

TEST REPORT



Applicant	MEKBAO PLASTIC ELECTRONIC INDUSTRIAL CO., LTD
Address	JIAOXI INDUSTRY AREAS LIANXIA CHENGHAI SHANTOU CITY, GD CHINA

Manufacturer or Supplier	MEKBAO PLASTIC ELECTRONIC INDUSTRIAL CO., LTD	
Address	JIAOXI INDUSTRY AREAS LIANXIA CHENGHAI SHANTOU CITY, GD CHINA	
Product	Remote control car series	
Brand Name	N/A	
Model	5588-608	
Additional Model & Model Difference	5588-611, 5588-612, 5588-613, etc.; See items 2.1	
Date of tests	Jan. 19, 2017 ~ Feb. 22, 2017	

The submitted sample of the above equipment has been tested according to the requirements of the following standards:

- ☒ EN 61000-6-3:2007 + A1:2011
- ☒ EN 61000-6-1:2007

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Glyn He Supervisor / EMC Department	Approved by Madison Luo Supervisor / EMC Department
	 Date: May 09, 2017

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Test Report No.: CE170119N006

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
CE170119N006	Original release	May 09, 2017



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

EMISSION			
Standard	Test Type	Result	Remarks
EN61000-6-3:2007 +A1:2011	Conducted test	PASS	Meets Limits Minimum passing margin is -11.52 dB at 0.71475 MHz
	Radiated test (30MHz~1GHz)	PASS	Meets limits minimum passing margin is - 6.83 dB at 228.045 MHz

IMMUNITY (EN 61000-6-1:2007)			
Standard	Test Type	Result	Remarks
IEC 61000-4-2:2008 ED. 2.0	Electrostatic discharge immunity test	PASS	Electrostatic Discharge – ESD: 8kV Air discharge, 4kV Contact discharge, Performance Criterion A
IEC 61000-4-3:2010 ED. 3.2	Radiated, radio-frequency, electromagnetic field immunity test	PASS	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80-1000 MHz, 3V/m, 80% AM (1kHz), 1400-2000 MHz, 3V/m, 80% AM (1kHz) 2000-2700 MHz, 1V/m, 80% AM (1kHz) Performance Criterion A
IEC 61000-4-8:2009 ED. 2.0	Power frequency magnetic field immunity test.	PASS	Power Frequency Magnetic Field Test, 50 Hz, 3A/m, Performance Criterion A



1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

MEASUREMENT	FREQUENCY	UNCERTAINTY
Mains Terminal Disturbance Voltage Test	0.15MHz ~ 30MHz	+ /-2.70 dB
Radiated Disturbance Test	30MHz ~ 1000MHz	+ /-4.06 dB



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Remote control car series
MODEL NO.	5588-608
ADDITIONAL MODELS	5588-611, 5588-612, 5588-613, 5588-614, 5588-615, 5588-616, 5588-617, 5588-618, 5588-619, 5588-620, 5588-702, 5588-703, 5588-705, 5588-706
POWER SUPPLY	TX: DC 3V(1.5V*AA*2) from battery RX: DC 6.4V from battery RX Battery: DC 5V from USB
CABLE SUPPLIED	USB Cable: Unshielded, detachable, 0.3m
THE HIGHEST OPERATING FREQUENCY	Below 108MHz

NOTE:

1. For the test results, the EUT had been tested with all conditions. But only the worst case was showed in test report.
2. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
3. Please refer to the EUT photo document (Reference No.: 170119N006) for detailed product photo.
4. Additional models 5588-611, 5588-612, 5588-613, 5588-614, 5588-615, 5588-616, 5588-617, 5588-618, 5588-619, 5588-620, 5588-702, 5588-703, 5588-705, 5588-706 are identical with the test model 5588-608 except the appearance and model no. for trading purpose.



2.2 DESCRIPTION OF TEST MODES

The EUT was tested under the **Charging** mode for all tests.

2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT has been tested and complied with the requirements of the following standards:

EN 61000-6-3:2007 + A1:2011

EN 61000-6-1:2007

IEC 61000-4-2:2008 ED. 2.0

IEC 61000-4-3:2010 ED. 3.2

IEC 61000-4-8:2009 ED. 2.0

Notes: The above IEC basic standards are applied with latest version if customer has no special requirement
The EUT is without AC input function and therefore the test items Conduction, Harmonic, Flicker, EFT, Surge, CS and Dip were not tested.

2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Adapter	Infocus	C5010-C08N	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A



3 EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- Note:**
- (1) The lower limit shall apply at the transition frequencies.
 - (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 - (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,16	Apr. 04,17
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 04,16	Mar. 03,17
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,16	Apr. 04,17
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 04,17	Jan. 03,18
Test software	ADT	ADT_Cond _V7.3.7	N/A	N/A	N/A

- NOTE:**
1. The test was performed in shielded room 553.
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



