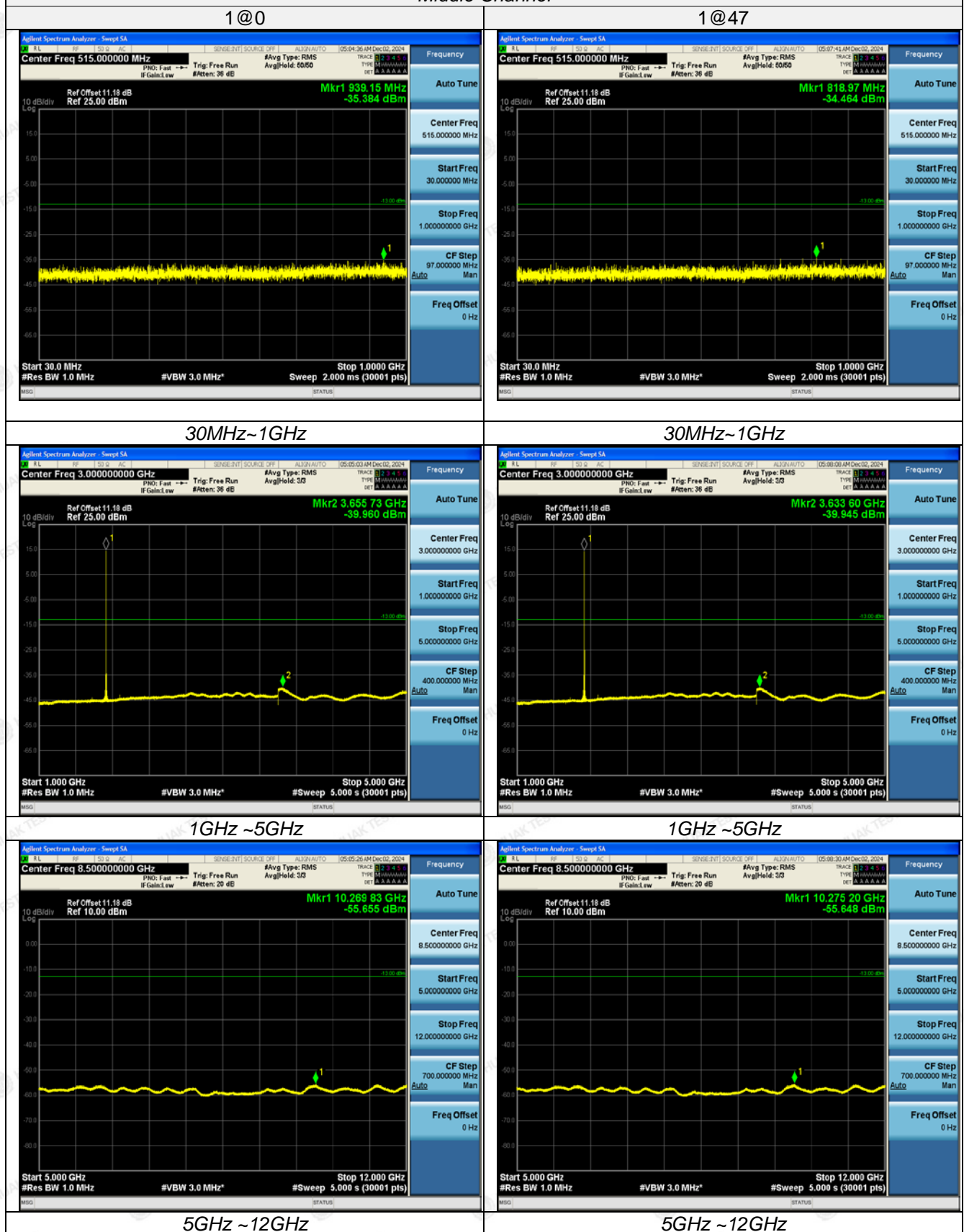
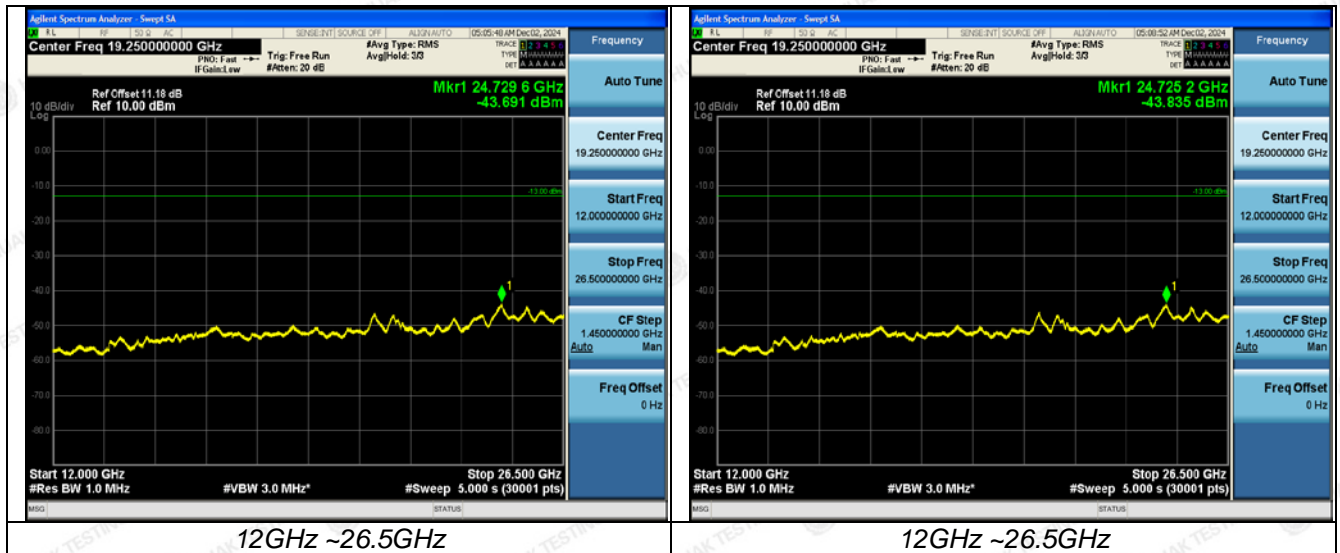


