Shenzhen Huatongwei International Inspection Co., Ltd.
Keji S,12th , Road, Hi-tech Industrial Park, Shenzhen, Guangdong, China
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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.....:	**TRE11100072**
FCC ID.....:	**BBP-PRSP35101**
Compiled by (position+printed name+signature)..:	File administrators Eric Zhang
Supervised by (position+printed name+signature)..:	Test Engineer Tim Zhang
Approved by (position+printed name+signature)..:	Manager Wenliang Li
Date of issue.....:	Nov 15, 2011
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 Company Ltd.**
Address .....:	810, Shimoimaizum, Ebina-Shi, Kanagawa-ken, 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 .....:	/
Manufacturer .....:	Ricoh Components＆Products(Shenzhen)Ltd.
Model/Type reference.....:	Aficio SP 3500N, SP 3500N/Aficio SP 3500N, Aficio SP 3510DN, SP 3510DN/Aficio SP 3510DN
Ratings .....:	120V 60Hz 10A 850W
Result.....:	**Positive**

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

Test Report No. :	TRE11100072	Nov 15, 2011 Date of issue

Equipment under Test	:	Laser Printer
Model / Type	:	Aficio SP 3500N, SP 3500N/Aficio SP 3500N, Aficio SP 3510DN, SP 3510DN/Aficio SP 3510DN
Listed Model	:	/
Applicant	:	Ricoh Company Ltd.
Address	:	810, Shimoimaizum, Ebina-Shi, Kanagawa-ken, 243-0460 Japan
Manufacturer	:	Ricoh Components＆Products(Shenzhen)Ltd.
Address	:	RICOH industry group,Hao Ye Road,Heping Community,Fuyong Town,Baoan Distrist,Shenzhen,Guangdong,China

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

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 : Oct 17, 2011

Testing commenced on : Oct 17, 2011

Testing concluded on : Nov 15, 2011

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. 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.

2.4. EUT configuration

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

● - supplied by the manufacturer

○ - supplied by the lab

Test Configuration

1) Equipment under test

Kind of equipment	Manufacturer	Model name	Serial number	Remarks
(1)Print Machine	RICOH	Aficio SP 3510DN	JM117170011	
(2)BANK	RICOH	TK1080	S5918700174	

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

Kind of equipment	Mode name	Operates Frequency	Remark
Print Machine	Aficio SP 3510DN	295MHz	CPU

3) Supporting equipment

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

4) Cables Used

	Cable Name	Length	Shielded	Maker
1	USB Cable	2m	YES	RICOH
2	NIC Cable	3m	No	Black Box
3	Power Cable	1.8m	No	Volex

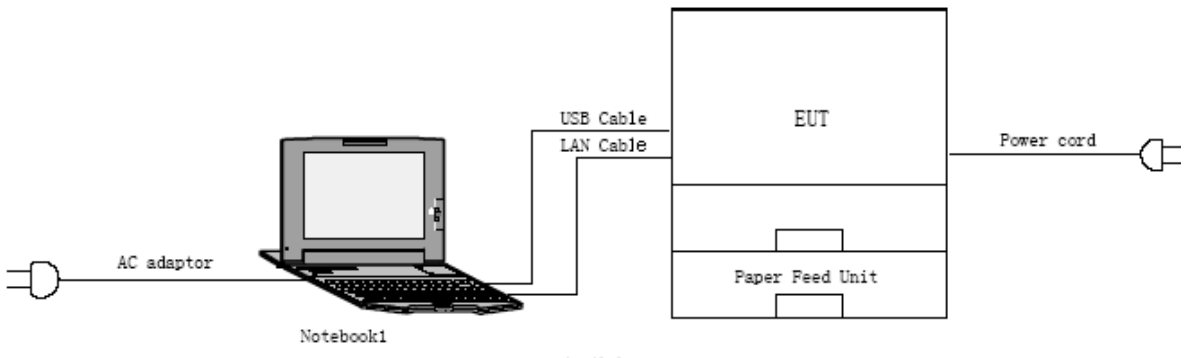
5) Operating modes：

No.	Operating modes	Remarks
1	Standby	
2	NIC Print	
3	USB Print	

6) Short description of the Equipment under Test (EUT)

The EUT is a Printer.
Model Difference: They were similar, except Aficio SP 3510DN， SP 3510DN /Aficio SP 3510DN employed additional Duplex motor for duplex side printing function
Unless otherwise indicated, all tests were conducted on Aficio SP 3510DN.
Tests performed on Aficio SP 3510DN were considered to be representative of SP 3500N /Aficio SP 3500N, Aficio SP 3500N, SP 3510DN/ Aficio SP 3510DN.

7) 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

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2009) and CISPR Publication 22.

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. 30, 2009. Valid time is until Mar. 29, 2012.

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 Jul. 01, 2009, valid time is until Jun. 30, 2012.

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, 2010. Valid time is until Dec. 23, 2013.

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, 2009. Valid time is until Dec. 19, 2012.

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, 2010. Valid time is until May 06, 2013.

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	2011/05/30
2	EMI TEST RECEIVER	Rohde & Schwarz	ESI 26	100009	2011/10/24
3	RF TEST PANEL	Rohde & Schwarz	TS / RSP	335015/ 0017	2011/10/24
4	TURNTABLE	ETS	2088	2149	2011/10/24
5	ANTENNA MAST	ETS	2075	2346	2011/10/24
6	EMI TEST SOFTWARE	Rohde & Schwarz	ESK1	N/A	2011/10/24
7	Double-Ridged-Waveguide Horn Antenna	Rohde & Schwarz	HF906	100039	2011/10/24
8	Semi-anechoic chamber	ETS-LINDGREN	AJ 593 HTW	N/A	2011/06/12

Conducted Disturbance					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	Rohde & Schwarz	ESCS30	100038	2011/10/24
2	Artificial Mains	Rohde & Schwarz	ESH2-Z5	100028	2011/10/24
3	Artificial Mains	Rohde & Schwarz	ESH3-Z5	100040	2011/10/24
4	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100044	2011/10/24
5	EMI Test Software	Rohde & Schwarz	ESK1	N/A	2011/10/24
6	2# shielded room	ETS-LINDGREN	RFD-100	2406	N/A

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 295MHz, so the measurement was made up to 2 GHz.

4.1.3. Description of the test set-up

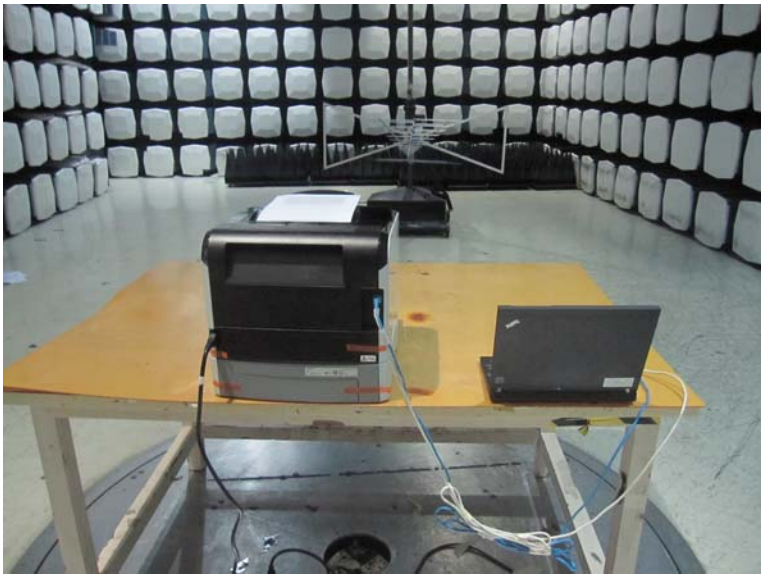
4.1.3.1. Operating Condition

The EUT is set to work that shall be carried out respectively standby, USB print and NIC print modes 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

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)

mode 1: STANDBY (30MHz-1000MHz)

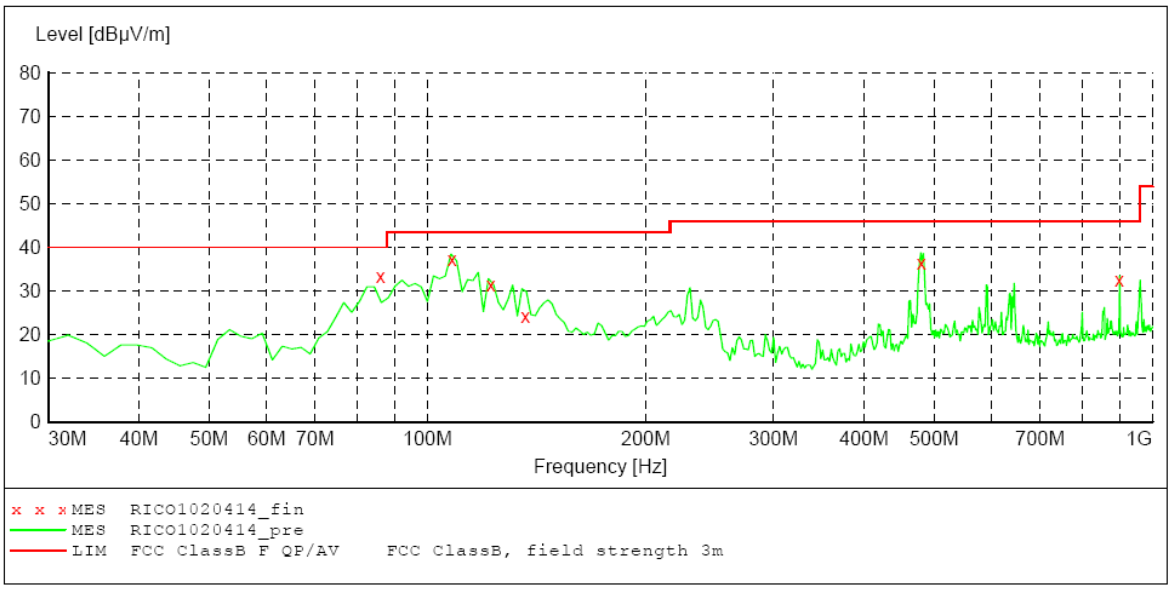
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION FCC PART 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  STANDBY
Test Site:            3M CHAMBER
Operator:             FIYO
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 5:46:07PM
```

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

```
  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: "RICO1020414_fin"

10/20/2011 6:02PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
86.160000	33.30	-31.8	40.0	6.7	QP	100.0	79.00	VERTICAL
108.120000	37.10	-30.6	43.5	6.4	QP	100.0	237.00	VERTICAL
122.340000	31.40	-30.5	43.5	12.1	QP	100.0	0.00	VERTICAL
136.620000	24.30	-32.2	43.5	19.2	QP	100.0	191.00	VERTICAL
480.000000	36.30	-24.5	46.0	9.7	QP	196.0	326.00	VERTICAL
900.000000	32.50	-18.8	46.0	13.5	QP	100.0	247.00	VERTICAL

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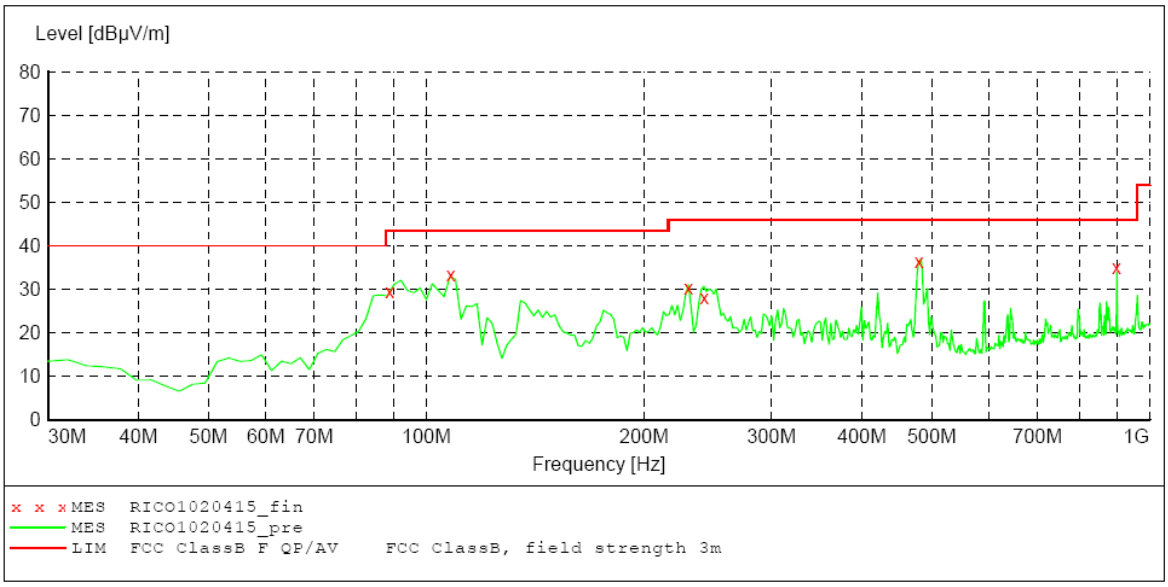
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION FCC PART 15 B

```
EUT:                Laser Printer M/N:Aficio SP 3510DN
Manufacturer:       RICOH
Operating Condition: STANDBY
Test Site:          3M CHAMBER
Operator:           FIYO
Test Specification: AC 120V/60Hz
Comment:
Start of Test:      10/20/2011 / 6:03:18PM
```

