


 Report No.: ZEWM2306000841RG01
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TEST REPORT

Application No.: ZEWM2306000841RG
Applicant: Quectel Wireless Solutions Co., Ltd.
Address of Applicant: Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer: Quectel Wireless Solutions Co., Ltd.
Address of Manufacturer: Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
EUT Description: 5G Sub-6 GHz M.2 Module
Model No.: RM520N-GL
Trade Mark: Quectel
FCC ID: XMR2023RM520NGL
Standards: 47 CFR Part 2
 47 CFR Part 96
Date of Receipt: 2022/05/15 (for original report FYCR220600021101)
Date of Test: 2022/05/22 to 2022/07/22 (for original report FYCR220600021101)
 2023/05/09 to 2023/06/19 (for new report ZEWM2306000841RG01)
Date of Issue: 2023/06/21

| | |
|----------------------|---------------|
| Test Result : | PASS * |
|----------------------|---------------|

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

 Ervin Li
 Regulatory Manager

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1 Version

| Revision Record | | | | |
|-----------------|---------|------------|----------|----------|
| Version | Chapter | Date | Modifier | Remark |
| 01 | | 2023/06/21 | | Original |

| | |
|-------------|-----------------------------|
| Prepared By | <i>Dee Zheng</i> |
| | (Dee Zheng) / Test Engineer |
| Checked By | <i>Daniel Wang</i> |
| | (Daniel Wang) / Reviewer |



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2 Test Summary

2.1 LTE Band 48/ LTE CA_48C

| Test Item | FCC Rule No. | Requirements | Test Result | Verdict |
|--|-----------------|--|-----------------------------------|---------|
| Effective (Isotropic) Radiated Power Output Data | §2.1046, §96.41 | EIRP ≤ 23dBm | Section 1 of Appendix B.48&B.49 | Pass |
| Peak-Average Ratio | §96.41 | FCC: Limit≤13 dB | Reference report FYCR220600021101 | Pass |
| Bandwidth | §2.1049 | OBW: No limit. EBW: No limit. | Reference report FYCR220600021101 | Pass |
| Band Edges Compliance | §2.1051, §96.41 | for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. | Reference report FYCR220600021101 | Pass |
| Spurious Emission at Antenna Terminals | §2.1051, §96.41 | for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed -25 dBm/MHz. | Reference report FYCR220600021101 | Pass |



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| | | | | |
|--------------------------------------|-----------------|--|-----------------------------------|------|
| | | (2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz. | | |
| Field Strength of Spurious Radiation | §2.1053, §96.41 | for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed -25 dBm/MHz. (2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz. | Reference report FYCR220600021101 | Pass |
| Frequency Stability | §2.1055, §96.41 | Within authorized bands of operation/ frequency block. | Reference report FYCR220600021101 | Pass |



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Remark:

This test report (Report No.: ZEWM2306000841RG01 issue on 2023/06/21) is based on the original test report (Report No.: FYCR220600021101 issue on 2022/07/24).

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

The Effective (Isotropic) Radiated Power Output Data were fully tested in this report, and other items data please refer to the test report FYCR220600021101. The FCC ID is XMR2022RM520NGL has been certified, and the test report issued by Compliance Certification Services (Kunshan) Inc. Shenzhen branch. on 2022/07/24.



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3 General Information

3.1 Details of Client

| | |
|--------------------------|---|
| Applicant: | Quectel Wireless Solutions Co., Ltd. |
| Address of Applicant: | Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233 |
| Manufacturer: | Quectel Wireless Solutions Co., Ltd. |
| Address of Manufacturer: | Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233 |

3.2 Test Location

| | |
|----------------|---|
| Company: | SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch |
| Address: | No. 1 Workshop, M-10, Middle section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China |
| Post code: | 518057 |
| Test engineer: | Jinhua Wei |

3.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

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CAB identifier: CN0006.

