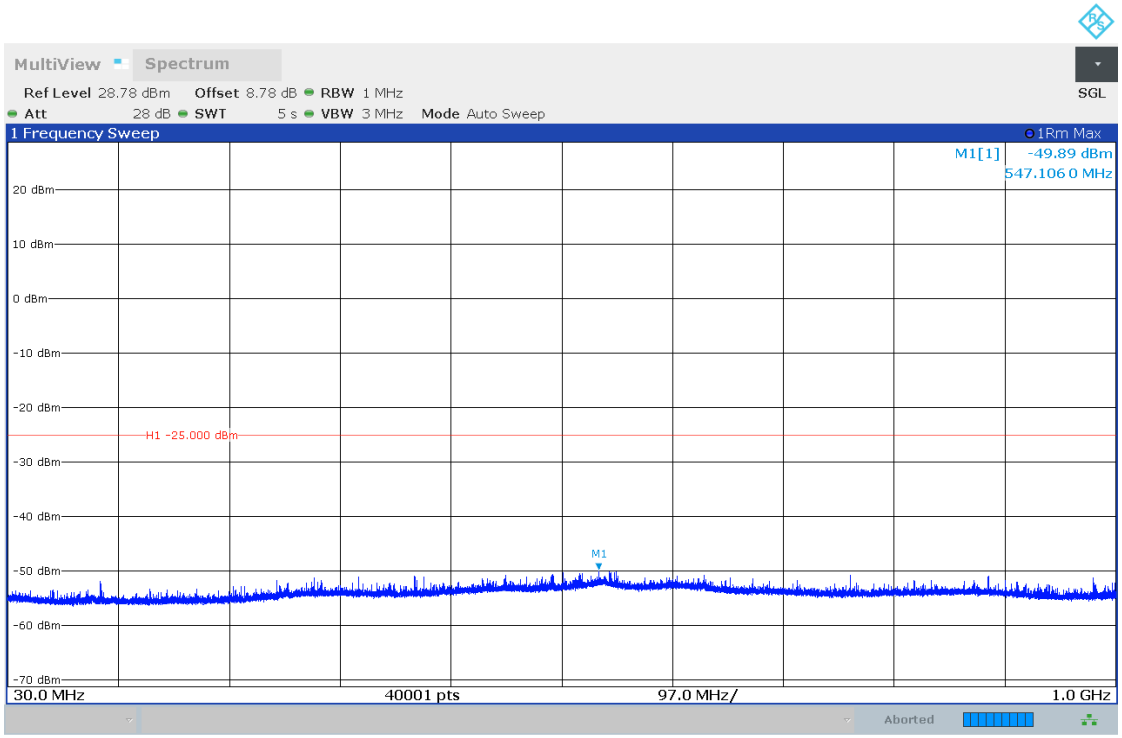

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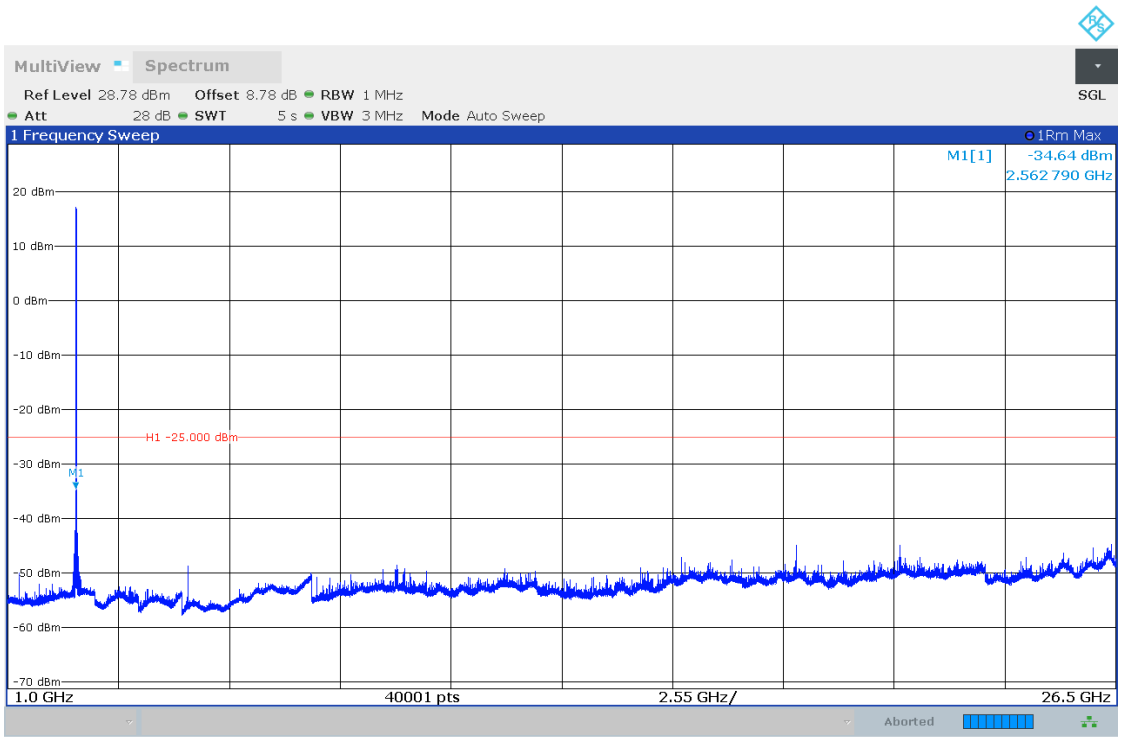

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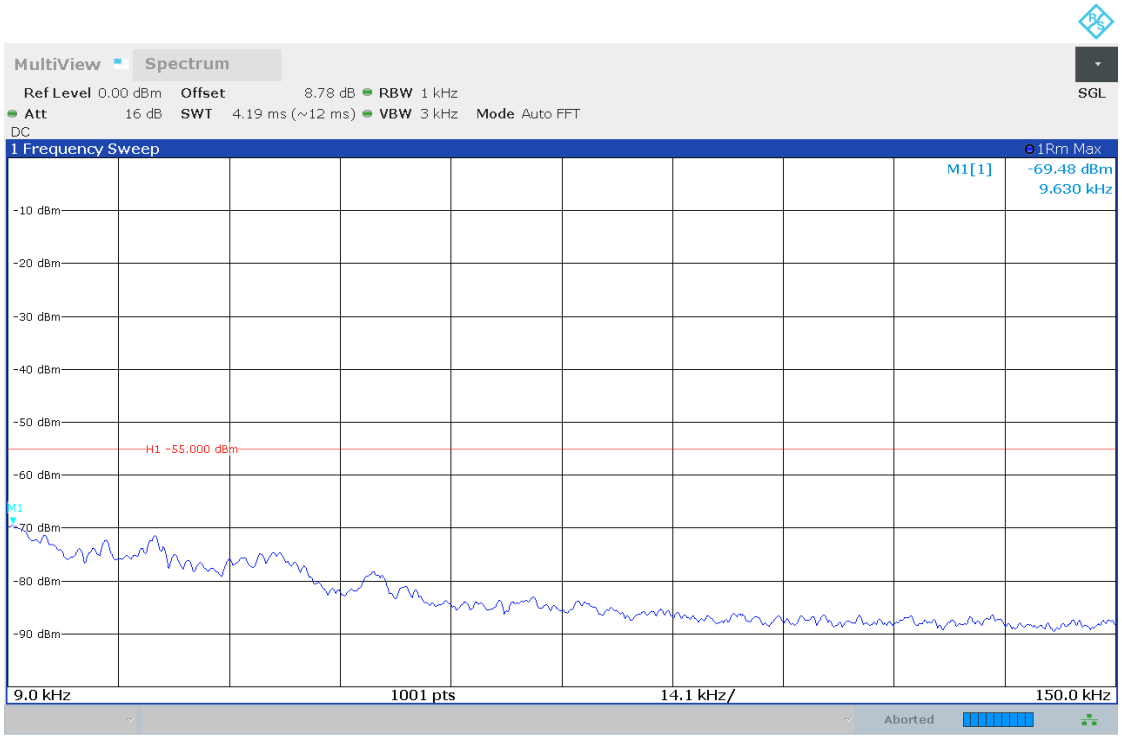

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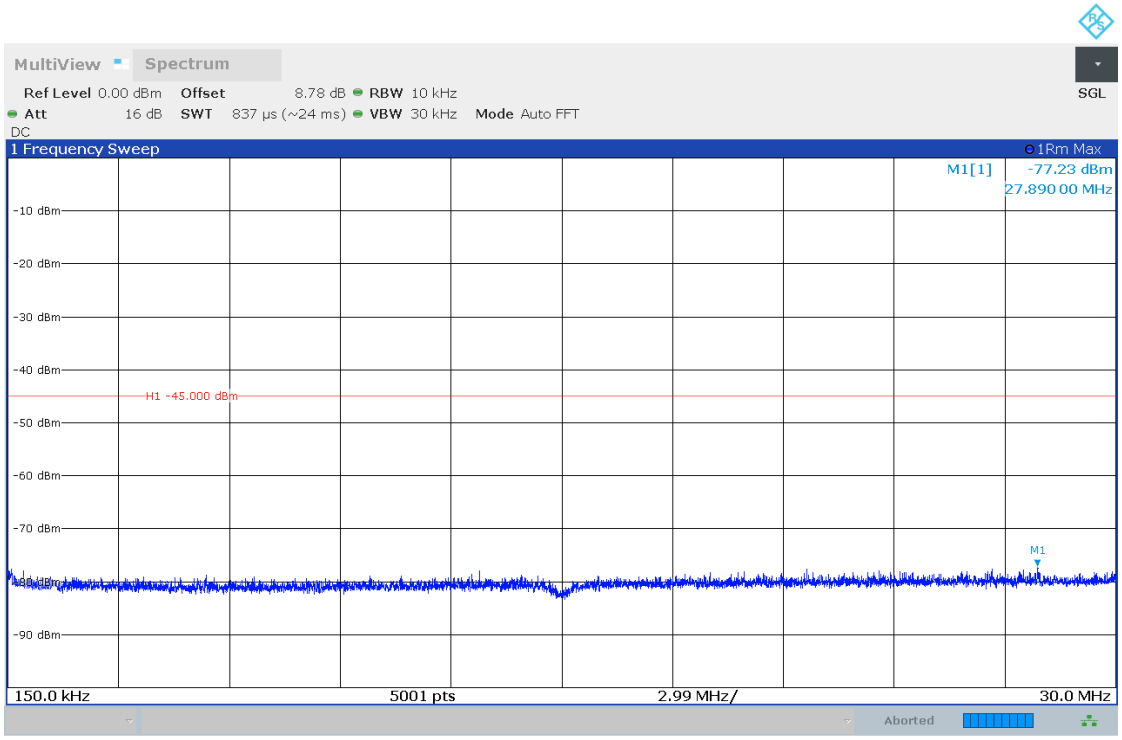

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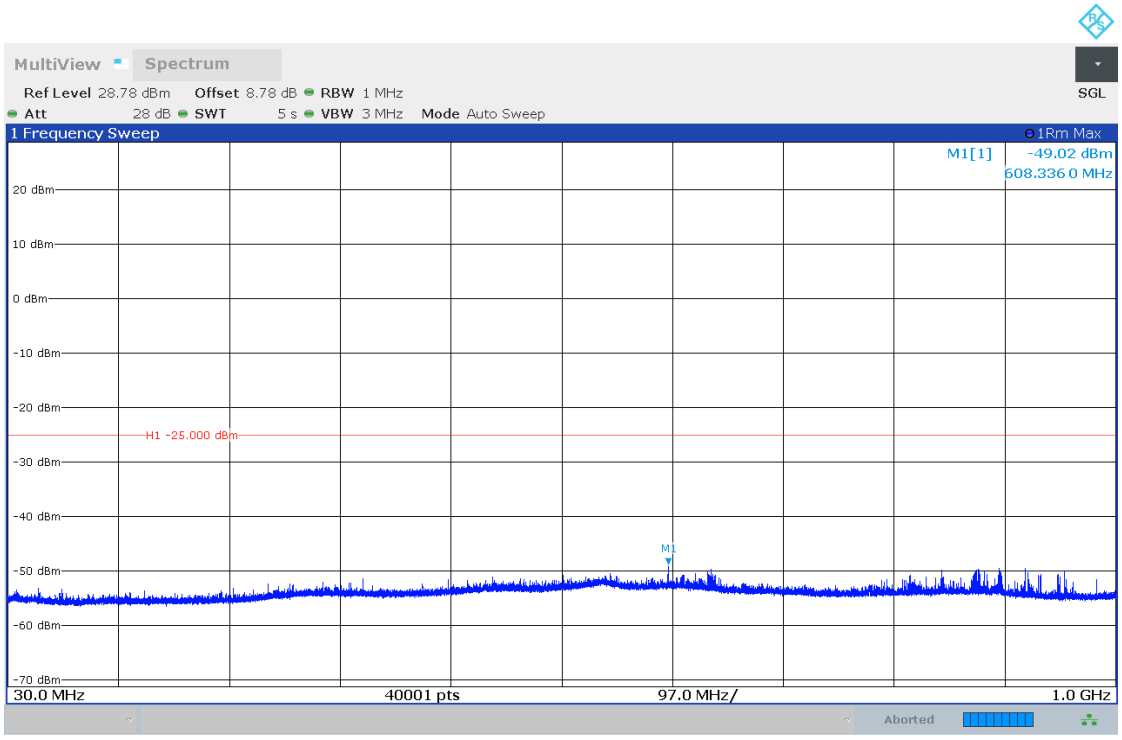

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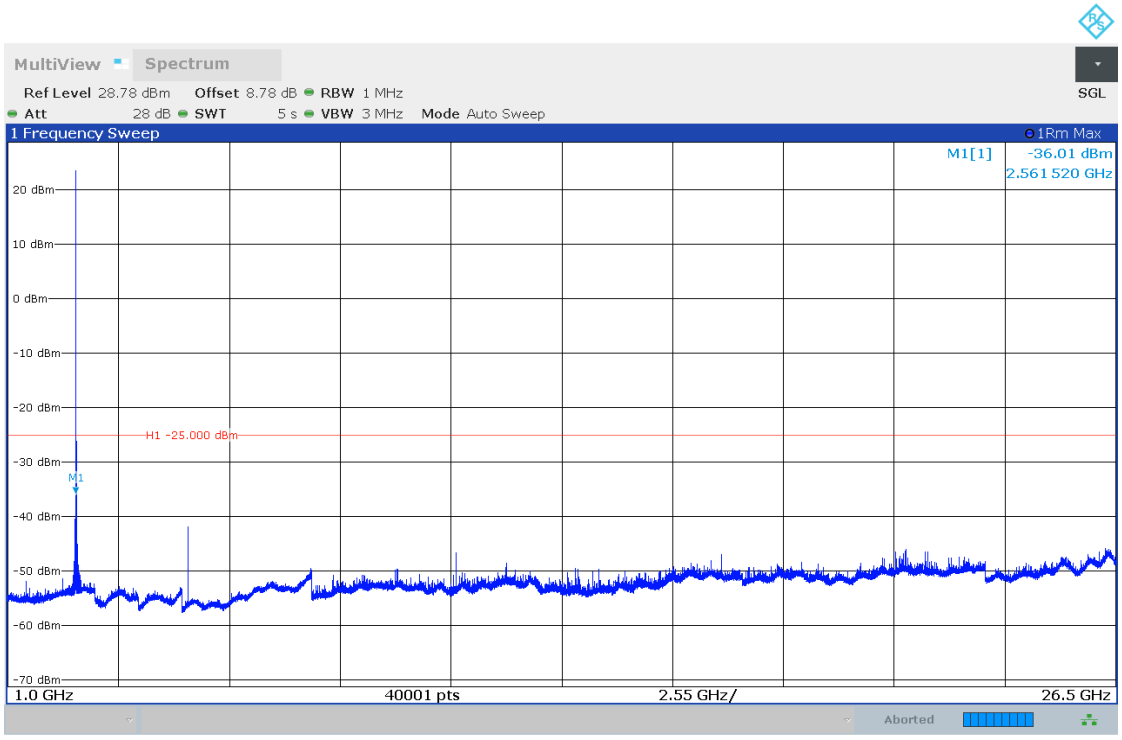

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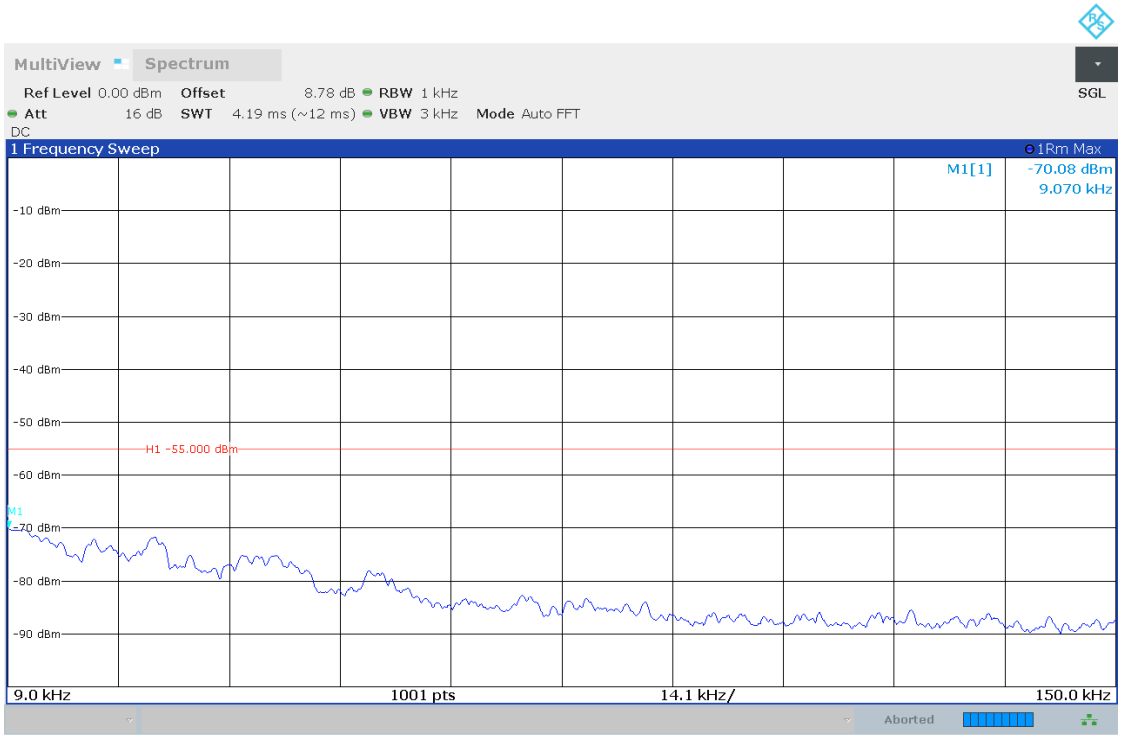
TM1_5MHz_LCH_RB1#24



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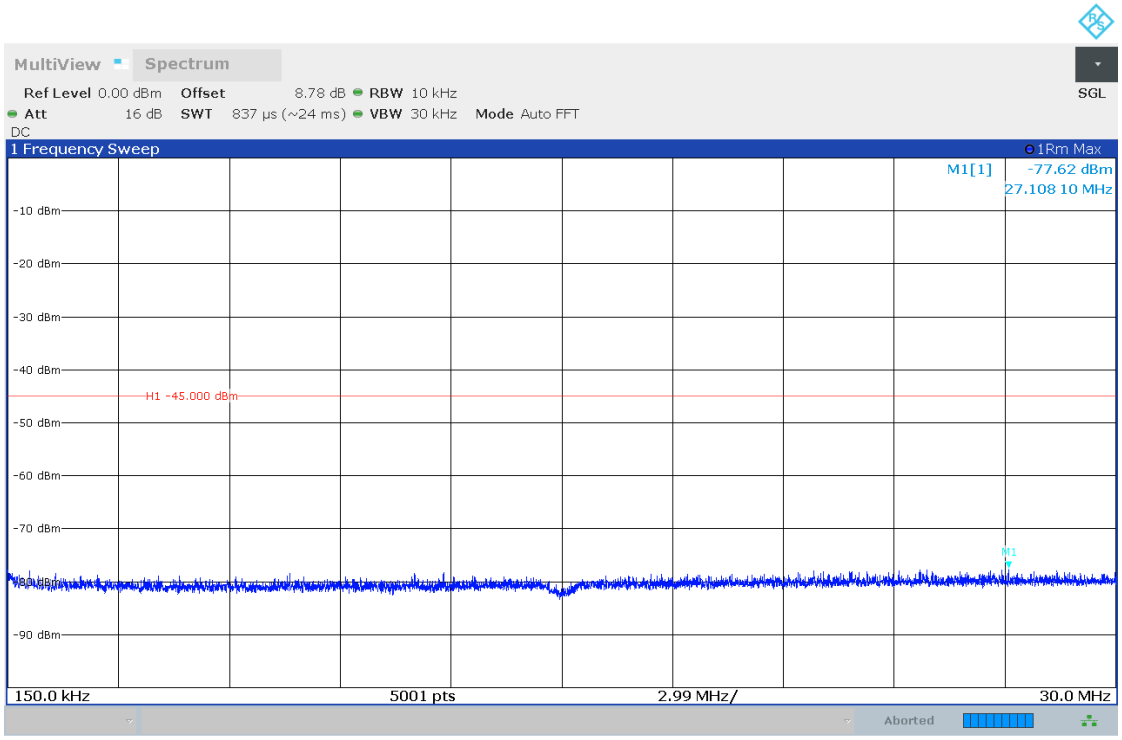

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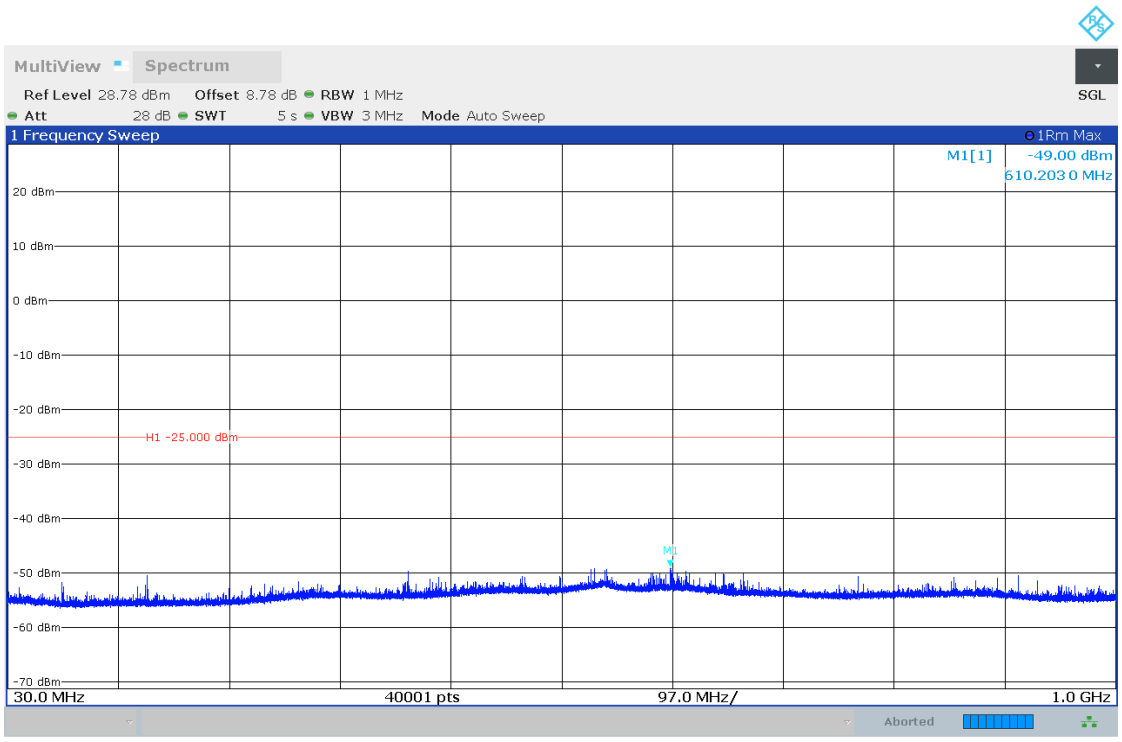

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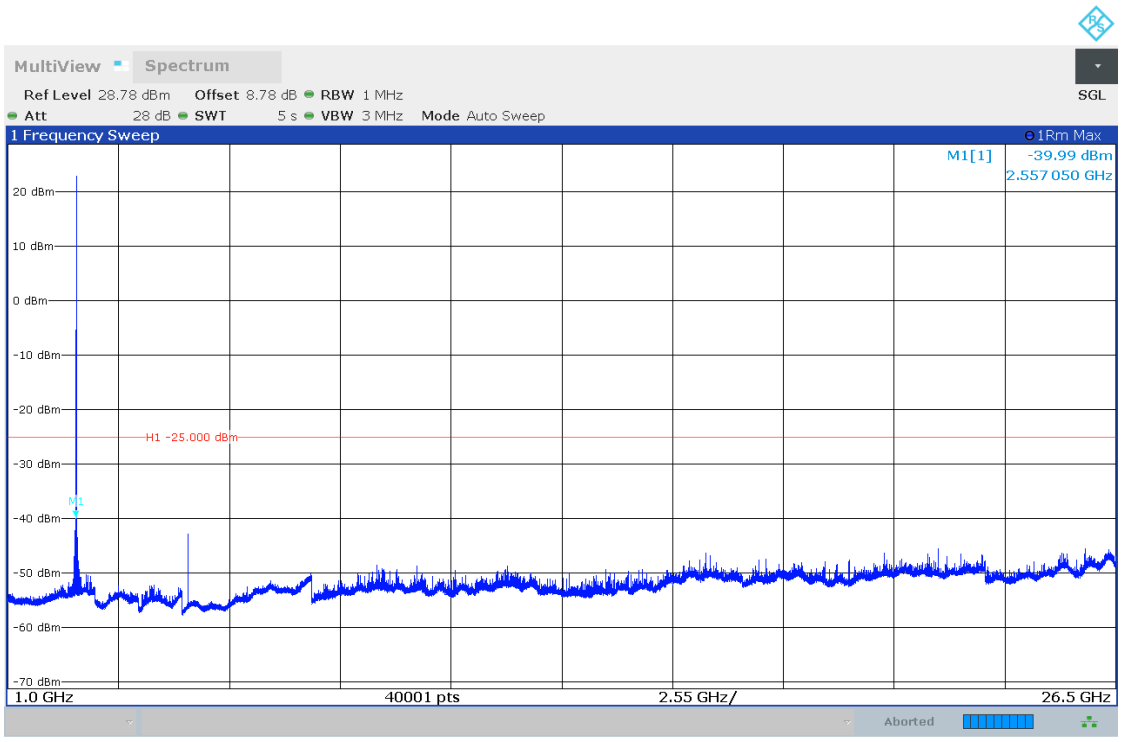

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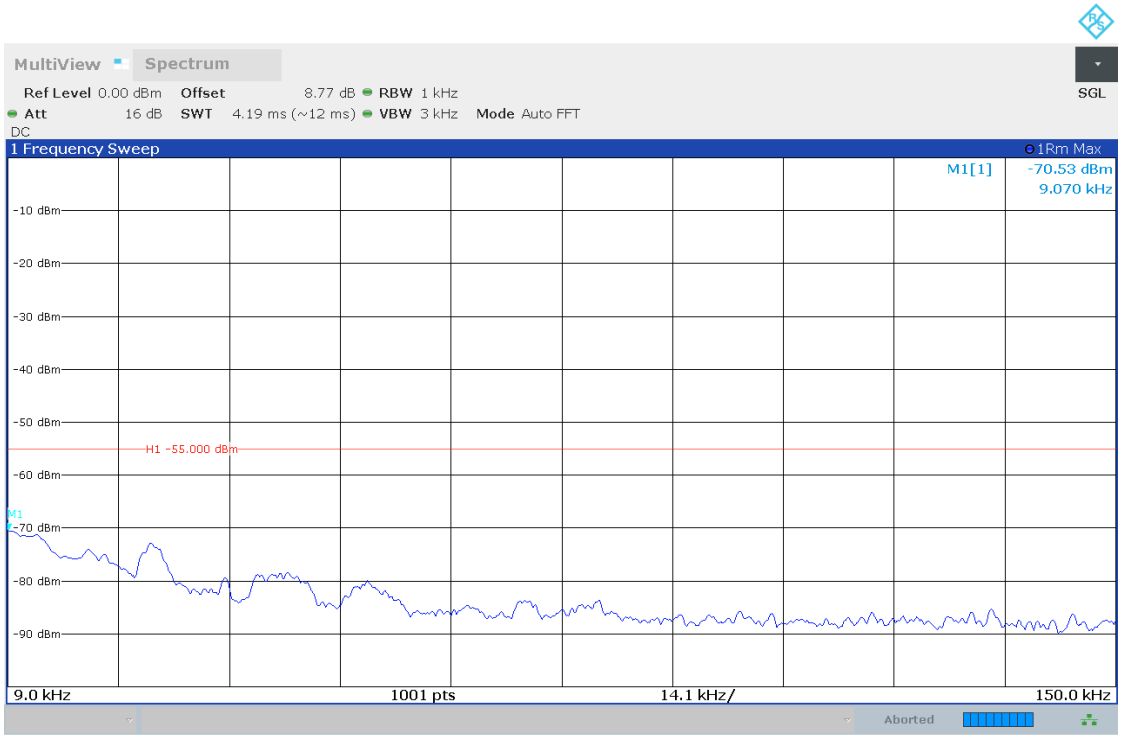
TM1_5MHz_MCH_RB25#0



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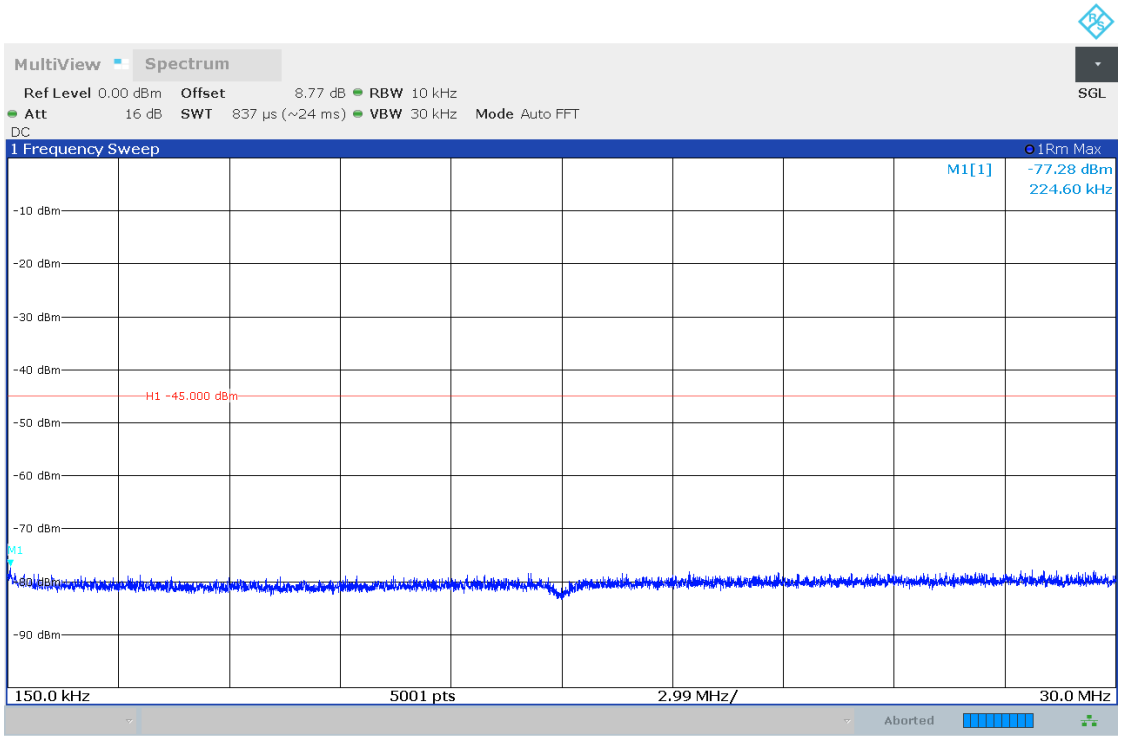

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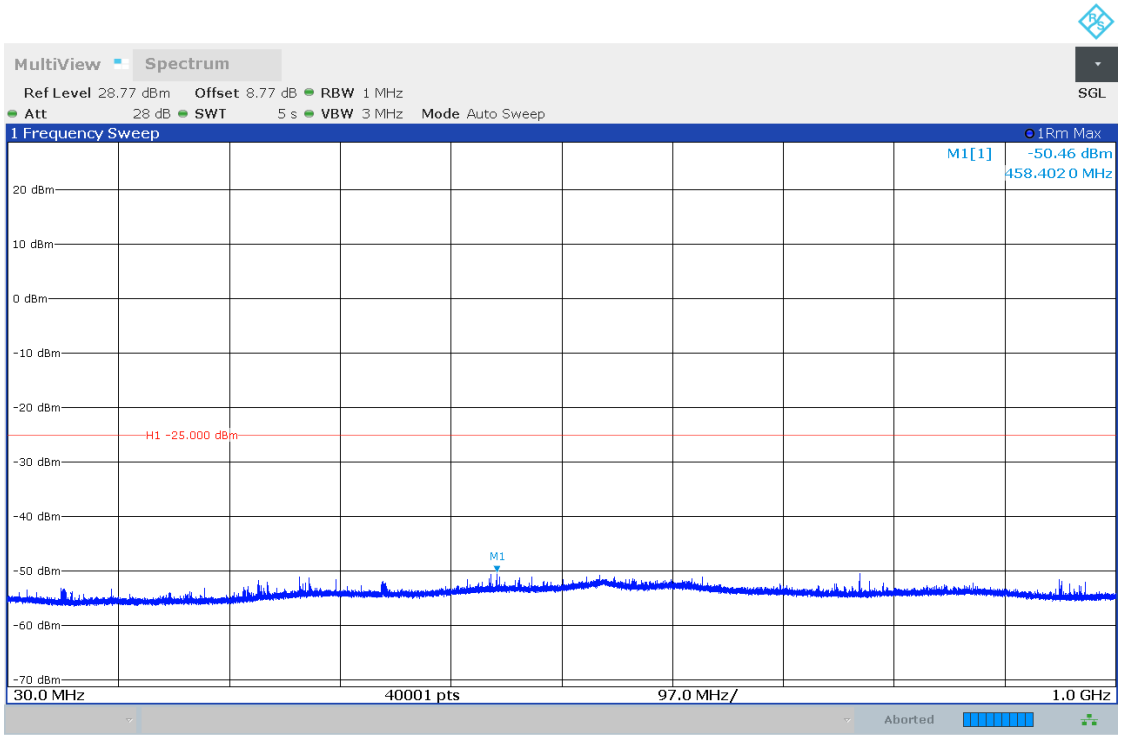

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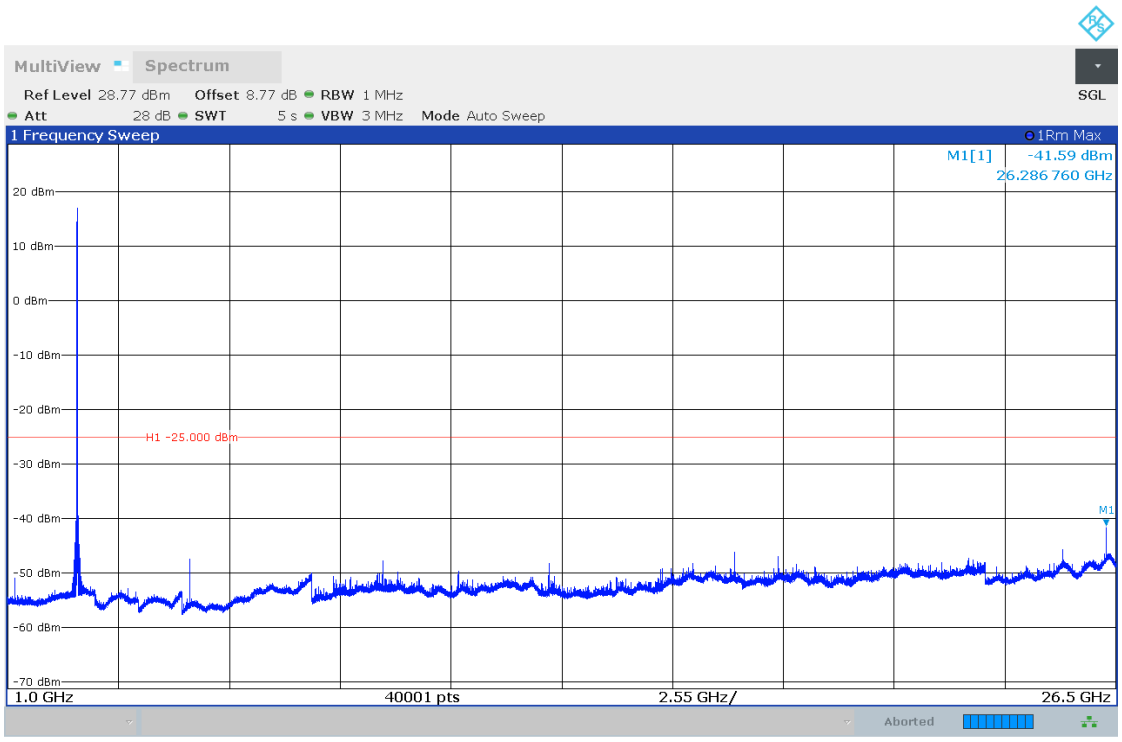

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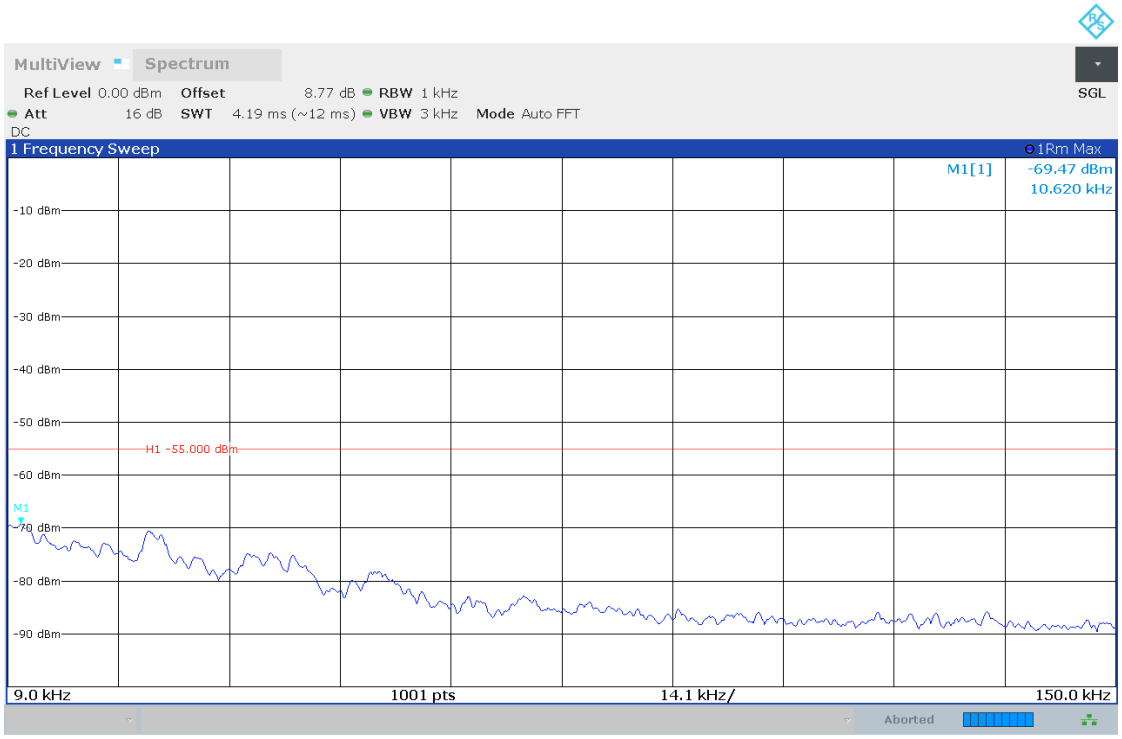
TM1_5MHz_MCH_RB1#0



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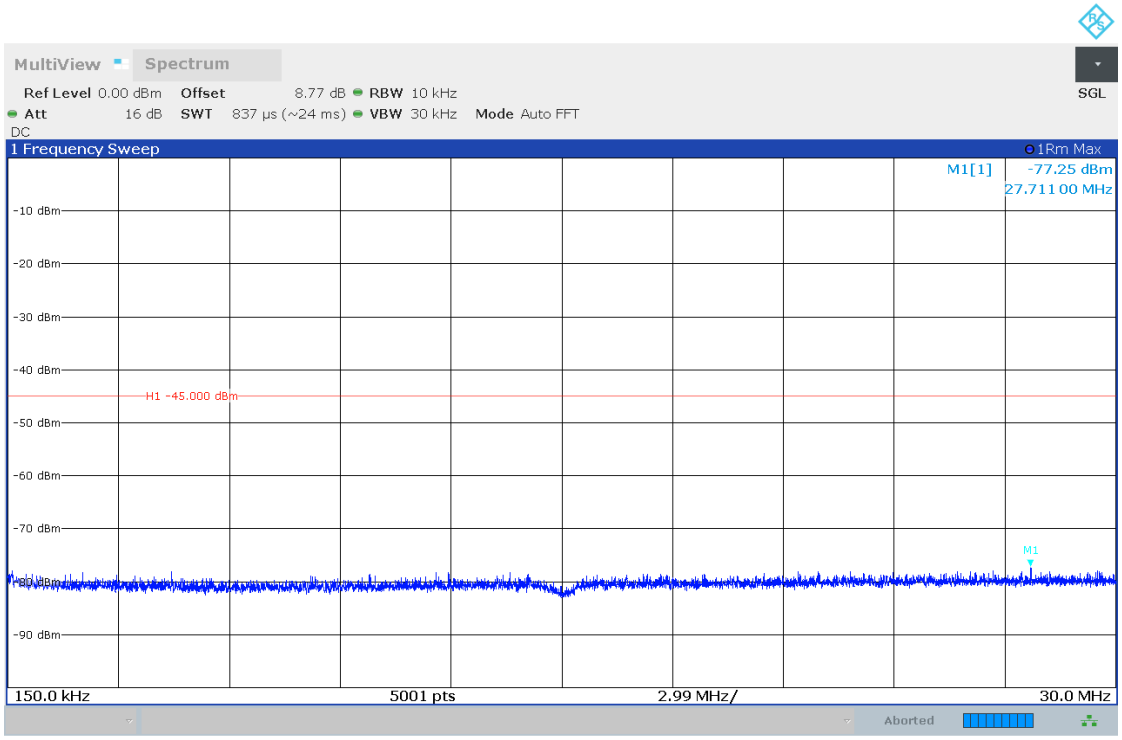

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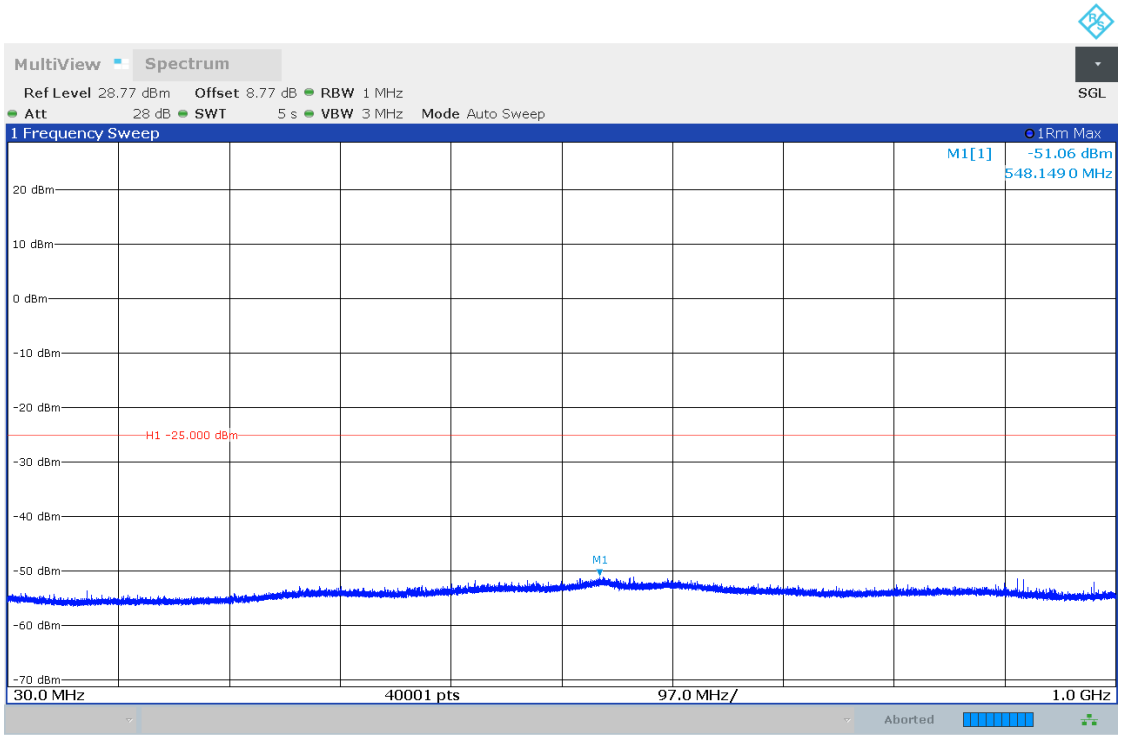

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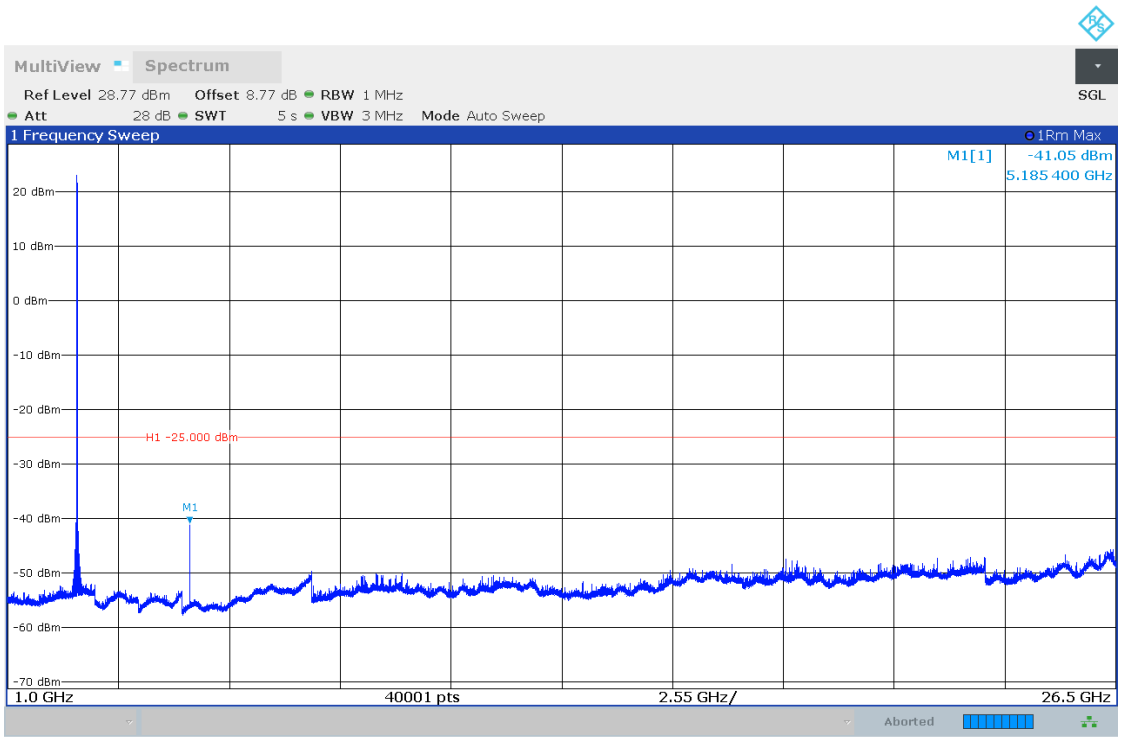

