

# Appendix -

## Test Data and Result for report

**GZCR250300027210**

(For 3.7GHz Service Band UL)



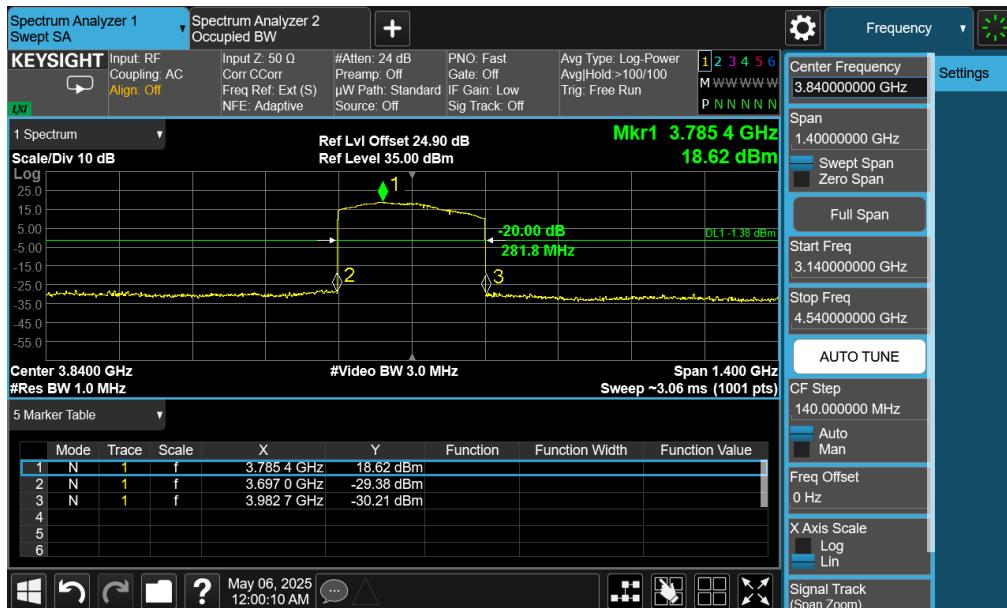
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## 1 Out-of-band rejection

### Out-of-band rejection

UL



#### Remark:

1. The peak of the frequency response  $f_0$  is 3785.4MHz.
2. The frequency point  $f_0$  with the highest power level fall in the CMRS band, EUT is compiled the KDB 935210 D05 Signal Booster Measurements v01r04 Out-of-band rejection verification test requirement.
3. AGC threshold level was measured as below:

Test Path	Test Signal	Test Channel	AGC threshold level
UL	4.1MHz AWGN	MCH	-57.85dBm
	100MHz AWGN	MCH	-57.85dBm
	GSM	MCH	-57.85dBm



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**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:  
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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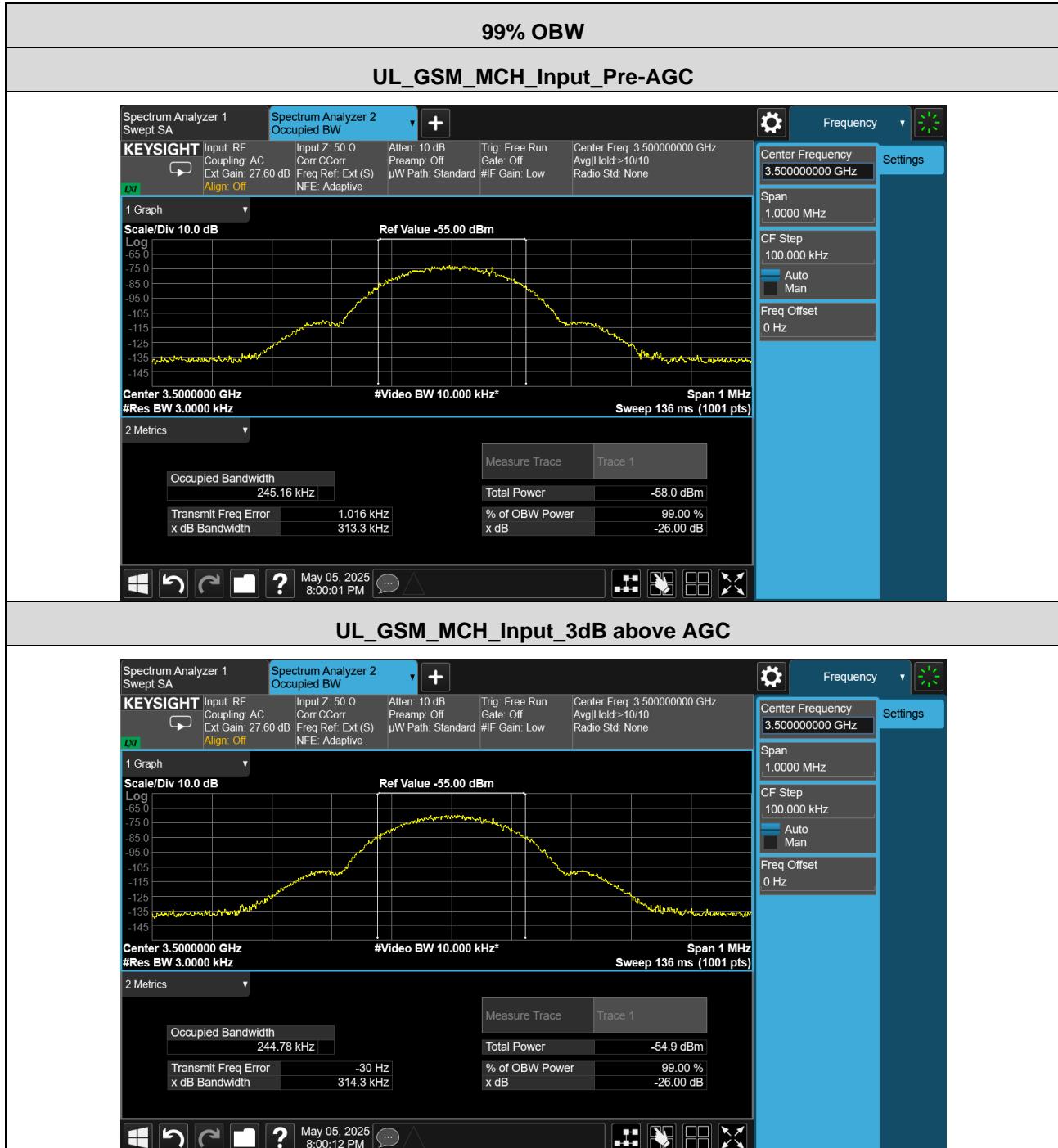
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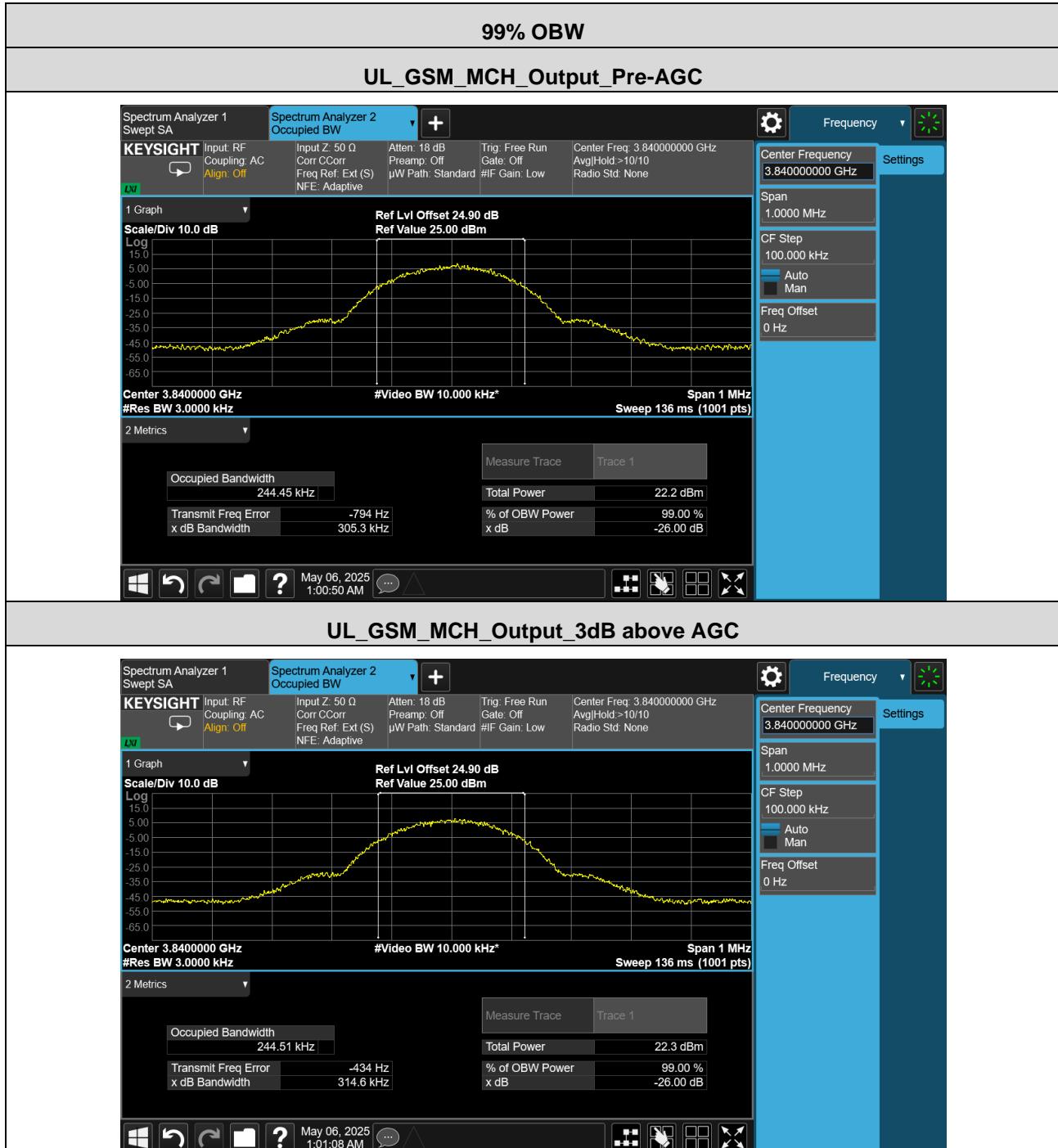
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## 3 Output power and amplifier/booster gain

