FCC TEST REPORT

FOR

Shenzhen ZHIQU Technology Limited

MIXTILE HUB

Test Model: H17A

Additional Model No. : /

Prepared for	:	Shenzhen ZHIQU Technology Limited
Address	:	RM1101, Tower B, Haisong Building, Tairan 9th Road, Futian District, Shenzhen, China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Tel	:	(+86)755-82591330
Fax	:	(+86)755-82591332
Web	:	www.LCS-cert.com
Mail	:	webmaster@LCS-cert.com
Date of receipt of test sample	:	Jul 05, 2017
Number of tested samples	:	1
Sample number	:	Prototype
Date of Test	:	Jul 05, 2017~Jul 12, 2017
Date of Report	:	Jul 12, 2017

FCC TEST REPORT FCC CFR 47 PART 15 C(15.249)	
Report Reference No. ..... :	**LCS170705117AE**
Date of Issue..... :	Jul 12, 2017
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 ..... :	**Shenzhen ZHIQU Technology Limited**
Address..... :	RM1101, Tower B, Haisong Building, Tairan 9th Road, Futian District, Shenzhen, 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..... :	**MIXTILE HUB**
Trade Mark..... :	MIXTILE
Test Model..... :	H17A
Ratings..... :	DC 5V/2.5A by power adapter Adapter input : 100~240VAC, 50/60Hz, 0.6A DC 3.7V, 2500mAh by rechargeable battery(for backup use)
Result ..... :	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Calvin Weng	Dick Su	Gavin Liang
Calvin Weng/ Administrators	Dick Su / Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS170705117AE	Jul 12, 2017 Date of issue

Test Model.....	: H17A
EUT.....	: MIXTILE HUB
Applicant.....	**: Shenzhen ZHIQU Technology Limited**
Address.....	: RM1101, Tower B, Haisong Building, Tairan 9th Road, Futian District, Shenzhen, China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: Shenzhen ZHIQU Technology Limited**
Address.....	: RM1101, Tower B, Haisong Building, Tairan 9th Road, Futian District, Shenzhen, China
Telephone.....	: /
Fax.....	: /
Factory.....	: **Shenzhen ZHIQU Technology Limited**
Address.....	: RM1101, Tower B, Haisong Building, Tairan 9th Road, Futian District, Shenzhen, 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
000	Jul 12, 2017	Initial Issue	Gavin Liang

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT	MIXTILE HUB
Test Model	H17A
List Model Number	/
Model Declaration	/
Power Supply	DC 5V/2.5A by power adapter
Hardware Version	/
Software Version	/
Zigbee(2.4G Band)	
Frequency Range	2405-2480MHz,(Channel Number: 16, Channel Frequency=2405+5(K-1), K=1, 2, 3 ……16)
Channel Spacing	5MHz
Channel Number	16
Modulation Type	O-QPSK
Antenna Description	PIFA Antenna, 1.0 dBi(Max.)
WIFI(2.4G Band)	
Frequency Range	2412-2462MHz
Channel Spacing	5MHz
Channel Number	11 Channel for 20MHz bandwidth(2412~2462MHz) 7 channels for 40MHz bandwidth(2422~2462MHz)
Modulation Type	802.11b: DSSS; 802.11g/n: OFDM
Antenna Description	PIFA Antenna, 1.0 dBi(Max.)
Z-Wave	
Frequency Range	908.42MHz
Channel Spacing	N/A
Channel Number	1
Modulation Type	FSK
Antenna Description	Spring Antenna, 0 dBi(Max.)

1.2 Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
SIMSUKIAN	Adapter	SK03T1-0500250Z	--	---

1.3 External I/O

I/O Port Description	Quantity	Cable
DC in port	1	1.2m, unshielded cable
HDMI port	1	N/A
RJ45 Port	1	N/A
USB port	1	N/A

