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

TEST REPORT

FCC Part 27

Report Reference No. ..... :	**CTL2203279012-WF07**	
Compiled by: (position+printed name+signature)	Happy Guo (File administrators)	Happy Guo
Tested by: (position+printed name+signature)	Gary Gao (Test Engineer)	Gary Gao
Approved by: (position+printed name+signature)	Ivan Xie (Manager)	Ivan Xie

Product Name ..... :	Electrocardiograph
Model/Type reference ..... :	SE-1201 Pro
List Model(s)..... :	SE-1200 Pro
Trade Mark..... :	N/A
FCC ID..... :	**SMQSE120XPRO**
Applicant's name ..... :	**Edan Instruments, Inc**
Address of applicant ..... :	#15 Jinhui Road, Jinsha Community, Kengzi Sub-District, Pingshan District, 518122 Shenzhen P.R.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 27** **ANSI/TIA/EIA-603-E:2016** **KDB 971168 D01**
TRF Originator ..... :	Shenzhen CTL Testing Technology Co., Ltd.
Master TRF..... :	Dated 2011-01
Date of receipt of test item ..... :	May 12, 2022
Date of sampling..... :	May 12, 2022
Date of Test Date..... :	May 12, 2022- Jun. 07, 2022
Data of Issue ..... :	Jun. 08, 2022
Result..... :	**Pass**

TEST REPORT

Test Report No. :	CTL2203279012-WF07	Jun. 08, 2022 Date of issue

Equipment under Test	:	Electrocardiograph
Sample No.		CTL220327901-2-S001(Normal sample) CTL220327901-2-S002(Engineer sample)
Model /Type	:	SE-1201 Pro
Listed Models	:	SE-1200 Pro
Applicant	:	**Edan Instruments, Inc**
Address	:	#15 Jinhui Road, Jinsha Community, Kengzi Sub-District, Pingshan District, 518122 Shenzhen P.R.China
Manufacturer	:	**Edan Instruments, Inc**
Address	:	#15 Jinhui Road, Jinsha Community, Kengzi Sub-District, Pingshan District, 518122 Shenzhen P.R.China

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	2022-06-08	CTL2203279012-WF07	Tracy Qi

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1. SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:
FCC Part 27 : MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
ANSI/TIA/EIA-603-E March 2016: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: v02r02 MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS
ANSI C63.26-2015 American National Standard for Compliance Testing of Licensed Wireless Devices

ANSI C63.4: 2014: –American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz Range of 9 kHz to 40GHz

1.2. Test Description

Test Item	Section in CFR 47	Result
RF Output Power	Part 2.1046 Part 27.50(d)(4)	Pass
Peak-to-Average Ratio	Part 27.50(d)(4)	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 27.53(h)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 27.53(h)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 27.53(h)	Pass
Out of band emission, Band Edge	Part 2.1051 Part 27.53(h)	Pass
Frequency stability	Part 2.1055 Part 27.54	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 C63.4 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	0.009~30MHz	3.40dB	(1)
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)
Frequency Stability	1MHz~18GHz	60Hz	(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

2.2. General Description of EUT

Product Name:	Electrocardiograph	
Model/Type reference:	SE-1201 Pro	
Power supply:	DC 14.8V from battery	
Adapter information:	Model No: UE48-190253SPA3 Input: AC 100-240V 50/60Hz 1.1A Output: 19.0V⎓2.53A	
Hardware version:	V1.0	
Software version:	V1.0	
LTE Band 4		
Operation Band:	Band 4	
Modulation Type:	QPSK, 16QAM	
Frequency range:	LTE Band 4(Channel Bandwidth:1.4MHz)	1710.7~ 1754.3MHz
	LTE Band 4(Channel Bandwidth:3MHz)	1711.5~ 1753.5MHz
	LTE Band 4(Channel Bandwidth:5MHz)	1712.5~ 1752.5MHz
	LTE Band 4(Channel Bandwidth:10MHz)	1715~ 1750MHz
	LTE Band 4(Channel Bandwidth:15MHz)	1717.5~ 1747.5MHz
	LTE Band 4(Channel Bandwidth:20MHz)	1720~ 1745MHz
Max. EIRP:	LTE Band 4(Channel Bandwidth:1.4MHz)	610.94 mW
	LTE Band 4(Channel Bandwidth:3MHz)	595.66 mW
	LTE Band 4(Channel Bandwidth:5MHz)	597.04 mW
	LTE Band 4(Channel Bandwidth:10MHz)	608.14 mW
	LTE Band 4(Channel Bandwidth:15MHz)	591.56 mW
	LTE Band 4(Channel Bandwidth:20MHz)	623.73 mW
Emission Designator:	LTE Band 4(Channel Bandwidth:1.4MHz)	1M14G7D
	LTE Band 4(Channel Bandwidth:3MHz)	2M71G7D
	LTE Band 4(Channel Bandwidth:5MHz)	4M53W7D
	LTE Band 4(Channel Bandwidth:10MHz)	9M07G7D
	LTE Band 4(Channel Bandwidth:15MHz)	13M6G7D
	LTE Band 4(Channel Bandwidth:20MHz)	18M1G7D
Antenna Type:	FPC antenna	

