

Data of Conducted Disturbance Test

UL Japan, Inc.
YAMAKITA No.2 SHIELD TEST ROOM
Report No. : 29GE0132-YK-01-A

Applicant : Sony Corporation
 Type of Equipment : Contactless IC Card Reader/Writer
 Model No. : RC-S620/U
 Serial No. : D100113
 Power : PC_AC120V/60Hz (Module_DC:3.3V)
 Mode : Transmitting(13.56MHz)
 Remarks :
 Date : 4/3/2009
 Phase : Single Phase
 Temperature : 24 °C
 Humidity : 34 %
 Limit : FCC Part15C § 15.207. (CISPR Pub. 22)

Engineer : Akira Sato

No.	FREQ. [MHz]	READING(N)		READING(L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μV]	AV	QP [dB μV]	AV				QP [dB]	AV [dB μV]	QP [dB μV]	AV [dB μV]	QP [dB]	AV [dB]
1.	0.1500	45.0	-	44.7	-	0.3	0.1	0.0	45.4	-	66.0	56.0	20.6	-
2.	0.1863	47.1	26.2	45.9	26.2	0.2	0.1	0.0	47.4	26.5	64.2	54.2	16.8	27.7
3.	0.2470	38.5	-	37.8	-	0.2	0.1	0.0	38.8	-	61.9	51.9	23.1	-
4.	0.5529	32.2	-	33.3	-	0.2	0.1	0.0	33.6	-	56.0	46.0	22.4	-
5.	2.8851	28.2	-	26.0	-	0.2	0.2	0.0	28.6	-	56.0	46.0	27.4	-
6.	13.5600	34.7	-	34.9	-	0.5	0.5	0.0	35.9	-	60.0	50.0	24.1	-
7.	14.6126	32.0	-	30.8	-	0.5	0.6	0.0	33.1	-	60.0	50.0	26.9	-
8.	27.1199	33.0	-	32.7	-	0.9	0.8	0.0	34.7	-	60.0	50.0	25.3	-

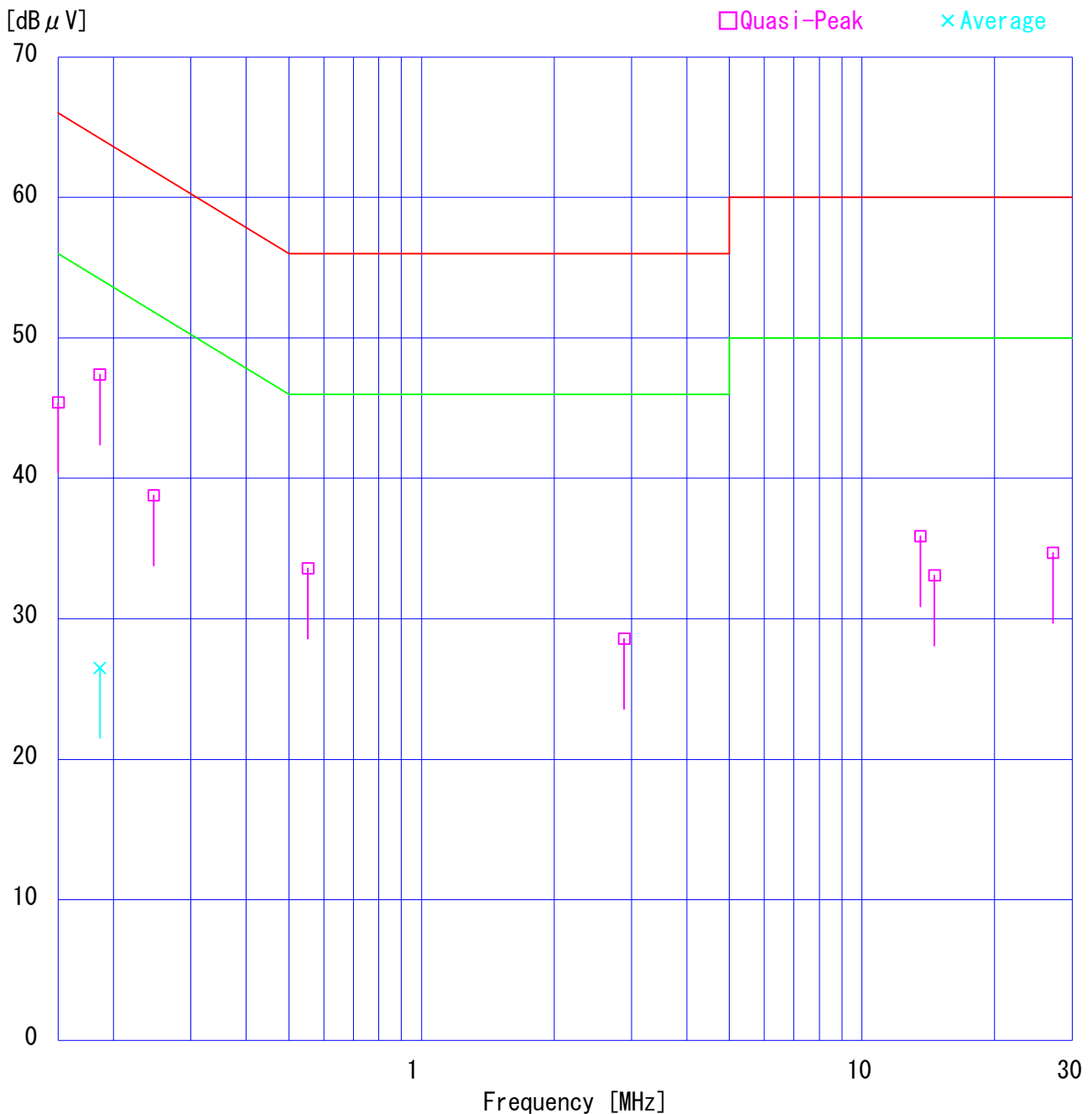
CALCULATION: READING + LISN FACTOR + CABLE LOSS + ATTEN.

