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# TEST REPORT

## FCC Part 22 Subpart H

Report Reference No. .... : **CTL2103249071-WF07**

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**Product Name** ..... : Electrocardiograph

**Model/Type reference** ..... : iSE-1210

**List Model(s)** ..... : iSE-1810

**Trade Mark** ..... : N/A

**FCC ID** ..... : SMQISEEDAN

**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 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** ..... : Apr. 08, 2021

**Date of sampling** ..... : Apr. 08, 2021

**Date of Test Date** ..... : Apr. 08, 2021-Apr. 21, 2021

**Date of Issue** ..... : Apr. 22, 2021

**Result** ..... : Pass

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# TEST REPORT

<b>Test Report No. :</b>	<b>CTL2103249071-WF05</b>	<b>Apr. 22, 2021</b>
		<b>Date of issue</b>

Equipment under Test : Electrocardiograph

Sample No : CTL210324907-1-S001

Model /Type : iSE-1210

Listed Models : iSE-1810

**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

<b>Test result</b>	<b>Pass *</b>
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\*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 \*\*

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## 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 ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS](#)

[KDB971168 D01:v02r02 MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS](#)

[ANSI C63.10-2013 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
RF Output Power	Part 2.1046 Part 22.913(a)	Pass
Peak-to-Average Ratio	N/A	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917(b)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917(b)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917(b)	Pass
Out of band emission, Band Edge	Part 2.1051 Part 22.917(b)	Pass
Frequency stability	Part 2.1055 22.917	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	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

### 2.2. General Description of EUT

Product Name:	Electrocardiograph	
Model/Type reference:	iSE-1210	
Power supply:	DC 19.0V from adapter	
Adapter information:	Model: UE48-190253SPA3 Input: 100-240V~, 50/60Hz, 1.1A MAX Output: 19V---2.53A 48.0W	
Hardware version:	V1.0	
Software version:	V2.0	
<b>LTE</b>		
Operation Band:	FDD-LTE: Band 5 TDD-LTE: Band 40/41	
Operating Frequency Range (s)	Band	Tx (MHz)
	LTE: Band 5	824~849
	LTE: Band 40a	2305~2315
	LTE: Band 40b	2350~2360
	LTE: Band 41	2555~2655
Modulation Type:	QPSK, 16QAM	
Release Version:	Release 9	
Category:	Cat 4	
Antenna type:	FPC antenna	
Antenna gain:	Band 5 : 0.78dBi Band 40 : 1.35dBi Band 41 : 1.45dBi	

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

Note1: This report only reports band 5.

### 2.3. Description of Test Modes

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.

**Test Frequency:**

FDD Band 5				
Channel	1.4MHz Bandwidth/ Frequency (MHz)	3MHz Bandwidth/ Frequency (MHz)	5MHz Bandwidth/ Frequency (MHz)	10MHz Bandwidth/ Frequency (MHz)
LCH	824.7	825.5	826.5	829.0
MCH	836.5	836.5	836.5	836.5
HCH	848.3	847.5	846.5	844.0

TDD Band 40a		
Channel	5MHz Bandwidth/ Frequency (MHz)	10MHz Bandwidth/ Frequency (MHz)
LCH	2307.5	
MCH	2310.0	2310
HCH	2312.5	

TDD Band 40b		
Channel	5MHz Bandwidth/ Frequency (MHz)	10MHz Bandwidth/ Frequency (MHz)
LCH	2352.5	
MCH	2355.0	2355
HCH	2357.5	

TDD Band 41				
Channel	5MHz Bandwidth/ Frequency (MHz)	10MHz Bandwidth/ Frequency (MHz)	15MHz Bandwidth/ Frequency (MHz)	20MHz Bandwidth/ Frequency (MHz)
LCH	2557.5	2560	2562.5	2565.0
MCH	2605.0	2605	2605.0	2605.0
HCH	2652.5	2650	2647.5	2645.0

## 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	2020/05/14	2021/05/13
Bilog Antenna	Sunol Sciences Corp.	JB1	A061714	2020/05/14	2021/05/13
EMI Test Receiver	R&S	ESCI	103710	2020/05/14	2021/05/13
Spectrum Analyzer	Agilent	E4407B	MY41440676	2020/05/14	2021/05/13
Spectrum Analyzer	Agilent	N9020	US46220290	2020/05/14	2021/05/13
Spectrum Analyzer	Keysight	N9020A	MY53420874	2020/05/14	2021/05/13
Controller	EM Electronics	Controller EM 1000	N/A	2020/05/22	2021/05/21
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2020/05/14	2021/05/13
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062014	2020/05/14	2021/05/13
Active Loop Antenna	SCHWARZBEC K	FMZB1519	1519-037	2020/05/24	2021/05/23
Amplifier	Agilent	8349B	3008A02306	2020/05/14	2021/05/14
Amplifier	Agilent	8447D	2944A10176	2020/05/14	2021/05/14
Temperature/Humidity Meter	Gangxing	CTH-608	02	2020/05/14	2021/05/15
Wideband Radio Communication Tester	R&S	CMW500	101814	2020/05/14	2021/05/13
High-Pass Filter	K&L	9SH10-2700/X1 2750-O/O	N/A	2020/05/14	2021/05/13
High-Pass Filter	K&L	41H10-1375/U1 2750-O/O	N/A	2020/05/14	2021/05/13
RF Cable	HUBER+SUHNER	RG214	N/A	2020/05/14	2021/05/13
Climate Chamber	ESPEC	EL-10KA	A20120523	2020/05/14	2021/05/13
SIGNAL GENERATOR	Agilent	E4421B	US40051744	2020/05/14	2021/05/13
Directional Coupler	Agilent	87300B	3116A03638	2020/05/14	2021/05/13
Power Sensor	Agilent	U2021XA	MY5365004	2020/05/14	2021/05/13
Power Meter	Agilent	U2531A	TW53323507	2020/05/14	2021/05/13

