

RADIO TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results, data evaluation, test procedures, and equipment of configurations shown in this report were made in accordance with the procedures in ANSI C63.10(2013).

Applicant : VA Amplifier LLC
Address : 177A E Main St., Suite 407, New Rochelle, NY 10801
Manufacturer/Factory : VA Amplifier LLC
Address : 177A E Main St., Suite 407, New Rochelle, NY 10801
E.U.T. : Wireless heating oil spill prevention tool
Brand Name : N/A
Model No. : VA00
FCC ID : 2AKLC-VA00
Measurement Standard : FCC PART 15.249: 2016
Date of Receiver : October 10, 2016
Date of Test : October 10, 2016 to December 09, 2016
Date of Report : December 09, 2016

This Test Report is Issued Under the Authority of :

Prepared by



Rose Hu / Engineer

Approved & Authorized Signer



Iori Fan / Authorized Signatory

This test report is for the customer shown above and their specific product only. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

Table of Contents

1. GENERAL INFORMATION	4
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST	4
1.2 RELATED SUBMITTAL(S) / GRANT (S).....	5
1.3 TEST METHODOLOGY	5
1.4 EQUIPMENT MODIFICATIONS	5
1.5 SUPPORT DEVICE	5
1.6 TEST FACILITY AND LOCATION.....	6
1.7 SUMMARY OF TEST RESULTS	7
2. SYSTEM TEST CONFIGURATION.....	8
2.1 EUT CONFIGURATION	8
2.2 SPECIAL ACCESSORIES.....	8
2.3 DESCRIPTION OF TEST MODES	8
3. CONDUCTED EMISSIONS TEST	9
3.1 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	9
3.2 TEST CONDITION	9
3.3 MEASUREMENT RESULTS.....	9
4. RADIATED EMISSION AND BAND EDGE TEST	12
4.1 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	12
4.2 MEASUREMENT PROCEDURE	13
4.3 LIMIT.....	14
4.4 MEASUREMENT RESULTS	15
5. 20DB BANDWIDTH.....	19
5.1 MEASUREMENT PROCEDURE	19
5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	19
5.3 MEASUREMENT RESULTS.....	19
6. ANTENNA REQUIREMENT	21
6.1 MEASUREMENT PROCEDURE	21
6.2 MEASUREMENT RESULTS.....	21
7. TEST EQUIPMENT LIST.....	22

Revision History of This Test Report

Report Number	Description	Issued Date
NTC1610226F	Initial Issue	2016-12-09

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test

This device is a Wireless heating oil spill prevention tool, it's powered by DC 3.7 come from li-ion battery or DC 5V come from USB port. For more details features, please refer to User's Manual.

Power Supply	: DC 5V come from USB Port, DC 3.7V li-ion battery
Adapter	: None
Test voltage	: AC 120V 60Hz Adapter input, DC 3.7V li-ion battery (Only the worst case was recorded in the report.)
Model name	: VA00
Model difference	: None
Hardware version	: 30-VA00-011700 161101
Software version	: V1.1
Serial number	: N/A
Note	: N/A

Technical Specification:

Frequency Range	: 915MHz
Modulation Type	: FMOD
Number of Channel	: 1
Antenna Type	: FPC
Antenna Gain	: 0 dBi (Declaration by manufacturer)

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **2AKLC-VA00** filing to comply with Section 15.249 of the FCC Part 15 (2016), Subpart C Rule.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters.

1.4 Equipment Modifications

Not available for this EUT intended for grant.

1.5 Support Device

Adapter : Model: BSYC050200UW
Input: AC100-240V 50/60Hz 0.5A
Output: DC 5.0V 2000mA

1.6 Test Facility and Location

Listed by CNAS, August 14, 2015
The certificate is valid until August 13, 2018
The Laboratory has been assessed and proved to be
in compliance with CNAS/CL01
The Certificate Registration Number is L5795.

Listed by FCC, July 03, 2014
The Certificate Registration Number is 665078.
Listed by Industry Canada, June 18, 2014
The Certificate Registration Number is 46405-9743.

Dongguan NTC Co., Ltd.
(Full Name: Dongguan Nore Testing Center Co., Ltd.)

Building D, Gaosheng Science and Technology Park, Hongtu Road,
Nancheng District, Dongguan City, Guangdong, China
(Full Name: Building D, Gaosheng Science & Technology Park,
Zhouxi Longxi Road, Nancheng District, Dongguan, Guangdong, China.

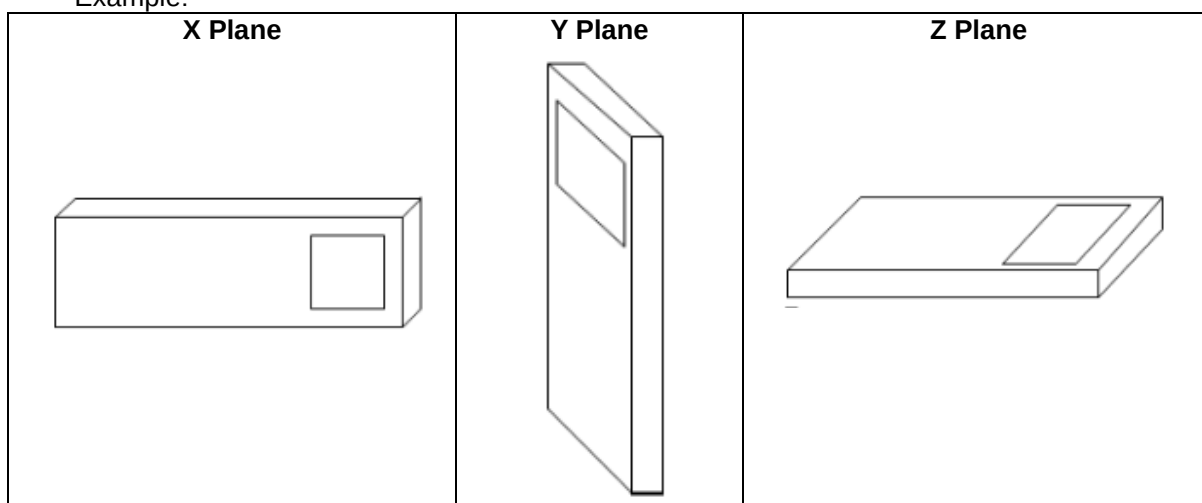
1.7 Summary of Test Results

FCC Rules	Description Of Test	Uncertainty	Result
§15.207(a)	AC Power Conducted Emission	±1.06dB	Compliant
§15.249(a)/ 15.209	Radiated Emissions	±3.70dB	Compliant
§15.249(d)/ 15.205	Band Edge	±1.70dB	Compliant
§15.215(c)	20dB Bandwidth	±1.42 x10 ⁻⁴ %	Compliant
§15.203	Antenna Requirement	±0.60dB	Compliant

Note: 1. The EUT has been tested as an independent unit. And Continual transmitting in maximum power (the fully-charged battery is used during the measurement)

2. The EUT powered by battery and operating multiple positions, so the EUT shall be performed three orthogonal planes. The worst plane is Z.

Example:



2. System Test Configuration

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 which intends to maximize its emission characteristics in a continuous normal application.

2.2 Special Accessories

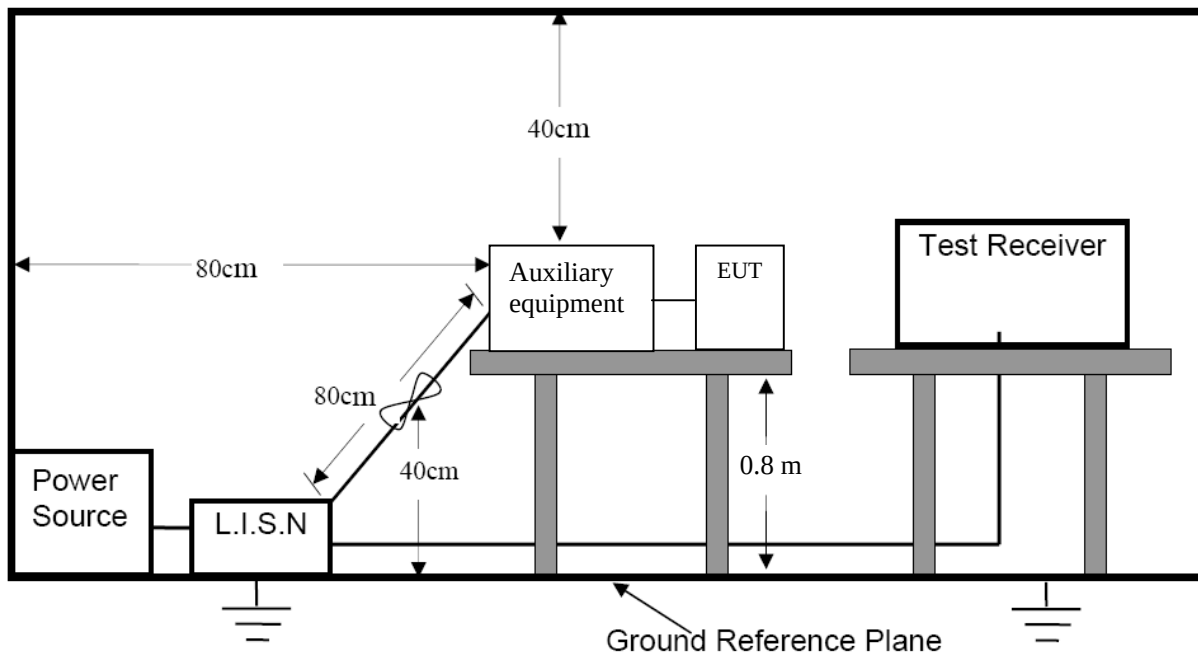
Not available for this EUT intended for grant.

2.3 Description of test modes

The EUT has been tested under operating condition.

3. Conducted Emissions Test

3.1 Test SET-UP (Block Diagram of Configuration)



3.2 Test Condition

Test Requirement: FCC Part 15.207

Frequency Range: 150KHz ~ 30MHz

Detector: RBW 9KHz, VBW 30KHz

Operation Mode: Charging+TX Mode

3.3 Measurement Results

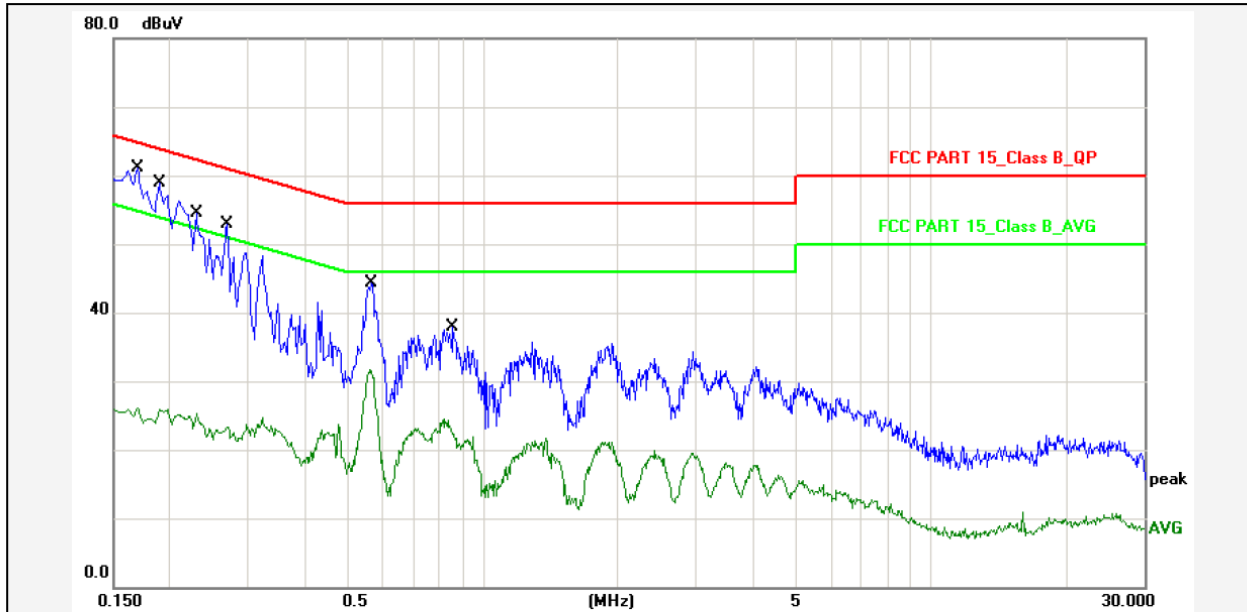
Please refer to following plots.



Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Conduction

Test Time: 2016-11-7 11:06:00



Report No.: VA00

Test Standard: FCC PART 15_Class B_QP

Test item: Conducted Emission

Applicant: VA Amplifier

Product: Wireless heating oil spill prevention tool

Model No.: VA00

Phase: L1

Temp.()/Hum.(%): 22(C) / 52 %

Power Rating: AC 120V/60Hz

Test Engineer: Jerry

Test Mode: Charging+TX

Remark:

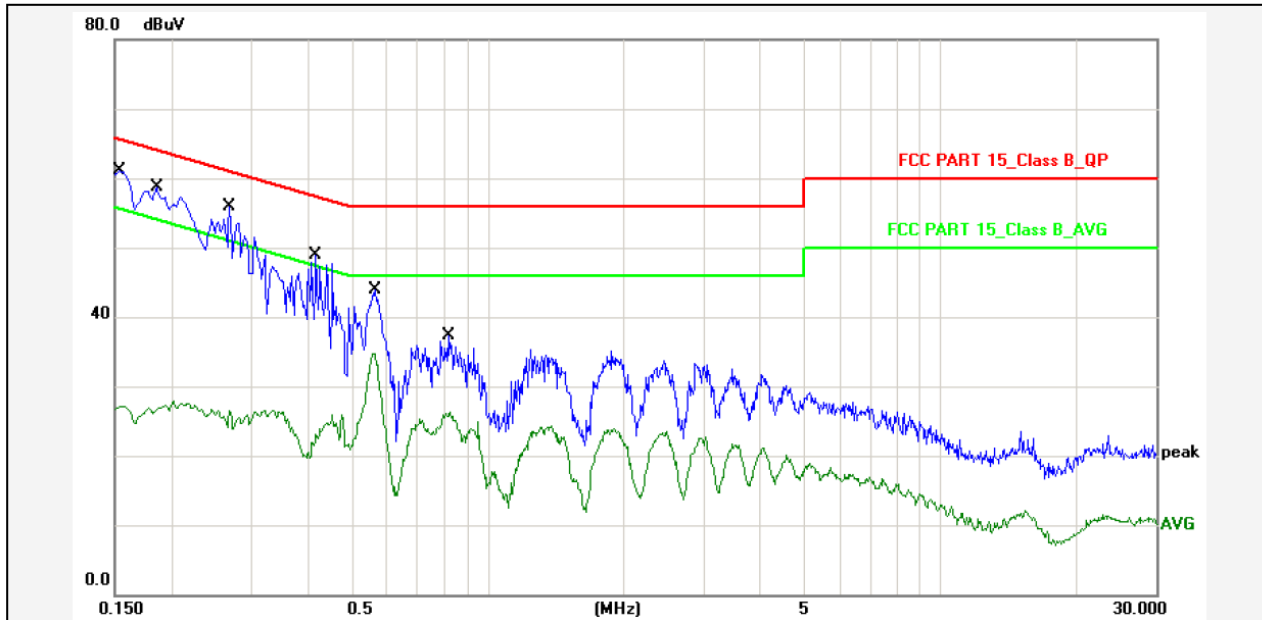
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1700	10.80	47.30	58.10	64.96	-6.86	QP	P	
2	0.1700	10.80	13.40	24.20	54.96	-30.76	AVG	P	
3	0.1900	10.80	45.10	55.90	64.03	-8.13	QP	P	
4	0.1900	10.80	13.10	23.90	54.03	-30.13	AVG	P	
5	0.2300	10.80	40.60	51.40	62.45	-11.05	QP	P	
6	0.2300	10.80	12.60	23.40	52.45	-29.05	AVG	P	
7	0.2700	10.80	39.00	49.80	61.12	-11.32	QP	P	
8	0.2700	10.80	10.40	21.20	51.12	-29.92	AVG	P	
9	0.5660	10.80	30.40	41.20	56.00	-14.80	QP	P	
10	0.5660	10.80	18.90	29.70	46.00	-16.30	AVG	P	
11	0.8580	10.80	24.10	34.90	56.00	-21.10	QP	P	
12	0.8580	10.80	11.80	22.60	46.00	-23.40	AVG	P	



Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Conduction

Test Time: 2016-11-7 11:13:03



Report No.: VA00

Test Standard: FCC PART 15_Class B_QP

Test item: Conducted Emission

Phase: N

Applicant: VA Amplifier

Temp.()/Hum.(%): 22(C) / 52 %

Product: Wireless heating oil spill prevention tool

Power Rating: AC 120V/60Hz

Model No.: VA00

Test Engineer: Jerry

Test Mode: Charging+TX

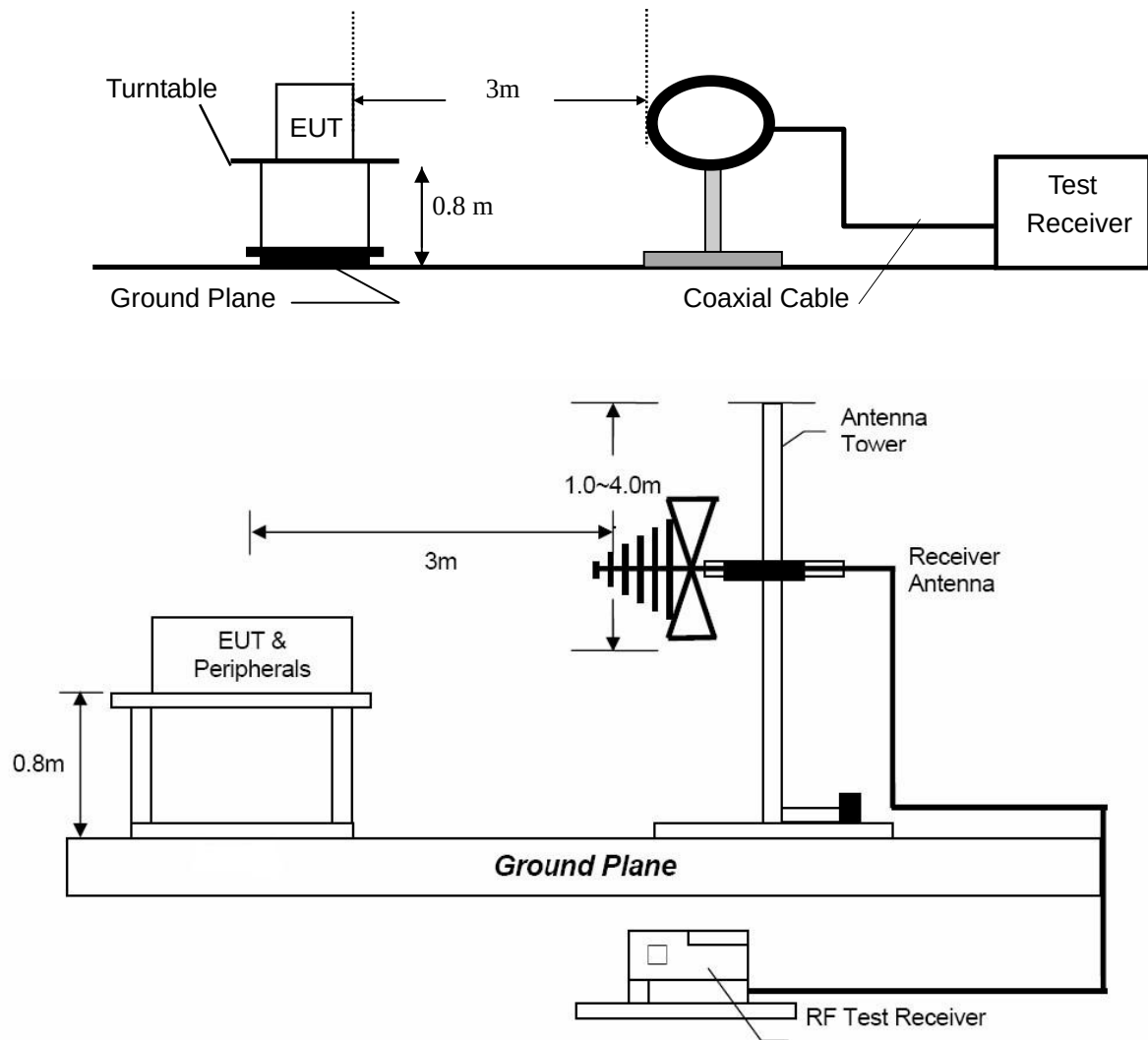
Remark:

No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1539	10.80	47.30	58.10	65.78	-7.68	QP	P	
2	0.1539	10.80	14.40	25.20	55.78	-30.58	AVG	P	
3	0.1860	10.80	44.90	55.70	64.21	-8.51	QP	P	
4	0.1860	10.80	14.60	25.40	54.21	-28.81	AVG	P	
5	0.2700	10.80	42.00	52.80	61.12	-8.32	QP	P	
6	0.2700	10.80	13.60	24.40	51.12	-26.72	AVG	P	
7	0.4180	10.80	35.00	45.80	57.49	-11.69	QP	P	
8	0.4180	10.80	11.60	22.40	47.49	-25.09	AVG	P	
9	0.5660	10.80	30.00	40.80	56.00	-15.20	QP	P	
10	0.5660	10.80	22.10	32.90	46.00	-13.10	AVG	P	
11	0.8180	10.80	23.50	34.30	56.00	-21.70	QP	P	
12	0.8180	10.80	13.40	24.20	46.00	-21.80	AVG	P	

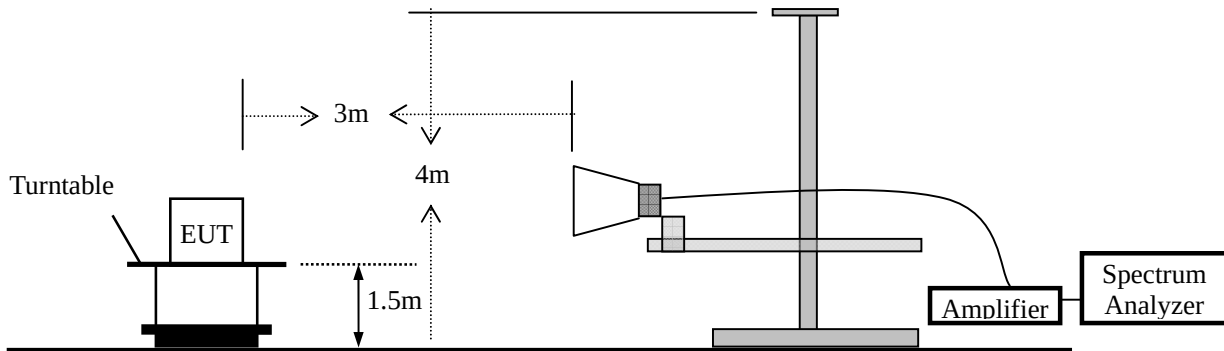
4. Radiated Emission and Band Edge Test

4.1 Test SET-UP (Block Diagram of Configuration)

4.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz



4.1.2 Radiated Emission Test Set-Up, Frequency above 1GHz



4.2 Measurement Procedure

- Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
- For the radiated emission test above 1GHz:
The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Level	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
	Average	1 MHz	10 Hz

4.3 Limit

Frequency range MHz	Distance Meters	Field Strengths Limit (15.209)	
		$\mu\text{V/m}$	
0.009 ~ 0.490	300	2400/F(kHz)	
0.490 ~ 1.705	30	24000/F(kHz)	
1.705 ~ 30	30	30	
30 ~ 88	3	100	
88 ~ 216	3	150	
216 ~ 960	3	200	
Above 960	3	500	
Frequency range MHz	Distance Meters	Field Strengths Limit (15.249)	
		mV/m (Field strength of fundamental)	$\mu\text{V/m}$ (Field strength of Harmonics)
902 ~ 928	3	50	500
2400 ~ 2483.5	3	50	500
5725 ~ 5875	3	50	500
24000 ~ 2425000	3	250	2500

- Remark : (1) Emission level (dB) μV = 20 log Emission level $\mu\text{V/m}$
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
(4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

4.4 Measurement Results

Please refer to following test plots of the worst case: Charging+TX.

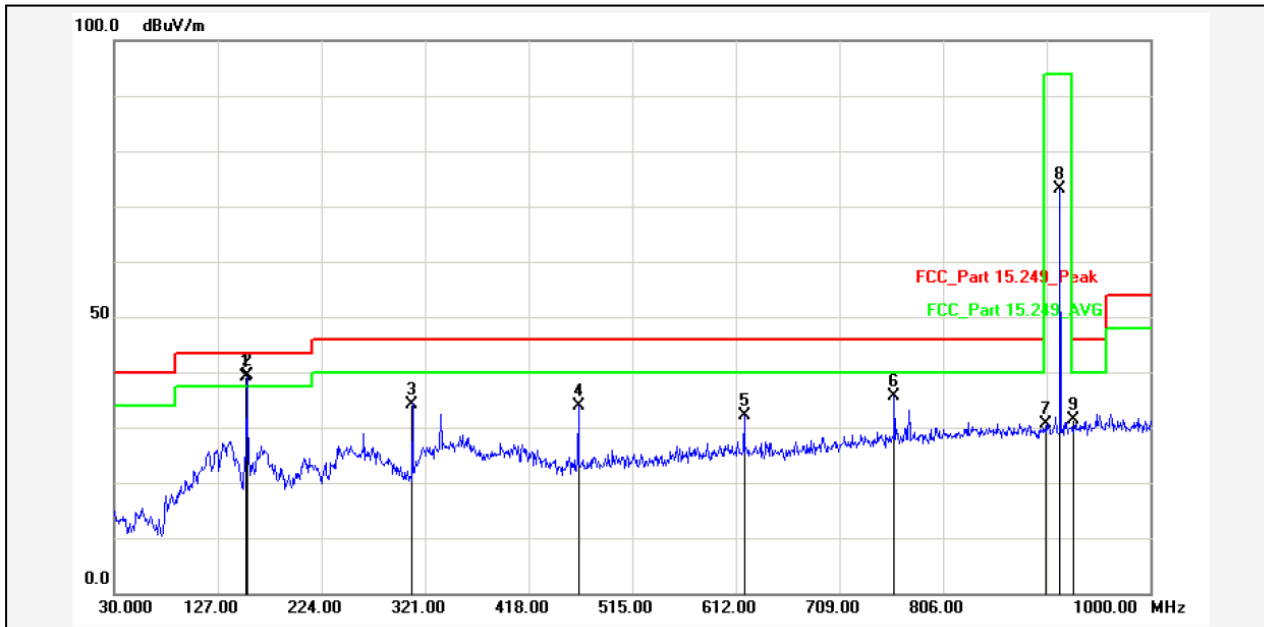
For Spurious Emission, Fundamental radiation, Band Edge.



Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Radiation

Test Time: 2016-11-8 16:54:59



Report No.: VA00

Test Standard: FCC_Part 15.249_Peak

Test Distance: 3m

Test item: Radiation Emission

Ant. Polarization: Horizontal

Applicant: VA Amplifier

Temp.(C)/Hum.(%): 22(C) / 54 %

Product: Wireless heating oil spill prevention tool

Power Rating: AC 120V/60Hz

Model No.: VA00

Test Engineer: Chilam

Test Mode: Charging+TX

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	154.1596	-15.38	54.59	39.21	43.50	-4.29	peak			P	
2	154.1600	-15.38	54.88	39.50	43.50	-4.00	QP			P	
3	309.3599	-10.22	44.42	34.20	46.00	-11.80	QP			P	
4	464.5600	-7.62	41.42	33.80	46.00	-12.20	QP			P	
5	619.7600	-5.05	37.15	32.10	46.00	-13.90	QP			P	
6	760.4099	-2.46	38.06	35.60	46.00	-10.40	QP			P	
7	902.0000	-1.19	31.75	30.56	46.00	-15.44	QP			P	
8	915.0920	-0.92	74.00	73.08	94.00	-20.92	QP			P	
9	928.0000	-0.67	32.10	31.43	46.00	-14.57	QP			P	

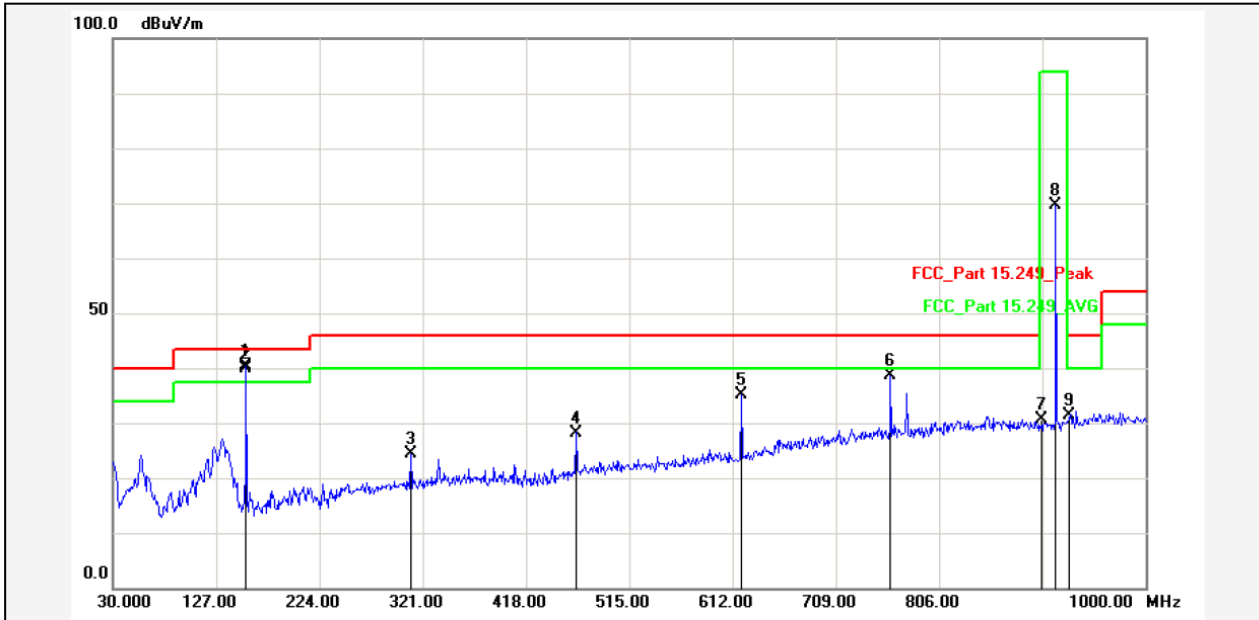
Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.



Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Radiation

Test Time: 2016-11-8 16:47:28



Report No.: VA00

Test Standard: FCC_Part 15.249_Peak

Test Item: Radiation Emission

Applicant: VA Amplifier

Product: Wireless heating oil spill prevention tool

Model No.: VA00

Test Distance: 3m

Ant. Polarization: Vertical

Temp.(C)/Hum.(%): 22(C) / 54 %

Power Rating: AC 120V/60Hz

Test Engineer: Chilam

Test Mode: Charging+TX

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	155.1297	-18.36	58.82	40.46	43.50	-3.04	peak			P	
2	155.1300	-18.36	58.23	39.87	43.50	-3.63	QP			P	
3	310.3299	-12.20	36.50	24.30	46.00	-21.70	QP			P	
4	465.5300	-9.58	37.78	28.20	46.00	-17.80	QP			P	
5	620.7300	-7.03	42.13	35.10	46.00	-10.90	QP			P	
6	760.4099	-2.46	41.16	38.70	46.00	-7.30	QP			P	
7	902.0000	-1.19	31.86	30.67	46.00	-15.33	QP			P	
8	915.0920	-0.92	70.54	69.62	94.00	-24.38	QP			P	
9	928.0000	-0.67	31.99	31.32	46.00	-14.68	QP			P	

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

For Harmonic radiation.

Frequency range: 30MHz~10GHz
Operation Mode: TX
Test Result: PASS Temperature : 22 °C
Measured Distance: 3m Humidity : 54 %
Test Date : November 08, 2016 Test By: Anson

Freq. (MHz)	Ant.Pol. H/V	Reading Level (dBuV)	Factor (dB/m)	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
1830	V	54.11	-3.10	51.01	74.0	-22.99	peak
1830	V	51.43	-3.10	48.33	54.0	-5.67	AV
2745	V	42.46	1.27	43.73	74.0	-30.27	peak
2745	V	39.38	1.27	40.65	54.0	-13.35	AV
3660	V	38.63	3.06	41.69	74.0	-32.31	peak
3660	V	35.50	3.06	38.56	54.0	-15.44	AV

1830	H	48.67	-3.10	45.57	74.0	-28.43	peak
1830	H	45.77	-3.10	42.67	54.0	-11.33	AV
2745	H	36.18	1.27	37.45	74.0	-36.55	peak
2745	H	33.01	1.27	34.28	54.0	-19.72	AV
3660	H	42.29	3.06	45.35	74.0	-28.65	peak
3660	H	39.13	3.06	42.19	54.0	-11.81	AV

- Note:**
- (1) All Readings are Peak Value and AV.
 - (2) Emission Level= Reading Level + Factor
 - (3) Factor= Antenna Gain + Cable Loss – Amplifier Gain
 - (4) Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits.
 - (5) Measurement uncertainty : ± 3.7 dB.
 - (6) Horn antenna used for the emission over 1000MHz.

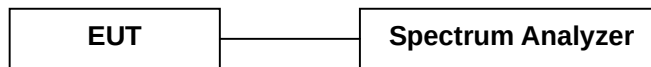
5. 20dB Bandwidth

5.1 Measurement Procedure

The 20dB bandwidth of the emission was contained within the frequency band designated which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered, FCC Rule 15.215(c):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. Use the spectrum 20dB down delta function to measure the bandwidth.

5.2 Test SET-UP (Block Diagram of Configuration)

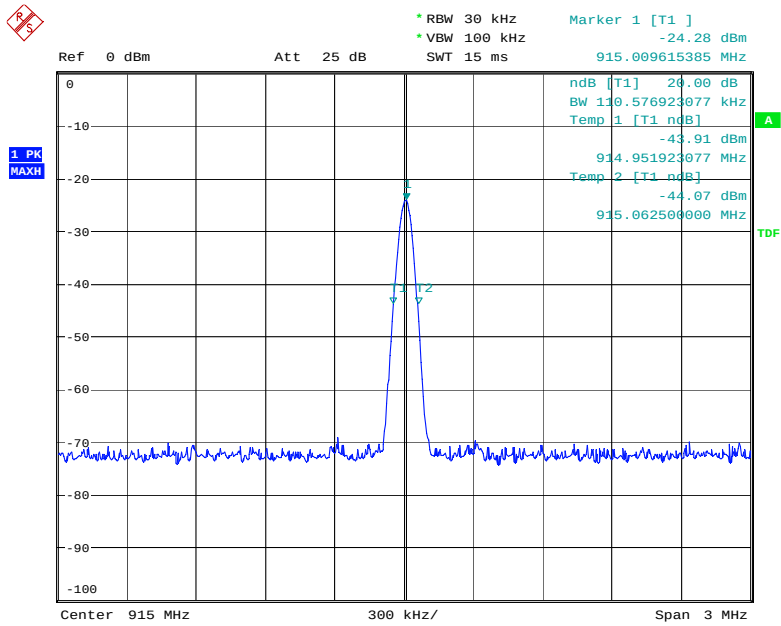


5.3 Measurement Results

Refer to attached data chart.

RBW:	30KHz	VBW:	100KHz
Spectrum Detector:	PK	Temperature :	22 °C
Test By:	Sance	Humidity :	54 %
Test Result:	PASS	Test Date :	October 18, 2016

Channel frequency (MHz)	20dB Down BW(kHz)
915	111



Date: 28.OCT.2016 13:33:11

6. Antenna requirement

6.1 Measurement Procedure

According to of FCC part 15C section 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

6.2 Measurement Results

The antenna is FPC antenna and no consideration of replacement, and the best case gain of the antenna is 0dBi. So, the antenna is consider meet the requirement.

7. Test Equipment List

Description	Manufacturer	Model Number	Serial Number	Characteristics	Calibration Date	Calibration Due Date
Test Receiver	Rohde & Schwarz	ESCI7	100837	9KHz~7GHz	Nov. 22, 2016	Nov. 21, 2017
Antenna	Schwarzbeck	VULB9162	9162-010	30MHz~7GHz	Nov. 25, 2016	Nov. 24, 2017
Positioning Controller	UC	UC 3000	N/A	0~360°, 1-4m	N/A	N/A
Color Monitor	SUNSPO	SP-140A	N/A	N/A	N/A	N/A
Single Phase Power Line Filter	SAEMC	PF201A-32	110210	32A	N/A	N/A
3 Phase Power Line Filter	SAEMC	PF401A-200	110318	200A	N/A	N/A
DC Power Filter	SAEMC	PF301A-200	110245	200A	N/A	N/A
Cable	Huber+Suhner	CBL2-NN-1M	22390001	9KHz~7GHz	Nov. 06, 2016	Nov. 05, 2017
Cable	Huber+Suhner	CIL02	N/A	9KHz~7GHz	Nov. 06, 2016	Nov. 05, 2017
RF Cable	Huber+Suhner	SF-104	MY16559/4	9KHz~25GHz	Mar. 06, 2016	Mar. 05, 2017
Power Amplifier	HP	HP 8447D	1145A00203	100KHz~1.3GHz	Nov. 06, 2016	Nov. 05, 2017
Horn Antenna	Schwarzbeck	BBHA9170	9170-372	15GHz~26.5GHz	Oct.22, 2016	Oct.21, 2017
Horn Antenna	Com-Power	AH-118	071078	1GHz~18GHz	Nov. 04, 2016	Nov. 03, 2017
Loop antenna	Daze	ZA30900A	0708	9KHz~30MHz	Oct.09, 2016	Oct.08, 2017
Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	20Hz~26.5GHz	Aug. 31, 2016	Aug. 30, 2017
Pre-Amplifier	Agilent	8449B	3008A02964	1GHz~26.5GHz	Nov. 02, 2016	Nov. 01, 2017
L.I.S.N.	Rohde & Schwarz	ENV 216	101317	9KHz~30MHz	Nov. 02, 2016	Nov. 01, 2017
Temporary antenna connector	TESCOM	SS402	N/A	9KHz-25GHz	N/A	N/A

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

---End---