

Environmental Conditions

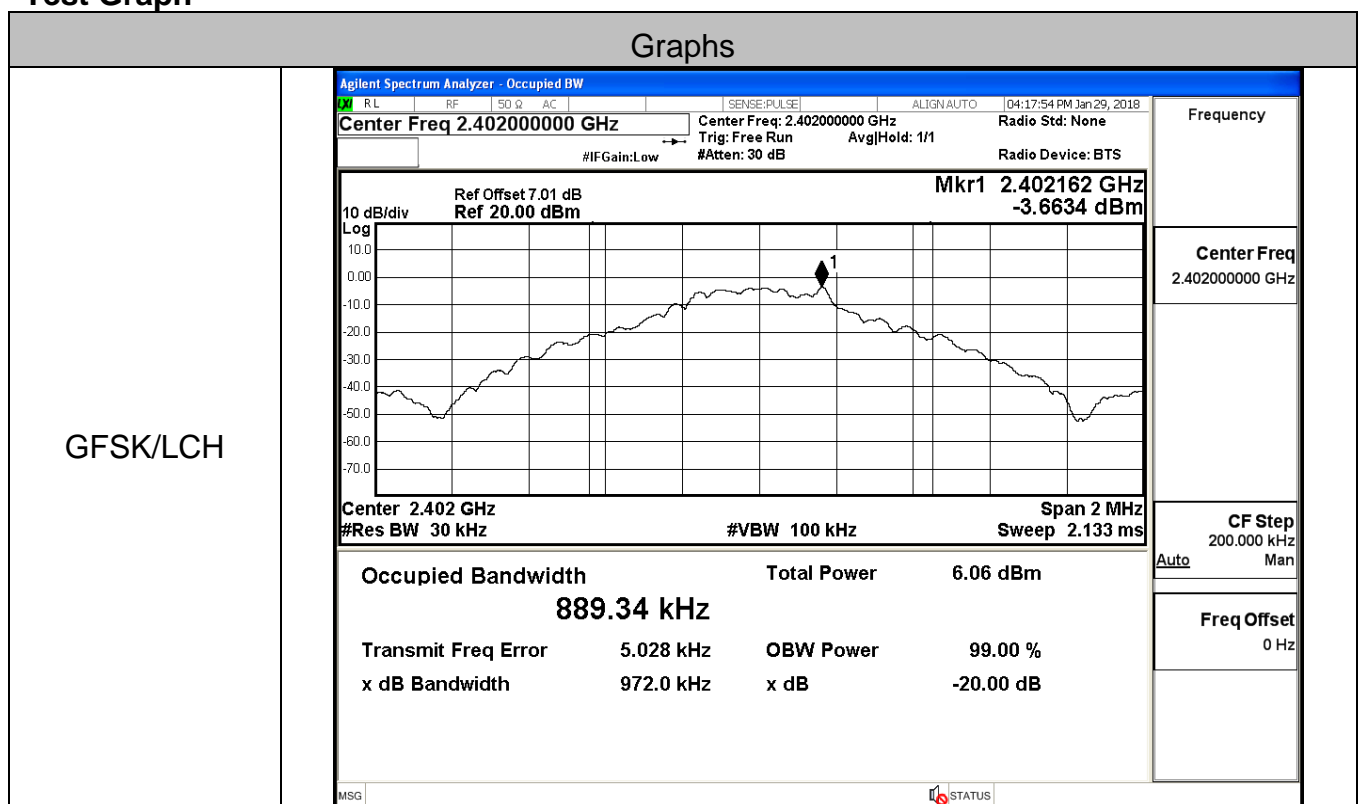
Temperature:	22.9 ° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.xu
Supervised by:	Tom.Liu

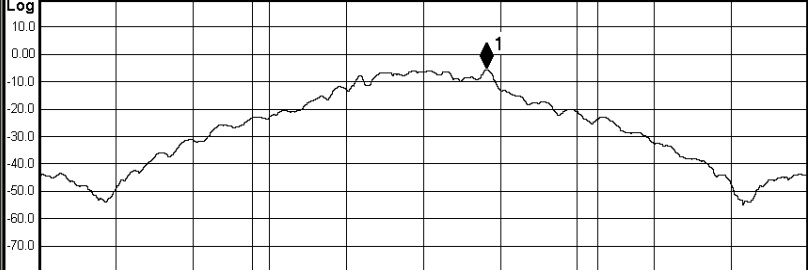
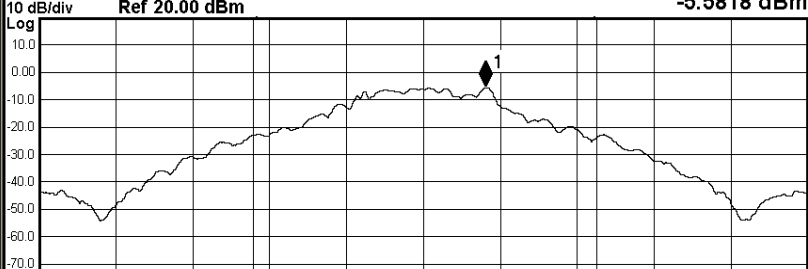
Appendix A): 20dB Bandwidth

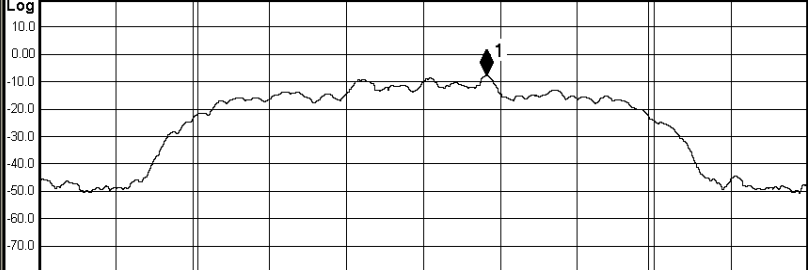
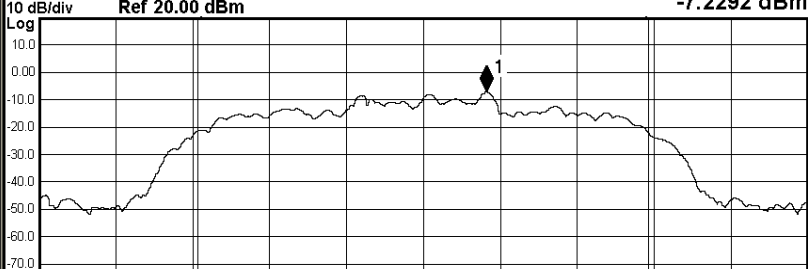
Test Result

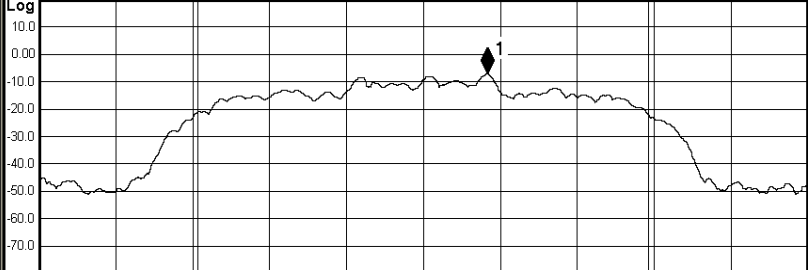
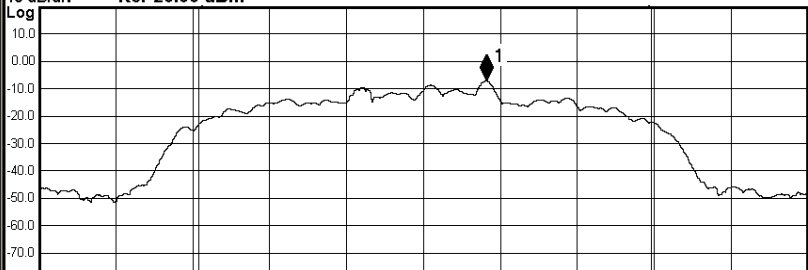
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9720	Not Specified	PASS
	MCH	1.017	Not Specified	PASS
	HCH	1.031	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.287	Not Specified	PASS
	MCH	1.287	Not Specified	PASS
	HCH	1.288	Not Specified	PASS
8DPSK	LCH	1.290	Not Specified	PASS
	MCH	1.290	Not Specified	PASS
	HCH	1.289	Not Specified	PASS

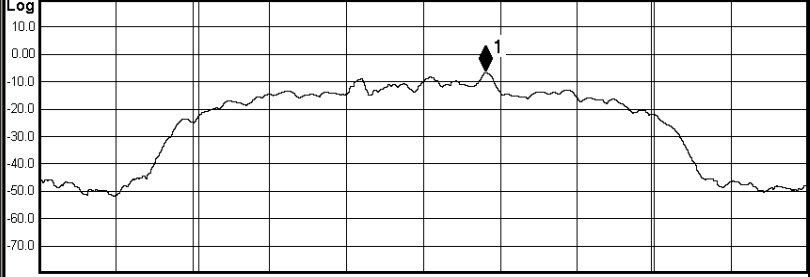
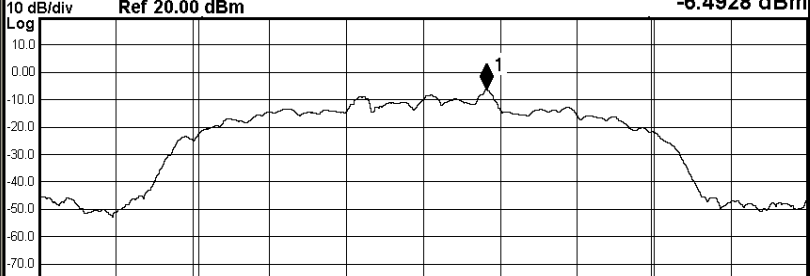
Test Graph



<div>GFSK/MCH</div>	<div><div>Agilent Spectrum Analyzer - Occupied BW</div><div><div><div>RL</div><div>RF</div><div>50 Ω</div><div>AC</div></div><div><div>SENSE:PULSE</div><div>ALIGN:AUTO</div><div>04:25:06 PM Jan 29, 2018</div></div></div><div><div>Center Freq 2.441000000 GHz</div><div>Center Freq: 2.441000000 GHz</div><div>Radio Std: None</div></div><div><div>#IFGain:Low</div><div>Trig: Free Run</div><div>Avg/Hold: 1/1</div><div>Radio Device: BTS</div></div><div><div>10 dB/div</div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.441164 GHz</div><div>-5.6740 dBm</div></div><div></div><div><div>Center 2.441 GHz</div><div>#Res BW 30 kHz</div><div>#VBW 100 kHz</div><div>Span 2 MHz</div><div>Sweep 2.133 ms</div></div><div><div>Occupied Bandwidth</div><div>Total Power</div><div>3.88 dBm</div></div><div><div>894.38 kHz</div></div><div><div>Transmit Freq Error</div><div>5.521 kHz</div><div>OBW Power</div><div>99.00 %</div></div><div><div>x dB Bandwidth</div><div>1.017 MHz</div><div>x dB</div><div>-20.00 dB</div></div><div><div>MSG</div><div>STATUS</div></div></div> <div><div>Frequency</div><div>Center Freq</div><div>2.441000000 GHz</div><div>CF Step</div><div>200.000 kHz</div><div>Auto</div><div>Man</div><div>Freq Offset</div><div>0 Hz</div></div>
<div>GFSK/HCH</div>	<div><div>Agilent Spectrum Analyzer - Occupied BW</div><div><div><div>RL</div><div>RF</div><div>50 Ω</div><div>AC</div></div><div><div>SENSE:PULSE</div><div>ALIGN:AUTO</div><div>04:26:41 PM Jan 29, 2018</div></div></div><div><div>Center Freq 2.480000000 GHz</div><div>Center Freq: 2.480000000 GHz</div><div>Radio Std: None</div></div><div><div>#IFGain:Low</div><div>Trig: Free Run</div><div>Avg/Hold: 1/1</div><div>Radio Device: BTS</div></div><div><div>10 dB/div</div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.480162 GHz</div><div>-5.5818 dBm</div></div><div></div><div><div>Center 2.48 GHz</div><div>#Res BW 30 kHz</div><div>#VBW 100 kHz</div><div>Span 2 MHz</div><div>Sweep 2.133 ms</div></div><div><div>Occupied Bandwidth</div><div>Total Power</div><div>4.14 dBm</div></div><div><div>889.25 kHz</div></div><div><div>Transmit Freq Error</div><div>5.098 kHz</div><div>OBW Power</div><div>99.00 %</div></div><div><div>x dB Bandwidth</div><div>1.031 MHz</div><div>x dB</div><div>-20.00 dB</div></div><div><div>MSG</div><div>STATUS</div></div></div> <div><div>Frequency</div><div>Center Freq</div><div>2.480000000 GHz</div><div>CF Step</div><div>200.000 kHz</div><div>Auto</div><div>Man</div><div>Freq Offset</div><div>0 Hz</div></div>

<div>π/4DQPSK/LCH</div>	<div><div>Agilent Spectrum Analyzer - Occupied BW</div><div><div><div>Center Freq 2.40200000 GHz</div><div>Center Freq: 2.402000000 GHz</div><div>Trig: Free Run</div><div>#IFGain:Low</div><div>#Atten: 30 dB</div></div><div><div>Align: AUTO</div><div>04:29:04 PM Jan 29, 2018</div><div>Radio Std: None</div><div>Radio Device: BTS</div></div></div><div><div>10 dB/div</div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.402164 GHz</div><div>-7.9064 dBm</div><div></div></div><div><div>Center 2.402 GHz</div><div>#Res BW 30 kHz</div><div>#VBW 100 kHz</div><div>Span 2 MHz</div><div>Sweep 2.133 ms</div></div><div><div>Occupied Bandwidth</div><div>1.1666 MHz</div><div>Total Power</div><div>2.19 dBm</div></div><div><div>Transmit Freq Error</div><div>595 Hz</div><div>OBW Power</div><div>99.00 %</div></div><div><div>x dB Bandwidth</div><div>1.287 MHz</div><div>x dB</div><div>-20.00 dB</div></div><div><div>MSG</div><div>STATUS</div></div></div> <div><div>Frequency</div><div>Center Freq</div><div>2.40200000 GHz</div><div>CF Step</div><div>200.000 kHz</div><div>Auto</div><div>Man</div><div>Freq Offset</div><div>0 Hz</div></div>
<div>π/4DQPSK/MCH</div>	<div><div>Agilent Spectrum Analyzer - Occupied BW</div><div><div><div>Center Freq 2.44100000 GHz</div><div>Center Freq: 2.441000000 GHz</div><div>Trig: Free Run</div><div>#IFGain:Low</div><div>#Atten: 30 dB</div></div><div><div>Align: AUTO</div><div>04:31:20 PM Jan 29, 2018</div><div>Radio Std: None</div><div>Radio Device: BTS</div></div></div><div><div>10 dB/div</div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.441164 GHz</div><div>-7.2292 dBm</div><div></div></div><div><div>Center 2.441 GHz</div><div>#Res BW 30 kHz</div><div>#VBW 100 kHz</div><div>Span 2 MHz</div><div>Sweep 2.133 ms</div></div><div><div>Occupied Bandwidth</div><div>1.1654 MHz</div><div>Total Power</div><div>2.75 dBm</div></div><div><div>Transmit Freq Error</div><div>655 Hz</div><div>OBW Power</div><div>99.00 %</div></div><div><div>x dB Bandwidth</div><div>1.287 MHz</div><div>x dB</div><div>-20.00 dB</div></div><div><div>MSG</div><div>STATUS</div></div></div> <div><div>Frequency</div><div>Center Freq</div><div>2.44100000 GHz</div><div>CF Step</div><div>200.000 kHz</div><div>Auto</div><div>Man</div><div>Freq Offset</div><div>0 Hz</div></div>

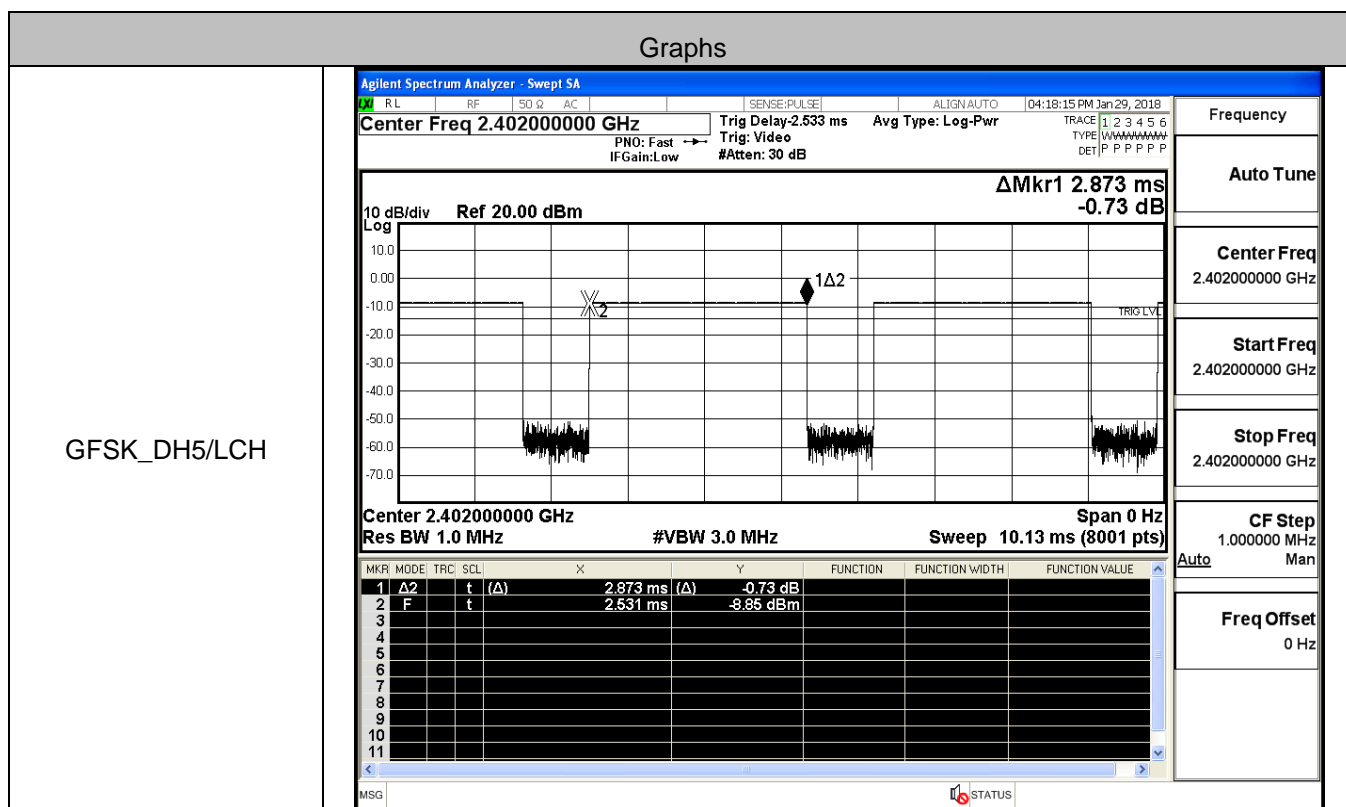
<div>π/4DQPSK/HCH</div>	<div><div>Agilent Spectrum Analyzer - Occupied BW</div><div><div><div>RL</div><div>RF</div><div>50 Ω</div><div>AC</div></div><div><div>SENSE:PULSE</div><div>ALIGN:AUTO</div><div>04:32:54 PM Jan 29, 2018</div></div></div><div><div>Center Freq 2.480000000 GHz</div><div>Center Freq: 2.480000000 GHz</div><div>Radio Std: None</div></div><div><div>#IFGain:Low</div><div>Trig: Free Run</div><div>Avg Hold: 1/1</div><div>Radio Device: BTS</div></div><div><div>10 dB/div</div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.480166 GHz</div><div>-7.2370 dBm</div></div><div></div><div><div>Center 2.48 GHz</div><div>#Res BW 30 kHz</div><div>#VBW 100 kHz</div><div>Span 2 MHz</div><div>Sweep 2.133 ms</div></div><div><div>Occupied Bandwidth</div><div>Total Power</div><div>2.86 dBm</div></div><div><div>1.1658 MHz</div></div><div><div>Transmit Freq Error</div><div>922 Hz</div><div>OBW Power</div><div>99.00 %</div></div><div><div>x dB Bandwidth</div><div>1.288 MHz</div><div>x dB</div><div>-20.00 dB</div></div><div><div>MSG</div><div>STATUS</div></div></div> <div><div>Frequency</div><div>Center Freq</div><div>2.480000000 GHz</div><div>CF Step</div><div>200.000 kHz</div><div>Auto</div><div>Man</div><div>Freq Offset</div><div>0 Hz</div></div>
<div>8DPSK/LCH</div>	<div><div>Agilent Spectrum Analyzer - Occupied BW</div><div><div><div>RL</div><div>RF</div><div>50 Ω</div><div>AC</div></div><div><div>SENSE:PULSE</div><div>ALIGN:AUTO</div><div>04:35:16 PM Jan 29, 2018</div></div></div><div><div>Center Freq 2.402000000 GHz</div><div>Center Freq: 2.402000000 GHz</div><div>Radio Std: None</div></div><div><div>#IFGain:Low</div><div>Trig: Free Run</div><div>Avg Hold: 1/1</div><div>Radio Device: BTS</div></div><div><div>10 dB/div</div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.402164 GHz</div><div>-7.1132 dBm</div></div><div></div><div><div>Center 2.402 GHz</div><div>#Res BW 30 kHz</div><div>#VBW 100 kHz</div><div>Span 2 MHz</div><div>Sweep 2.133 ms</div></div><div><div>Occupied Bandwidth</div><div>Total Power</div><div>2.11 dBm</div></div><div><div>1.1729 MHz</div></div><div><div>Transmit Freq Error</div><div>4.514 kHz</div><div>OBW Power</div><div>99.00 %</div></div><div><div>x dB Bandwidth</div><div>1.290 MHz</div><div>x dB</div><div>-20.00 dB</div></div><div><div>MSG</div><div>STATUS</div></div></div> <div><div>Frequency</div><div>Center Freq</div><div>2.402000000 GHz</div><div>CF Step</div><div>200.000 kHz</div><div>Auto</div><div>Man</div><div>Freq Offset</div><div>0 Hz</div></div>

