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Appendix -

Test Data and Result for report GZCR230300024802 (A)

(For 100MHz AWGN test data)



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1 AWS-1 (1710-1755MHz paired with 2110-2155MHz)

1.1 AGC threshold level

Test Conf.	AGC Threshold level
DL_1S_M_AWGN	-0.10dBm



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Input_DL_1S_M_AWGN_Pre-AGC_OBW um Analy. ied BW Ö • + ctrum pt SA Frequency Center Freq: 2.132500000 GHz Avg|Hold:>10/10 Radio Std, None Input Z: 50 Ω Corr CCorr RCal Freq Ref: Ext (S) KEYSIGHT Input RF Atten: 14 dB Trig: Free Rur Preamp: Off Gate: Off uW Path: Standard #/F Gain: Low Coupling: AC Align: Auto Center Frequency 2.132500000 GHz ettings Graph 200.00 MHz le/Div 10.0 dB Ref Value 5.00 dBm CF Step 20.000000 MHz Auto Man Freq Offset 0 Hz #Video BW 3.0000 MHz Center 2.1325 GHz Res BW 1.0000 MHz Span 200 MHz Sweep 1.00 ms (1001 pts) 2 Metrics Measure Trace Trace 1 Occupied Bandwidth 97.406 MHz 0.05 dBm Total Power Transmit Freq Error x dB Bandwidth -97.672 kHz 100.6 MHz % of OBW Power 99.00 % -26.00 dB x dB 443:22 PM Input DL 1S M AWGN AGC+3dB OBW Ö ectrum A ept SA rum Analyz bied BW + Frequency Center Freq: 2.132500000 GHz Avg|Hold:>10/10 Radio Std: None KEYSIGHT Input: RF Coupling: AC Align: Auto Input Z: 50 Ω Corr CCorr RCal Freg Ref: Ext (S) Atten: 14 dB Trig: Free Rur Preamp: Off Gate: Off µW Path: Standard #IF Gain: Low ettings Center Frequency 2.132500000 GHz Graph 200.00 MHz Ref Value 5.00 dBm Div 10.0 dB CF Step 20.000000 MHz Auto Man Freq Offset 0 Hz #Video BW 3.0000 MHz* Center 2.1325 GHz Res BW 1.0000 MHz Span 200 MHz Sweep 1.00 ms (1001 pts) Trace 1 Measure Trace Occupied Bandwidth 97.466 MHz Total Power 2.97 dBm Transmit Freq Error x dB Bandwidth 112.83 kHz % of OBW Power x dB 99.00 % -26.00 dB 📲 🏷 (~ 🗖 ? Aug 25, 2023 💬

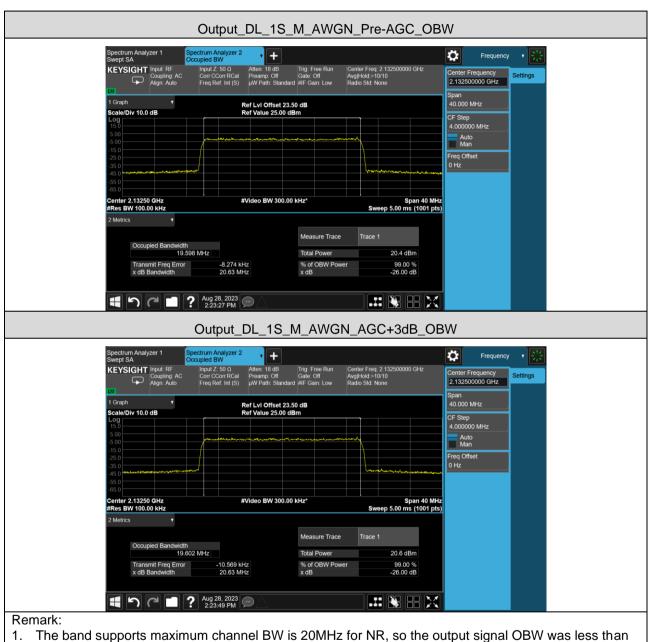
1.2 Input-versus-output signal comparison



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- the input when 100MHz AWGN as input signal.
- 2. 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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1.3 Mean output power and amplifier/booster gain

Test Conf.	Test Freq. f₀ (MHz)	Signal Level	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Verdict	
	GN 2132.5	Pre-AGC	-0.15	20.40	20.55	PASS	
DL_1S_AWGN		AGC+3dB	2.85	20.28	/	PASS	
Remark:							
According to the declaration from the applicant, the antenna gain should not exceed 12.5dBi, the							
Directional gain = G(ANT) + 10 log (NANT) dBi = 12.5dBi+10log (2) dBi= 15.5dBi.							
The total maximum EIRP for the EUT is (20.40dBm+20.40dBm) +15.5dBi=38.91dBm (7.781W)							
which don't exceed the required EIRP limit (1640W/MHz)							

