MEDICAL DIRECTIVE—EMC
TEST REPORT

For

Multifunctional Nd:Yag Laser Beauty Machine

Model: Yinhe-V18, Yinhe-V12, Yinhe-280, Yinhe-V8, Yinhe-2, Yinhe-King, Yinhe-C6, Yinhe-V28

Brand Name: Yinhe Lasylaser

Report No.: ENC121217GZ55E1

Date of Issue: Dec. 17, 2012

Prepared For

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Prepared By

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1. VERIFICATION OF CONFORMITY

Equipment Under Test:	Multifunctional Nd:Yag Laser Beauty Machine
Model Name:	Yinhe-V18, Yinhe-V12, Yinhe-280, Yinhe-V8, Yinhe-2, Yinhe-King, Yinhe-C6, Yinhe-V28
Model Difference:	The series models have same electrical structural as Yinhe-V12, except for the different energy, power and the laser lamp.
Brand Name:	Yinhe Lasylaser
Applicant:	Yiwu Lasy Science & Technology Co.,Ltd
	NO. 207 Jingfa Road Yiwu City 322000, Zhejiang China
Manufacturer:	Yiwu Lasy Science & Technology Co.,Ltd
	NO. 207 Jingfa Road Yiwu City 322000, Zhejiang China
Type of Test:	MEDICAL DEVICES:GENERATL Directive 93/42/EEC for CE Marking
Technical Standards:	EN 60601-1-2:2007, EN 61000-3-2:2006+A1:2009+A2:2009, EN 61000-3-3:2008
File Number:	ENC121217GZ55E1
Date of test:	Dec. 7, 2012 – Dec. 17, 2012
Deviation:	None
Condition of Test Sample:	Normal

The above equipment was tested by East Notice Certification Service Co., Ltd. for compliance with the requirements set forth in MEDICAL DEVICES:GENERATL Directive 93/42/EEC and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.
Should any objections to the test reports occurred, should submit it to the Company within ten days since the issuing of the report, Fail to accept.
The test results of this report relate only to the tested Sample identified in this report.

Checked By Yemig

Yemig Dec. 17, 2012

Authorized By Ray Zhou

Ray Zhou Dec. 17, 2012

2. SYSTEM DESCRIPTION

EUT Test Procedure:

1. Connect EUT and peripheral devices if need.
2. Power on the EUT, the EUT begins to work.
3. Make sure the EUT operates normally during the test.

3. PRODUCT INFORMATION

Housing Type: Plastic
Rating Voltage: 110-240V~, 50/60Hz
Rating Power: 600W

I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	**Q'TY**	**Cable**	**Tested with**
AC input port	1	1	1

4. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
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***Note:** All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.*

***Grounding:** Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.*

5. TEST FACILITY

Location: 1/F, Haohui Commercial Building, Zhuji Street, Dongpu Town, Tianhe District, Guangzhou City, China

Description: There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.

Site Filing: The site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.

Instrument Tolerance: All measuring equipment is in accord with ANSI C63.4 and CISPR 22 requirements that meet industry regulatory agency and accreditation agency requirement.

6. EN 60601-1-2 LINE CONDUCTED EMISSION TEST

6.1. TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	Aeroflex	2399A	N/A	03/25/2012	03/24/2013
LISN	HAMEG	HM6050-2	N/A	03/25/2012	03/24/2013

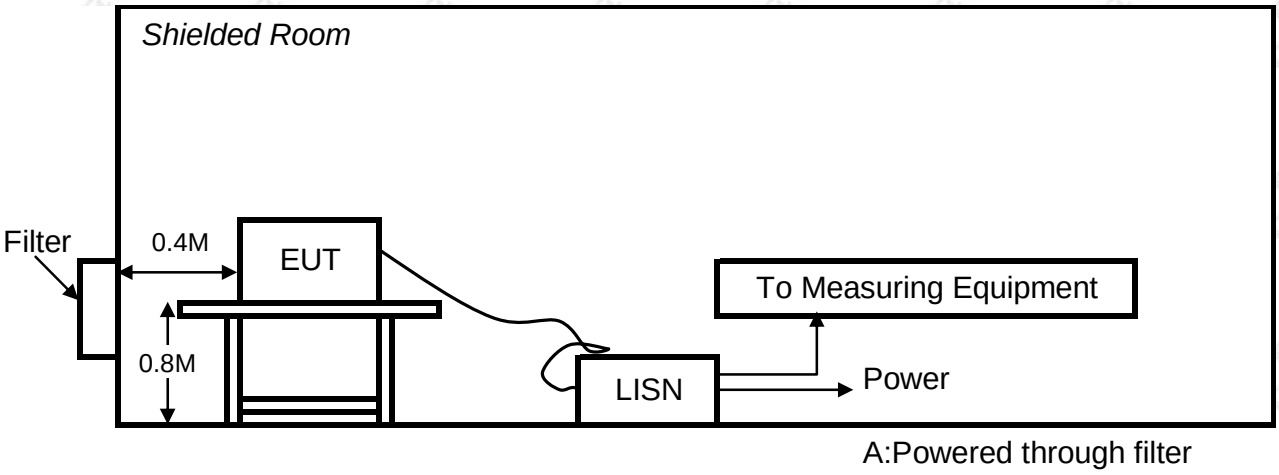
6.2. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBμV)	Average(dBμV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

***Note:** 1. The lower limit shall apply at the transition frequency.*

2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

6.3. BLOCK DIAGRAM OF TEST SETUP



6.4. PROCEDURE OF LINE CONDUCTED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN 60601-1-2 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2) Support equipment, if needed, was placed as per EN 60601-1-2.
3) All I/O cables were positioned to simulate typical actual usage as per EN60601-1-2
4) The EUT received AC230V/50Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5) All support equipments received power from a second LISN supplying power of AC 230V/50Hz, if any.
6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7) Analyzer / Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.
8) During the above scans, the emissions were maximized by cable manipulation.
9) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
10) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

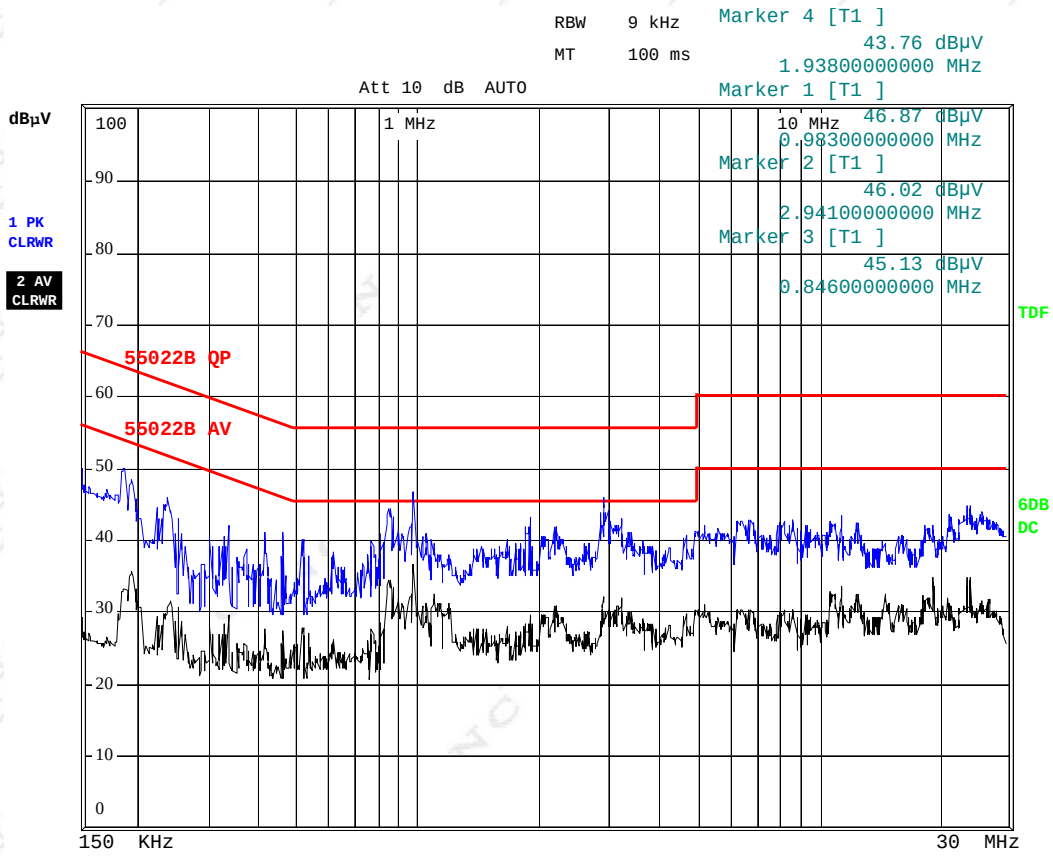
Frequency Range Investigated			
Mode of operation	**Date**	**Report No.**	**Worst Mode**
Normal	Dec. 17, 2012	ENC121217GZ55E1	☒

The test data of the worst case condition(s) was reported on the Summary Data page.

