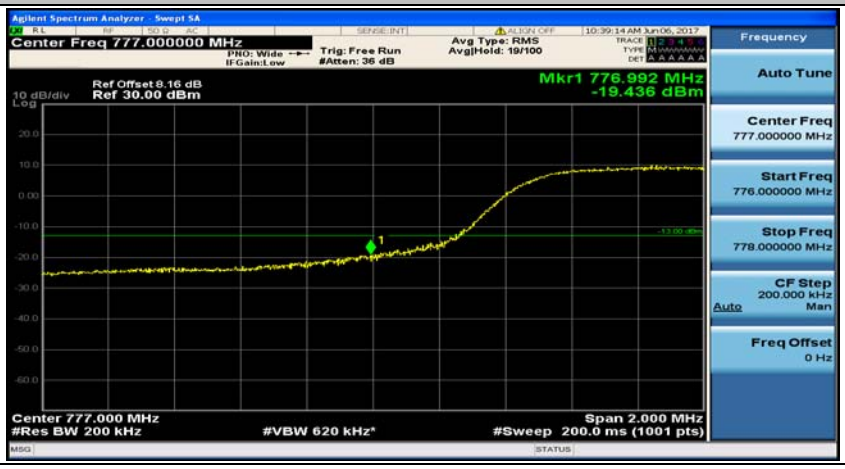
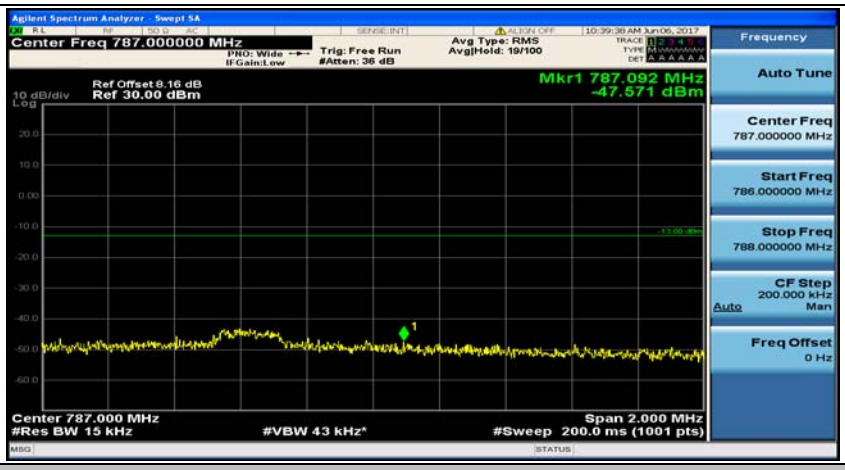
Channel Bandwidth: 10 MHz_LCH_QPSK_50RB#0



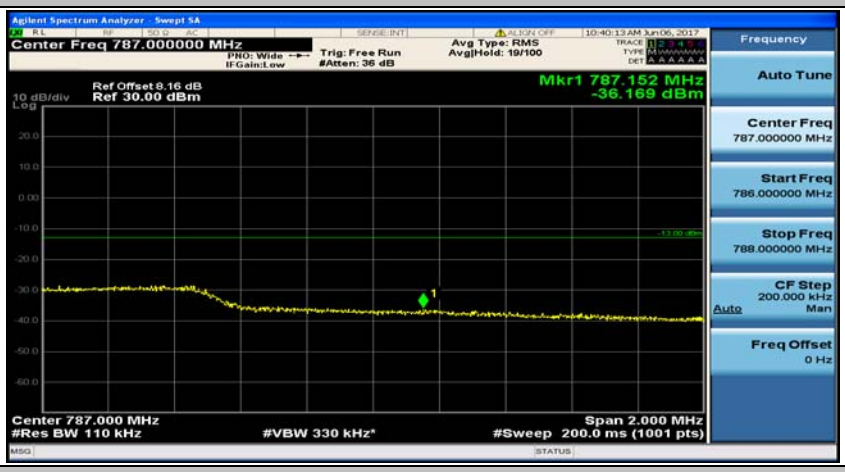
Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#0

Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#24

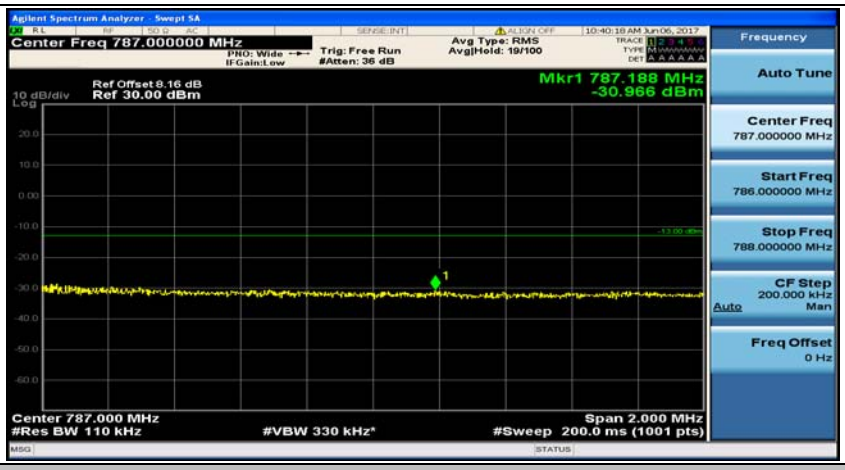


Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#49

Channel Bandwidth: 10 MHz_HCH_QPSK_25RB#0



Channel Bandwidth: 10 MHz_HCH_QPSK_25RB#12

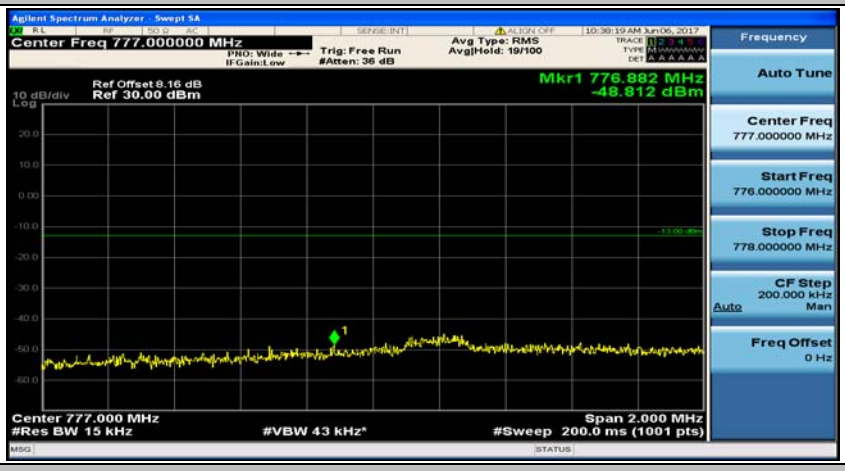


Channel Bandwidth: 10 MHz_HCH_QPSK_25RB#25

Channel Bandwidth: 10 MHz_HCH_QPSK_50RB#0

Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#0

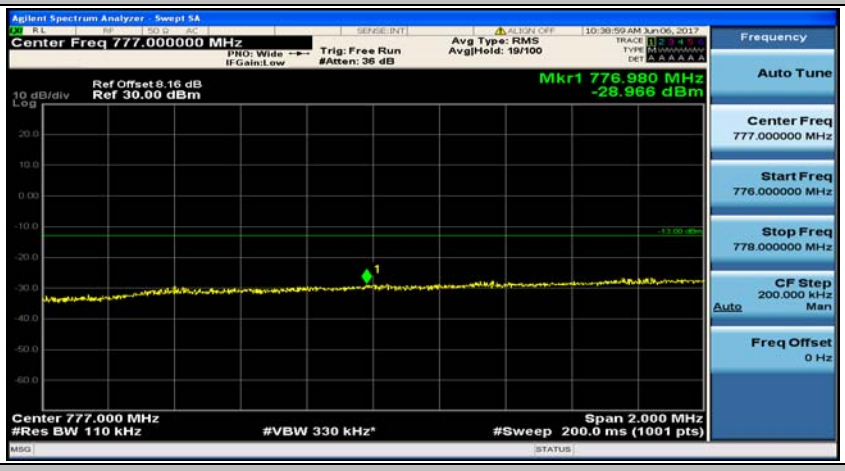
Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#24



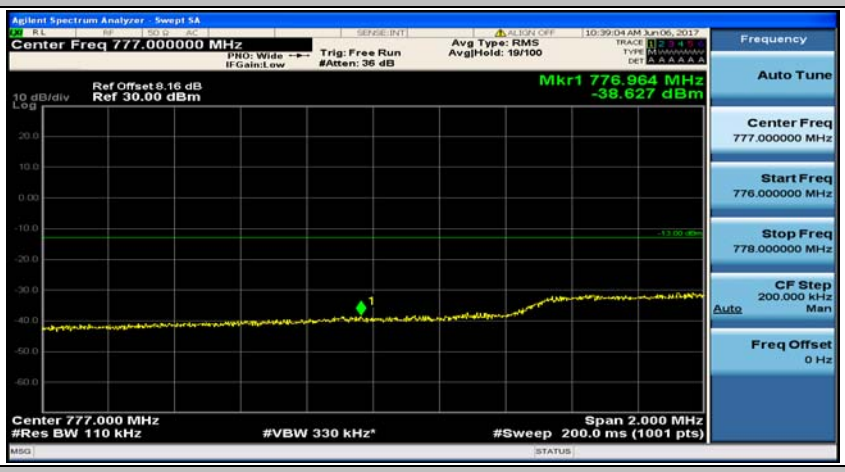
Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#49

Channel Bandwidth: 10 MHz_LCH_16QAM_25RB#0

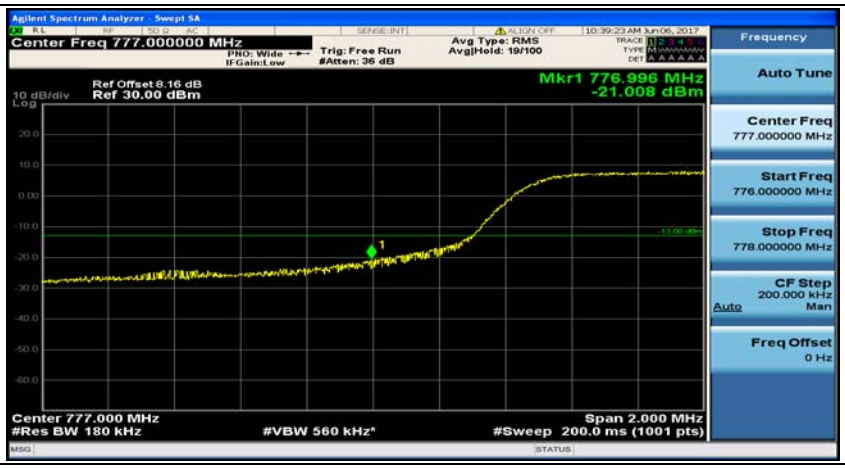
Channel Bandwidth: 10 MHz_LCH_16QAM_25RB#12



Channel Bandwidth: 10 MHz_LCH_16QAM_25RB#25

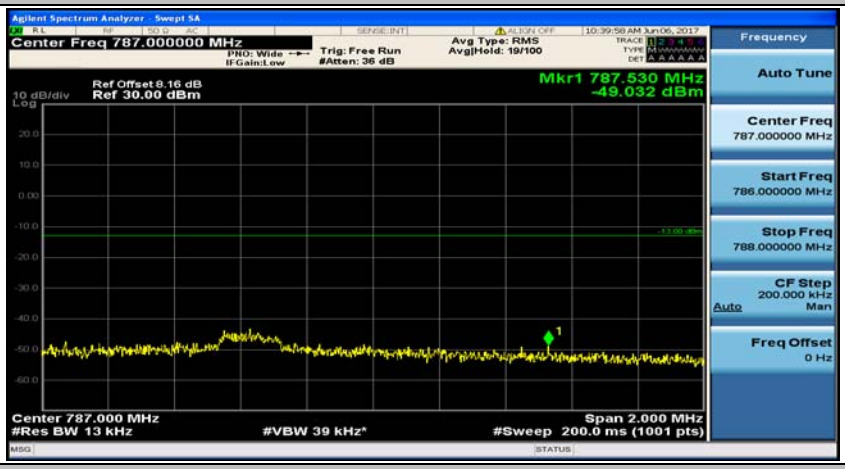


Channel Bandwidth: 10 MHz_LCH_16QAM_50RB#0



Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#0

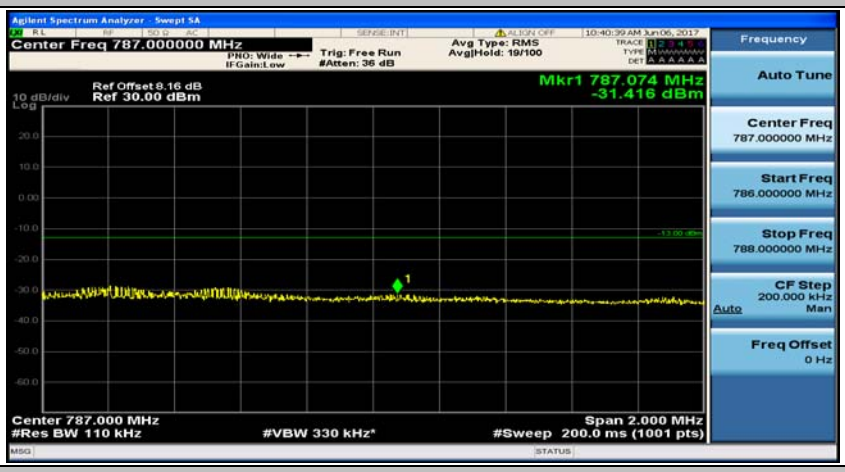
Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#24



Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#49

Channel Bandwidth: 10 MHz_HCH_16QAM_25RB#0

Channel Bandwidth: 10 MHz_HCH_16QAM_25RB#12



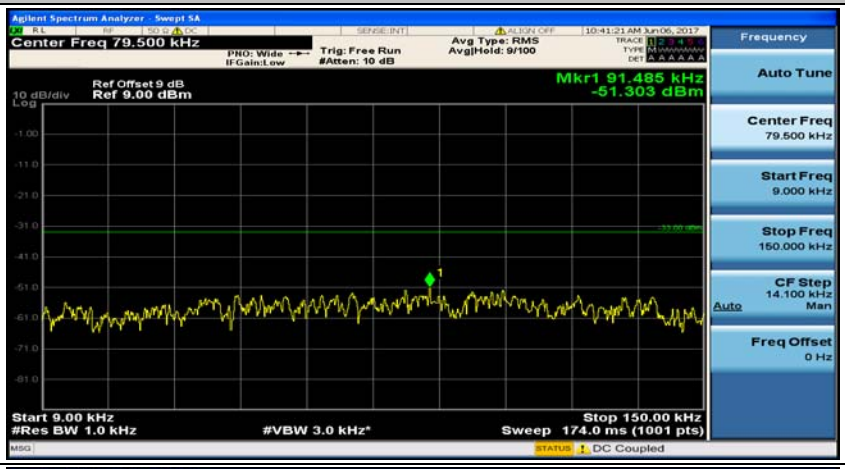
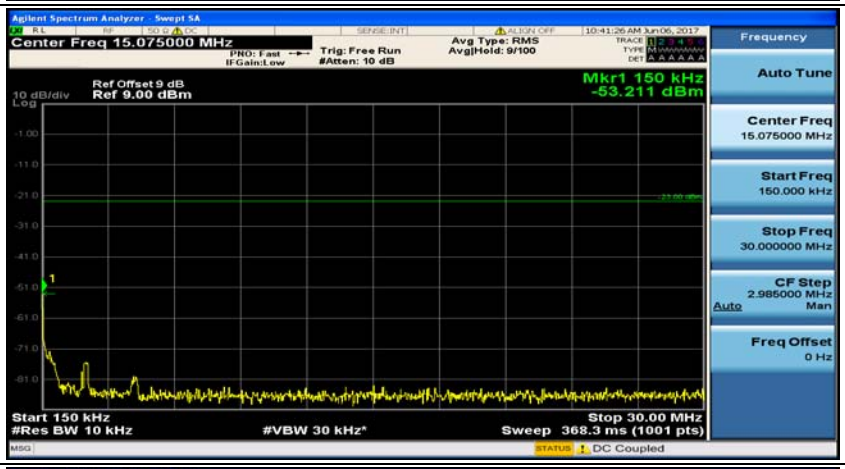
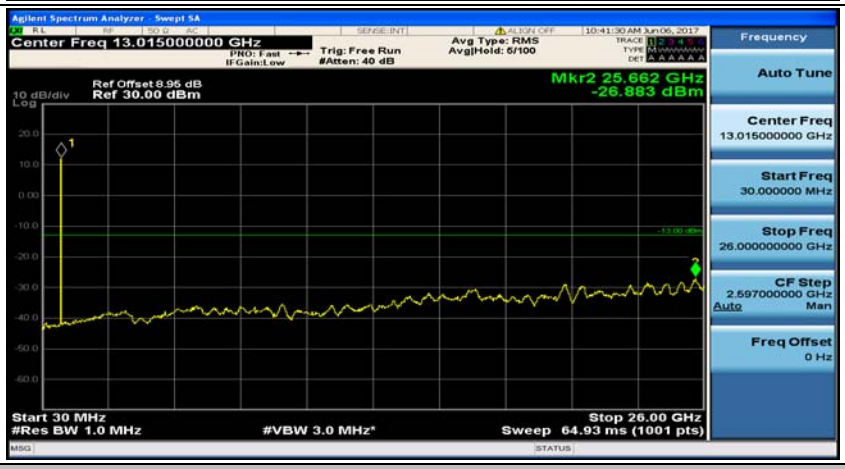
Channel Bandwidth: 10 MHz_HCH_16QAM_25RB#25

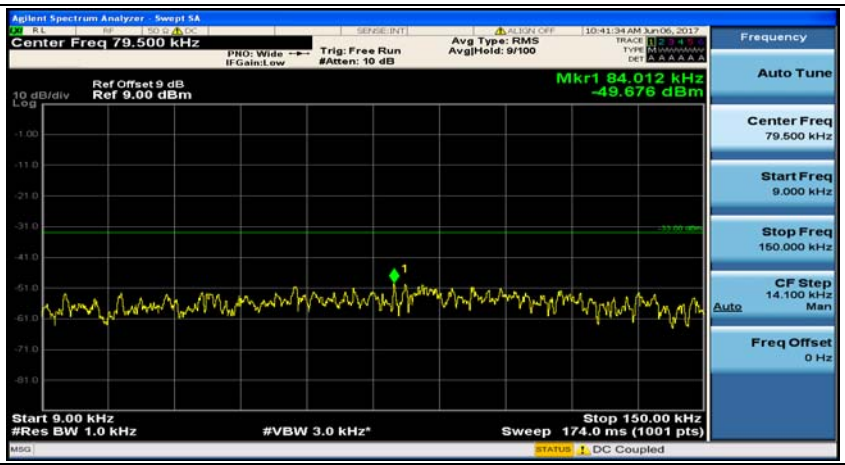
Channel Bandwidth: 10 MHz_HCH_16QAM_50RB#0

