

Test mode:	LTE Band 12 (1.4MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3701.40	Vertical	-36.72	-13.00	Pass
5552.10	V	-39.01		
7402.80	V	-38.32		
9253.50	V	-42.91		
11104.20	V	---		
3701.40	Horizontal	-39.42	-13.00	Pass
5552.10	H	-42.25		
7402.80	H	-44.97		
9253.50	H	-46.09		
11104.20	H	---		
Test mode:	LTE Band 12 (1.4MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-37.03	-13.00	Pass
5640.00	V	-39.24		
7520.00	V	-37.79		
9400.00	V	-43.55		
11280.00	V	---		
3760.00	Horizontal	-39.05	-13.00	Pass
5640.00	H	-42.46		
7520.00	H	-45.27		
9400.00	H	-46.30		
11280.00	H	---		
Test mode:	LTE Band 12 (1.4MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3818.60	Vertical	-36.56	-13.00	Pass
5727.90	V	-39.00		
7637.20	V	-37.56		
9546.50	V	-43.00		
11455.80	V	---		
3818.60	Horizontal	-38.66	-13.00	Pass
5727.90	H	-42.42		
7637.20	H	-44.39		
9546.50	H	-46.22		
11455.80	H	---		

Remark :

- 1 The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
- 2 Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
- 3 The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

Test mode:	LTE Band 26(1.4MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3421.40	Vertical	-36.83	-13.00	Pass
5132.10	V	-39.34		
6842.80	V	-37.82		
8553.50	V	-43.76		
10264.20	V	---		
3421.40	Horizontal	-39.26	-13.00	Pass
5132.10	H	-42.74		
6842.80	H	-44.85		
8553.50	H	-45.90		
10264.20	H	---		
Test mode:	LTE Band 26(1.4MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3465.00	Vertical	-36.68	-13.00	Pass
5197.50	V	-39.77		
6930.00	V	-37.67		
8662.50	V	-43.61		
10395.00	V	---		
3465.00	Horizontal	-39.16	-13.00	Pass
5197.50	H	-43.01		
6930.00	H	-45.31		
8662.50	H	-45.58		
10395.00	H	---		
Test mode:	LTE Band 26(1.4MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3508.60	Vertical	-36.83	-13.00	Pass
5262.90	V	-38.95		
7017.20	V	-37.64		
8771.50	V	-42.92		
10525.80	V	---		
3508.60	Horizontal	-39.56	-13.00	Pass
5262.90	H	-42.75		
7017.20	H	-44.49		
8771.50	H	-46.02		
10525.80	H	---		

Remark:

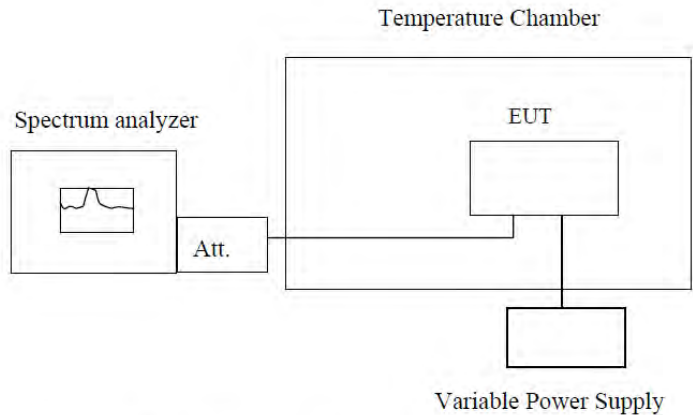
- 1 The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
- 2 Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
- 3 The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

