

Appendix -

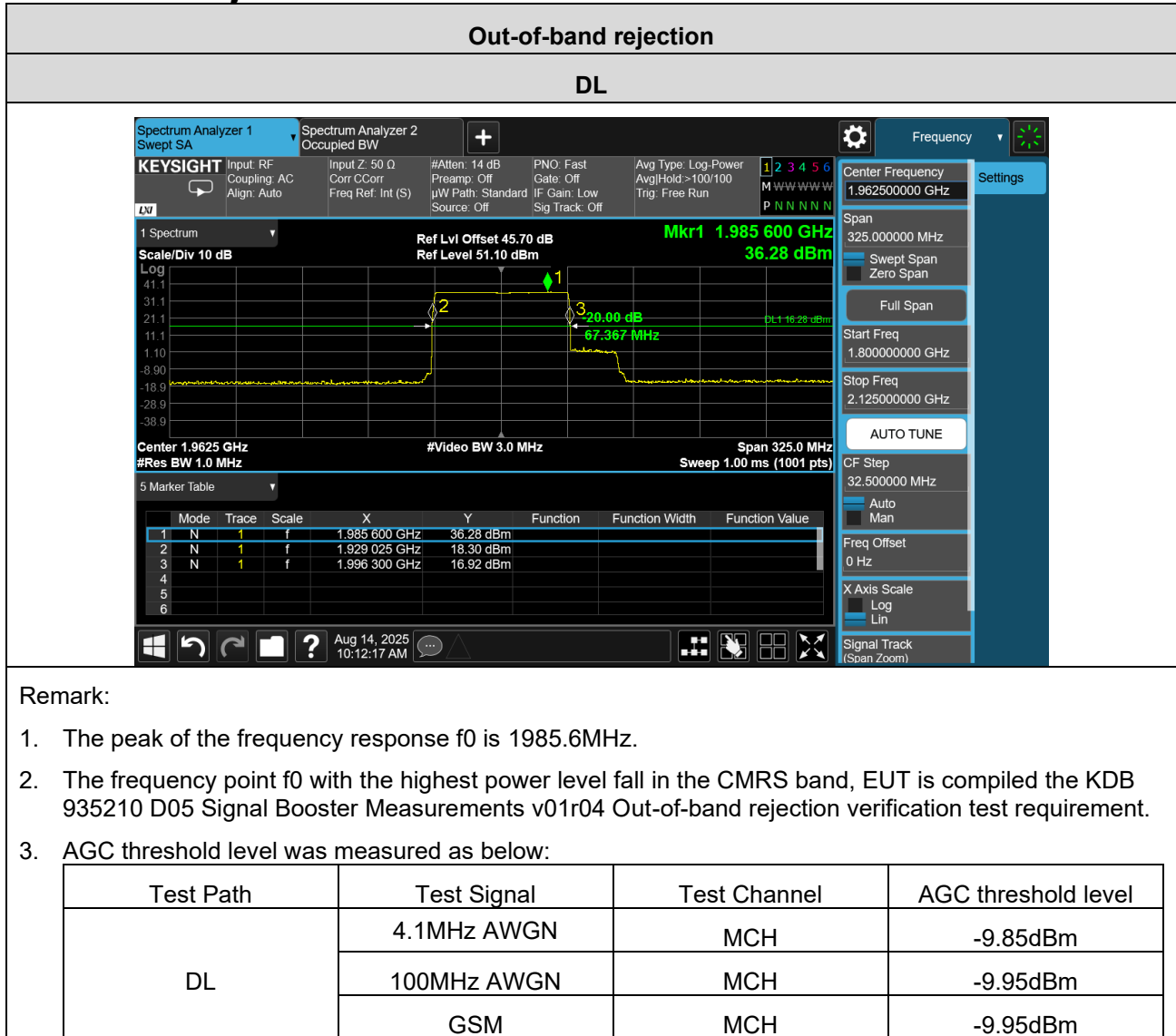
Test Data and Result for report

GZCR250800119306

(For Broadband PCS band DL)



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 single channel BW is 60MHz 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.

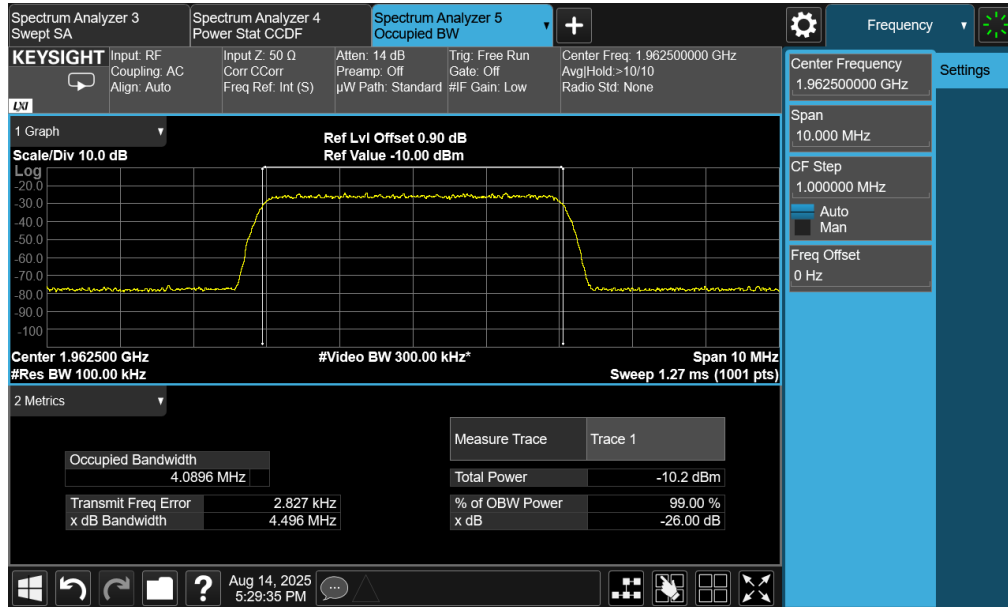


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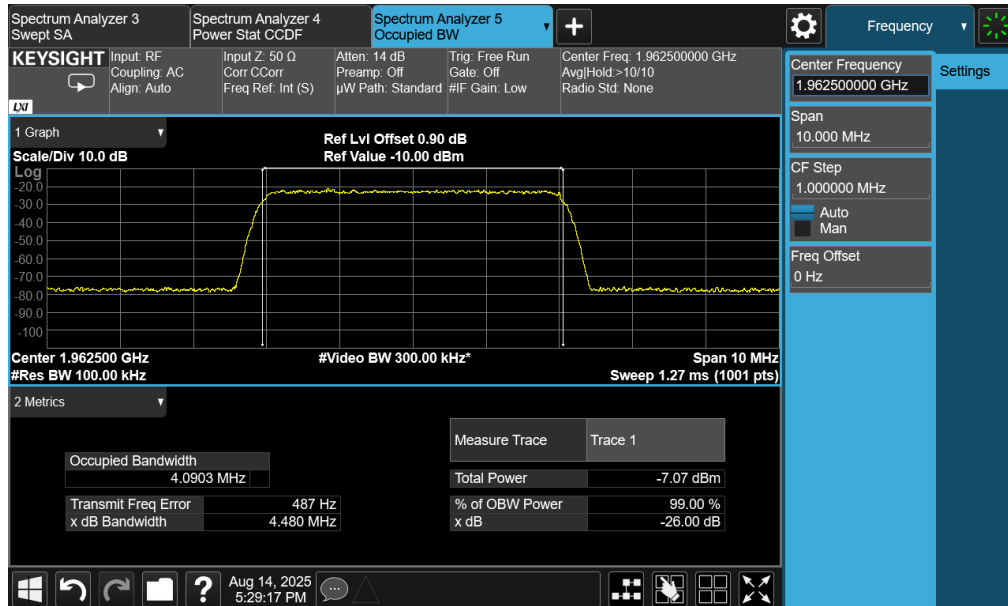
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99% OBW

