

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 Isozal

Approved by:

Osamu Watatani

Site Manager of Yamakita Lab.

UL Apex Co., Ltd. YAMAKITA EMC LAB. 907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

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Issued date	: January 22, 2004

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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

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.

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
Α	Game Controller	UHP2-109	S1	HORI CO., LTD.	RQZUHP2-109	EUT
В	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 ± 1.3 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 ± 4.8 dB. The measurement uncertainty (with 95% confidence level) for this test using Logperiodic antenna is ± 5.2 dB. The measurement uncertainty (with 95% confidence level) for this test using Horn antenna is ± 6.6 dB.

The result is within Yamakita EMC lab's uncertainty.

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

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 ≤ 1 GHz. X was worst in these positions under the horizontal antenna polarization and X was worst in these po

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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Conducted emission





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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 - ji

Applicant Kind of Equipment Model No. Serial No. Power Mode Remarks Date Phase Temperature Humidity Regulation				IORI CO IAME CO IHP2-10 C3.5V(Transmi /20/20 Single 1 C I3 % TCC Par	, LTD NTROLI 9 AC120 tting 04 Phase t15C	_ER //60Hz) CH1:90 § 15. 20	3. 0180 7. (CIS	MHz Eng PR Pub.	ineer 22)	.: 1	chiro	lsozak	i		
No.	FREQ.	READI	NG (N)	READI	NG (L1)	LISN	CABLE	ATTEN.	RES	ULT		ITS	MAR	MARGIN	
	[MHz]	[dB	uV]	[dB	uV]	[dB]	[dB]	[dB]	dBu	V]	dBu	V]	Qr [d	B]	
1. 2. 3. 4. 5. 6.	0. 1885 0. 3763 0. 5607 0. 7504 1. 8839 2. 2600	59.7 42.5 40.1 33.2 24.8 32.7	52. 7 32. 1 33. 0 25. 9 14. 2 21. 9	59. 2 42. 2 40. 1 35. 0 30. 7 36. 1	52. 330. 333. 127. 619. 624. 2	0. 1 0. 1 0. 1 0. 1 0. 1 0. 1	0.0 0.1 0.1 0.1 0.1 0.1	0.0 0.0 0.0 0.0 0.0 0.0 0.0	59. 8 42. 7 40. 3 35. 2 30. 9 36. 3	52. 8 32. 3 33. 3 27. 8 19. 8 24. 4	$\begin{array}{c} 64.\ 1\\ 58.\ 4\\ 56.\ 0\\ 56.\ 0\\ 56.\ 0\\ 56.\ 0\\ 56.\ 0\end{array}$	54. 148. 446. 046. 046. 046. 0	4. 3 15. 7 15. 7 20. 8 25. 1 19. 7	1.3 16.1 12.7 18.2 26.2 21.6	

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

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

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DATA OF CONDUCTION TEST

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		
Serial No.	S1		
Power :	DC3. 5V (AC120V/60Hz)		
Mode :	Transmitting CH1:903,0180MHz	Z	
Remarks :	-		
Date :	1/20/2004		
Phase :	Single Phase		
Temperature	21 °C	Engineer	: Ichiro Isozaki
Humidity :	33 %	0	
Regulation :	FCC Part15C § 15. 207. (CISPR	Pub. 22)	



DATA OF CONDUCTION TEST CHART

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

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 0180MH	Z		
Remarks				
Date	: 1/20/2004			
Temperature	: 21 °C	Engineer	: Ichiro Isoza	iki
Humidity	: 33 %			
Regulation 1	: FCC Part15C § 15. 207. (CISPR	Pub. 22)		
Regulation 2	: None	•		



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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	1			
Date	: 1/20/2004			
Temperature	: 21 ℃	Engineer	: Ichiro Isozaki	
Humidity	: 33 %	•		
Regulation 1	: FCC Part15C § 15.207. (CISPR	Pub. 22)		
Regulation 2	: None			



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DATA OF CONDUCTION TEST CHART

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

Applicant	: HORI CO., LTD.		100010102	DECECC IN
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 ℃	Engineer	: Ichiro Isoza	iki
Humidity	: 33 %	•		
Regulation 1	: FCC Part15C § 15. 207. (CISPR P	ub. 22)		
Regulation 2	: None	•		