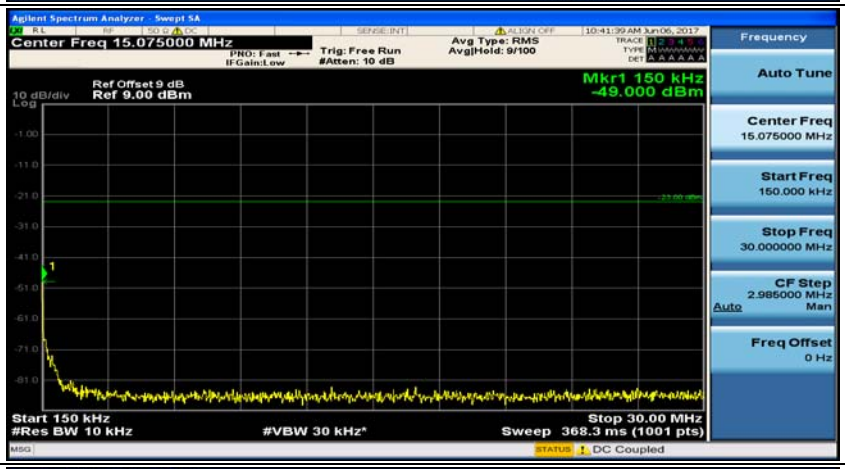
Appendix E: Conducted Spurious Emission

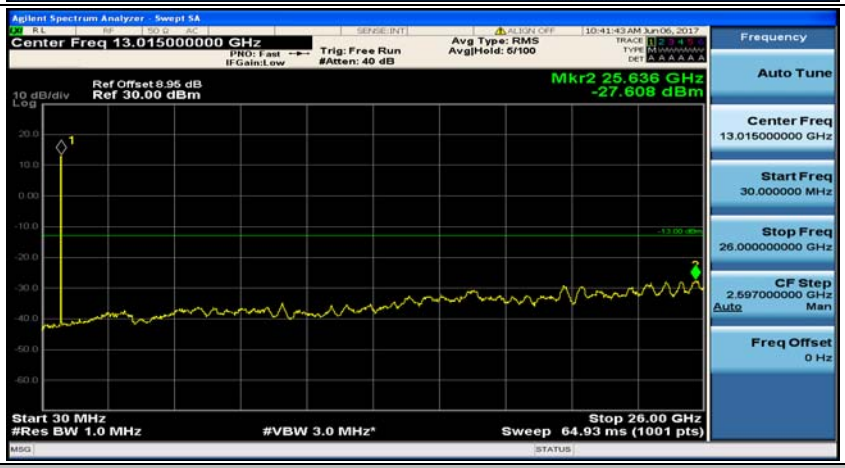
Test Graphs

Channel Bandwidth: 5 MHz

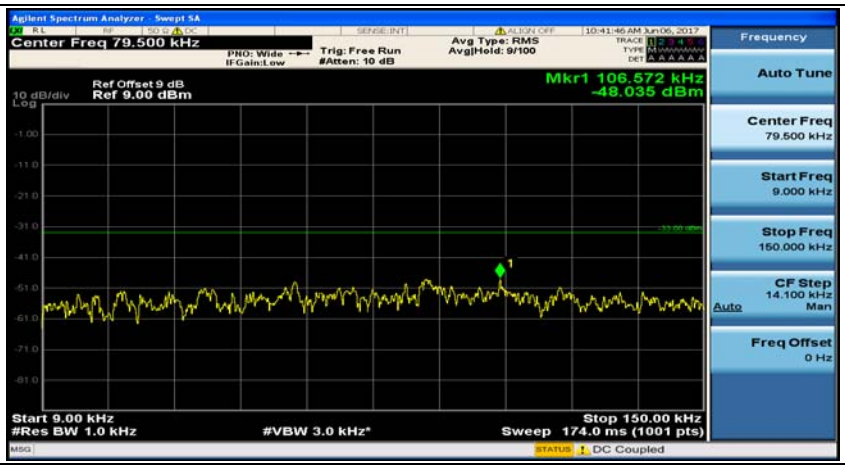
(Channel Bandwidth: 5 MHz)_LCH_QPSK_1RB#0



(Channel Bandwidth: 5 MHz)_LCH_QPSK_1RB#12

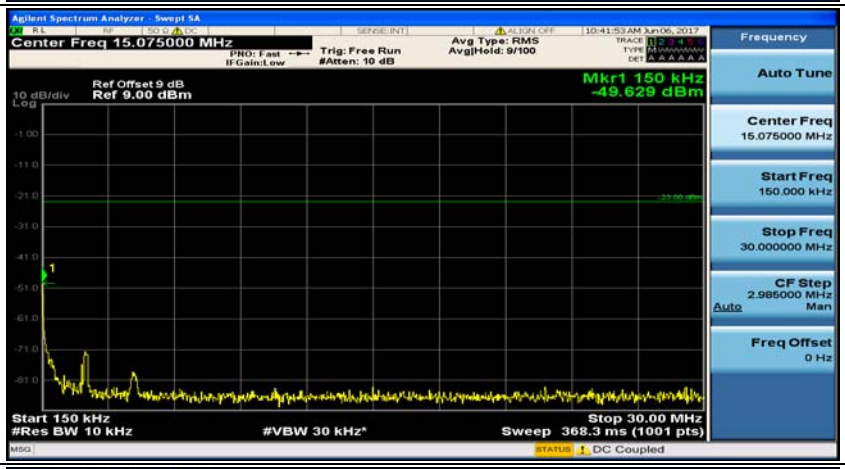


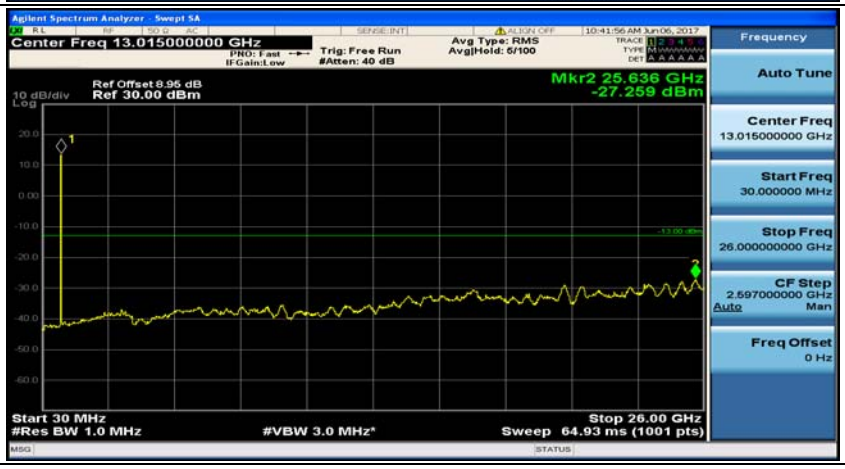




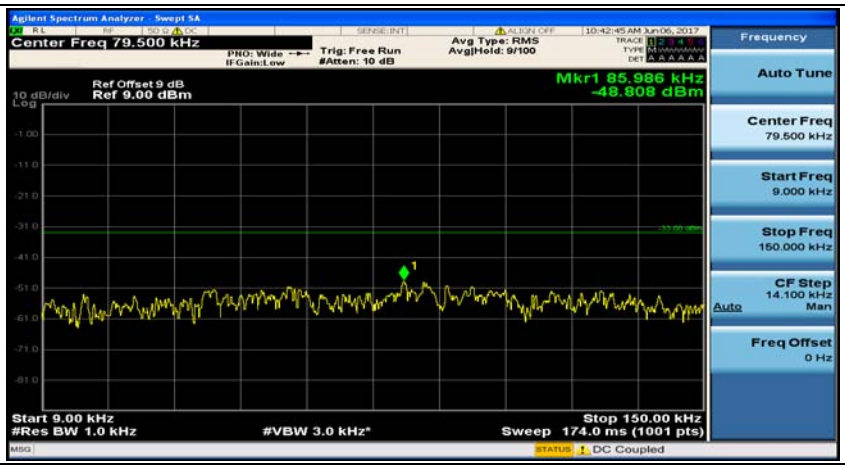
(Channel Bandwidth: 5 MHz)_LCH_QPSK_1RB#24

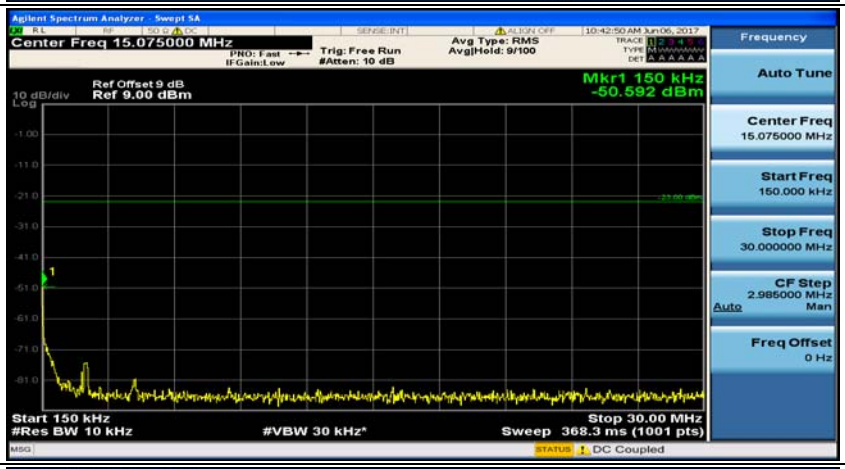


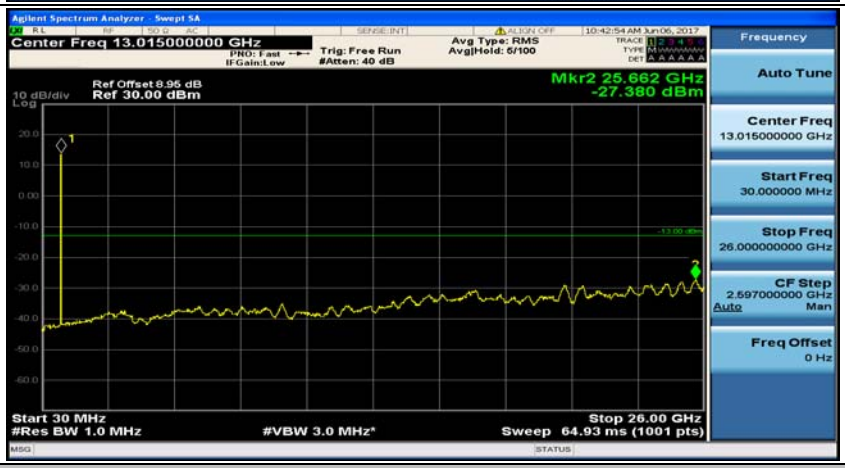




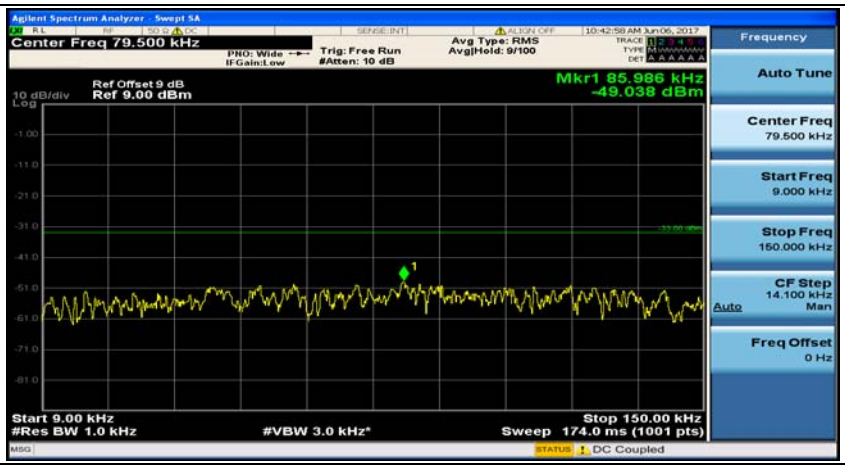
(Channel Bandwidth: 5 MHz)_MCH_QPSK_1RB#0

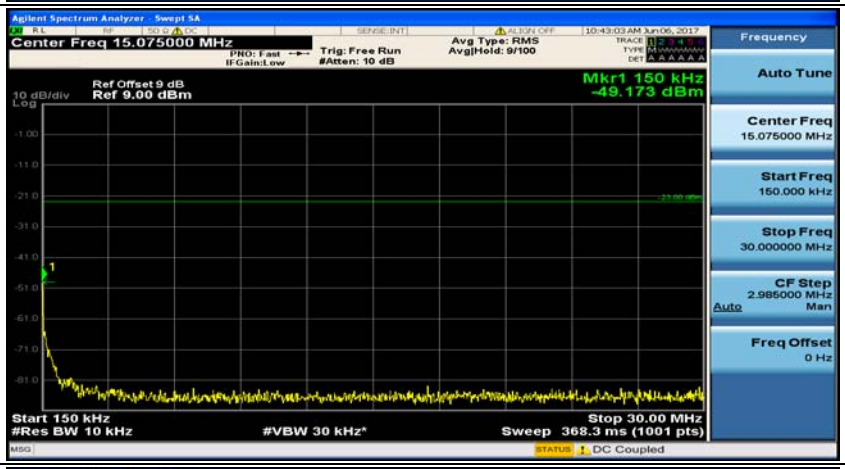




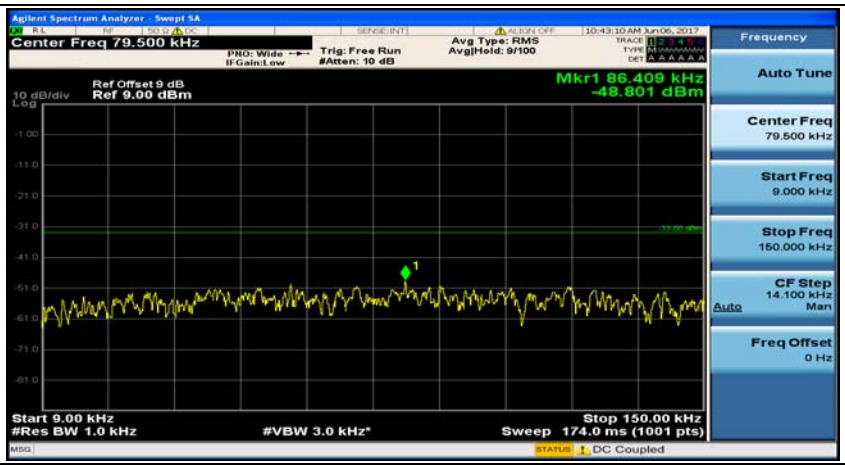


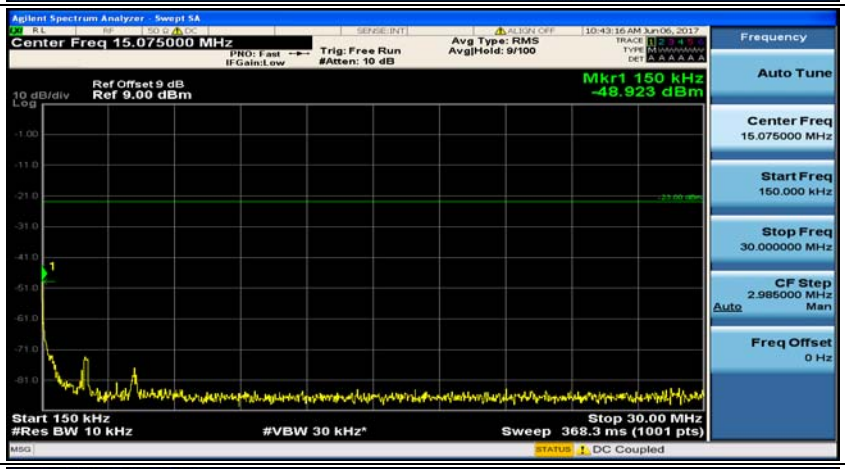
(Channel Bandwidth: 5 MHz)_MCH_QPSK_1RB#12

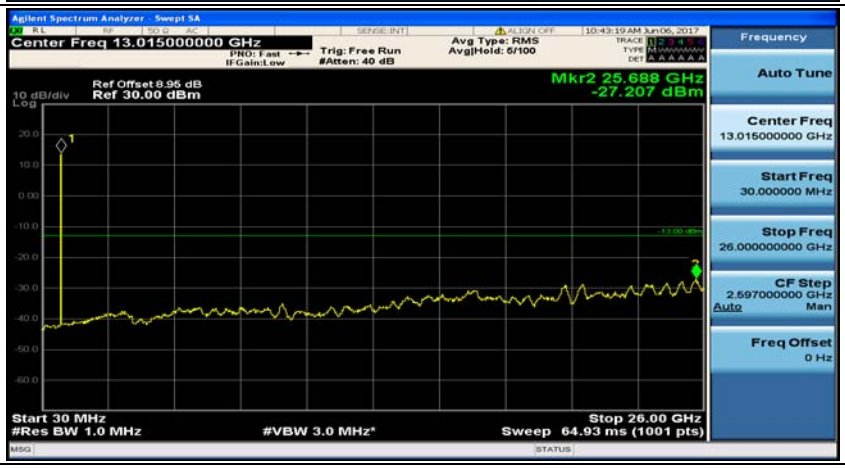




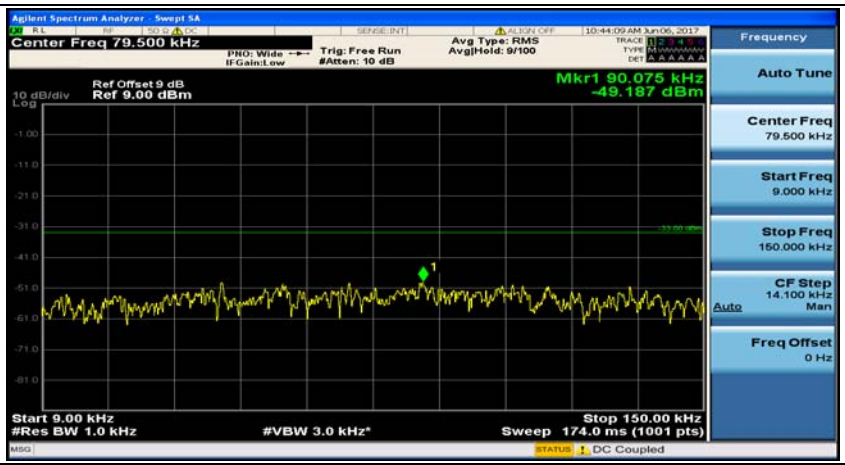
(Channel Bandwidth: 5 MHz)_MCH_QPSK_1RB#24

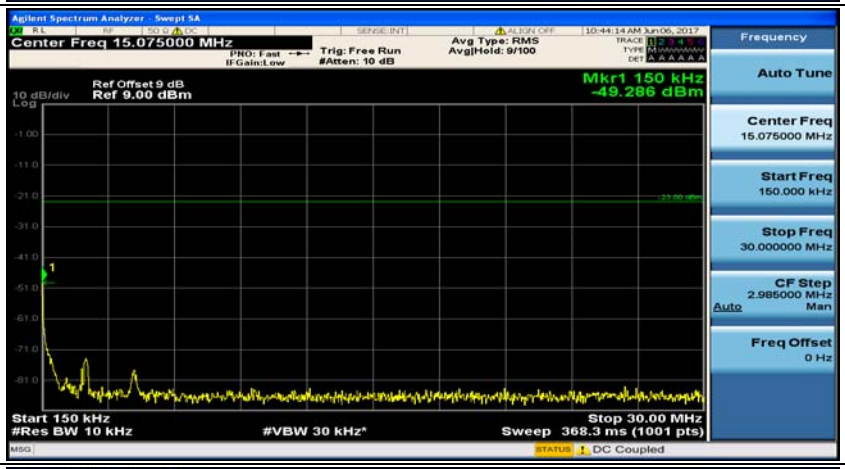


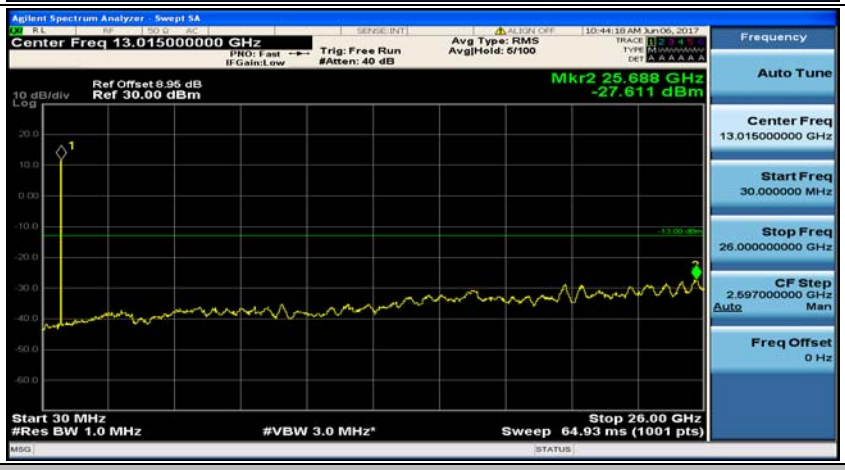




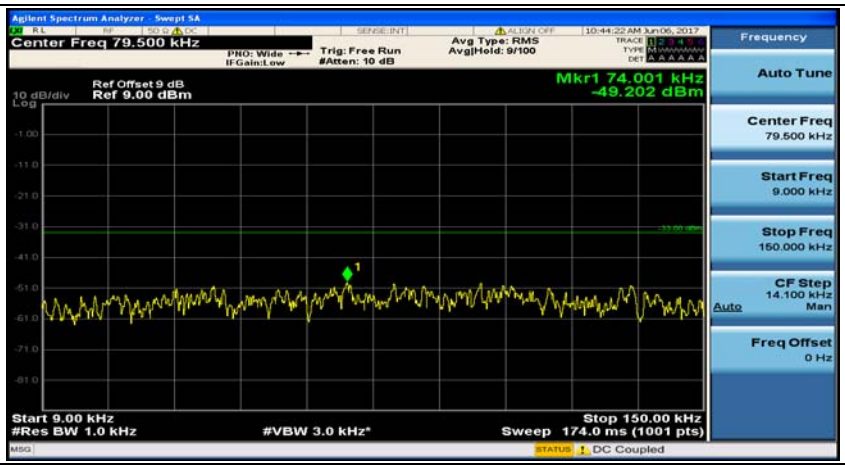
(Channel Bandwidth: 5 MHz)_HCH_QPSK_1RB#0