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

```
  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: "RICO1020415_fin"

10/20/2011 6:22PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
89.100000	29.50	-31.3	43.5	14.0	QP	321.0	157.00	HORIZONTAL
108.120000	33.40	-30.6	43.5	10.1	QP	288.0	327.00	HORIZONTAL
230.520000	30.30	-30.6	46.0	15.7	QP	127.0	229.00	HORIZONTAL
242.340000	28.10	-29.9	46.0	17.9	QP	131.0	206.00	HORIZONTAL
480.000000	36.50	-24.5	46.0	9.5	QP	100.0	192.00	HORIZONTAL
900.000000	35.10	-18.8	46.0	10.9	QP	100.0	198.00	HORIZONTAL

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mode 1: STANDBY (1000MHz-2000MHz)

SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

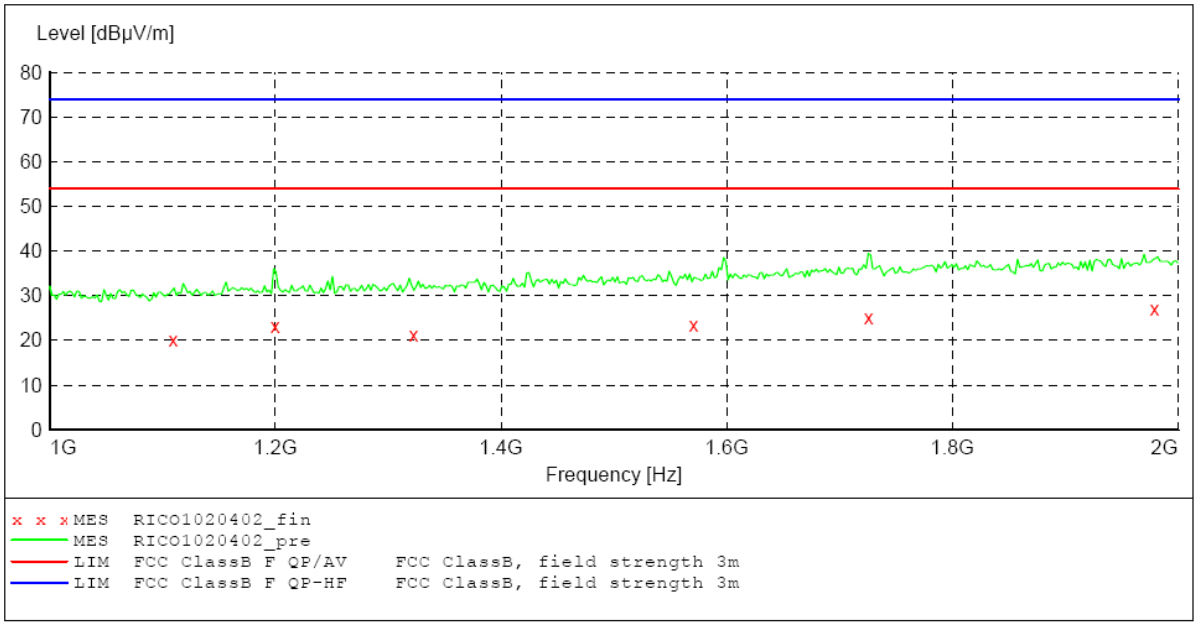
RADIATED EMISSION FCC PART 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  STANDBY
Test Site:            3M CHAMBER
Operator:             FIYO
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 3:41:53PM
```

SCAN TABLE: "test Field(1G-18G)AV"

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

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	500.0 kHz	Average	1.0 s	1 MHz	HF906 2011



MEASUREMENT RESULT: "RICO1020402_fin"

10/20/2011 3:53PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1109.500000	20.00	-8.8	54.0	34.0	AV	100.0	296.00	VERTICAL
1200.000000	23.20	-8.1	54.0	30.8	AV	100.0	175.00	VERTICAL
1322.500000	21.30	-7.1	54.0	32.7	AV	100.0	264.00	VERTICAL
1571.000000	23.50	-5.3	54.0	30.5	AV	300.0	252.00	VERTICAL
1726.000000	25.10	-3.7	54.0	28.9	AV	300.0	266.00	VERTICAL
1979.500000	27.00	-1.6	54.0	27.0	AV	100.0	358.00	VERTICAL

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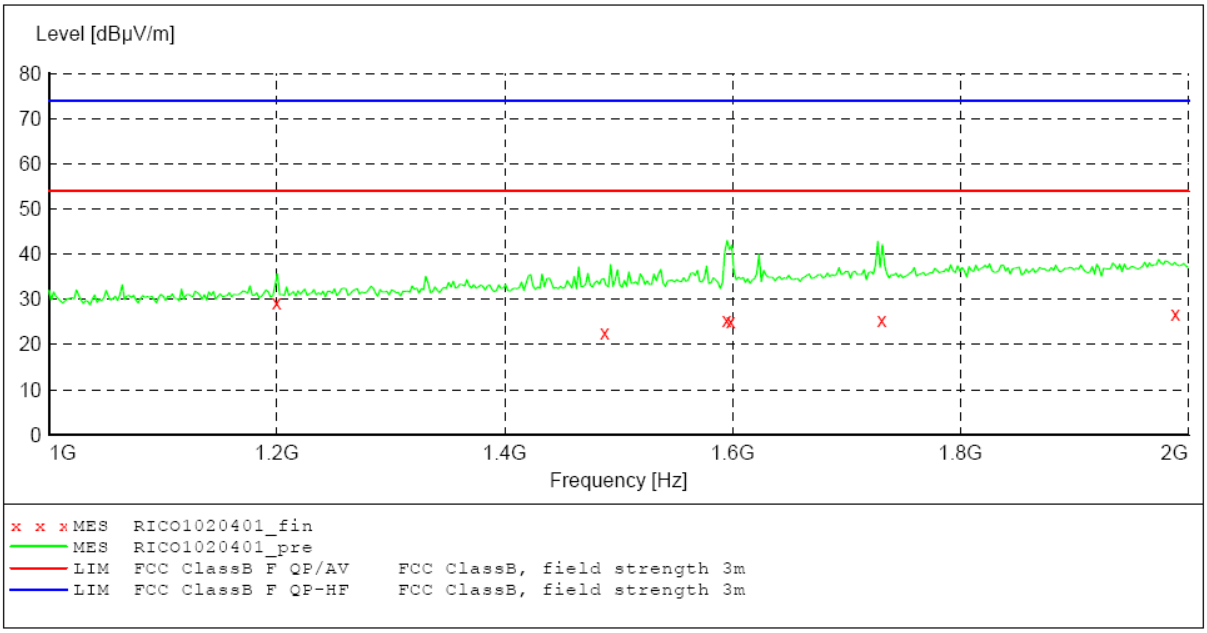
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION FCC PART 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  STANDBY
Test Site:            3M CHAMBER
Operator:             FIYO
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 3:29:47PM
```

SCAN TABLE: "test Field(1G-18G)AV"

```
  Short Description:            Field Strength(30M-1G)
  Start      Stop       Step       Detector  Meas.     IF      Transducer
  Frequency  Frequency  Width                Time      Bandw.
  1.0 GHz    18.0 GHz   500.0 kHz  Average   1.0 s     1 MHz   HF906 2011
```



MEASUREMENT RESULT: "RICO1020401_fin"

10/20/2011 3:40PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1200.000000	29.20	-8.1	54.0	24.8	AV	100.0	230.00	HORIZONTAL
1488.000000	22.70	-6.0	54.0	31.3	AV	100.0	249.00	HORIZONTAL
1595.000000	25.40	-5.0	54.0	28.6	AV	300.0	247.00	HORIZONTAL
1598.500000	25.00	-5.0	54.0	29.0	AV	100.0	260.00	HORIZONTAL
1731.000000	25.40	-3.7	54.0	28.6	AV	300.0	274.00	HORIZONTAL
1989.000000	26.80	-1.5	54.0	27.2	AV	100.0	326.00	HORIZONTAL

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mode 2: NIC print (30MHz-1000MHz)

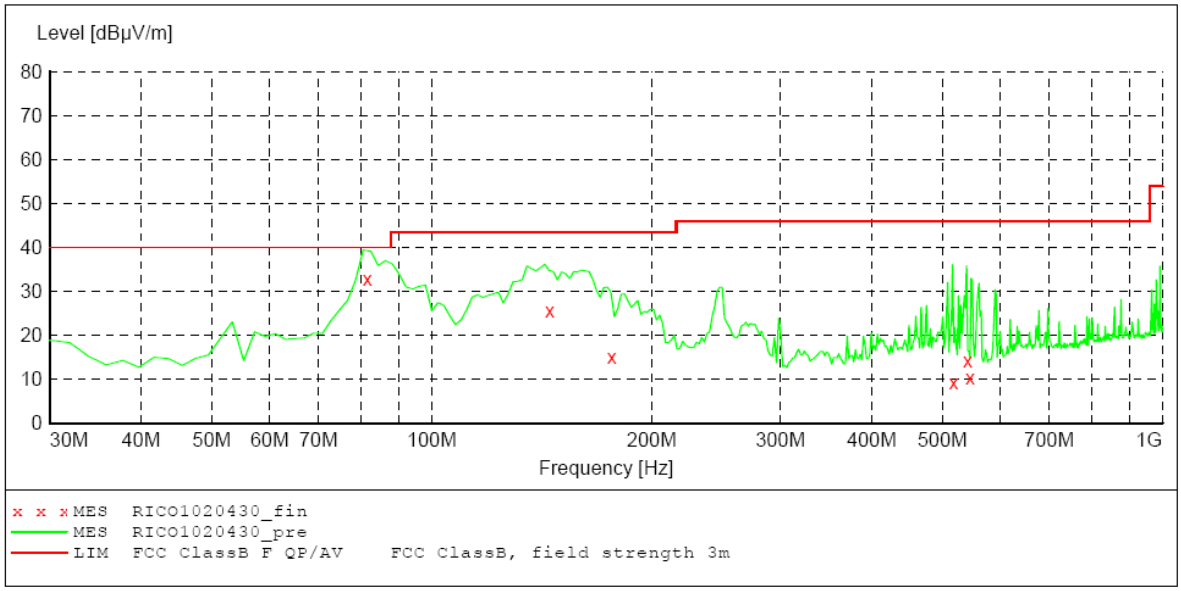
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION FCC PART 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  NIC PRINT
Test Site:            3M CHAMBER
Operator:             FIYO
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 7:33:00PM
```

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

```
  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: "RICO1020430_fin"

10/20/2011 7:59PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
81.660000	32.70	-32.8	40.0	7.3	QP	101.0	342.00	VERTICAL
145.080000	25.70	-33.4	43.5	17.8	QP	134.0	66.00	VERTICAL
176.400000	15.00	-33.7	43.5	28.5	QP	100.0	243.00	VERTICAL
517.740000	9.30	-23.9	46.0	36.7	QP	99.0	0.00	VERTICAL
541.500000	14.10	-24.6	46.0	31.9	QP	127.0	360.00	VERTICAL
545.220000	10.20	-24.7	46.0	35.8	QP	100.0	282.00	VERTICAL

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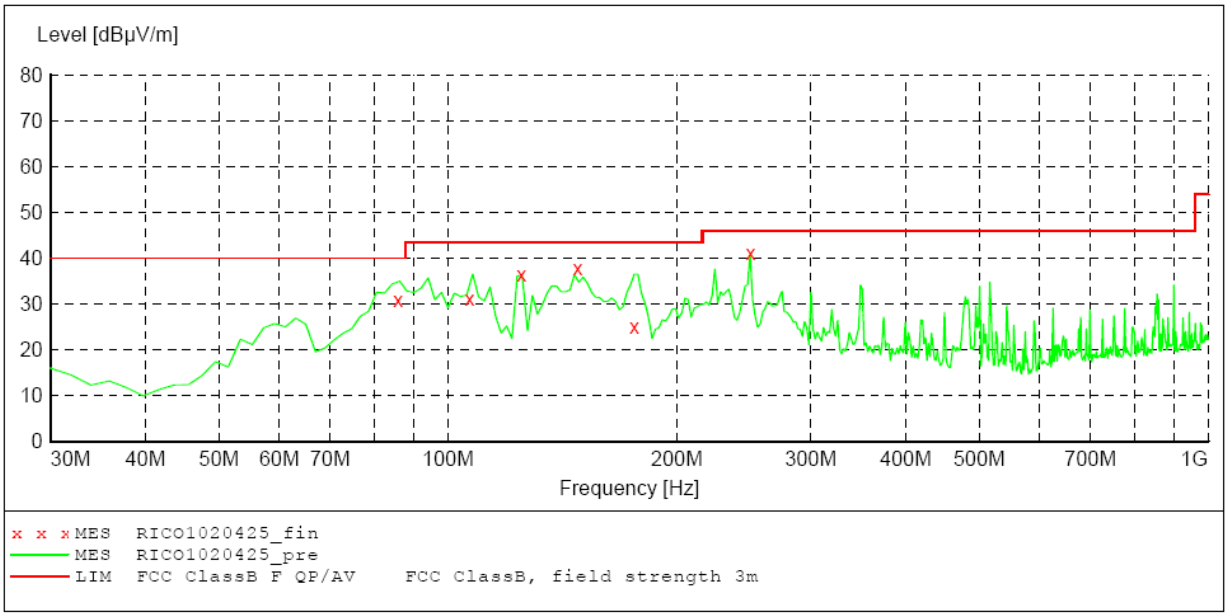
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION FCC PART 15 B

