

EN 61326-1:2006  
EN 61326-2-2:2006

## TEST REPORT

For

### Beijing Hysine Technology Co.,Ltd.

NO. 108, Beijing youth entrepreneur's demo park, Changping District, Beijing, china

**Model: TCX Series**

<b>Report Type:</b> Original Report		<b>Product Type:</b> Fan Coil Controller	
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<b>Report Number:</b>	R2BJ131011052-01		
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## GENERAL INFORMATION

### Product Description for Equipment Under Test (EUT)

The *Beijing Hysine Technology Co.,Ltd.*'s product, model *TCX Series* the "EUT" as referred to in this report is a *Fan Coil Controller*, which measures approximately: 14.2 cm (L) x 12.8 cm (W) x 4.0 cm (H), rated input voltage: AC 230/50Hz. The highest operating frequency is 16MHz.

*Note: the series product, has two models: TCX-FC2 and TCX-FC4 which are electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics, we selected the model TCX-FC4 for the testing and the difference between them please refers to the attached declaration letter.*

\* All measurement and test data in this report was gathered from production sample serial number: 131011052 (Assigned by BAACL, Dongguan). The EUT was received on 2013-10-12.

### Objective

This report is prepared on behalf of *Beijing Hysine Technology Co.,Ltd.* in accordance with EN 61326-1 and EN 61326-2-2, electrical equipment for measurement, control and laboratory use EMC requirements.

The objective of the manufacturer is to determine compliance with EN 61326-1 and EN 61326-2-2.

### Related Submittal(s)/Grant(s)

No related submittal(s).

### Test Methodology

All measurements contained in this report were conducted with CISPR 16-1, specification for radio disturbance and immunity measuring apparatus and methods Part 1: radio disturbance and immunity measuring apparatus measuring apparatus. CISPR 16-2, specification for radio disturbance and immunity measuring apparatus and methods Part 2: methods of measurement of disturbances and immunity radiated disturbance measurements.

All radiated and conducted Emission measurement was performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 10 Meters.

### Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

### Equipment Modifications

No modifications were made to the unit tested.

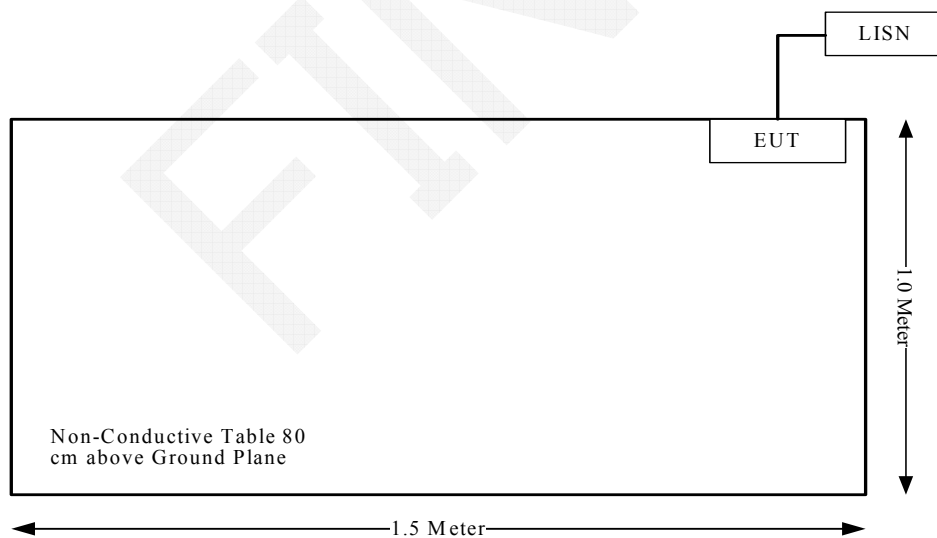
### Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

### External I/O Cable

Cable Description	Length (m)	From	To
/	/	/	/

### Block Diagram of Test Setup



**SUMMARY OF TEST REPORT****EN 61326-1**

<b>Rule</b>	<b>Description</b>	<b>Results</b>
§7	Conducted Emissions	Compliance
§7	Radiated Emissions	Compliance
§ 6	Electrostatic Discharges (IEC 61000-4-2)	Compliance
§ 6	Electrical Fast Transients (IEC 61000-4-4)	Compliance
§6	EM Field (IEC 610000-4-3)	Compliance
§6	Continuous Conducted Disturbances (IEC 61000-4-6)	Compliance
§6	Power Frequency Magnetic Fields (IEC 61000-4-8)	Compliance
§6	Surges (IEC 61000-4-5)	Compliance
§6	Voltage Dips and Short Interruptions (IEC 61000-4-11)	Compliance

**EN 61000-3-2**

<b>Rule</b>	<b>Description</b>	<b>Results</b>
	Harmonic Current Emissions	Compliance

**EN 61000-3-3**

<b>Rule</b>	<b>Description</b>	<b>Results</b>
	Voltage Fluctuation and Flicker	Compliance

## EN 61326-1 §7 CONDUCTED EMISSION

### Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cispr}$  of Table 1, then:

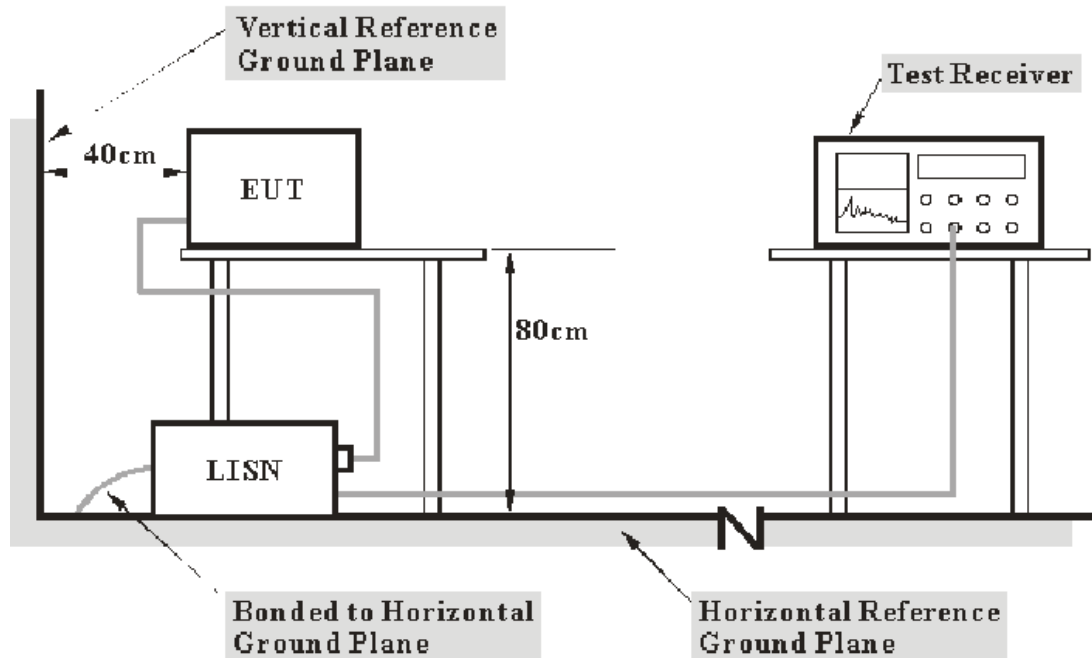
- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.46 dB (150 kHz to 30 MHz).