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- **FCC –Designation Number: CN1336**

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3.4 General Description of EUT

| | | | | |
|-------------------|---|------------------------------|-------------------------------|----------------|
| EUT Description: | 5G Sub-6 GHz M.2 Module | | | |
| Model No.: | RM520N-GL | | | |
| Trade Mark: | Quectel | | | |
| Hardware Version: | R1.0 | | | |
| Software Version: | RM520NGLAAR03A01M4G | | | |
| IMEI: | 868371050414016 | | | |
| Antenna Type: | External Antenna | | | |
| Antenna Gain: | LTE Band 48: | -6.1dBi (Ant2) | LTE CA_48C: | -6.1dBi (Ant2) |
| | Note: The antenna gain are derived from the gain information report provided by the manufacturer. | | | |
| RF Cable: | 9kHz ~ 30MHz (0.3dB) | 30MHz ~ 1000MHz (0.6dB) | 1000MHz ~ 2000MHz (0.8dB) | |
| | 2000MHz ~ 4000MHz (1.2dB) | 4000MHz ~ 6000MHz (1.8dB) | 6000MHz ~ 12750MHz (2.6dB) | |
| | Above 12750MHz (3.5dB) | | | |
| Remark: | As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information. | | | |





3.5 Test Mode

| Test Mode | Test Modes Description |
|-----------|-------------------------------|
| LTE/TM1 | LTE system, QPSK modulation |
| LTE/TM2 | LTE system, 16QAM modulation |
| LTE/TM3 | LTE system, 64QAM modulation |
| LTE/TM4 | LTE system, 256QAM modulation |

Remark: The test mode(s) are selected according to relevant radio technology specifications.

3.6 Test Environment

| Environment Parameter | 101.0 kPa Selected Values During Tests | |
|-----------------------|--|------------|
| Relative Humidity | 44-46 % RH Ambient | |
| Value | Temperature(°C) | Voltage(V) |
| NTNV | 22~23 | 3.7 |
| LTLV | -30 | 3.135 |
| LTHV | -30 | 4.4 |
| HTLV | 50 | 3.135 |
| HTHV | 50 | 4.4 |

Remark:
 NV: Normal Voltage LV: Low Extreme Test Voltage HV: High Extreme Test Voltage
 NT: Normal Temperature LT: Low Extreme Test Temperature HT: High Extreme Test Temperature

3.7 Description of Support Units

| Description | Manufacturer | Model No. |
|--------------------------|--------------|-----------|
| Test auxiliary PCB board | Quectel | N/A |

Remark: all above the information of table are provided by client.




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3.8 Technical Specification

| Characteristics | Description | | |
|-----------------------------|---|--|---|
| Radio System Type | <input checked="" type="checkbox"/> LTE | | |
| Supported Frequency Range | Band | TX | RX |
| | LTE Band 48 | 3550 to 3700 MHz | 3550 to 3700 MHz |
| | LTE CA_48C | 3550 to 3700 MHz | 3550 to 3700 MHz |
| Supported Channel Bandwidth | LTE Band48 | <input checked="" type="checkbox"/> 5 MHz <input checked="" type="checkbox"/> 10 MHz | <input checked="" type="checkbox"/> 15 MHz <input checked="" type="checkbox"/> 20 MHz |
| | LTE Band CA_48C | <input checked="" type="checkbox"/> 5MHz+20MHz | <input checked="" type="checkbox"/> 20MHz+5MHz |
| | | <input checked="" type="checkbox"/> 10MHz+20MHz | <input checked="" type="checkbox"/> 20MHz+10MHz |
| | | <input checked="" type="checkbox"/> 15MHz+20MHz | <input checked="" type="checkbox"/> 20MHz+15MHz |
| | | <input checked="" type="checkbox"/> 20MHz+20MHz | |


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3.9 Test Frequencies

| Test Mode | Bandwidth | TX / RX | RF Channel | | |
|-------------|-----------|---------|---------------|---------------|---------------|
| | | | Low (L) | Middle (M) | High (H) |
| LTE Band 48 | 5MHz | TX/RX | Channel 55265 | Channel 55990 | Channel 56715 |
| | | | 3552.5 MHz | 3625.0 MHz | 3697.5 MHz |
| | 10MHz | TX/RX | Channel 55290 | Channel 55990 | Channel 56690 |
| | | | 3555.0 MHz | 3625.0 MHz | 3695.0 MHz |
| | 15MHz | TX/RX | Channel 55315 | Channel 55990 | Channel 56665 |
| | | | 3557.5 MHz | 3625.0 MHz | 3692.5 MHz |
| | 20MHz | TX/RX | Channel 55340 | Channel 55990 | Channel 56640 |
| | | | 3560.0 MHz | 3625.0 MHz | 3690.0 MHz |



