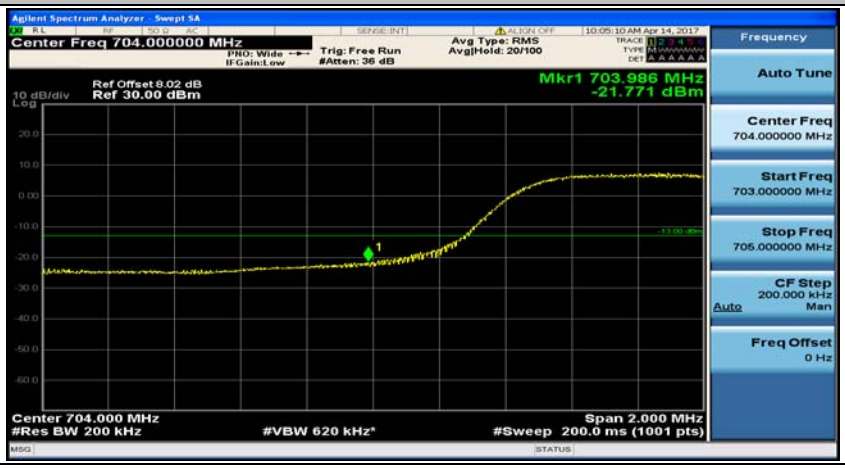
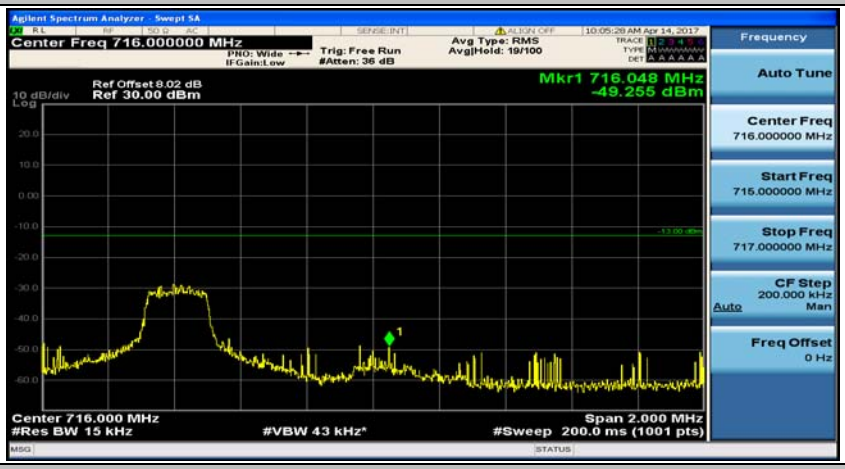
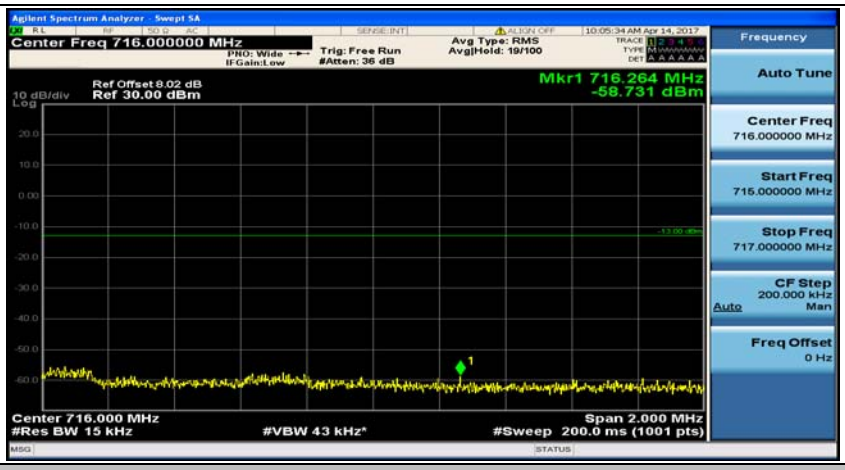
Channel Bandwidth: 10 MHz_LCH_QPSK_50RB#0



Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#0

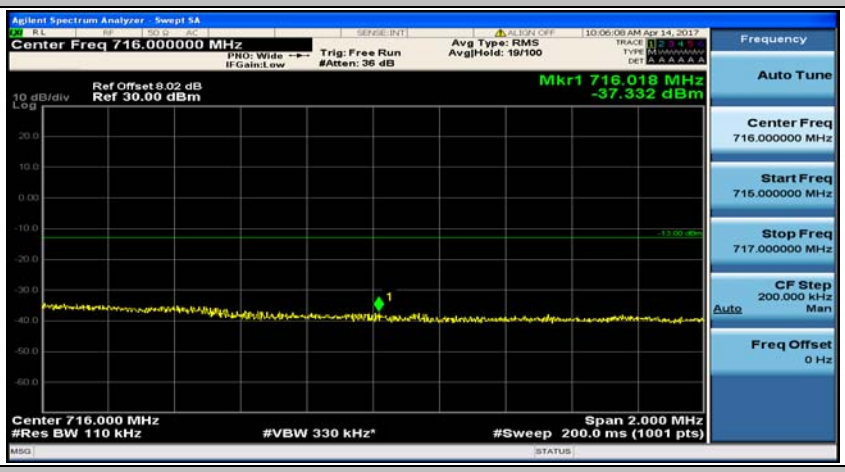


Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#24



Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#49

Channel Bandwidth: 10 MHz_HCH_QPSK_25RB#0



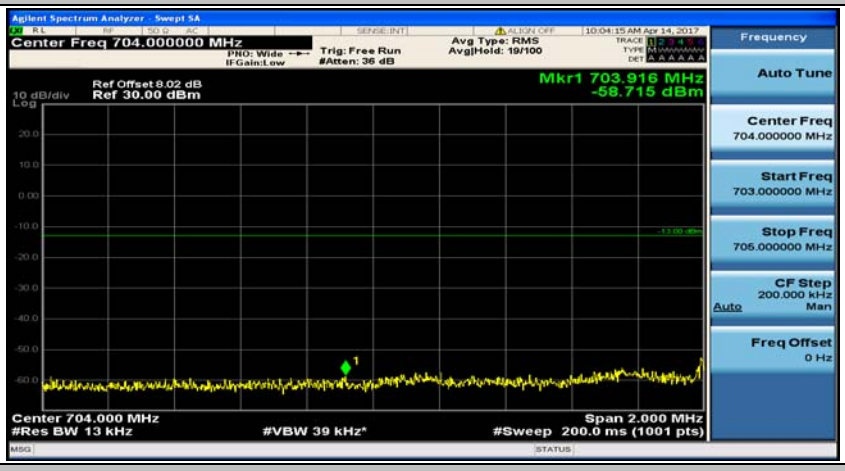
Channel Bandwidth: 10 MHz_HCH_QPSK_25RB#12

Channel Bandwidth: 10 MHz_HCH_QPSK_25RB#25

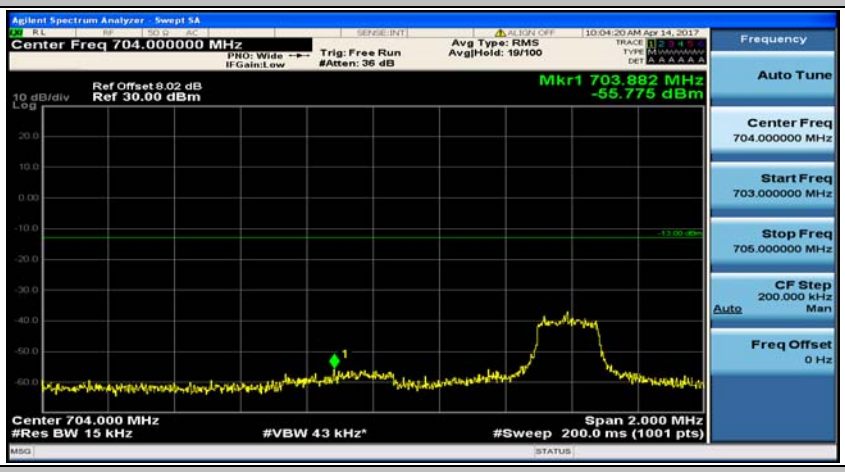
Channel Bandwidth: 10 MHz_HCH_QPSK_50RB#0

Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#0

Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#24

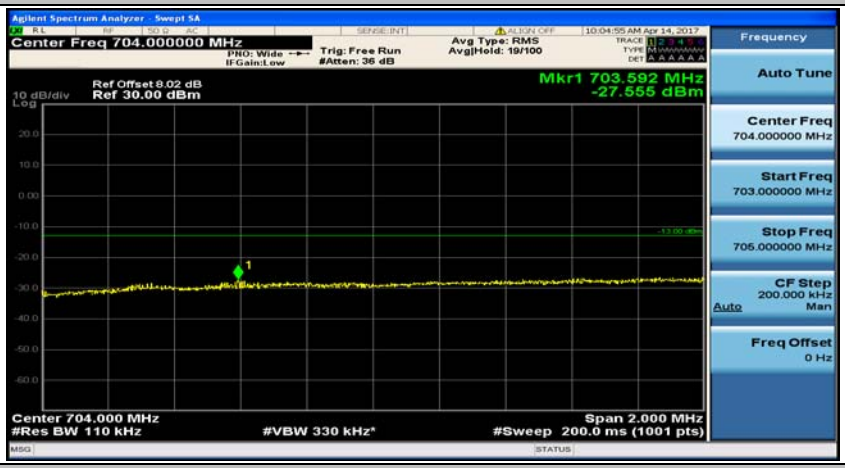


Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#49

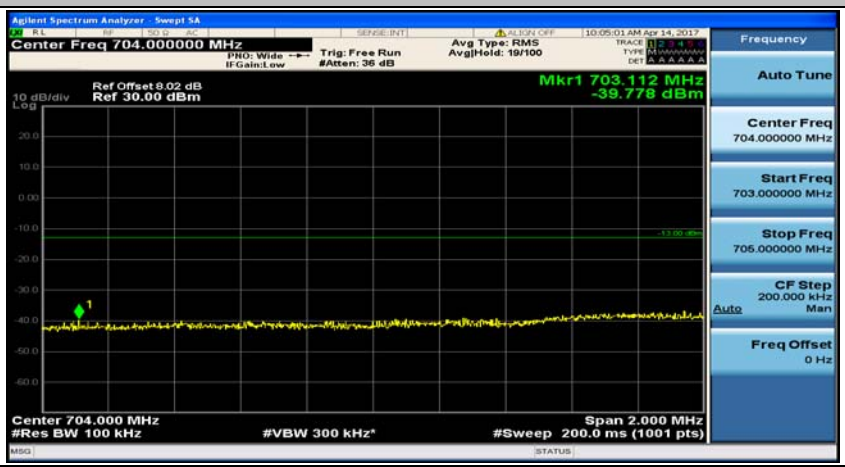


Channel Bandwidth: 10 MHz_LCH_16QAM_25RB#0

Channel Bandwidth: 10 MHz_LCH_16QAM_25RB#12



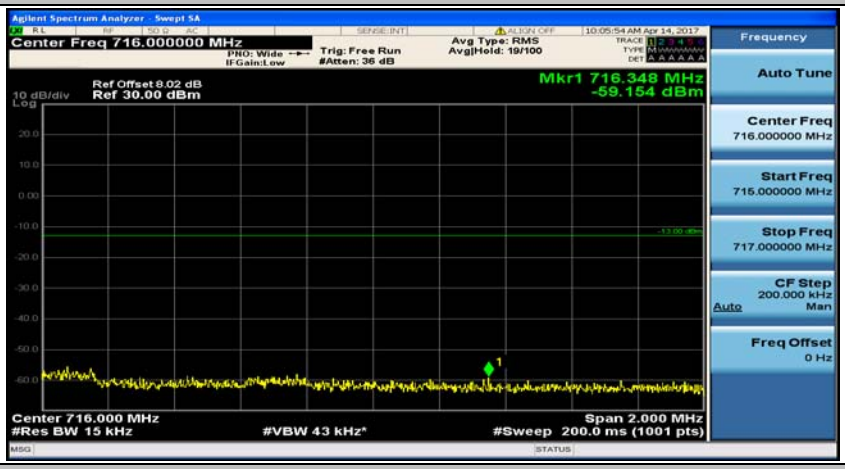
Channel Bandwidth: 10 MHz_LCH_16QAM_25RB#25



Channel Bandwidth: 10 MHz_LCH_16QAM_50RB#0

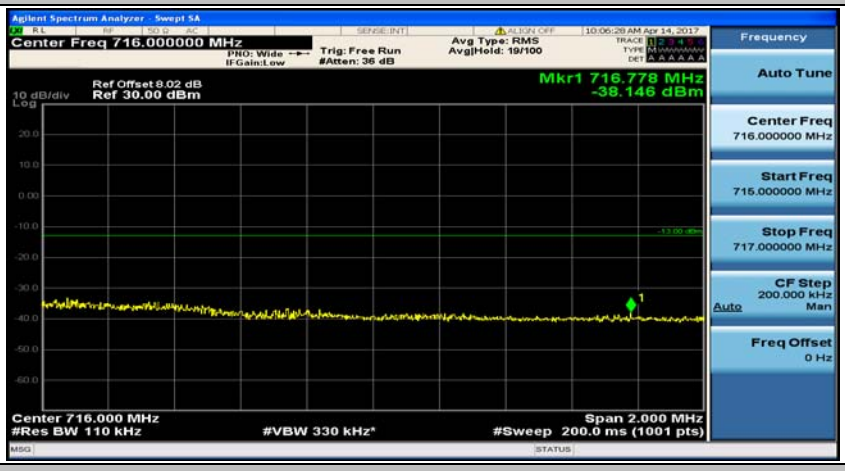
Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#0

Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#24

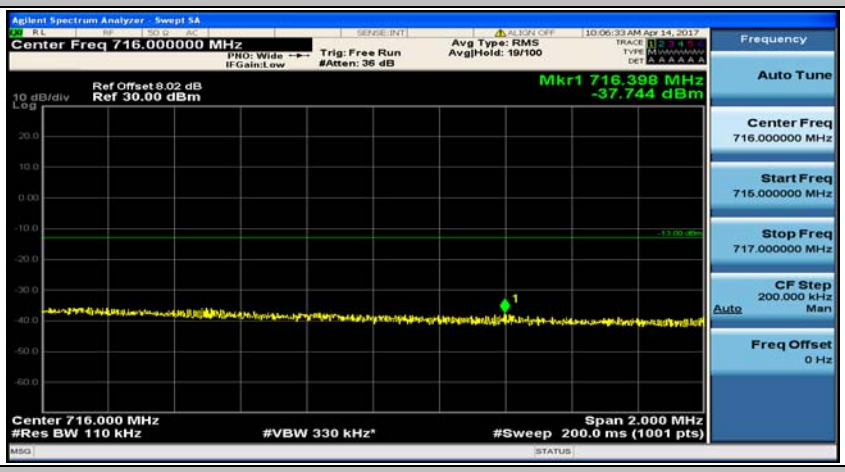


Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#49

Channel Bandwidth: 10 MHz_HCH_16QAM_25RB#0



Channel Bandwidth: 10 MHz_HCH_16QAM_25RB#12



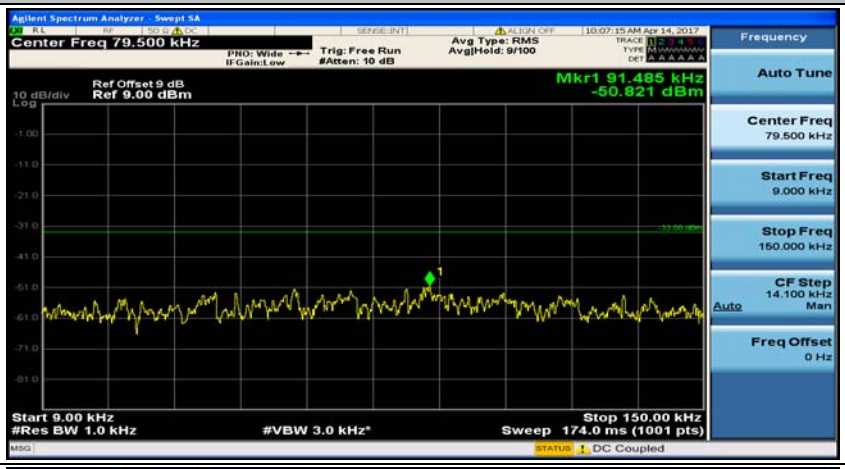
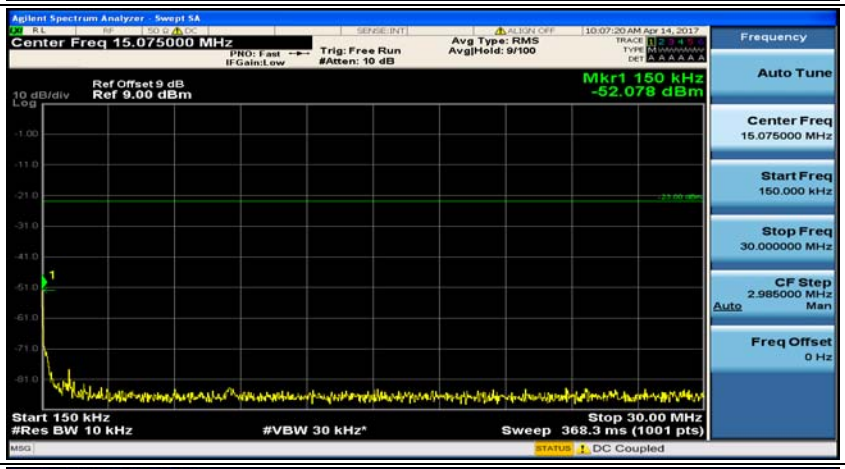
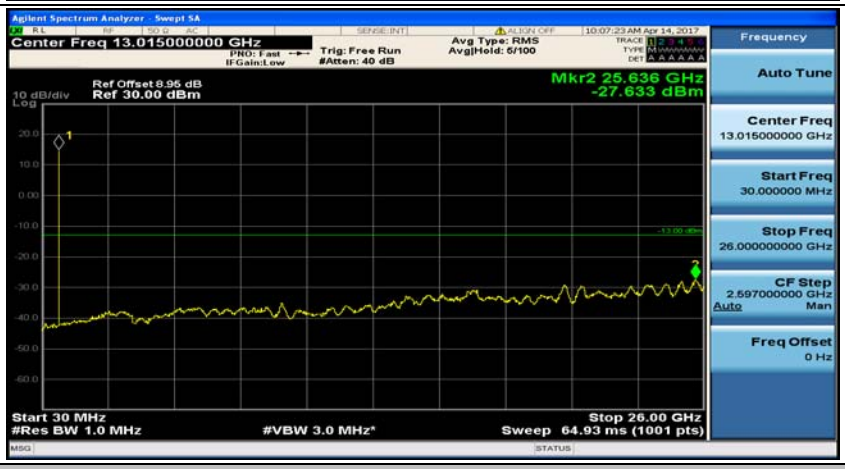
Channel Bandwidth: 10 MHz_HCH_16QAM_25RB#25

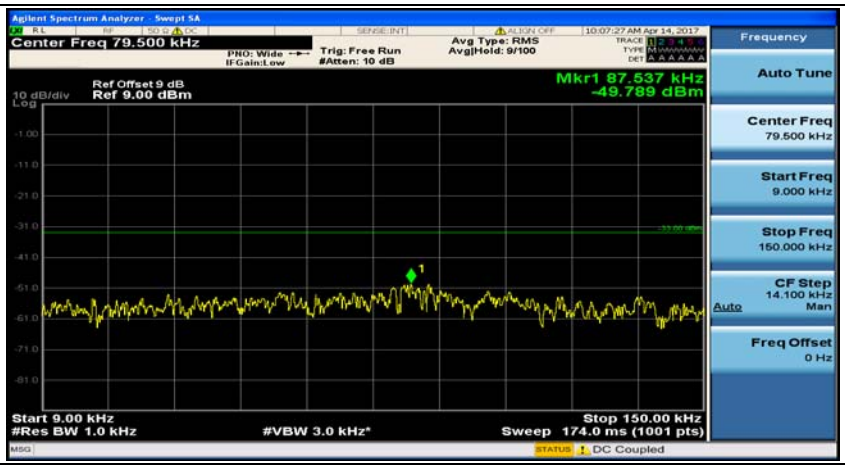
Channel Bandwidth: 10 MHz_HCH_16QAM_50RB#0

