

APPLICATION FOR VERIFICATION
On Behalf of
SHENZHEN QIAOHUA INDUSTRIES LIMITED.

Fog Machine
Model No.: FM400-K, QL-01, QT-14R

FCC ID: 2AAV8FM400KR

Prepared for : SHENZHEN QIAOHUA INDUSTRIES LIMITED
Address : Qiaohua Industrial Zone, Luo Tian Forestry Center, Song
Gang Town, Bao An District, Shenzhen, Guangdong,
China

Prepared by : Accurate Technology Co., Ltd.
Address : F1, Bldg. A&D, Changyuan New Material Port, Keyuan
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Report No. : ATE20160496
Date of Test : Mar 26, 2016-Apr 05, 2016
Date of Report : Apr 06, 2016

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Test Report Declaration

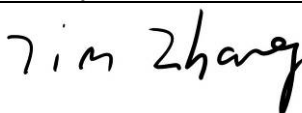
Applicant : SHENZHEN QIAOHUA INDUSTRIES LIMITED.
Manufacturer : SHENZHEN QIAOHUA INDUSTRIES LIMITED.
EUT Description : Fog Machine
(A) MODEL NO.: FM400-K, QL-01, QT-14R
(B) Trade name: QUHWA
(C) POWER SUPPLY: AC 120V/60Hz

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart B ANSI C63.4: 2014

The device described above is tested by Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Accurate Technology Co., Ltd.

Date of Test :	Mar 26, 2016-Apr 05, 2016
Date of Report :	Apr 06, 2016
Prepared by :	 (Tim.zhang, Engineer)
Approved & Authorized Signer :	 (Sean Liu, Manager)

1. TEST RESULTS SUMMARY

Test Items	Test Standard	Test Results
Power Line Conducted Emission	FCC Part 15 Subpart B	Pass
Radiated Emission	FCC Part 15 Subpart B	Pass

2. GENERAL INFORMATION

2.1.Product of Device (EUT)

EUT	: Fog Machine
Model Number	: FM400-K, QL-01, QT-14R Note: These samples are same except for the model number and colors are difference. So we prepare the FM400-K for test
Power Supply	: AC 120V/60Hz
Modulation:	: ASK
Receiver Frequency	: 433.92MHz RX
Applicant	: SHENZHEN QIAOHUA INDUSTRIES LIMITED.
Address	: Qiaohua Industrial Zone, Luo Tian Forestry Center, Song Gang Town, Bao An District, Shenzhen, Guangdong, China
Manufacturer	: SHENZHEN QIAOHUA INDUSTRIES LIMITED.
Address	: Qiaohua Industrial Zone, Luo Tian Forestry Center, Song Gang Town, Bao An District, Shenzhen, Guangdong, China
Date of sample received	: Mar 26, 2016
Date of Test	: Mar 26, 2016-Apr 05, 2016

2.2.Accessory and Auxiliary Equipment

NA

2.3. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen, May 10, 2004

Listed by FCC
The Registration Number is 253065
Listed by FCC
The Registration Number is 752051

Listed by Industry Canada
The Registration Number is 5077A-1
Listed by Industry Canada
The Registration Number is 5077A-2

Accredited by China National Accreditation Committee for Laboratories
The Certificate Registration Number is L3193

Name of Firm : Accurate Technology Co., Ltd.
Site Location : F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen 518057, P.R. China

2.4. Measurement Uncertainty

Conducted emission expanded uncertainty : U=2.23dB, k=2
Power disturbance expanded uncertainty : U=2.92dB, k=2
Radiated emission expanded uncertainty : U=3.08dB, k=2
(9kHz-30MHz)
Radiated emission expanded uncertainty : U=4.42dB, k=2
(30MHz-1000MHz)
Radiated emission expanded uncertainty : U=4.06dB, k=2
(Above 1GHz)

3. MEASURING DEVICE AND TEST EQUIPMENT

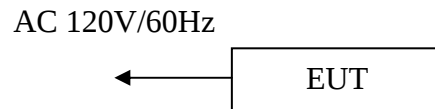
Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated date	Calibrated until
EMI Test FOG MACHINE	Rohde&Schwarz	ESCS30	100307	Jan. 10, 2016	Jan. 09, 2017
EMI Test FOG MACHINE	Rohde&Schwarz	ESPI3	101526/003	Jan. 10, 2016	Jan. 09, 2017
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 10, 2016	Jan. 09, 2017
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 10, 2016	Jan. 09, 2017
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 14, 2016	Jan. 13, 2017
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 14, 2016	Jan. 13, 2017
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 14, 2016	Jan. 13, 2017
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 14, 2016	Jan. 13, 2017
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 10, 2016	Jan. 09, 2017
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 10, 2016	Jan. 09, 2017