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

Appli Kind Model Seria Power Mode Remar Date Test	cant of Equ No. I No. ks Distan	ipment ce		HOR GAMI UHP2 S1 DC3. Trai 1/1! 3 m	CO., L E CONTR 2-109 .5V nsmitti 5/2004	TD. OLLER ng CH1	903. 0	180MHz	:				
Temperature Humidity Regulation			:	20 38 FCC	°C % Part15	C § 15	5. 249 (a) Funda	Engineer mental(D::	: 3m)	lchiro	lsozal	ci
No. FREQ. ANT TYPE [MHz]		READI HOR [dB µ	NG VER V]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR V [dBµV/n	[/ER n] [d]	LIMITS BµV/m]	MAR HOR [d	GIN VER B]	
1.	84. 1	76.8	22.4	28.8	3.4	6.1	87.2 7	79.9	93. 9	6.7	14.0		

CALCULATION: READING $[dB \mu V]$ + 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) ■ EM1 RECEIVER: KTR-01 (ES140)

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

Appli Kind Model Seria Power Mode Remar Date Test	cant of Equ No. 1 No. ks Distan	ipment		HORI GAME UHP2- S1 DC3.! Tran: 1/15, 3 m	CO.,L CONTRO -109 5V smittin /2004	TD. DLLER ng CH C	5:912.8	484MHz					·
Temperature Humidity Regulation				20 °C 38 % FCC	C 6 Part15(C § 15	5. 249 (a) Funda	Engineer mental(D::	: 3m)	lchiro	lsozal	ki
No. FREQ. ANT TYPE [MHz]			READIN HOR [dB μ V	G VER F] [ANT ACTOR dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR V [dB µ V/n	[] /ER n] [d]	LIMITS BµV/m]	MAR HOR [d	GIN VER B]
1.	912. 85	BB	83.5 7	9.4	22. 5	28.8	3.4	6. 1	86.7 8	32.6	93.9	7.2	11.3

CALCULATION: READING $[dB \mu V]$ + 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) ■ EM1 RECEIVER: KTR-01 (ES140)

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

Appli Kind Model Seria Power Mode Remar Date Test	cant of Equ No. 1 No. ks Distan	ipmen ce	t	HOR GAM UHP: S1 DC3 Trai 1/1: 3 m	CO.,L E CONTR 2-109 .5V nsmitti 5/2004	TD. OLLER ng CH8	3:926.3	652 M Hz	<u>.</u>				
lempe Humid Regul	rature ity ation			20 38 FCC	°C % Part15	C § 15	5. 249 (a) Funda	Engineer mental(D	: 1:3m)	lchiro	Isozal	KI
No.	FREQ.	ANT	READI	NG	ANT	AMP	CABLE	ATTEN.	RESU	LT	LIMITS	MAR	GIN
	[MHz]	ITPE	dB μ	V ^{PER}	[dB/m]	[dB]	[dB]	[dB]	HOR [dBμV	/m] [d	BμV/m]	HOK [d	VER [B]
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 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) ■ EM1 RECEIVER: KTR-01 (ES140)

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

Appli Kind Nodel Seria Power Mode Remar Date Test Tempe Humid Regul	cant of Equ No. I No. ks Distan rature lity ation	ipmen [.] ce	t	HOR GAM UHP S1 DC3 Tra 1/1 3 m 21 41 FCC	CO.,L E CONTR 2-109 .5V nsmitti 6/2004 ℃ % Part15	TD. OLLER ng CH C § 18	1 : 903. 0 5. 209	180NHz	Engineer	r :	Ichiro	Isoza	ki
No.	FREQ. [MHz]	ANT TYPE	READ HOR [dB µ	ING VER vV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESU HOR [dBµV	JLT VER //m] [d	LIMITS BµV/m]	MAI HOR [(RGIN VER BB]
1. 2. 3. 4. 5. 6.	107. 98 165. 86 377. 97 431. 97 589. 79 884. 70	BB BB BB BB BB BB	31.5 31.0 35.9 39.5 45.9 41.5	$\begin{array}{c} 33.\ 4\\ 26.\ 7\\ 36.\ 5\\ 33.\ 6\\ 44.\ 4\\ 36.\ 7\end{array}$	11.5 15.5 16.5 17.6 19.7 22.3	28. 3 28. 0 28. 2 28. 7 29. 2 28. 8	1.1 1.3 2.1 2.2 2.7 3.4	6. 1 6. 1 6. 1 6. 1 6. 1 6. 1	21.925.932.436.745.244.5	23. 8 21. 6 33. 0 30. 8 43. 7 39. 7	43.5 43.5 46.0 46.0 46.0 46.0	21.617.613.69.30.81.5	19. 7 21. 9 13. 0 15. 2 2. 3 6. 3