1.4 Description of Test Facility

CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

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

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 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 18, 2017	June 17, 2018
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	July 16, 2017	July 15, 2018
Signal analyzer	Agilent	N9020A	MY50510140	9kHz~26.5GHz	October 27, 2016	October 27, 2017
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 18, 2017	June 17, 2018
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 18, 2017	June 17, 2018
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18, 2017	June 17, 2018
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 18, 2017	June 17, 2018
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-18GHz 3m	June 18, 2017	June 17, 2018
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHzz	June 18, 2017	June 17, 2018
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16, 2017	July 15, 2018
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	July 16, 2017	July 15, 2018
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18, 2017	June 17, 2018
By-log Antenna	SCHWARZBEC	VULB9163	9163-470	30MHz-1GHz	June 10, 2017	June 09, 2018
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10, 2017	June 09, 2018
Horn Antenna	SCHWARZBEC	BBHA9170	BBHA9170154	15GHz-40GHz	June 10, 2017	June 09, 2018
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18, 2017	June 17, 2018
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18, 2017	June 17, 2018
Power Meter	R&S	NRVS	100444	DC-40GHz	June 18, 2017	June 17, 2018
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 18, 2017	June 17, 2018
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 18, 2017	June 17, 2018
AC Power Source	HPC	HPA-500E	HPA-9100024	AC 0~300V	June 18, 2017	June 17, 2018
DC power source	GW	GPC-6030D	C671845	DC 1V-60V	June 18, 2017	June 17, 2018
Temp. and Humidify Chamber	Giant Force	GTH-225-20-S	MAB0103-00	N/A	June 18, 2017	June 17, 2018
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18, 2017	June 17, 2018
RF CABLE-2m	JYE Bao	RG142	CB)35-2m	20MHz-1GHz	June 18, 2017	June 17, 2018
EMC Test software	Audix	E3	N/A	N/A	N/A	N/A

1.6 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.

1.7 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.

1.8 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)
FSK	908.42
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-908.42MHz.

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was determined to be TX-908.42MHz.

***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 and AC 240V/60Hz powered for power adapter were used. Only recorded the worst case data in this report.

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 MIXTILE HUB (H17A)		

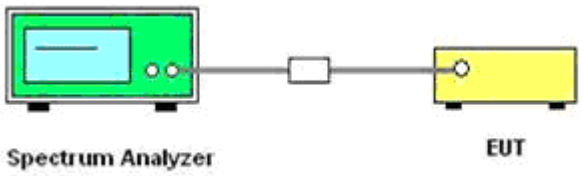
5. ANTENNA PORT MEASUREMENT

5.1 20 dB Bandwidth

5.1.1 Limit

No limits

5.2.2 Block Diagram of Test Setup



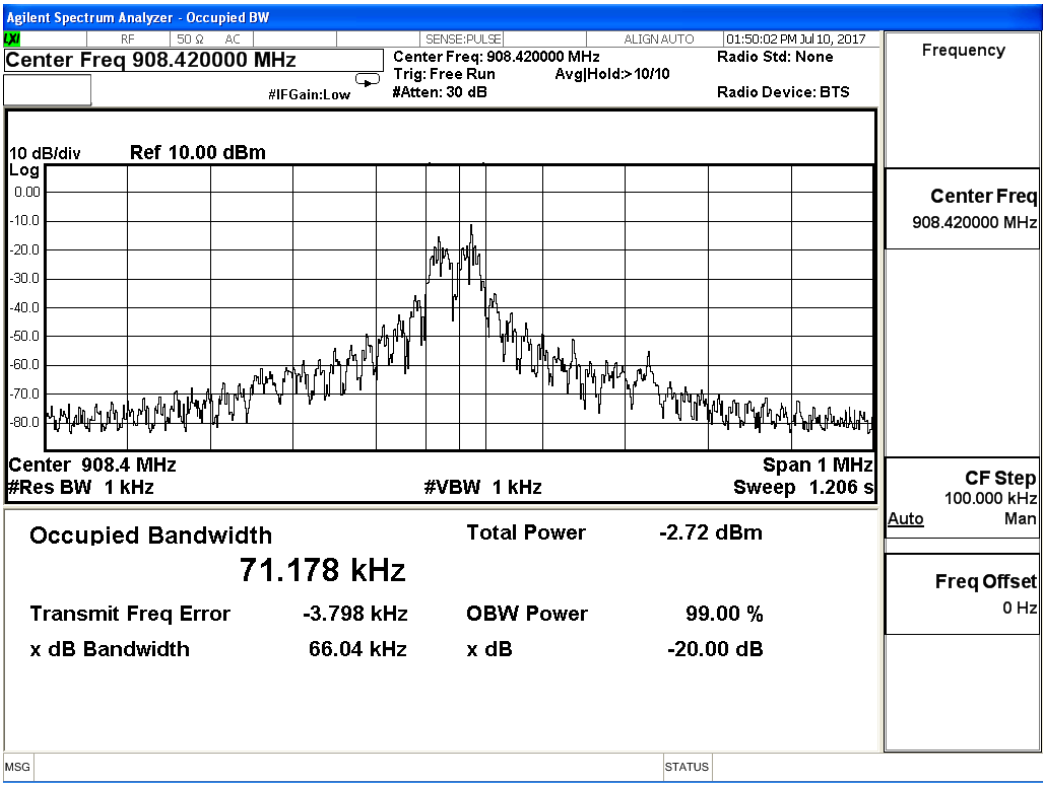
5.2.3 Test Procedure

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=30 KHz/ 100KHz; Sweep = auto; Detector function = peak; Trace = max hold.

