Channel Bandwidth: 10 MHz_HCH_16QAM_1RB#49

Channel Bandwidth: 15 MHz

(Channel Bandwidth:15 MHz)_LCH_QPSK_1RB#0
(Channel Bandwidth:15 MHz)_LCH_QPSK_1RB#37

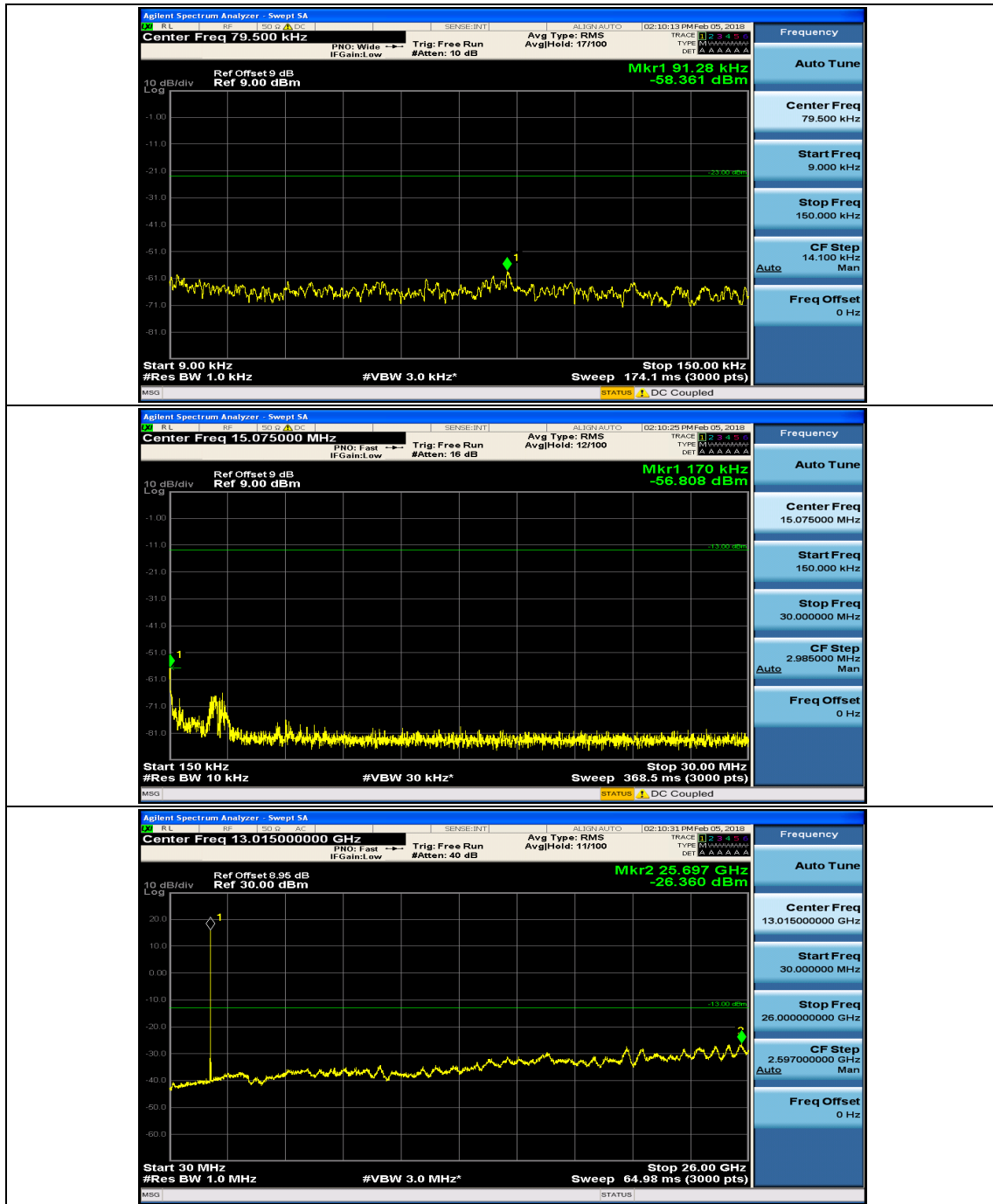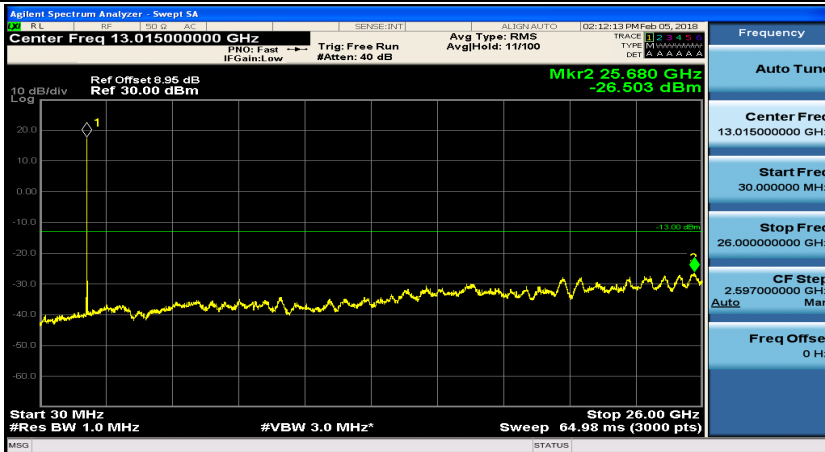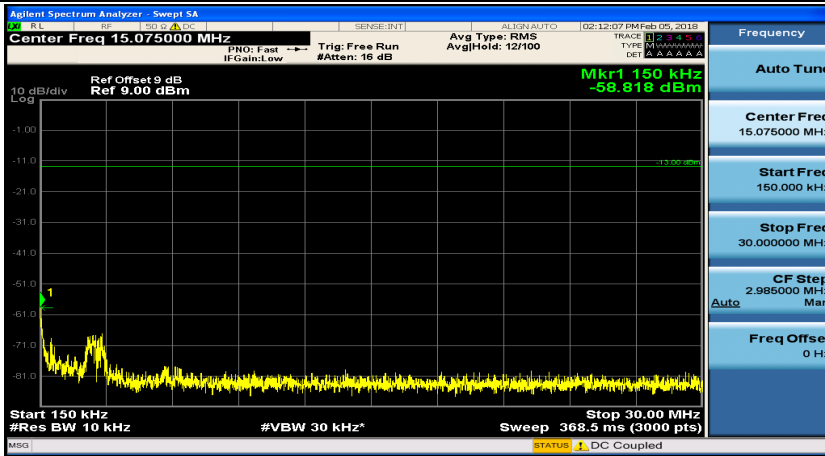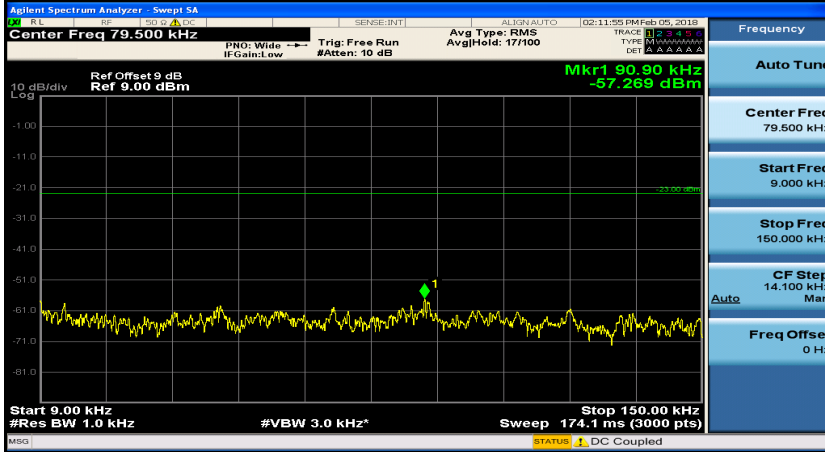(Channel Bandwidth:15 MHz)_LCH_QPSK_1RB#74

(Channel Bandwidth:15 MHz)_MCH_QPSK_1RB#0

(Channel Bandwidth:15 MHz)_MCH_QPSK_1RB#37

(Channel Bandwidth:15 MHz)_MCH_QPSK_1RB#74

Agilent Spectrum Analyzer - Swept SA
R L RF 50 Ω DC SENSE:INT ALIGN AUTO 02:12:42 PM Feb 05, 2018
Center Freq 79.500 kHz
PNO: Wide Trig: Free Run Avg Type: RMS Avg|Hold: 17/100 TRACE 1 2 3 4 5 6
IFGain:Low #Atten: 10 dB TYPE
DET

Ref Offset 9 dB
10 dB/div Ref 9.00 dBm
Log
Mkr1 90.71 kHz
-58.902 dBm

-1.00
-11.0
-21.0 -23.00 dBm
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0

Start 9.00 kHz Stop 150.00 kHz
#Res BW 1.0 kHz #VBW 3.0 kHz* Sweep 174.1 ms (3000 pts)
MSG STATUS DC Coupled

Frequency
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

Agilent Spectrum Analyzer - Swept SA
R L RF 50 Ω DC SENSE:INT ALIGN AUTO 02:12:54 PM Feb 05, 2018
Center Freq 15.075000 MHz
PNO: Fast Trig: Free Run Avg Type: RMS Avg|Hold: 12/100 TRACE 1 2 3 4 5 6
IFGain:Low #Atten: 16 dB TYPE
DET

Ref Offset 9 dB
10 dB/div Ref 9.00 dBm
Log
Mkr1 150 kHz
-58.779 dBm

-1.00
-11.0 -13.00 dBm
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0

Start 150 kHz Stop 30.00 MHz
#Res BW 10 kHz #VBW 30 kHz* Sweep 368.5 ms (3000 pts)
MSG STATUS DC Coupled

Frequency
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

Agilent Spectrum Analyzer - Swept SA
R L RF 50 Ω AC SENSE:INT ALIGN AUTO 02:13:00 PM Feb 05, 2018
Center Freq 13.015000000 GHz
PNO: Fast Trig: Free Run Avg Type: RMS Avg|Hold: 11/100 TRACE 1 2 3 4 5 6
IFGain:Low #Atten: 40 dB TYPE
DET

Ref Offset 8.95 dB
10 dB/div Ref 30.00 dBm
Log
Mkr2 25.619 GHz
-26.479 dBm

20.0
10.0
0.00
-10.0 -13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0

Start 30 MHz Stop 26.00 GHz
#Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 64.98 ms (3000 pts)
MSG STATUS

