



SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION Co., Ltd.

## Test Verification of Conformity

Certificate No.: CTE13050142

R/C: 61214

Issued Date: Mar 2, 2017

In accordance with the following Applicable Directives:

**2014/30/EU**

**Electromagnetic Compatibility**

The equipment, as described herewith, was tested pursuant to applicable test procedure and complies with the requirements of:

**EN 61000-6-2: 2005**

**EN 61000-6-4: 2007+A1: 2011**

**EN 61000-3-2: 2014**

**EN 61000-3-3: 2013**

The test results are traceable to the international or national standards.

**Applicant:** Kinco Electric (Shenzhen) Ltd.

Building 1, No.6 Langshan 1st Rd, Hi-tech Park North, Nanshan, Shenzhen, China. (518057)

**Manufacturer:** Kinco Electric (Shenzhen) Ltd.

Building 1, No.6 Langshan 1st Rd, Hi-tech Park North, Nanshan, Shenzhen, China. (518057)

**EUT Name:** Stepping Motor Drive

**Model number:** FM860-AA-000

**Listed Model(s):** FM860-XX-XXX

**Laboratory:** Shenzhen Huatongwei International Inspection Co., Ltd.

Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, Guangdong, China

Tel: 86-755-26748078 Fax: 86-755-26748089

Http: //www.szhtw.com.cn E-mail: cs@szhtw.com.cn



**Note:**

The certification is only valid for the equipment and configuration described, in conjunction with the test data detailed above.

The CE mark as shown beside can be used, under the responsibility of the manufacturer, after completion of an EC Directive of Conformity and compliance with all relevant EC Directive.

For and on behalf of  
Shenzhen Huatongwei International Inspection Co., Ltd.

Authorized by:





**TEST REPORT**

**EN 61000-6-4: 2007+A1:2011**

**Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards - Emission standard for industrial environments**

**EN 61000-6-2: 2005**

**Electromagnetic compatibility (EMC) -- Part 6-2: Generic standards - Immunity for industrial environments**

**Report Reference No.**.....: **TRE13050142 R/C: 93043**

Compiled by

(printed name+signature) .....: Stellar Xu

*Stellar Xu*

Supervised by

(printed name+signature) .....: LuoRin

*LuoRin*

Approved by

(printed name+signature) .....: Tony Jiang

*Tony Jiang*

Date of issue.....: Jun 09, 2013

**Testing Laboratory Name** .....: **Shenzhen Huatongwei International Inspection Co., Ltd**

Address.....: Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

Testing location/ procedure .....: Full application of Harmonised standards   
 Partial application of Harmonised standards   
 Other standard testing methods

**Applicant's name** .....: **Kinco Electric (Shenzhen) Ltd.**

Address.....: Building 1, No.6 Langshan 1st Rd, Hi-tech Park North, Nanshan, Shenzhen, China. (518057)

**Test specification:**

Standard .....: **EN 61000-6-2: 2005 EN 61000-6-4: 2007+A1: 2011**  
**EN 61000-3-2: 2014**  
**EN 61000-3-3: 2013**

**Test Report Form No.**.....: HTWEMCCE\_1A

TRF Originator.....: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF.....: Dated 2006-06

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**Test item description** .....: Stepping Motor Drive

Manufacturer .....: Kinco Electric (Shenzhen) Ltd.

Model/Type reference.....: FM860-AA-000

Listed models .....: FM860-XX-XXX

Ratings.....: DC 24-70V

Result.....: **Positive**

**Report version information:**

**Revised date: 2017-03-02 Clause 2.3.**

## EMC -- TEST REPORT

<b>Test Report No. :</b> TRE13010142	Jun 09, 2013
	Date of issue

Equipment under Test : Stepping Motor Drive

Model /Type : FM860-AA-000

Listed Models : FM860-XX-XXX

**Applicant** : Kinco Electric (Shenzhen) Ltd.

Address : Building 1, No.6 Langshan 1st Rd, Hi-tech Park North, Nanshan, Shenzhen, China. (518057)

**Manufacturer** : Kinco Electric (Shenzhen) Ltd.

Address : Building 1, No.6 Langshan 1st Rd, Hi-tech Park North, Nanshan, Shenzhen, China. (518057)

<b>Test Result</b> according to the standards on page 4:	<b>Positive</b>
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The test report merely corresponds to the test sample.  
 It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## **1. TEST STANDARDS**

The tests were performed according to following standards:

[EN 61000-6-2: 2005](#) Electromagnetic compatibility (EMC) -- Part 6-2: Generic standards - Immunity for industrial environments

[EN 61000-6-4: 2007+A1:2011](#) Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards - Emission standard for industrial environments

[EN 61000-3-2: 2014](#) Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

[EN 61000-3-3: 2013](#) Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection



## 2.4. EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

Test program (customer specific)

Emissions tests.....: According to EN 61000-6-4, searching for the highest disturbance.

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Immunity tests.....: According to EN 61000-6-2 , searching for the highest susceptibility.

---

Harmonic current.....: According to EN 61000-3-2, searching for the highest disturbance.

---

Voltage fluctuation.....: According to EN 61000-3-3, searching for the highest disturbance.

---

## 2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

■ - supplied by the manufacturer

o - supplied by the lab

■ Motor

M/N : 2S86Q-03080

Manufacturer : Kinco

## 2.6. Performance level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test relative to a performance criteria defined by its manufacturer or the requestor of the test, or agreed between the manufacturer and the purchaser of the product. Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;
- tests of all peripheral access(hard disks, floppy disks, printers, keyboard, mouse, etc.);
- quality of software execution
- quality of data display and transmission
- quality of speech transmission

**Definition related to the performance level:**

- based on the used product standard
- o based on the declaration of the manufacturer, requestor or purchaser

### **Criterion A:**

The apparatus shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment 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, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

### **Criterion B:**

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of

performance is allowed, however. 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, then either of these may be derived from the product description and documentation, and from 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, or by any operation specified in the instructions for use.

### **3. TEST ENVIRONMENT**

#### **3.1. Address of the test laboratory**

Shenzhen Huatongwei International Inspection Co., Ltd.  
Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, Guangdong, China  
Phone: 86-755-26748019 Fax: 86-755-26748089

#### **3.2. Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

##### **CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

##### **FCC-Registration No.: 662850&317478**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date Jul. 01, 2012, valid time is until Jun. 01, 2015. Registration 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

##### **IC-Registration No.: 5377A&5377B**

The 3 m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Dec. 31, 2013, valid time is until Dec. 31, 2016.

##### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

##### **VCCI**

Radiated disturbance above 1GHz measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20007. Date of Registration: Sept. 13, 2016. Valid time is until Sept. 12, 2019.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. Has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-20001. Date of Registration: Sept. 13, 2016. Valid time is until Sept. 12, 2019.

Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-20001. Date of Registration: Oct 18, 2016. Valid time is until Oct 17, 2019.

The 3m Semi-anechoic chamber (9.1m×6.4m×6.0m) of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.:R-4398. Date of Registration: Nov 21, 2016. Valid time is until Nov 20, 2019.

### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	<u>22-25 ° C</u>
Humidity:	<u>40-54 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

### 3.4. Test Description

Emission Measurement		
Radiated Emission	EN 61000-6-4: 2007+A1:2011	PASS
Conducted Disturbance	EN 61000-6-4: 2007+A1:2011	PASS
Harmonic Current	EN 61000-3-2: 2006+A1: 2009+A2: 2009	PASS
Voltage Fluctuation and Flicker	EN 61000-3-3: 2008	PASS
Immunity Measurement		
Electrostatic Discharge	EN 61000-6-2: 2005 EN 61000-4-2: 2009	PASS
RF Field Strength Susceptibility	EN 61000-6-2: 2005 EN 61000-4-3: 2006+A1:2008+A2:2010	PASS
Electrical Fast Transient/Burst Test	EN 61000-6-2: 2005 EN 61000-4-4: 2004+A1:2010	PASS
Surge Test	EN 61000-6-2: 2005 EN 61000-4-5: 2006	PASS
Conducted Susceptibility Test	EN 61000-6-2: 2005 EN 61000-4-6: 2009	PASS
Power Frequency Magnetic Field Susceptibility Test	EN 61000-6-2: 2005 EN 61000-4-8: 2010	PASS
Voltage Dips and Interruptions Test	EN 61000-6-2: 2005 EN 61000-4-11: 2004	PASS

Note: The measurement uncertainty is not included in the test result.