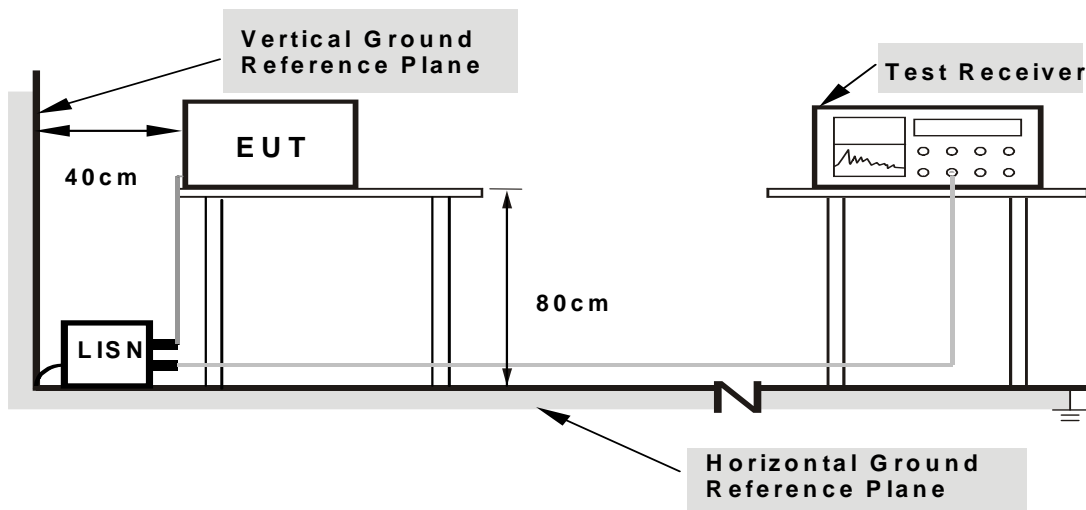
3.1.3 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20dB) were not recorded.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

3.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.

3.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power of all equipment.
- b. EUT was operated according to the type description in manufacturer's specifications or the User's Manual.

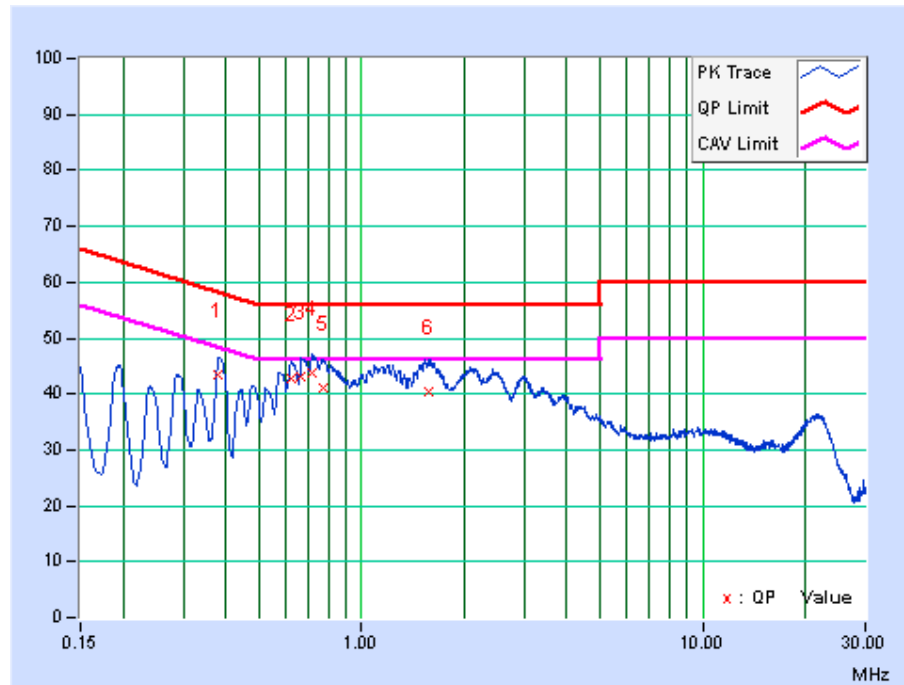


3.1.7 TEST RESULTS

TEST MODE	Charging	6dB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 5V from USB	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	23deg. C, 50% RH	TESTED BY: Yang	

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor (dB)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.38059	9.74	33.56	24.44	43.30	34.18	58.27	48.27	-14.97	-14.09
2	0.62029	9.74	32.89	23.56	42.63	33.30	56.00	46.00	-13.37	-12.70
3	0.66750	9.74	33.40	23.97	43.14	33.71	56.00	46.00	-12.86	-12.29
4	0.71475	9.74	34.16	24.74	43.90	34.48	56.00	46.00	-12.10	-11.52
5	0.76820	9.74	31.36	21.53	41.10	31.27	56.00	46.00	-14.90	-14.73
6	1.57117	9.75	30.72	20.85	40.47	30.60	56.00	46.00	-15.53	-15.40

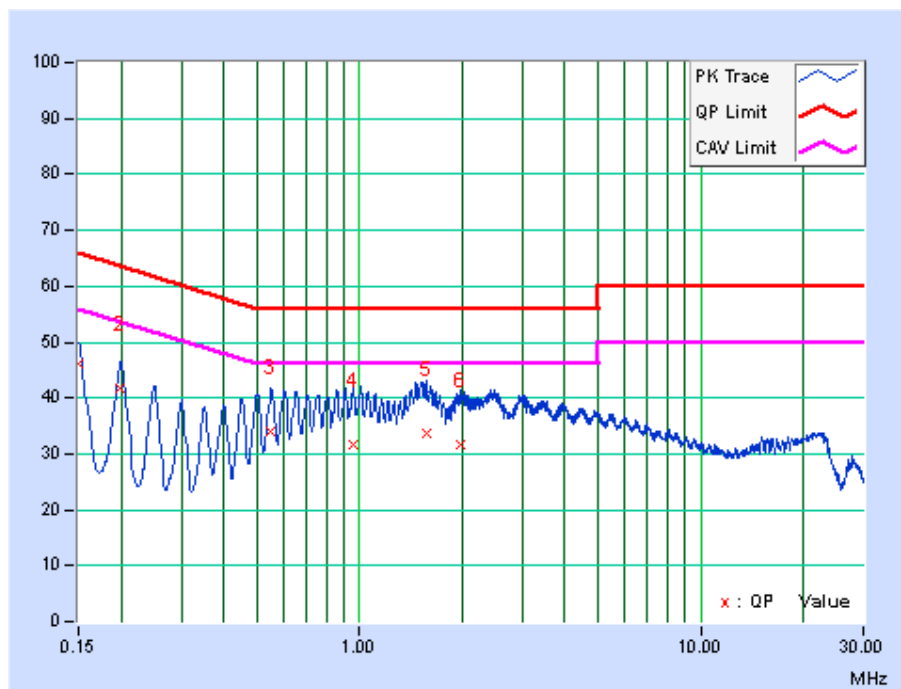
REMARKS: The emission levels of other frequencies were very low against the limit.