4. POWER LINE CONDUCTED MEASUREMENT

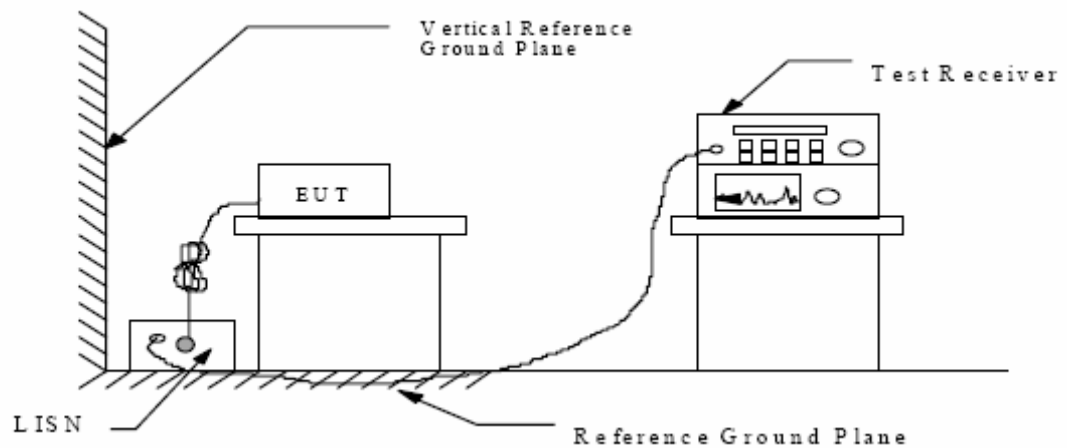
4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



(EUT: Fog Machine)

4.1.2. Shielding Room Test Setup Diagram



(EUT: Fog Machine)

4.2. The Emission Limit

4.2.1. Conducted Emission Measurement Limits According to Section 15.107(a)

Frequency (MHz)	Limit dB(μV)	
	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

* Decreases with the logarithm of the frequency.

4.3. Configuration of EUT on Measurement

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.

4.3.1. Fog Machine (EUT)

Model Number: FM400-K

Serial Number: N/A

Manufacturer: SHENZHEN QIAOHUA INDUSTRIES LIMITED.

4.4. Operating Condition of EUT

4.4.1. Setup the EUT and simulator as shown as Section 4.1

4.4.2. Turn on the power of all equipment.

4.4.3. Let the EUT work in test mode and measure it.

4.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines 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 ANSI C63.4: 2014 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

4.6. Power Line Conducted Emission Measurement Results

PASS.

Test Mode: RX								
MEASUREMENT RESULT: "0496-2_fin"								
2016-4-1 10:01								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.150000	17.50	10.3	66	48.5	QP	L1	GND	
0.826000	15.10	11.6	56	40.9	QP	L1	GND	
1.384000	14.80	11.6	56	41.2	QP	L1	GND	
MEASUREMENT RESULT: "0496-2_fin2"								
2016-4-1 10:01								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.150000	13.00	10.3	56	43.0	AV	L1	GND	
0.778000	10.50	11.5	46	35.5	AV	L1	GND	
1.398000	9.60	11.6	46	36.4	AV	L1	GND	
MEASUREMENT RESULT: "0496-1_fin"								
2016-4-1 9:59								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.150000	17.40	10.3	66	48.6	QP	N	GND	
0.738000	14.80	11.5	56	41.2	QP	N	GND	
1.190000	16.60	11.6	56	39.4	QP	N	GND	
20.612000	1.00	12.0	60	59.0	QP	N	GND	
MEASUREMENT RESULT: "0496-1_fin2"								
2016-4-1 9:59								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.778000	10.50	11.5	46	35.5	AV	N	GND	
1.344000	12.00	11.6	46	34.0	AV	N	GND	

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are shown in the following pages.

