




# FCC REPORT

Report Reference No..... : **CHEW20090093** Report verification: 

Project No. .... : **SHT2008039601EW**

FCC ID..... : **Q5ET330**

Applicant's name..... : **Kirisun Communication Co.,Ltd.**

Address..... : 3rd Floor, Building A, Tongfang Information Harbour, No.11  
Langshan Road, Nanshan District, Shenzhen 518057,  
P.R.China

Manufacturer..... : Kirisun Communication Co.,Ltd.

Address..... : 3rd Floor, Building A, Tongfang Information Harbour, No.11  
Langshan Road, Nanshan District, Shenzhen 518057,  
P.R.China

Test item description ..... : **PoC Radio**

Trade Mark ..... : KIRISUN

Model/Type reference..... : T330

Listed Model(s) ..... : -

Standard ..... : **FCC CFR Title 47 Part 2**  
**FCC CFR Title 47 Part 90**

Date of receipt of test sample..... : Aug. 25, 2020

Date of testing..... : Aug. 26, 2020- Sep. 15, 2020

Date of issue..... : Sep. 16, 2020

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

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Testing Laboratory Name ..... : **Shenzhen Huatongwei International Inspection Co., Ltd.**

Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road,  
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*The test report merely correspond to the test sample.*

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# **1. TEST STANDARDS AND REPORT VERSION**

## **1.1. Applicable Standards**

The tests were performed according to following standards:

[FCC Rules Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[FCC Rules Part 90](#): PRIVATE LAND MOBILE RADIO SERVICES.

[ANSI C63.26: 2015](#): American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

[KDB 971168 D01 Power Meas License Digital Systems v03](#): MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

## **1.2. Report version information**

Revision No.	Date of issue	Description
N/A	2020-09-16	Original

## **2. Test Description**

<b>Test Item</b>	<b>Section in CFR 47</b>	<b>Result</b>	<b>Test Engineer</b>
Conducted Output Power	Part 2.1046	Pass	Jiongsheng Feng
Peak-to-Average Ratio	-	Pass	Jiongsheng Feng
99% Occupied Bandwidth & 26 dB Bandwidth	Part 2.1049	Pass	Jiongsheng Feng
Band Edge	Part 2.1051 Part 90.543	Pass	Jiongsheng Feng
Conducted Spurious Emissions	Part 2.1051 Part 90.543	Pass	Jiongsheng Feng
Frequency stability VS Temperature	Part 2.1055(a)(1)(b) Part 90.213	Pass	Jiongsheng Feng
Frequency stability VS Voltage	Part 2.1055(d)(1)(2) Part 90.213	Pass	Jiongsheng Feng
ERP	Part 90.542	Pass	Pan Xie
Radiated Spurious Emissions	Part 2.1053 Part 90.543	Pass	Pan Xie

Note: The measurement uncertainty is not included in the test result.

### 3. SUMMARY

#### 3.1. Client Information

Applicant:	Kirisun Communication Co.,Ltd.
Address:	3rd Floor, Building A, Tongfang Information Harbour, No.11 Langshan Road, Nanshan District, Shenzhen 518057, P.R.China
Manufacturer:	Kirisun Communication Co.,Ltd.
Address:	3rd Floor, Building A, Tongfang Information Harbour, No.11 Langshan Road, Nanshan District, Shenzhen 518057, P.R.China

#### 3.2. Product Description

Name of EUT:	PoC Radio
Trade Mark:	KIRISUN
Model No.:	T330
Listed Model(s):	-
SIM Information:	Support Two SIM Card
Power supply:	DC 3.7V
Adapter information:	Manufacturer: Shenzhen Ruijing Industrial Co., Ltd. Model: STC-A51A-Z Input: AC100-240V, 50/60Hz, 250mA Output: 5.0Vdc,1000mA
Hardware version:	V1.0
Software version:	T330_KRS_V1.0
<b>4G</b>	
Operation Band:	<input checked="" type="checkbox"/> FDD Band 14
Transmit frequency:	FDD Band 14: 790.5 MHz – 795.5 MHz
Receive frequency:	FDD Band 14: 760.5 MHz – 765.5 MHz
Channel bandwidth:	FDD Band 14: 5MHz, 10MHz
Power Class:	Class 3
Modulation type:	QPSK, 16QAM
Antenna type	PIFA Antenna
Antenna Gain	0.5dBi