TEST MODE	Charging	6dB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 5V from USB	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	23deg. C, 50% RH	TESTED BY: Yang	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.74	36.25	21.54	45.99	31.28	66.00	56.00	-20.01	-24.72
2	0.19950	9.74	32.11	20.38	41.85	30.12	63.63	53.63	-21.78	-23.51
3	0.55050	9.74	24.13	14.60	33.87	24.34	56.00	46.00	-22.13	-21.66
4	0.96000	9.83	21.83	11.96	31.66	21.79	56.00	46.00	-24.34	-24.21
5	1.57425	9.85	23.94	13.71	33.79	23.56	56.00	46.00	-22.21	-22.44
6	1.97025	9.85	21.78	10.20	31.63	20.05	56.00	46.00	-24.37	-25.95

REMARKS: The emission levels of other frequencies were very low against the limit.





3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD: EN 61000-6-3

FOR FREQUENCY BELOW 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	Quasi-Peak (dBuV/m)	Quasi-Peak (dBuV/m)
30 – 230	40	30
230 – 1000	47	37

FREQUENCY (MHz)	Class A (at 3m)	Class B (at 3m)
	Quasi-Peak (dBuV/m)	Quasi-Peak (dBuV/m)
30 – 230	50	40
230 – 1000	57	47

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	Up to 5 times of the highest frequency or 6 GHz, whichever is less

FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (GHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
1 to 3	76	56	70	50
3 to 6	80	60	74	54

NOTE: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



3.2.2 TEST INSTRUMENTS

FREQUENCY RANGE BELOW 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	100962	Mar. 04,16	Mar. 03,17
EMI Test Receiver	Rohde&Schwarz	ESCI	101418	Mar. 04,16	Mar. 03,17
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-555	Nov. 13, 16	Nov. 12, 17
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-554	Dec. 17, 16	Dec. 16, 17
Signal Amplifier	Agilent	8447D	2944A10488	Jun. 25,16	Jun. 24,17
Signal Amplifier	Agilent	8447D	2944A11174	Jun. 25,16	Jun. 24,17
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8.8m	NSEMC006	Mar. 12,16	Mar. 11,18
Test Software	ADT	ADT_Radiated_V8.7.x	N/A	N/A	N/A

NOTES: 1. The test was performed in 10m Chamber.

2. The calibration interval of the above test instruments is 12 or 24 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

FREQUENCY RANGE ABOVE 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	ETS-Lindgren	3117	00085519	Dec. 30, 15	Dec. 29, 17
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 12,16	Mar. 11,17
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101003	Apr. 05,16	Apr. 04,17
Broadband Preamplifier	SCHWARZBECK	BBV9718	266	Mar. 22, 16	Mar. 21,17
Pre-Amplifier (100MHz-26.5GHz)	EMCI	EMC 012645	980077	May 04,16	May 03,17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,16	Nov. 03,17
Test Software	ADT	ADT_Radiated_V8.7.x	N/A	N/A	N/A

NOTES: 1. The test was performed in 10m Chamber.

2. The calibration interval of the above test instruments is 12 or 24 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



3.2.3 TEST PROCEDURE

<Frequency Range below 1GHz>

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from 1 meter to 4 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.
- d. 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.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

NOTE:

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. $\text{Emission level(dBuV/m)} = \text{Raw Value(dBuV)} + \text{Correction Factor(dB/m)}$
3. $\text{Correction Factor (dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Factor (dB)}$ (if the raw value not contains the amplifier).
4. $\text{Correction Factor (dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Factor (dB)} - \text{Amplifier Gain (dB)}$ (if the raw value contains the amplifier).
5. $\text{Margin value} = \text{Emission level} - \text{Limit value}.$

**<Frequency Range above 1GHz>**

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna can be varied from one meter-to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. The bore sight should be used during the test above 1GHz.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test receiver/spectrum was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

NOTE:

1. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
2. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the receiver antenna.
3. $\text{Emission level(dBuV/m)} = \text{Raw Value(dBuV)} + \text{Correction Factor(dB/m)}$
4. $\text{Correction Factor (dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Factor (dB)}$ (if the raw value not contains the amplifier).
5. $\text{Correction Factor (dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Factor (dB)} - \text{Amplifier Gain (dB)}$ (if the raw value contains the amplifier).
6. $\text{Margin value} = \text{Emission level} - \text{Limit value}$.

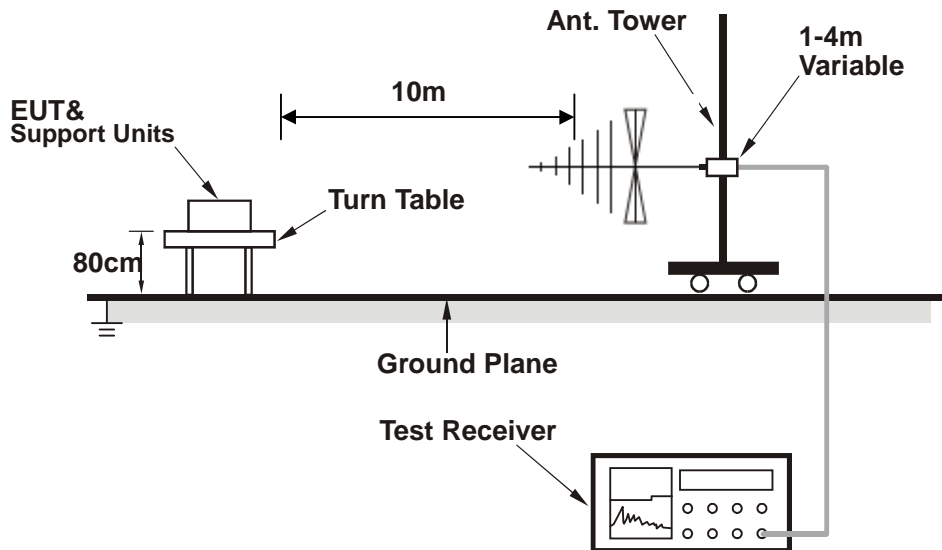
3.2.4 DEVIATION FROM TEST STANDARD

No deviation.

