




# **EMI TEST REPORT**


**Test Report No. : 26IE0305-YK-1**

**Applicant** : RICOH CO., LTD.  
**Type of Equipment** : Full-color MFP  
**Model No.** : Aficio MP C4500 (Aficio MP C3500)  
**FCC ID** : BBP-RFAPL01  
**Test Standard** : FCC Part15 Subpart C,  
Section 15.207, 15.209, 15.247(WLAN): 2006  
**Test Result** : Complied

1. This test report shall not be reproduced except in full, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this test report are traceable to the national or international standards.

**Date of test:** May 9 and 10, 2006

**Tested by:**   
Toyokazu Imamura

**Approved by:**   
Osamu Watatani  
Site Manager of Yamakita EMC Lab.

**UL Apex Co., Ltd.**

**YAMAKITA EMC LAB.**

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

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MF060b (12.02.06)

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## 1 Applicant Information

Company Name : RICOH CO., LTD.  
Address : 810 Shimoimaizumi, Ebina-shi, Kanagawa-ken, 243-0023 JAPAN  
Telephone Number : +81-46-292-6870  
Facsimile Number : +81-46-231-9183  
Contact Person : Shinji Okada

## 2 Product Description

Type of Equipment : Full-color MFP  
Model No. : Aficio MP C4500 (Aficio MP C3500)  
Serial No. : L906030056  
Rating : AC120±10%V, 50/60Hz  
Country of Manufacture : China  
Receipt Date of Sample : May 9, 2006  
Condition of EUT : Production prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)

Model: Aficio MP C4500 / Aficio MP C3500 (referred to as the EUT in this report) is a Full-color MFP.  
The difference between Model: Aficio MP C4500 and Model: Aficio MP C3500 is printing speed.

Aficio MP C4500: 45 pages per minute

Aficio MP C3500: 35 pages per minute

	RFID	Wireless LAN
Equipment type	Transceiver	Transceiver
Frequency of operation	13.56 MHz	2412 - 2462 MHz
Type of modulation	ASK 100%	CCK, DQPSK, DBPSK
Antenna type	Print pattern antenna	Patch antenna
Antenna connector type	None	None
Mode of operation	Duplex	Duplex
Other clock frequency	798.8MHz	44MHz
Emission Designation	A1D	26M0G2D
Operation temperature range	10 ~ 32 deg. C.	0 ~ 55 deg. C.

**\*FCC Part15.31 (e)**

Host device (Full-color MFP) provides the Wireless LAN Module with stable power supply, and the power is not changed when voltage of the Full-color MFP is varied. Therefore, the equipment complies power supply regulation.

**\*FCC Part15.203**

It is impossible for end users to replace the antenna, because the antenna is mounted on the board integrally. Therefore, the equipment complies with the antenna requirement of Section 15.203.

**\*FCC Part15.247 (i)**

(i) Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307 (b)(1) of this chapter.

Please refer to the application documents of FCC ID: M4Y-0XI330.

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### 3 Test Specification, Procedures and Results

#### 3.1 Test specification

Test specification : FCC Part15 Subpart C: 2006  
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.207: Conducted limits  
Section 15.209: Radiated emission limits, general requirements  
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,  
and 5725-5850MHz

#### 3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted Emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	AC Mains	N/A	10.5dB (6.9451MHz, N, AV, Tx 2412MHz)	Complied
6dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (a)(2) & 15.209	-	Excluded *1	-	N/A
Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (b)(3) & 15.209	-	Excluded *1	-	N/A
Out of Band Emission & Restricted Band Edges	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (d) & 15.209	Radiated	N/A	1.5dB (550.49MHz, Vertical, Tx 2437MHz)	Complied
Power Density	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (e) & 15.209	-	Excluded *1	-	N/A

\*1) These items were tested previously with Wireless LAN Module alone. The results were described in the test report RF920815H04, published by Advance Data Technology Corporation. The Wireless LAN Module has been certificated on August 6, 2004.

\*2) Test results for RFID Module were described in the test report 26FE0236-YK-F, published by UL Apex.

\*3) This test has been performed for co-location operation.

Note: UL Apex's EMI Work Procedures No.QPM05.

\* Other than above, no addition, exclusion nor deviation has been made from the standard.

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### 3.3 Uncertainty

#### Conducted emission

The measurement uncertainty (with 95% confidence level) for this test is  $\pm 2.7$ dB.

The data listed in this test report has enough margin, more than site margin.

#### Radiated emission

The measurement uncertainty (with a 95% confidence level) for this test using Loop antenna is  $\pm 2.3$ dB.

The measurement uncertainty (with 95% confidence level) for this test using Biconical antenna is  $\pm 4.5$ dB.

The measurement uncertainty (with 95% confidence level) for this test using Logperiodic antenna is  $\pm 4.3$ dB.

The measurement uncertainty (with 95% confidence level) for this test using Horn antenna is  $\pm 5.2$ dB.

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

### 3.4 Test Location

UL Apex Co., Ltd. Yamakita EMC Lab.

907, Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken 258-0124 JAPAN

Telephone number : +81 465 77 1011

Facsimile number : +81 465 77 2112

NVLAP Lab. code : 200441-0

No. 1 test site has been fully described in a report submitted to FCC office, and accepted on August 26, 2005 (Registration No.: 95486).

IC Registration No. : IC3489A

No. 2 test site has been fully described in a report submitted to FCC office, and accepted on April 4, 2005 (Registration No.: 466226).

IC Registration No. : IC3489A-2

No. 1 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on November 2, 2005 (Registration No.: 95967).

IC Registration No. : IC3489A-B

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 shielded room	8.0 x 5.0 x 2.5	No.1 EMS lab.	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5	(Semi-anechoic chamber)	
No.3 shielded room	4.0 x 5.0 x 2.7		

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## 4 System Test Configuration

### 4.1 Justification

The system was configured in typical fashion (as a customer would normally use it) for testing.

Operation: Transmitting

- Low channel : 2412MHz

- Middle channel : 2437MHz

- High channel : 2462MHz

\* RFID is also run into Transmitting (13.56MHz) mode.

Four RFID modules which have the same specification are mounted in the equipment and they don't have simultaneous transmitting function. They were previously checked and the one in which the maximum emission occurred was chosen. ID tag was mounted in the ribbon inside of the EUT to communicate with each module.

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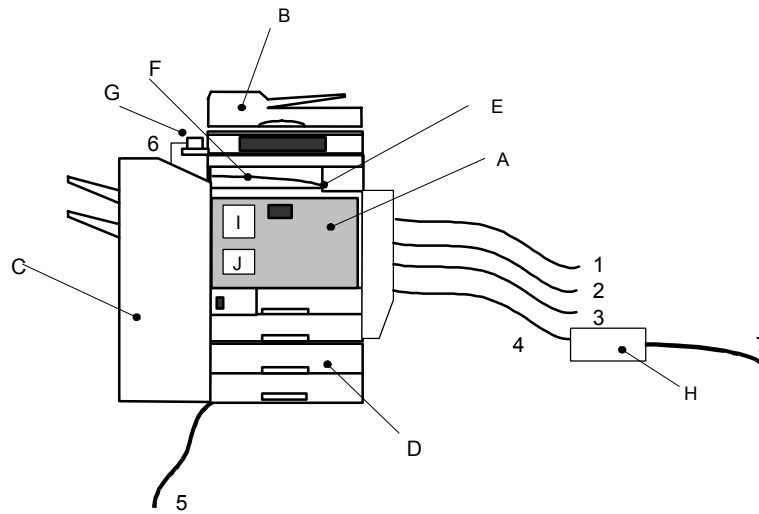
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## 4.2 Configuration of Tested System



\* Test data was taken under worse case conditions.

### Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID (Remark)
A	Full-color MFP	Aficio MP C4500 (Aficio MP C3500)	L906030056	RICOH	BBP-RFAPL01 (EUT)
B	Document Feeder	DF 3010	60211011	RICOH	-
C	Booklet Finisher	SR 3020	10072	RICOH	-
D	Paper Bank	PB 3000	90159	RICOH	-
E	Bridge Unit	BU 3000	90167	RICOH	-
F	1 Bin Tray	BN 3010	90143	RICOH	-
G	Telephone	Hand set type 1018	B43000	RICOH	-
H	Exchanger	CS-97	0S0024110	neix	-
I	Wireless LAN Module	R-WL11B	G8135461	RICOH	M4Y-0XI330
J	USB	USB Host Interface Unit Type A	50101152	RICOH	-

\* RFID modules are installed in the Full-color MFP, Aficio MP C4500 (Aficio MP C3500).

### List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	100BASE-Tx cable	5.0	Unshielded	Unshielded	-
2	USB cable	2.6	Shielded	Shielded	-
3	USB cable	2.5	Shielded	Shielded	-
4	Modular cable	2.0	Unshielded	Unshielded	-
5	Power cable	2.4	Unshielded	Unshielded	-
6	Telephone cable	0.9	Unshielded	Unshielded	-
7	Power cable	2.0	Unshielded	Unshielded	-

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## 5 Conducted Emissions

### 5.1 Operating environment

The test was carried out in No.1 anechoic chamber.

Temperature : See test data  
Humidity : See test data

### 5.2 Test configuration

EUT was placed on a platform of nominal size, 1.0m by 1.0m, raised 10cm above the conducting ground plane. EUT was located 80cm from LISN and excess AC cable was bundled in center.  
A drawing of the set up is shown in the photos of Appendix 1.

### 5.3 Test conditions

Frequency range : 0.15 - 30MHz  
EUT position : Floor standing  
EUT operation mode : Transmitting

### 5.4 Test procedure

The EUT was connected to a LISN (AMN).  
An overview sweep with peak detection has been performed.  
The Conducted emission measurements were made with the following detector function of the test receiver.  
Detector: QP/AV  
IF Bandwidth: 9kHz

### 5.5 Results

Summary of the test results : Pass  
Test data : APPENDIX 2 Page 13 to 17

Date : May 10, 2006      Test engineer : Toyokazu Imamura

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## 6 Out of Band Emissions (Radiated)

### 6.1 Operating environment

The test was carried out in No.1 anechoic chamber.

Temperature : See test data  
Humidity : See test data

### 6.2 Test configuration

EUT was placed on a non-metallic pallet of nominal size, 1.0m by 1.0m, raised 10cm above the conducting ground plane. The module was set at a height of 1.0m from the reference ground plane.  
A drawing of the set up is shown in the photos of Appendix 1.

### 6.3 Test conditions

Frequency range : 30MHz - 26GHz  
EUT position : Floor standing  
EUT operation mode : Transmitting

### 6.4 Test procedure

The Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3m.  
The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.  
The measurements were performed for both vertical and horizontal antenna polarization.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

Measurements were performed with QP, PK, and AV detector.

The radiated emission measurements were made with the following detector function of the test receiver.  
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
Detector	QP: BW 120kHz	PK: RBW: 1MHz/VBW: 1MHz
IF Bandwidth		AV: RBW: 1MHz/VBW: 10Hz

### 6.5 Results

Summary of the test results : Pass      Test data: APPENDIX 2 Page 18 to 26  
Date : May 9 and 10, 2006      Test engineer : Toyokazu Imamura

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### **APPENDIX 1: Photographs of test setup**

Page 11 : Conducted emission

Page 12 : Radiated emission

### **APPENDIX 2: Test Data**

Page 13 - 17 : Conducted Emission

Page 18 - 26 : Radiated Emission

18 - 20 : 30 - 1000MHz

21 - 26 : 1 - 26GHz

### **APPENDIX 3: Test instruments**

Page 27 : Test instruments

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## Conducted emission



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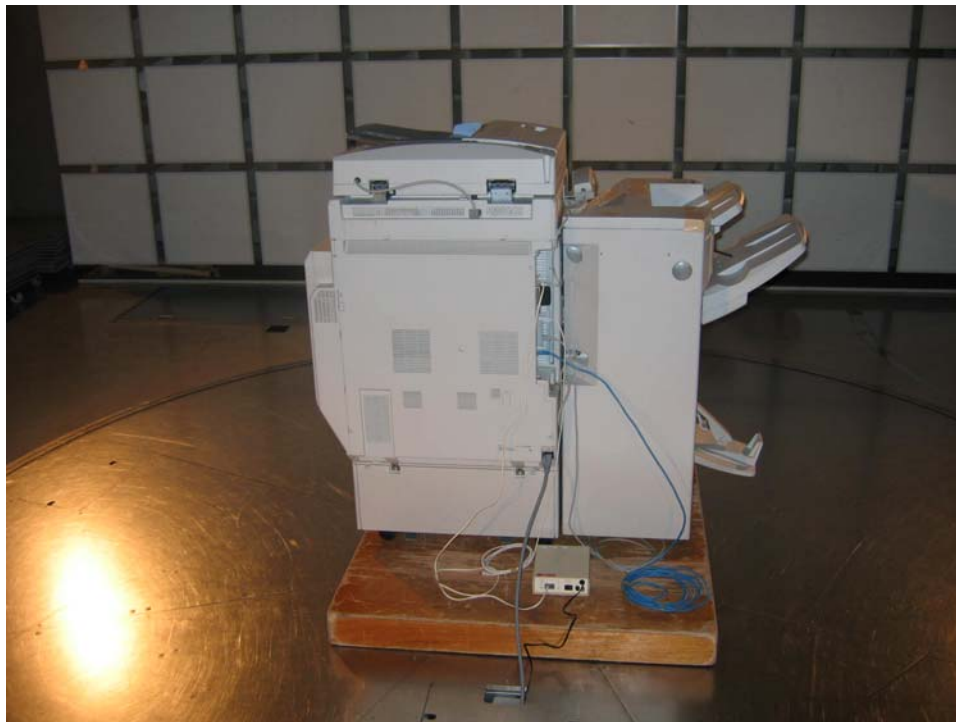
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## Radiated emission



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# DATA OF CONDUCTION TEST

UL Apex Co.,Ltd.  
YAMAKITA No.1 ANECHOIC CHAMBER  
Report No. : 261E0305-YK-1

Applicant : RICOH COMPANY, LTD.  
Kind of Equipment : Full-color MFP  
Model No. : Aficio MP C4500  
Serial No. : L906030056  
Power : AC120V/60Hz  
Mode : Transmitting (2412MHz)  
Remarks : With RF ID Transmitting  
Date : 5/10/2006  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 62 %  
Regulation : FCC Part15C § 15.207. (CISPR Pub. 22 )

Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μV]	AV [dB μV]	QP [dB μV]	AV [dB μV]				QP [dB]	AV [dB μV]	QP [dB μV]	AV [dB μV]	QP [dB]	AV [dB]
1.	0.1979	38.4	-	37.7	-	0.1	0.1	0.0	38.6	-	63.7	53.7	25.1	-
2.	0.2973	26.9	-	27.6	-	0.1	0.1	0.0	27.8	-	60.3	50.3	32.5	-
3.	0.6946	24.7	-	25.4	-	0.1	0.1	0.0	25.6	-	56.0	46.0	30.4	-
4.	1.0917	25.1	-	25.5	-	0.1	0.1	0.0	25.7	-	56.0	46.0	30.3	-
5.	2.5805	28.2	-	28.4	-	0.1	0.2	0.0	28.7	-	56.0	46.0	27.3	-
6.	6.9451	42.0	38.9	42.1	38.7	0.3	0.3	0.0	42.7	39.5	60.0	50.0	17.3	10.5
7	21.2125	27.2	-	21.8	-	0.8	0.6	0.0	28.6	-	60.0	50.0	31.4	-

READING + LISN FACTOR + CABLE LOSS + ATTEN.

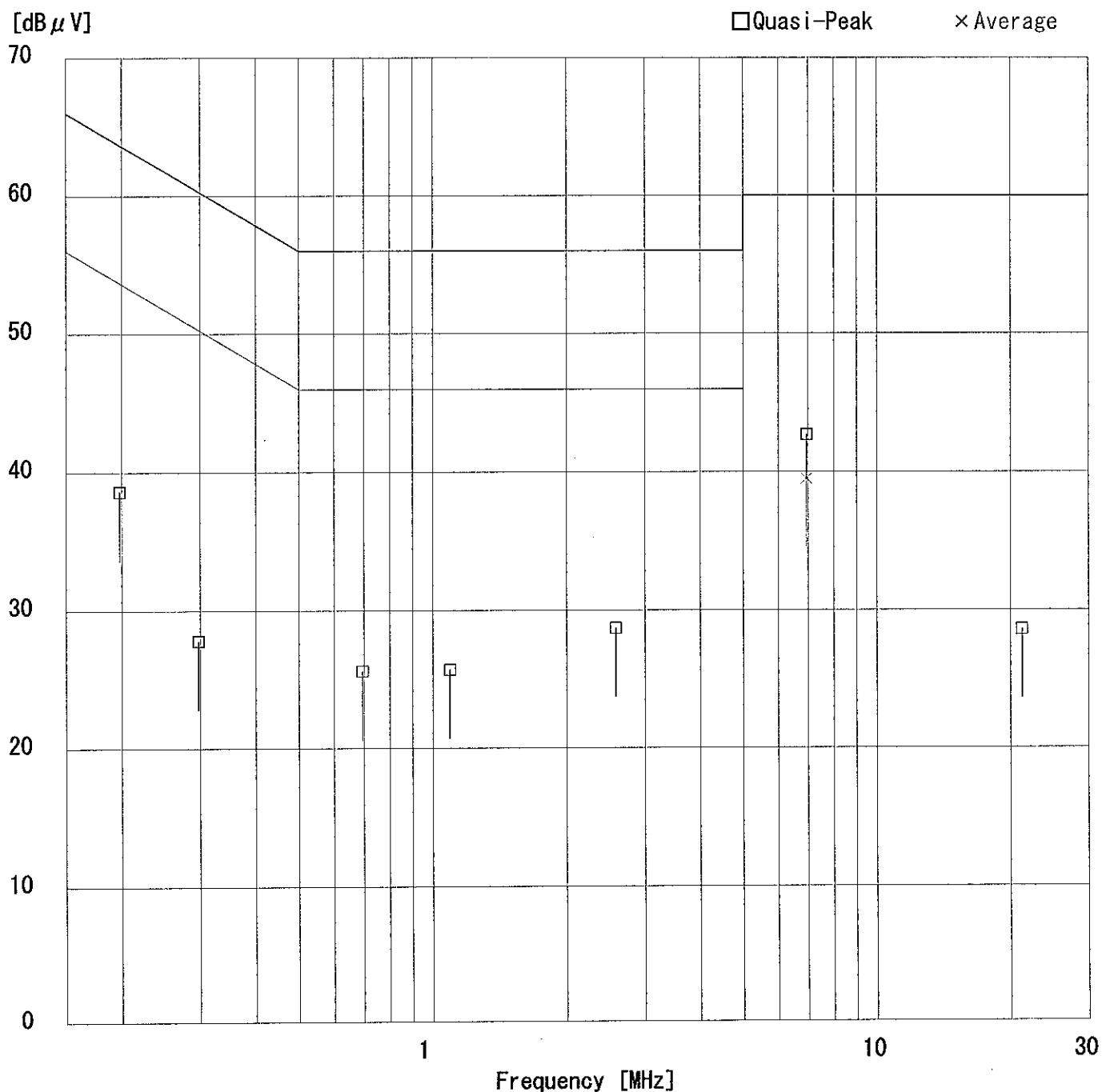
ISLK8126) ■ COAXIAL CABLE: KCC-33/34  
TR-01 (ES140)

# DATA OF CONDUCTION TEST

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Engineer : Toyokazu Imamura



# DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

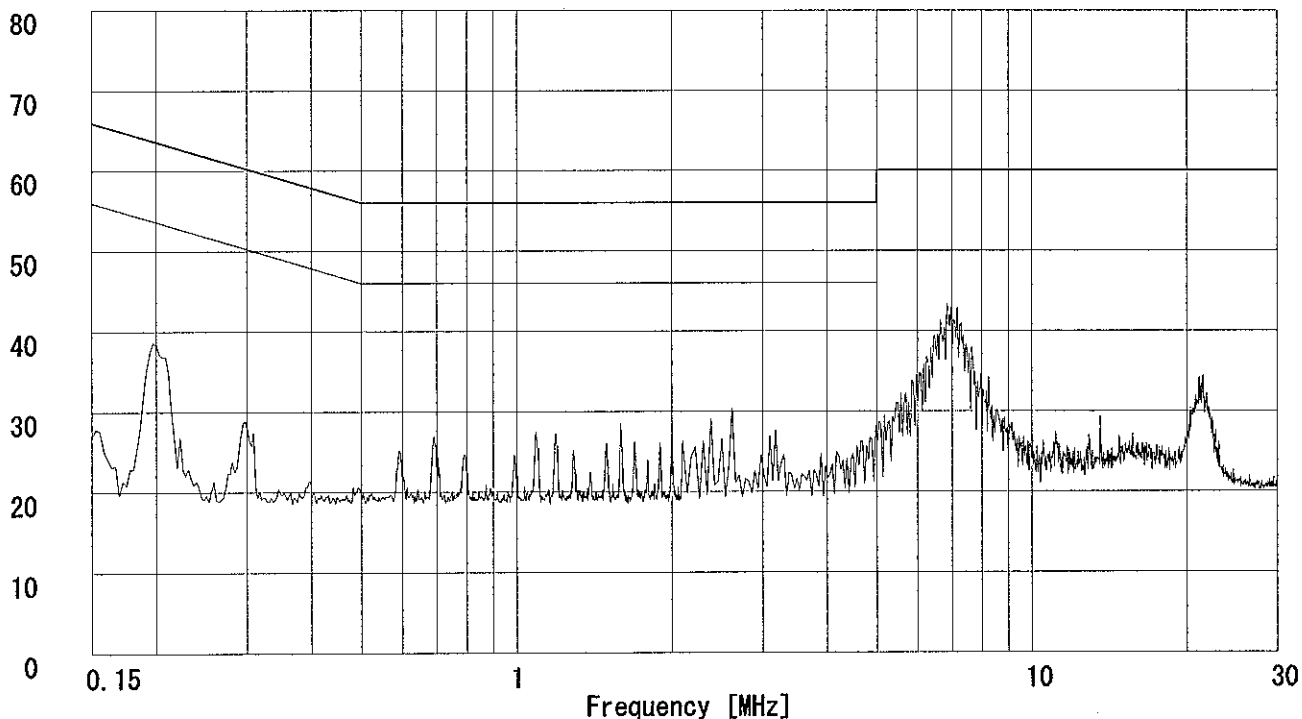
Report No. : 261E0305-YK-1

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Kind of Equipment : Full-color MFPⓂ  
Model No. : Aficio MP C4500Ⓜ  
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Power : AC120V/60Hz  
Mode : Transmitting (2412MHz)  
Remarks : With RF ID Transmitting  
Date : 5/10/2006  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 62 %  
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22 )  
Regulation 2 : None

Engineer : Toyokazu Imamura

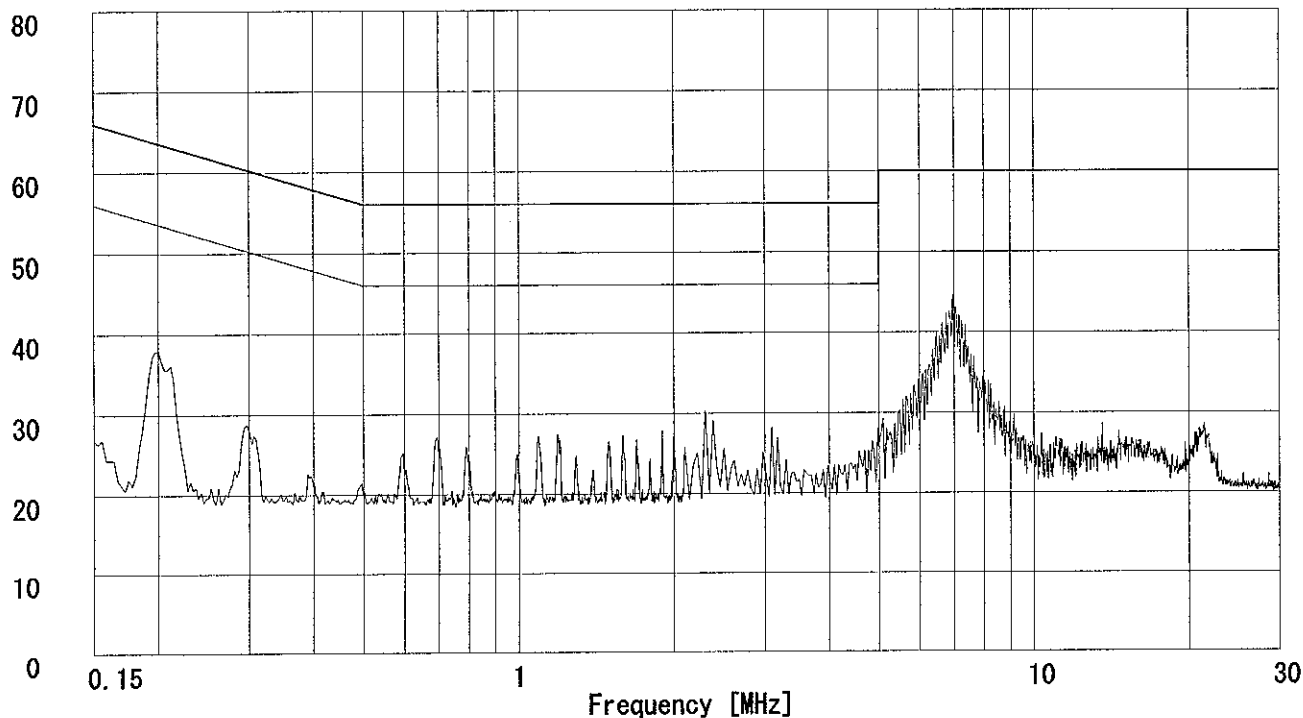
Emission Level [dB $\mu$ V]

PHASE:N



Emission Level [dB $\mu$ V]

PHASE:L1



# DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

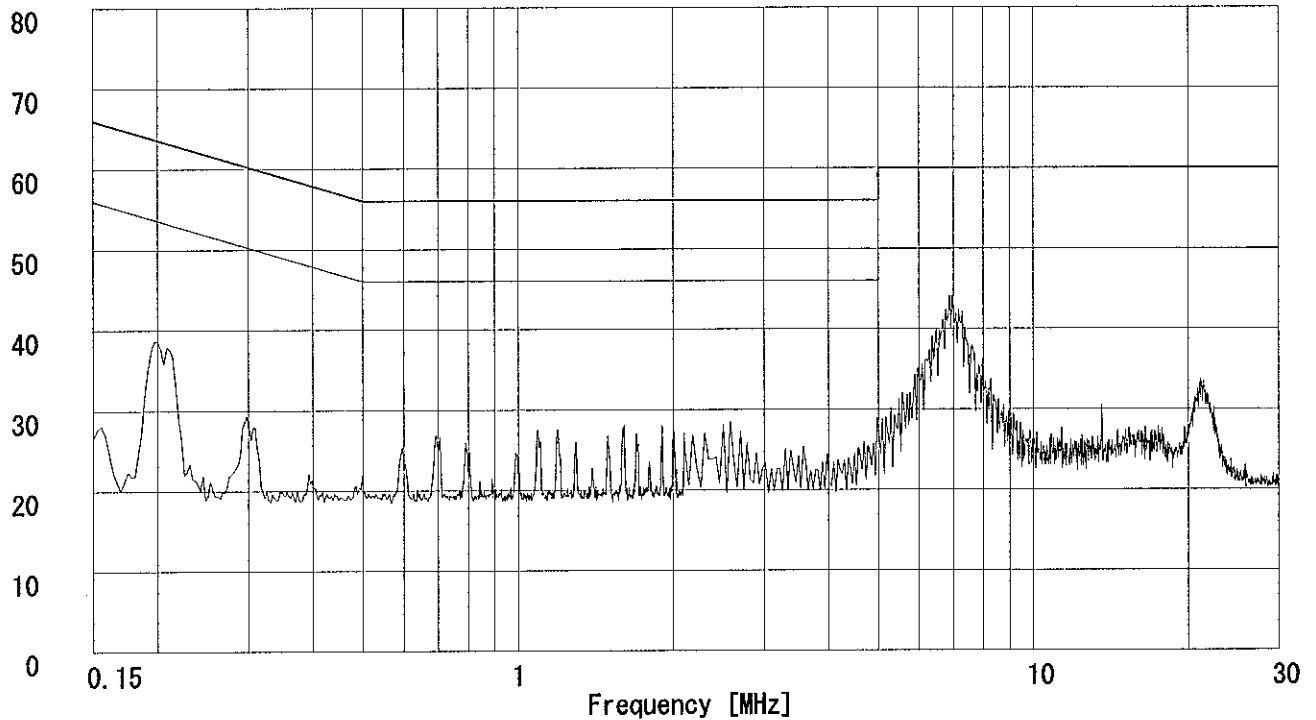
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Mode : Transmitting (2437MHz)  
Remarks : With RF ID Transmitting  
Date : 5/10/2006  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 62 %  
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22 )  
Regulation 2 : None

Engineer : Toyokazu Imamura

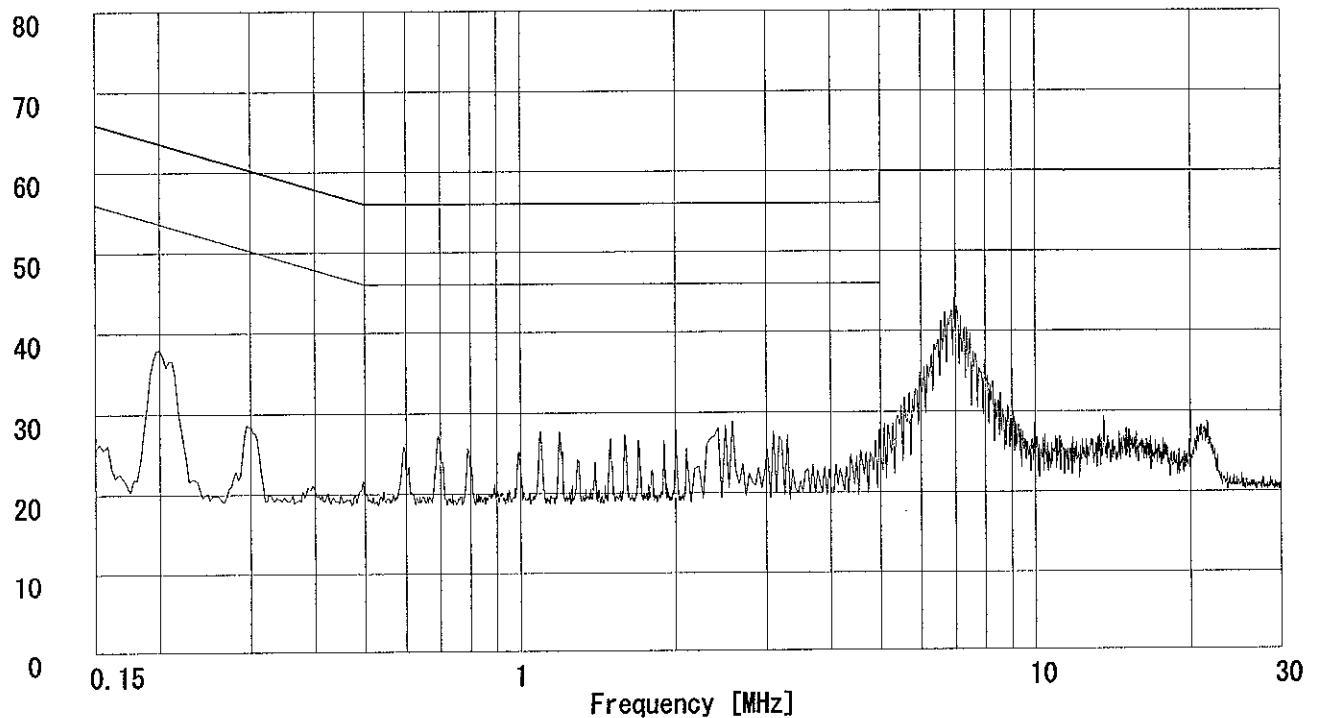
Emission Level [dB $\mu$ V]

PHASE:N



Emission Level [dB $\mu$ V]

PHASE:L1





# DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

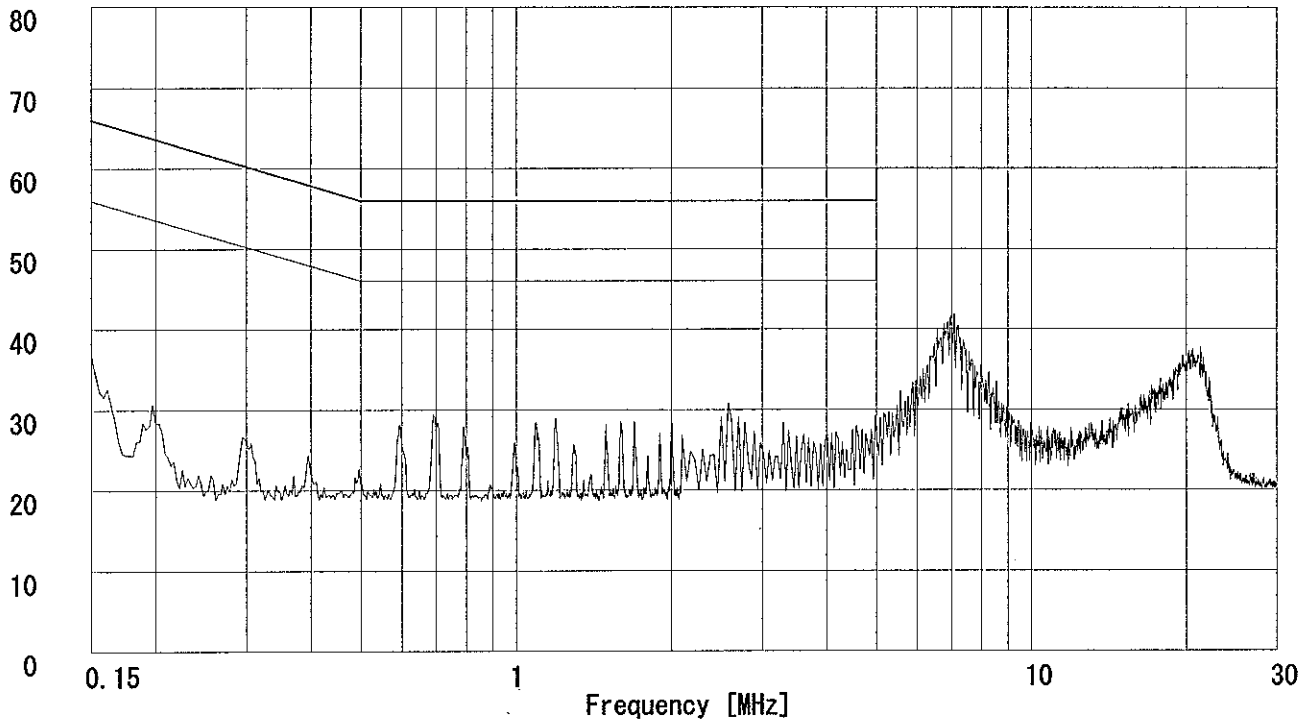
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Date : 5/10/2006  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 62 %  
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22 )  
Regulation 2 : None

Engineer : Toyokazu Imamura

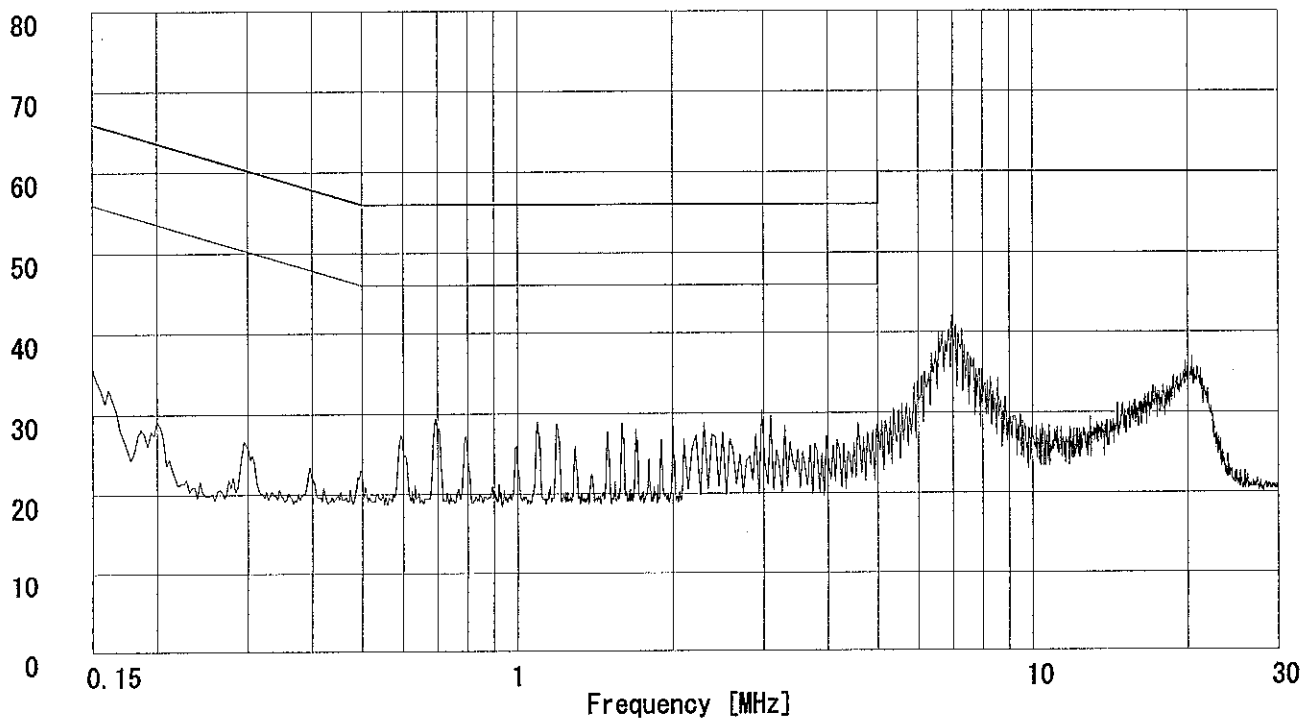
Emission Level [dB  $\mu$ V]

PHASE:N



Emission Level [dB  $\mu$ V]

PHASE:L1



# DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 261E0305-YK-1

Applicant : RICOH COMPANY, LTD.  
Kind of Equipment : Full-color MFP  
Model No. : Aficio MP C4500  
Serial No. : L906030056  
Power : AC120V/60Hz  
Mode : Transmitting (2412MHz)  
Remarks : With RF ID Transmitting  
Date : 5/10/2006  
Test Distance : 3 m  
Temperature : 24 °C  
Humidity : 66 %  
Regulation : FCC Part15C § 15.209

Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	33.22	BB	30.3	37.8	18.4	28.5	1.1	6.0	27.3	34.8	40.0	12.7	5.2
2.	49.95	BB	31.0	38.5	11.2	28.5	1.4	6.0	21.1	28.6	40.0	18.9	11.4
3.	52.61	BB	38.0	46.4	10.7	28.5	1.4	6.0	27.6	36.0	40.0	12.4	4.0
4.	88.48	BB	37.3	42.2	8.7	28.4	1.9	6.1	25.6	30.5	43.5	17.9	13.0
5.	94.91	BB	35.0	40.5	10.0	28.6	2.0	6.1	24.5	30.0	43.5	19.0	13.5
6.	203.39	BB	34.3	32.8	17.1	27.9	3.0	6.0	32.5	31.0	43.5	11.0	12.5
7.	227.38	BB	27.0	34.1	17.3	27.7	3.2	6.0	25.8	32.9	46.0	20.2	13.1
8.	412.86	BB	34.2	33.9	18.1	28.5	4.9	6.0	34.7	34.4	46.0	11.3	11.6
9.	449.98	BB	37.9	39.7	18.3	28.8	5.0	6.0	38.4	40.2	46.0	7.6	5.8
10.	481.68	BB	34.4	34.9	18.4	28.9	5.1	6.0	35.0	35.5	46.0	11.0	10.5
11.	500.06	BB	33.5	37.6	18.5	29.0	5.2	6.0	34.2	38.3	46.0	11.8	7.7
12.	550.49	BB	39.3	43.0	19.1	29.1	5.3	6.0	40.6	44.3	46.0	5.4	1.7
13.	688.12	BB	36.8	34.5	20.0	29.2	5.7	6.0	39.3	37.0	46.0	6.7	9.0

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299MHz/KLA-03 (USLP9143) 300-1000MHz

■ AMP: KAF-05 (8447D) ■ RECEIVER: KTR-01 (ES140) ■ KCC-30\_31\_32\_34 (RE)

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# DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 261E0305-YK-1

Applicant : RICOH COMPANY, LTD.  
Kind of Equipment : Full-color MFP  
Model No. : Aficio MP C4500  
Serial No. : L906030056  
Power : AC120V/60Hz  
Mode : Transmitting(2437MHz)  
Remarks : With RF ID Transmitting  
Date : 5/10/2006  
Test Distance : 3 m  
Temperature : 24 °C  
Humidity : 66 %  
Regulation : FCC Part15C § 15.209

Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	33.22	BB	30.0	37.2	18.4	28.5	1.1	6.0	27.0	34.2	40.0	13.0	5.8
2.	49.95	BB	31.0	39.0	11.2	28.5	1.4	6.0	21.1	29.1	40.0	18.9	10.9
3.	52.61	BB	38.0	46.6	10.7	28.5	1.4	6.0	27.6	36.2	40.0	12.4	3.8
4.	88.48	BB	37.2	46.2	8.7	28.4	1.9	6.1	25.5	34.5	43.5	18.0	9.0
5.	94.91	BB	32.5	40.8	10.0	28.6	2.0	6.1	22.0	30.3	43.5	21.5	13.2
6.	203.39	BB	31.3	31.4	17.1	27.9	3.0	6.0	29.5	29.6	43.5	14.0	13.9
7.	227.38	BB	26.9	33.0	17.3	27.7	3.2	6.0	25.7	31.8	46.0	20.3	14.2
8.	412.86	BB	33.2	34.7	18.1	28.5	4.9	6.0	33.7	35.2	46.0	12.3	10.8
9.	449.98	BB	37.6	37.2	18.3	28.8	5.0	6.0	38.1	37.7	46.0	7.9	8.3
10.	481.68	BB	32.5	36.0	18.4	28.9	5.1	6.0	33.1	36.6	46.0	12.9	9.4
11.	500.11	BB	31.8	36.9	18.5	29.0	5.2	6.0	32.5	37.6	46.0	13.5	8.4
12.	550.49	BB	37.6	43.2	19.1	29.1	5.3	6.0	38.9	44.5	46.0	7.1	1.5
13.	688.12	BB	32.0	30.1	20.0	29.2	5.7	6.0	34.5	32.6	46.0	11.5	13.4

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299MHz/KLA-03 (USLP9143) 300-1000MHz

■ AMP: KAF-05 (8447D) ■ RECEIVER: KTR-01 (ESI40) ■ KCC-30\_31\_32\_34 (RE)

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# DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 261E0305-YK-1

Applicant : RICOH COMPANY, LTD.  
 Kind of Equipment : Full-color MFP  
 Model No. : Aficio MP C4500  
 Serial No. : L906030056  
 Power : AC120V/60Hz  
 Mode : Transmitting (2462MHz)  
 Remarks : With RF ID Transmitting  
 Date : 5/9/2006  
 Test Distance : 3 m  
 Temperature : 24 °C  
 Humidity : 58 %  
 Regulation : FCC Part15C § 15.209

Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	33.22	BB	29.6	36.9	18.4	28.5	1.1	6.0	26.6	33.9	40.0	13.4	6.1
2.	49.95	BB	29.8	43.4	11.2	28.5	1.4	6.0	19.9	33.5	40.0	20.1	6.5
3.	58.72	BB	37.5	42.7	9.4	28.5	1.5	6.0	25.9	31.1	40.0	14.1	8.9
4.	88.48	BB	35.9	40.6	8.7	28.4	1.9	6.1	24.2	28.9	43.5	19.3	14.6
5.	94.91	BB	38.3	42.9	10.0	28.6	2.0	6.1	27.8	32.4	43.5	15.7	11.1
6.	203.39	BB	33.6	30.0	17.1	27.9	3.0	6.0	31.8	28.2	43.5	11.7	15.3
7.	227.38	BB	32.0	33.3	17.3	27.7	3.2	6.0	30.8	32.1	46.0	15.2	13.9
8.	412.86	BB	35.0	36.6	18.1	28.5	4.9	6.0	35.5	37.1	46.0	10.5	8.9
9.	449.98	BB	39.9	40.2	18.3	28.8	5.0	6.0	40.4	40.7	46.0	5.6	5.3
10.	481.68	BB	32.1	38.6	18.4	28.9	5.1	6.0	32.7	39.2	46.0	13.3	6.8
11.	500.12	BB	31.4	36.8	18.5	29.0	5.2	6.0	32.1	37.5	46.0	13.9	8.5
12.	550.49	BB	40.9	41.8	19.1	29.1	5.3	6.0	42.2	43.1	46.0	3.8	2.9
13.	688.12	BB	38.2	35.3	20.0	29.2	5.7	6.0	40.7	37.8	46.0	5.3	8.2

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299MHz/KLA-03 (USLP9143) 300-1000MHz

■ AMP: KAF-05 (8447D) ■ RECEIVER: KTR-01 (ES140) ■ KCC-30\_31\_32\_34 (RE)

Page:

# DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 261E0305-YK-1

Applicant : RICOH COMPANY, LTD.  
 Kind of Equipment : Full-color MFP  
 Model No. : Aficio MP C4500  
 Serial No. : L906030056  
 Power : AC120V/60Hz  
 Mode : Transmitting (2412MHz)  
 Remarks : With RF ID Transmitting PK Detector RBW:1MHz, VBW:1MHz  
 Date : 5/9/2006  
 Test Distance : 3 m  
 Temperature : 24 °C  
 Humidity : 58 %  
 Regulation : FCC Part15BC § 15. 209 (a) (PK) 1-18GHz:3m/18-40GHz:1m

Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	1228.35	BB	50.7	51.9	24.6	37.4	3.1	10.0	51.0	52.2	74.0	23.0	21.8
2.	2390.00	BB	57.9	55.0	28.7	36.8	4.0	9.9	63.7	60.8	74.0	10.3	13.2
3.	2397.49	BB	65.7	64.2	28.7	36.8	4.0	9.9	71.5	70.0	74.0	2.5	4.0
4.	2400.00	BB	65.1	63.5	28.7	36.8	4.0	9.9	70.9	69.3	74.0	3.1	4.7
5.	4824.00	BB	44.6	44.8	32.9	37.1	5.8	0.5	46.7	46.9	74.0	27.3	27.1
6.	7236.00	BB	55.8	58.1	36.5	36.9	6.6	0.5	62.5	64.8	74.0	11.5	9.2
7.	9648.00	BB	45.1	44.5	38.4	37.0	7.6	1.0	55.1	54.5	74.0	18.9	19.5
8.	12060.00	BB	42.8	43.4	40.6	36.1	9.0	0.5	56.8	57.4	74.0	17.2	16.6
9.	16884.00	BB	44.4	44.5	42.3	34.2	9.7	0.4	62.6	62.7	74.0	11.4	11.3
10.	19296.00	BB	44.2	44.8	40.9	33.8	10.2	0.0	61.5	62.1	83.5	22.0	21.4
11.	21708.00	BB	44.7	43.9	40.6	33.4	10.8	0.0	62.7	61.9	83.5	20.8	21.6
12.	24120.00	BB	44.3	44.6	40.6	33.2	11.5	0.0	63.2	63.5	83.5	20.3	20.0

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■CABLE:KCC-D3/D7■PREAMP:KAF-02 (8449B) ■SPECTRUMANALYZER:KTR-01 (ES140)

# DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 261E0305-YK-1

Applicant : RICOH COMPANY, LTD.  
 Kind of Equipment : Full-color MFP  
 Model No. : Aficio MP C4500  
 Serial No. : L906030056  
 Power : AC120V/60Hz  
 Mode : Transmitting (2412MHz)  
 Remarks : With RF ID Transmitting AV Detector RBW:1MHz, VBW:10Hz  
 Date : 5/9/2006  
 Test Distance : 3 m  
 Temperature : 24 °C Engineer : Toyokazu Imamura  
 Humidity : 58 %  
 Regulation : FCC Part15C § 15. 209 (a) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	1228.35	BB	37.0	37.0	24.6	37.4	3.1	10.0	37.3	37.3	54.0	16.7	16.7
2.	2390.00	BB	33.1	33.3	28.7	36.8	4.0	9.9	38.9	39.1	54.0	15.1	14.9
3.	2397.49	BB	34.3	34.1	28.7	36.8	4.0	9.9	40.1	39.9	54.0	13.9	14.1
4.	2400.00	BB	33.6	33.2	28.7	36.8	4.0	9.9	39.4	39.0	54.0	14.6	15.0
5.	4824.00	BB	32.1	32.4	32.9	37.1	5.8	0.5	34.2	34.5	54.0	19.8	19.5
6.	7236.00	BB	32.8	32.7	36.5	36.9	6.6	0.5	39.5	39.4	54.0	14.5	14.6
7.	9648.00	BB	32.2	32.4	38.4	37.0	7.6	1.0	42.2	42.4	54.0	11.8	11.6
8.	12060.00	BB	31.0	31.2	40.6	36.1	9.0	0.5	45.0	45.2	54.0	9.0	8.8
9.	16884.00	BB	32.5	32.5	42.3	34.2	9.7	0.4	50.7	50.7	54.0	3.3	3.3
10.	19296.00	BB	32.4	32.3	40.9	33.8	10.2	0.0	49.7	49.6	63.5	13.8	13.9
11.	21708.00	BB	32.6	32.6	40.6	33.4	10.8	0.0	50.6	50.6	63.5	12.9	12.9
12.	24120.00	BB	32.7	32.7	40.6	33.2	11.5	0.0	51.6	51.6	63.5	11.9	11.9

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE:KCC-D3/D7 ■ PREAMP:KAF-02 (8449B) ■ SPECTRUMANALYZER:KTR-01 (ES140)

# DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 261E0305-YK-1

Applicant : RICOH COMPANY, LTD.  
 Kind of Equipment : Full-color MFP  
 Model No. : Aficio MP C4500  
 Serial No. : L906030056  
 Power : AC120V/60Hz  
 Mode : Transmitting (2437MHz)  
 Remarks : With RF ID Transmitting PK Detector RBW:1MHz, VBW:1MHz  
 Date : 5/9/2006  
 Test Distance : 3 m  
 Temperature : 24 °C Engineer : Toyokazu Imamura  
 Humidity : 58 %  
 Regulation : FCC Part15BC § 15. 209 (a) (PK) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	1229.74	BB	51.8	51.4	24.6	37.4	3.1	10.0	52.1	51.7	74.0	21.9	22.3
2.	4874.00	BB	44.5	44.5	33.1	37.2	5.8	0.5	46.7	46.7	74.0	27.3	27.3
3.	7311.00	BB	55.9	60.5	36.6	37.0	6.7	0.5	62.7	67.3	74.0	11.3	6.7
4.	9748.00	BB	44.9	44.3	38.4	37.0	7.6	0.9	54.8	54.2	74.0	19.2	19.8
5.	12185.00	BB	42.9	43.5	40.5	35.9	8.9	0.5	56.9	57.5	74.0	17.1	16.5
6.	14622.00	BB	44.6	44.3	43.0	34.1	9.3	0.7	63.5	63.2	74.0	10.5	10.8
7.	17059.00	BB	44.2	44.7	43.1	34.0	9.7	0.4	63.4	63.9	74.0	10.6	10.1
8.	19496.00	BB	43.3	44.5	40.9	34.4	10.2	0.0	60.0	61.2	83.5	23.5	22.3
9.	21933.00	BB	45.7	45.7	40.7	33.7	11.0	0.0	63.7	63.7	83.5	19.8	19.8
10.	24370.00	BB	44.1	45.1	40.7	33.1	11.5	0.0	63.2	64.2	83.5	20.3	19.3

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KTR-01 (ES140)

# DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 261E0305-YK-1

Applicant : RICOH COMPANY, LTD.  
 Kind of Equipment : Full-color MFP  
 Model No. : Aficio MP C4500  
 Serial No. : L906030056  
 Power : AC120V/60Hz  
 Mode : Transmitting (2437MHz)  
 Remarks : With RF ID Transmitting AV Detector RBW:1MHz, VBW:10Hz  
 Date : 5/9/2006  
 Test Distance : 3 m  
 Temperature : 24 °C Engineer : Toyokazu Imamura  
 Humidity : 58 %  
 Regulation : FCC Part15C § 15. 209 (a) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER					HOR [dB μV/m]	VER		HOR [dB]	VER
1.	1229.74	BB	36.8	36.9	24.6	37.4	3.1	10.0	37.1	37.2	54.0	16.9	16.8
2.	4874.00	BB	32.0	32.4	33.1	37.2	5.8	0.5	34.2	34.6	54.0	19.8	19.4
3.	7311.00	BB	32.5	32.5	36.6	37.0	6.7	0.5	39.3	39.3	54.0	14.7	14.7
4.	9748.00	BB	32.2	32.4	38.4	37.0	7.6	0.9	42.1	42.3	54.0	11.9	11.7
5.	12185.00	BB	30.9	31.2	40.5	35.9	8.9	0.5	44.9	45.2	54.0	9.1	8.8
6.	14622.00	BB	32.6	32.6	43.0	34.1	9.3	0.7	51.5	51.5	54.0	2.5	2.5
7.	17059.00	BB	32.5	32.6	43.1	34.0	9.7	0.4	51.7	51.8	54.0	2.3	2.2
8.	19496.00	BB	32.6	32.5	40.9	34.4	10.2	0.0	49.3	49.2	63.5	14.2	14.3
9.	21933.00	BB	34.0	33.8	40.7	33.7	11.0	0.0	52.0	51.8	63.5	11.5	11.7
10.	24370.00	BB	33.0	32.9	40.7	33.1	11.5	0.0	52.1	52.0	63.5	11.4	11.5

