

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	RE / CE	2005/11/14 * 12
MOS-01	Digital Humidity Indicator	N.T	NT-1800	RE / CE	2004/11/25 * 24
MTR-01	Test Receiver	Rohde & Schwarz	ES140	RE / CE / ME	2005/11/10 * 12
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent/TSJ	-	RE	2006/02/20 * 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
MPA-04	Pre Amplifier	Agilent	8447D	RE	2005/05/24 * 12
MLS-03	LISN(AMN)	Schwarzbeck	NSLK8127	CE(EUT)	2005/11/09 * 12
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	RE	2005/12/06 * 12
MCC-31	coaxial cable	ULApex	-	RE	2005/06/02 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/Agilent/TSJ	-	CE/RE	2005/12/18 * 12
MRENT-23	Spectrum Analyzer	Advantest	R3273	AT	2006/01/10 * 12
MCC-21	Microwave Cable 1G-50GHz	Storm	421-011 (90-011-080)	AT	2005/04/29 * 12
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE/CE	-

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

Test Item:

RE: Radiated emission
CE: Conducted emission
AT: Antenna Terminal

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MF060b(14.06.06)

APPENDIX 3: Data of EMI test

Conducted emission

DATA OF CONDUCTED EMISSION TEST

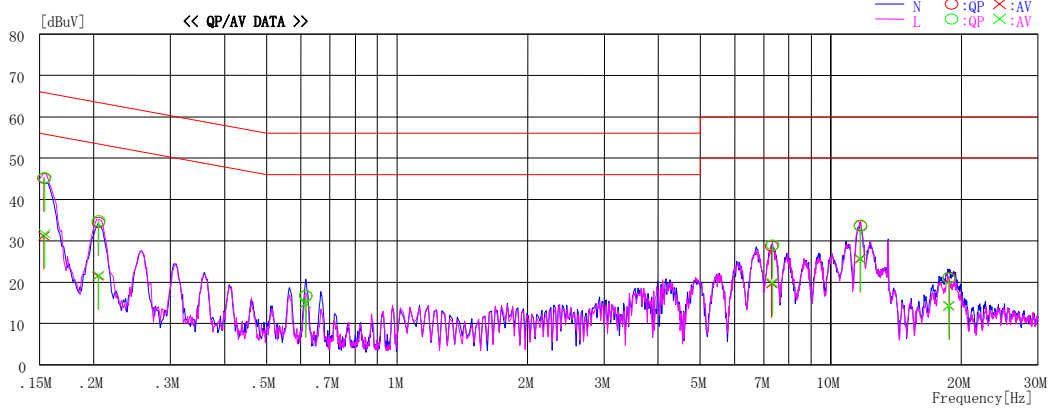
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2006/04/01 03:16:27

Applicant : KYOCERA MITA Corporation
 Kind of EUT : RFID Reader/Writer, Printer
 Model No. : B5J-0451, FS-C5010DN
 Serial No. : 059, SPL5900043

Report No. : 26FE0182-HO
 Power : 120W / 60Hz
 Temp./Humi. : 28deg. C / 25%
 Operator : Mitsuru Fujimura

Mode / Remarks : Transmitting

LIMIT : FCC15C §15.207 (QP) / RSS-Gen / RSS-210
 FCC15C §15.207 (AV) / RSS-Gen / RSS-210



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15341	45.0	31.0	0.2	45.2	31.2	65.8	55.8	20.6	24.6	N
0.15400	45.1	31.5	0.2	45.3	31.7	65.8	55.8	20.5	24.1	L
0.20451	34.3	21.3	0.2	34.5	21.5	63.4	53.4	28.9	31.9	N
0.20533	34.6	21.4	0.2	34.8	21.6	63.4	53.4	28.6	31.8	L
0.61503	16.4	14.5	0.3	16.7	14.8	56.0	46.0	39.3	31.2	N
0.61503	16.4	14.5	0.3	16.7	14.8	56.0	46.0	39.3	31.2	L
7.31260	27.7	18.5	1.1	28.8	19.6	60.0	50.0	31.2	30.4	N
7.33064	27.9	18.8	1.1	29.0	19.9	60.0	50.0	31.0	30.1	L
11.68336	32.1	24.1	1.6	33.7	25.7	60.0	50.0	26.3	24.3	N
11.72344	32.0	24.0	1.6	33.6	25.6	60.0	50.0	26.4	24.4	L
18.73752	19.0	12.1	2.2	21.2	14.3	60.0	50.0	38.8	35.7	N
18.69744	18.7	12.1	2.2	20.9	14.3	60.0	50.0	39.1	35.7	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.