#### 3.3. Operation state

##### ➤ Test frequency list

FDD Band 14	Test Frequency ID	Bandwidth [MHz]	N <sub>UL</sub>	Frequency of Uplink [MHz]	N <sub>DL</sub>	Frequency of Downlink [MHz]
	Low Range	5 <sup>[1]</sup>	23305	790.5	5305	760.5
		10 <sup>[1]</sup>	23330	793	5330	763
	Mid Range	5 <sup>[1]</sup> /10 <sup>[1]</sup>	23330	793	5330	763
	High Range	5 <sup>[1]</sup>	23355	795.5	5355	765.5
		10 <sup>[1]</sup>	23330	793	5330	763

### 3.4. EUT operation mode

For RF test items

The EUT has been tested under typical operating condition. Testing was performed by configuring EUT to maximum output power status.

The Test EUT support two SIM card(SIM1,SIM2),so all the tests are performed at each SIM card (SIM1,SIM2) mode, the datum recorded is the worst case for all the mode at SIM1 Card mode.

Test Items	Band	Bandwidth (MHz)					Modulation		RB #		
		1.4	3	5	10	15	QPSK	16QAM	1	Half	Full
Conducted Output Power	14	-	-	o	o	-	o	o	o	o	o
Peak-to-Average Ratio	14	-	-	o	o	-	o	o	o	-	o
99% Occupied Bandwidth & 26 dB Bandwidth	14	-	-	o	o	-	o	o	-	-	o
Band Edge	14	-	-	o	o	-	o	o	o	-	o
Conducted Spurious Emission	14	-	-	o	o	-	o	o	o	-	-
Frequency Stability	14	-	-	o	o	-	o	o	-	-	o
ERP and EIRP	14	-	-	o	o	-	o	o	o	-	-
Radiated Spurious Emission	14	-	-	o	o	-	o	o	o	-	-
<b>Remark</b>	1. The mark " o"means that this configuration is chosen for testing 2. The mark "-"means that this bandwidth is not test. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.										

### 3.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

○	/	Manufacturer:	/
		Model No.:	/
○	/	Manufacturer:	/
		Model No.:	/

### 3.6. Modifications

No modifications were implemented to meet testing criteria.

## **4. TEST ENVIRONMENT**

### **4.1. Address of the test laboratory**

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

### **4.2. Test Facility**

#### **CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### **A2LA-Lab Cert. No.: 3902.01**

Shenzhen Huatongwei International Inspection 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.

#### **FCC-Registration No.: 762235**

Shenzhen Huatongwei International Inspection 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.

#### **IC-Registration No.:5377A**

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377A.

#### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

### 4.3. Equipments Used during the Test

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Signal and spectrum Analyzer	R&S	HTWE0242	FSV40	100048	2019/10/26	2020/10/25
●	Spectrum Analyzer	Agilent	HTWE0286	N9020A	MY50510187	2019/10/26	2020/10/25
●	Radio communication tester	R&S	HTWE0287	CMW500	137688-Lv	2019/10/26	2020/10/25
●	Test software	Tonscend	N/A	JS1120	N/A	N/A	N/A

#### ● Radiated Spurious Emission

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	N/A	2018/09/27	2021/09/26
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2019/10/26	2020/10/25
●	Loop Antenna	R&S	HTWE0170	HFH2-Z2	100020	2018/04/02	2021/04/01
●	Broadband Horn Antenna	SCHWARZBECK	HTWE0103	BBHA9170	BBHA9170472	2018/10/11	2021/10/11
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0123	VULB9163	538	2018/04/04	2021/04/03
●	Horn Antenna	SCHWARZBECK	HTWE0126	9120D	1011	2020/04/01	2023/03/31
●	Pre-amplifier	CD	HTWE0071	PAP-0102	12004	2019/11/14	2020/11/13
●	Broadband Preamplifier	SCHWARZBECK	HTWE0201	BBV 9718	9718-248	2020/05/23	2021/05/22
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-01	6m 18GHz S Serisa	N/A	2020/05/10	2021/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-02	6m 3GHz RG Serisa	N/A	2020/05/10	2021/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-03	6m 3GHz RG Serisa	N/A	2020/05/10	2021/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-04	6m 3GHz RG Serisa	N/A	2020/05/10	2021/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0121-01	6m 18GHz S Serisa	N/A	2020/05/10	2021/05/09
●	EMI Test Software	Audix	N/A	E3	N/A	N/A	N/A