LTE FDD Band 4-QPSK-3.75KHz
Middle Channel

The results shown in this test report refer only to the sample(s) tested and otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAKE, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

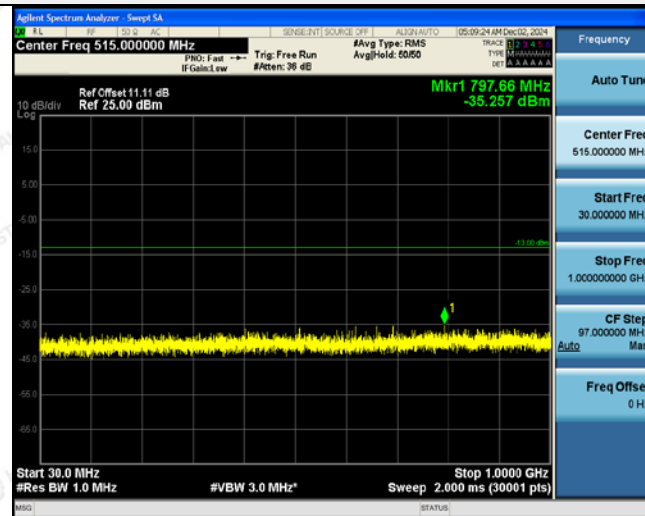
TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

