

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Page: 1 of 46 EMC-ARF-05 Rev 1.1 FCC ID: OJFDHRU-G2-35

# Appendix -

## Test Data and Result for report GZCR240300025403



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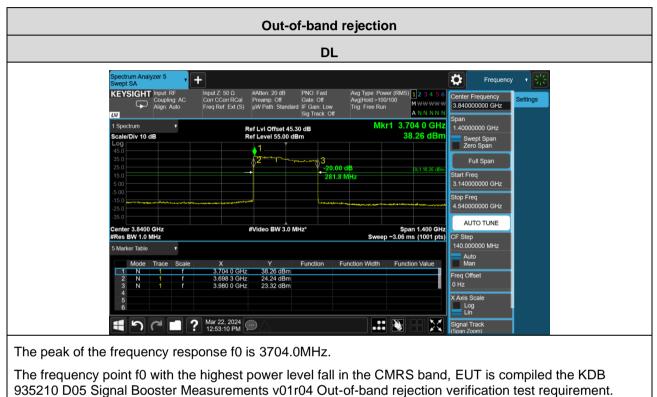


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Remark: Manufacture declared the product support 2X2 MIMO with identical PCB layout/component use/Tune up that make sure each antenna port with identical RF output, so the test only performed at one of the antenna port in this report.

#### 1 Out-of-band rejection



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#### 2 Input versus Output comparison

Occupied Bandwidth								
Test Path	Test Signal	nal Test Channel Signal Level		Verdict				
	4.1MHz AWGN 100MHz AWGN	МСН	Pre-AGC	PASS				
		WOIT	3dB above AGC	PASS				
D		MCH	Pre-AGC	PASS				
DL			3dB above AGC	PASS				
Pomark:	0014	МСН	Pre-AGC	PASS				
	GSM	MOIT	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.



