

## TEST REPORT

<b>Applicant:</b>	King's New Energy Co., Ltd
<b>Address of Applicant:</b>	Shangchong St, Tanjiang Ave, Dajiang, Taishan, Guangdong, China
<b>Manufacturer:</b>	King's New Energy Co., Ltd
<b>Address of Manufacturer:</b>	Shangchong St, Tanjiang Ave, Dajiang, Taishan, Guangdong, China
<b>Product name:</b>	KNE's Automatic Cleaning System
<b>Model:</b>	Frame:KCS, Control box:KP-A
<b>Rating(s):</b>	DC 24V, 4A
<b>Trademark:</b>	/
<b>FCC register number:</b>	935596
<b>FCC ID</b>	ZND54647864833
<b>Standards:</b>	FCC Part15 subpart B(2009 Edition) ANSI C63.4 (2003)
<b>Data of Receipt:</b>	2011-05-30
<b>Date of Test:</b>	2011-05-31
<b>Date of Issue:</b>	2011-06-03
<b>Test Result</b>	<b>Pass*</b>

\* In the configuration tested, the test item complied with the standards specified above.

### Authorized for issue by:

#### Test by:

June.07.2011 Jummy Qiu

Project Engineer

#### Reviewed by:

June.07.2011 Pauler Li

Project Engineer

Date

Name/Position

Signature

Date

Name/Position

Signature

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**Testing Laboratory information:**

Testing Laboratory Name ..... : I-Test Laboratory  
Address ..... : 1-2 floor, South Block, Building A2 , No 3 Keyan Lu, Science City, Guangzhou, Guangdong Province, P.R. China  
Testing location ..... : Same as above  
Tel..... : 0086-20-32209330  
Fax ..... : 0086-20-62824387  
E-mail ..... : itl@i-testlab.com

**Possible test case verdicts:**

- test case does not apply to the test object... : N/A
- test object does meet the requirement..... : P (Pass)
- test object does not meet the requirement . : F (Fail)

**General remarks:**

**The test results presented in this report relate only to the object tested.**

**The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.**

This report would be invalid test report without all the signatures of testing technician and approver.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

**General product information:**

The EUT include two parts, one is control box with a 433.92MHz receiver, and The other part is the clean frame. The two parts connect together with one signal cable. And should use together. It can receive the control signal from the corresponding transmitter to be controlled the working conditions.

**Test Summary:**

The following standards have been applied to ensure the product conforms with the protection requirements of the council directive FCC part 15B.

<b>Electromagnetic Emissions</b>			
<b>Test Item</b>	<b>Class</b>	<b>Test Standard</b>	<b>Result</b>
Conducted Emission(0.15-30MHz)	B	FCC part15.107	PASS
Radiated Emission(30-5000MHz)	B	FCC part15.109	PASS

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## Section 1 General Information and Equipment Used

### 1.1 Client Information

Applicant: King's New Energy Co., Ltd  
Address of Applicant: Shangchong St, Tanjiang Ave, Dajiang, Taishan, Guangdong, China

### 1.2 EUT General and Technical Descriptions

EUT Name: KNE's Automatic Cleaning System  
EUT Model: Frame:KCS, Control box:KP-A  
EUT Trademark: /  
Input Voltage: DC 24V  
Frequency: /  
Input Power/Current: 4A  
Output rated: /  
Power Cable Description: /  
Other Cables Description: /  
I/O Ports: /  
Function(s) Description: Automatic cleaning system with 433.92MHz super regenerative receiver  
Accessories information: /

### 1.3 Support Equipment(s) and Test Configuration

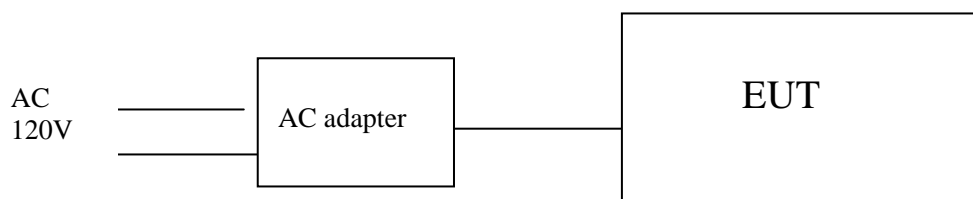
#### 1.3.1 Details of Support Equipment(s)

Description	Manufacturer	Model No.	Connection	Working state
AC adapter	Wentong	WT24000500	/	Normal

#### 1.3.2 Working State of EUT

Power Supply of EUT: 120V~/60Hz  
EUT Status: The EUT was set up and tested as typically used.  
The Signal generator "SMT06" together with a transmitting antenna was employed to radiate 433.92MHz CW signal in close proximity to the EUT.

#### 1.3.3 Block Diagram of Test Configuration



#### 1.4 Equipment Used during Test

Conducted Emission					
Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
EMI Test receiver	R&S	ESCI	ITL-102	2011/04/21	2012/04/21
Two-line v-network	R&S	ENV216	ITL-103	2011/05/04	2012/05/04
Shielded Room	ETS•Lindgren	8*4*3	ITL-101	2009/03/13	2012/03/12

Radiated Emission					
Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Semi-Anechoic chamber	ETS•Lindgren	FACT3 2.0	ITL-100	2009/04/11	2012/04/10
Shielding room	ETS•Lindgren	8*4*3	ITL-101	2009/03/13	2012/03/12
EMI Test receiver	R&S	ESU40	ITL-116	2011/04/21	2012/04/21
EMI Test receiver	R&S	ESCI	ITL-102	2011/04/21	2012/04/21
1-26.5GHz Pre-amplifier	Agilent	8449B	ITL-115	2011/04/21	2012/04/21
Biconilog Antenna	ETS•Lindgren	3142D	ITL-105	2009/01/29	2012/01/28
Horn Antenna	R&S	HF906	ITL-118	2010/04/15	2013/04/15
Signal generator	R&S	SMT06	ITL-112	2011/04/21	2012/04/21