■KLS-02 (NSLK8127) ■COAXIAL CABLE:KCC-33/34
 ■EMI RECEIVER:KTR-03 (ESHS10)

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Serial No.	: D100113		
Power	: PC_AC120V/60Hz (Module_DC:3.3V)		
Mode	: Transmitting(13.56MHz)		
Remarks	:		
Date	: 4/3/2009		
Phase	: Single Phase		
Temperature	: 24 °C	Engineer	: Akira Sato
Humidity	: 34 %		
Limit	: FCC Part15C § 15.207. (CISPR Pub. 22)		



Data of Conducted Disturbance Test

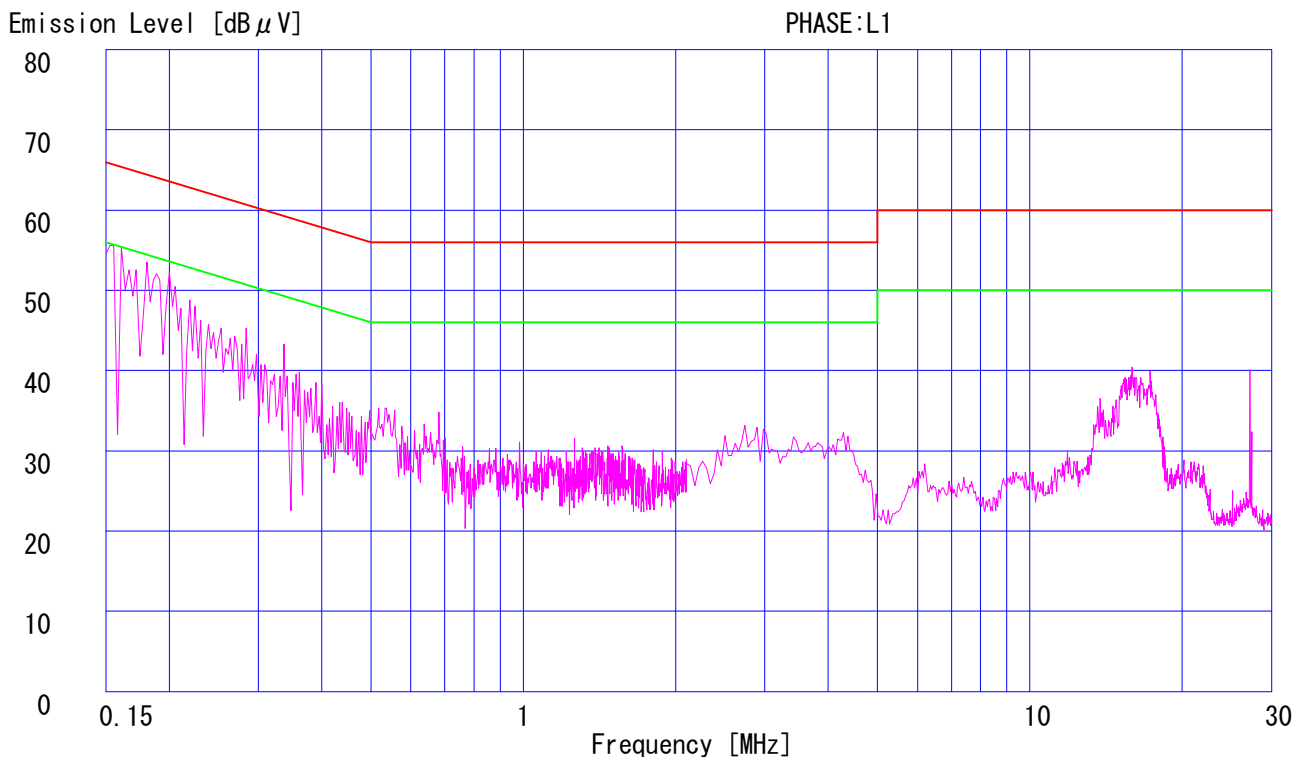
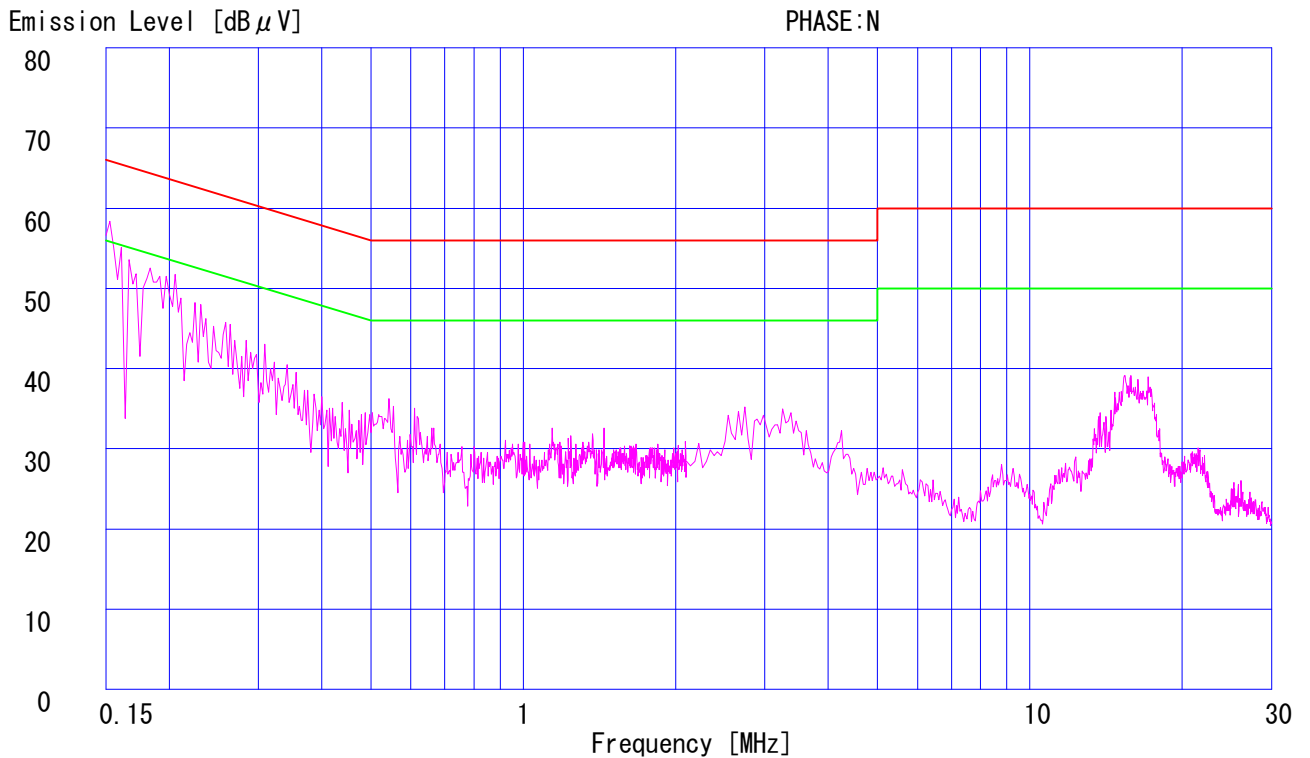
UL Japan, Inc.