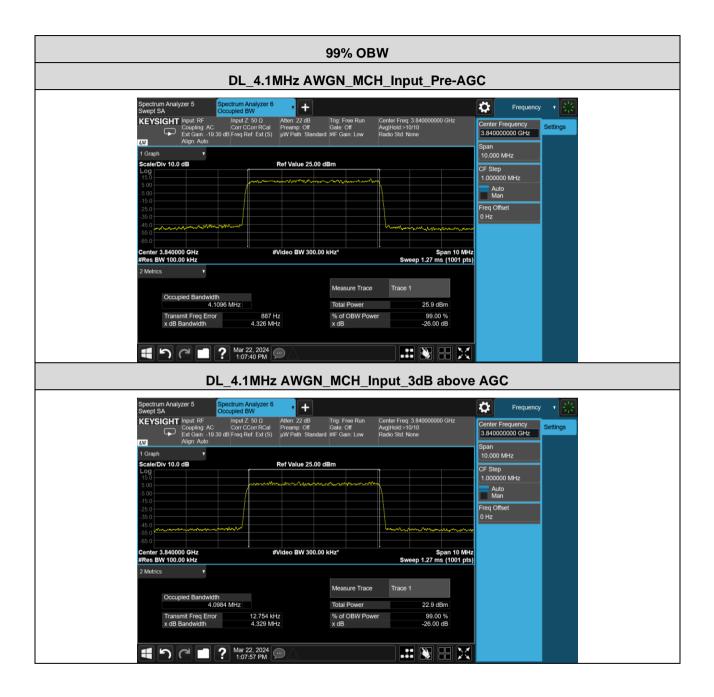
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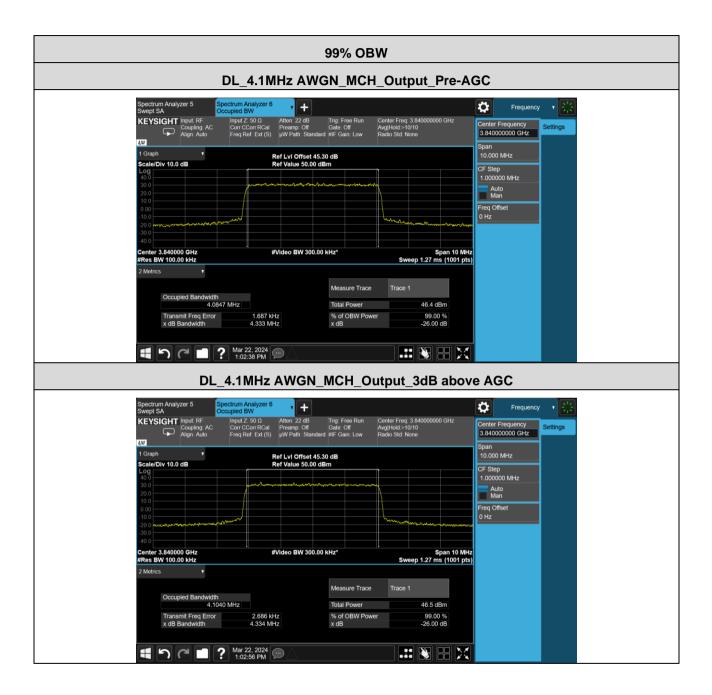
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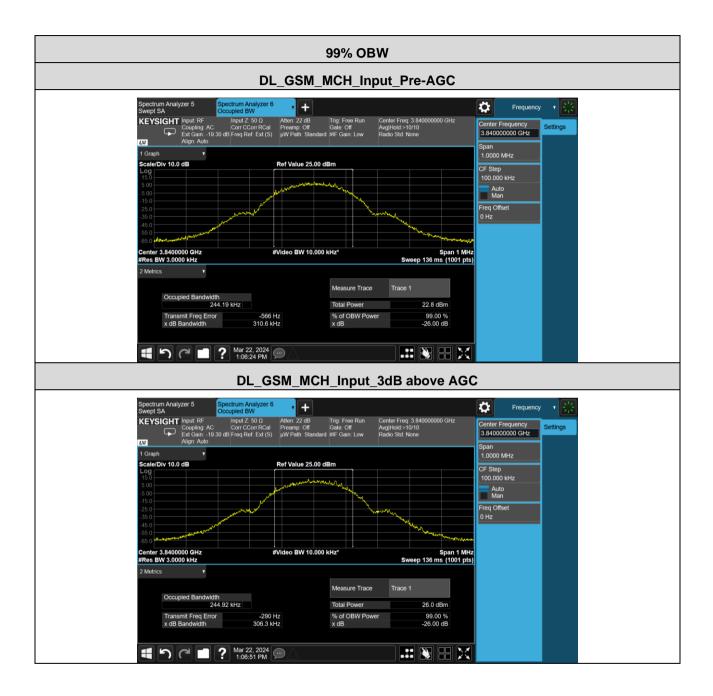