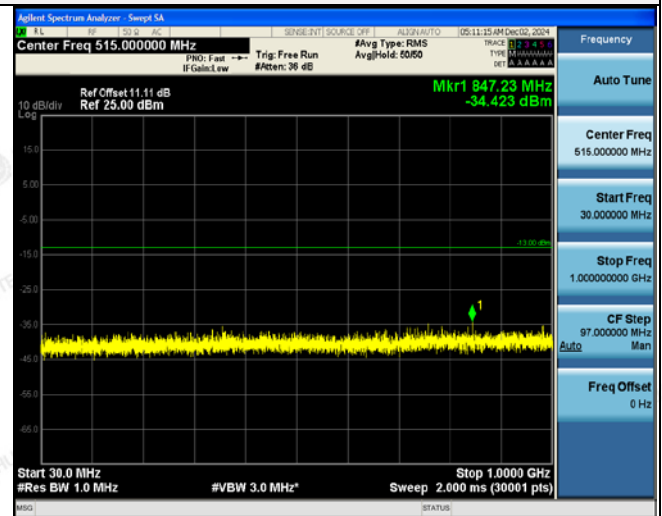


LTE FDD Band 4-QPSK-3.75KHz
High Channel

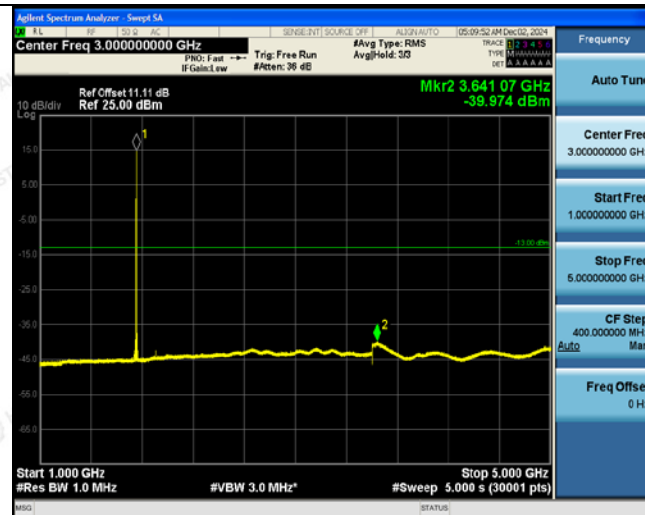
1@0



1@47



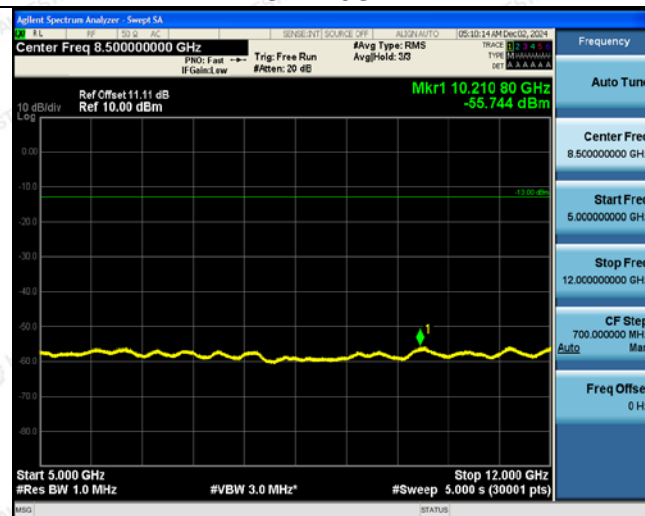
30MHz~1GHz



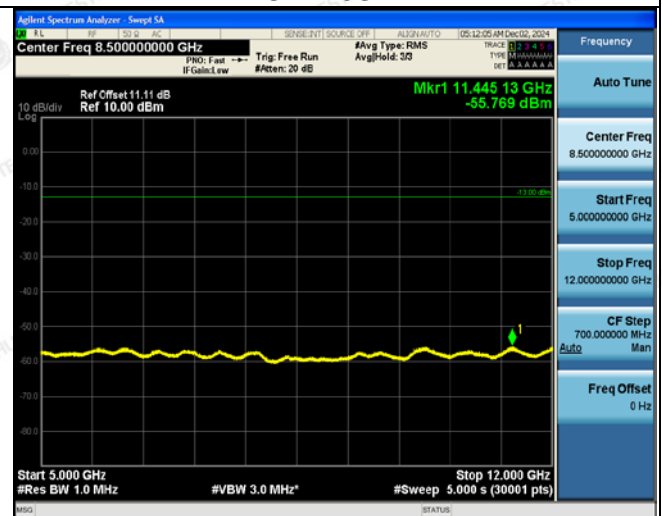
30MHz~1GHz



1GHz ~5GHz

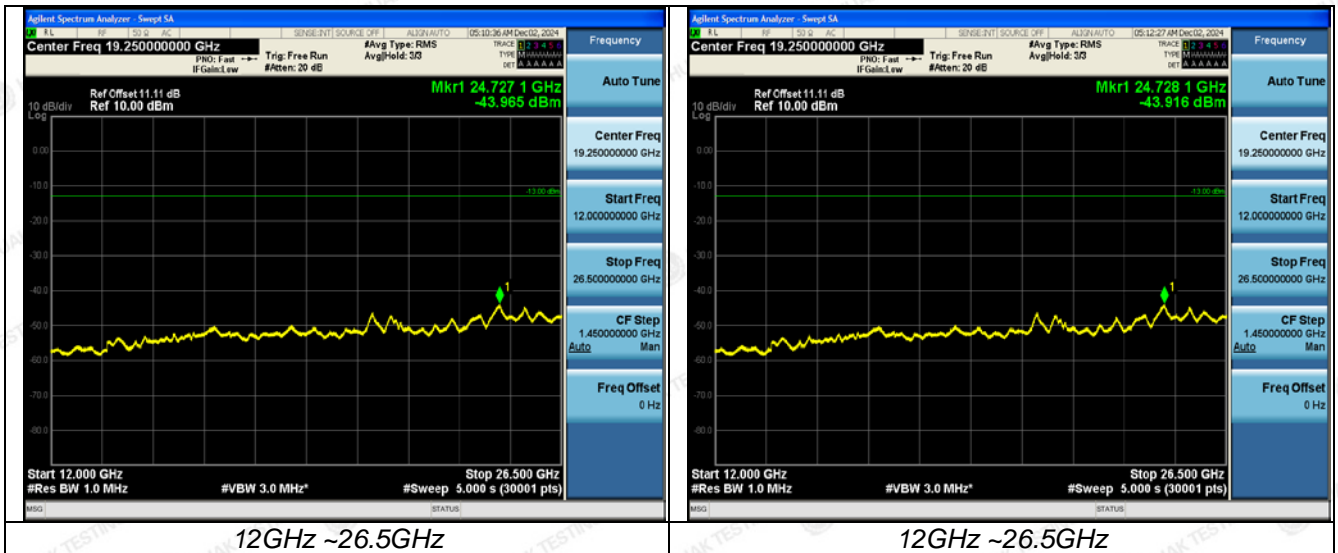


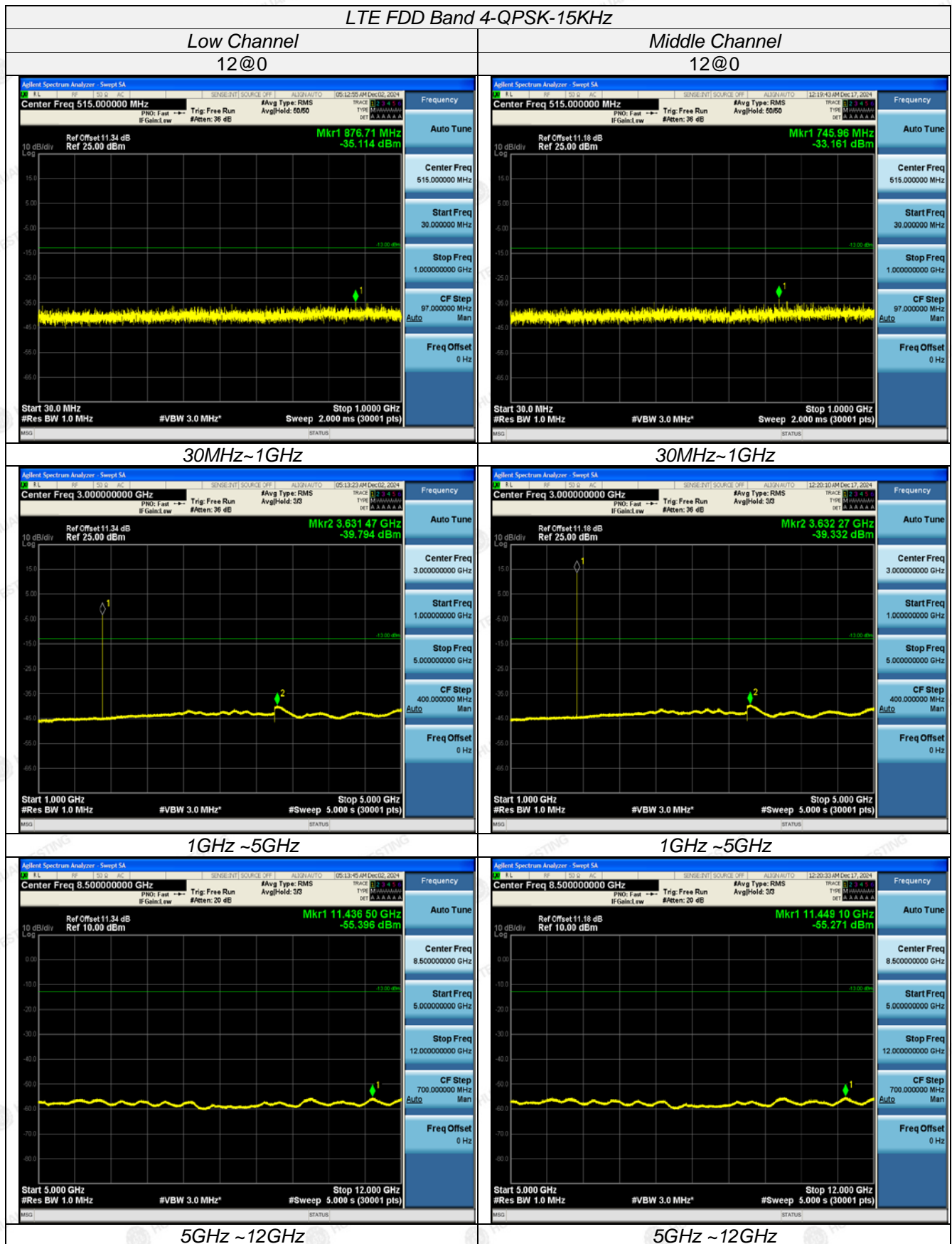
1GHz ~5GHz

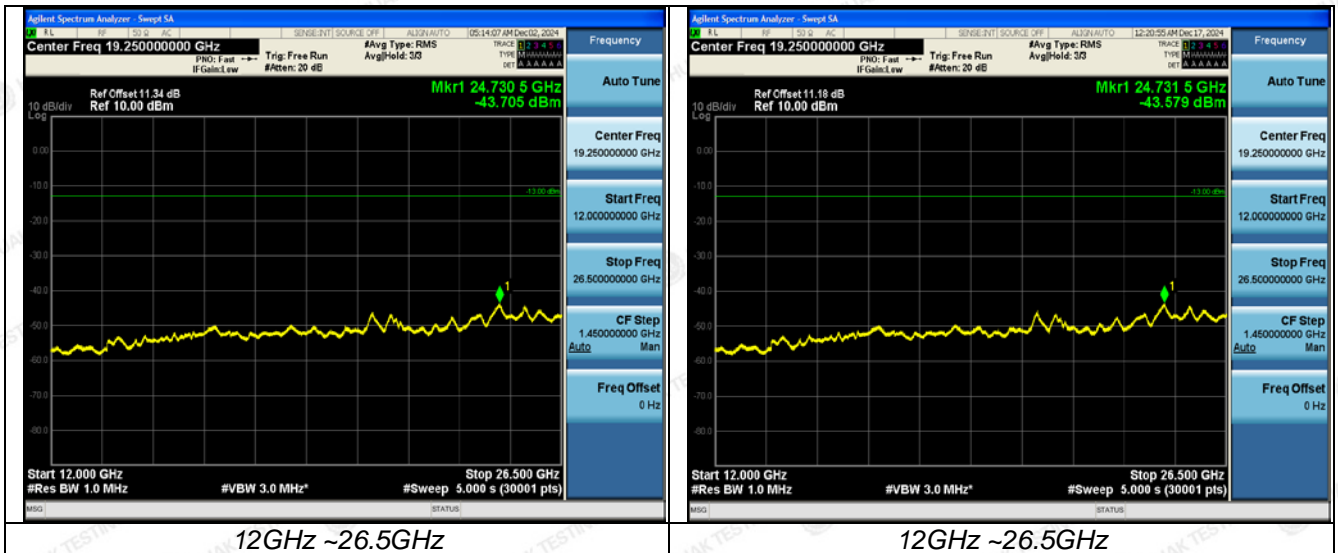


5GHz ~12GHz

5GHz ~12GHz





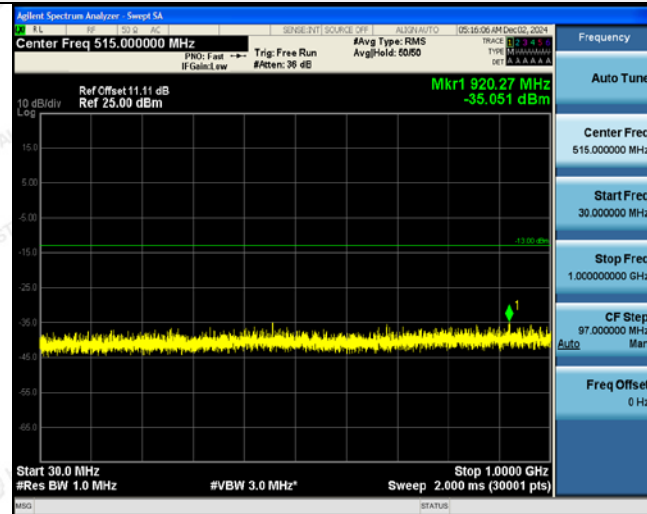




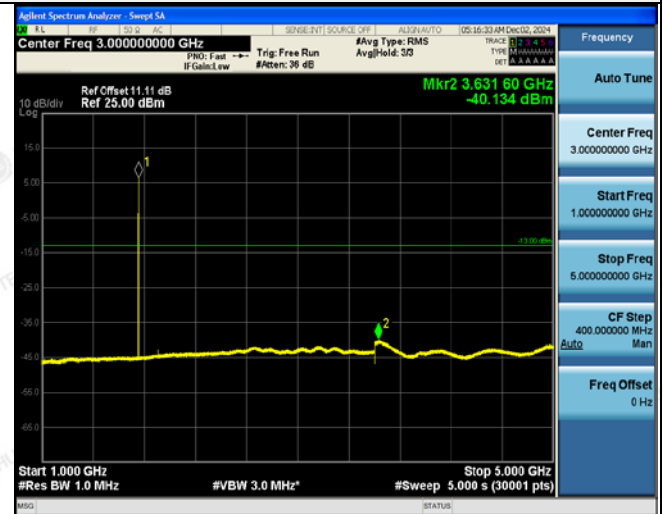
LTE FDD Band 4-QPSK-15KHz

High Channel

