



EMI TEST REPORT

Test Report No. : 24LE0170-HO-1

Applicant : Oki Data Corporation
Type of Equipment : Embedded RFID Read/Write System
Model No. : RX4004A
Test standard : FCC Part 15 Subpart C : 2004
Section 15.207 and 15.225
FCC ID : B2K-RX4004A
Test Result : Complied

1. This test report shall not be reproduced in full or partial, 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 report are traceable to the national or international standards.

Date of test:

August 30 to October 5, 2004

Tested by:

K. Adachi

Kenichi Adachi
EMC Service

Tested by :

H. Umeyama

Hiroka Umeyama
EMC Service

Approved by :

Naoki Sakamoto

Naoki Sakamoto
Group Leader of
EMC Service

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

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SECTION 1: Client information

Company Name : Oki Data Corporation
Brand or Trade name : Oki Data Corporation
Address : 3-1, Futaba-cho, Takasaki-shi, Gunma, 370-8585 Japan
Telephone Number : +81-27-328-6183
Facsimile Number : +81-27-328-6396
Contact Person : Toshikazu Ito

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

2.1 Identification of E.U.T.

Type of Equipment : Embedded RFID Read/Write System
Model No. : RX4004A
Serial No. : 1) 1
for Radiated Emission Test
2) 8
for other tests
Rating : DC 5.0V (Printer : AC 120V / 60Hz)
Country of Manufacture : Japan / China
Receipt Date of Sample : August 18, 2004
Condition of EUT : Production model
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: RX4004A is the Embedded RFID Read/Write System for Printer.

Equipment Type : Transceiver
Frequency of Operation : 13.56 MHz
Type of modulation : ASK
Power control : No
Mode of operation : Simplex
Antenna Type : Loop coil antenna (area < 0.05m²)
Method of Frequency Generation : Crystal
Operating voltage (inner) : DC 3.3V
Operating Temperature : 0 deg. C. to +50 deg. C.

FCC 15.31 (e)

This EUT provides stable voltage(DC3.3V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2004

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.225 : Operation within the band 13.110-14.010MHz

* The full port test filled all available ports was performed at the FCC Part15 SubpartB:DoC.

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A	15.9dB, AV 0.2036MHz	Complied
2	Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.225(a)	Radiated	N/A	*See data.	Complied
3	Spectrum Mask	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.225(b)(c)	Radiated	N/A	*See data.	Complied
4	-20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.215(c)	Radiated	N/A	*See data.	Complied
5	Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.209, Section 15.225 (d)	Radiated	N/A	6.8dB 46.12MHz Vertical	Complied
6	Frequency Tolerance	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.225(e)	Radiated	N/A	*See data.	Complied

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

Uncertainty:

*In case of the margin below the EMC Head Office's uncertainty.

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

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is ± 1.3 dB.

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Loop antenna is ± 1.9 dB(3m)/ ± 1.8 dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ± 4.5 dB(3m)/ ± 4.7 dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ± 5.2 dB(3m)/ ± 3.8 dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ± 6.6 dB.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is ± 3.0 dB.

*These tests were performed without any deviations from test procedure except for additions or exclusions.

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3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004 + Amendment4: 2004	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004 + Amendment4: 2004	Conducted	N/A	N/A	N/A

3.4 Confirmation

UL Apex Co., Ltd. hereby confirms that E.U.T., in the configuration tested, complies with the specifications
FCC Part 15 Subpart C: 2004 Section 15.225.

3.5 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	Listed date (for FCC)	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	February 01, 2002	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	June 05, 2002	846015	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 measurement room	-	-	-	3.1 x 5.0 x 2.7m	N/A	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1 and No.2 semi-anechoic and No.3 shielded room.

3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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SECTION 4: Operation of E.U.T. during testing

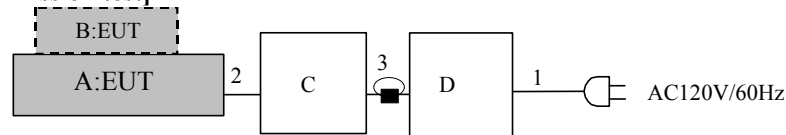
4.1 Operating Modes

The EUT was operated in a manner similar to typical use during the tests.

