

Appendix -

Test Data and Result for report

GZCR250300027203

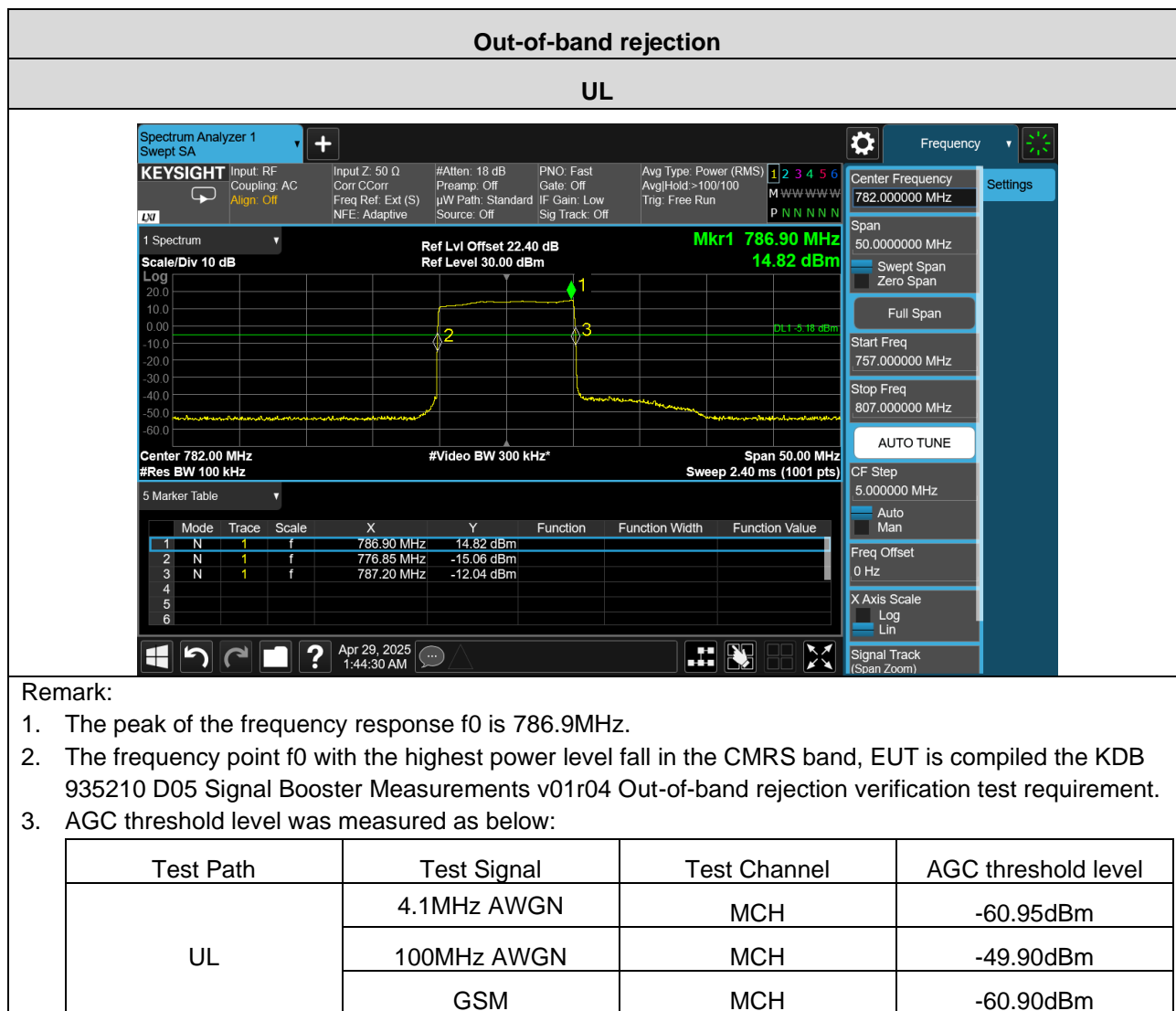
(For Upper 700MHz Band UL)



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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
UL	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 10MHz 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.

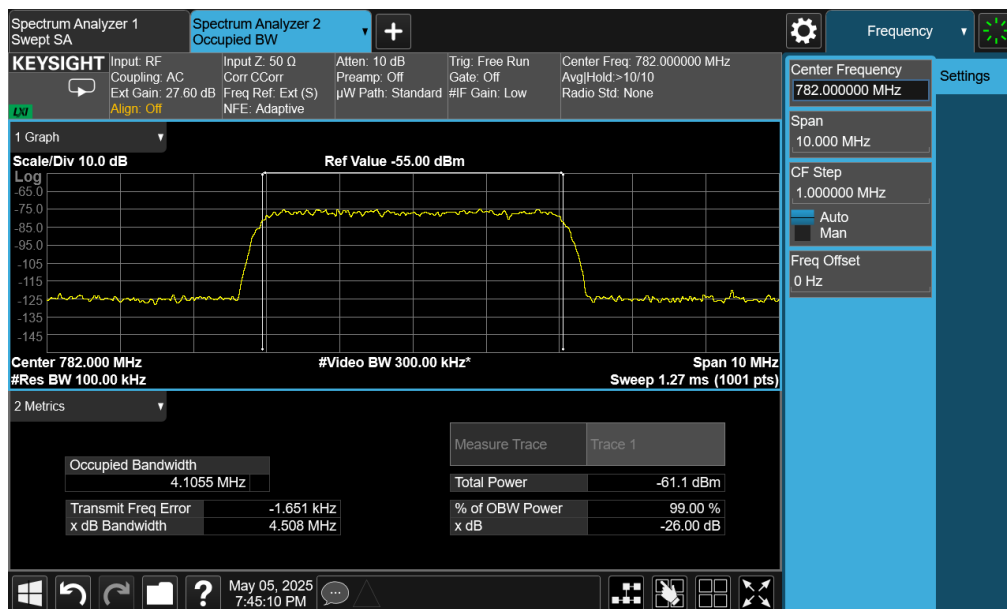


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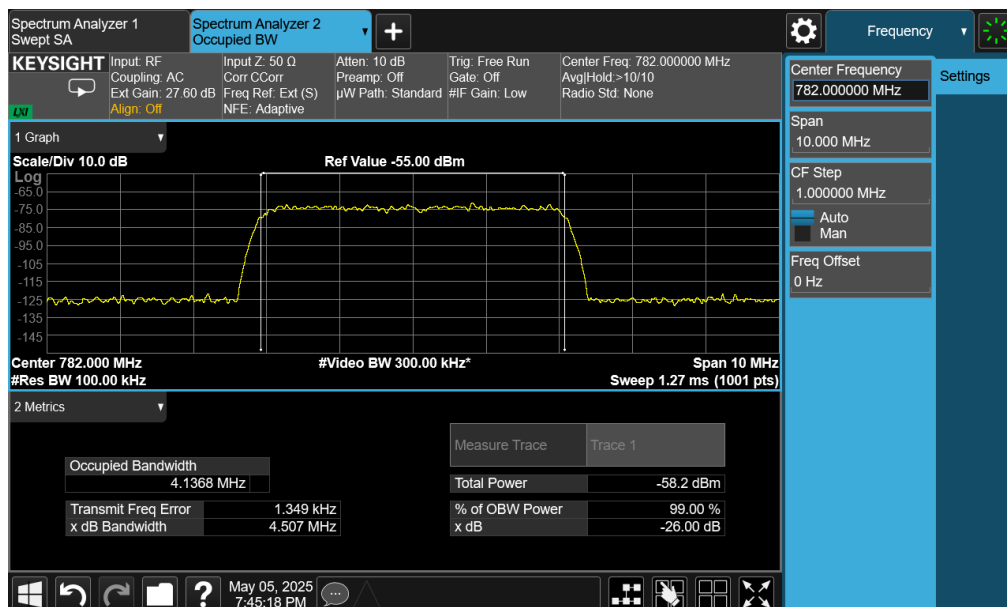
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99% OBW

UL_4.1MHz AWGN_MCH_Input_Pre-AGC



UL_4.1MHz AWGN_MCH_Input_3dB above AGC



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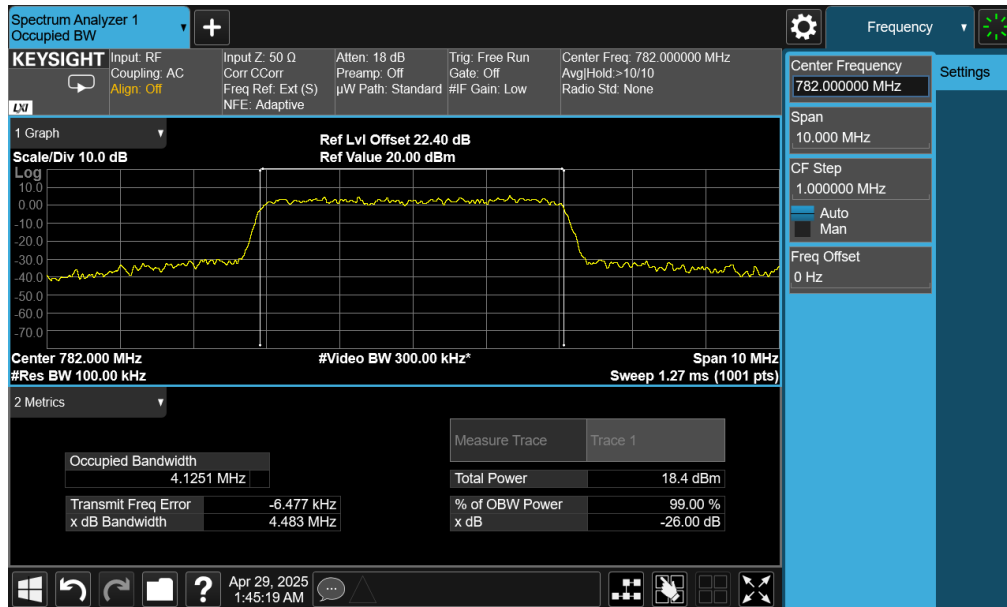
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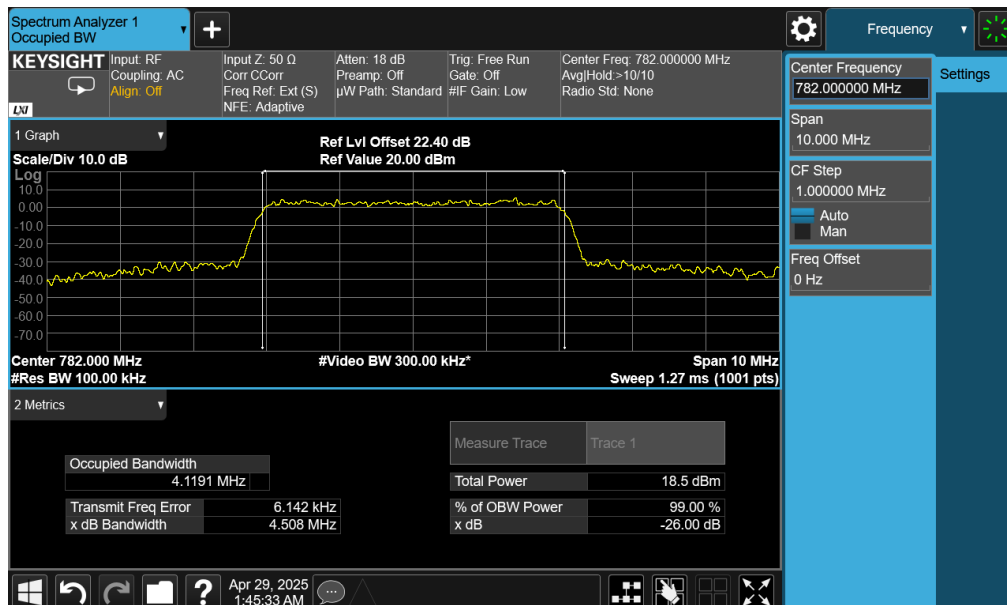
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99% OBW

