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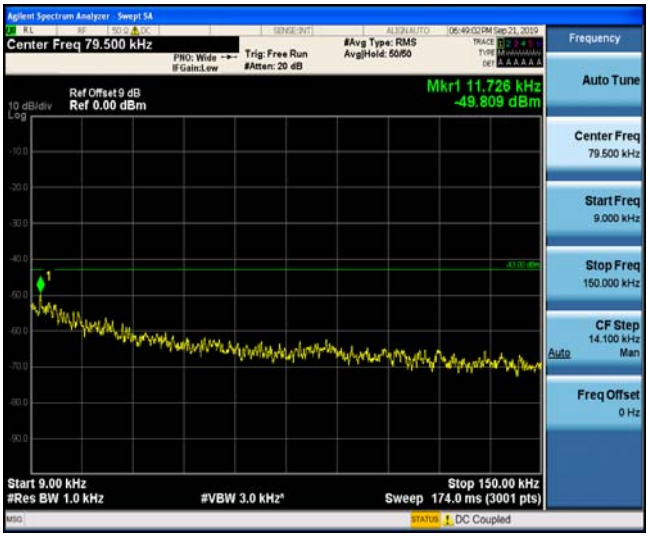
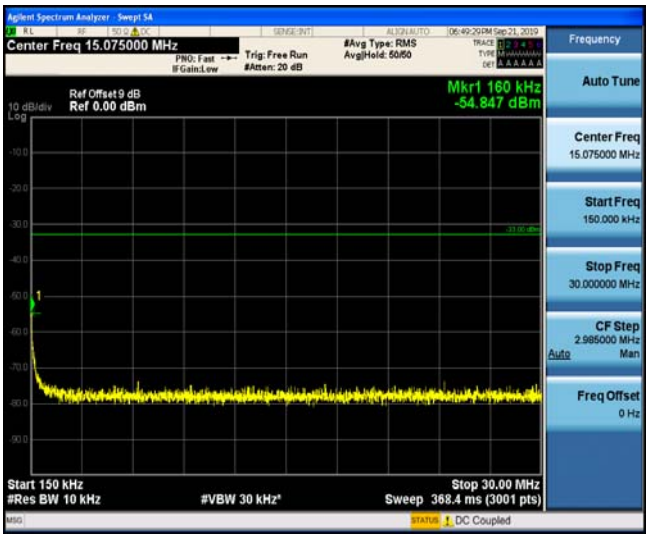
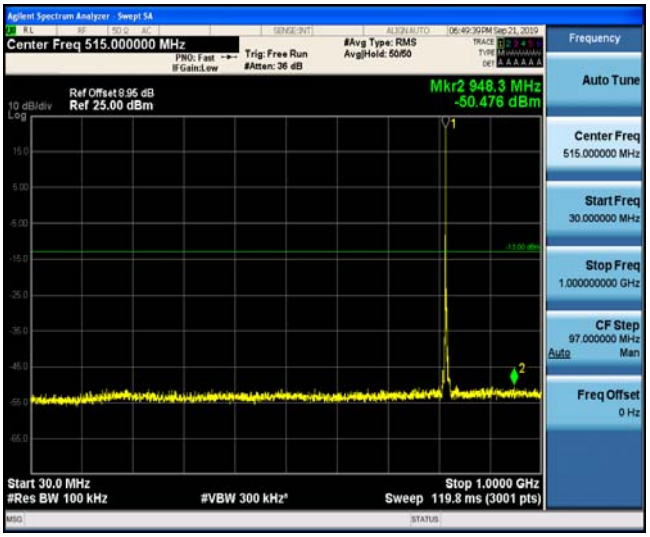


Band26_3MHz_QPSK_26740_1RB#0



Band26_3MHz_QPSK_26740_1RB#0



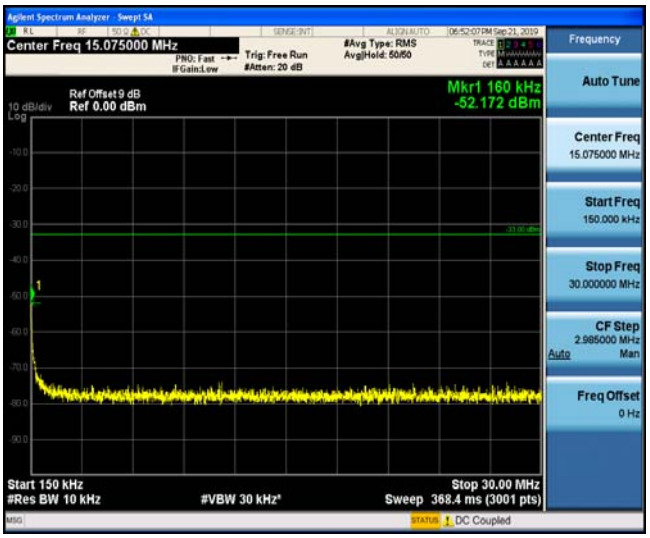
Band26_3MHz_QPSK_26740_1RB#0

Band26_3MHz_QPSK_26740_1RB#0

Band26_3MHz_QPSK_26740_1RB#0

Band26_3MHz_QPSK_26775_1RB#0

Band26_3MHz_QPSK_26775_1RB#0



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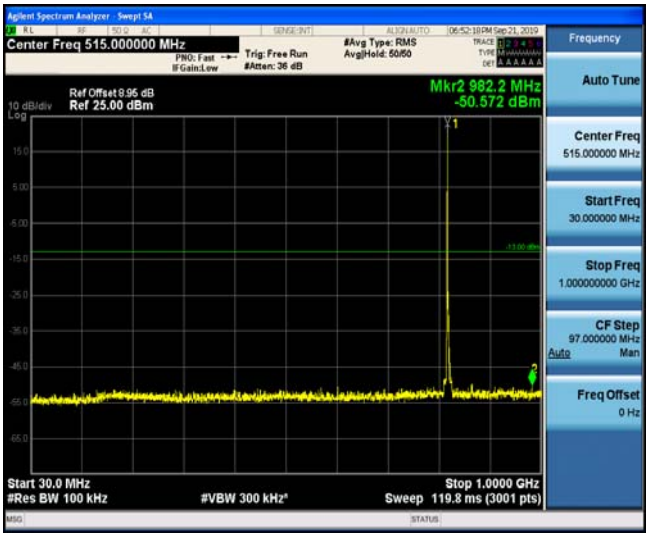


