Shenzhen Huatongwei International Inspection Co., Ltd.
Keji S,12th , Road, Hi-tech Industrial Park, Shenzhen, Guangdong, China
Phone:86-755-26748099 Fax:86-755-26748089 http://www.szhtw.com.cn

CNASL1225

TEST REPORT

47 CFR FCC Part 15 Subpart B (Class B)

Radio Frequency Devices – Unintentional Radiators – Limits and methods of measurement

ANSI C63.4: 2009

American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

Report Reference No.....:	**TRE13030018 R/C:23790**
FCC ID.....:	**BBP-PRSP1121**
Compiled by (position+printed name+signature)..:	File administrators Tim Zhang
Supervised by (position+printed name+signature)..:	Test Engineer Eric Zhang
Approved by (position+printed name+signature)..:	Manager Wenliang Li
Date of issue.....:	May 10, 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.....:	**RICOH Co., LTD.**
Address.....:	810 Shimoimaizumi,Ebina City, Kanagawa-Pref., 243-0460 Japan
Test specification:	
Standard .....:	**47 CFR FCC Part 15 Subpart B (Class B) ANSI C63.4: 2009**
Non-standard test method……..:	/
Test Report Form No.....:	HTWEMCFCC_1A
TRF Originator.....:	Shenzhen Huatongwei International Inspection Co., Ltd
Master TRF.....:	Dated 2006-06

Test item description ..... :	Laser Printer
Trade Mark .....:	Ricoh
Model/Type reference.....:	SP 112/ SP 111
Listed Model….. .....:	/
Ratings.....:	120Vac 50/60Hz 6A 680W
Result.....:	**Positive**

EMC -- T E S T R E P O R T

Test Report No. :	**TRE13030018**	May 10, 2013 Date of issue

Equipment under Test	:	Laser Printer
Model / Type	:	SP 112/ SP 111
Listed Model	:	/
Applicant	:	RICOH Co., LTD.
Address	:	810 Shimoimaizumi,Ebina City, Kanagawa-Pref., 243-0460 Japan
Manufacturer	:	RICOH Co., LTD.
Address	:	3-6，Naka-magome 1-Chome Ohta-ku,Tokyo 143-8555 Japan

Test Result according to the standards on page 4:	**Positive**

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.

Contents

1. TEST STANDARDS 4

2. SUMMARY 4

2.1. General Remarks: 4
2.2. Equipment under Test 4
2.3. Short description of the Equipment under Test (EUT) 4
2.4. EUT operation mode 4
2.5. EUT configuration 5

3. TEST ENVIRONMENT 6

3.1. Address of the test laboratory 6
3.2. Test Facility 6
3.3. Environmental conditions 7
3.4. Test Description 7
3.5. Statement of the measurement uncertainty 7
3.6. Equipments Used during the Test 8

4. TEST CONDITIONS AND RESULTS 9

4.1. Radiated Emission 9
4.2. Conducted Disturbance 24

5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT 32

5.1. External photos of the EUT 32
5.2. Internal photos of the EUT 34

1. TEST STANDARDS

The tests were performed according to following standards:

47 CFR FCC Part 15 Subpart B (Class B) Radio Frequency Devices – Unintentional Radiators – Limits and methods of measurement.
ANSI C63.4: 2009 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

2. SUMMARY

2.1. General Remarks:

Date of receipt of test sample	:	Mar 13, 2013
Testing commenced on	:	Mar 13, 2013
Testing concluded on	:	May 10, 2013

2.2. Equipment under Test

Power supply system utilised

Power supply voltage	:	o	230V / 50 Hz	o	115V / 60Hz
		o	12 V DC	o	24 V DC
		■	Other (specified in blank below)		

AC 120V/60Hz

2.3. Short description of the Equipment under Test (EUT)

The EUT is a laser Printer.

Model Difference: The SP 112 and SP 111 were differences for toner refill.The toner of SP 111 can be refilled, but SP 112 can not.Unless otherwise indicated, all tests were conducted on SP 112.

Tests performed on SP 112 were considered to be representative of SP 111.

There are two kinds of main motor, one is DC motor,the other is stepping motor. DC motor is spaced.

2.4. EUT operation mode

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

Test program (customer specific)

Emissions tests……: 47 CFR FCC Part 15 Subpart B (Class B) and ANSI C63.4 2009, searching for the highest disturbance.

2.5. EUT configuration

1) Equipment under test

Kind of equipment	Manufacturer	Model name	Serial number	Remarks
(1)EUT	RICOH	SP 112	NP130100007	

2) Highest Frequency Generated or Used in The Device or on Which the Device Operates (MHz)

Kind of equipment	Mode name	Operates Frequency	Remark
EUT	SP 112	480MHz	USB

3) Supporting equipment

Kind of equipment	Manufacturer	Model name	Serial number	Remarks
Notebook 1	LENOVO	ThinkPad X201i	R8-7DYTX 10/11	For EMI

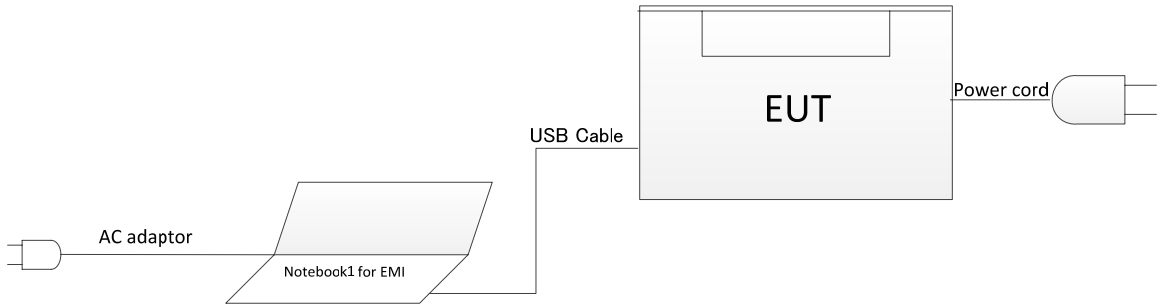
4) Cables Used

	Cable Name	Length	Shielded	Maker	Remarks
1	USB Cable	2m	YES	-	
2	Power Cable	1.8m	No	Long well	

5)Operating modes：

No.	Operating modes	CE	RE	Remarks
1	Standby	○	○	Stepping motor
2	Print	○	○	Stepping motor
3	Standby	X	X	DC motor
4	Print	○	○	DC motor

6)EUT Setup：



3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone: 86-755-26715686 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: Mar. 01, 2012. Valid time is until Feb. 28, 2015.

A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until Sept. 30, 2013.

FCC-Registration No.: 662850

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 June. 01, 2012, valid time is until Jun. 01, 2015.

IC-Registration No.: 5377A

The 3m 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 Jan. 25, 2011, valid time is until Jan. 24, 2014.

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.

NEMKO-Aut. No.: ELA125

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10, the authorization is valid through July 07, 2013

VCCI

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) and Shielded Room (8m×4m×3m) of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2012. Valid time is until Dec. 23, 2015.

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-2726. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 19, 2015.

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-1837. Date of Registration: May 07, 2013. Valid time is until May 06, 2016.

DNV

Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2013.

3.3. Environmental conditions

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

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Test Description

Emission Measurement		
Radiated Emission	47 CFR FCC Part 15 Subpart B Class B ANSI C63.4 2009	PASS
Conducted Disturbance	47 CFR FCC Part 15 Subpart B Class B ANSI C63.4 2009	PASS

Remark: 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	4.24dB	(1)
Radiated Emission	1G~2G	5.16dB	(1)
Conducted Disturbance	0.15~30 MHz	3.39dB	(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	2012/10/27
2	EMI TEST RECEIVER	Rohde & Schwarz	ESI 26	100009	2012/10/27
3	RF TEST PANEL	Rohde & Schwarz	TS / RSP	335015/ 0017	2012/10/27
4	TURNTABLE	ETS	2088	2149	2012/10/27
5	ANTENNA MAST	ETS	2075	2346	2012/10/27
6	EMI TEST SOFTWARE	Rohde & Schwarz	ESK1	N/A	2012/10/27
7	Double-Ridged-Waveguide Horn Antenna	Rohde & Schwarz	HF906	100039	2012/10/27
8	Semi-anechoic chamber	ETS-LINDGREN	AJ 593 HTW	N/A	2012/10/27

Conducted Disturbance					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	Rohde & Schwarz	ESCS30	100038	2012/10/27
2	Artificial Mains	Rohde & Schwarz	ESH2-Z5	100028	2012/10/27
3	Artificial Mains	Rohde & Schwarz	ESH3-Z5	100040	2012/10/27
4	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100044	2012/10/27
5	EMI Test Software	Rohde & Schwarz	ESK1	N/A	2012/10/27
6	3# shielded room	ETS-LINDGREN	RFD-100	2406	N/A

The Cal.Interval was one year.

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

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/m)	
30 ~ 88	3	40	
88~216	3	43.5	
216 ~ 960	3	46	
960-1000	3	54	
1000-2000	3	74(PK)	54(AV)

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.

(3)The highest frequency of the internal sources of the EUT is 480MHz, so the measurement was made up to 2 GHz.

4.1.3. Description of the test set-up

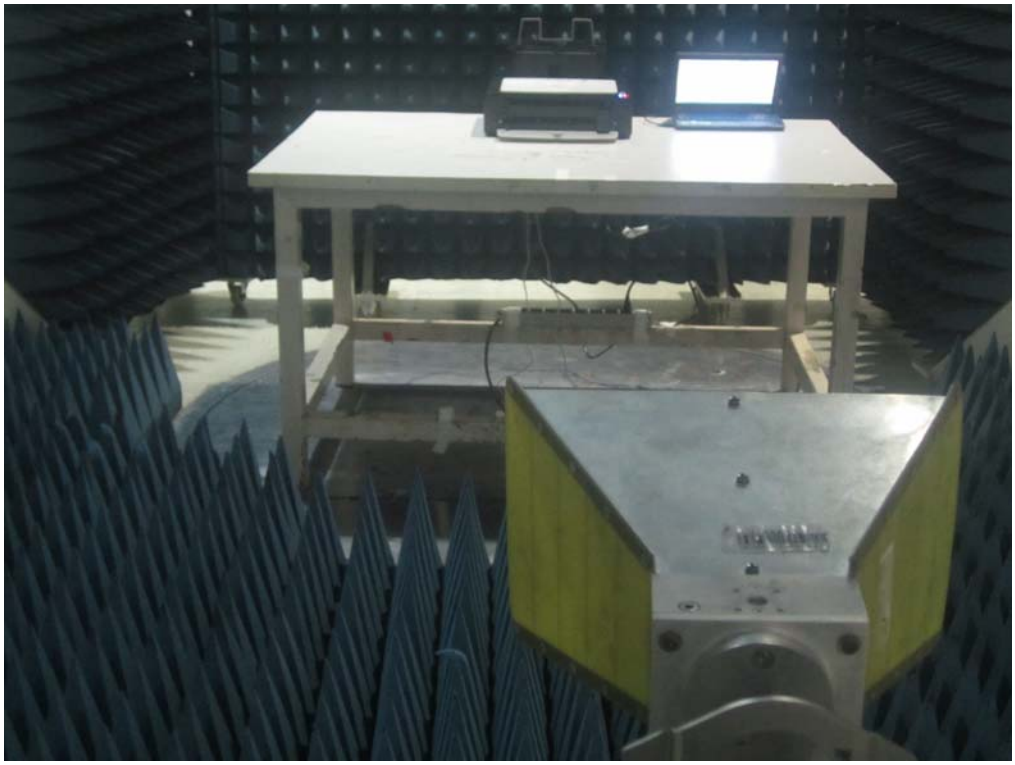
4.1.3.1. Operating Condition

The EUT is set to work that shall be carried out respectively Standby, Print modes on different motor, Stepping motor and DC motor during the test and the results of the maximum emanation are recorded.

4.1.3.2. Test Configuration and Procedure

Test is carried out in Semi-Anechoic Chamber. EUT is placed on a nonmetal table which is 0.8 meter above a grounded turntable. EUT is set 3 meters away from the center of receiving antenna. The turntable can rotate 360 degrees to determine the azimuth of the maximum emission level and then 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.

4.1.3.3. Photos of the test set-up



4.1.4. Test result

The requirements are **Fulfilled**

Band Width: 120 KHz

Frequency Range: 30MHz to 1000MHz

Band Width: 1MHz

Frequency Range: 1G-2G

The average measurement was not performed when the peak measured data under the limit of average detection.

