



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

EMC-ARF-05 Rev 1.1

Page: 1 of 28

FCC ID: PX8CFNG-MRU

Appendix -

Test Data and Result for report

GZCR241100135105

(For Cellular Band DL)



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2 Input versus Output comparison

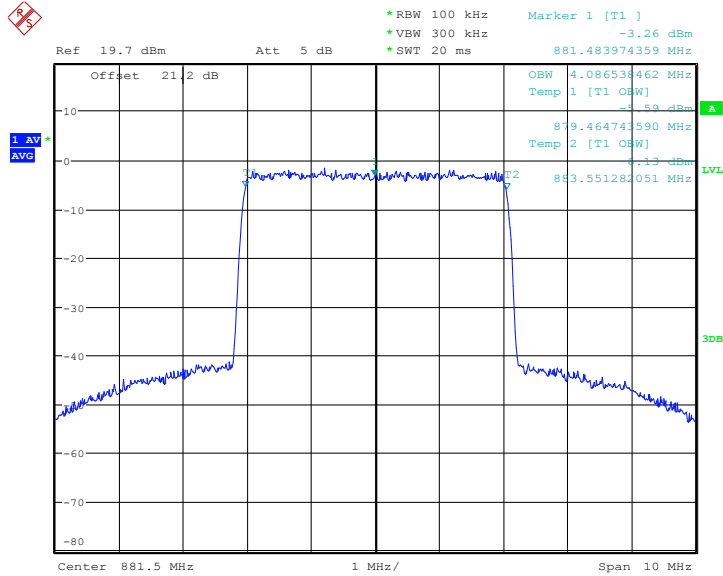
Occupied Bandwidth				
Test Path	Test Signal	Test Channel	Signal Level	Verdict
DL	4.1MHz AWGN	MCH	Pre-AGC	PASS
			3dB above AGC	PASS
	100MHz AWGN	MCH	Pre-AGC	PASS*
			3dB above AGC	PASS*
	GSM	MCH	Pre-AGC	PASS
			3dB above AGC	PASS

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.

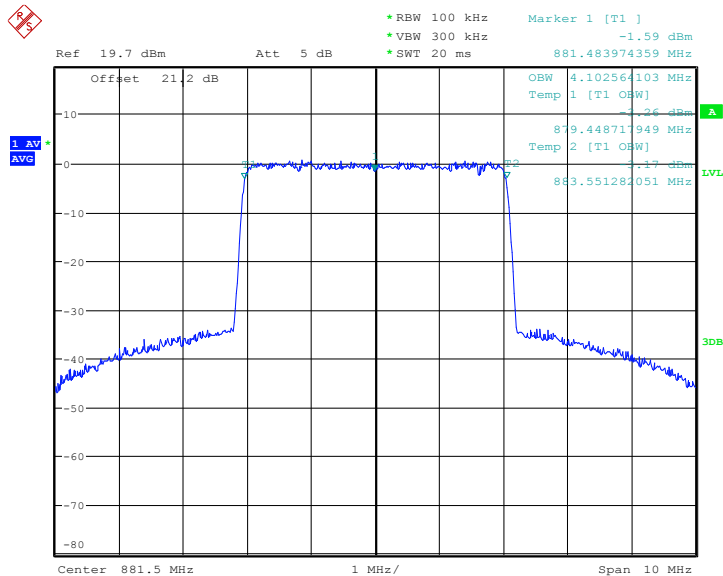
99% OBW

DL_4.1MHz AWGN_MCH_Input_Pre-AGC



Date: 19.NOV.2024 12:31:22

DL_4.1MHz AWGN_MCH_Input_3dB above AGC



Date: 19.NOV.2024 12:31:44



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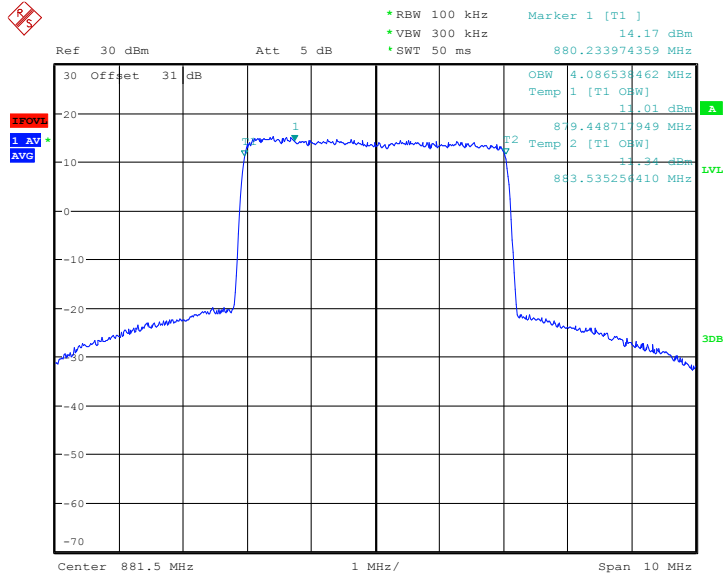
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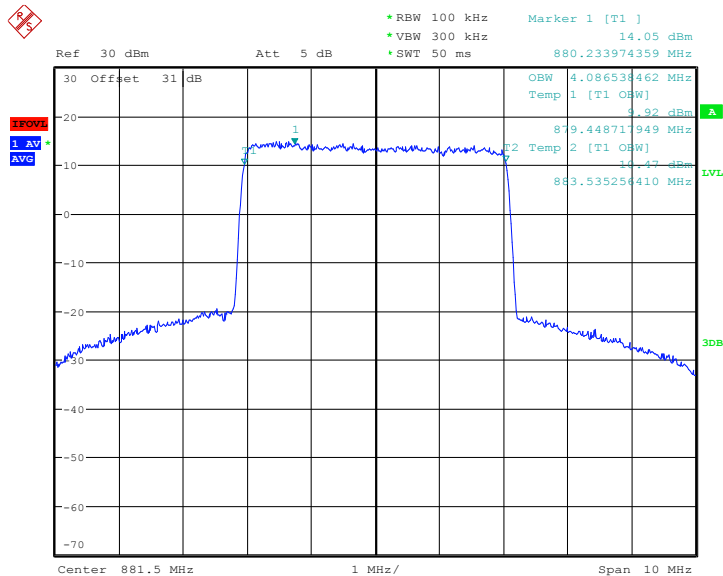
99% OBW