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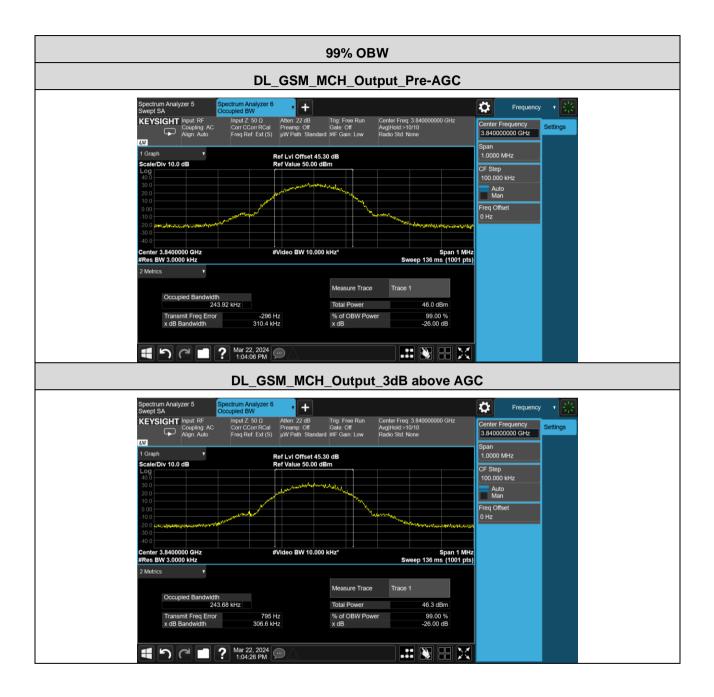
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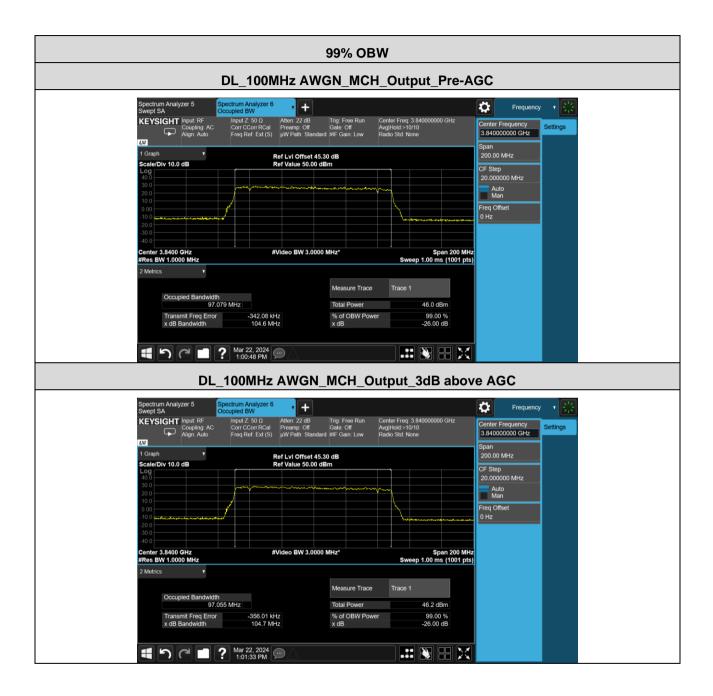
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#### 3 Output power and amplifier/booster gain