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)
UL	3785.4	4.1MHz AWGN	Pre-AGC	-58	22.27	36.27	4.24	80.27
			3dB above AGC	-55	22.75	36.75	4.74	/
		100MHz AWGN	Pre-AGC	-58	22.05	36.05	4.03	80.05
			3dB above AGC	-55	22.40	36.40	4.37	/
		GSM	Pre-AGC	-58	22.39	36.39	4.36	80.39
			3dB above AGC	-55	22.58	36.58	4.55	/

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 14dBi 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
UL	3785.4	4.1MHz AWGN	Pre-AGC	16.20	30.20	1.05	PASS
			3dB above AGC	16.64	30.64	1.16	PASS
		100MHz AWGN	Pre-AGC	2.15	16.15	0.05	PASS
			3dB above AGC	2.51	16.51	0.05	PASS
		GSM	Pre-AGC	22.39	36.39	4.36	PASS
			3dB above AGC	22.58	36.58	4.55	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 14dBi 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
UL	3785.4	4.1MHz AWGN	Pre-AGC	8.39	≤13	PASS
			3dB above AGC	8.10		PASS
		100MHz AWGN	Pre-AGC	8.52		PASS
			3dB above AGC	8.37		PASS

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**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 to demonstrate PAR compliance.

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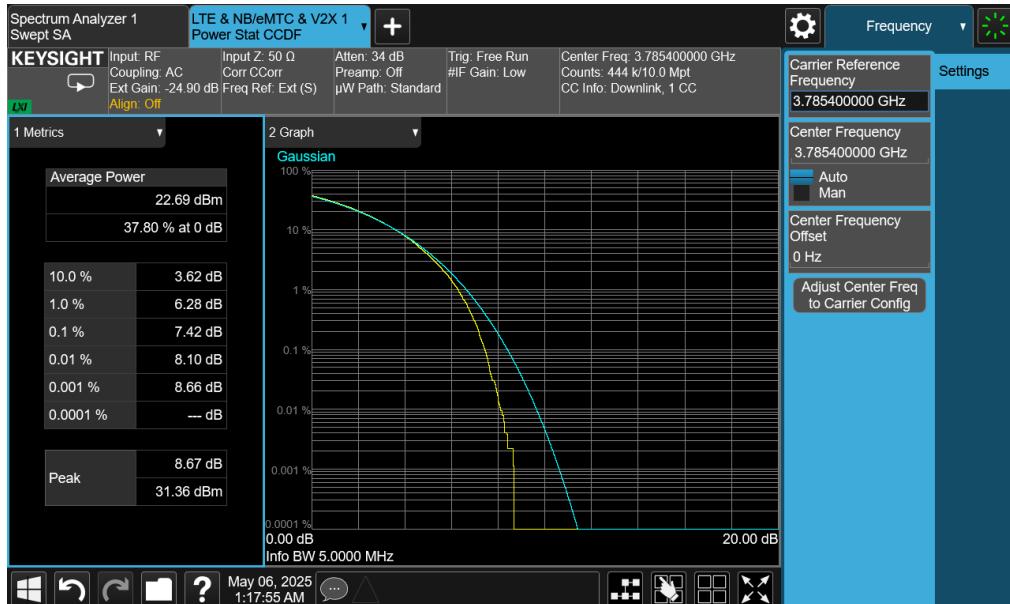
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## Peak-to-average ratio (PAR)

## UL\_4.1MHz AWGN\_Pre-AGC



## UL\_4.1MHz AWGN\_3dB above AGC



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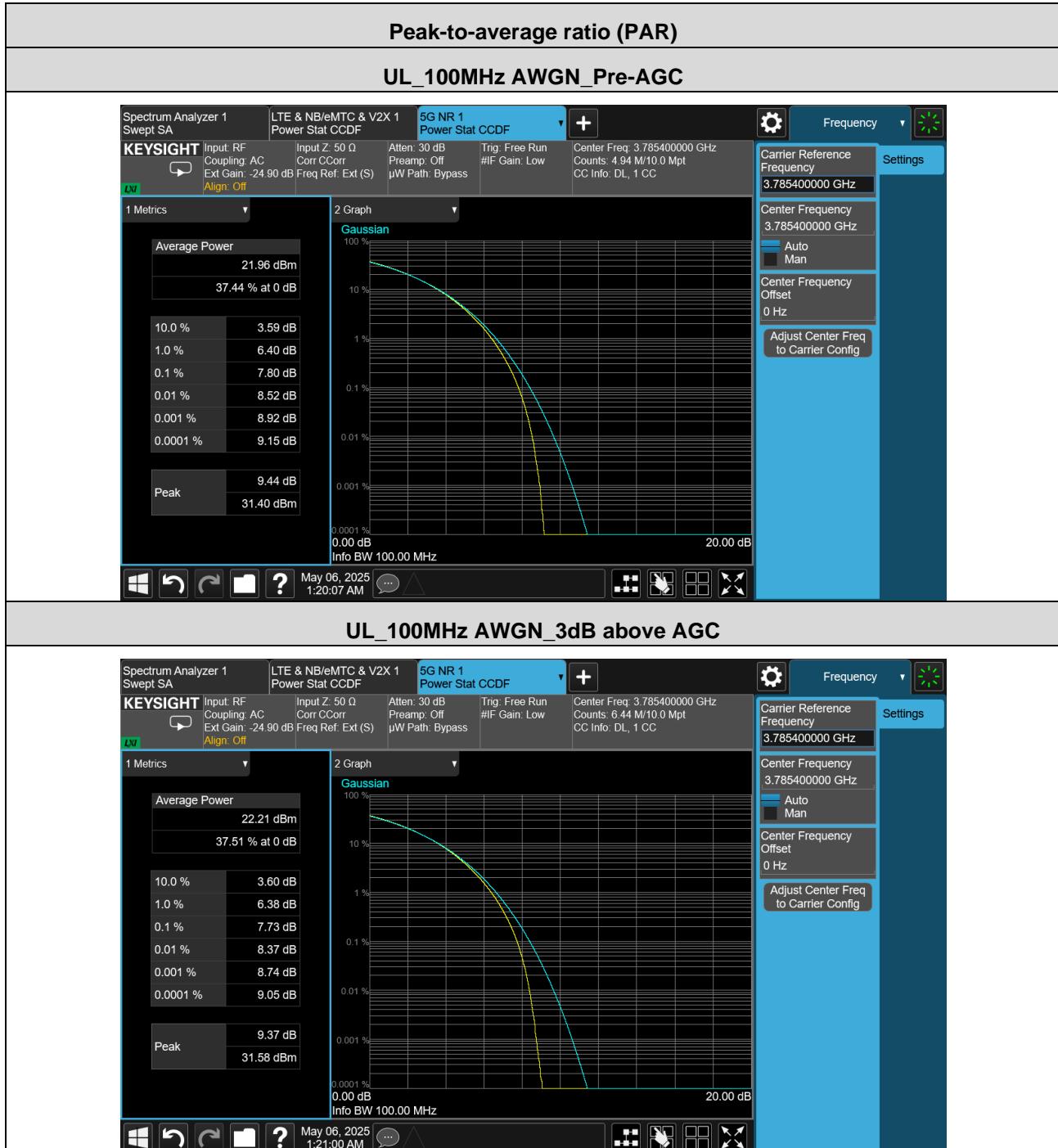
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## 4 Out-of-band/out-of-block(including intermodulation) emissions