DL_4.1MHz AWGN_MCH_Output_Pre-AGC



Date: 15.NOV.2024 06:25:28

DL_4.1MHz AWGN_MCH_Output_3dB above AGC



Date: 15.NOV.2024 06:25:58



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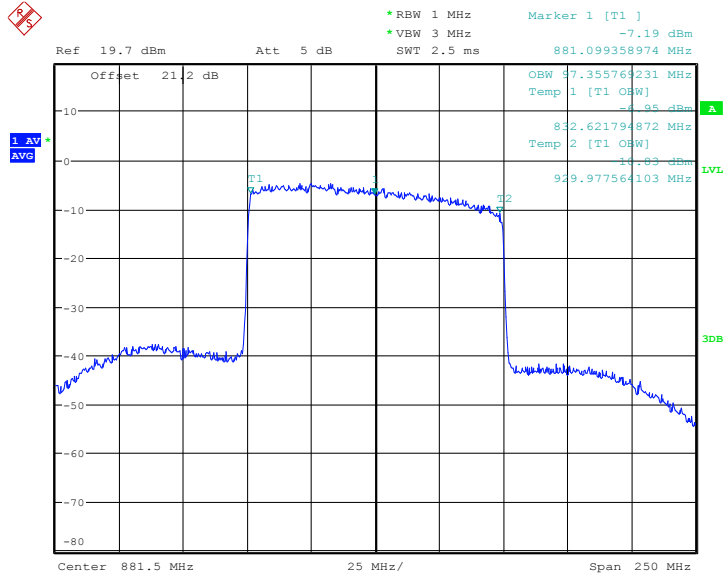
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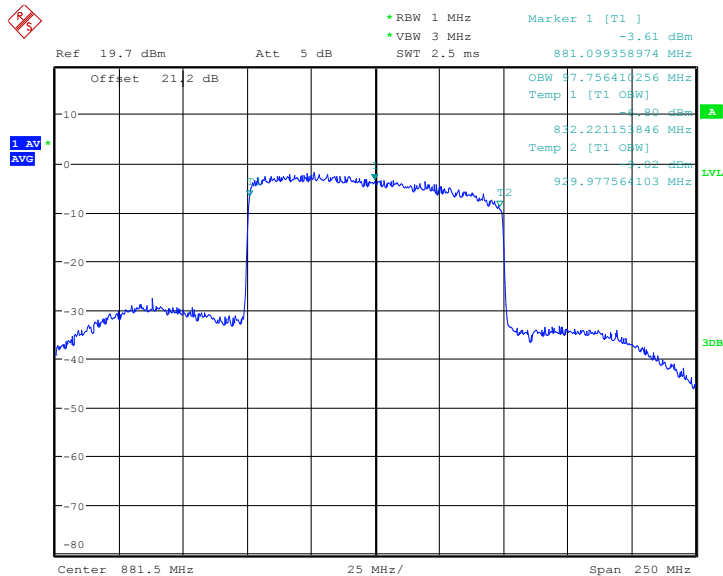
99% OBW

DL_100MHz AWGN_MCH_Input_Pre-AGC



Date: 19.NOV.2024 12:29:53

DL_100MHz AWGN_MCH_Input_3dB above AGC



Date: 19.NOV.2024 12:30:00



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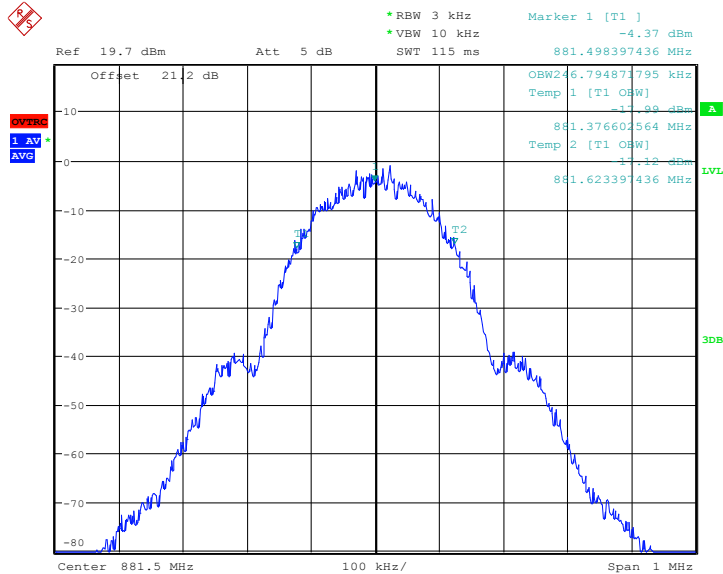
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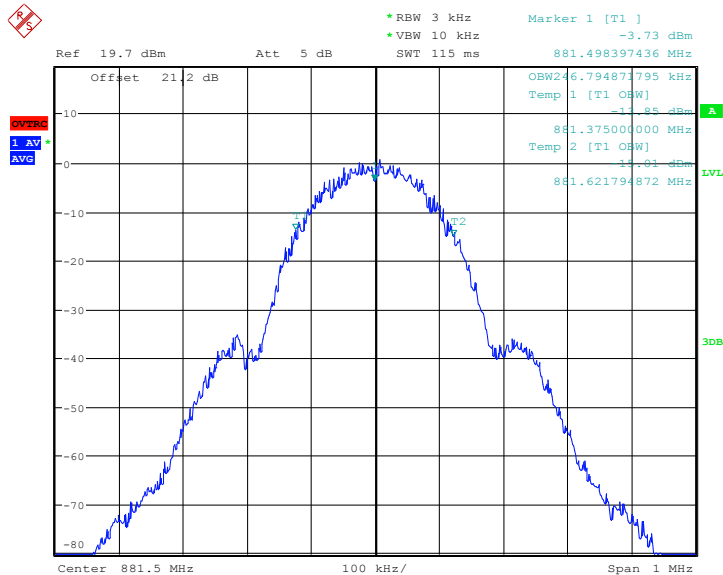
99% OBW