Radiated emission (Fundamental emission and Spectrum Mask)

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

COMPANY : KYOCERA MITA Corporation
EQUIPMENT : RFID Reader / Writer
MODEL : B5J-0451
S/N : 059
POWER : AC120V / 60Hz
MODE : Transmitting

REPORT NO. : 26FE0182-HO
REGULATION : FCC 15.225
TEST DISTANCE : 3m
DATE : 15/03/2006
TEMPERATURE : 28 deg.C.
HUMIDITY : 25 %
ENGINEER : Mitsuru Fujimura

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	31.2	20.4	-26.7	24.9	69.5	44.6	90
13.4100	31.1	20.4	-26.7	24.8	80.5	55.7	90
13.5530	39.0	20.5	-26.7	32.8	90.4	57.6	90
13.5600	50.7	20.5	-26.6	44.6	123.9	79.3	90
13.5670	39.3	20.5	-26.6	33.2	90.4	57.2	90
13.7100	31.1	20.5	-26.6	25.0	80.5	55.5	90
14.0100	31.0	20.5	-26.6	24.9	69.5	44.6	90

Calculation : Reading + Ant. Factor + C.F(Cable loss + Attenuator - 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. : 26FE0182-HO
EQUIPMENT : RFID Reader / Writer REGULATION : FCC 15.225
MODEL : B5J-0451 TEST DISTANCE : 3m
S/ N : 059 DATE : 15/03/2006
POWER : AC120V / 60Hz TEMPERATURE : 28 deg.C.
MODE : Transmitting HUMIDITY : 25 %
ENGINEER : Mitsuru Fujimura

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	30.7	21.3	-26.1	25.9	69.5	43.6	90

Calculation : Reading + Ant. Factor + C.F(Cable loss + Attenuator - 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)

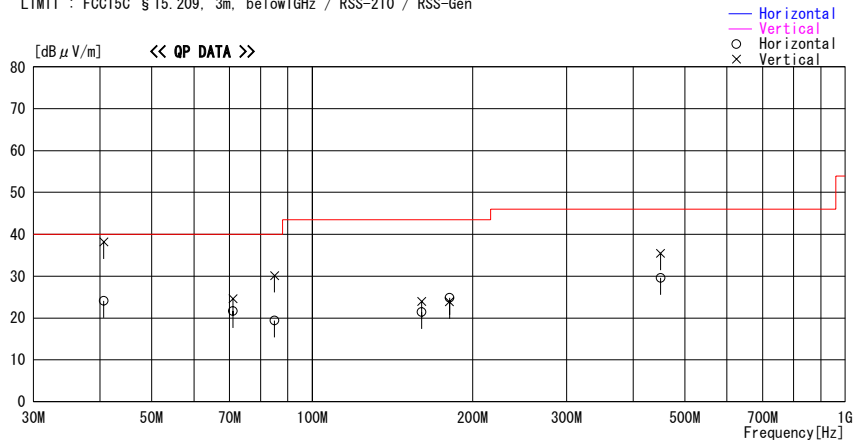
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
 Date : 2006/03/16 22:30:11

Applicant : KYOCERA MITA Corporation
 Kind of EUT : RFID Reader / Writer
 Model No. : B5J-0451
 Serial No. : 059
 Report No. : 26FE0182-H0
 Power : 120V / 60Hz
 Temp./Humi. : 27deg.C / 27%
 Operator : Mitsuru Fujimura