YAMAKITA No.2 SHIELD TEST ROOM

Report No. : 29GE0132-YK-01-A

Applicant : Sony Corporation
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Model No. : RC-S620/U
Serial No. : D100113
Power : PC_AC120V/60Hz (Module_DC:3.3V)
Mode : Transmitting(13.56MHz)
Remarks :
Date : 4/3/2009
Phase : Single Phase
Temperature : 24 °C
Humidity : 34 %
Limit 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Limit 2 : None

Engineer : Akira Sato



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

UL Japan, Inc.
YAMAKITA No1 Anechoic Chamber

Company : Sony Corporation	Report No. : 29GE0132-YK-01-A
Equipment : Contactless IC Card Reader/Writer	Regulation : FCC Part15 SupartC 15.225(a)(b)(c)
Model : RC-S620/U	Test Distance : 3m
Sample No. : D100113	Date : 2009/4/03
Power : DC3V	Temperature : 22deg.C
Mode : Transmitting (13.56MHz)	Humidity : 34%

ENGINEER : Akira Sato

Field strength

No.	FREQ [MHz]	T/R Reading		ANT Factor [dB]	ATTEN [dB]	CABLE LOSS [dB]	AMP GAIN [dB]	RESULT		LIMIT (3m) [dBuV/m]	MARGIN	
		H [dBuV]	V [dBuV]					Hor [dBuV/m]	Ver [dBuV/m]		Hor [dB]	Ver [dB]
1	13.560	53.2	60.7	19.5	6.0	0.8	28.3	51.2	58.7	124.0	72.8	65.3

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 [dB]	ATTEN [dB]	CABLE LOSS [dB]	AMP GAIN [dB]	RESULT		LIMIT (3m) [dBuV/m]	MARGIN	
		H [dBuV]	V [dBuV]					Hor [dBuV/m]	Ver [dBuV/m]		Hor [dB]	Ver [dB]
1	13.110	27.2	26.3	19.5	6.0	0.8	28.3	25.2	24.3	69.5	44.3	45.2
2	13.410	27.6	26.7	19.5	6.0	0.8	28.3	25.6	24.7	80.5	54.9	55.8
3	13.553	39.0	46.5	19.5	6.0	0.8	28.3	37.0	44.5	90.5	53.5	46.0
4	13.567	36.9	43.7	19.5	6.0	0.8	28.3	34.9	41.7	90.5	55.6	48.8
5	13.710	26.9	26.7	19.5	6.0	0.8	28.3	24.9	24.7	80.5	55.6	55.8
6	14.010	26.6	26.3	19.4	6.0	0.8	28.3	24.5	24.2	69.5	45.0	45.3

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 Radiated Disturbance Test

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 29GE0132-YK-01-A

Applicant : Sony Corporation
Kind of Equipment : Contactless IC Card Reader/Writer
Model No. : RC-S620/U
Serial No. : D100113
Power : DC3.3V
Mode : Transmitting(13.56MHz)
Remarks : HOR:Y VER:Y
Date : 4/3/2009
Test Distance : 3 m
Temperature : 22 °C Engineer : Akira Sato
Humidity : 34 %
Limit : FCC Part15C § 15.209 9KHz-30MHz (3m)

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	27.56	BB	25.2	25.1	19.7	28.3	1.1	6.0	23.7	23.6	69.5	45.8	45.9	

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA:KLP-01 (HFH2-Z2) 0.15-30MHz

■ CABLE:KCC-30/31/32/34 ■ PREAMP:KAF-05 (8447D) ■ EMI RECEIVER:KTR-03 (ESHS10)

Data of Radiated Disturbance Test

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 29GE0132-YK-01-A

Applicant : Sony Corporation
 Kind of Equipment : Contactless IC Card Reader/Writer
 Model No. : RC-S620/U
 Serial No. : D100113
 Power : DC3.3V
 Mode : Transmitting(13.56MHz)
 Remarks : HOR:Y VER:Y
 Date : 4/3/2009
 Test Distance : 3 m
 Temperature : 22 °C
 Humidity : 34 %
 Limit : FCC Part15C § 15.209

Engineer : Akira Sato

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	40.68	BB	37.6	40.2	14.4	28.6	1.3	6.0	30.7	33.3	40.0	9.3	6.7
2.	54.24	BB	30.4	33.6	9.9	28.5	1.5	6.0	19.3	22.5	40.0	20.7	17.5
3.	67.81	BB	36.7	35.4	7.0	28.6	1.7	6.0	22.8	21.5	40.0	17.2	18.5
4.	81.36	BB	26.8	24.5	6.6	28.5	1.9	6.0	12.8	10.5	40.0	27.2	29.5
5.	94.93	BB	38.7	31.6	9.0	28.5	2.1	6.0	27.3	20.2	43.5	16.2	23.3
6.	108.48	BB	31.9	26.8	11.5	28.4	2.3	6.0	23.3	18.2	43.5	20.2	25.3
7.	122.04	BB	29.7	28.8	13.4	28.4	2.4	6.0	23.1	22.2	43.5	20.4	21.3
8.	135.61	BB	29.1	25.0	14.2	28.3	2.6	6.0	23.6	19.5	43.5	19.9	24.0
9.	230.55	BB	31.6	21.5	17.3	27.8	3.4	6.0	30.5	20.4	46.0	15.5	25.6
10.	257.66	BB	34.5	27.6	18.0	27.7	3.7	6.0	34.5	27.6	46.0	11.5	18.4
11.	311.88	BB	32.9	28.3	14.7	27.6	4.2	6.1	30.3	25.7	46.0	15.7	20.3
12.	339.01	BB	36.4	30.8	15.4	27.8	4.4	6.1	34.5	28.9	46.0	11.5	17.1

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz / KLA-03 (USLP9143) 300-1000MHz
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

Data of Frequency Tolerance: FCC 15.225(e)

UL Japan, Inc.
YAMAKITA No4 Shield room

Company : Sony Corporation	Report No. : 29GE0132-YK-01-A
Equipment : Contactless IC Card Reader/Writer	Regulation : FCC Part15 SupartC 15.225 (e)
Model : RC-S620/U	
Sample No. : D100113	Date : 2009/04/08
Power : AC120V/60Hz	Temperature : 22deg.C
Mode : Transmitting (13.56MHz)	Humidity : 44%

ENGINEER : Akira Sato

Temperature Variation: -30deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560003	0.000003	0.00002	0.01
after 2minutes	13.56	13.560012	0.000012	0.00009	0.01
after 5minutes	13.56	13.560014	0.000014	0.00010	0.01
after 10minutes	13.56	13.560013	0.000013	0.00010	0.01

Temperature Variation: -20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560081	0.000081	0.00060	0.01
after 2minutes	13.56	13.560089	0.000089	0.00066	0.01
after 5minutes	13.56	13.560091	0.000091	0.00067	0.01
after 10minutes	13.56	13.560092	0.000092	0.00068	0.01

Temperature Variation: -10deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560137	0.000137	0.00101	0.01
after 2minutes	13.56	13.560136	0.000136	0.00100	0.01
after 5minutes	13.56	13.560136	0.000136	0.00100	0.01
after 10minutes	13.56	13.560137	0.000137	0.00101	0.01

Temperature Variation: 0deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560154	0.000154	0.00114	0.01
after 2minutes	13.56	13.560154	0.000154	0.00114	0.01
after 5minutes	13.56	13.560155	0.000155	0.00114	0.01
after 10minutes	13.56	13.560154	0.000154	0.00114	0.01

Temperature Variation: 10deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560154	0.000154	0.00114	0.01
after 2minutes	13.56	13.560153	0.000153	0.00113	0.01
after 5minutes	13.56	13.560153	0.000153	0.00113	0.01
after 10minutes	13.56	13.560153	0.000153	0.00113	0.01

Data of Frequency Tolerance: FCC 15.225(e)

UL Japan, Inc.
YAMAKITA No4 Shield room

Company : Sony Corporation	Report No. : 29GE0132-YK-01-A
Equipment : Contactless IC Card Reader/Writer	Regulation : FCC Part15 SupartC 15.225 (e)
Model : RC-S620/U	
Sample No. : D100113	Date : 2009/04/08
Power : AC120V/60Hz	Temperature : 22deg.C
Mode : Transmitting (13.56MHz)	Humidity : 44%

ENGINEER : Akira Sato

Temperature Variation: 20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560141	0.000141	0.00104	0.01
after 2minutes	13.56	13.560140	0.000140	0.00103	0.01
after 5minutes	13.56	13.560140	0.000140	0.00103	0.01
after 10minutes	13.56	13.560139	0.000139	0.00103	0.01

Temperature Variation: 30deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560125	0.000125	0.00092	0.01
after 2minutes	13.56	13.560121	0.000121	0.00089	0.01
after 5minutes	13.56	13.560121	0.000121	0.00089	0.01
after 10minutes	13.56	13.560121	0.000121	0.00089	0.01

Temperature Variation: 40deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560111	0.000111	0.00082	0.01
after 2minutes	13.56	13.560107	0.000107	0.00079	0.01
after 5minutes	13.56	13.560107	0.000107	0.00079	0.01
after 10minutes	13.56	13.560107	0.000107	0.00079	0.01

Temperature Variation: 50deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560103	0.000103	0.00076	0.01
after 2minutes	13.56	13.560104	0.000104	0.00077	0.01
after 5minutes	13.56	13.560105	0.000105	0.00077	0.01
after 10minutes	13.56	13.560104	0.000104	0.00077	0.01

Data of Frequency Tolerance: FCC 15.225(e)

UL Japan, Inc.
YAMAKITA No.4 Shield room

Company : Sony Corporation
Equipment : Contactless IC Card Reader/Writer
Model : RC-S620/U
Sample No. : D100113
Power : AC120V/60Hz
Mode : Transmitting (13.56MHz)

Report No. : 29GE0132-YK-01-A
Regulation : FCC Part15 SupartC 15.225 (e)

Date : 2009/04/08
Temperature : 22deg.C
Humidity : 44%

ENGINEER : Akira Sato

Input Voltage:AC102V/60Hz

Temperature Variation: 20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560140	0.000140	0.00103	0.01
after 2minutes	13.56	13.560140	0.000140	0.00103	0.01
after 5minutes	13.56	13.560140	0.000140	0.00103	0.01
after 10minutes	13.56	13.560140	0.000140	0.00103	0.01

Input Voltage:AC138V/60Hz

Temperature Variation: 20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (kHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560139	0.000139	0.00103	0.01
after 2minutes	13.56	13.560140	0.000140	0.00103	0.01
after 5minutes	13.56	13.560140	0.000140	0.00103	0.01
after 10minutes	13.56	13.560140	0.000140	0.00103	0.01

APPENDIX 3 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
CUST-YA-CE	Conducted emission(software)	UL Japan	CE(Ver.1.9)	-	CE	-
CUST-YA-RE	Radiated emission(software)	UL Japan	RE(Ver.1.9)	-	RE	-
KAF-05	Pre Amplifier	Agilent	8447D	2944A10150	RE	2009/03/27 * 12
KAT6-01	Attenuator	INMET	18N-6dB	-	RE	2009/03/10 * 12
KAEC-01(NSA)	Anechoic Chamber	JSE	Semi 3m	1	RE	2008/08/06 * 12
KBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1926	RE	2008/12/28 * 12
KCC-30/31/32/34/KRM-03	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	5D-2W/S04272B/RFM-E421	-/01055	RE	2008/10/22 * 12
KCC-33/34/KRM-03	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	5D-2W/S04272B/RFM-E421	-/01055	CE	2008/10/22 * 12
KLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	170	RE	2008/12/28 * 12
KLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	8127344	CE	2008/08/01 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	95060087	CE/RE	2008/09/29 * 12
KTR-03	Test Receiver	Rohde & Schwarz	ESHS10	839698/014	CE/RE	2009/02/09 * 12
KTR-04	Test Receiver	Rohde & Schwarz	ESVS10	825475/006	RE	2009/03/03 * 12
KOS-01	Humidity Indicator	Custom	CTH-190	K-01	CE	2008/07/14 * 12
KOS-02	Humidity Indicator	Custom	CTH-190	K-02	RE	2008/07/07 * 12
KJM-07	Measure	KOMELON	KMC-36	-	CE/RE	-
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	BW	2009/01/22 * 12
KFC-01	Microwave Counter	Advantest	R5373	120100309	AT	2008/04/23 * 12
KLP-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	827779/008	RE	2008/12/05 * 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,

FT: Frequency tolerance

BW: Bandwidth