UL_4.1MHz AWGN_MCH_Output_Pre-AGC



UL_4.1MHz AWGN_MCH_Output_3dB above AGC

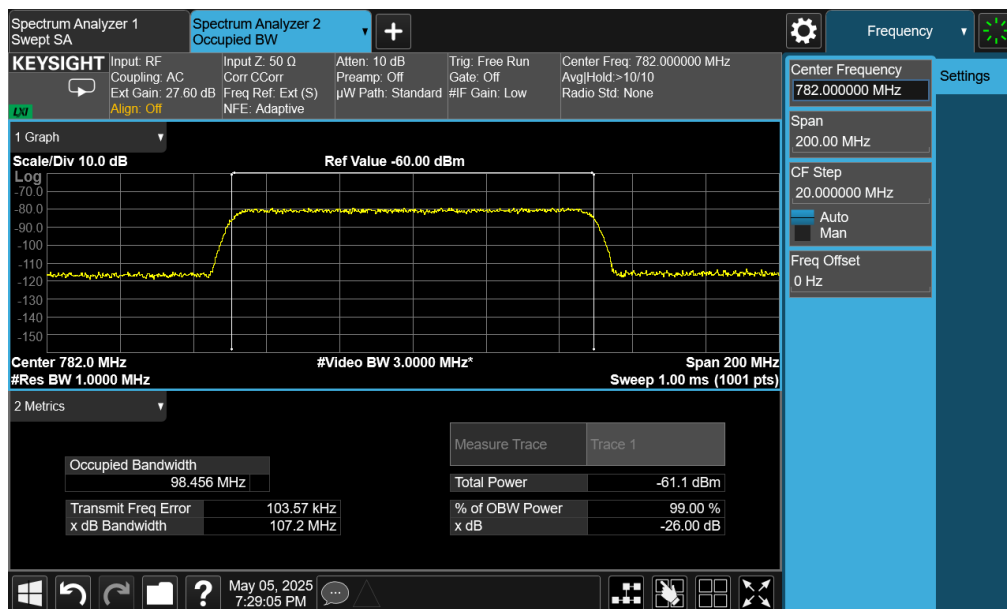


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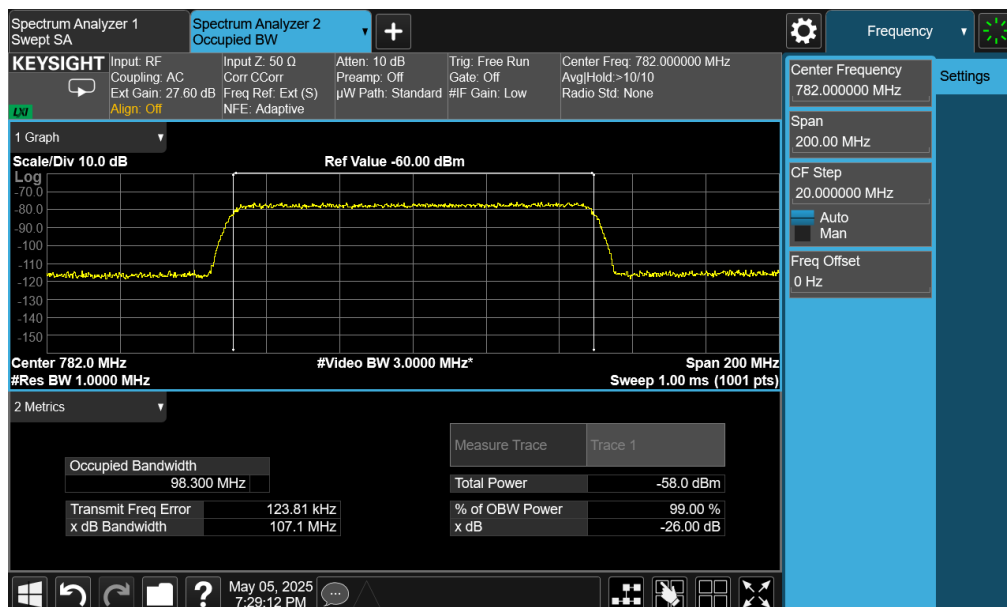
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99% OBW

UL_100MHz AWGN_MCH_Input_Pre-AGC



UL_100MHz AWGN_MCH_Input_3dB above AGC



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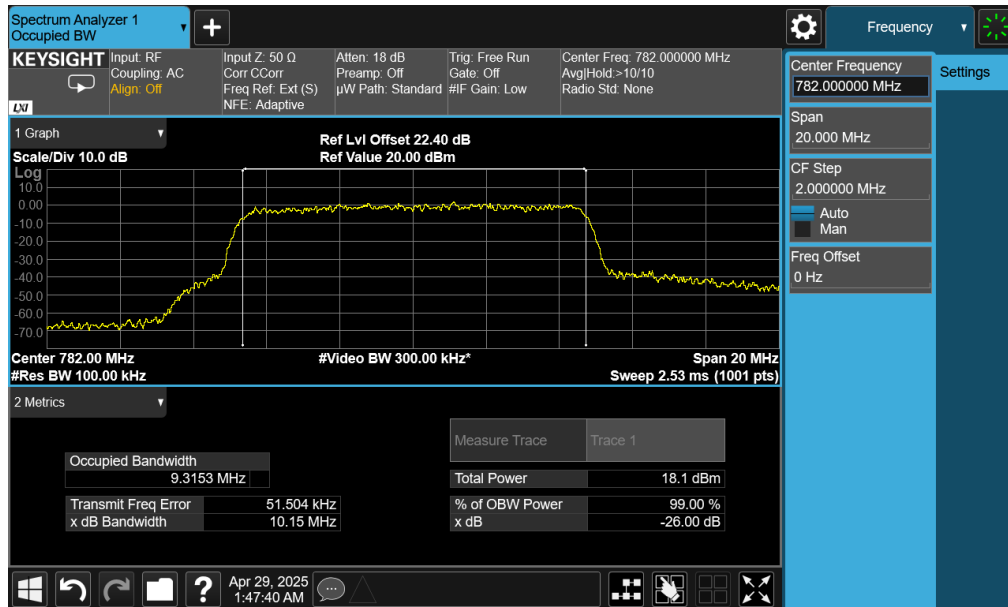
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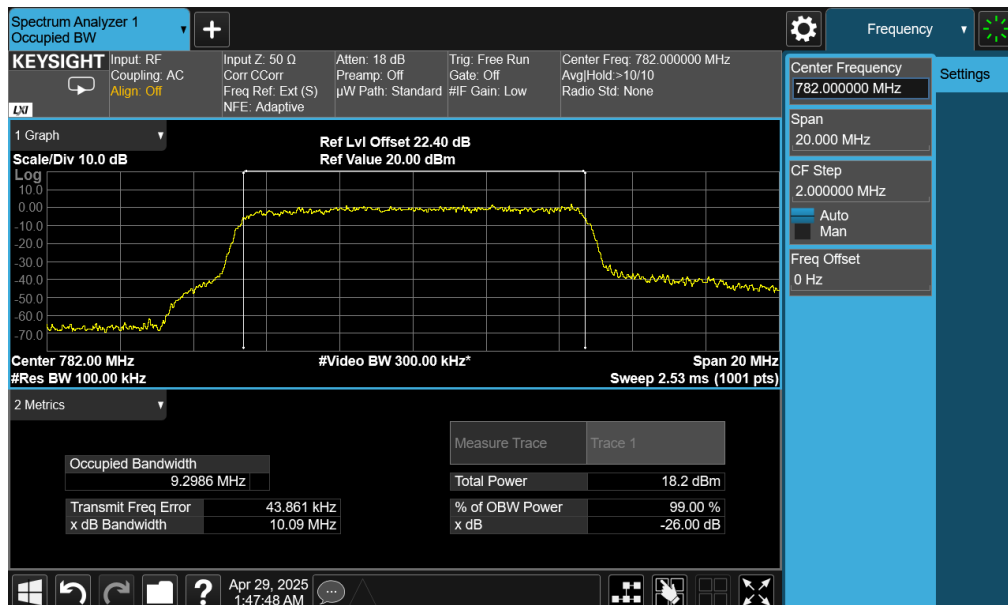
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99% OBW

UL_100MHz AWGN_MCH_Output_Pre-AGC

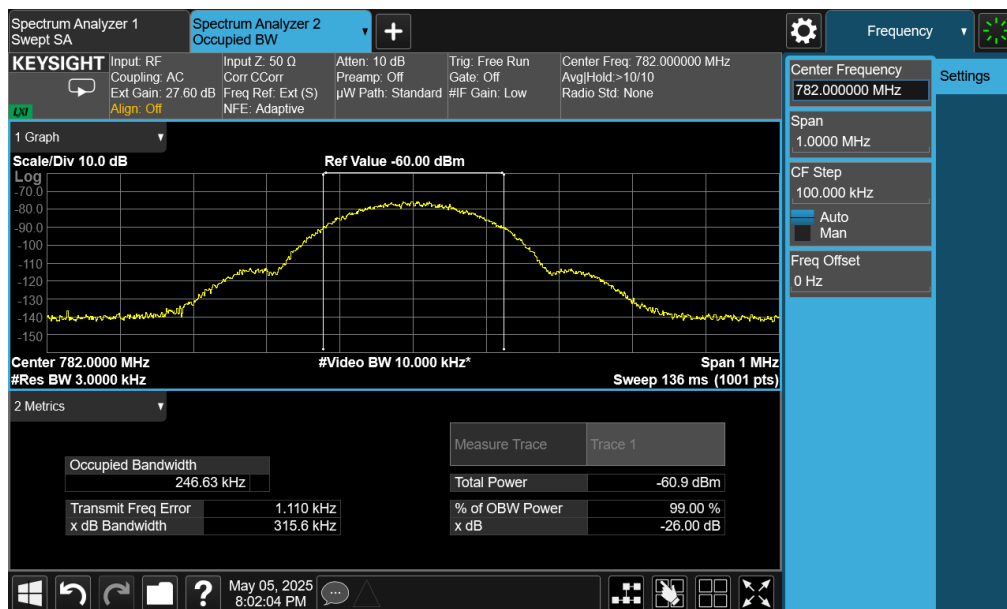


UL_100MHz AWGN_MCH_Output_3dB above AGC

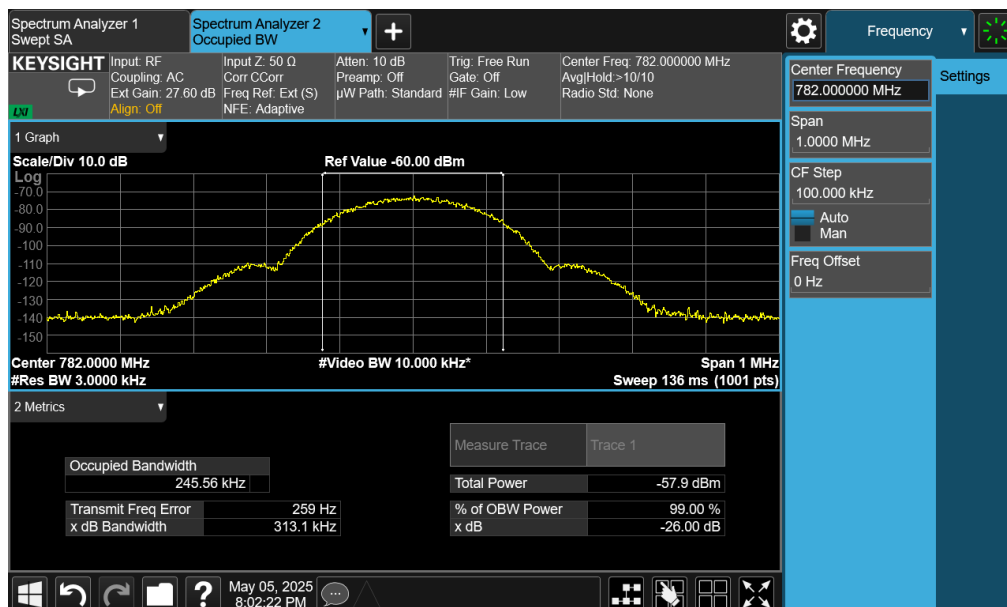


99% OBW

UL_GSM_MCH_Input_Pre-AGC



UL_GSM_MCH_Input_3dB above AGC



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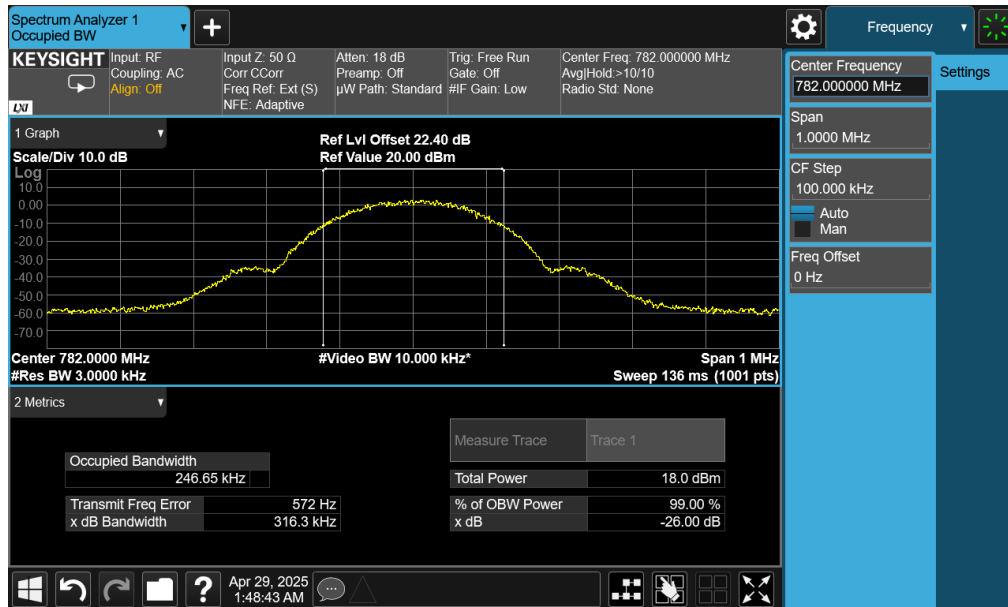
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99% OBW

UL_GSM_MCH_Output_Pre-AGC



UL_GSM_MCH_Output_3dB above AGC



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)
UL	786.9	4.1MHz AWGN	Pre-AGC	-61	18.49	30.34	1.09	79.49
			3dB above AGC	-58	18.66	30.51	1.13	/
		100MHz AWGN	Pre-AGC	-50	18.15	30.00	1.00	68.15
			3dB above AGC	-47	18.33	30.18	1.05	/
		GSM	Pre-AGC	-61	18.06	29.91	0.98	79.06
			3dB above AGC	-58	18.23	30.08	1.02	/
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 14dBi declared by the manufacturer.								