```
EUT:                 Laser Printer M/N:Aficio SP 3510DN
Manufacturer:        RICOH
Operating Condition: NIC PRINT
Test Site:           3M CHAMBER
Operator:            FIYO
Test Specification:  AC 120V/60Hz
Comment:
Start of Test:       10/20/2011 / 6:40:23PM
```

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

```
  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: "RICO1020425_fin"

10/20/2011 7:07PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
86.040000	30.90	-31.8	40.0	9.1	QP	400.0	170.00	HORIZONTAL
106.740000	31.10	-30.6	43.5	12.4	QP	321.0	347.00	HORIZONTAL
124.980000	36.30	-30.7	43.5	7.2	QP	231.0	135.00	HORIZONTAL
148.140000	37.70	-33.6	43.5	5.8	QP	217.0	287.00	HORIZONTAL
175.980000	24.90	-33.7	43.5	18.6	QP	122.0	199.00	HORIZONTAL
250.020000	41.00	-29.6	46.0	5.0	QP	147.0	312.00	HORIZONTAL

mode 2: NIC print (1000MHz-2000MHz)

SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

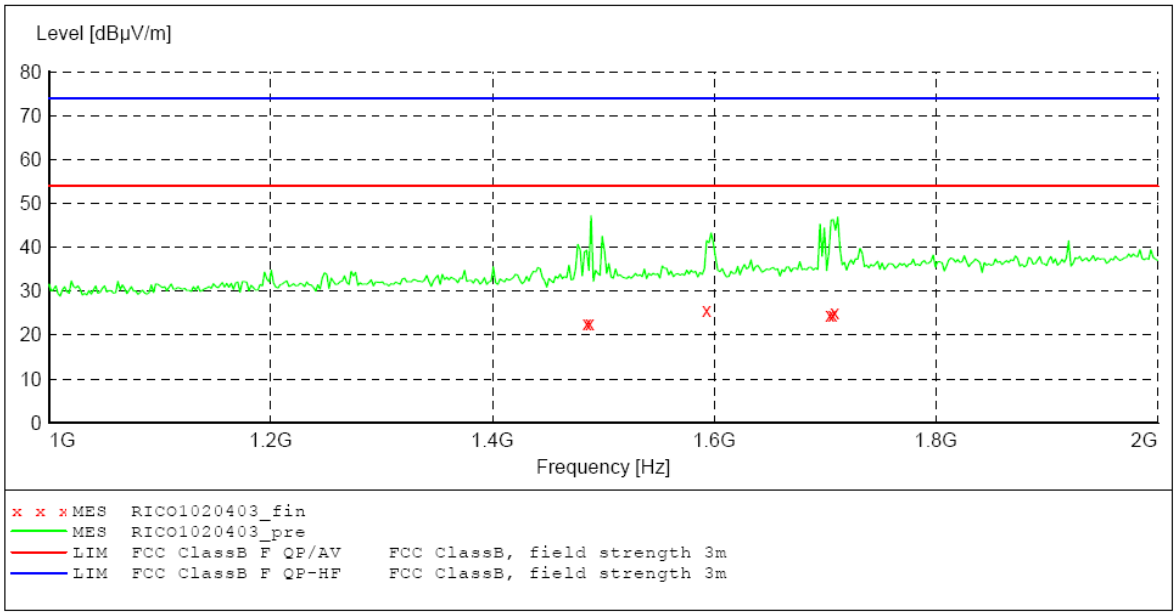
RADIATED EMISSION FCC PART 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  NIC PRINT
Test Site:            3M CHAMBER
Operator:             FIYO
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 3:55:34PM
```

SCAN TABLE: "test Field(1G-18G)AV"

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

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
1.0 GHz	18.0 GHz	500.0 kHz	Average	1.0 s	1 MHz	HF906 2011



MEASUREMENT RESULT: "RICO1020403_fin"

10/20/2011 4:05PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1485.500000	22.60	-6.1	54.0	31.4	AV	100.0	257.00	VERTICAL
1488.000000	22.70	-6.0	54.0	31.3	AV	100.0	250.00	VERTICAL
1593.500000	25.80	-5.0	54.0	28.2	AV	300.0	250.00	VERTICAL
1704.500000	24.50	-3.9	54.0	29.5	AV	300.0	7.00	VERTICAL
1707.000000	24.70	-3.9	54.0	29.3	AV	100.0	0.00	VERTICAL
1709.000000	25.00	-3.9	54.0	29.0	AV	300.0	0.00	VERTICAL

Page 1/1 10/20/2011 4:05PM RICO1020403

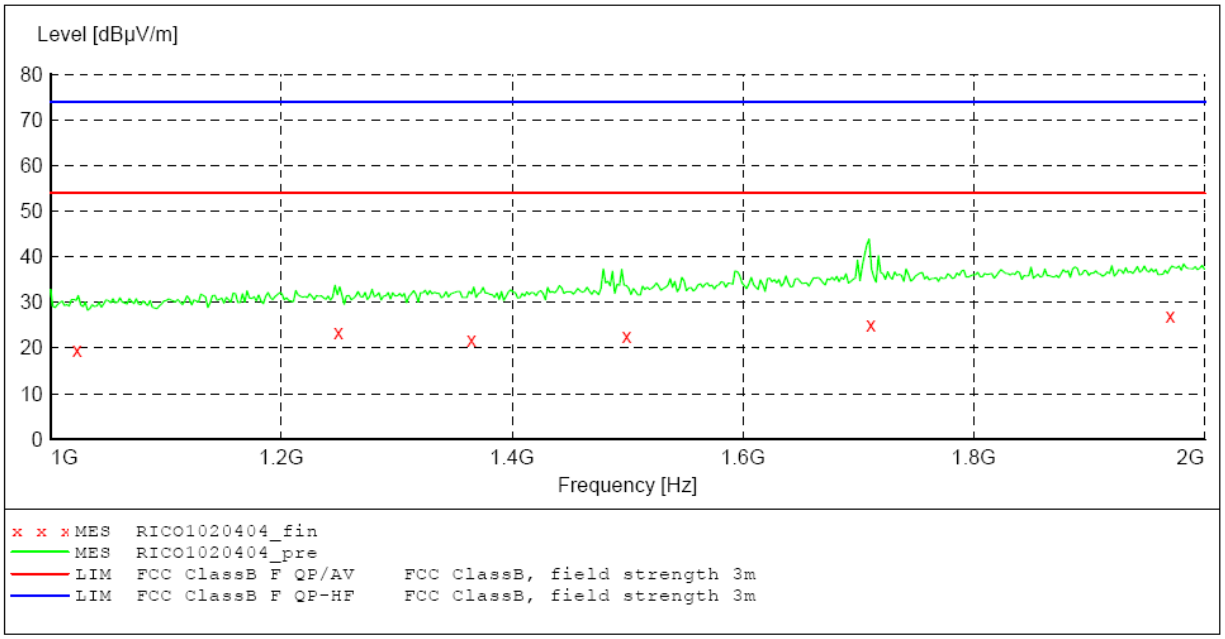
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION FCC PART 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  NIC PRINT
Test Site:            3M CHAMBER
Operator:             FIYO
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 4:06:51PM
```

SCAN TABLE: "test Field(1G-18G)AV"

```
  Short Description:            Field Strength(30M-1G)
  Start      Stop       Step       Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width                Time      Bandw.
  1.0 GHz    18.0 GHz   500.0 kHz  Average   1.0 s     1 MHz    HF906 2011
```



MEASUREMENT RESULT: "RICO1020404_fin"

10/20/2011 4:16PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1023.000000	19.50	-9.6	54.0	34.5	AV	100.0	233.00	HORIZONTAL
1249.500000	23.60	-7.7	54.0	30.4	AV	100.0	207.00	HORIZONTAL
1365.000000	21.70	-6.9	54.0	32.3	AV	100.0	235.00	HORIZONTAL
1499.500000	22.70	-6.0	54.0	31.3	AV	100.0	266.00	HORIZONTAL
1711.000000	25.00	-3.8	54.0	29.0	AV	100.0	154.00	HORIZONTAL
1970.500000	27.00	-1.7	54.0	27.0	AV	100.0	61.00	HORIZONTAL

Page 1/1 10/20/2011 4:16PM RICO1020404

mode 3:USB PRINT (30MHz-1000MHz)

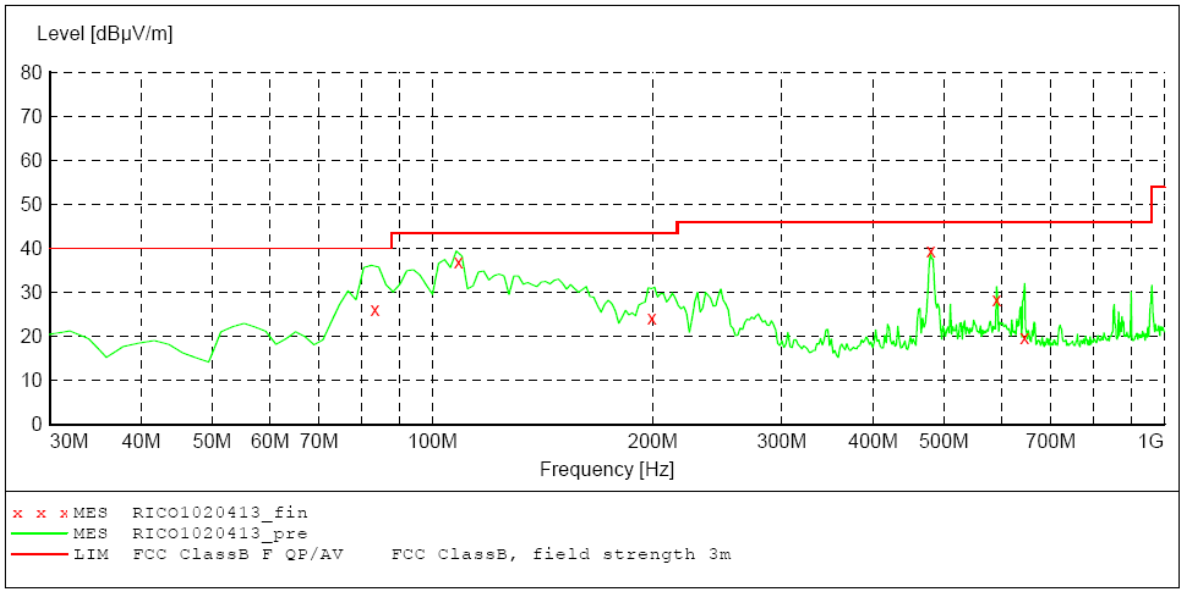
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION FCC PART 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  USB PRINT
Test Site:            3M CHAMBER
Operator:             FIYO
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 5:27:02PM
```

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

```
  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: "RICO1020413_fin"

10/20/2011 5:45PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
83.460000	26.10	-32.4	40.0	13.9	QP	355.0	297.00	VERTICAL
108.540000	36.90	-30.6	43.5	6.6	QP	114.0	247.00	VERTICAL
199.440000	24.20	-32.5	43.5	19.3	QP	119.0	307.00	VERTICAL
480.000000	39.50	-24.5	46.0	6.5	QP	100.0	243.00	VERTICAL
590.160000	28.40	-24.1	46.0	17.6	QP	118.0	348.00	VERTICAL
644.520000	19.80	-21.6	46.0	26.2	QP	101.0	345.00	VERTICAL