Table 1 – Values of  $U_{cispr}$

Measurement	$U_{cispr}$
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

### Test System Setup



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with CISPR 16-1:1999, CISPR 16-2:1996 measurement procedure. The specification used was the EN 61326-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The EUT was connected to a 230V/50Hz AC line power source.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI TEST RECEIVER	ESCS 30	830245/006	2012-11-29	2013-11-28
R&S	Two-line V-network	ENV216	3560.6550.12	2013-2-18	2014-2-17
R&S	L.I.S.N	ESH3-Z5	100113	2012-11-29	2013-11-28

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the first LISN.

Maximizing procedure was performed on the six (6) highest Emission to ensure EUT compliance using all installation combination.

All data was recorded in the Quasi-peak and average detection mode.

### Test Results Summary

According to the recorded data in following table, the EUT complied with the EN 61326-1, with the worst margin reading of:

**9.45 dB at 0.685 MHz** in the **Line** conducted mode



**Test Data**

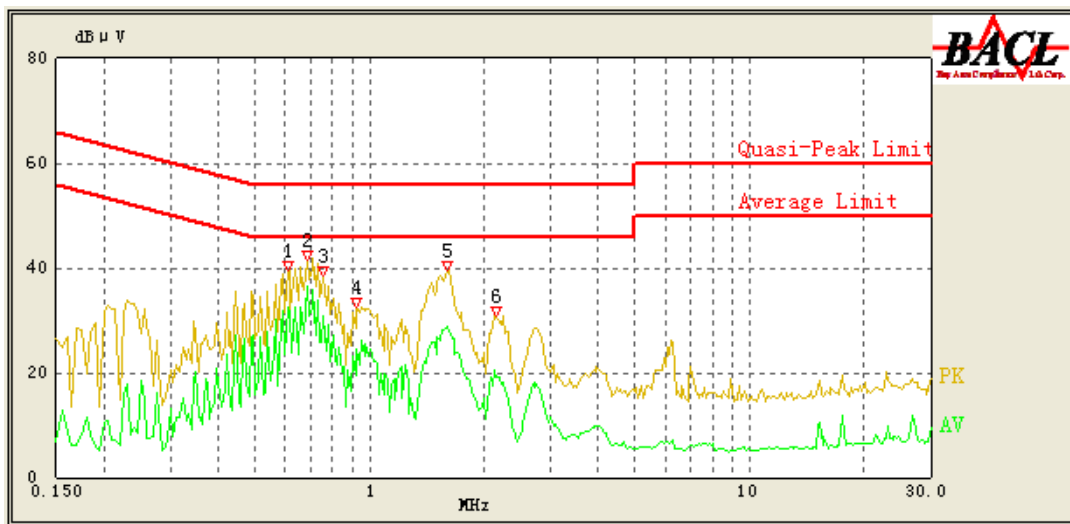
**Environmental Conditions**

<b>Temperature:</b>	28.1 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	100.4 kPa

The testing was performed by Jone Lv 2013-10-14.

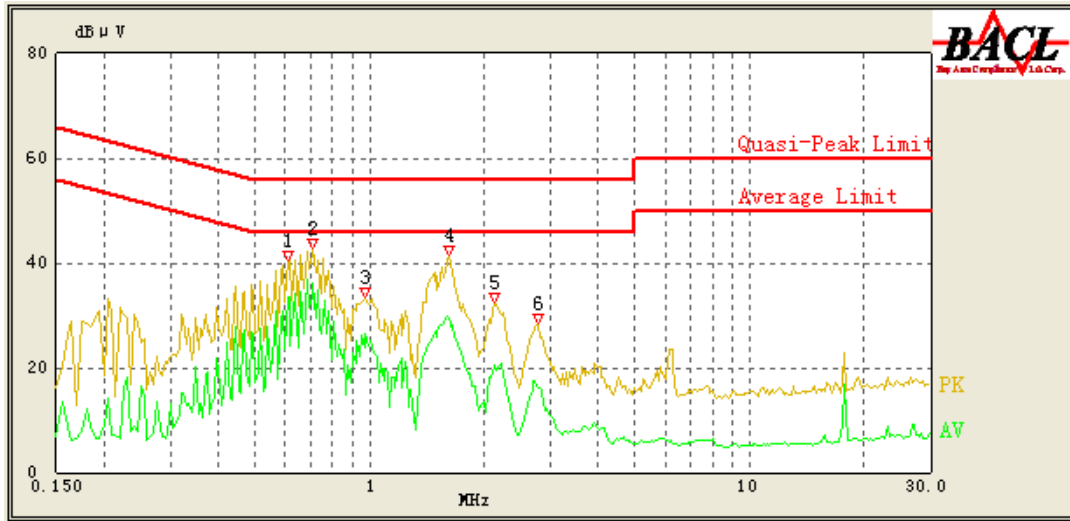
Test Mode: Running

**Line:**



No.	Frequency (MHz)	Cord. Reading (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/AV/QP)
1	0.610	36.68	9.67	56.00	19.32	QP
2	0.610	32.49	9.67	46.00	13.51	AV
3	0.685	39.71	9.67	56.00	16.29	QP
4	0.685	36.55	9.67	46.00	9.45	AV
5	0.755	36.02	9.67	56.00	19.98	QP
6	0.755	30.85	9.67	46.00	15.15	AV
7	0.925	30.24	9.68	56.00	25.76	QP
8	0.925	24.35	9.68	46.00	21.65	AV
9	1.600	36.06	9.68	56.00	19.94	QP
10	1.600	28.99	9.68	46.00	17.01	AV
11	2.150	26.61	9.68	56.00	29.39	QP
12	2.150	19.32	9.68	46.00	26.68	AV

**Neutral:**



No.	Frequency (MHz)	Cord. Reading (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/AV/QP)
1	0.610	37.47	9.67	56.00	18.53	QP
2	0.610	33.43	9.67	46.00	12.57	AV
3	0.710	40.46	9.67	56.00	15.54	QP
4	0.710	36.16	9.67	46.00	9.84	AV
5	0.975	31.99	9.68	56.00	24.01	QP
6	0.975	26.49	9.68	46.00	19.51	AV
7	1.625	35.56	9.68	56.00	20.44	QP
8	1.625	29.39	9.68	46.00	16.61	AV
9	2.130	28.40	9.68	56.00	27.60	QP
10	2.130	20.38	9.68	46.00	25.62	AV
11	2.790	21.28	9.69	56.00	34.72	QP
12	2.775	16.22	9.69	46.00	29.78	AV

## EN 61326-1 §7 RADIATED EMISSION

### Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cispr}$  of Table 1, then:

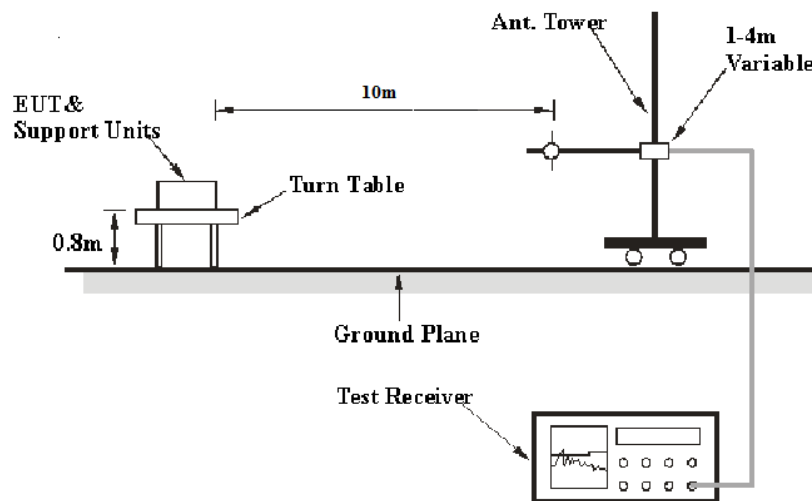
- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.9 dB; 200M~1GHz: 5.0 dB; Measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 5.0 dB; 200M~1GHz: 6.2 dB; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB

Table 1 – Values of  $U_{cispr}$

Measurement	$U_{cispr}$
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

### Test System Setup



The radiated emission tests were performed in the 10 meters chamber test site, using the setup accordance with the CISPR 16-1, CISPR16-2. The specification used was EN 61326-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

### EMI Test Receiver Setup

The system was investigated from 30 MHz to 1000 MHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI TEST RECEIVER	ESCI	100035	2013-5-6	2014-5-5
Sunol Sciences	Antenna	JB3	A060611-2	2011-9-6	2014-9-5
HP	AMPLIFIER	8447D	2727A05902	N/A	N/A

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Procedure

Maximizing procedure was performed on the highest Emission to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode.

### Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7dB below the limit . The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

### Test Results Summary

According to the data in the following table, the EUT complied with the EN 61326-1, with the worst margin reading of:

**12.20 dB at 131.8500 MHz in the Vertical polarization**

**Test Data**

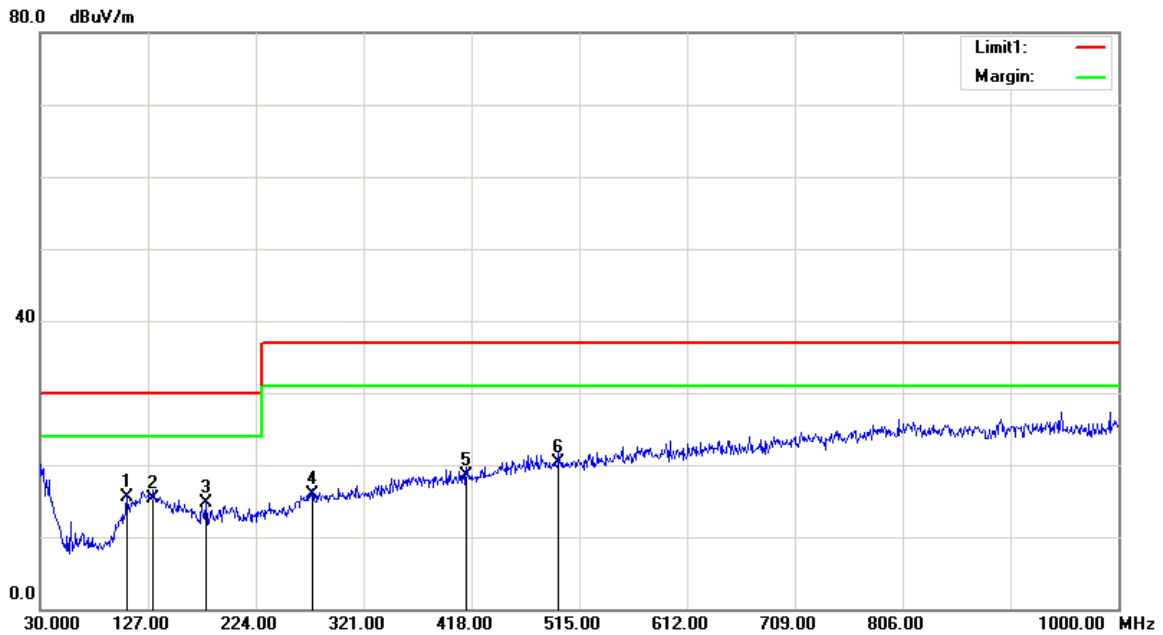
**Environmental Conditions**

<b>Temperature:</b>	25.3 ° C
<b>Relative Humidity:</b>	57 %
<b>ATM Pressure:</b>	100.4 kPa

The testing was performed by Jone Lv on 2013-10-14.

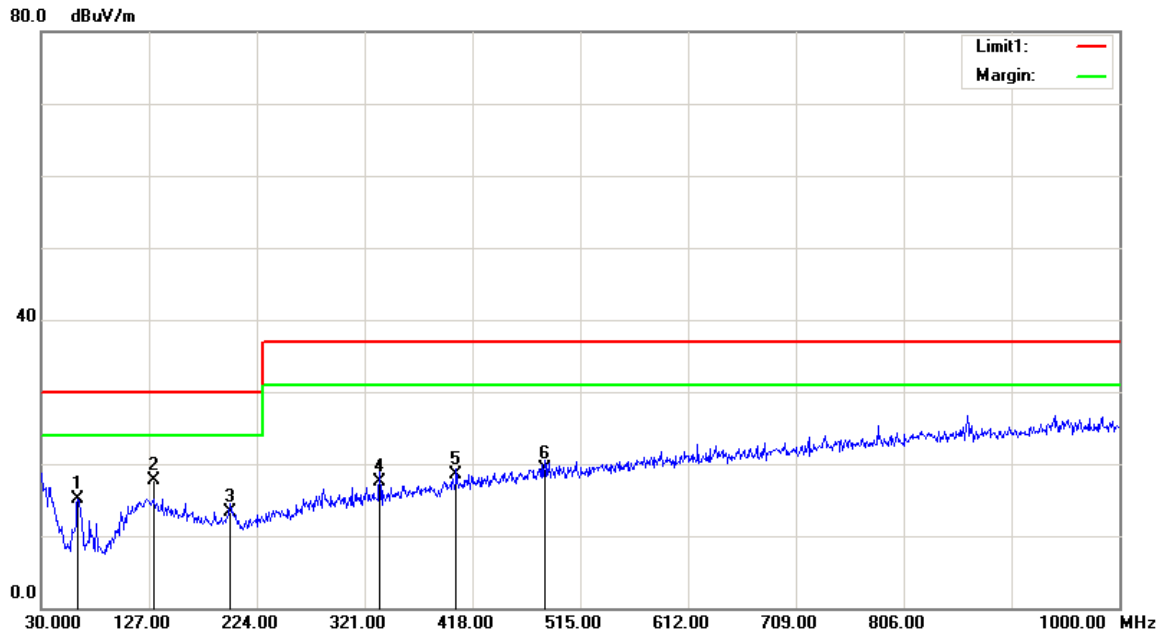
Test Mode: Running

**Horizontal:**



Frequency (MHz)	Receiver Reading (dBuV/m)	Detector (PK/QP/AV)	Correction Factor (dB)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
107.6000	22.59	QP	-6.99	15.60	30.00	14.40
131.8500	20.62	QP	-5.22	15.40	30.00	14.60
179.3800	22.66	QP	-7.86	14.80	30.00	15.20
275.4100	21.09	QP	-5.19	15.90	37.00	21.10
413.1500	20.74	QP	-2.24	18.50	37.00	18.50
496.5700	21.10	QP	-0.80	20.30	37.00	16.70

Vertical

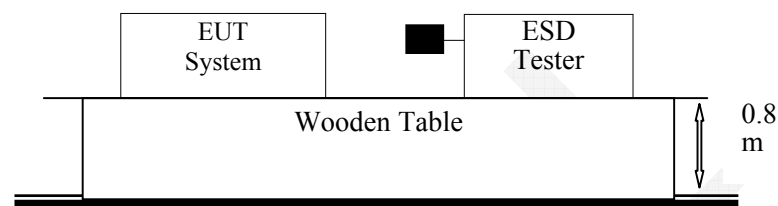


Frequency (MHz)	Receiver Reading (dBuV/m)	Detector (PK/QP/Ave)	Correction Factor (dB)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
62.9800	32.93	QP	-17.83	15.10	30.00	14.90
131.8500	28.89	QP	-11.09	17.80	30.00	12.20
199.7500	25.19	QP	-11.79	13.40	30.00	16.60
334.5800	27.02	QP	-9.42	17.60	37.00	19.40
403.4500	26.79	QP	-8.29	18.50	37.00	18.50
482.9900	26.13	QP	-6.83	19.30	37.00	17.70