	Mean output power and gain											
Test Path	Test Freq. f0 (MHz)	Test Signal	Signal Level	Input power (dBm)	Output Power (dBm)	SISO EIRP (W)	Total EIRP (W)	Gain (dB)	Verdict			
		4.1MHz AWGN 704.0 100MHz AWGN GSM	Pre-AGC	23.00	45.64	115.88	463.45	22.64	PASS			
			3dB above AGC	26.00	45.81	120.51	481.95	/	PASS			
			Pre-AGC	23.00	45.88	122.47	489.78	22.88	PASS			
DL	DL 3704.0		3dB above AGC	26.00	46.05	127.36	509.34	1	PASS			
			Pre-AGC	23.00	45.89	122.75	490.91	23.49	PASS			
			3dB above AGC	26.00	46.05	127.36	509.34	/	PASS			
		GSM						23.49 /				

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, the directional gain =  $G_{ANT}$  + 10 log (N<sub>ANT</sub>) dBi = 8dBi.

	Mean output power										
Test Path	Test Freq. f0 (MHz)	Test Signal	Signal Level	Output Power (dBm/MHz)	SISO EIRP (W/MHz)	Total EIRP (W/MHz)	Verdict				
		4.1MHz AWGN 100MHz AWGN	Pre-AGC	39.61	28.91	115.62	PASS				
			3dB above AGC	39.58	28.71	114.82	PASS				
			100MHz	Pre-AGC	29.48	2.81	11.23	PASS			
DL	3704.0		3dB above AGC	29.61	2.90	11.57	PASS				
			Pre-AGC	45.89	122.75	490.91	PASS				
Domo		GSM	3dB above AGC	46.05	127.36	509.34	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, the directional gain = GANT + 10 log (NANT) dBi = 8dBi.

3. The output power is limited to an EIRP of 1640W/MHz.



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Test Path	Test Freq. f0 (MHz)	Test Signal	Peal Signal Level	k-to-average ratio (PAR) PAR (dB)	Limit (dB)	Verdict		
		704.0 4.1MHz AWGN 100MHz AWGN	Pre-AGC	10.13	≤13	PASS		
			3dB above AGC	10.23		PASS		
DL	3704.0		Pre-AGC	8.61		PASS		
			3dB above AGC	8.74		PASS		
Remark: GSM signals are not similar to a noise-like signal, the PAR of a GSM signal is very low and not displayed in this report.								



