



SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

EMC-ARF-05 Rev 1.1

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FCC ID: PX8HRU-7851719

Appendix -

Test Data and Result for report

GZCR250800119305

(For Cellular Band DL)



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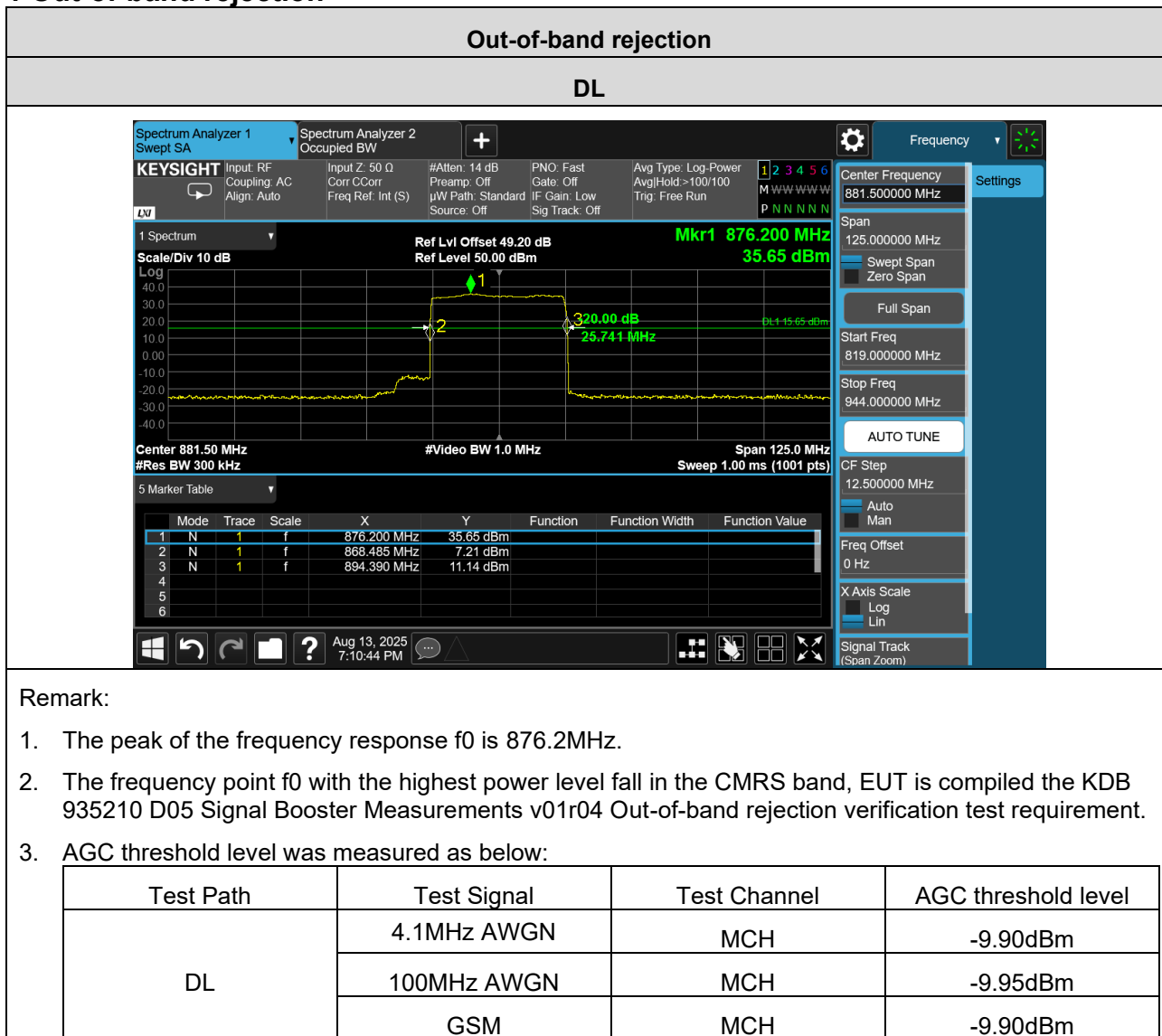
SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Testing Center EMC Laboratory

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1 Out-of-band rejection



2 Input versus Output comparison

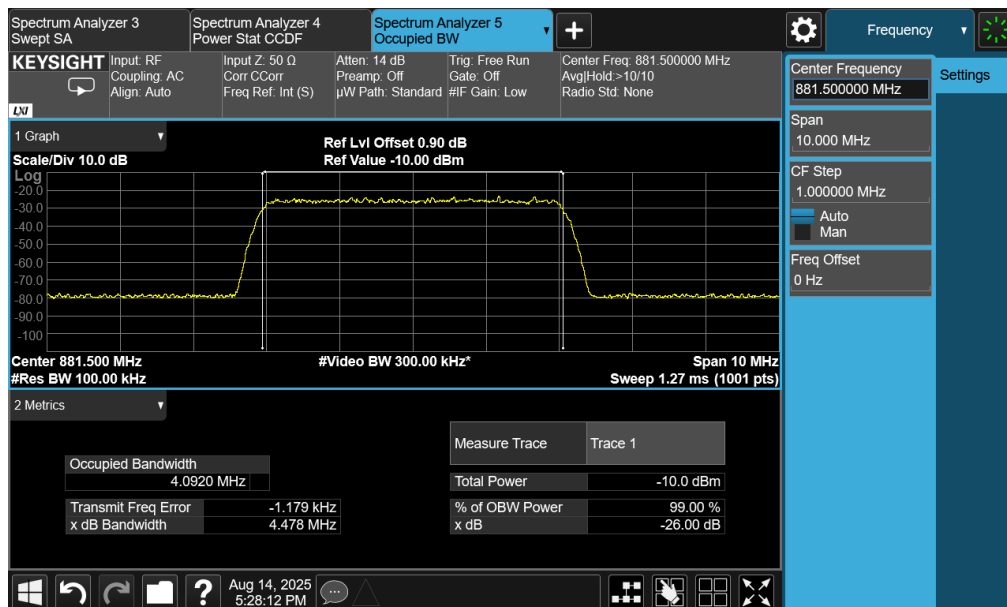
Occupied Bandwidth				
Test Path	Test Signal	Test Channel	Signal Level	Verdict
DL	4.1MHz AWGN	MCH	Pre-AGC	PASS
			3dB above AGC	PASS
	100MHz AWGN	MCH	Pre-AGC	PASS*
			3dB above AGC	PASS*
	GSM	MCH	Pre-AGC	PASS
			3dB above AGC	PASS

Remark:

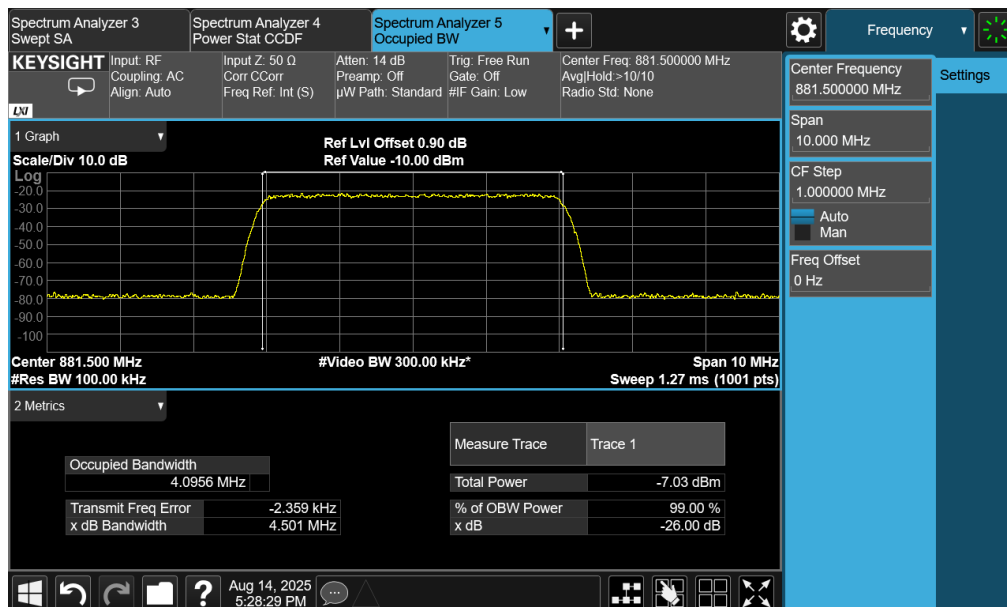
- * The band supports maximum channel BW is 20MHz for NR, so the output signal OBW was less than the input when 100MHz AWGN was as stimulus signal.
- Compare the spectral plot of the input signal to the output signal affirm that they are similar (in passband and roll off characteristic features and relative spectral locations). The test result complies with the requirement.

99% OBW

DL_4.1MHz AWGN_MCH_Input_Pre-AGC



DL_4.1MHz AWGN_MCH_Input_3dB above AGC



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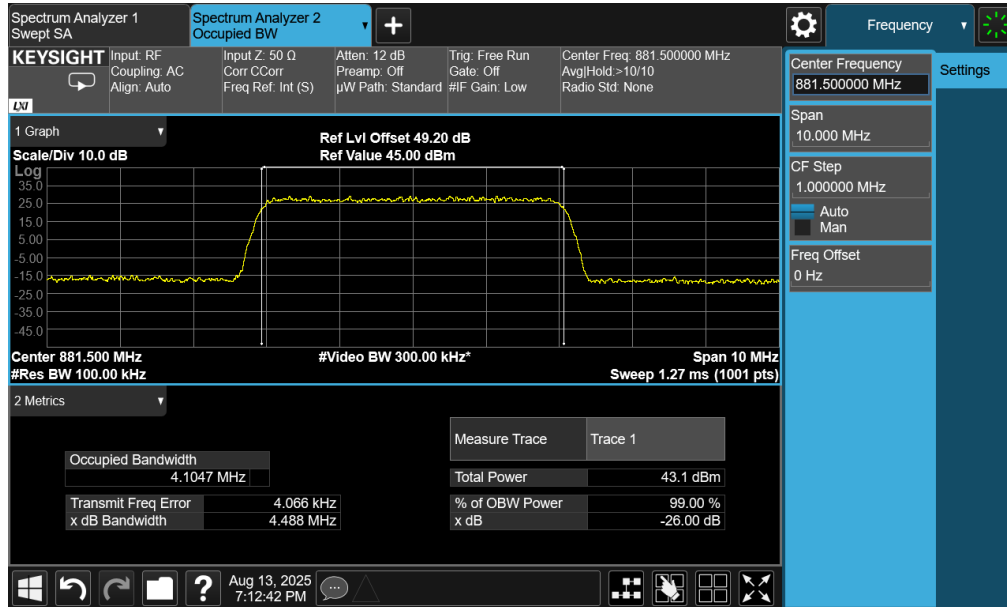
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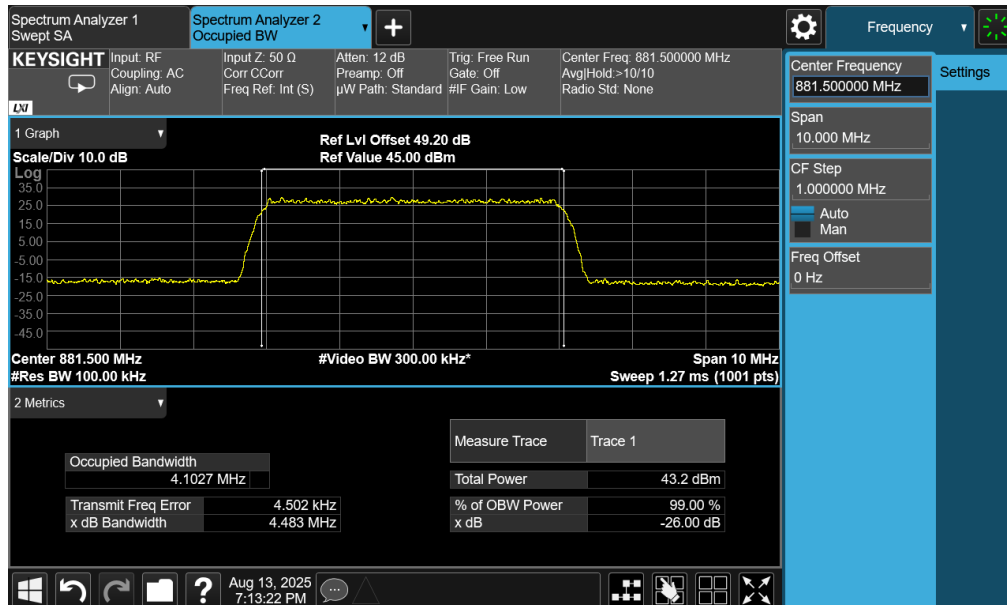
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99% OBW