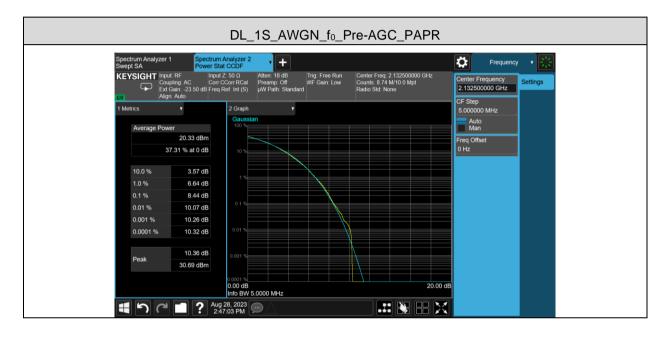


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Test Conf.	Test Freq. f₀ (MHz)	Signal Level	PAPR (dB)	Limit (dB)	Verdict
DL_1S_AWGN	2132.5	Pre-AGC	10.07	13	PASS





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1.4 Out-of-band/out-of-block (including intermodulation) emissions and spurious emissions

Note: 1. The tested max conducted power for single antenna port is 20.40dBm, 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 log10 (P) dB

Here,

P=20.4dBm= 0.1096W.

So the limit =

P(dBm)- [43 + 10 log (0.1096W)] =-13dBm

The EUT supports 2x2 MIMO and the emissions were measured at one of output port, so the limit line was set to -16.01dBm in following test plots in order to determine the test result conveniently.

2. The spurious emissions 9kHz to 30MHz were very low and not displayed in this report.



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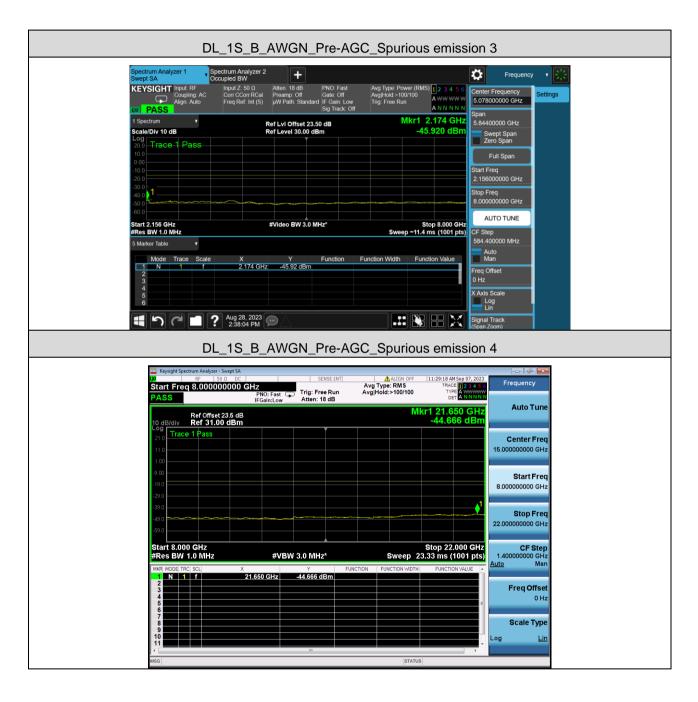




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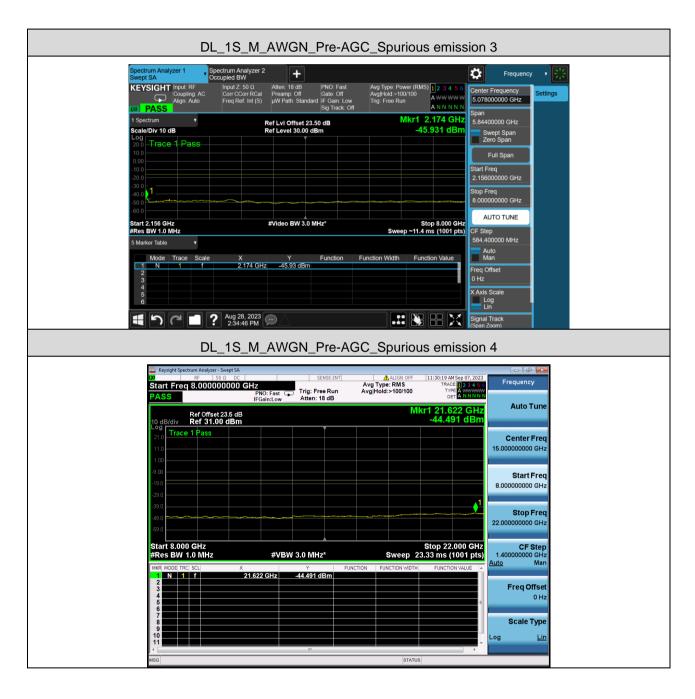