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

Margin=limit-level

Level=read valus+transducer

Transducer=antenna factor+pre-amplifier factor+cable loss (with 6db attenuator)

SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

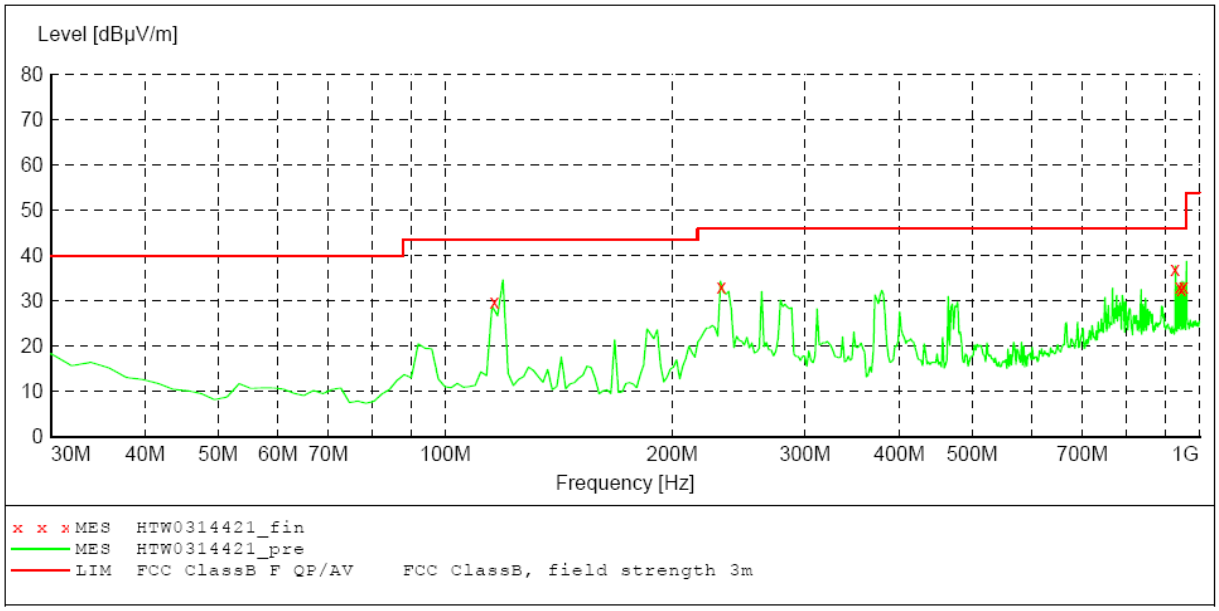
RADIATED EMISSION TEST FCC PART15

EUT: SP 112
Manufacturer: RICOH
Operating Condition: STANDBY
Test Site: 3M CHAMBER
Operator: FENG
Test Specification: AC 120V/60Hz
Comment: Stepping motor
Start of Test: 3/14/2013 / 10:25:35AM

SCAN TABLE: "test Field(30M-1G)OP"

Short Description: Field Strength(30M-1G)

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	60.0 kHz	QuasiPeak	1.0 s	120 kHz	HL562 201106



MEASUREMENT RESULT: "HTW0314421_fin"

3/14/2013 10:41AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
116.240000	29.80	-16.5	43.5	13.7	QP	236.0	58.00	HORIZONTAL
232.480000	33.10	-16.4	46.0	12.9	QP	113.0	175.00	HORIZONTAL
929.920000	36.90	-3.8	46.0	9.1	QP	99.0	231.00	HORIZONTAL
941.820000	33.20	-3.9	46.0	12.8	QP	101.0	231.00	HORIZONTAL
947.820000	32.60	-4.0	46.0	13.4	QP	100.0	234.00	HORIZONTAL
953.940000	33.20	-3.8	46.0	12.8	QP	100.0	237.00	HORIZONTAL

SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

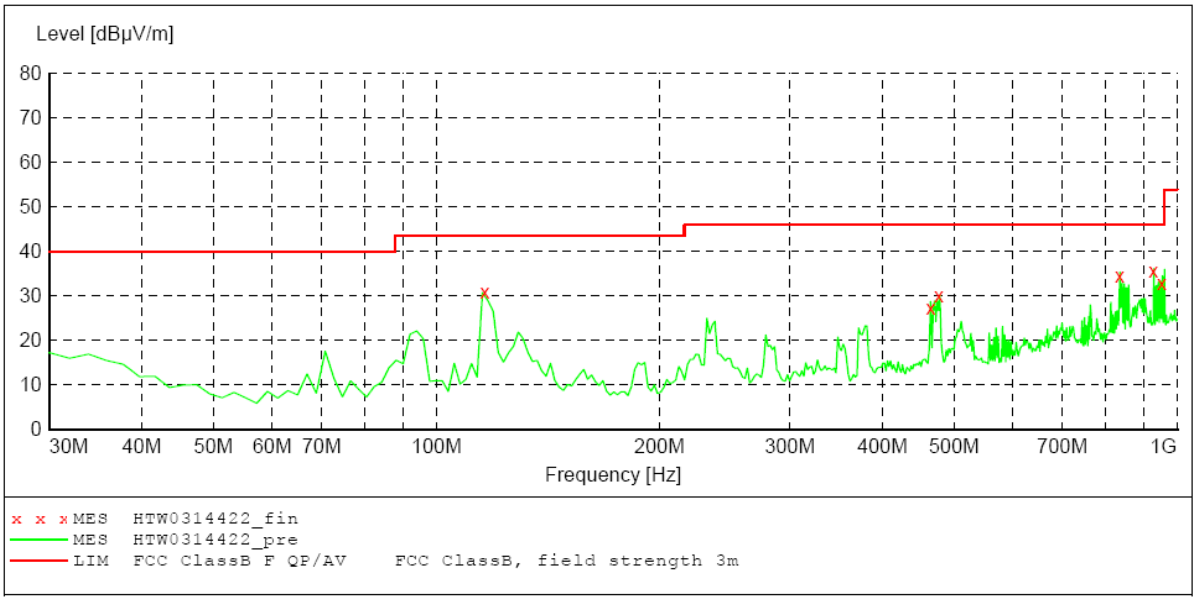
RADIATED EMISSION TEST FCC PART15

EUT: SP 112
Manufacturer: RICOH
Operating Condition: STANDBY
Test Site: 3M CHAMBER
Operator: FENG
Test Specification: AC 120V/60Hz
Comment: Stepping motor
Start of Test: 3/14/2013 / 10:42:41AM

SCAN TABLE: "test Field(30M-1G)OP"

Short Description: Field Strength(30M-1G)

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	60.0 kHz	QuasiPeak	1.0 s	120 kHz	HL562 201106



MEASUREMENT RESULT: "HTW0314422_fin"

3/14/2013 10:58AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
116.260000	31.00	-16.5	43.5	12.5	QP	99.0	43.00	VERTICAL
464.980000	27.20	-10.8	46.0	18.8	QP	100.0	175.00	VERTICAL
476.940000	30.20	-10.6	46.0	15.8	QP	118.0	182.00	VERTICAL
836.920000	34.50	-4.4	46.0	11.5	QP	115.0	160.00	VERTICAL
929.920000	35.50	-3.8	46.0	10.5	QP	101.0	277.00	VERTICAL
953.940000	32.80	-3.8	46.0	13.2	QP	100.0	156.00	VERTICAL

SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

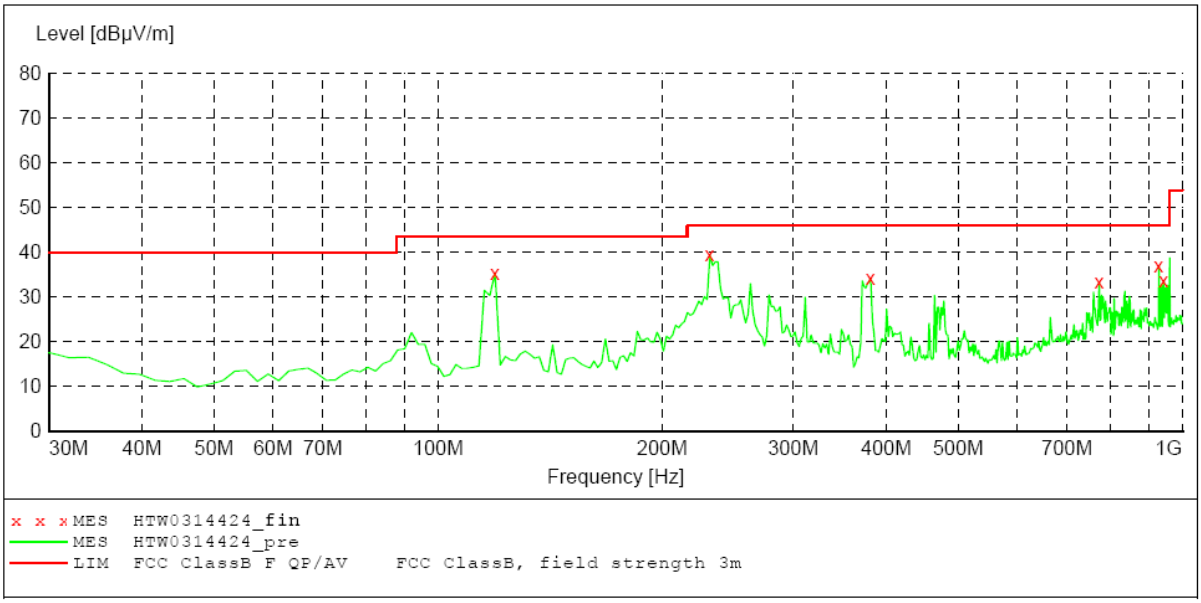
RADIATED EMISSION TEST FCC PART15

EUT: SP 112
Manufacturer: Ricoh
Operating Condition: Print
Test Site: 3M CHAMBER
Operator: FENG
Test Specification: AC 120V/60Hz
Comment: stepping motor
Start of Test: 3/14/2013 / 10:55:19AM

SCAN TABLE: "test Field(30M-1G)OP"

Short Description: Field Strength(30M-1G)

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	60.0 kHz	QuasiPeak	1.0 s	120 kHz	HL562 201106



MEASUREMENT RESULT: "HTW0314424_fin"

3/14/2013 11:07AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
119.240000	35.40	-16.3	43.5	8.1	QP	300.0	218.00	HORIZONTAL
231.760000	39.40	-16.4	46.0	6.6	QP	100.0	152.00	HORIZONTAL
381.140000	34.20	-13.1	46.0	11.8	QP	100.0	205.00	HORIZONTAL
773.020000	33.30	-6.0	46.0	12.7	QP	100.0	200.00	HORIZONTAL
930.160000	37.00	-3.8	46.0	9.0	QP	100.0	226.00	HORIZONTAL
943.740000	33.60	-3.9	46.0	12.4	QP	100.0	226.00	HORIZONTAL

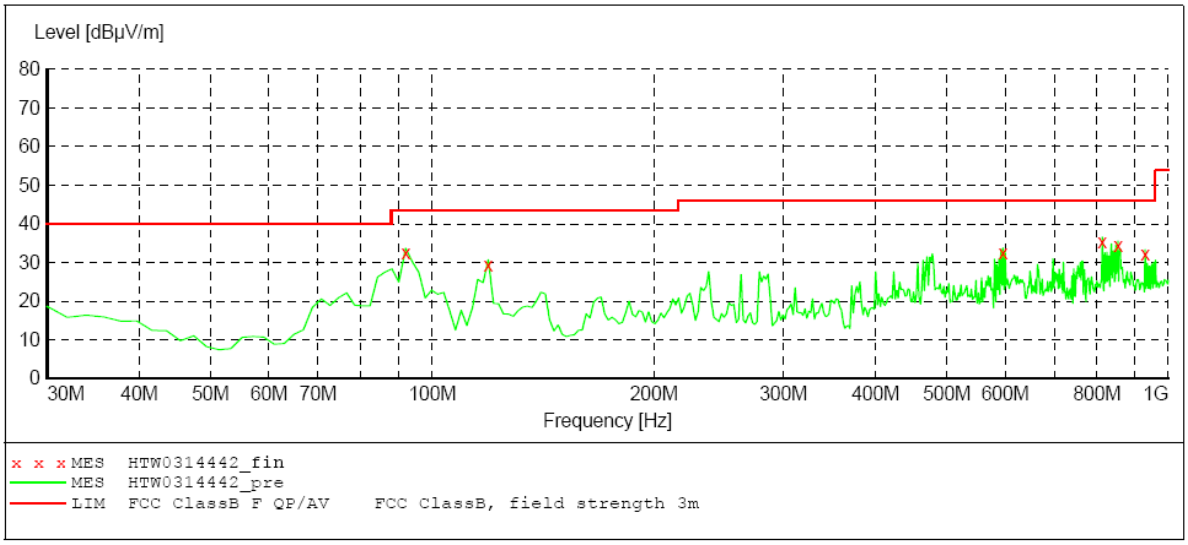
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION TEST FCC PART15

```
EUT:                  SP 112
Manufacturer:         Ricoh
Operating Condition:  Print
Test Site:            3M CHAMBER
Operator:             FENG
Test Specification:   AC 120V/60Hz
Comment:              stepping motor
Start of Test:        3/14/2013 / 3:06:48PM
```

SCAN TABLE: "test Field(30M-1G)OP"

```
  Short Description:            Field Strength(30M-1G)
  Start      Stop       Step       Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width                Time      Bandw.
  30.0 MHz   1.0 GHz    60.0 kHz   QuasiPeak 1.0 s     120 kHz  HL562 201106
```



MEASUREMENT RESULT: "HTW0314442_fin"

3/14/2013 3:28PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
92.080000	33.70	-17.0	43.5	9.8	QP	100.0	119.00	VERTICAL
119.240000	30.70	-16.3	43.5	12.8	QP	100.0	220.00	VERTICAL
596.480000	33.80	-9.5	46.0	12.2	QP	100.0	304.00	VERTICAL
813.760000	36.60	-4.6	46.0	9.4	QP	100.0	319.00	VERTICAL
854.500000	35.60	-4.2	46.0	10.4	QP	100.0	185.00	VERTICAL
930.160000	33.30	-3.8	46.0	12.7	QP	100.0	247.00	VERTICAL

SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

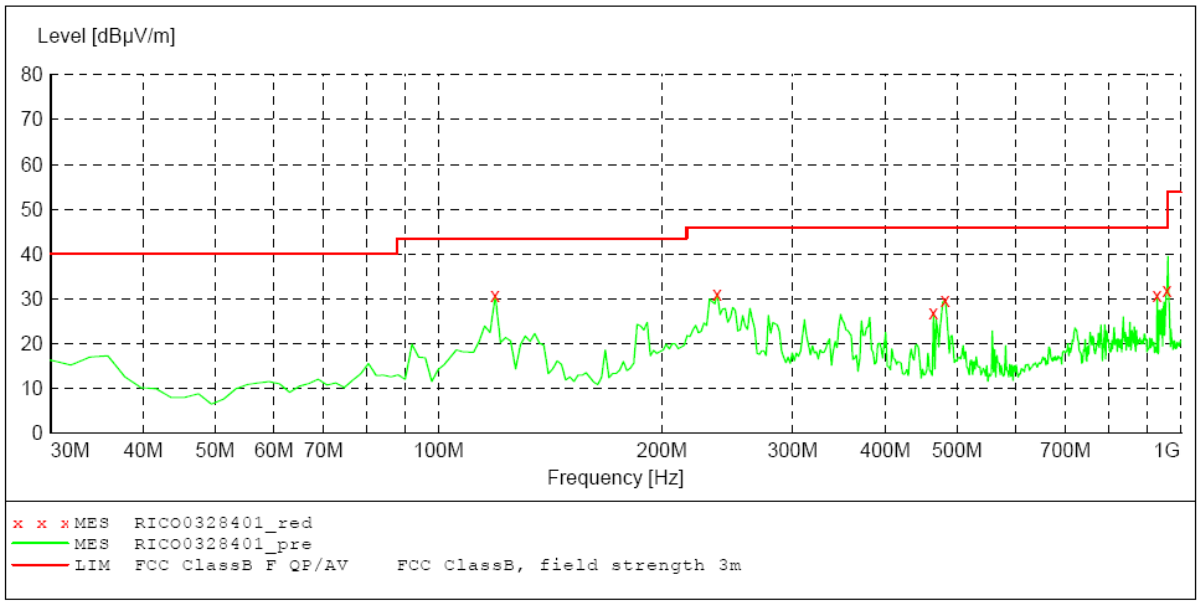
RADIATED EMISSION TEST FCC Part15

EUT: SP 112
Manufacturer: RICOH
Operating Condition: Print
Test Site: 3M CHAMBER
Operator: JONY
Test Specification: AC 120V/60Hz
Comment: DC Motor
Start of Test: 3/28/2013 / 9:40:06AM

