Shenzhen CTL Testing Technology Co., Ltd.
Tel: +86-755-89486194 E-mail: ctl@ctl-lab.com

TEST REPORT

FCC Part 22 Subpart H

Report Reference No.....	:	**CTL2111122071-WF06**
Compiled by: (position+printed name+signature)		Happy Guo (File administrators)
Tested by: (position+printed name+signature)		Gray Gao (Test Engineer)
Approved by: (position+printed name+signature)		Ivan Xie (Manager)

Product Name.....	:	All Netcom Android module
Model/Type reference.....	:	M101C
List Model(s).....	:	M101C-QVCT-1G8G, M101C-QVCX-1G8G, M101C-QVCT-2G16G, M101C-QVCX-2G16G, M101C-QECT-1G8G, M101C-QECX-1G8G, M101C-QECT-2G16G, M101C-QECX-2G16G
Trade Mark.....	:	Temolin
FCC ID.....	:	**2AM5I-M101C**
Applicant's name.....	:	**Temolin Technology, Inc**
Address of applicant.....	:	Room 313c, Building South D, NO.33Guangshun Road, Changning District, shanghai, China
Test Firm.....	:	**Shenzhen CTL Testing Technology Co., Ltd.**
Address of Test Firm.....	:	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Test specification.....	:	
Standard.....	:	**FCC CFR Title 47 Part 2, Part 22H** **EIA/TIA 603-D: 2010** **KDB 971168 D01**
TRF Originator.....	:	Shenzhen CTL Testing Technology Co., Ltd.
Master TRF.....	:	Dated 2011-01
Date of receipt of test item.....	:	Nov. 22, 2021
Date of sampling.....	:	Nov. 22, 2021
Date of Test Date.....	:	Nov. 22, 2021-Dec. 27, 2021
Data of Issue.....	:	Dec. 27, 2021
Result.....	:	Pass

TEST REPORT

Test Report No. :	CTL2111122071-WF06	Dec. 27, 2021 Date of issue

Equipment under Test	:	All Netcom Android module
Sample No	:	CTL211112207-1-S001
Model /Type	:	M101C
Listed Models	:	M101C-QVCT-1G8G, M101C-QVCX-1G8G, M101C-QVCT-2G16G, M101C-QVCX-2G16G, M101C-QECT-1G8G, M101C-QECX-1G8G, M101C-QECT-2G16G, M101C-QECX-2G16G
Applicant	:	**Temolin Technology,Inc**
Address	:	Room 313c, Building South D, NO.33Guangshun Road, Changning District, shanghai, China
Manufacturer	:	**Shenzhen Guoguan Electronics co., Ltd**
Address	:	4 / F, building E, Xinxiong Industrial Zone, No. 157, Gushu 1st Road, Xixiang street, Bao'an District, Shenzhen

Test result	**Pass ***

*In the configuration tested, the EUT complied with the standards specified page 5.

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

** Modified History **

Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2021-12-27	CTL2111122071-WF06	Tracy Qi

Table of Contents Page

1. SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:
FCC Part 22: PRIVATE LAND MOBILE RADIO SERVICES.
TIA/EIA 603 D June 2010: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
FCC Part 2: FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
KDB971168 D01:v03r01 MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS
ANSI C63.10-2020 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

1.2. Test Description

Test Item	Section in CFR 47	Result
Effective (Isotropic) Radiated Power Output Data	§2.1046 §22.913	Pass
Peak-to-Average Ratio	§22.913（d）	Pass
Modulation Characteristics	§2.1047	Pass
Bandwidth	§2.1049 §22.917	Pass
Band Edges Compliance	§ 2.1051 §22.917	Pass
Spurious Emission at Antenna Terminals	§2.1051 §22.917	Pass
Field Strength of Spurious Radiation	§2.1053 § 22.917	Pass
Frequency stability	§2.1055 §22.355	Pass

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.10 and CISPR 32/EN 55032 requirements.

1.3.2 Laboratory accreditation

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

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: 9618B

CAB identifier: CN0041

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9618B on Jan. 22, 2019.

FCC-Registration No.: 399832

Designation No.: CN1216

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832, December 08, 2017.

1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. GENERAL INFORMATION

2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C	
Relative Humidity:	55 %	
Air Pressure:	101 kPa	
Voltage:	NV	5.00
	HV	5.50
	LV	4.50
Remark: LV= lower extreme test voltage; NV= nominal voltage; HV= upper extreme test voltage		

2.2. General Description of EUT

Product Name:	All Netcom Android module		
Model/Type reference:	M101C		
Power supply:	DC 5V from USB		
Hardware version:	V1.3		
Software version:	Alps-mp-p.mp1-v5.10-temolin-m100c-v1.34f		
Test Mode(S)			
Mode:	WCDMA Band V; LTE Band 5;		
Modulation Type:	(WCDMA)QPSK; (LTE)QPSK 16QAM		
Operating Frequency Range(S)	Band	Tx(MHz)	Rx(MHz)
	WCDMA Band V	824~849	869~894
	LTE Band 5	824~849	869~894
Release Version:	Release 9		
Category:	Cat 4		
Antenna type:	PIFA Antenna		
Antenna gain:	Band V: 3.0 dBi Band 5: 3.0 dBi		

Note: For more details, refer to the user's manual of the EUT.

