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FCC ID: OJFDLRUG21719235

# Appendix -

# Test Data and Result for report GZCR230300024803 (A)

(For copied data)



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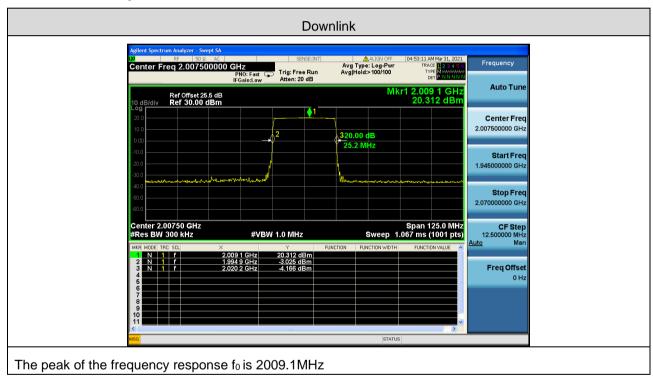
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### 1 AWS-2 & AWS-4 (only for downlink: 1995-2020MHz)

### 1.1 AGC threshold level

Test Conf.	AGC Threshold level	
DL_1S_M_AWGN	-0.20dBm	
DL_1S_M_GSM	-0.25dBm	

### 1.2 Out-of-band rejection





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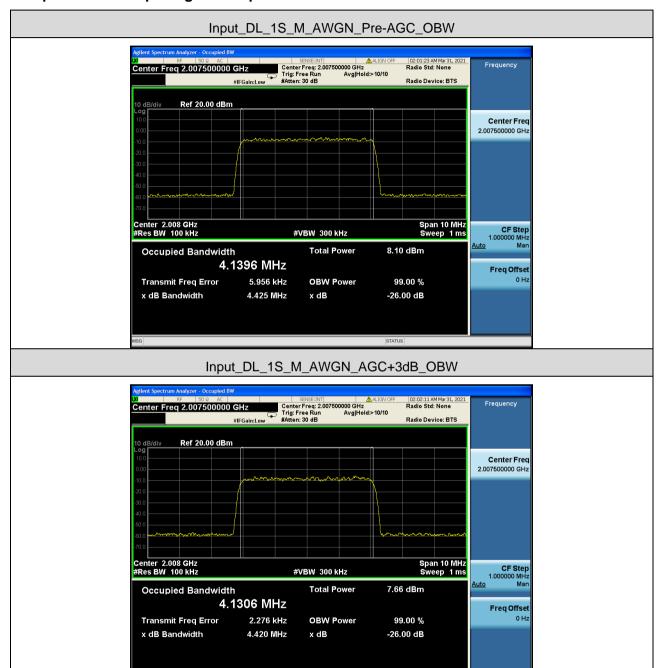
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### 1.3 Input-versus-output signal comparison





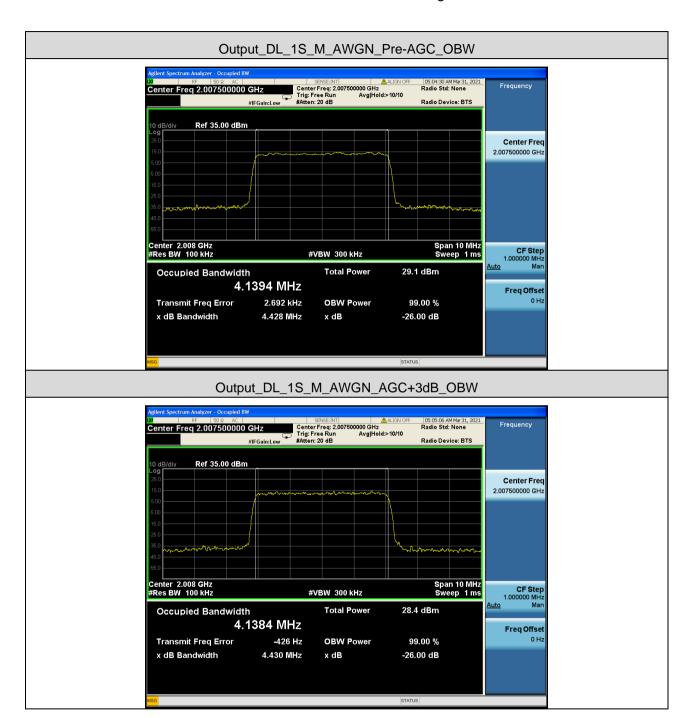
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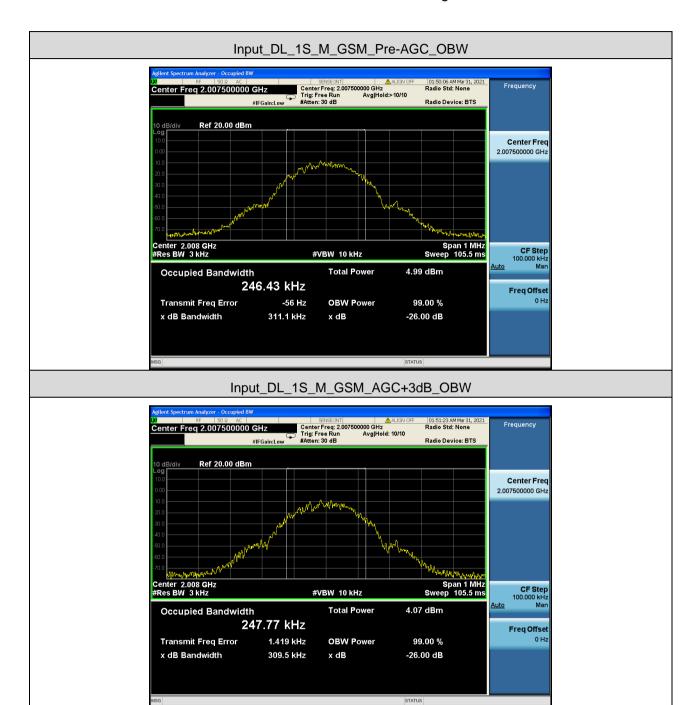
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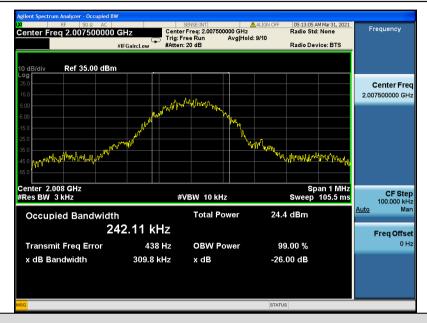
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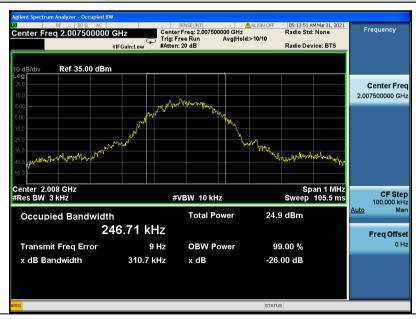