Test mode:	LTE Band 41 (5MHz)		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3701.40	Vertical	-36.43	-13.00	Pass
5552.10	V	-39.02		
7402.80	V	-37.52		
9253.50	V	-43.63		
11104.20	V	---		
3701.40	Horizontal	-39.13	-13.00	Pass
5552.10	H	-42.25		
7402.80	H	-44.77		
9253.50	H	-45.69		
11104.20	H	---		
Test mode:	LTE Band 41 (5MHz)		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-36.48	-13.00	Pass
5640.00	V	-39.62		
7520.00	V	-37.60		
9400.00	V	-42.96		
11280.00	V	---		
3760.00	Horizontal	-39.39	-13.00	Pass
5640.00	H	-42.55		
7520.00	H	-44.41		
9400.00	H	-45.99		
11280.00	H	---		
Test mode:	LTE Band 41 (5MHz)		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3818.60	Vertical	-36.31	-13.00	Pass
5727.90	V	-39.15		
7637.20	V	-38.46		
9546.50	V	-43.65		
11455.80	V	---		
3818.60	Horizontal	-39.26	-13.00	Pass
5727.90	H	-42.60		
7637.20	H	-45.29		
9546.50	H	-45.80		
11455.80	H	---		

Remark :

- 1 The emission behaviour belongs to narrowband spurious emission, all modes investigated and only worst case is reported.
- 2 Remark"---" means that the emission level is too low (20dB lower than the limit) to be measured
- 3 The emission levels of below 1 GHz are very lower (20dB lower than the limit) than the limit and not show in test report.

4.10 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part2.1055(a)(1)(b), FCC part90.213.(a)
Test Method:	ANSI C63.26:2015
Limit:	2.5ppm(Part 22) Within the authorized bands of operation(Part 24, Part 27)
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test procedure:	1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to –20°C . After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass
Remark:	If all frequencies stability are comply with the lower limit, then all results can be considered qualified

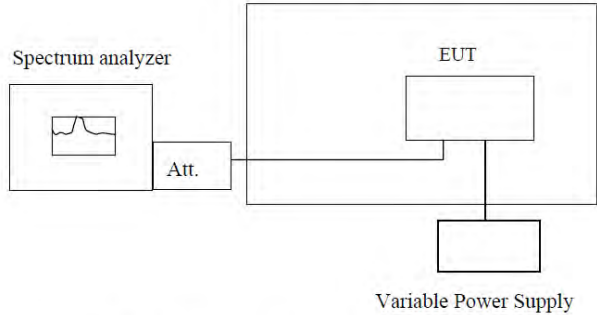
Measurement Data

Reference Frequency: LTE Band 2 Middle channel=18900 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20℃	18	0.0095	Within the authorized bands	Pass
	-10℃	23	0.0122		
	-5℃	22	0.0116		
	0℃	-28	-0.0147		
	+10℃	20	0.0105		
	+20℃	12	0.0061		
	+30℃	-3	-0.0016		
	+40℃	12	0.0064		
	+50℃	18	0.0094		
Reference Frequency: LTE Band 4 Middle channel=20175 channel=1732.5MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20℃	14	0.0081	2.5	Pass
	-10℃	13	0.0073		
	-5℃	13	0.0073		
	0℃	-17	-0.0098		
	+10℃	10	0.0059		
	+20℃	13	0.0076		
	+30℃	0	-0.0002		
	+40℃	14	0.0079		
	+50℃	15	0.0086		
Reference Frequency: LTE Band 5 Middle channel=20175 channel=836.5MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20℃	12	0.0141	2.5	Pass
	-10℃	15	0.0178		
	-5℃	9	0.0107		
	0℃	-16	-0.0191		
	+10℃	9	0.0106		
	+20℃	12	0.0141		
	+30℃	-2	-0.0019		
	+40℃	10	0.0121		
	+50℃	15	0.0177		

Reference Frequency: LTE Band 7 Middle channel=21100 channel=2535MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20°C	20	0.0079	Within the authorized bands	Pass
	-10°C	24	0.0095		
	-5°C	22	0.0087		
	0°C	-26	-0.0104		
	+10°C	16	0.0062		
	+20°C	14	0.0055		
	+30°C	-1	-0.0003		
	+40°C	7	0.0028		
	+50°C	17	0.0066		
Reference Frequency: LTE Band 12 Middle channel=23095 channel=707.5MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20°C	15	0.0219	2.5	Pass
	-10°C	10	0.0146		
	-5°C	10	0.0147		
	0°C	-29	-0.0417		
	+10°C	12	0.0176		
	+20°C	13	0.0178		
	+30°C	-5	-0.0070		
	+40°C	7	0.0093		
	+50°C	10	0.0147		
Reference Frequency: LTE Band 17 Middle channel=21100 channel=2535MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20°C	13	0.0051	Within the authorized bands	Pass
	-10°C	11	0.0043		
	-5°C	-29	-0.0114		
	0°C	8	0.0031		
	+10°C	16	0.0062		
	+20°C	-5	-0.0019		
	+30°C	5	0.0021		
	+40°C	9	0.0036		
	+50°C	14	0.0055		