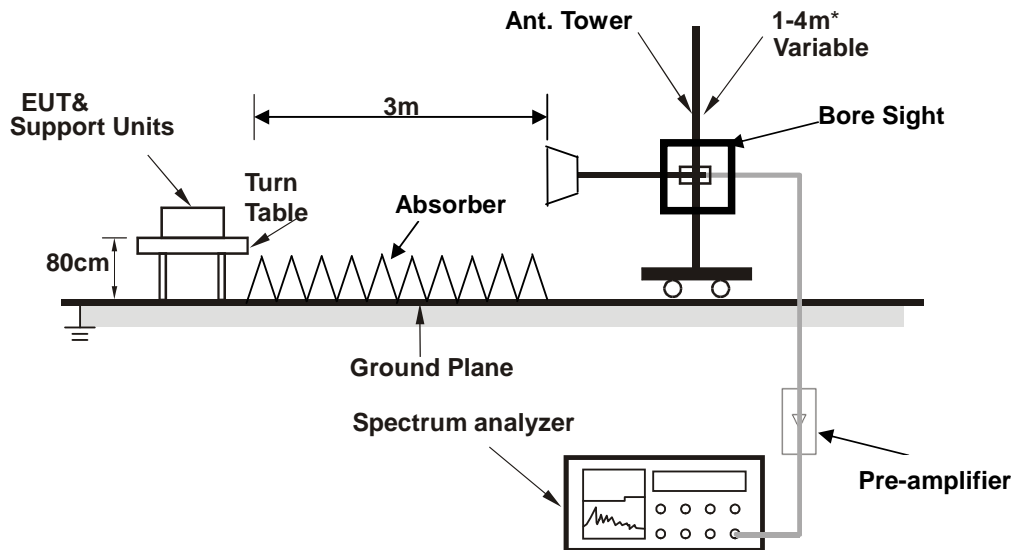


3.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



* : depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

3.2.6 EUT OPERATING CONDITIONS

- c. Turned on the power of all equipment.
- d. EUT was operated according to the type description in manufacturer's specifications or the User's Manual.

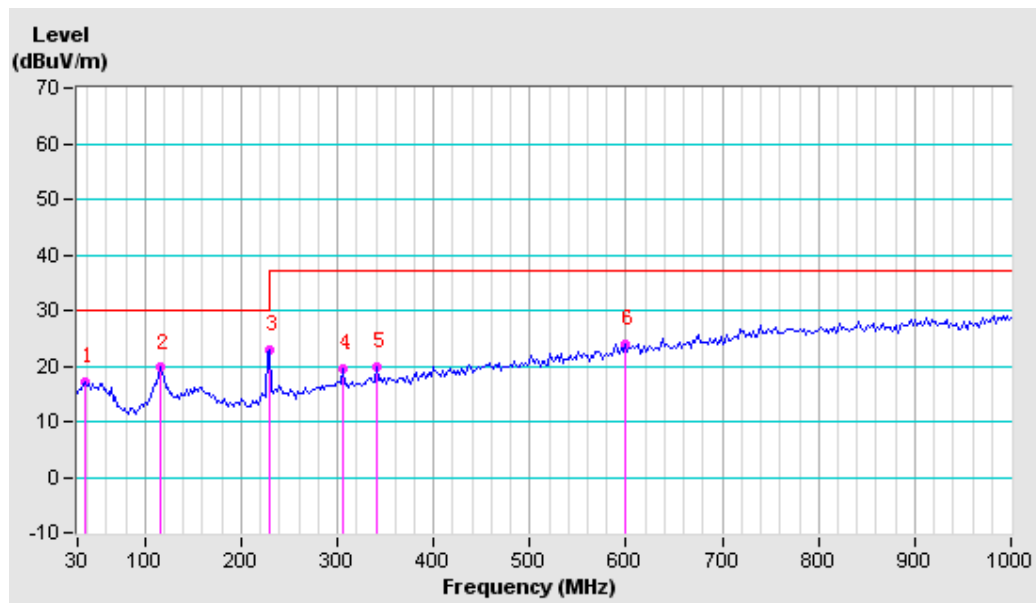


3.2.7 TEST RESULTS

TEST MODE	Charging	FREQUENCY RANGE	30-1000MHz
TEST VOLTAGE	DC 5V from USB	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	21deg. C, 54% RH	TESTED BY: Wang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	37.760	-9.65	26.79	17.14	30.00	-12.86	400	24
2	115.360	-11.99	31.72	19.73	30.00	-10.27	400	226
3	229.820	-10.10	33.05	22.95	30.00	-7.05	200	138
4	305.480	-7.49	27.11	19.62	37.00	-17.38	400	336
5	340.400	-6.92	26.78	19.86	37.00	-17.14	200	191
6	598.420	-1.29	25.11	23.82	37.00	-13.18	200	345

REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 30MHz to 1000MHz.
4. Only emissions significantly above equipment noise floor are reported.