Page 1/1 10/20/2011 5:45PM RICO1020413

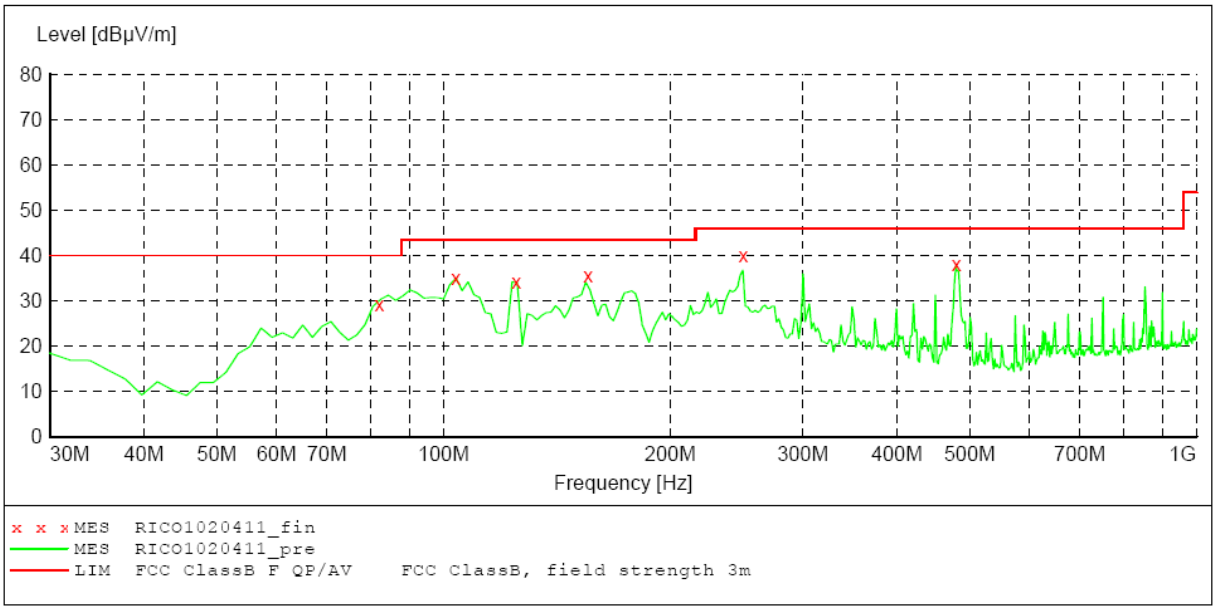
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION FCC PART 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  USB PRINT
Test Site:            3M CHAMBER
Operator:             FIYO
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 5:02:43PM
```

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

```
  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: "RICO1020411_fin"

10/20/2011 5:21PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
82.200000	29.30	-32.7	40.0	10.7	QP	313.0	219.00	HORIZONTAL
103.860000	34.90	-30.7	43.5	8.6	QP	343.0	324.00	HORIZONTAL
124.980000	34.30	-30.7	43.5	9.2	QP	275.0	325.00	HORIZONTAL
155.640000	35.60	-33.8	43.5	7.9	QP	190.0	127.00	HORIZONTAL
250.020000	39.90	-29.6	46.0	6.1	QP	100.0	297.00	HORIZONTAL
480.000000	38.10	-24.5	46.0	7.9	QP	100.0	200.00	HORIZONTAL

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mode 3: USB PRINT (1000MHz-2000MHz)

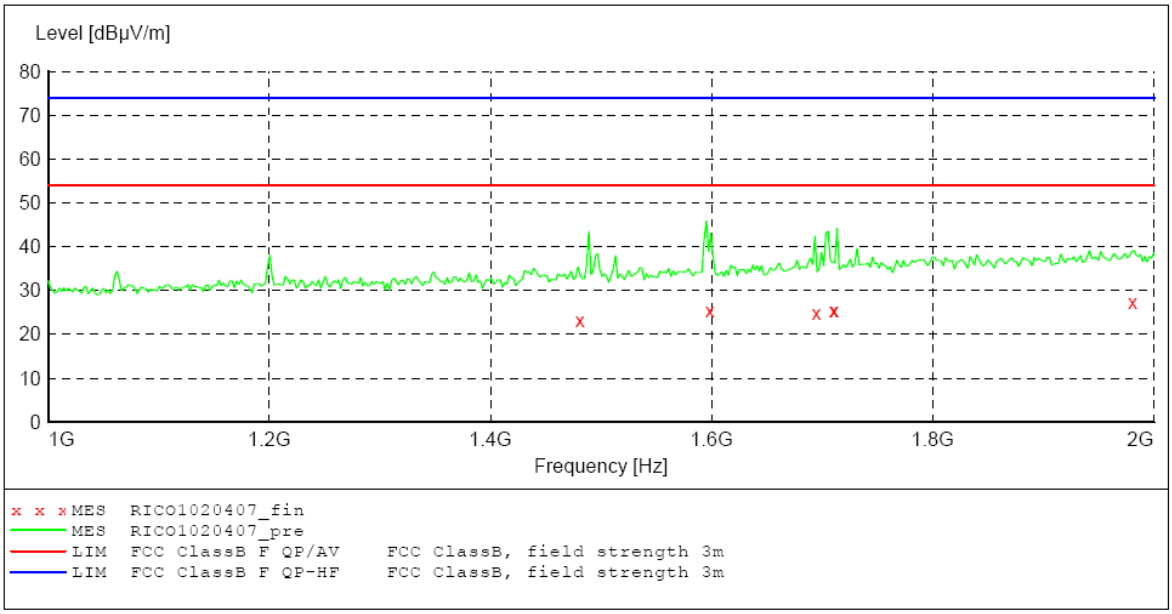
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION FCC PART 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  USB PRINT
Test Site:            3M CHAMBER
Operator:             FIYO
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 4:29:55PM
```

SCAN TABLE: "test Field(1G-18G)AV"

```
  Short Description:            Field Strength(30M-1G)
  Start      Stop       Step       Detector  Meas.    IF       Transducer
  Frequency  Frequency  Width                Time     Bandw.
  1.0 GHz    18.0 GHz   500.0 kHz  Average   1.0 s    1 MHz    HF906 2011
```



MEASUREMENT RESULT: "RICO1020407_fin"

10/20/2011 4:39PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1481.000000	23.10	-6.1	54.0	30.9	AV	100.0	261.00	VERTICAL
1598.500000	25.30	-5.0	54.0	28.7	AV	100.0	264.00	VERTICAL
1695.000000	24.90	-4.0	54.0	29.1	AV	100.0	7.00	VERTICAL
1710.500000	25.30	-3.8	54.0	28.7	AV	100.0	360.00	VERTICAL
1711.000000	25.30	-3.8	54.0	28.7	AV	100.0	0.00	VERTICAL
1981.000000	27.40	-1.6	54.0	26.6	AV	100.0	0.00	VERTICAL

Page 1/1 10/20/2011 4:39PM RICO1020407

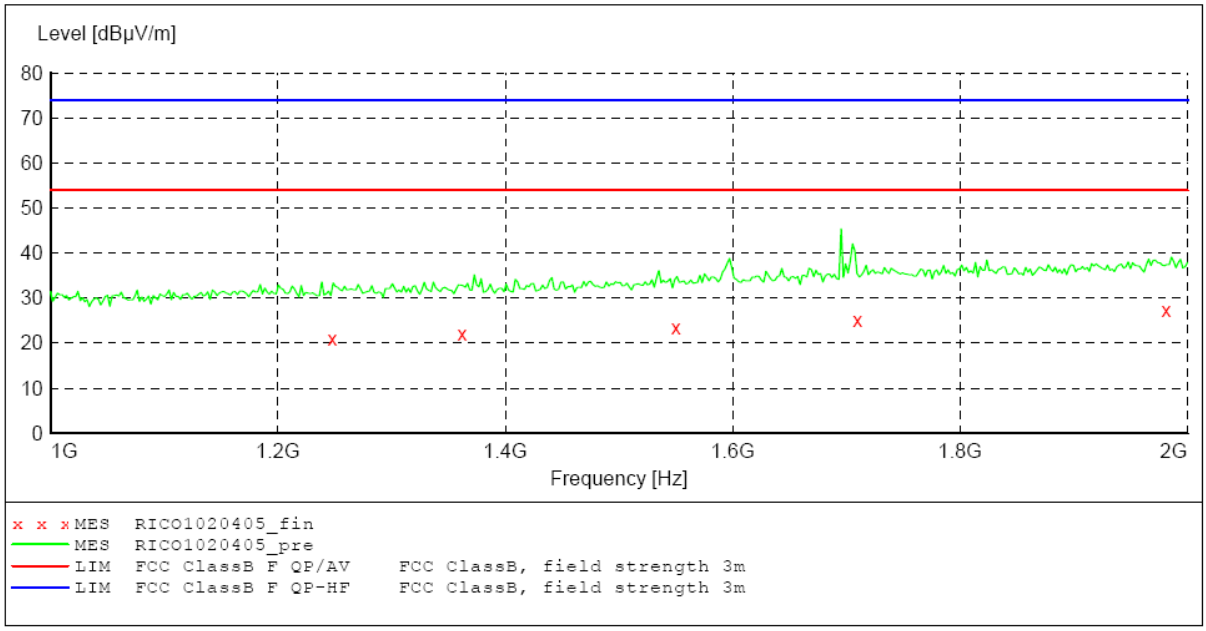
SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO.,LTD

RADIATED EMISSION FCC PART 15 B

```
EUT:                 Laser Printer M/N:Aficio SP 3510DN
Manufacturer:        RICOH
Operating Condition: USB PRINT
Test Site:           3M CHAMBER
Operator:            FIYO
Test Specification:  AC 120V/60Hz
Comment:
Start of Test:       10/20/2011 / 4:18:09PM
```

SCAN TABLE: "test Field(1G-18G)AV"

```
  Short Description:           Field Strength(30M-1G)
  Start      Stop       Step       Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width                Time      Bandw.
  1.0 GHz    18.0 GHz   500.0 kHz  Average   1.0 s     1 MHz    HF906 2011
```



MEASUREMENT RESULT: "RICO1020405_fin"

10/20/2011 4:28PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1248.000000	20.90	-7.7	54.0	33.1	AV	100.0	204.00	HORIZONTAL
1362.000000	22.00	-6.9	54.0	32.0	AV	100.0	360.00	HORIZONTAL
1550.000000	23.40	-5.5	54.0	30.6	AV	100.0	281.00	HORIZONTAL
1710.000000	25.20	-3.9	54.0	28.8	AV	100.0	153.00	HORIZONTAL
1710.000000	25.20	-3.9	54.0	28.8	AV	100.0	186.00	HORIZONTAL
1981.500000	27.30	-1.6	54.0	26.7	AV	100.0	229.00	HORIZONTAL

Page 1/1 10/20/2011 4:28PM RICO1020405

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. 2

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, USB print and NIC print modes during the test and the maximum emanating results 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

mode 1: STANDBY

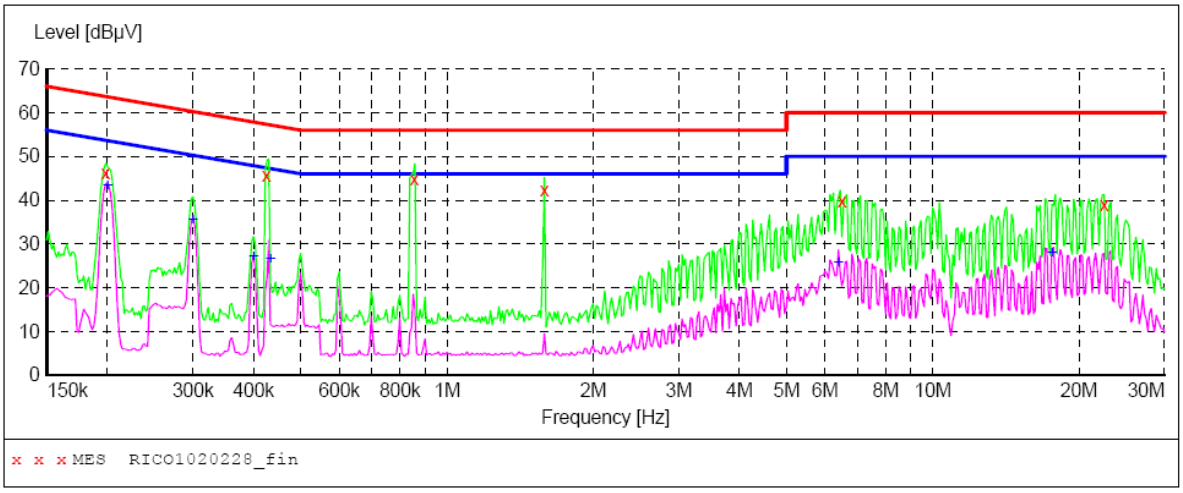
Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC Part 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  STANDBY
Test Site:            2# SHIELDED ROOM
Operator:             BRIAN
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 10:02:52PM
```