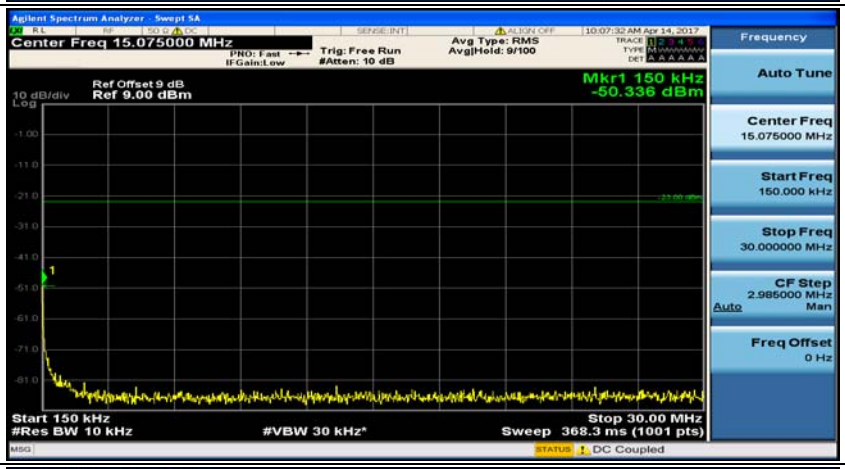
Appendix E: Conducted Spurious Emission

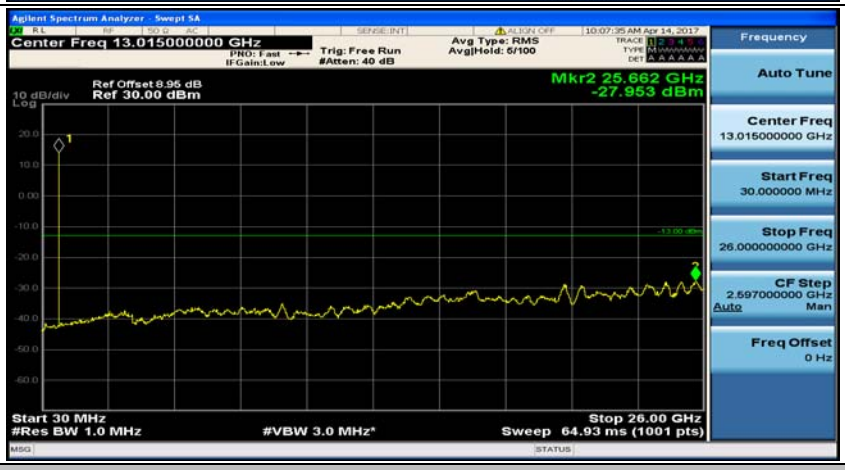
Test Graphs

Channel Bandwidth: 5 MHz

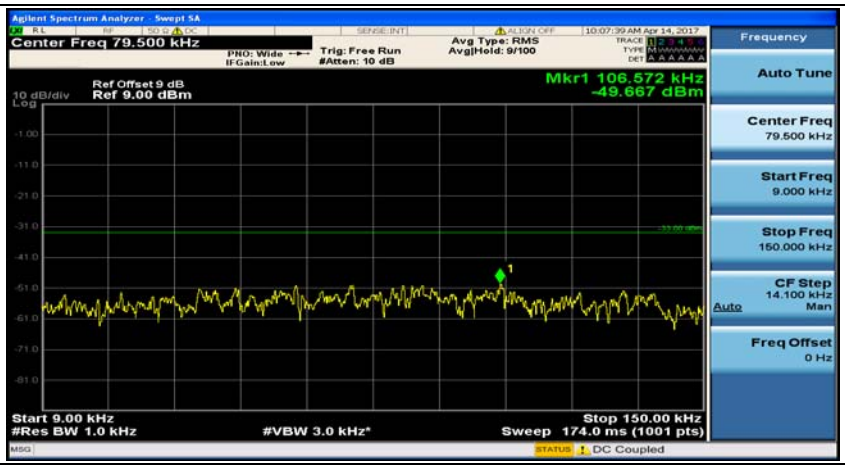
(Channel Bandwidth: 5 MHz)_LCH_QPSK_1RB#0



(Channel Bandwidth: 5 MHz)_LCH_QPSK_1RB#12

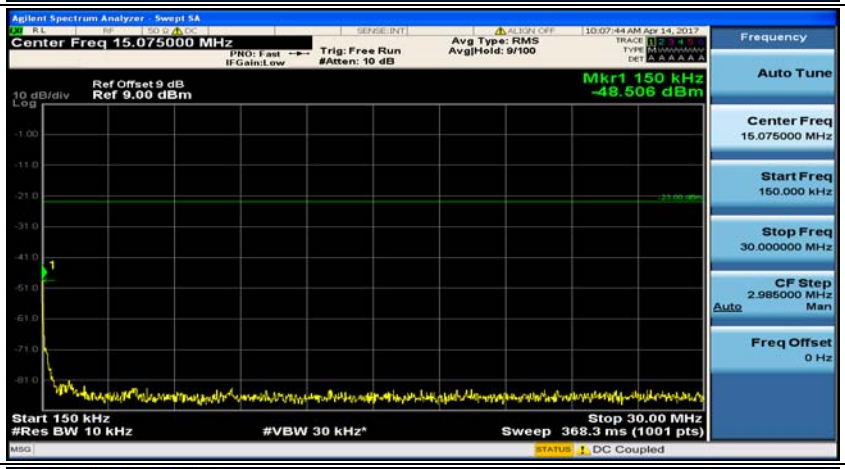


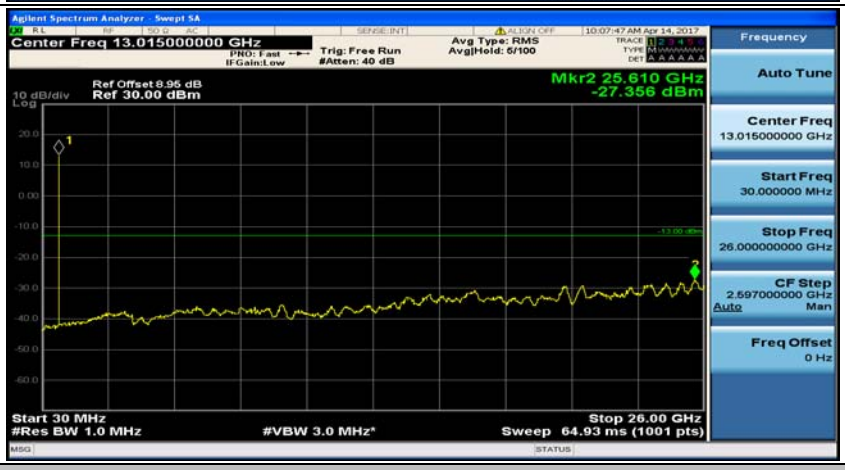




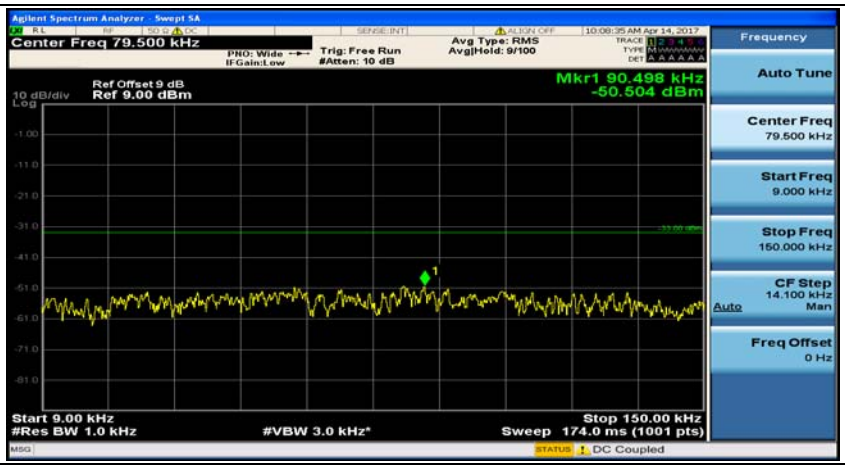
(Channel Bandwidth: 5 MHz)_LCH_QPSK_1RB#24

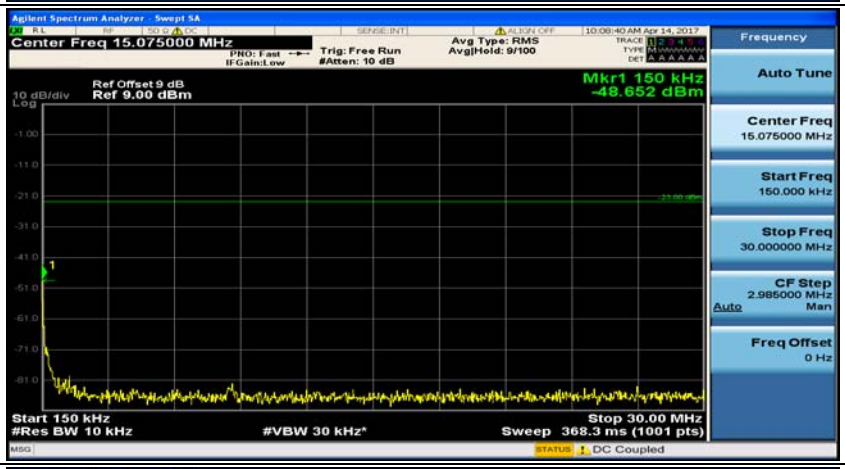


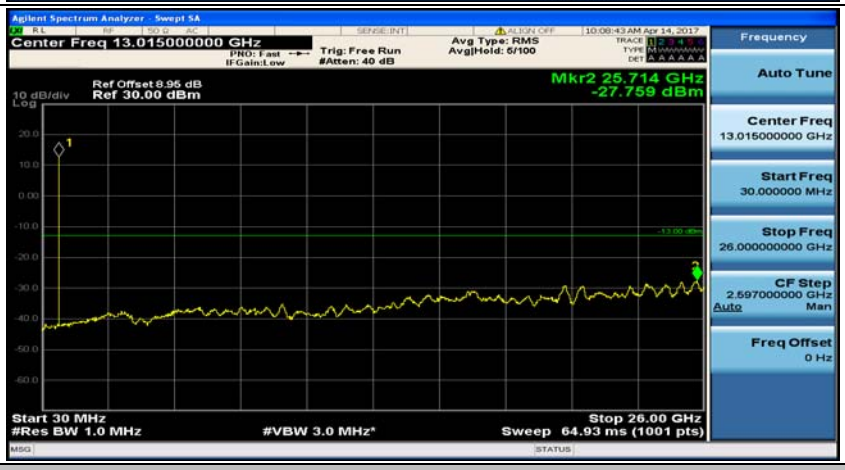




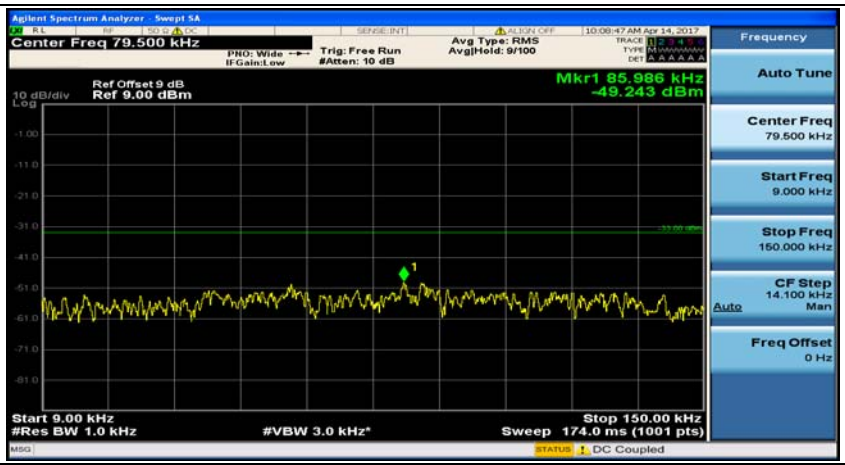
(Channel Bandwidth: 5 MHz)_MCH_QPSK_1RB#0

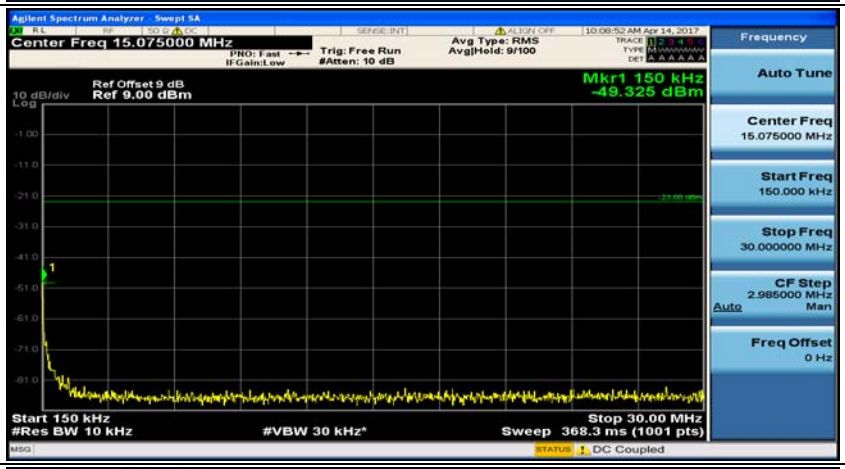




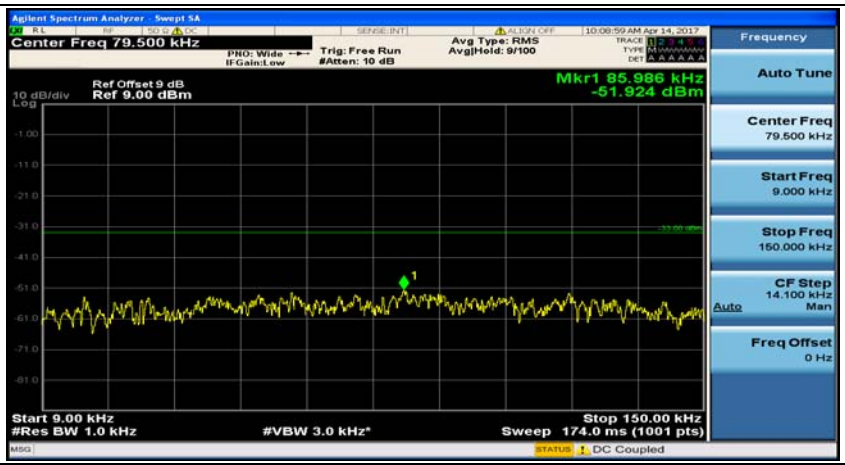


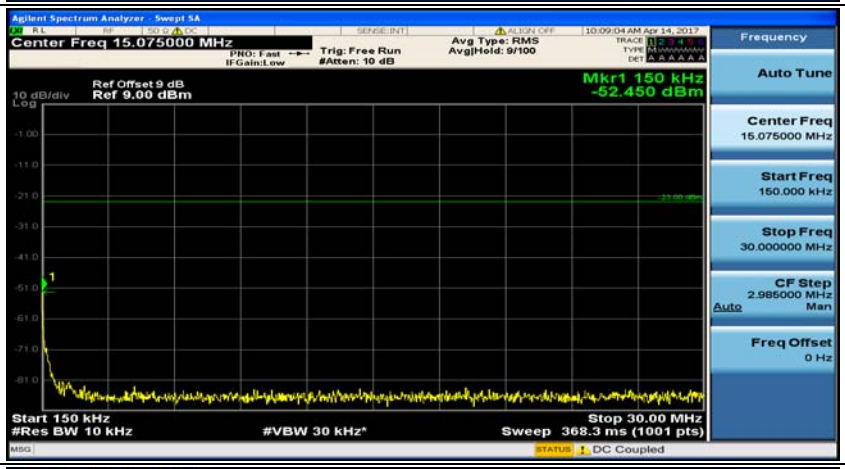
(Channel Bandwidth: 5 MHz)_MCH_QPSK_1RB#12

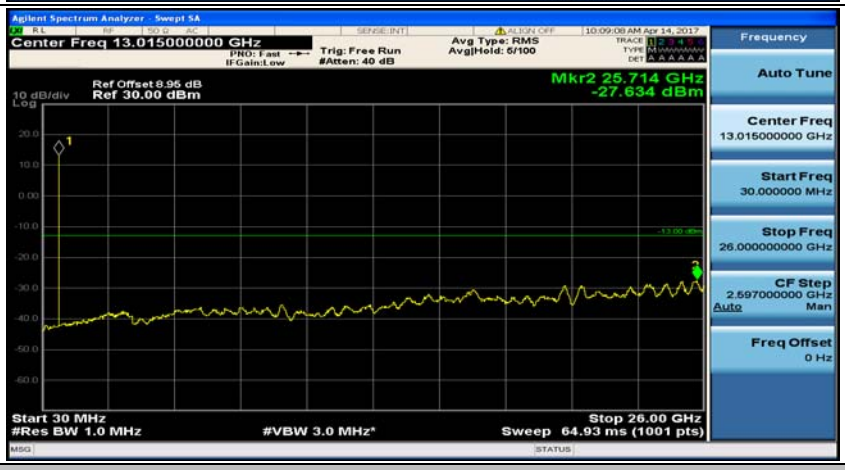




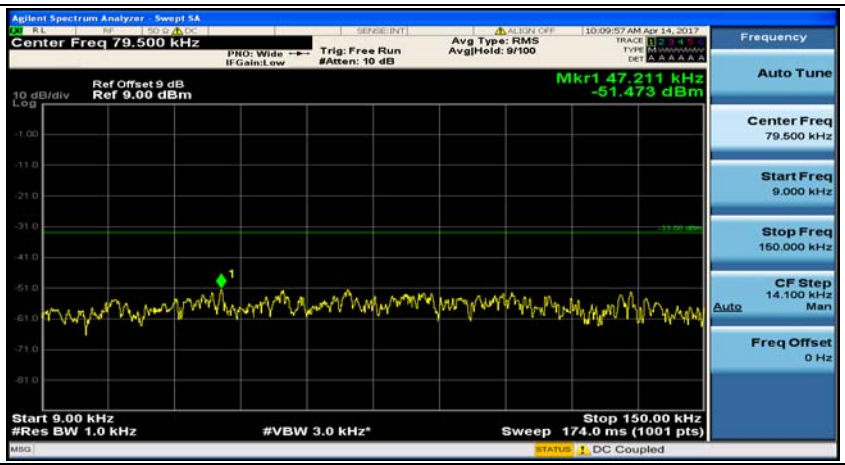
(Channel Bandwidth: 5 MHz)_MCH_QPSK_1RB#24