DL_4.1MHz AWGN_MCH_Output_Pre-AGC



DL_4.1MHz AWGN_MCH_Output_3dB above AGC

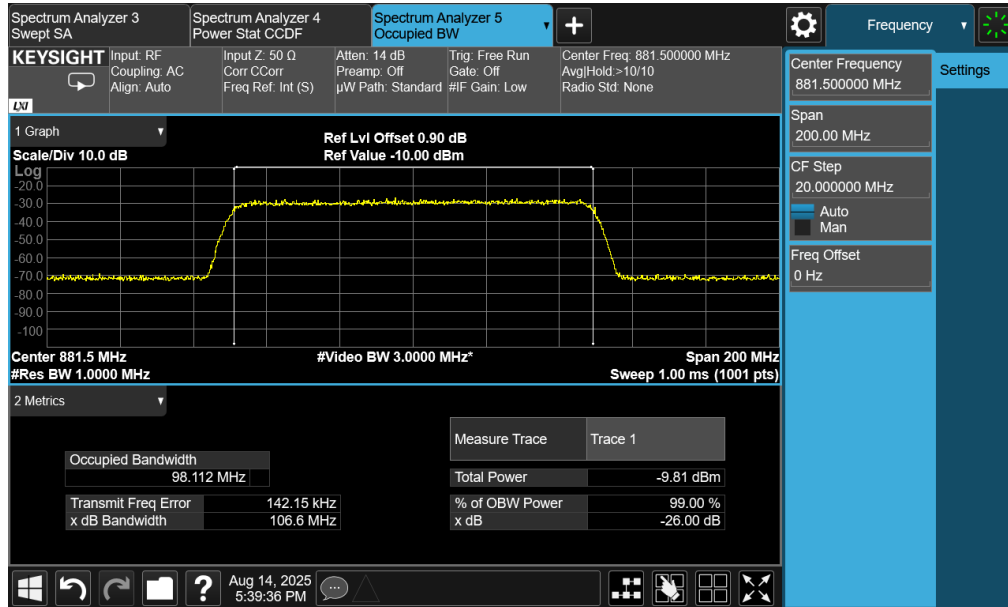


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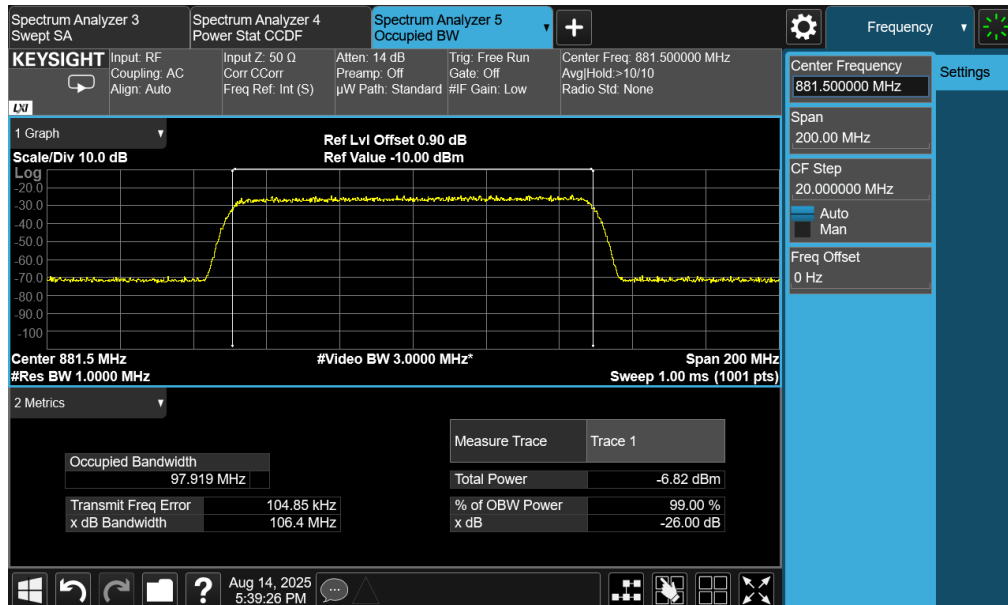
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99% OBW

DL_100MHz AWGN_MCH_Input_Pre-AGC



DL_100MHz AWGN_MCH_Input_3dB above AGC

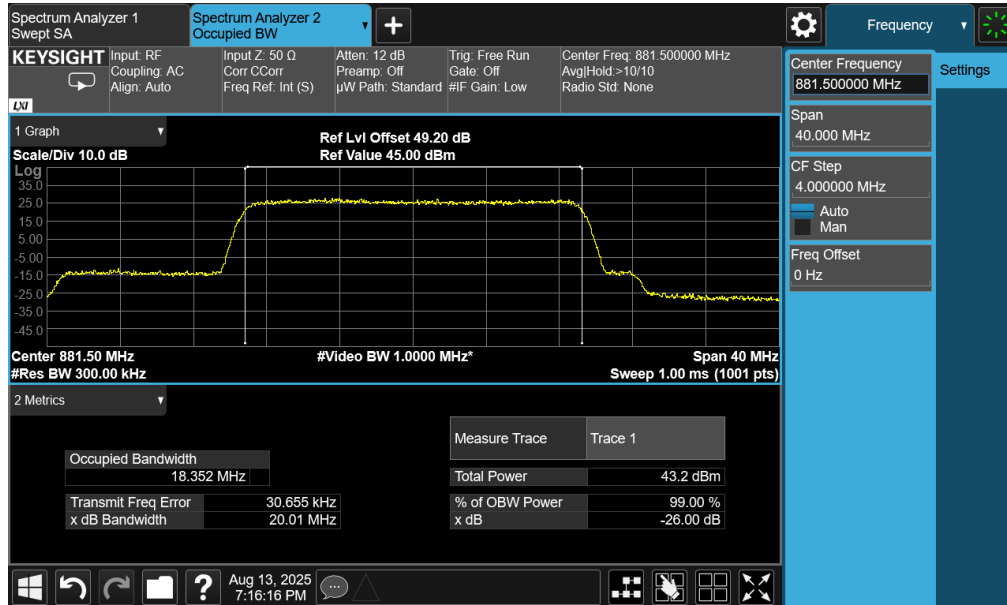


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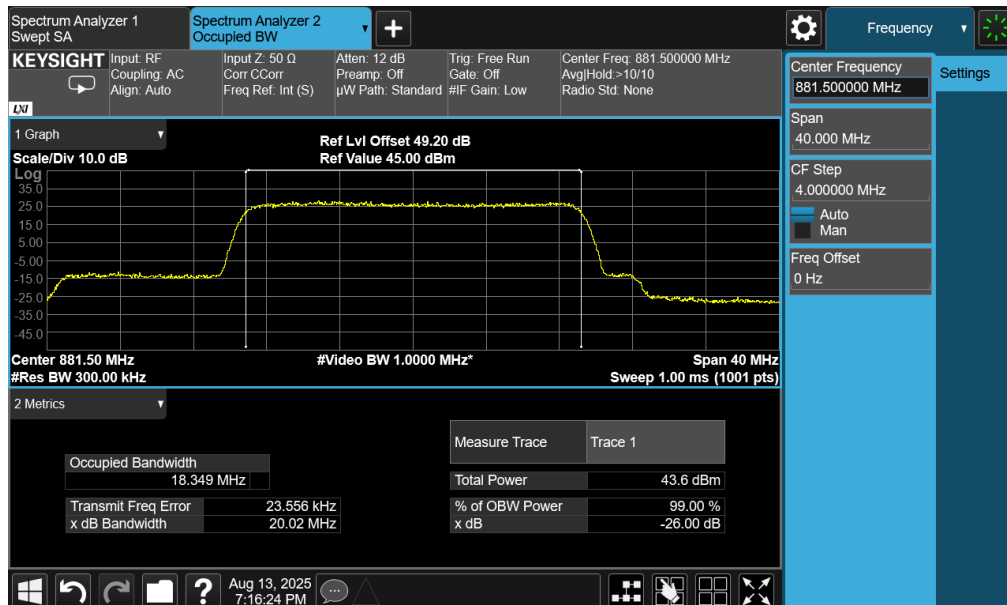
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99% OBW