### 3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.65dB	(1)
Conducted Disturbance	0.15~30MHz	3.42dB	(1)

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

### 3.6. Equipments Used during the Test

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2011/06
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2012/10
3	RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	2012/10
4	TURNTABLE	ETS	2088	2149	2012/10
5	ANTENNA MAST	ETS	2075	2346	2012/10
6	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	2012/10

Conducted Disturbance					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100038	2012/10
2	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	100028	2012/10
3	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100044	2012/10
4	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2012/10

Harmonic Current					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Harmonic And Flicker Analyzer	EM TEST	DPA503S1	0500-10	2012/10
2	Purified Power Source	CALIFORNIA INSTRUMENTS	HFS500	54513	2012/10

Voltage Fluctuation and Flicker					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Purified Power Source	CALIFORNIA INSTRUMENTS	HFS500	54513	2012/10
2	Harmonic And Flicker Analyzer	EM TEST	DPA503S1	0500-10	2012/10

Electrostatic Discharge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	EM TEST	DITOC0103Z	0301-04	2012/10

RF Field Strength Susceptibility(80-2500MHz)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	SIGNAL GENERATOR	IFR	2032	203002/100	2012/10
2	AMPLIFIER	AR	150W1000	301584	2012/10
3	DUAL DIRECTIONAL COUPLER	AR	DC6080	301508	2012/10
4	POWER HEAD	AR	PH2000	301193	2012/10
5	POWER METER	AR	PM2002	302799	2012/10
6	TRANSMITTING AERIAL	AR	AT1080	28570	2012/10
7	POWER AMPLIFIER	AR	25S1G4A	0325511	2012/10
8	DUAL DIRECTIONAL COUPLER	AR	DC7144A	0325100	2012/10
9	TRANSMITTING AERIAL	AR	AT4002A	0324848	2012/10

Electrical Fast Transient/Burst					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Ultra Compact Simulator	EM TEST	UCS500M6	0500-19	2012/10

Surge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA COMPACT SIMULATOR	EM TEST	UCS500M6	0500-19	2012/10

Conducted Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal Generator	IFR	2023A	202304/060	2012/10
2	Amplifier	AR	75A250	302205	2012/10
3	Dual Directional Coupler	AR	DC2600	302389	2012/10
4	6db Attenuator	EMTEST	ATT6/75	0010230A	2012/10
5	EM CLAMP	LÜTHI	EM101	335625	2012/10
6	CDN	EMTEST	CDN M3	0802-03	2012/10

Power Frequency Magnetic Field Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA COMPACT SIMULATOR	EM TEST	UCS500M6	202304/060	2012/10
2	MOTOR DRIVEN VOLTAGE TRANSFORMER	EM TEST	MV2616	302205	2012/10
3	CURRENT TRANSFORMER	EM TEST	MC2630	302389	2012/10
4	MAGNETIC COIL	EM TEST	MS100	0010230A	2012/10

Voltage Dips and Interruptions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Purified Power Source	CALIFORNIA INSTRUMENTS	HFS500	54513	2012/10

## **4. TEST CONDITIONS AND RESULTS**

### **4.1. Radiated Emission**

For test instruments and accessories used see section 3.6.

#### **4.1.1. Description of the test location**

Test location: Shielded room No. 4

#### **4.1.2. Limits of disturbance(Class A)**

<b>Frequency (MHz)</b>	<b>Distance (Meters)</b>	<b>Field Strengths Limits (dB<math>\mu</math>V/m)</b>
30 ~ 230	3	50
230 ~ 1000	3	57

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

#### **4.1.3. Description of the test set-up**

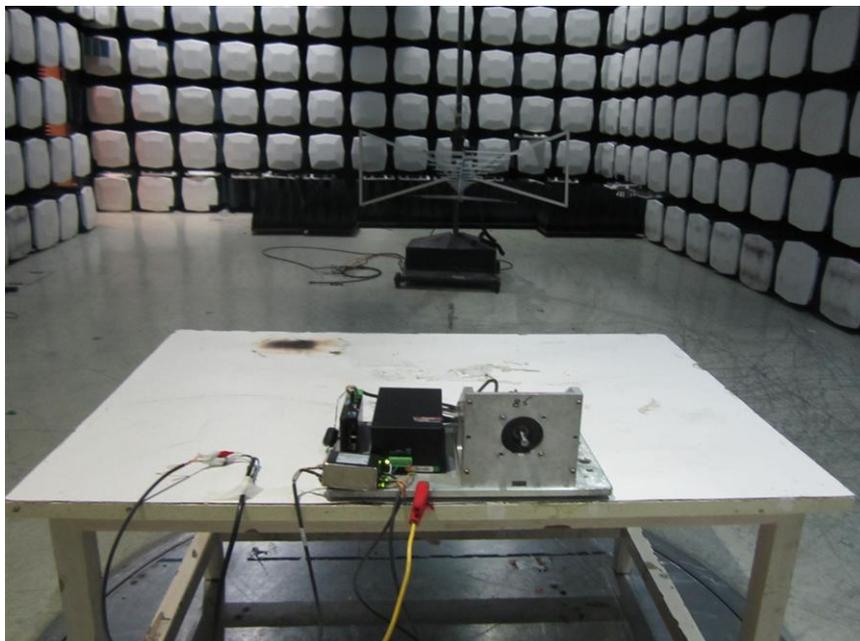
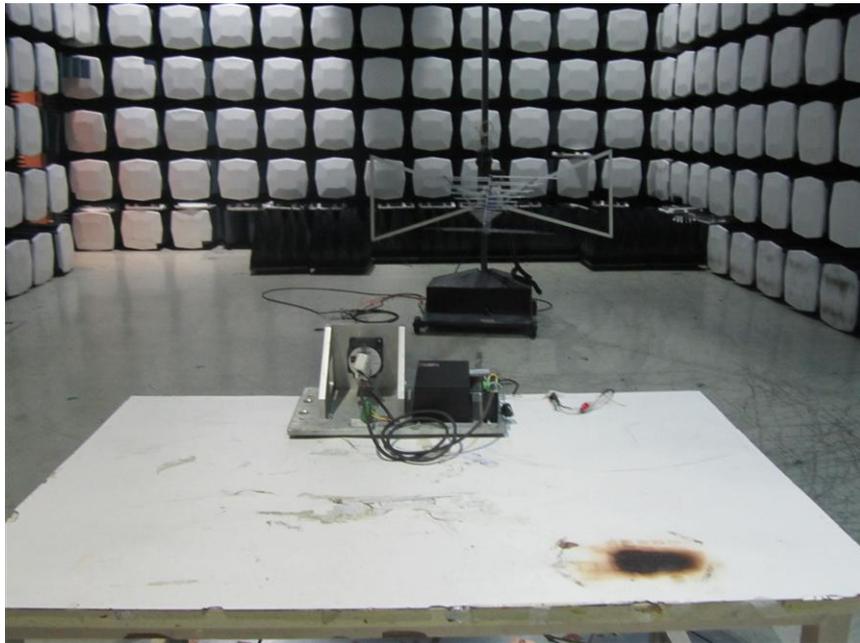
##### **4.1.3.1. Operating Condition**

The EUT is turned on during the test, and the results of the maximum emanation are recorded.

##### **4.1.1.1. Test Configuration and Procedure**

EUT is tested in Semi-Anechoic Chamber. EUT is placed on a nonmetal table which is 0.8 meter above a grounded turntable. The turntable can rotate 360 degrees to determine the azimuth of the maximum emission level. EUT is set 3 meters away from the center of receiving antenna, and the antenna can move up and down from 1 to 4 meter to find out the maximum emission level. Both horizontal and vertical polarizations of the antenna are set on the test.

