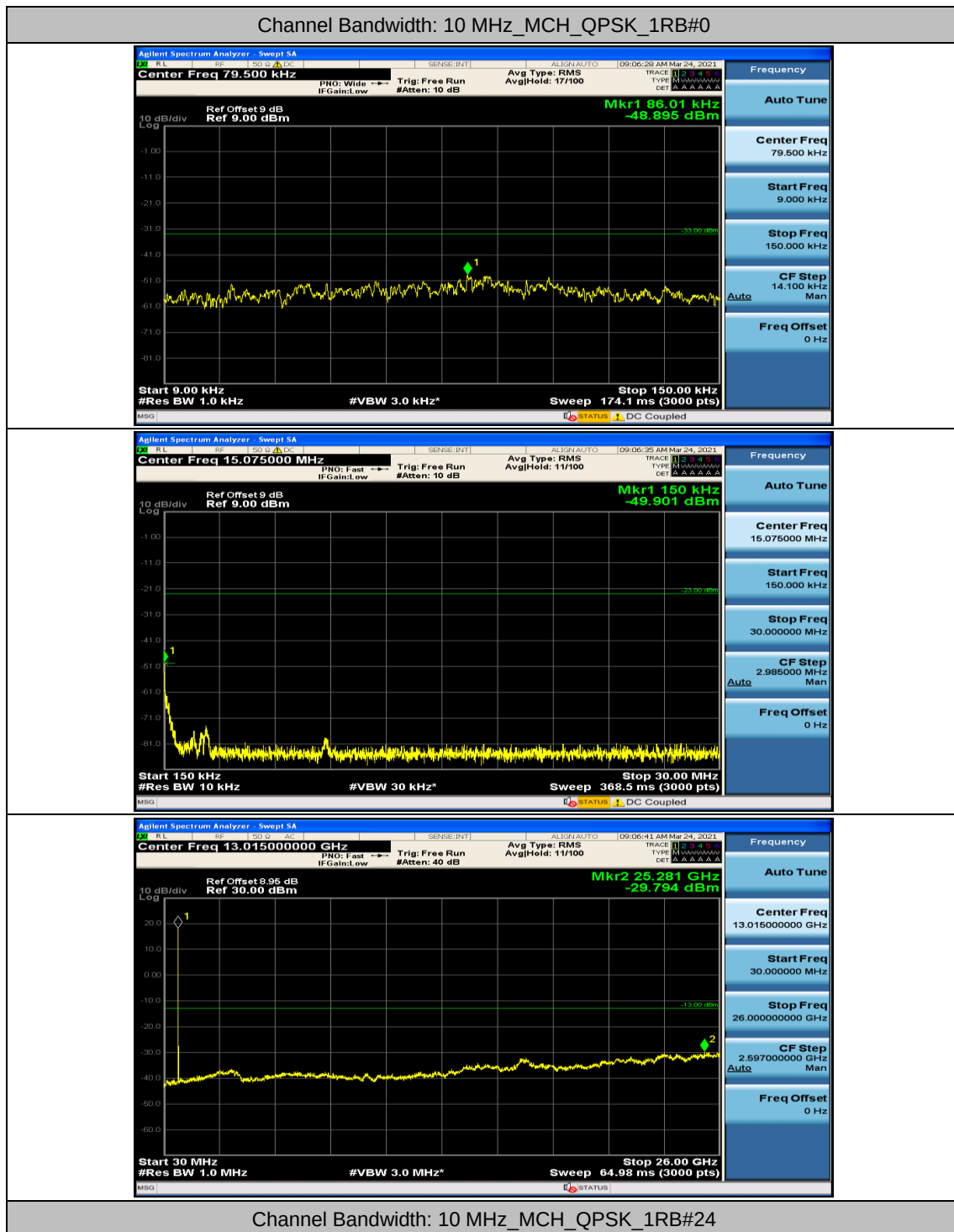
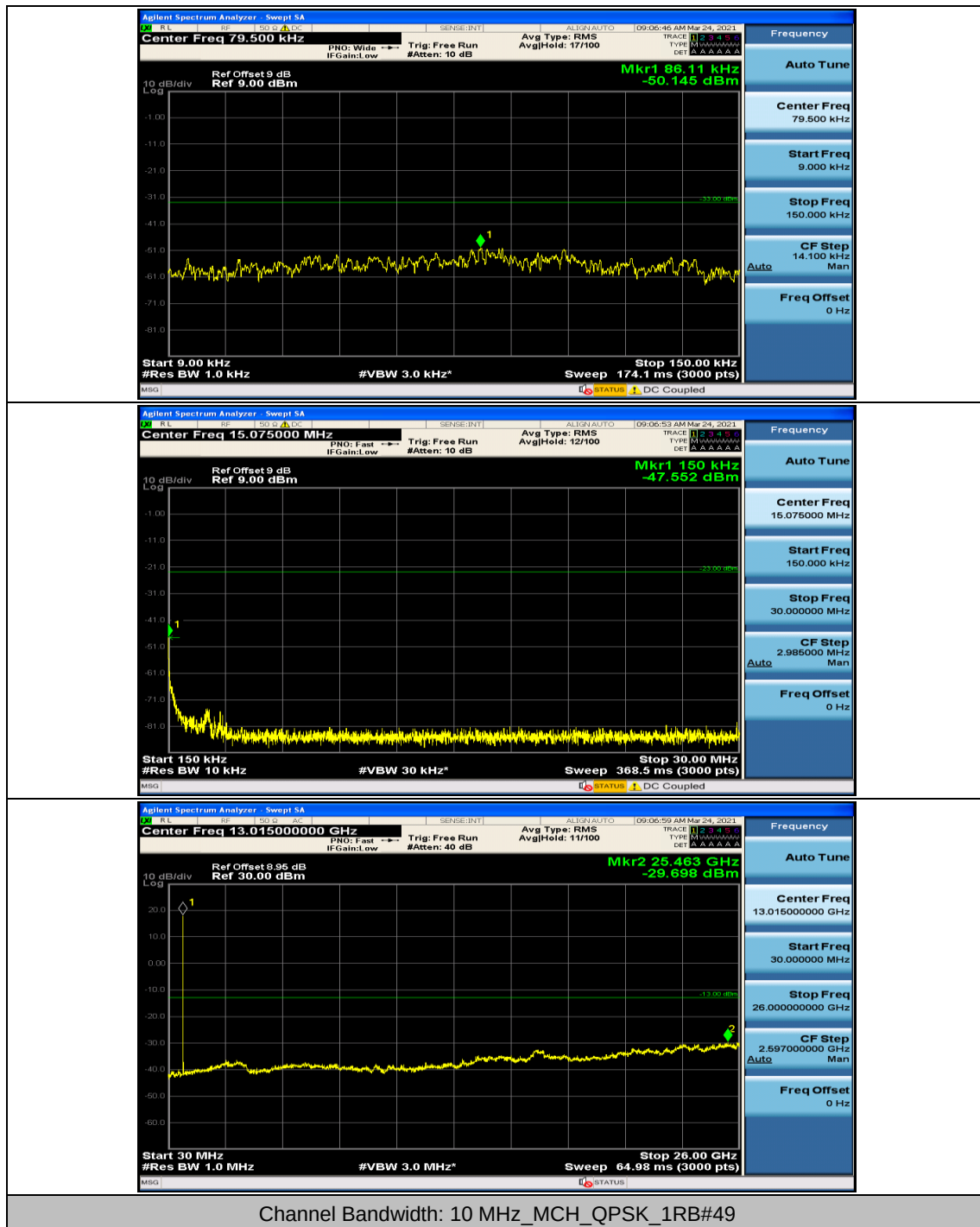
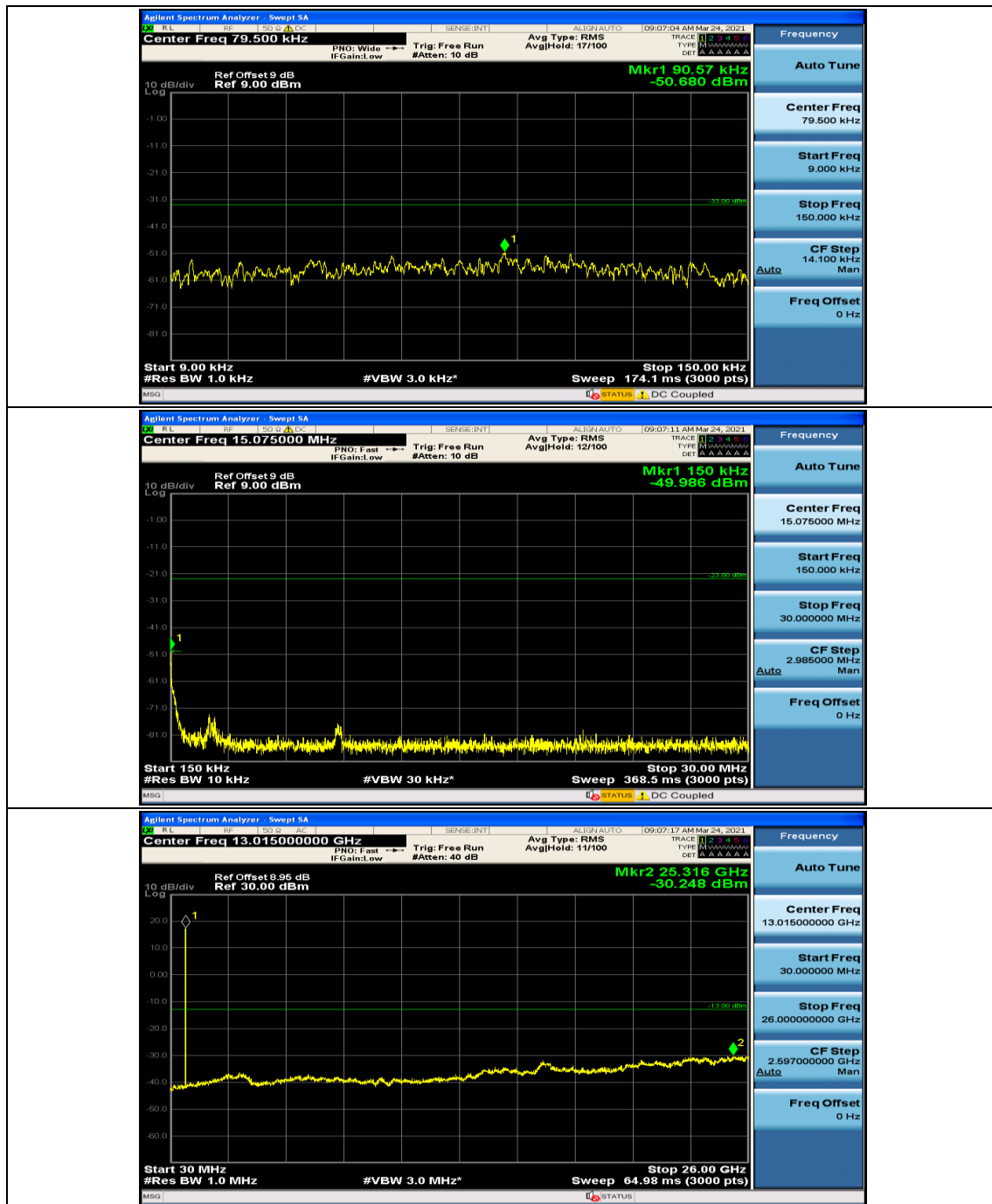