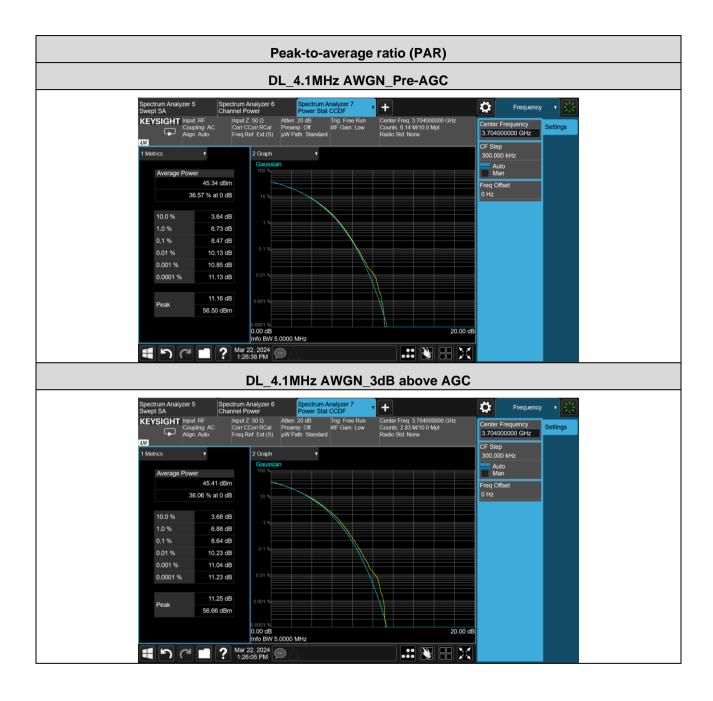
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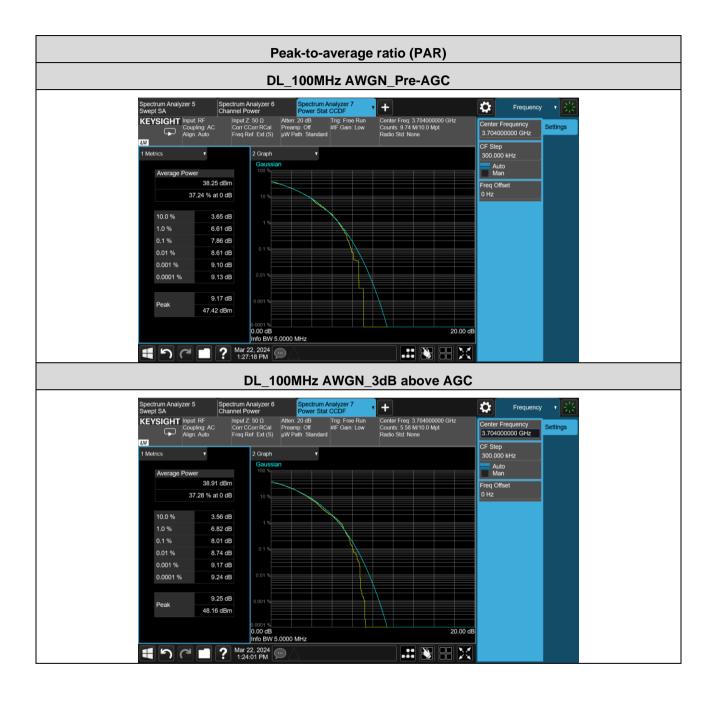
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Out-of-band/out-of-block(including intermodulation) emissions										
Test Channel	Test Signal	Stimulus	Signal Level	Worst conducted test level (dBm)		Limit (dBm/MHz)	Verdict			
Onanner	Olgriai	Condition		/200kHz	/1MHz					
				-27.39	-20.40		PASS			
		One signal	FIE-AGC	/	-17.03		PASS			
		input	2dB above ACC	-26.90	-19.91		PASS			
			SUB above AGC	/	-16.93		PASS			
LCH	4.1MHz AWGN		Pre-AGC	-29.03	-22.04		PASS			
		Two signals input		/	-18.23		PASS PASS			
			3dB above AGC	-29.10	-22.11	≤-16	PASS			
				/	-18.67		PASS			
		One signal	Pre-AGC	-28.29	-21.30		PASS			
				/	-16.86		PASS			
		input		-28.49	-21.50		PASS			
			3dB above AGC	/	-16.74		PASS			
нсн				-30.85 -23.86		PASS				
		Two signals	Pre-AGC	/	-19.60		PASS			
		input		-30.74	-23.75	-	PASS			
			3dB above AGC	/	-19.42		PASS			
	Test Channel	Test ChannelTest SignalLCH4.1MHz AWGN	Test ChannelTest SignalStimulus ConditionLCHOne signal inputLCHTwo signals input4.1MHz AWGNHCHOne signal input	Test ChannelTest SignalStimulus ConditionSignal LevelLCHAre-AGC InputPre-AGC 3dB above AGC3dB above AGCLCH4.1MHz AWGNTwo signals InputPre-AGC 3dB above AGC4.1MHz AWGNOne signal InputPre-AGC 3dB above AGCHCHFre-AGC AGCPre-AGC Pre-AGCHCHFre-AGC AGCPre-AGC Pre-AGC	Test Channel Test Signal Stimulus Condition Signal Level Worst condition   LCH Antipactor -27.39 -27.39   LCH One signal input Pre-AGC -26.90   At 1MHz Two signals input Pre-AGC -29.03   Two signals input Pre-AGC -29.03   HCH One signal input Pre-AGC -29.03   HCH Two signals input Pre-AGC -29.10   MCH One signal input -28.29 -28.29   Pre-AGC / -28.49 -28.49   MCH Two signals input Pre-AGC -30.85   MCH Two signals input Pre-AGC -30.85	Test ChannelTest SignalStimulus ConditionSignal LevelWorst co-ducted test level (dBm)LCH	Test Channel   Test Signal   Stimulus Condition   Signal Level   Worst conducted test level (dBm)   Limit (dBm/MHz)     LCH   A.1MHz   One signal input   Pre-AGC   -27.39   -20.40   -27.30   -22.04   -28.39   -21.01   -22.04   -29.10   -22.11   -29.10   -22.11   -29.10   -22.11   -28.49   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50   -21.50			