6.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

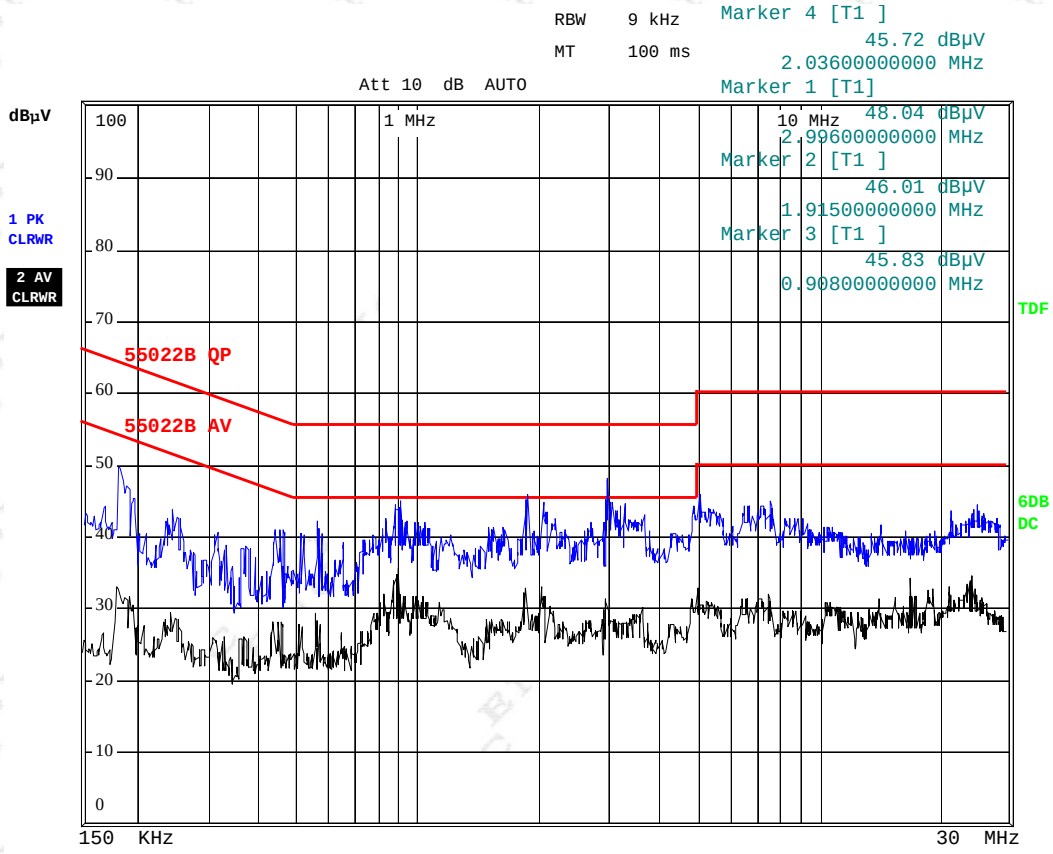
EUT	:	Multifunctional Nd:Yag Laser Beauty Machine	**Power**	:	AC 230V
M/N	:	Yinhe-V12	**Temperature**	:	25℃
Mode	:	Normal, L	**Humidity**	:	53%

Test Result of Line Conducted Emission Test-Line Line



EUT	:	Multifunctional Nd:Yag Laser Beauty Machine	**Power**	:	AC 230V
M/N	:	Yinhe-V12	**Temperature**	:	25℃
Mode	:	Normal, N	**Humidity**	:	53%

Test Result of Line Conducted Emission Test-Neutral Line



7. EN60601-1-2 DISTURBANCE POWER EMISSION TEST

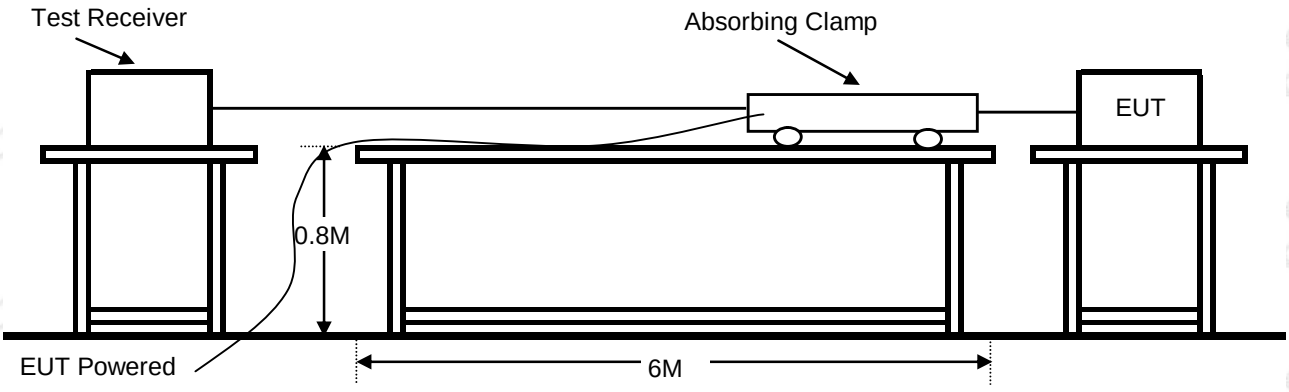
7.1. TEST EQUIPMENT OF DISTURBANCE POWER EMISSION TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Test Receiver	R&S	CISPR16	N/A	03/25/2012	03/24/2013
Absorbing Clamp	CSI	CLA-050	N/A	03/25/2012	03/24/2013
Cable	TS	TS®90	N/A	03/25/2012	03/24/2013

7.2. LIMITS OF DISTURBANCE POWER EMISSION TEST

Equipment Type	Frequency (MHz)	Limit Values dB(pW)	
		Quasi-peak	Average
Associated equipment	30-300	45-55	35-45
Increasing linearly with the frequency			

7.3. BLOCK DIAGRAM OF TEST SETUP



Note:

EUT is placed on a non-metallic table of 0.1 m of height above the floor and at least 0.8m from other metallic objects and from any person. The lead to be measured shall be stretched in a straight horizontal line for length sufficient to accommodated the absorbing clamp.