## 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.

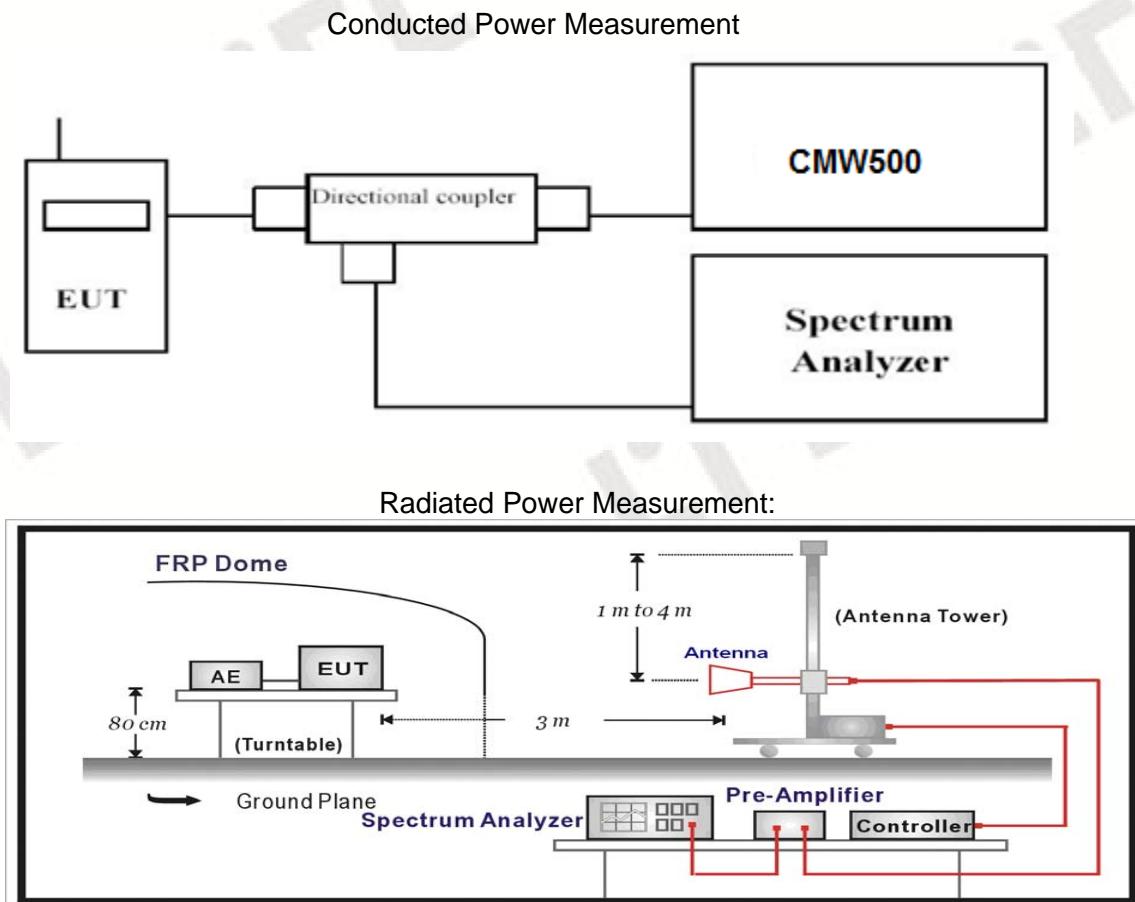
### 3. TEST CONDITIONS AND RESULTS

#### 3.1. 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



##### TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

##### **Conducted Power Measurement:**

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

##### **Radiated Power Measurement:**

- The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- 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

**Conducted Measurement :** See Appendix A.

**Radiated Measurement:**

*Remark:*

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 5; recorded worst case for each Channel Bandwidth of LTE FDD Band 5.
2. EIRP=PMea(dBm)-Pcl(dB)+PAg(dB)+Ga(dBi)
3. We test the H direction and V direction recorded worst case ( ✓ )

*LTE FDD Band 5\_Channel Bandwidth 1.4MHz\_QPSK*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	Correction (dB)	P <sub>Ag</sub> (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
824.7	-12.07	2.42	8.45	2.15	36.82	28.63	38.45	9.82	V
836.5	-12.17	2.46	8.45	2.15	36.82	28.49	38.45	9.96	V
848.3	-12.02	2.53	8.36	2.15	36.82	28.48	38.45	9.97	V

*LTE FDD Band 5\_Channel Bandwidth 3MHz\_QPSK*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	Correction (dB)	P <sub>Ag</sub> (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
825.5	-12.00	2.42	8.45	2.15	36.82	28.70	38.45	9.75	V
836.5	-12.12	2.46	8.45	2.15	36.82	28.54	38.45	9.91	V
847.5	-11.94	2.53	8.36	2.15	36.82	28.56	38.45	9.89	V

*LTE FDD Band 5\_Channel Bandwidth 5MHz\_QPSK*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	Correction (dB)	P <sub>Ag</sub> (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
826.5	-11.93	2.42	8.45	2.15	36.82	28.77	38.45	9.68	V
836.5	-11.87	2.46	8.45	2.15	36.82	28.79	38.45	9.66	V
846.5	-12.02	2.53	8.36	2.15	36.82	28.48	38.45	9.97	V