## Section 2 Emission Test Results

### 2.1 Conducted Emission at Mains Terminals, 150 KHz to 30MHz

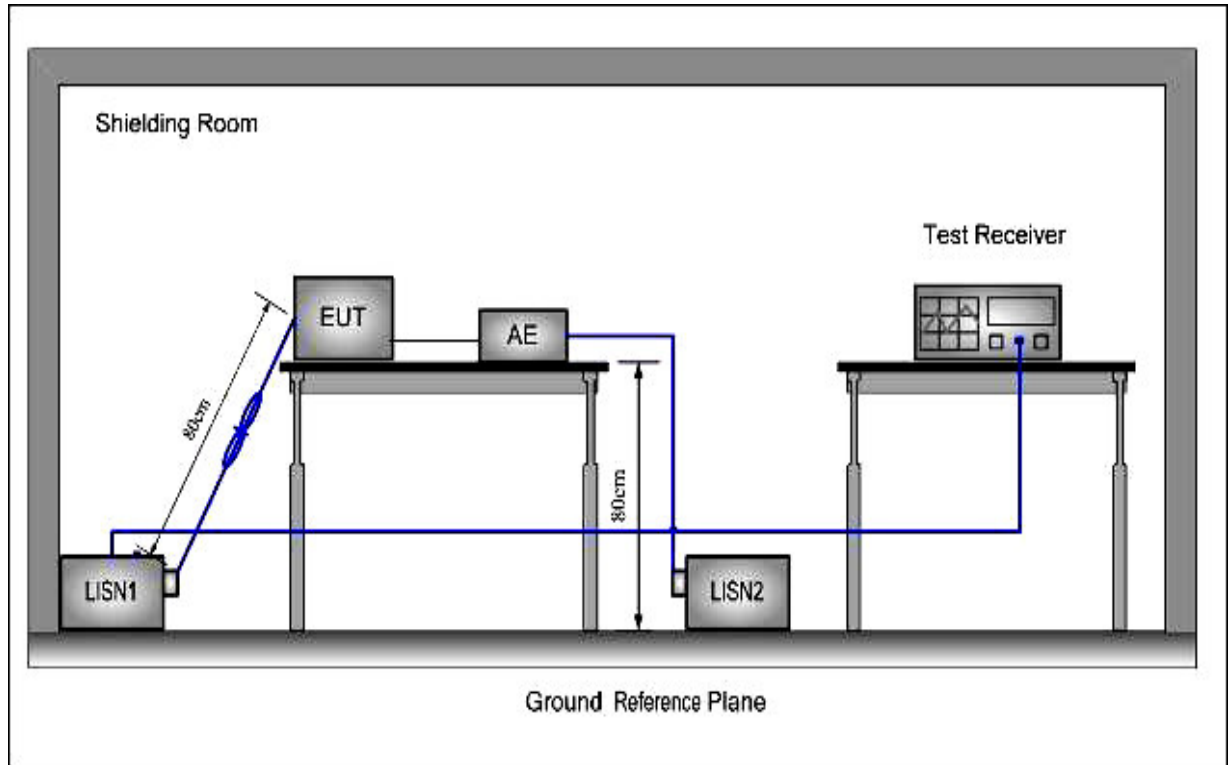
Test Requirement: FCC part 15.107  
Test Method: FCC part 15B  
Test Voltage: 120V AC  
Test Date: 2011-05-31  
Frequency Range: 150 KHz to 30MHz  
Detector: Peak for pre-scan  
Quasi-Peak and Average at frequency with maximum peak  
(9 kHz resolution bandwidth)  
Class / Limit: Class B

Frequency range MHz	Class B Limits dB (µV)	
	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
NOTE 1 :The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		
NOTE 2: The lower limit is applicable at the transition frequency.		

#### 2.1.1 E.U.T. Operation

Operating Environment:  
Temperature: 25.0 °C      Humidity: 45 % RH      Atmospheric Pressure: 101 k Pa  
EUT Operation: Normal Working