The mode is used : Transmitting mode
* ID Tag is in continuously transmitting mode during the tests.

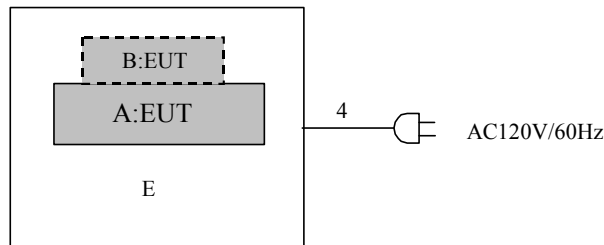
Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration and peripherals [for Radiated Emission test]



[for other tests]

■: Ferrite Core



* Cabling was taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID	Remarks
A	Embedded RFID Read/Write System	RX4004A	1 *1) 8 *2)	Oki Data Corporation	B2K-RX4004A	EUT
B	ID Tag	N/A	N/A	Oki Data Corporation	-	EUT
C	Jig	N/A	N/A	YOSHIKAWA	-	-
D	DC Power Supply	PMC35-2A	13090501	KIKUSUI	-	-
E	Printer	N31201A	8	Oki Data Corporation	-	-

*1) for Radiated Emission Test

*2) for other tests

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	AC Cable	2.0	N	Polyvinyl chloride
2	DC and Control Cable	0.5	N	Polyvinyl chloride
3	DC Cable	0.2	N	Polyvinyl chloride
4	AC Cable	2.0	N	Polyvinyl chloride

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4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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SECTION 5: Conducted emission

5.1 Operating environment

Test place : No.2 semi anechoic chamber.
Temperature : See data
Humidity : See data

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from LISN/AMN and excess AC cable was bundled in center. I/O cables that were connected to the peripherals were bundled in center. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/ an AMN to the input power source. All unused 50ohm connectors of the LISN/ AMN were resistively terminated in 50ohm when not connected to the measuring equipment. The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT on a horizontal conducting plane 4.0 x 4.0m and a vertical conducting plane 2.0 x 2.0m in a No.2 semi Anechoic Chamber. A drawing of the set up is shown in the photos of APPENDIX 1.

5.3 Test conditions

Frequency range : 0.15MHz – 30MHz
EUT position : Table top
EUT operation mode : Transmitting

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT in the semi Anechoic Chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains Network (AMN). An overview sweep with peak detection has been performed. The measurements had been performed with a quasi-peak detector and if required, with an average detector. The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type : QP and AV
IF Bandwidth : 9kHz

5.5 Test result

Summary of the test results : Pass

Date : August 30, 2004 Test engineer : Kenichi Adachi

SECTION 6: Radiated emission (Fundamental , Spurious Emission and Spectrum Mask)

6.1 Operating environment

The test was carried out in a No.2 semi Anechoic Chamber

Temperature : See data
Humidity : See data

6.2 Test Procedure

The Radiated Electric Field Strength intensity has been measured on No.2 semi anechoic chamber 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 a QP, PK, and AV detector.

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

	From 9kHz to 90kHz and From 110kHz to 150kHz	From 90kHz to 110kHz	From 150kHz to 490kHz	From 490kHz to 30MHz	From 30MHz to 1GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz

* 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])

6.3 Test result

Summary of the test results : Pass

Date : October 5, 2004

Test engineer : Hiroka Umeyama

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

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SECTION 7: -20dB Bandwidth

Test Procedure

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

Test data	: APPENDIX 3
Test result	: Pass

SECTION 8: 99% Occupied Bandwidth

Test Procedure

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

Test data	: APPENDIX 3
Test result	: Pass

SECTION 9: Frequency Tolerance

Test Procedure

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

Test data	: APPENDIX 3
Test result	: Pass

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4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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APPENDIX 1: Photographs of test setup