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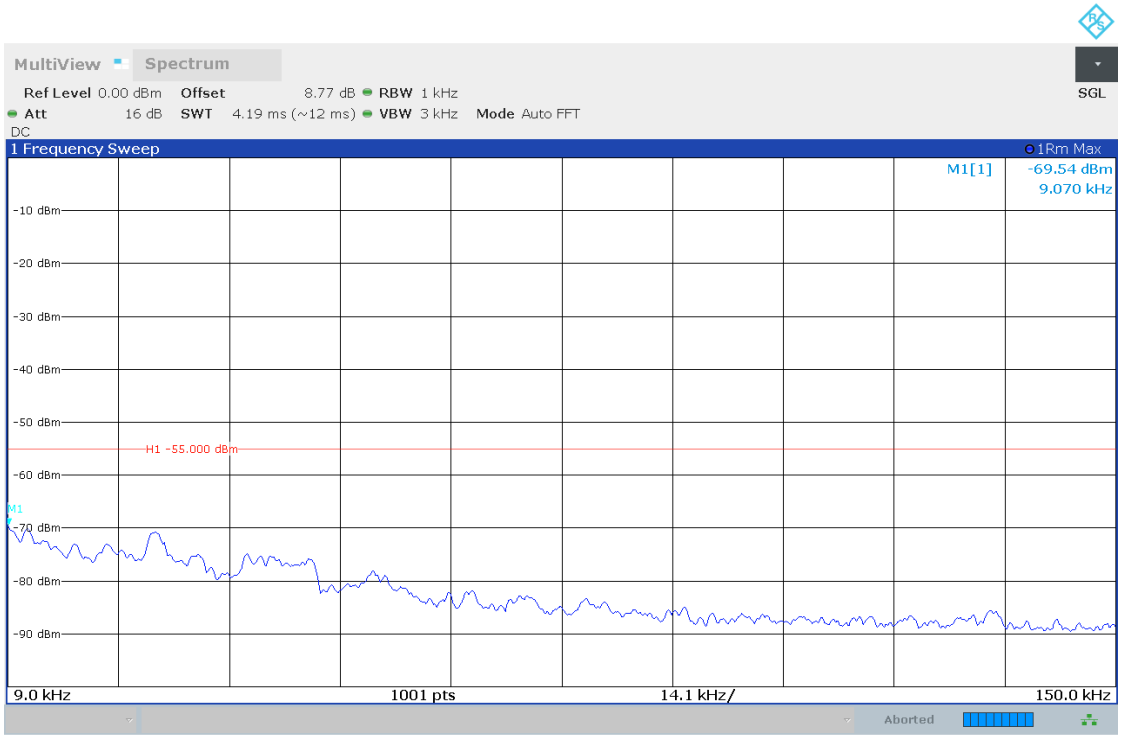

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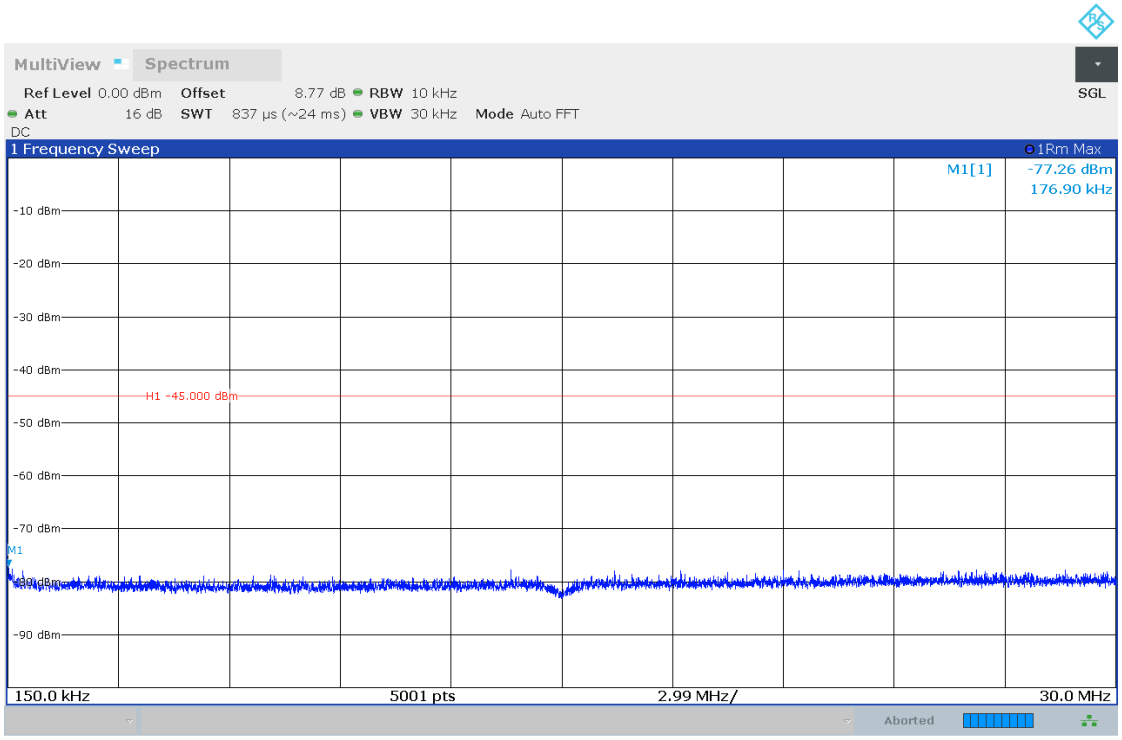

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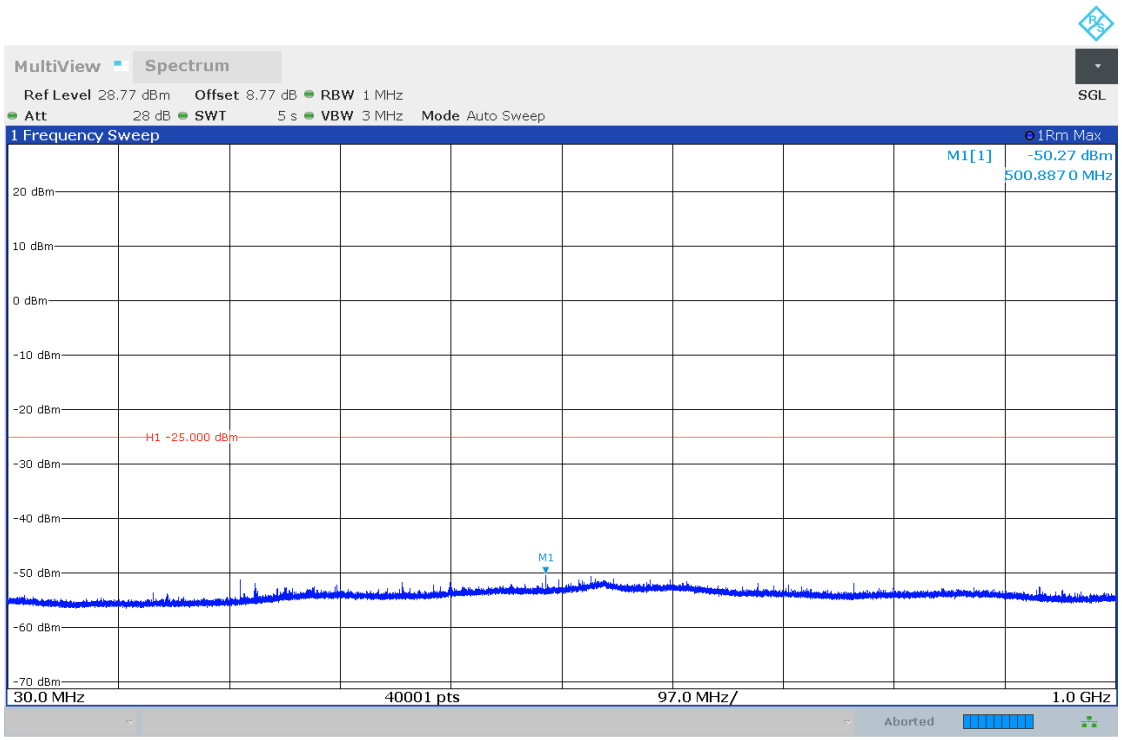

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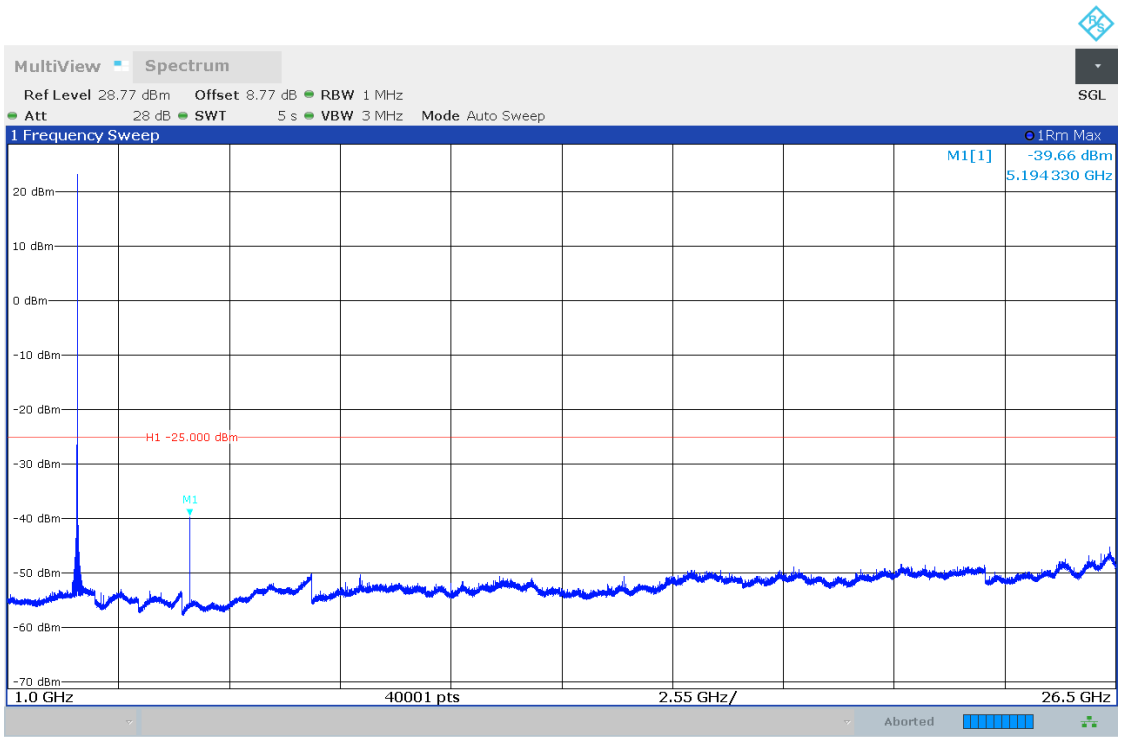

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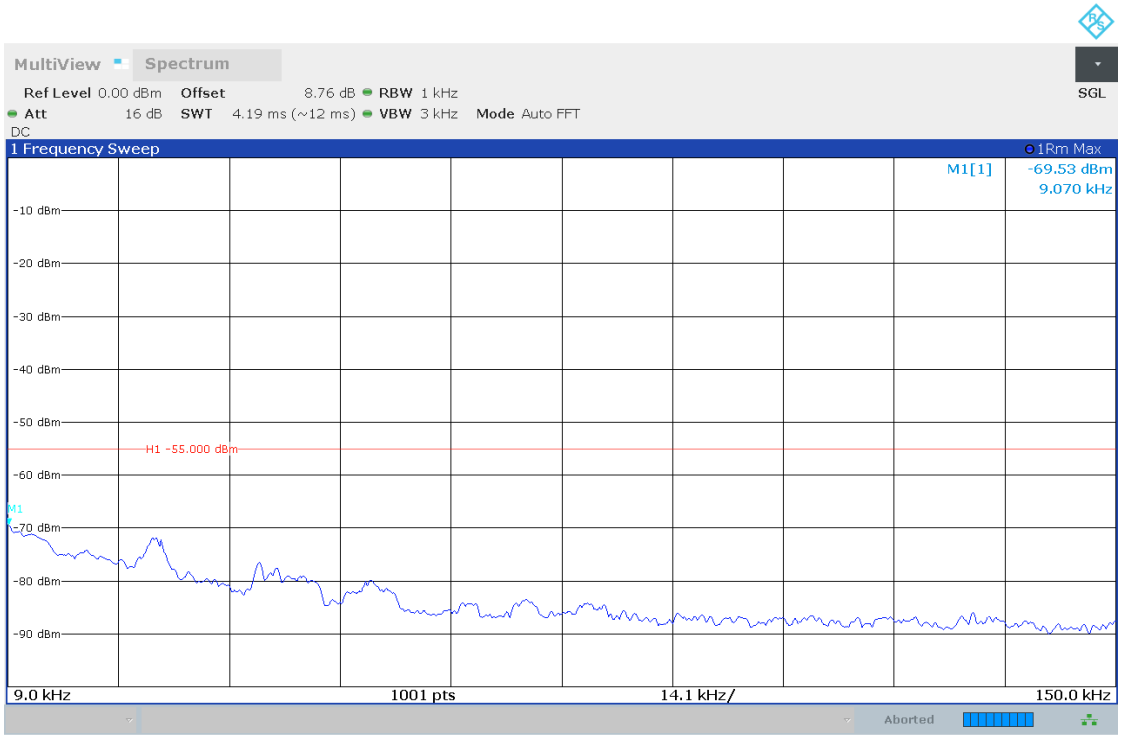
TM1_5MHz_HCH_RB25#0



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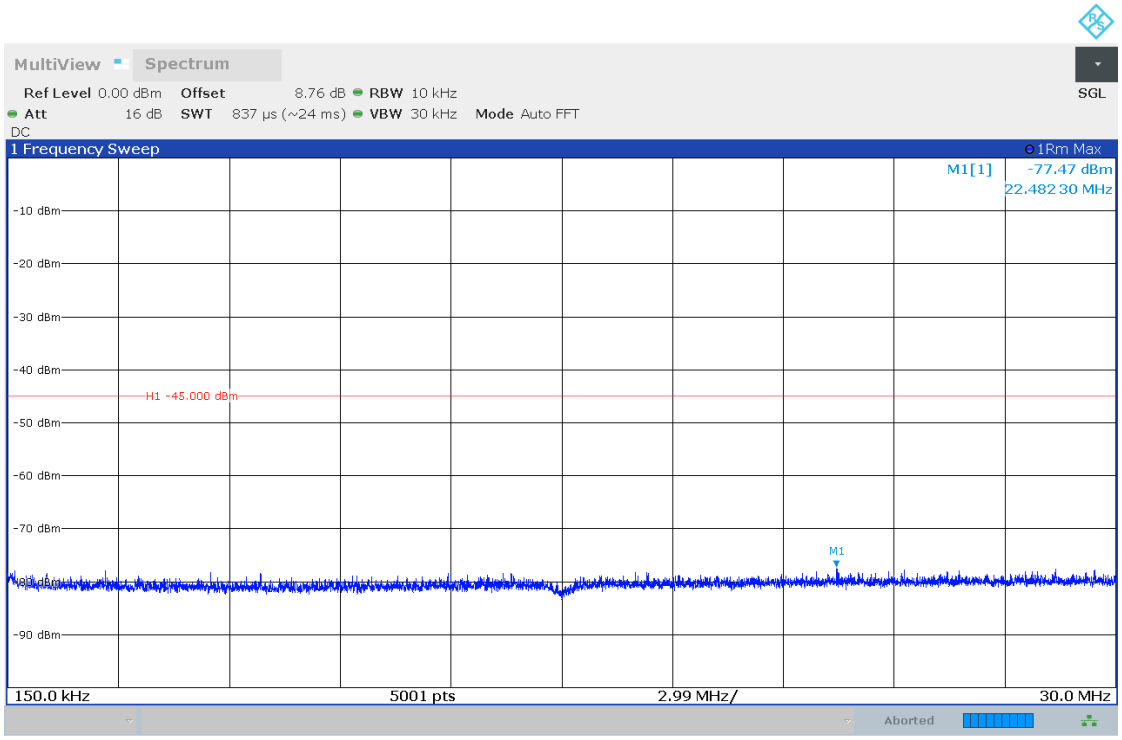

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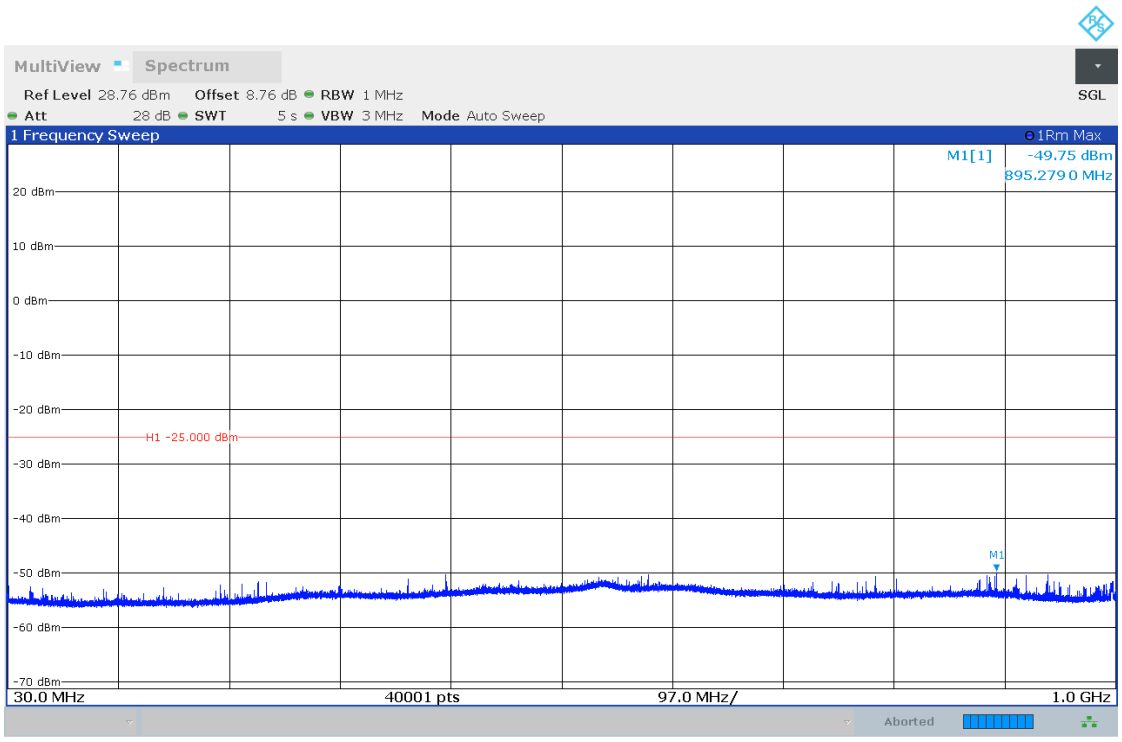

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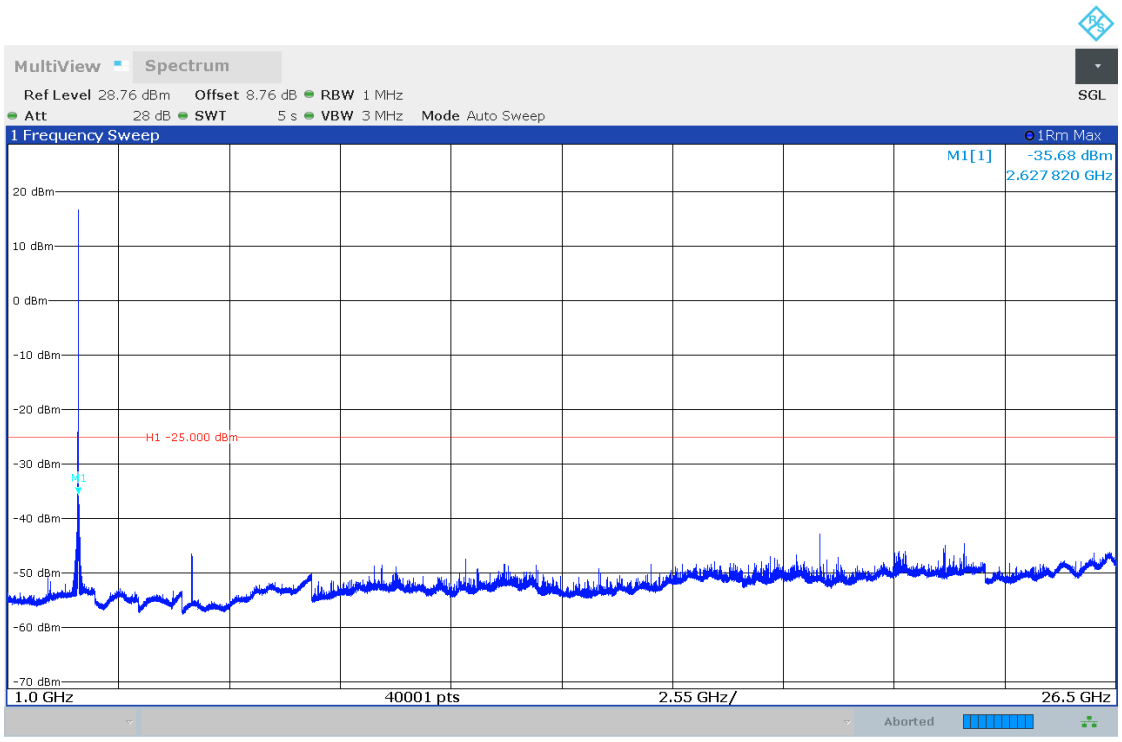

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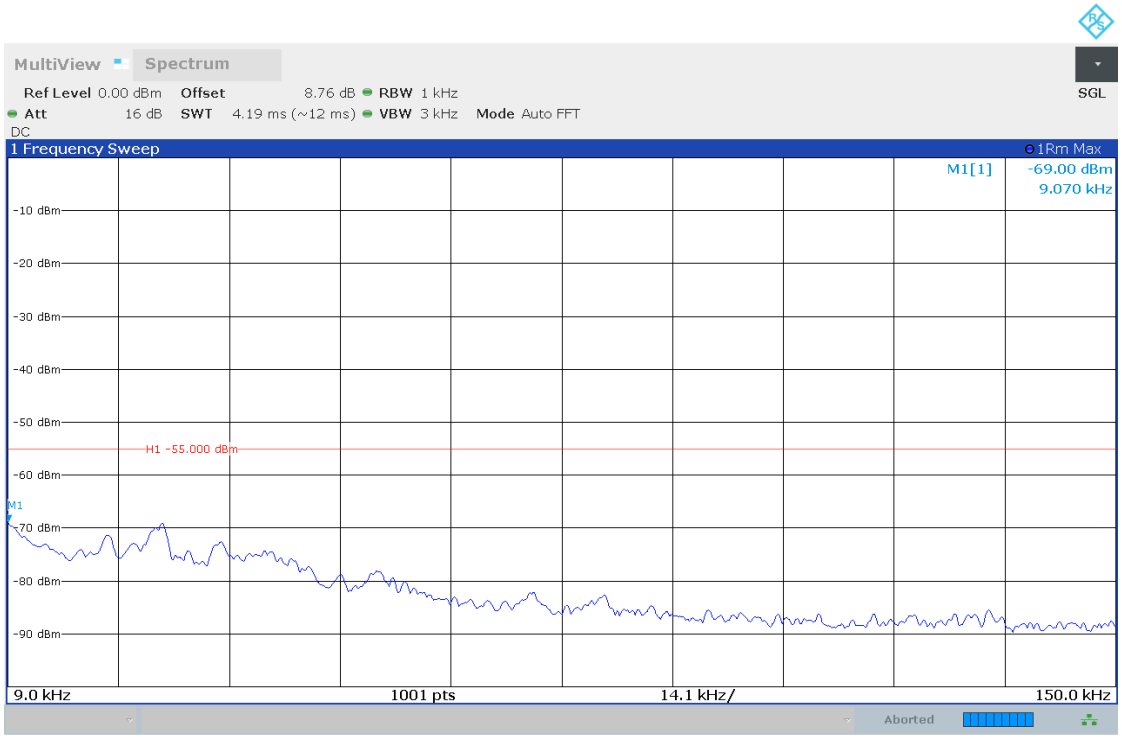
TM1_5MHz_HCH_RB1#0



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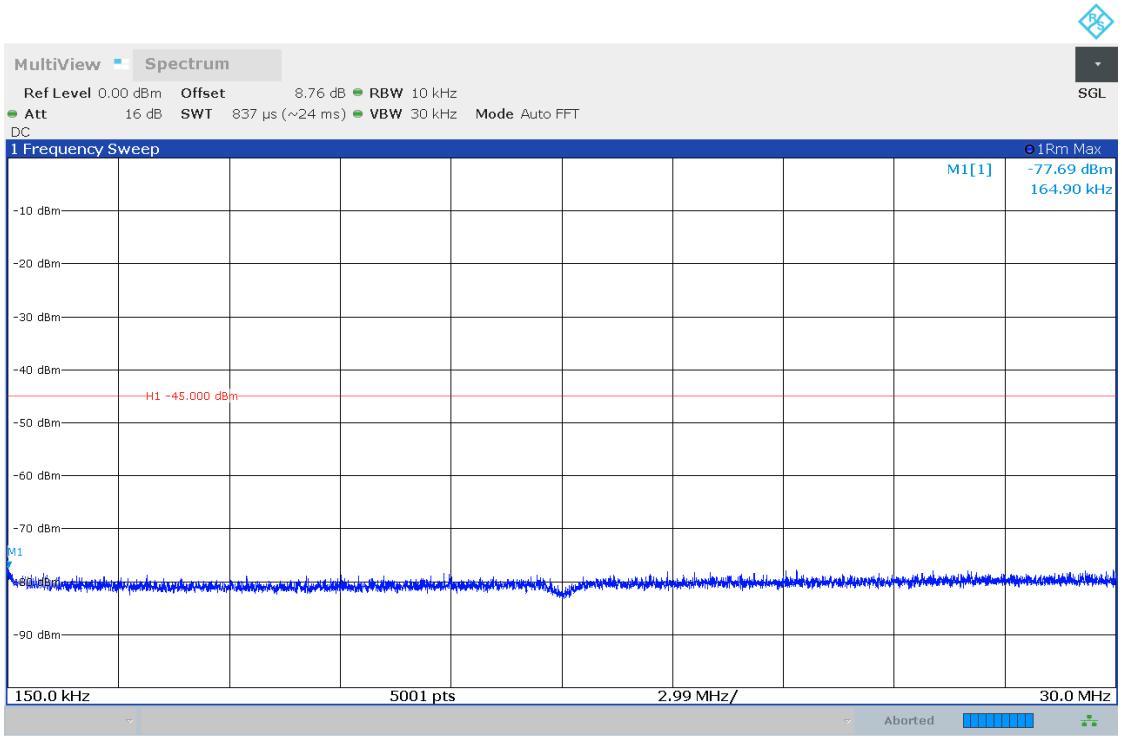

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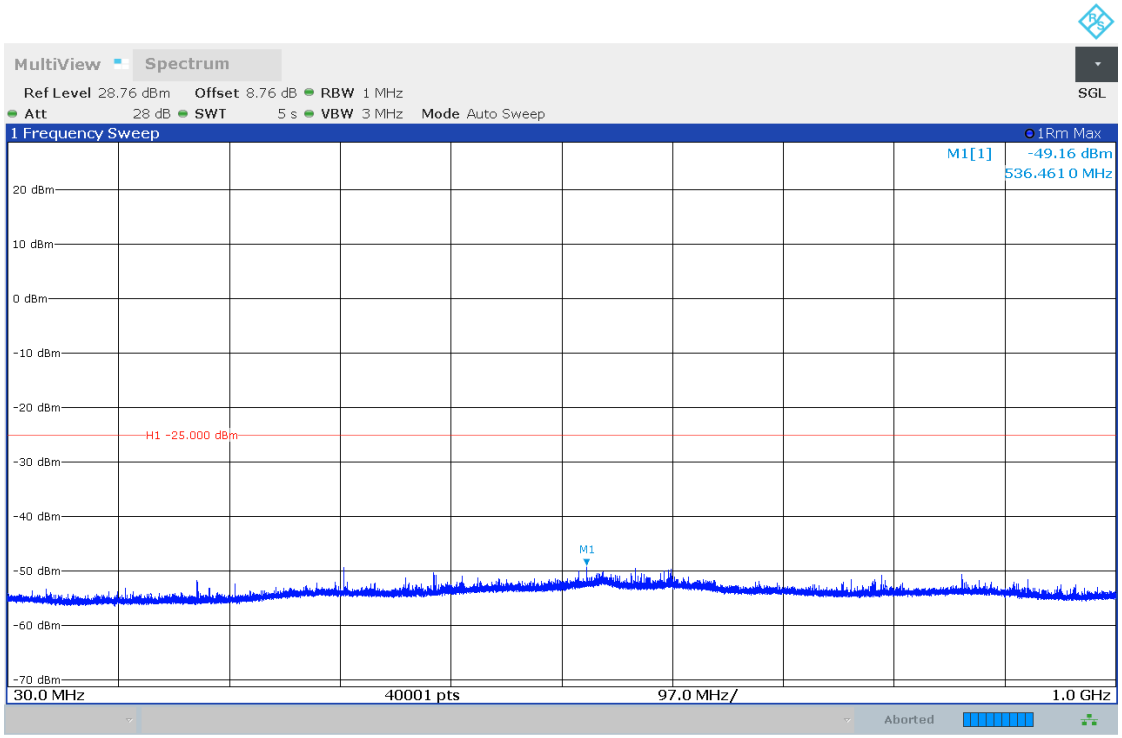

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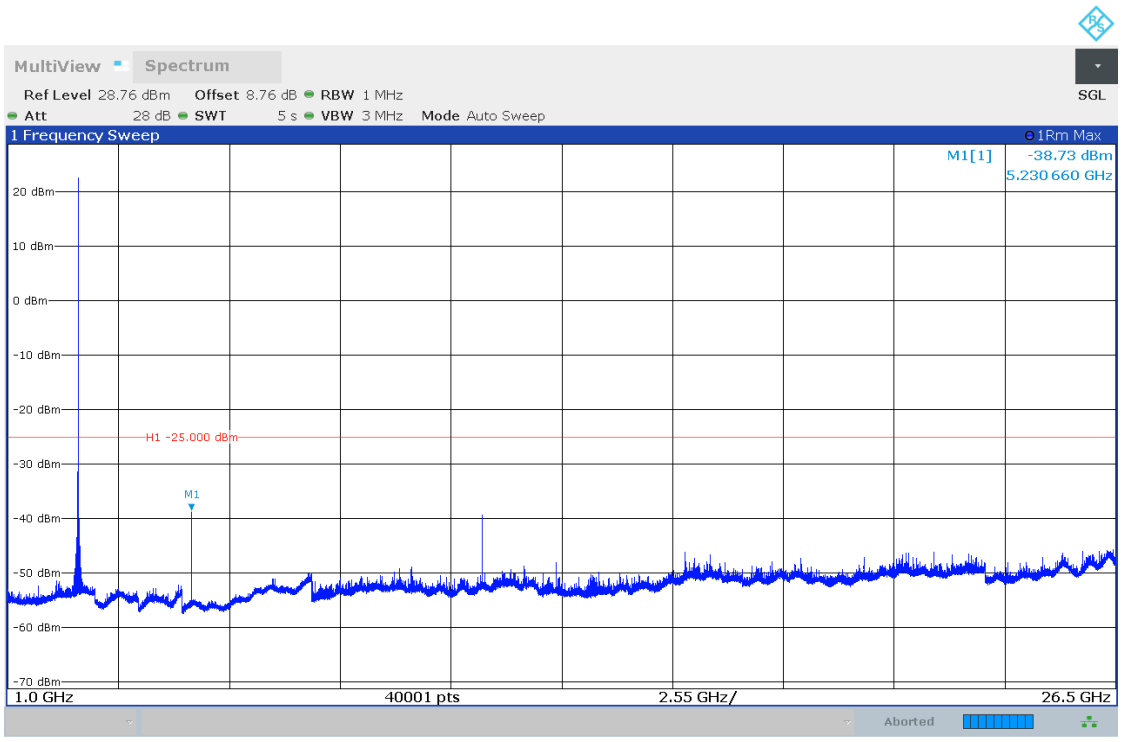

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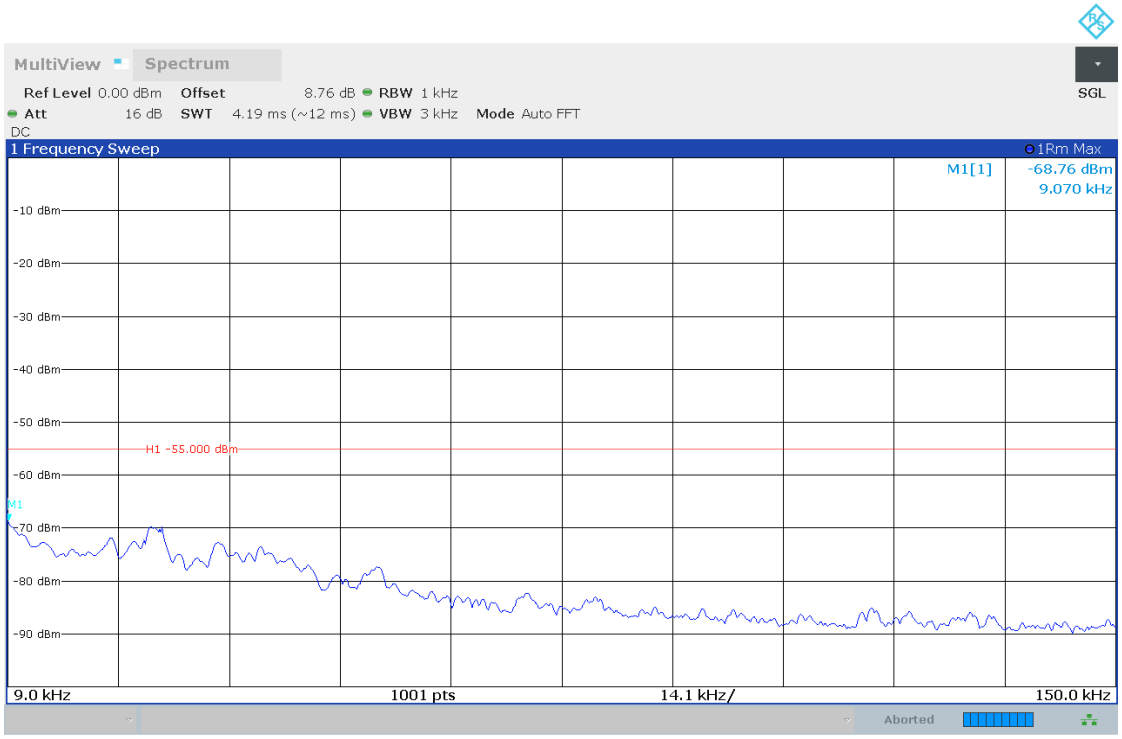
TM1_5MHz_HCH_RB1#24



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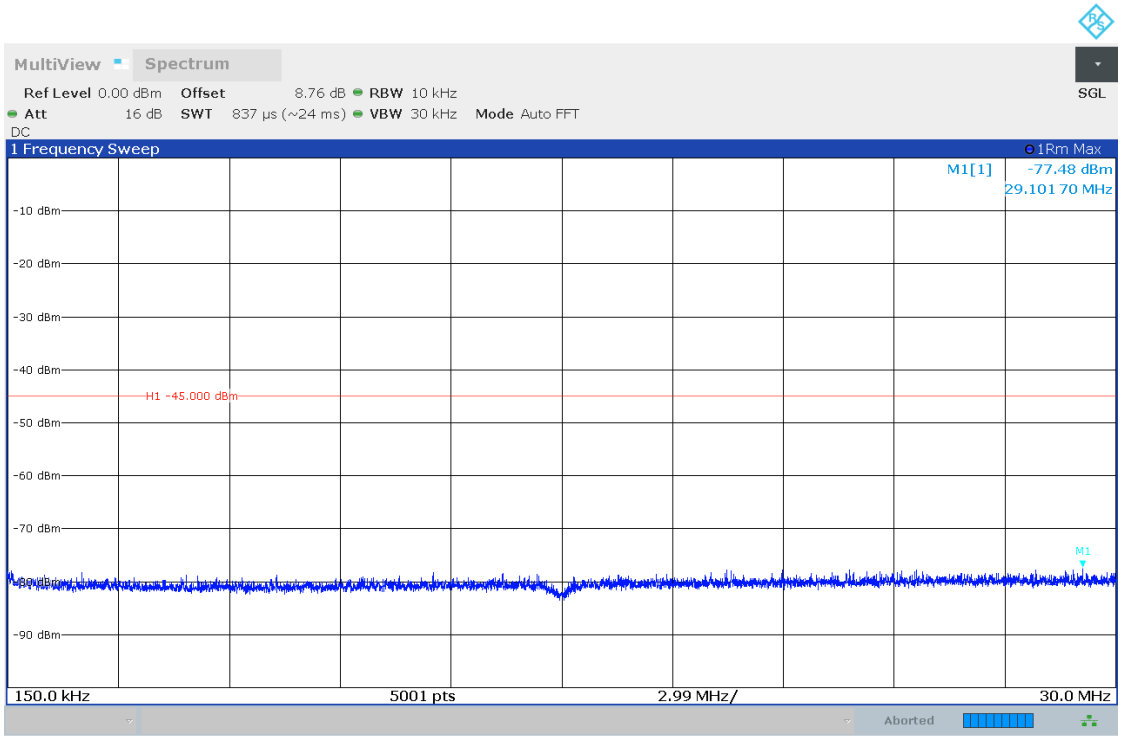

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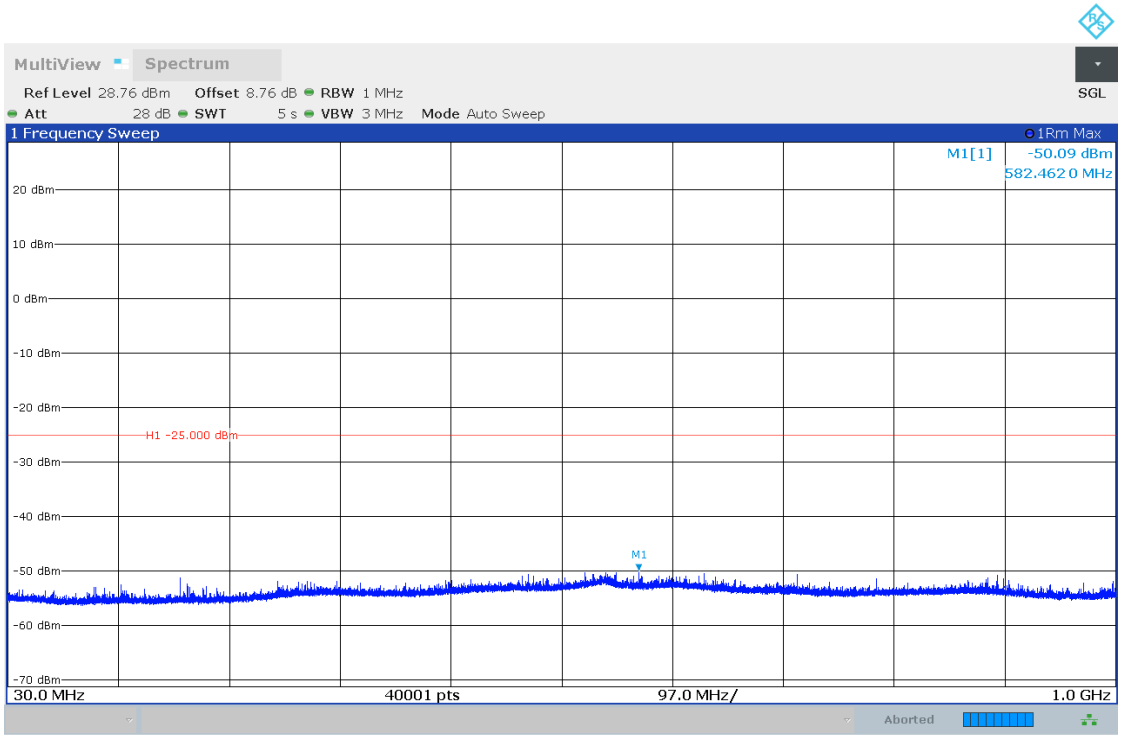

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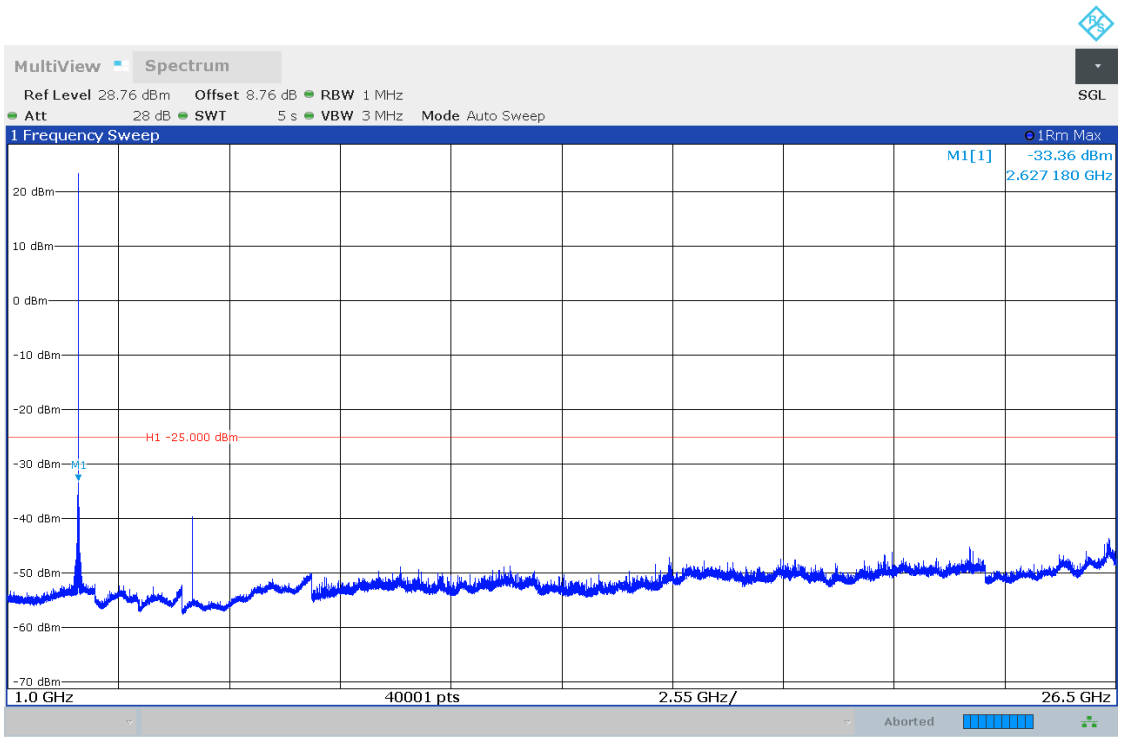

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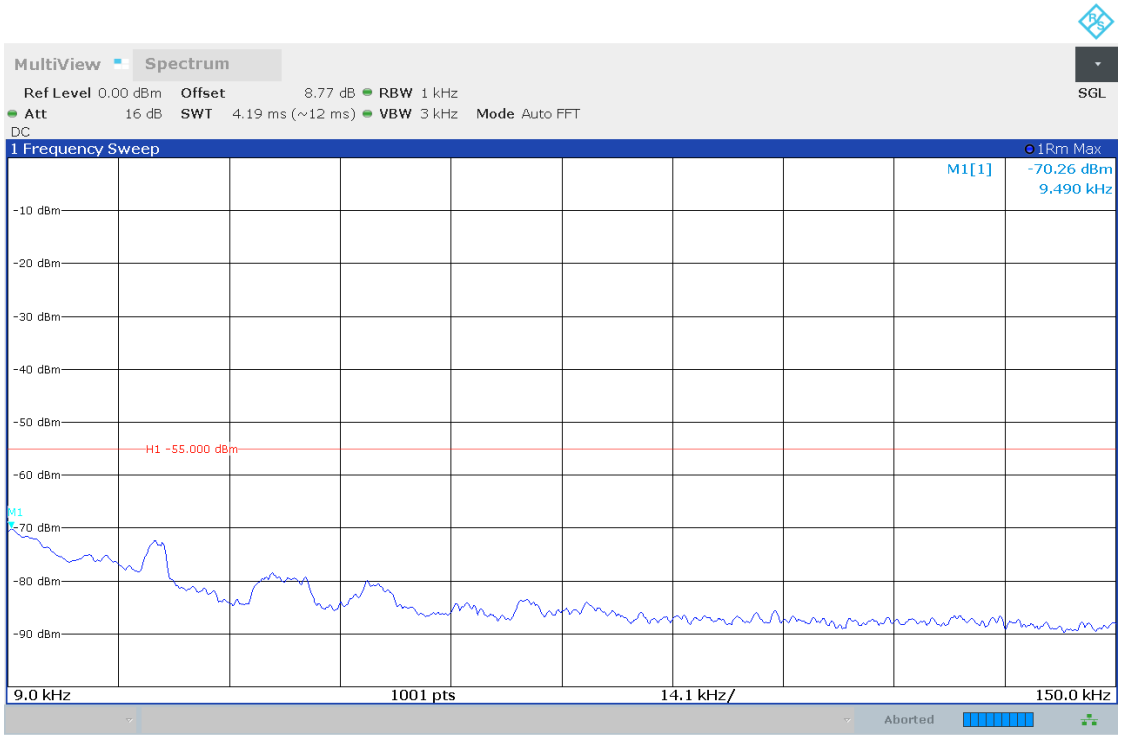
TM1_20MHz_LCH_RB100#0



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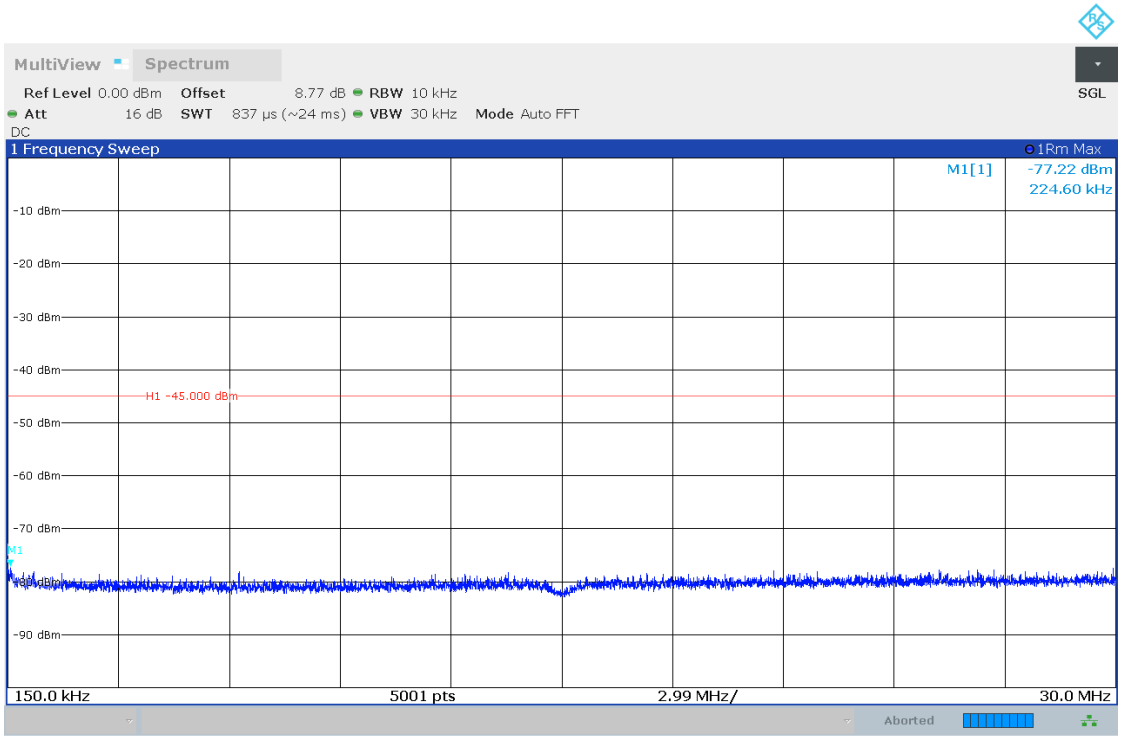

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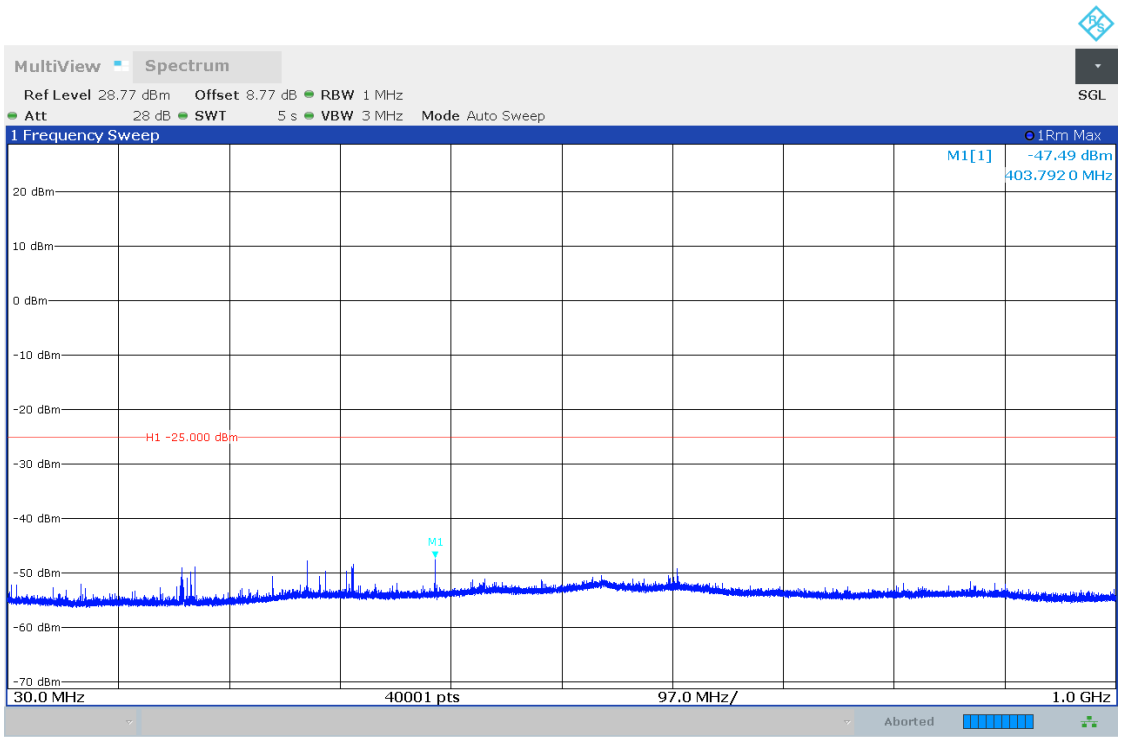