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■CABLE:KCC-D3/D7■PREAMP:KAF-02 (8449B) ■SPECTRUMANALYZER:KTR-01 (ES140)

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# DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 261E0305-YK-1

Applicant : RICOH COMPANY, LTD.  
 Kind of Equipment : Full-color MFP  
 Model No. : Aficio MP C4500  
 Serial No. : L906030056  
 Power : AC120V/60Hz  
 Mode : Transmitting (2462MHz)  
 Remarks : With RF ID Transmitting PK Detector RBW:1MHz, VBW:1MHz  
 Date : 5/9/2006  
 Test Distance : 3 m  
 Temperature : 24 °C Engineer : Toyokazu Imamura  
 Humidity : 58 %  
 Regulation : FCC Part15BC § 15. 209 (a) (PK) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	1230.41	BB	50.4	51.8	24.6	37.4	3.1	10.0	50.7	52.1	74.0	23.3	21.9
2.	2483.50	BB	54.5	55.0	28.8	36.8	4.0	9.9	60.4	60.9	74.0	13.6	13.1
3.	4924.00	BB	43.4	43.3	33.2	37.3	5.8	0.4	45.5	45.4	74.0	28.5	28.6
4.	7386.00	BB	53.7	56.5	36.8	37.0	6.7	0.5	60.7	63.5	74.0	13.3	10.5
5.	9848.00	BB	43.9	43.9	38.5	36.9	7.6	0.9	54.0	54.0	74.0	20.0	20.0
6.	12310.00	BB	43.6	43.5	40.4	35.6	8.7	0.5	57.6	57.5	74.0	16.4	16.5
7.	14772.00	BB	43.3	43.5	42.6	34.5	9.4	0.7	61.5	61.7	74.0	12.5	12.3
8.	17234.00	BB	43.2	44.4	43.9	34.1	9.7	0.3	63.0	64.2	74.0	11.0	9.8
9.	19696.00	BB	43.2	43.7	40.9	34.1	10.3	0.0	60.3	60.8	83.5	23.2	22.7
10.	22158.00	BB	44.1	45.8	40.8	33.4	11.1	0.0	62.6	64.3	83.5	20.9	19.2
11.	24620.00	BB	45.2	45.5	40.8	33.2	11.6	0.0	64.4	64.7	83.5	19.1	18.8

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KTR-01 (ES140)

# DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 261E0305-YK-1

Applicant : RICOH COMPANY, LTD.  
 Kind of Equipment : Full-color MFP  
 Model No. : Aficio MP C4500  
 Serial No. : L906030056  
 Power : AC120V/60Hz  
 Mode : Transmitting (2462MHz)  
 Remarks : With RF ID Transmitting AV Detector RBW:1MHz, VBW:10Hz  
 Date : 5/9/2006  
 Test Distance : 3 m  
 Temperature : 24 °C  
 Humidity : 58 %  
 Regulation : FCC Part15C § 15. 209 (a) 1-18GHz:3m/18-40GHz:1m  
 Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER					HOR [dB μV/m]	VER		HOR [dB]	VER
1.	1230.41	BB	36.4	37.0	24.6	37.4	3.1	10.0	36.7	37.3	54.0	17.3	16.7
2.	2483.50	BB	33.6	33.1	28.8	36.8	4.0	9.9	39.5	39.0	54.0	14.5	15.0
3.	4924.00	BB	32.6	32.1	33.2	37.3	5.8	0.4	34.7	34.2	54.0	19.3	19.8
4.	7386.00	BB	32.6	32.5	36.8	37.0	6.7	0.5	39.6	39.5	54.0	14.4	14.5
5.	9848.00	BB	32.0	31.9	38.5	36.9	7.6	0.9	42.1	42.0	54.0	11.9	12.0
6.	12310.00	BB	31.5	31.5	40.4	35.6	8.7	0.5	45.5	45.5	54.0	8.5	8.5
7.	14772.00	BB	32.3	32.3	42.6	34.5	9.4	0.7	50.5	50.5	54.0	3.5	3.5
8.	17234.00	BB	32.3	32.3	43.9	34.1	9.7	0.3	52.1	52.1	54.0	1.9	1.9
9.	19696.00	BB	32.5	32.5	40.9	34.1	10.3	0.0	49.6	49.6	63.5	13.9	13.9
10.	22158.00	BB	33.6	33.6	40.8	33.4	11.1	0.0	52.1	52.1	63.5	11.4	11.4
11.	24620.00	BB	33.6	33.1	40.8	33.2	11.6	0.0	52.8	52.3	63.5	10.7	11.2

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: KTR-01 (ES140)

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### APPENDIX 3 Test Instruments

#### EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
YA-CE	Conducted emission(software)	UL-Apex	CE(Ver.1.6)	CE	-
YA-RE	Radiated emission(software)	UL-Apex	RE(Ver.1.5)	RE	-
KAEC-01(NSA)	Anechoic Chamber	JSE	Semi 3m	CE/RE	2005/09/03 * 12
KAF-05	Pre Amplifier	Agilent	8447D	RE	2006/04/21 * 12
KAT6-01	Attenuator	INMET	18N-6dB	RE	2006/03/24 * 12
KBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2006/01/17 * 12
KCC-30/31/32/34/KRM-03	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	5D-2W/S04272B/RF M-E421	RE	2005/12/22 * 12
KCC-33/34/KRM-03	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	5D-2W/S04272B/RF M-E421	CE	2005/12/22 * 12
KLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2006/01/17 * 12
KLS-01	LISN(AMN)	Schwarzbeck	NSLK8126	CE (EUT)	2006/04/19 * 12
KLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	CE	2005/10/12 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	CE/RE	2005/09/13 * 12
KTR-01	Test Receiver	Rohde & Schwarz	ESI40	CE/RE	2005/08/05 * 12
KOS-02	Digital Humidity Indicator	Custom	CTH-190	CE/RE	2004/07/22 * 24
KTM-02	Terminator	TME	CT-01BP	CE	2006/03/24 * 12
KAF-02	Pre Amplifier	Hewlett Packard	8449B	RE	2006/04/24 * 12
KAT10-S1	Attenuator	Agilent	8449D 010	RE	2006/04/11 * 12
KCC-D3/D7	Coaxial Cable	Rosenberger/Advantest	2201/JUN-08-01-061	RE	2006/04/11 * 12
KCC-D7	Coaxial Cable	Advantest	A01002	RE	2006/04/11 * 12
KFL-01	Highpass Filter	Hewlett Packard	84300 80038	RE	2006/04/11 * 12
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	RE	2005/08/20 * 12
KHA-03	Horn Antenna	EMCO	3160-09	RE	2006/04/10 * 12

All equipment is calibrated with traceable calibrations . Each calibration is traceable to the national or international standards .

Test Item :

CE: Conducted emission,

RE: Radiated emission