Reference Frequency: LTE Band 26 Middle channel=26740 channel=819MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20℃	9	0.0115	2.5	Pass
	-10℃	11	0.0140		
	-5℃	-28	-0.0338		
	0℃	12	0.0151		
	+10℃	13	0.0157		
	+20℃	-4	-0.0046		
	+30℃	7	0.0083		
	+40℃	9	0.0114		
	+50℃	11	0.0138		
Reference Frequency: LTE Band 41 Middle channel=21100 channel=2535MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20℃	15	0.0059	Within the authorized bands	Pass
	-10℃	8	0.0033		
	-5℃	-19	-0.0074		
	0℃	8	0.0033		
	+10℃	15	0.0060		
	+20℃	-1	-0.0003		
	+30℃	9	0.0034		
	+40℃	8	0.0032		
	+50℃	13	0.0051		

4.11 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part2.1055(d)(1)(2), FCC part90.213.(a)
Test Method:	ANSI C63.26:2015
Limit:	2.5ppm Band II & Band VII should be within authorized band.
Test setup:	Temperature Chamber  Variable Power Supply Note : Measurement setup for testing on Antenna connector
Test procedure:	1. Set chamber temperature to 20°C . Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass
Remark:	1. Manufacturer specified the battery operating end point voltage is 3.32VDC, max voltage is 4.37VDC. 2. If all frequencies stability are comply with the lower limit, then all results can be considered qualified