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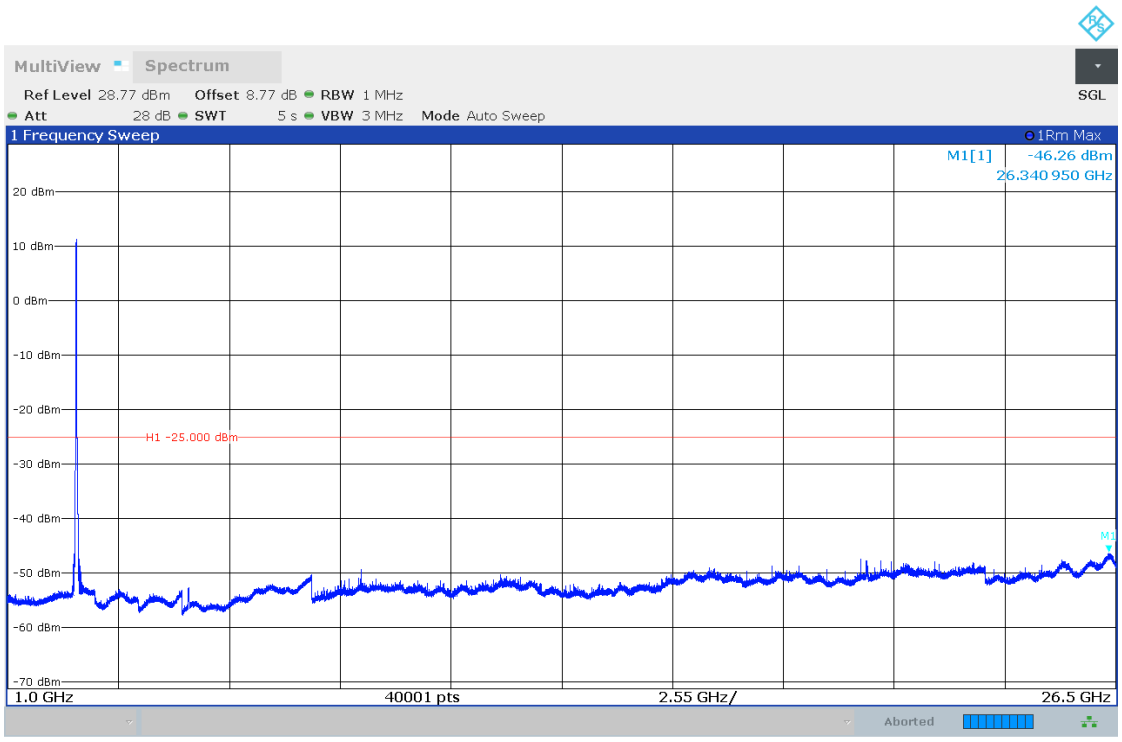

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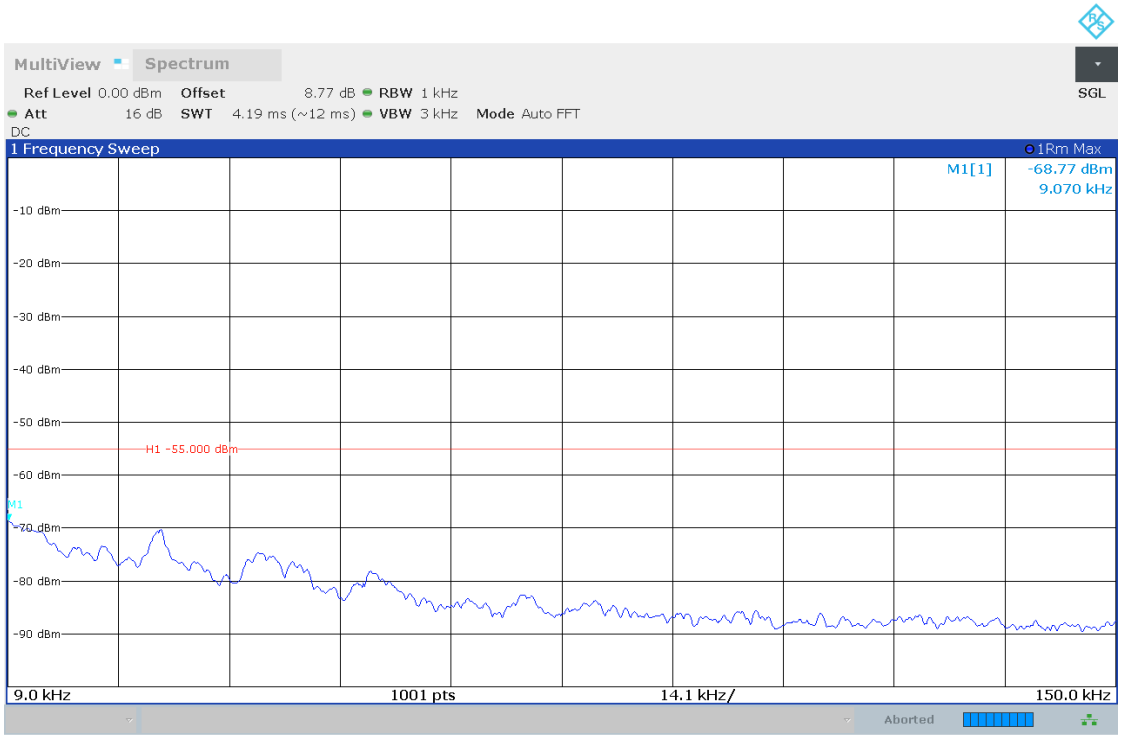
TM1_20MHz_LCH_RB1#0



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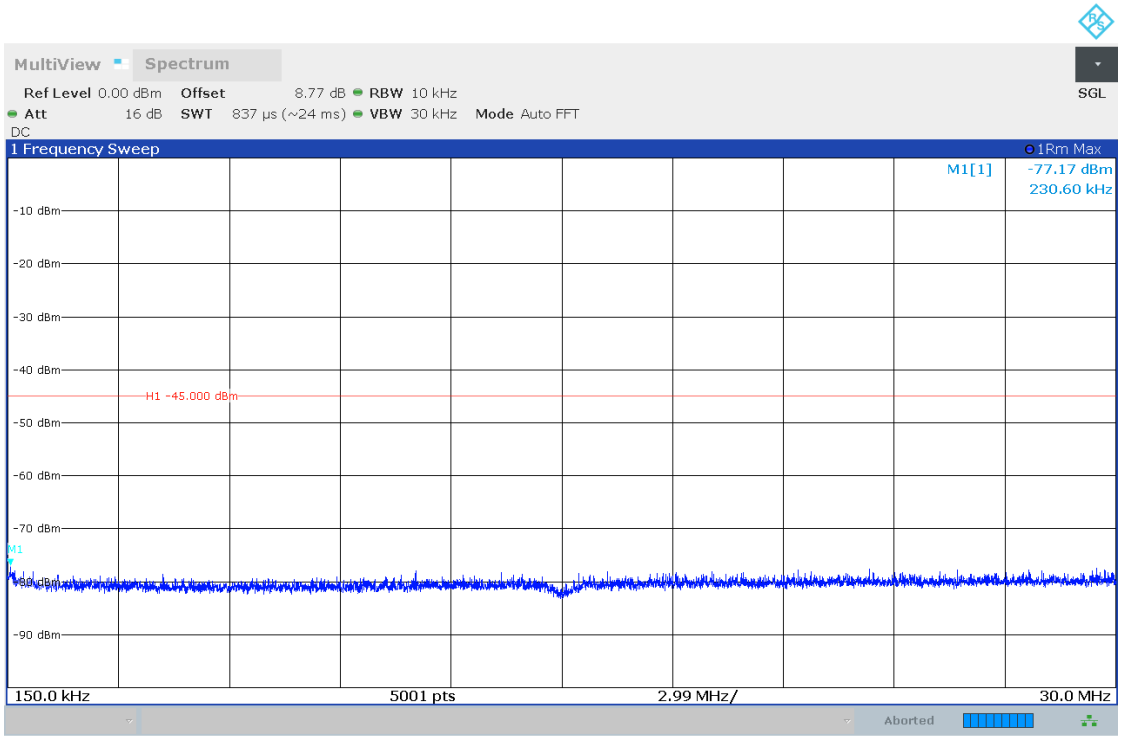

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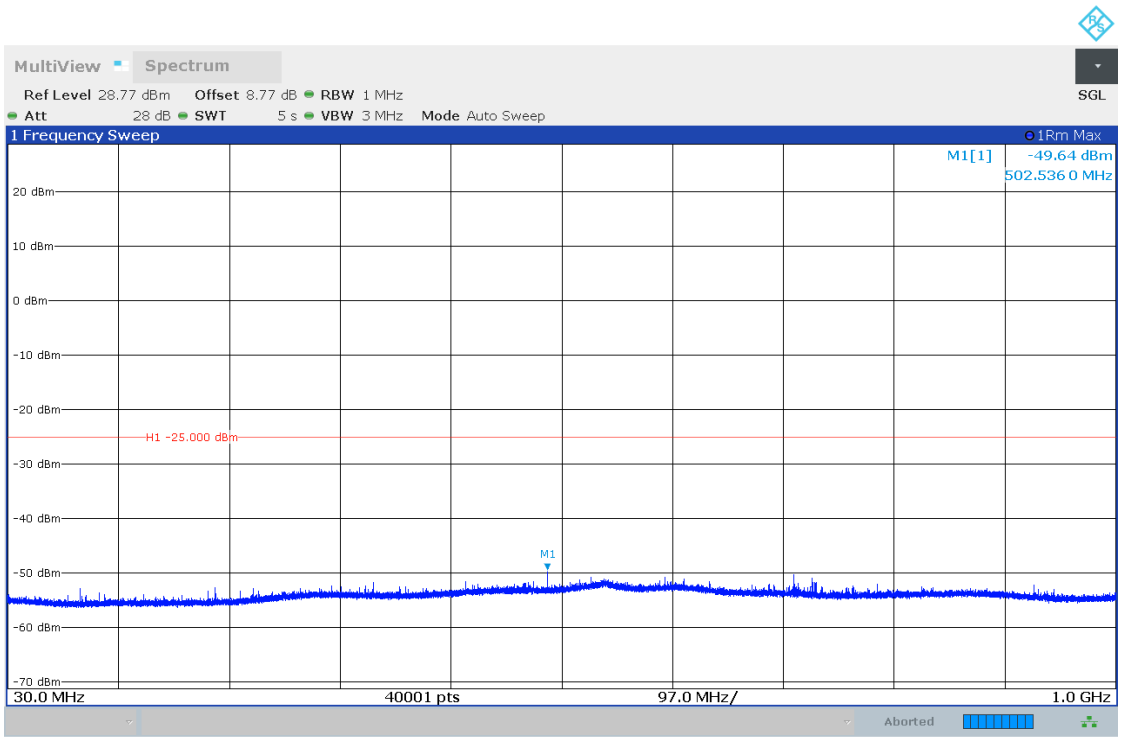

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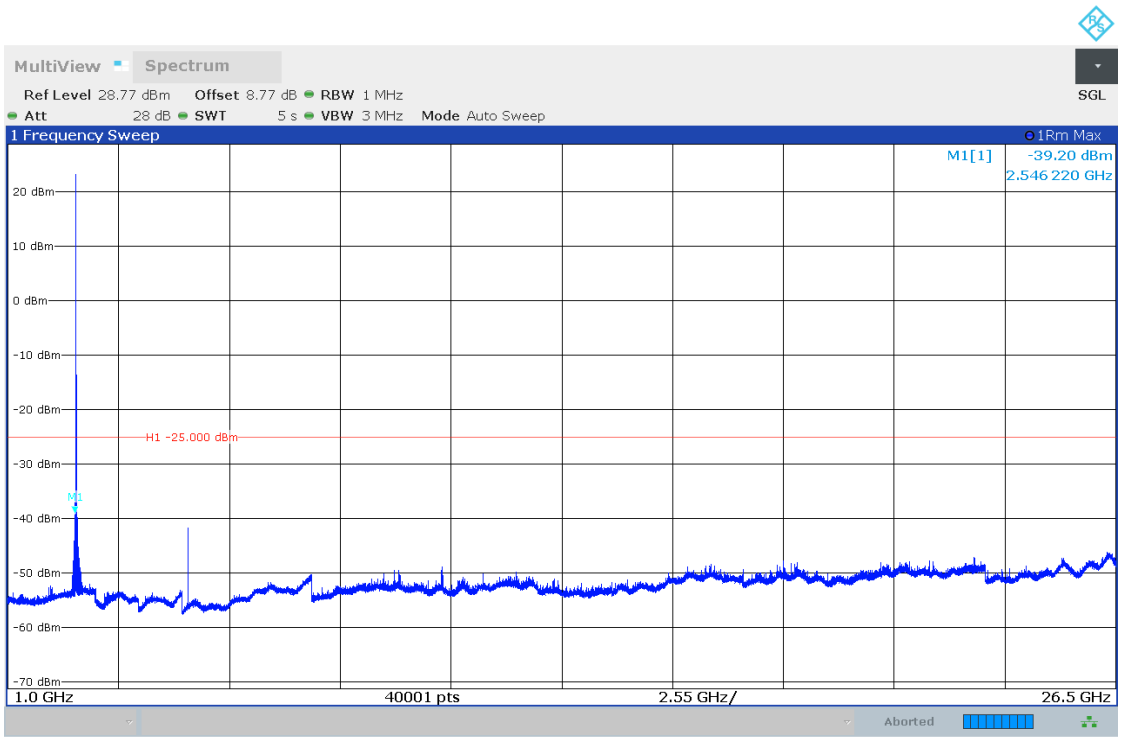

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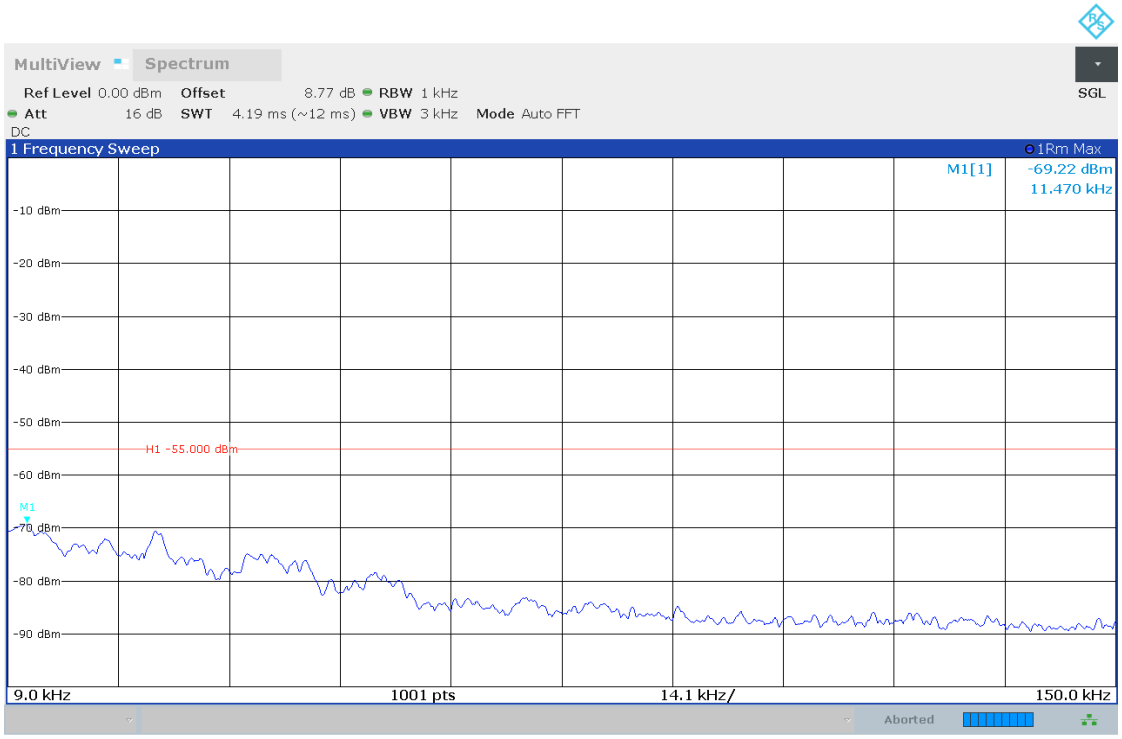

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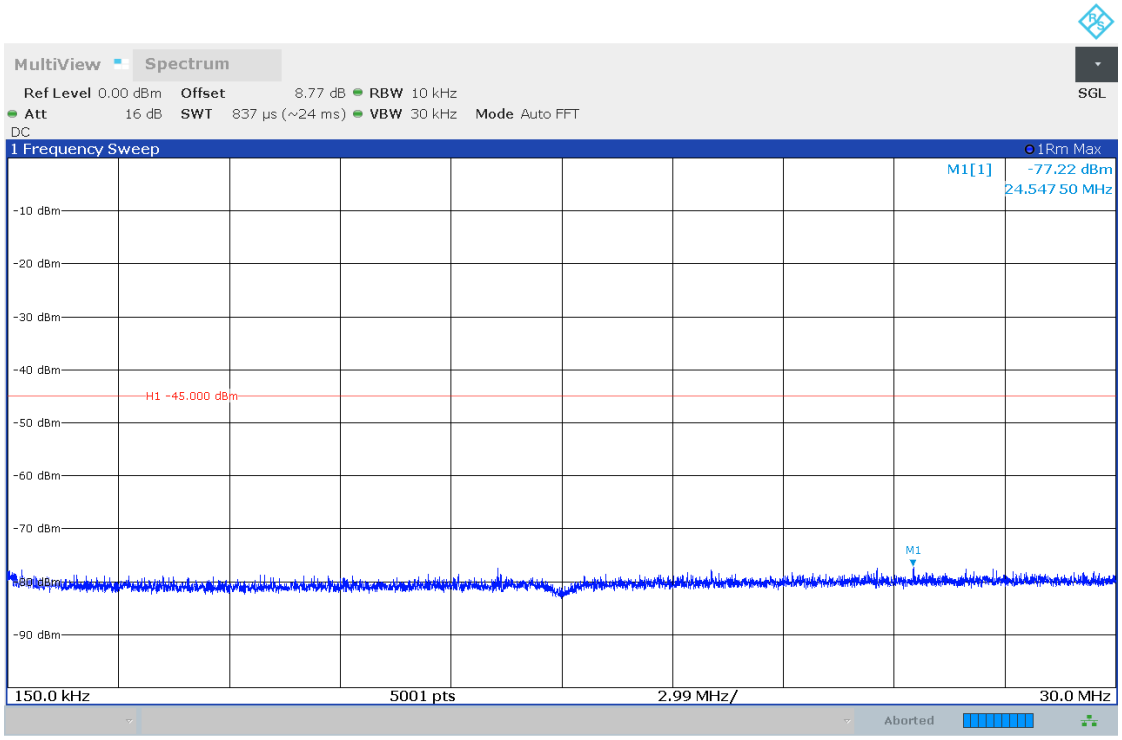

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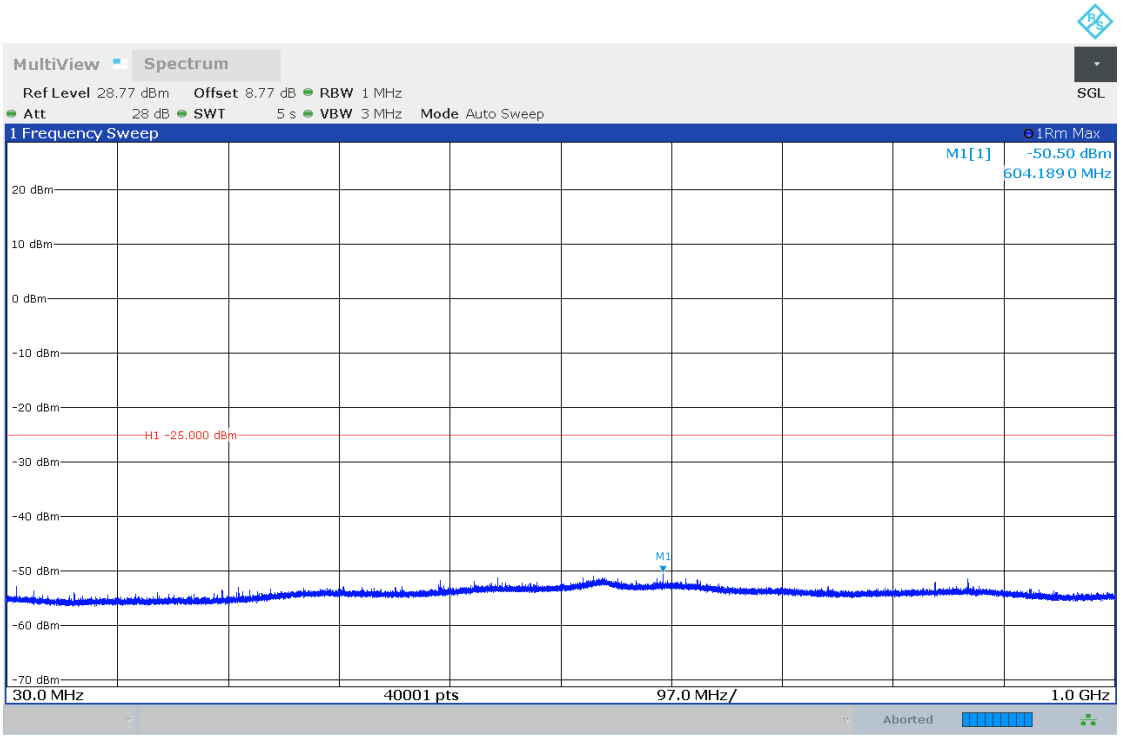

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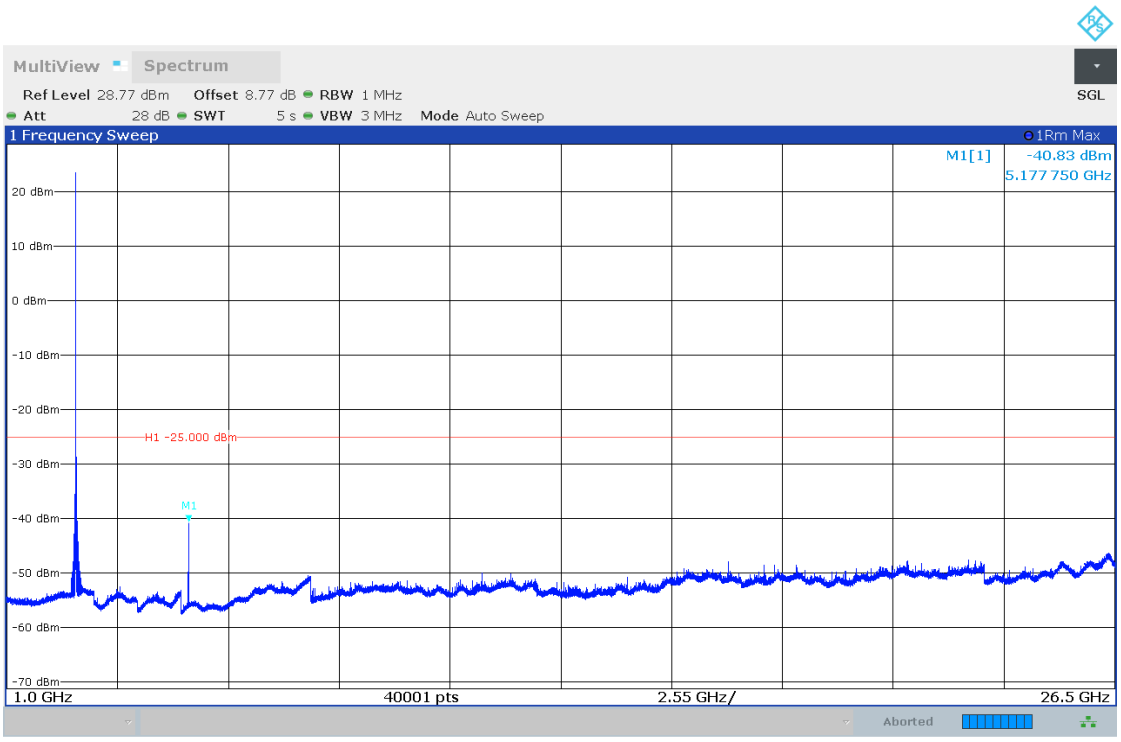

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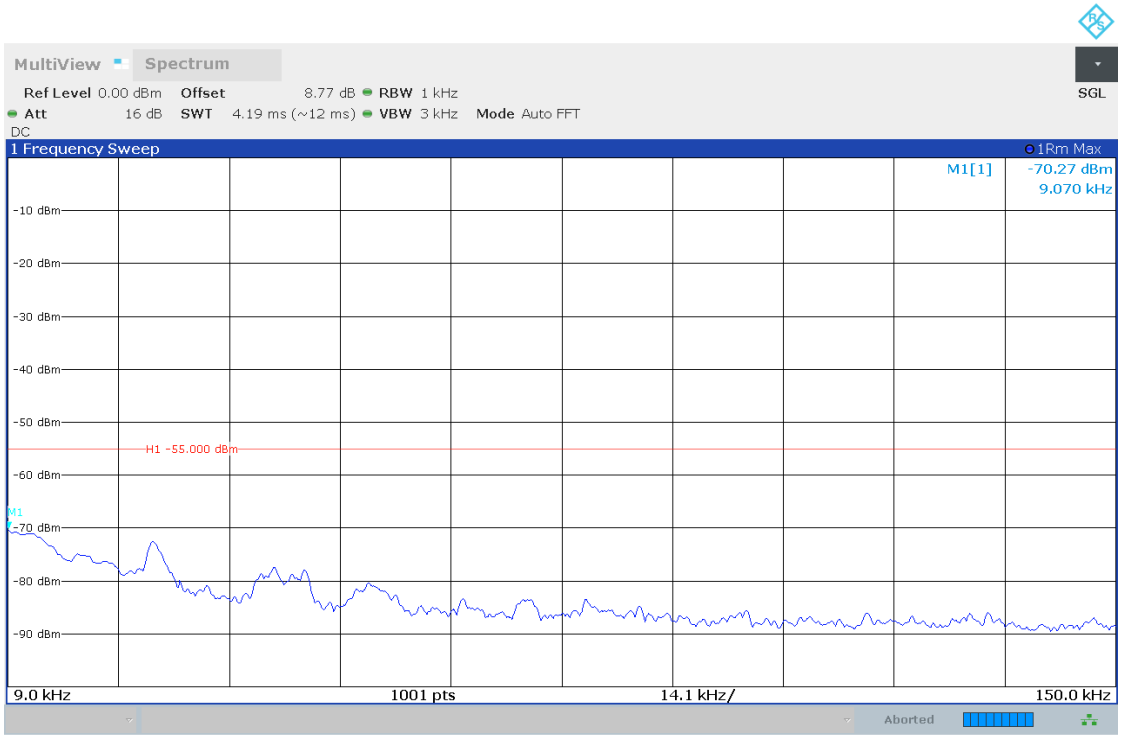

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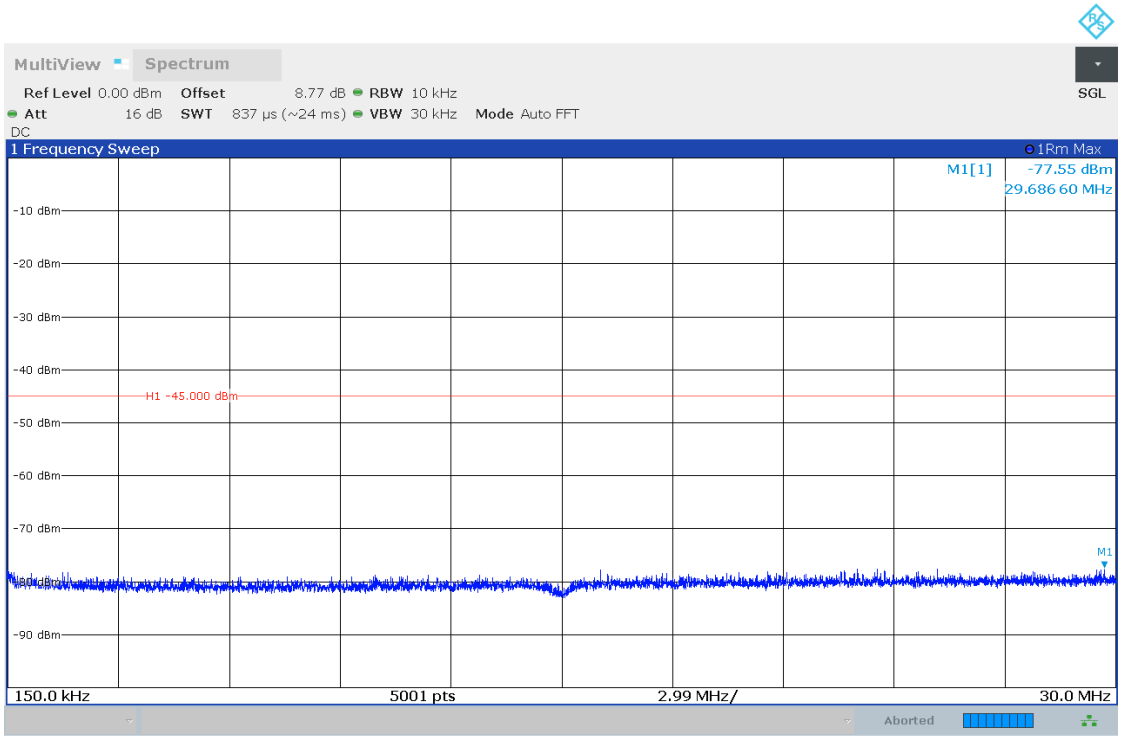

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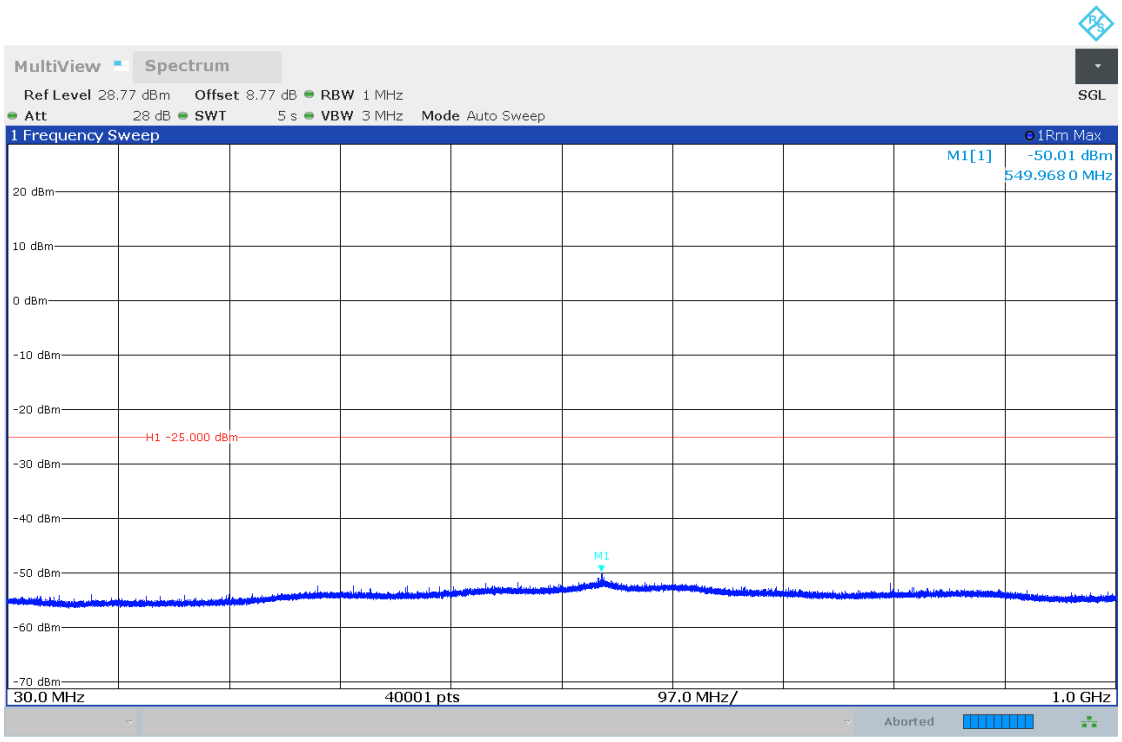

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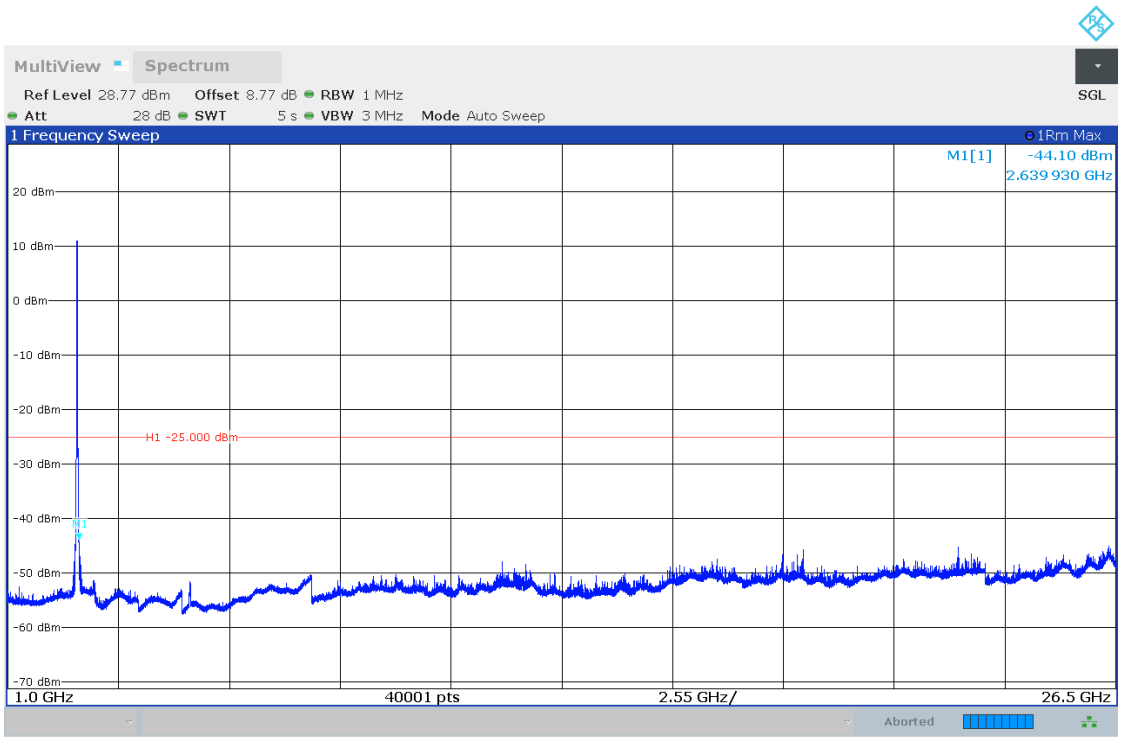

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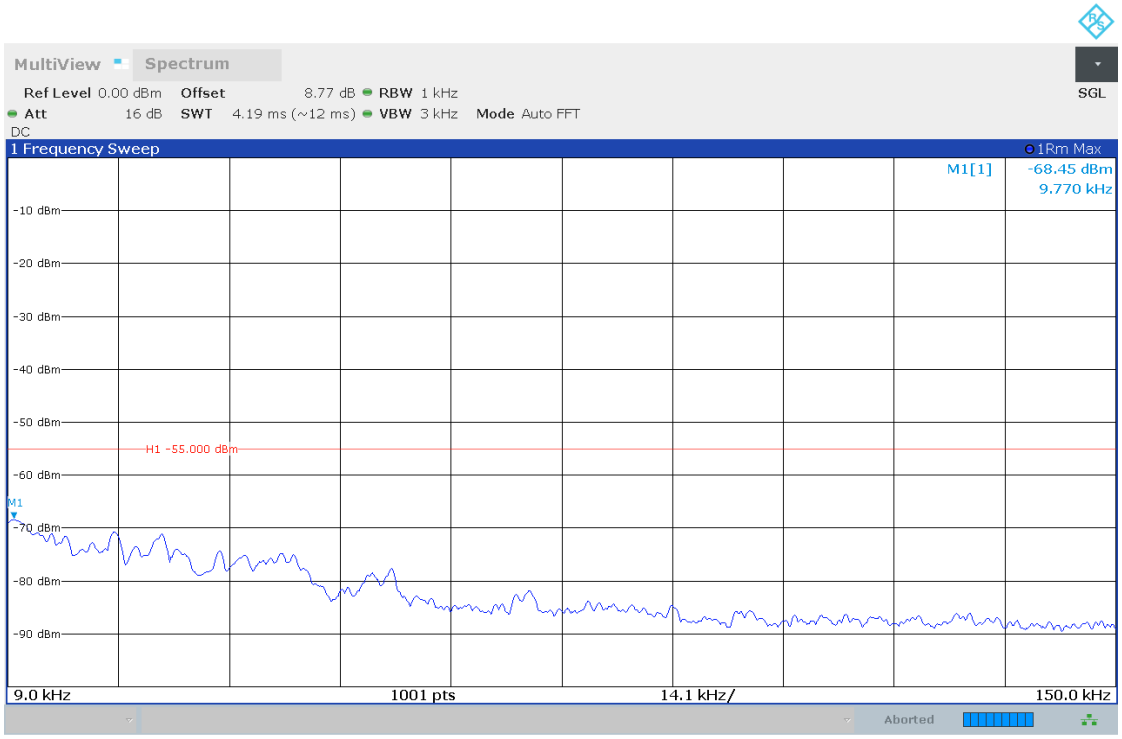

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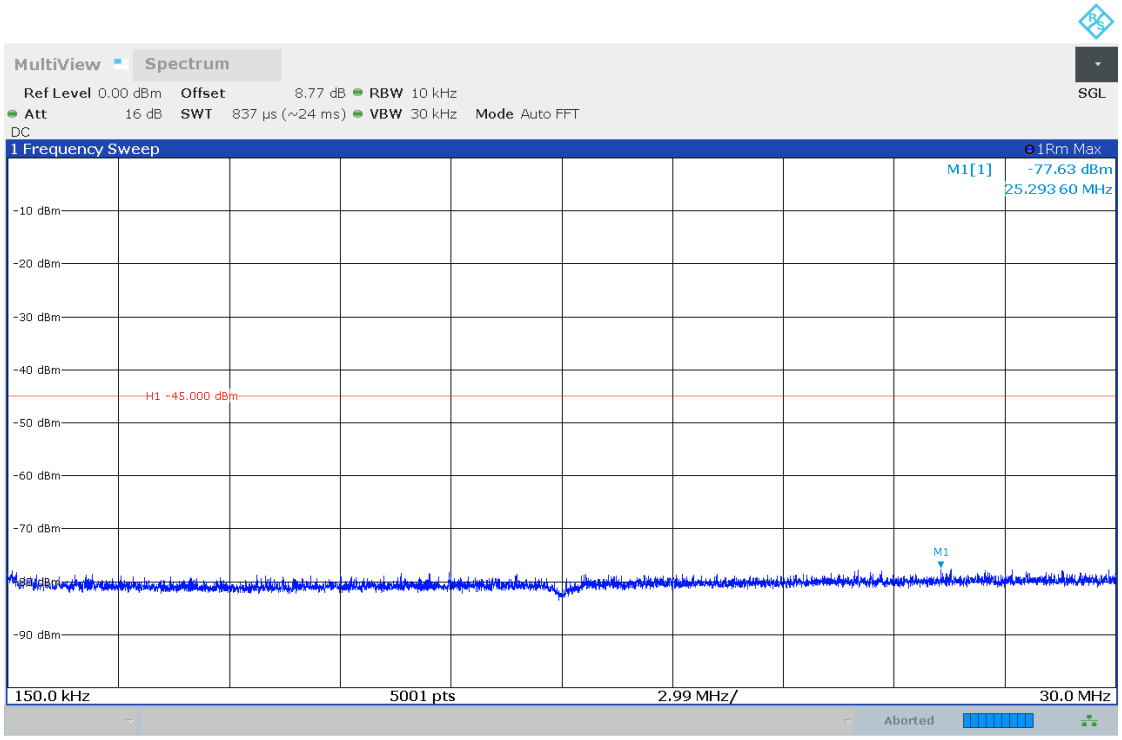

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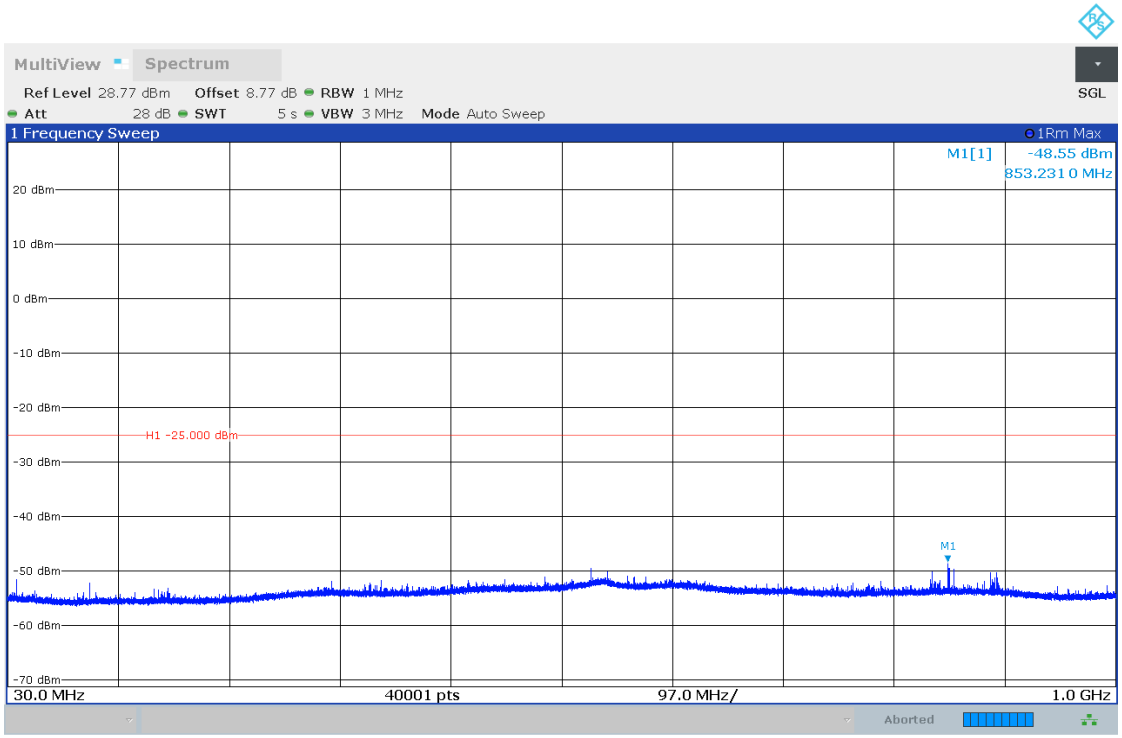

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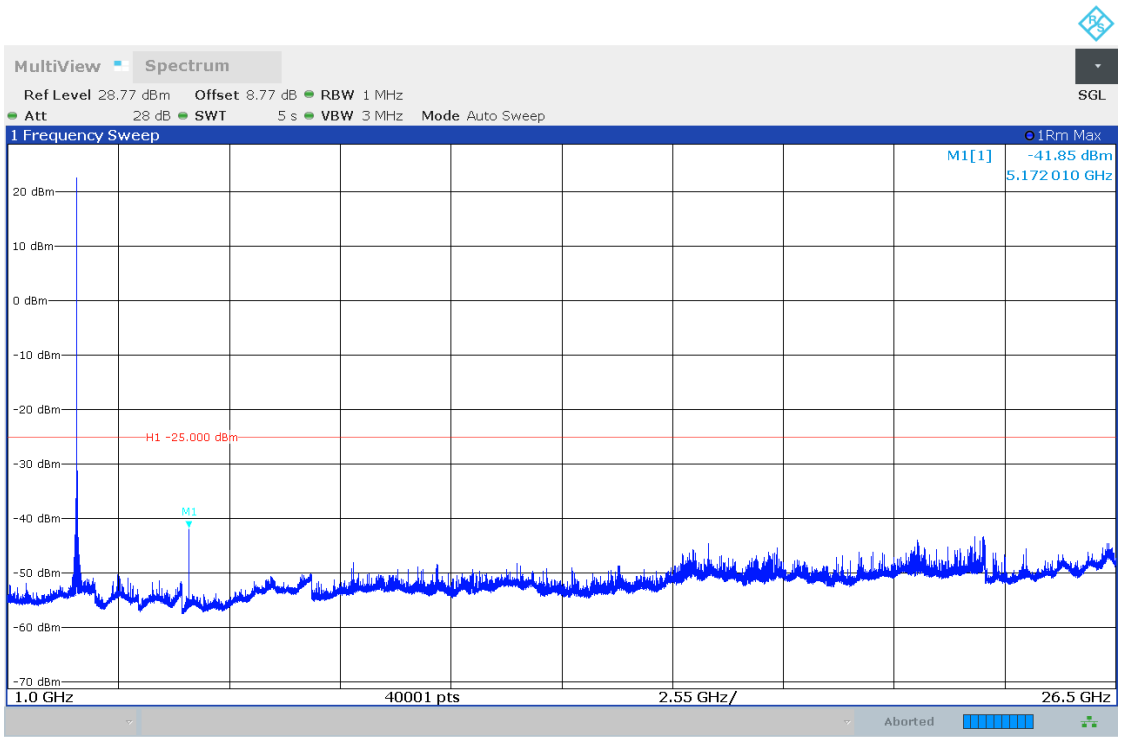

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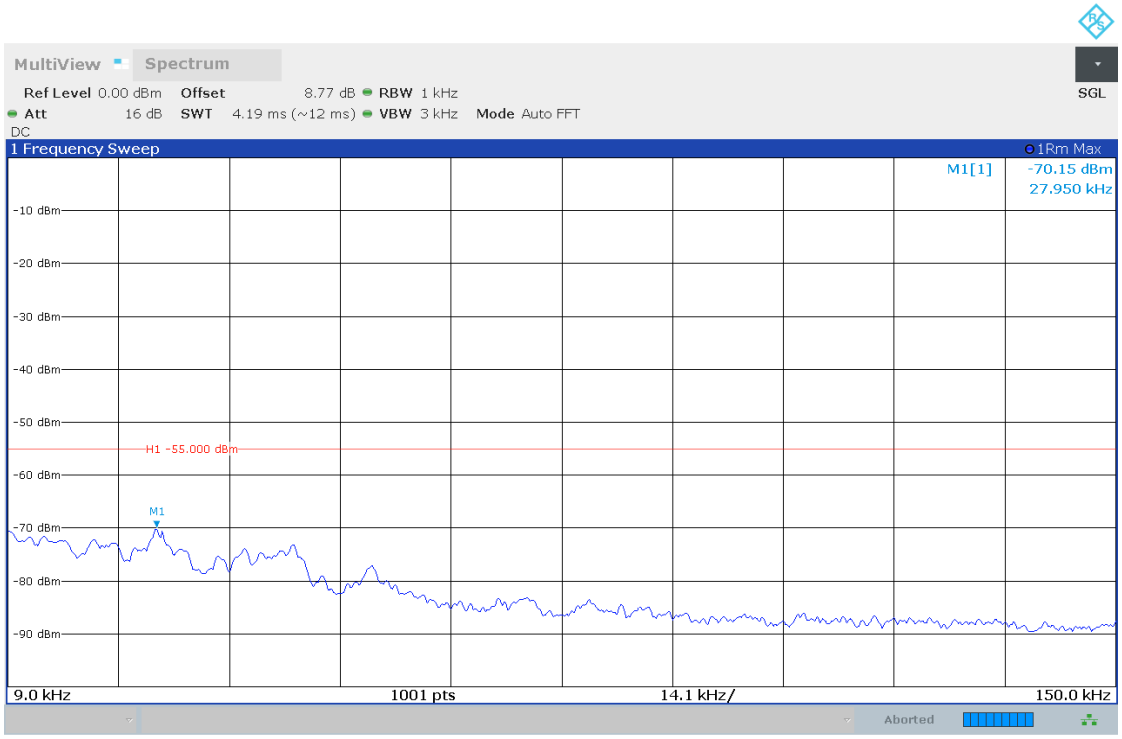
TM1_20MHz_MCH_RB1#99