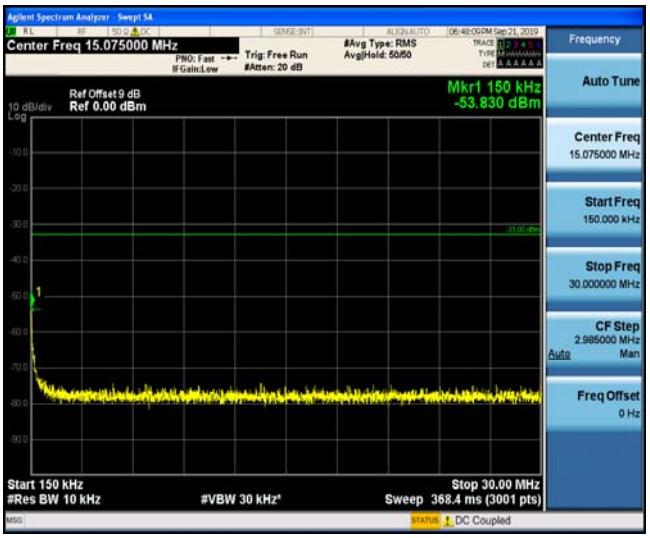
Band26_3MHz_QPSK_26775_1RB#0

Band26_3MHz_QPSK_26775_1RB#0

Band26_3MHz_QPSK_26775_1RB#0

Band26_3MHz_16QAM_26705_1RB#0

Band26_3MHz_16QAM_26705_1RB#0



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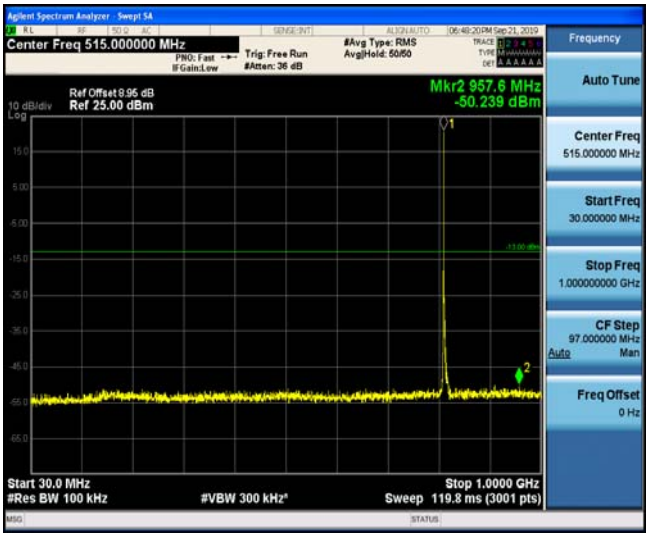

Band26_3MHz_16QAM_26705_1RB#0

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Band26_3MHz_16QAM_26705_1RB#0

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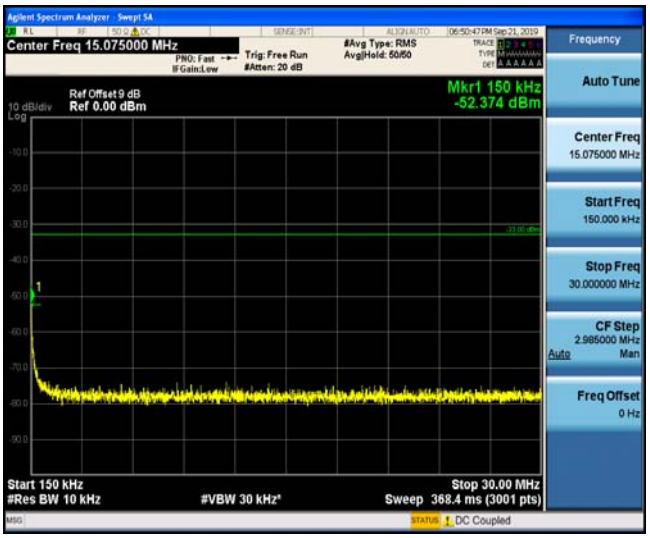
Band26_3MHz_16QAM_26740_1RB#0



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Band26_3MHz_16QAM_26740_1RB#0

Band26_3MHz_16QAM_26740_1RB#0

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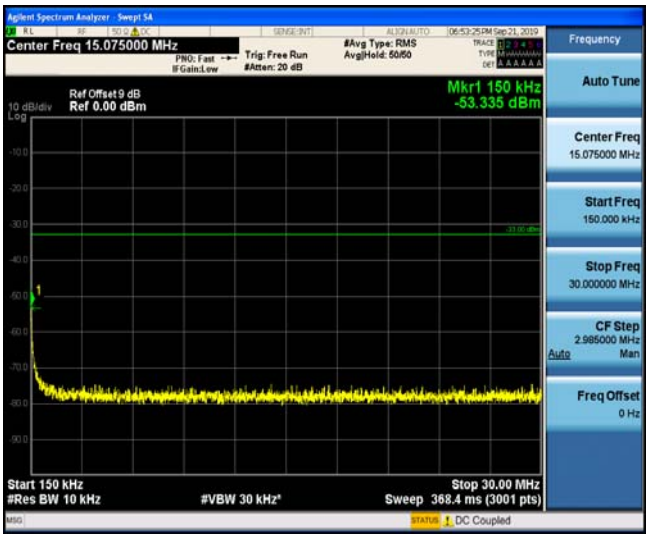
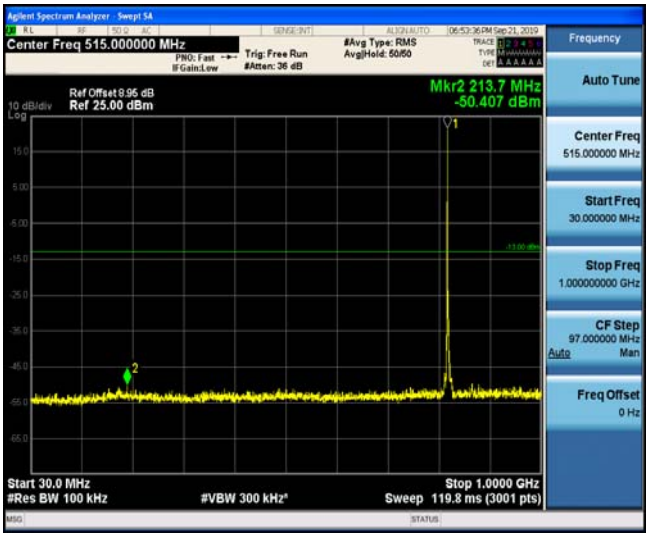
Band26_3MHz_16QAM_26775_1RB#0