DL_4.1MHz AWGN_MCH_Input_Pre-AGC

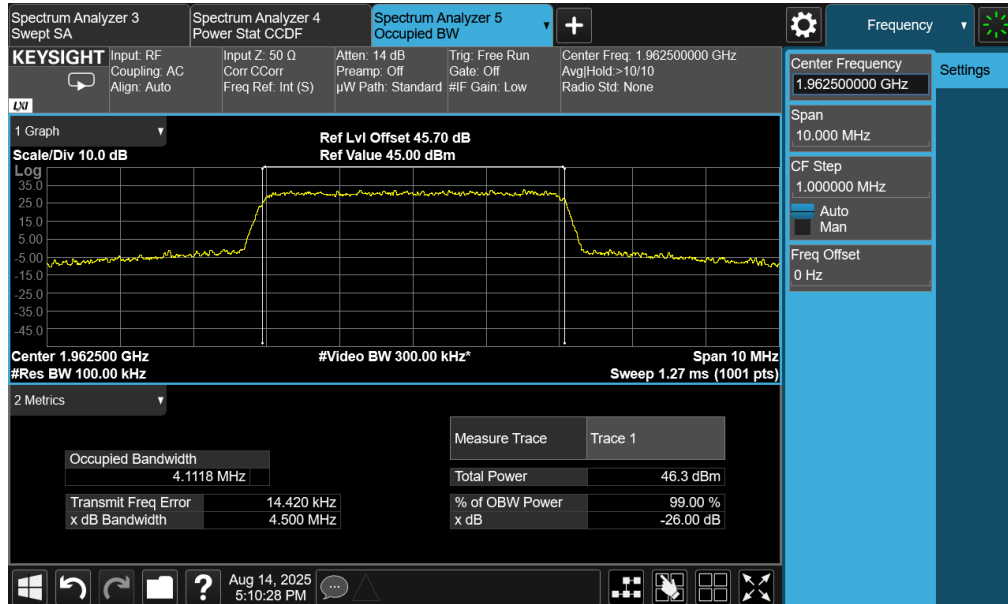


DL_4.1MHz AWGN_MCH_Input_3dB above AGC

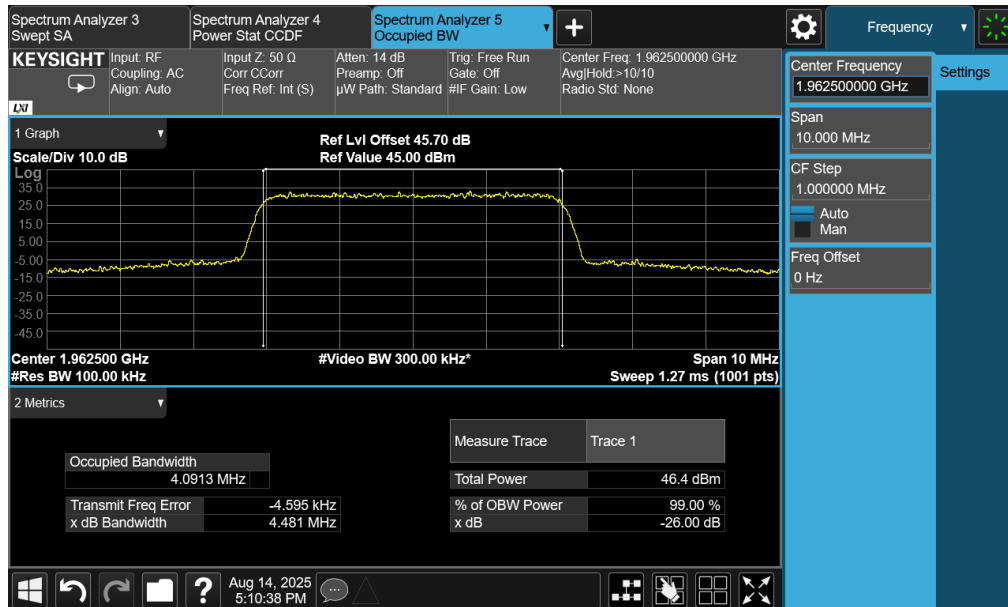


99% OBW

DL_4.1MHz AWGN_MCH_Output_Pre-AGC



DL_4.1MHz AWGN_MCH_Output_3dB above AGC



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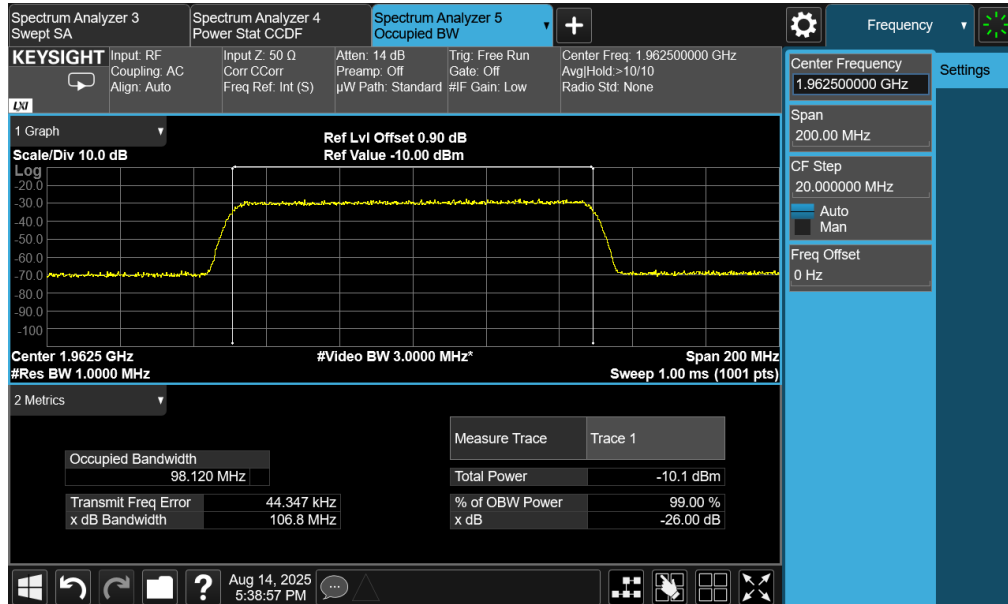
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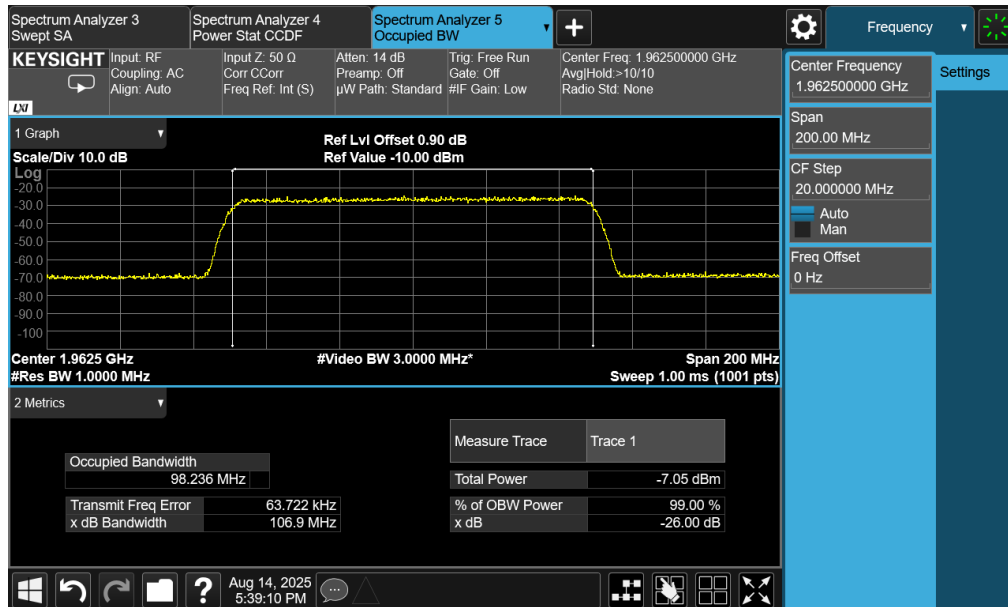
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99% OBW

DL_100MHz AWGN_MCH_Input_Pre-AGC



DL_100MHz AWGN_MCH_Input_3dB above AGC



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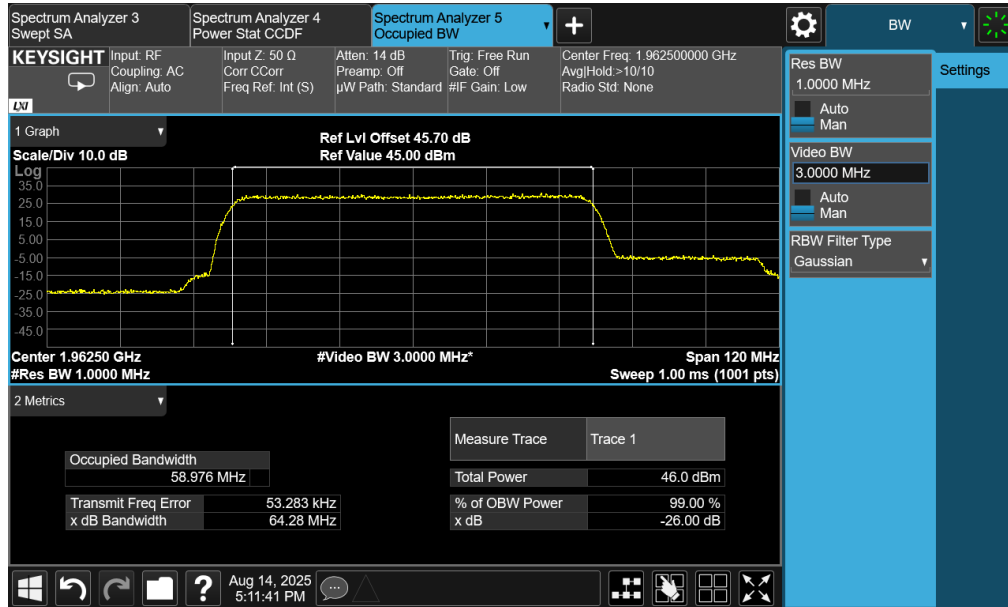
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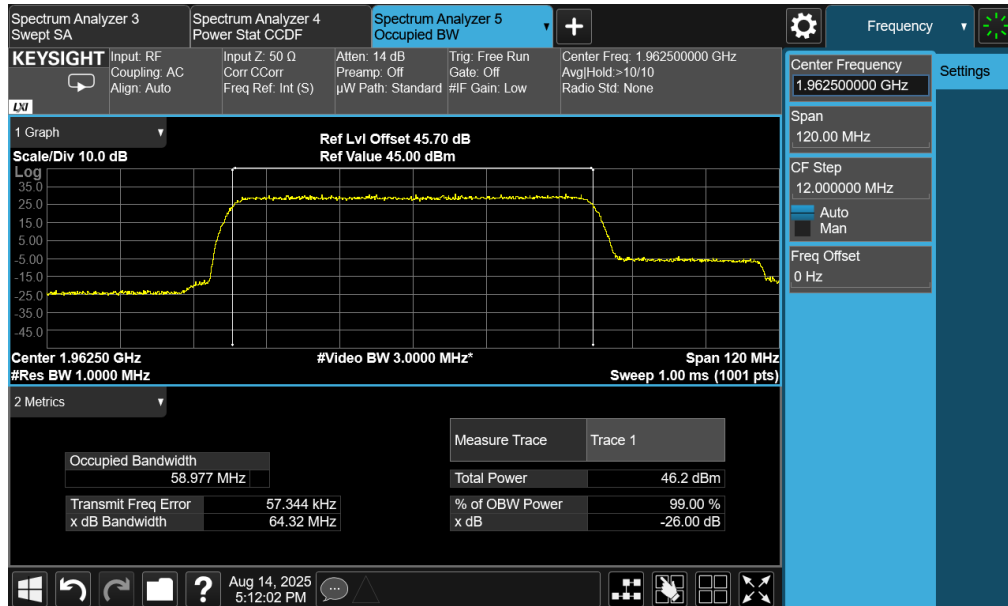
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99% OBW

DL_100MHz AWGN_MCH_Output_Pre-AGC



DL_100MHz AWGN_MCH_Output_3dB above AGC



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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)	EIRP (dBm)	EIRP (W)	Gain (dB)
DL	1985.6	4.1MHz AWGN	Pre-AGC	-10	46.27	51.27	133.97	56.27
			3dB above AGC	-7	46.62	51.62	145.21	/
		100MHz AWGN	Pre-AGC	-10	46.09	51.09	128.53	56.09
			3dB above AGC	-7	46.22	51.22	132.43	/
		GSM	Pre-AGC	-10	46.58	51.58	143.88	56.58
			3dB above AGC	-7	46.73	51.73	148.94	/
Remark: 1. f0 is from Out-of-band Rejection test in the report. 2. EIRP= output power (dBm)+ antenna gain (dBi), the antenna gain is 5dBi declared by the manufacturer.								

Mean output power							
Test Path	Test Freq. f0 (MHz)	Test Signal	Signal Level	Output Power (dBm/MHz)	EIRP (dBm/MHz)	EIRP (W/MHz)	Verdict
DL	1985.6	4.1MHz AWGN	Pre-AGC	40.03	45.03	31.84	PASS
			3dB above AGC	40.27	45.27	33.65	PASS
		100MHz AWGN	Pre-AGC	28.85	33.85	2.43	PASS
			3dB above AGC	29.03	34.03	2.53	PASS
		GSM	Pre-AGC	46.58	51.58	143.88	PASS
			3dB above AGC	46.73	51.73	148.94	PASS
Remark: 1. f0 is from Out-of-band Rejection test in the report. 2. EIRP= output power (dBm)+ antenna gain (dBi), the antenna gain is 5dBi declared by the manufacturer. 3. The output power is limited to an EIRP of 1640W/MHz.							



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Peak-to-average ratio (PAR)						
Test path	Test freq. f0 (MHz)	Test Signal	Signal level	PAR (dB)	Limit (dB)	Verdict
DL	1985.6	4.1MHz AWGN	Pre-AGC	9.68	≤13	PASS
			3dB above AGC	9.37		PASS
		100MHz AWGN	Pre-AGC	9.55		PASS
			3dB above AGC	9.64		PASS
Remark: The GSM signal is narrow band signal with extremity low PAR values (the worst case is lower than 0.3dB), so only the test plots for 4.1MHz and 100MHz AWGN were record in the report for demonstrate PAR compliance.						