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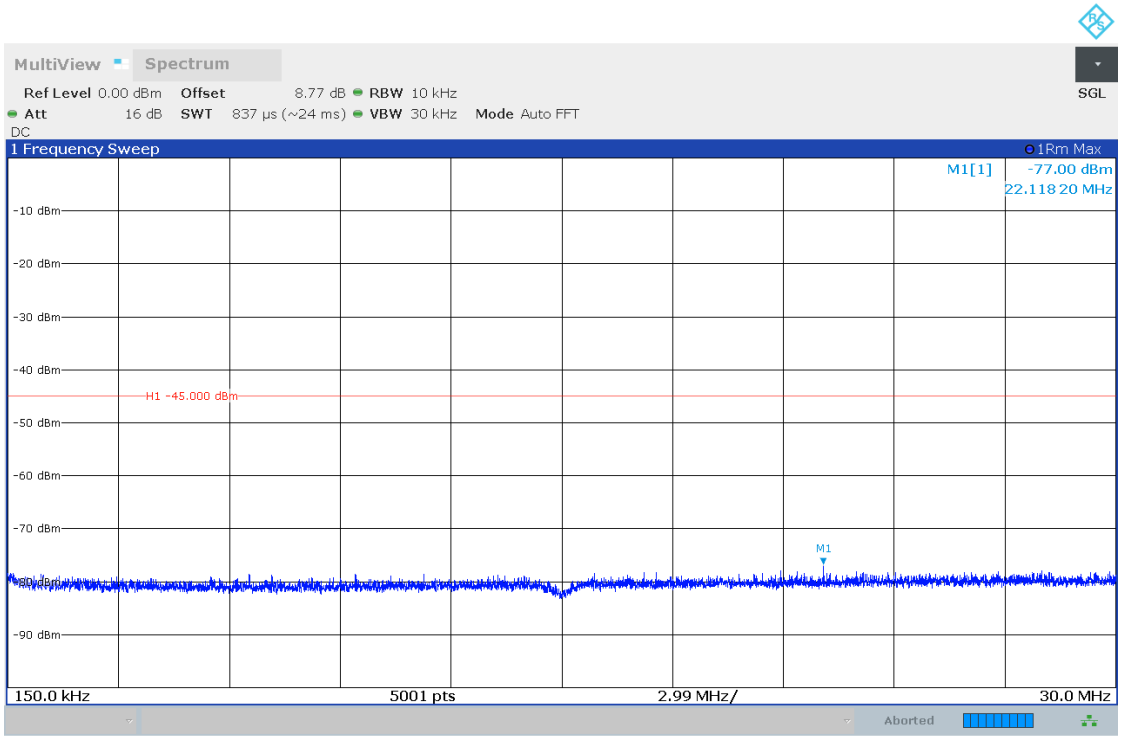

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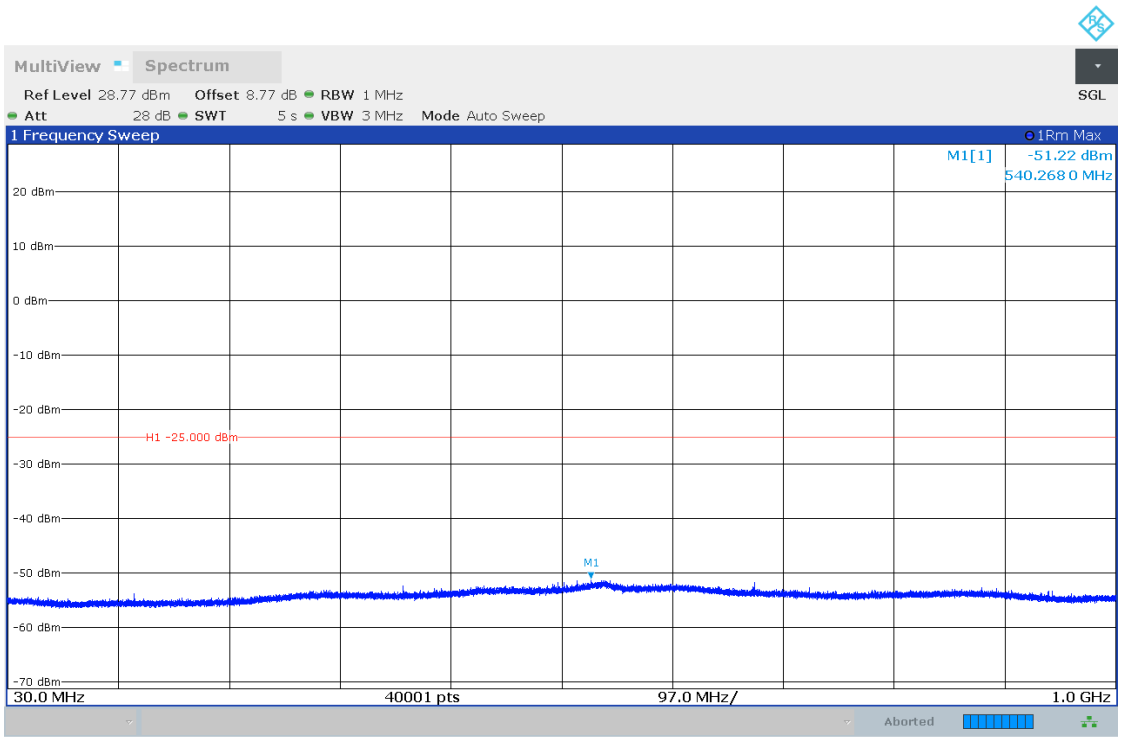

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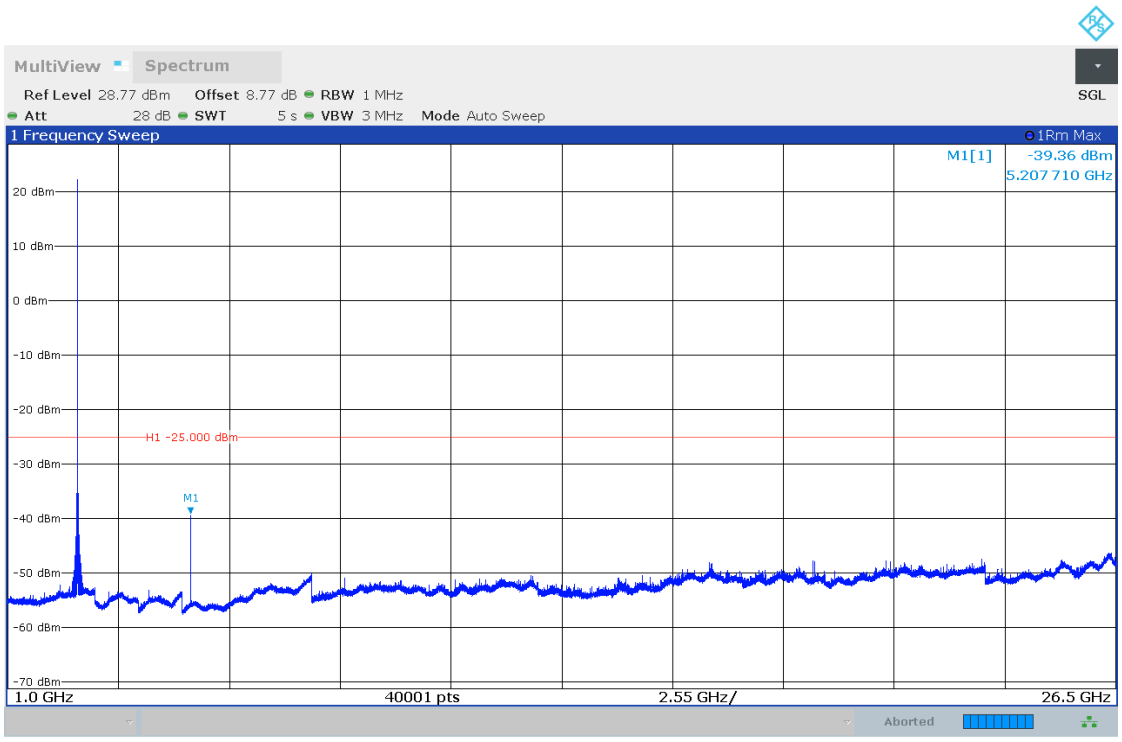

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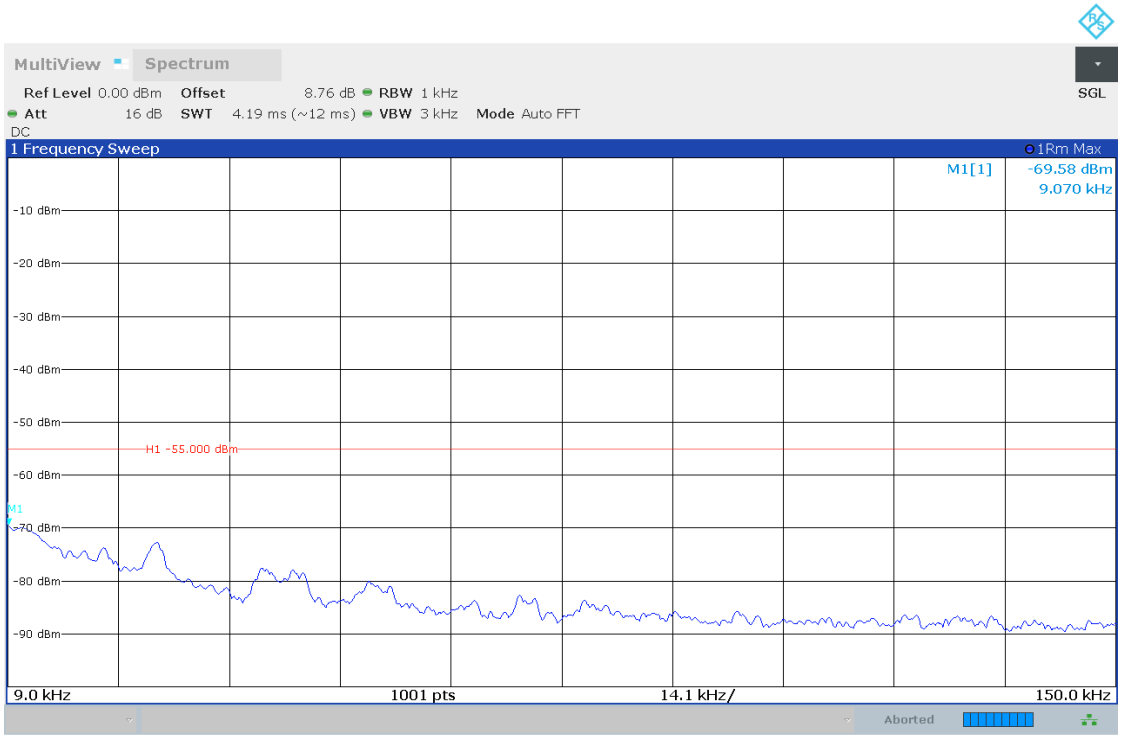
TM1_20MHz_HCH_RB100#0



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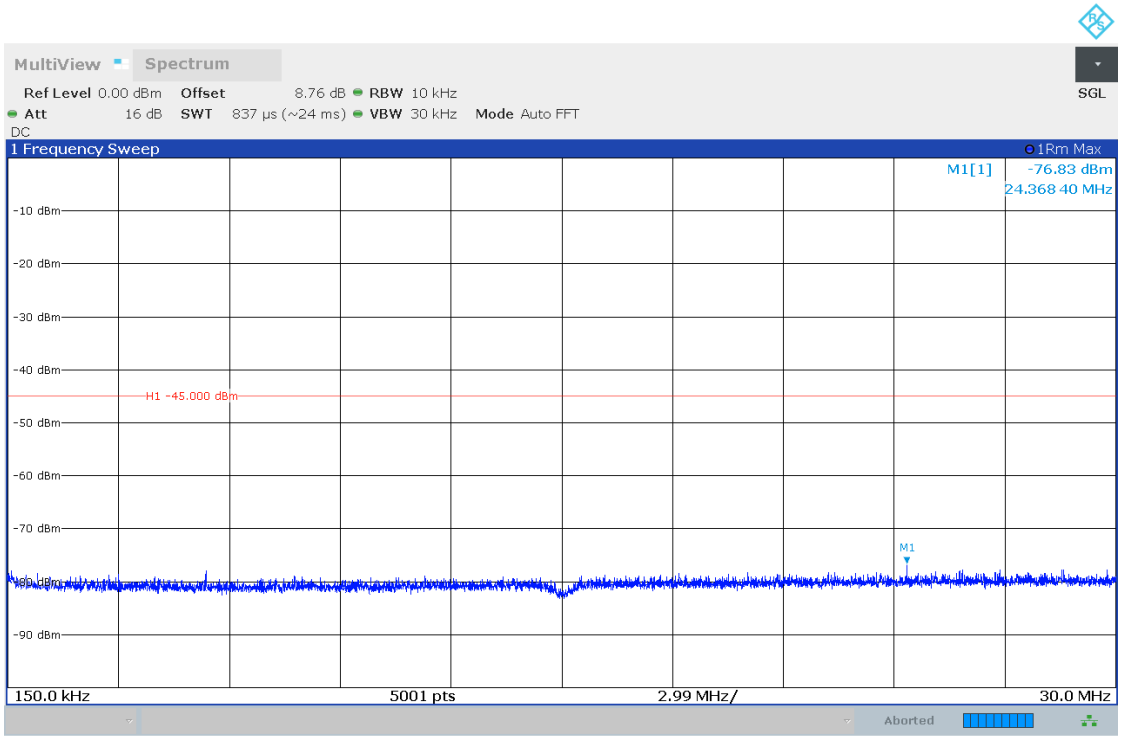

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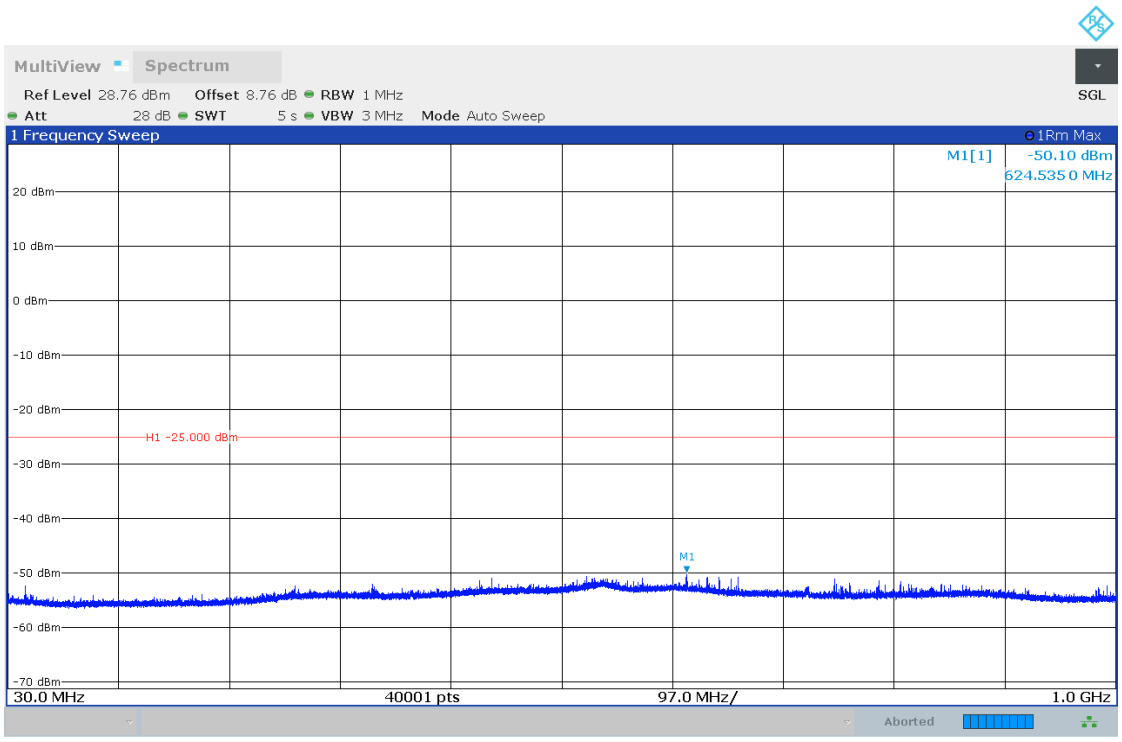

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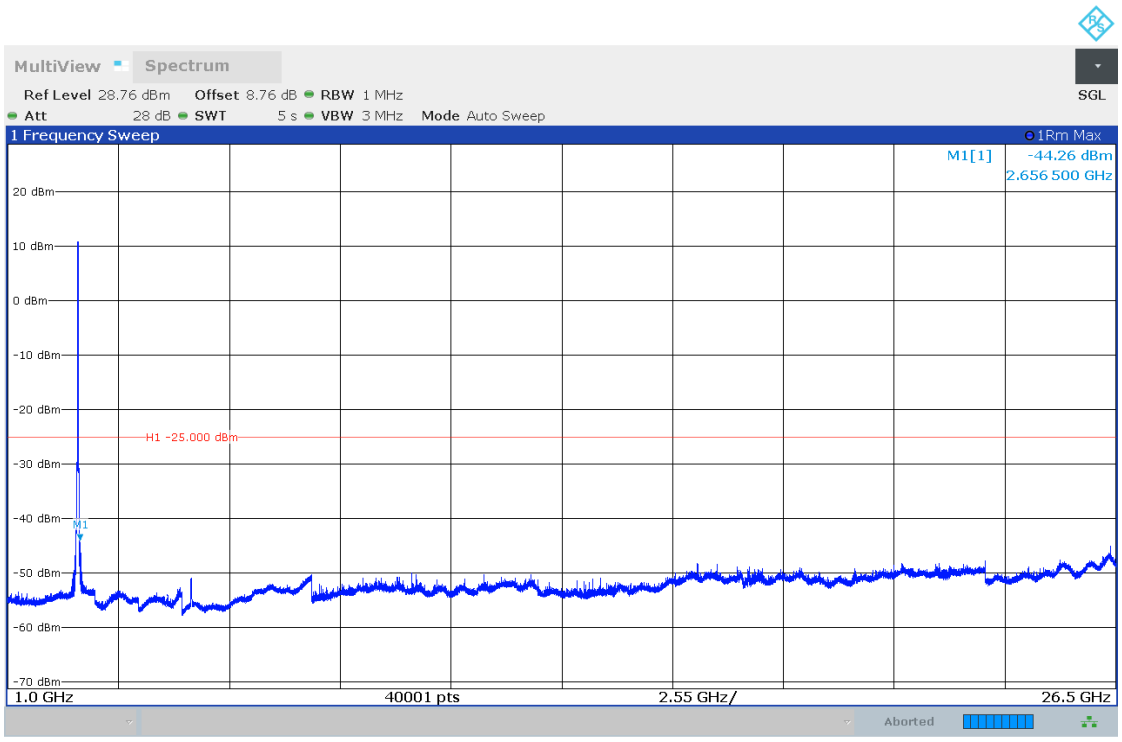

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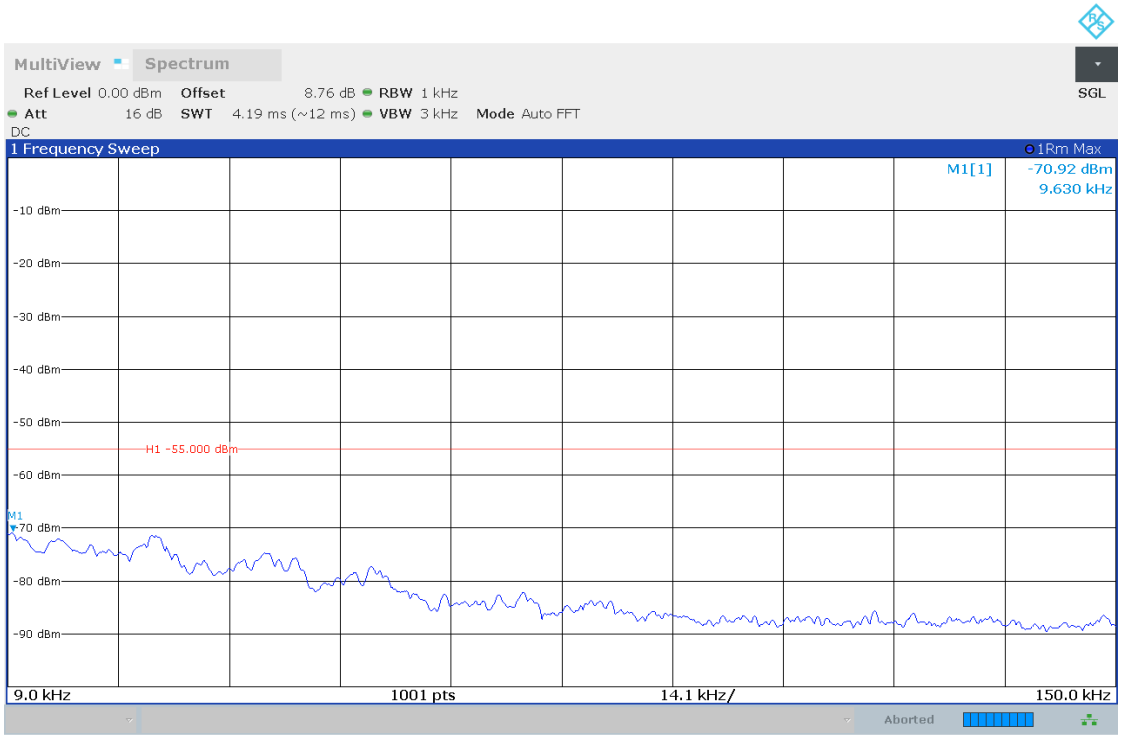
TM1_20MHz_HCH_RB1#0



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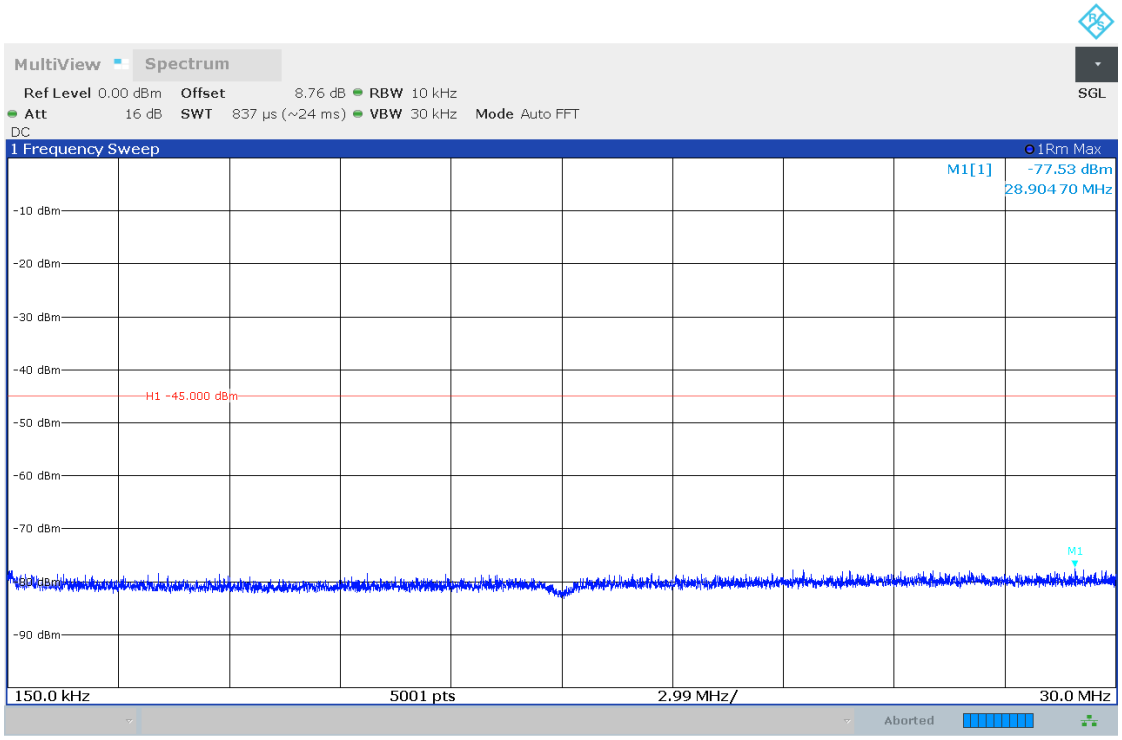

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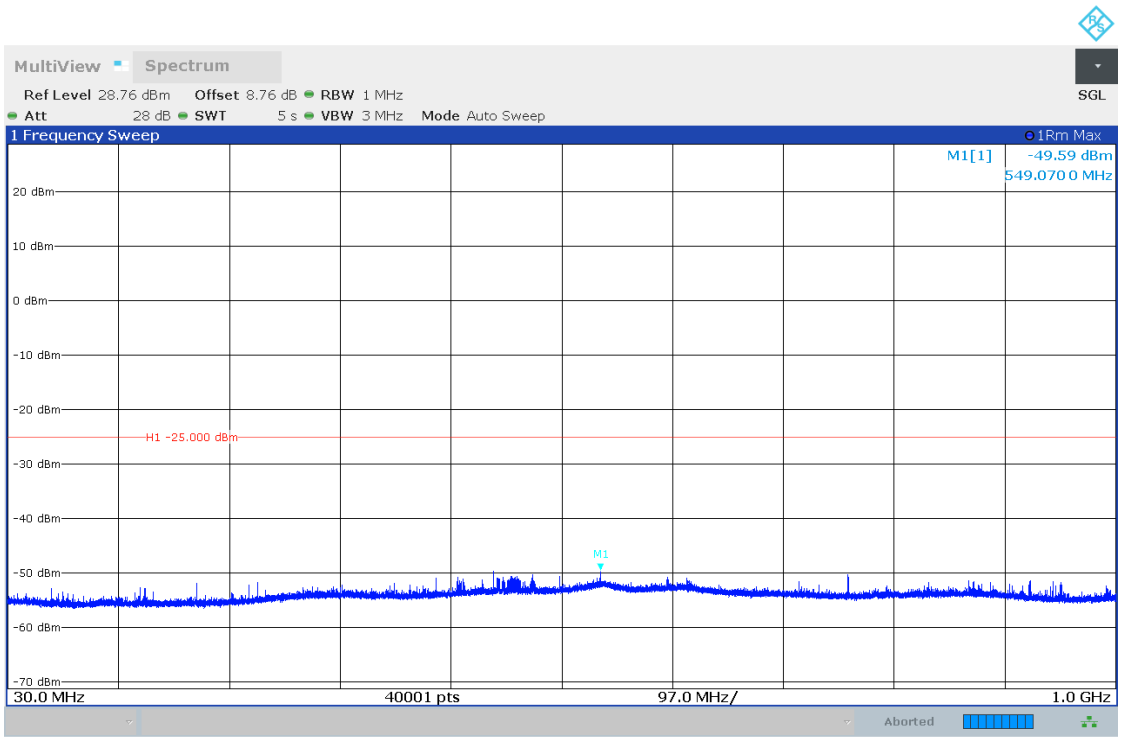

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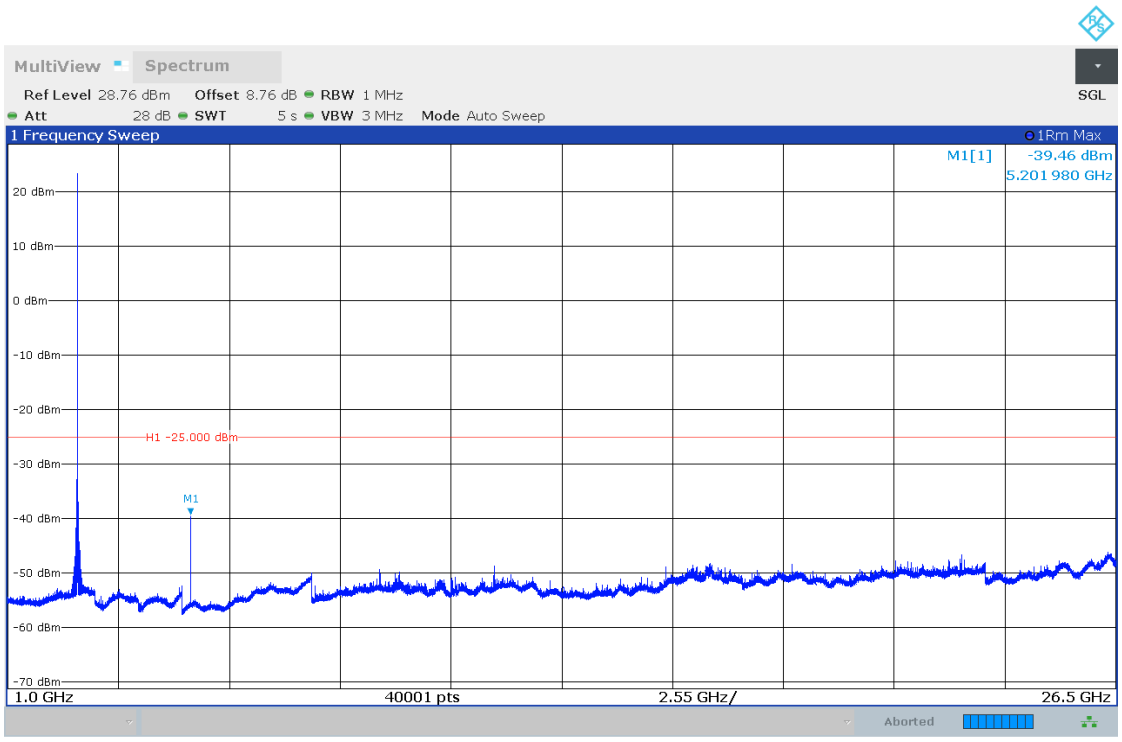

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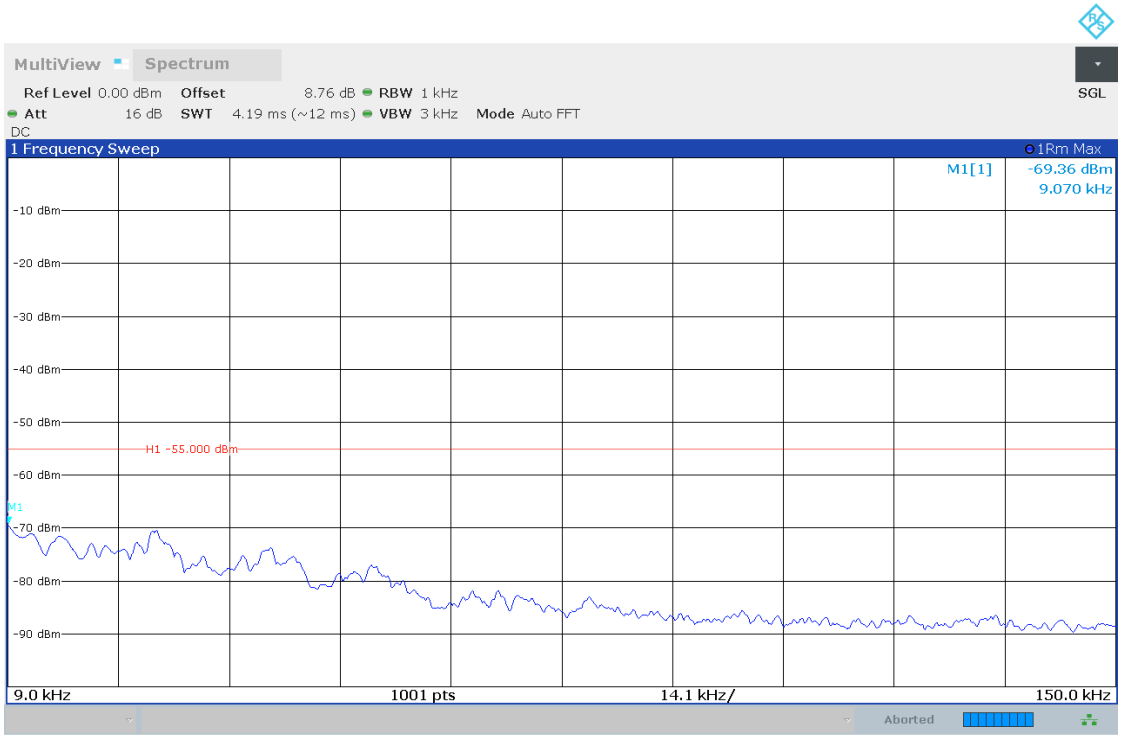
TM1_20MHz_HCH_RB1#99



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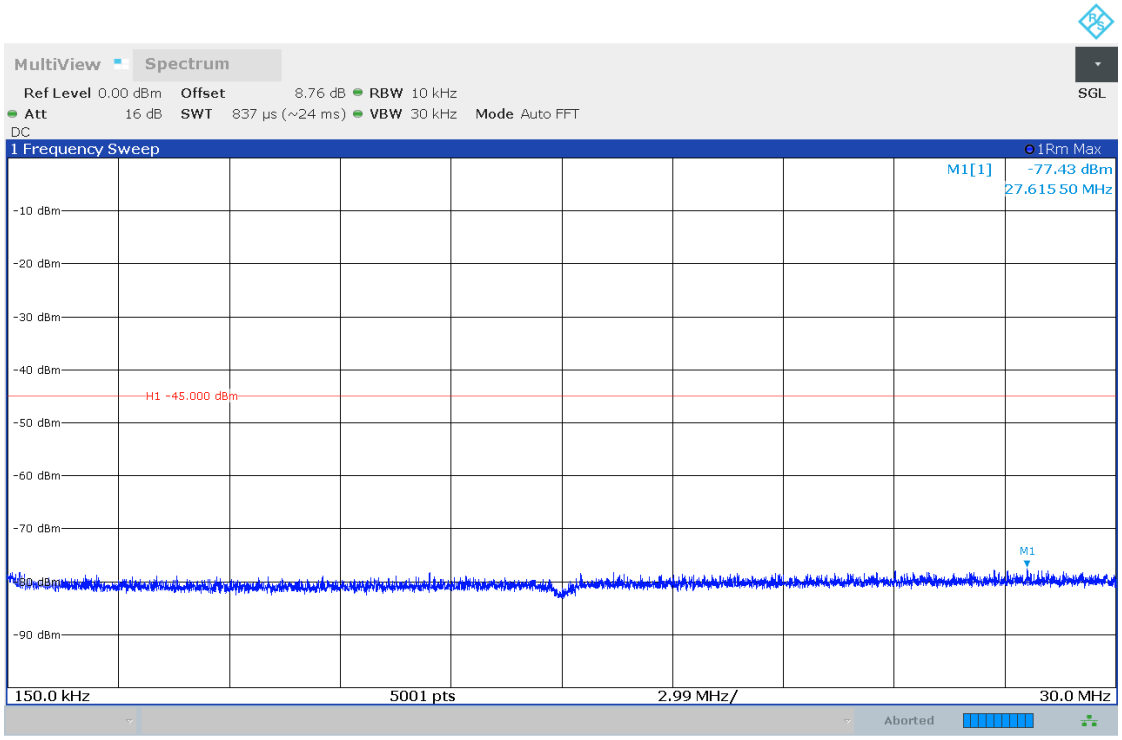

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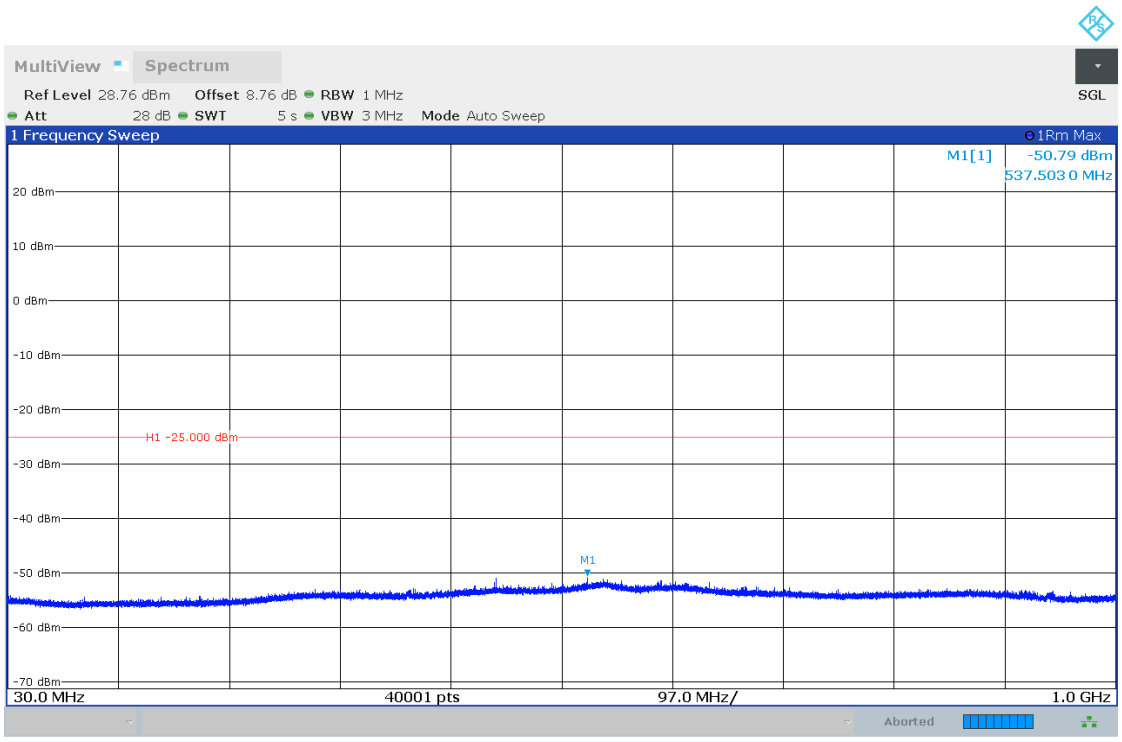

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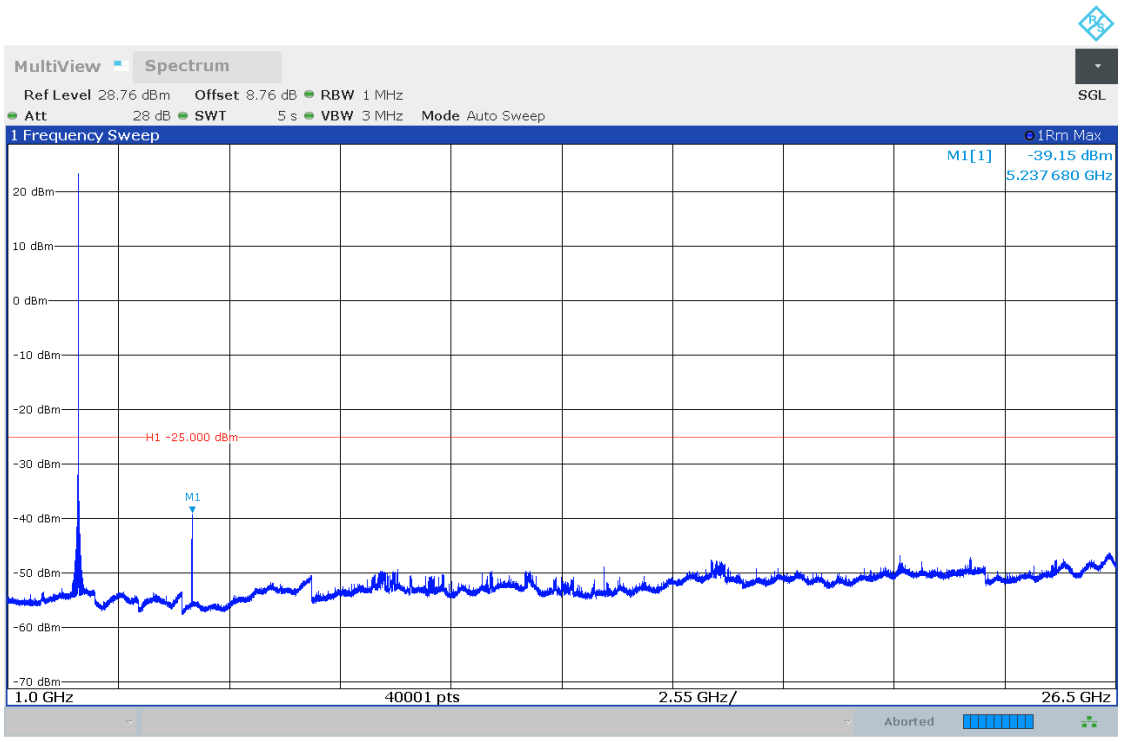

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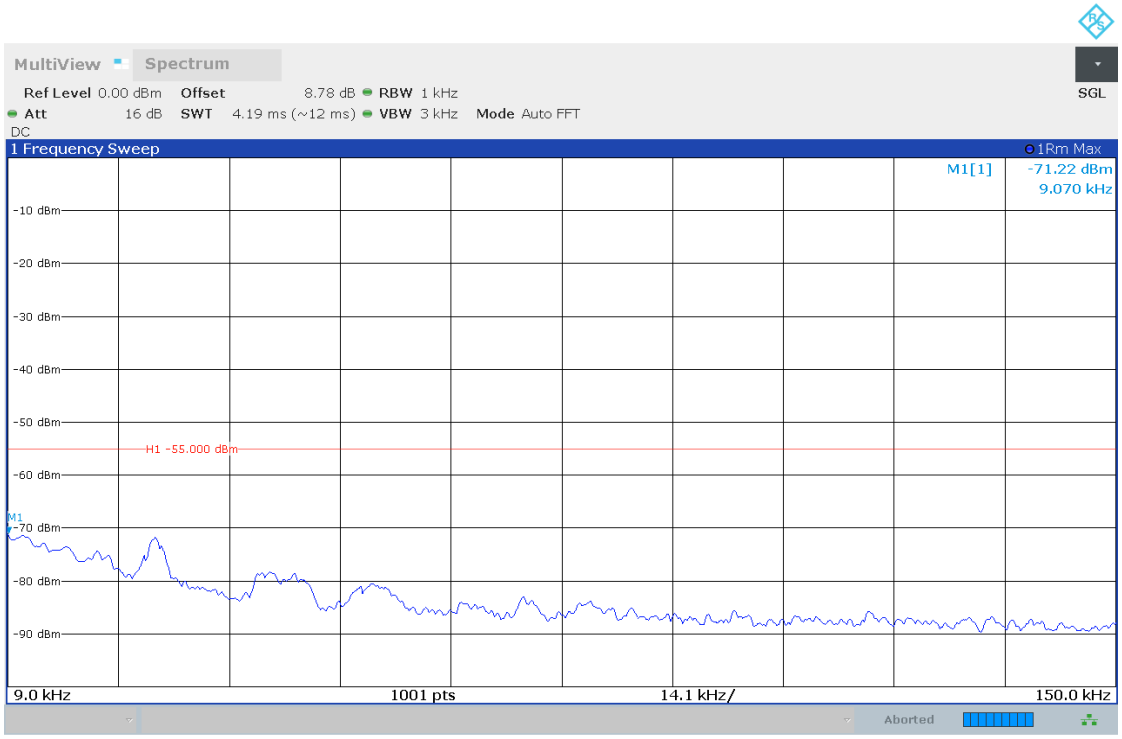
TM2_5MHz_LCH_RB25#0



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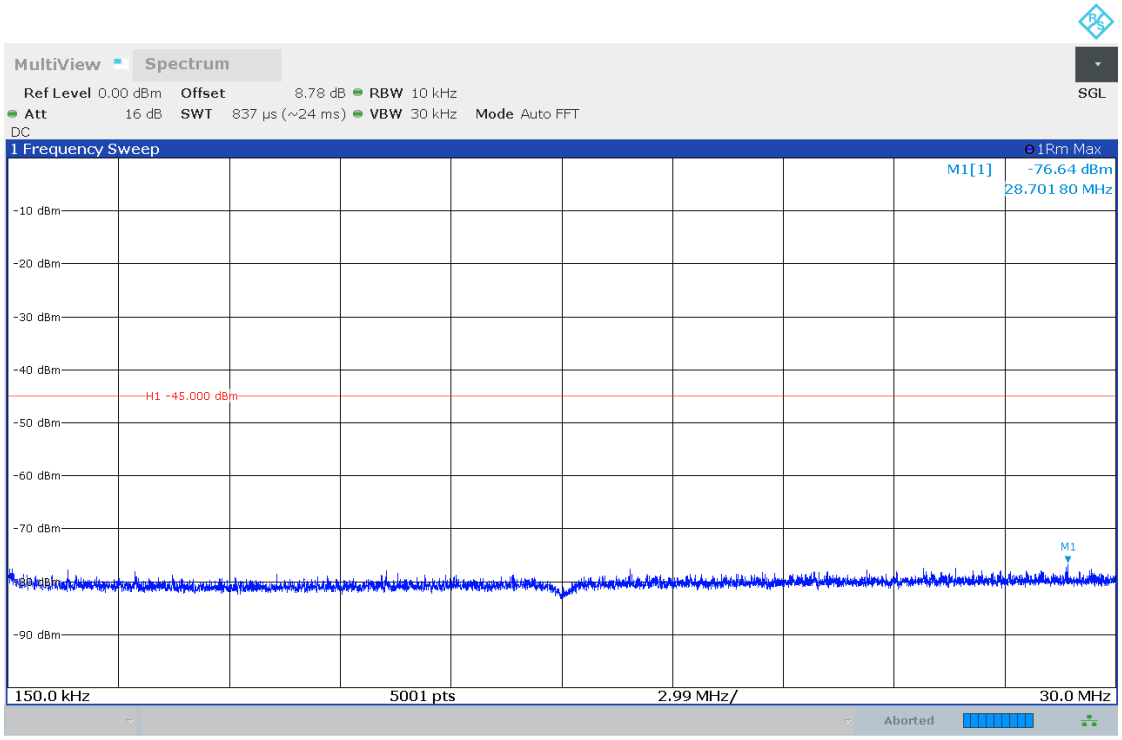

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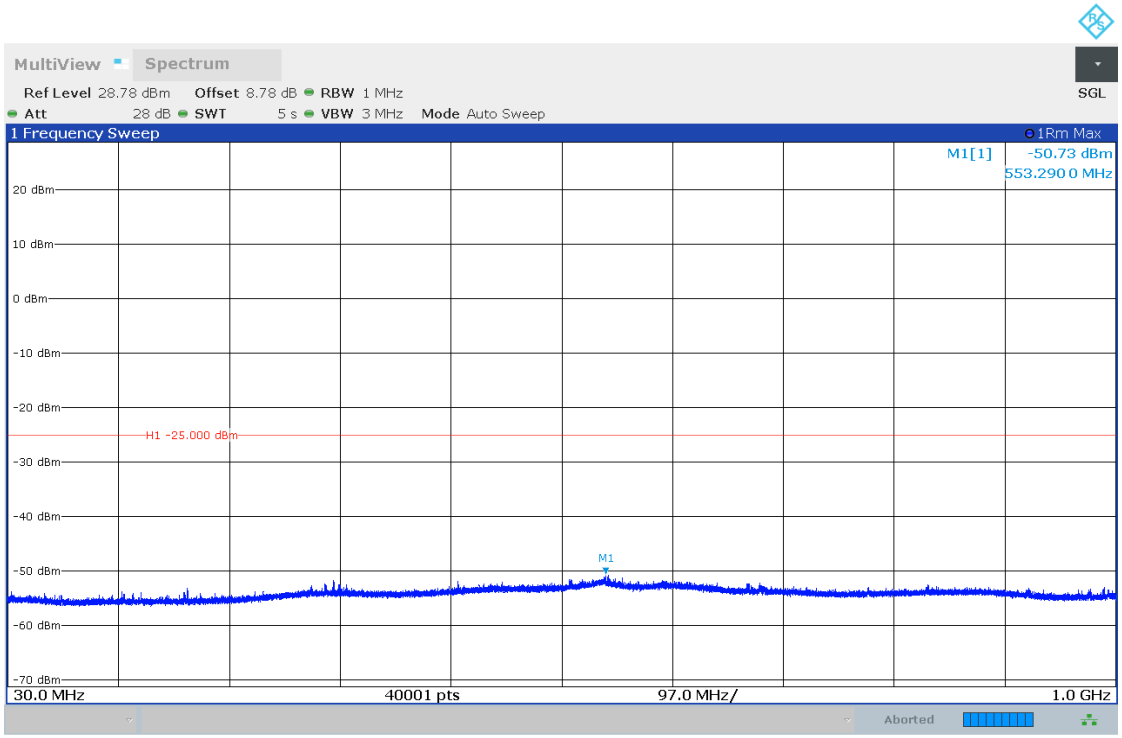