Band26_3MHz_16QAM_26775_1RB#0



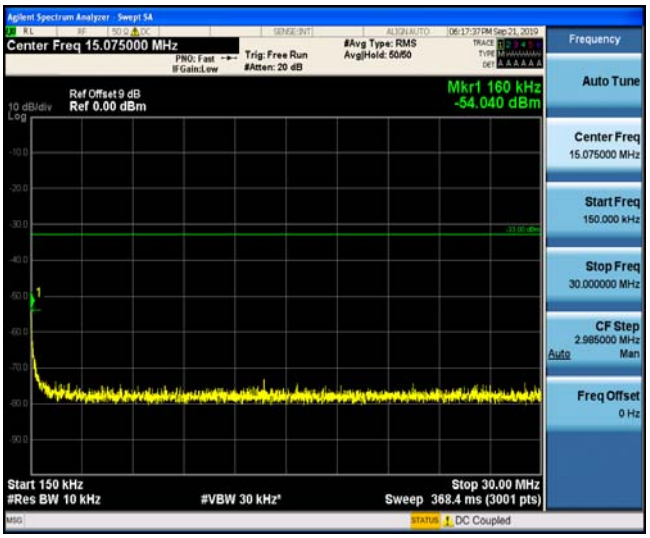
Band26_3MHz_16QAM_26775_1RB#0

Band26_3MHz_16QAM_26775_1RB#0

Band26_3MHz_16QAM_26775_1RB#0

Band26_5MHz_QPSK_26715_1RB#0

Band26_5MHz_QPSK_26715_1RB#0



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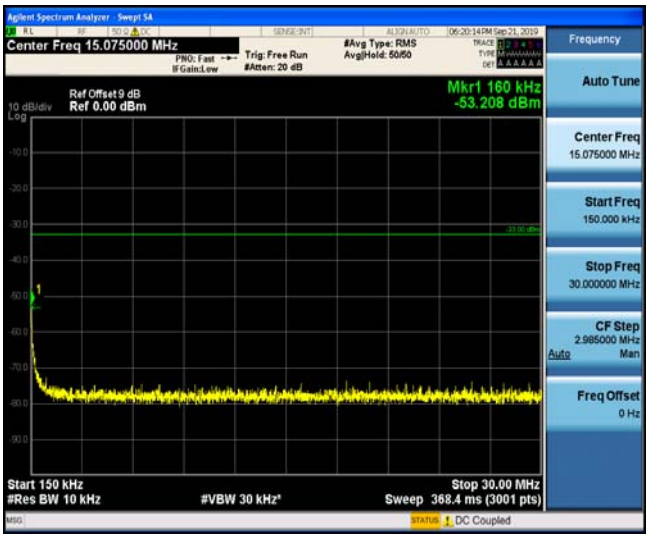
Band26_5MHz_QPSK_26715_1RB#0

Band26_5MHz_QPSK_26715_1RB#0

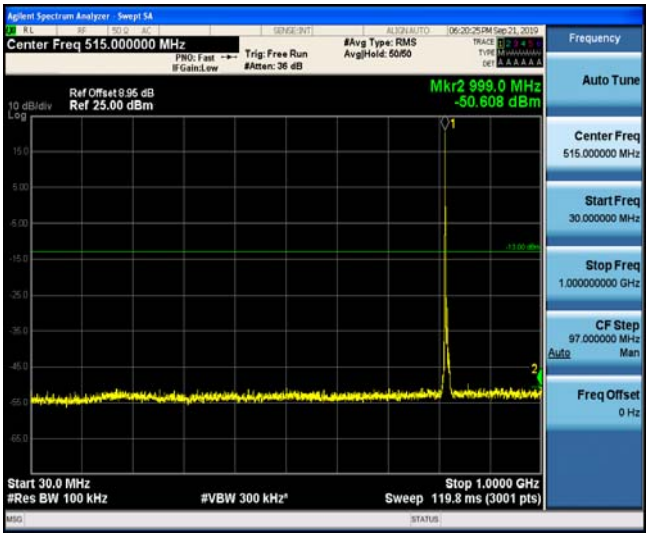
Band26_5MHz_QPSK_26715_1RB#0

Band26_5MHz_QPSK_26740_1RB#0

Band26_5MHz_QPSK_26740_1RB#0



Band26_5MHz_QPSK_26740_1RB#0



Band26_5MHz_QPSK_26740_1RB#0

Band26_5MHz_QPSK_26740_1RB#0

Band26_5MHz_QPSK_26740_1RB#0

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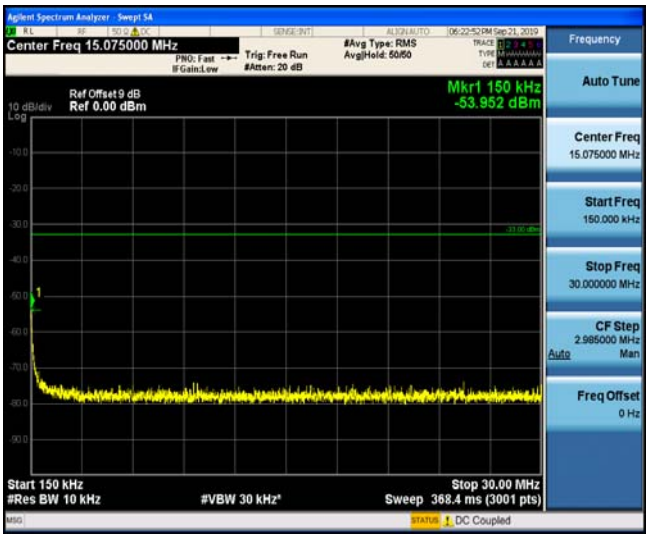
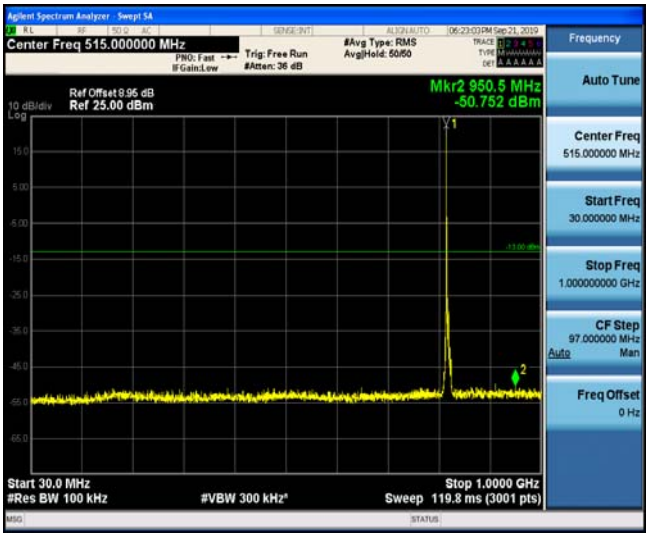
Band26_5MHz_QPSK_26765_1RB#0