DL_100MHz AWGN_MCH_Output_Pre-AGC



DL_100MHz AWGN_MCH_Output_3dB above AGC



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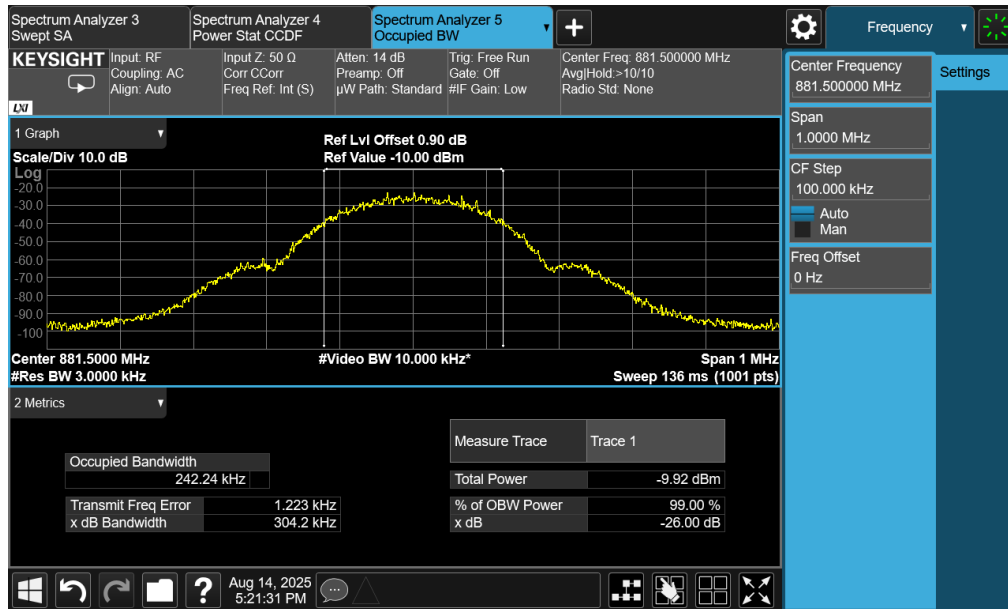
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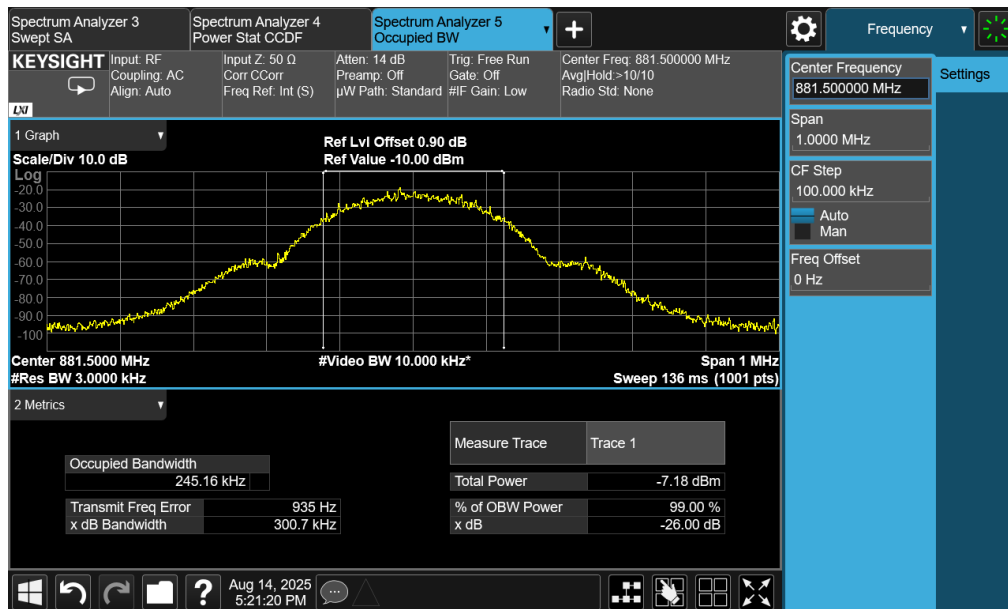
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99% OBW

DL_GSM_MCH_Input_Pre-AGC



DL_GSM_MCH_Input_3dB above AGC

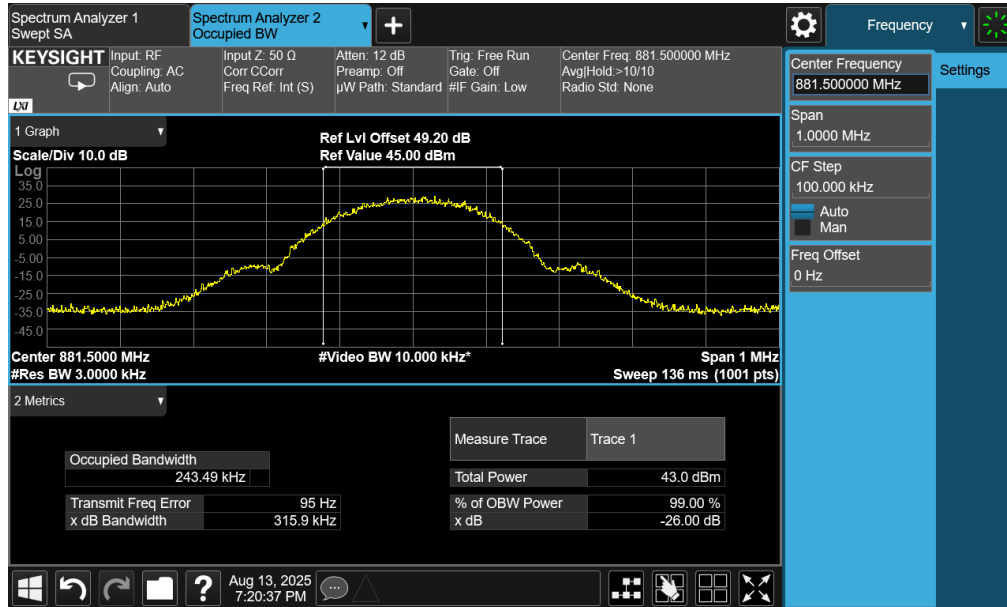


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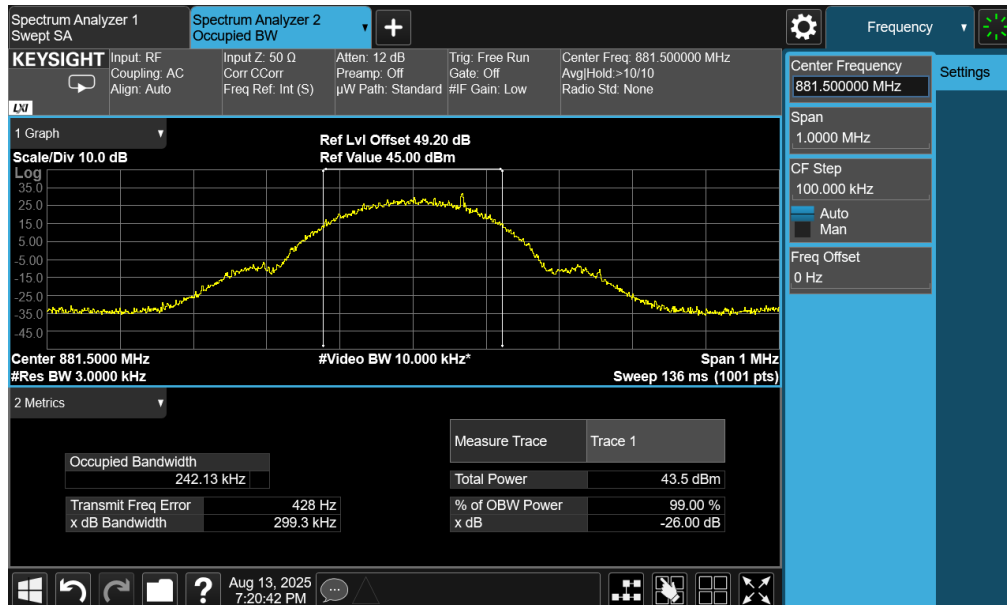
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99% OBW

DL_GSM_MCH_Output_Pre-AGC



DL_GSM_MCH_Output_3dB above AGC



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3 Mean output power and amplifier/booster gain

Mean output power and gain								
Test Path	Test Freq. f0 (MHz)	Test Signal	Signal Level	Input power (dBm)	Output Power (dBm)	ERP (dBm)	ERP (W)	Gain (dB)
DL	876.2	4.1MHz AWGN	Pre-AGC	-10	43.13	45.98	39.63	53.13
			3dB above AGC	-7	43.28	46.13	41.02	/
		100MHz AWGN	Pre-AGC	-10	43.25	46.10	40.74	53.25
			3dB above AGC	-7	43.68	46.53	44.98	/
		GSM	Pre-AGC	-10	43.07	45.92	39.08	53.07
			3dB above AGC	-7	43.57	46.42	43.85	/
Remark: 1. f0 is from Out-of-band Rejection test in the report. 2. ERP= output power (dBm)+ antenna gain (dBi)- 2.15, the antenna gain is 5dBi declared by the manufacturer. 3. The output power is limited to an ERP of 500W and the total ERP does not exceed the limit.								



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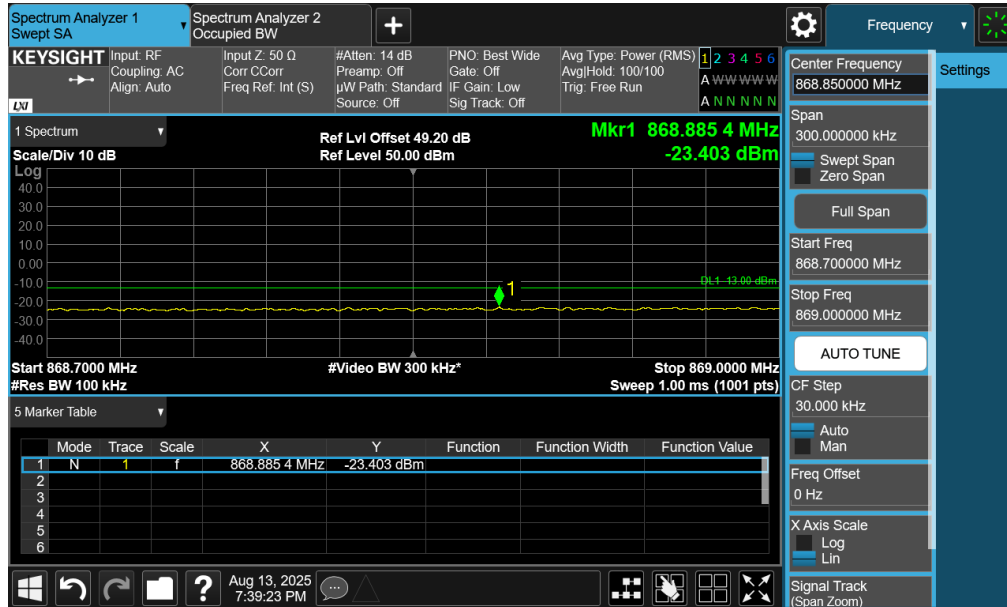
4 Out-of-band/out-of-block(including intermodulation) emissions

Out-of-band/out-of-block(including intermodulation) emissions							
Test Path	Test Channel	Test Signal	Stimulus Condition	Signal Level	Worst conducted test level (dBm)	Limit (dBm)	Verdict
DL	LCH	4.1MHz AWGN	One signal input	Pre-AGC	-23.40	≤-13	PASS
				3dB above AGC	-24.07		PASS
			Two signals input	Pre-AGC	-24.45		PASS
				3dB above AGC	-25.42		PASS
	HCH		One signal input	Pre-AGC	-28.79		PASS
				3dB above AGC	-29.75		PASS
			Two signals input	Pre-AGC	-29.11		PASS
				3dB above AGC	-29.33		PASS
DL	LCH	100MHz AWGN	One signal input	Pre-AGC	-26.94	≤-13	PASS
	3dB above AGC			-28.40	PASS		
	HCH		One signal input	Pre-AGC	-30.00		PASS
				3dB above AGC	-26.40		PASS
DL	LCH	GSM	One signal input	Pre-AGC	-22.08	≤-13	PASS
				3dB above AGC	-22.88		PASS
			Two signals input	Pre-AGC	-17.45		PASS
				3dB above AGC	-17.10		PASS
	HCH		One signal input	Pre-AGC	-27.41		PASS
				3dB above AGC	-27.05		PASS
			Two signals input	Pre-AGC	-18.29		PASS
				3dB above AGC	-18.14		PASS
Remark: The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10log10 (P) dB, here, P= 43dBm= 20W the limit= 43dBm- [43+ 10log10(20W)]dB= -13dBm							