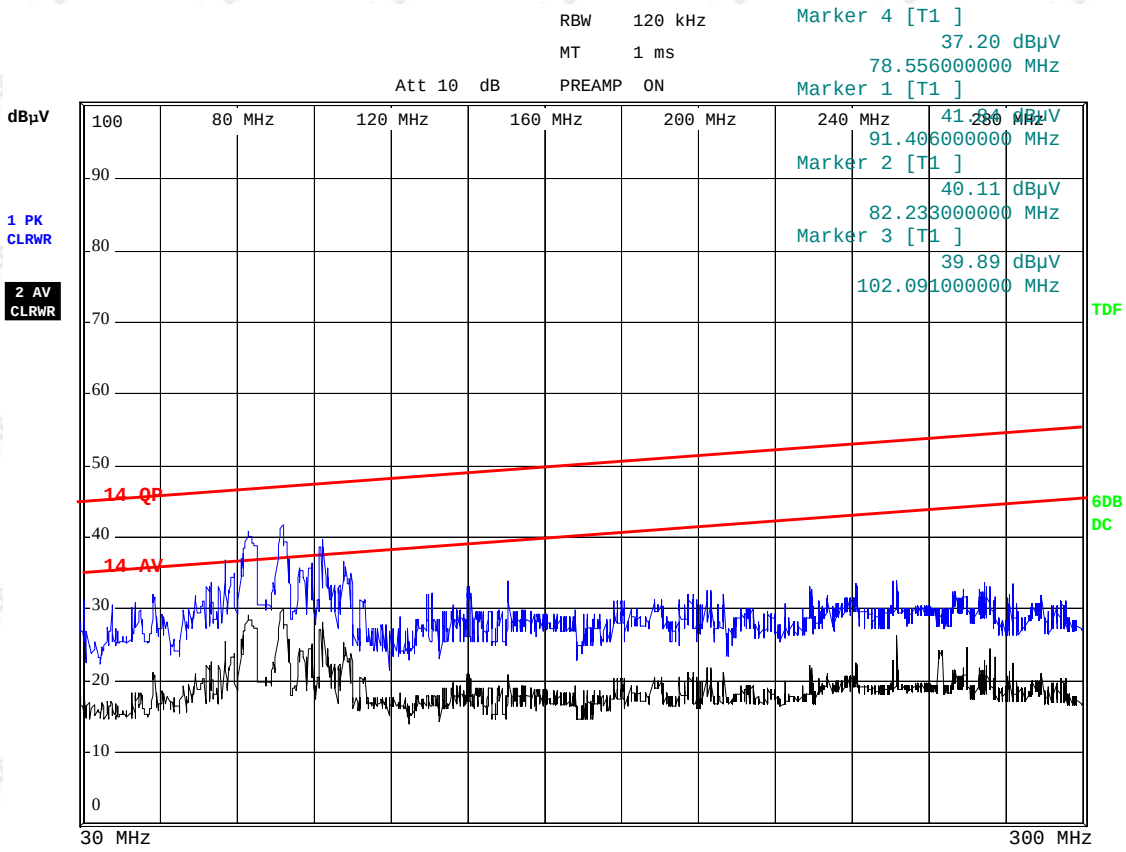
The absorbing clamp is placed around the lead to be measured, with its current transformer towards the equipment under test.

All connectors not used shall be left un-terminated. All connectors having a connected lead shall be terminated in a manner representative of use.

The absorbing clamp is applied successively to all leads whose length is 25cm or longer, unscreened or screened, which may be connected to the individual units of the equipment under test.

At each test frequency the absorbing clamp shall be moved along the lead until the maximum value is found between a position adjacent to the equipment under test and a distance of about a half wavelength from it.

7.4. SUMMARY DATA OF DISTURBANCE POWER EMISSION TEST

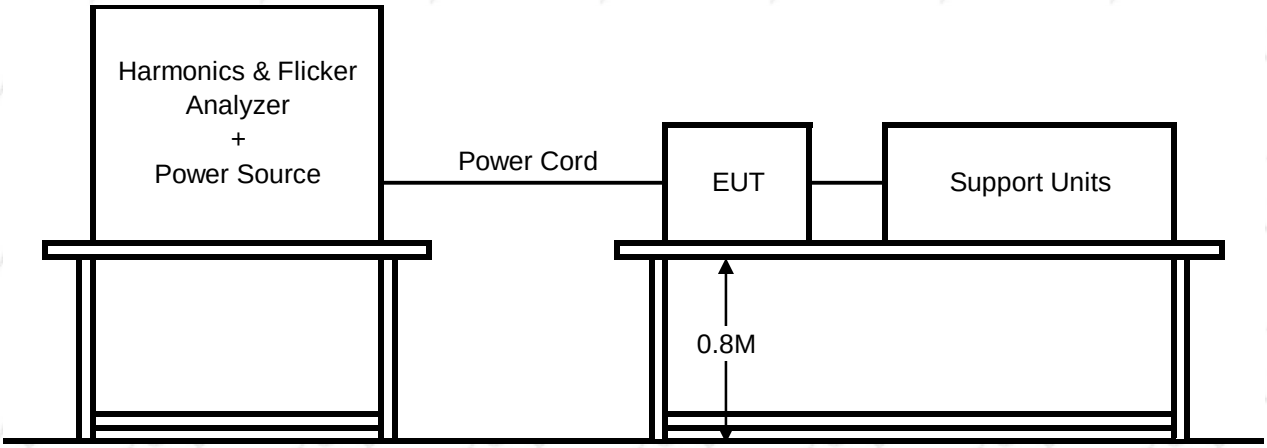


8. EN 61000-3-2 POWER HARMONICS TEST

POWER HARMONICS MEASUREMENT

Port	:	AC mains
Basic Standard	:	EN 61000-3-2
Limits	:	CLASS A
Tester	:	Sam Liu
Temperature	:	25℃
Humidity	:	53%

8.1. BLOCK DIAGRAM OF TEST SETUP



8.2. LIMITS OF HARMONIC CURRENT

Limits for Class A Equipment	
Harmonics Order n	**Max. permissible harmonic current (A)**
Odd harmonics	
3	2.3
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15≤n≤39	0.15×15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8≤n≤40	0.23×8/n

NOTE:

1. According to section 5 of EN61000-3-2, the EUT is Class A equipment.
2. The above limits are for all applications having an active input power>75W. No limits apply for equipment with an active input power up to and including 75W.

8.3. RESULT

Test Specification

Test Frequency:	50Hz	Test Voltage:	230Vac
Waveform:	Sine	Test Time:	2.5min
Classification:	Class A	Test result:	**PASS**

Harmonic current results

Hn	Harms(max) [A]	Limit [%]	Limit[A]	Result
1	5.863			
2	0.004	0.333	1.080	PASS
3	0.272	11.843	2.300	PASS
4	0.018	4.121	0.430	PASS
5	0.243	21.349	1.140	PASS
6	0.014	4.544	0.300	PASS
7	0.226	29.390	0.770	PASS
8	0.011	4.742	0.230	PASS
9	0.186	46.521	0.400	PASS
10	0.010	5.557	0.184	PASS
11	0.082	24.993	0.330	PASS
12	0.009	5.792	0.153	PASS
13	0.075	35.705	0.210	PASS
14	0.007	5.724	0.131	PASS
15	0.065	43.624	0.150	PASS
16	0.007	5.927	0.115	PASS
17	0.052	39.245	0.132	PASS
18	0.006	6.014	0.102	PASS
19	0.024	20.218	0.118	PASS
20	0.006	6.668	0.092	PASS
21	0.033	30.578	0.107	PASS
22	0.006	7.303	0.084	PASS
23	0.037	37.559	0.098	PASS
24	0.006	7.967	0.077	PASS
25	0.029	32.567	0.090	PASS
26	0.005	6.720	0.071	PASS
27	0.015	18.067	0.083	PASS
28	0.004	6.197	0.066	PASS
29	0.012	15.730	0.078	PASS
30	0.004	6.705	0.061	PASS
31	0.013	18.493	0.073	PASS
32	0.003	5.876	0.058	PASS
33	0.012	18.043	0.068	PASS
34	0.003	6.311	0.054	PASS
35	0.007	11.716	0.064	PASS
36	0.003	5.346	0.051	PASS
37	0.005	8.197	0.061	PASS
38	0.002	3.197	0.048	PASS
39	0.001	1.724	0.058	PASS
40	0.001	2.174	0.046	PASS

9. EN 61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST

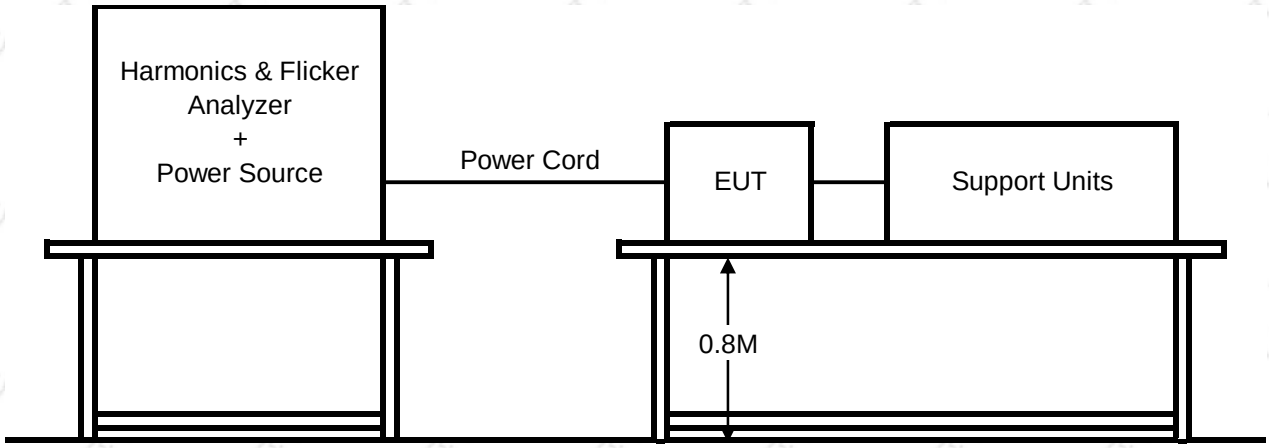
VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-3: 2008
Limits : §5 of EN 61000-3-3
Tester : Sam Liu
Temperature : 25℃
Humidity : 53%