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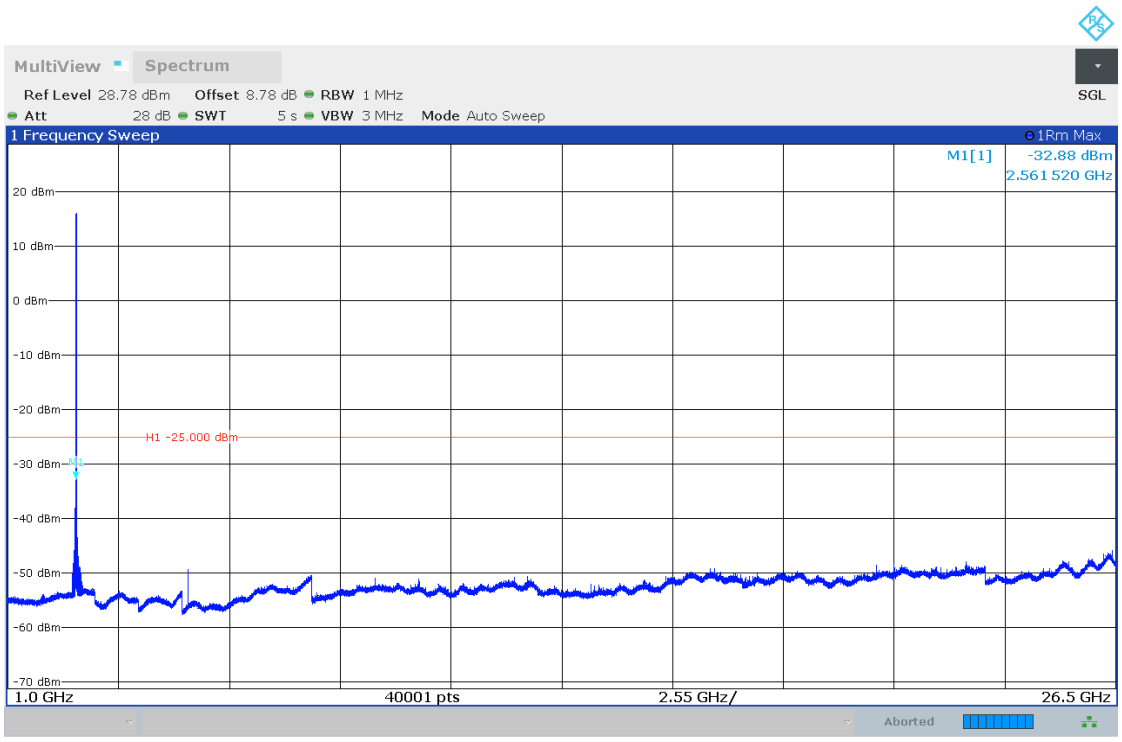

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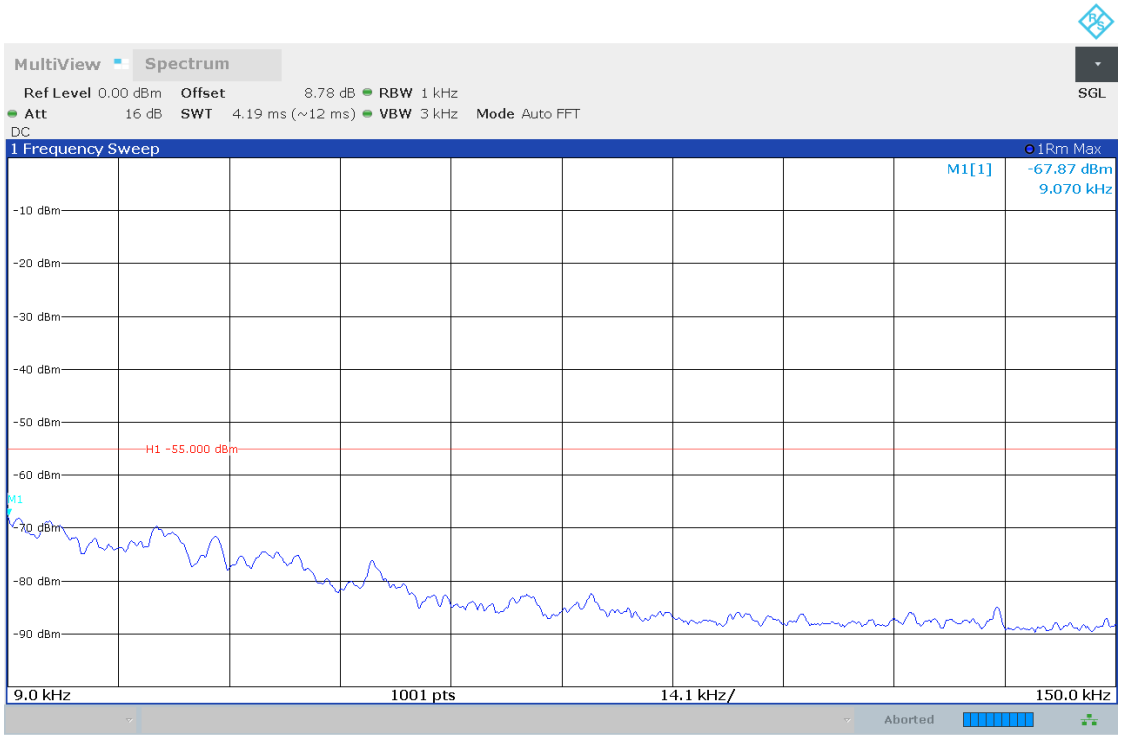
TM2_5MHz_LCH_RB1#0



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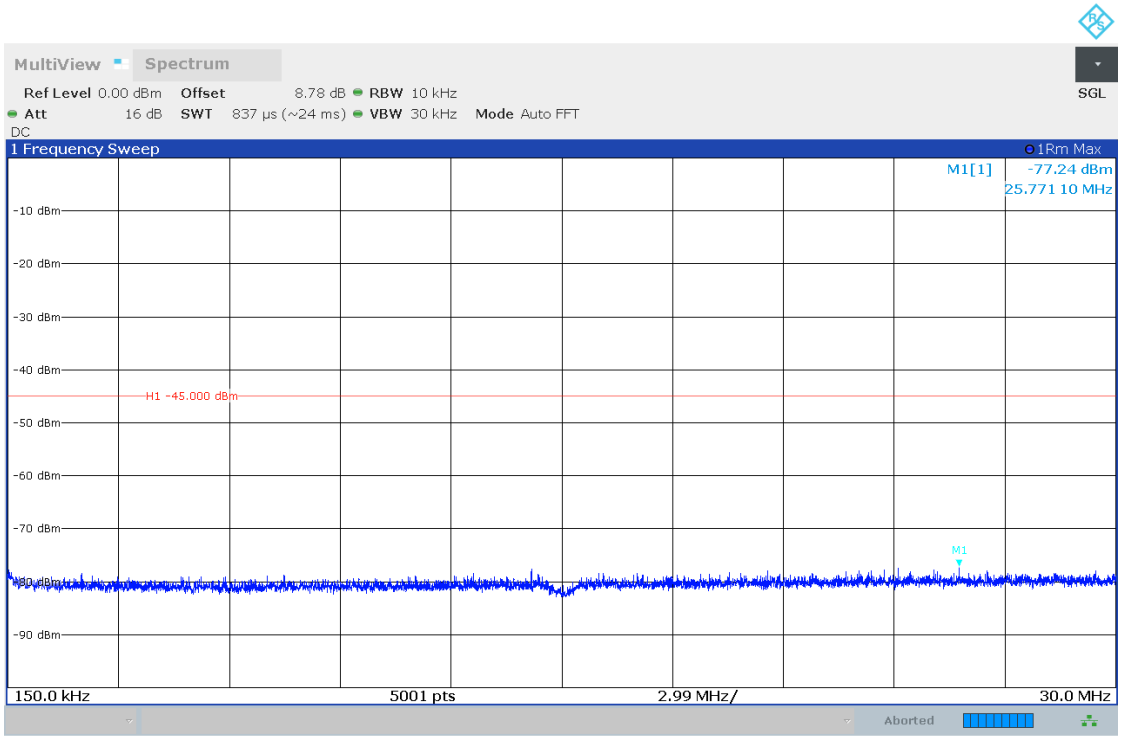

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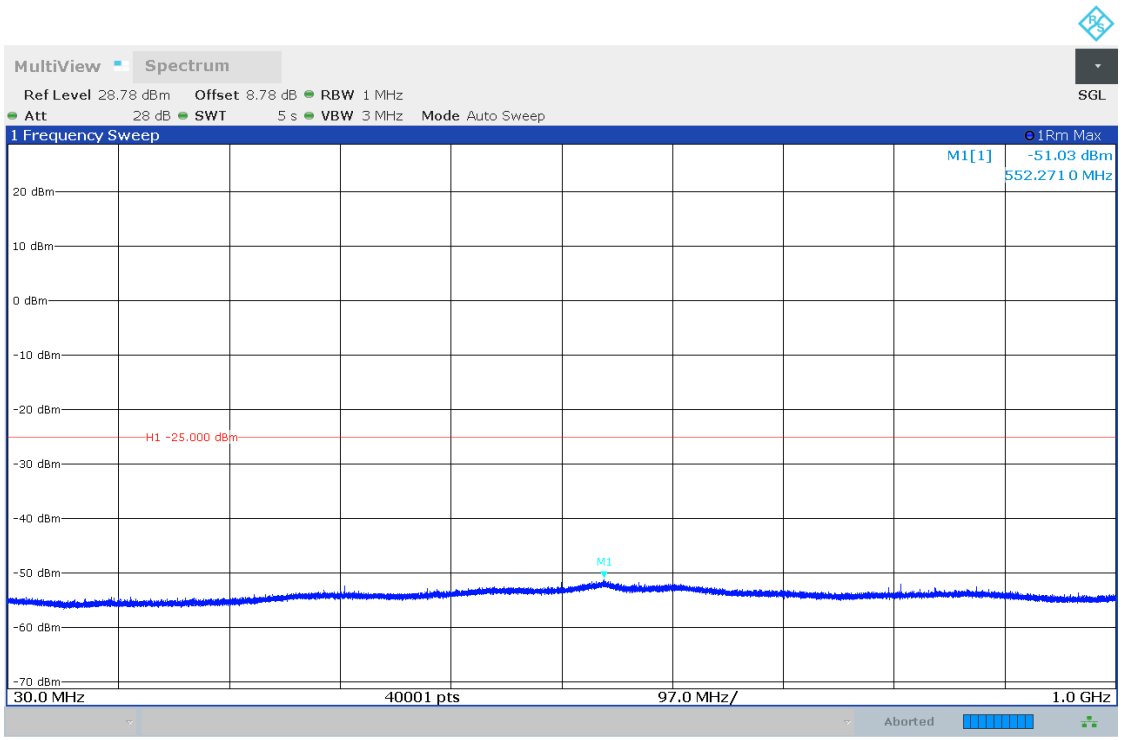

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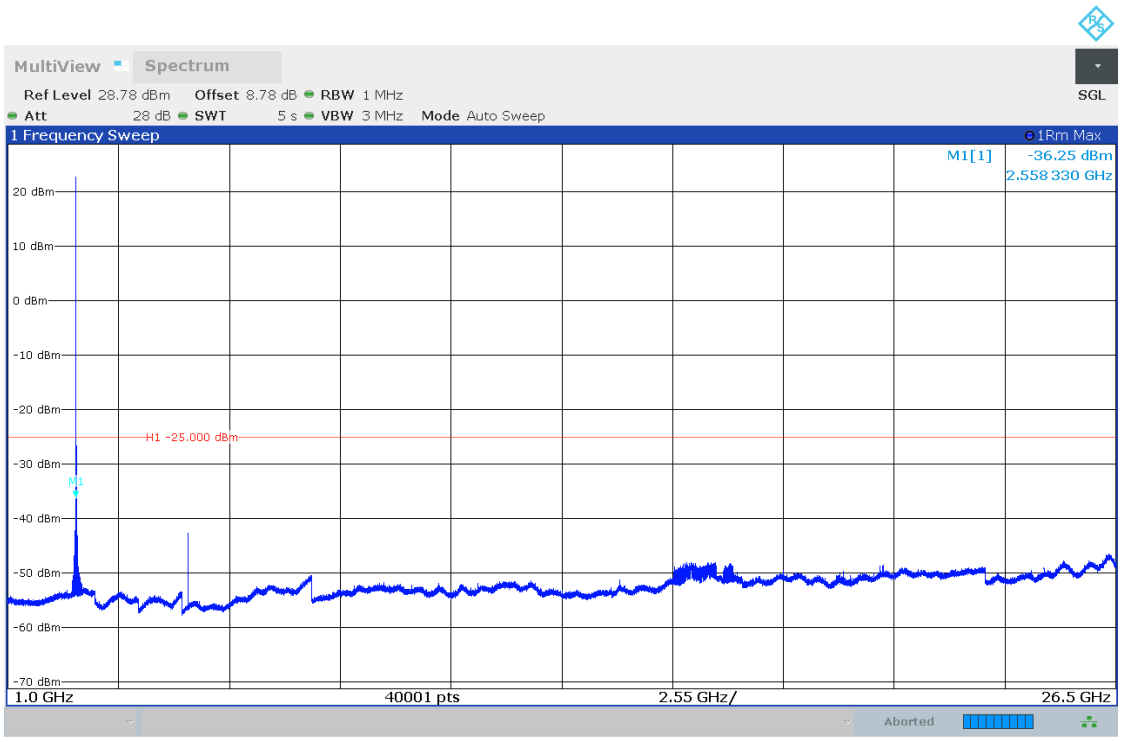

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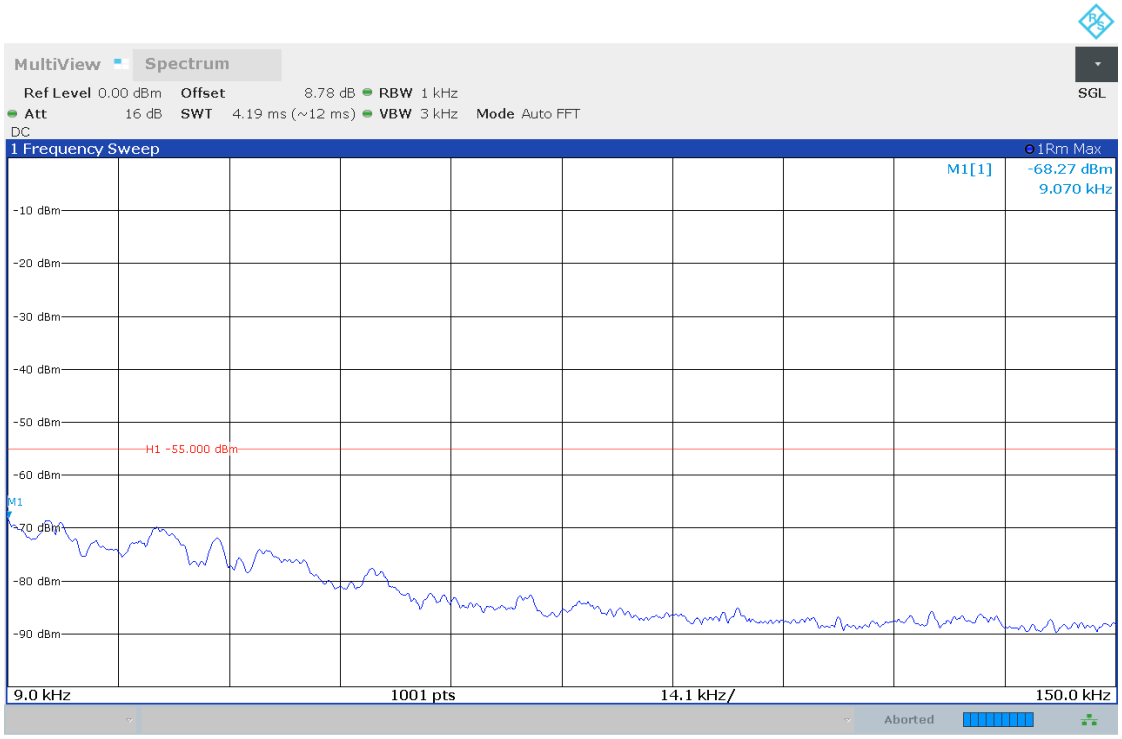
TM2_5MHz_LCH_RB1#24



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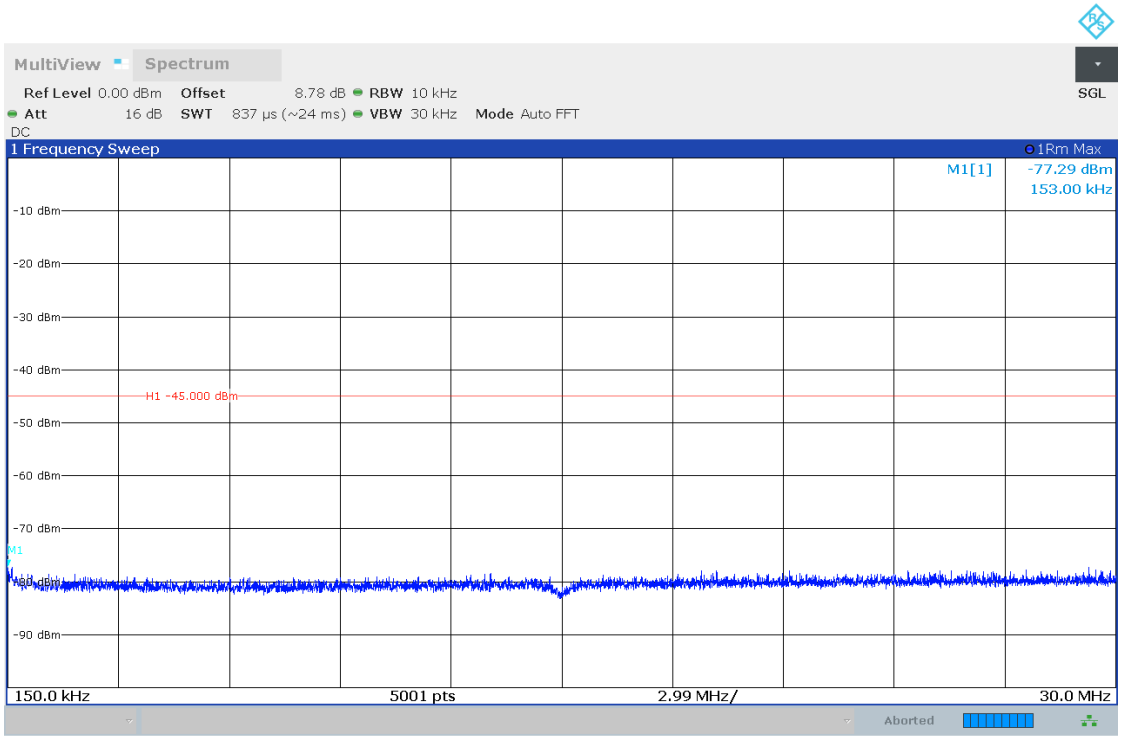

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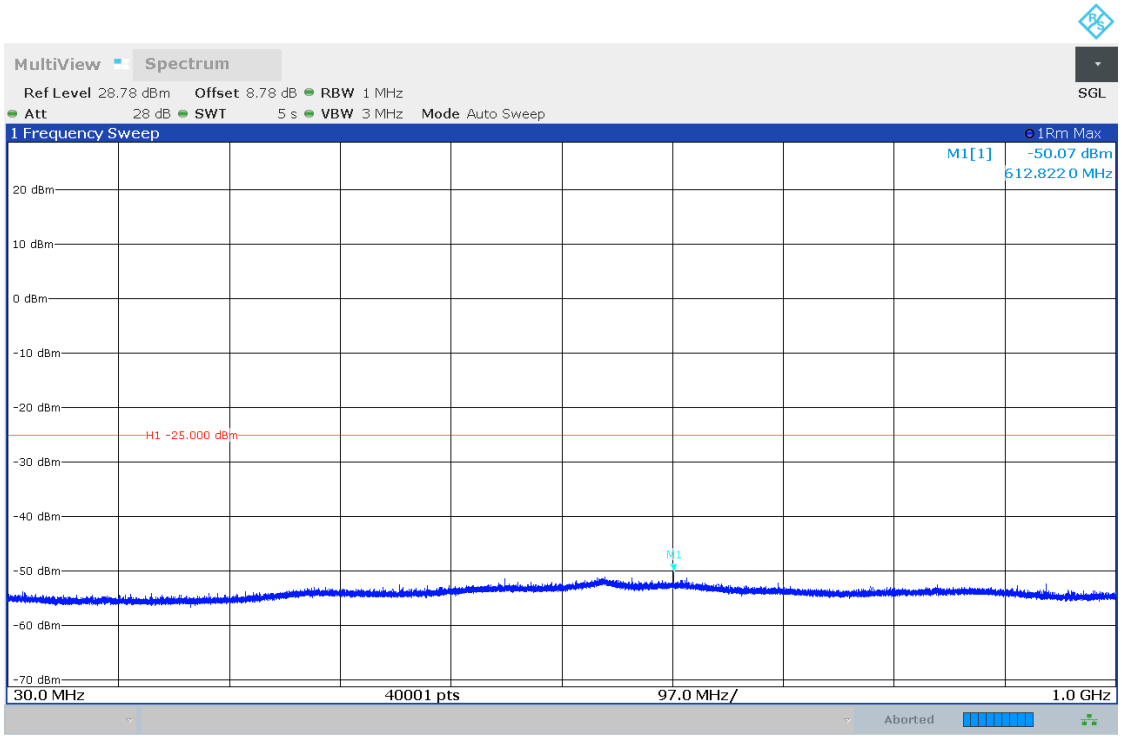

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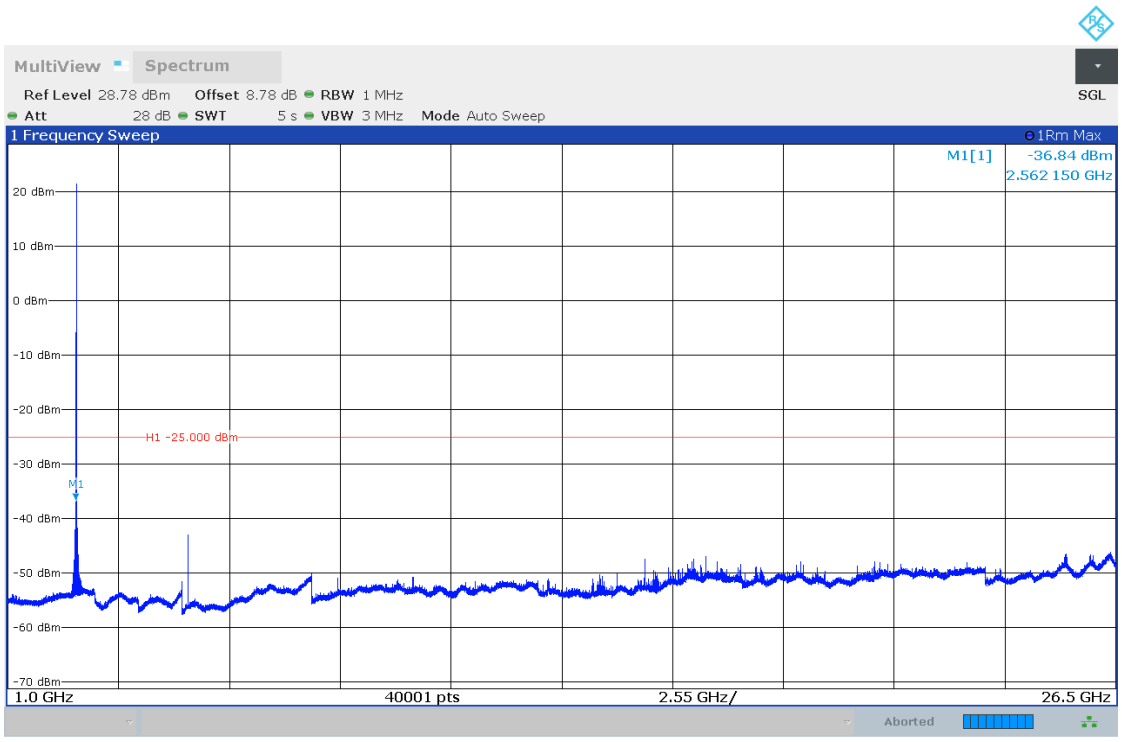

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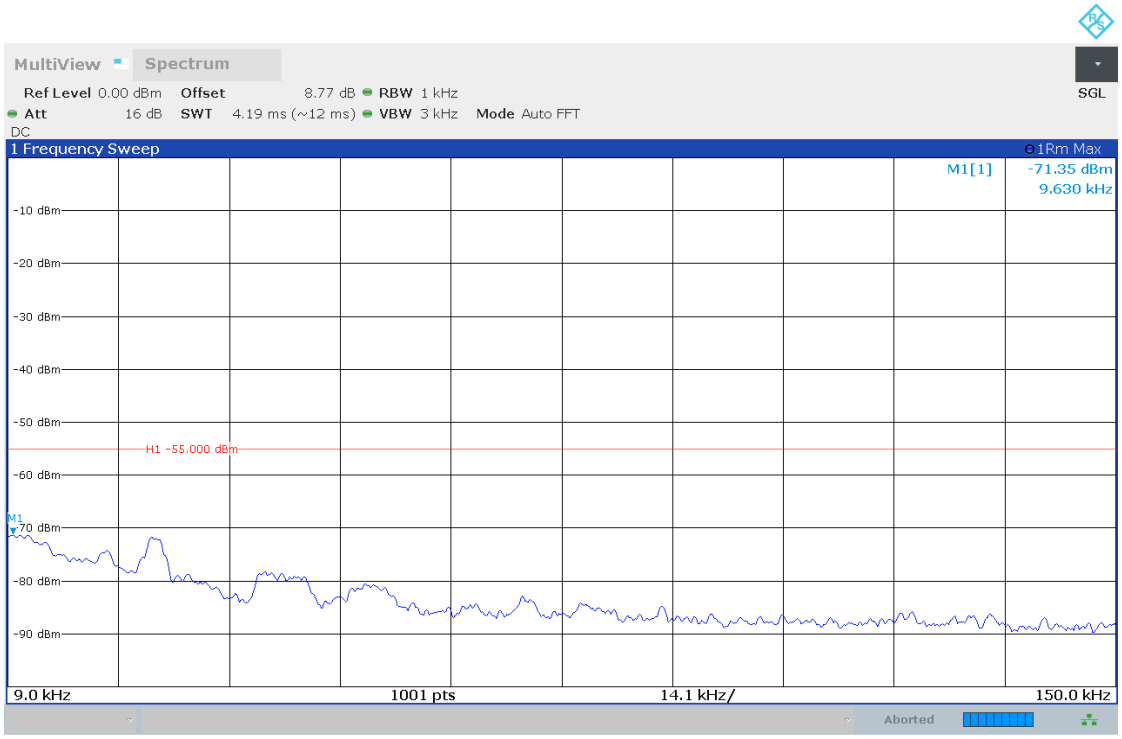
TM2_5MHz_MCH_RB25#0



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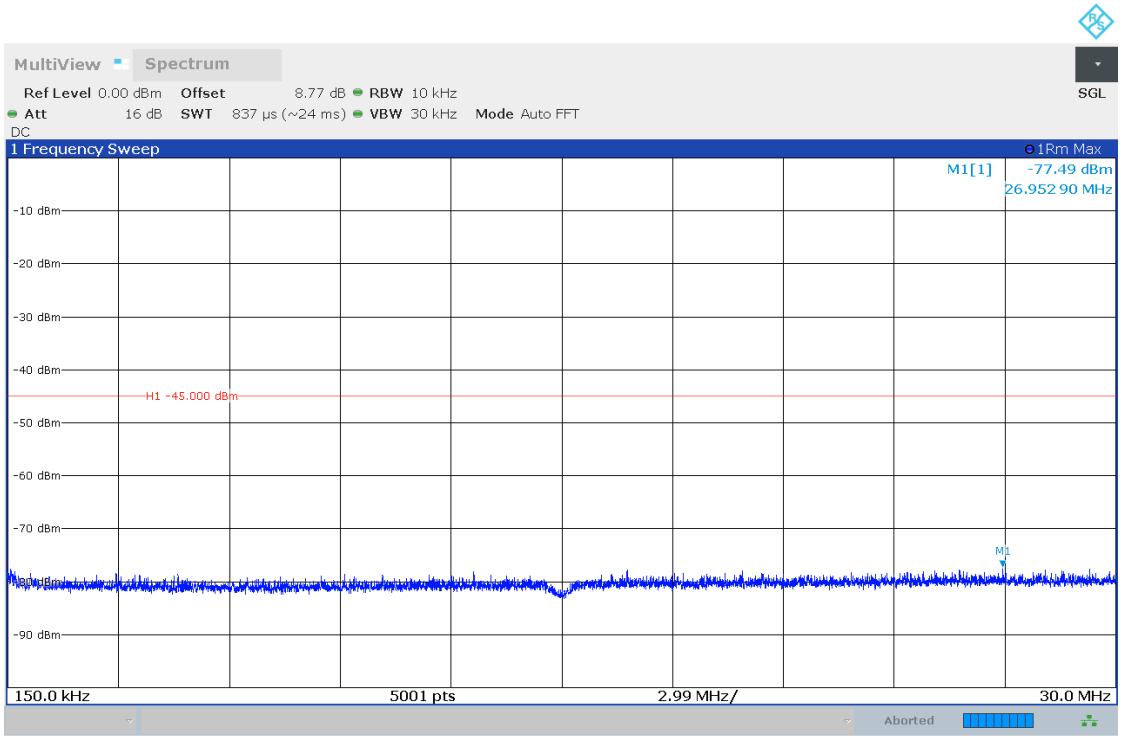

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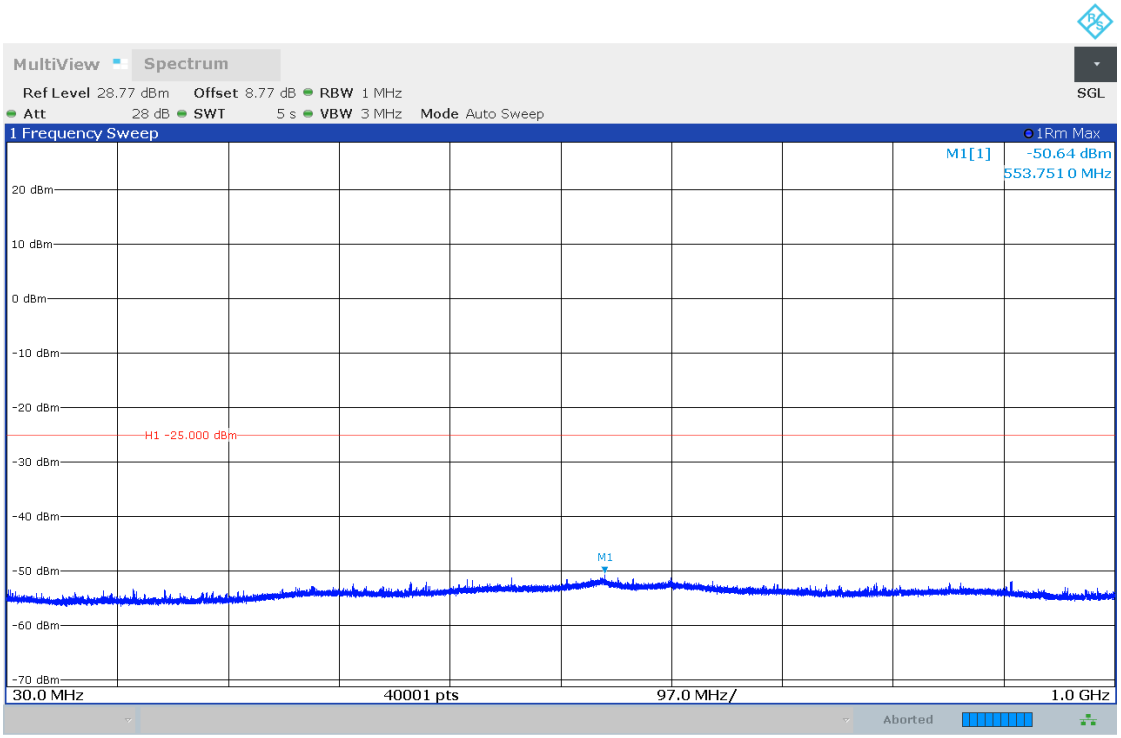

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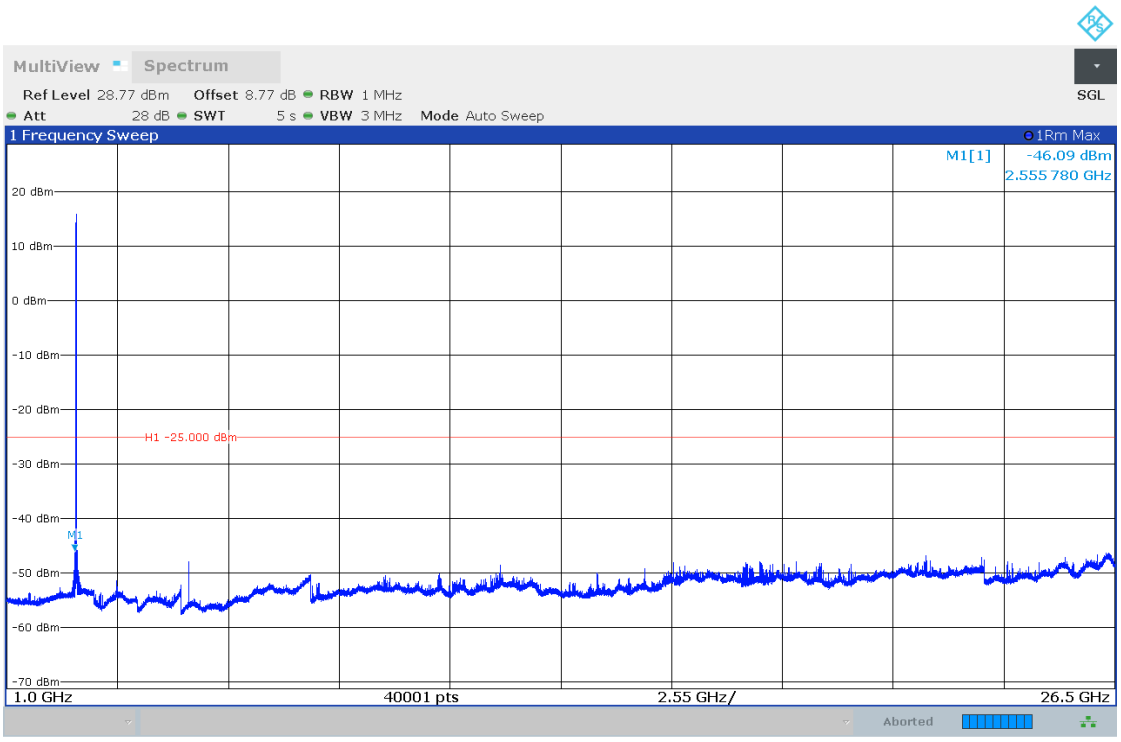

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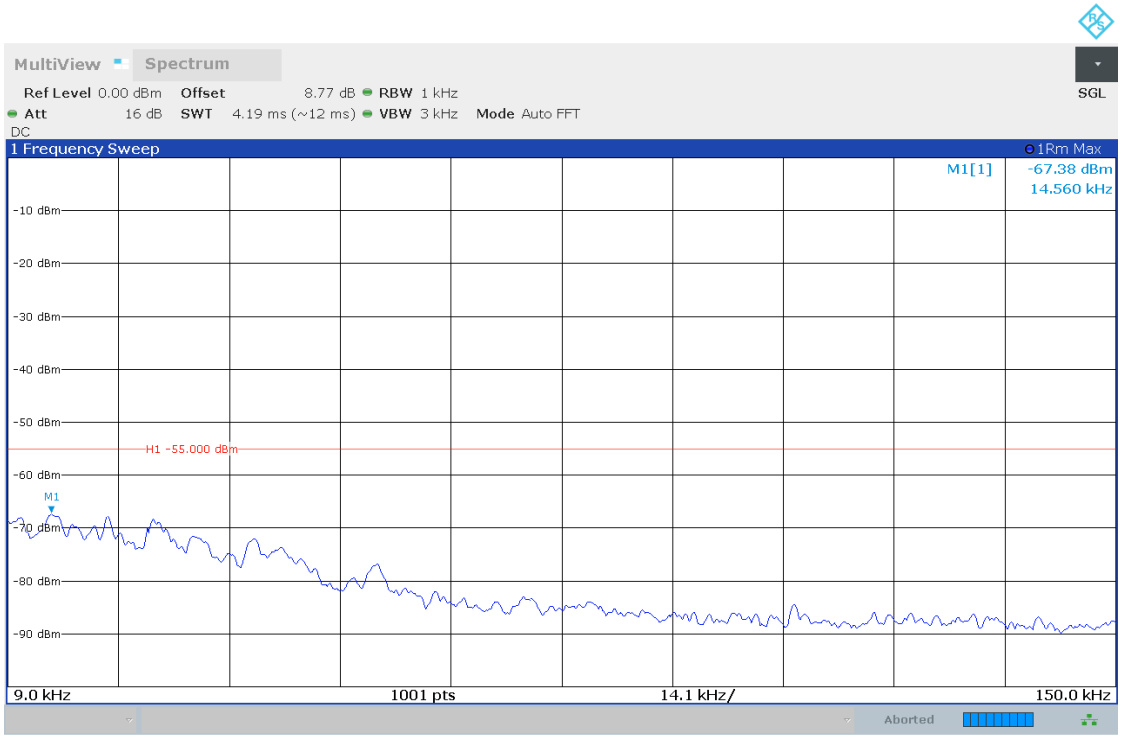
TM2_5MHz_MCH_RB1#0



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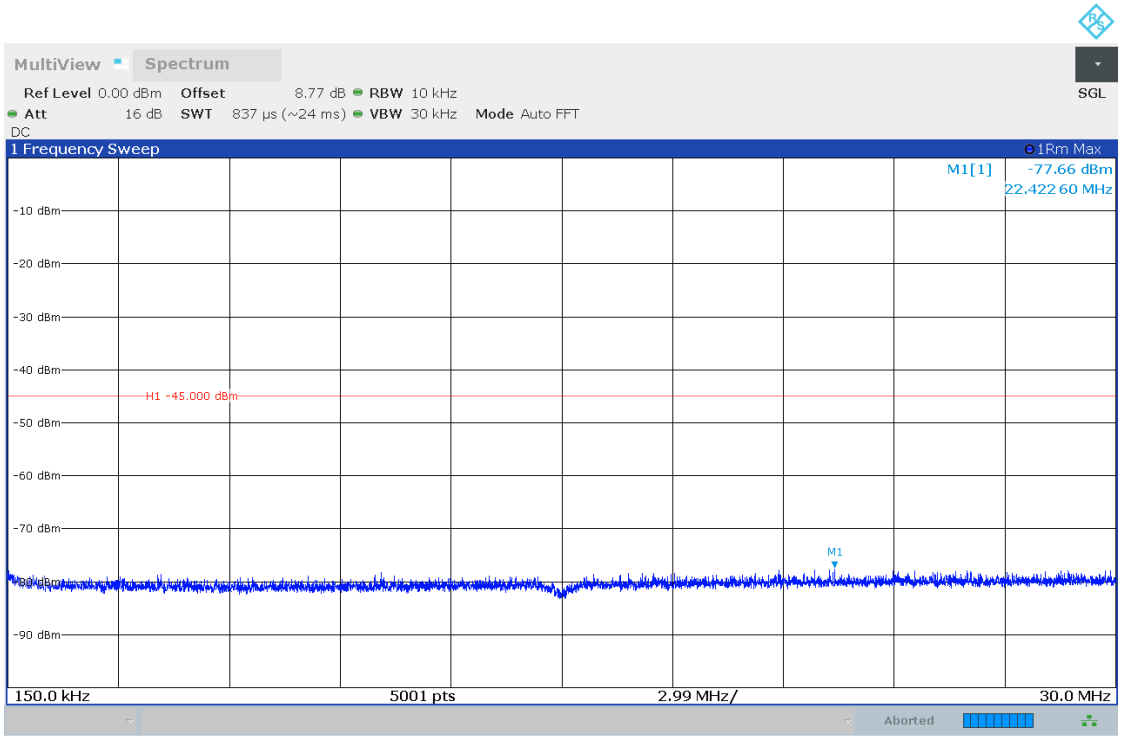

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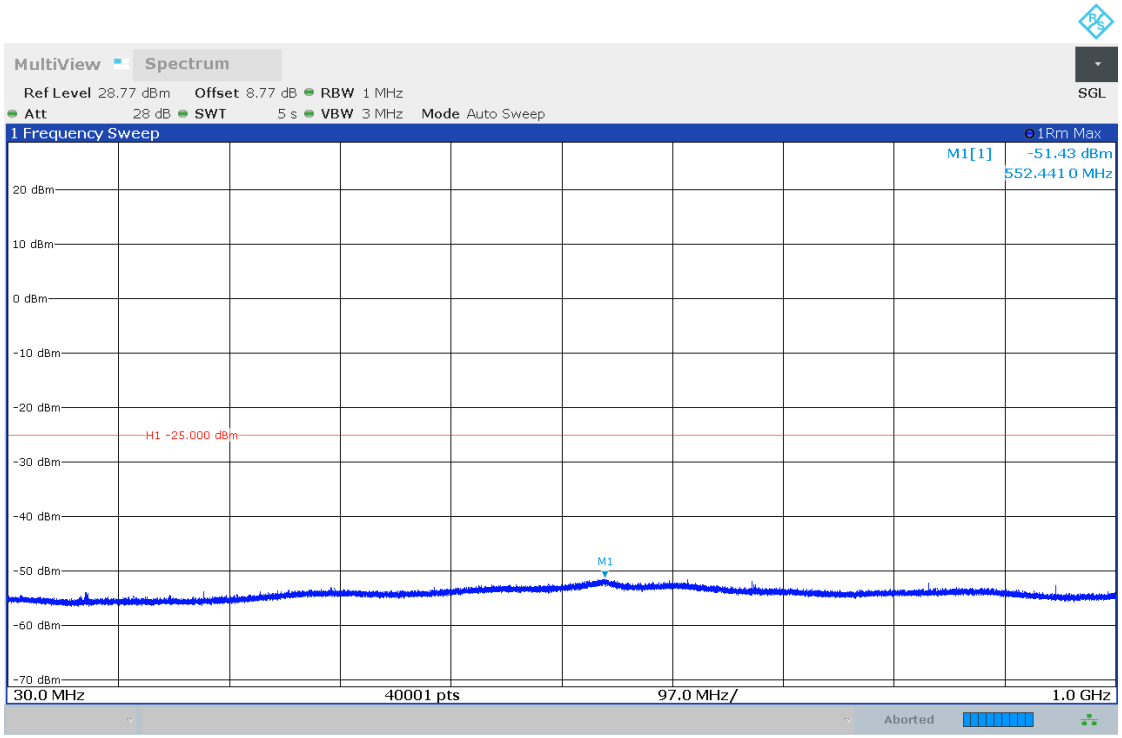

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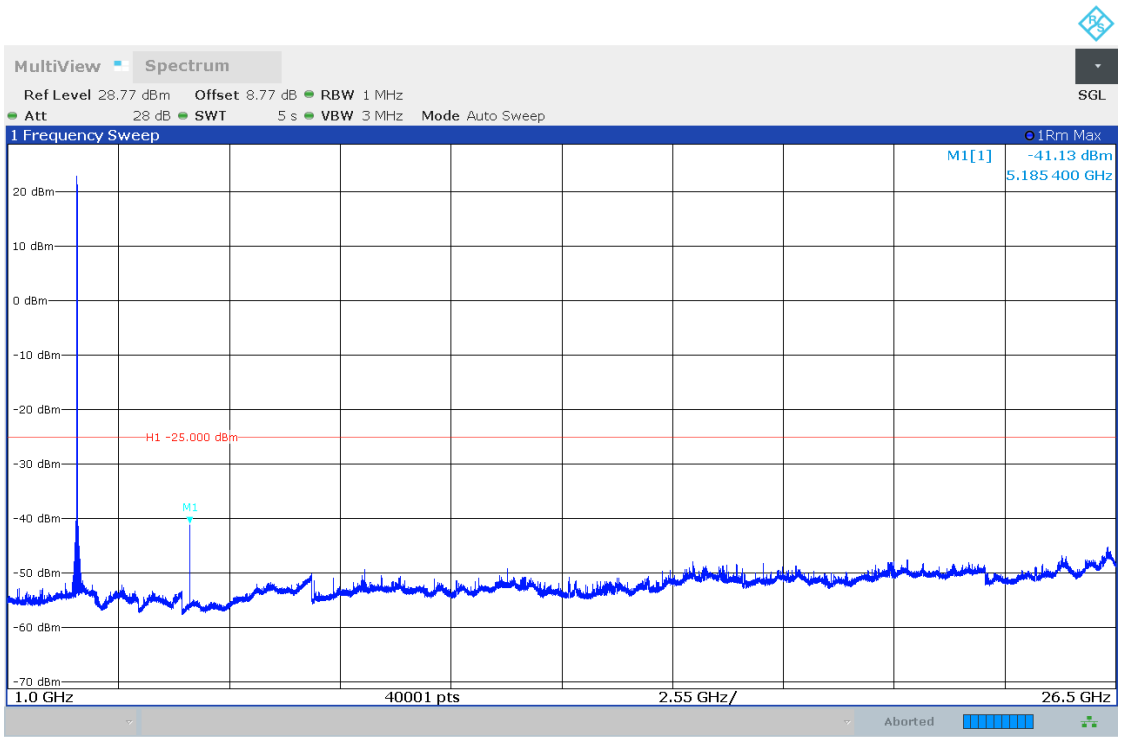

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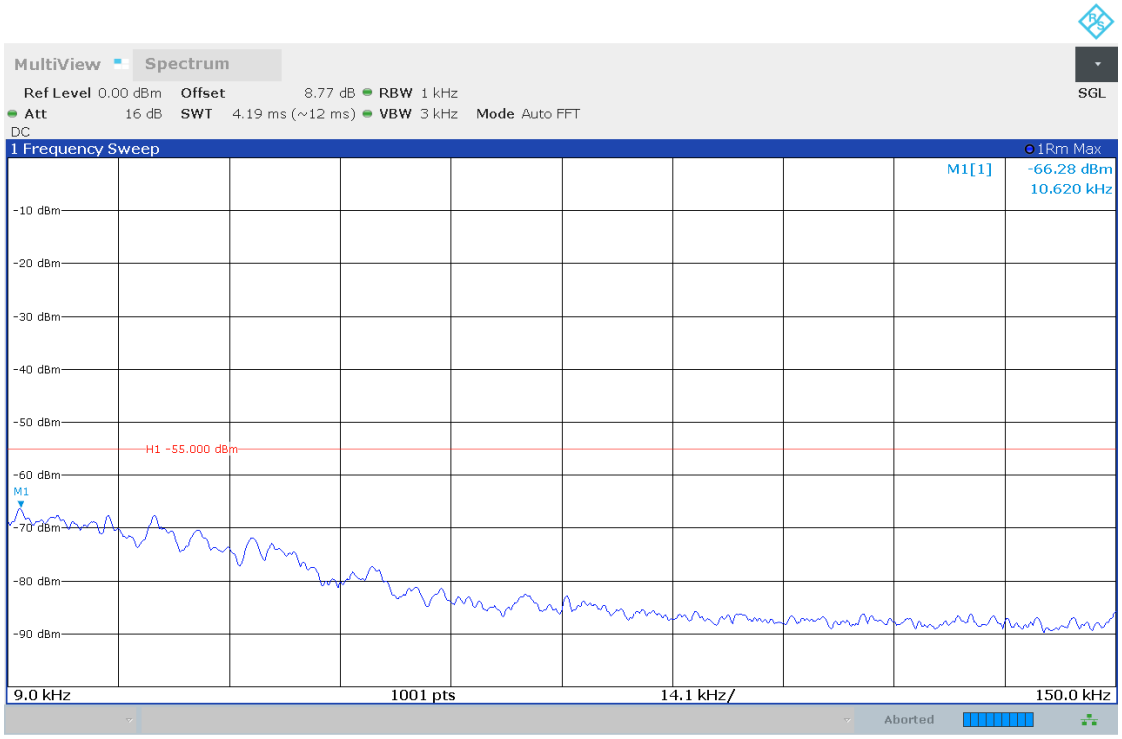
TM2_5MHz_MCH_RB1#24



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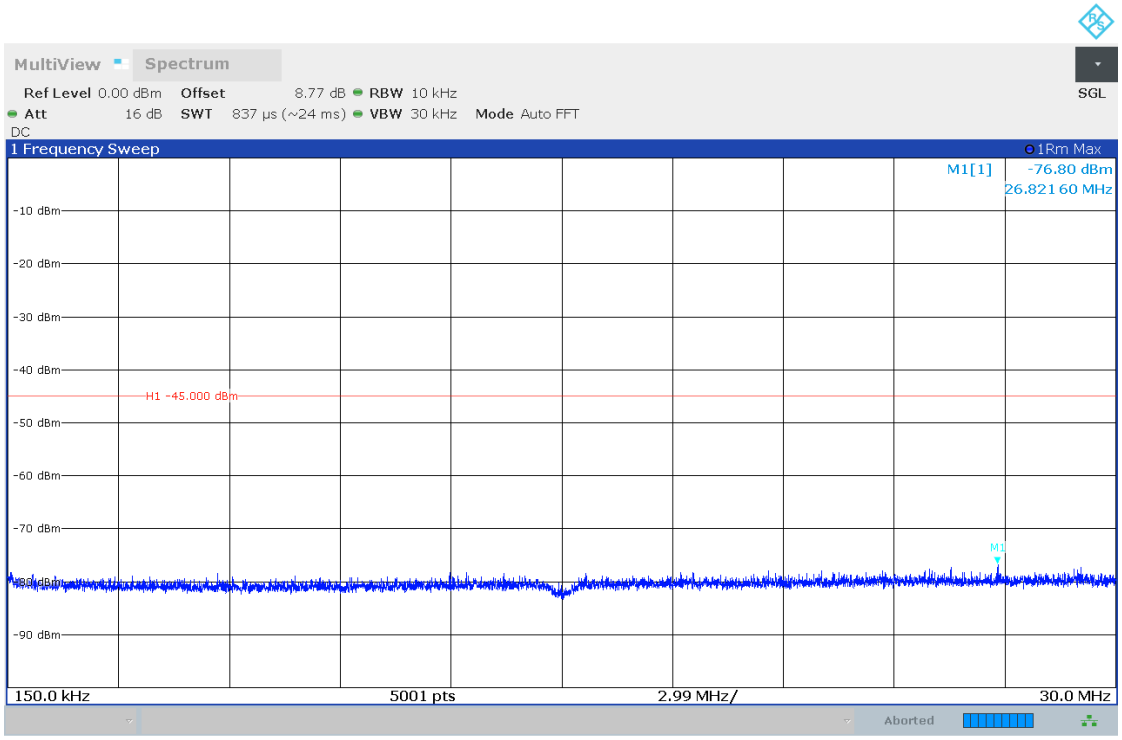