5.2.4 Test Results

Channel	20dB Bandwidth (KHz)	99% OBW(KHz)	Limit
908.42MHz	66.04	71.178	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:

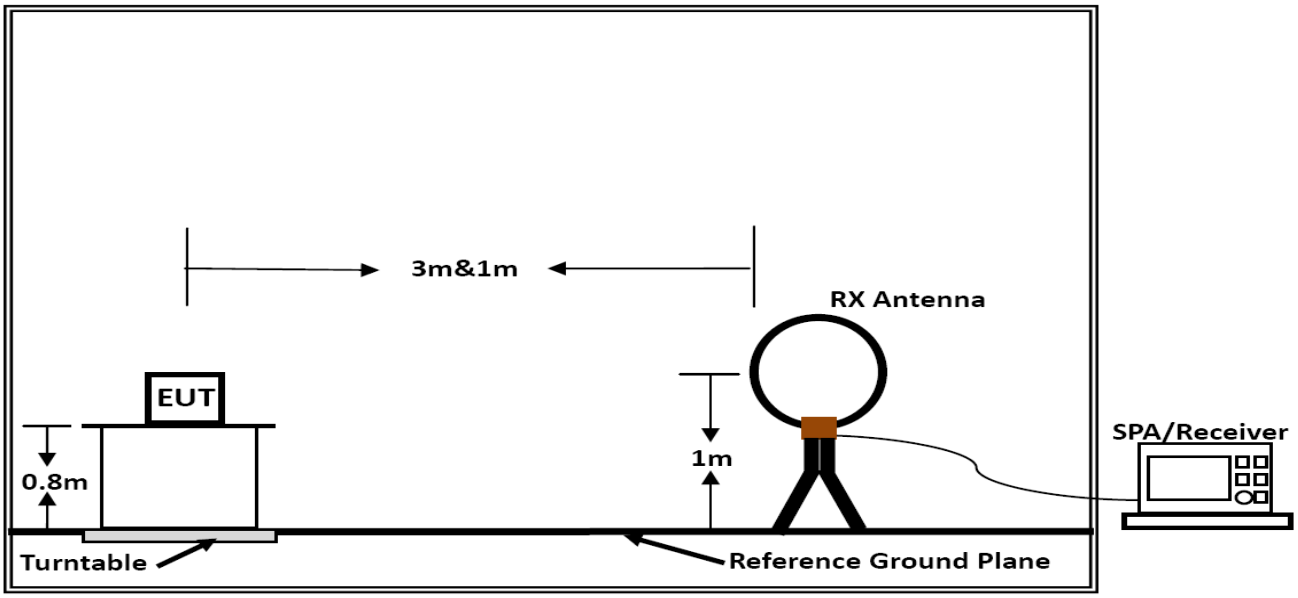
--- The antenna is moved spherical over the EUT in different polarizations of the antenna.

Final measurement:

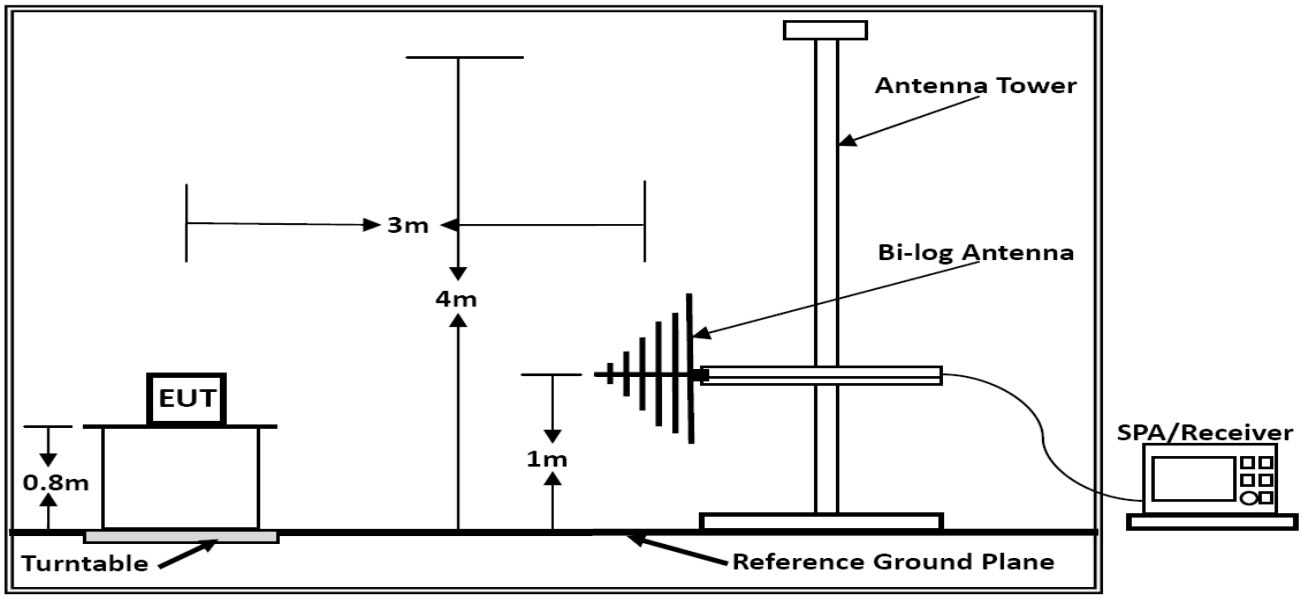
--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

