

## FCC Part 15, Subpart B, Class B

## TEST REPORT

Shenzhen Xtooltech Intelligent Co., Ltd

KC501

Test Model: KC501

Prepared for : Shenzhen Xtooltech Intelligent Co., Ltd  
Address : 2nd Floor, Tower 2, Excellence City, No.128,  
Zhongkang Road, Shangmeilin, Futian District,  
Shenzhen China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.  
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Date of receipt of test sample : August 21, 2020  
Number of tested samples : 1  
Serial number : Prototype  
Date of Test : August 21, 2020 ~ September 03, 2020  
Date of Report : September 08, 2020



## FCC TEST REPORT

### FCC Part 15, Subpart B, Class B

**Report Reference No.** ..... : **LCS200810197AE**

**Date Of Issue**..... : September 08, 2020

**Testing Laboratory Name** .... : **Shenzhen LCS Compliance Testing Laboratory Ltd.**

**Address** ..... : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, 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 Xtooltech Intelligent Co., Ltd**

**Address** ..... : 2nd Floor, Tower 2, Excellence City, No.128, Zhongkang Road, Shangmeilin, Futian District, Shenzhen China

#### Test Specification

**Standard**..... : FCC Part 15, Subpart B, Class B

**Test Report Form No.**..... : LCSEMC-1.0

**TRF Originator**..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

**Master TRF**..... : Dated 2011-03

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**Test Item Description** ..... : **KC501**

**Trade Mark** ..... : XTOOL

**Test Model**..... : KC501

**Power Supply** ..... : For adapter:  
 Input: AC 100-240V, 50/60Hz, 1A  
 Output: DC 12V, 3A, 36W

**Result** ..... : **Positive**

**Compiled by:**

*Jayden Zhuo*

Jayden Zhuo / Administrators

**Supervised by:**

*Jin Wang*

Jin Wang/ Technique principal

**Approved by:**

*Gavin Liang*

Gavin Liang/ Manager

## FCC -- TEST REPORT

**Test Report No. : LCS200810197AE**
September 08, 2020

Date of issue

Test Model ..... : KC501

EUT..... : KC501

**Applicant..... : Shenzhen Xtooltech Intelligent Co., Ltd**

 Address..... : 2nd Floor, Tower 2, Excellence City, No.128, Zhongkang  
Road, Shangmeilin, Futian District, Shenzhen China

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Telephone..... : /

Fax..... : /

**Factory..... : Shenzhen Xtooltech Intelligent Co., Ltd**

 Address..... : 2nd Floor, Tower 2, Excellence City, No.128, Zhongkang  
Road, Shangmeilin, Futian District, Shenzhen China

Telephone..... : /

Fax..... : /

**Test Result** according to the standards on page 6: **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	September 08, 2020	Initial Issue	Gavin Liang

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## 1. SUMMARY OF STANDARDS AND RESULTS

### 1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	FCC Part 15, Subpart B, Class B	Class B	PASS
Radiated disturbance	FCC Part 15, Subpart B, Class B	Class B	PASS

N/A is an abbreviation for Not Applicable.

#### Test mode:

Mode 1	Normal Operation	Record
--------	------------------	--------

\*\*\*Note: All test modes were tested, but we only recorded the worst case in this report.

## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

EUT	: KC501
Trade Mark	: XTOOL
Test Model	: KC501
Power Supply	: For adapter: Input: AC 100-240V, 50/60Hz, 1A Output: DC 12V, 3A, 36W

Highest internal frequency (Fx)	Highest measured frequency
$F_x \leq 108 \text{ MHz}$	1 GHz
$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2 GHz
$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5 GHz
$F_x > 1 \text{ GHz}$	$5 \times F_x$ up to a maximum of 6 GHz

NOTE 1 For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

Where Fx is unknown, the radiated emission measurements shall be performed up to 6 GHz.

### 2.2. Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
Shenzhen Mingxin Power Technology Co., Ltd	AC/DC ADAPTER	MX36Z1-1203000	--	SDOC

### 2.3. Description of Test Facility

Site Description	
EMC Lab.	: NVLAP Accreditation Code is 600167-0. FCC Designation Number is CN5024. CAB identifier is CN0071. CNAS Registration Number is L4595.

## 2.4. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the 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.

## 2.5. Measurement Uncertainty

Test	Parameters	Expanded Uncertainty (U <sub>lab</sub> )	Expanded Uncertainty (U <sub>cispr</sub> )
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB

( 1 ) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

( 2 ) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.



### 3. TEST RESULTS

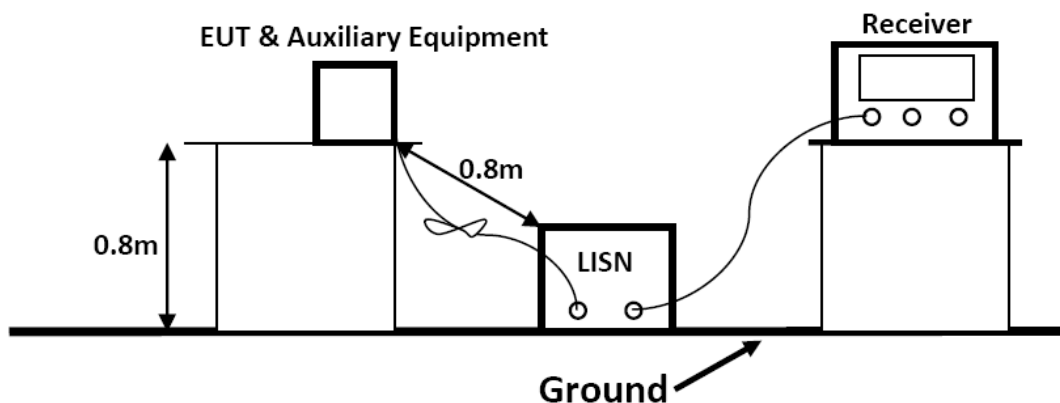
#### 3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

##### 3.1.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	EZ	EZ-EMC	/	N/A	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2020-06-22	2021-06-21
3	Artificial Mains	R&S	ENV216	101288	2020-06-22	2021-06-21
4	10dB Attenuator	SCHWARZBEC K	MTS-IMP-136	261115-001-0032	2020-06-22	2021-06-21

##### 3.1.2. Block Diagram of Test Setup



##### 3.1.3. Test Standard

###### Power Line Conducted Emission Limits (Class B)

Frequency (MHz)			Limit (dB $\mu$ V)	
			Quasi-peak Level	Average Level
0.15	~	0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50	~	5.00	56.0	46.0
5.00	~	30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.

NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

##### 3.1.4. EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

##### 3.1.5. Operating Condition of EUT

3.1.5.1. Setup the EUT as shown on Section 3.1.2

3.1.5.2. Turn on the power of all equipments.

3.1.5.3. Let the EUT work in measuring Mode 1 and measure it.

### 3.1.6. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC/ANSI C63.4-2014 on Conducted Emission Measurement.

The bandwidth of the test receiver is set at 9kHz.

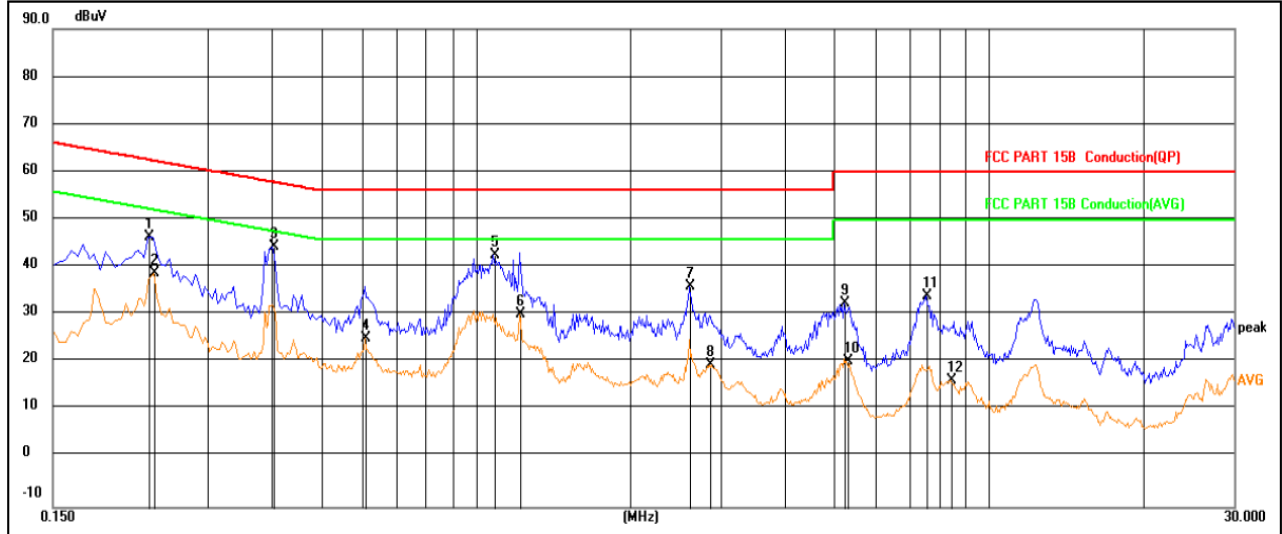
The frequency range from 150kHz to 30MHz is investigated