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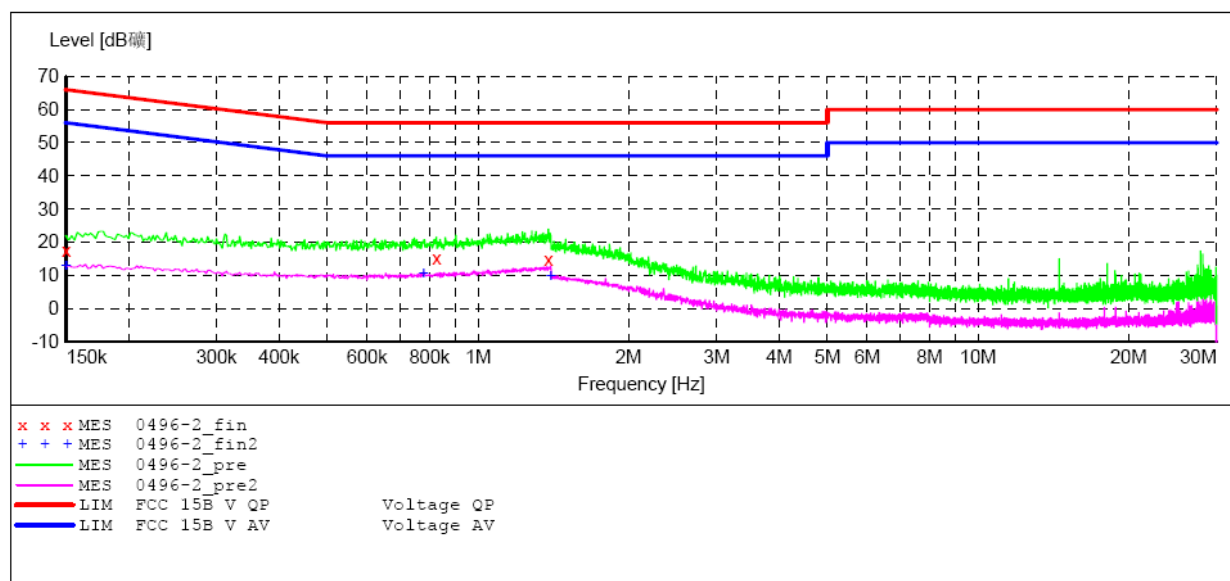
CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: FOG MACHINE M/N:FM400-K
 Manufacturer: QIAOHUA
 Operating Condition: 433.92MHz RX
 Test Site: 2#Shielding Room
 Operator: Frank
 Test Specification: L 120V/60Hz
 Comment: Report NO.:ATE20160496
 Start of Test: 2016-4-1 / 9:59:40

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency 150.0 kHz	Frequency 30.0 MHz	Width 4.5 kHz	QuasiPeak	1.0 s	9 kHz	LISN(ESH3-Z5)
Average						



MEASUREMENT RESULT: "0496-2_fin"

2016-4-1 10:01

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	17.50	10.3	66	48.5	QP	L1	GND
0.826000	15.10	11.6	56	40.9	QP	L1	GND
1.384000	14.80	11.6	56	41.2	QP	L1	GND

MEASUREMENT RESULT: "0496-2_fin2"

2016-4-1 10:01

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	13.00	10.3	56	43.0	AV	L1	GND
0.778000	10.50	11.5	46	35.5	AV	L1	GND
1.398000	9.60	11.6	46	36.4	AV	L1	GND

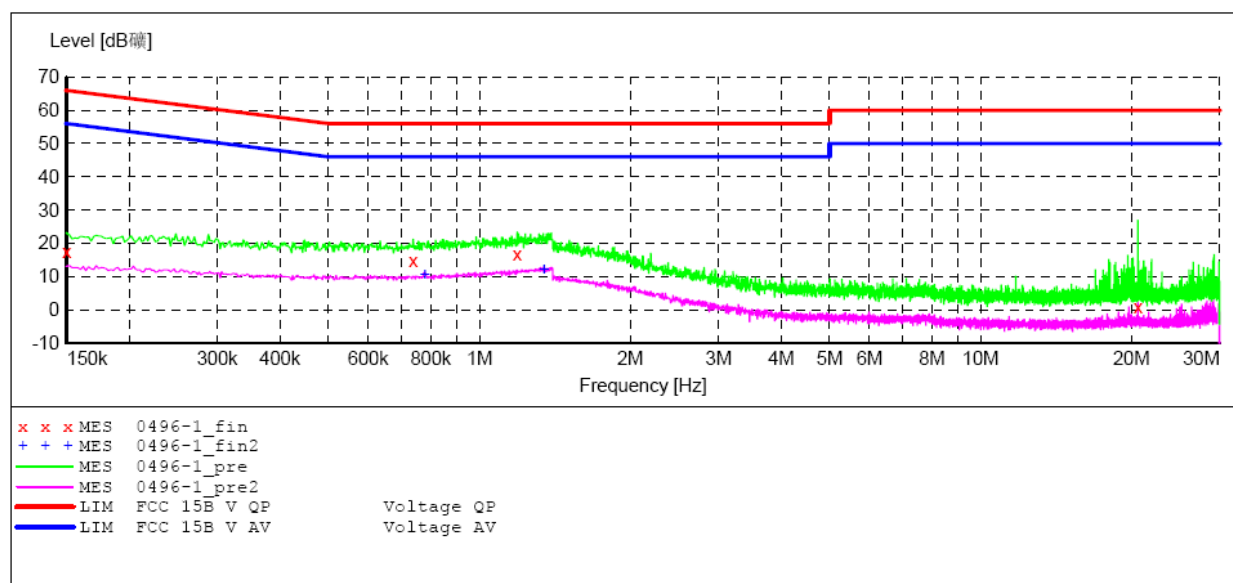
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CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: FOG MACHINE M/N:FM400-K
 Manufacturer: QIAOHUA
 Operating Condition: 433.92MHz RX
 Test Site: 2#Shielding Room
 Operator: Frank
 Test Specification: N 120V/60Hz
 Comment: Report NO.:ATE20160496
 Start of Test: 2016-4-1 / 9:57:26