--- 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.

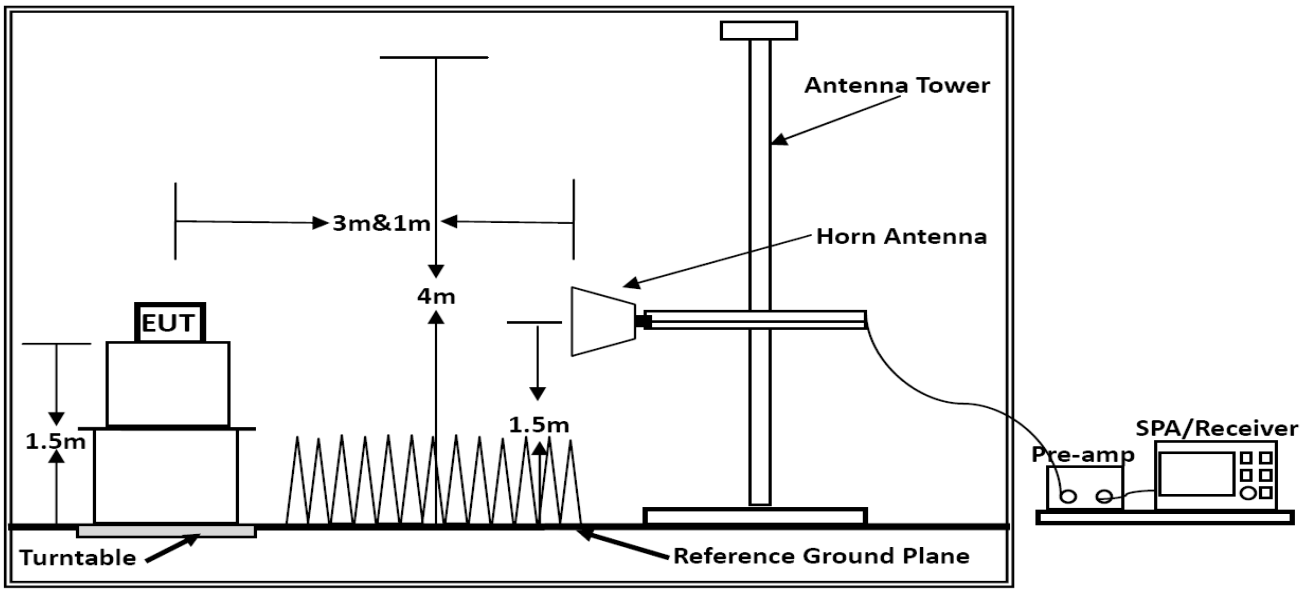
6.4 Test Setup Layout



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

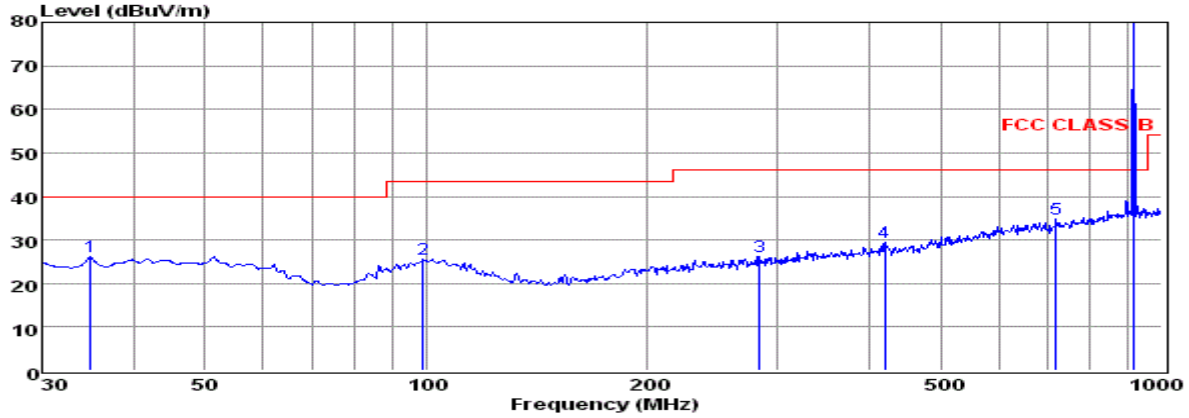
PASS.