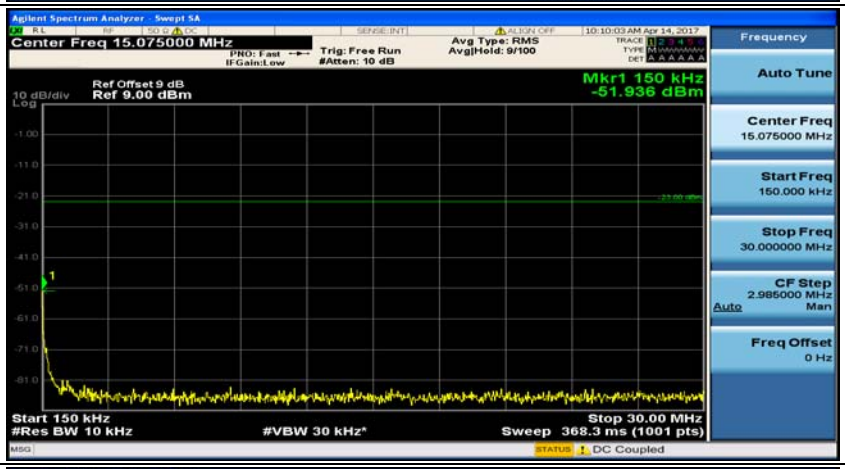


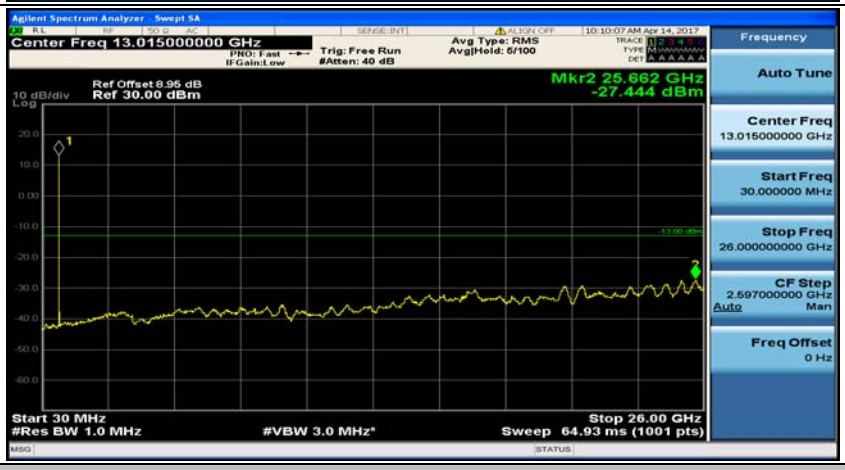




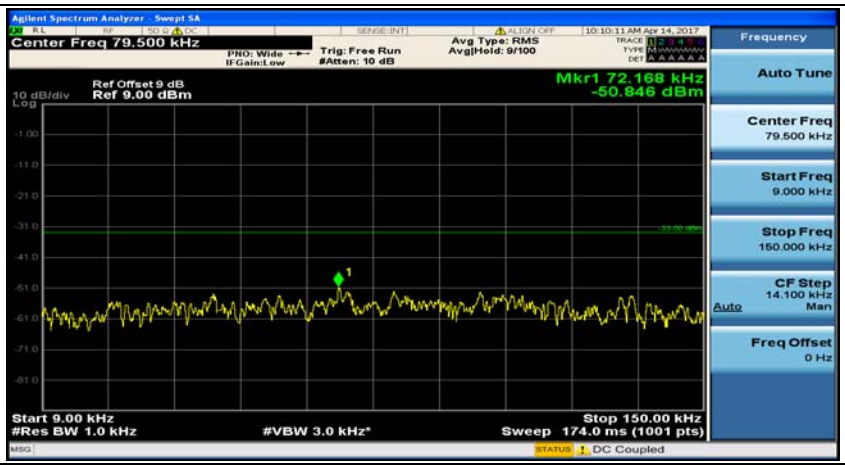
(Channel Bandwidth: 5 MHz)_HCH_QPSK_1RB#0

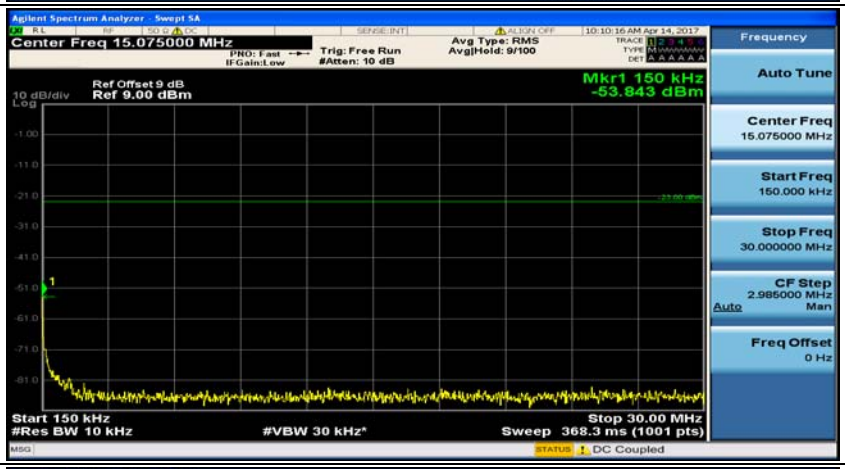


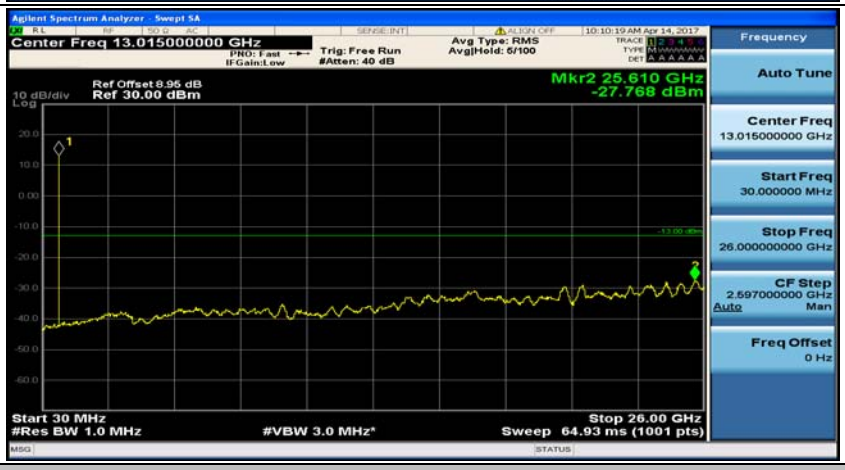




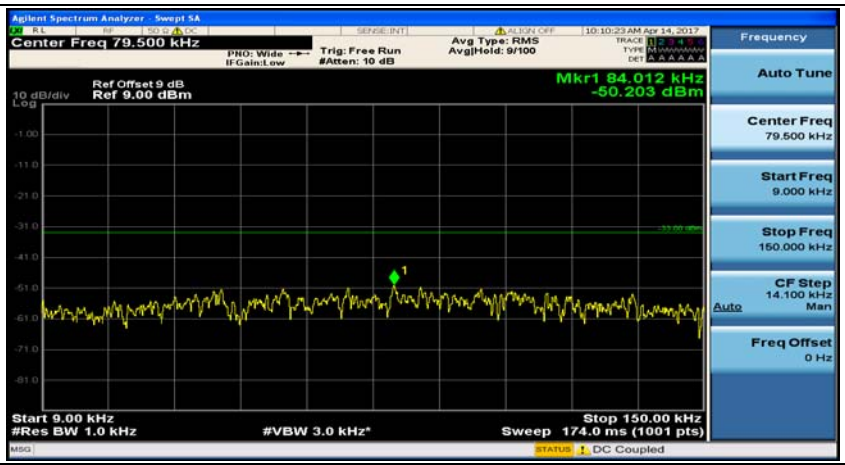
(Channel Bandwidth: 5 MHz)_HCH_QPSK_1RB#12

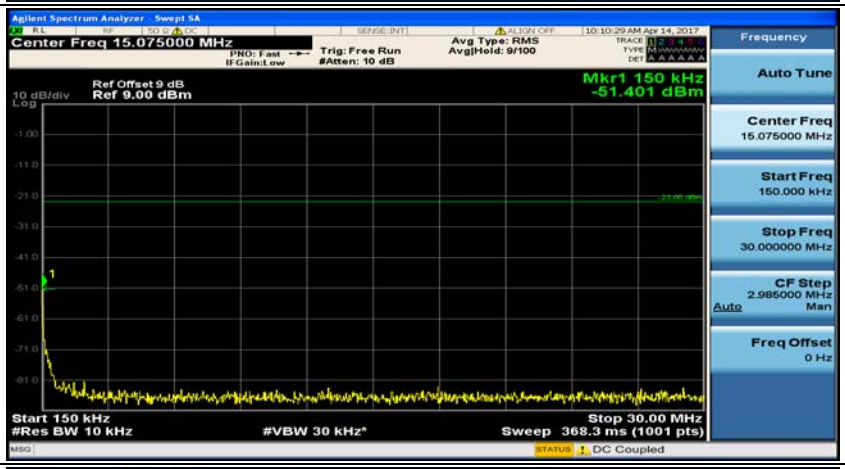


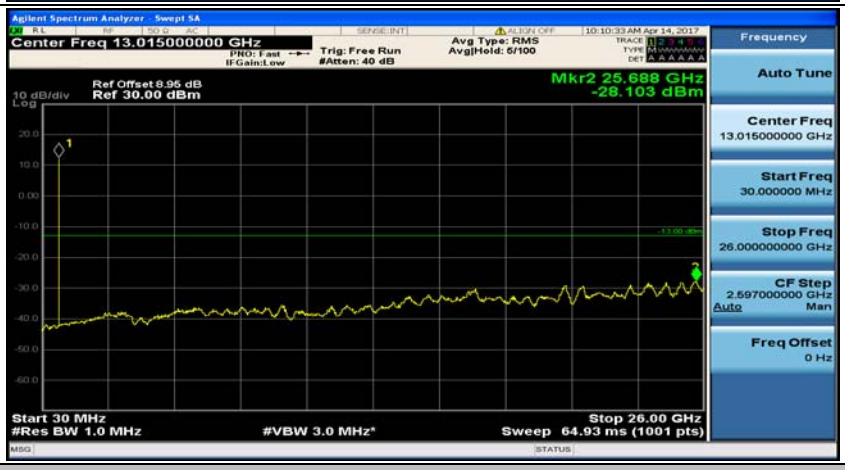




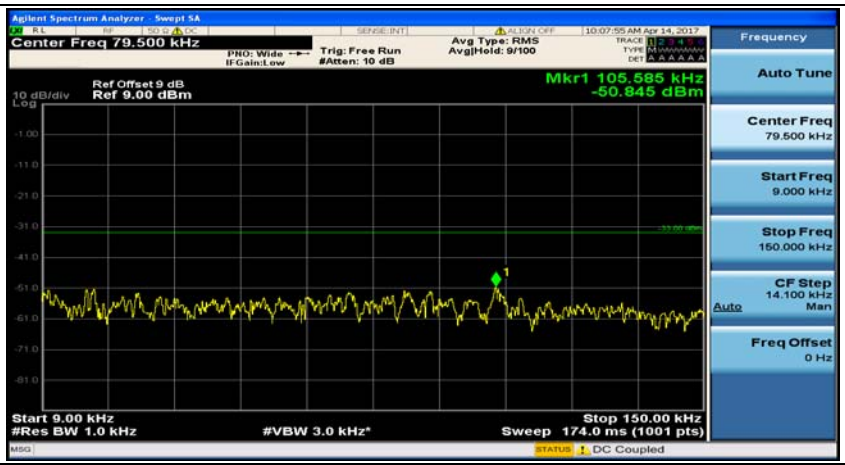
(Channel Bandwidth: 5 MHz)_HCH_QPSK_1RB#24

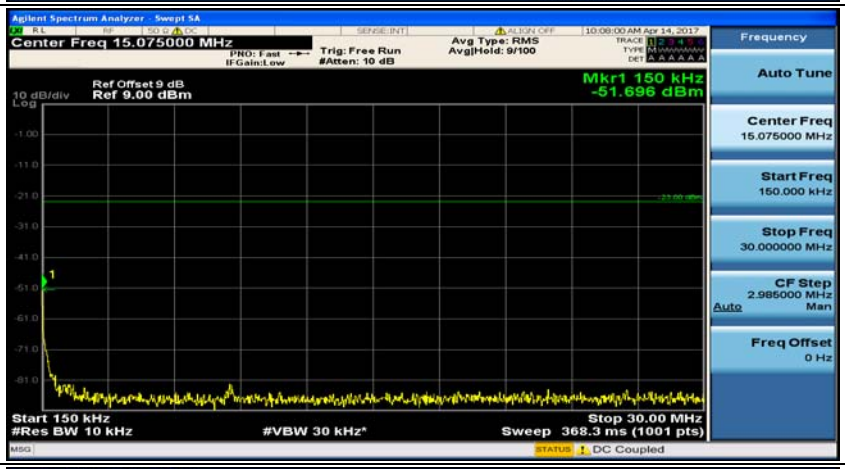


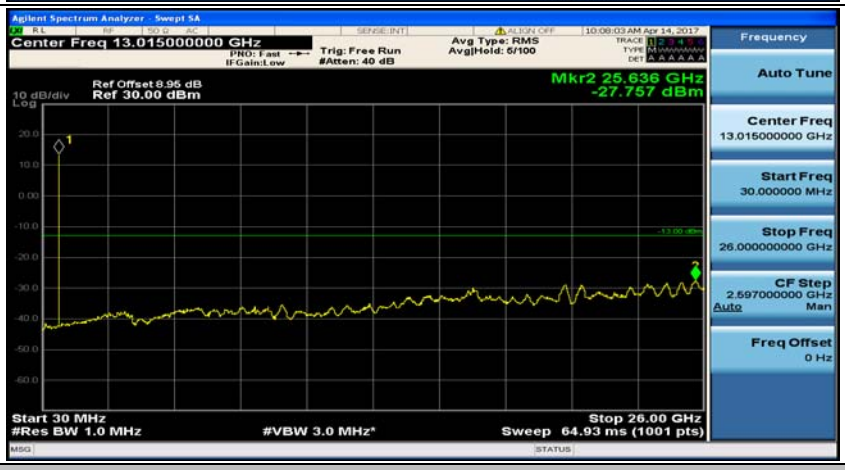




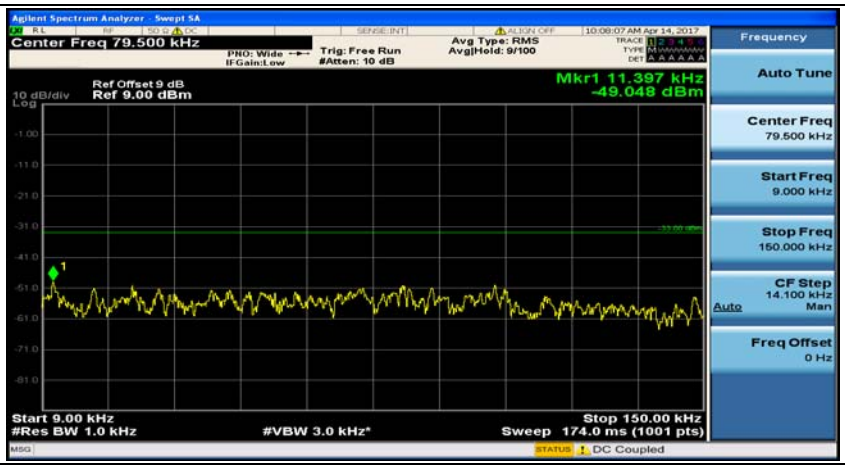
(Channel Bandwidth: 5 MHz)_LCH_16QAM_1RB#0

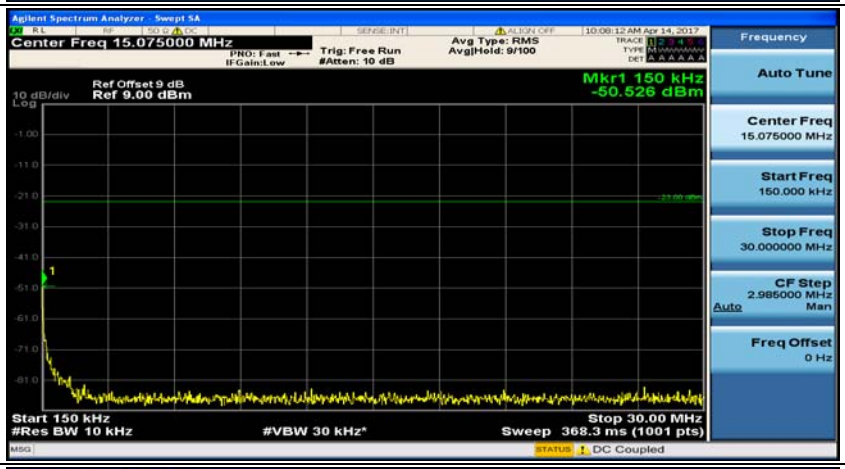


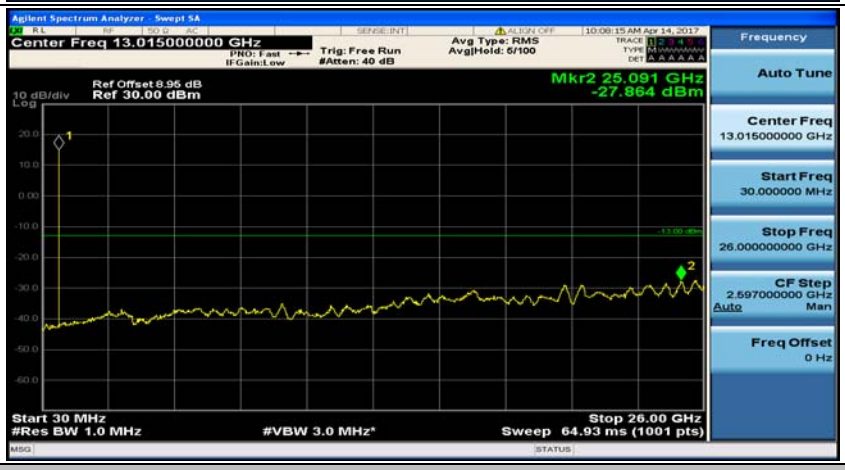




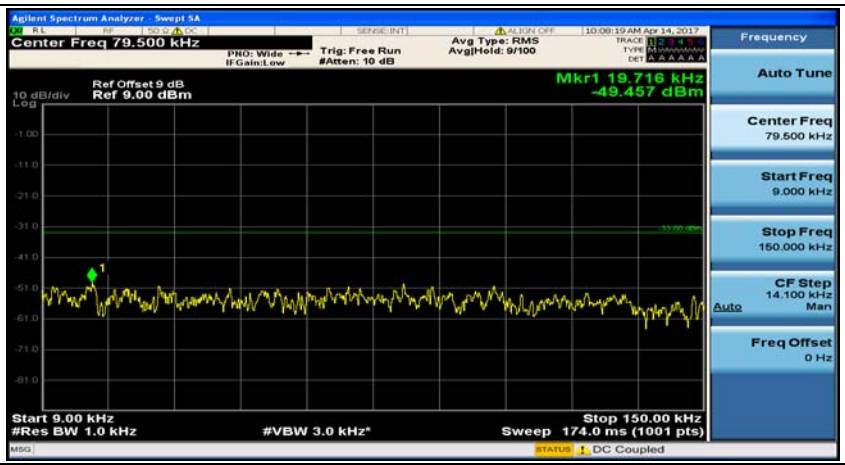
(Channel Bandwidth: 5 MHz)_LCH_16QAM_1RB#12

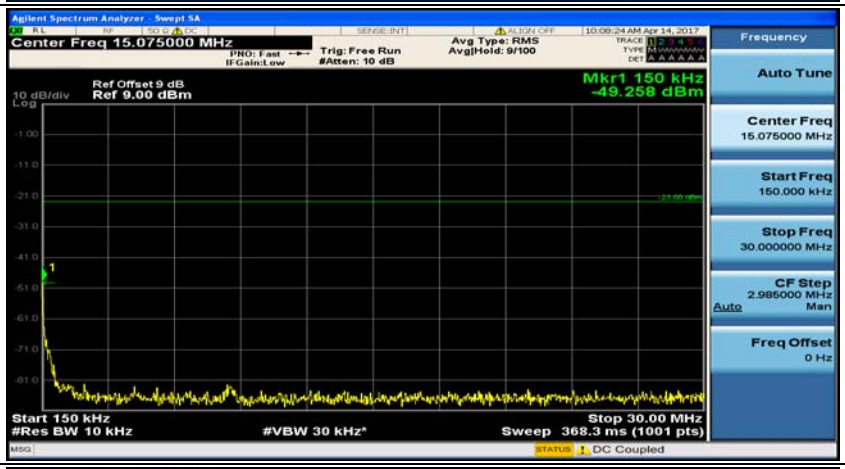


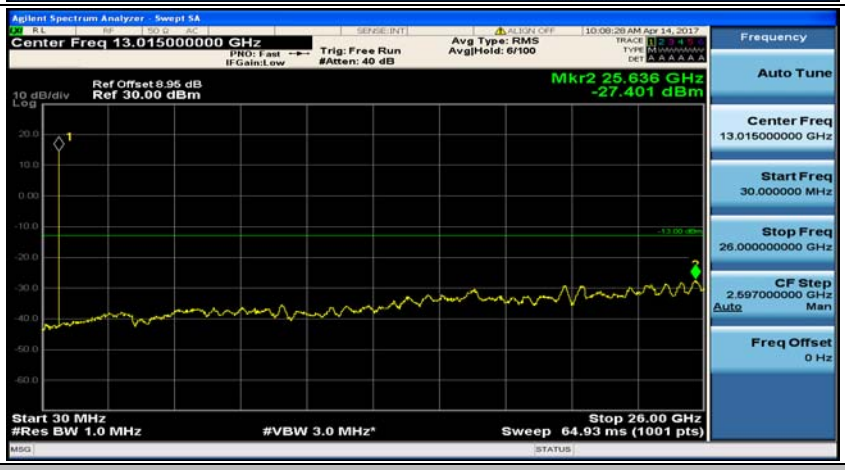




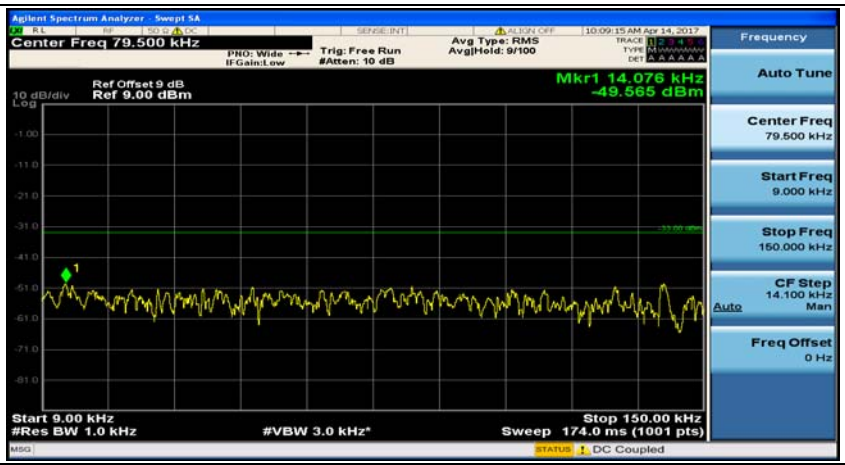
(Channel Bandwidth: 5 MHz)_LCH_16QAM_1RB#24