**EN 61326-1 §6 ELECTROSTATIC DISCHARGE (EN 61000-4-2)****Test Equipment**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
SCHAFFNER	ESD TESTER	NSG435	005101	2013-5-9	2014-5-9

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test System Setup**

Remark: ■ is the tip of the electrode

EN 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.5 by 1.0-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

**Test standard**

EN 61326-1:2006 (IEC 61000-4-2:2001)

Test level 2 for Air Discharge at  $\pm 4$  kV

Test level 2 for Contact Discharge at  $\pm 4$  kV

**Test Level**

Level	Test Voltage Contact Discharge ( $\pm$ kV)	Test Voltage Air Discharge ( $\pm$ kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

**Performance criteria: B**

## Test Procedure

### Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

### Contact Discharge:

All the procedure shall be same as Section 8.3.2 of EN 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### Indirect discharge for horizontal coupling plane:

At least 20 single Discharge shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1 m from the EUT and with the discharge electrode touching the coupling plane.

### Indirect discharge for vertical coupling plane:

At least 20 single Discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharge shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## Test Data and Setup Photographs

### Environmental Conditions

<b>Temperature:</b>	21.8 ° C
<b>Relative Humidity:</b>	54 %
<b>ATM Pressure:</b>	100.4 kPa

*The testing was performed by Jone Lv on 2013-10-14.*



Test Mode: Running

Table 1: Electrostatic Discharge Immunity (Air Discharge)

EN 61000-4-2 Test Points Location	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Surface (8 points)	A	A	A	A	/	/	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

EN 61000-4-2 Test Points Location	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
/	/	/	/	/	/	/	/	/

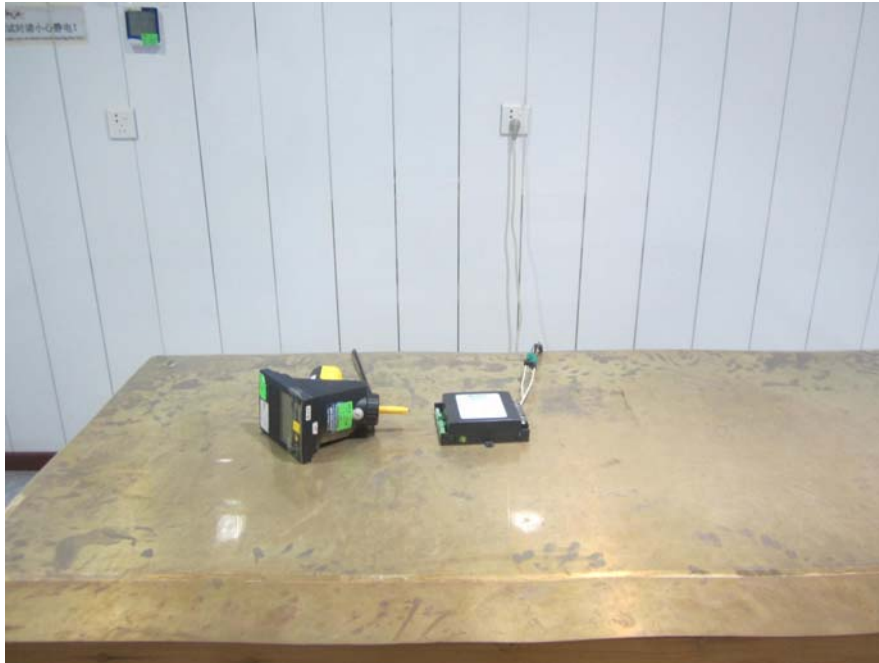
Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

EN 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

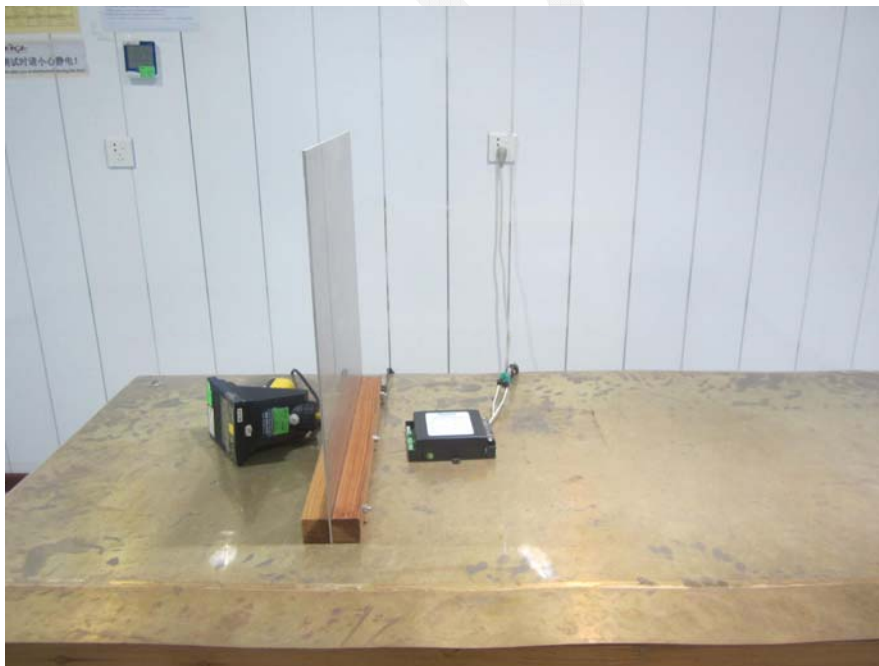
Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

EN 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

**Air Discharge**



**Indirect Contact**



**Test Setup Photo**

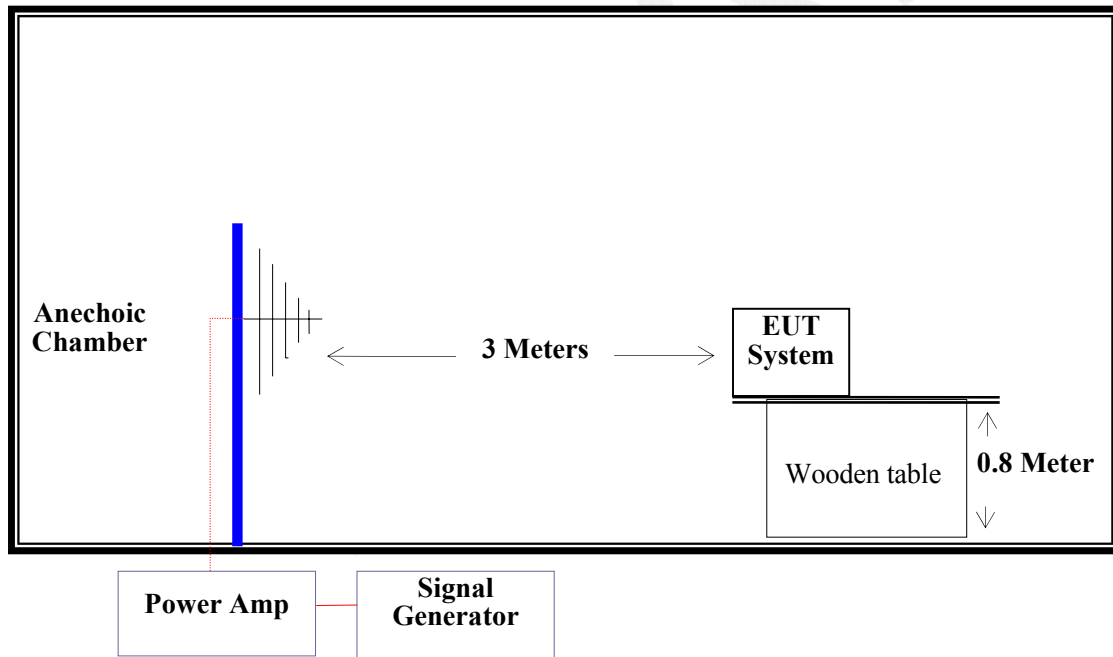
**EN 61326-1 §6 EM FIELD (EN 61000-4-3)**