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	24.8℃	Humidity	51%
Test Engineer	Chaz Liu	Configurations	TX-908.42MHz

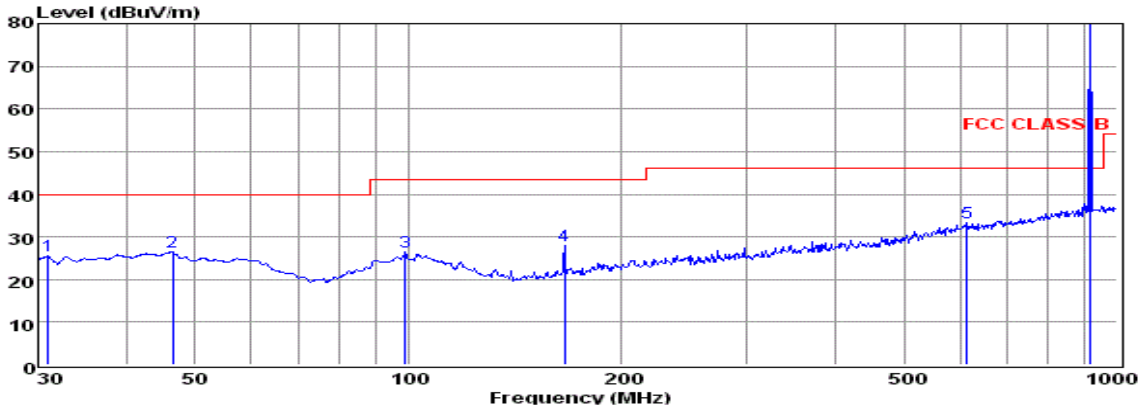
Horizontal:



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	34.88	13.41	0.41	12.30	26.12	40.00	-13.88	QP
2	98.83	11.78	0.61	13.09	25.48	43.50	-18.02	QP
3	283.98	12.57	1.00	12.75	26.32	46.00	-19.68	QP
4	420.58	12.49	1.33	15.47	29.29	46.00	-16.71	QP
5	719.20	14.04	1.75	19.05	34.84	46.00	-11.16	QP
6	908.42	63.05	2.04	21.19	86.28	46.00	40.28	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:



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	30.96	12.76	0.39	12.32	25.47	40.00	-14.53	QP
2	46.50	12.62	0.35	13.46	26.43	40.00	-13.57	QP
3	98.83	12.79	0.61	13.09	26.49	43.50	-17.01	QP
4	166.07	18.21	0.77	8.85	27.83	43.50	-15.67	QP
5	614.21	13.33	1.48	18.50	33.31	46.00	-12.69	QP
6	908.42	69.30	2.04	21.19	92.53	46.00	46.53	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