CALCULATION: READING [dB μ V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB]. **MANTENNA: KBA-03 (BBA9106) 30-299. 99NHz/KLA-03 (USLP9143) 300-1000MHz MANTENNA: KCC-A1/A3 PREAMP: KAF-05 (8447D) MEMI** RECEIVER: KTR-01 (ES140)

DATA OF RADIATION TEST UL Apex Co.,Ltd.

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

Applicant Kind of Equipment Model No.	: HORI CO., LTD. : GAME CONTROLLER : UHP2-109		
Power Mode	DC3.5V Transmitting CH1:903.018	OMHz	
Remarks Date	1/16/2004		
Temperature Humidity Regulation	- 3 m 21 °C 41 % FCC Part15C §15.209	Engineer	: Ichiro Isozaki



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

Appli Kind Model Seria Power Mode Remar Date Test Tempe Humid Regul	cant of Equ No. I No. ks Distan rature ity ation	ipmen [.] ce	t	HOR GAM UHP S1 DC3 Tra 1/1 3 m 21 41 FCC	CO.,L E CONTR 2-109 .5V nsmitti 6/2004 ℃ % Part15	TD. OLLER ng CH6	5:912.8 5.209	484MHz	z Enginee	r	lchiro	Isoza	ki
No.	FREQ. [MHz]	ANT TYPE	READ HOR [dB µ	ING VER V]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RES HOR [dB µ	ULT VER V/m] [4	LIMITS dBµV/m]	MAH HOR [c	RGIN VER JB]
1. 2. 3. 4. 5. 6.	107. 98 165. 86 377. 97 431. 97 589. 79 884. 70	BB BB BB BB BB BB	33. 5 30. 7 36. 3 39. 6 46. 4 42. 5	33. 3 27. 1 36. 2 34. 0 41. 5 40. 1	11. 5 15. 5 16. 5 17. 6 19. 7 22. 3	28. 3 28. 0 28. 2 28. 7 29. 2 28. 8	1.1 1.3 2.1 2.2 2.7 3.4	6. 1 6. 1 6. 1 6. 1 6. 1 6. 1	$\begin{array}{c} 23.9\\ 25.6\\ 32.8\\ 36.8\\ 45.7\\ 45.5\end{array}$	23. 7 22. 0 32. 7 31. 2 40. 8 43. 1	43.5 43.5 46.0 46.0 46.0 46.0	19.6 17.9 13.2 9.2 0.3 0.5	19.8 21.5 13.3 14.8 5.2 2.9

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) ■ EM1 RECEIVER: KTR-01 (ES140)