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LTE CA 48C(3550-3700):

| Range | CC-Combo / NRB_agg [RB] | CC1 Note1 | | | CC2 Note1 | | |
|---------|-------------------------|-----------|--------|--------------|-----------|--------|--------------|
| | | BW [RB] | NUL/DL | fUL/DL [MHz] | BW [RB] | NUL/DL | fUL/DL [MHz] |
| Low | 25+100 | 25 | 55273 | 3553.3 | 100 | 55390 | 3565 |
| | | 100 | 55340 | 3560 | 25 | 55457 | 3571.7 |
| | 50+100 | 50 | 55295 | 3555.5 | 100 | 55439 | 3569.9 |
| | | 100 | 55340 | 3560 | 50 | 55484 | 3574.4 |
| | 75+100 | 75 | 55318 | 3557.8 | 100 | 55489 | 3574.9 |
| | | 100 | 55340 | 3560 | 75 | 55511 | 3577.1 |
| | 100+100 | 100 | 55340 | 3560 | 100 | 55538 | 3579.8 |
| | Mid | 25+100 | 25 | 55898 | 3615.8 | 100 | 56015 |
| 100 | | | 55965 | 3622.5 | 25 | 56082 | 3634.2 |
| 50+100 | | 50 | 55896 | 3615.6 | 100 | 56040 | 3630 |
| | | 100 | 55941 | 3620.1 | 50 | 56085 | 3634.5 |
| 75+100 | | 75 | 55893 | 3615.3 | 100 | 56064 | 3632.4 |
| | | 100 | 55916 | 3617.6 | 75 | 56087 | 3634.7 |
| 100+100 | | 100 | 55891 | 3615.1 | 100 | 56089 | 3634.9 |
| High | | 25+100 | 25 | 56523 | 3678.3 | 100 | 56640 |
| | 100 | | 56590 | 3685 | 25 | 56707 | 3696.7 |
| | 50+100 | 50 | 56496 | 3675.6 | 100 | 56640 | 3690 |
| | | 100 | 56541 | 3680.1 | 50 | 56685 | 3694.5 |
| | 75+100 | 75 | 56469 | 3672.9 | 100 | 56640 | 3690 |
| | | 100 | 56491 | 3675.1 | 75 | 56662 | 3692.2 |
| | 100+100 | 100 | 56442 | 3670.2 | 100 | 56640 | 3690 |

Note 1: Carriers in increasing frequency order.



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4 Description of Tests

4.1 Conducted Output Power

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.2.1

The transmitter output was connected to a calibrated coaxial cable, attenuator and power meter, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The power output at the transmitter antenna port was determined by adding the value of the cable insertion loss to the power reading. The tests were performed at three frequencies (low channel, middle channel and high channel) and on the highest power levels, which can be setup on the transmitters.

Remark: Reference test setup 1


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4.2 Effective (Isotropic) Radiated Power of Transmitter

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.8.4

Calculate power in dBm by the following formula:

$$\text{ERP (dBm)} = \text{Conducted Power (dBm)} + \text{antenna gain (dBd)}$$

$$\text{EIRP(dBm)} = \text{Conducted Power (dBm)} + \text{antenna gain (dBi)}$$

$$\text{EIRP} = \text{ERP} + 2.15\text{dB}$$

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4.3 Occupied Bandwidth

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 4.2 & 4.3

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel, middle channel and high channel). The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

Remark: Reference test setup 1

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW \geq 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7



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4.4 Band Edge at Antenna Terminals

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 6.0

The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at two frequencies (low channel and high channel).in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of 100kHz or 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed. The EUT emission bandwidth is measured as the width of the signal between two points, outside of which all emission are attenuated at least 26dB below the transmitter power. The video bandwidth of the spectrum analyzer was set at thrice the resolution bandwidth. Detector Mode was set to rms.

Remark: Reference test setup 1

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. $RBW \geq 1\%$ of the emission bandwidth
4. $VBW \geq 3 \times RBW$
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span}/RBW$
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize



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4.5 Spurious And Harmonic Emissions at Antenna Terminal

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 6.0

The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyzer, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel and high channel). The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

Remark: Reference test setup 1

Test Settings

1. Start frequency was set to 9kHz and stop frequency was set to at least 10* the fundamental frequency(Separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings



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4.6 Peak-Average Ratio

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.7.2

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode.