2.3. Description of Test Modes

1 The EUT has been tested under typical operating condition. The CMW500 used to control the EUT staying in continuous transmitting and receiving mode for testing. Regards to the frequency band operation: the lowest、middle and highest frequency of channel were selected to perform the test, then shown on this report.

2 Test Frequencies

Test Mode	TX/RX	RF Channel		
		Low（L）	Middle（M）	High（H）
WCDMA Band V	TX	Channel 4132	Channel 4182	Channel 4233
		826.4MHz	836.6MHz	846.6MHz
	RX	Channel 4357	Channel 4407	Channel 4458
		871.4MHz	881.4MHz	891.6MHz

Test Mode	Bandwidth	TX/RX	RF Channel		
			Low（L）	Middle（M）	High（H）
LTE Band 5	1.4MHz	TX	Channel 20407	Channel 20525	Channel 20643
			824.7MHz	836.5MHz	848.3MHz
		RX	Channel 2407	Channel 2525	Channel 2643
			869.7MHz	881.5MHz	893.3MHz
	3MHz	TX	Channel 20415	Channel 20525	Channel 20635
			825.5MHz	836.5MHz	847.5MHz
		RX	Channel 2415	Channel 2525	Channel 2635
			870.5MHz	881.5MHz	846.5MHz
	5MHz	TX	Channel 20425	Channel 20525	Channel 20625
			826.5MHz	836.5MHz	846.6MHz
		RX	Channel 2425	Channel 2525	Channel 2625
			871.5MHz	881.5MHz	891.5MHz
	10MHz	TX	Channel 20450	Channel 20525	Channel 20600
			829MHz	836.5MHz	844MHz
		RX	Channel 2450	Channel 2525	Channel 2600
			874MHz	881.5MHz	889MHz

2.4. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2020/04/08	2023/04/07
EMI Test Receiver	R&S	ESCI	101235	2021/08/20	2022/08/19
Spectrum Analyzer	Agilent	E4407B	MY41440676	2021/05/14	2022/05/13
Spectrum Analyzer	Agilent	N9020	US46220290	2021/05/14	2022/05/13
Spectrum Analyzer	Keysight	N9020A	MY53420874	2021/0514	2022/05/13
Controller	EM Electronics	Controller EM 1000	N/A	2021/05/22	2022/05/21
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2020/09/22	2023/09/21
Active Loop Antenna	SCHWARZBECK	ZN30900A	N/A	2021/05/13	2024/05/12
Amplifier	Agilent	8349B	3008A02306	2021/05/10	2022/05/09
Amplifier	Agilent	8447D	2944A10176	2021/05/10	2022/05/09
Temperature/Humidity Meter	Gangxing	CTH-608	02	2021/05/11	2022/0510
Wideband Radio Communication Tester	R&S	CMW500	101814	2021/05/14	2022/05/13
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2021/05/22	2022/05/21
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2021/05/22	2022/05/21
RF Cable	HUBER+SUHNER	RG214	N/A	2021/05/22	2022/05/21
Climate Chamber	ESPEC	EL-10KA	A20120523	2021/05/22	2022/05/21
SIGNAL GENERATOR	Agilent	E4421B	US40051744	2021/05/14	2022/05/13
Directional Coupler	Agilent	87300B	3116A03638	2021/05/14	2022/05/13
Power Sensor	Agilent	U2021XA	MY5365004	2021/05/14	2022/05/13
Power Meter	Agilent	U2531A	TW53323507	2021/05/14	2022/05/13

2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with of the Part 22 Rules.

2.6. Modifications

No modifications were implemented to meet testing criteria.

