


TEST REPORT

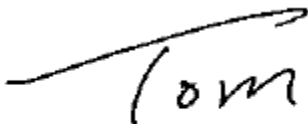
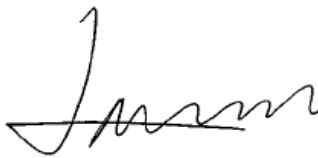
Applicant	Innokin Technology Co., Ltd
Address	Building 6, XinXinTian Industrial Park, XinSha Road, ShaJing, Baoan District, ShenZhen, China

Manufacturer or Supplier	Innokin Technology Co., Ltd	
Address	Building 6, XinXinTian Industrial Park, XinSha Road, ShaJing, Baoan District, ShenZhen, China	
Product	Cool Fire IV plus	
Brand Name	N/A	
Model	Cool Fire IV plus	
Additional Model & Model Difference	N/A	
Date of tests	Nov. 20, 2015 ~ Dec. 27, 2015	

The submitted sample of the above equipment has been tested according to the following European Directive - Electromagnetic directive 2004/108/EC and 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 Tom Chen Project Engineer / EMC Department	Approved by Madison Luo Supervisor / EMC Department
	 Date: Dec. 29, 2015

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification



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**BUREAU
VERITAS**

Test Report No.: CE151126N093

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
CE 151126N093	Original release	Dec. 29, 2015

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1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

EMISSION			
Standard	Test Type	Result	Remarks
EN 61000-6-3:2007 + A1:2011	Conducted emission test	PASS	Meets requirement limit Minimum passing margin is -5.42dB at 17.5500MHz
	Radiated emission test (30MHz ~ 1GHz)	PASS	Meets limits minimum passing margin is -3.20 dB at 151.2500 MHz

IMMUNITY (EN 61000-6-1:2007)			
Standard	Test Type	Result	Remarks
IEC 61000-4-2:2008	Electrostatic discharge immunity test	PASS	Electrostatic Discharge – ESD: 8kV Air discharge, 4kV Contact discharge, Performance Criterion A
IEC 61000-4-3:2010	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	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	UNCERTAINTY
Conducted emissions	+/-2.74 dB
Radiated emissions(30 MHz ~ 1GHz)	+/-4.27 dB



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Cool Fire IV plus
MODEL NO.	Cool Fire IV plus
ADDITIONAL MODEL	N/A
POWER SUPPLY	DC 5.5V from battery or DC 5V from PC
CABLE SUPPLIED	USB cable: Unshielded, detachable, 1.0m
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.: 151126N093) for detailed product photo.



2.2 DESCRIPTION OF TEST MODES

The EUT was tested under the following modes. And the final worst mode were marked in boldface and recorded in this report.

FOR CE EMISSION TEST:

Test Mode	Test Voltage
Charging	DC 5V from PC

FOR RE EMISSION TEST:

Test Mode	Test Voltage
Charging	DC 5V from PC
Normal working	DC 5.5V from internal battery

FOR IMMUNITY TESTS:

Test Mode	Test Voltage
Charging	DC 5V from PC
Normal working	DC 5.5V from internal battery



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 Harmonic, Flicker, EFT, Surge, CS and Dip were not tested.

2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an dependent 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	PC	Lenovo	ThinkCentre 8701	8701A53L3BC108	N/A
2	PC	DELL	D11M	CN-0CV772-0887-31L-5219	N/A
3	Printer	HP	C89520	CN25S182N6	N/A
4	Monitor	DELL	E2013HC	CN-0841PW-64180-341-0KRS	N/A
5	Keyboard	Lenovo	KB-0225	41A5039	N/A
6	Mouse	Lenovo	MO28UOL	44D2639	N/A

NO.	CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line :Unshielded, Detachable,1.0m; DC Line: Unshielded, Undetachable,2.0m;
2	AC Line :Unshielded, Detachable,1.5m; DC Line: Unshielded, Undetachable,1.8m;
3	AC Line :Unshielded, Detachable 1.5m; USB Line: Unshielded, Detachable 1.5m
4	AC Line :Unshielded, Detachable 1.5m; USB Line: Unshielded, Detachable 1.8m
5-6	USB Line: Unshielded, Detachable 1.8m



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.
Test Receiver	Rohde & Schwarz	ESCI	26115-010-0027	May 16, 2015	Mar. 15,16
L.I.S.N.	Rohde & Schwarz	ENV216	101161	May 16, 2015	May 15,16
50Ω Coaxial Switch	Anritsu	MP59B	6100175589	May 17, 2015	May 16,16
Voltage Probe	Rohde & Schwarz	ESH2-Z3	100122	May 17, 2015	May 16,16

- NOTE:**
- 1. The test was performed in CE Room, Shenzhen EMTEK Co., Ltd.
 - 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.