DL_GSM_MCH_Input_Pre-AGC



Date: 19.NOV.2024 12:36:25

DL_GSM_MCH_Input_3dB above AGC



Date: 19.NOV.2024 12:36:33



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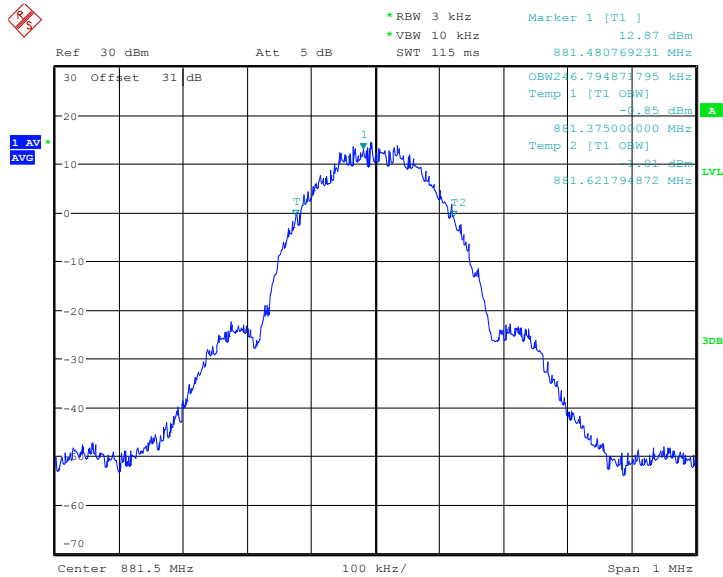
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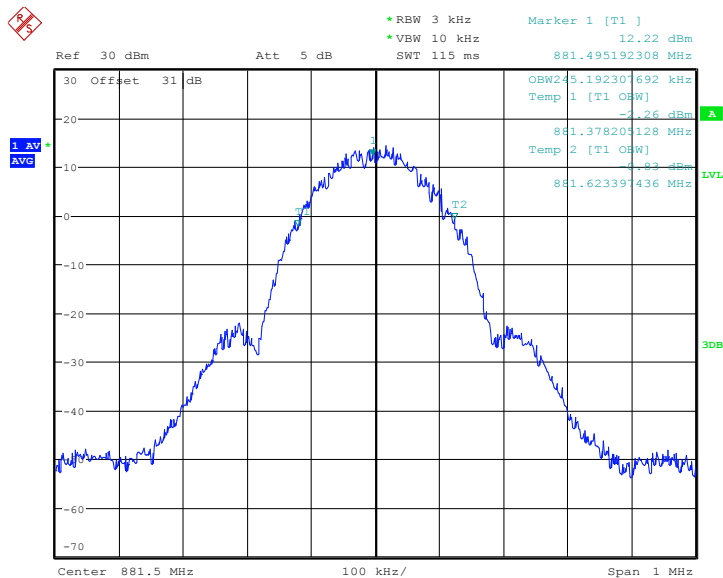
99% OBW

DL_GSM_MCH_Output_Pre-AGC



Date: 15.NOV.2024 06:27:07

DL_GSM_MCH_Output_3dB above AGC



Date: 15.NOV.2024 06:27:21



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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	877.0	4.1MHz AWGN	Pre-AGC	15	29.37	32.22	1.67	14.37
			3dB above AGC	18	29.75	32.60	1.82	/
		100MHz AWGN	Pre-AGC	15	29.21	32.06	1.61	14.21
			3dB above AGC	18	29.44	32.29	1.70	/
		GSM	Pre-AGC	15	30.62	33.47	2.23	15.62
			3dB above AGC	18	30.78	33.63	2.31	/
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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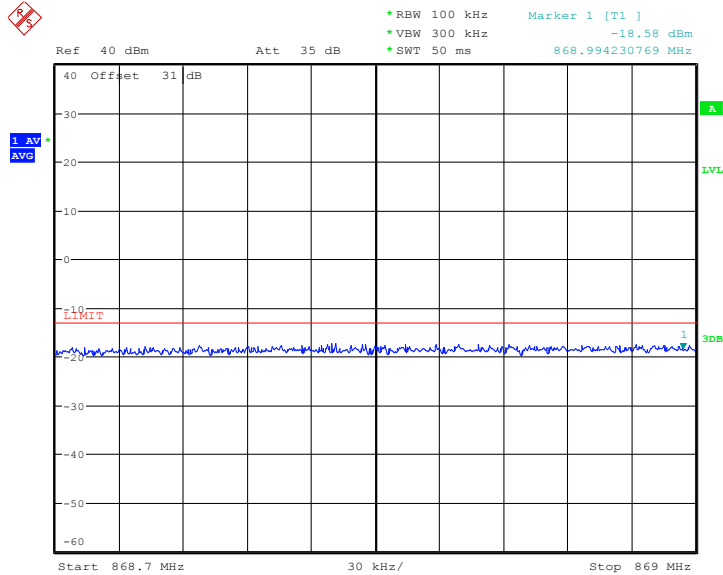
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4 Out-of-band/out-of-block(including intermodulation) emissions

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	-18.58	≤-13	PASS
				3dB above AGC	-17.72		PASS
			Two signals input	Pre-AGC	-21.00		PASS
				3dB above AGC	-21.34		PASS
	HCH		One signal input	Pre-AGC	-20.66		PASS
				3dB above AGC	-20.71		PASS
			Two signals input	Pre-AGC	-23.80		PASS
				3dB above AGC	-23.26		PASS
DL	LCH	100MHz AWGN	One signal input	Pre-AGC	-24.65	≤-13	PASS
	3dB above AGC			-23.73	PASS		
	HCH		One signal input	Pre-AGC	-26.14		PASS
				3dB above AGC	-25.79		PASS
DL	LCH	GSM	One signal input	Pre-AGC	-17.52	≤-13	PASS
				3dB above AGC	-17.69		PASS
			Two signals input	Pre-AGC	-19.88		PASS
				3dB above AGC	-18.25		PASS
	HCH		One signal input	Pre-AGC	-18.34		PASS
				3dB above AGC	-18.31		PASS
			Two signals input	Pre-AGC	-20.48		PASS
				3dB above AGC	-20.04		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= 30dBm= 1W the limit= 30dBm- [43+ 10log10(1W)]dB= -13dBm							