**Test Equipment**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Signal Generator	8648A	3426A00831	2012-11-29	2013-11-28
AR	Power Amplifier	100W1000M1	13410	2012-11-29	2013-11-28
Sunol Sciences	Antenna	JB3	A060611-3	N/A	N/A
Amplifier Research	Sensor	FP5000	301825	2012-12-22	2015-12-21
OPHJOR	Power Amplifier	E4440A	1015	N/A	N/A
Beijing Dayang	Horn Antenna	OMCDH10180	10279001B	N/A	N/A

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test System Setup**



**Test Standard**

- EN 61326-1:2006 (EN 61000-4-3:2002)
- Test level 2 at 3V/ m (80MHz to 1GHz)
- Test level 2 at 3V/ m (1.4GHz to 2GHz)
- Test level 1 at 1V / m (2.0GHz to 2.7GHz)

**Test Level**

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

**Performance criteria: A**

**Test Procedure**

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor the EUT. All the scanning conditions are as follows:

Condition of Test	Remarks
Field Strength	3V/m (80MHz to 1GHz) 3V/m (1.4GHz to 2GHz) 1V/m (2.0GHz to 2.7GHz )
Radiated Signal	Modulated AM 1 kHz 80% Modulation
Scanning Frequency	80-1000 MHz, 1.4 GHz-2.0 GHz, 2.0 GHz-2.7 GHz
Sweeping Frequency Step	1%
Dwell Time	1Sec.

**Test Data and Setup Photographs**

**Environmental Conditions**

<b>Temperature:</b>	21.8 ° C
<b>Relative Humidity:</b>	54 %
<b>ATM Pressure:</b>	100.4 kPa

*The testing was performed by Jone Lv on 2013-10-14.*

Test Mode: Running

Severity Level:   3   V/m Unmodulated, r.m.s

Frequency Range (MHz)	Front Side		Back side		Left side		Right side	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	/	/	/	/	/	/

Severity Level:   3   V/m Unmodulated, r.m.s

Frequency Range (MHz)	Front Side		Back side		Left side		Right side	
	HORI	VERT	HORI	VERT	VERT	HORI	VERT	HORI
1400-2000	A	A	/	/	/	/	/	/

Severity Level:   1   V/m Unmodulated, r.m.s

Frequency Range (MHz)	Front Side		Back side		Left side		Right side	
	HORI	VERT	HORI	VERT	VERT	HORI	VERT	HORI
2000-2700	A	A	/	/	/	/	/	/

Note: According to the EN 61326-2-2:2006 §6.2.102 EM-field, if the maximum dimension of the equipment enclosure is <0.3m, the test is performed from only one side.



Test Setup Photo

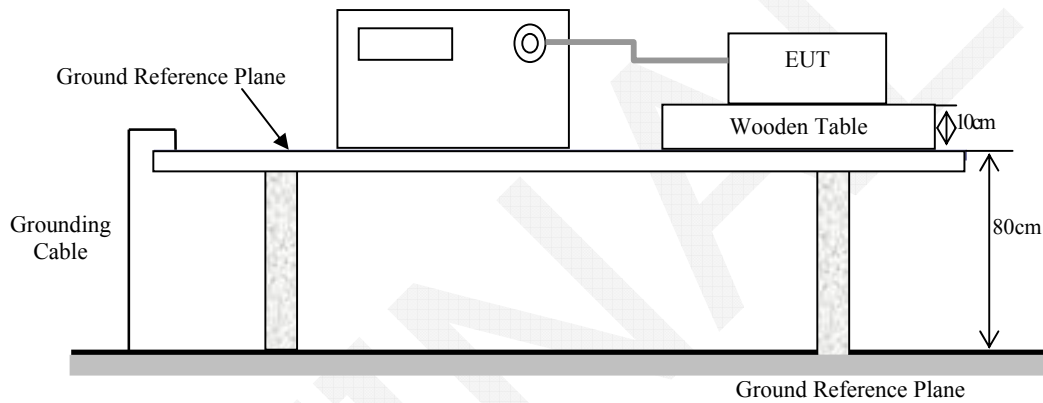
**EN 61326-1 §6 BURST (EN 61000-4-4)**

**Test Equipment**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EM TEST	Auto transformer	MV2616	0403-16	N/A	N/A
EM TEST	Ultra Compact Generator	UCS500-M	303279	2012-12-27	2013-12-26
EM TEST	EFT Clamp	N/A	300886	2013-1-9	2014-1-8

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test System Setup**



**Test Standard**

EN 61326-1:2006 (IEC 61000-4-4:2004)  
 AC Mains L, N, L+N: Test level 2 at 1kV

**Test Level**

Open Circuit Output Test Voltage ±10%		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

**Performance criteria: B**

**Test Procedure**

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility’s electrical earth.

**Test Data and Setup Photographs**

**Environmental Conditions**

<b>Temperature:</b>	21.8 °C
<b>Relative Humidity:</b>	54 %
<b>ATM Pressure:</b>	100.4 kPa

*The testing was performed by Jone Lv on 2013-10-14*

*Test Mode: Running*

EN61000-4-4 Test Points		Test Levels (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC mains power input ports	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	Earth	/	/	/	/	/	/	/	/
	L+N	A	A	A	A	/	/	/	/
	L + Earth	/	/	/	/	/	/	/	/
	N + Earth	/	/	/	/	/	/	/	/
	L+N+Earth	/	/	/	/	/	/	/	/
Signal ports	/	/	/	/	/	/	/	/	



**Test Setup Photo**



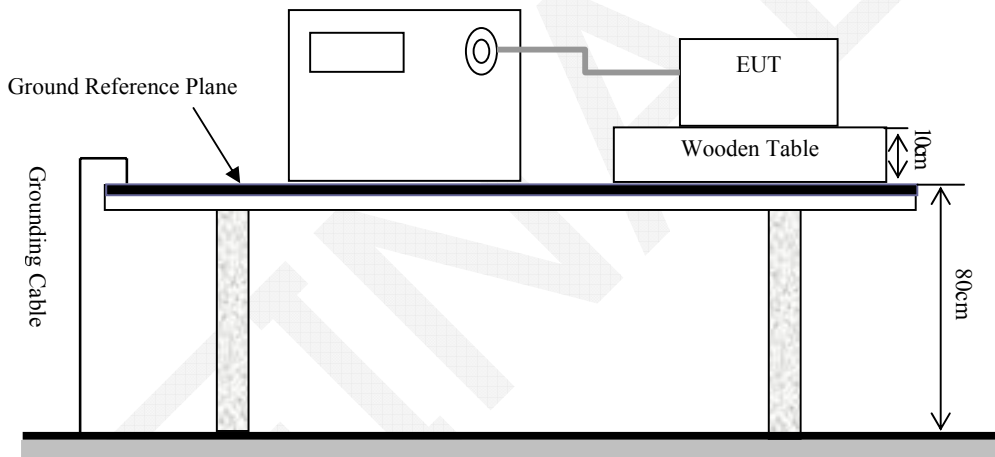
**EN 61326-1 §6-SURGE (IEC 61000-4-5)**

**Test Equipment**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EM TEST	Auto transformer	MV2616	0403-16	N/A	N/A
EM TEST	Ultra Compact Generator	UCS500-M	303279	2012-12-27	2013-12-26
EM TEST	EM Test Coupling/Decoupling Network	CNV508 S1	311137	2013-10-8	2014-10-7