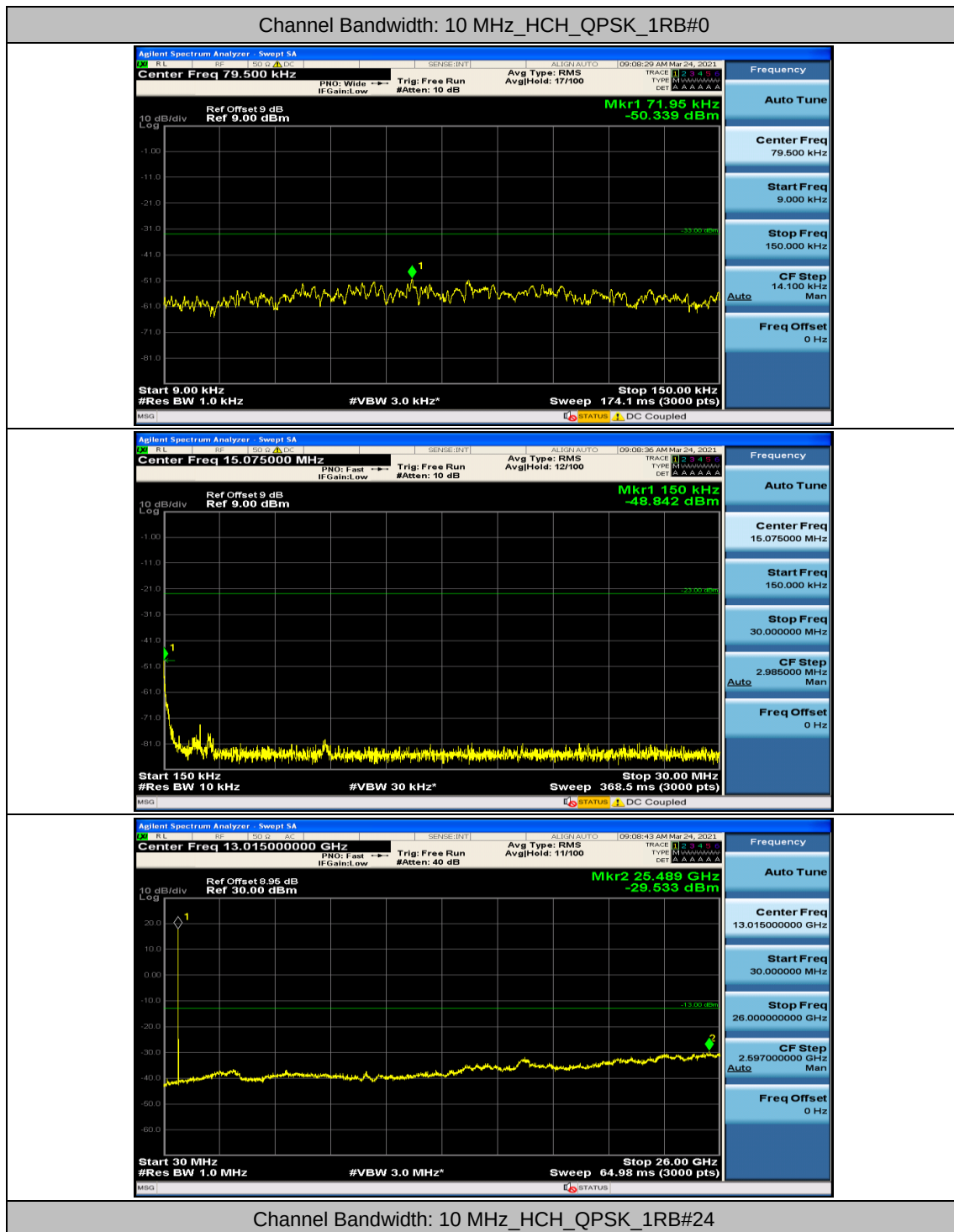
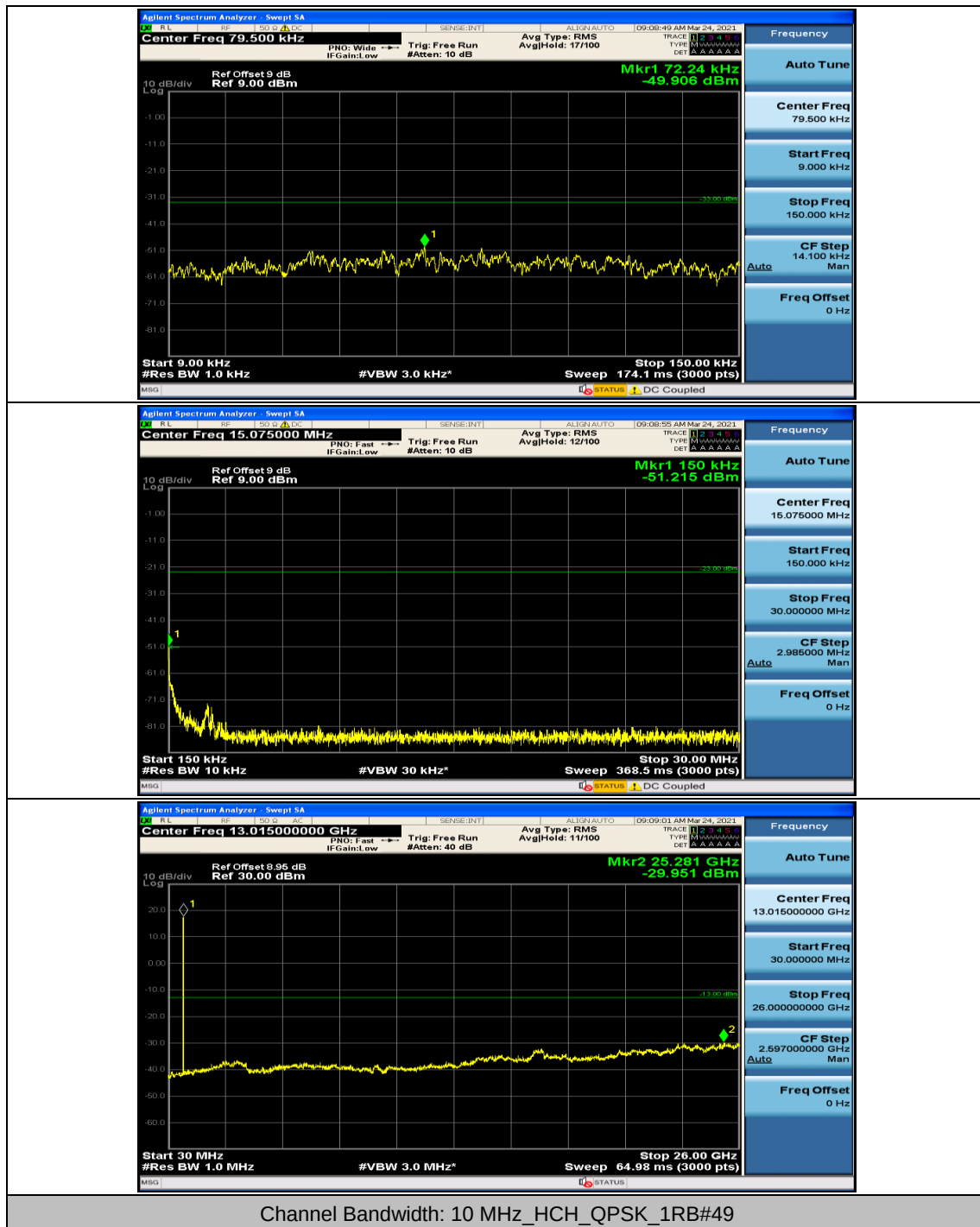


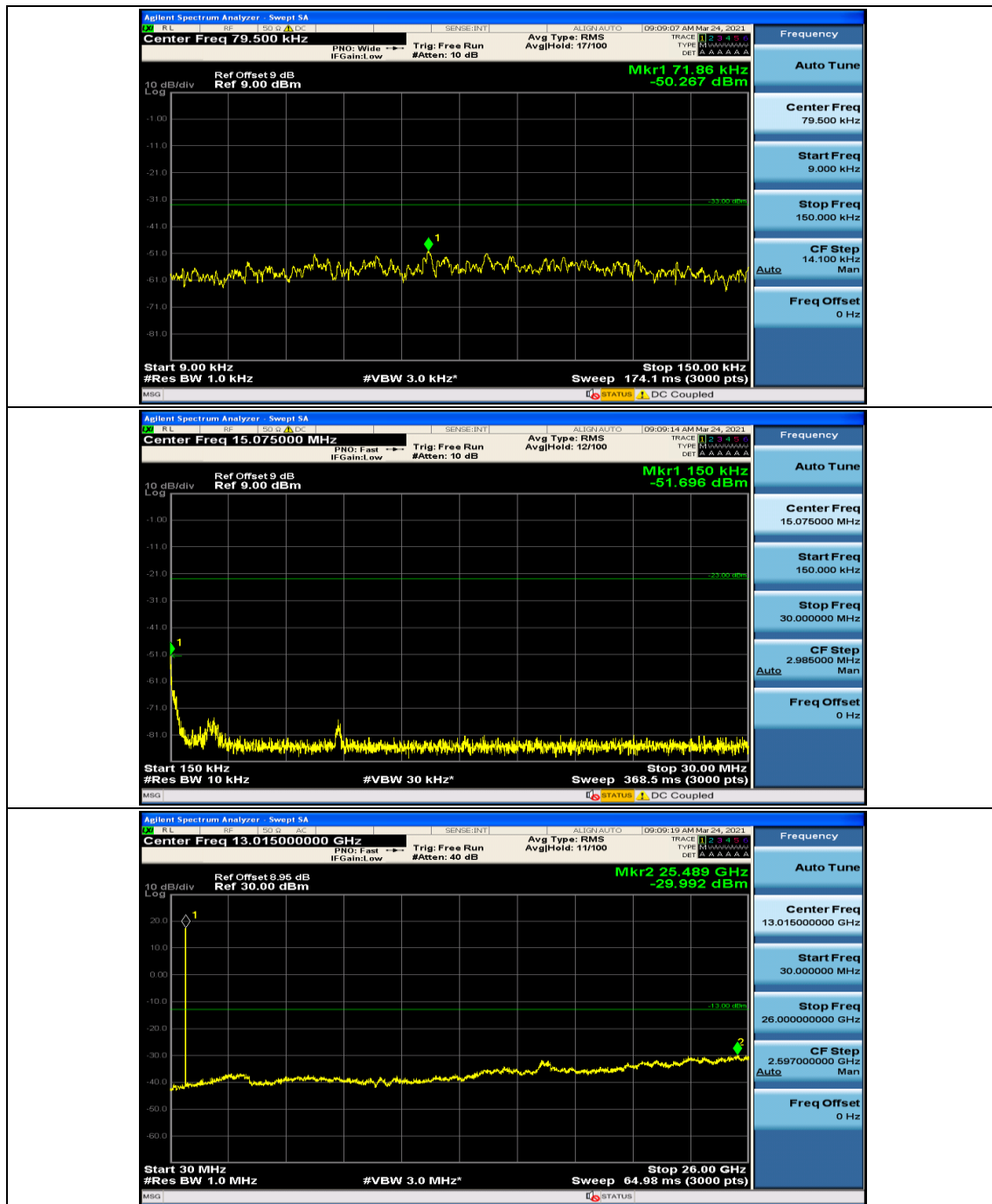


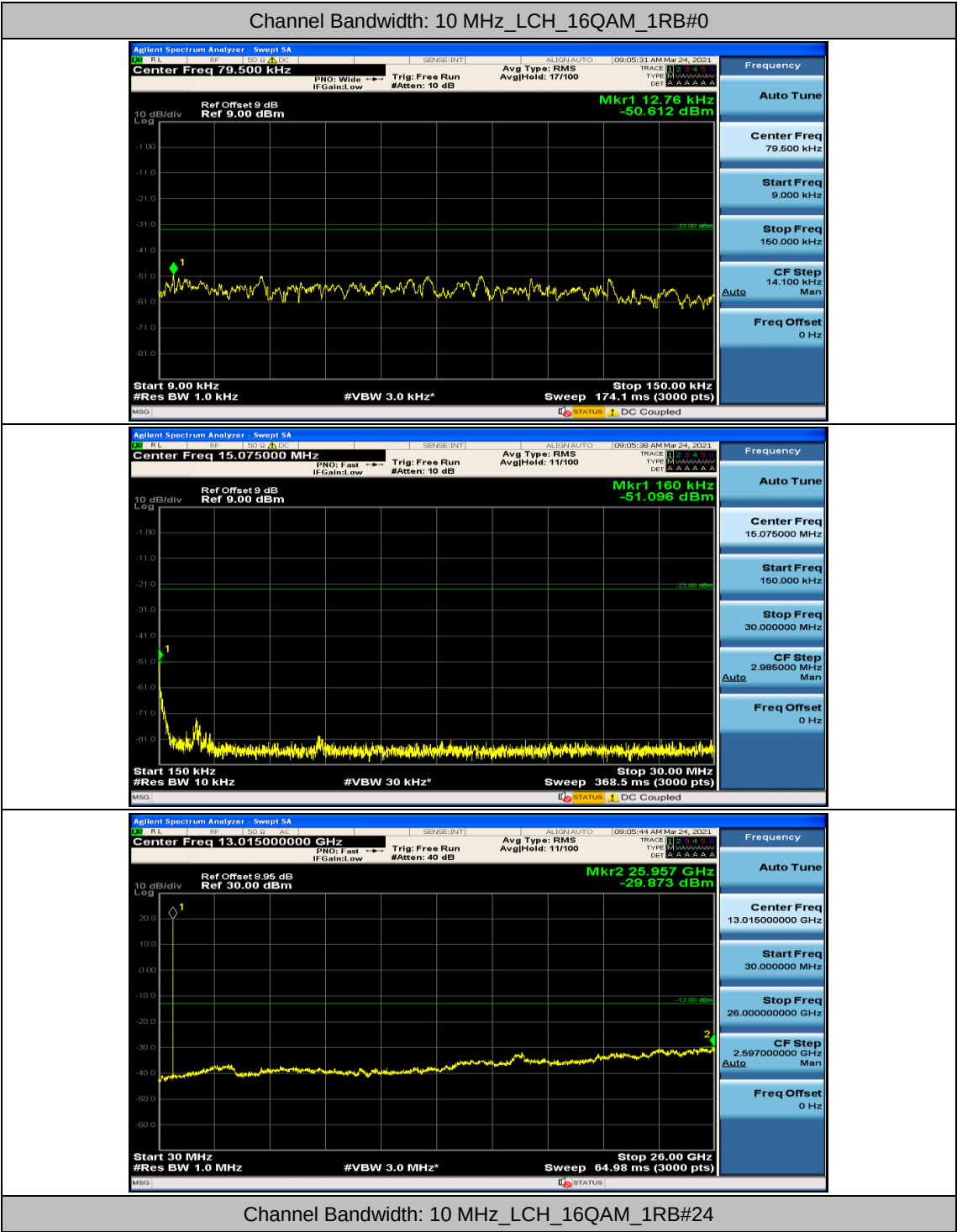


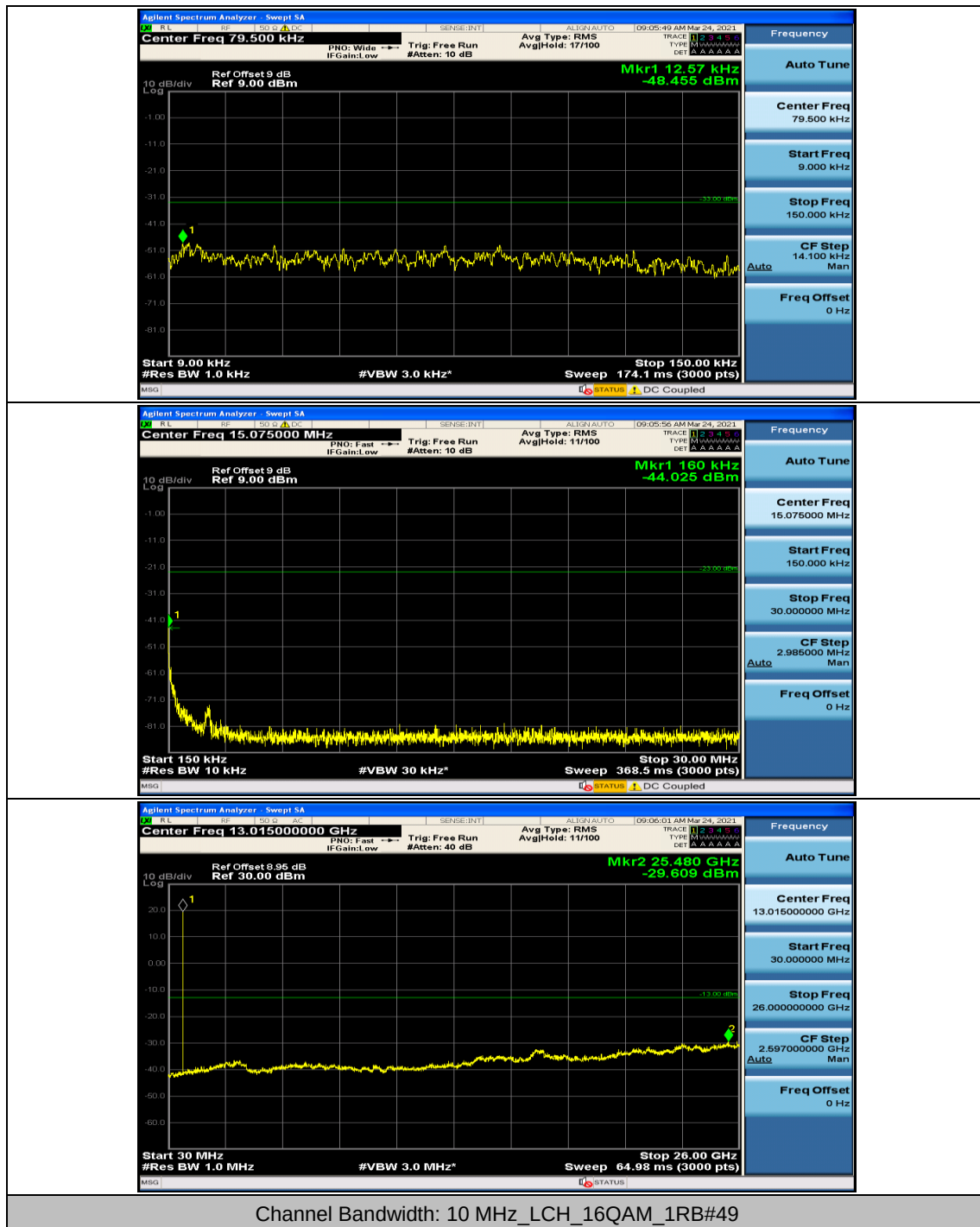


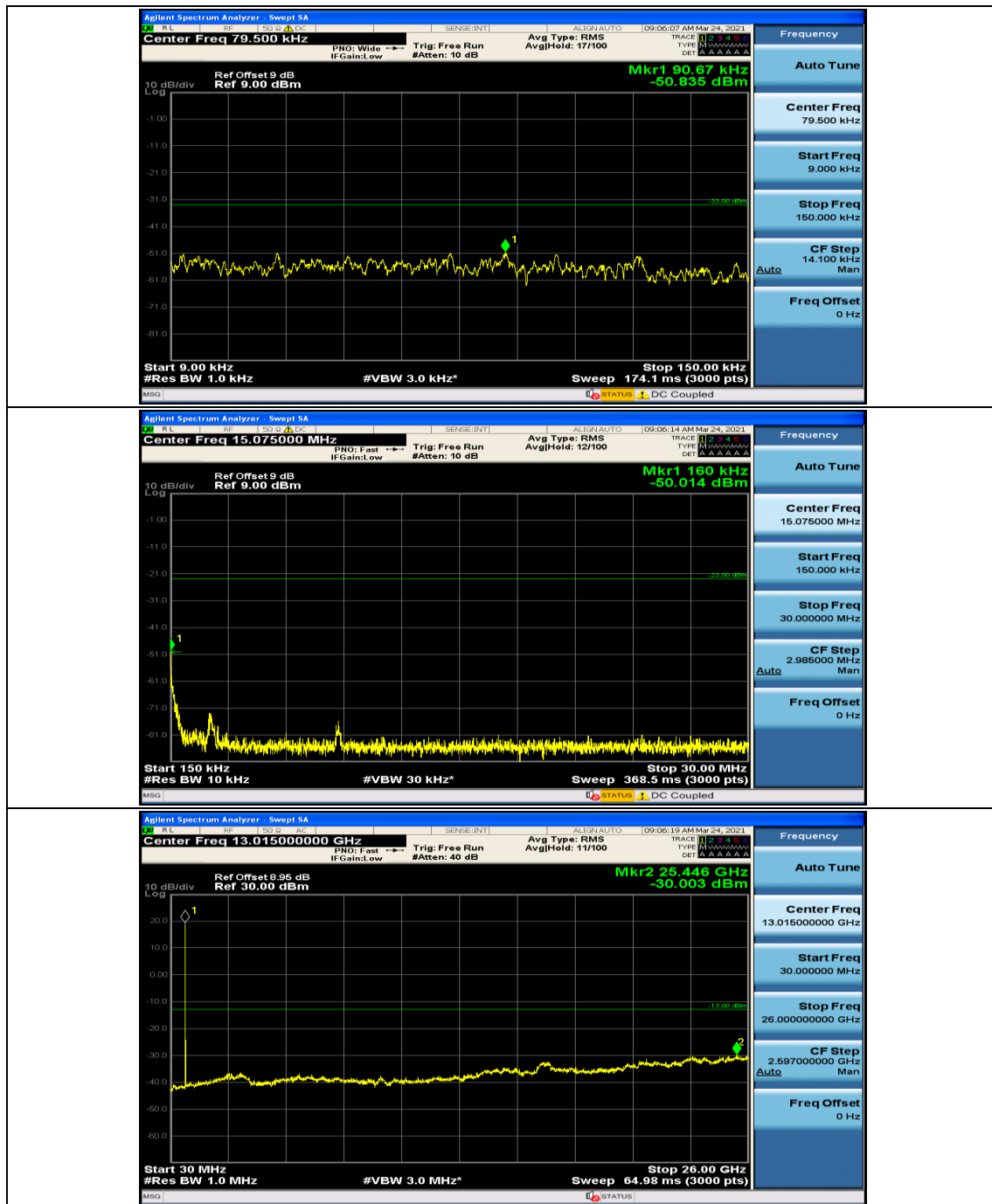


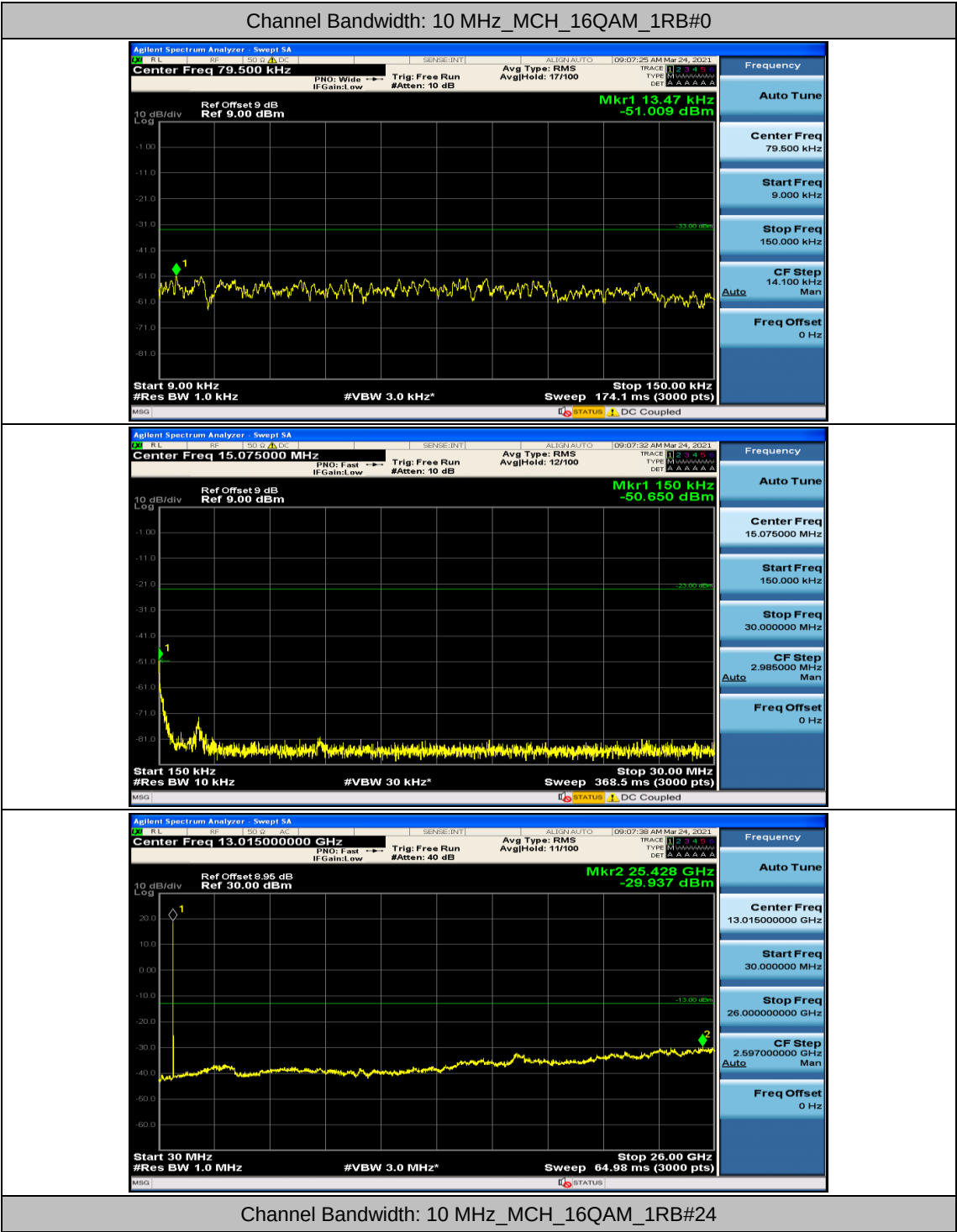


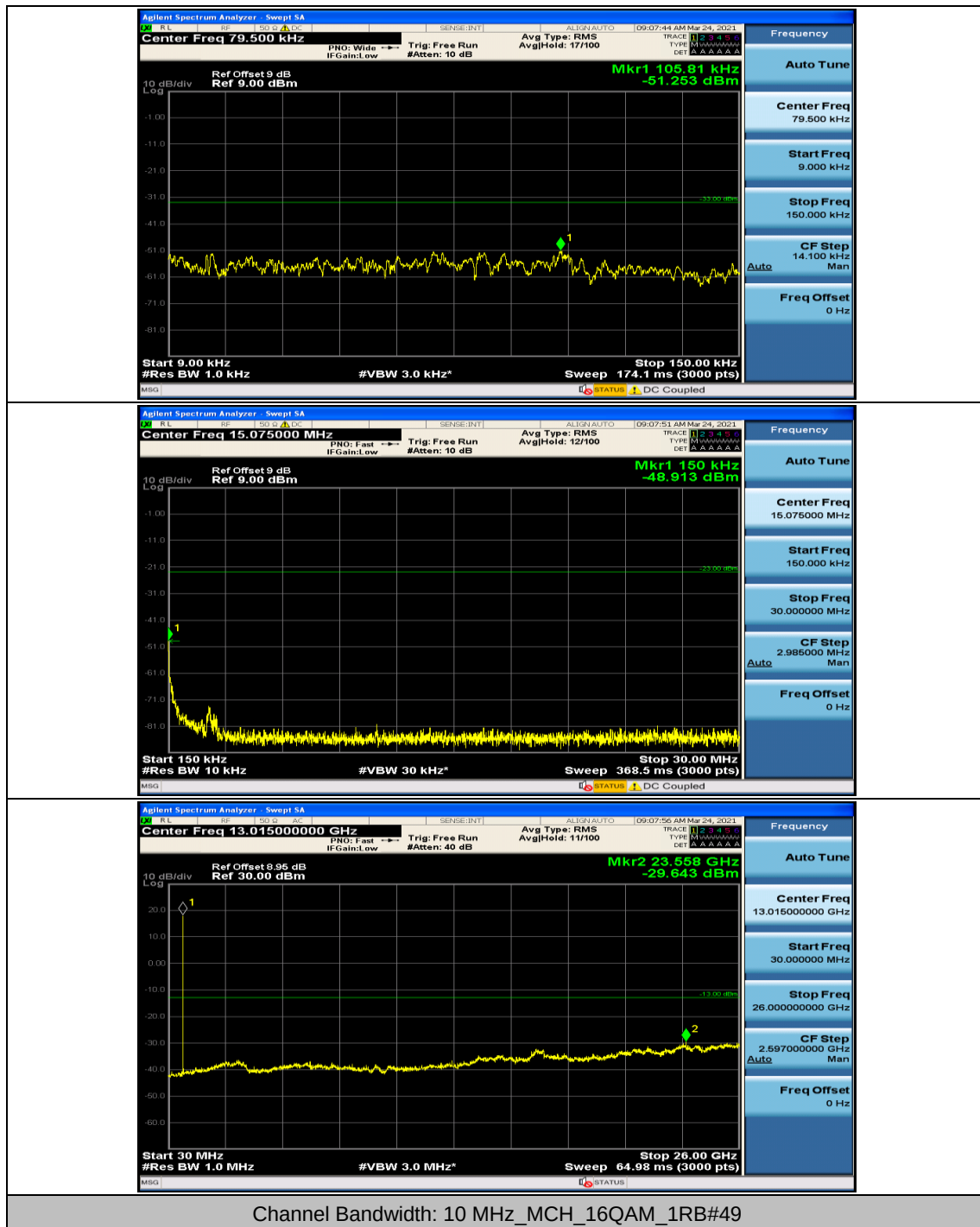


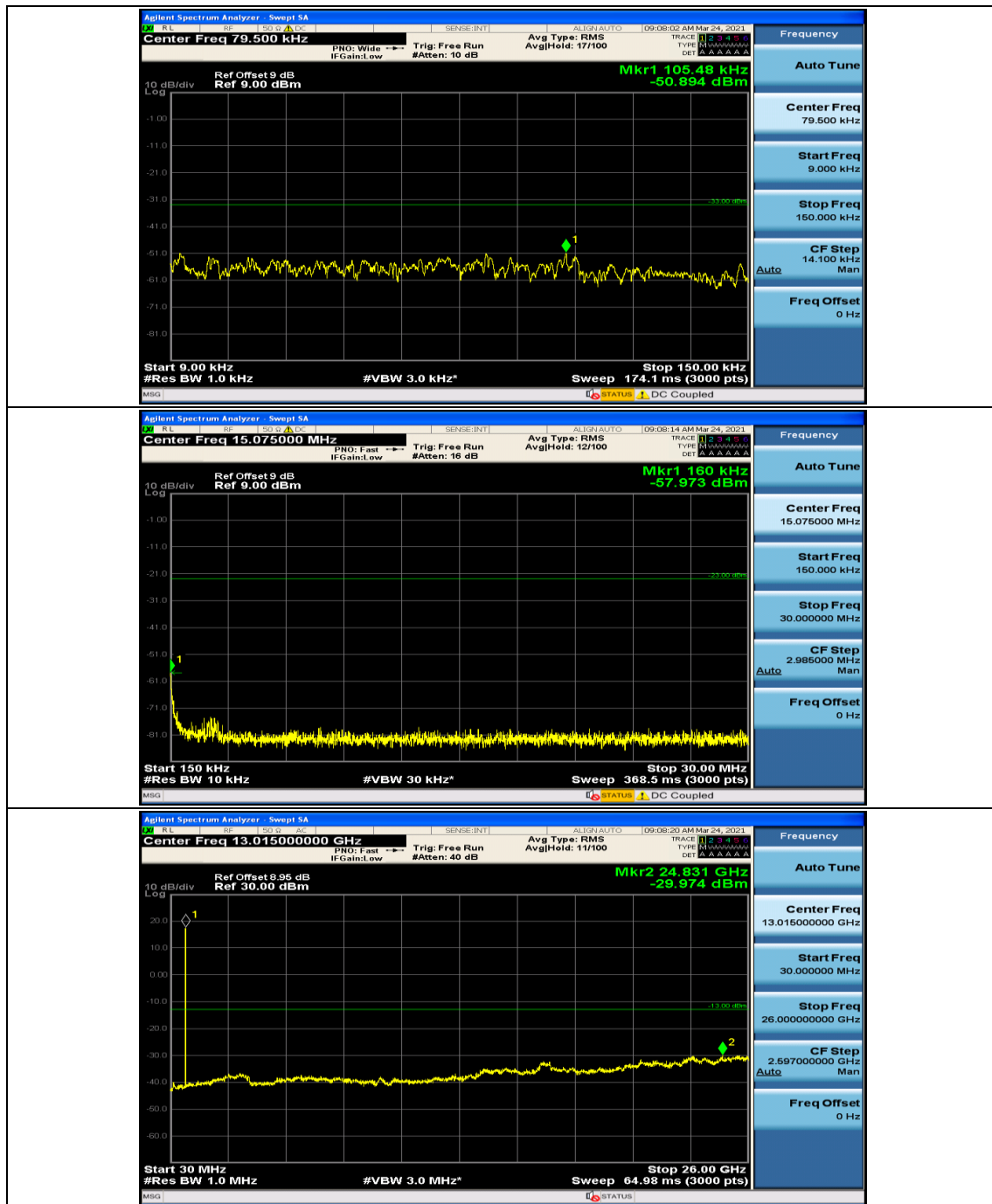


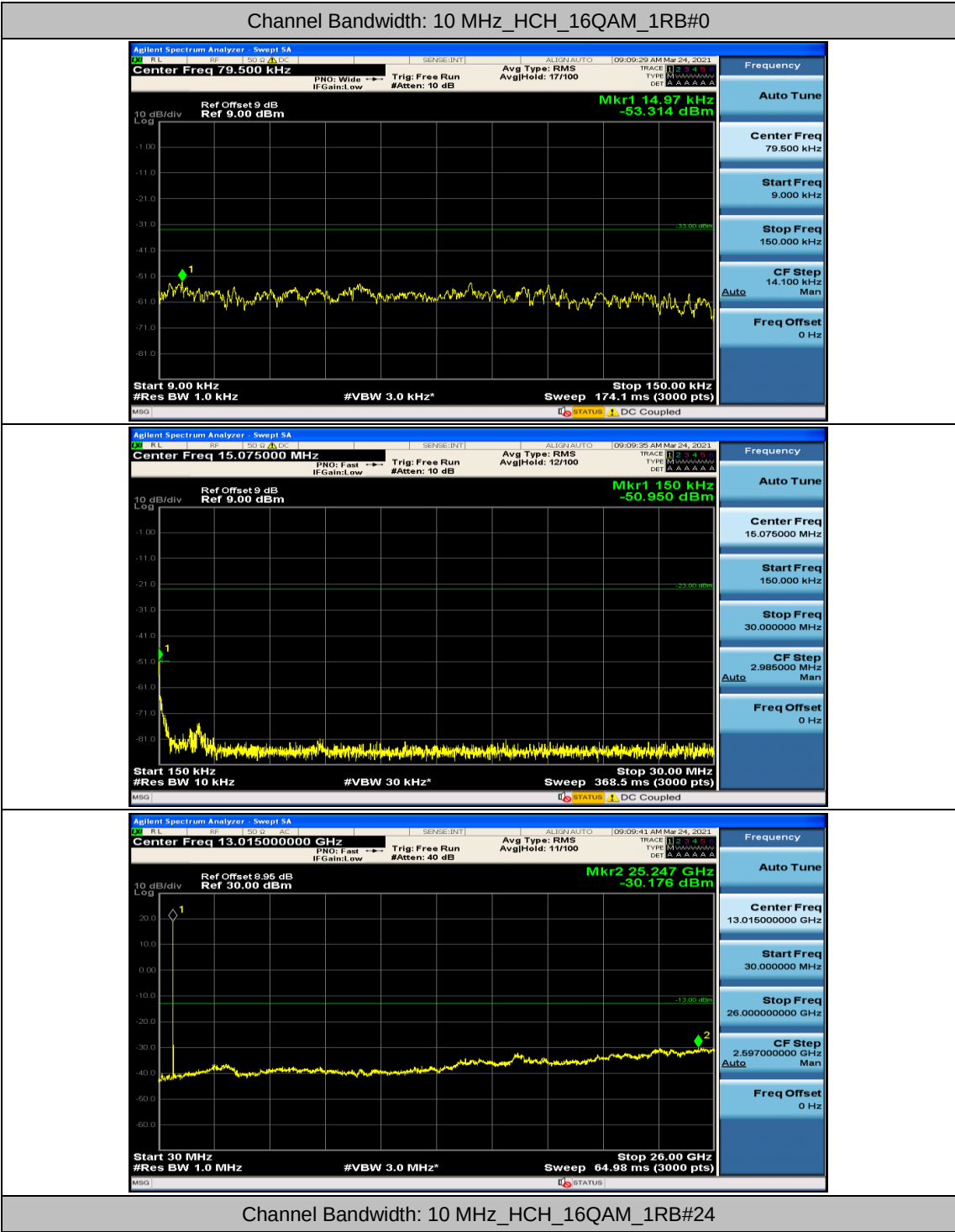


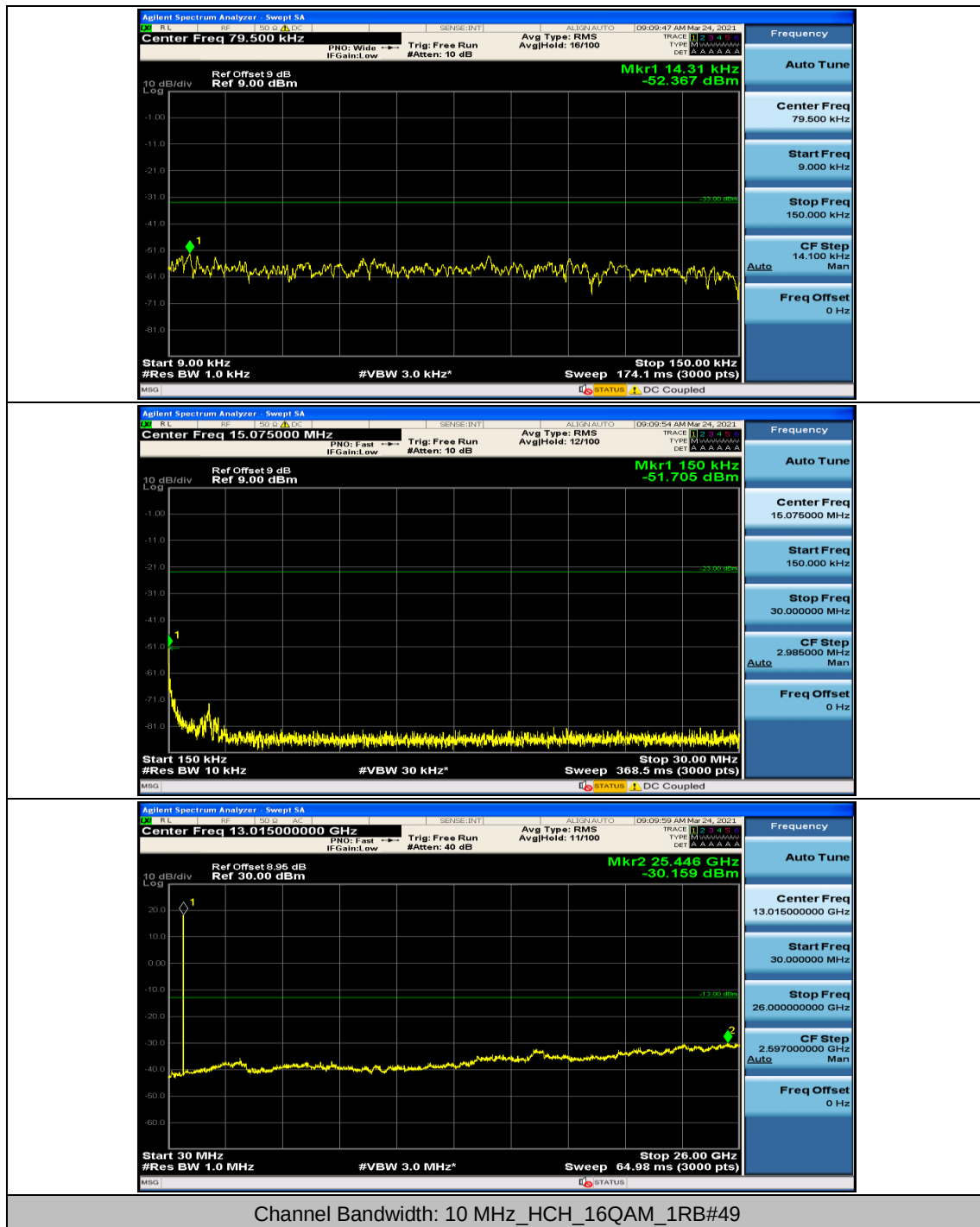


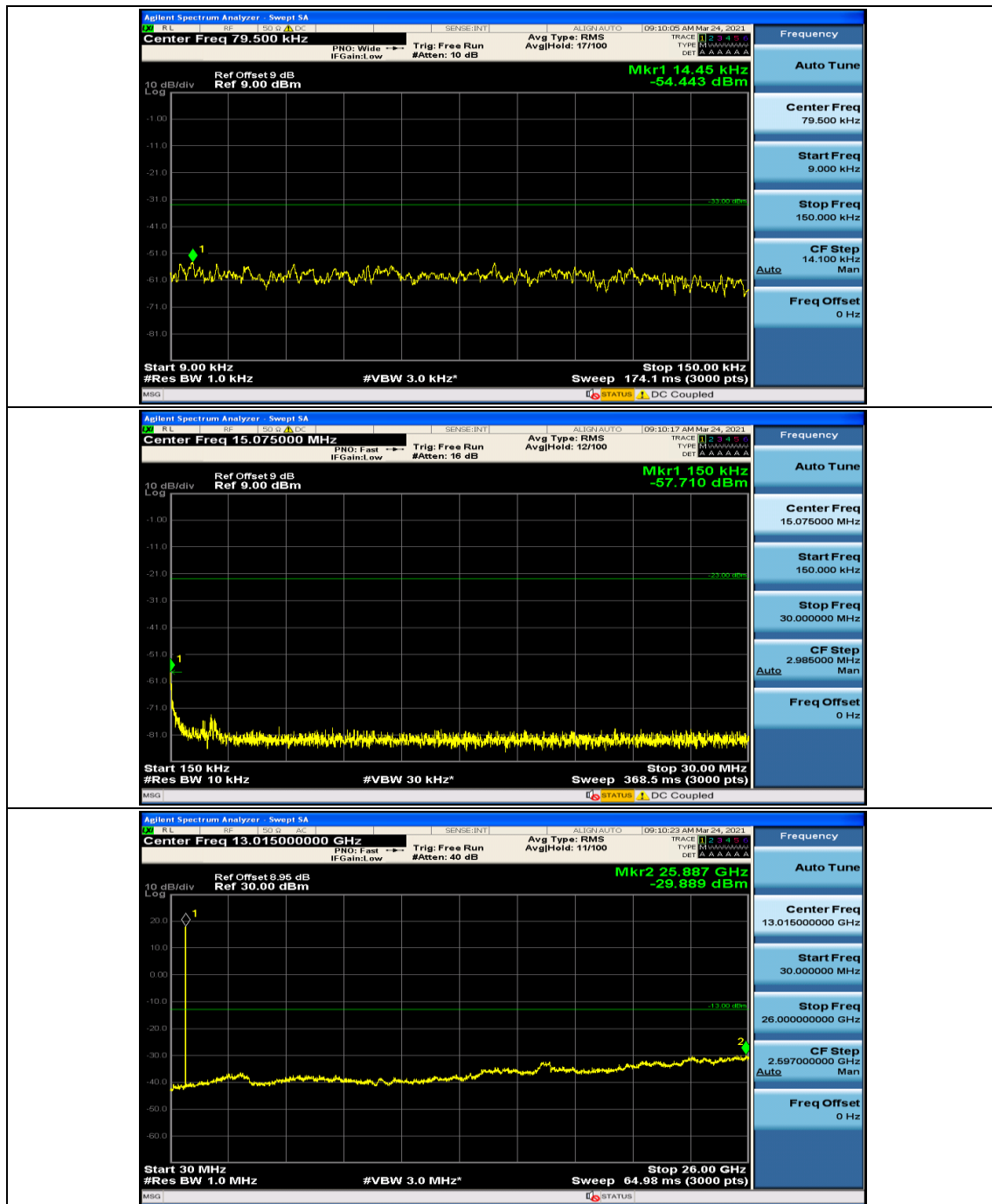












Appendix F: Frequency Stability

Test Result

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	-1.83	-0.002615	± 2.5	PASS
		VN	TN	1.82	0.002601	± 2.5	PASS
		VH	TN	4.43	0.006331	± 2.5	PASS
	MCH	VL	TN	3.04	0.004297	± 2.5	PASS
		VN	TN	4.24	0.005993	± 2.5	PASS
		VH	TN	1.31	0.001852	± 2.5	PASS
	HCH	VL	TN	1.23	0.001720	± 2.5	PASS
		VN	TN	2.73	0.003817	± 2.5	PASS
		VH	TN	2.53	0.003537	± 2.5	PASS
16QAM	LCH	VL	TN	4.95	0.007074	± 2.5	PASS
		VN	TN	2.82	0.004030	± 2.5	PASS
		VH	TN	-1.55	-0.002215	± 2.5	PASS
	MCH	VL	TN	-1.78	-0.002516	± 2.5	PASS
		VN	TN	1.62	0.002290	± 2.5	PASS
		VH	TN	4.11	0.005809	± 2.5	PASS
	HCH	VL	TN	4.16	0.005816	± 2.5	PASS
		VN	TN	2.83	0.003956	± 2.5	PASS
		VH	TN	4.44	0.006207	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-0.65	-0.000929	± 2.5	PASS
		VN	-20	3.56	0.005088	± 2.5	PASS
		VN	-10	-0.53	-0.000757	± 2.5	PASS
		VN	0	3.64	0.005202	± 2.5	PASS
		VN	10	0.89	0.001272	± 2.5	PASS
		VN	20	1.19	0.001701	± 2.5	PASS
		VN	30	2.11	0.003016	± 2.5	PASS
		VN	40	1.53	0.002187	± 2.5	PASS
		VN	50	-0.04	-0.000057	± 2.5	PASS

	MCH	VN	-30	1.04	0.001470	± 2.5	PASS
		VN	-20	-1.88	-0.002657	± 2.5	PASS
		VN	-10	-0.57	-0.000806	± 2.5	PASS
		VN	0	0.93	0.001314	± 2.5	PASS
		VN	10	-1.13	-0.001597	± 2.5	PASS
		VN	20	0.65	0.000919	± 2.5	PASS
		VN	30	4.82	0.006813	± 2.5	PASS
		VN	40	4.6	0.006502	± 2.5	PASS
		VN	50	-0.88	-0.001244	± 2.5	PASS
	HCH	VN	-30	1.86	0.002600	± 2.5	PASS
		VN	-20	-0.38	-0.000531	± 2.5	PASS
		VN	-10	-1.31	-0.001831	± 2.5	PASS
		VN	0	0.88	0.001230	± 2.5	PASS
		VN	10	2.91	0.004068	± 2.5	PASS
		VN	20	0.51	0.000713	± 2.5	PASS
		VN	30	-1.45	-0.002027	± 2.5	PASS
		VN	40	4.09	0.005718	± 2.5	PASS
		VN	50	2.3	0.003215	± 2.5	PASS
16QAM	LCH	VN	-30	2.25	0.003216	± 2.5	PASS
		VN	-20	3.32	0.004745	± 2.5	PASS
		VN	-10	-0.93	-0.001329	± 2.5	PASS
		VN	0	0.28	0.000400	± 2.5	PASS
		VN	10	-0.65	-0.000929	± 2.5	PASS
		VN	20	4.28	0.006117	± 2.5	PASS
		VN	30	-1.26	-0.001801	± 2.5	PASS
		VN	40	4.93	0.007046	± 2.5	PASS
		VN	50	1.73	0.002472	± 2.5	PASS
	MCH	VN	-30	-1.1	-0.001555	± 2.5	PASS
		VN	-20	2.43	0.003435	± 2.5	PASS
		VN	-10	1.17	0.001654	± 2.5	PASS
		VN	0	2.95	0.004170	± 2.5	PASS
		VN	10	0.36	0.000509	± 2.5	PASS
		VN	20	4.22	0.005965	± 2.5	PASS
		VN	30	1.31	0.001852	± 2.5	PASS
		VN	40	3.53	0.004989	± 2.5	PASS
		VN	50	1.38	0.001951	± 2.5	PASS
	HCH	VN	-30	0.87	0.001216	± 2.5	PASS
		VN	-20	4.84	0.006766	± 2.5	PASS
		VN	-10	2.78	0.003886	± 2.5	PASS
		VN	0	-1.61	-0.002251	± 2.5	PASS
		VN	10	2.37	0.003313	± 2.5	PASS

		VN	20	4.12	0.005760	± 2.5	PASS
		VN	30	0.72	0.001007	± 2.5	PASS
		VN	40	2.54	0.003551	± 2.5	PASS
		VN	50	2.43	0.003397	± 2.5	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz+							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	1.85	0.002641	± 2.5	PASS
		VN	TN	3.31	0.004725	± 2.5	PASS
		VH	TN	-1.81	-0.002584	± 2.5	PASS
	MCH	VL	TN	1.43	0.002021	± 2.5	PASS
		VN	TN	-0.95	-0.001343	± 2.5	PASS
		VH	TN	-1.11	-0.001569	± 2.5	PASS
	HCH	VL	TN	3.21	0.004493	± 2.5	PASS
		VN	TN	0.33	0.000462	± 2.5	PASS
		VH	TN	3.78	0.005290	± 2.5	PASS
16QAM	LCH	VL	TN	1.11	0.001585	± 2.5	PASS
		VN	TN	-0.39	-0.000557	± 2.5	PASS
		VH	TN	0.54	0.000771	± 2.5	PASS
	MCH	VL	TN	-1.9	-0.002686	± 2.5	PASS
		VN	TN	1.96	0.002770	± 2.5	PASS
		VH	TN	-0.82	-0.001159	± 2.5	PASS
	HCH	VL	TN	2.05	0.002869	± 2.5	PASS
		VN	TN	2.76	0.003863	± 2.5	PASS
		VH	TN	4.97	0.006956	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-0.31	-0.000443	± 2.5	PASS
		VN	-20	3.47	0.004954	± 2.5	PASS
		VN	-10	0.46	0.000657	± 2.5	PASS
		VN	0	2.29	0.003269	± 2.5	PASS
		VN	10	-0.47	-0.000671	± 2.5	PASS
		VN	20	0.77	0.001099	± 2.5	PASS
		VN	30	0.19	0.000271	± 2.5	PASS
		VN	40	-0.18	-0.000257	± 2.5	PASS
		VN	50	-0.28	-0.000400	± 2.5	PASS
	MCH	VN	-30	1.8	0.002544	± 2.5	PASS

		VN	-20	-1.78	-0.002516	± 2.5	PASS
		VN	-10	-0.19	-0.000269	± 2.5	PASS
		VN	0	1.91	0.002700	± 2.5	PASS
		VN	10	0.43	0.000608	± 2.5	PASS
		VN	20	2.89	0.004085	± 2.5	PASS
		VN	30	1.57	0.002219	± 2.5	PASS
		VN	40	0.32	0.000452	± 2.5	PASS
		VN	50	-1.1	-0.001555	± 2.5	PASS
	HCH	VN	-30	-0.14	-0.000196	± 2.5	PASS
		VN	-20	1.95	0.002729	± 2.5	PASS
		VN	-10	-0.38	-0.000532	± 2.5	PASS
		VN	0	4.8	0.006718	± 2.5	PASS
		VN	10	2.02	0.002827	± 2.5	PASS
		VN	20	2.96	0.004143	± 2.5	PASS
		VN	30	-0.04	-0.000056	± 2.5	PASS
		VN	40	1.12	0.001568	± 2.5	PASS
		VN	50	-0.65	-0.000910	± 2.5	PASS
16QAM	LCH	VN	-30	1.64	0.002341	± 2.5	PASS
		VN	-20	1.78	0.002541	± 2.5	PASS
		VN	-10	-0.82	-0.001171	± 2.5	PASS
		VN	0	0.01	0.000014	± 2.5	PASS
		VN	10	1.42	0.002027	± 2.5	PASS
		VN	20	3.48	0.004968	± 2.5	PASS
		VN	30	-0.75	-0.001071	± 2.5	PASS
		VN	40	4.66	0.006652	± 2.5	PASS
		VN	50	3.2	0.004568	± 2.5	PASS
	MCH	VN	-30	3.2	0.004523	± 2.5	PASS
		VN	-20	0.2	0.000283	± 2.5	PASS
		VN	-10	-1.53	-0.002163	± 2.5	PASS
		VN	0	2.06	0.002912	± 2.5	PASS
		VN	10	0.79	0.001117	± 2.5	PASS
		VN	20	1.26	0.001781	± 2.5	PASS
		VN	30	4.56	0.006445	± 2.5	PASS
		VN	40	3.14	0.004438	± 2.5	PASS
		VN	50	2.35	0.003322	± 2.5	PASS
	HCH	VN	-30	-0.39	-0.000546	± 2.5	PASS
		VN	-20	-0.6	-0.000840	± 2.5	PASS
		VN	-10	4.33	0.006060	± 2.5	PASS
		VN	0	0.38	0.000532	± 2.5	PASS
		VN	10	3.55	0.004969	± 2.5	PASS
		VN	20	-0.13	-0.000182	± 2.5	PASS

		VN	30	2.86	0.004003	± 2.5	PASS
		VN	40	3.7	0.005178	± 2.5	PASS
		VN	50	-1.37	-0.001917	± 2.5	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	-1.16	-0.001654	± 2.5	PASS
		VN	TN	4.11	0.005859	± 2.5	PASS
		VH	TN	0.55	0.000784	± 2.5	PASS
	MCH	VL	TN	2.11	0.002982	± 2.5	PASS
		VN	TN	0.65	0.000919	± 2.5	PASS
		VH	TN	-0.86	-0.001216	± 2.5	PASS
	HCH	VL	TN	1.67	0.002341	± 2.5	PASS
		VN	TN	0.38	0.000533	± 2.5	PASS
		VH	TN	-1.34	-0.001878	± 2.5	PASS
16QAM	LCH	VL	TN	1.44	0.002053	± 2.5	PASS
		VN	TN	-1.63	-0.002324	± 2.5	PASS
		VH	TN	-1.78	-0.002537	± 2.5	PASS
	MCH	VL	TN	3.37	0.004763	± 2.5	PASS
		VN	TN	4.01	0.005668	± 2.5	PASS
		VH	TN	3.85	0.005442	± 2.5	PASS
	HCH	VL	TN	-0.92	-0.001289	± 2.5	PASS
		VN	TN	4.9	0.006868	± 2.5	PASS
		VH	TN	-1.37	-0.001920	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-1.49	-0.002124	± 2.5	PASS
		VN	-20	4.87	0.006942	± 2.5	PASS
		VN	-10	0.12	0.000171	± 2.5	PASS
		VN	0	0.31	0.000442	± 2.5	PASS
		VN	10	1.81	0.002580	± 2.5	PASS
		VN	20	-1.55	-0.002210	± 2.5	PASS
		VN	30	-0.49	-0.000699	± 2.5	PASS
		VN	40	0.19	0.000271	± 2.5	PASS
		VN	50	-0.54	-0.000770	± 2.5	PASS
	MCH	VN	-30	0.47	0.000664	± 2.5	PASS
		VN	-20	-1.73	-0.002445	± 2.5	PASS

		VN	-10	4.22	0.005965	± 2.5	PASS	
		VN	0	0.81	0.001145	± 2.5	PASS	
		VN	10	-0.9	-0.001272	± 2.5	PASS	
		VN	20	0.99	0.001399	± 2.5	PASS	
		VN	30	4.56	0.006445	± 2.5	PASS	
		VN	40	-1.49	-0.002106	± 2.5	PASS	
		VN	50	2.79	0.003943	± 2.5	PASS	
	HCH	VN	-30	3.96	0.005550	± 2.5	PASS	
		VN	-20	0.17	0.000238	± 2.5	PASS	
		VN	-10	0	0.000000	± 2.5	PASS	
		VN	0	4.28	0.005999	± 2.5	PASS	
		VN	10	2.48	0.003476	± 2.5	PASS	
		VN	20	-0.69	-0.000967	± 2.5	PASS	
		VN	30	-1.15	-0.001612	± 2.5	PASS	
		VN	40	3.98	0.005578	± 2.5	PASS	
		VN	50	1.87	0.002621	± 2.5	PASS	
	16QAM	LCH	VN	-30	-0.18	-0.000257	± 2.5	PASS
			VN	-20	4.03	0.005745	± 2.5	PASS
VN			-10	4.67	0.006657	± 2.5	PASS	
VN			0	3.12	0.004448	± 2.5	PASS	
VN			10	-1.99	-0.002837	± 2.5	PASS	
VN			20	4.8	0.006842	± 2.5	PASS	
VN			30	0.95	0.001354	± 2.5	PASS	
VN			40	4.34	0.006187	± 2.5	PASS	
VN			50	-1.38	-0.001967	± 2.5	PASS	
MCH		VN	-30	4.6	0.006502	± 2.5	PASS	
		VN	-20	-1.82	-0.002572	± 2.5	PASS	
		VN	-10	2.28	0.003223	± 2.5	PASS	
		VN	0	4.77	0.006742	± 2.5	PASS	
		VN	10	-0.39	-0.000551	± 2.5	PASS	
		VN	20	0.16	0.000226	± 2.5	PASS	
		VN	30	1.63	0.002304	± 2.5	PASS	
		VN	40	2.38	0.003364	± 2.5	PASS	
		VN	50	4.07	0.005753	± 2.5	PASS	
HCH		VN	-30	4.4	0.006167	± 2.5	PASS	
		VN	-20	1.98	0.002775	± 2.5	PASS	
		VN	-10	-1.2	-0.001682	± 2.5	PASS	
		VN	0	-0.11	-0.000154	± 2.5	PASS	
		VN	10	0.75	0.001051	± 2.5	PASS	
		VN	20	1.21	0.001696	± 2.5	PASS	
		VN	30	-0.39	-0.000547	± 2.5	PASS	

		VN	40	0.57	0.000799	± 2.5	PASS
		VN	50	2.79	0.003910	± 2.5	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	3.2	0.004545	± 2.5	PASS
		VN	TN	3.22	0.004574	± 2.5	PASS
		VH	TN	0.21	0.000298	± 2.5	PASS
	MCH	VL	TN	4.78	0.006756	± 2.5	PASS
		VN	TN	-0.76	-0.001074	± 2.5	PASS
		VH	TN	-0.04	-0.000057	± 2.5	PASS
	HCH	VL	TN	2.32	0.003263	± 2.5	PASS
		VN	TN	-0.55	-0.000774	± 2.5	PASS
		VH	TN	3.8	0.005345	± 2.5	PASS
16QAM	LCH	VL	TN	2.47	0.003509	± 2.5	PASS
		VN	TN	1.03	0.001463	± 2.5	PASS
		VH	TN	2.7	0.003835	± 2.5	PASS
	MCH	VL	TN	0.95	0.001343	± 2.5	PASS
		VN	TN	-1.65	-0.002332	± 2.5	PASS
		VH	TN	-0.87	-0.001230	± 2.5	PASS
	HCH	VL	TN	3.97	0.005584	± 2.5	PASS
		VN	TN	-0.09	-0.000127	± 2.5	PASS
		VH	TN	-1.61	-0.002264	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	2.73	0.003878	± 2.5	PASS
		VN	-20	-1.88	-0.002670	± 2.5	PASS
		VN	-10	4.82	0.006847	± 2.5	PASS
		VN	0	2.92	0.004148	± 2.5	PASS
		VN	10	1.23	0.001747	± 2.5	PASS
		VN	20	4.89	0.006946	± 2.5	PASS
		VN	30	3.09	0.004389	± 2.5	PASS
		VN	40	3.81	0.005412	± 2.5	PASS
		VN	50	4.95	0.007031	± 2.5	PASS
	MCH	VN	-30	2.83	0.004000	± 2.5	PASS
		VN	-20	3.82	0.005399	± 2.5	PASS
		VN	-10	3.64	0.005145	± 2.5	PASS

		VN	0	-0.2	-0.000283	± 2.5	PASS
		VN	10	1.54	0.002177	± 2.5	PASS
		VN	20	-0.28	-0.000396	± 2.5	PASS
		VN	30	1.33	0.001880	± 2.5	PASS
		VN	40	-0.37	-0.000523	± 2.5	PASS
		VN	50	0.85	0.001201	± 2.5	PASS
	HCH	VN	-30	4.78	0.006723	± 2.5	PASS
		VN	-20	1.59	0.002236	± 2.5	PASS
		VN	-10	1.52	0.002138	± 2.5	PASS
		VN	0	1.35	0.001899	± 2.5	PASS
		VN	10	4.82	0.006779	± 2.5	PASS
		VN	20	1.4	0.001969	± 2.5	PASS
		VN	30	3.58	0.005035	± 2.5	PASS
		VN	40	1.28	0.001800	± 2.5	PASS
		VN	50	2.92	0.004107	± 2.5	PASS
16QAM	LCH	VN	-30	-1.88	-0.002670	± 2.5	PASS
		VN	-20	3.51	0.004986	± 2.5	PASS
		VN	-10	-0.97	-0.001378	± 2.5	PASS
		VN	0	4.01	0.005696	± 2.5	PASS
		VN	10	1.88	0.002670	± 2.5	PASS
		VN	20	-1.3	-0.001847	± 2.5	PASS
		VN	30	4.15	0.005895	± 2.5	PASS
		VN	40	1.29	0.001832	± 2.5	PASS
		VN	50	-0.56	-0.000795	± 2.5	PASS
	MCH	VN	-30	1.95	0.002756	± 2.5	PASS
		VN	-20	-0.71	-0.001004	± 2.5	PASS
		VN	-10	-1.35	-0.001908	± 2.5	PASS
		VN	0	4.07	0.005753	± 2.5	PASS
		VN	10	-0.02	-0.000028	± 2.5	PASS
		VN	20	3.5	0.004947	± 2.5	PASS
		VN	30	3.37	0.004763	± 2.5	PASS
		VN	40	3.85	0.005442	± 2.5	PASS
		VN	50	-1.2	-0.001696	± 2.5	PASS
	HCH	VN	-30	4.87	0.006850	± 2.5	PASS
		VN	-20	-1.28	-0.001800	± 2.5	PASS
		VN	-10	0.45	0.000633	± 2.5	PASS
		VN	0	-0.52	-0.000731	± 2.5	PASS
		VN	10	2.88	0.004051	± 2.5	PASS
		VN	20	2.98	0.004191	± 2.5	PASS
		VN	30	3.74	0.005260	± 2.5	PASS
		VN	40	4.36	0.006132	± 2.5	PASS

		VN	50	3.15	0.004430	± 2.5	PASS
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