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### Output\_DL\_1S\_M\_GSM\_AGC+3dB\_OBW



### 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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### 1.4 Mean output power and amplifier/booster gain

Test Conf.	Test Freq. f <sub>0</sub> (MHz)	Signal Level	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Verdict
DL_1S_AWGN	2009.1	Pre-AGC	-0.30	20.10	20.40	PASS
		AGC+3dB	2.70	20.24	/	PASS
DL_1S_GSM	2009.1	Pre-AGC	-0.35	20.26	20.61	PASS
		AGC+3dB	2.65	20.18	/	PASS

### Remark:

1. 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 (20.26dBm+20.26dBm) +15.5dBi=38.92dBm (7.80W) which don't exceed the required EIRP limit (1640W/MHz).

2. Based on discussion in docket No. DA 13-2409 (section 26 & 47) for operation in 2000-2020MHz in downlink, only 27.50(d)(1) and 27.50(d)(2) apply.



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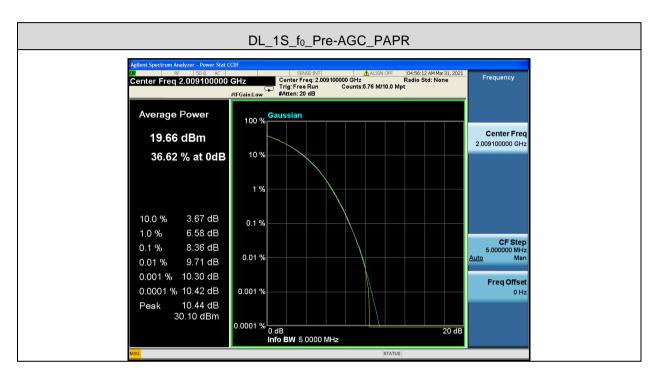
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Test Conf.	Test Freq. f <sub>0</sub> (MHz)	Signal Level	PAPR (dB)	Limit (dB)	Verdict
DL_1S_AWGN	2009.1	Pre-AGC	9.71	13	PASS





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

Note:

The EUT support 2x2 MIMO, Per 662911 D01 Multiple Transmitter Output v02r01 clause (3)(a)(iii): Measure and add 10 log(NANT) dB, where NANT is the number of outputs to combine the emission measurements from multiple outputs prior to comparing to the emission limit.

Here, the factor 10 log (NANT) dB= 10 log (2) dB=3.01dB.

1. The tested max conducted power for single antenna port is 20.26dBm, 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=20.26dBm= 0.1062W.

So the limit =

P(dBm)- [43 + 10 log (0.1062W)] = -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. Based on discussion in docket No. DA 13-2409 (section 26 & 47) for operation in 2000-2020MHz in downlink, only 27.53(h)(1) and 27.53(h)(3) apply.
- 3. Pretest performe at AWS-2: 1995MHz to 2000MHz block;

Pretest performe at AWS-4: 2000MHz to 2020MHz block;

Pretest performe at combined AWS-4 and AWS-2: 1995MHz to 2020MHz block;

As the emission limit of above sub-block are identical, therefore, only the worst-case combined AWS-4 and AWS-2 block test plot was record in the report.



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# DL 1S B AWGN Pre-AGC Out-of-band emission Start Freq 1.992000000 GHz Avg Type: RMS Avg|Hold:>100/100 95 000 0 GH -47.669 dBr Ref Offset 25.5 dB Ref 35.00 dBm Center Free 1.994750000 GH: Start Fred 1.992000000 GHz Stop Fred 1.997500000 GH: CF Step 550.000 kHz Man Freq Offset Start 1.992000 GHz #Res BW 100 kHz Stop 1.997500 GHz Sweep 1.000 ms (1001 pts) #VBW 300 kHz\* DL\_1S\_B\_AWGN\_AGC+3\_Out-of-band emission Avg Type: RMS Avg|Hold:>100/100 Start Freq 1.992000000 GHz PNO: Wide Trig: Free Run Atten: 20 dB 95 000 0 GH: -47.880 dBn **Auto Tune** Ref Offset 25.5 dB Ref 35.00 dBm 1 994750000 GH 1.992000000 GHz 1.997500000 GH



Start 1.992000 GHz #Res BW 100 kHz

#VBW 300 kHz\*

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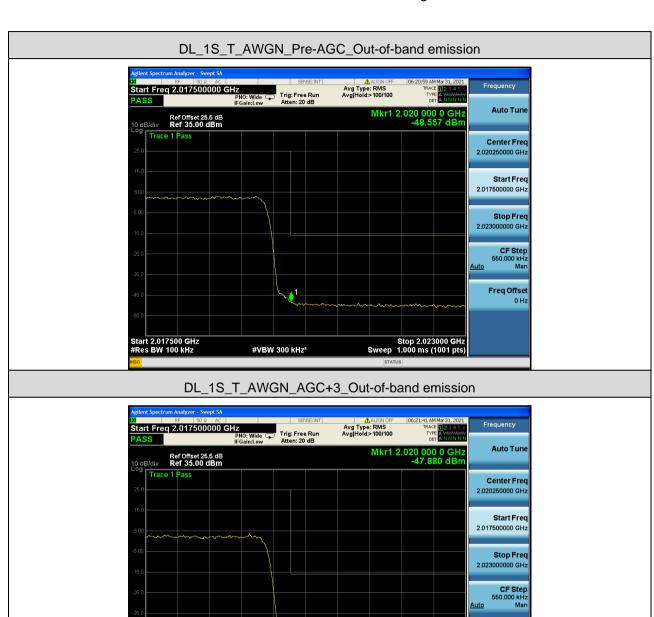
Stop 1.997500 GHz Sweep 1.000 ms (1001 pts) Freq Offse



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Freq Offset

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Start 2.017500 GHz #Res BW 100 kHz