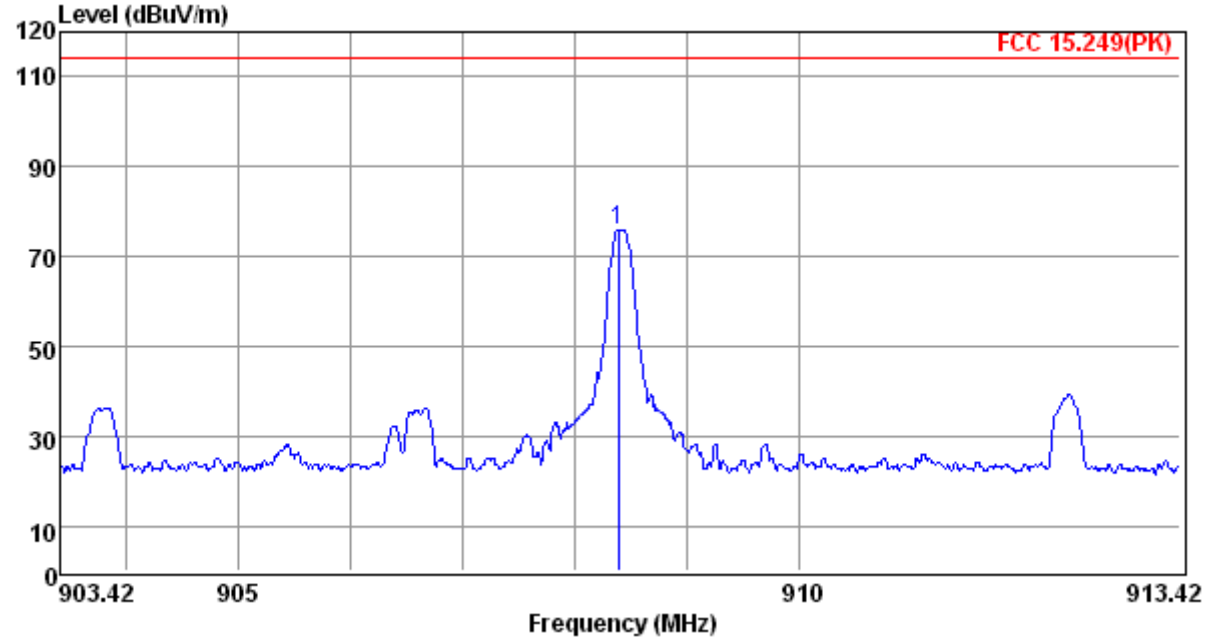
****Note:*

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

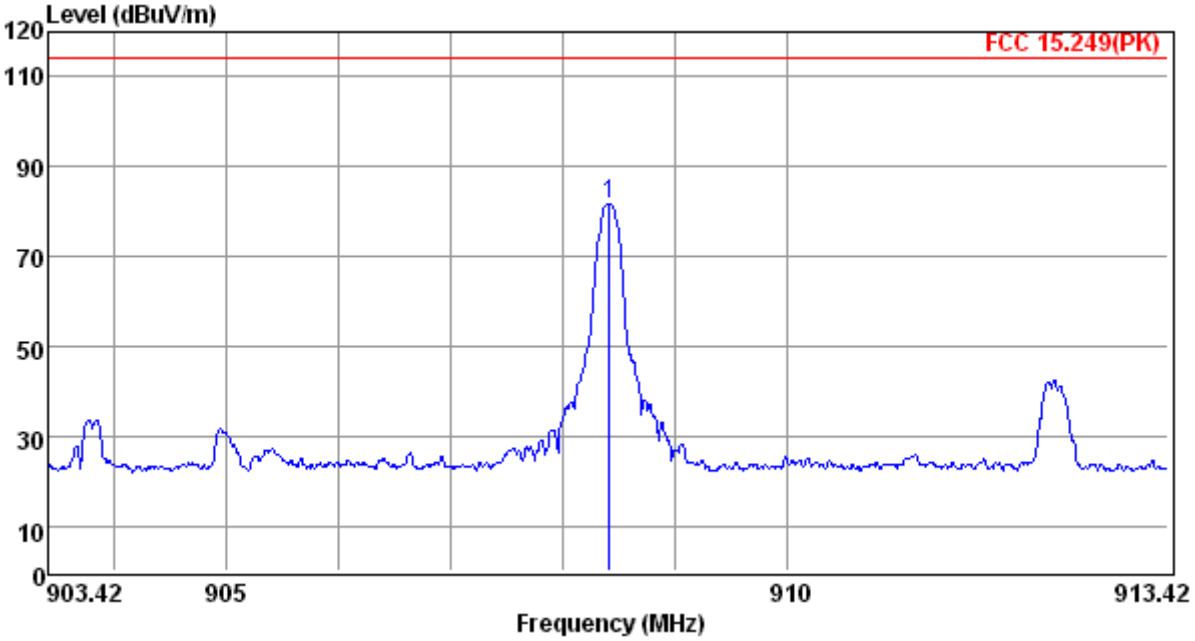
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

The value that exceed the limit is the fundamental, for the fundamental emission limit at 908.42MHz, please refer to following page.

Horizontal:



Vertical:



Frequency (MHz)	Pol.	Measure Result (AV, dBuV/m)	AV Limit (dBuV/m)	Margin (dBuV/m)	Result
908.42	H	77.25	94	-16.75	Pass
908.42	V	83.46	94	-10.54	Pass