Conducted emission

Front



Rear

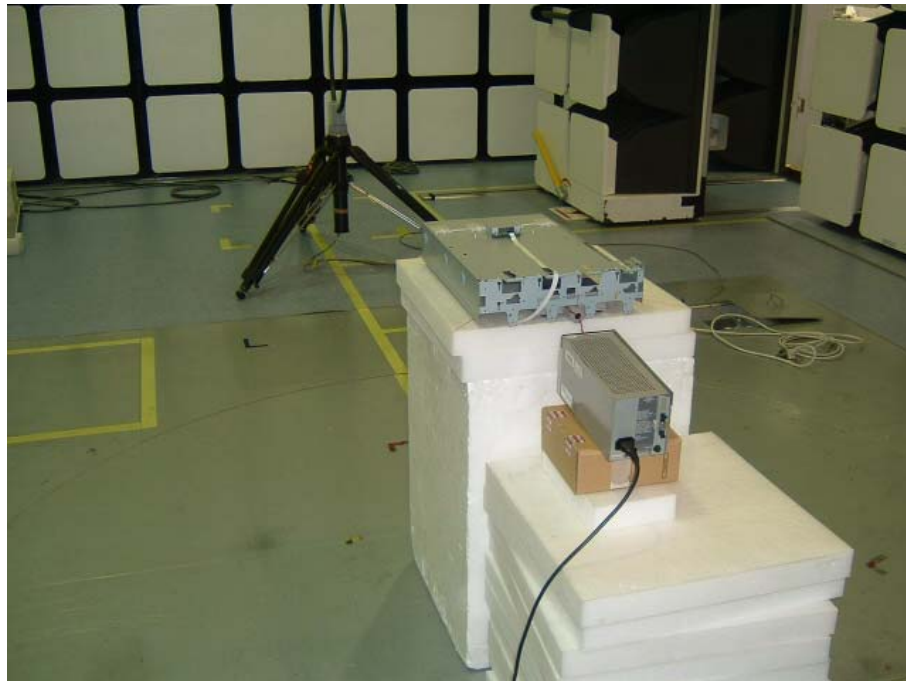


Radiated emission

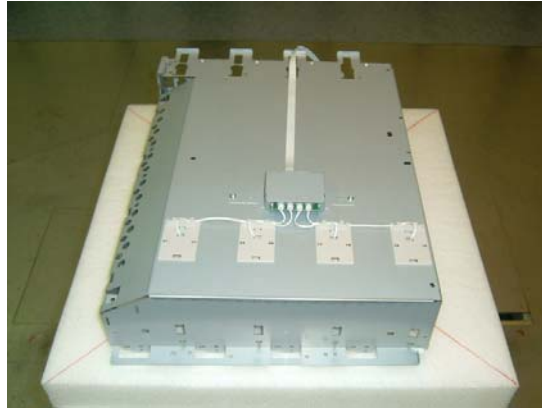
Front



Rear



Worst Case Position (Normal)



**EUT is installed inside of the printer. The printer is used with the installation position of this above photograph.*

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE/ME/CE	2004/04/12 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE/ME/CE	2004/02/03 * 12
MRENT-09	Spectrum Analyzer	Advantest	R3273	RE/ME/CE	2004/02/18 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	ME/CE	2004/02/24 * 12
MPA-06	Pre Amplifier	Hewlett Packard	8447D	RE/ME	2004/08/29 * 12
MCC-31	coaxial cable	ULApex	-	ME	2004/06/12 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	ME	2004/01/08 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2004/02/24 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2003/12/16 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2003/10/15 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2003/10/15 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE(EUT)	2004/02/17 * 12
MBTR10	Spectrum Analyzer	Rohde & Schwarz	FSP30	ME	2003/11/12 * 12
MCC-10	Coaxial cable	Storm	90-195-394	ME	2004/03/25 * 12
MCH-01	Temperature and Humidity Chamber	Tabai Espec	PL-2KP	ME	2003/12/18 * 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,
ME: Magnetic radiated emission,

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4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

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APPENDIX 3: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

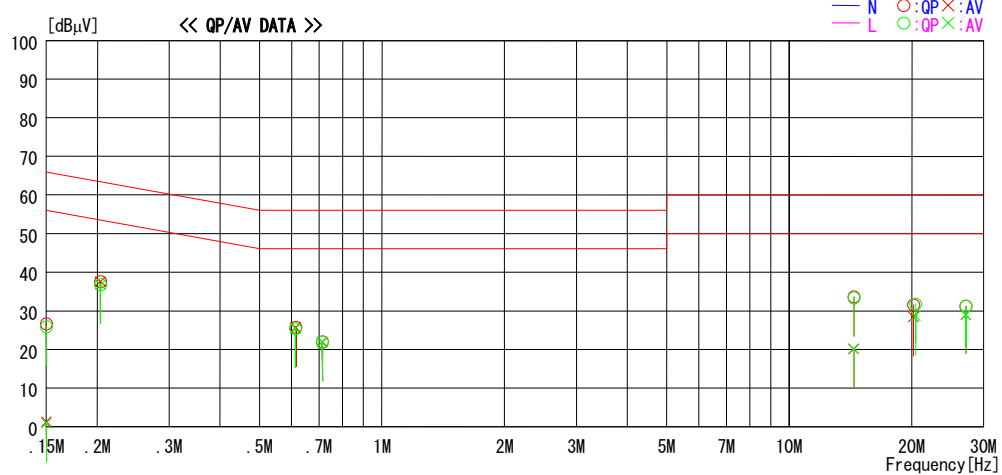
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/08/30 19:46:45

Applicant : Oki Data Corporation
Kind of EUT : Embedded RFID Read/Write System
Model No. : RX4004A
Serial No. : 8

Report No. : 24LE0170-HO
Power : AC120V / 60Hz
Temp°C/Humi% : 25 deg. C / 60%
Operator : Kenichi Adachi

Mode / Remarks : Transmitting

LIMIT : FCC15C § 15.207 (QP)
FCC15C § 15.207 (AV)



NO	FREQ [MHz]	READING		C. F	RESULT		LIMIT		MARGIN		PHASE
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
1	0.1500	26.6	1.3	0.0	26.6	1.3	66.0	56.0	39.4	54.7	N
2	0.2036	37.5	37.5	0.1	37.6	37.6	63.5	53.5	25.9	15.9	N
3	0.6139	25.5	25.5	0.2	25.7	25.7	56.0	46.0	30.3	20.3	N
4	0.7144	21.9	21.9	0.1	22.0	22.0	56.0	46.0	34.0	24.0	N
5	14.4086	32.2	18.7	1.4	33.6	20.1	60.0	50.0	26.4	29.9	N
6	20.1741	29.8	26.6	1.8	31.6	28.4	60.0	50.0	28.4	21.6	N
7	27.1217	29.0	26.8	2.2	31.2	29.0	60.0	50.0	28.8	21.0	N
8	0.1500	25.9	0.9	0.0	25.9	0.9	66.0	56.0	40.1	55.1	L
9	0.2036	36.7	36.7	0.1	36.8	36.8	63.5	53.5	26.7	16.7	L
10	0.6126	25.2	25.2	0.2	25.4	25.4	56.0	46.0	30.6	20.6	L
11	0.7144	21.8	21.8	0.1	21.9	21.9	56.0	46.0	34.1	24.1	L
12	14.4072	32.0	18.8	1.4	33.4	20.2	60.0	50.0	26.6	29.8	L
13	20.4178	30.0	26.9	1.8	31.8	28.7	60.0	50.0	28.2	21.3	L
14	27.1217	29.1	26.8	2.2	31.3	29.0	60.0	50.0	28.7	21.0	L

CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C.F (LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

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Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

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Radiated emission(Fundamental emission and Spectrum Mask)

Head Office EMC Lab. No2 Semi Anechoic Chamber

COMPANY	: Oki Data Corporation	REPORT NO.	: 24LE0170-HO
EQUIPMENT	: Embedded RFID Read/Write System	REGULATION	: FCC 15.225
MODEL	: RX4004A	TEST DISTANCE	: 3m
S/ N	: 1	DATE	: 10/05/2004
POWER	: DC5V	TEMPERATURE	: 23 deg.C.
MODE	: Transmitting	HUMIDITY	: 60 %
		ENGINEER	: Hiroka Umeyama