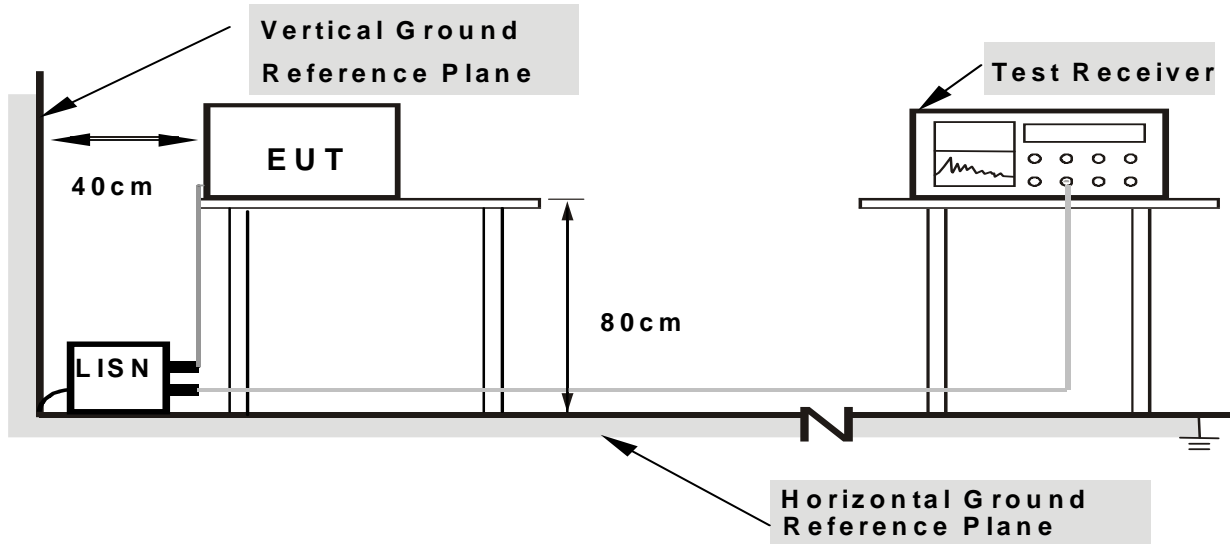
3.1.3 TEST PROCEDURE

- 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 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power of EUT.
- b. EUT was operated according to the type described in manufacturer's specifications or the user's manual.