**#VBW** 300 kHz\*

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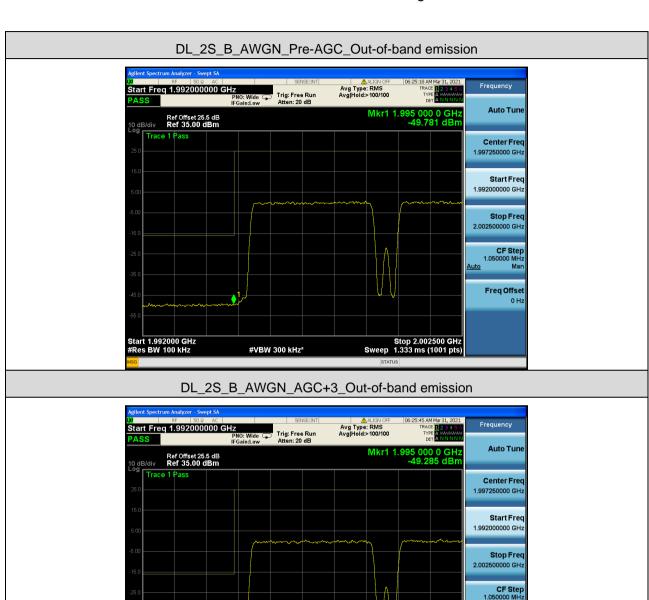
Stop 2.023000 GHz Sweep 1.000 ms (1001 pts)

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Start 1.992000 GHz #Res BW 100 kHz

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Stop 2.002500 GHz Sweep 1.333 ms (1001 pts)

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#VBW 300 kHz\*

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# DL 2S T AWGN Pre-AGC Out-of-band emission Avg Type: RMS Avg|Hold:>100/100 Start Freq 2.012500000 GHz Mkr1 2.020 000 0 GH -50.157 dB Ref Offset 25.5 dB Ref 35.00 dBm Center Fred 2.017750000 GHz Start Fred 2.012500000 GHz Stop Freq 2.023000000 GHz CF Step 1.050000 MHz Man Freq Offset Start 2.012500 GHz #Res BW 100 kHz Stop 2.023000 GHz 1.333 ms (1001 pts) #VBW 300 kHz\* DL\_2S\_T\_AWGN\_AGC+3\_Out-of-band emission Start Freq 2,012500000 GHz PASS PRO: Wide Free Run IFGainLow Atten: 20 dB Avg Type: RMS AvgHold>100/100 Auto Tune Ref Offset 25.5 dB Ref 35.00 dBm 2.017750000 GH: 2.012500000 GHz 2.023000000 GHz Freq Offset



Start 2.012500 GHz #Res BW 100 kHz

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Stop 2.023000 GHz Sweep 1.333 ms (1001 pts)

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#VBW 300 kHz\*

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#VBW 300 kHz\*

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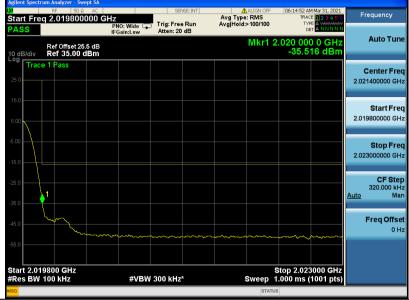
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# DL 1S T GSM Pre-AGC Out-of-band emission Avg Type: RMS Avg|Hold:>100/100 Start Freq 2.019800000 GHz



### DL\_1S\_T\_GSM\_AGC+3\_Out-of-band emission





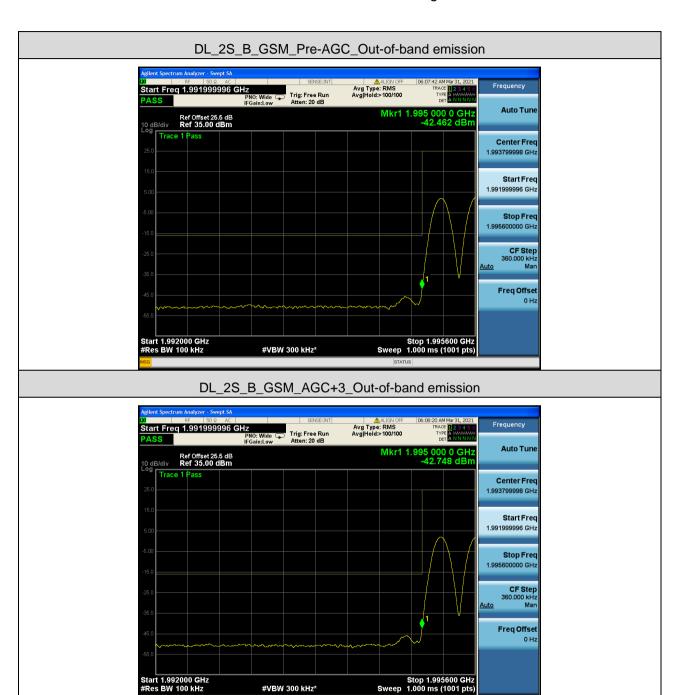
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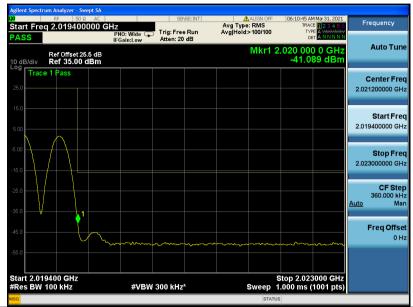
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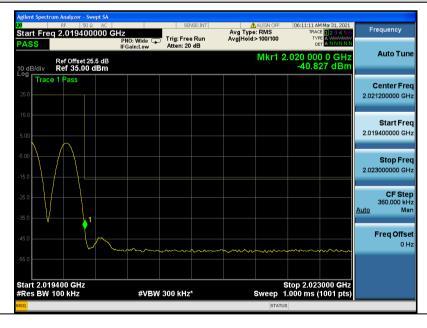


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### DL\_2S\_T\_GSM\_AGC+3\_Out-of-band emission





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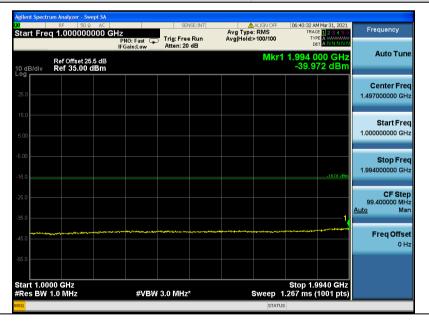


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### DL 1S B AWGN Pre-AGC Spurious emission 1



### DL\_1S\_B\_AWGN\_Pre-AGC\_Spurious emission 2





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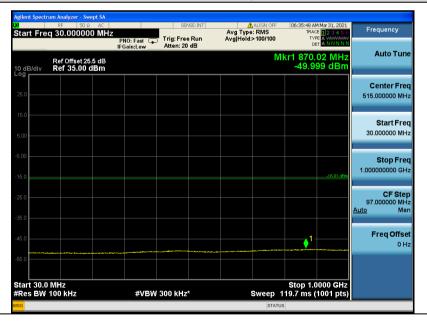


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### DL\_1S\_B\_AWGN\_Pre-AGC\_Spurious emission 3