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO1020228_fin"

11/17/2011 3:34PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.198243	46.20	10.2	64	17.5	QP	L1	GND
0.424850	45.80	10.2	57	11.4	QP	L1	GND
0.855780	44.80	10.1	56	11.2	QP	L1	GND
1.585790	42.40	10.2	56	13.6	QP	L1	GND
6.500140	39.90	10.4	60	20.1	QP	L1	GND
22.530241	39.10	10.7	60	20.9	QP	L1	GND

MEASUREMENT RESULT: "RICO1020228_fin2"

11/17/2011 3:35PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.199826	43.50	10.2	54	10.1	AV	L1	GND
0.300021	35.50	10.2	50	14.7	AV	L1	GND
0.399702	27.20	10.2	48	20.7	AV	L1	GND
0.432850	26.80	10.2	47	20.4	AV	L1	GND
6.397373	25.90	10.4	50	24.1	AV	L1	GND
17.599050	28.10	10.5	50	21.9	AV	L1	GND

Page 1/1 11/17/2011 3:35PM RICO1020228

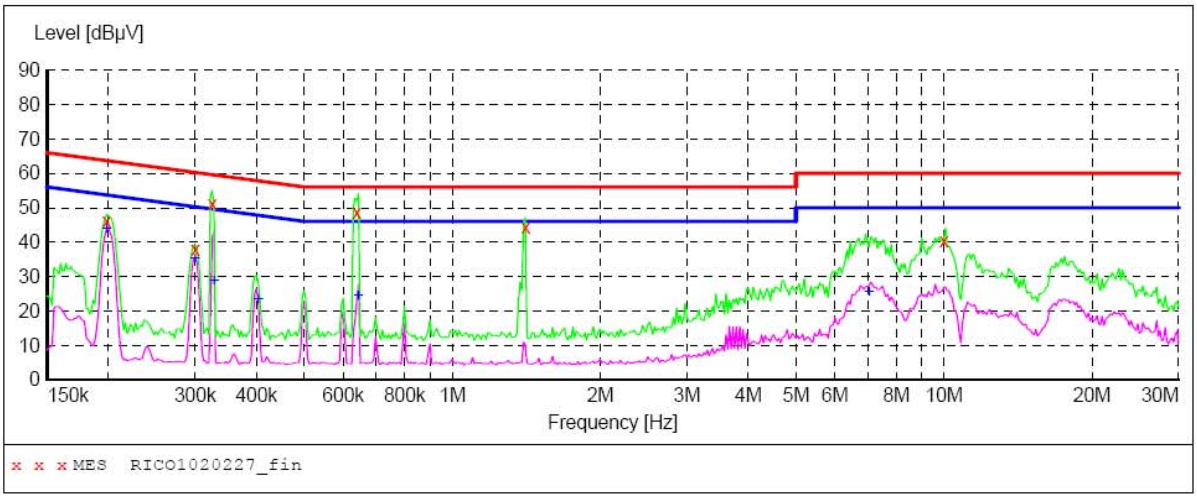
Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC Part 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  STANDBY
Test Site:            2# SHIELDED ROOM
Operator:             BRIAN
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 9:55:21PM
```

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO1020227_fin"

11/17/2011 3:42PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.198243	46.20	10.2	64	17.5	QP	N	GND
0.300021	37.80	10.2	60	22.4	QP	N	GND
0.324900	51.10	10.2	60	8.5	QP	N	GND
0.639590	48.70	10.2	56	7.3	QP	N	GND
1.408930	44.30	10.2	56	11.7	QP	N	GND
9.995200	40.30	10.6	60	19.7	QP	N	GND

MEASUREMENT RESULT: "RICO1020227_fin2"

11/17/2011 3:41PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.198240	44.00	10.2	54	9.7	AV	N	GND
0.300021	35.20	10.2	50	15.0	AV	N	GND
0.327499	28.90	10.2	50	20.6	AV	N	GND
0.402890	23.60	10.2	48	24.2	AV	N	GND
0.644707	24.70	10.2	46	21.3	AV	N	GND
7.039280	25.70	10.5	50	24.3	AV	N	GND

Page 1/1 11/17/2011 3:42PM RICO1020227

mode 2: NIC PRINT

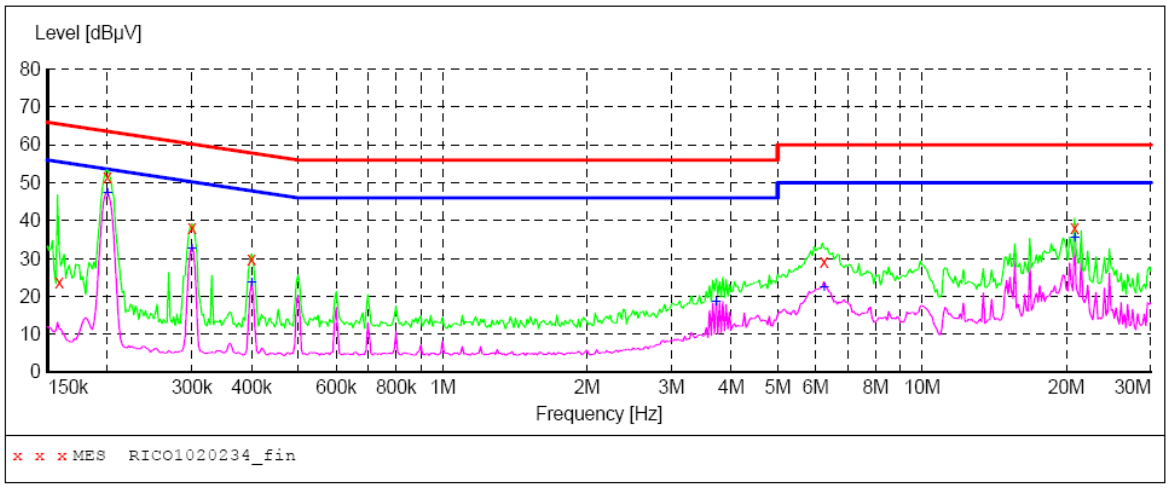
Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC Part 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  NIC PRINT
Test Site:            2# SHIELDED ROOM
Operator:             BRIAN
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 11:09:10PM
```

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO1020234_fin"

10/20/2011 11:15PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.158597	23.70	10.1	66	41.8	QP	L1	GND
0.199826	51.50	10.2	64	12.1	QP	L1	GND
0.300021	38.00	10.2	60	22.2	QP	L1	GND
0.399702	29.90	10.2	58	28.0	QP	L1	GND
6.246253	29.30	10.4	60	30.7	QP	L1	GND
20.804656	38.20	10.6	60	21.8	QP	L1	GND

MEASUREMENT RESULT: "RICO1020234_fin2"

10/20/2011 11:15PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.199826	47.40	10.2	54	6.2	AV	L1	GND
0.300021	32.70	10.2	50	17.5	AV	L1	GND
0.399702	23.60	10.2	48	24.3	AV	L1	GND
3.721213	18.70	10.3	46	27.3	AV	L1	GND
6.246253	22.50	10.4	50	27.5	AV	L1	GND
20.804656	35.60	10.6	50	14.4	AV	L1	GND

Page 1/1 10/20/2011 11:15PM RICO1020234

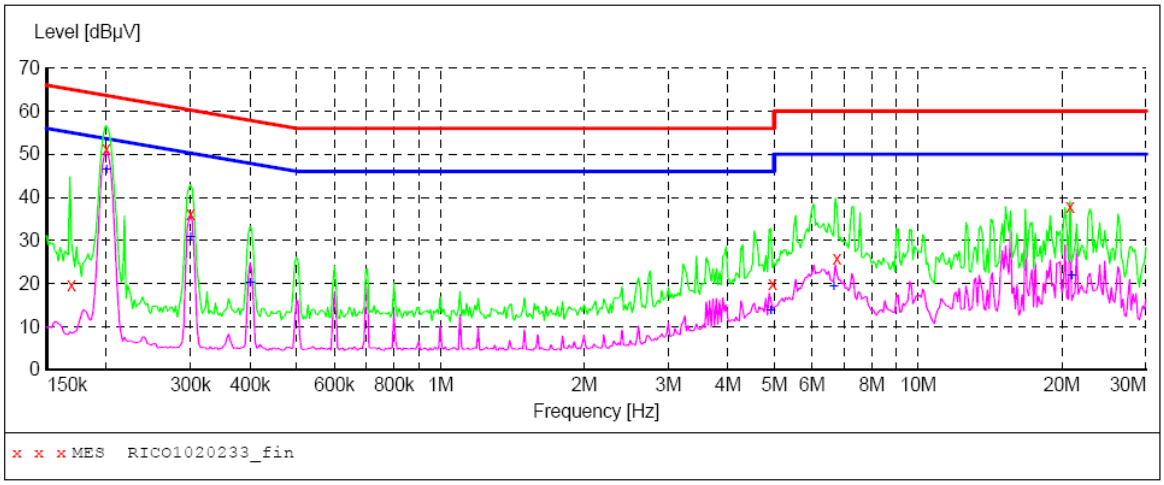
Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC Part 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  NIC PRINT
Test Site:            2# SHIELDED ROOM
Operator:             BRIAN
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 10:45:46PM
```

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO1020233_fin"

10/20/2011 11:08PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.169040	19.60	10.1	65	45.4	QP	N	GND
0.199826	51.20	10.2	64	12.4	QP	N	GND
0.300021	36.30	10.2	60	23.9	QP	N	GND
4.957519	19.90	10.4	56	36.1	QP	N	GND
6.764340	25.80	10.4	60	34.2	QP	N	GND
20.804656	37.80	10.6	60	22.2	QP	N	GND

MEASUREMENT RESULT: "RICO1020233_fin2"

10/20/2011 11:08PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.199826	46.60	10.2	54	7.0	AV	N	GND
0.300021	30.80	10.2	50	19.4	AV	N	GND
0.399702	20.30	10.2	48	27.6	AV	N	GND
4.918170	13.70	10.4	46	32.3	AV	N	GND
6.657390	19.50	10.4	50	30.5	AV	N	GND
20.971090	21.90	10.6	50	28.1	AV	N	GND

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mode 3: USB PRINT

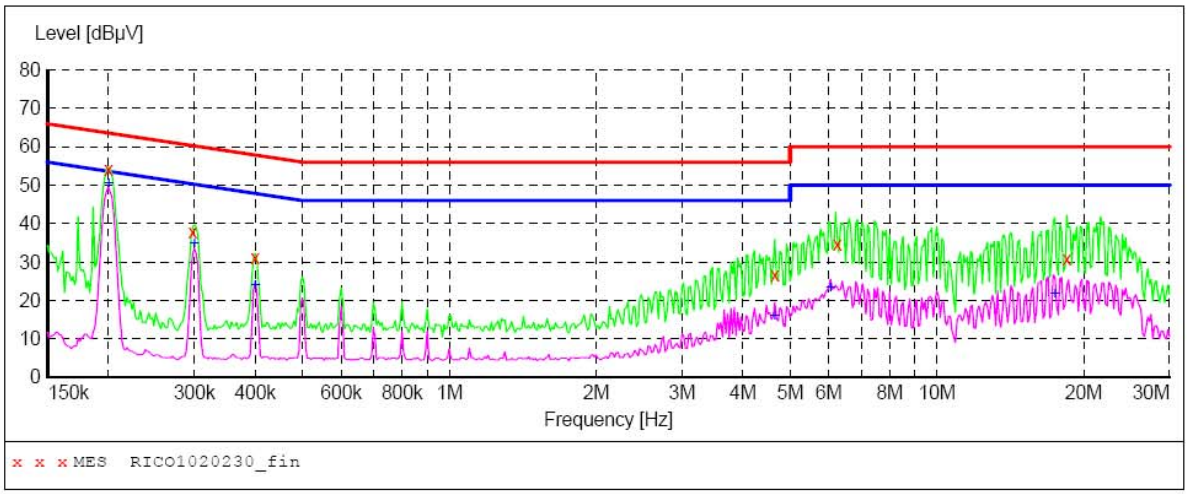
Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC Part 15 B