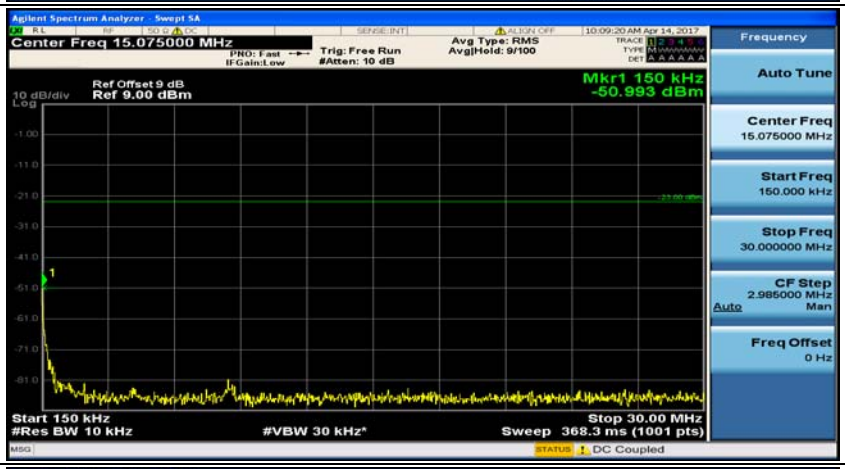


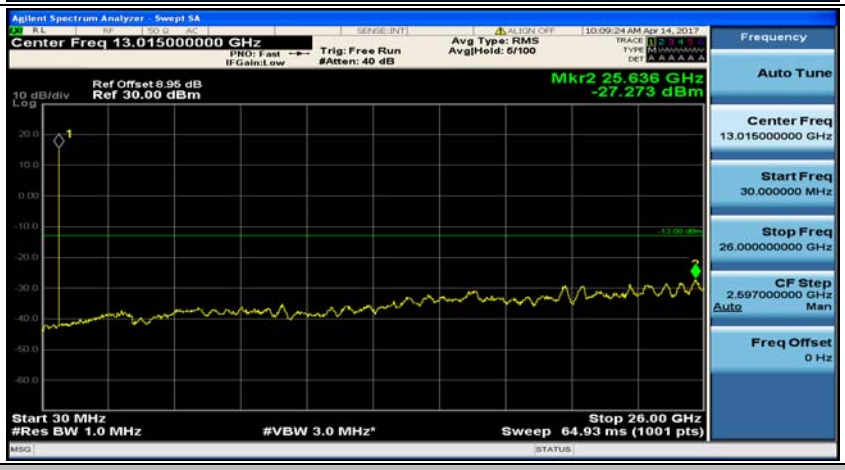




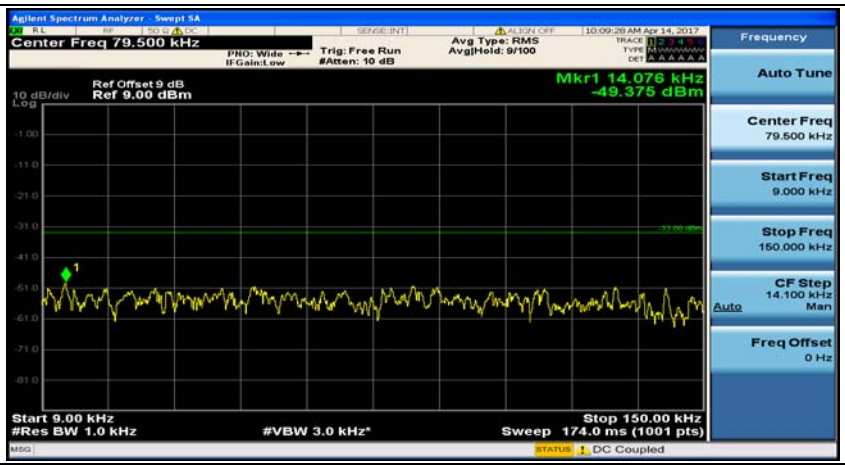
(Channel Bandwidth: 5 MHz)_MCH_16QAM_1RB#0

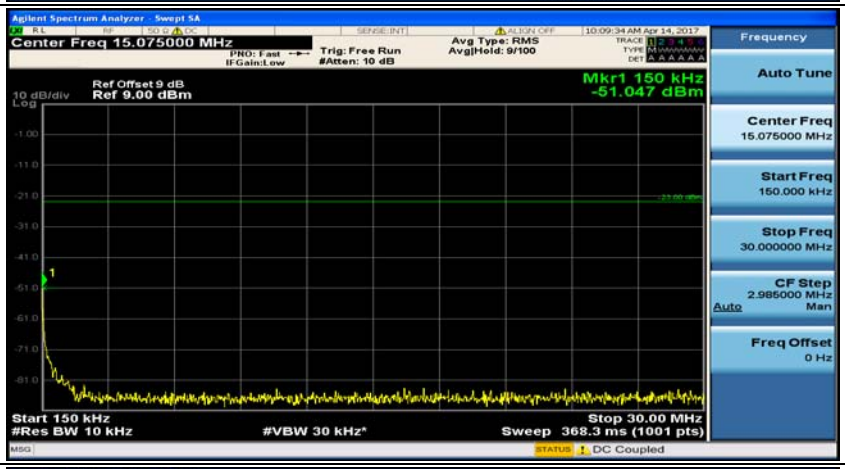


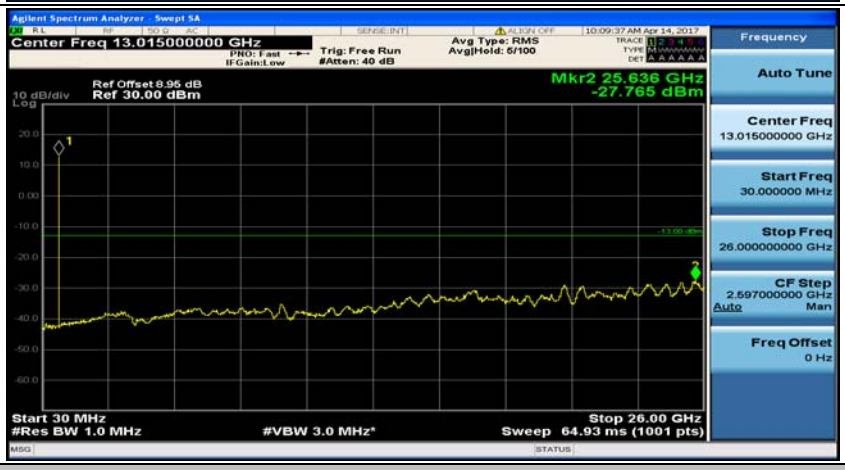




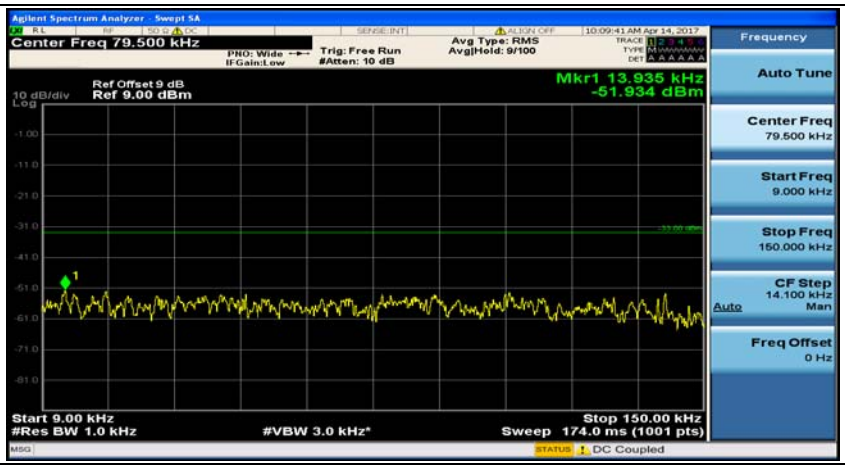
(Channel Bandwidth: 5 MHz)_MCH_16QAM_1RB#12

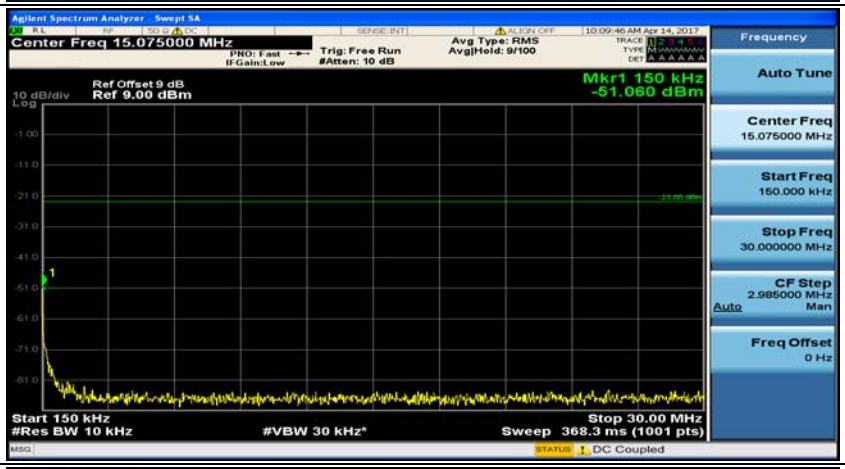


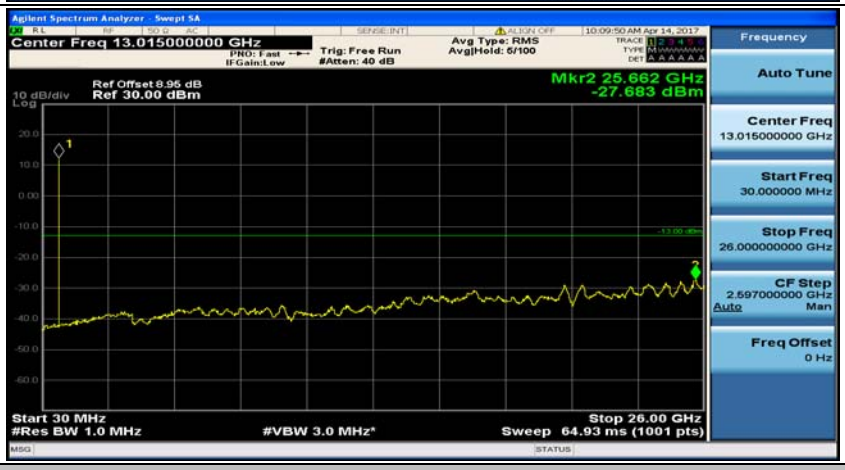




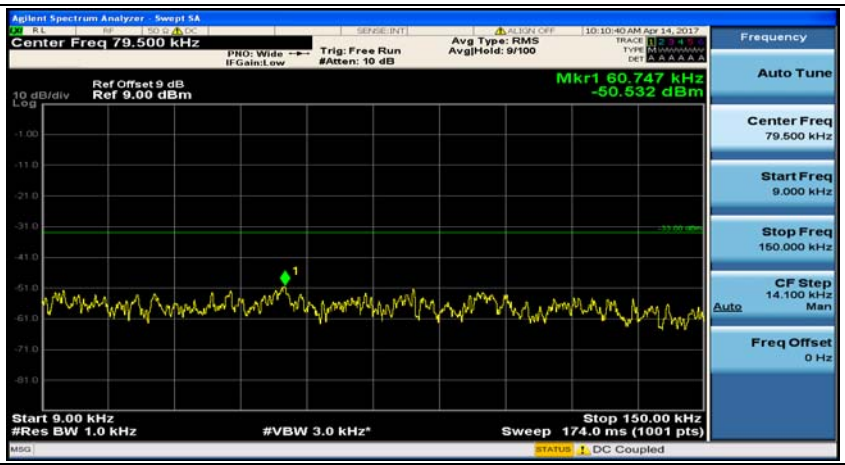
(Channel Bandwidth: 5 MHz)_MCH_16QAM_1RB#24

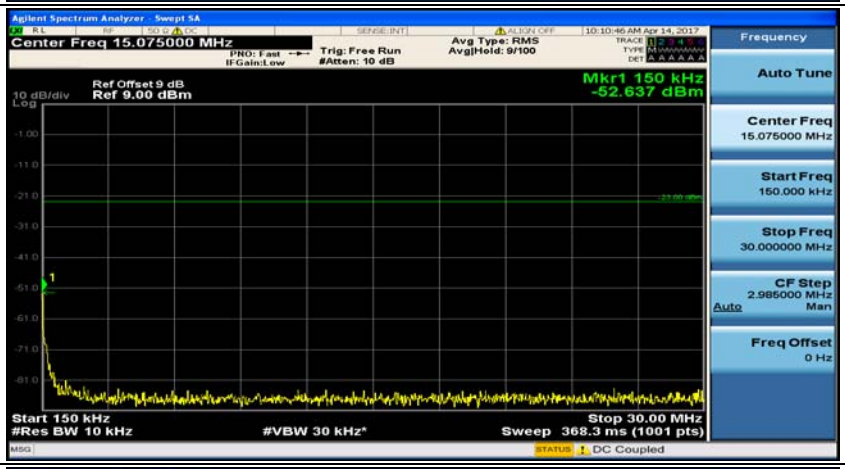


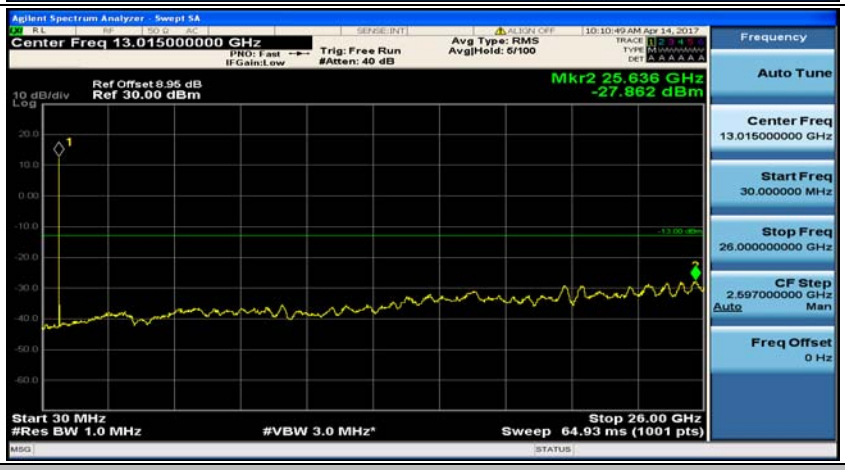




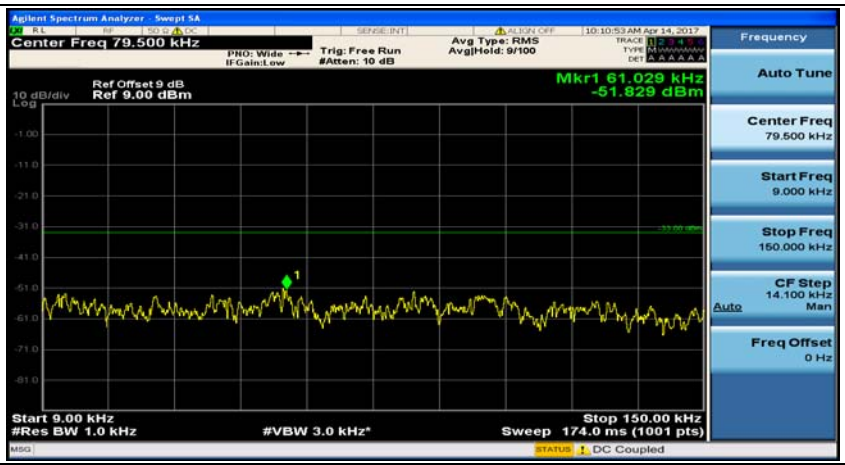
(Channel Bandwidth: 5 MHz)_HCH_16QAM_1RB#0

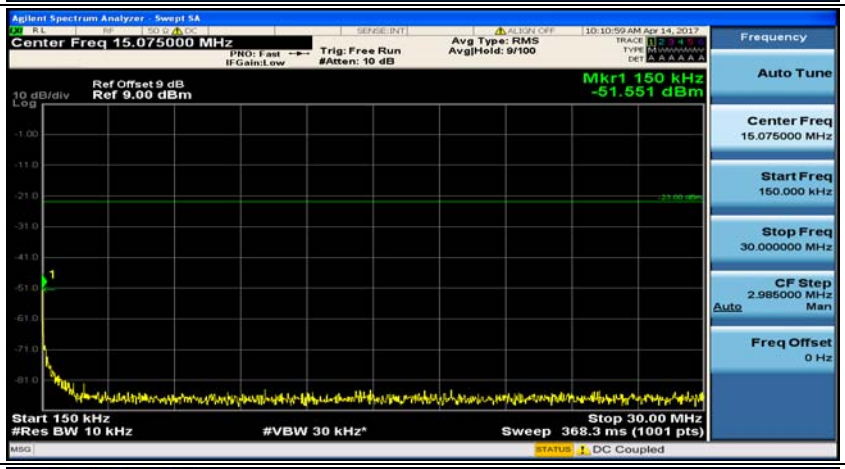




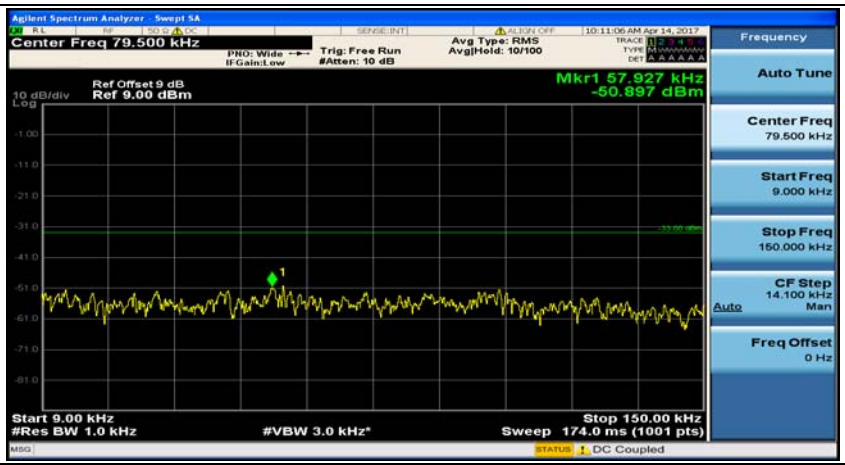


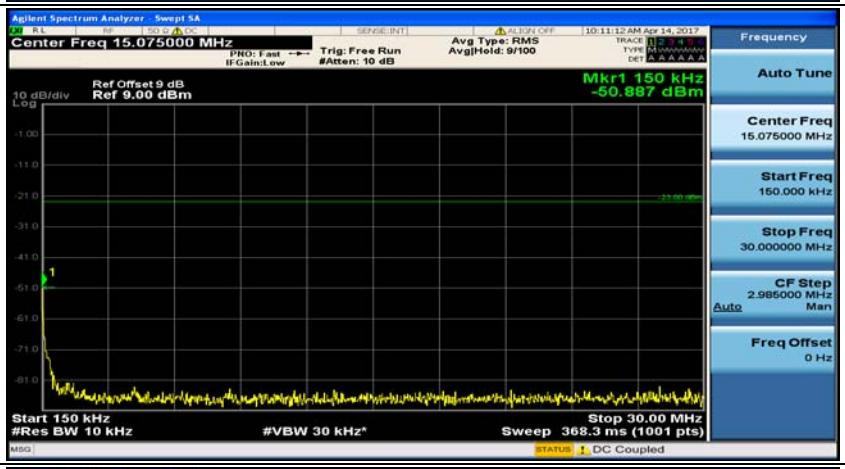
(Channel Bandwidth: 5 MHz)_HCH_16QAM_1RB#12

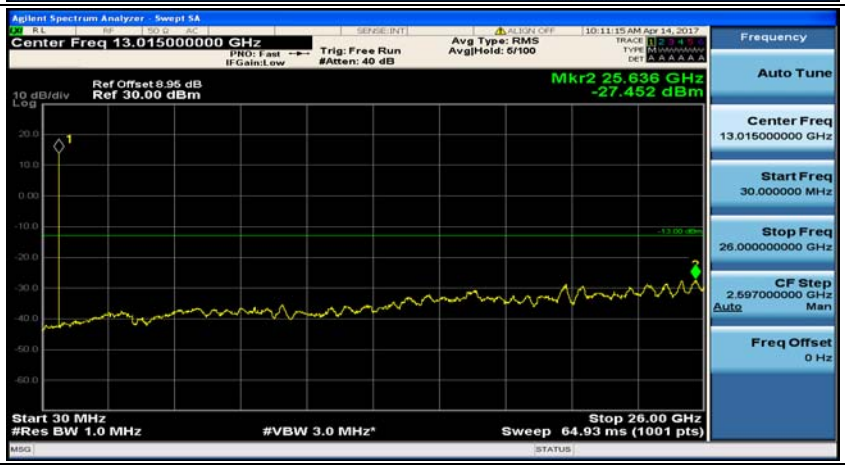




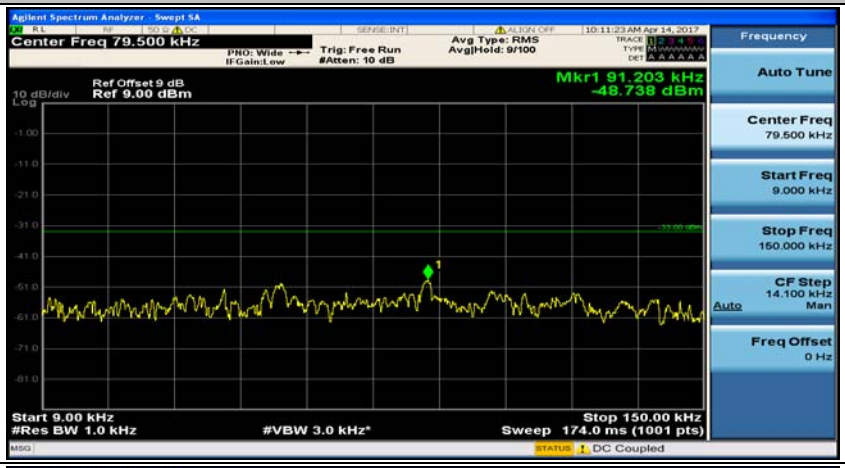
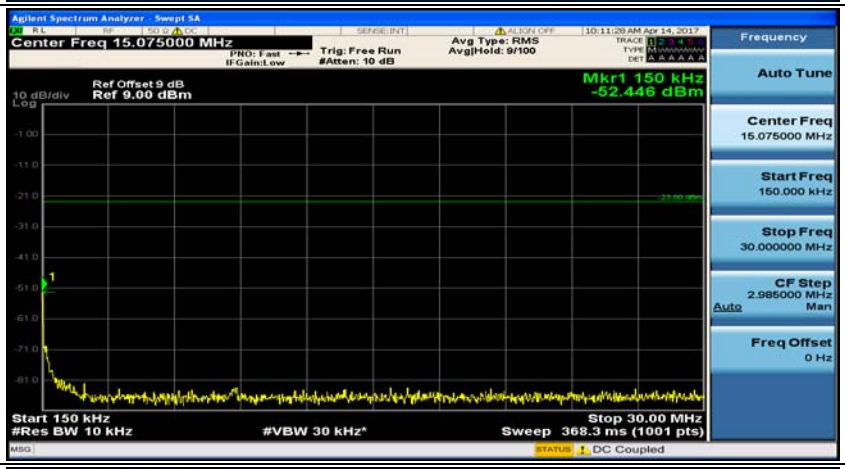
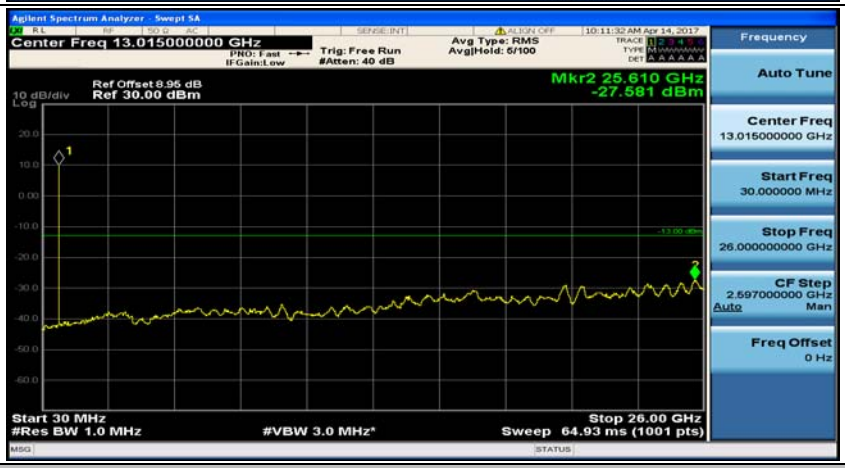
(Channel Bandwidth: 5 MHz)_HCH_16QAM_1RB#24

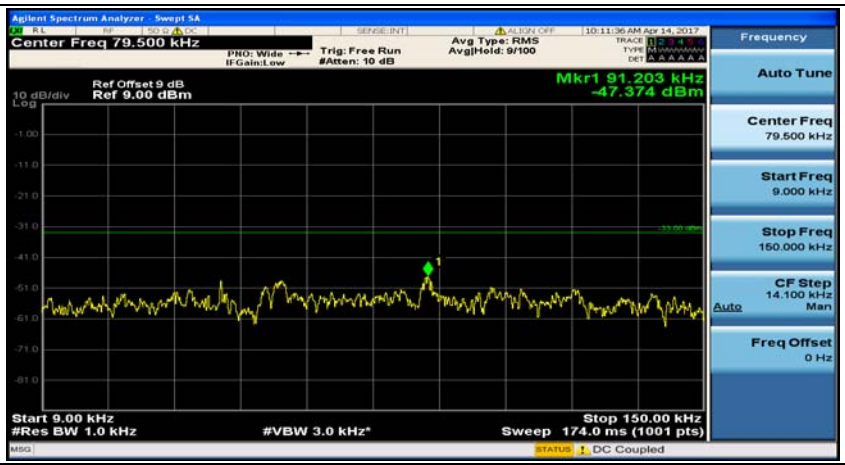

Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 10/100
10:11:06 AM Apr 14, 2017
Frequency
Auto Tune
Ref Offset 9 dB
10 dB/div
Log
Ref 9.00 dBm
Mkr1 57.927 kHz
-50.897 dBm
Center Freq
79.500 kHz
Start Freq
9.000 kHz
Stop Freq
150.000 kHz
CF Step
14.100 kHz
Auto
Man
Freq Offset
0 Hz
Start 9.00 kHz
#Res BW 1.0 kHz
#VBW 3.0 kHz*
Stop 150.00 kHz
Sweep 174.0 ms (1001 pts)
DC Coupled

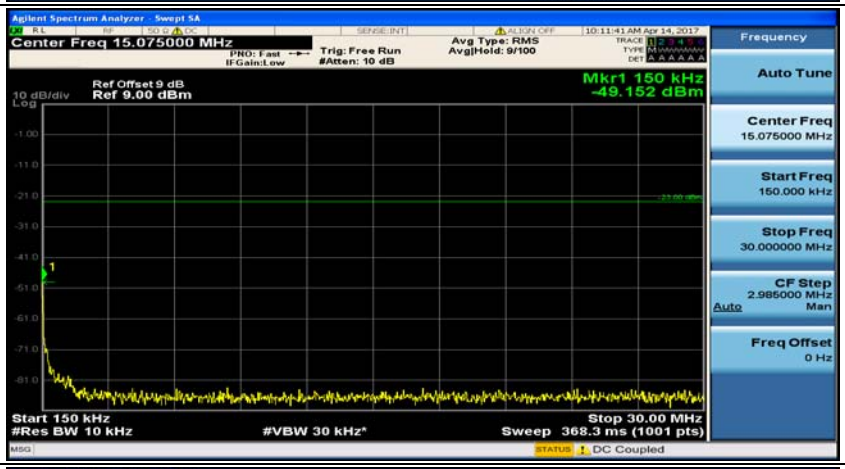

Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 9/100
10:11:12 AM Apr 14, 2017
Frequency
Auto Tune
Ref Offset 9 dB
10 dB/div
Log
Ref 9.00 dBm
Mkr1 150 kHz
-50.887 dBm
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz*
Stop 30.00 MHz
Sweep 368.3 ms (1001 pts)
DC Coupled

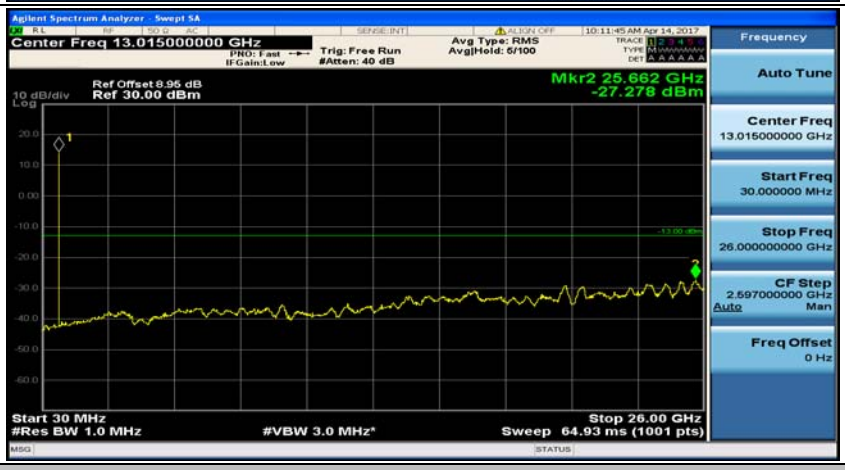

Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: RMS
Avg|Hold: 5/100
10:11:15 AM Apr 14, 2017
Frequency
Auto Tune
Ref Offset 8.95 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr2 25.636 GHz
-27.452 dBm
Center Freq
13.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
26.000000000 GHz
CF Step
2.597000000 GHz
Auto
Man
Freq Offset
0 Hz
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 26.00 GHz
Sweep 64.93 ms (1001 pts)

Channel Bandwidth: 10 MHz

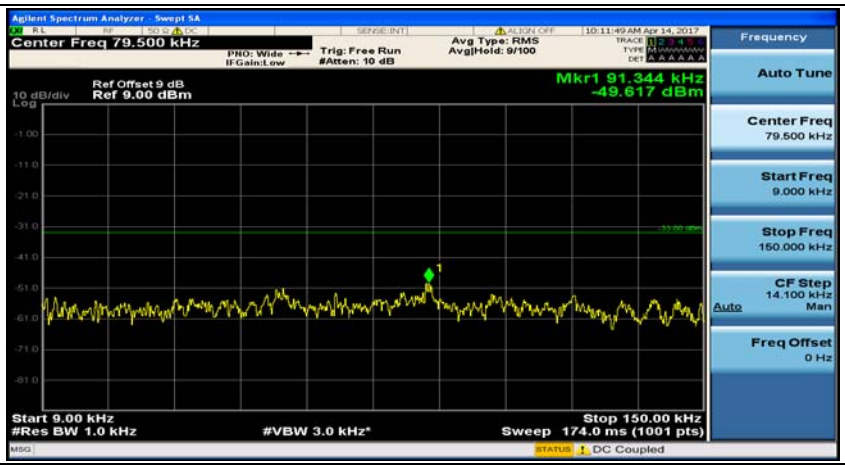
Channel Bandwidth: 10 MHz_LCH_QPSK_1RB#0



Channel Bandwidth: 10 MHz_LCH_QPSK_1RB#24

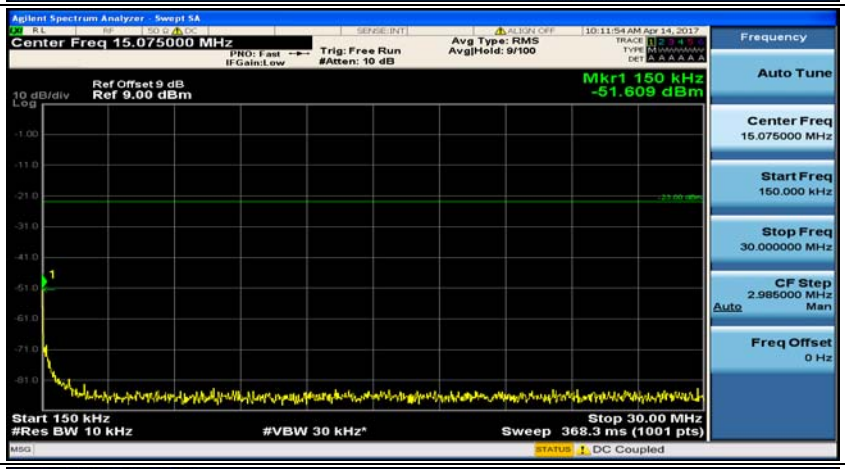




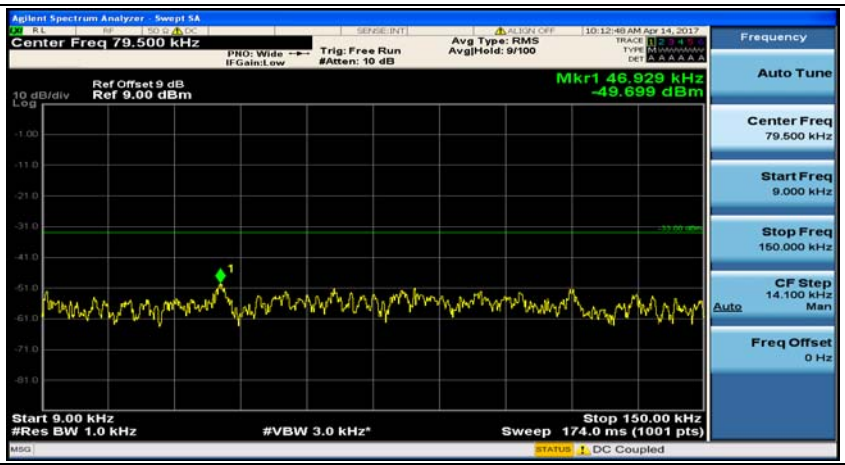


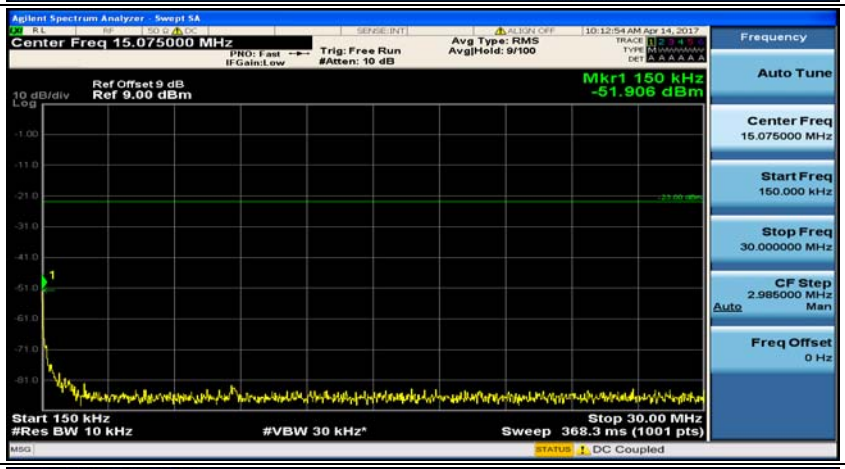
Channel Bandwidth: 10 MHz_LCH_QPSK_1RB#49

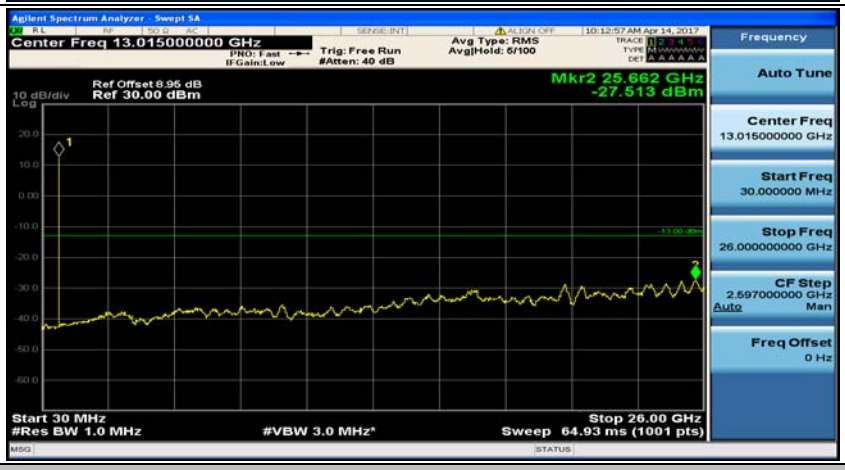




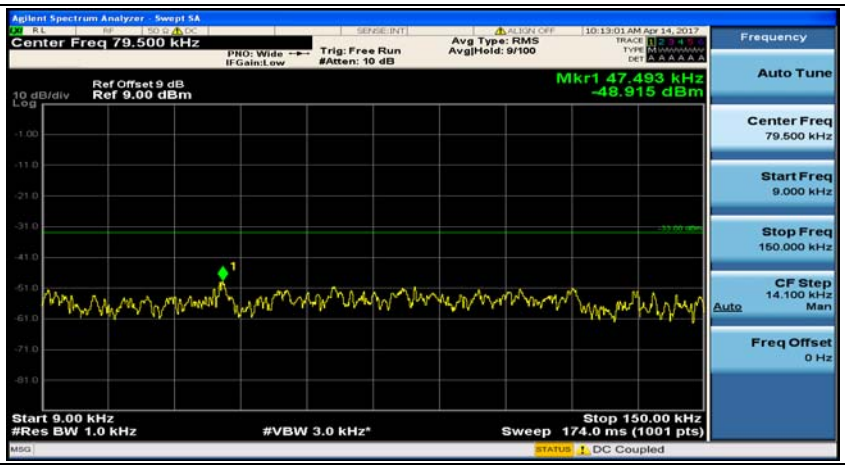
Channel Bandwidth: 10 MHz_MCH_QPSK_1RB#0

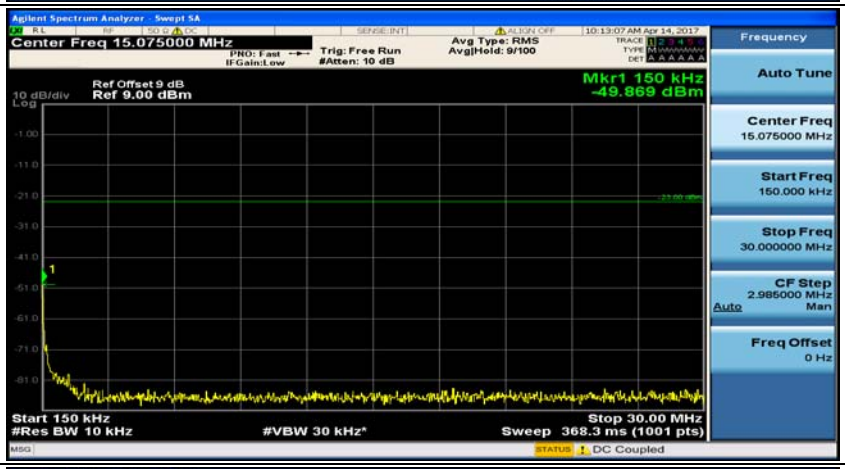


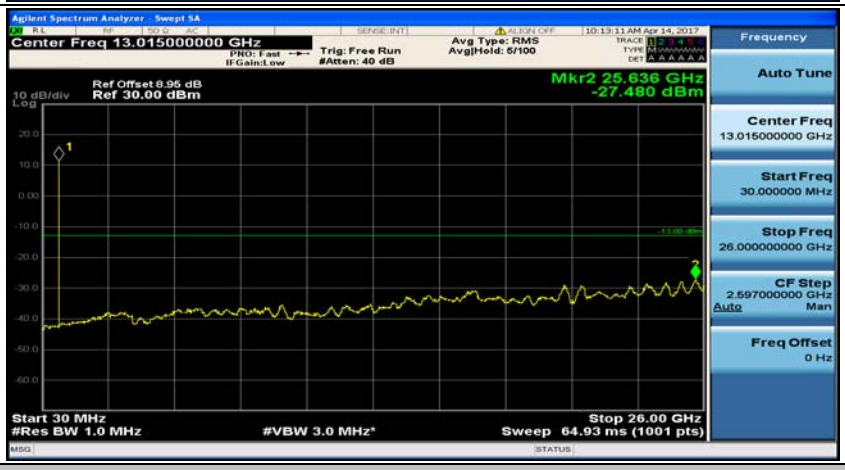




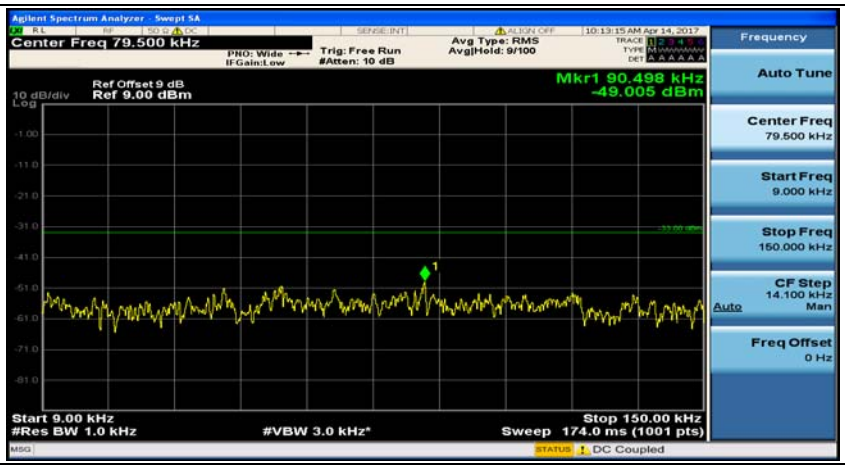
Channel Bandwidth: 10 MHz_MCH_QPSK_1RB#24

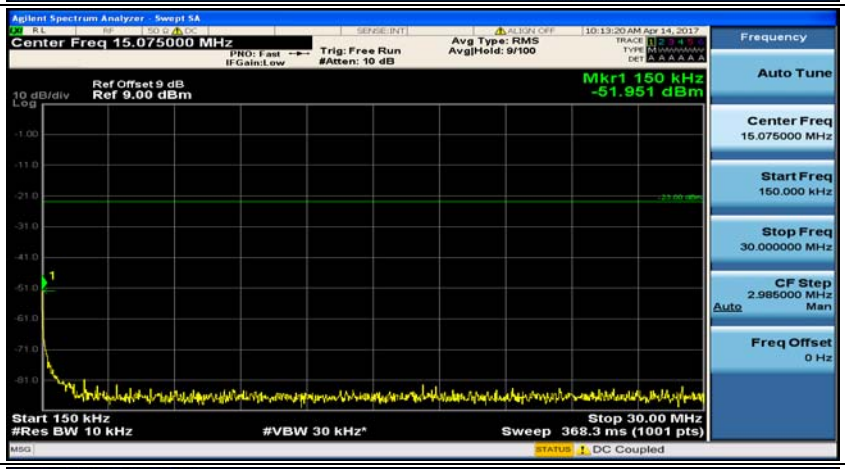


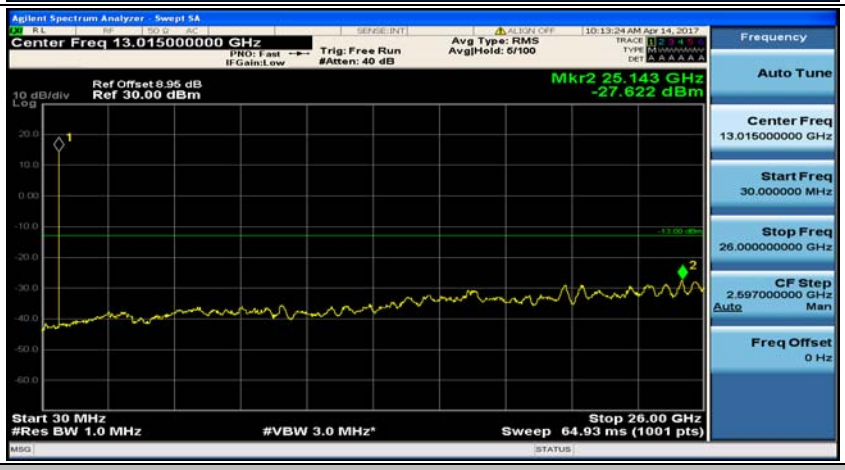




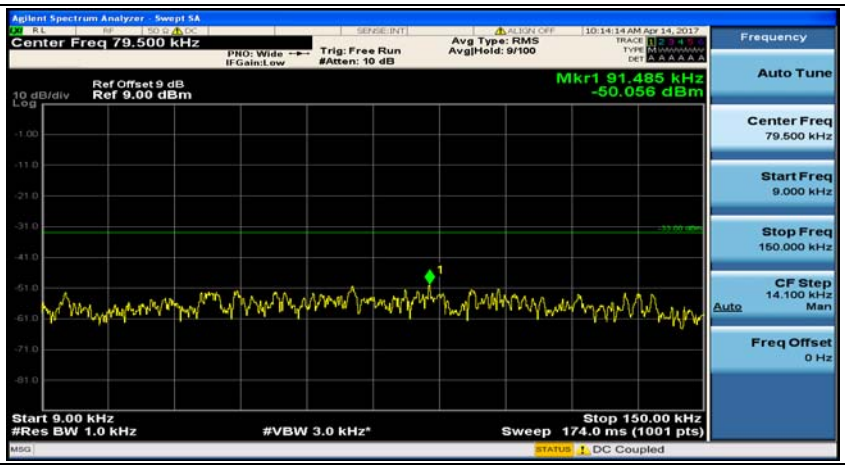
Channel Bandwidth: 10 MHz_MCH_QPSK_1RB#49

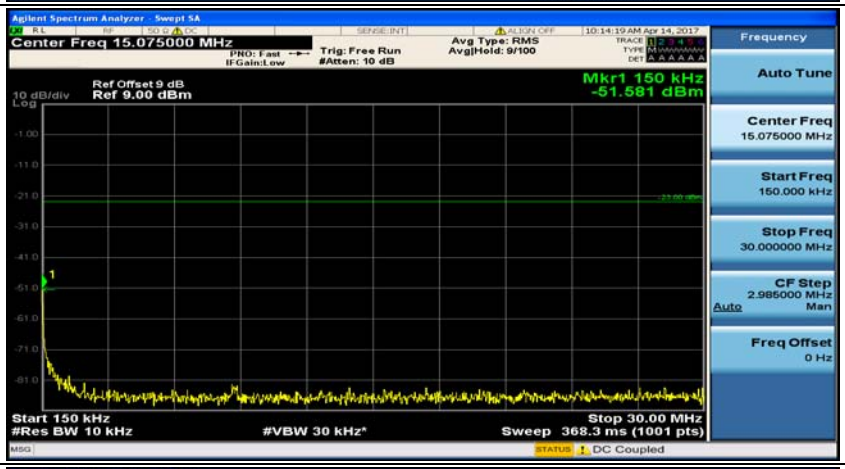




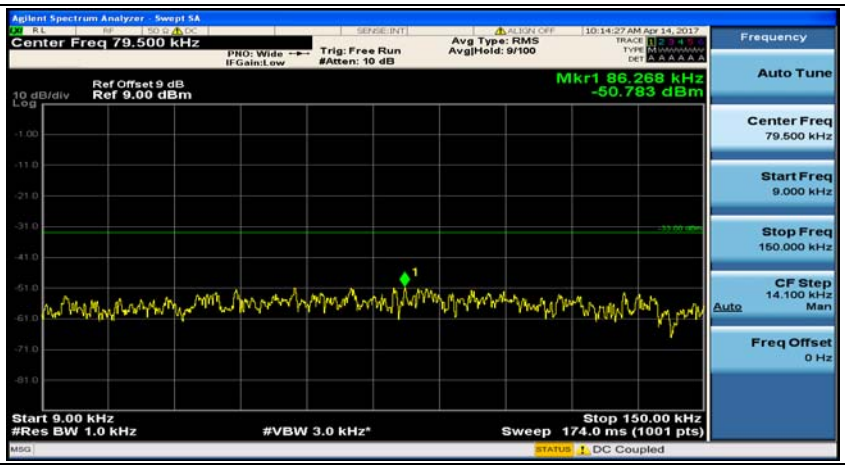


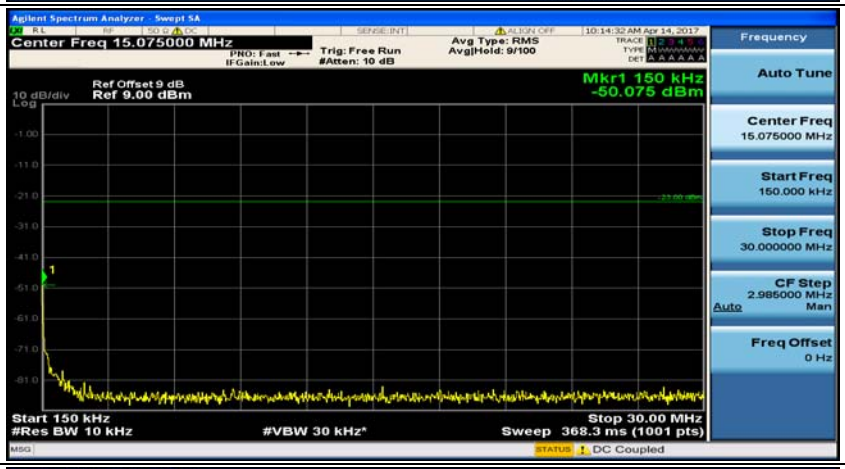
Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#0

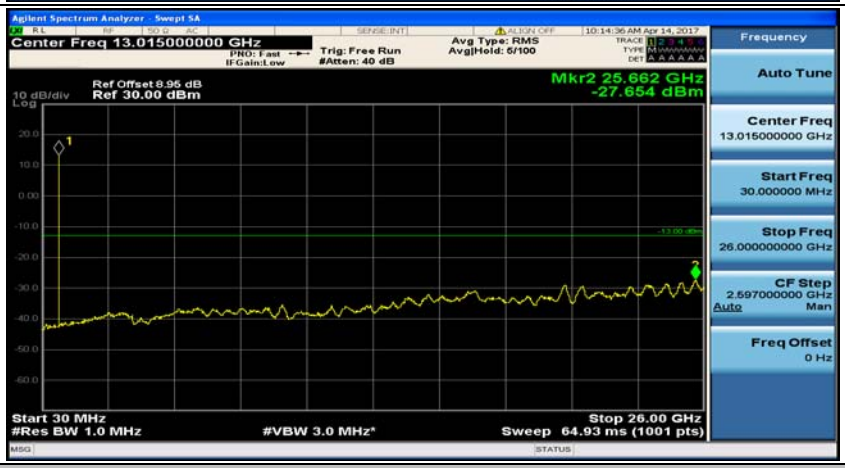




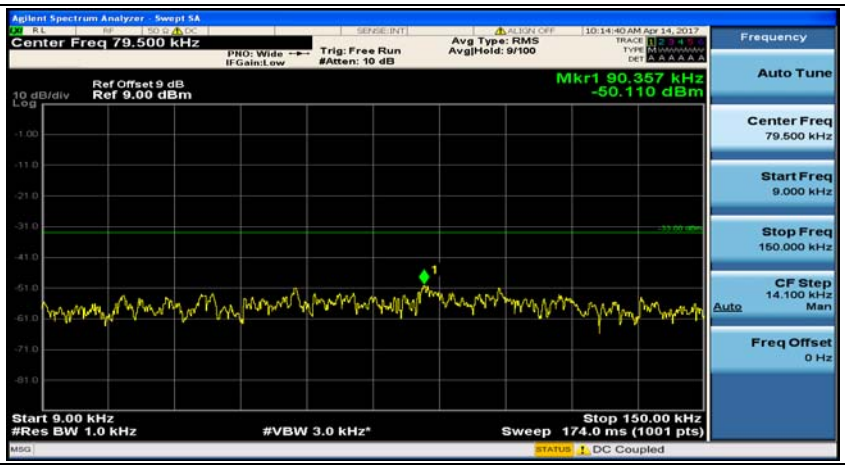
Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#24

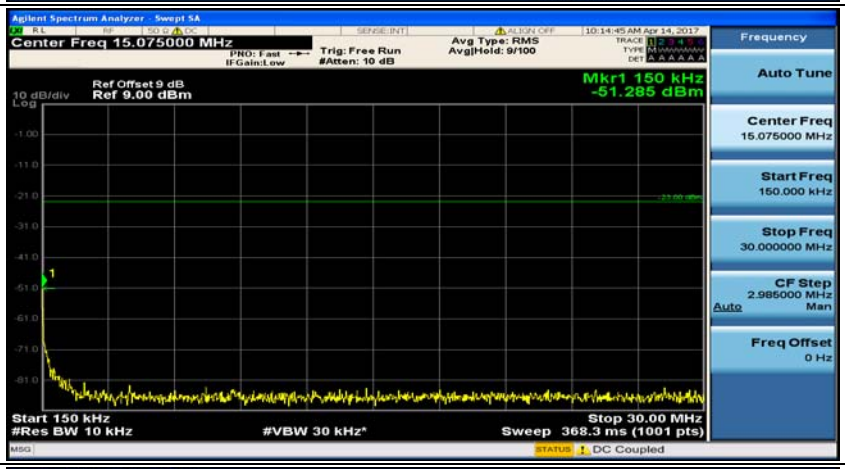


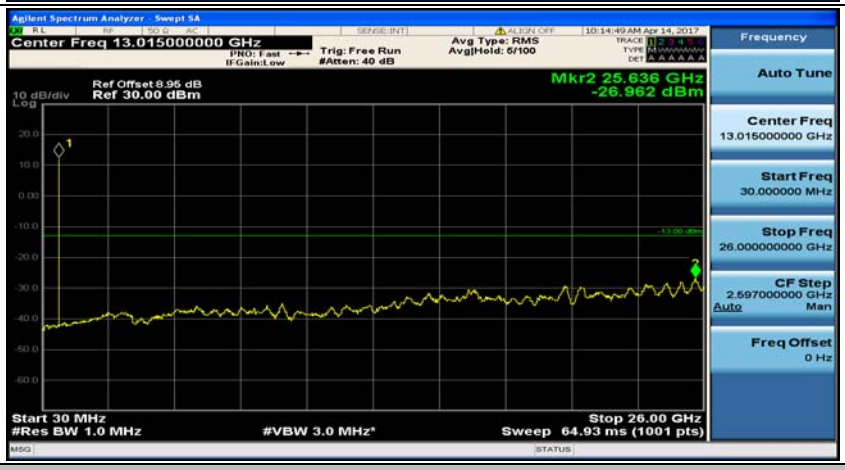




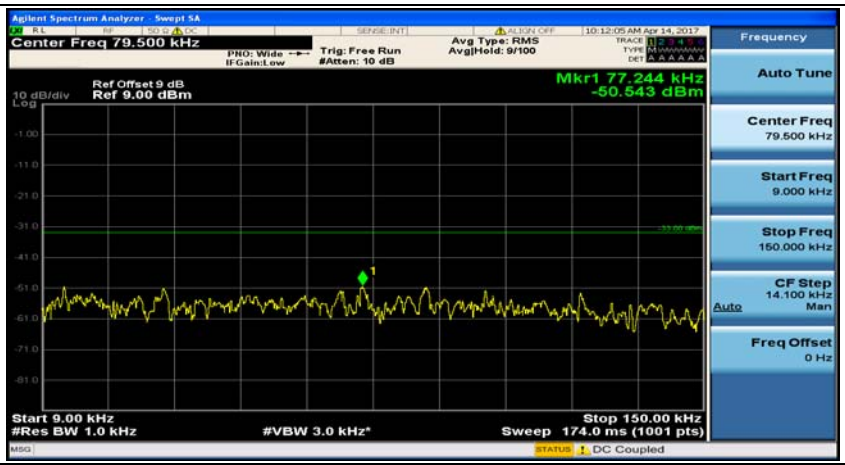
Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#49

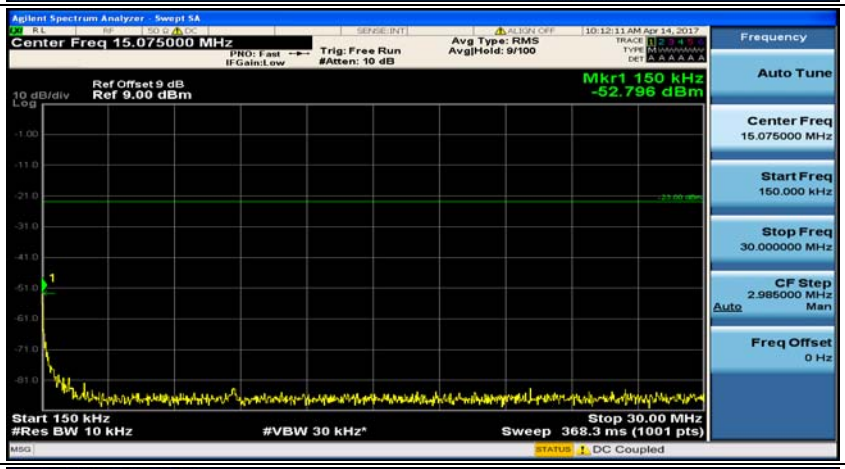


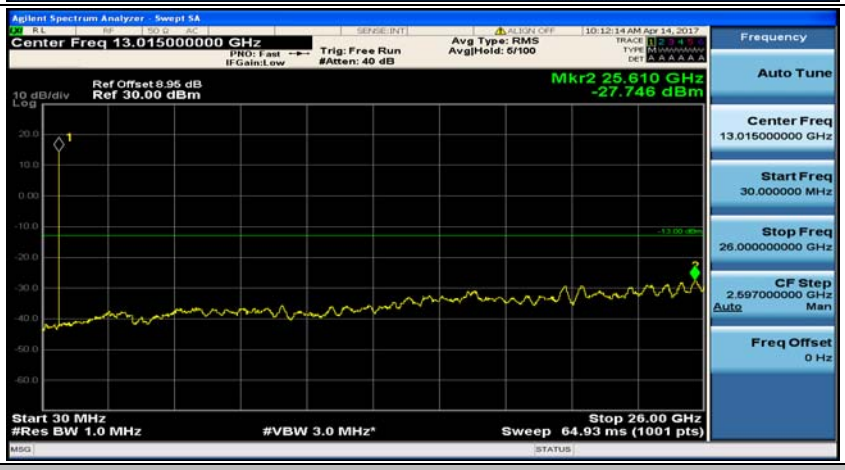




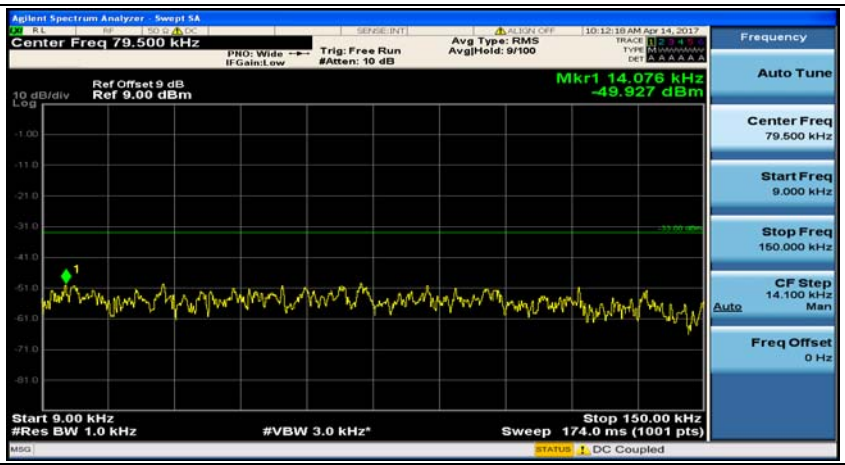
Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#0

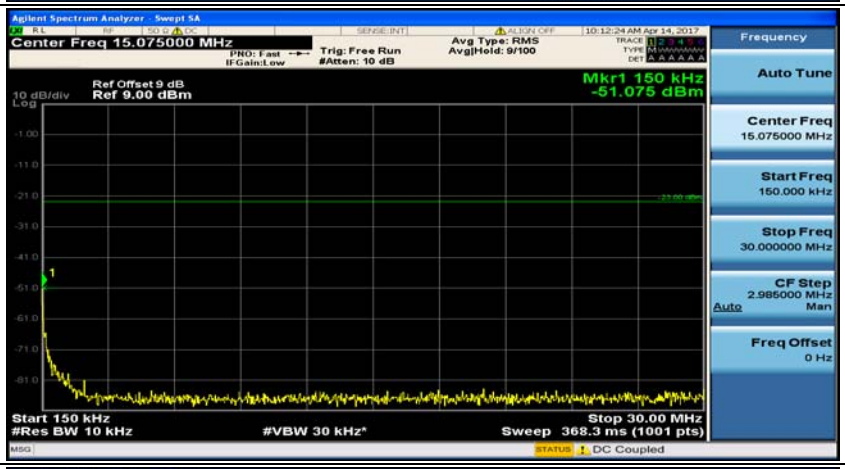


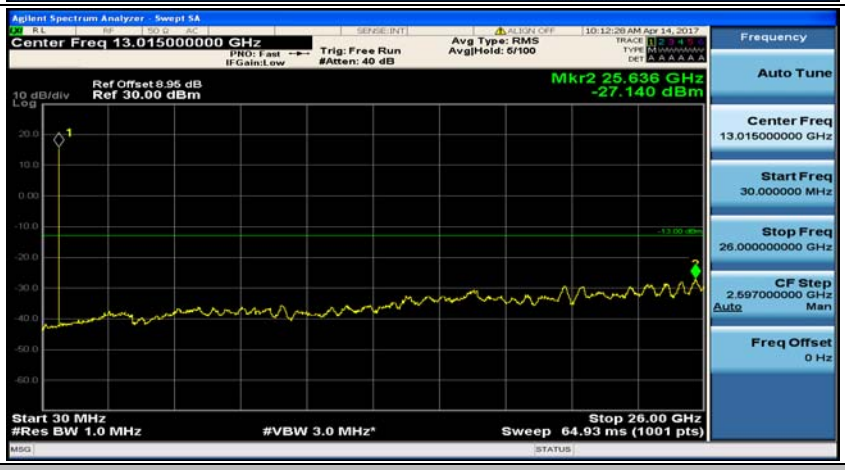




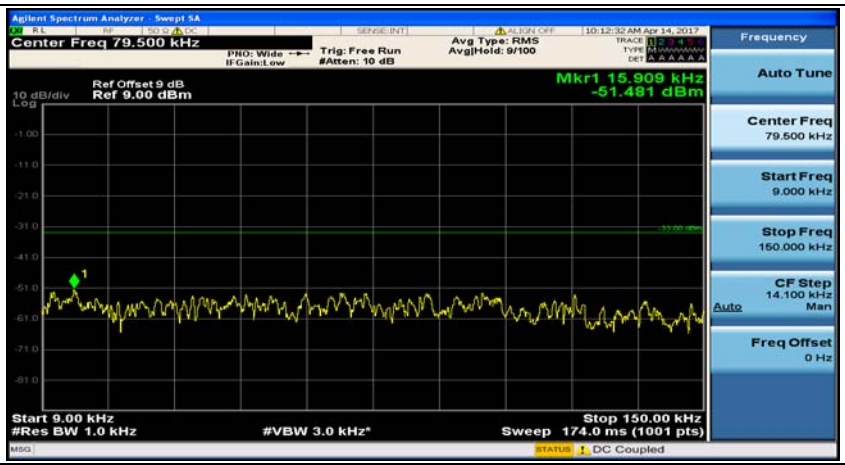
Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#24

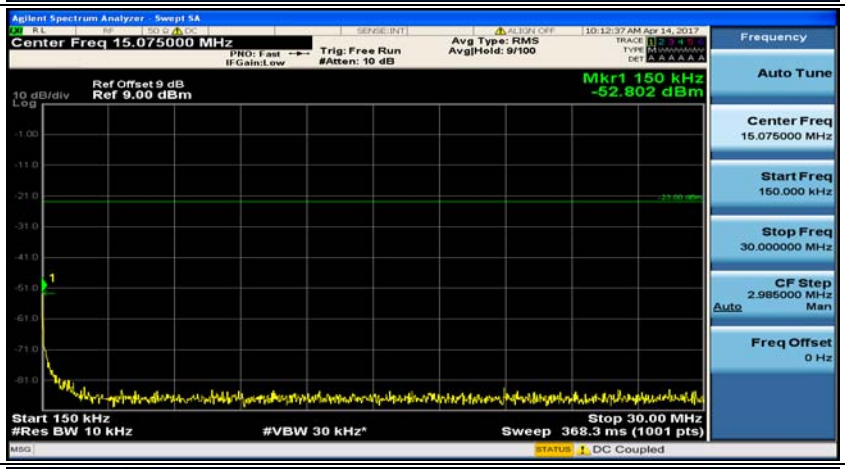




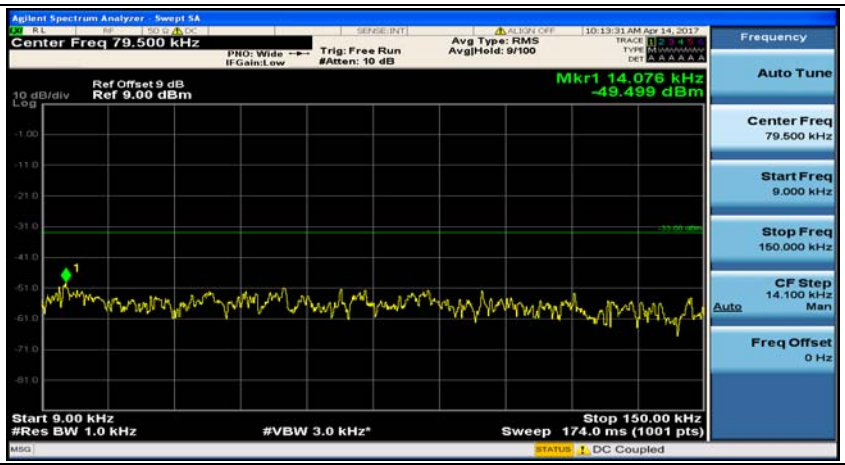


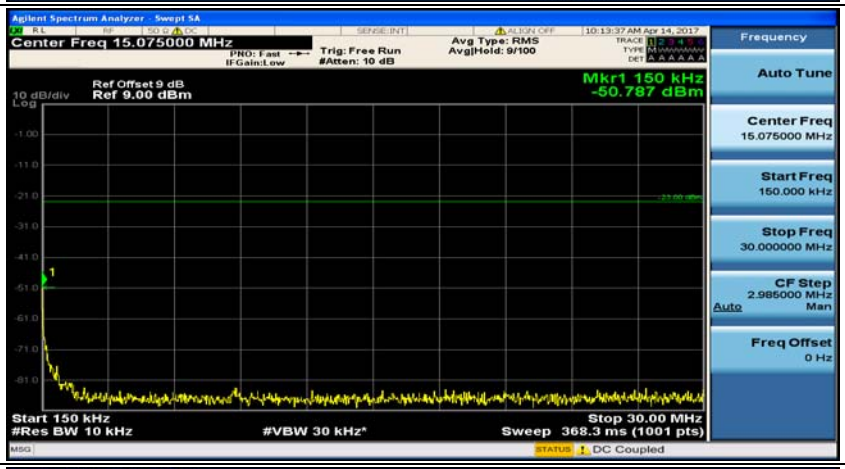
Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#49

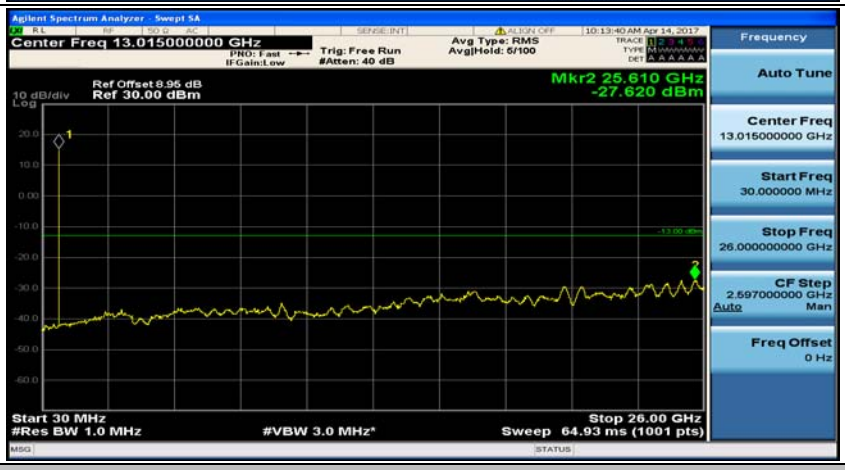




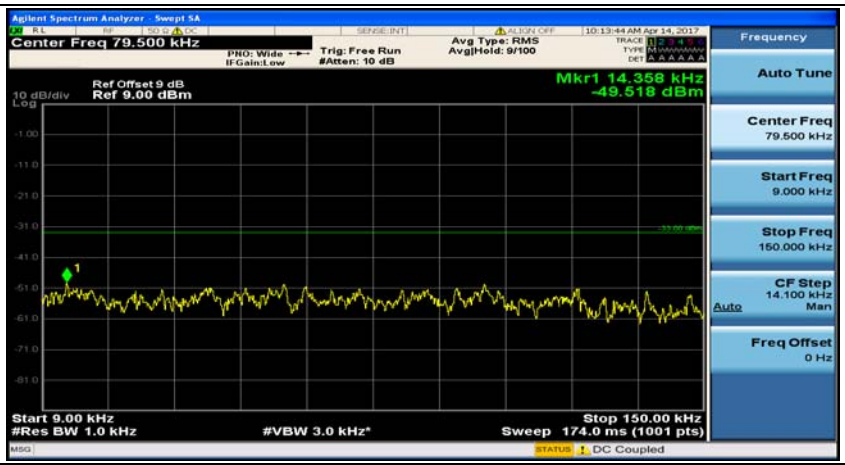
Channel Bandwidth: 10 MHz_MCH_16QAM_1RB#0

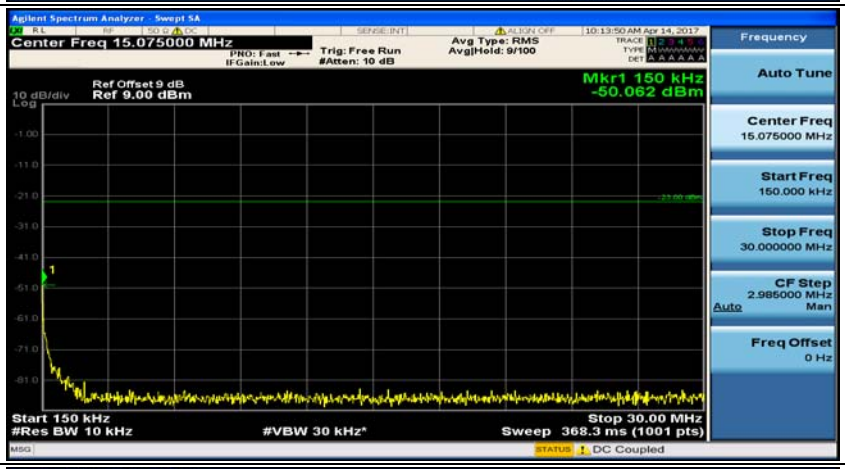


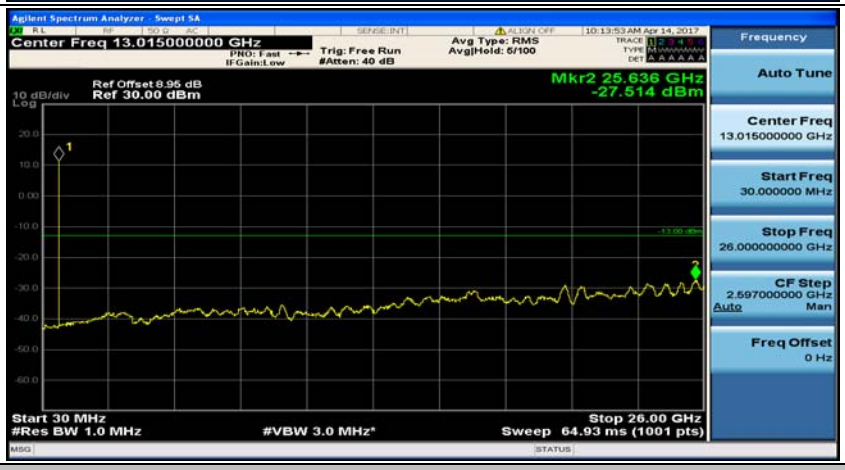




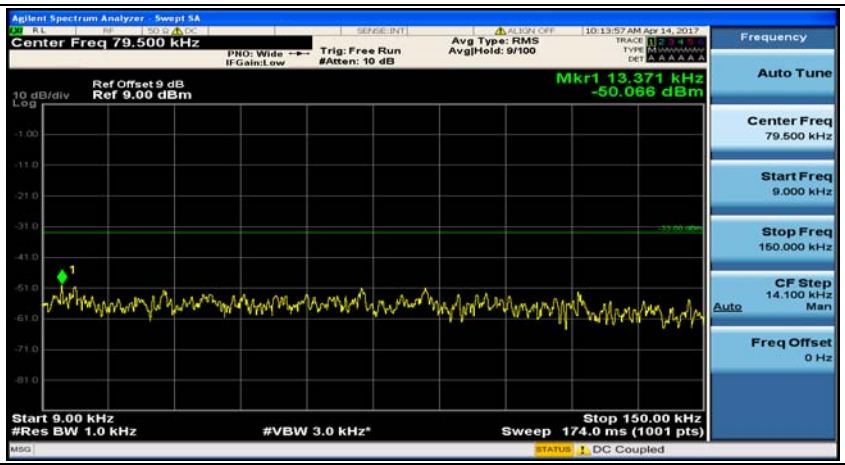
Channel Bandwidth: 10 MHz_MCH_16QAM_1RB#24

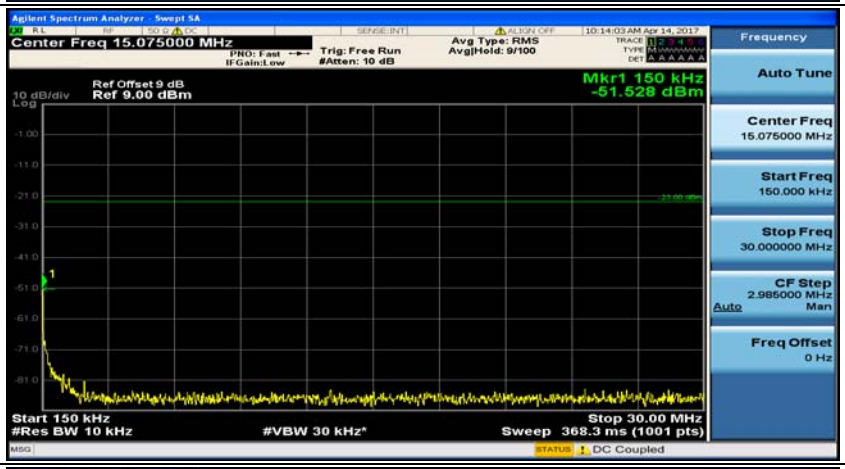


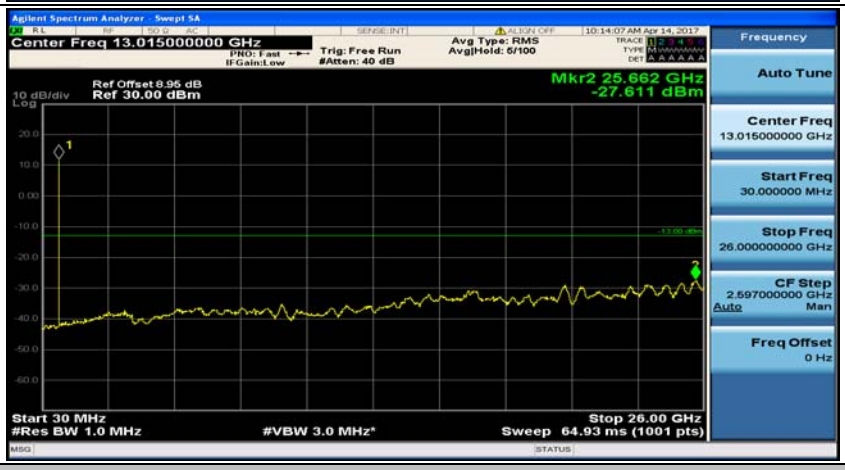




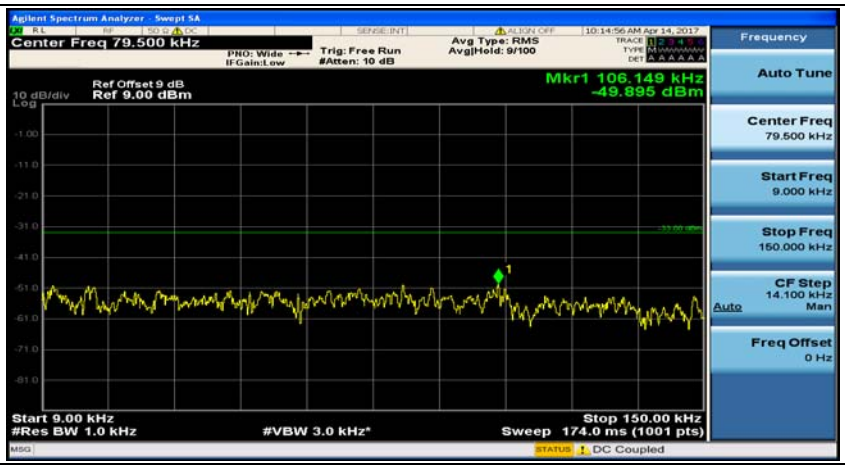
Channel Bandwidth: 10 MHz_MCH_16QAM_1RB#49

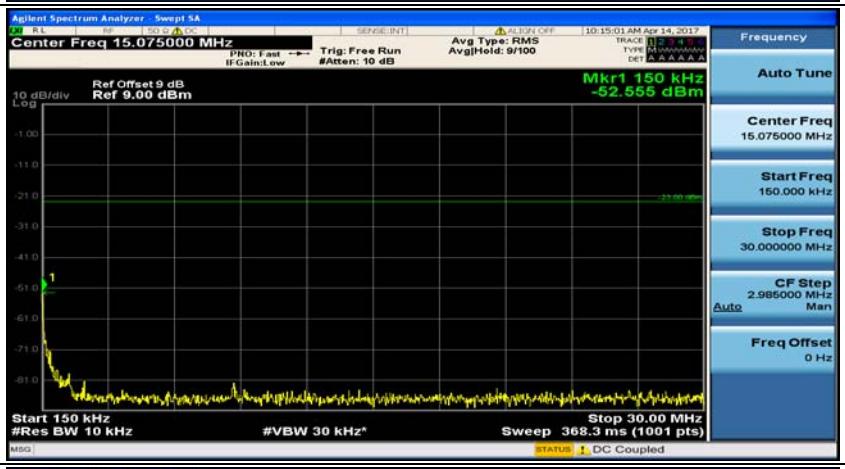


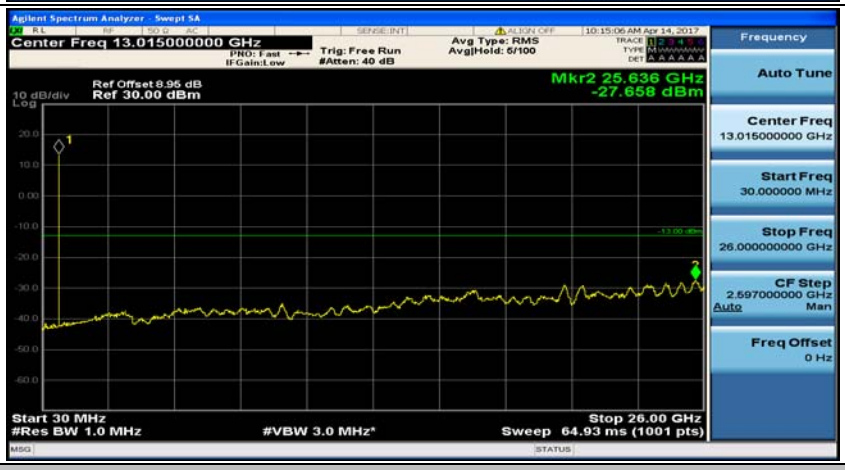




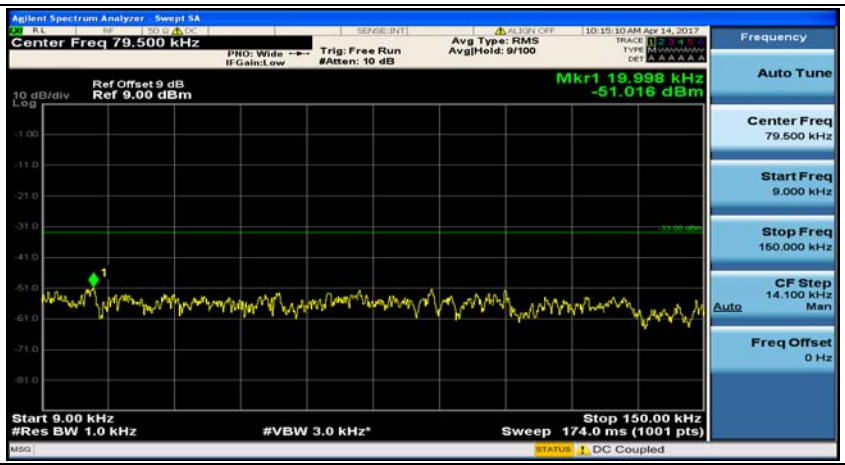
Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#0

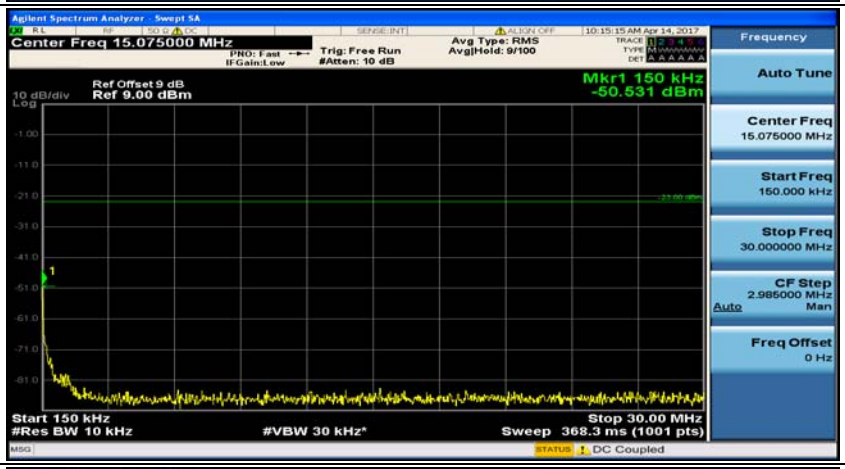


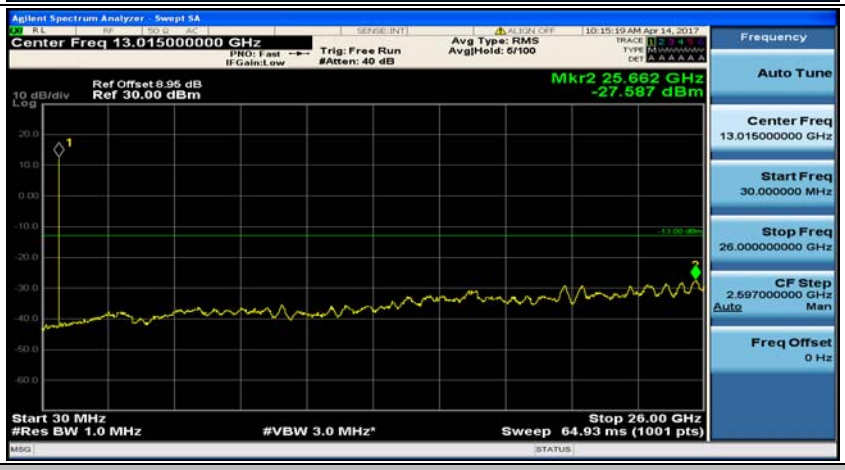




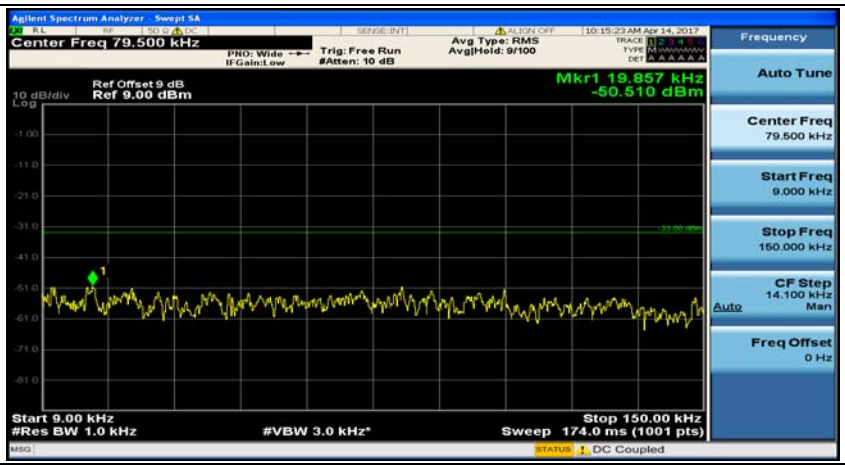
Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#24

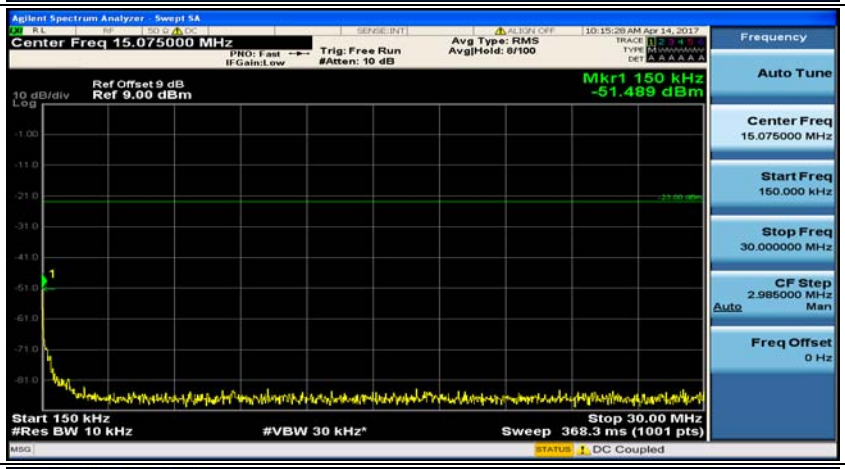


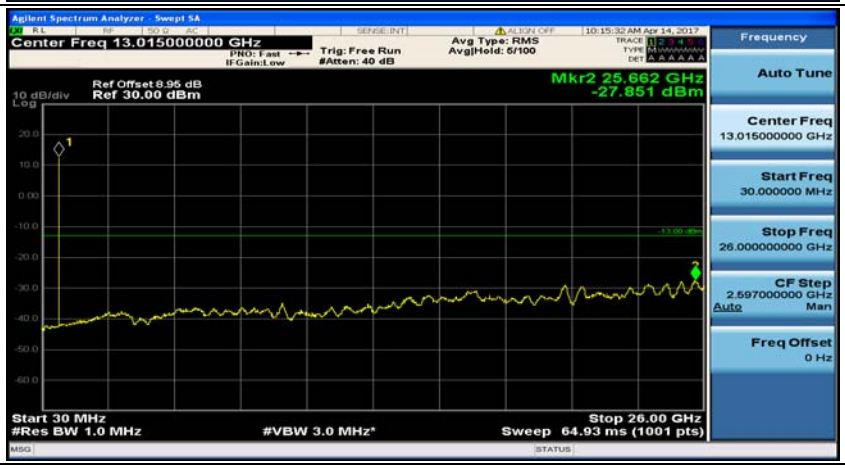




Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#49


Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 9/100
10:15:23 AM Apr 14, 2017
Frequency
Ref Offset 9 dB
10 dB/div
Log
Ref 9.00 dBm
Mkr1 19.857 kHz
-50.510 dBm
Auto Tune
Center Freq
79.500 kHz
Start Freq
9.000 kHz
Stop Freq
150.000 kHz
CF Step
14.100 kHz
Auto
Man
Freq Offset
0 Hz
Start 9.00 kHz
#Res BW 1.0 kHz
#VBW 3.0 kHz*
Stop 150.00 kHz
Sweep 174.0 ms (1001 pts)
DC Coupled


Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 6/100
10:15:28 AM Apr 14, 2017
Frequency
Ref Offset 9 dB
10 dB/div
Log
Ref 9.00 dBm
Mkr1 150 kHz
-51.489 dBm
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz*
Stop 30.00 MHz
Sweep 368.3 ms (1001 pts)
DC Coupled


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: RMS
Avg|Hold: 5/100
10:15:32 AM Apr 14, 2017
Frequency
Ref Offset 8.95 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr2 25.662 GHz
-27.851 dBm
Auto Tune
Center Freq
13.015000000 GHz
Start Freq
30.000000 MHz
Stop Freq
26.000000000 GHz
CF Step
2.597000000 GHz
Auto
Man
Freq Offset
0 Hz
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 26.00 GHz
Sweep 64.93 ms (1001 pts)

Appendix F: Frequency Stability

Test Result

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	3.88	0.005492	± 2.5	PASS
		VN	TN	-0.07	-0.000099	± 2.5	PASS
		VH	TN	-1.32	-0.001868	± 2.5	PASS
	MCH	VL	TN	4.13	0.005817	± 2.5	PASS
		VN	TN	3.78	0.005324	± 2.5	PASS
		VH	TN	1.58	0.002225	± 2.5	PASS
	HCH	VL	TN	3.89	0.005452	± 2.5	PASS
		VN	TN	-1.6	-0.002242	± 2.5	PASS
		VH	TN	1.63	0.002285	± 2.5	PASS
16QAM	LCH	VL	TN	2.69	0.003808	± 2.5	PASS
		VN	TN	3.17	0.004487	± 2.5	PASS
		VH	TN	-0.47	-0.000665	± 2.5	PASS
	MCH	VL	TN	1.61	0.002268	± 2.5	PASS
		VN	TN	2.47	0.003479	± 2.5	PASS
		VH	TN	3.31	0.004662	± 2.5	PASS
	HCH	VL	TN	-1.68	-0.002355	± 2.5	PASS
		VN	TN	0.42	0.000589	± 2.5	PASS
		VH	TN	-0.09	-0.000126	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	1.28	0.001812	± 2.5	PASS
		VN	-20	4.49	0.006355	± 2.5	PASS
		VN	-10	4.02	0.005690	± 2.5	PASS
		VN	0	0.65	0.000920	± 2.5	PASS
		VN	10	4.02	0.005690	± 2.5	PASS
		VN	20	-1.12	-0.001585	± 2.5	PASS
		VN	30	3.2	0.004529	± 2.5	PASS
		VN	40	2.49	0.003524	± 2.5	PASS
		VN	50	-1.73	-0.002449	± 2.5	PASS
	MCH	VN	-30	4.71	0.006634	± 2.5	PASS
		VN	-20	-1.88	-0.002648	± 2.5	PASS

		VN	-10	1.18	0.001662	± 2.5	PASS
		VN	0	0.26	0.000366	± 2.5	PASS
		VN	10	2.17	0.003056	± 2.5	PASS
		VN	20	1.9	0.002676	± 2.5	PASS
		VN	30	2.41	0.003394	± 2.5	PASS
		VN	40	3.49	0.004915	± 2.5	PASS
		VN	50	0.72	0.001014	± 2.5	PASS
	HCH	VN	-30	-1.43	-0.002004	± 2.5	PASS
		VN	-20	3.38	0.004737	± 2.5	PASS
		VN	-10	0.83	0.001163	± 2.5	PASS
		VN	0	-1.37	-0.001920	± 2.5	PASS
		VN	10	3.87	0.005424	± 2.5	PASS
		VN	20	1.87	0.002621	± 2.5	PASS
		VN	30	4.38	0.006139	± 2.5	PASS
		VN	40	4.1	0.005746	± 2.5	PASS
		VN	50	4.11	0.005760	± 2.5	PASS
16QAM	LCH	VN	-30	1.82	0.002576	± 2.5	PASS
		VN	-20	3.09	0.004374	± 2.5	PASS
		VN	-10	0.87	0.001231	± 2.5	PASS
		VN	0	2.61	0.003694	± 2.5	PASS
		VN	10	1.73	0.002449	± 2.5	PASS
		VN	20	4.88	0.006907	± 2.5	PASS
		VN	30	0.84	0.001189	± 2.5	PASS
		VN	40	-0.41	-0.000580	± 2.5	PASS
		VN	50	-0.2	-0.000283	± 2.5	PASS
	MCH	VN	-30	-0.49	-0.000687	± 2.5	PASS
		VN	-20	1.1	0.001542	± 2.5	PASS
		VN	-10	-0.81	-0.001135	± 2.5	PASS
		VN	0	1.2	0.001682	± 2.5	PASS
		VN	10	2.95	0.004135	± 2.5	PASS
		VN	20	-0.36	-0.000505	± 2.5	PASS
		VN	30	3.42	0.004793	± 2.5	PASS
		VN	40	0.84	0.001177	± 2.5	PASS
		VN	50	-1.65	-0.002313	± 2.5	PASS
	HCH	VN	-30	0.67	0.000939	± 2.5	PASS
		VN	-20	4.28	0.005999	± 2.5	PASS
		VN	-10	3.05	0.004275	± 2.5	PASS
		VN	0	1.76	0.002467	± 2.5	PASS
		VN	10	2.48	0.003476	± 2.5	PASS
		VN	20	-1.56	-0.002186	± 2.5	PASS
		VN	30	4.56	0.006391	± 2.5	PASS

		VN	40	2.7	0.003784	± 2.5	PASS
		VN	50	-0.1	-0.000140	± 2.5	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	-1.07	-0.001509	± 2.5	PASS
		VN	TN	-0.06	-0.000085	± 2.5	PASS
		VH	TN	0.13	0.000183	± 2.5	PASS
	MCH	VL	TN	0.27	0.000380	± 2.5	PASS
		VN	TN	4.1	0.005775	± 2.5	PASS
		VH	TN	3.39	0.004775	± 2.5	PASS
	HCH	VL	TN	0.43	0.000605	± 2.5	PASS
		VN	TN	0.82	0.001153	± 2.5	PASS
		VH	TN	1.61	0.002264	± 2.5	PASS
16QAM	LCH	VL	TN	4.26	0.006008	± 2.5	PASS
		VN	TN	-0.11	-0.000155	± 2.5	PASS
		VH	TN	4.07	0.005740	± 2.5	PASS
	MCH	VL	TN	-0.97	-0.001366	± 2.5	PASS
		VN	TN	4.63	0.006521	± 2.5	PASS
		VH	TN	2.5	0.003521	± 2.5	PASS
	HCH	VL	TN	2.58	0.003629	± 2.5	PASS
		VN	TN	-0.98	-0.001378	± 2.5	PASS
		VH	TN	0.96	0.001350	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
16QAM	LCH	VN	-30	-0.44	-0.000621	± 2.5	PASS
		VN	-20	-1.46	-0.002059	± 2.5	PASS
		VN	-10	-0.51	-0.000719	± 2.5	PASS
		VN	0	-0.78	-0.001100	± 2.5	PASS
		VN	10	1.26	0.001777	± 2.5	PASS
		VN	20	-1.23	-0.001735	± 2.5	PASS
		VN	30	3.28	0.004626	± 2.5	PASS
		VN	40	0.3	0.000423	± 2.5	PASS
		VN	50	0.5	0.000705	± 2.5	PASS
	MCH	VN	-30	3.52	0.004958	± 2.5	PASS
		VN	-20	3.41	0.004803	± 2.5	PASS
		VN	-10	2.26	0.003183	± 2.5	PASS
		VN	0	-0.68	-0.000958	± 2.5	PASS

		VN	10	4.03	0.005676	± 2.5	PASS
		VN	20	-1.21	-0.001704	± 2.5	PASS
		VN	30	-1.63	-0.002296	± 2.5	PASS
		VN	40	0.61	0.000859	± 2.5	PASS
		VN	50	2.42	0.003408	± 2.5	PASS
	HCH	VN	-30	0.99	0.001392	± 2.5	PASS
		VN	-20	2.06	0.002897	± 2.5	PASS
		VN	-10	3.88	0.005457	± 2.5	PASS
		VN	0	-1.44	-0.002025	± 2.5	PASS
		VN	10	-1.55	-0.002180	± 2.5	PASS
		VN	20	4.73	0.006653	± 2.5	PASS
		VN	30	-0.69	-0.000970	± 2.5	PASS
		VN	40	-0.16	-0.000225	± 2.5	PASS
		VN	50	2.31	0.003249	± 2.5	PASS
QPSK	LCH	VN	-30	3	0.004225	± 2.5	PASS
		VN	-20	4.87	0.006859	± 2.5	PASS
		VN	-10	3.61	0.005085	± 2.5	PASS
		VN	0	-1.04	-0.001465	± 2.5	PASS
		VN	10	-0.41	-0.000577	± 2.5	PASS
		VN	20	1.39	0.001958	± 2.5	PASS
		VN	30	0.57	0.000803	± 2.5	PASS
		VN	40	3.28	0.004620	± 2.5	PASS
		VN	50	1.85	0.002606	± 2.5	PASS
	MCH	VN	-30	-0.59	-0.000830	± 2.5	PASS
		VN	-20	2.51	0.003530	± 2.5	PASS
		VN	-10	-0.24	-0.000338	± 2.5	PASS
		VN	0	-0.14	-0.000197	± 2.5	PASS
		VN	10	-0.58	-0.000816	± 2.5	PASS
		VN	20	-1.76	-0.002475	± 2.5	PASS
		VN	30	3.86	0.005429	± 2.5	PASS
		VN	40	2.19	0.003080	± 2.5	PASS
		VN	50	0.8	0.001125	± 2.5	PASS
	HCH	VN	-30	1.61	0.002264	± 2.5	PASS
		VN	-20	-0.79	-0.001111	± 2.5	PASS
		VN	-10	3.27	0.004599	± 2.5	PASS
		VN	0	3.34	0.004698	± 2.5	PASS
		VN	10	0.62	0.000872	± 2.5	PASS
		VN	20	3.3	0.004641	± 2.5	PASS
		VN	30	2.42	0.003404	± 2.5	PASS
		VN	40	-1.55	-0.002180	± 2.5	PASS
		VN	50	-1.36	-0.001913	± 2.5	PASS