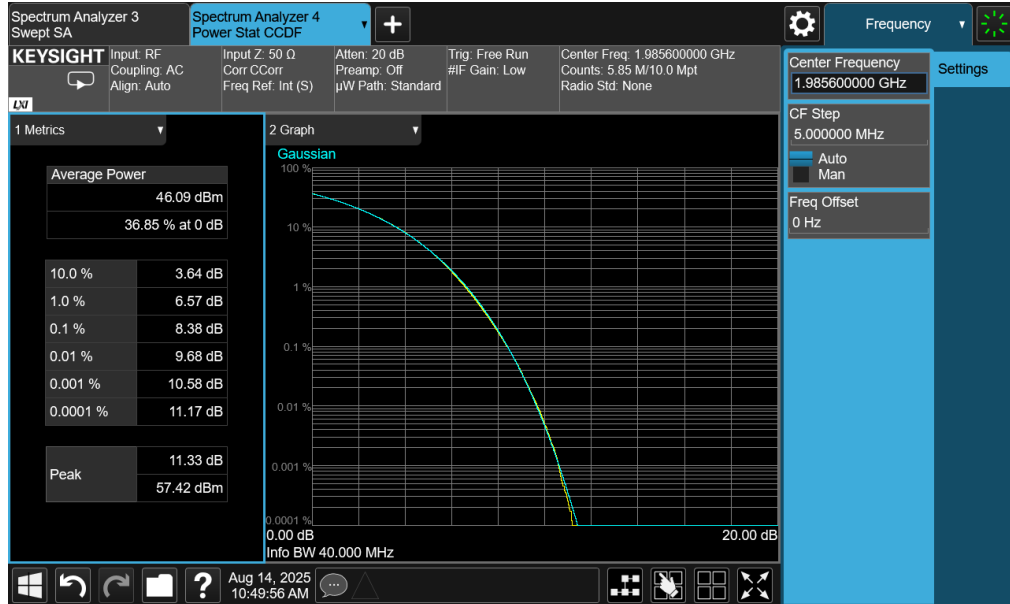


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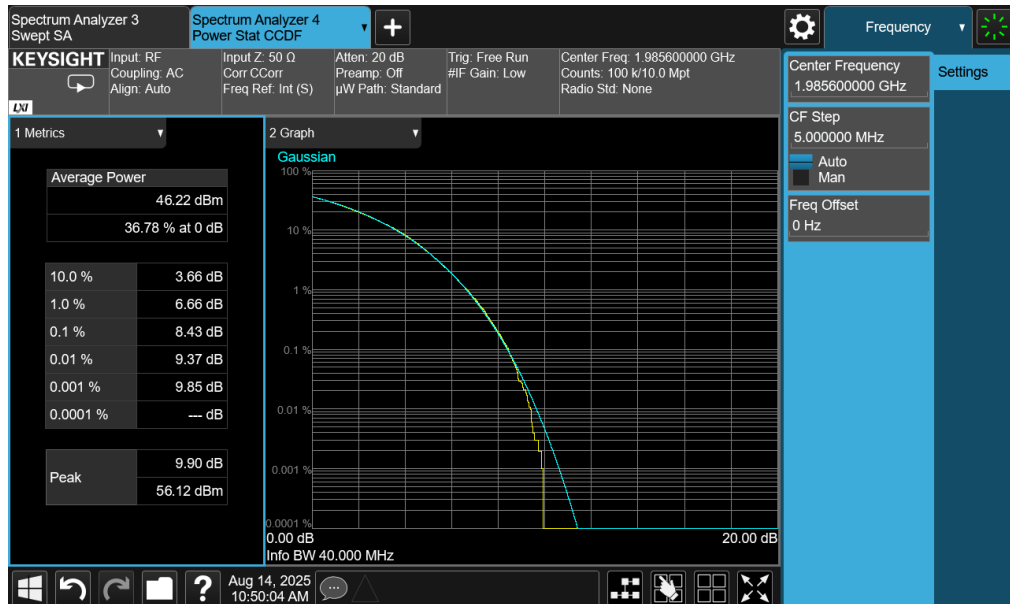
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Peak-to-average ratio (PAR)

DL_4.1MHz AWGN_Pre-AGC



DL_4.1MHz AWGN_3dB above AGC



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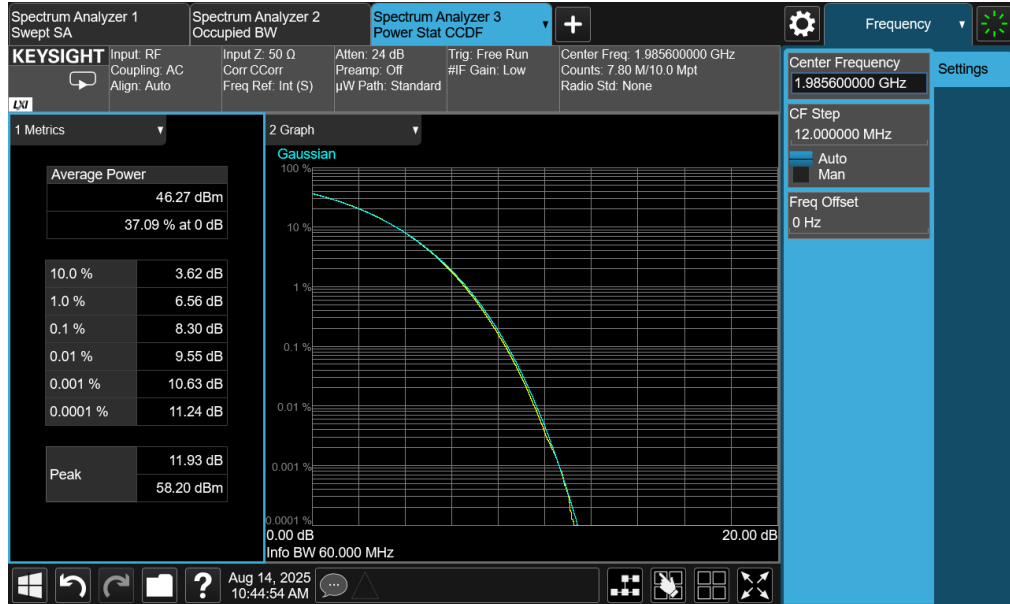
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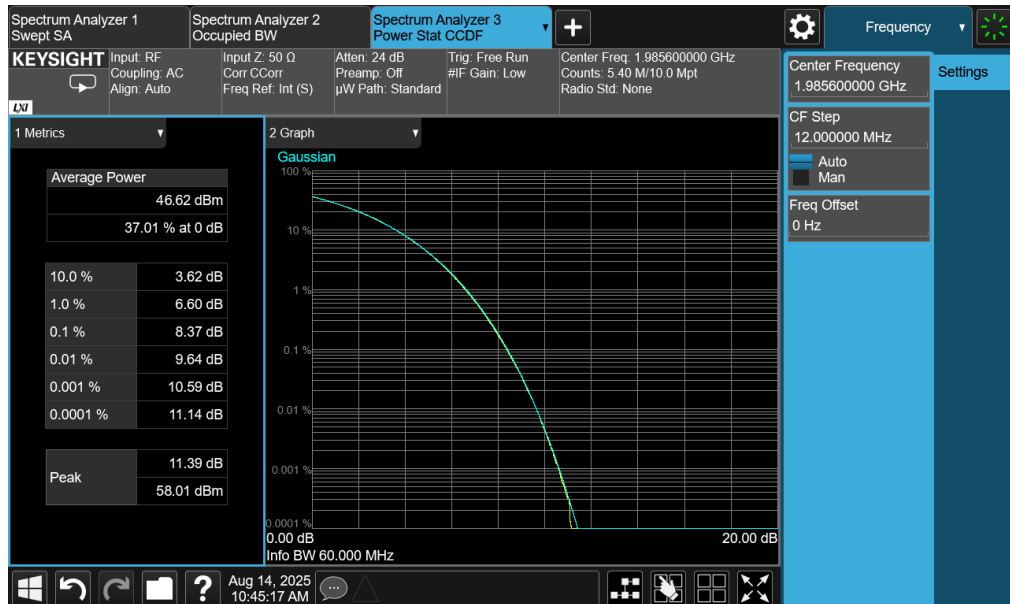
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Peak-to-average ratio (PAR)

DL_100MHz AWGN_Pre-AGC



DL_100MHz AWGN_3dB above AGC



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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	-14.93	≤-13	PASS
				3dB above AGC	-17.48		PASS
			Two signals input	Pre-AGC	-23.26		PASS
				3dB above AGC	-22.68		PASS
	HCH		One signal input	Pre-AGC	-15.92		PASS
				3dB above AGC	-15.76		PASS
			Two signals input	Pre-AGC	-17.03		PASS
				3dB above AGC	-16.42		PASS
DL	LCH	100MHz AWGN	One signal input	Pre-AGC	-16.00	≤-13	PASS
	3dB above AGC			-15.78	PASS		
	HCH		One signal input	Pre-AGC	-13.48		PASS
				3dB above AGC	-13.65		PASS
DL	LCH	GSM	One signal input	Pre-AGC	-29.14	≤-13	PASS
				3dB above AGC	-28.25		PASS
			Two signals input	Pre-AGC	-13.51		PASS
				3dB above AGC	-13.68		PASS
	HCH		One signal input	Pre-AGC	-14.97		PASS
				3dB above AGC	-15.12		PASS
			Two signals input	Pre-AGC	-21.93		PASS
				3dB above AGC	-22.66		PASS

Remark:

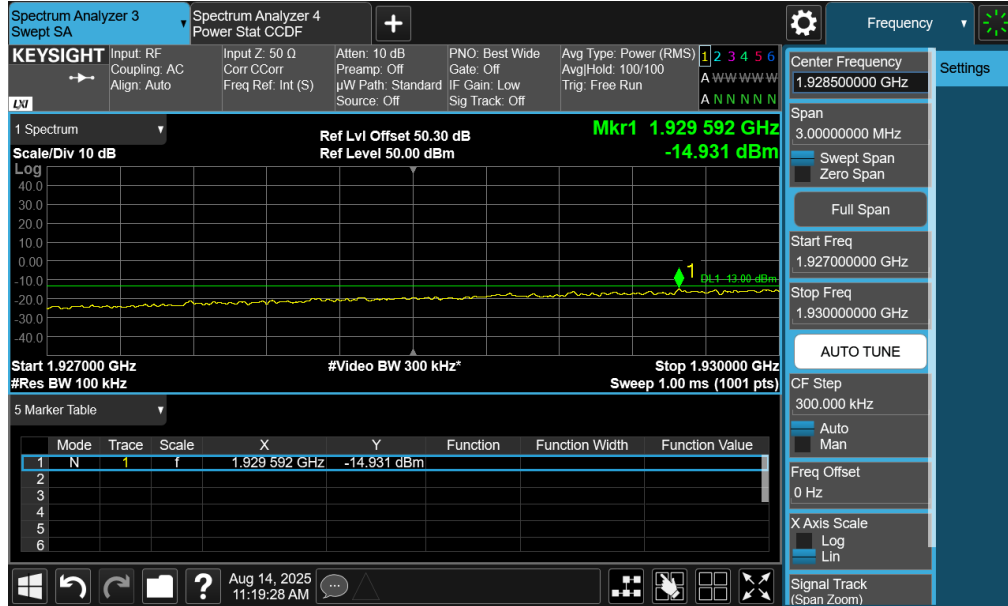
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\log_{10}(P)$ dB, here,