### DL\_1S\_M\_AWGN\_Pre-AGC\_Spurious emission 1





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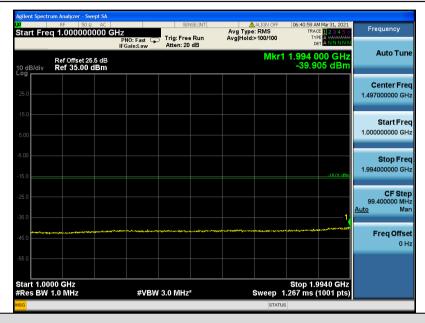
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### DL\_1S\_M\_AWGN\_Pre-AGC\_Spurious emission 3





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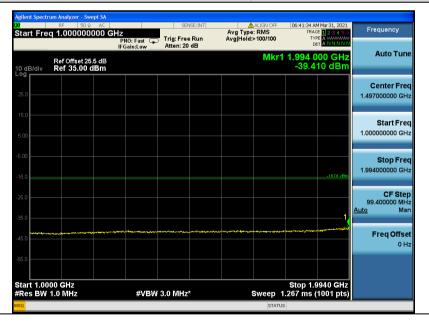


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### DL\_1S\_T\_AWGN\_Pre-AGC\_Spurious emission 1



### DL\_1S\_T\_AWGN\_Pre-AGC\_Spurious emission 2





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### DL 1S T AWGN Pre-AGC Spurious emission 3



### DL\_1S\_B\_GSM\_Pre-AGC\_Spurious emission 1





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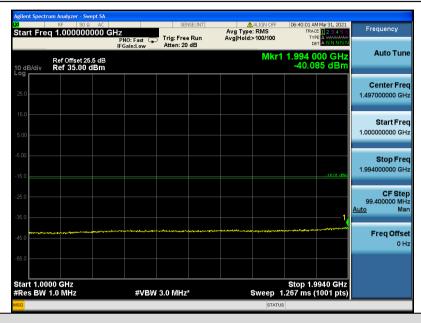
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### DL\_1S\_B\_GSM\_Pre-AGC\_Spurious emission 3





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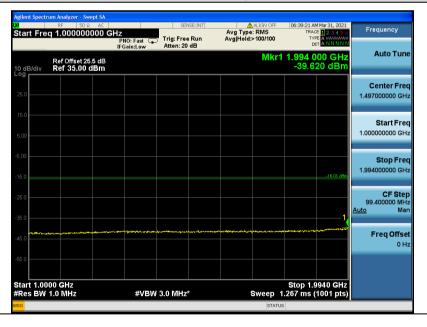


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### DL 1S M GSM Pre-AGC Spurious emission 1



### DL\_1S\_M\_GSM\_Pre-AGC\_Spurious emission 2





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### DL 1S M GSM Pre-AGC Spurious emission 3



### DL\_1S\_T\_GSM\_Pre-AGC\_Spurious emission 1





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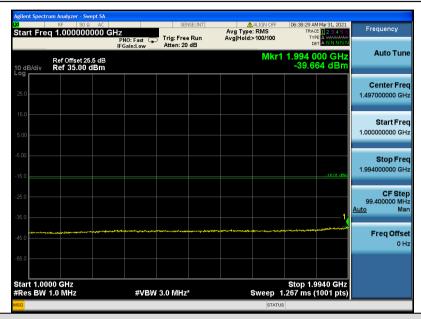
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### DL\_1S\_T\_GSM\_Pre-AGC\_Spurious emission 3





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### 1.6 Frequency Stability

Note:

- 1. At 10 °C intervals of temperatures between -30 °C and +50 °C at the manufacturer's 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.
- 4. Frequency stability has been tested using an AWGN test signal and a GSM-TDMA test signal, only the worst-case was recorded in this report.

Frequency stability vs temperature				
Temperature (°C)	Test Conf.	Test data (MHz)	Tolerance (ppm)	Verdict
50		2007.516276	-0.04	PASS
40		2007.516237	-0.06	PASS
30		2007.516398	0.02	PASS
20		2007.516354	Reference	PASS
10	DL_1S_M_AWGN	2007.516163	-0.09	PASS
0		2007.516324	-0.01	PASS
-10		2007.516286	-0.03	PASS
-20		2007.516263	-0.05	PASS
-30		2007.516274	-0.04	PASS

Frequency stability vs voltage				
Voltage (V)	Test Conf.	Test data (MHz)	Tolerance (ppm)	Verdict
DC 40.8		2007.516382	0.01	PASS
DC 48	DL_1S_M_AWGN	2007.516354	Reference	PASS
DC 55.2		2007.516212	-0.07	PASS



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### 1.7 Radiated spurious emissions

Note:

1. The tested max conducted power for single antenna port is 20.26dBm, 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=20.26dBm= 0.1062W.

So the limit =

P(dBm)- [43 + 10 log (0.1062W)] = -13dBm

- 2. Based on discussion in docket No. DA 13-2409 (section 26 & 47) for operation in 2000-2020MHz in downlink, only 27.53(h)(1) and 27.53(h)(3) apply.
- 3. 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.
- 4. 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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### DL 1S M AWGN Horizontal 30MHz~1GHz 20 Level (dBm) 10 13DBM -10 -30 -50 3 -70 -90 -110 -120<sub>30</sub> 200 50 100 1000 500 Frequency (MHz) Limit Read Correction Over Freq Pol/Phase Level Factor Level Line Limit MHz dBm dB dBm dBm dB -78.35 35.13 2.85 -75.50 -12.99 -62.51 HORIZONTAL 2 58.61 -74.24 -2.41 -76.65 -12.99 -63.66 HORIZONTAL -60.00 -6.44 -66.44 -12.99 -53.45 3 160.35 HORIZONTAL -63.97 -3.18 -67.15 -12.99 -54.16 268.49 HORIZONTAL 5 472.18 -72.30 0.33 -71.97 -12.99 -58.98 HORIZONTAL -79.54 8.60 -70.94 -12.99 -57.95 HORIZONTAL 884.50



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### DL 1S M AWGN Horizontal above 1GHz 20 Level (dBm) 10 13DBM -10 -30 6 5 4 -50 -70 -90 -110 -120 1000 5000 10000 1500 2000 18000 Frequency (MHz) Limit Read Correction Over Freq Line Pol/Phase Level Factor Level Limit dBm MHz dB dBm dBm dB -60.19 1 1260.15 4.01 -56.18 -12.99 -43.19 HORIZONTAL -62.55 9.79 -52.76 -12.99 -39.77 -62.95 9.76 -53.19 -12.99 -40.20 2 2036.09 HORIZONTAL 3 4902.30 HORIZONTAL -63.66 15.12 -48.54 -12.99 -35.55 7650.89 HORIZONTAL 5 11368.00 -66.10 21.79 -44.31 -12.99 -31.32 HORIZONTAL 15622.99 -62.11 21.88 -40.23 -12.99 -27.24 HORIZONTAL



