



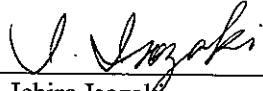
EMI TEST REPORT

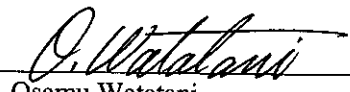
Test Report No. : 24DE0265-YK-1

Applicant: HORI CO., LTD.
Type of Equipment: Game Controller
Model No.: UHP2-109
FCC ID RQZUHP2-109
Test standard: FCC Part15 Subpart C, Section 15.249
Test Result: Complied

1. This test report shall not be reproduced except 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.

Date of test: January 15, 16, 19 and 20, 2004

Tested by: 
Ichiro Isozaki

Approved by: 
Osamu Watatani
Site Manager of Yamakita Lab.

UL Apex Co., Ltd.

YAMAKITA EMC LAB.

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MF060b(23.04.02)

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1 GENERAL INFORMATION

Applicant

Company Name : HORI CO., LTD.
Brand Name : HORI
Address : 640 Saedo-cho, Tsuzuki-ku, Yokohama, 224-0054 Japan
Telephone Number : +81 45 933 9611
Facsimile Number : +81 45 933 9617
Contact Person : Kazutoshi Kijima / kijima-k@hori.ne.jp
Type of Equipment : Game Controller
Model No. : UHP2-109
Serial No. : S1
Rating : DC3.5V
Receipt Date of Sample : January 13, 2004
Condition of EUT : Production prototype
Regulation(s) : FCC Part15 Subpart C, Section 15.249
Test Site : UL Apex No.1 Anechoic Chamber

1.1 Tested Methodology

The measurements were performed according to the procedures in ANSI C63.4 (2001).

1.2 Test Facility

This site has been fully described in a report submitted to FCC office, and accepted on November 28, 2002 (Registration No.: 95967).

NVLAP Lab. code : 200441-0

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2 PRODUCT DESCRIPTION

HORI CO., LTD. , Model: UHP2-109 (referred to as the EUT in this report) is a Game Controller.
The clock frequencies used in EUT : 14.7456MHz, 8MHz

Frequency characteristics	:	903.018MHz through 926.3652MHz
Number of channels/ channel spacing	:	8 channels/ 3MHz
Modulation	:	Frequency modulation
Antenna type	:	Chip
Antenna Gain	:	-3dBi
Operating Voltage	:	DC3.5V

***FCC Part15.31 (e)**

The host device SCPH-39001 provides the Game controller with stable power supply (DC3.5V), and the power is not changed when voltage of the Play Station2 is varied.
Therefore, the Game Controller complies power supply regulation.

***FCC Part15.203**

The Game controller and its antenna comply with this requirement since this antenna is built in Game controller when they are put up for sale and they are used with a particular antenna connector.

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3 SYSTEM TEST CONFIGURATION

3.1 Justification

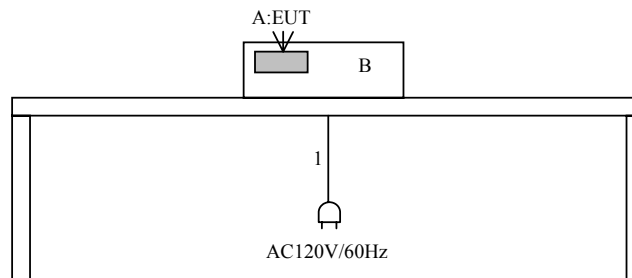
The system was configured in typical fashion (as a customer would normally use it) for testing.

Test mode: Transmitting mode
Low channel : 903.0180MHz
Middle channel : 912.8484MHz
High channel : 926.3652MHz

The EUT was tested in all three orthogonal planes in order to determine worst case emissions. Channels at 903.0180 MHz, 912.8484 MHz and 926.3652 MHz were tested and investigated from 30 MHz to 10 GHz. Data for all three channels are presented in this report.

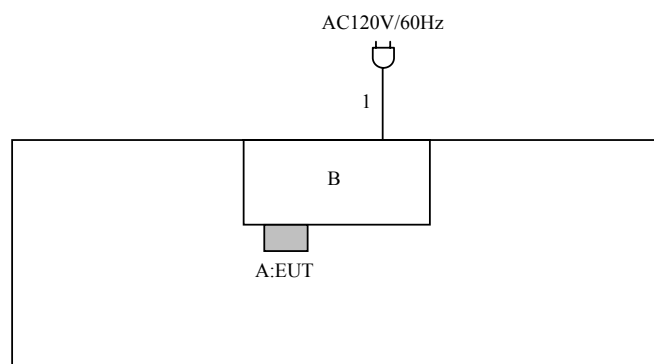
3.2 Configuration of Tested System

Front View



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

Top View



*Cabling was 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	Remarks
A	Game Controller	UHP2-109	S1	HORI CO., LTD.	RQZUHP2-109	EUT
B	Play Station 2	SCPH-39001	AU2559312	SONY	D.o.C.	-

List of cables used

No.	Name	Length (m)	Shield	Backshell material
1	AC Cable	2.0	Unshielded	Polyvinyl chloride

4 MEASUREMENT UNCERTAINTY

Conducted emission test

The measurement uncertainty (with a 95% confidence level) for this test was $\pm 1.3\text{dB}$.

The data listed in this test report has enough margin, more than site margin.

Radiated emission test

The measurement uncertainty (with 95% confidence level) for this test using Biconical antenna is $\pm 4.8\text{dB}$.

The measurement uncertainty (with 95% confidence level) for this test using Logperiodic antenna is $\pm 5.2\text{dB}$.

The measurement uncertainty (with 95% confidence level) for this test using Horn antenna is $\pm 6.6\text{dB}$.

The result is within Yamakita EMC lab's uncertainty.

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5 SUMMARY OF TESTS

5.1 §15.207 Conducted Emissions (Limits by CISPR Pub.22 Class B)

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.8m, raised 80cm above the conducting ground plane.

The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripheral 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, and excess AC cable was bundled in center. It was folded back and forth forming a bundle 30cm to 40cm long. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT on a shielded room.

The EUT was connected to a Line Impedance Stabilization Network (LISN).

An overview sweep with peak detection has been performed.

The measurements have been performed with CISPR quasi-peak detector and average detector (IF BW 9kHz).
(Measurement range: 150kHz to 30MHz)

Test data : APPENDIX Page 13 to 17

Photographs of test setup : Page 10

Test result : Pass

Test instruments : KCC-A1/A3, KLS-06, KSA-04, KTR-01

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5.2 § 15.249(a)&(d) Field Strength (Radiated Emissions)

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.8m, raised 80cm above the conducting ground plane.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

The Radiated Electric Field Strength intensity has been measured in an anechoic chamber with a ground plane and at a distance of 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.

EUT emission levels were compared when the EUT antenna position was vertical polarization and horizontal polarization.

The equipment was also previously checked at each position of two axis X and Y.

At <1GHz, X was worst in these positions under the horizontal antenna polarization and Y was worst in these positions under the vertical antenna polarization.

At >1GHz, Y was worst in these positions under the antenna polarization of both vertical and horizontal.

The position in which the maximum noise occurred was chosen to put into measurement.

See the photographs in page 12.

Maximum Filed Strength of Fundamental by §15.249 (a)

Measurement range : CISPR QP Detector, IF BW 120kHz

Test data : APPENDIX Page 18 to 20
Test result : Pass
Test instruments : KAF-05, KAT6-01, KTR-01, KCC-A1/A3, KLA-03, KAEC-01

Filed Strength of Spurious emissions by §15.249 (d)

Measurement range : 30MHz to 1000MHz CISPR QP Detector, IF BW 120kHz

: 1GHz to 10GHz PK and AV Detector, IF BW 1MHz

Test data : APPENDIX Page 21 to 26 (30 - 1000MHz)
: APPENDIX Page 27 to 32 (1 - 10GHz)
Photographs of test setup : Page 11
Test result : Pass
Test instruments : KAF-02, KAF-05, KAT10-S1, KAT6-01, KBA-03, KTR-01, KFL-01
KCC-A1/A3, KCC-D7, KCC-D13, KHA-01, KLA-03, KAEC-01, KSA-04

5.3 26dB Bandwidth

Test Procedure

The minimum 26dB bandwidth was measured with a radiated condition.