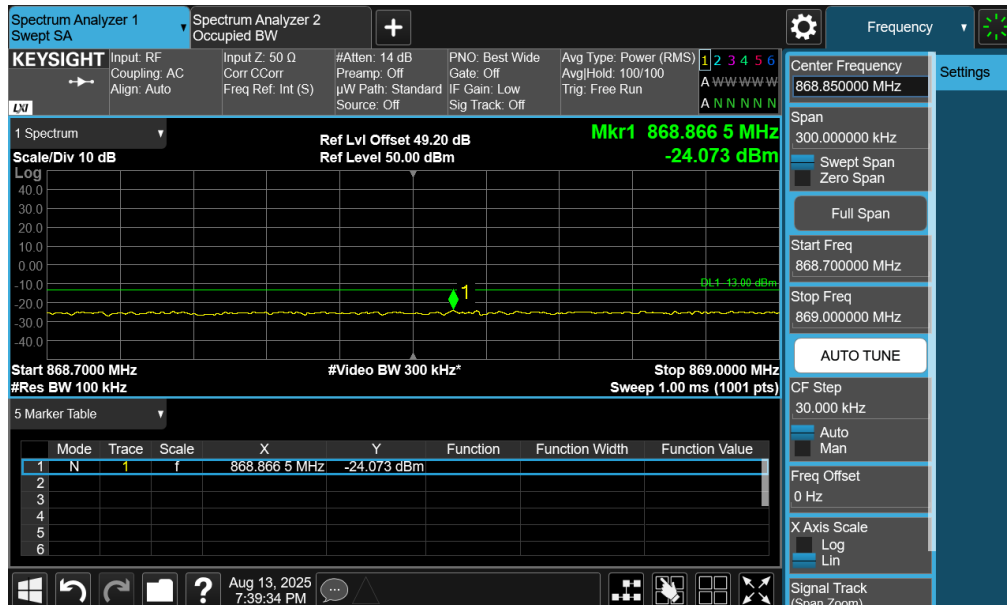


Out-of-band/out-of-block emissions

DL_4.1MHz AWGN_LCH_a single test signal_Pre-AGC

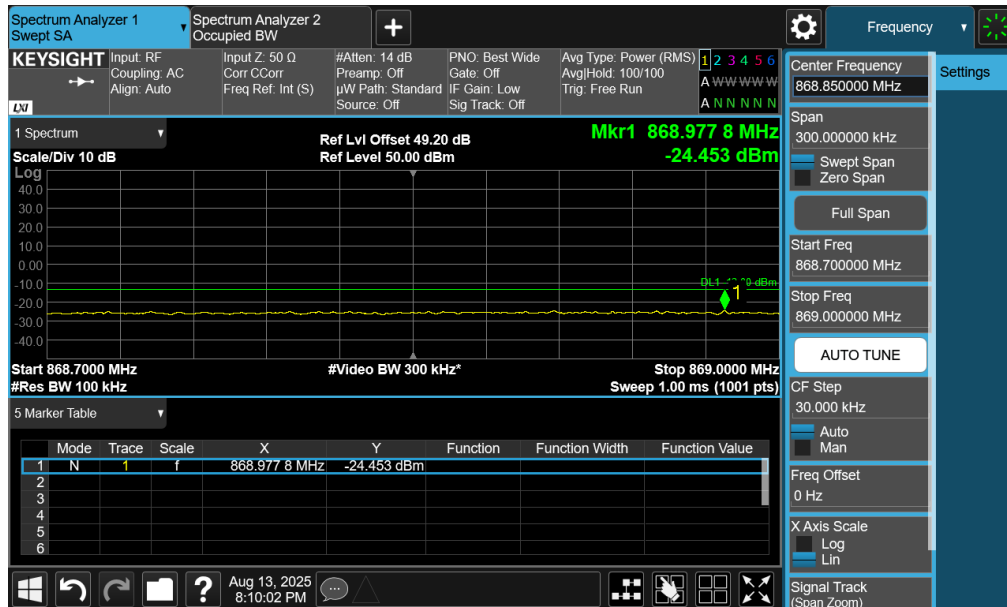


DL_4.1MHz AWGN_LCH_a single test signal_3dB above AGC

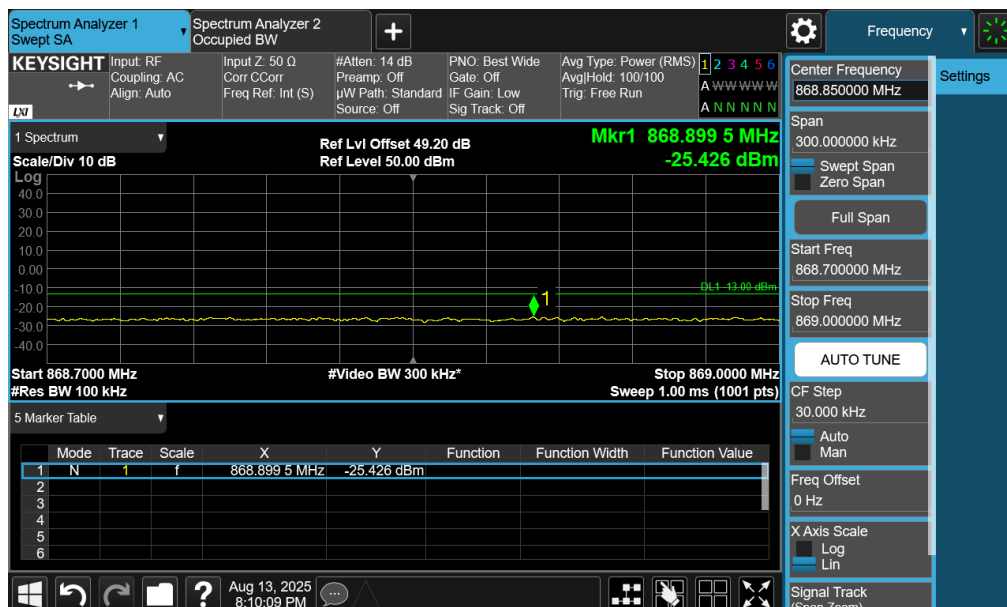


Out-of-band/out-of-block emissions

DL_4.1MHz AWGN_LCH_two adjacent test signals_Pre-AGC

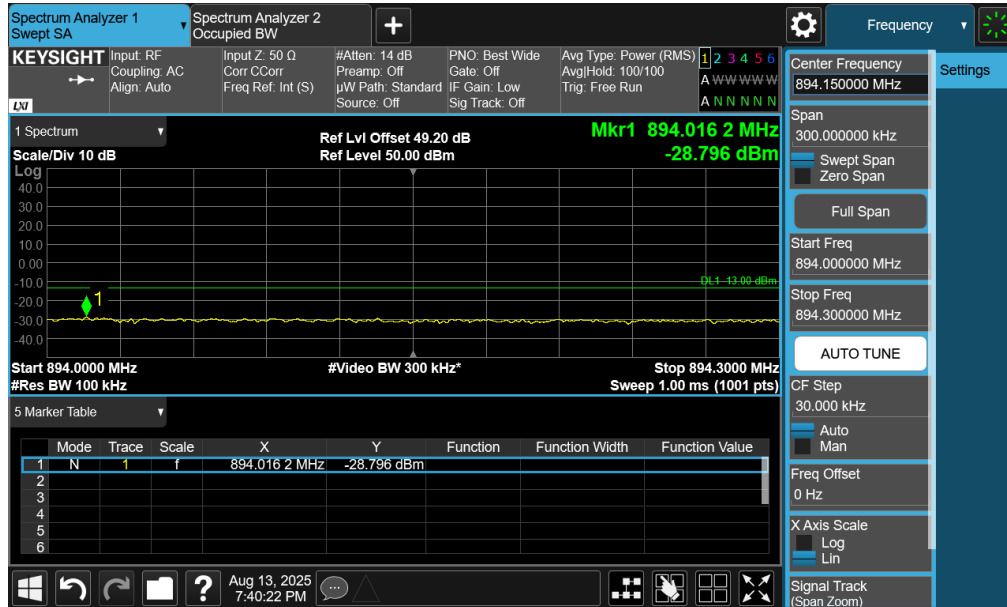


DL_4.1MHz AWGN_LCH_two adjacent test signals_3dB above AGC

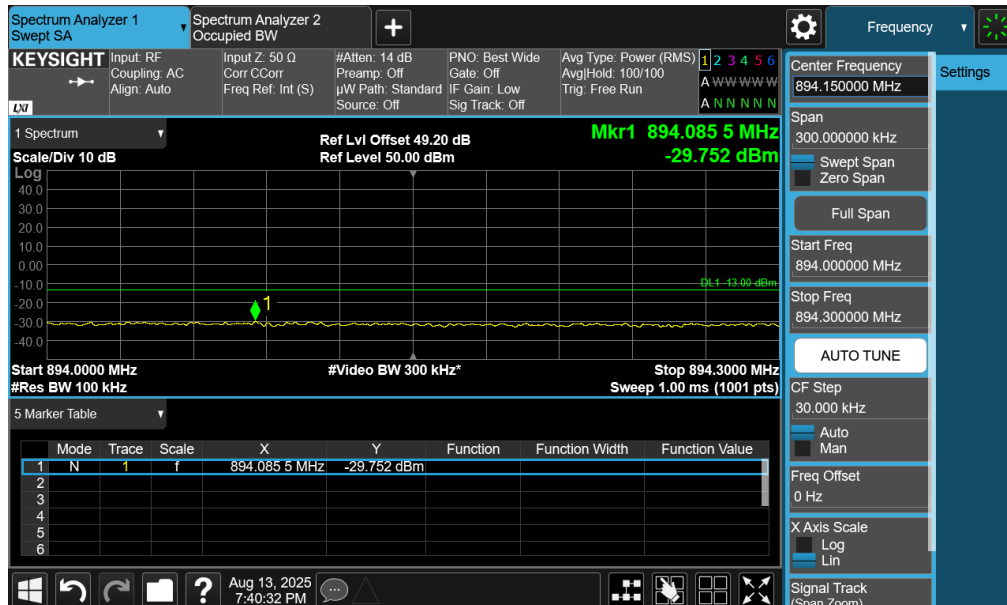


Out-of-band/out-of-block emissions

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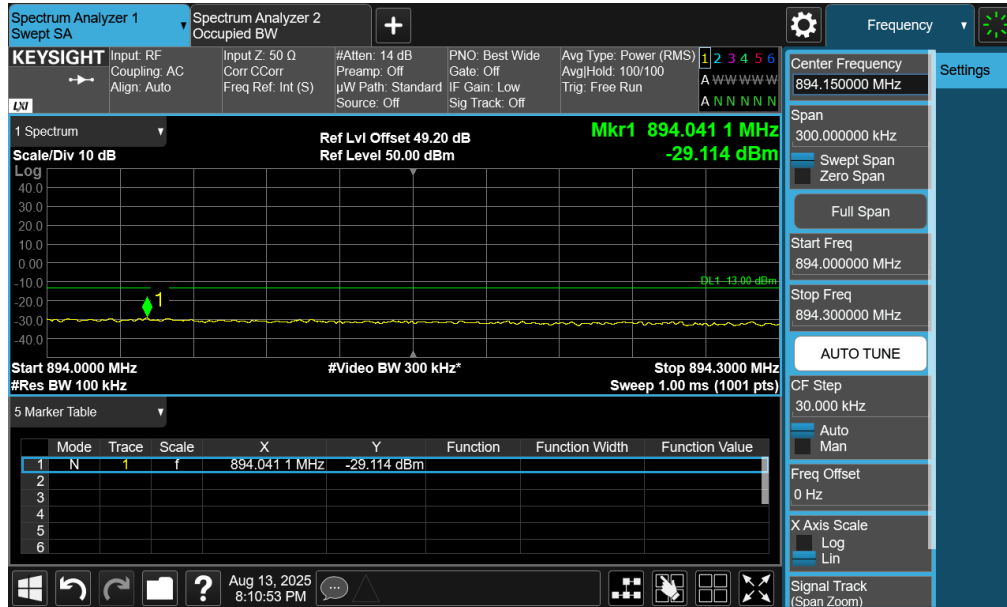