3. TEST CONDITIONS AND RESULTS

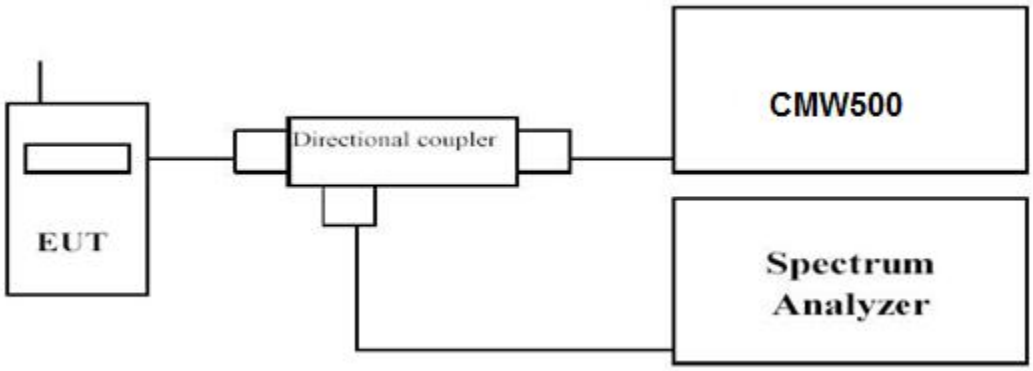
3.1. Conducted Output Power

LIMIT

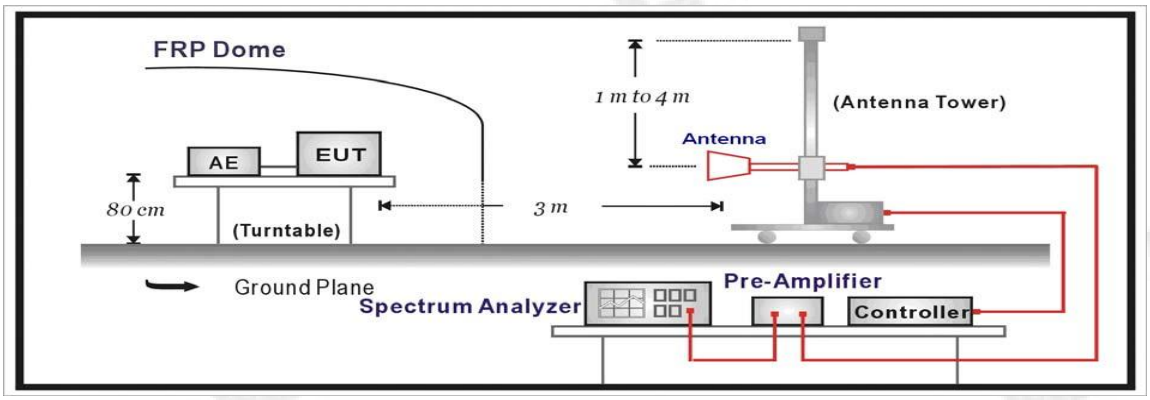
According to § 22.913(a) specifies ” The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

TEST CONFIGURATION

Conducted Power Measurement



Radiated Power Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

Conducted Power Measurement:

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
c) EUT Communicate with CMW500 then selects a channel for testing.
d) Add a correction factor to the display of spectrum, and then test.

Radiated Power Measurement:

a) The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
b) The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to thefrequency of the transmitter
c) The output of the test antenna shall be connected to the measuring receiver.

d) The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
e) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
f) The transmitter shall then be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
g) The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
h) The maximum signal level detected by the measuring receiver shall be noted.
i) The transmitter shall be replaced by a substitution antenna.
j) The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
k) The substitution antenna shall be connected to a calibrated signal generator.
l) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
m) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
n) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
o) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
p) The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
q) Test site anechoic chamber refer to ANSI C63.10

TEST RESULTS

Conducted Measurement:

1. Please refer to Appendix C: Section 1
2. Please refer to Appendix F: Section 1

Radiated Measurement:

Remark:

1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of WCDMA Band V LTE Band 5; recorded worst case for each Channel Bandwidth of WCDMA Band V LTE Band 5.*

WCDMA Band V

Mode	Channel	Frquency (MHz)	ERP (dBm)	Limit (dBm)	Polarization	Conclusion
WCDMA Band V	Low	826.4	21.68	38.45	H	Pass
	Mid	836.6	21.48	38.45	H	Pass
	High	846.6	21.65	38.45	H	Pass