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

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



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

Appli Kind Model Seria Power Mode Remar Date Test	cant of Equ No. I No. ks Distan	ipment	t	HOR GAM UHP S1 DC3 Trai 1/1 3 m	CO.,L E CONTR 2-109 .5V nsmitti 6/2004	TD. OLLER ng CH8	3:926.3	652 N Hz					
lempe Humid Regul	rature ity ation			21 41 FCC	°C % Part15	C § 1!	5. 209		Enginee	r	: Ichiro	lsoza	κı
No.	FREQ. [MHz]	ANT TYPE	READ HOR [dB µ	ING VER v]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESU HOR [dB µ \	JLT VER V/m] [LIMITS dBµV/m]	MAH HOR [c	RGIN VER 1B]
1. 2. 3. 4. 5. 6.	107. 98 165. 86 377. 97 431. 97 589. 79 884. 70	BB BB BB BB BB BB	33. 4 32. 4 36. 3 39. 2 46. 3 40. 6	$\begin{array}{c} 33.1\\ 26.7\\ 36.0\\ 34.1\\ 41.9\\ 36.4 \end{array}$	11. 5 15. 5 16. 5 17. 6 19. 7 22. 3	28. 3 28. 0 28. 2 28. 7 29. 2 28. 8	1.1 1.3 2.1 2.2 2.7 3.4	6. 1 6. 1 6. 1 6. 1 6. 1 6. 1	23.827.332.836.445.643.6	$\begin{array}{c} 23.5\\ 21.6\\ 32.5\\ 31.3\\ 41.2\\ 39.4 \end{array}$	43. 5 43. 5 46. 0 46. 0 46. 0 46. 0	19.7 16.2 13.2 9.6 0.4 2.4	20. 0 21. 9 13. 5 14. 7 4. 8 6. 6

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) ■ EM1 RECEIVER: KTR-01 (ES140)

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	Engineer	: Ichiro Isozaki
Humidity	41 %		
Regulation :	FCC Part15C § 15. 209		



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

Appl Kind Seri Powe Rema Date Test Temp Humi Regu	licant d of Equ el No. ial No. er arks barks barks distand berature idity ulation	ipmen ce	t	HOR GAM UHP S1 DC3 Tra 1/1 3 m 21 32 FCC	l CO.,L E CONTR 2-109 .5V nsmitti 9/2004 °C % Part15	TD. OLLER ng CH1 C § 15	1 : 903. 0 5. 209 (A	180MHz Ē V Detec	Enginee stion)	r :	lchiro	lsoza	ki
No.	FREQ.	ANT	REAL	DING	ANT	AMP	CABLE	ATTEN.	RESU	JLT	LIMITS	MAI	RGIN
	[MHz]	TYPE	HOR [dB]	νεκ μ V]	FACTOR [dB/m]	GA1N [dB]	LOSS [dB]	[dB]	$\frac{HOR}{[dB \mu]}$	VER //m] [c	lBμV/m]	HOR	VER iB]
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. 9	1806.04	DD DD	42.7	42. Z	29.0	37.1	3.6	10.0	48.2	47.7	54.0	5.8	6.3
з. А	2709.00	DD RR	42.0 AQ A	30,9 AA 8	30.7	36.7	4.0 5.9	10.0	50.8	45.1 46.4	54,0 54,0	3.2	8.9 76
5	4515 09	RR	36.8	34 1	33.8	35.2	59	1.0 0.7	42 0	40.4	54.0 54.0	12 0	1.0
6.	5418.11	BB	34.7	32.4	35.9	36.2	64	0.1	41.6	39.3	54.0	12.0	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 $[dB \mu V]$ + 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) ■EM1 RECEIVER:KTR-0 (ES140)

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

Appl Kind Seri Powe Rema Date Test Temp Humi Regu	licant d of Equ el No. ial No. er arks d Distand berature idity ulation	ipmen ce	t	HOR GAMI UHP: S1 DC3. Trai 1/19 3 m 21 32 FCC	l CO., L E CONTR 2-109 5V nsmitti 9/2004 PC Part15	TD. OLLER ng CH1 C §15	: 903. 0 5. 209 (P	180MHz Ē K Detec	nginee stion)	r :	lchiro	Isoza	ki
No.	FREQ.	ANT	REAL	DING	ANT	AMP	CABLE	ATTEN.	RESU	ULT	LIMITS	MAH	GIN
	[MHz]	TYPE	HOR [dB	νer μV]	FACTOR [dB/m]	GAIN [dB]	LOSS [dB]	[dB]	HOR [dB µ \ 	VER V/m] [c	∃BµV/m]	HOR	VER IB]
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. 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
э. Л	2612 07	DD RR	40.1 52 7	40.9	20.7	36.7	4.5	10.0	50.3 54 3	54. 1 40. 0	74.0	16.7	19.9
5.	4515.09	BB	45.9	45.1	33 8	35.2	59	0.7	51 1	49,9 50 3	74.0	19.7 99 Q	24.1
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 $[dB \mu V]$ + 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) ■ ENI RECEIVER: KTR-0 (ES140)