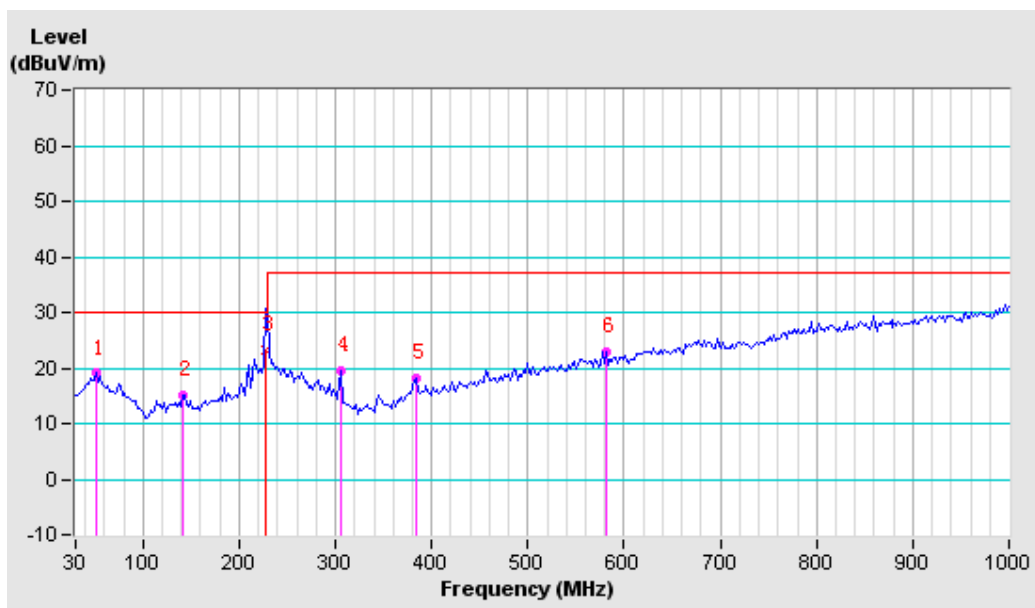




TEST MODE	Charging	FREQUENCY RANGE	30-1000 MHz
TEST VOLTAGE	DC 5V from USB	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	21deg. C, 54% RH	TESTED BY: Wang	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBUV)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	51.340	-7.84	26.88	19.04	30.00	-10.96	300	278
2	140.580	-11.07	26.24	15.17	30.00	-14.83	300	259
3	228.045	-7.98	31.15	23.17	30.00	-6.83	100	212
4	305.480	-9.13	28.56	19.43	37.00	-17.57	100	312
5	383.080	-7.63	25.72	18.09	37.00	-18.91	100	183
6	580.960	-2.60	25.47	22.87	37.00	-14.13	100	309

REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 30MHz to 1000MHz.
4. Only emissions significantly above equipment noise floor are reported.





4 IMMUNITY TEST

4.1 GENERAL DESCRIPTION

4.1.1 GENERAL DESCRIPTION OF EN 61000-6-1

Product Standard:	EN 61000-6-1:2007	
Basic Standard, specification requirement, and Performance Criteria:	IEC 61000-4-2	Electrostatic Discharge – ESD: 8kV air discharge, 4kV Contact discharge, Performance Criterion B
	IEC 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80-1000 MHz, 3V/m, 80% AM (1kHz), 1400-2000 MHz, 3V/m, 80% AM (1kHz) 2000-2700 MHz, 1V/m, 80% AM (1kHz) Performance Criterion A
	IEC 61000-4-8	Power Frequency Magnetic Field Test, 50/60 Hz, 1A/m, Performance Criterion A



4.1.2 PERFORMANCE CRITERIA

According to Clause 7.1 of EN 61000-6-1:2007 standard, the following describes the general performance criteria.

CRITERION A	The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
CRITERION B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
CRITERION C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

4.1.3 EUT OPERATING CONDITION

Same as item 3.1.6



4.2 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

4.2.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge: 8kV (Direct) Contact Discharge : 4 kV (Direct & Indirect)
Polarity:	Positive & Negative
Number of Discharge:	20 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
ESD Generator	TESEQ	NSG 437	279	Mar. 07,16	Mar. 06,17
Test Software	TESEQ	V03.03	N/A	N/A	N/A
ESD Generator	EM TEST	Dito	V1211112265	Mar. 17,16	Mar. 16,17
Test Software	EM TEST	V 2.31	N/A	N/A	N/A

- NOTE:** 1. The test was performed in ESD Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



4.2.3 TEST PROCEDURE

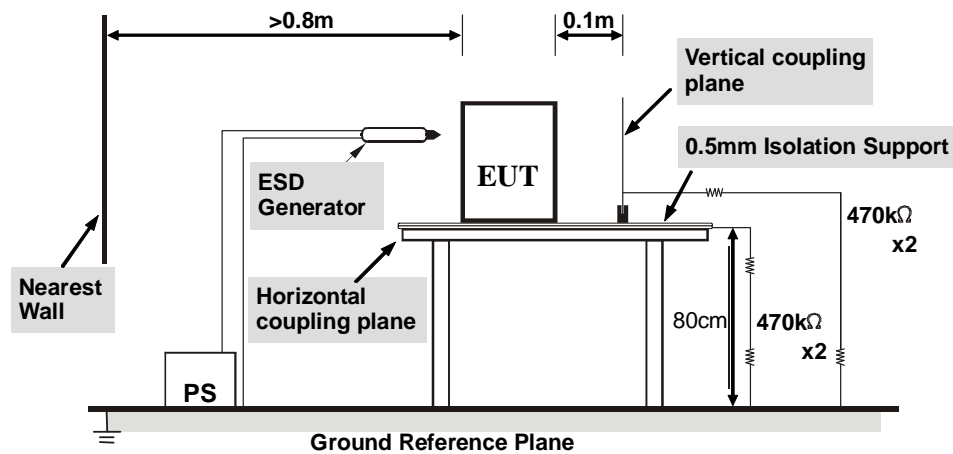
The basic test procedure was in accordance with IEC 61000-4-2:

- a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- c. The time interval between two successive single discharges was at least 1 second.
- d. The discharge return cable of the generator shall be kept at a distance of at least 0.2 m from the EUT whilst the discharge is being applied and should not be held by the operator.
- e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- g. At least ten single discharges (in the most sensitive polarity) were applied to the **Horizontal Coupling Plane** at points on each side of the EUT. The ESD generator was positioned horizontal at a distance of 0.1 meters from the EUT with the discharge electrode touching the **HCP**.
- h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the **Vertical Coupling Plane** in sufficiently different positions that the four faces of the EUT were completely illuminated. The **VCP** (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

4.2.4 DEVIATION FROM TEST STANDARD

No Deviation.

4.2.5 TEST SETUP



NOTE:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the **Ground Reference Plane**. The **GRP** consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A **Horizontal Coupling Plane** (1.6m x 0.8m) was placed on the table and attached to the **GRP** by means of a cable with 940kΩ total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC 61000-4-2, and its cables were placed on the **HCP** and isolated by an insulating support of 0.5mm thickness. A distance of 0.8-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.



4.2.6 TEST RESULTS

TEST MODE	Charging	TEST VOLTAGE	DC 5V from USB
ENVIRONMENTAL CONDITIONS	22deg. C, 43% RH, 101.3KPa	TESTED BY: Star	

DIRECT DISCHARGE APPLICATION				
Test Level (kV)	Polarity (+/-)	Test Point	Test Result of Contact Discharge	Test Result of Air Discharge
2,4	+/-	All Metal Parts	A	N/A
2,4,8	+/-	All Nonmetal Parts	N/A	A

INDIRECT DISCHARGE APPLICATION				
Test Level (kV)	Polarity (+/-)	Test Point	Test Result of HCP	Test Result of VCP
4	+/-	HCP	A	N/A
4	+/-	VCP	N/A	A

NOTE: A: There was no change compared with the initial operation during the test.



4.3 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

4.3.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-3
Frequency Range:	80-1000MHz, 1400-2000MHz, 2000-2700MHz
Field Strength:	3 V/m, 3V/m, 1V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Antenna Height:	1.5m
Dwell Time:	at least 3 seconds

4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Signal Generator	Agilent	N5181A	MY50142530	Oct. 13,16	Oct. 12,17
Bilog Antenna	Teseq	CBL 6111D	27089	July 19,16	July 18,17
Antenna Log-Periodic	CORAD	ATS700M11 G	0336821	N/A	N/A
Switch Controller	CORAD	SC1000	0337343	N/A	N/A
RF Power Meter	ESE	4242	13984	Nov. 04,16	Nov. 03,17
Power Sensor	ESE	51011EMC	35716	Nov. 04,16	Nov. 03,17
Power Sensor	ESE	51011EMC	35715	Nov. 04,16	Nov. 03,17
E-Field probe	Narda	NBM-520	2403/01B	May 28, 15	May 27, 17
Power Amplifier	TESEQ	CBA 1G-150	T44029	N/A	N/A
Power Amplifier	TESEQ	CBA 3G-100	T44030	N/A	N/A
Power Amplifier	TESEQ	CBA 6G-050	1041204	N/A	N/A
Dual Directional Coupler	TESEQ	C5982	95208	Nov. 04,16	Nov. 03,17
Dual Directional Coupler	TESEQ	C6187	95175	Nov. 04,16	Nov. 03,17
Dual Directional Coupler	TESEQ	CPH-274F	M251304-01	Nov. 04,16	Nov. 03,17
Test Software	ADT	BVADT_RS_ V7.6.4-DG	N/A	N/A	N/A

- NOTE:**
1. The calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 2. The test was performed in RS chamber.

4.3.3 TEST PROCEDURE

The test procedure was in accordance with IEC 61000-4-3

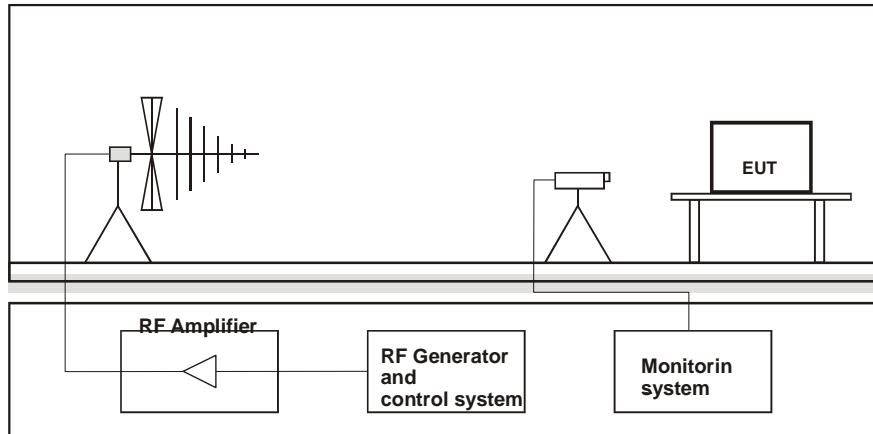
- a. The testing was performed in a fully-anechoic chamber.
- b. The frequency range is swept from 80 MHz to 1000 MHz, 1400MHz to 2000MHz, 2000MHz to 2700MHz with the signal 80% amplitude modulated with a 1kHz sine wave.
- c. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0,5s.
- d. The field strength levels were 3V/m, 1V/m.
- e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.3.4 DEVIATION FROM TEST STANDARD

No Deviation.