```
EUT:                  Laser Printer M/N:Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  USB PRINT
Test Site:            2# SHIELDED ROOM
Operator:             BRIAN
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 10:18:04PM
```

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO1020230_fin"

10/20/2011 10:24PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.199826	54.00	10.2	64	9.6	QP	L1	GND
0.297640	37.80	10.2	60	22.5	QP	L1	GND
0.399702	31.20	10.2	58	26.7	QP	L1	GND
4.651366	26.50	10.4	56	29.5	QP	L1	GND
6.246260	34.50	10.4	60	25.5	QP	L1	GND
18.460885	30.90	10.5	60	29.1	QP	L1	GND

MEASUREMENT RESULT: "RICO1020230_fin2"

10/20/2011 10:24PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.199826	50.60	10.2	54	3.0	AV	L1	GND
0.300021	34.90	10.2	50	15.3	AV	L1	GND
0.399702	24.10	10.2	48	23.8	AV	L1	GND
4.651366	16.00	10.4	46	30.0	AV	L1	GND
6.050308	23.50	10.4	50	26.5	AV	L1	GND
17.459380	21.90	10.5	50	28.1	AV	L1	GND

Page 1/1 10/20/2011 10:24PM RICO1020230

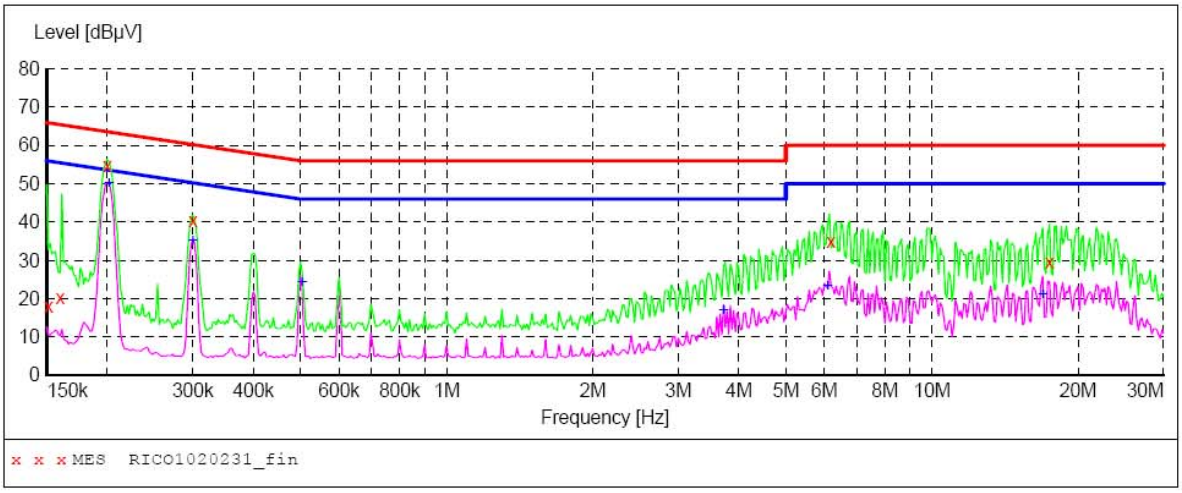
Shenzhen Huatongwei International Inspection CO.,Ltd

Voltage Mains Test FCC Part 15 B