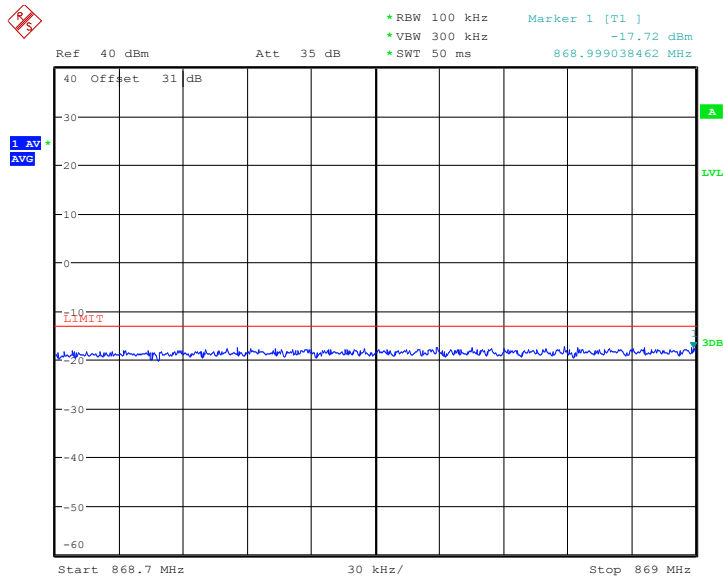
Out-of-band/out-of-block emissions

DL_4.1MHz AWGN_LCH_a single test signal_Pre-AGC



Date: 15.NOV.2024 07:15:36

DL_4.1MHz AWGN_LCH_a single test signal_3dB above AGC



Date: 15.NOV.2024 07:15:43



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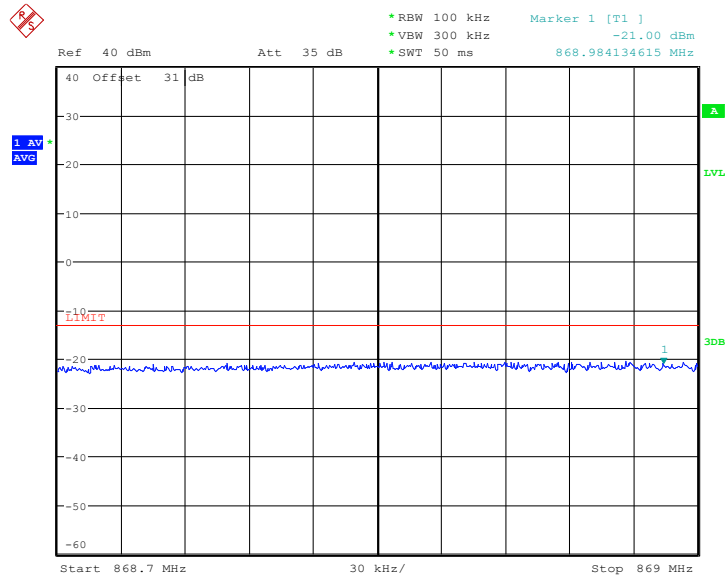
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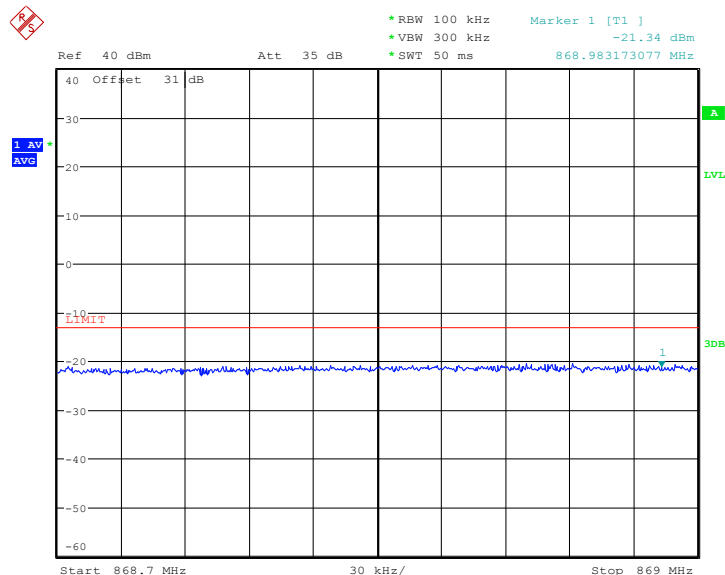
Out-of-band/out-of-block emissions

DL_4.1MHz AWGN_LCH_two adjacent test signals_Pre-AGC



Date: 15.NOV.2024 07:16:24

DL_4.1MHz AWGN_LCH_two adjacent test signals_3dB above AGC



Date: 15.NOV.2024 07:16:34

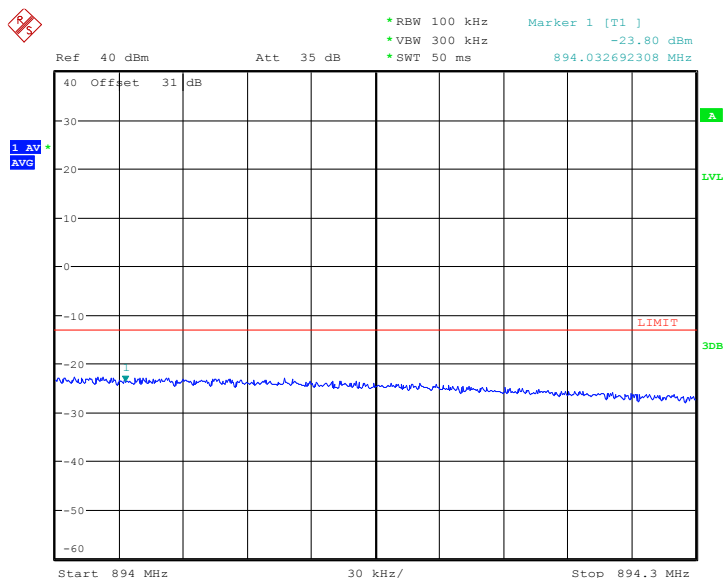


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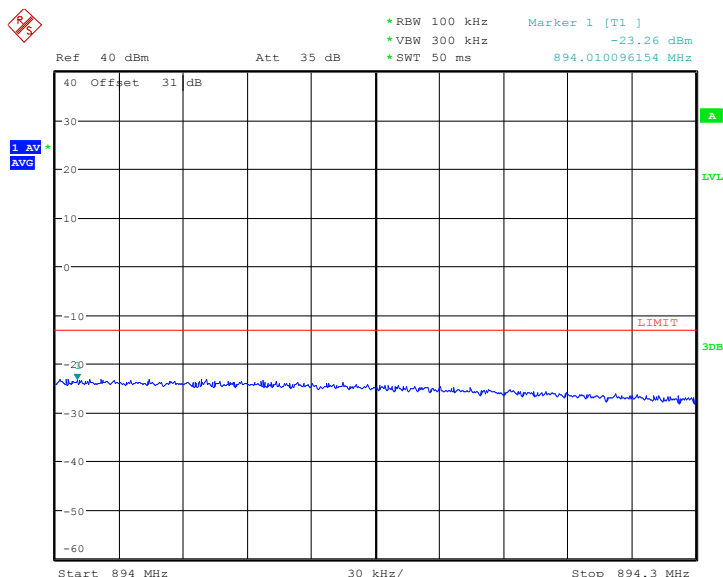
Out-of-band/out-of-block emissions