### 3.1.7. Test Results

**PASS.**

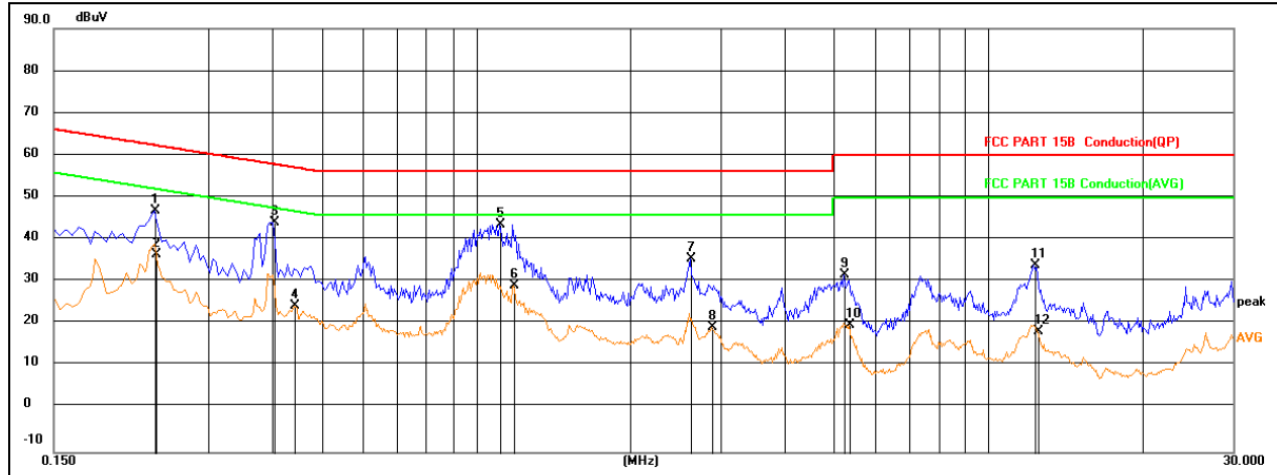
The test result please refer to the next page.

<b>Test Model</b>	KC501	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	23.3°C, 53.7% RH	<b>Test Engineer</b>	Carl Fu
<b>Pol</b>	Line	<b>Test Voltage</b>	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.2310	27.46	19.21	46.67	62.41	-15.74	QP
2	0.2355	19.70	19.22	38.92	52.25	-13.33	AVG
3	0.4020	25.22	19.32	44.54	57.81	-13.27	QP
4	0.6090	6.05	19.27	25.32	46.00	-20.68	AVG
5	1.0859	23.39	19.27	42.66	56.00	-13.34	QP
6	1.2210	11.13	19.29	30.42	46.00	-15.58	AVG
7	2.6160	16.88	19.45	36.33	56.00	-19.67	QP
8	2.8545	0.41	19.46	19.87	46.00	-26.13	AVG
9	5.2305	13.08	19.50	32.58	60.00	-27.42	QP
10	5.2845	1.17	19.51	20.68	50.00	-29.32	AVG
11	7.5570	14.66	19.61	34.27	60.00	-25.73	QP
12	8.4525	-2.98	19.65	16.67	50.00	-33.33	AVG

<b>Test Model</b>	KC501	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	23.3°C, 53.7% RH	<b>Test Engineer</b>	Carl Fu
<b>Pol</b>	Neutral	<b>Test Voltage</b>	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.2355	27.77	19.22	46.99	62.25	-15.26	QP
2	0.2378	17.42	19.22	36.64	52.17	-15.53	AVG
3	0.4020	25.06	19.32	44.38	57.81	-13.43	QP
4	0.4425	5.32	19.32	24.64	47.01	-22.37	AVG
5	1.1130	24.46	19.28	43.74	56.00	-12.26	QP
6	1.1849	10.13	19.29	29.42	46.00	-16.58	AVG
7	2.6340	16.33	19.46	35.79	56.00	-20.21	QP
8	2.8860	0.03	19.47	19.50	46.00	-26.50	AVG
9	5.2305	12.48	19.50	31.98	60.00	-28.02	QP
10	5.3430	0.65	19.51	20.16	50.00	-29.84	AVG
11	12.2685	14.29	19.89	34.18	60.00	-25.82	QP
12	12.4530	-1.41	19.91	18.50	50.00	-31.50	AVG

