

APPENDIX 2: 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 : 2006/09/15 15:41:17

Company : Konica Minolta Business Technologies Report No. : 27BE0182-H0
 Kind of EUT : Authentication Unit Power : DC5.0V(USB) , 120V/60Hz PC AC Adapter
 Model No. : AU-201 Temp./Humi. : 23 deg.C / 61%
 Serial No. : 064000295 Operator : Yutaka Yoshida

Mode / Remarks : Continuous IC CARD reading/writing (Antenna Attached)

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

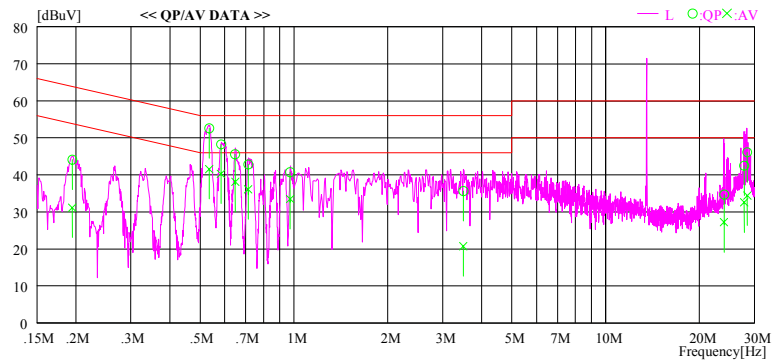
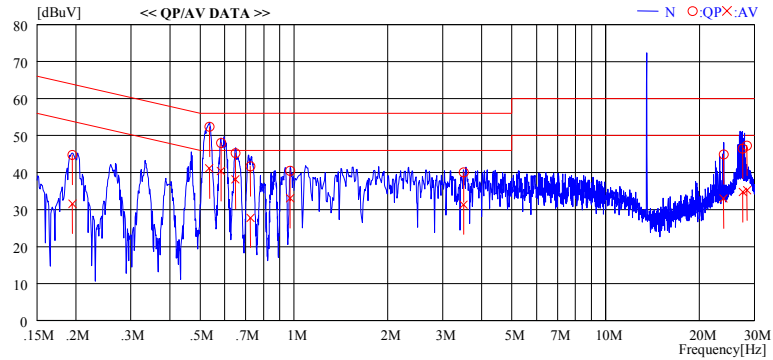


CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCURATION: RESULT=READING+C.F(LISM LOSS+CABLE LOSS)
 Except for the above table : adequate margin data below the limits.

Conducted emission

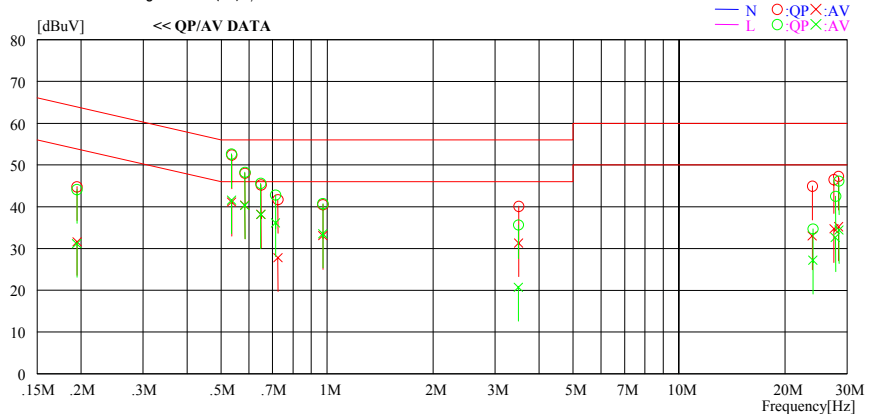
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
 Date : 2006/09/15 15:41:17

Company : Konica Minolta Business Technologies Report No. : 27BE0182-H0
 Kind of EUT : Authentication Unit Power : DC5.0V (USB) 120V/60Hz PC AC Adapter
 Model No. : AU-201 Temp./Humi. : 23 deg. C / 61%
 Serial No. : 064000295 Operator : Yutaka Yoshida

Mode / Remarks : Continuous IC CARD reading/writing (Antenna Attached)

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



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.19464	44.6	31.4	0.2	44.8	31.6	63.8	53.8	19.0	22.2	N	
0.53515	52.1	40.8	0.3	52.4	41.1	56.0	46.0	3.6	4.9	N	
0.58365	47.7	40.1	0.3	48.0	40.4	56.0	46.0	8.0	5.6	N	
0.64855	45.0	37.9	0.3	45.3	38.2	56.0	46.0	10.7	7.8	N	
0.72555	41.4	27.5	0.3	41.7	27.8	56.0	46.0	14.3	18.2	N	
0.97276	40.2	32.8	0.3	40.5	33.1	56.0	46.0	15.5	12.9	N	
3.50200	39.5	30.7	0.6	40.1	31.3	56.0	46.0	15.9	14.7	N	
23.88452	43.5	31.6	1.4	44.9	33.0	60.0	50.0	15.1	17.0	N	
27.54280	45.0	33.2	1.5	46.5	34.7	60.0	50.0	13.5	15.3	N	
28.41322	45.7	33.6	1.6	47.3	35.2	60.0	50.0	12.7	14.8	N	
0.19450	43.9	31.0	0.2	44.1	31.2	63.8	53.8	19.7	22.6	L	
0.53490	52.3	41.3	0.3	52.6	41.6	56.0	46.0	3.4	4.4	L	
0.58340	48.0	40.0	0.3	48.3	40.3	56.0	46.0	7.7	5.7	L	
0.64840	45.3	37.8	0.3	45.6	38.1	56.0	46.0	10.4	7.9	L	
0.71315	42.5	35.8	0.3	42.8	36.1	56.0	46.0	13.2	9.9	L	
0.97286	40.4	33.2	0.3	40.7	33.5	56.0	46.0	15.3	12.5	L	
3.49500	35.0	20.1	0.6	35.6	20.7	56.0	46.0	20.4	25.3	L	
23.98300	33.3	25.8	1.4	34.7	27.2	60.0	50.0	25.3	22.8	L	
27.81500	41.0	31.1	1.5	42.5	32.6	60.0	50.0	17.5	17.4	L	
28.45900	44.6	32.8	1.6	46.2	34.4	60.0	50.0	13.9	15.6	L	

CHART: WITH FACTOR. Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C.F (L1SN LOSS+CABLE LOSS)
 Except for the above table : adequate margin data below the limits.

Conducted emission

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
 Date : 2006/09/15 16:24:49

Company : Konica Minolta Business Technologies Report No. : 27BE0182-H0
 Kind of EUT : Authentication Unit Power : DC5.0V (USB), 120V/60Hz PC AC Adapter
 Model No. : AU-201 Temp./Humi. : 23 deg. C / 61%
 Serial No. : 064000296 Operator : Yutaka Yoshida

Mode / Remarks : Continuous IC CARD reading/writing (Antenna is terminated in antenna port.)

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

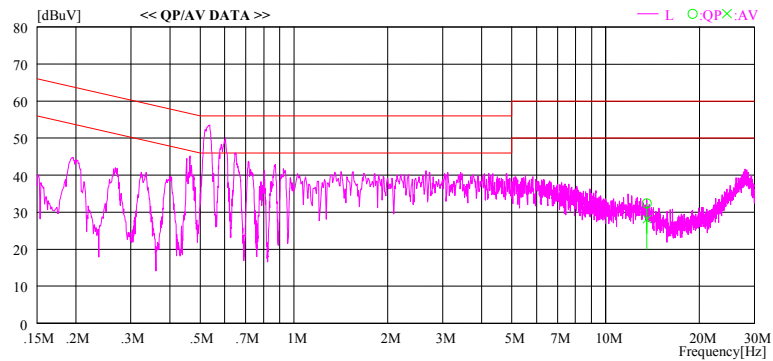
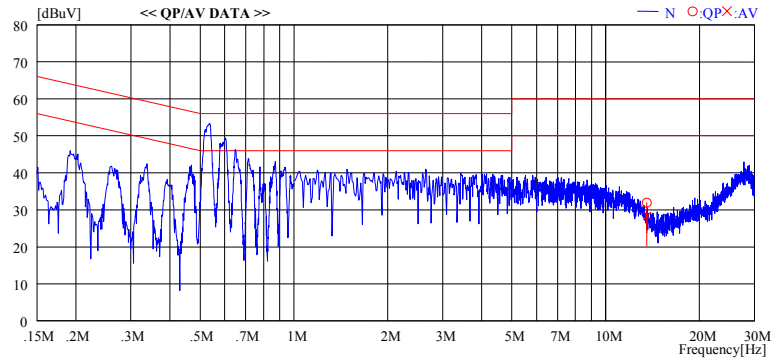


CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C.F (L1SN LOSS+CABLE LOSS)
 Except for the above table : adequate margin data below the limits.

Conducted emission

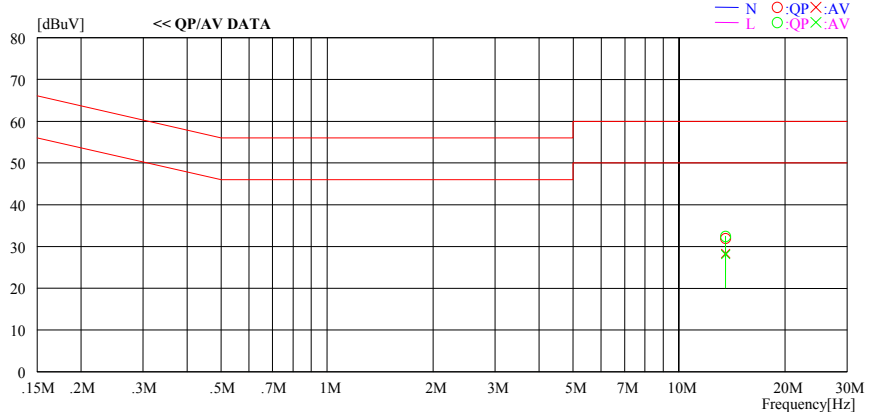
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
 Date : 2006/09/15 16:24:49

Company : Konjica Minolta Business Technologies Report No. : 27BE0182-H0
 Kind of EUT : Authentication Unit Power : DC5.0V (USB), 120V/60Hz PC AC Adapter
 Model No. : AU-201 Temp./Humi. : 23 deg. C / 61%
 Serial No. : 064000296 Operator : Yutaka Yoshida

Mode / Remarks : Continuous IC CARD reading/writing (Antenna is terminated in antenna port.)

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



Frequency	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
13.56000	30.8	27.2	1.1	31.9	28.3	60.0	50.0	28.1	21.7	N	
13.56000	31.3	27.0	1.1	32.4	28.1	60.0	50.0	27.6	21.9	L	

CHART: WITH FACTOR. Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C.F (L1SN 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. No2 Semi Anechoic Chamber

COMPANY : Konica Minolta Business Technologies
EQUIPMENT : Authentication Unit
MODEL : AU-201
S/N : 064000295
POWER : DC5V(USB) / AC120V/60Hz(AC ADP)
MODE : Continuous IC CARD Reading/Writing
13.56MHz , X-axis

REPORT NO. : 27BE0182-HO
REGULATION : FCC15.225/RSS-210A2.6
TEST DISTANCE : 3m
DATE : 09/15/2006
TEMPERATURE : 23 deg.C.
HUMIDITY : 61 %
ENGINEER : Yutaka Yoshida

FREQ [MHz]	T/R Reading [dBuV]	Ant Factor [dB/m]	C.F [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna angle [deg.]
13.11000	31.3	20.4	-27.6	24.1	69.5	45.4	90
13.41000	36.8	20.4	-27.6	29.6	80.5	50.9	90
13.55300	65.3	20.5	-27.6	58.2	90.4	32.2	90
13.56028	81.0	20.5	-27.6	73.9	123.9	50.0	90
13.56700	67.2	20.5	-27.6	60.1	90.4	30.3	90
13.71000	36.6	20.5	-27.6	29.5	80.5	51.0	90
14.01000	31.3	20.5	-27.6	24.2	69.5	45.3	90

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)

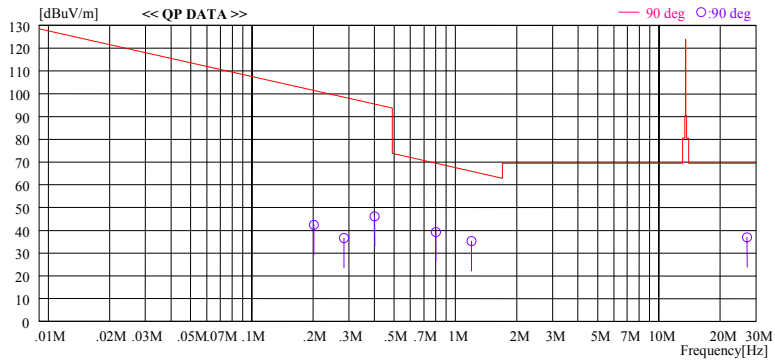
DATA OF MAGNETIC RADIATED EMISSION TEST

UL Apex Co.,LTD. Head Office EMC Lab. No.2 Semi Anechoic Chamber
 Date : 2006/09/15 10:51:55

Company : Konica Minolta Business Technologies Report No. : 27BE0182-HO
 Kind of EUT : Authentication Unit Power : DC5.0V (supplied by USB I/F)
 Model No. : AU-201 Temp./Humi. : 23deg.C / 61%
 Serial No. : 064000295 Operator : Yutaka Yoshida

Mode / Remarks : Continuous IC CARD reading/writing(13.56MHz)

LIMIT : FCC15C §15.225, 3m
 Except for the data below : adequate margin data below the limits.



Freq.	Reading	DET	Ant.Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dBm]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
0.20124	50.6	QP	19.5	0.2	27.9	42.4	101.5	59.1	90deg	109	X-axis
0.28294	44.9	QP	19.5	0.3	28.0	36.7	98.6	61.9	90deg	269	X-axis
0.40093	54.5	QP	19.5	0.3	28.2	46.1	95.5	49.4	90deg	161	X-axis
0.80057	48.0	QP	19.5	0.3	28.5	39.3	69.5	30.2	90deg	159	X-axis
1.19969	44.1	QP	19.5	0.3	28.6	35.3	66.0	30.7	90deg	161	X-axis
27.12034	42.7	QP	21.3	1.6	28.7	36.9	69.5	32.6	90deg	149	X-axis

CHART : WITH FACTOR ANT TYPE : LOOP
 CALCULATION : READING + ANT FACTOR + LOSS (CABLE + ATTEN. -AMP.)

Page:

Radiated emission (Spurious emission: above 30MHz)

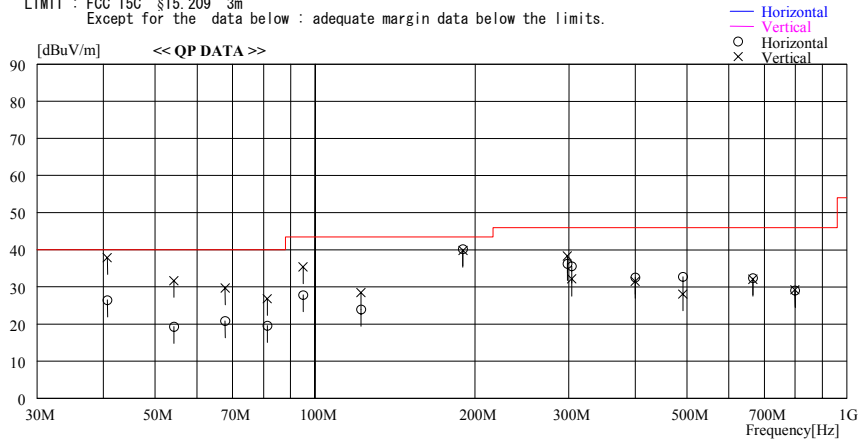
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
 Date : 2006/09/15 11:42:29

Company : Konica Minolta Business Technologies Report No. : 27BE0182-HO
 Kind of EUT : Authentication Unit Power : DC5.0V (supplied by USB I/F)
 Model No. : AU-201 Temp./Humi. : 23deg. C. / 61%
 Serial No. : 064000295 Operator : Yutaka Yoshida

Mode / Remarks : Continuous IC CARD reading/writing(13.56MHz), X-axis

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



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss&Gain [dB]							
40.677	35.2	QP	13.3	-22.0	26.5	156	281	Hori.	40.0	13.5	
40.677	46.6	QP	13.3	-22.0	37.9	76	100	Vert.	40.0	2.1	
54.240	44.3	QP	9.3	-21.9	31.7	90	100	Vert.	40.0	8.3	
54.240	31.9	QP	9.3	-21.9	19.3	320	400	Hori.	40.0	20.7	
67.800	44.4	QP	6.9	-21.6	29.7	71	100	Vert.	40.0	10.3	
67.800	35.5	QP	6.9	-21.6	20.8	281	400	Hori.	40.0	19.2	
81.300	41.7	QP	6.5	-21.4	26.8	27	100	Vert.	40.0	13.2	
81.377	34.5	QP	6.5	-21.4	19.6	281	236	Hori.	40.0	20.4	
94.920	47.8	QP	8.9	-21.3	35.4	64	100	Vert.	43.5	8.1	
94.926	40.2	QP	8.9	-21.3	27.8	90	300	Hori.	43.5	15.7	
122.040	32.2	QP	12.7	-21.0	23.9	246	314	Hori.	43.5	19.6	
122.041	36.8	QP	12.7	-21.0	28.5	10	100	Vert.	43.5	15.0	
189.842	43.8	QP	16.3	-20.3	39.8	308	100	Vert.	43.5	3.7	
189.848	44.2	QP	16.3	-20.3	40.2	233	173	Hori.	43.5	3.3	
298.326	37.5	QP	20.0	-19.2	38.3	287	302	Vert.	46.0	7.7	
298.324	35.5	QP	20.0	-19.2	36.3	0	364	Hori.	46.0	9.7	
304.002	37.0	QP	14.3	-19.2	32.1	207	100	Vert.	46.0	13.9	
304.005	40.5	QP	14.3	-19.2	35.6	85	100	Hori.	46.0	10.4	
400.000	34.6	QP	17.8	-19.8	32.6	276	100	Hori.	46.0	13.4	
400.000	33.5	QP	17.8	-19.8	31.5	288	138	Vert.	46.0	14.5	
491.977	30.4	QP	17.8	-20.1	28.1	336	100	Vert.	46.0	17.9	
491.997	35.0	QP	17.8	-20.1	32.7	315	135	Hori.	46.0	13.3	
666.000	31.1	QP	20.1	-19.1	32.1	178	100	Vert.	46.0	13.9	
666.264	31.3	QP	20.2	-19.1	32.4	215	148	Hori.	46.0	13.6	
799.190	25.8	QP	21.4	-18.2	29.0	105	287	Hori.	46.0	17.0	
799.192	26.0	QP	21.4	-18.2	29.2	359	100	Vert.	46.0	16.8	

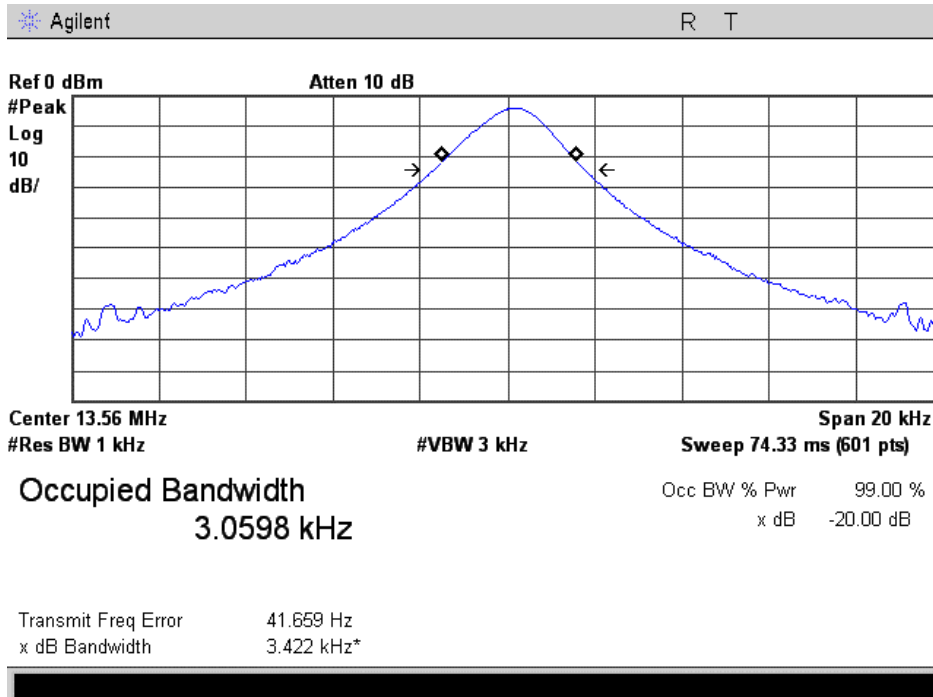
CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz-- HORN
 CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

-20dB Bandwidth

UL Apex Co., Ltd.
 Head Office EMC Lab. No.6 Measurement Room

COMPANY : Konica Minolta Business Technologies, Inc.	REPORT NO : 27BE0182-HO
EQUIPMENT : Authentication Unit	REGULATION : FCC 15.225/-
MODEL : AU-201	TEST DISTANCE : -
S/ N : 064000295	DATE : 10/30/2006
POWER : DC5.0V(USB I/F)	TEMPERATURE : 25 deg.C.
MODE : Tx 13.56MHz	HUMIDITY : 44 %
	ENGINEER : Makoto Kosaka

FREQ [MHz]	-20dB Bandwidth [kHz]
13.56	3.42

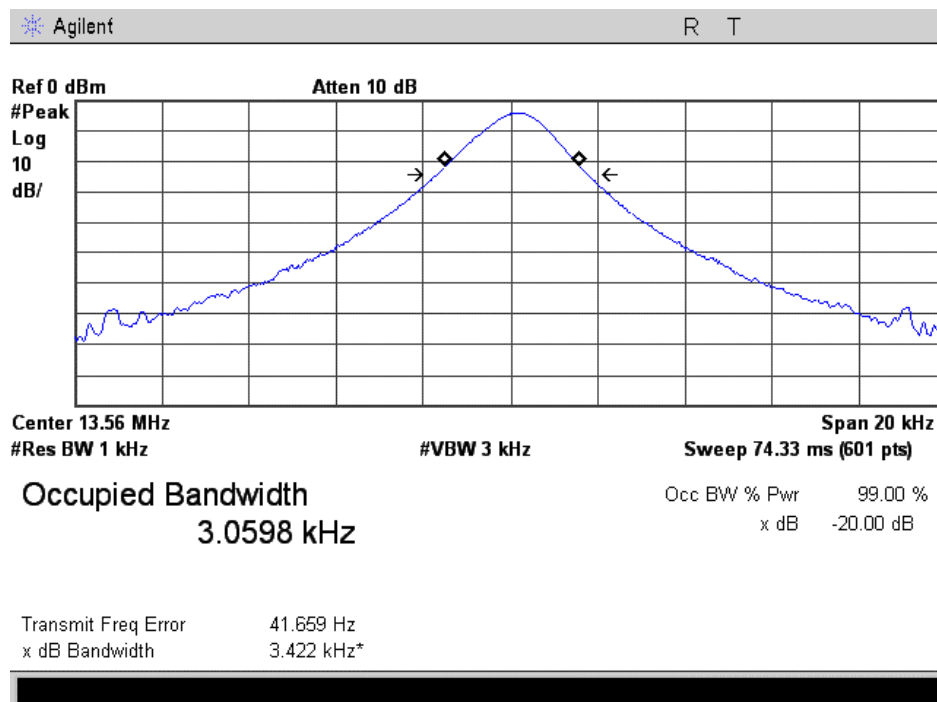


99% Occupied Bandwidth

UL Apex Co., Ltd.
 Head Office EMC Lab. No.6 Measurement Room

COMPANY : Konica Minolta Business Technologies, Inc.	REPORT NO : 27BE0182-HO
EQUIPMENT : Authentication Unit	REGULATION : RSS-Gen 4.4.1
MODEL : AU-201	TEST DISTANCE : -
S/N : 064000295	DATE : 10/30/2006
POWER : DC5.0V(USB I/F)	TEMPERATURE : 25 deg.C.
MODE : Tx 13.56MHz	HUMIDITY : 44 %
	ENGINEER : Makoto Kosaka

FREQ [MHz]	99% Occpied Bandwidth [kHz]
13.56	3.06



Frequency Tolerance

UL Apex Co., Ltd.
 Head Office EMC Lab. No.6 Measurement Room

COMPANY : Konica Minolta Business Technologies, Inc.	REPORT NO : 27BE0182-HO
EQUIPMENT : Authentication Unit	REGULATION : FCC15.225 (e)/RSS-210A2.6
MODEL : AU-201	TEST DISTANCE : -
S/ N : 064000295	DATE : 10/30/2006
POWER : DC5.0V(USB I/F)	TEMPERATURE : 25 deg.C.
MODE : Tx 13.56MHz	HUMIDITY : 44 %
	ENGINEER : Makoto Kosaka

Test Condition	Test Timing	Measured freq [MHz]	Freq error [MHz]	Result [ppm]	Limit (+/- 0.01%) [+/- ppm]	Margin [ppm]
T nom 20deg.C Vnom (100%)	Power on	13.56019500	0.00019500	14.38	100.00	85.62
	on 2min.	13.56019000	0.00019000	14.01	100.00	85.99
	on 5min.	13.56018800	0.00018800	13.86	100.00	86.14
	on 10min.	13.56018600	0.00018600	13.72	100.00	86.28
T max 50°C Vnom (100%)	Power on	13.56010900	0.00010900	8.04	100.00	91.96
	on 2min.	13.56010600	0.00010600	7.82	100.00	92.18
	on 5min.	13.56010300	0.00010300	7.60	100.00	92.40
	on 10min.	13.56009900	0.00009900	7.30	100.00	92.70
T min -20deg.C Vnom (100%)	Power on	13.56026900	0.00026900	19.84	100.00	80.16
	on 2min.	13.56026900	0.00026900	19.84	100.00	80.16
	on 5min.	13.56026900	0.00026900	19.84	100.00	80.16
	on 10min.	13.56026900	0.00026900	19.84	100.00	80.16

Limit : 13.56 MHz +/-0.01 % (+/- 100ppm)
 +/- 0.001356 MHz

APPENDIX 3: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MSA-06	Spectrum Analyzer	Agilent	E4407B	FT, BW	2006/05/24 * 12
MLPA-03	Loop Antenna	UL-Apex	-	FT, BW	Pre Check
MCC-30	coaxial cable	ULApex	-	FT, BW	2006/05/29 * 12
MCH-04	Temperature and Humidity Chamber	Espec	PL-2KP	FT	2006/09/06 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-180	FT, BW	2006/01/19 * 24
MSD-01	Volt Slider	TOKYO-RIKOSHA CO.,LTD.	RSA-10	FT, BW	Pre Check
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE/CE/ME	2006/04/10 * 12
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	ME	2005/12/06 * 12
MCC-31	coaxial cable	ULApex	-	ME	2006/05/29 * 12
MRENT-39	Spectrum Analyzer	Advantest	R3273	RE/CE/ME	2006/07/25 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	RE/CE/ME	2006/03/04 * 12
MOS-02	Digital Humidity Indicator	N.T	NT-1800	RE/CE/ME	2004/11/25 * 24
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2006/10/07 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2006/10/07 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2006/02/23 * 12
MAT-02	Attenuator(3dB)	Weinschel Corp	2	RE	2005/12/16 * 12
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE/ME/CE	-
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE (EUT)	2006/02/06 * 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(Above 30MHz),
- ME: Radiated emission(Below 30MHz),
- FT: Frequency Tolerance
- BW: Bandwidth

UL Apex Co., Ltd.

Head Office EMC Lab.

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MF060b(14.06.06)