DL_4.1MHz AWGN_HCH_a single test signal_3dB above AGC

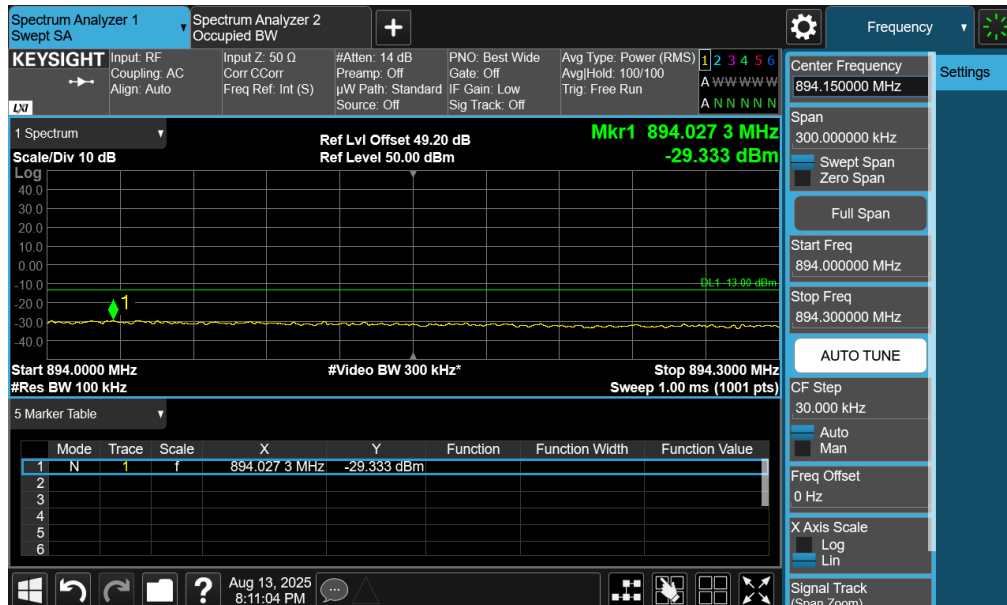


Out-of-band/out-of-block emissions

DL_4.1MHz AWGN_HCH_two adjacent test signals_Pre-AGC



DL_4.1MHz AWGN_HCH_two adjacent test signals_3dB above AGC

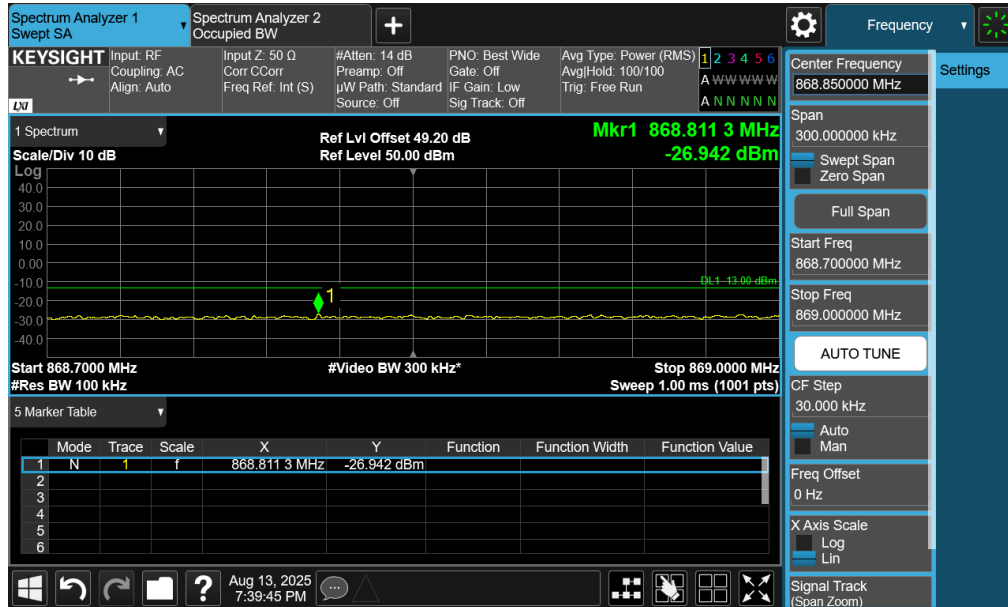


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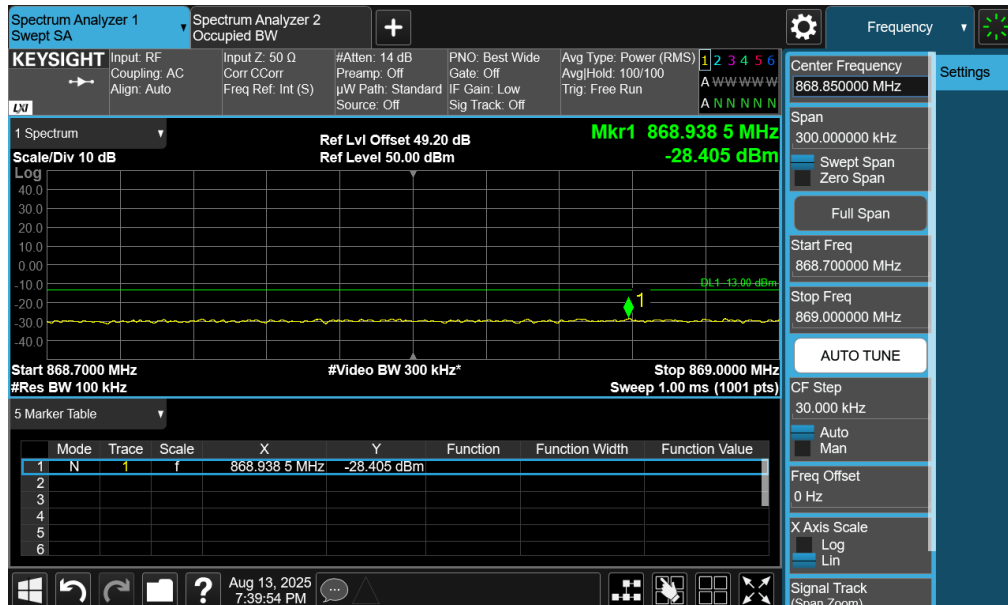
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Out-of-band/out-of-block emissions