Band26_5MHz_QPSK_26765_1RB#0



Band26_5MHz_QPSK_26765_1RB#0

Band26_5MHz_QPSK_26765_1RB#0

Band26_5MHz_QPSK_26765_1RB#0

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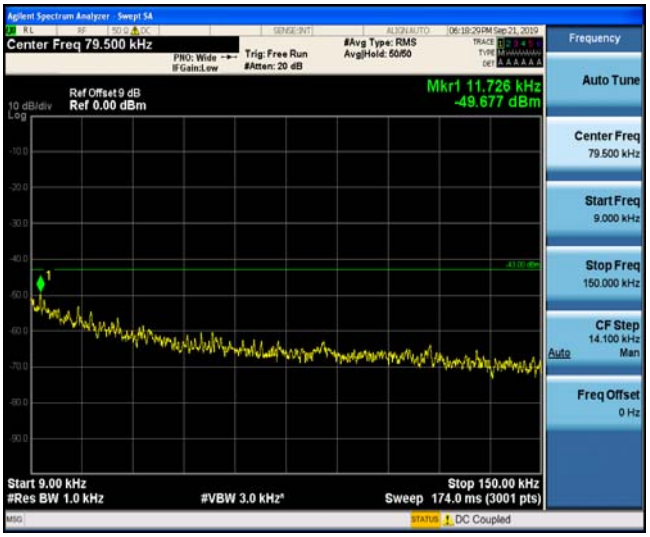
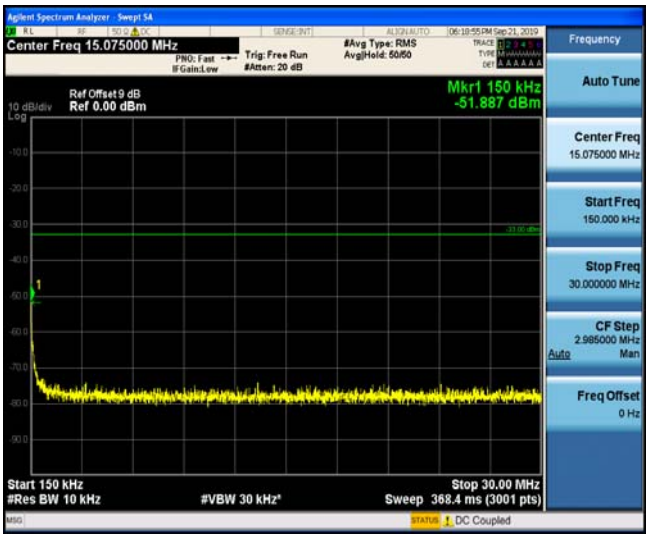
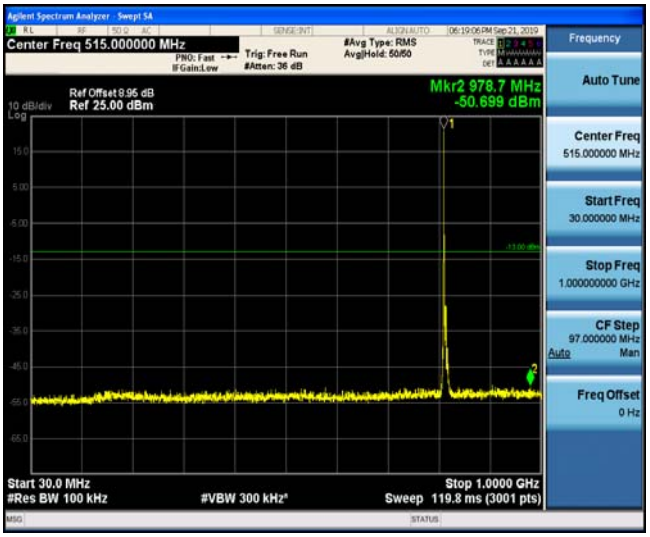


Band26_5MHz_16QAM_26715_1RB#0



Band26_5MHz_16QAM_26715_1RB#0



Band26_5MHz_16QAM_26715_1RB#0

Band26_5MHz_16QAM_26715_1RB#0

Band26_5MHz_16QAM_26715_1RB#0

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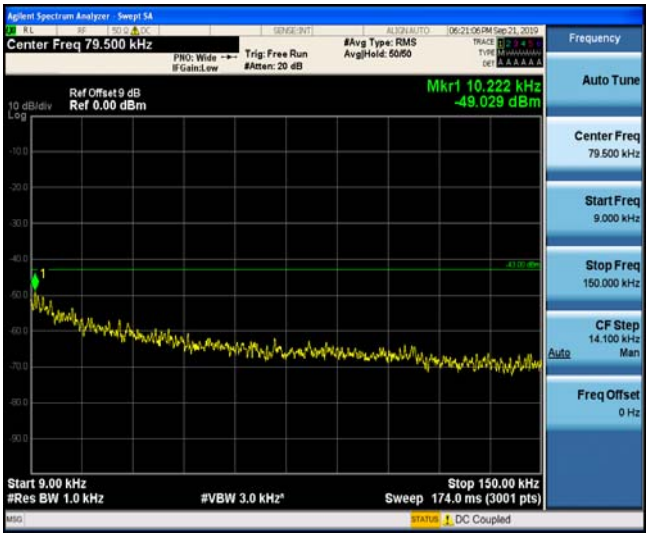

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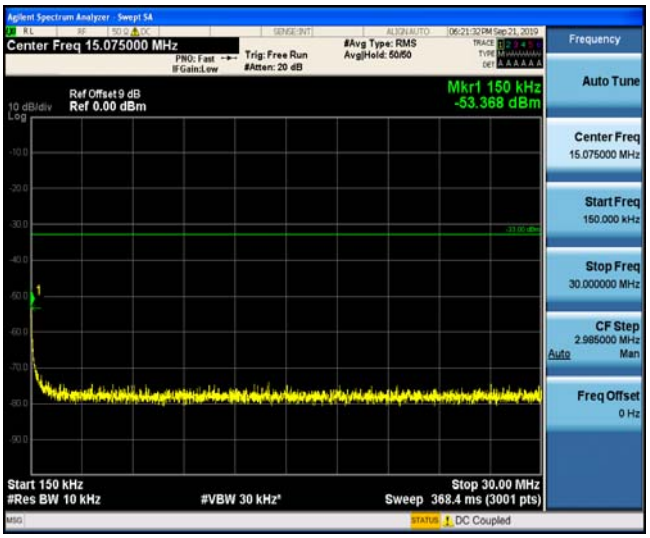

