



RADIO TEST REPORT

Test Report No.: 28FE0088-YK-A

Applicant : RICOH COMPANY, LTD.
Type of Equipment : Color Laser Printer
Model No. : Pro C900
FCC ID : BBP-RFAEG01
Test regulation : FCC Part15 Subpart C: 2008
Test result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.

Date of test: January 22, 23, 24 and 25, 2008

Tested by:

F. Matsuo
Fumiaki Matsuo

&

T. Arai
Tatsuya Arai

Approved by:

O. Watatani
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1 Applicant Information

Company Name : RICOH COMPANY, LTD.
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Facsimile Number : +81-46-231-9183
Contact Person : Shinji Okada

2 Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Color Laser Printer
Model No. : Pro C900
Serial No. : 48BE-010012
Rating : AC208-240V, 50/60Hz
Country of Manufacture : Japan
Receipt Date of Sample : January 21, 2008
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No modification by the test lab.

2.2 Product Description

Model: Pro C900 (referred to as the EUT in this report) is a Color Laser Printer.
Model: Pro C900S, Color Copier is an equivalent model of the EUT.
The only difference is scanning function. Pro C900S has scanner, but Pro C900 has no scanner.

Equipment type : Transceiver
Frequency of operation : 13.56MHz
Clock frequency : 13.56MHz
Bandwidth & channel spacing : 3.71kHz
Type of modulation : ASK
Antenna type : Print pattern antenna
Antenna connector type : None
ITU code : A1D
Operation temperature range : +10 ~ +32 deg.C.

*FCC Part15.31 (e)

Host device provides the RFID Module with stable power supply, and the power is not changed when voltage of the printer 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.

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3 Test Specification, Procedures and Results

3.1 Test specification

Test specification : FCC Part15 Subpart C: 2008, final revised on January 30, 2008
 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 15.215: Additional provisions to the general radiated emission limitations
 Section 15.225: Operation within the band 13.110-14.010MHz

*The revision on January 30, 2008 does not influence the test specification applied to the EUT.

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	FCC 15.207	-	N/A	4.5dB (2.5859MHz, AV, Tx Module C)	Complied
Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.225 (a)	Radiated	N/A	80.5dB (Horizontal, Tx Module Y)	Complied
Electric Field Strength of Outside the Allocated bands	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.225 (b) (c)	Radiated	N/A	36.7dB (13.110MHz, Horizontal, Tx Module C)	Complied
Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC15.209, FCC 15.225 (d)	Radiated	N/A	5.9dB (373.61MHz, Vertical, Tx Module Y)	Complied
20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC15.215(c)	Radiated	N/A	-	Complied
Frequency Tolerance	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC15.225 (e)	Radiated	N/A	-	Complied

Note: UL Japan's EMI Work Procedures No.QPM05 and QPM15.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2003 13. Measurement of intentional radiators RSS-Gen 4.6.1	RSS-Gen 4.6.1	Conducted	-	Complied

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

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3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

	No.1 open site (±)	No.2 open site (±)	No.1 anechoic chamber (±)
Conducted emission			
150kHz-30MHz	2.8 dB	2.8 dB	2.8 dB
Radiated emission (3m)			
<30MHz	2.3 dB	2.3 dB	2.2 dB
30-300MHz	4.5 dB	4.4 dB	4.5 dB
300-1000MHz	4.3 dB	4.3 dB	4.3 dB

Frequency tolerance	(±)
	0.000014MHz

Conducted Emission Test

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

Radiated Emission Test

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

3.5 Test Location

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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. : 2973B-1

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. : 2973B-3

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. : 2973B-2

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 Semi-anechoic chamber	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5		
No.3 shielded room	4.0 x 5.0 x 2.7		

Open test site	Maximum measurement distance
No.1 open test site	30m
No.2 open test site	10m