26dB Bandwidth 903.018MHz:118.888kHz
912.8484MHz:121.493kHz
926.3652MHz:114.291kHz

Test data : APPENDIX Page 33
Test result : Pass
Test instruments : KAF-05, KAT6-01, KTR-01, KCC-A1/A3, KLA-03, KAEC-01

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APPENDIX 1: Photographs of test setup

- 1. Page 10 : Conducted emission
- 2. Page 11 : Radiated emission
- 3. Page 12 : Pre check of worse-case position

APPENDIX 2: Test Data

- 1. Page 13 - 17 : Conducted emission
- 2. Page 18 - 20 : Field strength of Fundamental(Radiated)
- 3. Page 21 - 32 : Field strength of Spurious emission(Radiated)
- 4. Page 33 : 26dB Bandwidth

APPENDIX 3: Test instruments

- Page 34 : Test instruments

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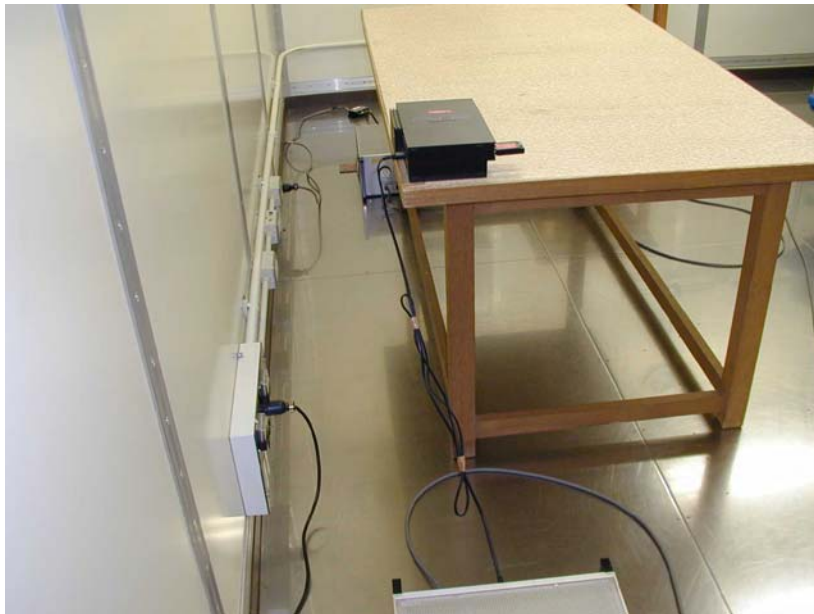
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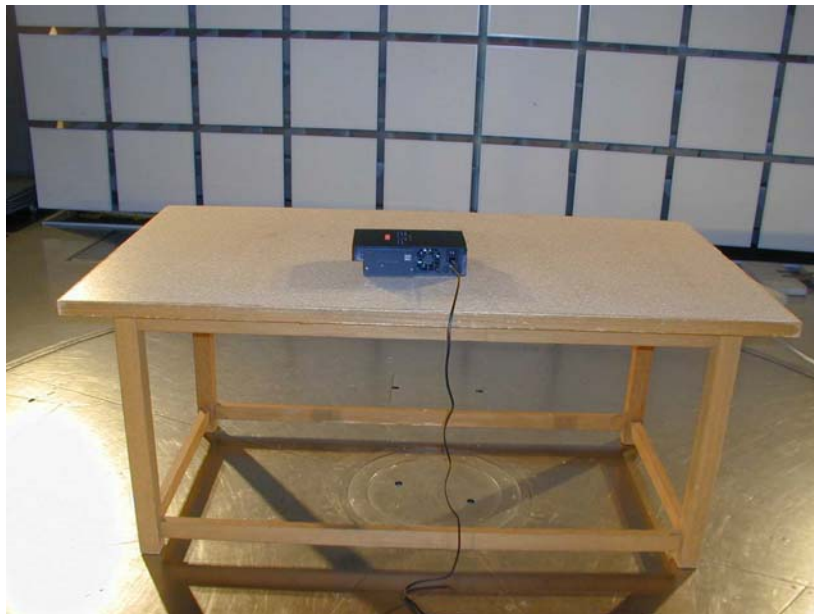
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Conducted emission



Radiated emission



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Pre check of worse-case position

X axis



Y axis



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DATA OF CONDUCTION TEST

UL Apex Co.,Ltd.
Yamakita No.2 Shielded Room
Report No. : 24DE0265-YK = Ⅱ

Applicant : HORI CO.,LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109
Serial No. : S1
Power : DC3.5V(AC120V/60Hz)
Mode : Transmitting CH1:903.0180MHz
Remarks :
Date : 1/20/2004
Phase : Single Phase
Temperature : 21 °C
Humidity : 33 %
Regulation : FCC Part15C § 15.207. (CISPR Pub.22)

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP	AV	QP	AV				QP	AV	QP	AV	QP	AV
		[dBuV]		[dBuV]					[dBuV]		[dBuV]		[dB]	
1.	0.1885	59.7	52.7	59.2	52.3	0.1	0.0	0.0	59.8	52.8	64.1	54.1	4.3	1.3
2.	0.3763	42.5	32.1	42.2	30.3	0.1	0.1	0.0	42.7	32.3	58.4	48.4	15.7	16.1
3.	0.5607	40.1	33.0	40.1	33.1	0.1	0.1	0.0	40.3	33.3	56.0	46.0	15.7	12.7
4.	0.7504	33.2	25.9	35.0	27.6	0.1	0.1	0.0	35.2	27.8	56.0	46.0	20.8	18.2
5.	1.8839	24.8	14.2	30.7	19.6	0.1	0.1	0.0	30.9	19.8	56.0	46.0	25.1	26.2
6.	2.2600	32.7	21.9	36.1	24.2	0.1	0.1	0.0	36.3	24.4	56.0	46.0	19.7	21.6

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

■ LISN : KLS-06 (NSLK8127) ■ COAXIAL CABLE : KCC-A1/A3
■ EMI RECEIVER : KTR-01 (ESI40)

DATA OF CONDUCTION TEST

UL Apex Co.,Ltd.

Yamakita No.2 Shielded Room

Report No. : 24DE0265-YK $\Rightarrow$ 1

Applicant : HORI CO.,LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109
Serial No. : S1
Power : DC3.5V (AC120V/60Hz)
Mode : Transmitting CH1:903.0180MHz
Remarks :
Date : 1/20/2004
Phase : Single Phase
Temperature : 21 °C
Humidity : 33 %
Regulation : FCC Part15C § 15.207. (CISPR Pub.22)

Engineer : Ichiro Isozaki

Emission Level [dB μ V]

□ Quasi-Peak

× Average

70

60

50

40

30

20

10

0

1

10

30

Frequency [MHz]

DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

Yamakita No.2 Shielded Room

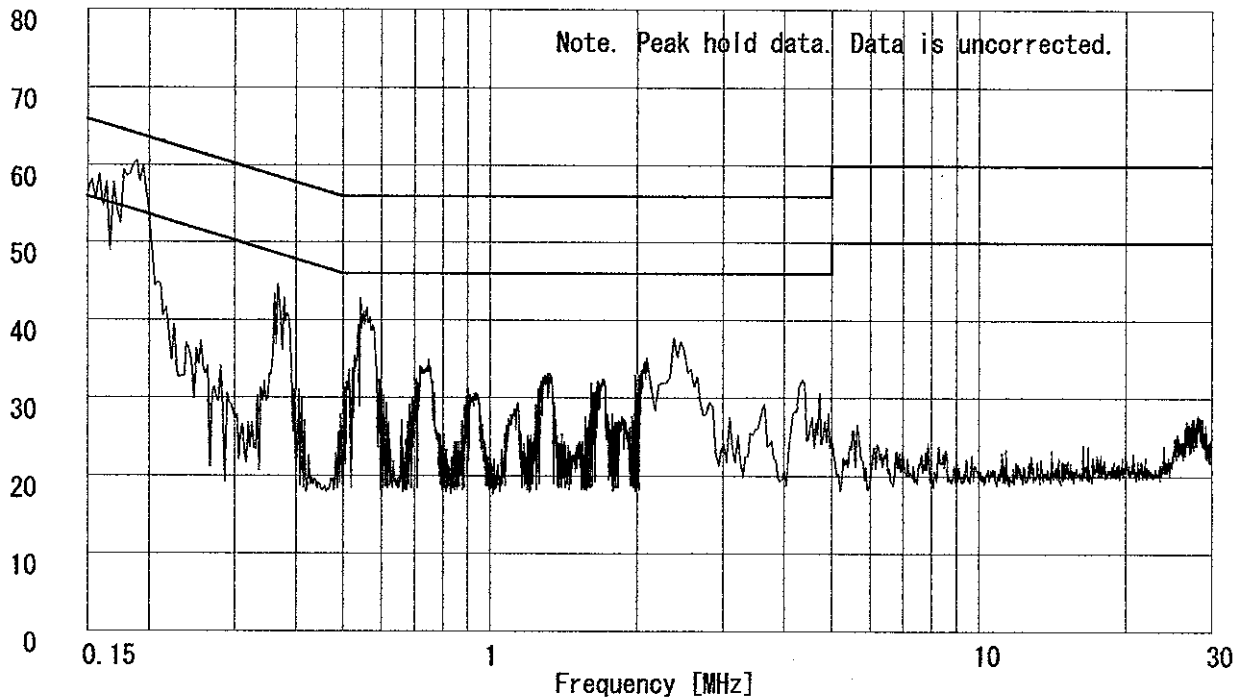
Report No. : 24DE0265-YK → 1

Applicant : HORI CO.,LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109-A
Serial No. : S1
Power : DC3.5V (AC120V/60Hz)
Mode : Transmitting CH1:903.0180MHz
Remarks :
Date : 1/20/2004
Temperature : 21 °C
Humidity : 33 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Ichiro Isozaki