FREQ [MHz]	T/R Reading [dBuV]	Ant Factor [dB/m]	C.F [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna angle [deg.]
13.1100	31.4	20.2	-27.0	24.6	69.5	44.9	0
13.4100	31.5	20.2	-27.0	24.7	80.5	55.8	0
13.5530	47.1	20.2	-27.0	40.3	90.4	50.1	0
13.5600	60.3	20.2	-26.9	53.6	123.9	70.3	0
13.5670	44.9	20.2	-26.9	38.2	90.4	52.2	0
13.7100	31.7	20.3	-26.9	25.1	80.5	55.4	0
14.0100	31.4	20.3	-26.9	24.8	69.5	44.7	0

Calculation : Reading + Ant. Factor + C.F(Cable loss - AMP.Gain + Atten).

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

Radiated emission (Spurious emission : below 30MHz)

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Head Office EMC Lab. No2 Semi Anechoic Chamber

COMPANY	: Oki Data Corporation	REPORT NO.	: 24LE0170-HO
EQUIPMENT	: Embedded RFID Read/Write System	REGULATION	: FCC 15.225
MODEL	: RX4004A	TEST DISTANCE	: 3m
S/ N	: 1	DATE	: 10/05/2004
POWER	: DC5V	TEMPERATURE	: 23 deg.C.
MODE	: Transmitting	HUMIDITY	: 60 %
		ENGINEER	: Hiroka Umeyama

FREQ	T/R Reading	Ant Factor	C.F	Result	Limit	Margin	Antenna angle
[MHz]	[dBuV]	[dB/m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg.]
27.1200	39.4	20.8	-26.5	33.7	69.5	35.8	0

Calculation : Reading + Ant. Factor + C.F(Cable loss - AMP.Gain + Atten).

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

Radiated emission (Spurious emission : above 30MHz)

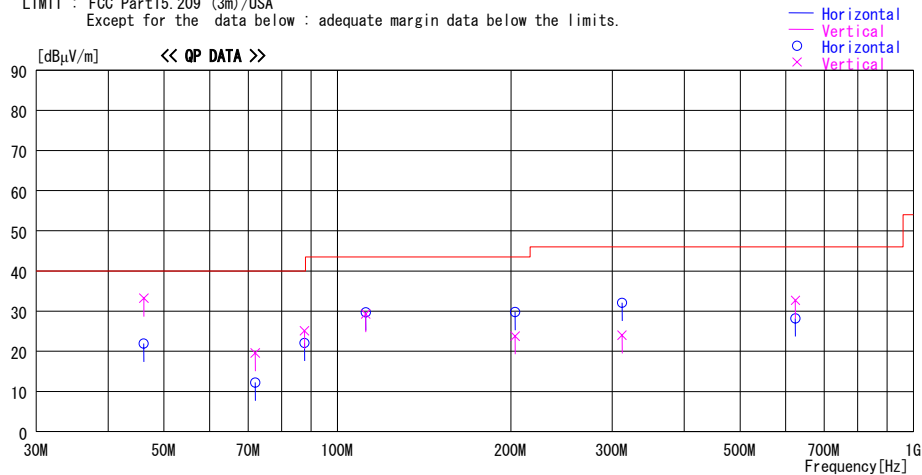
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/10/05 13:37:16

Applicant : Oki Data Corporation
Kind of EUT : Embedded RFID Read/Write System
Model No. : RX4004A
Serial No. : 1
Report No. : 24LE0170-HO
Power : DC5V
Temp/C/Humi% : 23deg.C / 60%
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting

LIMIT : FCC Part15.209 (3m)/USA
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	46.100	31.8	11.3	6.6	27.8	21.9	40.0	18.1	120	100
2	72.000	26.3	6.7	6.9	27.7	12.2	40.0	27.8	220	0
3	87.650	35.2	7.4	7.1	27.6	22.1	40.0	17.9	220	210
4	112.000	38.0	11.9	7.3	27.5	29.7	43.5	13.8	300	250
5	203.390	32.3	16.8	7.8	27.1	29.8	43.5	13.7	160	280
6	311.870	36.1	14.5	8.3	26.8	32.1	46.0	13.9	100	40
7	623.740	26.8	19.7	9.9	28.2	28.2	46.0	17.8	295	290
----- Vertical -----										
8	46.120	43.1	11.3	6.6	27.8	33.2	40.0	6.8	100	250
9	72.000	33.7	6.7	6.9	27.7	19.6	40.0	20.4	100	0
10	87.650	38.2	7.4	7.1	27.6	25.1	40.0	14.9	100	150
11	112.000	37.6	11.9	7.3	27.5	29.3	43.5	14.2	100	0
12	203.390	26.3	16.8	7.8	27.1	23.8	43.5	19.7	100	230
13	311.870	28.0	14.5	8.3	26.8	24.0	46.0	22.0	170	0
14	623.742	31.3	19.7	9.9	28.2	32.7	46.0	13.3	100	60

CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

-20dB Bandwidth

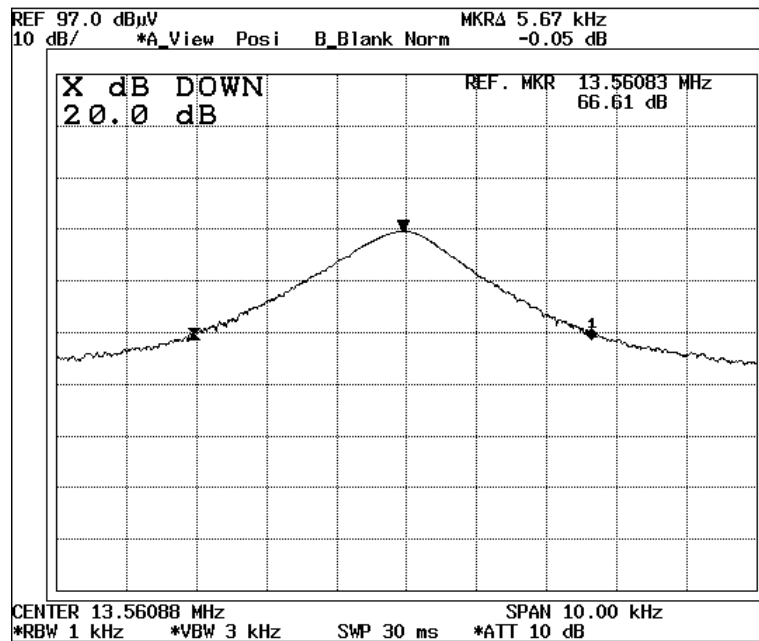
UL Apex Co., Ltd.
No2 Semi Anechoic Chamber

COMPANY : Oki Data Corporation
EQUIPMENT : Embedded RFID Read/Write System
MODEL : RX4004A
S/ N : 8
POWER : AC120V / 60Hz
MODE : TRANSMITTING

REPORT NO : 24LE0170-HO
REGULATION : FCC 15.215 (c)
TEST DISTANCE : 3m
DATE : 08/30/2004
TEMPERATURE : 25 deg. C
HUMIDITY : 54%