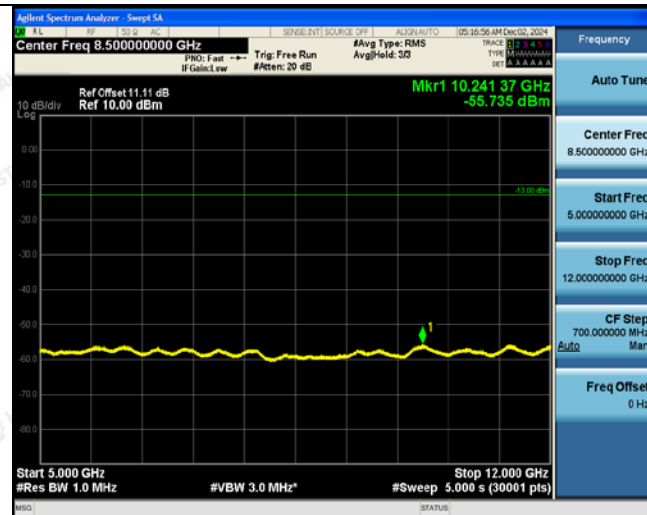
12@0



30MHz~1GHz



1GHz~5GHz



5GHz~12GHz



12GHz~26.5GHz

**Radiated Measurement:****Remark:**

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.
2. $EIRP = P_{Mea}(dBm) - P_{cl}(dB) + G_a(dBi)$
3. We were not recorded other points as values lower than limits.
4. $Margin = Limit - EIRP$

LTE FDD Band 4-15KHz-BPSK-Low Channel

Frequency (MHz)	PMea (dBm)	Pcl (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3420.2	-43.23	4.02	3.00	12.5	-34.75	-13.00	21.75	H
5130.3	-50.59	5.11	3.00	13.38	-42.32	-13.00	29.32	H