SCAN TABLE: "test Field(30M-1G)OP"

Short Description: Field Strength(30M-1G)

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	60.0 kHz	QuasiPeak	1.0 s	120 kHz	HL562 201106



MEASUREMENT RESULT: "RICO0328401_red"

3/28/2013 9:54AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
119.240000	30.70	-19.9	43.5	12.8	QP	300.0	208.00	HORIZONTAL
237.580000	31.20	-19.9	46.0	14.8	QP	100.0	116.00	HORIZONTAL
464.560000	26.80	-15.2	46.0	19.2	QP	100.0	224.00	HORIZONTAL
482.020000	29.60	-14.9	46.0	16.4	QP	100.0	295.00	HORIZONTAL
930.160000	30.90	-9.0	46.0	15.1	QP	100.0	176.00	HORIZONTAL
959.260000	32.00	-8.8	46.0	14.0	QP	100.0	224.00	HORIZONTAL

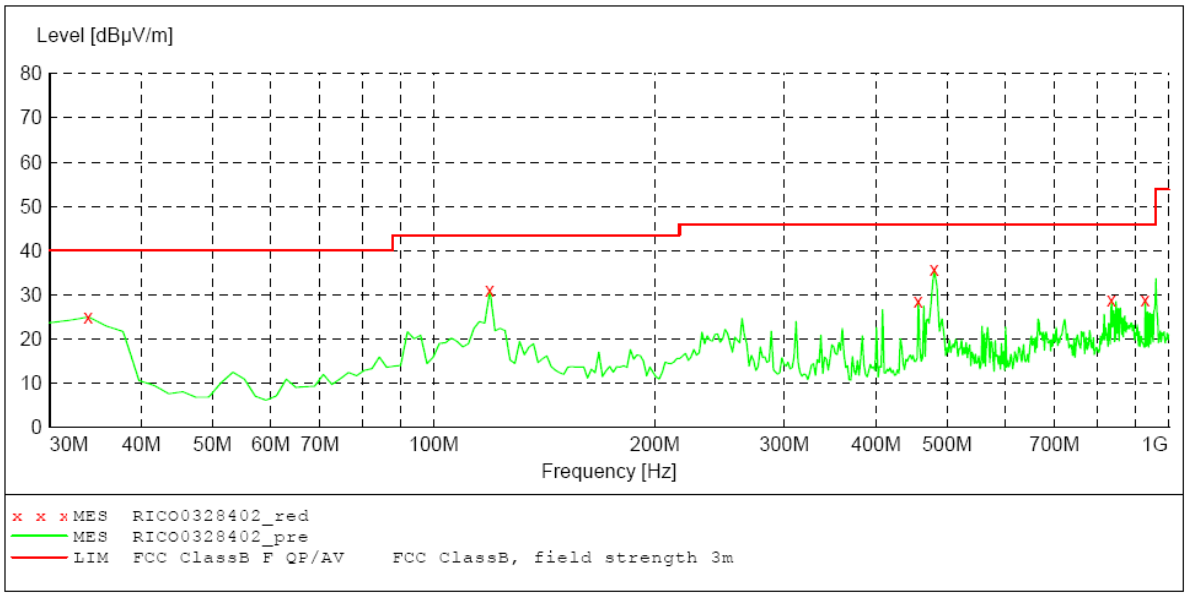
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION TEST FCC Part15

```
EUT:                  SP 112
Manufacturer:         RICOH
Operating Condition:  Print
Test Site:            3M CHAMBER
Operator:             JONY
Test Specification:   AC 120V/60Hz
Comment:              DC Motor
Start of Test:        3/28/2013 / 9:55:04AM
```

SCAN TABLE: "test Field(30M-1G)OP"

```
  Short Description:            Field Strength(30M-1G)
  Start      Stop       Step      Detector  Meas.     IF      Transducer
  Frequency  Frequency  Width               Time      Bandw.
  30.0 MHz   1.0 GHz    60.0 kHz  QuasiPeak 1.0 s     120 kHz HL562 201106
```



MEASUREMENT RESULT: "RICO0328402_red"

3/28/2013 10:22AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
33.880000	25.00	-13.6	40.0	15.0	QP	100.0	167.00	VERTICAL
119.240000	31.00	-19.9	43.5	12.5	QP	100.0	259.00	VERTICAL
456.800000	28.50	-15.4	46.0	17.5	QP	100.0	161.00	VERTICAL
480.080000	35.70	-14.9	46.0	10.3	QP	100.0	167.00	VERTICAL
837.040000	28.80	-9.5	46.0	17.2	QP	100.0	271.00	VERTICAL
930.160000	28.70	-9.0	46.0	17.3	QP	100.0	51.00	VERTICAL

ABOVE 1G

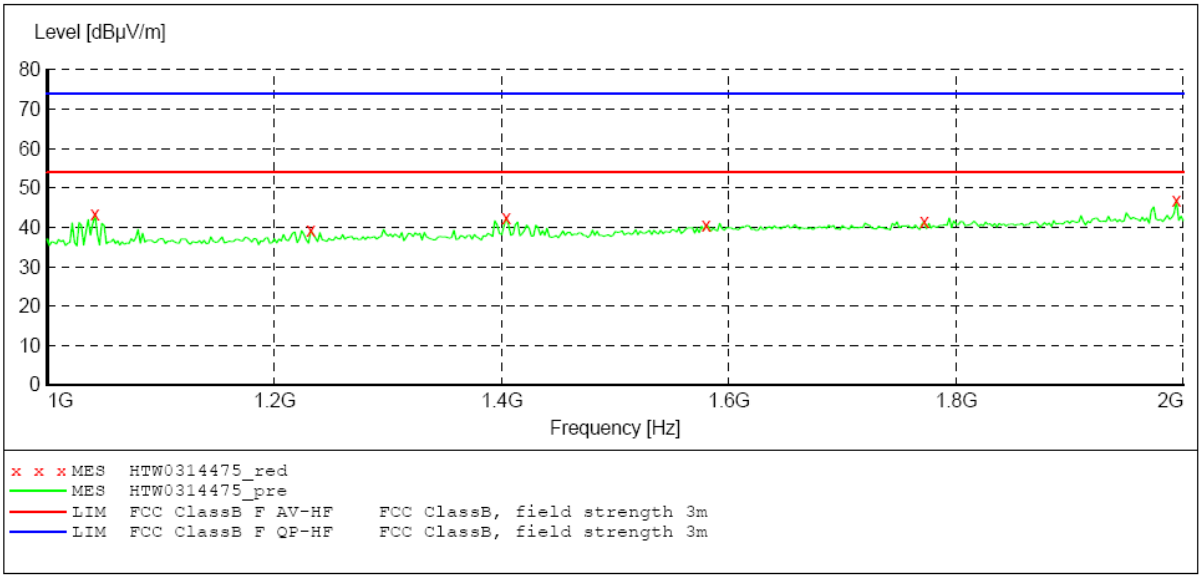
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION TEST FCC PART15

```
EUT:                    SP 112
Manufacturer:           Ricoh
Operating Condition:    STANDBY
Test Site:              3M CHAMBER
Operator:               FENG
Test Specification:     AC 120V/60Hz
Comment:                stepping motor
Start of Test:          3/14/2013 / 5:31:25PM
```

SWEEP TABLE: "test (1G-18G) P"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	2.0 GHz	MaxPeak	Coupled	1 MHz	HF906 2011



MEASUREMENT RESULT: "HTW0314475_red"

3/14/2013 5:32PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1042.000000	43.40	-0.3	54.0	10.6	PK	100.0	119.00	HORIZONTAL
1232.000000	39.30	1.0	54.0	14.7	PK	100.0	223.00	HORIZONTAL
1404.000000	42.50	2.1	54.0	11.5	PK	100.0	200.00	HORIZONTAL
1580.000000	40.70	3.2	54.0	13.3	PK	100.0	134.00	HORIZONTAL
1772.000000	41.50	4.7	54.0	12.5	PK	100.0	74.00	HORIZONTAL
1994.000000	47.00	6.2	54.0	7.0	PK	100.0	336.00	HORIZONTAL

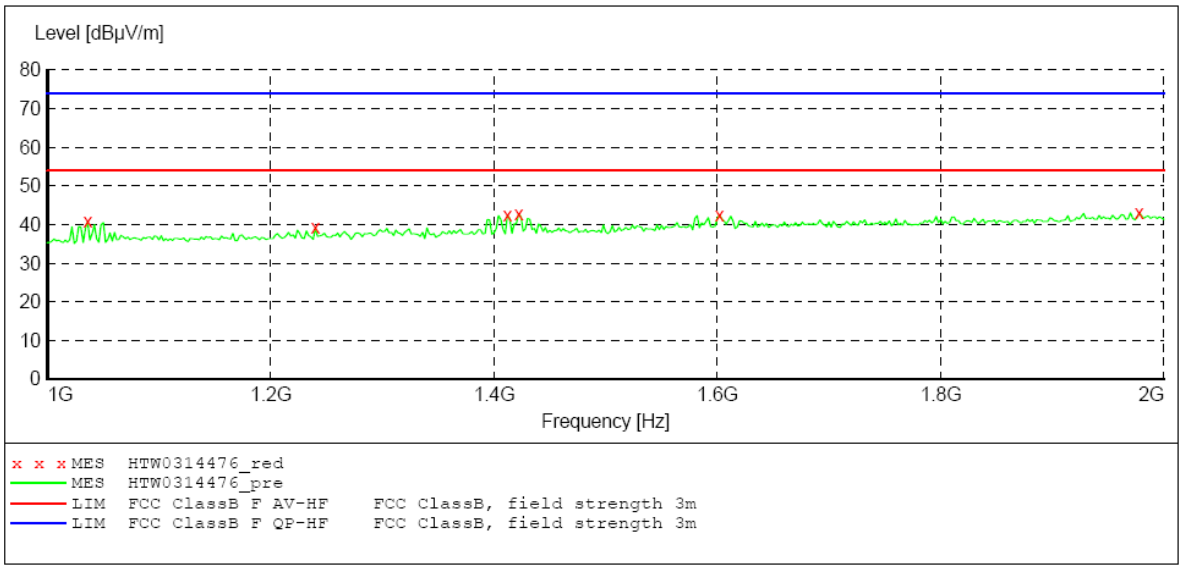
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION TEST FCC PART15

```
EUT:                  SP 112
Manufacturer:         Ricoh
Operating Condition:  STANDBY
Test Site:            3M CHAMBER
Operator:             FENG
Test Specification:   AC 120V/60Hz
Comment:              stepping motor
Start of Test:        3/14/2013 / 5:34:51PM
```

SWEEP TABLE: "test (1G-18G) P"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	2.0 GHz	MaxPeak	Coupled	1 MHz	HF906 2011



MEASUREMENT RESULT: "HTW0314476_red"

3/14/2013 5:36PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1036.000000	40.90	-0.4	54.0	13.1	PK	100.0	271.00	VERTICAL
1240.000000	39.20	1.1	54.0	14.8	PK	100.0	146.00	VERTICAL
1412.000000	42.40	2.1	54.0	11.6	PK	100.0	119.00	VERTICAL
1422.000000	42.80	2.2	54.0	11.2	PK	100.0	119.00	VERTICAL
1602.000000	42.60	3.4	54.0	11.4	PK	100.0	113.00	VERTICAL
1978.000000	43.20	6.1	54.0	10.8	PK	100.0	36.00	VERTICAL

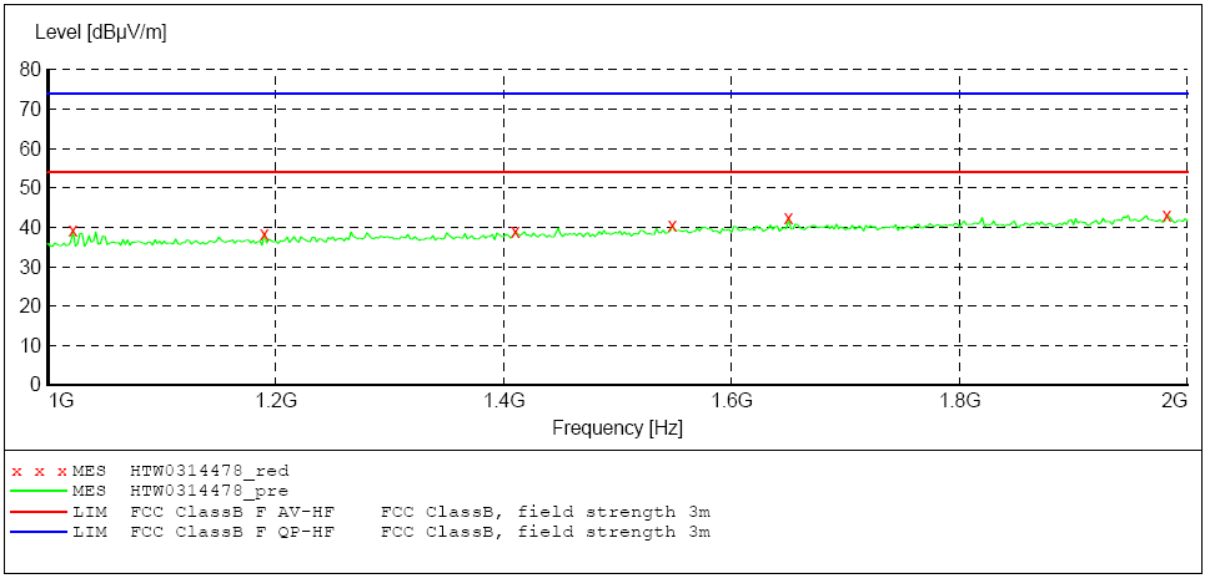
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION TEST FCC PART15

```
EUT:                  SP 112
Manufacturer:         Ricoh
Operating Condition:  PRINT
Test Site:            3M CHAMBER
Operator:             FENG
Test Specification:   AC 120V/60Hz
Comment:              stepping motor
Start of Test:        3/14/2013 / 5:41:30PM
```