*LTE FDD Band 5\_Channel Bandwidth 10MHz\_QPSK*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	Correction (dB)	P <sub>Ag</sub> (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
829.0	-12.13	2.42	8.45	2.15	36.82	28.57	38.45	9.88	V
836.5	-12.16	2.46	8.45	2.15	36.82	28.50	38.45	9.95	V
844.0	-12.15	2.53	8.36	2.15	36.82	28.35	38.45	10.10	V

*LTE FDD Band 5\_Channel Bandwidth 1.4MHz\_16QAM*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	Correction (dB)	P <sub>Ag</sub> (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
824.7	-11.92	2.42	8.45	2.15	36.82	28.78	38.45	9.67	V
836.5	-11.92	2.46	8.45	2.15	36.82	28.74	38.45	9.71	V
848.3	-12.15	2.53	8.36	2.15	36.82	28.35	38.45	10.10	V

*LTE FDD Band 5\_Channel Bandwidth 3MHz\_16QAM*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	Correction (dB)	P <sub>Ag</sub> (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
825.5	-12.12	2.42	8.45	2.15	36.82	28.58	38.45	9.87	V
836.5	-12.05	2.46	8.45	2.15	36.82	28.61	38.45	9.84	V
847.5	-11.86	2.53	8.36	2.15	36.82	28.64	38.45	9.81	V

## LTE FDD Band 5\_Channel Bandwidth 5MHz\_16QAM

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	Correction (dB)	P <sub>Ag</sub> (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
826.5	-12.12	2.42	8.45	2.15	36.82	28.58	38.45	9.87	V
836.5	-11.96	2.46	8.45	2.15	36.82	28.70	38.45	9.75	V
846.5	-11.78	2.53	8.36	2.15	36.82	28.72	38.45	9.73	V

## LTE FDD Band 5\_Channel Bandwidth 10MHz\_16QAM

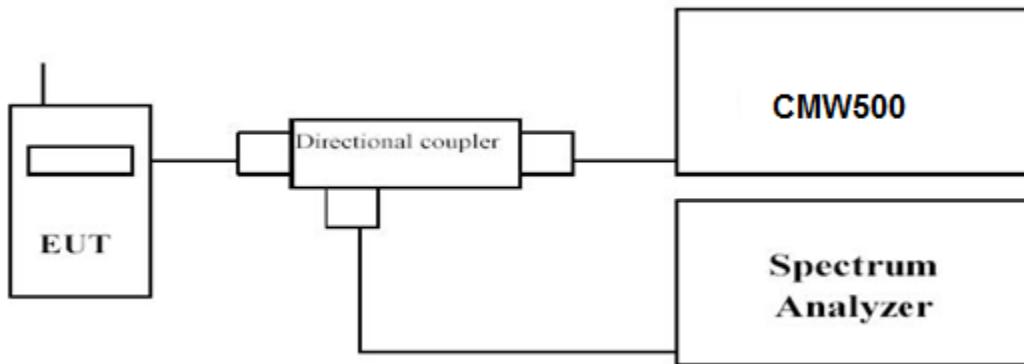
Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	Correction (dB)	P <sub>Ag</sub> (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
829.0	-11.96	2.42	8.45	2.15	36.82	28.74	38.45	9.71	V
836.5	-11.99	2.46	8.45	2.15	36.82	28.67	38.45	9.78	V
844.0	-11.87	2.53	8.36	2.15	36.82	28.63	38.45	9.82	V

### 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  $\geq$  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

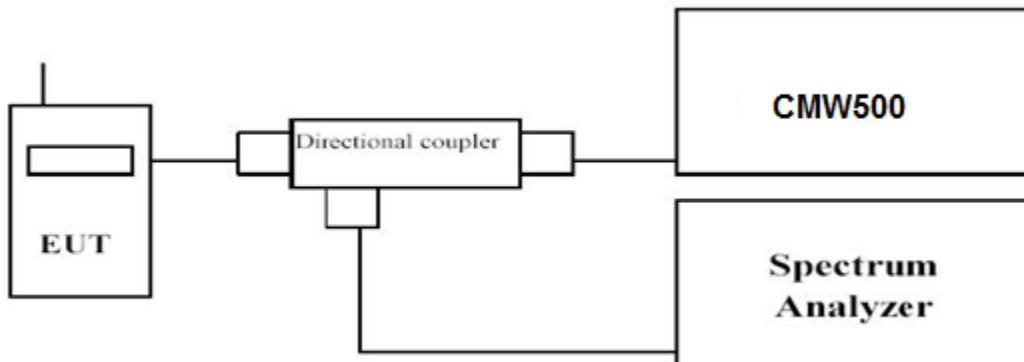
See Appendix B.

### 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,  $VBW \geq 3$  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

See Appendix C.

### 3.4. Band Edge compliance

#### LIMIT

For LTE FDD Band 2: Per FCC §24.238 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.

For LTE FDD Band 4: Per §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  $43 + 10 \log_{10}(P)$  dB.

For LTE FDD Band 5: Per FCC §22.917 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.