Mode / Remarks : Transmitting 13.56MHz / Max-axis

LIMIT : FCC15C § 15.209, 3m, below1GHz / RSS-210 / RSS-Gen



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Polar.	Limit [dBuV/m]	Margin [dB]
			Factor [dB/m]	Loss&Gain [dB]				
40.658	30.8	QP	13.8	-20.5	24.1	Hori.	40.0	15.9
40.658	44.9	QP	13.8	-20.5	38.2	Vert.	40.0	1.8
71.023	34.5	QP	7.0	-19.8	21.7	Hori.	40.0	18.3
71.023	37.4	QP	7.0	-19.8	24.6	Vert.	40.0	15.4
84.993	41.9	QP	7.7	-19.5	30.1	Vert.	40.0	9.9
84.993	31.2	QP	7.7	-19.5	19.4	Hori.	40.0	20.6
160.476	23.7	QP	15.9	-18.2	21.4	Hori.	43.5	22.1
160.476	26.2	QP	15.9	-18.2	23.9	Vert.	43.5	19.6
180.962	26.1	QP	16.6	-17.9	24.8	Hori.	43.5	18.7
180.962	25.2	QP	16.6	-17.9	23.9	Vert.	43.5	19.6
450.100	28.2	QP	17.8	-16.4	29.6	Hori.	46.0	16.4
450.100	34.1	QP	17.8	-16.4	35.5	Vert.	46.0	10.5

CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN

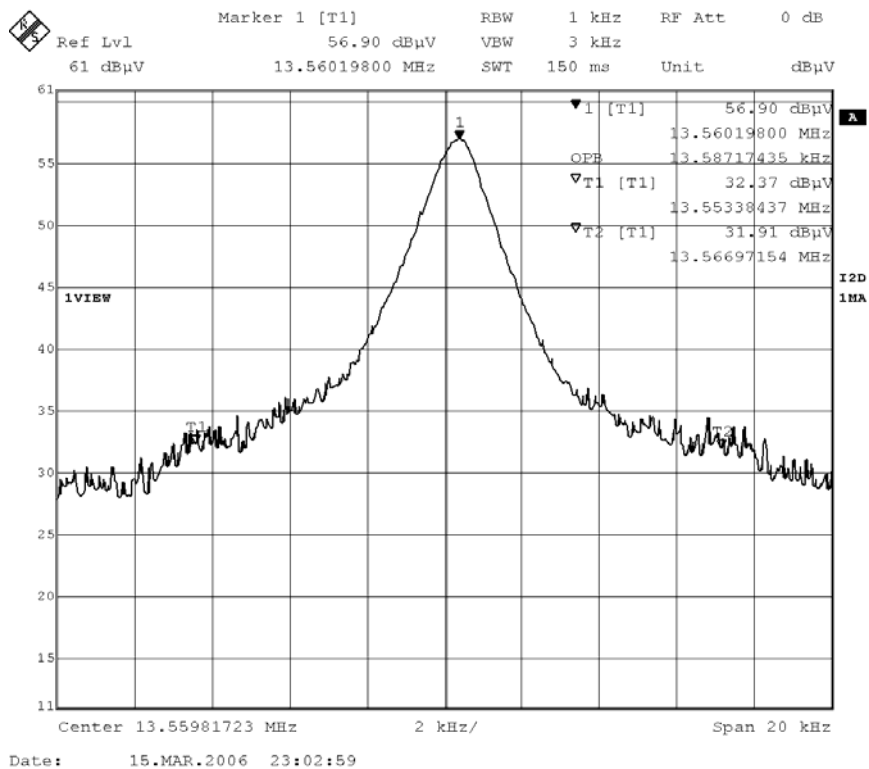
99% Occupied Bandwidth

UL Apex Co., Ltd.
 Head Office EMC Lab. No.7 shielded room

Company : KYOCERA MITA Corporation
 Equipment : RFID Module
 Model : B5J-0451
 Serial No. : 059
 Power : DC 3.30V
 Mode : Transmitting

Report No. : 26FE0182-HO
 Regulation : N/A
 Date : 15/03/2006
 Humidity : 25%
 Temperature : 28deg.C
 Engineer : Mitsuru Fujimura