Band26_5MHz_16QAM_26740_1RB#0

Band26_5MHz_16QAM_26740_1RB#0

Band26_5MHz_16QAM_26740_1RB#0

Band26_5MHz_16QAM_26740_1RB#0

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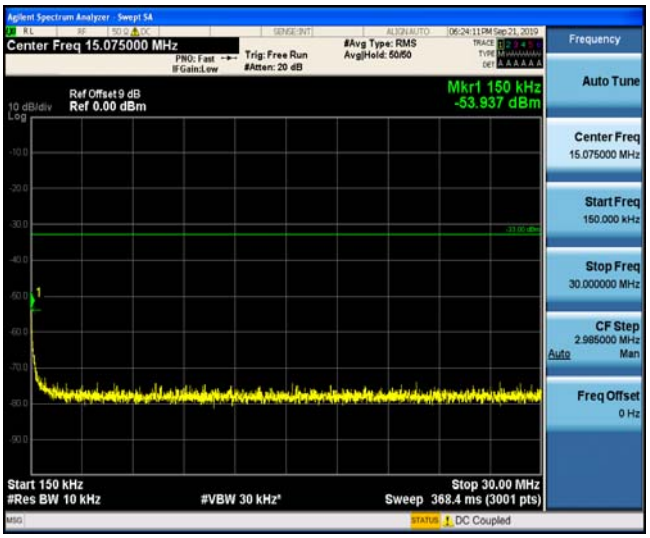
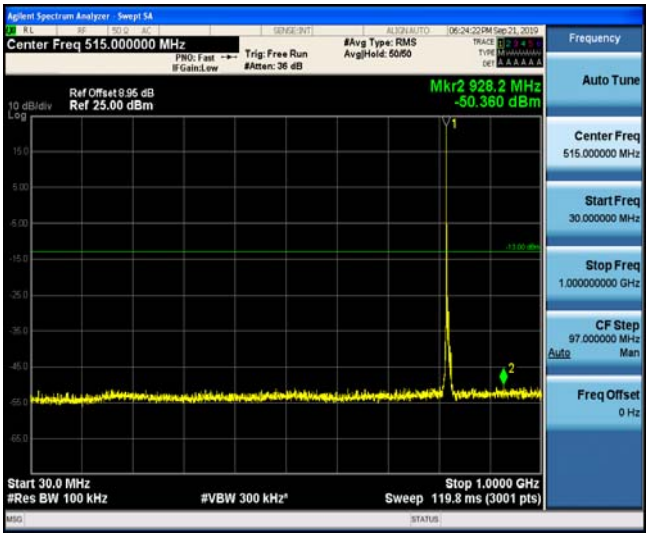
Band26_5MHz_16QAM_26765_1RB#0



Band26_5MHz_16QAM_26765_1RB#0



Band26_5MHz_16QAM_26765_1RB#0

Band26_5MHz_16QAM_26765_1RB#0

Band26_5MHz_16QAM_26765_1RB#0

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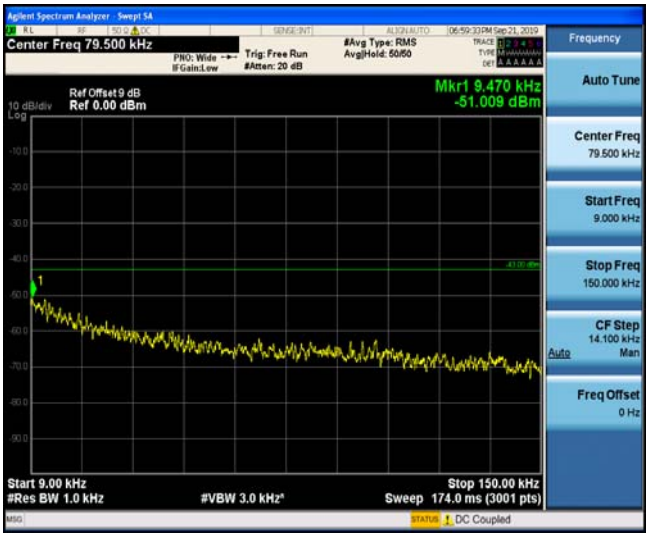
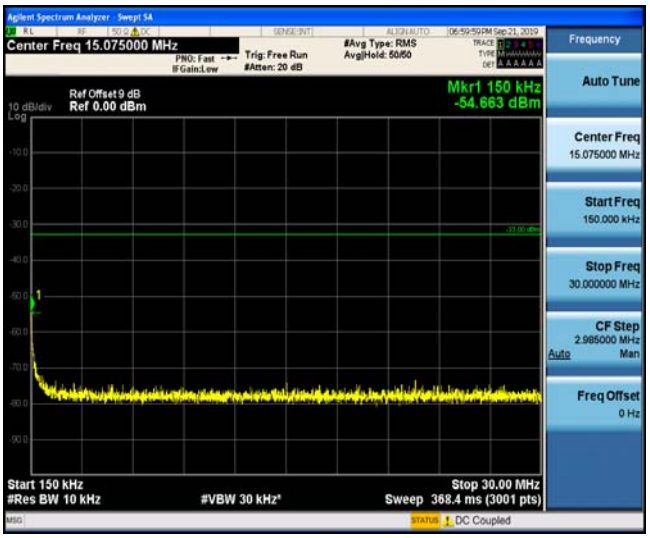
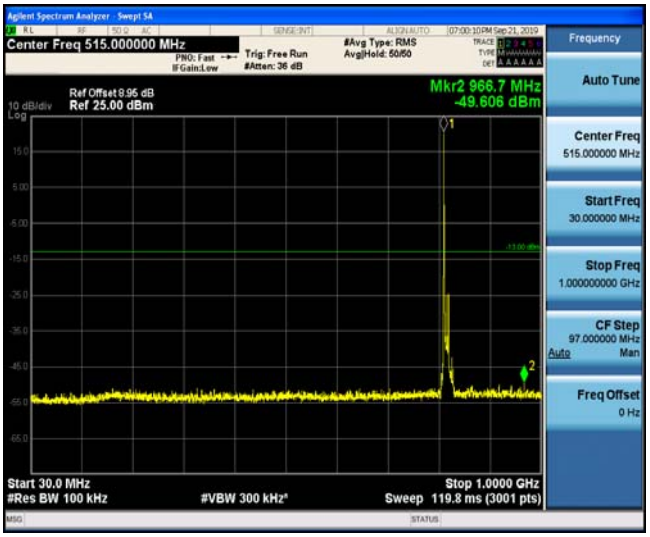


Band26_10MHz_QPSK_26740_1RB#0



Band26_10MHz_QPSK_26740_1RB#0



Band26_10MHz_QPSK_26740_1RB#0

Band26_10MHz_QPSK_26740_1RB#0

Band26_10MHz_QPSK_26740_1RB#0

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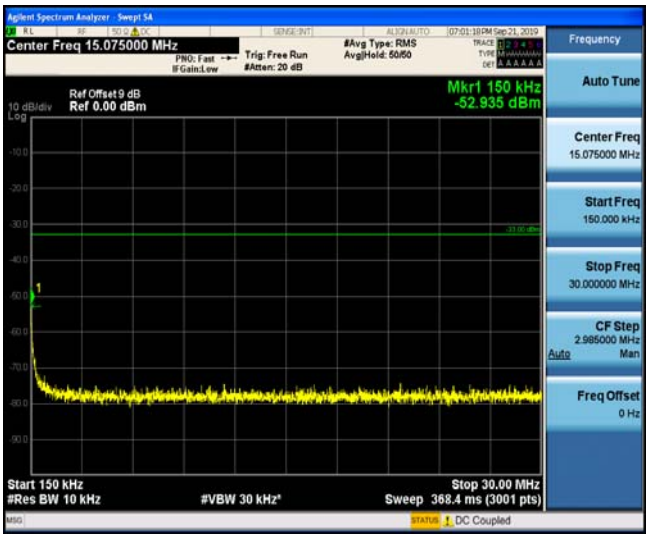
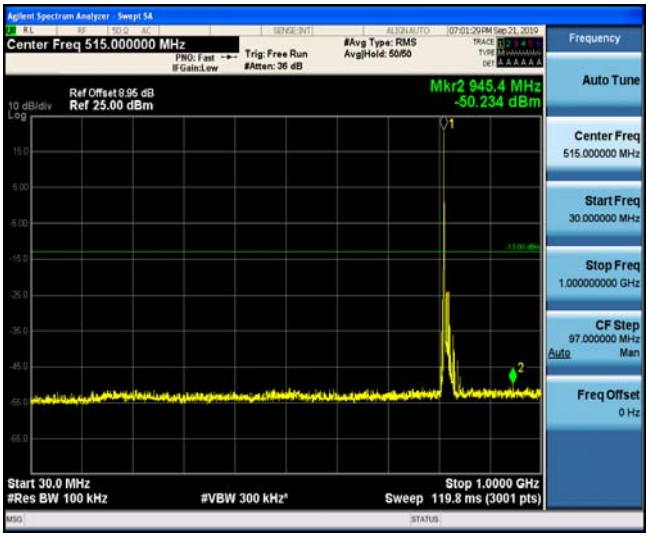