DL_100MHz AWGN_LCH_a single test signal_Pre-AGC

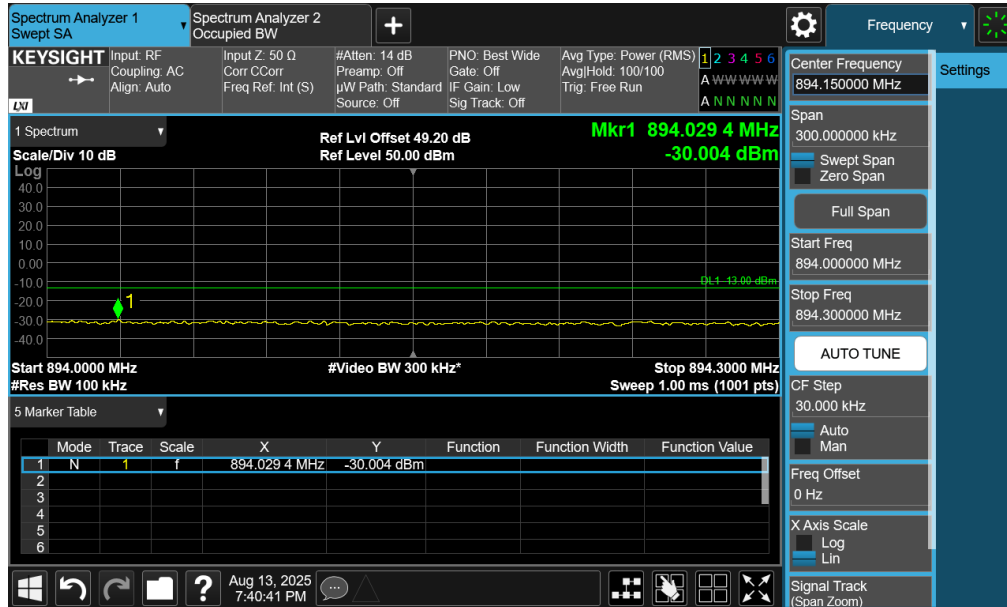


DL_100MHz AWGN_LCH_a single test signal_3dB above AGC

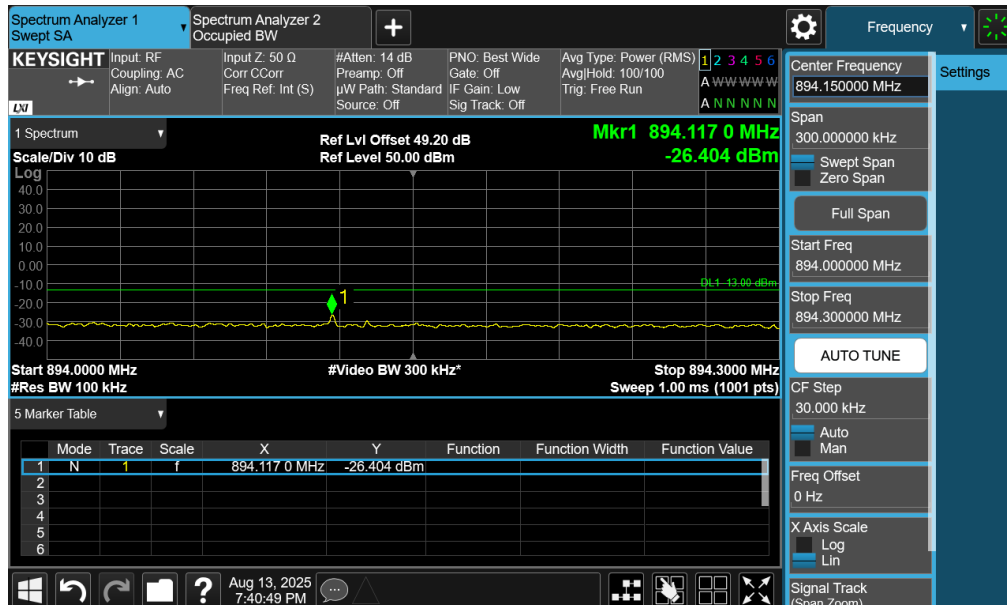


Out-of-band/out-of-block emissions

DL_100MHz AWGN_HCH_a single test signal_Pre-AGC

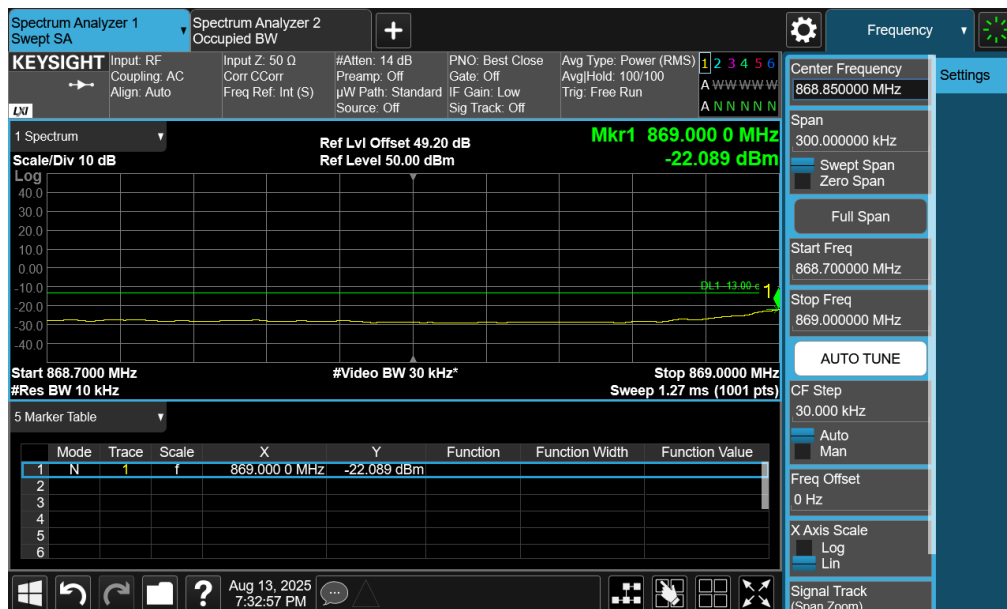


DL_100MHz AWGN_HCH_a single test signal_3dB above AGC

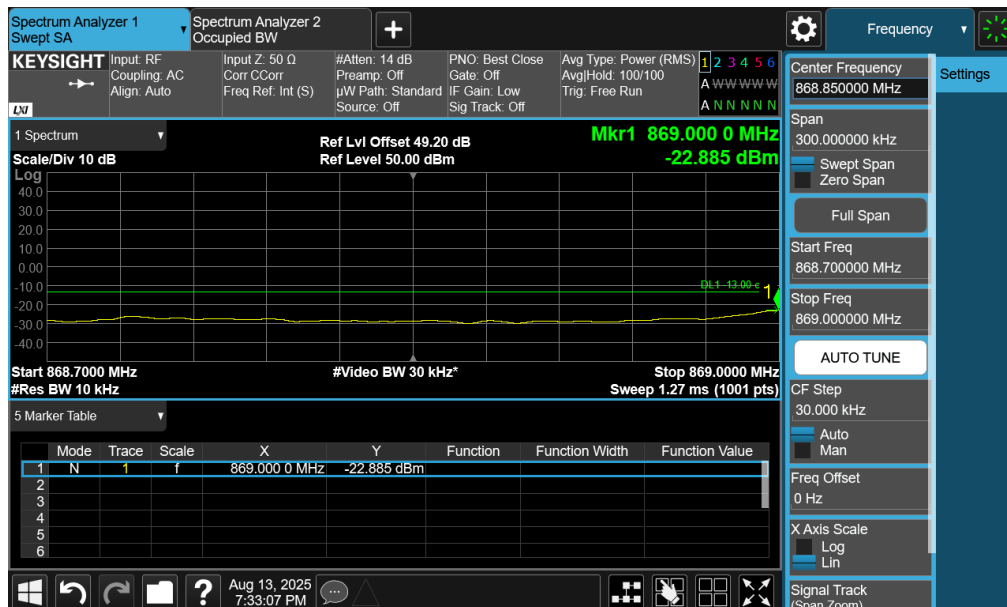


Out-of-band/out-of-block emissions

DL_GSM_LCH_a single test signal_Pre-AGC

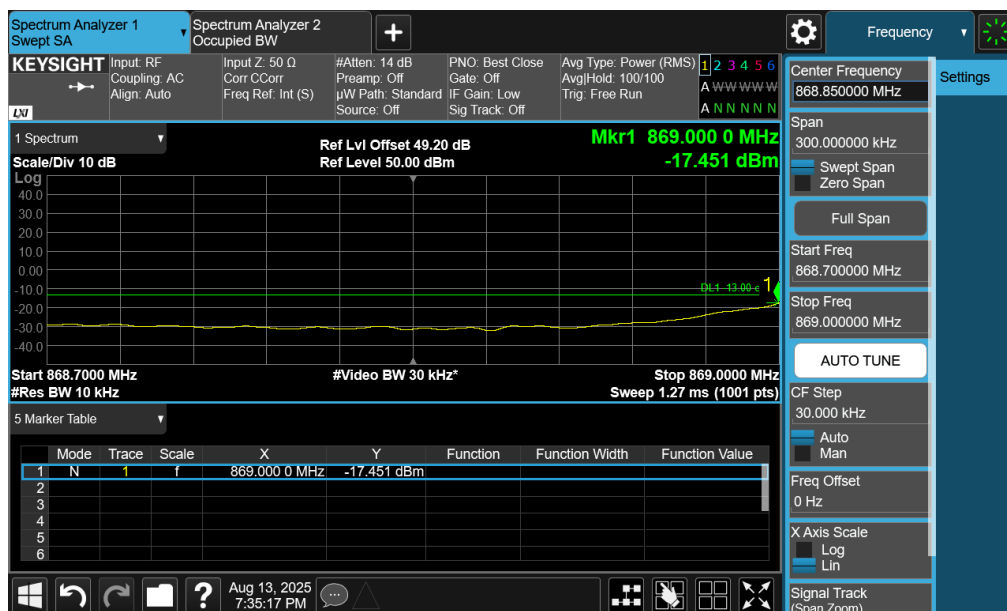


DL_GSM_LCH_a single test signal_3dB above AGC

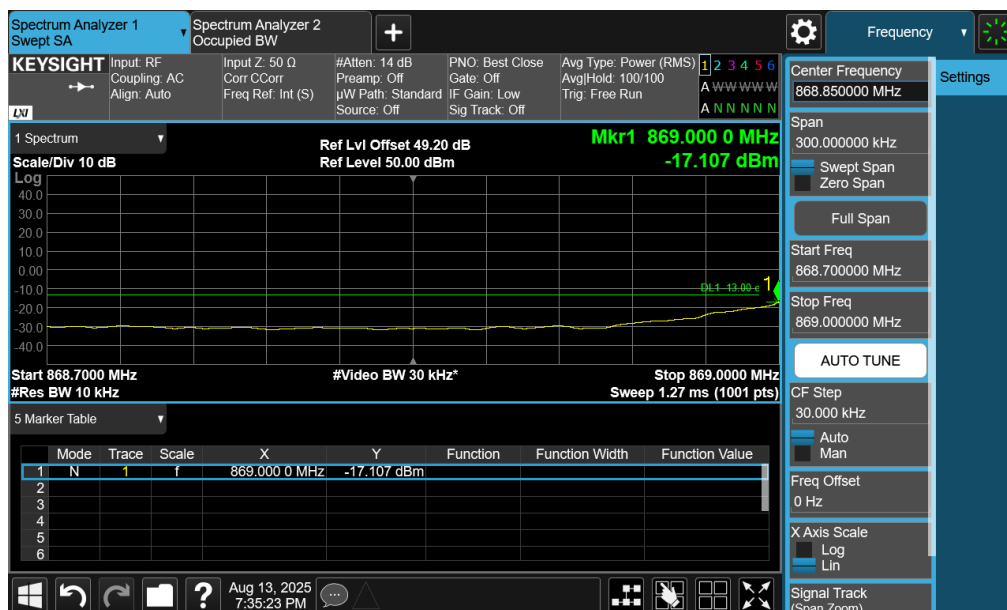


Out-of-band/out-of-block emissions

DL_GSM_LCH_two adjacent test signals_Pre-AGC



DL_GSM_LCH_two adjacent test signals_3dB above AGC



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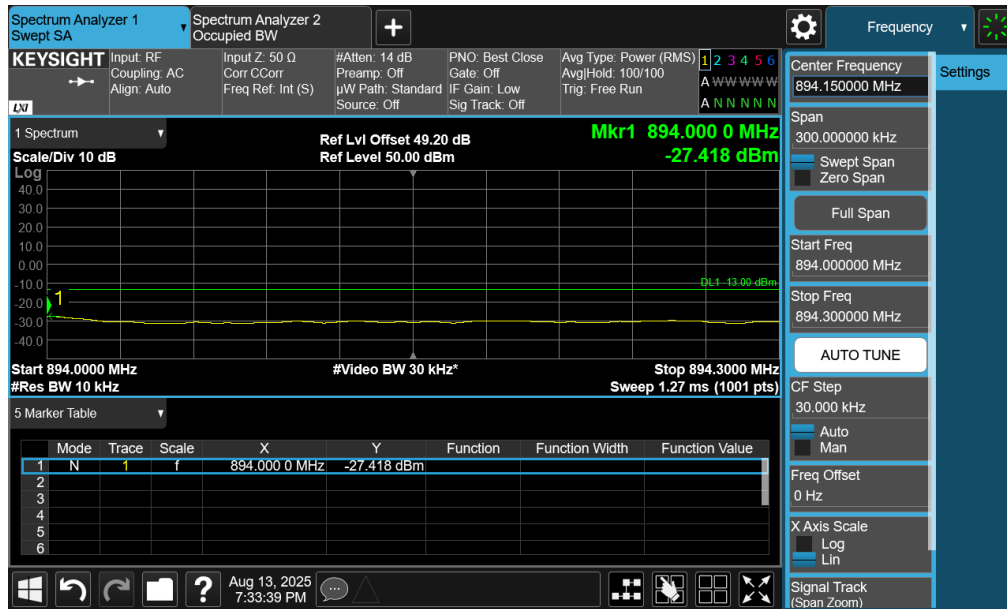
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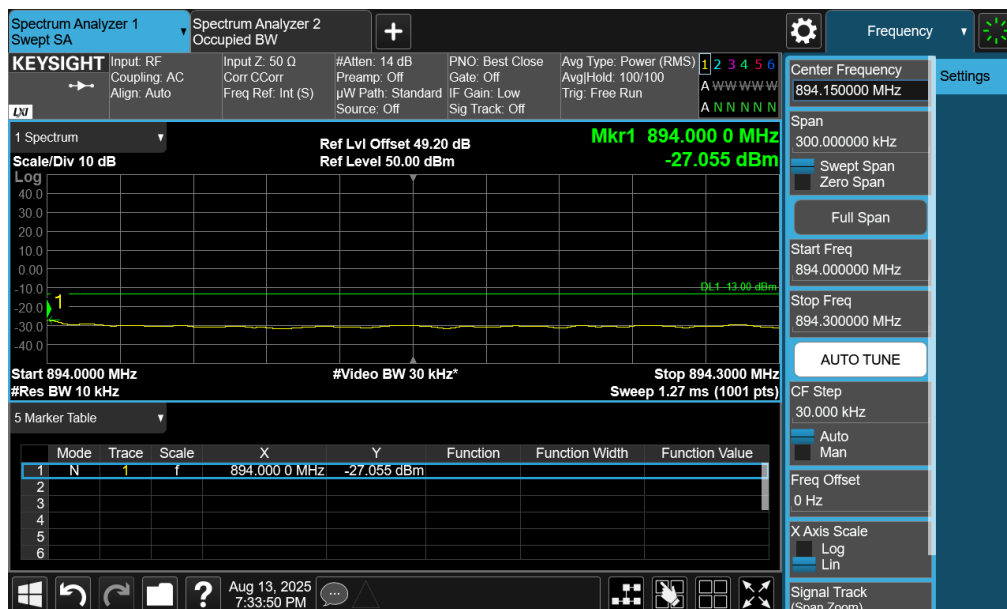
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Out-of-band/out-of-block emissions

DL_GSM_HCH_a single test signal_Pre-AGC



DL_GSM_HCH_a single test signal_3dB above AGC

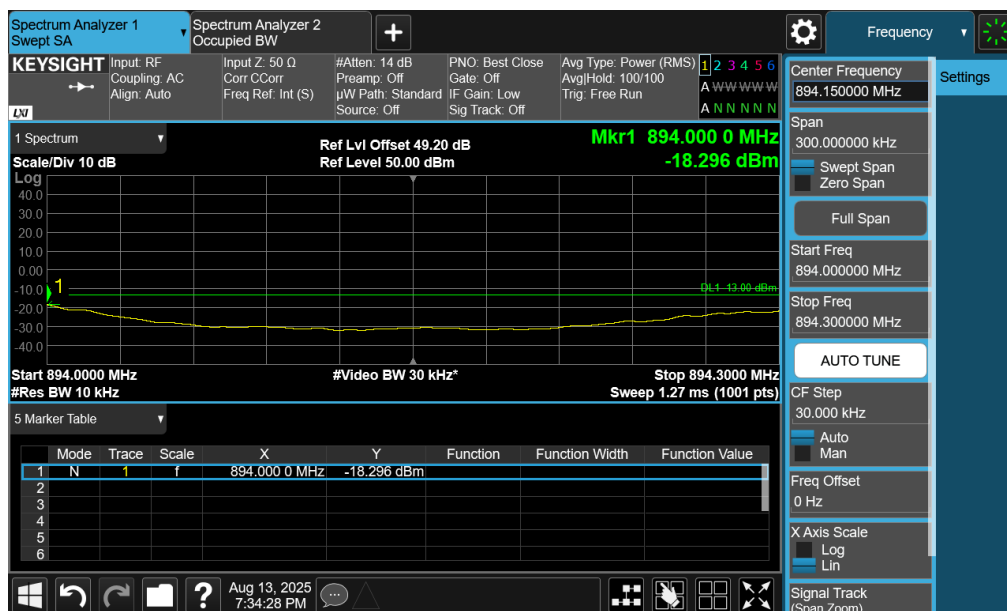


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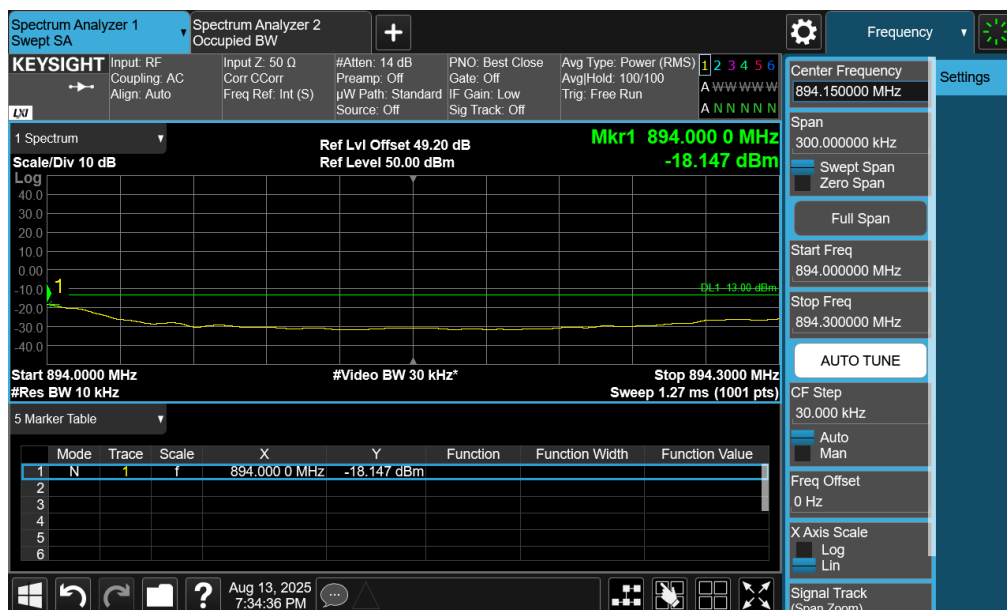
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Out-of-band/out-of-block emissions

DL_GSM_HCH_two adjacent test signals_Pre-AGC



DL_GSM_HCH_two adjacent test signals_3dB above AGC



5 Conducted Spurious emissions

Conducted Spurious emissions						
Test path	Test signal	Test channel	Frequency range (MHz)	Worst test level (dBm)	Limit (dBm)	Verdict
DL	4.1MHz AWGN	LCH	0.09-868.9	-20.57	≤-13	PASS
		HCH	894.1-1000	-24.61	≤-13	PASS
			1000-8940	-24.44	≤-13	PASS

Remark:

- The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\log_{10}(P)$ dB, here,
 $P = 43\text{dBm} = 20\text{W}$
 $\text{limit} = 43\text{dBm} - [43 + 10\log_{10}(20\text{W})] \text{ dB} = -13\text{dBm}$
- All modes (LCH/MCH/HCH, with 4.1MHz AWGN signal/ with 100MHz AWGN signal) had been tested, only show the worst-case in this report.

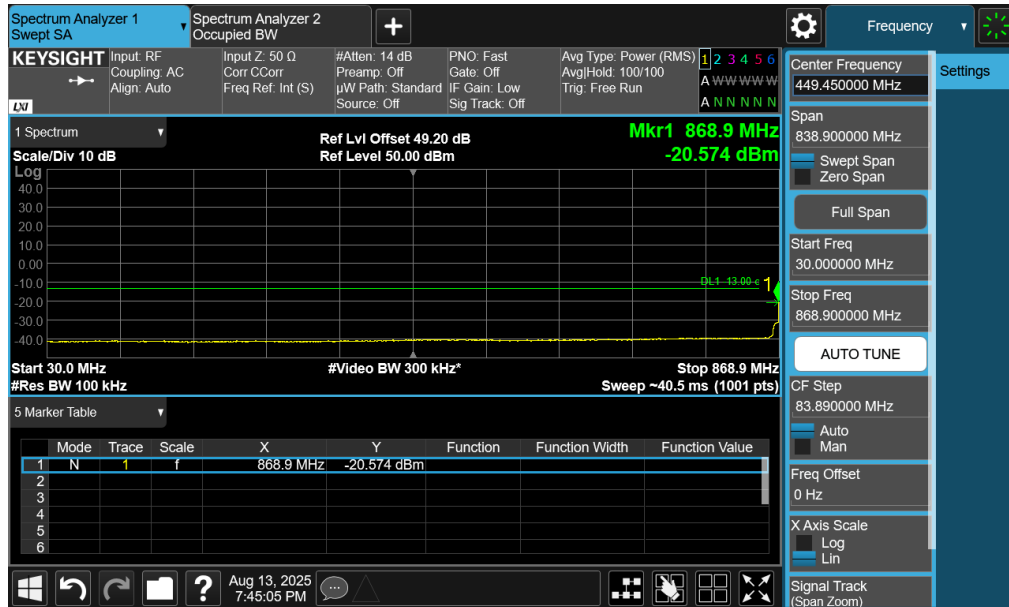


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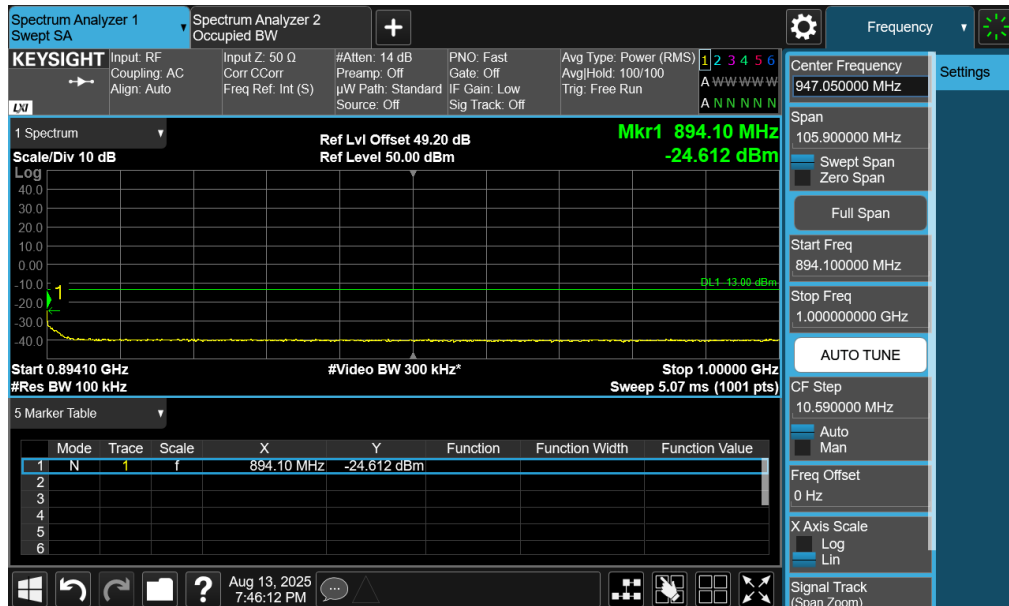
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Conducted spurious emissions

DL_4.1MHz AWGN_LCH_Pre-AGC

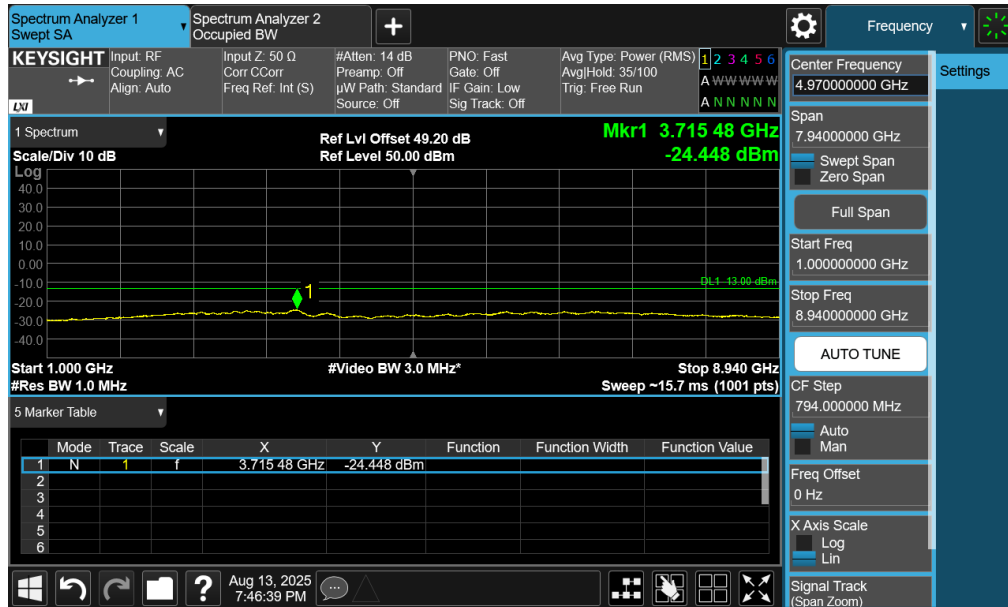


DL_4.1MHz AWGN_HCH_Pre-AGC



Conducted spurious emissions

DL_4.1MHz AWGN_HCH_Pre-AGC



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6 Frequency Stability

Frequency stability vs voltage							
Test path	Test Channel	Test Signal	Temperature	Voltage	Freq. error (Hz)	Tolerance (ppm)	Verdict
DL	MCH	4.1MHz AWGN	TN	VL	2.5	0.00284	PASS
			TN	VH	2.5	0.00284	PASS
		100MHz AWGN	TN	VL	3.0	0.00340	PASS
			TN	VH	3.0	0.00340	PASS
		GSM	TN	VL	3.0	0.00340	PASS
			TN	VH	3.0	0.00340	PASS



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Guangzhou Branch Testing Center EMC Laboratory

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Frequency stability vs temperature							
Test Path	Test Channel	Test Signal	Voltage	Temperature (°C)	Freq. error (Hz)	Tolerance (ppm)	Verdict
DL	MCH	4.1MHz AWGN	VN	+50	3.1	0.00352	PASS
			VN	+40	5.3	0.00601	PASS
			VN	+30	4.0	0.00454	PASS
			VN	+20	2.6	0.00295	PASS
			VN	+10	2.8	0.00318	PASS
			VN	0	4.9	0.00556	PASS
			VN	-10	3.2	0.00363	PASS
			VN	-20	5.8	0.00658	PASS
			VN	-30	5.7	0.00647	PASS
	MCH	100MHz AWGN	VN	+50	3.9	0.00442	PASS
			VN	+40	2.2	0.00250	PASS
			VN	+30	5.2	0.00590	PASS
			VN	+20	4.7	0.00533	PASS
			VN	+10	4.6	0.00522	PASS
			VN	0	5.3	0.00601	PASS
			VN	-10	2.3	0.00261	PASS
			VN	-20	3.5	0.00397	PASS
			VN	-30	5.4	0.00613	PASS
	MCH	GSM	VN	+50	3.3	0.00374	PASS
			VN	+40	5.4	0.00613	PASS
			VN	+30	2.2	0.00250	PASS
			VN	+20	3.0	0.00340	PASS
			VN	+10	3.5	0.00397	PASS
			VN	0	4.6	0.00522	PASS
			VN	-10	2.1	0.00238	PASS
			VN	-20	4.8	0.00545	PASS
			VN	-30	4.1	0.00465	PASS



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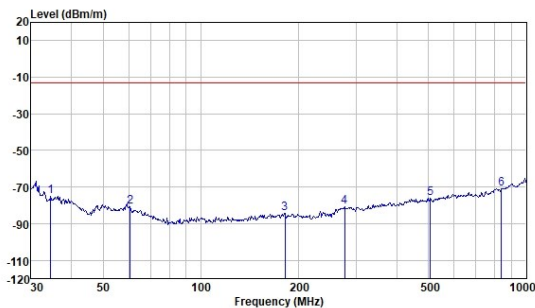
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7 Radiated Spurious emissions

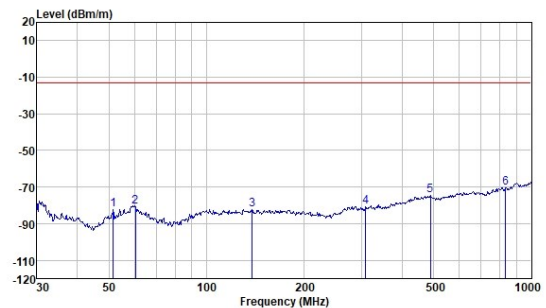
Radiated Spurious emissions

DL_4.1MHz AWGN_MCH_30MHz-1GHz

For HRU-7851719-DC

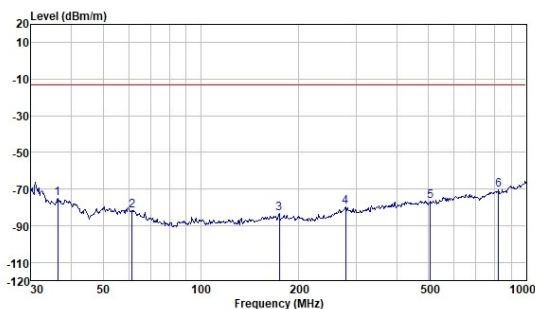


	Freq	Read Level	Correction Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	34.52	-77.86	2.91	-74.95	-13.00	-61.95	HORIZONTAL
2	60.49	-78.14	-2.63	-80.77	-13.00	-67.77	HORIZONTAL
3	181.28	-78.45	-6.04	-84.49	-13.00	-71.49	HORIZONTAL
4	276.12	-78.36	-2.63	-80.99	-13.00	-67.99	HORIZONTAL
5	506.48	-76.38	0.41	-75.97	-13.00	-62.97	HORIZONTAL
6	839.18	-78.16	7.19	-70.97	-13.00	-57.97	HORIZONTAL

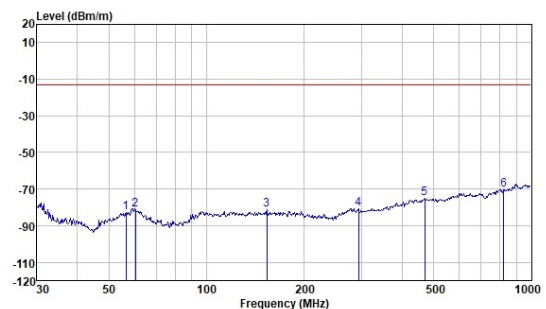


	Freq	Read Level	Correction Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	51.48	-75.95	-6.35	-82.30	-13.00	-69.30	VERTICAL
2	60.28	-78.50	-2.19	-80.69	-13.00	-67.69	VERTICAL
3	137.90	-78.28	-3.93	-82.21	-13.00	-69.21	VERTICAL
4	308.91	-78.11	-2.63	-80.74	-13.00	-67.74	VERTICAL
5	489.03	-76.67	1.99	-74.68	-13.00	-61.68	VERTICAL
6	833.32	-78.12	7.73	-70.39	-13.00	-57.39	VERTICAL

For HRU-7851719-AC



	Freq	Read Level	Correction Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	36.25	-77.86	2.67	-75.19	-13.00	-62.19	HORIZONTAL
2	61.35	-78.70	-2.87	-81.57	-13.00	-68.57	HORIZONTAL
3	173.81	-77.45	-6.11	-83.56	-13.00	-70.56	HORIZONTAL
4	278.07	-77.14	-2.52	-79.66	-13.00	-66.66	HORIZONTAL
5	506.48	-77.13	0.41	-76.72	-13.00	-63.72	HORIZONTAL
6	821.71	-77.69	7.05	-70.64	-13.00	-57.64	HORIZONTAL



	Freq	Read Level	Correction Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	56.39	-79.18	-3.37	-82.55	-13.00	-69.55	VERTICAL
2	60.28	-79.15	-2.19	-81.34	-13.00	-68.34	VERTICAL
3	153.20	-77.39	-3.94	-81.33	-13.00	-68.33	VERTICAL
4	294.11	-77.93	-2.67	-80.60	-13.00	-67.60	VERTICAL
5	468.88	-77.00	1.80	-75.20	-13.00	-62.20	VERTICAL
6	821.71	-77.89	7.61	-70.28	-13.00	-57.28	VERTICAL



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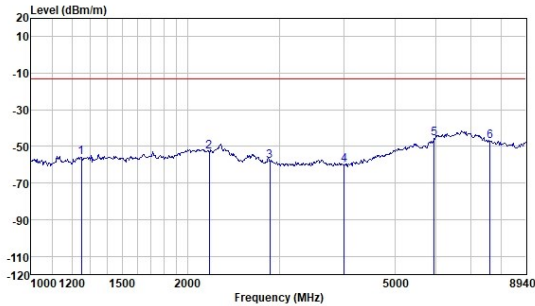
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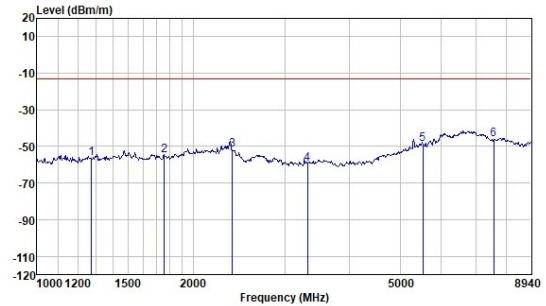
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Radiated Spurious emissions

DL_4.1MHz AWGN_MCH_above 1GHz



	Freq	Read Level	Correction Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1250.36	-60.11	3.94	-56.17	-13.00	-43.17	HORIZONTAL
2	2200.30	-62.17	9.23	-52.94	-13.00	-39.94	HORIZONTAL
3	2874.38	-62.16	4.03	-58.13	-13.00	-45.13	HORIZONTAL
4	3992.50	-62.79	2.69	-60.10	-13.00	-47.10	HORIZONTAL
5	5948.24	-62.96	17.42	-45.54	-13.00	-32.54	HORIZONTAL
6	7618.86	-62.59	15.25	-47.34	-13.00	-34.34	HORIZONTAL



	Freq	Read Level	Correction Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1272.47	-60.93	4.34	-56.59	-13.00	-43.59	VERTICAL
2	1759.73	-60.83	5.72	-55.11	-13.00	-42.11	VERTICAL
3	2375.63	-61.87	9.85	-52.02	-13.00	-39.02	VERTICAL
4	3314.22	-62.70	2.94	-59.76	-13.00	-46.76	VERTICAL
5	5533.43	-63.07	14.36	-48.71	-13.00	-35.71	VERTICAL
6	7568.95	-62.48	16.33	-46.15	-13.00	-33.15	VERTICAL

Remark:

Pre-test was performed for all modes (LCH/MCH/HCH, with GSM signal/ with 4.1MHz AWGN signals/ with 100MHz AWGN signals), the test result always keeps more than 20dB margin, the spurious emissions 9kHz to 30MHz were very low and not displayed in this report. Therefore, only show the worst-case in this report. The spurious emissions 9kHz to 30MHz were very low and not displayed in this report.

--End of Appendix--



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