For LTE FDD Band 7: Per FCC §27.53 (m)(4): For mobile digital stations, the attenuation factor shall be not less than:

$40 + 10\log P$  dB ( $-10$  dBm,  $100$  nW) on all frequencies between the channel edge and  $5$  MHz from the channel edge,

$43 + 10\log P$  dB ( $-13$  dBm,  $50$  nW) on all frequencies between  $5$  MHz and  $X$  MHz from the channel edge, and

$55 + 10\log P$  dB ( $-25$  dBm,  $3$  nW) on all frequencies more than  $X$  MHz from the channel edge, where  $X$  is the greater of  $6$  MHz or the actual emission bandwidth ( $26$  dB). [§ 27.53(m)(4)]

In addition, the attenuation factor (fixed limit) shall not be less than:

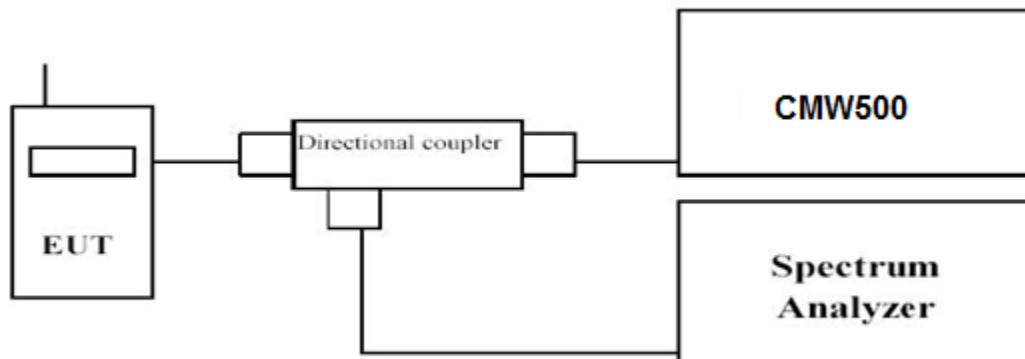
$43 + 10\log P$  dB on all frequencies between  $2490.5$  MHz and  $2496$  MHz, and

$55 + 10\log P$  dB at or below  $2490.5$  MHz. [§ 27.53(m)(4)]

For LTE FDD Band 12: Per §27.53 (g): For operations in the  $698$ – $746$  MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB.

For LTE FDD Band 17: Per §27.53(g): (g) For operations in the  $600$  MHz band and the  $698$ – $746$  MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of  $100$  kilohertz or greater. However, in the  $100$  kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least  $30$  kHz may be employed.

#### 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**

See Appendix D.

### 3.5. Spurious Emission

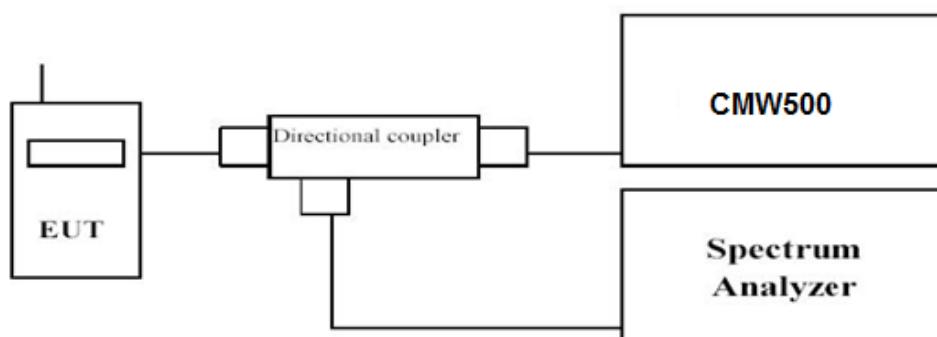
#### LIMIT

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.

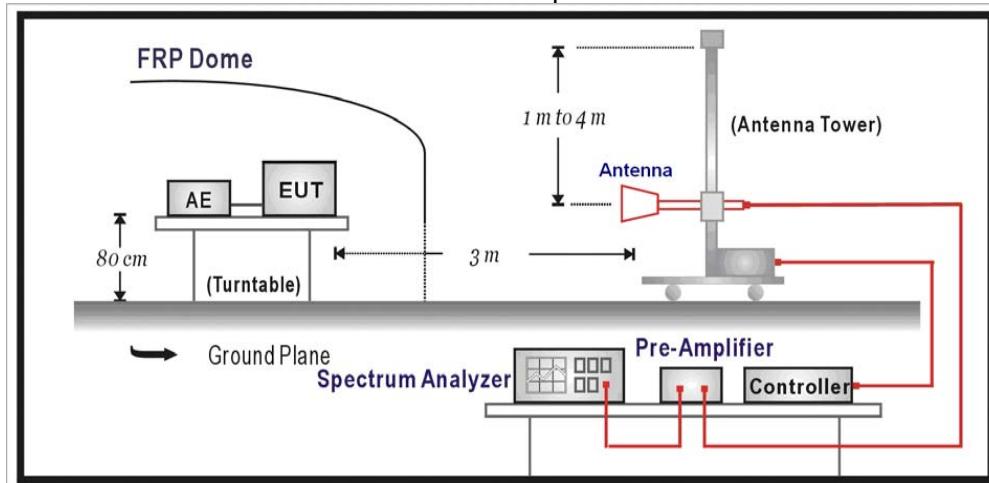
The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -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:

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- EUT Communicate with CMW500 then selects a channel for testing.
- Add a correction factor to the display of spectrum, and then test.
- The resolution bandwidth of the spectrum analyzer was set sufficient scans were taken to show the out of band Emission if any up to 10th 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**