SWEEP TABLE: "test (1G-18G) P"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	2.0 GHz	MaxPeak	Coupled	1 MHz	HF906 2011



MEASUREMENT RESULT: "HTW0314478_red"

3/14/2013 5:43PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1022.000000	39.20	-0.5	54.0	14.8	PK	100.0	209.00	HORIZONTAL
1190.000000	38.30	0.7	54.0	15.7	PK	100.0	54.00	HORIZONTAL
1410.000000	38.90	2.1	54.0	15.1	PK	100.0	86.00	HORIZONTAL
1548.000000	40.60	3.0	54.0	13.4	PK	100.0	176.00	HORIZONTAL
1650.000000	42.40	3.8	54.0	11.6	PK	100.0	48.00	HORIZONTAL
1982.000000	43.10	6.1	54.0	10.9	PK	100.0	144.00	HORIZONTAL

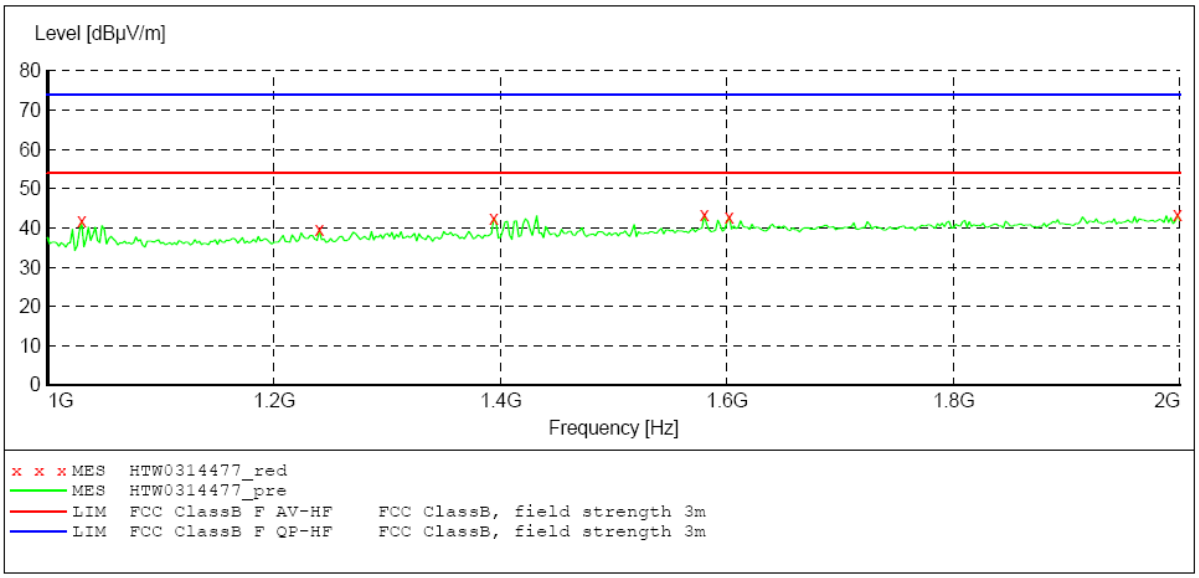
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION TEST FCC PART15

```
EUT:                  SP 112
Manufacturer:         Ricoh
Operating Condition:  PRINT
Test Site:            3M CHAMBER
Operator:             FENG
Test Specification:   AC 120V/60Hz
Comment:              stepping motor
Start of Test:        3/14/2013 / 5:39:48PM
```

SWEEP TABLE: "test (1G-18G) P"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	2.0 GHz	MaxPeak	Coupled	1 MHz	HF906 2011



MEASUREMENT RESULT: "HTW0314477_red"

3/14/2013 5:41PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1030.000000	41.70	-0.4	54.0	12.3	PK	100.0	266.00	VERTICAL
1240.000000	39.50	1.1	54.0	14.5	PK	100.0	117.00	VERTICAL
1394.000000	42.60	2.0	54.0	11.4	PK	100.0	138.00	VERTICAL
1580.000000	43.30	3.2	54.0	10.7	PK	100.0	143.00	VERTICAL
1602.000000	42.90	3.4	54.0	11.1	PK	100.0	150.00	VERTICAL
1998.000000	43.50	6.2	54.0	10.5	PK	100.0	39.00	VERTICAL

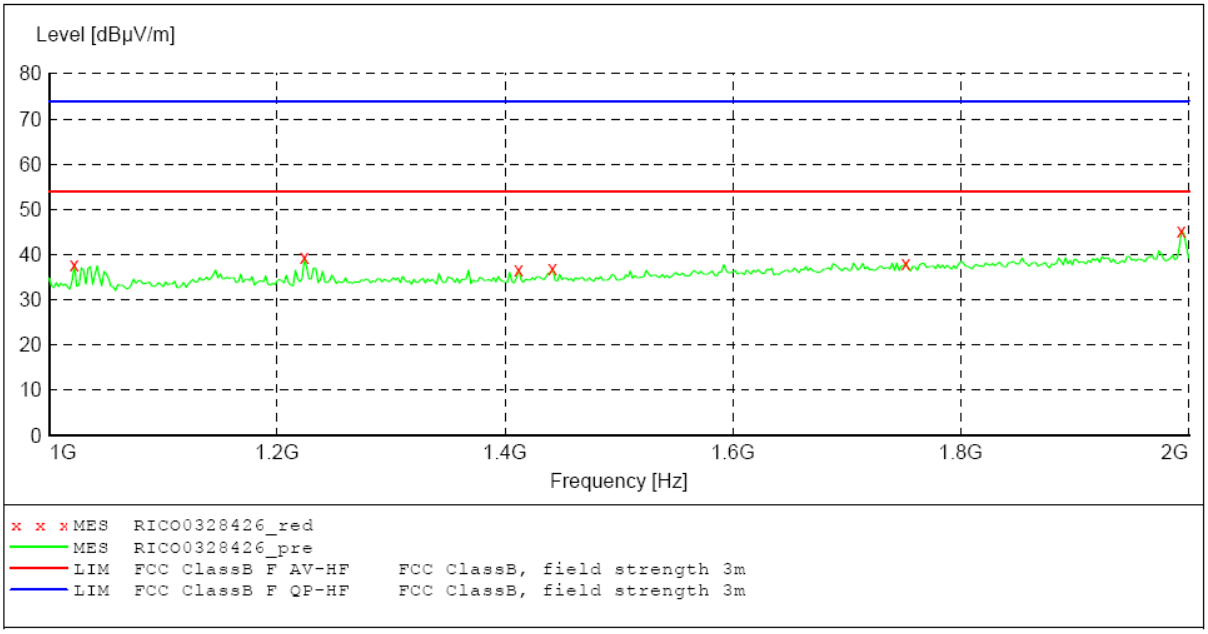
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION TEST FCC Part15

```
EUT:                 SP 112
Manufacturer:        RICOH
Operating Condition: PRINT
Test Site:           3M CHAMBER
Operator:            JONY
Test Specification:  AC 120V/60Hz
Comment:             DC Motor
Start of Test:       3/28/2013 / 11:48:10AM
```

SWEEP TABLE: "test (1G-18G) P"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	2.0 GHz	MaxPeak	Coupled	1 MHz	HF906 2011



MEASUREMENT RESULT: "RICO0328426_red"

3/28/2013 11:49AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1022.000000	37.90	-3.9	54.0	16.1	PK	100.0	136.00	HORIZONTAL
1224.000000	39.30	-2.7	54.0	14.7	PK	100.0	216.00	HORIZONTAL
1412.000000	36.80	-1.7	54.0	17.2	PK	100.0	216.00	HORIZONTAL
1442.000000	37.00	-1.6	54.0	17.0	PK	100.0	222.00	HORIZONTAL
1752.000000	38.20	0.9	54.0	15.8	PK	100.0	142.00	HORIZONTAL
1994.000000	45.30	2.8	54.0	8.7	PK	100.0	359.00	HORIZONTAL

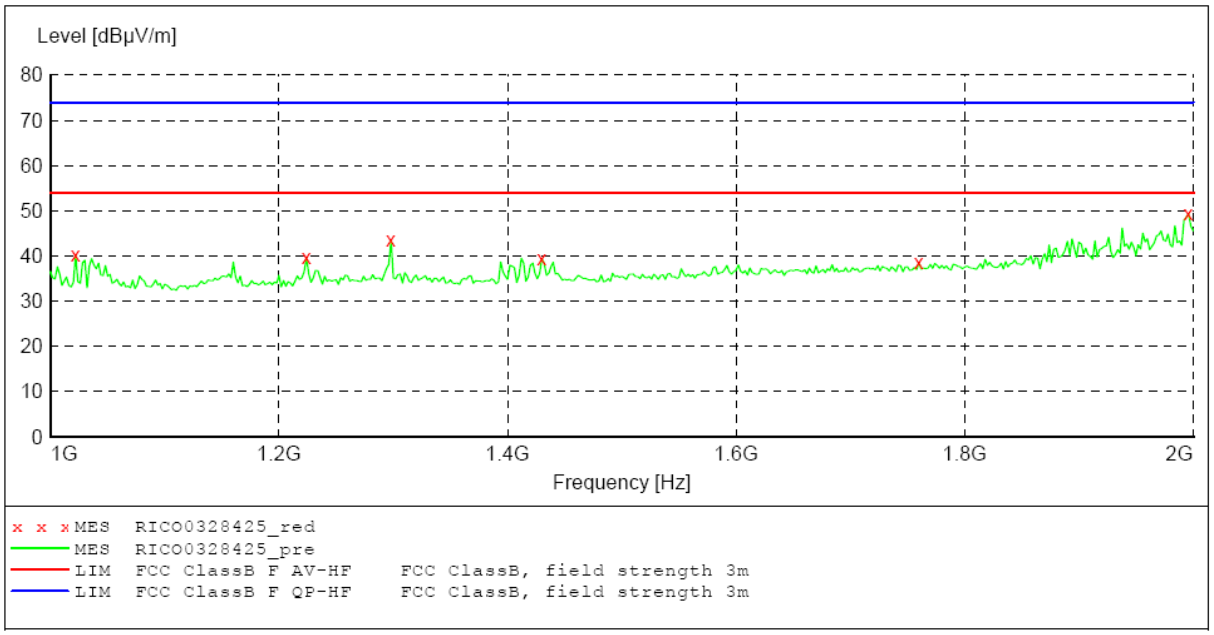
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION TEST FCC Part15

EUT: SP 112
Manufacturer: RICOH
Operating Condition: PRINT
Test Site: 3M CHAMBER
Operator: JONY
Test Specification: AC 120V/60Hz
Comment: DC Motor
Start of Test: 3/28/2013 / 11:44:36AM

SWEEP TABLE: "test (1G-18G) P"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	2.0 GHz	MaxPeak	Coupled	1 MHz	HF906 2011



MEASUREMENT RESULT: "RICO0328425_red"

3/28/2013 11:47AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1022.000000	40.20	-3.9	54.0	13.8	PK	100.0	75.00	VERTICAL
1224.000000	39.70	-2.7	54.0	14.3	PK	100.0	81.00	VERTICAL
1298.000000	43.50	-2.3	54.0	10.5	PK	100.0	0.00	VERTICAL
1430.000000	39.40	-1.6	54.0	14.6	PK	100.0	183.00	VERTICAL
1760.000000	38.50	1.0	54.0	15.5	PK	100.0	27.00	VERTICAL
1996.000000	49.30	2.8	54.0	4.7	PK	100.0	357.00	VERTICAL

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 Mains Ports (Class B)

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66~56	56~46
0.500～5.000	56	46
5.000~30.000	60	50

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 set to work that shall be carried out respectively Standby, Print modes on different motor, Stepping motor and DC motor during the test and the results of the maximum emanation are recorded.