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN(ESH3-Z5)
 Average



MEASUREMENT RESULT: "0496-1_fin"

2016-4-1 9:59

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	17.40	10.3	66	48.6	QP	N	GND
0.738000	14.80	11.5	56	41.2	QP	N	GND
1.190000	16.60	11.6	56	39.4	QP	N	GND
20.612000	1.00	12.0	60	59.0	QP	N	GND

MEASUREMENT RESULT: "0496-1_fin2"

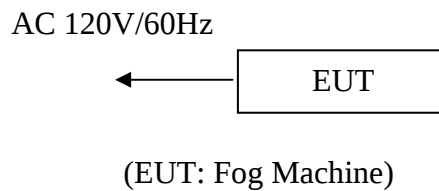
2016-4-1 9:59

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.778000	10.50	11.5	46	35.5	AV	N	GND
1.344000	12.00	11.6	46	34.0	AV	N	GND

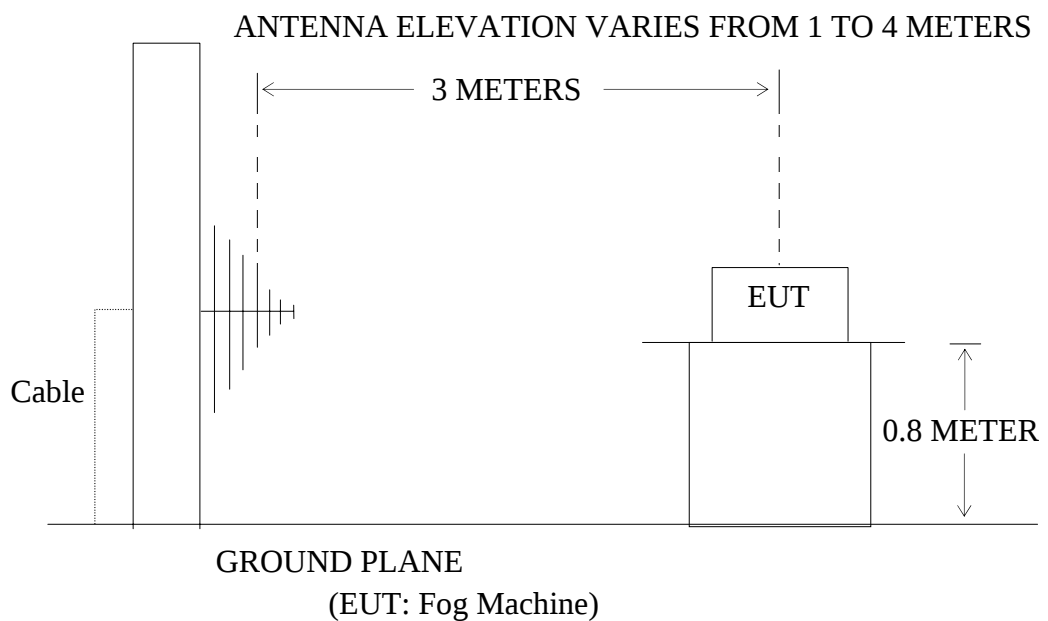
5. RADIATED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup

5.1.1. Block diagram of connection between the EUT and simulators



5.1.2. Semi-Anechoic Chamber Test Setup Diagram



5.2.The Emission Limit For Section 15.109 (a)

5.2.1.Radiation Emission Measurement Limits According to Section 15.109 (a).

Frequency MHz	Distance Meters	Field Strengths Limit	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V/m})$
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
960-1000	3	500	54.0
Remark: (1) Emission level $\text{dB}(\mu\text{V}) = 20 \log \text{Emission level } \mu\text{V/m}$. (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.			

5.3.EUT Configuration on Measurement

The following equipment is 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.

5.3.1.Fog Machine

Model Number: FM400-K

Serial Number: N/A

Manufacturer: SHENZHEN QIAOHUA INDUSTRIES LIMITED.

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 5.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in test mode (RX) and measure it.

5.5.Test Procedure

The 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 an 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 bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are 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(R&S ESCS30) is set at 120kHz from 30MHz to 1000MHz.

The frequency range from 30MHz to 5000MHz is checked.

5.6.Radiated Emission Noise Measurement Result

PASS.