Remark: Reference test setup 1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power





4.7 Field Strength of Spurious Radiation

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.8

Below 1GHz test procedure as below:

- 1). The EUT was powered ON and placed on a 80cm high table in the chamber. The antenna of the transmitter was extended to its maximum length.
- 2). The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.
- 3). Steps 1) and 2) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
- 4). Test the EUT in the lowest channel, the middle channel ,the Highest channel.
- 5). The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.
- 6). Repeat above procedures until all frequencies measured was complete.

$$E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dB}\mu\text{V)} + (\text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)} - \text{AMP(dB)})$$

$$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \log D - 104.8; \text{ where D is the measurement distance in meters}$$

Above 1GHz test procedure as below:

- 1) Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber
- 2) Calculate power in dBm by the following formula:

$$E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dB}\mu\text{V)} + (\text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)} - \text{AMP(dB)})$$

$$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \log D - 104.8; \text{ where D is the measurement distance in meters}$$
- 3). Test the EUT in the lowest channel, the middle channel the Highest channel
- 4). The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.
- 5). Repeat above procedures until all frequencies measured was complete

Remark1: Reference test setup 2

Remark2: The emission below 18G were measured at a 3m test distance, while emissions above 18GHz were measured at a 1m test distance. At a measurement distance of 1 meter the limit line was increased by $20 \cdot \text{LOG}(3/1) = 9.54 \text{ dB}$.

Remark: Reference test setup 2

Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & AMP. The basic equation with a sample calculation is as follows:

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Pre-amplifier (dB)

Level = Reading Level + AF + Factor -95.26

Margin = Limit - Level

- 2) Scan from 9kHz to 40GHz, The disturbance between 9KHz to 30MHz and 18GHz to 40GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

- 3) All modes have been tested, but only the worst case data displayed in this report.



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4.8 Frequency Stability / Temperature Variation

Measurement Procedure:

Frequency stability testing is performed in accordance with the guidelines of FCC KDB 971168 D01 V03r01; Section 9

. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Remark: Reference test setup 3