$P = 46\text{dBm} = 40\text{W}$

the limit = $46\text{dBm} - [43 + 10\log_{10}(40\text{W})]\text{dB} = -13\text{dBm}$

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



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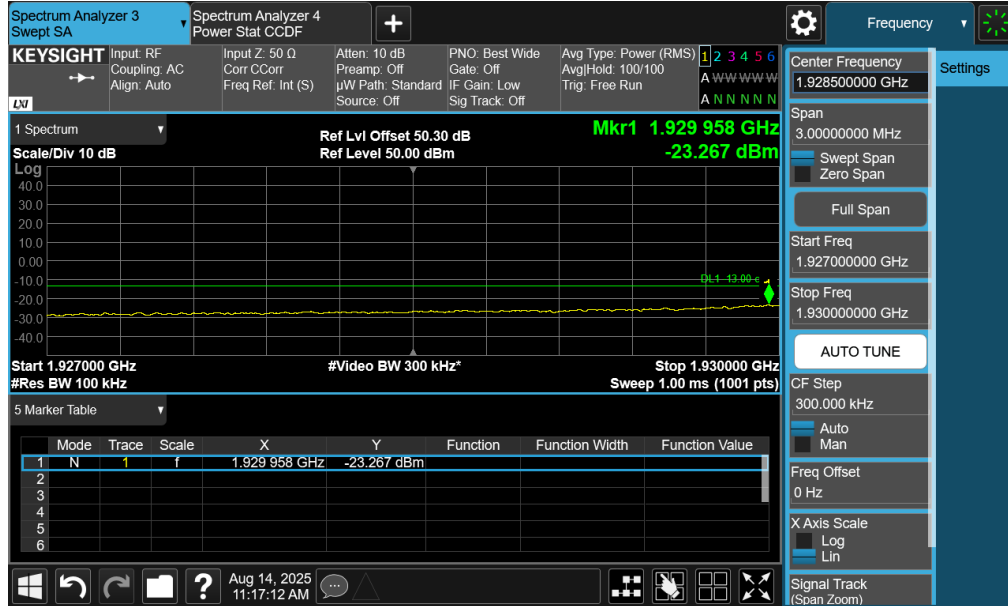
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Out-of-band/out-of-block emissions

DL_4.1MHz AWGN_LCH_two adjacent test signals_Pre-AGC



DL_4.1MHz AWGN_LCH_two adjacent test signals_3dB above AGC



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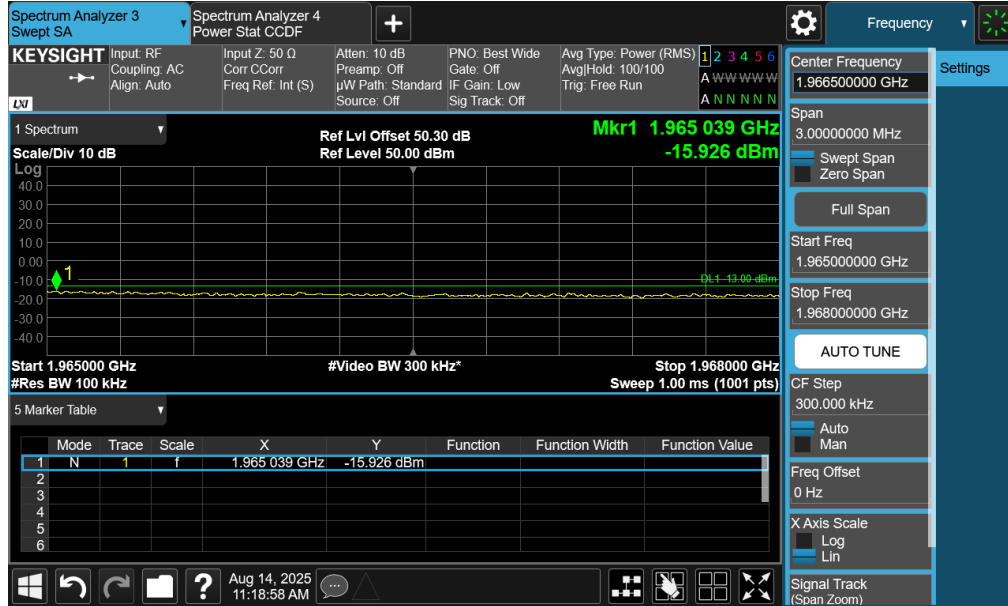
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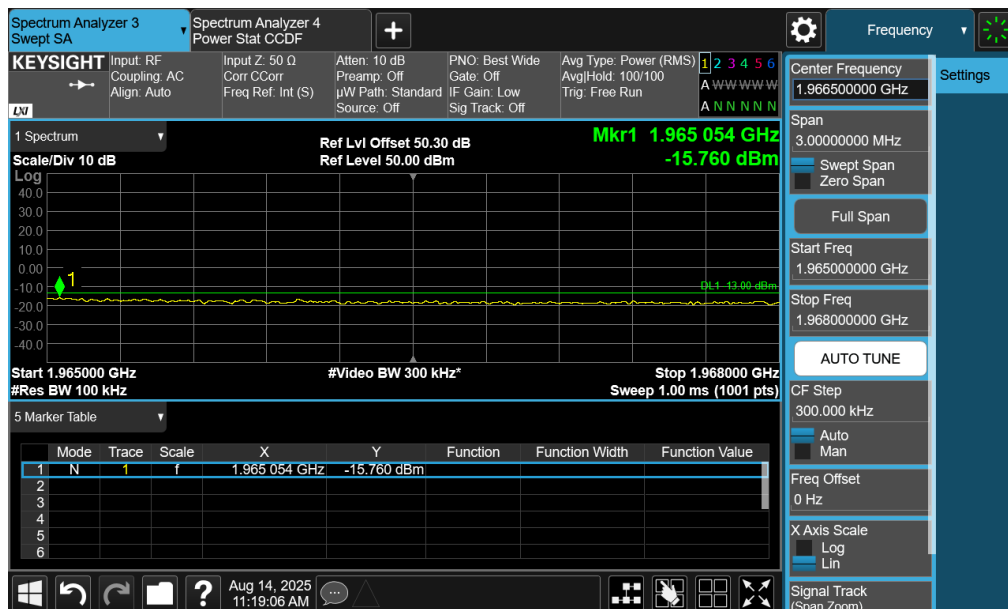
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Out-of-band/out-of-block emissions

DL_4.1MHz AWGN_HCH_a single test signal_Pre-AGC



DL_4.1MHz AWGN_HCH_a single test signal_3dB above AGC



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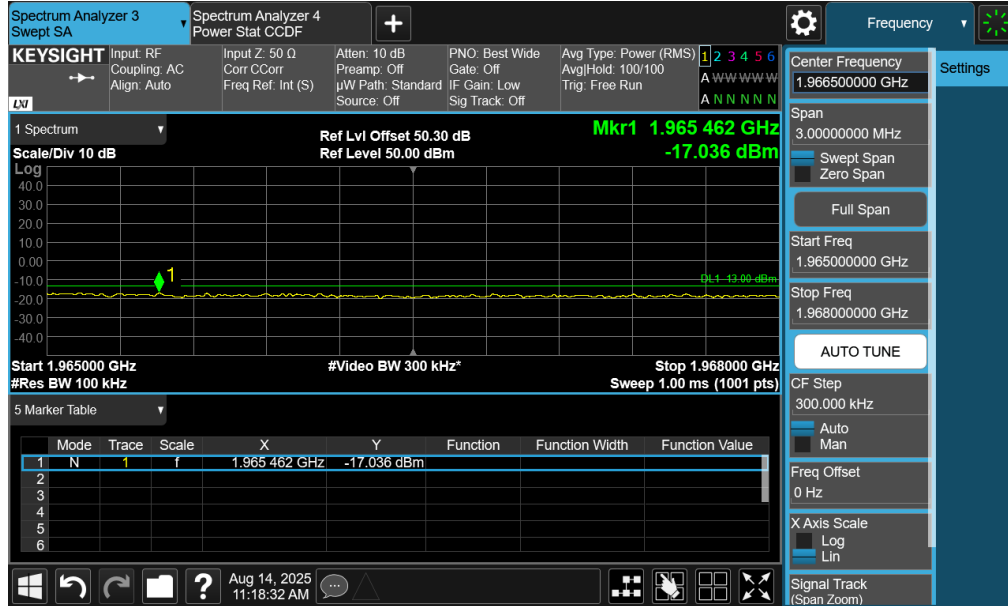
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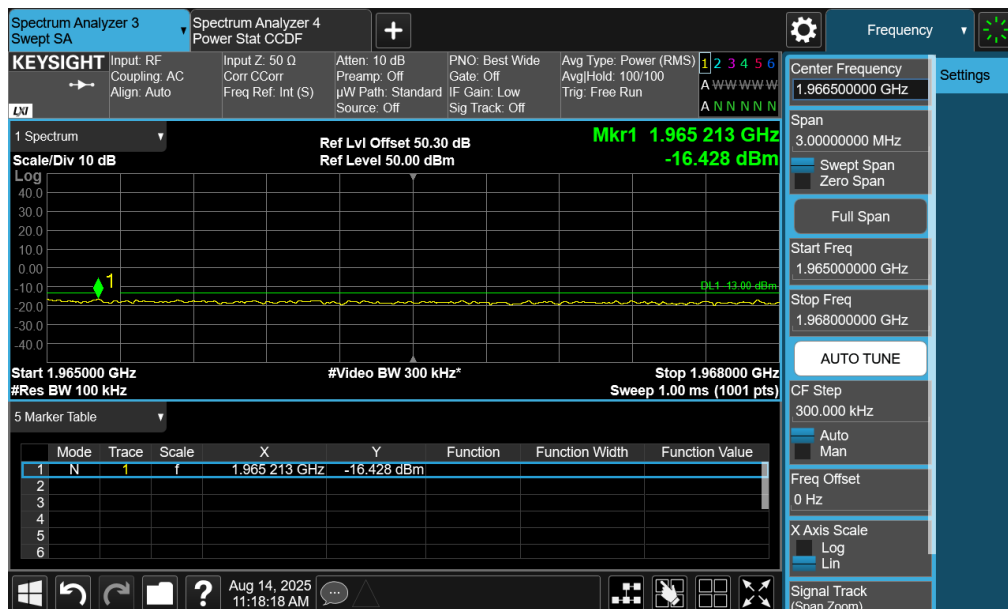
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Out-of-band/out-of-block emissions