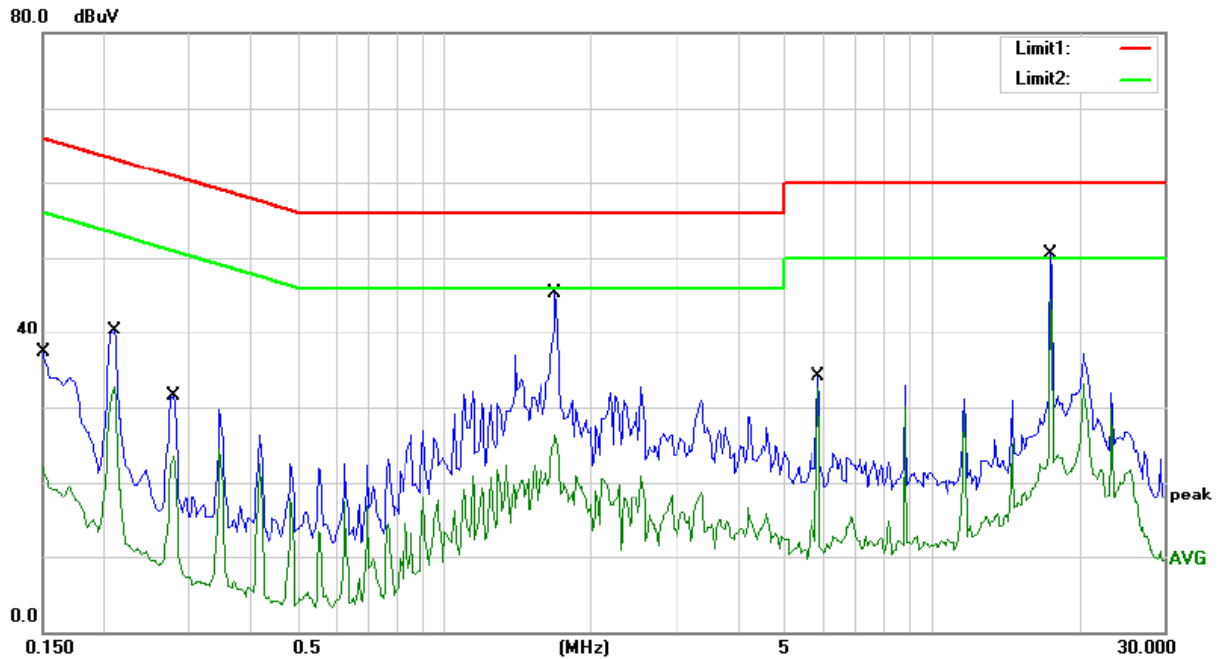


3.1.7 TEST RESULTS

TEST MODE	See section 2.2	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 5V from PC	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	22deg. C, 50%RH	TESTED BY	Bob

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	0.1500	0.00	37.21	22.03	37.21	22.03	66.00	56.00	-28.79	-33.97
2	0.2100	0.00	40.34	32.78	40.34	32.78	63.21	53.21	-22.87	-20.43
3	0.2800	0.00	31.46	23.55	31.46	23.55	60.82	50.82	-29.36	-27.27
4	1.6950	0.00	45.22	26.33	45.22	26.33	56.00	46.00	-10.78	-19.67
5	5.8500	0.00	34.14	32.52	34.14	32.52	60.00	50.00	-25.86	-17.48
6	17.5500	0.00	50.47	44.58	50.47	44.58	60.00	50.00	-9.53	-5.42

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

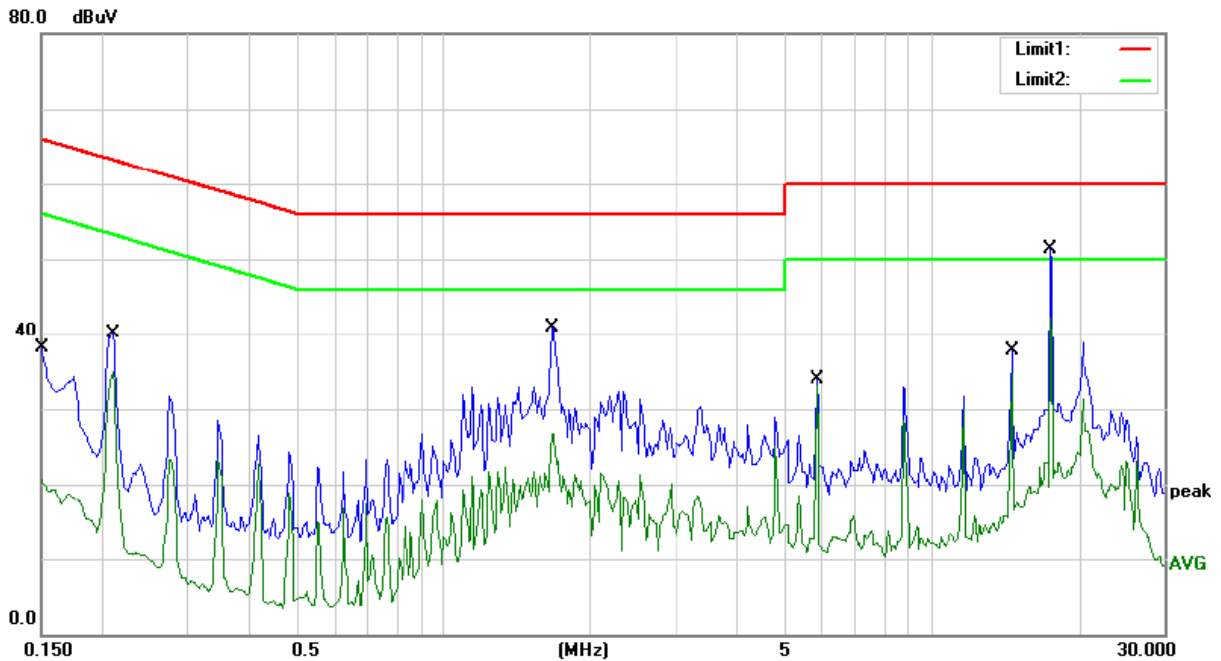




TEST MODE	See section 2.2	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	DC5V from PC	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	22deg. C, 50%RH	TESTED BY	Bob