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test System Setup**



**Test Standard**

EN 61326-1:2006 (IEC 61000-4-5:2001)  
 L-N: Test level 1 at 0.5 kV

**Test Level**

Level	Open Circuit Output Test Voltage $\pm 10\%$
1	0.5 kV
2	1 kV
3	2 kV
4	4 kV
X	Special

**Performance Criterion: B****Test Procedure**

- 1) For line to line coupling mode, provide a 0.5 kV 1.2/50us voltage surge (at open-circuit condition).
- 2) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 3) Different phase angles are done individually.
- 4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

**Test Data and Setup Photo****Environmental Conditions**

<b>Temperature:</b>	21.8 °C
<b>Relative Humidity:</b>	54 %
<b>ATM Pressure:</b>	100.4 kPa

*The testing was performed by Jone Lv on 2013-10-14*

*Test Mode: Running*

AC mains power input port

Level	Voltage	Poll	Path	Pass	Fail
1	0.5 kV	$\pm$	L-N	A	/
2	1 kV	$\pm$	L-PE, N-PE	/	/
3	2 kV	$\pm$	L-N, L-PE, N-PE	/	/
4	4 kV	$\pm$	L-N, L-PE, N-PE	/	/



**Test Setup Photo**

**EN 61326-1 §6 CONDUCTED RF (EN 61000-4-6)****Test Equipment**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Signal Generator	HP8657A	2849U00982	2012-11-29	2013-11-28
R&S	Power Amplifier	15A250	12934	N/A	N/A
NARDA	Attenuator	769-6	2754	N/A	N/A
COM-POWER	CDN	M325E	521064	2012-11-29	2013-11-28

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Setup****Test Standard**

EN 61326-1:2006 (IEC 61000-4-6:2003)  
Test level 2 at 3 V (r.m.s.), 0.15 MHz ~ 80 MHz,

**Test Level**

Level	Voltage Level (r.m.s.) (V)
1	1
2	3
3	10
X	Special

**Performance criteria: A**

**Test Procedure**

- 1) Let the EUT work in test mode and test it.
- 2) The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 3) The disturbance signal described below is injected to EUT through CDN.
- 4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5) The frequency range is swept from 150 kHz to 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- 6) The rate of sweep shall not exceed  $1.5 \cdot 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value. Recording the EUT operating situation during compliance testing and decide the EUT immunity criteria.

**Test Data and Setup Photographs**

**Environmental Conditions**

<b>Temperature:</b>	21.8 °C
<b>Relative Humidity:</b>	54 %
<b>ATM Pressure:</b>	100.4 kPa

*The testing was performed by Jone Lv on 2013-10-14*

*Test Mode: Running*

Tabel 1: AC 230V mains power input port

Frequency range: 150 kHz to 80 MHz  
 Modulated: Amplitude 80%, 1kHz sine wave     Unmodulated     Other:  
 Severity Level: 3 V Un modulated , r.m.s

Level	Voltage Level (e.m.f.) U <sub>0</sub>	Pass	Fail
1	1	/	/
2	3	A	/
3	10	/	/
X	Special	/	/



**Test Setup Photo**

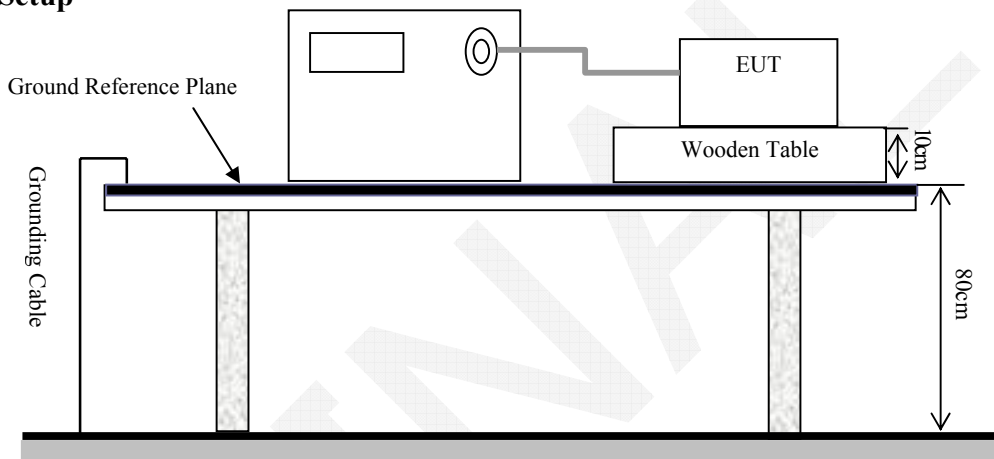
## EN 61326-1 §6-VOLTAGE DIP AND SHORT INTERRUPTIONS (IEC 61000-11)

### Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EM TEST	Auto transformer	MV2616	0403-16	N/A	N/A
EM TEST	Ultra Compact Generator	UCS500-M4	303279	2012-12-27	2013-12-26

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Setup



### Test Standard

EN 61326-1:2006 (IEC 61000-11:2004)

### Test Level

Test Level	U2 (% Reduction)	Duration (Periods)	Performance Criterion
1	100	0.5	B
2	100	1	B
3	100	250	C
4	30	25	C

### Test Procedure

- 1) The interruption is introduced at selected phase angles with specified duration.
- 2) Record any degradation of performance.

**Test Data and Setup Photo**

**Environmental Conditions**

<b>Temperature:</b>	21.8 °C
<b>Relative Humidity:</b>	54 %
<b>ATM Pressure:</b>	100.4 kPa

*The testing was performed by Jone Lv on 2013-10-14*

*Test Mode: Running*

AC mains power input port

Level	U2 (% Reduction)	Td (Periods)	Phase Angle	N	Result
1	100	0.5P	0/90/180/270	3	A
2	100	1	0/90/180/270	3	A
3	30	25	0/90/180/270	3	B
4	100	250	0/90/180/270	3	B



**Test Setup Photo**



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## **EN 61000-3-2-HARMONIC CURRENT EMISSIONS**

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According to EN 61000-3-2:2006 + A1:2009 + A2:2009 section 7: Equipment with a rated power of 75 W or less, other than discharge lighting equipment, are not included in this standard.

FENVA

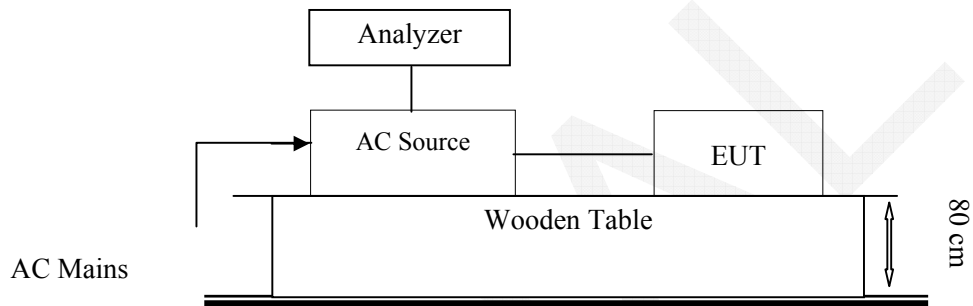
**EN 61000-3-3-VOLTAGE FLUCTUATION AND FLICKER**

**Test Equipment**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EM TEST	Harmonic & Flicker Analyzer	DPA 500	303278	2013-5-12	2014-5-11
ELGAR	AC POWER SOURCE	1751SX	5611	2013-5-3	2014-5-2

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test System Setup**



**Test Standard**

EN 61000-3-3: 2008

**Test Data and Setup Photo**

**Environmental Conditions**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	58 %
<b>ATM Pressure:</b>	100.3 kPa

Date of test:	11:30 14.Oct. 2013
Tester:	Jone Lv
Standard used:	EN/IEC 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	10 min (1 Flicker measurement)
Flicker meter:	230V / 50Hz
Customer:	Beijing Hysine Technology Co.,Ltd.
E. U. T.:	Fan Coil Controller
Model:	TCX Series
Test mode:	Running

### Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.145	3.30	PASS
dmax [%]	0.687	4.00	PASS
dt [s]	0.000	0.50	PASS



**Test Setup Photo**

## EXHIBIT A - PRODUCT LABELING

### CE Label Format



Specifications: The marking set out above must be affixed to the apparatus or to its data plate and have a minimum height of 5 mm. The elements should be easily readable and indelible. They may be placed anywhere on the apparatus case or in its battery compartment. No tool should be needed to view the marking.

