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#### 5.5 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 and less than 1.5ppm. Meet the requirement.

Frequency stability vs temperature				
Temperature (℃)	Test Conf.	Frequency Error (Hz)	Tolerance (ppm)	Verdict
50		102	0.12	PASS
40		129	0.15	PASS
30		125	0.14	PASS
20		131	0.15	PASS
10	DL_1S_M_AWGN	128	0.15	PASS
0		110	0.13	PASS
-10		110	0.13	PASS
-20		102	0.12	PASS
-30		112	0.13	PASS

Frequency stability vs voltage				
Voltage (V)	Test Conf.	Frequency Error (Hz)	Tolerance (ppm)	Verdict
DC 40.8		126	0.15	PASS
DC 48	DL_1S_M_AWGN	129	0.15	PASS
DC 55.2		133	0.15	PASS



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#### 5.6 Radiated spurious emissions

Note: 1.The tested max conducted power for single antenna port is 20.35dBm, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB Here, P=20.11dBm+20.11dBm= 0.2052W.

the limit = P(dBm)- [43 + 10 log (0.2052W)] =-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 from 9kHz to 30MHz was very low and 20db below the limit, therefore, the data was not recorded in the report.



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#### 6 Cellular (824-849MHz paired with 869-894MHz)

#### 6.1 AGC threshold level

Test Conf.	AGC Threshold level
DL_1S_M_AWGN	0.20dBm



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#### 6.2 Input-versus-output signal comparison



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

Test Conf.	Test Freq. f₀ (MHz)	Signal Level	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Verdict
DL_1S_AWGN		Pre-AGC	0.20	20.13	19.93	PASS
	886.71	AGC+3dB	3.20	20.05	/	PASS

Remark:

According to the declaration from the applicant, the single antenna gain should not exceed 12.5dBi, the Directional gain =  $G(ANT) + 10 \log (NANT) dBi = 12.5dBi+10 \log (2) dBi = 15.5dBi$ .

ERP= EIRP-2.15dB,

The total maximum ERP for the EUT is (20.13dBm+20.13dBm) +15.5dBi-2.15dB=36.49dBm (4.457W) which don't exceed the required ERP limit (500W).



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

Note: 1. The tested max conducted power for single antenna port is 20.13dBm, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB Here,

P=20.13dBm= 0.1030W.

So the limit =

P(dBm)- [43 + 10 log (0.1030W)] =-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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### SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

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#### 6.5 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 (℃)	Test Conf. Frequency Error (Hz)		Tolerance (ppm)	Verdict
50		131	0.15	PASS
40		112	0.13	PASS
30		126	0.14	PASS
20	DL_1S_M_AWGN	138	0.16	PASS
10		102	0.12	PASS
0		122	0.14	PASS
-10		144	0.16	PASS
-20	-	144	0.16	PASS
-30		107	0.12	PASS

Frequency stability vs voltage				
Voltage (V)	Test Conf.	Test Conf. Frequency Error (Hz)		Verdict
DC 40.8		135	0.15	PASS
DC 48	DL_1S_M_AWGN	130	0.15	PASS
DC 55.2		128	0.15	PASS



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#### 6.6 Radiated spurious emissions

Note: 1. The tested max conducted power for single antenna port is 20.13dBm, the 2x2 MIMO total power is 20.13dBm+20.13dBm= 0.2061W, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB Here,

P=20.13dBm+20.13dBm= 0.2061W.

So the limit =

P(dBm)- [43 + 10 log (0.2061W)] =-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 from 9kHz to 30MHz was very low and 20db below the limit, therefore, the data was not recorded in the report.



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--End of Appendix--



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