Frequency
Auto Tune
Center Freq 13.015000000 GHz
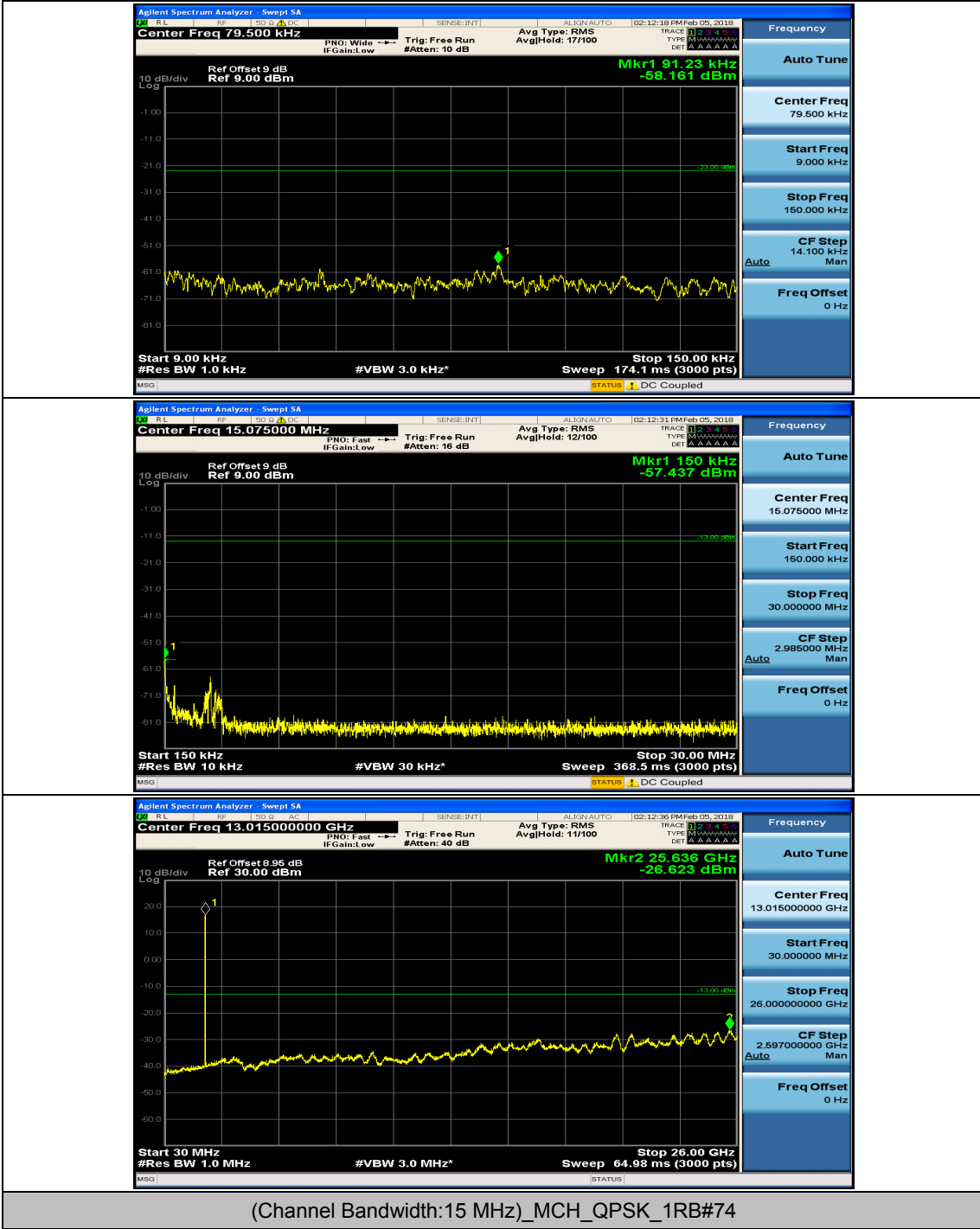Start Freq 30.000000 MHz
Stop Freq 26.000000000 GHz
CF Step 2.597000000 GHz Auto Man
Freq Offset 0 Hz
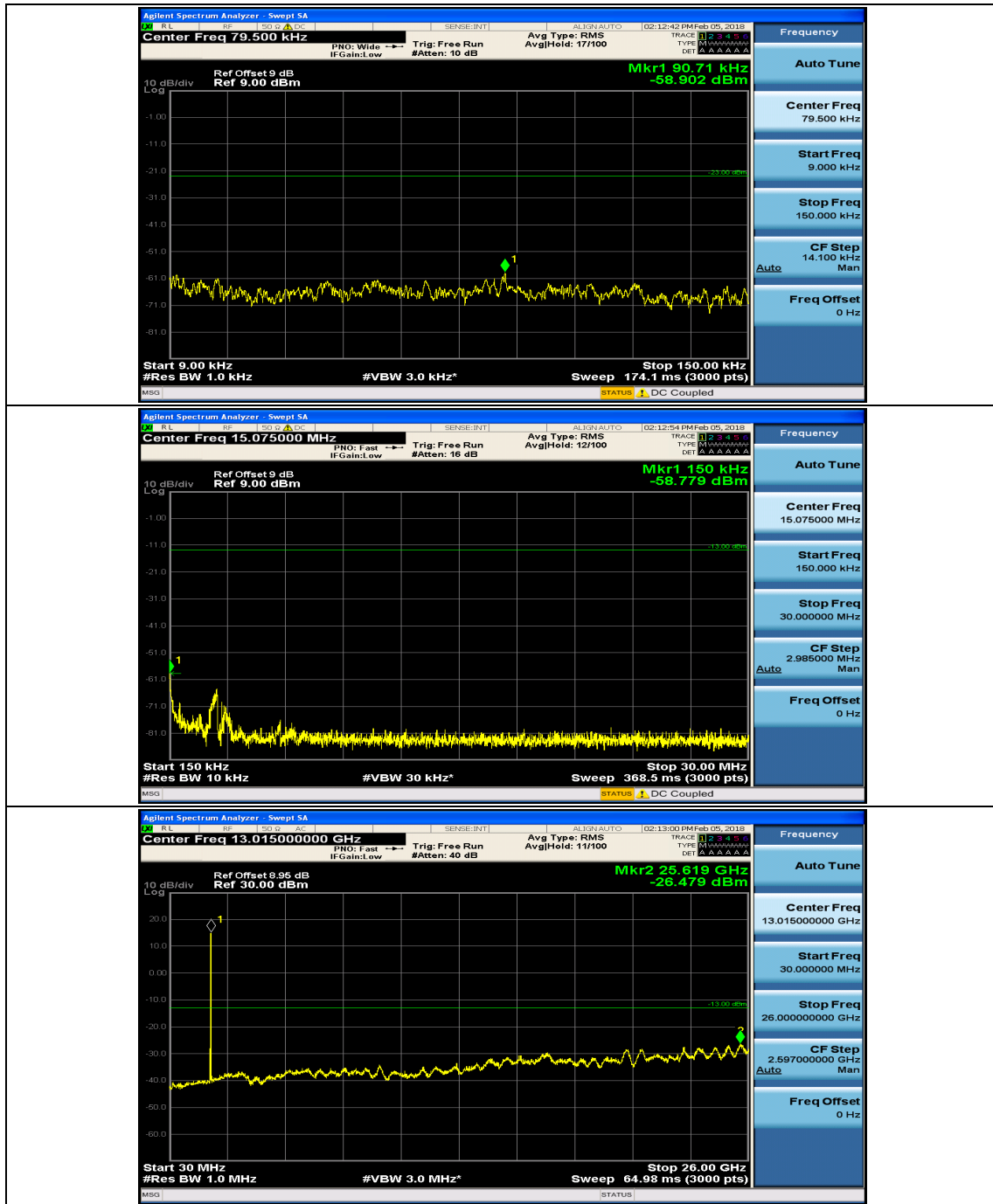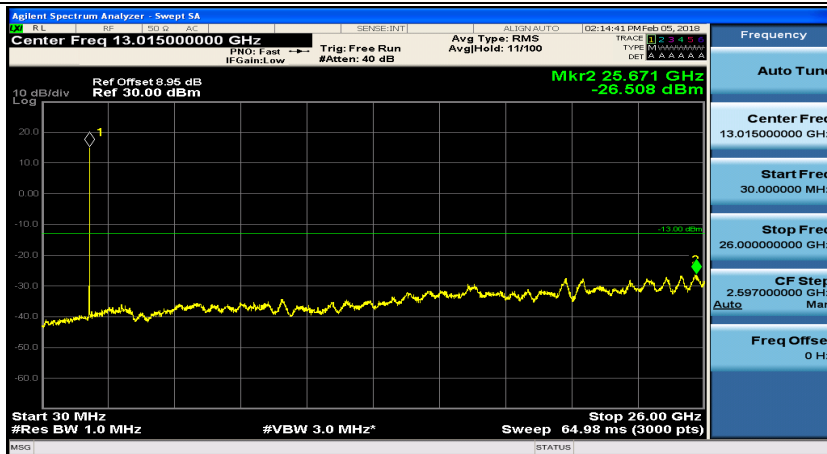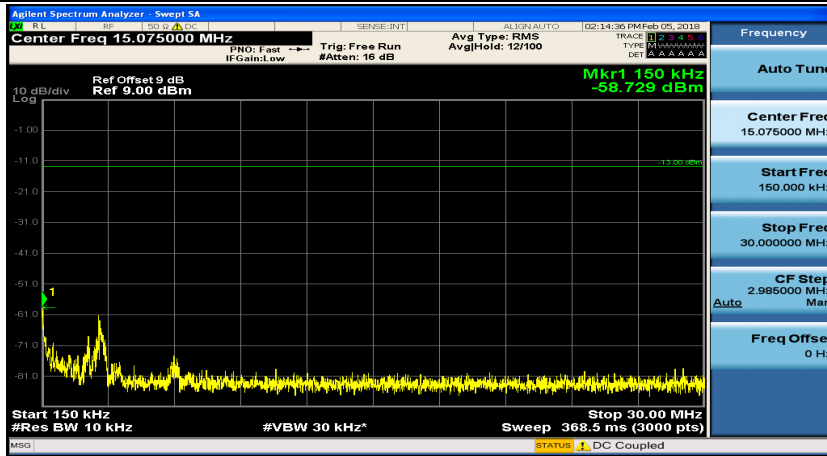
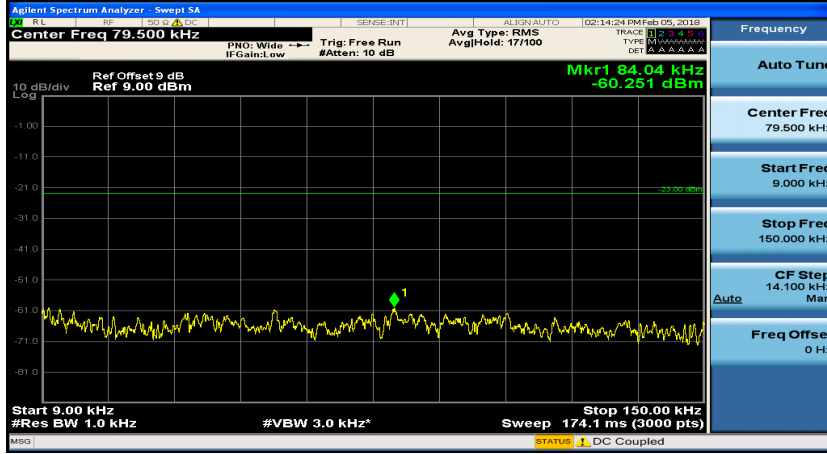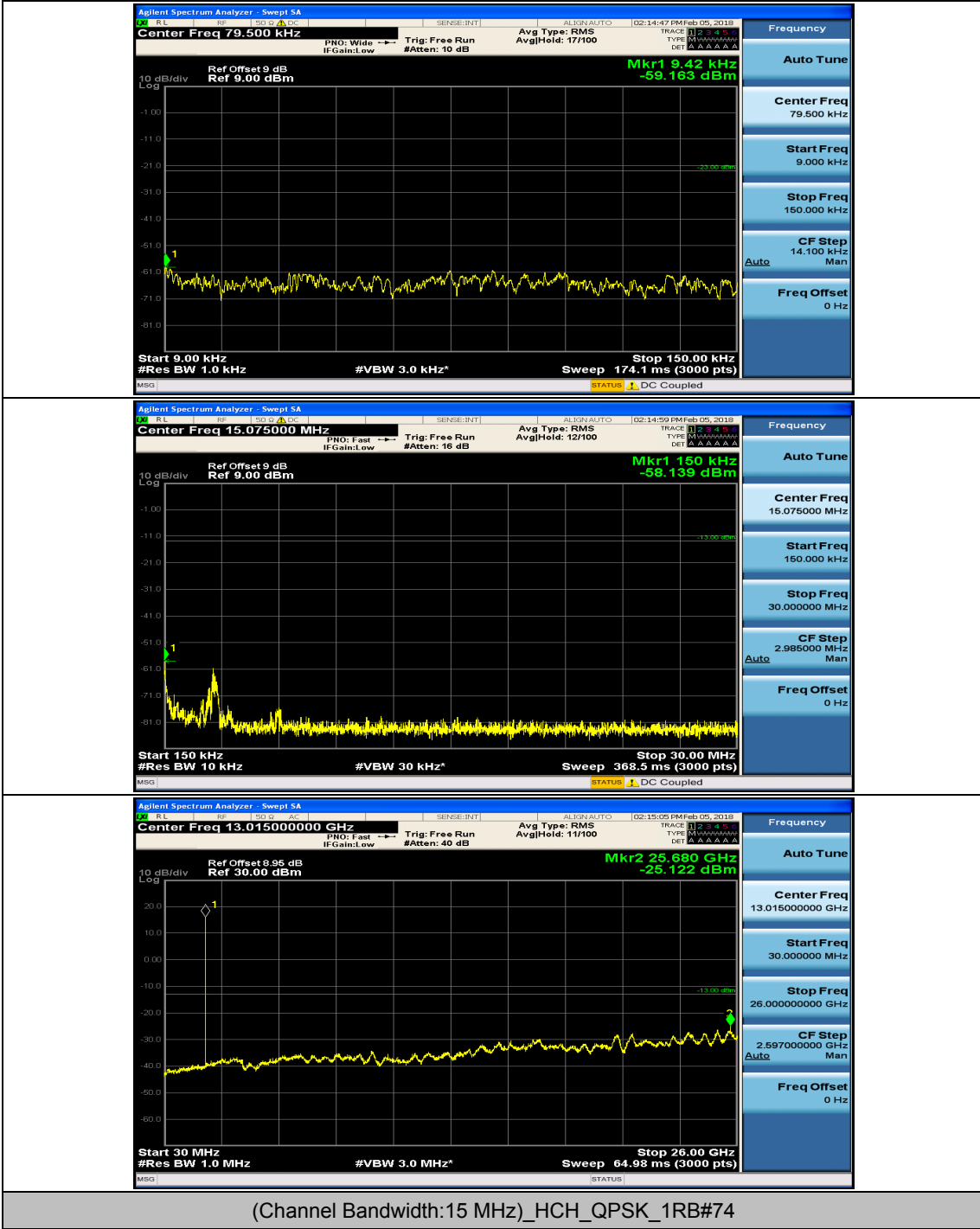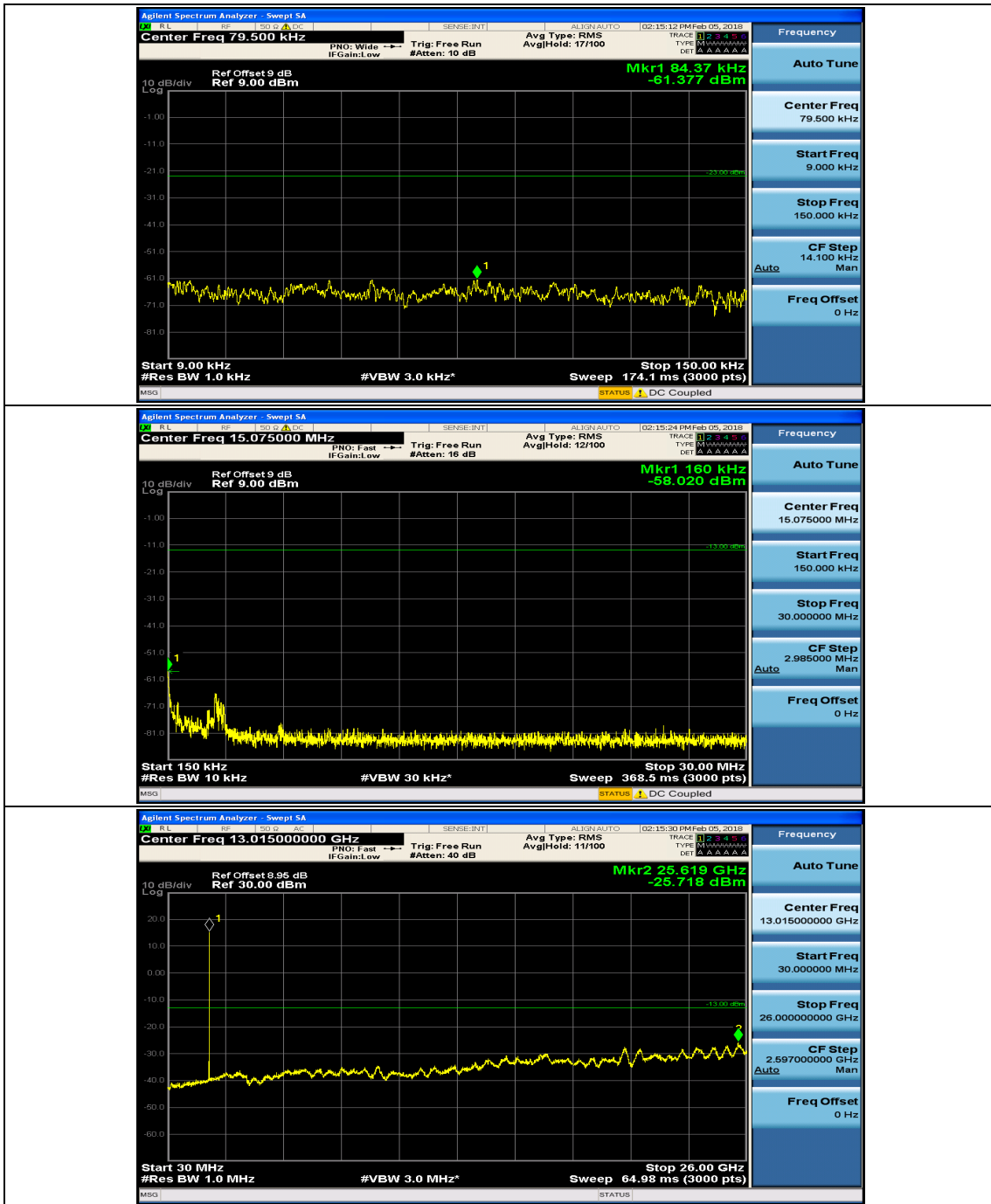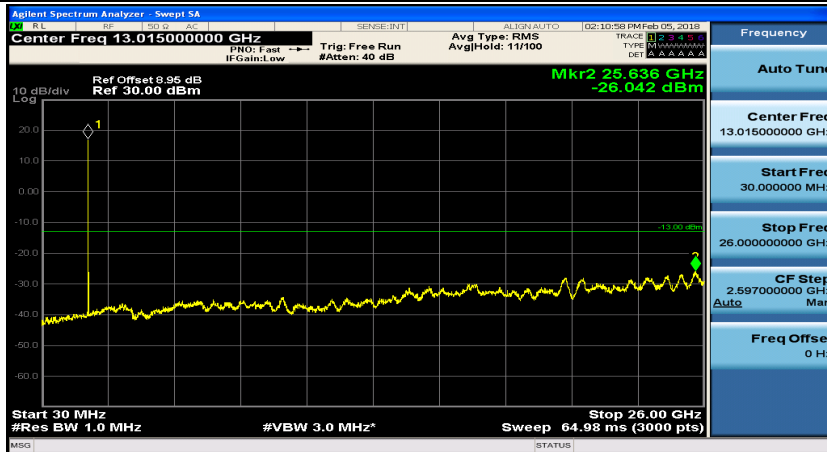| (Channel Bandwidth:15 MHz)_HCH_QPSK_1RB#0 |
|---|
| |
| |
| |
| (Channel Bandwidth:15 MHz)_HCH_QPSK_1RB#37 |

(Channel Bandwidth:15 MHz)_HCH_QPSK_1RB#74
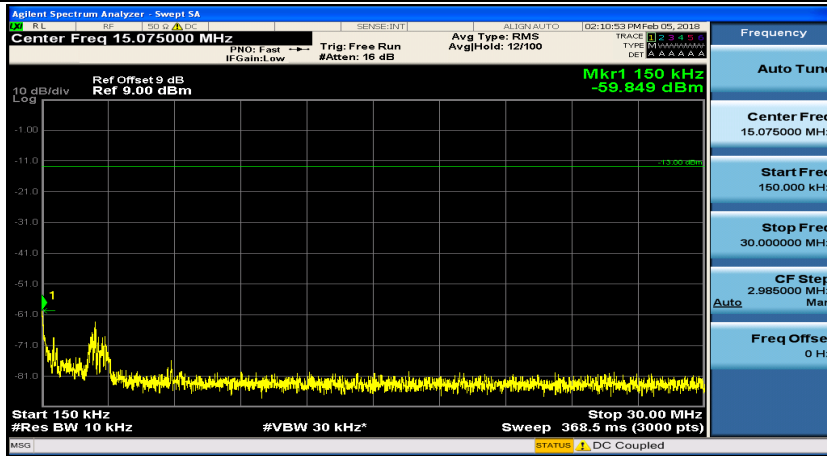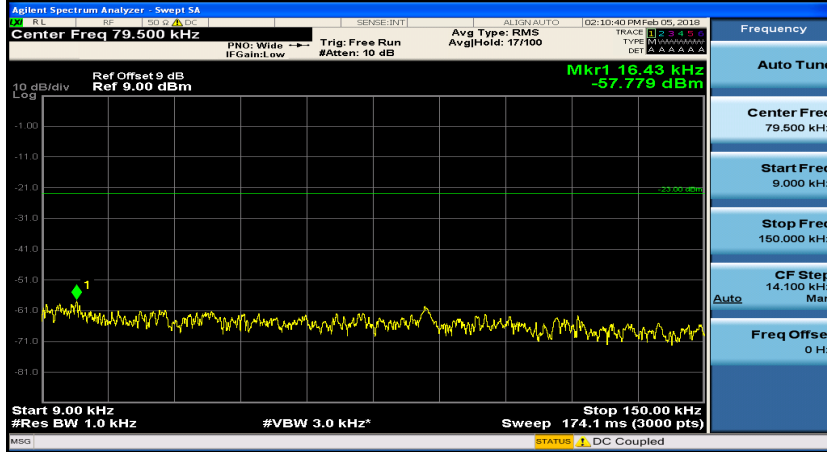
(Channel Bandwidth:15 MHz)_LCH_16QAM_1RB#0

(Channel Bandwidth:15 MHz)_LCH_16QAM_1RB#37

(Channel Bandwidth:15 MHz)_LCH_16QAM_1RB#74

(Channel Bandwidth:15 MHz)_MCH_16QAM_1RB#0

(Channel Bandwidth:15 MHz)_MCH_16QAM_1RB#37

(Channel Bandwidth:15 MHz)_MCH_16QAM_1RB#74

Screen 1 (Agilent Spectrum Analyzer - Swept SA)

R L RF 50 Ω DC SENSE:INT ALIGN AUTO 02:13:56 PM Feb 05, 2018
Center Freq 79.500 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 17/100
TRACE 1 2 3 4 5 6
TYPE
DET

Ref Offset 9 dB
10 dB/div Ref 9.00 dBm
Log

Mkr1 15.82 kHz
-57.196 dBm

-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0

Frequency
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 Stop 150.00 kHz
#Res BW 1.0 kHz #VBW 3.0 kHz* Sweep 174.1 ms (3000 pts)
MSG STATUS DC Coupled

Screen 2 (Agilent Spectrum Analyzer - Swept SA)

R L RF 50 Ω DC SENSE:INT ALIGN AUTO 02:14:09 PM Feb 05, 2018
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: RMS
Avg|Hold: 13/100
TRACE 1 2 3 4 5 6
TYPE
DET

Ref Offset 9 dB
10 dB/div Ref 9.00 dBm
Log

Mkr1 150 kHz
-58.165 dBm

-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0

Frequency
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 Stop 30.00 MHz
#Res BW 10 kHz #VBW 30 kHz* Sweep 368.5 ms (3000 pts)
MSG STATUS DC Coupled

Screen 3 (Agilent Spectrum Analyzer - Swept SA)

R L RF 50 Ω AC SENSE:INT ALIGN AUTO 02:14:14 PM Feb 05, 2018
Center Freq 13.015000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: RMS
Avg|Hold: 11/100
TRACE 1 2 3 4 5 6
TYPE
DET

Ref Offset 8.95 dB
10 dB/div Ref 30.00 dBm
Log

Mkr2 25.688 GHz
-26.224 dBm

20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0

Frequency
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 Stop 26.00 GHz
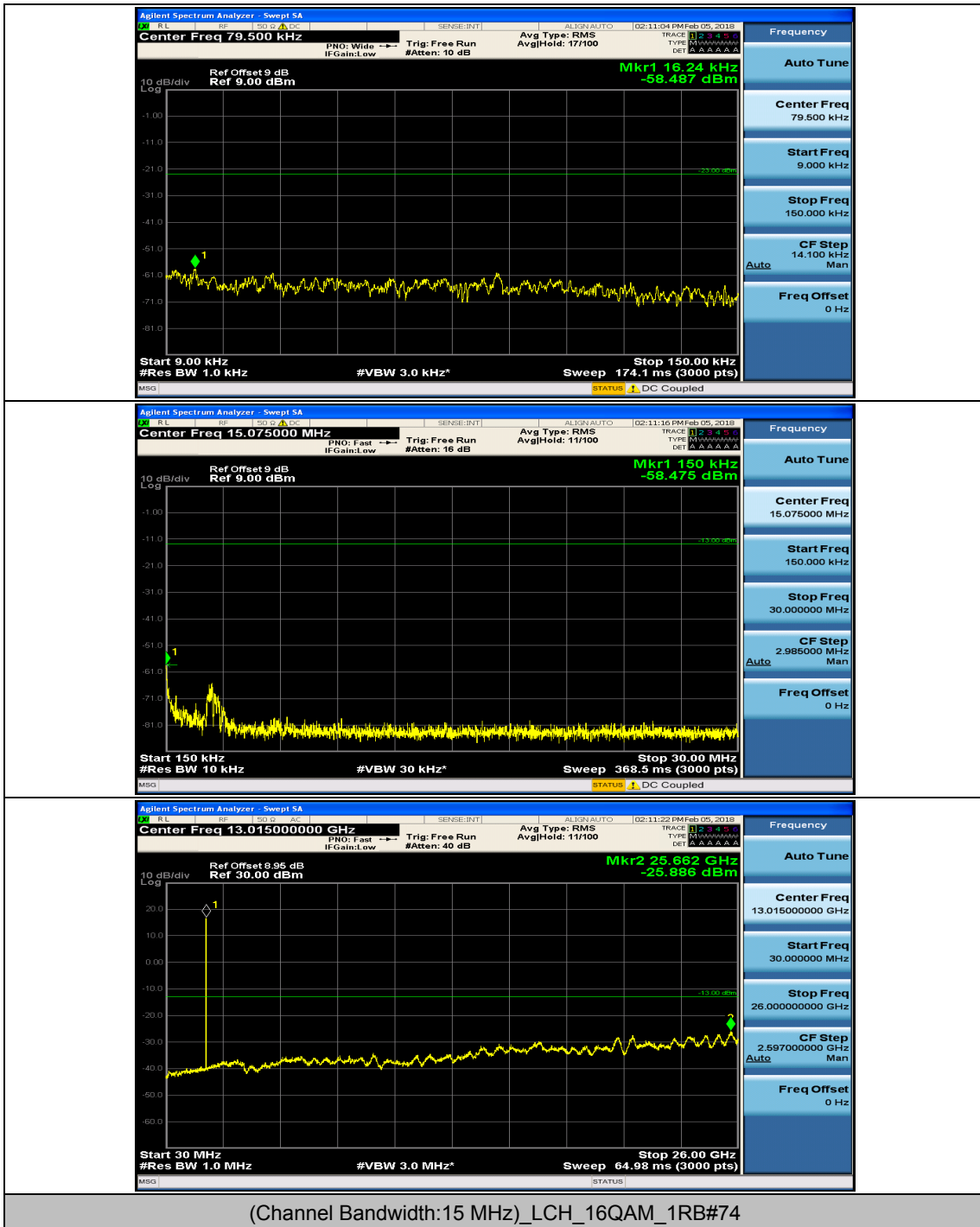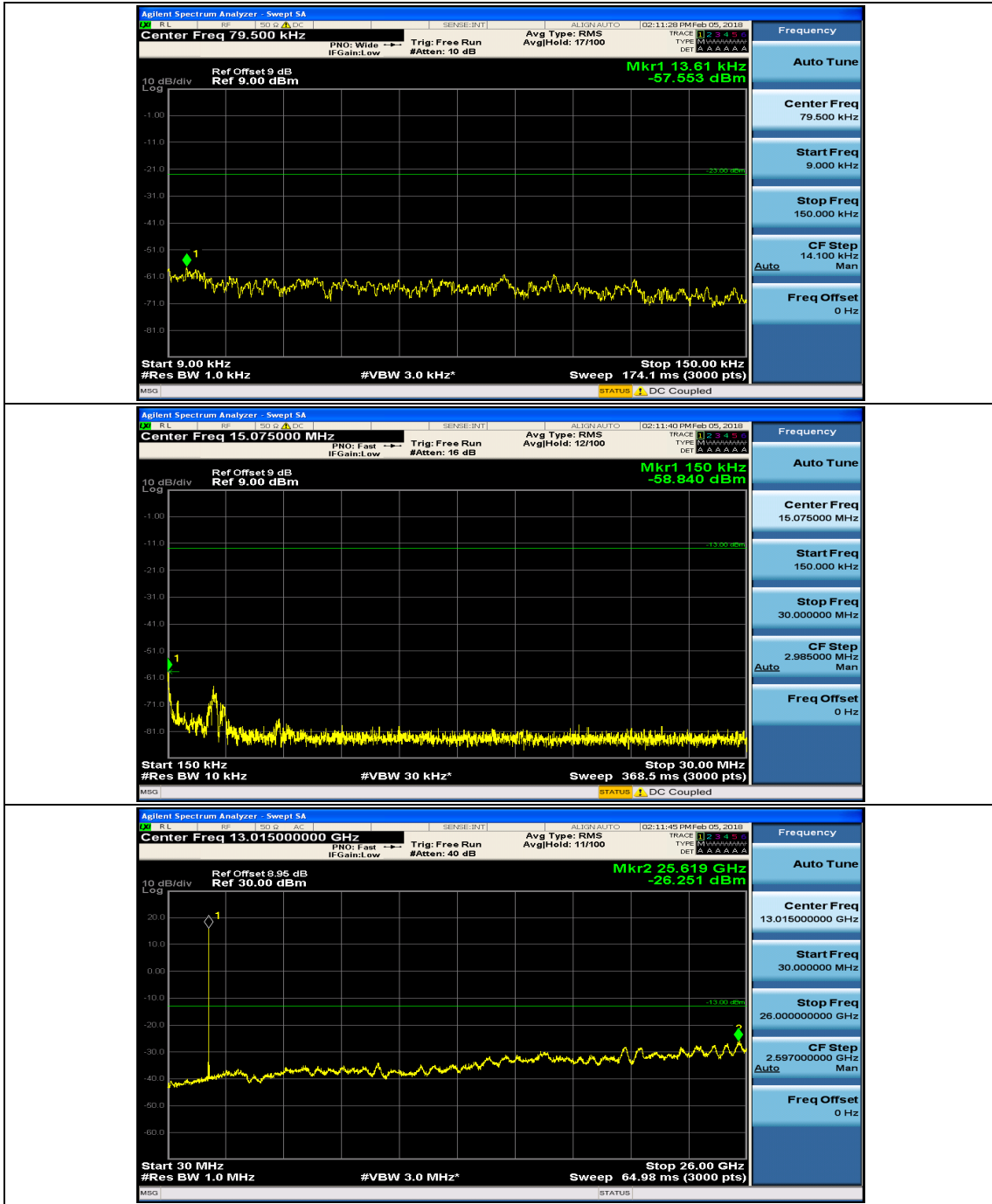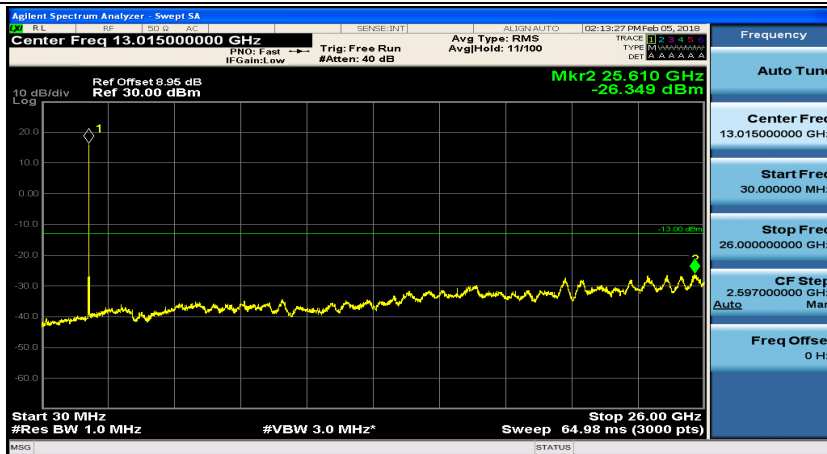#Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 64.98 ms (3000 pts)
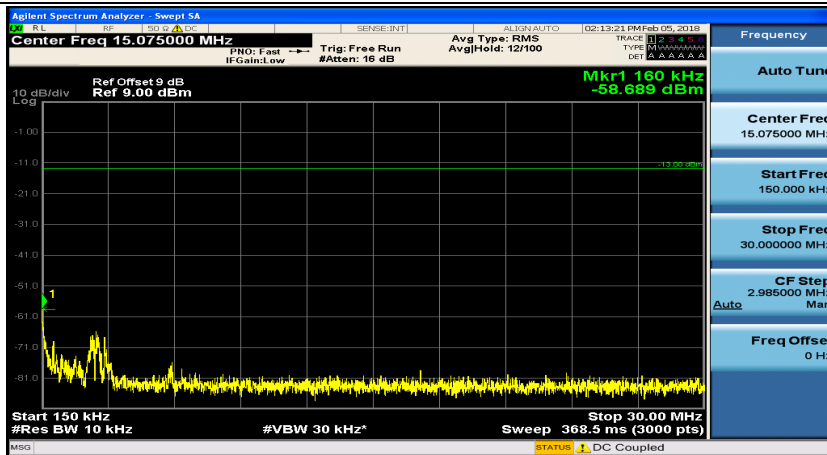MSG STATUS

(Channel Bandwidth:15 MHz)_HCH_16QAM_1RB#0

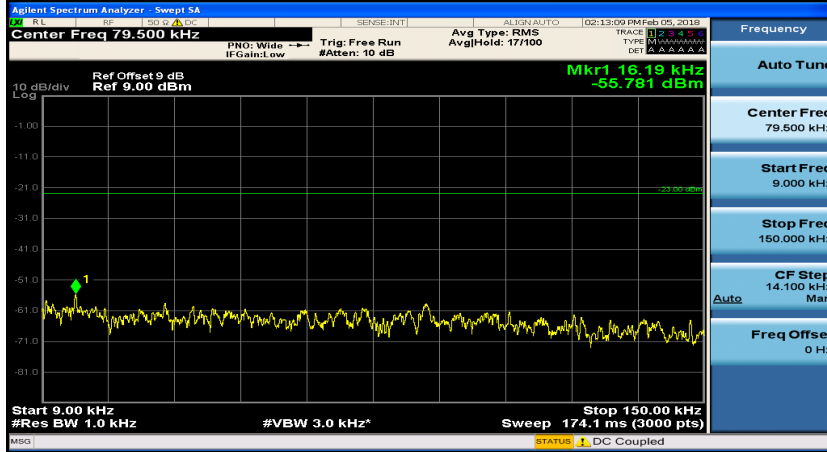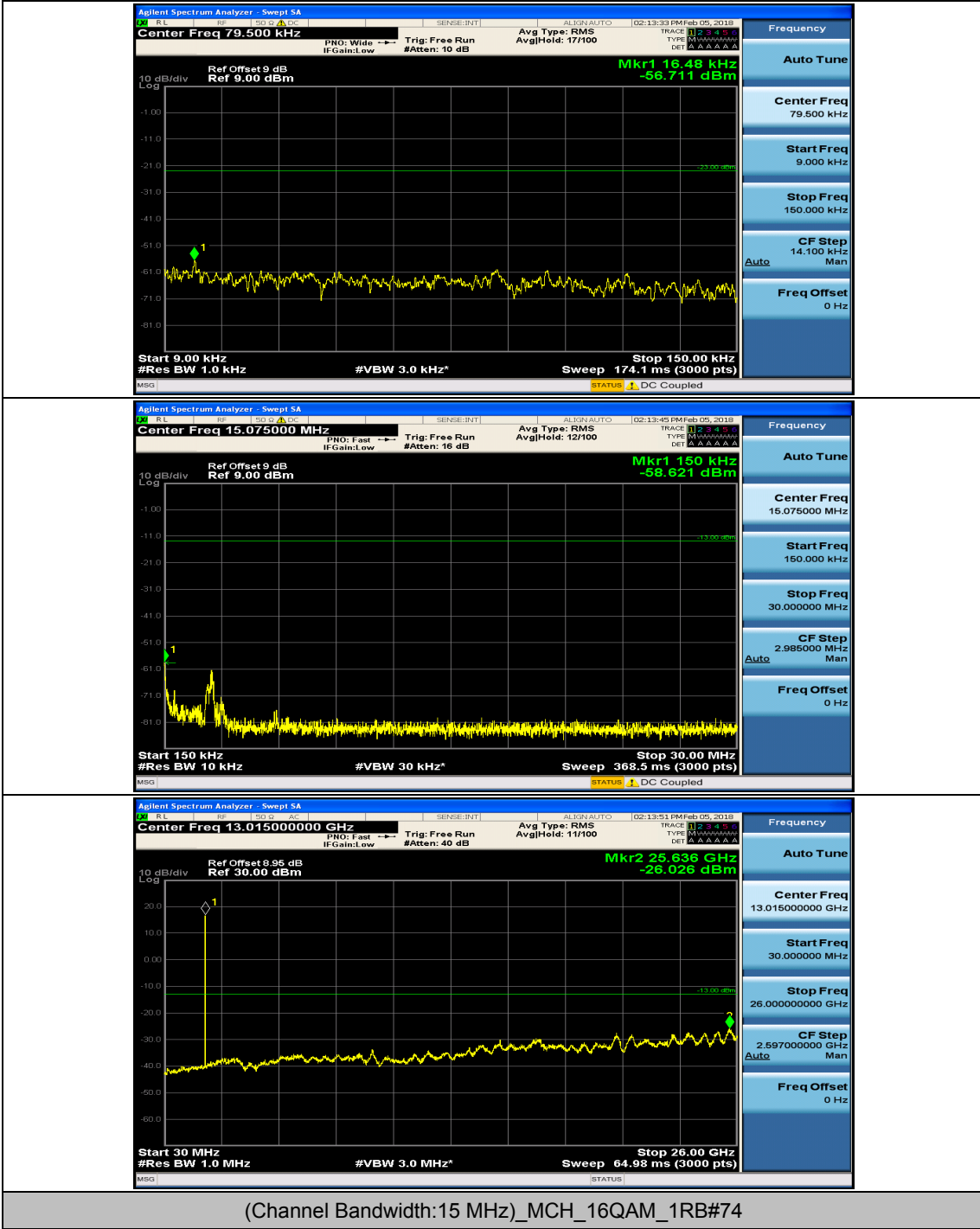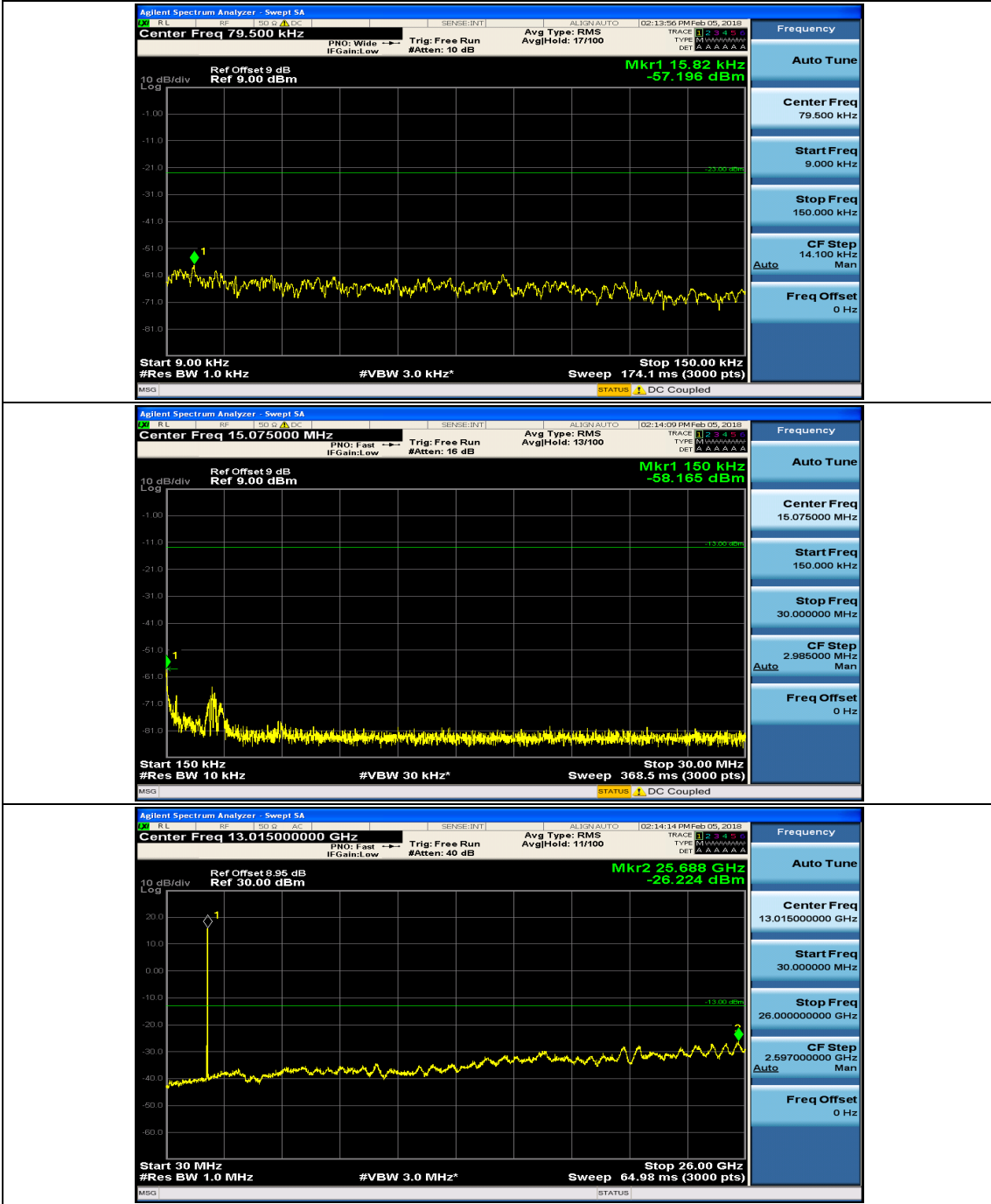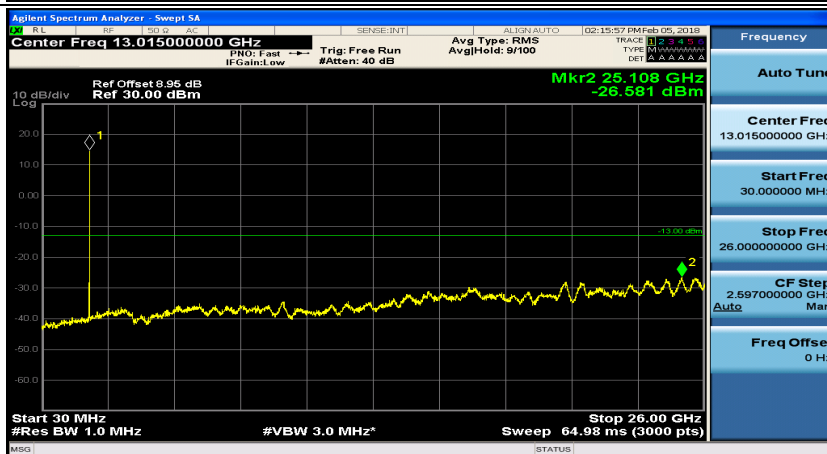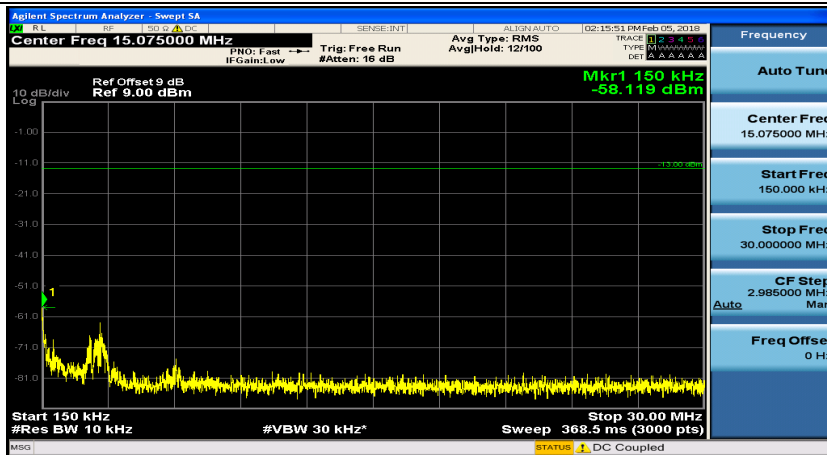

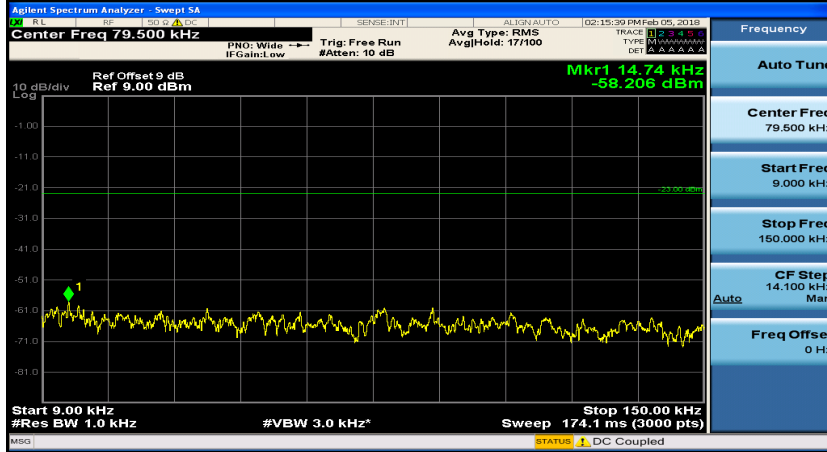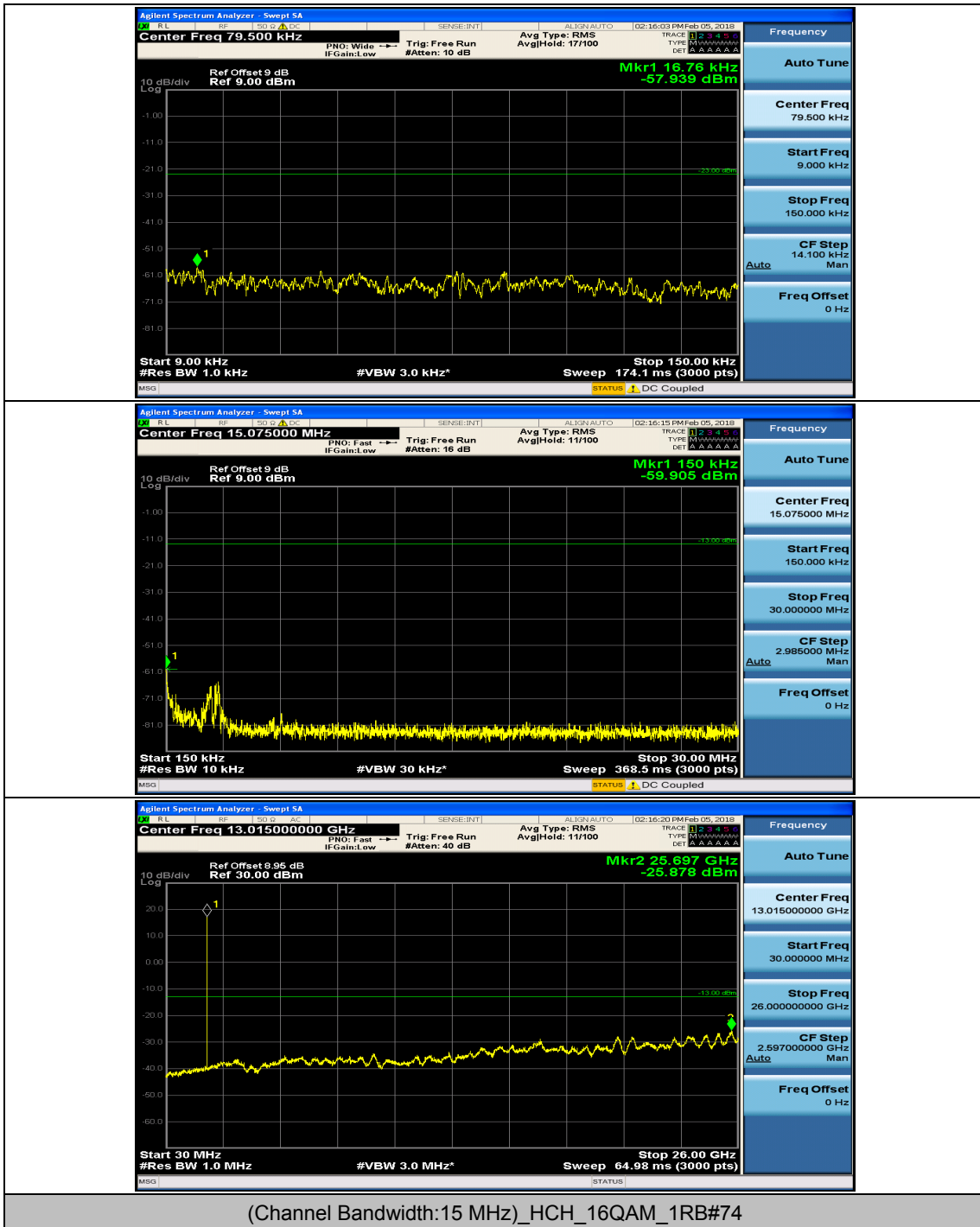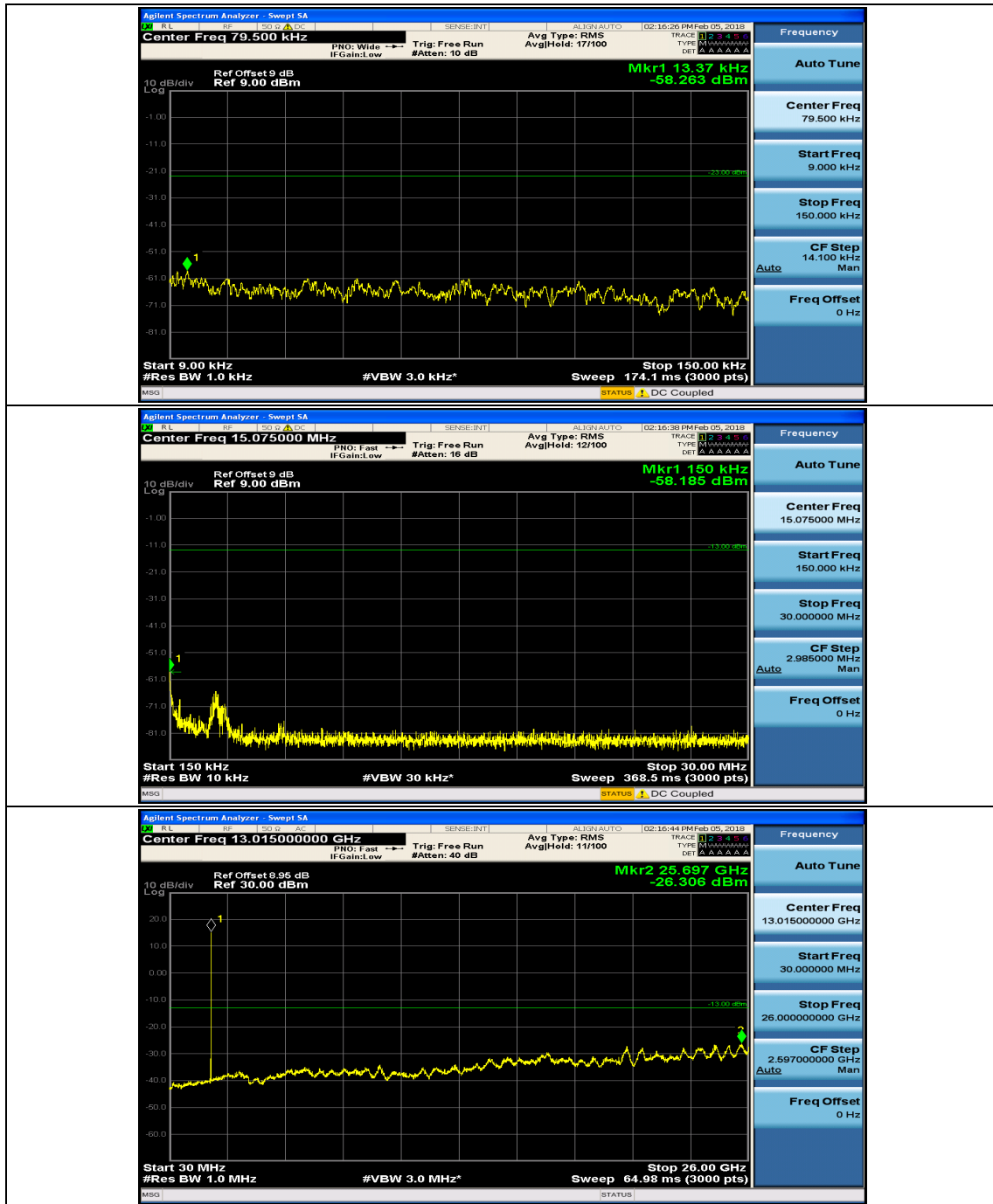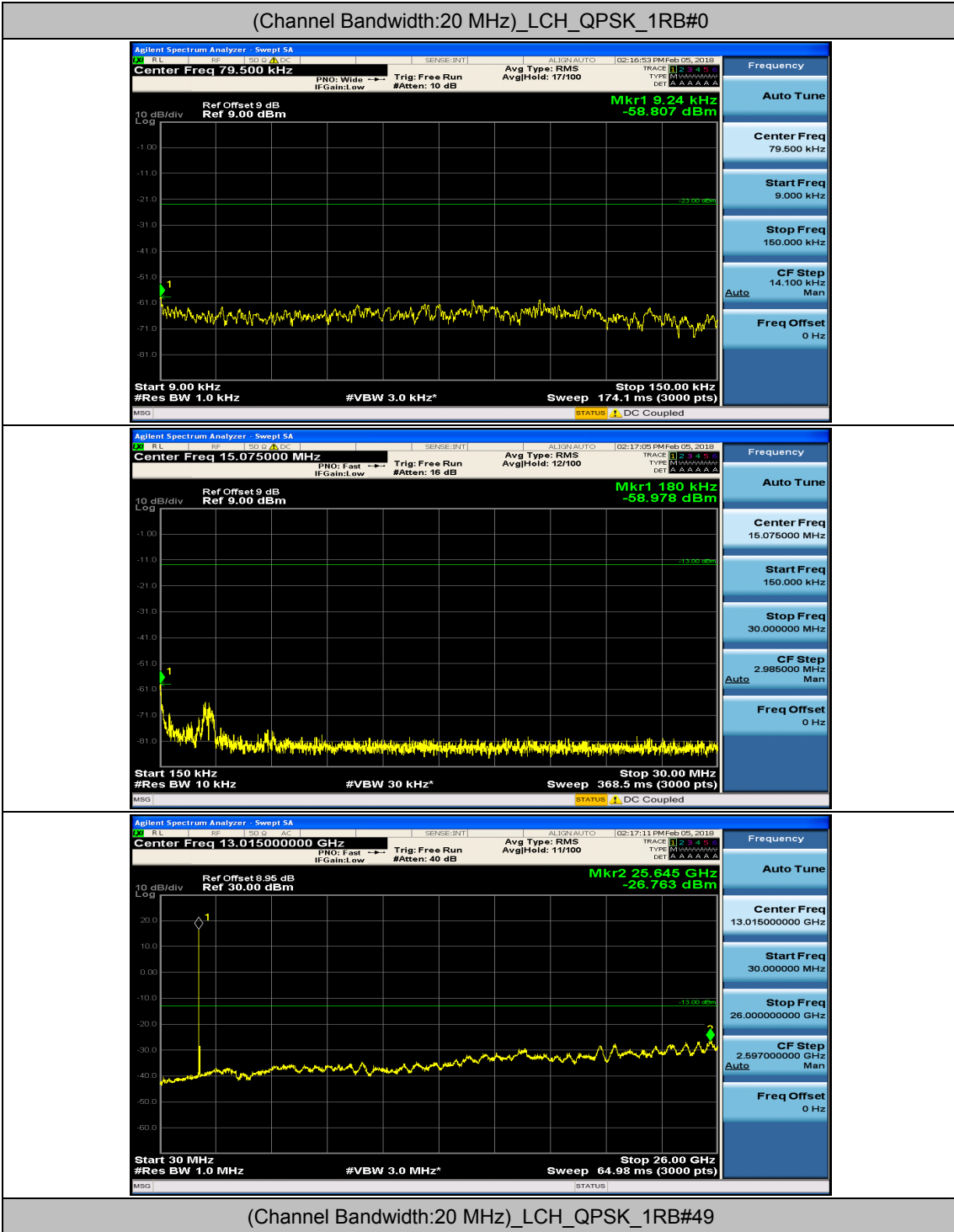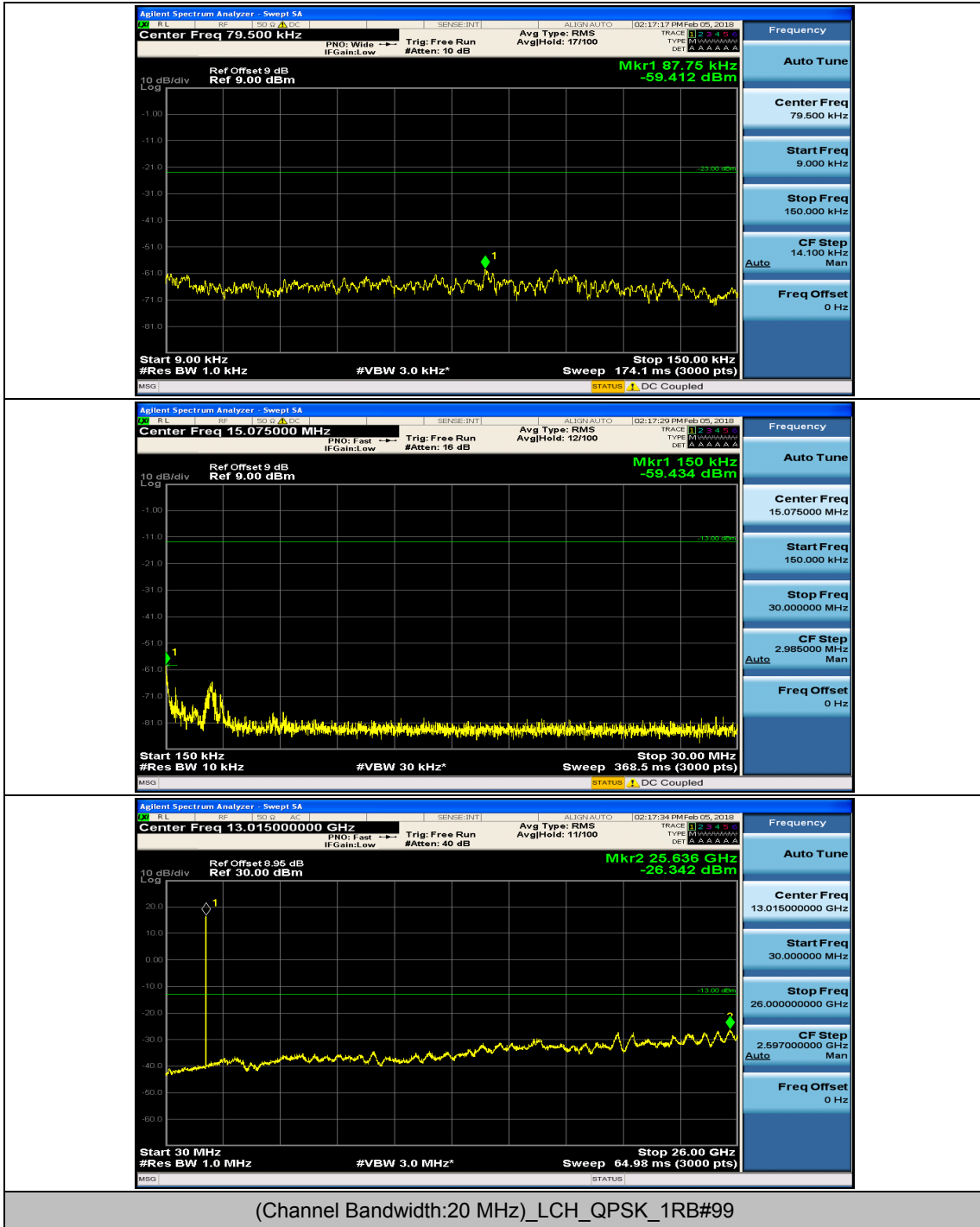(Channel Bandwidth:15 MHz)_HCH_16QAM_1RB#37

(Channel Bandwidth:15 MHz)_HCH_16QAM_1RB#74

Channel Bandwidth: 20 MHz

(Channel Bandwidth:20 MHz)_LCH_QPSK_1RB#0
(Channel Bandwidth:20 MHz)_LCH_QPSK_1RB#49

(Channel Bandwidth:20 MHz)_LCH_QPSK_1RB#99

Screen 1:

Agilent Spectrum Analyzer - Swept SA

R L RF 50 Ω DC SENSE:INT ALIGN AUTO 02:17:40 PM Feb 05, 2018

Center Freq 79.500 kHz

PNO: Wide Trig: Free Run Avg Type: RMS Avg|Hold: 17/100 TRACE 1 2 3 4 5 6
IFGain:Low #Atten: 10 dB TYPE M W W W W W W
DET A A A A A A

Ref Offset 9 dB
10 dB/div Ref 9.00 dBm
Log

Mkr1 104.96 kHz
-59.458 dBm

-1.00
-11.0
-21.0 -23.00 dBm
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0

Start 9.00 kHz Stop 150.00 kHz
#Res BW 1.0 kHz #VBW 3.0 kHz* Sweep 174.1 ms (3000 pts)
MSG STATUS DC Coupled

Frequency
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

Screen 2:

Agilent Spectrum Analyzer - Swept SA

R L RF 50 Ω DC SENSE:INT ALIGN AUTO 02:17:52 PM Feb 05, 2018

Center Freq 15.075000 MHz

PNO: Fast Trig: Free Run Avg Type: RMS Avg|Hold: 12/100 TRACE 1 2 3 4 5 6
IFGain:Low #Atten: 16 dB TYPE M W W W W W W
DET A A A A A A

Ref Offset 9 dB
10 dB/div Ref 9.00 dBm
Log

Mkr1 150 kHz
-58.029 dBm

-1.00
-11.0 -13.00 dBm
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0

Start 150 kHz Stop 30.00 MHz
#Res BW 10 kHz #VBW 30 kHz* Sweep 368.5 ms (3000 pts)
MSG STATUS DC Coupled

Frequency
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

Screen 3:

Agilent Spectrum Analyzer - Swept SA

R L RF 50 Ω AC SENSE:INT ALIGN AUTO 02:17:58 PM Feb 05, 2018

Center Freq 13.015000000 GHz

PNO: Fast Trig: Free Run Avg Type: RMS Avg|Hold: 11/100 TRACE 1 2 3 4 5 6
IFGain:Low #Atten: 40 dB TYPE M W W W W W W
DET A A A A A A

Ref Offset 8.95 dB
10 dB/div Ref 30.00 dBm
Log

Mkr2 25.636 GHz
-26.457 dBm

20.0
10.0
0.00
-10.0 -13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0

Start 30 MHz Stop 26.00 GHz
#Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 64.98 ms (3000 pts)
MSG STATUS

Frequency
Auto Tune
Center Freq 13.015000000 GHz
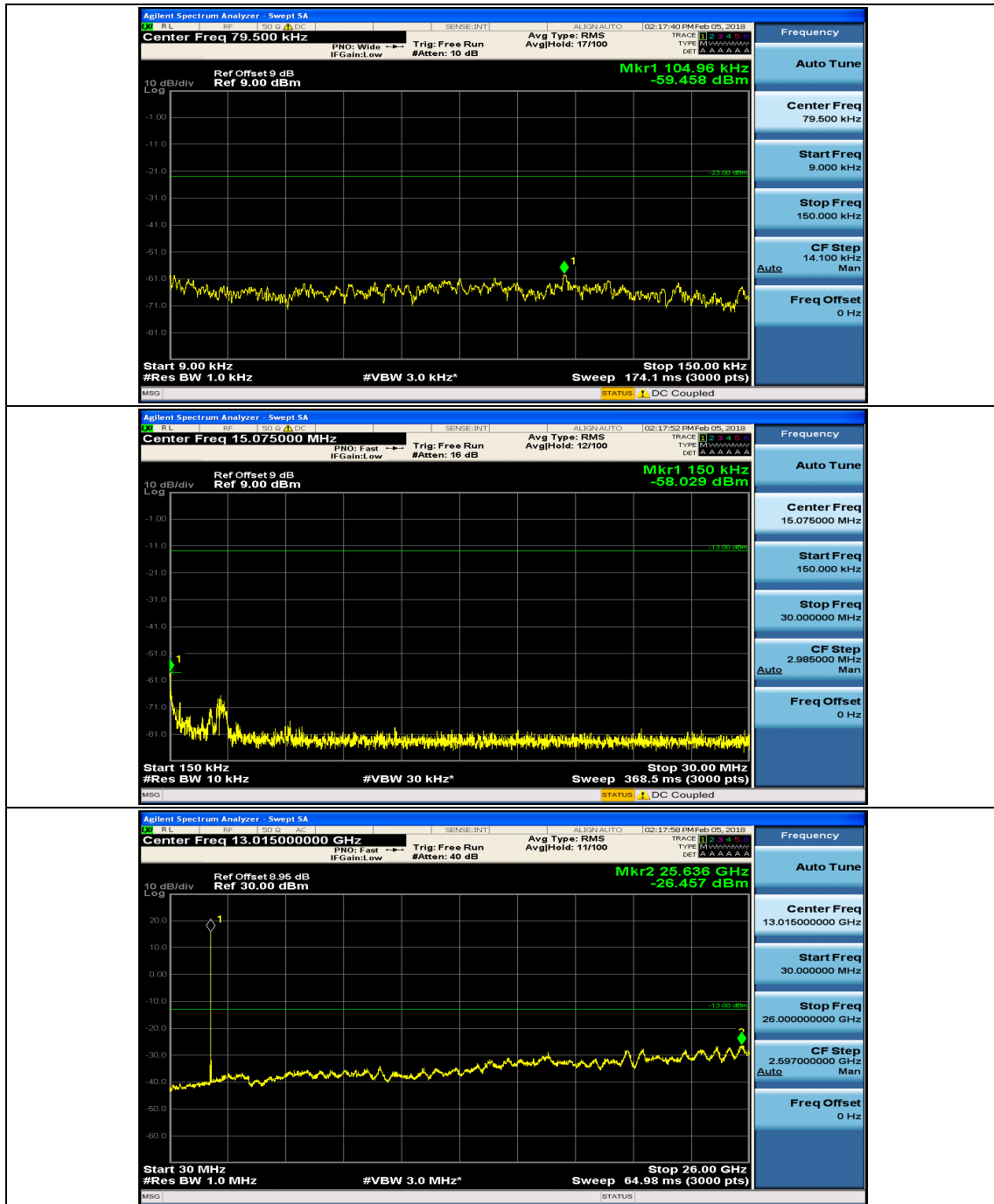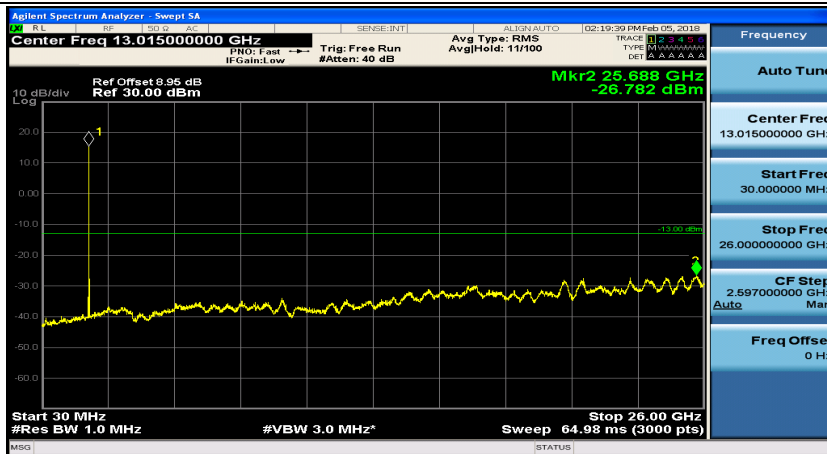Start Freq 30.000000 MHz
Stop Freq 26.000000000 GHz
CF Step 2.597000000 GHz Auto Man
Freq Offset 0 Hz

(Channel Bandwidth:20 MHz)_MCH_QPSK_1RB#0
(Channel Bandwidth:20 MHz)_MCH_QPSK_1RB#49

(Channel Bandwidth:20 MHz)_MCH_QPSK_1RB#99

(Channel Bandwidth:20 MHz)_HCH_QPSK_1RB#0
(Channel Bandwidth:20 MHz)_HCH_QPSK_1RB#49

(Channel Bandwidth:20 MHz)_HCH_QPSK_1RB#99

(Channel Bandwidth:20 MHz)_LCH_16QAM_1RB#0

(Channel Bandwidth:20 MHz)_LCH_16QAM_1RB#49

(Channel Bandwidth:20 MHz)_LCH_16QAM_1RB#99
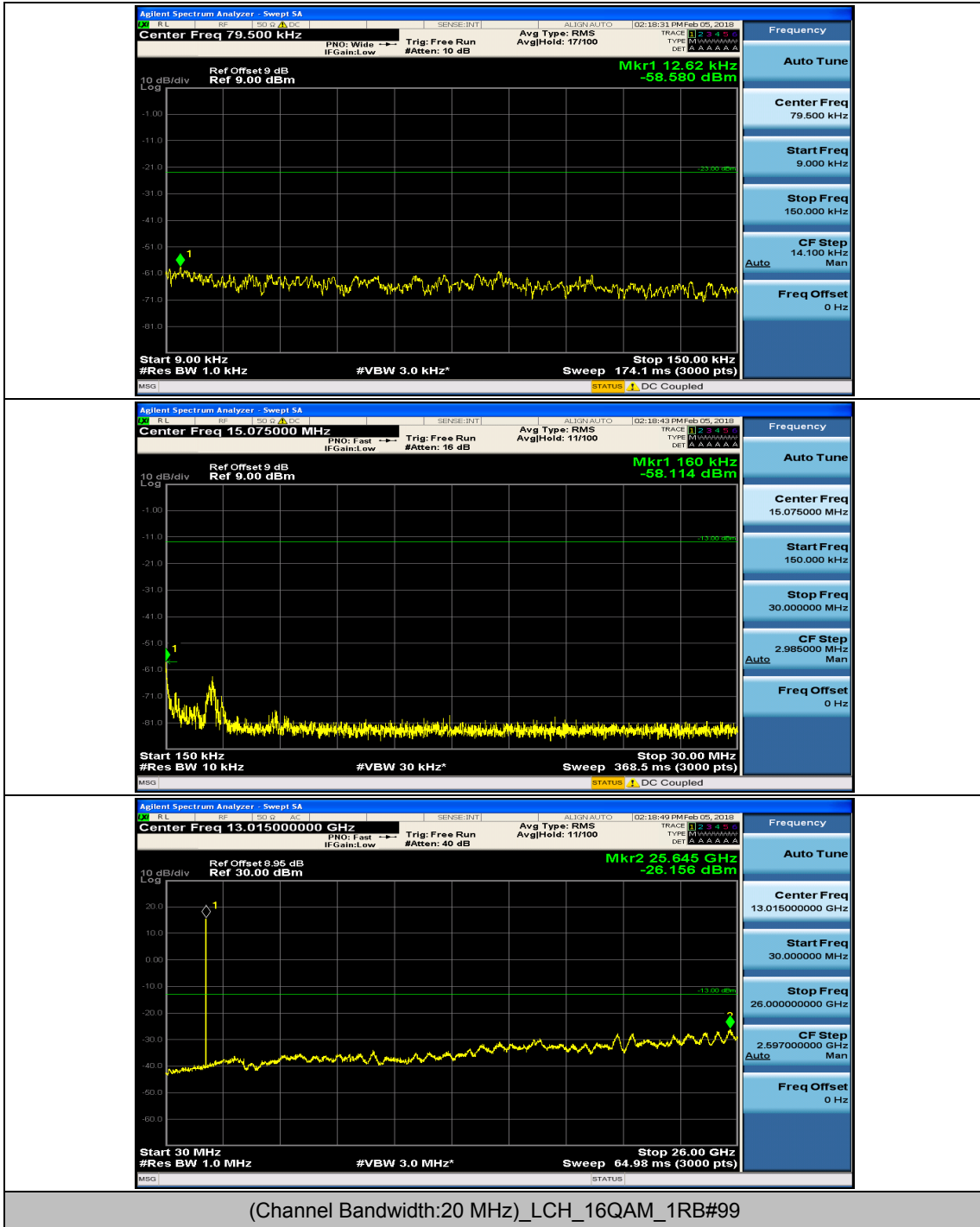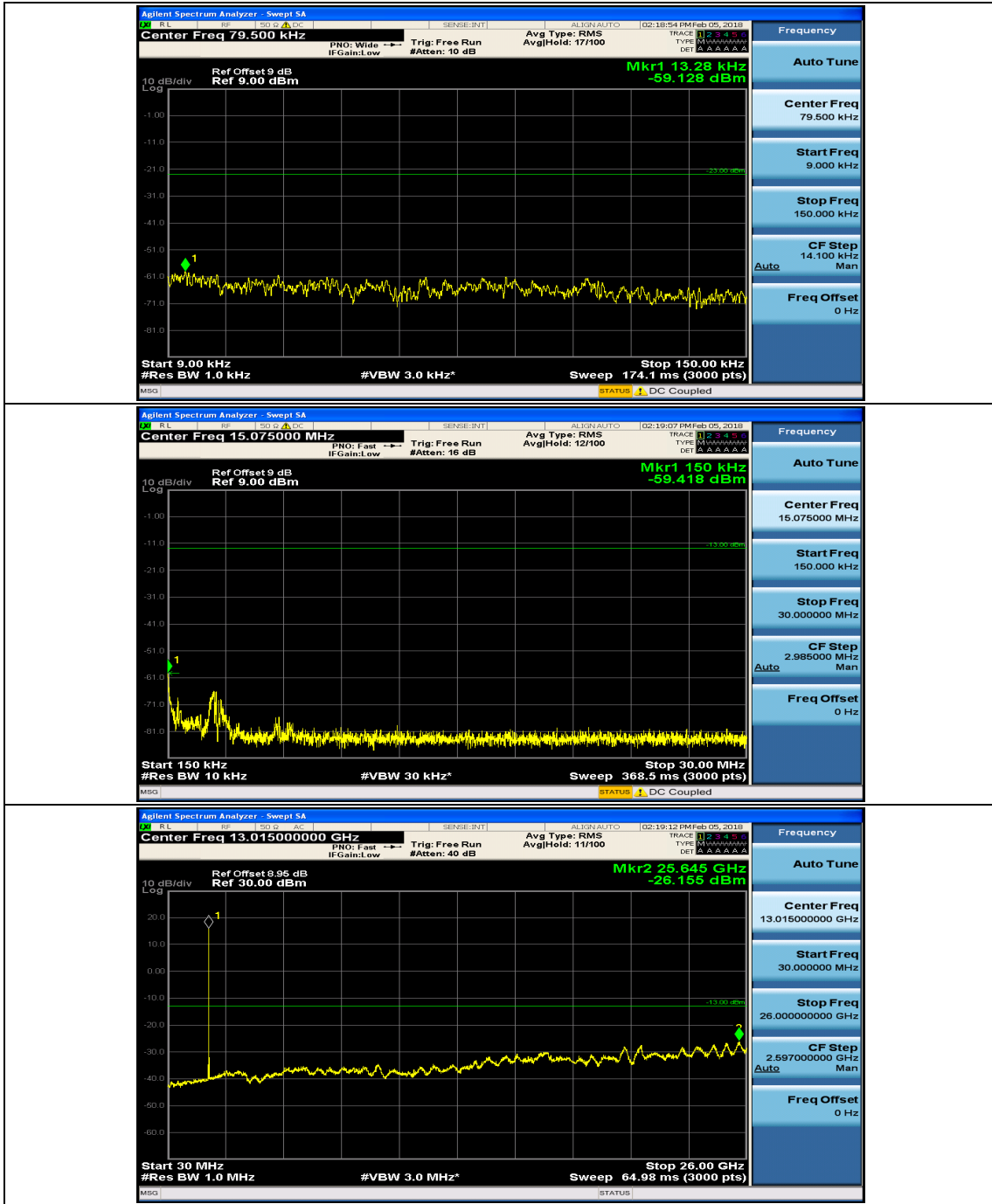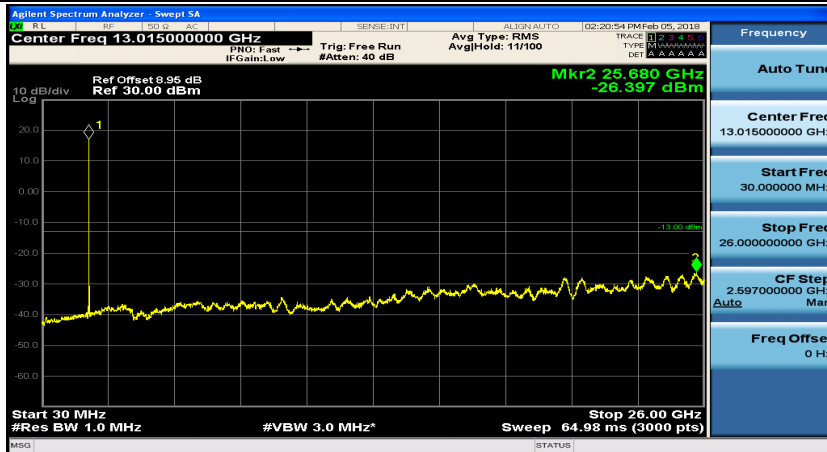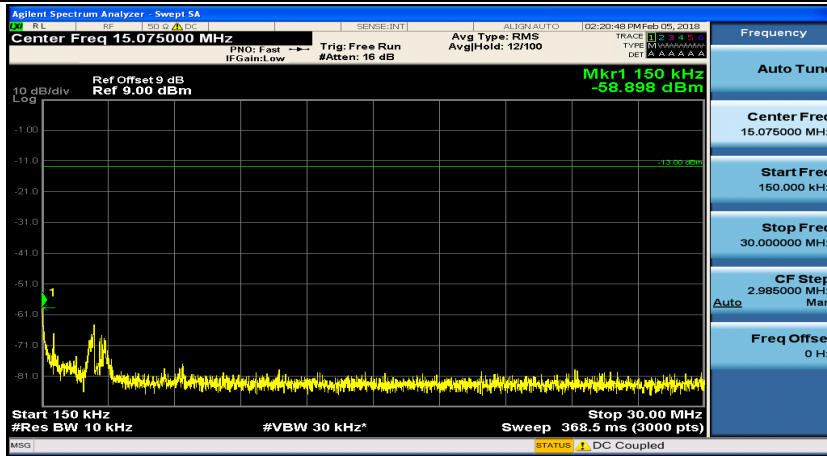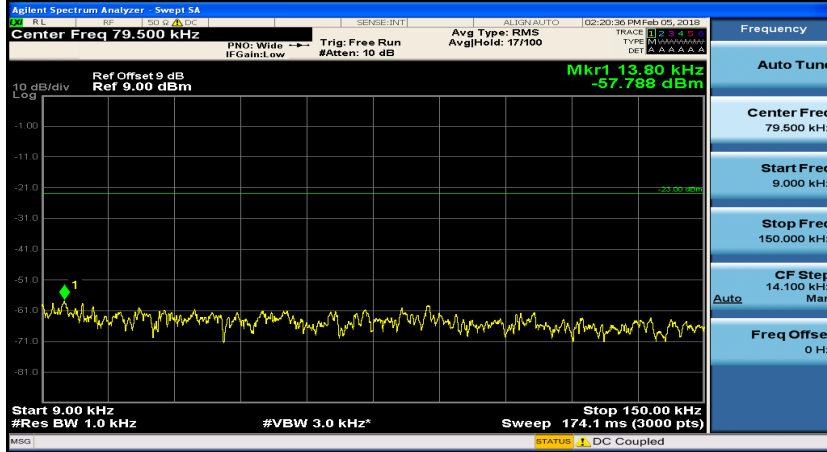
(Channel Bandwidth:20 MHz)_MCH_16QAM_1RB#0

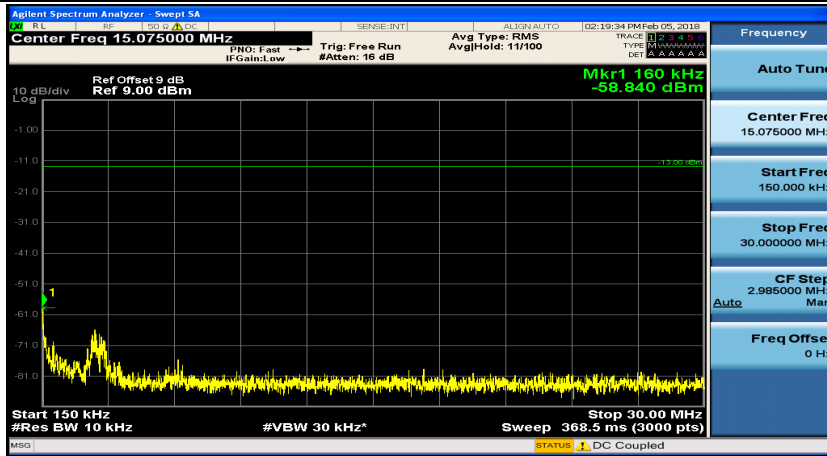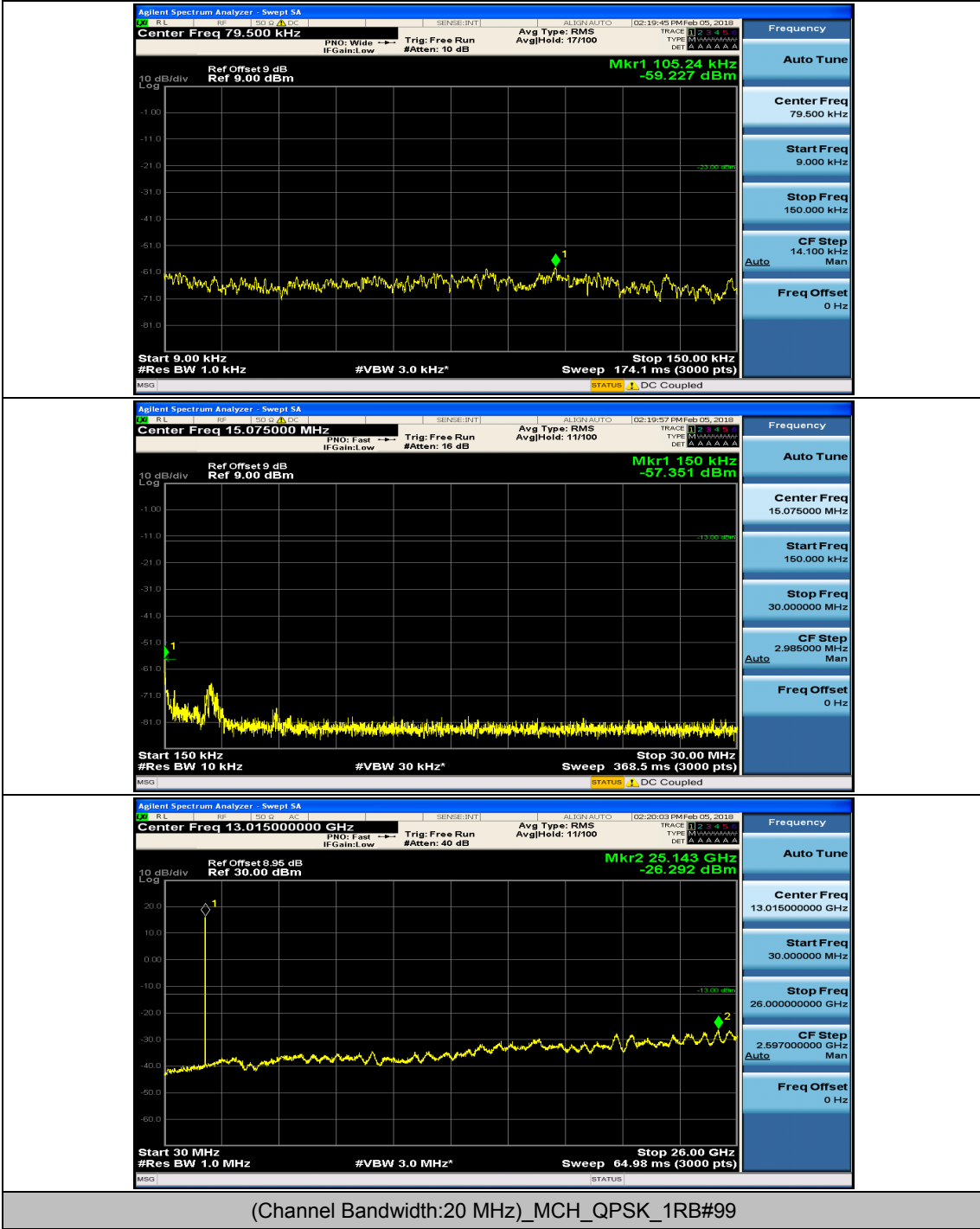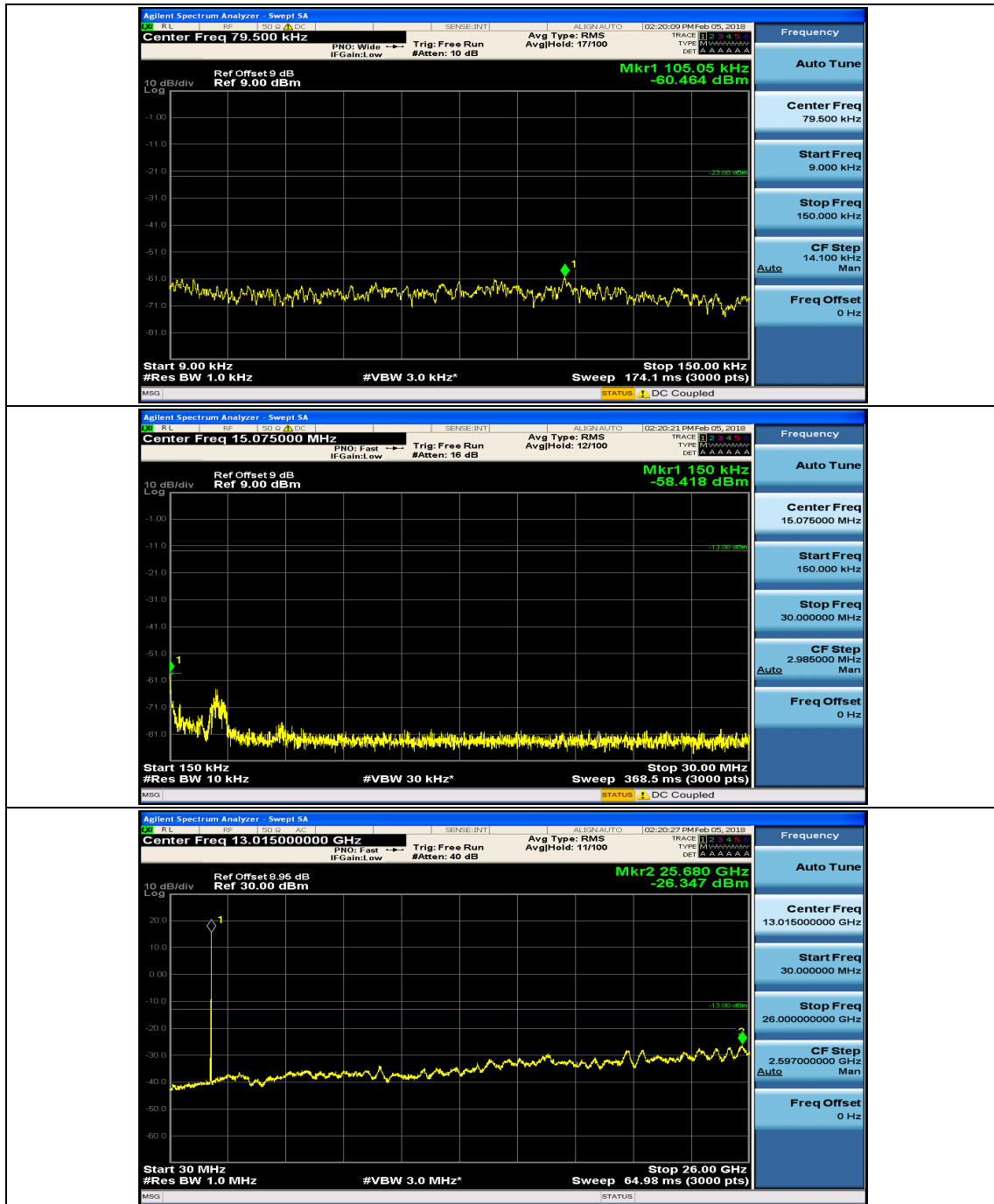| (Channel Bandwidth:20 MHz)_MCH_16QAM_1RB#49 |
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(Channel Bandwidth:20 MHz)_MCH_16QAM_1RB#99

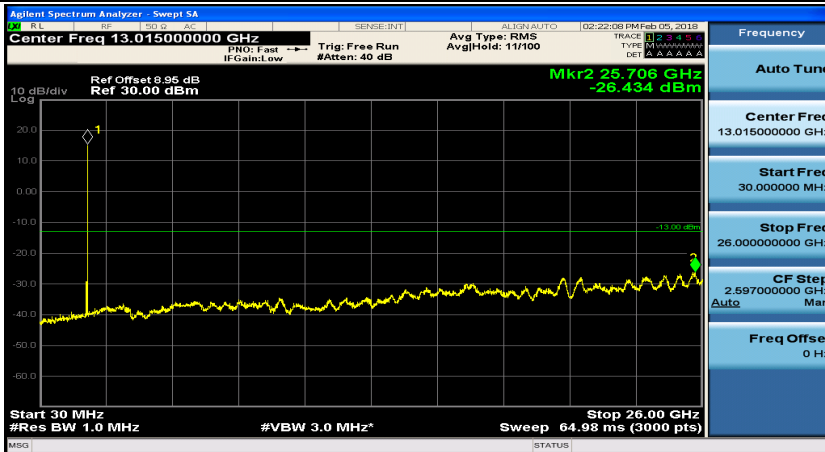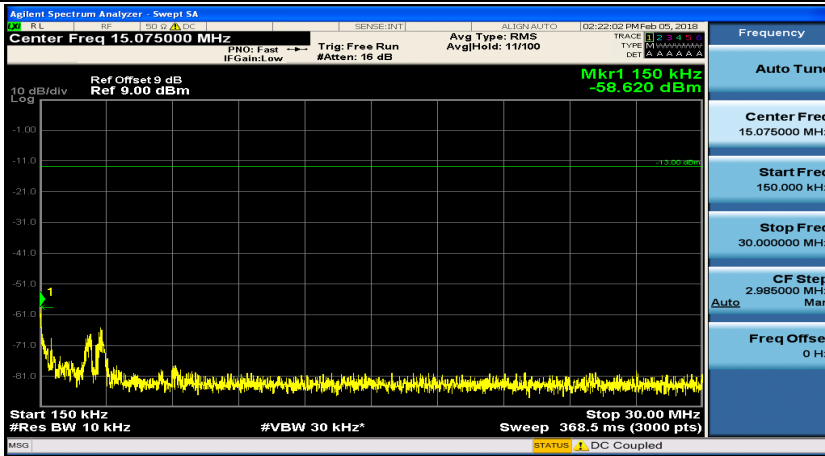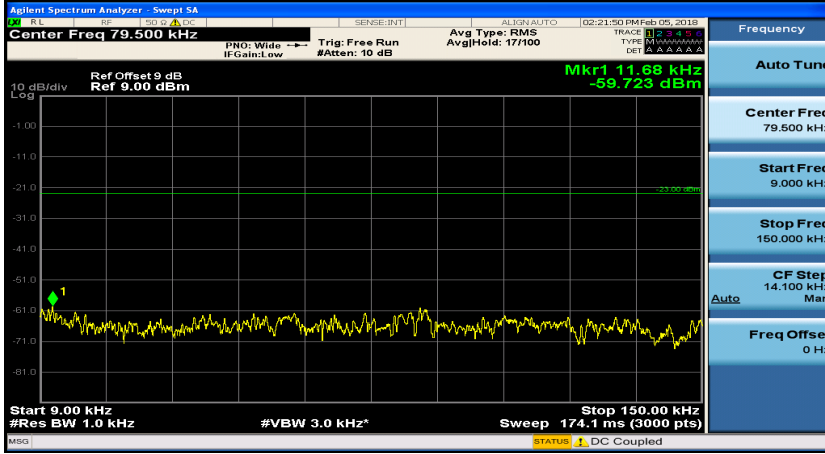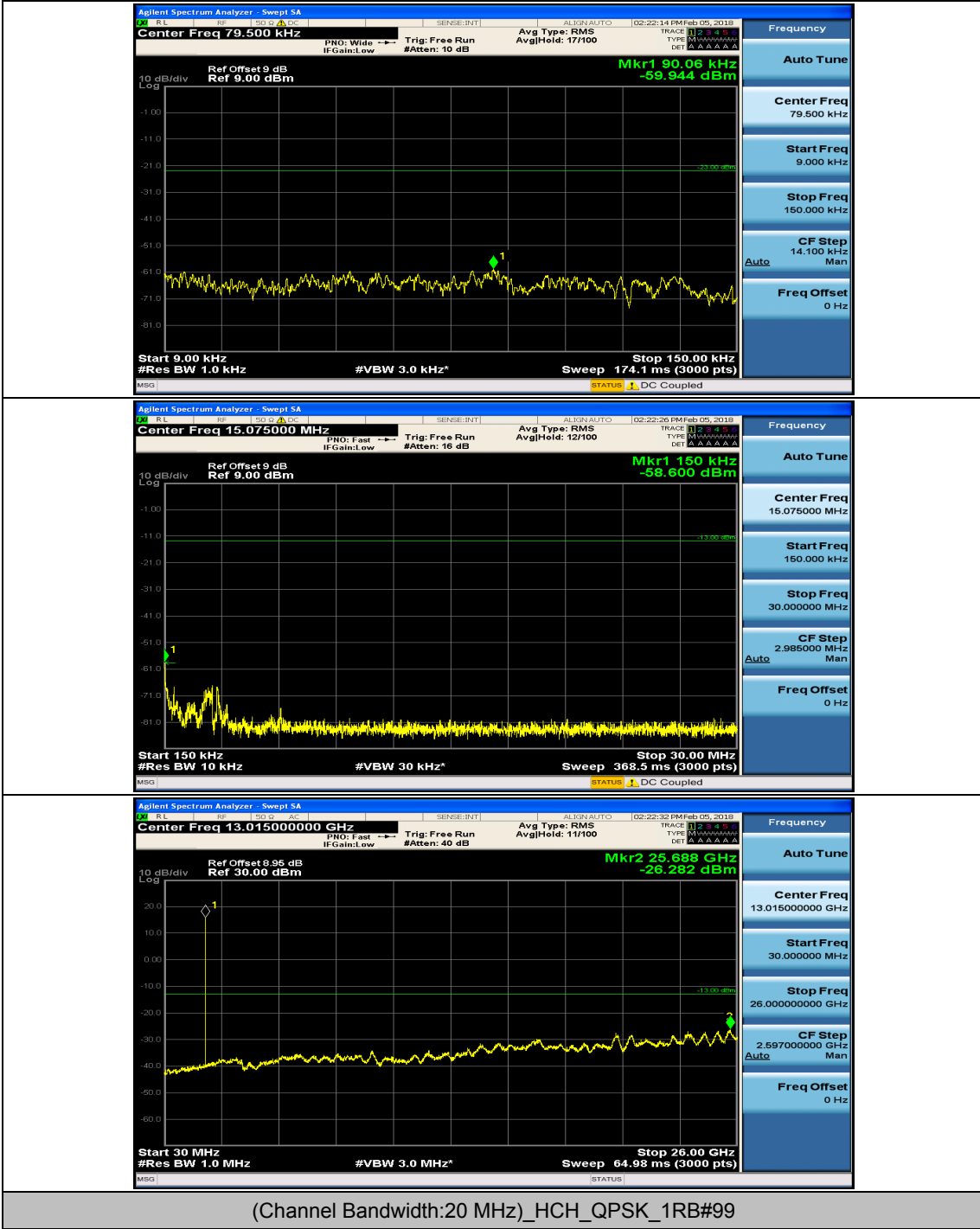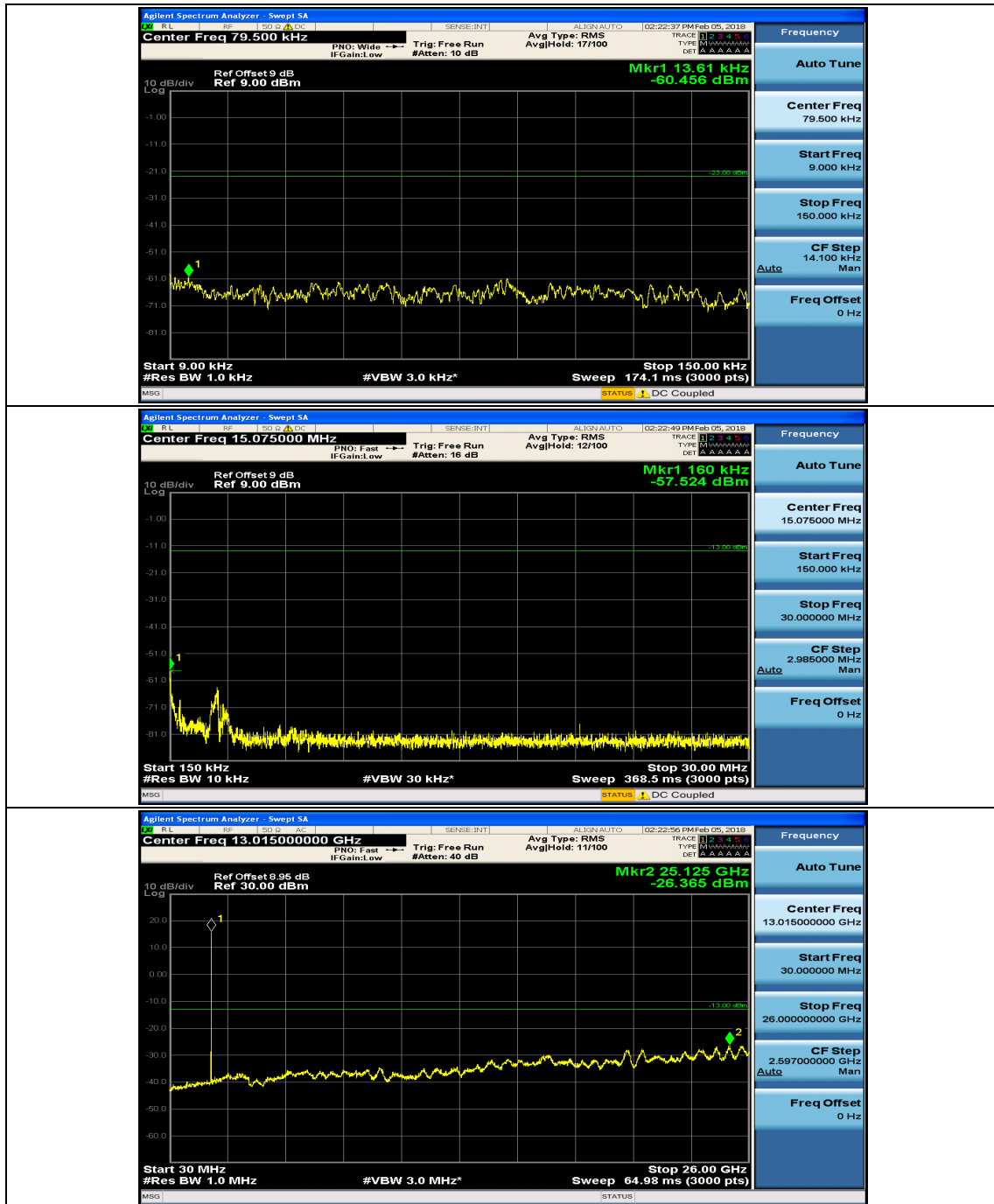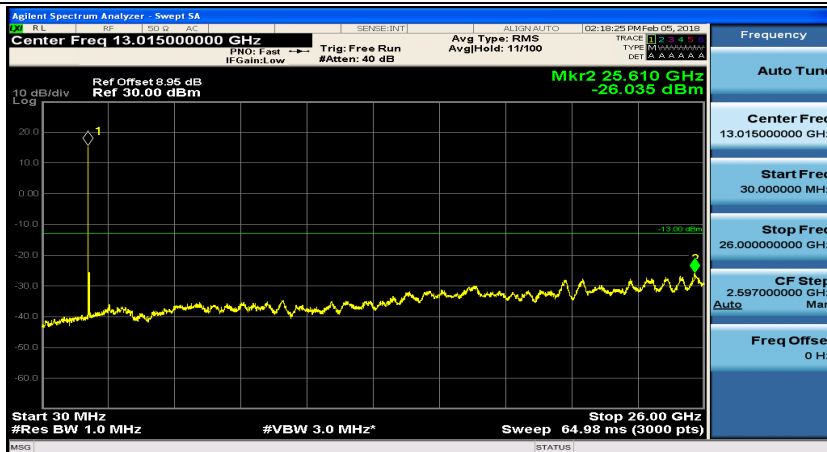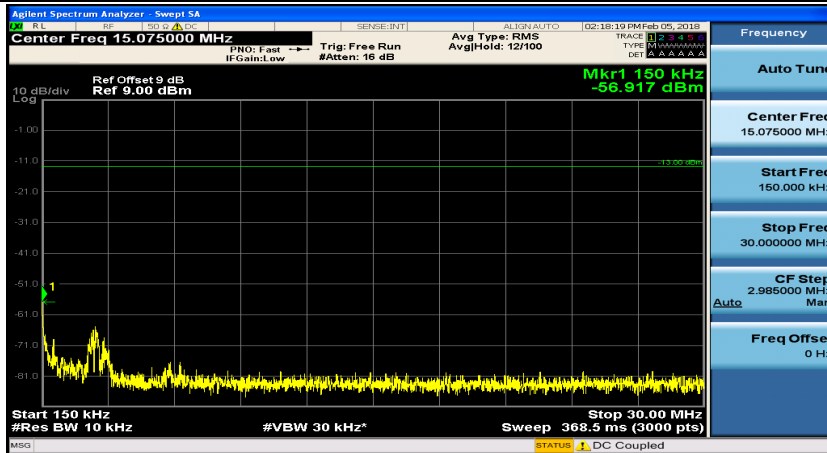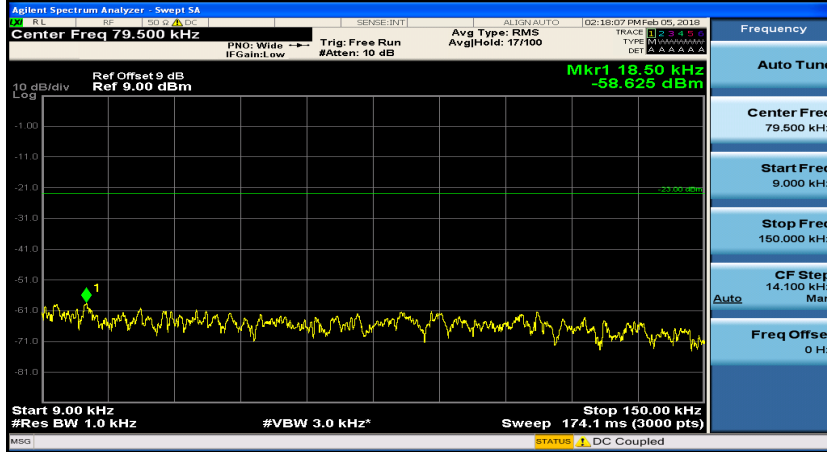| (Channel Bandwidth:20 MHz)_HCH_16QAM_1RB#0 |
|---|
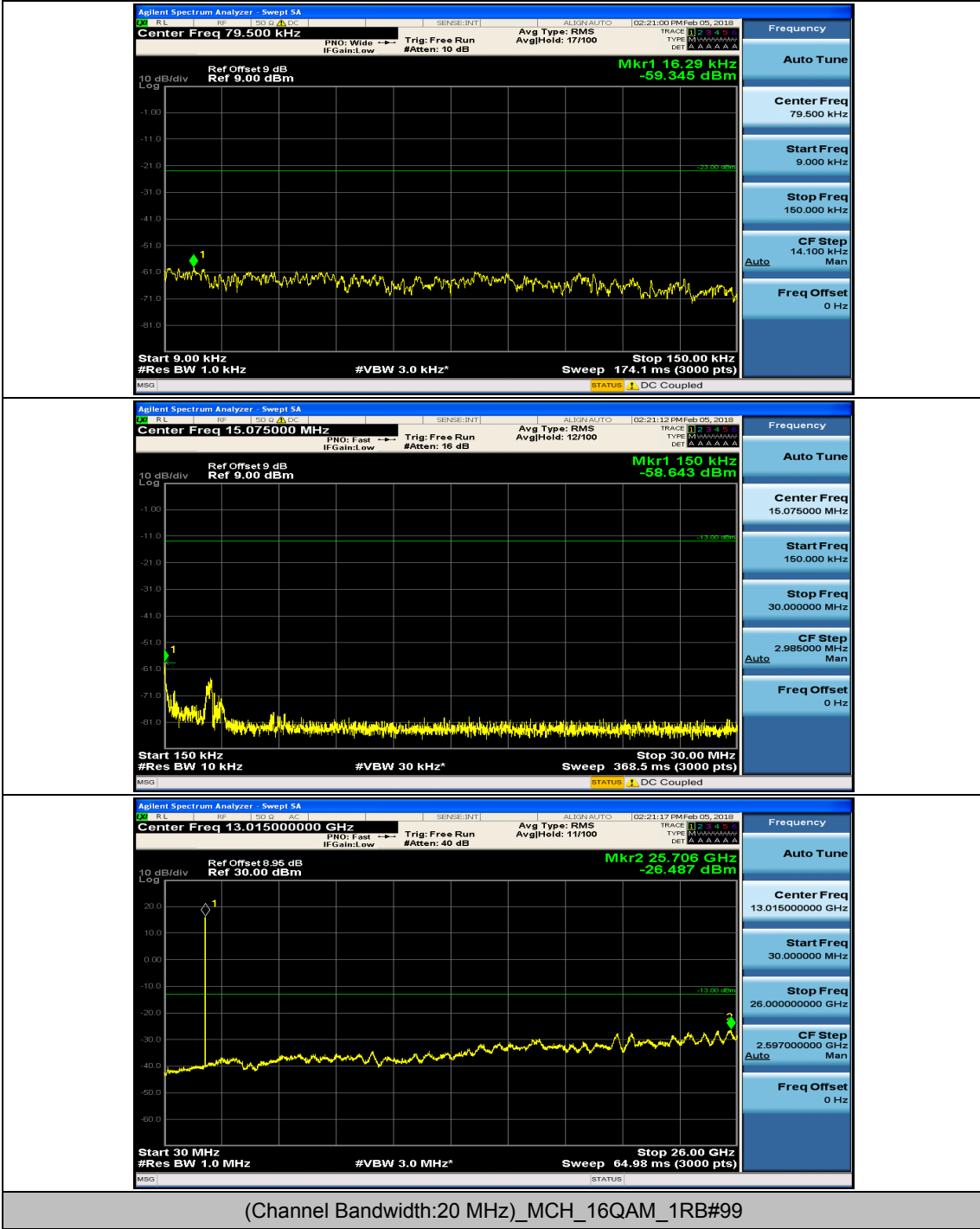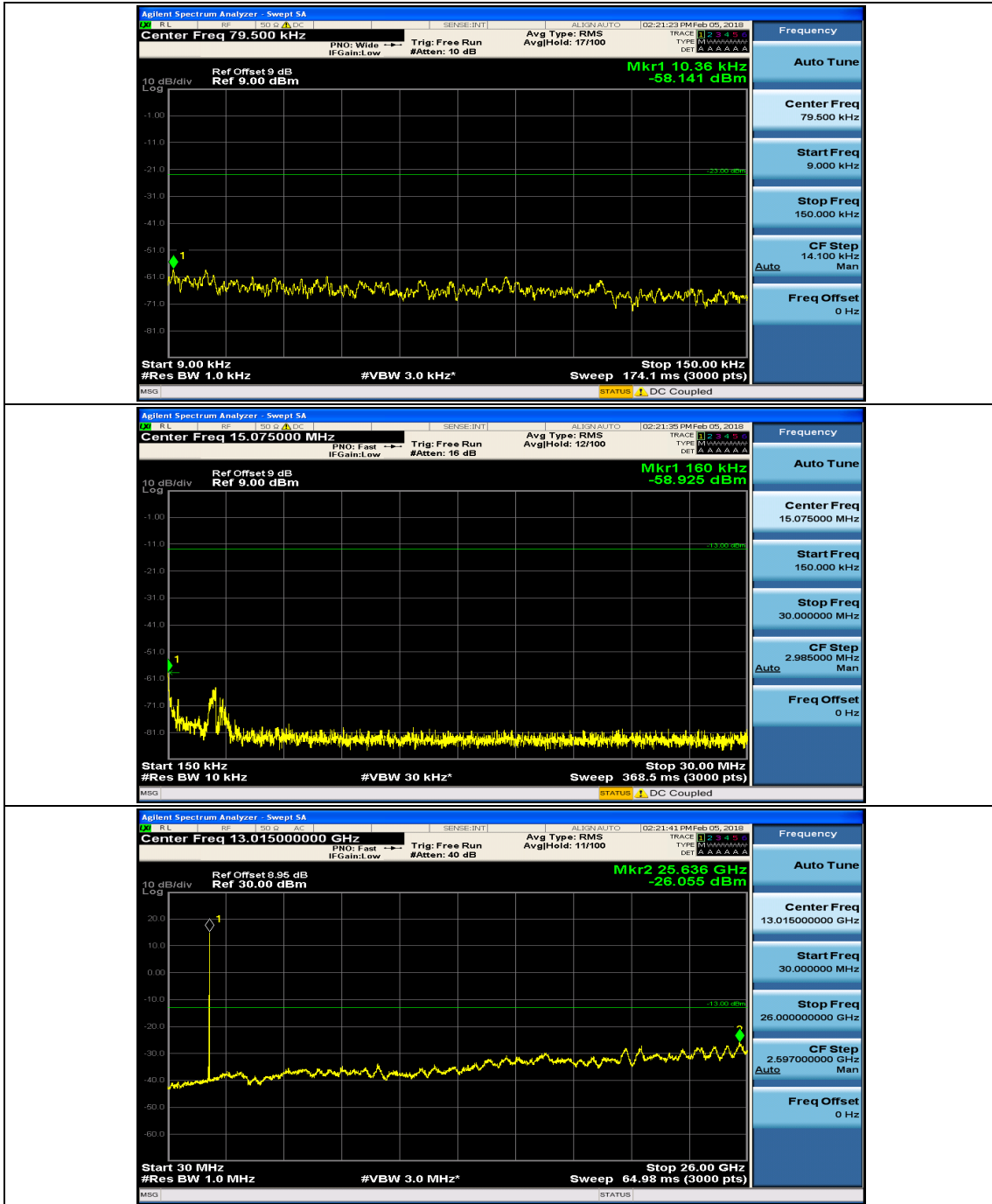
(Channel Bandwidth:20 MHz)_HCH_16QAM_1RB#49
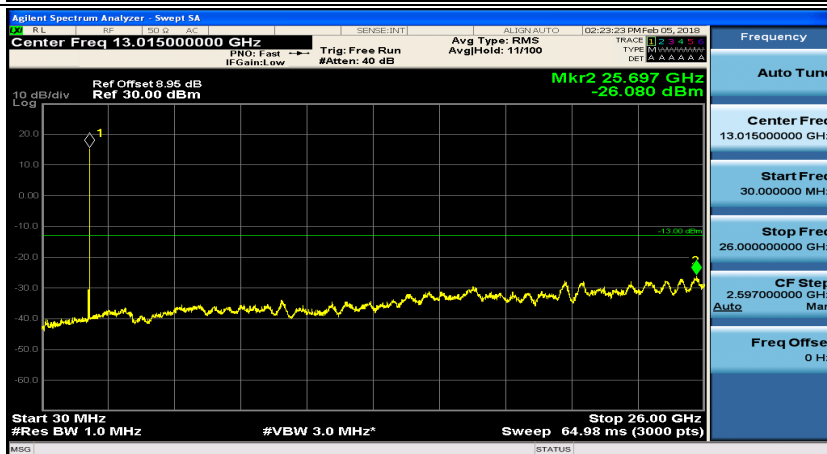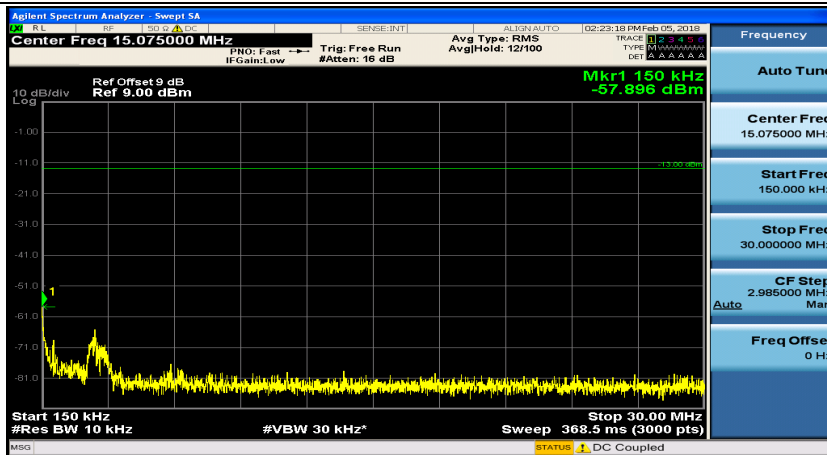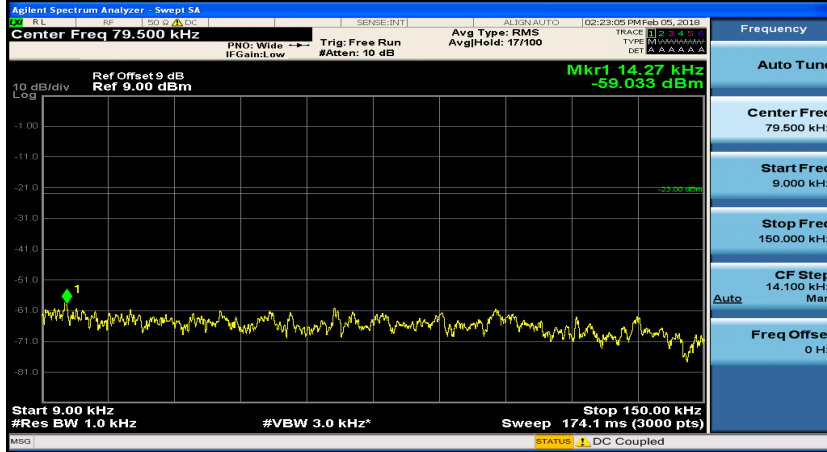
(Channel Bandwidth:20 MHz)_HCH_16QAM_1RB#99
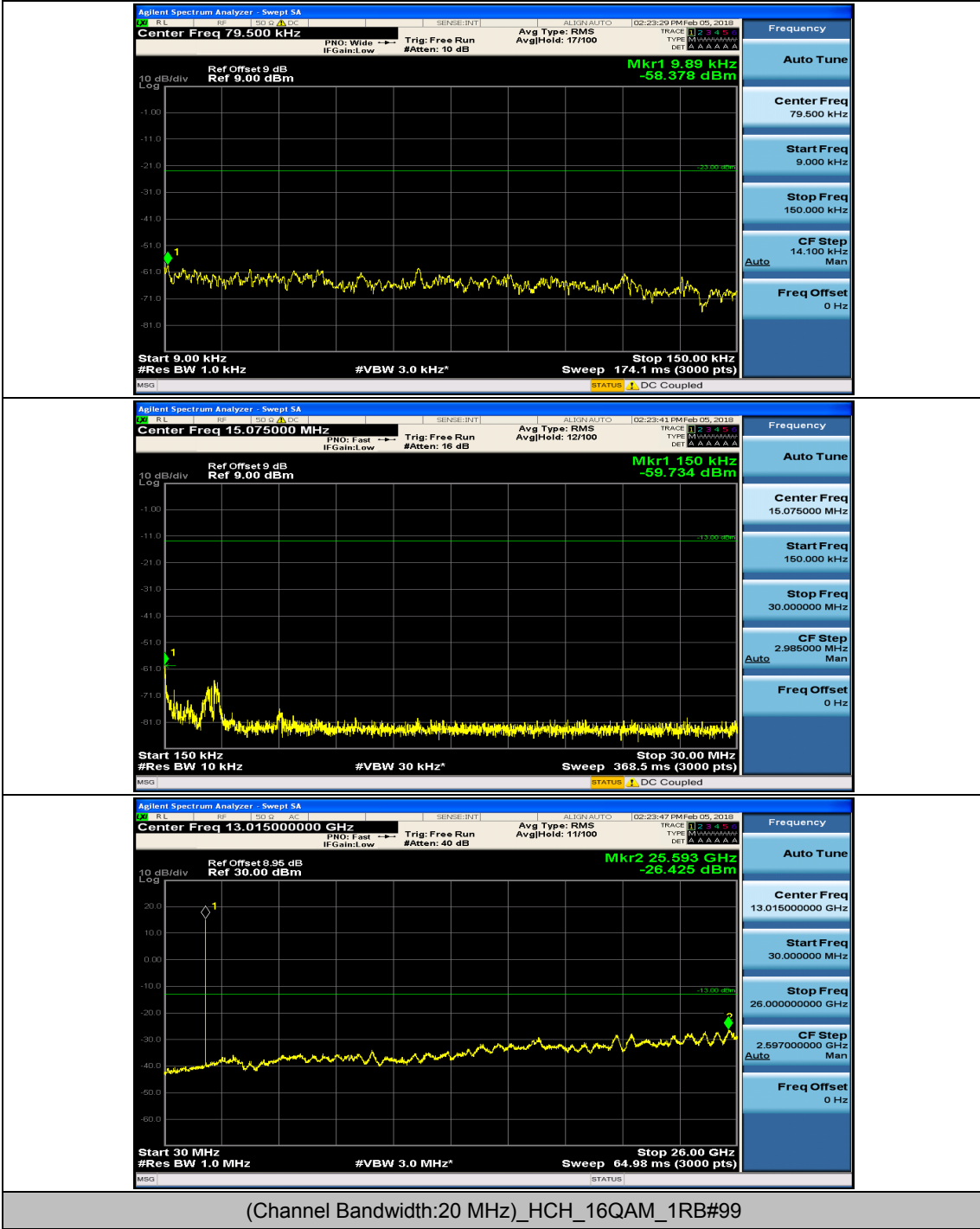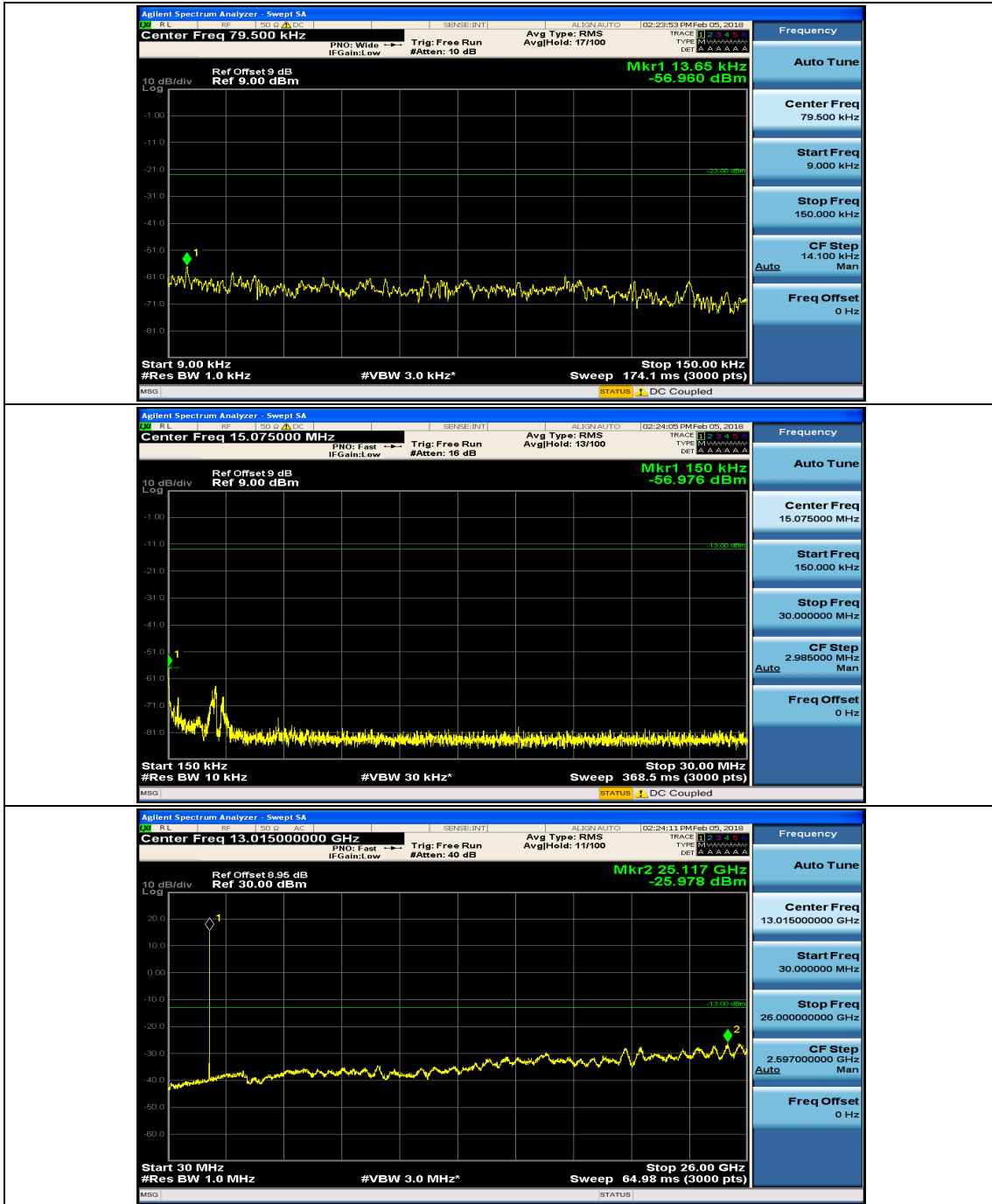
Appendix F: Frequency Stability