## 2.1.2 Test Setup and Procedure

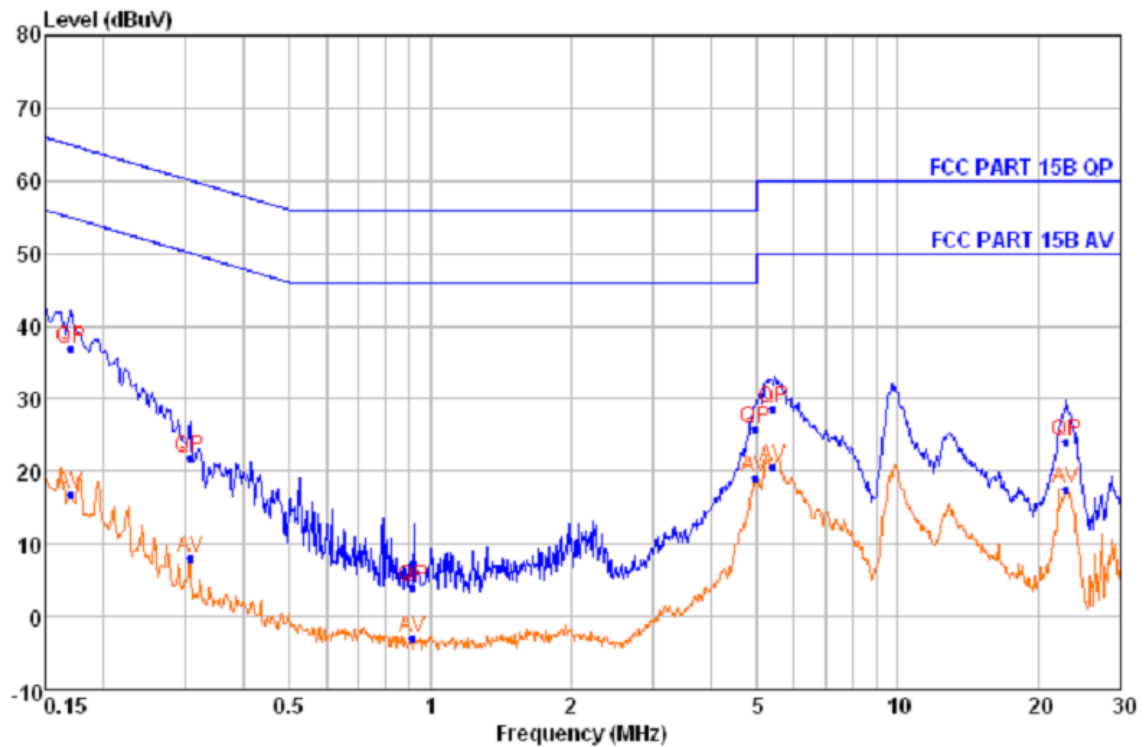


1. The mains terminal disturbance voltage test was conducted in a shielded room.
2. The EUT was connected to nominal power supply through a LISN 1 (Line Impedance Stabilization Network) which provides a  $50\Omega/50\mu\text{H}+5\Omega$  linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

### 2.1.3 Measurement Data

Pre-scan was performed with peak detected on both line and neutral cable. Quasi-peak & average measurements were performed at the frequencies which maximum peak emission level was detected. Please see the attached Quasi-peak and Average test results.



**Model:****Live Line:****Peak Scan:****Level (dBμV)**

Quasi-peak and Average measurement

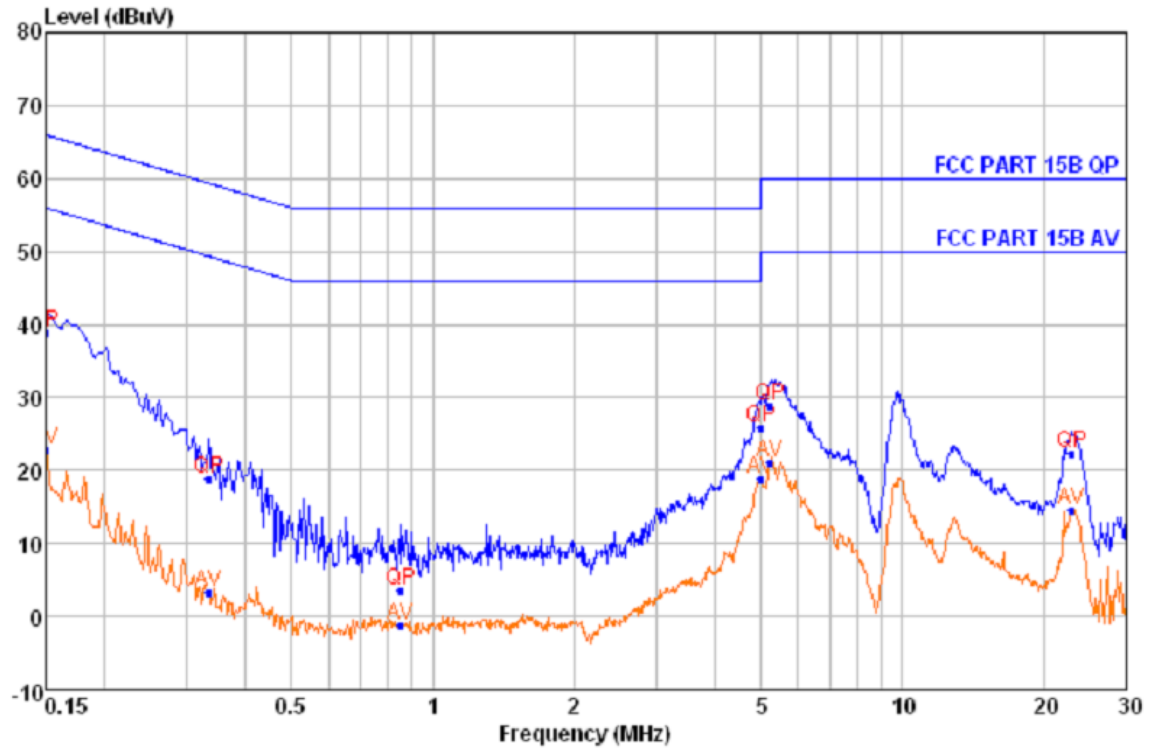
NO.	Freq MHz	Level dBμV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBμV	Margin dB
1	0.170	36.83	QP	9.69	0.21	64.94	-28.11
2	0.170	16.79	Average	9.69	0.21	54.94	-38.15
3	0.306	21.75	QP	9.67	0.24	60.08	-38.33
4	0.306	8.02	Average	9.67	0.24	50.08	-42.06
5	0.921	3.93	QP	9.68	0.30	56.00	-52.07
6	0.921	-3.05	Average	9.68	0.30	46.00	-49.05
7	4.968	25.91	QP	9.60	0.40	56.00	-30.09
8	4.968	19.10	Average	9.60	0.40	46.00	-26.90
9	5.435	28.63	QP	9.62	0.40	60.00	-31.37
10	5.435	20.67	Average	9.62	0.40	50.00	-29.33
11	22.957	24.10	QP	9.67	0.48	60.00	-35.90
12	22.957	17.52	Average	9.67	0.48	50.00	-32.48

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**Neutral Line:**

Peak Scan:

Level (dBμV)



## Quasi-peak and Average measurement

NO.	Freq MHz	Level dBμV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBμV	Margin dB
1	0.150	38.97	QP	9.71	0.20	66.00	-27.03
2	0.150	22.79	Average	9.71	0.20	56.00	-33.21
3	0.333	18.95	QP	9.65	0.25	59.37	-40.42
4	0.333	3.26	Average	9.65	0.25	49.37	-46.11
5	0.855	3.57	QP	9.63	0.30	56.00	-52.43
6	0.855	-1.27	Average	9.63	0.30	46.00	-47.27
7	5.000	25.93	QP	9.62	0.40	56.00	-30.07
8	5.000	18.92	Average	9.62	0.40	46.00	-27.08
9	5.236	28.89	QP	9.62	0.40	60.00	-31.11
10	5.236	21.11	Average	9.62	0.40	50.00	-28.89
11	22.957	22.24	QP	9.63	0.48	60.00	-37.76
12	22.957	14.65	Average	9.63	0.48	50.00	-35.35