4.3.5 TEST SETUP



NOTE:

TABLETOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.



4.3.6 TEST RESULTS

TEST MODE	Charging	TEST VOLTAGE	DC 5V from USB
ENVIRONMENTAL CONDITIONS	24 deg. C, 55% RH,	TESTED BY: Star	

Field Strength (V/m)	Test Frequency Note ^{#1} (MHz)	Polarization of antenna (Horizontal / Vertical)	Test Distance (m)	Test Result	Remark
3	80 - 1000	H&V	3	A	N/A
3	1400 - 2000	H&V	3	A	N/A
1	2000 - 2700	H&V	3	A	N/A

NOTE: A: There was no change compared with initial operation during the test.



4.4 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

4.4.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-8
Frequency Range:	50Hz, 60Hz
Field Strength:	3A/m
Observation Time:	5 minute
Inductance Coil:	Rectangular type, 1mx1m

4.4.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Magnetic Field Tester	HAEFELY	MAG100.1	150579	Oct. 12,15	Oct. 11,16
Test Software	N/A	N/A	N/A	N/A	N/A

NOTE: 1. The test was performed in Shielding Room 843. .
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

4.4.3 TEST PROCEDURE

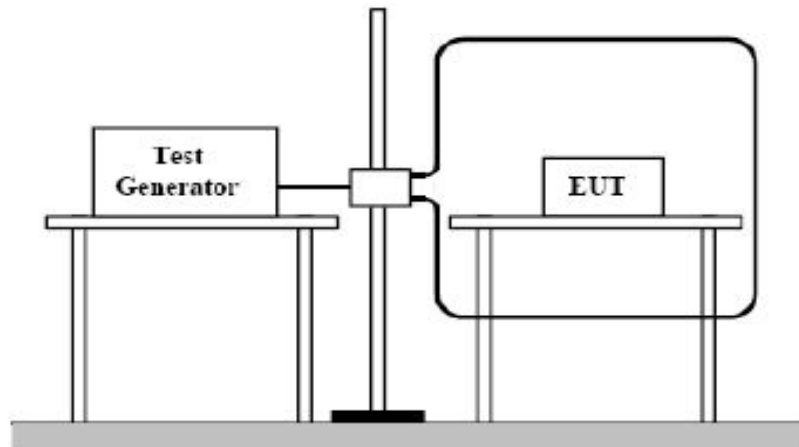
- The equipment is configured and connected to satisfy its functional requirements.
- The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.



4.4.5 TEST SETUP



NOTE:

TABLETOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 % of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.



4.4.6 TEST RESULTS

TEST MODE	Normal working	TEST VOLTAGE	DC 3V from battery
ENVIRONMENTAL CONDITIONS	22.3deg. C, 56.7% RH	TESTED BY: Xin peng	

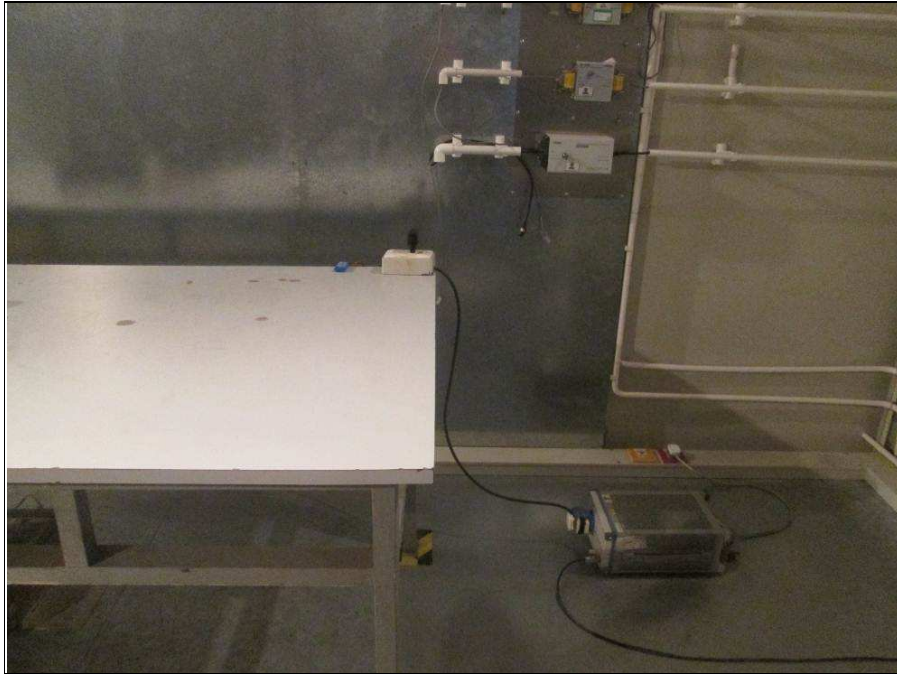
Magnetic field direction	Testing result	Remark
X - Axis	A	3A/m
Y - Axis	A	3A/m
Z - Axis	A	3A/m

NOTE: A: There was no change compared with initial operation during the test.