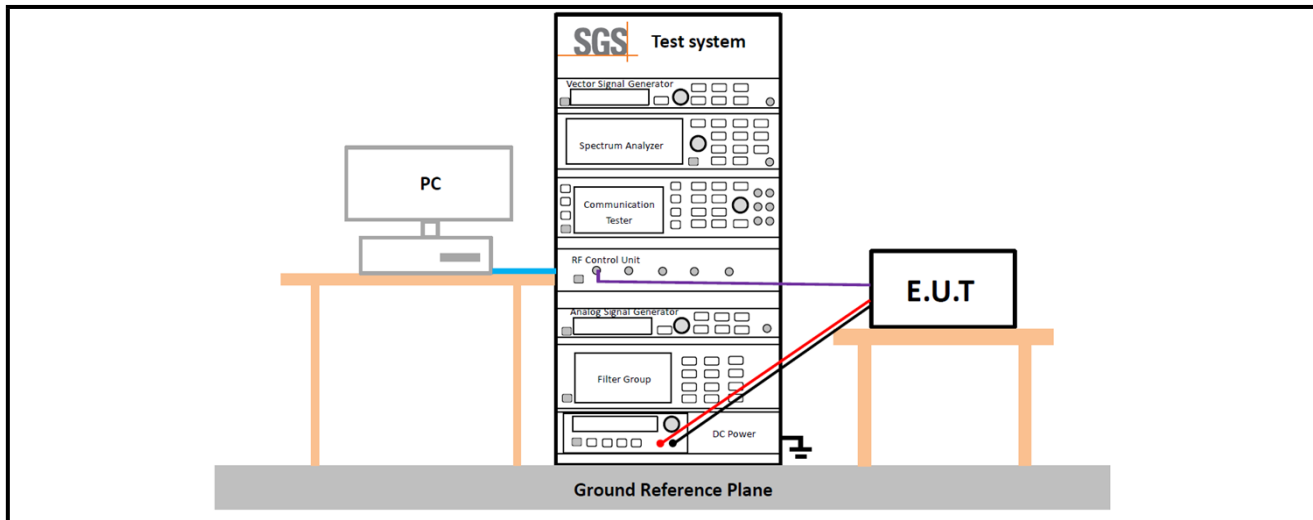
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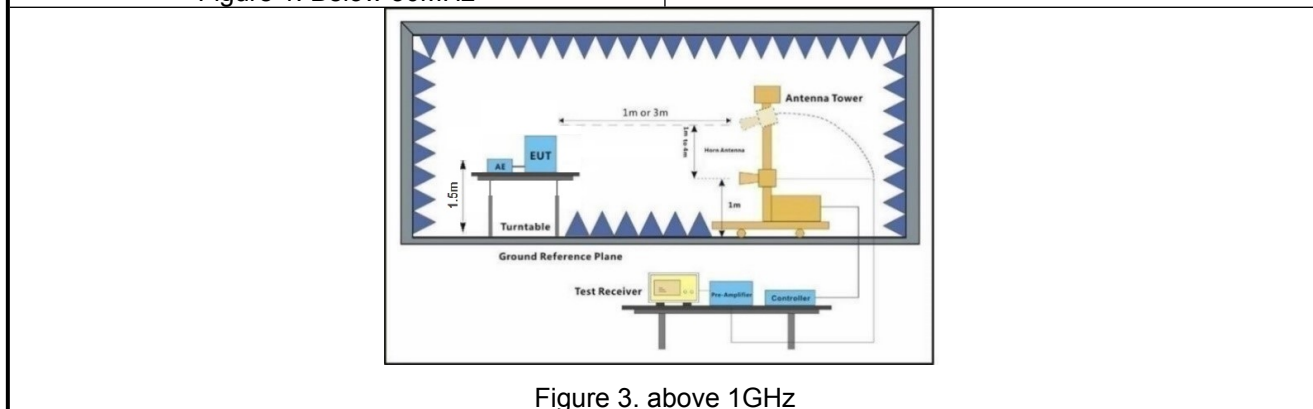
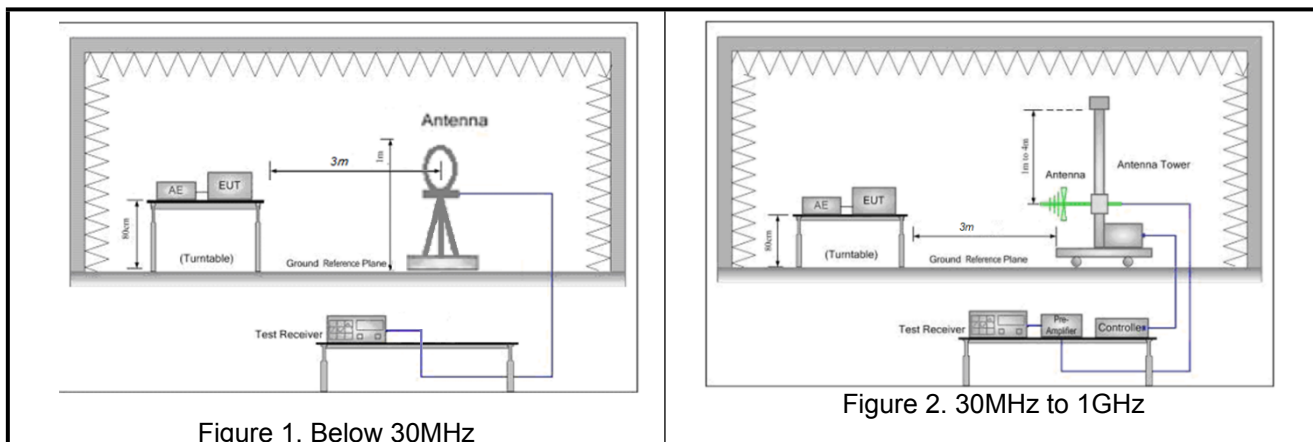