LTE FDD Band 5

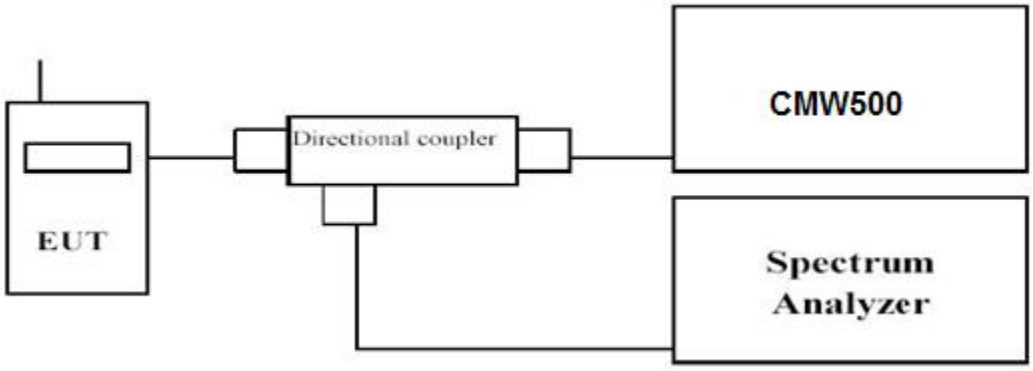
Bandwidth	Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Polarization	Conclusion
1.4MHz QPSK	Low	824.7	21.32	38.45	H	Pass
	Mid	836.5	21.75	38.45	H	Pass
	High	848.3	21.25	38.45	H	Pass
3MHz QPSK	Low	825.5	21.33	38.45	H	Pass
	Mid	836.5	21.71	38.45	H	Pass
	High	847.5	21.22	38.45	H	Pass
5MHz QPSK	Low	826.5	21.32	38.45	H	Pass
	Mid	836.5	21.14	38.45	H	Pass
	High	846.5	21.86	38.45	H	Pass
10MHz QPSK	Low	829.0	21.33	38.45	H	Pass
	Mid	836.5	21.32	38.45	H	Pass
	High	844.0	20.74	38.45	H	Pass
1.4MHz 16QAM	Low	1710.7	20.95	38.45	H	Pass
	Mid	1732.5	20.15	38.45	H	Pass
	High	1754.3	21.33	38.45	H	Pass
3MHz 16QAM	Low	1711.5	21.28	38.45	H	Pass
	Mid	1732.5	21.62	38.45	H	Pass
	High	1753.5	21.34	38.45	H	Pass
5MHz 16QAM	Low	1712.5	20.39	38.45	H	Pass
	Mid	1732.5	20.48	38.45	H	Pass
	High	1752.5	21.48	38.45	H	Pass
10MHz 16QAM	Low	1715.0	20.59	38.45	H	Pass
	Mid	1732.5	21.32	38.45	H	Pass
	High	1750.0	20.69	38.45	H	Pass

3.2. Peak-to-Average Ratio (PAR)

LIMIT

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13 dB.

TEST CONFIGURATION



TEST PROCEDURE

1. Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
2. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
3. Set the number of counts to a value that stabilizes the measured CCDF curve;
4. Set the measurement interval as follows:
   1). for continuous transmissions, set to 1 ms,
   2). for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
5. Record the maximum PAPR level associated with a probability of 0.1%.

TEST RESULTS

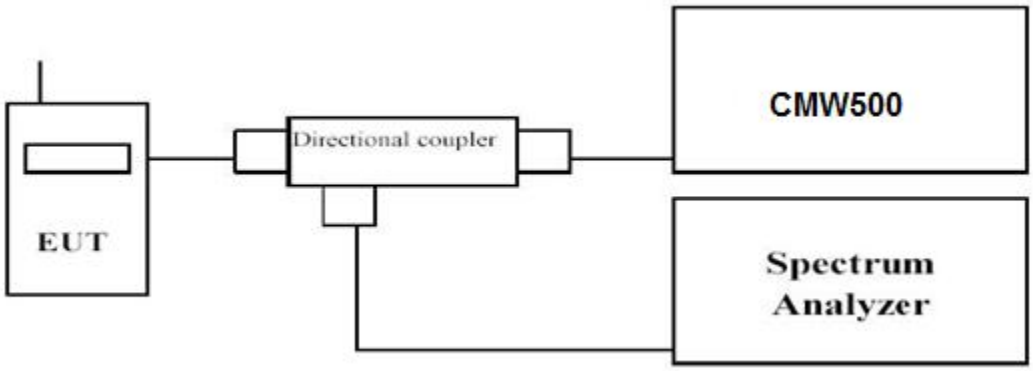
1. please refer to Appendix C: Section 5
2. please refer to Appendix F: Section 5

3.3. Occupied Bandwidth and Emission Bandwidth

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at low, middle and high channel in each band. The -26dBc Emission bandwidth was also measured and recorded.
Set RBW was set to about 1% of emission BW, VBW≥3 times RBW.
-26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

TEST RESULTS

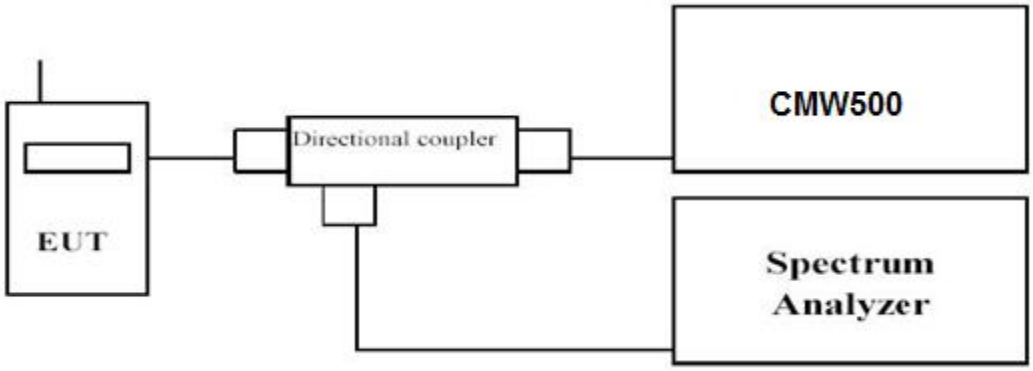
1. Please refer to Appendix C: Section 4
2. Please refer to Appendix F: Section 4