**Conducted Measurement:** See Appendix D.

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

1. We were tested all RB Configuration refer 3GPP TS136 52.1 for each Channel Bandwidth of LTE FDD Band 5; recorded worst case for each Channel Bandwidth of LTE FDD Band 5 @ QPSK
2.  $EIRP = P_{\text{Mea}}(\text{dBm}) - P_{\text{cl}}(\text{dB}) + G_a(\text{dBi})$
3. We were not recorded other points as values lower than limits.
4. Margin = Limit - EIRP

*LTE FDD Band 5\_Channel Bandwidth 1.4MHz\_QPSK\_Low Channel*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1649.4	-40.83	3.00	3.00	10.45	-33.38	-13.00	20.38	H
2474.1	-46.72	3.03	3.00	12.32	-37.43	-13.00	24.43	H
1649.4	-44.57	3.00	3.00	10.45	-37.12	-13.00	24.12	V
2474.1	-49.88	3.03	3.00	12.32	-40.59	-13.00	27.59	V

*LTE FDD Band 5\_Channel Bandwidth 1.4MHz\_QPSK\_Middle Channel*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.0	-39.53	3.00	3.00	11.12	-31.41	-13.00	18.41	H
2509.5	-47.10	3.03	3.00	12.02	-38.11	-13.00	25.11	H
1673.0	-43.12	3.00	3.00	11.12	-35.00	-13.00	22.00	V
2509.5	-47.63	3.03	3.00	12.02	-38.64	-13.00	25.64	V

*LTE FDD Band 5\_Channel Bandwidth 1.4MHz\_QPSK\_High Channel*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1696.6	3.00	3.00	9.98	-34.04	-13.00	21.04	3.00	H
2544.9	3.03	3.00	11.66	-38.10	-13.00	25.10	3.03	H
1696.6	3.00	3.00	9.98	-36.85	-13.00	23.85	3.00	V
2544.9	3.03	3.00	11.66	-40.57	-13.00	27.57	3.03	V

*LTE FDD Band 5\_Channel Bandwidth 3MHz\_QPSK\_Low Channel*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1651.0	-40.78	3.00	3.00	10.45	-33.33	-13.00	20.33	H
2476.5	-46.62	3.03	3.00	12.32	-37.33	-13.00	24.33	H
1651.0	-44.45	3.00	3.00	10.45	-37.00	-13.00	24.00	V
2476.5	-49.73	3.03	3.00	12.32	-40.44	-13.00	27.44	V

*LTE FDD Band 5\_Channel Bandwidth 3MHz\_QPSK\_Middle Channel*

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.0	-39.80	3.00	3.00	11.12	-31.68	-13.00	18.68	H
2509.5	-47.08	3.03	3.00	12.02	-38.09	-13.00	25.09	H
1673.0	-42.85	3.00	3.00	11.12	-34.73	-13.00	21.73	V
2509.5	-47.62	3.03	3.00	12.02	-38.63	-13.00	25.63	V

## LTE FDD Band 5\_Channel Bandwidth 3MHz\_QPSK\_High Channel

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1695.0	-41.04	3.00	3.00	9.98	-34.06	-13.00	21.06	H
2542.5	-46.84	3.03	3.00	11.66	-38.21	-13.00	25.21	H
1695.0	-43.81	3.00	3.00	9.98	-36.83	-13.00	23.83	V
2542.5	-49.52	3.03	3.00	11.66	-40.89	-13.00	27.89	V

## LTE FDD Band 5\_Channel Bandwidth 5MHz\_QPSK\_Low Channel

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1653.0	-40.84	3.00	3.00	9.58	-34.26	-13.00	21.26	H
2479.5	-45.90	3.03	3.00	10.72	-38.21	-13.00	25.21	H
1653.0	-40.12	3.00	3.00	9.58	-33.54	-13.00	20.54	V
2479.5	-45.17	3.03	3.00	10.72	-37.48	-13.00	24.48	V

## LTE FDD Band 5\_Channel Bandwidth 5MHz\_QPSK\_Middle Channel

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.0	-41.18	3.00	3.00	9.61	-34.57	-13.00	21.57	H
2509.5	-46.10	3.03	3.00	10.77	-38.36	-13.00	25.36	H
1673.0	-40.15	3.00	3.00	9.61	-33.54	-13.00	20.54	V
2509.5	-45.00	3.03	3.00	10.77	-37.26	-13.00	24.26	V

## LTE FDD Band 5\_Channel Bandwidth 5MHz\_QPSK\_High Channel

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1693.0	-41.13	3.00	3.00	9.77	-34.36	-13.00	21.36	H
2539.5	-46.20	3.03	3.00	10.89	-38.34	-13.00	25.34	H
1693.0	-40.15	3.00	3.00	9.77	-33.38	-13.00	20.38	V
2539.5	-45.65	3.03	3.00	10.89	-37.79	-13.00	24.79	V

## LTE FDD Band 5\_Channel Bandwidth 10MHz\_QPSK\_Low Channel

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1658.0	-40.94	3.00	3.00	9.58	-34.36	-13.00	21.36	H
2487.0	-46.07	3.03	3.00	10.72	-38.38	-13.00	25.38	H
1658.0	-40.05	3.00	3.00	9.58	-33.47	-13.00	20.47	V
2487.0	-44.95	3.03	3.00	10.72	-37.26	-13.00	24.26	V

## LTE FDD Band 5\_Channel Bandwidth 10MHz\_QPSK\_Middle Channel

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Diatance	G <sub>a</sub> Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.0	-41.04	3.00	3.00	9.61	-34.43	-13.00	21.43	H
2509.5	-45.92	3.03	3.00	10.77	-38.18	-13.00	25.18	H
1673.0	-40.3	3.00	3.00	9.61	-33.69	-13.00	20.69	V
2509.5	-45.27	3.03	3.00	10.77	-37.53	-13.00	24.53	V