4.2.3.2. Test Procedure

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

4.2.3.3. Photos of the test set-up

4.2.4. Test result

The requirements are **Fulfilled**

Band Width: 9 KHz

Frequency Range: 150 KHz to 30MHz

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

Margin=limit-level

Level=read valus+transducer

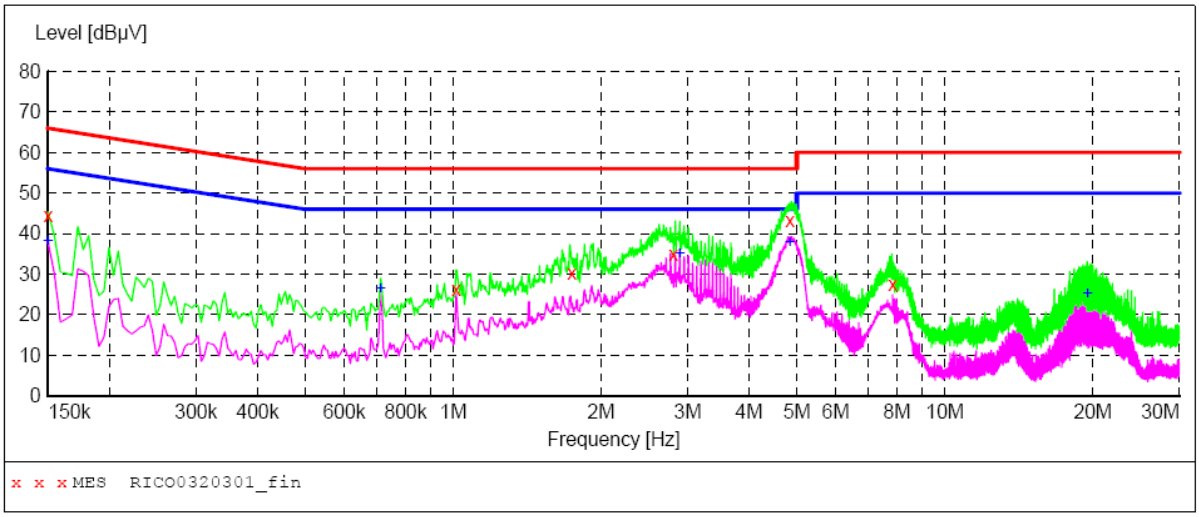
Transducer=insertion loss of LISN+cable loss+insertion loss of pulse limiter

Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC PART 15

EUT: SP 112
Manufacturer: RICOH
Operating Condition: STANDBY
Test Site: 3# SHIELDED ROOM
Operator: WANG
Test Specification: AC 120V/60Hz
Comment: Stepping motor
Start of Test: 3/20/2013 / 2:04:46PM

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO0320301_fin"

3/20/2013 2:06PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	44.40	10.2	66	21.6	QP	N	GND
1.014000	26.10	10.2	56	29.9	QP	N	GND
1.743000	30.20	10.2	56	25.8	QP	N	GND
2.800500	34.90	10.2	56	21.1	QP	N	GND
4.839000	43.10	10.2	56	12.9	QP	N	GND
7.827000	27.60	10.3	60	32.4	QP	N	GND

MEASUREMENT RESULT: "RICO0320301_fin2"

3/20/2013 2:06PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	38.10	10.2	56	17.9	AV	N	GND
0.712500	26.50	10.1	46	19.5	AV	N	GND
2.890500	35.10	10.2	46	10.9	AV	N	GND
4.843500	37.90	10.2	46	8.1	AV	N	GND
19.509000	25.40	10.4	50	24.6	AV	N	GND

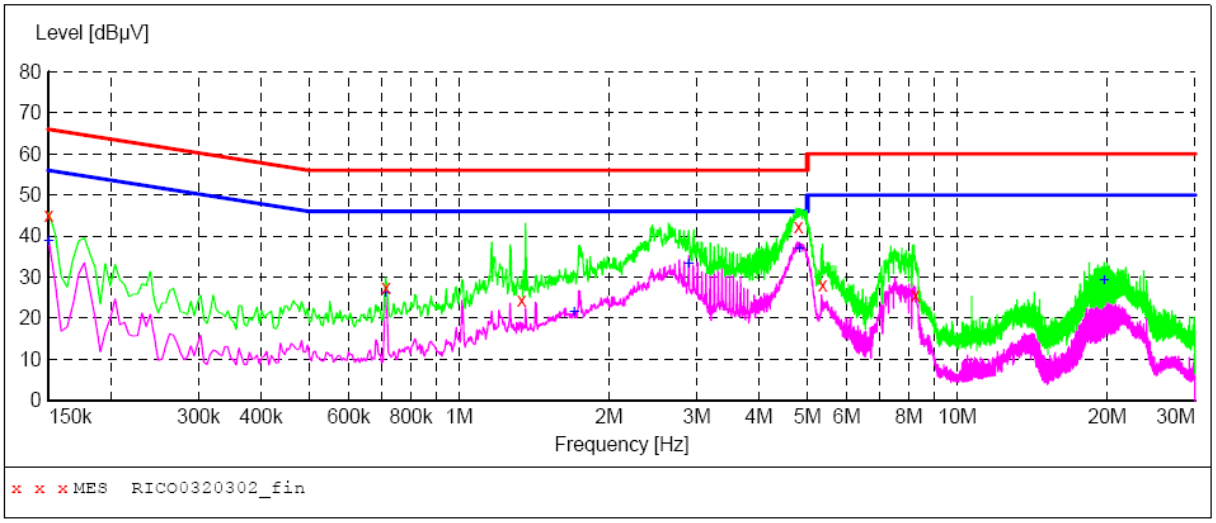
Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC PART 15

```
EUT:                    SP 112
Manufacturer:           RICOH
Operating Condition:    STANDBY
Test Site:              3# SHIELDED ROOM
Operator:               WANG
Test Specification:     AC 120V/60Hz
Comment:                Stepping motor
Start of Test:          3/20/2013 / 2:06:55PM
```

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO0320302_fin"

3/20/2013 2:09PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	44.90	10.2	66	21.1	QP	L1	GND
0.712500	27.30	10.1	56	28.7	QP	L1	GND
1.333500	24.30	10.2	56	31.7	QP	L1	GND
4.789500	42.20	10.2	56	13.8	QP	L1	GND
5.352000	28.10	10.2	60	31.9	QP	L1	GND
8.218500	25.50	10.3	60	34.5	QP	L1	GND

MEASUREMENT RESULT: "RICO0320302_fin2"

3/20/2013 2:09PM

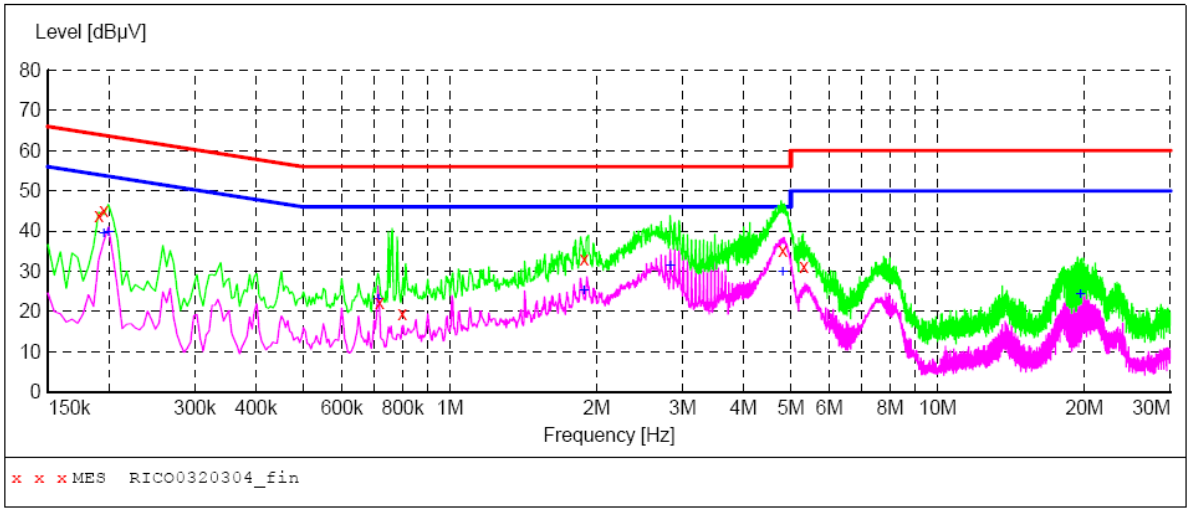
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	39.00	10.2	56	17.0	AV	L1	GND
0.712500	26.10	10.1	46	19.9	AV	L1	GND
1.702500	21.50	10.2	46	24.5	AV	L1	GND
2.890500	33.40	10.2	46	12.6	AV	L1	GND
4.821000	37.10	10.2	46	8.9	AV	L1	GND
19.707000	29.30	10.4	50	20.7	AV	L1	GND

Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC PART 15

EUT: SP 112
Manufacturer: RICOH
Operating Condition: Print
Test Site: 3# SHIELDED ROOM
Operator: WANG
Test Specification: AC 120V/60Hz
Comment: Stepping motor
Start of Test: 3/20/2013 / 2:15:22PM

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO0320304_fin"

3/20/2013 2:18PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.190500	43.80	10.2	64	20.2	QP	N	GND
0.195000	45.10	10.2	64	18.7	QP	N	GND
0.717000	22.20	10.1	56	33.8	QP	N	GND
0.798000	19.30	10.1	56	36.7	QP	N	GND
1.882500	32.90	10.2	56	23.1	QP	N	GND
4.807500	35.00	10.2	56	21.0	QP	N	GND
5.316000	31.20	10.2	60	28.8	QP	N	GND

MEASUREMENT RESULT: "RICO0320304_fin2"

3/20/2013 2:18PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	39.40	10.2	54	14.4	AV	N	GND
0.199500	39.80	10.2	54	13.8	AV	N	GND
0.712500	23.20	10.1	46	22.8	AV	N	GND
1.882500	25.40	10.2	46	20.6	AV	N	GND
2.832000	31.40	10.2	46	14.6	AV	N	GND
4.807500	29.90	10.2	46	16.1	AV	N	GND
19.630500	24.40	10.4	50	25.6	AV	N	GND

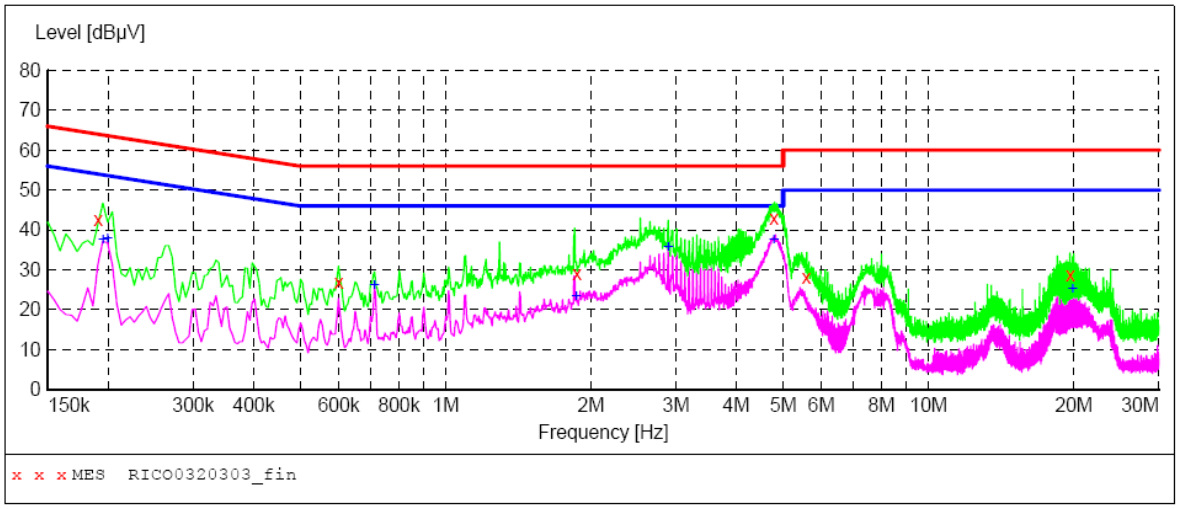
Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC PART 15

```
EUT:                  SP 112
Manufacturer:         RICOH
Operating Condition:  Print
Test Site:            3# SHIELDED ROOM
Operator:             WANG
Test Specification:   AC 120V/60Hz
Comment:              Stepping motor
Start of Test:        3/20/2013 / 2:11:22PM
```

SCAN TABLE: "Voltage (9K-30M)FIN"

```
  Short Description:          150K-30M Voltage
```



MEASUREMENT RESULT: "RICO0320303_fin"

3/20/2013 2:14PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.190500	42.60	10.2	64	21.4	QP	L1	GND
0.600000	26.80	10.2	56	29.2	QP	L1	GND
1.869000	29.10	10.2	56	26.9	QP	L1	GND
4.780500	42.70	10.2	56	13.3	QP	L1	GND
5.577000	28.10	10.2	60	31.9	QP	L1	GND
19.630500	28.80	10.4	60	31.2	QP	L1	GND

MEASUREMENT RESULT: "RICO0320303_fin2"

3/20/2013 2:14PM

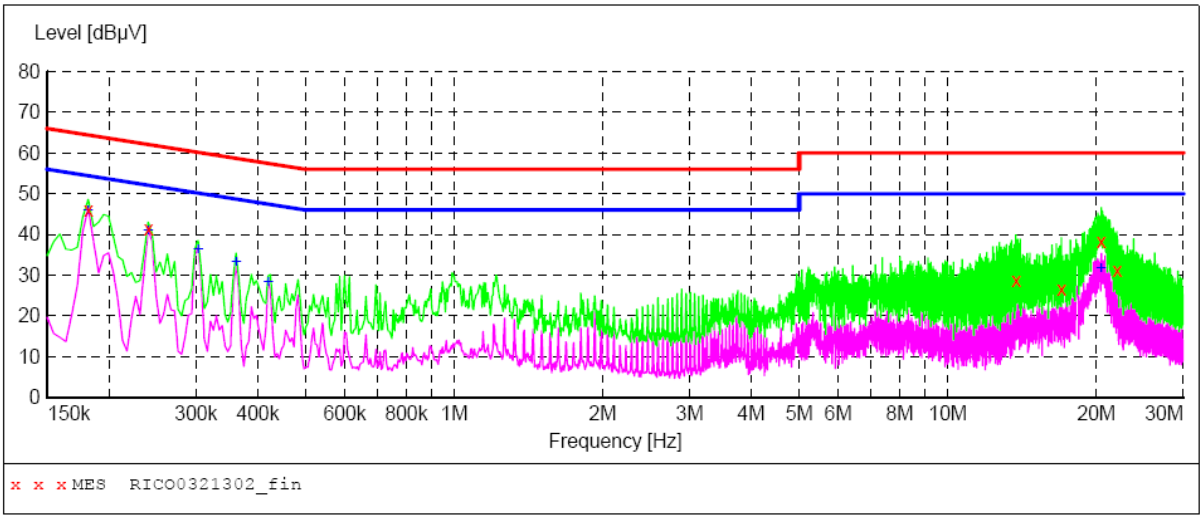
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	37.60	10.2	54	16.2	AV	L1	GND
0.199500	37.80	10.2	54	15.8	AV	L1	GND
0.712500	26.10	10.1	46	19.9	AV	L1	GND
1.864500	23.50	10.2	46	22.5	AV	L1	GND
2.890500	35.90	10.2	46	10.1	AV	L1	GND
4.780500	37.50	10.2	46	8.5	AV	L1	GND
19.869000	25.20	10.4	50	24.8	AV	L1	GND

Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC PART 15

EUT: SP 112
Manufacturer: RICOH
Operating Condition: Print
Test Site: 3# SHIELDED ROOM
Operator: WANG
Test Specification: AC 120V/60Hz
Comment: DC motor
Start of Test: 3/21/2013 / 10:15:32AM

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO0321302_fin"

3/21/2013 10:17AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.181500	45.90	10.2	64	18.5	QP	N	GND
0.240000	41.40	10.2	62	20.7	QP	N	GND
13.753500	28.60	10.3	60	31.4	QP	N	GND
16.980000	26.60	10.4	60	33.4	QP	N	GND
20.458500	38.20	10.4	60	21.8	QP	N	GND
22.038000	31.20	10.5	60	28.8	QP	N	GND