<div>8DPSK/MCH</div>	<div><div>Agilent Spectrum Analyzer - Occupied BW</div><div><div><div>RL</div><div>RF</div><div>50 Ω</div><div>AC</div></div><div><div>SENSE:PULSE</div><div>ALIGN:AUTO</div><div>04:37:49 PM Jan 29, 2018</div></div></div><div><div>Center Freq 2.441000000 GHz</div><div>Center Freq: 2.441000000 GHz</div><div>Radio Std: None</div></div><div><div>#IFGain:Low</div><div>Trig: Free Run</div><div>Avg Hold: 1/1</div><div>Radio Device: BTS</div></div><div><div>10 dB/div</div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.441162 GHz</div><div>-6.6163 dBm</div></div><div></div><div><div>Center 2.441 GHz</div><div>#Res BW 30 kHz</div><div>#VBW 100 kHz</div><div>Span 2 MHz</div><div>Sweep 2.133 ms</div></div><div><div>Occupied Bandwidth</div><div>Total Power</div><div>2.47 dBm</div></div><div><div>1.1747 MHz</div></div><div><div>Transmit Freq Error</div><div>4.580 kHz</div><div>OBW Power</div><div>99.00 %</div></div><div><div>x dB Bandwidth</div><div>1.290 MHz</div><div>x dB</div><div>-20.00 dB</div></div><div><div>Frequency</div><div>Center Freq</div><div>2.441000000 GHz</div></div><div><div>CF Step</div><div>200.000 kHz</div><div>Auto</div><div>Man</div></div><div><div>Freq Offset</div><div>0 Hz</div></div><div><div>MSG</div><div>STATUS</div></div></div>
<div>8DPSK/HCH</div>	<div><div>Agilent Spectrum Analyzer - Occupied BW</div><div><div><div>RL</div><div>RF</div><div>50 Ω</div><div>AC</div></div><div><div>SENSE:PULSE</div><div>ALIGN:AUTO</div><div>04:39:23 PM Jan 29, 2018</div></div></div><div><div>Center Freq 2.480000000 GHz</div><div>Center Freq: 2.480000000 GHz</div><div>Radio Std: None</div></div><div><div>#IFGain:Low</div><div>Trig: Free Run</div><div>Avg Hold: 1/1</div><div>Radio Device: BTS</div></div><div><div>10 dB/div</div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.480164 GHz</div><div>-6.4928 dBm</div></div><div></div><div><div>Center 2.48 GHz</div><div>#Res BW 30 kHz</div><div>#VBW 100 kHz</div><div>Span 2 MHz</div><div>Sweep 2.133 ms</div></div><div><div>Occupied Bandwidth</div><div>Total Power</div><div>2.67 dBm</div></div><div><div>1.1720 MHz</div></div><div><div>Transmit Freq Error</div><div>4.658 kHz</div><div>OBW Power</div><div>99.00 %</div></div><div><div>x dB Bandwidth</div><div>1.289 MHz</div><div>x dB</div><div>-20.00 dB</div></div><div><div>Frequency</div><div>Center Freq</div><div>2.480000000 GHz</div></div><div><div>CF Step</div><div>200.000 kHz</div><div>Auto</div><div>Man</div></div><div><div>Freq Offset</div><div>0 Hz</div></div><div><div>MSG</div><div>STATUS</div></div></div>

Appendix B): Dwell Time Result Table

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.87	106.7	0.306	0.4	PASS
GFSK	DH5	MCH	2.87	106.7	0.306	0.4	PASS
GFSK	DH5	HCH	2.87	106.7	0.306	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.87	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	2.87	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	2.87	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.87	106.7	0.307	0.4	PASS
8DPSK	3DH5	MCH	2.87	106.7	0.307	0.4	PASS
8DPSK	3DH5	HCH	2.87	106.7	0.307	0.4	PASS

Test Graph



$\pi/4$ DQPSK
_2DH5/LCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.402000000 GHz

Ref 20.00 dBm

Span 0 Hz

Res BW 1.0 MHz

#VBW 3.0 MHz

Sweep 10.13 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ 2	t	(Δ)	2.402000000	1.17 dB			
2	F	t		2.402000000	-13.85 dBm			

Frequency

Auto Tune

Center Freq
2.402000000 GHz

Start Freq
2.402000000 GHz

Stop Freq
2.402000000 GHz

CF Step
1.000000 MHz

Freq Offset
0 Hz

$\pi/4$ DQPSK
_2DH5/MCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.441000000 GHz

Ref 20.00 dBm

Span 0 Hz

Res BW 1.0 MHz

#VBW 3.0 MHz

Sweep 10.13 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ 2	t	(Δ)	2.441000000	-2.03 dB			
2	F	t		2.441000000	-12.01 dBm			

Frequency

Auto Tune

Center Freq
2.441000000 GHz

Start Freq
2.441000000 GHz

Stop Freq
2.441000000 GHz

CF Step
1.000000 MHz

Freq Offset
0 Hz

<

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.441000000 GHz

Ref 20.00 dBm

ΔMkr1 2.879 ms -2.13 dB

10 dB/div

Log

Trig Delay-2.533 ms

Avg Type: Log-Pwr

Trig: Video

PN0: Fast

IFGain:Low

#Atten: 30 dB

Frequency

Auto Tune

Center Freq 2.441000000 GHz

Start Freq 2.441000000 GHz

Stop Freq 2.441000000 GHz

CF Step 1.000000 MHz

Man

Freq Offset 0 Hz

Center 2.441000000 GHz

Res BW 1.0 MHz

#VBW 3.0 MHz

Sweep 10.13 ms (8001 pts)

Span 0 Hz

Auto

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	t	(Δ)	2.879 ms	(Δ)	-2.13 dB		
2	F	t		2.151 ms		-12.43 dBm		
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSG

STATUS

8DPSK_3DH5/MCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.480000000 GHz

Ref 20.00 dBm

ΔMkr1 2.878 ms -1.09 dB

10 dB/div

Log

Trig Delay-2.533 ms

Avg Type: Log-Pwr

Trig: Video

PN0: Fast

IFGain:Low

#Atten: 30 dB

Frequency

Auto Tune

Center Freq 2.480000000 GHz

Start Freq 2.480000000 GHz

Stop Freq 2.480000000 GHz

CF Step 1.000000 MHz

Man

Freq Offset 0 Hz

Center 2.480000000 GHz

Res BW 1.0 MHz

#VBW 3.0 MHz

Sweep 10.13 ms (8001 pts)

Span 0 Hz

Auto

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	t	(Δ)	2.878 ms	(Δ)	-1.09 dB		
2	F	t		3.544 ms		-11.78 dBm		
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSG

STATUS

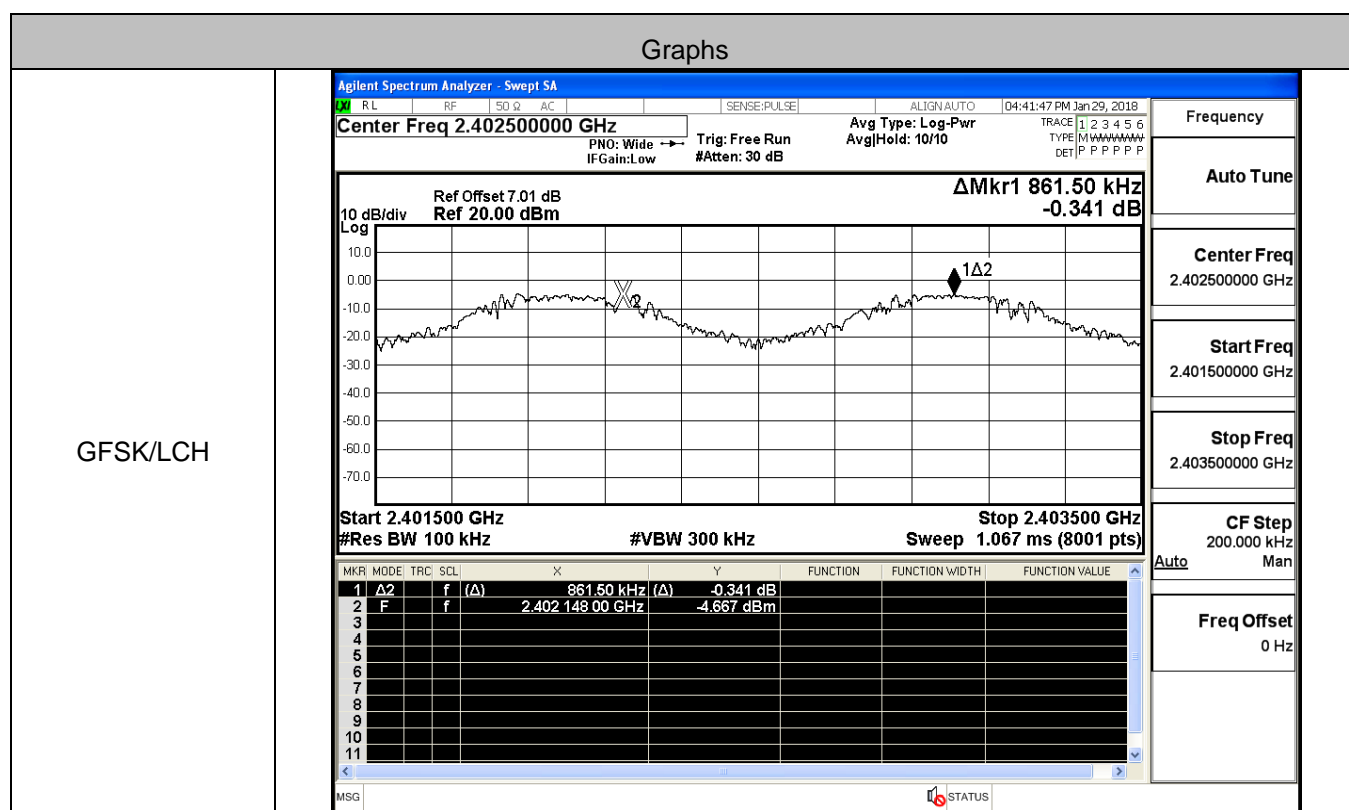
8DPSK_3DH5/HCH

Appendix C): Carrier Frequency Separation

Result Table

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz] 2/3*20dB Bandwidth	Verdict
GFSK	LCH	0.861	0.648	PASS
	MCH	0.832	0.678	PASS
	HCH	0.874	0.687	PASS
$\pi/4$ DQPSK	LCH	1.010	0.858	PASS
	MCH	0.872	0.858	PASS
	HCH	1.242	0.859	PASS
8DPSK	LCH	1.106	0.860	PASS
	MCH	1.146	0.860	PASS
	HCH	1.312	0.859	PASS

Test Graph



GFSK/MCH

GFSK/HCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.441500000 GHz

Ref Offset 7.01 dB
Ref 20.00 dBm

ΔMkr1 832 kHz
0.408 dB

Start 2.440500 GHz
#Res BW 100 kHz

Stop 2.442500 GHz
#VBW 300 kHz
Sweep 1.000 ms (1001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	f	(Δ)	832 kHz (Δ)	0.408 dB			
2	F	f		2.441 004 GHz	-4.434 dBm			

MSG

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.479500000 GHz

Ref Offset 7.01 dB
Ref 20.00 dBm

ΔMkr1 874 kHz
0.620 dB

Start 2.478500 GHz
#Res BW 100 kHz

Stop 2.480500 GHz
#VBW 300 kHz
Sweep 1.000 ms (1001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	f	(Δ)	874 kHz (Δ)	0.620 dB			
2	F	f		2.478 976 GHz	-4.397 dBm			

MSG

Frequency

Auto Tune

Center Freq
2.441500000 GHz

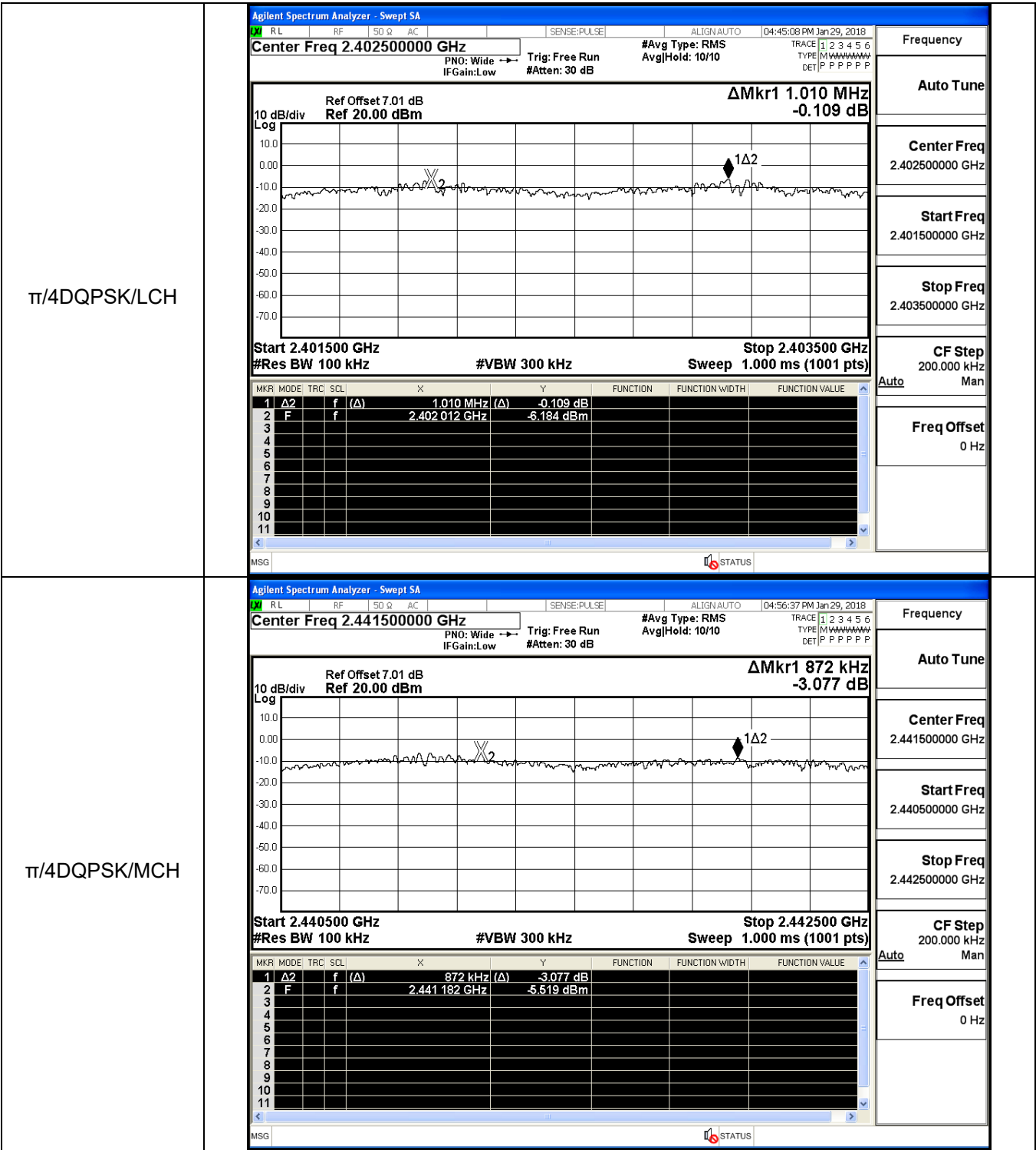
Start Freq
2.440500000 GHz

Stop Freq
2.442500000 GHz

CF Step
200.000 kHz

Auto Man

Freq Offset
0 Hz



$\pi/4$ DQPSK/HCH

8DPSK/LCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.479500000 GHz

Ref Offset 7.01 dB
Ref 20.00 dBm

10 dB/div

Log

Start 2.478500 GHz
#Res BW 100 kHz

Stop 2.480500 GHz
#VBW 300 kHz
Sweep 1.000 ms (1001 pts)

Frequency

Auto Tune

Center Freq 2.479500000 GHz

Start Freq 2.478500000 GHz

Stop Freq 2.480500000 GHz

CF Step 200.000 kHz

Freq Offset 0 Hz

1Δ2

ΔMkr1 1.242 MHz
0.288 dB

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	f	(Δ)	1.242 MHz (Δ)	0.288 dB			
2	F	f		2.478 828 GHz	-5.764 dBm			