## LTE FDD Band 5\_Channel Bandwidth 10MHz\_QPSK\_High Channel

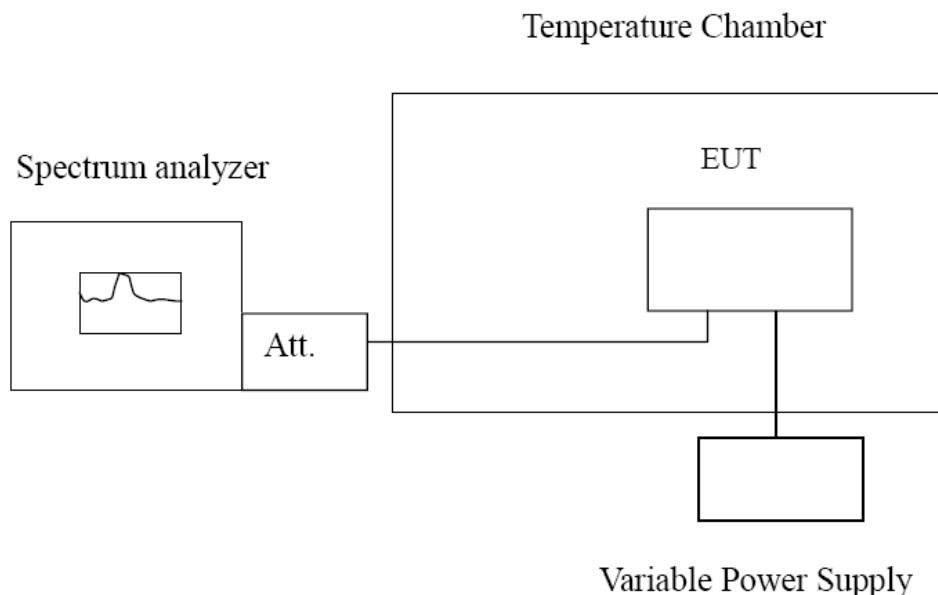
Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	Distance	G <sub>a</sub> Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1688.0	-40.84	3.00	3.00	10.45	-33.39	-13.00	20.39	H
2532.0	-46.59	3.03	3.00	12.32	-37.30	-13.00	24.30	H
1688.0	-44.37	3.00	3.00	10.45	-36.92	-13.00	23.92	V
2532.0	-49.83	3.03	3.00	12.32	-40.54	-13.00	27.54	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°C.
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°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1 Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50°C.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 °C increments from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

##### **Frequency Stability under Voltage Variations:**

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

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

## TEST RESULTS

Remark:

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

LTE Band 5, 1.4MHz bandwidth (worst case of all bandwidths)

Test Band: 5 _ 1.4MHz Bandwidth (Frequency Error VS. Voltage)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
QPSK	6	0	NT	LV	0.2861	-7.3957	-5.2643	0.0003	-0.0088	-0.0062	2.50	PASS
				NV	-9.6989	-7.1096	-6.2513	-0.0118	-0.0085	-0.0074	2.50	PASS
				HV	-11.0292	-6.0797	-3.9768	-0.0134	-0.0073	-0.0047	2.50	PASS
16QAM	6	0	NT	LV	-0.1717	0.4292	-7.4816	-0.0002	0.0005	-0.0088	2.50	PASS
				NV	-6.3944	-6.1798	-5.9080	-0.0078	-0.0074	-0.0070	2.50	PASS
				HV	-6.6233	-3.0899	-1.5306	-0.0080	-0.0037	-0.0018	2.50	PASS

Test Band: 5 _ 1.4MHz Bandwidth (Frequency Error VS. Temperature)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
QPSK	6	0	NV	-30.00	-0.9155	-2.4748	-0.4435	-0.0011	-0.0030	-0.0005	2.50	PASS
				-20.00	-9.7418	-5.3072	-2.8324	-0.0118	-0.0063	-0.0033	2.50	PASS
				-10.00	-5.1212	-6.0225	-5.8937	-0.0062	-0.0072	-0.0069	2.50	PASS
				0.00	-3.5906	-9.5415	-5.1641	-0.0044	-0.0114	-0.0061	2.50	PASS
				10.00	-4.1628	-6.9380	-2.3174	-0.0050	-0.0083	-0.0027	2.50	PASS
				20.00	-9.2125	-5.2357	-2.2459	-0.0112	-0.0063	-0.0026	2.50	PASS
				30.00	-8.3256	-5.0497	-2.1029	-0.0101	-0.0060	-0.0025	2.50	PASS
				40.00	-6.3229	-4.7779	-7.9536	-0.0077	-0.0057	-0.0094	2.50	PASS
				50.00	-4.3058	-7.1955	-4.2772	-0.0052	-0.0086	-0.0050	2.50	PASS
				-30.00	-5.9795	-2.3746	-1.8024	-0.0073	-0.0028	-0.0021	2.50	PASS
16QAM	6	0	NV	-20.00	-0.3862	-6.0654	-3.7622	-0.0005	-0.0073	-0.0044	2.50	PASS
				-10.00	-4.0483	-7.4387	-6.5517	-0.0049	-0.0089	-0.0077	2.50	PASS
				0.00	-10.6144	-6.8092	-8.9979	-0.0129	-0.0081	-0.0106	2.50	PASS
				10.00	-7.3242	-4.9210	-7.2098	-0.0089	-0.0059	-0.0085	2.50	PASS
				20.00	-7.4530	-0.8154	-5.5361	-0.0090	-0.0010	-0.0065	2.50	PASS
				30.00	-6.3515	-7.6675	-5.4502	-0.0077	-0.0092	-0.0064	2.50	PASS
				40.00	-8.6403	-0.6151	-7.4673	-0.0105	-0.0007	-0.0088	2.50	PASS
				50.00	-6.5231	-3.1328	-6.3658	-0.0079	-0.0037	-0.0075	2.50	PASS
				-30.00	-0.3862	-6.0654	-3.7622	-0.0005	-0.0073	-0.0044	2.50	PASS
				-20.00	-4.0483	-7.4387	-6.5517	-0.0049	-0.0089	-0.0077	2.50	PASS

