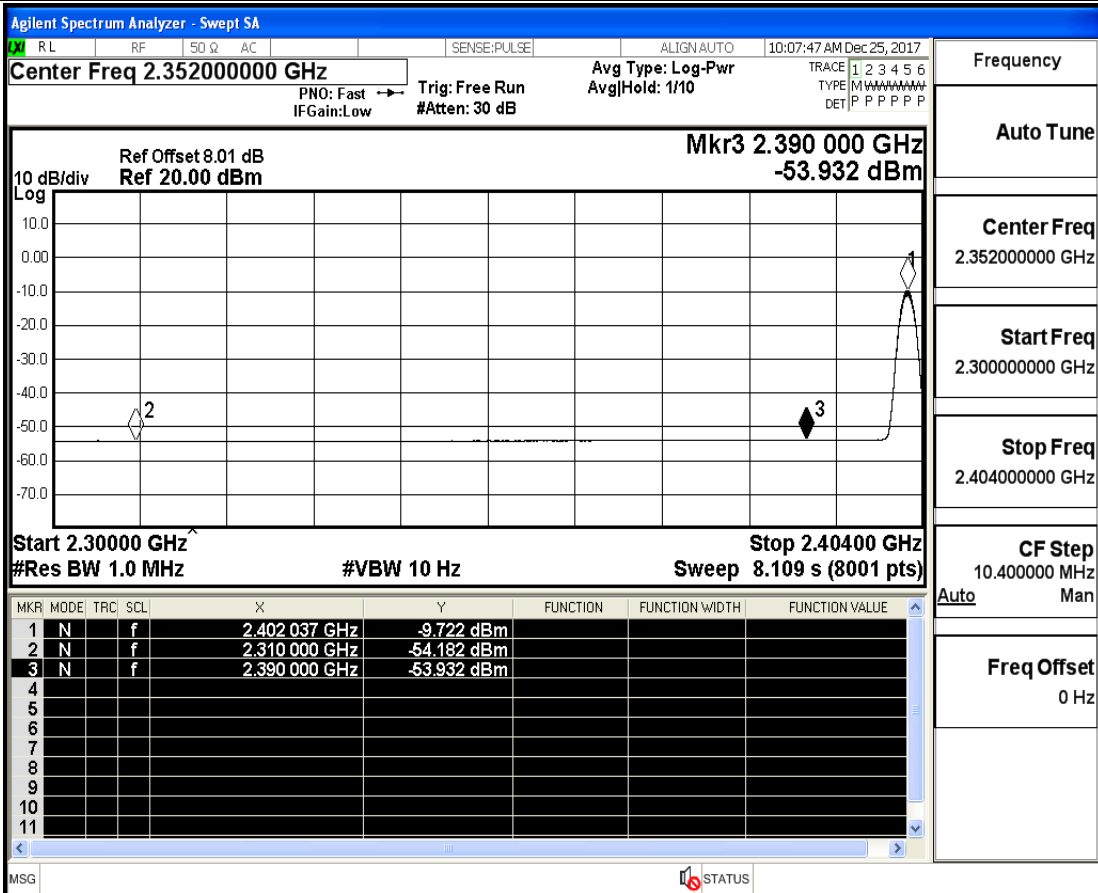
### A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.38	2	0	54.88	PEAK	74	PASS
	Off	2310.0	-54.18	2	0	43.08	AV	54	PASS
	Off	2390.0	-44.39	2	0	52.87	PEAK	74	PASS
	Off	2390.0	-53.93	2	0	43.33	AV	54	PASS
	Off	2483.5	-43.66	2	0	53.60	PEAK	74	PASS
	Off	2483.5	-53.69	2	0	43.57	AV	54	PASS
	Off	2500.0	-43.03	2	0	54.23	PEAK	74	PASS
	Off	2500.0	-53.61	2	0	43.65	AV	54	PASS
$\pi/4$ -DQPSK	Off	2310.0	-43.75	2	0	53.51	PEAK	74	PASS
	Off	2310.0	-54.24	2	0	43.01	AV	54	PASS
	Off	2390.0	-43.19	2	0	54.07	PEAK	74	PASS
	Off	2390.0	-53.93	2	0	43.32	AV	54	PASS
	Off	2483.5	-43.93	2	0	53.33	PEAK	74	PASS
	Off	2483.5	-53.62	2	0	43.64	AV	54	PASS
	Off	2500.0	-43.11	2	0	54.15	PEAK	74	PASS
	Off	2500.0	-53.60	2	0	43.66	AV	54	PASS
8-DPSK	Off	2310.0	-44.14	2	0	53.12	PEAK	74	PASS
	Off	2310.0	-54.22	2	0	43.04	AV	54	PASS
	Off	2390.0	-42.92	2	0	54.34	PEAK	74	PASS
	Off	2390.0	-53.95	2	0	43.31	AV	54	PASS
	Off	2483.5	-43.54	2	0	53.72	PEAK	74	PASS
	Off	2483.5	-53.62	2	0	43.63	AV	54	PASS
	Off	2500.0	-43.54	2	0	53.72	PEAK	74	PASS
	Off	2500.0	-53.61	2	0	43.65	AV	54	PASS

Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK



Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average





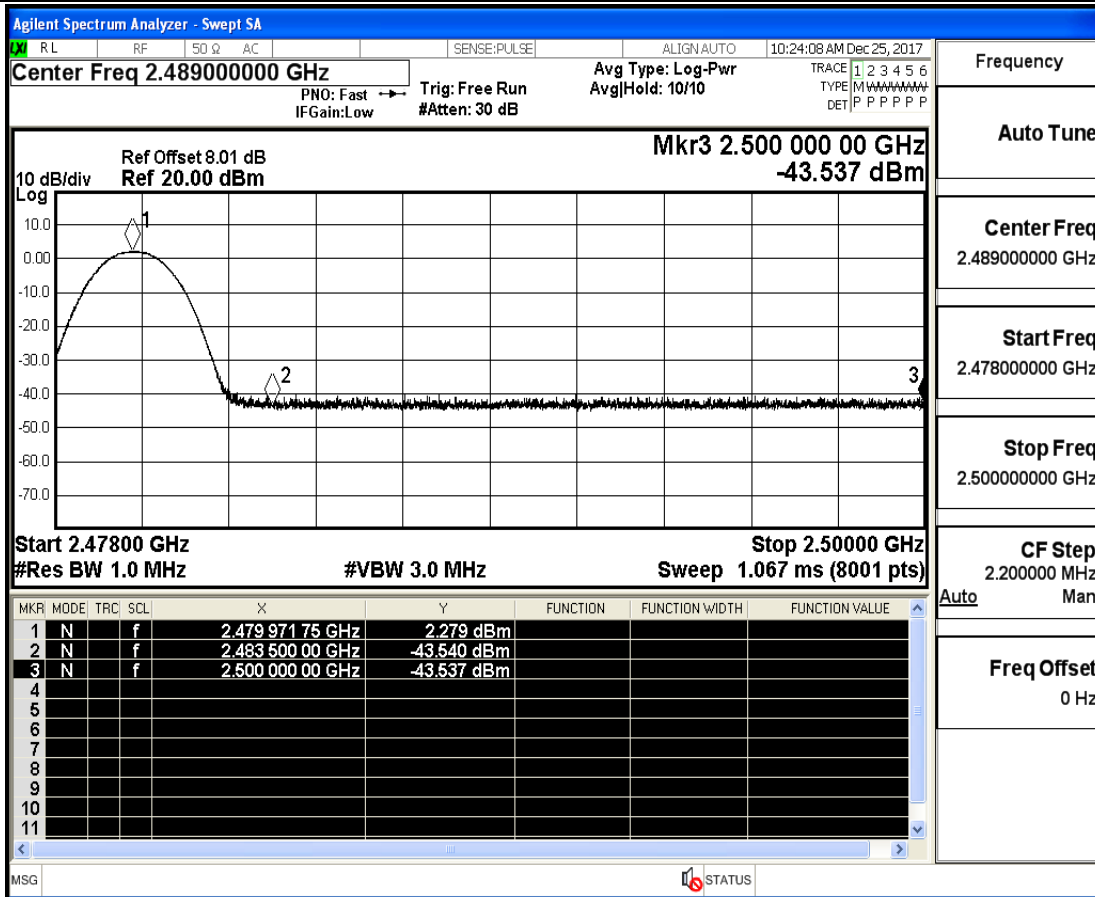








### Restrict-band band-edge measurements\_Hopping Off\_8-DPSK\_PEAK



### Restrict-band band-edge measurements\_Hopping Off\_8-DPSK\_Average