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### DL 1S M AWGN Vertical 30MHz~1GHz 20 Level (dBm) 10 13DBM -10 -30 -50 6 -70 -90 -110 -120<sup>1</sup>30 200 100 1000 50 500 Frequency (MHz) Limit Read Correction Over Freq Pol/Phase Level Factor Level Line Limit dBm dB MHz dBm dBm dB 44.59 -75.02 -12.53 -87.55 -12.99 -74.56 VERTICAL 2 91.49 -68.96 -6.87 -75.83 -12.99 -62.84 VERTICAL -71.14 -3.94 -75.08 -12.99 -62.09 3 159.78 VERTICAL -73.37 -2.61 -75.98 -12.99 -62.99 312.18 VERTICAL 5 520.89 -76.19 1.12 -75.07 -12.99 -62.08 VERTICAL -78.98 6.73 -72.25 -12.99 -59.26 763.38 VERTICAL



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### DL 1S M AWGN Vertical above 1GHz 20 Level (dBm) 10 13DBM -10 -30 6 5 -50 -70 -90 -110 -120 1000 18000 1500 5000 2000 10000 Frequency (MHz) Limit Read Correction Over Freq Line Pol/Phase Level Factor Level Limit dBm MHz dB dBm dBm dB 1 1667.95 -59.27 5.39 -53.88 -12.99 -40.89 VERTICAL -62.86 2.83 -60.03 -12.99 -47.04 -62.49 9.30 -53.19 -12.99 -40.20 2 3069.35 VERTICAL 3 4859.98 VERTICAL 7158.81 -65.01 19.35 -45.66 -12.99 -32.67 VERTICAL 5 9366.58 -64.60 17.32 -47.28 -12.99 -34.29 VERTICAL 12219.85 -66.06 22.43 -43.63 -12.99 -30.64 VERTICAL



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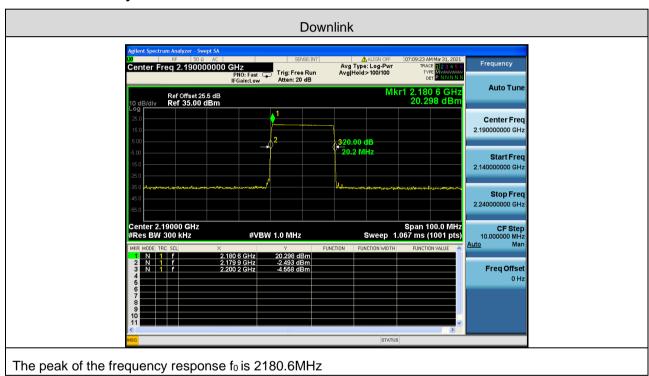
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### 2 AWS-4 (only for downlink: 2180-2200MHz)

### 2.1 AGC threshold level

Test Conf.	AGC Threshold level		
DL_1S_M_AWGN	0.00dBm		
DL_1S_M_GSM	0.20dBm		

### 2.2 Out-of-band rejection





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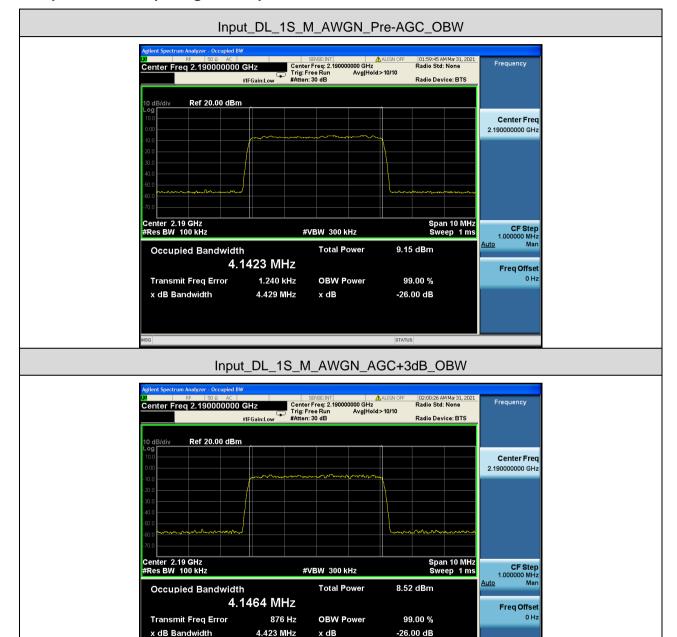
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### 2.3 Input-versus-output signal comparison



x dB



x dB Bandwidth

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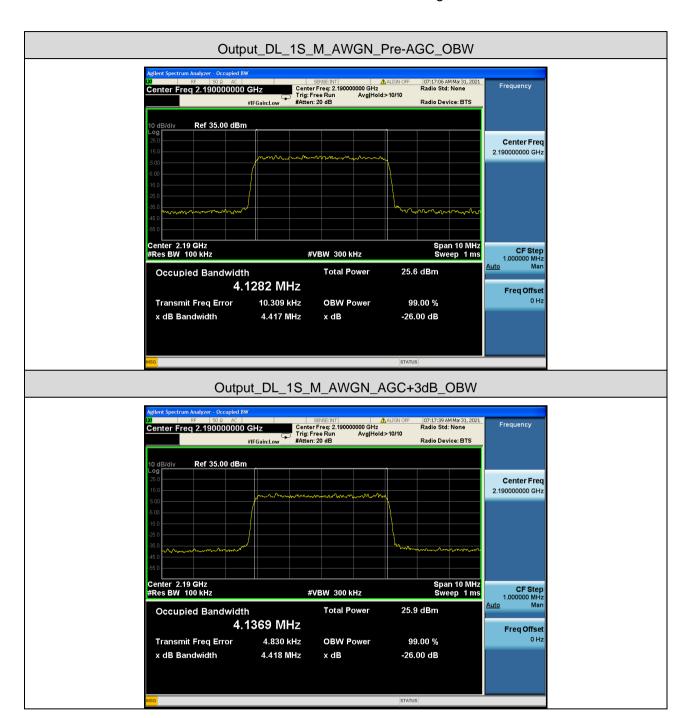
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-26.00 dB