FREQ [MHz]	99% Occupied Bandwidth [kHz]
13.56	13.59



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26dB Bandwidth

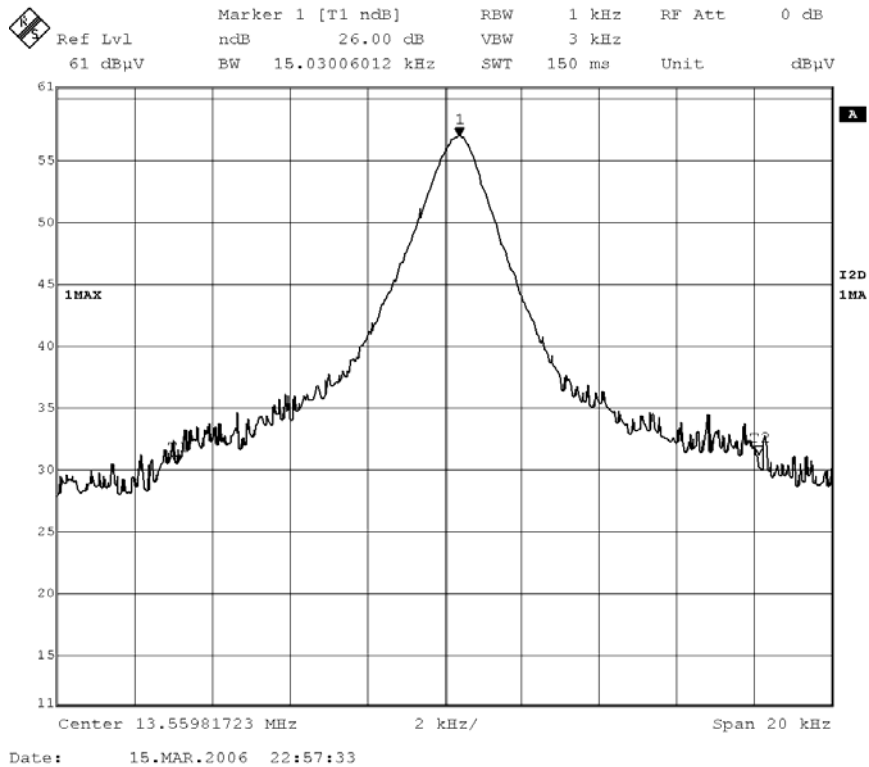
UL Apex Co., Ltd.
 Head Office EMC Lab. No.7 shielded room

Company : KYOCERA MITA Corporation
 Equipment : RFID Module
 Model : B5J-0451
 Serial No. : 059
 Power : DC 3.30V
 Mode : Transmitting

Report No. : 26FE0182-HO
 Regulation : N/A
 Date : 15/03/2006
 Humidity : 25%
 Temperature : 28deg.C
 Engineer : Mitsuru Fujimura

FREQ [MHz]	26dB Bandwidth [kHz]
13.56	15.03

*This test was performed instead of 20dB Bandwidth data.



Frequency Tolerance

Company : KYOCERA MITA Corporation Equipment : RFID Module Model : B5J-0451 Serial No. : 059 Power : DC 3.30V / DC2.93V / DC3.8V Mode : Transmitting	UL Apex Co., Ltd. Head Office EMC Lab. No.7 shielded room Report No. : 26FE0182-HO Regulation : FCC Part15 Subpart C 15.225 Date : 09/03/2006 Humidity : 32% Temperature : 24deg.C Engineer : Mitsuru Fujimura
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Limits	Operating frequency	13.56 MHz	±	0.01%	±	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	
-30deg.C	13.559915	13.559915	13.559916	13.559917	Complied
Margin	0.001271	0.001271	0.001272	0.001273	
-20deg.C	13.559990	13.559991	13.559996	13.559997	Complied
Margin	0.001346	0.001347	0.001352	0.001353	
-10deg.C	13.560073	13.560074	13.560075	13.560075	Complied
Margin	0.001283	0.001282	0.001281	0.001281	
0deg.C	13.560091	13.560092	13.560092	13.560093	Complied
Margin	0.001265	0.001264	0.001264	0.001263	
+10deg.C	13.560116	13.560116	13.560116	13.560117	Complied
Margin	0.001240	0.001240	0.001240	0.001239	
+20deg.C	13.560118	13.560119	13.560119	13.560117	Complied
Margin	0.001238	0.001237	0.001237	0.001239	
+30deg.C	13.560110	13.560109	13.560109	13.560109	Complied
Margin	0.001246	0.001247	0.001247	0.001247	
+40deg.C	13.560094	13.560093	13.560094	13.560094	Complied
Margin	0.001262	0.001263	0.001262	0.001262	
+50deg.C	13.560085	13.560085	13.560086	13.560086	Complied
Margin	0.001271	0.001271	0.001270	0.001270	