```
EUT:                  Aficio SP 3510DN
Manufacturer:         RICOH
Operating Condition:  USB PRINT
Test Site:            2# SHIELDED ROOM
Operator:             BRIAN
Test Specification:   AC 120V/60Hz
Comment:
Start of Test:        10/20/2011 / 10:26:58PM
```

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "RICO1020231_fin"

10/20/2011 10:35PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.151200	18.10	10.1	66	47.8	QP	N	GND
0.159870	20.40	10.1	66	45.1	QP	N	GND
0.199826	54.60	10.2	64	9.0	QP	N	GND
0.300021	40.50	10.2	60	19.7	QP	N	GND
6.196680	34.80	10.4	60	25.2	QP	N	GND
17.459376	29.40	10.5	60	30.6	QP	N	GND

MEASUREMENT RESULT: "RICO1020231_fin2"

10/20/2011 10:50PM

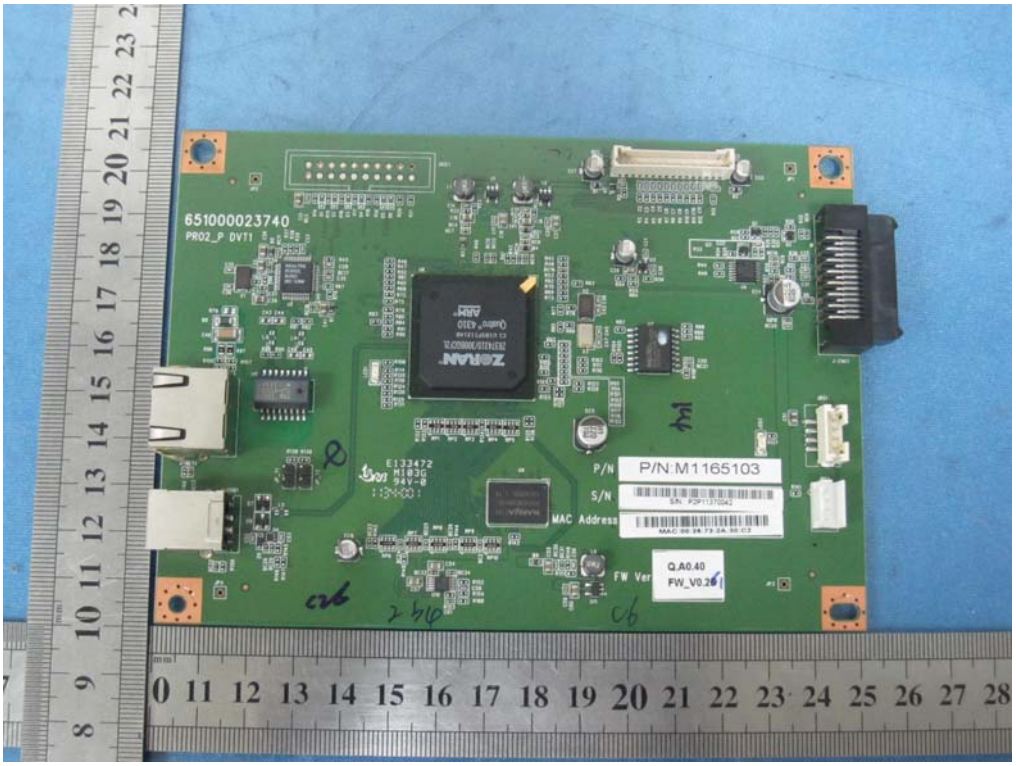
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.201430	50.40	10.2	54	3.2	AV	N	GND
0.300021	35.40	10.2	50	14.8	AV	N	GND
0.503600	24.30	10.2	46	21.7	AV	N	GND
3.721213	17.10	10.3	46	28.9	AV	N	GND
6.098710	23.50	10.4	50	26.5	AV	N	GND
16.911680	21.30	10.5	50	28.7	AV	N	GND

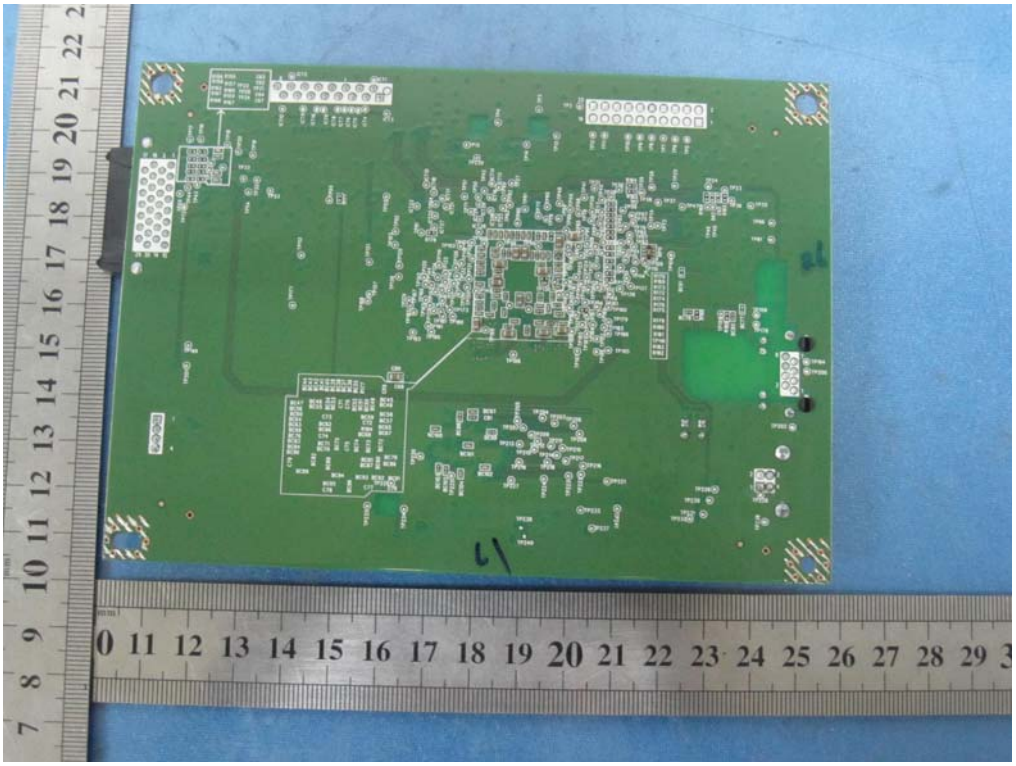