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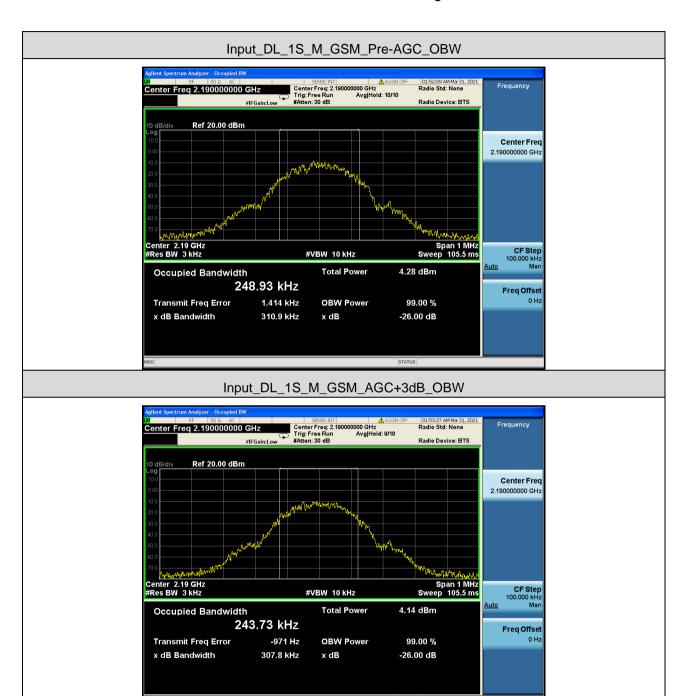
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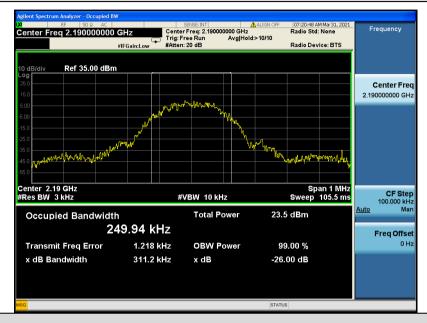
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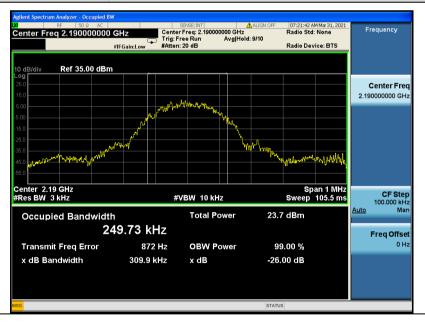


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#### Output\_DL\_1S\_M\_GSM\_AGC+3dB\_OBW



#### 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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#### 2.4 Mean output power and amplifier/booster gain

Test Conf.	Test Freq. f <sub>0</sub> (MHz)	Signal Level	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Verdict
DL_1S_AWGN	2180.6	Pre-AGC	-0.10	20.34	20.44	PASS
		AGC+3dB	2.90	20.15	/	PASS
DL_1S_GSM	2180.6	Pre-AGC	-0.30	20.31	20.61	PASS
		AGC+3dB	2.70	20.26	/	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 (20.34dBm+20.34dBm) +15.5dBi=38.92dBm (7.80W) which don't exceed the required EIRP limit (1640W/MHz)



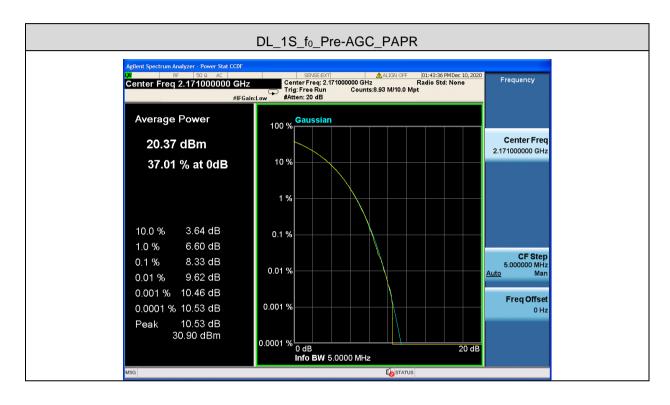
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Test Conf.	Test Freq. f <sub>0</sub> (MHz)	Signal Level	PAPR (dB)	Limit (dB)	Verdict
DL_1S_AWGN	2180.6	Pre-AGC	8.3	13	PASS





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

Note:

The tested max conducted power for single antenna port is 20.34dBm, 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=20.34dBm= 0.1081W.

So the limit =

P(dBm)- [43 + 10 log (0.1081W)] = -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.





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#### DL 1S B AWGN Pre-AGC Out-of-band emission



#### DL\_1S\_B\_AWGN\_AGC+3\_Out-of-band emission





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# DL 1S T AWGN Pre-AGC Out-of-band emission Avg Type: RMS Avg|Hold:>100/100 Start Freq 2.197500000 GHz Mkr1 2.200 000 0 GH -46.059 dB Ref Offset 25.5 dB Ref 35.00 dBm Center Fred 2.200250000 GHz Start Fred 2.197500000 GHz Stop Freq 2.203000000 GHz CF Step 550.000 kHz Freq Offset Start 2.197500 GHz #Res BW 100 kHz Stop 2.203000 GHz Sweep 1.000 ms (1001 pts) #VBW 300 kHz\* DL\_1S\_T\_AWGN\_AGC+3\_Out-of-band emission Start Freq 2.197500000 GHz PASS PRO: Wide Free Run IFGainLow Atten: 20 dB Avg Type: RMS AvgHold>100/100 Auto Tune Ref Offset 25.5 dB Ref 35.00 dBm 2 200250000 GH:





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# DL 2S B AWGN Pre-AGC Out-of-band emission Avg Type: RMS Avg|Hold:>100/100 Start Freq 2.177000000 GHz 80 000 0 GH -49,272 dB Ref Offset 25.5 dB Ref 35.00 dBm Center Fred 2.182250000 GHz Start Freq 2.177000000 GHz Stop Freq 2.187500000 GHz CF Step 1.050000 MHz Man Freq Offset Start 2.177000 GHz #Res BW 100 kHz Stop 2.187500 GHz Sweep 1.333 ms (1001 pts) #VBW 300 kHz\* DL\_2S\_B\_AWGN\_AGC+3\_Out-of-band emission Start Freq 2.177000000 GHz PASS PRO: Wide Span Atten: 20 dB Avg Type: RMS AvgiHold>100/100 Auto Tune Ref Offset 25.5 dB Ref 35.00 dBm 2 182250000 GH: 2.177000000 GHz 2.187500000 GHz Freq Offset



Start 2.177000 GHz #Res BW 100 kHz

**#VBW** 300 kHz\*

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Stop 2.187500 GHz Sweep 1.333 ms (1001 pts)