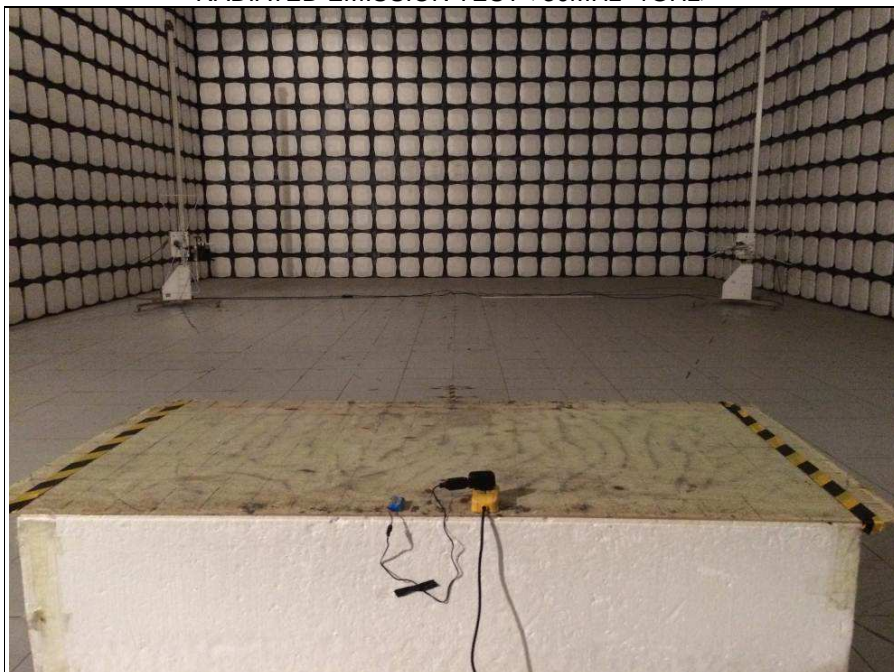


5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST < 30MHz~1GHz >



ESD TEST

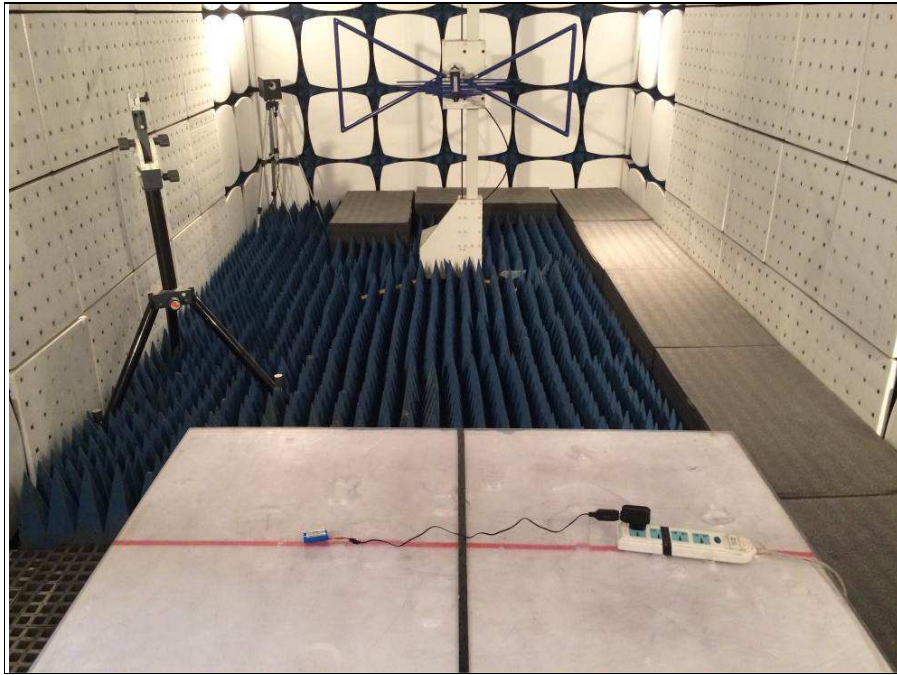




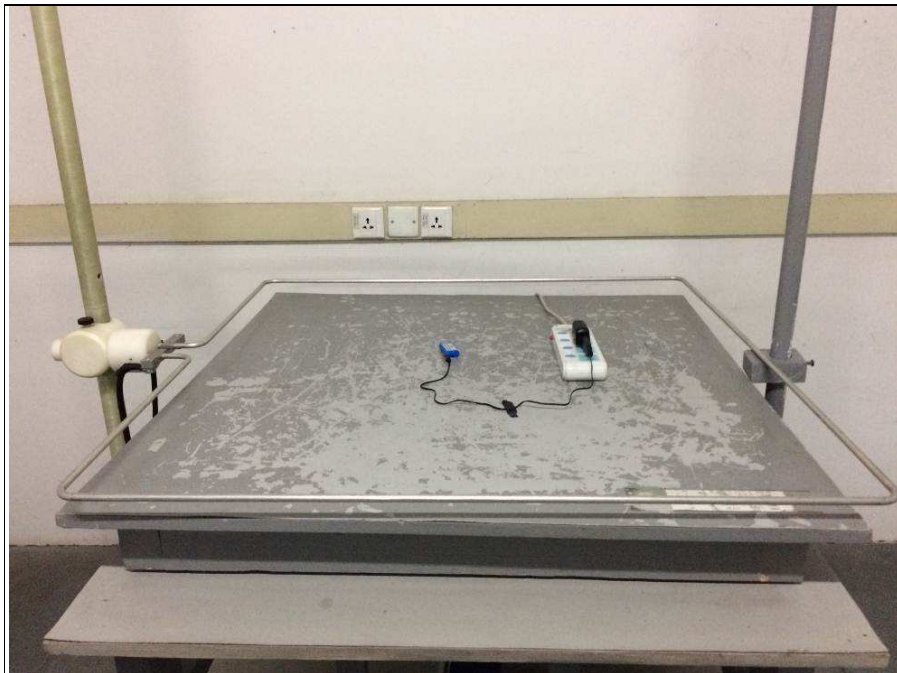
BUREAU
VERITAS

Test Report No.: CE170119N006

RS TEST



POWER-FREQUENCY MAGNETIC FIELDS TEST





Test Report No.: CE170119N006

6 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

---END---