3420.2	-54.47	4.02	3.00	12.5	-45.99	-13.00	32.99	V
5130.3	-51.64	5.11	3.00	13.38	-43.37	-13.00	30.37	V

LTE FDD Band 4-15KHz-BPSK-Middle Channel

Frequency (MHz)	PMea (dBm)	Pcl (dB)	Diatance	Ga Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3465.0	-43.83	4.02	3.00	12.45	-35.4	-13.00	22.4	H
5197.5	-48.02	5.11	3.00	13.38	-39.75	-13.00	26.75	H
3465.0	-49.15	4.02	3.00	12.45	-40.72	-13.00	27.72	V
5197.5	-47.84	5.11	3.00	13.38	-39.57	-13.00	26.57	V

LTE FDD Band 4-15KHz-BPSK-High Channel

Frequency (MHz)	PMea (dBm)	Pcl (dB)	Diatance	Ga Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3509.8	-43.79	4.02	3.00	12.21	-35.6	-13.00	22.6	H
5264.7	-46.92	5.11	3.00	13.26	-38.77	-13.00	25.77	H
3509.8	-48.41	4.02	3.00	12.21	-40.22	-13.00	27.22	V
5264.7	-48.03	5.11	3.00	13.26	-39.88	-13.00	26.88	V

LTE FDD Band 4-15KHz-QPSK-Low Channel

Frequency (MHz)	PMea (dBm)	Pcl (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3420.2	-49.74	4.02	3.00	12.5	-41.26	-13.00	28.26	H
5130.3	-51.55	5.11	3.00	13.38	-43.28	-13.00	30.28	H
3420.2	-52.14	4.02	3.00	12.5	-43.66	-13.00	30.66	V
5130.3	-49.95	5.11	3.00	13.38	-41.68	-13.00	28.68	V