Test Band: 5 _ 3MHz Bandwidth (Frequency Error VS. Voltage)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
QPSK	15	0	NT	LV	-7.1812	-5.3072	-6.4087	-0.0087	-0.0063	-0.0076	2.50	PASS
				NV	-8.8406	-4.0340	-3.6335	-0.0107	-0.0048	-0.0043	2.50	PASS
				HV	-4.3058	-8.5402	-3.6049	-0.0052	-0.0102	-0.0043	2.50	PASS
16QAM	15	0	NT	LV	-4.9067	-5.8508	-5.4789	-0.0059	-0.0070	-0.0065	2.50	PASS
				NV	-5.5790	-4.4632	-5.6362	-0.0068	-0.0053	-0.0067	2.50	PASS
				HV	-3.4332	-4.9353	-4.2915	-0.0042	-0.0059	-0.0051	2.50	PASS

Test Band: 5 _ 3MHz Bandwidth (Frequency Error VS. Temperature)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
QPSK	15	0	NV	-30.00	-4.1914	-2.5463	-3.8481	-0.0051	-0.0030	-0.0045	2.50	PASS
				-20.00	-4.7922	-5.4932	-7.8678	-0.0058	-0.0066	-0.0093	2.50	PASS
				-10.00	-6.7234	-8.9121	-7.4816	-0.0081	-0.0107	-0.0088	2.50	PASS
16QAM	15	0	NV	0.00	-4.3488	-8.5688	-2.8467	-0.0053	-0.0102	-0.0034	2.50	PASS
				10.00	-8.4114	-7.4100	-3.1614	-0.0102	-0.0089	-0.0037	2.50	PASS
				20.00	-7.1526	-6.4087	-2.1744	-0.0087	-0.0077	-0.0026	2.50	PASS
				30.00	-9.3555	-5.4646	-1.2302	-0.0113	-0.0065	-0.0015	2.50	PASS
				40.00	-3.4904	-7.4959	-5.9366	-0.0042	-0.0090	-0.0070	2.50	PASS
				50.00	-6.4230	-7.3528	-4.8351	-0.0078	-0.0088	-0.0057	2.50	PASS
				-30.00	-0.3004	-10.0708	-4.8065	-0.0004	-0.0120	-0.0057	2.50	PASS
				-20.00	-4.6492	-4.3201	-3.9053	-0.0056	-0.0052	-0.0046	2.50	PASS
				-10.00	-4.1914	-1.5879	-6.0368	-0.0051	-0.0019	-0.0071	2.50	PASS
				0.00	-4.1342	-5.5218	-4.3774	-0.0050	-0.0066	-0.0052	2.50	PASS

				10.00	-4.3058	-4.4060	-4.5061	-0.0052	-0.0053	-0.0053	2.50	PASS
				20.00	-7.0381	-9.6130	-2.4033	-0.0085	-0.0115	-0.0028	2.50	PASS
				30.00	-4.6349	-6.3658	-6.4087	-0.0056	-0.0076	-0.0076	2.50	PASS
				40.00	-4.4775	-4.5633	-6.2227	-0.0054	-0.0055	-0.0073	2.50	PASS
				50.00	-5.2500	-8.3685	-2.2888	-0.0064	-0.0100	-0.0027	2.50	PASS

Test Band: 5 _ 5MHz Bandwidth (Frequency Error VS. Voltage)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
QPSK	25	0	NT	LV	-7.6532	-2.2173	-9.1696	-0.0093	-0.0027	-0.0108	2.50	PASS
				NV	-9.8848	-7.3671	-5.1928	-0.0120	-0.0088	-0.0061	2.50	PASS
				HV	-5.5647	-9.1696	-7.1096	-0.0067	-0.0110	-0.0084	2.50	PASS
16QAM	25	0	NT	LV	-5.1785	-10.0851	-7.8535	-0.0063	-0.0121	-0.0093	2.50	PASS
				NV	-6.5517	-5.7364	-9.1839	-0.0079	-0.0069	-0.0108	2.50	PASS
				HV	-8.6403	-5.3930	-8.3971	-0.0105	-0.0064	-0.0099	2.50	PASS

Test Band: 5 _ 5MHz Bandwidth (Frequency Error VS. Temperature)												
Test Mode	RB Allocation		Test Volt.	Test Temp.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
QPSK	25	0	NV	-30.00	-5.0926	-1.5593	-11.2009	-0.0062	-0.0019	-0.0132	2.50	PASS
				-20.00	-16.4509	-3.0756	-3.8910	-0.0199	-0.0037	-0.0046	2.50	PASS
				-10.00	-7.5960	-7.0238	-10.2425	-0.0092	-0.0084	-0.0121	2.50	PASS
				0.00	-5.8937	-8.2397	-7.0524	-0.0071	-0.0099	-0.0083	2.50	PASS
				10.00	-4.2629	-1.9026	-9.2268	-0.0052	-0.0023	-0.0109	2.50	PASS
				20.00	-6.4516	-5.1498	-5.1641	-0.0078	-0.0062	-0.0061	2.50	PASS
				30.00	-8.5258	-3.6478	-5.3358	-0.0103	-0.0044	-0.0063	2.50	PASS
				40.00	-6.6662	-7.6246	-5.1355	-0.0081	-0.0091	-0.0061	2.50	PASS
				50.00	-6.5947	-6.5088	-11.7731	-0.0080	-0.0078	-0.0139	2.50	PASS
16QAM	25	0	NV	-30.00	-5.8508	-6.0940	-10.7288	-0.0071	-0.0073	-0.0127	2.50	PASS
				-20.00	-4.6921	0.0572	-7.9966	-0.0057	0.0001	-0.0094	2.50	PASS
				-10.00	-5.4932	-8.8120	-8.1682	-0.0066	-0.0105	-0.0096	2.50	PASS
				0.00	-3.1328	-6.5374	-8.2827	-0.0038	-0.0078	-0.0098	2.50	PASS
				10.00	-6.4087	-4.7350	-7.6532	-0.0078	-0.0057	-0.0090	2.50	PASS
				20.00	-7.1955	-3.2759	-8.4257	-0.0087	-0.0039	-0.0100	2.50	PASS
				30.00	-9.5844	-3.7336	-7.3385	-0.0116	-0.0045	-0.0087	2.50	PASS
				40.00	-7.4244	-4.9639	-9.8991	-0.0090	-0.0059	-0.0117	2.50	PASS
				50.00	-4.5204	-4.6349	-8.1396	-0.0055	-0.0055	-0.0096	2.50	PASS

Test Band: 5 _ 10MHz Bandwidth (Frequency Error VS. Voltage)												
Test Mode	RB Allocation		Test Temp.	Test Volt.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
QPSK	50	0	NT	LV	-5.8508	-6.8092	-3.6049	-0.0071	-0.0081	-0.0043	2.50	PASS
				NV	-6.8235	-6.5374	-2.3031	-0.0082	-0.0078	-0.0027	2.50	PASS
				HV	-6.1798	-7.3814	-2.2030	-0.0075	-0.0088	-0.0026	2.50	PASS
16QAM	50	0	NT	LV	-6.7520	-8.2541	-2.6464	-0.0081	-0.0099	-0.0031	2.50	PASS
				NV	-6.1941	-7.5817	-5.3215	-0.0075	-0.0091	-0.0063	2.50	PASS
				HV	-5.5504	-4.8208	-8.0395	-0.0067	-0.0058	-0.0095	2.50	PASS

Test Band: 5 _ 10MHz Bandwidth (Frequency Error VS. Temperature)												
Test Mode	RB Allocation		Test Volt.	Test Temp.	Freq. Error (Hz)			Freq. vs. rated (ppm)			Limit (ppm)	Verdict
	Size	Offset			LCH	MCH	HCH	LCH	MCH	HCH		
QPSK	50	0	NV	-30.00	-6.6805	-7.6246	-5.3072	-0.0081	-0.0091	-0.0063	2.50	PASS
				-20.00	-5.7220	-6.1369	-3.6764	-0.0069	-0.0073	-0.0044	2.50	PASS
				-10.00	-4.2629	-6.0081	-6.2656	-0.0051	-0.0072	-0.0074	2.50	PASS
				0.00	-3.0899	-5.1785	-4.2629	-0.0037	-0.0062	-0.0051	2.50	PASS
				10.00	-8.7404	-7.6532	-4.0340	-0.0105	-0.0091	-0.0048	2.50	PASS
				20.00	-7.0953	-4.4918	-7.5245	-0.0086	-0.0054	-0.0089	2.50	PASS
				30.00	-7.2527	-5.8508	-7.2384	-0.0087	-0.0070	-0.0086	2.50	PASS
				40.00	-7.2527	-5.9223	-5.8794	-0.0087	-0.0071	-0.0070	2.50	PASS
				50.00	-8.6117	-5.7650	-5.9938	-0.0104	-0.0069	-0.0071	2.50	PASS
16QAM	50	0	NV	-30.00	-10.2139	-5.9795	-4.2343	-0.0123	-0.0071	-0.0050	2.50	PASS
				-20.00	-3.3188	-6.6519	-6.0368	-0.0040	-0.0080	-0.0072	2.50	PASS
				-10.00	-7.7105	-4.9925	-3.3903	-0.0093	-0.0060	-0.0040	2.50	PASS
				0.00	-5.3072	-8.7261	-3.8624	-0.0064	-0.0104	-0.0046	2.50	PASS
				10.00	-6.2227	-7.5102	-6.4945	-0.0075	-0.0090	-0.0077	2.50	PASS
				20.00	-6.3086	-8.4114	-5.0354	-0.0076	-0.0101	-0.0060	2.50	PASS
				30.00	-5.7364	-8.4114	-4.2200	-0.0069	-0.0101	-0.0050	2.50	PASS
				40.00	-7.2956	-4.5061	-5.5933	-0.0088	-0.0054	-0.0066	2.50	PASS
				50.00	-5.0926	-7.7677	-5.4216	-0.0061	-0.0093	-0.0064	2.50	PASS

#### 4. Test Setup Photos of the EUT



## 5. External and Internal Photos of the EUT

Reference to the test report No. CTL2103249071-WF01

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