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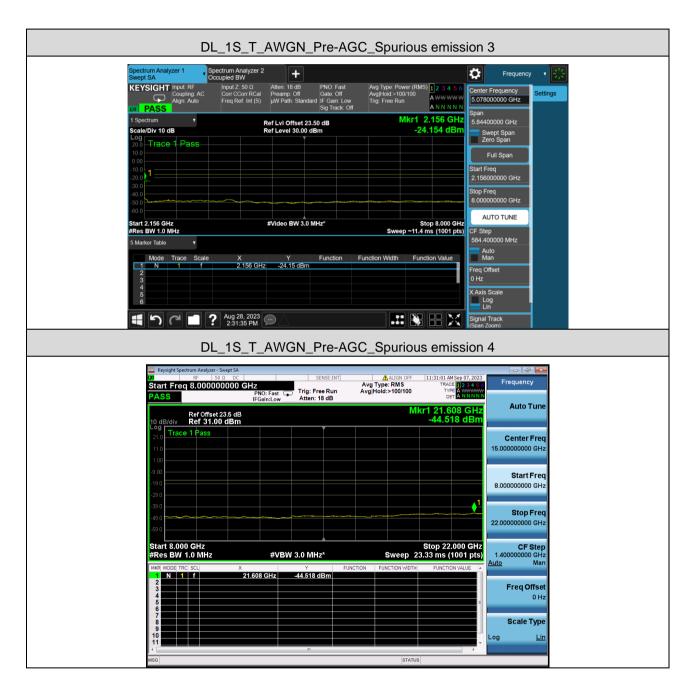




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1.5 Frequency Stability

1. At 10 °C intervals of temperatures between -30 °C and +50 °C at the manufacturer's Note: rated supply voltage, here the rated supply voltage is DC 48V.

> 2. At +20 °C temperature and ±15% supply voltage variations. If a product is specified to operate over a range of input voltage, then the -15% variation is applied to the lowermost voltage and the +15% is applied to the uppermost voltage.

> 3. The frequency stabilities can be maintained within the authorized bands of operation. Meet the requirement.



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Frequency stability vs temperature							
Temperature (℃)	Test Conf.	Frequency Error (Hz)	Tolerance (ppm)	Verdict			
50		102	0.048	PASS			
40		103	0.048	PASS			
30		99	0.046	PASS			
20		118	0.055	PASS			
10	DL_1S_M_AWGN	116	0.054	PASS			
0		95	0.045	PASS			
-10		109	0.051	PASS			
-20		118	0.055	PASS			
-30		99	0.046	PASS			

Frequency stability vs voltage						
Voltage (V)	Test Conf.	Frequency Error (Hz)	Tolerance (ppm)	Verdict		
DC 40.8		118	0.055	PASS		
DC 48	DL_1S_M_AWGN	118	0.055	PASS		
DC 55.2		120	0.056	PASS		



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1.6 Radiated spurious emissions

1. The tested max conducted power for single antenna port is 20.40dBm, the power of any Note: emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB

Here.

P=20.4dBm= 0.1096W.

So the limit =

P(dBm)- [43 + 10 log (0.1096W)] =-13dBm

2. The radiated test performed at bottom / middle / top channel, the data with more than 20db margin, therefore, only the worst-case middle channel test data was recorded in the report.

3. The disturbance 9kHz to 30MHz was very low and 20dB below the limit, therefore, the data was not recorded in the report.