9.1. TEST EQUIPMENT OF VOLTAGE FLUCTUATION / FLICKER TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Harmonic Emission Flicker	California instruments	500LIX-400	N/A	03/25/2012	03/24/2013

9.2. BLOCK DIAGRAM OF TEST SETUP



Note:

1. The test supply voltage (open-circuit voltage) was the rated voltage of the EUT. The test voltage was maintained within ±2 % of the nominal value. The frequency was 50 Hz ±0.5 %.
2. The voltage fluctuations and flicker were measured at the supply terminals of the EUT.
3. The observation period, Tp, for the assessment of flicker values by flicker measurement, flicker simulation, or analytical method was:

   — for Pst, Tp = 10 min;

   — for Plt, Tp = 2 h.

   The observation period included that part of the whole operation cycle in which the EUT produces the most unfavourable sequence of voltage changes.

9.3. RESULT

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: Multifunctional Nd:Yag Laser Beauty Machine — Tested by: Sam Liu

Test category: Class-A per Ed3.0 (European limits) — Test Margin: 100

Test date: 2012-12-16 — Start time: 11:40:22 — End time: 11:50:22

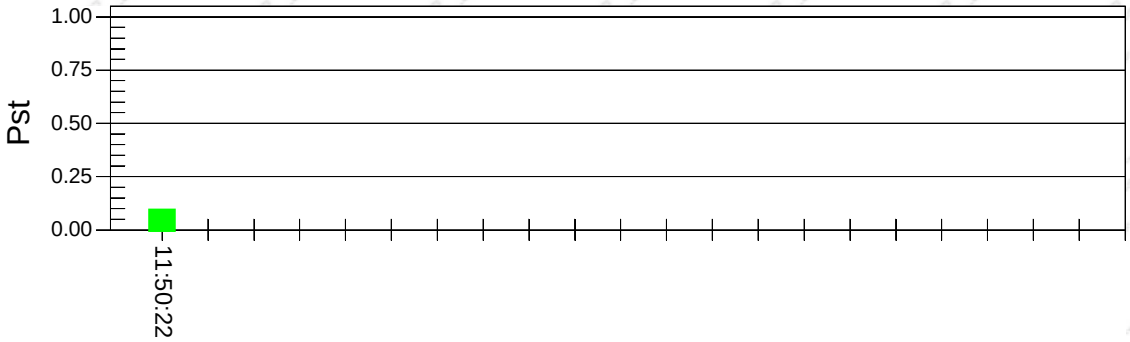
Test duration (min): 10

Comment: On

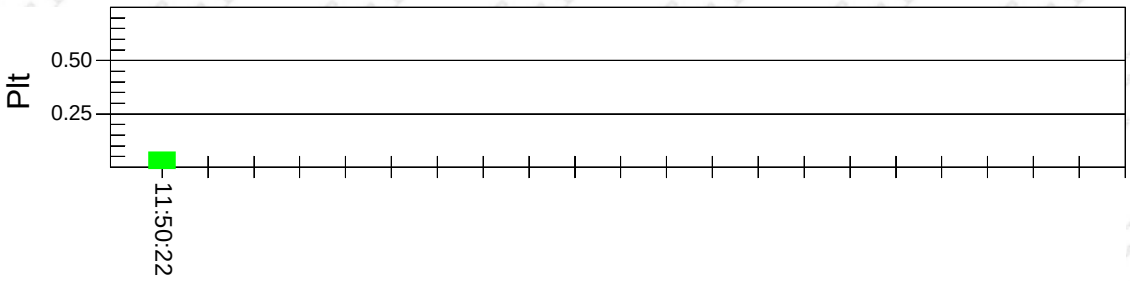
Customer: Yiwu Lasy Science & Technology Co.,Ltd

Test Result: Pass — **Source qualification: OK**

Pst and limit line — **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.1			
Highest dt(%):	-0.26	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	-0.16	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.103	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.072	Test limit:	0.650	Pass

10. IEC 61000-4-2 ESD IMMUNITY TEST

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

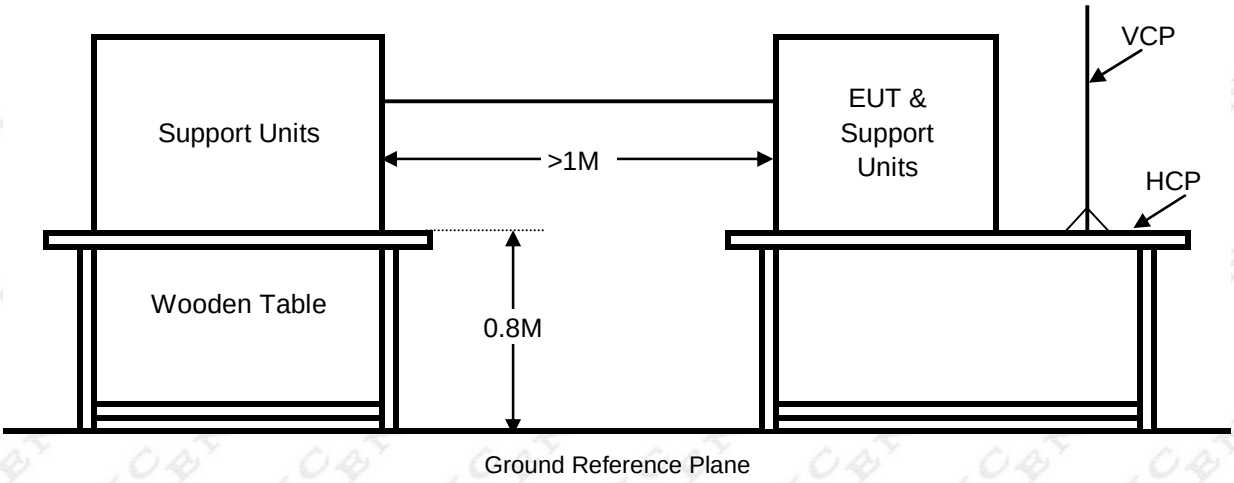
Port	:	Enclosure
Basic Standard	:	IEC 61000-4-2: 2008
Test Level	:	±8 kV (Air Discharge) ±6 kV (Contact Discharge) ±6 kV (Indirect Discharge)
Standard require	:	B
Tester	:	Sam Liu
Temperature	:	25℃
Humidity	:	53%

10.1. TEST EQUIPMENT OF ESD TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
ESD Simulator	EM-Test	ESY-V1883	N/A	03/25/2012	03/24/2013

10.2. BLOCK DIAGRAM OF TEST SETUP

(The 470 k ohm resistors are installed per standard requirement)



10.3. TEST PROCEDURE

The EUT was located 0.1 m minimum from all side of the HCP.

The support units were located 1 m minimum away from the EUT.

EUT worked with resistance load, and make sure EUT worked normally.

Actives the communication function if the EUT with such port(s).

As per the requirement of EN 60601-1-2: Contact discharge is the preferred test method. 20 discharges (10 with positive and 10 negative polarity) shall be applied on each accessible metal part of the enclosure. In case of a non-conductive enclosure, discharges shall be applied on the horizontal or vertical coupling planes as specified in IEC 61000-4-2.

Air discharges shall be used where contact discharges cannot be applied.

The following test condition was followed during the tests.