3.4. Band Edge compliance

LIMIT

According to Part §22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.
The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

TEST CONFIGURATION



TEST PROCEDURE

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest and highest channels for each band and different modulation.
5. Measure Band edge using RMS (Average) detector by spectrum

TEST RESULTS

1. Please refer to Appendix C: Section 6
2. Please refer to Appendix F: Section 6

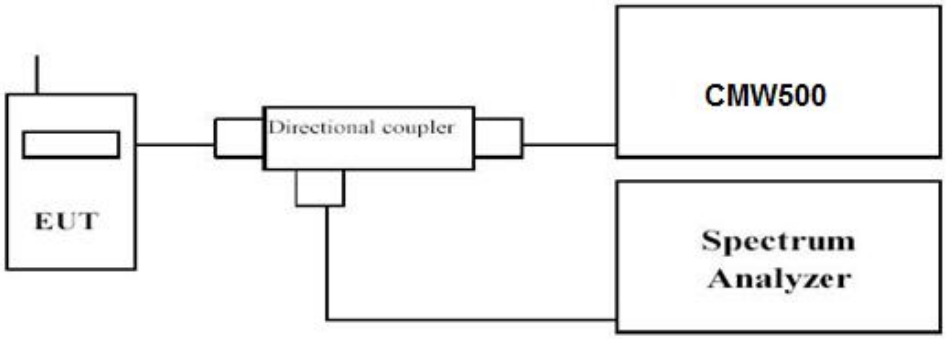
3.5. Spurious Emission

LIMIT

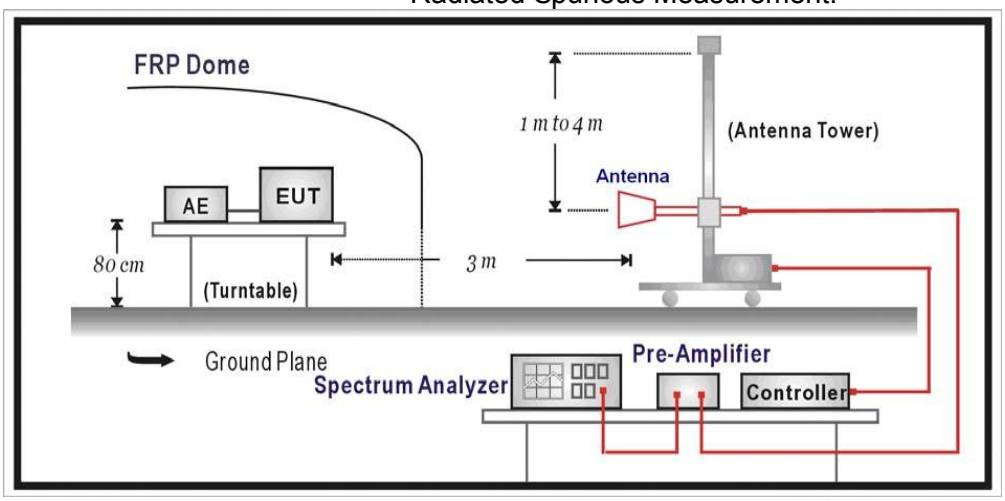
According to Part §22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.
The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

TEST CONFIGURATION

Conducted Spurious Measurement:



Radiated Spurious Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

Conducted Spurious Measurement:

a. Place the EUT on a bench and set it in transmitting mode.
b. Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
c. EUT Communicate with CMW500 then selects a channel for testing.
d. Add a correction factor to the display of spectrum, and then test.
e. The resolution bandwidth of the spectrum analyzer was set sufficient scans were taken to show the out of band Emission if any up to10th harmonic.

Radiated Spurious Measurement:

a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
c. The output of the test antenna shall be connected to the measuring receiver.
d. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
e. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
g. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
h. The maximum signal level detected by the measuring receiver shall be noted.
i. The transmitter shall be replaced by a substitution antenna.
j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
k. The substitution antenna shall be connected to a calibrated signal generator.
l. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
q. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for Part 22 and 1MHz for Part 24. The frequency range was checked up to 10th harmonic.
r. Test site anechoic chamber refer to ANSI C63.