MEASUREMENT RESULT: "RICO0321302_fin2"

3/21/2013 10:17AM

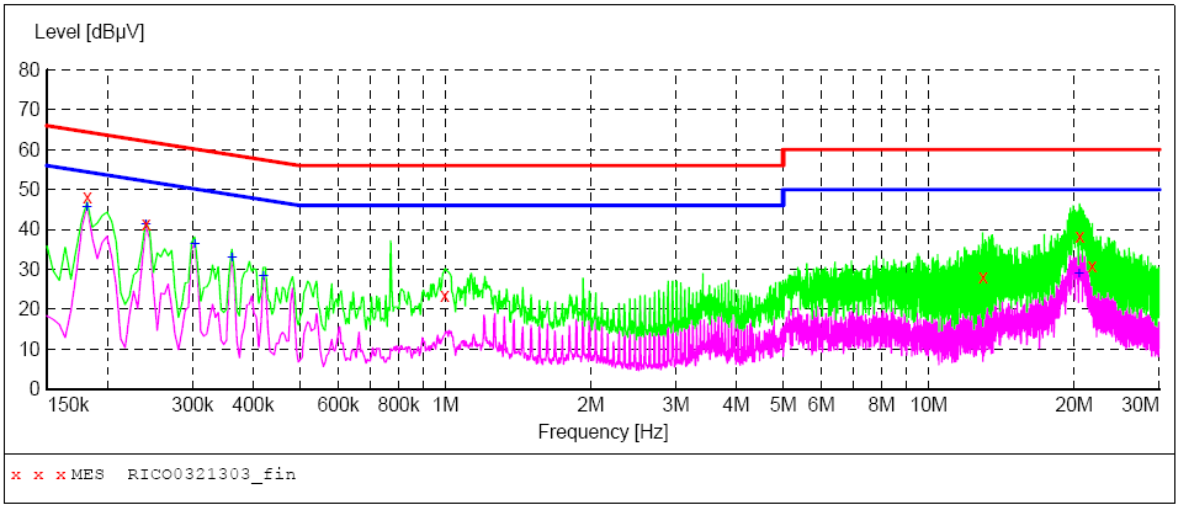
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.181500	45.90	10.2	54	8.5	AV	N	GND
0.240000	41.20	10.2	52	10.9	AV	N	GND
0.303000	36.50	10.3	50	13.7	AV	N	GND
0.361500	33.20	10.3	49	15.5	AV	N	GND
0.420000	28.50	10.4	47	18.9	AV	N	GND
20.463000	31.70	10.4	50	18.3	AV	N	GND

Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC PART 15

EUT: SP 112
Manufacturer: RICOH
Operating Condition: Print
Test Site: 3# SHIELDED ROOM
Operator: WANG
Test Specification: AC 120V/60Hz
Comment: DC motor
Start of Test: 3/21/2013 / 10:18:19AM

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO0321303_fin"

3/21/2013 10:22AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.181500	48.00	10.2	64	16.0	QP	L1	GND
0.240000	41.30	10.2	62	20.8	QP	L1	GND
0.996000	23.50	10.2	56	32.5	QP	L1	GND
12.957000	28.10	10.3	60	31.9	QP	L1	GND
20.526000	38.10	10.4	60	21.9	QP	L1	GND
21.781500	31.00	10.5	60	29.0	QP	L1	GND

MEASUREMENT RESULT: "RICO0321303_fin2"

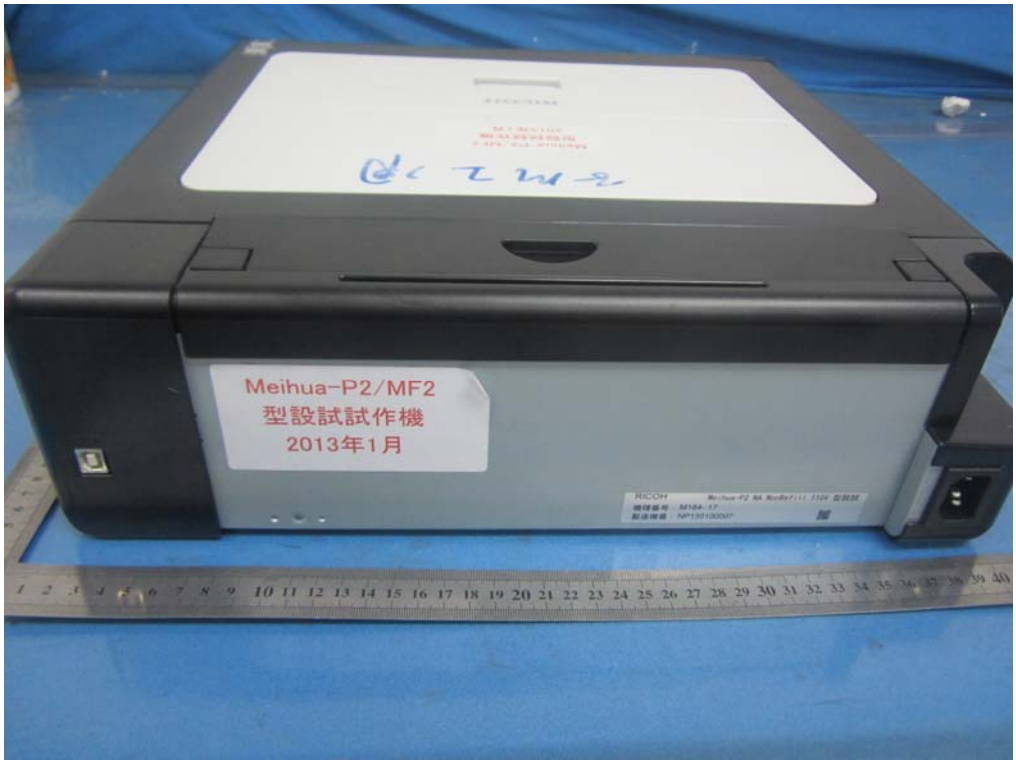
3/21/2013 10:21AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.181500	45.80	10.2	54	8.6	AV	L1	GND
0.240000	41.50	10.2	52	10.6	AV	L1	GND
0.303000	36.30	10.3	50	13.9	AV	L1	GND
0.361500	33.00	10.3	49	15.7	AV	L1	GND
0.420000	28.30	10.4	47	19.1	AV	L1	GND
20.499000	29.10	10.4	50	20.9	AV	L1	GND

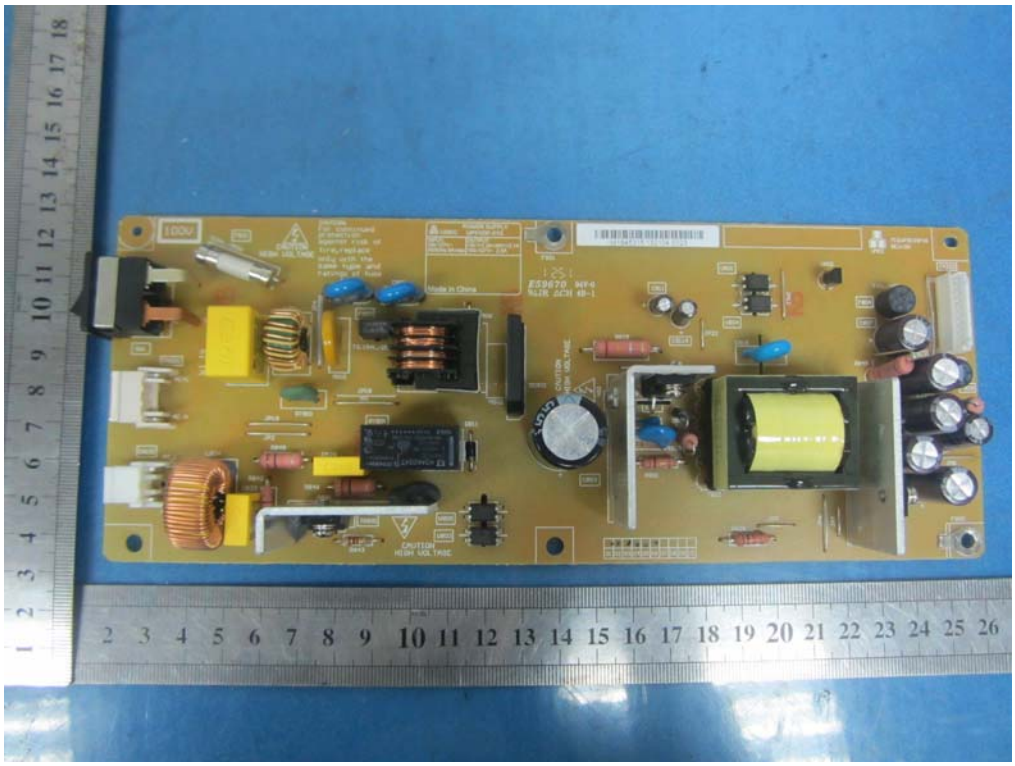
5. External and Internal Photos of the EUT