## 2.2 Radiated Emissions, 30MHz to 5GHz

Test Requirement:	FCC part15B
Test Method:	FCC part 15B
Test Voltage:	120V AC 60Hz
Test Date:	2011-05-31
Frequency Range:	30MHz to 5GHz
Measurement Distance	3m
Detector:	Peak for pre-scan Quasi-Peak if maximised peak within 6dB of limit below 1GHz (120 kHz resolution bandwidth) AV & Peak for above 1GHz (1 MHz RBW for measuring above 1 GHz)
Class / Limit:	Class B

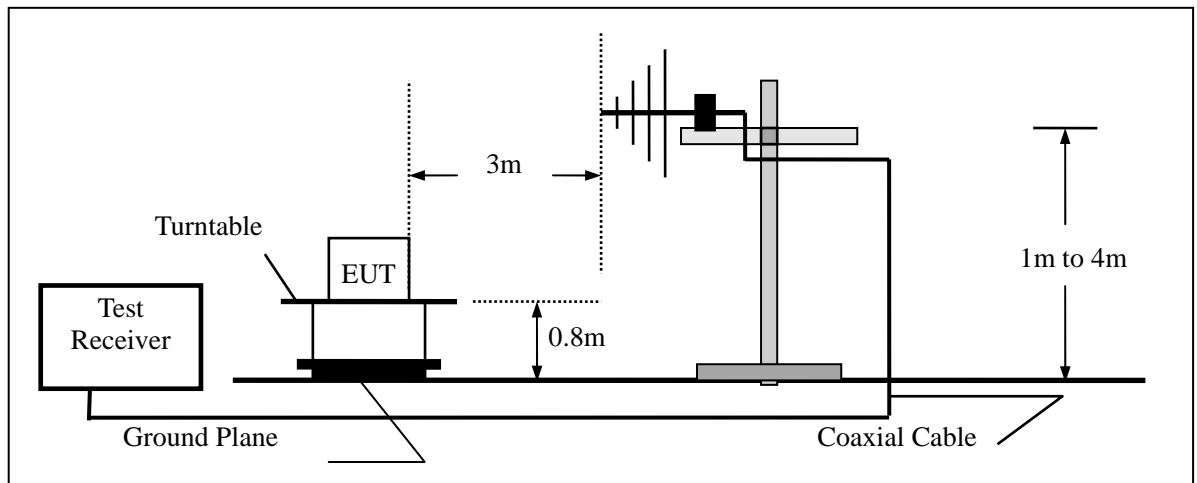
Frequency range MHz	Quasi-peak limits dB (µV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
960 to 1000	54
Above 1000	74 for peak limit; 54 for av limit
At transitional frequencies the lower limit applies	

### 2.2.1 E.U.T. Operation

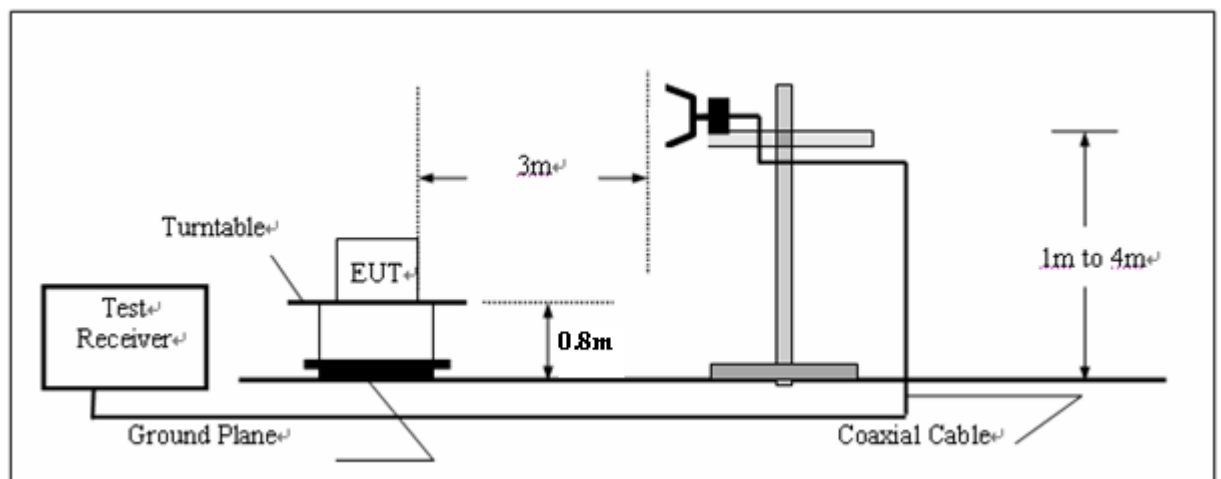
Operating Environment:		
Temperature: 25.0 °C	Humidity: 45 % RH	Atmospheric Pressure: 101 k Pa
EUT Operation: Normal working		

## 2.2.2 Test Setup and Procedure

(a) Radiated Emission Test Set-Up, Frequency below 1000MHz



(b) Radiated Emission Test Set-Up, Frequency above 1000MHz



1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. Bi-log and Horn antenna was used for the frequency range from 30MHz to 6GHz
3. The EUT was connected to nominal power supply through a mains power outlet which was bonded to the ground reference plane; The mains cables were draped to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
5. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