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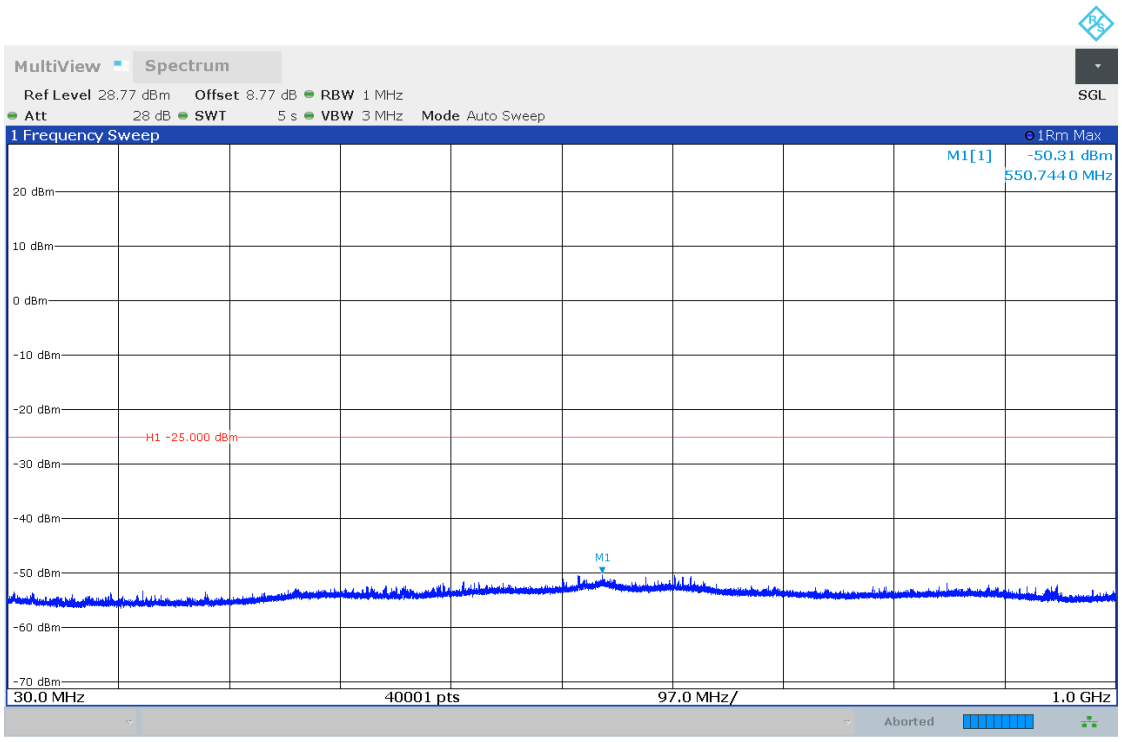

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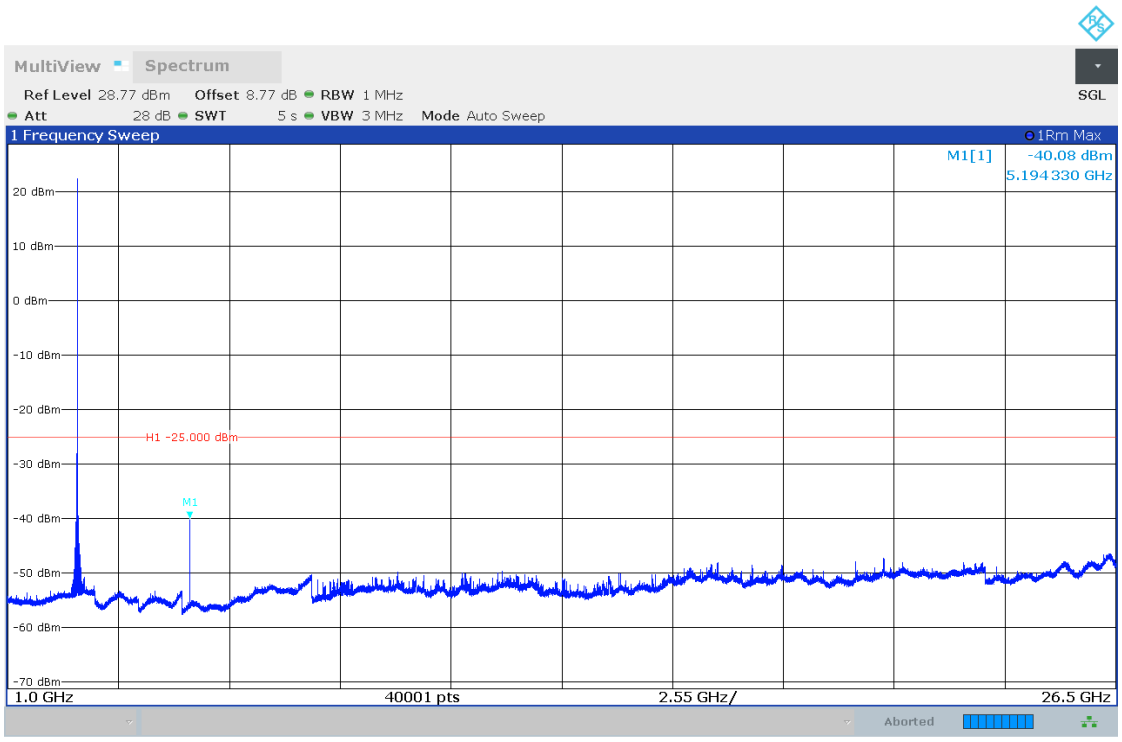

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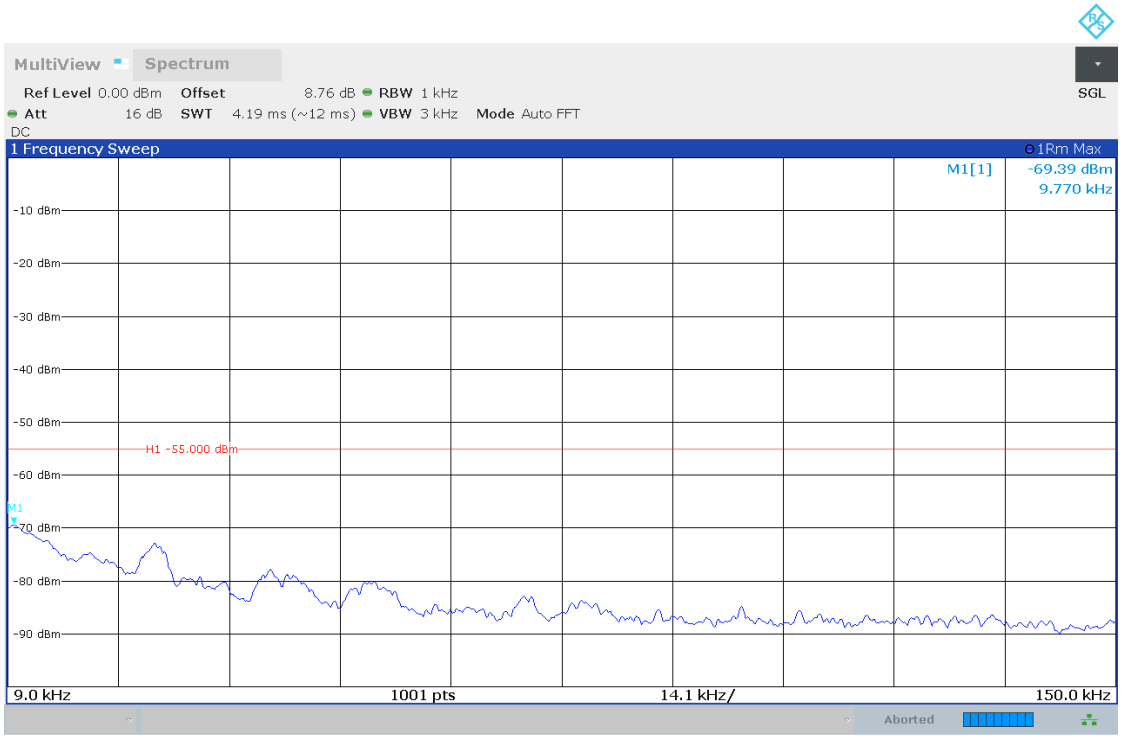
TM2_5MHz_HCH_RB25#0



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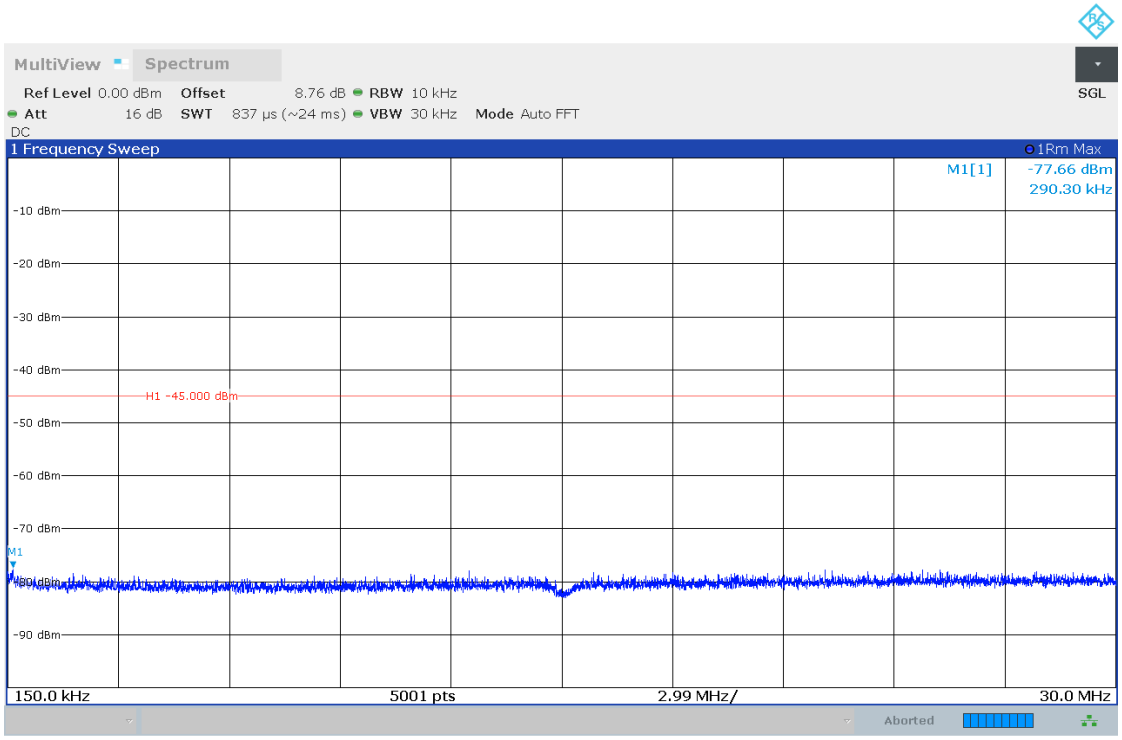

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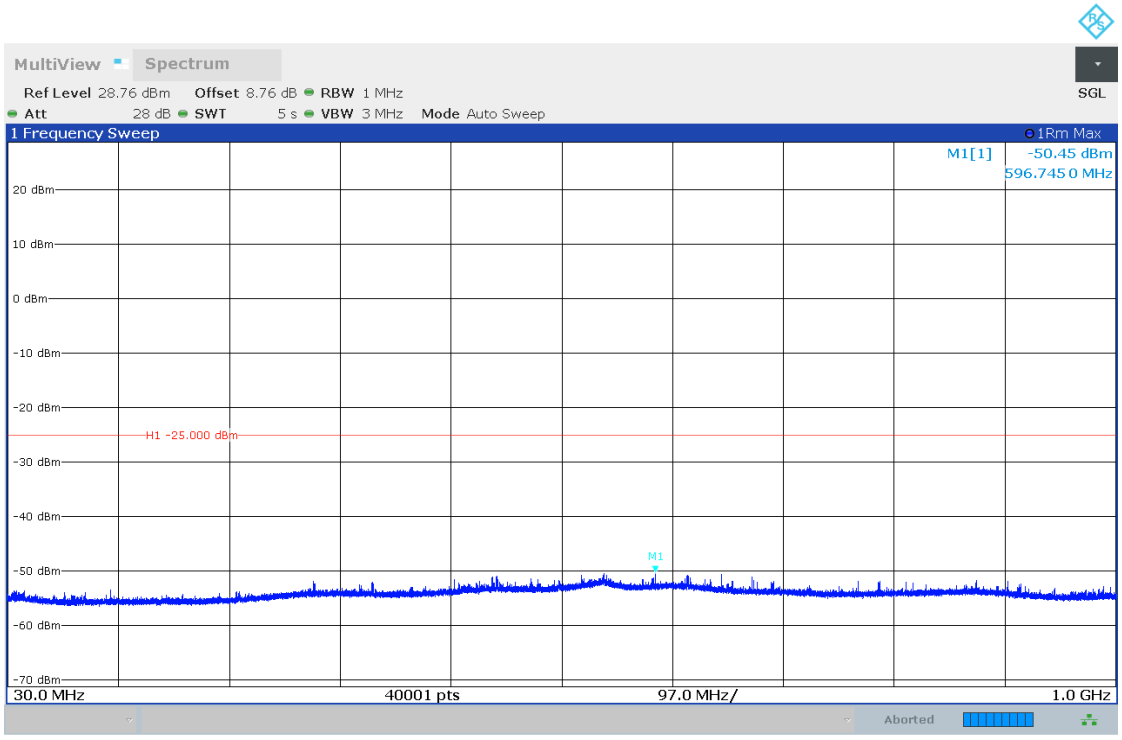

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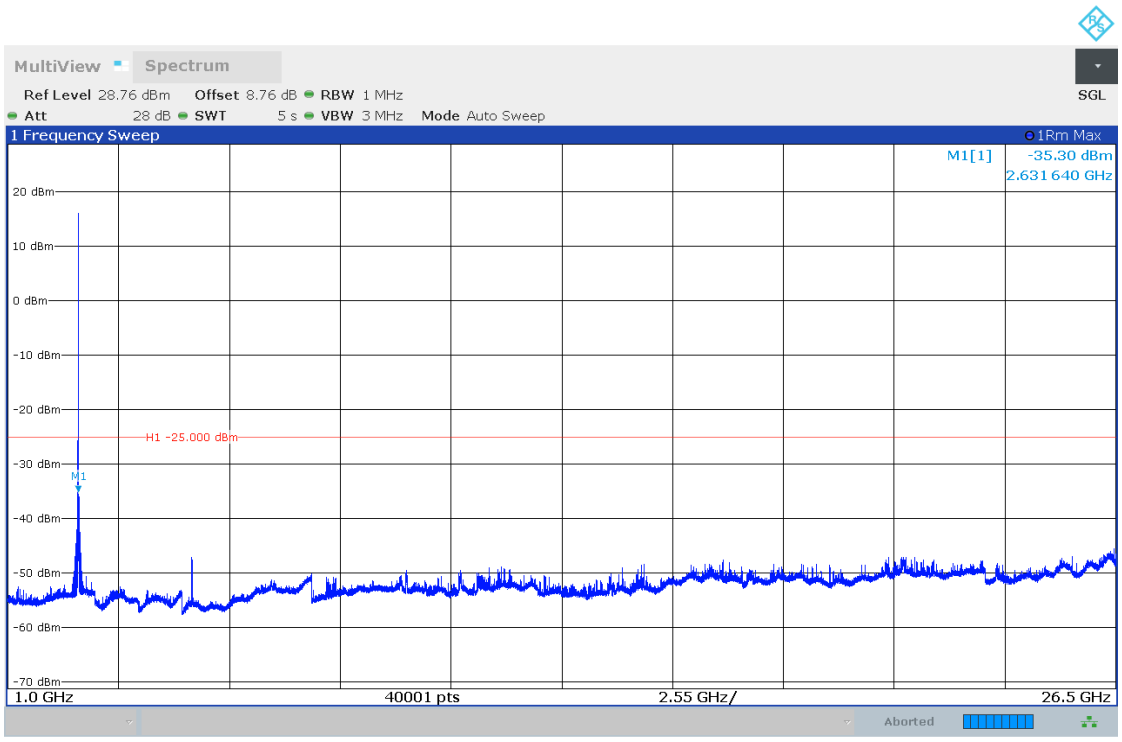

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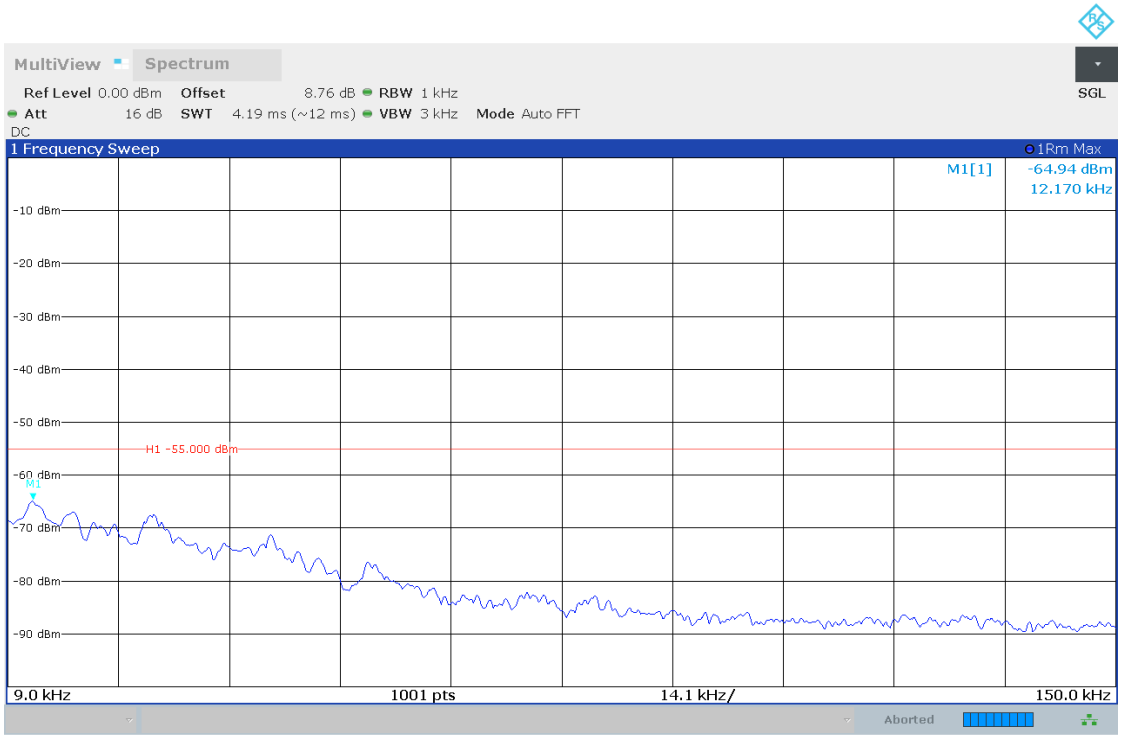
TM2_5MHz_HCH_RB1#0



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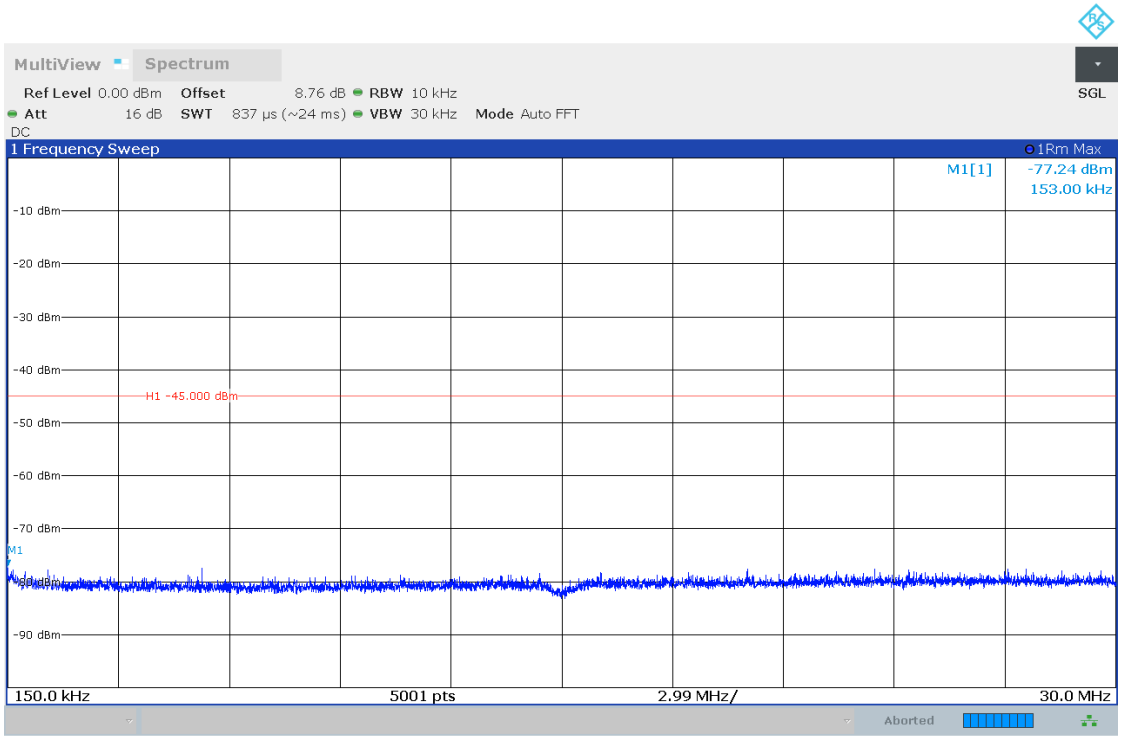

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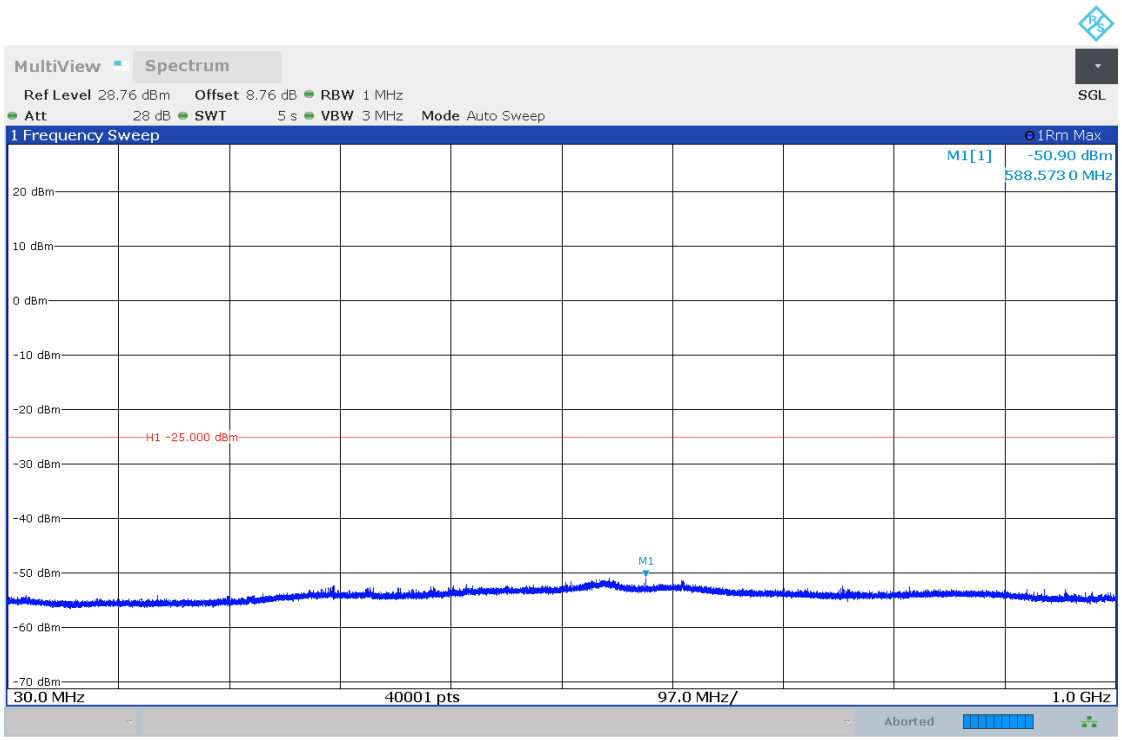

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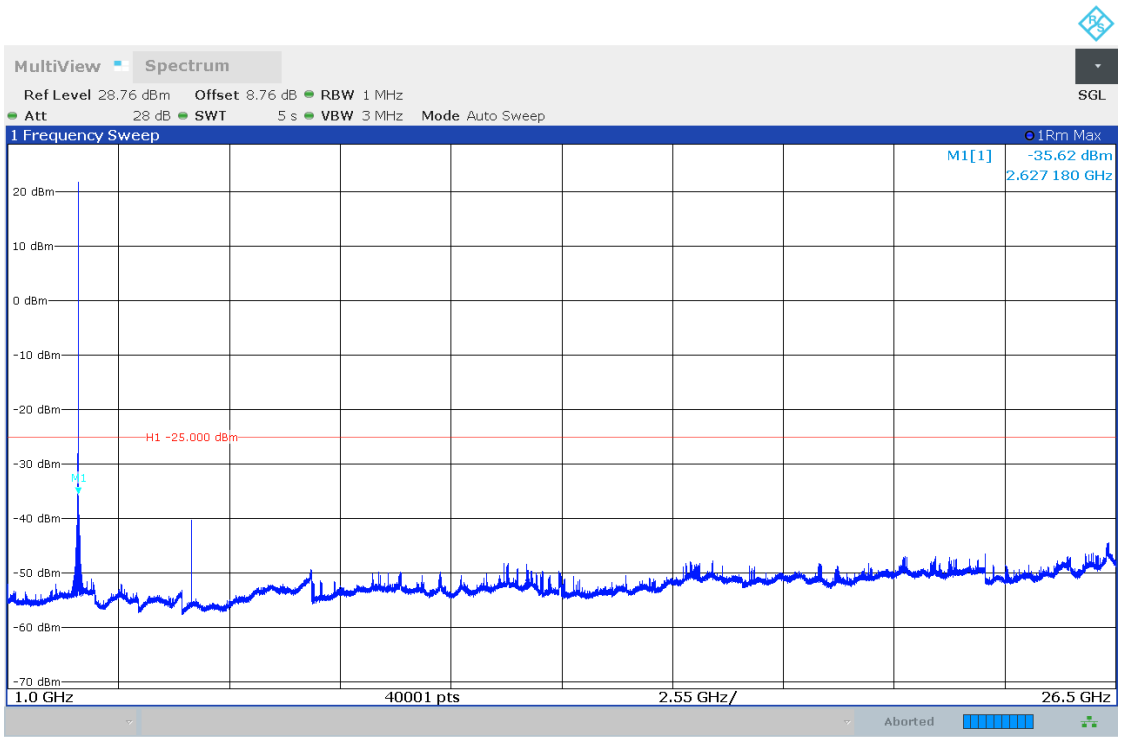

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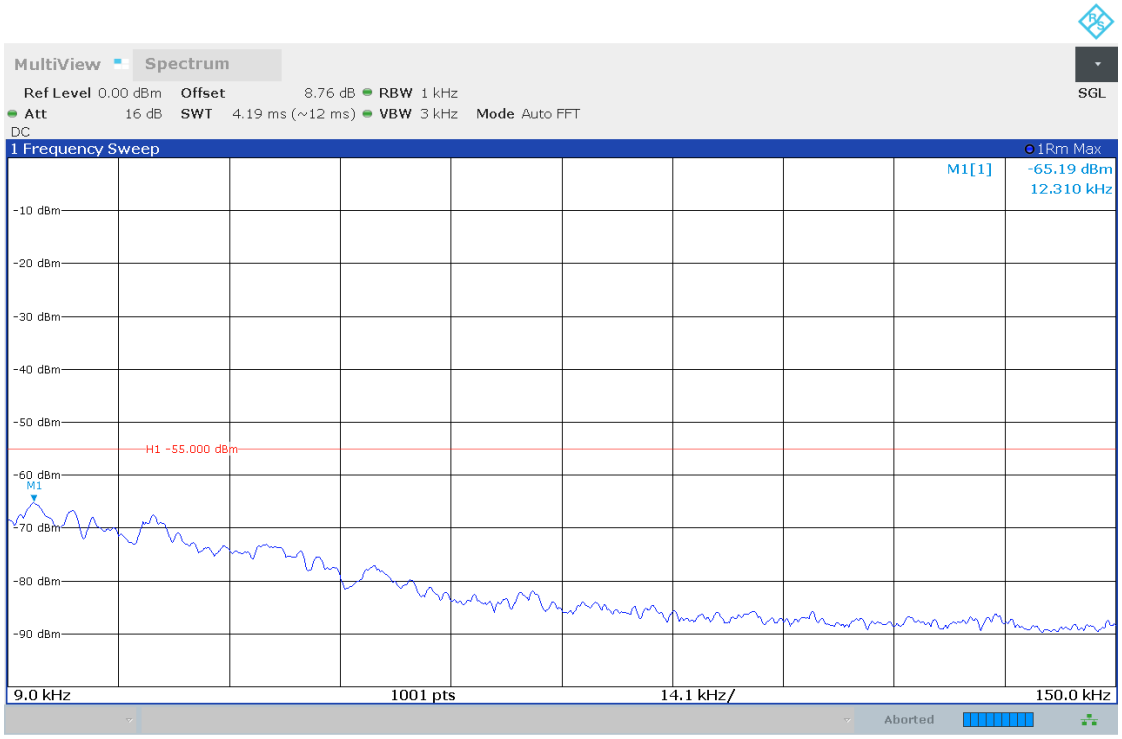
TM2_5MHz_HCH_RB1#24



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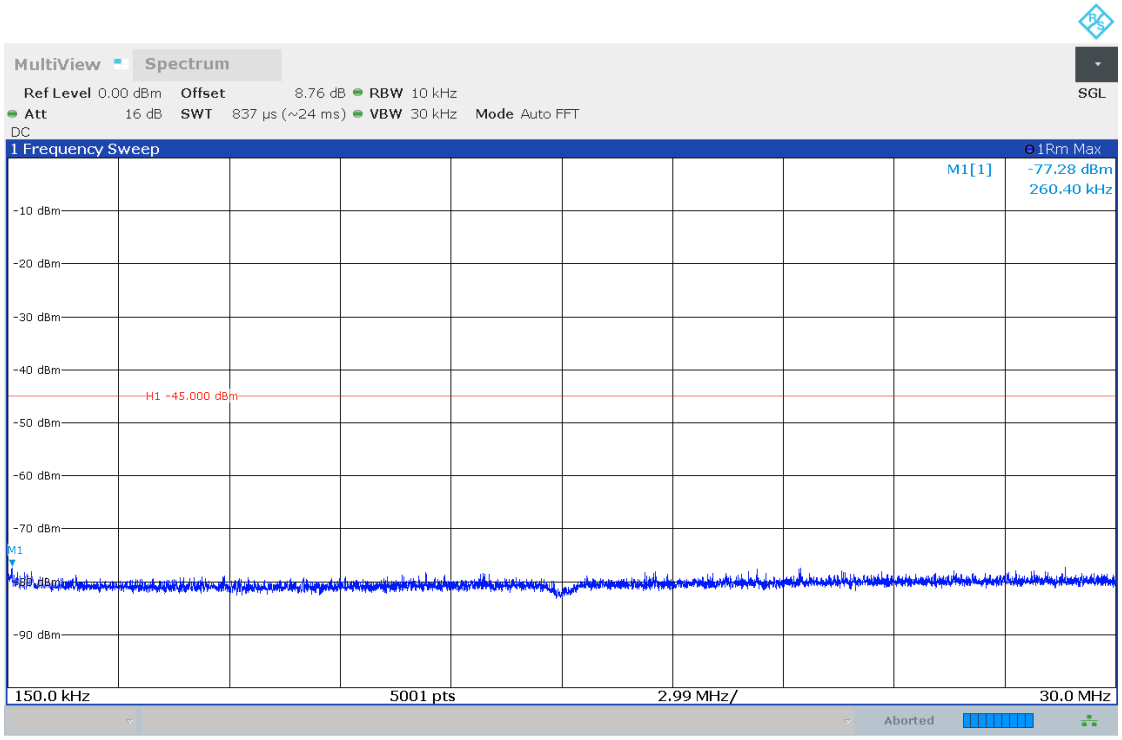

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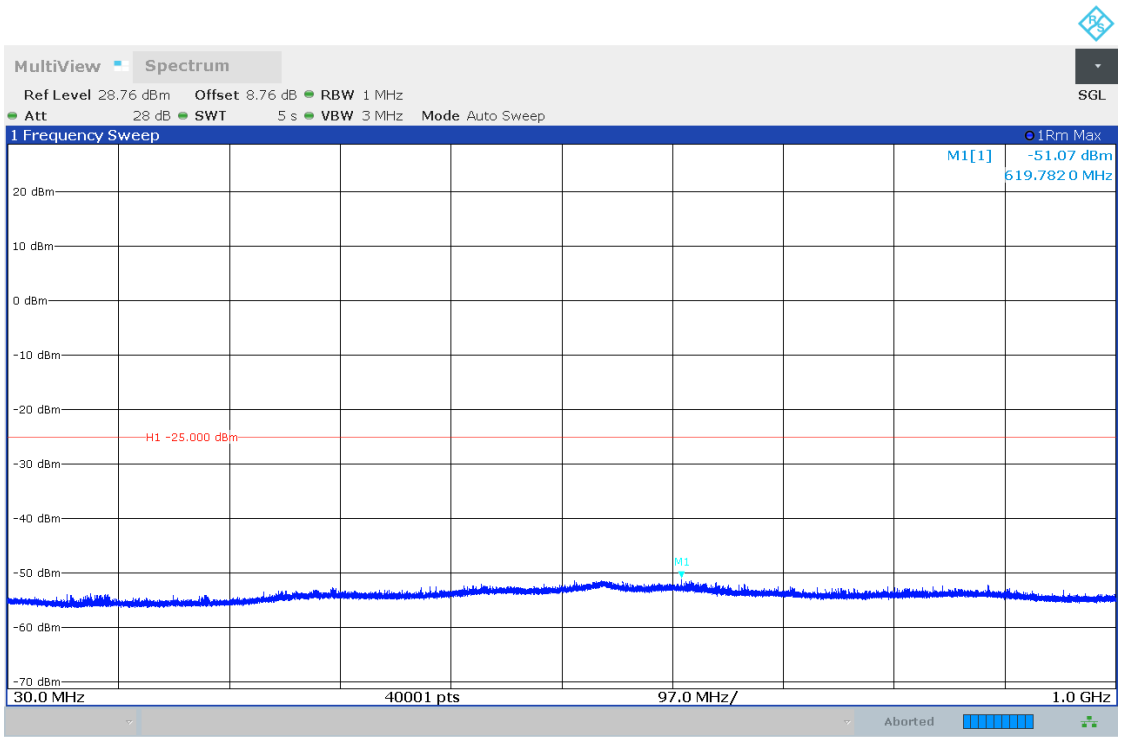

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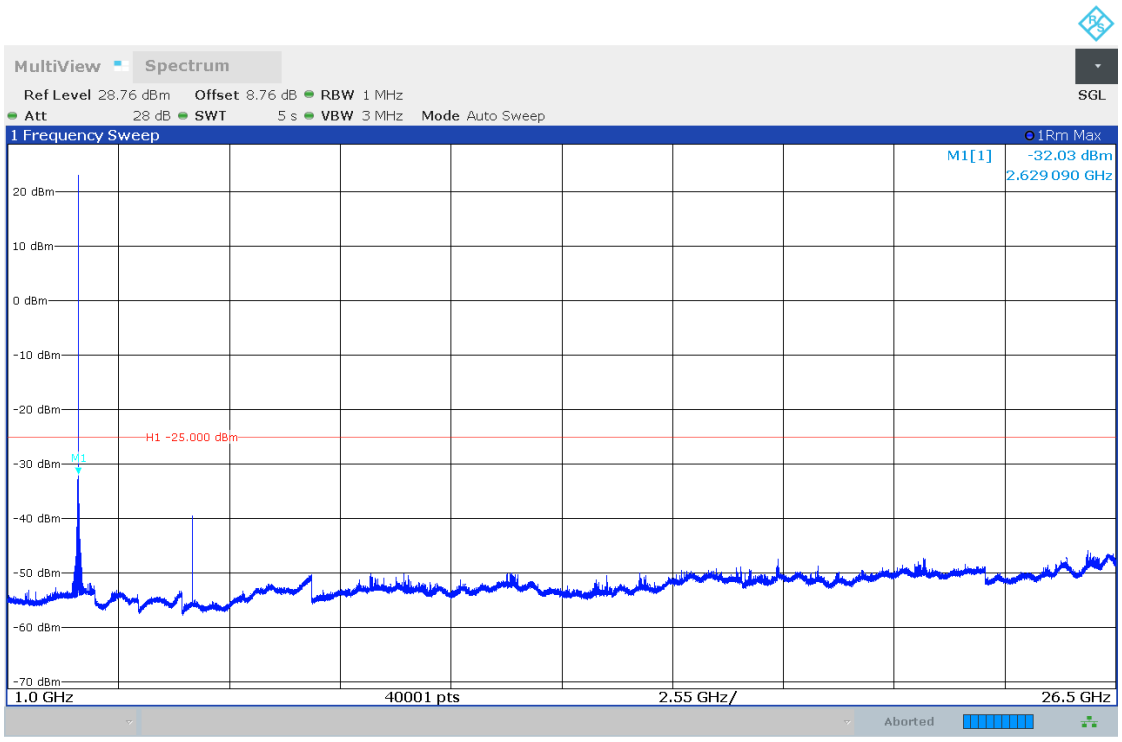

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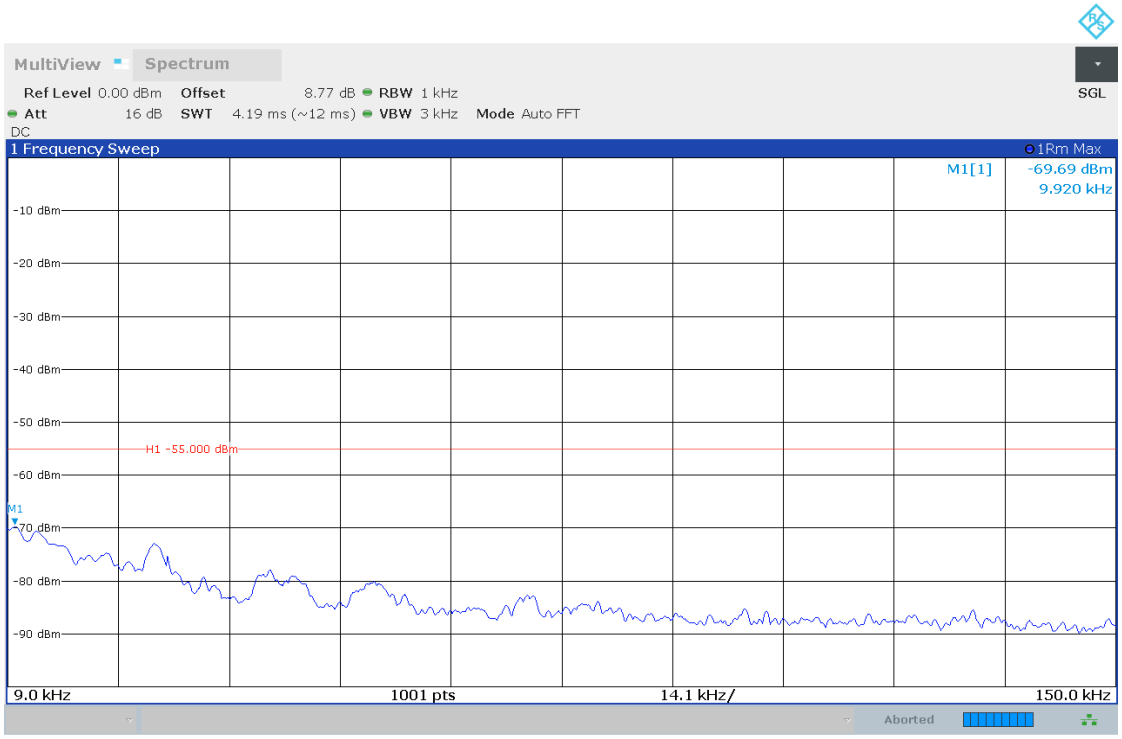
TM2_20MHz_LCH_RB100#0



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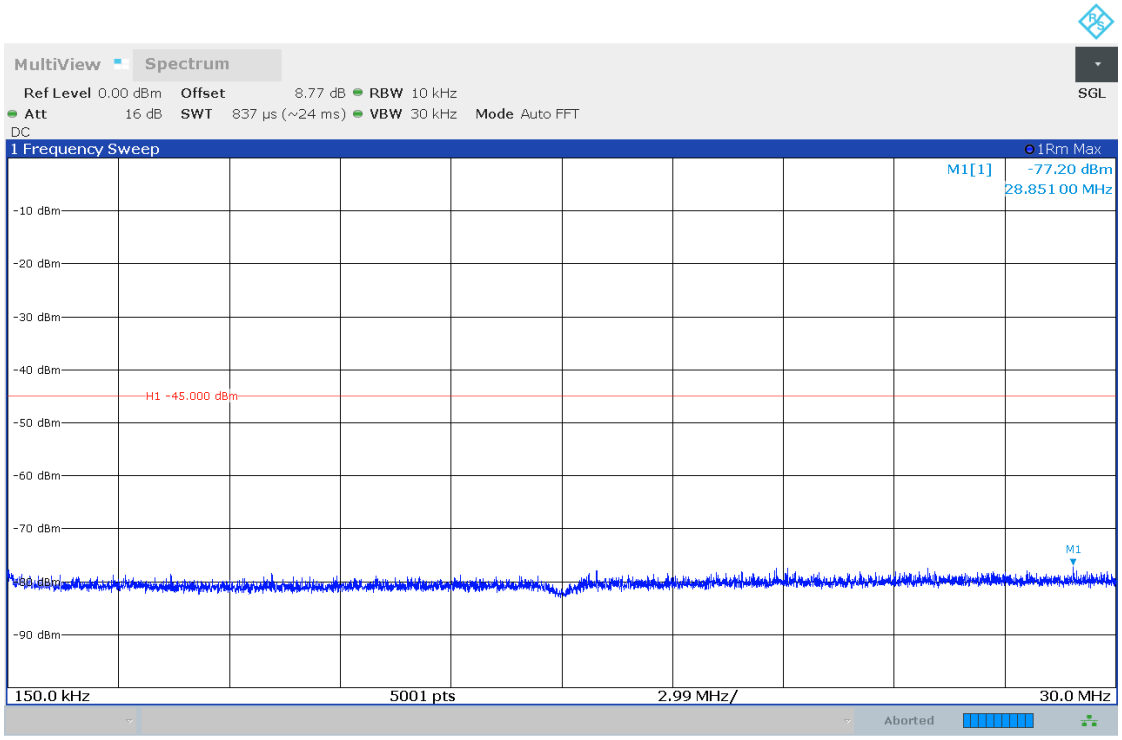

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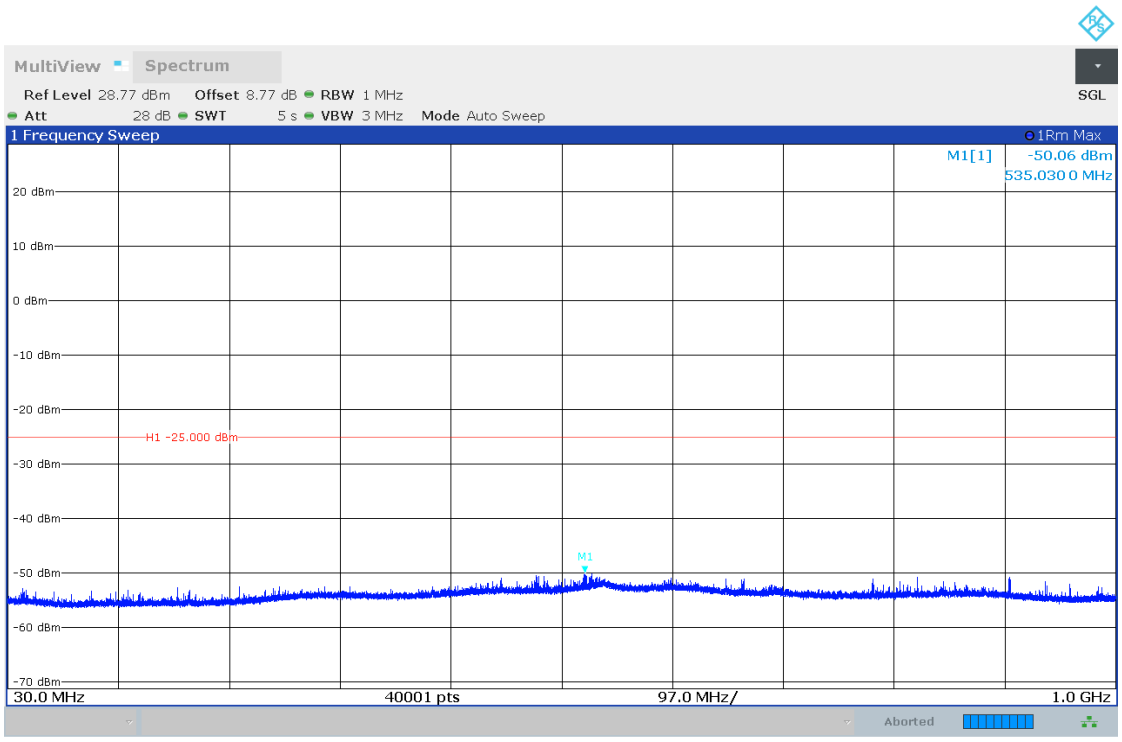

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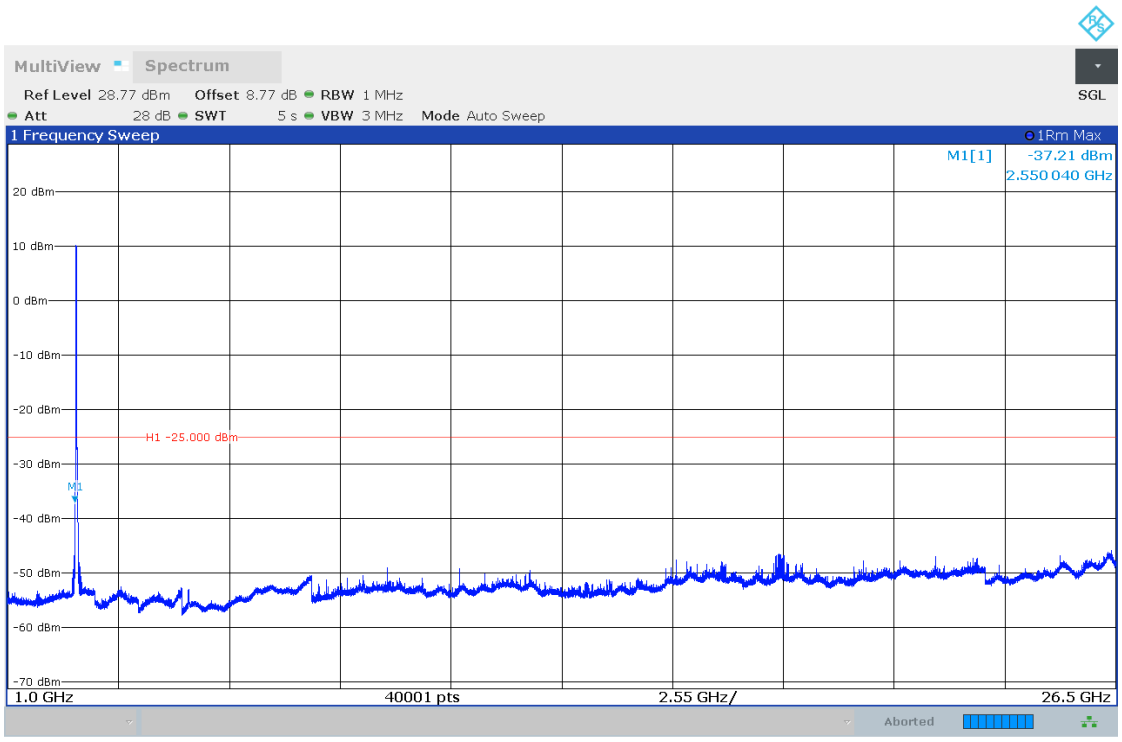
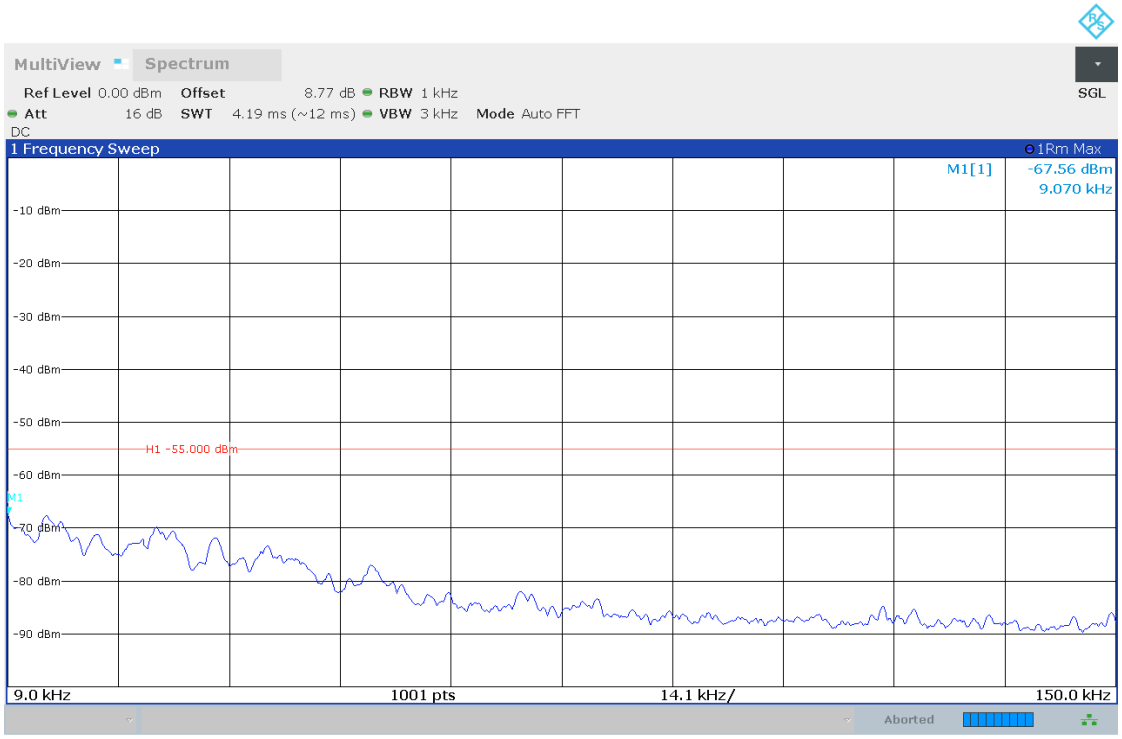