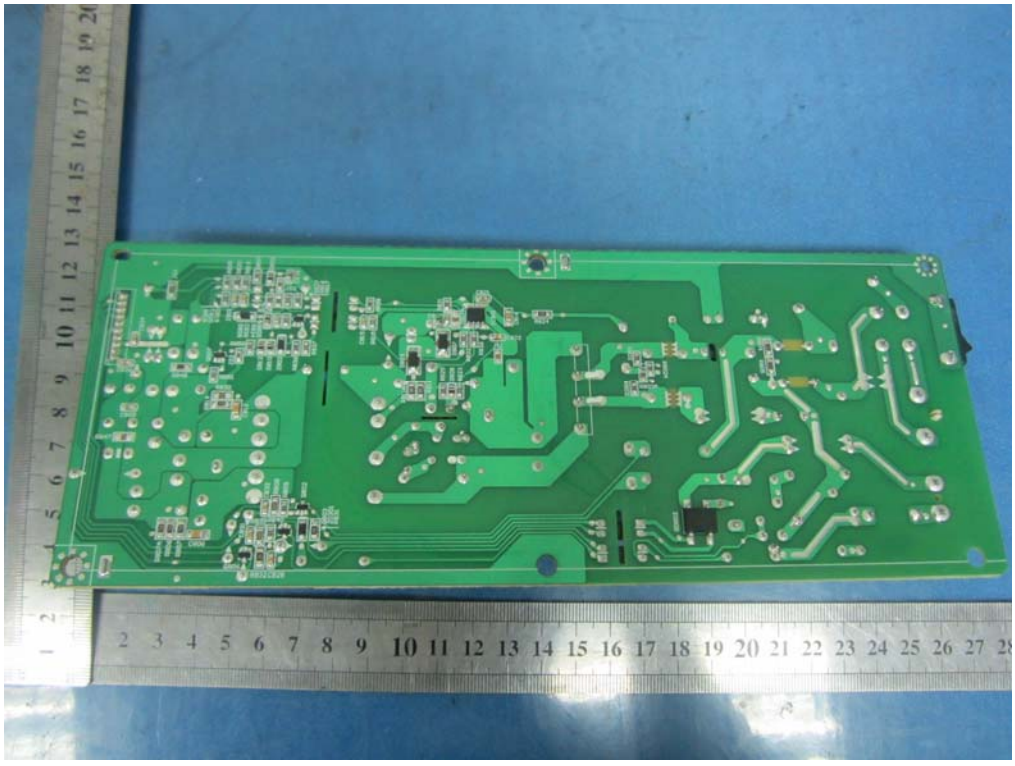
5.1. External photos of the EUT

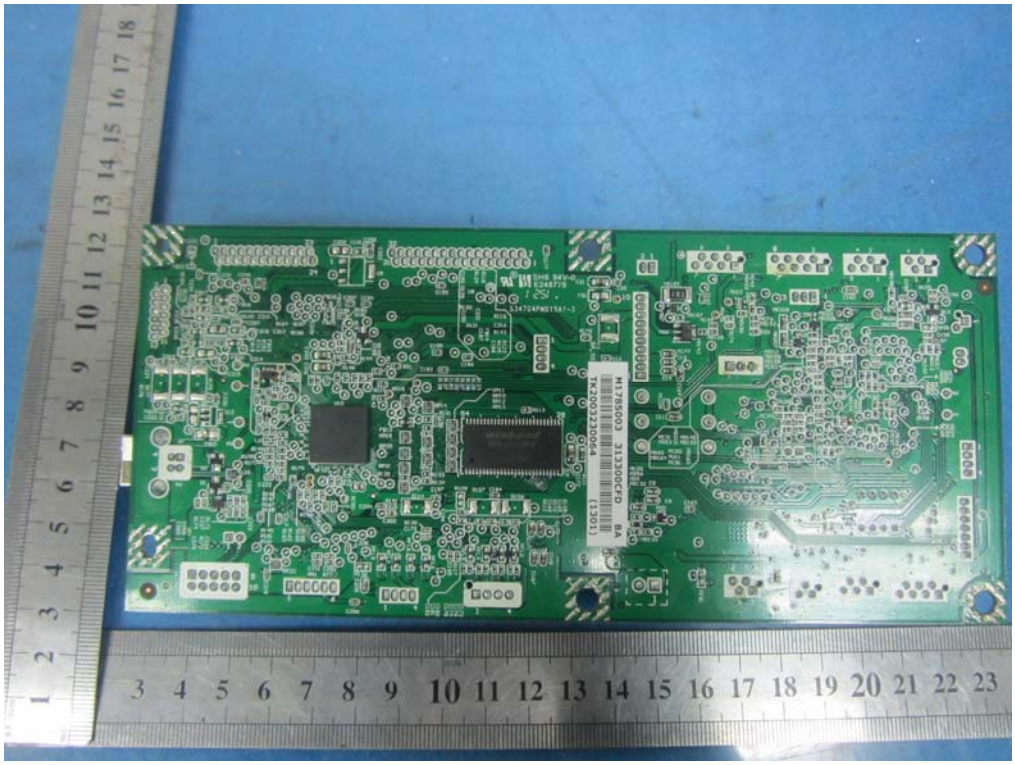

RICOH

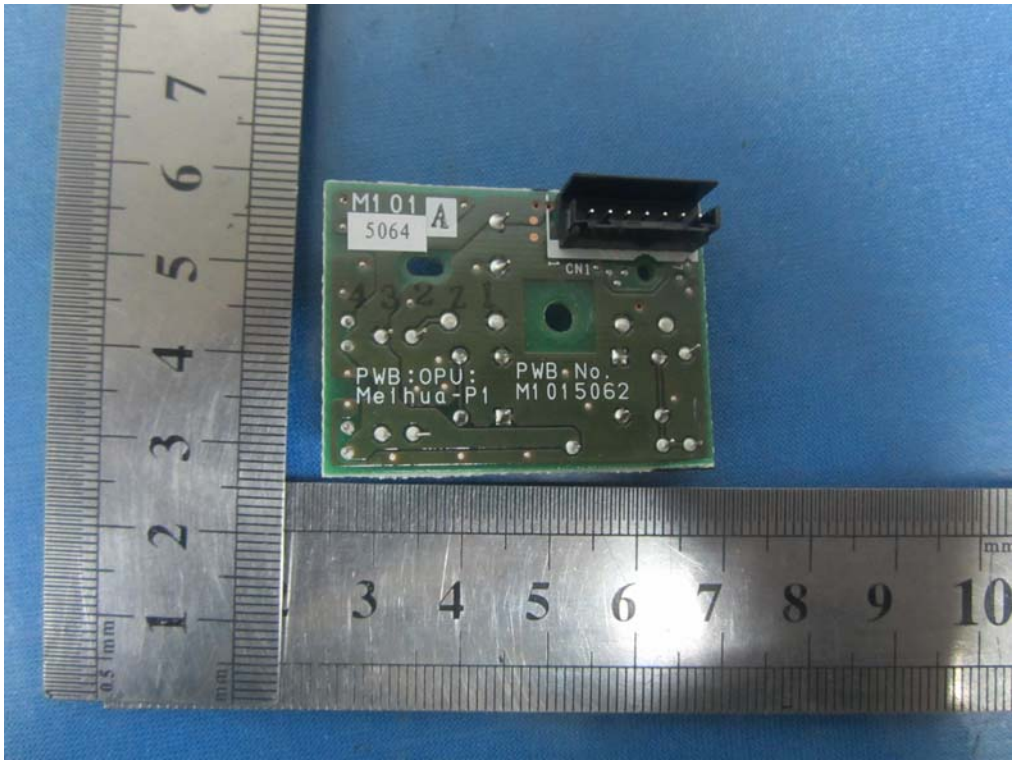

Meihua-P2/MF2
型設試試作機
2013年1月

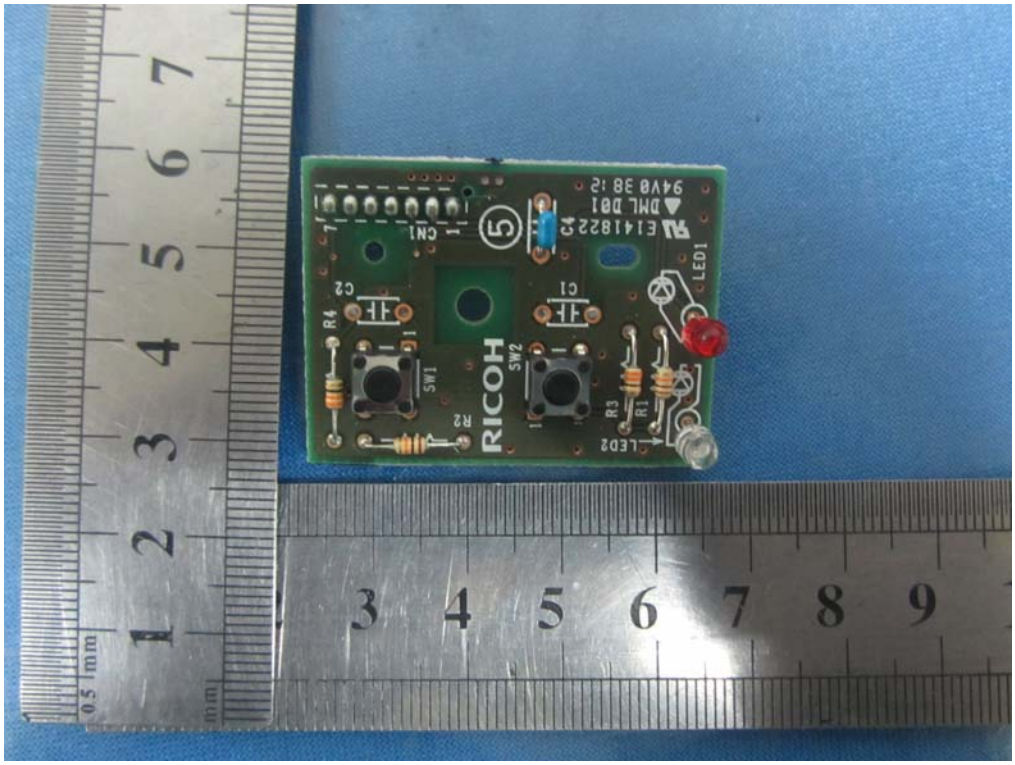
5.2. Internal photos of the EUT

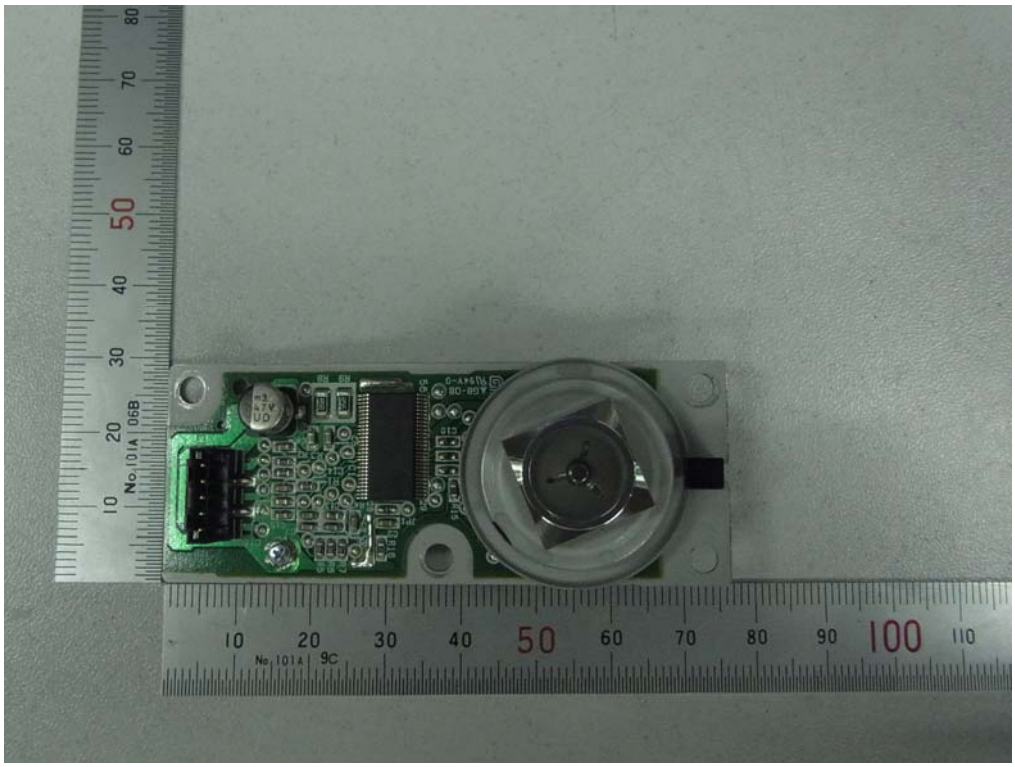




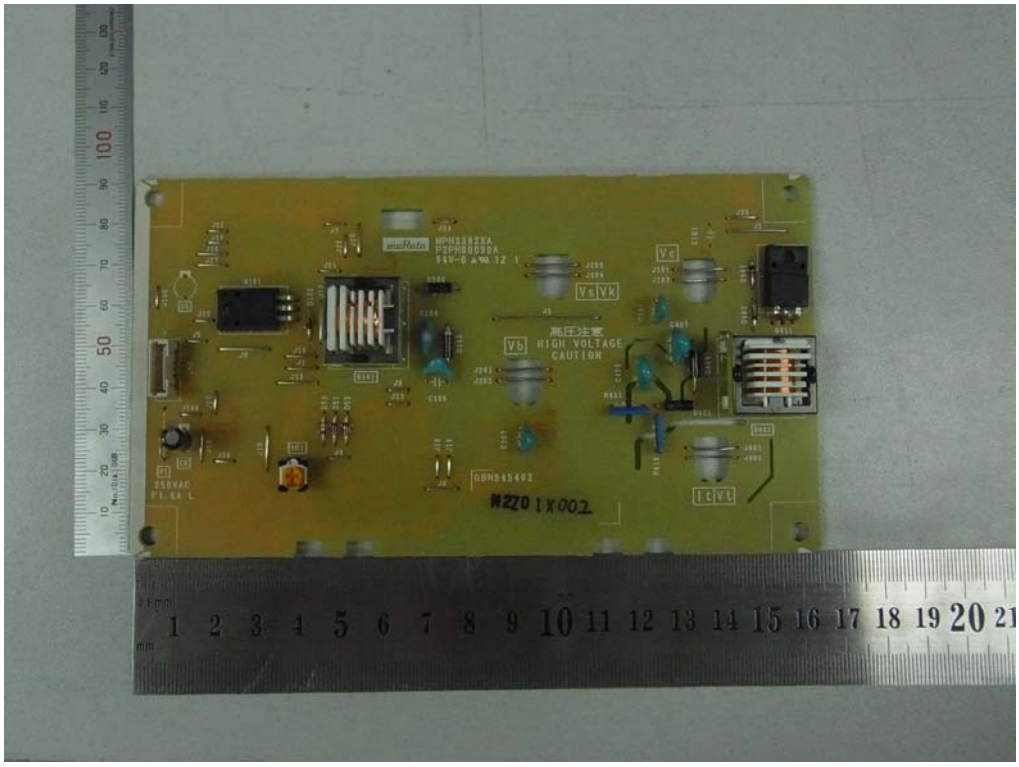


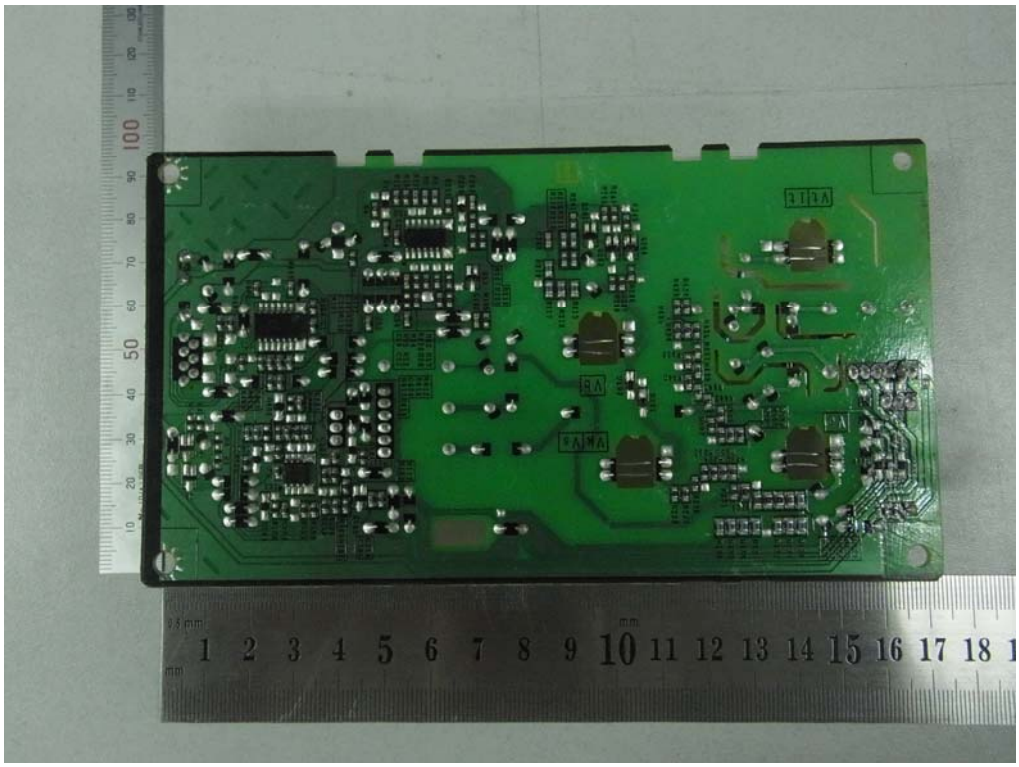

M1 01 A
5064
CN1
PWB:OPU:
Melhua-P1
PWB No.
M1015062

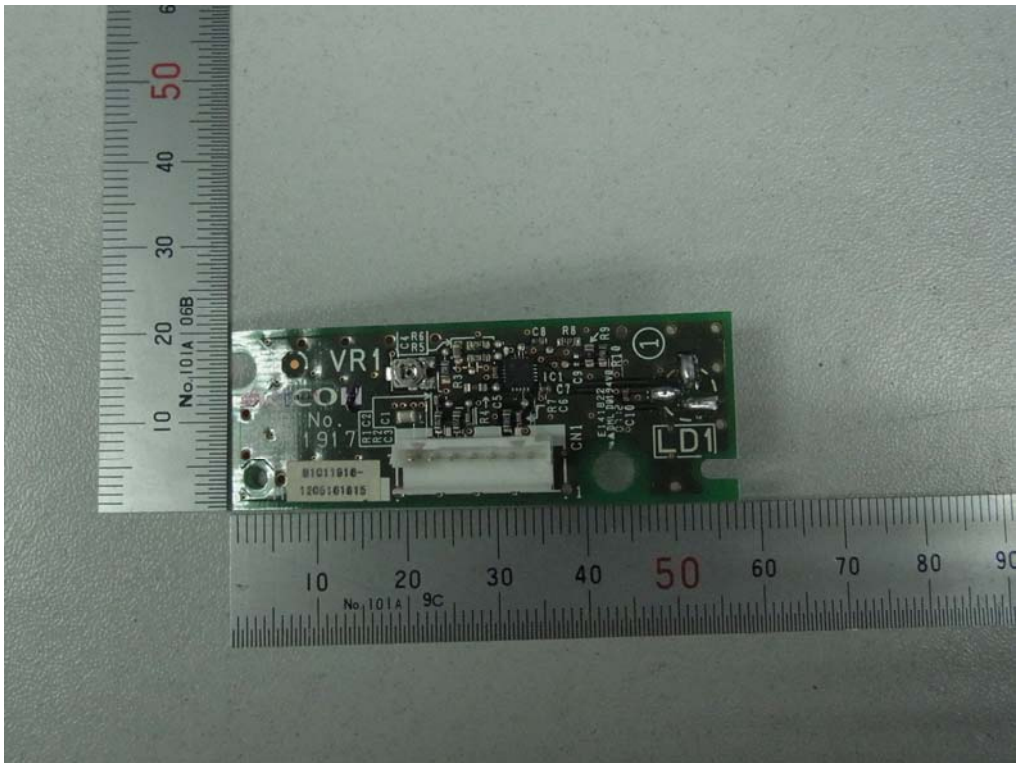