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/MHz)	Verdict	
UL	LCH	4.1MHz AWGN	One signal input	Pre-AGC	-24.45	≤-13	PASS	
				3dB above AGC	-23.99		PASS	
			Two signals input	Pre-AGC	-28.02		PASS	
				3dB above AGC	-27.85		PASS	
	HCH		One signal input	Pre-AGC	-28.17		PASS	
				3dB above AGC	-27.93		PASS	
			Two signals input	Pre-AGC	-31.96		PASS	
				3dB above AGC	-31.75		PASS	
UL	LCH		One signal input	Pre-AGC	-15.19	≤-13	PASS	
				3dB above AGC	-14.61		PASS	
	HCH		One signal input	Pre-AGC	-16.54		PASS	
				3dB above AGC	-15.71		PASS	
UL	LCH	GSM	One signal input	Pre-AGC	-14.73	≤-13	PASS	
				3dB above AGC	-14.56		PASS	
			Two signals input	Pre-AGC	-17.64		PASS	
				3dB above AGC	-17.55		PASS	
	HCH		One signal input	Pre-AGC	-14.32		PASS	
				3dB above AGC	-14.23		PASS	
			Two signals input	Pre-AGC	-17.04		PASS	
				3dB above AGC	-16.80		PASS	

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

## UL\_4.1MHz AWGN\_LCH\_a single test signal\_Pre-AGC



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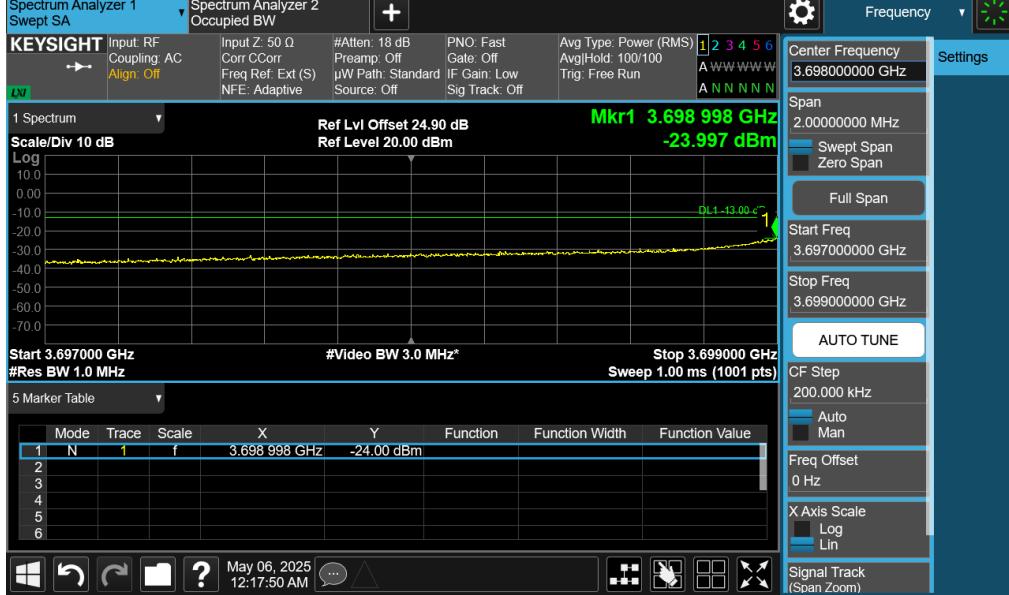
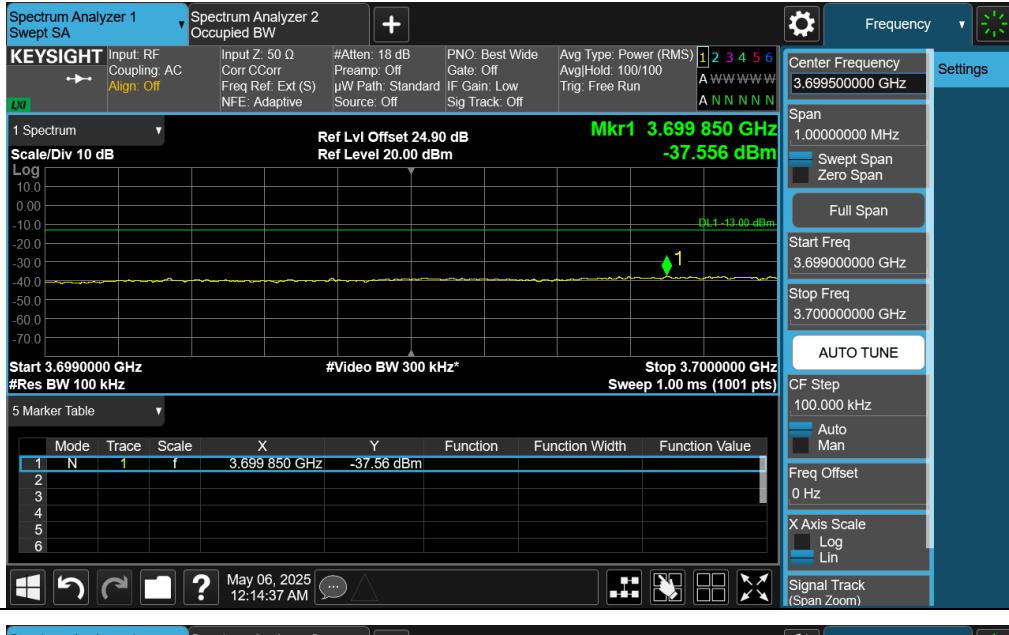
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## Out-of-band/out-of-block emissions

## UL\_4.1MHz AWGN\_LCH\_a single test signal\_3dB above AGC



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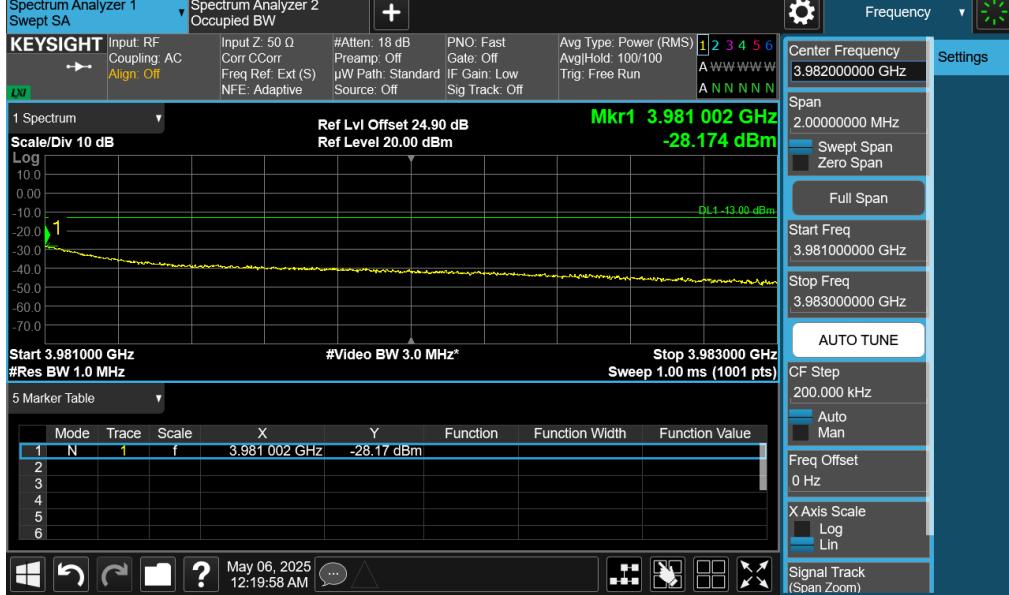
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## Out-of-band/out-of-block emissions

