FCC TEST REPORT

FOR

Xiamen Ingsoo Technology Co.,Ltd

Intelligent stable lamp Master

Test Model: MA00112050W

Prepared for	:	Xiamen Ingsoo Technology Co.,Ltd
Address	:	335# huanzhu road jimei district Xiamen China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	:	June 30, 2017
Number of tested samples	:	1
Sample number	:	Prototype
Date of Test	:	December 29 , 2017~January 11, 2018
Date of Report	:	January 11, 2018

FCC TEST REPORT FCC CFR 47 PART 15 C(15.249)	
Report Reference No. ..... :	**LCS171225109AEA**
Date of Issue..... :	January 11, 2018
Testing Laboratory Name ..... :	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address..... :	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure ..... :	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name ..... :	**Xiamen Ingsoo Technology Co.,Ltd**
Address..... :	335# huanzhu road jimei district Xiamen China
Test Specification	
Standard..... :	FCC CFR 47 PART 15 C(15.249) / ANSI C63.10: 2013
Test Report Form No..... :	LCSEMC-1.0
TRF Originator..... :	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF ..... :	Dated 2011-03

Test Item Description..... :	**Intelligent stable lamp Master**
Trade Mark..... :	equilux
Test Model..... :	MA00112050W
Ratings..... :	Input: AC 120V, 60Hz
Result ..... :	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Ace Chai/ Administrators	Dick Su/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS171225109AEA	January 11, 2018 Date of issue

Test Model.....	: MA00112050W
EUT.....	: Intelligent stable lamp Master
Applicant.....	**: Xiamen Ingsoo Technology Co.,Ltd**
Address.....	: 335# huanzhu road jimei district Xiamen China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: Xiamen Ingsoo Technology Co.,Ltd**
Address.....	: 335# huanzhu road jimei district Xiamen China
Telephone.....	: /
Fax.....	: /
Factory.....	: **Xiamen Ingsoo Technology Co.,Ltd**
Address.....	: 335# huanzhu road jimei district Xiamen China
Telephone.....	: /
Fax.....	: /

Test Result	**Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
00	January 11, 2018	Initial Issue	Gavin Liang

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT : Intelligent stable lamp Master

Model Number : MA00112050W

Hardware Version : 2.4
Software Version : 2.4
Power Supply : Input: AC 120V, 60Hz
Frequency Range : 915 MHz

Modulation : GFSK

Technology

Channel Number : 1 channel

Antenna Gain : Integral Antenna, 1dBi(Max.)

1.2 Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
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1.3 External I/O

I/O Port Description	Quantity	Cable
DC in Port	1	1m unshielded cable

1.4 Description of Test Facility

FCC Registration Number. is 254912.

Industry Canada Registration Number. is 9642A-1.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

NVLAP Registration Code is 600167-0

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10:2013 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.5 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 CISPR 16 – 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the LCS 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.

1.6 Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	3.10dB	(1)
		30MHz~200MHz	2.96dB	(1)
		200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
		26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)

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

1.7 Description of Test Modes

The following operating modes were applied for the related test items.
All test modes were tested, only the result of the worst case was recorded in the report.

Mode of Operations	Frequency Range (MHz)
GFSK	915
For Conducted Emission	
Test Mode	TX Mode
For Radiated Emission	
Test Mode	TX Mode

Worst-case mode and channel used for 150 kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power that was determined to be TX-915MHz.

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was determined to be TX-915MHz.

***Note: Using a temporary antenna connector for the EUT when conducted measurements are performed.

For AC conducted emission pre-testing, the input Voltage/Frequency AC 120V/60Hz

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013, FCC CFR PART 15C 15.207, 15.209, 15.249.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209, 15.249 under the FCC Rules Part 15 Subpart C.

2.3 General Test Procedures

2.3.1 Conducted Emissions

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a continuous transmits condition.

3.2 EUT Exercise Software

N/A.

3.3 Special Accessories

N/A.

3.4 Block Diagram/Schematics

Please refer to the related document.

3.5 Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6 Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart C		
FCC Rules	**Description of Test**	**Result**
§15.215	20dB bandwidth	Compliant
§15.205(a), §15.209(a), §15.249(a), §15.249(c)	Radiated Emissions Measurement	Compliant
§15.205, §15.249(d)	Emissions at Restricted Band	Compliant
§15.207(a)	AC Line Conducted Emissions	Compliant
§15.203	Antenna Requirements	Compliant
Note: This is a DXX test report for Intelligent stable lamp Master(MA00112050W)		