MSG

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.402500000 GHz

Ref Offset 7.01 dB
Ref 20.00 dBm

10 dB/div

Log

Start 2.401500 GHz
#Res BW 100 kHz

Stop 2.403500 GHz
#VBW 300 kHz
Sweep 1.000 ms (1001 pts)

Frequency

Auto Tune

Center Freq 2.402500000 GHz

Start Freq 2.401500000 GHz

Stop Freq 2.403500000 GHz

CF Step 200.000 kHz

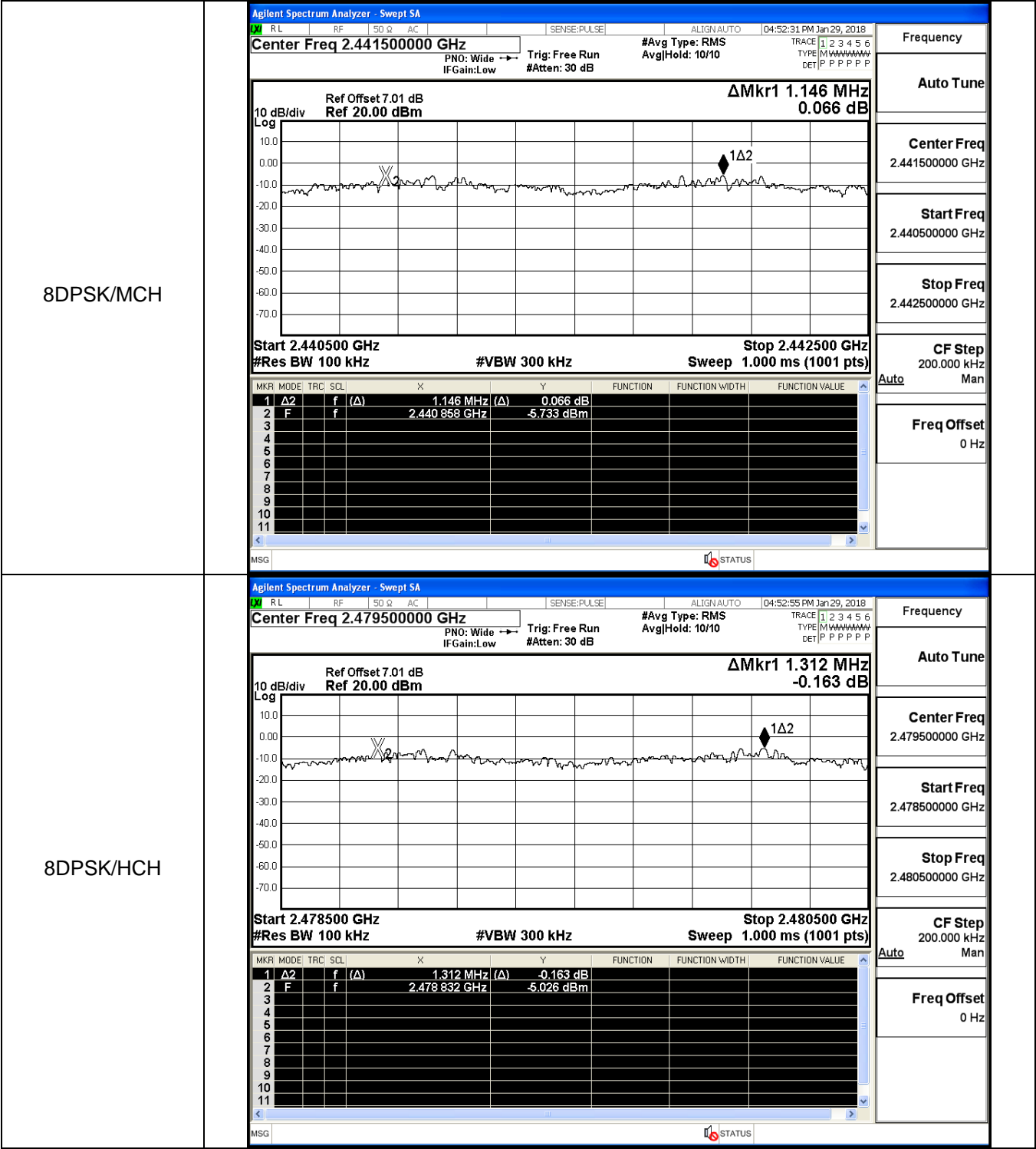
Freq Offset 0 Hz

1Δ2

ΔMkr1 1.106 MHz
-1.119 dB

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	f	(Δ)	1.106 MHz (Δ)	-1.119 dB			
2	F	f		2.401 848 GHz	-7.868 dBm			

MSG



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

Test Graph

Graphs

GFSK/Hop

Agilent Spectrum Analyzer - Swept SA

IM	RL	RF	SO Q	AC	SENSE/PULSE	ALIGN/AUTO	[Date/Time]
----	----	----	------	----	-------------	------------	-------------

Center Freq 2.441750000 GHz
#Avg Type: RMS
AvglHold: 10/10
TRACE 1 2 3 4 5 6
TYPE M W A V I N V
DET P P P P P P

PNO: Fast → Trig: Free Run
IF Gain: Low #Atten: 30 dB

**ΔMkr1 77.843 MHz
0.393 dB**

Ref Offset 7.01 dB
Ref 20.00 dBm

Δ2

Start 2.40000 GHz
Stop 2.48350 GHz

#Res BW 100 kHz
#VBW 300 kHz
Sweep 8.000 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	f	(Δ)	77.843 MHz	(Δ) 0.393 dB			
2	F	f		2.402056 GHz	-4.736 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

<
STATUS
>

Frequency

Auto Tune

Center Freq
2.441750000 GHz

Start Freq
2.400000000 GHz

Stop Freq
2.483500000 GHz

CF Step
8.350000 MHz

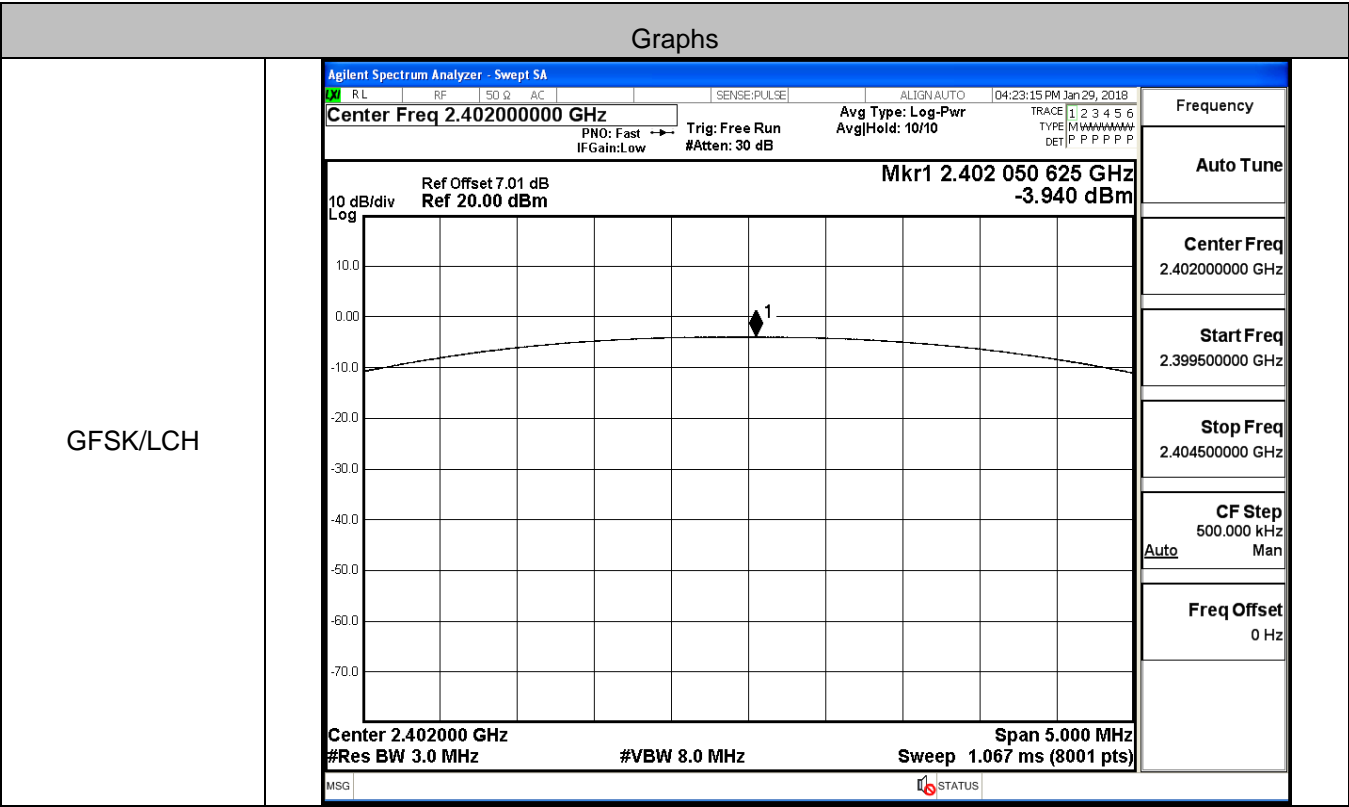
Freq Offset
0 Hz

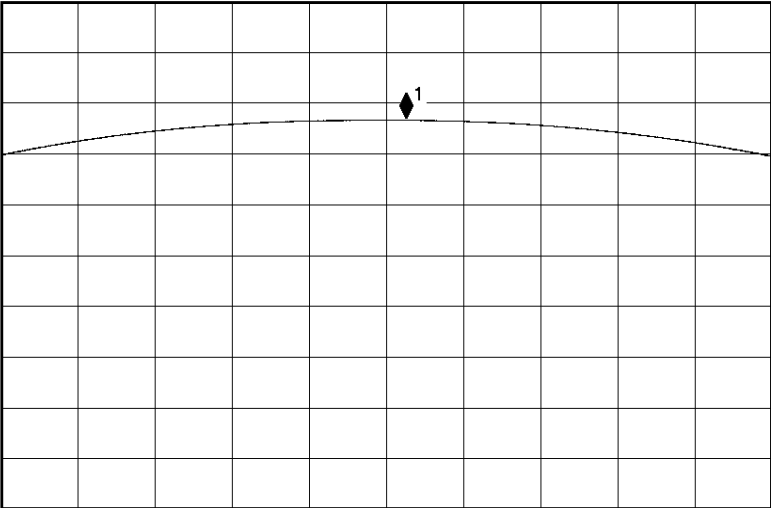

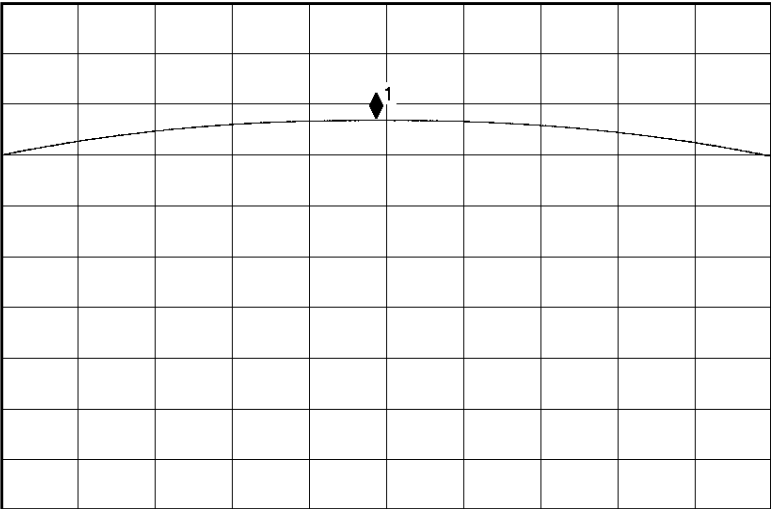

<div>π/4DQPSK/Hop</div>	<div><div>Agilent Spectrum Analyzer - Swept SA</div><div><div><div>Center Freq 2.441750000 GHz</div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div></div><div><div>10 dB/div</div><div>Log</div></div><div><div>Start 2.40000 GHz</div><div>#Res BW 100 kHz</div></div><div><div>Stop 2.48350 GHz</div><div>#VBW 300 kHz</div><div>Sweep 8.000 ms (8001 pts)</div></div></div><div><div><div>ΔMkr1 78.354 MHz</div><div>3.301 dB</div></div><div><div>1 Δ2</div></div></div><div><table><tr><th>MKR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>Δ2</td><td>f</td><td>(Δ)</td><td>78.354 MHz</td><td>(Δ)</td><td>3.301 dB</td><td></td><td></td></tr><tr><td>2</td><td>F</td><td>f</td><td></td><td>2.401795 GHz</td><td></td><td>-8.957 dBm</td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></div><div><div>MSG</div><div>STATUS</div></div></div> <div><div>Frequency</div><div>Auto Tune</div><div>Center Freq 2.441750000 GHz</div><div>Start Freq 2.400000000 GHz</div><div>Stop Freq 2.483500000 GHz</div><div>CF Step 8.350000 MHz</div><div>Auto</div><div>Freq Offset 0 Hz</div></div>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	78.354 MHz	(Δ)	3.301 dB			2	F	f		2.401795 GHz		-8.957 dBm			3									4									5									6									7									8									9									10									11								
	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																																																																																				
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<div>8DPSK/Hop</div>	<div><div>Agilent Spectrum Analyzer - Swept SA</div><div><div><div>Center Freq 2.441750000 GHz</div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div></div><div><div>10 dB/div</div><div>Log</div></div><div><div>Start 2.40000 GHz</div><div>#Res BW 100 kHz</div></div><div><div>Stop 2.48350 GHz</div><div>#VBW 300 kHz</div><div>Sweep 8.000 ms (8001 pts)</div></div></div><div><div><div>ΔMkr1 78.166 MHz</div><div>1.283 dB</div></div><div><div>1 Δ2</div></div></div><div><table><tr><th>MKR</th><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>Δ2</td><td>f</td><td>(Δ)</td><td>78.166 MHz</td><td>(Δ)</td><td>1.283 dB</td><td></td><td></td></tr><tr><td>2</td><td>F</td><td>f</td><td></td><td>2.402004 GHz</td><td></td><td>-6.211 dBm</td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></div><div><div>MSG</div><div>STATUS</div></div></div> <div><div>Frequency</div><div>Auto Tune</div><div>Center Freq 2.441750000 GHz</div><div>Start Freq 2.400000000 GHz</div><div>Stop Freq 2.483500000 GHz</div><div>CF Step 8.350000 MHz</div><div>Auto</div><div>Freq Offset 0 Hz</div></div>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	78.166 MHz	(Δ)	1.283 dB			2	F	f		2.402004 GHz		-6.211 dBm			3									4									5									6									7									8									9									10									11								
	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																																																																																				
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Appendix D): Conducted Peak Output Power
Result Table

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-3.940	21	PASS
	MCH	-3.291	21	PASS
	HCH	-3.138	21	PASS
π /4DQPSK	LCH	-4.059	21	PASS
	MCH	-3.516	21	PASS
	HCH	-3.358	21	PASS
8DPSK	LCH	-3.837	21	PASS
	MCH	-3.291	21	PASS
	HCH	-3.327	21	PASS

Test Graph



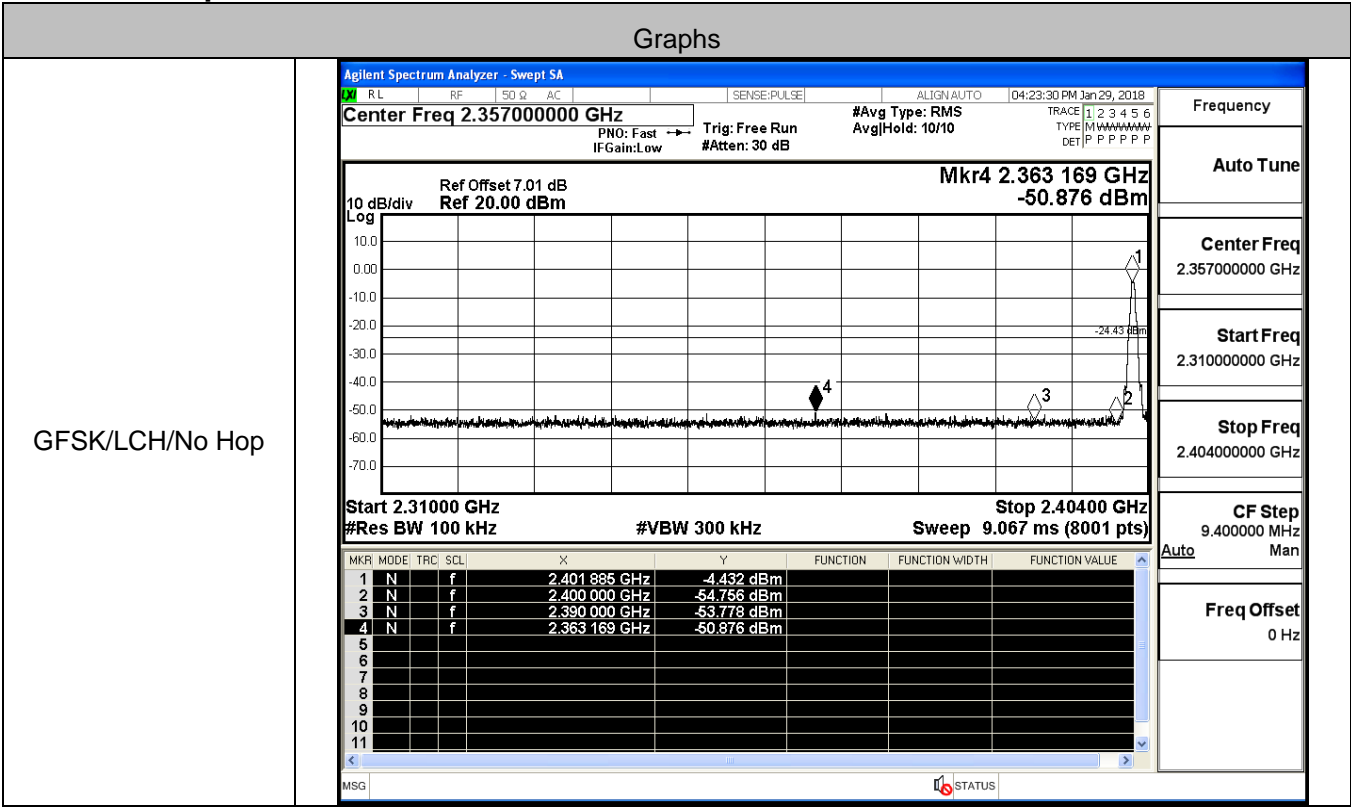
<div>GFSK/MCH</div>	<div><div><div>Agilent Spectrum Analyzer - Swept SA</div><div><div><div><div><div><div><div></div><div>R L</div><div>RF</div><div>50 Ω</div><div>AC</div></div><div>SENSE:PULSE</div><div>ALIGN:AUTO</div><div>04:25:39 PM Jan 29, 2018</div></div></div><div><div>Center Freq 2.441000000 GHz</div><div><div>PN0: Fast</div><div>IFGain:Low</div></div><div><div>Trig: Free Run</div><div>#Atten: 30 dB</div></div><div><div>Avg Type: Log-Pwr</div><div>AvgHld: 10/10</div></div><div><div>TRACE 1 2 3 4 5 6</div><div>TYPE: M W W W W W W W</div><div>DET: P P P P P P</div></div></div></div><div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.441 130 000 GHz</div><div>-3.291 dBm</div></div><div><div>10 dB/div</div><div>Log</div><div></div><div><div>Center 2.441000 GHz</div><div>#Res BW 3.0 MHz</div><div>#VBW 8.0 MHz</div><div>Span 5.000 MHz</div><div>Sweep 1.067 ms (8001 pts)</div></div><div><div>MSG</div><div> STATUS</div></div></div></div><div><div>Frequency</div><div>Auto Tune</div><div>Center Freq2.441000000 GHz</div><div>Start Freq2.438500000 GHz</div><div>Stop Freq2.443500000 GHz</div><div>CF Step500.000 kHz</div><div>AutoMan</div><div>Freq Offset0 Hz</div></div></div></div></div>
<div>GFSK/HCH</div>	<div><div><div>Agilent Spectrum Analyzer - Swept SA</div><div><div><div><div><div><div><div></div><div>R L</div><div>RF</div><div>50 Ω</div><div>AC</div></div><div>SENSE:PULSE</div><div>ALIGN:AUTO</div><div>04:27:14 PM Jan 29, 2018</div></div></div><div><div>Center Freq 2.480000000 GHz</div><div><div>PN0: Fast</div><div>IFGain:Low</div></div><div><div>Trig: Free Run</div><div>#Atten: 30 dB</div></div><div><div>Avg Type: Log-Pwr</div><div>AvgHld: 10/10</div></div><div><div>TRACE 1 2 3 4 5 6</div><div>TYPE: M W W W W W W W</div><div>DET: P P P P P P</div></div></div></div><div><div>Ref Offset 7.01 dB</div><div>Ref 20.00 dBm</div><div>Mkr1 2.479 930 000 GHz</div><div>-3.138 dBm</div></div><div><div>10 dB/div</div><div>Log</div><div></div><div><div>Center 2.480000 GHz</div><div>#Res BW 3.0 MHz</div><div>#VBW 8.0 MHz</div><div>Span 5.000 MHz</div><div>Sweep 1.067 ms (8001 pts)</div></div><div><div>MSG</div><div> STATUS</div></div></div></div><div><div>Frequency</div><div>Auto Tune</div><div>Center Freq2.480000000 GHz</div><div>Start Freq2.477500000 GHz</div><div>Stop Freq2.482500000 GHz</div><div>CF Step500.000 kHz</div><div>AutoMan</div><div>Freq Offset0 Hz</div></div></div></div></div>