## UL\_4.1MHz AWGN\_HCH\_a single test signal\_Pre-AGC



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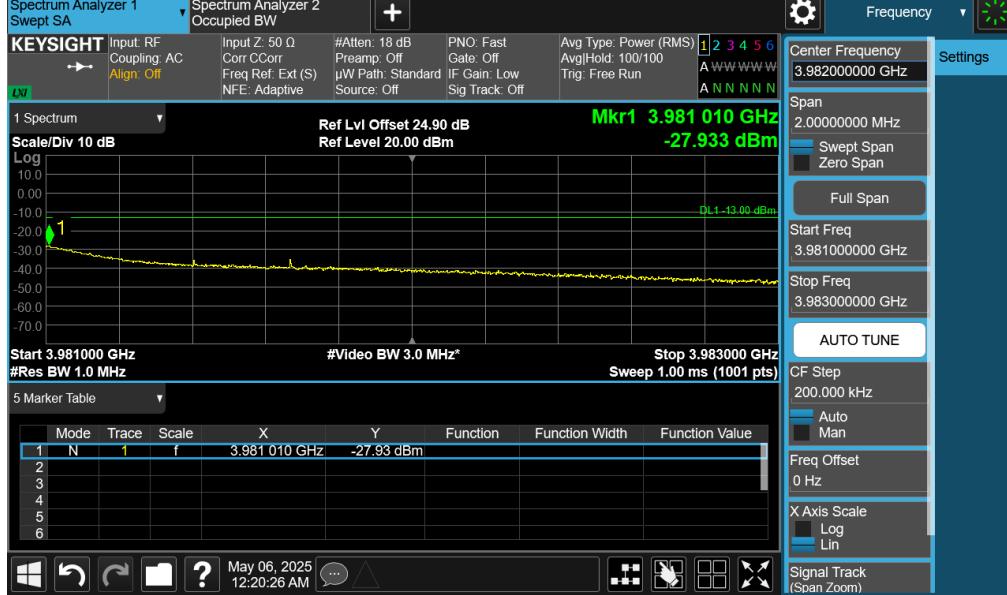
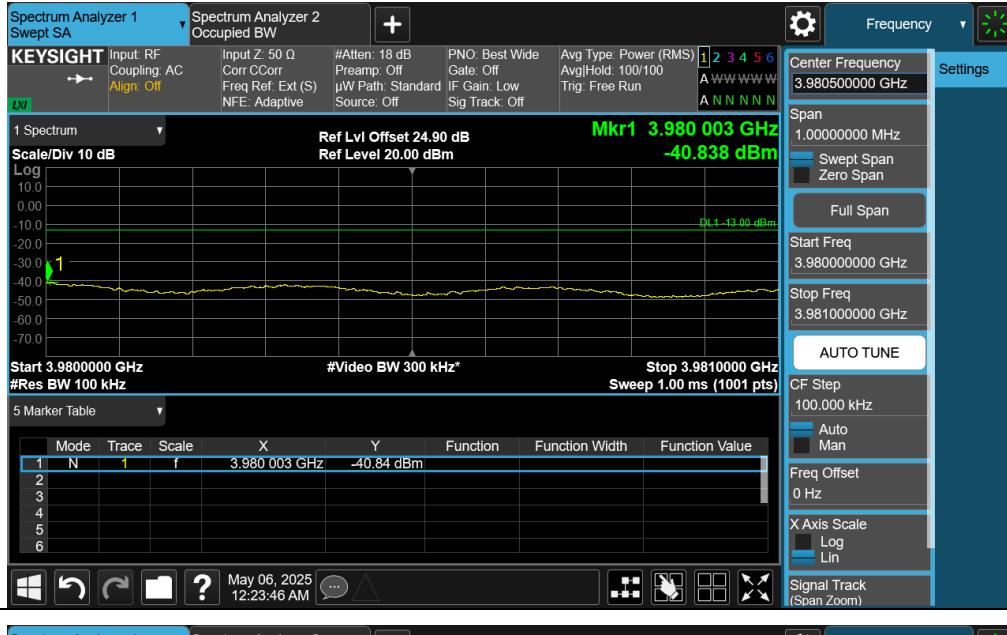
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## Out-of-band/out-of-block emissions

## UL\_4.1MHz AWGN\_HCH\_a single test signal\_3dB above AGC



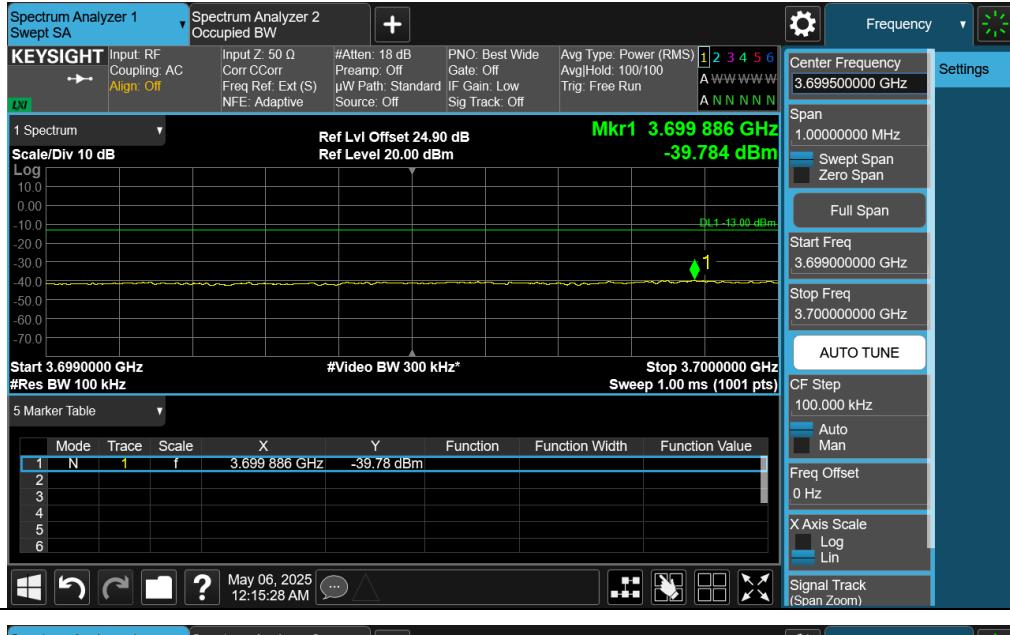
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## Out-of-band/out-of-block emissions