Model Number: FM400-K								
Test mode: RX								
Horizontal	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	39.3204	33.72	-18.88	14.84	40.00	-25.16	QP
	2	45.2538	32.54	-19.45	13.09	40.00	-26.91	QP
	3	336.4817	32.01	-15.09	16.92	46.00	-29.08	QP
Vertical	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	39.3204	33.72	-18.88	14.84	40.00	-25.16	peak
	2	45.2538	32.54	-19.45	13.09	40.00	-26.91	peak
	3	210.1294	32.28	-18.47	13.81	43.50	-29.69	peak
Above 1G								
Horizontal	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	2667.673	42.04	-6.77	35.27	74.00	-38.73	peak
	2	2939.842	41.25	-5.88	35.37	74.00	-38.63	peak
	3	3507.289	41.15	-3.81	37.34	74.00	-36.66	peak
Vertical	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	1841.206	42.17	-9.35	32.82	74.00	-41.18	peak
	2	2549.431	42.78	-7.16	35.62	74.00	-38.38	peak
	3	3501.615	38.95	-3.83	35.12	74.00	-38.88	peak



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Frank #2156

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: FOG MACHINE

Mode: 433.92MHz RX

Model: FM400-K

Manufacturer: QIAOHUA

Polarization: Horizontal

Power Source: AC 120V/60Hz

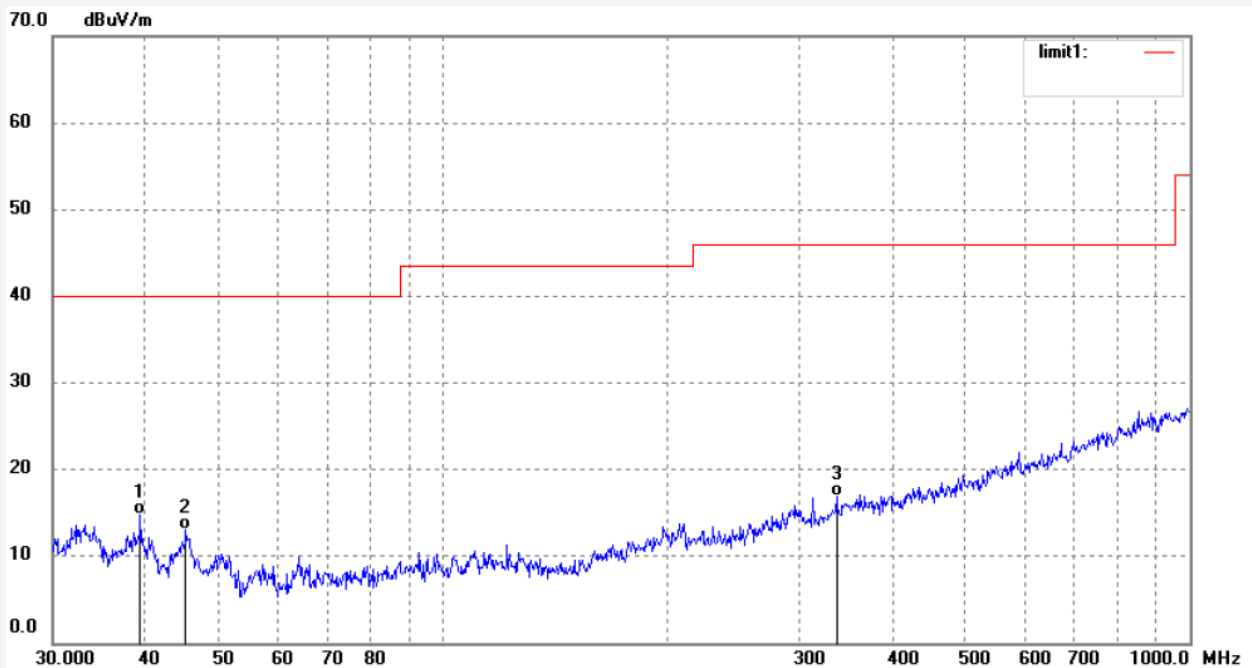
Date: 16/04/05/

Time: 8/45/45

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20160496



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	39.3204	33.72	-18.88	14.84	40.00	-25.16	QP			
2	45.2538	32.54	-19.45	13.09	40.00	-26.91	QP			
3	336.4817	32.01	-15.09	16.92	46.00	-29.08	QP			



