



# EMI TEST REPORT

**Test Report No. : 26AE0256-HO-1c**

**Applicant** : **KYOCERA MITA Corporation**  
**Type of Equipment** : **RFID Reader/Writer**  
**Model No.** : **B5J-0151**  
**Test standard** : **FCC Part 15 Subpart C : 2005  
Section 15.207 and 15.225**  
**FCC ID** : **E52B5J0151**  
**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:** September 19, 2005 to January 17, 2006

**Tested by:**

Norihisa Hashimoto  
EMC Services

**Approved by :**

Naoki Sakamoto  
Group Leader of  
EMC Services

**UL Apex Co., Ltd.**

**Head Office EMC Lab.**

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## **SECTION 1: Client information**

Company Name : KYOCERA MITA Corporation  
Address : 2-28, 1-Chome, Tamatsukuri, Chuo-ku, Osaka, Japan  
Telephone Number : +81-6-6764-3333  
Facsimile Number : +81-6-6764-3847  
Contact Person : Yutaka Shigemura

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

### **2.1 Identification of E.U.T.**

Type of Equipment : RFID Reader/Writer  
Model No. : B5J-0151  
Serial No. : 1 for Conducted emission test  
530 for other tests than Conducted emission test  
Rating : DC 5.0V/0.1A  
Country of Manufacture : Japan  
Receipt Date of Sample : September 19, 2005  
Condition of EUT : Engineering Prototype  
(Not for sale: This sample is equivalent to mass-produced items.)

### **2.2 Product Description**

Model No: B5J-0151 is the RFID Reader/Writer.

Equipment Type : Transceiver  
Frequency band : 13.553-13.567 MHz  
Frequency of Operation : 13.56 MHz  
Type of modulation : ASK  
Mode of operation : Simplex  
Antenna Type : PWB Pattern Antenna  
Method of Frequency Generation : Crystal  
Operating voltage : DC5.0V

### **FCC 15.31 (e)**

The EUT provides the voltage (DC5.0V) to the RF part. Testing of the variation of the input power (85% to 115% of 5.0V) was performed. Please refer to page 22 for details.

### **FCC Part 15.203 Antenna requirement**

It is impossible for end users to replace the antenna, because the EUT and its antenna are mounted inside of the end product.

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### **SECTION 3: Test specification, procedures & results**

#### **3.1 Test Specification**

Test Specification : FCC Part15 Subpart C : 2005  
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

#### **3.2 Procedures and results**

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	<FCC>ANSI C63.4:2003 7. AC powerline conducted emission measurements <IC>RSS-Gen 7.2.2	<FCC>Section 15.207 <IC>RSS-Gen 7.2.2	-	N/A	14.6dB (0.15040MHz, AV, N)	Complied
2	Electric Field Strength of Fundamental Emission	<FCC>ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.6	<FCC>Section 15.225(a) <IC>RSS-210 A2.6	Radiated	N/A	44.5dB (14.0100MHz, QP)	Complied
3	Spectrum Mask	<FCC>ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.7	<FCC>Section 15.225(a)(b)(c)(d) <IC>RSS-210 A2.6	Radiated	N/A		Complied
4	-20dB Bandwidth	<FCC>ANSI C63.4:2003 13. Measurement of intentional radiators <IC>-	<FCC>Section15.215 (c) <IC>-	Radiated	N/A	See data	Complied
5	Electric Field Strength of Spurious Emission	<FCC>ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.7	<FCC>Section15.209 and 15.225 (d) <IC>RSS-210 A2.6	Radiated	N/A	6.6dB (81.123MHz, Vert., QP)	Complied
6	Frequency Tolerance	<FCC>ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.5	<FCC>Section15.225 (e) <IC>RSS-210 A2.6	Radiated	N/A	See data	Complied

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

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

#### **3.3 Addition to standards**

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	<IC>RSS-Gen 4.4.1	<IC>RSS-Gen 4.4.1	Radiated	N/A	N/A	Complied
2*	APPENDIX 4: Confirmation Test data	<FCC>Section15.225	<FCC>Section15.225	Radiated	N/A	See data	Complied

\*Note: Confirmation test data for a host printer(FS-4000DN) with the RFID Reader/Writer installed inside. Confirmation test found that the host printer with the RFID Reader/Writer complied with FCC requirement.

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### 3.4 Uncertainty

#### Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is  $\pm 1.3$ dB.  
The data listed in this test report has enough margin, more than the site margin.

#### Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Loop antenna is  $\pm 1.9$ dB(3m)/  $\pm 1.8$ dB(10m).  
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is  $\pm 4.5$ dB(3m)/  $\pm 4.7$ dB(10m).  
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is  $\pm 5.2$ dB(3m)/  $\pm 3.8$ dB(10m).  
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is  $\pm 6.6$ dB.  
The data listed in this test report has enough margin, more than the site margin.

#### Other test except Conducted Emission and Spurious Emission (Radiated)

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

### 3.5 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m)	Other rooms
No.1 semi-anechoic chamber	313583	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	846015	IC4247A-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 used for testing: Continuous transmitting mode

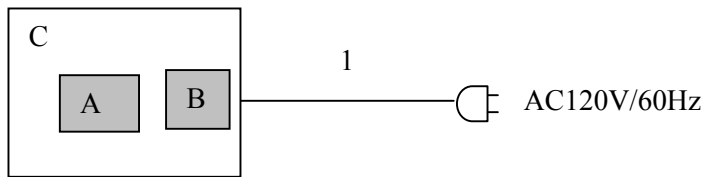
Frequency Tolerance:

Temperature for the extreme tests : -20 deg.C.(minimum) to + 50deg.C.(maximum)  
 Voltage for the extreme tests : DC 4.75V (minimum) to DC5.75V.(maximum)

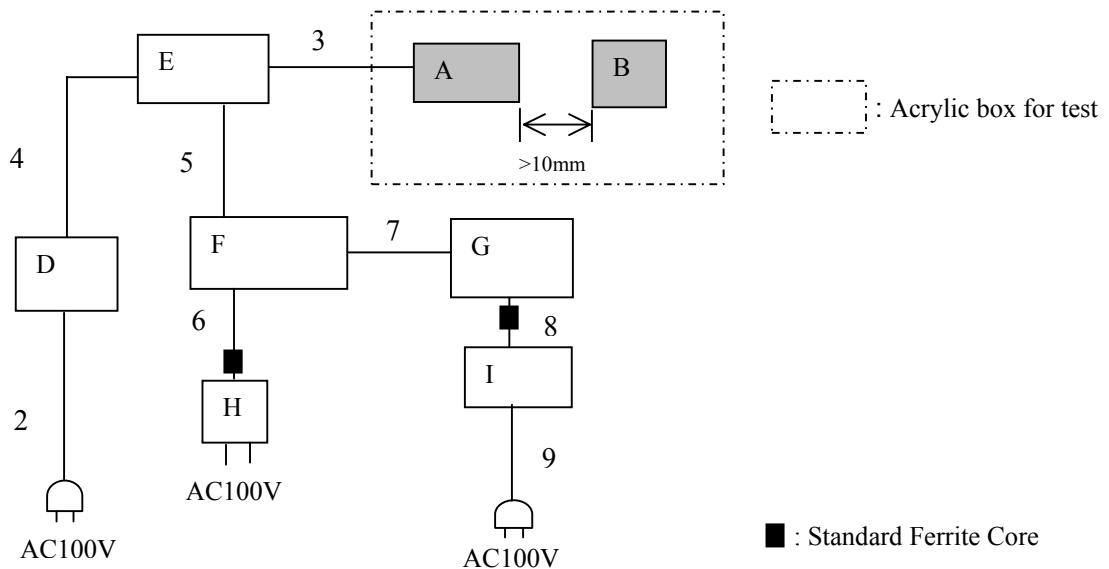
Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

### **4.2 Configuration and peripherals**

#### **[Conducted Emission & APPENDIX 4:Confirmation test data]**



#### **[Radiated Emission]**



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

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**Description of EUT and Support equipment**

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	RFID Reader/Writer	B5J-0151	1 for CE test 530 for other test than CE	OMRON	E52B5J0151
B	RFID Tag	V720S- D13P50F	-	OMRON	E52B5J0151
C	Printer	FS-4000DN	SPL5900184	KYOCERA MITA	-
D	DC Power Supply	PW8-3ATP	09067054	KENWOOD	-
E	Interface Board	427-501001-51	2	OMRON	-
F	Serial-I2C UNIT	M11C-203	1889	TOYO TECHNICA	-
G	Personal Computer	2609-43J	BA-ZGDCC	IBM	-
H	AC Adaptor	3A-161WP05	DMS050260-P6P-SZ	TOYO TECHNICA	-
I	AC Adaptor	02K6547	90C	IBM	-

**List of cables used**

No.	Name	Length (m)	Shield	Remark
1	AC Cable	2.5	N	-
2	AC Cable	2.8	N	-
3	Interface Cable	0.3	N	-
4	Power Cable	0.75	N	-
5	I2C Cable	1.3	Y	-
6	DC Cable	1.8	N	With a standard ferrite core
7	Serial Cable	0.2	Y	-
8	DC Cable	1.8	N	With a standard ferrite core
9	AC Cable	1.0	N	-

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## **SECTION 5: Conducted emission**

### **5.1 Operating environment**

Test place : No.1 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. The rear of EUT and its peripherals was aligned and flushed with rear of tabletop. 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. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. 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 : Continuous Transmitting mode

### **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 : October 25, 2005                      Test engineer : Norihisa Hashimoto

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

### **6.1 Operating environment**

Test place : No.1 semi anechoic chamber  
Temperature : See data  
Humidity : See data

### **6.2 Test Procedure**

The Radiated Electric Field Strength intensity has been measured on No.1 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.

After pre-check with each antenna at angles 0, 45, and 90 deg., the measurements were performed for antenna at angle 0deg of the maximum value of the electric field intensity.

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

- The carrier level and noise levels were confirmed at each position of X, Y and Z axis of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

\* 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 : September 19 and December 20, 2005

Test engineer : Norihisa Hashimoto

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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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**APPENDIX 1: Photographs of test setup**

**Conducted Emission**

**Front**



**Rear**

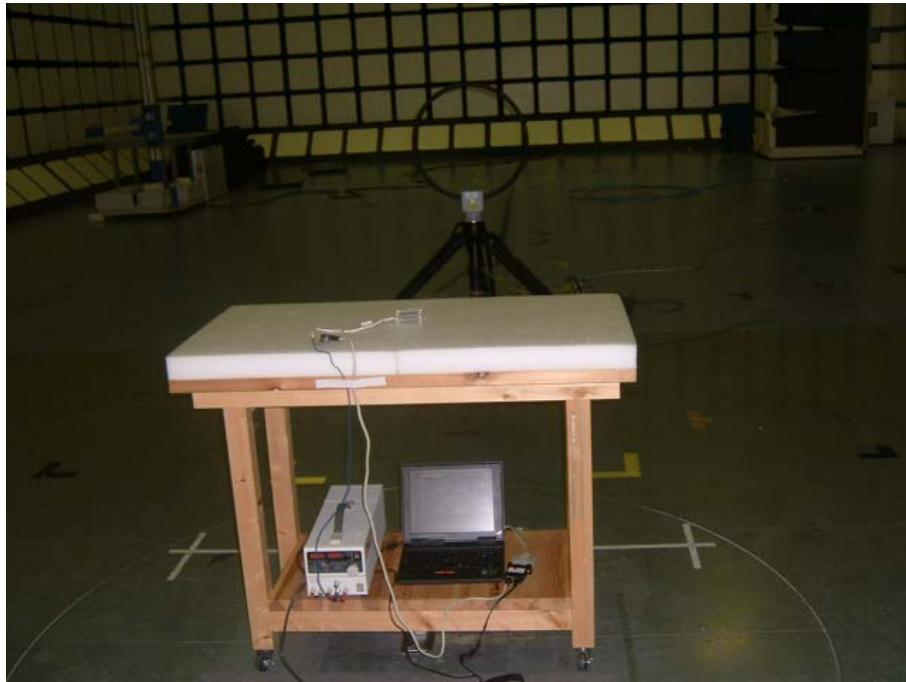


## Radiated emission

Front



Rear



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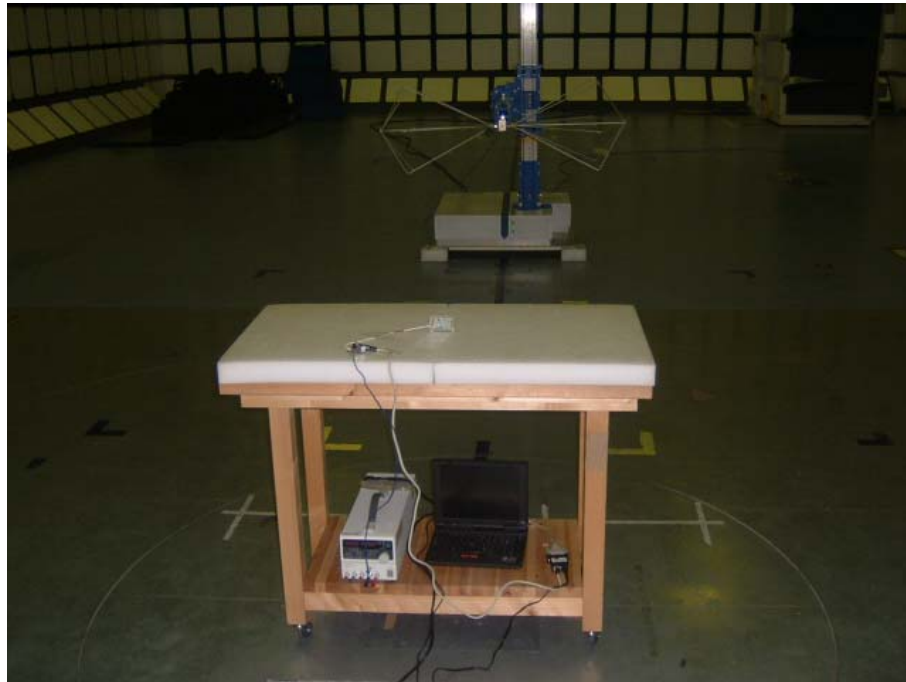
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## Radiated emission

**Front**



**Rear**

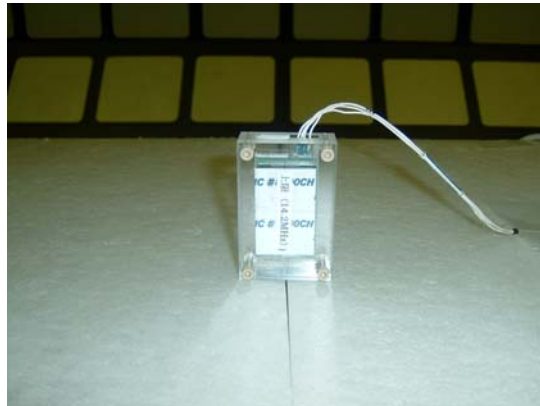


**Worst Case Position (Z-axis)**

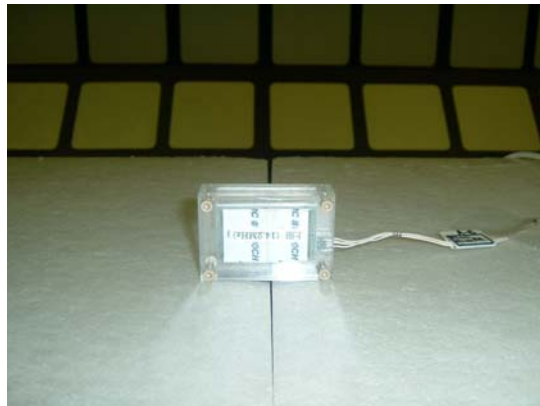
**X-axis**



**Y-axis**



**Z-axis**



## **APPENDIX 2: Test instruments**

### **EMI test equipment**

<b>Control No.</b>	<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Test Item</b>	<b>Calibration Date * Interval(month)</b>
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	CE (EUT)	2004/11/10 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/Agilent/TSJ	-	CE	2004/12/24 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	CE/RE	2004/11/12 * 12 (1) 2005/11/10* 12 (2)
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	CE/RE	2004/11/13 * 12 (1) 2005/11/12* 12 (2)
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent/TSJ	-	RE	2005/12/18* 12
MPA-04	Pre Amplifier	Agilent	8447D	RE	2005/05/24 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/Agilent/TSJ	-	RE	2004/12/24 * 12
MCC-31	coaxial cable	ULApex	-	RE	2005/06/02 * 12
MAT-06	Attenuator(6dB)	Weinschel Corp	2	RE	2005/12/16 * 12
MBA-01	Biconical Antenna	Schwarzbeck	BBA9106	RE	2005/10/10 * 12
MLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2005/10/14 * 12
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	RE	2004/12/10 * 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**

(1): Used at CE/RE tests on September 19 and October 25, 2005

(2): Used at RE test on December 20, 2005

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**APPENDIX 3: Data of EMI test**

**Conducted emission**

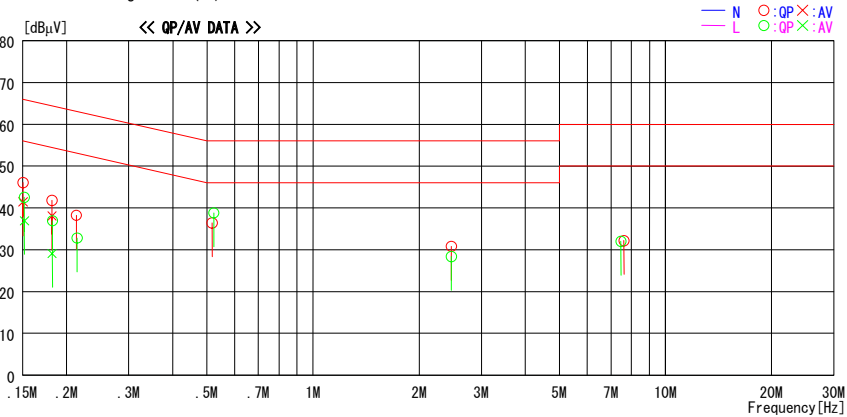
**DATA OF CONDUCTED EMISSION TEST**

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2005/10/25 12:45:29

Applicant : KYOCERA MITA Corporation Report No. : 26AE0256-HO  
Kind of EUT : RFID Reader/Writer Power : AC 120W / 60Hz (Printer input)  
Model No. : B5J-0151 Temp./Humi. : 24.3deg.C / 40%  
Serial No. : 1 Operator : Norihisa Hashimoto

Mode / Remarks : Read Write mode (13.56MHz)

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



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP	AV		QP	AV	QP	AV	QP	AV	
	[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
0.15040	45.8	41.1	0.3	46.1	41.4	66.0	56.0	19.9	14.6	N
0.18178	41.3	37.5	0.5	41.8	38.0	64.4	54.4	22.6	16.4	N
0.21287	37.6	---	0.6	38.2	---	63.1	---	24.9	---	N
0.51678	35.9	---	0.5	36.4	---	56.0	---	19.6	---	N
2.46609	30.1	---	0.7	30.8	---	56.0	---	25.2	---	N
7.61022	30.7	---	1.5	32.2	---	60.0	---	27.8	---	N
0.15172	42.2	36.6	0.3	42.5	36.9	65.9	55.9	23.4	19.0	L
0.18197	36.4	28.6	0.5	36.9	29.1	64.4	54.4	27.5	25.3	L
0.21377	32.2	---	0.6	32.8	---	63.1	---	30.3	---	L
0.52299	38.3	---	0.5	38.8	---	56.0	---	17.2	---	L
2.46533	27.7	---	0.7	28.4	---	56.0	---	27.6	---	L
7.46100	30.5	---	1.5	32.0	---	60.0	---	28.0	---	L

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



**Radiated emission(Fundamental emission and Spectrum Mask)**

UL Apex Co., Ltd.  
Head Office EMC Lab. No1 Semi Anechoic Chamber

COMPANY	: KYOCERA MITA Corporation	REPORT NO.	: 26AE0256-HO
EQUIPMENT	: RFID Reader/Writer	REGULATION	: FCC 15.225
MODEL	: B5J-0151	TEST DISTANCE	: 3m
S/ N	: 530	DATE	: 19/09/2005
POWER	: DC5V	TEMPERATURE	: 24 deg.C.
MODE	: Transmitting / Max-axis(Z)	HUMIDITY	: 60 %
		ENGINEER	: Norihisa Hashimoto

**With CLi Feeder**

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	31.3	20.0	-26.5	24.8	69.5	44.7	0
13.4100	31.4	20.0	-26.5	24.9	80.5	55.6	0
13.5530	32.5	20.0	-26.5	26.0	90.4	64.4	0
13.5600	50.3	20.0	-26.4	43.9	123.9	80.0	0
13.5670	39.5	20.0	-26.4	33.1	90.4	57.3	0
13.7100	31.5	20.0	-26.4	25.1	80.5	55.4	0
14.0100	31.4	20.0	-26.4	25.0	69.5	44.5	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)**

UL Apex Co., Ltd.  
Head Office EMC Lab. No1 Semi Anechoic Chamber

COMPANY	: KYOCERA MITA Corporation	REPORT NO.	: 26AE0256-HO
EQUIPMENT	: RFID Reader/Writer	REGULATION	: FCC 15.225
MODEL	: B5J-0151	TEST DISTANCE	: 3m
S/ N	: 530	DATE	: 19/09/2005
POWER	: DC5V	TEMPERATURE	: 24 deg.C.
MODE	: Transmitting / Max-axis(Z)	HUMIDITY	: 60 %
		ENGINEER	: Norihisa Hashimoto

**With CLi Feeder**

FREQ [MHz]	T/R Reading [dBuV]	Ant Factor [dB/m]	C.F [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna angle [deg.]
27.1200	30.6	19.9	-25.9	24.6	69.5	44.9	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.

---

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MF060b(01.06.05)

## Radiated emission (Spurious emission: above 30MHz)

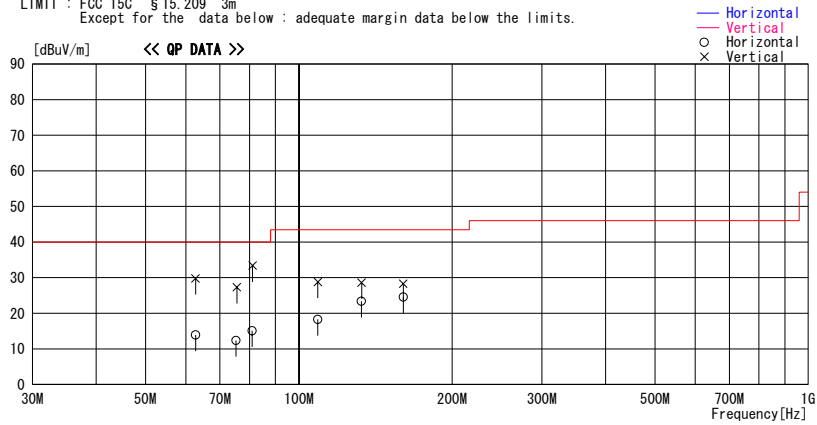
### DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2005/12/20 19:46:29

Applicant : OMRON Corporation  
 Kind of EUT : RF ID Module  
 Model No. : B5J-0151  
 Serial No. : 530  
 Report No. : 26AE0256-HO  
 Power : 005.0V  
 Temp/C/Humi% : 22deg. C /30%  
 Operator : Norihisa Hashimoto

Mode / Remarks : Transmitting 13.56MHz / Max-Axis(Z)

LIMIT : FCC 15C §15.209 3m  
 Except for the data below : adequate margin data below the limits.



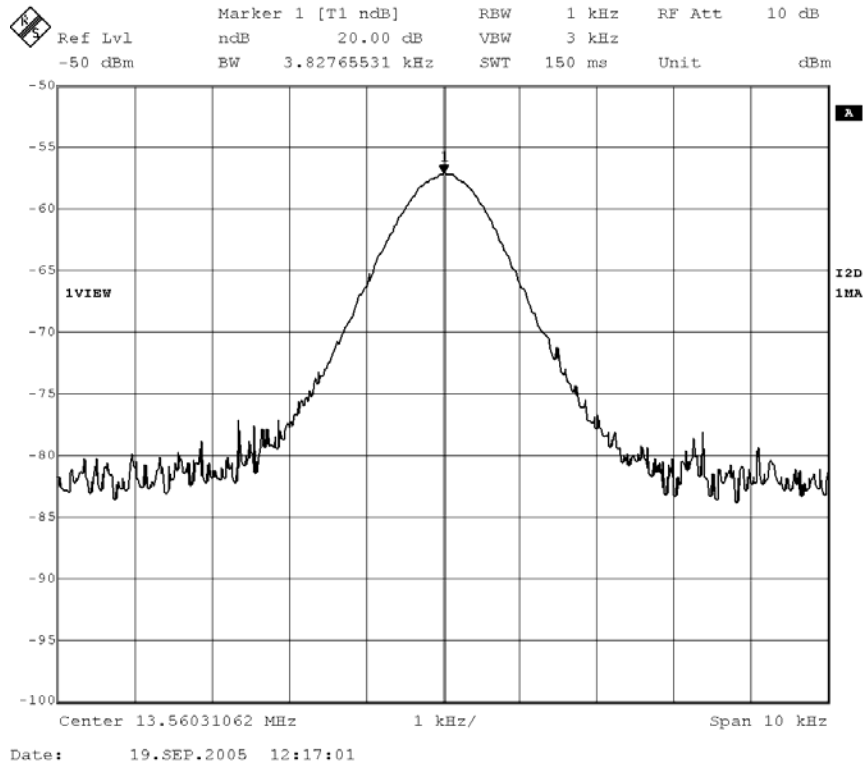
Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Polar.	Limit [dBuV/m]	Margin [dB]
			Factor [dB/m]	Gain [dB]				
62.689	26.2	OP	8.1	-20.4	13.9	Hori.	40.0	26.1
62.679	42.1	OP	8.1	-20.4	29.8	Vert.	40.0	10.2
75.567	40.5	OP	6.9	-20.1	27.3	Vert.	40.0	12.7
75.317	25.6	OP	6.9	-20.1	12.4	Hori.	40.0	27.6
80.995	28.2	OP	7.0	-20.1	15.1	Hori.	40.0	24.9
81.123	46.4	OP	7.1	-20.1	33.4	Vert.	40.0	6.6
108.982	26.3	OP	11.7	-19.7	18.3	Hori.	43.5	25.2
108.920	36.8	OP	11.7	-19.7	28.8	Vert.	43.5	14.7
132.754	33.7	OP	14.1	-19.2	28.6	Vert.	43.5	14.9
132.748	28.5	OP	14.1	-19.2	23.4	Hori.	43.5	20.1
160.342	27.6	OP	15.9	-18.9	24.6	Hori.	43.5	18.9
160.350	31.3	OP	15.9	-18.9	28.3	Vert.	43.5	15.2

CHART: WITHOUT FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz Dipole, 1000MHz- HORN

**-20dB Bandwidth**

COMPANY	: KYOCERA MITA Corporation	REPORT NO.	: 26AE0256-HO
EQUIPMENT	: RFID Reader/Writer	REGULATION	: FCC 15.215
MODEL	: B5J-0151	TEST DISTANCE	: 3m
S/N	: 530	DATE	: 19/09/2005
POWER	: DC5V	TEMPERATURE	: 24 deg.C.
MODE	: Transmitting / Max-axis(Z)	HUMIDITY	: 60 %
		ENGINEER	: Norihisa Hashimoto

FREQ [MHz]	-20dB Bandwidth [kHz]
13.56	3.83

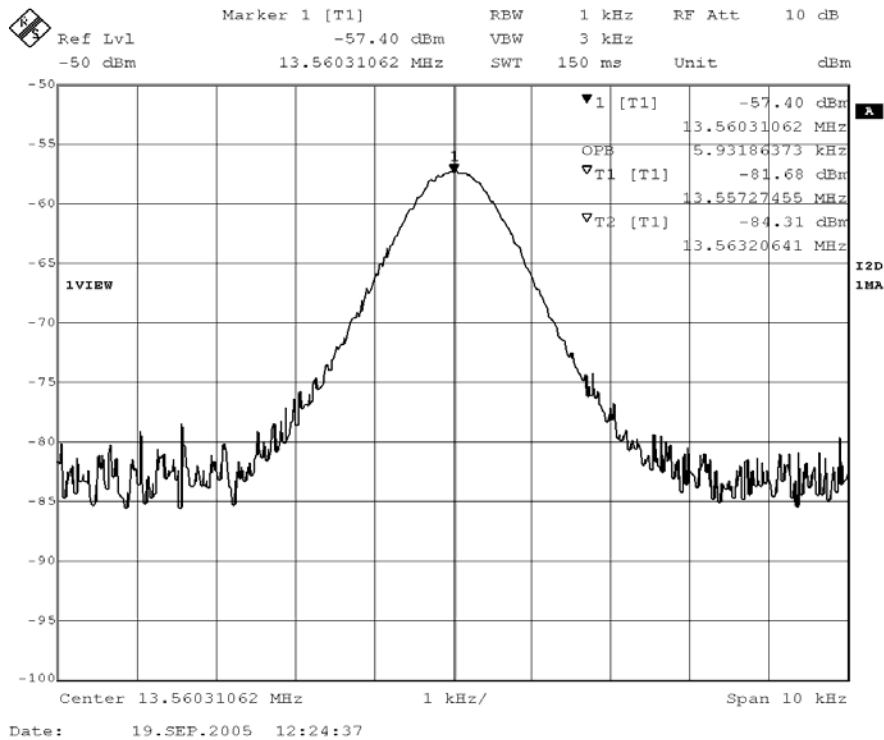


## 99% Occpied Bandwidth

UL Apex Co., Ltd.  
 Head Office EMC Lab. No1 Semi Anechoic Chamber

COMPANY : KYOCERA MITA Corporation	REPORT NO. : 26AE0256-HO
EQUIPMENT : RFID Reader/Writer	REGULATION : RSS-Gen 4.4.1
MODEL : B5J-0151	TEST DISTANCE : 3m
S/N : 530	DATE : 19/09/2005
POWER : DC5V	TEMPERATURE : 24 deg.C.
MODE : Transmitting / Max-axis(Z)	HUMIDITY : 60 %
	ENGINEER : Norihisa Hashimoto

FREQ [MHz]	99% Occpied Bandwidth [kHz]
13.56	5.93



## Frequency Tolerance

<p>Company : KYOCERA/MITA Corporation  Equipment : RFID Reader/Writer  Model : B5J-0151  Serial No. : 530  Power : DC 5V (EUT input)  Mode : Transmitting</p>	<p>UL Apex Co., Ltd.  Head Office EMC Lab. No.1 Semi Anechoic Chamber  Report No. : 26AE0256-HO  Regulation : FCC Part15 Subpart C 15.225 (e)  Date : 19/09/2005  Humidity : 60%  Temperature : 24deg.C  Engineer : Norihisa Hashimoto</p>
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Limits  
Operating frequency 13.56 MHz  $\pm$  0.01%  $\pm$  0.001356 MHz

MHz	
Lower Limit	13.558644
Upper Limit	13.561356

Frequency stability vs. temperature

Ambient temperature (deg.C)	Measured Frequency (MHz)				Result
	Start	2 minutes	5 minutes	10 minutes	
-20deg.C	13.560204	13.560190	13.560243	13.560210	Complied
Margin	0.001152	0.001166	0.001113	0.001146	
-10deg.C	13.560248	13.560313	13.560266	13.560363	Complied
Margin	0.001108	0.001043	0.001090	0.000993	
0deg.C	13.560240	13.560303	13.560358	13.560288	Complied
Margin	0.001116	0.001053	0.000998	0.001068	
+10deg.C	13.560351	13.560253	13.560243	13.560286	Complied
Margin	0.001005	0.001103	0.001113	0.001070	
+20deg.C	13.560317	13.560375	13.560309	13.560284	Complied
Margin	0.001039	0.000981	0.001047	0.001072	
+30deg.C	13.560330	13.560099	13.560284	13.560227	Complied
Margin	0.001026	0.001257	0.001072	0.001129	
+40deg.C	13.560412	13.560419	13.560339	13.560223	Complied
Margin	0.000944	0.000937	0.001017	0.001133	
+50deg.C	13.560441	13.560541	13.560481	13.560120	Complied
Margin	0.000915	0.000815	0.000875	0.001236	

\*1 Frequency stability vs. input voltage

% of Rated Supply	Supply Voltage	Measured Frequency (MHz)				Result
		Start	2 minutes	5 minutes	10 minutes	
Nor DC	5	13.560317	13.560375	13.560309	13.560284	Complied
Margin		0.001039	0.000981	0.001047	0.001072	
85% DC	4.25	13.560204	13.560190	13.560243	13.560210	Complied
Margin		0.001152	0.001166	0.001113	0.001146	
115% DC	5.75	13.560441	13.560541	13.560481	13.560120	Complied
Margin		0.000915	0.000815	0.000875	0.001236	

Note: Test Procedure ANSI C63.4-2000 Annex I.5.2 and I.5.3

**APPENDIX 4: Data of confirmation test data**

**Photographs of test setup Radiated emission**  
**(Spurious emission: below 30MHz)**

**Front**



**Rear**

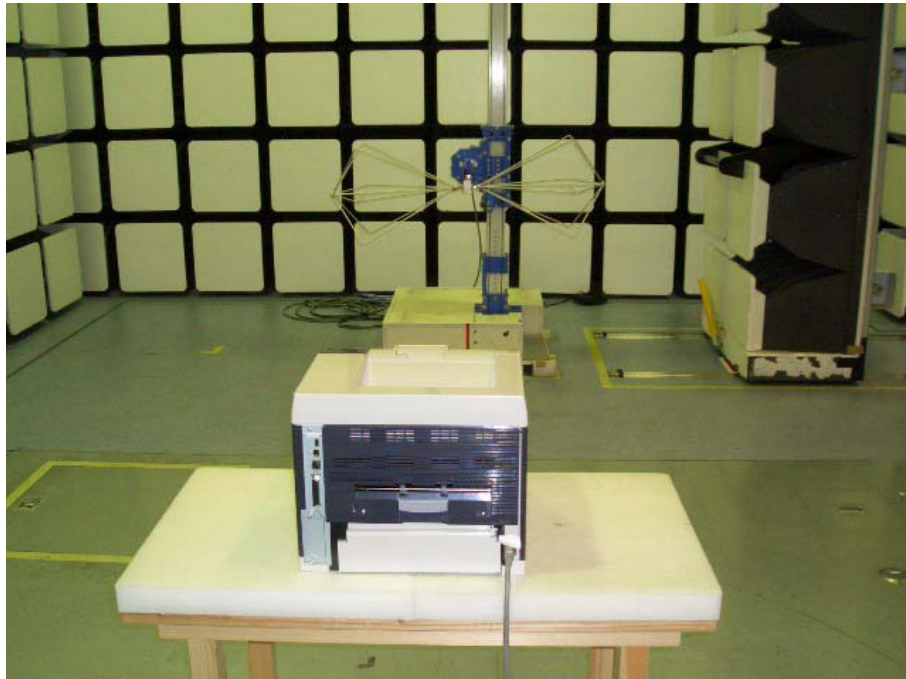


**Photographs of test setup Radiated emission**  
**(Spurious emission: above 30MHz)**

**Front**



**Rear**





### 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	2005/04/11 * 12
MRENT-23	Spectrum Analyzer	Advantest	R3273	RE	
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE	2005/02/02 * 12
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	RE	2005/12/06 * 12
MPA-09	Pre Amplifier	Agilent	8447D	RE	2005/09/07 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	RE	2005/02/24 * 12
MCC-31	coaxial cable	ULApex	-	RE	2005/06/02 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2005/12/16 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2005/02/24 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2005/10/10 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2005/10/14 * 12

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

**Test Item :**

**RE: Radiated emission**

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MF060b(01.06.05)

## Radiated emission(Fundamental emission and Spectrum Mask)

UL Apex Co., Ltd.  
Head Office EMC Lab. No2 Semi Anechoic Chamber

COMPANY	: KYOCERA MITA Corporation	REPORT NO.	: 26AE0256-HO
EQUIPMENT	: RFID Reader/Writer	REGULATION	: FCC15.225
MODEL	: B5J-0151	TEST DISTANCE	: 3m
S/ N	: 1	DATE	: 17/01/2006
POWER	: AC120V/60Hz	TEMPERATURE	: 24 deg.C.
MODE	: Transmitting / Usual Condition	HUMIDITY	: 28 %
		ENGINEER	: Norihisa Hashimoto

### With CLi Feeder

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	31.8	20.4	-27.8	24.4	69.5	45.1	0
13.4100	31.9	20.4	-27.8	24.5	80.5	56.0	0
13.5530	31.9	20.5	-27.8	24.6	90.4	65.8	0
13.5600	33.2	20.5	-27.7	26.0	123.9	97.9	0
13.5670	31.9	20.5	-27.7	24.7	90.4	65.7	0
13.7100	32.0	20.5	-27.7	24.8	80.5	55.7	0
14.0100	31.8	20.5	-27.7	24.6	69.5	44.9	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)**

UL Apex Co., Ltd.  
Head Office EMC Lab. No2 Semi Anechoic Chamber

COMPANY	: KYOCERA MITA Corporation	REPORT NO.	: 26AE0256-HO
EQUIPMENT	: RFID Reader/Writer	REGULATION	: FCC15.225
MODEL	: B5J-0151	TEST DISTANCE	: 3m
S/ N	: 1	DATE	: 17/01/2006
POWER	: AC120V/60Hz	TEMPERATURE	: 24 deg.C.
MODE	: Transmitting / Usual Condition	HUMIDITY	: 28 %
		ENGINEER	: Norihisa Hashimoto

**With CLi Feeder**

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	31.5	21.3	-27.3	25.5	69.5	44.0	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.

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MF060b(01.06.05)

## Radiated emission (Spurious emission: above 30MHz)

### DATA OF RADIATED EMISSION TEST

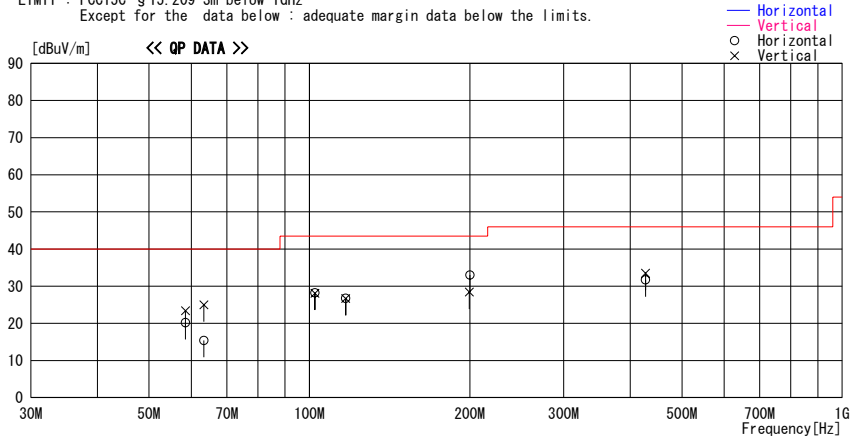
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber  
Date : 2006/01/17 16:56:06

Company : KYOCERA MITA Corporation  
 Kind of EUT : RFID Reader/Writer  
 Model No. : B5J-0151  
 Serial No. : 1  
 Report No. : 26AE0256-HO  
 Power : AC120V/60Hz  
 Temp./Humi. : 24deg. C. / 28%  
 Operator : Norihisa Hashimoto

Mode / Remarks : Transmitting / Usual Condition

LIMIT : FCC15C § 15.209 3m below 1GHz

Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss& Gain [dB]					
58.499	34.0	QP	8.5	-22.3	20.2	Hori.	40.0	19.8	
58.502	37.2	QP	8.5	-22.3	23.4	Vert.	40.0	16.6	
63.370	30.2	QP	7.6	-22.4	15.4	Hori.	40.0	24.6	
63.371	39.8	QP	7.6	-22.4	25.0	Vert.	40.0	15.0	
102.377	39.8	QP	10.2	-21.8	28.2	Hori.	43.5	15.3	
102.372	39.7	QP	10.2	-21.8	28.1	Vert.	43.5	15.4	
116.999	36.3	QP	12.1	-21.7	26.7	Hori.	43.5	16.8	
117.000	36.3	QP	12.1	-21.7	26.7	Vert.	43.5	16.8	
200.006	36.8	QP	16.6	-20.4	33.0	Hori.	43.5	10.5	
199.484	32.2	QP	16.6	-20.4	28.4	Vert.	43.5	15.1	
427.388	34.0	QP	17.8	-20.1	31.7	Hori.	46.0	14.3	
427.388	35.8	QP	17.8	-20.1	33.5	Vert.	46.0	12.5	

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)

Remarks: There was no noise from the RFID Reader/Writer. All the data is noise from the host printer.

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