## UL\_4.1MHz AWGN\_LCH\_two adjacent test signals\_Pre-AGC



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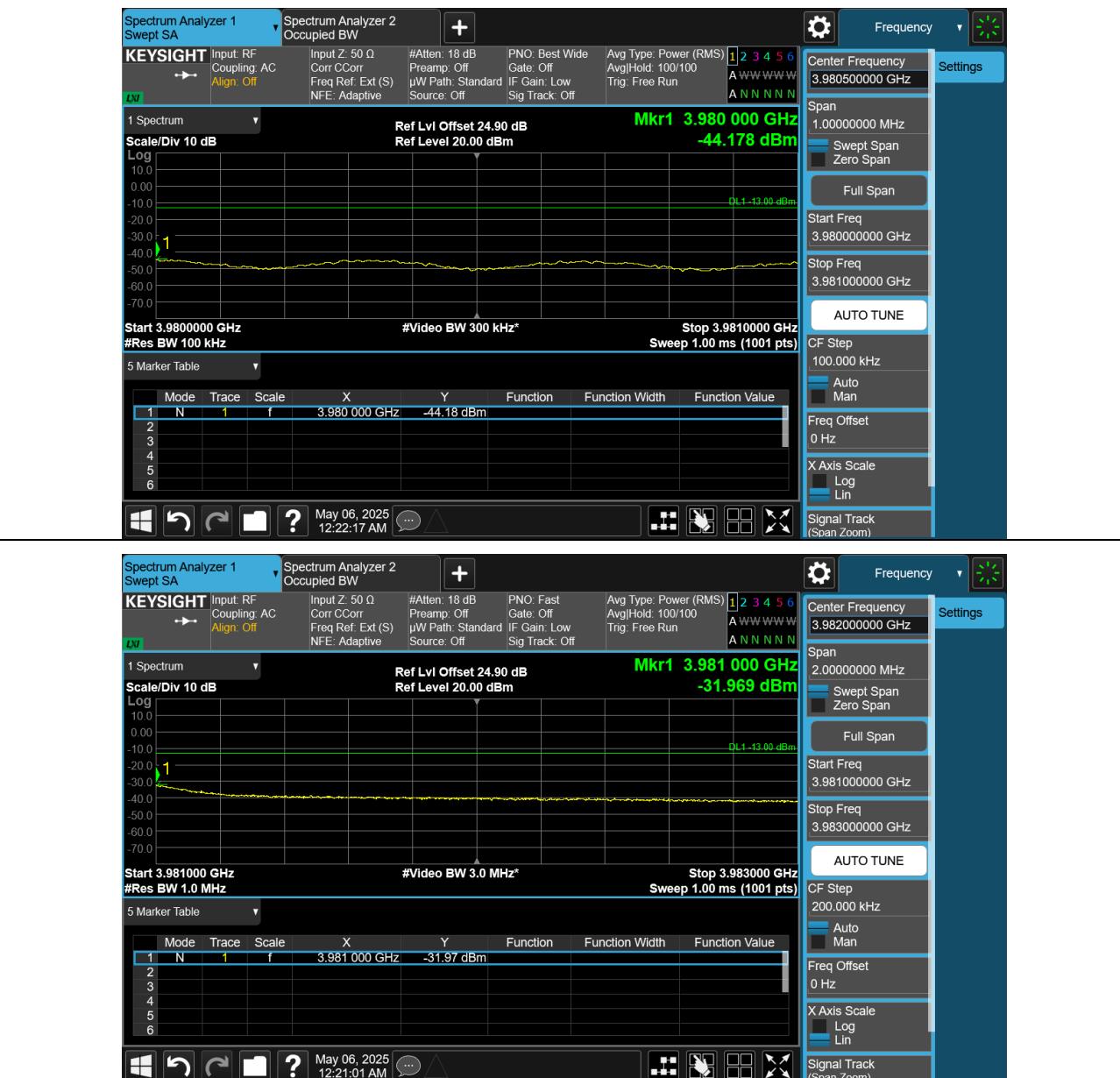
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## Out-of-band/out-of-block emissions

## UL\_4.1MHz AWGN\_HCH\_two adjacent test signals\_Pre-AGC



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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



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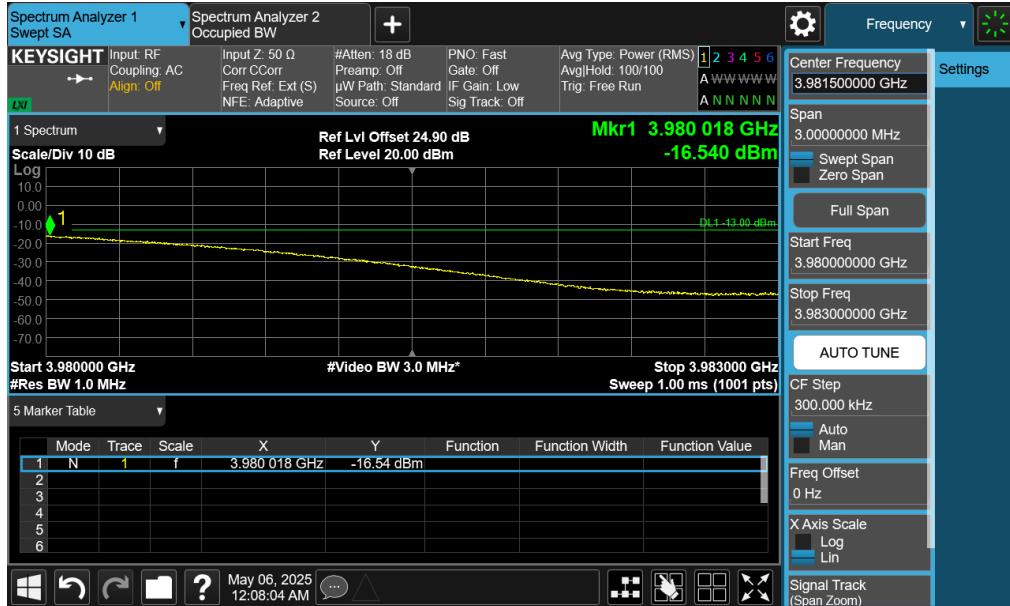
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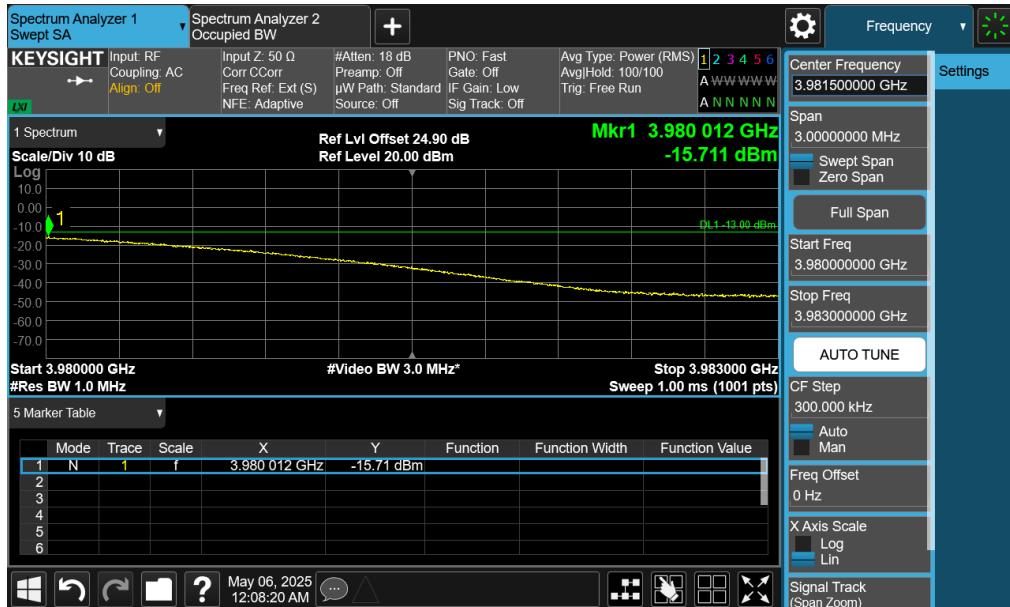
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## Out-of-band/out-of-block emissions