TEST RESULTS

1. Please refer to Appendix C: Section 6
2. Please refer to Appendix F: Section 6

Radiated Measurement:

Remark:
1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of* WCDMA Band V *LTE FDD Band 5 @* QPSK
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 =EIRP- Limit

WCDMA Band V _ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1652.8	-48.26	3.86	3.00	8.56	-43.56	-13.00	30.56	H
2479.2	-45.92	4.29	3.00	6.98	-43.23	-13.00	30.23	H
1652.8	-44.32	3.86	3.00	8.56	-39.62	-13.00	26.62	V
2479.2	-44.56	4.29	3.00	6.98	-41.87	-13.00	28.87	V

WCDMA Band V _ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1672.8	-48.99	3.90	3.00	8.58	-44.31	-13.00	31.31	H
2509.2	-50.65	4.32	3.00	6.80	-48.17	-13.00	35.17	H
1672.8	-45.26	3.90	3.00	8.58	-40.58	-13.00	27.58	V
2509.2	-45.25	4.32	3.00	6.80	-42.77	-13.00	29.77	V

WCDMA Band V _ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1693.2	-41.25	4.74	3.00	10.45	-35.54	-13.00	22.54	H
2539.8	-43.30	5.65	3.00	12.32	-36.63	-13.00	23.63	H
1693.2	-45.62	4.74	3.00	10.45	-39.91	-13.00	26.91	V
2539.8	-47.26	5.65	3.00	12.32	-40.59	-13.00	27.59	V

LTE FDD Band 5_Channel Bandwidth 1.4MHz_QPSK_ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1649.4	-38.35	5.98	3.00	11.12	-33.21	-13.00	20.21	H
2474.1	-46.14	6.45	3.00	12.02	-40.57	-13.00	27.57	H
1649.4	-42.11	5.98	3.00	11.12	-36.97	-13.00	23.97	V
2474.1	-47.38	6.45	3.00	12.02	-41.81	-13.00	28.81	V

LTE FDD Band 5_Channel Bandwidth 1.4MHz_QPSK_ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.0	-41.56	5.95	3.00	9.98	-37.53	-13.00	24.53	H
2509.5	-45.22	6.63	3.00	11.66	-40.19	-13.00	27.19	H
1673.0	-43.68	5.95	3.00	9.98	-39.65	-13.00	26.65	V
2509.5	-47.54	6.63	3.00	11.66	-42.51	-13.00	29.51	V

LTE FDD Band 5_Channel Bandwidth 1.4MHz_QPSK_ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1696.6	-42.26	4.74	3.00	10.45	-36.55	-13.00	23.55	H
2544.9	-43.67	5.65	3.00	12.32	-37.00	-13.00	24.00	H
1696.6	-44.77	4.74	3.00	10.45	-39.06	-13.00	26.06	V
2544.9	-48.59	5.65	3.00	12.32	-41.92	-13.00	28.92	V

LTE FDD Band 5_Channel Bandwidth 3MHz_QPSK_ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1651.0	-41.56	4.74	3.00	10.45	-35.85	-13.00	22.85	H
2476.5	-42.29	5.65	3.00	12.32	-35.62	-13.00	22.62	H
1651.0	-44.33	4.74	3.00	10.45	-38.62	-13.00	25.62	V
2476.5	-49.42	5.65	3.00	12.32	-42.75	-13.00	29.75	V

LTE FDD Band 5_Channel Bandwidth 3MHz_QPSK_ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.0	-42.26	5.95	3.00	9.98	-38.23	-13.00	25.23	H
2509.5	-45.81	6.63	3.00	11.66	-40.78	-13.00	27.78	H
1673.0	-43.26	5.95	3.00	9.98	-39.23	-13.00	26.23	V
2509.5	-49.33	6.63	3.00	11.66	-44.30	-13.00	31.30	V

LTE FDD Band 5_Channel Bandwidth 3MHz_QPSK_ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1695.0	-42.28	4.74	3.00	10.45	-36.57	-13.00	23.57	H
2542.5	-45.19	5.65	3.00	12.32	-38.52	-13.00	25.52	H
1695.0	-44.62	4.74	3.00	10.45	-38.91	-13.00	25.91	V
2542.5	-44.75	5.65	3.00	12.32	-38.08	-13.00	25.08	V

LTE FDD Band 5_Channel Bandwidth 5MHz_QPSK_ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1653.0	-41.02	4.74	3.00	10.45	-35.31	-13.00	22.31	H
2479.5	-46.31	5.65	3.00	12.32	-39.64	-13.00	26.64	H
1653.0	-44.08	4.74	3.00	10.45	-38.37	-13.00	25.37	V
2479.5	-45.91	5.65	3.00	12.32	-39.24	-13.00	26.24	V

LTE FDD Band 5_Channel Bandwidth 5MHz_QPSK_ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.0	-41.15	5.95	3.00	9.98	-37.12	-13.00	24.12	H
2509.5	-44.96	6.63	3.00	11.66	-39.93	-13.00	26.93	H
1673.0	-46.47	5.95	3.00	9.98	-42.44	-13.00	29.44	V
2509.5	-49.29	6.63	3.00	11.66	-44.26	-13.00	31.26	V