Test Result

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	4.78	0.002583	± 2.5	PASS
		VN	TN	3.39	0.001832	± 2.5	PASS
		VH	TN	0.25	0.000135	± 2.5	PASS
	MCH	VL	TN	-0.48	-0.000255	± 2.5	PASS
		VN	TN	-1.77	-0.000941	± 2.5	PASS
		VH	TN	1.32	0.000702	± 2.5	PASS
	HCH	VL	TN	0.8	0.000419	± 2.5	PASS
		VN	TN	4.61	0.002414	± 2.5	PASS
		VH	TN	2.97	0.001556	± 2.5	PASS
16QAM	LCH	VL	TN	3.82	0.002064	± 2.5	PASS
		VN	TN	0.2	0.000108	± 2.5	PASS
		VH	TN	4.21	0.002275	± 2.5	PASS
	MCH	VL	TN	-0.29	-0.000154	± 2.5	PASS
		VN	TN	-1.23	-0.000654	± 2.5	PASS
		VH	TN	0.9	0.000479	± 2.5	PASS
	HCH	VL	TN	1.98	0.001037	± 2.5	PASS
		VN	TN	1.99	0.001042	± 2.5	PASS
		VH	TN	4.78	0.002583	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-1.67	-0.000902	± 2.5	PASS
		VN	-20	0.97	0.000524	± 2.5	PASS
		VN	-10	1.86	0.001005	± 2.5	PASS
		VN	0	-0.24	-0.000130	± 2.5	PASS
		VN	10	0.98	0.000530	± 2.5	PASS
		VN	20	1.27	0.000686	± 2.5	PASS
		VN	30	-1.28	-0.000692	± 2.5	PASS
		VN	40	4.57	0.002469	± 2.5	PASS
		VN	50	1.25	0.000675	± 2.5	PASS
	MCH	VN	-30	-0.78	-0.000415	± 2.5	PASS
		VN	-20	-0.12	-0.000064	± 2.5	PASS

		VN	-10	4.54	0.002415	± 2.5	PASS
		VN	0	-1.65	-0.000878	± 2.5	PASS
		VN	10	0.47	0.000250	± 2.5	PASS
		VN	20	4.37	0.002324	± 2.5	PASS
		VN	30	2.62	0.001394	± 2.5	PASS
		VN	40	4.27	0.002271	± 2.5	PASS
		VN	50	4.26	0.002266	± 2.5	PASS
	HCH	VN	-30	1.41	0.000738	± 2.5	PASS
		VN	-20	1.19	0.000623	± 2.5	PASS
		VN	-10	1.94	0.001016	± 2.5	PASS
		VN	0	4.19	0.002195	± 2.5	PASS
		VN	10	1.04	0.000545	± 2.5	PASS
		VN	20	1.24	0.000649	± 2.5	PASS
		VN	30	4.38	0.002294	± 2.5	PASS
		VN	40	-0.57	-0.000299	± 2.5	PASS
		VN	50	-0.35	-0.000183	± 2.5	PASS
16QAM	LCH	VN	-30	0.02	0.000011	± 2.5	PASS
		VN	-20	-0.05	-0.000027	± 2.5	PASS
		VN	-10	-0.86	-0.000465	± 2.5	PASS
		VN	0	1.25	0.000675	± 2.5	PASS
		VN	10	1.14	0.000616	± 2.5	PASS
		VN	20	4.82	0.002604	± 2.5	PASS
		VN	30	-0.11	-0.000059	± 2.5	PASS
		VN	40	-1.78	-0.000962	± 2.5	PASS
		VN	50	0.2	0.000108	± 2.5	PASS
	MCH	VN	-30	1.82	0.000968	± 2.5	PASS
		VN	-20	0.26	0.000138	± 2.5	PASS
		VN	-10	-0.22	-0.000117	± 2.5	PASS
		VN	0	4.37	0.002324	± 2.5	PASS
		VN	10	-1.46	-0.000777	± 2.5	PASS
		VN	20	0.27	0.000144	± 2.5	PASS
		VN	30	-1.01	-0.000537	± 2.5	PASS
		VN	40	1.65	0.000878	± 2.5	PASS
		VN	50	-1.67	-0.000888	± 2.5	PASS
	HCH	VN	-30	1.42	0.000744	± 2.5	PASS
		VN	-20	-0.92	-0.000482	± 2.5	PASS
		VN	-10	4.76	0.002493	± 2.5	PASS
		VN	0	0.3	0.000157	± 2.5	PASS
		VN	10	3.88	0.002032	± 2.5	PASS
		VN	20	-1.86	-0.000974	± 2.5	PASS
		VN	30	4.3	0.002252	± 2.5	PASS

| | | VN | 40 | 0.09 | 0.000047 | ± 2.5 | PASS |
| | | VN | 50 | 3.09 | 0.001618 | ± 2.5 | PASS |

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz+							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	-1.73	-0.000934	± 2.5	PASS
		VN	TN	2.28	0.001231	± 2.5	PASS
		VH	TN	0.31	0.000167	± 2.5	PASS
	MCH	VL	TN	3.05	0.001622	± 2.5	PASS
		VN	TN	-1.39	-0.000739	± 2.5	PASS
		VH	TN	1.63	0.000867	± 2.5	PASS
	HCH	VL	TN	0.66	0.000346	± 2.5	PASS
		VN	TN	-0.6	-0.000314	± 2.5	PASS
		VH	TN	2.44	0.001278	± 2.5	PASS
16QAM	LCH	VL	TN	-1.7	-0.000918	± 2.5	PASS
		VN	TN	0.99	0.000535	± 2.5	PASS
		VH	TN	-1.51	-0.000816	± 2.5	PASS
	MCH	VL	TN	-1.96	-0.001043	± 2.5	PASS
		VN	TN	4.52	0.002404	± 2.5	PASS
		VH	TN	3.3	0.001755	± 2.5	PASS
	HCH	VL	TN	0.85	0.000445	± 2.5	PASS
		VN	TN	3.52	0.001844	± 2.5	PASS
		VH	TN	1.69	0.000886	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	1.63	0.000880	± 2.5	PASS
		VN	-20	0.34	0.000184	± 2.5	PASS
		VN	-10	3.99	0.002155	± 2.5	PASS
		VN	0	0.61	0.000329	± 2.5	PASS
		VN	10	2.99	0.001615	± 2.5	PASS
		VN	20	4.55	0.002457	± 2.5	PASS
		VN	30	2.91	0.001572	± 2.5	PASS
		VN	40	-0.78	-0.000421	± 2.5	PASS
		VN	50	-1.41	-0.000762	± 2.5	PASS
	MCH	VN	-30	1.45	0.000771	± 2.5	PASS
		VN	-20	3.57	0.001899	± 2.5	PASS
		VN	-10	2.19	0.001165	± 2.5	PASS

		VN	0	2.35	0.001250	± 2.5	PASS
		VN	10	4.21	0.002239	± 2.5	PASS
		VN	20	-1.86	-0.000989	± 2.5	PASS
		VN	30	3.05	0.001622	± 2.5	PASS
		VN	40	1.79	0.000952	± 2.5	PASS
		VN	50	4.71	0.002505	± 2.5	PASS
	HCH	VN	-30	0.55	0.000288	± 2.5	PASS
		VN	-20	-0.82	-0.000430	± 2.5	PASS
		VN	-10	0.11	0.000058	± 2.5	PASS
		VN	0	-0.5	-0.000262	± 2.5	PASS
		VN	10	1.88	0.000985	± 2.5	PASS
		VN	20	-0.47	-0.000246	± 2.5	PASS
		VN	30	1.48	0.000775	± 2.5	PASS
		VN	40	-0.77	-0.000403	± 2.5	PASS
		VN	50	-0.79	-0.000414	± 2.5	PASS
16QAM	LCH	VN	-30	1.85	0.000999	± 2.5	PASS
		VN	-20	0.92	0.000497	± 2.5	PASS
		VN	-10	1.13	0.000610	± 2.5	PASS
		VN	0	3.29	0.001777	± 2.5	PASS
		VN	10	-0.36	-0.000194	± 2.5	PASS
		VN	20	1.87	0.001010	± 2.5	PASS
		VN	30	0.54	0.000292	± 2.5	PASS
		VN	40	-0.17	-0.000092	± 2.5	PASS
		VN	50	3.99	0.002155	± 2.5	PASS
	MCH	VN	-30	0.04	0.000021	± 2.5	PASS
		VN	-20	0.78	0.000415	± 2.5	PASS
		VN	-10	-0.95	-0.000505	± 2.5	PASS
		VN	0	2.28	0.001213	± 2.5	PASS
		VN	10	4.36	0.002319	± 2.5	PASS
		VN	20	3.2	0.001702	± 2.5	PASS
		VN	30	3.81	0.002027	± 2.5	PASS
		VN	40	3.81	0.002027	± 2.5	PASS
		VN	50	3.23	0.001718	± 2.5	PASS
	HCH	VN	-30	2.68	0.001404	± 2.5	PASS
		VN	-20	1.87	0.000980	± 2.5	PASS
		VN	-10	2.54	0.001331	± 2.5	PASS
		VN	0	2.04	0.001069	± 2.5	PASS
		VN	10	-1.64	-0.000859	± 2.5	PASS
		VN	20	-0.82	-0.000430	± 2.5	PASS
		VN	30	4.58	0.002400	± 2.5	PASS
		VN	40	1.83	0.000959	± 2.5	PASS

| | | VN | 50 | 3.08 | 0.001614 | ± 2.5 | PASS |

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	0.95	0.000513	± 2.5	PASS
		VN	TN	2.04	0.001101	± 2.5	PASS
		VH	TN	-0.27	-0.000146	± 2.5	PASS
	MCH	VL	TN	1.29	0.000686	± 2.5	PASS
		VN	TN	1.96	0.001043	± 2.5	PASS
		VH	TN	1.73	0.000920	± 2.5	PASS
	HCH	VL	TN	3.43	0.001798	± 2.5	PASS
		VN	TN	0.42	0.000220	± 2.5	PASS
		VH	TN	0.26	0.000136	± 2.5	PASS
16QAM	LCH	VL	TN	3.85	0.002078	± 2.5	PASS
		VN	TN	1.71	0.000923	± 2.5	PASS
		VH	TN	0.04	0.000022	± 2.5	PASS
	MCH	VL	TN	0.85	0.000452	± 2.5	PASS
		VN	TN	0.06	0.000032	± 2.5	PASS
		VH	TN	-1.67	-0.000888	± 2.5	PASS
	HCH	VL	TN	-1.7	-0.000891	± 2.5	PASS
		VN	TN	0.88	0.000461	± 2.5	PASS
		VH	TN	0.9	0.000472	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-1.03	-0.000556	± 2.5	PASS
		VN	-20	-0.24	-0.000130	± 2.5	PASS
		VN	-10	-0.66	-0.000356	± 2.5	PASS
		VN	0	1.33	0.000718	± 2.5	PASS
		VN	10	3.62	0.001954	± 2.5	PASS
		VN	20	3.61	0.001949	± 2.5	PASS
		VN	30	-0.4	-0.000216	± 2.5	PASS
		VN	40	1.43	0.000772	± 2.5	PASS
		VN	50	3.23	0.001744	± 2.5	PASS
	MCH	VN	-30	0.66	0.000351	± 2.5	PASS
		VN	-20	1.72	0.000915	± 2.5	PASS
		VN	-10	4.8	0.002553	± 2.5	PASS
		VN	0	1.74	0.000926	± 2.5	PASS

		VN	10	0.65	0.000346	± 2.5	PASS
		VN	20	1.79	0.000952	± 2.5	PASS
		VN	30	3.31	0.001761	± 2.5	PASS
		VN	40	1.52	0.000809	± 2.5	PASS
		VN	50	-0.99	-0.000527	± 2.5	PASS
	HCH	VN	-30	2.68	0.001405	± 2.5	PASS
		VN	-20	0.19	0.000100	± 2.5	PASS
		VN	-10	-0.24	-0.000126	± 2.5	PASS
		VN	0	-0.99	-0.000519	± 2.5	PASS
		VN	10	-0.37	-0.000194	± 2.5	PASS
		VN	20	1.44	0.000755	± 2.5	PASS
		VN	30	-0.56	-0.000294	± 2.5	PASS
		VN	40	0.49	0.000257	± 2.5	PASS
		VN	50	1.67	0.000875	± 2.5	PASS
16QAM	LCH	VN	-30	-0.98	-0.000529	± 2.5	PASS
		VN	-20	1.44	0.000777	± 2.5	PASS
		VN	-10	4.04	0.002181	± 2.5	PASS
		VN	0	4.31	0.002327	± 2.5	PASS
		VN	10	1.34	0.000723	± 2.5	PASS
		VN	20	4.08	0.002202	± 2.5	PASS
		VN	30	0.45	0.000243	± 2.5	PASS
		VN	40	4.46	0.002408	± 2.5	PASS
		VN	50	-1.18	-0.000637	± 2.5	PASS
	MCH	VN	-30	-1.57	-0.000835	± 2.5	PASS
		VN	-20	3.72	0.001979	± 2.5	PASS
		VN	-10	3.36	0.001787	± 2.5	PASS
		VN	0	1.81	0.000963	± 2.5	PASS
		VN	10	4.82	0.002564	± 2.5	PASS
		VN	20	2.11	0.001122	± 2.5	PASS
		VN	30	3.19	0.001697	± 2.5	PASS
		VN	40	0.39	0.000207	± 2.5	PASS
		VN	50	2.85	0.001516	± 2.5	PASS
	HCH	VN	-30	-1.85	-0.000970	± 2.5	PASS
		VN	-20	3.21	0.001683	± 2.5	PASS
		VN	-10	1.63	0.000855	± 2.5	PASS
		VN	0	1.38	0.000723	± 2.5	PASS
		VN	10	0.44	0.000231	± 2.5	PASS
		VN	20	-1.01	-0.000529	± 2.5	PASS
		VN	30	1.87	0.000980	± 2.5	PASS
		VN	40	3.1	0.001625	± 2.5	PASS
		VN	50	-0.86	-0.000451	± 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	2.74	0.001477	± 2.5	PASS
		VN	TN	3.91	0.002108	± 2.5	PASS
		VH	TN	-1.05	-0.000566	± 2.5	PASS
	MCH	VL	TN	0.9	0.000479	± 2.5	PASS
		VN	TN	4.49	0.002388	± 2.5	PASS
		VH	TN	-0.07	-0.000037	± 2.5	PASS
	HCH	VL	TN	1.26	0.000661	± 2.5	PASS
		VN	TN	-0.79	-0.000415	± 2.5	PASS
		VH	TN	3.52	0.001848	± 2.5	PASS
16QAM	LCH	VL	TN	-1.89	-0.001019	± 2.5	PASS
		VN	TN	0.19	0.000102	± 2.5	PASS
		VH	TN	0.45	0.000243	± 2.5	PASS
	MCH	VL	TN	2.26	0.001202	± 2.5	PASS
		VN	TN	1.83	0.000973	± 2.5	PASS
		VH	TN	2.55	0.001356	± 2.5	PASS
	HCH	VL	TN	-1.37	-0.000719	± 2.5	PASS
		VN	TN	2.59	0.001360	± 2.5	PASS
		VH	TN	2.8	0.001470	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
16QAM	LCH	VN	-30	2.75	0.001482	± 2.5	PASS
		VN	-20	-1.9	-0.001024	± 2.5	PASS
		VN	-10	3.99	0.002151	± 2.5	PASS
		VN	0	4.31	0.002323	± 2.5	PASS
		VN	10	3.06	0.001650	± 2.5	PASS
		VN	20	-1	-0.000539	± 2.5	PASS
		VN	30	0.88	0.000474	± 2.5	PASS
		VN	40	-0.82	-0.000442	± 2.5	PASS
		VN	50	4.06	0.002189	± 2.5	PASS
	MCH	VN	-30	2.5	0.001330	± 2.5	PASS
		VN	-20	1.5	0.000798	± 2.5	PASS
		VN	-10	2.24	0.001191	± 2.5	PASS
		VN	0	4.19	0.002229	± 2.5	PASS
		VN	10	4.42	0.002351	± 2.5	PASS
		VN	20	3.78	0.002011	± 2.5	PASS

		VN	30	0.34	0.000181	± 2.5	PASS
		VN	40	3.79	0.002016	± 2.5	PASS
		VN	50	3.48	0.001851	± 2.5	PASS
	HCH	VN	-30	-1.92	-0.001008	± 2.5	PASS
		VN	-20	2.5	0.001312	± 2.5	PASS
		VN	-10	1.61	0.000845	± 2.5	PASS
		VN	0	2.27	0.001192	± 2.5	PASS
		VN	10	3.12	0.001638	± 2.5	PASS
		VN	20	1.19	0.000625	± 2.5	PASS
		VN	30	2.69	0.001412	± 2.5	PASS
		VN	40	-1.9	-0.000997	± 2.5	PASS
		VN	50	0.28	0.000147	± 2.5	PASS
QPSK	LCH	VN	-30	4.6	0.002480	± 2.5	PASS
		VN	-20	0.4	0.000216	± 2.5	PASS
		VN	-10	1.75	0.000943	± 2.5	PASS
		VN	0	-1.76	-0.000949	± 2.5	PASS
		VN	10	-1.14	-0.000615	± 2.5	PASS
		VN	20	4.97	0.002679	± 2.5	PASS
		VN	30	4.17	0.002248	± 2.5	PASS
		VN	40	1.75	0.000943	± 2.5	PASS
		VN	50	1.24	0.000668	± 2.5	PASS
	MCH	VN	-30	-0.79	-0.000420	± 2.5	PASS
		VN	-20	-1.82	-0.000968	± 2.5	PASS
		VN	-10	0.13	0.000069	± 2.5	PASS
		VN	0	0.71	0.000378	± 2.5	PASS
		VN	10	4.4	0.002340	± 2.5	PASS
		VN	20	-0.98	-0.000521	± 2.5	PASS
		VN	30	0.98	0.000521	± 2.5	PASS
		VN	40	2.94	0.001564	± 2.5	PASS
		VN	50	4.66	0.002479	± 2.5	PASS
	HCH	VN	-30	-1.98	-0.001039	± 2.5	PASS
		VN	-20	1.33	0.000698	± 2.5	PASS
		VN	-10	0.69	0.000362	± 2.5	PASS
		VN	0	-1.53	-0.000803	± 2.5	PASS
		VN	10	-1.24	-0.000651	± 2.5	PASS
		VN	20	4.66	0.002446	± 2.5	PASS
		VN	30	0.87	0.000457	± 2.5	PASS
		VN	40	3.27	0.001717	± 2.5	PASS
		VN	50	4.89	0.002567	± 2.5	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	4.06	0.002186	± 2.5	PASS
		VN	TN	-1.61	-0.000867	± 2.5	PASS
		VH	TN	2.82	0.001518	± 2.5	PASS
	MCH	VL	TN	0.99	0.000527	± 2.5	PASS
		VN	TN	4.65	0.002473	± 2.5	PASS
		VH	TN	0.34	0.000181	± 2.5	PASS
	HCH	VL	TN	1.08	0.000568	± 2.5	PASS
		VN	TN	3.62	0.001903	± 2.5	PASS
		VH	TN	2.39	0.001256	± 2.5	PASS
16QAM	LCH	VL	TN	-1.47	-0.000791	± 2.5	PASS
		VN	TN	2.08	0.001120	± 2.5	PASS
		VH	TN	-1.55	-0.000834	± 2.5	PASS
	MCH	VL	TN	3.69	0.001963	± 2.5	PASS
		VN	TN	1.76	0.000936	± 2.5	PASS
		VH	TN	3.82	0.002032	± 2.5	PASS
	HCH	VL	TN	4.67	0.002455	± 2.5	PASS
		VN	TN	-1.91	-0.001004	± 2.5	PASS
		VH	TN	3.7	0.001945	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-1.92	-0.001034	± 2.5	PASS
		VN	-20	1.84	0.000991	± 2.5	PASS
		VN	-10	-1.17	-0.000630	± 2.5	PASS
		VN	0	2.17	0.001168	± 2.5	PASS
		VN	10	3.31	0.001782	± 2.5	PASS
		VN	20	1.3	0.000700	± 2.5	PASS
		VN	30	3.5	0.001884	± 2.5	PASS
		VN	40	-1.99	-0.001071	± 2.5	PASS
		VN	50	4.59	0.002471	± 2.5	PASS
	MCH	VN	-30	3.51	0.001867	± 2.5	PASS
		VN	-20	0.83	0.000441	± 2.5	PASS
		VN	-10	1.14	0.000606	± 2.5	PASS
		VN	0	3.77	0.002005	± 2.5	PASS
		VN	10	2.41	0.001282	± 2.5	PASS
		VN	20	-0.55	-0.000293	± 2.5	PASS

		VN	30	4.37	0.002324	± 2.5	PASS
		VN	40	4.62	0.002457	± 2.5	PASS
		VN	50	1.71	0.000910	± 2.5	PASS
	HCH	VN	-30	-0.93	-0.000489	± 2.5	PASS
		VN	-20	3.96	0.002081	± 2.5	PASS
		VN	-10	2.14	0.001125	± 2.5	PASS
		VN	0	4.86	0.002555	± 2.5	PASS
		VN	10	3.26	0.001714	± 2.5	PASS
		VN	20	3.99	0.002097	± 2.5	PASS
		VN	30	-0.61	-0.000321	± 2.5	PASS
		VN	40	-1.64	-0.000862	± 2.5	PASS
		VN	50	-0.09	-0.000047	± 2.5	PASS
16QAM	LCH	VN	-30	3.12	0.001680	± 2.5	PASS
		VN	-20	3.44	0.001852	± 2.5	PASS
		VN	-10	2.81	0.001513	± 2.5	PASS
		VN	0	3.65	0.001965	± 2.5	PASS
		VN	10	-1.68	-0.000904	± 2.5	PASS
		VN	20	0.05	0.000027	± 2.5	PASS
		VN	30	3.46	0.001863	± 2.5	PASS
		VN	40	-1.51	-0.000813	± 2.5	PASS
		VN	50	3	0.001615	± 2.5	PASS
	MCH	VN	-30	0.66	0.000351	± 2.5	PASS
		VN	-20	1.91	0.001016	± 2.5	PASS
		VN	-10	4.24	0.002255	± 2.5	PASS
		VN	0	-1.84	-0.000979	± 2.5	PASS
		VN	10	-0.71	-0.000378	± 2.5	PASS
		VN	20	-1.6	-0.000851	± 2.5	PASS
		VN	30	0.62	0.000330	± 2.5	PASS
		VN	40	-0.5	-0.000266	± 2.5	PASS
		VN	50	-1.34	-0.000713	± 2.5	PASS
	HCH	VN	-30	4.68	0.002460	± 2.5	PASS
		VN	-20	1.15	0.000604	± 2.5	PASS
		VN	-10	0.84	0.000442	± 2.5	PASS
		VN	0	2.67	0.001403	± 2.5	PASS
		VN	10	2.62	0.001377	± 2.5	PASS
		VN	20	3.44	0.001808	± 2.5	PASS
		VN	30	3.35	0.001761	± 2.5	PASS
		VN	40	-0.25	-0.000131	± 2.5	PASS
		VN	50	-0.91	-0.000478	± 2.5	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	3.31	0.001780	± 2.5	PASS
		VN	TN	-0.2	-0.000108	± 2.5	PASS
		VH	TN	0.66	0.000355	± 2.5	PASS
	MCH	VL	TN	1.04	0.000553	± 2.5	PASS
		VN	TN	-2	-0.001064	± 2.5	PASS
		VH	TN	1.96	0.001043	± 2.5	PASS
	HCH	VL	TN	2	0.001053	± 2.5	PASS
		VN	TN	2.61	0.001374	± 2.5	PASS
		VH	TN	0.24	0.000126	± 2.5	PASS
16QAM	LCH	VL	TN	1.73	0.000930	± 2.5	PASS
		VN	TN	-1.37	-0.000737	± 2.5	PASS
		VH	TN	1.11	0.000597	± 2.5	PASS
	MCH	VL	TN	3.38	0.001798	± 2.5	PASS
		VN	TN	2.44	0.001298	± 2.5	PASS
		VH	TN	-1.55	-0.000824	± 2.5	PASS
	HCH	VL	TN	-0.5	-0.000263	± 2.5	PASS
		VN	TN	4.12	0.002168	± 2.5	PASS
		VH	TN	-0.57	-0.000300	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-1.98	-0.001065	± 2.5	PASS
		VN	-20	2.64	0.001419	± 2.5	PASS
		VN	-10	3.82	0.002054	± 2.5	PASS
		VN	0	4.87	0.002618	± 2.5	PASS
		VN	10	4.36	0.002344	± 2.5	PASS
		VN	20	1.24	0.000667	± 2.5	PASS
		VN	30	-1.93	-0.001038	± 2.5	PASS
		VN	40	2.77	0.001489	± 2.5	PASS
		VN	50	0.97	0.000522	± 2.5	PASS
	MCH	VN	-30	-0.63	-0.000335	± 2.5	PASS
		VN	-20	-1.93	-0.001027	± 2.5	PASS
		VN	-10	-0.69	-0.000367	± 2.5	PASS
		VN	0	-0.68	-0.000362	± 2.5	PASS
		VN	10	-0.57	-0.000303	± 2.5	PASS
		VN	20	-1.43	-0.000761	± 2.5	PASS

		VN	30	-1.33	-0.000707	± 2.5	PASS
		VN	40	1.72	0.000915	± 2.5	PASS
		VN	50	2.04	0.001085	± 2.5	PASS
	HCH	VN	-30	3.56	0.001874	± 2.5	PASS
		VN	-20	3.28	0.001726	± 2.5	PASS
		VN	-10	1.39	0.000732	± 2.5	PASS
		VN	0	2.58	0.001358	± 2.5	PASS
		VN	10	-0.36	-0.000189	± 2.5	PASS
		VN	20	2.39	0.001258	± 2.5	PASS
		VN	30	1.84	0.000968	± 2.5	PASS
		VN	40	0.92	0.000484	± 2.5	PASS
		VN	50	1.2	0.000632	± 2.5	PASS
16QAM	LCH	VN	-30	-1.3	-0.000699	± 2.5	PASS
		VN	-20	1.82	0.000978	± 2.5	PASS
		VN	-10	3.63	0.001952	± 2.5	PASS
		VN	0	1.74	0.000935	± 2.5	PASS
		VN	10	3.8	0.002043	± 2.5	PASS
		VN	20	1.77	0.000952	± 2.5	PASS
		VN	30	3.22	0.001731	± 2.5	PASS
		VN	40	-0.77	-0.000414	± 2.5	PASS
		VN	50	0.87	0.000468	± 2.5	PASS
	MCH	VN	-30	3.68	0.001957	± 2.5	PASS
		VN	-20	3.33	0.001771	± 2.5	PASS
		VN	-10	2.55	0.001356	± 2.5	PASS
		VN	0	-1.7	-0.000904	± 2.5	PASS
		VN	10	2.56	0.001362	± 2.5	PASS
		VN	20	1.45	0.000771	± 2.5	PASS
		VN	30	4.65	0.002473	± 2.5	PASS
		VN	40	3.32	0.001766	± 2.5	PASS
		VN	50	-0.95	-0.000505	± 2.5	PASS
	HCH	VN	-30	1.6	0.000842	± 2.5	PASS
		VN	-20	4.21	0.002216	± 2.5	PASS
		VN	-10	-1.65	-0.000868	± 2.5	PASS
		VN	0	-0.48	-0.000253	± 2.5	PASS
		VN	10	1.45	0.000763	± 2.5	PASS
		VN	20	-1.5	-0.000789	± 2.5	PASS
		VN	30	3.42	0.001800	± 2.5	PASS
		VN	40	0.01	0.000005	± 2.5	PASS
		VN	50	1.18	0.000621	± 2.5	PASS