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.
1816.84	48.12	33.06	35.04	2.14	49.08	74.00	-24.92	Peak	Horizontal
1816.84	44.11	33.06	35.04	2.14	45.07	54.00	-8.13	Average	Horizontal
1816.84	50.77	33.06	35.04	2.14	51.73	74.00	-21.47	Peak	Vertical
1816.84	46.02	33.06	35.04	2.14	46.98	54.00	-6.22	Average	Vertical
2725.26	54.65	33.11	35.09	2.72	55.39	74.00	-18.61	Peak	Horizontal
2725.26	39.99	33.11	35.09	2.72	40.73	54.00	-13.27	Average	Horizontal
2725.26	59.03	33.11	35.09	2.72	59.77	74.00	-14.23	Peak	Vertical
2725.26	42.18	33.11	35.09	2.72	42.92	54.00	-11.08	Average	Vertical
3633.68	54.62	33.03	35.07	3.12	55.70	74.00	-18.30	Peak	Horizontal
3633.68	40.23	33.03	35.07	3.12	41.31	54.00	-12.69	Average	Horizontal
3633.68	58.81	33.03	35.07	3.12	59.89	74.00	-14.11	Peak	Vertical
3633.68	41.81	33.03	35.07	3.12	42.89	54.00	-11.11	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 (Radiated)

Note: Only recorded the worst test result.

TX-908.42MHz

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
902	4.21	21.13	1.98	27.32	46.00	-18.68	QP	Horizontal
928	3.35	21.32	2.07	26.74	46.00	-19.26	QP	Horizontal
960	5.27	21.47	2.11	28.85	46.00	-17.15	QP	Horizontal
902	5.33	21.13	1.98	28.44	46.00	-17.56	QP	Vertical
928	6.29	21.32	2.07	29.68	46.00	-16.32	QP	Vertical
960	5.38	21.47	2.11	28.96	46.00	-17.04	QP	Vertical

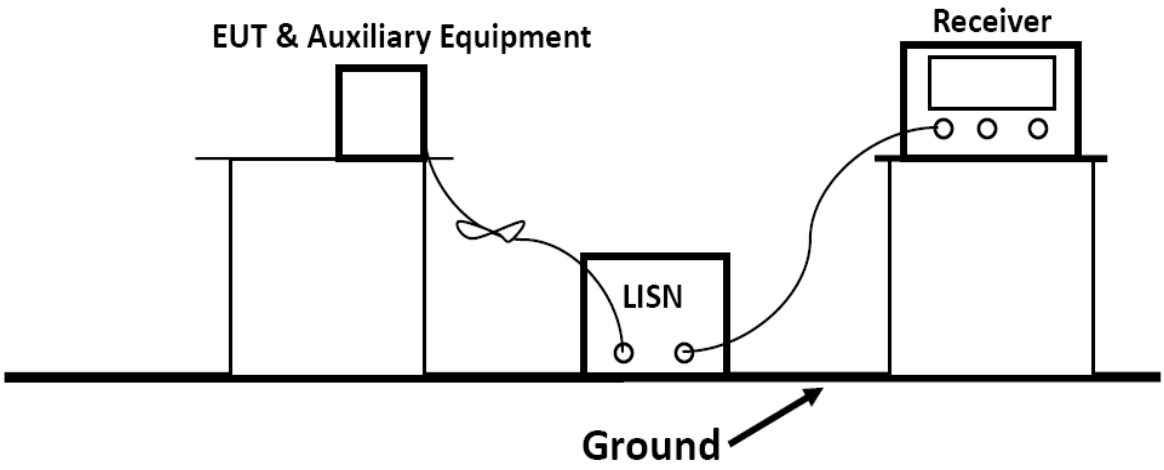
7. LINE CONDUCTED EMISSIONS

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



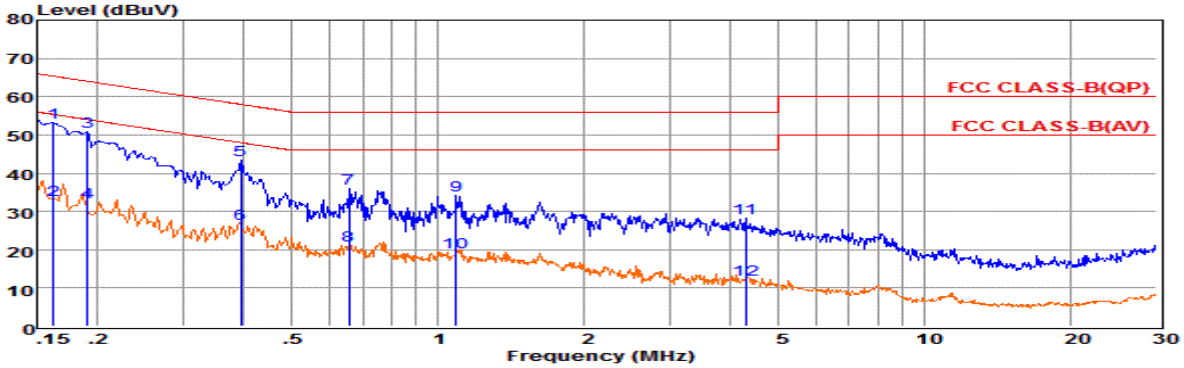
7.3 Test Results

PASS.