12:58:06 25.04.2022

TM2_20MHz_LCH_RB1#0



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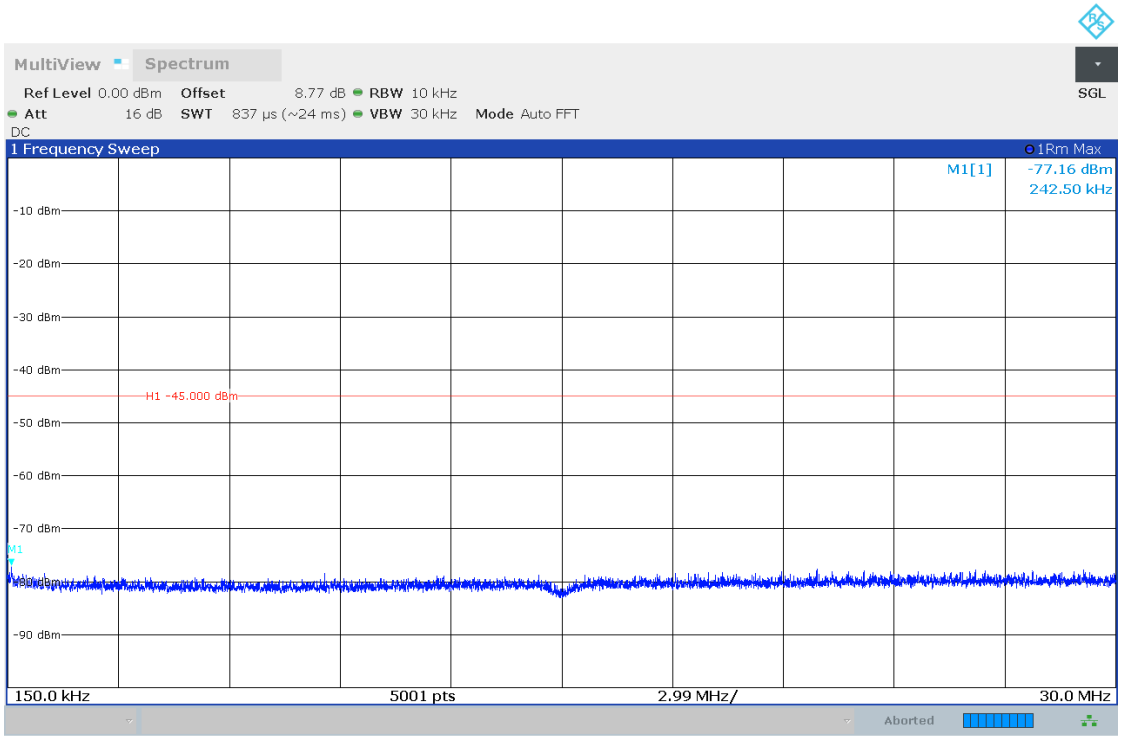

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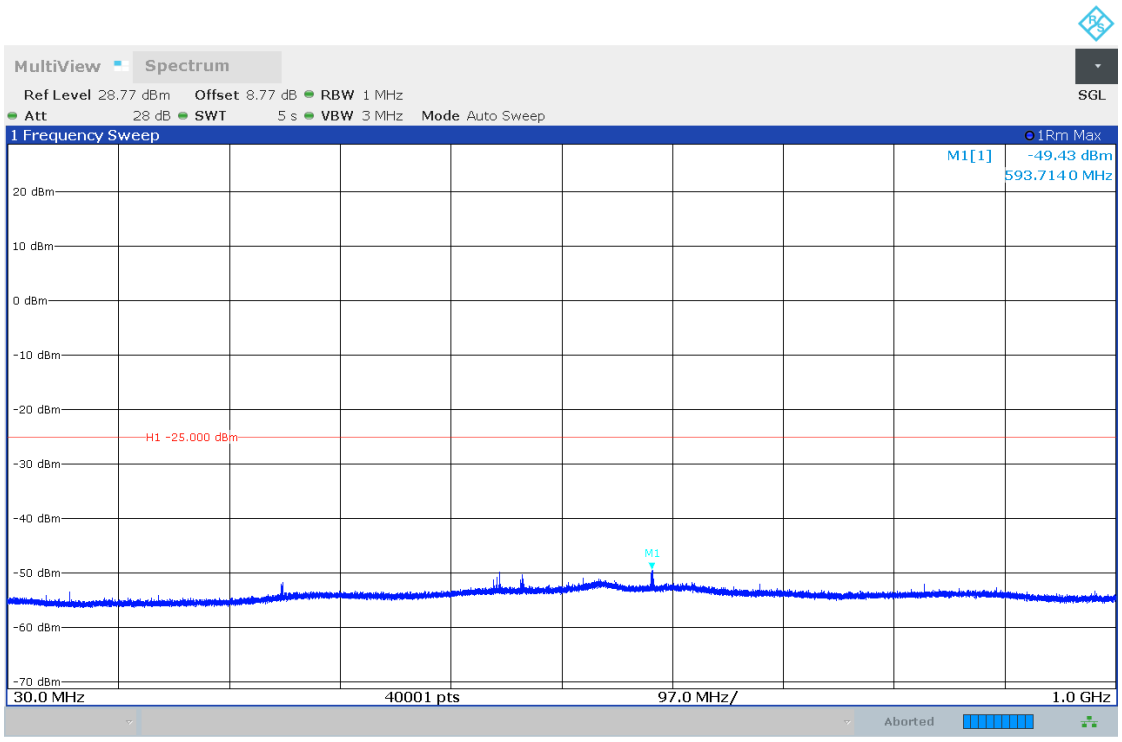

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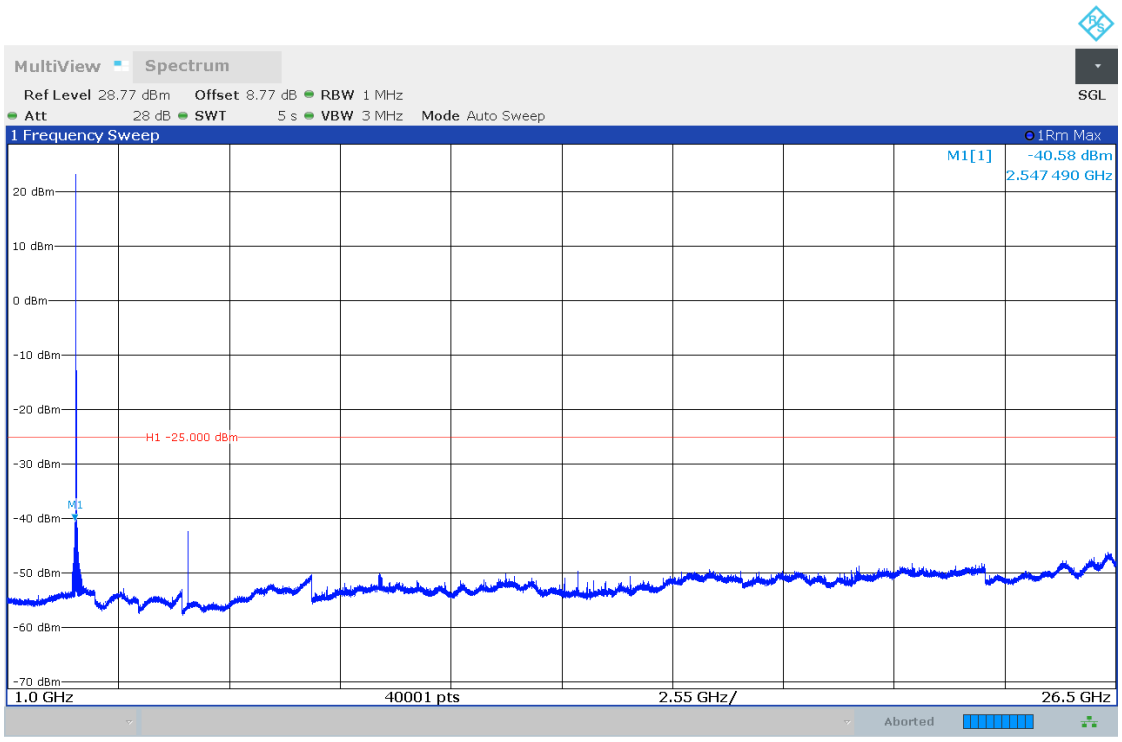

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TM2_20MHz_LCH_RB1#99

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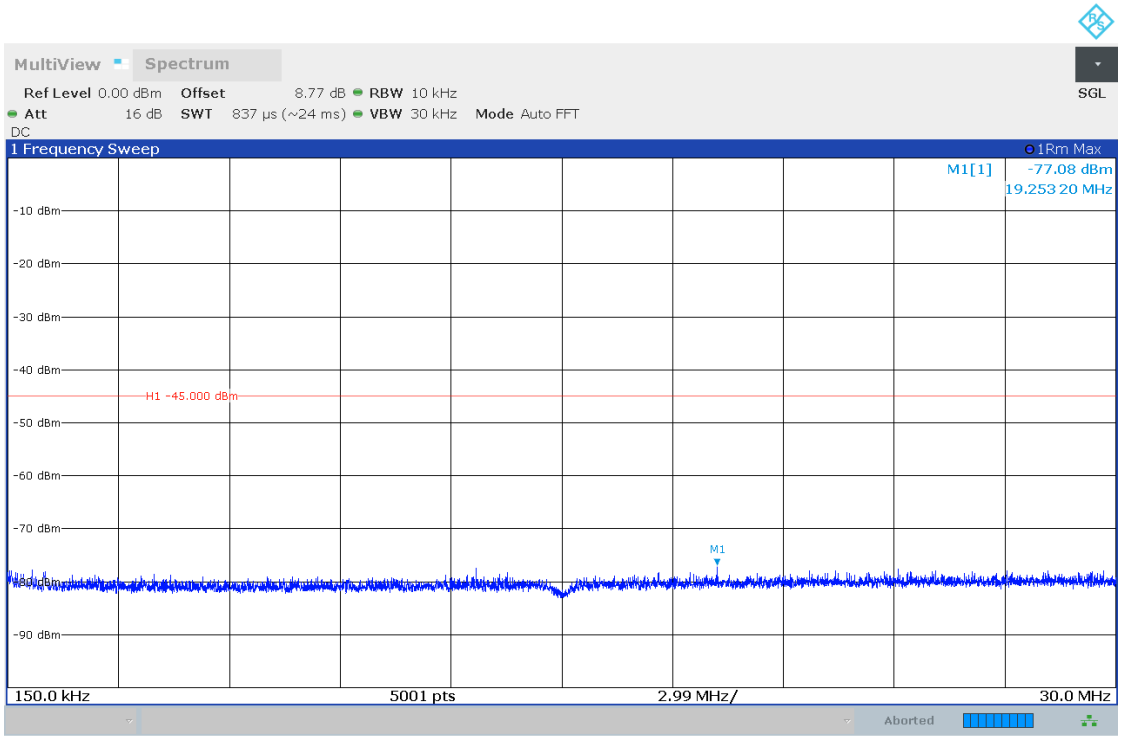

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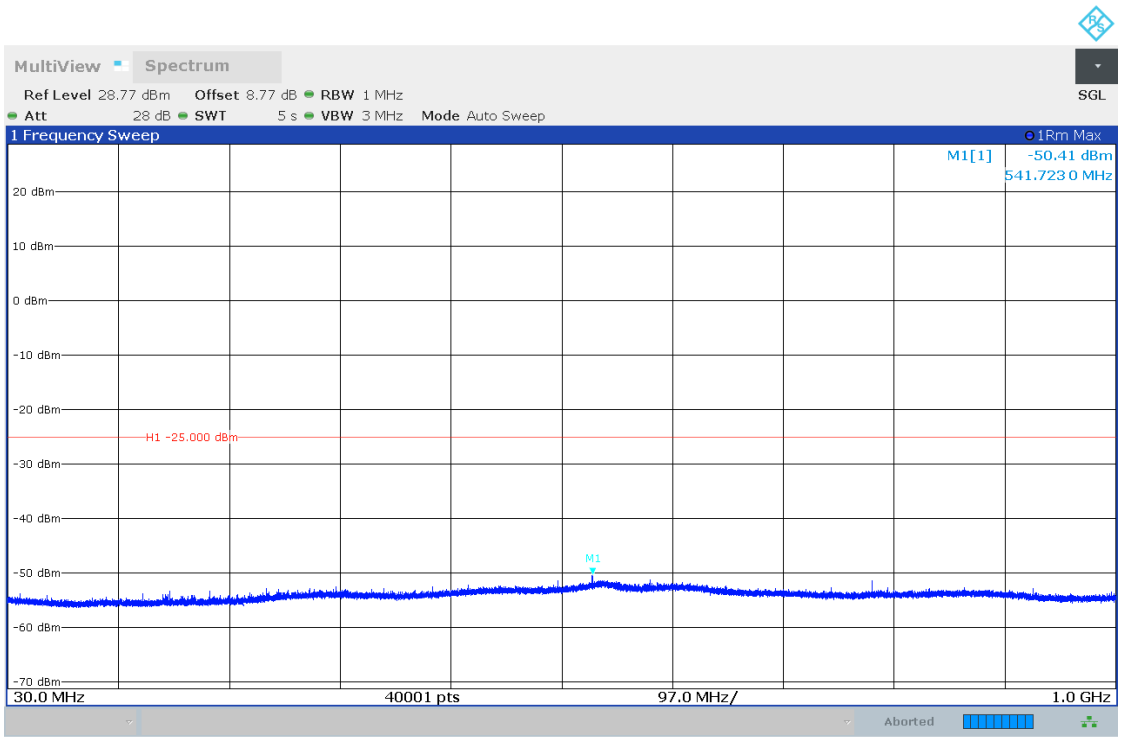

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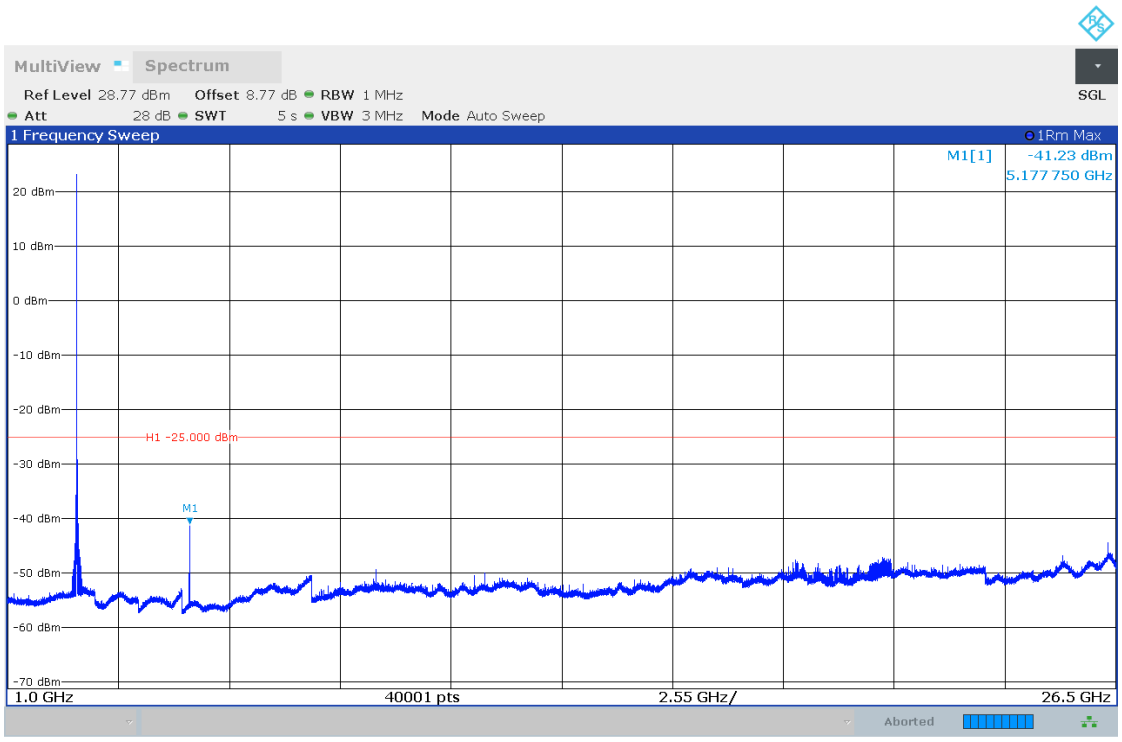

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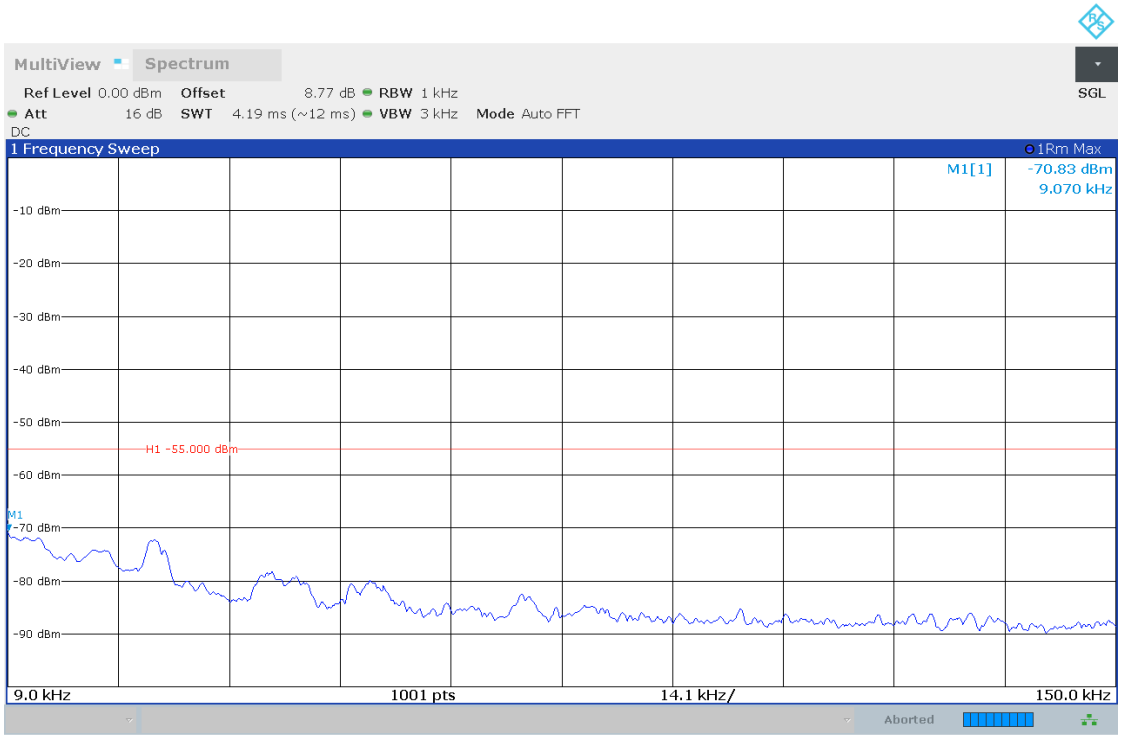
TM2_20MHz_MCH_RB100#0



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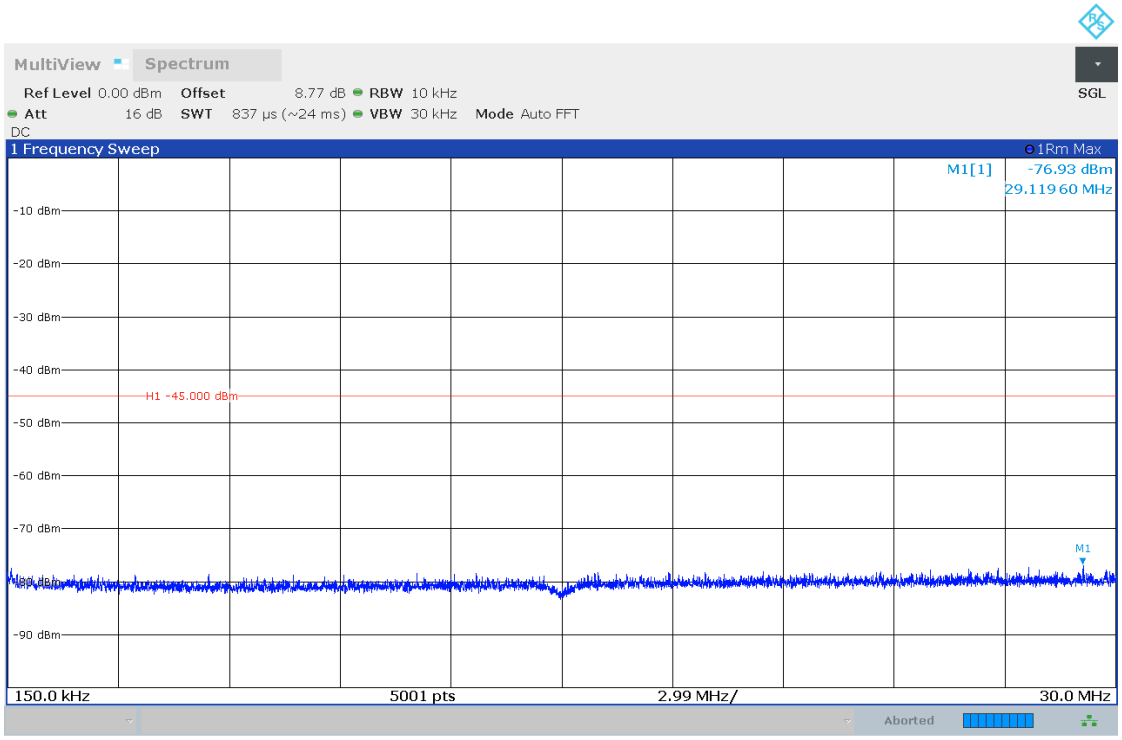

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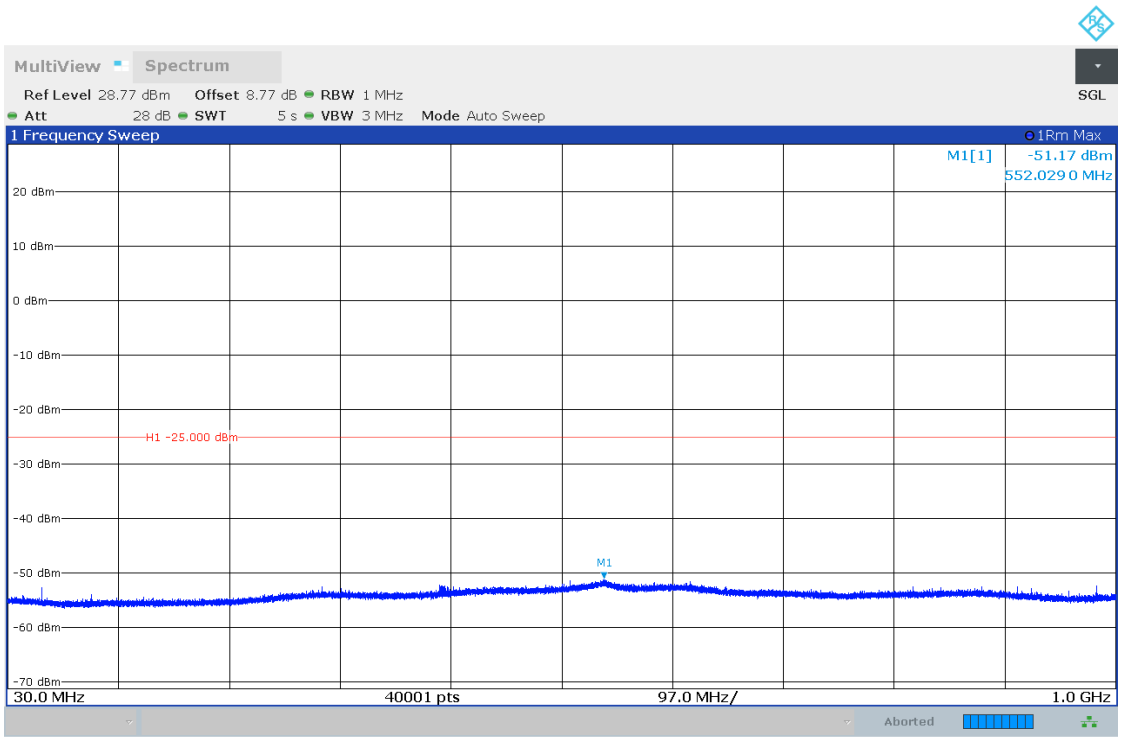

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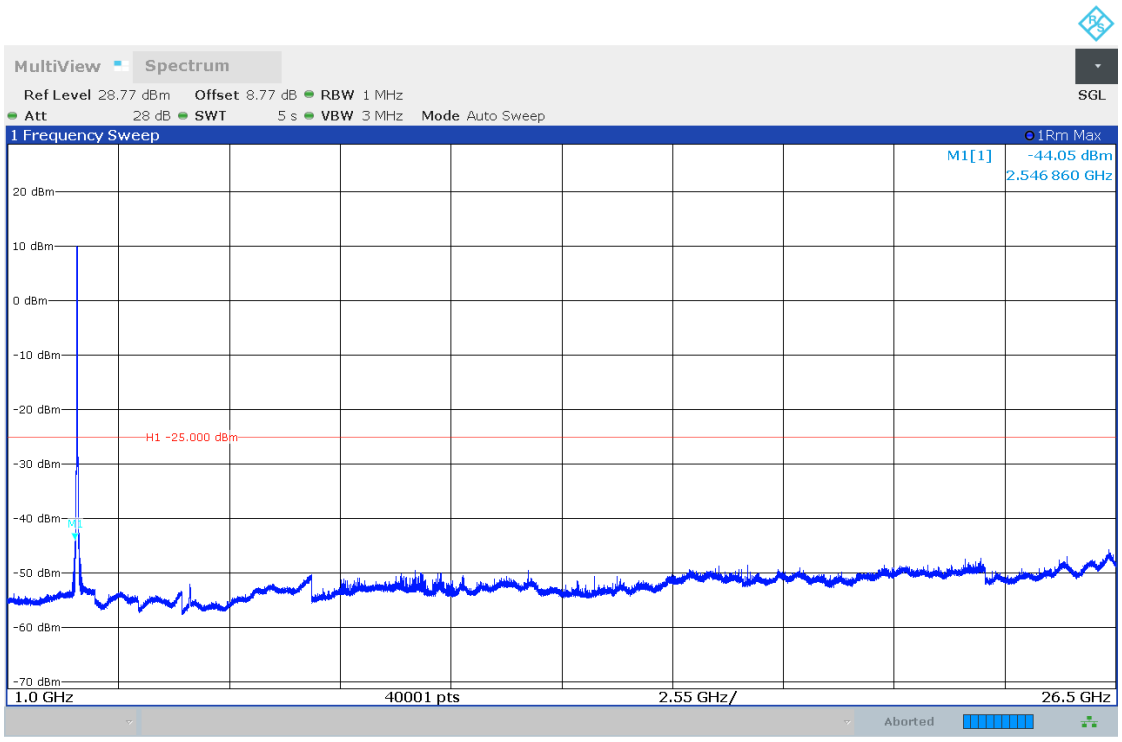

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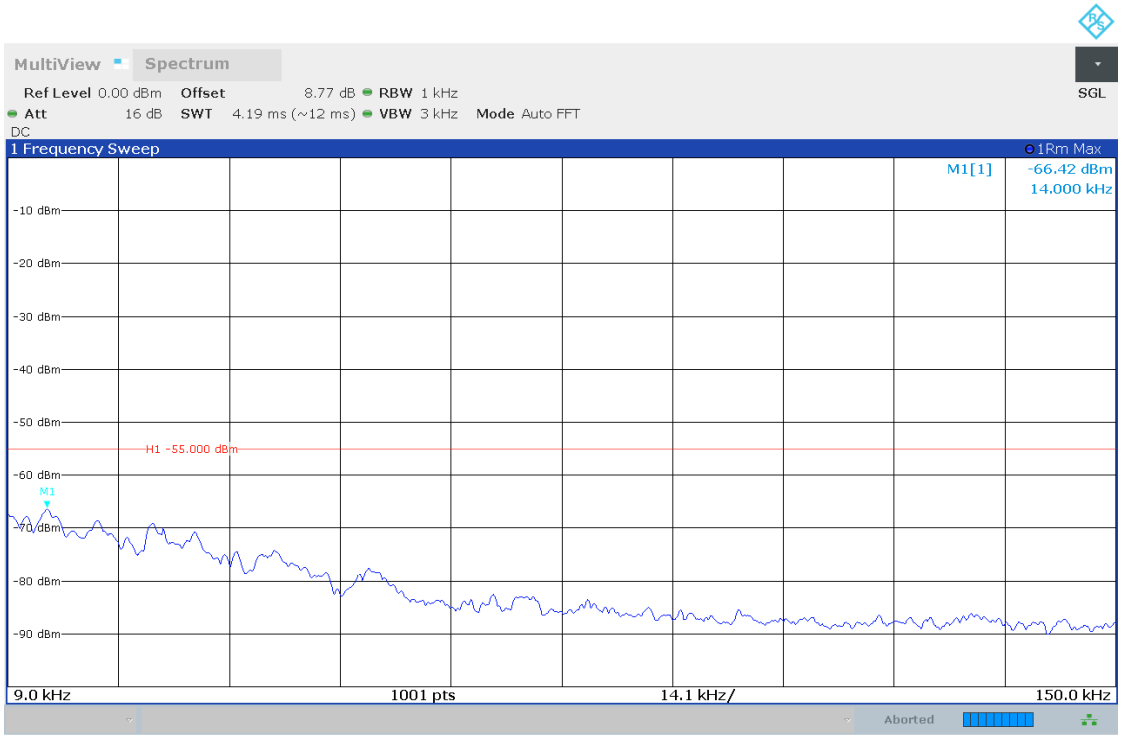
TM2_20MHz_MCH_RB1#0



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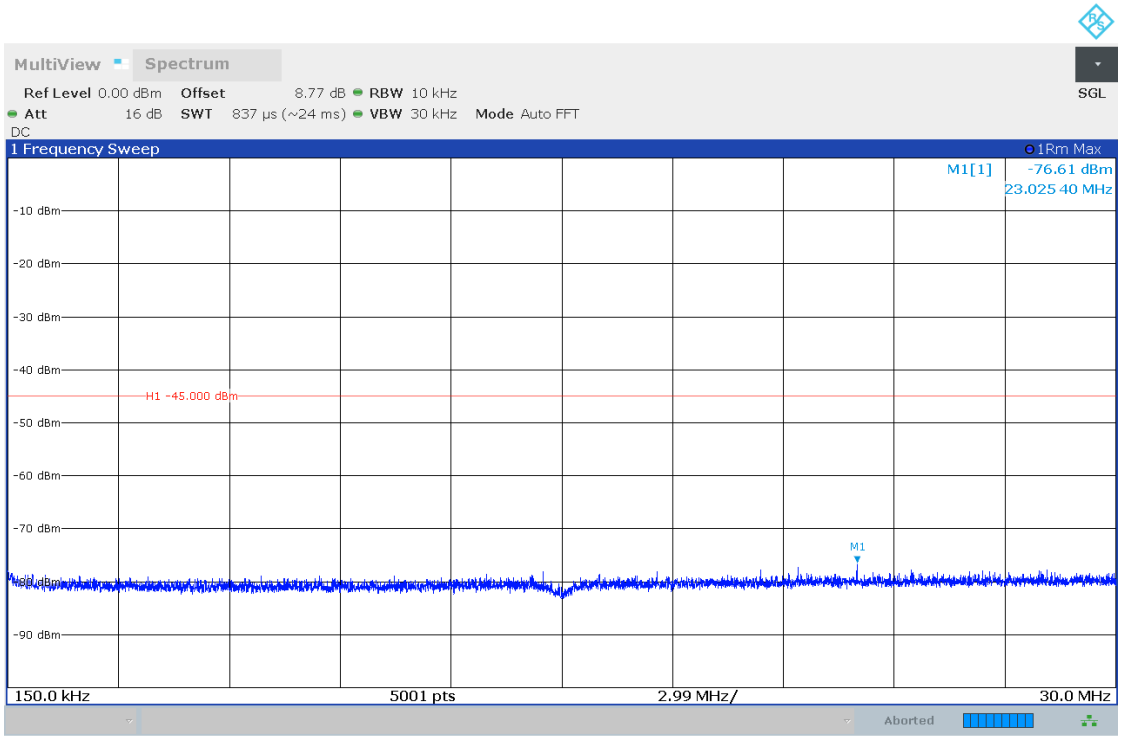

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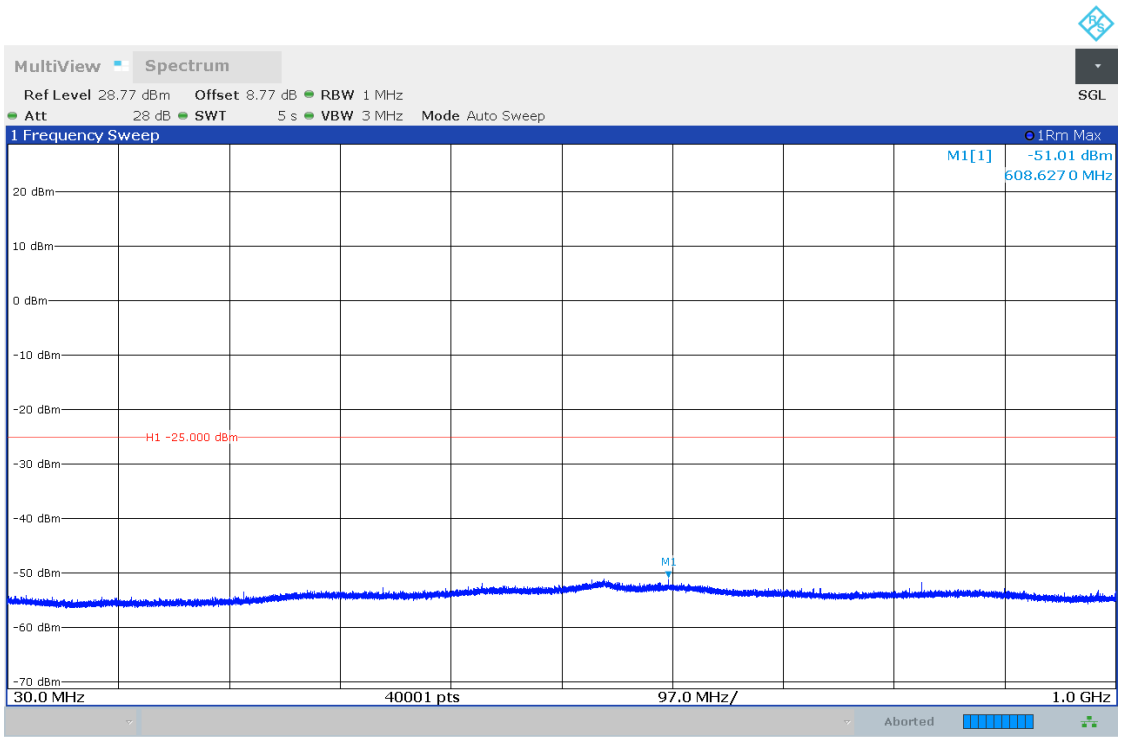

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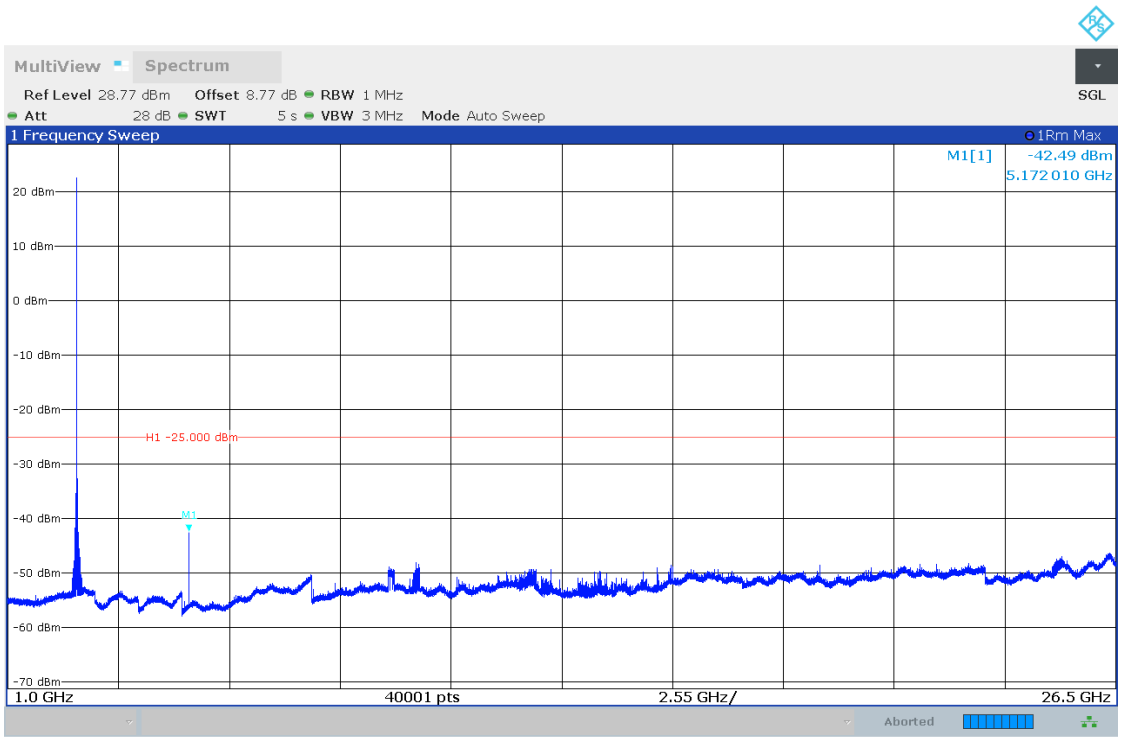

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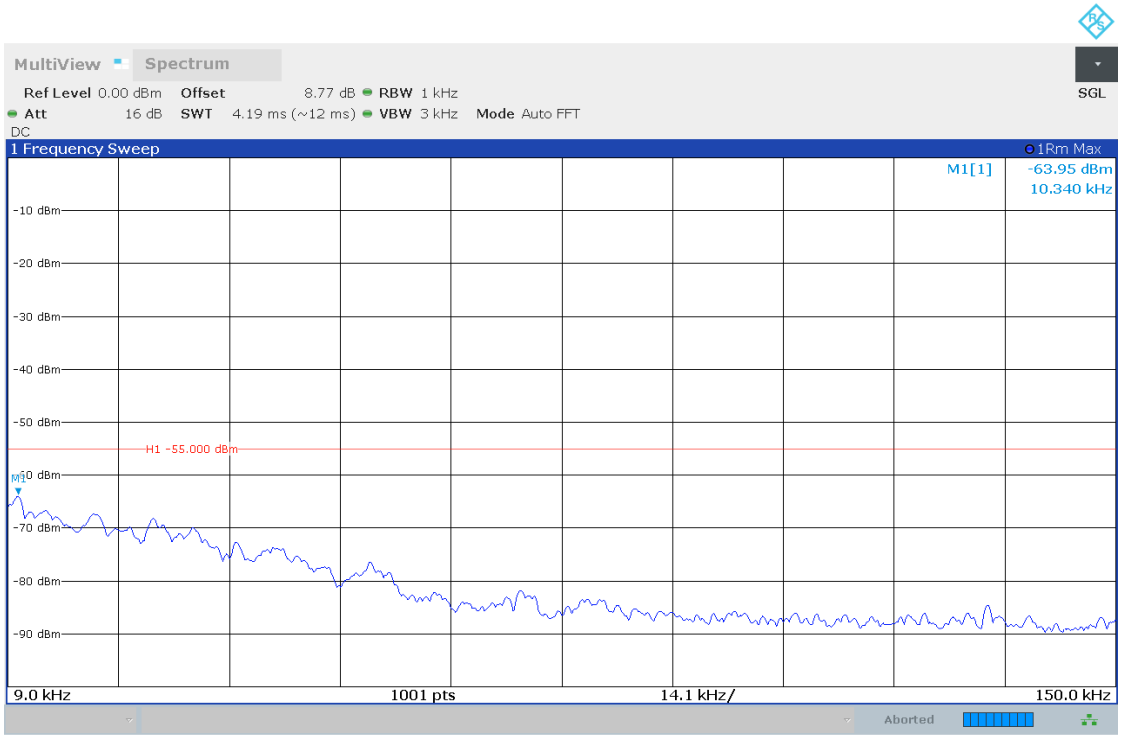
TM2_20MHz_MCH_RB1#99



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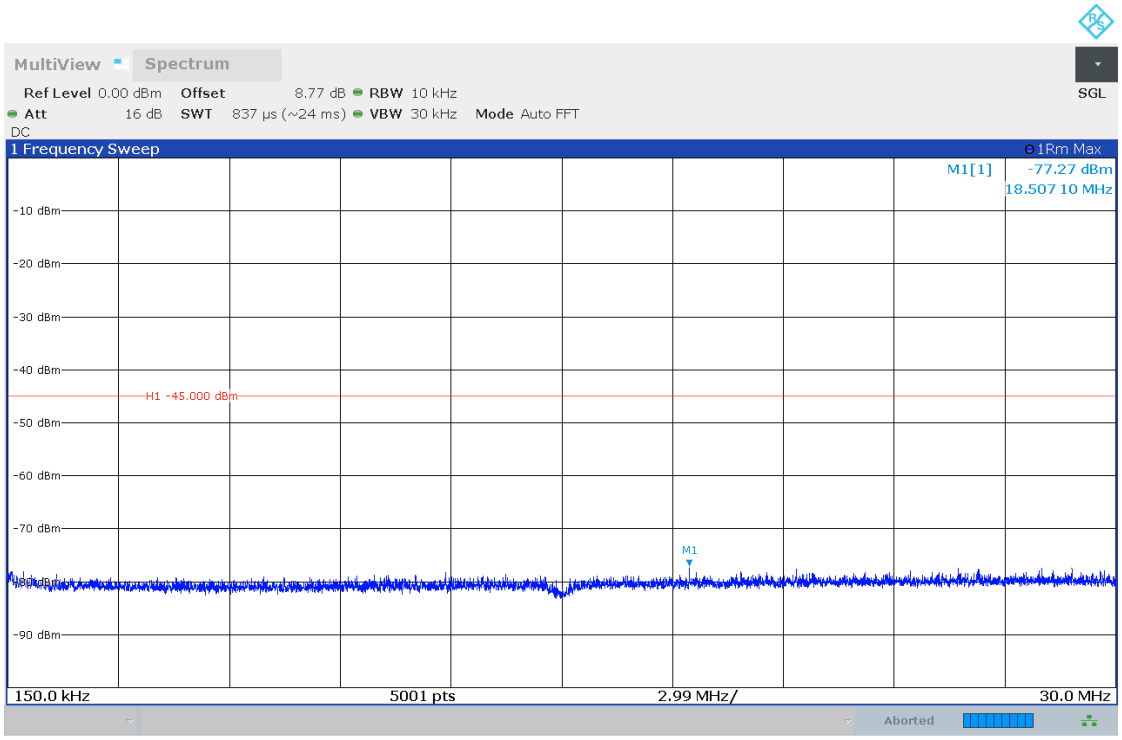

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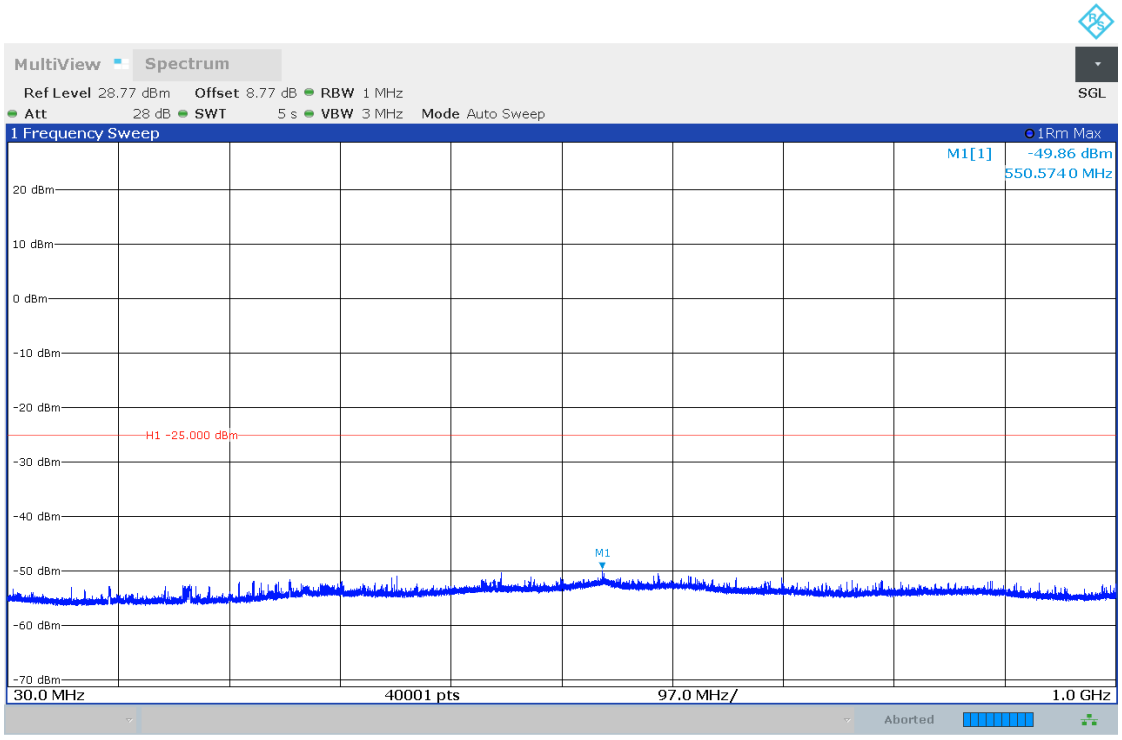