Band26_10MHz_16QAM_26740_1RB#0



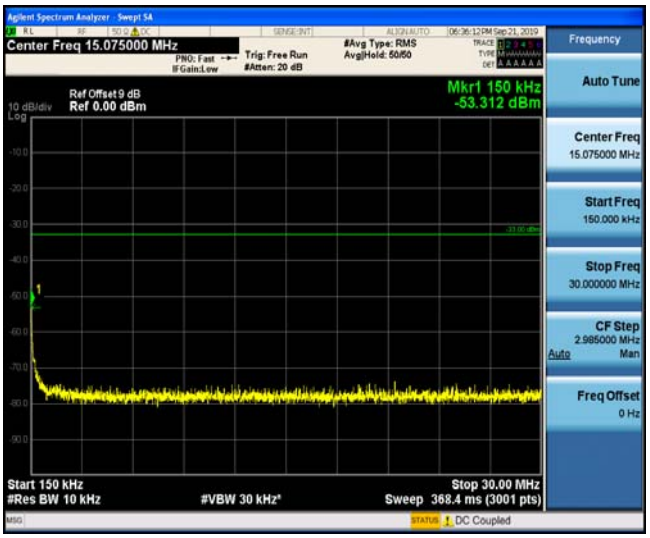
Band26_10MHz_16QAM_26740_1RB#0

Band26_10MHz_16QAM_26740_1RB#0

Band26_10MHz_16QAM_26740_1RB#0

Band26_15MHz_QPSK_26765_1RB#0

Band26_15MHz_QPSK_26765_1RB#0



Band26_15MHz_QPSK_26765_1RB#0

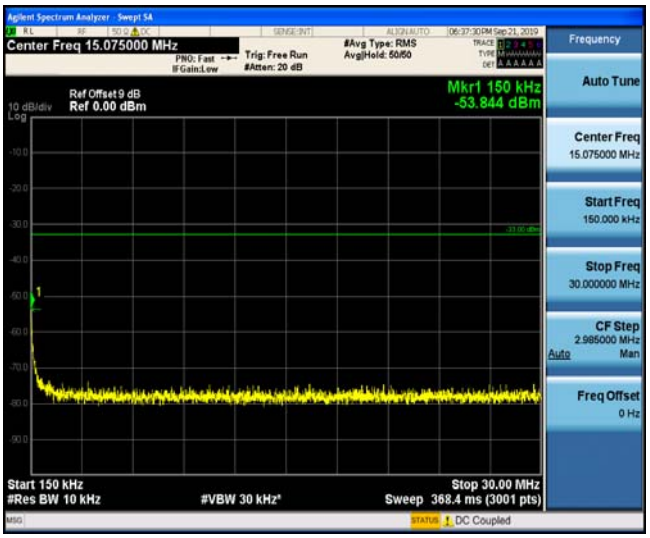
Band26_15MHz_QPSK_26765_1RB#0

Band26_15MHz_QPSK_26765_1RB#0

Band26_15MHz_QPSK_26765_1RB#0

Band26_15MHz_16QAM_26765_1RB#0

Band26_15MHz_16QAM_26765_1RB#0



Band26_15MHz_16QAM_26765_1RB#0

Band26_15MHz_16QAM_26765_1RB#0

Band26_15MHz_16QAM_26765_1RB#0

Band26_15MHz_16QAM_26765_1RB#0

Agilent Spectrum Analyzer - Swept SA
Center Freq 15.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 3/3
06:39:07 PM Sep 21, 2019
Frequency
Auto Tune
Ref Offset 18.76 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 17.071 5 GHz
-39.992 dBm
Center Freq
15.000000000 GHz
Start Freq
12.000000000 GHz
Stop Freq
18.000000000 GHz
CF Step
600.000000 MHz
Auto
Man
Freq Offset
0 Hz
Start 12.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 18.000 GHz
#Sweep 1.001 s (15000 pts)
MSG
STATUS

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	4.18	0.005131	± 2.5	PASS
		VN	TN	0.33	0.000405	± 2.5	PASS
		VH	TN	-0.7	-0.000859	± 2.5	PASS
	MCH	VL	TN	3.69	0.004505	± 2.5	PASS
		VN	TN	-1.56	-0.001905	± 2.5	PASS
		VH	TN	2.46	0.003004	± 2.5	PASS
	HCH	VL	TN	1.96	0.002381	± 2.5	PASS
		VN	TN	4.3	0.005223	± 2.5	PASS
		VH	TN	2.92	0.003547	± 2.5	PASS
16QAM	LCH	VL	TN	3.75	0.004603	± 2.5	PASS
		VN	TN	0.78	0.000957	± 2.5	PASS
		VH	TN	1.59	0.001952	± 2.5	PASS
	MCH	VL	TN	0.3	0.000366	± 2.5	PASS
		VN	TN	4.56	0.005568	± 2.5	PASS
		VH	TN	-0.41	-0.000501	± 2.5	PASS
	HCH	VL	TN	4.46	0.005417	± 2.5	PASS
		VN	TN	3.26	0.003960	± 2.5	PASS
		VH	TN	3.83	0.004652	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	0.44	0.000540	± 2.5	PASS
		VN	-20	-0.05	-0.000061	± 2.5	PASS
		VN	-10	4.39	0.005388	± 2.5	PASS
		VN	0	0.38	0.000466	± 2.5	PASS
		VN	10	4.51	0.005536	± 2.5	PASS
		VN	20	4.22	0.005180	± 2.5	PASS
		VN	30	0.2	0.000245	± 2.5	PASS
		VN	40	1.77	0.002173	± 2.5	PASS
		VN	50	-1.58	-0.001939	± 2.5	PASS
	MCH	VN	-30	3.17	0.003871	± 2.5	PASS
		VN	-20	-0.25	-0.000305	± 2.5	PASS