Page 1/1 10/20/2011 10:50PM RICO1020231

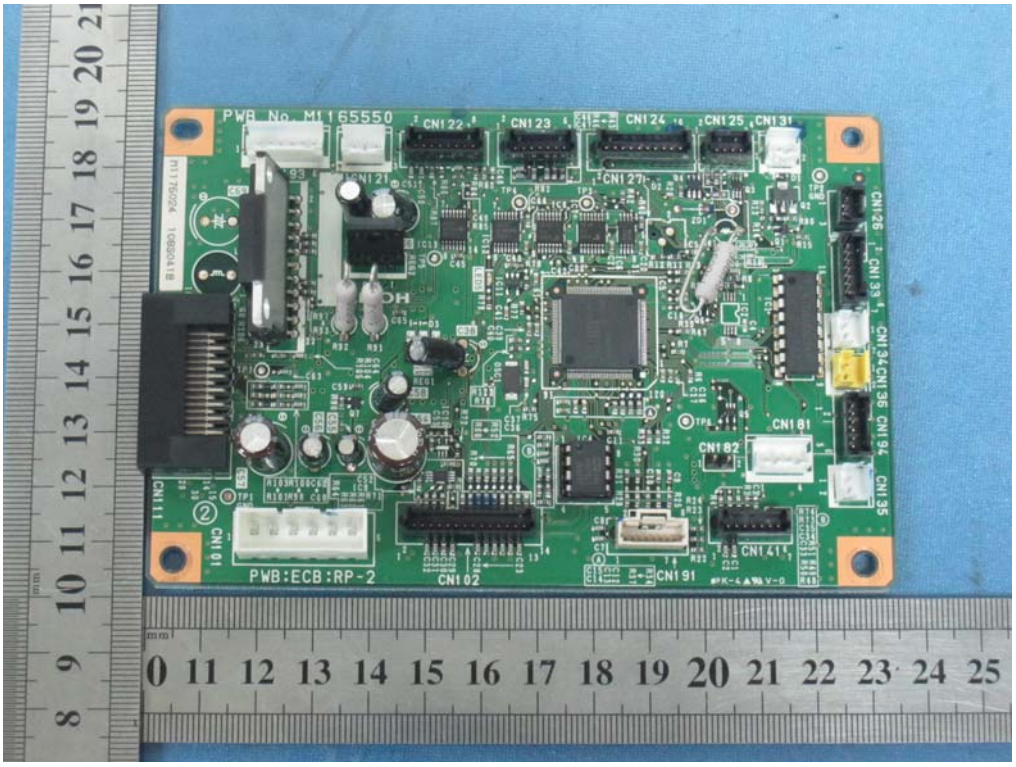
5. External and Internal Photos of the EUT

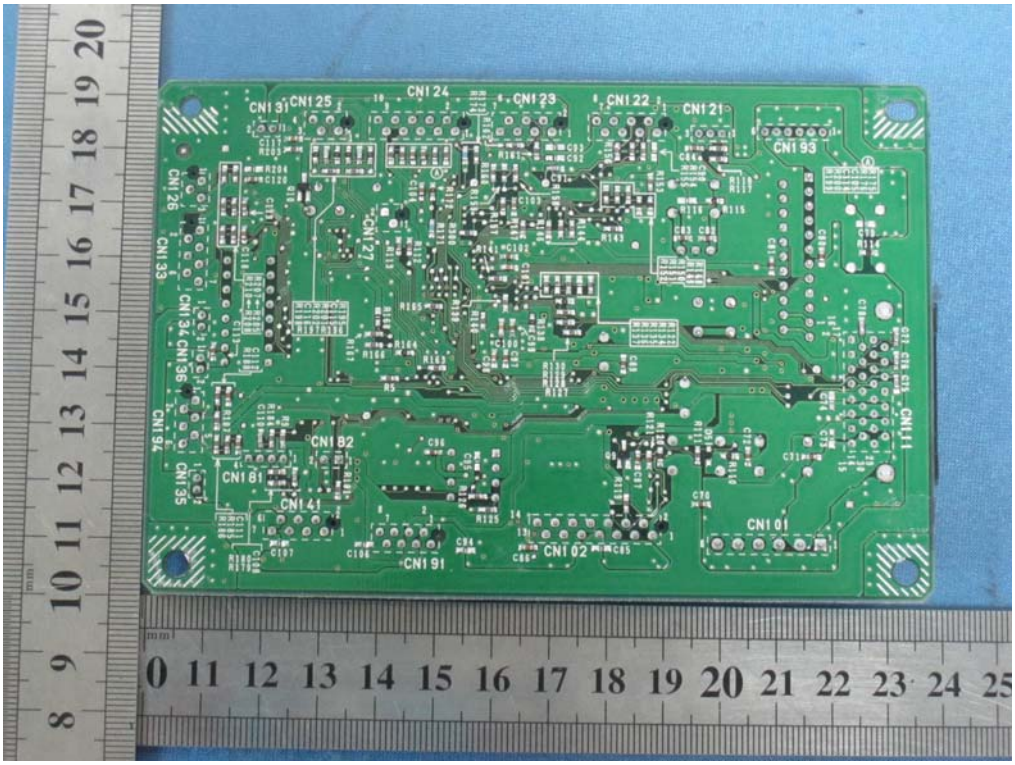
External Photos

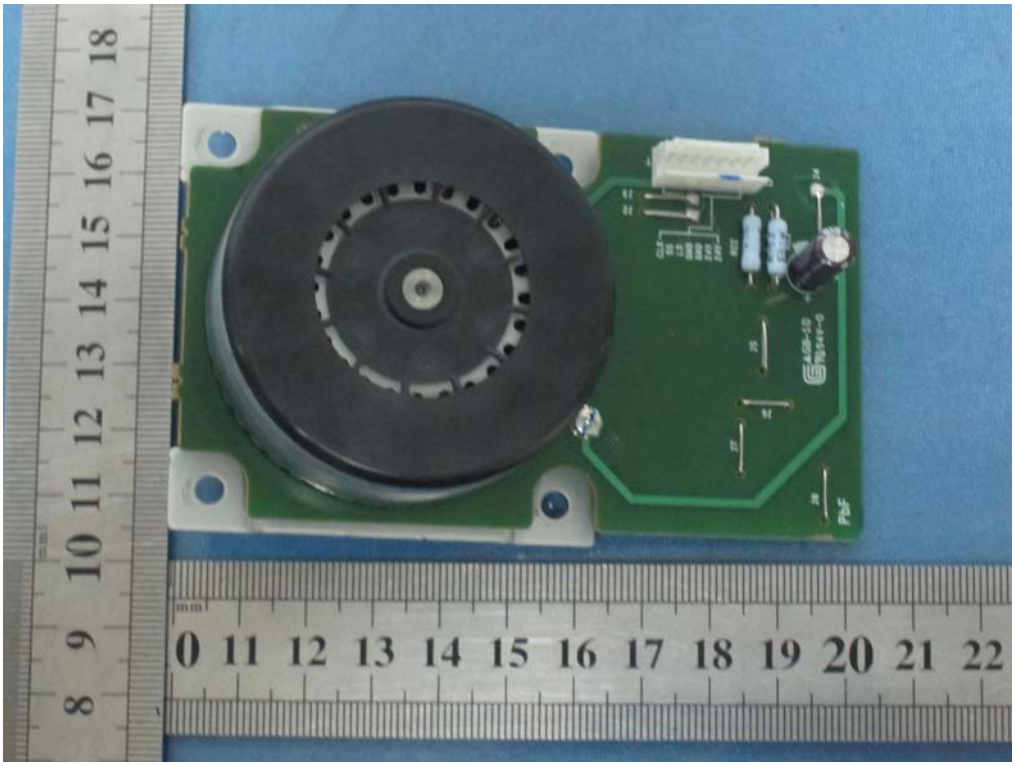
Internal Photos

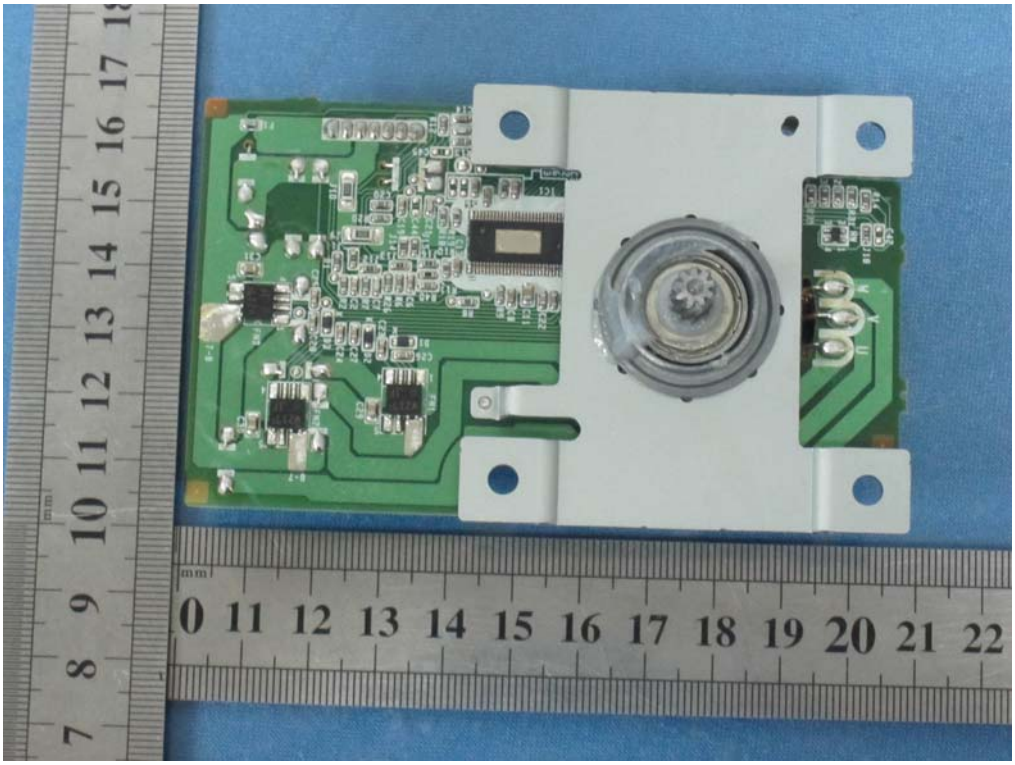


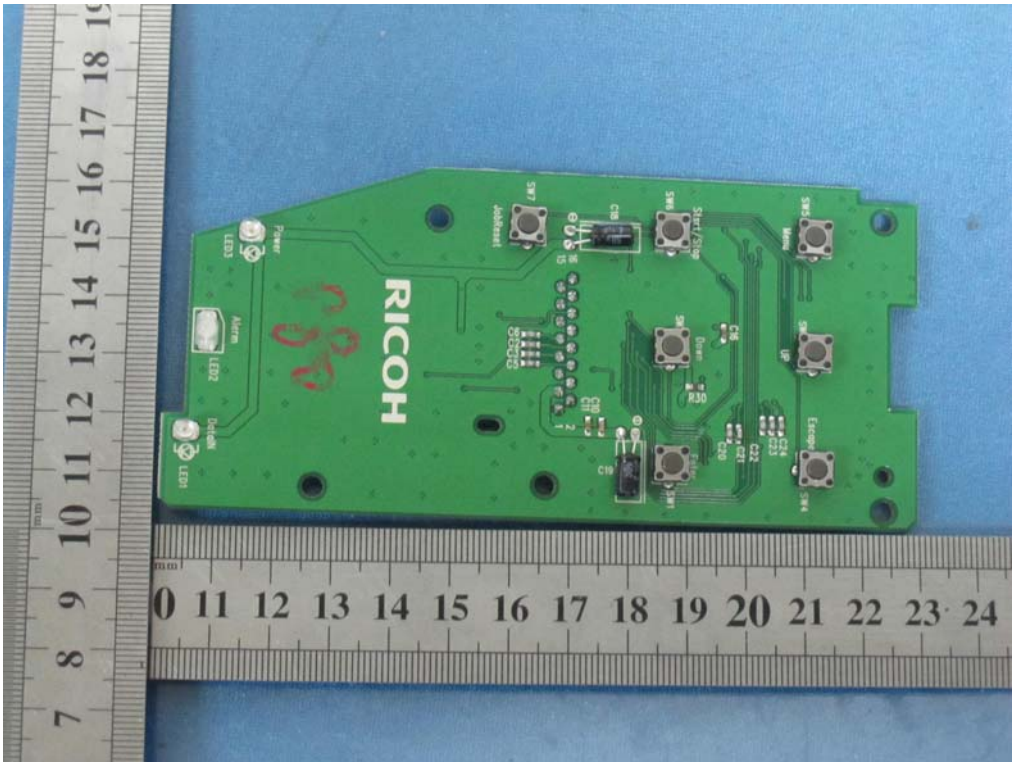


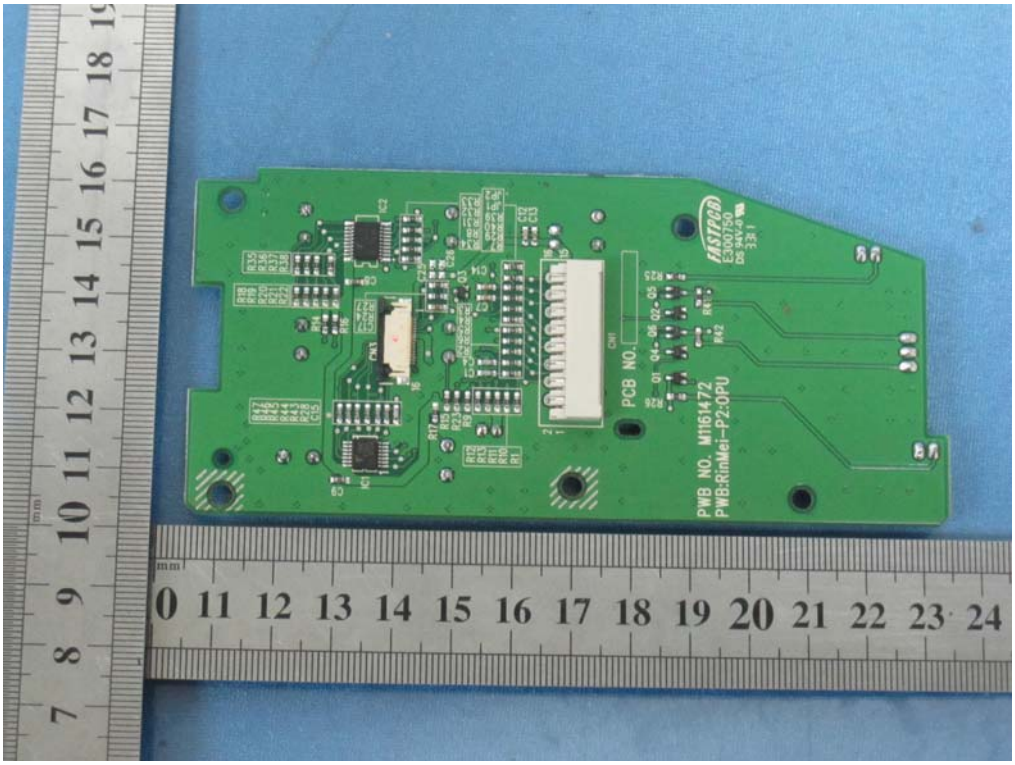

PWB No. M1165550
PWB:ECB:RP-2

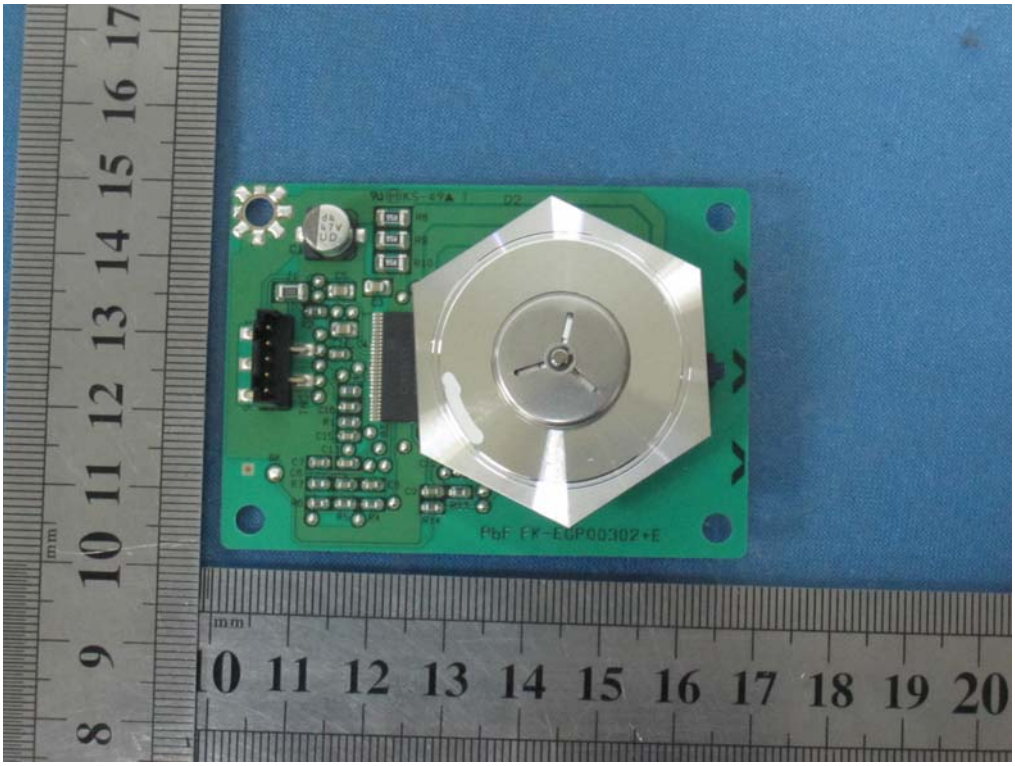

CN131
CN125
CN124
CN123
CN122
CN121
CN193
CN126
CN133
CN134
CN136
CN194
CN135
CN182
CN181
CN141
CN191
CN102
CN101
CN111
0 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

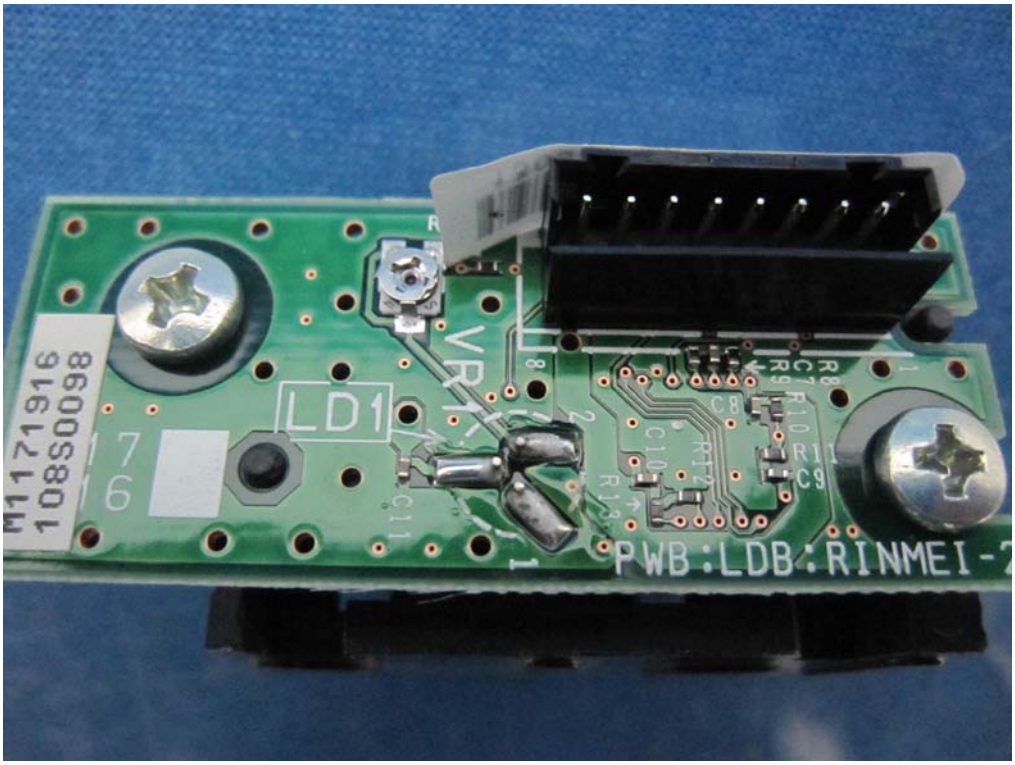

0 11 12 13 14 15 16 17 18 19 20 21 22

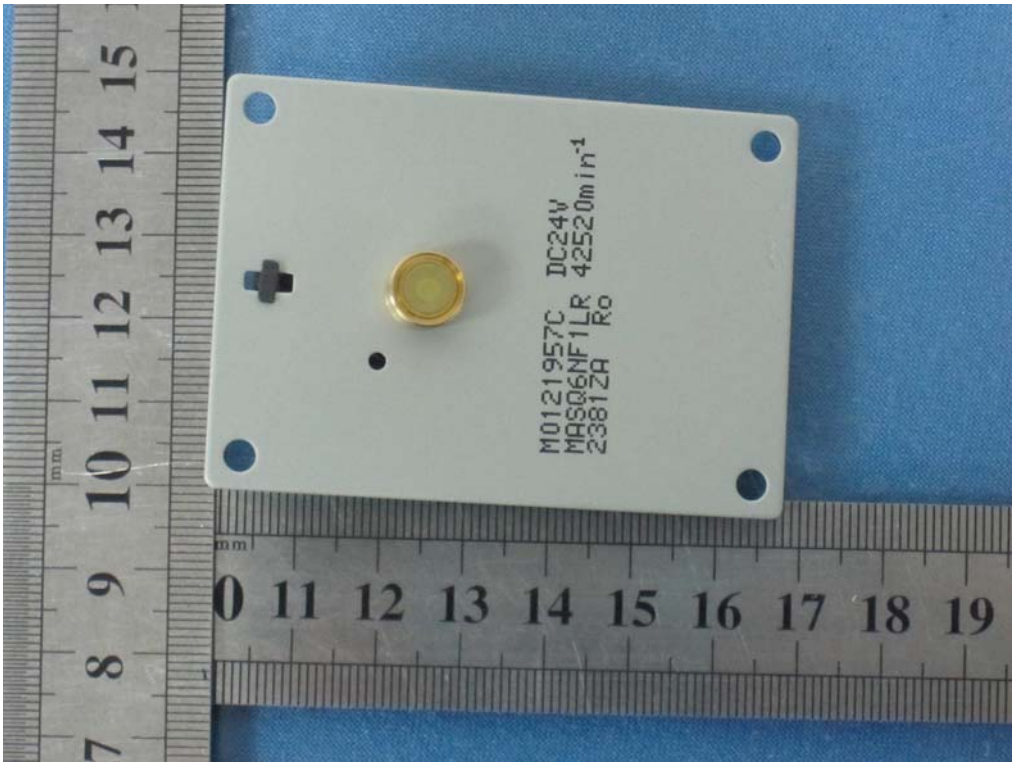


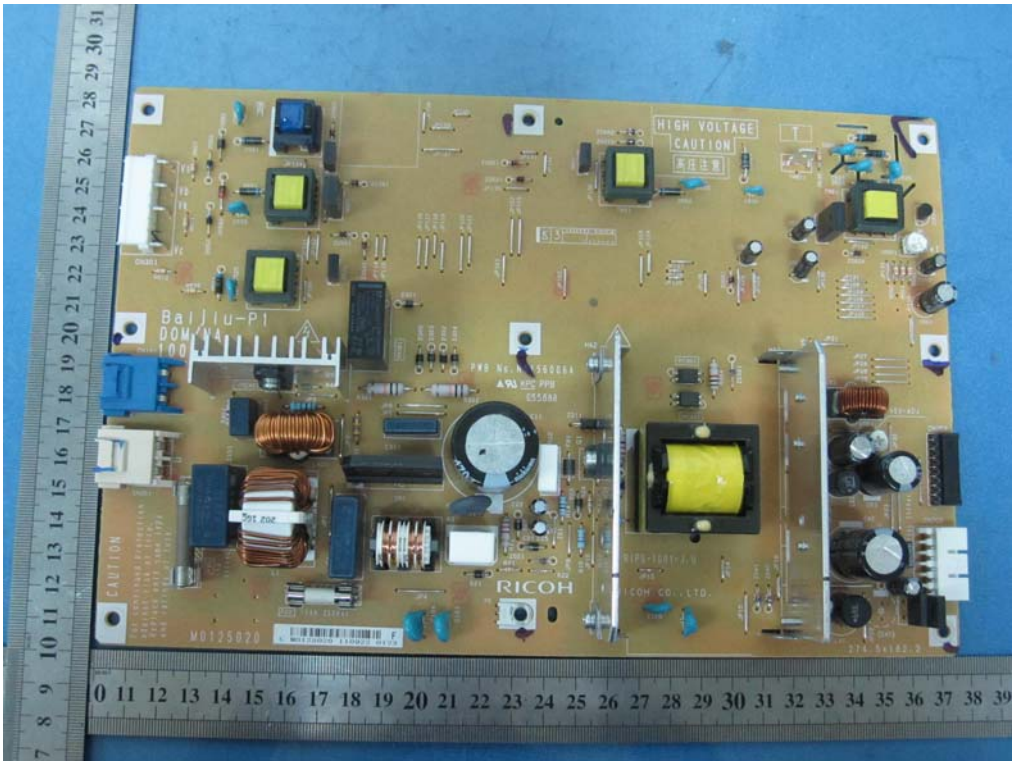

RICOH

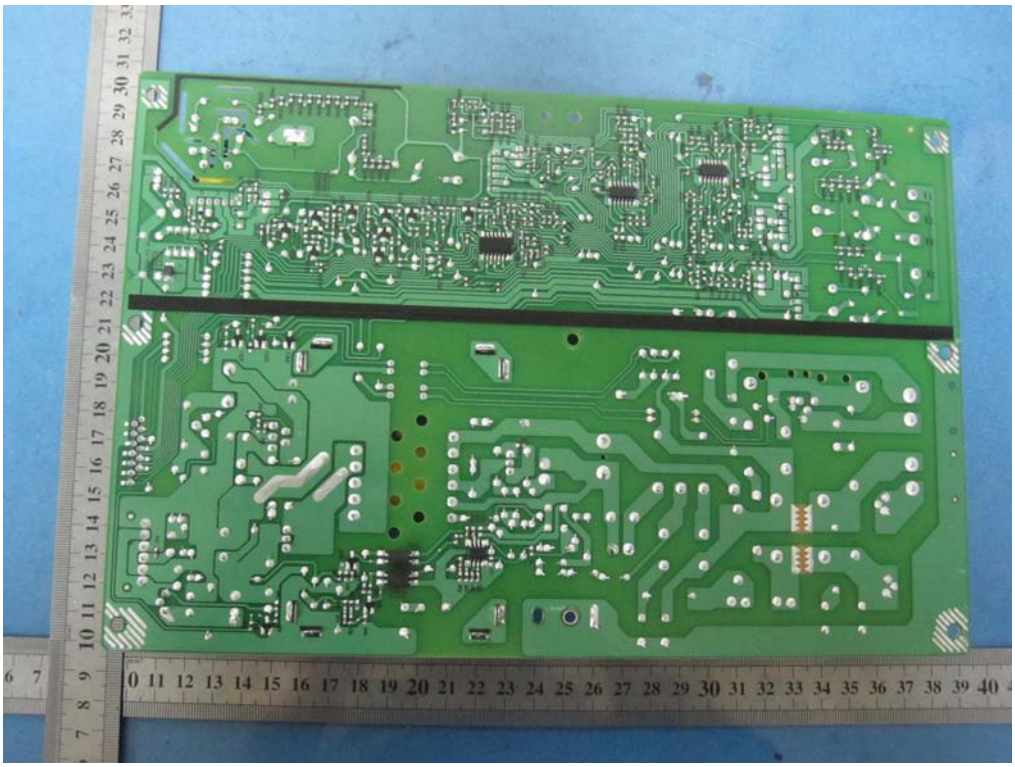

PCB NO.
PWB NO. MT1614172
PWB:RinMei-P2:0PU


PbF FK-EGP00302-E


M1171916
108S0098
LD1
PWB:LDB:RINMEI-


M01219S7C DC24V
MAS06NF1LR 42520min-1
23812A Ro





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