Note: *As per the A2 to IEC 61000-4-2, a bleed resistor cable is connected between the EUT and HCP during the test.*

The electrostatic discharges were applied as follows:

Amount of Discharges	Voltage	Coupling	Result (Pass/Fail)
Mini 25 /Point	±2kV; ±4kV;±6kV	Contact Discharge	Pass
Mini 25 /Point	±2kV; ±4kV;±6kV	Indirect Discharge HCP (Front)	Pass
Mini 25 /Point	±2kV; ±4kV;±6kV	Indirect Discharge VCP (Left)	Pass
Mini 25 /Point	±2kV; ±4kV;±6kV	Indirect Discharge VCP (Back)	Pass
Mini 25 /Point	±2kV; ±4kV;±6kV	Indirect Discharge VCP (Right)	Pass
Mini 10 /Point	±2kV; ±4kV;±8kV;	Air Discharge	Pass

10.4. PERFORMANCE & RESULT

☐Criteria A: The apparatus continues to operate as intended. 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. In some cases the performance level may be replaced by a permissible loss of performance.

☒Criteria B: The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS*** ☐ ***FAIL***

11. IEC 61000-4-3 TEST

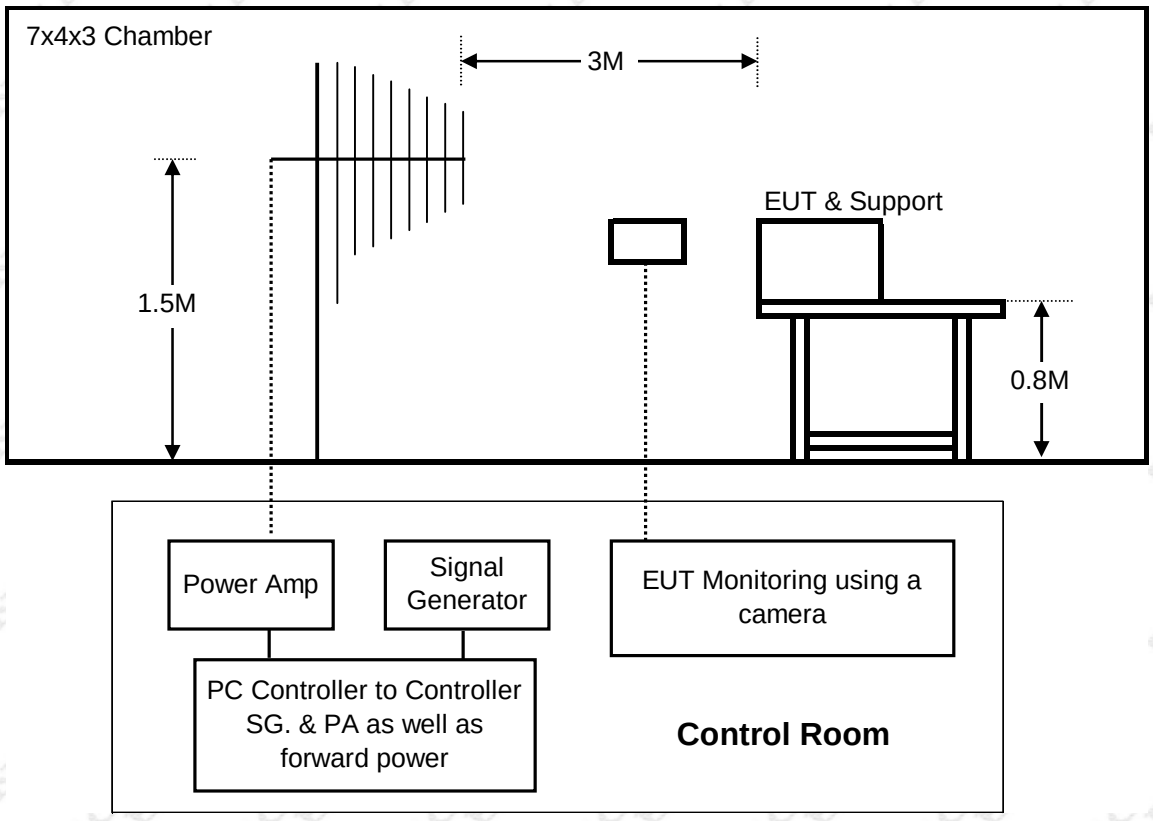
RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port : Enclosure
Basic Standard : IEC 61000-4-3:2010
Test Level : 3V/m with 80% AM. 1kHz Modulation.
Standard require : A
Tester : Sam Liu
Temperature : 25℃
Humidity : 53%

11.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Signal Generator	IFA	2023B	N/A	03/25/2012	03/24/2013
Power Amplifier	AR	800W1000	N/A	03/25/2012	03/24/2013
Power Antenna	AR	25S1G4A	N/A	03/25/2012	03/24/2013

11.2. BLOCK DIAGRAM OF TEST SETUP



11.3. TEST PROCEDURE

The EUT was located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity. The support units were located outside of the uniformity area, but the cable(s) connected with EUT were exposed to the calibrated field as per IEC 61000-4-3.

EUT worked with resistance load, and make sure EUT worked normally.

Setting the testing parameters of RS test software per IEC 61000-4-3.

Performing the test at each side of with specified level (3V/m) at 1% steps and test frequency from 80MHz to 1000MHz and 1400MHz to 2700MHz.

Recording the test result in following table.

It is not necessary to perform test as per annex A of EN 60601-1-2 if the EUT doesn't belong to TTE product.

IEC 61000-4-3 Final test conditions:

Test level : 3V/m

Steps : 1 % of fundamental

Dwell Time : 1 sec

Range (MHz)	Field	Modulation	Polarity	Position	Result (Pass/Fail)
80-1000 1400-2700	3V/m	AM	H	Front	Pass
80-1000 1400-2700	3V/m	AM	H	Left	Pass
80-1000 1400-2700	3V/m	AM	H	Back	Pass
80-1000 1400-2700	3V/m	AM	H	Right	Pass
80-1000 1400-2700	3V/m	AM	V	Front	Pass
80-1000 1400-2700	3V/m	AM	V	Left	Pass
80-1000 1400-2700	3V/m	AM	V	Back	Pass
80-1000 1400-2700	3V/m	AM	V	Right	Pass

11.4. PERFORMANCE & RESULT

☒Criteria A: The apparatus continues to operate as intended. 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. In some cases the performance level may be replaced by a permissible loss of performance.

☐Criteria B: The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS***	☐ ***FAIL***

12. IEC 61000-4-4 TEST

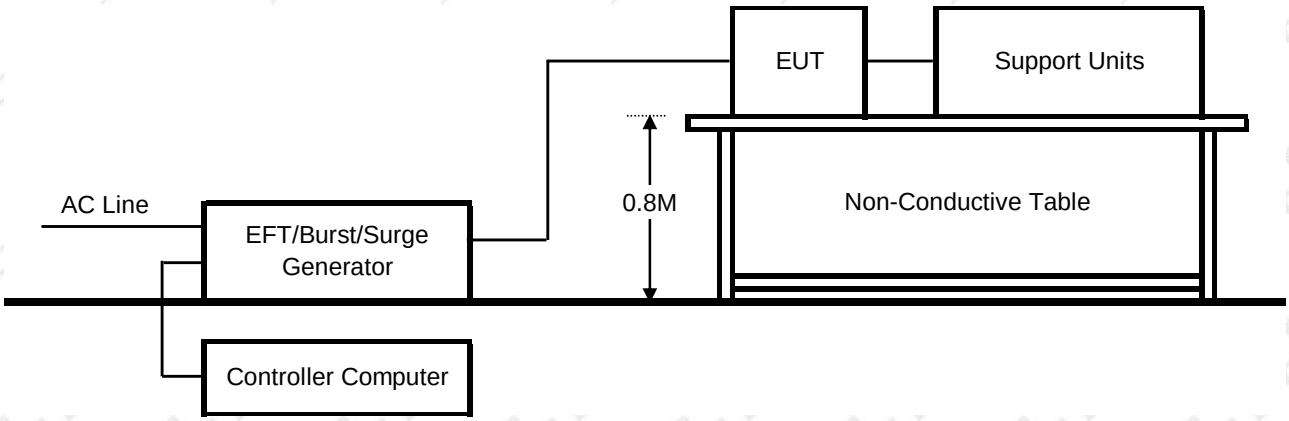
ELECTRICAL FAST TRANSIENTS/BURST IMMUNITY TEST

Port : On Power Supply Lines
Basic Standard : IEC 61000-4-4:2012
Test Level : +/- 2kV for Power Supply Lines
Standard require : B
Tester : Sam Liu
Temperature : 25℃
Humidity : 53%

12.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Compact Generator	EM-Test	UCS500M	N/A	03/25/2012	03/24/2013
Capacitive Clamp	EM-Test	HY21-EFTC	N/A	03/25/2012	03/24/2013
CDN for Telecom Port	EM-Test	CNV504S1	N/A	03/25/2012	03/24/2013

12.2. BLOCK DIAGRAM OF TEST SETUP



12.3. TEST PROCEDURE

The EUT and support units were located on a wooden table 0.8m away from ground reference plane.
A 1.0 meter long power cord was attached to EUT during the test.
The length of communication cable between communication port and clamp was keeping within 1 meter.
EUT worked with resistance load, and make sure EUT worked normally.
Related peripherals work during the test.
Recording the test result as shown in following table.

Test conditions:

Impulse Frequency: 5 kHz
Tr/Th: 5/50ns
Burst Duration: 15ms
Burst Period: 300ms

Inject Line	Voltage kV	Inject Method	Result (Pass/Fail)
PE+L+N	+ /- 2	Direct	Pass

12.4. PERFORMANCE & RESULT

☐Criteria A: The apparatus continues to operate as intended. 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. In some cases the performance level may be replaced by a permissible loss of performance.

☒Criteria B: The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS***	☐ ***FAIL***

13. IEC 61000-4-5 SURGE IMMUNITY TEST

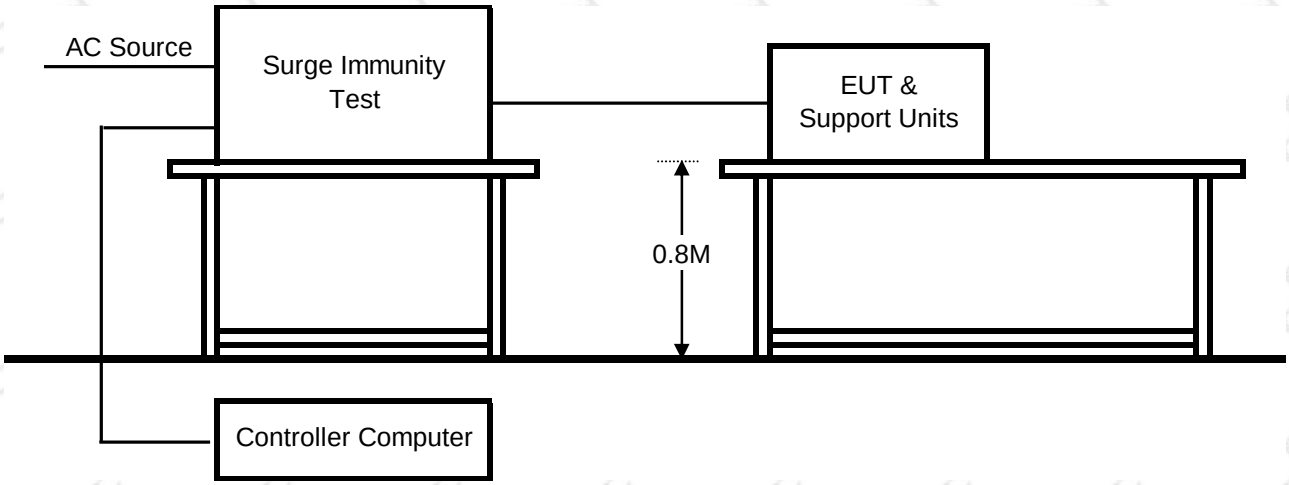
SURGE IMMUNITY TEST

Port	:	On Power Supply Lines
Basic Standard	:	IEC 61000-4-5:2005
Requirements	:	+/- 1kV (Line to Line) +/- 2kV (Line to Ground)
Standard require	:	B
Tester	:	Sam Liu
Temperature	:	25℃
Humidity	:	53%

13.1. TEST EQUIPMENT OF SURGE TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Compact Generator	EM-Test	UCS500M	N/A	03/25/2012	03/24/2013
Capacitive Clamp	EM-Test	HY21-EFTC	N/A	03/25/2012	03/24/2013
CDN for Telecom Port	EM-Test	CNV504S1	N/A	03/25/2012	03/24/2013

13.2. BLOCK DIAGRAM OF TEST SETUP



13.3. TEST PROCEDURE

The EUT and support units were located on a wooden table 0.8 m away from ground floor.
EUT worked with resistance load, and make sure EUT worked normally.
Recording the test result as shown in following table.

Test conditions:

Voltage Waveform	:	1.2/50 us
Current Waveform	:	8/20 us
Polarity	:	Positive/Negative
Phase angle	:	0^0, 90^0, 270^0
Number of Test	:	5

Coupling Line	Voltage (kV)	Polarity	Coupling Method	Result (Pass/Fail)
L1-L2	1	Positive	Capacitive	Pass
L1-L2	1	Negative	Capacitive	Pass
L1-PE	2	Positive	Capacitive	Pass
L1-PE	2	Negative	Capacitive	Pass
L2-PE	2	Positive	Capacitive	Pass
L2-PE	2	Negative	Capacitive	Pass

13.4. PERFORMANCE & RESULT

☐Criteria A: The apparatus continues to operate as intended. 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. In some cases the performance level may be replaced by a permissible loss of performance.

☒Criteria B: The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS***	☐ ***FAIL***

14. IEC 61000-4-6 TEST

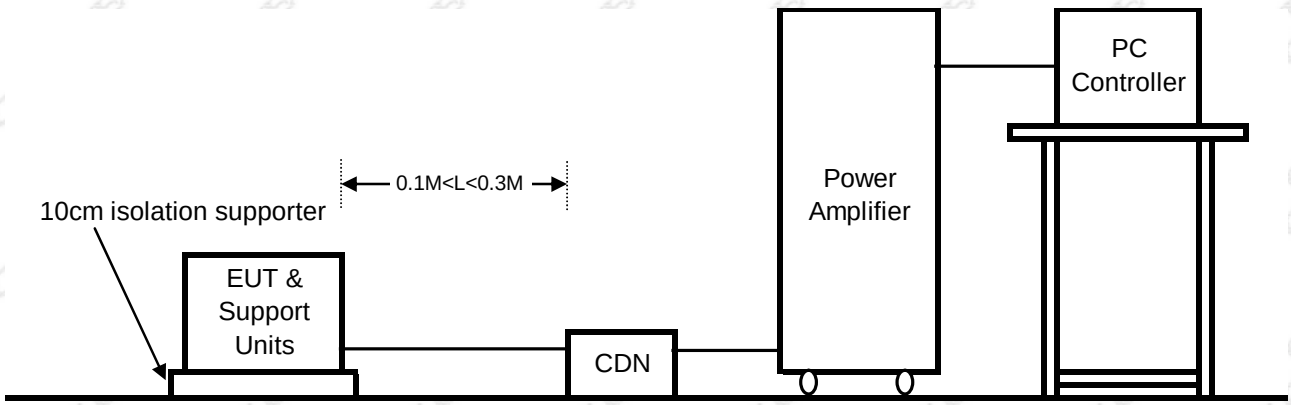
IEC 61000-4-6 IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELD

Port	:	Power Supply Lines
Basic Standard	:	IEC 61000-4-6: 2008
Requirements	:	3V with 80% AM. 1 kHz Modulation
Standard require	:	A
Tester	:	Sam Liu
Temperature	:	25℃
Humidity	:	53%

14.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Power Amplifier	AR	800W1000	N/A	03/25/2012	03/24/2013
CDN	EM-Test	CNV504S1	N/A	03/25/2012	03/24/2013
Direction Coupler	EM-Test	DC2600N	N/A	03/25/2012	03/24/2013
EM-Clamp	EM-Test	EM101	N/A	03/25/2012	03/24/2013
Caliberation	EM-Test	CAM2/M3	N/A	03/25/2012	03/24/2013
Attenuator	EM-Test	ATT6/75	N/A	03/25/2012	03/24/2013
Power Sensor	AR	PH2000	N/A	03/25/2012	03/24/2013
Power Meter	AR	PM2002	N/A	03/25/2012	03/24/2013
Signal Generator	IFA	2023A	N/A	03/25/2012	03/24/2013

14.2. BLOCK DIAGRAM OF TEST SETUP



14.3. TEST PROCEDURE

The EUT and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.

EUT worked with resistance load, and make sure EUT worked normally.

Related peripherals work during the test.

Setting the testing parameters of CS test software per IEC 61000-4-6.

Recording the test result in following table.

Test conditions:

Frequency Range: 0.15MHz-80MHz

Frequency Step: 1% of fundamental

Dwell Time: 1 sec

Range (MHz)	Strength	Modulation	Result (Pass/Fail)
0.15-80	3V	AM	Pass

14.4. PERFORMANCE & RESULT

☒Criteria A: The apparatus continues to operate as intended. 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. In some cases the performance level may be replaced by a permissible loss of performance.

☐Criteria B: The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS***	☐ ***FAIL***

15. IEC 61000-4-8 TEST

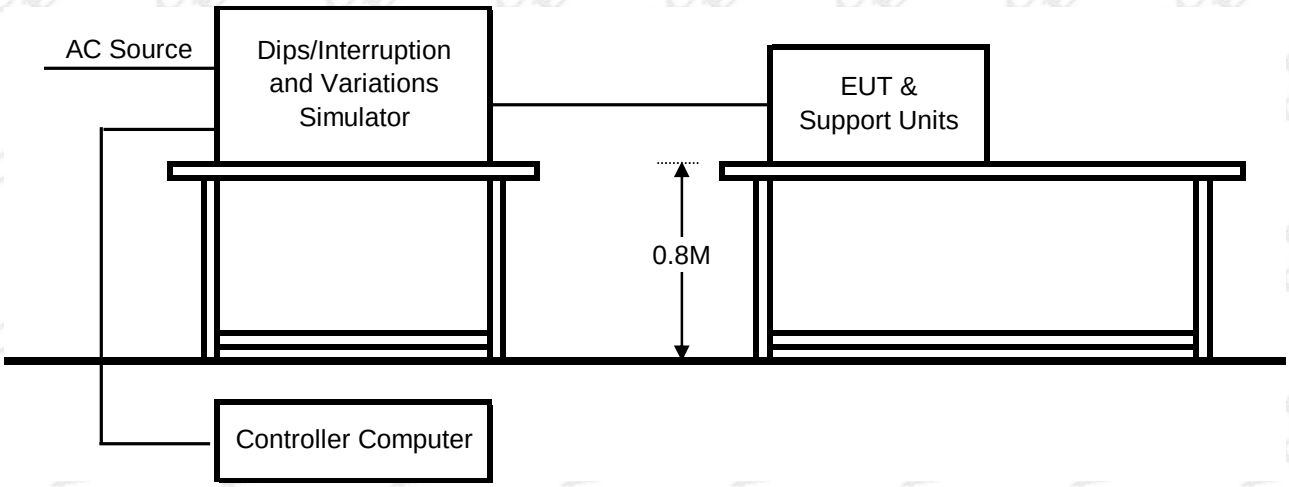
POWER FREQUENCY ELECTROMAGNETIC FIELDS IMMUNITY TEST

Port	:	Enclosure
Basic Standard	:	IEC 61000-4-8: 2009
Requirements	:	50Hz, 3A/m
Standard require	:	A
Tester	:	Sam Liu
Temperature	:	25℃
Humidity	:	53%

15.1 TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMCPRO	KEYTEK	--	N/A	03/25/2012	03/24/2013
COIL	KEYTEK	F-1000-4	N/A	03/25/2012	03/24/2013

15.2 BLOCK DIAGRAM OF TEST SETUP



15.3 TEST PROCEDURE

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m x1m). The induction coil shall then be rotated by 90¡ã in order to expose the EUT to the test field with different orientations.

Test Conditions:

Frequency	Polarity	Level	Observation	Meet Performance Criteria
50 Hz	X	3A/m	Normal	A
50 Hz	Y	3A/m	Normal	A
50 Hz	Z	3A/m	Normal	A

15.4 PERFORMANCE & RESULT

☒Criteria A: The apparatus continues to operate as intended. 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. In some cases the performance level may be replaced by a permissible loss of performance.

☐Criteria B: The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS*** ☐ ***FAIL***

16. IEC 61000-4-11 TEST

VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST

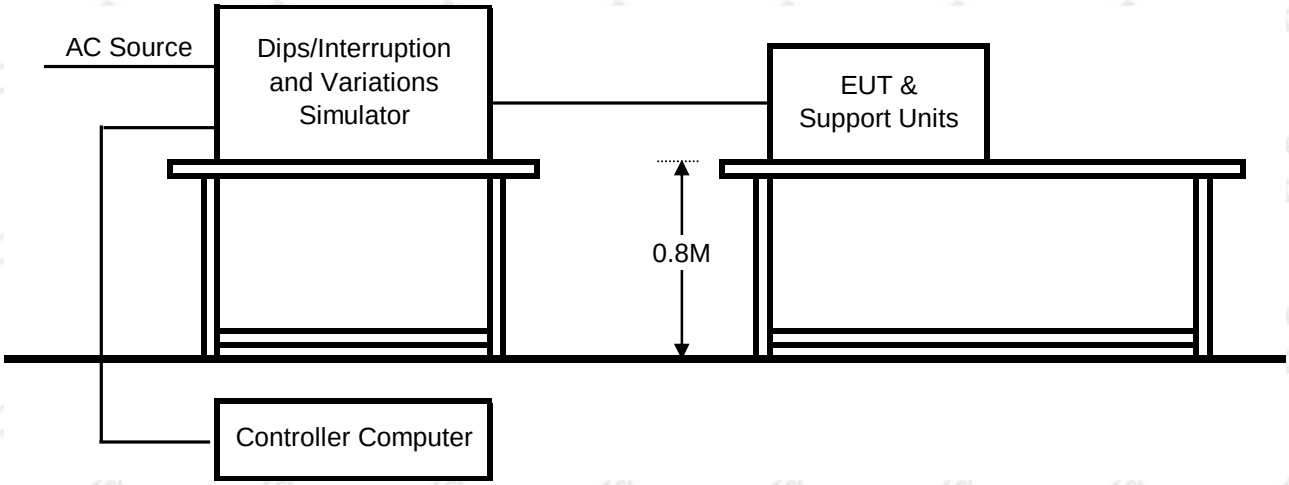
Port : Power Supply Lines
Basic Standard : IEC 61000-4-11: 2004
Requirements : 0, 45, 90, 135, 180, 225, 270, 315 degrees
Standard require : Min. 10 sec.
Test Interval: : Sam Liu
Temperature : 25℃
Humidity : 53%

	Test Level % U_T	Reduction (%)	Duration (periods)	Performance Criteria
Voltage Dips	<5	>95	0.5	B
	40	60	5	C
	70	30	25	C
Voltage Interruptions	**Test Level % U_T**	**Reduction (%)**	**Duration (periods)**	**Performance Criteria**
	<5	>95	5	C

16.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Compact Generator	EM-Test	UCS500M	N/A	03/25/2012	03/24/2013
Capacitive Clamp	EM-Test	HY21-EFTC	N/A	03/25/2012	03/24/2013
CDN for Telecom Port	EM-Test	CNV504S1	N/A	03/25/2012	03/24/2013

16.2. BLOCK DIAGRAM OF TEST SETUP



16.3. TEST PROCEDURE

The EUT and support units were located on a wooden table, 0.8 m away from ground floor. EUT worked with resistance load, and make sure EUT worked normally.

Setting the parameter of tests and then perform the test software of test simulator.

Conditions changes to occur at 0 degree crossover point of the voltage waveform.

Recording the test result in test record form.

Test conditions:

The duration with a sequence of three dips/interruptions with interval of 10 s minimum (Between each test event)

Voltage Dips:

Test Level % U_T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
<5	>95	0.5	Normal	B
40	60	5	Normal	C
70	30	25	Normal	C

Voltage Interruptions:

Test Level % U_T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
<5	>95	5	Normal	C

16.4. PERFORMANCE

☐Criteria A: The apparatus continues to operate as intended. 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. In some cases the performance level may be replaced by a permissible loss of performance.

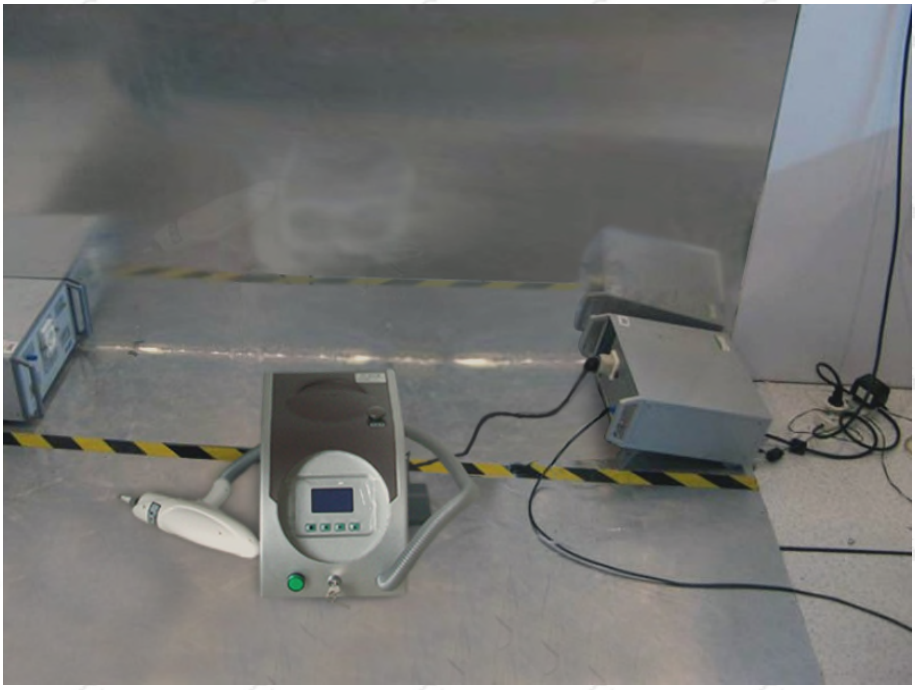
☐Criteria B: The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☒Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS*** ☐ ***FAIL***

APPENDIX 1
PHOTOGRAPHS OF TEST SETUP

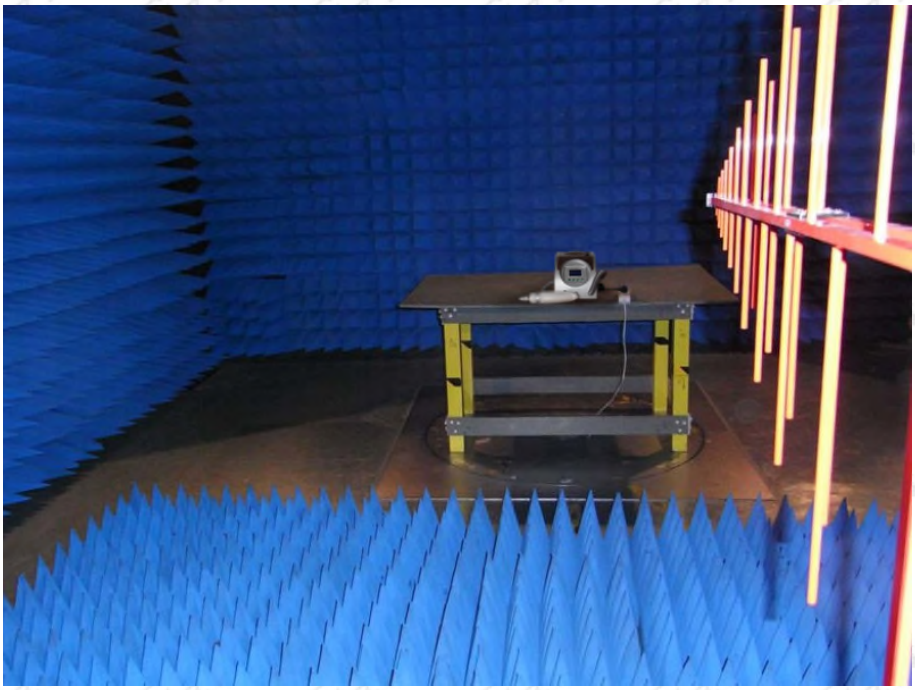
CONDUCTED EMISSION TEST SETUP



EN 61000-3-2 POWER HARMONICS &
EN 61000-3-3 VOLTAGE FLUCTUATION/FLICKER TEST SETUP

IEC 61000-4-2 ELECTROSTATIC DISCHARGE TEST SETUP

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST SETUP



APPENDIX 2
PHOTOGRAPHS OF EUT

Front View of EUT

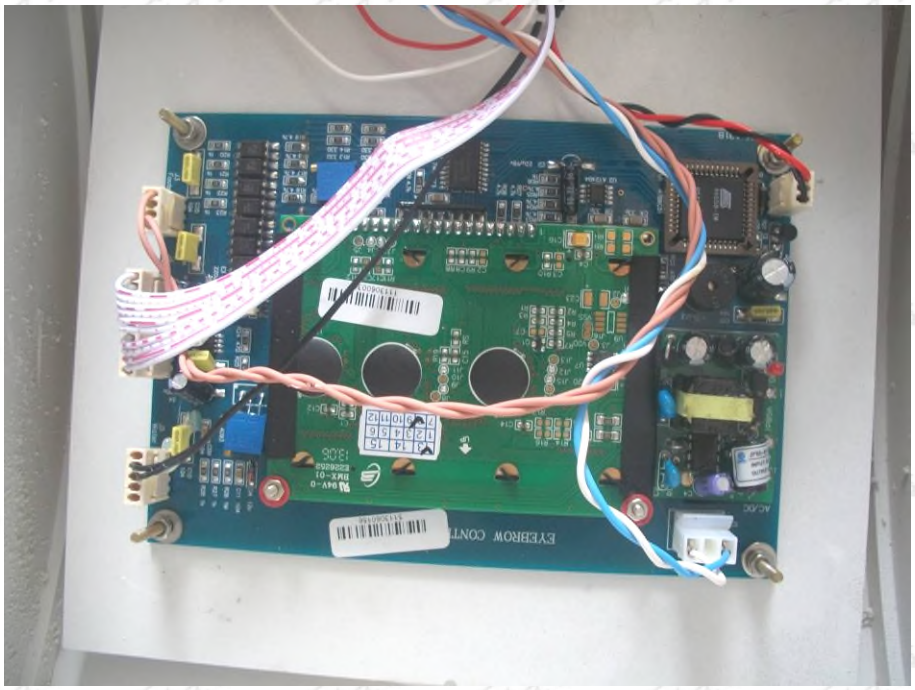
Back View of EUT

Right View of EUT

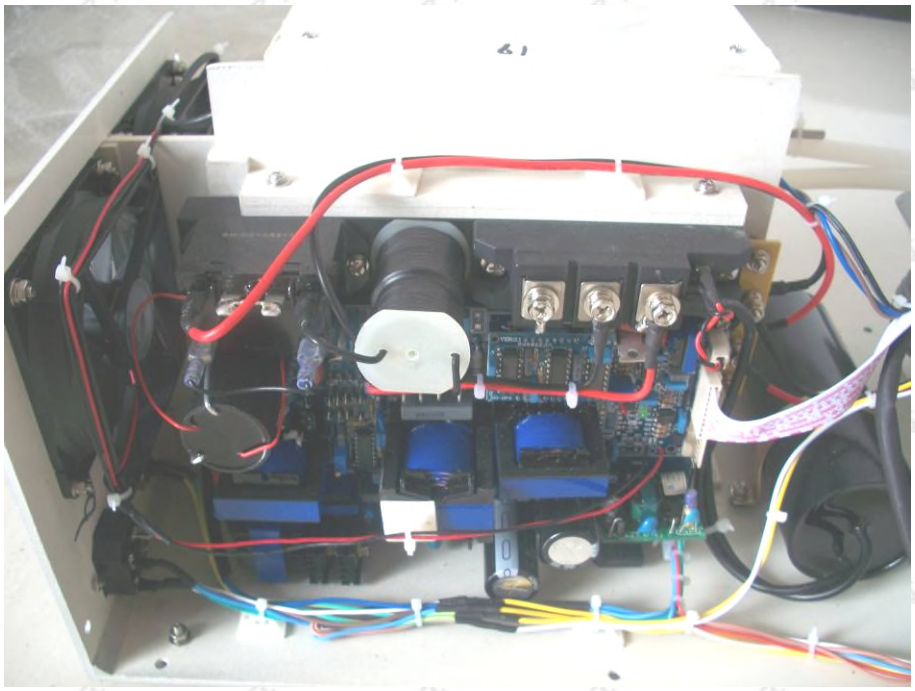
Left View of EUT

Overall View of Application Parts

Internal View of EUT



Internal View of EUT



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