The test data please refer to following page.

Result @120VAC:

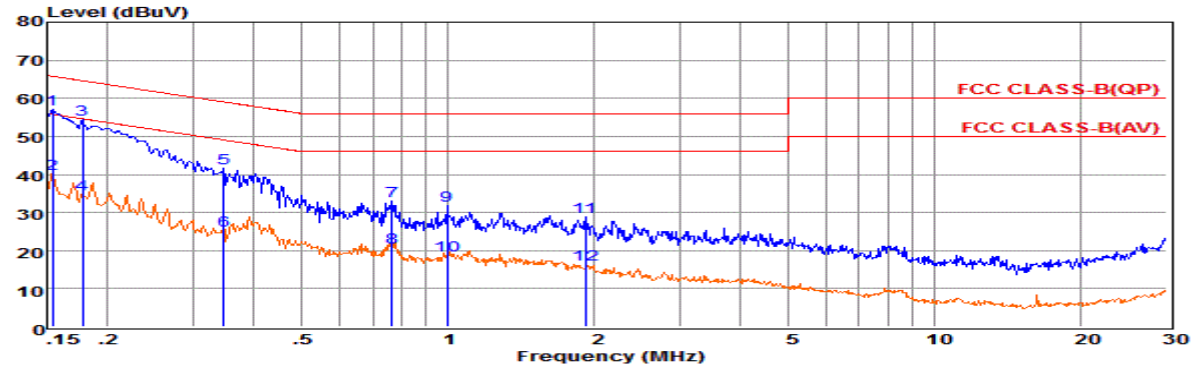
Line:



	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dB	dBuV	dBuV	dB
1	0.16	33.68	9.59	0.02	10.00	53.29	65.34	-12.05	QP
2	0.16	13.31	9.59	0.02	10.00	32.92	55.33	-22.41	Average
3	0.19	31.36	9.62	0.02	10.00	51.00	64.02	-13.02	QP
4	0.19	12.81	9.62	0.02	10.00	32.45	54.02	-21.57	Average
5	0.39	23.63	9.62	0.04	10.00	43.29	57.99	-14.70	QP
6	0.39	7.11	9.62	0.04	10.00	26.77	47.99	-21.22	Average
7	0.66	16.34	9.64	0.04	10.00	36.02	56.00	-19.98	QP
8	0.66	1.51	9.64	0.04	10.00	21.19	46.00	-24.81	Average
9	1.09	14.50	9.63	0.05	10.00	34.18	56.00	-21.82	QP
10	1.09	-0.31	9.63	0.05	10.00	19.37	46.00	-26.63	Average
11	4.29	8.54	9.65	0.06	10.00	28.25	56.00	-27.75	QP
12	4.29	-7.62	9.65	0.06	10.00	12.09	46.00	-33.91	Average

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

Neutral:



	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dB	dBuV	dBuV	dB
1	0.15	37.34	9.69	0.02	10.00	57.05	65.78	-8.73	QP
2	0.15	20.38	9.69	0.02	10.00	40.09	55.77	-15.68	Average
3	0.18	34.65	9.64	0.02	10.00	54.31	64.59	-10.28	QP
4	0.18	15.07	9.63	0.02	10.00	34.72	54.59	-19.87	Average
5	0.35	22.05	9.61	0.03	10.00	41.69	59.05	-17.36	QP
6	0.35	5.73	9.61	0.03	10.00	25.37	49.04	-23.67	Average
7	0.77	13.40	9.63	0.04	10.00	33.07	56.00	-22.93	QP
8	0.77	1.05	9.63	0.04	10.00	20.72	46.00	-25.28	Average
9	0.99	12.18	9.63	0.05	10.00	31.86	56.00	-24.14	QP
10	0.99	-0.90	9.63	0.05	10.00	18.78	46.00	-27.22	Average
11	1.92	9.26	9.63	0.05	10.00	28.94	56.00	-27.06	QP
12	1.92	-3.44	9.63	0.05	10.00	16.24	46.00	-29.76	Average

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

Note: Only recorded the worst case data in the test report.

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 0dBi, and the antenna is spring antenna connected to PCB board and no consideration of replacement. Please see EUT photo for details.

8.2.3. Results: Compliance.

9. PHOTOGRAPHS OF TEST SETUP

Please refer to separate file for Test Setup photos.

10. PHOTOGRAPHS OF EUT

Please refer to separate file for phtographs of EUT.

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