LTE FDD Band 4-15KHz-QPSK-Middle Channel

Frequency (MHz)	PMea (dBm)	Pcl (dB)	Diatance	Ga Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3465.0	-43.65	4.02	3.00	12.45	-35.22	-13.00	22.22	H
5197.5	-47.72	5.11	3.00	13.38	-39.45	-13.00	26.45	H
3465.0	-49.62	4.02	3.00	12.45	-41.19	-13.00	28.19	V
5197.5	-48.24	5.11	3.00	13.38	-39.97	-13.00	26.97	V



LTE FDD Band 4-15KHz-QPSK-High Channel

Frequency (MHz)	PMea (dBm)	Pcl (dB)	Diatance	Ga Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3509.8	-43.45	4.02	3.00	12.21	-35.26	-13.00	22.26	H
5264.7	-47.56	5.11	3.00	13.26	-39.41	-13.00	26.41	H
3509.8	-48.91	4.02	3.00	12.21	-40.72	-13.00	27.72	V
5264.7	-47.74	5.11	3.00	13.26	-39.59	-13.00	26.59	V

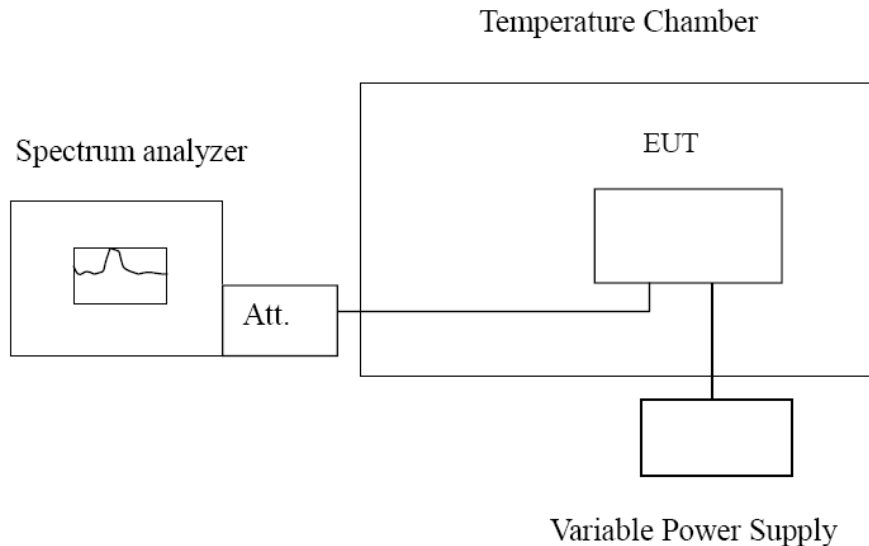


3.6 Frequency Stability Under Temperature & Voltage Variations

LIMIT

According to §27.54, §2.1055 requirement, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation and should not exceed 2.5ppm.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D.

Frequency Stability Under Temperature Variations:

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30°C.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE band 4, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50°C.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 °C increments from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

**TEST RESULTS**

Remark:

1. We tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case.

LTE Band 4, 15KHz, BPSK (worst case of all bandwidths).