## 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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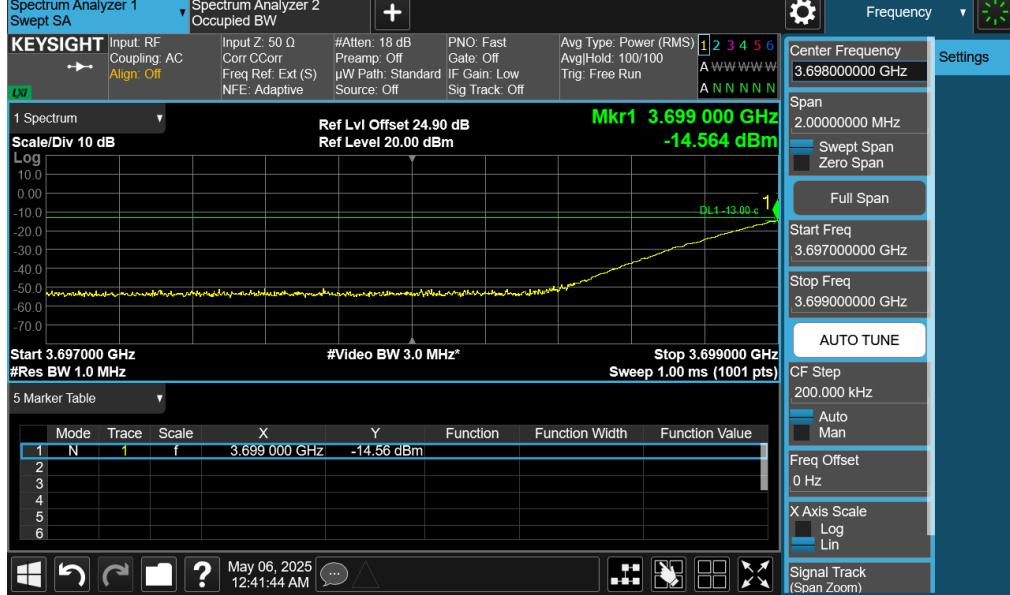
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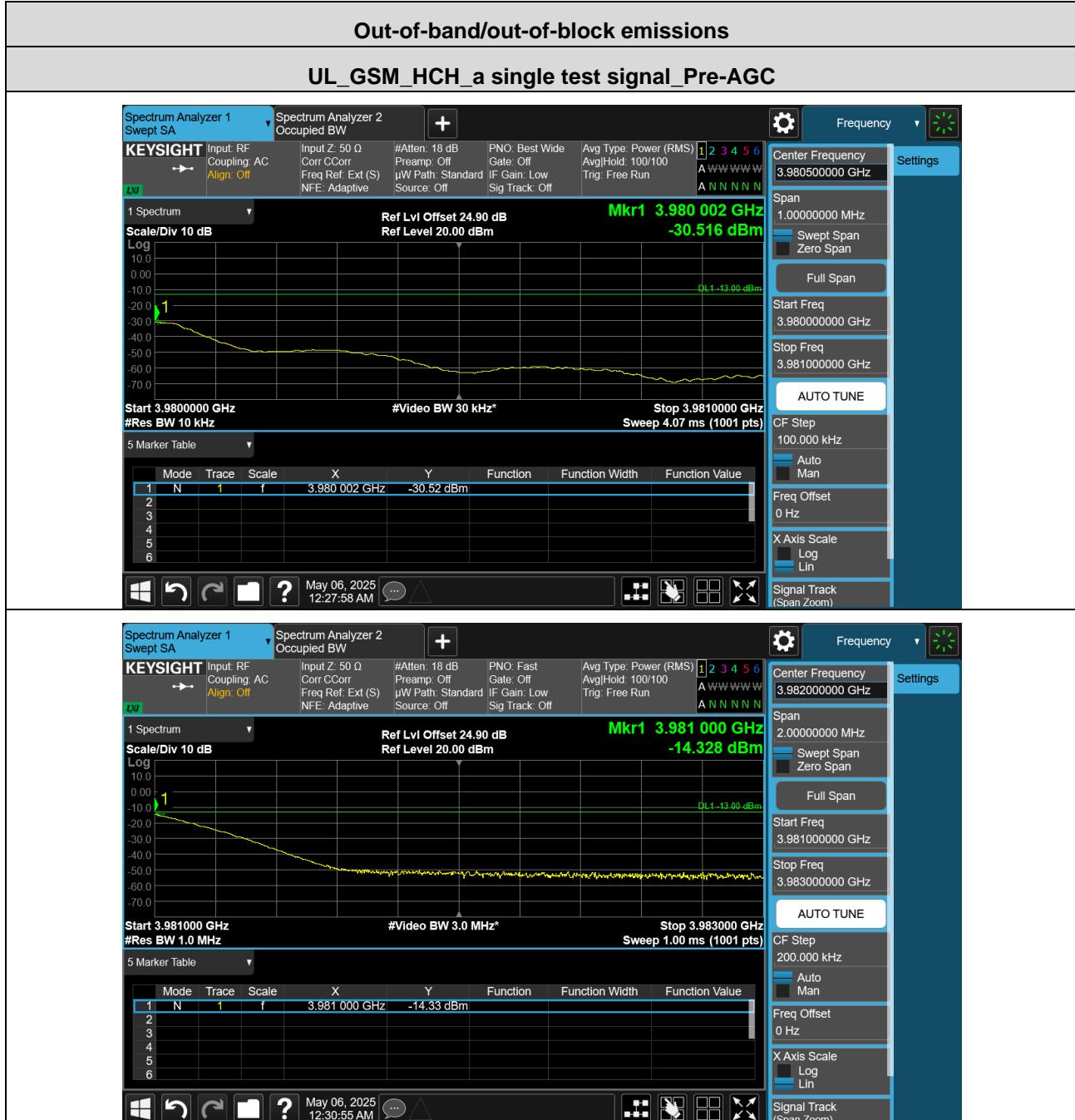
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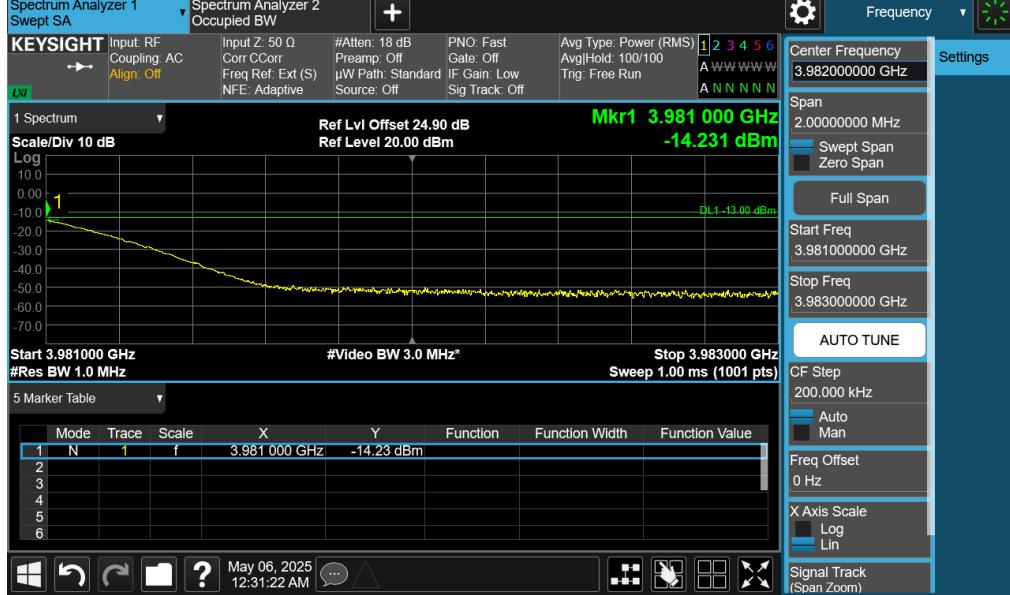
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## UL\_GSM\_HCH\_a single test signal\_3dB above AGC