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# DL 2S T AWGN Pre-AGC Out-of-band emission Avg Type: RMS Avg|Hold:>100/100 Start Freq 2.192500000 GHz Mkr1 2.200 000 0 GF -48.349 dB Ref Offset 25.5 dB Ref 35.00 dBm Center Fred 2.197750000 GHz Start Freq 2.192500000 GHz Stop Freq 2.203000000 GHz CF Step 1.050000 MHz Man Freq Offset Start 2.192500 GHz #Res BW 100 kHz Stop 2.203000 GHz 1.333 ms (1001 pts) #VBW 300 kHz\* DL\_2S\_T\_AWGN\_AGC+3\_Out-of-band emission Start Freq 2.192500000 GHz PASS PRO: Wide Free Run IFGainLow Atten: 20 dB Avg Type: RMS AvgHold>100/100 Auto Tune Ref Offset 25.5 dB Ref 35.00 dBm 2 197750000 GH: 2.192500000 GHz 2.203000000 GHz Freq Offset



Start 2.192500 GHz #Res BW 100 kHz

#VBW 300 kHz\*

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Stop 2.203000 GHz Sweep 1.333 ms (1001 pts)

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#### DL\_1S\_B\_GSM\_AGC+3\_Out-of-band emission





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#### DL\_1S\_T\_GSM\_AGC+3\_Out-of-band emission





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# DL 2S B GSM Pre-AGC Out-of-band emission Avg Type: RMS Avg|Hold:>100/100 Start Freq 2.177000000 GHz 80 000 0 GH -41,207 dB Ref Offset 25.5 dB Ref 35.00 dBm Center Fred 2.178800000 GHz Start Freq 2.177000000 GHz Stop Freq 2.180600000 GHz CF Step 360.000 kHz Freq Offset Start 2.177000 GHz #Res BW 100 kHz Stop 2.180600 GHz 1.000 ms (1001 pts) #VBW 300 kHz\* DL\_2S\_B\_GSM\_AGC+3\_Out-of-band emission Start Freq 2.177000000 GHz PASS PRO: Wide Span Atten: 20 dB Avg Type: RMS AvgiHold>100/100 Auto Tune Ref Offset 25.5 dB Ref 35.00 dBm 2 178800000 GH: 2.177000000 GHz 2.180600000 GHz



Start 2.177000 GHz #Res BW 100 kHz

**#VBW** 300 kHz\*

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<u>Auto</u>

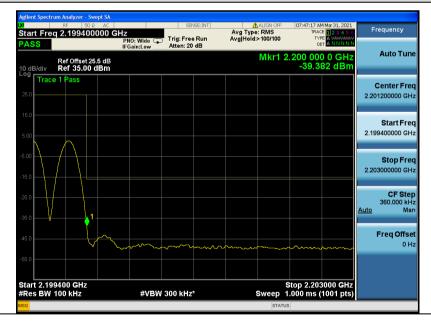
Stop 2.180600 GHz Sweep 1.000 ms (1001 pts) Freq Offset



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# DL 2S T GSM Pre-AGC Out-of-band emission Avg Type: RMS Avg|Hold:>100/100 Start Freq 2.199400000 GHz Mkr1 2.200 000 0 GH -39.000 dBi Ref Offset 25.5 dB Ref 35.00 dBm Center Fred 2.201200000 GHz Start Fred 2.199400000 GHz Stop Freq 2.203000000 GHz CF Step 360.000 kHz Freq Offset Start 2.199400 GHz #Res BW 100 kHz Stop 2.203000 GHz Sweep 1.000 ms (1001 pts) #VBW 300 kHz\*

#### DL\_2S\_T\_GSM\_AGC+3\_Out-of-band emission





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#### DL\_1S\_B\_AWGN\_Pre-AGC\_Spurious emission 2





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#### DL 1S B AWGN Pre-AGC Spurious emission 3



#### DL\_1S\_M\_AWGN\_Pre-AGC\_Spurious emission 1





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#### DL 1S M AWGN Pre-AGC Spurious emission 2



#### DL\_1S\_M\_AWGN\_Pre-AGC\_Spurious emission 3





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#### DL\_1S\_T\_AWGN\_Pre-AGC\_Spurious emission 1



#### DL\_1S\_T\_AWGN\_Pre-AGC\_Spurious emission 2





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#### DL 1S T AWGN Pre-AGC Spurious emission 3



#### DL\_1S\_B\_GSM\_Pre-AGC\_Spurious emission 1





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#### DL\_1S\_B\_GSM\_Pre-AGC\_Spurious emission 2



#### DL\_1S\_B\_GSM\_Pre-AGC\_Spurious emission 3





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#### DL\_1S\_M\_GSM\_Pre-AGC\_Spurious emission 1



#### DL\_1S\_M\_GSM\_Pre-AGC\_Spurious emission 2





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#### DL 1S M GSM Pre-AGC Spurious emission 3



#### DL\_1S\_T\_GSM\_Pre-AGC\_Spurious emission 1





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#### DL 1S T GSM Pre-AGC Spurious emission 2



#### DL\_1S\_T\_GSM\_Pre-AGC\_Spurious emission 3





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#### 2.6 Frequency Stability

Note:

- 1. At 10 °C intervals of temperatures between -30 °C and +50 °C at the manufacturer's 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.
- 4. Frequency stability has been tested using an AWGN test signal and a GSM-TDMA test signal, only the worst-case was recorded in this report.

Frequency stability vs temperature					
Temperature (°C)	Test Conf.	Test data (MHz)	Tolerance (ppm)	Verdict	
50		2155.512386	-0.02	PASS	
40		2155.512492	0.03	PASS	
30		2155.512352	-0.04	PASS	
20		2155.512432	Reference	PASS	
10	DL_1S_M_AWGN	2155.512346	-0.04	PASS	
0		2155.512374	-0.03	PASS	
-10		2155.512396	-0.02	PASS	
-20		2155.512411	-0.01	PASS	
-30		2155.512480	0.02	PASS	

Frequency stability vs voltage					
Voltage (V)	Test Conf.	Test data (MHz)	Tolerance (ppm)	Verdict	
DC 40.8		2155.512398	-0.02	PASS	
DC 48	DL_1S_M_AWGN	2155.512432	Reference	PASS	
DC 55.2		2155.512410	-0.01	PASS	



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#### 2.7 Radiated spurious emissions

Note:

1. The tested max conducted power for single antenna port is 20.36dBm. the 2x2 MIMO total power is 20.36dBm+20.36dBm= 0.2173W.