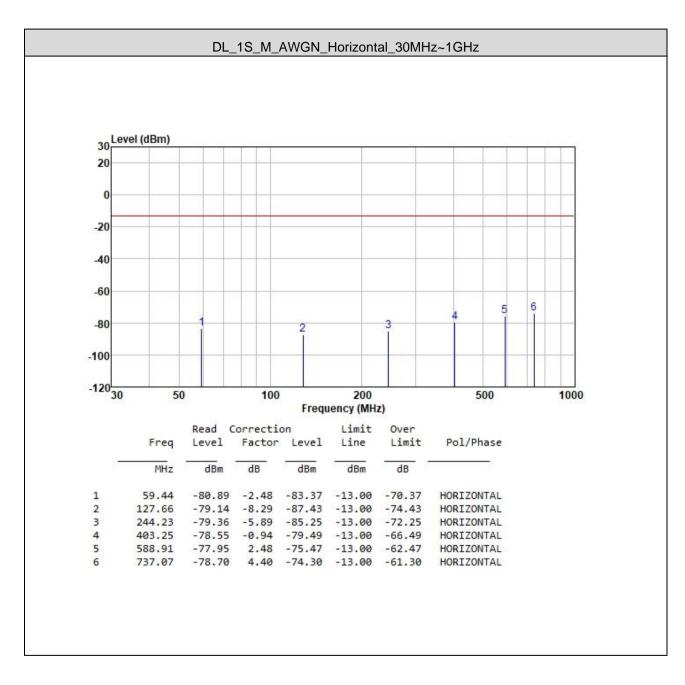


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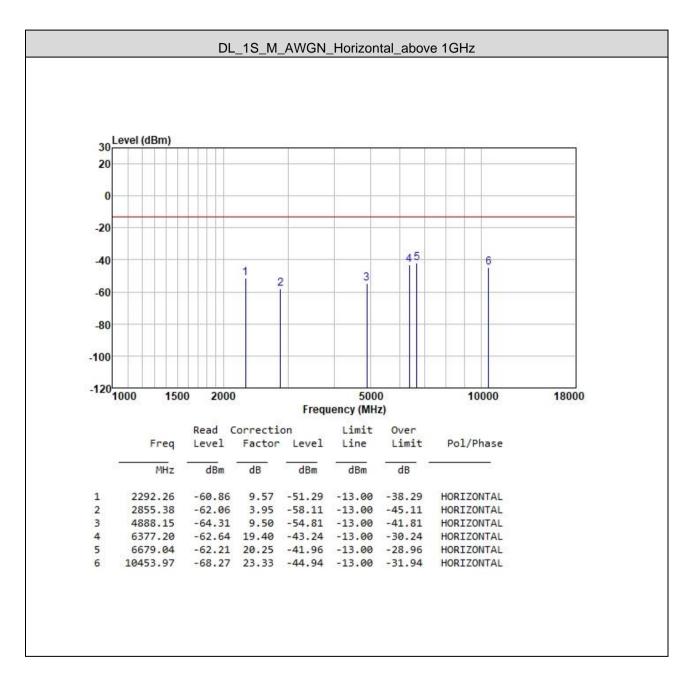




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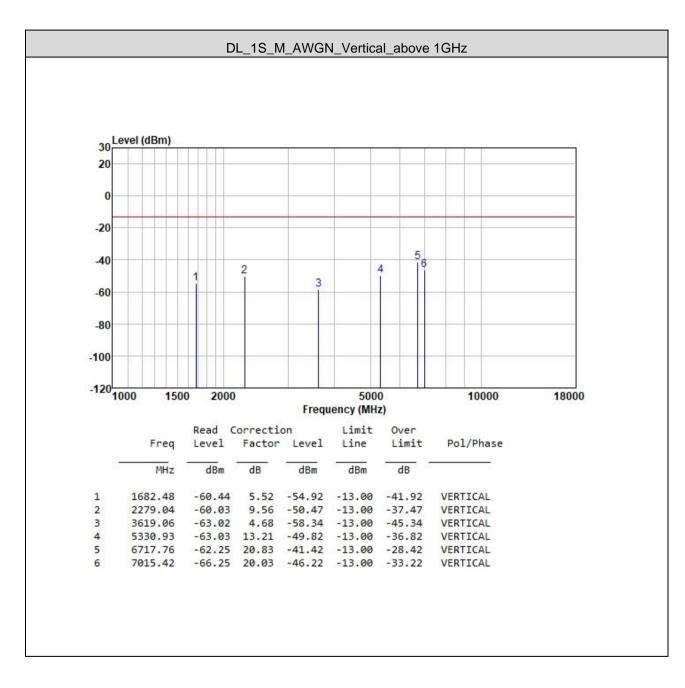
DL 1S M AWGN Vertical 30MHz~1GHz 30 Level (dBm) 20 0 -20 -40 -60 6 5 Δ 0 -80 1 -100 -120^{___}30 50 100 200 500 1000 Frequency (MHz) Limit Read Correction Over Pol/Phase Freq Level Factor Level Line Limit MHZ dBm dB dBm dBm dB 67.68 -81.08 -7.45 -88.53 -13.00 -75.53 VERTICAL 1 2 127.22 -79.74 -3.93 -83.67 -13.00 -70.67 VERTICAL 3 197.20 -80.55 -4.74 -85.29 -13.00 -72.29 VERTICAL 4 322.19 -78.39 -2.51 -80.90 -13.00 -67.90 VERTICAL 452.72 5 -78.98 1.53 -77.45 -13.00 -64.45 VERTICAL 607.79 -78.59 4.26 -74.33 -13.00 -61.33 VERTICAL 6