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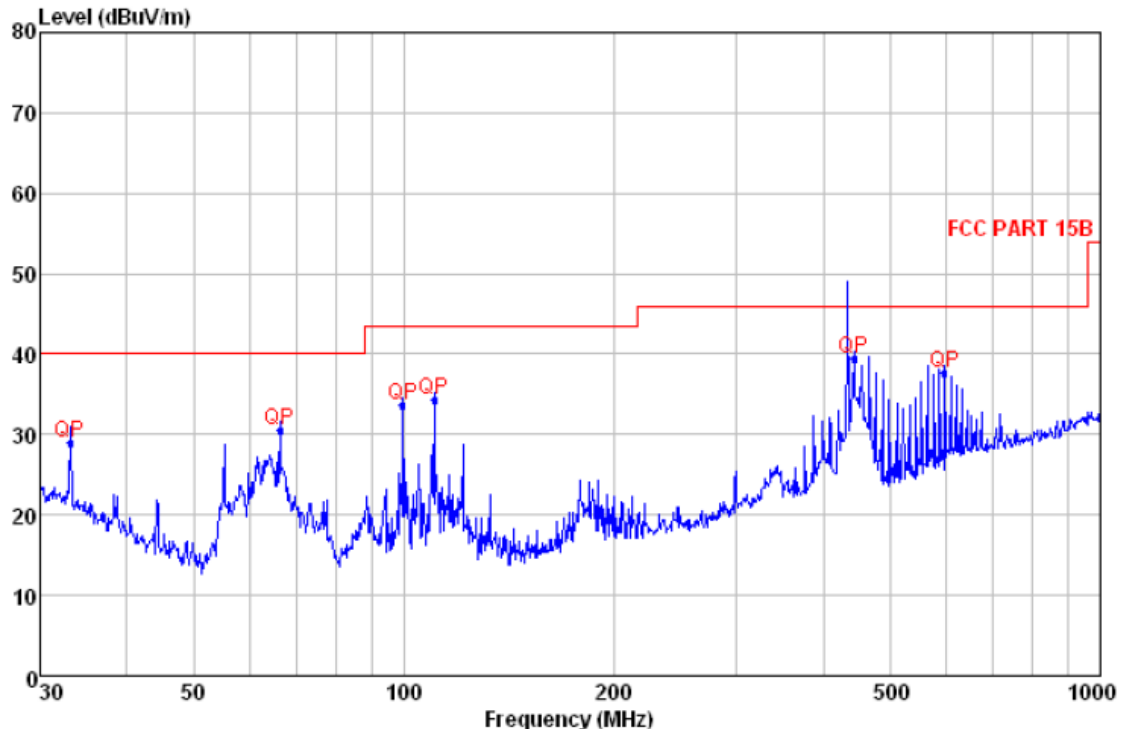
### 2.2.3 Measurement Data

Below 1GHz

Horizontal:

Peak scan

Level (dBμV/m)



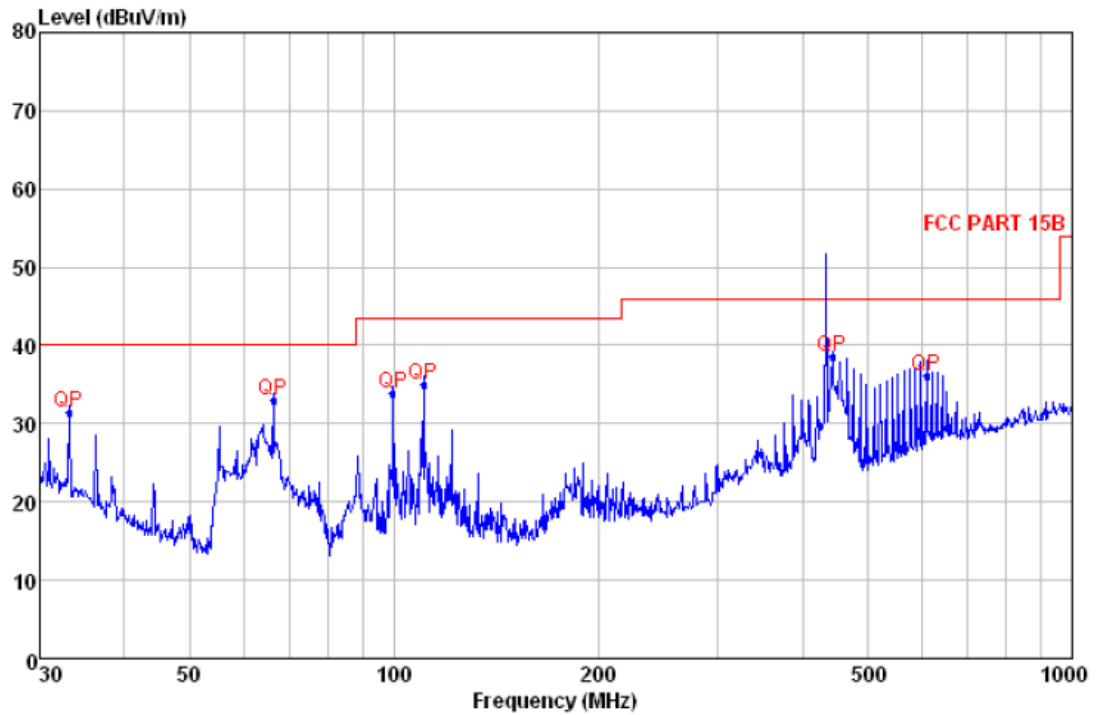
Quasi-peak measurement

No.	Freq MHz	Level dBμV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBμV/m	Margin dB	A/pos cm	T/pos deg
1	33.095	29.06	QP	16.14	1.64	40.00	-10.94	150	226
2	66.266	30.61	QP	6.63	1.96	40.00	-9.39	200	243
3	99.528	33.58	QP	8.68	2.15	43.50	-9.92	200	251
4	110.569	34.27	QP	8.36	2.20	43.50	-9.23	200	219
5	443.294	39.38	QP	16.37	2.83	46.00	-6.62	100	242
6	597.223	37.59	QP	19.83	2.96	46.00	-8.41	200	237

**Vertical:**

Peak scan

Level (dBμV/m)



Quasi-peak measurement

No.	Freq MHz	Level dBμV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBμV/m	Margin dB	A/pos cm	T/pos deg
1	33.095	31.42	QP	15.95	1.64	40.00	-8.58	100	120
2	66.266	32.93	QP	6.63	1.96	40.00	-7.07	200	139
3	99.528	33.87	QP	8.68	2.15	43.50	-9.63	100	110
4	110.569	35.06	QP	8.36	2.20	43.50	-8.44	100	108
5	443.294	38.50	QP	16.37	2.83	46.00	-7.50	100	120
6	609.922	36.20	QP	20.14	2.97	46.00	-9.80	100	128

Note: The frequency over the limit is emitted by the signal generator

**Above 1 GHz Test Results:**

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (PK/AV)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
1059.900	H	PK	49.88	-6.78	43.10	74.00	-30.90
1605.600	H	PK	52.01	-3.81	48.20	74.00	-25.80
2603.500	H	PK	49.43	3.08	52.51	74.00	-21.49
1059.900	V	PK	48.69	-6.78	41.91	74.00	-32.09
1605.600	V	PK	51.58	-3.81	47.77	74.00	-26.23
2603.500	V	PK	48.92	3.08	52.00	74.00	-22.00

**Note:** Corr.Factor = Antenna Factor + Cable Loss – Pre-amplifier.

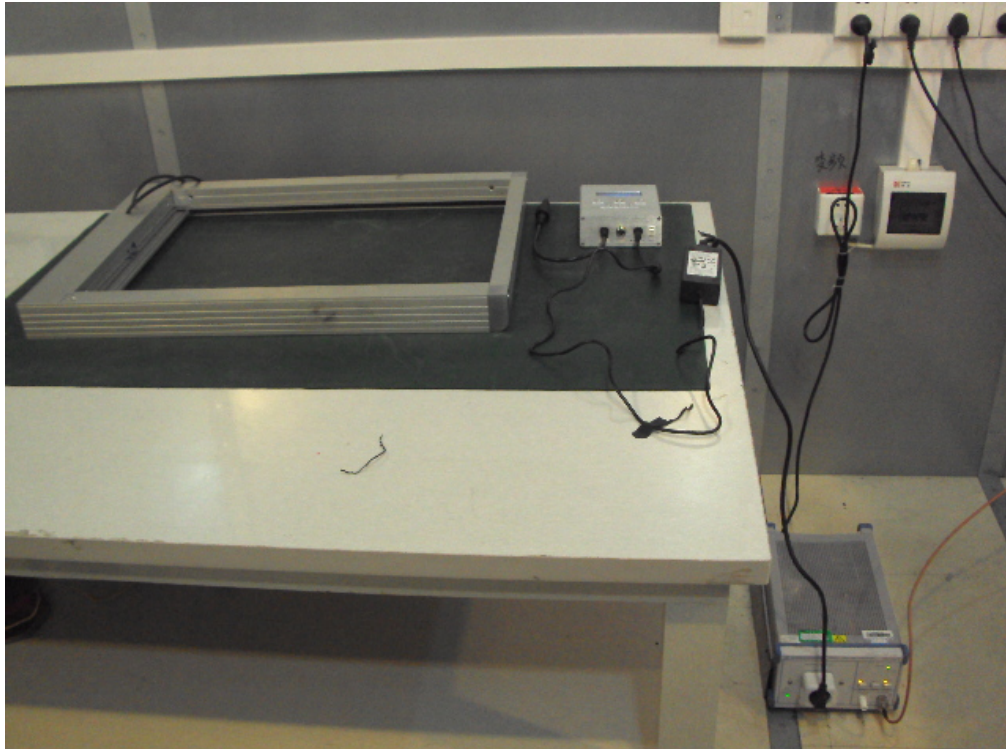
For example: Frequency 1059.9MHz

Antenna:25.1dB;Cable Loss:3.22dB, Pre-amplifier:35.1dB

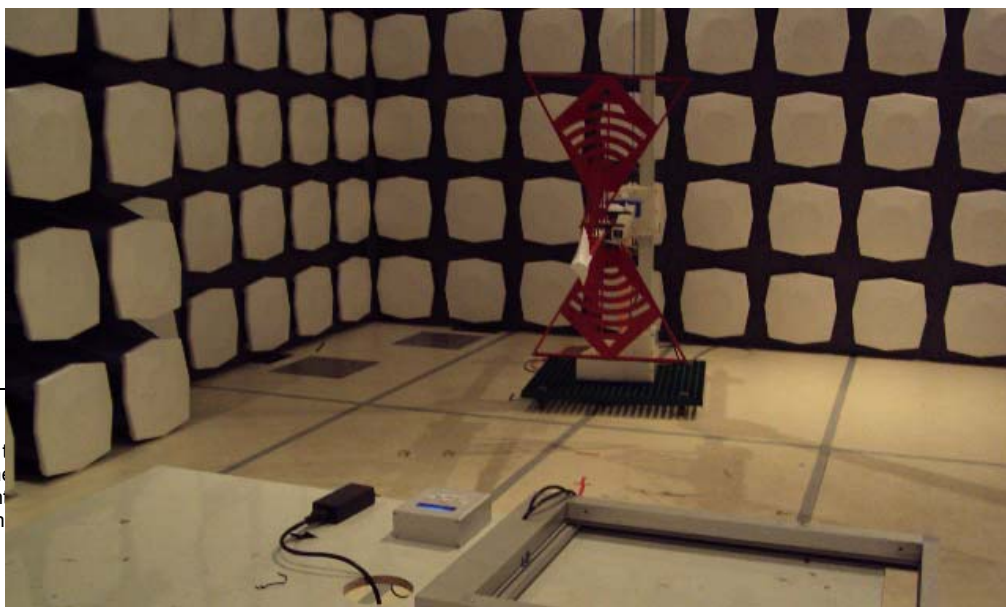
Corr.Factor=25.1+3.22-35.1=-6.78dB

## Section 3 Photographs

### 3.1 Conducted Emissions Mains Terminals Test Setup

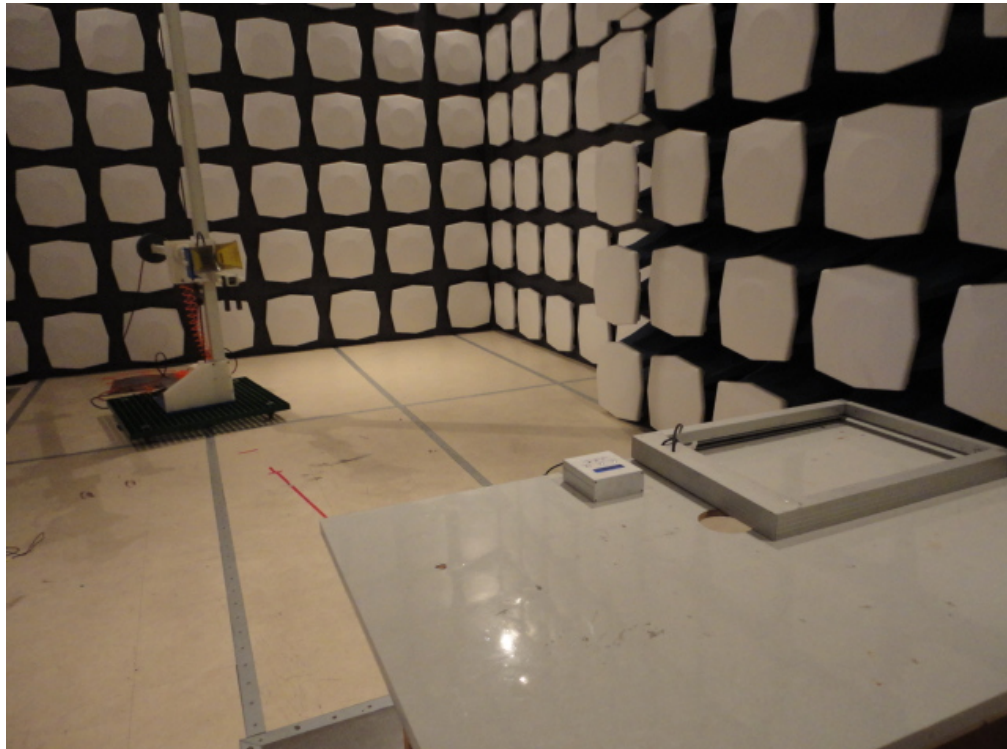


### 3.2 Radiated Emissions, 30MHz to 1GHz Test Setup

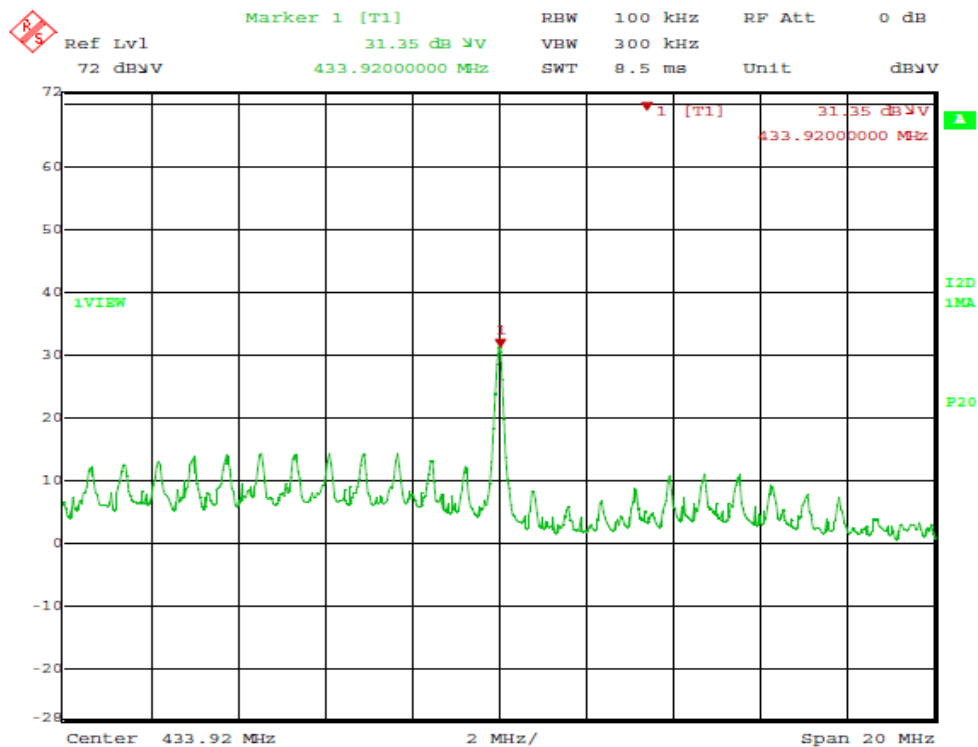




### 3.3 Radiated Emissions, 1GHz to 5GHz Test Setup



### 3.4 Superregenerative receiver frequency



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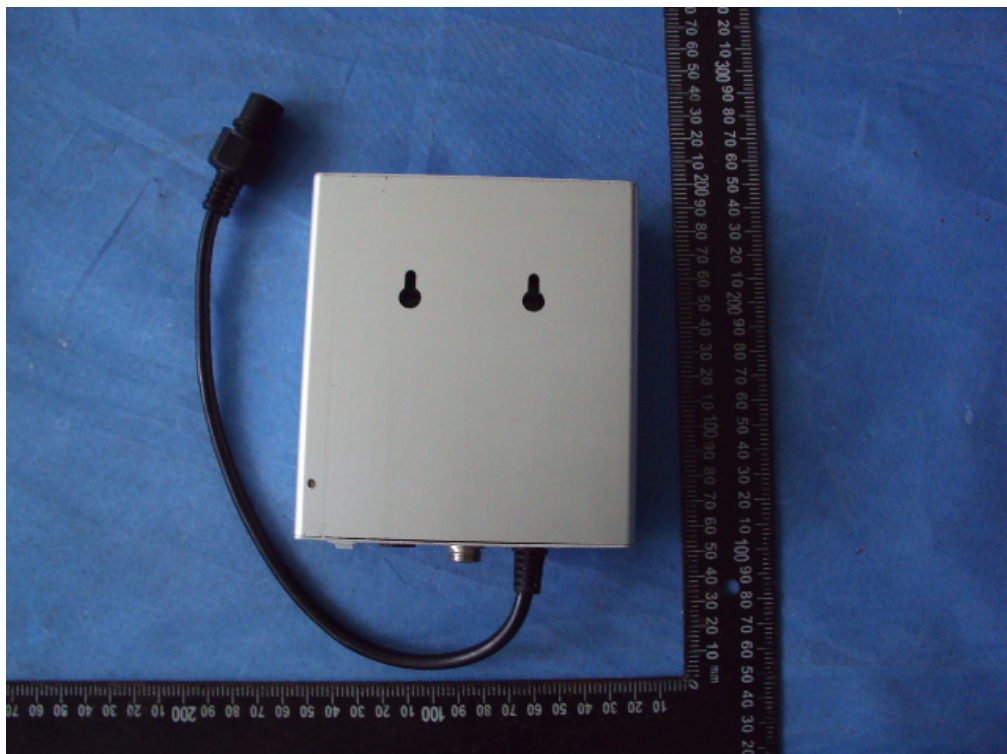
### 3.5 EUT Constructional Details