*1 Frequency stability vs. input voltage

% of Rated Supply	Supply Voltage	Measured Frequency (MHz)				Result	
		Start	2 minutes	5 minutes	10 minutes		
Nor	DC	3.30	13.560103	13.560103	13.560104	13.560103	Complied
	Margin		0.001039	0.000981	0.001047	0.001072	
85%	DC	2.93※	13.560099	13.560099	13.560099	13.560099	Complied
	Margin		0.001152	0.001166	0.001113	0.001146	
115%	DC	3.80	13.560143	13.560208	13.560232	13.560237	Complied
	Margin		0.000915	0.000815	0.000875	0.001236	

Note: Test Procedure ANSI C63.4-2003 Annex H.5.2 and H.5.3 ※End Point

APPENDIX 4: Data of Confirmation test

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

Front



Rear



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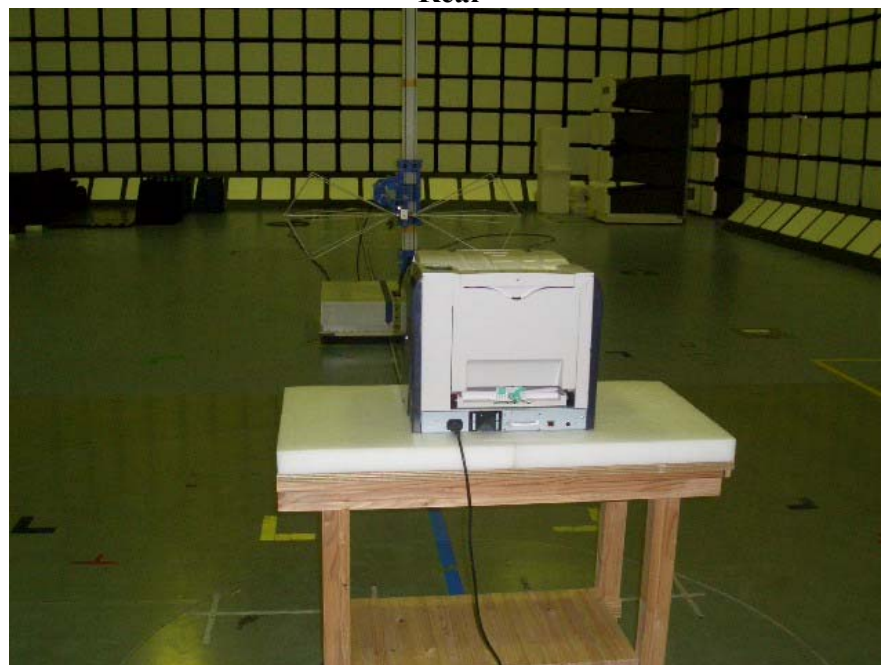
MF060b(14.06.06)

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

Front



Rear



Radiated emission(Fundamental emission and Spectrum Mask)
Module installed in the printer

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : KYOCERA MITA Corporation REPORT NO. : 26FE0182-HO
EQUIPMENT : RFID Reader/Writer / Printer REGULATION : FCC15.225
MODEL : B5J-0451/FS-C5010DN TEST DISTANCE : 3m
S/N : 059/ SPL5900043 DATE : 31/03/2006
POWER : AC120V/60Hz TEMPERATURE : 25 deg.C.
MODE : Transmitting / Usual Condition HUMIDITY : 31 %
ENGINEER : Mitsuru Fujimura

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	30.9	20.4	-26.7	24.6	69.5	44.9	0
13.4100	30.9	20.4	-26.7	24.6	80.5	55.9	0
13.5530	30.8	20.5	-26.7	24.6	90.4	65.8	0
13.5600	36.8	20.5	-26.6	30.7	123.9	93.2	0
13.5670	31.0	20.5	-26.6	24.9	90.4	65.5	0
13.7100	30.8	20.5	-26.6	24.7	80.5	55.8	0
14.0100	30.9	20.5	-26.6	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)