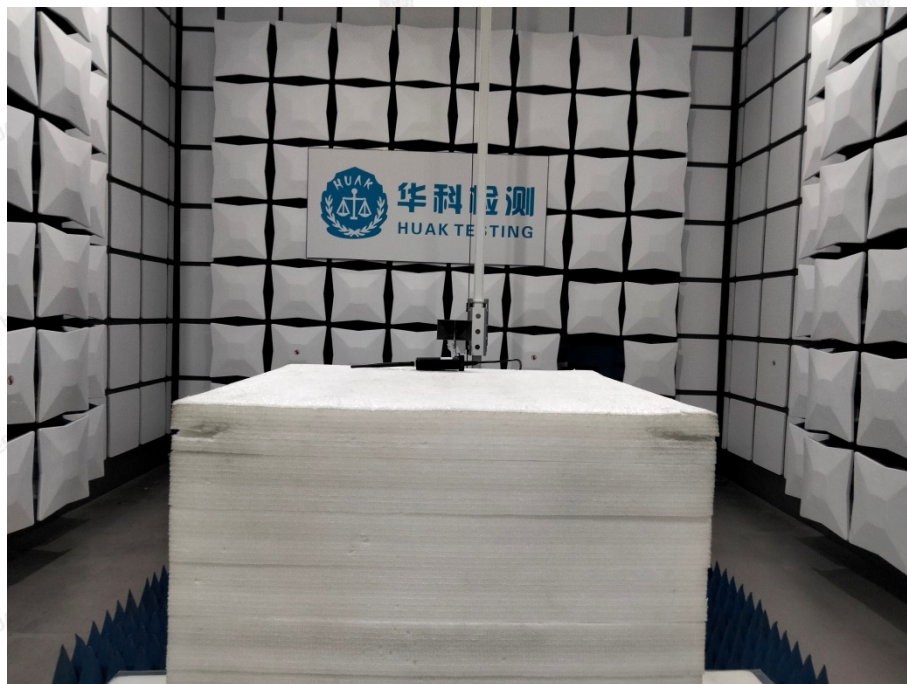
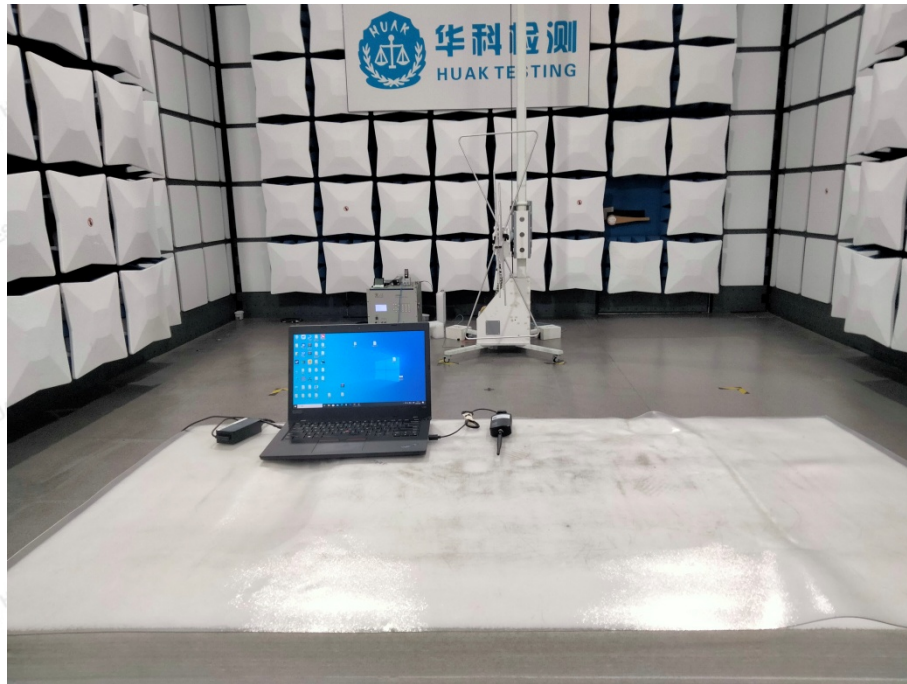
LTE FDD Band 4				
DC Power(V)	Temperature (°C)	Frequency error(Hz)	Frequency error(ppm)	Verdict
4.25	20	-11.56	-0.006760	PASS
5.0	20	-14.35	-0.008391	PASS
5.75	20	-18.41	-0.010765	PASS
5.0	-30	-15.94	-0.009321	PASS
5.0	-20	-13.95	-0.008157	PASS
5.0	-10	-11.64	-0.006807	PASS
5.0	0	-19.05	-0.010996	PASS
5.0	10	-16.08	-0.009281	PASS
5.0	20	-22.09	-0.012750	PASS
5.0	30	-20.86	-0.012040	PASS
5.0	40	-21.30	-0.012294	PASS
5.0	50	-18.44	-0.010644	PASS

LTE Band 4, 15KHz, QPSK (worst case of all bandwidths)

LTE FDD Band 4				
DC Power(V)	Temperature (°C)	Frequency error(Hz)	Frequency error(ppm)	Verdict
4.25	20	-9.94	-0.005813	PASS
5.0	20	-13.03	-0.007619	PASS
5.75	20	-11.20	-0.006549	PASS
5.0	-30	-10.76	-0.006292	PASS
5.0	-20	-14.71	-0.008602	PASS
5.0	-10	-9.33	-0.005456	PASS
5.0	0	-16.89	-0.009749	PASS
5.0	10	-14.05	-0.008110	PASS
5.0	20	-21.00	-0.012121	PASS
5.0	30	-15.81	-0.009126	PASS
5.0	40	-15.64	-0.009027	PASS
5.0	50	-12.99	-0.007498	PASS



4 Test Setup Photos of the EUT





5 Photos of the EUT

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos.

.....End of Report.....