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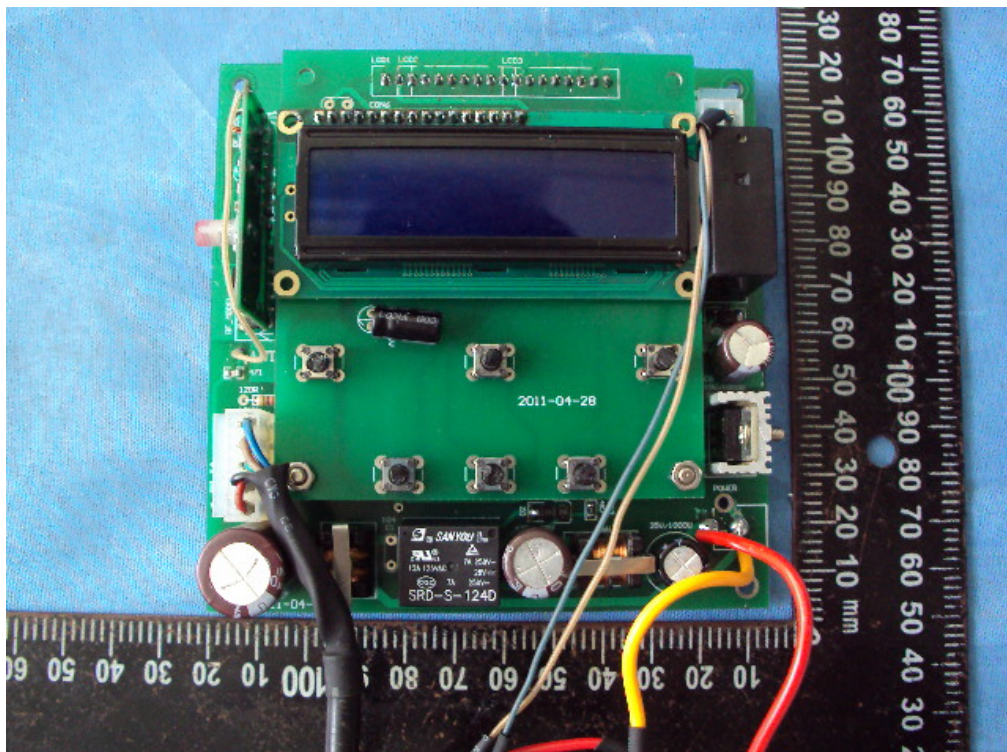


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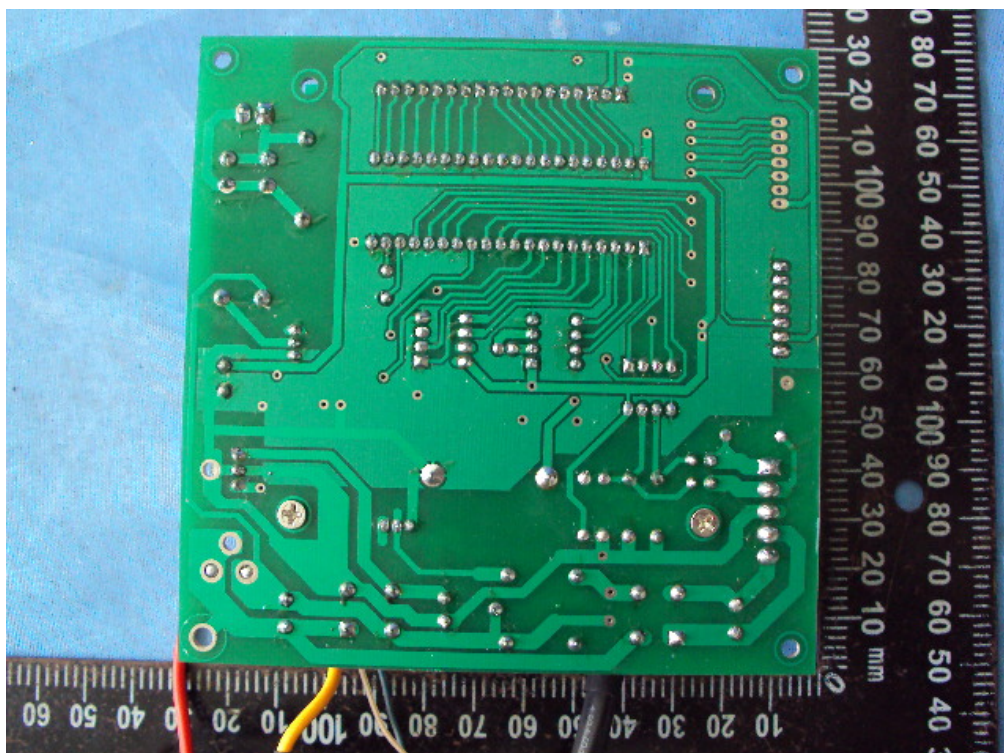




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END OF THE TEST REPORT