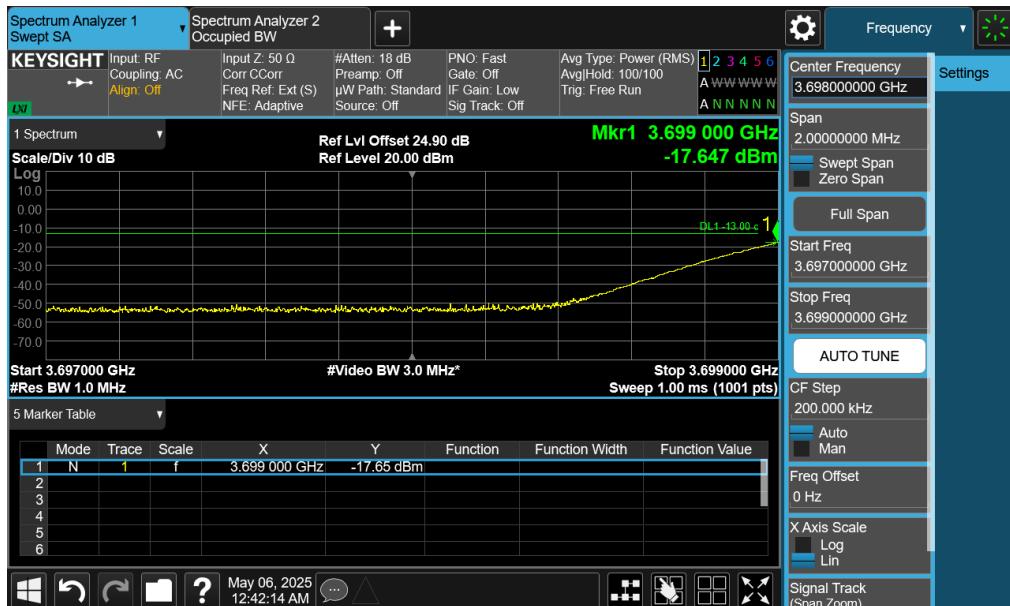
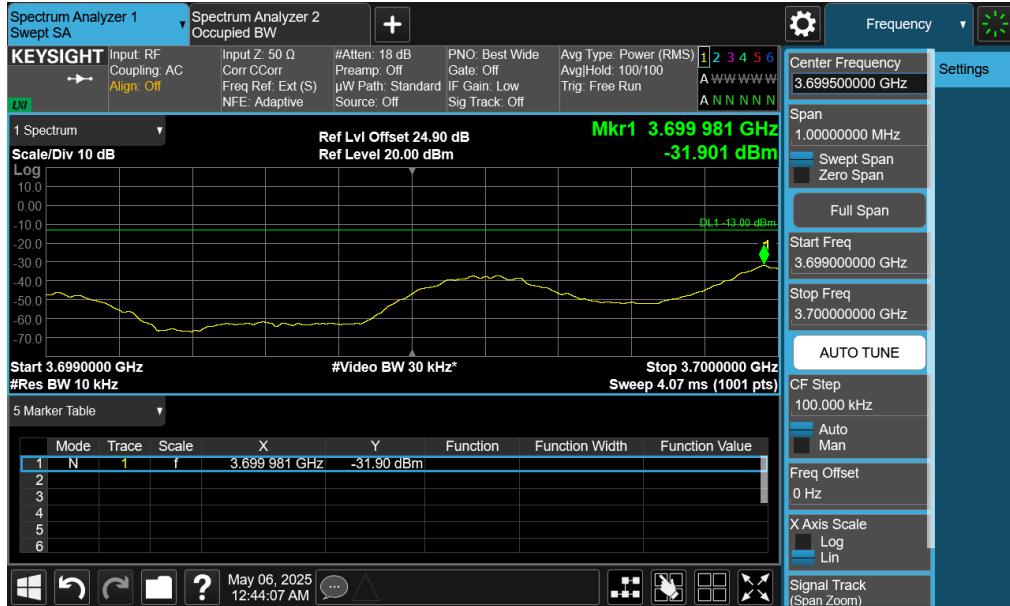
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## Out-of-band/out-of-block emissions

## UL\_GSM\_LCH\_two adjacent test signals\_Pre-AGC



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

## UL\_GSM\_LCH\_two adjacent test signals \_3dB above AGC



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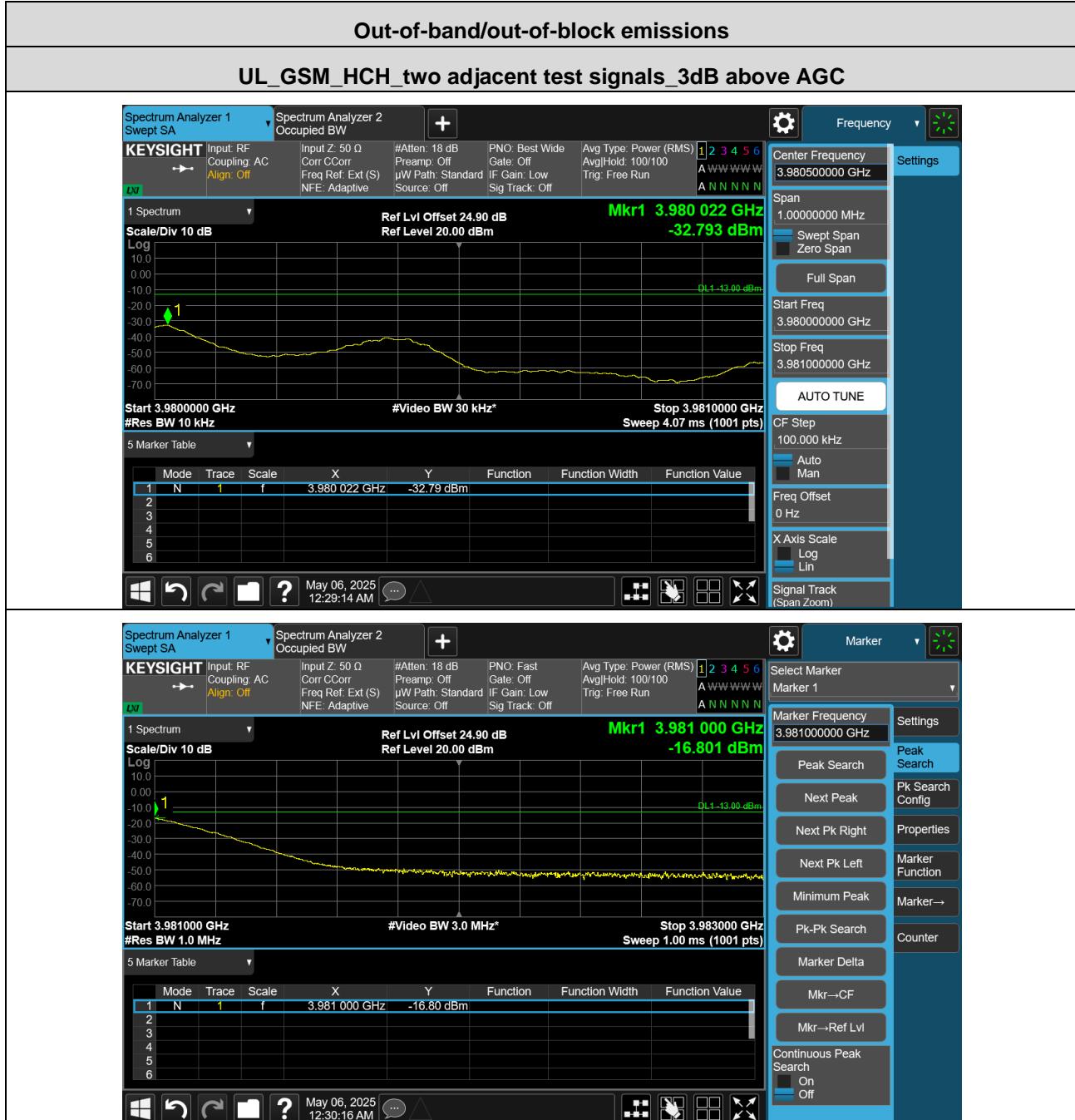




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## 5 Conducted Spurious emissions

Conducted Spurious emissions						
Test path	Test signal	Test channel	Frequency range (MHz)	Worst test level (dBm)	Limit (dBm)	Verdict
UL	GSM	LCH	0.09-1000	-56.59	≤-13	PASS
			1000-3699	-15.17	≤-13	PASS
		HCH	3981-39800	-14.61	≤-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  $43 + 10\log_{10}(P)$  dB, here,  
 $P = 22\text{dBm} = 0.16\text{W}$   
 $\text{limit} = 22\text{dBm} - [43 + 10\log_{10}(0.16\text{W})]\text{dB} = -13\text{dBm}$
2. 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.
3. The spurious emissions 9kHz to 30MHz and above 20GHz were very low and not displayed test plots in this report.