Appendix E): Band-edge for RF Conducted Emissions

Result Table

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequenc y Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-4.432	Off	-50.876	-24.43	PASS
			-4.097	On	-50.690	-24.1	PASS
GFSK	HCH	2480	-3.395	Off	-50.195	-23.4	PASS
			-3.722	On	-49.912	-23.72	PASS
π /4DQPSK	LCH	2402	-4.969	Off	-51.191	-24.97	PASS
			-5.116	On	-49.277	-25.12	PASS
π /4DQPSK	HCH	2480	-4.298	Off	-50.189	-24.3	PASS
			-4.778	On	-50.547	-24.78	PASS
8DPSK	LCH	2402	-5.016	Off	-50.519	-25.02	PASS
			-5.232	On	-50.929	-25.23	PASS
8DPSK	HCH	2480	-4.526	Off	-51.492	-24.53	PASS
			-4.880	On	-50.396	-24.88	PASS

Test Graph



Agilent Spectrum Analyzer - Swept SA

Center Freq 2.483500000 GHz
 PNO: Fast IFGain: Low Trig: Free Run #Atten: 30 dB
 #Avg Type: RMS AvgHold: 10/10

Ref Offset 7.01 dB
 Ref 20.00 dBm

Mkr4 2.492 425 0 GHz
 -49.912 dBm

10 dB/div
 Log

Center 2.48350 GHz Span 60.00 MHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 5.867 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.469 167 5 GHz	-3.722 dBm			
2	N	f		2.483 500 0 GHz	-53.747 dBm			
3	N	f		2.500 000 0 GHz	-51.522 dBm			
4	N	f		2.492 425 0 GHz	-49.912 dBm			

MSG STATUS

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

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.357000000 GHz
 PNO: Fast IFGain: Low Trig: Free Run #Atten: 30 dB
 #Avg Type: RMS AvgHold: 10/10

Ref Offset 7.01 dB
 Ref 20.00 dBm

Mkr4 2.364 450 GHz
 -51.191 dBm

10 dB/div
 Log

Start 2.31000 GHz Stop 2.40400 GHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 9.067 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.401 850 GHz	-4.969 dBm			
2	N	f		2.400 000 GHz	-54.412 dBm			
3	N	f		2.390 000 GHz	-53.325 dBm			
4	N	f		2.364 450 GHz	-51.191 dBm			

MSG STATUS

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

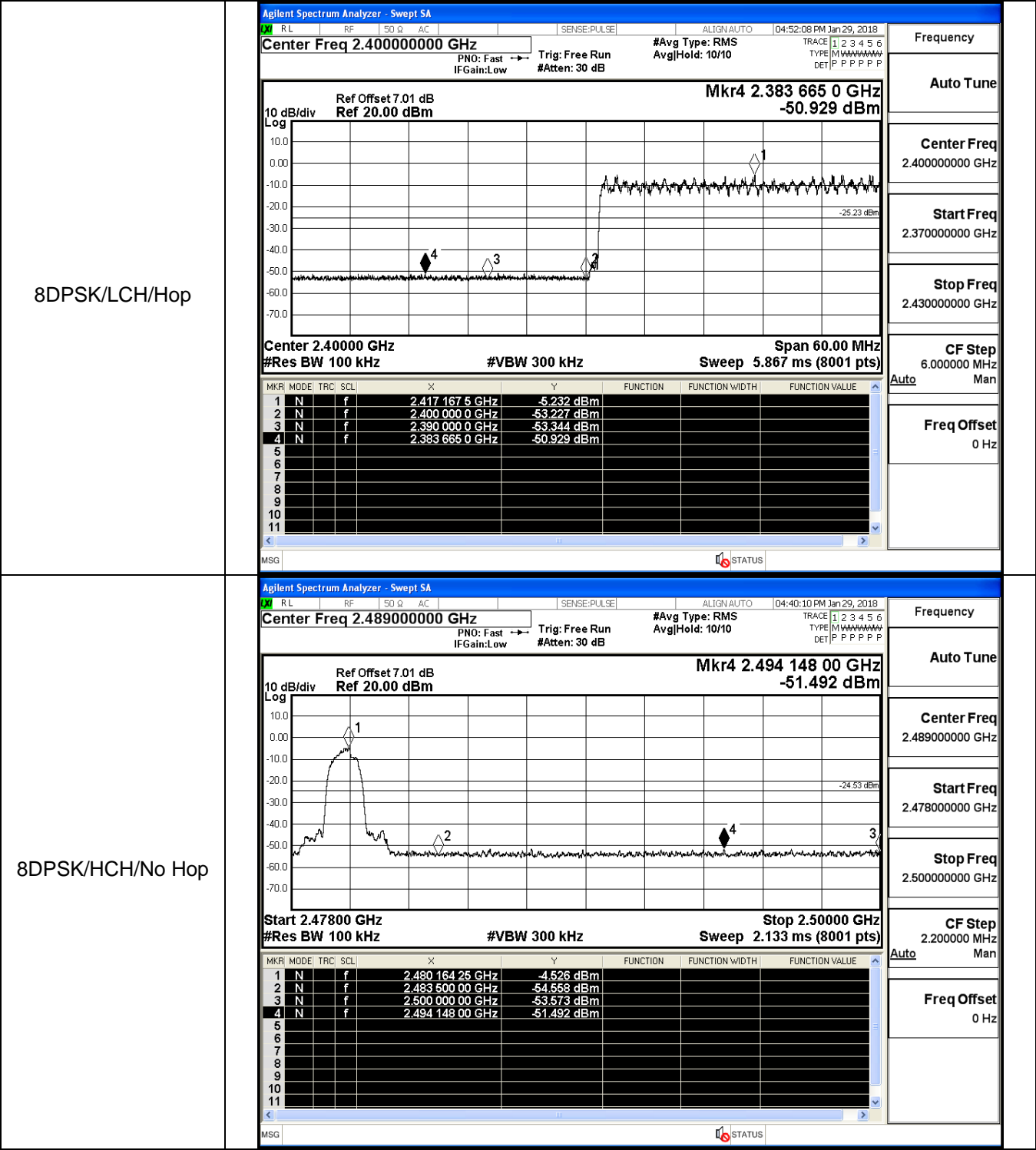
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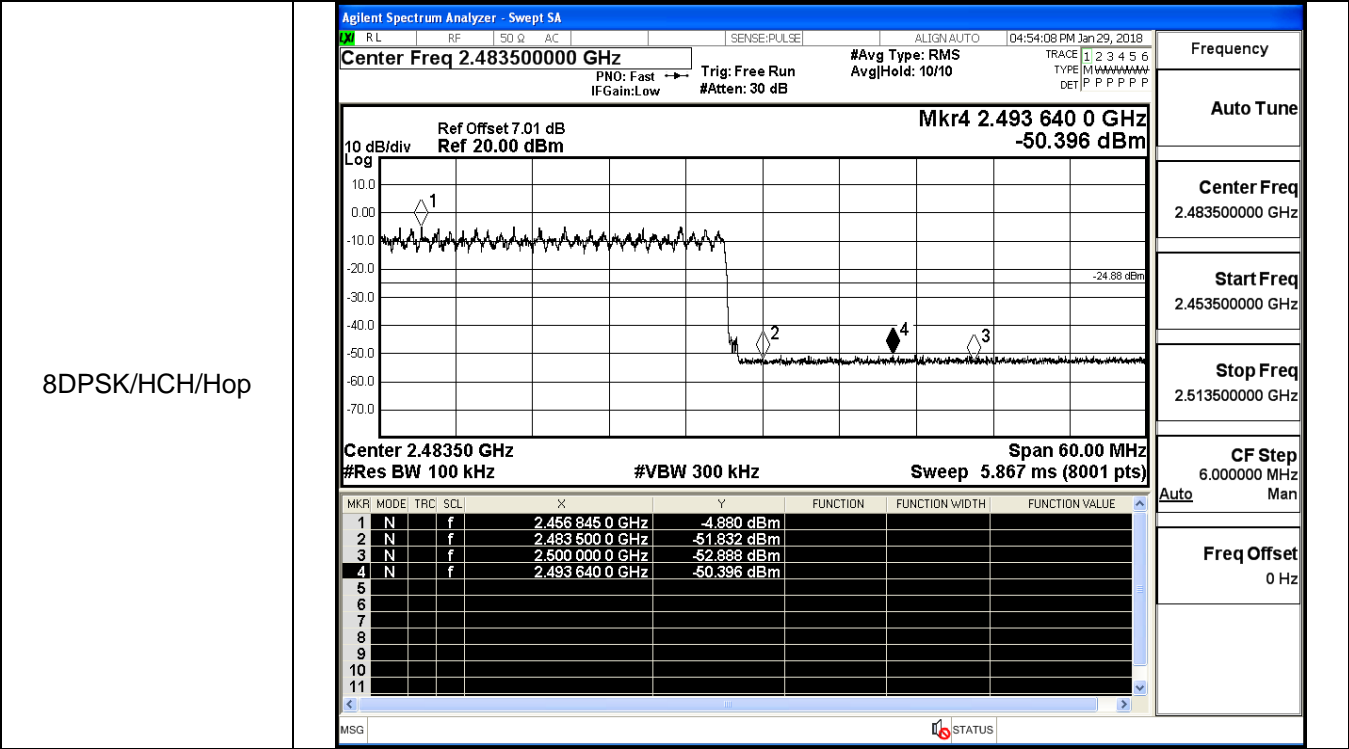
$\pi/4$ DQPSK/HCH/Hop

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.463 167 5 GHz	-4.778 dBm			
2	N	f		2.483 500 0 GHz	-52.577 dBm			
3	N	f		2.500 000 0 GHz	-51.973 dBm			
4	N	f		2.499 872 5 GHz	-50.547 dBm			

8DPSK/LCH/No Hop

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.402 167 GHz	-5.016 dBm			
2	N	f		2.400 000 GHz	-54.105 dBm			
3	N	f		2.390 000 GHz	-54.385 dBm			
4	N	f		2.352 253 GHz	-50.519 dBm			



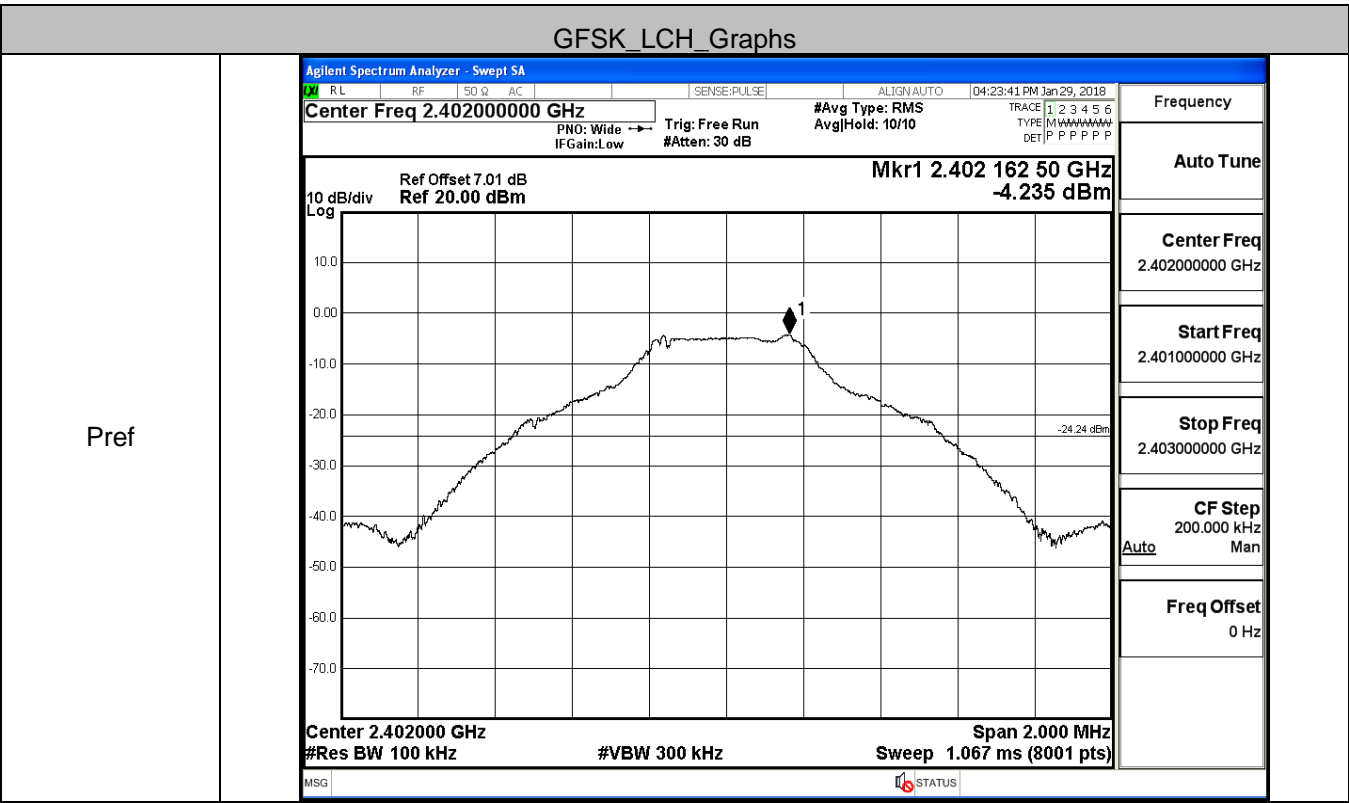


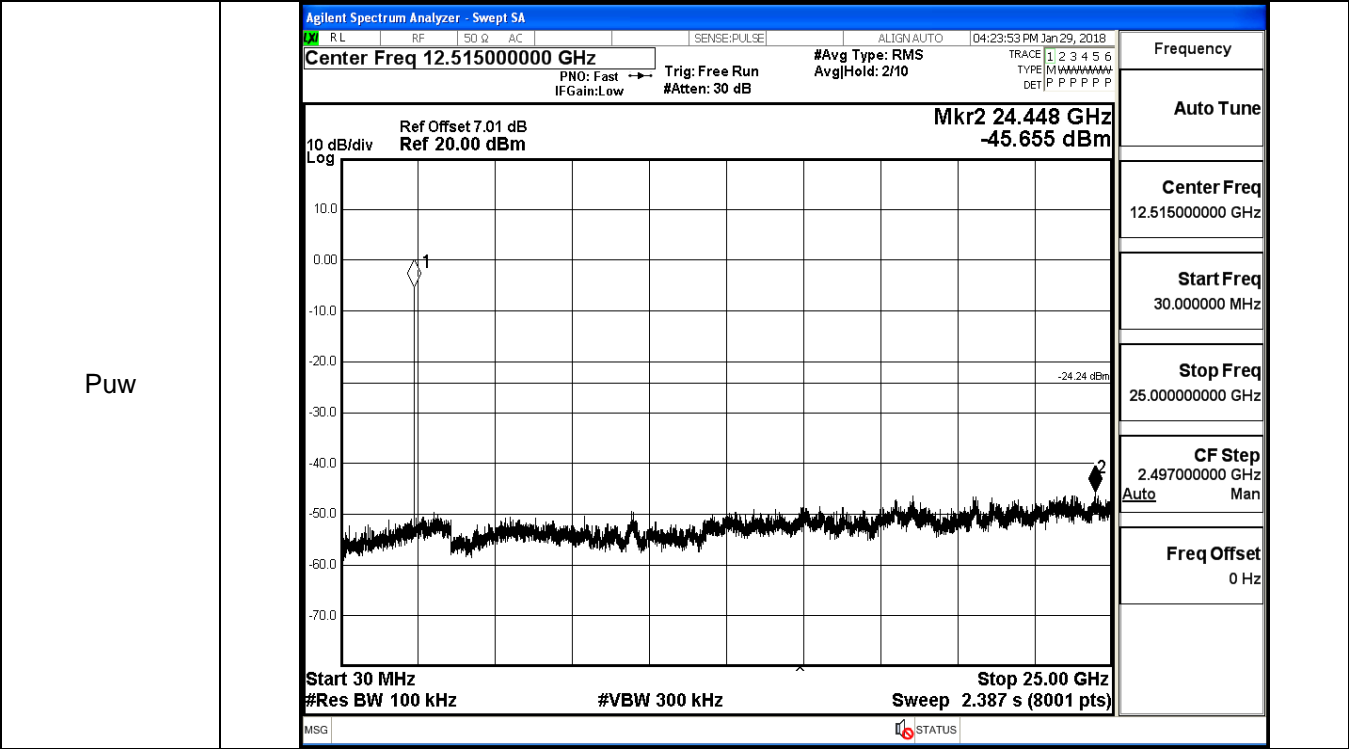
Appendix F): RF Conducted Spurious Emissions