#### ● Auxiliary Equipment

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Climate chamber	ESPEC	HTWE0254	GPL-2	N/A	2019/10/23	2020/10/22
●	DC Power Supply	Gwinstek	HTWE0274	SPS-2415	GER835793	N/A	N/A



#### 4.4. Environmental conditions

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

Voltage	VN=Nominal Voltage	DC 3.70V
	VL=Lower Voltage	DC 3.60V
	VH=Higher Voltage	DC 4.20V
Temperature	TN=Normal Temperature	25 °C
	Extreme Temperature	From -30° to + 50° centigrade
Humidity	30~60 %	
Air Pressure	950-1050 hPa	

#### 4.5. 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 TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection 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 Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.51 dB	(1)
Transmitter power Radiated	2.66dB for <1GHz 3.44dB for >1GHz	(1)
Conducted spurious emissions 9kHz~40GHz	0.51 dB	(1)
Radiated spurious emissions	2.66dB for <1GHz 3.44dB for >1GHz	(1)
Occupied Bandwidth	15Hz for <1GHz 70Hz for >1GHz	(1)
Frequency error	15Hz for <1GHz 70Hz for >1GHz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

## 5. TEST CONDITIONS AND RESULTS

### 5.1. Conducted Output Power

**LIMIT**

N/A

**TEST CONFIGURATION****TEST PROCEDURE**

1. The EUT output port was connected to communication tester.
2. Set EUT at maximum power through communication tester.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure the maximum burst average power.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS** **Passed**       **Not Applicable**

Refer to appendix A on the section 8 appendix report

## 5.2. Peak-to-Average Ratio

### LIMIT

13dB

### TEST CONFIGURATION



### TEST PROCEDURE

1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
2. Set EUT in maximum power output.
3. Center Frequency = Carrier frequency, RBW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed.
  - i. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.
  - ii. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power
6. Record the maximum PAPR level associated with a probability of 0.1%.

### TEST MODE:

Please refer to the clause 3.3

### TEST RESULTS

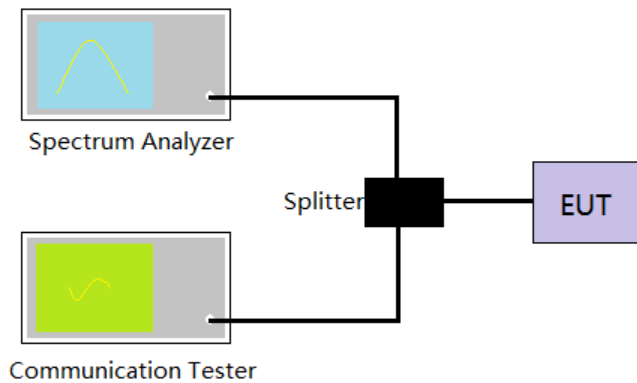
Passed       Not Applicable

Refer to appendix B on the section 8 appendix report

### 5.3. 99% Occupied Bandwidth & 26 dB Bandwidth

**LIMIT**

N/A

**TEST CONFIGURATION****TEST PROCEDURE**

1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
2. Set EUT in maximum power output.
3. Spectrum analyzer setting as follow:  
Center Frequency= Carrier frequency, RBW=1% to 5% of the anticipated OBW, VBW= 3 \* RBW,  
Detector=Peak,  
Trace maximum hold.
4. Record the value of 99% Occupied bandwidth and 26dB bandwidth.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS** **Passed**       **Not Applicable**