ENGINEER : Kenichi Adachi

FREQ [MHz]	-20dB Bandwidth [kHz]
13.56	5.67

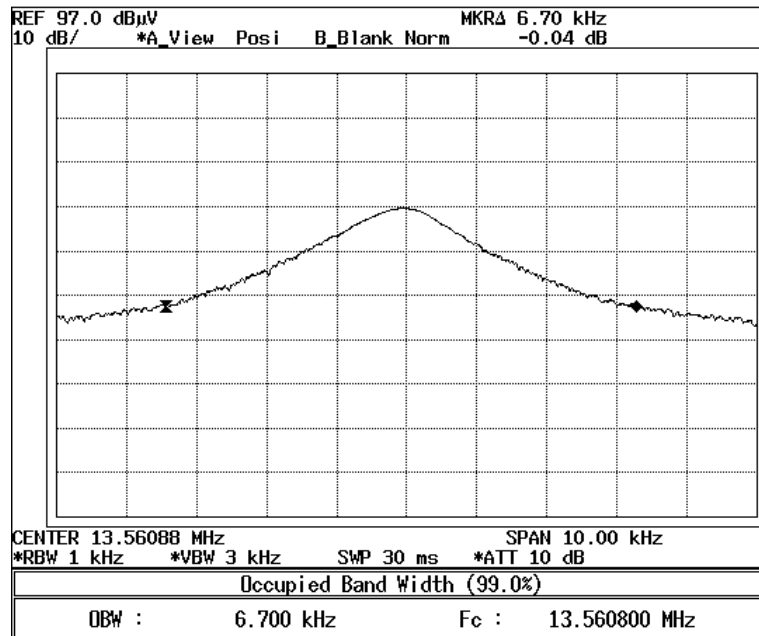


99% Occpied Bandwidth

UL Apex Co., Ltd.
No.2 Semi Anechoic Chamber

COMPANY	: Oki Data Corporation	REPORT NO	: 24LE0170-HO
EQUIPMENT	: Embedded RFID Read/Write System	REGULATION	: RSS-210
MODEL	: RX4004A	TEST DISTANCE	: 3m
S/ N	: 8	DATE	: 08/30/2004
POWER	: AC120V / 60Hz	TEMPERATURE	: 25 deg. C
MODE	: TRANSMITTING	HUMIDITY	: 54%
		ENGINEER	: Kenichi Adachi

FREQ [MHz]	99% Occpied Bandwidth [kHz]
13.56	6.70



Frequency Stability

UL-Apex Co.,Ltd.

EMC Head Office No.4 Measurement room

Company : Oki Data Corporation
Equipment : Embedded RFID Read/Write System
Model : RX4004A
Sample No. : 8
Power : 120V / 60Hz
Mode : Communication (Tx: 13.56MHz)

Report No. : 24LE0170-HO
Regulation : FCC 15.225(c)
Test Distance : -
Date : 09/02/2004
Temperature : 24 deg.C
Humidity : 38 %
Engineer : Kenichi Adachi

Limits

Operating frequency 13.56 MHz +/- 0.01%100ppm) = +/- 0.001356 MHz

	MHz
Lower Limit	13.558644

Frequency stability vs. temperature

Ambient temperature (deg.C)	Measured Frequency (MHz)				Result
	Start	2 minutes	5 minutes	10 minutes	
-20deg.C	13.561100	13.561100	13.561100	13.561100	OK
Deviation [ppm]	81.120944	81.120944	81.120944	81.120944	
-10deg.C	13.561100	13.561100	13.561100	13.561100	OK
Deviation [ppm]	81.120944	81.120944	81.120944	81.120944	
0deg.C	13.561100	13.561100	13.561100	13.561100	OK
Deviation [ppm]	81.120944	81.120944	81.120944	81.120944	
+10deg.C	13.561100	13.561100	13.561100	13.561100	OK
Deviation [ppm]	81.120944	81.120944	81.120944	81.120944	
+20deg.C	13.561100	13.561064	13.561068	13.561100	OK
Deviation [ppm]	81.120944	78.466077	78.761062	81.120944	
+30deg.C	13.561100	13.561100	13.561100	13.561100	OK
Deviation [ppm]	81.120944	81.120944	81.120944	81.120944	
+40deg.C	13.561100	13.561100	13.561068	13.561068	OK
Deviation [ppm]	81.120944	81.120944	78.761062	78.761062	
+50deg.C	13.561064	13.561064	13.561064	13.561064	OK
Deviation [ppm]	78.466077	78.466077	78.466077	78.466077	

*1 Frequency stability vs. input voltage

% of Rated Supply	Supply Voltage	Measured Frequency (MHz)				Result	
		Start	2 minutes	5 minutes	10 minutes		
100% AC	120	13.561100	13.561064	13.561068	13.561100	OK	+20deg.C.
Deviation [ppm]		81.120944	78.466077	78.761062	81.120944		
85% AC	102	13.561064	13.561064	13.561064	13.561096	OK	+20deg.C.
Deviation [ppm]		78.466077	78.466077	78.466077	80.825959		
106% *1 AC	127	13.561064	13.561064	13.561064	13.561064	OK	+20deg.C.
Deviation [ppm]		78.466077	78.466077	78.466077	78.466077		

Note: Test Procedure ANSI C63.4-2003 Annex I.5.2 and I.5.3

*1, EUT's power supply upper limit is 127V.

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)