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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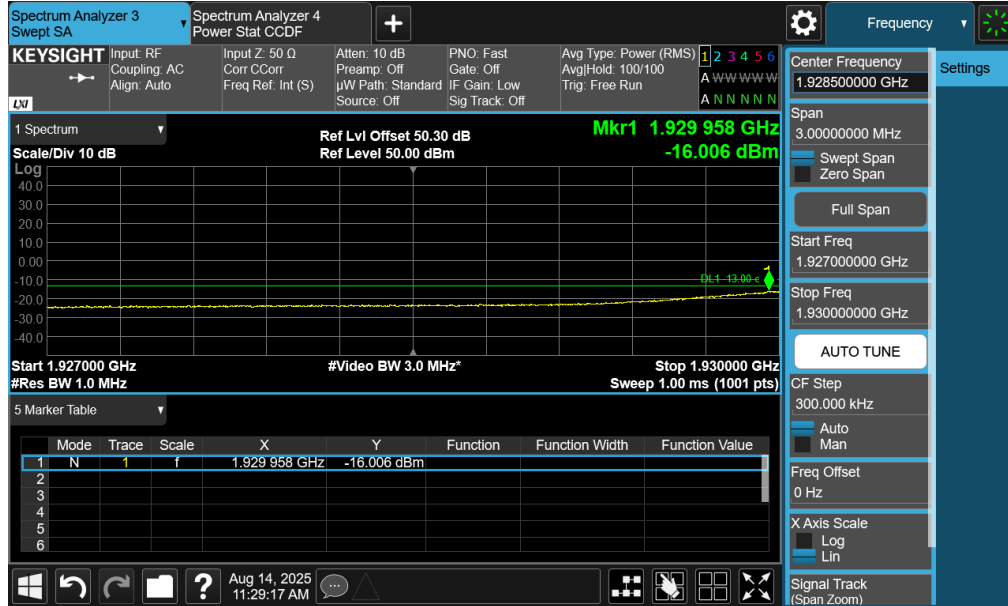
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No. 198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663
 中国·广东·广州高新技术产业开发区科学城科珠路198号 邮编: 510663

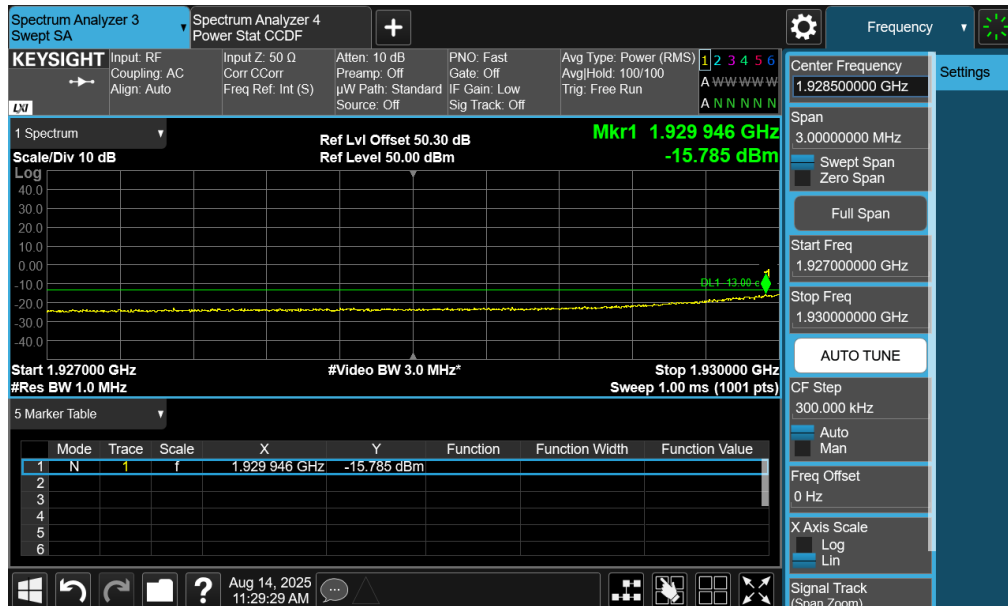
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Out-of-band/out-of-block emissions

DL_100MHz AWGN_LCH_a single test signal_Pre-AGC



DL_100MHz AWGN_LCH_a single test signal_3dB above AGC



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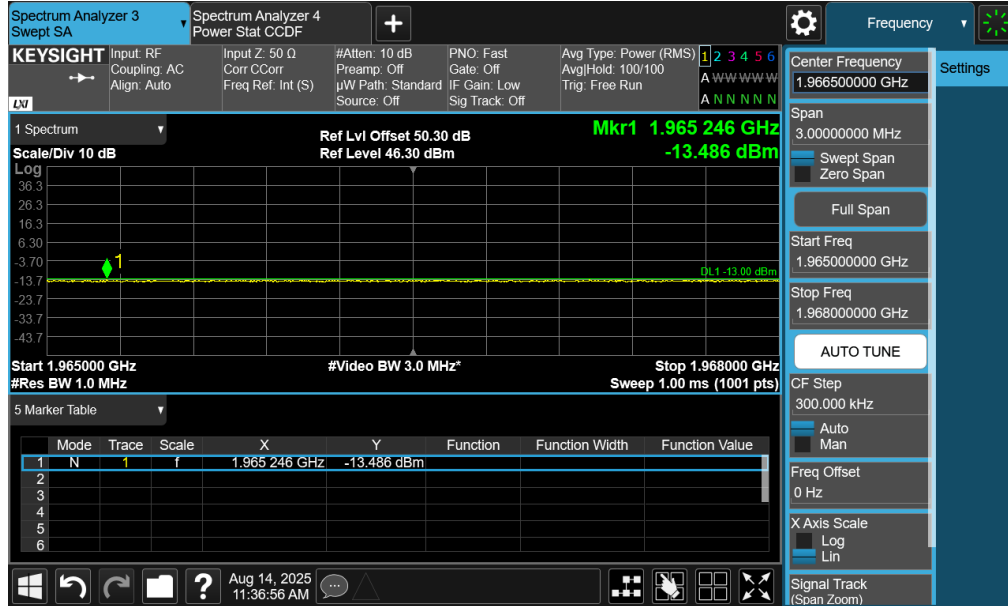
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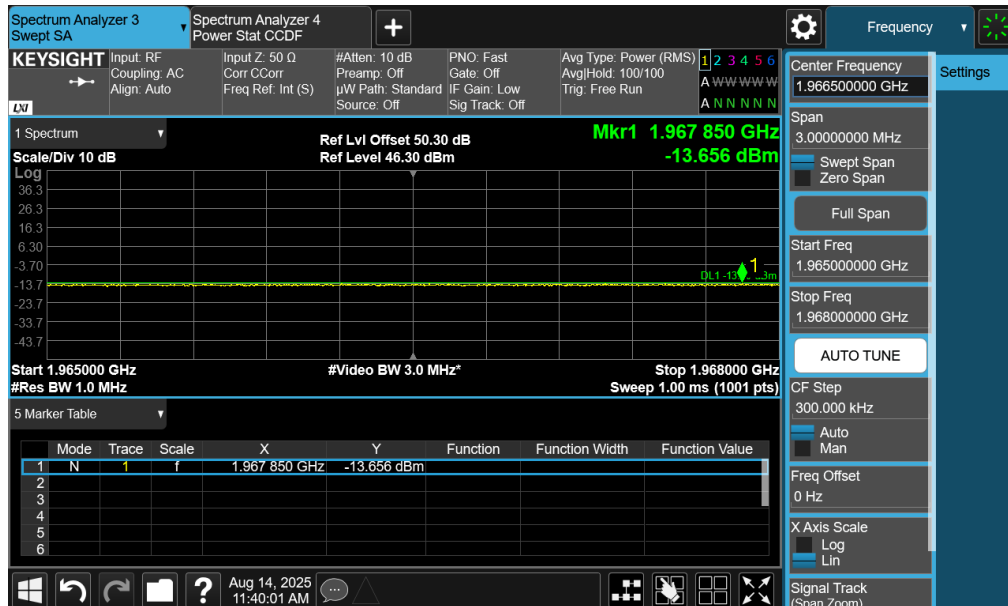
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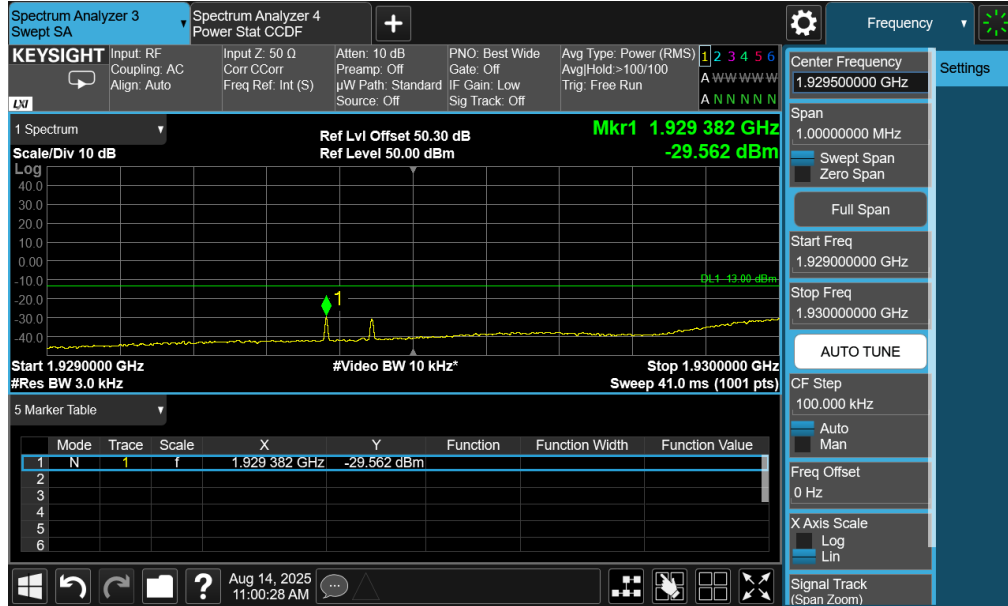
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Out-of-band/out-of-block emissions

DL_GSM_LCH_a single test signal_Pre-AGC



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

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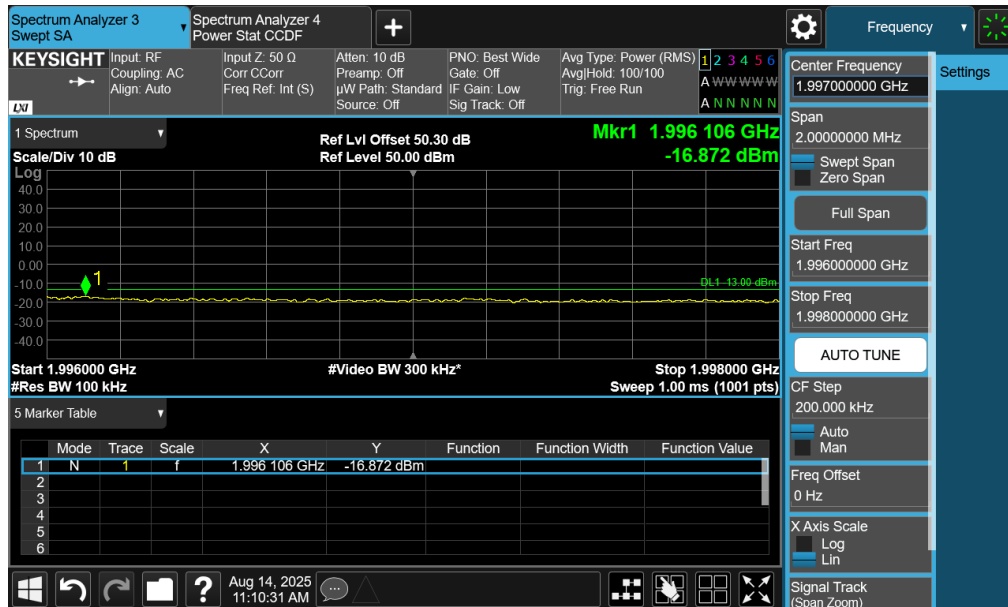
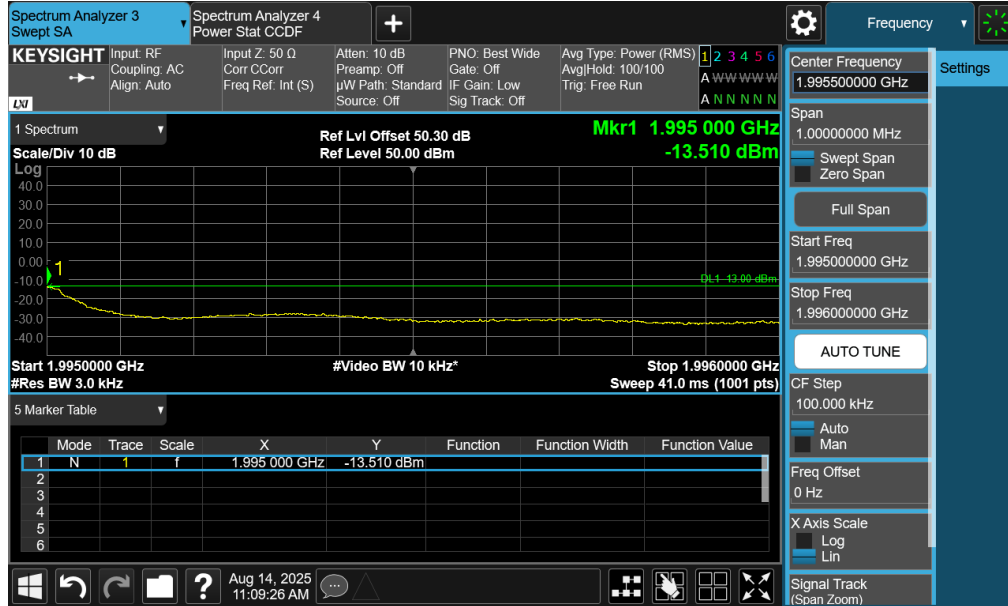
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Out-of-band/out-of-block emissions

DL_GSM_LCH_two adjacent test signals_Pre-AGC



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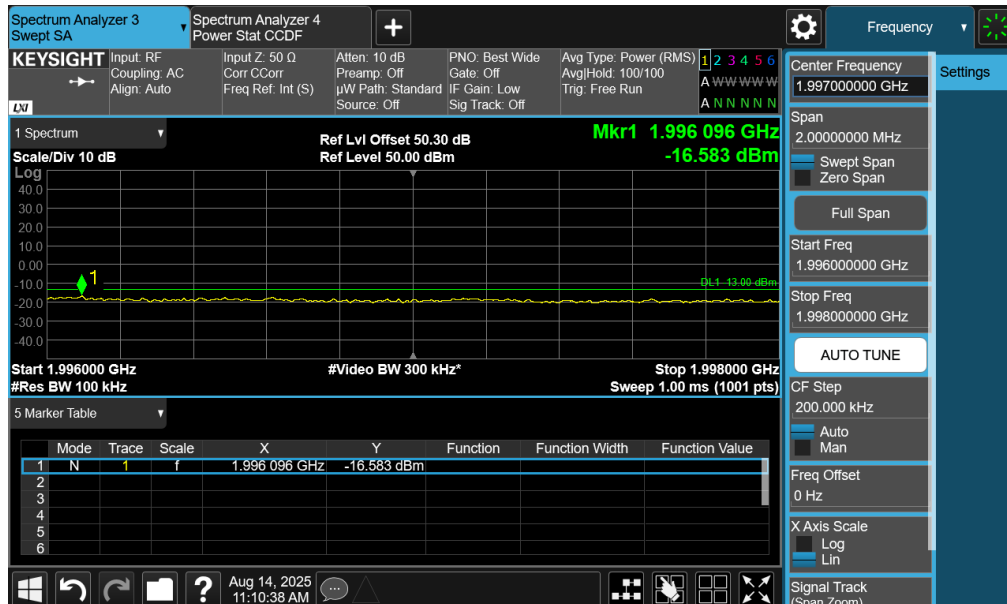
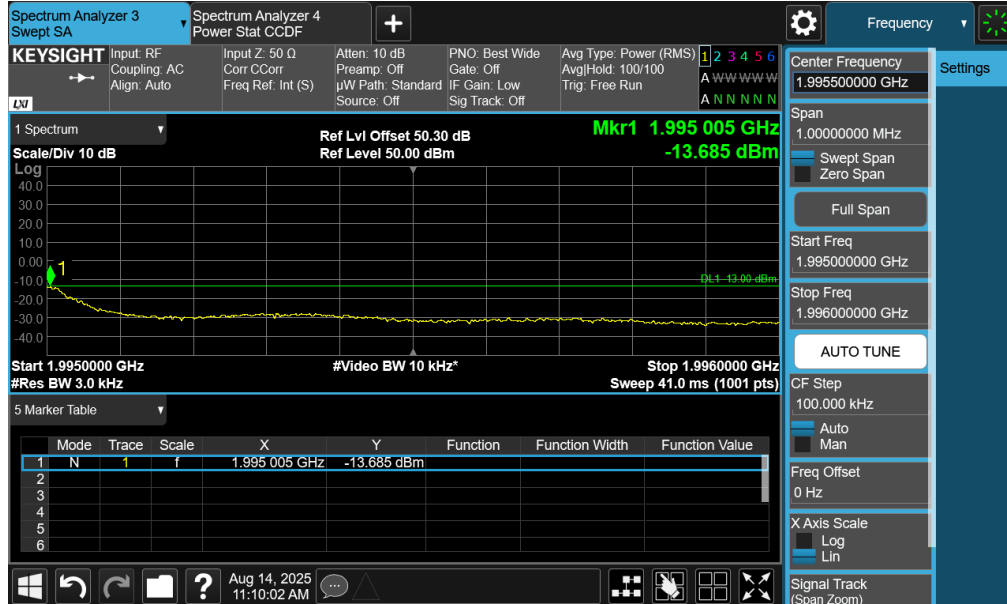
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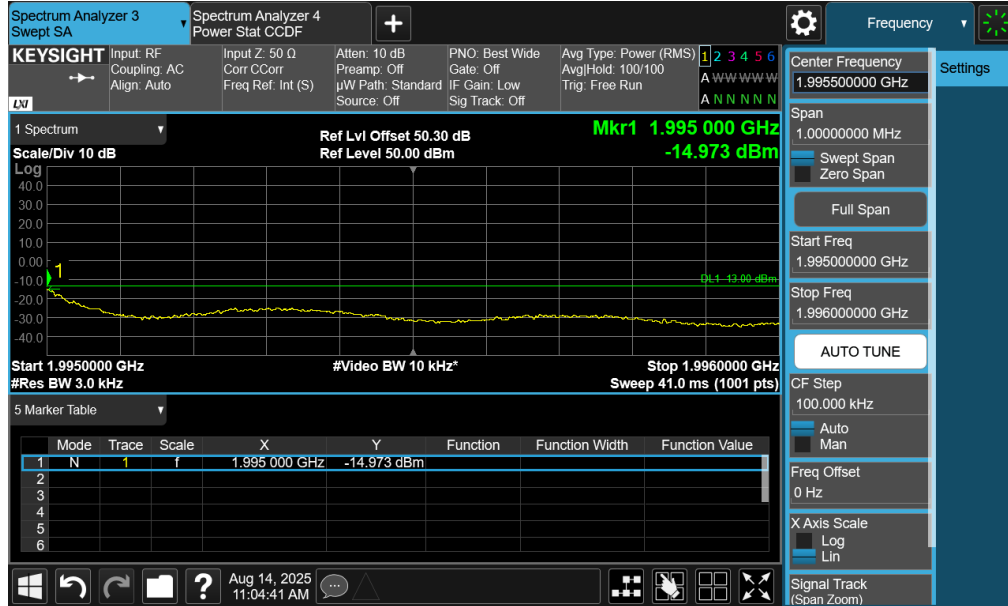
Out-of-band/out-of-block emissions

DL_GSM_LCH_two adjacent test signals_3dB above AGC



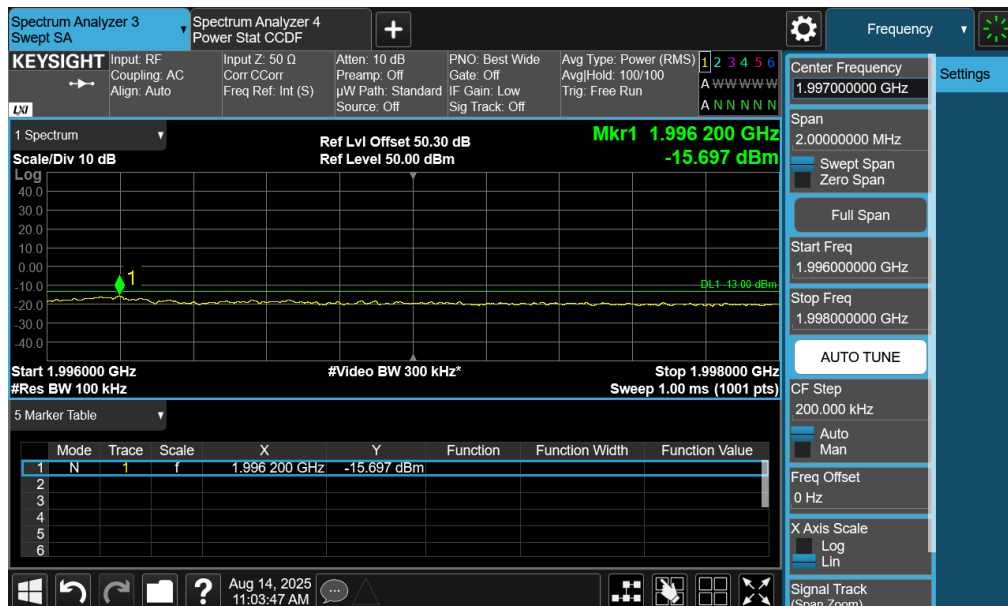
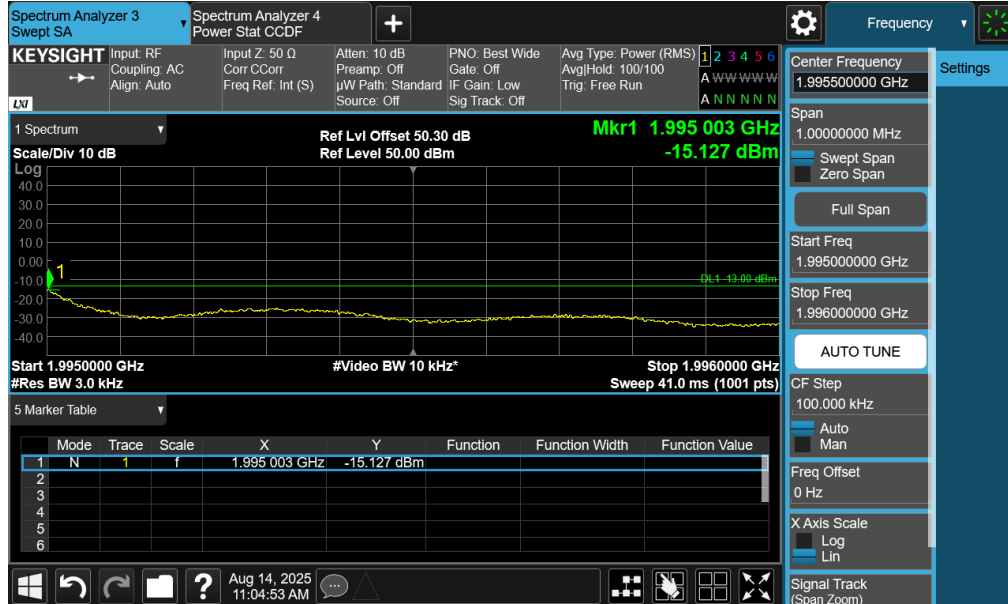
Out-of-band/out-of-block emissions

DL_GSM_HCH_a single test signal_Pre-AGC



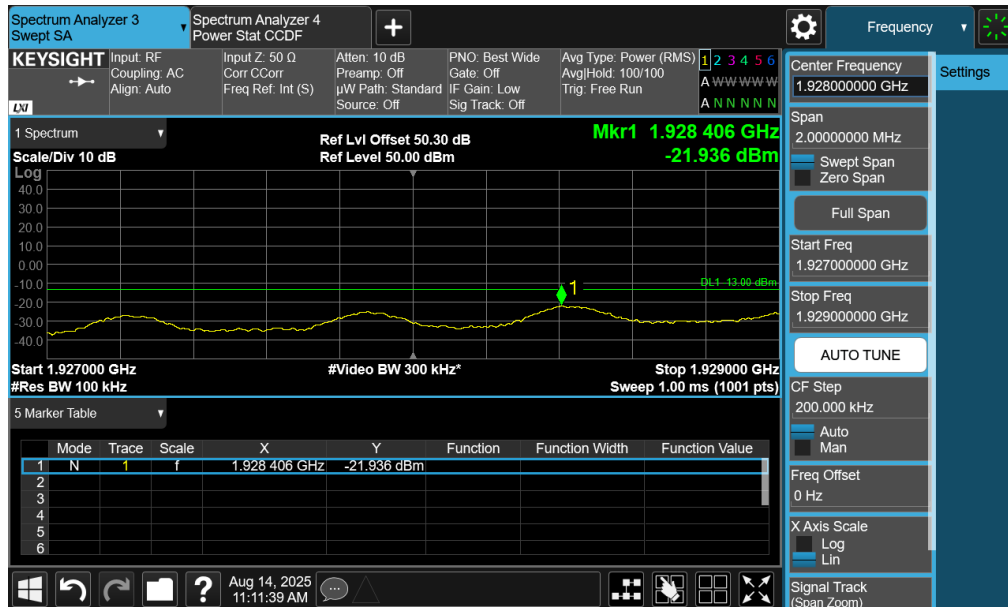
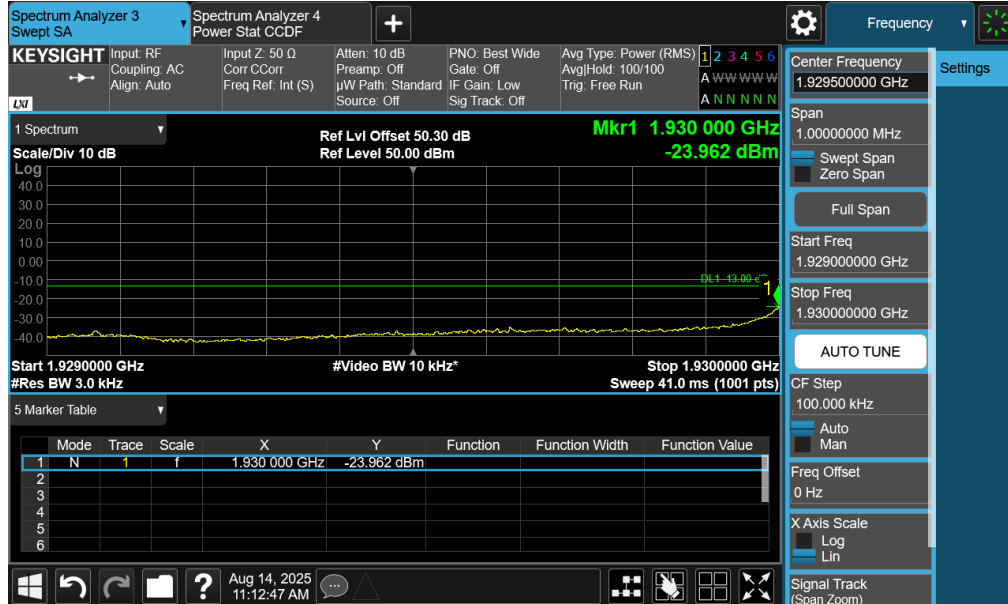
Out-of-band/out-of-block emissions

DL_GSM_HCH_a single test signal_3dB above AGC



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

DL_GSM_HCH_two adjacent test signals_Pre-AGC



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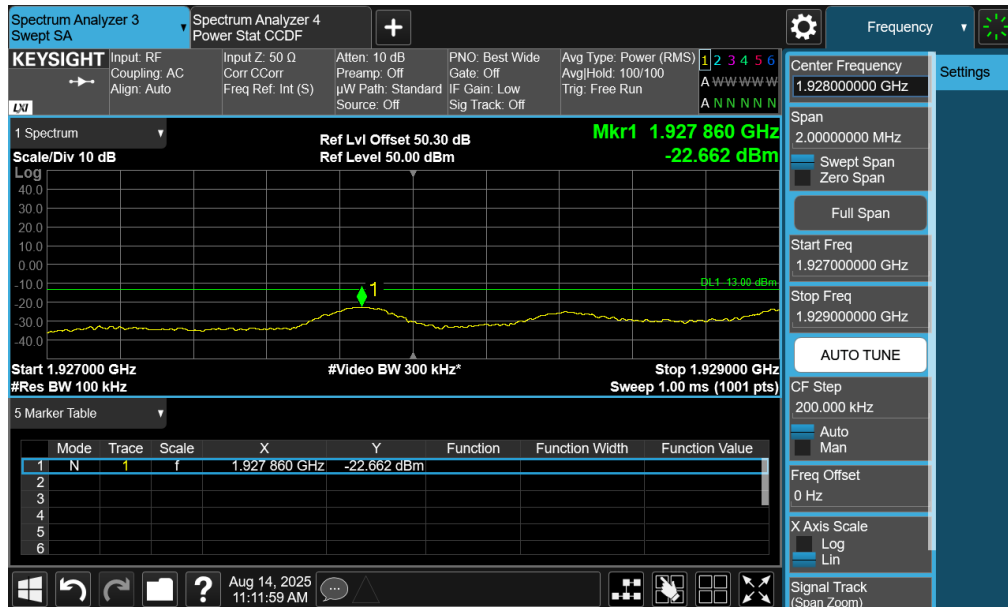
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Out-of-band/out-of-block emissions

DL_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
DL	4.1MHz AWGN	LCH	0.09-1000	-45.85	≤-13	PASS
			1000-1929	-14.67	≤-13	PASS
		HCH	1996-19950	-13.42	≤-13	PASS
Remark: 1. 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= 46dBm= 40W limit= 46dBm– [43+ 10log10(40W)]dB= -13dBm 2. 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.						

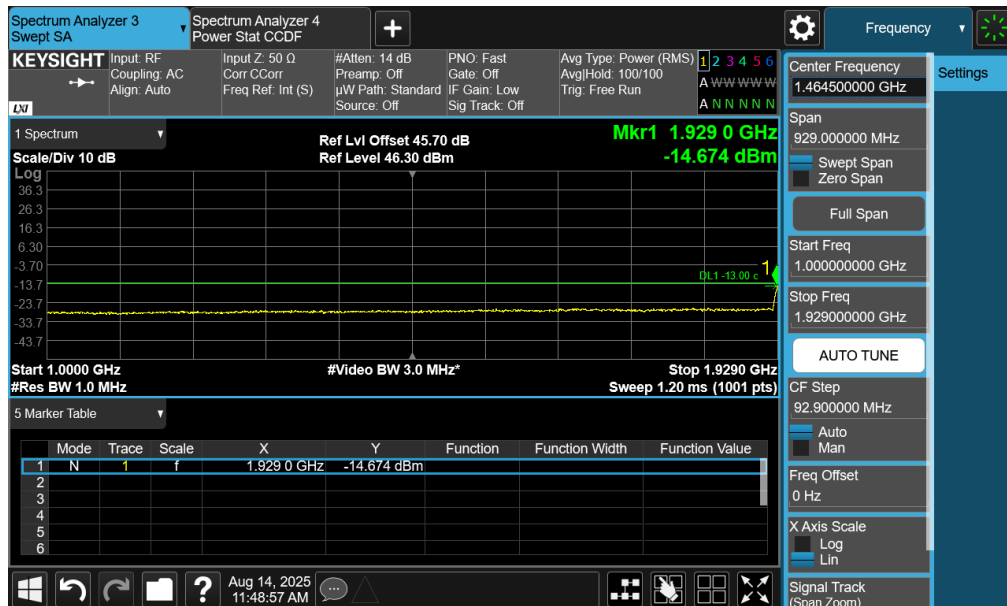
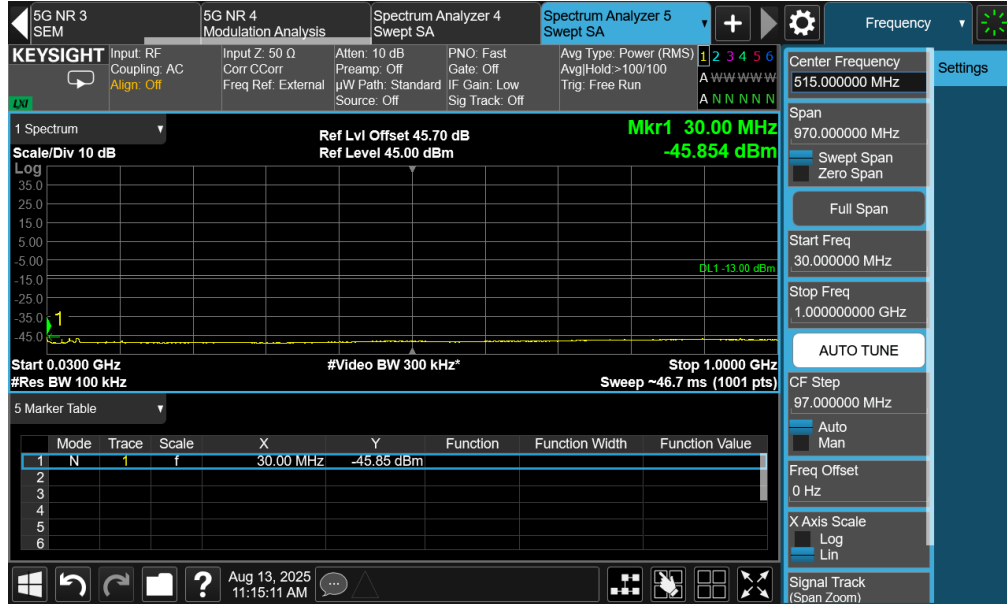


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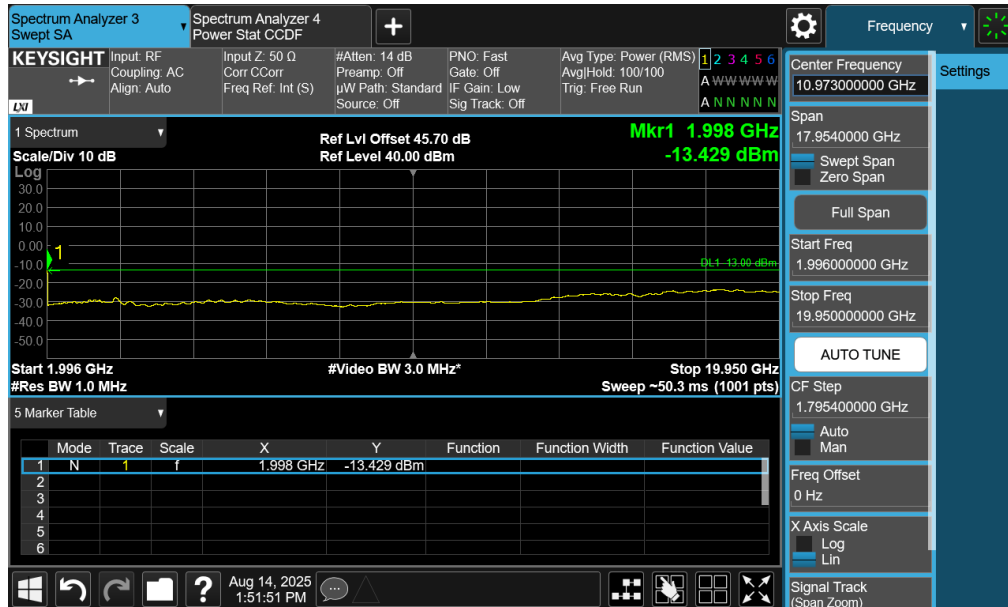
Conducted spurious emissions

DL_4.1MHz AWGN_LCH_Pre-AGC



Conducted spurious emissions

DL_4.1MHz AWGN_HCH_Pre-AGC



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	3.1	0.00158	PASS
			TN	VH	3.1	0.00158	PASS
		100MHz AWGN	TN	VL	2.7	0.00138	PASS
			TN	VH	2.7	0.00138	PASS
		GSM	TN	VL	3.2	0.00163	PASS
			TN	VH	3.2	0.00163	PASS



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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	2.1	0.00107	PASS
			VN	+40	3.5	0.00178	PASS
			VN	+30	3.1	0.00158	PASS
			VN	+20	3.1	0.00158	PASS
			VN	+10	4.6	0.00234	PASS
			VN	0	3.2	0.00163	PASS
			VN	-10	3.5	0.00178	PASS
			VN	-20	2.2	0.00112	PASS
			VN	-30	4.5	0.00229	PASS
	MCH	100MHz AWGN	VN	+50	5.0	0.00255	PASS
			VN	+40	3.2	0.00163	PASS
			VN	+30	5.0	0.00255	PASS
			VN	+20	4.8	0.00245	PASS
			VN	+10	5.0	0.00255	PASS
			VN	0	3.1	0.00158	PASS
			VN	-10	2.4	0.00122	PASS
			VN	-20	4.6	0.00234	PASS
			VN	-30	2.3	0.00117	PASS
	MCH	GSM	VN	+50	5.2	0.00265	PASS
			VN	+40	5.6	0.00285	PASS
			VN	+30	5.6	0.00285	PASS
			VN	+20	3.6	0.00183	PASS
			VN	+10	4.5	0.00229	PASS
			VN	0	3.1	0.00158	PASS
			VN	-10	2.6	0.00132	PASS
			VN	-20	2.3	0.00117	PASS
			VN	-30	3.2	0.00163	PASS



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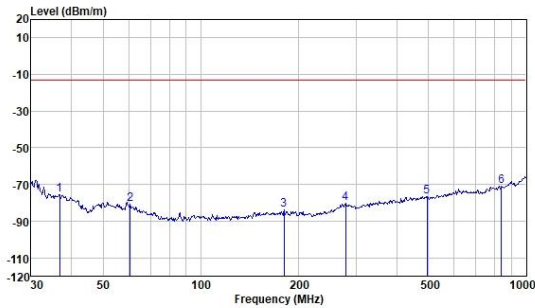
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7 Radiated Spurious emissions

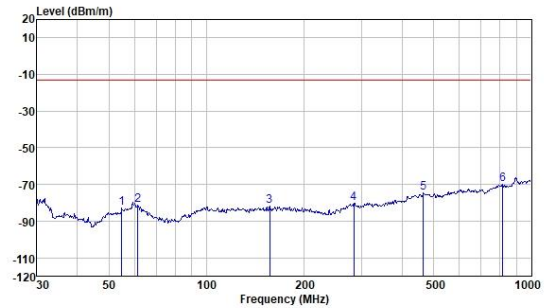
Radiated Spurious emissions

DL_4.1MHz AWGN_MCH_30MHz-1GHz

For HRU-7851719-DC

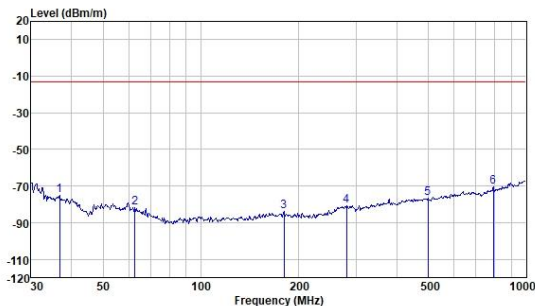


	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	36.77	-77.97	2.56	-75.41	-13.00	-62.41	HORIZONTAL
2	60.49	-78.16	-2.63	-80.79	-13.00	-67.79	HORIZONTAL
3	180.02	-78.05	-6.01	-84.06	-13.00	-71.06	HORIZONTAL
4	278.07	-77.73	-2.52	-80.25	-13.00	-67.25	HORIZONTAL
5	495.93	-76.80	0.38	-76.42	-13.00	-63.42	HORIZONTAL
6	839.18	-78.29	7.19	-71.10	-13.00	-58.10	HORIZONTAL

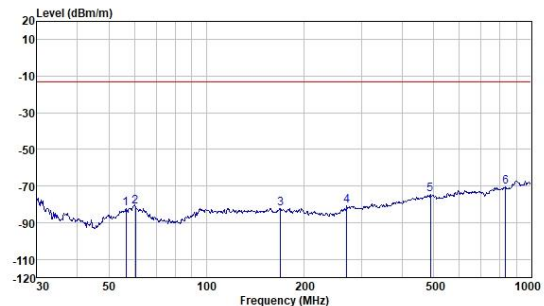


	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	54.83	-78.46	-4.45	-82.91	-13.00	-69.91	VERTICAL
2	61.35	-78.45	-2.67	-81.12	-13.00	-68.12	VERTICAL
3	156.46	-77.62	-3.94	-81.56	-13.00	-68.56	VERTICAL
4	283.98	-77.55	-2.70	-80.25	-13.00	-67.25	VERTICAL
5	465.60	-76.51	1.75	-74.76	-13.00	-61.76	VERTICAL
6	815.97	-77.53	7.57	-69.96	-13.00	-56.96	VERTICAL

For HRU-7851719-AC



	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	36.77	-77.39	2.56	-74.83	-13.00	-61.83	HORIZONTAL
2	62.65	-78.29	-3.32	-81.61	-13.00	-68.61	HORIZONTAL
3	180.02	-77.97	-6.01	-83.98	-13.00	-70.98	HORIZONTAL
4	280.02	-78.18	-2.42	-80.60	-13.00	-67.60	HORIZONTAL
5	499.42	-76.75	0.39	-76.36	-13.00	-63.36	HORIZONTAL
6	793.40	-76.73	6.57	-70.16	-13.00	-57.16	HORIZONTAL



	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	56.39	-78.81	-3.37	-82.18	-13.00	-69.18	VERTICAL
2	60.28	-79.04	-2.19	-81.23	-13.00	-68.23	VERTICAL
3	169.01	-78.18	-3.94	-82.12	-13.00	-69.12	VERTICAL
4	270.37	-77.41	-3.35	-80.76	-13.00	-67.76	VERTICAL
5	489.03	-76.39	1.99	-74.40	-13.00	-61.40	VERTICAL
6	833.32	-78.14	7.73	-70.41	-13.00	-57.41	VERTICAL



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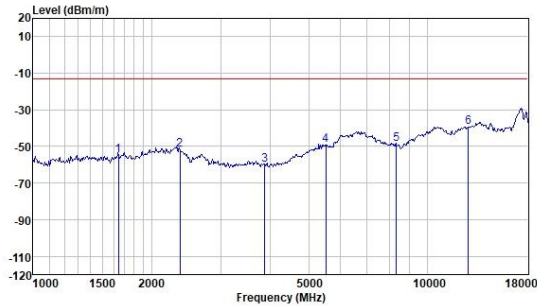
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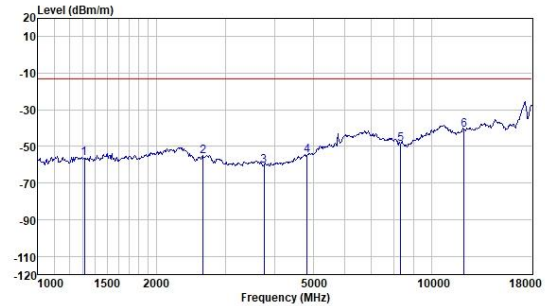
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Radiated Spurious emissions

DL_4.1MHz AWGN_MCH_above 1GHz



	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1648.78	-60.59	5.75	-54.84	-13.00	-41.84	HORIZONTAL
2	2359.48	-61.29	9.54	-51.75	-13.00	-38.75	HORIZONTAL
3	3867.83	-63.16	3.07	-60.09	-13.00	-47.09	HORIZONTAL
4	5519.07	-63.69	14.34	-49.35	-13.00	-36.35	HORIZONTAL
5	8343.92	-62.32	13.39	-48.93	-13.00	-35.93	HORIZONTAL
6	12687.75	-63.45	23.87	-39.58	-13.00	-26.58	HORIZONTAL



	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1312.19	-60.79	4.23	-56.56	-13.00	-43.56	VERTICAL
2	2625.00	-61.13	5.57	-55.56	-13.00	-42.56	VERTICAL
3	3746.79	-63.58	3.24	-60.34	-13.00	-47.34	VERTICAL
4	4818.02	-64.01	9.11	-54.90	-13.00	-41.90	VERTICAL
5	8343.92	-62.83	14.36	-48.47	-13.00	-35.47	VERTICAL
6	12879.39	-62.83	22.04	-40.79	-13.00	-27.79	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 and above 18GHz were very low and not displayed in this report. Therefore, only show the worst-case data in this report.

--End of Appendix--



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