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	0.1500	0.00	38.08	20.64	38.08	20.64	66.00	56.00	-27.92	-35.36
2	0.2100	0.00	40.08	35.00	40.08	35.00	63.21	53.21	-23.13	-18.21
3	1.6800	0.00	40.99	26.75	40.99	26.75	56.00	46.00	-15.01	-19.25
4	5.8500	0.00	33.93	33.01	33.93	33.01	60.00	50.00	-26.07	-16.99
5	5.8500	0.00	37.71	34.72	33.01	34.72	60.00	50.00	-22.29	-15.28
6	17.5500	0.00	51.36	42.27	51.36	42.27	60.00	50.00	-8.64	-7.73

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)
	dBuV/m	dBuV/m
30 – 230	40	30
230 – 1000	47	37

FREQUENCY (MHz)	Class A (at 3m)	Class B (at 3m)
	dBuV/m	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 30MHz-1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI	101414	May 16, 2015	May 15, 2016
Pre-Amplifier	LUNAR-EM	LNA30M3G-25	J101000000 71	May 16, 2015	May 15, 2016
Bilog Antenna	Schwarzbeck	VULB9163	660	May 17, 2015	May 16, 2016
Cable	H+B	NmSm-05-C15 052	N/A	May 17, 2015	May 16, 2016
Cable	H+B	NmSm-2-C152 01	N/A	May 17, 2015	May 16, 2016
Cable	H+B	NmNm-7-C15 702	N/A	May 17, 2015	May 16, 2016

Frequency Range 1GHz-40GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	FSV40	132.1-3008K39- 100967-AP	May 16, 2015	May 15, 2016
Pre-Amplifier	Lunar EM	LNA1G18-48	J101113101000 1	May 16, 2015	May 15, 2016
Horn Antenna	Schwarzbeck	BBHA 9120	1178	May 17, 2015	May 16, 2016
Cable	H+B	SAC-40G-1	414	May 17, 2015	May 16, 2016
Cable	H+B	SUCOFLEX10 4	MY14871/4	May 17, 2015	May 16, 2016
Cable	H+B	BLU18A-NmS m-6500	D8501	May 17, 2015	May 16, 2016

NOTES: 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 2. The test was performed in 3m Chamber, Shenzhen EMTEK Co., Ltd.



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 3 meters Semi-anechoic 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 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.
- 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 turn 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 1 GHz.

NOTE:

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
4. Margin value = Emission level – 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 3 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.
- 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:

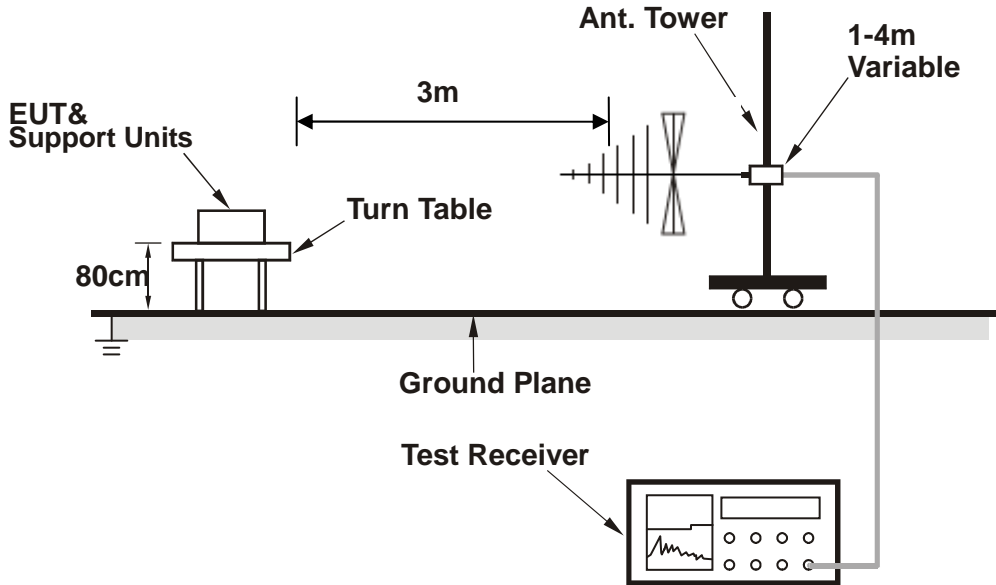
1. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
2. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the receiver antenna.