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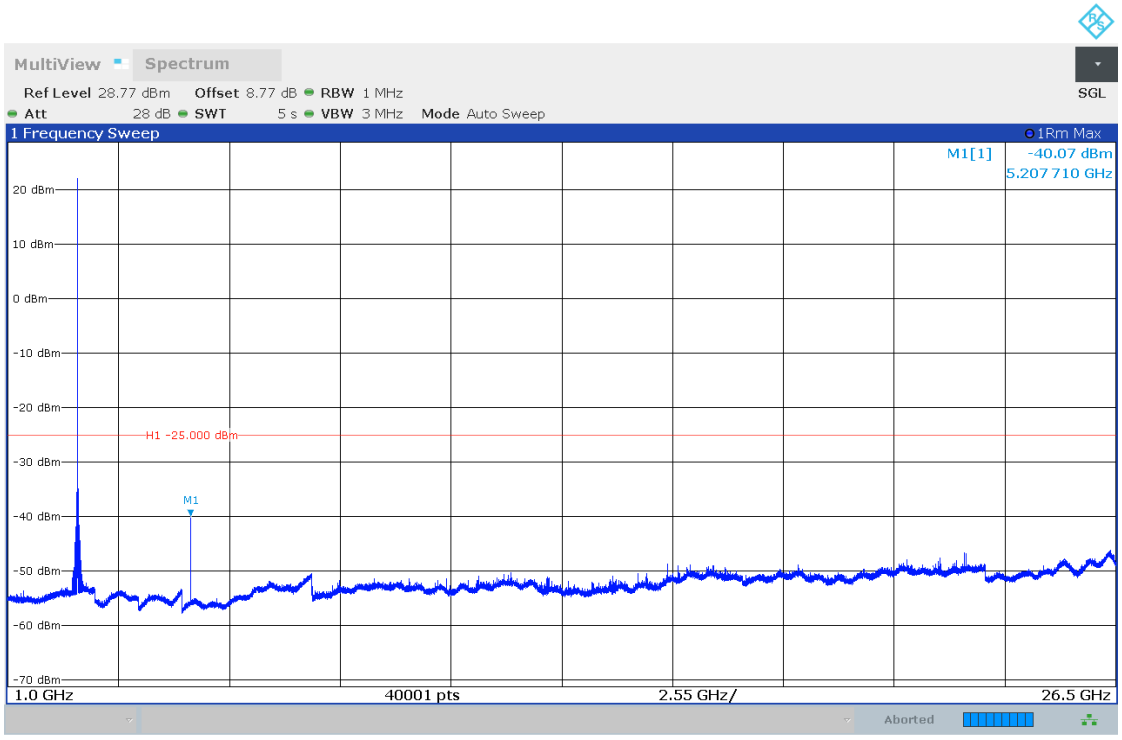

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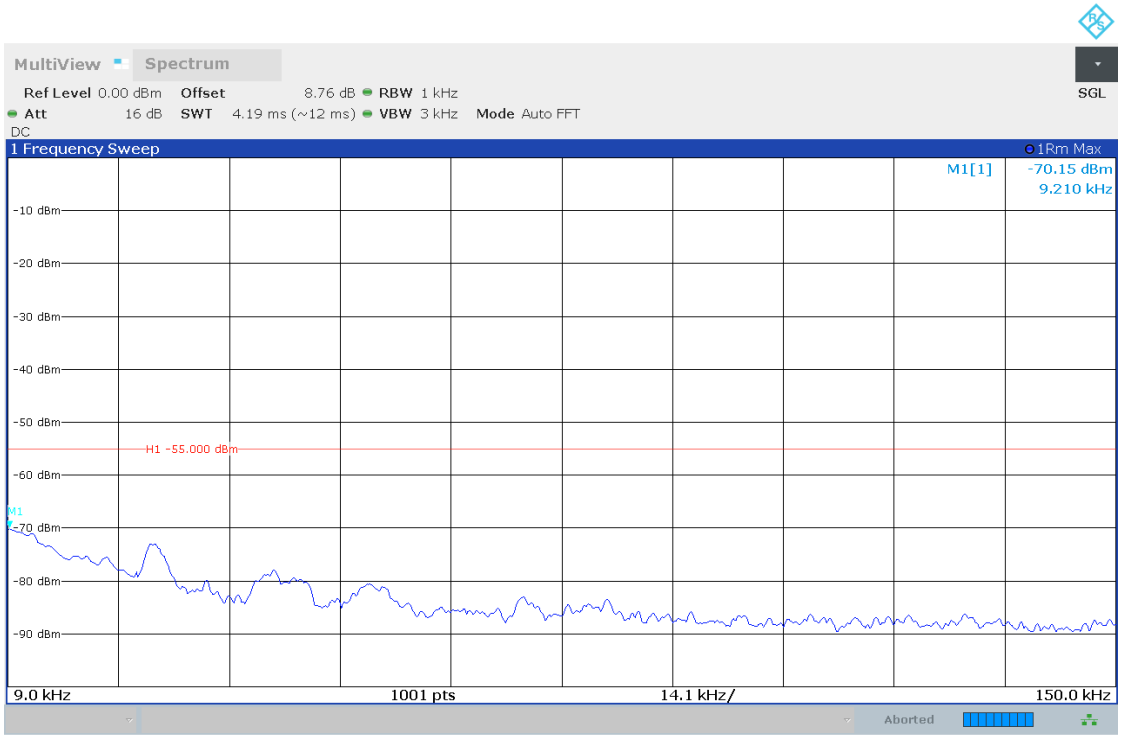
TM2_20MHz_HCH_RB100#0



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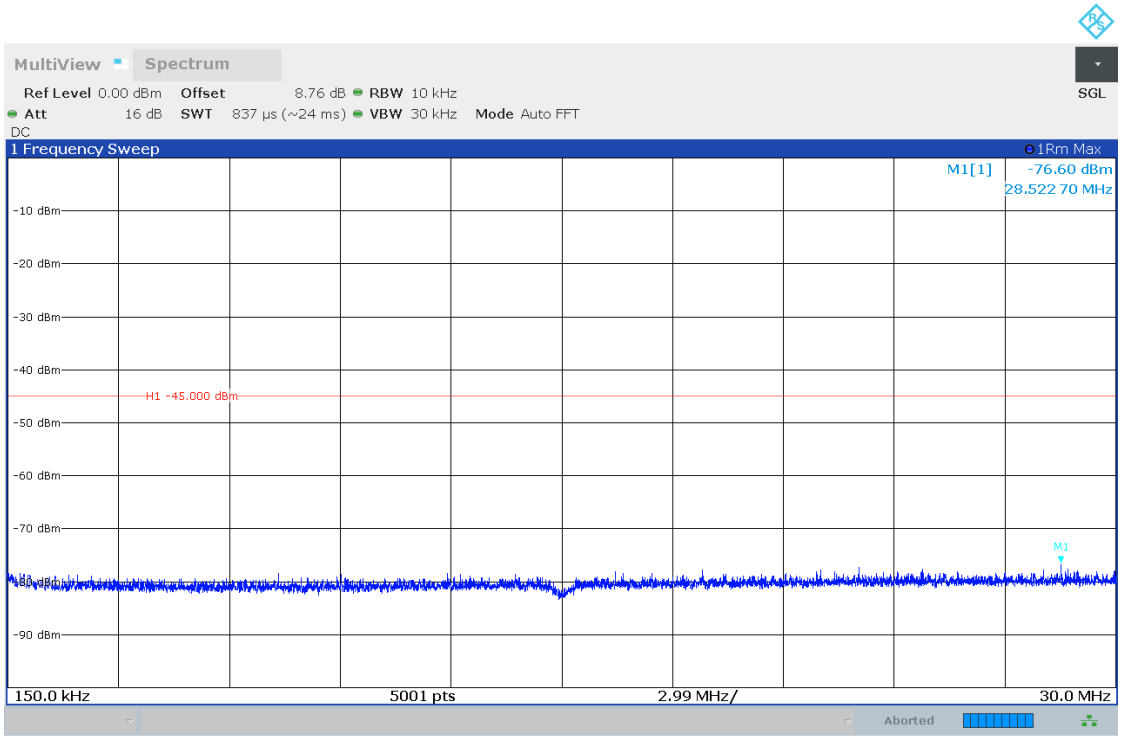

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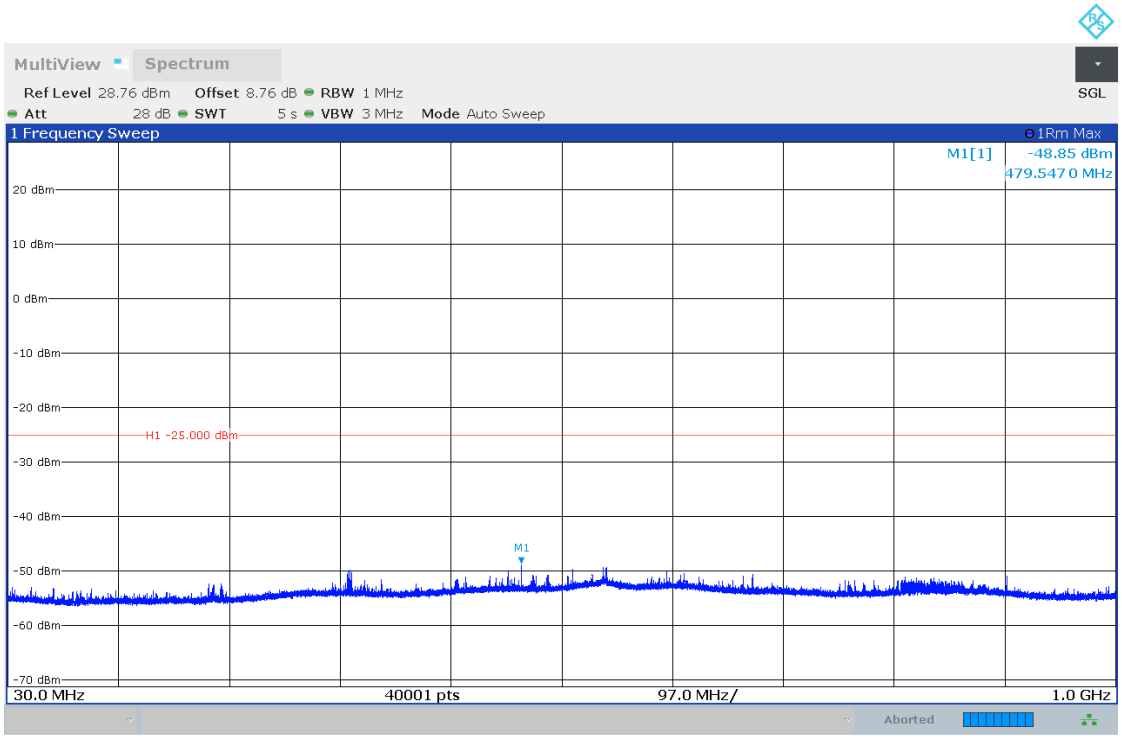
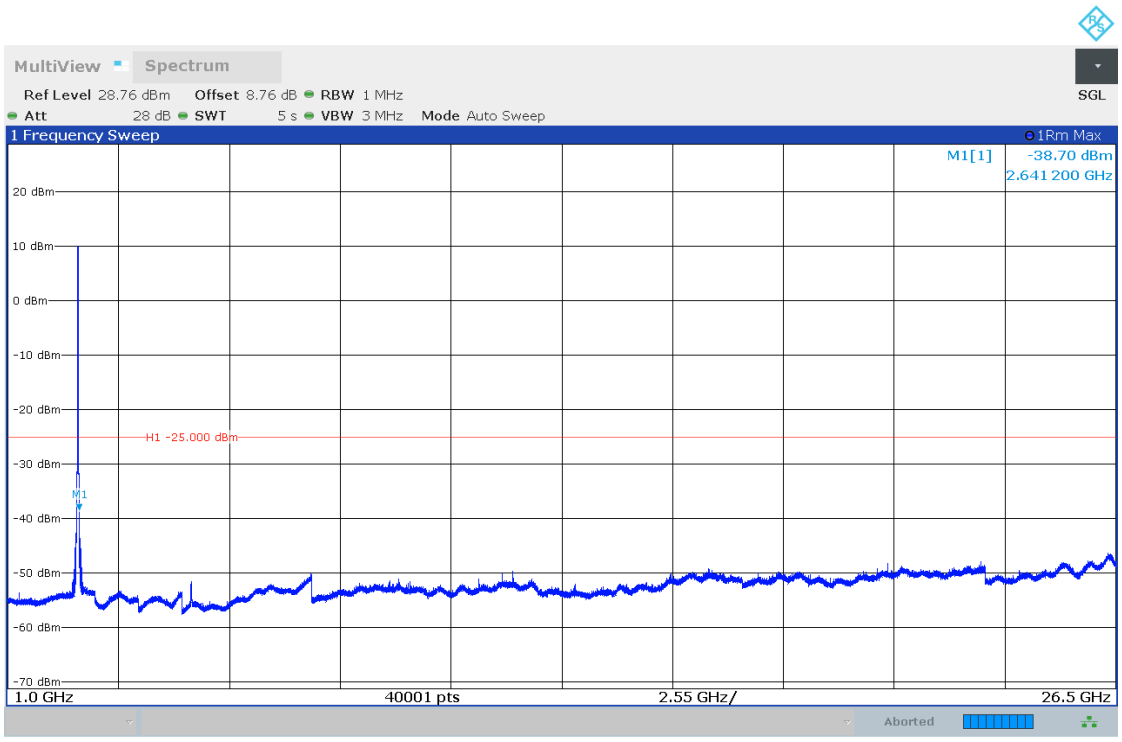


13:10:05 25.04.2022



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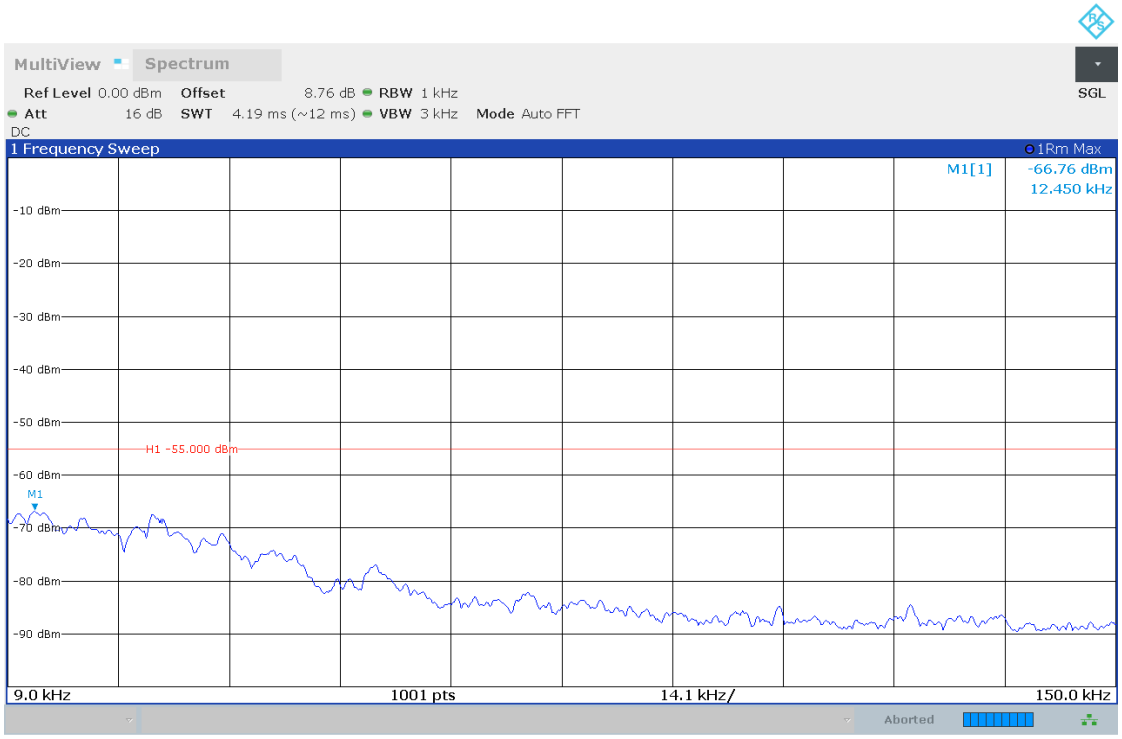
TM2_20MHz_HCH_RB1#0



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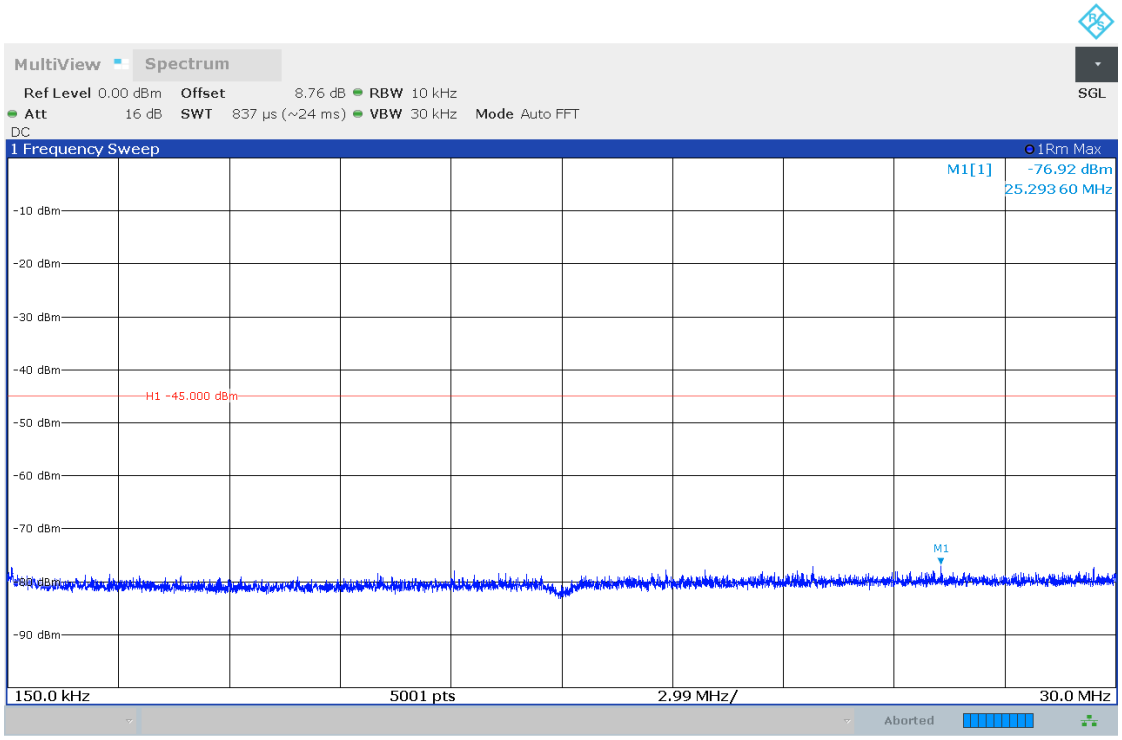

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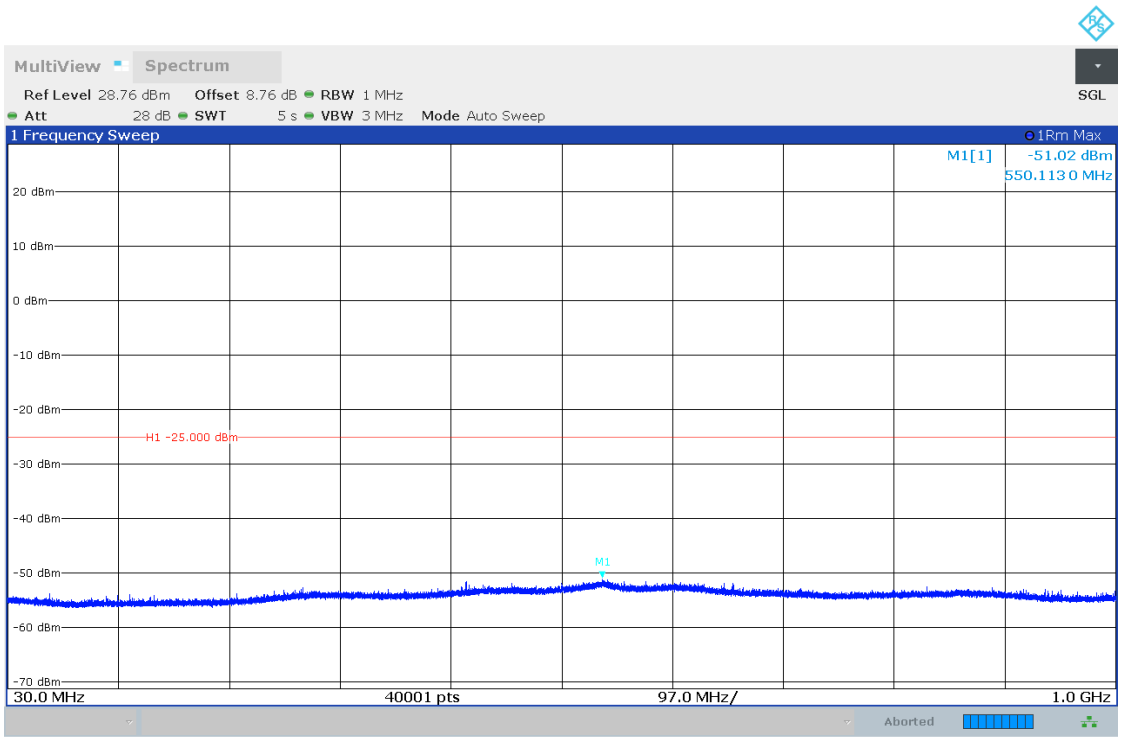

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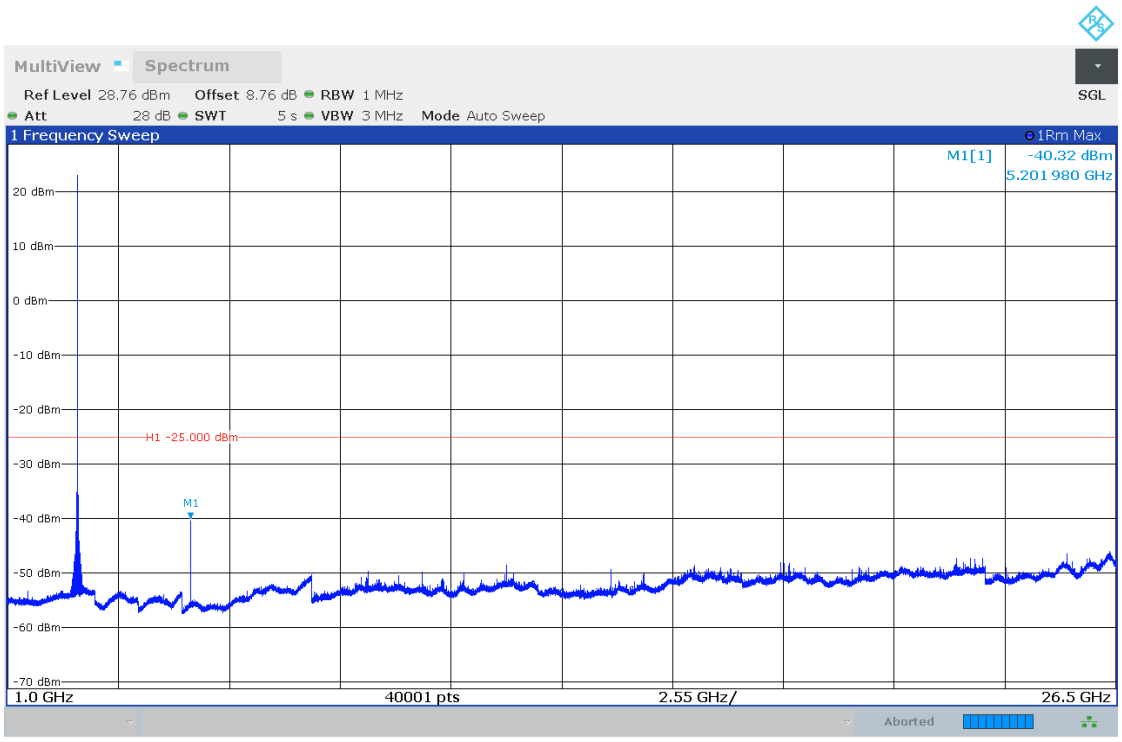

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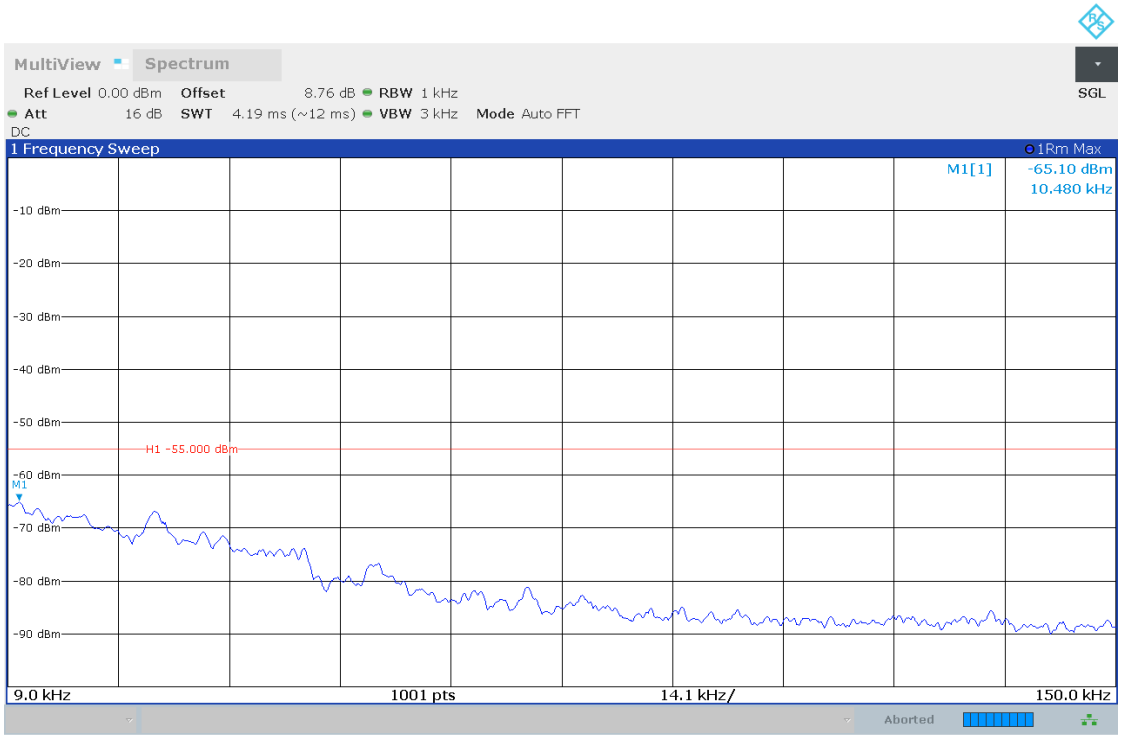
TM2_20MHz_HCH_RB1#99



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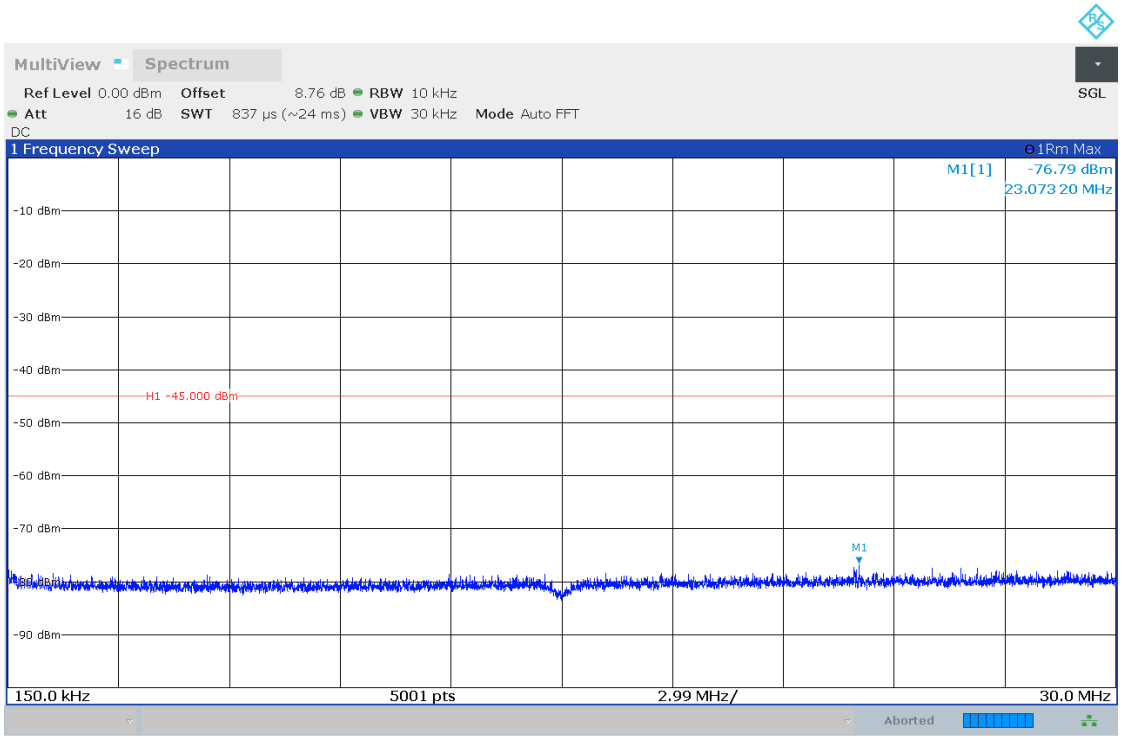

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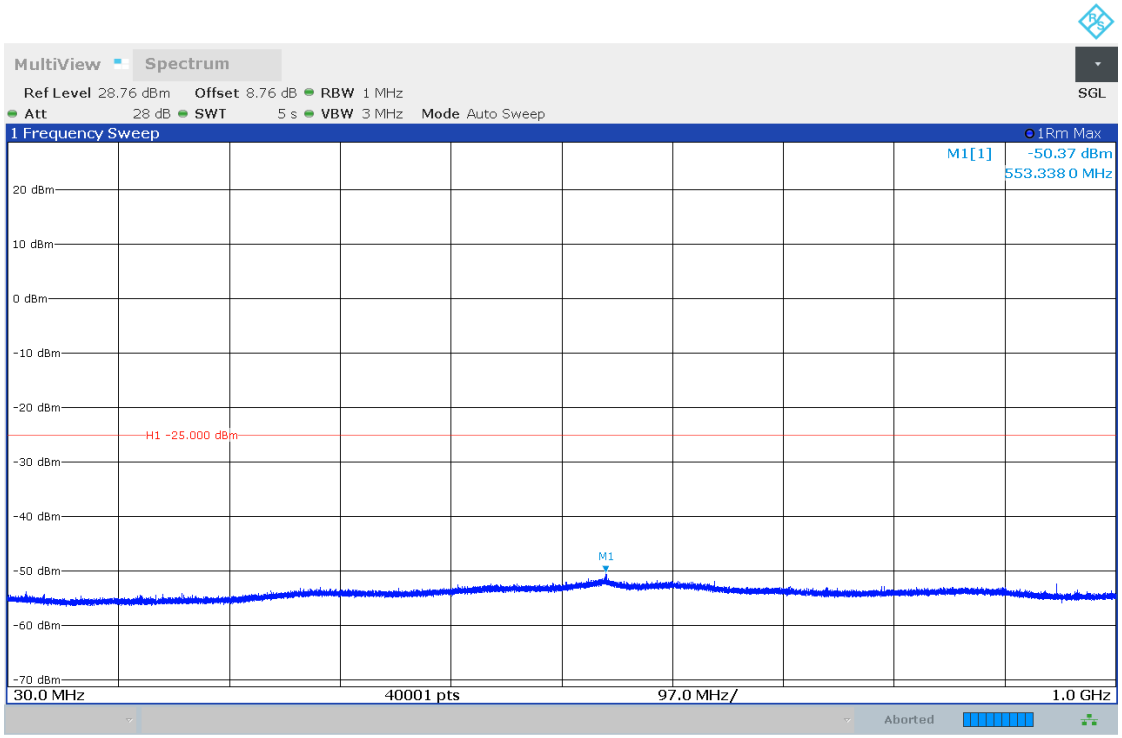
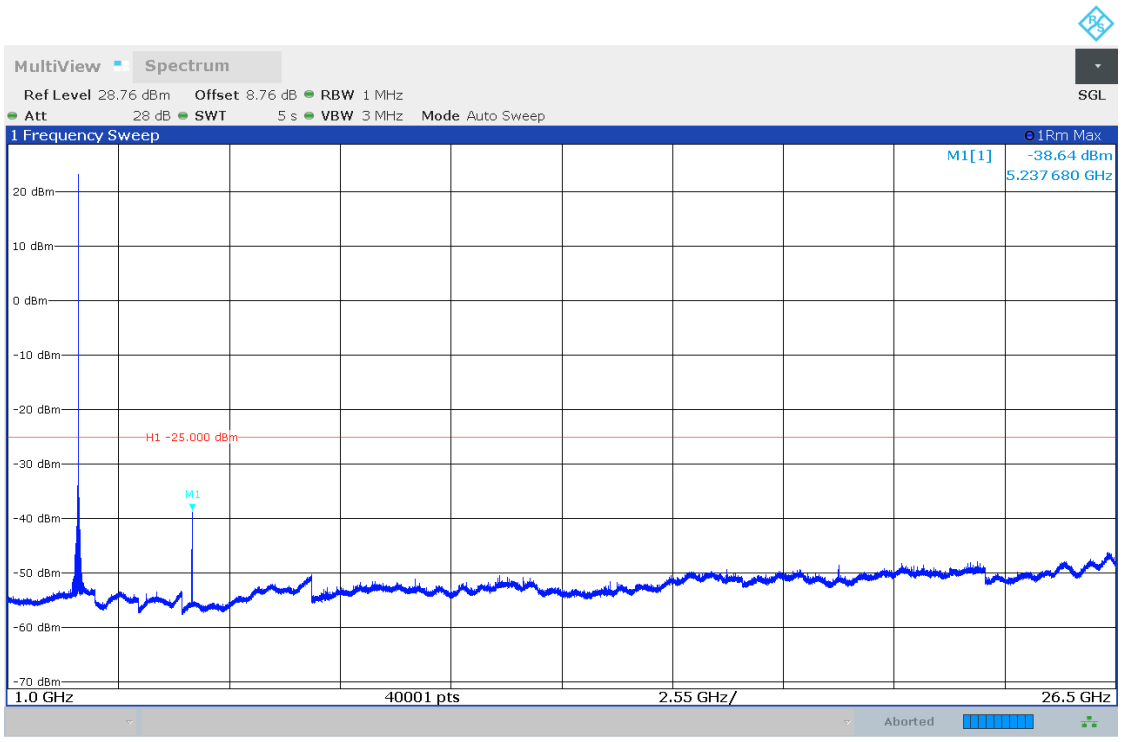


13:14:14 25.04.2022



13:14:50 25.04.2022

7 Appendix_G: Frequency Stability

7.1 Test Results

Frequency Error vs. Voltage

Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM1	5	LCH	QPSK	TN	VH	-2.04	-0.0	PASS
			QPSK	TN	VN	-22.01	-0.01	PASS
			QPSK	TN	VL	10.73	0.0	PASS
		MCH	QPSK	TN	VH	10.37	0.0	PASS
			QPSK	TN	VN	-13.09	-0.01	PASS
			QPSK	TN	VL	-8.48	-0.0	PASS
		HCH	QPSK	TN	VH	8.72	0.0	PASS
			QPSK	TN	VN	8.50	0.0	PASS
			QPSK	TN	VL	9.04	0.0	PASS
	20	LCH	QPSK	TN	VH	-5.32	-0.0	PASS
			QPSK	TN	VN	-3.47	-0.0	PASS
			QPSK	TN	VL	-0.09	-0.0	PASS
		MCH	QPSK	TN	VH	8.25	0.0	PASS
			QPSK	TN	VN	-4.24	-0.0	PASS
			QPSK	TN	VL	-1.35	-0.0	PASS
		HCH	QPSK	TN	VH	-1.87	-0.0	PASS
			QPSK	TN	VN	-7.48	-0.0	PASS
			QPSK	TN	VL	-2.59	-0.0	PASS

Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM2	5	LCH	16QAM	TN	VH	0.70	0.0	PASS
			16QAM	TN	VN	3.93	0.0	PASS
			16QAM	TN	VL	-6.02	-0.0	PASS
		MCH	16QAM	TN	VH	9.56	0.0	PASS
			16QAM	TN	VN	9.54	0.0	PASS
			16QAM	TN	VL	8.43	0.0	PASS
		HCH	16QAM	TN	VH	14.77	0.01	PASS
			16QAM	TN	VN	-13.77	-0.01	PASS
			16QAM	TN	VL	0.80	0.0	PASS
	20	LCH	16QAM	TN	VH	-0.83	-0.0	PASS
			16QAM	TN	VN	2.17	0.0	PASS
			16QAM	TN	VL	4.14	0.0	PASS
		MCH	16QAM	TN	VH	-4.16	-0.0	PASS
			16QAM	TN	VN	1.70	0.0	PASS
			16QAM	TN	VL	1.30	0.0	PASS
		HCH	16QAM	TN	VH	5.56	0.0	PASS
			16QAM	TN	VN	-2.72	-0.0	PASS
			16QAM	TN	VL	4.38	0.0	PASS

Frequency Error vs. Temperature

Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM1	5	LCH	QPSK	VN	-30	5.28	0.0	PASS
			QPSK	VN	-20	-3.75	-0.0	PASS
			QPSK	VN	-10	2.37	0.0	PASS
			QPSK	VN	0	-16.32	-0.01	PASS
			QPSK	VN	10	8.33	0.0	PASS
			QPSK	VN	20	5.81	0.0	PASS
			QPSK	VN	30	15.72	0.01	PASS
			QPSK	VN	40	-30.04	-0.01	PASS
			QPSK	VN	50	15.29	0.01	PASS
		MCH	QPSK	VN	-30	7.09	0.0	PASS
			QPSK	VN	-20	6.19	0.0	PASS
			QPSK	VN	-10	8.67	0.0	PASS
			QPSK	VN	0	8.26	0.0	PASS
			QPSK	VN	10	-4.45	-0.0	PASS
			QPSK	VN	20	13.18	0.01	PASS
			QPSK	VN	30	-11.6	-0.0	PASS
			QPSK	VN	40	6.60	0.0	PASS
			QPSK	VN	50	-7.91	-0.0	PASS
		HCH	QPSK	VN	-30	19.15	0.01	PASS
			QPSK	VN	-20	6.54	0.0	PASS
			QPSK	VN	-10	-3.81	-0.0	PASS
			QPSK	VN	0	-10.27	-0.0	PASS
			QPSK	VN	10	0.60	0.0	PASS
			QPSK	VN	20	-5.53	-0.0	PASS
			QPSK	VN	30	12.50	0.0	PASS
			QPSK	VN	40	-14.73	-0.01	PASS
			QPSK	VN	50	-5.08	-0.0	PASS

Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM1	10	LCH	QPSK	VN	-30	8.11	0.0	PASS
			QPSK	VN	-20	3.24	0.0	PASS
			QPSK	VN	-10	8.27	0.0	PASS
			QPSK	VN	0	-7.73	-0.0	PASS
			QPSK	VN	10	-2.23	-0.0	PASS
			QPSK	VN	20	-7.73	-0.0	PASS
			QPSK	VN	30	-6.14	-0.0	PASS
			QPSK	VN	40	-6.58	-0.0	PASS
			QPSK	VN	50	-4.58	-0.0	PASS
		MCH	QPSK	VN	-30	-11.38	-0.0	PASS
			QPSK	VN	-20	-11.03	-0.0	PASS
			QPSK	VN	-10	15.67	0.01	PASS
			QPSK	VN	0	-20.66	-0.01	PASS
			QPSK	VN	10	-7.35	-0.0	PASS
			QPSK	VN	20	-3.02	-0.0	PASS
			QPSK	VN	30	7.33	0.0	PASS
			QPSK	VN	40	1.75	0.0	PASS
			QPSK	VN	50	-14.71	-0.01	PASS
		HCH	QPSK	VN	-30	-9.66	-0.0	PASS
			QPSK	VN	-20	-7.19	-0.0	PASS
			QPSK	VN	-10	3.11	0.0	PASS
			QPSK	VN	0	4.57	0.0	PASS
			QPSK	VN	10	5.90	0.0	PASS
			QPSK	VN	20	-6.84	-0.0	PASS
			QPSK	VN	30	-0.79	-0.0	PASS
			QPSK	VN	40	-3.01	-0.0	PASS
			QPSK	VN	50	-3.58	-0.0	PASS

Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM1	15	LCH	QPSK	VN	-30	-0.33	-0.0	PASS
			QPSK	VN	-20	1.01	0.0	PASS
			QPSK	VN	-10	0.93	0.0	PASS
			QPSK	VN	0	-2.10	-0.0	PASS
			QPSK	VN	10	-8.49	-0.0	PASS
			QPSK	VN	20	-8.79	-0.0	PASS
			QPSK	VN	30	1.66	0.0	PASS
			QPSK	VN	40	-2.37	-0.0	PASS
			QPSK	VN	50	0.40	0.0	PASS
		MCH	QPSK	VN	-30	-2.75	-0.0	PASS
			QPSK	VN	-20	5.88	0.0	PASS
			QPSK	VN	-10	-4.78	-0.0	PASS
			QPSK	VN	0	-0.67	-0.0	PASS
			QPSK	VN	10	-10.07	-0.0	PASS
			QPSK	VN	20	2.43	0.0	PASS
			QPSK	VN	30	-4.73	-0.0	PASS
			QPSK	VN	40	-11.21	-0.0	PASS
			QPSK	VN	50	1.48	0.0	PASS
		HCH	QPSK	VN	-30	-7.57	-0.0	PASS
			QPSK	VN	-20	2.89	0.0	PASS
			QPSK	VN	-10	-6.74	-0.0	PASS
			QPSK	VN	0	0.68	0.0	PASS
			QPSK	VN	10	-2.84	-0.0	PASS
			QPSK	VN	20	5.10	0.0	PASS
			QPSK	VN	30	4.21	0.0	PASS
			QPSK	VN	40	-6.89	-0.0	PASS
			QPSK	VN	50	-3.81	-0.0	PASS

Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM1	20	LCH	QPSK	VN	-30	-6.35	-0.0	PASS
			QPSK	VN	-20	1.21	0.0	PASS
			QPSK	VN	-10	3.52	0.0	PASS
			QPSK	VN	0	3.08	0.0	PASS
			QPSK	VN	10	13.52	0.01	PASS
			QPSK	VN	20	-1.62	-0.0	PASS
			QPSK	VN	30	0.70	0.0	PASS
			QPSK	VN	40	-1.71	-0.0	PASS
			QPSK	VN	50	4.74	0.0	PASS
		MCH	QPSK	VN	-30	4.21	0.0	PASS
			QPSK	VN	-20	2.60	0.0	PASS
			QPSK	VN	-10	-4.92	-0.0	PASS
			QPSK	VN	0	5.50	0.0	PASS
			QPSK	VN	10	0.39	0.0	PASS
			QPSK	VN	20	-0.71	-0.0	PASS
			QPSK	VN	30	1.52	0.0	PASS
			QPSK	VN	40	0.49	0.0	PASS
			QPSK	VN	50	5.82	0.0	PASS
		HCH	QPSK	VN	-30	3.74	0.0	PASS
			QPSK	VN	-20	3.77	0.0	PASS
			QPSK	VN	-10	-0.71	-0.0	PASS
			QPSK	VN	0	2.05	0.0	PASS
			QPSK	VN	10	0.68	0.0	PASS
			QPSK	VN	20	-0.15	-0.0	PASS
			QPSK	VN	30	5.93	0.0	PASS
			QPSK	VN	40	-9.01	-0.0	PASS
			QPSK	VN	50	-5.62	-0.0	PASS

Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM2	5	LCH	16QAM	VN	-30	8.48	0.0	PASS
			16QAM	VN	-20	17.13	0.01	PASS
			16QAM	VN	-10	-0.41	-0.0	PASS
			16QAM	VN	0	-20.52	-0.01	PASS
			16QAM	VN	10	10.47	0.0	PASS
			16QAM	VN	20	8.86	0.0	PASS
			16QAM	VN	30	-1.19	-0.0	PASS
			16QAM	VN	40	0.98	0.0	PASS
			16QAM	VN	50	-1.84	-0.0	PASS
		MCH	16QAM	VN	-30	3.98	0.0	PASS
			16QAM	VN	-20	4.01	0.0	PASS
			16QAM	VN	-10	-1.03	-0.0	PASS
			16QAM	VN	0	13.67	0.01	PASS
			16QAM	VN	10	13.74	0.01	PASS
			16QAM	VN	20	-1.31	-0.0	PASS
			16QAM	VN	30	14.49	0.01	PASS
			16QAM	VN	40	6.92	0.0	PASS
			16QAM	VN	50	3.21	0.0	PASS
		HCH	16QAM	VN	-30	-0.29	-0.0	PASS
			16QAM	VN	-20	-11.69	-0.0	PASS
			16QAM	VN	-10	19.79	0.01	PASS
			16QAM	VN	0	21.18	0.01	PASS
			16QAM	VN	10	12.72	0.0	PASS
			16QAM	VN	20	-5.67	-0.0	PASS
			16QAM	VN	30	17.91	0.01	PASS
			16QAM	VN	40	8.00	0.0	PASS
			16QAM	VN	50	42.92	0.02	PASS

Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM2	10	LCH	16QAM	VN	-30	-17.63	-0.01	PASS
			16QAM	VN	-20	9.79	0.0	PASS
			16QAM	VN	-10	-8.84	-0.0	PASS
			16QAM	VN	0	-7.88	-0.0	PASS
			16QAM	VN	10	-9.86	-0.0	PASS
			16QAM	VN	20	-7.55	-0.0	PASS
			16QAM	VN	30	2.61	0.0	PASS
			16QAM	VN	40	4.73	0.0	PASS
			16QAM	VN	50	0.06	0.0	PASS
		MCH	16QAM	VN	-30	-8.34	-0.0	PASS
			16QAM	VN	-20	-4.38	-0.0	PASS
			16QAM	VN	-10	2.73	0.0	PASS
			16QAM	VN	0	-13.61	-0.01	PASS
			16QAM	VN	10	-3.85	-0.0	PASS
			16QAM	VN	20	4.81	0.0	PASS
			16QAM	VN	30	-4.41	-0.0	PASS
			16QAM	VN	40	-0.84	-0.0	PASS
			16QAM	VN	50	8.31	0.0	PASS
		HCH	16QAM	VN	-30	-3.65	-0.0	PASS
			16QAM	VN	-20	7.61	0.0	PASS
			16QAM	VN	-10	10.91	0.0	PASS
			16QAM	VN	0	-7.22	-0.0	PASS
			16QAM	VN	10	-3.14	-0.0	PASS
			16QAM	VN	20	-15.93	-0.01	PASS
			16QAM	VN	30	-7.17	-0.0	PASS
			16QAM	VN	40	-7.42	-0.0	PASS
			16QAM	VN	50	-4.35	-0.0	PASS

Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM2	15	LCH	16QAM	VN	-30	-2.70	-0.0	PASS
			16QAM	VN	-20	-0.89	-0.0	PASS
			16QAM	VN	-10	-5.79	-0.0	PASS
			16QAM	VN	0	-5.89	-0.0	PASS
			16QAM	VN	10	-13.05	-0.01	PASS
			16QAM	VN	20	3.07	0.0	PASS
			16QAM	VN	30	-12.77	-0.0	PASS
			16QAM	VN	40	1.59	0.0	PASS
			16QAM	VN	50	5.01	0.0	PASS
		MCH	16QAM	VN	-30	1.61	0.0	PASS
			16QAM	VN	-20	10.17	0.0	PASS
			16QAM	VN	-10	1.97	0.0	PASS
			16QAM	VN	0	4.12	0.0	PASS
			16QAM	VN	10	-0.97	-0.0	PASS
			16QAM	VN	20	4.13	0.0	PASS
			16QAM	VN	30	0.97	0.0	PASS
			16QAM	VN	40	1.03	0.0	PASS
			16QAM	VN	50	2.79	0.0	PASS
		HCH	16QAM	VN	-30	-13.49	-0.01	PASS
			16QAM	VN	-20	0.14	0.0	PASS
			16QAM	VN	-10	10.02	0.0	PASS
			16QAM	VN	0	-5.18	-0.0	PASS
			16QAM	VN	10	0.43	0.0	PASS
			16QAM	VN	20	4.26	0.0	PASS
			16QAM	VN	30	-8.67	-0.0	PASS
			16QAM	VN	40	6.74	0.0	PASS
			16QAM	VN	50	-0.90	-0.0	PASS

Test Mode	Test Bandwidth [MHz]	Test Channel	Modulation	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
TM2	20	LCH	16QAM	VN	-30	-4.03	-0.0	PASS
			16QAM	VN	-20	-3.19	-0.0	PASS
			16QAM	VN	-10	-0.93	-0.0	PASS
			16QAM	VN	0	2.02	0.0	PASS
			16QAM	VN	10	0.75	0.0	PASS
			16QAM	VN	20	-1.51	-0.0	PASS
			16QAM	VN	30	-0.29	-0.0	PASS
			16QAM	VN	40	0.71	0.0	PASS
			16QAM	VN	50	-5.22	-0.0	PASS
		MCH	16QAM	VN	-30	1.82	0.0	PASS
			16QAM	VN	-20	-1.06	-0.0	PASS
			16QAM	VN	-10	2.65	0.0	PASS
			16QAM	VN	0	8.20	0.0	PASS
			16QAM	VN	10	6.05	0.0	PASS
			16QAM	VN	20	3.27	0.0	PASS
			16QAM	VN	30	2.31	0.0	PASS
			16QAM	VN	40	2.73	0.0	PASS
			16QAM	VN	50	4.57	0.0	PASS
		HCH	16QAM	VN	-30	-1.09	-0.0	PASS
			16QAM	VN	-20	5.39	0.0	PASS
			16QAM	VN	-10	-7.79	-0.0	PASS
			16QAM	VN	0	8.65	0.0	PASS
			16QAM	VN	10	-1.85	-0.0	PASS
			16QAM	VN	20	3.37	0.0	PASS
			16QAM	VN	30	-0.71	-0.0	PASS
			16QAM	VN	40	-0.19	-0.0	PASS
			16QAM	VN	50	7.38	0.0	PASS

End of Test Report