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=0.2173W,

So the limit =

P(dBm)- [43 + 10 log (0.2173W)] = -13dBm

For these AWS-4 operations in the 2180-2200 MHz band, the power of any emissions on all frequencies between 2200 and 2290 MHz shall not exceed an EIRP of -100.6 dBW/4 kHz,

- -100.6 dBW/4 kHz = -70.6 dBm/4 kHz = -46.6 dBm/1 MHz
- 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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#### DL 1S M AWGN Horizontal 30MHz~1GHz 20 Level (dBm) 10 13DBM -10 -30 -50 3 -70 -90 -110 -120<sub>30</sub> 200 100 1000 50 500 Frequency (MHz) Limit Read Correction Over Freq Pol/Phase Level Factor Level Line Limit dBm MHz dB dBm dBm dB 35.50 -80.54 2.80 -77.74 -12.99 -64.75 HORIZONTAL 2 59.03 -73.55 -2.45 -76.00 -12.99 -63.01 HORIZONTAL -61.72 -6.46 -68.18 -12.99 -55.19 3 159.78 HORIZONTAL -62.01 -4.71 -66.72 -12.99 -53.73 256.52 HORIZONTAL 5 468.88 -72.26 0.32 -71.94 -12.99 -58.95 HORIZONTAL -79.08 3.65 -75.43 -12.99 -62.44 HORIZONTAL 721.73



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#### DL 1S M AWGN Horizontal above 1GHz 20 Level (dBm) 10 13DBM -10 -30 6 -50 -70 -90 -110 -120 1000 18000 5000 10000 1500 2000 Frequency (MHz) Limit Read Correction 0ver Freq Line Pol/Phase Level Factor Level Limit dBm MHz dB dBm dBm dB 1 1256.51 -60.24 3.99 -56.25 -12.99 -43.26 HORIZONTAL 9.56 -52.65 -12.99 -39.66 2.21 -60.10 -12.99 -47.11 2 2095.80 -62.21 HORIZONTAL 3 3357.06 -62.31 HORIZONTAL -63.24 10.49 -52.75 -12.99 -39.76 4944.99 HORIZONTAL 5 7739.86 -64.40 14.57 -49.83 -12.99 -36.84 HORIZONTAL 10423.80 -63.08 23.11 -39.97 -12.99 -26.98 HORIZONTAL



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#### DL 1S M AWGN Vertical 30MHz~1GHz 20 Level (dBm) 10 13DBM -10 -30 -50 6 -70 -90 -110 -120<sup>1</sup>30 200 100 1000 50 500 Frequency (MHz) Limit Read Correction 0ver Freq Pol/Phase Level Factor Level Line Limit dBm dB MHz dBm dBm dB 44.59 -75.02 -12.53 -87.55 -12.99 -74.56 VERTICAL 2 91.49 -68.96 -6.87 -75.83 -12.99 -62.84 VERTICAL -71.14 -3.94 -75.08 -12.99 -62.09 3 159.78 VERTICAL -73.37 -2.61 -75.98 -12.99 -62.99 312.18 VERTICAL 5 520.89 -76.19 1.12 -75.07 -12.99 -62.08 VERTICAL -78.98 6.73 -72.25 -12.99 -59.26 763.38 VERTICAL



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#### DL 1S M AWGN Vertical above 1GHz 20 Level (dBm) 10 13DBM -10 -30 6 -50 -70 -90 -110 -120 1000 18000 1500 5000 10000 2000 Frequency (MHz) Limit Read Correction 0ver Freq Line Pol/Phase Level Factor Level Limit dBm MHz dB dBm dBm dB 1 1103.26 -62.57 4.70 -57.87 -12.99 -44.88 VERTICAL 2 1824.30 -60.56 6.03 -54.53 -12.99 -41.54 VERTICAL 2.64 -59.93 -12.99 -46.94 3 3168.50 -62.57 VERTICAL -64.98 14.47 -50.51 -12.99 -37.52 5631.88 VERTICAL 5 8153.20 -64.62 15.21 -49.41 -12.99 -36.42 VERTICAL 11940.54 -64.84 21.71 -43.13 -12.99 -30.14 VERTICAL



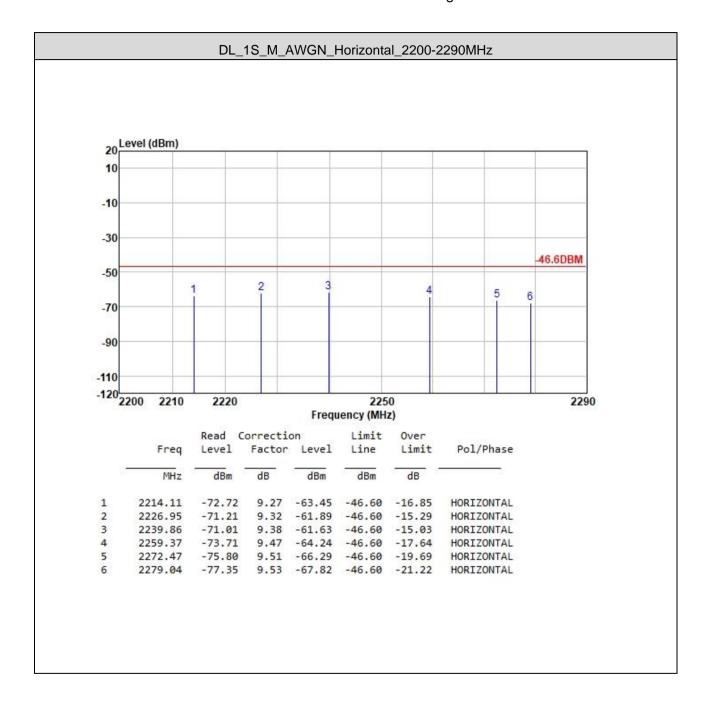
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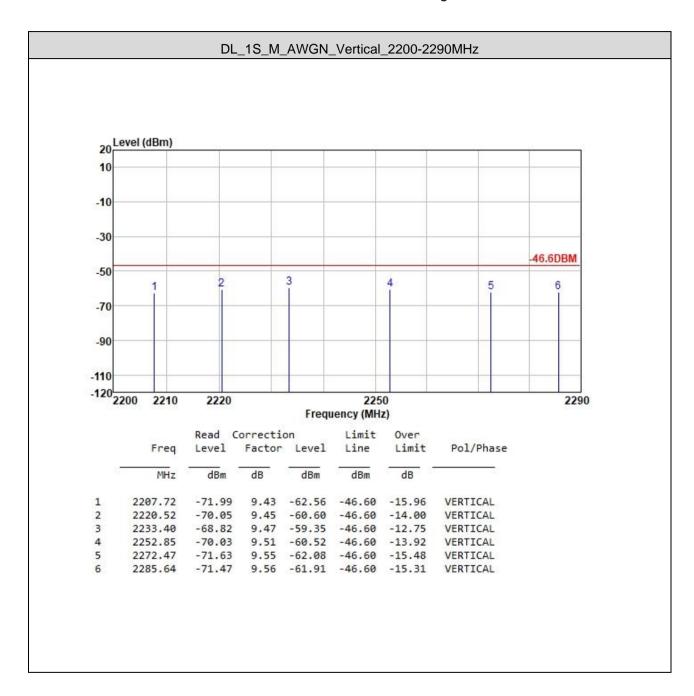
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