Mean output power							
Test Path	Test Freq. f0 (MHz)	Test Signal	Signal Level	Output Power (dBm/MHz)	ERP (dBm/MHz)	ERP (W/MHz)	Verdict
UL	786.9	4.1MHz AWGN	Pre-AGC	12.34	24.19	0.27	PASS
			3dB above AGC	12.54	24.39	0.28	PASS
		100MHz AWGN	Pre-AGC	8.47	20.32	0.11	PASS
			3dB above AGC	8.65	20.50	0.12	PASS
		GSM	Pre-AGC	18.06	29.91	0.98	PASS
			3dB above AGC	18.23	30.08	1.02	PASS
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 14dBi declared by the manufacturer. 3. The output power is limited to an EIRP of 1000W/MHz.							



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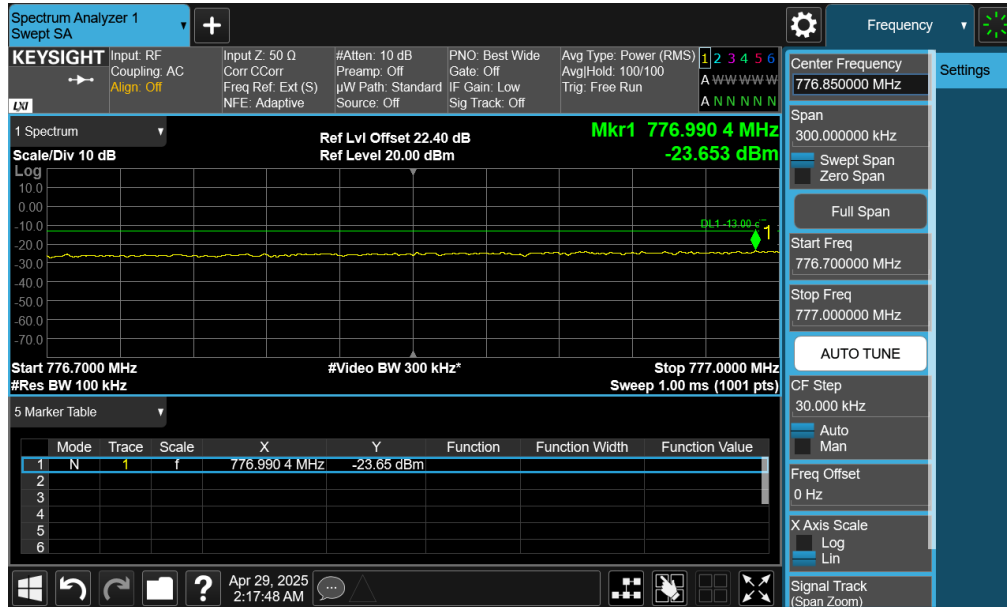
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4 Out-of-band/out-of-block(including intermodulation) emissions

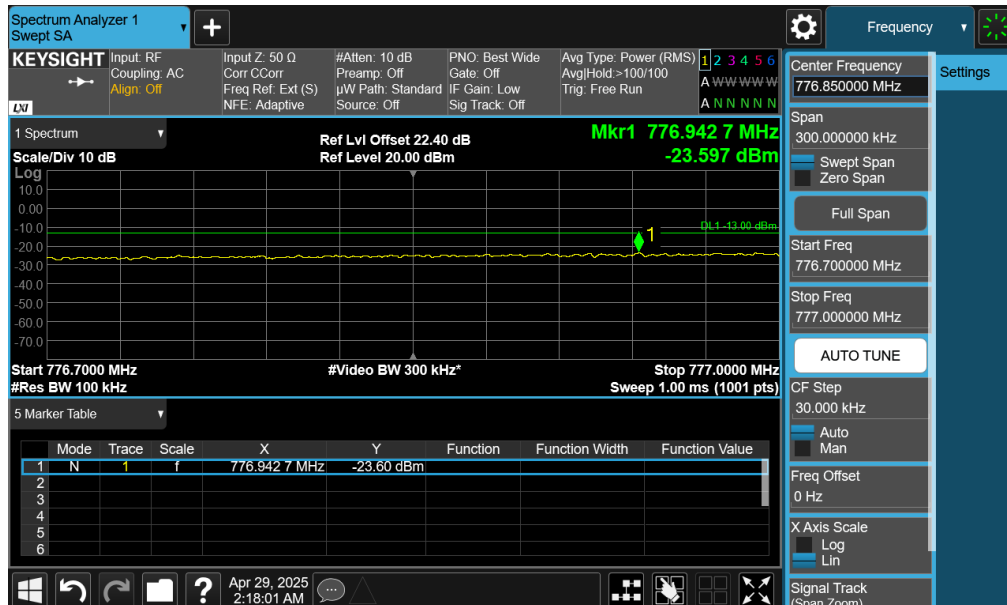
Out-of-band/out-of-block(including intermodulation) emissions							
Test Path	Test Channel	Test Signal	Stimulus Condition	Signal Level	Worst conducted test level (dBm)	Limit (dBm)	Verdict
UL	LCH	4.1MHz AWGN	One signal input	Pre-AGC	-23.65	≤-13	PASS
				3dB above AGC	-23.59		PASS
			Two signals input	Pre-AGC	-27.34		PASS
				3dB above AGC	-27.18		PASS
	HCH		One signal input	Pre-AGC	-22.32		PASS
				3dB above AGC	-21.88		PASS
			Two signals input	Pre-AGC	-23.15		PASS
				3dB above AGC	-23.09		PASS
UL	LCH	100MHz AWGN	One signal input	Pre-AGC	-40.93	≤-13	PASS
	3dB above AGC			-38.24	PASS		
	HCH		One signal input	Pre-AGC	-31.45		PASS
				3dB above AGC	-30.04		PASS
UL	LCH	GSM	One signal input	Pre-AGC	-27.80	≤-13	PASS
				3dB above AGC	-27.23		PASS
			Two signals input	Pre-AGC	-28.42		PASS
				3dB above AGC	-28.39		PASS
	HCH		One signal input	Pre-AGC	-21.30		PASS
				3dB above AGC	-20.89		PASS
			Two signals input	Pre-AGC	-24.62		PASS
				3dB above AGC	-23.53		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 = 19dBm = 0.08W the limit = 19dBm – [43 + 10 log10 (0.08W)] dB = -13dBm							

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

UL_4.1MHz AWGN_LCH_a single test signal_Pre-AGC

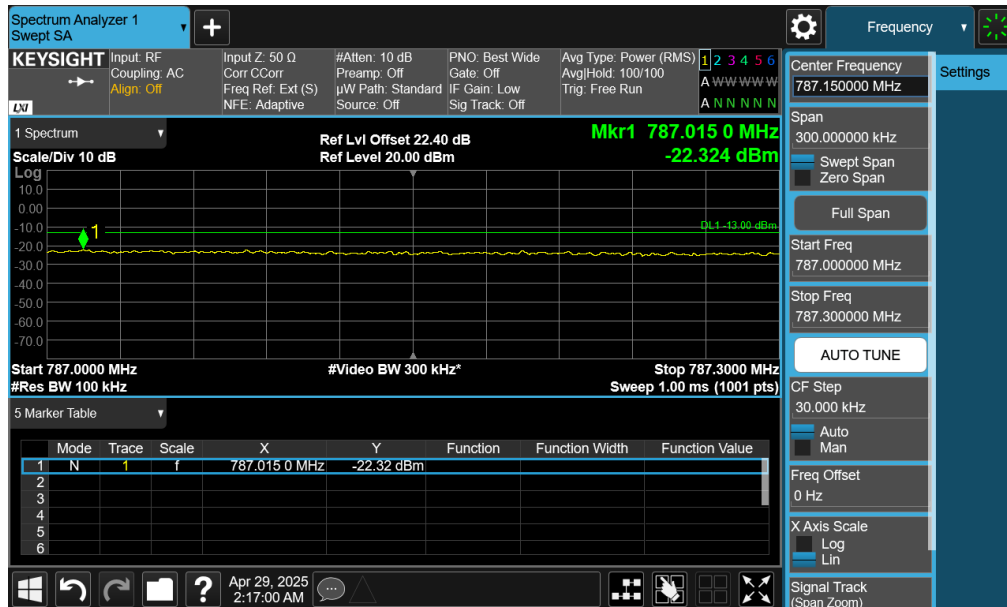


UL_4.1MHz AWGN_LCH_a single test signal_3dB above AGC

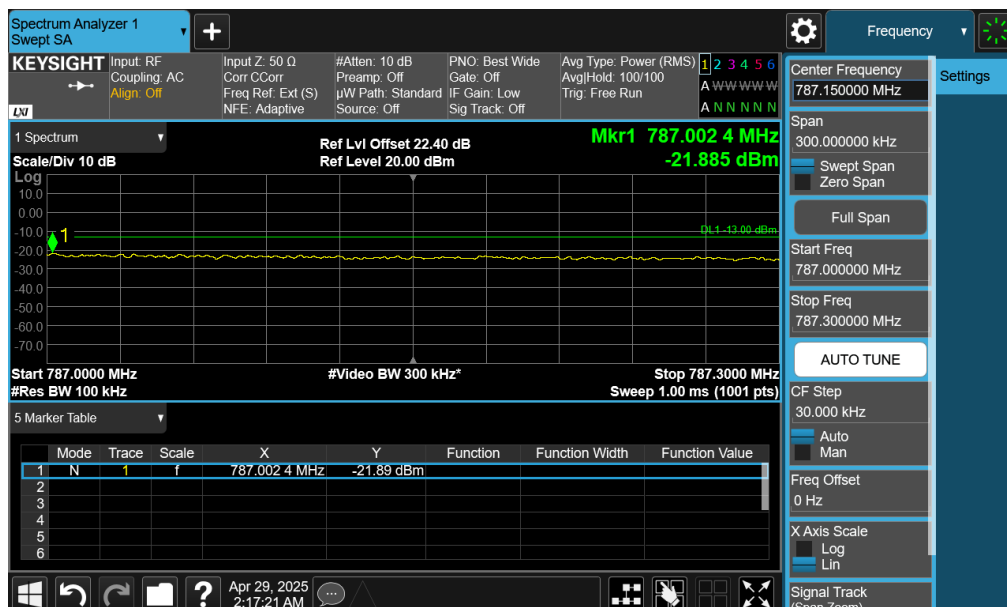


Out-of-band/out-of-block emissions

UL_4.1MHz AWGN_HCH_a single test signal_Pre-AGC



UL_4.1MHz AWGN_HCH_a single test signal_3dB above AGC



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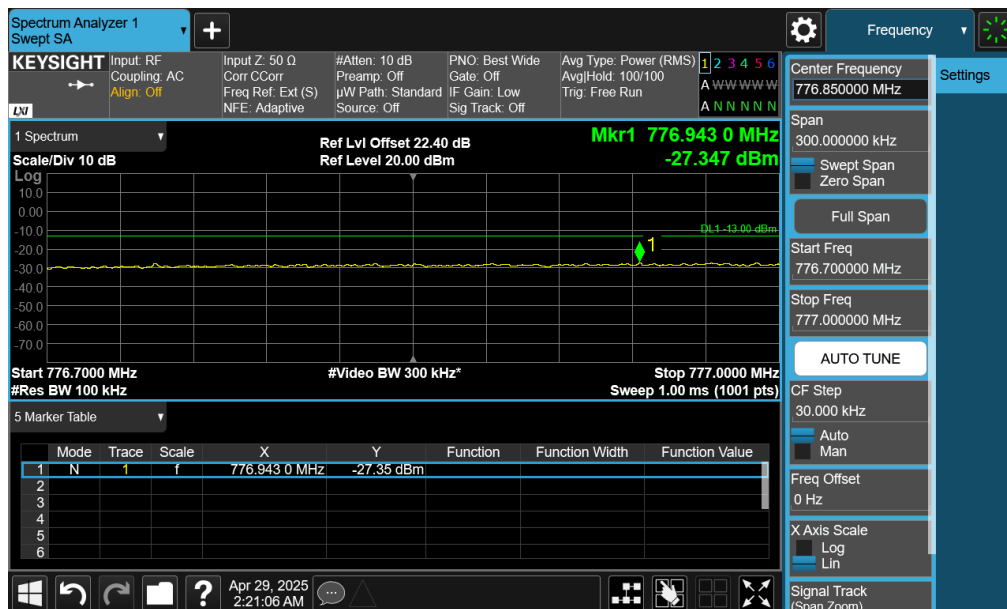
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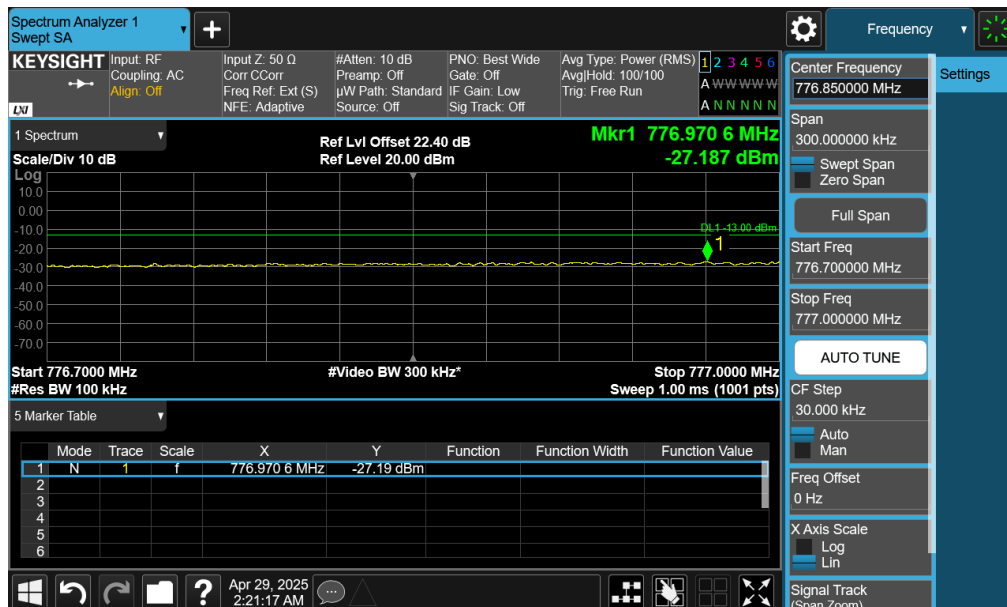
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Out-of-band/out-of-block emissions

UL_4.1MHz AWGN_LCH_two adjacent test signals_Pre-AGC



UL_4.1MHz AWGN_LCH_two adjacent test signals_3dB above AGC



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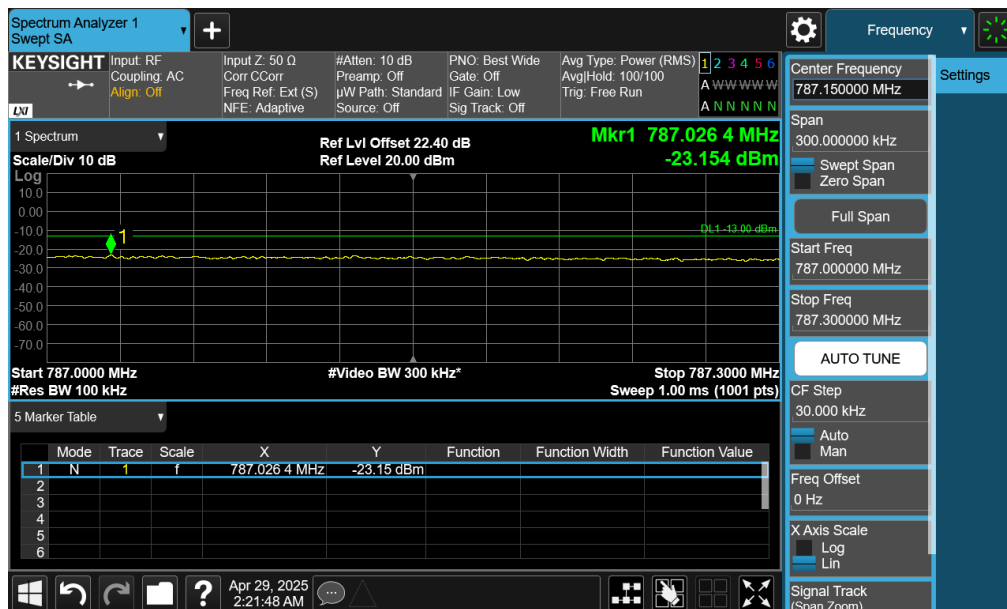
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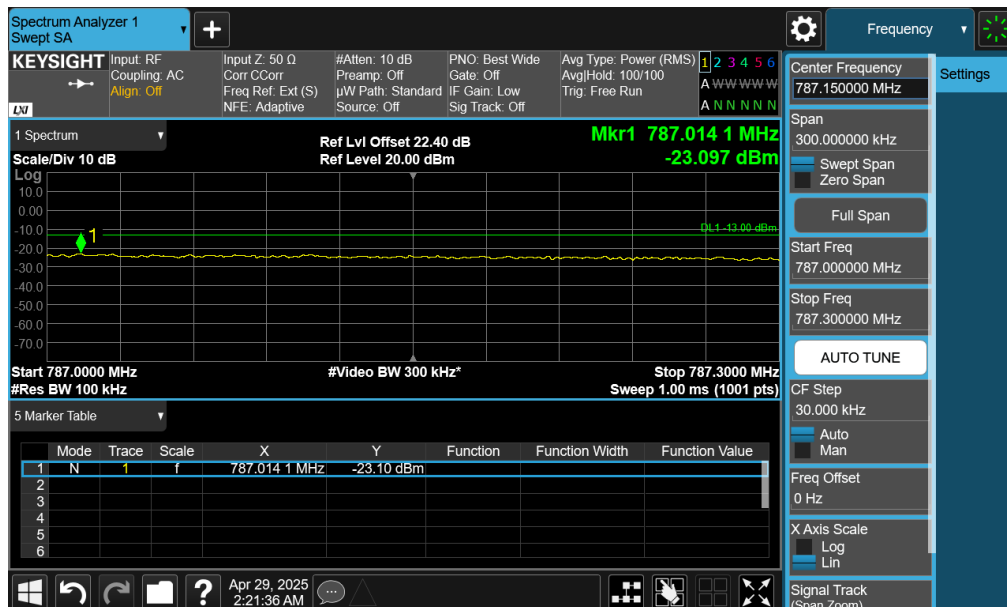
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Out-of-band/out-of-block emissions

UL_4.1MHz AWGN_HCH_two adjacent test signals_Pre-AGC



UL_4.1MHz AWGN_HCH_two adjacent test signals_3dB above AGC



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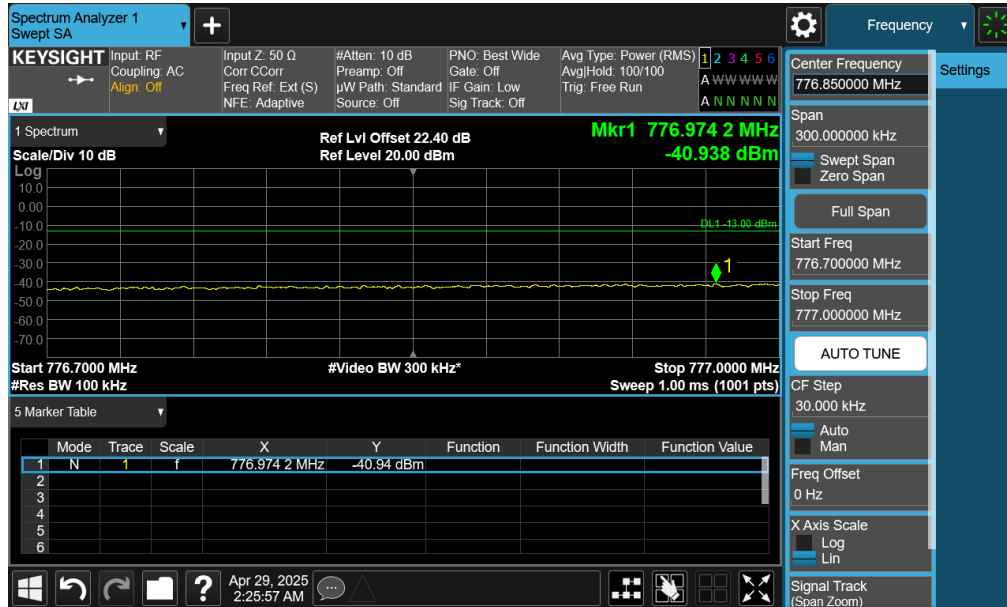
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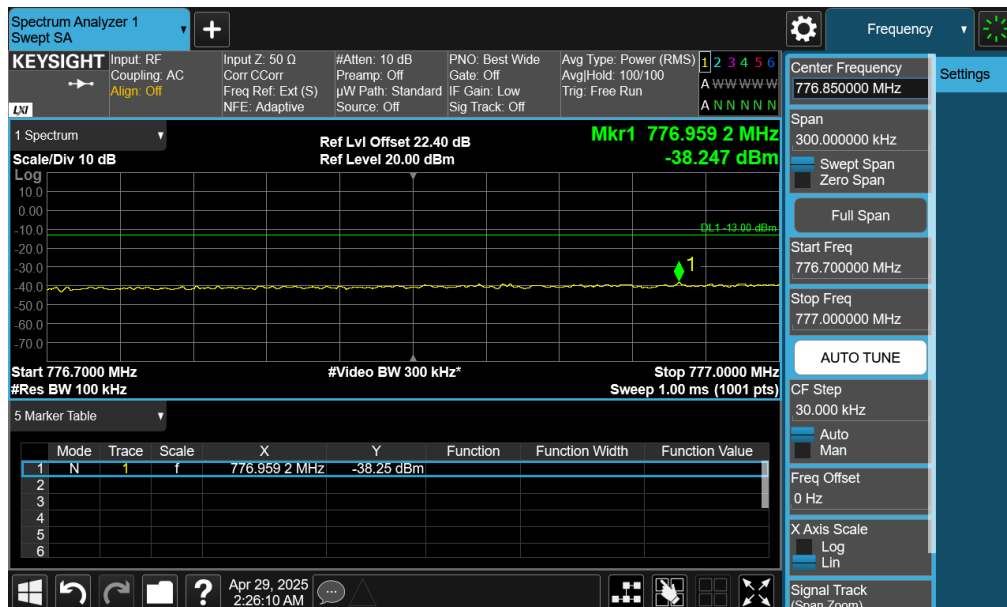
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Out-of-band/out-of-block emissions

UL_100MHz AWGN_LCH_a single test signal_Pre-AGC

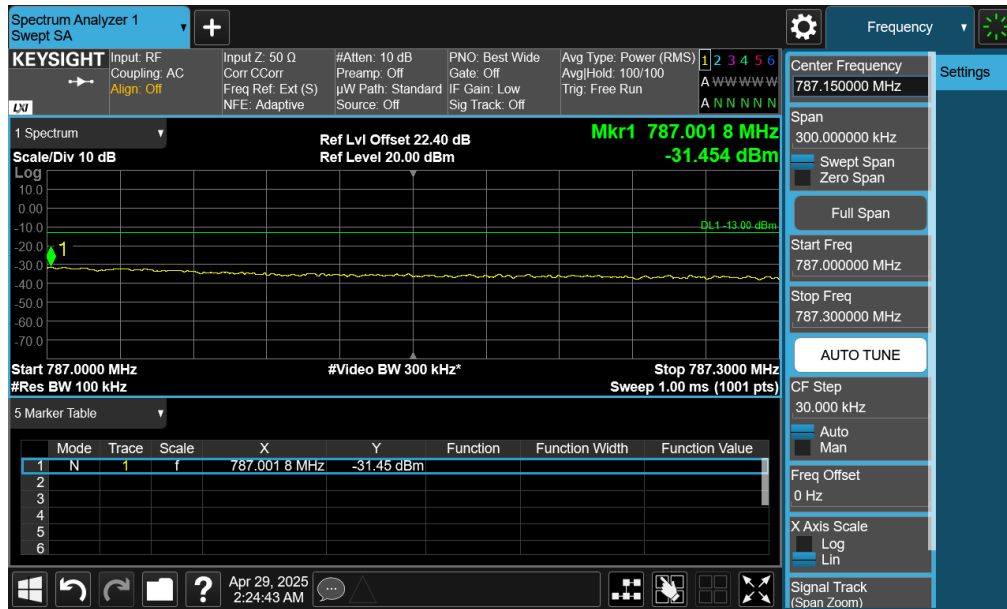


UL_100MHz AWGN_LCH_a single test signal_3dB above AGC

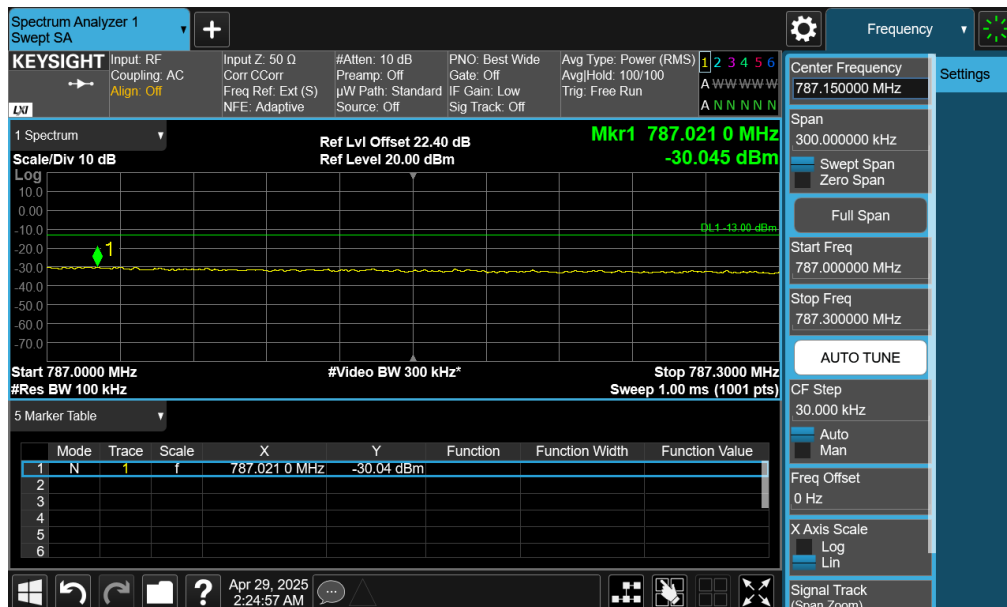


Out-of-band/out-of-block emissions

UL_100MHz AWGN_HCH_a single test signal_Pre-AGC



UL_100MHz AWGN_HCH_a single test signal_3dB above AGC



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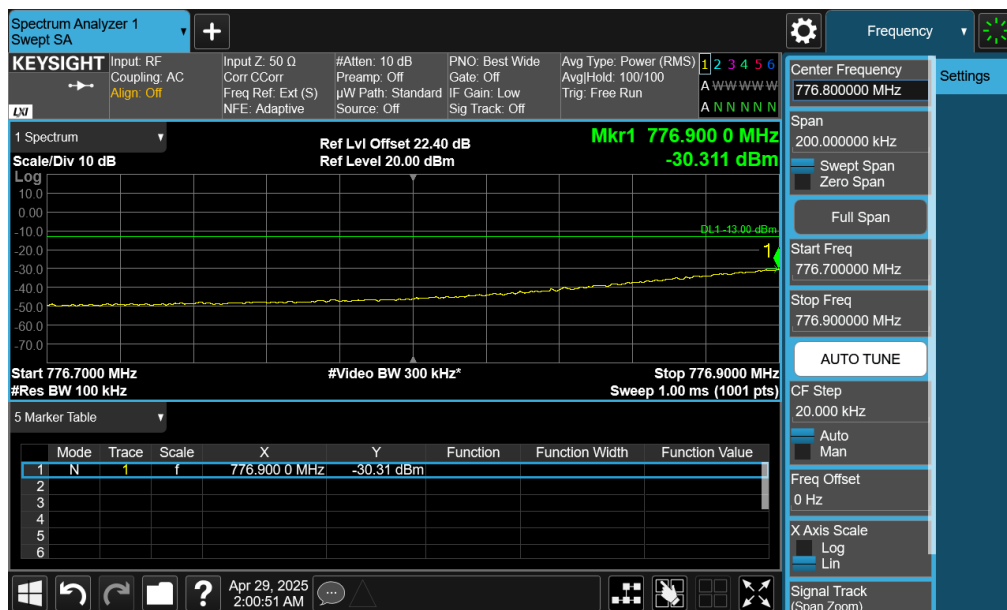
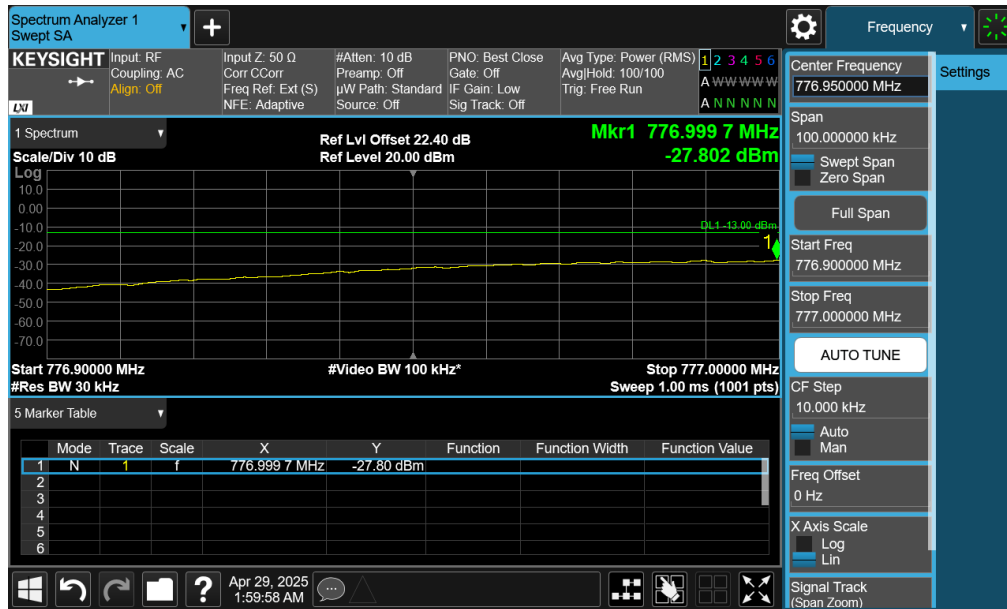
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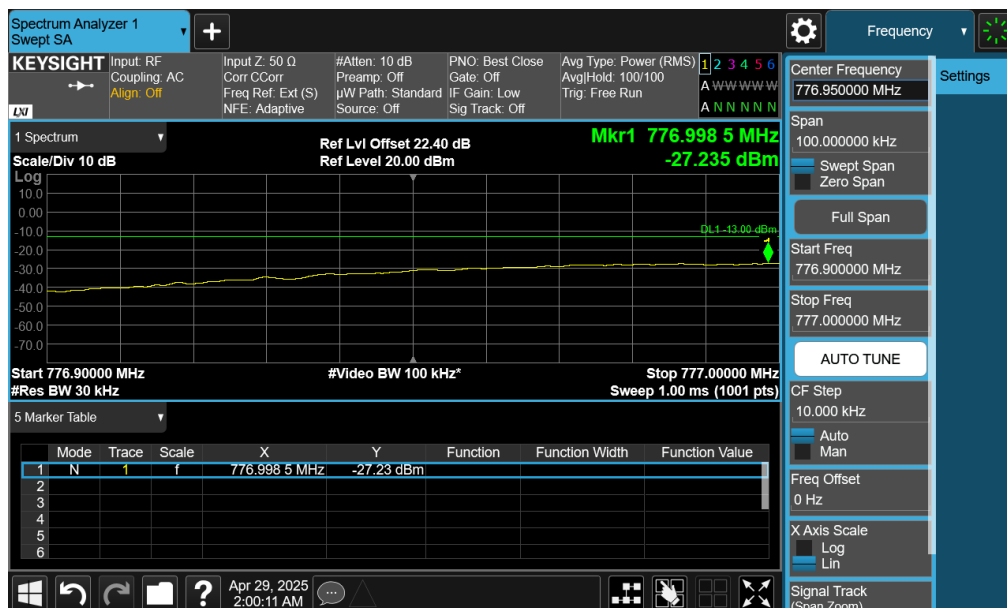
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Out-of-band/out-of-block emissions

UL_GSM_LCH_a single test signal_Pre-AGC



UL_GSM_LCH_a single test signal_3dB above AGC



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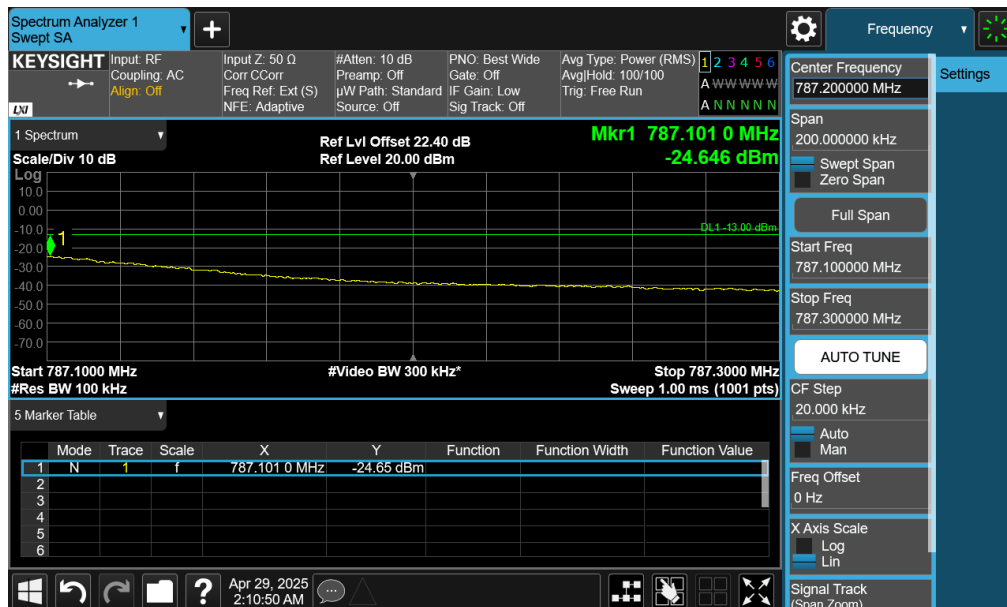
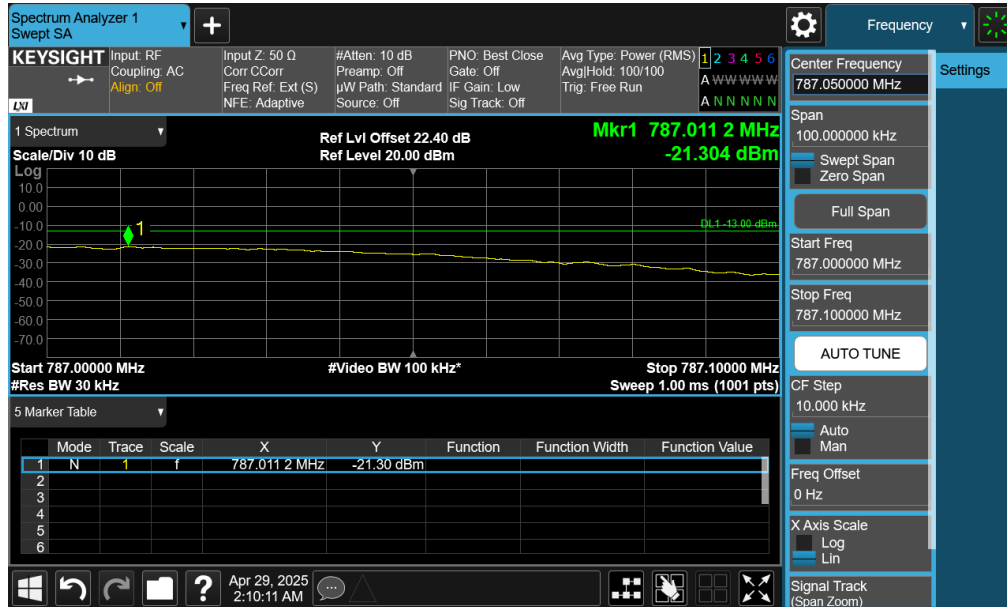
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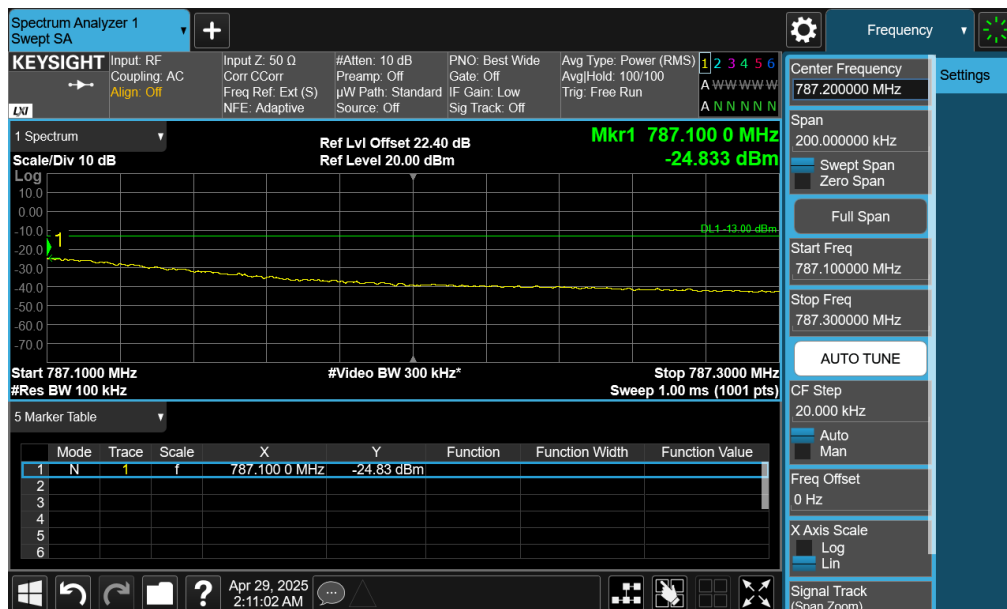
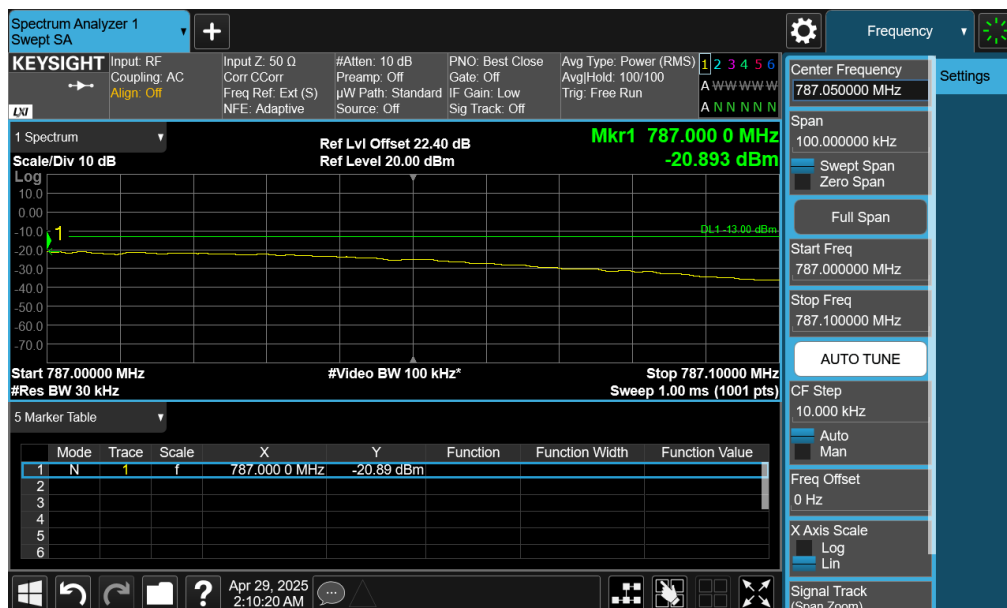
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Out-of-band/out-of-block emissions

UL_GSM_HCH_a single test signal_Pre-AGC



UL_GSM_HCH_a single test signal_3dB above AGC



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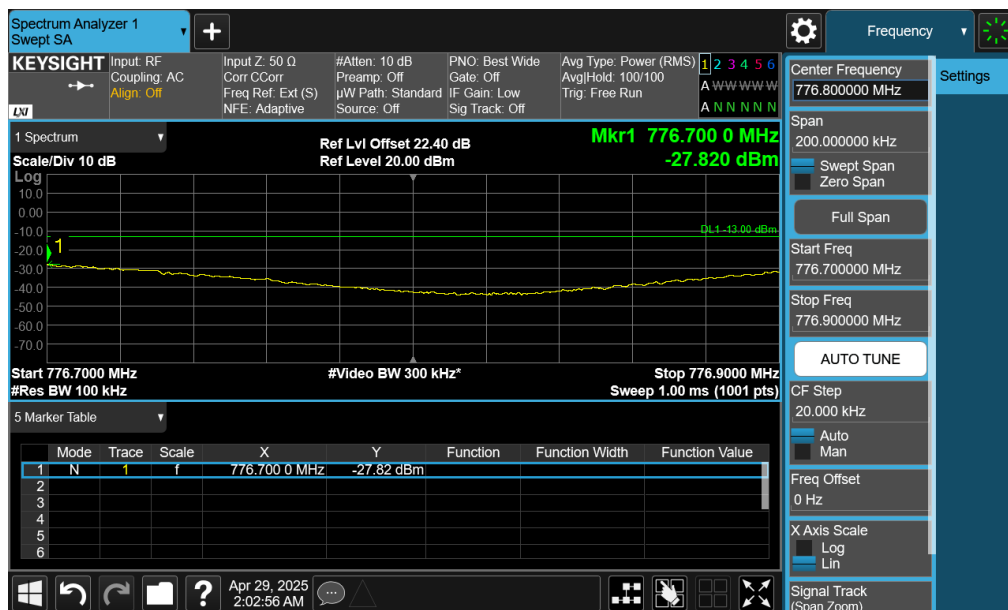
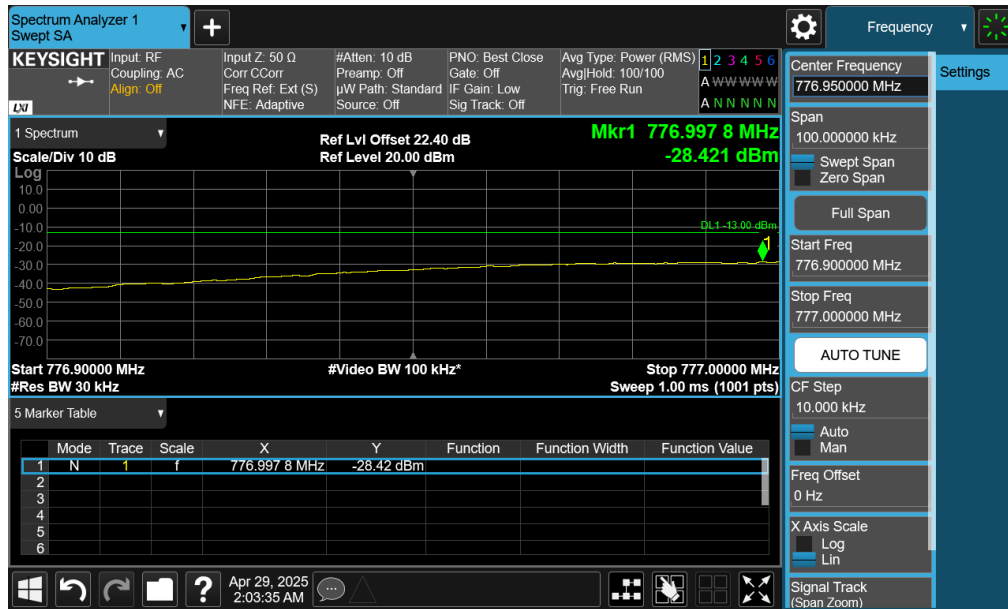
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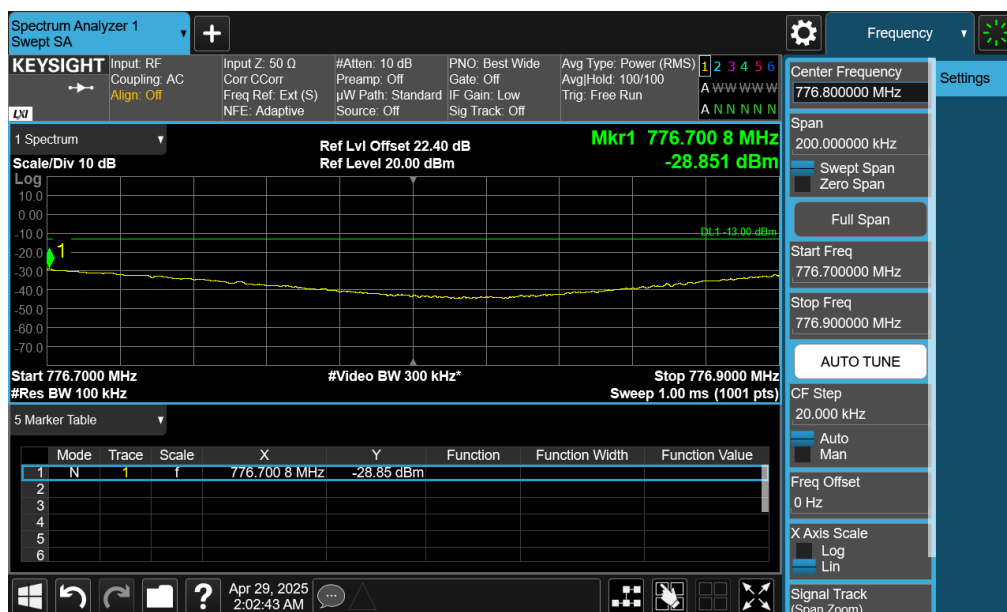
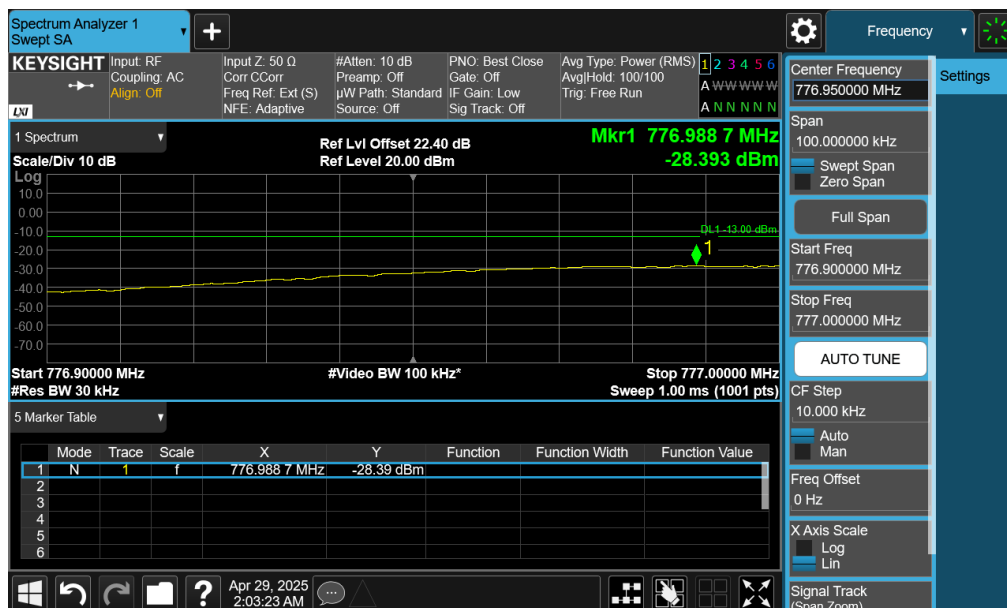
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Out-of-band/out-of-block emissions

UL_GSM_LCH_two adjacent test signals_Pre-AGC



UL_GSM_LCH_two adjacent test signals_3dB above AGC



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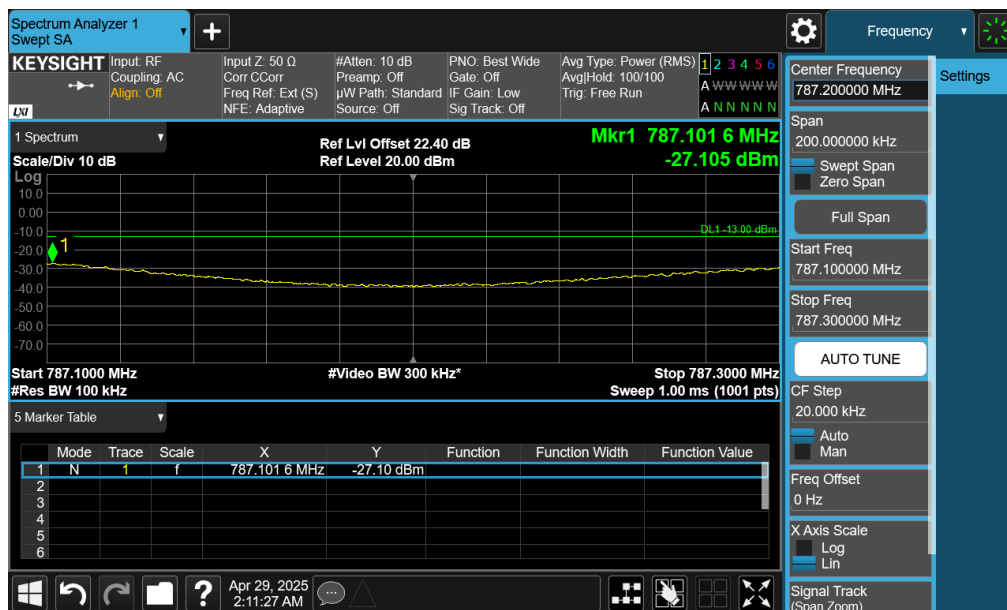
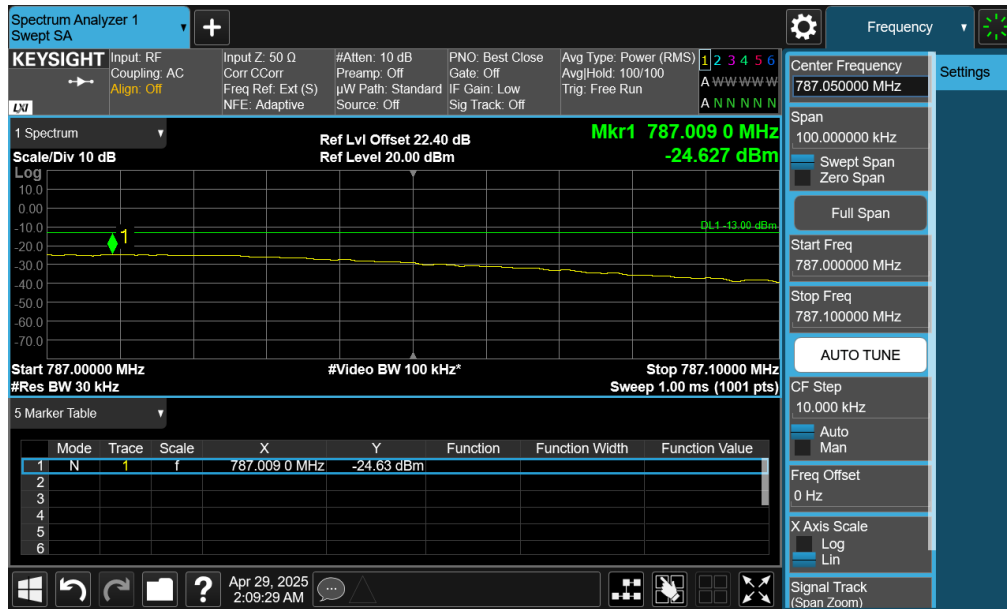
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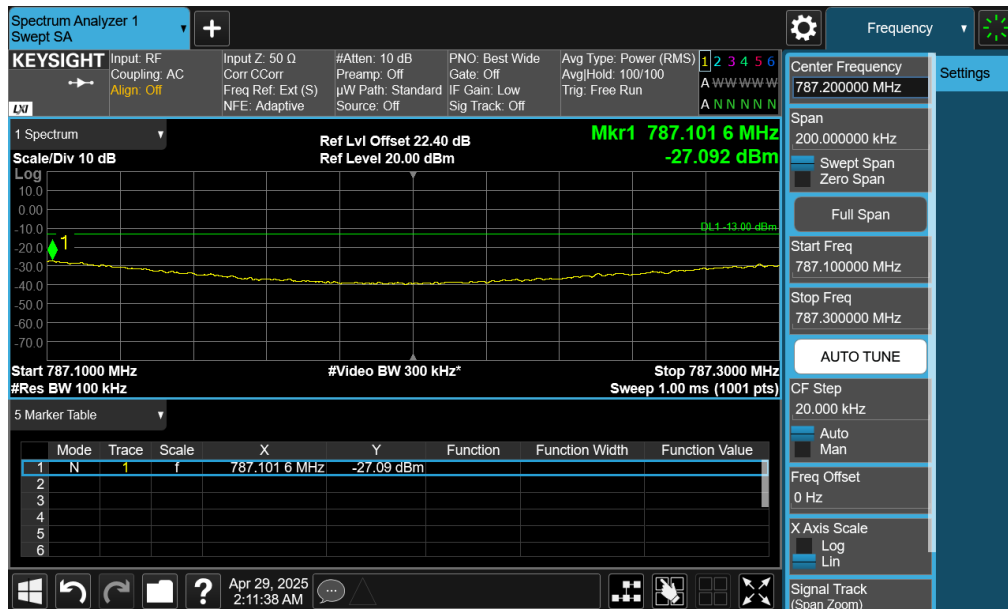
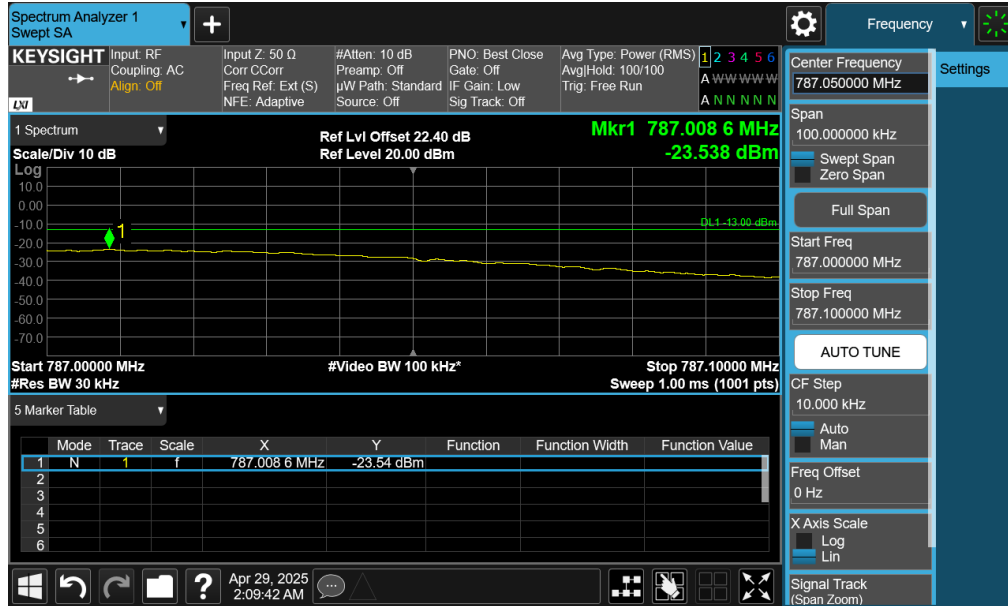
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Out-of-band/out-of-block emissions

UL_GSM_HCH_two adjacent test signals_Pre-AGC



UL_GSM_HCH_two adjacent test signals_3dB above AGC



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5 Conducted Spurious emissions

Conducted Spurious emissions						
Test path	Test signal	Test channel	Frequency range (MHz)	Worst test level (dBm)	Limit (dBm)	Verdict
UL	GSM	LCH	0.09-776.9	-27.67	≤-13	PASS
			763-775	-87.86	≤-46	PASS
		HCH	793-805	-67.60	≤-46	PASS
			787.1-1000	-34.97	≤-13	PASS
			1000-7870	-32.69	≤-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,
 $P = 19\text{dBm} = 0.08\text{W}$
 $\text{limit} = 19\text{dBm} - [43 + 10\log_{10}(0.08\text{W})] \text{ dB} = -13\text{dBm}$
- On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10\log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations, here,
 $P = 19\text{dBm} = 0.08\text{W}$
 $\text{limit} = 19\text{dBm} - [76 + 10\log_{10}(0.08\text{W})] \text{ dB} = -46\text{dBm}$
- All modes (LCH/MCH/HCH, with 4.1MHz AWGN signal/ with 100MHz AWGN signal/ with GSM signal) had been tested, only show the worst-case in this report.
- The spurious emissions 9kHz to 30MHz were very low and not displayed test plots in this report.

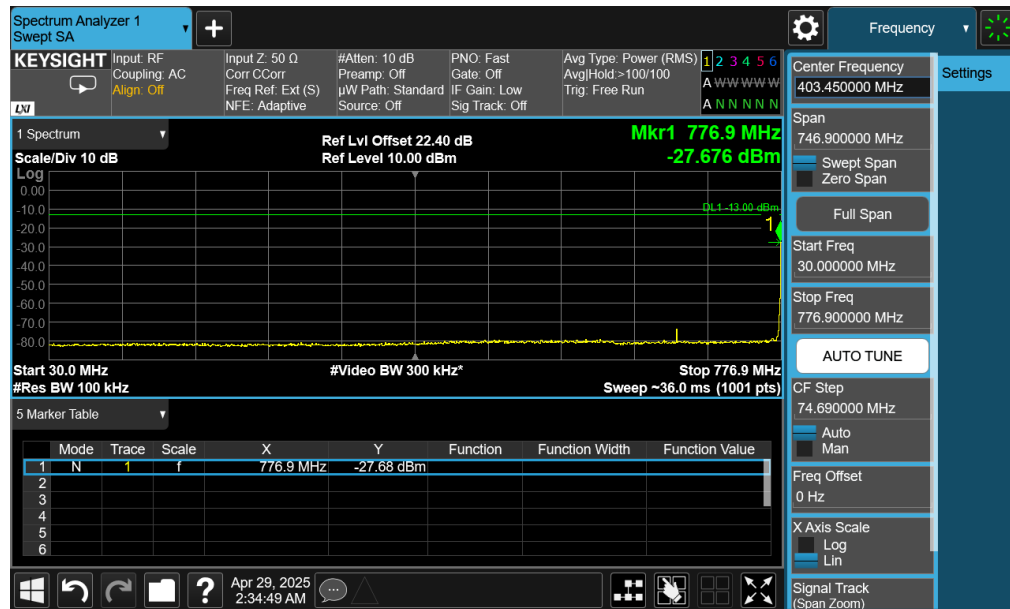


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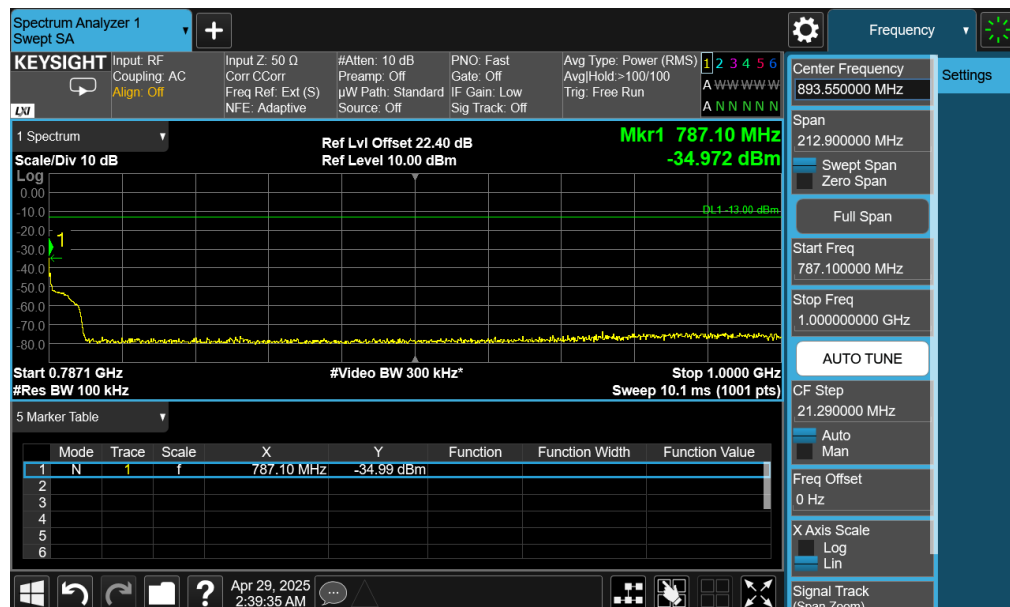
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Conducted spurious emissions

UL_GSM_LCH_Pre-AGC



UL_GSM_HCH_Pre-AGC



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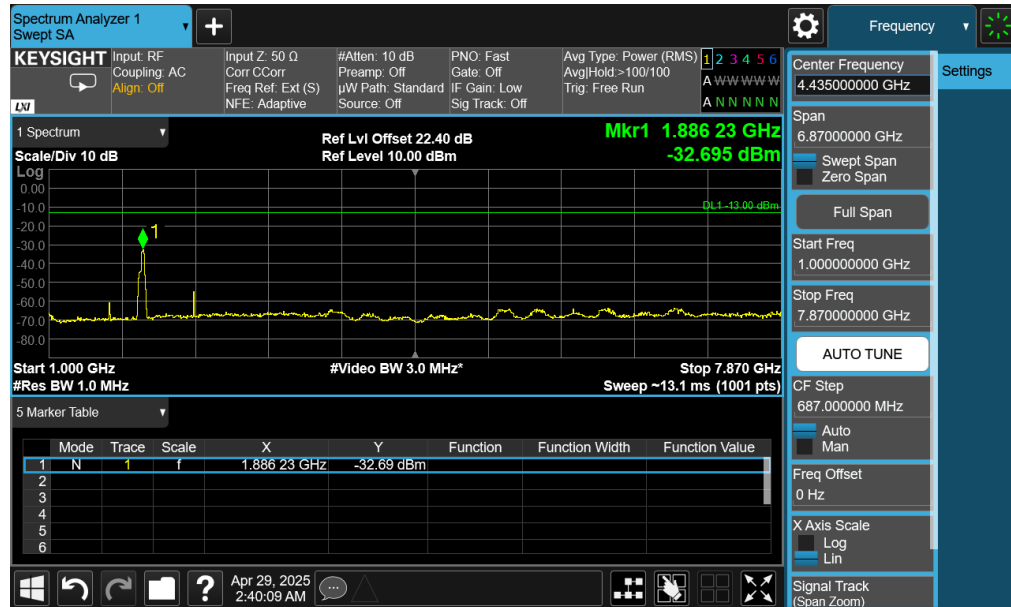
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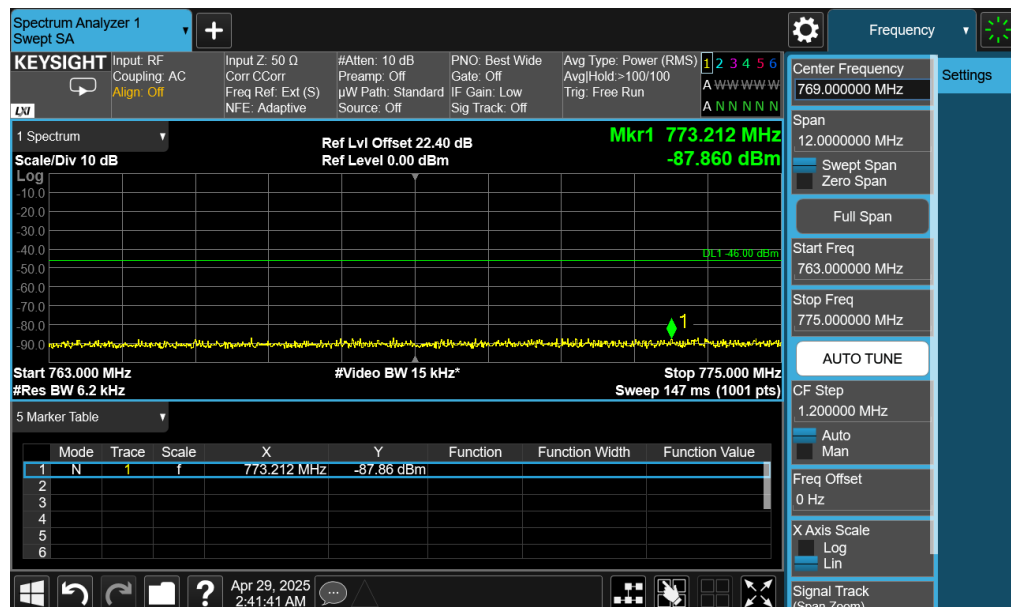
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Conducted spurious emissions

UL_GSM_HCH_Pre-AGC



UL_GSM_LCH_Pre-AGC



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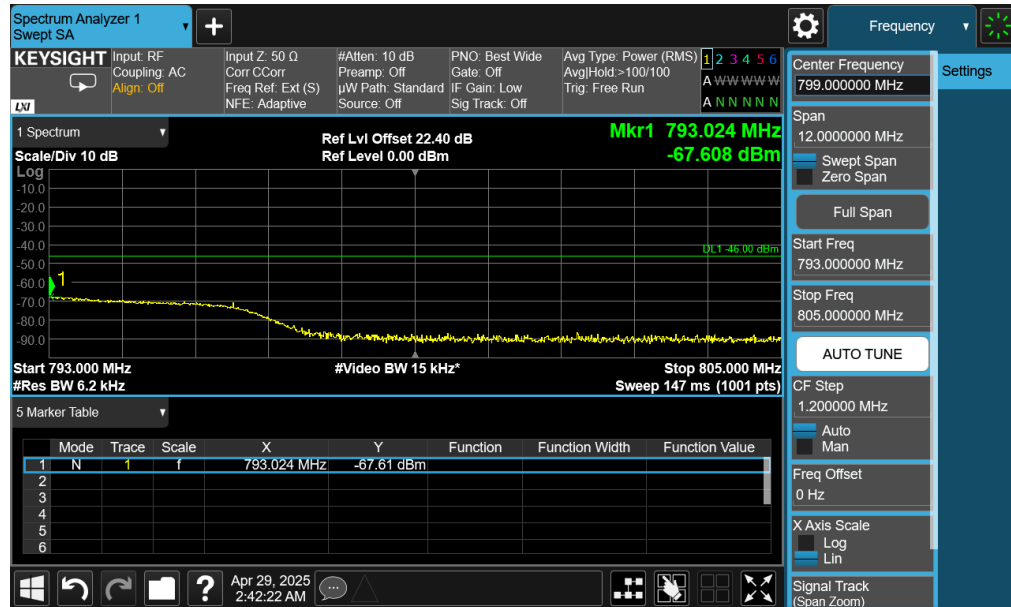
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Conducted spurious emissions

UL_GSM_HCH_Pre-AGC



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EMC-ARF-05 Rev 1.1

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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
UL	MCH	4.1MHz AWGN	TN	VL	7.0	0.00895	PASS
			TN	VH	7.0	0.00895	PASS
		100MHz AWGN	TN	VL	7.2	0.00921	PASS
			TN	VH	7.2	0.00921	PASS
		GSM	TN	VL	5.9	0.00754	PASS
			TN	VH	5.9	0.00754	PASS



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Frequency stability vs temperature							
Test Path	Test Channel	Test Signal	Voltage	Temperature (°C)	Freq. error (Hz)	Tolerance (ppm)	Verdict
UL	MCH	4.1MHz AWGN	VN	+50	7.3	0.00934	PASS
			VN	+40	4.5	0.00575	PASS
			VN	+30	8.0	0.01023	PASS
			VN	+20	5.4	0.00691	PASS
			VN	+10	4.6	0.00588	PASS
			VN	0	3.9	0.00499	PASS
			VN	-10	7.5	0.00959	PASS
			VN	-20	5.6	0.00716	PASS
			VN	-30	5.5	0.00703	PASS
	MCH	100MHz AWGN	VN	+50	4.5	0.00575	PASS
			VN	+40	7.2	0.00921	PASS
			VN	+30	6.9	0.00882	PASS
			VN	+20	8.1	0.01036	PASS
			VN	+10	6.9	0.00882	PASS
			VN	0	4.0	0.00512	PASS
			VN	-10	4.3	0.00550	PASS
			VN	-20	6.0	0.00767	PASS
			VN	-30	4.3	0.00550	PASS
	MCH	GSM	VN	+50	4.1	0.00524	PASS
			VN	+40	5.9	0.00754	PASS
			VN	+30	8.0	0.01023	PASS
			VN	+20	7.8	0.00997	PASS
			VN	+10	4.1	0.00524	PASS
			VN	0	4.9	0.00627	PASS
			VN	-10	7.5	0.00959	PASS
			VN	-20	4.6	0.00588	PASS
			VN	-30	7.2	0.00921	PASS



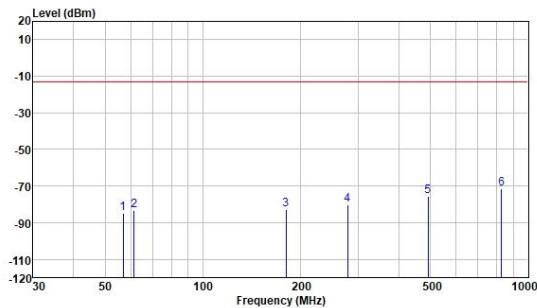
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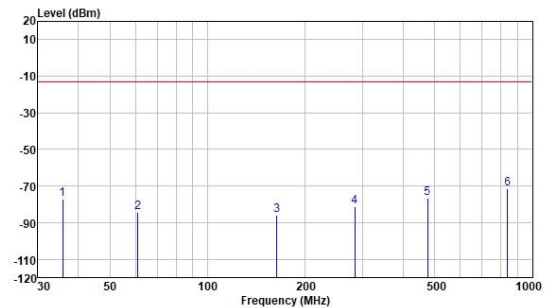
7 Radiated Spurious emissions

Radiated Spurious emissions

UL_4.1MHz AWGN_MCH_30MHz-1GHz

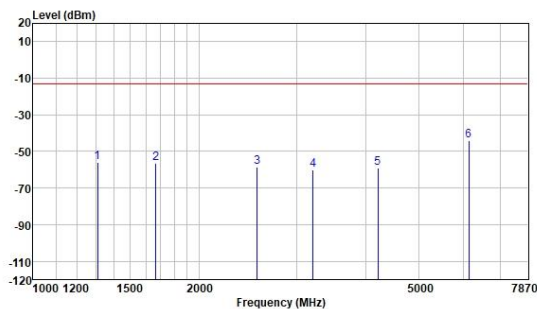


	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	56.79	-81.95	-3.18	-85.13	-13.00	-72.13	VERTICAL
2	61.35	-80.43	-2.67	-83.10	-13.00	-70.10	VERTICAL
3	180.02	-78.79	-3.94	-82.73	-13.00	-69.73	VERTICAL
4	278.07	-77.33	-2.82	-80.15	-13.00	-67.15	VERTICAL
5	492.47	-77.39	1.96	-75.43	-13.00	-62.43	VERTICAL
6	827.49	-79.03	7.66	-71.37	-13.00	-58.37	VERTICAL

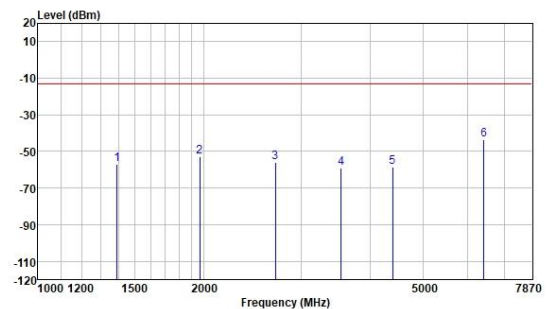


	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	35.75	-79.88	2.76	-77.12	-13.00	-64.12	HORIZONTAL
2	60.92	-81.47	-2.75	-84.22	-13.00	-71.22	HORIZONTAL
3	163.18	-79.62	-6.35	-85.97	-13.00	-72.97	HORIZONTAL
4	283.98	-78.75	-2.52	-81.27	-13.00	-68.27	HORIZONTAL
5	475.50	-76.82	0.34	-76.48	-13.00	-63.48	HORIZONTAL
6	839.18	-78.57	7.19	-71.38	-13.00	-58.38	HORIZONTAL

UL_4.1MHz AWGN_MCH_above 1GHz



	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1309.31	-60.41	4.24	-56.17	-13.00	-43.17	VERTICAL
2	1667.28	-61.75	5.39	-56.36	-13.00	-43.36	VERTICAL
3	2546.44	-64.87	6.60	-58.27	-13.00	-45.27	VERTICAL
4	3208.15	-62.45	2.62	-59.83	-13.00	-46.83	VERTICAL
5	4209.46	-63.37	4.19	-59.18	-13.00	-46.18	VERTICAL
6	6146.71	-62.85	19.03	-43.82	-13.00	-30.82	VERTICAL



	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1390.12	-61.65	4.56	-57.09	-13.00	-44.09	HORIZONTAL
2	1965.78	-61.52	8.06	-52.66	-13.00	-39.66	HORIZONTAL
3	2692.06	-60.53	4.53	-56.00	-13.00	-43.00	HORIZONTAL
4	3547.43	-62.73	3.95	-58.78	-13.00	-45.78	HORIZONTAL
5	4393.43	-62.93	4.45	-58.48	-13.00	-45.48	HORIZONTAL
6	6429.09	-62.93	19.55	-43.38	-13.00	-30.38	HORIZONTAL



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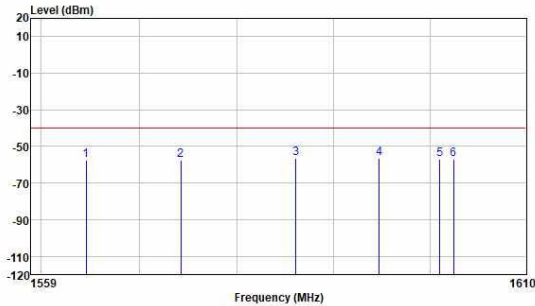
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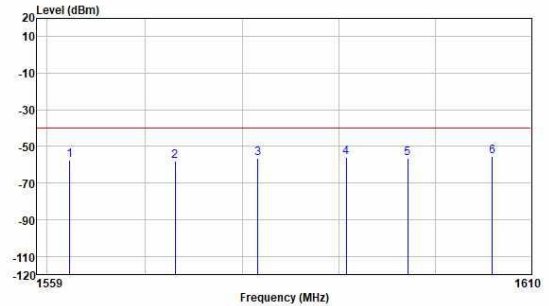
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Radiated Spurious emissions

UL_4.1MHz AWGN_MCH_1559MHz-1610MHz



	Freq	Read Level	Correction Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1564.58	-62.95	5.51	-57.44	-40.00	-17.44	VERTICAL
2	1574.28	-62.69	5.31	-57.38	-40.00	-17.38	VERTICAL
3	1586.08	-61.51	5.04	-56.47	-40.00	-16.47	VERTICAL
4	1594.68	-61.22	4.97	-56.25	-40.00	-16.25	VERTICAL
5	1601.01	-61.69	4.82	-56.87	-40.00	-16.87	VERTICAL
6	1602.40	-62.04	4.82	-57.22	-40.00	-17.22	VERTICAL



	Freq	Read Level	Correction Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1562.32	-62.38	5.04	-57.34	-40.00	-17.34	HORIZONTAL
2	1573.12	-63.22	5.12	-58.10	-40.00	-18.10	HORIZONTAL
3	1581.59	-61.43	5.17	-56.26	-40.00	-16.26	HORIZONTAL
4	1590.73	-61.40	5.20	-56.20	-40.00	-16.20	HORIZONTAL
5	1597.10	-61.74	5.22	-56.52	-40.00	-16.52	HORIZONTAL
6	1605.91	-60.93	5.28	-55.65	-40.00	-15.65	HORIZONTAL

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.

--End of Appendix--



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