		VN	-10	-0.1	-0.000122	± 2.5	PASS
		VN	0	0.26	0.000317	± 2.5	PASS
		VN	10	4.78	0.005836	± 2.5	PASS
		VN	20	0.91	0.001111	± 2.5	PASS
		VN	30	2.29	0.002796	± 2.5	PASS
		VN	40	-1.9	-0.002320	± 2.5	PASS
		VN	50	4.44	0.005421	± 2.5	PASS
	HCH	VN	-30	3.2	0.003887	± 2.5	PASS
		VN	-20	4.93	0.005988	± 2.5	PASS
		VN	-10	0.89	0.001081	± 2.5	PASS
		VN	0	-1.35	-0.001640	± 2.5	PASS
		VN	10	2.53	0.003073	± 2.5	PASS
		VN	20	-0.27	-0.000328	± 2.5	PASS
		VN	30	-1.2	-0.001458	± 2.5	PASS
		VN	40	0.9	0.001093	± 2.5	PASS
		VN	50	-0.83	-0.001008	± 2.5	PASS
16QAM	LCH	VN	-30	0.15	0.000184	± 2.5	PASS
		VN	-20	1.18	0.001448	± 2.5	PASS
		VN	-10	-1.13	-0.001387	± 2.5	PASS
		VN	0	4.04	0.004959	± 2.5	PASS
		VN	10	4.9	0.006014	± 2.5	PASS
		VN	20	3.55	0.004357	± 2.5	PASS
		VN	30	4.7	0.005769	± 2.5	PASS
		VN	40	1.71	0.002099	± 2.5	PASS
		VN	50	3.47	0.004259	± 2.5	PASS
	MCH	VN	-30	3.17	0.003871	± 2.5	PASS
		VN	-20	1.12	0.001368	± 2.5	PASS
		VN	-10	0.26	0.000317	± 2.5	PASS
		VN	0	-0.84	-0.001026	± 2.5	PASS
		VN	10	1.55	0.001893	± 2.5	PASS
		VN	20	-0.16	-0.000195	± 2.5	PASS
		VN	30	-1.9	-0.002320	± 2.5	PASS
		VN	40	2.91	0.003553	± 2.5	PASS
		VN	50	4.03	0.004921	± 2.5	PASS
	HCH	VN	-30	1.78	0.002162	± 2.5	PASS
		VN	-20	-0.82	-0.000996	± 2.5	PASS
		VN	-10	2.91	0.003535	± 2.5	PASS
		VN	0	2.05	0.002490	± 2.5	PASS
		VN	10	2.36	0.002867	± 2.5	PASS
		VN	20	1.63	0.001980	± 2.5	PASS
		VN	30	1.43	0.001737	± 2.5	PASS

		VN	40	-0.58	-0.000704	± 2.5	PASS
		VN	50	4.24	0.005150	± 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	1.72	0.002109	± 2.5	PASS
		VN	TN	-0.84	-0.001030	± 2.5	PASS
		VH	TN	2.46	0.003017	± 2.5	PASS
	MCH	VL	TN	1.1	0.001343	± 2.5	PASS
		VN	TN	-1.57	-0.001917	± 2.5	PASS
		VH	TN	2.98	0.003639	± 2.5	PASS
	HCH	VL	TN	0.42	0.000511	± 2.5	PASS
		VN	TN	1.78	0.002164	± 2.5	PASS
		VH	TN	-0.6	-0.000729	± 2.5	PASS
16QAM	LCH	VL	TN	4.66	0.005714	± 2.5	PASS
		VN	TN	-1.86	-0.002281	± 2.5	PASS
		VH	TN	-1.63	-0.001999	± 2.5	PASS
	MCH	VL	TN	1.46	0.001783	± 2.5	PASS
		VN	TN	-0.53	-0.000647	± 2.5	PASS
		VH	TN	1.26	0.001538	± 2.5	PASS
	HCH	VL	TN	-1	-0.001216	± 2.5	PASS
		VN	TN	0.8	0.000973	± 2.5	PASS
		VH	TN	0.5	0.000608	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	1.29	0.001582	± 2.5	PASS
		VN	-20	3.6	0.004414	± 2.5	PASS
		VN	-10	0.79	0.000969	± 2.5	PASS
		VN	0	2.39	0.002931	± 2.5	PASS
		VN	10	2.67	0.003274	± 2.5	PASS
		VN	20	0.79	0.000969	± 2.5	PASS
		VN	30	2.22	0.002722	± 2.5	PASS
		VN	40	-1.15	-0.001410	± 2.5	PASS
		VN	50	0.16	0.000196	± 2.5	PASS
	MCH	VN	-30	2.11	0.002576	± 2.5	PASS
		VN	-20	-1.42	-0.001734	± 2.5	PASS
		VN	-10	1.47	0.001795	± 2.5	PASS

		VN	0	0.41	0.000501	± 2.5	PASS
		VN	10	2.58	0.003150	± 2.5	PASS
		VN	20	3.62	0.004420	± 2.5	PASS
		VN	30	1.52	0.001856	± 2.5	PASS
		VN	40	2.3	0.002808	± 2.5	PASS
		VN	50	0.4	0.000488	± 2.5	PASS
	HCH	VN	-30	-1.95	-0.002371	± 2.5	PASS
		VN	-20	2.08	0.002529	± 2.5	PASS
		VN	-10	0.92	0.001119	± 2.5	PASS
		VN	0	2.58	0.003137	± 2.5	PASS
		VN	10	0.34	0.000413	± 2.5	PASS
		VN	20	0.17	0.000207	± 2.5	PASS
		VN	30	-0.57	-0.000693	± 2.5	PASS
		VN	40	2.44	0.002967	± 2.5	PASS
		VN	50	2.99	0.003635	± 2.5	PASS
QPSK	LCH	VN	-30	4.29	0.005261	± 2.5	PASS
		VN	-20	2.95	0.003617	± 2.5	PASS
		VN	-10	4.74	0.005812	± 2.5	PASS
		VN	0	-1.32	-0.001619	± 2.5	PASS
		VN	10	1.47	0.001803	± 2.5	PASS
		VN	20	1.65	0.002023	± 2.5	PASS
		VN	30	4.14	0.005077	± 2.5	PASS
		VN	40	2.46	0.003017	± 2.5	PASS
		VN	50	-0.04	-0.000049	± 2.5	PASS
	MCH	VN	-30	0.53	0.000647	± 2.5	PASS
		VN	-20	2.61	0.003187	± 2.5	PASS
		VN	-10	-1.72	-0.002100	± 2.5	PASS
		VN	0	4.89	0.005971	± 2.5	PASS
		VN	10	4.89	0.005971	± 2.5	PASS
		VN	20	3.44	0.004200	± 2.5	PASS
		VN	30	0.42	0.000513	± 2.5	PASS
		VN	40	-1.67	-0.002039	± 2.5	PASS
		VN	50	2.51	0.003065	± 2.5	PASS
	HCH	VN	-30	4.15	0.005046	± 2.5	PASS
		VN	-20	2.3	0.002796	± 2.5	PASS
		VN	-10	3.89	0.004729	± 2.5	PASS
		VN	0	3.19	0.003878	± 2.5	PASS
		VN	10	3.43	0.004170	± 2.5	PASS
		VN	20	3.07	0.003733	± 2.5	PASS
		VN	30	3.22	0.003915	± 2.5	PASS
		VN	40	1.47	0.001787	± 2.5	PASS