CN1
C2
C1
LED1
R4
SW1
SW2
RICOH
R2
R3
R1
LED2

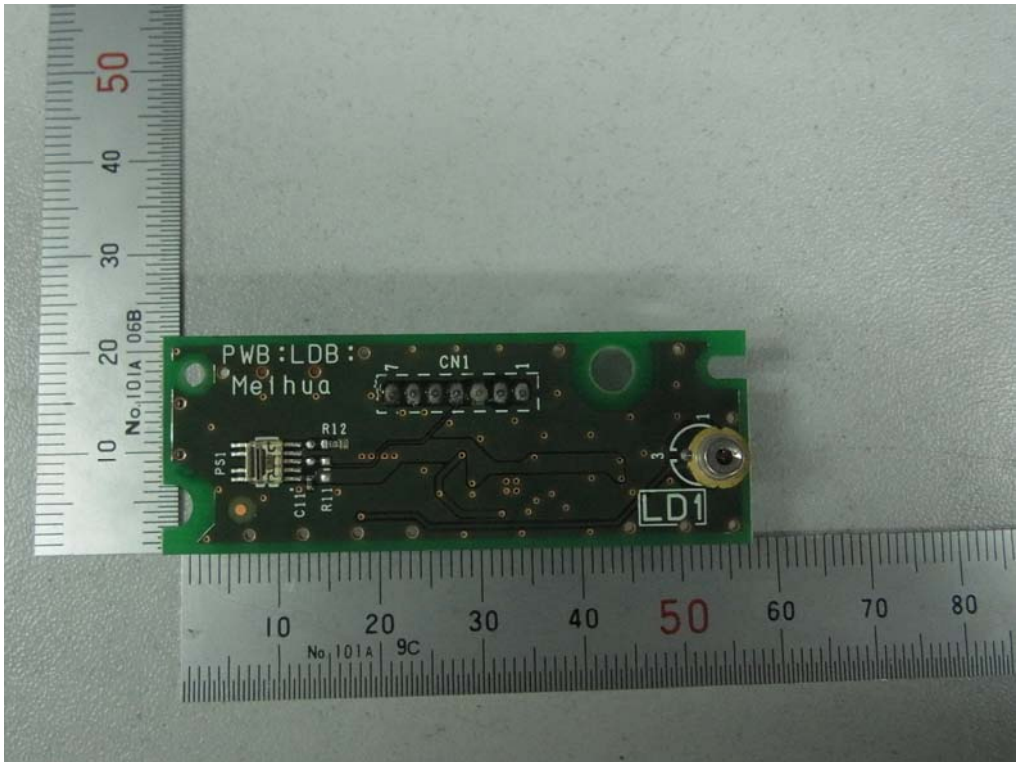


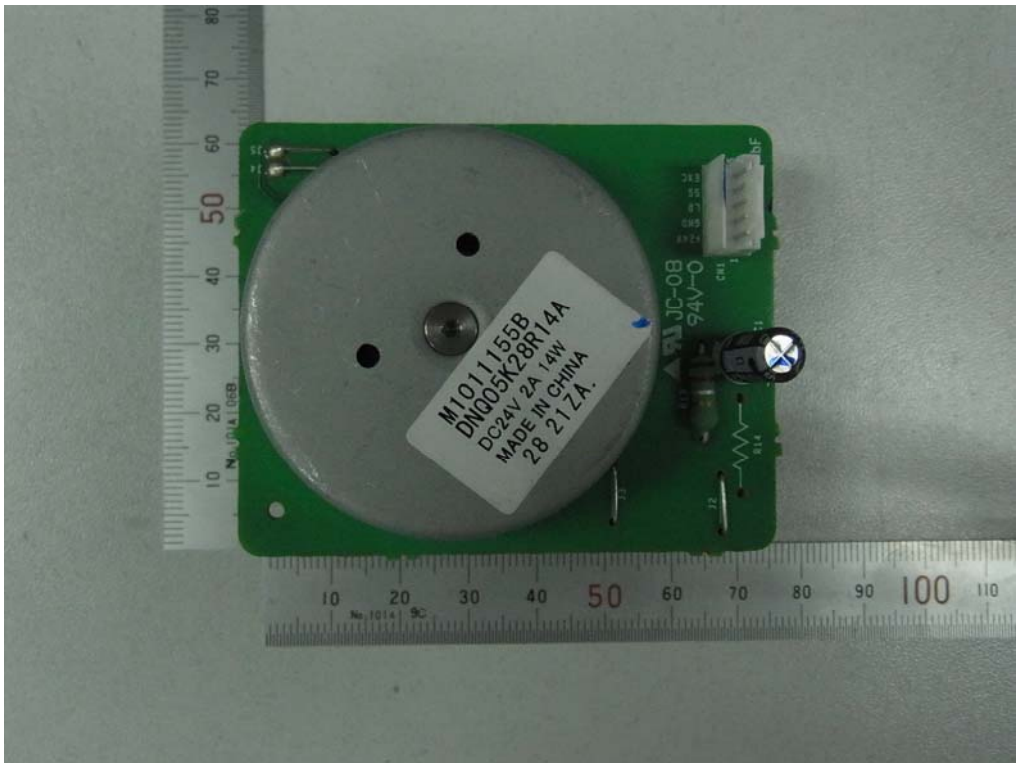

M1011954 DC24V
MA504EF1RR 30118min-1
NMB-MAT 29222A Ro.

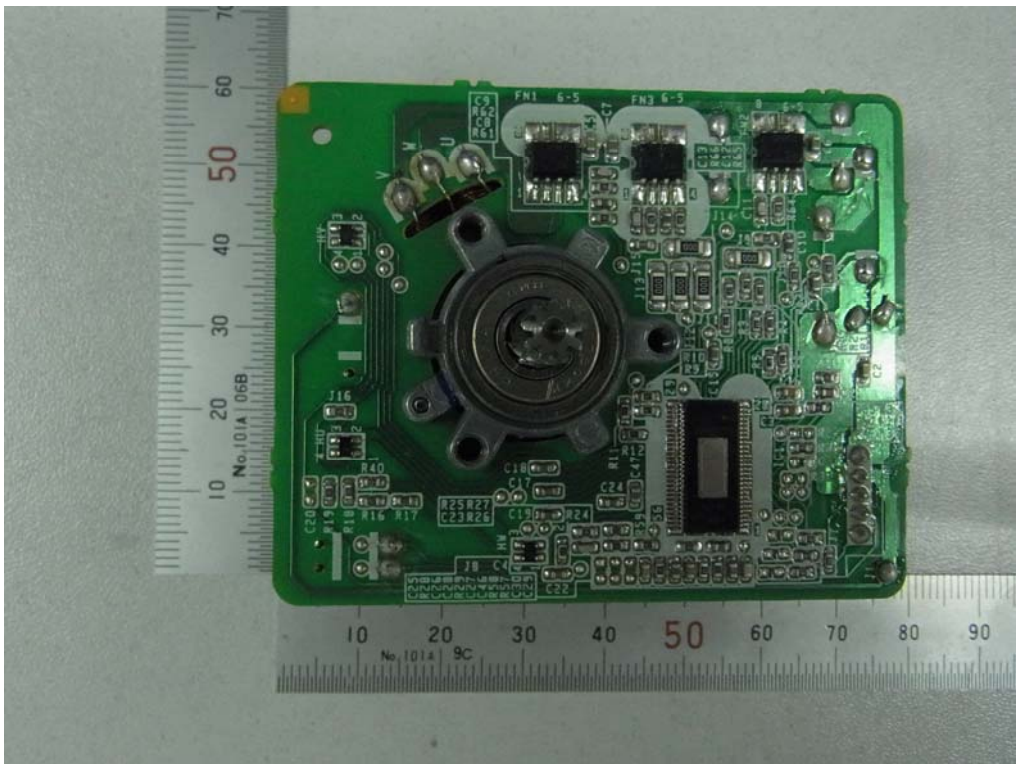

HIGH VOLTAGE
CAUTION

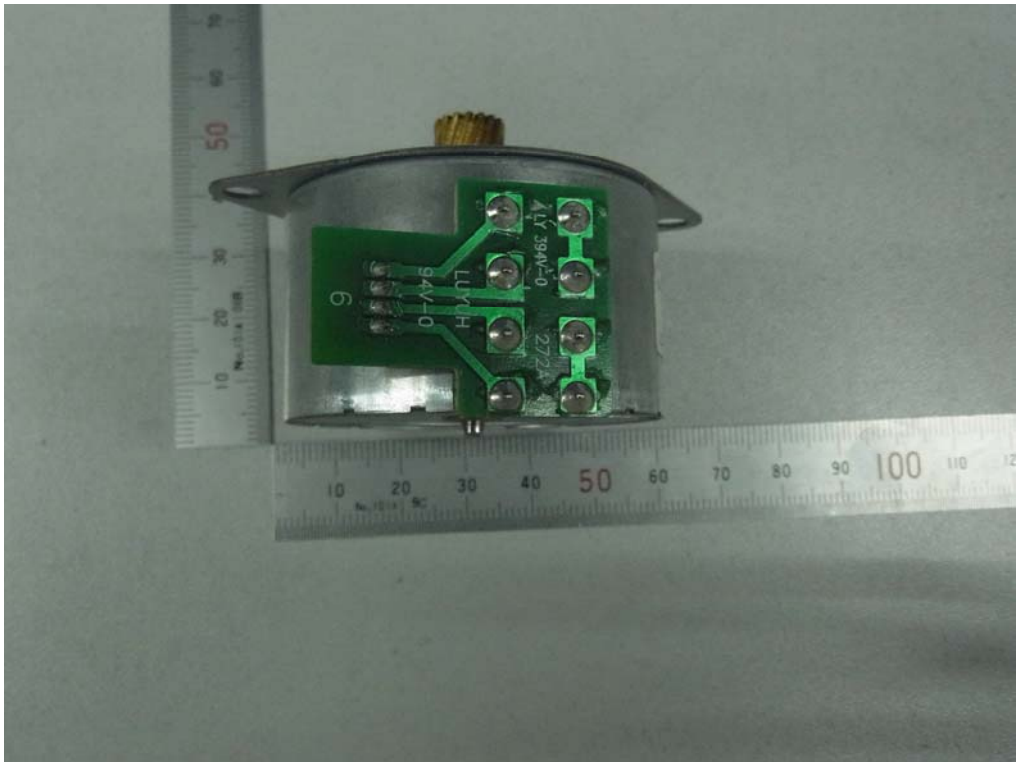


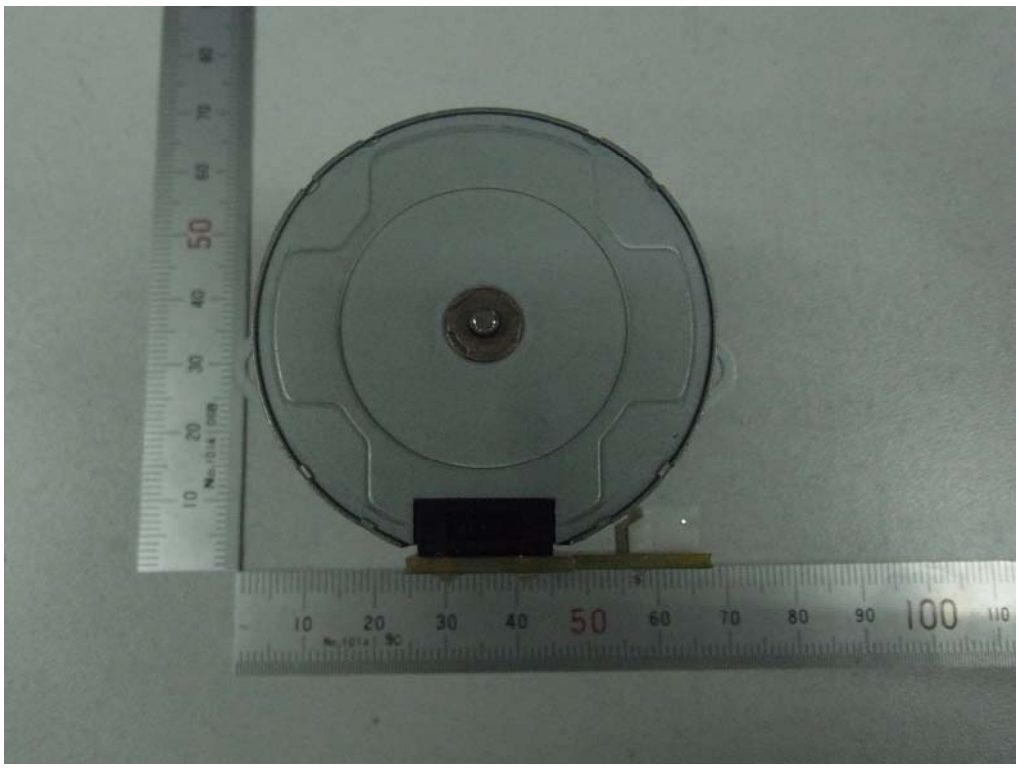

VR1
LD1
CN1


PWB:LDB:
Meihua
CN1
R12
LD1


M1011155B
DNQ05K28R14A
DC24V 2A 14W
MADE IN CHINA
28 21ZA.
JC-08
94V-0







.....End of Report.....