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

Appl Kind Seri Powe Rema Date Test Temp Humi Regu	licant Jof Equ Jof Equ I No. Jal No. Pr Arks Distan Derature Idity Jation	ipmen ce	t	HOR GAM UHP S1 DC3 Tra 1/1 3 m 21 32 FCC	l CO.,L E CONTR 2-109 .5V nsmitti 9/2004 °C % Part15	TD. OLLER ng CH(C §1{	5:912.8 5.209 (A	484MHz V Dete	Engineer ction)	:	Ichiro	Isoza	ki	
No.	FREQ.	ANT TVDE	READ	ING	ANT		CABLE	ATTEN.	RESU	LT	LIMITS	MAH	GIN	
	[MHz]		[dB]	u V]	[dB/m]	[dB]	[dB]	[dB]	[dB μ V	/m] [d	BµV/m]	HOR [c	IB]	
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	
Z.	1825.70	BB	43.0	45.2	29.1	37.1	3.6	10.0	49.2	50.8	54.0	4.8	3.2	
ง. 1	2730.00		41.4	31.0	30.7	37.0	4.5	10.0	49.4	40.0	54.0	4.6	8.0	
4. 5	A56A 9A	BR	28 8	33 0	34.0	35.7	5.Z	0.9	01.0 11 9	41.1 90 1	54.U	2.2	0.3 15 C	
6	5477 09	RR	36 4	32 0	34.0 35.0	36.3	5.9 6.4	0.1	44.4	20.4	54.0	9.0	10.0	
7.	6389.94	BB	38 7	36.9	37.3	36.5	7.0	0.9	46 7	14 Q	54.0 54.0	73	14.2 Q 1	
8.	7302.79	Β̈́Β	32.5	32.5	38.4	36.8	7.6	0.2	42.2	$\frac{11.9}{42.2}$	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 μ V] + 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) ■ENI RECEIVER:KTR-0 (ESI40)

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

App Kin Nod Ser Pow Mod Rem Dat Tes Tem Hum Reg	licant d of Equ el No. ial No. er e arks e t Distand perature idity ulation	ipmen ce	ŧt	HOR GAM UHP S1 DC3 Trai 1/19 3 m 21 32 FCC	CO.,L E CONTF 2-109 .5V nsmitti 9/2004 ℃ % Part15	.TD. ROLLER ng CH6 5C § 15	5:912.8 5.209(P	484MHz Ē K Detec	nginee tion)	r :	lchiro	Isoza	ki
No.	FREQ. [MHz]	ANT TYPE	REAL HOR [dB]	DING VER µV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESI HOR [dB µ]	ULT VER V/m] [d	LIMITS BµV/m]	MAI HOR	RGIN VER HB]
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	$\begin{array}{c} 1179.\ 61\\ 1825.\ 70\\ 2738.\ 55\\ 3651.\ 39\\ 4564.\ 24\\ 5477.\ 09\\ 6389.\ 94\\ 7302.\ 79\\ 8215.\ 64\\ 9128.\ 48 \end{array}$	BB BB BB BB BB BB BB BB BB BB	$54.5 \\ 48.6 \\ 47.0 \\ 52.3 \\ 46.1 \\ 45.2 \\ 46.3 \\ 44.8 \\ 44.9 \\ 44.7 \\ $	50.7 50.5 46.8 44.1 44.2 43.9 46.2 44.9 45.1 45.5	25. 6 29. 1 30. 7 32. 3 34. 0 35. 9 37. 3 38. 4 38. 0 39. 3	38. 1 37. 1 37. 0 36. 7 35. 2 36. 3 36. 5 36. 8 37. 0 37. 0	3.0 3.6 4.5 5.2 5.9 6.4 7.0 7.6 8.2 8.6	$10.0 \\ 10.0 \\ 10.0 \\ 0.9 \\ 0.7 \\ 0.9 \\ 0.2 \\ 0.5 \\ 0.6 \\ 0.4$	55.054.255.254.051.552.154.354.554.756.0	51.2 56.1 55.0 45.8 49.6 50.8 54.2 54.6 54.9 56.8	74.0 74.0 74.0 74.0 74.0 74.0 74.0 74.0	19. 0 19. 8 18. 8 20. 0 22. 5 21. 9 19. 7 19. 5 19. 3 18. 0	22.8 17.9 19.0 28.2 24.4 23.2 19.8 19.4 19.1 17.2