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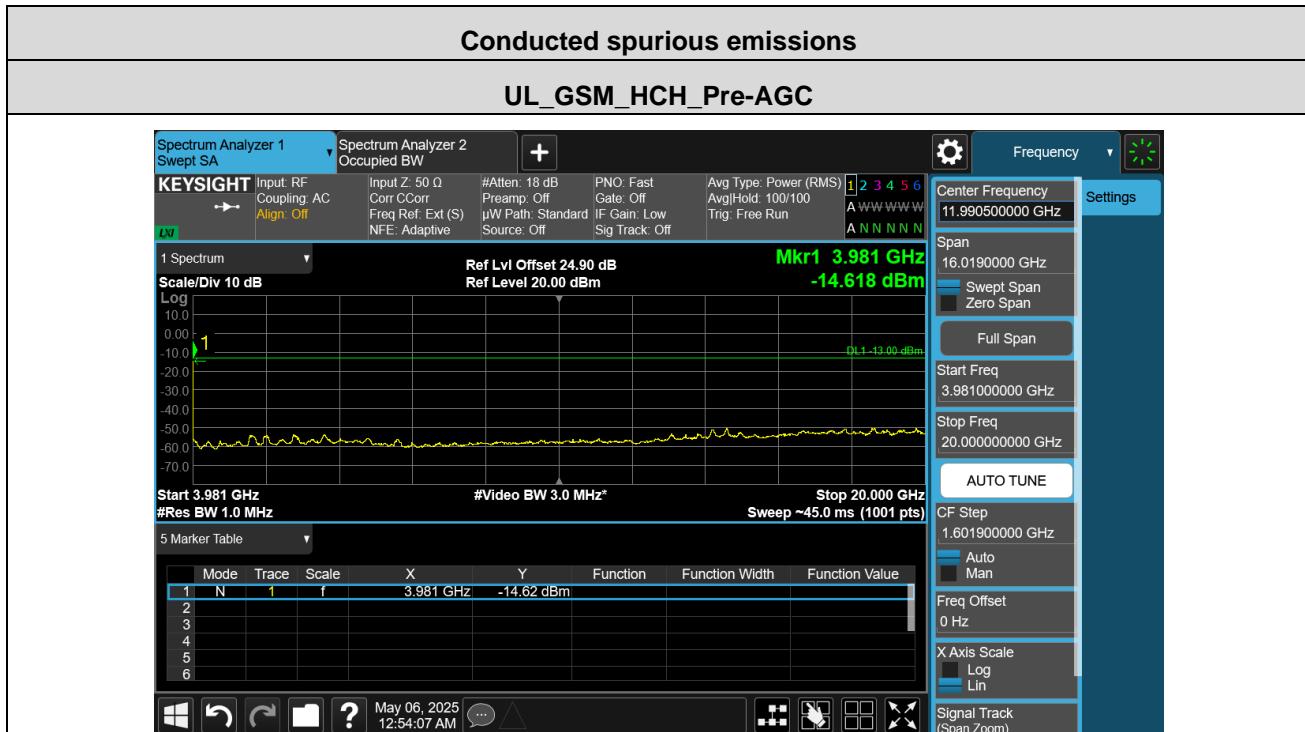
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## 6 Frequency Stability

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	6.2	0.00161	PASS
			TN	VH	6.2	0.00161	PASS
		100MHz AWGN	TN	VL	7.1	0.00185	PASS
			TN	VH	7.1	0.00185	PASS
		GSM	TN	VL	5.4	0.00141	PASS
			TN	VH	5.4	0.00141	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	6.5	0.00169	PASS
			VN	+40	4.5	0.00117	PASS
			VN	+30	6.5	0.00169	PASS
			VN	+20	4.4	0.00115	PASS
			VN	+10	7.5	0.00195	PASS
			VN	0	5.7	0.00148	PASS
			VN	-10	7.2	0.00188	PASS
			VN	-20	7.1	0.00185	PASS
			VN	-30	7.2	0.00188	PASS
	MCH	100MHz AWGN	VN	+50	8.0	0.00208	PASS
			VN	+40	7.1	0.00185	PASS
			VN	+30	4.1	0.00107	PASS
			VN	+20	7.9	0.00206	PASS
			VN	+10	8.1	0.00211	PASS
			VN	0	4.5	0.00117	PASS
			VN	-10	6.7	0.00174	PASS
			VN	-20	6.4	0.00167	PASS
			VN	-30	4.9	0.00128	PASS
	MCH	GSM	VN	+50	4.3	0.00112	PASS
			VN	+40	5.6	0.00146	PASS
			VN	+30	5.5	0.00143	PASS
			VN	+20	5.2	0.00135	PASS
			VN	+10	4.7	0.00122	PASS
			VN	0	7.3	0.00190	PASS
			VN	-10	6.3	0.00164	PASS
			VN	-20	6.0	0.00156	PASS
			VN	-30	7.0	0.00182	PASS

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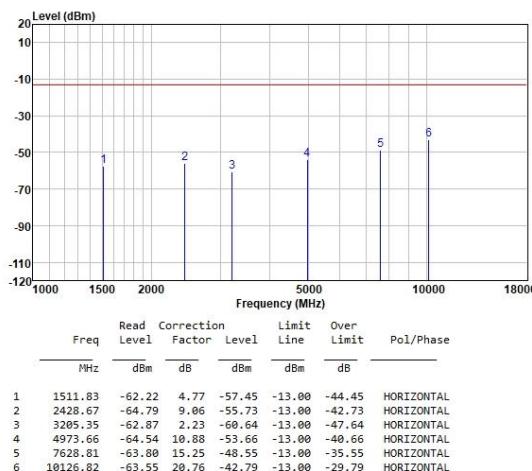
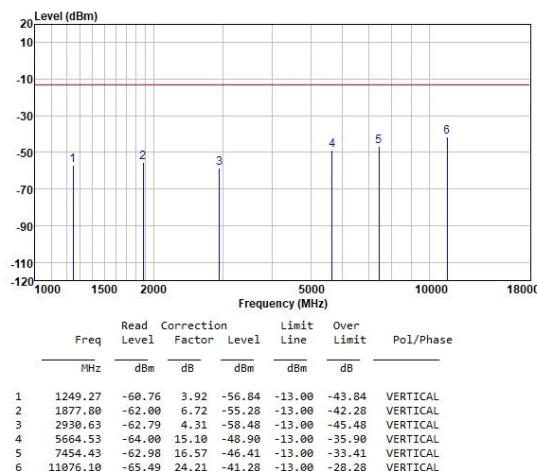
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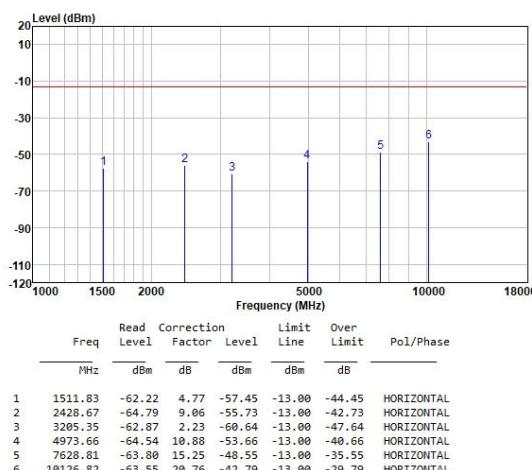
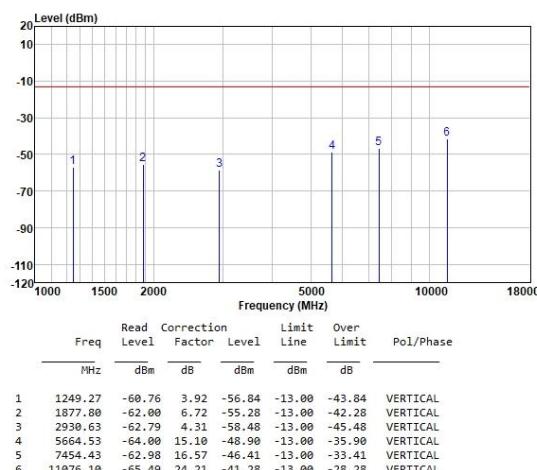
## 7 Radiated Spurious emissions

## Radiated Spurious emissions

## UL\_4.1MHz AWGN\_MCH\_30MHz-1GHz



## UL\_4.1MHz AWGN\_MCH\_above 1GHz



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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 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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