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4 System Test Configuration

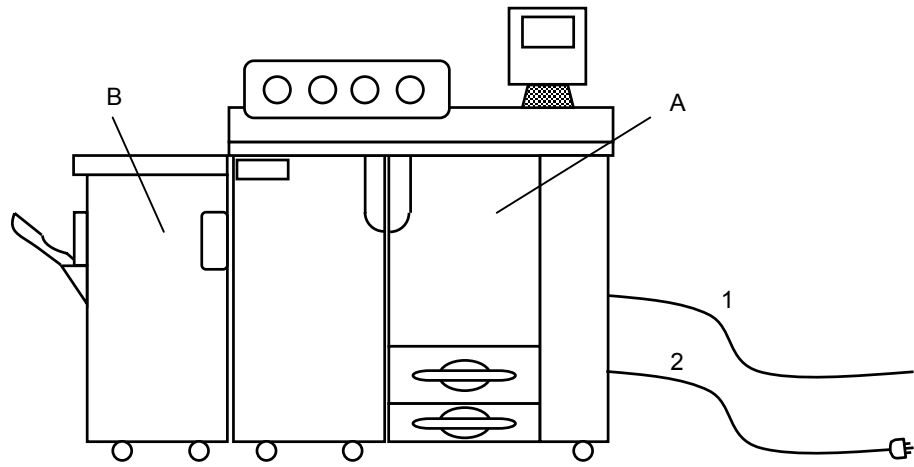
4.1 Justification

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

Operation: Transmitting (13.56MHz)

Four RFID modules, which identify each color toner (Y: Yellow, M: Magenta, C: Cyan, K: Black), are mounted in the equipment and they don't have simultaneous transmitting function. They were tested separately. ID tag was mounted in the ribbon inside of the EUT to communicate with each module.

4.2 Configuration of Tested System



AC240V/60Hz

* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Color Laser Printer	Pro-C900	48BE-010012	RICOH	EUT
B	VICTRIA-E (Finisher)	SR5000	3L33-110715	RICOH	EUT

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	LAN cable	5.0	Unshielded	Unshielded	-
2	AC cable	4.8	Unshielded	Unshielded	-

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5 Conducted Emissions

5.1 Operating environment

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

5.2 Test configuration

EUT was placed on a carpet for insulating above the conducting ground plane. EUT was located 80cm from a Line Impedance Stabilization Network (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 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

Date : January 24, 2008 Test engineer : Fumiaki Matsuo

6 Radiated Emissions (Fundamental, Spurious and Outside the Allocated bands)

6.1 Operating environment

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

6.2 Test configuration

EUT was placed on a carpet for insulating above the conducting ground plane. A drawing of the set up is shown in the photos of Appendix 1.

6.3 Test conditions

Frequency range : 9kHz - 1GHz
 Test distance : 3m
 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.

Frequency: From 9kHz to 30MHz at distance 3m

The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
 The measurements were performed for each antenna angle 0deg., 45deg. and 90deg.

Frequency: From 30MHz to 1GHz at distance 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.

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

The radiated emission measurements were made with the following detector function of the test receiver.

	9kHz to 90kHz & 110kHz to 150kHz	90kHz to 110kHz	150kHz to 490kHz	490kHz to 30MHz	30MHz to 1GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz
Measuring antenna	Loop antenna				Biconical (30-299.99MHz) Logperiodic (300MHz-1GHz)

* Part 15 Section 15.31 (f)(2) (9kHz-30MHz)

9kHz – 490kHz [Limit at 3m]= [Limit at 300m]-40log (3[m]/300[m])

490kHz – 30MHz [Limit at 3m]= [Limit at 30m]-40log (3[m]/30[m])

6.6 Results

Summary of the test results : Pass *No noise was detected above the 5th order harmonics.

Date : January 23 and 24, 2008 Test engineer : Fumiaki Matsuo

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7 20dB Bandwidth & Occupied Bandwidth (99%)

Test Procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength.

Summary of the test results: Pass

Date : January 22, 2008 Test engineer : Tatsuya Arai

8 Frequency Tolerance

Test Procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength.

The temperature test was started after the temperature stabilization time of 30 minutes. For the test, the module Y was chosen to put into measurement representatively.

Summary of the test results: Pass

Date : January 25, 2008 Test engineer : Fumiaki Matsuo

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APPENDIX 1: Photographs of test setup

Page 11 : Conducted emission
Page 12 : Radiated emission

APPENDIX 2: Test Data

Page 13 - 24 : Conducted Emission
Page 15 - 36 : Radiated Emission
15-28 : Fundamental and Outside the Allocated bands
29-36 : Spurious emission
Page 37 - 40 : Bandwidth
Page 41 - 43 : Frequency Tolerance

APPENDIX 3: Test instruments

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