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Frank #2155

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: FOG MACHINE

Mode: 433.92MHz RX

Model: FM400-K

Manufacturer: QIAOHUA

Polarization: Vertical

Power Source: AC 120V/60Hz

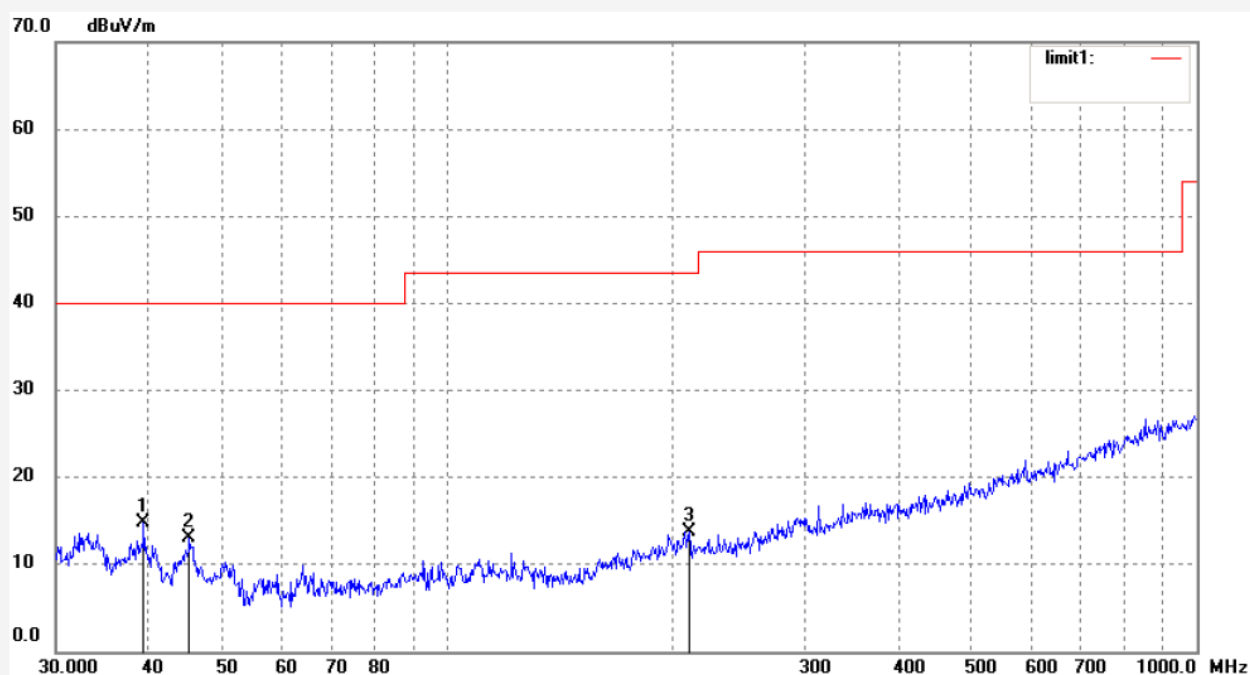
Date: 16/04/05/

Time: 8/45/28

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20160496



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	39.3204	33.72	-18.88	14.84	40.00	-25.16	peak			
2	45.2538	32.54	-19.45	13.09	40.00	-26.91	peak			
3	210.1294	32.28	-18.47	13.81	43.50	-29.69	peak			