4.1.3.2. Photos of the test set-up



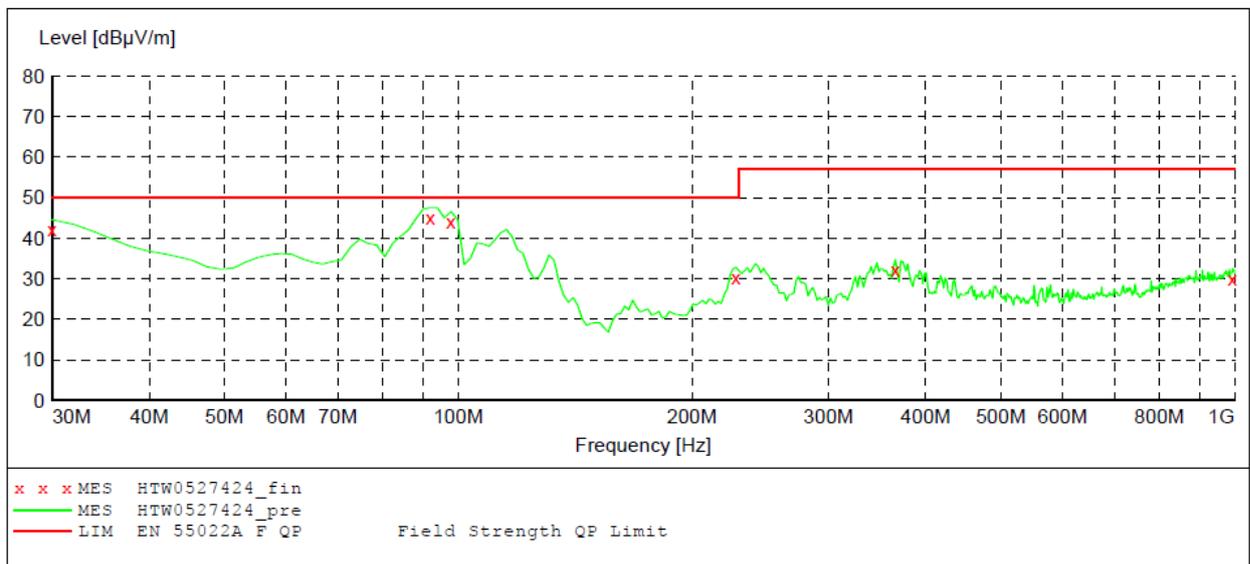
4.1.2. Test result

The requirements are **Fulfilled**

Band Width: 120kHz

Frequency Range: 30MHz to 1000MHz

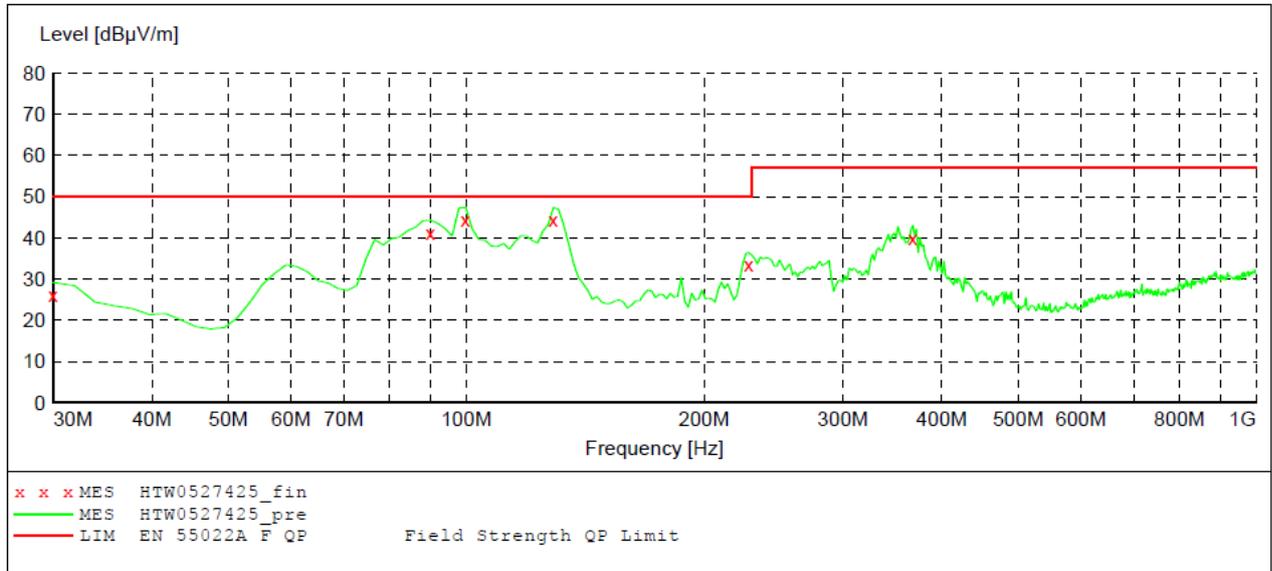
**Remarks:** The limits are kept. For detailed results, please see the following page(s).  
Margin=Limit-Level, Level=read values+transducer, Transducer=Antenna Factor+Pre-Amplifier Factor+Cable loss



**MEASUREMENT RESULT: "HTW0527424\_fin"**

5/27/2013 1:58PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	41.60	-10.0	50.0	8.4	QP	100.0	228.00	VERTICAL
92.080000	44.60	-18.7	50.0	5.4	QP	100.0	255.00	VERTICAL
97.900000	43.60	-18.5	50.0	6.4	QP	100.0	239.00	VERTICAL
227.880000	29.90	-18.2	50.0	20.1	QP	100.0	325.00	VERTICAL
365.620000	31.80	-14.8	57.0	25.2	QP	100.0	136.00	VERTICAL
994.180000	28.60	-3.0	57.0	27.4	QP	100.0	222.00	VERTICAL



**MEASUREMENT RESULT: "HTW0527425\_fin"**

5/27/2013 3:32PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	26.20	-10.0	50.0	23.8	QP	300.0	214.00	HORIZONTAL
90.140000	41.30	-18.8	50.0	8.7	QP	300.0	182.00	HORIZONTAL
99.840000	44.40	-18.5	50.0	5.6	QP	300.0	105.00	HORIZONTAL
128.940000	44.40	-18.8	50.0	5.6	QP	300.0	292.00	HORIZONTAL
227.880000	33.50	-18.2	50.0	13.5	QP	100.0	147.00	HORIZONTAL
367.560000	40.10	-14.8	57.0	16.9	QP	100.0	305.00	HORIZONTAL

## 4.2. Conducted disturbance

For test instruments and accessories used see section 3.6.

### 4.2.1. Description of the test location

Test location: Shielded room No.3

### 4.2.2. Limits of disturbance

Limit of conducted disturbance at the mains ports(Class A)

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150~0.500	79	66
0.5000~30.000	73	60

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

### 4.2.3. Description of the test set-up

#### 4.2.3.1. Operating Condition

The EUT is turned on during the test, and the results of the maximum emanation are recorded.

#### 4.2.3.2. Test Configuration and Procedure

For the main ports:

EUT is placed on a nonmetal table which is 0.8 meter above the grounded reference plane. Connect the power line of the EUT to the LISN which is connected to receiver by coaxial line, then disturbance signals of the neutral line and live line can be detected by the receiver.

#### 4.2.3.3. Photo of the test set-up



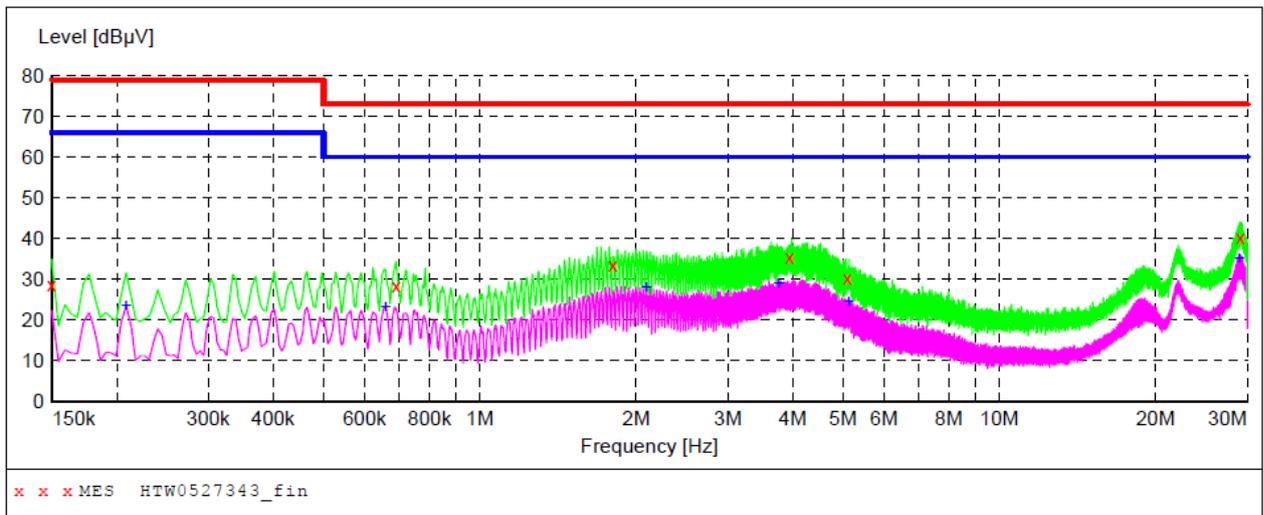
4.2.2. Test result

The requirements are **Fulfilled**

Band Width: 9kHz

Frequency Range: 150kHz to 30MHz

**Remarks:** The limits are kept. For detailed results, please see the following page(s).  
 Margin=Limit-Level, Level=read values+transducer, Transducer=Insertion loss of LISN+ Cable loss+Insertion loss of Pulse limiter



**MEASUREMENT RESULT: "HTW0527343\_fin"**

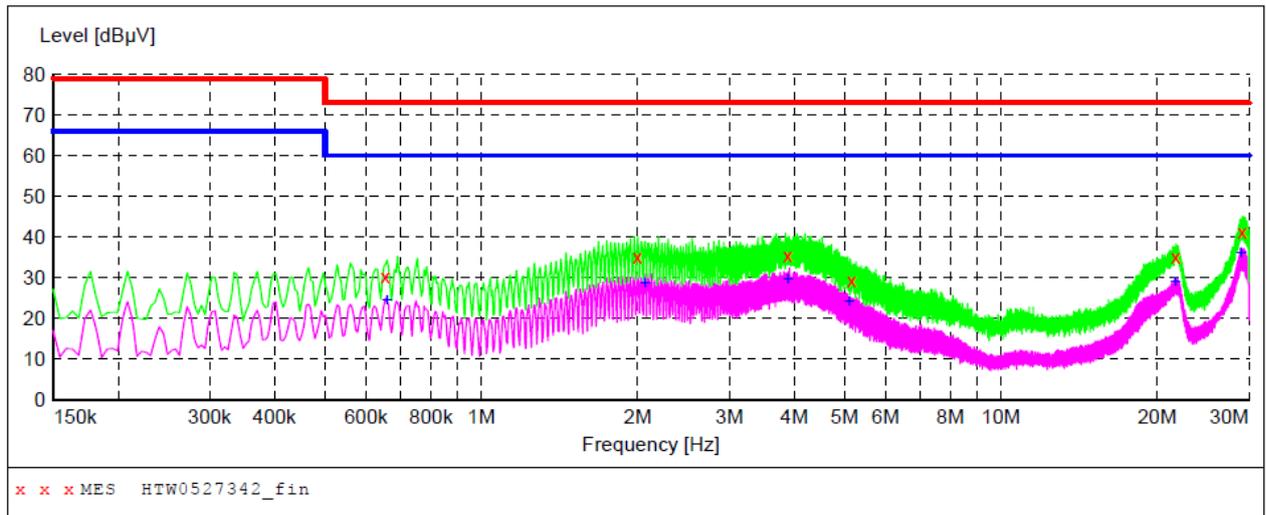
5/27/2013 6:38PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	28.80	10.2	79	50.2	QP	L1	GND
0.690000	28.40	10.1	73	44.6	QP	L1	GND
1.806000	33.60	10.2	73	39.4	QP	L1	GND
3.952500	35.40	10.2	73	37.6	QP	L1	GND
5.104500	30.40	10.2	73	42.6	QP	L1	GND
29.161500	40.30	10.6	73	32.7	QP	L1	GND

**MEASUREMENT RESULT: "HTW0527343\_fin2"**

5/27/2013 6:38PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.208500	23.50	10.2	66	42.5	AV	L1	GND
0.658500	23.40	10.1	60	36.6	AV	L1	GND
2.094000	27.90	10.2	60	32.1	AV	L1	GND
3.759000	29.10	10.2	60	30.9	AV	L1	GND
5.131500	24.60	10.2	60	35.4	AV	L1	GND
28.936500	35.20	10.6	60	24.8	AV	L1	GND



**MEASUREMENT RESULT: "HTW0527342\_fin"**

5/27/2013 6:35PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.654000	30.30	10.2	73	42.7	QP	N	GND
1.999500	35.30	10.2	73	37.7	QP	N	GND
3.889500	35.50	10.2	73	37.5	QP	N	GND
5.158500	29.40	10.2	73	43.6	QP	N	GND
21.696000	35.00	10.5	73	38.0	QP	N	GND
29.130000	41.20	10.6	73	31.8	QP	N	GND

**MEASUREMENT RESULT: "HTW0527342\_fin2"**

5/27/2013 6:35PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.658500	24.50	10.1	60	35.5	AV	N	GND
2.062500	28.60	10.2	60	31.4	AV	N	GND
3.885000	29.70	10.2	60	30.3	AV	N	GND
5.100000	24.20	10.2	60	35.8	AV	N	GND
21.624000	29.00	10.4	60	31.0	AV	N	GND
28.968000	36.20	10.6	60	23.8	AV	N	GND

### 4.3. Harmonic current

For test instruments and accessories used see section 3.6.

#### 4.3.1. Description of the test location

Test location: Shielded room No. 2

#### 4.3.2. Limits of harmonic current

Test configuration and procedure see clause 7.1 of standard EN 61000-3-2:2014.

#### 4.3.3. Description of the test set-up

##### 4.3.3.1 Operating Condition

The EUT is turned on during the test, and the results of the maximum emanation are recorded.

##### 4.3.3.2 Test Configuration and Procedure

Test configuration and procedure see clause 6.2.2 and Appendix C of standard EN 61000-3-2: 2014

##### 4.3.3.3 Photo of the test set-up



#### 4.3.4. Test result

The test results are **passed**

**Remarks:** The limits are kept. For detailed results, please see the following page(s).

**Test Report of HTW**

Standard used:	EN/IEC 61000-3-2 Ed.3 Quasi-stationary Equipment class A <= 150% of the limit
Observation time:	150s
Windows width:	10 periods – (IEC 61000-4-7: 2009)
Customer:	Kinco Electric (Shenzhen) Ltd.
Mains supply voltage:	AC 230V/50Hz
Ambient Temperature:	23°C
Humidity:	51%
Barometric Pressure:	1017mbar
E. U. T.:	Stepping Motor Drive M/N:FM860-AA-000
Date of test:	9:14 07.Jun 2013
Tester:	Chang Xu
<b>Test Result</b>	
E. U. T.:	PASS
Power Source:	PASS

**E. U. T. Result*****Check harmonics 2..40 [exception odd 21..39]:***

Harmonic(s) > 150%:	
Order (n):	None
Harmonic(s) with average > 100%:	
Order (n):	None

***Check odd harmonics 21..39:***

<b>All Partial Odd Harmonics below partial limits.</b>	
Harmonic(s) > 150%:	
Order (n):	None
Harmonic(s) with average > 150%:	
Order (n):	None

**Power Source Result**

First dataset out of limit:

DS (time):                      None

Harmonic(s) out of limit:

Order (n):                      None

**Average harmonic current results**

Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	4.133			
2	12.642E-3	1.171	1.08	PASS
3	407.008E-3	17.696	2.30	PASS
4	4.691E-3	1.091	430.00E-3	PASS
5	127.278E-3	11.165	1.14	PASS
6	5.977E-3	1.992	300.00E-3	PASS
7	233.140E-3	30.278	770.00E-3	PASS
8	8.072E-3	3.509	230.00E-3	PASS
9	60.432E-3	15.108	400.00E-3	PASS
10	5.311E-3	2.886	184.00E-3	PASS
11	81.053E-3	24.561	330.00E-3	PASS
12	3.216E-3	2.097	153.33E-3	PASS
13	13.291E-3	6.329	210.00E-3	PASS
14	2.334E-3	1.776	131.43E-3	PASS
15	12.247E-3	8.165	150.00E-3	PASS
16	1.186E-3	1.031	115.00E-3	PASS
17	9.022E-3	6.816	132.35E-3	PASS
18	737.422E-6	0.721	102.22E-3	PASS
19	5.712E-3	4.824	118.42E-3	PASS
20	636.150E-6	0.691	92.00E-3	PASS
21	3.666E-3	2.281	160.71E-3	PASS
22	531.328E-6	0.635	83.64E-3	PASS
23	2.364E-3	1.611	146.74E-3	PASS
24	498.569E-6	0.650	76.66E-3	PASS
25	1.958E-3	1.451	135.00E-3	PASS
26	456.044E-6	0.644	70.77E-3	PASS
27	754.902E-6	0.604	124.99E-3	PASS
28	446.313E-6	0.679	65.71E-3	PASS
29	1.768E-3	1.519	116.39E-3	PASS
30	439.144E-6	0.716	61.33E-3	PASS
31	667.313E-6	0.613	108.87E-3	PASS
32	400.151E-6	0.696	57.50E-3	PASS
33	655.058E-6	0.641	102.27E-3	PASS
34	378.032E-6	0.699	54.12E-3	PASS
35	705.367E-6	0.731	96.44E-3	PASS
36	367.438E-6	0.719	51.11E-3	PASS
37	670.340E-6	0.735	91.21E-3	PASS
38	363.923E-6	0.752	48.42E-3	PASS
39	535.458E-6	0.619	86.53E-3	PASS
40	381.807E-6	0.830	46.00E-3	PASS

**Maximum harmonic current results**

Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	7.632			
2	247.085E-3	15.252	1.62	PASS
3	503.167E-3	14.585	3.45	PASS
4	64.613E-3	10.018	645.00E-3	PASS
5	248.404E-3	14.527	1.71	PASS
6	46.827E-3	10.406	450.00E-3	PASS
7	312.226E-3	27.033	1.15	PASS
8	50.630E-3	14.675	345.00E-3	PASS
9	94.387E-3	15.731	600.00E-3	PASS
10	38.470E-3	13.938	276.00E-3	PASS
11	104.520E-3	21.115	495.00E-3	PASS
12	28.218E-3	12.269	229.99E-3	PASS
13	51.529E-3	16.358	315.00E-3	PASS
14	24.182E-3	12.266	197.15E-3	PASS
15	38.283E-3	17.015	225.00E-3	PASS
16	20.279E-3	11.756	172.50E-3	PASS
17	28.907E-3	14.561	198.52E-3	PASS
18	18.104E-3	11.807	153.33E-3	PASS
19	28.403E-3	15.990	177.63E-3	PASS
20	16.211E-3	11.747	138.00E-3	PASS
21	22.806E-3	14.191	160.71E-3	PASS
22	14.869E-3	11.851	125.46E-3	PASS
23	15.877E-3	10.819	146.74E-3	PASS
24	13.435E-3	11.684	114.99E-3	PASS
25	16.089E-3	11.918	135.00E-3	PASS
26	12.009E-3	11.312	106.16E-3	PASS
27	15.277E-3	12.222	124.99E-3	PASS
28	11.416E-3	11.582	98.57E-3	PASS
29	12.465E-3	10.710	116.39E-3	PASS
30	10.922E-3	11.873	92.00E-3	PASS
31	11.591E-3	10.646	108.87E-3	PASS
32	10.028E-3	11.627	86.25E-3	PASS
33	11.671E-3	11.412	102.27E-3	PASS
34	9.647E-3	11.884	81.18E-3	PASS
35	10.288E-3	10.668	96.44E-3	PASS
36	9.560E-3	12.470	76.66E-3	PASS
37	9.609E-3	10.535	91.21E-3	PASS
38	9.063E-3	12.478	72.63E-3	PASS
39	9.567E-3	11.056	86.53E-3	PASS
40	8.632E-3	12.511	69.00E-3	PASS

**Maximum harmonic voltage results**

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	230.01	100.005		
2	150.05E-3	0.065	0.2	PASS
3	646.86E-3	0.281	0.9	PASS
4	51.59E-3	0.022	0.2	PASS
5	150.67E-3	0.066	0.4	PASS
6	49.55E-3	0.022	0.2	PASS
7	55.72E-3	0.024	0.3	PASS
8	21.52E-3	0.009	0.2	PASS
9	52.31E-3	0.023	0.2	PASS
10	36.46E-3	0.016	0.2	PASS
11	44.11E-3	0.019	0.1	PASS
12	17.75E-3	0.008	0.1	PASS
13	32.32E-3	0.014	0.1	PASS
14	12.57E-3	0.005	0.1	PASS
15	46.06E-3	0.020	0.1	PASS
16	23.97E-3	0.010	0.1	PASS
17	34.45E-3	0.015	0.1	PASS
18	18.42E-3	0.008	0.1	PASS
19	17.97E-3	0.008	0.1	PASS
20	16.08E-3	0.007	0.1	PASS
21	20.74E-3	0.009	0.1	PASS
22	22.31E-3	0.010	0.1	PASS
23	31.16E-3	0.014	0.1	PASS
24	13.34E-3	0.006	0.1	PASS
25	13.80E-3	0.006	0.1	PASS
26	12.47E-3	0.005	0.1	PASS
27	8.84E-3	0.004	0.1	PASS
28	14.35E-3	0.006	0.1	PASS
29	14.63E-3	0.006	0.1	PASS
30	12.30E-3	0.005	0.1	PASS
31	11.14E-3	0.005	0.1	PASS
32	11.99E-3	0.005	0.1	PASS
33	10.60E-3	0.005	0.1	PASS
34	10.20E-3	0.004	0.1	PASS
35	8.49E-3	0.004	0.1	PASS
36	8.72E-3	0.004	0.1	PASS
37	9.35E-3	0.004	0.1	PASS
38	8.02E-3	0.003	0.1	PASS
39	7.80E-3	0.003	0.1	PASS
40	11.75E-3	0.005	0.1	PASS

## 4.4. Voltage Fluctuation and Flicker

For test instruments and accessories used see section 3.6.

### 4.4.1. Description of the test location

Test location: Shielded room No. 2

### 4.4.2 Limits of voltage fluctuation and flicker

Test configuration and procedure see clause 5 of standard EN 61000-3-3: 2008.

### 4.4.3 Description of the test set-up

#### 4.4.3.1. Operating Condition

The EUT is turned on during the test, and the results of the maximum emanation are recorded.

#### 4.4.3.2. Test Configuration and Procedure

Test configuration and procedure see clause 6 and Annex A or Annex B of standard EN 61000-3-3: 2013.

#### 4.4.3.3. Photo of the test set-up



### 4.4.4 Test result

The requirements are **Fulfilled**

**Remarks:** The limits are kept. For detailed results, please see the following page(s).

**Test Report of HTW**

Standard used:	EN 61000-3-3 Flicker
Short time (Pst):	10 mins
Observation time:	120 mins (12 Flicker measurements)
Customer:	Kinco Electric (Shenzhen) Ltd.
Flickermeter:	AC 230V / 50Hz
E. U. T.:	Stepping Motor Drive M/N:FM860-AA-000
Date of test:	9:24 07.Jun 2013
Tester:	Chang Xu

Test Result	PASS
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**Maximum Flicker results**

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.173	4.00	PASS
dt [s]	0.000	0.50	PASS

**Detail Flicker data**

Flicker measurement	EUT values	Limit	Result
1			
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.173	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement	EUT values	Limit	Result
2			
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.071	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 3	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.060	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 4	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.075	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 5	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.071	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 6	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.070	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 7	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.064	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 8	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.068	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 9	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.069	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 10	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.069	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 11	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.067	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 12	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.065	4.00	PASS
dt [s]	0.000	0.50	PASS

## 4.5. Electrostatic discharge

For test instruments and accessories used see section 3.6.

### 4.5.1. Description of the test location and date

Test location: Shielded room No.1

Date of test: Jun 04, 2013

Operator: Chang Xu

### 4.5.2. Severity levels of electrostatic discharge

4.5.2.1. Severity level: Contact Discharge at  $\pm 4\text{kV}$  Air Discharge at  $\pm 8\text{kV}$

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

4.5.2.2. Performance criterion: **B**

### 4.5.2. Description of the test set-up

#### 4.5.3.1. Operating Condition

The EUT is turned on during the test, and the results of the maximum susceptible results are recorded.

#### 4.5.3.1. Test Configuration and Procedure

Air Discharge:

- This test is done on a non-conductive surfaces. The round discharge tip of the Electrostatic Discharge simulator shall be approached as fast as possible then to touch the EUT. After each discharge, the simulator shall be removed from the EUT. The simulator 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 air discharge, except using the acute discharge tip. The top end of the Electrostatic Discharge simulator is touch the EUT all the time when the simulator is re-triggered for a new single discharge and repeated 10 times for each pre-selected test point.

Indirect Discharge:

- The vertical coupling plane(VCP) is placed 0.1m away from EUT. The top end of Electrostatic Discharge simulator should aim at the center of one border of the VCP for at least 10 times discharge.
- The top end of Electrostatic Discharge simulator should place at the point 0.1m away from EUT on the



## 4.6. Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 3.6.

### 4.6.1. Description of the test location and date

Test location: Shielded room No.4

Date of test: Jun 04, 2013

Operator: Chang Xu

### 4.6.2. Severity levels of radiated, radio-frequency, electromagnetic field

4.6.2.1. Severity level: 10 V/m 3 V/m 1 V/m

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

4.6.2.2. Performance criterion: A

### 4.6.2. Description of the test set-up

#### 4.6.3.1. Operating Condition

The EUT is turned on during the test, and the results of the maximum susceptible results are recorded.

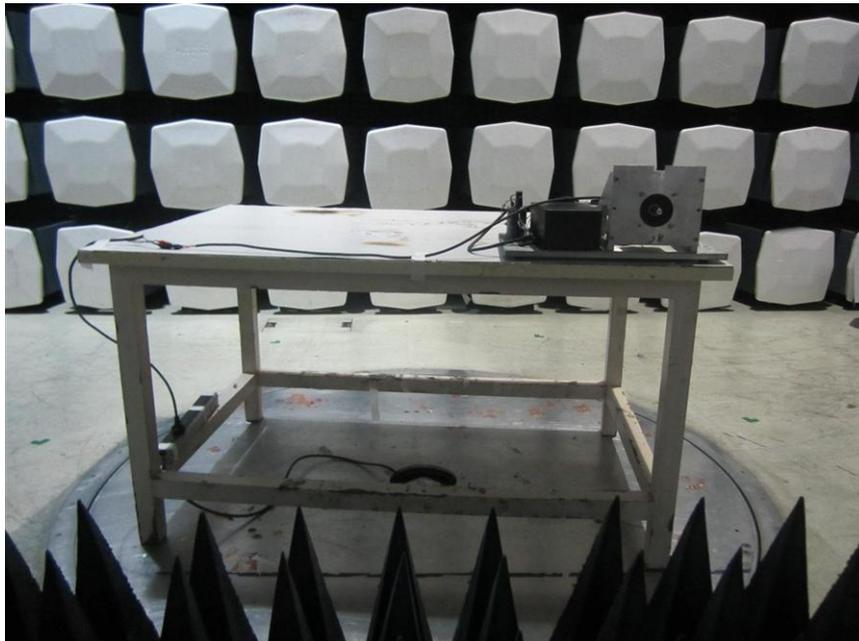
#### 4.6.3.1. Test Configuration and Procedure

EUT and its auxiliary instrument are placed on a turntable which is 0.8 meter above ground. The center of the transmitting antenna mounted on an antenna mast is set 3 meter away from the EUT. During the test, each of the four sides of EUT will face the transmitting antenna with the turntable cycled. Both horizontal and vertical polarization of the antenna are set on test and measured individually.

In order to judge the performance of the EUT, a set of monitor system is used.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

## 4.6.3.2. Photo of the test set-up



## 4.6.2. Test specification:

<u>Frequency range:</u>	■ 80 MHz to 1000 MHz
<u>Field strength:</u>	■ 10 V/m
<u>Frequency range:</u>	■ 1400 MHz to 2000 MHz
<u>Field strength:</u>	■ 3 V/m
<u>Frequency range:</u>	■ 2000 MHz to 2700 MHz
<u>Field strength:</u>	■ 1 V/m
<u>EUT - antenna separation:</u>	■ 3 m
<u>Modulation:</u>	■ AM: 80 % ■ sinusoidal 1000Hz
<u>Frequency step:</u>	■ 1 % with 3 s dwell time
<u>Antenna polarisation:</u>	■ horizontal                      ■ vertical

## 4.6.3. Test result

The requirements are **Fulfilled**Performance Criterion: **A****Remarks:** During the test, the EUT has no loss of function or performance.

## 4.7. Electrical fast transients / Burst

For test instruments and accessories used see section 3.6.

### 4.7.1. Description of the test location and date

Test location: Shielded room No.1

Date of test: Jun 05, 2013

Operator: Chang Xu

### 4.7.2. Severity levels of electrical fast transients / Burst

#### 4.7.2.1. Severity level: $\pm 2000V$ for AC power supply lines

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O signal, data and control ports	
	V peak(KV)	Repetition rate (KHz)	Voltage peak	Repetition rate (KHz)
1.	0.5	5 or 100	0.25	5 or 100
2.	1	5 or 100	0.5	5 or 100
3.	2	5 or 100	1	5 or 100
4.	4	5 or 100	2	5 or 100
X	Special	Special	Special	Special

#### 4.7.2.2. Performance criterion: **B**

### 4.7.2. Description of the test set-up

#### 4.7.3.1. Operating Condition

The EUT is turned on during the test, and the results of the maximum susceptible results are recorded.

#### 4.7.3.1. Test Requirements

EUT and its simulators shall be placed 0.1m high above the ground reference plane which is a minimum 1m\*1m with minimum 0.65mm thickness. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

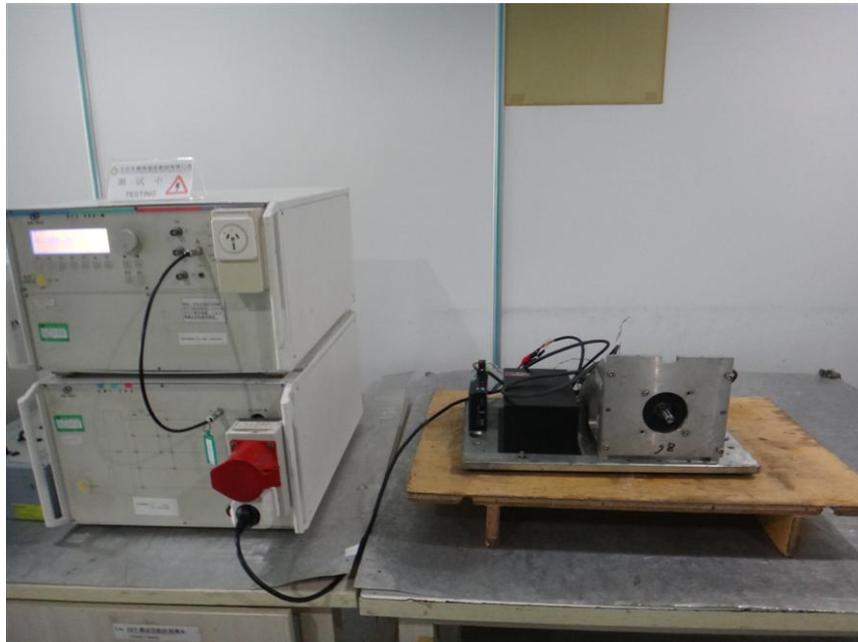
#### 4.7.3.2. Test Configuration and Procedure

For AC power input lines:

- EUT is connected to coupling/decoupling network which couples the EFT signal to power input lines. During the test, both polarities of the test voltage should be applied and the duration of the test can't be less than 1mins.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.7.3.2. Photo of the test set-up



4.7.2. Test specification:

- Coupling network:  0.5 kV  1 kV  2 kV
- Coupling clamp:  0.5 kV  1 kV
- Burst frequency:  5.0 kHz
- Coupling duration:  60 s
- Polarity:  positive  negative

4.7.3. Coupling points

- Cable description: AC power line: L, N, PE, L-N, L-PE, N-PE, L-N-PE

---

- Screening:  screened  unscreened
- Status:  passive  active
- Signal transmission:  analogue  digital
- Length:  1.5 m

4.7.4. Test result

The requirements are **Fulfilled** Performance Criterion: **B**

**Remarks:** During the test, the EUT has no loss of function or performance.

## 4.8. Surge

For test instruments and accessories used see section 3.6.

### 4.8.1. Description of the test location and date

Test location: Shielded room No.1

Date of test: Jun 04, 2013

Operator: Chang Xu

### 4.8.2. Severity levels of surge

4.8.2.1. Severity level: Line to line: 1kV

Level	Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

4.8.2.2. Performance Criterion: **B**

### 4.8.2. Description of the test set-up

4.8.3.1. Operating Condition

The EUT is turned on during the test, and the results of the maximum susceptible results are recorded.

4.8.3.1. Test Configuration and Procedure

For AC power input ports

In this test, the 1.2/50us & 8/20us surge generator must be used for AC power ports. The voltage for line to line 1KV and line to earth are 2KV. At least 5 positive and 5 negative (polarity) surge signal with a maximum 1/min repetition rate are injected to AC power lines from 4 different phase angle( 0°, 90°, 180°, 270°) during the test.

4.8.3.2. Photo of the test set-up



4.8.2. Test specification:

AC Port Pulse amplitude-Power line sym:     0.5 kV     1 kV     2 kV     4 kV  
Source impedance: 2 Ω + 18μF)

Pulse amplitude-Power line unsym:     0.5 kV     1 kV     2 kV     4 kV  
Source impedance: (12 Ω + 9μF)

Number of surges:     5 Surges/Phase angle

Repetition rate:     60 s

Polarity:     positive     negative

4.8.1. Coupling points

Cable description:    AC power line: L-N, N-PE, L-N-PE

---

Screening:     screened     unscreened  
Status:     passive     active  
Signal transmission:     analogue     digital  
Length:     1.0 m

4.8.2. Test result

The requirements are **Fulfilled**

Performance Criterion: **B**

**Remarks:**    During the test, the EUT has no loss of function or performance.

## 4.9. Conducted disturbances induced by radio-frequency fields

For test instruments and accessories used see section 3.6.

### 4.9.1. Description of the test location and date

Test location: Shielded room No.2

Date of test: Jun 03, 2013

Operator: Chang Xu

### 4.9.2. Severity levels of conducted disturbances induced by radio-frequency fields discharge

#### 4.9.2.1. Severity Level: 10V

Level	Field Strength (V)
1.	1
2.	3
3.	10
X	Special

#### 4.9.2.2. Performance Criterion: A

### 4.9.3. Description of the test set-up

#### 4.9.3.1. Operating Condition

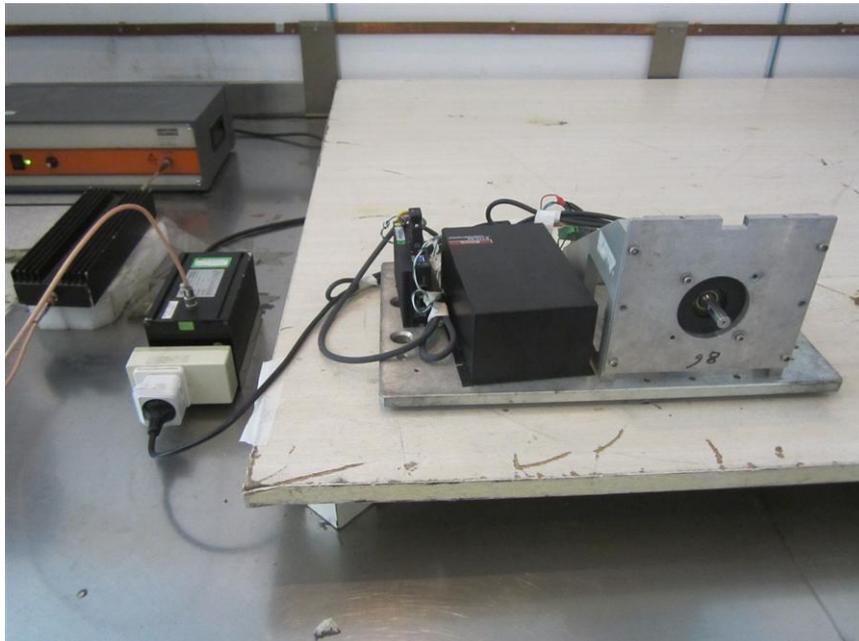
The EUT is turned on during the test, and the results of the maximum susceptible results are recorded.

#### 4.9.3.1. Test Configuration and Procedure

—EUT is placed on an insulating support of 0.1m high above a ground reference plane. It must be 0.3m away the CDN (coupling and decoupling network) of which the bottom is made of metallic material and placed directly on the ground plane. 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). The disturbance signal amplified by amplifier is injected to EUT through CDN.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.9.3.2. Photo of the test set-up



4.9.4. Test specification:

- Frequency range:  0.15 MHz to 80 MHz
- Test voltage:  10 V
- Modulation:
  - AM: 80 %
  - sinusoidal 1000Hz
- Frequency step:  1 % with 3 s dwell time

4.9.5. Coupling points

- Cable description : DCPower line, ACPower line,
- Screening:  screened  unscreened
- Status:  passive  active
- Signal transmission:  analogue  digital
- Length:  1.0 m

4.9.6. Test result

The requirements are **Fulfilled**

Performance Criterion: **A**

**Remarks:** During the test, the EUT has no loss of function or performance.

## 4.10. Magnetic Field Immunity

For test instruments and accessories used see section 3.6.

### 4.10.1. Description of the test location and date

Test location: Shielded room No.1

Date of test: Jun 03, 2013

Operator: Chang Xu

### 4.10.2. Severity levels of magnetic field immunity

4.10.3.1. Severity Level: 30A/m

Level	Magnetic Field Strength (A/m)
1	1
2	3
3	10
4	30
5	100
X.	Special

### 4.10.3. Description of the test set-up

4.10.3.2. Operating Condition

The EUT is turned on during the test, and the results of the maximum susceptibility are recorded.

4.10.3.3. Test Configuration and Procedure:

EUT is placed on an insulating support of 0.1m high above a table of 0.8m high. There is a minimum 1m\*1m ground metallic plane put on this table. EUT is put in the center of the magnetic coil then three orientations of the magnetic coil, X, Y and Z, shall be rotated in order to expose the EUT to the difference polarization magnetic field.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

## 4.10.3.4. Photo of the test set-up



## 4.10.2. Test specification:

Test frequency:  50 Hz  60 HzContinuous field:  30A/mTest duration:  5 m

Antenna factor: 0.917 A/m

Axis:  x-axis  y-axis  z-axis

## 4.10.3. Test result

The requirements are **Fulfilled**Performance Criterion: **A****Remarks:** During the test, the EUT has no loss of function or performance.

## 4.11 Voltage Dips and Interruptions

For test instruments and accessories used see section 3.6.

### 4.11.1 Description of the test location and date

Test location: Shielded room No.1

Date of test: Jun 08,2013

Operator: Chang Xu

### 4.11.2 Severity levels of voltage dips and interruptions

Test Level (%Ut)	Voltage Dip And Short Interruptions (%Ut)	Performance Criterion	Duration (In Period)	Phase angle (°)
0	100	B	0.5	0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°
70	30	C	25	0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°
0	100	C	250	0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°

### 4.11.3 Description of the test set-up

#### 4.11.3.1 Operating Condition

The EUT is turned on during the test, and the results of the maximum susceptibility are recorded.

#### 4.11.3.2 Test Configuration and Procedure

EUT is connected to the simulator according to the setup outline of 12.3. When conducting the test level of 0.5 period duration, make sure that it shall start at the phase angle of 0° and 180°

4.11.3.3 Photo of the test set-up



4.11.4 Test specification:

- Nominal Mains Voltage ( $V_N$ ): ■ 230 V AC
- Number of voltage fluctuations: ■ 3
- Level of reduction(dip) / duration: ■ 100 % / 10ms ■ 30 % / 500ms
- Nominal Mains Voltage ( $V_N$ ): ■ 230 V AC
- Number of Interruptions: ■ 3
- Duration of the Interruption: ■ 5000 ms

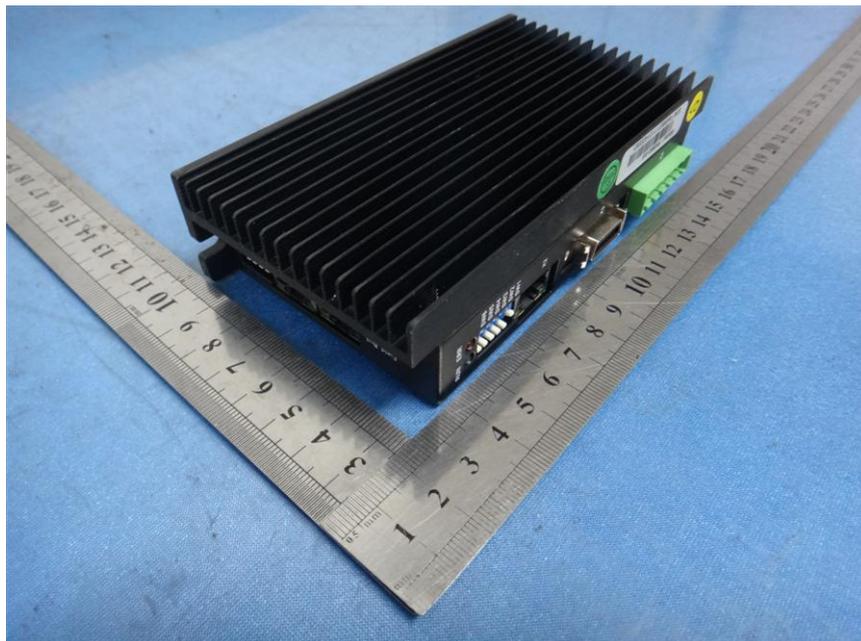
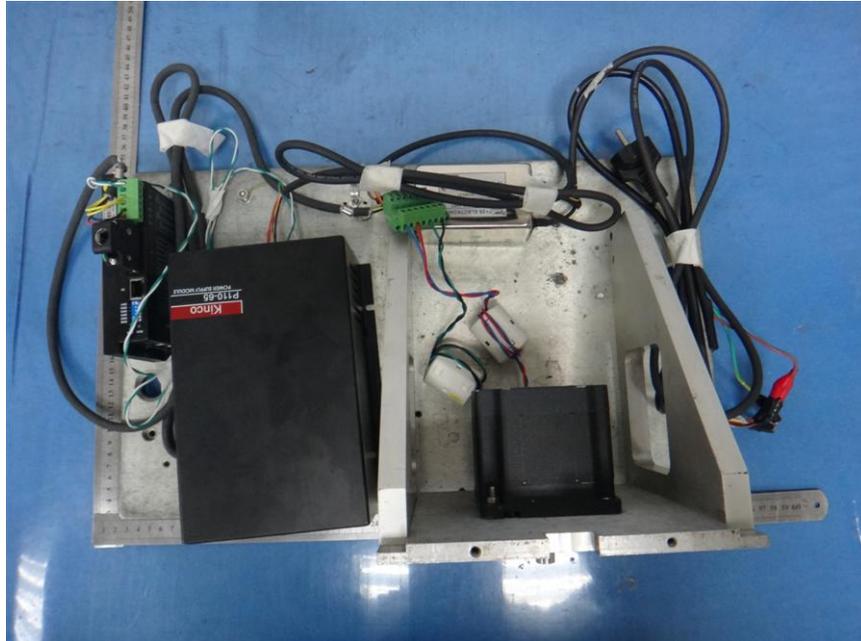
4.11.5 Test result

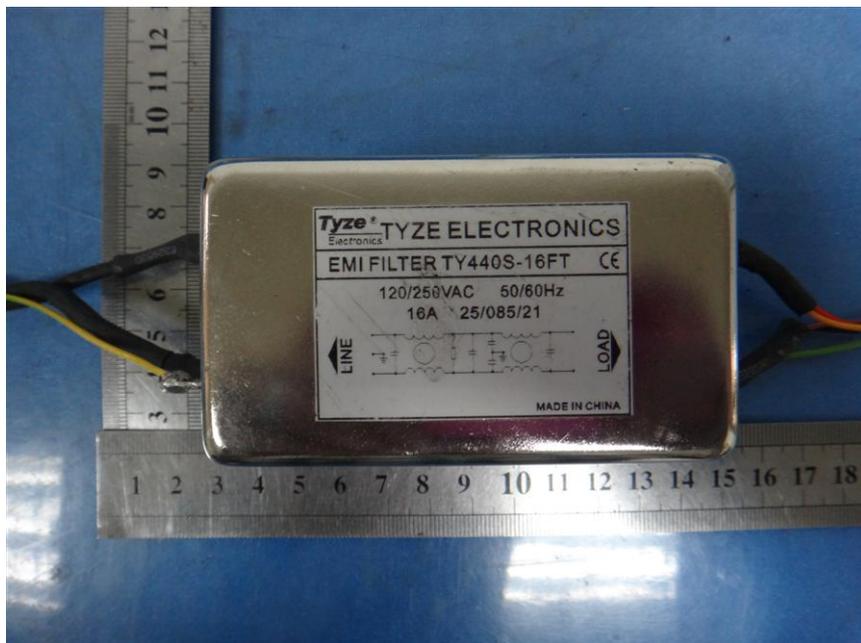
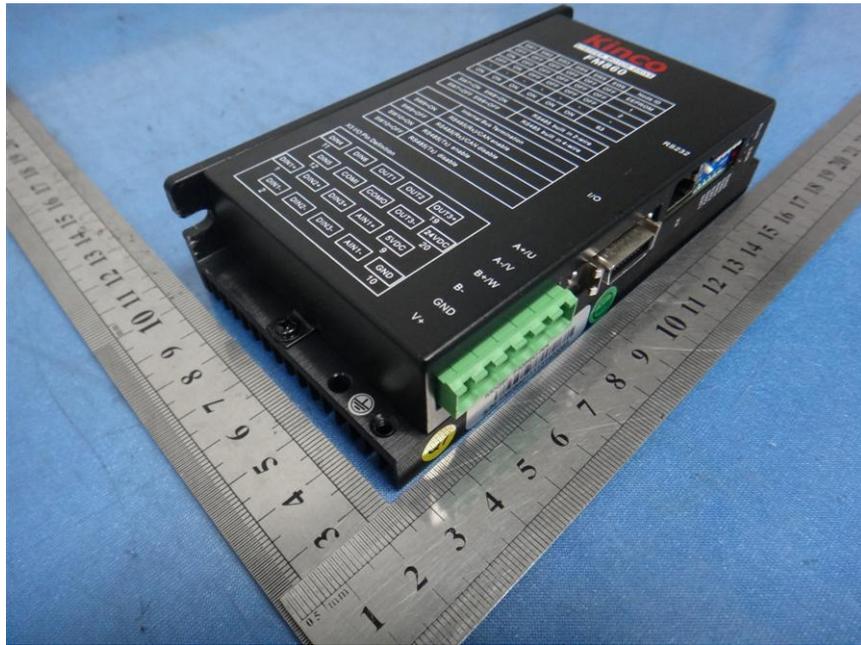
The requirements are **Fulfilled**  
Performance Criterion **See section 4.11.2**

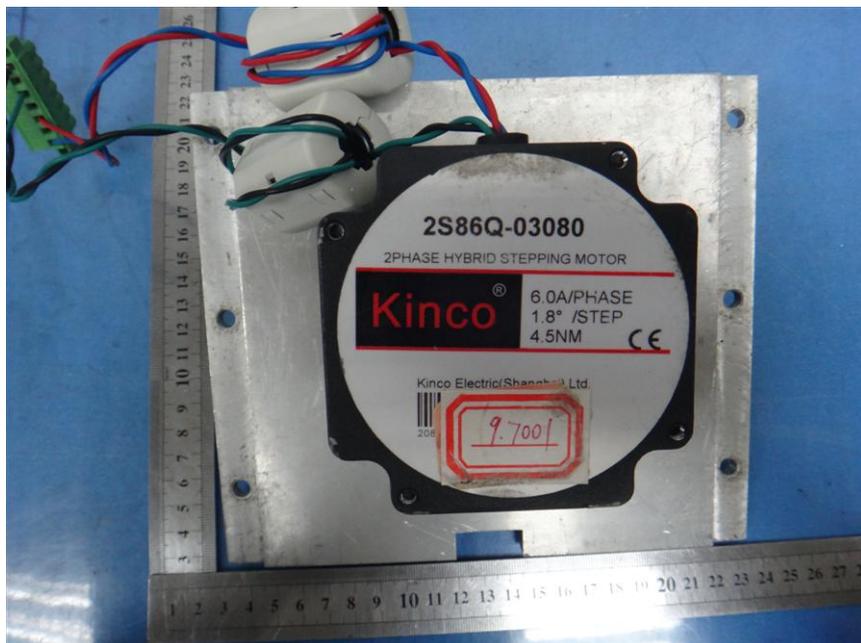
**Remarks:** During the test no deviation was detected to the selected operation mode(s).

## 5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

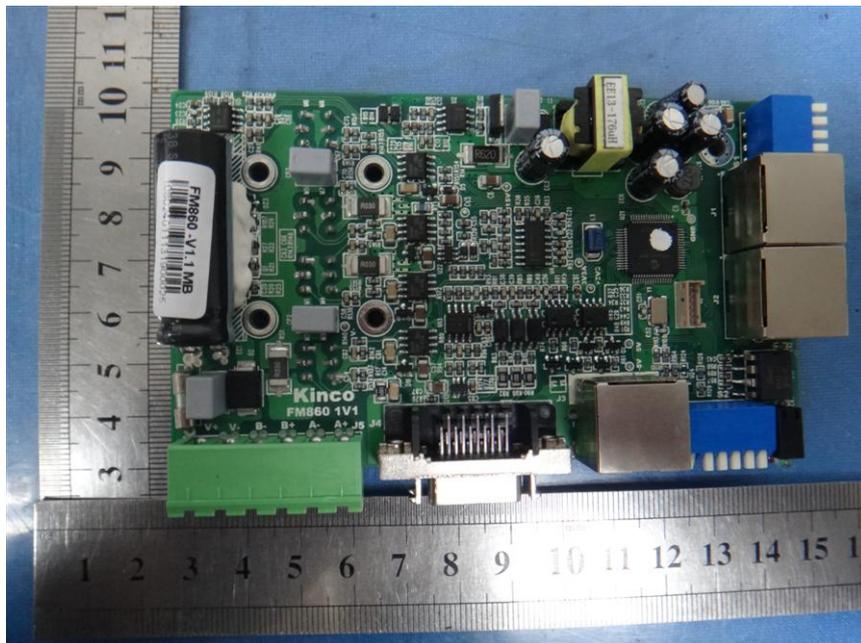
### 5.1. External photos of the EUT

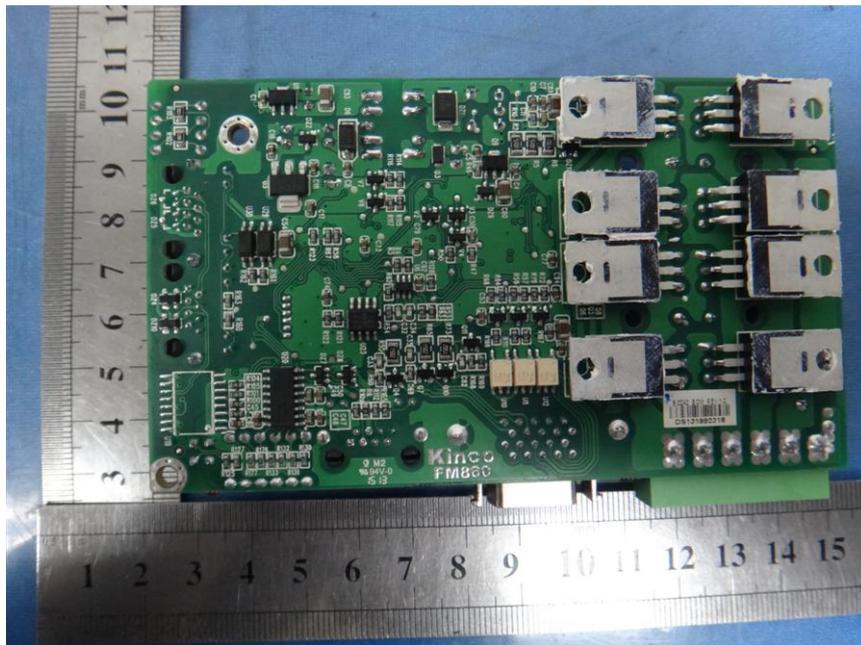






## 5.2. Internal photos of the EUT





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