4.9 Test Setups

4.9.1 Test Setup 1



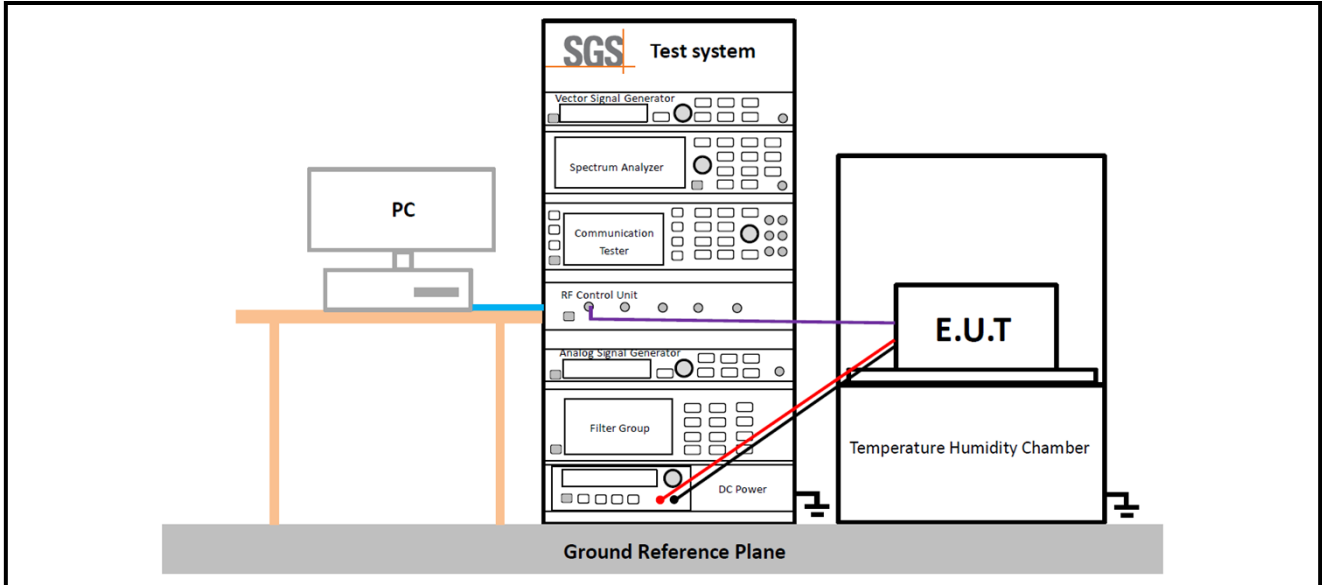
4.9.2 Test Setup 2



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4.9.3 Test Setup 3



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4.10 Test Conditions

| Transmit Output Power Data - Average Power, Total | |
|---|--|
| Test Case | Test Conditions |
| Test Environment | Ambient Climate & Rated Voltage |
| Test Setup | Test Setup 1 |
| RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel) |
| Test Mode | LTE/TM1;LTE/TM2;LTE/TM3;LTE/TM4 |





5 Main Test Instruments

| RF conducted test | | | | | |
|-------------------------------------|--|-----------|---------------|------------------------|---------------------------|
| Test Equipment | Manufacturer | Model No. | Inventory No. | Cal. date (yyyy/mm/dd) | Cal.Due date (yyyy/mm/dd) |
| Humidity/ Temperature Indicator | Shanghai Meteorological Industry Factory | HTC-1 | SZ-WRG-M-032 | 2023/02/17 | 2024/02/16 |
| Spectrum Analyzer | Rohde & Schwarz | FSV | SZ-WRG-M-012 | 2023/02/16 | 2024/02/15 |
| DC power supply | HYELEC | HY3005B | SZ-WRG-M-044 | 2022/09/22 | 2023/09/21 |
| Digital Multimeter | VICTOR | VC890C | SZ-WRG-M-071 | 2023/02/16 | 2024/02/15 |
| Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | SZ-WRG-M-033 | 2023/02/16 | 2024/02/15 |
| Wideband Radio Communication Tester | Anritsu | MT8821C | SZ-WRG-M-042 | 2022/05/31 | 2023/05/30 |
| | | | | 2023/05/25 | 2024/05/24 |
| Humidity/ Temperature Indicator | Shanghai Meteorological Industry Factory | HTC-1 | SZ-WRG-M-077 | 2022/07/06 | 2023/07/05 |
| Signal Generator | KEYSIGHT | N5182A | SZ-WRG-M-041 | 2023/02/16 | 2024/02/15 |
| Signal & Spectrum Analyzer | Rohde & Schwarz | FSV | SZ-WRG-M-048 | 2023/02/16 | 2024/02/15 |





6 Measurement Uncertainty

For a 95% confidence level ($k = 2$), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

| No. | Item | Measurement Uncertainty |
|---|---------------------------|-------------------------|
| 1 | Total RF power, conducted | $\pm 0.42\text{dB}$ |
| Remark: The U_{lab} (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (CISPR/ETSI Uncertainty), so the test results – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit. | | |





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7 Appendixes

| | |
|---------------|--|
| Setup Photos | Please reference report FYCR220600021101 |
| Appendix B.48 | LTE Band 48(3550-3700) |
| Appendix B.49 | LTE CA_48C(3550-3700) |

---End of Report---



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