DL_4.1MHz AWGN_HCH_two adjacent test signals_Pre-AGC



Date: 15.NOV.2024 07:14:50

DL_4.1MHz AWGN_HCH_two adjacent test signals_3dB above AGC



Date: 15.NOV.2024 07:14:57



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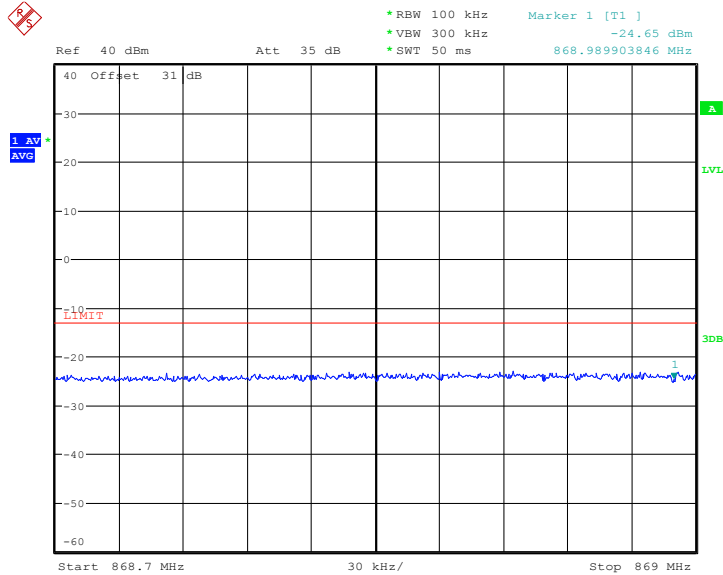
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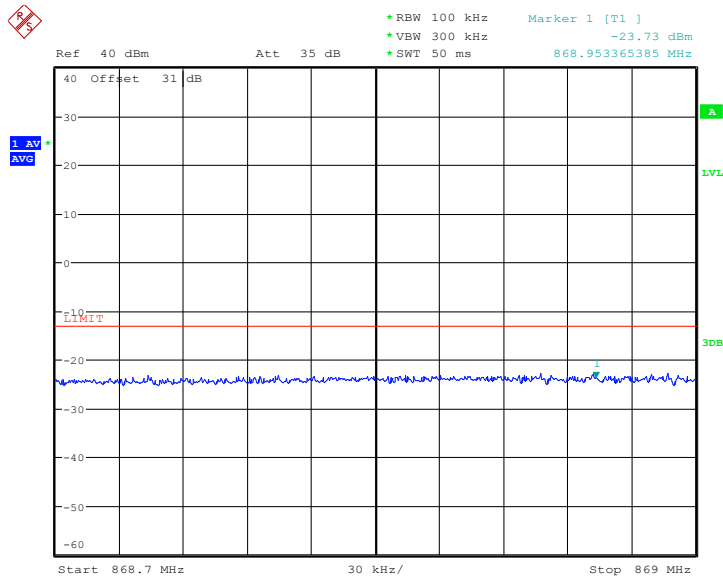
Out-of-band/out-of-block emissions

DL_100MHz AWGN_LCH_a single test signal_Pre-AGC



Date: 15.NOV.2024 07:20:40

DL_100MHz AWGN_LCH_a single test signal_3dB above AGC



Date: 15.NOV.2024 07:20:47



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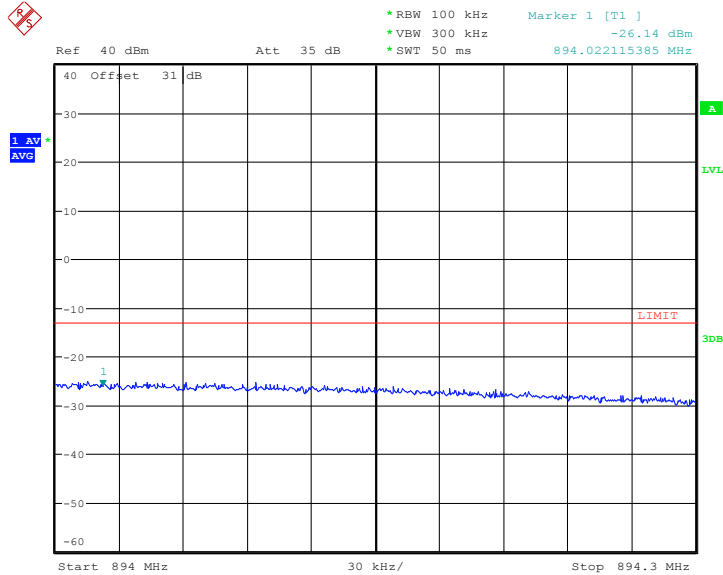
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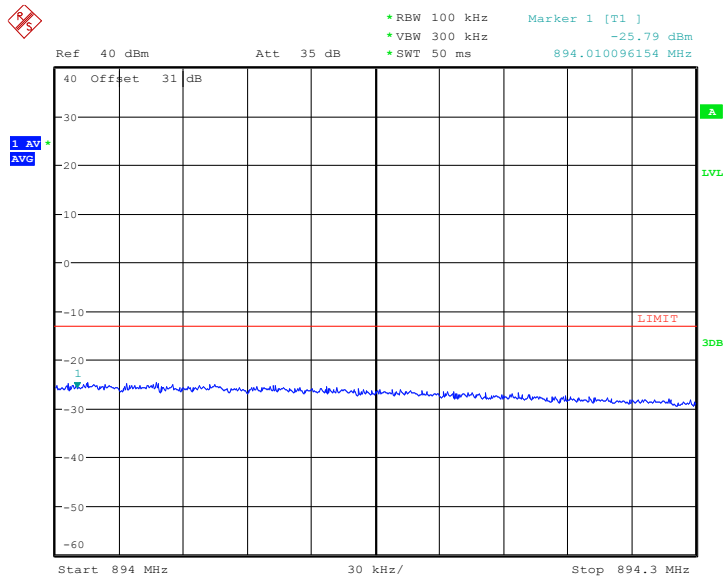
Out-of-band/out-of-block emissions

DL_100MHz AWGN_HCH_a single test signal_Pre-AGC



Date: 15.NOV.2024 07:21:48

DL_100MHz AWGN_HCH_a single test signal_3dB above AGC



Date: 15.NOV.2024 07:21:56



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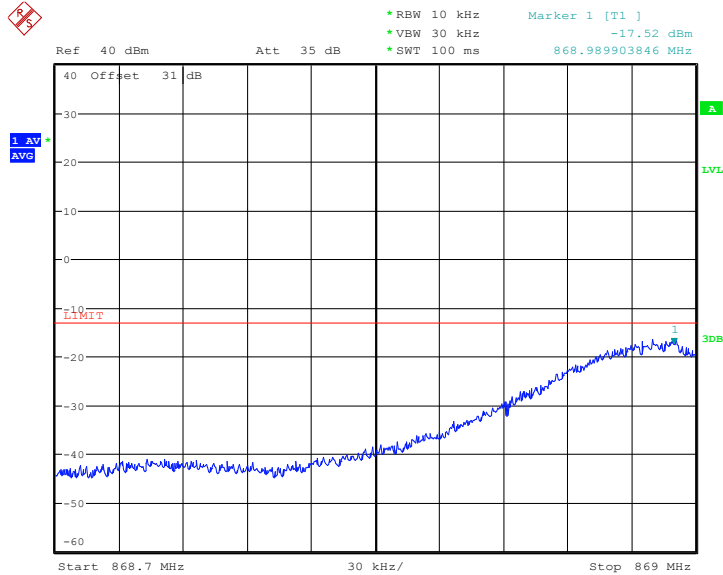
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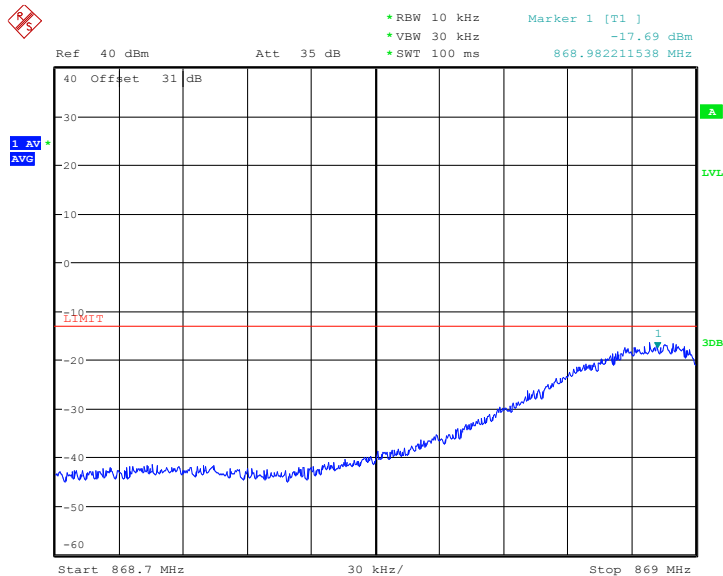
Out-of-band/out-of-block emissions

DL_GSM_LCH_a single test signal_Pre-AGC



Date: 15.NOV.2024 06:54:20

DL_GSM_LCH_a single test signal_3dB above AGC



Date: 15.NOV.2024 06:54:53



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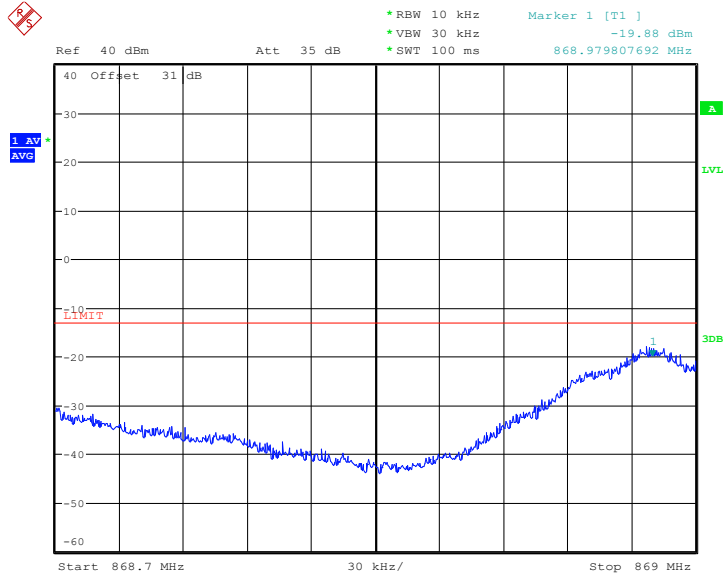
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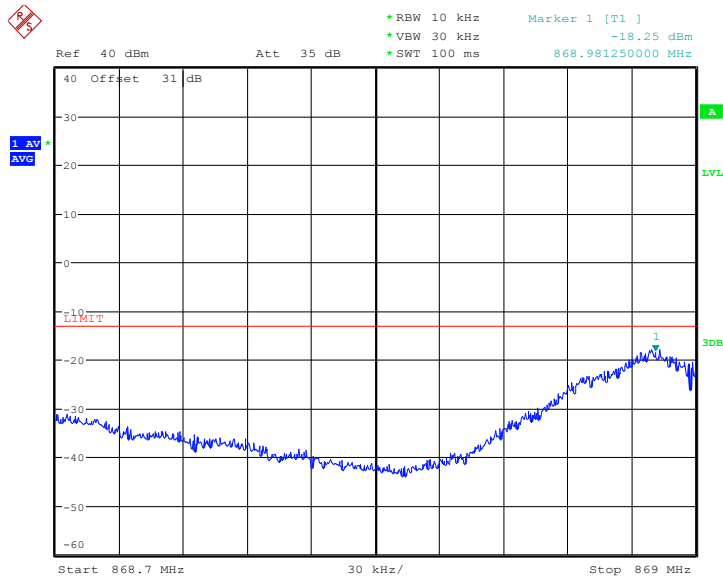
Out-of-band/out-of-block emissions

DL_GSM_LCH_two adjacent test signals_Pre-AGC



Date: 15.NOV.2024 06:55:48

DL_GSM_LCH_two adjacent test signals_3dB above AGC



Date: 15.NOV.2024 06:55:55



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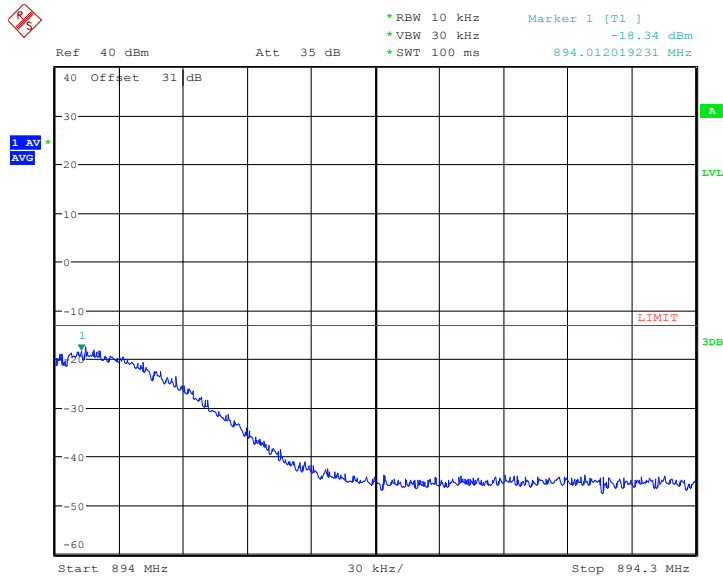
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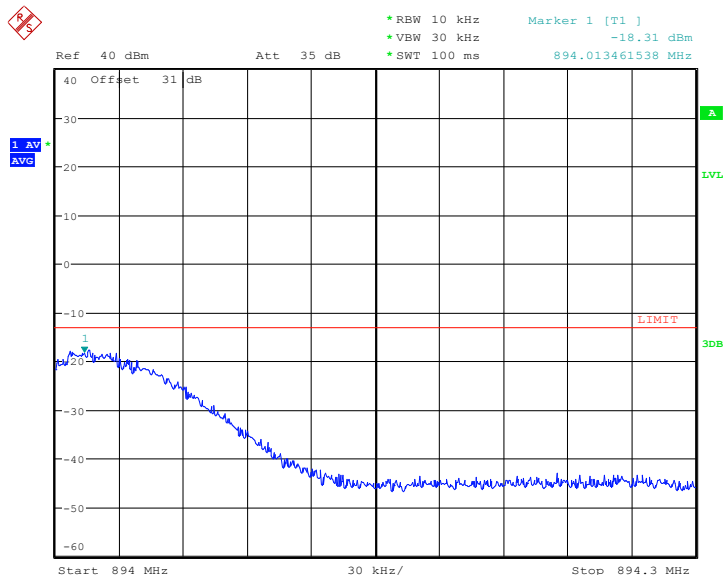
Out-of-band/out-of-block emissions

DL_GSM_HCH_a single test signal_Pre-AGC



Date: 15.NOV.2024 06:56:51

DL_GSM_HCH_a single test signal_3dB above AGC



Date: 15.NOV.2024 06:56:58



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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	0.09-868.9	-19.65	≤-13	PASS
		HCH	894.1-1000	-23.79	≤-13	PASS
			1000-8940	-19.45	≤-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,
 $P = 30\text{dBm} = 1\text{W}$
 $\text{limit} = 30\text{dBm} - [43 + 10\log_{10}(1\text{W})] \text{ dB} = -13\text{dBm}$
- 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.

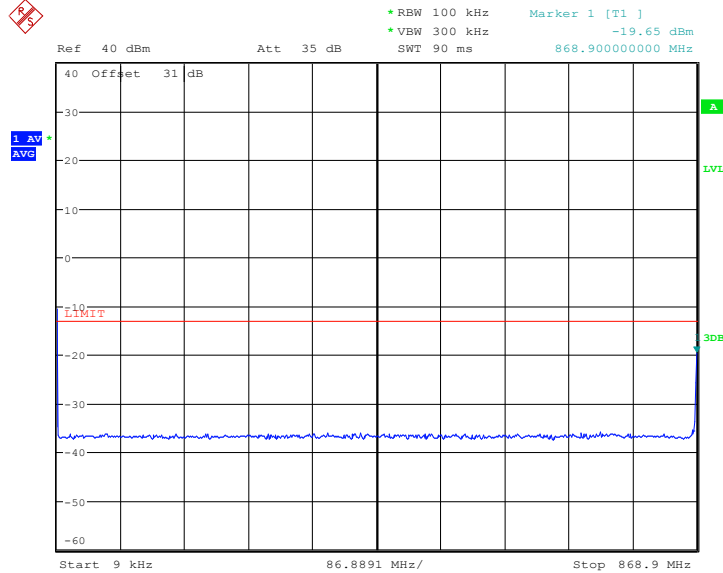


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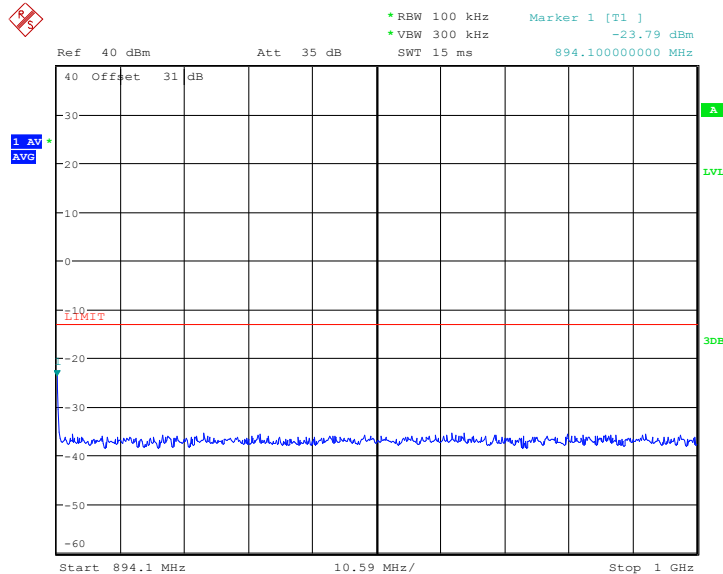
Conducted spurious emissions

DL_4.1MHz AWGN_LCH_Pre-AGC



Date: 15.NOV.2024 07:27:12

DL_4.1MHz AWGN_HCH_Pre-AGC



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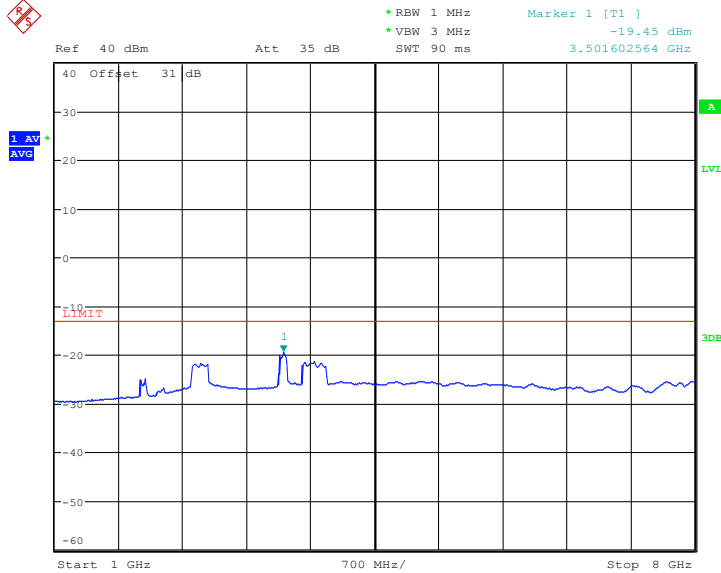
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Conducted spurious emissions

DL_4.1MHz AWGN_HCH_Pre-AGC



Date: 15.NOV.2024 07:28:39



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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	11.8	0.01339	PASS
			TN	VH	11.4	0.01293	PASS
		100MHz AWGN	TN	VL	11.0	0.01248	PASS
			TN	VH	14.5	0.01645	PASS
		GSM	TN	VL	12.8	0.01452	PASS
			TN	VH	16.2	0.01838	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	10.3	0.01168	PASS
			VN	+40	9.8	0.01112	PASS
			VN	+30	16.0	0.01815	PASS
			VN	+20	13.6	0.01543	PASS
			VN	+10	13.2	0.01497	PASS
			VN	0	15.7	0.01781	PASS
			VN	-10	11.8	0.01339	PASS
			VN	-20	14.2	0.01611	PASS
			VN	-30	13.6	0.01543	PASS
	MCH	100MHz AWGN	VN	+50	13.7	0.01554	PASS
			VN	+40	11.6	0.01316	PASS
			VN	+30	9.5	0.01078	PASS
			VN	+20	9.8	0.01112	PASS
			VN	+10	14.3	0.01622	PASS
			VN	0	12.0	0.01361	PASS
			VN	-10	9.6	0.01089	PASS
			VN	-20	11.9	0.01350	PASS
			VN	-30	13.3	0.01509	PASS
	MCH	GSM	VN	+50	13.9	0.01577	PASS
			VN	+40	15.1	0.01713	PASS
			VN	+30	12.6	0.01429	PASS
			VN	+20	11.4	0.01293	PASS
			VN	+10	11.8	0.01339	PASS
			VN	0	13.7	0.01554	PASS
			VN	-10	14.1	0.01600	PASS
			VN	-20	12.4	0.01407	PASS
			VN	-30	10.9	0.01237	PASS



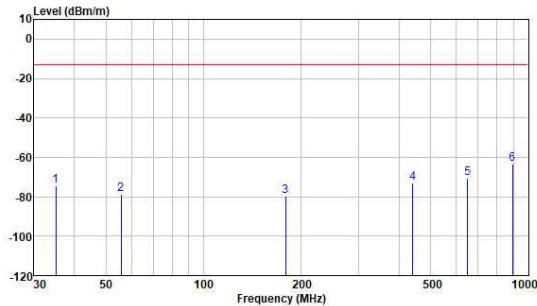
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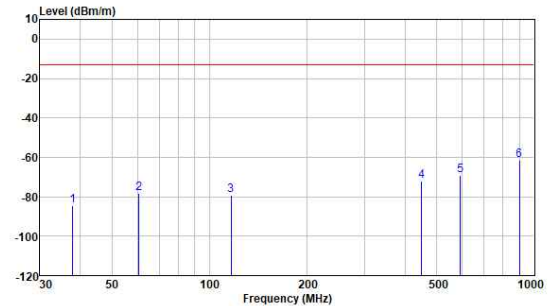
7 Radiated Spurious emissions

Radiated Spurious emissions

DL_4.1MHz AWGN_MCH_30MHz-1GHz

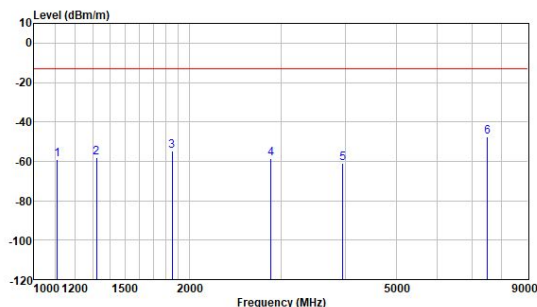


	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	35.00	-77.28	2.87	-74.41	-13.00	-61.41	HORIZONTAL
2	55.61	-76.68	-2.06	-78.74	-13.00	-65.74	HORIZONTAL
3	178.76	-73.68	-6.03	-79.71	-13.00	-66.71	HORIZONTAL
4	440.20	-73.28	0.22	-73.06	-13.00	-60.06	HORIZONTAL
5	649.66	-74.60	3.79	-70.81	-13.00	-57.81	HORIZONTAL
6	893.86	-72.37	9.15	-63.22	-13.00	-50.22	HORIZONTAL

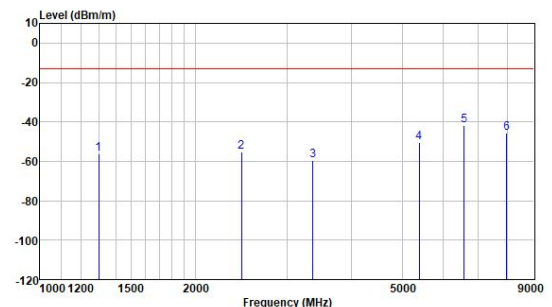


	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	37.81	-76.60	-7.83	-84.43	-13.00	-71.43	VERTICAL
2	60.49	-76.16	-2.28	-78.44	-13.00	-65.44	VERTICAL
3	116.54	-75.23	-4.05	-79.28	-13.00	-66.28	VERTICAL
4	449.56	-73.40	1.48	-71.92	-13.00	-58.92	VERTICAL
5	590.97	-72.80	3.65	-69.15	-13.00	-56.15	VERTICAL
6	900.15	-72.18	10.65	-61.53	-13.00	-48.53	VERTICAL

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	1100.79	-61.41	2.34	-59.07	-13.00	-46.07	HORIZONTAL
2	1321.87	-61.97	4.04	-57.93	-13.00	-44.93	HORIZONTAL
3	1850.07	-60.99	6.09	-54.90	-13.00	-41.90	HORIZONTAL
4	2864.72	-62.71	3.99	-58.72	-13.00	-45.72	HORIZONTAL
5	3948.22	-63.79	2.81	-60.98	-13.00	-47.98	HORIZONTAL
6	7499.64	-63.20	15.83	-47.37	-13.00	-34.37	HORIZONTAL



	Freq	Read Level	Correction Factor	Level	Limit	Over Limit	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	1298.84	-60.44	4.28	-56.16	-13.00	-43.16	VERTICAL
2	2450.93	-64.51	9.28	-55.23	-13.00	-42.23	VERTICAL
3	3363.12	-62.56	3.05	-59.51	-13.00	-46.51	VERTICAL
4	5393.91	-63.61	13.24	-50.37	-13.00	-37.37	VERTICAL
5	6587.80	-62.11	20.39	-41.72	-13.00	-28.72	VERTICAL
6	7958.02	-61.86	16.44	-45.42	-13.00	-32.42	VERTICAL



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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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