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

Remark:

1. The level in 1MHz RBW= the level in 200kHz RBW+ 10lg(1000/200).

2. For  $2 \times 2$  MIMO, one of ANT ports was measured and the limit shall be reduced by 10lg(2) = 3dB, so the limit was calculated to show -16dBm/MHz in order to determine the test result conveniently.



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Out-of-band/out-of-block(including intermodulation) emissions									
Test Path	Test Channel	Test Signal	Stimulus Condition	Signal Level	Worst conducted test level (dBm/MHz)	Limit (dBm/MHz)	Verdict		
			One signal	Pre-AGC	-18.15		PASS		
	LCH		input	3dB above AGC	-17.34		PASS		
	LON	100MHz AWGN	Two signals input	Pre-AGC	-19.82		PASS		
51				3dB above AGC	-18.77		PASS		
DL			One signal	Pre-AGC	-18.23	≤-16	PASS		
			input	3dB above AGC	-17.25		PASS		
	HCH		Two signals	Pre-AGC	-19.11		PASS		
			input	3dB above AGC	-18.82		PASS		
Remark:		1			1	1			

For  $2 \times 2$  MIMO, one of ANT ports was measured and the limit shall be reduced by 10lg(2) = 3dB, so the limit was calculated to show -16dBm/MHz in order to determine the test result conveniently.

Out-of-band/out-of-block(including intermodulation) emissions										
Test	Test	Test	Stimulus Condition	Signal Level		onducted el (dBm)	Limit	Verdict		
Path	Channel	Signal	Condition		/10kHz	/1MHz	(dBm/MHz)			
			One signal	Pre-AGC	-38.63	-18.63		PASS		
			input	3dB above AGC	-39.38	-19.38	≤-16	PASS		
	LCH	GSM	Two signals input	Pre-AGC	-37.75	-17.75		PASS		
DI DI				3dB above AGC	-37.37	-17.37		PASS		
DL			One signal	Pre-AGC	-39.19	-19.19		PASS		
			input	3dB above AGC	-39.13	-19.13		PASS PASS		
	НСН		Two signals	Pre-AGC	-37.39	-17.39		PASS		
			input	3dB above AGC	-37.01	-17.01		PASS		

Remark:

1. The level in 1MHz RBW= the level in 10kHz RBW+ 10lg(1000/10).

2. For  $2 \times 2$  MIMO, one of ANT ports was measured and the limit shall be reduced by 10lg(2) = 3dB, so the limit was calculated to show -16dBm/MHz in order to determine the test result conveniently.



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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	
Faur	Channel	Signal	Condition		/100kHz	/1MHz			
			One signal	Pre-AGC	-34.31	-24.31		PASS	
			input	3dB above AGC	-34.22	-24.22	≤-16	PASS	
	LCH	GSM	Two signals input	Pre-AGC	-33.50	-23.50		PASS	
D				3dB above AGC	-33.51	-23.51		PASS	
DL			One signal	Pre-AGC	-36.63	-26.63		PASS	
			input	3dB above AGC	GC -35.88 -25.88		PASS		
	HCH		Two signals	Pre-AGC	-33.16	-23.16	-	PASS	
			input	3dB above AGC	-33.05	-23.05		PASS	
Remark:	•		•		•		•		

1. The level in 1MHz RBW= the level in 100kHz RBW+ 10lg(1000/100).

2. For 2×2 MIMO, one of ANT ports was measured and the limit shall be reduced by 10lg(2) =3dB, so the limit was calculated to show -16dBm/MHz in order to determine the test result conveniently.