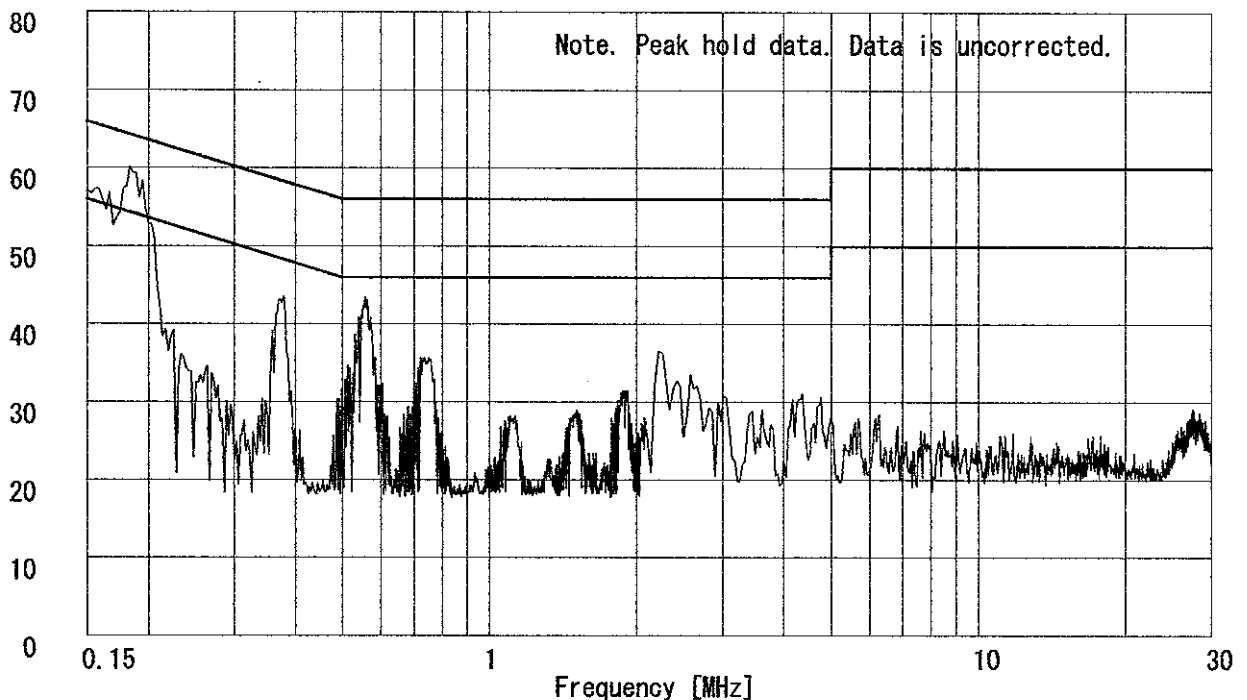
Emission Level [dB μ A]

PHASE:N



Emission Level [dB μ A]

PHASE:L1



DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

Yamakita No.2 Shielded Room

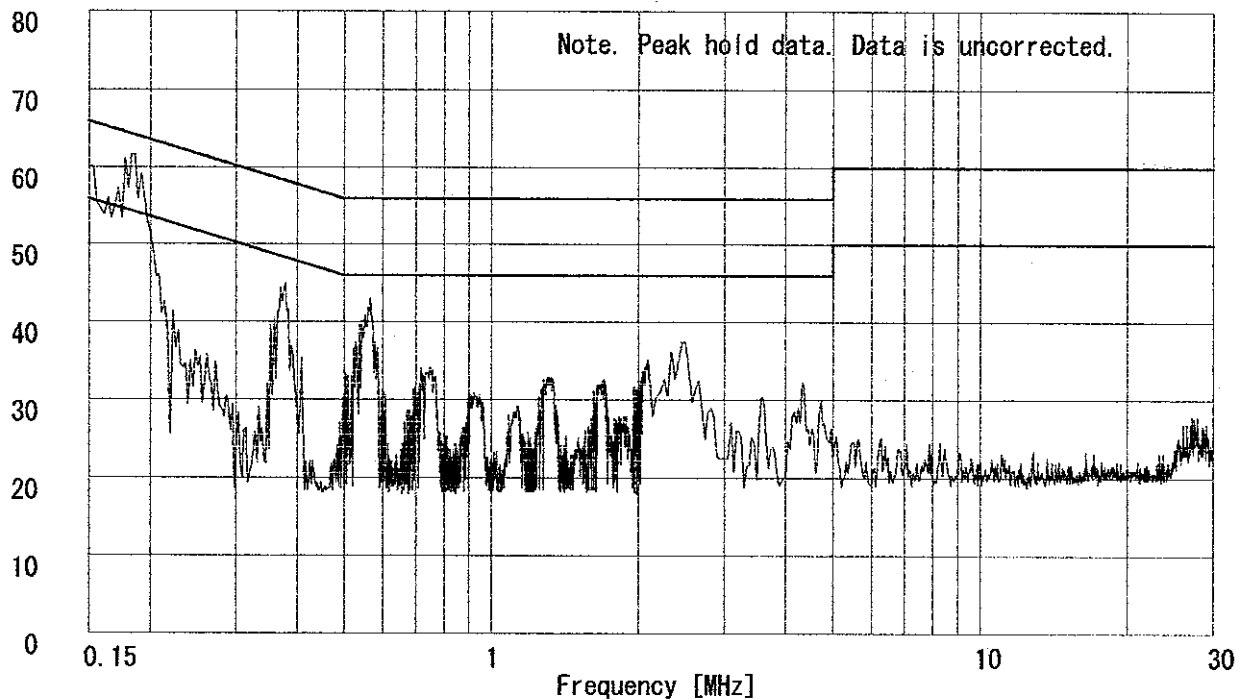
Report No. : 24DE0265-YK-1

Applicant : HORI CO.,LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109-A
Serial No. : S1
Power : DC3.5V (AC120V/60Hz)
Mode : Transmitting CH6:912.8484MHz
Remarks :
Date : 1/20/2004
Temperature : 21 °C
Humidity : 33 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Ichiro Isozaki

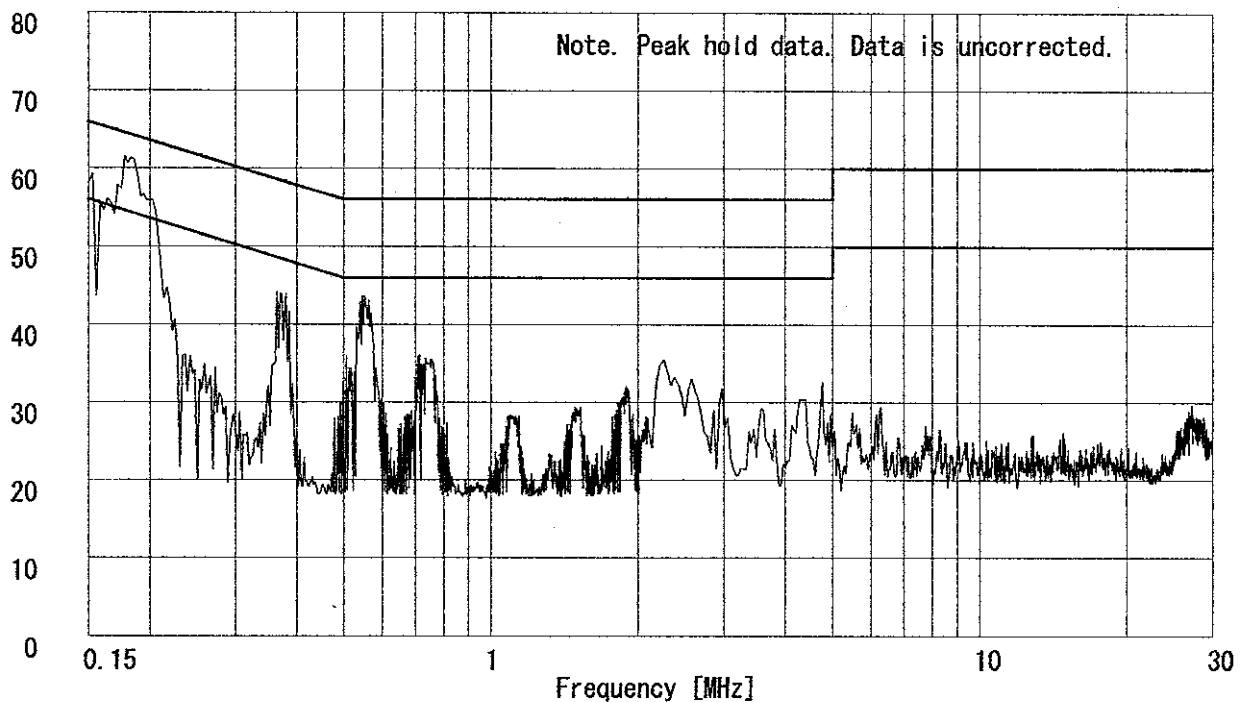
Emission Level [dB μ A]

PHASE:N



Emission Level [dB μ A]

PHASE:L1



DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

Yamakita No.2 Shielded Room

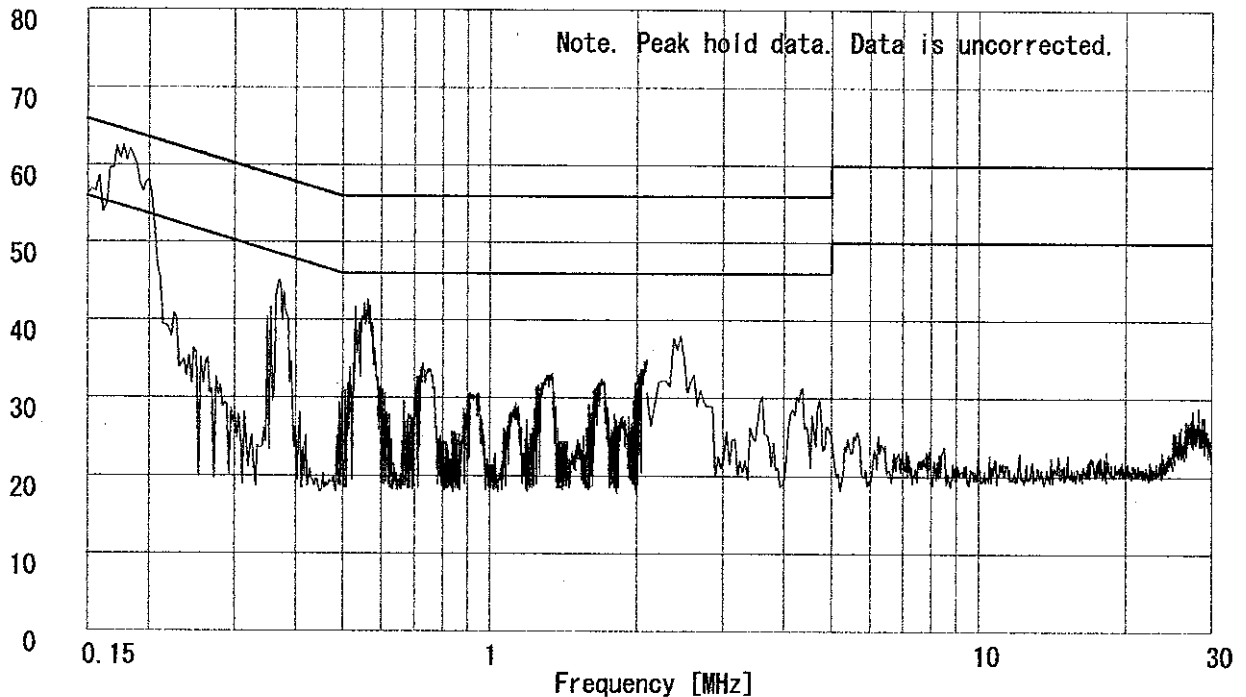
Report No. : 24DE0265-YK-1

Applicant : HORI CO.,LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109-A
Serial No. : S1
Power : DC3.5V (AC120V/60Hz)
Mode : Transmitting CH8:926.3652MHz
Remarks :
Date : 1/20/2004
Temperature : 21 °C
Humidity : 33 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Ichiro Isozaki

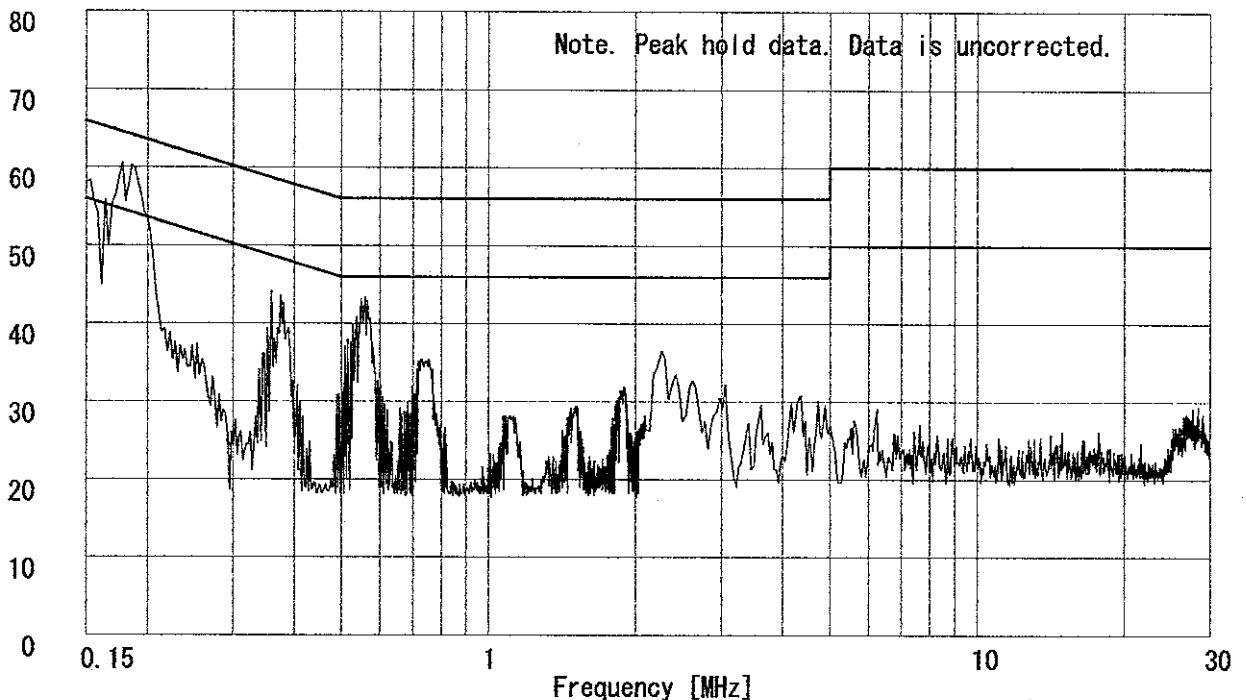
Emission Level [dB μ A]

PHASE:N



Emission Level [dB μ A]

PHASE:L1



DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK-1

Applicant : HORI CO.,LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109
Serial No. : S1
Power : DC3.5V
Mode : Transmitting CH1:903.0180MHz
Remarks :
Date : 1/15/2004
Test Distance : 3 m
Temperature : 20 °C
Humidity : 38 %
Regulation : FCC Part15C § 15.249(a) Fundamental (D:3m)

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR	AMP GAIN	CABLE LOSS	ATTEN. [dB]	RESULT		LIMITS	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	903.02	BB	84.1	76.8	22.4	28.8	3.4	6.1	87.2	79.9	93.9	6.7	14.0

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz

■ CABLE: KCC-A1/A3 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.
Yamakita No.1 Anechoic Chamber
Report No. : 24DE0265-YK- 1

Applicant : HORI CO.,LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109
Serial No. : S1
Power : DC3.5V
Mode : Transmitting CH6:912.8484MHz
Remarks :
Date : 1/15/2004
Test Distance : 3 m
Temperature : 20 °C
Humidity : 38 %
Regulation : FCC Part15C § 15.249(a) Fundamental (D:3m)

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR	AMP GAIN	CABLE LOSS	ATTEN.	RESULT		LIMITS	MARGIN	
			HOR	VER					HOR	VER		HOR	VER
			[dB μ V]	[dB/m]		[dB]	[dB]	[dB]	[dB μ V/m]	[dB μ V/m]		[dB]	[dB]
1.	912.85	BB	83.5	79.4	22.5	28.8	3.4	6.1	86.7	82.6	93.9	7.2	11.3

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz
■ CABLE: KCC-A1/A3 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

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Yamakita No.1 Anechoic Chamber

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Applicant : HORI CO.,LTD.
 Kind of Equipment : GAME CONTROLLER
 Model No. : UHP2-109
 Serial No. : S1
 Power : DC3.5V
 Mode : Transmitting CH8:926.3652MHz
 Remarks :
 Date : 1/15/2004
 Test Distance : 3 m
 Temperature : 20 °C
 Humidity : 38 %
 Regulation : FCC Part15C § 15.249(a) Fundamental (D:3m)

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR	AMP GAIN	CABLE LOSS	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	926.37	BB	81.4	75.7	22.6	28.7	3.5	6.1	84.9	79.2	93.9	9.0	14.7

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz

■ CABLE: KCC-A1/A3 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK 

Applicant : HORI CO.,LTD.
 Kind of Equipment : GAME CONTROLLER
 Model No. : UHP2-109
 Serial No. : S1
 Power : DC3.5V
 Mode : Transmitting CH1:903.0180MHz
 Remarks :
 Date : 1/16/2004
 Test Distance : 3 m
 Temperature : 21 °C
 Humidity : 41 %
 Regulation : FCC Part15C §15.209

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR	AMP GAIN	CABLE LOSS	ATTEN.	RESULT		LIMITS	MARGIN	
			HOR	VER					HOR	VER		HOR	VER
			[dB μV]		[dB/m]	[dB]	[dB]	[dB]	[dB μV/m]		[dB μV/m]	[dB]	
1.	107.98	BB	31.5	33.4	11.5	28.3	1.1	6.1	21.9	23.8	43.5	21.6	19.7
2.	165.86	BB	31.0	26.7	15.5	28.0	1.3	6.1	25.9	21.6	43.5	17.6	21.9
3.	377.97	BB	35.9	36.5	16.5	28.2	2.1	6.1	32.4	33.0	46.0	13.6	13.0
4.	431.97	BB	39.5	33.6	17.6	28.7	2.2	6.1	36.7	30.8	46.0	9.3	15.2
5.	589.79	BB	45.9	44.4	19.7	29.2	2.7	6.1	45.2	43.7	46.0	0.8	2.3
6.	884.70	BB	41.5	36.7	22.3	28.8	3.4	6.1	44.5	39.7	46.0	1.5	6.3

CALCULATION: READING[dB μV] + ANT.FACTOR[dB/m] + CABLE LOSS[dB] - AMP.GAIN[dB] + ATTEN[dB].

■ANTENNA:KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz

■CABLE:KCC-A1/A3 ■PREAMP:KAF-05 (8447D) ■EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK-1

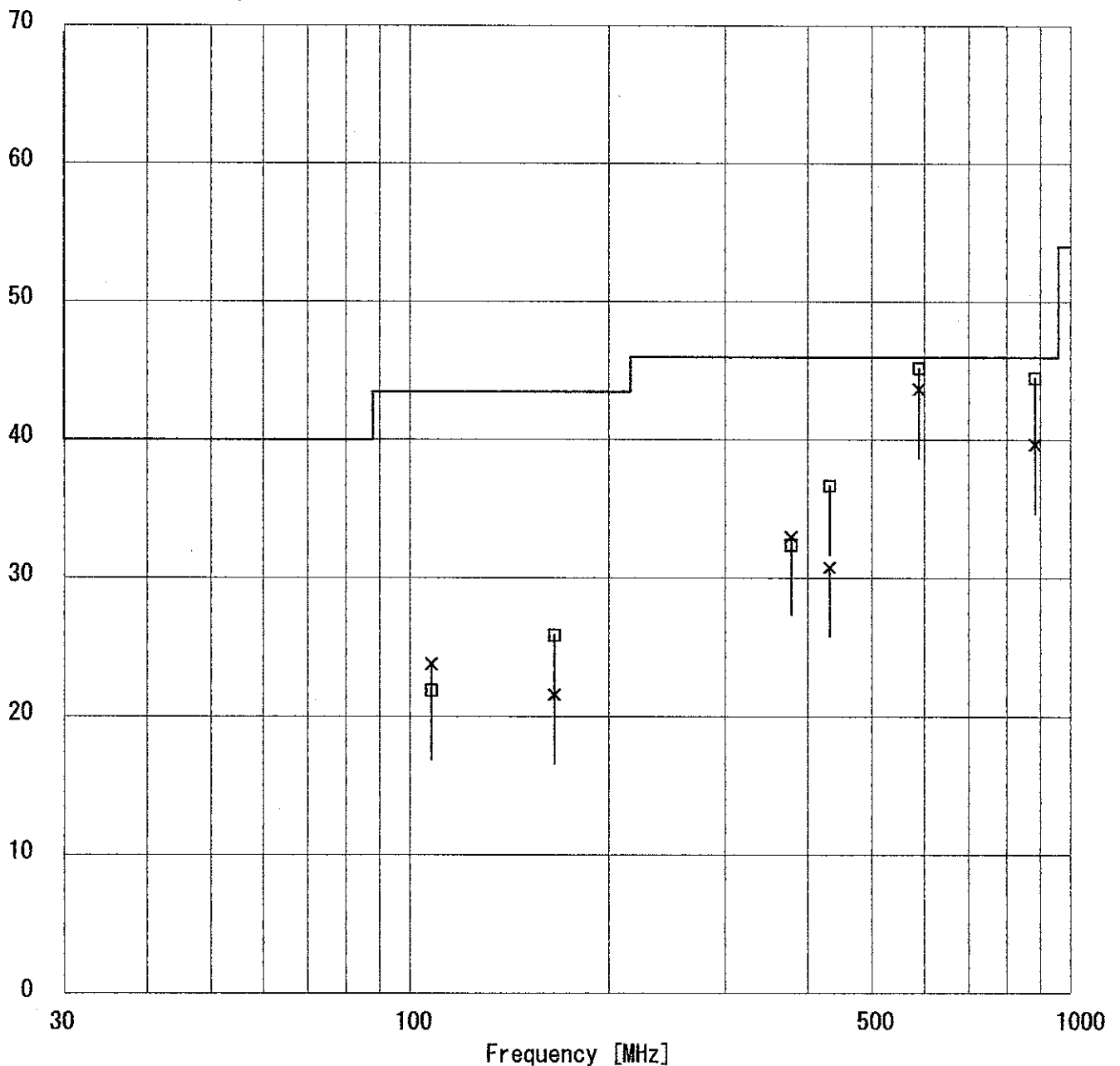
Applicant : HORI CO.,LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109
Serial No. : S1
Power : DC3.5V
Mode : Transmitting CH1:903.0180MHz
Remarks :
Date : 1/16/2004
Test Distance : 3 m
Temperature : 21 °C
Humidity : 41 %
Regulation : FCC Part15C § 15.209

Engineer : Ichiro Isozaki

Emission Level [dB μ V/m]

□ Horizontal

× Vertical



DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK-1

Applicant : HORI CO.,LTD.
 Kind of Equipment : GAME CONTROLLER
 Model No. : UHP2-109
 Serial No. : S1
 Power : DC3.5V
 Mode : Transmitting CH6:912.8484MHz
 Remarks :
 Date : 1/16/2004
 Test Distance : 3 m
 Temperature : 21 °C
 Humidity : 41 %
 Regulation : FCC Part15C § 15.209

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	107.98	BB	33.5	33.3	11.5	28.3	1.1	6.1	23.9	23.7	43.5	19.6	19.8
2.	165.86	BB	30.7	27.1	15.5	28.0	1.3	6.1	25.6	22.0	43.5	17.9	21.5
3.	377.97	BB	36.3	36.2	16.5	28.2	2.1	6.1	32.8	32.7	46.0	13.2	13.3
4.	431.97	BB	39.6	34.0	17.6	28.7	2.2	6.1	36.8	31.2	46.0	9.2	14.8
5.	589.79	BB	46.4	41.5	19.7	29.2	2.7	6.1	45.7	40.8	46.0	0.3	5.2
6.	884.70	BB	42.5	40.1	22.3	28.8	3.4	6.1	45.5	43.1	46.0	0.5	2.9

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz

■ CABLE: KCC-A1/A3 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK-1

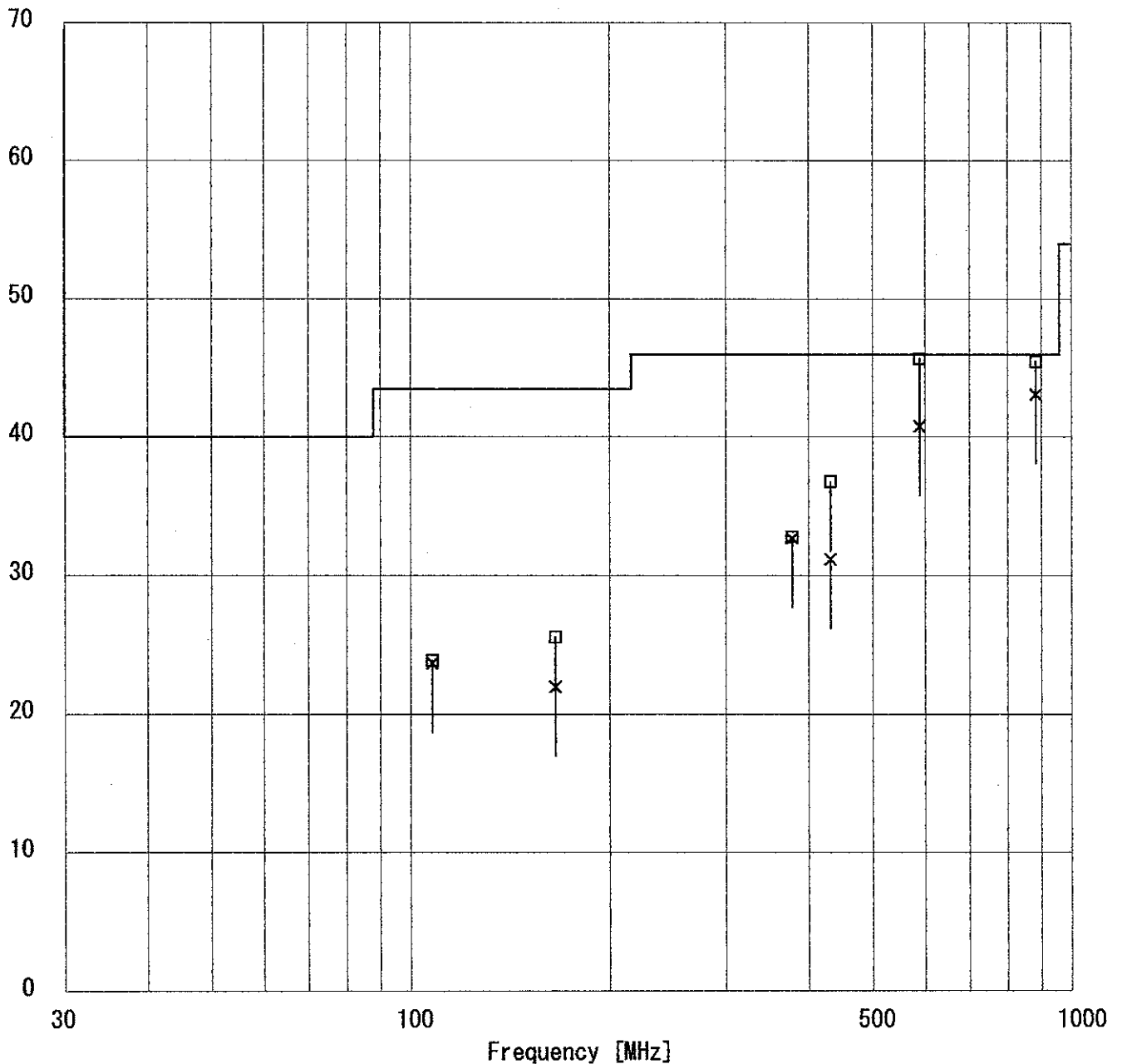
Applicant : HORI CO., LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109
Serial No. : S1
Power : DC3.5V
Mode : Transmitting CH6:912.8484MHz
Remarks :
Date : 1/16/2004
Test Distance : 3 m
Temperature : 21 °C
Humidity : 41 %
Regulation : FCC Part15C § 15.209

Engineer : Ichiro Isozaki

Emission Level [dB μ V/m]

□ Horizontal

× Vertical



DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK-1

Applicant : HORI CO.,LTD.
 Kind of Equipment : GAME CONTROLLER
 Model No. : UHP2-109
 Serial No. : S1
 Power : DC3.5V
 Mode : Transmitting CH8:926.3652MHz
 Remarks :
 Date : 1/16/2004
 Test Distance : 3 m
 Temperature : 21 °C
 Humidity : 41 %
 Regulation : FCC Part15C § 15.209

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	107.98	BB	33.4	33.1	11.5	28.3	1.1	6.1	23.8	23.5	43.5	19.7	20.0
2.	165.86	BB	32.4	26.7	15.5	28.0	1.3	6.1	27.3	21.6	43.5	16.2	21.9
3.	377.97	BB	36.3	36.0	16.5	28.2	2.1	6.1	32.8	32.5	46.0	13.2	13.5
4.	431.97	BB	39.2	34.1	17.6	28.7	2.2	6.1	36.4	31.3	46.0	9.6	14.7
5.	589.79	BB	46.3	41.9	19.7	29.2	2.7	6.1	45.6	41.2	46.0	0.4	4.8
6.	884.70	BB	40.6	36.4	22.3	28.8	3.4	6.1	43.6	39.4	46.0	2.4	6.6

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz

■ CABLE: KCC-A1/A3 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK 

Applicant : HORI CO.,LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109
Serial No. : S1
Power : DC3.5V
Mode : Transmitting CH8:926.3652MHz
Remarks :
Date : 1/16/2004
Test Distance : 3 m
Temperature : 21 °C
Humidity : 41 %
Regulation : FCC Part15C §15.209

Engineer : Ichiro Isozaki

Emission Level [dB μ V/m]

☐ Horizontal

☒ Vertical

70

60

50

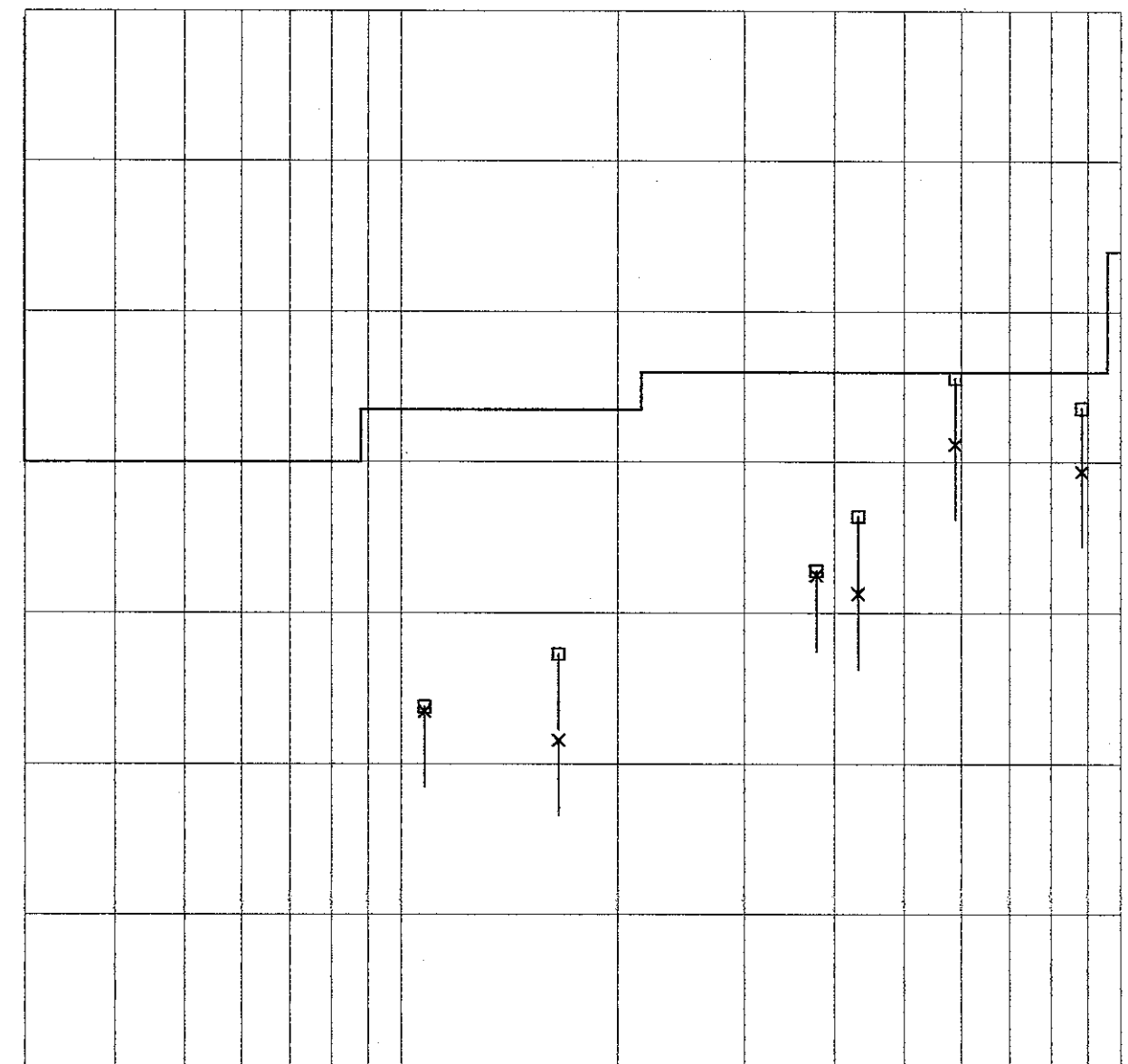
40

30

20

10

0



30

100

Frequency [MHz]

500

1000

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK-1

Applicant : HORI CO.,LTD.
 Kind of Equipment : GAME CONTROLLER
 Model No. : UHP2-109
 Serial No. : S1
 Power : DC3.5V
 Mode : Transmitting CH1:903.0180MHz
 Remarks :
 Date : 1/19/2004
 Test Distance : 3 m
 Temperature : 21 °C
 Humidity : 32 %
 Regulation : FCC Part15C § 15.209(AV Detection)

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR	AMP GAIN	CABLE LOSS	ATTEN.	RESULT		LIMITS	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	1179.60	BB	48.6	43.5	25.6	38.1	3.0	10.0	49.1	44.0	54.0	4.9	10.0
2.	1806.04	BB	42.7	42.2	29.0	37.1	3.6	10.0	48.2	47.7	54.0	5.8	6.3
3.	2709.05	BB	42.6	36.9	30.7	37.0	4.5	10.0	50.8	45.1	54.0	3.2	8.9
4.	3612.07	BB	49.4	44.8	32.1	36.7	5.2	1.0	51.0	46.4	54.0	3.0	7.6
5.	4515.09	BB	36.8	34.1	33.8	35.2	5.9	0.7	42.0	39.3	54.0	12.0	14.7
6.	5418.11	BB	34.7	32.4	35.9	36.2	6.4	0.8	41.6	39.3	54.0	12.4	14.7
7.	6321.13	BB	37.1	38.5	37.3	36.4	7.0	0.3	45.3	46.7	54.0	8.7	7.3
8.	7224.14	BB	32.6	32.9	38.2	36.8	7.6	0.5	42.1	42.4	54.0	11.9	11.6
9.	8127.16	BB	32.5	32.6	37.9	37.0	8.1	0.5	42.0	42.1	54.0	12.0	11.9
10.	9030.18	BB	32.5	32.6	39.4	37.1	8.5	0.5	43.8	43.9	54.0	10.2	10.1

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ANTENNA:KHA-01(SAS-200 571)1-18GHz

■CABLE:KCC-D7/D13■PREAMP:KAF-02(8449B)■EMI RECEIVER:KTR-0(ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK-1

Applicant : HORI CO.,LTD.
 Kind of Equipment : GAME CONTROLLER
 Model No. : UHP2-109
 Serial No. : S1
 Power : DC3.5V
 Mode : Transmitting CH1:903.0180MHz
 Remarks :
 Date : 1/19/2004
 Test Distance : 3 m
 Temperature : 21 °C
 Humidity : 32 %
 Regulation : FCC Part15C § 15.209(PK Detection)

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	1179.60	BB	52.3	49.7	25.6	38.1	3.0	10.0	52.8	50.2	74.0	21.2	23.8
2.	1806.04	BB	48.8	48.9	29.0	37.1	3.6	10.0	54.3	54.4	74.0	19.7	19.6
3.	2709.05	BB	48.1	45.9	30.7	37.0	4.5	10.0	56.3	54.1	74.0	17.7	19.9
4.	3612.07	BB	52.7	48.3	32.1	36.7	5.2	1.0	54.3	49.9	74.0	19.7	24.1
5.	4515.09	BB	45.9	45.1	33.8	35.2	5.9	0.7	51.1	50.3	74.0	22.9	23.7
6.	5418.11	BB	44.2	44.0	35.9	36.2	6.4	0.8	51.1	50.9	74.0	22.9	23.1
7.	6321.13	BB	41.8	46.9	37.3	36.4	7.0	0.3	50.0	55.1	74.0	24.0	18.9
8.	7224.14	BB	45.1	44.3	38.2	36.8	7.6	0.5	54.6	53.8	74.0	19.4	20.2
9.	8127.16	BB	45.0	43.8	37.9	37.0	8.1	0.5	54.5	53.3	74.0	19.5	20.7
10.	9030.18	BB	44.8	43.7	39.4	37.1	8.5	0.5	56.1	55.0	74.0	17.9	19.0

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ANTENNA:KHA-01(SAS-200 571)1-18GHz

■CABLE:KCC-D7/D13■PREAMP:KAF-02(8449B)■EMI RECEIVER:KTR-0(ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK 

Applicant : HORI CO.,LTD.
 Kind of Equipment : GAME CONTROLLER
 Model No. : UHP2-109
 Serial No. : S1
 Power : DC3.5V
 Mode : Transmitting CH6:912.8484MHz
 Remarks :
 Date : 1/19/2004
 Test Distance : 3 m
 Temperature : 21 °C
 Humidity : 32 %
 Regulation : FCC Part15C § 15.209 (AV Detection)

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR	AMP GAIN	CABLE LOSS	ATTEN.	RESULT		LIMITS	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	1179.61	BB	51.5	45.9	25.6	38.1	3.0	10.0	52.0	46.4	54.0	2.0	7.6
2.	1825.70	BB	43.6	45.2	29.1	37.1	3.6	10.0	49.2	50.8	54.0	4.8	3.2
3.	2738.55	BB	41.2	37.8	30.7	37.0	4.5	10.0	49.4	46.0	54.0	4.6	8.0
4.	3651.39	BB	50.1	46.0	32.3	36.7	5.2	0.9	51.8	47.7	54.0	2.2	6.3
5.	4564.24	BB	38.8	33.0	34.0	35.2	5.9	0.7	44.2	38.4	54.0	9.8	15.6
6.	5477.09	BB	36.4	32.9	35.9	36.3	6.4	0.9	43.3	39.8	54.0	10.7	14.2
7.	6389.94	BB	38.7	36.9	37.3	36.5	7.0	0.2	46.7	44.9	54.0	7.3	9.1
8.	7302.79	BB	32.5	32.5	38.4	36.8	7.6	0.5	42.2	42.2	54.0	11.8	11.8
9.	8215.64	BB	32.6	32.6	38.0	37.0	8.2	0.6	42.4	42.4	54.0	11.6	11.6
10.	9128.48	BB	32.8	32.8	39.3	37.0	8.6	0.4	44.1	44.1	54.0	9.9	9.9

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ANTENNA:KHA-01 (SAS-200 571) 1-18GHz

■CABLE:KCC-D7/D13 ■PREAMP:KAF-02 (8449B) ■EMI RECEIVER:KTR-0 (ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK-1

Applicant : HORI CO.,LTD.
Kind of Equipment : GAME CONTROLLER
Model No. : UHP2-109
Serial No. : S1
Power : DC3.5V
Mode : Transmitting CH6:912.8484MHz
Remarks :
Date : 1/19/2004
Test Distance : 3 m
Temperature : 21 °C
Humidity : 32 %
Regulation : FCC Part15C § 15.209(PK Detection)

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	1179.61	BB	54.5	50.7	25.6	38.1	3.0	10.0	55.0	51.2	74.0	19.0	22.8
2.	1825.70	BB	48.6	50.5	29.1	37.1	3.6	10.0	54.2	56.1	74.0	19.8	17.9
3.	2738.55	BB	47.0	46.8	30.7	37.0	4.5	10.0	55.2	55.0	74.0	18.8	19.0
4.	3651.39	BB	52.3	44.1	32.3	36.7	5.2	0.9	54.0	45.8	74.0	20.0	28.2
5.	4564.24	BB	46.1	44.2	34.0	35.2	5.9	0.7	51.5	49.6	74.0	22.5	24.4
6.	5477.09	BB	45.2	43.9	35.9	36.3	6.4	0.9	52.1	50.8	74.0	21.9	23.2
7.	6389.94	BB	46.3	46.2	37.3	36.5	7.0	0.2	54.3	54.2	74.0	19.7	19.8
8.	7302.79	BB	44.8	44.9	38.4	36.8	7.6	0.5	54.5	54.6	74.0	19.5	19.4
9.	8215.64	BB	44.9	45.1	38.0	37.0	8.2	0.6	54.7	54.9	74.0	19.3	19.1
10.	9128.48	BB	44.7	45.5	39.3	37.0	8.6	0.4	56.0	56.8	74.0	18.0	17.2

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ANTENNA:KHA-01(SAS-200 571)1-18GHz

■CABLE:KCC-D7/D13■PREAMP:KAF-02(8449B)■EMI RECEIVER:KTR-0(ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK-1

Applicant : HORI CO.,LTD.
 Kind of Equipment : GAME CONTROLLER
 Model No. : UHP2-109
 Serial No. : S1
 Power : DC3.5V
 Mode : Transmitting CH8:926.3652MHz
 Remarks :
 Date : 1/19/2004
 Test Distance : 3 m
 Temperature : 21 °C
 Humidity : 32 %
 Regulation : FCC Part15C § 15.209(AV Detection)

Engineer : Ichiro Isozaki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR	AMP GAIN	CABLE LOSS	ATTEN.	RESULT		LIMITS	MARGIN	
			HOR	VER					HOR	VER		HOR	VER
			[dB μV]		[dB/m]	[dB]	[dB]	[dB]	[dB μV/m]		[dB μV/m]	[dB]	
1.	1179.61	BB	50.8	46.4	25.6	38.1	3.0	10.0	51.3	46.9	54.0	2.7	7.1
2.	1852.73	BB	40.9	47.0	29.3	37.0	3.6	10.0	46.8	52.9	54.0	7.2	1.1
3.	2779.10	BB	42.0	38.6	30.7	37.0	4.6	10.0	50.3	46.9	54.0	3.7	7.1
4.	3705.46	BB	45.8	46.0	32.5	36.6	5.3	0.9	47.9	48.1	54.0	6.1	5.9
5.	4631.83	BB	37.9	33.7	34.4	35.2	6.0	0.7	43.8	39.6	54.0	10.2	14.4
6.	5558.19	BB	35.7	32.1	36.1	36.3	6.5	0.8	42.8	39.2	54.0	11.2	14.8
7.	6484.56	BB	38.4	36.5	37.3	36.5	7.1	0.2	46.5	44.6	54.0	7.5	9.4
8.	7410.92	BB	32.4	32.4	38.7	36.9	7.6	0.5	42.3	42.3	54.0	11.7	11.7
9.	8337.29	BB	32.4	32.5	38.1	37.0	8.2	0.6	42.3	42.4	54.0	11.7	11.6
10.	9263.65	BB	32.6	32.7	39.2	37.0	8.6	0.4	43.8	43.9	54.0	10.2	10.1

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ANTENNA:KHA-01(SAS-200 571)1-18GHz

■CABLE:KCC-D7/D13■PREAMP:KAF-02(8449B)■EMI RECEIVER:KTR-0(ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 24DE0265-YK-1

Applicant : HORI CO.,LTD.
 Kind of Equipment : GAME CONTROLLER
 Model No. : UHP2-109
 Serial No. : S1
 Power : DC3.5V
 Mode : Transmitting CH8:926.3652MHz
 Remarks :
 Date : 1/19/2004
 Test Distance : 3 m
 Temperature : 21 °C
 Humidity : 32 %
 Regulation : FCC Part15C § 15.209(PK Detection)

Engineer : Ichiro Isozaki

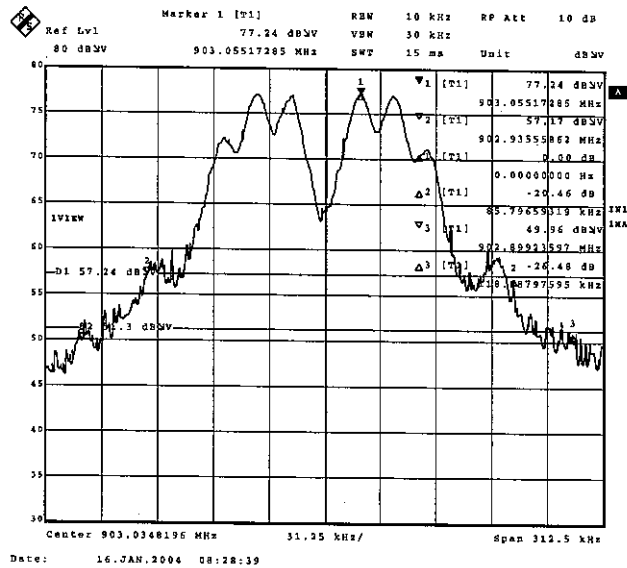
No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	1179.61	BB	54.2	51.8	25.6	38.1	3.0	10.0	54.7	52.3	74.0	19.3	21.7
2.	1852.73	BB	47.3	51.2	29.3	37.0	3.6	10.0	53.2	57.1	74.0	20.8	16.9
3.	2779.10	BB	48.1	46.8	30.7	37.0	4.6	10.0	56.4	55.1	74.0	17.6	18.9
4.	3705.46	BB	50.4	50.2	32.5	36.6	5.3	0.9	52.5	52.3	74.0	21.5	21.7
5.	4631.83	BB	45.9	44.9	34.4	35.2	6.0	0.7	51.8	50.8	74.0	22.2	23.2
6.	5558.19	BB	44.6	43.9	36.1	36.3	6.5	0.8	51.7	51.0	74.0	22.3	23.0
7.	6484.56	BB	45.5	45.8	37.3	36.5	7.1	0.2	53.6	53.9	74.0	20.4	20.1
8.	7410.92	BB	43.9	44.1	38.7	36.9	7.6	0.5	53.8	54.0	74.0	20.2	20.0
9.	8337.29	BB	43.9	45.5	38.1	37.0	8.2	0.6	53.8	55.4	74.0	20.2	18.6
10.	9263.65	BB	45.4	45.4	39.2	37.0	8.6	0.4	56.6	56.6	74.0	17.4	17.4

CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

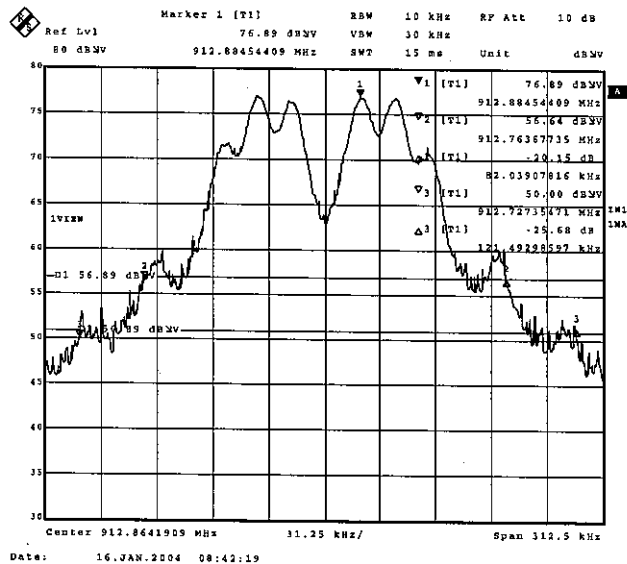
■ANTENNA:KHA-01(SAS-200 571)1-18GHz

■CABLE:KCC-D7/D13■PREAMP:KAF-02(8449B)■EMI RECEIVER:KTR-0(ES140)

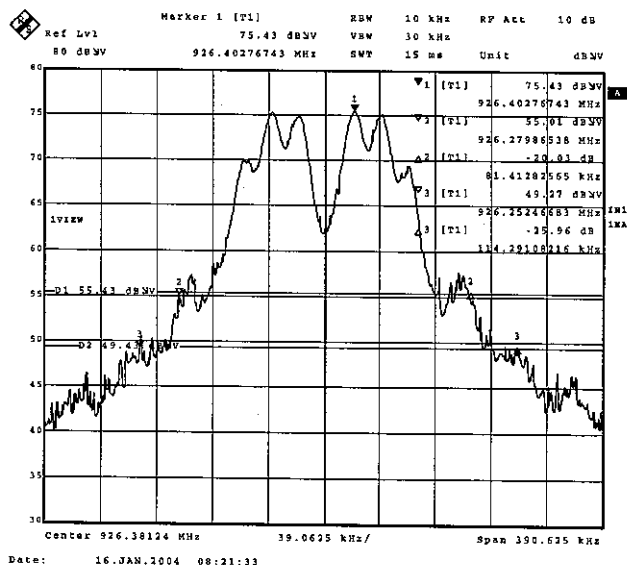
1. Ch Low:903.018MHz



2. Ch Mid:912.8484MHz



3. Ch High:926.3652MHz



Test Report No : 24DE0265-YK-1

APPENDIX 3 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
KAEC-01(NSA)	Anechoic Chamber	JSE	Semi 3m	RE	2003/09/07 * 12
KAF-02	Pre Amplifier	Hewlett Packard	8449B	RE	2003/05/08 * 12
KAF-05	Pre Amplifier	Agilent	8447D	RE	2003/06/12 * 12
KAT10-S1	Attenuator	Agilent	8449D 010	RE	2003/04/18 * 12
KAT6-01	Attenuator	INMET	18N-6dB	RE	2003/05/12 * 12
KBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2003/02/06 * 12
KCC-A1/A3	Coaxial Cable	Fujikura	5D-2W	CE/RE	2003/07/25 * 12
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	RE	2003/08/11 * 12
KLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2003/02/06 * 12
KLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE(EUT)	2003/09/19 * 12
KTR-01	Test Receiver	Rohde & Schwarz	ES140	CE/RE	2003/07/25 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	CE/RE	2003/09/17 * 12
KCC-D7/D13	Coaxial cable	Advantest/Suhuner	A01002/SUCOFLEX1 04	RE	2003/04/18 * 12
KFL-01	Highpass Filter	Hewlett Packard	84300 80038	RE	2003/04/18 * 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,