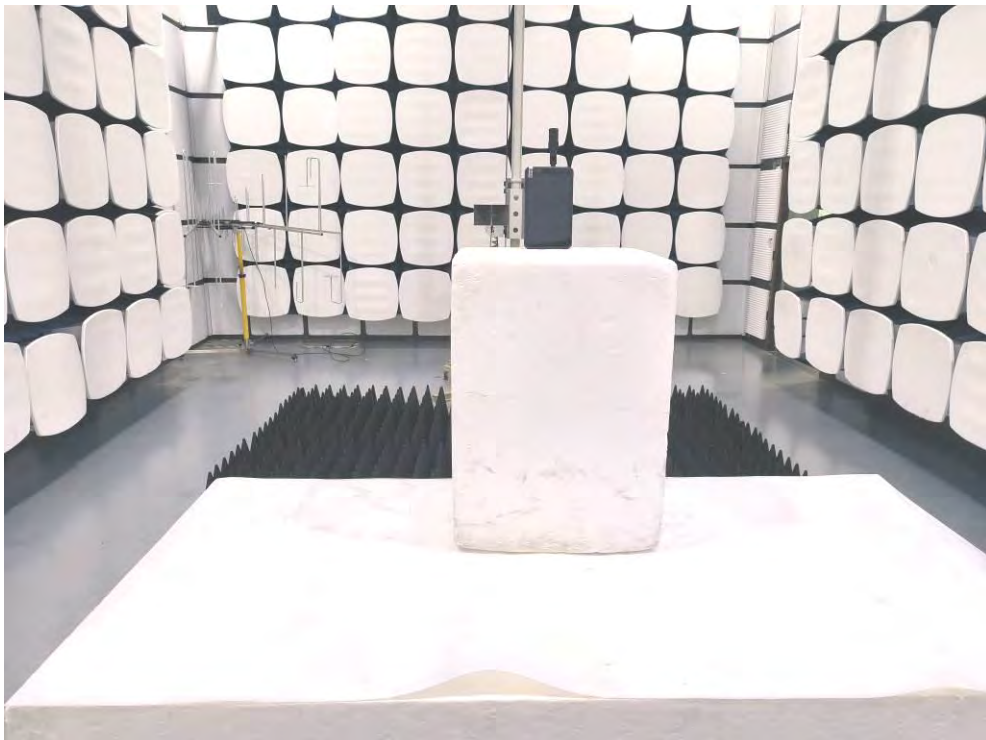
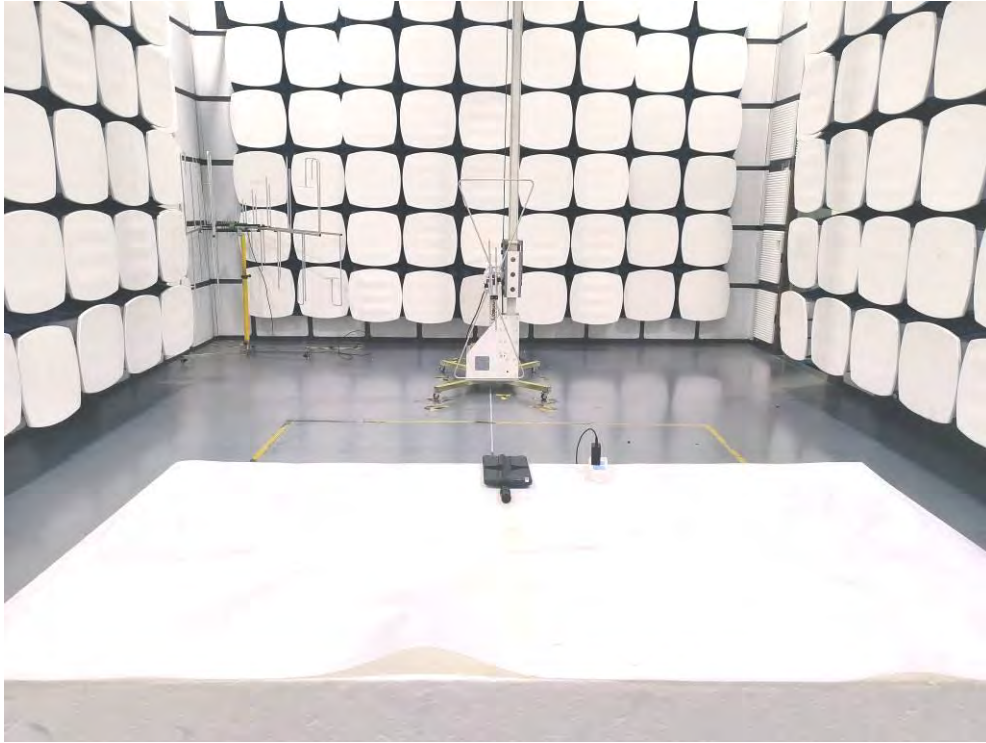
Measurement Data

Reference Frequency: LTE Band 2 Middle channel=18900 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.18	7	0.0038	within authorized band	Pass
	3.80	8	0.0045		
	3.61	12	0.0064		
Reference Frequency: LTE Band 4 Middle channel=20175 channel=1732.5MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.18	17	0.0097	2.5	Pass
	3.80	13	0.0077		
	3.61	14	0.0080		
Reference Frequency: LTE Band 5 Middle channel=20175 channel=836.5MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.18	8	0.0096	2.5	Pass
	3.80	12	0.0146		
	3.61	11	0.0127		
Reference Frequency: LTE Band 7 Middle channel=21100 channel=2535MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.18	14	0.0054	within authorized band	Pass
	3.80	-17	-0.0066		
	3.61	8	0.0032		

Reference Frequency: LTE Band 12 Middle channel=23095 channel=707.5MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.18	12	0.0165	within authorized band	Pass
	3.80	11	0.0150		
	3.61	6	0.0087		
Reference Frequency: LTE Band 17 Middle channel=20175 channel=836.5MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.18	18	0.0214	2.5	Pass
	3.80	12	0.0148		
	3.61	10	0.0114		
Reference Frequency: LTE Band 26 Middle channel=26740 channel=819MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.18	13	0.0156	2.5	Pass
	3.80	-2	-0.0026		
	3.61	8	0.0098		
Reference Frequency: LTE Band 41 Middle channel=20175 channel=1732.5MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.18	7	0.0043	2.5	Pass
	3.80	11	0.0065		
	3.61	-2	-0.0013		

4.12 Test Setup Photo

Radiated Emission



-----END OF REPORT-----