		VN	50	2.16	0.002626	± 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	-0.38	-0.000465	± 2.5	PASS
		VN	TN	4.41	0.005401	± 2.5	PASS
		VH	TN	-1.92	-0.002352	± 2.5	PASS
	MCH	VL	TN	0.48	0.000586	± 2.5	PASS
		VN	TN	-1.18	-0.001441	± 2.5	PASS
		VH	TN	-0.75	-0.000916	± 2.5	PASS
	HCH	VL	TN	1.78	0.002167	± 2.5	PASS
		VN	TN	2.74	0.003335	± 2.5	PASS
		VH	TN	4.59	0.005587	± 2.5	PASS
16QAM	LCH	VL	TN	4.19	0.005132	± 2.5	PASS
		VN	TN	2.79	0.003417	± 2.5	PASS
		VH	TN	-1.78	-0.002180	± 2.5	PASS
	MCH	VL	TN	1.04	0.001270	± 2.5	PASS
		VN	TN	4.59	0.005604	± 2.5	PASS
		VH	TN	4.48	0.005470	± 2.5	PASS
	HCH	VL	TN	-0.7	-0.000852	± 2.5	PASS
		VN	TN	2.9	0.003530	± 2.5	PASS
		VH	TN	2.8	0.003408	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-0.36	-0.000441	± 2.5	PASS
		VN	-20	-0.94	-0.001151	± 2.5	PASS
		VN	-10	-1.62	-0.001984	± 2.5	PASS
		VN	0	1.42	0.001739	± 2.5	PASS
		VN	10	-0.7	-0.000857	± 2.5	PASS
		VN	20	2.64	0.003233	± 2.5	PASS
		VN	30	3.36	0.004115	± 2.5	PASS
		VN	40	4.7	0.005756	± 2.5	PASS
		VN	50	4.19	0.005132	± 2.5	PASS
	MCH	VN	-30	4.24	0.005177	± 2.5	PASS
		VN	-20	2.8	0.003419	± 2.5	PASS
		VN	-10	4.55	0.005556	± 2.5	PASS
		VN	0	2.25	0.002747	± 2.5	PASS

		VN	10	-1.75	-0.002137	± 2.5	PASS
		VN	20	3.9	0.004762	± 2.5	PASS
		VN	30	2.67	0.003260	± 2.5	PASS
		VN	40	0.25	0.000305	± 2.5	PASS
		VN	50	2.65	0.003236	± 2.5	PASS
	HCH	VN	-30	2.09	0.002544	± 2.5	PASS
		VN	-20	-1.56	-0.001899	± 2.5	PASS
		VN	-10	0.84	0.001023	± 2.5	PASS
		VN	0	0.7	0.000852	± 2.5	PASS
		VN	10	3.86	0.004699	± 2.5	PASS
		VN	20	1.68	0.002045	± 2.5	PASS
		VN	30	2.39	0.002909	± 2.5	PASS
		VN	40	2.82	0.003433	± 2.5	PASS
		VN	50	1.89	0.002301	± 2.5	PASS
16QAM	LCH	VN	-30	2.25	0.002756	± 2.5	PASS
		VN	-20	1.64	0.002009	± 2.5	PASS
		VN	-10	-1.92	-0.002352	± 2.5	PASS
		VN	0	1.71	0.002094	± 2.5	PASS
		VN	10	0.57	0.000698	± 2.5	PASS
		VN	20	0.56	0.000686	± 2.5	PASS
		VN	30	-1.9	-0.002327	± 2.5	PASS
		VN	40	4.48	0.005487	± 2.5	PASS
		VN	50	-1.63	-0.001996	± 2.5	PASS
	MCH	VN	-30	1.41	0.001722	± 2.5	PASS
		VN	-20	3.91	0.004774	± 2.5	PASS
		VN	-10	-1.23	-0.001502	± 2.5	PASS
		VN	0	2.06	0.002515	± 2.5	PASS
		VN	10	-0.84	-0.001026	± 2.5	PASS
		VN	20	4.27	0.005214	± 2.5	PASS
		VN	30	4.02	0.004908	± 2.5	PASS
		VN	40	-0.06	-0.000073	± 2.5	PASS
		VN	50	1.63	0.001990	± 2.5	PASS
	HCH	VN	-30	1.04	0.001266	± 2.5	PASS
		VN	-20	-0.63	-0.000767	± 2.5	PASS
		VN	-10	3.87	0.004711	± 2.5	PASS
		VN	0	1.97	0.002398	± 2.5	PASS
		VN	10	4.66	0.005673	± 2.5	PASS
		VN	20	4.54	0.005526	± 2.5	PASS
		VN	30	-0.38	-0.000463	± 2.5	PASS
		VN	40	1.05	0.001278	± 2.5	PASS
		VN	50	0.17	0.000207	± 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	MCH	VL	TN	3.69	0.004505	± 2.5	PASS
		VN	TN	4.56	0.005568	± 2.5	PASS
		VH	TN	-0.53	-0.000647	± 2.5	PASS
16QAM	MCH	VL	1.49	0.001819	1.49	± 2.5	PASS
		VN	3.09	0.003773	3.09	± 2.5	PASS
		VH	3.33	0.004066	3.33	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
16QAM	MCH	VN	-30	0.000171	0.000171	± 2.5	PASS
		VN	-20	-0.000818	-0.000818	± 2.5	PASS
		VN	-10	-0.001612	-0.001612	± 2.5	PASS
		VN	0	0.004847	0.004847	± 2.5	PASS
		VN	10	0.004872	0.004872	± 2.5	PASS
		VN	20	0.004310	0.004310	± 2.5	PASS
		VN	30	0.000403	0.000403	± 2.5	PASS
		VN	40	-0.000488	-0.000488	± 2.5	PASS
		VN	50	0.003199	0.003199	± 2.5	PASS
QPSK	MCH	VN	-30	0.002613	0.002613	± 2.5	PASS
		VN	-20	0.000122	0.000122	± 2.5	PASS
		VN	-10	0.004493	0.004493	± 2.5	PASS
		VN	0	-0.000586	-0.000586	± 2.5	PASS
		VN	10	0.002943	0.002943	± 2.5	PASS
		VN	20	0.005495	0.005495	± 2.5	PASS
		VN	30	-0.001966	-0.001966	± 2.5	PASS
		VN	40	-0.000183	-0.000183	± 2.5	PASS
		VN	50	0.003858	0.003858	± 2.5	PASS