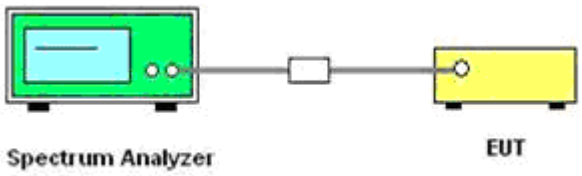
5. ANTENNA PORT MEASUREMENT

5.1 20 dB Bandwidth

5.1.1 Limit

No limits

5.2.2 Block Diagram of Test Setup



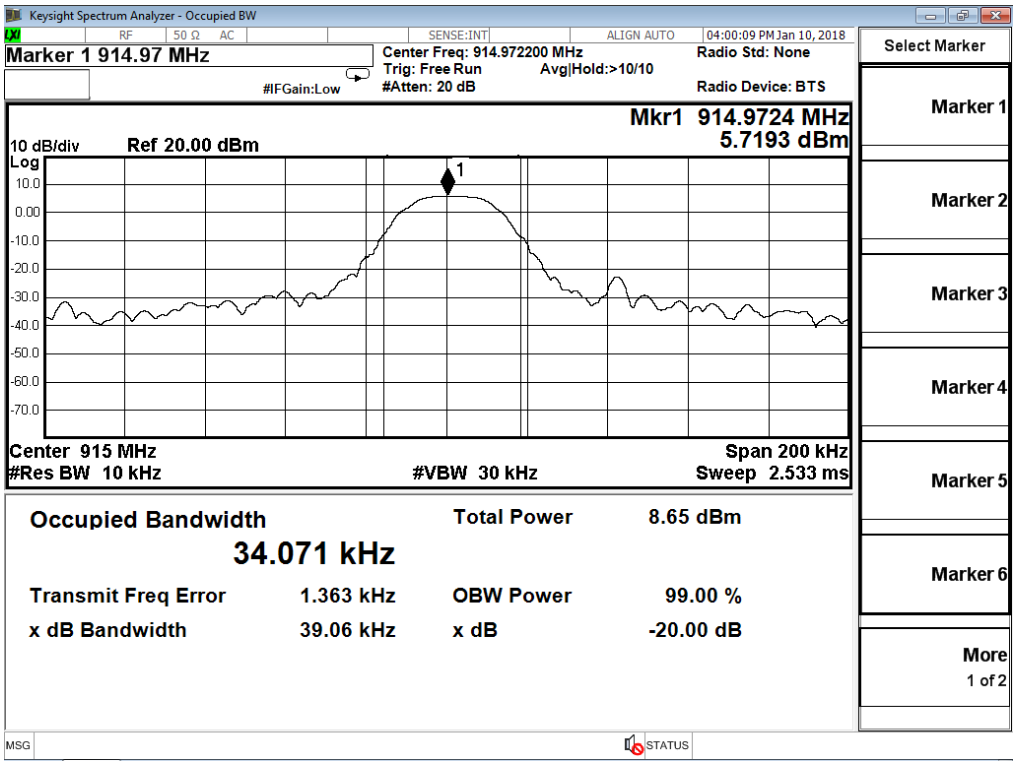
5.2.3 Test Procedure

A. Place the EUT on the table and set it in transmitting mode.
B. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.
C. Set to the maximum power setting and enable the EUT transmit continuously.
D. For 20dB bandwidth measurement, use the following spectrum analyzer settings: Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW/VBW=10 KHz/ 30KHz; Sweep = auto; Detector function = peak; Trace = max hold.

5.2.4 Test Results

Channel	20dB Bandwidth (KHz)	99% OBW(KHz)	Limit
915MHz	39.06	34.071	Non-specified

The test data refer to the following page.



6. RADIATED MEASUREMENT

6.1 Standard Applicable

1. According to §15.249 (d): Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Frequencies(MHz)	Field Strength(microvolts/meter)	Measurement Distance(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

2. According to §15.249 (a): Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental		Field strength of harmonics	
	millivolts/meter	dBuV/m	microvolts/meter	dBuV/m
902-928 MHz	50	94	500	54
2400-2483.5 MHz	50	94	500	54
5725-5875 MHz	50	94	500	54
24.0-24.25 GHz	250	108	2500	68

As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth

6.2 Instruments Setting

The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/Average
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/Average
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

6.3 Test Procedures

1) **Sequence of testing 9 kHz to 30 MHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0 °to 315 °using 45 °steps.

--- The antenna height is 0.8 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0 °to 360 °) and by rotating the elevation axes (0 °to 360 °).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) **Sequence of testing 30 MHz to 1 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0 °to 315 °using 45 °steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (±45 °) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) **Sequence of testing 1 GHz to 18 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0 °to 315 °using 45 °steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (±45 °) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) **Sequence of testing above 18 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Premeasurement:

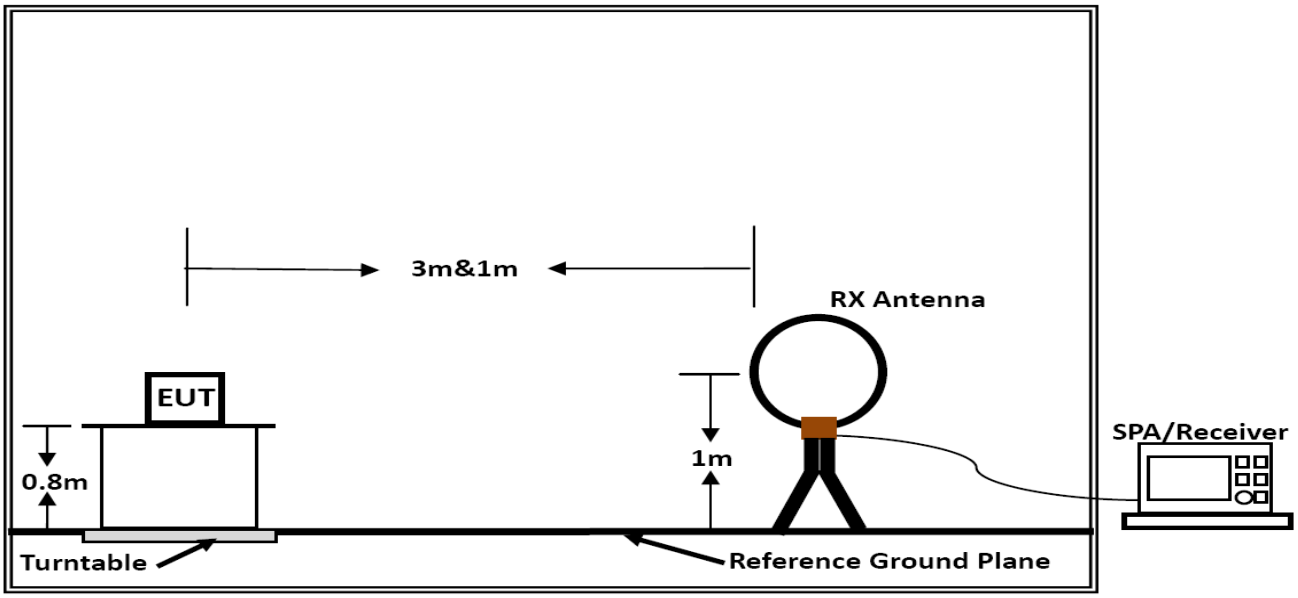
--- The antenna is moved spherical over the EUT in different polarizations of the antenna.

Final measurement:

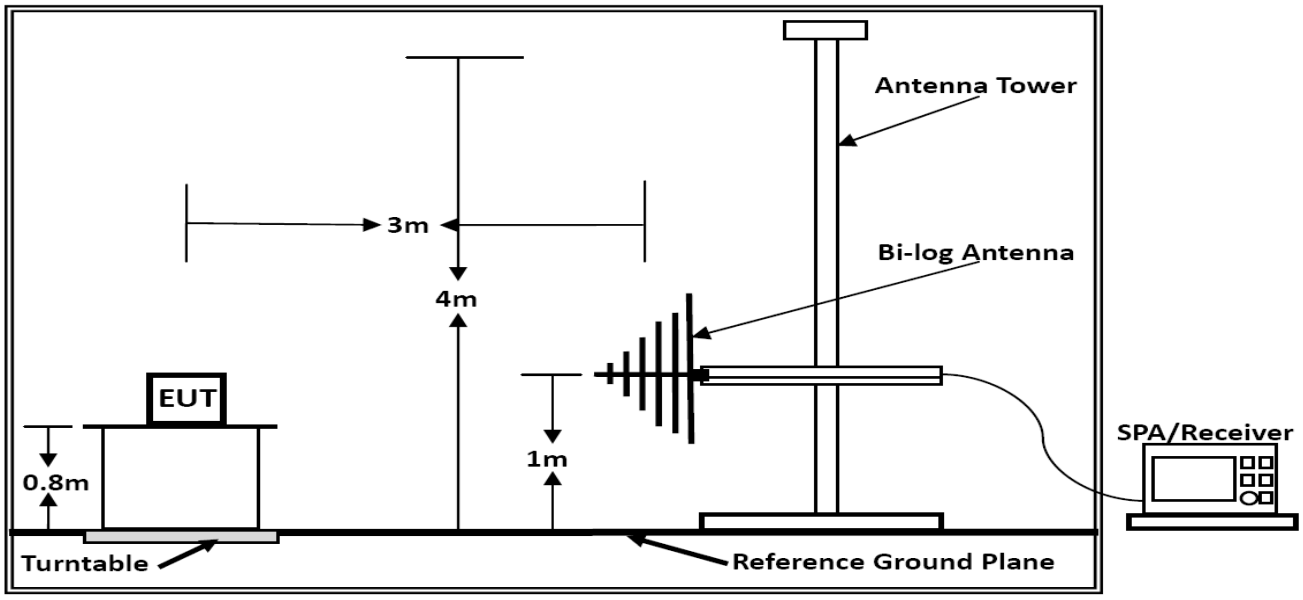
--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

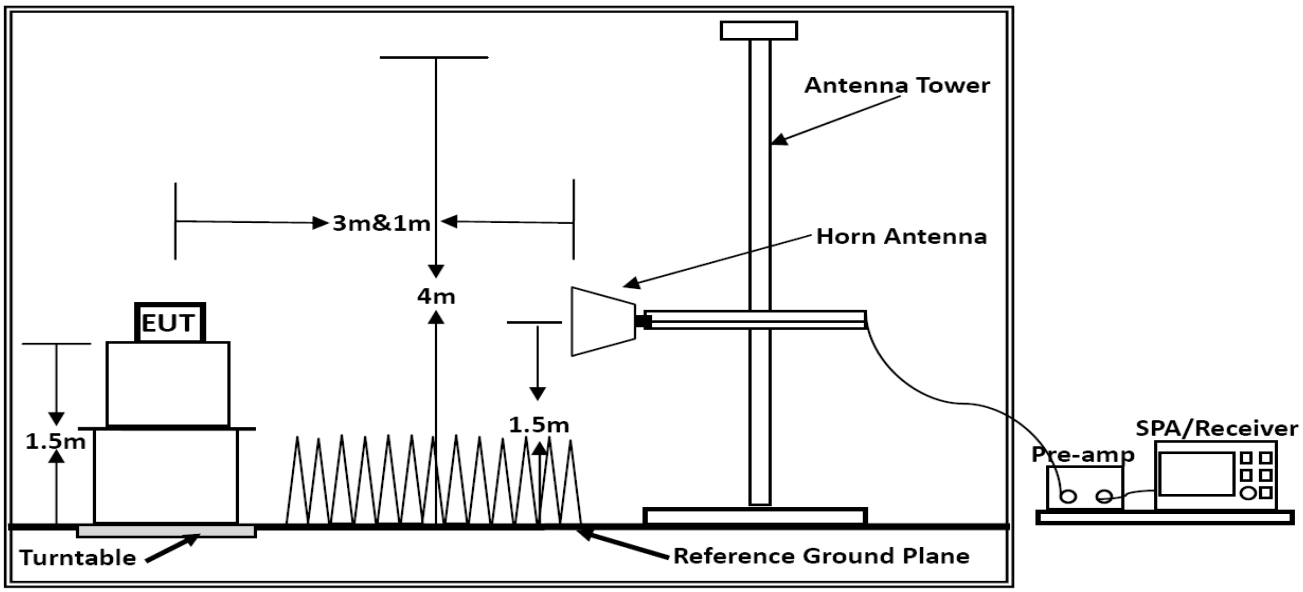
6.4 Test Setup Layout



Below 30MHz



Below 1GHz



Above 1GHz

6.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

6.6 Results for Radiated Emissions

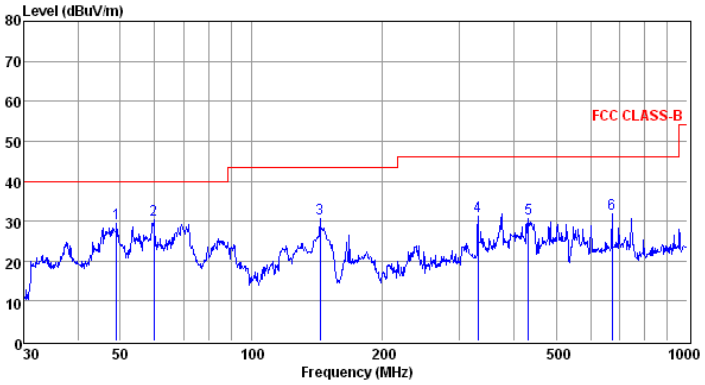
PASS.

Only record the worst test result in this report.
The radiated emissions from 9 kHz to 30MHz are at least 20dB below the official limit and no need to report.
The test data please refer to following page:

Below 1GHz

Temperature	24.1℃	Humidity	49.8%
Test Engineer	Tom Liu	Configurations	TX-915MHz

Horizontal:

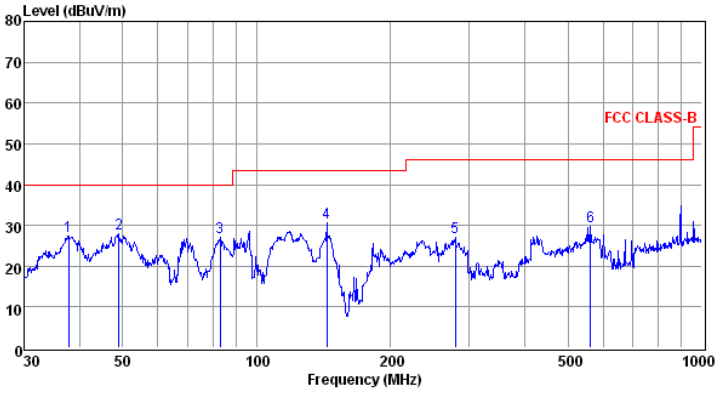


pol: HORIZONTAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	49.01	15.81	0.35	13.31	29.47	40.00	-10.53	QP
2	59.65	17.17	0.49	12.71	30.37	40.00	-9.63	QP
3	143.83	21.62	0.71	8.22	30.55	43.50	-12.95	QP
4	331.35	16.18	1.17	13.78	31.13	46.00	-14.87	QP
5	432.55	13.86	1.18	15.53	30.57	46.00	-15.43	QP
6	672.84	11.35	1.65	18.71	31.71	46.00	-14.29	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

Vertical:



pol: VERTICAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	37.81	13.93	0.38	13.02	27.33	40.00	-12.67	QP
2	49.01	14.30	0.35	13.31	27.96	40.00	-12.04	QP
3	82.65	16.96	0.54	9.48	26.98	40.00	-13.02	QP
4	143.83	21.74	0.71	8.22	30.67	43.50	-12.83	QP
5	279.04	13.35	1.01	12.64	27.00	46.00	-19.00	QP
6	562.66	10.52	1.43	17.75	29.70	46.00	-16.30	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

****Note:*

Pre-scan all modes and recorded the worst case results in this report.
Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

For the fundamental emission limit at 915MHz, please refer to following page.

Above 1GHz

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
1830.00	49.07	33.06	35.04	2.14	49.23	74.00	-24.77	Peak	Horizontal
1830.00	44.94	33.06	35.04	2.14	45.10	54.00	-8.90	Average	Horizontal
1830.00	51.10	33.06	35.04	2.14	51.26	74.00	-22.74	Peak	Vertical
1830.00	46.58	33.06	35.04	2.14	46.74	54.00	-7.26	Average	Vertical
2745.00	54.59	33.11	35.09	2.72	55.33	74.00	-18.67	Peak	Horizontal
2745.00	39.86	33.11	35.09	2.72	40.60	54.00	-13.40	Average	Horizontal
2745.00	58.22	33.11	35.09	2.72	58.96	74.00	-15.04	Peak	Vertical
2745.00	42.59	33.11	35.09	2.72	43.33	54.00	-10.67	Average	Vertical
3660.00	54.49	33.03	35.07	3.12	55.57	74.00	-18.43	Peak	Horizontal
3660.00	40.92	33.03	35.07	3.12	42.00	54.00	-12.00	Average	Horizontal
3660.00	58.68	33.03	35.07	3.12	59.76	74.00	-14.24	Peak	Vertical
3660.00	42.29	33.03	35.07	3.12	43.37	54.00	-10.63	Average	Vertical
9150.00	50.02	33.26	35.14	3.98	52.12	74.00	-21.88	Peak	Horizontal
9150.00	44.62	33.26	35.14	3.98	46.72	54.00	-7.28	Average	Horizontal
9150.00	53.11	33.26	35.14	3.98	55.21	74.00	-18.79	Peak	Vertical
9150.00	47.45	33.26	35.14	3.98	49.55	54.00	-4.45	Average	Vertical

Notes:

1. *Measuring frequencies from 9k~10th harmonic (ex. 10GHz), No emission found between lowest internal used/generated frequency to 30MHz.*
2. *Radiated emissions measured in frequency range from 9k~10th harmonic (ex. 10GHz) were made with an instrument using Peak detector mode.*

6.7 Results for Band edge Testing (Conducted)

6.7.1 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

6.7.2. Test Setup Layout

6.7.3. Measuring Instruments and Setting

Please refer to section 6 of equipment list in this report. The following table is the setting of Spectrum Analyzer.

6.7.4. Test Procedures

According to KDB 412172 section 1.1 Field Strength Approach (linear terms):

eirp = pt x gt = (E x d)2/30

Where:

pt = transmitter output power in watts,

gt = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m,

d = measurement distance in meters (m).

erp = eirp/1.64 = (E x d)2/(30 x 1.64)

Where all terms are as previously defined.

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=100KHz, VBW=300KHz for peak detector
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.
6. Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).

7. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)
8. Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
9. For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
10. Compare the resultant electric field strength level to the applicable regulatory limit.
11. Perform radiated spurious emission test duress until all measured frequencies were complete.

6.7.5. Test Results

Remark:

1. Measured at difference Packet Type for each mode and recorded worst case for each mode.

2. Measured at Hopping and Non-Hopping mode, recorded worst at Non-Hopping mode.

3. The other emission levels were very low against the limit.

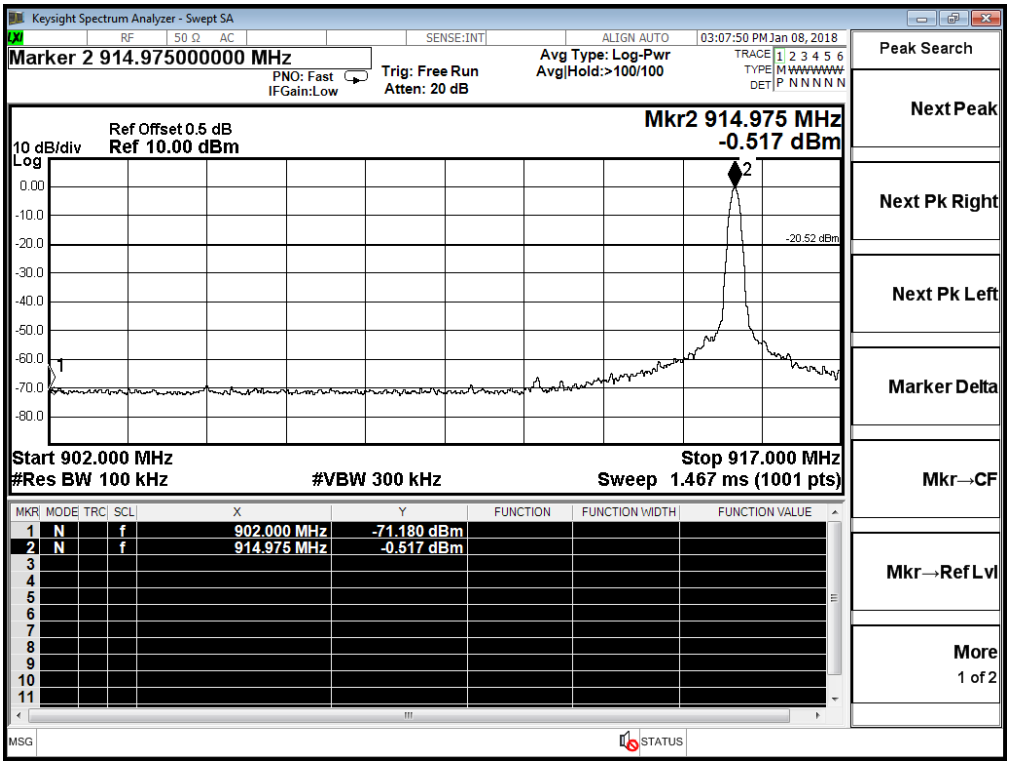
4. Detector PEAK is setting spectrum/receiver. RBW=100KHz/VBW=300KHz/Sweep time=Auto/Detector=Peak;

5. Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.

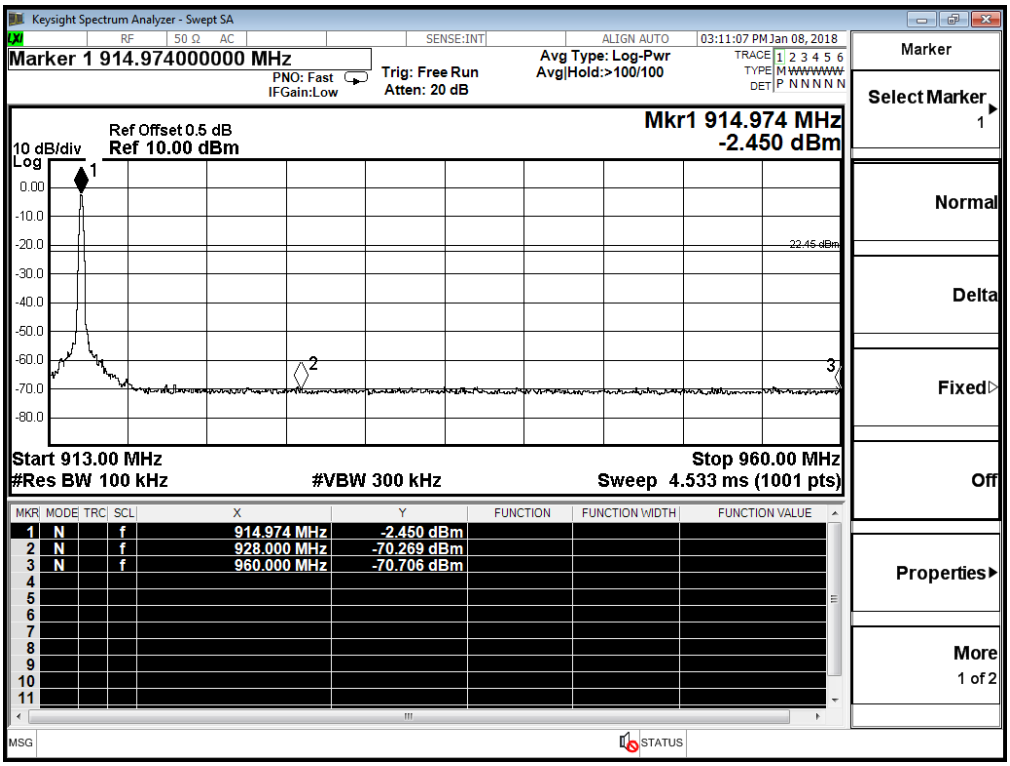
TX-915MHz

Freq. MHz	Reading Level dBm	Antenna Gain dBi	Ground Factor dB	Measured E [dBuV/m]	Limit dBuV/m	Margin dB	Detector
902	-71.18	2	4.7	30.780	46.00	-15.220	Peak
928	-70.269	2	4.7	31.691	46.00	-14.309	Peak
960	-70.706	2	4.7	31.254	46.00	-14.746	Peak

902-915MHz Band Edge

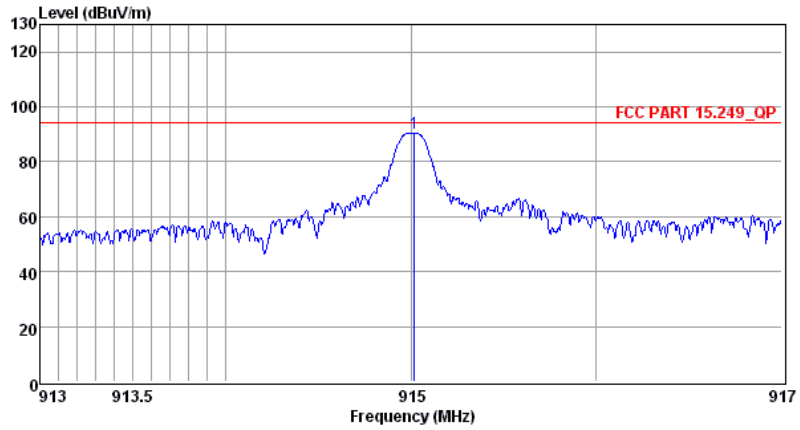


915-960MHz Band Edge



6.8 Results for Band edge Testing (Radiation)

915MHz
Horizontal

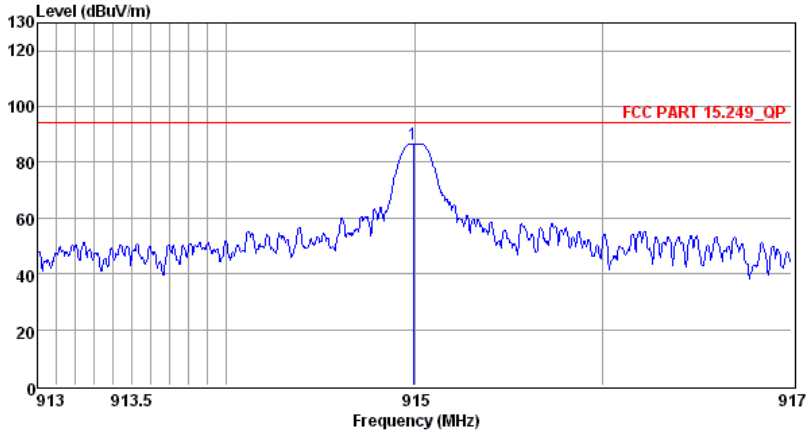


pol: HORIZONTAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	915.02	67.07	2.04	21.19	90.30	94.00	-3.70	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

Vertical

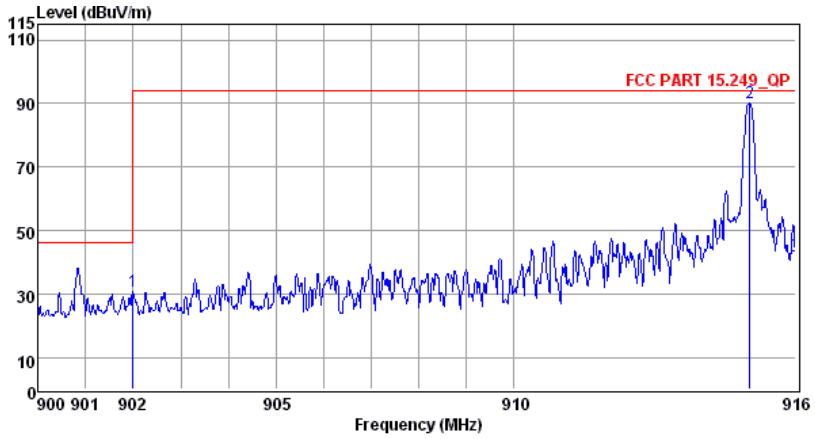


pol: VERTICAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	914.99	63.39	2.04	21.19	86.62	94.00	-7.38	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

900MHz-916MHz
Horizontal

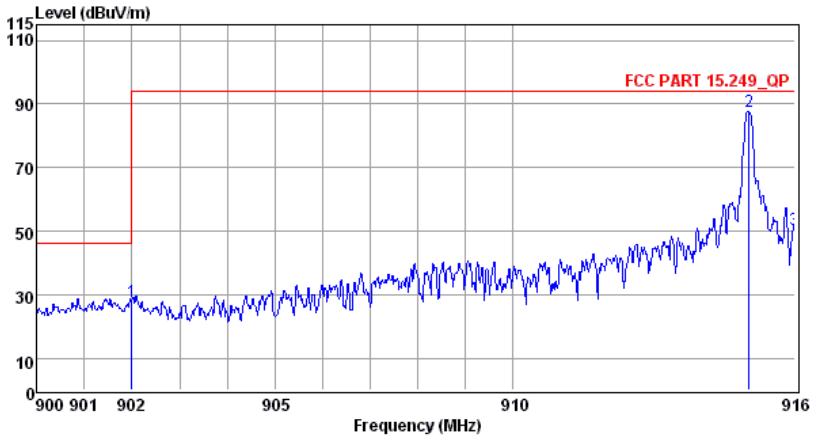


pol: HORIZONTAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	902.00	7.60	1.87	21.10	30.57	46.00	-15.43	QP
2	915.03	66.85	2.04	21.19	90.08	94.00	-3.92	QP
3	916.00	18.72	2.04	21.19	41.95	94.00	-52.05	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

Vertical

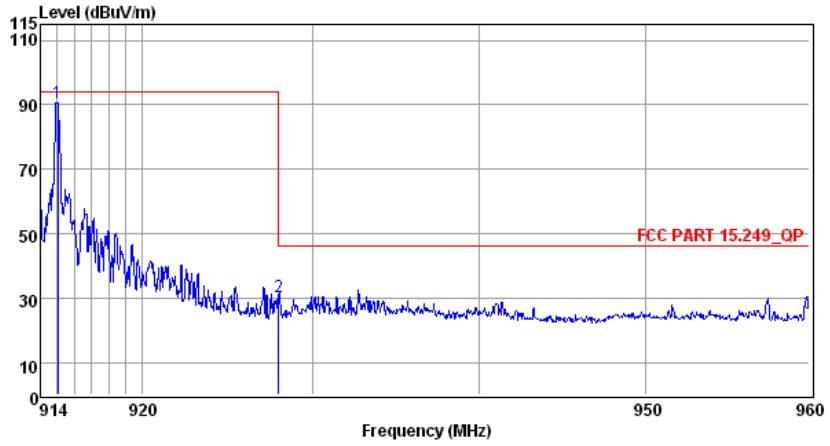


pol: VERTICAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	902.00	5.02	1.87	21.10	27.99	46.00	-18.01	QP
2	915.03	64.51	2.04	21.19	87.74	94.00	-6.26	QP
3	916.00	27.04	2.04	21.19	50.27	94.00	-43.73	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

914MHz-960MHz
Horizontal

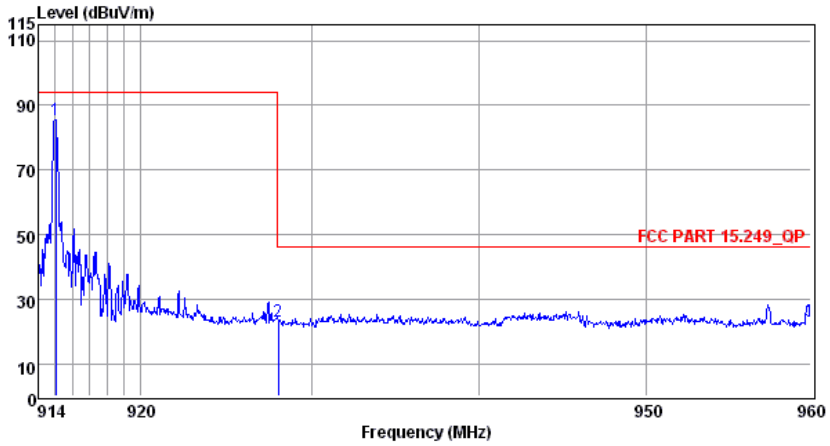


pol: HORIZONTAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	915.03	67.61	2.04	21.19	90.84	94.00	-3.16	QP
2	928.02	7.02	1.90	21.27	30.19	46.00	-15.81	QP
3	960.00	1.68	1.90	21.48	25.06	46.00	-20.94	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

Vertical



pol: VERTICAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	915.03	62.30	2.04	21.19	85.53	94.00	-8.47	QP
2	928.06	-0.03	1.90	21.27	23.14	46.00	-22.86	QP
3	960.00	-0.36	1.90	21.48	23.02	46.00	-22.98	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

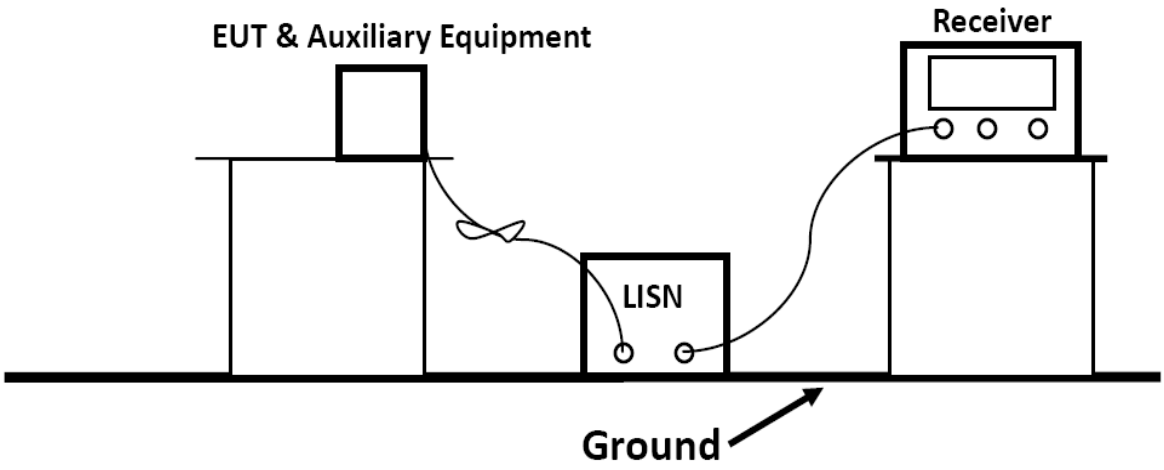
7. LINE CONDUCTED EMISSIONS

7.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolt (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range(MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

7.2 Block Diagram of Test Setup



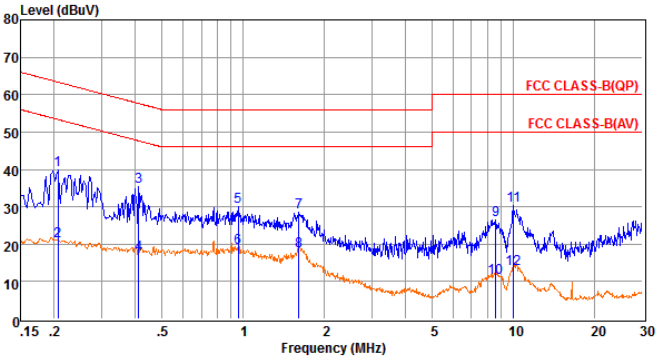
7.3 Test Results

PASS.

The test data please refer to following page.

Test Results for AC 120V/60Hz @ GFSK (worst case)

Line:

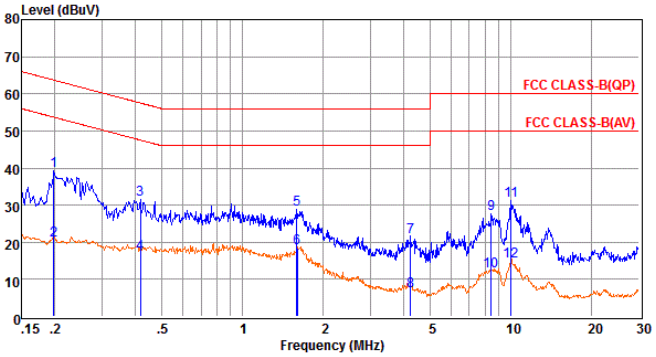


Pol: LINE

	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.21	20.14	9.63	0.03	10.00	39.80	63.36	-23.56	QP
2	0.21	1.29	9.63	0.03	10.00	20.95	53.36	-32.41	Average
3	0.41	15.70	9.62	0.04	10.00	35.36	57.64	-22.28	QP
4	0.41	-2.47	9.62	0.04	10.00	17.19	47.64	-30.45	Average
5	0.96	10.42	9.63	0.05	10.00	30.10	56.00	-25.90	QP
6	0.96	-0.70	9.63	0.05	10.00	18.98	46.00	-27.02	Average
7	1.61	8.90	9.64	0.05	10.00	28.59	56.00	-27.41	QP
8	1.61	-1.50	9.64	0.05	10.00	18.19	46.00	-27.81	Average
9	8.59	6.77	9.69	0.08	10.00	26.54	60.00	-33.46	QP
10	8.59	-8.71	9.69	0.08	10.00	11.06	50.00	-38.94	Average
11	10.02	10.49	9.69	0.08	10.00	30.26	60.00	-29.74	QP
12	10.02	-6.36	9.69	0.08	10.00	13.41	50.00	-36.59	Average

Remarks: 1. Measured = Reading + LISNFac + Cable Loss + Aux2 Fac.
2. The emission levels that are 20dB below the official limit are not reported.

Neutral:



Pol: NEUTRAL

	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.20	19.63	9.59	0.02	10.00	39.24	63.71	-24.47	QP
2	0.20	0.83	9.59	0.02	10.00	20.44	53.71	-33.27	Average
3	0.42	11.92	9.61	0.04	10.00	31.57	57.51	-25.94	QP
4	0.42	-2.78	9.61	0.04	10.00	16.87	47.50	-30.63	Average
5	1.59	9.22	9.63	0.05	10.00	28.90	56.00	-27.10	QP
6	1.60	-1.35	9.63	0.05	10.00	18.33	46.00	-27.67	Average
7	4.22	1.67	9.65	0.06	10.00	21.38	46.00	-24.62	QP
8	4.22	-13.00	9.65	0.06	10.00	6.71	56.00	-49.29	Average
9	8.46	7.82	9.71	0.08	10.00	27.61	60.00	-32.39	QP
10	8.46	-7.55	9.71	0.08	10.00	12.24	50.00	-37.76	Average
11	10.02	11.40	9.72	0.08	10.00	31.20	60.00	-28.80	QP
12	10.02	-5.03	9.72	0.08	10.00	14.77	50.00	-35.23	Average

Remarks: 1. Measured = Reading + LISNFac + Cable Loss + Aux2 Fac.
2. The emission levels that are 20dB below the official limit are not reported.

8. ANTENNA REQUIREMENT

8.1 Standard Applicable

According to antenna requirement of §15.203.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

8.2 Antenna Connected Construction

8.2.1. Standard Applicable

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2.2. Antenna Connector Construction

The antenna gain of antenna used for transmitting is 1dBi, and the antenna is integrate connected to PCB board and no consideration of replacement. Please see EUT photo for details.

8.2.3. Results: Compliance.

8.3 List of Measuring Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Power Meter	R&S	NRVS	100444	2017-06-17	2018-06-16
2	Power Sensor	R&S	NRV-Z81	100458	2017-06-17	2018-06-16
3	Power Sensor	R&S	NRV-Z32	10057	2017-06-17	2018-06-16
4	ESA-E SERIES SPECTRUM ANALYZER	Agilent	E4407B	MY41440754	2017-11-17	2018-11-16
5	MXA Signal Analyzer	Agilent	N9020A	MY49100040	2017-06-17	2018-06-16
6	SPECTRUM ANALYZER	R&S	FSP	100503	2017-06-17	2018-06-16
7	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2017-06-17	2018-06-16
8	Positioning Controller	MF	MF-7082	/	2017-06-17	2018-06-16
9	EMI Test Software	AUDIX	E3	N/A	2017-06-17	2018-06-16
10	EMI Test Receiver	R&S	ESR 7	101181	2017-06-17	2018-06-16
11	AMPLIFIER	QuieTek	QTK-A2525G	CHM10809065	2017-11-17	2018-11-16
12	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2017-06-23	2018-06-22
13	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2017-05-02	2018-05-01
14	Horn Antenna	EMCO	3115	6741	2017-06-23	2018-06-22
15	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2017-09-21	2018-09-20
16	Broadband Preamplifier	SCHWARZBECK	BBV 9719	9719-025	2017-09-21	2018-09-20
17	RF Cable-R03m	Jye Bao	RG142	CB021	2017-06-17	2018-06-16
18	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2017-06-17	2018-06-16
19	TEST RECEIVER	R&S	ESCI	101142	2017-06-17	2018-06-16
20	RF Cable-CON	UTIFLEX	3102-26886-4	CB049	2017-06-17	2018-06-16
21	10dB Attenuator	SCHWARZBECK	MTS-IMP136	261115-001-0032	2017-06-17	2018-06-16
22	Artificial Mains	R&S	ENV216	101288	2017-06-17	2018-06-16
23	RF Control Unit	JS Tonscend Corporation	JS0806-2	178060073	2017-10-28	2018-10-27
24	JS1120-3 BT/WIFI Test Software	JS Tonscend Corporation	JS1120-3	/	N/A	N/A
Note: All equipment is calibrated through GUANGZHOU LISAI CALIBRATION AND TEST CO.,LTD.						

9. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files for Test Setup Photos of the EUT.

10. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

11. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

----------THE END OF REPORT----------