Note: Pre-Scan all mode, Thus record worse case mode result in this report.  
 Result = Reading + Correct, Margin = Result – Limit.

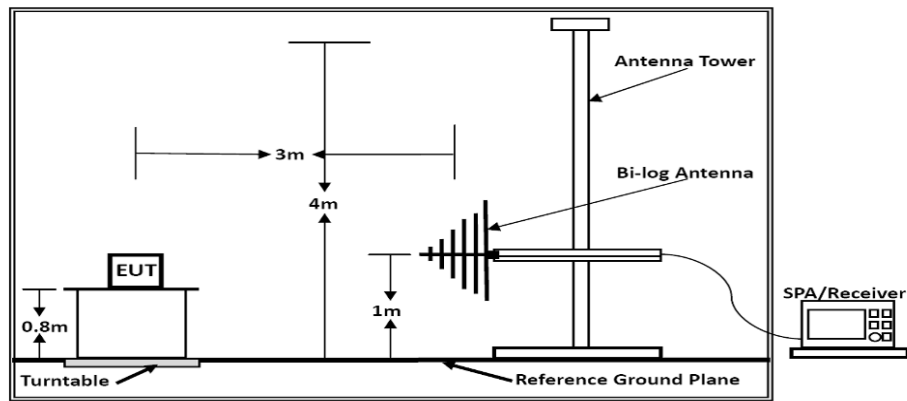
### 3.2. Radiated emission Measurement

#### 3.2.1. Test Equipment

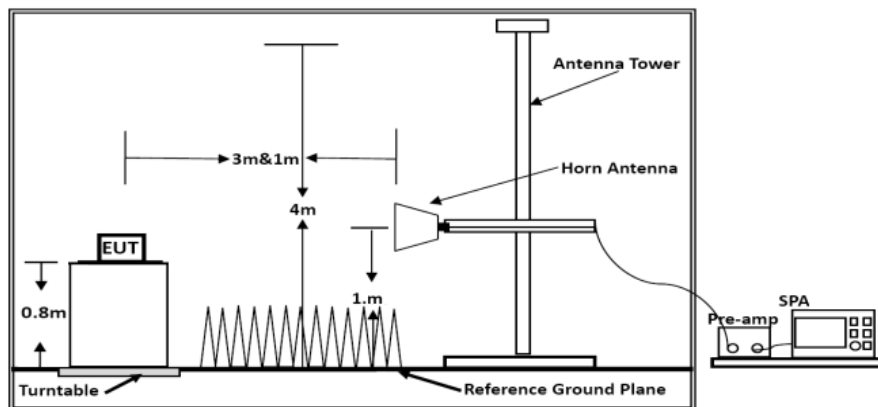
The following test equipments are used during the radiated emission measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	EZ	EZ-EMC	/	N/A	N/A
2	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2019-09-27	2020-09-26
3	Positioning Controller	MF	MF7082	MF78020803	2020-06-22	2021-06-21
4	By-log Antenna	SCHWARZBEC K	VULB9163	9163-470	2018-07-26	2021-07-25
5	Horn Antenna	SCHWARZBEC K	BBHA 9120D	9120D-1925	2018-07-02	2021-07-01
6	EMI Test Receiver	R&S	ESR 7	101181	2020-06-22	2021-06-21
7	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2019-11-22	2020-11-21
8	Broadband Preamplifier	/	BP-01M18G	P190501	2020-06-22	2021-06-21
9	RF Cable-R03m	Jye Bao	RG142	CB021	2020-06-22	2021-06-21
10	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2020-06-22	2021-06-21

#### 3.2.2. Block Diagram of Test Setup



Below 1GHz



Above 1GHz

### 3.2.3. Radiated Emission Limit (Class B)

Limits for Radiated Disturbance Below 1GHz

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46
960 ~ 1000	3	500	54
Remark : (1) Emission level $(\text{dB})\mu\text{V} = 20 \log$ Emission level $\mu\text{V}/\text{m}$ (2) The smaller limit shall apply at the cross point between two frequency bands. (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.			
Limits for Radiated Emission Above 1GHz			
Frequency (MHz)	Distance (Meters)	Peak Limit ( $\text{dB}\mu\text{V}/\text{m}$ )	Average Limit ( $\text{dB}\mu\text{V}/\text{m}$ )
1000 ~ 3000	3	70	42~35
3000 ~ 6000	3	74	42
***Note: The lower limit applies at the transition frequency.			