### Label Location on EUT

CE Label Location

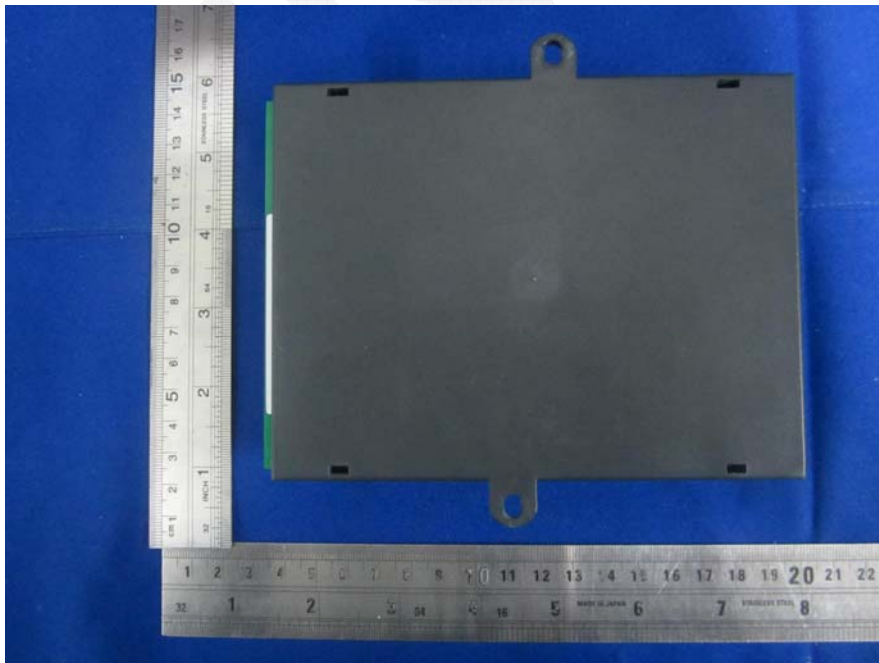


## EXHIBIT B - EUT PHOTOGRAPHS

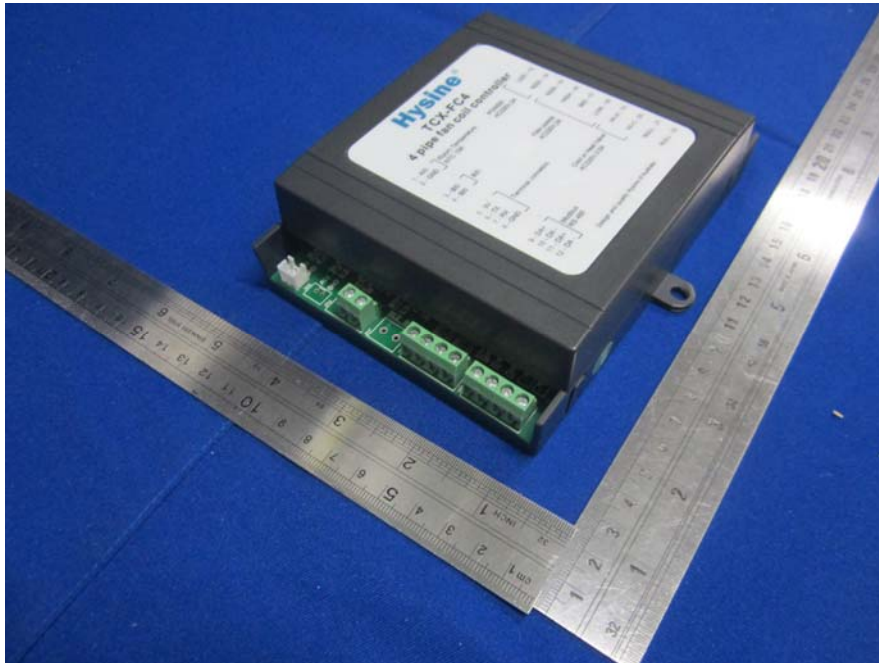
EUT – Top View



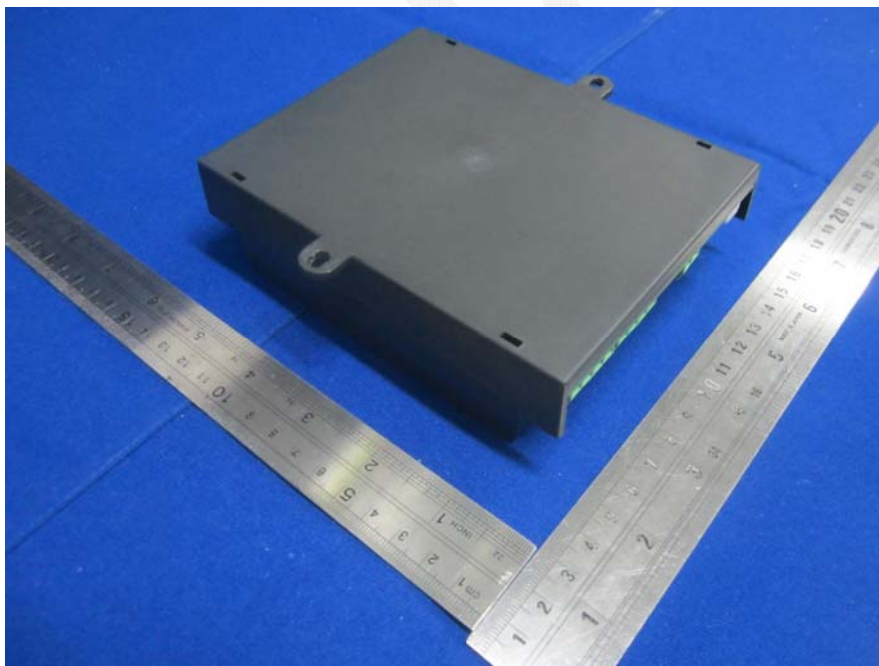
EUT – Bottom View



**EUT –Side View**



**EUT –Side View**



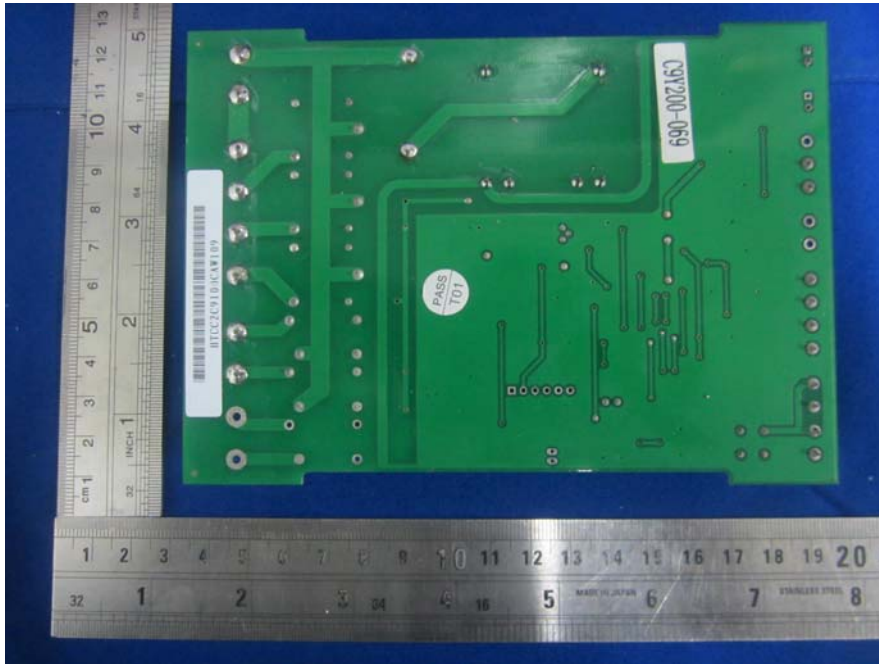
**EUT – Uncover View**



**EUT – Main Board Top View**



**EUT –Main Board Bottom View**





## EXHIBIT C - TEST SETUP PHOTOGRAPHS

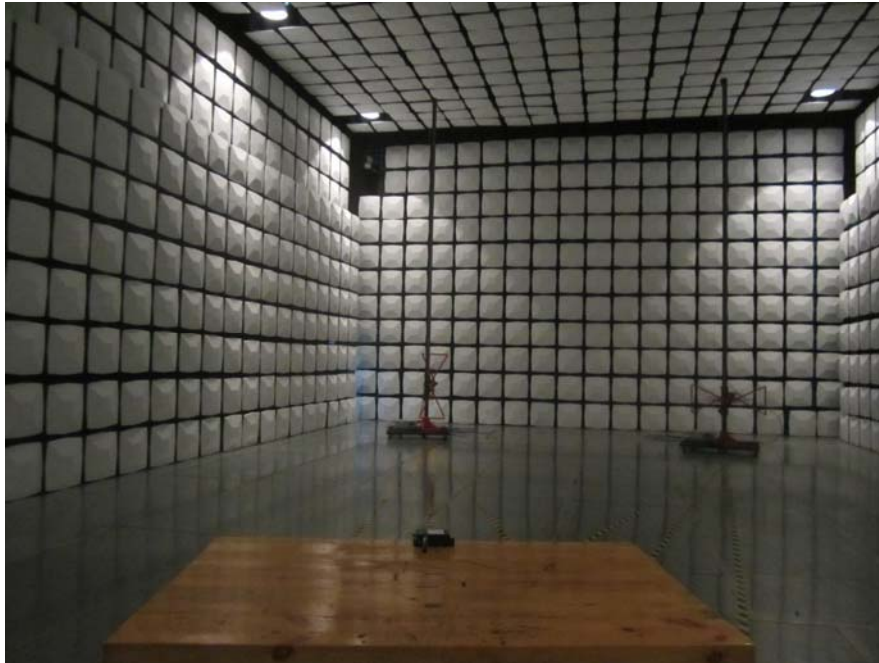
### Conducted Emission - Front View



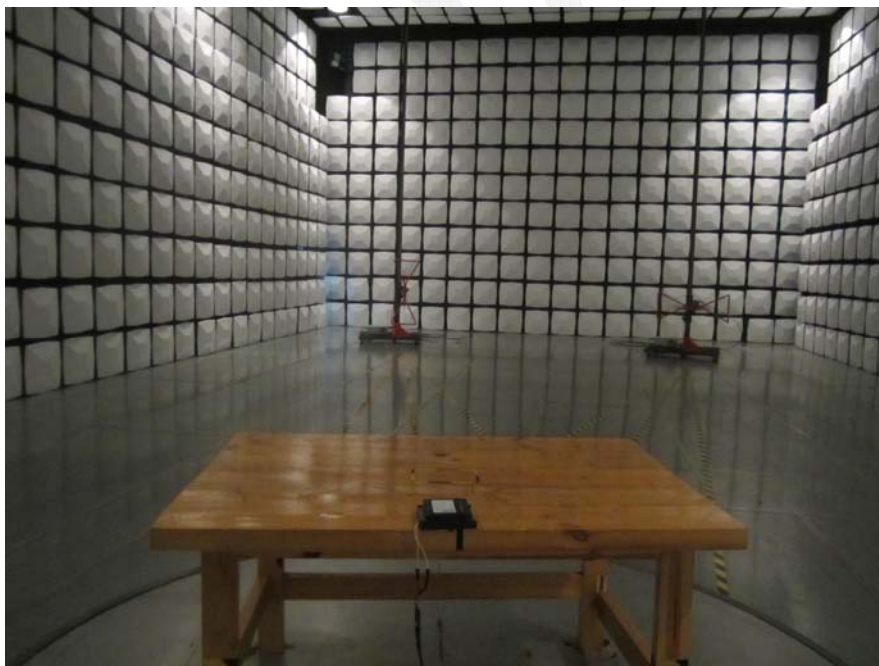
### Conducted Emission - Rear View



**Radiated Emission - Front View**



**Radiated Emission - Rear View**



## DECLARATION LETTER

# Hysine®

Company name: Beijing Hysine Technology Co., Ltd.  
Address: No.108, Beijing youth entrepreneur's demo park, Changping District, Beijing, china  
Postal Code: 100080  
Tel: 010-62719309-116 Fax: 010-62718559

### DECLARATION OF SIMILARITY

2013-10-09

To:  
Bay Area Compliance Laboratories Corp. (Dongguan)  
No.69 Pulong Village, Puxinhu Industry Zone, Tangxia, Dongguan, China  
Tel: +86 769 86858888 Fax: +86 769 86858892  
<http://www.baclcorp.com>

Dear Sir or Madam:

We Beijing Hysine Technology Co.,Ltd. hereby declare that our product Fan Coil Controller, model(s): TCX Series (include model number: TCX-FC2, TCX-FC4) are electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics. And TCX-FC4 is tested by BA CL, the results of which are featured in BA CL project: R2BJ131011052.

A description of the differences between the tested model and the other number is as following:

Models: TCX-FC2, TCX-FC4 just have differen the model name.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Signature:   
XU LIN  
Manager 2013/10/09  


\*\*\*\*\*END OF REPORT\*\*\*\*\*