LTE FDD Band 5_Channel Bandwidth 5MHz_QPSK_ High Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1693.0	-41.26	4.74	3.00	10.45	-35.55	-13.00	22.55	H
2539.5	-46.48	5.65	3.00	12.32	-39.81	-13.00	26.81	H
1693.0	-45.14	4.74	3.00	10.45	-39.43	-13.00	26.43	V
2539.5	-47.66	5.65	3.00	12.32	-40.99	-13.00	27.99	V

LTE FDD Band 5_Channel Bandwidth 10MHz_QPSK_ Low Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1658.0	-40.26	4.74	3.00	10.45	-34.55	-13.00	21.55	H
2487.0	-41.29	5.65	3.00	12.32	-34.62	-13.00	21.62	H
1658.0	-44.55	4.74	3.00	10.45	-38.84	-13.00	25.84	V
2487.0	-40.26	5.65	3.00	12.32	-33.59	-13.00	20.59	V

LTE FDD Band 5_Channel Bandwidth 10MHz_QPSK_ Middle Channel

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Diatance	G_a Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.0	-42.61	5.95	3.00	9.98	-38.58	-13.00	25.58	H
2509.5	-45.75	6.63	3.00	11.66	-40.72	-13.00	27.72	H
1673.0	-44.94	5.95	3.00	9.98	-40.91	-13.00	27.91	V
2509.5	-46.18	6.63	3.00	11.66	-41.15	-13.00	28.15	V

LTE FDD Band 5_Channel Bandwidth 10MHz_QPSK_ High Channel

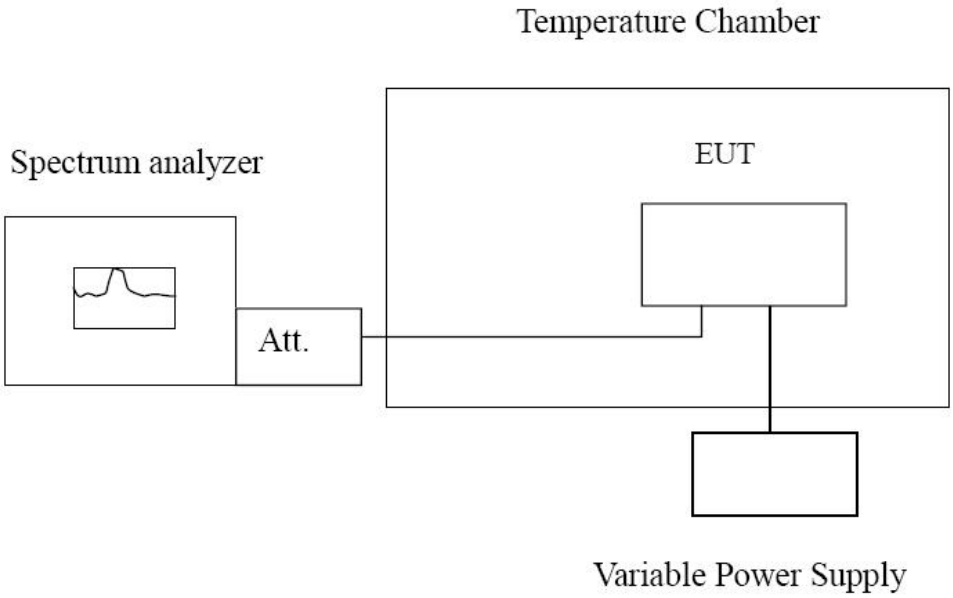
Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	Distance	G_a Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1688.0	-44.18	4.74	3.00	10.45	-38.47	-13.00	25.47	H
2532.0	-46.38	5.65	3.00	12.32	-39.71	-13.00	26.71	H
1688.0	-43.61	4.74	3.00	10.45	-37.90	-13.00	24.9	V
2532.0	-48.85	5.65	3.00	12.32	-42.18	-13.00	29.18	V

3.6. Frequency Stability under Temperature & Voltage Variations

LIMIT

According to §22.917, §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℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE Band 5, 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℃ increments from -30℃ to +50℃. 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℃.
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 ℃ increments from +50℃ to -30℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

Frequency Stability under Voltage Variations:

Set chamber temperature to 20℃. 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 (±15%) and endpoint, record the maximum frequency change.

TEST RESULTS

1. Please refer to Appendix C: Section .2
2. Please refer to Appendix F: Section .2

3.7. Modulation Characteristics

Standard Applicable

According to FCC Part 2 §2.1047:

(a) Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

(b) Equipment which employs modulation limiting. A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.

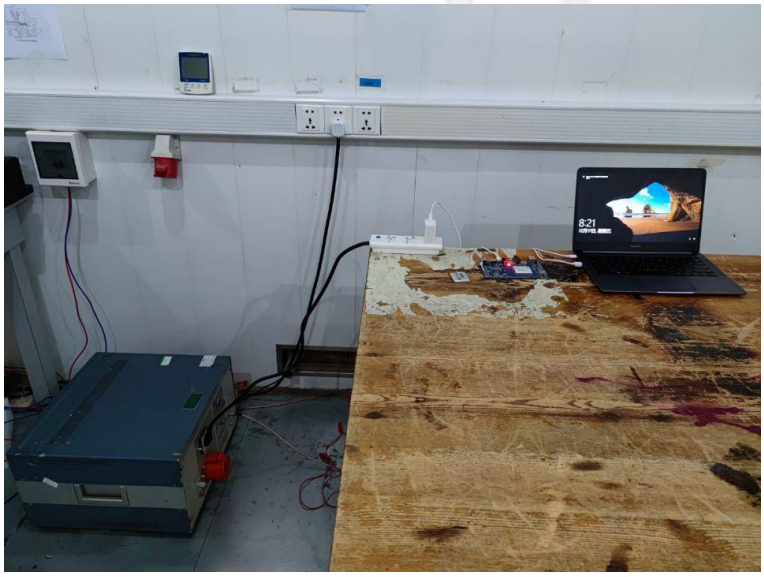
(c) Single sideband and independent sideband radiotelephone transmitters which employ a device or circuit to limit peak envelope power. A curve showing the peak envelope power output versus the modulation input voltage shall be supplied. The modulating signals shall be the same in frequency as specified in paragraph (c) of §2.1049 for the occupied bandwidth tests.

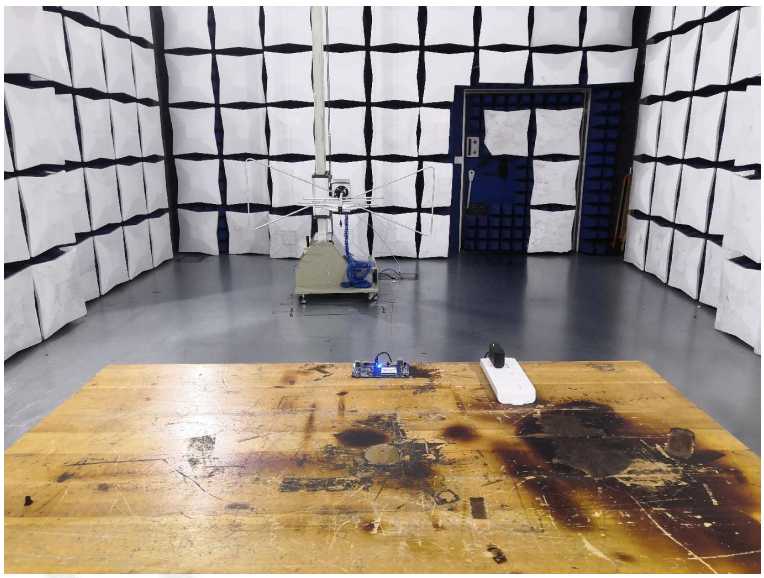
(d) Other types of equipment. A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

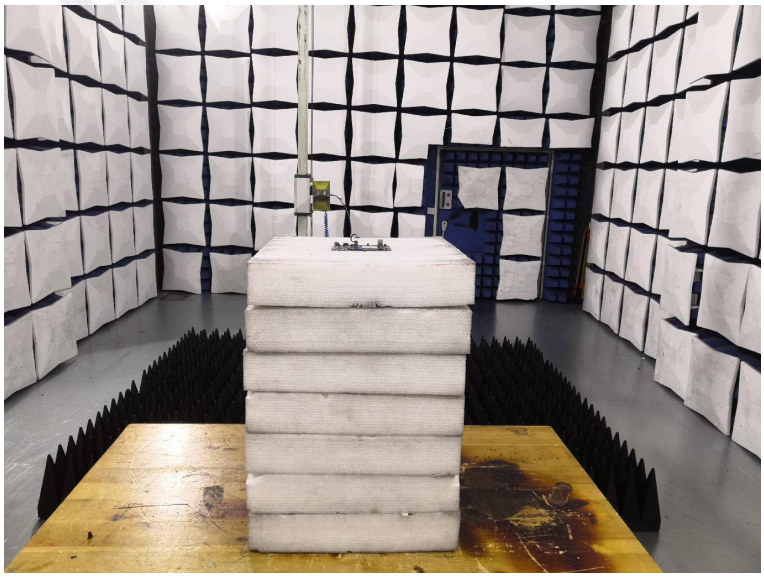
TEST RESULTS

1. Please refer to Appendix C: Section .3
2. Please refer to Appendix F: Section .3

4. Test Setup Photos of the EUT







5. External and Internal Photos of the EUT

Reference to the test report No. CTL2111122071-WF01

********** End of Report **********