### 3.2.4. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 3.2.5. Operating Condition of EUT

3.2.5.1. Setup the EUT as shown in Section 3.2.2.

3.2.5.2. Let the EUT work in test Mode 1 and measure it.

### 3.2.6. Test Procedure

EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated by-log antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.

The bandwidth of the EMI test receiver is set at 120kHz, 300kHz.

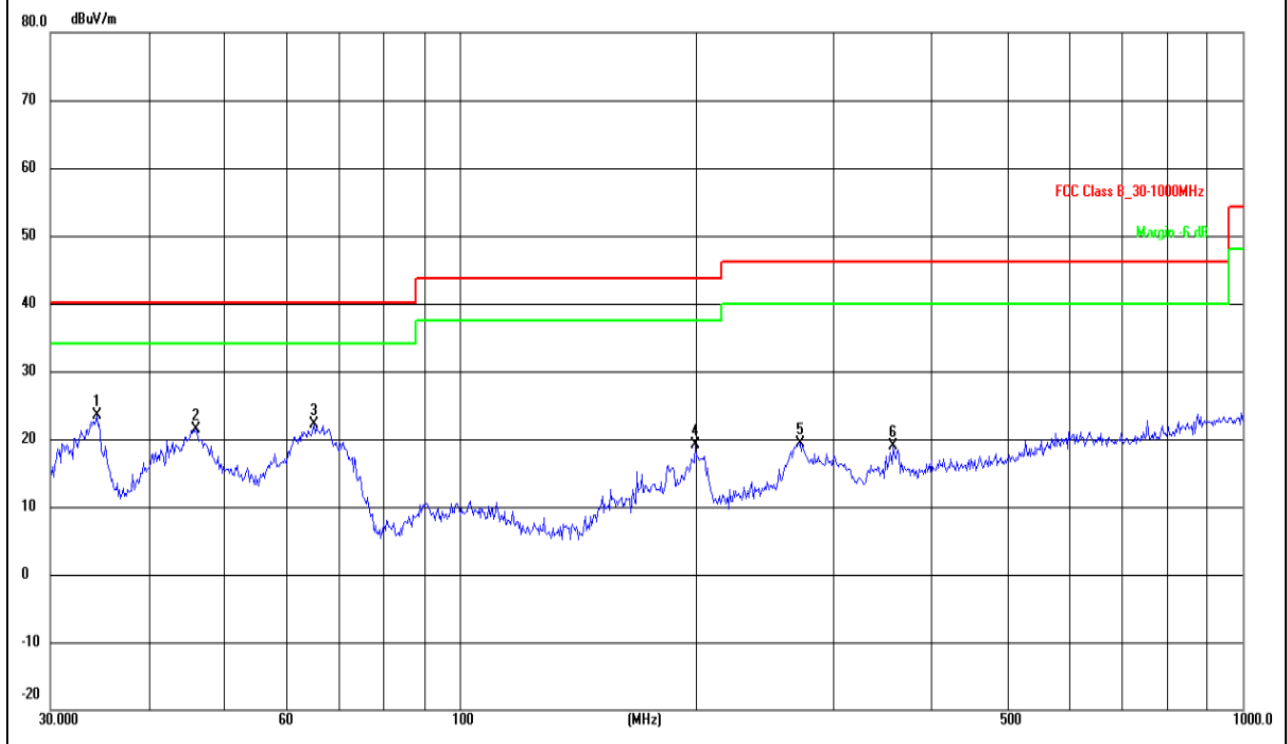
The frequency range from 30MHz to 1000MHz is checked.

### 3.2.7. Radiated Emission Noise Measurement Result

**PASS.**

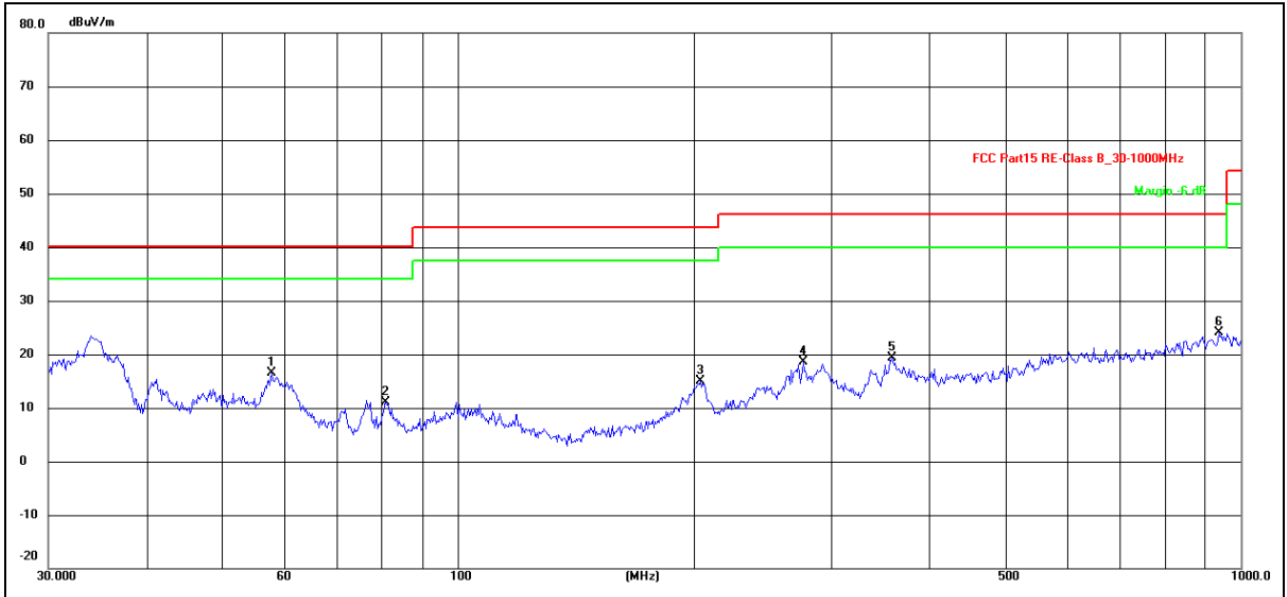
The scanning waveforms please refer to the next page.

<b>Test Model</b>	KC501	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	24.6°C, 54.1% RH	<b>Detector Function</b>	Quasi-peak
<b>Pol</b>	Vertical	<b>Distance</b>	3m
<b>Test Engineer</b>	Carl Fu	<b>Test Voltage</b>	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1 *	34.3962	42.75	-19.32	23.43	40.00	-16.57	QP
2	46.0162	36.98	-15.60	21.38	40.00	-18.62	QP
3	65.1144	40.55	-18.44	22.11	40.00	-17.89	QP
4	199.9855	36.40	-17.20	19.20	43.50	-24.30	QP
5	272.2776	34.55	-15.15	19.40	46.00	-26.60	QP
6	357.9286	32.24	-13.21	19.03	46.00	-26.97	QP

<b>Test Model</b>	KC501	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	24.6°C, 54.1% RH	<b>Detector Function</b>	Quasi-peak
<b>Pol</b>	Horizontal	<b>Distance</b>	3m
<b>Test Engineer</b>	Carl Fu	<b>Test Voltage</b>	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	57.7961	33.11	-16.54	16.57	40.00	-23.43	QP
2	80.9274	32.62	-21.56	11.06	40.00	-28.94	QP
3	204.2375	32.07	-17.06	15.01	43.50	-28.49	QP
4	276.1234	33.62	-15.08	18.54	46.00	-27.46	QP
5	359.1859	32.45	-13.18	19.27	46.00	-26.73	QP
6 *	938.8324	29.65	-5.68	23.97	46.00	-22.03	QP

*Note: Pre-Scan all mode, Thus record worse case mode result in this report.  
 Level = Reading + Factor, Margin = Level – Limit,  
 Factor = Antenna Factor + Cable Loss - Preamp Factor*



#### **4. TEST SETUP PHOTOGRAPHS OF EUT**

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

#### **5. EXTERIOR PHOTOGRAPHS OF THE EUT**

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

#### **6. INTERIOR PHOTOGRAPHS OF THE EUT**

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

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