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

COMPANY : KYOCERA MITA Corporation REPORT NO. : 26FE0182-HO
EQUIPMENT : MFP (RFID Reader/Writer) REGULATION : FCC15.225
MODEL : FS-C5010DN (B5J-0451) TEST DISTANCE : 3m
S/ N : SPL5900043 DATE : 31/03/2006
POWER : AC120V/60Hz TEMPERATURE : 25 deg.C.
MODE : Transmitting / Usual Condition HUMIDITY : 31 %
ENGINEER : Mitsuru Fujimura

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	30.2	21.3	-26.1	25.4	69.5	44.1	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

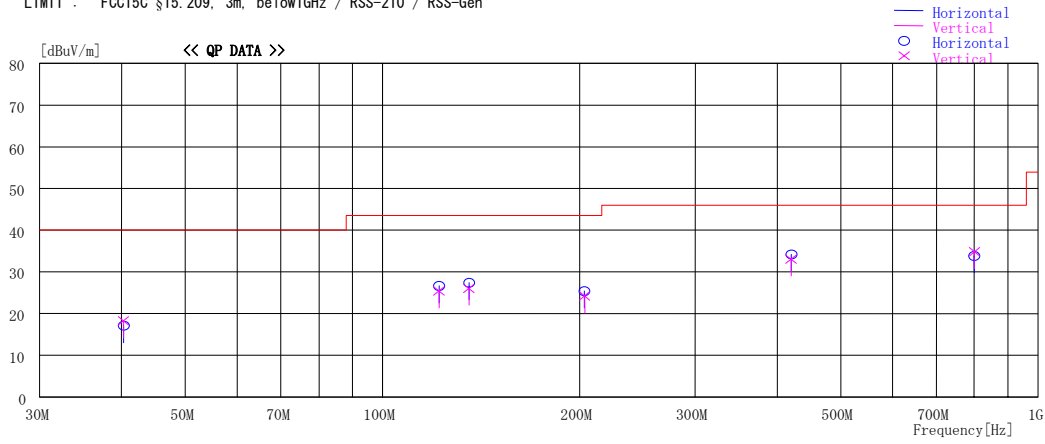
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2006/04/01 01:19:38

Applicant : KYOCERA MITA Corporation
 Kind of EUT : RFID Reader / Writer / Printer
 Model No. : B5J-0451/ FS-C5010DN
 Serial No. : 059/ SPL5900043

Report No. : 26FE0182-HO
 Power : 120V / 60Hz
 Temp./Humi. : 25deg. C / 31%
 Operator : Mitsuru Fujimura

Mode / Remarks : Transmitting 13.56MHz

LIMIT : FCC15C §15.209, 3m, below1GHz / RSS-210 / RSS-Gen



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Polar.	Limit [dBuV/m]	Margin [dB]
			Factor [dB/m]	Loss& Gain [dB]				
40.281	23.7	QP	13.9	-20.5	17.1	Hori.	40.0	22.9
40.281	24.8	QP	13.9	-20.5	18.2	Vert.	40.0	21.8
121.984	32.1	QP	13.3	-18.8	26.6	Hori.	43.5	16.9
122.028	30.9	QP	13.3	-18.8	25.4	Vert.	43.5	18.1
135.511	31.6	QP	14.4	-18.6	27.4	Hori.	43.5	16.1
135.586	30.2	QP	14.4	-18.6	26.0	Vert.	43.5	17.5
203.400	24.7	QP	17.1	-17.6	24.2	Vert.	43.5	19.3
203.244	25.9	QP	17.1	-17.6	25.4	Hori.	43.5	18.1
420.360	33.0	QP	17.7	-16.5	34.2	Hori.	46.0	11.8
420.360	31.9	QP	17.7	-16.5	33.1	Vert.	46.0	12.9
800.040	26.9	QP	21.6	-14.7	33.8	Hori.	46.0	12.2
800.040	27.9	QP	21.6	-14.7	34.8	Vert.	46.0	11.2

CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN