

# DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber  
Date : 2010/11/12

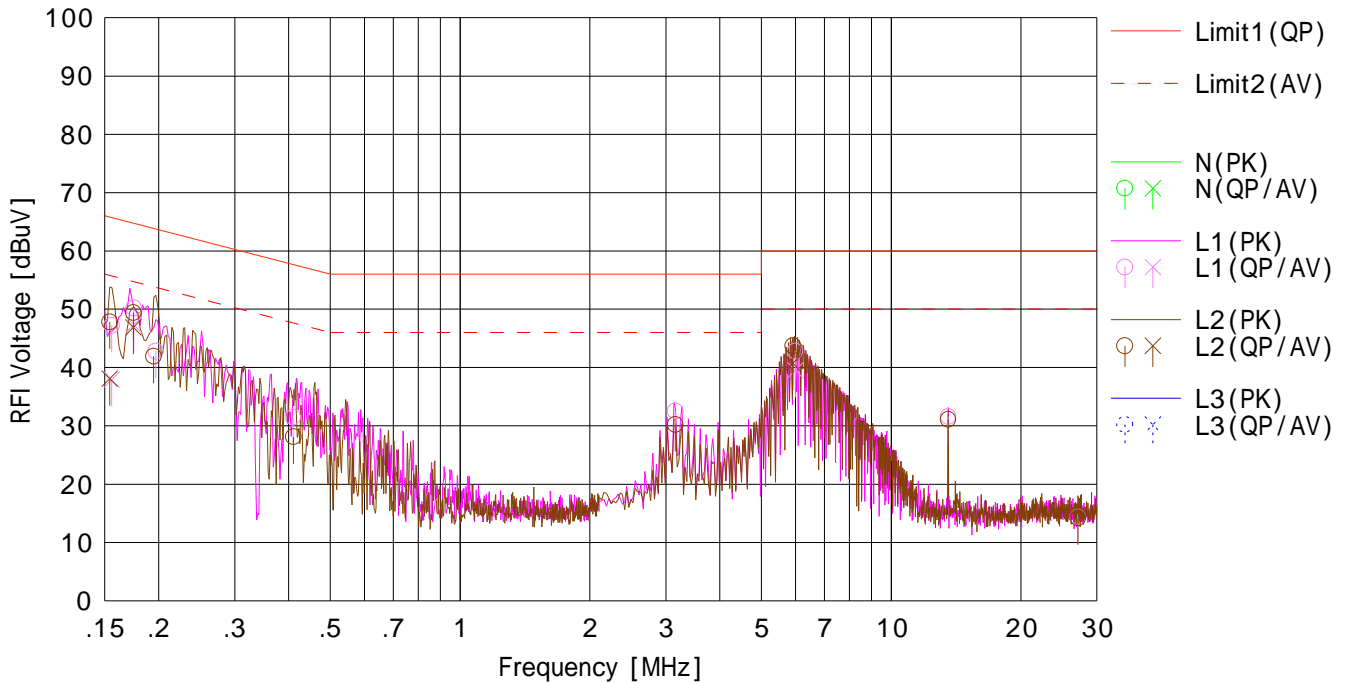
Company : RICOH COMPANY LTD.  
Kind of E.U.T. : Color Copier  
Model No. : Pro C751EX  
Serial No. : G000000020

Mode : Transmitting(13.56MHz)  
Report No. : 31BE0047-SH-E  
Power : AC240V/60Hz SinglePhase with PE  
Temp./Humi. : 20 / 41%

Remarks : RFID Module: K

Limit1 : FCC 15C(15.207) QP  
Limit2 : FCC 15C(15.207) AV

Engineer : Yasumasa Owaki



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15548	33.6	24.3	13.6	47.2	37.9	65.7	55.7	18.5	17.8	L1	
2	0.17502	36.6	33.7	13.6	50.2	47.3	64.7	54.7	14.5	7.4	L1	
3	0.19680	29.2	---	13.6	42.8	---	63.7	53.7	20.9	---	L1	
4	0.40955	18.1	---	13.4	31.5	---	57.6	47.6	26.1	---	L1	
5	3.15760	18.9	---	13.6	32.5	---	56.0	46.0	23.5	---	L1	
6	5.98960	29.0	25.7	13.8	42.8	39.5	60.0	50.0	17.2	10.5	L1	
7	13.56000	17.6	---	14.0	31.6	---	60.0	50.0	28.4	---	L1	
8	27.12000	0.2	---	14.1	14.3	---	60.0	50.0	45.7	---	L1	
9	0.15390	34.2	24.5	13.6	47.8	38.1	65.7	55.7	17.9	17.6	L2	
10	0.17450	35.8	33.3	13.6	49.4	46.9	64.7	54.7	15.3	7.8	L2	
11	0.19450	28.3	---	13.6	41.9	---	63.8	53.8	21.9	---	L2	
12	0.41035	14.7	---	13.4	28.1	---	57.6	47.6	29.5	---	L2	
13	3.15742	16.6	---	13.6	30.2	---	56.0	46.0	25.8	---	L2	
14	5.92390	29.9	26.9	13.8	43.7	40.7	60.0	50.0	16.3	9.3	L2	
15	13.56000	17.1	---	14.0	31.1	---	60.0	50.0	28.9	---	L2	
16	27.12000	0.1	---	14.1	14.2	---	60.0	50.0	45.8	---	L2	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]

**Data of Field Strength and Outside Filed Strength: FCC15.225(a)(b)(c)**

UL Japan, Inc.  
Shonan No2 Semi-Anechoic Chamber

Company	: RICOH COMPANY LTD.	Report No.	: 30BE0047-SH-E
Equipment	: Color Copier	Regulation	: FCC Part15 SupartC 15.225
Model	: Pro C751EX	Test Distance	: 3m
Serial No.	: G000000020	Date	: 2010/11/11
Power	: AC240V/60Hz	Temperature	: 20deg.C
Mode	: Transmitting (13.56MHz)	Humidity	: 41%
Remarks	: Vertical polarization (antenna angle) of the worst case: 0deg		

ENGINEER : Tatsuya Arai

**Field strength**

No.	FREQ [MHz]	T/R Reading		ANT Factor	LOSS [dB]	AMP GAIN [dB]	RESULT		LIMIT (3m) [dBuV/m]	MARGIN	
		Hor [dBuV]	Ver [dBuV]				Hor [dBuV/m]	Ver [dBuV/m]		Hor [dB]	Ver [dB]
1	13.560	54.8	56.6	19.6	6.3	31.9	48.8	50.6	124.0	75.2	73.4

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]

Field strength of 13.553MHz to 13.567MHz Limit(3m) = 84dBuV/m + 40log 30m/3m  
= 124dBuV/m (FCC15.225(a))

**Outside Field strength**

No.	FREQ [MHz]	T/R Reading		ANT Factor	LOSS [dB]	AMP GAIN [dB]	RESULT		LIMIT (3m) [dBuV/m]	MARGIN	
		Hor [dBuV]	Ver [dBuV]				Hor [dBuV/m]	Ver [dBuV/m]		Hor [dB]	Ver [dB]
1	13.110	32.7	32.7	19.6	3.5	32.2	23.6	23.6	69.5	45.9	45.9
2	13.410	32.8	32.8	19.6	3.5	32.2	23.7	23.7	80.5	56.8	56.8
3	13.553	40.3	43.0	19.6	3.5	32.2	31.2	33.9	90.5	59.3	56.6
4	13.567	39.6	42.0	19.6	3.5	32.2	30.5	32.9	90.5	60.0	57.6
5	13.710	32.7	32.8	19.6	3.5	32.2	23.6	23.7	80.5	56.9	56.8
6	14.010	32.7	32.9	19.6	3.5	32.2	23.6	23.8	69.5	45.9	45.7

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]

**Outside filed strength frequencies**

- filed strength band  $F_c \pm 7\text{kHz}$ : 13.553MHz to 13.567MHz
  - Outside filde strength  $F_c \pm 150\text{kHz}$ : 13.410MHz to 13.710MHz
  - Outside filde strength  $F_c \pm 450\text{kHz}$ : 13.110MHz to 14.010MHz
- $F_c = 13.56\text{MHz}$

**Limits (3m)**

- 13.410MHz to 13.553MHz and 13.567MHz to 13.710MHz :  $50.5\text{dBuV/m} + 40\log 30\text{m}/3\text{m} = 90.5\text{dBuV/m}$  (FCC15.225(b))
- 13.110MHz to 14.010MHz and 13.710MHz to 14.010MHz :  $40.5\text{dBuV/m} + 40\log 30\text{m}/3\text{m} = 80.5\text{dBuV/m}$  (15.225(c))
- Below 13.110MHz and Above 14.010MHz :  $29.5\text{dBuV/m} + 40\log 30\text{m}/3\text{m} = 69.5\text{dBuV/m}$  (FCC15.225(d)and FCC15.209)

# DATA OF MAGNETIC EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber  
Date : 2010/11/12

Company : RICOH COMPANY LTD.  
Kind of E.U.T. : Color Copier  
Model No. : Pro C751EX  
Serial No. : G000000020

Mode : Transmitting (13.56MHz)  
Report No. : 31BE0047-SH-E  
Power : AC240V/60Hz SinglePhase with PE  
Temp./Humi. : 20°C / 41%

Remarks : RF ID Module:K

Limit1 : FCC15.209 (a) 3m, 9-90,110-490kHz:PK, other:QP

Limit2 : FCC15.209 (a) 3m, 9-90,110-490kHz:AV, other:QP Tested by : Yasumasa Owaki

<< QP/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Antenna	Table [deg]	Comment
		<QP> [dBuV]	<PK> [dBuV]				<QP> [dBuV/m]	<PK> [dBuV/m]	<PK> [dBuV/m]	<QP> [dBuV/m]	<PK> [dB]	<QP> [dB]			
1	27.12000	32.6	---	20.5	3.8	31.9	25.0	---	69.5	69.5	---	44.5	Hor	359	
2	27.12000	36.4	---	20.5	3.8	31.9	28.8	---	69.5	69.5	---	40.7	Ver	321	

# DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber  
Date : 2010/11/12

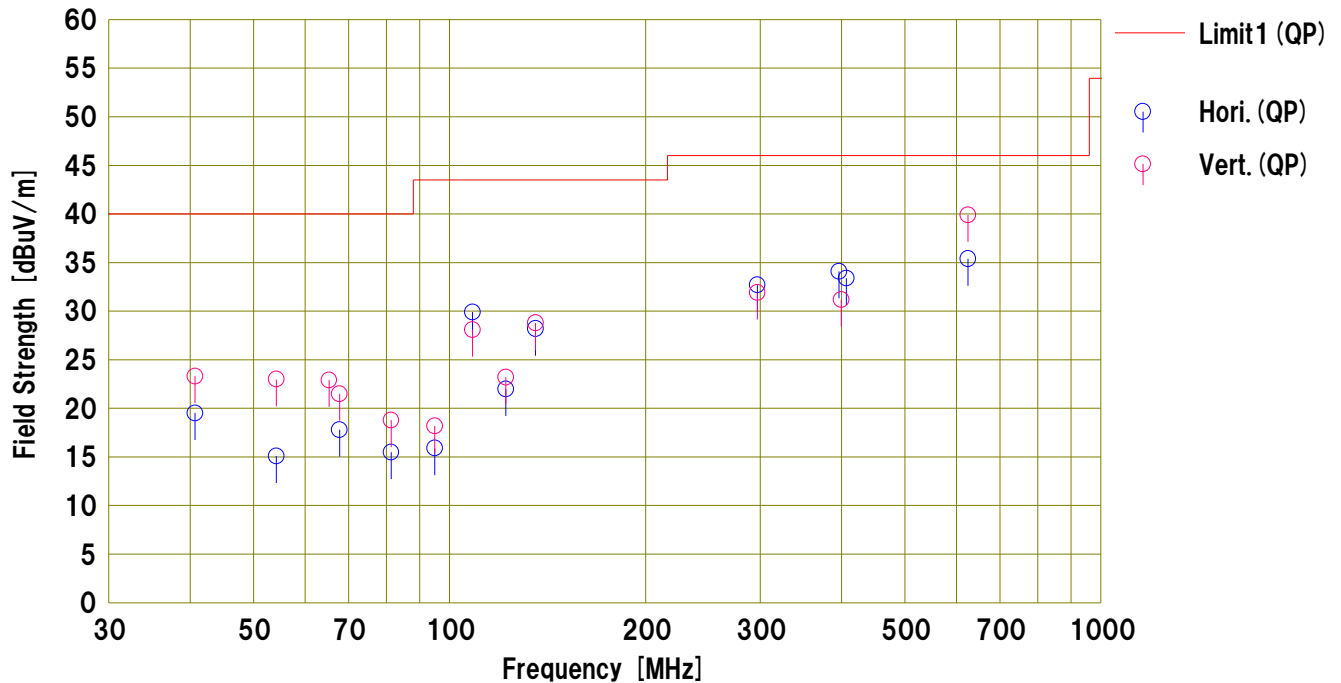
Company : RICOH COMPANY LTD.  
Kind of E.U.T. : Color Copier  
Model No. : Pro C751EX  
Serial No. : G000000020