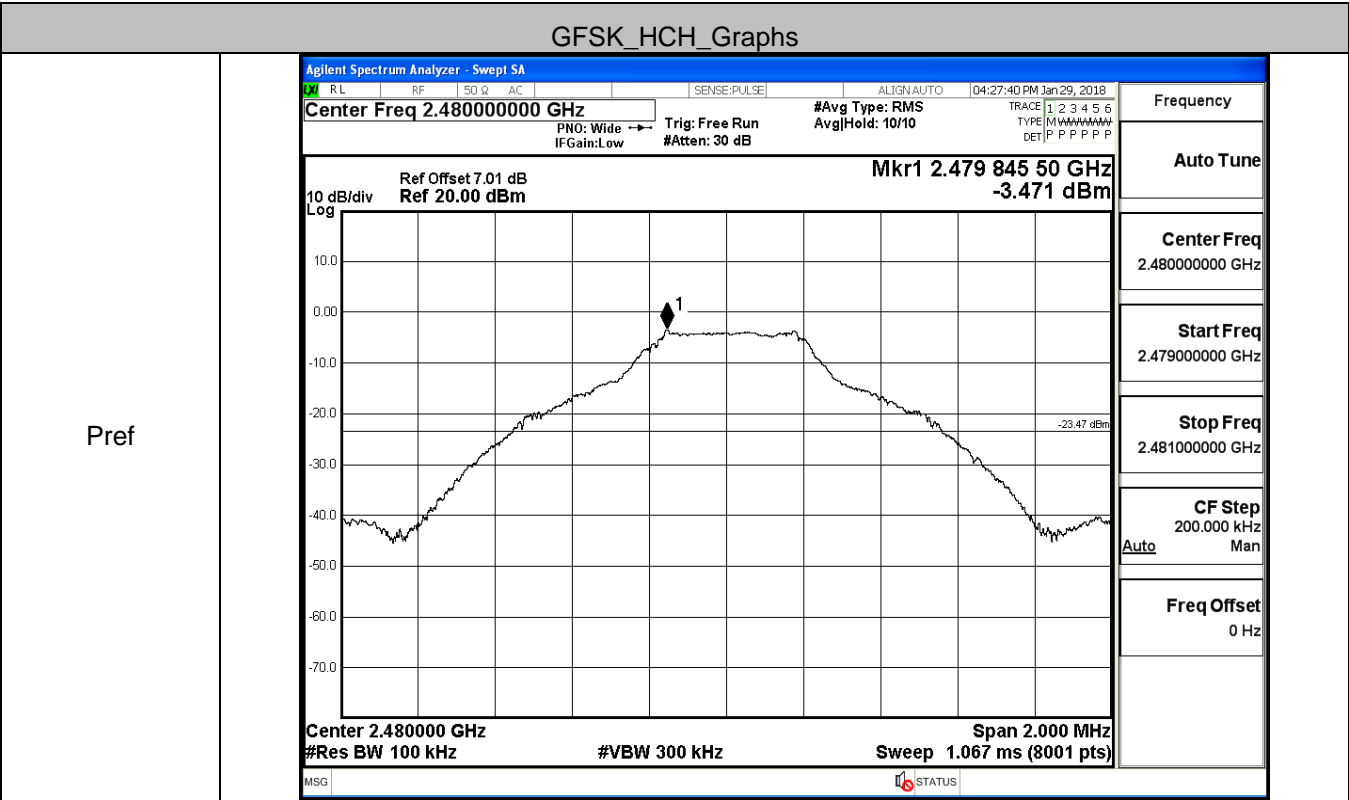
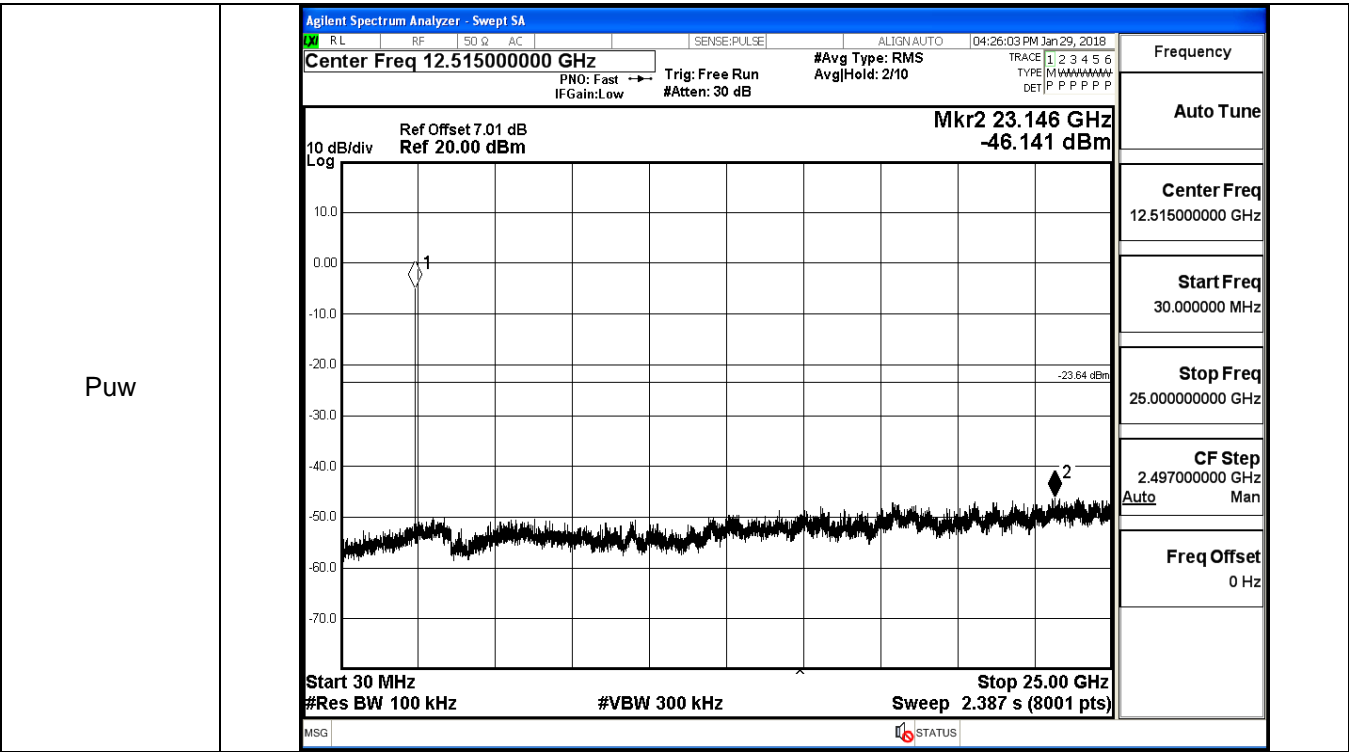
Result Table

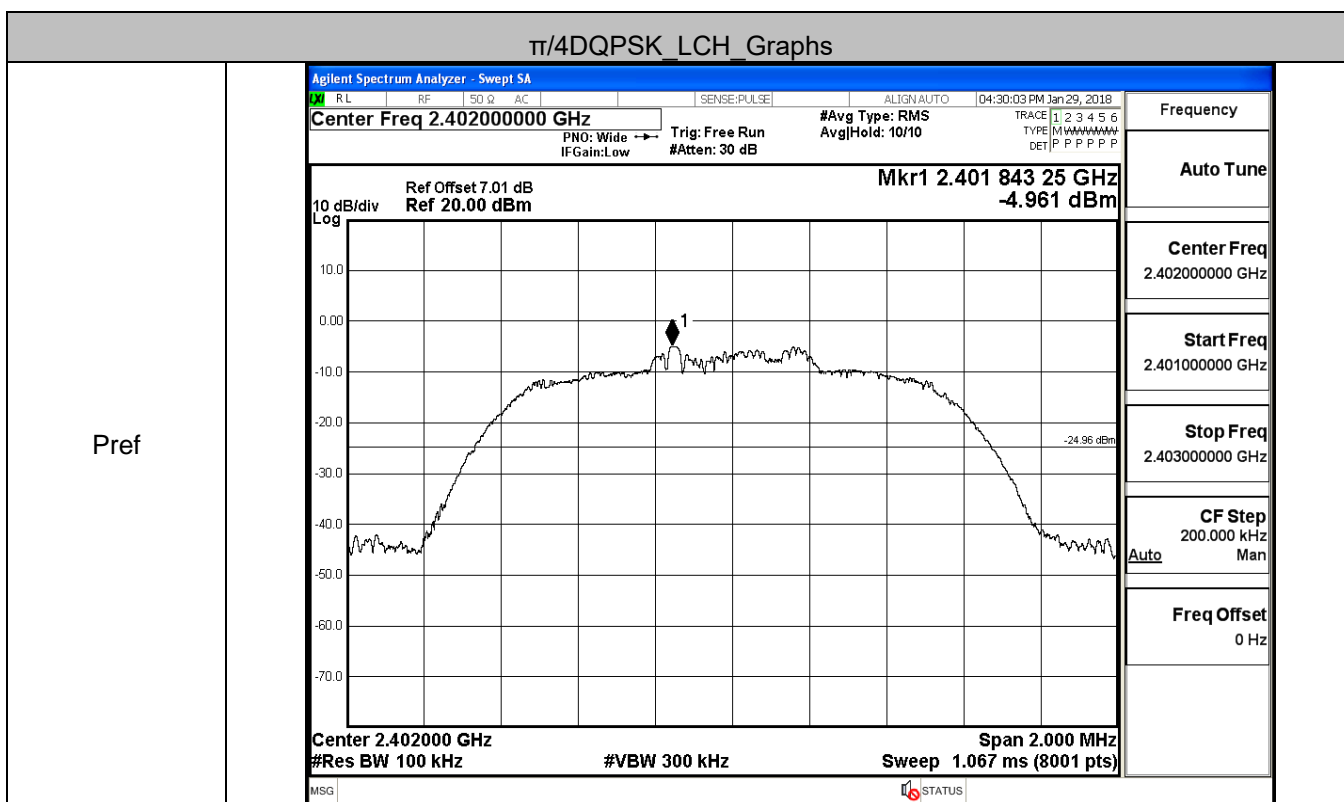
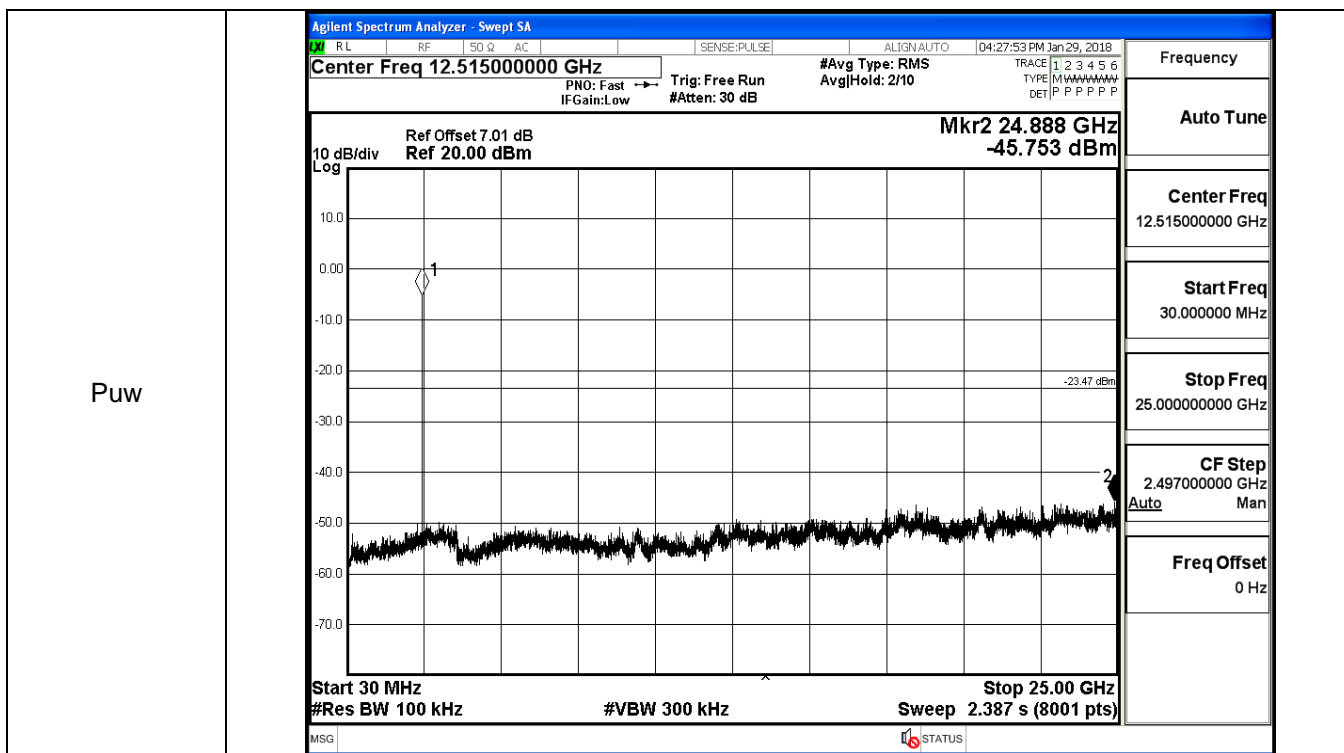
Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
GFSK	LCH	-4.235	<Limit	PASS
GFSK	MCH	-3.641	<Limit	PASS
GFSK	HCH	-3.471	<Limit	PASS
π /4DQPSK	LCH	-4.961	<Limit	PASS
π /4DQPSK	MCH	-4.649	<Limit	PASS
π /4DQPSK	HCH	-4.376	<Limit	PASS
8DPSK	LCH	-5.276	<Limit	PASS
8DPSK	MCH	-4.562	<Limit	PASS
8DPSK	HCH	-4.564	<Limit	PASS

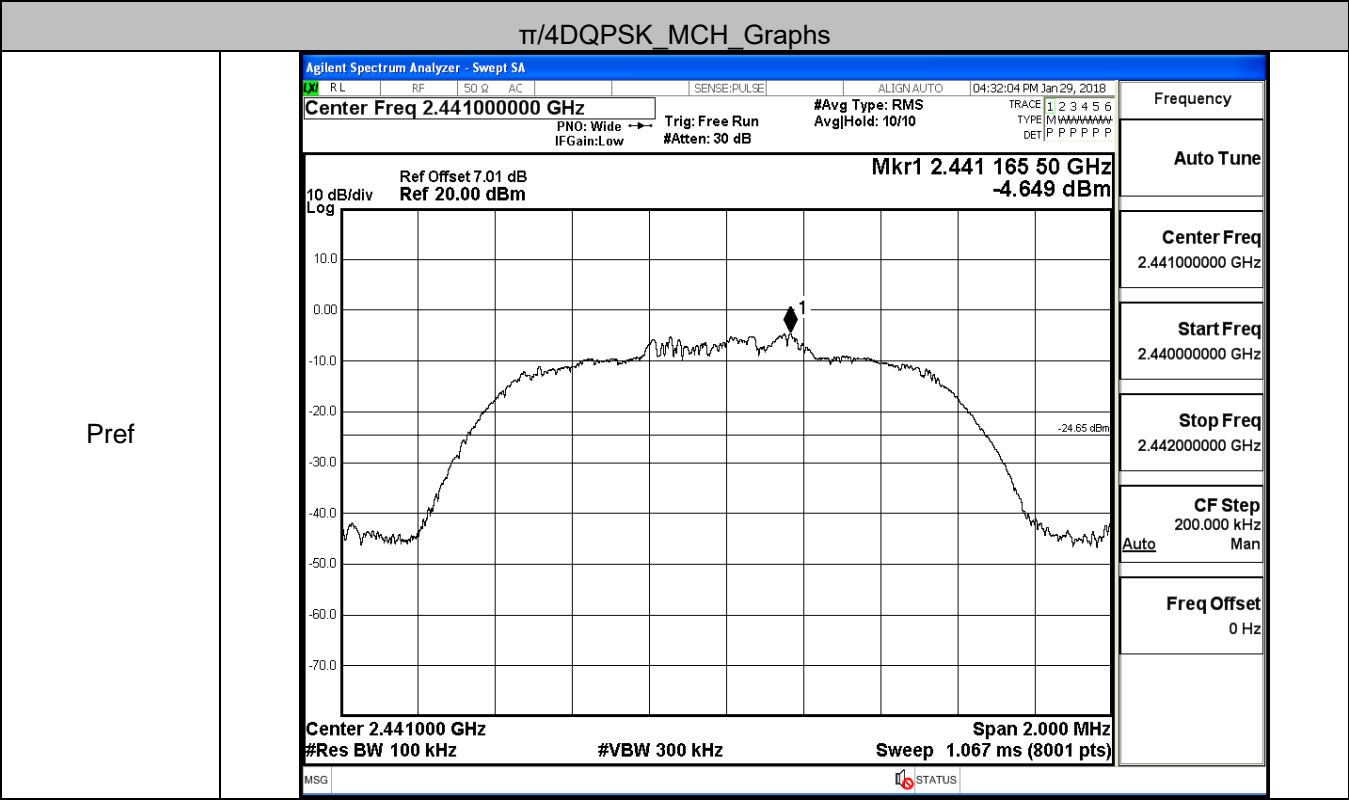
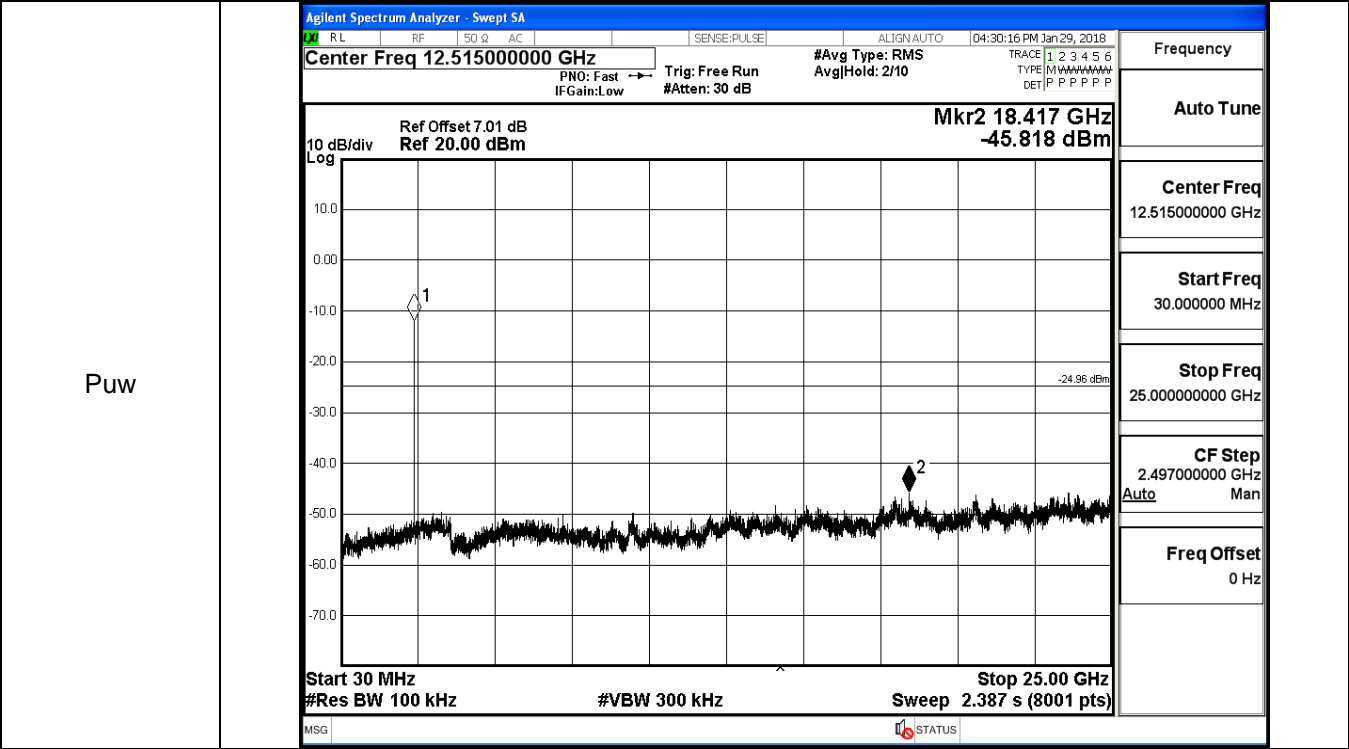
Test Graph

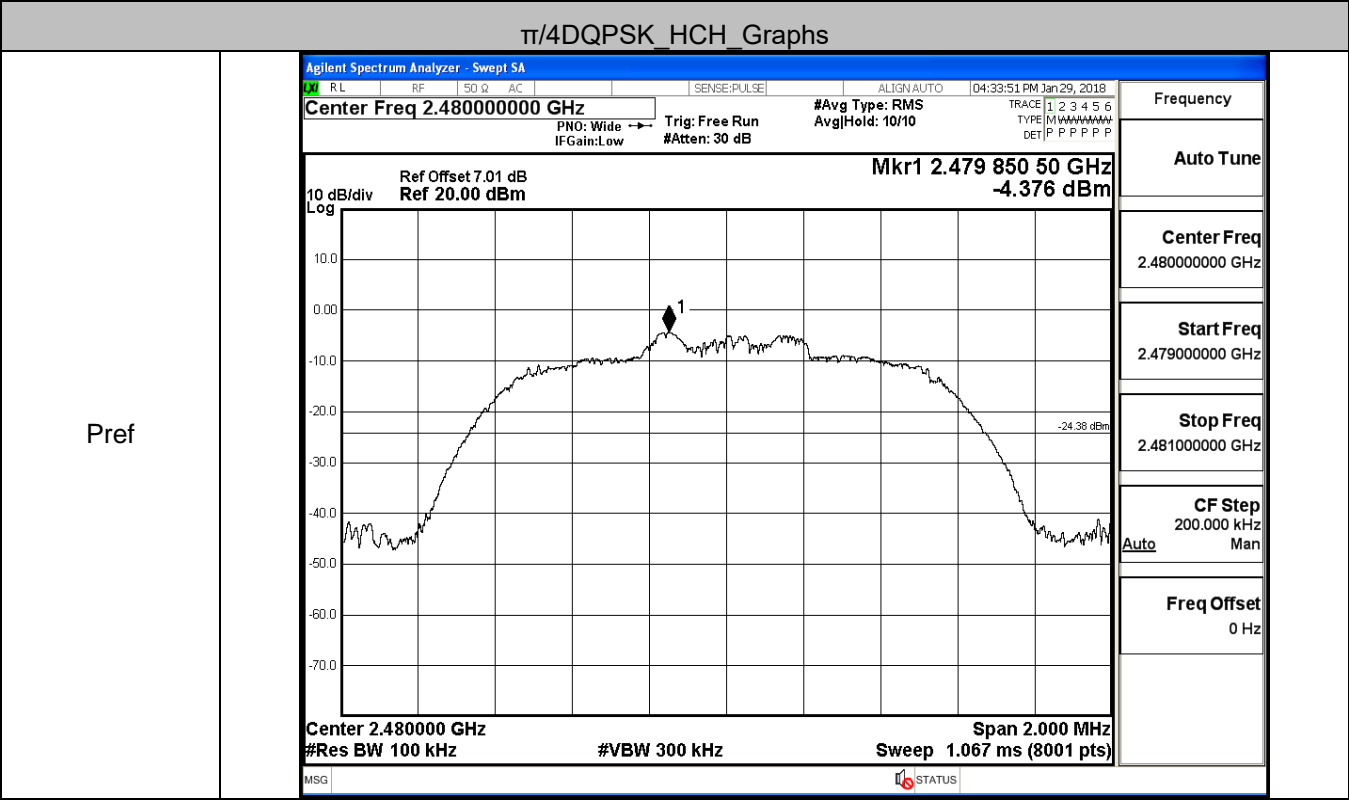
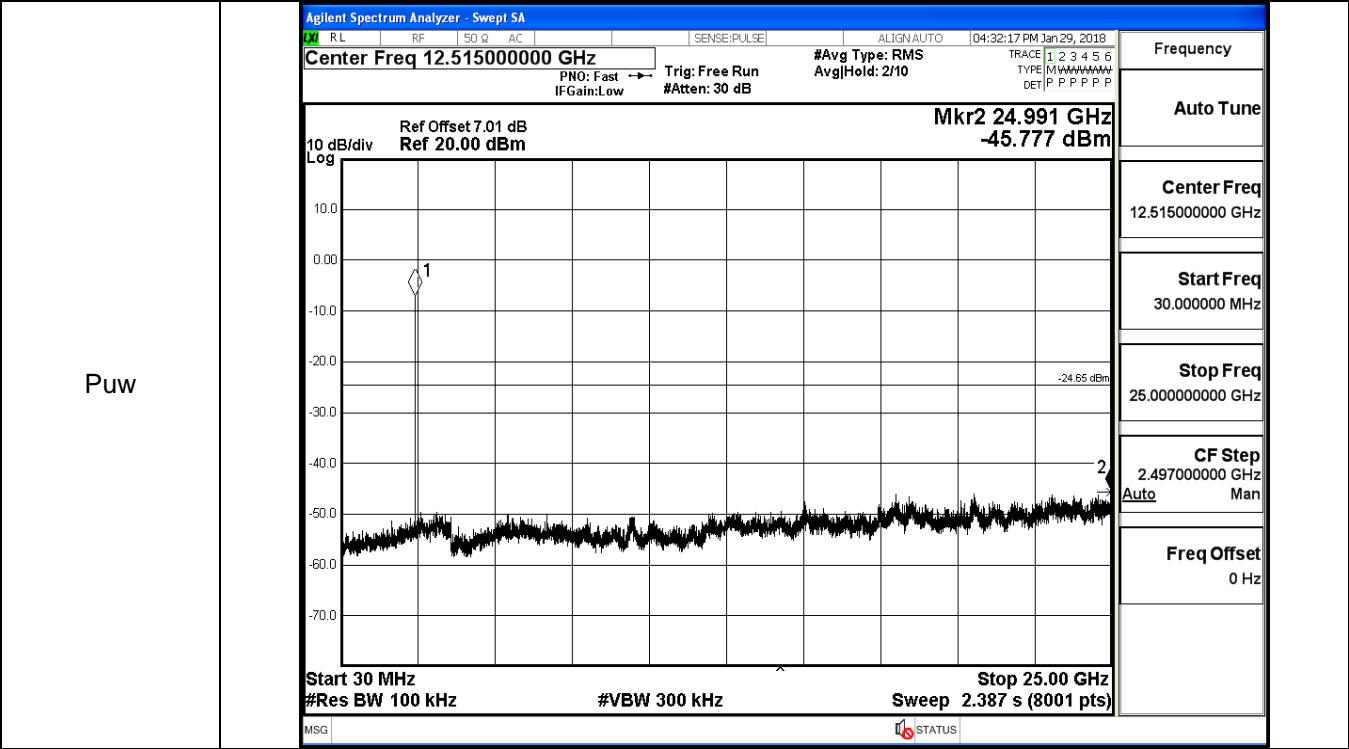


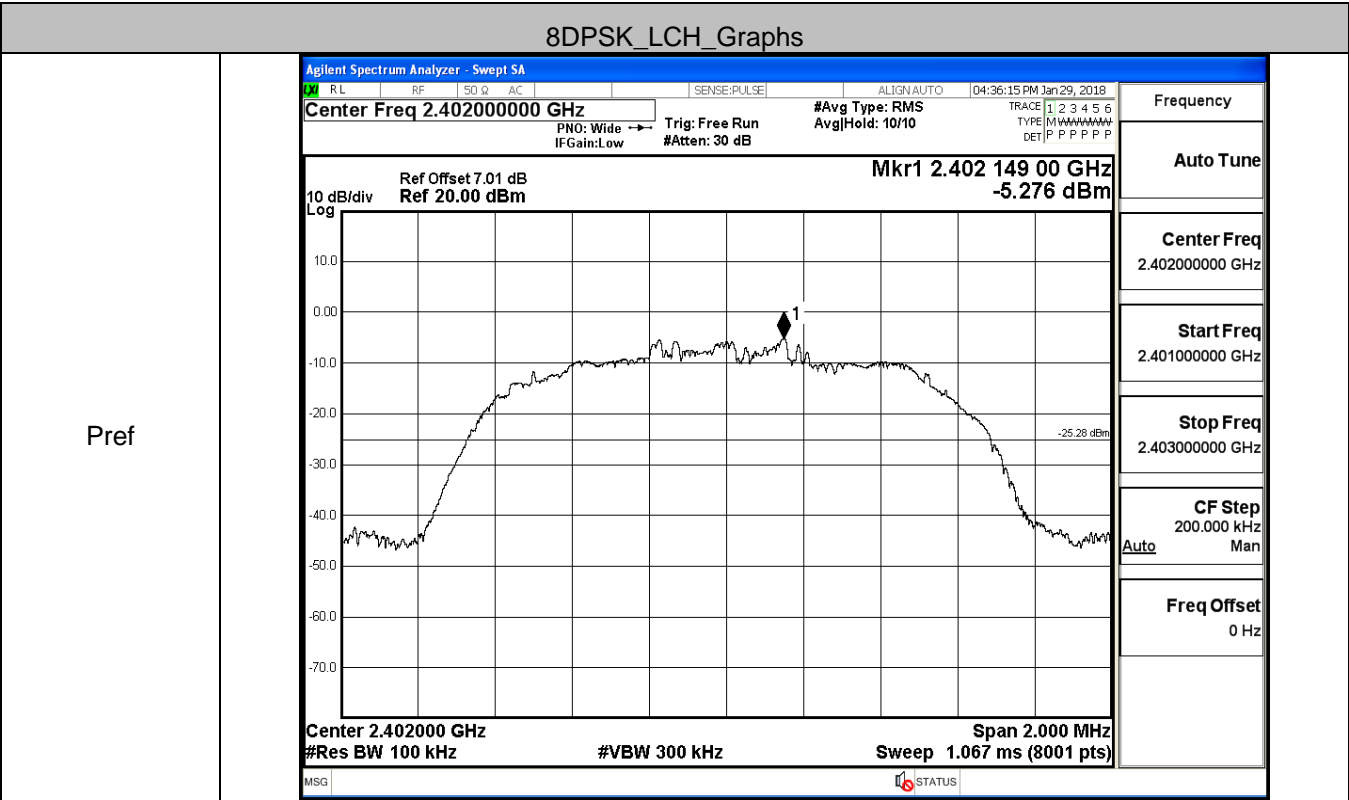
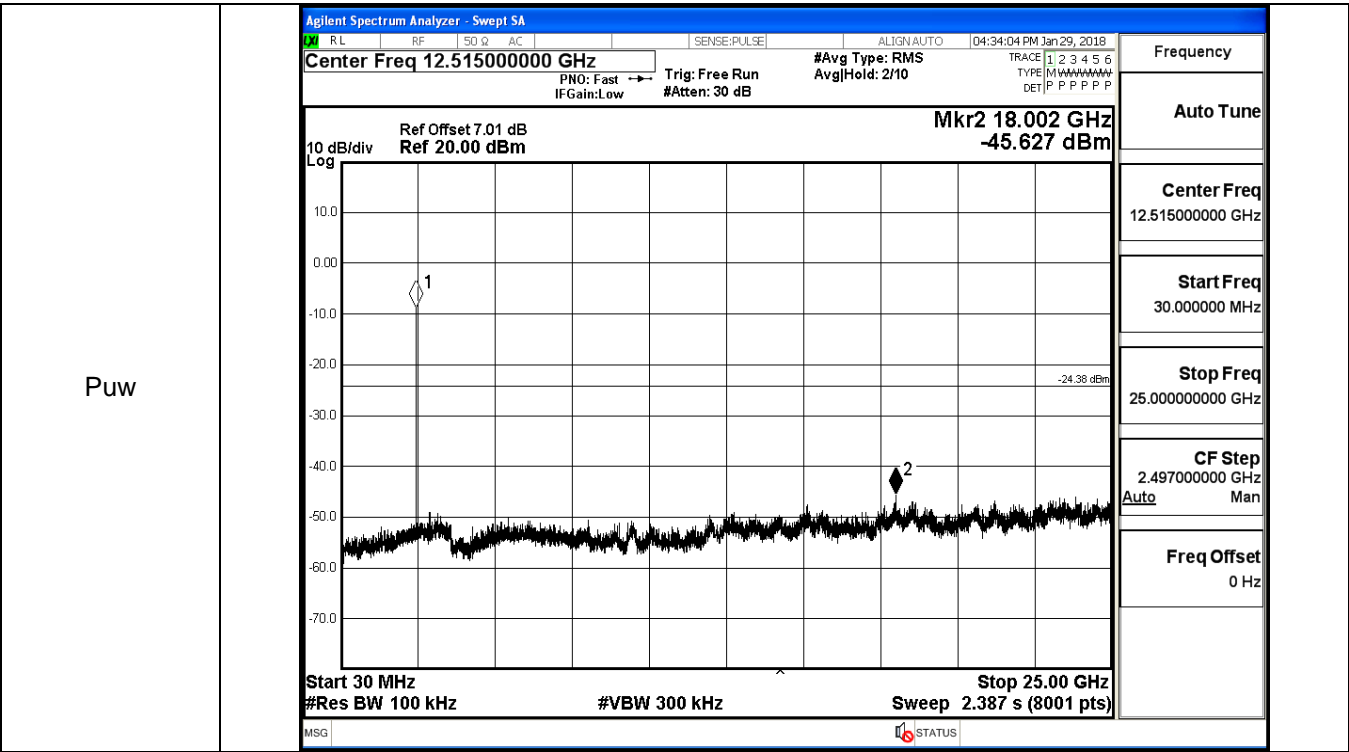


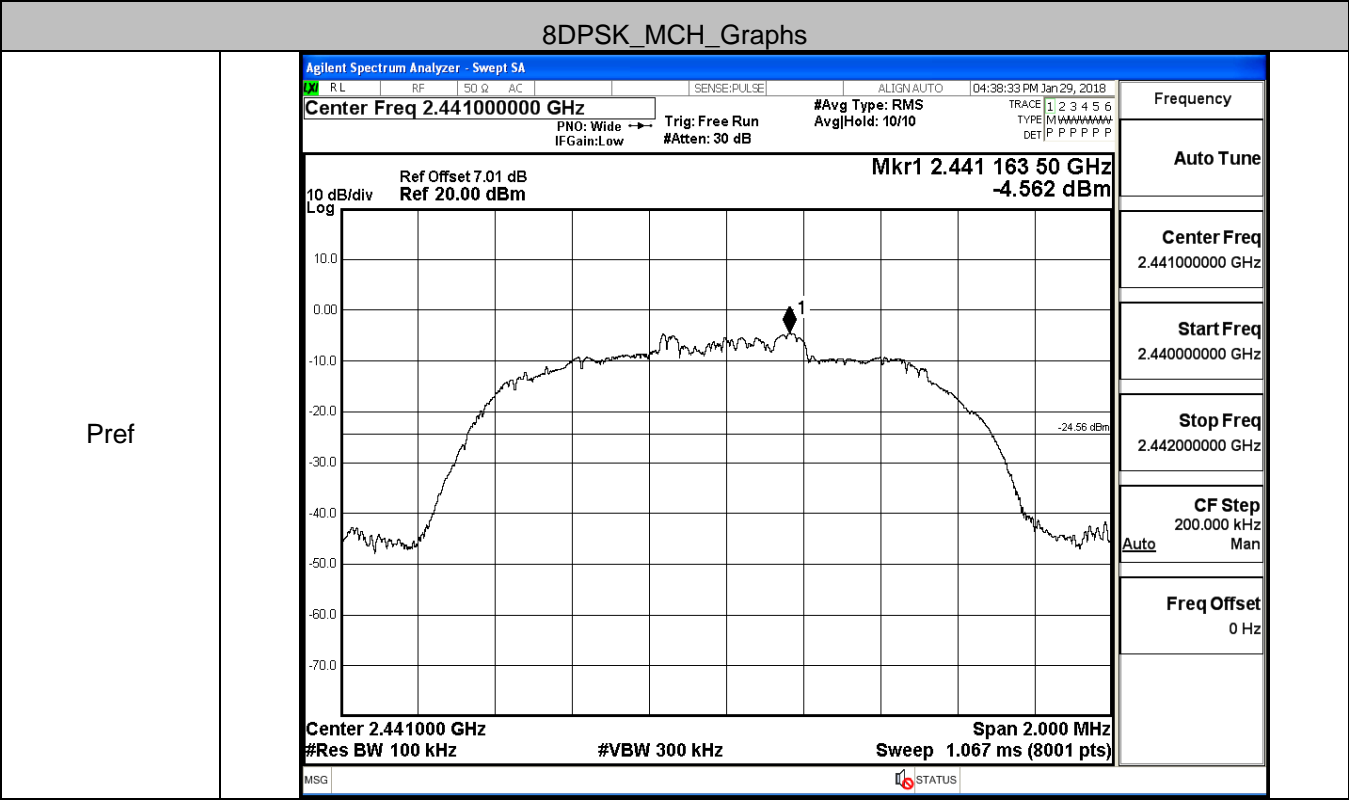
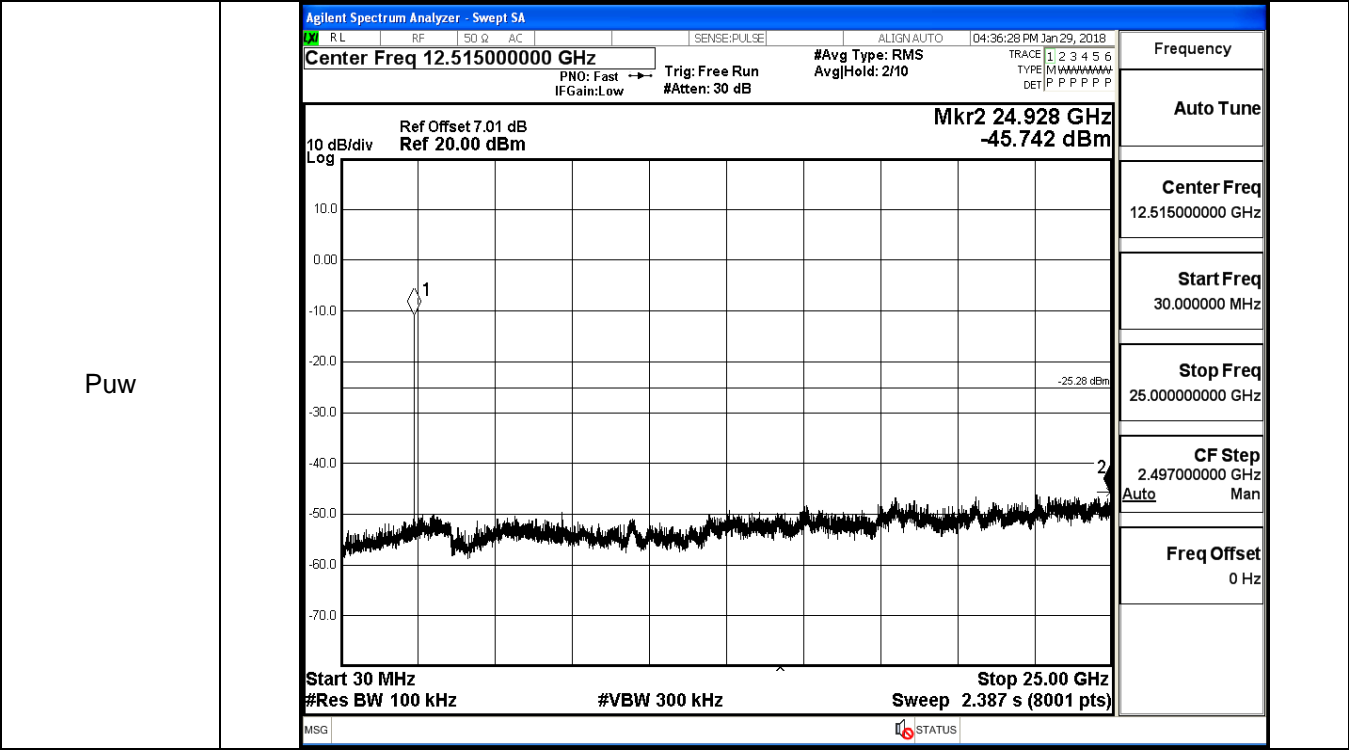


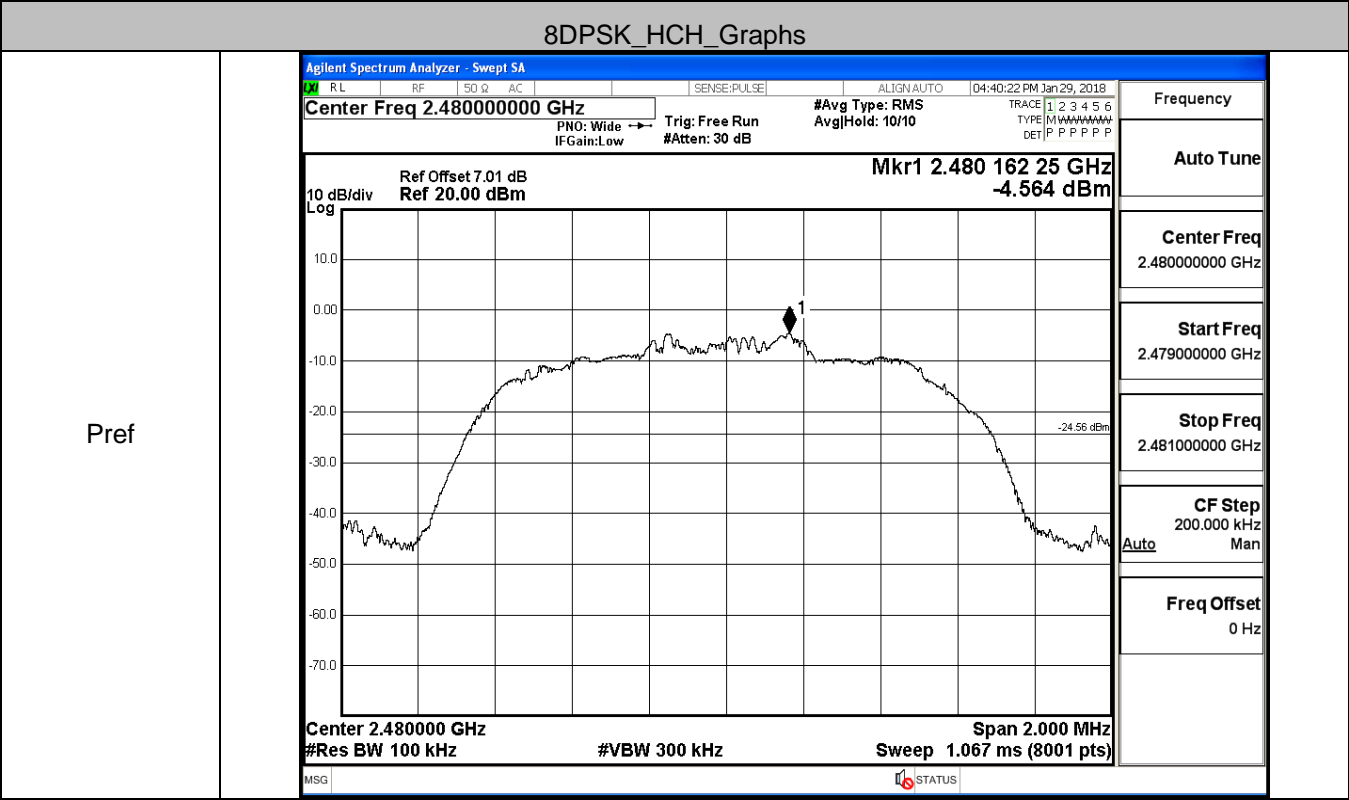
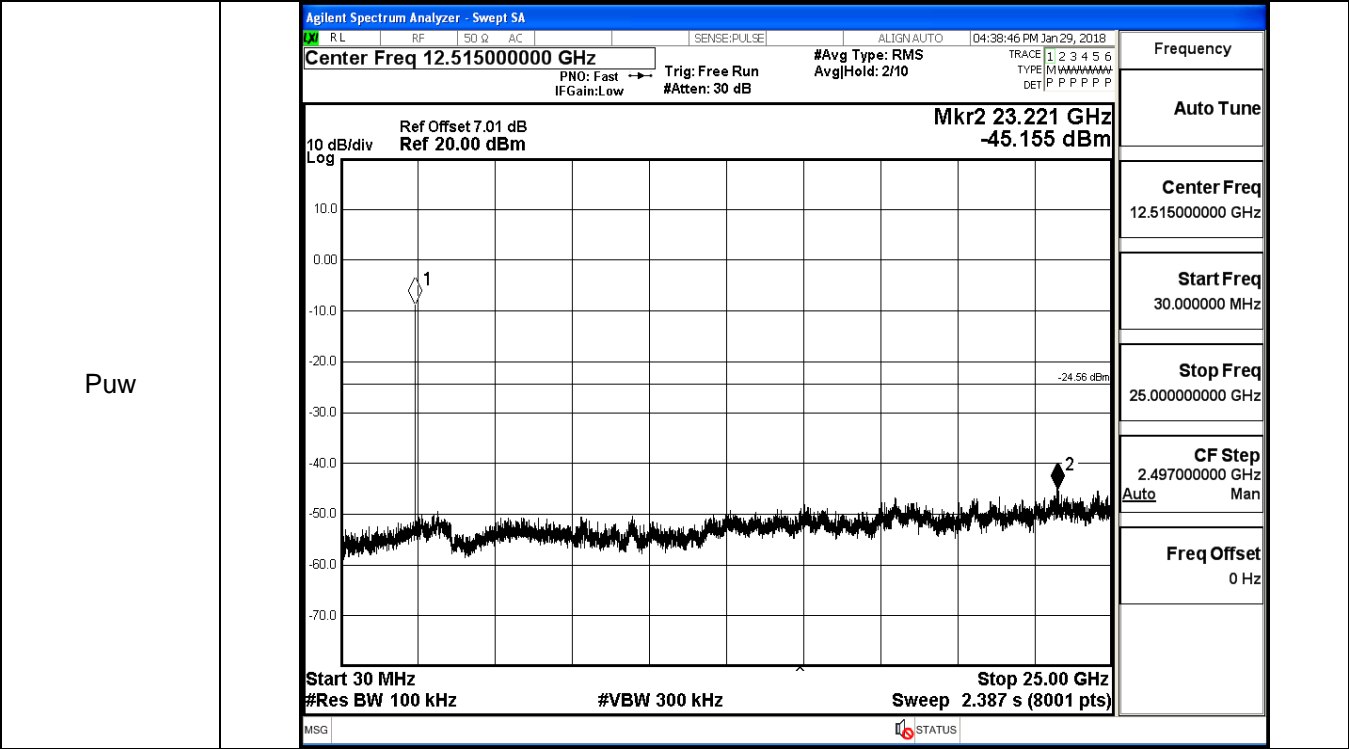


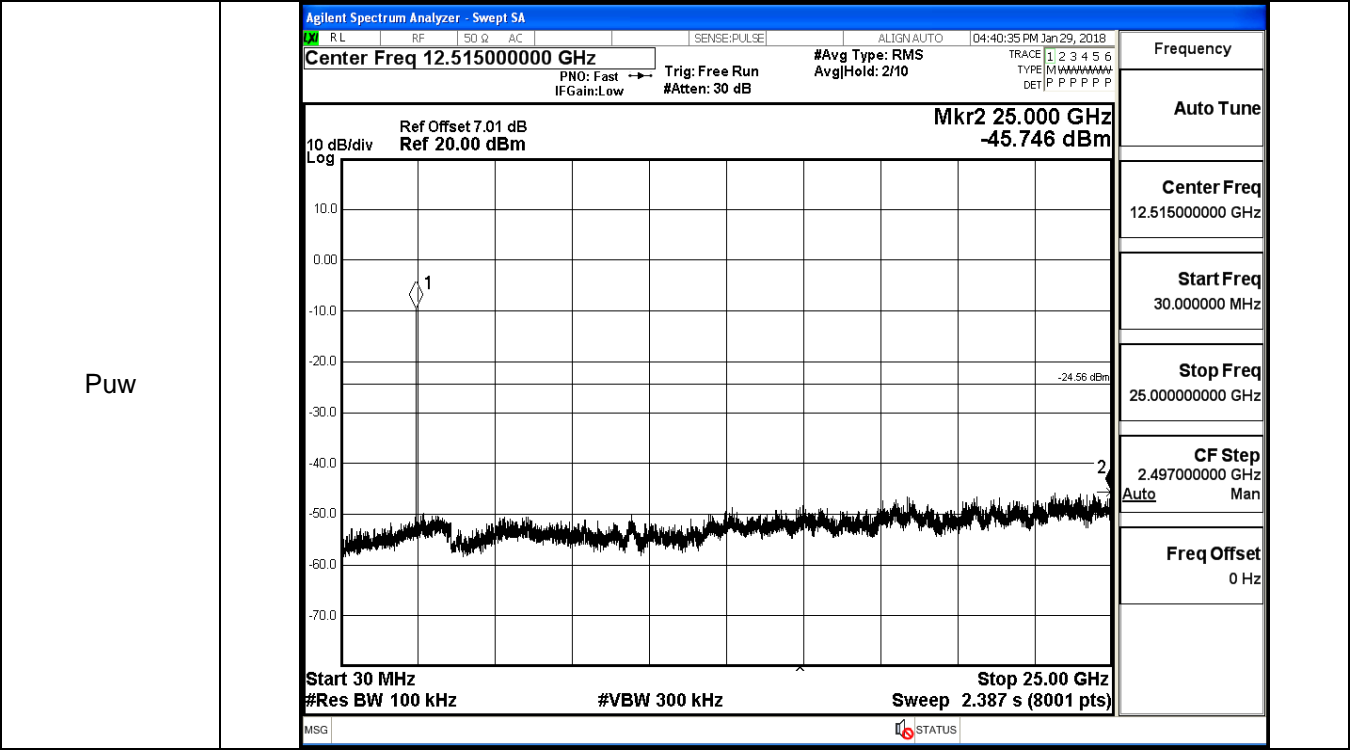








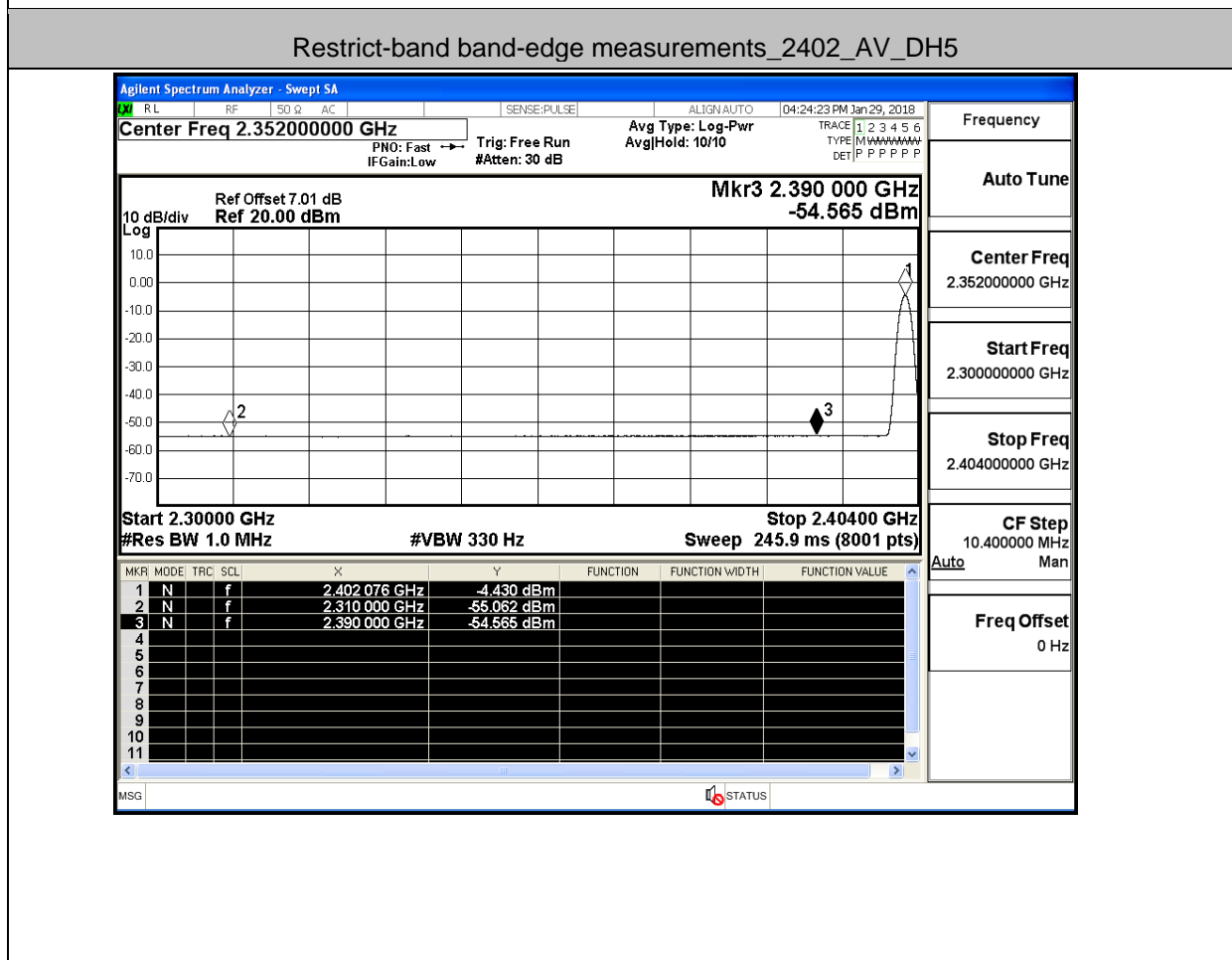




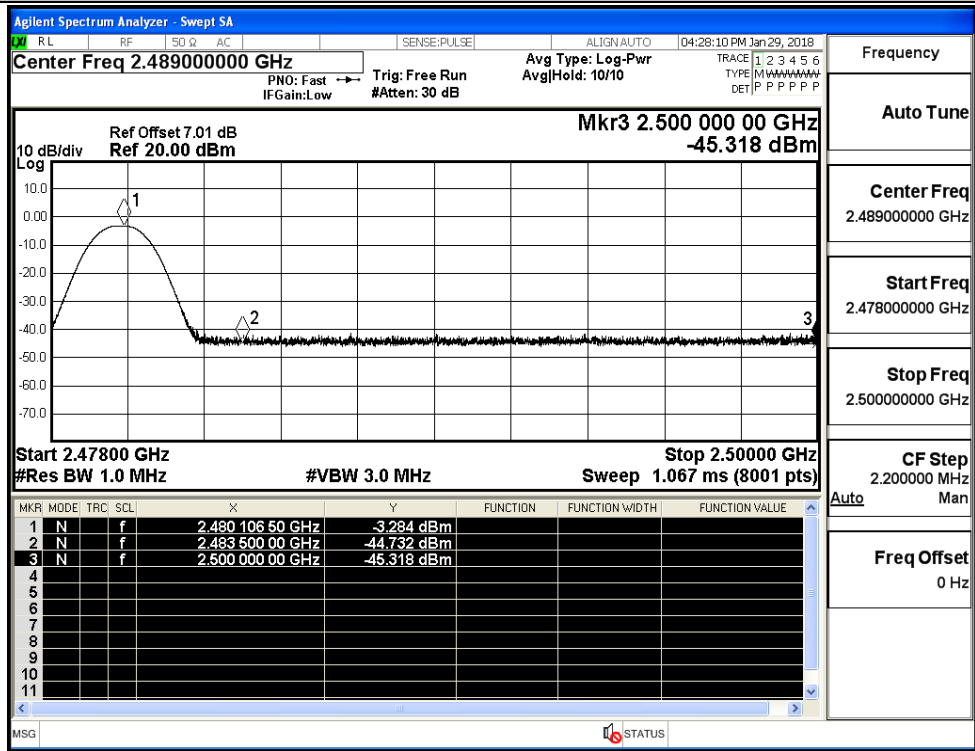
. Appendix G):Restrict-band band-edge measurements

Result Table

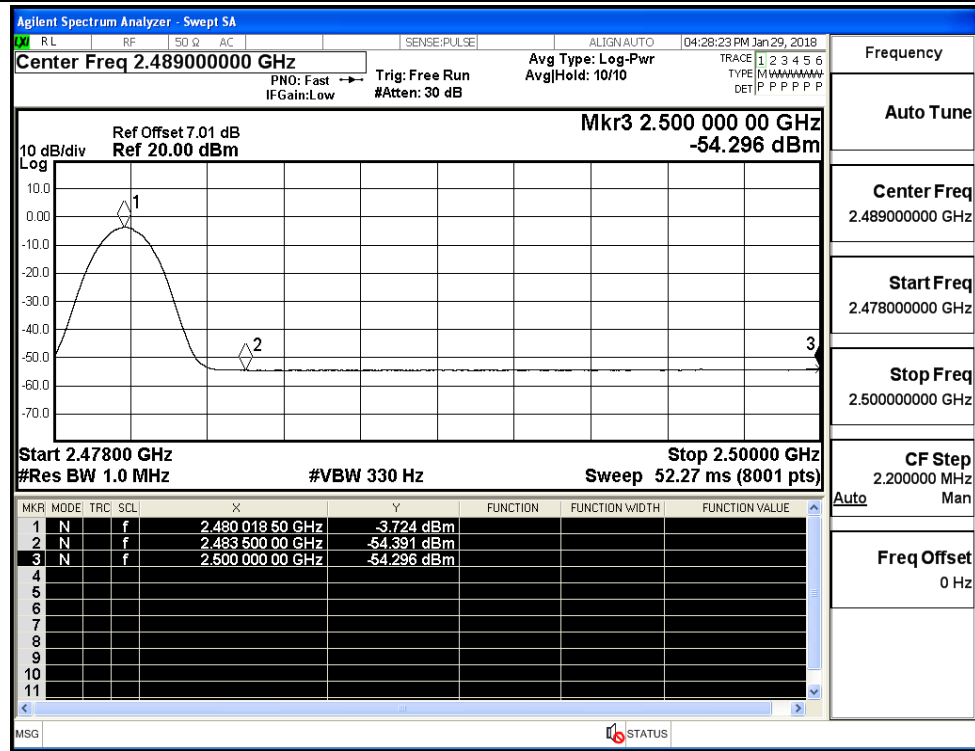
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detect or	Limit [dBuV/m]	Verdi
GFSK_DH5	On	2310.0	-43.57	2	0	51.69	PEAK	74	PASS
GFSK_DH5	On	2310.0	-55.06	2	0	40.20	AV	54	PASS
GFSK_DH5	On	2390.0	-44.94	2	0	50.32	PEAK	74	PASS
GFSK_DH5	On	2390.0	-54.57	2	0	40.69	AV	54	PASS
GFSK_DH5	On	2483.5	-44.73	2	0	50.53	PEAK	74	PASS
GFSK_DH5	On	2483.5	-54.39	2	0	40.87	AV	54	PASS
GFSK_DH5	On	2500.0	-45.32	2	0	49.94	PEAK	74	PASS
GFSK_DH5	On	2500.0	-54.30	2	0	40.96	AV	54	PASS
π /4DQPSK_2DH5	On	2310.0	-44.73	2	0	50.53	PEAK	74	PASS
π /4DQPSK_2DH5	On	2310.0	-55.05	2	0	40.21	AV	54	PASS
π /4DQPSK_2DH5	On	2390.0	-45.30	2	0	49.96	PEAK	74	PASS
π /4DQPSK_2DH5	On	2390.0	-54.69	2	0	40.57	AV	54	PASS
π /4DQPSK_2DH5	On	2483.5	-44.92	2	0	50.33	PEAK	74	PASS
π /4DQPSK_2DH5	On	2483.5	-54.46	2	0	40.80	AV	54	PASS
π /4DQPSK_2DH5	On	2500.0	-43.87	2	0	51.38	PEAK	74	PASS
π /4DQPSK_2DH5	On	2500.0	-54.38	2	0	40.87	AV	54	PASS
8DPSK_3DH5	On	2310.0	-44.22	2	0	51.04	PEAK	74	PASS
8DPSK_3DH5	On	2310.0	-54.95	2	0	40.31	AV	54	PASS
8DPSK_3DH5	On	2390.0	-44.99	2	0	50.27	PEAK	74	PASS
8DPSK_3DH5	On	2390.0	-54.75	2	0	40.51	AV	54	PASS
8DPSK_3DH5	On	2483.5	-43.90	2	0	51.36	PEAK	74	PASS
8DPSK_3DH5	On	2483.5	-54.45	2	0	40.81	AV	54	PASS
8DPSK_3DH5	On	2500.0	-43.62	2	0	51.64	PEAK	74	PASS
8DPSK_3DH5	On	2500.0	-54.43	2	0	40.83	AV	54	PASS



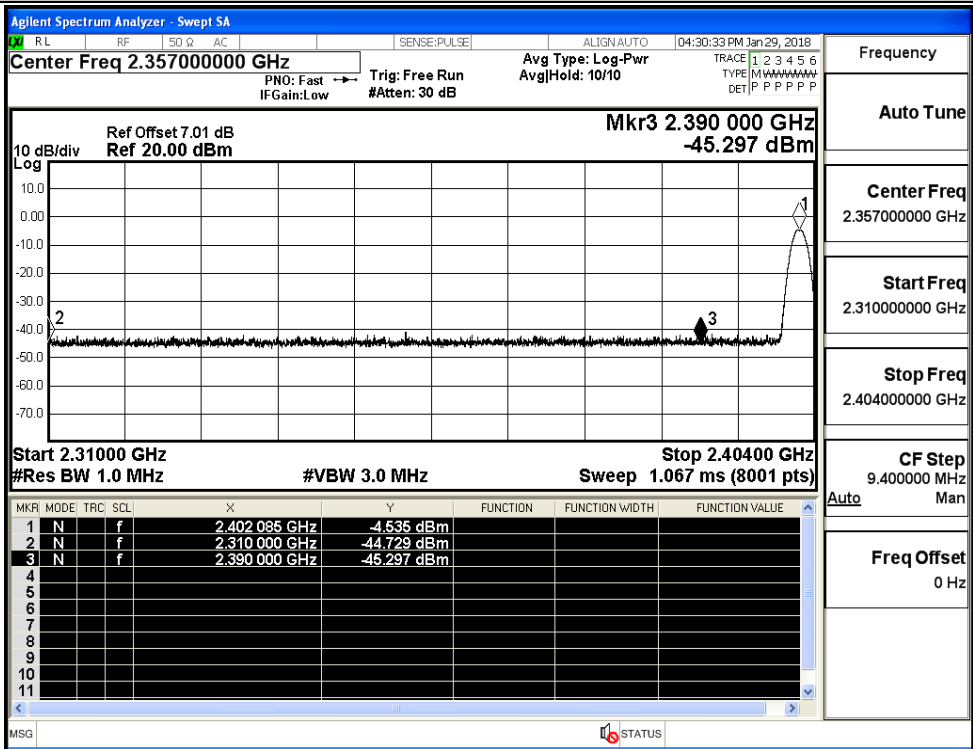
Restrict-band band-edge measurements_2480_PEAK_DH5



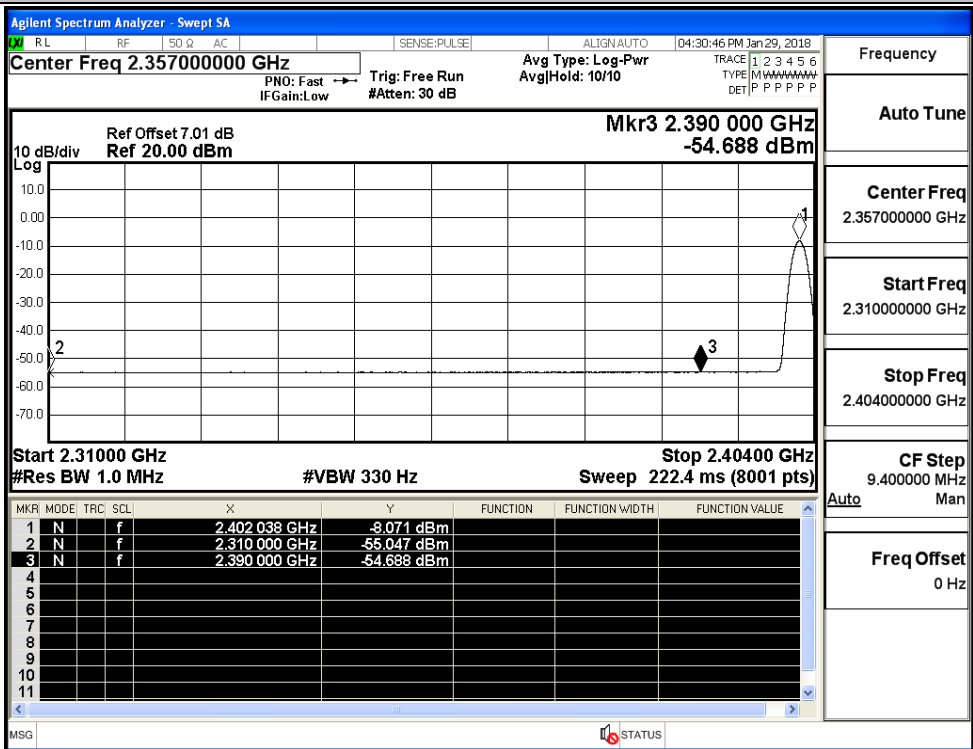
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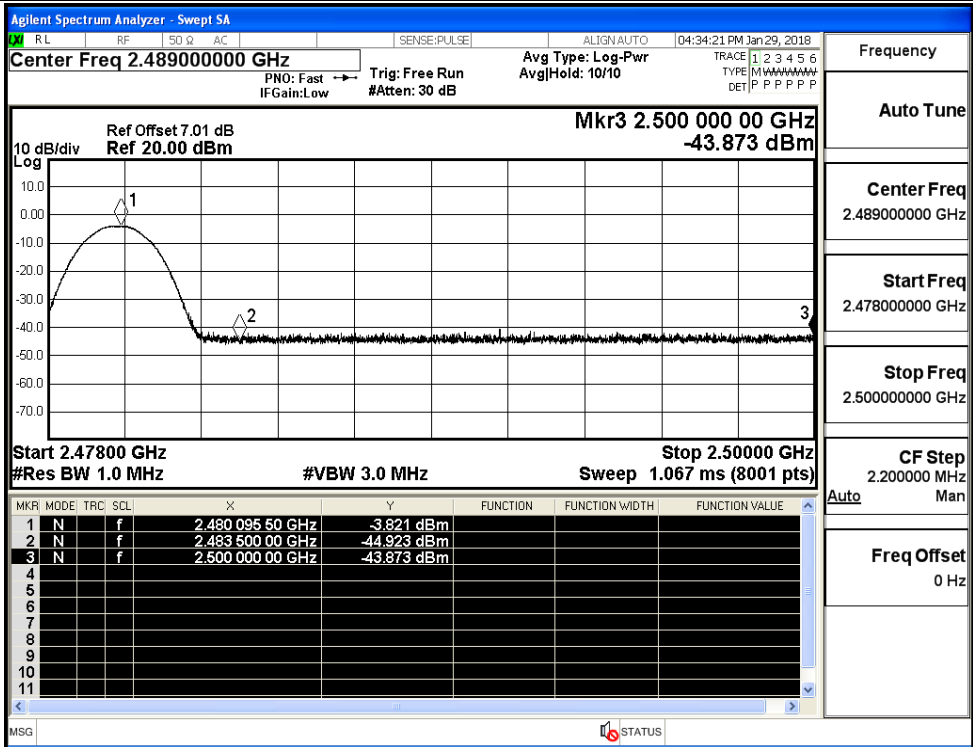
Restrict-band band-edge measurements_2402_PEAK_2DH5



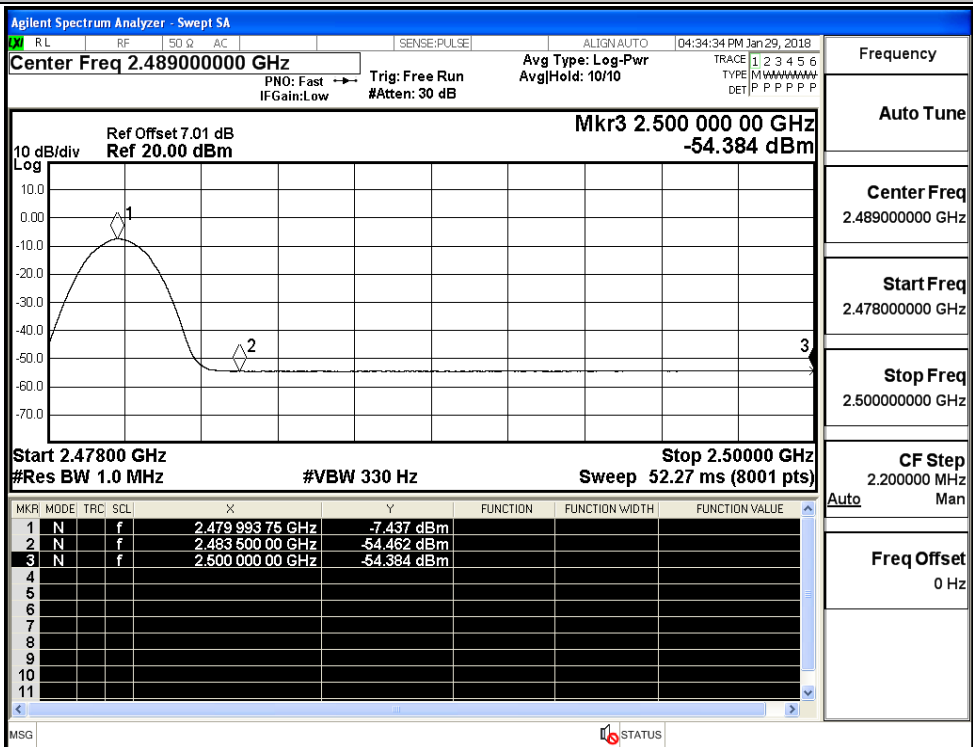
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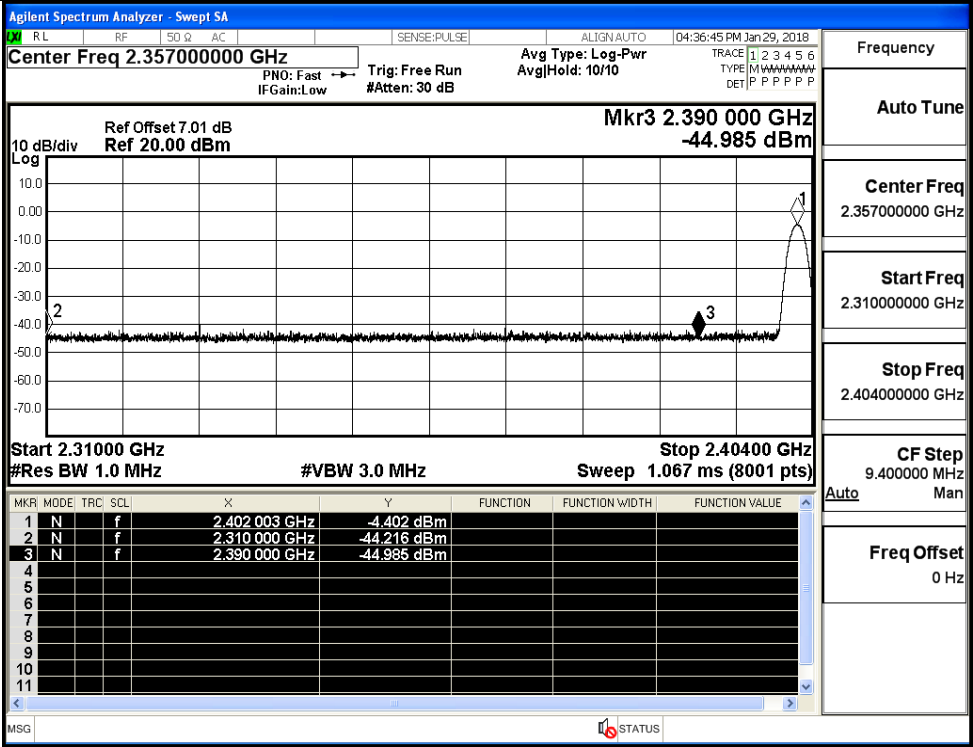
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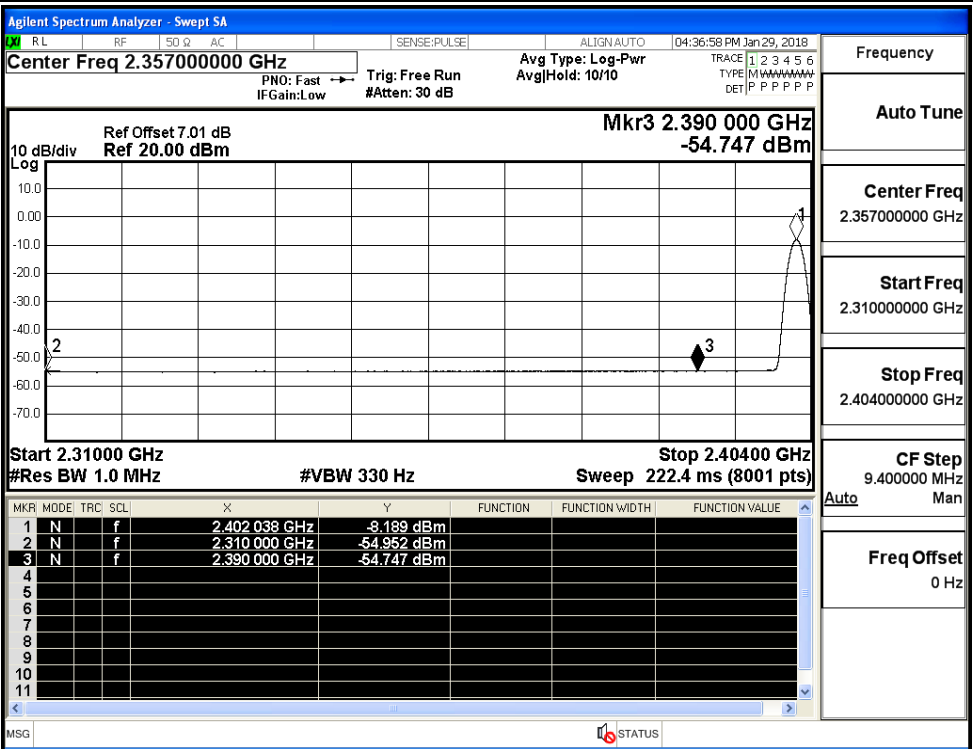
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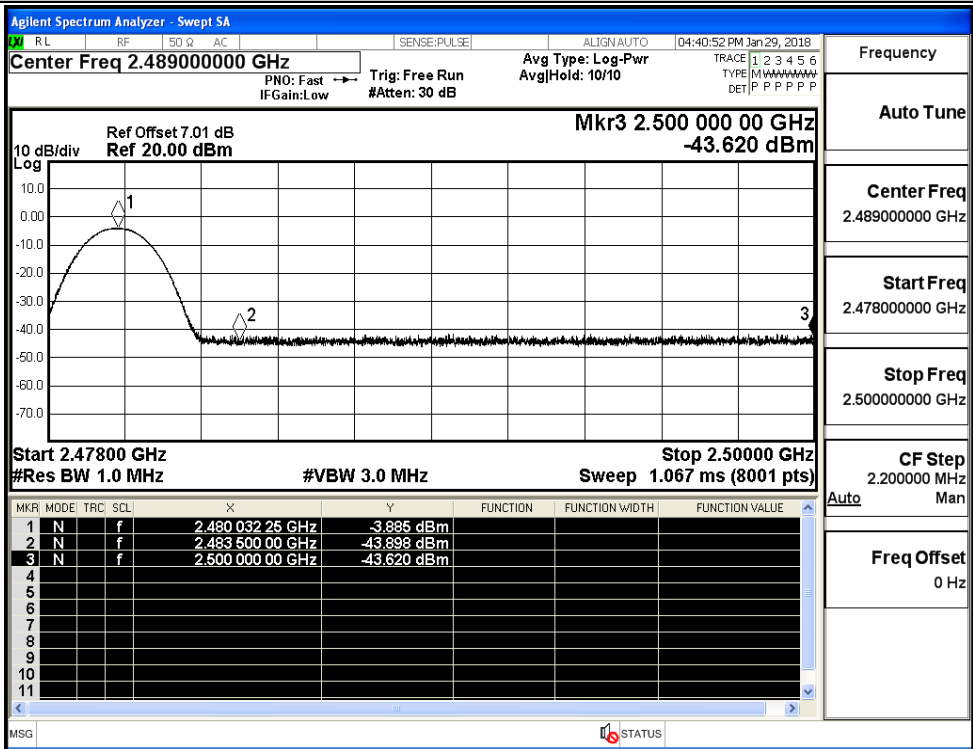
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5