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Frank #2161

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: FOG MACHINE

Mode: RX

Model: FM400-K

Manufacturer: QIAOHUA

Polarization: Horizontal

Power Source: AC 120V/60Hz

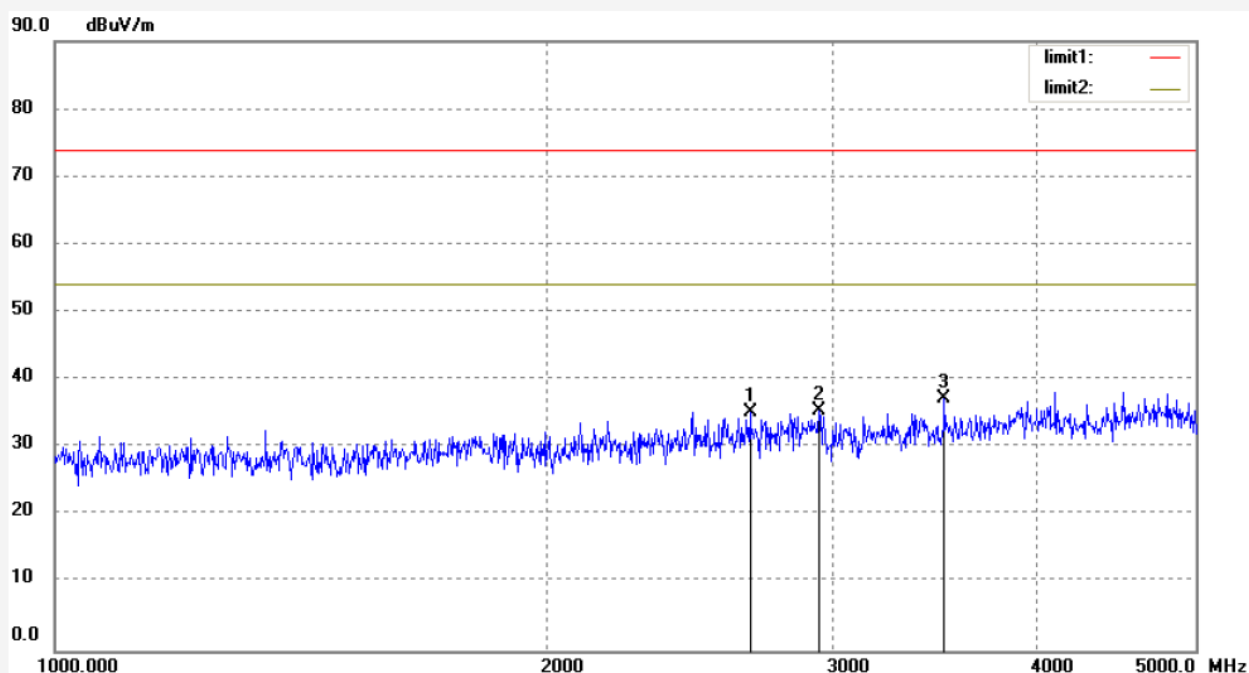
Date: 16/04/05/

Time: 8/52/38

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20160496



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2667.673	42.04	-6.77	35.27	74.00	-38.73	peak			
2	2939.842	41.25	-5.88	35.37	74.00	-38.63	peak			
3	3507.289	41.15	-3.81	37.34	74.00	-36.66	peak			



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Frank #2160

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: FOG MACHINE

Mode: RX

Model: FM400-K

Manufacturer: QIAOHUA

Polarization: Vertical

Power Source: AC 120V/60Hz

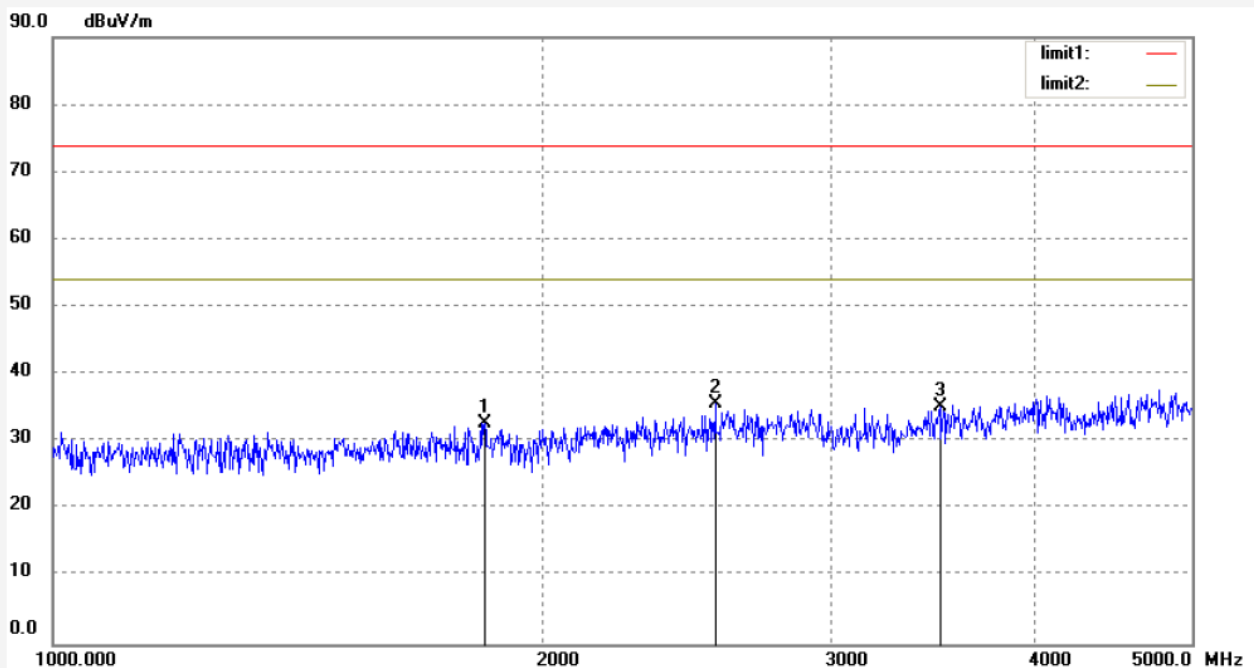
Date: 16/04/05/

Time: 8/51/53

Engineer Signature: Frank

Distance: 3m

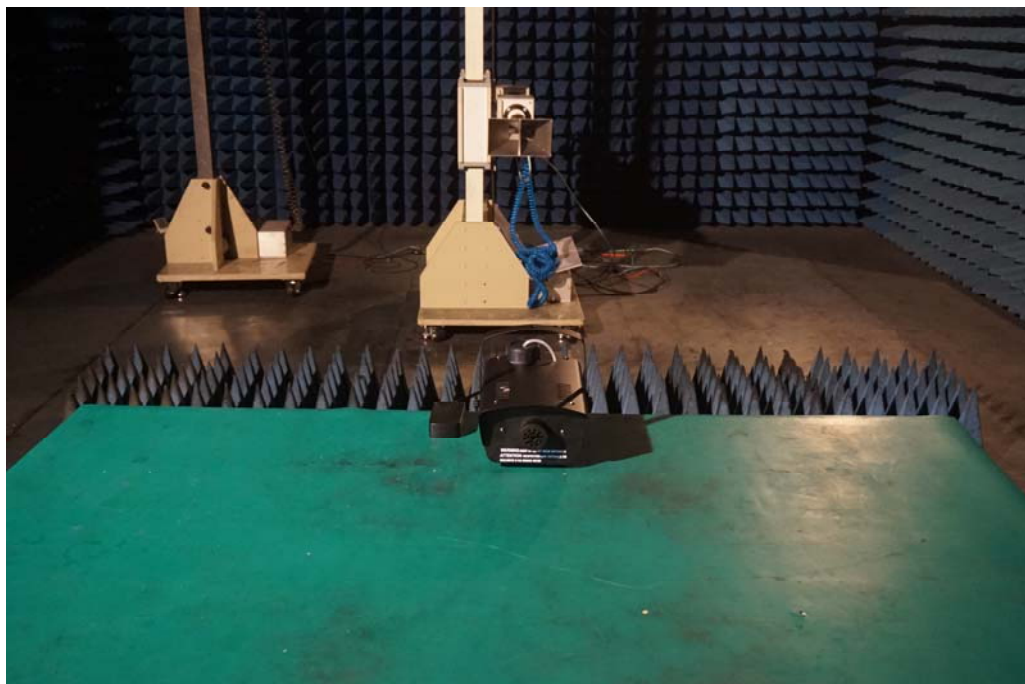
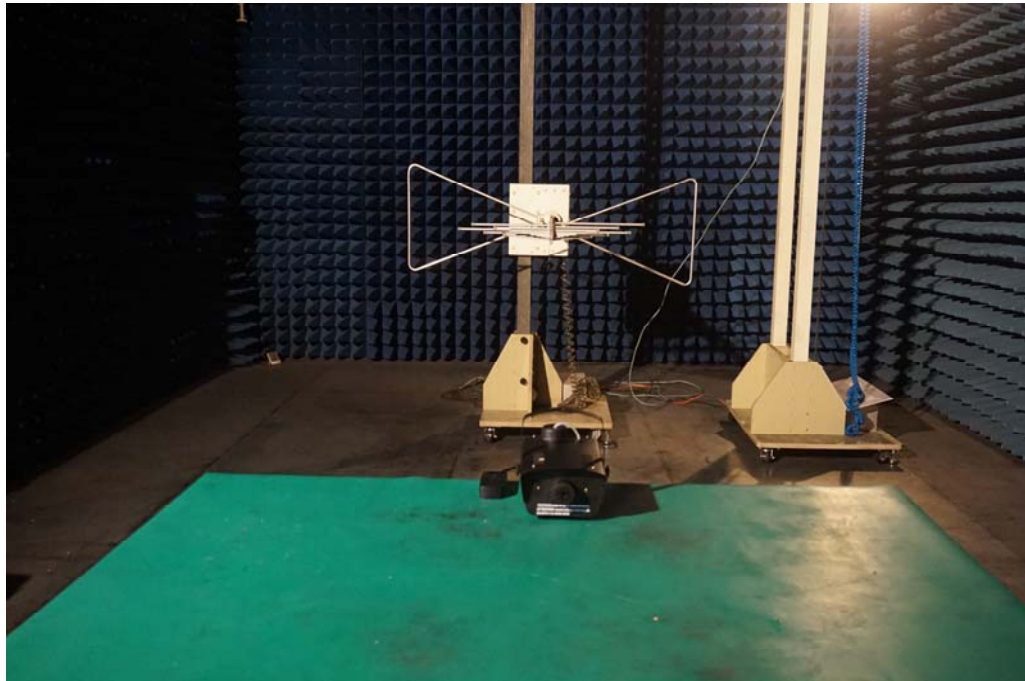
Note: Report NO.:ATE20160496



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1841.206	42.17	-9.35	32.82	74.00	-41.18	peak			
2	2549.431	42.78	-7.16	35.62	74.00	-38.38	peak			
3	3501.615	38.95	-3.83	35.12	74.00	-38.88	peak			

6. PHOTOGRAPHS

6.1.Photos of Radiated Emission Measurement



6.2.Photo of Conducted Emission Measurement



6.3.Photo of EUT