CALCULATION: READING $[dB \mu V]$ + 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) ■ENI RECEIVER:KTR-0 (ES140)

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

Appl Kind Seri Powe Rema Date Test Temp Humi Regu	licant l of Equ l No. ial No. er arks Distan perature idity llation	ipmen ce	t .	: HOR : GAMI : UHP2 : S1 : DC3. : Trai : 1/19 : 3 m : 21 : 32 f : FCC	l CO.,L E CONTR 2-109 .5V nsmitti 9/2004 °C % Part15	TD. OLLER ng CH8 C § 15	3: 926. 3 5. 209 (A	652MHz Ē V Detec	ngineen tion)	r :	lchiro	Isoza	ki
No.	FREQ.	ANT	REAL	ING	ANT	AMP	CABLE	ATTEN.	RESU	ILT VED	LIMITS	MAI	RGIN
	[MHz]	1116	[dB]	и V]	[dB/m]	[dB]	[dB]	[dB]	$\begin{bmatrix} dB \ \mu \end{bmatrix}$	VER //m] [c	lBμV/m]	нок [с	IB]
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. 2	1852.73	DD DD	40.9	47.0	29.3	37.0	3.6	10.0	46.8	52.9	54.0	7.2	$\frac{1.1}{7}$
э. 1	3705 46	BB	42.0	30.0 46 0	১৩.7 ২৭ ম	36.6	4.0	10.0	50.3 47 0	40.9	54.0 54.0	3.7 6 1	7.1 5.0
5.	4631.83	BB	37.9	$\frac{10.0}{33.7}$	34.4	35.2	6.0	0.9	43.8	39 6	54.0 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	10.2 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 $[dB \mu V]$ + 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) ■ EN1 RECEIVER: KTR-0 (ES140)

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

Applicant Kind of Equipment Model No. Serial No. Power Mode Remarks Date Test Distance Temperature Humidity Regulation			HOR GAM UHP S1 DC3 Tra 1/1 3 m 21 32 FCC	HORI CO., LTD. GAME CONTROLLER UHP2-109 S1 DC3.5V Transmitting CH8:926.3652MHz 1/19/2004 3 m 21 °C Engineer : Ichiro Isozaki 32 % FCC Part15C § 15.209 (PK Detection)								ki	
No.	FREQ.	ANT TYPE	READ HOR	ING VER	ANT FACTOR	AMP GAIN	CABLE LOSS	ATTEN.	RESU	JLT VER	LIMITS	MAI HOR	RGIN VER
	[MHz]		[dB /	u V]	[dB/m]	[dB]	[dB]	[dB]	[dB µ V	//m] [d	BμV/m]	[iB]
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
ટ. ૧	2770 10	BB	41.3	91.Z	29.3	37.0	3.0 16	10.0	53. Z 56 4	57.1	74.0	20.8	16.9
4.	3705.46	BB	50.4	$\frac{10.8}{50.2}$	32.5	36.6	4.0 5.3	0.9	50.4 52.5	52.3	74.0	21.0	10.9 91 7
5.	4631.83	BB	45.9	44.9	34.4	35.2	6.0	0.7	51.8	50.8	74.0	21.0 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.	9203.05		43.4	45.4		37.U	ა. ზ 	0.4	56. 6 	55,6	74.0	17.4	17.4

CALCULATION: READING [dB μ V] + 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) ■ ENI RECEIVER:KTR-0 (ESI40)

FCC ID: Job No: 24DE0265-YK-1

1. Ch Low:903.018MHz



2. Ch Mid:912.8484MHz



3. Ch High:926.3652MHz



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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
KAF05	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	ESI40	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
		1			

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,