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2 AWS-3 (1755-1780MHz paired with 2155-2180MHz)

2.1 AGC threshold level

Test Conf.	AGC Threshold level
DL_1S_M_AWGN	-0.10dBm



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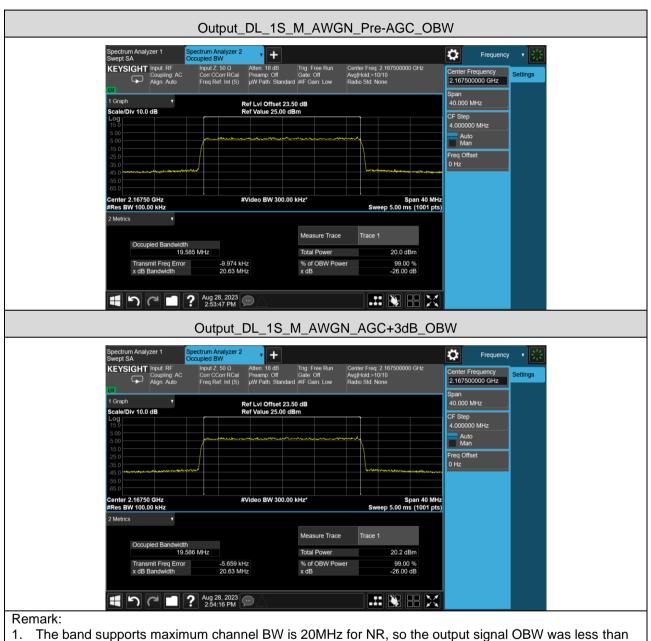
2.2 Input-versus-output signal comparison



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- the input when 100MHz AWGN as input signal.
- 2. 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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2.3 Mean output power and amplifier/booster gain

Test Conf.	Test Freq. f₀ (MHz)	Signal Level	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Verdict	
	1S_AWGN 2171.0	Pre-AGC	-0.20	20.15	20.35	PASS	
DL_1S_AWGN		AGC+3dB	2.80	20.00	/	PASS	
Remark:							
According to the declaration from the applicant, the antenna gain should not exceed 12.5dBi, the							
Directional gain = G(ANT) + 10 log (NANT) dBi = 12.5dBi+10log (2) dBi= 15.5dBi.							
The total maximum EIRP for the EUT is (20.10dBm+20.10dBm) +15.5dBi=38.61dBm (7.262W)							
which don't exceed the required EIRP limit (1640W/MHz)							



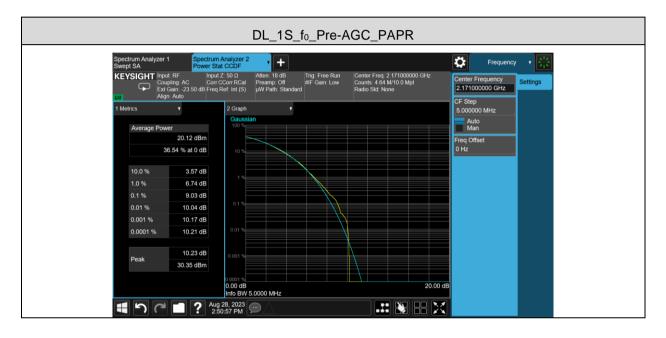
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Test Conf.	Test Freq. f₀ (MHz)	Signal Level	PAPR (dB)	Limit (dB)	Verdict
DL_1S_AWGN	2171.0	Pre-AGC	10.04	13	PASS





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2.4 Out-of-band/out-of-block (including intermodulation) emissions and spurious emissions

Note: 1. The tested max conducted power for single antenna port is 20.36dBm, 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 log10 (P) dB

Here,

P=20.36dBm= 0.1086W.

So the limit =

P(dBm)- [43 + 10 log (0.1050W)] =-13dBm

The EUT supports 2x2 MIMO and the emissions were measured at one of output port, so the limit line was set to -16.01dBm in following test plots in order to determine the test result conveniently.

2. The spurious emissions 9kHz to 30MHz were very low and not displayed in this report.



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