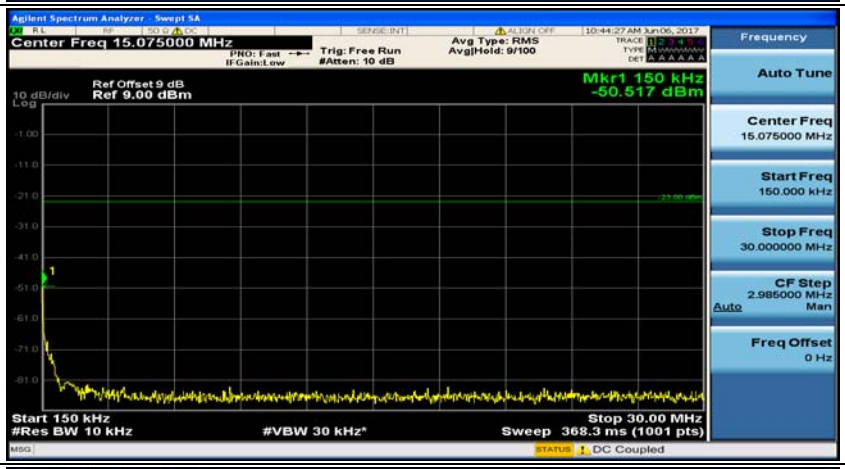


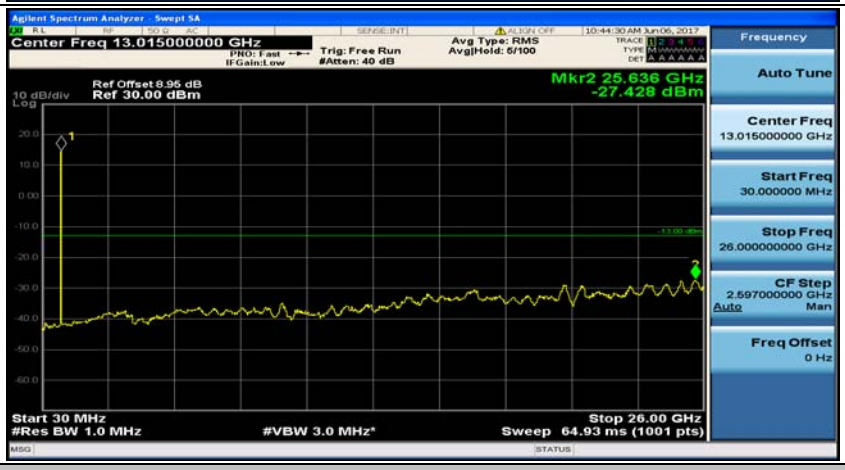




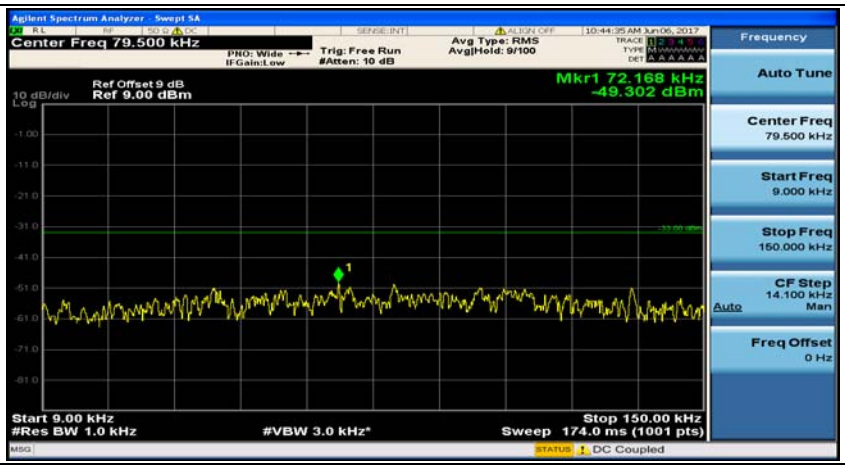
(Channel Bandwidth: 5 MHz)_HCH_QPSK_1RB#12

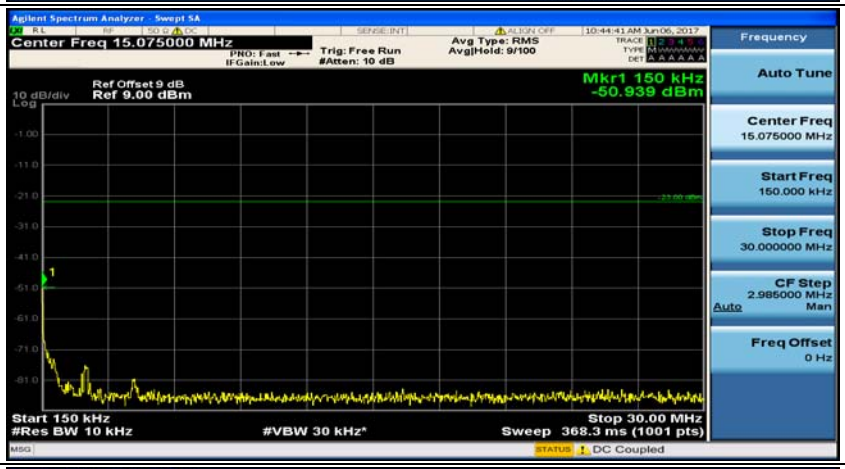


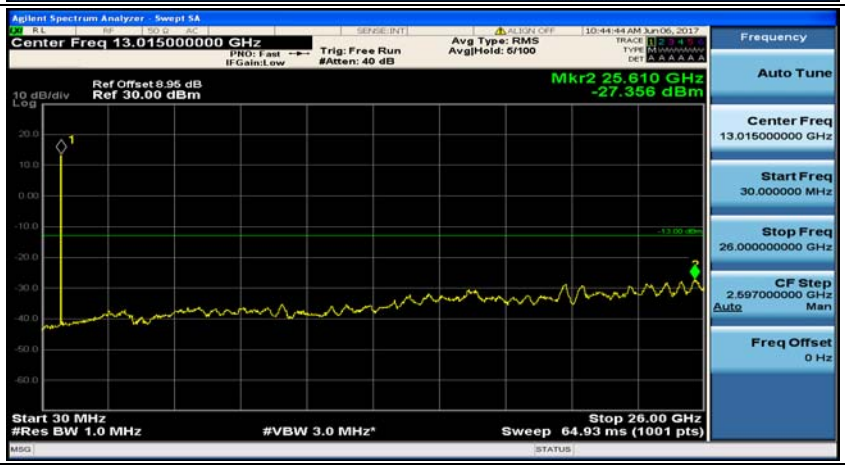




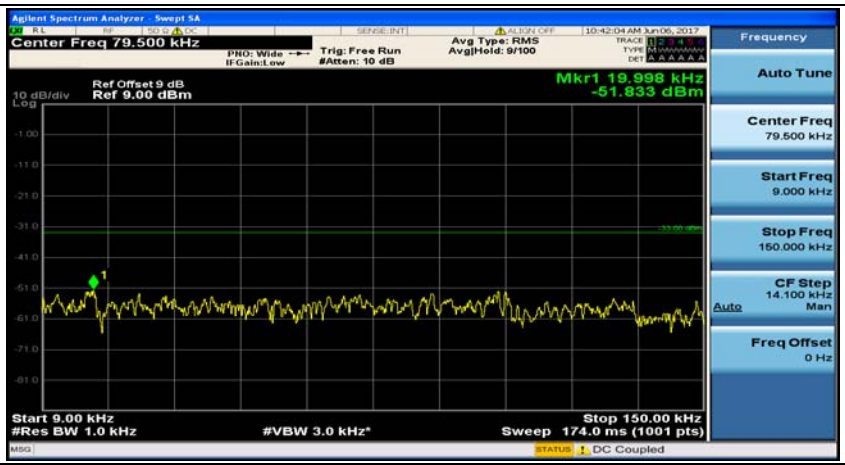
(Channel Bandwidth: 5 MHz)_HCH_QPSK_1RB#24

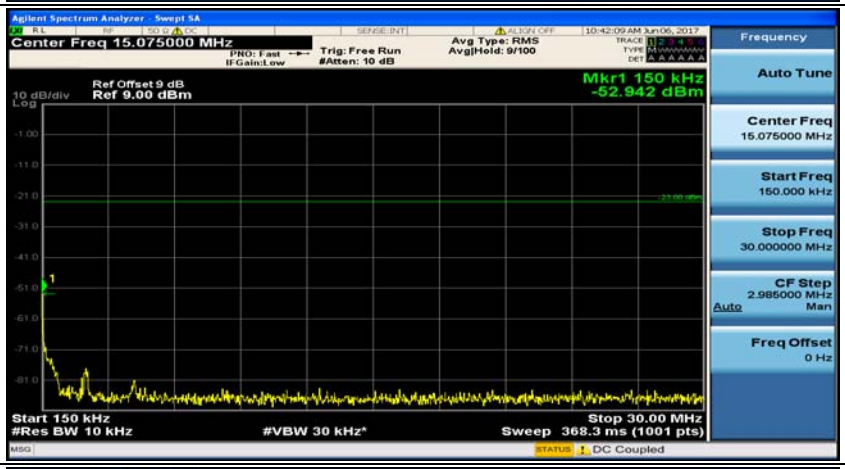


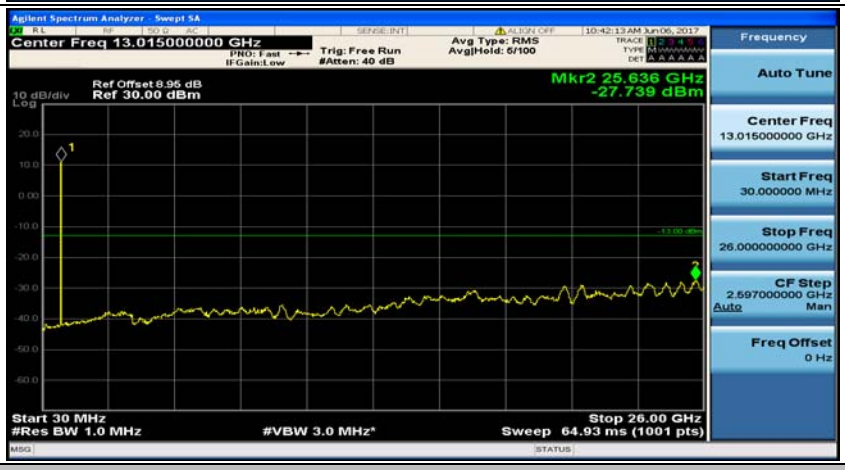




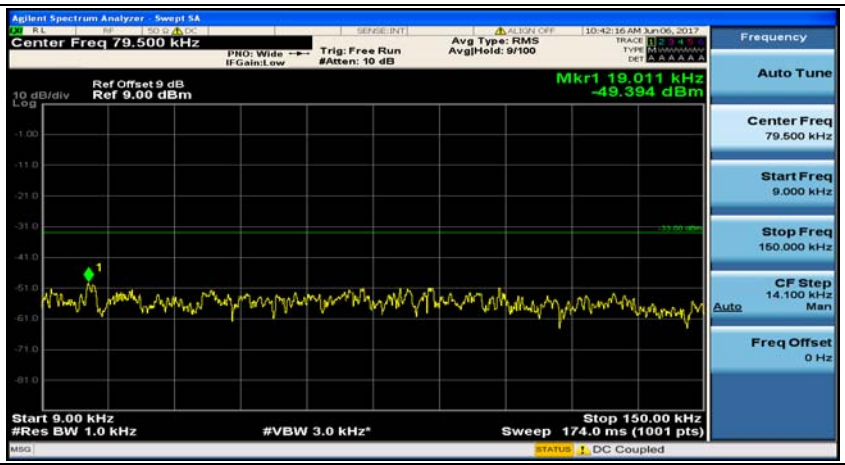
(Channel Bandwidth: 5 MHz)_LCH_16QAM_1RB#0

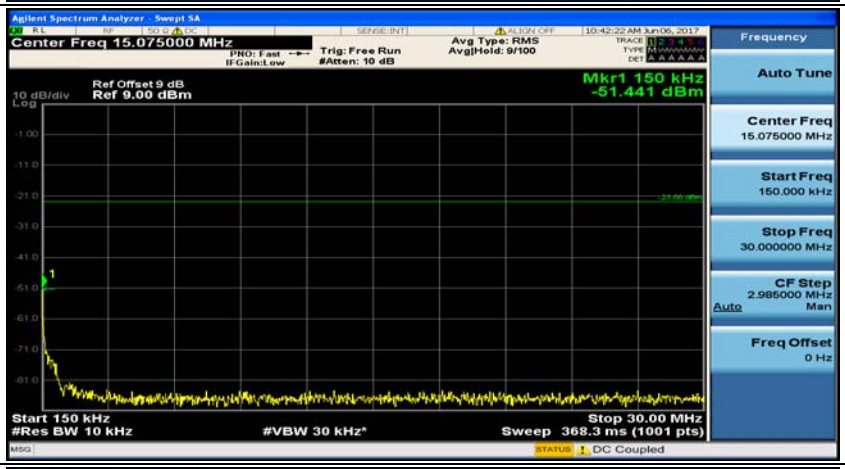


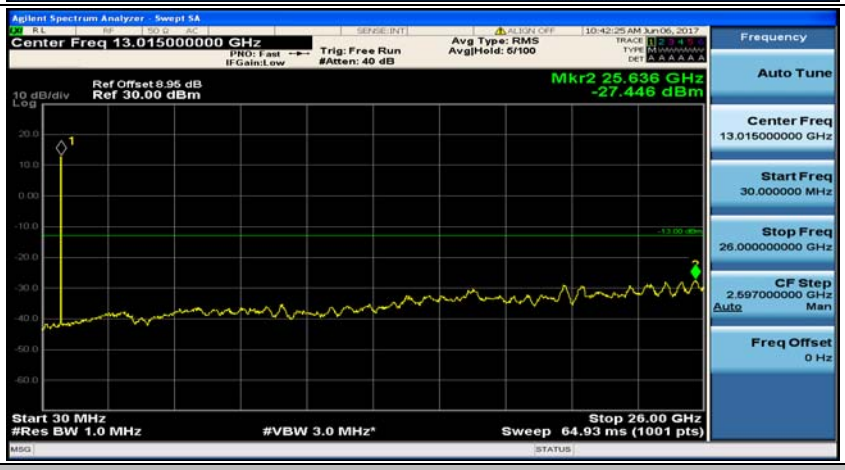




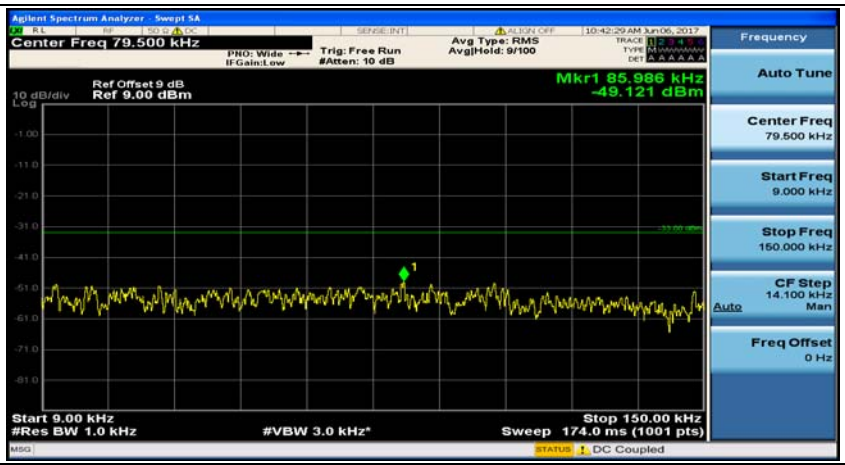
(Channel Bandwidth: 5 MHz)_LCH_16QAM_1RB#12

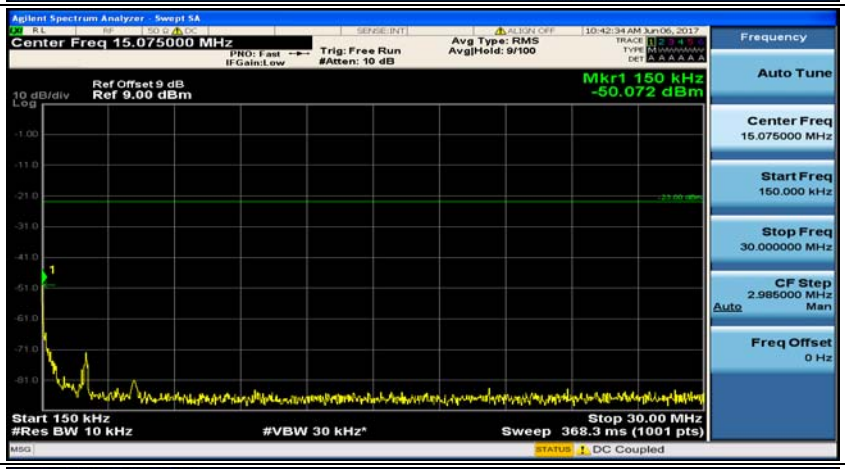


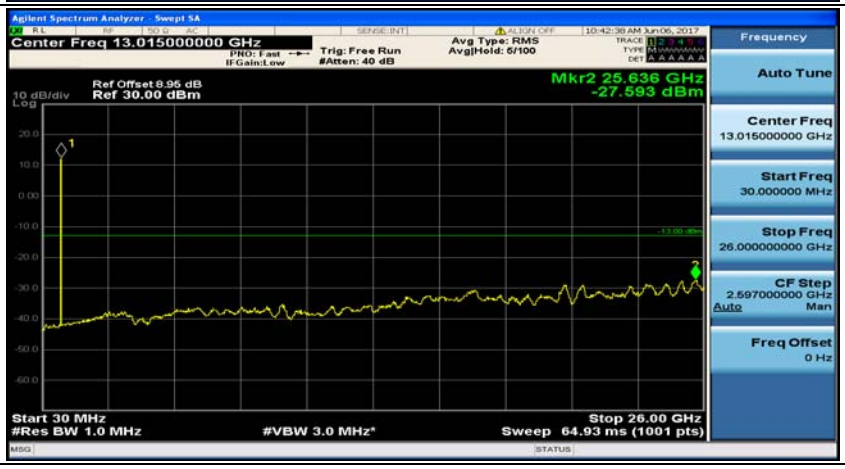




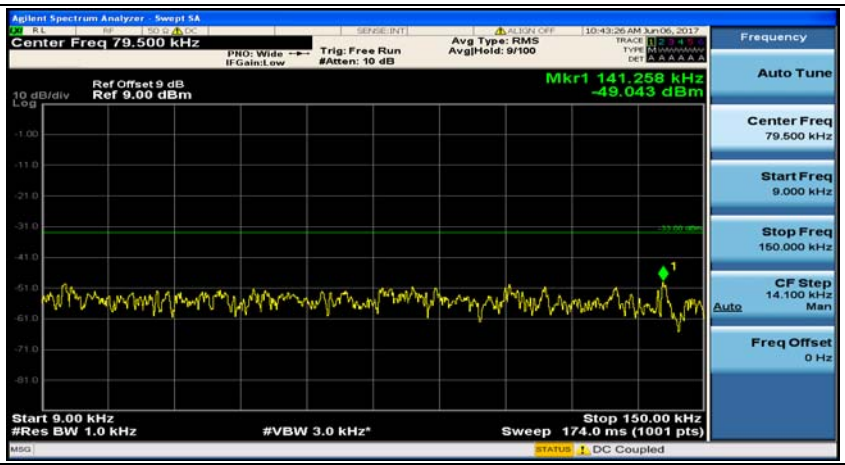
(Channel Bandwidth: 5 MHz)_LCH_16QAM_1RB#24