Antenna Gain:	2.74 dBi

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

2.3. Description of Test Modes

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis.

The worst-case was found when positioned as the table below, Following channel(s) was(were) selected for the final test as listed below.

Band	Radiated Emission
LTE Band 4	X-plane

Test Item	Available Channel	Test Channel	Channel Bandwidth	Modulation	Mode
RF Output Power/EIRP	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/2 RB Offset 1 RB/5 RB Offset 3 RB/0 RB Offset 3 RB/1 RB Offset 3 RB/3 RB Offset 6 RB/0 RB Offset
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/8 RB Offset 1 RB/14 RB Offset 8 RB/0 RB Offset 8 RB/4 RB Offset 8 RB/7 RB Offset 15 RB/0 RB Offset
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/12 RB Offset 1 RB/24 RB Offset 12 RB/0 RB Offset 12 RB/6 RB Offset 12 RB/13 RB Offset 25 RB/0 RB Offset
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/24 RB Offset 1 RB/49 RB Offset 25 RB/0 RB Offset 25 RB/12 RB Offset 25 RB/25 RB Offset 50 RB/0 RB Offset
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/38 RB Offset 1 RB/74 RB Offset 38 RB/0 RB Offset 38 RB/18 RB Offset 38 RB/37 RB Offset 75 RB/0 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/49 RB Offset 1 RB/99 RB Offset 50 RB/0 RB Offset 50 RB/25 RB Offset 50 RB/50 RB Offset 100 RB/0 RB Offset
Peak-to-Average Ratio	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1 RB/0 RB Offset 6 RB/0 RB Offset
	19965 to 20385	19965, 20175,	3MHz	QPSK,	1 RB/0 RB Offset

		20385		16QAM	15 RB/0 RB Offset
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB/0 RB Offset 25 RB/0 RB Offset
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB/0 RB Offset 50 RB/0 RB Offset
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB/0 RB Offset 75 RB/0 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB/0 RB Offset 100 RB/0 RB Offset
Occupied Bandwidth	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	6 RB/0 RB Offset
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	15 RB/0 RB Offset
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	25 RB/0 RB Offset
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	50 RB/0 RB Offset
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	75 RB/0 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	100 RB/0 RB Offset
Conducted Emission	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1 RB/0 RB Offset
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1 RB/0 RB Offset
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB/0 RB Offset
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB/0 RB Offset
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB/0 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB/0 RB Offset
Radiated Emission	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK	1 RB/2 RB Offset
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK	1 RB/12 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK	1 RB/49 RB Offset
Band Edge compliance	19957 to 20393	19957, 20393	1.4MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/5 RB Offset 6 RB/0 RB Offset
	19965 to 20385	19965, 20385	3MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/14 RB Offset 15 RB/0 RB Offset
	19975 to 20375	19975, 20375	5MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/24 RB Offset 25 RB/0 RB Offset
	20000 to 20350	20000, 20350	10MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/49 RB Offset 50 RB/0 RB Offset
	20025 to 20325	20025, 20325	15MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/74 RB Offset 75 RB/0 RB Offset
	20050 to 20300	20050, 20300	20MHz	QPSK, 16QAM	1 RB/0 RB Offset 1 RB/99 RB Offset 100 RB/0 RB Offset
Frequency stability	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	6 RB/0 RB Offset

	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	15 RB/0 RB Offset
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	25 RB/0 RB Offset
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	50 RB/0 RB Offset
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	75 RB/0 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	100 RB/0 RB Offset

Note:This device was tested under all RB configurations and modulations. The worst case was found in QPSK modulation.

2.4. Equipments Used during the Test

3. Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ESH2-Z5	860014/010	2022/05/07	2023/05/06
Double cone logarithmic antenna	Schwarzbeck	VULB 9168	824	2020/04/07	2023/04/06
Horn Antenna	Ocean Microwave	OBH100400	26999002	2019/11/28	2022/11/27
Wideband Radio Communication Tester	R&S	CMW500	1201.0002K50-107930-CD	2022/05/06	2023/05/05
Wideband Radio Communication Tester	R&S	CMW500	1201.0002K50-143933-qT	2022/05/07	2023/05/06
EMI Test Receiver	R&S	ESCI	1166.5950.03	2022/05/07	2023/05/06
Spectrum Analyzer	Agilent	E4407B	MY41440676	2022/05/07	2023/05/06
Spectrum Analyzer	Agilent	N9020A	US46220290	2022/05/07	2023/05/06
Spectrum Analyzer	Keysight	N9020A	MY53420874	2022/05/07	2023/05/06
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2021/12/23	2024/12/22
Active Loop Antenna	Da Ze	ZN30900A	/	2021/05/13	2024/05/12
Amplifier	Agilent	8449B	3008A02306	2022/05/07	2023/05/06
Amplifier	Agilent	8447D	2944A10176	2022/05/06	2023/05/05
Amplifier	Brief&Smart	LNA-4018	2104197	2022/05/07	2023/05/06
Temperature/Humidity Meter	Ji Yu	MC501	/	2022/05/07	2023/05/06
Power Sensor	Agilent	U2021XA	MY55130004	2022/05/07	2023/05/06
Power Sensor	Agilent	U2021XA	MY55130006	2022/05/07	2023/05/06
Power Sensor	Agilent	U2021XA	MY54510008	2022/05/07	2023/05/06
Power Sensor	Agilent	U2021XA	MY55060003	2022/05/07	2023/05/06
Spectrum Analyzer	RS	FSP	1164.4391.38	2022/05/07	2023/05/06
RF Cable	Megalon	RF-A303	N/A	2021/06/15	2022/06/14
RF Control Unit	Tonsecnd	JS0806-2	20J8060323	2022/05/07	2023/05/06

Test Software

Name of Software	Version
JS1120-3	2.6.880341
EZ_EMC(Below 1GHz)	V1.1.4.2
EZ_EMC((Above 1GHz)	V1.1.4.2

The calibration interval was one year

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

This submittal(s) (test report) is intended to comply with of the Part 27.

3.2. Modifications

No modifications were implemented to meet testing criteria.

4. TEST CONDITIONS AND RESULTS

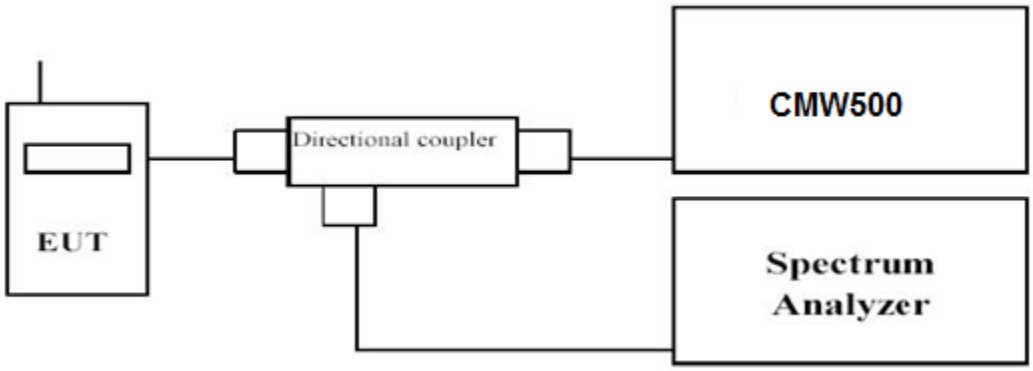
4.1. Output Power

LIMIT

1 watt EIRP.

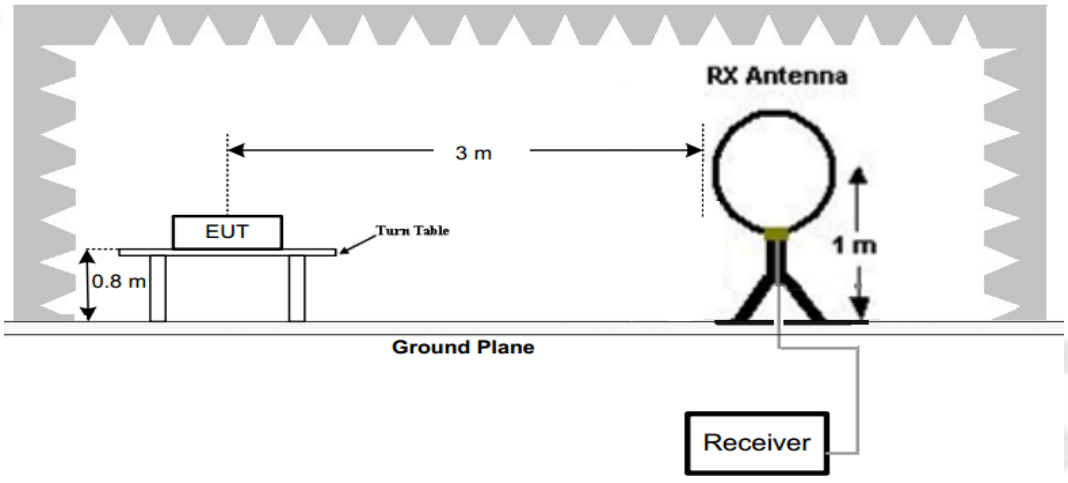
TEST CONFIGURATION

Conducted Power Measurement

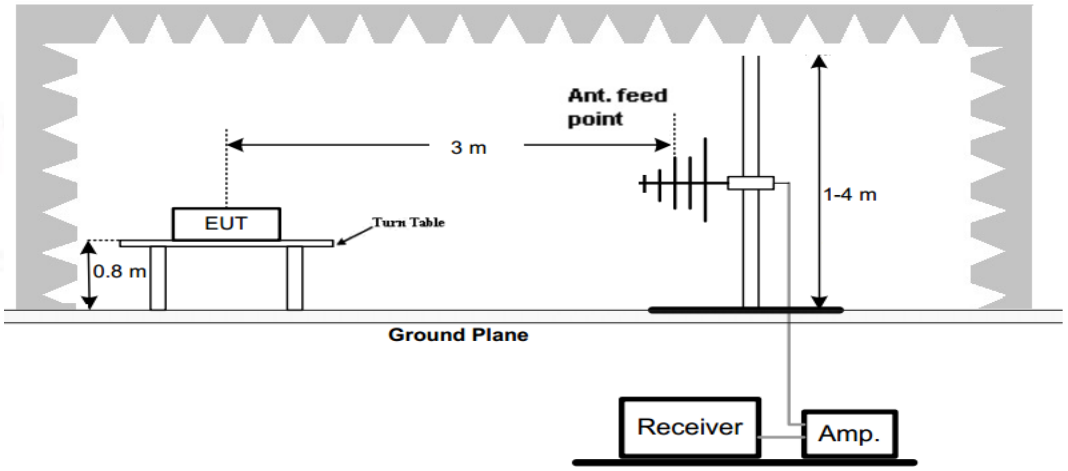


Radiated Power Measurement:

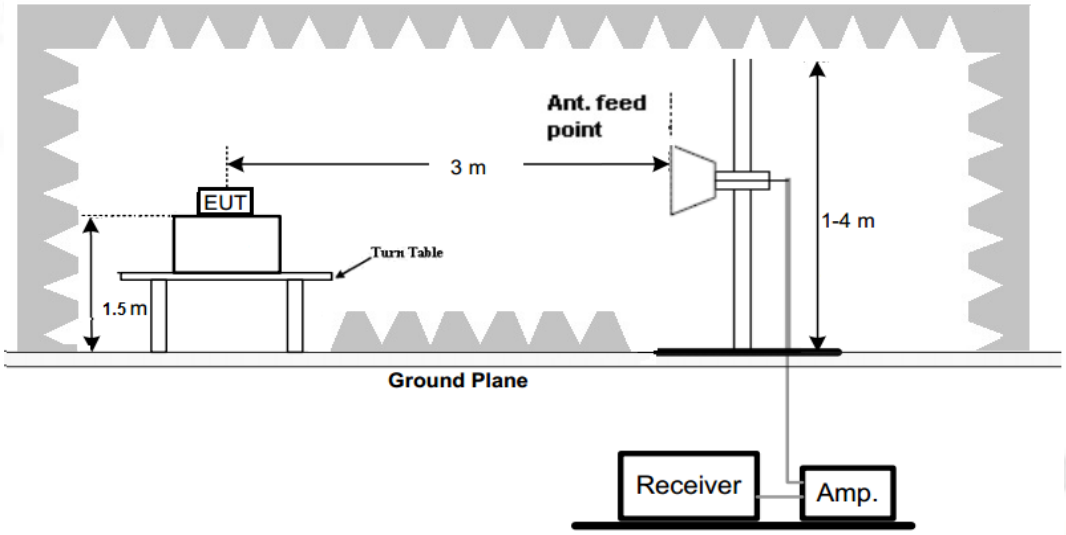
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



TEST PROCEDURE

The EUT was setup according to ANSI/TIA/EIA-603-E

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 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) Test site anechoic chamber refer to ANSI C63.4.

TEST RESULTS

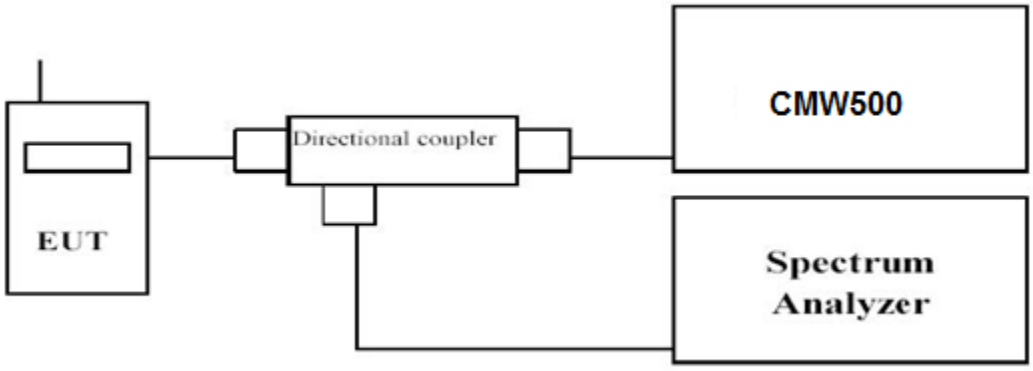
Raw data reference to Annex for FCC LTE Band 4.

4.2. 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

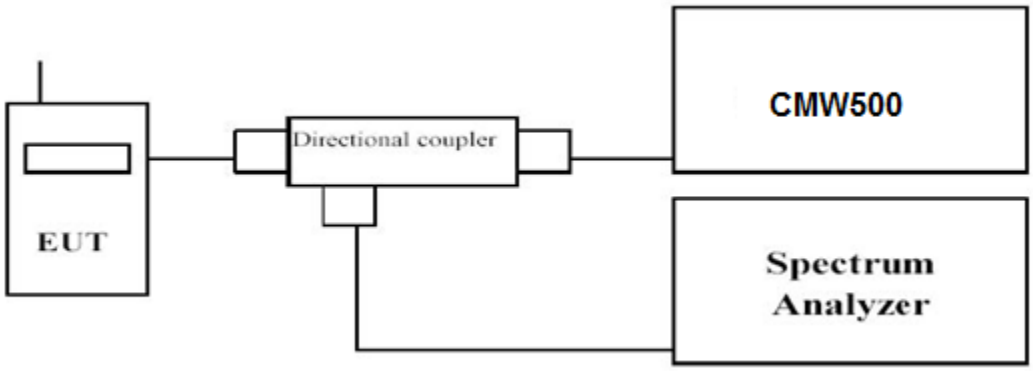
Raw data reference to Annex for FCC LTE Band 4.

4.3. 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

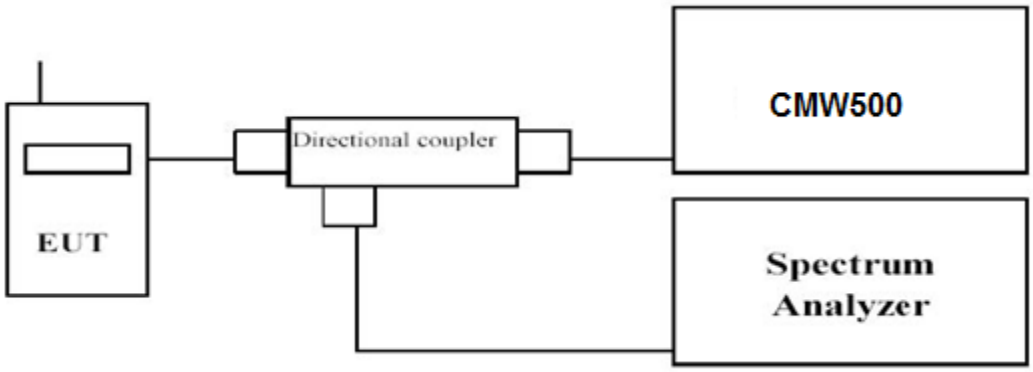
Raw data reference to Annex for FCC LTE Band 4.

4.4. Band Edge compliance

LIMIT

According to §27.53 (h): For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

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

Raw data reference to Annex for FCC LTE Band 4.

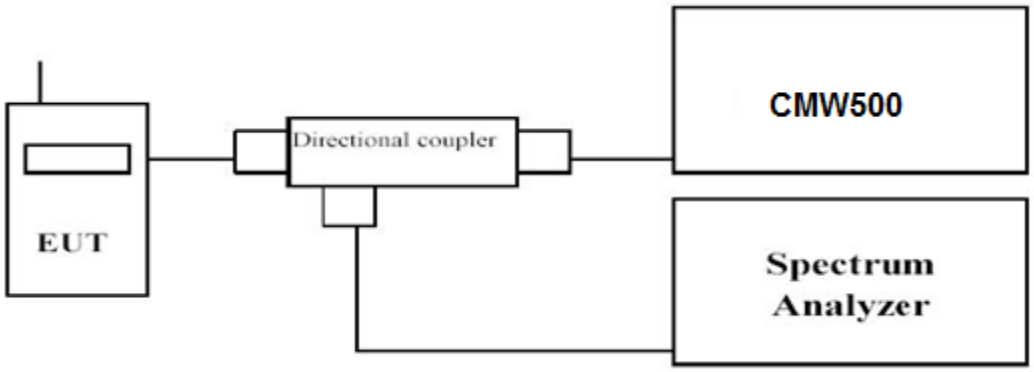
4.5. Spurious Emission

LIMIT

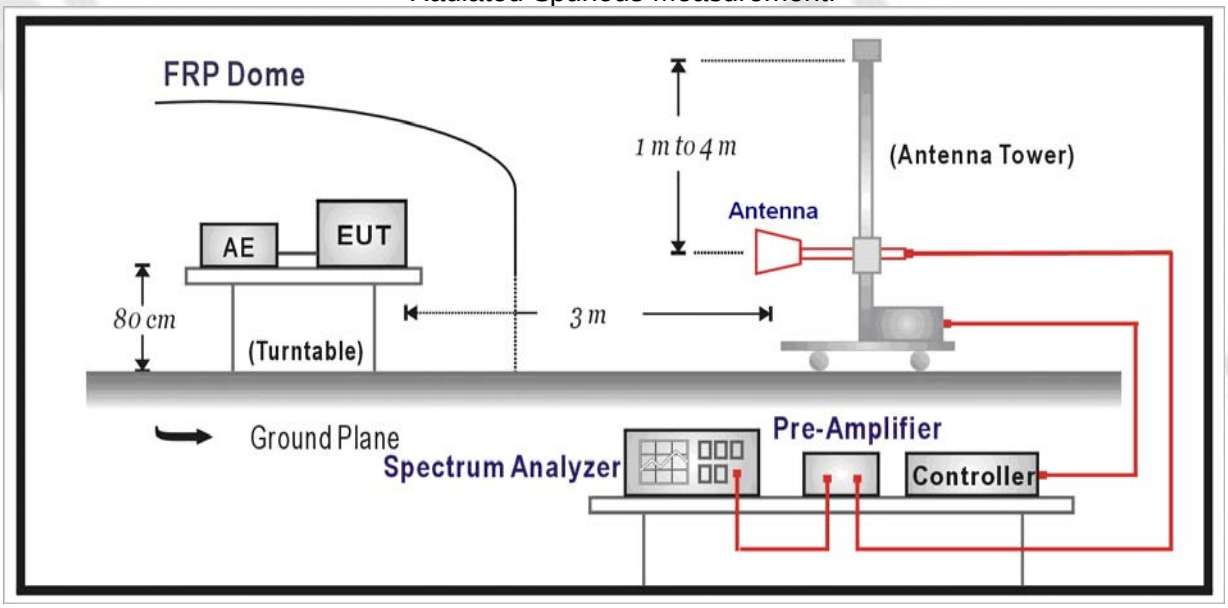
According to §27.53 (h): For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

TEST CONFIGURATION

Conducted Spurious Measurement:



Radiated Spurious Measurement:



TEST PROCEDURE

The EUT was setup according to ANSI/TIA/EIA-603-E

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

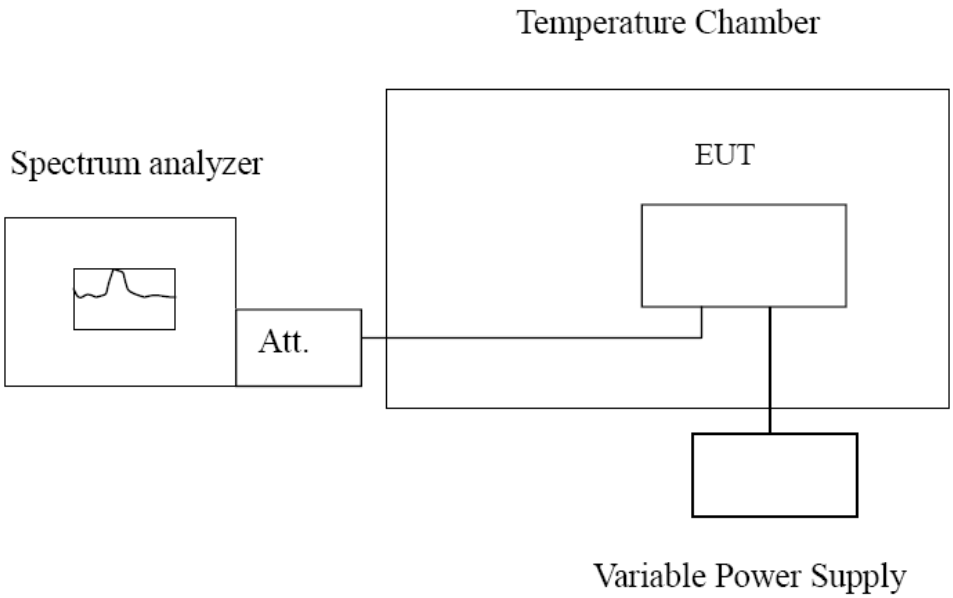
Raw data reference to Annex for FCC LTE Band 4.

4.6. 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 ANSI/TIA/EIA-603-E

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 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℃ increments from -30℃ to +85℃. 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 +85℃.
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 +85℃ 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

Raw data reference to Annex for FCC LTE Band 4.

5. Test Setup Photos of the EUT

6. Photos of the EUT

Reference to the test report No. CTL2203279012-WF01

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