Mode : Transmitting (13.56MHz)  
Report No. : 31BE0047-SH-E  
Power : AC240V/60Hz SinglePhase with PE  
Temp./Humi. : 20°C / 41%

Remarks : RF ID Module :K

Limit1 : FCC 15.209 (3m)

Engineer :Tatsuya Arai



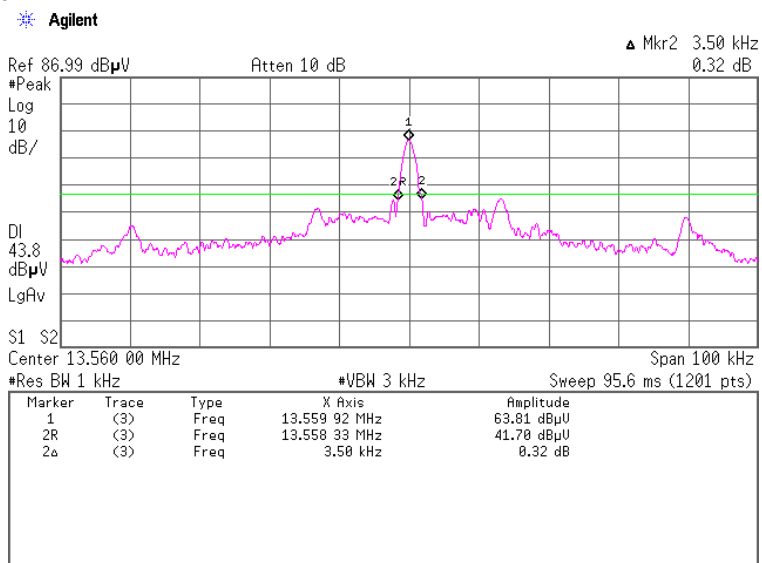
No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]				<QP> [dBuV/m]	<QP> [dB]						
1	40.680	29.6	14.7	7.1	31.9	19.5	40.0	20.5	Hori.	353	336	BC	
2	54.240	29.8	9.9	7.3	31.9	15.1	40.0	24.9	Hori.	400	138	BC	
3	67.800	34.9	7.2	7.5	31.8	17.8	40.0	22.2	Hori.	353	259	BC	
4	81.360	33.0	6.7	7.6	31.8	15.5	40.0	24.5	Hori.	234	0	BC	
5	94.920	30.7	9.2	7.8	31.8	15.9	43.5	27.6	Hori.	339	290	BC	
6	108.480	42.4	11.3	8.0	31.8	29.9	43.5	13.6	Hori.	300	271	BC	
7	122.040	32.8	12.9	8.1	31.8	22.0	43.5	21.5	Hori.	263	245	BC	
8	135.600	38.5	13.2	8.3	31.8	28.2	43.5	15.3	Hori.	259	283	BC	
9	296.994	35.1	19.6	9.7	31.7	32.7	46.0	13.3	Hori.	123	359	BC	
10	396.324	42.2	16.4	7.1	31.6	34.1	46.0	11.9	Hori.	126	107	LP	
11	406.796	41.2	16.6	7.2	31.6	33.4	46.0	12.6	Hori.	100	91	LP	
12	624.996	39.3	19.4	8.3	31.6	35.4	46.0	10.6	Hori.	100	71	LP	
13	40.680	33.4	14.7	7.1	31.9	23.3	40.0	16.7	Vert.	100	242	BC	
14	54.240	37.7	9.9	7.3	31.9	23.0	40.0	17.0	Vert.	100	357	BC	
15	65.320	39.8	7.5	7.4	31.8	22.9	40.0	17.1	Vert.	100	83	BC	
16	67.800	38.6	7.2	7.5	31.8	21.5	40.0	18.5	Vert.	100	232	BC	
17	81.360	36.3	6.7	7.6	31.8	18.8	40.0	21.2	Vert.	122	224	BC	
18	94.920	33.0	9.2	7.8	31.8	18.2	43.5	25.3	Vert.	100	354	BC	
19	108.480	40.6	11.3	8.0	31.8	28.1	43.5	15.4	Vert.	100	310	BC	
20	122.040	34.0	12.9	8.1	31.8	23.2	43.5	20.3	Vert.	100	127	BC	
21	135.600	39.1	13.2	8.3	31.8	28.8	43.5	14.7	Vert.	100	311	BC	
22	297.002	34.3	19.6	9.7	31.7	31.9	46.0	14.1	Vert.	123	359	BC	
23	399.660	39.2	16.5	7.1	31.6	31.2	46.0	14.8	Vert.	143	195	LP	
24	624.997	43.8	19.4	8.3	31.6	39.9	46.0	6.1	Vert.	100	212	LP	

## 20dB bandwidth & Occupied bandwidth (99%): FCC 15.215(c)

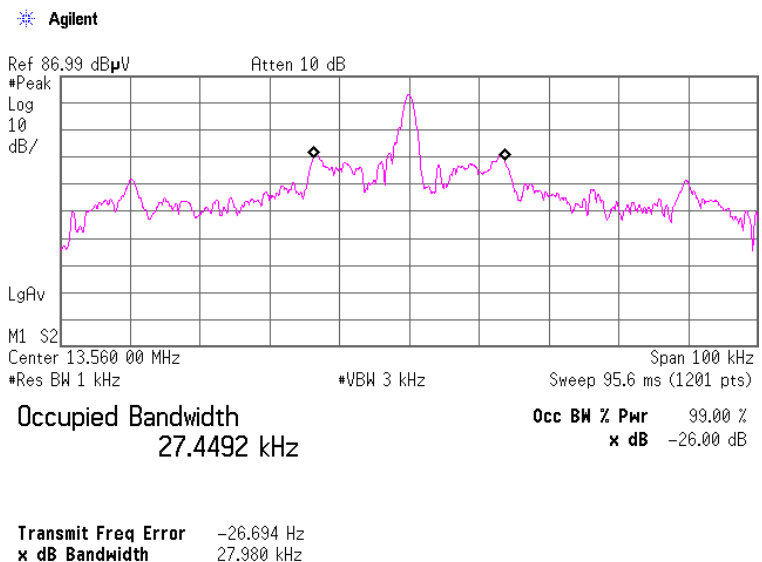
COMPANY : RICOH COMPANY LTD.  
 Equipment : Color Copier  
 MODEL NUMBER: Pro C751EX  
 SERIAL NUMBER: G00000020  
 POWER : DC5V

UL Japan, Inc. Shonan No5 Shield room  
 REPORT No. : 30BE0047-SH-E  
 REGULATION : FCC Part15SubpartC 215(c)  
 DATE : 2010/11/11  
 TEMP./HUMI : 23°C/35%  
 TEST MODE : Transmitting(13.56MHz)  
 ENGINEER : Tatsuya Arai

### 20dB Bandwidth: 3.50kHz



### OBW(99%): 27.4492kHz



**Data of Frequency Tolerance: FCC 15.225(e)**

UL Japan, Inc.  
Shonan No5 Shield room

Company : RICOH COMPANY LTD. Report No. : 30BE0047-SH-E  
 Equipment : Color Copier Regulation : FCC Part15 SupartC 15.225 (e)  
 Model : Pro C751EX  
 Sample No. : G000000020 Date : 2010/11/11  
 Power : DC5V Temperature : 23deg.C  
 Mode : Transmitting (13.56MHz) Humidity : 35%

ENGINEER : Tatsuya Arai

**Temperature Variation: -30deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559686	-0.0003140	-0.00232	0.01
after 2minutes	13.56	13.559698	-0.0003020	-0.00223	0.01
after 5minutes	13.56	13.559701	-0.0002990	-0.00221	0.01
after 10minutes	13.56	13.559701	-0.0002990	-0.00221	0.01

**Temperature Variation: -20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559833	-0.0001670	-0.00123	0.01
after 2minutes	13.56	13.559842	-0.0001580	-0.00117	0.01
after 5minutes	13.56	13.559842	-0.0001580	-0.00117	0.01
after 10minutes	13.56	13.559841	-0.0001590	-0.00117	0.01

**Temperature Variation: -10deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559918	-0.0000820	-0.00060	0.01
after 2minutes	13.56	13.559924	-0.0000760	-0.00056	0.01
after 5minutes	13.56	13.559923	-0.0000770	-0.00057	0.01
after 10minutes	13.56	13.559923	-0.0000770	-0.00057	0.01

**Temperature Variation: 0deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559958	-0.0000420	-0.00031	0.01
after 2minutes	13.56	13.559959	-0.0000410	-0.00030	0.01
after 5minutes	13.56	13.559959	-0.0000410	-0.00030	0.01
after 10minutes	13.56	13.559959	-0.0000410	-0.00030	0.01

**Temperature Variation: 10deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559964	-0.0000360	-0.00027	0.01
after 2minutes	13.56	13.559957	-0.0000430	-0.00032	0.01
after 5minutes	13.56	13.559959	-0.0000410	-0.00030	0.01
after 10minutes	13.56	13.559960	-0.0000400	-0.00029	0.01

**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559948	-0.0000520	-0.00038	0.01
after 2minutes	13.56	13.559948	-0.0000520	-0.00038	0.01
after 5minutes	13.56	13.559949	-0.0000510	-0.00038	0.01
after 10minutes	13.56	13.559949	-0.0000510	-0.00038	0.01

**Temperature Variation: 30deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559940	-0.0000600	-0.00044	0.01
after 2minutes	13.56	13.559938	-0.0000620	-0.00046	0.01
after 5minutes	13.56	13.559937	-0.0000630	-0.00046	0.01
after 10minutes	13.56	13.559937	-0.0000630	-0.00046	0.01

**Temperature Variation: 40deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559918	-0.0000820	-0.00060	0.01
after 2minutes	13.56	13.559916	-0.0000840	-0.00062	0.01
after 5minutes	13.56	13.559916	-0.0000840	-0.00062	0.01
after 10minutes	13.56	13.559915	-0.0000850	-0.00063	0.01

**Temperature Variation: 50deg.C**

Test Conditions	Original Frequency (MHz)	Mesure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559906	-0.0000940	-0.00069	0.01
after 2minutes	13.56	13.559906	-0.0000940	-0.00069	0.01
after 5minutes	13.56	13.559905	-0.0000950	-0.00070	0.01
after 10minutes	13.56	13.559905	-0.0000950	-0.00070	0.01

**Data of Frequency Tolerance: FCC 15.225(e)**

UL Japan, Inc.  
 Shonan No5 Shield room

Company	: RICOH COMPANY LTD.	Report No.	: 30BE0047-SH-E
Equipment	: Color Copier	Regulation	: FCC Part15 SupartC 15.225 (e)
Model	: Pro C751EX		
Sample No.	: G000000020	Date	: 2010/11/11
Power	: DC5V	Temperature	: 23deg.C
Mode	: Transmitting (13.56MHz)	Humidity	: 35%

ENGINEER : Tatsuya Arai

**Input Voltage:DC4.25V (85%)**

**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559949	-0.0000510	-0.00038	0.01
after 2minutes	13.56	13.559950	-0.0000500	-0.00037	0.01
after 5minutes	13.56	13.559950	-0.0000500	-0.00037	0.01
after 10minutes	13.56	13.559949	-0.0000510	-0.00038	0.01

**Input Voltage:DC5.75V (115%)**

**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559949	-0.0000510	-0.00038	0.01
after 2minutes	13.56	13.559950	-0.0000500	-0.00037	0.01
after 5minutes	13.56	13.559949	-0.0000510	-0.00038	0.01
after 10minutes	13.56	13.559950	-0.0000500	-0.00037	0.01



### APPENDIX 3 Test Instruments

#### EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	BW	2010/06/22 * 12
SFC-01	Microwave Counter	Agilent	53151A	US40511493	FT	2010/02/18 * 12
SCH-01	Temperature and Humidity Chamber	Espec	PL-1KT	14020837	FT	2010/04/24 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	BW,FT	2010/02/17 * 12
SCC-B9/B10/B11/B13/SRSE-02	Coaxial Cable&RF Selector	Suhner/Fujikura/Suhner/Suhner/TOYO	RG223U/12DSFA/141PE/NS4906	-/0901-270(RF Selector)	CE	2010/04/02 * 12
SLS-02	LISN	Rohde & Schwarz	ENV216	100512	CE(EUT)	2010/02/09 * 12
SLS-04	LISN	Rohde & Schwarz	ENV216	100514	CE(EUT)	2010/02/18 * 12
SLS-09	LISN	Rohde & Schwarz	ENV4200	100050	CE(EUT)	2010/04/13 * 12
SLS-07	LISN	Schwarzbeck	NSLK8126	8126441	CE(AE)	2010/04/26 * 12
SLS-08	LISN	Schwarzbeck	NSLK8126	8126442	CE(AE)	2010/09/02 * 12
SAT3-03	Attenuator	JFW	50HF-003N	-	CE	2010/02/06 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	CE/RE	2010/02/09 * 12
STM-02	Terminator	TME	CT-01 BP	-	CE	2010/01/08 * 12
STM-03	Terminator	TME	CT-01 BP	-	CE	2010/01/08 * 12
STM-04	Terminator	TME	CT-01 BP	-	CE	2010/01/08 * 12
STM-08	Terminator	TME	CT-01 BP	-	CE	2010/01/08 * 12
STR-02	Test Receiver	Rohde & Schwarz	ESCI	100575	CE/RE	2010/08/18 * 12
SJM-02	Measure	KOMELON	KMC-36	-	CE/RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV	-	CE/RE	-
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2010/02/06 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2010/02/06 * 12
SAT3-02	Attenuator	JFW	50HF-003N	-	RE	2010/02/06 * 12
SLP-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100218	RE	2010/10/15 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE	2010/10/11 * 12
SCC-B1/B3/B5/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2010/04/02 * 12
SCC-B2/B4/B6/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2010/04/02 * 12
SLA-02	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0893	RE	2010/10/11 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2010/09/04 * 12

The expiration date of the calibration is the end of the expired month .  
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

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,  
BW: Bandwidth,  
FT: Frequency tolerance

#### **APPENDIX 4: Similar model description**

Model No.	Pro C751EX	Pro C651EX	Pro C751
Category	Copier	Copier	Printer
Power supply	208-240V, 50/60Hz, 16A		
Printing speed (A4)	Bk/FC: 75	Bk/FC: 65	Bk/FC: 75
Auto document feeder	Yes	Yes	No
Scanner	Yes	Yes	No
Sensor for scanner (Document size sensor)	Vertical scanning: 2	Vertical scanning: 2	No
Heater for scanner (Dew condensation prevention)	Optional (230V/15W)	Optional (230V/15W)	No
Fuse heater (6 heaters)	230V/1000W	230V/1000W	230V/1000W
	230V/870W	230V/870W	230V/870W
	230V/650W	230V/650W	230V/650W
	230V/400W	230V/400W	230V/400W
	230V/400W	230V/400W	230V/400W
	230V/400W	230V/400W	230V/400W

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