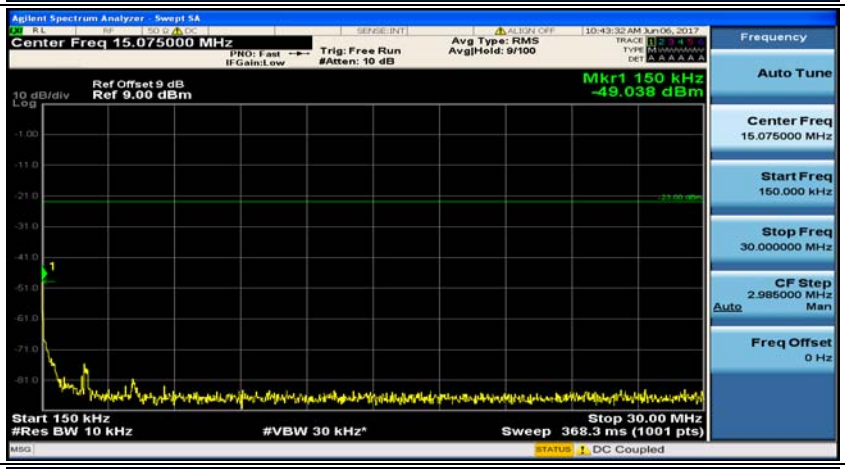


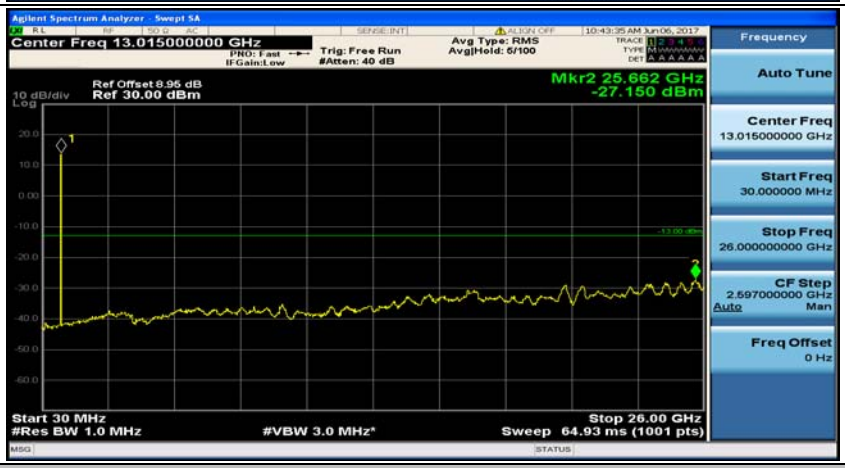




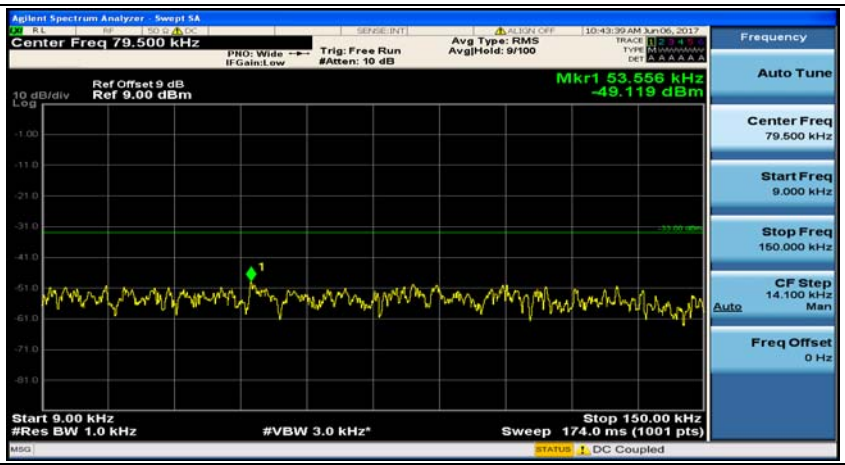
(Channel Bandwidth: 5 MHz)_MCH_16QAM_1RB#0

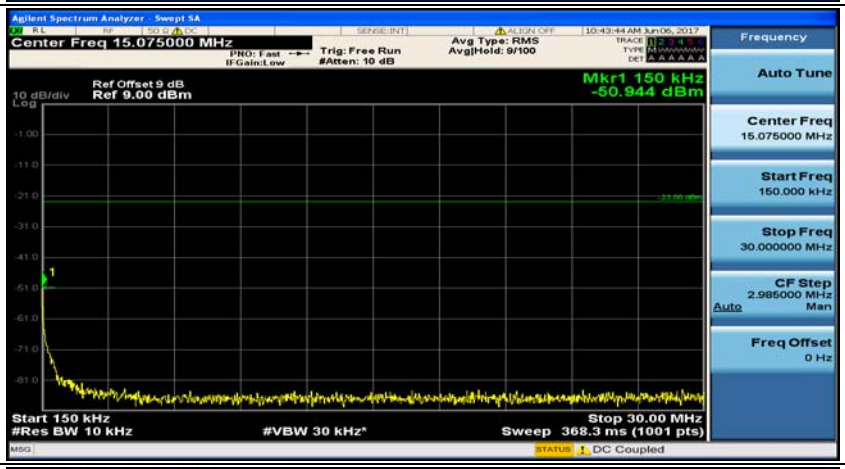


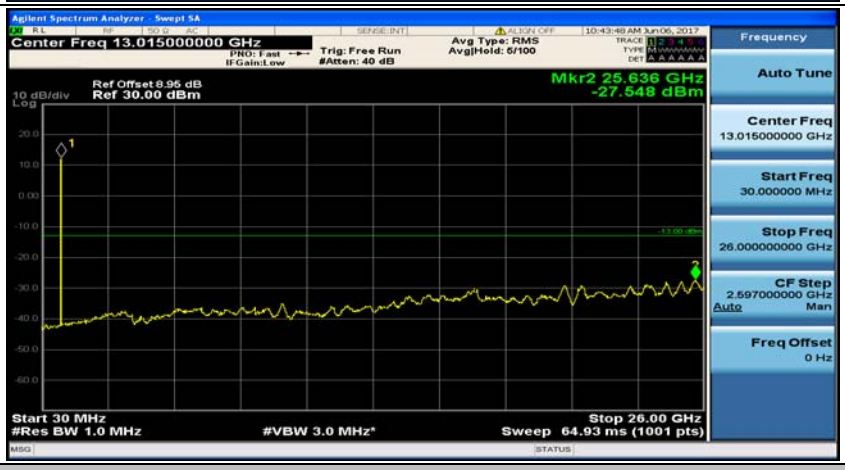




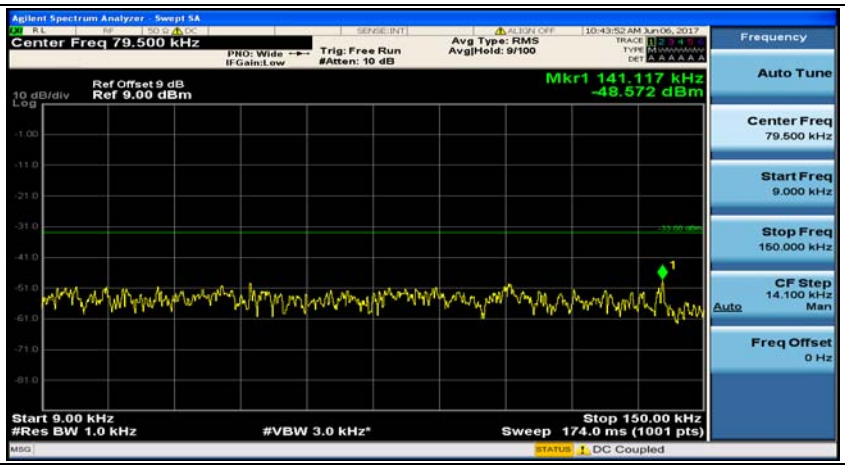
(Channel Bandwidth: 5 MHz)_MCH_16QAM_1RB#12

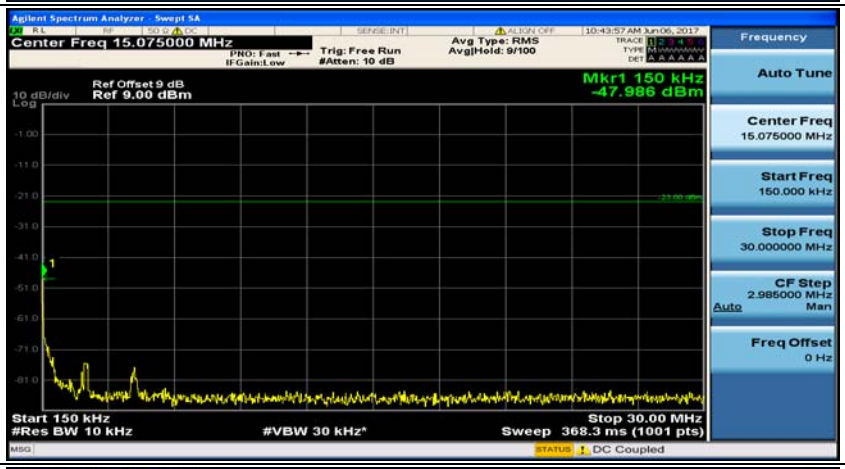


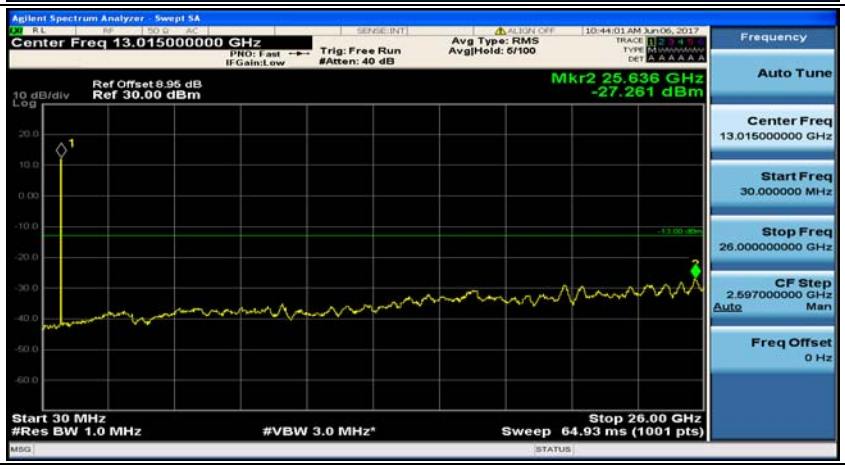




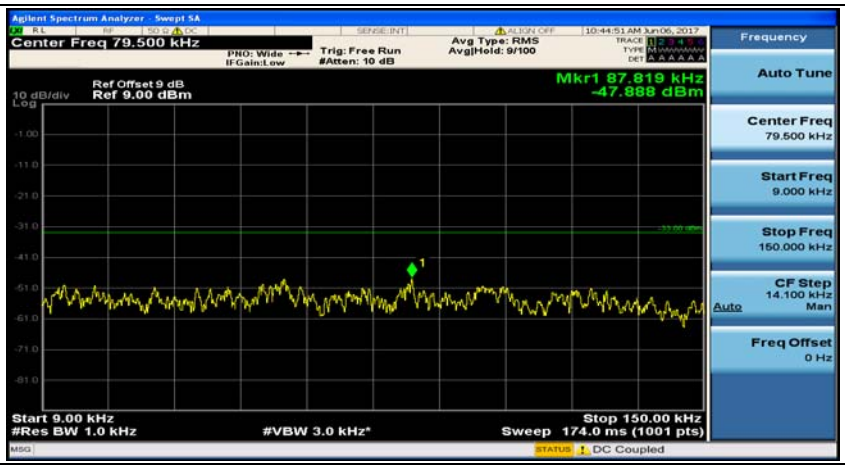
(Channel Bandwidth: 5 MHz)_MCH_16QAM_1RB#24

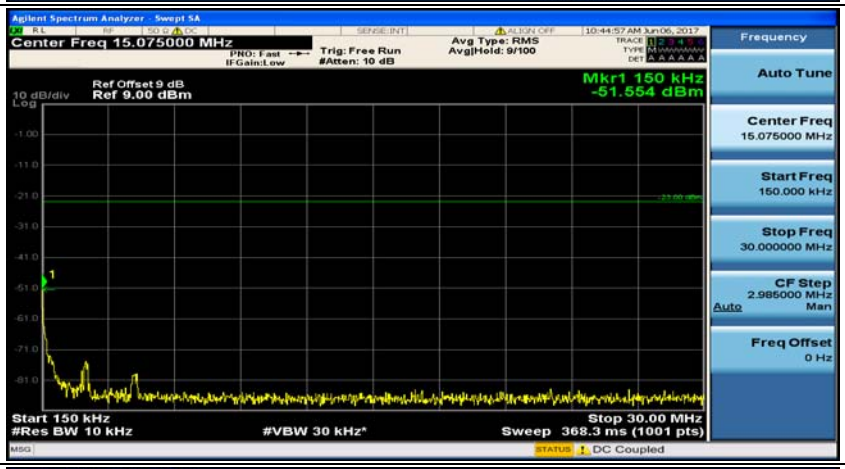


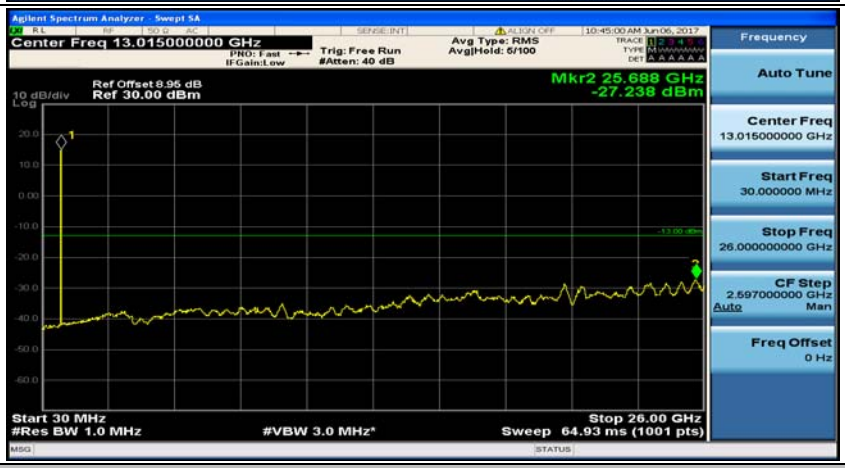




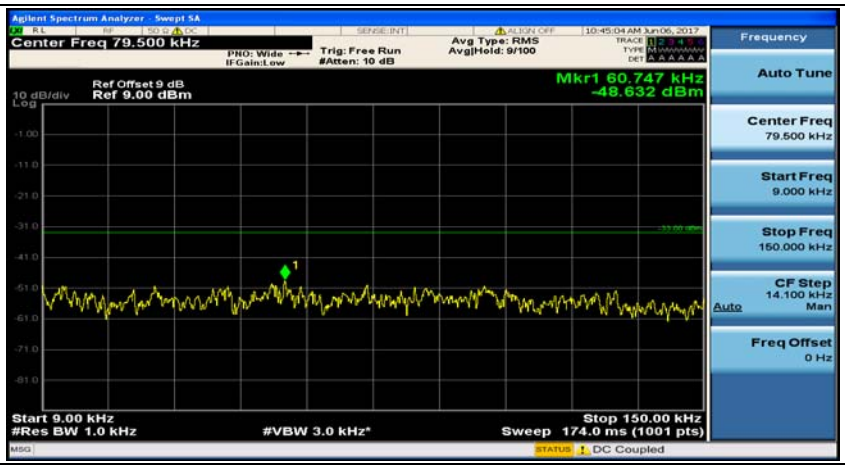
(Channel Bandwidth: 5 MHz)_HCH_16QAM_1RB#0

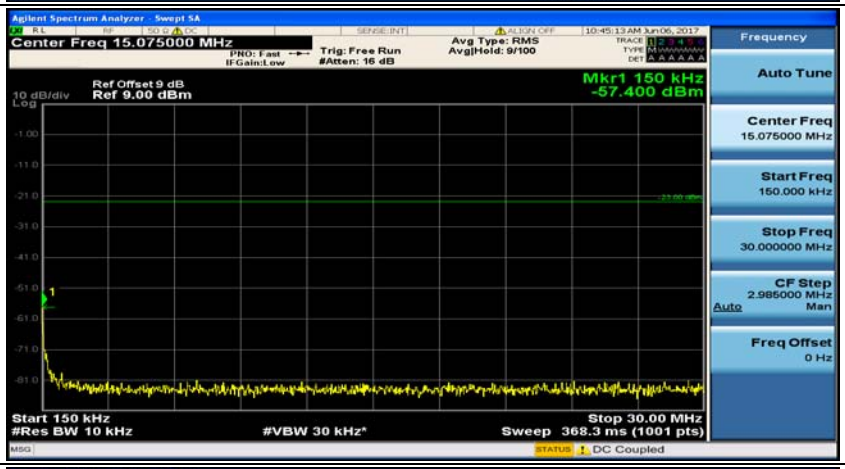


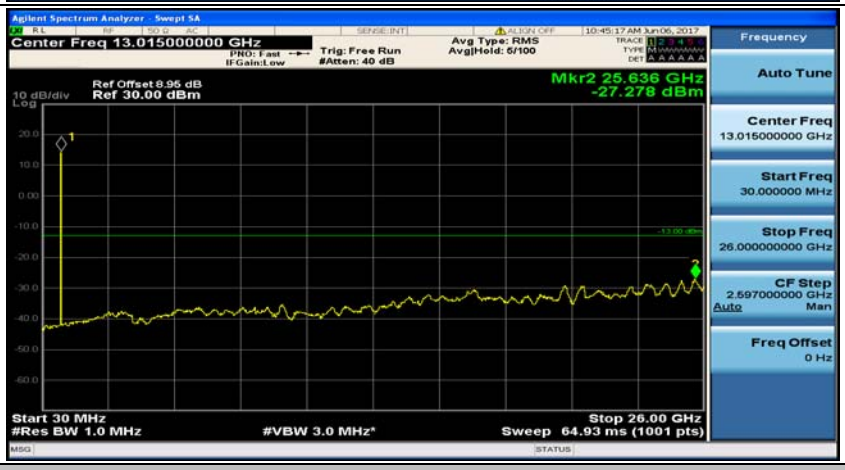




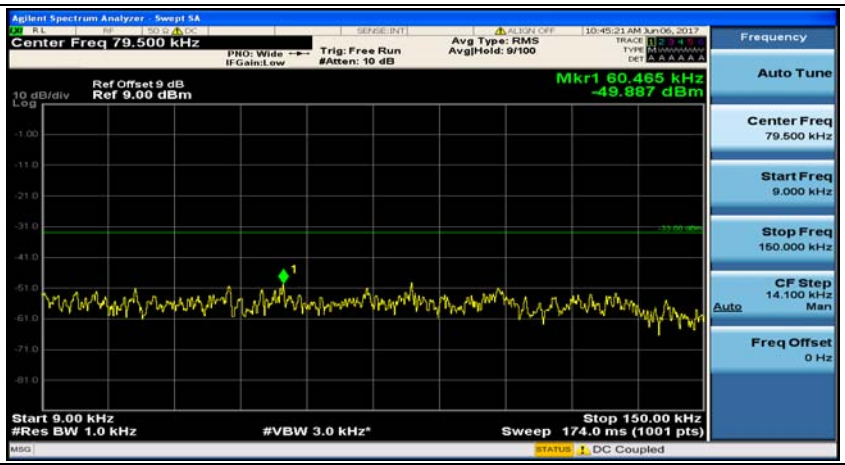
(Channel Bandwidth: 5 MHz)_HCH_16QAM_1RB#12

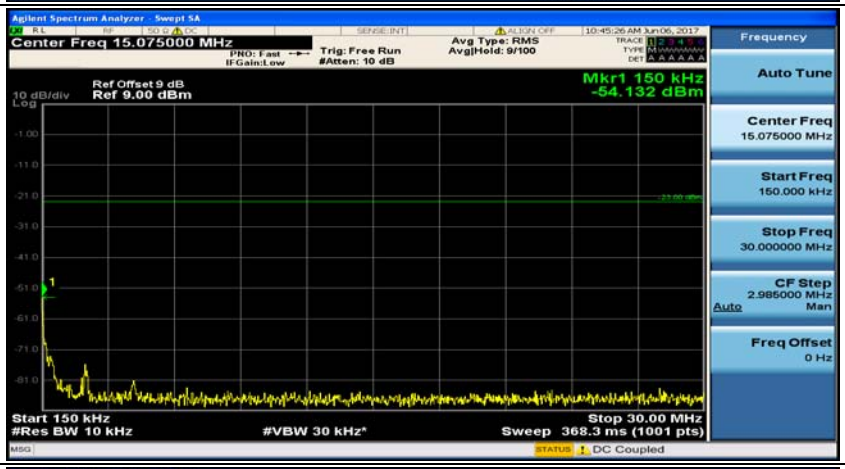


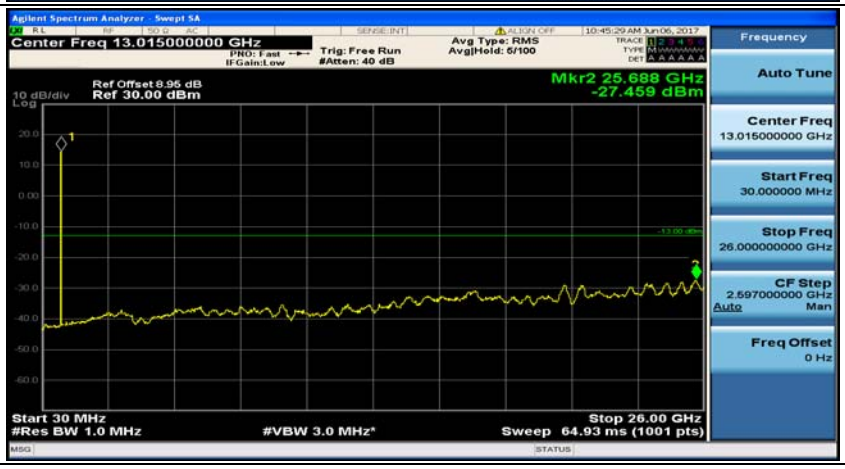




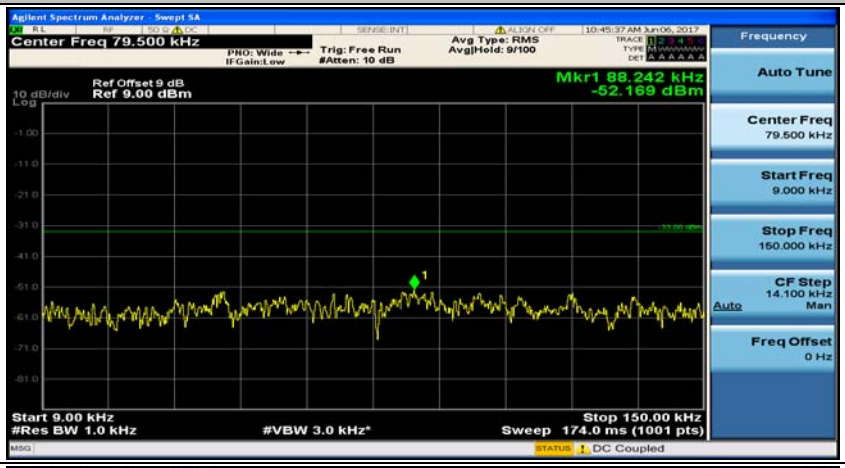
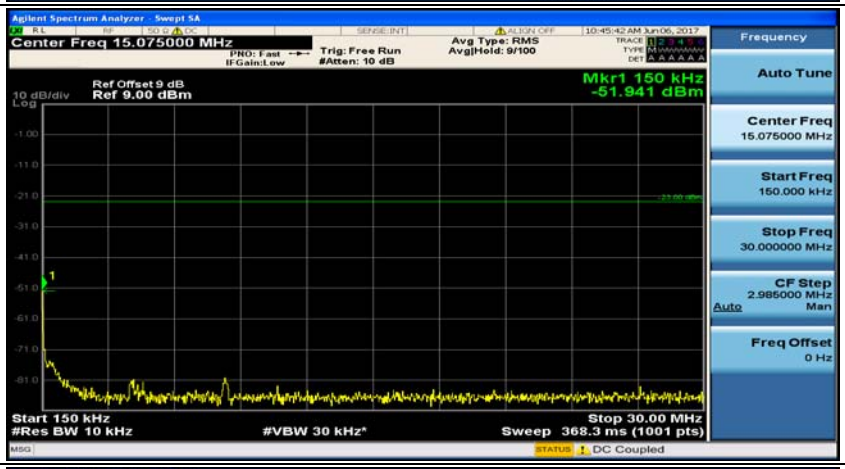
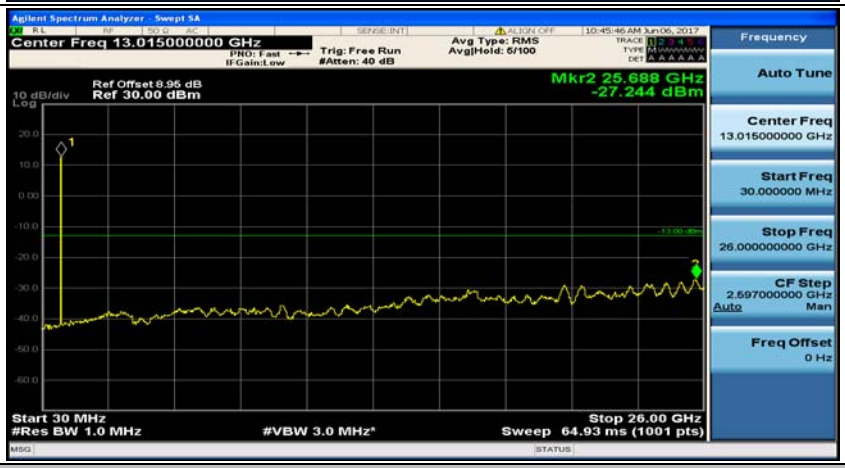
(Channel Bandwidth: 5 MHz)_HCH_16QAM_1RB#24

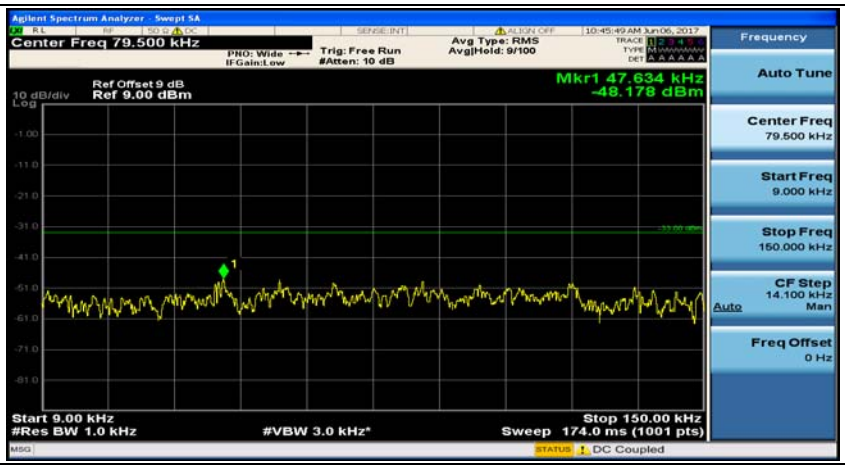

Agilent Spectrum Analyzer - Swept SA
Center Freq 79.500 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 9/100
10:45:21 AM Jun 06, 2017
Frequency
Ref Offset 9 dB
10 dB/div
Log
Ref 9.00 dBm
Mkr1 60.465 kHz
-49.887 dBm
Auto Tune
Center Freq
79.500 kHz
Start Freq
9.000 kHz
Stop 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

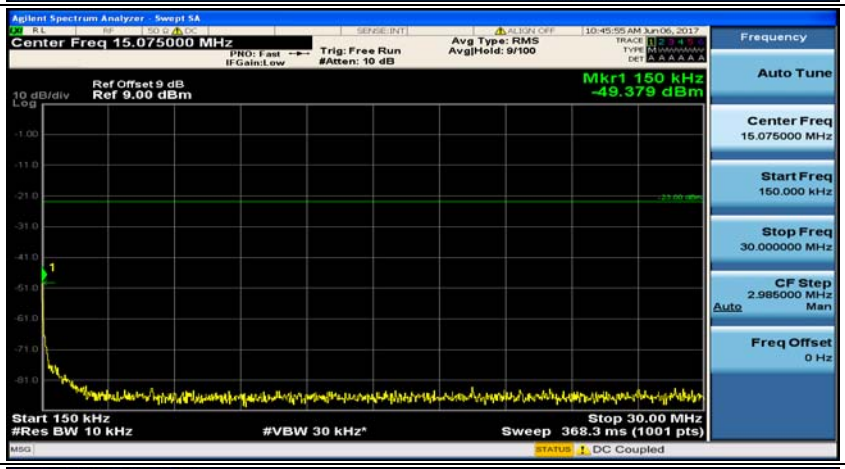

Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 9/100
10:45:26 AM Jun 06, 2017
Frequency
Ref Offset 9 dB
10 dB/div
Log
Ref 9.00 dBm
Mkr1 150 kHz
-54.132 dBm
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 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

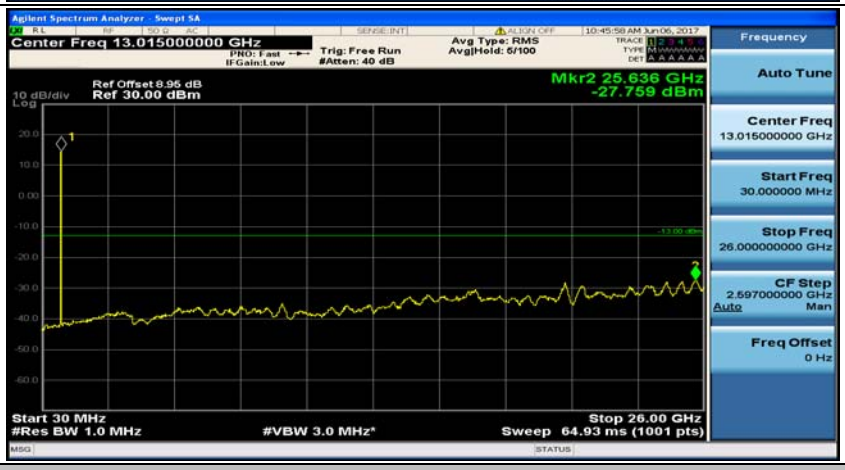

Agilent Spectrum Analyzer - Swept SA
Center Freq 13.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: RMS
Avg|Hold: 5/100
10:45:29 AM Jun 06, 2017
Frequency
Ref Offset 8.95 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr2 25.688 GHz
-27.459 dBm
Auto Tune
Center Freq
13.015000000 GHz
Start 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)

Channel Bandwidth: 10 MHz

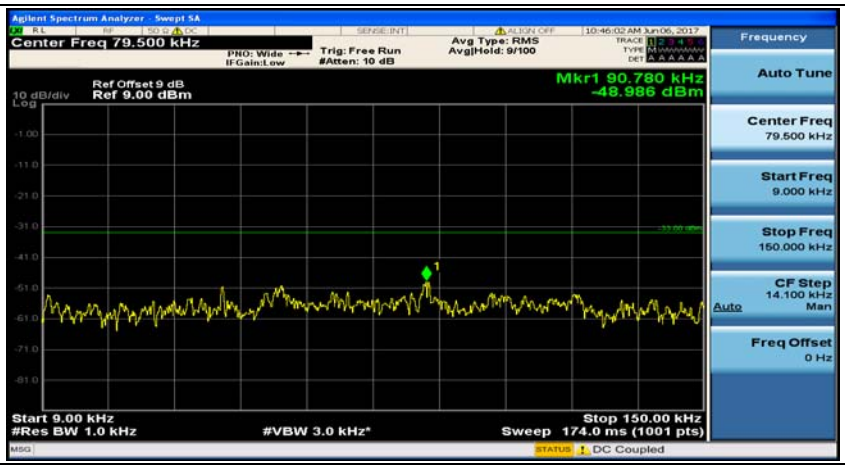
Channel Bandwidth: 10 MHz_LCH_QPSK_1RB#0



Channel Bandwidth: 10 MHz_LCH_QPSK_1RB#24

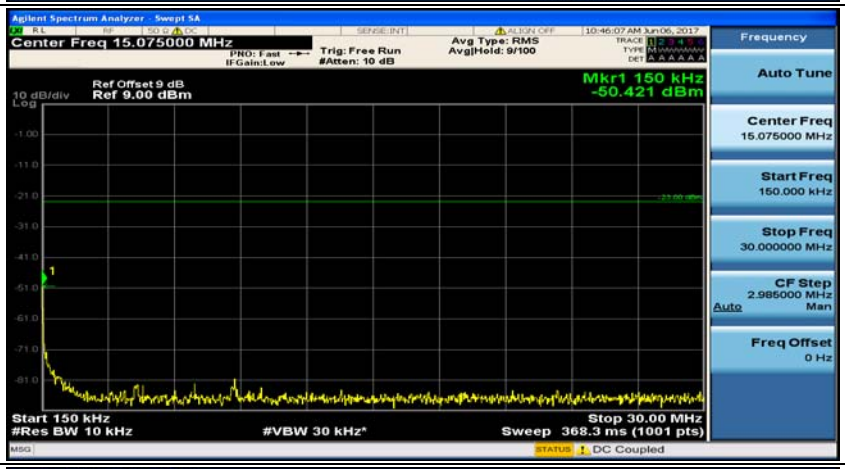


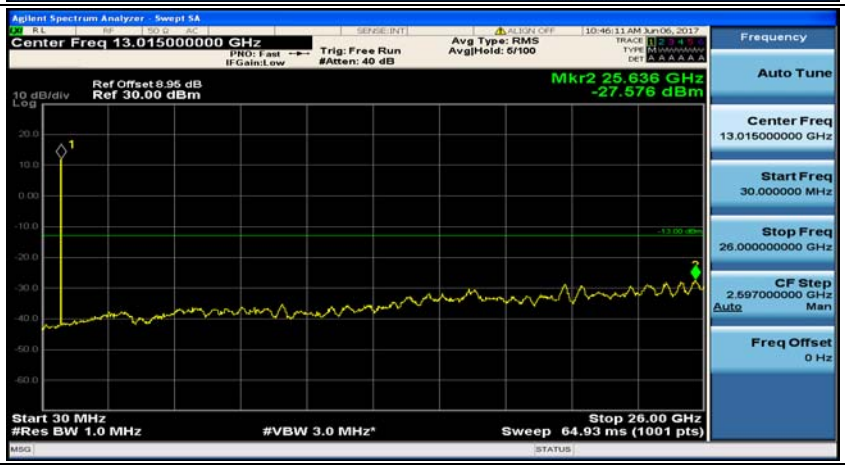




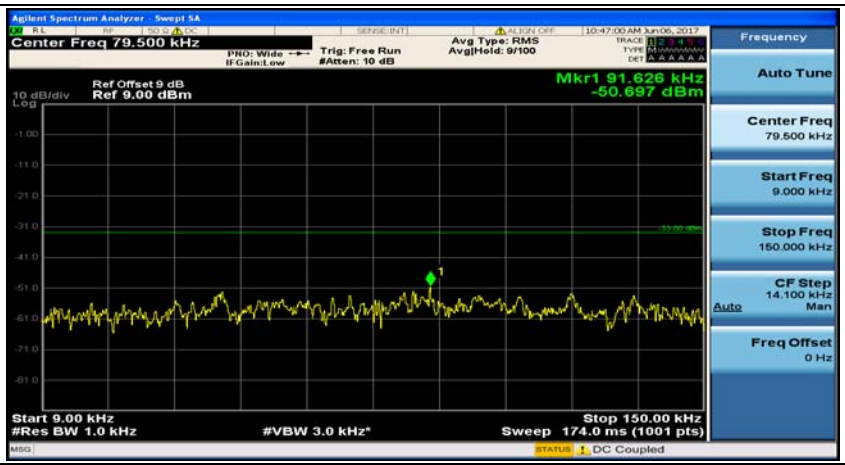
Channel Bandwidth: 10 MHz_LCH_QPSK_1RB#49

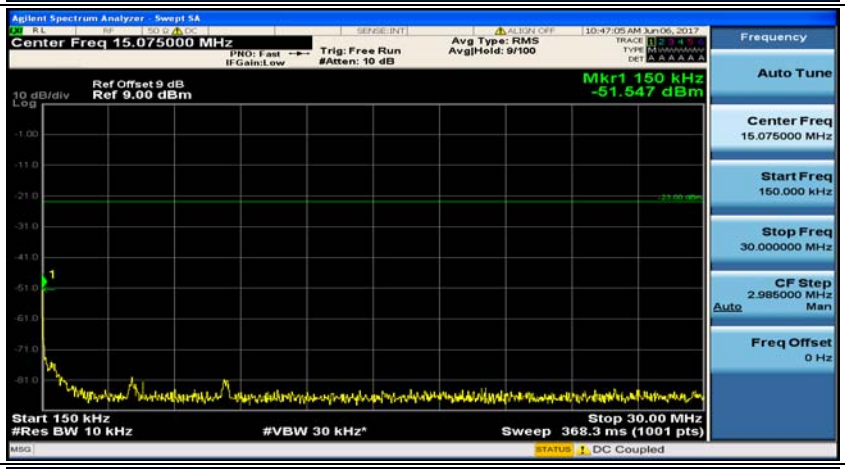


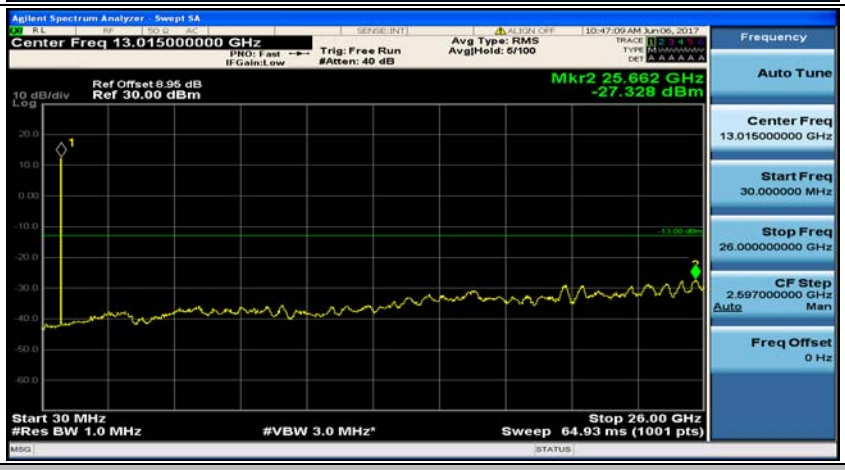




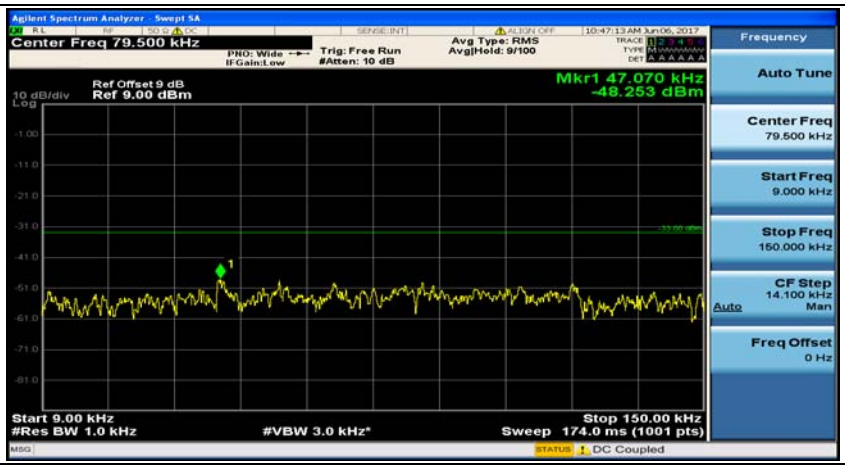
Channel Bandwidth: 10 MHz_MCH_QPSK_1RB#0

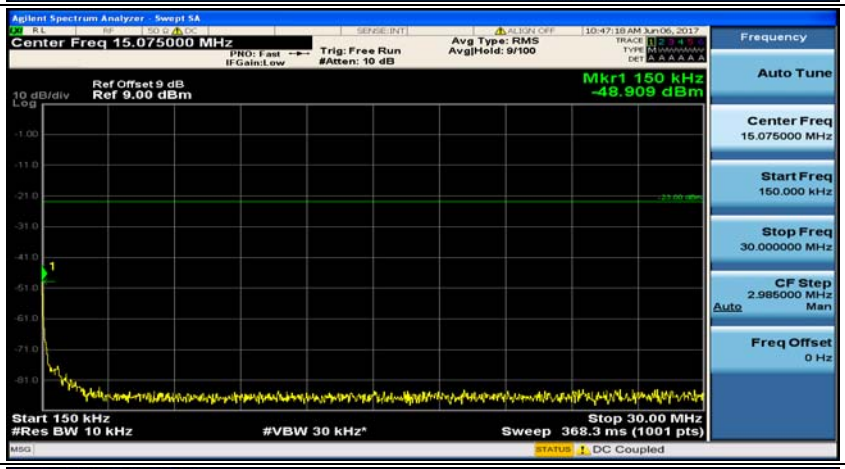


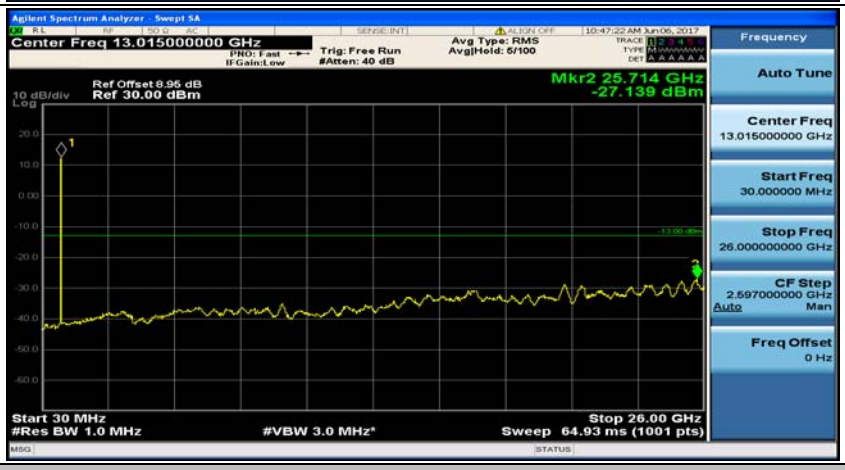




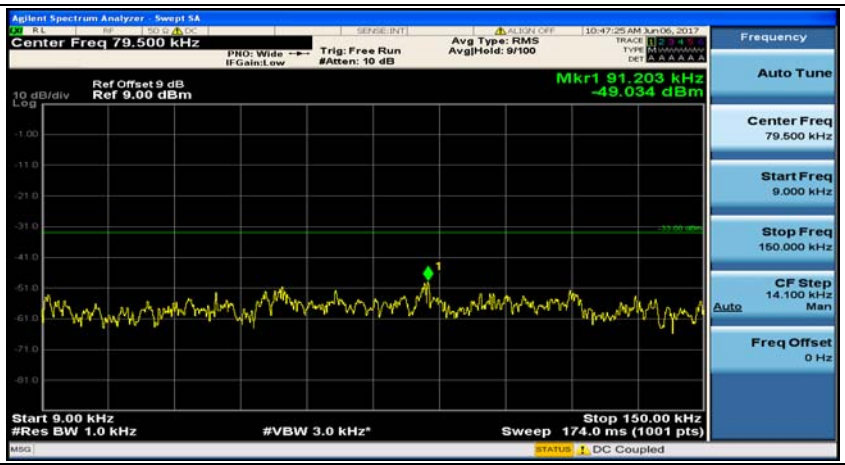
Channel Bandwidth: 10 MHz_MCH_QPSK_1RB#24

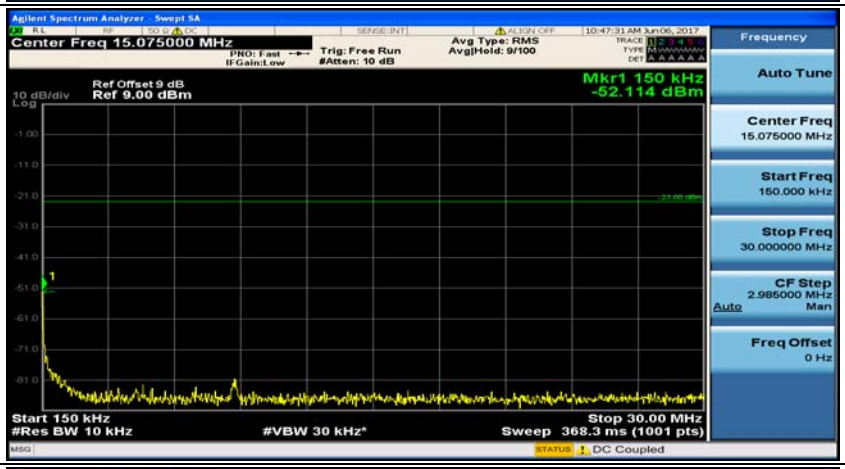


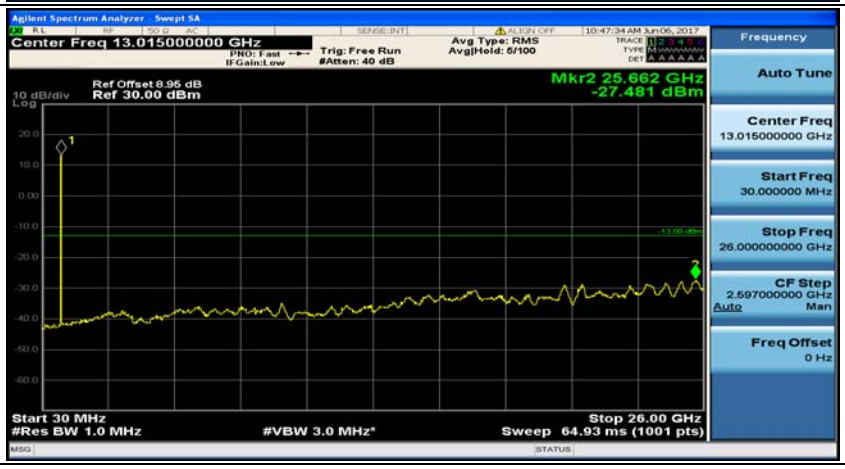




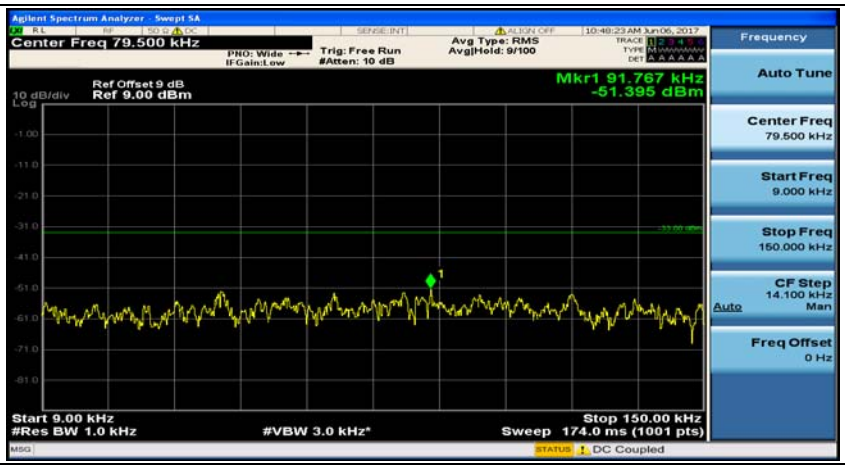
Channel Bandwidth: 10 MHz_MCH_QPSK_1RB#49

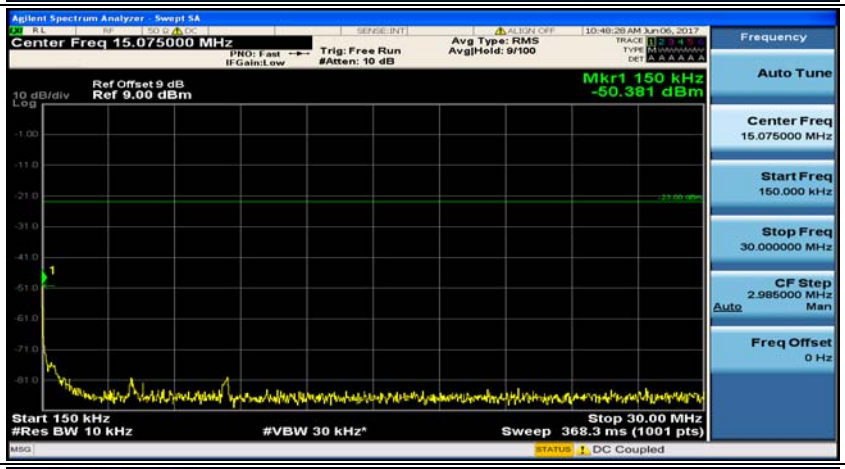


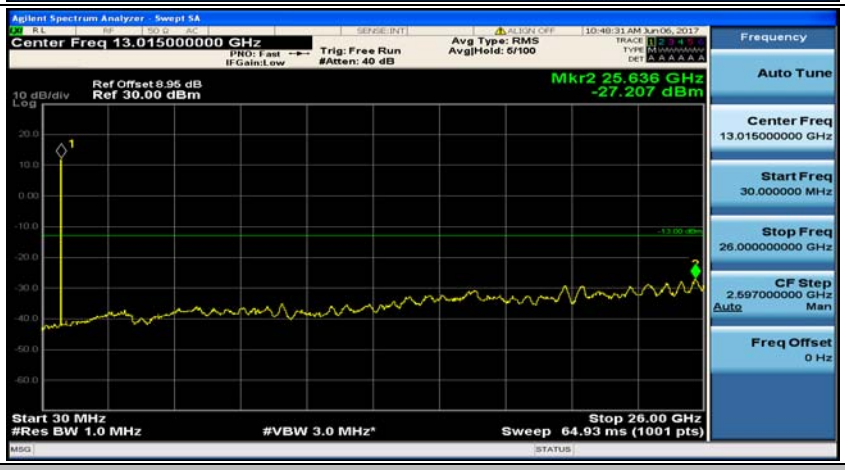




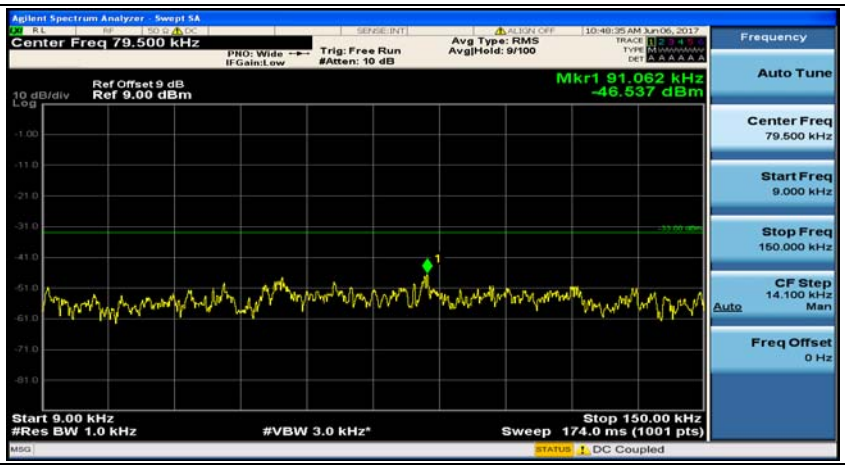
Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#0

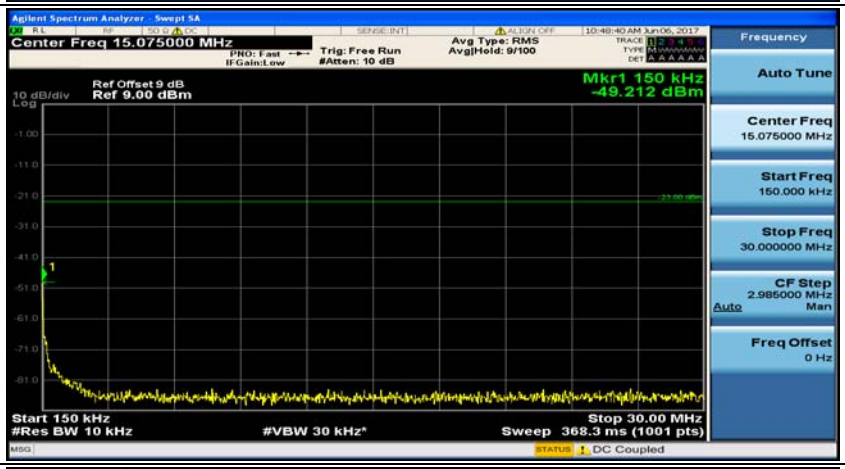


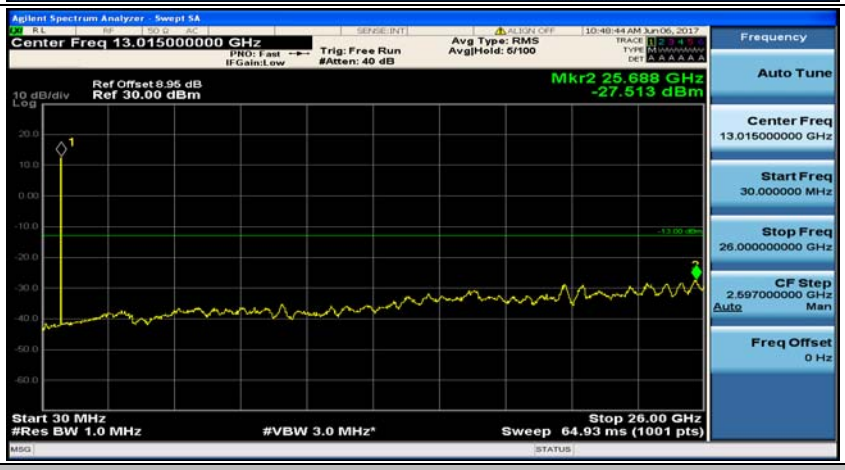




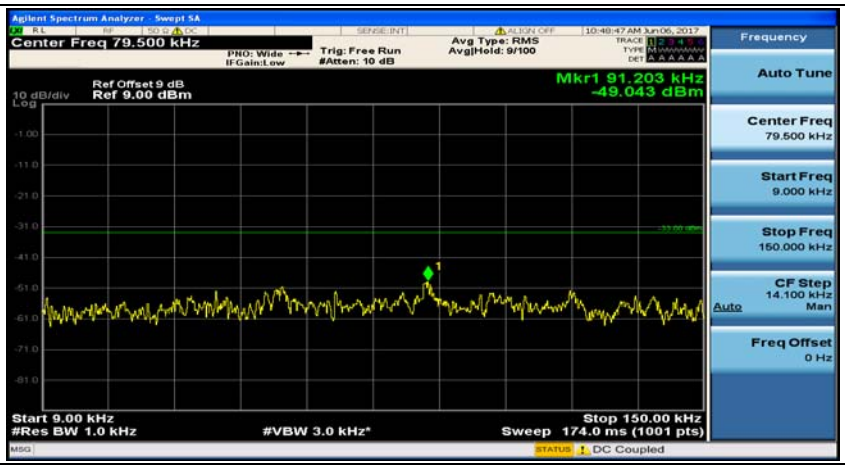
Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#24

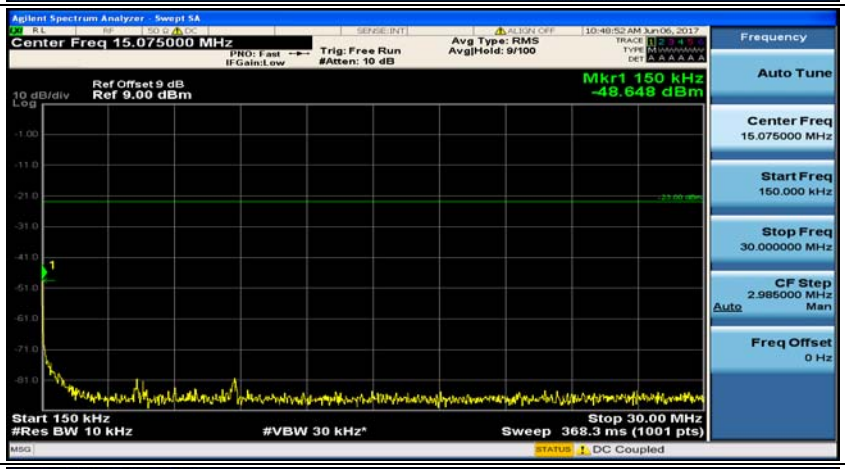


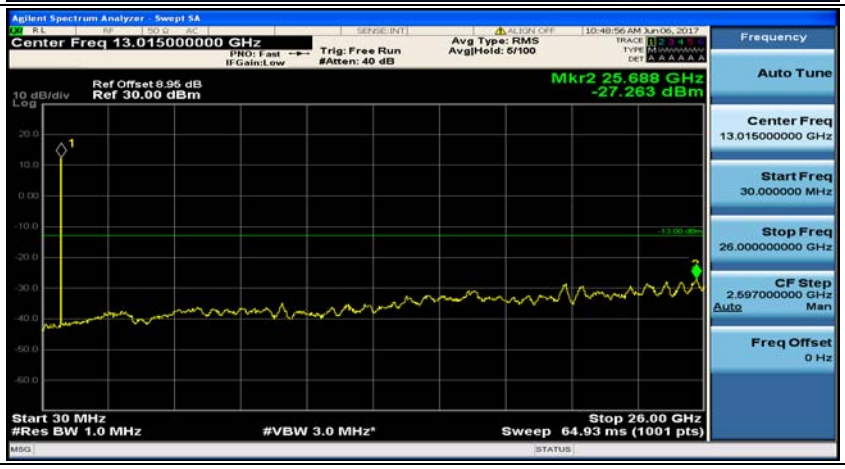




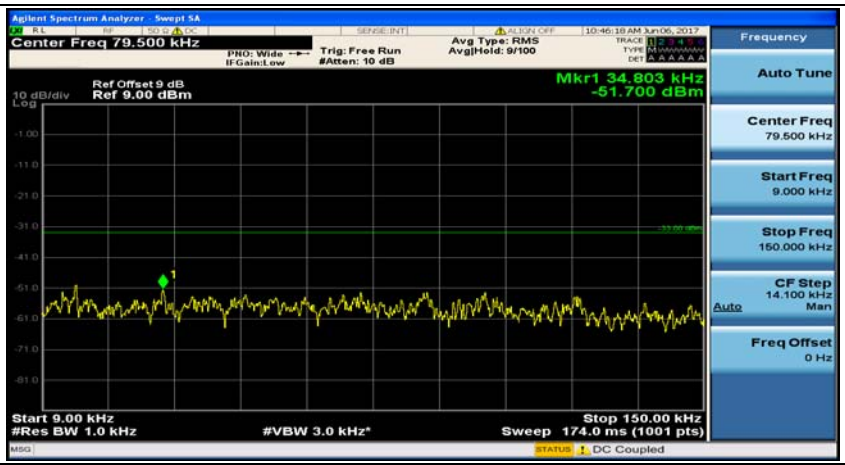
Channel Bandwidth: 10 MHz_HCH_QPSK_1RB#49

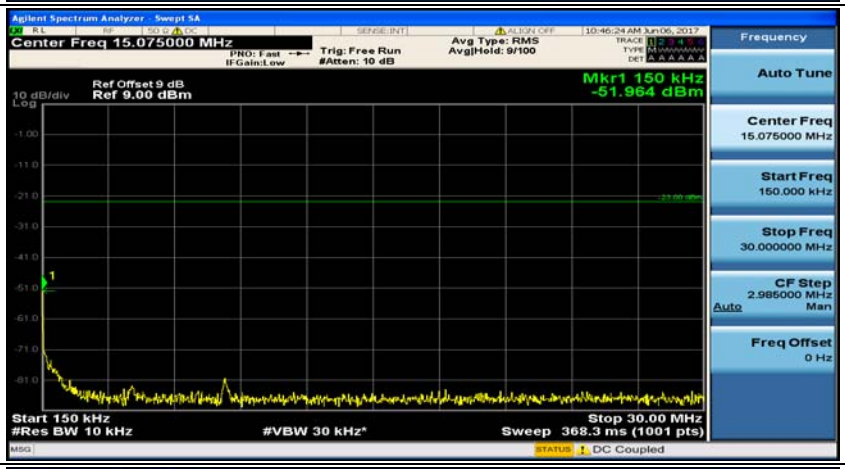


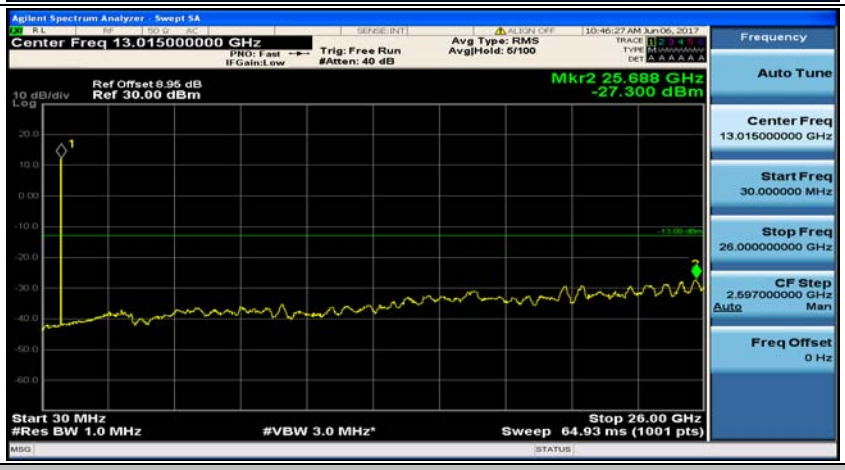




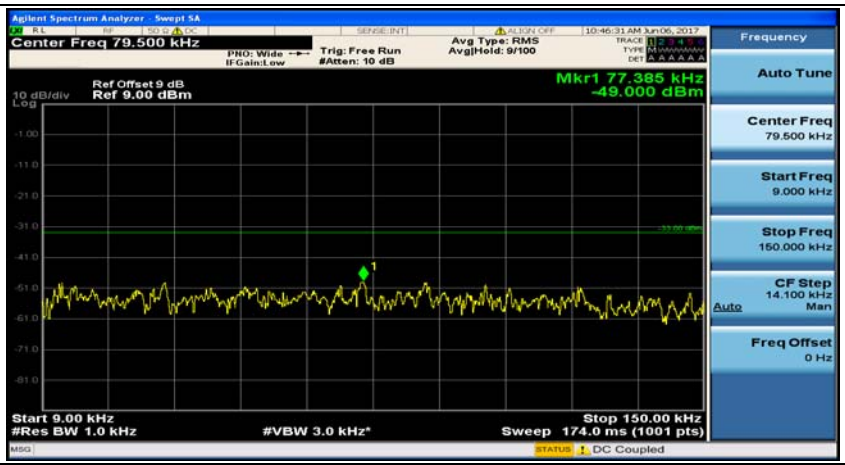
Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#0

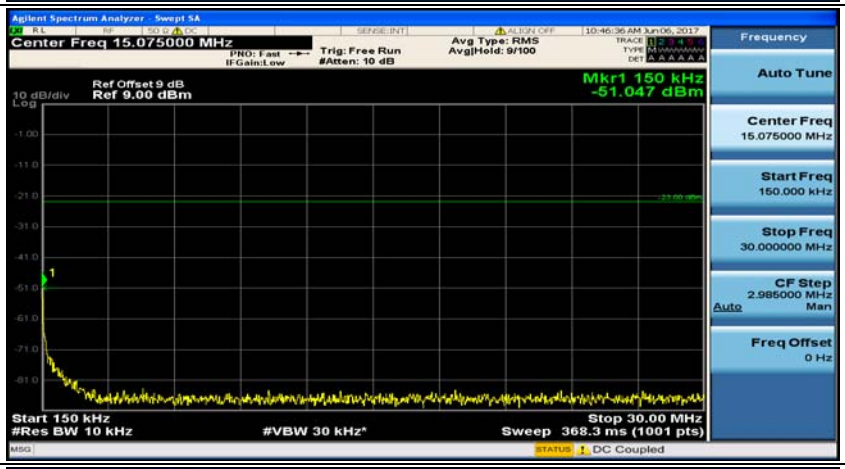


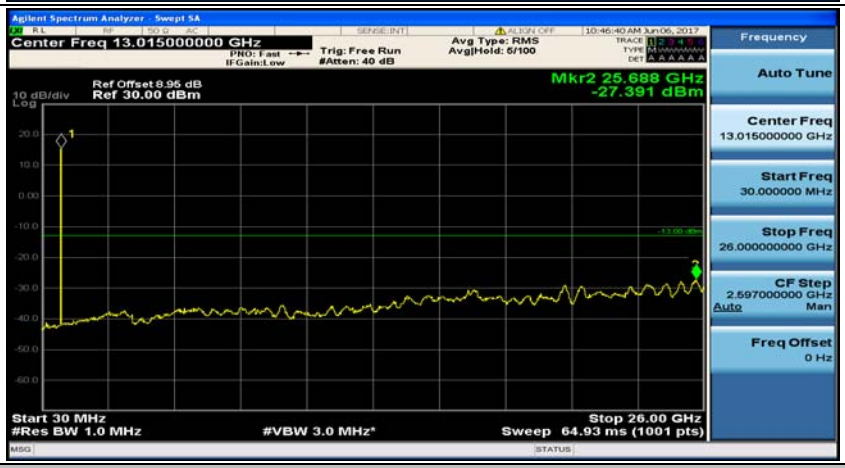




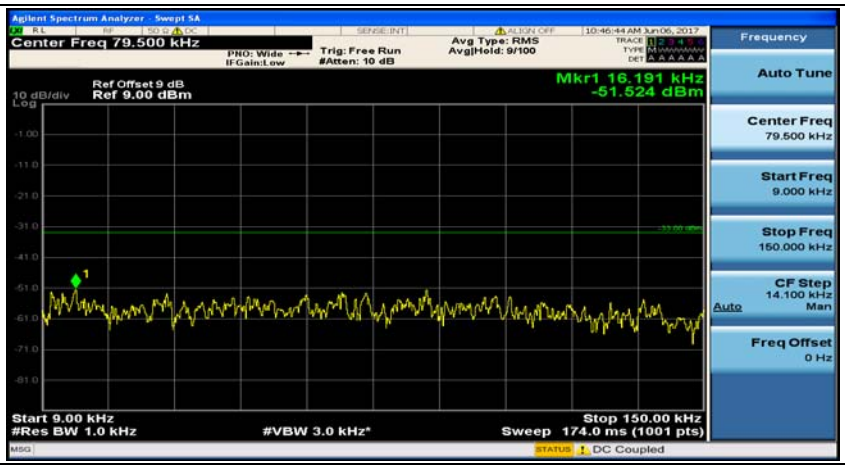
Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#24

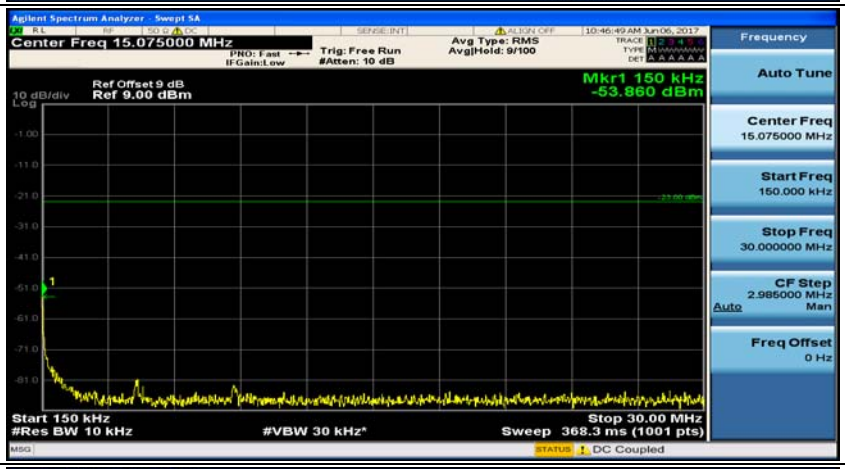


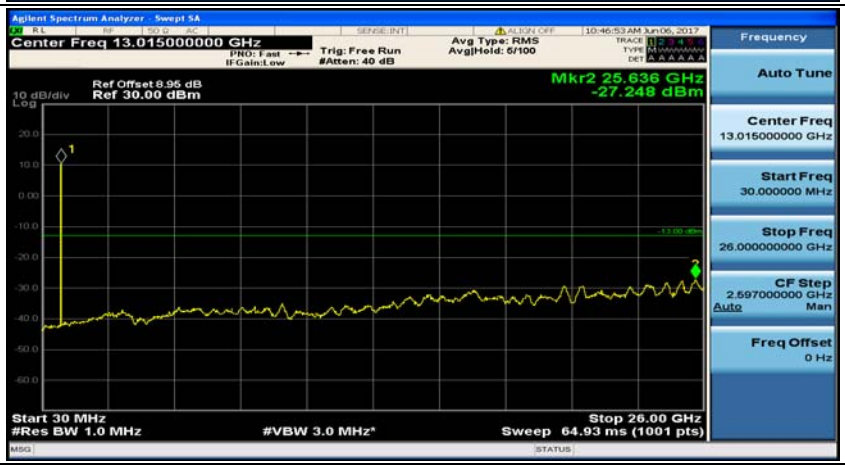




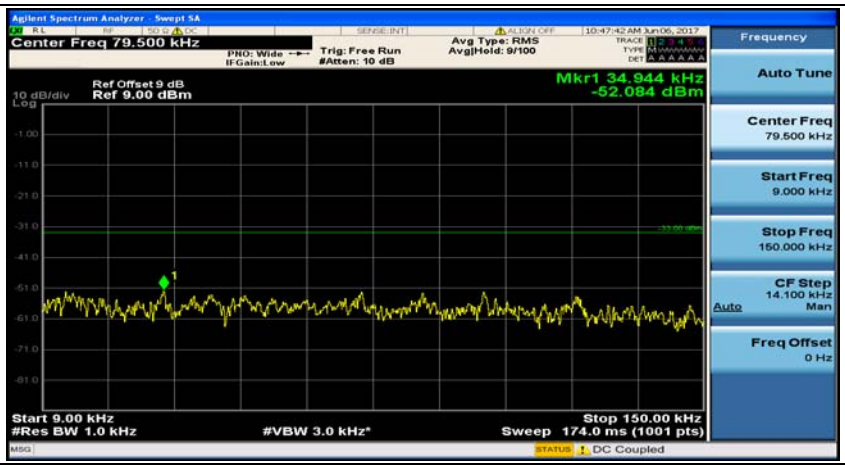
Channel Bandwidth: 10 MHz_LCH_16QAM_1RB#49

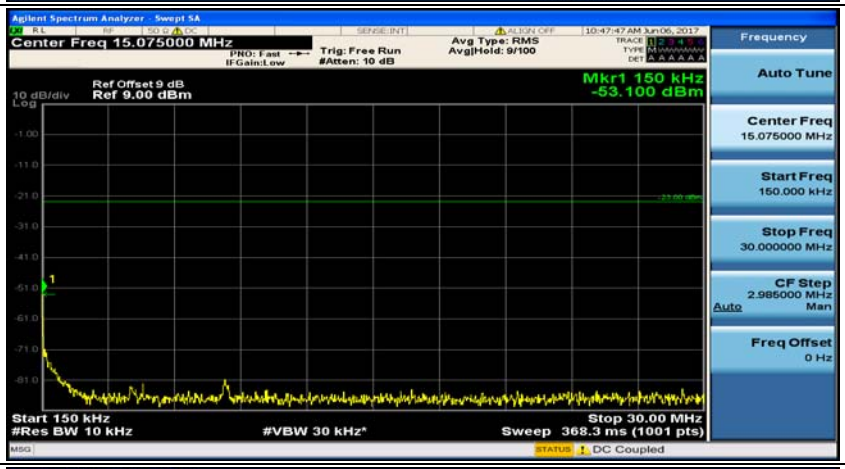


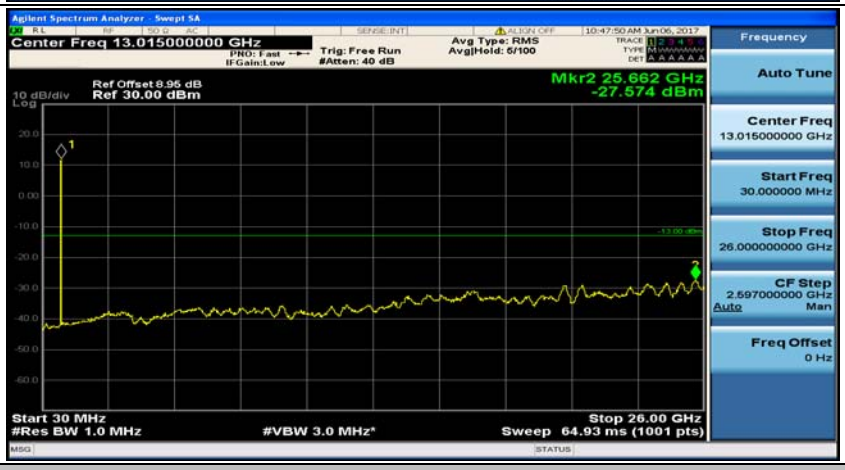




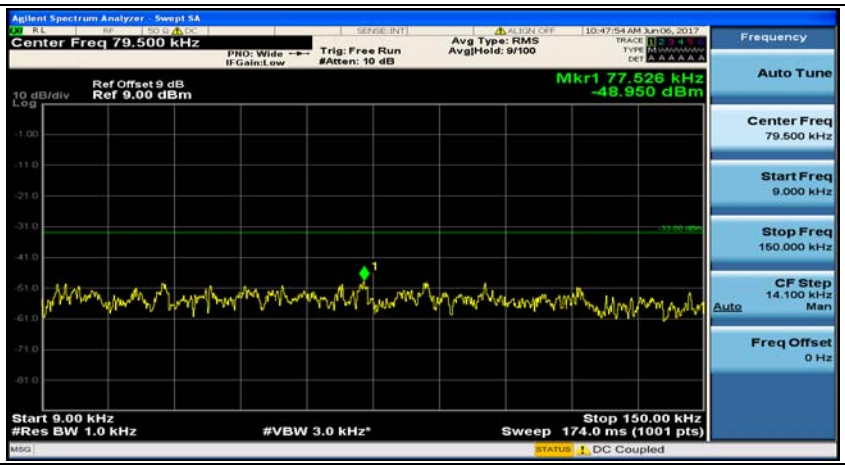
Channel Bandwidth: 10 MHz_MCH_16QAM_1RB#0

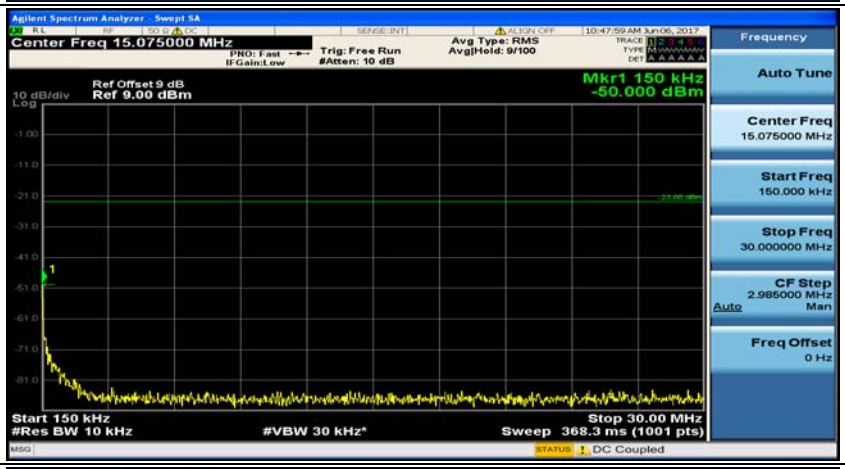


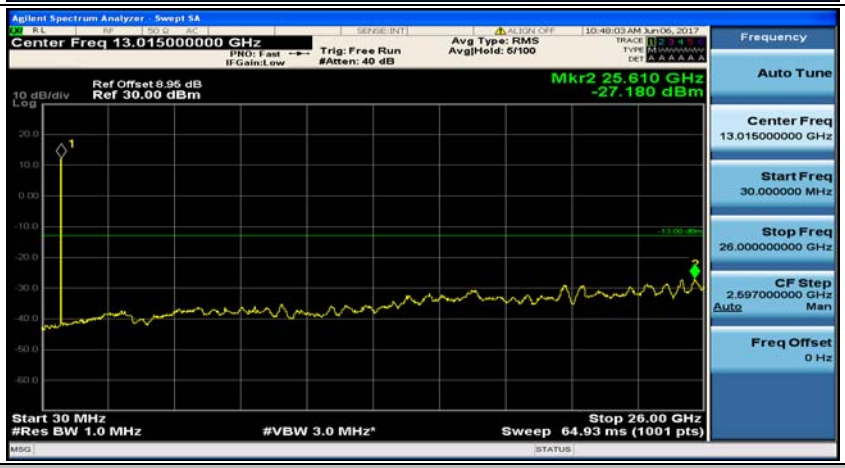




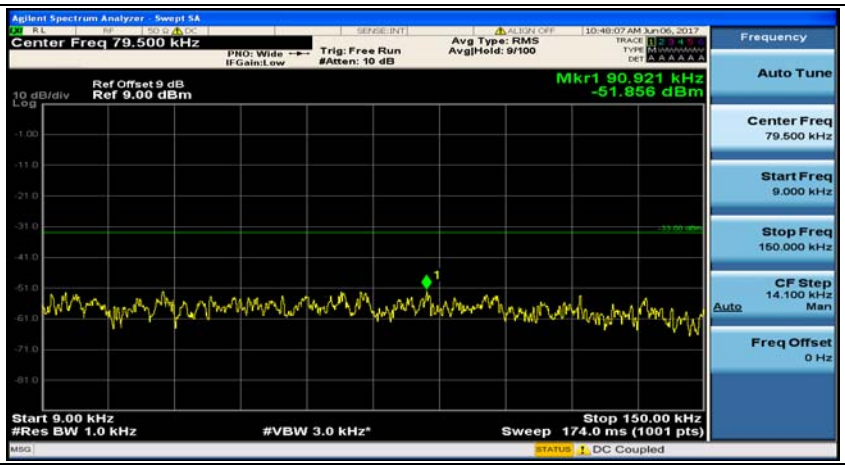
Channel Bandwidth: 10 MHz_MCH_16QAM_1RB#24

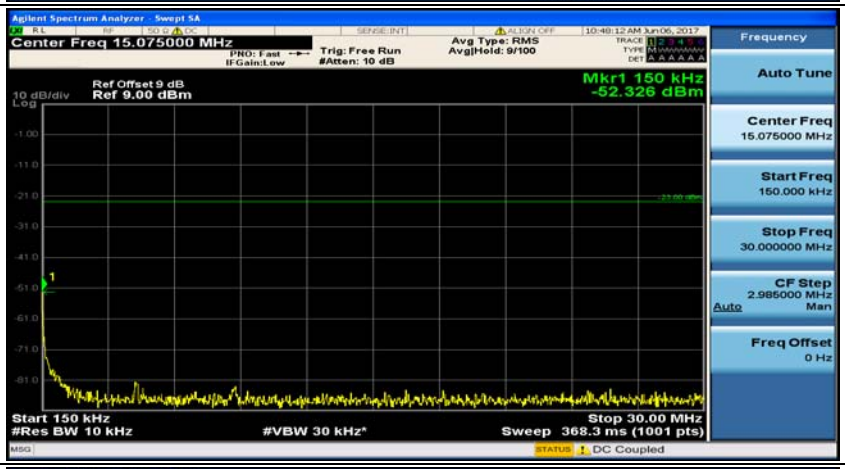


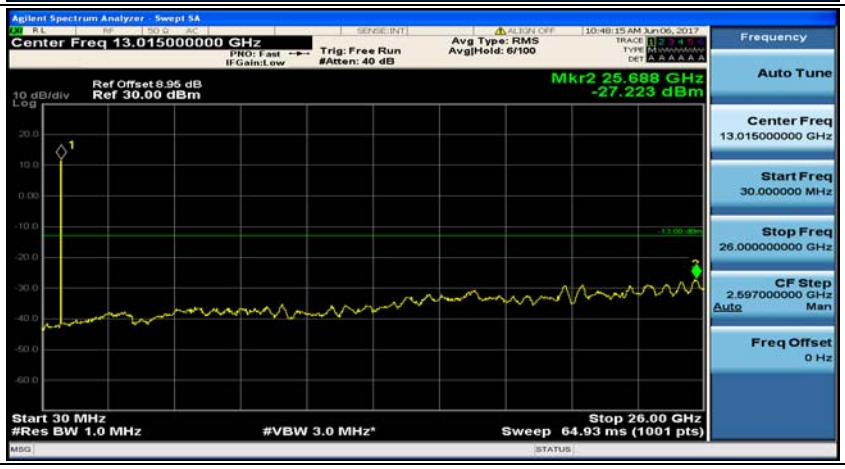




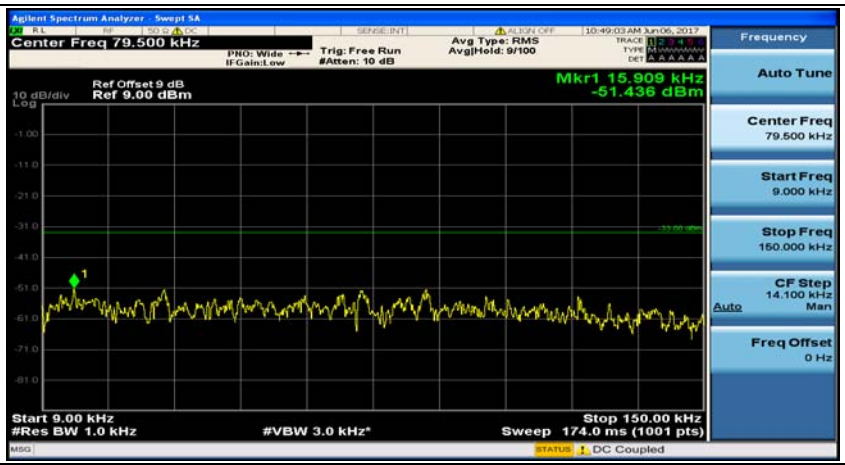
Channel Bandwidth: 10 MHz_MCH_16QAM_1RB#49

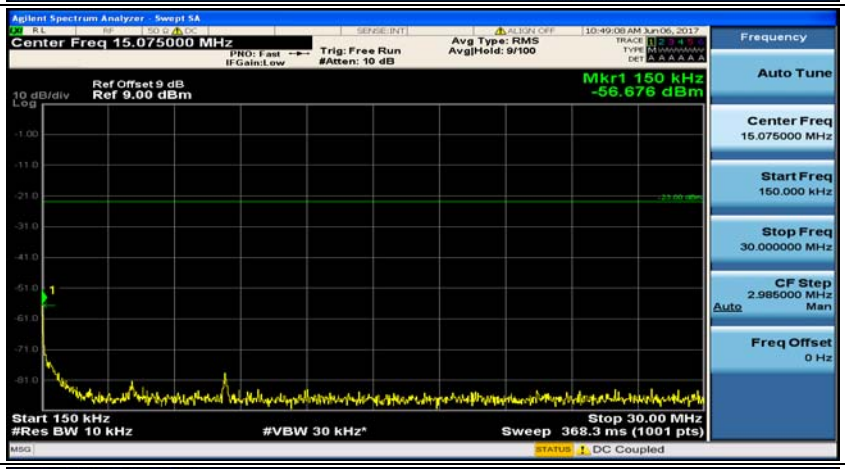


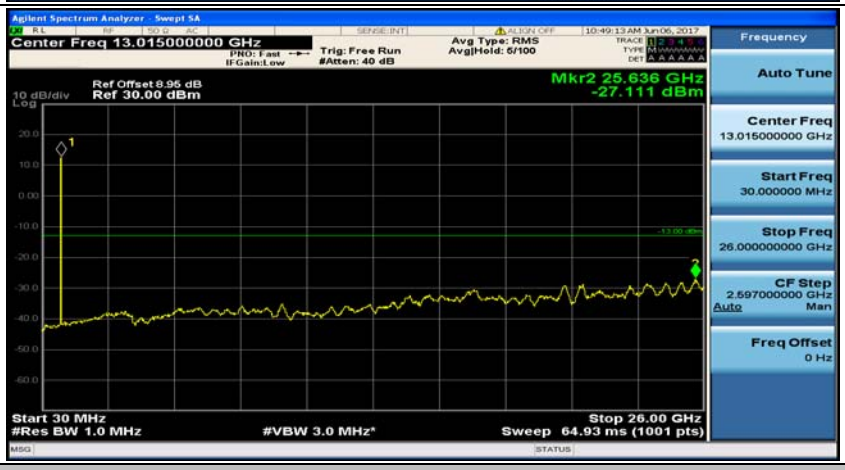




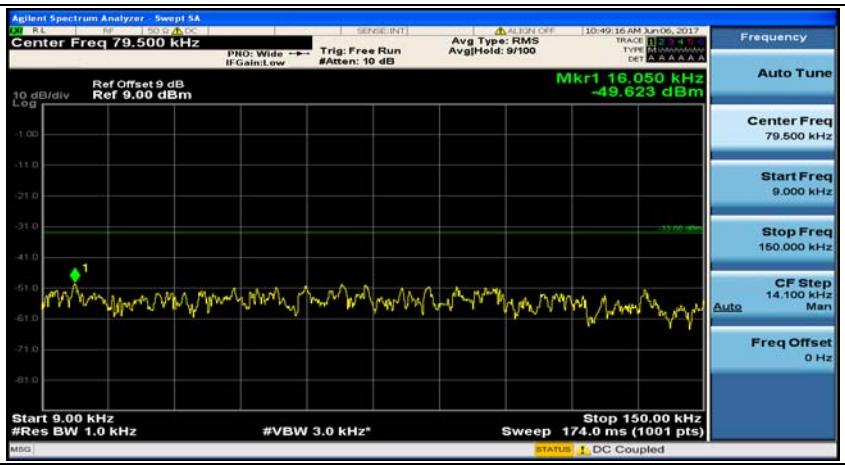
Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#0

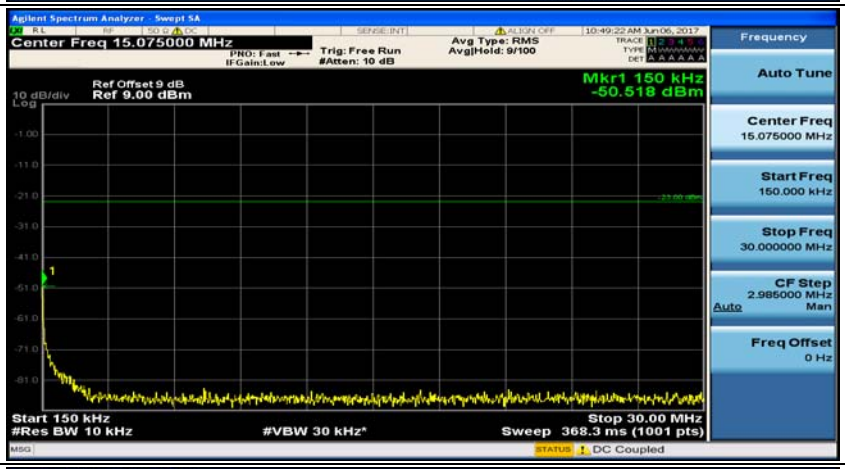


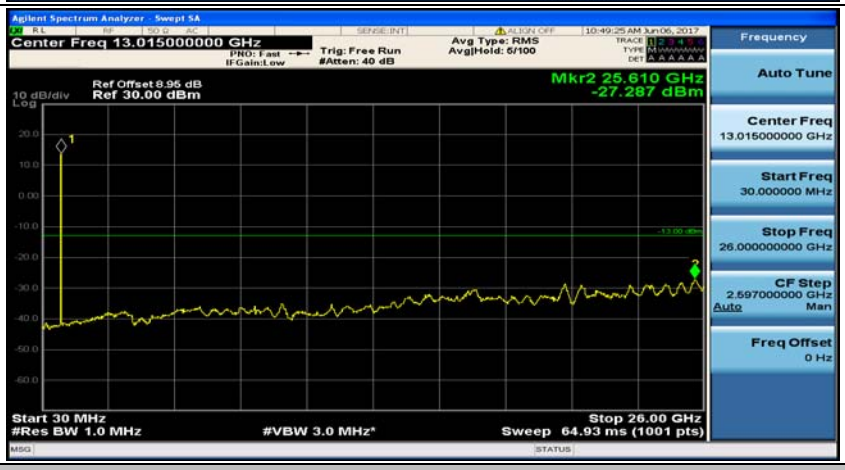




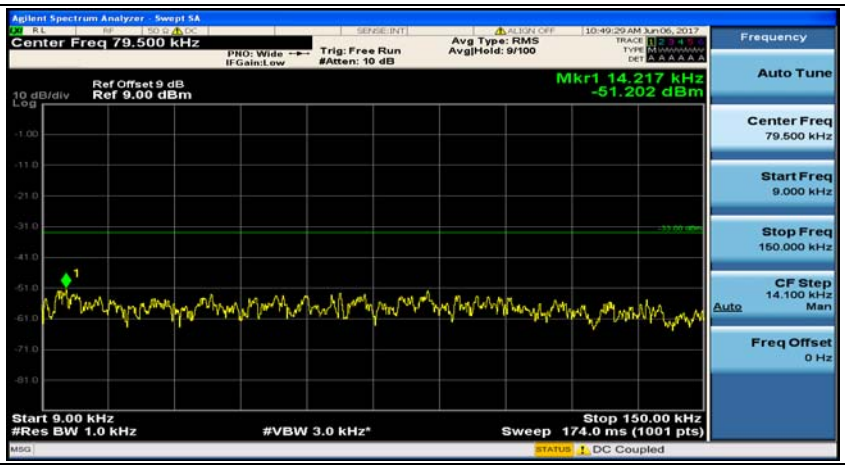
Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#24

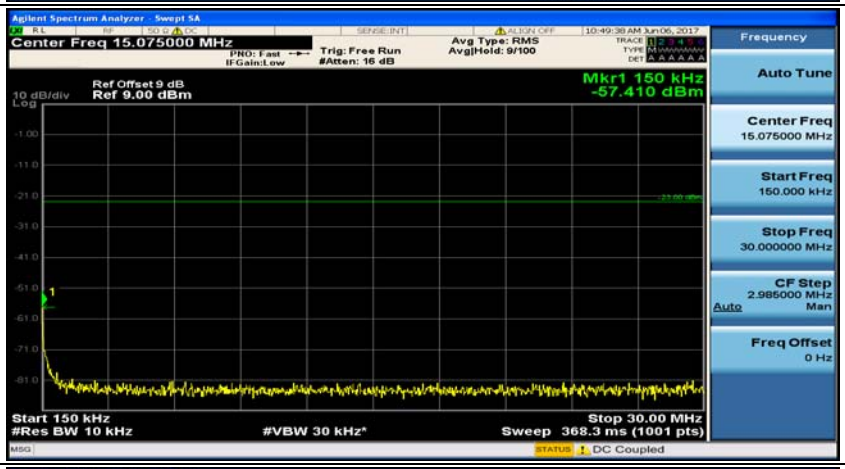


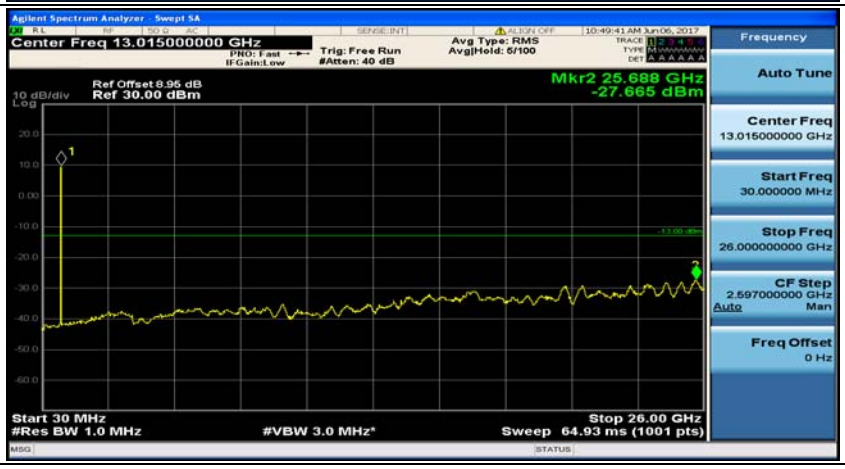




Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#49


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
10:49:29 AM Jun 06, 2017
Frequency
Ref Offset 9 dB
10 dB/div
Log
Ref 9.00 dBm
Mkr1 14.217 kHz
-51.202 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: 16 dB
Avg Type: RMS
Avg|Hold: 9/100
10:49:38 AM Jun 06, 2017
Frequency
Ref Offset 9 dB
10 dB/div
Log
Ref 9.00 dBm
Mkr1 150 kHz
-57.410 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
10:49:41 AM Jun 06, 2017
Frequency
Ref Offset 8.95 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr2 25.688 GHz
-27.665 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	-1.93	-0.002476	± 2.5	PASS
		VN	TN	-0.84	-0.001078	± 2.5	PASS
		VH	TN	1.36	0.001745	± 2.5	PASS
	MCH	VL	TN	2.54	0.003248	± 2.5	PASS
		VN	TN	1.21	0.001547	± 2.5	PASS
		VH	TN	1.84	0.002353	± 2.5	PASS
	HCH	VL	TN	3.36	0.004283	± 2.5	PASS
		VN	TN	2.07	0.002639	± 2.5	PASS
		VH	TN	1.41	0.001797	± 2.5	PASS
16QAM	LCH	VL	TN	-1.97	-0.002527	± 2.5	PASS
		VN	TN	0.59	0.000757	± 2.5	PASS
		VH	TN	2.45	0.003143	± 2.5	PASS
	MCH	VL	TN	-1.41	-0.001803	± 2.5	PASS
		VN	TN	0.47	0.000601	± 2.5	PASS
		VH	TN	3.58	0.004578	± 2.5	PASS
	HCH	VL	TN	3.8	0.004844	± 2.5	PASS
		VN	TN	4.84	0.006170	± 2.5	PASS
		VH	TN	0.18	0.000229	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-0.79	-0.001013	± 2.5	PASS
		VN	-20	1.19	0.001527	± 2.5	PASS
		VN	-10	0.17	0.000218	± 2.5	PASS
		VN	0	-1.32	-0.001693	± 2.5	PASS
		VN	10	1.26	0.001616	± 2.5	PASS
		VN	20	4.88	0.006260	± 2.5	PASS
		VN	30	3.3	0.004233	± 2.5	PASS
		VN	40	1.41	0.001809	± 2.5	PASS
		VN	50	-0.51	-0.000654	± 2.5	PASS
	MCH	VN	-30	3.23	0.004130	± 2.5	PASS
		VN	-20	3.69	0.004719	± 2.5	PASS
		VN	-10	0.63	0.000806	± 2.5	PASS

		VN	0	0.07	0.000090	± 2.5	PASS
		VN	10	-1.84	-0.002353	± 2.5	PASS
		VN	20	1.85	0.002366	± 2.5	PASS
		VN	30	0.97	0.001240	± 2.5	PASS
		VN	40	-0.53	-0.000678	± 2.5	PASS
		VN	50	1.46	0.001867	± 2.5	PASS
	HCH	VN	-30	2.19	0.002792	± 2.5	PASS
		VN	-20	3.77	0.004806	± 2.5	PASS
		VN	-10	0.52	0.000663	± 2.5	PASS
		VN	0	0.63	0.000803	± 2.5	PASS
		VN	10	2.89	0.003684	± 2.5	PASS
		VN	20	4.94	0.006297	± 2.5	PASS
		VN	30	-0.23	-0.000293	± 2.5	PASS
		VN	40	1.75	0.002231	± 2.5	PASS
		VN	50	1.37	0.001746	± 2.5	PASS
16QAM	LCH	VN	-30	2.21	0.002835	± 2.5	PASS
		VN	-20	0.2	0.000257	± 2.5	PASS
		VN	-10	3.96	0.005080	± 2.5	PASS
		VN	0	1.05	0.001347	± 2.5	PASS
		VN	10	-0.2	-0.000257	± 2.5	PASS
		VN	20	2.72	0.003489	± 2.5	PASS
		VN	30	-0.95	-0.001219	± 2.5	PASS
		VN	40	-1.78	-0.002284	± 2.5	PASS
		VN	50	2.45	0.003143	± 2.5	PASS
	MCH	VN	-30	-1.99	-0.002537	± 2.5	PASS
		VN	-20	0.17	0.000217	± 2.5	PASS
		VN	-10	-0.32	-0.000408	± 2.5	PASS
		VN	0	-1.78	-0.002269	± 2.5	PASS
		VN	10	-0.71	-0.000905	± 2.5	PASS
		VN	20	2.42	0.003085	± 2.5	PASS
		VN	30	2.56	0.003263	± 2.5	PASS
		VN	40	-1.52	-0.001938	± 2.5	PASS
		VN	50	2.29	0.002919	± 2.5	PASS
	HCH	VN	-30	3.88	0.004946	± 2.5	PASS
		VN	-20	1.48	0.001887	± 2.5	PASS
		VN	-10	-0.66	-0.000841	± 2.5	PASS
		VN	0	-1.04	-0.001326	± 2.5	PASS
		VN	10	-1.36	-0.001734	± 2.5	PASS
		VN	20	4.3	0.005481	± 2.5	PASS
		VN	30	4.06	0.005175	± 2.5	PASS
		VN	40	3.93	0.005010	± 2.5	PASS

		VN	50	4.13	0.005264	± 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	4.73	0.006049	± 2.5	PASS
		VN	TN	2.39	0.003056	± 2.5	PASS
		VH	TN	2.62	0.003350	± 2.5	PASS
	MCH	VL	TN	1.01	0.001292	± 2.5	PASS
		VN	TN	-0.66	-0.000844	± 2.5	PASS
		VH	TN	2.59	0.003312	± 2.5	PASS
	HCH	VL	TN	3.82	0.004885	± 2.5	PASS
		VN	TN	4.84	0.006189	± 2.5	PASS
		VH	TN	4.87	0.006228	± 2.5	PASS
16QAM	LCH	VL	TN	-0.75	-0.000959	± 2.5	PASS
		VN	TN	-0.27	-0.000345	± 2.5	PASS
		VH	TN	-1.07	-0.001368	± 2.5	PASS
	MCH	VL	TN	-0.14	-0.000179	± 2.5	PASS
		VN	TN	0.43	0.000550	± 2.5	PASS
		VH	TN	1.01	0.001292	± 2.5	PASS
	HCH	VL	TN	0.13	0.000166	± 2.5	PASS
		VN	TN	0.35	0.000448	± 2.5	PASS
		VH	TN	3.05	0.003900	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-1.68	-0.002148	± 2.5	PASS
		VN	-20	2.66	0.003402	± 2.5	PASS
		VN	-10	3.33	0.004258	± 2.5	PASS
		VN	0	3.19	0.004079	± 2.5	PASS
		VN	10	2.44	0.003120	± 2.5	PASS
		VN	20	-1	-0.001279	± 2.5	PASS
		VN	30	1.1	0.001407	± 2.5	PASS
		VN	40	4.62	0.005908	± 2.5	PASS
		VN	50	0.97	0.001240	± 2.5	PASS
	MCH	VN	-30	-1.03	-0.001317	± 2.5	PASS
		VN	-20	2.23	0.002852	± 2.5	PASS
		VN	-10	-1.12	-0.001432	± 2.5	PASS
		VN	0	2.97	0.003798	± 2.5	PASS
		VN	10	4.64	0.005934	± 2.5	PASS

		VN	20	3.53	0.004514	± 2.5	PASS
		VN	30	0.48	0.000614	± 2.5	PASS
		VN	40	-1.46	-0.001867	± 2.5	PASS
		VN	50	2.13	0.002724	± 2.5	PASS
	HCH	VN	-30	4.1	0.005243	± 2.5	PASS
		VN	-20	4.87	0.006228	± 2.5	PASS
		VN	-10	-1.42	-0.001816	± 2.5	PASS
		VN	0	3.13	0.004003	± 2.5	PASS
		VN	10	-0.4	-0.000512	± 2.5	PASS
		VN	20	4.34	0.005550	± 2.5	PASS
		VN	30	2.12	0.002711	± 2.5	PASS
		VN	40	4.75	0.006074	± 2.5	PASS
		VN	50	1.38	0.001765	± 2.5	PASS
16QAM	LCH	VN	-30	2.23	0.002852	± 2.5	PASS
		VN	-20	-0.29	-0.000371	± 2.5	PASS
		VN	-10	3.59	0.004591	± 2.5	PASS
		VN	0	4.88	0.006240	± 2.5	PASS
		VN	10	2.36	0.003018	± 2.5	PASS
		VN	20	3.17	0.004054	± 2.5	PASS
		VN	30	1.21	0.001547	± 2.5	PASS
		VN	40	4.39	0.005614	± 2.5	PASS
		VN	50	1.58	0.002020	± 2.5	PASS
	MCH	VN	-30	1.51	0.001931	± 2.5	PASS
		VN	-20	-1.78	-0.002276	± 2.5	PASS
		VN	-10	4.83	0.006176	± 2.5	PASS
		VN	0	3.22	0.004118	± 2.5	PASS
		VN	10	3.9	0.004987	± 2.5	PASS
		VN	20	4.86	0.006215	± 2.5	PASS
		VN	30	1.02	0.001304	± 2.5	PASS
		VN	40	0.23	0.000294	± 2.5	PASS
		VN	50	3.51	0.004488	± 2.5	PASS
	HCH	VN	-30	-0.03	-0.000038	± 2.5	PASS
		VN	-20	2.16	0.002762	± 2.5	PASS
		VN	-10	3.94	0.005038	± 2.5	PASS
		VN	0	-0.54	-0.000691	± 2.5	PASS
		VN	10	3.42	0.004373	± 2.5	PASS
		VN	20	-0.55	-0.000703	± 2.5	PASS
		VN	30	2.16	0.002762	± 2.5	PASS
		VN	40	-0.51	-0.000652	± 2.5	PASS
		VN	50	3.46	0.004425	± 2.5	PASS