Refer to appendix C on the section 8 appendix report

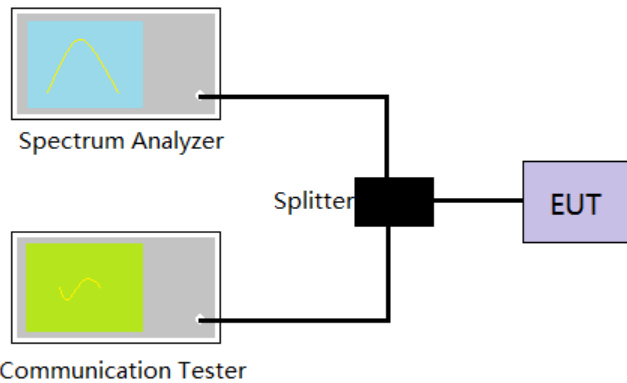
## 5.4. Band Edge

### LIMIT

Band 14, Part 90.543(e)

- (1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than  $65+10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.
- (2) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least  $43+10\log(P)$  dB.

### TEST CONFIGURATION



### TEST PROCEDURE

1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
2. Set EUT in maximum power output.
3. The band edges of low and high channels were measured.
4. Spectrum analyzer setting as follow:  
RBW= no less than 1% of the OBW, VBW =3 \* RBW, Sweep time= Auto
5. Record the test plot.

### TEST MODE:

Please refer to the clause 3.3

### TEST RESULTS

Passed       Not Applicable

Refer to appendix D on the section 8 appendix report

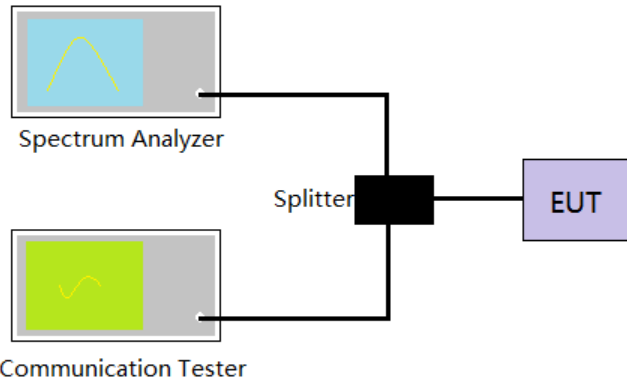
## 5.5. Conducted Spurious Emissions

### LIMIT

Band 14, Part 90.543(e)

- (1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than  $65+10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.
- (2) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least  $43+10\log(P)$  dB.

### TEST CONFIGURATION



### TEST PROCEDURE

1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
2. Set EUT in maximum power output.
3. Spectrum analyzer setting as follow:  
Below 1GHz, RBW=100KHz, VBW = 300KHz, Detector=Peak, Sweep time= Auto  
Above 1GHz, RBW=1MHz, VBW=3MHz, Detector=Peak, Sweep time= Auto  
Scan frequency range up to 10<sup>th</sup> harmonic.
4. Record the test plot.

### TEST MODE:

Please refer to the clause 3.3

### TEST RESULTS

**Passed**       **Not Applicable**

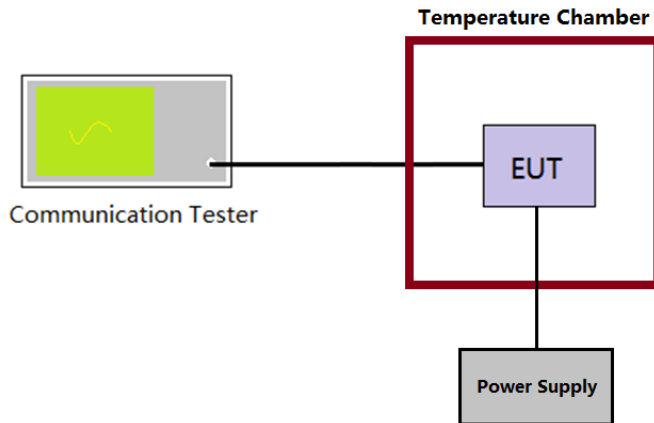
Refer to appendix E on the section 8 appendix report

## 5.6. Frequency stability VS Temperature measurement

### LIMIT

2.5ppm

### TEST CONFIGURATION



### TEST PROCEDURE

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. The EUT output port was connected to communication tester.
3. The EUT was placed inside the temperature chamber.
4. Turn EUT off and set the chamber temperature to  $-30^{\circ}\text{C}$ . After the temperature stabilized for approximately 30 minutes recorded the frequency.
5. Repeat step 4 measure with  $10^{\circ}\text{C}$  increased per stage until the highest temperature of  $+50^{\circ}\text{C}$  reached.

### TEST MODE:

Please refer to the clause 3.3

### TEST RESULTS

Passed       Not Applicable

Refer to appendix F on the section 8 appendix report

## 5.7. Frequency stability VS Voltage measurement

### LIMIT

2.5ppm

### TEST CONFIGURATION



### TEST PROCEDURE

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. The EUT output port was connected to communication tester.
3. The EUT was placed inside the temperature chamber at 25°C
4. The power supply voltage to the EUT was varied  $\pm 15\%$  of the nominal value measured at the input to the EUT
5. Record the maximum frequency change.

### TEST MODE:

Please refer to the clause 3.3

### TEST RESULTS

Passed       Not Applicable

Refer to appendix F on the section 8 appendix report

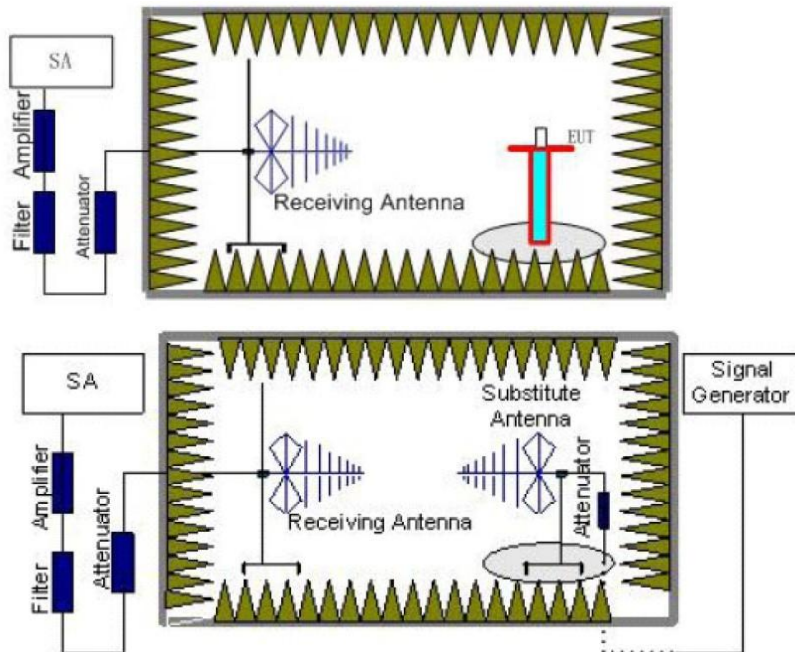


## 5.8. ERP

### LIMIT

LTE Band 14: 3W(34.77dBm) ERP

### TEST CONFIGURATION



### TEST PROCEDURE

1. Place the EUT in the center of the turntable.
  - a) For radiated emissions measurements performed at frequencies less than or equal to 1 GHz, the EUT shall be placed on a RF-transparent table at a nominal height of 80 cm above the reference ground plane
  - b) For radiated measurements performed at frequencies above 1 GHz, the EUT shall be placed on an RF transparent table at a nominal height of 1.5 m above the ground plane.
2. Unless the EUT uses an integral antenna, the EUT shall be terminated with a non-radiating transmitter load. In cases where the EUT uses an adjustable antenna, the antenna shall be adjusted through typical positions and lengths to maximize emissions levels.
3. The EUT shall be tested while operating on the frequency per manufacturer specification. Set the transmitter to operate in continuous transmit mode.
4. Receiver or Spectrum set as follow:
 

Below 1GHz, RBW=100kHz, VBW=300kHz, Detector=Peak, Sweep time=Auto

Above 1GHz, RBW=1MHz, VBW=3MHz, Detector=Peck, Sweep time=Auto
5. Each emission under consideration shall be evaluated:
  - a) Raise and lower the measurement antenna from 1 m to 4 m, as necessary to enable detection of the maximum emission amplitude relative to measurement antenna height.
  - b) Rotate the EUT through 360° to determine the maximum emission level relative to the axial position.
  - c) Return the turntable to the azimuth where the highest emission amplitude level was observed.
  - d) Vary the measurement antenna height again through 1 m to 4 m again to find the height associated with the maximum emission amplitude.
  - e) Record the measured emission amplitude level and frequency
6. Repeat step 5 for each emission frequency with the measurement antenna oriented in both the horizontal and vertical polarizations to determine the orientation that gives the maximum emissions amplitude.
7. Set-up the substitution measurement with the reference point of the substitution antenna located as near

as possible to where the center of the EUT radiating element was located during the initial EUT measurement.

8. Maintain the previous measurement instrument settings and test set-up, with the exception that the EUT is removed and replaced by the substitution antenna.
9. Connect a signal generator to the substitution antenna; locate the signal generator so as to minimize any potential influences on the measurement results. Set the signal generator to the frequency where emissions are detected, and set an output power level such that the radiated signal can be detected by the measurement instrument, with sufficient dynamic range relative to the noise floor.
10. For each emission that was detected and measured in the initial test
  - a) Vary the measurement antenna height between 1 m to 4 m to maximize the received (measured) signal amplitude.
  - b) Adjust the signal generator output power level until the amplitude detected by the measurement instrument equals the amplitude level of the emission previously measured directly in step 5 and step 6.
  - c) Record the output power level of the signal generator when equivalence is achieved in step b).
11. Repeat step 8 through step 10 with the measurement antenna oriented in the opposite polarization.
12. Calculate the emission power in dBm referenced to a half-wave dipole using the following equation:  
 $Pe = Ps(dBm) - \text{cable loss (dB)} + \text{antenna gain (dBd)}$  where  
 $Pe = \text{equivalent emission power in dBm}$   
 $Ps = \text{source (signal generator) power in dBm}$   
*NOTE—dBd refers to the measured antenna gain in decibels relative to a half-wave dipole.*
13. Correct the antenna gain of the substitution antenna if necessary to reference the emission power to a half-wave dipole. When using measurement antennas with the gain specified in dBi, the equivalent dipole-referenced gain can be determined from:  
 $\text{gain (dBd)} = \text{gain (dBi)} - 2.15 \text{ dB.}$   
 If necessary, the antenna gain can be calculated from calibrated antenna factor information
14. Provide the complete measurement results as a part of the test report.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS**

**Passed**       **Not Applicable**

LTE Band 14-5MHz						
Modulation	Channel	ERP (dBm)		Limit (dBm)	Result	
		Vertical	Horizontal			
QPSK	Low	21.34	18.49	<34.77	PASS	
	Mid	22.31	19.09			
	High	21.40	18.14			
16QAM	Low	21.14	18.35		<34.77	PASS
	Mid	22.13	19.33			
	High	21.18	17.91			
LTE Band 14-10MHz						
Modulation	Channel	ERP (dBm)		Limit (dBm)		Result
		Vertical	Horizontal			
QPSK	Mid	22.48	19.00	<34.77	PASS	
16QAM	Mid	21.82	18.96		PASS	

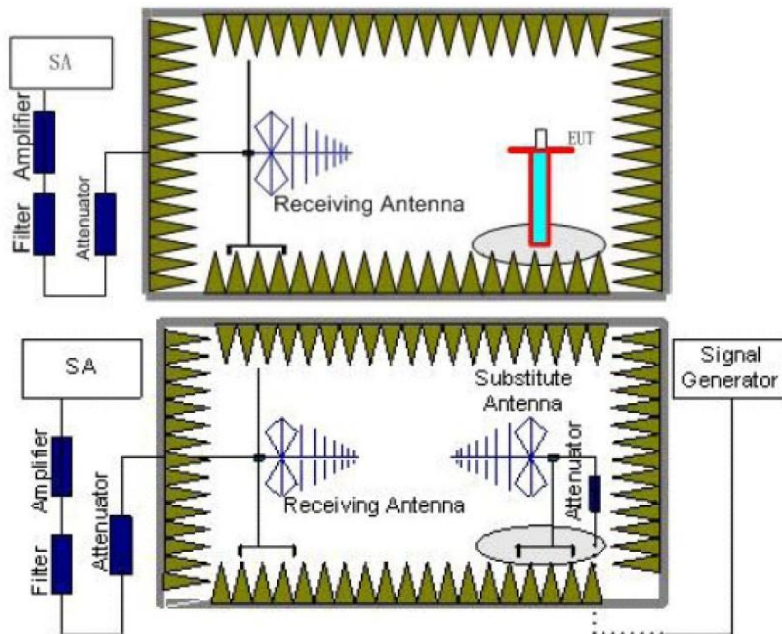
## 5.9. Radiated Spurious Emission

### LIMIT

-13dBm and as below,

Part 90.543(f) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

### TEST CONFIGURATION



### TEST PROCEDURE

1. Place the EUT in the center of the turntable.
  - a) For radiated emissions measurements performed at frequencies less than or equal to 1 GHz, the EUT shall be placed on a RF-transparent table at a nominal height of 80 cm above the reference ground plane
  - b) For radiated measurements performed at frequencies above 1 GHz, the EUT shall be placed on an RF transparent table at a nominal height of 1.5 m above the ground plane.
2. Unless the EUT uses an integral antenna, the EUT shall be terminated with a non-radiating transmitter load. In cases where the EUT uses an adjustable antenna, the antenna shall be adjusted through typical positions and lengths to maximize emissions levels.
3. The EUT shall be tested while operating on the frequency per manufacturer specification. Set the transmitter to operate in continuous transmit mode.
4. Receiver or Spectrum set as follow:
  - Below 1GHz, RBW=100kHz, VBW=300kHz, Detector=Peak, Sweep time=Auto
  - Above 1GHz, RBW=1MHz, VBW=3MHz, Detector=Peck, Sweep time=Auto
5. Each emission under consideration shall be evaluated:
  - a) Raise and lower the measurement antenna from 1 m to 4 m, as necessary to enable detection of the maximum emission amplitude relative to measurement antenna height.
  - b) Rotate the EUT through 360° to determine the maximum emission level relative to the axial position.
  - c) Return the turntable to the azimuth where the highest emission amplitude level was observed.
  - d) Vary the measurement antenna height again through 1 m to 4 m again to find the height associated

with the maximum emission amplitude.

- e) Record the measured emission amplitude level and frequency
6. Repeat step 5 for each emission frequency with the measurement antenna oriented in both the horizontal and vertical polarizations to determine the orientation that gives the maximum emissions amplitude.
7. Set-up the substitution measurement with the reference point of the substitution antenna located as near as possible to where the center of the EUT radiating element was located during the initial EUT measurement.
8. Maintain the previous measurement instrument settings and test set-up, with the exception that the EUT is removed and replaced by the substitution antenna.
9. Connect a signal generator to the substitution antenna; locate the signal generator so as to minimize any potential influences on the measurement results. Set the signal generator to the frequency where emissions are detected, and set an output power level such that the radiated signal can be detected by the measurement instrument, with sufficient dynamic range relative to the noise floor.
10. For each emission that was detected and measured in the initial test
  - a) Vary the measurement antenna height between 1 m to 4 m to maximize the received (measured) signal amplitude.
  - b) Adjust the signal generator output power level until the amplitude detected by the measurement instrument equals the amplitude level of the emission previously measured directly in step 5 and step 6.
  - c) Record the output power level of the signal generator when equivalence is achieved in step b).
11. Repeat step 8 through step 10 with the measurement antenna oriented in the opposite polarization.
12. Calculate the emission power in dBm referenced to a half-wave dipole using the following equation:  
$$P_e = P_s(\text{dBm}) - \text{cable loss (dB)} + \text{antenna gain (dBd)}$$
where  
 $P_e$  = equivalent emission power in dBm  
 $P_s$  = source (signal generator) power in dBm  
*NOTE—dBd refers to the measured antenna gain in decibels relative to a half-wave dipole.*
13. Correct the antenna gain of the substitution antenna if necessary to reference the emission power to a half-wave dipole. When using measurement antennas with the gain specified in dBi, the equivalent dipole-referenced gain can be determined from:  
$$\text{gain (dBd)} = \text{gain (dBi)} - 2.15 \text{ dB.}$$
If necessary, the antenna gain can be calculated from calibrated antenna factor information
14. Provide the complete measurement results as a part of the test report.

#### **TEST MODE:**

Please refer to the clause 3.3

#### **TEST RESULTS**

**Passed**       **Not Applicable**

Note: only show the worse case for QPSK modulation.

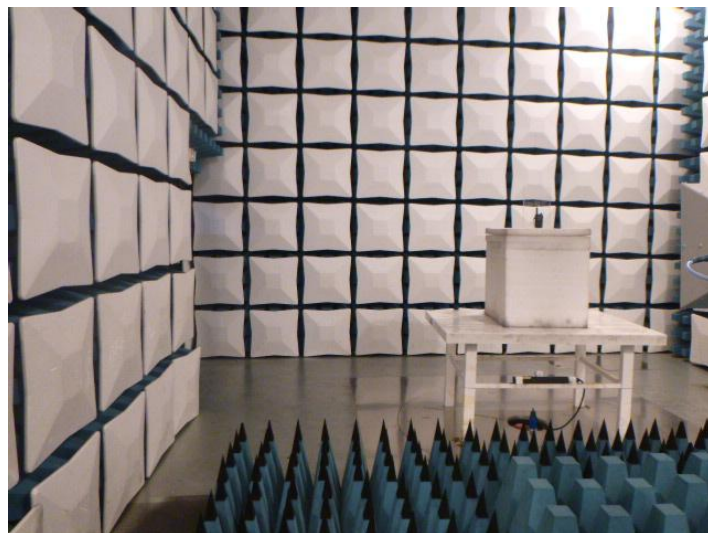
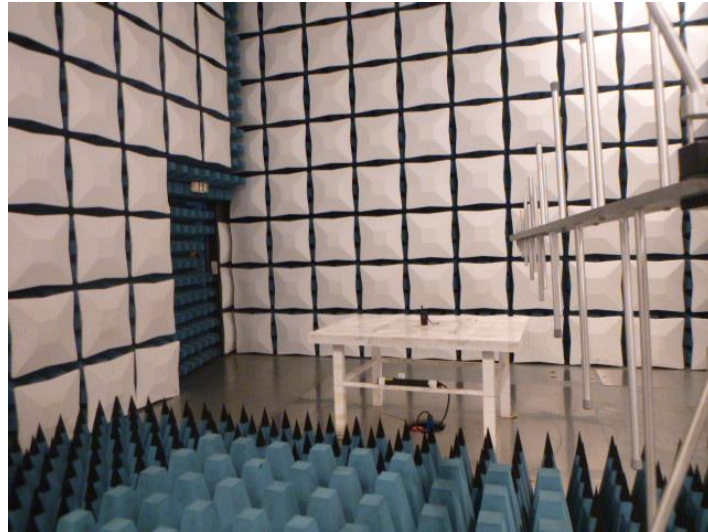
LTE Band 14-5MHz					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
Low	1559	Vertical	-44.13	<-40.00	Pass
	2338.5	V	-42.28	<-13.00	
	3118	V	-41.96	<-13.00	
	1559	Horizontal	-44.81	<-40.00	Pass
	2338.5	H	-42.68	<-13.00	
	3118	H	-41.34	<-13.00	
Mid	1564	Vertical	-43.89	<-40.00	Pass
	2346	V	-42.12	<-13.00	
	3128	V	-41.05	<-13.00	
	1564	Horizontal	-44.64	<-40.00	Pass
	2346	H	-42.35	<-13.00	
	3128	H	-41.77	<-13.00	
High	1569	Vertical	-44.56	<-40.00	Pass
	2353.5	V	-42.52	<-13.00	
	3138	V	-41.73	<-13.00	
	1569	Horizontal	-44.71	<-40.00	Pass
	2353.5	H	-42.50	<-13.00	
	3138	H	-40.66	<-13.00	

LTE Band 14-10MHz					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
Mid	1564	Vertical	-44.24	<-40.00	Pass
	2346	V	-42.26	<-13.00	
	3128	V	-39.41	<-13.00	
	1564	Horizontal	-44.18	<-40.00	Pass
	2346	H	-42.10	<-13.00	
	3128	H	-40.51	<-13.00	

## Remark:

1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

## 6. TEST SETUP PHOTOS OF THE EUT



## 7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Refer to the test report No.: CHTEW20090091

## 8. APPENDIX REPORT