3.2.4 DEVIATION FROM TEST STANDARD

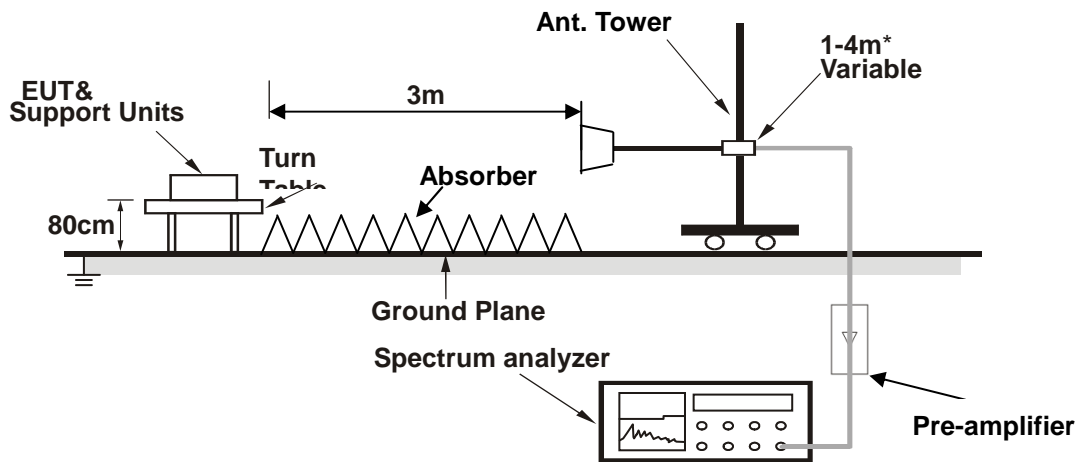
No deviation

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

Same as item 3.6.1.

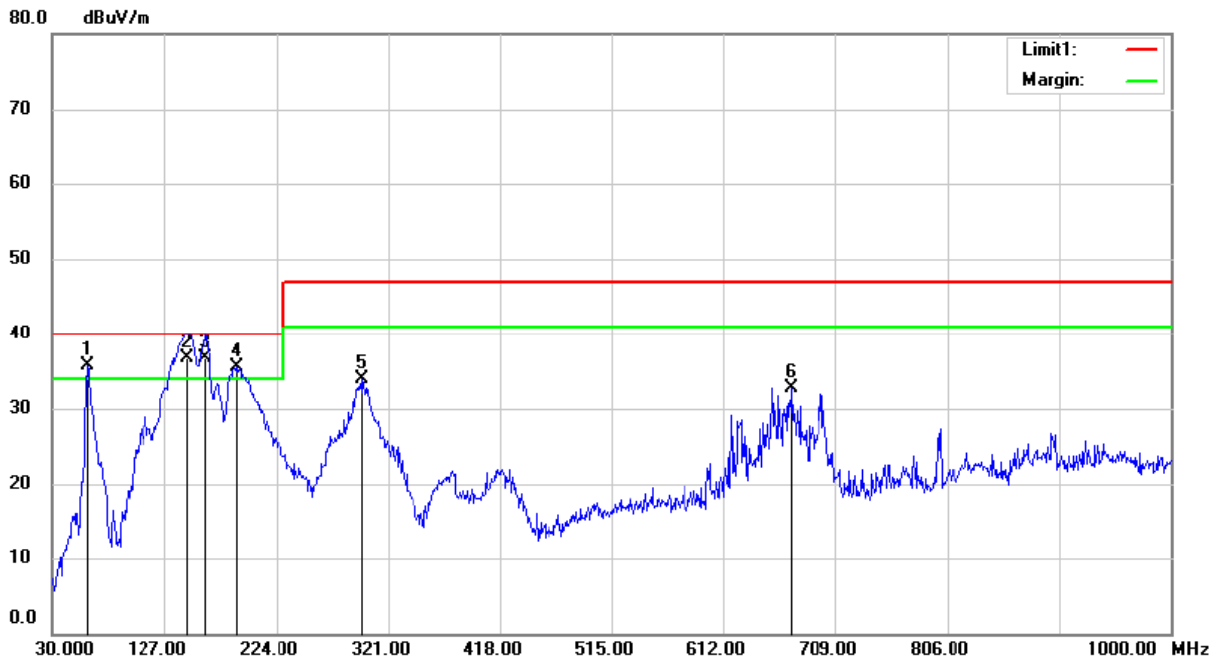


3.2.7 TEST RESULTS

TEST MODE	See section 2.2	FREQUENCY RANGE	30-1000MHz
TEST VOLTAGE	DC 5V from PC	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 53% RH	TESTED BY: Robert	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	60.0700	-15.53	51.21	35.68	40.00	-4.32	120	103
2	146.4000	-17.99	54.69	36.70	40.00	-3.30	139	117
3	162.8900	-18.92	55.72	36.80	40.00	-3.20	181	149
4	189.0800	-17.44	52.94	35.50	40.00	-4.50	198	163
5	298.6900	-13.74	52.94	33.83	47.00	-13.17	159	132
6	671.1700	-6.27	39.02	32.75	47.00	-14.25	223	182

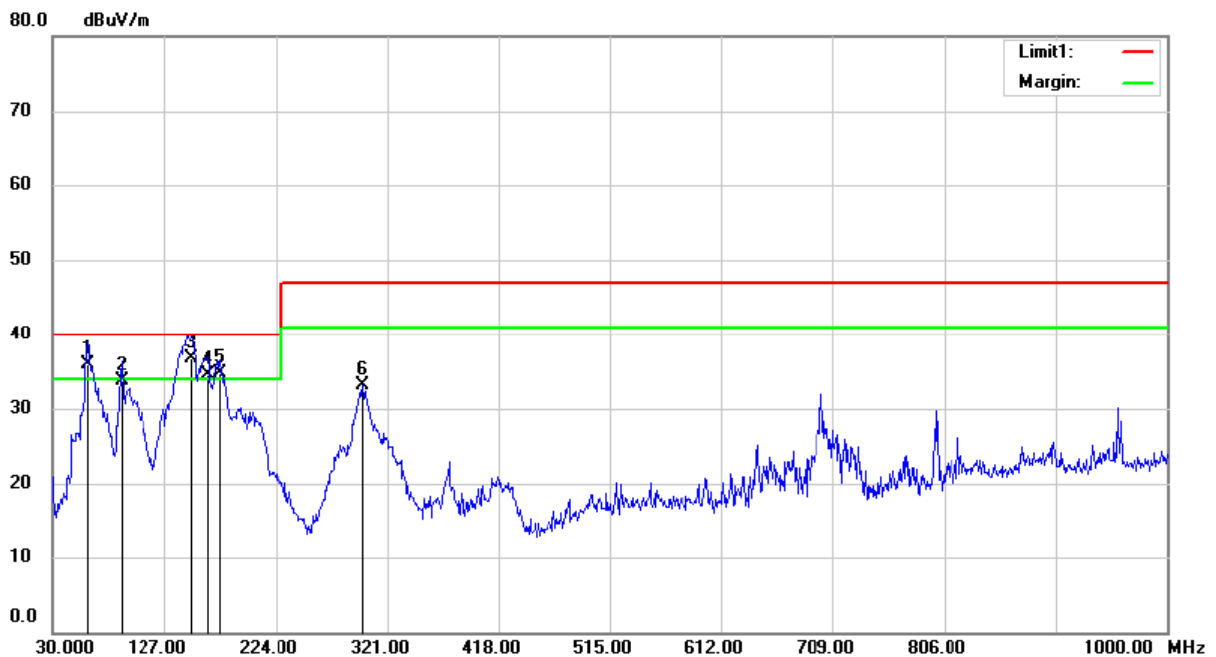
REMARKS: The emission levels of other frequencies were very low against the limit.



TEST MODE	See section 2.2	FREQUENCY RANGE	30-1000MHz
TEST VOLTAGE	DC 5V from PC	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 53% RH	TESTED BY: Robert	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	60.0700	-15.53	51.43	35.90	40.00	-4.10	100	169
2	90.1400	-16.85	50.55	33.70	40.00	-6.30	100	156
3	151.2500	-18.18	54.98	36.80	40.00	-3.20	100	224
4	164.8300	-19.07	53.57	34.50	40.00	-5.50	100	262
5	175.5000	-19.17	53.87	34.70	40.00	-5.30	100	186
6	299.6600	-13.81	46.97	33.16	47.00	-13.84	100	210

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





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 Hz, 3A/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 Tester	TESEQ AG	NSG 438A	130	July 22, 2015	July 21, 2016
Impulse Module	TESEQ AG	IN NSG 438A A 4380-150pF/33 0Ohm	403-550/171 2	May 17, 2015	May 16, 2016
Impulse Module	TESEQ AG	INA 4553-330pF/33 0Ohm	403-588/191 2	May 17, 2015	May 16, 2016
Impulse Module	TESEQ AG	INA 4381-150pF/2k Ohm	403-564/181 2	May 17, 2015	May 16, 2016
Impulse Module	TESEQ AG	INA 4382-330pF/2k Ohm	403-565/191 2	May 17, 2015	May 16, 2016

- NOTE:** 1. The test was performed in ESD Room, Shenzhen EMTEK Co., Ltd.
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

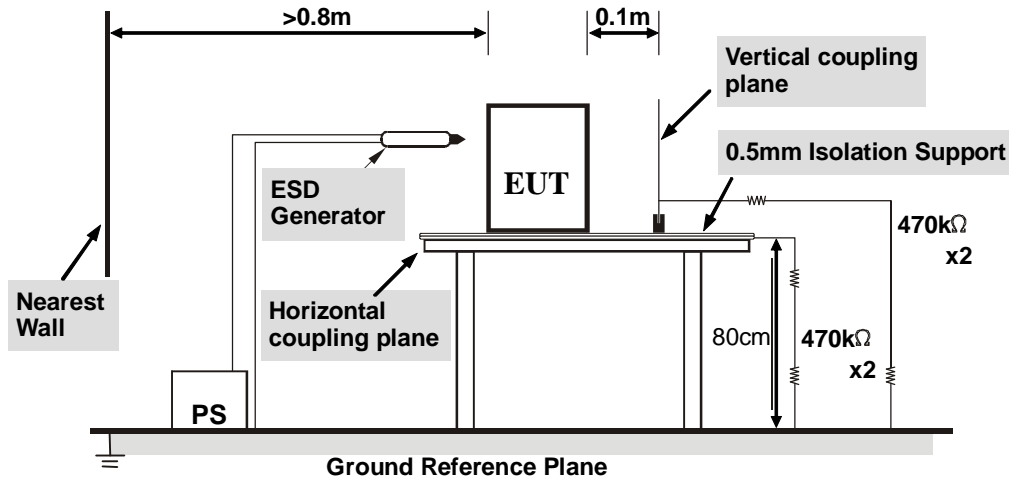
The basic test procedure was in accordance with IEC 61000-4-2:

- 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 ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.
- 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 1-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	See section 2.2	TEST VOLTAGE	DC5.5V from battery, DC 5V from PC
ENVIRONMENTAL CONDITIONS	22 deg. C, 50% RH, 101kPa	TESTED BY: William	

DIRECT DISCHARGE APPLICATION				
Test Level (kV)	Polarity (+/-)	Test Point	Test Result of Contact Discharge	Test Result of Air Discharge
4	+/-	All Metal Parts	A	N/A
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&VCP	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	MY50145187	May 16, 2015	May 15, 2016
RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 17, 2015	May 16, 2016
50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 17, 2015	May 16, 2016
Field Strength Meter	DARE	RSS1006A	10I00037SO22	May 17, 2015	May 16, 2016
50ohm Diode Power Sensor	BOONTON	51011EMC	36164	May 17, 2015	May 16, 2016
Power Amplifier	MILMEGA	80RF1000-175	1059345	May 16, 2015	May 16, 2016
Power Amplifier	MILMEGA	AS0102-55	1018770	May 16, 2015	May 16, 2016
Power Amplifier	MILMEGA	AS1860-50	1059346	May 16, 2015	May 16, 2016
Log.-Per. Antenna	SCHWARZBEC K	VULP 9118E	811	May 17, 2015	May 16, 2016
Broad-Band Horn Antenna	SCHWARZBEC K	STLP 9149	9149-227	May 17, 2015	May 16, 2016
Multi-function interface system	DARE	CTR1009B	12I00250SNO72	N/A	N/A
Automatic switch group	DARE	RSW1004A	N/A	N/A	N/A

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



4.3.3 TEST PROCEDURE

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

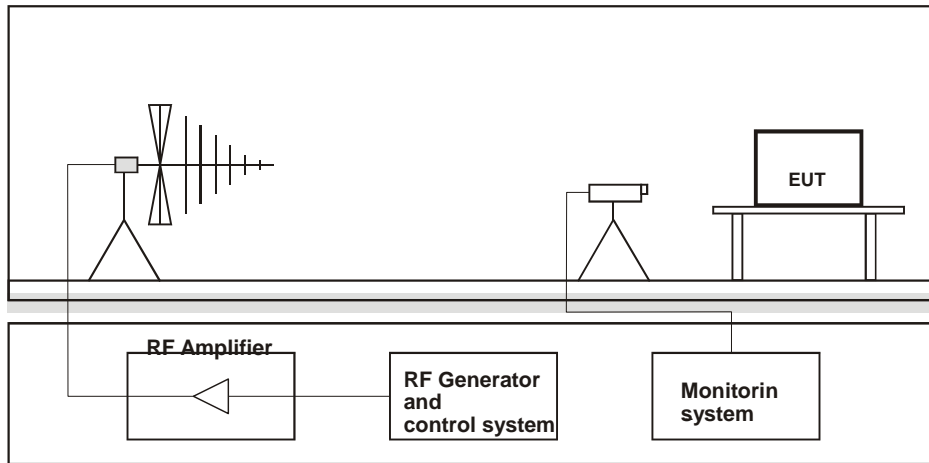
- a. The testing was performed in a fully-anechoic chamber.
- b. The frequency range is swept from 80 MHz to 1000 MHz, 1400MHz to 2000MHz, 2000MHz to 2700MHz with the signal 80% amplitude modulated with a 1kHz sine wave.
- c. The dwell time at each frequency shall not be less than the time necessary 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	See section 2.2	TEST VOLTAGE	DC 5.5V from battery, DC 5V from PC
ENVIRONMENTAL CONDITIONS	22deg. C, 50% RH	TESTED BY: William	

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:	1 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	250040.1	May 16, 2015	May 15, 2016

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

4.4.3 TEST PROCEDURE

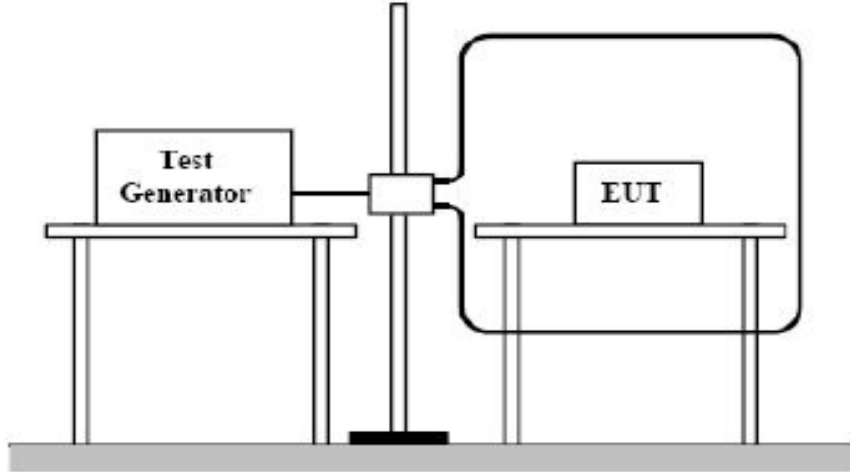
- The equipment is configured and connected to satisfy its functional requirements.
- The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables 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	See section 2.2	TEST VOLTAGE	DC 5.5V from battery, DC 5V from PC
ENVIRONMENTAL CONDITIONS	22deg. C, 50% RH	TESTED BY: William	

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.

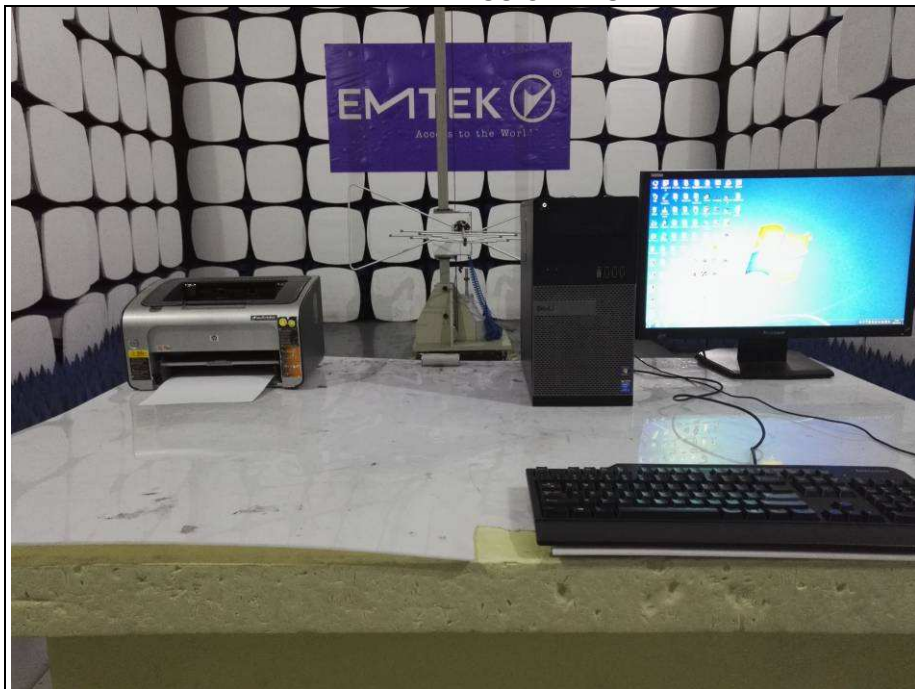


5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST



ESD TEST



RS TEST





**BUREAU
VERITAS**

Test Report No.: CE151126N093

POWER-FREQUENCY MAGNETIC FIELDS TEST



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**BUREAU
VERITAS**

Test Report No.: CE151126N093

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---

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