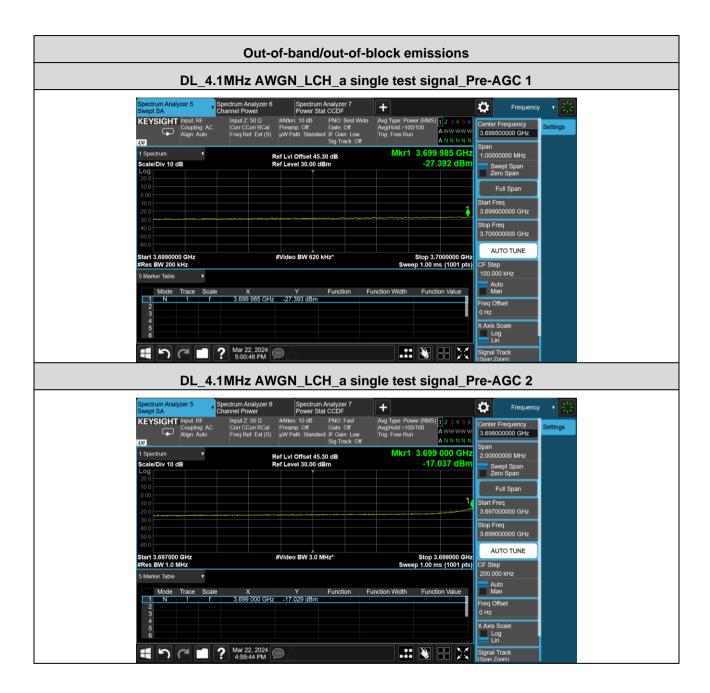
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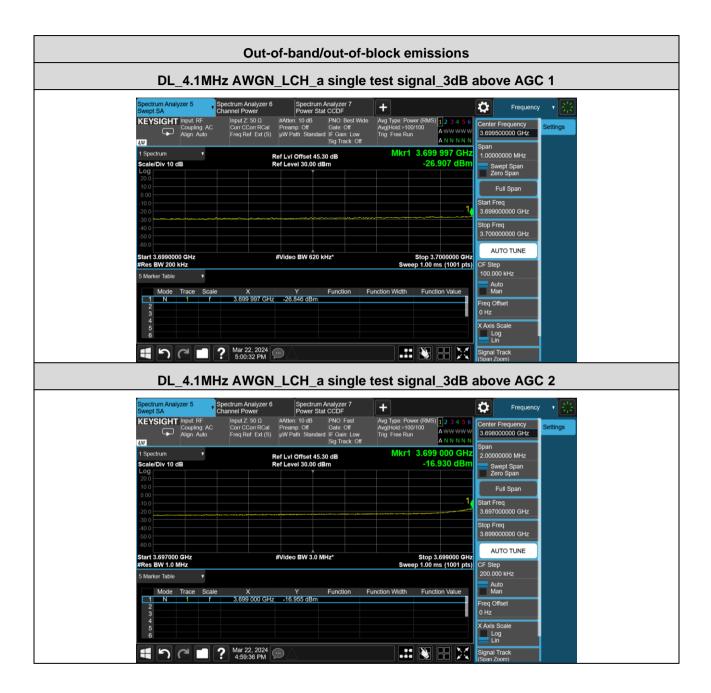
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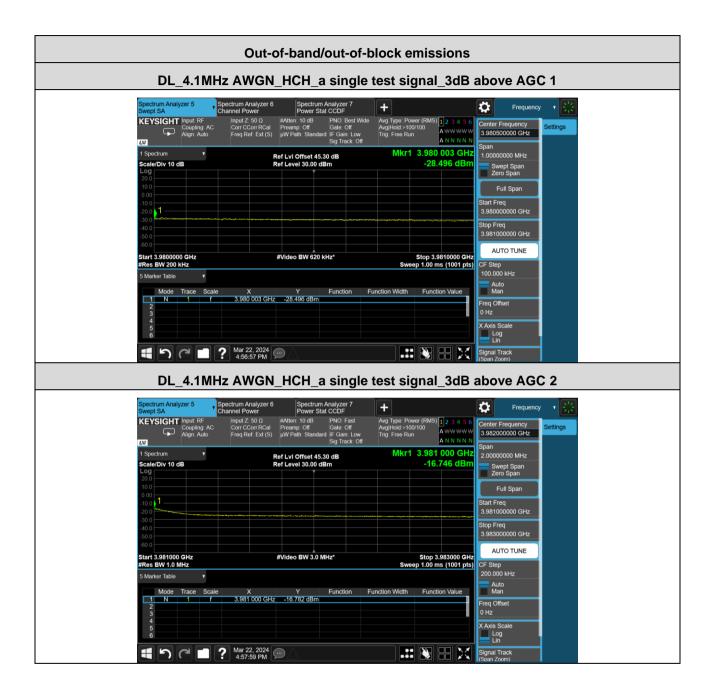
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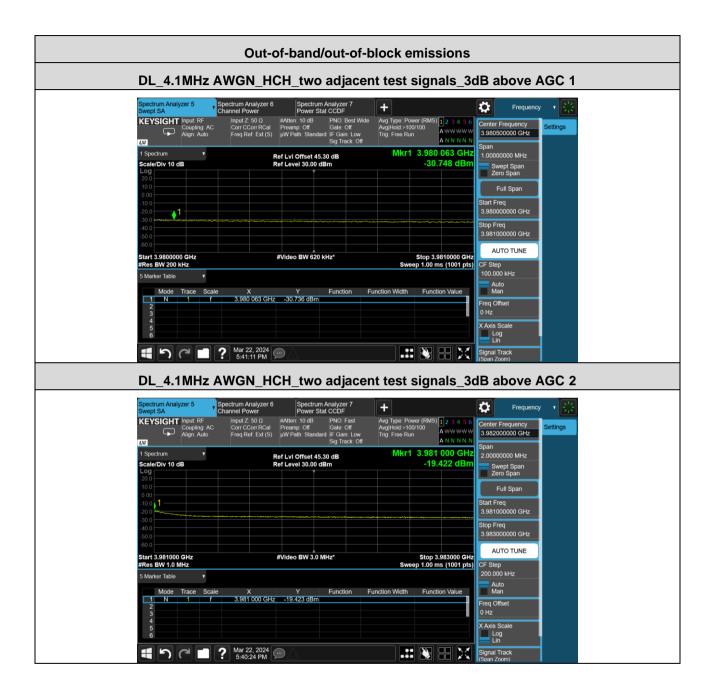
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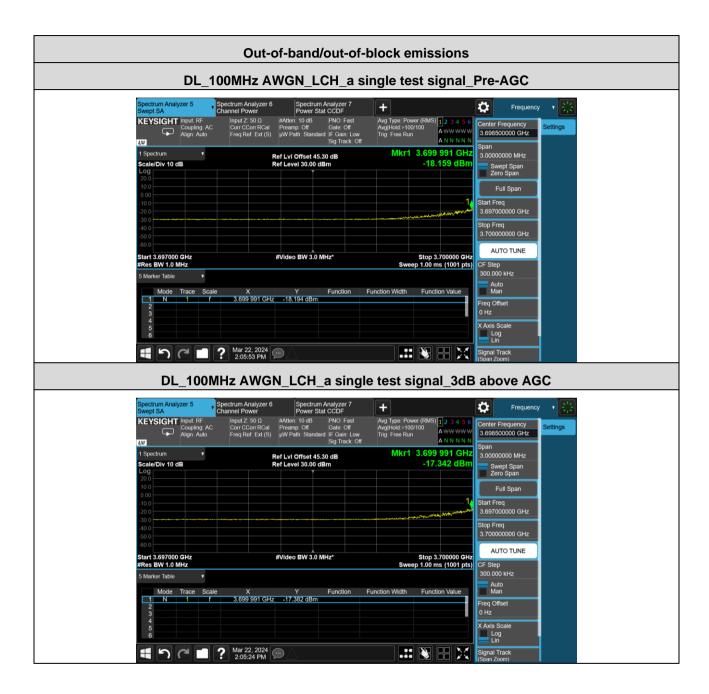
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